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ATOMIC DATA FOR CONTROLLED FUSION RESEARCH

VOLUME IV

"SPECTROSCOPIC DATA FOR IRON"

W. L. Wiese, Editor

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SERIES PREFACE

The primary objective of the Controlled-Fusion Atomic Data Center at Oak Ridge National Laboratory is to publish handbooks containing numerical and graphical cross sections and other physical data relevant to fusion energy research. In 1977, a two-volume compilation was published as ORNL reports ORNL-5206 and ORNL-5207. Since that time, a large volume of pertinent data has become available, necessitating an update of the previous compilation. Plans are to include both cross sections and rate coefficients for collisional processes, and to publish the revised series in handbook form. The specific volumes which are in preparation are listed below, with their expected completion dates.

Vol. 1, "Collisions of H, H_2, He, and Li Atoms and Ions with Atoms and Molecules," C. F. Barnett, ORNL (January 1986).

Vol. 2, "Collisions of Electrons with Atoms and Molecules," J. W. Gallagher, Joint Institute for Laboratory Astrophysics; and C. F. Barnett, ORNL (October 1985).

Vol. 3, "Particle Interactions with Surfaces," E. W. Thomas, Georgia Institute of Technology (January 1985).

Vol. 4, "Spectroscopic Data for Iron," W. L. Wiese, National Bureau of Standards (March 1985).

Vol. 5, Collisions of Carbon and Oxygen Ions with Electrons, H, H_2, and He," R. A. Phaneuf, ORNL; R. K. Janev, Institute of Physics, Yugoslavia; and M. S. Pindzola, Auburn University (March 1986).

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Spectroscopic Data for Iron

W. L. Wiese, Editor

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ABSTRACT

Comprehensive spectroscopic data tables are presented for all ions of Fe. Tables of ionization potentials, wave lengths of spectral lines, atomic energy levels, and transition probabilities are given which were excerpted from general critical compilations. All utilized compilations are less than five years old and include data on electric dipole as well as magnetic dipole transitions.

A. Introduction

This compendium contains a collection of recent spectroscopic data tables for iron, which—as a widely used first-wall material for magnetic fusion devices—has become of great importance for the assessment of the effects of plasma impurities and plasma-wall interactions as well as for the application of several plasma diagnostic techniques.

Numerical data are tabulated for spectroscopic quantities which are of principal importance for such impurity studies and plasma diagnostics, specifically:

Ionization energies,
Wavelengths,
Atomic energy levels, and
Atomic transition probabilities.

The majority of the critical evaluation and compilation work for these data has been done at the National Bureau of Standards. Most tables are parts of larger tabulations[1-4] containing many other chemical elements besides iron. Excerpting the iron data from these larger compilations required some modifications in the reprinted material, especially the modification of the introductory material with comments and explanations that specifically pertain to the iron spectra. All of the material is of very recent vintage, less than four years old, and one tabulation is still in the process of being published, all under the sponsorship of the National Standard Reference Data System (NSRDS).

However, the different tabulations have been completed at different times. Thus where data overlap, mainly on energy levels and wavelengths, they are sometimes based on different material. Also, there may occasionally be different judgments, by independent evaluators, on the quality of the source material. Thus, some inconsistencies in this overlapping material are found. For example, wavelengths which may be derived from the atomic energy levels of Section E may not always be fully consistent with directly observed line wavelengths in the wavelength tables of Sections C and D. Also, there may be slight inconsistencies in the energy level data contained in the wavelength and transition probability tables as compared with the energy level table itself. But these differences are so small that they should not matter for any plasma applications, and therefore the use of any of these recent tabulations is appropriate. However, we generally recommend using the *primary* tables to obtain data on a specific atomic quantity.

This compendium is divided into six sections—A through F—each having its own pagination. Since the book is prepared in a looseleaf format, it is possible to exchange each section separately with a new tabulation if one should become available in the future. It is our intention to provide such updates infrequently when this is warranted.The editor acknowledges the cooperation of the data compilers and the NSRDS editing staff, which has provided the lists of vacuum ultraviolet lines prior to publication. Also, the permission of NSRDS, as well as that of the American Institute of Physics and the American Chemical Society, to reprint excerpts of these tables is gratefully acknowledged.

References

1. J. Reader, C. H. Corliss, W. L. Wiese, and G. A. Martin, *Wavelengths and Transition Probabilities for Atoms and Atomic Ions,* Nat. Stand. Ref. Data Ser., Nat. Bur. Stand. (U.S), 68, 415 pgs., U. S. Government Printing Office, Washington, DC (1980).
2. R. L. Kelly, *Atomic and Ionic Spectral Lines below 3500 Å (H through Kr),* to be published in J. Phys. Chem. Ref. Data, Supplement.
3. C. H. Corliss and J. Sugar, *Energy Levels of Iron, Fe I through Fe XXVI,* J. Phys. Chem. Ref. Data **11,** 135–241 (1982).
4. J. R. Fuhr, G. A. Martin, W. L. Wiese, and S. M. Younger, *Atomic Transition Probabilities for Iron, Cobalt and Nickel (A Critical Data Compilation of Allowed Lines),* J. Phys. Chem. Ref. Data **10,** 305–565 (1981).

B. Ionization Energy of Iron Ions

[Source: C. Corliss and J. Sugar, J. Phys. Chem. Ref. Data **11**, 135 (1982)]

Spectrum	Ground State Configuration	Ground Level	Ionization Energy (eV)
Fe I	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^6 4s^2$	$^5D_4$	7.870
Fe II	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^6 4s$	$^6D_{9/2}$	16.1879
Fe III	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^6$	$^5D_4$	30.652
Fe IV	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^5$	$^6S_{5/2}$	54.8
Fe V	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^4$	$^5D_0$	75.0
Fe VI	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^3$	$^4F_{3/2}$	99.1
Fe VII	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^2$	$^3F_2$	124.98
Fe VIII	$1s^2 2s^2 2p^6 3s^2 3p^6 3d$	$^2D_{3/2}$	151.061
Fe IX	$1s^2 2s^2 2p^6 3s^2 3p^6$	$^1S_0$	233.6
Fe X	$1s^2 2s^2 2p^6 3s^2 3p^5$	$^2P^\circ_{3/2}$	262.1
Fe XI	$1s^2 2s^2 2p^6 3s^2 3p^4$	$^3P_2$	290.3
Fe XII	$1s^2 2s^2 2p^6 3s^2 3p^3$	$^4S^\circ_{3/2}$	330.8
Fe XIII	$1s^2 2s^2 2p^6 3s^2 3p^2$	$^3P_0$	361.0
Fe XIV	$1s^2 2s^2 2p^6 3s^2 3p$	$^2P^\circ_{1/2}$	392.2
Fe XV	$1s^2 2s^2 2p^6 3s^2$	$^1S_0$	457.0
Fe XVI	$1s^2 2s^2 2p^6 3s$	$^2S_{1/2}$	489.264
Fe XVII	$1s^2 2s^2 2p^6$	$^1S_0$	1262.2
Fe XVIII	$1s^2 2s^2 2p^5$	$^2P^\circ_{3/2}$	1362
Fe XIX	$1s^2 2s^2 2p^4$	$^3P_2$	1469
Fe XX	$1s^2 2s^2 2p^3$	$^4S^\circ_{3/2}$	1582.0
Fe XXI	$1s^2 2s^2 2p^2$	$^3P_0$	1689
Fe XXII	$1s^2 2s^2 2p$	$^2P^\circ_{1/2}$	1799
Fe XXIII	$1s^2 2s^2$	$^1S_0$	1958.6
Fe XXIV	$1s^2 2s$	$^2S_{1/2}$	2045.8
Fe XXV	$1s^2$	$^1S_0$	8828.14
Fe XXVI	$1s$	$^2S_{1/2}$	9277.65

C. Prominent Spectral Lines for Fe I to Fe V
(Vacuum Ultraviolet to Near Infrared Regions)

C. Prominent Spectral Lines for Fe I to Fe V

(Vacuum Ultraviolet to Near Infrared Regions)

These lists were recently prepared under the auspices of the Committee on Line Spectra of the Elements of the National Academy of Sciences—National Research Council as part of a general wavelength table.[1,2] The tables contain the outstanding spectral lines—from the far ultraviolet to the far infrared—of neutral (I), singly ionized (II), doubly ionized (III), triply ionized (IV), and quadruply ionized (V) iron atoms. The lines are selected from larger lists (see references) in such a way as to include the stronger observed lines in each spectral region.

The data were compiled by Henry M. and Hannah Crosswhite, Argonne National Laboratory (Fe I and Fe II), and Joseph Reader, NBS (Fe III – Fe V). For Fe I and II, the following six literature references were used as the principal sources of data:

H. M. Crosswhite, J. Res. Nat. Bur. Stand. (U. S.) **79A,** 17 (1975).

J. C. Dobbie, Ann. Sol. Phys. Obs. Cambridge **5, 1** (1938).

L. C. Green, Phys. Rev. **55,** 1209 (1939).

S. Johansson and U. Litzen, Phys. Scr. **10,** 121 (1974).

U. Litzen and J. Verges, Phys. Scr. **13,** 240 (1976).

H. N. Russell, C. E. Moore, and D. W. Weeks, Trans. Am. Philos. Soc. **34** (Part 2), 111 (1944).

For Fe III, IV and V, the following references were used:

B. Edlen and P. Swings, Astrophys. J. **95,** 532 (1942).

S. Glad, Ark. Fys. **10,** 291 (1956).

J. O. Ekberg and B. Edlen, Phys. Scr. **18,** 107 (1978).

J. O. Ekberg, Phys. Scr. **12,** 42 (1975).

All wavelengths are given in Angstrom units (Å). Below 2000 Å, the wavelengths are in vacuum; above 2000 Å, the wavelengths are in air. Wavelengths given to three decimal places have an uncertainty of less than 0.001 Å and are therefore suitable for the calibration of most spectrometers. The line intensities are estimates of the relative strengths of lines which are not greatly separated in wavelength. Since the intensity scale is in general different for each data source, even within a fairly narrow wavelength range, the intensities tabulated here are useful only as a rough indication of the appearance of a spectrum. Furthermore, in the tables of first and second spectra the intensities of the lines of the singly ionized atom relative to those of the neutral atom should be used with caution, inasmuch as the concentration of the ions in the light source depends greatly on the excitation conditions.

The descriptive symbols used in the tables have the following meaning:

H	–	hazy
L	–	shaded to longer wavelengths
S	–	shaded to shorter wavelengths
P	–	perturbed by a close line
W	–	wide

References

1. J. Reader, C. H. Corliss, W. L. Wiese, and G. A. Martin, *Wavelengths and Transition Probabilities for Atoms and Atomic Ions,* Nat. Stand. Ref. Data Ser., Nat. Bur. Stand. (U.S.), 68, 415 pgs., U. S. Government Printing Office, Washington, D.C. (1980).
2. J. Reader and C. H. Corliss, in *Handbook of Chemistry and Physics,* 64th Edition (R. C. Weast, Ed.), pp. E192 – E318, CRC Press, Inc., Boca Raton, FL (1983).

Iron (Fe)

Z=26

Intensity	Wavelength (Å)	Spectrum
	Fe I and II	
	Vacuum	
12	1055.27	II
15	1068.36	II
15	1071.60	II
15	1096.89	II
12	1099.12	II
18	1112.09	II
12	1121.99	II
12	1122.86	II
12	1128.07	II
12	1130.43	II
15	1133.41	II
12	1133.68	II
12	1138.64	II
12	1142.33	II
12	1143.23	II
18	1144.95	II
12	1147.41	II
15	1148.29	II
12	1151.16	II
12	1267.44	II
12	1272.00	II
12	1371.02	II
12	1563.79	II
12	1580.62	II
18	1608.46	II
12	1618.47	II
15	1621.68	II
15	1629.15	II
15	1631.12	II
18	1635.40	II
15	1636.32	II
15	1639.40	II
12	1641.76	II
12	1647.16	II
12	1670.74	II
12	1702.04	II
12	1761.38	II
20	1785.26	II
20	1786.74	II
18	1788.07	II
30	1934.538	I
25	1937.269	I
50	1946.988	I
25	1951.571	I
30	1952.59	I
30	1953.005	I
60	1957.823	I
60	1960.144	I
30	1961.25	I
50	1962.111	I
12	1963.11	II
	Air	
100	2084.122	I
50	2157.794	I
15	2162.02	II
40	2166.773	I
300	2178.118	I
250	2186.486	I
60	2186.892	I
120	2187.195	I
250	2191.839	I
150	2196.043	I
80	2200.390	I
80	2200.724	I
15	2208.41	II
20	2213.65	II
12	2218.26	II
20	2220.38	II
25	2245.58	II
50	2250.790	I
60	2251.874	I
25	2255.77	II
300	2259.511	I
60	2264.389	I
80	2267.085	I
80	2267.469	I
50	2270.862	I
150	2272.070	I
150	2276.026	I
80	2279.937	I
150	2284.086	I
150	2287.250	I
300	2292.524	I
80	2294.41	I
200	2297.787	I
600	2298.169	I
80	2299.220	I
300	2300.142	I
50	2301.684	I
100	2303.424	I

Intensity	Wavelength (Å)	Spectrum	Intensity	Wavelength (Å)	Spectrum
150	2303.581	I	40	2388.37	II
120	2308.999	I	300	2388.63	II
150	2313.104	I	200	2389.973	I
200	2320.358	I	30	2390.10	II
100	2327.40	II	20	2390.77	II
15	2327.88	II	15	2391.48	II
100	2331.31	II	20	2392.58	II
15	2331.97	II	40	2395.42	II
300	2332.80	II	1000	2395.62	II
200	2338.01	II	15	2396.72	II
600	2343.49	II	300	2399.24	II
80	2343.96	II	20	2400.05	II
150	2344.28	II	15	2401.29	II
25	2344.98	II	50	2404.43	II
50	2345.34	II	800	2404.88	II
200	2348.11	II	250	2406.66	II
250	2348.30	II	80	2406.97	II
50	2351.20	II	300	2410.52	II
15	2351.67	II	200	2411.07	II
25	2352.31	II	50	2411.81	II
30	2353.47	II	150	2413.31	II
15	2353.68	II	20	2416.45	II
50	2354.48	II	80	2417.87	II
40	2354.89	II	15	2418.44	II
200	2359.12	II	60	2420.396	I
15	2359.59	II	60	2422.69	II
150	2360.00	II	60	2423.089	I
120	2360.29	II	40	2423.21	II
30	2360.51	II	150	2424.14	II
40	2362.02	II	15	2424.39	II
60	2363.86	II	30	2424.59	II
200	2364.83	II	30	2428.29	II
80	2365.76	II	120	2428.36	II
25	2366.59	II	25	2428.80	II
80	2368.59	II	25	2429.03	II
80	2369.456	I	20	2429.39	II
80	2369.95	II	30	2429.86	II
25	2370.50	II	120	2430.08	II
120	2371.430	I	25	2431.02	II
300	2373.624	I	80	2432.26	II
150	2373.74	II	60	2432.87	II
120	2374.518	I	25	2434.06	II
60	2375.19	II	20	2434.24	II
120	2376.43	II	20	2434.65	II
20	2378.13	II	50	2434.73	II
80	2379.27	II	50	2434.95	II
20	2379.41	II	25	2436.62	II
40	2380.20	II	60	2438.182	I
120	2380.76	II	150	2439.30	II
150	2381.835	I	150	2439.74	I
1000	2382.04	II	80	2440.11	I
20	2382.90	II	40	2440.42	II
20	2383.06	II	30	2442.37	II
60	2383.25	II	100	2442.57	I
50	2384.39	II	60	2443.71	II

Intensity	Wavelength (Å)	Spectrum
250	2443.872	I
100	2444.51	II
50	2445.11	II
50	2445.212	I
100	2445.57	II
40	2445.80	II
50	2446.11	II
30	2446.47	II
40	2447.20	II
25	2447.33	II
60	2447.709	I
30	2447.75	II
25	2449.96	II
25	2450.20	II
100	2453.476	I
20	2453.98	II
30	2454.58	II
15	2455.71	II
15	2455.90	II
15	2457.09	II
1500	2457.598	I
150	2458.78	II
40	2458.97	II
60	2460.44	II
80	2461.28	II
100	2461.86	II
100	2462.181	I
1500	2462.647	I
50	2463.29	II
50	2463.730	I
40	2464.01	II
40	2464.90	II
800	2465.149	I
50	2465.91	II
15	2466.50	II
60	2466.67	II
60	2466.82	II
60	2467.732	I
15	2468.29	II
600	2468.879	I
60	2469.51	II
25	2470.41	II
80	2470.67	II
80	2470.965	I
800	2472.336	I
40	2472.43	II
40	2472.60	II
1000	2472.895	I
200	2473.16	I
50	2473.32	II
30	2474.05	II
600	2474.814	I
50	2475.12	II
40	2475.54	II
15	2476.26	II
60	2476.657	I
25	2477.34	II
60	2478.57	II
120	2479.480	I
1200	2479.776	I
100	2480.16	II
15	2481.05	II
80	2482.12	II
25	2482.32	II
100	2482.66	II
15	2482.87	II
10000	2483.271	I
300	2483.533	I
15	2483.72	II
1000	2484.185	I
60	2484.24	II
30	2484.44	II
50	2485.990	I
800	2486.373	I
100	2486.691	I
100	2487.066	I
120	2487.370	I
4000	2488.143	I
100	2488.945	I
80	2489.48	II
1000	2489.750	I
50	2489.83	II
50	2489.913	I
3000	2490.644	I
100	2490.71	II
60	2490.86	II
2000	2491.155	I
100	2491.40	II
25	2492.34	II
100	2493.18	II
500	2493.26	II
20	2493.88	II
60	2494.000	I
50	2494.251	I
100	2495.87	I
600	2496.533	I
50	2497.82	II
150	2498.90	I
40	2500.92	II
1000	2501.132	I
40	2501.31	II
50	2501.693	I
60	2502.39	II
40	2503.33	II
20	2503.57	II
60	2503.87	II
80	2506.09	II
40	2506.80	II
500	2507.900	I
30	2508.34	II

Intensity	Wavelength (Å)	Spectrum
50	2508.753	I
1000	2510.835	I
120	2511.76	II
80	2512.275	I
400	2512.365	I
50	2514.38	II
80	2516.570	I
50	2517.13	II
300	2517.661	I
800	2518.102	I
60	2519.05	II
150	2519.629	I
40	2521.09	II
30	2521.82	II
50	2522.480	I
4000	2522.849	I
200	2523.66	I
500	2524.293	I
100	2525.02	I
200	2525.39	II
25	2526.07	II
300	2526.29	II
20	2527.10	II
2000	2527.435	I
30	2527.70	II
20	2528.88	II
20	2529.08	II
800	2529.135	I
25	2529.23	II
80	2529.31	I
250	2529.55	II
150	2529.836	I
40	2530.11	II
200	2530.687	I
20	2531.87	II
120	2533.63	II
60	2533.80	I
100	2534.42	II
120	2535.49	II
400	2535.607	I
60	2536.67	II
200	2536.792	I
200	2536.80	II
50	2536.84	II
50	2537.14	II
50	2538.20	II
40	2538.50	II
20	2538.68	II
100	2538.80	II
100	2538.91	II
150	2538.99	II
50	2539.357	I
20	2540.52	II
200	2540.66	II
600	2540.972	I
80	2541.10	II
60	2541.84	II
300	2542.10	I
25	2542.78	II
60	2543.38	II
250	2543.92	I
150	2544.70	I
40	2544.97	II
40	2545.22	II
20	2545.44	II
800	2545.978	I
40	2546.44	II
80	2546.67	II
80	2546.87	I
20	2548.59	II
100	2548.74	II
80	2549.08	II
80	2549.39	II
60	2549.46	II
600	2549.613	I
40	2549.77	II
60	2550.03	II
25	2550.15	II
50	2550.68	II
40	2560.28	II
25	2562.09	II
400	2562.53	II
200	2563.48	II
20	2566.22	II
60	2566.91	II
25	2570.52	II
30	2570.85	II
150	2574.36	II
50	2575.74	I
300	2576.691	I
25	2576.86	II
60	2577.92	II
50	2582.30	I
100	2582.58	II
1500	2584.54	I
650	2585.88	II
90	2588.00	I
90	2591.54	II
30	2592.78	II
60	2593.51	I
90	2593.73	II
650	2598.37	II
2000	2599.40	II
300	2599.57	I
20	2605.34	II
20	2605.42	II
60	2605.657	I
300	2606.51	II
800	2606.827	I
650	2607.09	II

Intensity	Wavelength (Å)	Spectrum
20	2611.07	II
600	2611.87	II
320	2613.82	II
320	2617.62	II
250	2618.018	I
20	2619.07	II
90	2620.41	II
20	2620.69	II
40	2621.67	II
400	2623.53	I
50	2625.49	II
200	2625.67	II
150	2628.29	II
20	2630.07	II
250	2631.05	II
250	2631.32	II
50	2631.61	II
100	2632.237	I
300	2635.809	I
50	2641.646	I
200	2643.998	I
60	2664.66	II
30	2666.64	II
300	2666.812	I
60	2666.965	I
600	2679.062	I
500	2684.75	II
400	2689.212	I
60	2692.60	II
50	2696.28	I
200	2699.106	I
60	2703.99	II
80	2706.012	I
400	2706.582	I
60	2708.571	I
20	2709.05	II
200	2711.655	I
80	2714.41	II
50	2716.22	II
50	2716.257	I
50	2717.786	I
50	2717.87	II
250	2718.436	I
4000	2719.027	I
100	2719.420	I
50	2720.197	I
1500	2720.903	I
400	2723.578	I
30	2724.88	II
150	2724.953	I
80	2726.05	I
50	2726.235	I
25	2727.38	II
80	2727.54	II
200	2728.020	I
50	2728.820	I
80	2728.90	II
40	2730.73	II
1000	2733.581	I
60	2734.005	I
50	2734.268	I
500	2735.475	I
50	2735.612	I
500	2737.310	I
120	2737.83	I
400	2739.55	II
250	2742.254	I
800	2742.405	I
200	2743.20	II
150	2743.565	I
200	2744.068	I
80	2744.527	I
300	2746.48	II
100	2749.32	II
500	2749.48	II
1200	2750.140	I
20	2751.13	II
20	2752.15	II
80	2753.29	II
50	2753.69	I
150	2754.032	I
100	2754.426	I
30	2754.89	II
800	2755.73	II
250	2756.328	I
100	2757.316	I
50	2759.81	I
120	2761.780	I
150	2761.81	II
150	2762.026	I
120	2762.772	I
120	2763.109	I
20	2763.66	II
25	2765.13	II
80	2766.910	I
250	2767.522	I
50	2769.30	I
25	2769.35	II
300	2772.07	I
50	2773.23	I
20	2774.69	II
15	2776.91	II
60	2778.07	I
600	2778.220	I
40	2779.30	II
50	2783.69	II
30	2785.19	II
3000	2788.10	I
20	2793.89	II
200	2797.78	I

Intensity	Wavelength (Å)	Spectrum	Intensity	Wavelength (Å)	Spectrum
30	2799.29	II	15	3002.64	II
400	2804.521	I	200	3007.282	I
1500	2806.98	I	500	3008.14	I
2500	2813.287	I	120	3009.569	I
300	2823.276	I	60	3017.627	I
600	2825.56	I	60	3018.983	I
50	2825.687	I	60	3020.01	II
120	2828.808	I	500	3020.491	I
25	2831.56	II	1500	3020.639	I
1500	2832.436	I	600	3021.073	I
120	2835.950	I	500	3024.032	I
200	2838.119	I	150	3025.638	I
30	2839.51	II	500	3025.842	I
20	2839.80	II	80	3030.148	I
15	2840.65	II	60	3031.214	I
200	2843.631	I	60	3034.484	I
1000	2843.977	I	40	3036.96	II
100	2845.594	I	800	3037.389	I
15	2848.11	II	80	3041.637	I
15	2848.32	II	800	3047.604	I
800	2851.797	I	600	3057.446	I
30	2856.91	II	1000	3059.086	I
25	2858.34	II	250	3067.244	I
50	2869.307	I	120	3075.719	I
50	2872.334	I	120	3091.577	I
80	2874.172	I	80	3098.189	I
50	2894.504	I	100	3099.895	I
120	2912.157	I	100	3099.968	I
120	2929.007	I	60	3100.303	I
1200	2936.903	I	100	3100.665	I
60	2941.343	I	12	3154.20	II
12	2944.40	II	80	3175.445	I
1000	2947.876	I	150	3184.895	I
60	2950.24	I	250	3191.659	I
600	2953.940	I	500	3193.226	I
250	2957.364	I	800	3193.299	I
80	2959.99	I	12	3196.08	II
150	2965.254	I	200	3196.928	I
1500	2966.898	I	80	3199.500	I
120	2969.36	I	60	3200.47	I
800	2970.099	I	50	3205.398	I
15	2970.52	II	50	3211.67	I
1200	2973.132	I	100	3211.88	I
500	2973.235	I	13	3213.31	II
600	2981.445	I	200	3214.011	I
1000	2983.570	I	200	3214.396	I
60	2984.77	I	60	3215.938	I
50	2984.82	II	50	3217.377	I
13	2985.54	II	80	3219.583	I
1000	2994.427	I	60	3219.766	I
250	2994.502	I	300	3222.045	I
500	2999.512	I	600	3225.78	I
120	3000.451	I	13	3227.73	II
800	3000.948	I	80	3227.796	I
60	3001.655	I	20	3230.42	II

Intensity	Wavelength (Å)	Spectrum	Intensity	Wavelength (Å)	Spectrum
80	3233.05	I	200	3556.878	I
50	3233.967	I	400	3558.515	I
120	3234.613	I	1000	3565.379	I
300	3236.222	I	1200	3570.097	I
100	3239.433	I	800	3570.25	I
80	3244.187	I	120	3571.996	I
80	3246.005	I	100	3573.393	I
60	3254.36	I	60	3573.829	I
80	3265.046	I	60	3573.888	I
50	3265.617	I	4000	3581.19	I
50	3271.000	I	150	3582.199	I
50	3280.26	I	150	3584.660	I
150	3286.75	I	120	3584.929	I
120	3305.97	I	300	3585.319	I
200	3306.343	I	150	3585.705	I
400	3355.227	I	200	3586.103	I
80	3355.517	I	400	3586.984	I
60	3369.546	I	100	3594.633	I
120	3370.783	I	150	3603.204	I
50	3378.678	I	200	3605.454	I
50	3380.110	I	500	3606.680	I
60	3383.978	I	1500	3608.859	I
12	3388.13	II	250	3610.16	I
50	3392.304	I	60	3612.068	I
150	3392.651	I	150	3617.788	I
150	3399.333	I	1500	3618.768	I
80	3404.353	I	200	3621.462	I
500	3407.458	I	150	3622.004	I
250	3413.131	I	150	3623.19	I
60	3424.284	I	100	3631.096	I
500	3427.119	I	1200	3631.463	I
60	3428.748	I	60	3632.041	I
6000	3440.606	I	100	3638.298	I
2500	3440.989	I	200	3640.389	I
1000	3443.876	I	80	3643.717	I
200	3445.149	I	1500	3647.842	I
15	3453.61	II	250	3649.506	I
1200	3465.860	I	80	3650.279	I
2000	3475.450	I	200	3651.467	I
500	3476.702	I	120	3670.024	I
2500	3490.574	I	150	3670.089	I
500	3497.840	I	100	3676.311	I
250	3513.817	I	150	3677.629	I
300	3521.261	I	1500	3679.913	I
400	3526.040	I	200	3682.242	I
100	3526.166	I	120	3683.054	I
60	3526.237	I	150	3684.107	I
60	3526.381	I	120	3685.998	I
60	3526.467	I	500	3687.456	I
100	3533.199	I	120	3689.477	I
200	3536.556	I	150	3694.008	I
300	3541.083	I	120	3695.051	I
250	3542.075	I	150	3701.086	I
80	3553.739	I	80	3704.462	I
400	3554.925	I	1200	3705.566	I

Intensity	Wavelength (Å)	Spectrum
60	3707.041	I
150	3707.821	I
300	3707.919	I
600	3709.246	I
120	3716.442	I
8000	3719.935	I
1500	3722.563	I
120	3724.377	I
60	3725.491	I
60	3727.093	I
500	3727.619	I
150	3732.396	I
1200	3733.317	I
5000	3734.864	I
120	3735.324	I
6000	3737.131	I
100	3738.306	I
400	3743.362	I
80	3743.47	I
6000	3745.561	I
1200	3745.899	I
3000	3748.262	I
80	3748.964	I
3000	3749.485	I
1500	3758.232	I
400	3760.05	I
1500	3763.788	I
400	3765.54	I
600	3767.191	I
60	3776.452	I
250	3785.95	I
100	3786.68	I
250	3787.880	I
250	3790.092	I
150	3794.34	I
400	3795.002	I
120	3797.518	I
250	3798.511	I
400	3799.547	I
200	3805.345	I
80	3806.696	I
600	3812.964	I
60	3813.059	I
1500	3815.840	I
2500	3820.425	I
150	3821.179	I
80	3824.306	I
2500	3824.444	I
1500	3825.880	I
1200	3827.823	I
1000	3834.222	I
120	3839.257	I
500	3840.437	I
800	3841.047	I
120	3843.256	I

Intensity	Wavelength (Å)	Spectrum
80	3846.800	I
200	3849.96	I
120	3850.817	I
2500	3856.372	I
150	3859.212	I
10000	3859.911	I
150	3865.523	I
60	3867.215	I
250	3872.501	I
150	3873.761	I
250	3878.018	I
2000	3878.573	I
4000	3886.282	I
200	3887.048	I
300	3888.513	I
800	3895.656	I
1200	3899.707	I
400	3902.945	I
250	3906.479	I
80	3916.731	I
600	3920.258	I
1200	3922.911	I
1200	3927.920	I
2000	3930.296	I
60	3948.774	I
60	3949.953	I
50	3951.164	I
50	3952.601	I
60	3956.454	I
250	3956.68	I
60	3966.614	I
100	3969.257	I
80	3977.741	I
40	3981.771	I
50	3983.956	I
60	3994.114	I
200	3997.392	I
40	3998.053	I
400	4005.241	I
60	4009.713	I
80	4014.53	I
100	4021.867	I
50	4040.638	I
4000	4045.813	I
1500	4063.594	I
50	4066.975	I
50	4067.977	I
1200	4071.737	I
40	4076.629	I
40	4100.737	I
40	4107.489	I
150	4118.544	I
40	4127.608	I
400	4132.058	I
80	4134.676	I

Intensity	Wavelength (Å)	Spectrum	Intensity	Wavelength (Å)	Spectrum
40	4136.997	I	200	4482.252	I
200	4143.415	I	50	4489.739	I
800	4143.869	I	50	4528.613	I
40	4153.898	I	11	4583.83	II
50	4154.500	I	30	4647.433	I
60	4156.799	I	30	4736.771	I
50	4172.744	I	50	4859.741	I
60	4174.912	I	120	4871.317	I
50	4175.635	I	60	4872.136	I
50	4177.593	I	30	4878.208	I
120	4181.754	I	100	4890.754	I
50	4184.891	I	250	4891.492	I
120	4187.038	I	30	4903.309	I
120	4187.795	I	150	4918.992	I
80	4191.430	I	500	4920.502	I
40	4195.329	I	12	4923.92	II
150	4198.304	I	1500	4957.597	I
40	4199.095	I	11	4990.50	II
300	4202.029	I	80	5001.862	I
40	4203.984	I	18	5001.91	II
80	4206.696	I	11	5004.20	II
80	4210.343	I	30	5005.711	I
400	4216.183	I	100	5006.117	I
100	4219.360	I	60	5012.067	I
50	4222.212	I	30	5014.941	I
50	4225.956	I	12	5018.43	II
200	4227.423	I	11	5030.64	II
11	4233.17	II	25	5030.77	I
100	4233.602	I	12	5035.71	II
250	4235.936	I	150	5041.755	I
50	4238.809	I	30	5049.819	I
50	4247.425	I	30	5051.634	I
200	4250.118	I	25	5074.748	I
300	4250.787	I	18	5100.73	II
40	4258.315	I	15	5100.95	II
800	4260.473	I	150	5110.357	I
250	4271.153	I	40	5133.69	I
1200	4271.759	I	40	5139.251	I
1200	4282.402	I	100	5139.462	I
80	4291.462	I	11	5144.36	II
250	4299.234	I	12	5149.46	II
1200	4307.901	I	25	5151.910	I
150	4315.084	I	30	5162.27	I
1500	4325.761	I	80	5166.281	I
80	4352.734	I	2500	5167.487	I
80	4369.771	I	80	5168.897	I
800	4375.929	I	12	5169.03	II
3000	4383.544	I	500	5171.595	I
1200	4404.750	I	50	5191.454	I
300	4415.122	I	80	5192.343	I
600	4427.299	I	200	5194.941	I
400	4461.652	I	30	5204.582	I
120	4466.551	I	25	5215.179	I
80	4476.017	I	150	5216.274	I
80	4482.169	I	18	5216.85	II

Intensity	Wavelength (Å)	Spectrum	Intensity	Wavelength (Å)	Spectrum
60	5226.862	I	13	5544.76	II
1000	5227.150	I	30	5569.618	I
13	5227.49	II	60	5572.841	I
250	5232.939	I	120	5586.755	I
13	5247.95	II	200	5615.644	I
13	5251.23	II	20	5624.541	I
18	5260.26	II	12	5645.40	II
11	5264.18	II	50	5662.515	I
100	5266.555	I	20	5762.990	I
1200	5269.537	I	11	5783.63	II
800	5270.357	I	30	5862.353	I
30	5281.789	I	13	5885.02	II
60	5283.621	I	16	5902.82	II
25	5302.299	I	30	5914.114	I
11	5306.18	II	14	5955.70	II
13	5316.23	II	30	5986.956	I
150	5324.178	I	18	5961.71	II
800	5328.038	I	30	5962.4	II
300	5328.531	I	13	5965.63	II
100	5332.899	I	40	6065.482	I
14	5339.59	II	30	6102.159	I
80	5339.928	I	40	6136.614	I
500	5341.023	I	40	6137.694	I
25	5364.87	I	30	6147.73	II
40	5367.47	I	20	6149.24	II
50	5369.96	I	15	6175.16	II
400	5371.489	I	40	6191.558	I
60	5383.37	I	30	6213.429	I
14	5387.06	II	30	6219.279	I
40	5393.167	I	40	6230.726	I
12	5395.86	II	20	6238.37	II
300	5397.127	I	20	6246.317	I
15	5402.06	II	80	6247.56	II
60	5404.12	I	30	6252.554	I
250	5405.774	I	15	6305.32	II
30	5410.91	I	12	6331.97	II
60	5415.20	I	15	6383.75	II
60	5424.07	I	20	6393.602	I
30	5427.83	II	30	6399.999	I
250	5429.695	I	20	6411.647	I
13	5429.99	II	20	6416.90	II
100	5434.523	I	20	6421.349	I
200	5446.871	I	30	6430.844	I
25	5455.45	I	20	6446.43	II
120	5455.609	I	200	6456.38	II
16	5465.93	II	60	6494.981	I
20	5466.94	II	20	6516.05	II
16	5482.31	II	20	6546.239	I
14	5493.83	II	20	6592.913	I
25	5497.516	I	40	6677.989	I
20	5501.464	I	15	6855.18	I
18	5506.20	II	15	6945.21	I
30	5506.778	I	20	7067.44	II
12	5510.78	II	15	7130.94	I
12	5529.06	II	25	7164.443	I

Intensity	Wavelength (Å)	Spectrum
80	7187.313	I
30	7207.381	I
12	7224.51	II
50	7307.97	II
40	7320.70	II
20	7376.46	II
30	7445.746	I
20	7462.38	II
40	7495.059	I
60	7511.045	I
15	7586.04	I
15	7711.71	II
30	7780.59	I
40	7832.22	I
80	7937.131	I
60	7945.984	I
80	7998.939	I
60	8046.047	I
50	8085.176	I
150	8220.41	I
120	8327.053	I
20	8331.908	I
120	8387.770	I
30	8468.404	I
15	8514.069	I
60	8661.898	I
150	8688.621	I
12	8793.38	I
12	8824.23	I
20	8866.96	I
15	8999.56	I
15	10216.32	I
13	10469.65	I
21	11119.80	I
14	11374.08	I
52	11422.32	I
87	11439.12	I
91	11593.59	I
255	11607.57	I
160	11638.26	I
230	11689.98	I
160	11783.26	I
580	11882.84	I
225	11884.08	I
1030	11973.05	I
15	12638.71	I
14	12879.76	I
17	13565.04	I
30	14236.25	I
24	14285.11	I
14	14292.38	I
16	14308.69	I
96	14400.56	I
20	14442.28	I
72	14512.23	I

Intensity	Wavelength (Å)	Spectrum
50	14555.06	I
14	14565.95	I
40	14826.43	I
37	15051.77	I
28	15207.55	I
94	15294.58	I
16	15335.40	I
30	15621.67	I
25	15631.97	I
14	15723.59	I
41	15769.42	I
28	15813.13	I
13	16444.82	I
20	16486.69	I
105	18856.65	I
47	18987.01	I
25	19113.68	I
22	19791.88	I
14	22380.82	I
21	22619.85	I
38	26222.04	I
17	26659.22	I

Fe III

Vacuum

Intensity		Wavelength (Å)	Spectrum
6		728.81	III
5		730.00	III
5		737.71	III
5		739.26	III
9		807.55	III
8		807.86	III
8		808.84	III
8	P	811.28	III
10		813.38	III
8		838.05	III
10		844.28	III
9		845.41	III
8	W	847.42	III
8		859.72	III
8	P	861.76	III
10	P	861.83	III
8		873.46	III
9		890.76	III
10		891.17	III
8		891.44	III
8		899.42	III
10		950.33	III
10		981.37	III
10	W	983.88	III
8		985.82	III
9		991.23	III
9		1017.25	III

Intensity		Wavelength (Å)	Spectrum
8		1017.74	III
8		1018.29	III
8		1032.12	III
8		1063.87	III
9		1122.53	III
9		1124.88	III
8		1128.02	III
10	H	1505.17	III
10	H	1538.63	III
12	H	1550.20	III
10	H	1601.21	III
10		1869.83	III
12		1877.99	III
10		1882.05	III
12		1886.76	III
13		1890.67	III
11		1893.98	III
20		1895.46	III
10	S	1907.58	III
19		1914.06	III
15		1915.08	III
15		1922.79	III
10	P	1926.01	III
18		1926.30	III
15		1930.39	III
14		1931.51	III
14		1937.34	III
10	L	1938.90	III
14	S	1943.48	III
12		1945.34	III
10		1950.33	III
12		1951.01	III
11		1952.65	III
13		1953.32	III
10		1953.49	III
10	W	1954.22	III
11		1958.58	III
13		1960.32	III
15		1987.50	III
14		1991.61	III
13		1994.07	III
12		1995.56	III
12		1996.42	III
		Air	
10		2061.55	III
12		2068.24	III
14		2078.99	III
10		2084.35	III
12		2090.14	III
15		2097.48	III
12		2097.69	III
12		2103.80	III
10		2107.32	III
15		2151.78	III
12		2157.71	III
12		2158.47	III
10		2161.27	III
12		2166.95	III
12		2171.04	III
15		2174.66	III
12		2180.41	III
10	P	2208.85	III
10		2221.83	III
10		2229.27	III
10		2232.43	III
10		2232.69	III
10		2235.91	III
10		2238.16	III
12	P	2241.54	III
12		2261.59	III
10		2267.42	III
10		2293.06	III
15		2295.86	III
10	P	2317.70	III
10		2319.22	III
10	P	2321.71	III
10		2326.95	III
10	P	2336.77	III
10		2338.96	III
8		2389.53	III
8		2438.17	III
8	P	2582.37	III
8		2595.62	III
8		2617.15	III
9	P	2645.39	III
10	H	2695.13	III
9	H	2695.34	III
8	H	2700.02	III
8	H	2701.13	III
8		2773.31	III
10	P	2813.24	III
8	P	2895.08	III
9	P	2902.47	III
12		2904.43	III
8	P	2905.80	III
10		2907.50	III
12		2907.70	III
8		2923.90	III
8		2948.39	III
8		2963.23	III
12		3001.62	III
12	H	3007.28	III
15		3013.17	III
10	P	3136.43	III
10		3174.09	III
10		3175.99	III
10		3178.01	III
13		3266.88	III

Intensity		Wavelength (Å)	Spectrum	Intensity		Wavelength (Å)	Spectrum
11		3276.08	III	9		5272.37	III
10		3288.81	III	14		5272.98	III
9		3305.22	III	15		5276.48	III
9		3339.39	III	16		5282.30	III
9		3499.59	III	12		5284.83	III
9		3500.28	III	11		5298.12	III
10		3501.76	III	12		5299.93	III
10		3586.04	III	14	W	5302.60	III
11		3600.94	III	10		5306.76	III
11		3603.88	III	9		5310.88	III
16		3954.33	III	10		5322.74	III
11		3968.72	III	11		5346.88	III
9		3969.49	III	12		5353.77	III
10	W	3979.42	III	12		5363.76	III
10		4035.42	III	10		5368.06	III
11		4053.11	III	11	L	5375.47	III
12		4081.00	III	11		5719.88	III
10		4120.90	III	9		5744.19	III
11		4122.02	III	10		5756.38	III
11		4122.78	III	18		5833.93	III
15		4137.76	III	9		5848.76	III
13		4139.35	III	10		5854.62	III
9		4140.48	III	9		5876.26	III
9		4154.96	III	15		5891.91	III
18		4164.73	III	9		5898.68	III
9		4164.92	III	9		5918.96	III
13		4166.84	III	10	P	5920.13	III
13		4174.26	III	18	P	5929.69	III
9		4210.67	III	10		5952.31	III
11		4222.27	III	14		5953.62	III
13		4235.56	III	9		5968.48	III
9		4238.62	III	12		5979.32	III
12		4243.75	III	9	H	5981.01	III
12	H	4273.40	III	12	H	5989.08	III
12		4279.72	III	18		5999.54	III
14	H	4286.16	III	9		6031.02	III
16	H	4296.85	III	16		6032.59	III
18	H	4304.78	III	13		6036.56	III
20	H	4310.36	III	11		6048.72	III
9		4323.68	III	11		6054.18	III
9	H	4372.04	III	9		6056.36	III
9	H	4372.14	III	9		6149.99	III
11	H	4372.31	III	9		6169.74	III
14	H	4372.53	III	9		6185.26	III
18	H	4372.81	III	7		6186.56	III
9		4395.76	III	7		6194.79	III
12		4419.60	III	6		6195.43	III
9		4431.02	III	6		6201.37	III
9		5111.07	III	5	S	6203.04	III
9		5127.35	III	5		6259.81	III
12		5156.12	III	6	P	6294.50	III
10		5199.08	III	5		6357.81	III
10		5235.66	III	5	H	7317.63	III
18		5243.31	III	6	H	7320.14	III
13	L	5260.34	III	5	W	7921.17	III

Intensity		Wavelength (Å)	Spectrum
5	W	8230.88	III
5	W	8231.79	III
9	W	8235.45	III
8	W	8236.75	III
6	W	8238.98	III
5		8563.49	III

Fe IV

Vacuum

Intensity	Wavelength (Å)	Spectrum
10	502.42	IV
11	506.69	IV
11	505.35	IV
17	525.69	IV
15	526.29	IV
10	526.57	IV
13	526.63	IV
10	530.91	IV
10	531.78	IV
10	535.55	IV
14	536.61	IV
10	536.74	IV
15	537.10	IV
13	537.26	IV
14	537.79	IV
13	537.94	IV
10	538.44	IV
10	544.20	IV
10	546.22	IV
10	548.80	IV
11	550.32	IV
10	551.77	IV
13	552.14	IV
11	552.74	IV
10	554.26	IV
10	555.66	IV
10	572.88	IV
10	576.76	IV
10	579.76	IV
14	607.53	IV
13	608.80	IV
10	609.65	IV
12	1425.73	IV
13	1431.43	IV
12	1473.20	IV
12	1489.53	IV
12	1495.18	IV
13	1526.60	IV
13	1530.26	IV
14	1532.63	IV
13	1532.91	IV
15	1533.86	IV
13	1533.95	IV
14	1536.58	IV
12	1538.29	IV
13	1542.16	IV
14	1542.70	IV
12	1546.40	IV
12	1552.35	IV
12	1552.71	IV
12	1562.46	IV
13	1566.26	IV
14	1568.27	IV
12	1570.18	IV
12	1570.42	IV
12	1571.24	IV
12	1577.20	IV
12	1577.76	IV
12	1590.62	IV
13	1591.51	IV
13	1592.05	IV
12	1596.67	IV
13	1598.01	IV
12	1600.50	IV
13	1600.58	IV
13	1601.67	IV
12	1602.08	IV
13	1603.18	IV
13	1603.73	IV
13	1604.88	IV
13	1605.68	IV
15	1605.97	IV
13	1606.98	IV
17	1609.10	IV
14	1609.83	IV
13	1610.47	IV
13	1611.20	IV
13	1613.64	IV
15	1614.02	IV
13	1614.64	IV
13	1615.00	IV
12	1615.61	IV
16	1616.68	IV
14	1617.68	IV
14	1619.02	IV
12	1620.91	IV
13	1621.16	IV
14	1621.57	IV
13	1623.38	IV
13	1623.53	IV
15	1626.47	IV
14	1626.90	IV
13	1628.54	IV
13	1630.18	IV
17	1631.08	IV
12	1632.08	IV
14	1632.40	IV
13	1634.01	IV

Intensity	Wavelength (Å)	Spectrum
12	1638.07	IV
12	1638.30	IV
14	1639.40	IV
16	1640.04	IV
14	1640.16	IV
15	1641.87	IV
12	1642.88	IV
15	1647.09	IV
15	1651.58	IV
15	1652.90	IV
13	1653.41	IV
13	1656.11	IV
15	1656.65	IV
12	1657.82	IV
12	1658.43	IV
14	1660.10	IV
12	1661.57	IV
13	1662.32	IV
13	1662.52	IV
13	1663.54	IV
13	1668.09	IV
12	1669.61	IV
14	1671.04	IV
12	1672.86	IV
13	1673.68	IV
14	1675.66	IV
12	1676.78	IV
12	1677.12	IV
13	1681.36	IV
12	1681.95	IV
15	1687.69	IV
15	1698.88	IV
12	1700.40	IV
12	1704.93	IV
13	1709.81	IV
15	1711.41	IV
14	1712.76	IV
12	1717.11	IV
14	1717.90	IV
14	1718.16	IV
12	1718.42	IV
14	1719.46	IV
14	1722.71	IV
14	1724.06	IV
12	1724.26	IV
16	1725.63	IV
13	1761.08	IV
12	1764.92	IV
12	1767.36	IV
13	1792.10	IV
13	1796.93	IV
12	1805.32	IV
12	1820.42	IV
13	1827.98	IV
12	1840.24	IV
12	1860.42	IV
12	1869.64	IV
12	1874.23	IV

Fe V

Vacuum

Intensity	Wavelength (Å)	Spectrum
300	361.28	V
300	365.43	V
300	365.86	V
300	374.24	V
300	374.87	V
300	375.98	V
300	379.59	V
300	380.31	V
300	381.27	V
300	384.96	V
300	384.97	V
300	385.03	V
300	385.11	V
300	385.25	V
300	385.26	V
300	385.30	V
300	385.75	V
300	385.88	V
350	386.16	V
300	386.74	V
300	386.78	V
300	386.85	V
300	386.88	V
350	386.88	V
400	387.20	V
400	387.50	V
300	387.62	V
400	387.76	V
400	387.78	V
300	387.98	V
300	388.61	V
300	388.82	V
300	390.11	V
300	390.19	V
300	390.78	V
300	391.94	V
300	392.06	V
300	392.38	V
300	392.50	V
300	392.51	V
300	392.70	V
300	392.91	V
300	393.27	V
300	393.72	V
300	393.73	V
300	393.91	V

Intensity	Wavelength (Å)	Spectrum	Intensity	Wavelength (Å)	Spectrum
300	393.97	V	300	415.01	V
300	394.04	V	300	416.66	V
300	394.64	V	300	416.84	V
300	395.15	V	700	417.39	V
300	395.79	V	700	418.04	V
400	395.90	V	500	418.47	V
300	399.84	V	300	420.56	V
300	400.11	V	700	421.06	V
300	400.51	V	500	421.78	V
300	400.52	V	300	422.28	V
300	400.63	V	500	422.31	V
300	401.04	V	300	423.23	V
300	401.64	V	500	426.06	V
300	401.86	V	500	426.11	V
300	402.87	V	300	426.83	V
300	403.06	V	350	426.97	V
400	404.62	V	300	434.42	V
400	405.50	V	300	439.22	V
800	407.42	V	300	444.70	V
600	407.44	V	300	445.44	V
400	407.49	V	300	446.04	V
500	407.75	V	300	458.16	V
400	409.71	V	300	486.17	V
400	410.20	V	400	1317.86	V
600	411.55	V	300	1318.35	V

D. Vacuum Ultraviolet Lines for Fe I through Fe XXVI

D. Vacuum Ultraviolet Lines for Fe I through Fe XXVI

The following tables, including the introductory comments, are excerpted from a new tabulation by R. L. Kelly,[1] which supersedes and revises his previous tables published with Palumbo in 1973.[2]

The listed wavelength data are generally from observations, with lines of the helium-like and hydrogen-like ions (Fe XXV and Fe XXVI) as notable exceptions. But also in many cases where lines have been observed, wavelengths given here are those resulting from a comprehensive analysis of the spectrum rather than the measured values. A few lines have been predicted from unpublished extrapolations along isoelectronic sequences, and some unobserved weak lines in multiplets have been included for completeness. Such predicted values of wavelength are marked by the symbol P in the column labeled "Notes."

The lines are arranged in order of increasing wavelength within each spectrum, and the vacuum wavelengths are given as they are reported in the reference listed first for each line. A complete listing of these references is given at the end of these introductory comments.

With respect to the accuracy of the wavelength data, it is conservatively estimated that all wavelengths reported should have uncertainties of ten to twenty in the last digit given.

The listed intensities have been normalized to a maximum of 1000 for convenience in comparing the different references. The normalization procedure used was generally a linear or logarithmic transformation of the intensities reported by the original authors, depending on the particular case. Intensities given by different observers have seldom been found compatible, however, and the tabulated intensities should be used only as a rough estimate.

The transitions are shown in standard spectroscopic notation with the lower level given first, and the energy levels, i.e., energies above the ground state, are presented in units of 1000 cm^{-1}, each value being rounded off to conserve space. Additive uncertainties are indicated by B, C, K, etc. which may be thousands of cm^{-1}. The energy level data are taken from the files of the Naval Postgradutate School Spectroscopic Data Center (and thus do not necessarily agree with those tabulated in Section E of this book).

The multiplet numbers assigned by C. E. Moore[3] are given in a separate column. The classifications of the transitions are given in the accepted form, the primary references being the NBS spectroscopy tables.[3,4] For convenience, separate columns are used for showing the configurations, terms, and J-values. In the term column, the symbol g is used to denote the ground term. Otherwise, the term designation follows that of Cowan and Andrew.[5]

The parent terms are given where they are known and where they are not immediately obvious. The older practice of using primes, double primes, etc. to indicate that the parent term of a configuration is an excited state of the next higher ion has been abandoned. But the notation of a, b, c, . . . (for even terms) and z, y, x, . . . (for odd terms) to indicate the order of appearance of terms of the same multiplicity and same type has been continued.

A few descriptive symbols are used in the "Notes" column which have the following meanings:

- F — line is forbidden by electric dipole selection rules
- A — line observed in absorption
- Q — uncertain classification
- P — predicted value of wavelength

There are three classes of predicted lines:

(a) lines that have been observed but for which calculations of wavelengths from energy levels are superior to the observations as in hydrogenic spectra and in other specific transitions.

(b) lines which have not been observed but for which Ritz calculations between known levels can be made, as in many of the forbidden lines.

(c) lines for which one or both of the energy levels have been found by Hartree-Fock type calculations, by interpolation, or by extrapolation.

These three classes are not separately distinguished in the "Notes" column.

References for Introductory Comments

1. R. L. Kelly, *Atomic and Ionic Spectrum Lines below 2000 Angstroms (Hydrogen through Krypton),* J. Phys. Chem. Ref. Data, Supplement (to be published).
2. R. L. Kelly and L. J. Palumbo, *Atomic and Ionic Emission Lines Below 2000 Angstroms: Hydrogen through Krypton,* NRL Report 7599 (June 1973).
3. C. E. Moore, *An Ultraviolet Multiplet Table,* NBS Circular 488, Sect. 1 (1950); Sect. 2 (1952).
4. J. Reader and J. Sugar, J. Phys. Chem. Ref. Data **4,** 353 (1975).
5. R. D. Cowan and K. L. Andrew, J. Opt. Soc. Am. **55,** 502 (1965).

General Reference List for Section D

3. E. E. Anderson and J. E. Mack, Phys. Rev. **59,** 717–723 (1941).
7. K. L. Andrew and K. W. Meissner, J. Opt. Soc. Am. **49,** 146–161 (1958).
9. E. Alexander, U. Feldman, and B. S. Fraenkel, J. Opt. Soc. Am. **55,** 650–653 (1965).
10. E. Alexander, U. Feldman, and B. S. Fraenkel, Phys. Lett. **14,** 40–41 (1965).
30. L. Bloch and E. Bloch, J. Phys. Radium **6,** 441–450 (1935).
45. I. S. Bowen, Phys. Rev. **46,** 791–792 (1934).
46. I. S. Bowen, Phys. Rev. **47,** 924–925 (1935).
47. I. S. Bowen, Phys. Rev. **52,** 1153–1156 (1937).
49. I. S. Bowen and S. B. Ingram, Phys. Rev. **28,** 444–448 (1926).
58. J. C. Boyce, Phys. Rev. **47,** 718–720 (1935).
59. J. C. Boyce, Phys. Rev. **48,** 396–402 (1935).
77. W. S. Black et al., Nature **206,** 654–658 (1965).
89. W. M. Burton and A. Ridgeley, Sol. Phys. **14,** 3–28 (1970).
91. V. A. Boiko, Y. P. Voinov, V. A. Gribkov and G. V. Sklizkov, Opt. Spectrosc. **29,** 545–546 (1970).
93. W. E. Behring, L. Cohen, and U. Feldman, Astrophys. J. **175,** 493–523 (1972).

94. H. G. Berry, M. C. Buchet-Poulizac, and J. P. Buchet, J. Opt. Soc. Am. **63**, 240–241 (1973).
130. J. A. Carroll, Trans. R. Soc. (London) **225A**, 357–420 (1925).
137. R. D. Cowan and K. G. Widing, Astrophys. J. **180**, 285–292 (1973).
140. C. W. Curtis, J. Opt. Soc. Am. **42**, 300–305 (1952).
146. L. Cohen and U. Feldman, Astrophys. J. **160**, L105–L106 (1970).
178. B. Edlen, Z. Phys. **100**, 621–635 (1936).
180. B. Edlen, Z. Phys. **103**, 536–541 (1936).
181. B. Edlen, Z. Phys. **104**, 188–193 (1937).
182. B. Edlen, Z. Phys. **104**, 407–416 (1937).
188. B. Edlen and P. Swings, Astrophys. J. **95**, 532–554 (1942).
197. B. Edlen, *Reports On Progress In Physics*, Vol. 26, 181–212 (1963).
199. R. C. Elton, A. C. Kolb, W. E. Austin, R. Tousey, and K. G. Widing, Astrophys. J. **140**, 388–395 (1964).
208. U. Feldman and L. Cohen, Astrophys. J. **151**, L55–L58 (1968).
209. B. Edlen, private communication.
228. J. O. Ekberg, Phys. Scr. **11**, 23–30 (1975).
229. J. O. Ekberg, Phys. Scr. **12**, 42–57 (1975).
237. U. Feldman, L. Katz, W. Behring and L. Cohen, J. Opt. Soc. Am. **61**, 91–95 (1971).
239. B. C. Fawcett, J. Phys. B **4**, 1577–1586 (1971).
241. B. C. Fawcett, R. D. Cowan, E. Ya. Kononov and R. W. Hayes, J. Phys. B **5**, 1255–1269 (1972).
242. B. C. Fawcett (1972).
256. B. C. Fawcett and A. H. Gabriel, Astrophys. J. **141**, 343–353 (1965).
260. B. C. Fawcett and A. H. Gabriel, Proc. Phys. Soc. **88**, 262–264 (1966).
261. U. Feldman and B. S. Fraenkel, Astrophys. J. **145**, 959 (1966).
266. B. C. Fawcett, A. H. Gabriel, F. E. Irons, N. J. Peacock, and P. A. H. Saunders, Proc. Phys. Soc. **88**, 1051–1053 (1966).
271. B. C. Fawcett, N. J. Peacock and R. D. Cowan, J. Phys. B **1**, 295–306 (1968).
288. S. Glad, Ark. Fys. **10**, 291–334 (1956).
292. L. C. Green, Phys. Rev. **55**, 1209–1217 (1939).
305. Yu. I. Grineva, V. I. Karev, V. V. Korneev, V. V. Krutov, S. L. Mandelstam, L. A. Vainstein, B. N. Vasilyev, and I. A. Zhitnik, Sol. Phys. **29**, 441–446 (1973).
330. L. Johansson, Phys. Scr. **10**, 236–240 (1974).
365. P. G. Kruger and S. G. Weissberg, Phys. Rev. **52**, 314–317 (1937).
366. P. G. Kruger, S. G. Weissberg, and L. W. Phillips, Phys. Rev. **51**, 1090–1091 (1937).
375. R. L. Kelly, unpublished work prepared for this report.
378. C. C. Kiess, V. C. Rubin, and C. E. Moore, J. Res. Nat. Bur. Stand. **65A**, 1–29 (1961).
388. V. I. Kovalev, A. A. Ramonas, and A. N. Ryabtsev, Liet. Fiz. Rinkinys **15**, 915–927 (1975).
389. V. Kaufman and B. Edlen, J. Phys. Chem. Ref. Data **3**, 825–895 (1974).
390. S. O. Kastner, W. M. Neupert, and M. Swartz, Astrophys. J. **191**, 261–270 (1974).
393. E. Ya. Kononov, K. N. Koshelev, L. I. Podobedova, S. V. Chekalin, and S. S. Churilov, J. Phys. B **9**, 565–572 (1976).
395. S. O. Kastner, W. E. Behring, and L. Cohen, Astrophys. J. **199**, 777–780 (1975).
429. T. N. Lie and R. C. Elton, Phys. Rev. A **3**, 865–871 (1971).
430. A. E. Livingston, J. Phys. B **9**, L215–L217 (1976).
432. B. C. Fawcett and H. F. Henrichs, Astron. Astrophys. Suppl. **18**, 157–167 (1974).
436. L. Cohen, U. Feldman, and G. A. Doschek, Astrophys. J. Suppl., to be published.
437. K. P. Dere, Astrophys. J. **221**, 1062–1067 (1978).
439. G. A. Doschek, U. Feldman, M. E. Van Hoosier, and J. D. F. Bartoe, Astrophys. J. Suppl. **31**, 417–443 (1976).
440. S. O. Kastner, A. M. Crooker, W. E. Behring, and L. Cohen, Phys. Rev. A **16**, 577–582 (1977).
442. G. D. Sandlin, G. E. Brueckner, and R. Tousey, Astrophys. J. **214**, 898–904 (1977).
443. K. G. Widing, Astrophys. J. **197**, L33–L35 (1975).
447. R. J. Hutcheon, J. P. Pye, and K. D. Evans, Mon. Not. R. Astron. Soc. **175**, 489–499 (1976).
463. J. G. Firth, F. F. Freeman, A. H. Gabriel, B. B. Jones, C. Jordan, C. R. Negus, D. B. Shenton, and R. F. Turner, Mon. Not. R. Astron. Soc. **166**, 543–560 (1974).
464. J. H. Parkinson, Sol. Phys. **42**, 183–207 (1975).
487. C. E. Moore, Nat. Bur. Stand. (U.S.), Circ. 467, *Atomic Energy Levels*, Vol. I, 309 pp. (1949), Vol. II, 227 pp. (1952), Vol. III, 245 pp. (1958).
488. C. E. Moore, Nat. Bur. Stand. (U.S.), Circ. 488, Sec. I, 78 pp. (1950), Sec. II, 115 pp. (1952).
593. A. Ridgeley and W. M. Burton, Sol. Phys. **27**, 280–285 (1972).
605. H. N. Russell and C. E. Moore, Trans. Am. Philos. Soc. **34**, II, 113–179 (1944).
616. J. Reader and J. Sugar, J. Phys. Chem. Ref. Data **4**, 353–440 (1975).
620. D. R. Flower and H. Nussbaumer, Astron. Astrophys. **31**, 353–360 (1974).
626. U. I. Safronova, Opt. Spectrosc. **38**, 118–120 (1975).
643. V. A. Boiko, A. Ya. Faenov, and S. A. Pikuz, J. Quant. Spectrosc. Radiat. Transfer **19**, 11–50 (1978).
645. M. Sales, An. Real Soc. Espan. Fis. Quim. **49A**, 15–30 (1953).
680. S. O. Kastner, A. K. Bhatia, and L. Cohen, Phys. Scr. **15**, 259–267 (1977).
716. M. Swartz, S. Kastner, E. Rothe, and W. Neupert, J. Phys. B **4**, 1747–1768 (1971).
726. R. Smitt, L. A. Svensson, and M. Outred, Phys. Scr. **13**, 293–307 (1976).
728. J. H. Scofield, Report UCRL–16848, Lawrence Livermore Lab., Univ. Calif. (1975).
729. M. Swartz, S. O. Kastner, L. Goldsmith, and W. M. Neupert, J. Opt. Soc. Am. **66**, 240–244 (1976).
730. G. D. Sandlin, G. E. Brueckner, V. E. Scherrer, and R. Tousey, Astrophys. J. **205**, L47–L50 (1976).
736. W. M. Neupert, M. Swartz, and S. O. Kastner, Sol. Phys. **31**, 171–195 (1973).
741. M. Klapisch, J. L. Schwob, B. S. Fraenkel, and J. Oreg, J. Opt. Soc. Am. **67**, 148–155 (1977).
746. R. Smitt, Sol. Phys. **51**, 113–119 (1977).
748. S. Johansson, Astrophys. J. **212**, 923–924 (1977).
749. S. Johansson, Phys. Scr. **18**, 217–265 (1978).
795. P. G. Wilkinson, J. Opt. Soc. Am. **47**, 182–185 (1957).
804. K. G. Widing, G. D. Sandlin, and R. D. Cowan, Astrophys. J. **169**, 405–411 (1971).
806. W. J. Wagner and L. L. House, Astrophys. J. **166**, 683–698 (1971); Astrophys. J. **155**, 677–686 (1969).
812. H. Zirin, Astrophys. J. **140**, 1332–1338 (1964).
814. L. L. House, W. A. Deutschmann, and G. A. Sawyer, Astrophys. J. **140**, 814–816 (1964).
816. J. Junkes, E. W. Salpeter, and G. Milazzo, *Atomic Spectra in the Vacuum Ultra-Violet*, Specola Vaticana (1965).
839. G. A. Doschek, Space Sci. Rev. **13**, 765–821 (1972).
849. U. Feldman, G. A. Doschek, D. Nagel, W. Behring, and L. Cohen, Astrophys. J. Lett. **183**, L43–L45 (1973).
850. U. Feldman, G. A. Doschek, R. D. Cowan, and L. Cohen, J. Opt. Soc. Am. **63**, 1445–1453 (1973).
856. B. C. Fawcett, *Advances in Atomic and Molecular Physics*, Vol. 10, Academic Press (1974).
868. B. C. Fawcett, M. Galanti, and N. J. Peacock, J. Phys. B **7**, 1149–1153 (1974).
900. L. Cohen, private communication and NRL Solar List.
901. J. A. Bearden, Nat. Stand. Ref. Data Ser., Nat. Bur. Stand. (U.S.) 14 (1967).
918. A. M. Ermolaev and M. Jones, J. Phys. B **7**, 199–207 (1974).
923. W. E. Behring, L. Cohen, U. Feldman, and G. A. Doschek, Astrophys. J. **203**, 521–527 (1976).
940. U. Feldman and G. A. Doschek, J. Opt. Soc. Am. **67**, 726–734 (1977).
943. G. E. Bromage, R. D. Cowan, and B. C. Fawcett, Mon. Not. R. Astron. Soc. **183**, 19–28 (1978).
944. G. E. Bromage, R. D. Cowan, and B. C. Fawcett, Phys. Scr. **15**, 177–182 (1977).

945. G. E. Bromage, R. D. Cowan, B. C. Fawcett, H. Gordon, M. G. Hobby, N. J. Peacock, and A. Ridgeley, Culham Lab. Report CLM–R 170 (1977).
946. G. E. Bromage, R. D. Cowan, B. C. Fawcett, and A. Ridgeley, J. Opt. Soc. Am. **68,** 48–51 (1978).
949. G. E. Bromage and B. C. Fawcett, Mon. Not. R. Astron. Soc. **178,** 605–610 (1978).
955. P. O. Bogdanovich, G. V. Merkelis, Z. B. Rudzikas, and S. D. Sadziuviene, Phys. Scr. **17,** 549–555 (1978).
956. W. M. Neupert, Sol. Phys. **18,** 474–488 (1971).
958. J. O. Ekberg and B. Edlen, Phys. Scr. **18,** 107–124 (1978).
970. S. O. Kastner, M. Swartz, A. K. Bhatia, and J. Lapides, J. Opt. Soc. Am. **68,** 1558–1564 (1978).
977. B. Edlen, Phys. Scr. **19,** 255–266 (1979).
979. P. G. Burkhalter, L. Cohen, R. D. Cowan, and U. Feldman, J. Opt. Soc. Am. **69,** 1133–1140 (1979).
983. S. O. Kastner and A. K. Bhatia, J. Opt. Soc. Am. **69,** 1391–1393 (1979).
986. A. F. Shestakov, Opt. Spectrosc. **46,** 117–118 (1979).
988. A. K. Bhatia and S. O. Kastner, to be published (1980).
1042. G. W. Erickson, J. Phys. Chem. Ref. Data **6,** 831–869 (1977).
1055. B. C. Fawcett, G. E. Bromage, and R. W. Hayes, Mon. Not. R. Astron. Soc. **186,** 113–116 (1979).
1057. B. C. Fawcett, A. Ridgeley, and T. P. Hughes, Mon. Not. R. Astron. Soc. **188,** 365–370 (1979).
1059. U. Feldman, G. A. Doschek, and R. W. Kreplin, Astrophys. J. **238,** 365–374 (1980).
1067. D. L. McKenzie, P. B. Landecker, R. M. Broussard, H. R. Rugge, R. M. Young, U. Feldman, and G. A. Doschek, Astrophys. J. **241,** 409–416 (1980).
1075. S. O. Kastner, E. D. Rothe, and W. M. Neupert, Astron. Astrophys. **37,** 339–348 (1974).
1076. S. O. Kastner and H. E. Mason, Astron. Astrophys. **67,** 119–127 (1978).
1082. S. Suckewer and E. Hinnov, Phys. Rev. A **20,** 578–585 (1979).
1085. A. A. Ramonas and A. N. Ryabtsev, Opt. Spectrosc. **48,** 348–351 (1980).
1089. N. Spector, A. Zigler, H. Zmora, and J. L. Schwob, J. Opt. Soc. Am. **70,** 857–861 (1980).
1091. K. D. Lawson and N. J. Peacock, J. Phys. B **13,** 3313–3334 (1980).
1094. H. Gordon, M. G. Hobby, and N. J. Peacock, J. Phys. B **13,** 1985–1999 (1980).
1103. J. O. Ekberg, Phys. Scr. **23,** 7–20 (1981).
1104. B. Edlen, Phys. Scr. **22,** 593–602 (1980).
1106. S. Suckewer, Phys. Scr. **23,** 72–86 (1981).
1112. M. Klapisch, A. Bar Shalom, J. L. Schwob, B. S. Fraenkel, C. Breton, C. De Michelis, M. Finkenthal, and M. Mattioli, Phys. Lett. **69A,** 34–36 (1978).
1137. E. Hinnov and S. Suckewer, Phys. Lett. **79A,** 298–300 (1980).
1144. R. J. Hutcheon, J. P. Pye, and K. D. Evans, Astron. Astrophys. **51,** 451–460 (1976).

IRON , Z = 26

Unclassified Lines

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		1.8283						1059
		1.8309						1059
		1.8344						1059
		1.8389						1059
		1.8424						1059
		1.9360						901
	5	6.725						643
	15	7.106						643
	9	7.143						643
	16	7.210						643
	14	7.230						643
	15	7.277						643
	19	7.355						643
	15	7.612						643
	28	7.901						643
	23	8.082						643
	20	8.118						643
	21	8.167						643
	14	8.240						643
	15	8.334						643
	15	8.348						643
	23	8.406						643
	20	8.439						643
	21	8.452						643
	14	8.494						643
	17	8.510						643
	26	8.543						643
	17	8.563						643
	29	8.583						643
	23	8.714						643
	10	8.797						643
	16	8.807						643
	20	8.823						643
	18	8.850						643
	16	8.900						643
	15	8.908						643
	22	8.915						643
	16	8.921						643
	19	8.946						643
	21	9.022						643
	17	9.042						643
	28	9.120						643
	24	9.129						643
	40	9.145						643
	31	9.155						643
	34	9.248						643
	18	9.271						643
	22	9.287						643
	32	9.380						643
	22	9.401						643
	31	9.486						643
	0	9.507						643
	0	9.568						643
	11	9.619						643
	28	9.644						643
	32	9.817						643
	12	9.882						643
	5	9.936						945
	85	10.065						643
	36	10.071						643

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	21	10.205						643
	15	10.269						643
	19	10.408						643
	19	10.486						643
	1	10.516						643
	1	10.762						643
	15	10.877						945
	12	10.964						643
	1	10.987						1089
	21	11.090						945
	5	11.113						643
	61	11.166						643
	15	11.199						643
	48	11.233						643
	125	11.333						643
	86	11.485						643
	47	11.632						643
	128	11.948						643
	24	11.953						945
	2	12.016						643
	25	12.158						643
	130	12.297						643
	70	13.030						643
	2	13.307						643
	33	13.614						643
	42	13.719						945
	7	13.829						643
	29	14.041						945
	0	14.053						643
	36	14.750						945
	0	14.812						643
	16	14.833						945
	20	14.908						146
		14.942						643
	1	15.070						643
	30	15.075						945
	69	15.091						643
	1	15.222						643
	34	15.237						945
	28	15.289						945
	58	15.294						643
	14	15.339						945
	14	15.360						945
	77	15.585						643
	1	15.598						643
	75	15.635						643
	77	15.686						643
	120	15.806						643
	140	15.918						643
	0	15.979						643
	2	16.236						643
	2	16.336						643
	1	16.506						643
	9	16.819						979
	8	17.734						979
	8	17.787						979
	8	17.821						979
	6	17.901						979
	13	17.944						979
	245	24.55						736
	10	83.94						868
	20	99.05						393
		101.435						241
	90	108.45						393
	10	115.46						729

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	6	117.89						393
		123.76						390
	60	134.743						729
	30	136.34						868
	5	139.82						393
		155.50						814
		155.78						814
		155.81						814
	130	156.84						393
		163.52						814
	500	165.47						256
	600	166.35						256
	20	169.616						856
	600	169.88						256
	30	169.915						856
	30	171.533						856
	400	176.32						256
	700	176.74						256
	40	176.982						856
	30	177.597						856
	600	178.15						256
	500	179.00						256
	20	186.983						856
	600	187.27						256
	40	188.498						856
	500	188.86						256
	300	189.50						256
	200	191.20						199
		194.31						814
	250	194.762						365
	1000	195.476						365
	750	196.046						365
	100	200.80						256
	300	201.69						256
	100	202.92						256
	50	203.739						856
	400	204.77						256
		205.31						814
	30	206.180						856
	30	206.264						856
	40	207.124						856
	30	207.935						856
	300	210.03						256
	300	210.40						256
	200	210.67						256
	30	220.882						856
	200	222.189						365
	200	223.870						365
	30	225.867						856
	30	228.057						856
	40	249.389						856
	40	256.919						856
		1249.20						593
	4	1370.11						089
	1	1428.84						089
	7	1440.63						089
	40	1544.90						089
	10	1553.77						089
	0	1574.12						816
	10	1667.95						089
	100	1681.05						089
	100	1731.77						089
	20	1734.54						089
	20	1737.83						089
	20	1740.14						089

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	20	1766.36						089
	15	1777.35						089
	15	1779.35						089
	15	1814.06						089
	0	1839.65						816
	40	1842.97						089
	2	1872.65						816
	0	1875.14						816
	1	1878.06						816
	0	1878.20						816
	70	1878.31						089
	2	1879.86						816
	2	1884.73						816
	150	1888.03						089
	150	1901.71						089
	0	1958.84						816

IRON I (Fe^{+0}), Z = 26

Ground State $1s^22s^22p^63s^23p^63d^64s^2$ ($^5D_4$) (26 electrons)

Ionization Potential 63 480 cm^{-1}; 7.870 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	0	1737.63	0. - 57.550000	$3d^64s^2$ - $3d^6(a^3D)4s4p(^3P^o)$	ga^5D - t^3F^o	4 - 4	Q	816,375
	0	1761.08	0. - 56.783317	$3d^64s^2$ - $3d^6(a^1G)4s4p(^3P^o)$	ga^5D - u^3F^o	4 - 3	Q	816,375
	0	1851.39	0. - 54.013747	$3d^64s^2$ - $3d^6(a^3D)4s4p(^3P^o)$	ga^5D - $^5F^o$	4 - 5	Q	816,375
1.	100	1855.58	0. - 53.891520	$3d^64s^2$ - $3d^6(a^3D)4s4p(^3P^o)$	ga^5D - $^5D^o$	4 - 3		605
	0	1856.21	.415932 - 54.28909	$3d^64s^2$ -	ga^5D - 22^o	3 - 3	Q	816,375
	40	1859.26	0. - 53.78474	$3d^64s^2$ -	ga^5D - 20^o	4 - 3		378
39.	100	1862.318	.415932 - 54.112218	$3d^64s^2$ - $3d^6(a^3P)4s4p(^3P^o)$	ga^5D - $^5P^o$	3 - 2		292
40.	10	1863.54	0. - 53.66109	$3d^64s^2$ - $3d^7(a^2D)4p$	ga^5D - y^1F^o	4 - 3		605
	300	1865.30	0. - 53.61044	$3d^64s^2$ -	ga^5D - 17^o	4 - 4		378
42.	80	1866.07	.415932 - 54.00478	$3d^64s^2$ - $3d^6(a^3P)4s4p(^3P^o)$	ga^5D - $^5P^o$	3 - 3		605
39.	40	1866.815	.704004 - 54.271057	$3d^64s^2$ - $3d^6(a^3P)4s4p(^3P^o)$	ga^5D - $^5P^o$	2 - 1		292
	0	1870.36	.415932 - 53.88191	$3d^64s^2$ -	ga^5D - 21^o	3 - 4	Q	816,375
39.	160	1872.359	.704004 - 54.112218	$3d^64s^2$ - $3d^6(a^3P)4s4p(^3P^o)$	ga^5D - $^5P^o$	2 - 2		292
	160	1873.052	0. - 53.38868	$3d^64s^2$ -	ga^5D - 27^o	4 - 3		292
39.	100	1873.259	.888129 - 54.271057	$3d^64s^2$ - $3d^6(a^3P)4s4p(^3P^o)$	ga^5D - $^5P^o$	1 - 1		292
39.	40	1876.419	.978072 - 54.271057	$3d^64s^2$ - $3d^6(a^3P)4s4p(^3P^o)$	ga^5D - $^5P^o$	0 - 1		292
39.	20	1878.849	.888129 - 54.112218	$3d^64s^2$ - $3d^6(a^3P)4s4p(^3P^o)$	ga^5D - $^5P^o$	1 - 2		292
41.	35	1880.14	.704004 - 53.891520	$3d^64s^2$ - $3d^6(a^3D)4s4p(^3P^o)$	ga^5D - $^5D^o$	2 - 3		605
	40	1883.91	.704004 - 53.78474	$3d^64s^2$ -	ga^5D - 20^o	2 - 3		378
	300	1887.761	.415932 - 53.38868	$3d^64s^2$ -	ga^5D - 27^o	3 - 3		292
40.	80	1888.32	.704004 - 53.66109	$3d^64s^2$ - $3d^7(a^2D)4p$	ga^5D - y^1F^o	2 - 3		605
	200	1891.74	.888129 - 53.74939	$3d^64s^2$ -	ga^5D - 19^o	1 - 2		378
	20	1899.21	.704004 - 53.35753	$3d^64s^2$ -	ga^5D - 16^o	2 - 3		378
38.	20	1903.39	.415932 - 52.95368	$3d^64s^2$ -	ga^5D - s^3D^o	3 - 3	P	605
	0	1910.53	.888129 - 53.229942	$3d^64s^2$ - $3d^7(a^2D)4p$	ga^5D - $^3D^o$	1 - 1	Q	816,375
37.	500	1934.528	0. - 51.691935	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^5D - u^5P^o	4 - 3		292
35.	500	1937.274	0. - 51.619069	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^5D - u^5F^o	4 - 3		292
37.	500	1940.649	.415932 - 51.944774	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^5D - u^5P^o	3 - 2		292
35.	200	1945.090	.415932 - 51.827401	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^5D - u^5F^o	3 - 2	P	292
37.	400	1945.274	.704004 - 52.110587	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^5D - u^5P^o	2 - 1	P	292
35.	40	1946.219	0. - 51.381455	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^5D - u^5F^o	4 - 4		292
36.	600	1946.983	0. - 51.361394	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^5D - t^5D^o	4 - 3		795,292
37.	500	1950.223	.415932 - 51.691935	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^5D - u^5P^o	3 - 3		292
35.	500	1951.571	.704004 - 51.944774	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^5D - u^5P^o	2 - 2	P	292
37.	500	1952.262	.888129 - 52.110587	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^5D - u^5P^o	1 - 1		292

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
36.	500	1952.579	.415932 - 51.63007	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - t^{5}D^o	3 - 2		795,292
35.	500	1953.001	.415932 - 51.619069	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - u^{5}F^o	3 - 3		795,292
36.	400	1955.690	.704004 - 51.83687	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - t^{5}D^o	2 - 1		292
35.	500	1956.052	.704004 - 51.827401	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - u^{5}F^o	2 - 2	P	292
36.	600	1957.838	0. - 51.076626	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - t^{5}D^o	4 - 4		795,292
37.	600	1958.598	.888129 - 51.944774	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - u^{5}P^o	1 - 2		292
36.	300	1958.724	.888129 - 51.941786	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - t^{5}D^o	1 - 0	P	292
35.	600	1960.139	0. - 51.016658	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - u^{5}F^o	4 - 5		795,292
37.	500	1961.236	.704004 - 51.691935	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - u^{5}P^o	2 - 3		292
35.	500	1962.031	.978072 - 51.945805	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - u^{5}F^o	0 - 1		292
35.	600	1962.107	.415932 - 51.381455	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - u^{5}F^o	3 - 4		292
36.	10	1962.746	.888129 - 51.83687	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - t^{5}D^o	1 - 1		292
36.	400	1962.871	.415932 - 51.361394	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - t^{5}D^o	3 - 3		292
35.	500	1963.110	.888129 - 51.827401	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - u^{5}F^o	1 - 2		292
35.	200	1963.629	.704004 - 51.63007	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - t^{5}D^o	2 - 2		292
35.	400	1964.043	.704004 - 51.619069	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - u^{5}F^o	2 - 3		292
36.	10	1970.771	.888129 - 51.63007	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - t^{5}D^o	1 - 2		292
36.	20	1973.911	.415932 - 51.076626	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - t^{5}D^o	3 - 4		292
36.	20	1974.059	.704004 - 51.361394	$3d^64s^2$ - $3d^6(a^5D)4s(a^6D)5p$	ga^{5}D - t^{5}D^o	2 - 3		292

IRON II (Fe^{+1}), Z = 26

Ground State $1s^22s^22p^63s^23p^63d^64s$ ($^6D_{9/2}$) (25 electrons)

Ionization Potential 130 563 cm^{-1}; 16.188 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
31	1	896.504	.384790 - 111.9290	$3d^6(a^5D)4s$ -	ga^{6}D - 29^o	$\frac{7}{2}$ - $\frac{5}{2}$		292
31	0	898.776	.667683 - 111.9290	$3d^6(a^5D)4s$ -	ga^{6}D - 29^o	$\frac{5}{2}$ - $\frac{5}{2}$		292
31	5	900.360	.862613 - 111.9290	$3d^6(a^5D)4s$ -	ga^{6}D - 29^o	$\frac{3}{2}$ - $\frac{5}{2}$		292
	1	918.118	.862613 - 109.7800	$3d^6(a^5D)4s$ -	ga^{6}D - 28^o	$\frac{3}{2}$ - $\frac{3}{2}$		292
	0	919.095	.977053 - 109.7800	$3d^6(a^5D)4s$ -	ga^{6}D - 28^o	$\frac{1}{2}$ - $\frac{3}{2}$		292
28	2	923.880	0. - 108.2392	$3d^6(a^5D)4s$ -	ga^{6}D - 24^o	$\frac{9}{2}$ - $\frac{7}{2}$		749
30	2	924.970	.667683 - 108.7800	$3d^6(a^5D)4s$ -	ga^{6}D - 27^o	$\frac{5}{2}$ - $\frac{3}{2}$		292
25	5	926.215	0. - 107.9647	$3d^6(a^5D)4s$ -	ga^{6}D - 21^o	$\frac{9}{2}$ - $\frac{9}{2}$		749
30	1	926.618	.862613 - 108.7800	$3d^6(a^5D)4s$ -	ga^{6}D - 27^o	$\frac{3}{2}$ - $\frac{3}{2}$		292
24	2	926.900	0. - 107.8866	$3d^6(a^5D)4s$ -	ga^{6}D - 20^o	$\frac{9}{2}$ - $\frac{7}{2}$		292
28	2	927.178	.384790 - 108.2392	$3d^6(a^5D)4s$ -	ga^{6}D - 24^o	$\frac{7}{2}$ - $\frac{7}{2}$		749
30	1	927.632	.977053 - 108.7800	$3d^6(a^5D)4s$ -	ga^{6}D - 27^o	$\frac{1}{2}$ - $\frac{3}{2}$		292
26	1	928.107	.384790 - 108.1306	$3d^6(a^5D)4s$ -	ga^{6}D - 22^o	$\frac{7}{2}$ - $\frac{5}{2}$		292
29	2	928.470	.667683 - 108.3717	$3d^6(a^5D)4s$ -	ga^{6}D - 25^o	$\frac{5}{2}$ - $\frac{3}{2}$		292
25	1	929.538	.384790 - 107.9647	$3d^6(a^5D)4s$ -	ga^{6}D - 21^o	$\frac{7}{2}$ - $\frac{9}{2}$		292
28	1	929.612	.667683 - 108.2392	$3d^6(a^5D)4s$ -	ga^{6}D - 24^o	$\frac{5}{2}$ - $\frac{7}{2}$		292
27	1	930.030	.667683 - 108.1916	$3d^6(a^5D)4s$ -	ga^{6}D - 23^o	$\frac{5}{2}$ - $\frac{3}{2}$		292
29	1	930.165	.862613 - 108.3717	$3d^6(a^5D)4s$ -	ga^{6}D - 25^o	$\frac{3}{2}$ - $\frac{3}{2}$		292
24	1	930.219	.384790 - 107.8866	$3d^6(a^5D)4s$ -	ga^{6}D - 20^o	$\frac{7}{2}$ - $\frac{7}{2}$		292
26	1	930.558	.667683 - 108.1306	$3d^6(a^5D)4s$ -	ga^{6}D - 22^o	$\frac{5}{2}$ - $\frac{5}{2}$		292
29	2	931.142	.977053 - 108.3717	$3d^6(a^5D)4s$ -	ga^{6}D - 25^o	$\frac{1}{2}$ - $\frac{3}{2}$		292
27	1	931.709	.862613 - 108.1916	$3d^6(a^5D)4s$ -	ga^{6}D - 23^o	$\frac{3}{2}$ - $\frac{3}{2}$		292
26	0	932.244	.862613 - 108.1306	$3d^6(a^5D)4s$ -	ga^{6}D - 22^o	$\frac{3}{2}$ - $\frac{5}{2}$		292
27	0	932.687	.977053 - 108.1916	$3d^6(a^5D)4s$ -	ga^{6}D - 23^o	$\frac{1}{2}$ - $\frac{3}{2}$		292
22	0	935.783	0. - 106.8632	$3d^6(a^5D)4s$ -	ga^{6}D - 16^o	$\frac{9}{2}$ - $\frac{7}{2}$		292
23	1	936.484	.384790 - 107.1656	$3d^6(a^5D)4s$ -	ga^{6}D - 17^o	$\frac{7}{2}$ - $\frac{7}{2}$		292
23	1	938.967	.667683 - 107.1656	$3d^6(a^5D)4s$ -	ga^{6}D - 17^o	$\frac{5}{2}$ - $\frac{5}{2}$		292
22	2	939.159	.384790 - 106.8632	$3d^6(a^5D)4s$ -	ga^{6}D - 16^o	$\frac{7}{2}$ - $\frac{7}{2}$		292
22	1	941.660	.667683 - 106.8632	$3d^6(a^5D)4s$ -	ga^{6}D - 16^o	$\frac{5}{2}$ - $\frac{7}{2}$		292
56	0	942.589	1.872567 - 107.9647	$3d^7$ -	a^{4}F - 21^o	$\frac{9}{2}$ - $\frac{7}{2}$		292
55	1	943.267	1.872567 - 107.8866	$3d^7$ -	a^{4}F - 20^o	$\frac{9}{2}$ - $\frac{7}{2}$		292
58	2	943.910	2.837950 - 108.7800	$3d^7$ -	a^{4}F - 27^o	$\frac{5}{2}$ - $\frac{3}{2}$		292
57	3	945.095	2.430097 - 108.2392	$3d^7$ -	a^{4}F - 24^o	$\frac{7}{2}$ - $\frac{7}{2}$		292
	0	946.051	2.430097 - 108.1306	$3d^7$ -	a^{4}F - 22^o	$\frac{7}{2}$ - $\frac{5}{2}$		292
	0	947.564	2.430097 - 107.9647	$3d^7$ -	a^{4}F - 21^o	$\frac{7}{2}$ - $\frac{9}{2}$		292

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
53	1	952.470	1.872567 - 106.8632	$3d^7$ -	a^4F - 16^o	$\frac{9}{2}$ - $\frac{7}{2}$		292
	0	954.496	2.430097 - 107.1962	$3d^7$ -	a^4F - 18^o	$\frac{7}{2}$ - $\frac{5}{2}$		292
	0	954.786	2.430097 - 107.1656	$3d^7$ -	a^4F - 17^o	$\frac{7}{2}$ - $\frac{5}{2}$		292
77	1	995.829	7.955299 - 108.3738	$3d^6(a^5D)4s$ -	a^4D - 26^o	$\frac{7}{2}$ - $\frac{7}{2}$		292
	0	999.003	8.680454 - 108.7800	$3d^6(a^5D)4s$ -	a^4D - 27^o	$\frac{3}{2}$ - $\frac{3}{2}$		292
77	0	1000.183	8.391938 - 108.3738	$3d^6(a^5D)4s$ -	a^4D - 26^o	$\frac{5}{2}$ - $\frac{7}{2}$		292
	0	1000.665	8.846768 - 108.7800	$3d^6(a^5D)4s$ -	a^4D - 27^o	$\frac{1}{2}$ - $\frac{3}{2}$		292
	0	1005.082	8.391938 - 107.8866	$3d^6(a^5D)4s$ -	a^4D - 20^o	$\frac{5}{2}$ - $\frac{7}{2}$		292
76	2	1007.657	7.955299 - 107.1962	$3d^6(a^5D)4s$ -	a^4D - 18^o	$\frac{7}{2}$ - $\frac{5}{2}$		292
75	3	1007.975	7.955299 - 107.1656	$3d^6(a^5D)4s$ -	a^4D - 17^o	$\frac{7}{2}$ - $\frac{7}{2}$		292
74	3	1011.037	7.955299 - 106.8632	$3d^6(a^5D)4s$ -	a^4D - 16^o	$\frac{7}{2}$ - $\frac{7}{2}$		292
76	2	1012.088	8.391938 - 107.1962	$3d^6(a^5D)4s$ -	a^4D - 18^o	$\frac{5}{2}$ - $\frac{5}{2}$		292
75	25	1012.417	8.391938 - 107.1656	$3d^6(a^5D)4s$ -	a^4D - 17^o	$\frac{5}{2}$ - $\frac{5}{2}$		292
76	1	1015.083	.384790 - 98.89871	$3d^6(a^5D)4s$ - $3d^6(b^1G)4p$	ga^6D - $^2F^o$	$\frac{7}{2}$ - $\frac{7}{2}$		292
74	2	1015.520	8.391938 - 106.8632	$3d^6(a^5D)4s$ -	a^4D - 16^o	$\frac{5}{2}$ - $\frac{7}{2}$		292
	1	1038.370	13.474411 - 109.7800	$3d^7$ -	a^4P - 28^o	$\frac{5}{2}$ - $\frac{3}{2}$		292
	5	1055.262	0. - 94.763219	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6P^o$	$\frac{9}{2}$ - $\frac{7}{2}$	P	749
	5	1059.564	.384790 - 94.763219	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6P^o$	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
	5	1060.442	.384790 - 94.68509	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6P^o$	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
	2	1062.152	0. - 94.148518	$3d^6(a^5D)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	ga^6D - w^4G^o	$\frac{9}{2}$ - $\frac{9}{2}$	P	749
	2	1062.750	.667683 - 94.763219	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6P^o$	$\frac{5}{2}$ - $\frac{7}{2}$	P	749
	2	1063.021	.667683 - 94.73917	$3d^6(a^5D)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	ga^6D - $^4P^o$	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
	5	1063.176	0. - 94.057773	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6D^o$	$\frac{9}{2}$ - $\frac{9}{2}$	P	749
	1	1063.625	.862613 - 94.88074	$3d^6(a^5D)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	ga^6D - $^4P^o$	$\frac{3}{2}$ - $\frac{1}{2}$	P	749
	1	1063.633	.667683 - 94.68509	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6P^o$	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	1	1063.972	0. - 93.987457	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6D^o$	$\frac{9}{2}$ - $\frac{7}{2}$	P	749
	0	1064.921	.977053 - 94.88074	$3d^6(a^5D)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	ga^6D - $^4P^o$	$\frac{1}{2}$ - $\frac{1}{2}$	P	749
	2	1065.843	.862613 - 94.68509	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6P^o$	$\frac{3}{2}$ - $\frac{5}{2}$	P	749
	5	1066.529	.977053 - 94.73917	$3d^6(a^5D)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	ga^6D - $^4P^o$	$\frac{1}{2}$ - $\frac{3}{2}$	P	749
	5	1067.544	.384790 - 94.057773	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6D^o$	$\frac{7}{2}$ - $\frac{9}{2}$	P	749
	5	1068.346	.384790 - 93.987457	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6D^o$	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
	1	1070.135	.384790 - 93.830979	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6D^o$	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
	2	1071.247	.862613 - 94.211739	$3d^6(a^5D)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	ga^6D - $^4P^o$	$\frac{3}{2}$ - $\frac{5}{2}$	P	749
	5	1071.584	.667683 - 93.987457	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6D^o$	$\frac{5}{2}$ - $\frac{7}{2}$	P	749
	2	1073.321	.862613 - 94.031378	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6D^o$	$\frac{3}{2}$ - $\frac{1}{2}$	P	749
	2	1073.384	.667683 - 93.830979	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6D^o$	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	0	1074.641	.977053 - 94.031378	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6D^o$	$\frac{1}{2}$ - $\frac{1}{2}$	P	749
	2	1075.635	.862613 - 93.830979	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6D^o$	$\frac{3}{2}$ - $\frac{5}{2}$	P	749
	1	1076.852	.977053 - 93.84034	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6D^o$	$\frac{1}{2}$ - $\frac{3}{2}$	P	749
	30	1081.875	0. - 92.432136	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6F^o$	$\frac{9}{2}$ - $\frac{11}{2}$	P	749
	1	1083.420	0. - 92.300277	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6F^o$	$\frac{9}{2}$ - $\frac{9}{2}$	P	749
	0	1086.458	.384790 - 92.42698	$3d^6(a^5D)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	ga^6D - v^4F^o	$\frac{7}{2}$ - $\frac{9}{2}$	P	749
	10	1087.956	.384790 - 92.300277	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6F^o$	$\frac{7}{2}$ - $\frac{9}{2}$	P	749
	5	1089.688	.384790 - 92.154165	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6F^o$	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
	1	1091.523	1.872567 - 93.48765	$3d^7$ - $3d^6(b^3F)4p$	a^4F - u^4F^o	$\frac{9}{2}$ - $\frac{7}{2}$	P	749
	1	1091.560	1.872567 - 93.48458	$3d^7$ - $3d^6(b^3F)4p$	a^4F - u^4F^o	$\frac{9}{2}$ - $\frac{9}{2}$	P	749
	2	1093.058	.667683 - 92.154165	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6F^o$	$\frac{5}{2}$ - $\frac{7}{2}$	P	749
	2	1094.678	.667683 - 92.018729	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6F^o$	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	1	1095.802	1.872567 - 93.12990	$3d^7$ - $3d^6(b^3F)4p$	a^4F - $^4D^o$	$\frac{9}{2}$ - $\frac{7}{2}$	P	749
	1	1095.911	.667683 - 91.915950	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6F^o$	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
18	5	1096.607	.384790 - 91.575139	$3d^6(a^5D)4s$ - $3d^6(a^5D)5p$	ga^6D - $^6P^o$	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
18	1	1096.782	.667683 - 91.843470	$3d^6(a^5D)4s$ - $3d^6(a^5D)5p$	ga^6D - $^6P^o$	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
18	30	1096.877	0. - 91.167937	$3d^6(a^5D)4s$ - $3d^6(a^5D)5p$	ga^6D - $^6P^o$	$\frac{9}{2}$ - $\frac{7}{2}$	P	749
	1	1097.019	.862613 - 92.018729	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6F^o$	$\frac{3}{2}$ - $\frac{5}{2}$	P	749
	4	1098.244	2.430097 - 93.48458	$3d^7$ - $3d^6(b^3F)4p$	a^4F - u^4F^o	$\frac{7}{2}$ - $\frac{9}{2}$	P	749
	1	1098.257	.862613 - 91.915950	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6F^o$	$\frac{3}{2}$ - $\frac{3}{2}$	P	749
18	2	1099.132	.862613 - 91.843470	$3d^6(a^5D)4s$ - $3d^6(a^5D)5p$	ga^6D - $^6P^o$	$\frac{3}{2}$ - $\frac{3}{2}$	P	749
	0	1099.321	2.430097 - 93.39536	$3d^7$ - $3d^6(b^3F)4p$	a^4F - u^4F^o	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
	0	1099.639	.977053 - 91.915950	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6F^o$	$\frac{1}{2}$ - $\frac{3}{2}$	P	749
18	5	1100.020	.667683 - 91.575139	$3d^6(a^5D)4s$ - $3d^6(a^5D)5p$	ga^6D - $^6P^o$	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	1	1100.429	.977053 - 91.850722	$3d^6(a^5D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	ga^6D - $^6F^o$	$\frac{1}{2}$ - $\frac{1}{2}$	P	749
18	1	1100.517	.977053 - 91.843470	$3d^6(a^5D)4s$ - $3d^6(a^5D)5p$	ga^6D - $^6P^o$	$\frac{1}{2}$ - $\frac{3}{2}$	P	749
18	2	1101.526	.384790 - 91.167937	$3d^6(a^5D)4s$ - $3d^6(a^5D)5p$	ga^6D - $^6P^o$	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
18	0	1102.384	.862613 - 91.575139	$3d^6(a^5D)4s$ - $3d^6(a^5D)5p$	ga^6D - $^6P^o$	$\frac{3}{2}$ - $\frac{5}{2}$	P	749
	0	1102.538	2.430097 - 93.12990	$3d^7$ - $3d^6(b^3F)4p$	a^4F - $^4D^o$	$\frac{7}{2}$ - $\frac{7}{2}$	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	1102.71	.384790 - 91.070547	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$ga^6D - {}^4F^o$	$\frac{7}{2} - \frac{5}{2}$	P	292
	1	1104.272	2.837950 - 93.39536	$3d^7 - 3d^6(b^3F)4p$	$a^4F - u^4F^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
18	0	1104.969	.667683 - 91.167937	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$ga^6D - {}^6P^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	0	1105.350	2.430097 - 92.89950	$3d^7 - 3d^6(b^3F)4p$	$a^4F - {}^4D^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
	2	1105.754	7.955299 - 98.39133	$3d^6(a^3D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4D - {}^4D^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	2	1106.203	7.955299 - 98.35466	$3d^6(a^3D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4D - {}^4F^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
	5	1106.362	0. - 90.386528	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$ga^6D - {}^4F^o$	$\frac{9}{2} - \frac{9}{2}$		292
	1	1107.430	1.872567 - 92.171716	$3d^7 - 3d^6(b^3F)4p$	$a^4F - u^2G^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
	1	1108.512	3.117461 - 93.32848	$3d^7 - 3d^6(b^3F)4p$	$a^4F - u^4F^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	1	1109.716	8.391938 - 98.50510	$3d^6(a^3D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4D - {}^4D^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	0	1110.005	8.680454 - 98.77014	$3d^6(a^3D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4D - {}^4D^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	1	1111.119	8.391938 - 98.39133	$3d^6(a^3D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4D - {}^4D^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	30	1112.048	0. - 89.924175	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$ga^6D - {}^6F^o$	$\frac{9}{2} - \frac{11}{2}$	P	749
	35	1112.086	.977053 - 90.898873	$3d^6(a^5D)4s - 3d^6(b^3P)4p$	$ga^6D - {}^4P^o$	$\frac{1}{2} - \frac{3}{2}$		488
	0	1112.937	2.430097 - 92.28246	$3d^7 - 3d^5(a^4G)4s4p(^3P^o)$	$a^4F - v^4F^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	0	1113.467	2.837950 - 92.64751	$3d^7 - 3d^6(b^3F)4p$	$a^4F - {}^4D^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	0	1115.044	.384790 - 90.067347	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$ga^6D - {}^6F^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
	0	1115.349	.384790 - 90.042779	$3d^6(a^5D)4s - 3d^6(b^3F)4p$	$ga^6D - {}^4G^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
	0	1115.661	.667683 - 90.300625	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$ga^6D - {}^6F^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	0	1118.116	2.837950 - 92.27412	$3d^7 - 3d^6(b^3P)4p$	$a^4F - {}^4P^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	0	1119.204	8.846768 - 98.19600	$3d^6(a^3D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4D - {}^4F^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
	1	1119.370	3.117461 - 92.45346	$3d^7 - 3d^6(b^3F)4p$	$a^4F - {}^4D^o$	$\frac{3}{2} - \frac{1}{2}$	P	749
	1	1120.559	3.117461 - 92.35861	$3d^7 - 3d^5(a^4G)4s4p(^3P^o)$	$a^4F - v^4F^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	40	1121.975	0. - 89.128561	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6P^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	30	1122.843	.384790 - 89.444458	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6P^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
	10	1124.123	.667683 - 89.625940	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6P^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	30	1125.448	0. - 88.853533	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$ga^6D - {}^6D^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	20	1126.421	.667683 - 89.444458	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6P^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	20	1126.591	.862613 - 89.625940	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6P^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	20	1126.840	.384790 - 89.128561	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6P^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	20	1126.955	.384790 - 89.119457	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$ga^6D - {}^6D^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
	5	1127.098	0. - 88.723400	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$ga^6D - {}^6D^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
	10	1127.860	.667683 - 89.331195	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$ga^6D - {}^6D^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	40	1128.046	.977053 - 89.625940	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6P^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
	5	1128.180	2.430097 - 91.070547	$3d^7 - 3d^6(a^5D)5p$	$a^4F - {}^4F^o$	$\frac{7}{2} - \frac{5}{2}$	Q	292
	1	1128.557	.862613 - 89.471365	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$ga^6D - {}^6D^o$	$\frac{3}{2} - \frac{1}{2}$	P	749
	20	1128.899	.862613 - 89.444458	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6P^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	5	1129.621	1.872567 - 90.397868	$3d^7 - 3d^6(a^5D)5p$	$a^4F - {}^4D^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	1	1129.765	1.872567 - 90.386528	$3d^7 - 3d^6(a^5D)4p$	$a^4F - {}^4F^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
	30	1130.443	.667683 - 89.128561	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6P^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	0	1130.560	.667683 - 89.119457	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$ga^6D - {}^6D^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	0	1130.863	1.872567 - 90.300625	$3d^7 - 3d^6(a^5D)5p$	$a^4F - {}^6F^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	2	1131.594	2.837950 - 91.208887	$3d^7 - 3d^6(a^5D)5p$	$a^4F - {}^4F^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	1	1132.001	1.872567 - 90.211700	$3d^7 - 3d^6(b^3F)4p$	$a^4F - {}^4G^o$	$\frac{9}{2} - \frac{11}{2}$	P	749
	40	1133.405	.384790 - 88.61452	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6D^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
	5	1133.654	2.837950 - 91.048256	$3d^7 - 3d^6(a^5D)5p$	$a^4F - {}^4D^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	20	1133.665	0. - 88.20945	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6D^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	15	1133.675	2.430097 - 90.638822	$3d^7 - 3d^6(a^5D)5p$	$a^4F - {}^4D^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
	0	1134.170	1.872567 - 90.042779	$3d^7 - 3d^6(b^3F)4p$	$a^4F - {}^4G^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
	1	1135.302	3.117461 - 91.199746	$3d^7 - 3d^6(a^5D)5p$	$a^4F - {}^4D^o$	$\frac{3}{2} - \frac{1}{2}$	P	749
	0	1135.548	2.837950 - 90.901124	$3d^7 - 3d^6(a^5D)5p$	$a^4F - {}^4P^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	1	1135.577	2.837950 - 90.898873	$3d^7 - 3d^6(b^3P)4p$	$a^4F - {}^4P^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	0	1136.780	2.430097 - 90.397868	$3d^7 - 3d^6(a^5D)5p$	$a^4F - {}^4D^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	0	1137.258	3.117461 - 91.048256	$3d^7 - 3d^6(a^5D)5p$	$a^4F - {}^4D^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	0	1137.681	21.251608 - 109.14968	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4H - {}^2I^o$	$\frac{13}{2} - \frac{13}{2}$	P	749
	0	1138.038	2.430097 - 90.300625	$3d^7 - 3d^6(a^5D)5p$	$a^4F - {}^6F^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	40	1138.632	.384790 - 88.20945	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6D^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	1	1138.941	2.837950 - 90.638822	$3d^7 - 3d^6(a^5D)5p$	$a^4F - {}^4D^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	20	1142.312	.667683 - 88.20945	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6D^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
10	20	1142.366	0. - 87.537652	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$ga^6D - y^6F^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
10	90	1143.226	0. - 87.471765	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$ga^6D - y^6F^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
56	5	1144.052	20.830582 - 108.2392	$3d^6(a^3P)4s -$	$b^4P - 24^o$	$\frac{5}{2} - \frac{7}{2}$		488
	40	1144.273	.667683 - 88.05938	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6D^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
10	110	1144.939	0. - 87.340983	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$ga^6D - y^6F^o$	$\frac{9}{2} - \frac{11}{2}$	P	749
	2	1145.515	.667683 - 87.96465	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6D^o$	$\frac{5}{2} - \frac{3}{2}$	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	1146.364	21.251608 - 108.48387	$3d^6(a^3H)4s - 3d^5(a^2G)4s4p(^1P^o)$	$a^4H - {}^4G^o$	$\frac{13}{2} - \frac{11}{2}$	P	749
	20	1146.831	.862613 - 88.05938	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6D^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
10	20	1146.952	.384790 - 87.572431	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$ga^6D - y^6F^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
10	55	1147.409	.384790 - 87.537652	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$ga^6D - y^6F^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	2	1147.576	21.430359 - 108.57056	$3d^6(a^3H)4s - 3d^5(a^2G)4s4p(^1P^o)$	$a^4H - {}^4G^o$	$\frac{11}{2} - \frac{9}{2}$	P	749
	40	1148.079	.862613 - 87.96465	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6D^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
10	90	1148.277	.384790 - 87.471765	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$ga^6D - y^6F^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
	0	1148.719	21.430359 - 108.48387	$3d^6(a^3H)4s - 3d^5(a^2G)4s4p(^1P^o)$	$a^4H - {}^4G^o$	$\frac{11}{2} - \frac{11}{2}$	P	749
	1	1148.733	2.837950 - 89.890373	$3d^7 - 3d^6(b^3F)4p$	$a^4F - {}^4G^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	1	1148.772	21.581638 - 108.63109	$3d^6(a^3H)4s - 3d^5(a^2G)4s4p(^1P^o)$	$a^4H - {}^4G^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
10	5	1148.956	.862613 - 87.89812	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$ga^6D - y^6F^o$	$\frac{3}{2} - \frac{1}{2}$	P	749
	20	1149.589	.977053 - 87.96465	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6D^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
10	10	1150.290	.667683 - 87.60225	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$ga^6D - y^6F^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
10	30	1150.469	.977053 - 87.89812	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$ga^6D - y^6F^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
10	30	1150.685	.667683 - 87.572431	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$ga^6D - y^6F^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
10	70	1151.146	.667683 - 87.537652	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$ga^6D - y^6F^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	1	1152.428	.862613 - 87.63592	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6D^o$	$\frac{3}{2} - \frac{1}{2}$	P	749
10	10	1152.875	.862613 - 87.60225	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$ga^6D - y^6F^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
10	20	1153.272	.862613 - 87.572431	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$ga^6D - y^6F^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	1	1153.950	.977053 - 87.63592	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$ga^6D - {}^6D^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
10	5	1154.399	.977053 - 87.60225	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$ga^6D - y^6F^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
57	2	1155.273	21.812055 - 108.3717	$3d^6(a^3P)4s$ -	$b^4P - 25^o$	$\frac{3}{2} - \frac{3}{2}$		488
	2	1156.575	23.317633 - 109.7800	$3d^54s^2$ -	$a^6S - 28^o$	$\frac{5}{2} - \frac{3}{2}$		292
	1	1158.115	8.391938 - 94.73917	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$a^4D - {}^4P^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	10	1159.334	7.955299 - 94.211739	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$a^4D - {}^4P^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
	0	1160.089	8.680454 - 94.88074	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$a^4D - {}^4P^o$	$\frac{3}{2} - \frac{1}{2}$	P	749
	0	1162.332	8.846768 - 94.88074	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$a^4D - {}^4P^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
	5	1164.474	7.955299 - 93.830979	$3d^6(a^5D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4D - {}^6D^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
	5	1165.232	8.391938 - 94.211739	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$a^4D - {}^4P^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	2	1166.042	22.810357 - 108.57056	$3d^6(a^3F)4s - 3d^5(a^2G)4s4p(^1P^o)$	$b^4F - {}^4G^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
	1	1166.974	22.939358 - 108.63109	$3d^6(a^3F)4s - 3d^5(a^2G)4s4p(^1P^o)$	$b^4F - {}^4G^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	2	1168.252	23.031300 - 108.62925	$3d^6(a^3F)4s - 3d^5(a^2G)4s4p(^1P^o)$	$b^4F - {}^4G^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	10	1168.552	21.430359 - 107.00635	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4H - {}^2H^o$	$\frac{11}{2} - \frac{9}{2}$	P	749
	10	1169.190	7.955299 - 93.48458	$3d^6(a^5D)4s - 3d^6(b^3F)4p$	$a^4D - u^4F^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
	2	1170.297	8.391938 - 93.84034	$3d^6(a^5D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4D - {}^6D^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	1	1171.633	8.680454 - 94.031378	$3d^6(a^5D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4D - {}^6D^o$	$\frac{3}{2} - \frac{1}{2}$	P	749
	1	1173.921	8.846768 - 94.031378	$3d^6(a^5D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4D - {}^6D^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
	0	1174.059	7.955299 - 93.12990	$3d^6(a^5D)4s - 3d^6(b^3F)4p$	$a^4D - {}^4D^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	1	1175.699	23.317633 - 108.3738	$3d^54s^2$ -	$a^6S - 26^o$	$\frac{5}{2} - \frac{7}{2}$		292
	1	1180.109	8.391938 - 93.12990	$3d^6(a^5D)4s - 3d^6(b^3F)4p$	$a^4D - {}^4D^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	2	1180.430	8.680454 - 93.39536	$3d^6(a^5D)4s - 3d^6(b^3F)4p$	$a^4D - u^4F^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	1	1181.362	8.680454 - 93.32848	$3d^6(a^5D)4s - 3d^6(b^3F)4p$	$a^4D - u^4F^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	1	1181.891	1.872567 - 86.48275	$3d^7 - 3d^6(a^1F)4p$	$a^4F - u^2F^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	1	1183.438	2.430097 - 86.929649	$3d^7 - 3d^6(b^3P)4p$	$a^4F - v^4D^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	10	1183.829	7.955299 - 92.42698	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4D - v^4F^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
	2	1185.712	2.430097 - 86.767577	$3d^7 - 3d^6(b^3P)4p$	$a^4F - v^4D^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
	1	1185.857	7.955299 - 92.28246	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4D - v^4F^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	10	1187.417	7.955299 - 92.171716	$3d^6(a^5D)4s - 3d^6(b^3F)4p$	$a^4D - u^2G^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
	0	1187.705	22.810357 - 107.00635	$3d^6(a^3F)4s - 3d^5(a^2I)4s4p(^3P^o)$	$b^4F - {}^2H^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
	1	1188.815	2.430097 - 86.54749	$3d^7 - 3d^6(a^1F)4p$	$a^4F - u^2F^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
	0	1189.726	22.637205 - 106.69017	$3d^6(a^3F)4s - 3d^5(a^2I)4s4p(^3P^o)$	$b^4F - {}^2H^o$	$\frac{9}{2} - \frac{11}{2}$	P	749
	1	1191.356	8.391938 - 92.32989	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4D - v^4F^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	1	1191.474	2.837950 - 86.767577	$3d^7 - 3d^6(b^3P)4p$	$a^4F - v^4D^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	10	1192.030	8.391938 - 92.28246	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4D - v^4F^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	0	1192.148	8.391938 - 92.27412	$3d^6(a^5D)4s - 3d^6(b^3P)4p$	$a^4D - {}^4P^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	2	1194.657	2.837950 - 86.543974	$3d^7 - 3d^6(b^3P)4p$	$a^4F - v^4D^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	0	1195.055	8.680454 - 92.35861	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4D - v^4F^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	2	1195.465	8.680454 - 92.32989	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4D - v^4F^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	1	1196.263	8.680454 - 92.27412	$3d^6(a^5D)4s - 3d^6(b^3P)4p$	$a^4D - {}^4P^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	1	1196.671	21.251608 - 104.81680	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4H - {}^4H^o$	$\frac{13}{2} - \frac{11}{2}$	P	749
	1	1197.435	8.846768 - 92.35861	$3d^6(a^5D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4D - v^4F^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
	1	1197.498	21.430359 - 104.93780	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4H - {}^4H^o$	$\frac{11}{2} - \frac{9}{2}$	P	749
	0	1198.064	8.846768 - 92.314758	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$a^4D - {}^4P^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
	0	1198.087	25.805328 - 109.27171	$3d^6(a^3G)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4G - {}^2I^o$	$\frac{9}{2} - \frac{11}{2}$	P	749
	1	1198.366	21.581638 - 105.02860	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4H - {}^4H^o$	$\frac{9}{2} - \frac{7}{2}$	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	0	1198.660	3.117461 - 86.543974	$3d^7 - 3d^6(b^3P)4p$	$a^4F - v^4D^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	55	1198.931	21.251608 - 104.65926	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4H - {}^4H^o$	$\frac{13}{2} - \frac{13}{2}$	P	749
	40	1199.236	21.430359 - 104.81680	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4H - {}^4H^o$	$\frac{11}{2} - \frac{11}{2}$	P	749
	20	1199.671	21.581638 - 104.93780	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4H - {}^4H^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
	20	1200.240	21.711917 - 105.02860	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4H - {}^4H^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	1	1201.415	21.581638 - 104.81680	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4H - {}^4H^o$	$\frac{9}{2} - \frac{11}{2}$	P	749
	1	1201.506	21.430359 - 104.65926	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4H - {}^4H^o$	$\frac{11}{2} - \frac{13}{2}$	P	749
	0	1201.549	21.711917 - 104.93780	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4H - {}^4H^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
	2	1202.591						749
	5	1204.035	15.84465 - 98.89871	$3d^7 - 3d^6(b^1G)4p$	$a^2G - {}^2F^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	2	1205.117	26.170181 - 109.14968	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$b^2H - {}^2I^o$	$\frac{11}{2} - \frac{13}{2}$	P	749
	2	1205.997	26.352766 - 109.27171	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$b^2H - {}^2I^o$	$\frac{9}{2} - \frac{11}{2}$	P	749
	1	1207.360	7.955299 - 90.780621	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$a^4D - {}^4F^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	2	1207.898						749
	1	1208.237	25.805328 - 108.57056	$3d^6(a^3G)4s - 3d^5(a^2G)4s4p(^1P^o)$	$a^4G - {}^4G^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
	1	1209.431	7.955299 - 90.638822	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$a^4D - {}^4D^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
	1	1209.929	25.981629 - 108.63109	$3d^6(a^3G)4s - 3d^5(a^2G)4s4p(^1P^o)$	$a^4G - {}^4G^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	2	1211.986	8.391938 - 90.901124	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$a^4D - {}^4P^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	2	1212.966	7.955299 - 90.397868	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$a^4D - {}^4D^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	20	1213.149	7.955299 - 90.386528	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$a^4D - {}^4F^o$	$\frac{7}{2} - \frac{9}{2}$		292
	2	1213.738	8.680454 - 91.070547	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$a^4D - {}^4F^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	3	1213.759	8.391938 - 90.780621	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$a^4D - {}^4F^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	1	1214.150	8.846768 - 91.208887	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$a^4D - {}^4F^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
	1	1214.398	7.955299 - 90.300625	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$a^4D - {}^6F^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	2	1217.848	7.955299 - 90.067347	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$a^4D - {}^6F^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
	0	1218.088	8.391938 - 90.487810	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$a^4D - {}^6F^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	2	1218.231	7.955299 - 90.042779	$3d^6(a^5D)4s - 3d^6(b^3F)4p$	$a^4D - {}^4G^o$	$\frac{7}{2} - \frac{9}{2}$	Q	749
	30	1219.802	21.251608 - 103.2321	$3d^6(a^3H)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4H - {}^4I^o$	$\frac{13}{2} - \frac{15}{2}$	P	749
	1	1220.872	8.391938 - 90.300625	$3d^6(a^5D)4s - 3d^6(a^5D)5p$	$a^4D - {}^6F^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	40	1224.132	21.430359 - 103.1209	$3d^6(a^3H)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4H - {}^4I^o$	$\frac{11}{2} - \frac{13}{2}$	P	749
	20	1225.497	21.251608 - 102.8512	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4H - {}^4K^o$	$\frac{13}{2} - \frac{15}{2}$	P	749
	20	1228.521	21.581638 - 102.9803	$3d^6(a^3H)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4H - {}^4I^o$	$\frac{9}{2} - \frac{11}{2}$	P	749
	1	1230.597	25.428784 - 106.69017	$3d^6(a^3G)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4G - {}^2H^o$	$\frac{11}{2} - \frac{11}{2}$	P	749
	10	1230.927	21.711917 - 102.9515	$3d^6(a^3H)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4H - {}^4I^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
	10	1233.661	21.430359 - 102.4899	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4H - {}^4K^o$	$\frac{11}{2} - \frac{13}{2}$	P	749
	5	1234.386	13.673185 - 94.68509	$3d^7 - 3d^5(a^4D)4s4p(^3P^o)$	$a^4P - {}^6P^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	0	1236.34	25.805328 - 106.69017	$3d^6(a^3G)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4G - {}^2H^o$	$\frac{9}{2} - \frac{11}{2}$		816
	0	1237.93	8.846768 - 89.625940	$3d^6(a^5D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$a^4D - {}^6P^o$	$\frac{1}{2} - \frac{3}{2}$		816
	2	1238.257	21.581638 - 102.3403	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4H - {}^4K^o$	$\frac{9}{2} - \frac{11}{2}$	P	749
	5	1239.871	26.352766 - 107.00635	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$b^2H - {}^2H^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
	5	1241.928	26.170181 - 106.69017	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$b^2H - {}^2H^o$	$\frac{11}{2} - \frac{11}{2}$	P	749
	1	1242.046	15.84465 - 96.35696	$3d^7 - 3d^5(a^4G)4s4p(^3P^o)$	$a^2G - t^2F^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	2	1244.750	26.352766 - 106.69017	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$b^2H - {}^2H^o$	$\frac{9}{2} - \frac{11}{2}$	P	749
	2	1245.340						749
	2	1246.760						749
	2	1247.816	22.810357 - 102.9515	$3d^6(a^3F)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4F - {}^4I^o$	$\frac{7}{2} - \frac{9}{2}$	Q	749
	2	1249.798	26.170181 - 106.1831	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$b^2H - {}^2K^o$	$\frac{11}{2} - \frac{13}{2}$	P	749
	5	1250.597						749
	20	1255.406	13.474411 - 93.12990	$3d^7 - 3d^6(b^3F)4p$	$a^4P - {}^4D^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	0	1257.18	27.620412 - 107.1656	$3d^6(a^3F)4s$ -	$a^2F - 17^o$	$\frac{5}{2} - \frac{7}{2}$	Q	816
	10	1259.053	13.474411 - 92.89950	$3d^7 - 3d^6(b^3F)4p$	$a^4P - {}^4D^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	10	1259.179	20.34030 - 99.75712	$3d^7 - 3d^6(b^1G)4p$	$a^2H - {}^2G^o$	$\frac{11}{2} - \frac{9}{2}$	P	749
	0	1259.636	25.428784 - 104.81680	$3d^6(a^3G)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4G - {}^4H^o$	$\frac{11}{2} - \frac{11}{2}$	P	749
9	110	1260.533	0. - 79.33150	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^1P^o)$	$ga^6D - x^6P^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	5	1260.829	20.34030 - 99.65322	$3d^7 - 3d^5(a^4G)4s4p(^4P^o)$	$a^2H - {}^2G^o$	$\frac{11}{2} - \frac{9}{2}$	P	749
	10	1262.141	25.428784 - 104.65926	$3d^6(a^3G)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4G - {}^4H^o$	$\frac{11}{2} - \frac{13}{2}$	P	749
	10	1262.212	13.673185 - 92.89950	$3d^7 - 3d^6(b^3F)4p$	$a^4P - {}^4D^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	0	1263.055	13.474411 - 92.64751	$3d^7 - 3d^6(b^3F)4p$	$a^4P - {}^4D^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	0	1263.200	22.409852 - 101.57390	$3d^6(a^3P)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4P - {}^4P^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
	1	1263.704	25.805328 - 104.93780	$3d^6(a^3G)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4G - {}^4H^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
	1	1265.071	25.981629 - 105.02860	$3d^6(a^3G)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4G - {}^4H^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	10	1265.639	25.805328 - 104.81680	$3d^6(a^3G)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4G - {}^4H^o$	$\frac{9}{2} - \frac{11}{2}$	P	749
	10	1265.781	20.80577 - 99.80840	$3d^7 - 3d^6(b^1G)4p$	$a^2H - {}^2G^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	5	1266.234	7.955299 - 86.929649	$3d^6(a^5D)4s - 3d^6(b^3P)4p$	$a^4D - v^4D^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	15	1266.253	26.055423 - 105.02860	$3d^6(a^3G)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4G - {}^4H^o$	$\frac{5}{2} - \frac{7}{2}$	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	5	1266.525	25.981629 - 104.93780	$3d^6(a^3G)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^4G - {}^4H^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
9	30	1266.677	.384790 - 79.33150	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^1P^o)$	$ga^6D - x^6P^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
9	55	1267.422	.384790 - 79.28511	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^1P^o)$	$ga^6D - x^6P^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
	5	1268.143	13.474411 - 92.32989	$3d^7 - 3d^5(a^4G)4s4p(^3P^o)$	$a^4P - v^4F^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	1	1268.557	20.80577 - 99.63552	$3d^7 - 3d^5(a^4G)4s4p(^3P^o)$	$a^2H - {}^2G^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	2	1269.040	13.474411 - 92.27412	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4P^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	1	1269.353	13.673185 - 92.45346	$3d^7 - 3d^6(b^3F)4p$	$a^4P - {}^4D^o$	$\frac{3}{2} - \frac{1}{2}$	P	749
	1	1269.823	13.474411 - 92.225538	$3d^7 - 3d^6(a^5D)5p$	$a^4P - {}^4P^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	1	1269.959	13.904824 - 92.64751	$3d^7 - 3d^6(b^3F)4p$	$a^4P - {}^4D^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
9	2	1271.232	.667683 - 79.33150	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^1P^o)$	$ga^6D - x^6P^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	1	1271.347	13.673185 - 92.32989	$3d^7 - 3d^5(a^4G)4s4p(^3P^o)$	$a^4P - v^4F^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	1	1271.592	13.673185 - 92.314758	$3d^7 - 3d^6(a^5D)5p$	$a^4P - {}^4P^o$	$\frac{3}{2} - \frac{1}{2}$	P	749
9	55	1271.983	.667683 - 79.28511	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^1P^o)$	$ga^6D - x^6P^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	5	1272.250	13.673185 - 92.27412	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4P^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
9	35	1272.613	.667683 - 79.24617	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^1P^o)$	$ga^6D - x^6P^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	5	1272.655	.667683 - 79.24360	$3d^6(a^5D)4s - 3d^6(a^1D)4p$	$ga^6D - w^2P^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	2	1273.036	13.673185 - 92.225538	$3d^7 - 3d^6(a^5D)5p$	$a^4P - {}^4P^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	5	1273.097	13.904824 - 92.45346	$3d^7 - 3d^6(b^3F)4p$	$a^4P - {}^4D^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
	2	1274.063	26.170181 - 104.65926	$3d^6(a^3H)4s - 3d^5(a^2I)4s4p(^3P^o)$	$b^2H - {}^4H^o$	$\frac{11}{2} - \frac{13}{2}$	P	749
9	20	1275.144	.862613 - 79.28511	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^1P^o)$	$ga^6D - x^6P^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	2	1275.349	13.904824 - 92.314758	$3d^7 - 3d^6(a^5D)5p$	$a^4P - {}^4P^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
9	55	1275.778	.862613 - 79.24617	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^1P^o)$	$ga^6D - x^6P^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	60	1275.807	20.516960 - 98.89871	$3d^7 - 3d^6(b^1G)4p$	$a^2D - {}^2F^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	10	1275.820	.862613 - 79.24360	$3d^6(a^5D)4s - 3d^6(a^1D)4p$	$ga^6D - w^2P^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	10	1276.801	13.904824 - 92.225538	$3d^7 - 3d^6(a^5D)5p$	$a^4P - {}^4P^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
9	60	1277.643	.977053 - 79.24617	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^1P^o)$	$ga^6D - x^6P^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
	10	1277.685	.977053 - 79.24360	$3d^6(a^5D)4s - 3d^6(a^1D)4p$	$ga^6D - w^2P^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
	5	1279.101	25.787598 - 103.96749	$3d^6(a^3P)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^2P - {}^2S^o$	$\frac{3}{2} - \frac{1}{2}$	P	749
	5	1280.526	20.80577 - 98.89871	$3d^7 - 3d^6(b^1G)4p$	$a^2H - {}^2F^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	20	1283.063	20.34030 - 98.27877	$3d^7 - 3d^6(b^1G)4p$	$a^2H - {}^2H^o$	$\frac{11}{2} - \frac{11}{2}$	P	749
	1	1286.914	20.830582 - 98.53585	$3d^6(a^3P)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4P - {}^4F^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	1	1287.423	20.830582 - 98.50510	$3d^6(a^3P)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4P - {}^4D^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	1	1289.094	13.474411 - 91.048256	$3d^7 - 3d^6(a^5D)5p$	$a^4P - {}^4D^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	5	1289.312	20.830582 - 98.39133	$3d^6(a^3P)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4P - {}^4D^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	40	1290.194	20.830582 - 98.33828	$3d^6(a^3P)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4P - {}^4S^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	20	1290.772	20.80577 - 98.27877	$3d^7 - 3d^6(b^1G)4p$	$a^2H - {}^2H^o$	$\frac{9}{2} - \frac{11}{2}$	P	749
	30	1291.581	13.474411 - 90.898873	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4P^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	1	1292.406	13.673185 - 91.048256	$3d^7 - 3d^6(a^5D)5p$	$a^4P - {}^4D^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	2	1293.044	26.055423 - 103.39129	$3d^6(a^3G)4s - 3d^6(a^5D_{5/2})4f$	$a^4G - {}_{5/2}[3/2]^o$	$\frac{5}{2} - \frac{3}{2}$	Q	749
	0	1293.543	13.474411 - 90.780621	$3d^7 - 3d^6(a^5D)5p$	$a^4P - {}^4F^o$	$\frac{5}{2} - \frac{7}{2}$		292
	30	1294.906	13.673185 - 90.898873	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4P^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	1	1295.903	21.430359 - 98.59665	$3d^6(a^3H)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4H - {}^4F^o$	$\frac{11}{2} - \frac{9}{2}$	P	749
	40	1296.084	13.474411 - 90.629902	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4S^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	1	1296.287	13.904824 - 91.048256	$3d^7 - 3d^6(a^5D)5p$	$a^4P - {}^4D^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
	10	1297.933	20.80577 - 97.85135	$3d^7 - 3d^6(b^1G)4p$	$a^2H - {}^2H^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
	2	1298.116	26.932748 - 103.96749	$3d^6(a^3P)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^2P - {}^2S^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
	5	1298.802	13.904824 - 90.898873	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4P^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
	30	1299.432	13.673185 - 90.629902	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4S^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	0	1299.804	13.904824 - 90.83948	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4P^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
	1	1299.994	13.474411 - 90.397868	$3d^7 - 3d^6(a^5D)5p$	$a^4P - {}^4D^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	2	1303.030	26.932748 - 103.67622	$3d^6(a^3P)4s - 3d^6(a^5D_{3/2})4f$	$b^2P - {}_{3/2}[1/2]^o$	$\frac{1}{2} - \frac{1}{2}$	Q	749
	5	1303.355	13.904824 - 90.629902	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4S^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
	2	1303.899	21.812055 - 98.50510	$3d^6(a^3P)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4P - {}^4D^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	5	1304.436	25.787598 - 102.44910	$3d^6(a^3P)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^2P - {}^2D^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	1	1305.520	22.409852 - 99.00770	$3d^6(a^3P)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4P - {}^4D^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
	0	1305.784	15.84465 - 92.42698	$3d^7 - 3d^5(a^4G)4s4p(^3P^o)$	$a^2G - v^4F^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
	20	1306.742	21.812055 - 98.33828	$3d^6(a^3P)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4P - {}^4S^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	2	1306.830	18.360646 - 94.88074	$3d^7 - 3d^5(a^4P)4s4p(^3P^o)$	$a^2P - {}^4P^o$	$\frac{3}{2} - \frac{1}{2}$	Q	749
	2	1307.263	20.830582 - 97.32627	$3d^6(a^3P)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4P - {}^2P^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	0	1308.968	32.875646 - 109.27171	$3d^6(a^1I)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^2I - {}^2I^o$	$\frac{13}{2} - \frac{11}{2}$	P	749
	30	1309.555	32.909905 - 109.27171	$3d^6(a^1I)4s - 3d^5(a^2I)4s4p(^3P^o)$	$a^2I - {}^2I^o$	$\frac{11}{2} - \frac{11}{2}$	P	749
	10	1309.581	22.409852 - 98.77014	$3d^6(a^3P)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4P - {}^4D^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
	1	1309.929	18.360646 - 94.70066	$3d^7 - 3d^6(b^3F)4p$	$a^2P - {}^2D^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	1	1310.151	15.84465 - 92.171716	$3d^7 - 3d^6(b^3F)4p$	$a^2G - u^2G^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
	1	1310.588	30.388542 - 106.69017	$3d^6(a^3G)4s - 3d^5(a^2I)4s4p(^3P^o)$	$b^2G - {}^2H^o$	$\frac{9}{2} - \frac{11}{2}$	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	30	1311.062	32.875646 - 109.14968	$3d^6(a^1I)4s$ - $3d^5(a^2I)4s4p(^3P^o)$	a^2I - $^2I^o$	$\frac{13}{2}$ - $\frac{13}{2}$	P	749
	2	1311.762	16.36936 - 92.602703	$3d^7$ - $3d^6(b^3F)4p$	a^2G - u^2G^o	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
	5	1316.492	22.637205 - 98.59665	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4F - $^4F^o$	$\frac{9}{2}$ - $\frac{9}{2}$	P	749
	5	1317.030	22.409852 - 98.33828	$3d^6(a^3P)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	b^4P - $^4S^o$	$\frac{1}{2}$ - $\frac{3}{2}$	P	749
	5	1317.545	22.637205 - 98.53585	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4F - $^4F^o$	$\frac{9}{2}$ - $\frac{7}{2}$	P	749
	1	1318.065	27.314922 - 103.1837	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	a^2F - $^2F^o$	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
	0	1318.565	20.516960 - 96.35696	$3d^7$ - $3d^5(a^4G)4s4p(^3P^o)$	a^2D - t^2F^o	$\frac{5}{2}$ - $\frac{7}{2}$	P	749
	0	1318.726	22.939358 - 98.77014	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4F - $^4D^o$	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
	2	1320.060	22.637205 - 98.39133	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4F - $^4D^o$	$\frac{9}{2}$ - $\frac{7}{2}$	P	749
	0	1320.327	23.031300 - 98.77014	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4F - $^4D^o$	$\frac{3}{2}$ - $\frac{3}{2}$	P	749
	1	1320.559	22.810357 - 98.53585	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4F - $^4F^o$	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
	1	1320.765	27.620412 - 103.3341	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	a^2F - $^2F^o$	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	1	1321.096	22.810357 - 98.50510	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4F - $^4D^o$	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
	1	1323.084	22.810357 - 98.39133	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4F - $^4D^o$	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
	1	1323.258	26.932748 - 102.50381	$3d^6(a^3P)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^2P - $^2D^o$	$\frac{1}{2}$ - $\frac{3}{2}$	P	749
	0	1323.351	22.939358 - 98.50510	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4F - $^4D^o$	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	5	1324.254	21.812055 - 97.32627	$3d^6(a^3P)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	b^4P - $^2P^o$	$\frac{3}{2}$ - $\frac{3}{2}$	P	749
	0	1325.991	22.939358 - 98.35466	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4F - $^4F^o$	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	0	1327.14	7.955299 - 83.305251	$3d^6(a^5D)4s$ - $3d^6(a^1F)4p$	a^4D - v^2G^o	$\frac{7}{2}$ - $\frac{7}{2}$	P	816
	0	1328.786	22.939358 - 98.19600	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4F - $^4F^o$	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
	1	1328.793	20.80577 - 96.06206	$3d^7$ - $3d^5(a^4G)4s4p(^3P^o)$	a^2H - $^2H^o$	$\frac{9}{2}$ - $\frac{11}{2}$	P	749
	1	1330.01	23.317633 - 98.50510	$3d^54s^2$ - $3d^5(a^4D)4s4p(^3P^o)$	a^6S - $^4D^o$	$\frac{5}{2}$ - $\frac{5}{2}$	P	816
	2	1330.052						749
	1	1330.405	20.830582 - 95.99569	$3d^6(a^3P)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	b^4P - $^4D^o$	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	0	1330.412	23.031300 - 98.19600	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4F - $^4F^o$	$\frac{3}{2}$ - $\frac{3}{2}$	P	749
	10	1330.952	27.314922 - 102.44910	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	a^2F - $^2D^o$	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
	2	1335.410	27.620412 - 102.50381	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	a^2F - $^2D^o$	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
	1	1336.386	27.620412 - 102.44910	$3d^6(a^3F)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	a^2F - $^2D^o$	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	1	1336.712	21.251608 - 96.06206	$3d^6(a^3H)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	a^4H - $^2H^o$	$\frac{13}{2}$ - $\frac{11}{2}$	P	749
	1	1340.260	25.787598 - 100.40036	$3d^6(a^3P)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	b^2P - $^2D^o$	$\frac{3}{2}$ - $\frac{5}{2}$	P	749
	5	1345.382	25.428784 - 99.75712	$3d^6(a^3G)4s$ - $3d^6(b^1G)4p$	a^4G - $^2G^o$	$\frac{11}{2}$ - $\frac{9}{2}$	P	749
	10	1347.265	25.428784 - 99.65322	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	a^4G - $^2G^o$	$\frac{11}{2}$ - $\frac{9}{2}$	P	749
	5	1348.005	20.516960 - 94.70066	$3d^7$ - $3d^6(b^3F)4p$	a^2D - $^2D^o$	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	5	1349.592	32.909905 - 107.00635	$3d^6(a^1I)4s$ - $3d^5(a^2I)4s4p(^3P^o)$	a^2I - $^2H^o$	$\frac{11}{2}$ - $\frac{9}{2}$	P	749
	2	1353.023	20.830582 - 94.73917	$3d^6(a^3P)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	b^4P - $^4P^o$	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
	1	1354.013	20.830582 - 94.68509	$3d^6(a^3P)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4P - $^6P^o$	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	1	1354.459	25.805328 - 99.63552	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	a^4G - $^2G^o$	$\frac{9}{2}$ - $\frac{7}{2}$	P	749
	2	1354.747	32.875646 - 106.69017	$3d^6(a^1I)4s$ - $3d^5(a^2I)4s4p(^3P^o)$	a^2I - $^2H^o$	$\frac{13}{2}$ - $\frac{11}{2}$	P	749
	0	1354.87	20.34030 - 94.148518	$3d^7$ - $3d^5(a^4G)4s4p(^3P^o)$	a^2H - w^4G^o	$\frac{11}{2}$ - $\frac{9}{2}$	Q	816
	0	1356.483	22.637205 - 96.35696	$3d^6(a^3F)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	b^4F - t^2F^o	$\frac{9}{2}$ - $\frac{7}{2}$	P	749
	20	1357.796	32.875646 - 106.5244	$3d^6(a^1I)4s$ - $3d^5(a^2I)4s4p(^3P^o)$	a^2I - $^2K^o$	$\frac{13}{2}$ - $\frac{15}{2}$	P	749
	2	1358.788						749
	20	1358.937	26.170181 - 99.75712	$3d^6(a^3H)4s$ - $3d^6(b^1G)4p$	b^2H - $^2G^o$	$\frac{11}{2}$ - $\frac{9}{2}$	P	749
	20	1359.063	22.637205 - 96.21742	$3d^6(a^3F)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	b^4F - $^4D^o$	$\frac{9}{2}$ - $\frac{7}{2}$	P	749
	12	1360.16	.977053 - 74.498057	$3d^6(a^5D)4s$ - $3d^6(a^3D)4p$	ga^6D - x^2D^o	$\frac{1}{2}$ - $\frac{3}{2}$	Q	439
	5	1360.450	33.501253 - 107.00635	$3d^6(a^1G)4s$ - $3d^5(a^2I)4s4p(^3)$	c^2G - $^2H^o$	$\frac{7}{2}$ - $\frac{9}{2}$	P	749
	20	1360.858	26.170181 - 99.65322	$3d^6(a^3H)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	b^2H - $^2G^o$	$\frac{11}{2}$ - $\frac{9}{2}$	P	749
	25	1361.366	26.352766 - 99.80840	$3d^6(a^3H)4s$ - $3d^6(b^1G)4p$	b^2H - $^2G^o$	$\frac{9}{2}$ - $\frac{7}{2}$	P	749
	30	1361.373	13.474411 - 86.929649	$3d^7$ - $3d^6(b^3P)4p$	a^4P - v^4D^o	$\frac{5}{2}$ - $\frac{7}{2}$	P	749
	1	1361.504	22.409852 - 95.85805	$3d^6(a^3P)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	b^4P - $^4D^o$	$\frac{1}{2}$ - $\frac{3}{2}$	P	749
	2	1362.267	22.810357 - 96.21742	$3d^6(a^3F)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	b^4F - $^4D^o$	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
	1	1362.535	21.308040 - 94.70066	$3d^7$ - $3d^6(b^3F)4p$	a^2D - $^2D^o$	$\frac{3}{2}$ - $\frac{5}{2}$	P	749
	10	1362.748	20.830582 - 94.211739	$3d^6(a^3P)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	b^4P - $^4P^o$	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	20	1364.384	13.474411 - 86.767577	$3d^7$ - $3d^6(b^3P)4p$	a^4P - v^4D^o	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	40	1364.578	26.352766 - 99.63552	$3d^6(a^3H)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	b^2H - $^2G^o$	$\frac{9}{2}$ - $\frac{7}{2}$	P	749
	20	1364.756	32.909905 - 106.1831	$3d^6(a^1I)4s$ - $3d^5(a^2I)4s4p(^3P^o)$	a^2I - $^2K^o$	$\frac{11}{2}$ - $\frac{13}{2}$	P	749
	10	1365.678	33.466463 - 106.69017	$3d^6(a^1G)4s$ - $3d^5(a^2I)4s4p(^3P^o)$	c^2G - $^2H^o$	$\frac{9}{2}$ - $\frac{11}{2}$	P	749
	20	1366.394	22.810357 - 95.99569	$3d^6(a^3F)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	b^4F - $^4D^o$	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
	30	1366.720	25.428784 - 98.59665	$3d^6(a^3G)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	a^4G - $^4F^o$	$\frac{11}{2}$ - $\frac{9}{2}$	P	749
	2	1367.161	20.34030 - 93.48458	$3d^7$ - $3d^6(b^3F)4p$	a^2H - u^4F^o	$\frac{11}{2}$ - $\frac{9}{2}$	P	749
	2	1367.950						749
	10	1368.094	13.673185 - 86.767577	$3d^7$ - $3d^6(b^3P)4p$	a^4P - v^4D^o	$\frac{3}{2}$ - $\frac{5}{2}$	P	749
	2	1368.262	27.314922 - 100.40036	$3d^6(a^3F)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	a^2F - $^2D^o$	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
	1	1368.493	13.474411 - 86.54749	$3d^7$ - $3d^6(a^1F)4p$	a^4P - u^2F^o	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	2	1368.575	21.812055 - 94.88074	$3d^6(a^3P)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	b^4P - $^4P^o$	$\frac{3}{2}$ - $\frac{1}{2}$	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	5	1368.807	22.939358 - 95.99569	$3d^6(a^3F)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4F - {}^4D^o$	5/2 - 5/2	P	749
	20	1369.707	13.474411 - 86.48275	$3d^7 - 3d^6(a^1F)4p$	$a^4P - u^2F^o$	5/2 - 7/2	P	749
	10	1369.856	20.830582 - 93.830979	$3d^6(a^3P)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4P - {}^6D^o$	5/2 - 5/2	P	749
	2	1370.191	25.787598 - 98.77014	$3d^6(a^3P)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^2P - {}^4D^o$	3/2 - 3/2	P	749
	0	1370.532	23.031300 - 95.99569	$3d^6(a^3F)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4F - {}^4D^o$	3/2 - 5/2	P	749
	55	1371.022	21.251608 - 94.189888	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4H - w^4G^o$	13/2 - 11/2	P	749
	0	1371.232	21.812055 - 94.73917	$3d^6(a^3P)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4P - {}^4P^o$	3/2 - 3/2	P	749
	5	1371.390	22.939358 - 95.85805	$3d^6(a^3F)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4F - {}^4D^o$	5/2 - 3/2	P	749
	0	1372.226	13.673185 - 86.54749	$3d^7 - 3d^6(a^1F)4p$	$a^4P - u^2F^o$	3/2 - 5/2	P	749
	40	1372.292	13.673185 - 86.543974	$3d^7 - 3d^6(b^3P)4p$	$a^4P - v^4D^o$	3/2 - 3/2	P	749
	5	1373.122	23.031300 - 95.85805	$3d^6(a^3F)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4F - {}^4D^o$	3/2 - 3/2	P	749
	30	1373.718	30.388542 - 103.1837	$3d^6(a^3G)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^2G - {}^2F^o$	9/2 - 7/2	P	749
	0	1374.005	27.620412 - 100.40036	$3d^6(a^3F)4s - 3d^5(a^4P)4s4p(^3P^o)$	$a^2F - {}^2D^o$	5/2 - 5/2	P	749
	1	1374.393	21.430359 - 94.189888	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4H - w^4G^o$	11/2 - 11/2	P	749
	5	1374.827	23.031300 - 95.76770	$3d^6(a^3F)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4F - {}^4D^o$	3/2 - 1/2	P	749
	10	1374.939	25.805328 - 98.53585	$3d^6(a^3G)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4G - {}^4F^o$	9/2 - 7/2	P	749
	55	1375.172	21.430359 - 94.148518	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4H - w^4G^o$	11/2 - 9/2	P	749
	1	1375.859	20.80577 - 93.48765	$3d^7 - 3d^6(b^3F)4p$	$a^2H - u^4F^o$	9/2 - 7/2	P	749
	10	1376.668	13.904824 - 86.543974	$3d^7 - 3d^6(b^3P)4p$	$a^4P - v^4D^o$	1/2 - 3/2	P	749
	0	1377.676	25.805328 - 98.39133	$3d^6(a^3G)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4G - {}^4D^o$	9/2 - 7/2	P	749
	2	1377.99	30.764485 - 103.3341	$3d^6(a^3G)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^2G - {}^2F^o$	7/2 - 5/2	Q	816
	30	1378.036	25.787598 - 98.35466	$3d^6(a^3P)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^2P - {}^4F^o$	3/2 - 5/2	P	749
	2	1378.280	25.981629 - 98.53585	$3d^6(a^3G)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4G - {}^4F^o$	7/2 - 7/2	P	749
	2	1378.347	25.787598 - 98.33828	$3d^6(a^3P)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^2P - {}^4S^o$	3/2 - 3/2	P	749
	55	1379.470	21.581638 - 94.073248	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4H - w^4G^o$	9/2 - 7/2	P	749
	5	1379.615	13.904824 - 86.388820	$3d^7 - 3d^6(b^3P)4p$	$a^4P - v^4D^o$	1/2 - 1/2	P	749
	10	1380.411	27.314922 - 99.75712	$3d^6(a^3F)4s - 3d^6(b^1G)4p$	$a^2F - {}^2G^o$	7/2 - 9/2	P	749
	2	1380.711	26.170181 - 98.59665	$3d^6(a^3H)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^2H - {}^4F^o$	11/2 - 9/2	P	749
	10	1381.221	21.812055 - 94.211739	$3d^6(a^3P)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4P - {}^4P^o$	3/2 - 5/2	P	749
	20	1381.730	25.981629 - 98.35466	$3d^6(a^3G)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4G - {}^4F^o$	7/2 - 5/2	P	749
	1	1381.954	21.711917 - 94.073248	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4H - w^4G^o$	7/2 - 7/2	P	749
	2	1382.394	27.314922 - 99.65322	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^2F - {}^2G^o$	7/2 - 9/2	P	749
	1	1382.565	22.409852 - 94.73917	$3d^6(a^3P)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4P - {}^4P^o$	1/2 - 3/2	P	749
	1	1382.732	27.314922 - 99.63552	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^2F - {}^2G^o$	7/2 - 7/2	P	749
	2	1383.139	20.830582 - 93.12990	$3d^6(a^3P)4s - 3d^6(b^3F)4p$	$b^4P - {}^4D^o$	5/2 - 7/2	P	749
	70	1383.580	21.711917 - 93.98817	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4H - w^4G^o$	7/2 - 5/2	P	749
	5	1384.671	21.812055 - 94.031378	$3d^6(a^3P)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4P - {}^6D^o$	3/2 - 1/2	P	749
	2	1385.272	27.620412 - 99.80840	$3d^6(a^3F)4s - 3d^6(b^1G)4p$	$a^2F - {}^2G^o$	5/2 - 7/2	P	749
	1	1385.456	20.516960 - 92.695374	$3d^7 - 3d^6(b^3P)4p$	$a^2D - u^2D^o$	5/2 - 5/2	P	749
	20	1386.182	26.055423 - 98.19600	$3d^6(a^3G)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4G - {}^4F^o$	5/2 - 3/2	P	749
	1	1386.462	22.637205 - 94.763219	$3d^6(a^3F)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4F - {}^6P^o$	9/2 - 7/2	P	749
	1	1386.797	26.170181 - 98.27877	$3d^6(a^3H)4s - 3d^6(b^1G)4p$	$b^2H - {}^2H^o$	11/2 - 11/2	P	749
	55	1387.219	20.34030 - 92.42698	$3d^7 - 3d^5(a^4G)4s4p(^3P^o)$	$a^2H - v^4F^o$	11/2 - 9/2	P	749
	1	1387.445	26.932748 - 99.00770	$3d^6(a^3P)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^2P - {}^4D^o$	1/2 - 1/2	P	749
	0	1387.87	31.364440 - 103.41808	$3d^6(a^3D)4s - 3d^6(a^5D_{5/2})4f$	$b^4D - {}_{5/2}[0]^o$	3/2 - 1/2	Q	816
	10	1387.94	31.999048 - 104.04635	$3d^7 - 3d^6(a^5D_{<,0})4f$	$b^2F - 0[_{5/2}]^o$	7/2 - 5/2	Q	436
	5	1388.524	21.812055 - 93.830979	$3d^6(a^3P)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4P - {}^6D^o$	3/2 - 5/2	P	749
	5	1388.597	27.620412 - 99.63552	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^2F - {}^2G^o$	5/2 - 7/2	P	749
	2	1389.660	20.34030 - 92.300277	$3d^7 - 3d^5(a^4D)4s4p(^3P^o)$	$a^2H - {}^6F^o$	11/2 - 9/2		749
	5	1390.318	26.352766 - 98.27877	$3d^6(a^3H)4s - 3d^6(b^1G)4p$	$b^2H - {}^2H^o$	9/2 - 11/2	P	749
	1	1391.309	22.810357 - 94.68509	$3d^6(a^3F)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4F - {}^6P^o$	7/2 - 5/2	P	749
	70	1392.149	20.34030 - 92.171716	$3d^7 - 3d^6(b^3F)4p$	$a^2H - u^2G^o$	11/2 - 9/2	P	749
	90	1392.817	20.80577 - 92.602703	$3d^7 - 3d^6(b^3F)4p$	$a^2H - u^2G^o$	9/2 - 7/2	P	749
	2	1393.214	20.34030 - 92.11678	$3d^7 - 3d^5(a^4G)4s4p(^3P^o)$	$a^2H - x^4H^o$	11/2 - 9/2	P	749
	1	1393.49	22.939358 - 94.70066	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - {}^2D^o$	5/2 - 3/2	Q	816
	1	1394.713	20.516960 - 92.216320	$3d^7 - 3d^6(b^3P)4p$	$a^2D - u^2D^o$	5/2 - 3/2	P	749
	2	1396.228	22.409852 - 94.031378	$3d^6(a^3P)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4P - {}^6D^o$	1/2 - 1/2	P	749
	5	1396.234	20.80577 - 92.42698	$3d^7 - 3d^5(a^4G)4s4p(^3P^o)$	$a^2H - v^4F^o$	9/2 - 9/2	P	749
	1	1396.964	27.314922 - 98.89871	$3d^6(a^3F)4s - 3d^6(b^1G)4p$	$a^2F - {}^2F^o$	7/2 - 7/2	P	749
	0	1396.974	21.812055 - 93.39536	$3d^6(a^3P)4s - 3d^6(b^3F)4p$	$b^4P - u^4F^o$	3/2 - 5/2	P	749
	30	1397.572	22.637205 - 94.189888	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - w^4G^o$	9/2 - 11/2	P	749
	40	1397.845	25.787598 - 97.32627	$3d^6(a^3P)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^2P - {}^2P^o$	3/2 - 3/2	P	749
	10	1398.380	22.637205 - 94.148518	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - w^4G^o$	9/2 - 9/2	P	749
	0	1398.629	26.352766 - 97.85135	$3d^6(a^3H)4s - 3d^6(b^1G)4p$	$b^2H - {}^2H^o$	9/2 - 9/2	P	749
	2	1399.057	20.80577 - 92.28246	$3d^7 - 3d^5(a^4G)4s4p(^3P^o)$	$a^2H - v^4F^o$	9/2 - 7/2	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	1399.962	22.409852 - 93.84034	$3d^6(a^3P)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4P - {}^6D^o$	1/2 - 3/2	P	749
	0	1400.452	26.932748 - 98.33828	$3d^6(a^3P)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^2P - {}^4S^o$	1/2 - 3/2	P	749
	0	1401.229	20.80577 - 92.171716	$3d^7 - 3d^6(b^3F)4p$	$a^2H - u^2G^o$	9/2 - 9/2	P	749
	30	1401.774	22.810357 - 94.148518	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - w^4G^o$	7/2 - 9/2	P	749
	1	1403.101	1.872567 - 73.143288	$3d^7 - 3d^6(a^1G)4p$	$a^4F - w^2G^o$	9/2 - 7/2	P	749
	10	1403.255	22.810357 - 94.073248	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - w^4G^o$	7/2 - 7/2	P	749
	1	1404.119	1.872567 - 73.091590	$3d^7 - 3d^6(a^1G)4p$	$a^4F - w^2G^o$	9/2 - 9/2	P	749
	40	1405.608	1.872567 - 73.016147	$3d^7 - 3d^6(a^1G)4p$	$a^4F - x^2F^o$	9/2 - 7/2	P	749
	30	1405.800	22.939358 - 94.073248	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - w^4G^o$	5/2 - 7/2	P	749
	1	1406.718	21.812055 - 92.89950	$3d^6(a^3P)4s - 3d^6(b^3F)4p$	$b^4P - {}^4D^o$	3/2 - 5/2	P	749
	5	1407.483	22.939358 - 93.98817	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - w^4G^o$	5/2 - 5/2	P	749
	110	1408.478	21.251608 - 92.25021	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4H - x^4H^o$	13/2 - 13/2	P	749
	10	1409.307	23.031300 - 93.98817	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - w^4G^o$	3/2 - 5/2	P	749
	1	1410.139	21.251608 - 92.16660	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4H - x^4H^o$	13/2 - 11/2	P	749
	1	1410.273	21.308040 - 92.216320	$3d^7 - 3d^6(b^3P)4p$	$a^2D - u^2D^o$	3/2 - 3/2	P	749
	0	1410.621	21.711917 - 92.602703	$3d^6(a^3H)4s - 3d^6(b^3F)4p$	$a^4H - u^2G^o$	7/2 - 7/2	P	749
	15	1411.424	22.637205 - 93.48765	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - u^4F^o$	9/2 - 7/2	P	749
	25	1411.485	22.637205 - 93.48458	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - u^4F^o$	9/2 - 9/2	P	749
47	70	1412.842	1.872567 - 72.651876	$3d^7 - 3d^6(a^3D)4p$	$a^4F - w^4D^o$	9/2 - 7/2	P	749
	70	1413.702	21.430359 - 92.16660	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4H - x^4H^o$	11/2 - 11/2	P	749
	2	1414.699	21.430359 - 92.11678	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4H - x^4H^o$	11/2 - 9/2	P	749
	2	1414.882	22.810357 - 93.48765	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - u^4F^o$	7/2 - 7/2	P	749
	1	1414.943	22.810357 - 93.48458	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - u^4F^o$	7/2 - 9/2	P	749
	2	1415.763	25.428784 - 96.06206	$3d^6(a^3G)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4G - {}^2H^o$	11/2 - 11/2	P	749
	1	1415.934	2.430097 - 73.054881	$3d^7 - 3d^6(a^1G)4p$	$a^4F - x^2F^o$	7/2 - 5/2	P	749
	1	1416.630	21.581638 - 92.171716	$3d^6(a^3H)4s - 3d^6(b^3F)4p$	$a^4H - u^2G^o$	9/2 - 9/2	P	749
	0	1416.710	2.430097 - 73.016147	$3d^7 - 3d^6(a^1G)4p$	$a^4F - x^2F^o$	7/2 - 7/2	P	749
	5	1416.732	22.810357 - 93.39536	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - u^4F^o$	7/2 - 5/2	P	749
	2	1417.469	22.939358 - 93.48765	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - u^4F^o$	5/2 - 7/2	P	749
	40	1417.733	21.581638 - 92.11678	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4H - x^4H^o$	9/2 - 9/2	P	749
	1	1418.286	21.581638 - 92.08926	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4H - x^4H^o$	9/2 - 7/2	P	749
	1	1418.587	22.637205 - 93.12990	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - {}^4D^o$	9/2 - 7/2	P	749
	20	1418.853	1.872567 - 72.352024	$3d^7 - 3d^6(a^3D)4p$	$a^4F - w^4F^o$	9/2 - 7/2	P	749
	10	1419.325	22.939358 - 93.39536	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - u^4F^o$	5/2 - 5/2	P	749
	1	1419.445	31.999048 - 102.44910	$3d^7 - 3d^5(a^4D)4s4p(^3P^o)$	$b^2F - {}^2D^o$	7/2 - 5/2	P	749
	1	1419.603	21.711917 - 92.154165	$3d^6(a^3H)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^4H - {}^6F^o$	7/2 - 7/2	P	749
	0	1419.771	25.805328 - 96.23920	$3d^6(a^3G)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4G - {}^2H^o$	9/2 - 9/2	P	749
	1	1420.356	21.711917 - 92.11678	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4H - x^4H^o$	7/2 - 9/2	P	749
	0	1420.368	21.812055 - 92.216320	$3d^6(a^3P)4s - 3d^6(b^3P)4p$	$b^4P - u^2D^o$	3/2 - 3/2	P	749
	1	1420.575	13.474411 - 83.86845	$3d^7 - 3d^6(a^1F)4p$	$a^4P - v^2D^o$	5/2 - 5/2	P	749
	1	1420.585	26.932748 - 97.32627	$3d^6(a^3P)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^2P - {}^2P^o$	1/2 - 3/2	P	749
	1	1420.674	22.939358 - 93.32848	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - u^4F^o$	5/2 - 3/2	P	749
	40	1420.912	21.711917 - 92.08926	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4H - x^4H^o$	7/2 - 7/2	P	749
	1	1421.180	23.031300 - 93.39536	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - u^4F^o$	3/2 - 5/2	P	749
	1	1421.441	2.837950 - 73.189110	$3d^7 - 3d^6(a^3D)4p$	$a^4F - y^2P^o$	5/2 - 3/2	P	749
	5	1422.080	22.810357 - 93.12990	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - {}^4D^o$	7/2 - 7/2	P	749
	10	1422.532	23.031300 - 93.32848	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - u^4F^o$	3/2 - 3/2	P	749
	5	1423.922						749
	8	1424.08	2.430097 - 72.650658	$3d^7 - 3d^6(a^3D)4p$	$a^4F - w^4F^o$	7/2 - 9/2	P	488
	2	1424.309	31.364440 - 101.57390	$3d^6(a^3D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4D - {}^4P^o$	3/2 - 3/2	P	749
	2	1424.597	13.673185 - 83.86845	$3d^7 - 3d^6(a^1F)4p$	$a^4P - v^2D^o$	3/2 - 5/2	P	749
47	55	1424.717	2.430097 - 72.619490	$3d^7 - 3d^6(a^3D)4p$	$a^4F - w^4D^o$	7/2 - 5/2	P	749
	10	1424.786	31.387948 - 101.57390	$3d^6(a^3D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4D - {}^4P^o$	5/2 - 3/2	P	749
	2	1425.610	38.660043 - 108.804667	$3d^6(a^5D)4p - 3d^6(a^3D)5s$	$z^6D^o - {}^4D$	7/2 - 7/2	Q	749
	10	1426.21					Q	436
7		1426.21						13D,49
7	4P	1426.21						13D,49
	1	1426.761	22.810357 - 92.89950	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - {}^4D^o$	7/2 - 5/2	P	749
	2	1427.148	3.117461 - 73.187280	$3d^7 - 3d^6(a^3D)4p$	$a^4F - y^2P^o$	3/2 - 1/2	P	749
	2	1427.798	31.364440 - 101.40238	$3d^6(a^3D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4D - {}^4P^o$	3/2 - 1/2	P	749
	2	1427.879	31.368450 - 101.40238	$3d^6(a^3D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4D - {}^4P^o$	1/2 - 1/2	P	749
	2	1428.688	8.846768 - 78.84196	$3d^6(a^5D)4s - 3d^6(a^1D)4p$	$a^4D - w^2P^o$	1/2 - 1/2	Q	749
	1	1429.276	22.637205 - 92.602703	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - u^2G^o$	9/2 - 7/2	P	749
	1	1429.391	22.939358 - 92.89950	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - {}^4D^o$	5/2 - 5/2	P	749
	10	1430.167	2.430097 - 72.352024	$3d^7 - 3d^6(a^3D)4p$	$a^4F - w^4F^o$	7/2 - 7/2	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	30	1430.781	26.170181 - 96.06206	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^2H - ^2H^o$	11/2 - 11/2	P	749
	30	1430.893	26.352766 - 96.23920	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^2H - ^2H^o$	9/2 - 9/2	P	749
	10	1432.492	2.430097 - 72.238513	$3d^7 - 3d^6(a^3D)4p$	$a^4F - w^4F^o$	7/2 - 5/2	P	749
	10	1432.822	22.810357 - 92.602703	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - u^2G^o$	7/2 - 7/2	P	749
	15	1432.875	22.637205 - 92.42698	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - v^4F^o$	9/2 - 9/2	P	749
47	5	1433.044	2.837950 - 72.619490	$3d^7 - 3d^6(a^3D)4p$	$a^4F - w^4D^o$	5/2 - 5/2	P	749
	0	1433.568	22.939358 - 92.695374	$3d^6(a^3F)4s - 3d^6(b^3P)4p$	$b^4F - u^2D^o$	5/2 - 5/2	P	749
	2	1434.145	20.34030 - 90.067347	$3d^7 - 3d^6(a^5D)5p$	$a^2H - ^6F^o$	11/2 - 9/2	Q	749
	1	1434.669	20.34030 - 90.042779	$3d^7 - 3d^6(b^3F)4p$	$a^2H - ^4G^o$	11/2 - 9/2	P	749
47	55	1434.996	2.837950 - 72.524566	$3d^7 - 3d^6(a^3D)4p$	$a^4F - w^4D^o$	5/2 - 3/2	P	749
	1	1435.475	22.939358 - 92.602703	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - u^2G^o$	5/2 - 7/2	P	749
	2	1435.848	22.637205 - 92.28246	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - v^4F^o$	9/2 - 7/2	P	749
	1	1436.041	30.764485 - 100.40036	$3d^6(a^3G)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^2G - ^2D^o$	7/2 - 5/2	P	749
	2	1436.438	22.810357 - 92.42698	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - v^4F^o$	7/2 - 9/2	P	749
	0	1436.447	23.031300 - 92.64751	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - ^4D^o$	3/2 - 3/2	P	749
	20	1438.133	2.430097 - 71.964710	$3d^7 - 3d^6(a^3D)4p$	$a^4F - w^4P^o$	7/2 - 5/2	P	749
	10	1438.135	22.637205 - 92.171716	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - u^2G^o$	9/2 - 9/2	P	749
	5	1438.445	22.810357 - 92.32989	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - v^4F^o$	7/2 - 5/2	P	749
	30	1439.427	22.810357 - 92.28246	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - v^4F^o$	7/2 - 7/2	P	749
	2	1439.600	22.810357 - 92.27412	$3d^6(a^3F)4s - 3d^6(b^3P)4p$	$b^4F - ^4P^o$	7/2 - 5/2	P	749
	1	1440.510	30.388542 - 99.80840	$3d^6(a^3G)4s - 3d^6(b^1G)4p$	$b^2G - ^2G^o$	9/2 - 7/2	P	749
	1	1440.523	22.939358 - 92.35861	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - v^4F^o$	5/2 - 3/2	P	749
47	5	1440.775	3.117461 - 72.524566	$3d^7 - 3d^6(a^3D)4p$	$a^4F - w^4D^o$	3/2 - 3/2	P	749
	2	1440.910	2.837950 - 72.238513	$3d^7 - 3d^6(a^3D)4p$	$a^4F - w^4F^o$	5/2 - 5/2	P	749
	5	1441.119	22.939358 - 92.32989	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - v^4F^o$	5/2 - 5/2	P	749
	5	1441.575	30.388542 - 99.75712	$3d^6(a^3G)4s - 3d^6(b^1G)4p$	$b^2G - ^2G^o$	9/2 - 9/2	P	749
	2	1441.725	22.810357 - 92.171716	$3d^6(a^3F)4s - 3d^6(b^3F)4p$	$b^4F - u^2G^o$	7/2 - 9/2	P	749
	2	1442.104	22.939358 - 92.28246	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - v^4F^o$	5/2 - 7/2	P	749
	2	1442.278	22.939358 - 92.27412	$3d^6(a^3F)4s - 3d^6(b^3P)4p$	$b^4F - ^4P^o$	5/2 - 5/2	P	749
	5	1442.433	23.031300 - 92.35861	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - v^4F^o$	3/2 - 3/2	P	749
47	20	1442.746	3.117461 - 72.429711	$3d^7 - 3d^6(a^3D)4p$	$a^4F - w^4D^o$	3/2 - 1/2	P	749
	1	1443.031	23.031300 - 92.32989	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^4F - v^4F^o$	3/2 - 5/2	P	749
	1	1443.481	22.939358 - 92.216320	$3d^6(a^3F)4s - 3d^6(b^3P)4p$	$b^4F - u^2D^o$	5/2 - 3/2	P	749
	20	1443.737	30.388542 - 99.65322	$3d^6(a^3G)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^2G - ^2G^o$	9/2 - 9/2	P	749
	1	1444.193	23.031300 - 92.27412	$3d^6(a^3F)4s - 3d^6(b^3P)4p$	$b^4F - ^4P^o$	3/2 - 5/2	P	749
	10	1444.981	2.837950 - 72.043026	$3d^7 - 3d^6(a^3D)4p$	$a^4F - w^4P^o$	5/2 - 3/2	P	749
	2	1445.400	23.031300 - 92.216320	$3d^6(a^3F)4s - 3d^6(b^3P)4p$	$b^4F - u^2D^o$	3/2 - 3/2	P	749
	0	1446.737	3.117461 - 72.238513	$3d^7 - 3d^6(a^3D)4p$	$a^4F - w^4F^o$	3/2 - 5/2	P	749
	10	1447.272	3.117461 - 72.212978	$3d^7 - 3d^6(a^3D)4p$	$a^4F - w^4P^o$	3/2 - 1/2	P	749
	1	1448.194	3.117461 - 72.168998	$3d^7 - 3d^6(a^3D)4p$	$a^4F - w^4F^o$	3/2 - 3/2	P	749
	40	1448.393	27.314922 - 96.35696	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^2F - t^2F^o$	7/2 - 7/2	P	749
	2	1450.020	27.314922 - 96.27949	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^2F - t^2F^o$	7/2 - 5/2	P	749
	1	1451.616	30.764485 - 99.65322	$3d^6(a^3G)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^2G - ^2G^o$	7/2 - 9/2	P	749
	10	1451.989	30.764485 - 99.63552	$3d^6(a^3G)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^2G - ^2G^o$	7/2 - 7/2	P	749
	40	1454.311	25.428784 - 94.189888	$3d^6(a^3G)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4G - w^4G^o$	11/2 - 11/2	P	749
	1	1454.830	27.620412 - 96.35696	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^2F - t^2F^o$	5/2 - 7/2	P	749
	2	1455.186	25.428784 - 94.148518	$3d^6(a^3G)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4G - w^4G^o$	11/2 - 9/2	P	749
	20	1456.472	27.620412 - 96.27949	$3d^6(a^3F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^2F - t^2F^o$	5/2 - 5/2	P	749
	0	1457.431	20.830582 - 89.444458	$3d^6(a^3P)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4P - ^6P^o$	5/2 - 5/2	P	749
93	40	1459.304	23.317633 - 91.843470	$3d^54s^2 - 3d^6(a^5D)5p$	$a^6S - ^6P^o$	5/2 - 3/2	P	749
	0	1461.145	.862613 - 69.30209	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^3P^o)$	$ga^6D - x^4P^o$	3/2 - 3/2	P	749
	1	1461.840	18.360646 - 86.767577	$3d^7 - 3d^6(b^3P)4p$	$a^2P - v^4D^o$	3/2 - 5/2	P	749
	2	1462.318	25.805328 - 94.189888	$3d^6(a^3G)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4G - w^4G^o$	9/2 - 11/2	P	749
	40	1463.204	25.805328 - 94.148518	$3d^6(a^3G)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4G - w^4G^o$	9/2 - 9/2	P	749
	1	1463.592	.977053 - 69.30209	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^3P^o)$	$ga^6D - x^4P^o$	1/2 - 3/2	P	749
	1	1464.817	25.805328 - 94.073248	$3d^6(a^3G)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4G - w^4G^o$	9/2 - 7/2	P	749
93	40	1465.040	23.317633 - 91.575139	$3d^54s^2 - 3d^6(a^5D)5p$	$a^6S - ^6P^o$	5/2 - 5/2	P	749
	2	1466.220	25.787598 - 93.98817	$3d^6(a^3P)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^2P - w^4G^o$	3/2 - 5/2		749
	2	1466.988	25.981629 - 94.148518	$3d^6(a^3G)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4G - w^4G^o$	7/2 - 9/2	P	749
	30	1468.610	25.981629 - 94.073248	$3d^6(a^3G)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4G - w^4G^o$	7/2 - 7/2	P	749
	5	1469.383	25.428784 - 93.48458	$3d^6(a^3G)4s - 3d^6(b^3F)4p$	$a^4G - u^4F^o$	11/2 - 9/2	P	749
	0	1469.68	22.939358 - 90.9815	$3d^6(a^3F)4s -$	$b^4F - 10^o$	5/2 - 3/2	Q	816
	2	1470.015	15.84465 - 83.871184	$3d^7 - 3d^6(a^1F)4p$	$a^2G - v^2G^o$	9/2 - 9/2	P	749
	1	1470.162	26.170181 - 94.189888	$3d^6(a^3H)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^2H - w^4G^o$	11/2 - 11/2	P	749
	1	1470.203	26.055423 - 94.073248	$3d^6(a^3G)4s - 3d^5(a^4G)4s4p(^3P^o)$	$a^4G - w^4G^o$	7/2 - 7/2	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	1470.447	25.981629 - 93.98817	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	a^4G - w^4G^o	7/2 - 5/2	P	749
	5	1470.662	31.811822 - 99.80840	$3d^7$ - $3d^6(b^1G)4p$	b^2F - $^2G^o$	5/2 - 7/2	P	749
	20	1472.044	26.055423 - 93.98817	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	a^4G - w^4G^o	5/2 - 5/2	P	749
	0	1472.966	30.388542 - 98.27877	$3d^6(a^3G)4s$ - $3d^6(b^1G)4p$	b^2G - $^2H^o$	9/2 - 11/2	P	749
	1	1473.090	2.430097 - 70.314604	$3d^7$ - $3d^6(a^3G)4p$	a^4F - x^2G^o	7/2 - 9/2	P	749
93	40	1473.833	23.317633 - 91.167937	$3d^54s^2$ - $3d^6(a^5D)5p$	a^6S - $^6P^o$	5/2 - 7/2	P	749
	0	1474.033	36.126387 - 103.96749	$3d^6(a^3D)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	b^2D - $^2S^o$	3/2 - 1/2	P	749
	1	1474.723	31.999048 - 99.80840	$3d^7$ - $3d^6(b^1G)4p$	b^2F - $^2G^o$	7/2 - 7/2	P	749
	1	1475.019	26.352766 - 94.148518	$3d^6(a^3H)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	b^2H - w^4G^o	9/2 - 9/2	P	749
	10	1475.694	27.314922 - 95.07964	$3d^6(a^1F)4s$ - $3d^6(b^3P)4p$	a^2F - $^2F^o$	7/2 - 7/2	P	749
	5	1475.839	31.999048 - 99.75712	$3d^7$ - $3d^6(b^1G)4p$	b^2F - $^2G^o$	7/2 - 9/2	P	749
	10	1476.030	22.637205 - 90.386528	$3d^6(a^3F)4s$ - $3d^6(a^5D)4p$	b^4F - $^4F^o$	9/2 - 9/2	P	292
	5	1477.491	25.805328 - 93.48765	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - u^4F^o	9/2 - 7/2	P	749
	2	1477.558	25.805328 - 93.48458	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - u^4F^o	9/2 - 9/2	P	749
	10	1478.105	31.999048 - 99.65322	$3d^7$ - $3d^5(a^4G)4s4p(^3P^o)$	b^2F - $^2G^o$	7/2 - 9/2	P	749
	1	1478.344	31.364440 - 99.00770	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4D - $^4D^o$	3/2 - 1/2	P	749
	1	1478.431	31.368450 - 99.00770	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4D - $^4D^o$	1/2 - 1/2	P	749
	2	1479.848	22.637205 - 90.211700	$3d^6(a^3F)4s$ - $3d^6(b^3F)4p$	b^4F - $^4G^o$	9/2 - 11/2	P	749
	0	1480.42	22.939358 - 90.487810	$3d^6(a^3F)4s$ - $3d^6(a^5D)5p$	b^4F - $^6F^o$	5/2 - 5/2	P	645
	2	1481.349	25.981629 - 93.48765	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - u^4F^o	7/2 - 7/2	P	749
	1	1481.417	25.981629 - 93.48458	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - u^4F^o	7/2 - 9/2	P	749
	1	1481.441	16.36936 - 83.871184	$3d^7$ - $3d^6(a^1F)4p$	a^2G - v^2G^o	7/2 - 9/2	P	749
	0	1482.393	22.939358 - 90.397868	$3d^6(a^3F)4s$ - $3d^6(a^5D)5p$	b^4F - $^4D^o$	5/2 - 7/2	P	749
	2	1483.377	25.981629 - 93.39536	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - u^4F^o	7/2 - 5/2	P	749
	5	1483.554	31.364440 - 98.77014	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4D - $^4D^o$	3/2 - 3/2	P	749
	5	1483.556	22.637205 - 90.042779	$3d^6(a^3F)4s$ - $3d^6(b^3F)4p$	b^4F - $^4G^o$	9/2 - 9/2	P	749
	1	1483.642	31.368450 - 98.77014	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4D - $^4D^o$	1/2 - 3/2	P	749
	2	1484.072	31.387948 - 98.77014	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4D - $^4D^o$	5/2 - 3/2	P	749
	5	1485.003	26.055423 - 93.39536	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - u^4F^o	5/2 - 5/2	P	749
	2	1485.342	25.805328 - 93.12990	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - $^4D^o$	9/2 - 7/2	P	749
	1	1485.566	26.170181 - 93.48458	$3d^6(a^3H)4s$ - $3d^6(b^3F)4p$	b^2H - u^4F^o	11/2 - 9/2	P	749
	10	1486.479	26.055423 - 93.32848	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - u^4F^o	5/2 - 5/2	P	749
	1	1486.834	22.810357 - 90.067347	$3d^6(a^3F)4s$ - $3d^6(a^5D)5p$	b^4F - $^6F^o$	7/2 - 9/2	P	749
	1	1487.377	22.810357 - 90.042779	$3d^6(a^3F)4s$ - $3d^6(b^3F)4p$	b^4F - $^4G^o$	7/2 - 9/2	P	749
	1	1489.250	31.387948 - 98.53585	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4D - $^4F^o$	5/2 - 7/2	P	749
	2	1489.410	31.364440 - 98.50510	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4D - $^4D^o$	3/2 - 5/2	P	749
	30	1489.932	31.387948 - 98.50510	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4D - $^4D^o$	5/2 - 5/2	P	749
	5	1490.605	30.764485 - 97.85135	$3d^6(a^3G)4s$ - $3d^6(b^1G)4p$	b^2G - $^2H^o$	7/2 - 9/2	P	749
	1	1490.757	22.810357 - 89.890373	$3d^6(a^3F)4s$ - $3d^6(b^3F)4p$	b^4F - $^4G^o$	7/2 - 7/2	P	749
	5	1491.365	31.483176 - 98.53585	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4D - $^4F^o$	7/2 - 7/2	P	749
	2	1492.049	31.483176 - 98.50510	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4D - $^4D^o$	7/2 - 5/2	P	749
	2	1492.462	31.387948 - 98.39133	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4D - $^4D^o$	5/2 - 7/2	P	749
	20	1492.577	25.428784 - 92.42698	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	a^4G - v^4F^o	11/2 - 9/2	P	749
	1	1493.279	31.387948 - 98.35466	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4D - $^4F^o$	5/2 - 5/2	P	749
	5	1493.629	22.939358 - 89.890373	$3d^6(a^3F)4s$ - $3d^6(b^3F)4p$	b^4F - $^4G^o$	5/2 - 7/2	P	749
	2	1493.967	16.36936 - 83.305251	$3d^7$ - $3d^6(a^1F)4p$	a^2G - v^2G^o	7/2 - 7/2	P	749
	0	1494.081	36.252918 - 103.1837	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^2D - $^2F^o$	5/2 - 7/2	P	749
	1	1494.376	25.981629 - 92.89950	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - $^4D^o$	7/2 - 5/2	P	749
	10	1494.586	31.483176 - 98.39133	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^4D - $^4D^o$	7/2 - 7/2	P	749
	20	1494.595	25.787598 - 92.695374	$3d^6(a^3P)4s$ - $3d^6(b^3P)4p$	b^2P - u^2D^o	3/2 - 5/2	P	749
	10	1494.776	31.999048 - 98.89871	$3d^7$ - $3d^6(b^1G)4p$	b^2F - $^2F^o$	7/2 - 7/2	P	749
	0	1496.019	26.055423 - 92.89950	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - $^4D^o$	5/2 - 5/2	P	749
	40	1496.526	25.428784 - 92.25021	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	a^4G - x^4H^o	11/2 - 13/2	P	749
	2	1497.065	25.805328 - 92.602703	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - u^2G^o	9/2 - 7/2	P	749
	20	1498.287	25.428784 - 92.171716	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - u^2G^o	11/2 - 9/2	P	749
	1	1499.339	23.031300 - 89.727342	$3d^6(a^3F)4s$ - $3d^6(b^3F)4p$	b^4F - $^4G^o$	3/2 - 5/2	P	749
	5	1501.027	25.981629 - 92.602703	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - u^2G^o	7/2 - 7/2	P	749
	1	1501.680	26.055423 - 92.64751	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - $^4D^o$	5/2 - 3/2	P	749
	20	1504.277	25.805328 - 92.28246	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	a^4G - v^4F^o	9/2 - 7/2	P	749
	0	1504.996	25.981629 - 92.42698	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	a^4G - v^4F^o	7/2 - 9/2	P	749
	0	1505.37	25.787598 - 92.216320	$3d^6(a^3P)4s$ - $3d^6(b^3P)4p$	b^2P - u^2D^o	3/2 - 3/2	P	816
	10	1506.539	0. - 66.377283	$3d^6(a^5D)4s$ - $3d^6(a^3G)4p$	ga^6D - x^4F^o	9/2 - 7/2	P	749
	1	1506.787	25.805328 - 92.171716	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - u^2G^o	9/2 - 9/2	P	749
	20	1506.903	25.805328 - 92.16660	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	a^4G - x^4H^o	9/2 - 11/2	P	749
	5	1507.198	25.981629 - 92.32989	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	a^4G - v^4F^o	7/2 - 5/2	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	1507.779	36.126387 - 102.44910	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^2D - $^2D^o$	3/2 - 5/2	P	749
	1	1508.107	23.317633 - 89.625940	$3d^54s^2$ - $3d^5(a^4P)4s4p(^3P^o)$	a^6S - $^6P^o$	5/2 - 3/2	P	749
	5	1508.223	26.055423 - 92.35861	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	a^4G - v^4F^o	5/2 - 3/2	P	749
	2	1508.277	25.981629 - 92.28246	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	a^4G - v^4F^o	7/2 - 7/2	P	749
	2	1508.467	25.981629 - 92.27412	$3d^6(a^3G)4s$ - $3d^6(b^3P)4p$	a^4G - $^4P^o$	7/2 - 5/2	P	749
	2	1508.877	26.055423 - 92.32989	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	a^4G - v^4F^o	5/2 - 5/2	P	749
	0	1509.279	26.170181 - 92.42698	$3d^6(a^3H)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	b^2H - v^4F^o	11/2 - 9/2	P	749
	1	1509.414	36.252918 - 102.50381	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^2D - $^2D^o$	5/2 - 3/2	P	749
	1	1509.435	26.352766 - 92.602703	$3d^6(a^3H)4s$ - $3d^6(b^3F)4p$	b^2H - u^2G^o	9/2 - 7/2	P	749
	1	1510.148	26.055423 - 92.27412	$3d^6(a^3G)4s$ - $3d^6(b^3P)4p$	a^4G - $^4P^o$	5/2 - 5/2	P	749
	20	1510.661	36.252918 - 102.44910	$3d^6(a^3D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	b^2D - $^2D^o$	5/2 - 5/2	P	749
	1	1510.801	25.981629 - 92.171716	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - u^2G^o	7/2 - 9/2	P	749
	1	1511.467	26.055423 - 92.216320	$3d^6(a^3G)4s$ - $3d^6(b^3P)4p$	a^4G - u^2D^o	5/2 - 3/2	P	749
	30	1512.055	25.981629 - 92.11678	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	a^4G - x^4H^o	7/2 - 9/2	P	749
	1	1512.214	1.872567 - 68.000788	$3d^7$ - $3d^6(a^3G)4p$	a^4F - y^2H^o	9/2 - 9/2	P	749
	1	1512.246	23.317633 - 89.444458	$3d^54s^2$ - $3d^5(a^4P)4s4p(^3P^o)$	a^6S - $^6P^o$	5/2 - 5/2	P	749
	2	1513.316	26.170181 - 92.25021	$3d^6(a^3H)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	b^2H - x^4H^o	11/2 - 13/2	P	749
	10	1514.375	26.055423 - 92.08926	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	a^4G - x^4H^o	5/2 - 7/2	P	749
	2	1515.117	26.170181 - 92.171716	$3d^6(a^3H)4s$ - $3d^6(b^3F)4p$	b^2H - u^2G^o	11/2 - 9/2	P	749
	2	1515.171	18.360646 - 84.35980	$3d^7$ - $3d^6(a^1F)4p$	a^2P - v^2D^o	3/2 - 3/2	P	749
	5	1515.877	30.388542 - 96.35696	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	b^2G - t^2F^o	9/2 - 7/2	P	749
	5	1515.937	20.516960 - 86.48275	$3d^7$ - $3d^6(a^1F)4p$	a^2D - u^2F^o	5/2 - 7/2	P	749
	0	1516.569	31.387948 - 97.32627	$3d^6(a^3D)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	b^4D - $^2P^o$	5/2 - 3/2	P	749
	1	1518.685	38.858958 - 104.70542	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6D^o - ^6D	5/2 - 7/2	P	749
	1	1519.437	26.352766 - 92.16660	$3d^6(a^3H)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	b^2H - x^4H^o	9/2 - 11/2	P	749
	1	1519.504	23.317633 - 89.128561	$3d^54s^2$ - $3d^5(a^4P)4s4p(^3P^o)$	a^6S - $^6P^o$	5/2 - 7/2	P	749
	1	1520.416	38.858958 - 104.63043	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6D^o - ^6P	5/2 - 3/2	P	749
	5	1520.874	38.660043 - 104.41169	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6D^o - ^6D	7/2 - 9/2	P	749
	1	1521.586	38.660043 - 104.38094	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6D^o - ^6F	7/2 - 7/2	P	749
	10	1522.684	30.388542 - 96.06206	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	b^2G - $^2H^o$	9/2 - 11/2	P	749
	1	1523.280	39.109307 - 104.75711	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6D^o - ^6D	1/2 - 1/2	P	749
	20	1523.374	1.872567 - 67.516332	$3d^7$ - $3d^6(a^3G)4p$	a^4F - y^2H^o	9/2 - 11/2	P	749
	2	1523.990	39.013206 - 104.63043	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6D^o - ^6P	3/2 - 3/2	P	749
	2	1525.072	2.430097 - 68.000788	$3d^7$ - $3d^6(a^3G)4p$	a^4F - y^2H^o	7/2 - 9/2	P	749
	5	1525.743	38.458981 - 104.00081	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6D^o - ^6P	9/2 - 7/2	P	749
	2	1526.205	38.858958 - 104.38094	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6D^o - ^6F	5/2 - 7/2	P	749
	5	1526.369	30.764485 - 96.27949	$3d^6(a^3G)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	b^2G - t^2F^o	7/2 - 5/2	P	749
	30	1526.536	18.360646 - 83.86845	$3d^7$ - $3d^6(a^1F)4p$	a^2P - v^2D^o	3/2 - 5/2	P	749
	10	1526.913	38.458981 - 103.95059	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6D^o - ^6F	9/2 - 9/2	P	749
	20	1527.239	38.458981 - 103.93660	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6D^o - ^6F	9/2 - 11/2	P	749
	40	1527.347	18.886780 - 84.35980	$3d^7$ - $3d^6(a^1F)4p$	a^2P - v^2D^o	1/2 - 3/2	P	749
	5	1527.645	38.660043 - 104.12027	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6D^o - ^6P	7/2 - 5/2	P	749
	0	1528.742	39.013206 - 104.42646	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6D^o - ^6F	3/2 - 5/2	P	749
	0	1528.979	32.875646 - 98.27877	$3d^6(a^1I)4s$ - $3d^6(b^1G)4p$	a^2I - $^2H^o$	13/2 - 11/2	P	749
	1	1529.509	27.314922 - 92.695374	$3d^6(a^3F)4s$ - $3d^6(b^3P)4p$	a^2F - u^2D^o	7/2 - 5/2	P	749
	5	1530.438	38.660043 - 104.00081	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6D^o - ^6P	7/2 - 7/2	P	749
	1	1530.680	38.858958 - 104.18938	$3d^6(a^5D)4p$ - $3d^6(a^3H)4d$	z^6D^o - ^4F	5/2 - 3/2	P	749
	10	1531.615	38.660043 - 103.95059	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6D^o - ^6F	7/2 - 9/2	P	749
	0	1532.301	38.858958 - 104.12027	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6D^o - ^6P	5/2 - 5/2	P	749
	10	1532.815	21.308040 - 86.54749	$3d^7$ - $3d^6(a^1F)4p$	a^2D - u^2F^o	3/2 - 5/2	P	749
	0	1534.838	26.055423 - 91.208887	$3d^6(a^3G)4s$ - $3d^6(a^5D)5p$	a^4G - $^4F^o$	5/2 - 3/2	P	749
	2	1538.044	13.673185 - 78.690846	$3d^7$ - $3d^6(a^1D)4p$	a^4P - w^2D^o	3/2 - 5/2	P	749
	0	1539.046	25.805328 - 90.780621	$3d^6(a^3G)4s$ - $3d^6(a^5D)5p$	a^4G - $^4F^o$	9/2 - 7/2	P	749
	5	1539.462	25.428784 - 90.386528	$3d^6(a^3G)4s$ - $3d^6(a^5D)4p$	a^4G - $^4F^o$	11/2 - 9/2	P	749
	0	1541.026	23.317633 - 88.20945	$3d^54s^2$ - $3d^5(a^4P)4s4p(^3P^o)$	a^6S - $^6D^o$	5/2 - 7/2	P	292
	1	1542.508	31.387948 - 96.21742	$3d^6(a^3D)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	b^4D - $^4D^o$	5/2 - 7/2	P	749
	0	1543.234	25.981629 - 90.780621	$3d^6(a^3G)4s$ - $3d^6(a^5D)5p$	a^4G - $^4F^o$	7/2 - 7/2	P	749
	1	1543.277	8.391938 - 73.189110	$3d^6(a^5D)4s$ - $3d^6(a^3D)4p$	a^4D - y^2P^o	5/2 - 3/2	P	749
	2	1543.617	25.428784 - 90.211700	$3d^6(a^3G)4s$ - $3d^6(b^3F)4p$	a^4G - $^4G^o$	11/2 - 11/2	P	749
	10	1544.777	31.483176 - 96.21742	$3d^6(a^3D)4s$ - $3d^5(a^4P)4s4p(^3P^o)$	b^4D - $^4D^o$	7/2 - 7/2	P	749
	0	1545.202	1.872567 - 66.589008	$3d^7$ - $3d^6(a^3G)4p$	a^4F - y^4H^o	9/2 - 9/2	P	749
	0	1545.677	7.955299 - 72.651876	$3d^6(a^5D)4s$ - $3d^6(a^3D)4p$	a^4D - w^4D^o	7/2 - 7/2	P	749
	0	1545.706	7.955299 - 72.650658	$3d^6(a^5D)4s$ - $3d^6(a^3D)4p$	a^4D - w^4F^o	7/2 - 9/2	P	749
	2	1545.808	30.388542 - 95.07964	$3d^6(a^3G)4s$ - $3d^5(b^3P)4p$	b^2G - $^2F^o$	9/2 - 7/2	P	749
	2	1546.451	7.955299 - 72.619490	$3d^6(a^5D)4s$ - $3d^6(a^3D)4p$	a^4D - w^4D^o	7/2 - 5/2	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	1547.239	31.364440 - 95.99569	$3d^6(a^3D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4D - {}^4D^o$	3/2 - 5/2	P	749
	1	1547.802	31.387948 - 95.99569	$3d^6(a^3D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4D - {}^4D^o$	5/2 - 5/2	P	749
	2	1548.204	1.872567 - 66.463528	$3d^7 - 3d^6(a^3G)4p$	$a^4F - y^4H^o$	9/2 - 11/2	P	749
	1	1548.438	25.805328 - 90.386528	$3d^6(a^3G)4s - 3d^6(a^5D)4p$	$a^4G - {}^4F^o$	9/2 - 9/2	P	749
	30	1548.697	2.430097 - 67.000517	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^2D^o$	7/2 - 5/2	P	749
	10	1549.593	27.620412 - 92.154165	$3d^6(a^3F)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^2F - {}^6F^o$	5/2 - 7/2	Q	749
45	90	1550.274	1.872567 - 66.377283	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4F^o$	9/2 - 7/2	P	749
	1	1550.52	31.364440 - 95.85805	$3d^6(a^3D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4D - {}^4D^o$	3/2 - 3/2	Q	816
	1	1550.638	31.368450 - 95.85805	$3d^6(a^3D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4D - {}^4D^o$	1/2 - 3/2	P	749
	0	1551.17	31.811822 - 96.27949	$3d^7 - 3d^5(a^4G)4s4p(^3P^o)$	$b^2F - t^2F^o$	5/2 - 5/2	Q	816
46	20	1551.930	2.837950 - 67.273826	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^2D^o$	5/2 - 3/2	P	749
	1	1552.677	25.981629 - 90.386528	$3d^6(a^3G)4s - 3d^6(a^5D)4p$	$a^4G - {}^4F^o$	7/2 - 9/2	P	749
	0	1552.716	31.364440 - 95.76770	$3d^6(a^3D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4D - {}^4D^o$	3/2 - 1/2	P	749
	1	1552.813	31.368450 - 95.76770	$3d^6(a^3D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4D - {}^4D^o$	1/2 - 1/2	P	749
	10	1553.810	31.999048 - 96.35696	$3d^7 - 3d^5(a^4G)4s4p(^3P^o)$	$b^2F - t^2F^o$	7/2 - 7/2	P	749
	1	1554.08	37.227326 - 101.57390	$3d^6(a^1S)4s - 3d^5(a^4D)4s4p(^3P^o)$	$a^2S - {}^4P^o$	1/2 - 3/2	P	816
	1	1554.751	25.981629 - 90.300625	$3d^6(a^3G)4s - 3d^6(a^5D)5p$	$a^4G - {}^6F^o$	7/2 - 7/2	P	749
	0	1554.843	30.764485 - 95.07964	$3d^6(a^3G)4s - 3d^5(b^3P)4p$	$b^2G - {}^2F^o$	7/2 - 7/2	P	749
	2	1555.655	30.764485 - 95.04610	$3d^6(a^3G)4s - 3d^5(b^3P)4p$	$b^2G - {}^2F^o$	7/2 - 5/2	P	749
	1	1556.129	25.805328 - 90.067347	$3d^6(a^3G)4s - 3d^6(a^5D)5p$	$a^4G - {}^6F^o$	9/2 - 9/2	P	749
	1	1556.608	2.430097 - 66.672334	$3d^7 - 3d^6(a^3G)4p$	$a^4F - y^4H^o$	7/2 - 7/2	P	749
46	70	1558.541	2.837950 - 67.000517	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^2D^o$	5/2 - 5/2	P	749
46	55	1558.692	3.117461 - 67.273826	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^2D^o$	3/2 - 3/2	P	749
45	110	1559.085	1.872567 - 66.012750	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4F^o$	9/2 - 9/2	P	749
	5	1559.269	8.391938 - 72.524566	$3d^6(a^5D)4s - 3d^6(a^3D)4p$	$a^4D - w^4D^o$	5/2 - 3/2	P	749
45	90	1560.252	2.430097 - 66.522304	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4F^o$	7/2 - 5/2	P	749
44	20	1561.067	1.872567 - 65.931334	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4G^o$	9/2 - 7/2	P	749
	20	1562.270	7.955299 - 71.964710	$3d^6(a^5D)4s - 3d^6(a^3D)4p$	$a^4D - w^4P^o$	7/2 - 5/2	P	749
45	160	1563.790	2.430097 - 66.377283	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4F^o$	7/2 - 7/2	P	749
	30	1565.360	3.117461 - 67.000517	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^2D^o$	3/2 - 5/2	P	749
	2	1566.346	20.516960 - 84.35980	$3d^7 - 3d^6(a^1F)4p$	$a^2D - v^2D^o$	5/2 - 3/2	P	749
44	110	1566.822	1.872567 - 65.696038	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4G^o$	9/2 - 9/2	P	749
45	55	1568.020	2.837950 - 66.612656	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4F^o$	5/2 - 3/2	P	749
	2	1568.646	8.680454 - 72.429711	$3d^6(a^5D)4s - 3d^6(a^3D)4p$	$a^4D - w^4D^o$	3/2 - 1/2	P	749
44	110	1569.674	1.872567 - 65.580041	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4G^o$	9/2 - 11/2	P	749
45	110	1570.244	2.837950 - 66.522304	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4F^o$	5/2 - 5/2	P	749
	1	1570.498	38.660043 - 102.334112	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6D^o - {}^6D$	7/2 - 5/2	P	749
	10	1571.065	8.391938 - 72.043026	$3d^6(a^5D)4s - 3d^6(a^3D)4p$	$a^4D - w^4P^o$	5/2 - 3/2	P	749
44	20	1571.137	2.430097 - 66.078269	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4G^o$	7/2 - 5/2	P	749
	1	1572.21	22.939358 - 86.543974	$3d^6(a^3F)4s - 3d^6(b^3P)4p$	$b^4F - v^4D^o$	5/2 - 3/2	P	816
	5	1572.749	8.846768 - 72.429711	$3d^6(a^5D)4s - 3d^6(a^3D)4p$	$a^4D - w^4D^o$	1/2 - 1/2	P	749
45	5	1572.756	2.430097 - 66.012750	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4F^o$	7/2 - 9/2	P	749
	5	1573.000	8.391938 - 71.964710	$3d^6(a^5D)4s - 3d^6(a^3D)4p$	$a^4D - w^4P^o$	5/2 - 5/2	P	749
45	55	1573.828	2.837950 - 66.377283	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4F^o$	5/2 - 7/2	P	749
	55	1574.038	20.34030 - 83.871184	$3d^7 - 3d^6(a^1F)4p$	$a^2H - v^2G^o$	11/2 - 9/2	P	749
	1	1574.399	31.364440 - 94.88074	$3d^6(a^3D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4D - {}^4P^o$	3/2 - 1/2	P	749
44	30	1574.772	2.430097 - 65.931334	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4G^o$	7/2 - 7/2	P	749
45	70	1574.922	3.117461 - 66.612656	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4F^o$	3/2 - 3/2	P	749
	0	1575.420	38.858958 - 102.334112	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6D^o - {}^6D$	5/2 - 5/2	P	749
	1	1575.80	44.915046 - 108.3738	$3d^6(a^1F)4s$ -	$c^2F - 26^o$	7/2 - 7/2	Q	816
	1	1576.433	39.109307 - 102.543648	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6D^o - {}^6D$	1/2 - 3/2	P	749
45	55	1577.167	3.117461 - 66.522304	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4F^o$	5/2 - 5/2	P	749
	1	1578.012	38.660043 - 102.030912	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6D^o - {}^6D$	7/2 - 7/2	P	749
	2	1578.128	8.846768 - 72.212978	$3d^6(a^5D)4s - 3d^6(a^3D)4p$	$a^4D - w^4P^o$	1/2 - 1/2	P	749
	5	1578.219	8.680454 - 72.043026	$3d^6(a^5D)4s - 3d^6(a^3D)4p$	$a^4D - w^4P^o$	3/2 - 3/2	P	749
	20	1578.495	20.516960 - 83.86845	$3d^7 - 3d^6(a^1F)4p$	$a^2D - v^2D^o$	5/2 - 5/2	P	749
	20	1578.501	31.387948 - 94.73917	$3d^6(a^3D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^4D - {}^4P^o$	5/2 - 3/2	P	749
	2	1579.257	39.013206 - 102.334112	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6D^o - {}^6D$	3/2 - 5/2	P	749
44	110	1580.629	2.430097 - 65.696038	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4G^o$	7/2 - 9/2	P	749
44	3	1581.270	2.837950 - 66.078269	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4G^o$	5/2 - 5/2	P	749
	2	1581.290	38.458981 - 101.698489	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6D^o - {}^6D$	9/2 - 9/2	P	749
	5	1581.421	31.811822 - 95.04610	$3d^7 - 3d^5(b^3P)4p$	$b^2F - {}^2F^o$	5/2 - 5/2	P	749
	2	1582.372	8.846768 - 72.043026	$3d^6(a^5D)4s - 3d^6(a^3D)4p$	$a^4D - w^4P^o$	1/2 - 3/2	P	749
	2	1582.981	38.858958 - 102.030912	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6D^o - {}^6D$	5/2 - 7/2	P	749
	0	1584.417	42.334822 - 105.44954	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^4G$	5/2 - 7/2	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
44	110	1584.952	2.837950 - 65.931334	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4G^o$	5/2 - 7/2	P	749
	5	1585.274	31.999048 - 95.07964	$3d^7 - 3d^5(b^3P)4p$	$b^2F - {}^2F^o$	7/2 - 7/2	P	749
	2	1585.655	20.80577 - 83.871184	$3d^7 - 3d^6(a^1F)4p$	$a^2H - v^2G^o$	9/2 - 9/2	P	749
	30	1585.999	21.308040 - 84.35980	$3d^7 - 3d^6(a^1F)4p$	$a^2D - v^2D^o$	3/2 - 3/2	P	749
	3	1586.288	42.114818 - 105.15509	$3d^6(a^5D)4p - 3d^6(a^3F)4d$	$z^6F^o - {}^4G$	9/2 - 9/2	P	749
	2	1586.333	38.660043 - 101.698489	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6D^o - {}^6D$	7/2 - 9/2	P	749
44	110	1588.290	3.117461 - 66.078269	$3d^7 - 3d^6(a^3G)4p$	$a^4F - x^4G^o$	3/2 - 5/2	P	749
	5	1588.688	0. - 62.945038	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$ga^6D - x^4D^o$	9/2 - 7/2	P	749
	2	1590.124	.384790 - 63.272976	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$ga^6D - x^4D^o$	7/2 - 5/2	P	749
	1	1590.559	42.334822 - 105.20579	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6G$	5/2 - 5/2	P	749
	2	1591.122	42.439822 - 105.28853	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6G$	1/2 - 3/2	P	749
	2	1591.622	42.401302 - 105.23029	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^4D$	3/2 - 1/2	P	749
	0	1591.632	42.237033 - 105.06563	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6G$	7/2 - 7/2	P	749
	5	1592.243	42.401302 - 105.20579	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6G$	3/2 - 5/2	P	749
	1	1592.909	33.501253 - 96.27949	$3d^6(a^1G)4s - 3d^5(a^4G)4s4p(^3P^o)$	$c^2G - t^2F^o$	7/2 - 5/2	P	749
	5	1593.532	42.114818 - 104.86850	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6G$	9/2 - 9/2	P	749
	2	1593.661	42.114818 - 104.86343	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^4G$	9/2 - 11/2	P	749
	10	1594.113	42.334822 - 105.06563	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6G$	5/2 - 7/2	P	749
	1	1595.416	2.430097 - 65.109679	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^2G^o$	7/2 - 7/2	P	749
	10	1596.641	42.237033 - 104.86850	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6G$	7/2 - 9/2	P	749
	1	1596.82	41.968046 - 104.59327	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6G$	11/2 - 11/2	Q	816
	1	1598.455	21.308040 - 83.86845	$3d^7 - 3d^6(a^1F)4p$	$a^2D - v^2D^o$	3/2 - 5/2	P	749
	55	1600.013	20.80577 - 83.305251	$3d^7 - 3d^6(a^1F)4p$	$a^2H - v^2G^o$	9/2 - 7/2	P	749
	5	1600.552	42.114818 - 104.59327	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6G$	9/2 - 11/2	P	749
	20	1600.714	31.368450 - 93.84034	$3d^6(a^3D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4D - {}^6D^o$	1/2 - 3/2	Q	749
	5	1601.220	31.387948 - 93.84034	$3d^6(a^3D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4D - {}^6D^o$	5/2 - 3/2	P	749
	1	1601.460	31.387948 - 93.830979	$3d^6(a^3D)4s - 3d^5(a^4D)4s4p(^3P^o)$	$b^4D - {}^6D^o$	5/2 - 5/2	P	749
	20	1601.669						749
	10	1602.210	1.872567 - 64.286345	$3d^7 - 3d^6(a^3F)4p$	$a^4F - z^2F^o$	9/2 - 7/2	P	749
	40	1602.596	41.968046 - 104.36682	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6G$	11/2 - 13/2	P	749
	5	1604.583	16.36936 - 78.690846	$3d^7 - 3d^6(a^1D)4p$	$a^2G - w^2D^o$	7/2 - 5/2	P	749
	70	1605.324	15.84465 - 78.137364	$3d^7 - 3d^6(a^1D)4p$	$a^2G - v^2F^o$	9/2 - 7/2	P	749
	1	1605.41	21.581638 - 83.871184	$3d^6(a^3H)4s - 3d^6(a^1F)4p$	$a^4H - v^2G^o$	9/2 - 9/2	P	816
	1	1605.865	2.837950 - 65.109679	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^2G^o$	5/2 - 7/2	P	749
	1	1606.010	42.114818 - 104.38094	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6F$	9/2 - 7/2	P	749
	1	1607.960	42.439822 - 104.63043	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6P$	1/2 - 3/2	P	749
	0	1607.990	42.237033 - 104.42646	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6F$	7/2 - 5/2	P	749
8	160	1608.451	0. - 62.171615	$3d^6(a^5D)4s - 3d^5(a^6S)$	$ga^6D - y^6P^o$	9/2 - 7/2	P	749
	2	1609.168	42.237033 - 104.38094	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6F$	7/2 - 7/2	P	749
	2	1610.314	31.387948 - 93.48765	$3d^6(a^3D)4s - 3d^6(b^3F)4p$	$b^4D - u^4F^o$	5/2 - 7/2	P	749
43	90	1610.923	1.872567 - 63.948790	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^4G^o$	9/2 - 9/2	P	749
	40	1611.201	0. - 62.065521	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$ga^6D - y^4F^o$	9/2 - 7/2	P	749
	2	1611.540	43.238586 - 105.29101	$3d^6(a^5D)4p - 3d^6(a^3F)4d$	$z^6P^o - {}^4G$	5/2 - 7/2	P	749
	2	1612.099	31.364440 - 93.39536	$3d^6(a^3D)4s - 3d^6(b^3F)4p$	$b^4D - u^4F^o$	3/2 - 5/2	P	749
43	135	1612.806	1.872567 - 63.876317	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^4G^o$	9/2 - 11/2	P	749
	2	1613.183	31.999048 - 93.98817	$3d^7 - 3d^5(a^4G)4s4p(^3P^o)$	$b^2F - w^4G^o$	7/2 - 5/2		816
	1	1613.29	.977053 - 62.962205	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$ga^6D - y^4D^o$	1/2 - 3/2	P	816
	1	1613.357	41.968046 - 103.95059	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6F$	11/2 - 9/2	P	749
	2	1613.722	41.968046 - 103.93660	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6F$	11/2 - 11/2	P	749
	1	1613.944	31.368450 - 93.32848	$3d^6(a^3D)4s - 3d^6(b^3F)4p$	$b^4D - u^4F^o$	1/2 - 3/2	P	749
	1	1616.326	42.114818 - 103.98351	$3d^6(a^5D)4p - 3d^6(a^3G)5s$	$z^6F^o - e^2G$	9/2 - 7/2	P	749
	20	1616.652	2.430097 - 64.286345	$3d^7 - 3d^6(a^3F)4p$	$a^4F - z^2F^o$	7/2 - 7/2	P	749
	1	1617.187	42.114818 - 103.95059	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6F^o - {}^6F$	9/2 - 9/2	P	749
8	160	1618.468	.384790 - 62.171615	$3d^6(a^5D)4s - 3d^5(a^6S)$	$ga^6D - y^6P^o$	7/2 - 7/2	P	749
	0	1618.955	42.658224 - 104.42646	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6P^o - {}^6F$	7/2 - 5/2	P	749
	2	1618.961	16.36936 - 78.137364	$3d^7 - 3d^6(a^1D)4p$	$a^2G - v^2F^o$	7/2 - 7/2	P	749
	2	1619.342	42.658224 - 104.41169	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6P^o - {}^6D$	7/2 - 9/2	P	749
	0	1619.526	42.237033 - 103.98351	$3d^6(a^5D)4p - 3d^6(a^3G)5s$	$z^6F^o - e^2G$	7/2 - 7/2	P	749
	0	1619.644	31.387948 - 93.12990	$3d^6(a^3D)4s - 3d^6(b^3F)4p$	$b^4D - {}^4D^o$	5/2 - 7/2	P	749
	2	1620.061	0. - 61.726077	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$ga^6D - y^4D^o$	9/2 - 7/2	P	749
	1	1620.149	42.658224 - 104.38094	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^6P^o - {}^6F$	7/2 - 7/2	P	749
	10	1621.252	.384790 - 62.065521	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$ga^6D - y^4F^o$	7/2 - 7/2	P	749
8	160	1621.686	.384790 - 62.049025	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^3P^o)$	$ga^6D - y^6P^o$	7/2 - 5/2	P	749
	5	1621.867	2.430097 - 64.087418	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^4G^o$	7/2 - 5/2	P	749
	1	1622.146	31.483176 - 93.12990	$3d^6(a^3D)4s - 3d^6(b^3F)4p$	$b^4D - {}^4D^o$	7/2 - 7/2	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	1622.464	43.238586 - 104.87323	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6P^o - ${}^4D$	$\frac{5}{2}$ - $\frac{7}{2}$	P	749
43	110	1623.092	2.430097 - 64.040886	$3d^7$ - $3d^6(a^3F)4p$	a^4F - y^4G^o	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
	10	1623.707	2.837950 - 64.425408	$3d^7$ - $3d^6(a^3F)4p$	a^4F - z^2F^o	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
43	135	1625.522	2.430097 - 63.948790	$3d^7$ - $3d^6(a^3F)4p$	a^4F - y^4G^o	$\frac{7}{2}$ - $\frac{9}{2}$	P	749
	0	1625.711	31.387948 - 92.89950	$3d^6(a^3D)4s$ - $3d^6(b^3F)4p$	b^4D - ${}^4D^o$	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
8	70	1625.912	.667683 - 62.171615	$3d^6(a^5D)4s$ - $3d^5(a^6S)$	ga^6D - y^6P^o	$\frac{5}{2}$ - $\frac{7}{2}$	P	749
	1	1626.443	.667683 - 62.151561	$3d^6(a^5D)4s$ - $3d^6(a^3F)4p$	ga^6D - y^4F^o	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	1	1626.894	43.238586 - 104.70542	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6P^o - ${}^6D$	$\frac{5}{2}$ - $\frac{7}{2}$	P	749
	1	1627.020	42.658224 - 104.12027	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6P^o - ${}^6P$	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
	2	1627.130	.667683 - 62.125600	$3d^6(a^5D)4s$ - $3d^6(a^3P)4p$	ga^6D - z^2D^o	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
	30	1627.382	2.837950 - 64.286345	$3d^7$ - $3d^6(a^3F)4p$	a^4F - z^2F^o	$\frac{5}{2}$ - $\frac{7}{2}$	P	749
	1	1628.722	.667683 - 62.065521	$3d^6(a^5D)4s$ - $3d^6(a^3F)4p$	ga^6D - y^4F^o	$\frac{5}{2}$ - $\frac{7}{2}$	P	749
	1	1628.881	43.238586 - 104.63043	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6P^o - ${}^6P$	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
8	135	1629.160	.667683 - 62.049025	$3d^6(a^5D)4s$ - $3d^5(a^6S)4s4p(^3P^o)$	ga^6D - y^6P^o	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	40	1629.371	16.36936 - 77.742730	$3d^7$ - $3d^6(a^1D)4p$	a^2G - v^2F^o	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
	2	1630.189	42.658224 - 104.00081	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6P^o - ${}^6P$	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
8	110	1631.128	.667683 - 61.974933	$3d^6(a^5D)4s$ - $3d^5(a^6S)4s4p(^3P^o)$	ga^6D - y^6P^o	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
	5	1632.307	.862613 - 62.125600	$3d^6(a^5D)4s$ - $3d^6(a^3P)4p$	ga^6D - z^2D^o	$\frac{3}{2}$ - $\frac{3}{2}$	P	749
43	55	1632.667	2.837950 - 64.087418	$3d^7$ - $3d^6(a^3F)4p$	a^4F - y^4G^o	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
43	90	1633.909	2.837950 - 64.040886	$3d^7$ - $3d^6(a^3F)4p$	a^4F - y^4G^o	$\frac{5}{2}$ - $\frac{7}{2}$	P	749
	70	1634.350	.862613 - 62.049025	$3d^6(a^5D)4s$ - $3d^5(a^6S)4s4p(^3P^o)$	ga^6D - y^6P^o	$\frac{3}{2}$ - $\frac{5}{2}$	P	749
68	110	1635.401	7.955299 - 69.10238	$3d^6(a^5D)4s$ - $3d^5(a^6S)4s4p(^3P^o)$	a^4D - x^4P^o	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
	2	1635.810	13.474411 - 74.606841	$3d^7$ - $3d^6(a^3D)4p$	a^4P - x^2D^o	$\frac{5}{2}$ - $\frac{5}{2}$	Q	749
8	110	1636.331	.862613 - 61.974933	$3d^6(a^5D)4s$ - $3d^5(a^6S)4s4p(^3P^o)$	ga^6D - y^6P^o	$\frac{3}{2}$ - $\frac{3}{2}$	P	749
42	110	1637.399	1.872567 - 62.945038	$3d^7$ - $3d^6(a^3F)4p$	a^4F - x^4D^o	$\frac{9}{2}$ - $\frac{7}{2}$	P	749
8	110	1639.401	.977053 - 61.974933	$3d^6(a^5D)4s$ - $3d^5(a^6S)4s4p(^3P^o)$	ga^6D - y^6P^o	$\frac{1}{2}$ - $\frac{3}{2}$	P	749
	2	1639.609	31.368450 - 92.35861	$3d^6(a^3D)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	b^4D - v^4F^o	$\frac{1}{2}$ - $\frac{3}{2}$	P	749
43	110	1640.152	3.117461 - 64.087418	$3d^7$ - $3d^6(a^3F)4p$	a^4F - y^4G^o	$\frac{3}{2}$ - $\frac{5}{2}$	P	749
	20	1640.856	31.483176 - 92.42698	$3d^6(a^3D)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	b^4D - v^4F^o	$\frac{7}{2}$ - $\frac{9}{2}$	P	749
68	90	1641.762	8.391938 - 69.30209	$3d^6(a^5D)4s$ - $3d^5(a^6S)4s4p(^3P^o)$	a^4D - x^4P^o	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
	10	1642.427	18.360646 - 79.24617	$3d^7$ - $3d^5(a^6S)4s4p(^1P^o)$	a^2P - x^6P^o	$\frac{3}{2}$ - $\frac{3}{2}$	P	749
	10	1642.496	18.360646 - 79.24360	$3d^7$ - $3d^6(a^1D)4p$	a^2P - w^2P^o	$\frac{3}{2}$ - $\frac{3}{2}$	P	749
	2	1642.927	48.039090 - 108.90664	$3d^7$ - $3d^5(a^2G)4s4p(^1P^o)$	d^2D - ${}^4H^o$	$\frac{5}{2}$ - $\frac{7}{2}$	Q	749
42	90	1643.578	2.430097 - 63.272976	$3d^7$ - $3d^6(a^3F)4p$	a^4F - x^4D^o	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
	2	1644.756	31.483176 - 92.28246	$3d^6(a^3D)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	b^4D - v^4F^o	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
	30	1645.016	1.872567 - 62.662244	$3d^7$ - $3d^6(a^3H)4p$	a^4F - z^2I^o	$\frac{9}{2}$ - $\frac{11}{2}$	P	749
	1	1645.707	44.446878 - 105.21114	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^4D^o - ${}^4G$	$\frac{7}{2}$ - $\frac{9}{2}$	P	749
	110	1646.185	8.680454 - 69.42698	$3d^6(a^5D)4s$ - $3d^5(a^6S)4s4p(^3P^o)$	a^4D - x^4P^o	$\frac{3}{2}$ - $\frac{1}{2}$	P	749
	1	1646.510	38.164194 - 98.89871	$3d^6(a^1D)4s$ - $3d^6(b^1G)4p$	c^2D - ${}^2F^o$	$\frac{5}{2}$ - $\frac{7}{2}$	P	749
68	90	1647.163	8.391938 - 69.10238	$3d^6(a^5D)4s$ - $3d^5(a^6S)4s4p(^3P^o)$	a^4D - x^4P^o	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	30	1647.546	31.999048 - 92.695374	$3d^7$ - $3d^6(b^3P)4p$	b^2F - u^2D^o	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
	5	1647.758	31.483176 - 92.171716	$3d^6(a^3D)4s$ - $3d^6(b^3F)4p$	b^4D - u^2G^o	$\frac{7}{2}$ - $\frac{9}{2}$	P	749
	2	1648.403	44.784761 - 105.44954	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^4D^o - ${}^4G$	$\frac{5}{2}$ - $\frac{7}{2}$	P	749
	2	1649.112						749
	5	1649.323	44.232512 - 104.86343	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^4F^o - ${}^4G$	$\frac{9}{2}$ - $\frac{11}{2}$	P	749
42	55	1649.426	2.837950 - 63.465109	$3d^7$ - $3d^6(a^3F)4p$	a^4F - x^4D^o	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
68	90	1649.576	8.680454 - 69.30209	$3d^6(a^5D)4s$ - $3d^5(a^6S)4s4p(^3P^o)$	a^4D - x^4P^o	$\frac{3}{2}$ - $\frac{3}{2}$	P	749
	0	1650.065	31.999048 - 92.602703	$3d^7$ - $3d^6(b^3F)4p$	b^2F - u^2G^o	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
68	70	1650.704	8.846768 - 69.42698	$3d^6(a^5D)4s$ - $3d^5(a^6S)4s4p(^3P^o)$	a^4D - x^4P^o	$\frac{1}{2}$ - $\frac{1}{2}$	P	749
	10	1651.615	31.811822 - 92.35861	$3d^7$ - $3d^5(a^4G)4s4p(^3P^o)$	b^2F - v^4F^o	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
	0	1652.44	47.674721 - 108.1916	$3d^7$ -	d^2D - 23^o	$\frac{3}{2}$ - $\frac{3}{2}$	Q	816
	0	1652.489	2.430097 - 62.945038	$3d^7$ - $3d^6(a^3F)4p$	a^4F - x^4D^o	$\frac{7}{2}$ - $\frac{7}{2}$		292
	0	1652.911	43.620957 - 104.12027	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^6P^o - ${}^6P$	$\frac{3}{2}$ - $\frac{5}{2}$	P	749
	20	1653.403	18.360646 - 78.84196	$3d^7$ - $3d^6(a^1D)4p$	a^2P - w^2P^o	$\frac{3}{2}$ - $\frac{1}{2}$	P	749
	20	1654.062	44.753799 - 105.21114	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^4F^o - ${}^4G$	$\frac{7}{2}$ - $\frac{9}{2}$	P	749
68	10	1654.114	8.846768 - 69.30209	$3d^6(a^5D)4s$ - $3d^5(a^6S)4s4p(^3P^o)$	a^4D - x^4P^o	$\frac{1}{2}$ - $\frac{3}{2}$	P	749
	2	1654.263	1.872567 - 62.322431	$3d^7$ - $3d^6(a^3H)4p$	a^4F - z^2G^o	$\frac{9}{2}$ - $\frac{7}{2}$	P	749
42	30	1654.478	3.117461 - 63.559488	$3d^7$ - $3d^6(a^3F)4p$	a^4F - x^4D^o	$\frac{3}{2}$ - $\frac{1}{2}$	P	749
42	2	1654.670	2.837950 - 63.272976	$3d^7$ - $3d^6(a^3F)4p$	a^4F - x^4D^o	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
	0	1654.91	.667683 - 61.093413	$3d^6(a^5D)4s$ - $3d^6(a^3P)4p$	ga^6D - z^2D^o	$\frac{5}{2}$ - $\frac{5}{2}$	Q	816
68	10	1655.028	8.680454 - 69.10238	$3d^6(a^5D)4s$ - $3d^5(a^6S)4s4p(^3P^o)$	a^4D - x^4P^o	$\frac{3}{2}$ - $\frac{5}{2}$	P	749
	1	1655.253	31.811822 - 92.225538	$3d^7$ - $3d^6(a^5D)5p$	b^2F - ${}^4P^o$	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
	20	1655.506	31.811822 - 92.216320	$3d^7$ - $3d^6(b^3P)4p$	b^2F - u^2D^o	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
	1	1656.142	44.446878 - 104.82816	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^4D^o - ${}^6D$	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
	5	1656.461	45.079879 - 105.44954	$3d^6(a^5D)4p$ - $3d^6(a^5D)5d$	z^4F^o - ${}^4G$	$\frac{5}{2}$ - $\frac{7}{2}$	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	2	1656.743	18.886780 - 79.24617	$3d^7 - 3d^5(a^6S)4s4p(^1P^o)$	$a^2P - x^6P^o$	1/2 - 3/2	P	749
	5	1656.814	18.886780 - 79.24360	$3d^7 - 3d^6(a^1D)4p$	$a^2P - w^2P^o$	1/2 - 3/2	P	749
	4	1657.07	3.117461 - 63.465109	$3d^7 - 3d^6(a^3F)4p$	$a^4F - x^4D^o$	3/2 - 3/2	P	645
	1	1657.249	45.289801 - 105.63075	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^4F^o - {}^4G$	3/2 - 3/2	P	749
	30	1657.545	18.360646 - 78.690846	$3d^7 - 3d^6(a^1D)4p$	$a^2P - w^2D^o$	3/2 - 5/2	P	749
	10	1658.401	1.872567 - 62.171615	$3d^7 - 3d^5(a^6S)$	$a^4F - y^6P^o$	9/2 - 7/2	P	749
41	90	1658.772	1.872567 - 62.158110	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^4F^o$	9/2 - 9/2	P	749
	0	1659.327	42.401302 - 102.666694	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6F^o - {}^6D$	3/2 - 1/2	P	749
40	110	1659.482	2.430097 - 62.689880	$3d^7 - 3d^6(a^3P)4p$	$a^4F - y^4D^o$	7/2 - 5/2	P	749
	1	1660.388	42.439822 - 102.666694	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6F^o - {}^6D$	1/2 - 1/2	P	749
	5	1660.839	1.872567 - 62.083108	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^2G^o$	9/2 - 9/2	P	749
	15	1660.886	42.334822 - 102.543648	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6F^o - {}^6D$	5/2 - 3/2	P	749
41	30	1661.324	1.872567 - 62.065521	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^4F^o$	9/2 - 7/2	P	749
42	2	1662.358	3.117461 - 63.272976	$3d^7 - 3d^6(a^3F)4p$	$a^4F - x^4D^o$	3/2 - 5/2	P	749
	10	1662.425	36.126387 - 96.27949	$3d^6(a^3D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^2D - t^2F^o$	3/2 - 5/2	P	749
	1	1662.722	42.401302 - 102.543648	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6F^o - {}^6D$	3/2 - 3/2	P	749
40	110	1663.222	2.837950 - 62.962205	$3d^7 - 3d^6(a^3P)4p$	$a^4F - y^4D^o$	5/2 - 3/2	P	749
42	5	1663.697	2.837950 - 62.945038	$3d^7 - 3d^6(a^3F)4p$	$a^4F - x^4D^o$	5/2 - 7/2	P	749
	5	1663.782	36.252918 - 96.35696	$3d^6(a^3D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^2D - t^2F^o$	5/2 - 7/2	P	749
	0	1663.788	42.439822 - 102.543648	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6F^o - {}^6D$	1/2 - 3/2	P	749
	2	1663.974	42.237033 - 102.334112	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6F^o - {}^6D$	7/2 - 5/2	P	749
	1	1665.133	44.784761 - 104.84002	$3d^6(a^5D)4p$ -	z^4D^o - 38	5/2 - 3/2	P	749
	1	1665.929	36.252918 - 96.27949	$3d^6(a^3D)4s - 3d^5(a^4G)4s4p(^3P^o)$	$b^2D - t^2F^o$	5/2 - 5/2	P	749
	0	1666.06	33.466463 - 93.48765	$3d^6(a^1G)4s - 3d^6(b^3F)4p$	$c^2G - u^4F^o$	9/2 - 7/2	Q	816
	20	1666.686	42.334822 - 102.334112	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6F^o - {}^6D$	5/2 - 5/2	P	749
	55	1667.913	18.886780 - 78.84196	$3d^7 - 3d^6(a^1D)4p$	$a^2P - w^2P^o$	1/2 - 1/2	P	749
	0	1668.535	42.401302 - 102.334112	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6F^o - {}^6D$	3/2 - 5/2	P	749
	5	1669.001	42.114818 - 102.030912	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6F^o - {}^6D$	9/2 - 7/2	P	749
	5	1669.003	45.289801 - 105.20579	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^4F^o - {}^6G$	3/2 - 5/2	P	749
	40	1669.663	2.430097 - 62.322431	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^2G^o$	7/2 - 7/2	P	749
40	150	1670.746	1.872567 - 61.726077	$3d^7 - 3d^6(a^3P)4p$	$a^4F - y^4D^o$	9/2 - 7/2	P	749
40	70	1670.790	2.837950 - 62.689880	$3d^7 - 3d^6(a^3P)4p$	$a^4F - y^4D^o$	5/2 - 5/2	P	749
40	30	1670.991	3.117461 - 62.962205	$3d^7 - 3d^6(a^3P)4p$	$a^4F - y^4D^o$	3/2 - 3/2	P	749
	1	1672.412	42.237033 - 102.030912	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6F^o - {}^6D$	7/2 - 7/2	P	749
	0	1672.427	45.079879 - 104.87323	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^4F^o - {}^4D$	5/2 - 7/2	P	749
	0	1672.675	44.784761 - 104.56923	$3d^6(a^5D)4p$ -	z^4D^o - 36	5/2 - 5/2	P	749
02	110	1673.464	15.84465 - 75.600931	$3d^7 - 3d^6(a^3D)4p$	$a^2G - w^2F^o$	9/2 - 7/2	P	749
	5	1674.188	41.968046 - 101.698489	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6F^o - {}^6D$	11/2 - 9/2	P	749
41	55	1674.256	2.430097 - 62.158110	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^4F^o$	7/2 - 9/2	P	749
41	1	1674.440	2.430097 - 62.151561	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^4F^o$	7/2 - 5/2	P	749
40	70	1674.716	3.117461 - 62.829075	$3d^7 - 3d^6(a^3P)4p$	$a^4F - y^4D^o$	3/2 - 1/2	P	749
	0	1676.156	31.387948 - 91.048256	$3d^6(a^3D)4s - 3d^6(a^5D)5p$	$b^4D - {}^4D^o$	5/2 - 3/2	P	749
	10	1676.361	2.430097 - 62.083108	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^2G^o$	7/2 - 9/2	P	749
41	70	1676.856	2.430097 - 62.065521	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^4F^o$	7/2 - 7/2	P	749
	40	1677.842	18.886780 - 78.487153	$3d^7 - 3d^6(a^1D)4p$	$a^2P - w^2D^o$	1/2 - 3/2	P	749
	0	1678.312	42.114818 - 101.698489	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6F^o - {}^6D$	9/2 - 9/2	P	749
40	1	1678.629	3.117461 - 62.689880	$3d^7 - 3d^6(a^3P)4p$	$a^4F - y^4D^o$	3/2 - 3/2	P	749
02	70	1679.378	16.36936 - 75.915215	$3d^7 - 3d^6(a^3D)4p$	$a^2G - w^2F^o$	7/2 - 5/2	P	749
	30	1679.494	13.474411 - 73.016147	$3d^7 - 3d^6(a^1G)4p$	$a^4P - x^2F^o$	5/2 - 7/2	P	749
	1	1680.36	31.387948 - 90.898873	$3d^6(a^3D)4s - 3d^6(b^3P)4p$	$b^4D - {}^4P^o$	5/2 - 3/2	P	816
	40	1681.111	2.837950 - 62.322431	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^2G^o$	5/2 - 7/2	P	749
	1	1682.822	45.206450 - 104.63043	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^4D^o - {}^6P$	1/2 - 3/2	P	749
	1	1682.993	31.483176 - 90.901124	$3d^6(a^3D)4s - 3d^6(a^5D)5p$	$b^4D - {}^4P^o$	7/2 - 5/2	P	749
41	2	1683.315	2.837950 - 62.244520	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^4F^o$	5/2 - 5/2	P	749
	5	1684.004	45.044168 - 104.42646	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^4D^o - {}^6F$	3/2 - 5/2	P	749
	0	1684.276	42.658224 - 102.030912	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6P^o - {}^6D$	7/2 - 7/2	P	749
41	70	1685.954	2.837950 - 62.151561	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^4F^o$	5/2 - 5/2	P	749
40	70	1686.455	2.430097 - 61.726077	$3d^7 - 3d^6(a^3P)4p$	$a^4F - y^4D^o$	7/2 - 7/2	P	749
39	40	1686.692	2.837950 - 62.125600	$3d^7 - 3d^6(a^3P)4p$	$a^4F - z^2D^o$	5/2 - 3/2	P	749
	5	1686.788	1.872567 - 61.156835	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^4H^o$	9/2 - 7/2	P	749
	1	1687.739	31.387948 - 90.638822	$3d^6(a^3D)4s - 3d^6(a^5D)5p$	$b^4D - {}^4D^o$	5/2 - 5/2	P	749
02	10	1688.289	16.36936 - 75.600931	$3d^7 - 3d^6(a^3D)4p$	$a^2G - w^2F^o$	7/2 - 7/2	P	749
41	30	1688.403	2.837950 - 62.065521	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^4F^o$	5/2 - 7/2	P	749
85	55	1689.832	13.474411 - 72.651876	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4D^o$	5/2 - 7/2	P	749
	0	1690.456	31.483176 - 90.638822	$3d^6(a^3D)4s - 3d^6(a^5D)5p$	$b^4D - {}^4D^o$	1/2 - 3/2	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
85	20	1690.758	13.474411 - 72.619490	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4D^o$	5/2 - 5/2	P	749
	0	1691.010	33.466463 - 92.602703	$3d^6(a^1G)4s - 3d^6(b^3F)4p$	$c^2G - u^2G^o$	9/2 - 7/2	P	749
41	40	1691.273	3.117461 - 62.244520	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^4F^o$	3/2 - 3/2	P	749
	1	1691.564	1.872567 - 60.989444	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^4H^o$	9/2 - 9/2	P	749
	1	1692.175	43.238586 - 102.334112	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6P^o - {}^6D$	5/2 - 5/2	P	749
38	40	1692.499	1.872567 - 60.956781	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^4G^o$	9/2 - 7/2	P	749
85	30	1693.476	13.474411 - 72.524566	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4D^o$	5/2 - 3/2	P	749
	0	1693.602	43.620957 - 102.666694	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6P^o - {}^6D$	3/2 - 1/2	P	749
	1	1693.759	42.658224 - 101.698489	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6P^o - {}^6D$	7/2 - 9/2	P	749
41	40	1693.936	3.117461 - 62.151561	$3d^7 - 3d^6(a^3F)4p$	$a^4F - y^4F^o$	3/2 - 5/2	P	749
	10	1694.484	1.872567 - 60.887598	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^4H^o$	9/2 - 11/2	P	749
39	10	1694.681	3.117461 - 62.125600	$3d^7 - 3d^6(a^3P)4p$	$a^4F - z^2D^o$	3/2 - 3/2	P	749
85	20	1696.459	13.673185 - 72.619490	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4D^o$	3/2 - 5/2	P	749
	135	1696.794	1.872567 - 60.807230	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^4G^o$	9/2 - 9/2	P	749
	0	1697.139	43.620957 - 102.543648	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6P^o - {}^6D$	3/2 - 3/2	P	749
	0	1697.225	36.126387 - 95.04610	$3d^6(a^3D)4s - 3d^6(b^3P)4p$	$b^2D - {}^2F^o$	3/2 - 5/2	P	749
	0	1697.428	31.387948 - 90.300625	$3d^6(a^3D)4s - 3d^6(a^5D)5p$	$b^4D - {}^6F^o$	5/2 - 7/2	P	749
40	20	1698.135	2.837950 - 61.726077	$3d^7 - 3d^6(a^3P)4p$	$a^4F - y^4D^o$	5/2 - 7/2	P	749
	20	1698.438	13.474411 - 72.352024	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4F^o$	5/2 - 7/2	P	749
85	20	1699.195	13.673185 - 72.524566	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4D^o$	3/2 - 3/2	P	749
	2	1699.908	36.252918 - 95.07964	$3d^6(a^3D)4s - 3d^6(b^3P)4p$	$b^2D - {}^2F^o$	5/2 - 7/2	P	749
	2	1700.902	43.238586 - 102.030912	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6P^o - {}^6D$	5/2 - 7/2	P	749
	2	1701.719	13.474411 - 72.238513	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4F^o$	5/2 - 5/2	P	749
85	5	1701.939	13.673185 - 72.429711	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4D^o$	3/2 - 1/2	P	749
38	110	1702.044	1.872567 - 60.625449	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^4G^o$	9/2 - 11/2	P	749
	5	1702.730	20.516960 - 79.24617	$3d^7 - 3d^5(a^6S)4s4p(^1P^o)$	$a^2D - x^6P^o$	5/2 - 3/2	P	749
	20	1702.805	20.516960 - 79.24360	$3d^7 - 3d^6(a^1D)4p$	$a^2D - w^2P^o$	5/2 - 3/2	P	749
	1	1703.196	43.620957 - 102.334112	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^6P^o - {}^6D$	3/2 - 5/2	P	749
	2	1703.735	13.474411 - 72.168998	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4F^o$	5/2 - 3/2	P	749
39	40	1704.643	2.430097 - 61.093413	$3d^7 - 3d^6(a^3P)4p$	$a^4F - z^2D^o$	7/2 - 5/2	P	749
	2	1704.815						749
85	1	1705.910	13.904824 - 72.524566	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4D^o$	1/2 - 3/2	P	749
38	55	1706.145	2.430097 - 61.041748	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^4G^o$	7/2 - 5/2	P	749
	2	1706.678	8.680454 - 67.273826	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - y^2D^o$	3/2 - 3/2	P	749
84	90	1707.399	13.474411 - 72.043026	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4P^o$	5/2 - 3/2	P	749
	5	1707.669	2.430097 - 60.989444	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^4H^o$	7/2 - 9/2	P	749
84	10	1708.240	13.673185 - 72.212978	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4P^o$	3/2 - 1/2	P	749
38	110	1708.622	2.430097 - 60.956781	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^4G^o$	7/2 - 7/2	P	749
	55	1709.553	2.837950 - 61.332764	$3d^7 - 3d^6(a^3P)4p$	$a^4F - y^4P^o$	5/2 - 3/2	P	749
84	55	1709.685	13.474411 - 71.964710	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4P^o$	5/2 - 5/2	P	749
	2	1710.930	36.252918 - 94.70066	$3d^6(a^3D)4s - 3d^6(b^3F)4p$	$b^2D - {}^2D^o$	5/2 - 5/2	P	749
	2	1711.536	8.846768 - 67.273826	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - y^2D^o$	1/2 - 3/2	P	749
	5	1711.684	7.955299 - 66.377283	$3d^6(a^5D)4s - 3d^6(a^3G)4p$	$a^4D - x^4F^o$	7/2 - 7/2	P	749
	5	1712.064						749
38	160	1712.999	2.430097 - 60.807230	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^4G^o$	7/2 - 9/2	P	749
84	10	1713.213	13.673185 - 72.043026	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4P^o$	3/2 - 3/2	P	749
	1	1713.724	44.232512 - 102.584963	$3d^6(a^5D)4p - 3d^6(a^3G)5s$	$z^4F^o - f^4G$	9/2 - 11/2	P	749
	15	1714.676	8.680454 - 67.000517	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - y^2D^o$	3/2 - 5/2	P	749
	5	1714.710	2.837950 - 61.156835	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^4H^o$	5/2 - 7/2	P	749
84	30	1715.026	13.904824 - 72.212978	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4P^o$	1/2 - 1/2	P	749
84	40	1715.515	13.673185 - 71.964710	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4P^o$	3/2 - 5/2	P	749
	0	1716.321	13.904824 - 72.168998	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4F^o$	1/2 - 3/2	P	749
39	55	1716.577	2.837950 - 61.093413	$3d^7 - 3d^6(a^3P)4p$	$a^4F - z^2D^o$	5/2 - 5/2	P	749
	5	1717.107	16.36936 - 74.606841	$3d^7 - 3d^6(a^3D)4p$	$a^2G - x^2D^o$	7/2 - 5/2	P	749
	5	1717.448	30.388542 - 88.61452	$3d^6(a^3G)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^2G - {}^6D^o$	9/2 - 9/2		749
	5	1717.716	18.360646 - 76.577482	$3d^7 - 3d^6(a^1S)4p$	$a^2P - x^2P^o$	3/2 - 1/2	P	749
	5	1717.761	3.117461 - 61.332764	$3d^7 - 3d^6(a^3P)4p$	$a^4F - y^4P^o$	3/2 - 3/2	P	749
38	55	1718.101	2.837950 - 61.041748	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^4G^o$	5/2 - 5/2	P	749
	20	1718.984	20.516960 - 78.690846	$3d^7 - 3d^6(a^1D)4p$	$a^2D - w^2D^o$	5/2 - 5/2	P	749
	5	1719.330	44.232512 - 102.394718	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^4F^o - {}^4D$	9/2 - 7/2	P	749
84	30	1720.039	13.904824 - 72.043026	$3d^7 - 3d^6(a^3D)4p$	$a^4P - w^4P^o$	1/2 - 3/2	P	749
	2	1720.271	8.391938 - 66.522304	$3d^6(a^5D)4s - 3d^6(a^3G)4p$	$a^4D - x^4F^o$	5/2 - 5/2	P	749
	110	1720.613	2.837950 - 60.956781	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^4G^o$	5/2 - 7/2	P	749
	2	1721.080	31.368450 - 89.471365	$3d^6(a^3D)4s - 3d^6(a^5D)5p$	$b^4D - {}^6D^o$	1/2 - 1/2	Q	749
	1	1721.738	25.787598 - 83.86845	$3d^6(a^3P)4s - 3d^6(a^1F)4p$	$b^2P - v^2D^o$	3/2 - 3/2	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	1721.934	45.044168 - 103.118400	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^4D^o - {}^4D$	3/2 - 3/2	P	749
	30	1722.432	7.955299 - 66.012750	$3d^6(a^5D)4s - 3d^6(a^3G)4p$	$a^4D - x^4F^o$	7/2 - 9/2	P	749
	2	1722.697	44.753799 - 102.802312	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^4F^o - {}^4D$	7/2 - 5/2	P	749
	1	1722.994	45.079879 - 103.118400	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^4F^o - {}^4D$	5/2 - 3/2	P	749
	1	1723.616	44.784761 - 102.802312	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^4D^o - {}^4D$	5/2 - 5/2	P	749
	40	1724.574	8.391938 - 66.377283	$3d^6(a^5D)4s - 3d^6(a^3G)4p$	$a^4D - x^4F^o$	5/2 - 7/2	P	749
	50	1724.853	3.117461 - 61.093413	$3d^7 - 3d^6(a^3P)4p$	$a^4F - z^2D^o$	3/2 - 5/2	P	749
	20	1724.855	45.289801 - 103.265694	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^4F^o - {}^4D$	3/2 - 1/2	P	749
	70	1724.963	2.430097 - 60.402342	$3d^7 - 3d^6(a^3P)4p$	$a^4F - y^4P^o$	7/2 - 5/2	P	749
	5	1725.390	44.92955 - 102.88712	$3d^6(a^1F)4s - 3d^6(a^5D_{7/2})4f$	$c^2F - {}_{7/2}[7/2]^o$	5/2 - 7/2	Q	749
	2	1725.690	44.446878 - 102.394718	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^4D^o - {}^4D$	7/2 - 7/2	P	749
	1	1725.979	21.308040 - 79.24617	$3d^7 - 3d^5(a^6S)4s4p(^1P^o)$	$a^2D - x^6P^o$	3/2 - 3/2	P	749
	1	1726.056	21.308040 - 79.24360	$3d^7 - 3d^6(a^1D)4p$	$a^2D - w^2P^o$	3/2 - 3/2	P	749
	0	1726.156	8.680454 - 66.612656	$3d^6(a^5D)4s - 3d^6(a^3G)4p$	$a^4D - x^4F^o$	3/2 - 3/2	P	749
	90	1726.392	3.117461 - 61.041748	$3d^7 - 3d^6(a^3H)4p$	$a^4F - z^4G^o$	3/2 - 5/2	P	749
	5	1726.584	3.117461 - 61.035287	$3d^7 - 3d^6(a^3P)4p$	$a^4F - y^4P^o$	3/2 - 1/2	P	749
	20	1726.918	15.84465 - 73.751282	$3d^7 - 3d^6(a^1I)4p$	$a^2G - w^2H^o$	9/2 - 9/2	P	749
	10	1727.325						749
	2	1728.288	46.967444 - 104.82816	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^4P^o - {}^6D$	5/2 - 5/2	P	749
	1	1728.639	47.389779 - 105.23877	$3d^6(a^5D)4p$ -	z^4P^o - 40	3/2 - 5/2	P	749
	20	1728.852	8.680454 - 66.522304	$3d^6(a^5D)4s - 3d^6(a^3G)4p$	$a^4D - x^4F^o$	3/2 - 5/2	P	749
	10	1729.325						749
10	55	1731.038	18.360646 - 76.129446	$3d^7 - 3d^6(a^1S)4p$	$a^2P - x^2P^o$	3/2 - 3/2	P	749
	5	1731.125	8.846768 - 66.612656	$3d^6(a^5D)4s - 3d^6(a^3G)4p$	$a^4D - x^4F^o$	1/2 - 3/2	P	749
	20	1731.336	15.84465 - 73.60350	$3d^7 - 3d^6(a^1I)4p$	$a^2G - w^2H^o$	9/2 - 11/2	P	749
	30	1731.879	7.955299 - 65.696038	$3d^6(a^5D)4s - 3d^6(a^3G)4p$	$a^4D - x^4G^o$	7/2 - 9/2	P	749
	5	1732.275	31.999048 - 89.727342	$3d^7 - 3d^6(b^3F)4p$	$b^2F - {}^4G^o$	7/2 - 5/2	Q	749
	5	1732.575						749
	2	1733.072	26.170181 - 83.871184	$3d^6(a^3H)4s - 3d^6(a^1F)4p$	$b^2H - v^2G^o$	11/2 - 9/2	P	749
10	10	1733.382	18.886780 - 76.577482	$3d^7 - 3d^6(a^1S)4p$	$a^2P - x^2P^o$	1/2 - 1/2	P	749
	1	1733.513	8.391938 - 66.078269	$3d^6(a^5D)4s - 3d^6(a^3G)4p$	$a^4D - x^4G^o$	5/2 - 5/2	P	749
	5	1733.860						749
	200	1733.88	50.212826 - 107.8866	$3d^6(b^3P)4s$ -	c^4P - 20^o	5/2 - 7/2	Q	436
	10	1734.080	33.501253 - 91.167937	$3d^6(a^1G)4s - 3d^6(a^5D)5p$	$c^2G - {}^6P^o$	7/2 - 7/2	Q	749
	10	1734.448						749
	20	1735.496	20.516960 - 78.137364	$3d^7 - 3d^6(a^1D)4p$	$a^2D - v^2F^o$	5/2 - 7/2	P	749
	1	1735.811	44.784761 - 102.394718	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^4D^o - {}^4D$	5/2 - 7/2	P	749
	10	1736.602	42.334822 - 99.918569	$3d^6(a^5D)4p - 3d^6(a^3F)5s$	$z^6F^o - f^4F$	5/2 - 3/2		749
	20	1737.185	2.837950 - 60.402342	$3d^7 - 3d^6(a^3P)4p$	$a^4F - y^4P^o$	5/2 - 5/2	P	749
	10	1737.940	8.391938 - 65.931334	$3d^6(a^5D)4s - 3d^6(a^3G)4p$	$a^4D - x^4G^o$	5/2 - 7/2	P	749
	10	1738.105	21.308040 - 78.84196	$3d^7 - 3d^6(a^1D)4p$	$a^2D - w^2P^o$	3/2 - 1/2	P	749
	20	1740.312	45.206450 - 102.666694	$3d^6(a^5D)4p - 3d^6(a^5D)6s$	$z^4D^o - {}^6D$	1/2 - 1/2	Q	749
	1	1741.340	26.932748 - 84.35980	$3d^6(a^3P)4s - 3d^6(a^1F)4p$	$b^2P - v^2D^o$	1/2 - 3/2	P	749
	40	1741.560						749
		1741.82	0. - 57.411065	$3d^6(a^5D)4s - 3d^54s^2$	$ga^6D - d^4P$	9/2 - 5/2	F,P	375,749
	55	1742.709	16.36936 - 73.751282	$3d^7 - 3d^6(a^1I)4p$	$a^2G - w^2H^o$	7/2 - 9/2	P	749
	20	1743.338						749
	10	1744.526						749
	0	1744.99	20.830582 - 78.137364	$3d^6(a^3P)4s - 3d^6(a^1D)4p$	$b^4P - v^2F^o$	5/2 - 7/2	Q	816
01	5	1745.242	15.84465 - 73.143288	$3d^7 - 3d^6(a^1G)4p$	$a^2G - w^2G^o$	9/2 - 7/2	P	749
01	2	1745.661	3.117461 - 60.402342	$3d^7 - 3d^6(a^3P)4p$	$a^4F - y^4P^o$	3/2 - 5/2	P	749
	110	1746.818	15.84465 - 73.091590	$3d^7 - 3d^6(a^1G)4p$	$a^2G - w^2G^o$	9/2 - 9/2	P	749
	0	1748.880	47.389779 - 104.56923	$3d^6(a^5D)4p$ -	z^4P^o - 36	3/2 - 5/2	P	749
	5	1748.890	21.308040 - 78.487153	$3d^7 - 3d^6(a^1D)4p$	$a^2D - w^2D^o$	3/2 - 3/2	P	749
	30	1749.123	15.84465 - 73.016147	$3d^7 - 3d^6(a^1G)4p$	$a^2G - x^2F^o$	9/2 - 7/2	P	749
	5	1749.358	52.29939 - 109.46312	$3d^5(a^6S)4s4p(^3P^o) - 3d^54s(a^7S)4d$	$z^8P^o - {}^8D$	5/2 - 7/2	P	749
	10	1749.602	52.29939 - 109.45525	$3d^5(a^6S)4s4p(^3P^o) - 3d^54s(a^7S)4d$	$z^8P^o - {}^8D$	5/2 - 5/2	P	749
	10	1749.777	52.29939 - 109.44953	$3d^5(a^6S)4s4p(^3P^o) - 3d^54s(a^7S)4d$	$z^8P^o - {}^8D$	5/2 - 3/2	P	749
		1751.05	.384790 - 57.493321	$3d^6(a^5D)4s - 3d^54s^2$	$ga^6D - d^4P$	7/2 - 3/2	F,P	375,749
	20	1753.26	47.389779 - 104.42646	$3d^6(a^5D)4p - 3d^6(a^5D)5d$	$z^4P^o - {}^6F$	3/2 - 5/2	Q	389
		1753.58	.384790 - 57.411065	$3d^6(a^5D)4s - 3d^54s^2$	$ga^6D - d^4P$	7/2 - 5/2	F,P	375,749
	20	1755.850	26.352766 - 83.305251	$3d^6(a^3H)4s - 3d^6(a^1F)4p$	$b^2H - v^2G^o$	9/2 - 7/2	P	749
	2	1756.84	33.466463 - 90.386528	$3d^6(a^1G)4s - 3d^6(a^5D)4p$	$c^2G - {}^4F^o$	9/2 - 9/2	Q	816
	5	1756.960						749
		1757.14	.667683 - 57.578484	$3d^6(a^5D)4s - 3d^54s^2$	$ga^6D - d^4P$	5/2 - 1/2	F,P	375,749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	30	1757.743	52.58251 - 109.47365	$3d^5(a^6S)4s4p(^3P^o)$ - $3d^54s(a^7S)4d$	z^8P^o - ^8D	$\frac{7}{2}$ - $\frac{9}{2}$	P	749
	20	1758.065	52.58251 - 109.46312	$3d^5(a^6S)4s4p(^3P^o)$ - $3d^54s(a^7S)4d$	z^8P^o - ^8D	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
	5	1758.312	52.58251 - 109.45525	$3d^5(a^6S)4s4p(^3P^o)$ - $3d^54s(a^7S)4d$	z^8P^o - ^8D	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
		1759.77	.667683 - 57.493321	$3d^6(a^5D)4s$ - $3d^54s^2$	ga^6D - d^4P	$\frac{5}{2}$ - $\frac{3}{2}$	F,P	375,749
	10	1759.773	2.837950 - 59.663456	$3d^7$ - $3d^6(a^3P)4p$	a^4F - z^4S^o	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
	20	1760.390	15.84465 - 72.650658	$3d^7$ - $3d^6(a^3D)4p$	a^2G - w^4F^o	$\frac{9}{2}$ - $\frac{9}{2}$	Q	749
01	110	1761.372	16.36936 - 73.143288	$3d^7$ - $3d^6(a^1G)4p$	a^2G - w^2G^o	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
		1761.84	1.872567 - 58.631531	$3d^7$ - $3d^6(b^1G)4s$	a^4F - d^2G	$\frac{9}{2}$ - $\frac{9}{2}$	F,P	375,749
		1762.32	.667683 - 57.411065	$3d^6(a^5D)4s$ - $3d^54s^2$	ga^6D - d^4P	$\frac{5}{2}$ - $\frac{5}{2}$	F,P	375,749
	10	1762.977	16.36936 - 73.091590	$3d^7$ - $3d^6(a^1G)4p$	a^2G - w^2G^o	$\frac{7}{2}$ - $\frac{9}{2}$	P	749
		1763.17	.862613 - 57.578484	$3d^6(a^5D)4s$ - $3d^54s^2$	ga^6D - d^4P	$\frac{3}{2}$ - $\frac{1}{2}$	F,P	375,749
	20	1764.119	16.36936 - 73.054881	$3d^7$ - $3d^6(a^1G)4p$	a^2G - x^2F^o	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
	20	1765.325	16.36936 - 73.016147	$3d^7$ - $3d^6(a^1G)4p$	a^2G - x^2F^o	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
		1765.83	.862613 - 57.493321	$3d^6(a^5D)4s$ - $3d^54s^2$	ga^6D - d^4P	$\frac{3}{2}$ - $\frac{3}{2}$	F,P	375,749
		1766.74	.977053 - 57.578484	$3d^6(a^5D)4s$ - $3d^54s^2$	ga^6D - d^4P	$\frac{1}{2}$ - $\frac{1}{2}$	F,P	375,749
	1	1767.75	36.126387 - 92.695374	$3d^6(a^3D)4s$ - $3d^6(b^3P)4p$	b^2D - u^2D^o	$\frac{3}{2}$ - $\frac{5}{2}$	P	816
	5	1768.012						749
	40	1769.275	52.96582 - 109.48615	$3d^5(a^6S)4s4p(^3P^o)$ - $3d^54s(a^7S)4d$	z^8P^o - ^8D	$\frac{9}{2}$ - $\frac{11}{2}$	P	749
	30	1769.666	52.96582 - 109.47365	$3d^5(a^6S)4s4p(^3P^o)$ - $3d^54s(a^7S)4d$	z^8P^o - ^8D	$\frac{9}{2}$ - $\frac{9}{2}$	P	749
	1	1769.993	52.96582 - 109.46312	$3d^5(a^6S)4s4p(^3P^o)$ - $3d^54s(a^7S)4d$	z^8P^o - ^8D	$\frac{9}{2}$ - $\frac{7}{2}$	P	749
	5	1771.260						749
	5	1771.510						749
	10	1771.960	21.308040 - 77.742730	$3d^7$ - $3d^6(a^1D)4p$	a^2D - v^2F^o	$\frac{3}{2}$ - $\frac{5}{2}$	P	749
99	110	1772.513	15.84465 - 72.261729	$3d^7$ - $3d^6(a^1G)4p$	a^2G - x^2H^o	$\frac{9}{2}$ - $\frac{11}{2}$	P	749
	2	1773.22	36.252918 - 92.64751	$3d^6(a^3D)4s$ - $3d^6(b^3F)4p$	b^2D - $^4D^o$	$\frac{5}{2}$ - $\frac{3}{2}$	P	816
99	30	1776.649	15.84465 - 72.130390	$3d^7$ - $3d^6(a^1G)4p$	a^2G - x^2H^o	$\frac{9}{2}$ - $\frac{9}{2}$	P	749
	0	1777.45	44.232512 - 100.49202	$3d^6(a^5D)4p$ - $3d^6(a^3F)5s$	z^4F^o - e^2F	$\frac{9}{2}$ - $\frac{7}{2}$	Q	816
	10	1777.898	18.360646 - 74.606841	$3d^7$ - $3d^6(a^3D)4p$	a^2P - x^2D^o	$\frac{3}{2}$ - $\frac{5}{2}$	P	749
		1778.22	2.430097 - 58.666258	$3d^7$ - $3d^6(b^1G)4s$	a^4F - d^2G	$\frac{7}{2}$ - $\frac{7}{2}$	F,P	375,749
		1779.31	2.430097 - 58.631531	$3d^7$ - $3d^6(b^1G)4s$	a^4F - d^2G	$\frac{7}{2}$ - $\frac{9}{2}$	F,P	375,749
	2	1780.99	31.387948 - 87.537652	$3d^6(a^3D)4s$ - $3d^5(a^4G)4s4p(^3P^o)$	b^4D - y^6F^o	$\frac{5}{2}$ - $\frac{7}{2}$	Q	816
	30	1781.343	18.360646 - 74.498057	$3d^7$ - $3d^6(a^3D)4p$	a^2P - x^2D^o	$\frac{3}{2}$ - $\frac{3}{2}$	P	749
	5	1781.530	7.955299 - 64.087418	$3d^6(a^5D)4s$ - $3d^6(a^3F)4p$	a^4D - y^4G^o	$\frac{7}{2}$ - $\frac{5}{2}$	Q	749
	2	1781.702	8.680454 - 64.806487	$3d^6(a^5D)4s$ - $3d^6(a^3P)4p$	a^4D - z^2P^o	$\frac{3}{2}$ - $\frac{1}{2}$		488
	20	1782.012						749
91	160	1785.272	23.317633 - 79.33150	$3d^54s^2$ - $3d^5(a^6S)4s4p(^1P^o)$	a^6S - x^6P^o	$\frac{5}{2}$ - $\frac{7}{2}$	P	749
	5	1785.922	7.955299 - 63.948790	$3d^6(a^5D)4s$ - $3d^6(a^3F)4p$	a^4D - y^4G^o	$\frac{7}{2}$ - $\frac{9}{2}$	P	749
	1	1786.448	13.673185 - 69.650484	$3d^7$ - $3d^6(a^6G)4p$	a^4P - y^2F^o	$\frac{3}{2}$ - $\frac{5}{2}$		292
91	110	1786.752	23.317633 - 79.28511	$3d^54s^2$ - $3d^5(a^6S)4s4p(^1P^o)$	a^6S - x^6P^o	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
91	40	1787.996	23.317633 - 79.24617	$3d^54s^2$ - $3d^5(a^6S)4s4p(^1P^o)$	a^6S - x^6P^o	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
	40	1788.078	23.317633 - 79.24360	$3d^54s^2$ - $3d^6(a^1D)4p$	a^6S - w^2P^o	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
	2	1789.90	16.36936 - 72.238513	$3d^7$ - $3d^6(a^3D)4p$	a^2G - w^4F^o	$\frac{7}{2}$ - $\frac{5}{2}$	P	816
		1791.21	2.837950 - 58.666258	$3d^7$ - $3d^6(b^1G)4s$	a^4F - d^2G	$\frac{5}{2}$ - $\frac{7}{2}$	F,P	375,749
		1792.32	2.837950 - 58.631531	$3d^7$ - $3d^6(b^1G)4s$	a^4F - d^2G	$\frac{5}{2}$ - $\frac{9}{2}$	F,P	375,749
99	110	1793.367	16.36936 - 72.130390	$3d^7$ - $3d^6(a^1G)4p$	a^2G - x^2H^o	$\frac{7}{2}$ - $\frac{9}{2}$	P	749
	1	1794.77	30.764485 - 86.48275	$3d^6(a^3G)4s$ - $3d^6(a^1F)4p$	b^2G - u^2F^o	$\frac{7}{2}$ - $\frac{7}{2}$	Q	816
	2	1795.11	44.784761 - 100.49202	$3d^6(a^5D)4p$ - $3d^6(a^3F)5s$	z^4D^o - e^2F	$\frac{5}{2}$ - $\frac{7}{2}$	Q	816
	20	1796.915						749
	40	1796.98	8.391938 - 64.040886	$3d^6(a^5D)4s$ - $3d^6(a^3F)4p$	a^4D - y^4G^o	$\frac{5}{2}$ - $\frac{7}{2}$	P	645
	5	1798.025	38.214507 - 93.830979	$3d^6(a^1D)4s$ - $3d^5(a^4D)4s4p(^3P^o)$	c^2D - $^6D^o$	$\frac{3}{2}$ - $\frac{5}{2}$		749
42	100	1798.157	20.516960 - 76.129446	$3d^7$ - $3d^6(a^1S)4p$	a^2D - x^2P^o	$\frac{5}{2}$ - $\frac{3}{2}$	P	749
	10	1798.196	18.886780 - 74.498057	$3d^7$ - $3d^6(a^3D)4p$	a^2P - x^2D^o	$\frac{1}{2}$ - $\frac{3}{2}$	P	749
		1800.22	3.117461 - 58.666258	$3d^7$ - $3d^6(b^1G)4s$	a^4F - d^2G	$\frac{3}{2}$ - $\frac{7}{2}$	F,P	375,749
	1	1800.449	31.387948 - 86.929649	$3d^6(a^3D)4s$ - $3d^6(b^3P)4p$	b^4D - v^4D^o	$\frac{5}{2}$ - $\frac{7}{2}$	P	749
		1800.55	1.872567 - 57.411065	$3d^7$ - $3d^54s^2$	a^4F - d^4P	$\frac{9}{2}$ - $\frac{5}{2}$	F,P	375,749
	1	1801.08	13.904824 - 69.42698	$3d^7$ - $3d^5(a^6S)4s4p(^3P^o)$	a^4P - x^4P^o	$\frac{1}{2}$ - $\frac{1}{2}$	P	816
	5	1803.541	31.483176 - 86.929649	$3d^6(a^3D)4s$ - $3d^6(b^3P)4p$	b^4D - v^4D^o	$\frac{7}{2}$ - $\frac{7}{2}$	P	749
	0	1804.166	46.967444 - 102.394718	$3d^6(a^5D)4p$ - $3d^6(a^5D)6s$	z^4P^o - ^4D	$\frac{5}{2}$ - $\frac{7}{2}$	P	749
	0	1804.646	47.389779 - 102.802312	$3d^6(a^5D)4p$ - $3d^6(a^5D)6s$	z^4P^o - ^4D	$\frac{3}{2}$ - $\frac{5}{2}$	P	749
	1	1804.827	8.680454 - 64.087418	$3d^6(a^5D)4s$ - $3d^6(a^3F)4p$	a^4D - y^4G^o	$\frac{3}{2}$ - $\frac{5}{2}$	P	749
	1	1804.95	31.364440 - 86.767577	$3d^6(a^3D)4s$ - $3d^6(b^3P)4p$	b^4D - v^4D^o	$\frac{3}{2}$ - $\frac{5}{2}$	P	816
	1	1805.718	31.387948 - 86.767577	$3d^6(a^3D)4s$ - $3d^6(b^3P)4p$	b^4D - v^4D^o	$\frac{5}{2}$ - $\frac{5}{2}$	P	749
66	20	1807.740	7.955299 - 63.272976	$3d^6(a^5D)4s$ - $3d^6(a^3F)4p$	a^4D - x^4D^o	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
	0	1808.828	31.483176 - 86.767577	$3d^6(a^3D)4s$ - $3d^6(b^3P)4p$	b^4D - v^4D^o	$\frac{7}{2}$ - $\frac{5}{2}$	P	749
42	90	1809.318	21.308040 - 76.577482	$3d^7$ - $3d^6(a^1S)4p$	a^2D - x^2P^o	$\frac{3}{2}$ - $\frac{1}{2}$	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	3	1810.57	38.164194 - 93.39536	$3d^6(a^1D)4s - 3d^6(b^3F)4p$	$c^2D - u^4F^o$	$\frac{5}{2} - \frac{5}{2}$	P	816
	0	1812.266	31.364440 - 86.543974	$3d^6(a^3D)4s - 3d^6(b^3P)4p$	$b^4D - v^4D^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	1	1814.01	44.446878 - 99.573225	$3d^6(a^5D)4p - 3d^6(a^3F)5s$	$z^4D^o - f^4F$	$\frac{7}{2} - \frac{9}{2}$	P	816
	30	1815.410	20.516960 - 75.600931	$3d^7 - 3d^6(a^3D)4p$	$a^2D - w^2F^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
66	20	1815.766	8.391938 - 63.465109	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - x^4D^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	0	1815.87	44.753799 - 99.824045	$3d^6(a^5D)4p - 3d^6(a^3F)5s$	$z^4F^o - f^4F$	$\frac{7}{2} - \frac{5}{2}$	Q	816
		1816.09	2.430097 - 57.493321	$3d^7 - 3d^5 4s^2$	$a^4F - d^4P$	$\frac{7}{2} - \frac{3}{2}$	F,P	375,749
	0	1817.509	31.368450 - 86.388820	$3d^6(a^3D)4s - 3d^6(b^3P)4p$	$b^4D - v^4D^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
66	70	1818.521	7.955299 - 62.945038	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - x^4D^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
		1818.81	2.430097 - 57.411065	$3d^7 - 3d^5 4s^2$	$a^4F - d^4P$	$\frac{7}{2} - \frac{5}{2}$	F,P	375,749
	2	1819.646	31.811822 - 86.767577	$3d^7 - 3d^6(b^3P)4p$	$b^2F - v^4D^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	2	1820.479	31.999048 - 86.929649	$3d^7 - 3d^6(b^3P)4p$	$b^2F - v^4D^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
66	40	1822.123	8.391938 - 63.272976	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - x^4D^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
66	1	1822.189	8.680454 - 63.559488	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - x^4D^o$	$\frac{3}{2} - \frac{1}{2}$	P	749
	10	1823.870	18.360646 - 73.189110	$3d^7 - 3d^6(a^3D)4p$	$a^2P - y^2P^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	5	1823.931	18.360646 - 73.187280	$3d^7 - 3d^6(a^3D)4p$	$a^2P - y^2P^o$	$\frac{3}{2} - \frac{1}{2}$	P	749
	1	1824.105	21.308040 - 76.129446	$3d^7 - 3d^6(a^1S)4p$	$a^2D - x^2P^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	2	1824.979	20.80577 - 75.600931	$3d^7 - 3d^6(a^3D)4p$	$a^2H - w^2F^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
66	20	1825.329	8.680454 - 63.465109	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - x^4D^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
		1826.80	2.837950 - 57.578484	$3d^7 - 3d^5 4s^2$	$a^4F - d^4P$	$\frac{5}{2} - \frac{1}{2}$	F,P	375,749
	50	1826.962	31.811822 - 86.54749	$3d^7 - 3d^6(a^1F)4p$	$b^2F - u^2F^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
65	30	1826.999	7.955299 - 62.689880	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - y^4D^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
66	30	1827.729	8.846768 - 63.559488	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - x^4D^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
	5	1828.346	18.360646 - 73.054881	$3d^7 - 3d^6(a^1G)4p$	$a^2P - x^2F^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	20	1828.854	15.84465 - 70.523706	$3d^7 - 3d^6(a^3G)4p$	$a^2G - x^2G^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	0	1829.126	31.811822 - 86.48275	$3d^7 - 3d^6(a^1F)4p$	$b^2F - u^2F^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
		1829.65	2.837950 - 57.493321	$3d^7 - 3d^5 4s^2$	$a^4F - d^4P$	$\frac{5}{2} - \frac{3}{2}$	F,P	375,749
	30	1830.262	52.58251 - 107.2195	$3d^5(a^6S)4s4p(^3P^o) - 3d^5 4p^2$	$z^8P^o - {}^8P$	$\frac{7}{2} - \frac{9}{2}$	P	749
	20	1830.463	54.275637 - 108.90664	$3d^5 4s^2 - 3d^5(a^2G)4s4p(^1P^o)$	$b^4G - {}^4H^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	20	1830.734	54.283220 - 108.90664	$3d^5 4s^2 - 3d^5(a^2G)4s4p(^1P^o)$	$b^4G - {}^4H^o$	$\frac{7}{2} - \frac{7}{2}$	Q	749
66	20	1830.887	8.846768 - 63.465109	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - x^4D^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
	40	1831.261	21.308040 - 75.915215	$3d^7 - 3d^6(a^3D)4p$	$a^2D - w^2F^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
66	30	1831.753	8.680454 - 63.272976	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - x^4D^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	30	1831.980	54.283220 - 108.86898	$3d^5 4s^2 - 3d^5(a^2G)4s4p(^1P^o)$	$b^4G - {}^4H^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
		1832.40	2.837950 - 57.411065	$3d^7 - 3d^5 4s^2$	$a^4F - d^4P$	$\frac{5}{2} - \frac{5}{2}$	F,P	375,749
65	20	1832.500	8.391938 - 62.962205	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - y^4D^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
66	40	1833.076	8.391938 - 62.945038	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - x^4D^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	2	1833.233	31.999048 - 86.54749	$3d^7 - 3d^6(a^1F)4p$	$b^2F - u^2F^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
	55	1833.631	52.29939 - 106.8360	$3d^5(a^6S)4s4p(^3P^o) - 3d^5 4p^2$	$z^8P^o - {}^8P$	$\frac{5}{2} - \frac{7}{2}$	P	749
	55	1833.662	54.273641 - 108.80931	$3d^5 4s^2 - 3d^5(a^2G)4s4p(^1P^o)$	$b^4G - {}^4H^o$	$\frac{9}{2} - \frac{11}{2}$	P	749
	1	1833.813	38.164194 - 92.695374	$3d^6(a^1D)4s - 3d^6(b^3P)4p$	$c^2D - u^2D^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	40	1834.964	54.232195 - 108.72916	$3d^5 4s^2 - 3d^5(a^2G)4s4p(^1P^o)$	$b^4G - {}^4H^o$	$\frac{11}{2} - \frac{13}{2}$	P	749
	40	1835.411	31.999048 - 86.48275	$3d^7 - 3d^6(a^1F)4p$	$b^2F - u^2F^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
98	110	1835.874	15.84465 - 70.314604	$3d^7 - 3d^6(a^3G)4p$	$a^2G - x^2G^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
		1836.18	3.117461 - 57.578484	$3d^7 - 3d^5 4s^2$	$a^4F - d^4P$	$\frac{3}{2} - \frac{1}{2}$	F,P	375,749
		1839.05	3.117461 - 57.493321	$3d^7 - 3d^5 4s^2$	$a^4F - d^4P$	$\frac{3}{2} - \frac{3}{2}$	F,P	375,749
	5	1839.460						749
	5	1839.674	54.273641 - 108.63109	$3d^5 4s^2 - 3d^5(a^2G)4s4p(^1P^o)$	$b^4G - {}^4G^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	5	1839.742	54.275637 - 108.63109	$3d^5 4s^2 - 3d^5(a^2G)4s4p(^1P^o)$	$b^4G - {}^4G^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	10	1839.804	54.275637 - 108.62925	$3d^5 4s^2 - 3d^5(a^2G)4s4p(^1P^o)$	$b^4G - {}^4G^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	20	1839.998	54.283220 - 108.63109	$3d^5 4s^2 - 3d^5(a^2G)4s4p(^1P^o)$	$b^4G - {}^4G^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	0	1840.320	54.232195 - 108.57056	$3d^5 4s^2 - 3d^5(a^2G)4s4p(^1P^o)$	$b^4G - {}^4G^o$	$\frac{11}{2} - \frac{9}{2}$	P	749
	20	1841.542	18.886780 - 73.189110	$3d^7 - 3d^6(a^3D)4p$	$a^2P - y^2P^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
	10	1841.604	18.886780 - 73.187280	$3d^7 - 3d^6(a^3D)4p$	$a^2P - y^2P^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
65	30	1841.690	8.391938 - 62.689880	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - y^4D^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	10	1841.725	54.273641 - 108.57056	$3d^5 4s^2 - 3d^5(a^2G)4s4p(^1P^o)$	$b^4G - {}^4G^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
	1	1842.050	54.283220 - 108.57056	$3d^5 4s^2 - 3d^5(a^2G)4s4p(^1P^o)$	$b^4G - {}^4G^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
	20	1842.240	8.680454 - 62.962205	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - y^4D^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
		1842.52	0. - 54.273641	$3d^6(a^5D)4s - 3d^5 4s^2$	$ga^6D - b^4G$	$\frac{9}{2} - \frac{9}{2}$	F,P	375,749
	20	1843.193	52.96582 - 107.2195	$3d^5(a^6S)4s4p(^3P^o) - 3d^5 4p^2$	$z^8P^o - {}^8P$	$\frac{9}{2} - \frac{9}{2}$	P	749
	15	1843.199	52.58251 - 106.8360	$3d^5(a^6S)4s4p(^3P^o) - 3d^5 4p^2$	$z^8P^o - {}^8P$	$\frac{7}{2} - \frac{7}{2}$	P	749
	10	1843.261	54.232195 - 108.48387	$3d^5 4s^2 - 3d^5(a^2G)4s4p(^1P^o)$	$b^4G - {}^4G^o$	$\frac{11}{2} - \frac{11}{2}$	P	749
		1843.92	0. - 54.232195	$3d^6(a^5D)4s - 3d^5 4s^2$	$ga^6D - b^4G$	$\frac{9}{2} - \frac{11}{2}$	F,P	375,749
	5	1844.59	44.232512 - 98.445400	$3d^6(a^5D)4p - 3d^6(a^3H)5s$	$z^4F^o - e^4H$	$\frac{9}{2} - \frac{9}{2}$		488
	0	1844.671	54.273641 - 108.48387	$3d^5 4s^2 - 3d^5(a^2G)4s4p(^1P^o)$	$b^4G - {}^4G^o$	$\frac{9}{2} - \frac{11}{2}$	P	749

Multiplet	Rel. Int.	λ$_{vac}$ (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	30	1844.923	7.955299 - 62.158110	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - y^4F^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
	2	1845.146	7.955299 - 62.151561	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - y^4F^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
	20	1846.273	18.360646 - 72.524566	$3d^7 - 3d^6(a^3D)4p$	$a^2P - w^4D^o$	$\frac{3}{2} - \frac{3}{2}$	Q	749
98	40	1846.574	16.36936 - 70.523706	$3d^7 - 3d^6(a^6G)4p$	$a^2G - x^2G^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
65	10	1846.769	8.680454 - 62.829075	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - y^4D^o$	$\frac{3}{2} - \frac{1}{2}$	P	749
65	10	1847.902	8.846768 - 62.962205	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - y^4D^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
41	70	1848.775	20.516960 - 74.606841	$3d^7 - 3d^6(a^3D)4p$	$a^2D - x^2D^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
65	30	1851.529	8.680454 - 62.689880	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - y^4D^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
65	20	1852.459	8.846768 - 62.829075	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - y^4D^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
	10	1853.732	16.36936 - 70.314604	$3d^7 - 3d^6(a^6G)4p$	$a^2G - x^2G^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
	2	1854.239	8.391938 - 62.322431	$3d^6(a^5D)4s - 3d^6(a^3H)4p$	$a^4D - z^2G^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
		1855.34	.384790 - 54.283220	$3d^6(a^5D)4s - 3d^54s^2$	$ga^6D - b^4G$	$\frac{7}{2} - \frac{7}{2}$	F,P	375,749
		1855.67	.384790 - 54.273641	$3d^6(a^5D)4s - 3d^54s^2$	$ga^6D - b^4G$	$\frac{7}{2} - \frac{9}{2}$	F,P	375,749
	20	1856.315	52.96582 - 106.8360	$3d^5(a^6S)4s4p(^8P^o) - 3d^54p^2$	$z^8P^o - {}^8P$	$\frac{9}{2} - \frac{7}{2}$	P	749
	0	1856.921	8.391938 - 62.244520	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - y^4F^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	5	1856.930	18.360646 - 72.212978	$3d^7 - 3d^6(a^3D)4p$	$a^2P - w^4P^o$	$\frac{3}{2} - \frac{1}{2}$	P	749
		1857.10	.384790 - 54.232195	$3d^6(a^5D)4s - 3d^54s^2$	$ga^6D - b^4G$	$\frac{7}{2} - \frac{11}{2}$	F,P	375,749
	30	1857.959						749
	5	1859.557	20.830582 - 74.606841	$3d^6(a^3P)4s - 3d^6(a^3D)4p$	$b^4P - x^2D^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
65	40	1859.746	7.955299 - 61.726077	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - y^4D^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
97	160	1860.053	15.84465 - 69.606552	$3d^7 - 3d^6(a^6G)4p$	$a^2G - y^2F^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	1	1861.031	8.391938 - 62.125600	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - z^2D^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	8	1862.81	18.360646 - 72.043026	$3d^7 - 3d^6(a^3D)4p$	$a^2P - w^4P^o$	$\frac{3}{2} - \frac{3}{2}$	P	645
	2	1863.114	8.391938 - 62.065521	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - y^4F^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
26	55	1864.647	20.34030 - 73.969767	$3d^7 - 3d^6(a^1I)4p$	$a^2H - y^2I^o$	$\frac{11}{2} - \frac{11}{2}$	P	749
26	90	1864.749	20.34030 - 73.966832	$3d^7 - 3d^6(a^1I)4p$	$a^2H - y^2I^o$	$\frac{11}{2} - \frac{13}{2}$	P	749
		1865.13	.667683 - 54.283220	$3d^6(a^5D)4s - 3d^54s^2$	$ga^6D - b^4G$	$\frac{5}{2} - \frac{7}{2}$	F,P	375,749
		1865.39	.667683 - 54.275637	$3d^6(a^5D)4s - 3d^54s^2$	$ga^6D - b^4G$	$\frac{5}{2} - \frac{5}{2}$	F,P	375,749
		1865.46	.667683 - 54.273641	$3d^6(a^5D)4s - 3d^54s^2$	$ga^6D - b^4G$	$\frac{5}{2} - \frac{9}{2}$	F,P	375,749
	2	1866.923	8.680454 - 62.244520	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - y^4F^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	10	1867.258	50.157452 - 103.71157	$3d^6(b^3F)4s - 3d^6(a^5D_{3/2})4f$	$c^4F - {}_{3/2}[7/2]^o$	$\frac{9}{2} - \frac{7}{2}$	Q	749
	1	1867.660	18.886780 - 72.429711	$3d^7 - 3d^6(a^3D)4p$	$a^2P - w^4D^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
	10	1867.942	48.039090 - 101.57390	$3d^7 - 3d^5(a^4D)4s4p(^3P^o)$	$d^2D - {}^4P^o$	$\frac{5}{2} - \frac{3}{2}$	Q	749
	30	1869.549	50.187813 - 103.67678	$3d^6(b^3F)4s - 3d^6(a^5D_{3/2})4f$	$c^4F - {}_{3/2}[5/2]^o$	$\frac{7}{2} - \frac{7}{2}$	Q	749
	5	1869.766	30.388542 - 83.871184	$3d^6(a^3G)4s - 3d^6(a^1F)4p$	$b^2G - v^2G^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
	1	1870.72	25.787598 - 79.24360	$3d^6(a^3P)4s - 3d^6(a^1D)4p$	$b^2P - w^2P^o$	$\frac{3}{2} - \frac{3}{2}$	Q	816
	2	1871.077	8.680454 - 62.125600	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - z^2D^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
		1871.94	.862613 - 54.283220	$3d^6(a^5D)4s - 3d^54s^2$	$ga^6D - b^4G$	$\frac{3}{2} - \frac{7}{2}$	F,P	375,749
		1872.20	.862613 - 54.275637	$3d^6(a^5D)4s - 3d^54s^2$	$ga^6D - b^4G$	$\frac{3}{2} - \frac{5}{2}$	F,P	375,749
	20	1872.638						749
	0	1872.738	8.846768 - 62.244520	$3d^6(a^5D)4s - 3d^6(a^3F)4p$	$a^4D - y^4F^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
	3	1874.58	36.126387 - 89.471365	$3d^6(a^3D)4s - 3d^6(a^5D)5p$	$b^2D - {}^6D^o$	$\frac{3}{2} - \frac{1}{2}$	Q	816
65	40	1874.972	8.391938 - 61.726077	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - y^4D^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	2	1875.211	13.673185 - 67.000517	$3d^7 - 3d^6(a^3F)4p$	$a^4P - y^2D^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	0	1875.43	54.870528 - 108.1916	$3d^6(b^3P)4s$ -	$d^2F - 23^o$	$\frac{5}{2} - \frac{5}{2}$	Q	816
	15	1875.536	36.126387 - 89.444458	$3d^6(a^3D)4s - 3d^5(a^4P)4s4p(^3P^o)$	$b^2D - {}^6P^o$	$\frac{3}{2} - \frac{5}{2}$		488
41	40	1876.215	21.308040 - 74.606841	$3d^7 - 3d^6(a^3D)4p$	$a^2D - x^2D^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
		1876.22	.977053 - 54.275637	$3d^6(a^5D)4s - 3d^54s^2$	$ga^6D - b^4G$	$\frac{1}{2} - \frac{5}{2}$	F,P	375,749
97	160	1876.837	16.36936 - 69.650484	$3d^7 - 3d^6(a^6G)4p$	$a^2G - y^2F^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
25	190	1877.469	20.34030 - 73.60350	$3d^7 - 3d^6(a^1I)4p$	$a^2H - w^2H^o$	$\frac{11}{2} - \frac{11}{2}$	P	749
97	40	1878.386	16.36936 - 69.606552	$3d^7 - 3d^6(a^6G)4p$	$a^2G - y^2F^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
41	55	1880.052	21.308040 - 74.498057	$3d^7 - 3d^6(a^3D)4p$	$a^2D - x^2D^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
26	110	1880.972	20.80577 - 73.969767	$3d^7 - 3d^6(a^1I)4p$	$a^2H - y^2I^o$	$\frac{9}{2} - \frac{11}{2}$	P	749
	0	1883.06	22.810357 - 75.915215	$3d^6(a^3F)4s - 3d^6(a^3D)4p$	$b^4F - w^2F^o$	$\frac{7}{2} - \frac{5}{2}$	Q	816
		1885.67	1.872567 - 54.904222	$3d^7 - 3d^6(b^3P)4s$	$a^4F - d^2F$	$\frac{9}{2} - \frac{7}{2}$	F,P	375,749
		1886.86	1.872567 - 54.870528	$3d^7 - 3d^6(b^3P)4s$	$a^4F - d^2F$	$\frac{9}{2} - \frac{5}{2}$	F,P	375,749
	1	1888.010	0. - 52.96582	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^8P^o)$	$ga^6D - z^8P^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
25	160	1888.734	20.80577 - 73.751282	$3d^7 - 3d^6(a^1I)4p$	$a^2H - w^2H^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
	2	1890.256	13.474411 - 66.377283	$3d^7 - 3d^6(a^3G)4p$	$a^4P - x^4F^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	2	1893.649						749
25	70	1894.021	20.80577 - 73.60350	$3d^7 - 3d^6(a^1I)4p$	$a^2H - w^2H^o$	$\frac{9}{2} - \frac{11}{2}$	P	749
24	55	1895.688	20.34030 - 73.091590	$3d^7 - 3d^6(a^1G)4p$	$a^2H - w^2G^o$	$\frac{11}{2} - \frac{9}{2}$	P	749
	2	1897.480	8.391938 - 61.093413	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - z^2D^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
40	90	1898.536	20.516960 - 73.189110	$3d^7 - 3d^6(a^3D)4p$	$a^2D - y^2P^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	1	1900.190	20.516960 - 73.143288	$3d^7 - 3d^6(a^1G)4p$	$a^2D - w^2G^o$	$\frac{5}{2} - \frac{7}{2}$	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	10	1900.67						488
	30	1901.773	0. - 52.58251	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^7P^o)$	$ga^6D - z^8P^o$	9/2 - 7/2	P	749
	20	1902.027	13.673185 - 66.24866	$3d^7 - 3d^6(a^3P)4p$	$a^4P - z^2S^o$	3/2 - 1/2	P	749
	1	1903.023	31.811822 - 84.35980	$3d^7 - 3d^6(a^1F)4p$	$b^2F - v^2D^o$	5/2 - 3/2	P	749
	5	1903.284	30.764485 - 83.305251	$3d^6(a^3G)4s - 3d^6(a^1F)4p$	$b^2G - v^2G^o$	7/2 - 7/2	P	749
39	5	1903.387	20.516960 - 73.054881	$3d^7 - 3d^6(a^1G)4p$	$a^2D - x^2F^o$	5/2 - 5/2	P	749
39	110	1904.791	20.516960 - 73.016147	$3d^7 - 3d^6(a^1G)4p$	$a^2D - x^2F^o$	5/2 - 7/2	P	749
	1	1905.270	8.846768 - 61.332764	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - y^4P^o$	1/2 - 3/2	P	749
		1905.70	2.430097 - 54.904222	$3d^7 - 3d^6(b^3P)4s$	$a^4F - d^2F$	7/2 - 7/2	F,P	375,749
		1905.77	2.430097 - 54.902315	$3d^7 - 3d^6(b^3P)4s$	$a^4F - c^2P$	7/2 - 3/2	F,P	375,749
		1906.93	2.430097 - 54.870528	$3d^7 - 3d^6(b^3P)4s$	$a^4F - d^2F$	7/2 - 5/2	F,P	375,749
		1908.36	1.872567 - 54.273641	$3d^7 - 3d^54s^2$	$a^4F - b^4G$	9/2 - 9/2	F,P	375,749
	1	1909.808	8.680454 - 61.041748	$3d^6(a^5D)4s - 3d^6(a^3H)4p$	$a^4D - z^4G^o$	3/2 - 5/2	P	749
		1909.87	1.872567 - 54.232195	$3d^7 - 3d^54s^2$	$a^4F - b^4G$	9/2 - 11/2	F,P	375,749
	1	1910.04	8.680454 - 61.035287	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - y^4P^o$	3/2 - 1/2	P	816
	1	1910.150	21.251608 - 73.60350	$3d^6(a^3H)4s - 3d^6(a^1I)4p$	$a^4H - w^2H^o$	13/2 - 11/2		292
	1	1910.445	13.904824 - 66.24866	$3d^7 - 3d^6(a^3P)4p$	$a^4P - z^2S^o$	1/2 - 1/2	P	749
24	40	1910.675	20.80577 - 73.143288	$3d^7 - 3d^6(a^1G)4p$	$a^2H - w^2G^o$	9/2 - 7/2	P	749
24	10	1912.564	20.80577 - 73.091590	$3d^7 - 3d^6(a^1G)4p$	$a^2H - w^2G^o$	9/2 - 9/2	P	749
	5	1914.330						749
	2	1915.328	20.80577 - 73.016147	$3d^7 - 3d^6(a^1G)4p$	$a^2H - x^2F^o$	9/2 - 7/2	P	749
	1	1915.792	.384790 - 52.58251	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^7P^o)$	$ga^6D - z^8P^o$	7/2 - 7/2	P	749
	0	1916.239	20.830582 - 73.016147	$3d^6(a^3P)4s - 3d^6(a^1G)4p$	$b^4P - x^2F^o$	5/2 - 7/2	P	749
	40	1917.320	15.84465 - 68.000788	$3d^7 - 3d^6(a^3G)4p$	$a^2G - y^2H^o$	9/2 - 9/2	P	749
38	30	1918.100	20.516960 - 72.651876	$3d^7 - 3d^6(a^3D)4p$	$a^2D - w^4D^o$	5/2 - 7/2	P	749
		1920.63	2.837950 - 54.904222	$3d^7 - 3d^6(b^3P)4s$	$a^4F - d^2F$	5/2 - 7/2	F,P	375,749
		1920.70	2.837950 - 54.902315	$3d^7 - 3d^6(b^3P)4s$	$a^4F - c^2P$	5/2 - 3/2	F,P	375,749
	0	1920.985	31.811822 - 83.86845	$3d^7 - 3d^6(a^1F)4p$	$b^2F - v^2D^o$	5/2 - 5/2	P	749
		1921.87	2.837950 - 54.870528	$3d^7 - 3d^6(b^3P)4s$	$a^4F - d^2F$	5/2 - 5/2	F,P	375,749
	0	1922.269	21.581638 - 73.60350	$3d^6(a^3H)4s - 3d^6(a^1I)4p$	$a^4H - w^2H^o$	9/2 - 11/2	P	292
	5	1922.692	8.391938 - 60.402342	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - y^4P^o$	5/2 - 5/2	P	749
	20	1922.797	20.516960 - 72.524566	$3d^7 - 3d^6(a^3D)4p$	$a^2D - w^4D^o$	5/2 - 3/2		292
23	135	1925.987	20.34030 - 72.261729	$3d^7 - 3d^6(a^1G)4p$	$a^2H - x^2H^o$	11/2 - 11/2	P	749
	30	1926.240	.384790 - 52.29939	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^7P^o)$	$ga^6D - z^8P^o$	7/2 - 5/2	P	748
40	5	1927.485	21.308040 - 73.189110	$3d^7 - 3d^6(a^3D)4p$	$a^2D - y^2P^o$	3/2 - 3/2	P	749
40	25	1927.553	21.308040 - 73.187280	$3d^7 - 3d^6(a^3D)4p$	$a^2D - y^2P^o$	3/2 - 1/2	P	749
	2	1927.919	31.999048 - 83.86845	$3d^7 - 3d^6(a^1F)4p$	$b^2F - v^2D^o$	7/2 - 5/2	P	749
		1928.52	2.430097 - 54.283220	$3d^7 - 3d^54s^2$	$a^4F - b^4G$	7/2 - 7/2	F,P	375,749
23	2	1928.785	20.80577 - 72.651876	$3d^7 - 3d^6(a^3D)4p$	$a^2H - w^4D^o$	9/2 - 7/2	P	749
		1928.88	2.430097 - 54.273641	$3d^7 - 3d^54s^2$	$a^4F - b^4G$	7/2 - 9/2	F,P	375,749
	10	1929.196	20.516960 - 72.352024	$3d^7 - 3d^6(a^3D)4p$	$a^2D - w^4F^o$	5/2 - 7/2	P	749
	2	1929.709	20.830582 - 72.651876	$3d^6(a^3P)4s - 3d^6(a^3D)4p$	$b^4P - w^4D^o$	5/2 - 7/2	P	749
		1930.42	2.430097 - 54.232195	$3d^7 - 3d^54s^2$	$a^4F - b^4G$	7/2 - 11/2	F,P	375,749
	40	1930.915	20.830582 - 72.619490	$3d^6(a^3P)4s - 3d^6(a^3D)4p$	$b^4P - w^4D^o$	5/2 - 5/2	P	749
		1931.00	3.117461 - 54.904222	$3d^7 - 3d^6(b^3P)4s$	$a^4F - d^2F$	3/2 - 7/2	F,P	375,749
		1931.07	3.117461 - 54.902315	$3d^7 - 3d^6(b^3P)4s$	$a^4F - c^2P$	3/2 - 3/2	F,P	375,749
		1932.25	3.117461 - 54.870528	$3d^7 - 3d^6(b^3P)4s$	$a^4F - d^2F$	3/2 - 5/2	F,P	375,749
39	70	1932.485	21.308040 - 73.054881	$3d^7 - 3d^6(a^1G)4p$	$a^2D - x^2F^o$	3/2 - 5/2	P	749
	5	1933.417	8.680454 - 60.402342	$3d^6(a^5D)4s - 3d^6(a^3P)4p$	$a^4D - y^4P^o$	3/2 - 5/2	P	749
	10	1933.45	20.516960 - 72.238513	$3d^7 - 3d^6(a^3D)4p$	$a^2D - w^4F^o$	5/2 - 5/2		645
	1	1934.47	20.830582 - 72.524566	$3d^6(a^3P)4s - 3d^6(a^3D)4p$	$b^4P - w^4D^o$	5/2 - 3/2		645
96	110	1935.296	15.84465 - 67.516332	$3d^7 - 3d^6(a^3G)4p$	$a^2G - y^2H^o$	9/2 - 11/2	P	749
	0	1935.45	22.939358 - 74.606841	$3d^6(a^3F)4s - 3d^6(a^3D)4p$	$b^4F - x^2D^o$	5/2 - 5/2	Q	816
	15	1936.793	.667683 - 52.29939	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^7P^o)$	$ga^6D - z^8P^o$	5/2 - 5/2	P	748
96	55	1936.805	16.36936 - 68.000788	$3d^7 - 3d^6(a^3G)4p$	$a^2G - y^2H^o$	7/2 - 9/2	P	749
	8	1938.899	23.031300 - 74.606841	$3d^6(a^3F)4s - 3d^6(a^3D)4p$	$b^4F - x^2D^o$	3/2 - 5/2		292
	0	1940.939	20.830582 - 72.352024	$3d^6(a^3P)4s - 3d^6(a^3D)4p$	$b^4P - w^4F^o$	5/2 - 7/2	P	749
	2	1941.995	31.811822 - 83.305251	$3d^7 - 3d^6(a^1F)4p$	$b^2F - v^2G^o$	5/2 - 7/2	P	749
		1943.81	2.837950 - 54.283220	$3d^7 - 3d^54s^2$	$a^4F - b^4G$	5/2 - 7/2	F,P	375,749
		1944.10	2.837950 - 54.275637	$3d^7 - 3d^54s^2$	$a^4F - b^4G$	5/2 - 5/2	F,P	375,749
	0	1944.134	.862613 - 52.29939	$3d^6(a^5D)4s - 3d^5(a^6S)4s4p(^7P^o)$	$ga^6D - z^8P^o$	3/2 - 5/2	P	749
		1944.18	2.837950 - 54.273641	$3d^7 - 3d^54s^2$	$a^4F - b^4G$	5/2 - 9/2	F,P	375,749
	5	1946.437	27.314922 - 78.690846	$3d^6(a^3F)4s - 3d^6(a^1D)4p$	$a^2F - w^2D^o$	7/2 - 5/2	P	749
	2	1946.85	44.915046 - 96.27949	$3d^6(a^1F)4s - 3d^5(a^4G)4s4p(^3P^o)$	$c^2F - t^2F^o$	7/2 - 5/2	Q	816
23	70	1948.383	20.80577 - 72.130390	$3d^7 - 3d^6(a^1G)4p$	$a^2H - x^2H^o$	9/2 - 9/2	P	749

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	1948.883	21.308040 - 72.619490	$3d^7 - 3d^6(a^3D)4p$	$a^2D - w^4D^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
		1952.15	2.837950 - 54.063459	$3d^7 - 3d^6(b^3P)4s$	$a^4F - c^2P$	$\frac{5}{2} - \frac{1}{2}$	F,P	375,749
	1	1952.650	20.830582 - 72.043026	$3d^6(a^3P)4s - 3d^6(a^3D)4p$	$b^4P - w^4P^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
		1954.43	3.117461 - 54.283220	$3d^7 - 3d^54s^2$	$a^4F - b^4G$	$\frac{3}{2} - \frac{7}{2}$	F,P	375,749
	1	1954.618	13.673185 - 64.834073	$3d^7 - 3d^6(a^3P)4p$	$a^4P - z^2P^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
		1954.72	3.117461 - 54.275637	$3d^7 - 3d^54s^2$	$a^4F - b^4G$	$\frac{3}{2} - \frac{5}{2}$	F,P	375,749
	5	1955.641	20.830582 - 71.964710	$3d^6(a^3P)4s - 3d^6(a^3D)4p$	$b^4P - w^4P^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	10	1956.12	21.308040 - 72.429711	$3d^7 - 3d^6(a^3D)4p$	$a^2D - w^4D^o$	$\frac{3}{2} - \frac{1}{2}$	P	645
	5	1958.09	21.581638 - 72.651876	$3d^6(a^3H)4s - 3d^6(a^3D)4p$	$a^4H - w^4D^o$	$\frac{9}{2} - \frac{7}{2}$		645
	5	1958.121	21.581638 - 72.650658	$3d^6(a^3H)4s - 3d^6(a^3D)4p$	$a^4H - w^4F^o$	$\frac{9}{2} - \frac{9}{2}$		292
	1	1962.07	22.637205 - 73.60350	$3d^6(a^3F)4s - 3d^6(a^1I)4p$	$b^4F - w^2H^o$	$\frac{9}{2} - \frac{11}{2}$		645
		1962.86	3.117461 - 54.063459	$3d^7 - 3d^6(b^3P)4s$	$a^4F - c^2P$	$\frac{3}{2} - \frac{1}{2}$	F,P	375,749
	25	1963.110	21.711917 - 72.651876	$3d^6(a^3H)4s - 3d^6(a^3D)4p$	$a^4H - w^4D^o$	$\frac{7}{2} - \frac{7}{2}$		292
	12	1964.342	21.711917 - 72.619490	$3d^6(a^3H)4s - 3d^6(a^3D)4p$	$a^4H - w^4D^o$	$\frac{7}{2} - \frac{5}{2}$	P	197,292
	1	1964.572	13.904824 - 64.806487	$3d^7 - 3d^6(a^3P)4p$	$a^4P - z^2P^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
	2	1965.921	27.620412 - 78.487153	$3d^6(a^3F)4s - 3d^6(a^1D)4p$	$a^2F - w^2D^o$	$\frac{5}{2} - \frac{3}{2}$	P	749
	20	1966.200	48.039090 - 98.89871	$3d^7 - 3d^6(b^1G)4p$	$d^2D - {}^2F^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	1	1967.635	27.314922 - 78.137364	$3d^6(a^3F)4s - 3d^6(a^1D)4p$	$a^2F - v^2F^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
	20	1968.042	13.474411 - 64.286345	$3d^7 - 3d^6(a^3F)4p$	$a^4P - z^2F^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	2	1968.216	21.812055 - 72.619490	$3d^6(a^3P)4s - 3d^6(a^3D)4p$	$b^4P - w^4D^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	10	1968.684	52.29939 - 103.09473	$3d^5(a^6S)4s4p(^3P^o) - 3d^54s(a^7S)5s$	$z^8P^o - {}^8S$	$\frac{5}{2} - \frac{7}{2}$	P	749
	5	1968.896	25.787598 - 76.577482	$3d^6(a^3P)4s - 3d^6(a^1S)4p$	$b^2P - x^2P^o$	$\frac{3}{2} - \frac{1}{2}$	P	749
	2	1970.357	13.673185 - 64.425408	$3d^7 - 3d^6(a^3F)4p$	$a^4P - z^2F^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	10	1970.662	15.84465 - 66.589008	$3d^7 - 3d^6(a^3G)4p$	$a^2G - y^4H^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
	1	1971.03	21.308040 - 72.043026	$3d^7 - 3d^6(a^3D)4p$	$a^2D - w^4P^o$	$\frac{3}{2} - \frac{3}{2}$	P	645
		1971.96	7.955299 - 58.666258	$3d^6(a^5D)4s - 3d^6(b^1G)4s$	$a^4D - d^2G$	$\frac{7}{2} - \frac{7}{2}$	F,P	375,749
		1973.31	7.955299 - 58.631531	$3d^6(a^5D)4s - 3d^6(b^1G)4s$	$a^4D - d^2G$	$\frac{7}{2} - \frac{9}{2}$	F,P	375,749
	1	1974.49	20.34030 - 70.986677	$3d^7 - 3d^6(a^1I)4p$	$a^2H - z^2K^o$	$\frac{11}{2} - \frac{13}{2}$		645
	40	1975.548	15.84465 - 66.463528	$3d^7 - 3d^6(a^3G)4p$	$a^2G - y^4H^o$	$\frac{9}{2} - \frac{11}{2}$	P	749
	1	1977.595	13.474411 - 64.040886	$3d^7 - 3d^6(a^3F)4p$	$a^4P - y^4G^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
95	2	1978.919	15.84465 - 66.377283	$3d^7 - 3d^6(a^3G)4p$	$a^2G - x^4F^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	0	1979.156	21.711917 - 72.238513	$3d^6(a^3H)4s - 3d^6(a^3D)4p$	$a^4H - w^4F^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
	20	1979.719	52.58251 - 103.09473	$3d^5(a^6S)4s4p(^3P^o) - 3d^54s(a^7S)5s$	$z^8P^o - {}^8S$	$\frac{7}{2} - \frac{7}{2}$	P	749
	5	1983.033	27.314922 - 77.742730	$3d^6(a^3F)4s - 3d^6(a^1D)4p$	$a^2F - v^2F^o$	$\frac{7}{2} - \frac{5}{2}$	P	749
	1	1983.941	33.466463 - 83.871184	$3d^6(a^1G)4s - 3d^6(a^1F)4p$	$c^2G - v^2G^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
	5	1984.091	21.812055 - 72.212978	$3d^6(a^3P)4s - 3d^6(a^3D)4p$	$b^4P - w^4P^o$	$\frac{3}{2} - \frac{1}{2}$	P	749
	20	1984.956	22.637205 - 73.016147	$3d^6(a^3F)4s - 3d^6(a^1G)4p$	$b^4F - x^2F^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	40	1986.419	25.787598 - 76.129446	$3d^6(a^3P)4s - 3d^6(a^1S)4p$	$b^2P - x^2P^o$	$\frac{3}{2} - \frac{3}{2}$	P	749
	1	1987.954	16.36936 - 66.672334	$3d^7 - 3d^6(a^3G)4p$	$a^2G - y^4H^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
		1989.09	8.391938 - 58.666258	$3d^6(a^5D)4s - 3d^6(b^1G)4s$	$a^4D - d^2G$	$\frac{5}{2} - \frac{7}{2}$	F,P	375,749
		1990.46	8.391938 - 58.631531	$3d^6(a^5D)4s - 3d^6(b^1G)4s$	$a^4D - d^2G$	$\frac{5}{2} - \frac{9}{2}$	F,P	375,749
	1	1990.805	21.812055 - 72.043026	$3d^6(a^3P)4s - 3d^6(a^3D)4p$	$b^4P - w^4P^o$	$\frac{3}{2} - \frac{3}{2}$		645
	10	1991.252	16.36936 - 66.589008	$3d^7 - 3d^6(a^3G)4p$	$a^2G - y^4H^o$	$\frac{7}{2} - \frac{9}{2}$	P	749
		1991.52	0. - 50.212826	$3d^6(a^5D)4s - 3d^6(b^3P)4s$	$ga^6D - c^4P$	$\frac{9}{2} - \frac{5}{2}$	F,P	375,749
	2	1991.802	22.810357 - 73.016147	$3d^6(a^3F)4s - 3d^6(a^1G)4p$	$b^4F - x^2F^o$	$\frac{7}{2} - \frac{7}{2}$	P	749
95	10	1993.298	15.84465 - 66.012750	$3d^7 - 3d^6(a^3G)4p$	$a^2G - x^4F^o$	$\frac{9}{2} - \frac{9}{2}$	P	749
		1993.72	0. - 50.157452	$3d^6(a^5D)4s - 3d^6(b^3F)4s$	$ga^6D - c^4F$	$\frac{9}{2} - \frac{9}{2}$	F,P	375,749
	2	1993.912	21.812055 - 71.964710	$3d^6(a^3P)4s - 3d^6(a^3D)4p$	$b^4P - w^4P^o$	$\frac{3}{2} - \frac{5}{2}$	P	749
	20	1994.857	52.96582 - 103.09473	$3d^5(a^6S)4s4p(^3P^o) - 3d^54s(a^7S)5s$	$z^8P^o - {}^8S$	$\frac{9}{2} - \frac{7}{2}$	P	749
	1	1995.119	27.620412 - 77.742730	$3d^6(a^3F)4s - 3d^6(a^1D)4p$	$a^2F - v^2F^o$	$\frac{5}{2} - \frac{5}{2}$	P	749
	2	1995.422	22.409852 - 72.524566	$3d^6(a^3P)4s - 3d^6(a^3D)4p$	$b^4P - w^4D^o$	$\frac{1}{2} - \frac{3}{2}$	P	749
	2	1996.539	15.84465 - 65.931334	$3d^7 - 3d^6(a^3G)4p$	$a^2G - x^4G^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	0	1996.933	22.939358 - 73.016147	$3d^6(a^3F)4s - 3d^6(a^1G)4p$	$b^4F - x^2F^o$	$\frac{5}{2} - \frac{7}{2}$	P	749
	4	1997.03	26.055423 - 76.129446	$3d^6(a^3G)4s - 3d^6(a^1S)4p$	$a^4G - x^2P^o$	$\frac{5}{2} - \frac{3}{2}$		645
	1	1999.206	22.409852 - 72.429711	$3d^6(a^3P)4s - 3d^6(a^3D)4p$	$b^4P - w^4D^o$	$\frac{1}{2} - \frac{1}{2}$	P	749
87	70	1999.413	22.637205 - 72.651876	$3d^6(a^3F)4s - 3d^6(a^3D)4p$	$b^4F - w^4D^o$	$\frac{9}{2} - \frac{7}{2}$	P	749
	10	1999.462	22.637205 - 72.650658	$3d^6(a^3F)4s - 3d^6(a^3D)4p$	$b^4F - w^4F^o$	$\frac{9}{2} - \frac{9}{2}$	P	292
	30	1999.730	20.516960 - 70.523706	$3d^7 - 3d^6(a^3G)4p$	$a^2D - x^2G^o$	$\frac{5}{2} - \frac{7}{2}$	P	749

IRON III (Fe^{+2}), Z = 26

Ground State $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6$ ($^5D_4$) (24 electrons)

Ionization Potential 247 221 cm^{-1}; 30.652 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
01	200	679.129	20.0511 - 167.2989	$3d^6 - 3d^5(b^2G)4p$	$a^3H - t^3G^o$	6 - 5		188
01	150	680.700	20.3008 - 167.2073	$3d^6 - 3d^5(b^2G)4p$	$a^3H - t^3G^o$	5 - 4		188
01	150	682.10	20.4819 - 167.0850	$3d^6 - 3d^5(b^2G)4p$	$a^3H - t^3G^o$	4 - 3		188
02	70	684.28	20.0511 - 166.18750	$3d^6 - 3d^5(b^2G)4p$	$a^3H - v^3H^o$	6 - 6		188
	70	684.858	20.4819 - 166.498	$3d^6 - 3d^5(b^2G)4p$	$a^3H - r^3F^o$	4 - 3		188
02	70	686.63	20.3008 - 165.9396	$3d^6 - 3d^5(b^2G)4p$	$a^3H - v^3H^o$	5 - 5		188
02	20	688.53	20.4819 - 165.7191	$3d^6 - 3d^5(b^2G)4p$	$a^3H - v^3H^o$	4 - 4		188
03	70	700.575	24.5588 - 167.2989	$3d^6 - 3d^5(b^2G)4p$	$a^3G - t^3G^o$	5 - 5		188
03	70	703.506	24.9409 - 167.0850	$3d^6 - 3d^5(b^2G)4p$	$a^3G - t^3G^o$	4 - 3		188
04	70	704.923	25.1424 - 167.002	$3d^6 - 3d^5(b^2G)4p$	$a^3G - r^3F^o$	3 - 2		188
04	150	705.892	24.5588 - 166.2222	$3d^6 - 3d^5(b^2G)4p$	$a^3G - r^3F^o$	5 - 4		188
04	70	707.444	25.1424 - 166.498	$3d^6 - 3d^5(b^2G)4p$	$a^3G - r^3F^o$	3 - 3		188
	250	722.419	30.3562 - 168.7801	$3d^6 - 3d^5(b^2G)4p$	$a^1I - w^1H^o$	6 - 5		188
8	200	727.681	0.0 - 137.42300	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5D^o$	4 - 3		188
	70	728.52	21.4622 - 158.7293	$3d^6 - 3d^5(b^2D)4p$	$a^3F - t^3D^o$	4 - 3		188
8	400	728.810	0.0 - 137.20973	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5D^o$	4 - 4		188
8	200	729.349	0.4362 - 137.54460	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5D^o$	3 - 2		188
8	300	729.996	0.4362 - 137.42300	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5D^o$	3 - 3		188
8		730.88	0.7389 - 137.5611	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5D^o$	2 - 1		188
8	150	730.96	0.7389 - 137.54460	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5D^o$	2 - 2		188
8	70	731.130	0.4362 - 137.20973	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5D^o$	3 - 4		188
	70	731.443	21.6999 - 158.4168	$3d^6 - 3d^5(b^2D)4p$	$a^3F - t^3D^o$	3 - 2		188
8	150	731.612	0.7389 - 137.42300	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5D^o$	2 - 3		188
8	150	731.846	0.9324 - 137.5732	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5D^o$	1 - 0		188
8	70	731.90	0.9324 - 137.5611	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5D^o$	1 - 1		188
8	200	732.004	0.9324 - 137.54460	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5D^o$	1 - 2		188
8	150	732.425	1.0273 - 137.5611	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5D^o$	0 - 1		188
	70	733.13	21.8572 - 158.2573	$3d^6 - 3d^5(b^2D)4p$	$a^3F - t^3D^o$	2 - 1		188
05	250	734.296	0.0 - 136.18517	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5F^o$	4 - 5		188
05	70	735.338	0.0 - 135.99062	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5F^o$	4 - 4		188
06	20	736.47	30.7162 - 166.498	$3d^6 - 3d^5(b^2G)4p$	$a^3D - r^3F^o$	2 - 3		188
05	300	737.708	0.4362 - 135.99062	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5F^o$	3 - 4		188
06	70	738.742	30.8578 - 166.2222	$3d^6 - 3d^5(b^2G)4p$	$a^3D - r^3F^o$	3 - 4		188
05	300	739.264	0.7389 - 136.00874	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5F^o$	2 - 3		188
05	150	739.594	1.0273 - 136.23584	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5F^o$	0 - 1		188
05	250	739.724	0.9324 - 136.11794	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - x^5F^o$	1 - 2		188
07	200	746.247	24.5588 - 158.5627	$3d^6 - 3d^5(b^2D)4p$	$a^3G - s^3F^o$	5 - 4		188
	150	751.427						188
07	150	751.648	24.9409 - 157.9820	$3d^6 - 3d^5(b^2D)4p$	$a^3G - s^3F^o$	4 - 3		188
07	150	754.478	25.1424 - 157.6843	$3d^6 - 3d^5(b^2D)4p$	$a^3G - s^3F^o$	3 - 2		188
	150	757.167						188
	150	757.279						188
	150	776.097	70.72501 - 199.57771	$3d^5(a^4G)4s - 3d^5(a^4G)5p$	$b^3G - q^3F^o$	3 - 2	Q	188
	200	782.035	30.8578 - 158.7293	$3d^6 - 3d^5(b^2D)4p$	$a^3D - t^3D^o$	3 - 3		188
	200	783.069	30.8578 - 158.5627	$3d^6 - 3d^5(b^2D)4p$	$a^3D - s^3F^o$	3 - 4		188
	70	785.76	30.7162 - 157.9820	$3d^6 - 3d^5(b^2D)4p$	$a^3D - s^3F^o$	2 - 3		188
08	200	792.559	21.4622 - 147.63595	$3d^6 - 3d^5(b^2F)4p$	$a^3F - u^3D^o$	4 - 3		188
09	70	794.01	21.4622 - 147.40614	$3d^6 - 3d^5(b^2F)4p$	$a^3F - u^3G^o$	4 - 5		188
08	150	794.19	21.6999 - 147.61465	$3d^6 - 3d^5(b^2F)4p$	$a^3F - u^3D^o$	3 - 2		188
08	150	795.550	21.8572 - 147.55645	$3d^6 - 3d^5(b^2F)4p$	$a^3F - u^3D^o$	2 - 1		188
08	150	797.055	21.6999 - 147.16136	$3d^6 - 3d^5(b^2F)4p$	$a^3F - u^3G^o$	3 - 4		188
	150	797.16	0.0 - 125.44358	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^3F^o$	4 - 4		188
	70	801.32	20.0511 - 144.84324	$3d^6 - 3d^5(a^2H)4p$	$a^3H - x^1H^o$	6 - 5		188
19	600	807.547	20.0511 - 143.88374	$3d^6 - 3d^5(a^2G)4p$	$a^3H - v^3G^o$	6 - 5		188
19	550	807.855	20.3008 - 144.08597	$3d^6 - 3d^5(a^2G)4p$	$a^3H - v^3G^o$	5 - 4		188
7	300	808.079	0.0 - 123.75039	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - x^5P^o$	4 - 3		188
19	550	808.840	20.4819 - 144.11664	$3d^6 - 3d^5(a^2G)4p$	$a^3H - v^3G^o$	4 - 3		188
	200	809.675	21.4622 - 144.96850	$3d^6 - 3d^5(b^2F)4p$	$a^3F - t^3F^o$	4 - 4		188
7	450	810.940	0.4362 - 123.75039	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - x^5P^o$	3 - 3		188
	250	811.246	21.6999 - 144.96850	$3d^6 - 3d^5(b^2F)4p$	$a^3F - t^3F^o$	3 - 4		188

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
7	550	811.284	0.4362 - 123.69718	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - x^5P^o$	3 - 2		188
	300	812.931	0.7389 - 123.75039	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - x^5P^o$	2 - 3		188
7	250	813.288	0.7389 - 123.69718	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - x^5P^o$	2 - 2		188
6	650	813.382	0.0 - 122.94415	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5D^o$	4 - 4		188
	300	813.862	21.6999 - 144.57053	$3d^6 - 3d^5(b^2F)4p$	$a^3F - t^3F^o$	3 - 3		188
	70	814.148	0.0 - 122.82955	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5D^o$	4 - 3		188
7	400	814.242	0.7389 - 123.55295	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - x^5P^o$	2 - 1		188
	300	814.565	0.9324 - 123.69718	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - x^5P^o$	1 - 2		188
	200	815.363	21.8572 - 144.50174	$3d^6 - 3d^5(b^2F)4p$	$a^3F - t^3F^o$	2 - 2		188
	70	815.52	0.9324 - 123.55295	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - x^5P^o$	1 - 1		188
	200	815.612	20.3008 - 142.90848	$3d^6 - 3d^5(a^2H)4p$	$a^3H - w^3H^o$	5 - 5		188
6	400	816.163	0.9324 - 123.45592	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5D^o$	1 - 0		188
6	400	816.273	0.4362 - 122.94415	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5D^o$	3 - 4		188
6	450	817.038	0.4362 - 122.82955	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5D^o$	3 - 3		188
	200	817.166	20.4819 - 142.85559	$3d^6 - 3d^5(a^2H)4p$	$a^3H - w^3H^o$	4 - 4		188
	200	817.348	0.0 - 122.34661	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - z^3D^o$	4 - 3		188
6	200	818.383	0.4362 - 122.62834	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5D^o$	3 - 2		188
	250	818.598	0.7389 - 122.89884	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - z^3D^o$	2 - 2		188
6	70	818.981	0.7389 - 122.84303	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5D^o$	2 - 1		188
6	250	819.066	0.7389 - 122.82955	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5D^o$	2 - 3		188
	70	819.742	0.9324 - 122.92137	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - z^3D^o$	1 - 1		188
	200	819.898	0.9324 - 122.89884	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - z^3D^o$	1 - 2		188
	200	820.271	0.4362 - 122.34661	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - z^3D^o$	3 - 3		188
6	200	820.409	0.7389 - 122.62834	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5D^o$	2 - 2		188
6	200	820.915	1.0273 - 122.84303	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5D^o$	0 - 1		188
6	200	821.723	0.9324 - 122.62834	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5D^o$	1 - 2		188
	200	822.314	0.7389 - 122.34661	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - z^3D^o$	2 - 3		188
5	400	823.257	0.0 - 121.46882	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5F^o$	4 - 5		188
	200	824.800	0.0 - 121.24167	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5F^o$	4 - 4		188
5	400	827.777	0.4362 - 121.24167	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5F^o$	3 - 4		188
	250	829.375	0.4362 - 84.36992	$3d^6 - 3d^5(a^2F)4s$	$ga^5D - c^3F$	3 - 3		188
48	)4P	829.375	204.94326 - 24.5588	$3d^5(a^4D)5p - 3d^6$	$u^5F^o - a^3G$	2 - 2		33D,7
48	)4P	830.500	0.7389 - 121.00878	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5F^o$	2 - 3		43D,7
18	300	832.328	20.0511 - 140.19633	$3d^6 - 3d^5(a^2H)4p$	$a^3H - y^3I^o$	6 - 7		188
	150	833.532	20.4819 - 140.45310	$3d^6 - 3d^5(a^2F)4p$	$a^3H - y^1F^o$	4 - 3		188
5	250	834.067	0.9324 - 120.82617	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5F^o$	1 - 2		188
43	400	834.944	30.8864 - 150.6549	$3d^6 - 3d^5(b^2F)4p$	$a^1G - w^1F^o$	4 - 3		188
5	150	835.627	1.0273 - 120.69710	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - y^5F^o$	0 - 1		188
	150	835.917	24.9409 - 144.57053	$3d^6 - 3d^5(b^2F)4p$	$a^3G - t^3F^o$	4 - 3		188
18	450	836.521	20.3008 - 139.84618	$3d^6 - 3d^5(a^2H)4p$	$a^3H - y^3I^o$	5 - 6		188
33	200	836.628	24.5588 - 144.08597	$3d^6 - 3d^5(a^2G)4p$	$a^3G - v^3G^o$	5 - 4		188
17	450	837.439	20.0511 - 139.46336	$3d^6 - 3d^5(a^4F)4p$	$a^3H - w^3G^o$	6 - 5		188
	200	837.803	25.1424 - 144.50174	$3d^6 - 3d^5(b^2F)4p$	$a^3G - t^3F^o$	3 - 2		188
17	550	838.048	20.3008 - 139.62517	$3d^6 - 3d^5(a^4F)4p$	$a^3H - w^3G^o$	5 - 4		188
	150	838.498	0.4362 - 119.69764	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - z^3P^o$	3 - 2		188
18	150	838.869	20.3008 - 139.50944	$3d^6 - 3d^5(a^2H)4p$	$a^3H - y^3I^o$	5 - 5		188
17	300	838.936	20.4819 - 139.68047	$3d^6 - 3d^5(a^4F)4p$	$a^3H - w^3G^o$	4 - 3		188
	250	838.997	25.1424 - 144.33221	$3d^6 - 3d^5(b^2F)4p$	$a^3G - x^1G^o$	3 - 4		188
33	150	839.092	24.9409 - 144.11664	$3d^6 - 3d^5(a^2G)4p$	$a^3G - v^3G^o$	4 - 3		188
17	150	839.195	20.3008 - 139.46336	$3d^6 - 3d^5(a^4F)4p$	$a^3H - w^3G^o$	5 - 5		188
17	300	839.319	20.4819 - 139.62517	$3d^6 - 3d^5(a^4F)4p$	$a^3H - w^3G^o$	4 - 4		188
	200	839.981	0.9324 - 119.98226	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - z^3P^o$	1 - 1		188
18	250	840.141	20.4819 - 139.50944	$3d^6 - 3d^5(a^2H)4p$	$a^3H - y^3I^o$	4 - 5		188
25	300	840.381	21.6999 - 140.69336	$3d^6 - 3d^5(a^2G)4p$	$a^3F - v^3F^o$	3 - 3		188
33	250	840.518	25.1424 - 144.11664	$3d^6 - 3d^5(a^2G)4p$	$a^3G - v^3G^o$	3 - 3		188
	200	840.629	0.7389 - 119.69764	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - z^3P^o$	2 - 2		188
33	150	840.741	24.9409 - 143.88374	$3d^6 - 3d^5(a^2G)4p$	$a^3G - v^3G^o$	4 - 5		188
25	300	841.088	21.8572 - 140.75098	$3d^6 - 3d^5(a^2G)4p$	$a^3F - v^3F^o$	2 - 2		188
	150	841.688	30.7162 - 149.52563	$3d^6 - 3d^5(a^2S)4p$	$a^3D - w^3P^o$	2 - 2		188
32	400	842.020	24.5588 - 143.32085	$3d^6 - 3d^5(a^2H)4p$	$a^3G - w^3H^o$	5 - 6		188
	300	842.09	21.6999 - 140.45310	$3d^6 - 3d^5(a^2F)4p$	$a^3F - y^1F^o$	3 - 3		188
	300	842.686	30.8578 - 149.52563	$3d^6 - 3d^5(a^2S)4p$	$a^3D - w^3P^o$	3 - 2		188
4	650	844.284	0.0 - 118.44292	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - y^5P^o$	4 - 3		188
	250	844.838	21.4622 - 139.82717	$3d^6 - 3d^5(a^2G)4p$	$a^3F - y^1G^o$	4 - 4		188
32	150	844.954	24.5588 - 142.90848	$3d^6 - 3d^5(a^2H)4p$	$a^3G - w^3H^o$	5 - 5		188

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
4	600	845.408	0.4362 - 118.72160	3d^6 - 3d^5(a^{4}P)4p	ga^{5}D - y^{5}P^o	3 - 2		188
	70	845.686	0.0 - 118.24652	3d^6 - 3d^5(a^{4}G)4p	ga^{5}D - z^{5}F^o	4 - 3		188
16	450	845.925	20.0511 - 138.26447	3d^6 - 3d^5(a^{2}G)4p	a^{3}H - x^{3}H^o	6 - 6		188
	200	846.035	30.7162 - 148.9153	3d^6 - 3d^5(a^{2}S)4p	a^{3}D - w^{3}P^o	2 - 1		188
	150	846.089	30.7258 - 148.9153	3d^6 - 3d^5(a^{2}S)4p	a^{3}D - w^{3}P^o	1 - 1		188
4	400	846.534	0.7389 - 118.86787	3d^6 - 3d^5(a^{4}P)4p	ga^{5}D - y^{5}P^o	2 - 1		188
4	550	847.425	0.4362 - 118.44292	3d^6 - 3d^5(a^{4}P)4p	ga^{5}D - y^{5}P^o	3 - 3		188
4	450	847.578	0.7389 - 118.72160	3d^6 - 3d^5(a^{4}P)4p	ga^{5}D - y^{5}P^o	2 - 2		188
32	400	847.700	24.9409 - 142.90848	3d^6 - 3d^5(a^{2}H)4p	a^{3}G - w^{3}H^o	4 - 5		188
4	400	847.924	0.9324 - 118.86787	3d^6 - 3d^5(a^{4}P)4p	ga^{5}D - y^{5}P^o	1 - 1		188
	300	847.984	21.6999 - 139.62517	3d^6 - 3d^5(a^{4}F)4p	a^{3}F - w^{3}G^o	3 - 4		188
32	70	848.07	24.9409 - 142.85559	3d^6 - 3d^5(a^{2}H)4p	a^{3}G - w^{3}H^o	4 - 4		188
4	250	848.601	1.0273 - 118.86787	3d^6 - 3d^5(a^{4}P)4p	ga^{5}D - y^{5}P^o	0 - 1		188
	250	848.729	21.8572 - 139.68047	3d^6 - 3d^5(a^{4}F)4p	a^{3}F - w^{3}G^o	2 - 3		188
4	200	848.977	0.9324 - 118.72160	3d^6 - 3d^5(a^{4}P)4p	ga^{5}D - y^{5}P^o	1 - 2		188
32	300	849.524	25.1424 - 142.85559	3d^6 - 3d^5(a^{2}H)4p	a^{3}G - w^{3}H^o	3 - 4		188
	250	849.569	20.4819 - 138.18793	3d^6 - 3d^5(a^{2}H)4p	a^{3}H - x^{3}G^o	4 - 3		188
31	450	851.150	24.5588 - 142.0470	3d^6 - 3d^5(a^{4}F)4p	a^{3}G - u^{5}F^o	5 - 4		188
16	450	851.332	20.3008 - 137.76370	3d^6 - 3d^5(a^{2}G)4p	a^{3}H - x^{3}H^o	5 - 5		188
31	400	851.842	25.1424 - 142.53507	3d^6 - 3d^5(a^{4}F)4p	a^{3}G - u^{5}F^o	3 - 2		188
31	400	851.992	24.9409 - 142.31290	3d^6 - 3d^5(a^{4}F)4p	a^{3}G - u^{5}F^o	4 - 3		188
16	150	852.644	20.4819 - 137.76370	3d^6 - 3d^5(a^{2}G)4p	a^{3}H - x^{3}H^o	4 - 5		188
16	70	853.045	20.3008 - 137.52792	3d^6 - 3d^5(a^{2}G)4p	a^{3}H - x^{3}H^o	5 - 4		188
31	70	853.456	25.1424 - 142.31290	3d^6 - 3d^5(a^{4}F)4p	a^{3}G - u^{5}F^o	3 - 3		188
3	300	854.073	0.4362 - 117.52191	3d^6 - 3d^5(a^{4}P)4p	ga^{5}D - z^{5}D^o	3 - 4		188
3	70	854.205	0.0 - 117.06856	3d^6 - 3d^5(a^{4}G)4p	ga^{5}D - z^{5}D^o	4 - 3		188
16	400	854.367	20.4819 - 137.52792	3d^6 - 3d^5(a^{2}G)4p	a^{3}H - x^{3}H^o	4 - 4		188
	150	854.532	50.2761 - 167.2989	3d^6 - 3d^5(b^{2}G)4p	b^{3}F - t^{3}G^o	4 - 5		188
	70	855.336	50.2952 - 167.2073	3d^6 - 3d^5(b^{2}G)4p	b^{3}F - t^{3}G^o	3 - 4		188
	200	855.441	30.7162 - 147.61465	3d^6 - 3d^5(b^{2}F)4p	a^{3}D - u^{3}D^o	2 - 2		188
	150	855.879	30.7162 - 147.55645	3d^6 - 3d^5(b^{2}F)4p	a^{3}D - u^{3}D^o	2 - 1		188
	150	855.935	30.7258 - 147.55645	3d^6 - 3d^5(b^{2}F)4p	a^{3}D - u^{3}D^o	1 - 1		188
	150	856.039	50.1849 - 167.002	3d^6 - 3d^5(b^{2}G)4p	b^{3}F - r^{3}F^o	2 - 2		188
	70	856.244	50.2952 - 167.0850	3d^6 - 3d^5(b^{2}G)4p	b^{3}F - t^{3}G^o	3 - 3		188
	300	856.325	30.8578 - 147.63595	3d^6 - 3d^5(b^{2}F)4p	a^{3}D - u^{3}D^o	3 - 3		188
	70	856.480	30.8578 - 147.61465	3d^6 - 3d^5(b^{2}F)4p	a^{3}D - u^{3}D^o	3 - 2		188
3	300	857.392	0.4362 - 117.06856	3d^6 - 3d^5(a^{4}G)4p	ga^{5}D - z^{5}D^o	3 - 3		188
	300	857.690	21.4622 - 138.05459	3d^6 - 3d^5(a^{2}H)4p	a^{3}F - x^{3}G^o	4 - 5		188
2	250	858.565	0.0 - 116.47544	3d^6 - 3d^5(a^{4}P)4p	ga^{5}D - z^{5}F^o	4 - 3		188
2	400	858.602	0.0 - 116.46741	3d^6 - 3d^5(a^{4}G)4p	ga^{5}D - z^{5}F^o	4 - 4		188
	200	859.086	21.6999 - 138.10312	3d^6 - 3d^5(a^{2}H)4p	a^{3}F - x^{3}G^o	3 - 4		188
3	400	859.626	0.7389 - 117.06856	3d^6 - 3d^5(a^{4}G)4p	ga^{5}D - z^{5}D^o	2 - 3		188
2	550	859.721	0.0 - 116.31663	3d^6 - 3d^5(a^{4}G)4p	ga^{5}D - z^{5}F^o	4 - 5		188
11	400	859.838	19.4048 - 135.7057	3d^6 - 3d^5(a^{2}F)4p	a^{3}P - w^{3}D^o	2 - 3		188
2	300	860.315	0.7389 - 116.97505	3d^6 - 3d^5(a^{4}G)4p	ga^{5}D - z^{5}F^o	2 - 2		188
	150	860.565	50.2952 - 166.498	3d^6 - 3d^5(b^{2}G)4p	b^{3}F - r^{3}F^o	3 - 3		188
	150	860.889	0.7389 - 116.89822	3d^6 - 3d^5(a^{4}P)4p	ga^{5}D - z^{5}S^o	2 - 2		188
	150	861.087	20.0511 - 136.18517	3d^6 - 3d^5(a^{4}F)4p	a^{3}H - x^{5}F^o	6 - 5		188
11	250	861.284	20.6884 - 136.7938	3d^6 - 3d^5(a^{2}F)4p	a^{3}P - w^{3}D^o	1 - 2		188
2	550	861.761	0.9324 - 116.97505	3d^6 - 3d^5(a^{4}G)4p	ga^{5}D - z^{5}F^o	1 - 2		188
2	650	861.832	0.4362 - 116.46741	3d^6 - 3d^5(a^{4}G)4p	ga^{5}D - z^{5}F^o	3 - 4		188
2	300	862.028	0.9324 - 116.93757	3d^6 - 3d^5(a^{4}G)4p	ga^{5}D - z^{5}F^o	1 - 1		188
3	150	862.191	0.4362 - 116.41939	3d^6 - 3d^5(a^{4}P)4p	ga^{5}D - z^{5}D^o	3 - 2		188
	150	862.326	0.9324 - 116.89822	3d^6 - 3d^5(a^{4}P)4p	ga^{5}D - z^{5}S^o	1 - 2		188
	200	862.468	50.2761 - 166.2222	3d^6 - 3d^5(b^{2}G)4p	b^{3}F - r^{3}F^o	4 - 4		188
2	300	862.735	1.0273 - 116.93757	3d^6 - 3d^5(a^{4}G)4p	ga^{5}D - z^{5}F^o	0 - 1		188
	70	863.004	19.4048 - 135.2790	3d^6 - 3d^5(a^{2}D)4p	a^{3}P - x^{3}D^o	2 - 2		188
	250	863.232	20.6884 - 136.53245	3d^6 - 3d^5(a^{2}F)4p	a^{3}P - w^{3}F^o	1 - 2		188
	250	863.302	35.8037 - 151.6373	3d^6 - 3d^5(a^{2}S)4p	a^{1}D - y^{1}P^o	2 - 1		188
11	70	863.730	20.6884 - 136.4649	3d^6 - 3d^5(a^{2}F)4p	a^{3}P - w^{3}D^o	1 - 1		188
2	400	864.034	0.7389 - 116.47544	3d^6 - 3d^5(a^{4}P)4p	ga^{5}D - z^{5}F^o	2 - 3		188
	150	864.375	20.3008 - 135.99062	3d^6 - 3d^5(a^{4}F)4p	a^{3}H - x^{5}F^o	5 - 4		188
	250	864.425	20.0511 - 135.73531	3d^6 - 3d^5(a^{4}F)4p	a^{3}H - y^{5}G^o	6 - 5		188
3		864.450	0.7389 - 116.41939	3d^6 - 3d^5(a^{4}P)4p	ga^{5}D - z^{5}D^o	2 - 2	P	188
	70	865.267	19.4048 - 134.97622	3d^6 - 3d^5(a^{2}D)4p	a^{3}P - x^{3}D^o	2 - 3		188

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
3	250	865.896	0.9324 - 116.41939	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - z^5D^o$	1 - 2		188
3	70	866.905	1.0273 - 116.38007	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - z^5D^o$	0 - 1		188
11	300	867.639	21.2085 - 136.4649	$3d^6 - 3d^5(a^2F)4p$	$a^3P - w^3D^o$	0 - 1		188
	200	868.428	21.4622 - 136.61278	$3d^6 - 3d^5(a^2F)4p$	$a^3F - w^3F^o$	4 - 4	P	188
	50	868.473	19.4048 - 134.5494	$3d^6 - 3d^5(a^2D)4p$	$a^3P - x^3P^o$	2 - 1	P	188
	300	868.836	21.6999 - 136.79705	$3d^6 - 3d^5(a^2F)4p$	$a^3F - w^3F^o$	3 - 3		188
	200	870.041	20.3008 - 135.23974	$3d^6 - 3d^5(a^4F)4p$	$a^3H - y^5G^o$	5 - 4		188
	150	870.235	21.6999 - 136.61278	$3d^6 - 3d^5(a^2F)4p$	$a^3F - w^3F^o$	3 - 4		188
	150	870.274	24.5588 - 139.46336	$3d^6 - 3d^5(a^4F)4p$	$a^3G - w^3G^o$	5 - 5		188
	300	870.621	19.4048 - 134.26542	$3d^6 - 3d^5(a^2D)4p$	$a^3P - x^3P^o$	2 - 2		188
	150	871.552	21.4622 - 136.20013	$3d^6 - 3d^5(a^2D)4p$	$a^3F - z^1F^o$	4 - 3		188
	250	871.968	24.9409 - 139.62517	$3d^6 - 3d^5(a^4F)4p$	$a^3G - w^3G^o$	4 - 4		188
	250	872.027	0.4362 - 115.11092	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - z^5H^o$	3 - 4		188
	200	873.080	25.1424 - 139.68047	$3d^6 - 3d^5(a^4F)4p$	$a^3G - w^3G^o$	3 - 3		188
	150	873.130	20.6884 - 135.2171	$3d^6 - 3d^5(a^2D)4p$	$a^3P - x^3D^o$	1 - 1		188
38	550	873.462	30.3562 - 144.84324	$3d^6 - 3d^5(a^2H)4p$	$a^1I - x^1H^o$	6 - 5		188
	70	873.988	21.6999 - 136.11794	$3d^6 - 3d^5(a^4F)4p$	$a^3F - x^5F^o$	3 - 2		188
	150	874.129	20.6884 - 135.0881	$3d^6 - 3d^5(a^2D)4p$	$a^3P - x^3P^o$	1 - 0		188
	70	874.560	21.8572 - 136.20013	$3d^6 - 3d^5(a^2D)4p$	$a^3F - z^1F^o$	2 - 3		188
	150	875.090	21.4622 - 135.73531	$3d^6 - 3d^5(a^4F)4p$	$a^3F - y^5G^o$	4 - 5		188
	300	875.423	30.3562 - 144.58683	$3d^6 - 3d^5(a^2G)4p$	$a^1I - y^1H^o$	6 - 5		188
	300	876.021	30.8864 - 145.03861	$3d^6 - 3d^5(a^2G)4p$	$a^1G - x^1F^o$	4 - 3		188
	200	876.483	21.4622 - 135.55441	$3d^6 - 3d^5(a^2F)4p$	$a^3F - y^3G^o$	4 - 4		188
	200	876.564	30.8864 - 144.96850	$3d^6 - 3d^5(b^2F)4p$	$a^1G - t^3F^o$	4 - 4		188
	200	876.679	20.4819 - 134.54900	$3d^6 - 3d^5(a^2F)4p$	$a^3H - y^3G^o$	4 - 3		188
	50	878.264	20.6884 - 134.5494	$3d^6 - 3d^5(a^2D)4p$	$a^3P - x^3P^o$	1 - 1	P	188
	200	878.316	21.4622 - 135.31642	$3d^6 - 3d^5(a^2F)4p$	$a^3F - y^3G^o$	4 - 5	P	188
	250	879.505	30.8864 - 144.58683	$3d^6 - 3d^5(a^2G)4p$	$a^1G - y^1H^o$	4 - 5		188
	300	880.008	0.0 - 113.63534	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - z^5G^o$	4 - 4		188
24	400	880.447	21.6999 - 135.2790	$3d^6 - 3d^5(a^2D)4p$	$a^3F - x^3D^o$	3 - 2		188
24	400	880.949	21.4622 - 134.97622	$3d^6 - 3d^5(a^2D)4p$	$a^3F - x^3D^o$	4 - 3		188
30	450	881.088	24.5588 - 138.05459	$3d^6 - 3d^5(a^2H)4p$	$a^3G - x^3G^o$	5 - 5		188
	200	881.477	30.8864 - 144.33221	$3d^6 - 3d^5(b^2F)4p$	$a^1G - x^1G^o$	4 - 4		188
24	250	882.147	21.8572 - 135.2171	$3d^6 - 3d^5(a^2D)4p$	$a^3F - x^3D^o$	2 - 1		188
	70	882.295	21.2085 - 134.5494	$3d^6 - 3d^5(a^2D)4p$	$a^3P - x^3P^o$	0 - 1		188
	200	883.090	21.8572 - 135.09684	$3d^6 - 3d^5(a^4F)4p$	$a^3F - y^5G^o$	2 - 3		188
30	400	883.688	24.9409 - 138.10312	$3d^6 - 3d^5(a^2H)4p$	$a^3G - x^3G^o$	4 - 4		188
	250	884.263	57.2217 - 170.3106	$3d^6 - 3d^5(b^2G)4p$	$b^1G - u^1F^o$	4 - 3		188
30	300	884.600	25.1424 - 138.18793	$3d^6 - 3d^5(a^2H)4p$	$a^3G - x^3G^o$	3 - 3		188
	70	886.138	21.6999 - 134.54900	$3d^6 - 3d^5(a^2F)4p$	$a^3F - y^3G^o$	3 - 3		188
	200	887.372	21.8572 - 134.54900	$3d^6 - 3d^5(a^2F)4p$	$a^3F - y^3G^o$	2 - 3		188
15	150	888.777	20.0511 - 132.56471	$3d^6 - 3d^5(a^2I)4p$	$a^3H - y^3H^o$	6 - 5		188
15	150	890.008	20.3008 - 132.65917	$3d^6 - 3d^5(a^2I)4p$	$a^3H - y^3H^o$	5 - 4		188
15	600	890.755	20.3008 - 132.56471	$3d^6 - 3d^5(a^2I)4p$	$a^3H - y^3H^o$	5 - 5		188
15	650	891.172	20.0511 - 132.26266	$3d^6 - 3d^5(a^2I)4p$	$a^3H - y^3H^o$	6 - 6		188
15	550	891.442	20.4819 - 132.65917	$3d^6 - 3d^5(a^2I)4p$	$a^3H - y^3H^o$	4 - 4		188
49	400	892.417	24.5588 - 136.61278	$3d^6 - 3d^5(a^2F)4p$	$a^3G - w^3F^o$	5 - 4		188
	250	894.008	24.9409 - 136.79705	$3d^6 - 3d^5(a^2F)4p$	$a^3G - w^3F^o$	4 - 3		188
	70	896.072	30.7162 - 142.31290	$3d^6 - 3d^5(a^4F)4p$	$a^3D - u^3F^o$	2 - 3		188
	70	896.380	57.2217 - 168.7801	$3d^6 - 3d^5(b^2G)4p$	$b^1G - w^1H^o$	4 - 5		188
	70	897.580	20.3008 - 131.71079	$3d^6 - 3d^5(a^2I)4p$	$a^3H - z^1H^o$	5 - 5		188
	150	897.747	25.1424 - 136.53245	$3d^6 - 3d^5(a^2F)4p$	$a^3G - w^3F^o$	3 - 2		188
	70	898.805	24.9409 - 136.20013	$3d^6 - 3d^5(a^2D)4p$	$a^3G - z^1F^o$	4 - 3		188
	70	899.052	20.4819 - 131.71079	$3d^6 - 3d^5(a^2I)4p$	$a^3H - z^1H^o$	4 - 5		188
37	550	899.417	30.3562 - 141.53955	$3d^6 - 3d^5(a^2H)4p$	$a^1I - y^1I^o$	6 - 6		188
	150	900.432	25.1424 - 136.20013	$3d^6 - 3d^5(a^2D)4p$	$a^3G - z^1F^o$	3 - 3		188
	200	900.940	24.5588 - 135.55441	$3d^6 - 3d^5(a^2F)4p$	$a^3G - y^3G^o$	5 - 4		188
	300	901.034	20.0511 - 131.03507	$3d^6 - 3d^5(a^2I)4p$	$a^3H - z^3I^o$	6 - 7		188
	200	902.869	24.5588 - 135.31642	$3d^6 - 3d^5(a^2F)4p$	$a^3G - y^3G^o$	5 - 5		188
	200	904.320	30.8864 - 141.46653	$3d^6 - 3d^5(a^4F)4p$	$a^1G - v^3D^o$	4 - 3		188
	450	905.338	20.3008 - 130.75684	$3d^6 - 3d^5(a^2I)4p$	$a^3H - z^3I^o$	5 - 6		188
	70	905.964	21.6999 - 132.07991	$3d^6 - 3d^5(a^2D)4p$	$a^3F - x^3F^o$	3 - 3		188
	70	907.041	21.8572 - 132.10494	$3d^6 - 3d^5(a^2D)4p$	$a^3F - x^3F^o$	2 - 2		188
	250	907.891	30.8578 - 141.00299	$3d^6 - 3d^5(a^2G)4p$	$a^3D - v^3F^o$	3 - 4		188
	300	908.131	30.8864 - 141.00299	$3d^6 - 3d^5(a^2G)4p$	$a^1G - v^3F^o$	4 - 4		188

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	70	908.800	30.7162 - 140.75098	$3d^6 - 3d^5(a^2G)4p$	$a^3D - v^3F^o$	2 - 2		188
	150	908.885	30.7258 - 140.75098	$3d^6 - 3d^5(a^2G)4p$	$a^3D - v^3F^o$	1 - 2		188
	250	909.178	20.0511 - 130.04056	$3d^6 - 3d^5(a^2I)4p$	$a^3H - z^3K^o$	6 - 7		188
	150	909.279	30.7162 - 140.69336	$3d^6 - 3d^5(a^2G)4p$	$a^3D - v^3F^o$	2 - 3		188
	200	910.639	35.8037 - 145.61839	$3d^6 - 3d^5(b^2F)4p$	$a^1D - x^1D^o$	2 - 2		188
	250	910.693	30.8864 - 140.69336	$3d^6 - 3d^5(a^2G)4p$	$a^1G - v^3F^o$	4 - 3		188
	400	910.961	20.4819 - 130.25627	$3d^6 - 3d^5(a^2I)4p$	$a^3H - z^3I^o$	4 - 5		188
	70	911.205	21.6999 - 131.44503	$3d^6 - 3d^5(a^2D)4p$	$a^3F - z^1D^o$	3 - 2		188
	150	911.265	30.7162 - 140.45310	$3d^6 - 3d^5(a^2F)4p$	$a^3D - y^1F^o$	2 - 3		188
	150	912.197	50.4123 - 160.0379	$3d^6 - 3d^5(b^2D)4p$	$b^3P - v^3P^o$	2 - 2		188
	300	912.683	30.8864 - 140.45310	$3d^6 - 3d^5(a^2F)4p$	$a^1G - y^1F^o$	4 - 3		188
	200	912.794	20.3008 - 129.85480	$3d^6 - 3d^5(a^2I)4p$	$a^3H - z^3K^o$	5 - 6		188
	70	913.132	19.4048 - 128.91751	$3d^6 - 3d^5(a^4D)4p$	$a^3P - y^3P^o$	2 - 2		188
	70	913.324	30.3562 - 139.84618	$3d^6 - 3d^5(a^2H)4p$	$a^1I - y^3I^o$	6 - 6		188
	150	913.919	24.9409 - 134.36040	$3d^6 - 3d^5(a^2F)4p$	$a^3G - z^1G^o$	4 - 4		188
	200	915.455	35.8037 - 145.03861	$3d^6 - 3d^5(a^2G)4p$	$a^1D - x^1F^o$	2 - 3		188
	150	917.684	30.8578 - 139.82717	$3d^6 - 3d^5(a^2G)4p$	$a^3D - y^1G^o$	3 - 4		188
	250	917.932	30.8864 - 139.82717	$3d^6 - 3d^5(a^2G)4p$	$a^1G - y^1G^o$	4 - 4		188
	70	918.800	49.5769 - 158.4168	$3d^6 - 3d^5(b^2D)4p$	$b^3P - t^3D^o$	1 - 2		188
	70	923.215	50.4123 - 158.7293	$3d^6 - 3d^5(b^2D)4p$	$b^3P - t^3D^o$	2 - 3		188
	250	928.004	42.8969 - 150.6549	$3d^6 - 3d^5(b^2F)4p$	$a^1F - w^1F^o$	3 - 3		188
	300	928.474	24.5588 - 132.26266	$3d^6 - 3d^5(a^2I)4p$	$a^3G - y^3H^o$	5 - 6		188
	300	929.163	24.9409 - 132.56471	$3d^6 - 3d^5(a^2I)4p$	$a^3G - y^3H^o$	4 - 5		188
	250	930.086	25.1424 - 132.65917	$3d^6 - 3d^5(a^2I)4p$	$a^3G - y^3H^o$	3 - 4		188
	70	931.124	21.2085 - 128.60565	$3d^6 - 3d^5(a^4D)4p$	$a^3P - y^3P^o$	0 - 1		188
10	450	934.703	19.4048 - 126.39057	$3d^6 - 3d^5(a^4P)4p$	$a^3P - z^3S^o$	2 - 1		188
	150	942.363	42.8969 - 149.01336	$3d^6 - 3d^5(a^2H)4p$	$a^1F - w^1G^o$	3 - 4		188
10	400	946.056	20.6884 - 126.39057	$3d^6 - 3d^5(a^4P)4p$	$a^3P - z^3S^o$	1 - 1		188
	300	948.322	19.4048 - 124.85404	$3d^6 - 3d^5(a^4D)4p$	$a^3P - y^3D^o$	2 - 3		188
	250	948.918	30.3562 - 135.73947	$3d^6 - 3d^5(a^2I)4p$	$a^1I - z^1I^o$	6 - 6		188
	650	950.334	30.3562 - 135.58208	$3d^6 - 3d^5(a^4F)4p$	$a^1I - y^5G^o$	6 - 6		188
10	200	950.722	21.2085 - 126.39057	$3d^6 - 3d^5(a^4P)4p$	$a^3P - z^3S^o$	0 - 1		188
	200	953.383	35.8037 - 140.69336	$3d^6 - 3d^5(a^2G)4p$	$a^1D - v^3F^o$	2 - 3		188
	150	955.141	30.8578 - 135.55441	$3d^6 - 3d^5(a^2F)4p$	$a^3D - y^3G^o$	3 - 4		188
46	300	955.572	35.8037 - 140.45310	$3d^6 - 3d^5(a^2F)4p$	$a^1D - y^1F^o$	2 - 3		188
	70	956.355	30.7162 - 135.2790	$3d^6 - 3d^5(a^2D)4p$	$a^3D - x^3D^o$	2 - 2		188
	70	959.070	20.6884 - 124.95488	$3d^6 - 3d^5(a^4D)4p$	$a^3P - y^3D^o$	1 - 1		188
	70	959.329	30.8578 - 135.09684	$3d^6 - 3d^5(a^4F)4p$	$a^3D - y^5G^o$	3 - 3		188
	250	959.552	20.6884 - 124.90392	$3d^6 - 3d^5(a^4D)4p$	$a^3P - y^3D^o$	1 - 2		188
	70	960.454	30.8578 - 134.97622	$3d^6 - 3d^5(a^2D)4p$	$a^3D - x^3D^o$	3 - 3		188
	150	961.709	21.4622 - 125.44358	$3d^6 - 3d^5(a^4D)4p$	$a^3F - y^3F^o$	4 - 4		188
45	450	961.901	35.8037 - 139.76448	$3d^6 - 3d^5(a^2F)4p$	$a^1D - y^1D^o$	2 - 2		188
	70	962.108	21.6999 - 125.63798	$3d^6 - 3d^5(a^4D)4p$	$a^3F - y^3F^o$	3 - 3		188
44	300	962.655	34.8124 - 138.69181	$3d^6 - 3d^5(a^2D)4p$	$a^1S - z^1P^o$	0 - 1		188
	50	963.172	30.7258 - 134.5494	$3d^6 - 3d^5(a^2D)4p$	$a^3D - x^3P^o$	1 - 1	P	188
	100	963.246	21.8572 - 125.67283	$3d^6 - 3d^5(a^4D)4p$	$a^3F - y^3F^o$	2 - 2	P	188
	200	963.880	21.2085 - 124.95488	$3d^6 - 3d^5(a^4D)4p$	$a^3P - y^3D^o$	0 - 1		188
	70	965.717	30.7162 - 134.26542	$3d^6 - 3d^5(a^2D)4p$	$a^3D - x^3P^o$	2 - 2		188
23	400	967.197	21.4622 - 124.85404	$3d^6 - 3d^5(a^4D)4p$	$a^3F - y^3D^o$	4 - 3		188
23	250	968.955	21.6999 - 124.90392	$3d^6 - 3d^5(a^4D)4p$	$a^3F - y^3D^o$	3 - 2		188
	150	969.423	21.6999 - 124.85404	$3d^6 - 3d^5(a^4D)4p$	$a^3F - y^3D^o$	3 - 3		188
23	200	969.954	21.8572 - 124.95488	$3d^6 - 3d^5(a^4D)4p$	$a^3F - y^3D^o$	2 - 1		188
	150	970.381	119.69764 - 222.75023	$3d^5(a^4P)4p - 3d^5(a^4G)5d$	$z^3P^o - h^5F$	2 - 3	Q	188
	150	970.435	21.8572 - 124.90392	$3d^6 - 3d^5(a^4D)4p$	$a^3F - y^3D^o$	2 - 2		188
	200	971.929	35.8037 - 138.69181	$3d^6 - 3d^5(a^2D)4p$	$a^1D - z^1P^o$	2 - 1		188
	250	973.505	42.8969 - 145.61839	$3d^6 - 3d^5(b^2F)4p$	$a^1F - x^1D^o$	3 - 2		188
	150	977.790	57.2217 - 159.4930	$3d^6 - 3d^5(b^2D)4p$	$b^1G - v^1F^o$	4 - 3		188
	300	979.032	42.8969 - 145.03861	$3d^6 - 3d^5(a^2G)4p$	$a^1F - x^1F^o$	3 - 3		188
	150	979.704	42.8969 - 144.96850	$3d^6 - 3d^5(b^2F)4p$	$a^1F - t^3F^o$	3 - 4		188
	70	980.416	21.6999 - 123.69718	$3d^6 - 3d^5(a^4D)4p$	$a^3F - x^5P^o$	3 - 2		188
	70	981.084	30.8578 - 132.78536	$3d^6 - 3d^5(a^2D)4p$	$a^3D - x^3F^o$	3 - 4		188
13	650	981.373	66.52295 - 168.42101	$3d^5(a^4P)4s - 3d^5(a^6S)5p$	$a^5P - w^5P^o$	2 - 2		188
	150	983.510	30.8864 - 132.56471	$3d^6 - 3d^5(a^2I)4p$	$a^1G - y^3H^o$	4 - 5		188
13	400	983.860	20.3008 - 121.94129	$3d^6 - 3d^5(a^4G)4p$	$a^3H - z^3G^o$	5 - 4	P	188
	250	983.909	30.3562 - 131.99158	$3d^6 - 3d^5(a^2I)4p$	$a^1I - z^1K^o$	6 - 7	P	188

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
13	550	985.824	20.4819 - 121.91974	$3d^6 - 3d^5(a^4G)4p$	$a^3H - z^3G^o$	4 - 3		188
	250	986.514	21.4622 - 122.82955	$3d^6 - 3d^5(a^4D)4p$	$a^3F - y^5D^o$	4 - 3		188
	300	986.637	30.3562 - 131.71079	$3d^6 - 3d^5(a^2I)4p$	$a^1I - z^1H^o$	6 - 5		188
22	150	988.148	21.6999 - 122.89884	$3d^6 - 3d^5(a^4P)4p$	$a^3F - z^3D^o$	3 - 2		188
22	250	989.467	21.8572 - 122.92137	$3d^6 - 3d^5(a^4P)4p$	$a^3F - z^3D^o$	2 - 1		188
	250	990.235	21.8572 - 122.84303	$3d^6 - 3d^5(a^4D)4p$	$a^3F - y^5D^o$	2 - 1		188
	400	990.800	21.6999 - 122.62834	$3d^6 - 3d^5(a^4D)4p$	$a^3F - y^5D^o$	3 - 2		188
22	600	991.232	21.4622 - 122.34661	$3d^6 - 3d^5(a^4P)4p$	$a^3F - z^3D^o$	4 - 3		188
42	400	991.829	30.8864 - 131.71079	$3d^6 - 3d^5(a^2I)4p$	$a^1G - z^1H^o$	4 - 5		188
	150	992.337	21.8572 - 122.62834	$3d^6 - 3d^5(a^4D)4p$	$a^3F - y^5D^o$	2 - 2		188
29	450	993.080	24.9409 - 125.63798	$3d^6 - 3d^5(a^4D)4p$	$a^3G - y^3F^o$	4 - 3		188
9	200	994.257	19.4048 - 119.98226	$3d^6 - 3d^5(a^4P)4p$	$a^3P - z^3P^o$	2 - 1		188
29	400	994.724	25.1424 - 125.67283	$3d^6 - 3d^5(a^4D)4p$	$a^3G - y^3F^o$	3 - 2		188
21	400	995.150	21.4622 - 121.94962	$3d^6 - 3d^5(a^4G)4p$	$a^3F - z^3G^o$	4 - 5		188
21	150	995.223	21.4622 - 121.94129	$3d^6 - 3d^5(a^4G)4p$	$a^3F - z^3G^o$	4 - 4		188
9	450	997.081	19.4048 - 119.69764	$3d^6 - 3d^5(a^4P)4p$	$a^3P - z^3P^o$	2 - 2		188
21	400	997.599	21.6999 - 121.94129	$3d^6 - 3d^5(a^4G)4p$	$a^3F - z^3G^o$	3 - 4		188
21	70	997.794	21.6999 - 121.91974	$3d^6 - 3d^5(a^4G)4p$	$a^3F - z^3G^o$	3 - 3		188
21	300	999.376	21.8572 - 121.91974	$3d^6 - 3d^5(a^4G)4p$	$a^3F - z^3G^o$	2 - 3		188
	150	1005.106	82.33392 - 181.82567	$3d^5(a^6S)4p - 3d^5(a^4G)5s$	$z^7P^o - f^5G$	3 - 4		188
	150	1006.341	30.8864 - 130.25627	$3d^6 - 3d^5(a^2I)4p$	$a^1G - z^3I^o$	4 - 5		188
9	200	1007.113	20.6884 - 119.98226	$3d^6 - 3d^5(a^4P)4p$	$a^3P - z^3P^o$	1 - 1		188
9	250	1010.005	20.6884 - 119.69764	$3d^6 - 3d^5(a^4P)4p$	$a^3P - z^3P^o$	1 - 2		188
9	200	1012.411	21.2085 - 119.98226	$3d^6 - 3d^5(a^4P)4p$	$a^3P - z^3P^o$	0 - 1		188
12	600	1017.254	20.0511 - 118.35501	$3d^6 - 3d^5(a^4G)4p$	$a^3H - z^3H^o$	6 - 6		188
12	550	1017.745	20.3008 - 118.55725	$3d^6 - 3d^5(a^4G)4p$	$a^3H - z^3H^o$	5 - 5		188
12	550	1018.286	20.4819 - 118.68625	$3d^6 - 3d^5(a^4G)4p$	$a^3H - z^3H^o$	4 - 4		188
41	400	1019.789	30.8578 - 128.91751	$3d^6 - 3d^5(a^4D)4p$	$a^3D - y^3P^o$	3 - 2		188
	150	1020.022	49.5769 - 147.61465	$3d^6 - 3d^5(b^2F)4p$	$b^3P - u^3D^o$	1 - 2		188
41	250	1021.561	30.7162 - 128.60565	$3d^6 - 3d^5(a^4D)4p$	$a^3D - y^3P^o$	2 - 1		188
41	200	1024.108	30.7258 - 128.37153	$3d^6 - 3d^5(a^4D)4p$	$a^3D - y^3P^o$	1 - 0		188
28	400	1026.790	24.5588 - 121.94962	$3d^6 - 3d^5(a^4G)4p$	$a^3G - z^3G^o$	5 - 5		188
	150	1029.551	50.2761 - 147.40614	$3d^6 - 3d^5(b^2F)4p$	$b^3F - u^3G^o$	4 - 5		188
28	150	1030.844	24.9409 - 121.94962	$3d^6 - 3d^5(a^4G)4p$	$a^3G - z^3G^o$	4 - 5		188
28	400	1030.924	24.9409 - 121.94129	$3d^6 - 3d^5(a^4G)4p$	$a^3G - z^3G^o$	4 - 4		188
20	550	1032.123	21.4622 - 118.35024	$3d^6 - 3d^5(a^4G)4p$	$a^3F - z^3F^o$	4 - 4		188
	150	1032.337	42.8969 - 139.76448	$3d^6 - 3d^5(a^2F)4p$	$a^1F - y^1D^o$	3 - 2	P	188
	100	1032.352	50.2952 - 147.16136	$3d^6 - 3d^5(b^2F)4p$	$b^3F - u^3G^o$	3 - 4	P	188
28	70	1033.079	25.1424 - 121.94129	$3d^6 - 3d^5(a^4G)4p$	$a^3G - z^3G^o$	3 - 4		188
20	150	1033.225	21.4622 - 118.24652	$3d^6 - 3d^5(a^4G)4p$	$a^3F - z^3F^o$	4 - 3		188
28	300	1033.298	25.1424 - 121.91974	$3d^6 - 3d^5(a^4G)4p$	$a^3G - z^3G^o$	3 - 3		188
	150	1034.054	50.1849 - 146.8910	$3d^6 - 3d^5(b^2F)4p$	$b^3F - u^3G^o$	2 - 3		188
20	150	1034.654	21.6999 - 118.35024	$3d^6 - 3d^5(a^4G)4p$	$a^3F - z^3F^o$	3 - 4		188
20	400	1035.768	21.6999 - 118.24652	$3d^6 - 3d^5(a^4G)4p$	$a^3F - z^3F^o$	3 - 3		188
20	150	1036.659	21.6999 - 118.16356	$3d^6 - 3d^5(a^4G)4p$	$a^3F - z^3F^o$	3 - 2		188
20	70	1037.462	21.8572 - 118.24652	$3d^6 - 3d^5(a^4G)4p$	$a^3F - z^3F^o$	2 - 3		188
20	400	1038.355	21.8572 - 118.16356	$3d^6 - 3d^5(a^4G)4p$	$a^3F - z^3F^o$	2 - 2		188
	250	1060.258	50.1849 - 144.50174	$3d^6 - 3d^5(b^2F)4p$	$b^3F - t^3F^o$	2 - 2		188
	250	1060.723	50.2952 - 144.57053	$3d^6 - 3d^5(b^2F)4p$	$b^3F - t^3F^o$	3 - 3		188
	250	1061.127	30.7162 - 124.95488	$3d^6 - 3d^5(a^4D)4p$	$a^3D - y^3D^o$	2 - 1		188
40	300	1061.245	30.7258 - 124.95488	$3d^6 - 3d^5(a^4D)4p$	$a^3D - y^3D^o$	1 - 1		188
40	400	1061.708	30.7162 - 124.90392	$3d^6 - 3d^5(a^4D)4p$	$a^3D - y^3D^o$	2 - 2		188
40	250	1061.827	30.7258 - 124.90392	$3d^6 - 3d^5(a^4D)4p$	$a^3D - y^3D^o$	1 - 2		188
40	200	1062.272	30.7162 - 124.85404	$3d^6 - 3d^5(a^4D)4p$	$a^3D - y^3D^o$	2 - 3		188
	250	1063.188	50.2761 - 144.33221	$3d^6 - 3d^5(b^2F)4p$	$b^3F - x^1G^o$	4 - 4		188
40	200	1063.309	30.8578 - 124.90392	$3d^6 - 3d^5(a^4D)4p$	$a^3D - y^3D^o$	3 - 2		188
40	550	1063.872	30.8578 - 124.85404	$3d^6 - 3d^5(a^4D)4p$	$a^3D - y^3D^o$	3 - 3		188
	70	1064.611	50.1849 - 144.11664	$3d^6 - 3d^5(a^2G)4p$	$b^3F - v^3G^o$	2 - 3		188
27	350	1066.143	24.5588 - 118.35501	$3d^6 - 3d^5(a^4G)4p$	$a^3G - z^3H^o$	5 - 6		188
26	300	1066.181	34.8124 - 128.60565	$3d^6 - 3d^5(a^4D)4p$	$a^1S - y^3P^o$	0 - 1		188
27	300	1068.190	24.9409 - 118.55725	$3d^6 - 3d^5(a^4G)4p$	$a^3G - z^3H^o$	4 - 5		188
	200	1068.299	50.2761 - 143.88374	$3d^6 - 3d^5(a^2G)4p$	$b^3F - v^3G^o$	4 - 5		188
27	300	1069.019	25.1424 - 118.68625	$3d^6 - 3d^5(a^4G)4p$	$a^3G - z^3H^o$	3 - 4		188
	250	1070.284	57.2217 - 150.6549	$3d^6 - 3d^5(b^2F)4p$	$b^1G - w^1F^o$	4 - 3		188
26	200	1070.556	24.9409 - 118.35024	$3d^6 - 3d^5(a^4G)4p$	$a^3G - z^3F^o$	4 - 4		188

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
26	300	1071.746	24.9409 - 118.24652	$3d^6 - 3d^5(a^4G)4p$	$a^3G - z^3F^o$	4 - 3		188
	250	1072.217	40.99987 - 134.26542	$3d^5(a^6S)4s - 3d^5(a^2D)4p$	$a^5S - x^3P^o$	2 - 2		188
26	70	1074.061	25.1424 - 118.24652	$3d^6 - 3d^5(a^4G)4p$	$a^3G - z^3F^o$	3 - 3		188
26	250	1075.024	25.1424 - 118.16356	$3d^6 - 3d^5(a^4G)4p$	$a^3G - z^3F^o$	3 - 2		188
	2	1076.556	117.52191 - 210.41132	$3d^5(a^4P)4p - 3d^5(a^6S)6d$	$z^5D^o - {}^7D$	4 - 5	Q	292
	250	1082.838	50.1849 - 142.53507	$3d^6 - 3d^5(a^4F)4p$	$b^3F - u^3F^o$	2 - 2		188
	150	1083.176	49.148 - 141.46945	$3d^6 - 3d^5(a^4F)4p$	$b^3P - v^3D^o$	0 - 1		188
	300	1086.748	50.2952 - 142.31290	$3d^6 - 3d^5(a^4F)4p$	$b^3F - u^3F^o$	3 - 3		188
	70	1088.224	49.5769 - 141.46945	$3d^6 - 3d^5(a^4F)4p$	$b^3P - v^3D^o$	1 - 1		188
	200	1089.061	49.5769 - 141.39904	$3d^6 - 3d^5(a^4F)4p$	$b^3P - v^3D^o$	1 - 2		188
	250	1089.416	57.2217 - 149.01336	$3d^6 - 3d^5(a^2H)4p$	$b^1G - w^1G^o$	4 - 4		188
	250	1089.671	50.2761 - 142.0470	$3d^6 - 3d^5(a^4F)4p$	$b^3F - u^3F^o$	4 - 4		188
	150	1093.332	42.8969 - 134.36040	$3d^6 - 3d^5(a^2F)4p$	$a^1F - z^1G^o$	3 - 4		188
	300	1095.476	50.1849 - 141.46945	$3d^6 - 3d^5(a^4F)4p$	$b^3F - v^3D^o$	2 - 1		188
	200	1096.606	50.2761 - 141.46653	$3d^6 - 3d^5(a^4F)4p$	$b^3F - v^3D^o$	4 - 3		188
	70	1097.649	50.2952 - 141.39904	$3d^6 - 3d^5(a^4F)4p$	$b^3F - v^3D^o$	3 - 2		188
	2	1097.782	66.59168 - 157.6843	$3d^5(a^4P)4s - 3d^5(b^2D)4p$	$a^5P - s^3F^o$	1 - 2	Q	292
	300	1098.247	50.4123 - 141.46653	$3d^6 - 3d^5(a^4F)4p$	$b^3P - v^3D^o$	2 - 3		188
	150	1099.061	50.4123 - 141.39904	$3d^6 - 3d^5(a^4F)4p$	$b^3P - v^3D^o$	2 - 2		188
1	600	1122.526	0.0 - 89.08479	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - z^5P^o$	4 - 3		188
1	600	1124.883	0.4362 - 89.33459	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - z^5P^o$	3 - 2		188
1	400	1126.728	0.7389 - 89.49144	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - z^5P^o$	2 - 1		188
1	550	1128.050	0.4362 - 89.08479	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - z^5P^o$	3 - 3		188
1	450	1128.723	0.7389 - 89.33459	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - z^5P^o$	2 - 2		188
1	450	1129.190	0.9324 - 89.49144	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - z^5P^o$	1 - 1		188
1	300	1130.404	1.0273 - 89.49144	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - z^5P^o$	0 - 1		188
1	450	1131.194	0.9324 - 89.33459	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - z^5P^o$	1 - 2		188
1	200	1131.914	0.7389 - 89.08479	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - z^5P^o$	2 - 3		188
	200	1141.272	57.2217 - 144.84324	$3d^6 - 3d^5(a^2H)4p$	$b^1G - x^1H^o$	4 - 5		188
39	250	1142.464	30.7162 - 118.24652	$3d^6 - 3d^5(a^4G)4p$	$a^3D - z^3F^o$	2 - 3		188
39	300	1142.955	30.8578 - 118.35024	$3d^6 - 3d^5(a^4G)4p$	$a^3D - z^3F^o$	3 - 4		188
39	70	1143.545	30.7162 - 118.16356	$3d^6 - 3d^5(a^4G)4p$	$a^3D - z^3F^o$	2 - 2		188
39	200	1143.671	30.7258 - 118.16356	$3d^6 - 3d^5(a^4G)4p$	$a^3D - z^3F^o$	1 - 2		188
	2	1325.61	57.2217 - 132.65917	$3d^6 - 3d^5(a^2I)4p$	$b^1G - y^3H^o$	4 - 4	Q	816
	70	1382.857	63.42517 - 135.73947	$3d^5(a^4G)4s - 3d^5(a^2I)4p$	$a^5G - z^1I^o$	6 - 6		188
	70	1394.024	50.1849 - 121.91974	$3d^6 - 3d^5(a^4G)4p$	$b^3F - z^3G^o$	2 - 3		188
	200	1395.213	50.2761 - 121.94962	$3d^6 - 3d^5(a^4G)4p$	$b^3F - z^3G^o$	4 - 5		188
	20	1395.382	50.2761 - 121.94129	$3d^6 - 3d^5(a^4G)4p$	$b^3F - z^3G^o$	4 - 4		188
	150	1395.750	50.2952 - 121.94129	$3d^6 - 3d^5(a^4G)4p$	$b^3F - z^3G^o$	3 - 4		188
	50	1465.291	113.58420 - 181.83002	$3d^5(a^4G)4p - 3d^5(a^4G)5s$	$z^5G^o - f^5G$	2 - 3	P	288
	150	1465.320	113.58420 - 181.82866	$3d^5(a^4G)4p - 3d^5(a^4G)5s$	$z^5G^o - f^5G$	2 - 2	P	288
	150	1465.746	113.60537 - 181.83002	$3d^5(a^4G)4p - 3d^5(a^4G)5s$	$z^5G^o - f^5G$	3 - 3	P	288
	50	1465.775	113.60537 - 181.82866	$3d^5(a^4G)4p - 3d^5(a^4G)5s$	$z^5G^o - f^5G$	3 - 2	P	288
	20	1465.839	113.60537 - 181.82567	$3d^5(a^4G)4p - 3d^5(a^4G)5s$	$z^5G^o - f^5G$	3 - 4	P	288
	250	1466.484	113.63534 - 181.82567	$3d^5(a^4G)4p - 3d^5(a^4G)5s$	$z^5G^o - f^5G$	4 - 4	P	288
	250	1467.746	113.67701 - 181.80870	$3d^5(a^4G)4p - 3d^5(a^4G)5s$	$z^5G^o - f^5G$	5 - 5	P	288
	20	1468.524	113.67701 - 181.77259	$3d^5(a^4G)4p - 3d^5(a^4G)5s$	$z^5G^o - f^5G$	5 - 6	P	288
	150	1468.986	50.2761 - 118.35024	$3d^6 - 3d^5(a^4G)4p$	$b^3F - z^3F^o$	4 - 4		188
	400	1469.876	113.73962 - 181.77259	$3d^5(a^4G)4p - 3d^5(a^4G)5s$	$z^5G^o - f^5G$	6 - 6	P	288
	20	1471.051	50.1849 - 118.16356	$3d^6 - 3d^5(a^4G)4p$	$b^3F - z^3F^o$	2 - 2		188
	70	1471.638	50.2952 - 118.24652	$3d^6 - 3d^5(a^4G)4p$	$b^3F - z^3F^o$	3 - 3		188
	150	1481.169	69.69573 - 137.20973	$3d^5(a^4D)4s - 3d^5(a^4F)4p$	$b^5D - x^5D^o$	4 - 4		188
	20	1484.241	70.72875 - 138.10312	$3d^5(a^4G)4s - 3d^5(a^2H)4p$	$b^3G - x^3G^o$	4 - 4		188
	70	1484.546	70.69403 - 138.05459	$3d^5(a^4G)4s - 3d^5(a^2H)4p$	$b^3G - x^3G^o$	5 - 5		188
85	450	1486.254	82.00173 - 149.28500	$3d^5(a^6S)4p - 3d^5(a^6S)5s$	$z^7P^o - e^7S$	2 - 3	P	288
85	600	1493.626	82.33392 - 149.28500	$3d^5(a^6S)4p - 3d^5(a^6S)5s$	$z^7P^o - e^7S$	3 - 3	P	288
	70	1495.213	114.94855 - 181.82866	$3d^5(a^4G)4p - 3d^5(a^4G)5s$	$z^5H^o - f^5G$	3 - 2	P	288
	70	1498.821	115.11092 - 181.83002	$3d^5(a^4G)4p - 3d^5(a^4G)5s$	$z^5H^o - f^5G$	4 - 3	P	288
	150	1502.951	115.28991 - 181.82567	$3d^5(a^4G)4p - 3d^5(a^4G)5s$	$z^5H^o - f^5G$	5 - 4	P	288
	150	1504.002	69.69573 - 136.18517	$3d^5(a^4D)4s - 3d^5(a^4F)4p$	$b^5D - x^5F^o$	4 - 5		188
85	650	1505.152	82.84659 - 149.28500	$3d^5(a^6S)4p - 3d^5(a^6S)5s$	$z^7P^o - e^7S$	4 - 3	P	288
	150	1507.512	115.47425 - 181.80870	$3d^5(a^4G)4p - 3d^5(a^4G)5s$	$z^5H^o - f^5G$	6 - 5	P	288
	150	1511.138	113.58420 - 179.75949	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5G^o - e^5G$	2 - 2	P	288
	200	1511.594	113.60537 - 179.76072	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5G^o - e^5G$	3 - 3	P	288
	50	1511.622	113.60537 - 179.75949	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5G^o - e^5G$	3 - 2	P	288

Multiplet	Rel. Int.	λ_{air} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	50	1511.656	113.60537 - 179.75798	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5G	3 - 4	P	288
	150	1512.165	115.64223 - 181.77259	$3d^5(a^4G)4p$ - $3d^5(a^4G)5s$	z^5H^o - f^5G	7 - 6	P	288
	20	1512.279	113.63534 - 179.76072	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5G	4 - 3	P	288
	150	1512.341	113.63534 - 179.75798	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5G	4 - 4	P	288
	50	1512.364	116.36476 - 182.48640	$3d^5(a^4P)4p$ - $3d^5(a^4P)4d$	z^5D^o - f^5F	0 - 1	P	288
	20	1512.844	116.38007 - 182.48072	$3d^5(a^4P)4p$ - $3d^5(a^4P)4d$	z^5D^o - f^5F	1 - 2	P	288
	150	1512.888	113.58420 - 179.68294	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5F	2 - 1	P	288
	50	1513.511	113.60537 - 179.67689	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5F	3 - 2	P	288
	250	1513.520	113.67701 - 179.74817	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5G	5 - 5	P	288
	150	1514.552	113.63534 - 179.66148	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5F	4 - 3	P	288
	20	1514.571	116.41939 - 182.44470	$3d^5(a^4P)4p$ - $3d^5(a^4P)4d$	z^5D^o - f^5F	2 - 3	P	288
	20	1514.955	113.73962 - 179.74817	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5G	6 - 5	P	288
	300	1515.480	113.73962 - 179.72531	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5G	6 - 6	P	288
	200	1516.214	113.67701 - 179.63077	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5F	5 - 4	P	288
	20	1516.594	116.47544 - 182.41265	$3d^5(a^4P)4p$ - $3d^5(a^4P)4d$	z^5F^o - f^5F	3 - 4	P	288
	20	1516.785	135.99062 - 201.91953	$3d^5(a^4F)4p$ - $3d^5(a^4F)5s$	x^5F^o - g^5F	4 - 4	P	288
	20	1517.777	120.82617 - 186.71202	$3d^5(a^4D)4p$ - $3d^5(a^4D)4d$	y^5F^o - e^5D	2 - 1	P	288
	300	1518.829	113.73962 - 179.57983	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5F	6 - 5	P	288
	20	1521.902	136.18517 - 201.89244	$3d^5(a^4F)4p$ - $3d^5(a^4F)5s$	x^5F^o - g^5F	5 - 5	P	288
	300	1524.520	113.58420 - 179.17862	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5H	2 - 3	P	288
	300	1524.649	113.60537 - 179.19422	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5H	3 - 4	P	288
	70	1524.797	116.89822 - 182.48072	$3d^5(a^4P)4p$ - $3d^5(a^4P)4d$	z^5S^o - f^5F	2 - 2	P	288
	350	1525.036	113.63534 - 179.20757	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5H	4 - 5	P	288
	50	1525.051	120.69710 - 186.26869	$3d^5(a^4D)4p$ - $3d^5(a^4D)4d$	y^5F^o - g^5G	1 - 2	P	288
	70	1525.346	113.63534 - 179.19422	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5H	4 - 4	P	288
	150	1525.635	116.89822 - 182.44470	$3d^5(a^4P)4p$ - $3d^5(a^4P)4d$	z^5S^o - f^5F	2 - 3	P	288
	400	1525.798	113.67701 - 179.21647	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5H	5 - 6	P	288
	150	1526.024	121.46882 - 186.99860	$3d^5(a^4D)4p$ - $3d^5(a^4D)4d$	y^5F^o - e^5D	5 - 4	P	288
	400	1527.141	113.73962 - 179.22145	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5H	6 - 7	P	288
	50	1527.248	120.82617 - 186.30344	$3d^5(a^4D)4p$ - $3d^5(a^4D)4d$	y^5F^o - g^5G	2 - 3	P	288
	150	1527.257	113.73962 - 179.21647	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5G^o - e^5H	6 - 6	P	288
	70	1527.745	116.31663 - 181.77259	$3d^5(a^4G)4p$ - $3d^5(a^4G)5s$	z^5F^o - f^5G	5 - 6	P	288
	20	1528.864	134.97622 - 200.38428	$3d^5(a^2D)4p$ - $3d^5(a^4F)4d$	x^3D^o - h^5G	3 - 3	P	288
	200	1529.750	121.00878 - 186.37894	$3d^5(a^4D)4p$ - $3d^5(a^4D)4d$	y^5F^o - g^5G	3 - 4	P	288
	150	1530.216	116.47544 - 181.82567	$3d^5(a^4P)4p$ - $3d^5(a^4G)5s$	z^5F^o - f^5G	3 - 4	P	288
	20	1530.426	116.46741 - 181.80870	$3d^5(a^4G)4p$ - $3d^5(a^4G)5s$	z^5F^o - f^5G	4 - 5	P	288
84	400	1531.294	82.00173 - 147.30597	$3d^5(a^6S)4p$ - $3d^5(a^6S)4d$	z^7P^o - e^7D	2 - 3	P	288
84	550	1531.640	82.00173 - 147.29121	$3d^5(a^6S)4p$ - $3d^5(a^6S)4d$	z^7P^o - e^7D	2 - 2	P	288
	400	1531.862	122.82955 - 188.10958	$3d^5(a^4D)4p$ - $3d^5(a^4D)5s$	y^5D^o - f^5D	3 - 3	P	288
84	50	1531.864	82.00173 - 147.28169	$3d^5(a^6S)4p$ - $3d^5(a^6S)4d$	z^7P^o - e^7D	2 - 1	P	288
	250	1533.450	121.24167 - 186.45409	$3d^5(a^4D)4p$ - $3d^5(a^4D)4d$	y^5F^o - g^5G	4 - 5	P	288
	250	1535.427	121.46882 - 186.59730	$3d^5(a^4D)4p$ - $3d^5(a^4D)4d$	y^5F^o - g^5G	5 - 6	P	288
	150	1536.433	135.23974 - 200.32556	$3d^5(a^4F)4p$ - $3d^5(a^4F)4d$	y^5G^o - h^5G	4 - 4	P	288
	70	1536.596	135.31642 - 200.39533	$3d^5(a^2F)4p$ - $3d^5(a^4F)4d$	y^3G^o - h^5G	5 - 5	P	288
	150	1536.658	118.35501 - 183.43128	$3d^5(a^4G)4p$ - $3d^5(a^4G)5s$	z^3H^o - e^3G	6 - 5	P	288
	70	1536.824	122.94415 - 188.01340	$3d^5(a^4D)4p$ - $3d^5(a^4D)5s$	y^5D^o - f^5D	4 - 4	P	288
84	650	1538.628	82.33392 - 147.32685	$3d^5(a^6S)4p$ - $3d^5(a^6S)4d$	z^7P^o - e^7D	3 - 4	P	288
84	550	1539.123	82.33392 - 147.30597	$3d^5(a^6S)4p$ - $3d^5(a^6S)4d$	z^7P^o - e^7D	3 - 3	P	288
84	300	1539.474	82.33392 - 147.29121	$3d^5(a^6S)4p$ - $3d^5(a^6S)4d$	z^7P^o - e^7D	3 - 2	P	288
	450	1540.164	114.94855 - 179.87671	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5H^o - e^5I	3 - 4	P	288
	20	1540.340	135.73531 - 200.65602	$3d^5(a^4F)4p$ - $3d^5(a^4F)4d$	y^5G^o - h^5G	5 - 6	P	288
	70	1540.439	135.73947 - 200.65602	$3d^5(a^2I)4p$ - $3d^5(a^4F)4d$	z^1I^o - h^5G	6 - 6	P	288
	150	1540.834	118.55725 - 183.45715	$3d^5(a^4G)4p$ - $3d^5(a^4G)5s$	z^3H^o - e^3G	5 - 4	P	288
	300	1541.831	117.52191 - 182.37986	$3d^5(a^4P)4p$ - $3d^5(a^4P)4d$	z^5D^o - f^5F	4 - 5	P	288
	70	1542.614	124.85404 - 189.67907	$3d^5(a^4D)4p$ - $3d^5(a^4D)5s$	y^3D^o - e^3D	3 - 3	P	288
	150	1542.949	114.94855 - 179.75949	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5H^o - e^5G	3 - 2	P	288
	400	1543.623	115.11092 - 179.89356	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5H^o - e^5I	4 - 5	P	288
	200	1544.068	134.93784 - 199.70182	$3d^5(a^4F)4p$ - $3d^5(a^4F)4d$	y^5G^o - f^5H	2 - 3	P	288
	250	1544.232	117.06856 - 181.82567	$3d^5(a^4G)4p$ - $3d^5(a^4G)5s$	z^5D^o - f^5G	3 - 4	P	288
	200	1545.405	135.09684 - 199.80481	$3d^5(a^4F)4p$ - $3d^5(a^4F)4d$	y^5G^o - f^5H	3 - 4	P	288
	250	1546.104	135.70557 - 200.38428	$3d^5(a^2F)4p$ - $3d^5(a^4F)4d$	w^3D^o - h^5G	3 - 3	P	288
	20	1546.551	135.73531 - 200.39533	$3d^5(a^4F)4p$ - $3d^5(a^4F)4d$	y^5G^o - h^5G	5 - 5	P	288
	250	1546.918	135.23974 - 199.88439	$3d^5(a^4F)4p$ - $3d^5(a^4F)4d$	y^5G^o - f^5H	4 - 5	P	288
	20	1547.509	135.70557 - 200.32556	$3d^5(a^2F)4p$ - $3d^5(a^4F)4d$	w^3D^o - h^5G	3 - 4	P	288
	550	1547.637	115.28991 - 179.90456	$3d^5(a^4G)4p$ - $3d^5(a^4G)4d$	z^5H^o - e^5I	5 - 6	P	288

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	300	1548.237	135.31642 - 199.90603	$3d^5(a^2F)4p - 3d^5(a^4F)4d$	$y^3G^o - f^5H$	5 - 6	P	288
84	800	1550.193	82.84659 - 147.35470	$3d^5(a^6S)4p - 3d^5(a^6S)4d$	$z^7P^o - e^7D$	4 - 5	P	288
	300	1550.459	118.35501 - 182.85205	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^3H^o - e^3I$	6 - 7	P	288
84	550	1550.862	82.84659 - 147.32685	$3d^5(a^6S)4p - 3d^5(a^6S)4d$	$z^7P^o - e^7D$	4 - 4	P	288
	150	1551.089	136.18517 - 200.65602	$3d^5(a^4F)4p - 3d^5(a^4F)4d$	$x^5F^o - h^5G$	5 - 6	P	288
	150	1551.156	115.28991 - 179.75798	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5H^o - e^5G$	5 - 4	P	288
84	250	1551.365	82.84659 - 147.30597	$3d^5(a^6S)4p - 3d^5(a^6S)4d$	$z^7P^o - e^7D$	4 - 3	P	288
	550	1552.064	115.47425 - 179.90456	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5H^o - e^5I$	6 - 7	P	288
	20	1552.682	135.99062 - 200.39533	$3d^5(a^4F)4p - 3d^5(a^4F)4d$	$x^5F^o - h^5G$	4 - 5	P	288
	20	1555.154	135.58208 - 199.88439	$3d^5(a^4F)4p - 3d^5(a^4F)4d$	$y^5G^o - f^5H$	6 - 5	P	288
	200	1555.851	118.55725 - 182.83076	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^3H^o - e^3I$	5 - 6	P	288
	300	1556.076	135.73947 - 200.00370	$3d^5(a^2I)4p - 3d^5(a^4F)4d$	$z^1I^o - f^5H$	6 - 7	P	288
	70	1556.410	135.55441 - 199.80481	$3d^5(a^2F)4p - 3d^5(a^4F)4d$	$y^3G^o - f^5H$	4 - 4	P	288
	550	1556.498	115.64223 - 179.88903	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5H^o - e^5I$	7 - 8	P	288
	70	1556.772	125.44358 - 189.67907	$3d^5(a^4D)4p - 3d^5(a^4D)5s$	$y^3F^o - e^3D$	4 - 3	P	288
	50	1556.903	114.94855 - 179.17862	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5H^o - e^5H$	3 - 3	P	288
	100	1556.929	118.16356 - 182.39255	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^3F^o - e^3F$	2 - 2	P	288
	150	1557.581	136.23584 - 200.43794	$3d^5(a^4F)4p - 3d^5(a^4F)4d$	$x^5F^o - h^5G$	1 - 2	P	288
	20	1558.308	118.24652 - 182.41870	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^3F^o - e^3F$	3 - 4	P	288
		1558.545	118.24652 - 182.40891	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^3F^o - e^3F$	3 - 3	P	288
	150	1559.468	118.68625 - 182.81066	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^3H^o - e^3I$	4 - 5	P	288
	150	1560.469	115.11092 - 179.19422	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5H^o - e^5H$	4 - 4	P	288
	50	1560.474	115.64223 - 179.72531	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5H^o - e^5G$	7 - 6	P	288
	50	1560.830	118.35024 - 182.41870	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^3F^o - e^3F$	4 - 4	P	288
	100	1560.849	115.11092 - 179.17862	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5H^o - e^5H$	4 - 3	P	288
	10	1561.172	122.94415 - 186.99860	$3d^5(a^4D)4p - 3d^5(a^4D)4d$	$y^5D^o - e^5D$	4 - 4	P	288
	10	1561.197	122.82955 - 186.88298	$3d^5(a^4D)4p - 3d^5(a^4D)4d$	$y^5D^o - e^5D$	3 - 3	P	288
	20	1564.295	115.28991 - 179.21647	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5H^o - e^5H$	5 - 6	P	288
	150	1564.513	115.28991 - 179.20757	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5H^o - e^5H$	5 - 5	P	288
	200	1565.118	122.89884 - 186.79178	$3d^5(a^4P)4p - 3d^5(a^4D)4d$	$z^3D^o - e^5D$	2 - 2	P	288
	70	1567.628	122.92137 - 186.71202	$3d^5(a^4P)4p - 3d^5(a^4D)4d$	$z^3D^o - e^5D$	1 - 1	P	288
		1568.696	115.47425 - 179.22145	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5H^o - e^5H$	6 - 7	P	288
	200	1568.819	115.47425 - 179.21647	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5H^o - e^5H$	6 - 6	P	288
	20	1569.038	115.47425 - 179.20757	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5H^o - e^5H$	6 - 5	P	288
	50	1569.059	118.68625 - 182.41870	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^3H^o - e^3F$	4 - 4	P	288
	70	1571.237	136.79382 - 200.43794	$3d^5(a^2F)4p - 3d^5(a^4F)4d$	$w^3D^o - h^5G$	2 - 2	P	288
	200	1572.798	125.44358 - 189.02453	$3d^5(a^4D)4p - 3d^5(a^4D)4d$	$y^3F^o - f^3G$	4 - 5	P	288
	300	1572.841	115.64223 - 179.22145	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5H^o - e^5H$	7 - 7	P	288
	20	1572.964	115.64223 - 179.21647	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5H^o - e^5H$	7 - 6	P	288
	200	1577.071	116.31663 - 179.72531	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5F^o - e^5G$	5 - 6	P	288
	150	1577.938	125.63798 - 189.01184	$3d^5(a^4D)4p - 3d^5(a^4D)4d$	$y^3F^o - f^3G$	3 - 4	P	288
	150	1578.748	116.41939 - 179.76072	$3d^5(a^4P)4p - 3d^5(a^4G)4d$	$z^5D^o - e^5G$	2 - 3	P	288
	150	1580.215	116.47544 - 179.75798	$3d^5(a^4P)4p - 3d^5(a^4G)4d$	$z^5F^o - e^5G$	3 - 4	P	288
	150	1580.259	116.46741 - 179.74817	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5F^o - e^5G$	4 - 5	P	288
	150	1580.698	116.31663 - 179.57983	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5F^o - e^5F$	5 - 5	P	288
	70	1581.072	123.75039 - 186.99860	$3d^5(a^4D)4p - 3d^5(a^4D)4d$	$x^5P^o - e^5D$	3 - 4	P	288
	20	1582.427	116.46741 - 179.66148	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5F^o - e^5F$	4 - 3	P	288
	20	1582.634	123.69718 - 186.88298	$3d^5(a^4D)4p - 3d^5(a^4D)4d$	$x^5P^o - e^5D$	2 - 3	P	288
	200	1583.196	116.46741 - 179.63077	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5F^o - e^5F$	4 - 4	P	288
	20	1583.968	123.75039 - 186.88298	$3d^5(a^4D)4p - 3d^5(a^4D)4d$	$x^5P^o - e^5D$	3 - 3	P	288
		1584.922	123.69718 - 186.79178	$3d^5(a^4D)4p - 3d^5(a^4D)4d$	$x^5P^o - e^5D$	2 - 2	P	288
	150	1591.801	116.93757 - 179.75949	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5F^o - e^5G$	1 - 2	P	288
	70	1592.720	116.97505 - 179.76072	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5F^o - e^5G$	2 - 3	P	288
	70	1592.898	116.89822 - 179.67689	$3d^5(a^4P)4p - 3d^5(a^4G)4d$	$z^5S^o - e^5F$	2 - 2	P	288
	70	1593.743	116.93757 - 179.68294	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5F^o - e^5F$	1 - 1	P	288
	70	1593.897	116.93757 - 179.67689	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5F^o - e^5F$	1 - 2	P	288
	20	1594.850	116.97505 - 179.67689	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5F^o - e^5F$	2 - 2	P	288
	20	1595.166	117.06856 - 179.75798	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5D^o - e^5G$	3 - 4	P	288
119	400	1595.586	89.08479 - 151.75767	$3d^5(a^6S)4p - 3d^5(a^6S)5s$	$z^5P^o - e^5S$	3 - 2	P	288
	70	1597.625	117.06856 - 179.66148	$3d^5(a^4G)4p - 3d^5(a^4G)4d$	$z^5D^o - e^5F$	3 - 3	P	288
118	650	1601.204	89.08479 - 151.53780	$3d^5(a^6S)4p - 3d^5(a^6S)4d$	$z^5P^o - e^5D$	3 - 4	P	288
118	400	1601.298	89.08479 - 151.53413	$3d^5(a^6S)4p - 3d^5(a^6S)4d$	$z^5P^o - e^5D$	3 - 3	P	288
119	300	1601.970	89.33451 - 151.75767	$3d^5(a^6S)4p - 3d^5(a^6S)5s$	$z^5P^o - e^5S$	2 - 2	P	288
119	200	1606.006	89.49139 - 151.75767	$3d^5(a^6S)4p - 3d^5(a^6S)5s$	$z^5P^o - e^5S$	1 - 2	P	288
118	600	1607.727	89.33451 - 151.53413	$3d^5(a^6S)4p - 3d^5(a^6S)4d$	$z^5P^o - e^5D$	2 - 3	P	288

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
118	450	1611.726	89.49139 - 151.53668	$3d^5(a^6S)4p$ - $3d^5(a^6S)4d$	z^5P^o - e^5D	1 - 1	P	288
118	450	1611.772	89.49139 - 151.53490	$3d^5(a^6S)4p$ - $3d^5(a^6S)4d$	z^5P^o - e^5D	1 - 2	P	288
	70	1614.611	70.72501 - 132.65917	$3d^5(a^4G)4s$ - $3d^5(a^2I)4p$	b^3G - y^3H^o	3 - 4		188
	70	1617.171	70.72875 - 132.56471	$3d^5(a^4G)4s$ - $3d^5(a^2I)4p$	b^3G - y^3H^o	4 - 5		188
	150	1624.206	70.69403 - 132.26266	$3d^5(a^4G)4s$ - $3d^5(a^2I)4p$	b^3G - y^3H^o	5 - 6		188
	200	1628.304	83.42961 - 144.84324	$3d^5(a^2I)4s$ - $3d^5(a^2H)4p$	b^1I - x^1H^o	6 - 5		188
	150	1656.831	79.84012 - 140.19633	$3d^5(a^2I)4s$ - $3d^5(a^2H)4p$	a^3I - y^3I^o	7 - 7		188
	150	1695.036	30.08884 - 89.08479	$3d^5(a^6S)4s$ - $3d^5(a^6S)4p$	a^7S - z^5P^o	3 - 3		188
	250	1709.892	88.92307 - 147.40614	$3d^5(a^2H)4s$ - $3d^5(b^2F)4p$	b^3H - u^3G^o	6 - 5		188
	200	1710.374	88.69467 - 147.16136	$3d^5(a^2H)4s$ - $3d^5(b^2F)4p$	b^3H - u^3G^o	5 - 4		188
	150	1717.414	88.66387 - 146.8910	$3d^5(a^2H)4s$ - $3d^5(b^2F)4p$	b^3H - u^3G^o	4 - 3		188
	250	1722.837	63.42517 - 121.46882	$3d^5(a^4G)4s$ - $3d^5(a^4D)4p$	a^5G - y^5F^o	6 - 5		188
	250	1730.842	63.46639 - 121.24167	$3d^5(a^4G)4s$ - $3d^5(a^4D)4p$	a^5G - y^5F^o	5 - 4		188
	200	1738.468	63.48678 - 121.00878	$3d^5(a^4G)4s$ - $3d^5(a^4D)4p$	a^5G - y^5F^o	4 - 3		188
	20	1739.201	89.90785 - 147.40614	$3d^5(a^2G)4s$ - $3d^5(b^2F)4p$	c^3G - u^3G^o	5 - 5		188
	200	1744.233	63.49400 - 120.82617	$3d^5(a^4G)4s$ - $3d^5(a^4D)4p$	a^5G - y^5F^o	3 - 2		188
	250	1745.638	66.46464 - 123.75039	$3d^5(a^4P)4s$ - $3d^5(a^4D)4p$	a^5P - x^5P^o	3 - 3		188
	70	1747.260	66.46464 - 123.69718	$3d^5(a^4P)4s$ - $3d^5(a^4D)4p$	a^5P - x^5P^o	3 - 2		188
	150	1748.177	63.49456 - 120.69710	$3d^5(a^4G)4s$ - $3d^5(a^4D)4p$	a^5G - y^5F^o	2 - 1		188
	70	1749.052	66.52295 - 123.69718	$3d^5(a^4P)4s$ - $3d^5(a^4D)4p$	a^5P - x^5P^o	2 - 2		188
	20	1753.455	66.52295 - 123.55295	$3d^5(a^4P)4s$ - $3d^5(a^4D)4p$	a^5P - x^5P^o	2 - 1		188
	200	1770.247	92.52391 - 149.01336	$3d^5(a^2H)4s$ - $3d^5(a^2H)4p$	a^1H - w^1G^o	5 - 4		188
	400	1770.554	66.46464 - 122.94415	$3d^5(a^4P)4s$ - $3d^5(a^4D)4p$	a^5P - y^5D^o	3 - 4		188
	150	1771.975	66.46464 - 122.89884	$3d^5(a^4P)4s$ - $3d^5(a^4P)4p$	a^5P - z^3D^o	3 - 2		188
	70	1773.098	66.52295 - 122.92137	$3d^5(a^4P)4s$ - $3d^5(a^4P)4p$	a^5P - z^3D^o	2 - 1		188
	70	1775.267	66.59168 - 122.92137	$3d^5(a^4P)4s$ - $3d^5(a^4P)4p$	a^5P - z^3D^o	1 - 1		188
	20	1775.566	66.52295 - 122.84303	$3d^5(a^4P)4s$ - $3d^5(a^4D)4p$	a^5P - y^5D^o	2 - 1	P	188
	400	1775.983	66.52295 - 122.82955	$3d^5(a^4P)4s$ - $3d^5(a^4D)4p$	a^5P - y^5D^o	2 - 3		188
	70	1777.737	66.59168 - 122.84303	$3d^5(a^4P)4s$ - $3d^5(a^4D)4p$	a^5P - y^5D^o	1 - 1		188
	20	1791.345	66.52295 - 122.34661	$3d^5(a^4P)4s$ - $3d^5(a^4P)4p$	a^5P - z^3D^o	2 - 3		188
	70	1793.785	69.69573 - 125.44358	$3d^5(a^4D)4s$ - $3d^5(a^4D)4p$	b^5D - y^3F^o	4 - 4		188
	20	1797.769	93.38875 - 149.01336	$3d^5(b^2F)4s$ - $3d^5(a^2H)4p$	e^3F - w^1G^o	4 - 4		188
	200	1801.766	93.51264 - 149.01336	$3d^5(a^2G)4s$ - $3d^5(a^2H)4p$	c^1G - w^1G^o	4 - 4		188
	70	1803.330	88.66387 - 144.11664	$3d^5(a^2H)4s$ - $3d^5(a^2G)4p$	b^3H - v^3G^o	4 - 3		188
	150	1805.337	88.69467 - 144.08597	$3d^5(a^2H)4s$ - $3d^5(a^2G)4p$	b^3H - v^3G^o	5 - 4		188
	20	1808.203	84.15955 - 139.46336	$3d^5(a^2F)4s$ - $3d^5(a^4F)4p$	c^3F - w^3G^o	4 - 5		188
	200	1811.924	73.72764 - 128.91751	$3d^5(a^4P)4s$ - $3d^5(a^4D)4p$	c^3P - y^3P^o	2 - 2		188
	150	1812.974	69.69573 - 124.85404	$3d^5(a^4D)4s$ - $3d^5(a^4D)4p$	b^5D - y^3D^o	4 - 3		188
	150	1819.480	88.92307 - 143.88374	$3d^5(a^2H)4s$ - $3d^5(a^2G)4p$	b^3H - v^3G^o	6 - 5		188
	70	1819.718	84.67187 - 139.62517	$3d^5(a^2F)4s$ - $3d^5(a^4F)4p$	c^3F - w^3G^o	3 - 4		188
	70	1820.496	63.42517 - 118.35501	$3d^5(a^4G)4s$ - $3d^5(a^4G)4p$	a^5G - z^3H^o	6 - 6		188
	20	1821.865	63.46639 - 118.35501	$3d^5(a^4G)4s$ - $3d^5(a^4G)4p$	a^5G - z^3H^o	5 - 6		188
	70	1824.659	89.69752 - 144.50174	$3d^5(a^2G)4s$ - $3d^5(b^2F)4p$	c^3G - t^3F^o	3 - 2		188
	70	1826.156	63.48678 - 118.24652	$3d^5(a^4G)4s$ - $3d^5(a^4G)4p$	a^5G - z^3F^o	4 - 3		188
	20	1826.267	73.84910 - 128.60565	$3d^5(a^4P)4s$ - $3d^5(a^4D)4p$	c^3P - y^3P^o	1 - 1		188
	70	1828.857	89.90785 - 144.58683	$3d^5(a^2G)4s$ - $3d^5(a^2G)4p$	c^3G - y^1H^o	5 - 5		188
	150	1829.172	63.49400 - 118.16356	$3d^5(a^4G)4s$ - $3d^5(a^4G)4p$	a^5G - z^3F^o	3 - 2		188
17	200	1830.623	88.69467 - 143.32085	$3d^5(a^2H)4s$ - $3d^5(a^2H)4p$	b^3H - w^3H^o	5 - 6		188
	70	1834.096	73.84910 - 128.37153	$3d^5(a^4P)4s$ - $3d^5(a^4D)4p$	c^3P - y^3P^o	1 - 0		188
	70	1837.422	89.90785 - 144.33221	$3d^5(a^2G)4s$ - $3d^5(b^2F)4p$	c^3G - x^1G^o	5 - 4		188
	250	1837.588	89.69752 - 144.11664	$3d^5(a^2G)4s$ - $3d^5(a^2G)4p$	c^3G - v^3G^o	3 - 3		188
17	450	1838.309	88.92307 - 143.32085	$3d^5(a^2H)4s$ - $3d^5(a^2H)4p$	b^3H - w^3H^o	6 - 6		188
	70	1838.621	89.69752 - 144.08597	$3d^5(a^2G)4s$ - $3d^5(a^2G)4p$	c^3G - v^3G^o	3 - 4		188
	70	1838.698	82.41094 - 136.79705	$3d^5(a^2D)4s$ - $3d^5(a^2F)4p$	c^3D - w^3F^o	2 - 3		188
97	200	1841.387	83.23786 - 137.54460	$3d^5(a^4F)4s$ - $3d^5(a^4F)4p$	a^5F - x^5D^o	3 - 2		188
	300	1841.536	89.78359 - 144.08597	$3d^5(a^2G)4s$ - $3d^5(a^2G)4p$	c^3G - v^3G^o	4 - 4		188
	20	1841.96	83.23786 - 137.52792	$3d^5(a^4F)4s$ - $3d^5(a^2G)4p$	a^5F - x^3H^o	3 - 4	Q	645
97	300	1842.927	83.16148 - 137.42300	$3d^5(a^4F)4s$ - $3d^5(a^4F)4p$	a^5F - x^5D^o	4 - 3		188
	250	1843.409	93.38875 - 147.63595	$3d^5(b^2F)4s$ - $3d^5(b^2F)4p$	e^3F - u^3D^o	4 - 3		188
17	150	1843.502	88.66387 - 142.90848	$3d^5(a^2H)4s$ - $3d^5(a^2H)4p$	b^3H - w^3H^o	4 - 5		188
	200	1843.999	82.38287 - 136.61278	$3d^5(a^2D)4s$ - $3d^5(a^2F)4p$	c^3D - w^3F^o	3 - 4		188
	300	1844.263	93.39245 - 147.61465	$3d^5(b^2F)4s$ - $3d^5(b^2F)4p$	e^3F - u^3D^o	3 - 2		188
17	400	1844.547	88.69467 - 142.90848	$3d^5(a^2H)4s$ - $3d^5(a^2H)4p$	b^3H - w^3H^o	5 - 5		188
97	200	1844.942	83.35888 - 137.5611	$3d^5(a^4F)4s$ - $3d^5(a^4F)4p$	a^5F - x^5D^o	2 - 1		188
17	300	1845.304	88.66387 - 142.85559	$3d^5(a^2H)4s$ - $3d^5(a^2H)4p$	b^3H - w^3H^o	4 - 4		188

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
97	450	1845.521	83.23786 - 137.42300	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5D^o$	3 - 3		188
	70	1845.749	70.72501 - 124.90392	$3d^5(a^4G)4s - 3d^5(a^4D)4p$	$b^3G - y^3D^o$	3 - 2		188
	200	1846.943	93.41293 - 147.55645	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$e^3F - u^3D^o$	2 - 1		188
	70	1847.348	105.90623 - 160.0379	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$d^3D - v^3P^o$	2 - 2		188
	150	1847.637	93.51264 - 147.63595	$3d^5(a^2G)4s - 3d^5(b^2F)4p$	$c^1G - u^3D^o$	4 - 3		188
	150	1848.130	105.92916 - 160.0379	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$d^3D - v^3P^o$	3 - 2		188
	5	1848.231	66.59168 - 120.69710	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	$a^5P - y^5F^o$	1 - 1	Q	488
	20	1848.428	89.78359 - 143.88374	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$c^3G - v^3G^o$	4 - 5		188
	70	1848.492	90.47253 - 144.57053	$3d^5(a^4F)4s - 3d^5(b^2F)4p$	$d^3F - t^3F^o$	4 - 3		188
	70	1848.883	90.48394 - 144.57053	$3d^5(a^4F)4s - 3d^5(b^2F)4p$	$d^3F - t^3F^o$	3 - 3		188
	70	1849.172	90.42368 - 144.50174	$3d^5(a^4F)4s - 3d^5(b^2F)4p$	$d^3F - t^3F^o$	2 - 2		188
97	450	1849.407	83.13823 - 137.20973	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5D^o$	5 - 4		188
97	70	1849.648	83.35888 - 137.42300	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5D^o$	2 - 3		188
53	300	1849.960	63.46639 - 117.52191	$3d^5(a^4G)4s - 3d^5(a^4P)4p$	$a^5G - z^5D^o$	5 - 4		188
97	300	1850.200	83.16148 - 137.20973	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5D^o$	4 - 4		188
53	70	1850.650	63.48678 - 117.52191	$3d^5(a^4G)4s - 3d^5(a^4P)4p$	$a^5G - z^5D^o$	4 - 4		188
	400	1851.261	93.38875 - 147.40614	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$e^3F - u^3G^o$	4 - 5		188
	70	1852.366	88.92307 - 142.90848	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	$b^3H - w^3H^o$	6 - 5		188
	400	1852.677	89.90785 - 143.88374	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$c^3G - v^3G^o$	5 - 5		188
97	150	1852.812	83.23786 - 137.20973	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5D^o$	3 - 4		188
97	200	1854.384	83.64698 - 137.5732	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5D^o$	1 - 0		188
63	600	1854.826	69.83683 - 123.75039	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - x^5P^o$	3 - 3		188
63	300	1854.975	69.78819 - 123.69718	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - x^5P^o$	1 - 2		188
	200	1855.510	93.51264 - 147.40614	$3d^5(a^2G)4s - 3d^5(b^2F)4p$	$c^1G - u^3G^o$	4 - 5		188
63	450	1856.690	69.83776 - 123.69718	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - x^5P^o$	2 - 2		188
63	300	1858.542	69.74740 - 123.55295	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - x^5P^o$	0 - 1		188
	300	1859.813	93.39245 - 147.16136	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$e^3F - u^3G^o$	3 - 4		188
63	200	1859.955	69.78819 - 123.55295	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - x^5P^o$	1 - 1		188
63	200	1861.665	69.83776 - 123.55295	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - x^5P^o$	2 - 1		188
	150	1862.446	90.42368 - 144.11664	$3d^5(a^4F)4s - 3d^5(a^2G)4p$	$d^3F - v^3G^o$	2 - 3		188
62	250	1863.317	69.78819 - 123.45592	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5D^o$	1 - 0		188
	70	1864.534	90.48394 - 144.11664	$3d^5(a^4F)4s - 3d^5(a^2G)4p$	$d^3F - v^3G^o$	3 - 3		188
	450	1865.202	97.04138 - 150.6549	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$c^1F - w^1F^o$	3 - 3		188
54	150	1865.445	86.84711 - 140.45310	$3d^5(a^2D)4s - 3d^5(a^2F)4p$	$b^1D - y^1F^o$	2 - 3		188
	150	1865.606	90.48394 - 144.08597	$3d^5(a^4F)4s - 3d^5(a^2G)4p$	$d^3F - v^3G^o$	3 - 4		188
53	600	1866.305	63.48678 - 117.06856	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5D^o$	4 - 3		188
53	300	1866.554	63.49400 - 117.06856	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5D^o$	3 - 3		188
	150	1866.900	87.90187 - 141.46653	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	$b^1F - v^3D^o$	3 - 3		188
52	650	1869.828	63.49400 - 116.97505	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5F^o$	3 - 2		188
	250	1869.925	93.41293 - 146.8910	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$e^3F - u^3G^o$	2 - 3		188
52	600	1871.152	63.49456 - 116.93757	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5F^o$	2 - 1		188
	150	1871.319	83.35888 - 136.79705	$3d^5(a^4F)4s - 3d^5(a^2F)4p$	$a^5F - w^3F^o$	2 - 3		188
	20	1871.435	83.35888 - 136.7938	$3d^5(a^4F)4s - 3d^5(a^2F)4p$	$a^5F - w^3D^o$	2 - 2	P	188
	400	1872.214	89.90785 - 143.32085	$3d^5(a^2G)4s - 3d^5(a^2H)4p$	$c^3G - w^3H^o$	5 - 6		188
	250	1872.515	63.49400 - 116.89822	$3d^5(a^4G)4s - 3d^5(a^4P)4p$	$a^5G - z^5S^o$	3 - 2		188
	150	1873.534	83.23786 - 136.61278	$3d^5(a^4F)4s - 3d^5(a^2F)4p$	$a^5F - w^3F^o$	3 - 4		188
62	800	1877.989	69.69573 - 122.94415	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5D^o$	4 - 4		188
	150	1878.550	66.46464 - 119.69764	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$a^5P - z^5P^o$	3 - 2		188
	200	1880.620	69.74740 - 122.92137	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$b^5D - z^5D^o$	0 - 1		188
	250	1880.704	82.38287 - 135.55441	$3d^5(a^2D)4s - 3d^5(a^2F)4p$	$c^3D - y^3G^o$	3 - 4		188
	300	1881.178	89.69752 - 142.85559	$3d^5(a^2G)4s - 3d^5(a^2H)4p$	$c^3G - w^3H^o$	3 - 4		188
	200	1881.578	83.64698 - 136.7938	$3d^5(a^4F)4s - 3d^5(a^2F)4p$	$a^5F - w^3D^o$	1 - 2		188
62	650	1882.047	69.69573 - 122.82955	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5D^o$	4 - 3		188
	300	1882.357	89.78359 - 142.90848	$3d^5(a^2G)4s - 3d^5(a^2H)4p$	$c^3G - w^3H^o$	4 - 5		188
62	250	1882.979	69.83683 - 122.94415	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5D^o$	3 - 4		188
	150	1883.185	87.90187 - 141.00299	$3d^5(a^2F)4s - 3d^5(a^2G)4p$	$b^1F - v^3F^o$	3 - 4		188
62	70	1883.394	69.74740 - 122.84303	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5D^o$	0 - 1		188
	200	1883.816	69.83776 - 122.92137	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$b^5D - z^3D^o$	2 - 1		188
	150	1884.233	89.78359 - 142.85559	$3d^5(a^2G)4s - 3d^5(a^2H)4p$	$c^3G - w^3H^o$	4 - 4	P	188
	550	1884.596	69.83683 - 122.89884	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$b^5D - z^3D^o$	3 - 2		188
96	600	1885.125	83.13823 - 136.18517	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5F^o$	5 - 5		188
96	300	1885.947	83.16148 - 136.18517	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5F^o$	4 - 5		188
	300	1886.607	69.83776 - 122.84303	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5D^o$	2 - 1		188
52	800	1886.757	63.46639 - 116.46741	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5F^o$	5 - 4		188
62	70	1887.085	69.83776 - 122.82955	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5D^o$	2 - 3		188

Multiplet	Rel. Int.	λ_{s} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
52	550	1887.197	63.48678 - 116.47544	$3d^5(a^4G)4s - 3d^5(a^4P)4p$	$a^5G - z^5F^o$	4 - 3		188
52	550	1887.471	63.49456 - 116.47544	$3d^5(a^4G)4s - 3d^5(a^4P)4p$	$a^5G - z^5F^o$	2 - 3		188
52	250	1887.734	63.49400 - 116.46741	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5F^o$	3 - 4		188
	150	1888.260	114.33995 - 167.2989	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$d^3G - t^3G^o$	4 - 5		188
53	300	1889.451	63.49400 - 116.41939	$3d^5(a^4G)4s - 3d^5(a^4P)4p$	$a^5G - z^5D^o$	3 - 2		188
	250	1889.735	86.84711 - 139.76448	$3d^5(a^2D)4s - 3d^5(a^2F)4p$	$b^1D - y^1D^o$	2 - 2		188
52	900	1890.669	63.42517 - 116.31663	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5F^o$	6 - 5		188
53	150	1890.893	63.49456 - 116.38007	$3d^5(a^4G)4s - 3d^5(a^4P)4p$	$a^5G - z^5D^o$	2 - 1		188
96	250	1891.070	83.23786 - 136.11794	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5F^o$	3 - 2		188
96	200	1891.186	83.35888 - 136.23584	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5F^o$	2 - 1		188
	70	1891.339	84.67187 - 137.54460	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	$c^3F - x^5D^o$	3 - 2		188
	300	1891.516	82.41094 - 135.2790	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$c^3D - x^3D^o$	2 - 2		188
	200	1891.909	82.38287 - 135.23974	$3d^5(a^2D)4s - 3d^5(a^4F)4p$	$c^3D - y^5G^o$	3 - 4		188
96	300	1892.073	83.13823 - 135.99062	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5F^o$	5 - 4		188
52	300	1892.140	63.46639 - 116.31663	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5F^o$	5 - 5		188
96	300	1892.247	83.16148 - 136.00874	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5F^o$	4 - 3		188
	70	1892.339	88.69467 - 141.53955	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	$b^3H - y^1I^o$	5 - 6		188
	70	1892.488	69.78819 - 122.62834	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5D^o$	1 - 2		188
	70	1892.598	89.69752 - 142.53507	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$c^3G - u^3F^o$	3 - 2		188
96	300	1892.890	83.16148 - 135.99062	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5F^o$	4 - 4		188
	200	1893.113	105.90623 - 158.7293	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$d^3D - t^3D^o$	2 - 3		188
83	700	1893.981	79.86042 - 132.65917	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$a^3I - y^3H^o$	5 - 4		188
	300	1894.252	69.83683 - 122.62834	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5D^o$	3 - 2		188
	200	1894.509	82.49488 - 135.2790	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$c^3D - x^3D^o$	1 - 2		188
96	250	1894.983	83.23786 - 136.00874	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5F^o$	3 - 3		188
34	1000	1895.456	30.08884 - 82.84659	$3d^5(a^6S)4s - 3d^5(a^6S)4p$	$a^7S - z^7P^o$	3 - 4		188
96		1895.635	83.23786 - 135.99062	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5F^o$	3 - 4		188
	70	1895.912	114.33995 - 167.0850	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$d^3G - t^3G^o$	4 - 3		188
	250	1896.333	114.35192 - 167.0850	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$d^3G - t^3G^o$	3 - 3		188
	250	1896.734	82.49488 - 135.2171	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$c^3D - x^3D^o$	1 - 1		188
83	600	1896.803	79.84474 - 132.56471	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$a^3I - y^3H^o$	6 - 5		188
	250	1897.028	82.38287 - 135.09684	$3d^5(a^2D)4s - 3d^5(a^4F)4p$	$c^3D - y^5G^o$	3 - 3		188
83	200	1897.379	79.86042 - 132.56471	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$a^3I - y^3H^o$	5 - 5		188
	400	1898.870	73.72764 - 126.39057	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$c^3P - z^3S^o$	2 - 1		188
96	300	1899.318	69.69573 - 122.34661	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$b^5D - z^3D^o$	4 - 3		188
	300	1899.931	105.92916 - 158.5627	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$d^3D - s^3F^o$	3 - 4		188
	70	1900.575	89.69752 - 142.31290	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$c^3G - u^3F^o$	3 - 3		188
	600	1901.096	83.13823 - 135.73947	$3d^5(a^4F)4s - 3d^5(a^2I)4p$	$a^5F - z^1I^o$	5 - 6		188
	300	1901.379	82.38287 - 134.97622	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$c^3D - x^3D^o$	3 - 3		188
96	200	1901.540	83.64698 - 136.23584	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5F^o$	1 - 1		188
	300	1902.076	83.16148 - 135.73531	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - y^5G^o$	4 - 5		188
	400	1902.402	82.41094 - 134.97622	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$c^3D - x^3D^o$	2 - 3		188
	300	1902.902	87.90187 - 140.45310	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$b^1F - y^1F^o$	3 - 3		188
	70	1903.159	83.16148 - 135.7057	$3d^5(a^4F)4s - 3d^5(a^2F)4p$	$a^5F - w^3D^o$	4 - 3		188
	200	1903.257	73.84910 - 126.39057	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$c^3P - z^3S^o$	1 - 1		188
	70	1903.706	89.78359 - 142.31290	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$c^3G - u^3F^o$	4 - 3		188
	70	1903.983	105.89535 - 158.4168	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$d^3D - t^3D^o$	1 - 2		188
	150	1904.257	109.57084 - 162.0848	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$c^1D - w^1D^o$	2 - 2		188
	250	1904.402	69.83683 - 122.34661	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$b^5D - z^3D^o$	3 - 3		188
	70	1905.214	105.92916 - 158.4168	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$d^3D - t^3D^o$	3 - 2		188
96	150	1905.818	83.64698 - 136.11794	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - x^5F^o$	1 - 2		188
08	400	1906.457	84.15955 - 136.61278	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$c^3F - w^3F^o$	4 - 4		188
	400	1906.814	83.13823 - 135.58208	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - y^5G^o$	5 - 6		188
83	650	1907.577	79.84012 - 132.26266	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$a^3I - y^3H^o$	7 - 6		188
83	250	1907.741	79.84474 - 132.26266	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$a^3I - y^3H^o$	6 - 6		188
	150	1909.782	105.89535 - 158.2573	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$d^3D - t^3D^o$	1 - 1		188
	150	1909.846	117.95032 - 170.3106	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$d^1G - u^1F^o$	4 - 3		188
	70	1910.172	105.90623 - 158.2573	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$d^3D - t^3D^o$	2 - 1		188
57	400	1910.401	66.52295 - 118.86787	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$a^5P - y^5P^o$	2 - 1		188
35	450	1911.338	92.52391 - 144.84324	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	$a^1H - x^1H^o$	5 - 5		188
	100	1911.685	83.42961 - 135.73947	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$b^1I - z^1I^o$	6 - 6	P	188
	50	1911.742	88.69467 - 141.00299	$3d^5(a^2H)4s - 3d^5(a^2G)4p$	$b^3H - v^3F^o$	5 - 4	P	188
57	250	1912.920	66.59168 - 118.86787	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$a^5P - y^5P^o$	1 - 1		188
	70	1913.386	89.78359 - 142.0470	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$c^3G - u^3F^o$	4 - 4		188
57	250	1913.622	66.46464 - 118.72160	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$a^5P - y^5P^o$	3 - 2		188

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
34	1000	1914.056	30.08884 - 82.33392	$3d^5(a^6S)4s - 3d^5(a^6S)4p$	$a^7S - z^7P^o$	3 - 3		188
51	750	1915.083	63.42517 - 115.64223	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5H^o$	6 - 7		188
57	150	1915.750	66.52295 - 118.72160	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$a^5P - y^5P^o$	2 - 2		188
94	300	1916.507	83.13823 - 135.31642	$3d^5(a^4F)4s - 3d^5(a^2F)4p$	$a^5F - y^3G^o$	5 - 5		188
08	150	1917.087	84.36992 - 136.53245	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$c^3F - w^3F^o$	2 - 2		188
	250	1917.250	114.33995 - 166.498	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$d^3G - r^3F^o$	4 - 3		188
94	550	1917.351	83.16148 - 135.31642	$3d^5(a^4F)4s - 3d^5(a^2F)4p$	$a^5F - y^3G^o$	4 - 5		188
01	600	1917.453	83.42961 - 135.58208	$3d^5(a^2I)4s - 3d^5(a^4F)4p$	$b^1I - y^5G^o$	6 - 6		188
	150	1917.665	79.84474 - 131.99158	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$a^3I - z^1K^o$	6 - 7		188
	400	1917.960	89.90785 - 142.0470	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$c^3G - u^3F^o$	5 - 4		188
57	450	1918.284	66.59168 - 118.72160	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$a^5P - y^5P^o$	1 - 2		188
08	450	1918.459	84.67187 - 136.79705	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$c^3F - w^3F^o$	3 - 3	P	188
	200	1918.966	90.42368 - 142.53507	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$d^3F - u^3F^o$	2 - 2		188
07	250	1919.572	84.36992 - 136.4649	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$c^3F - w^3D^o$	2 - 1		188
95	250	1920.186	83.16148 - 135.23974	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - y^5G^o$	4 - 4		188
	150	1920.260	105.90623 - 157.9820	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$d^3D - s^3F^o$	2 - 3		188
	150	1920.752	92.52391 - 144.58683	$3d^5(a^2H)4s - 3d^5(a^2G)4p$	$a^1H - y^1H^o$	5 - 5		188
	150	1921.132	105.92916 - 157.9820	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$d^3D - s^3F^o$	3 - 3		188
	70	1921.990	88.66387 - 140.69336	$3d^5(a^2H)4s - 3d^5(a^2G)4p$	$b^3H - v^3F^o$	4 - 3		188
	70	1922.132	84.15955 - 136.18517	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	$c^3F - x^5F^o$	4 - 5		188
51	1000	1922.789	63.46639 - 115.47425	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5H^o$	5 - 6		188
95	450	1923.003	83.23786 - 135.23974	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - y^5G^o$	3 - 4		188
57	450	1923.877	66.46464 - 118.44292	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$a^5P - y^5P^o$	3 - 3		188
	250	1924.119	97.04138 - 149.01336	$3d^5(b^2F)4s - 3d^5(a^2H)4p$	$c^1F - w^1G^o$	3 - 4		188
79	400	1924.532	76.95679 - 128.91751	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^3D - y^3P^o$	3 - 2		188
	250	1925.271	84.67187 - 136.61278	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$c^3F - w^3F^o$	3 - 4		188
	200	1925.855	87.90187 - 139.82717	$3d^5(a^2F)4s - 3d^5(a^2G)4p$	$b^1F - y^1G^o$	3 - 4		188
	250	1926.036	83.35888 - 135.2790	$3d^5(a^4F)4s - 3d^5(a^2D)4p$	$a^5F - x^3D^o$	2 - 2	P	188
57	250	1926.041	66.52295 - 118.44292	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$a^5P - y^5P^o$	2 - 3	P	188
34	1000	1926.304	30.08884 - 82.00173	$3d^5(a^6S)4s - 3d^5(a^6S)4p$	$a^7S - z^7P^o$	3 - 2		188
	200	1926.898	114.32535 - 166.2222	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$d^3G - r^3F^o$	5 - 4		188
	300	1927.436	82.38287 - 134.26542	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$c^3D - x^3P^o$	3 - 2		188
	150	1927.679						188
	250	1928.178	87.90187 - 139.76448	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$b^1F - y^1D^o$	3 - 2		188
	100	1928.247	84.67187 - 136.53245	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$c^3F - w^3F^o$	3 - 2	P	188
95	200	1928.306	83.23786 - 135.09684	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - y^5G^o$	3 - 3	P	188
	250	1928.642	79.86042 - 131.71079	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$a^3I - z^1H^o$	5 - 5		188
	250	1928.837	86.84711 - 138.69181	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$b^1D - z^1P^o$	2 - 1		188
	70	1928.991	90.47253 - 142.31290	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$d^3F - u^3F^o$	4 - 3		188
	250	1929.413	90.48394 - 142.31290	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$d^3F - u^3F^o$	3 - 3		188
51	70	1929.632	63.46639 - 115.28991	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5H^o$	5 - 5		188
79	150	1929.941	77.10243 - 128.91751	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^3D - y^3P^o$	2 - 2		188
	150	1930.184	92.52391 - 144.33221	$3d^5(a^2H)4s - 3d^5(b^2F)4p$	$a^1H - x^1G^o$	5 - 4		188
51	1000	1930.387	63.48678 - 115.28991	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5H^o$	4 - 5		188
	150	1930.917	105.89535 - 157.6843	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$d^3D - s^3F^o$	1 - 2		188
	70	1931.309	105.90623 - 157.6843	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$d^3D - s^3F^o$	2 - 2		188
61	950	1931.507	69.69573 - 121.46882	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5F^o$	4 - 5		188
95	300	1932.818	83.35888 - 135.09684	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - y^5G^o$	2 - 3		188
	250	1936.806	89.90785 - 141.53955	$3d^5(a^2G)4s - 3d^5(a^2H)4p$	$c^3G - y^1I^o$	5 - 6		188
51	200	1937.077	63.48678 - 115.11092	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5H^o$	4 - 4		188
51	950	1937.345	63.49400 - 115.11092	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5H^o$	3 - 4		188
	250	1937.996	114.33995 - 165.9396	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$d^3G - v^3H^o$	4 - 5		188
95	250	1938.775	83.35888 - 134.93784	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - y^5G^o$	2 - 2		188
	650	1938.901	84.15955 - 135.73531	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	$c^3F - y^5G^o$	4 - 5		188
	70	1939.107	83.64698 - 135.2171	$3d^5(a^4F)4s - 3d^5(a^2D)4p$	$a^5F - x^3D^o$	1 - 1		188
61	550	1940.018	69.69573 - 121.24167	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5F^o$	4 - 4		188
79	150	1940.604	77.07530 - 128.60565	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^3D - y^3P^o$	1 - 1	P	188
	250	1940.769	93.51264 - 145.03861	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$c^1G - x^1F^o$	4 - 3		188
79	200	1941.633	77.10243 - 128.60565	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^3D - y^3P^o$	2 - 1		188
51	950	1943.481	63.49456 - 114.94855	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5H^o$	2 - 3		188
	150	1943.715	30.8864 - 82.33392	$3d^6 - 3d^5(a^6S)4p$	$a^1G - z^7P^o$	4 - 3	Q	188
61	800	1945.342	69.83683 - 121.24167	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5F^o$	3 - 4		188
06	150	1945.724	84.15955 - 135.55441	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$c^3F - y^3G^o$	4 - 4		188
	20	1946.321	114.33995 - 165.7191	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$d^3G - v^3H^o$	4 - 4		188
	200	1946.769	114.35192 - 165.7191	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$d^3G - v^3H^o$	3 - 4		188

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	200	1948.280	117.95032 - 169.2776	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$d^1G - v^1G^o$	4 - 4		188
79	150	1949.462	77.07530 - 128.37153	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^3D - y^3P^o$	1 - 0		188
95	200	1949.666	83.64698 - 134.93784	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$a^5F - y^5G^o$	1 - 2		188
16	650	1950.334	88.92307 - 140.19633	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	$b^3H - y^3I^o$	6 - 7		188
68	800	1951.007	70.69403 - 121.94962	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$b^3G - z^3G^o$	5 - 5		188
68	200	1951.318	70.69403 - 121.94129	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$b^3G - z^3G^o$	5 - 4		188
	100	1952.329	70.72875 - 121.94962	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$b^3G - z^3G^o$	4 - 5	P	188
68	50	1952.385	89.78359 - 141.00299	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$c^3G - v^3F^o$	4 - 4	P	188
68	200	1952.514	70.72501 - 121.94129	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$b^3G - z^3G^o$	3 - 4		188
68	700	1952.648	70.72875 - 121.94129	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$b^3G - z^3G^o$	4 - 4		188
	250	1953.202	93.38875 - 144.58683	$3d^5(b^2F)4s - 3d^5(a^2G)4p$	$e^3F - y^1H^o$	4 - 5		188
68	900	1953.322	70.72501 - 121.91974	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$b^3G - z^3G^o$	3 - 3		188
68	650	1953.488	70.72875 - 121.91974	$3d^5(a^4C)4s - 3d^5(a^4G)4p$	$b^3G - z^3G^o$	4 - 3		188
	70	1953.821	93.38875 - 144.57053	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$e^3F - t^3F^o$	4 - 3		188
	250	1953.968	93.39245 - 144.57053	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$e^3F - t^3F^o$	3 - 3		188
61	650	1954.223	69.83776 - 121.00878	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5F^o$	2 - 3		188
	250	1954.769	84.15955 - 135.31642	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$c^3F - y^3G^o$	4 - 5		188
16	550	1954.975	88.69467 - 139.84618	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	$b^3H - y^3I^o$	5 - 6		188
	20	1955.943	73.72764 - 124.85404	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	$c^3P - y^3D^o$	2 - 3		188
	200	1957.137	89.90785 - 141.00299	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$c^3G - v^3F^o$	5 - 4		188
	150	1957.375	93.41293 - 144.50174	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$e^3F - t^3F^o$	2 - 2		188
47	400	1957.938	93.51264 - 144.58683	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$c^1G - y^1H^o$	4 - 5		188
55	700	1958.583	66.46464 - 117.52191	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$a^5P - z^5D^o$	3 - 4		188
	300	1958.732	89.69752 - 140.75098	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$c^3G - v^3F^o$	3 - 2		188
	200	1959.026	90.42368 - 141.46945	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$d^3F - v^3D^o$	2 - 1		188
61	550	1959.324	69.78819 - 120.82617	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5F^o$	1 - 2		188
82	900	1960.318	79.84012 - 130.85225	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$a^3I - z^3K^o$	7 - 8		188
	300	1961.010	90.47253 - 141.46653	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$d^3F - v^3D^o$	4 - 3		188
61	400	1961.230	69.83776 - 120.82617	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5F^o$	2 - 2		188
	70	1961.456	90.48394 - 141.46653	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$d^3F - v^3D^o$	3 - 3		188
	70	1961.724	90.42368 - 141.39904	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$d^3F - v^3D^o$	2 - 2		188
61	300	1962.717	69.74740 - 120.69710	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5F^o$	0 - 1		188
	250	1962.958	93.38875 - 144.33221	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$e^3F - x^1G^o$	4 - 4		188
	70	1963.209	84.15955 - 135.09684	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	$c^3F - y^5G^o$	4 - 3		188
	70	1963.461	88.69467 - 139.62517	$3d^5(a^2H)4s - 3d^5(a^4F)4p$	$b^3H - w^3G^o$	5 - 4		188
81	200	1963.991	79.84012 - 130.75684	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$a^3I - z^3I^o$	7 - 6	P	188
	100	1964.054	90.48394 - 141.39904	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$d^3F - v^3D^o$	3 - 2	P	188
81	550	1964.169	79.84474 - 130.75684	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$a^3I - z^3I^o$	6 - 6		188
61	450	1964.260	89.78359 - 140.69336	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$c^3G - v^3F^o$	4 - 3		188
81	550	1964.776	79.86042 - 130.75684	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$a^3I - z^3I^o$	5 - 6		188
06	550	1965.309	84.67187 - 135.55441	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$c^3F - y^3G^o$	3 - 4		188
	200	1966.074	98.66268 - 149.52563	$3d^5(^4S)4s - 3d^5(a^2S)4p$	$a^3S - w^3P^o$	1 - 2		188
61	150	1966.201	69.83776 - 120.69710	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$b^5D - y^5F^o$	2 - 1		188
16	550	1966.740	88.66387 - 139.50944	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	$b^3H - y^3I^o$	4 - 5		188
	250	1967.352	117.95032 - 168.7801	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$d^1G - w^1H^o$	4 - 5		188
	150	1968.625	92.52391 - 143.32085	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	$a^1H - w^3H^o$	5 - 6		188
	150	1972.245	93.41293 - 144.11664	$3d^5(b^2F)4s - 3d^5(a^2G)4p$	$e^3F - v^3G^o$	2 - 3		188
	150	1972.638	93.39245 - 144.08597	$3d^5(b^2F)4s - 3d^5(a^2G)4p$	$e^3F - v^3G^o$	3 - 4		188
	20	1973.578	89.78359 - 140.45310	$3d^5(a^2G)4s - 3d^5(a^2F)4p$	$c^3G - y^1F^o$	4 - 3		188
55	550	1976.126	66.46464 - 117.06856	$3d^5(a^4P)4s - 3d^5(a^4G)4p$	$a^5P - z^5D^o$	3 - 3		188
55	250	1978.417	66.52295 - 117.06856	$3d^5(a^4P)4s - 3d^5(a^4G)4p$	$a^5P - z^5D^o$	2 - 3		188
	150	1978.626	88.92307 - 139.46336	$3d^5(a^2H)4s - 3d^5(a^4F)4p$	$b^3H - w^3G^o$	6 - 5		188
	70	1979.002	90.47253 - 141.00299	$3d^5(a^4F)4s - 3d^5(a^2G)4p$	$d^3F - v^3F^o$	4 - 4		188
	150	1980.392	93.38875 - 143.88374	$3d^5(b^2F)4s - 3d^5(a^2G)4p$	$e^3F - v^3G^o$	4 - 5		188
54	400	1982.076	66.52295 - 116.97505	$3d^5(a^4P)4s - 3d^5(a^4G)4p$	$a^5P - z^5F^o$	2 - 2		188
56	550	1982.805	66.46464 - 116.89822	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$a^5P - z^5S^o$	3 - 2		188
	20	1983.144	84.67187 - 135.09684	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	$c^3F - y^5G^o$	3 - 3	P	188
		1983.6	0.0 - 50.4123	$3d^6 - 3d^6$	$ga^5D - b^3P$	4 - 2	F,P	375,487
81	150	1983.676	79.84474 - 130.25627	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$a^3I - z^3I^o$	6 - 5		188
86	450	1984.027	82.38287 - 132.78536	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$c^3D - x^3F^o$	3 - 4		188
81	600	1984.288	79.86042 - 130.25627	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$a^3I - z^3I^o$	5 - 5		188
56	200	1985.105	66.52295 - 116.89822	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$a^5P - z^5S^o$	2 - 2		188
	70	1987.006	90.42368 - 140.75098	$3d^5(a^4F)4s - 3d^5(a^2G)4p$	$d^3F - v^3F^o$	2 - 2		188
50	1000	1987.503	63.42517 - 113.73962	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5G^o$	6 - 6		188
56	200	1987.810	66.59168 - 116.89822	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$a^5P - z^5S^o$	1 - 2		188

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		1989.0	0.0 - 50.2761	$3d^6 - 3d^6$	$ga^5D - b^3F$	4 - 4	F,P	375,487
50	450	1989.975	63.42517 - 113.67701	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5G^o$	6 - 5		188
50	950	1991.613	63.46639 - 113.67701	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5G^o$	5 - 5		188
82	600	1992.017	79.84012 - 130.04056	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$a^3I - z^3K^o$	7 - 7		188
82	600	1992.196	79.84474 - 130.04056	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$a^3I - z^3K^o$	6 - 7		188
50	70	1992.427	63.48678 - 113.67701	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5G^o$	4 - 5		188
06	400	1992.858	84.36992 - 134.54900	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$c^3F - y^3G^o$	2 - 3		188
50	450	1993.262	63.46639 - 113.63534	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5G^o$	5 - 4		188
50	900	1994.073	63.48678 - 113.63534	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5G^o$	4 - 4		188
50	70	1994.366	63.49400 - 113.63534	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5G^o$	3 - 4		188
50	450	1995.266	63.48678 - 113.60537	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5G^o$	4 - 3		188
50	800	1995.563	63.49400 - 113.60537	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5G^o$	3 - 3		188
50	800	1996.420	63.49456 - 113.58420	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$a^5G - z^5G^o$	2 - 2		188
	70	1999.100	73.72764 - 123.75039	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	$c^3P - x^3P^o$	2 - 3		188
54	600	1999.588	66.46464 - 116.47544	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$a^5P - z^5F^o$	3 - 3		188
54	200	1999.893	66.46464 - 116.46741	$3d^5(a^4P)4s - 3d^5(a^4G)4p$	$a^5P - z^5F^o$	3 - 4		188

IRON IV (Fe^{+3}), Z = 26

Ground State $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5$ ($^6S_{5/2}$) (23 electrons)

Ionization Potential [442 000] cm^{-1}; [54.8] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	4	446.569	35.2538 - 259.18382	$3d^5 - 3d^4(b^3F)4p$	$a^4P - {}^4D^o$	5/2 - 3/2		958
	80	458.172	32.2455 - 250.50229	$3d^5 - 3d^4(b^3F)4p$	$a^4G - {}^4F^o$	11/2 - 9/2		958
	1	458.307	0.0 - 218.19566	$3d^5 - 3d^4(a^5F)4p$	$ga^6S - {}^4F^o$	5/2 - 5/2		958
	30	458.746	32.2928 - 250.27906	$3d^5 - 3d^4(b^3F)4p$	$a^4G - {}^4F^o$	9/2 - 7/2		958
	30	458.935	32.3012 - 250.19507	$3d^5 - 3d^4(b^3F)4p$	$a^4G - {}^4F^o$	5/2 - 5/2		958
	50	458.949	32.3057 - 250.19507	$3d^5 - 3d^4(b^3F)4p$	$a^4G - {}^4F^o$	7/2 - 5/2		958
	12	460.999	47.0905 - 264.01154	$3d^5 - 3d^4(b^1G)4p$	$a^2I - {}^2H^o$	13/2 - 11/2		958
	12	461.492	35.2538 - 251.94403	$3d^5 - 3d^4(b^3P)4p$	$a^4P - {}^4D^o$	5/2 - 3/2		958
	1	467.343	51.3942 - 265.36948	$3d^5 - 3d^4(b^1G)4p$	$a^2F - {}^2F^o$	7/2 - 5/2		958
	12	469.085	38.7794 - 251.95894	$3d^5 - 3d^4(b^3P)4p$	$a^4D - {}^4P^o$	7/2 - 5/2		958
	30	469.749	38.7794 - 251.65834	$3d^5 - 3d^4(b^3P)4p$	$a^4D - {}^4D^o$	7/2 - 7/2		958
	1	471.118	38.8967 - 251.15694	$3d^5 - 3d^4(b^3P)4p$	$a^4D - {}^4P^o$	1/2 - 1/2		958
	4	471.524	38.9351 - 251.01402	$3d^5 - 3d^4(b^3P)4p$	$a^4D - {}^4D^o$	5/2 - 5/2		958
	4	471.800	38.9382 - 250.89105	$3d^5 - 3d^4(b^3P)4p$	$a^4D - {}^4P^o$	3/2 - 3/2		958
	12	481.592	56.3688 - 264.01154	$3d^5 - 3d^4(b^1G)4p$	$a^2H - {}^2H^o$	11/2 - 11/2		958
	80	481.905	56.3688 - 263.87691	$3d^5 - 3d^4(b^1G)4p$	$a^2H - {}^2G^o$	11/2 - 9/2		958
	1	482.241	57.7212 - 265.08477	$3d^5 - 3d^4(b^1G)4p$	$a^2G - {}^2F^o$	9/2 - 7/2		958
	50	483.238	56.0583 - 262.99501	$3d^5 - 3d^4(b^1G)4p$	$a^2H - {}^2G^o$	9/2 - 7/2		958
	1	483.967	74.1331 - 280.75837	$3d^5 - 3d^4(b^1D)4p$	$b^2D - {}^2P^o$	5/2 - 3/2		958
	4	484.261	56.0583 - 262.55777	$3d^5 - 3d^4(b^1G)4p$	$a^2H - {}^2H^o$	9/2 - 9/2		958
	1	484.990	56.3688 - 262.55777	$3d^5 - 3d^4(b^1G)4p$	$a^2H - {}^2H^o$	11/2 - 9/2		958
	1	485.509	52.6207 - 258.59192	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4D^o$	9/2 - 7/2		958
	1	487.383	61.1565 - 266.33524	$3d^5 - 3d^4(b^3F)4p$	$b^2F - {}^2D^o$	5/2 - 3/2		958
	4	489.409	49.5415 - 253.86843	$3d^5 - 3d^4(b^3P)4p$	$a^2D - {}^2D^o$	5/2 - 3/2		958
	4	491.832	38.9382 - 242.25925	$3d^5 - 3d^4(a^1D)4p$	$a^4D - {}^2P^o$	3/2 - 3/2		958
	30	492.152	82.8949 - 286.08472	$3d^5 - 3d^4(b^1D)4p$	$b^2G - {}^2F^o$	9/2 - 7/2		958
	50	492.653	56.0583 - 259.03972	$3d^5 - 3d^4(b^3F)4p$	$a^2H - {}^2G^o$	9/2 - 7/2		958
	1	493.529	61.2544 - 263.87691	$3d^5 - 3d^4(b^1G)4p$	$b^2F - {}^2G^o$	7/2 - 9/2		958
	110	494.567	56.3688 - 258.56602	$3d^5 - 3d^4(b^3F)4p$	$a^2H - {}^2G^o$	11/2 - 9/2		958
	30	494.669	82.8973 - 285.05277	$3d^5 - 3d^4(b^1D)4p$	$b^2G - {}^2F^o$	7/2 - 5/2		958
	4	495.447	61.1565 - 262.99501	$3d^5 - 3d^4(b^1G)4p$	$b^2F - {}^2G^o$	5/2 - 7/2		958
	4	495.953	57.4080 - 259.03972	$3d^5 - 3d^4(b^3F)4p$	$a^2G - {}^2G^o$	7/2 - 7/2		958
	50	496.171	52.6207 - 254.16484	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4G^o$	9/2 - 11/2		958
	4	496.724	57.7212 - 259.03972	$3d^5 - 3d^4(b^3F)4p$	$a^2G - {}^2G^o$	9/2 - 7/2		958
	1	496.766	52.6207 - 253.92359	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^2F^o$	9/2 - 7/2		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	12	497.184	52.6954 - 253.82743	$3d^5$ - $3d^4(b^3F)4p$	a^4F - $^4G^o$	7/2 - 9/2		958
	4	497.810	52.6954 - 253.57565	$3d^5$ - $3d^4(b^3P)4p$	a^4F - $^2D^o$	7/2 - 5/2		958
	1	497.896	57.7212 - 258.56602	$3d^5$ - $3d^4(b^3F)4p$	a^2G - $^2G^o$	9/2 - 9/2		958
	1	499.880	52.8371 - 252.88448	$3d^5$ - $3d^4(b^3F)4p$	a^4F - $^4G^o$	3/2 - 5/2		958
	4	500.558	52.1667 - 251.94403	$3d^5$ - $3d^4(b^3P)4p$	a^2F - $^4D^o$	5/2 - 3/2		958
	150	501.849	52.6954 - 251.95894	$3d^5$ - $3d^4(b^3P)4p$	a^4F - $^4P^o$	7/2 - 5/2		958
	30	502.142	52.8371 - 251.98420	$3d^5$ - $3d^4(b^3P)4p$	a^4F - $^4D^o$	3/2 - 1/2		958
	80	502.246	52.8380 - 251.94403	$3d^5$ - $3d^4(b^3P)4p$	a^4F - $^4D^o$	5/2 - 3/2		958
	300	502.421	52.6207 - 251.65834	$3d^5$ - $3d^4(b^3P)4p$	a^4F - $^4D^o$	9/2 - 7/2		958
	80	504.240	52.6954 - 251.01402	$3d^5$ - $3d^4(b^3P)4p$	a^4F - $^4D^o$	7/2 - 5/2		958
	12	504.919	52.8380 - 250.89105	$3d^5$ - $3d^4(b^3P)4p$	a^4F - $^4P^o$	5/2 - 3/2		958
	12	504.982	50.0514 - 248.07797	$3d^5$ - $3d^4(a^1F)4p$	a^2D - $^2D^o$	3/2 - 3/2		958
	375	505.354	52.6207 - 250.50229	$3d^5$ - $3d^4(b^3F)4p$	a^4F - $^4F^o$	9/2 - 9/2		958
	4	505.545	52.6954 - 250.50229	$3d^5$ - $3d^4(b^3F)4p$	a^4F - $^4F^o$	7/2 - 9/2		958
	200	506.117	52.6954 - 250.27906	$3d^5$ - $3d^4(b^3F)4p$	a^4F - $^4F^o$	7/2 - 7/2		958
	4	506.482	52.8380 - 250.27906	$3d^5$ - $3d^4(b^3F)4p$	a^4F - $^4F^o$	5/2 - 7/2		958
	375	506.694	52.8380 - 250.19507	$3d^5$ - $3d^4(b^3F)4p$	a^4F - $^4F^o$	5/2 - 5/2		958
	80	506.976	32.2455 - 229.49474	$3d^5$ - $3d^4(a^3D)4p$	a^4G - $^4F^o$	11/2 - 9/2		958
	30	507.631	32.2928 - 229.28802	$3d^5$ - $3d^4(a^3D)4p$	a^4G - $^4F^o$	9/2 - 7/2		958
	50	508.240	32.3057 - 229.06258	$3d^5$ - $3d^4(a^3D)4p$	a^4G - $^4F^o$	7/2 - 5/2		958
	12	508.749	32.3012 - 228.86261	$3d^5$ - $3d^4(a^3D)4p$	a^4G - $^4F^o$	5/2 - 3/2		958
	1	509.681	57.7212 - 253.92359	$3d^5$ - $3d^4(b^3F)4p$	a^2G - $^2F^o$	9/2 - 7/2		958
	12	511.424	57.7212 - 253.25437	$3d^5$ - $3d^4(b^3F)4p$	a^2G - $^4G^o$	9/2 - 7/2		958
	1	511.570	57.4080 - 252.88448	$3d^5$ - $3d^4(b^3F)4p$	a^2G - $^4G^o$	7/2 - 5/2		958
	1	516.253	35.3333 - 229.03702	$3d^5$ - $3d^4(a^3D)4p$	a^4P - $^4P^o$	3/2 - 1/2		958
	4	517.099	0.0 - 193.38617	$3d^5$ - $3d^4(a^5D)4p$	ga^6S - $^6D^o$	5/2 - 7/2		958
	4	517.234	35.2538 - 228.58967	$3d^5$ - $3d^4(a^3D)4p$	a^4P - $^4P^o$	5/2 - 3/2		958
	1	517.447	35.3333 - 228.58967	$3d^5$ - $3d^4(a^3D)4p$	a^4P - $^4P^o$	3/2 - 3/2		958
	4	517.642	35.4066 - 228.58967	$3d^5$ - $3d^4(a^3D)4p$	a^4P - $^4P^o$	1/2 - 3/2		958
	30	518.908	61.1565 - 253.86843	$3d^5$ - $3d^4(b^3P)4p$	b^2F - $^2D^o$	5/2 - 3/2		958
	150	519.035	35.2538 - 227.91905	$3d^5$ - $3d^4(a^3D)4p$	a^4P - $^4P^o$	5/2 - 5/2		958
	12	519.141	32.2455 - 224.87085	$3d^5$ - $3d^4(a^3G)4p$	a^4G - $^4G^o$	11/2 - 11/2		958
	80	519.221	0.0 - 192.59528	$3d^5$ - $3d^4(a^5D)4p$	ga^6S - $^4P^o$	5/2 - 5/2		958
	12	519.247	35.3333 - 227.91905	$3d^5$ - $3d^4(a^3D)4p$	a^4P - $^4P^o$	3/2 - 5/2		958
	50	519.962	61.2544 - 253.57565	$3d^5$ - $3d^4(b^3P)4p$	b^2F - $^2D^o$	7/2 - 5/2		958
	4	521.570	35.2538 - 226.98358	$3d^5$ - $3d^4(a^3D)4p$	a^4P - $^4D^o$	5/2 - 5/2		958
	50	521.665	0.0 - 191.69411	$3d^5$ - $3d^4(a^5D)4p$	ga^6S - $^4P^o$	5/2 - 3/2		958
	4	521.782	35.3333 - 226.98358	$3d^5$ - $3d^4(a^3D)4p$	a^4P - $^4D^o$	3/2 - 5/2		958
	4	522.000	51.3942 - 242.96562	$3d^5$ - $3d^4(a^1F)4p$	a^2F - $^2F^o$	7/2 - 7/2		958
	1	522.810	74.0966 - 265.36948	$3d^5$ - $3d^4(b^1G)4p$	b^2D - $^2F^o$	3/2 - 5/2		958
	12	523.694	74.1331 - 265.08477	$3d^5$ - $3d^4(b^1G)4p$	b^2D - $^2F^o$	5/2 - 7/2		958
	12	524.344	38.7794 - 229.49474	$3d^5$ - $3d^4(a^3D)4p$	a^4D - $^4F^o$	7/2 - 9/2		958
	30	525.339	38.9351 - 229.28802	$3d^5$ - $3d^4(a^3D)4p$	a^4D - $^4F^o$	5/2 - 7/2		958
	900	525.689	0.0 - 190.22687	$3d^5$ - $3d^4(a^5D)4p$	ga^6S - $^6P^o$	5/2 - 7/2		958
	50	525.930	38.8967 - 229.03702	$3d^5$ - $3d^4(a^3D)4p$	a^4D - $^4P^o$	1/2 - 1/2		958
	12	525.976	38.9382 - 229.06258	$3d^5$ - $3d^4(a^3D)4p$	a^4D - $^4F^o$	3/2 - 5/2		958
	30	526.045	38.9382 - 229.03702	$3d^5$ - $3d^4(a^3D)4p$	a^4D - $^4P^o$	3/2 - 1/2		958
	700	526.293	0.0 - 190.00828	$3d^5$ - $3d^4(a^5D)4p$	ga^6S - $^6P^o$	5/2 - 5/2		958
	4	526.411	38.8967 - 228.86261	$3d^5$ - $3d^4(a^3D)4p$	a^4D - $^4F^o$	1/2 - 3/2		958
	4	526.517	38.9351 - 228.86261	$3d^5$ - $3d^4(a^3D)4p$	a^4D - $^4F^o$	5/2 - 3/2		958
	300	526.567	32.2455 - 222.15499	$3d^5$ - $3d^4(a^3G)4p$	a^4G - $^4H^o$	11/2 - 13/2		958
	520	526.634	0.0 - 189.88511	$3d^5$ - $3d^4(a^5D)4p$	ga^6S - $^6P^o$	5/2 - 3/2		958
	12	527.096	32.3012 - 222.02009	$3d^5$ - $3d^4(a^3P)4p$	a^4G - $^2D^o$	5/2 - 3/2		958
	12	527.193	56.0583 - 245.74229	$3d^5$ - $3d^4(a^1F)4p$	a^2H - $^2G^o$	9/2 - 9/2		958
	200	527.276	38.9351 - 228.58967	$3d^5$ - $3d^4(a^3D)4p$	a^4D - $^4P^o$	5/2 - 3/2		958
	4	527.977	32.2455 - 221.64749	$3d^5$ - $3d^4(a^3G)4p$	a^4G - $^4H^o$	11/2 - 11/2		958
	50	528.056	56.3688 - 245.74229	$3d^5$ - $3d^4(a^1F)4p$	a^2H - $^2G^o$	11/2 - 9/2		958
	80	528.109	32.2928 - 221.64749	$3d^5$ - $3d^4(a^3G)4p$	a^4G - $^4H^o$	9/2 - 11/2		958
	110	528.710	38.7794 - 227.91905	$3d^5$ - $3d^4(a^3D)4p$	a^4D - $^4P^o$	7/2 - 5/2		958
	30	528.951	32.2928 - 221.34606	$3d^5$ - $3d^4(a^3G)4p$	a^4G - $^4F^o$	9/2 - 7/2		958
	4	528.987	32.3057 - 221.34606	$3d^5$ - $3d^4(a^3G)4p$	a^4G - $^4F^o$	7/2 - 7/2		958
	30	529.057	32.3057 - 221.32054	$3d^5$ - $3d^4(a^3G)4p$	a^4G - $^4F^o$	7/2 - 5/2		958
	30	529.117	32.2455 - 221.23921	$3d^5$ - $3d^4(a^3G)4p$	a^4G - $^4F^o$	11/2 - 9/2		958
	50	529.287	32.3057 - 221.23921	$3d^5$ - $3d^4(a^3G)4p$	a^4G - $^4F^o$	7/2 - 9/2		958
	12	529.328	32.3012 - 221.21929	$3d^5$ - $3d^4(a^3G)4p$	a^4G - $^4F^o$	5/2 - 3/2		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	80	529.469	32.2928 - 221.16102	$3d^5$ - $3d^4(a^3H)4p$	a^4G - $^2H^o$	9/2 - 11/2		958
	4	529.493	32.2455 - 221.10417	$3d^5$ - $3d^4(a^3G)4p$	a^4G - $^4H^o$	11/2 - 9/2		958
	12	529.628	32.2928 - 221.10417	$3d^5$ - $3d^4(a^3G)4p$	a^4G - $^4H^o$	9/2 - 9/2		958
	80	529.665	32.3057 - 221.10417	$3d^5$ - $3d^4(a^3G)4p$	a^4G - $^4H^o$	7/2 - 9/2		958
	30	529.936	56.0583 - 244.75925	$3d^5$ - $3d^4(a^1F)4p$	a^2H - $^2G^o$	9/2 - 7/2		958
	250	530.562	38.7794 - 227.25880	$3d^5$ - $3d^4(a^3D)4p$	a^4D - $^4D^o$	7/2 - 7/2		958
	300	530.907	32.3012 - 220.65804	$3d^5$ - $3d^4(a^3G)4p$	a^4G - $^4H^o$	5/2 - 7/2		958
	30	531.475	32.3057 - 220.46133	$3d^5$ - $3d^4(a^3H)4p$	a^4G - $^2H^o$	7/2 - 9/2		958
	300	531.777	38.9351 - 226.98358	$3d^5$ - $3d^4(a^3D)4p$	a^4D - $^4D^o$	5/2 - 5/2		958
	150	531.854	57.7212 - 245.74229	$3d^5$ - $3d^4(a^1F)4p$	a^2G - $^2G^o$	9/2 - 7/2		958
	4	531.927	38.8967 - 226.89210	$3d^5$ - $3d^4(a^3D)4p$	a^4D - $^4D^o$	1/2 - 3/2		958
	200	532.043	38.9382 - 226.89210	$3d^5$ - $3d^4(a^3D)4p$	a^4D - $^4D^o$	3/2 - 3/2		958
	4	532.157	38.9382 - 226.85193	$3d^5$ - $3d^4(a^3D)4p$	a^4D - $^4D^o$	3/2 - 1/2		958
	4	532.209	32.3012 - 220.19725	$3d^5$ - $3d^4(a^3G)4p$	a^4G - $^2F^o$	5/2 - 5/2		958
	12	532.649	49.5415 - 237.28309	$3d^5$ - $3d^4(a^1D)4p$	a^2D - $^2D^o$	5/2 - 5/2		958
	1	532.828	51.3942 - 239.07140	$3d^5$ - $3d^4(a^1D)4p$	a^2F - $^2F^o$	7/2 - 7/2		958
	12	533.598	32.2928 - 219.70053	$3d^5$ - $3d^4(a^3F)4p$	a^4G - $^4D^o$	9/2 - 7/2		958
	12	533.628	32.2455 - 219.64076	$3d^5$ - $3d^4(a^3H)4p$	a^4G - $^2I^o$	11/2 - 13/2		958
	80	533.757	57.4080 - 244.75925	$3d^5$ - $3d^4(a^1F)4p$	a^2G - $^2G^o$	7/2 - 7/2		958
	1	533.945	32.3057 - 219.59084	$3d^5$ - $3d^4(a^3F)4p$	a^4G - $^4D^o$	7/2 - 5/2		958
	1	534.421	51.3942 - 238.51284	$3d^5$ - $3d^4(a^1D)4p$	a^2F - $^2F^o$	7/2 - 5/2		958
	12	534.652	57.7212 - 244.75925	$3d^5$ - $3d^4(a^1F)4p$	a^2G - $^2G^o$	9/2 - 7/2		958
	1	534.988	61.1565 - 248.07797	$3d^5$ - $3d^4(a^1F)4p$	b^2F - $^2D^o$	5/2 - 3/2		958
	4	535.028	52.1667 - 239.07140	$3d^5$ - $3d^4(a^1D)4p$	a^2F - $^2F^o$	5/2 - 7/2		958
	12	535.142	50.0514 - 236.91879	$3d^5$ - $3d^4(a^1D)4p$	a^2D - $^2D^o$	3/2 - 3/2		958
	50	535.359	32.3012 - 219.09167	$3d^5$ - $3d^4(a^3F)4p$	a^4G - $^2D^o$	5/2 - 3/2		958
	300	535.551	47.0786 - 233.80212	$3d^5$ - $3d^4(a^1I)4p$	a^2I - $^2H^o$	11/2 - 9/2		958
	250	536.006	32.3057 - 218.87121	$3d^5$ - $3d^4(a^3F)4p$	a^4G - $^2D^o$	7/2 - 5/2		958
	1	536.339	52.6207 - 239.07140	$3d^5$ - $3d^4(a^1D)4p$	a^4F - $^2F^o$	9/2 - 7/2		958
	600	536.609	32.2455 - 218.60103	$3d^5$ - $3d^4(a^3F)4p$	a^4G - $^4F^o$	11/2 - 9/2		958
	300	536.735	32.3012 - 218.61388	$3d^5$ - $3d^4(a^3P)4p$	a^4G - $^4S^o$	5/2 - 3/2		958
	700	537.103	32.2928 - 218.47836	$3d^5$ - $3d^4(a^3F)4p$	a^4G - $^4F^o$	9/2 - 7/2		958
	200	537.133	32.3057 - 218.47836	$3d^5$ - $3d^4(a^3F)4p$	a^4G - $^4F^o$	7/2 - 7/2		958
	520	537.261	32.2455 - 218.37512	$3d^5$ - $3d^4(a^3H)4p$	a^4G - $^4G^o$	11/2 - 11/2		958
	12	537.396	32.2928 - 218.37512	$3d^5$ - $3d^4(a^3H)4p$	a^4G - $^4G^o$	9/2 - 11/2		958
	50	537.655	32.2455 - 218.23851	$3d^5$ - $3d^4(a^3H)4p$	a^4G - $^4G^o$	11/2 - 9/2		958
	600	537.792	32.2928 - 218.23851	$3d^5$ - $3d^4(a^3H)4p$	a^4G - $^4G^o$	9/2 - 9/2		958
	520	537.941	32.3057 - 218.19566	$3d^5$ - $3d^4(a^3F)4p$	a^4G - $^4F^o$	7/2 - 5/2		958
	150	538.021	32.2928 - 218.15977	$3d^5$ - $3d^4(a^3H)4p$	a^4G - $^4G^o$	9/2 - 7/2		958
	250	538.057	32.3057 - 218.15977	$3d^5$ - $3d^4(a^3H)4p$	a^4G - $^4G^o$	7/2 - 7/2		958
	12	538.222	38.7794 - 224.57643	$3d^5$ - $3d^4(a^3G)4p$	a^4D - $^4G^o$	7/2 - 9/2		958
	300	538.441	32.3012 - 218.02381	$3d^5$ - $3d^4(a^3P)4p$	a^4G - $^4P^o$	5/2 - 5/2		958
	30	538.450	32.3057 - 218.02381	$3d^5$ - $3d^4(a^3P)4p$	a^4G - $^4P^o$	7/2 - 5/2		958
	200	538.968	32.3057 - 217.84529	$3d^5$ - $3d^4(a^3H)4p$	a^4G - $^4G^o$	7/2 - 5/2		958
	4	539.127	74.0966 - 259.58164	$3d^5$ - $3d^4(b^3P)4p$	b^2D - $^2P^o$	3/2 - 1/2		958
	80	539.388	35.2538 - 220.64922	$3d^5$ - $3d^4(a^3G)4p$	a^4P - $^2F^o$	5/2 - 7/2		958
	4	539.681	38.9351 - 224.23060	$3d^5$ - $3d^4(a^3G)4p$	a^4D - $^4G^o$	5/2 - 7/2		958
	4	539.829	57.7212 - 242.96562	$3d^5$ - $3d^4(a^1F)4p$	a^2G - $^2F^o$	9/2 - 7/2		958
	12	539.938	57.4080 - 242.61460	$3d^5$ - $3d^4(a^1F)4p$	a^2G - $^2F^o$	7/2 - 5/2		958
	110	540.058	32.3012 - 217.46619	$3d^5$ - $3d^4(a^3F)4p$	a^4G - $^4F^o$	5/2 - 3/2		958
	80	540.230	35.2538 - 220.36044	$3d^5$ - $3d^4(a^3P)4p$	a^4P - $^2P^o$	5/2 - 3/2		958
	12	540.462	35.3333 - 220.36044	$3d^5$ - $3d^4(a^3P)4p$	a^4P - $^2P^o$	3/2 - 3/2		958
	80	540.675	35.4066 - 220.36044	$3d^5$ - $3d^4(a^3P)4p$	a^4P - $^2P^o$	1/2 - 3/2		958
	12	540.703	35.2538 - 220.19725	$3d^5$ - $3d^4(a^3G)4p$	a^4P - $^2F^o$	5/2 - 5/2		958
	50	540.743	49.5415 - 234.47200	$3d^5$ - $3d^4(a^3D)4p$	a^2D - $^2D^o$	5/2 - 5/2		958
	50	540.896	74.1331 - 259.01148	$3d^5$ - $3d^4(b^3P)4p$	b^2D - $^2P^o$	5/2 - 3/2		958
	50	540.939	35.3333 - 220.19725	$3d^5$ - $3d^4(a^3G)4p$	a^4P - $^2F^o$	3/2 - 5/2		958
	30	541.266	52.1667 - 236.91879	$3d^5$ - $3d^4(a^1D)4p$	a^2F - $^2D^o$	5/2 - 3/2		958
	4	541.342	35.3333 - 220.05933	$3d^5$ - $3d^4(a^3F)4p$	a^4P - $^4D^o$	3/2 - 1/2		958
	12	541.557	35.4066 - 220.05933	$3d^5$ - $3d^4(a^3F)4p$	a^4P - $^4D^o$	1/2 - 1/2		958
	4	541.751	52.6954 - 237.28309	$3d^5$ - $3d^4(a^1D)4p$	a^4F - $^2D^o$	7/2 - 5/2		958
	12	541.789	35.2538 - 219.82661	$3d^5$ - $3d^4(a^3F)4p$	a^4P - $^4D^o$	5/2 - 5/2		958
	200	542.028	35.3333 - 219.82661	$3d^5$ - $3d^4(a^3F)4p$	a^4P - $^4D^o$	3/2 - 5/2		958
	150	542.163	35.2538 - 219.70053	$3d^5$ - $3d^4(a^3F)4p$	a^4P - $^4D^o$	5/2 - 7/2		958
	4	542.240	35.4066 - 219.82661	$3d^5$ - $3d^4(a^3F)4p$	a^4P - $^4D^o$	1/2 - 3/2		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	50	542.483	35.2538 - 219.59084	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^4D^o$	5/2 - 5/2		958
	110	542.720	35.3333 - 219.59084	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^4D^o$	3/2 - 5/2		958
	110	542.756	49.5415 - 233.78672	$3d^5 - 3d^4(a^1S)4p$	$a^2D - {}^2P^o$	5/2 - 3/2		958
	80	542.770	49.5415 - 233.78086	$3d^5 - 3d^4(a^3D)4p$	$a^2D - {}^2F^o$	5/2 - 7/2		958
	30	543.078	32.2928 - 216.42844	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^2G^o$	9/2 - 9/2		958
	30	543.116	32.3057 - 216.42844	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^2G^o$	7/2 - 9/2		958
	1	543.245	52.8380 - 236.91879	$3d^5 - 3d^4(a^1D)4p$	$a^4F - {}^2D^o$	5/2 - 3/2		958
	50	543.315	50.0514 - 234.10672	$3d^5 - 3d^4(a^3D)4p$	$a^2D - {}^2F^o$	3/2 - 5/2		958
	4	543.635	38.9351 - 222.88023	$3d^5 - 3d^4(a^3P)4p$	$a^4D - {}^2D^o$	5/2 - 5/2		958
	12	543.691	35.4066 - 219.33390	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^2P^o$	1/2 - 1/2		958
	80	543.845	50.0514 - 233.92712	$3d^5 - 3d^4(a^1S)4p$	$a^2D - {}^2P^o$	3/2 - 1/2		958
	50	543.956	35.2538 - 219.09167	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^2D^o$	5/2 - 3/2		958
	1	544.056	32.3057 - 216.11169	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^2G^o$	7/2 - 7/2		958
	300	544.196	32.2455 - 216.00272	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G^o$	11/2 - 11/2		958
	30	544.257	50.0514 - 233.78672	$3d^5 - 3d^4(a^1S)4p$	$a^2D - {}^2P^o$	3/2 - 3/2		958
	30	544.336	32.2928 - 216.00272	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G^o$	9/2 - 11/2		958
	30	544.409	35.4066 - 219.09167	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^2D^o$	1/2 - 3/2		958
	4	544.609	35.2538 - 218.87121	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^2D^o$	5/2 - 5/2		958
	4	544.658	61.1565 - 244.75925	$3d^5 - 3d^4(a^1F)4p$	$b^2F - {}^2G^o$	5/2 - 7/2		958
	12	544.768	32.2455 - 215.80891	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4I^o$	11/2 - 11/2		958
	50	544.911	32.2928 - 215.80891	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4I^o$	9/2 - 11/2		958
	12	545.377	35.2538 - 218.61388	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4S^o$	5/2 - 3/2		958
	12	545.602	35.3333 - 218.61388	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4S^o$	3/2 - 3/2		958
	30	545.829	35.4066 - 218.61388	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4S^o$	1/2 - 3/2		958
	80	546.031	32.2455 - 215.38523	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G^o$	11/2 - 9/2		958
	80	546.135	47.0905 - 230.19502	$3d^5 - 3d^4(a^1I)4p$	$a^2I - {}^2K^o$	13/2 - 15/2		958
	30	546.167	32.2928 - 215.38523	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G^o$	9/2 - 9/2		958
	300	546.216	51.3942 - 234.47200	$3d^5 - 3d^4(a^3D)4p$	$a^2F - {}^2D^o$	7/2 - 5/2		958
	30	546.408	56.0583 - 239.07140	$3d^5 - 3d^4(a^1D)4p$	$a^2H - {}^2F^o$	9/2 - 7/2		958
	12	546.622	35.2538 - 218.19566	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^4F^o$	5/2 - 5/2		958
	50	546.715	32.2455 - 215.15569	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4I^o$	11/2 - 9/2		958
	4	546.857	32.2928 - 215.15569	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4I^o$	9/2 - 9/2		958
	50	546.897	32.3057 - 215.15569	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4I^o$	7/2 - 9/2		958
	80	546.995	52.1667 - 234.98435	$3d^5 - 3d^4(a^3D)4p$	$a^2F - {}^2D^o$	5/2 - 3/2		958
	30	547.136	35.2538 - 218.02381	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4P^o$	5/2 - 5/2		958
	30	547.222	32.2928 - 215.03381	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G^o$	9/2 - 7/2		958
	30	547.254	32.3057 - 215.03381	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G^o$	7/2 - 7/2		958
	12	547.373	35.3333 - 218.02381	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4P^o$	3/2 - 5/2		958
	12	547.673	35.2538 - 217.84529	$3d^5 - 3d^4(a^3H)4p$	$a^4P - {}^4G^o$	5/2 - 5/2		958
	110	547.744	38.7794 - 221.34606	$3d^5 - 3d^4(a^3G)4p$	$a^4D - {}^4F^o$	7/2 - 7/2		958
	12	547.818	38.7794 - 221.32054	$3d^5 - 3d^4(a^3G)4p$	$a^4D - {}^4F^o$	7/2 - 5/2		958
	80	547.887	32.3012 - 214.82174	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G^o$	5/2 - 5/2		958
	30	547.901	32.3057 - 214.82174	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G^o$	7/2 - 5/2		958
	50	548.029	82.8973 - 265.36948	$3d^5 - 3d^4(b^1G)4p$	$b^2G - {}^2F^o$	7/2 - 5/2		958
	250	548.066	38.7794 - 221.23921	$3d^5 - 3d^4(a^3G)4p$	$a^4D - {}^4F^o$	7/2 - 9/2		958
	150	548.211	38.9351 - 221.34606	$3d^5 - 3d^4(a^3G)4p$	$a^4D - {}^4F^o$	5/2 - 7/2		958
	4	548.265	47.0786 - 229.47283	$3d^5 - 3d^4(a^1I)4p$	$a^2I - {}^2K^o$	11/2 - 13/2		958
	250	548.298	38.9382 - 221.32054	$3d^5 - 3d^4(a^3G)4p$	$a^4D - {}^4F^o$	3/2 - 5/2		958
	150	548.474	38.8967 - 221.21929	$3d^5 - 3d^4(a^3G)4p$	$a^4D - {}^4F^o$	1/2 - 3/2		958
	110	548.605	38.9382 - 221.21929	$3d^5 - 3d^4(a^3G)4p$	$a^4D - {}^4F^o$	3/2 - 3/2		958
	30	548.627	35.3333 - 217.60771	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^2S^o$	3/2 - 1/2		958
	12	548.763	47.0786 - 229.30661	$3d^5 - 3d^4(a^1G)4p$	$a^2I - {}^2H^o$	11/2 - 11/2		958
	300	548.801	47.0905 - 229.30661	$3d^5 - 3d^4(a^1G)4p$	$a^2I - {}^2H^o$	13/2 - 11/2		958
	80	548.878	82.8949 - 265.08477	$3d^5 - 3d^4(b^1G)4p$	$b^2G - {}^2F^o$	9/2 - 7/2		958
	4	549.012	52.8380 - 234.98435	$3d^5 - 3d^4(a^3D)4p$	$a^4F - {}^2D^o$	5/2 - 3/2		958
	1	549.628	52.1667 - 234.10672	$3d^5 - 3d^4(a^3D)4p$	$a^2F - {}^2F^o$	5/2 - 5/2		958
	50	549.843	38.7794 - 220.64922	$3d^5 - 3d^4(a^3G)4p$	$a^4D - {}^2F^o$	7/2 - 7/2		958
	4	550.030	61.1565 - 242.96562	$3d^5 - 3d^4(a^1F)4p$	$b^2F - {}^2F^o$	5/2 - 7/2		958
	110	550.122	35.2538 - 217.03189	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4P^o$	5/2 - 3/2		958
	375	550.315	47.0786 - 228.79386	$3d^5 - 3d^4(a^1G)4p$	$a^2I - {}^2H^o$	11/2 - 9/2		958
	4	550.464	57.4080 - 239.07140	$3d^5 - 3d^4(a^1D)4p$	$a^2G - {}^2F^o$	7/2 - 7/2		958
	30	550.584	35.4066 - 217.03189	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4P^o$	1/2 - 3/2		958
	12	550.617	52.1667 - 233.78086	$3d^5 - 3d^4(a^3D)4p$	$a^2F - {}^2F^o$	5/2 - 7/2		958
	4	550.728	108.2421 - 289.81877	$3d^5 - 3d^4(b^1D)4p$	$c^2D - {}^2D^o$	5/2 - 5/2		958
	150	551.094	61.1565 - 242.61460	$3d^5 - 3d^4(a^1F)4p$	$b^2F - {}^2F^o$	5/2 - 5/2		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	551.188	38.9351 - 220.36044	$3d^5$ - $3d^4(a^3P)4p$	a^4D - $^2P^o$	5/2 - 3/2		958
	200	551.421	57.7212 - 239.07140	$3d^5$ - $3d^4(a^1D)4p$	a^2G - $^2F^o$	9/2 - 7/2		958
	80	551.689	38.9382 - 220.19725	$3d^5$ - $3d^4(a^3G)4p$	a^4D - $^2F^o$	3/2 - 5/2		958
	300	551.766	47.0786 - 228.31503	$3d^5$ - $3d^4(a^1I)4p$	a^2I - $^2I^o$	11/2 - 11/2		958
	12	551.993	38.8967 - 220.05933	$3d^5$ - $3d^4(a^3F)4p$	a^4D - $^4D^o$	1/2 - 1/2		958
	4	552.050	32.3012 - 213.44505	$3d^5$ - $3d^4(a^3P)4p$	a^4G - $^4D^o$	5/2 - 3/2		958
	50	552.106	47.0786 - 228.20433	$3d^5$ - $3d^4(a^1I)4p$	a^2I - $^2I^o$	11/2 - 13/2		958
	520	552.142	47.0905 - 228.20433	$3d^5$ - $3d^4(a^1I)4p$	a^2I - $^2I^o$	13/2 - 13/2		958
	200	552.168	57.4080 - 238.51284	$3d^5$ - $3d^4(a^1D)4p$	a^2G - $^2F^o$	7/2 - 5/2		958
	50	552.543	82.8949 - 263.87691	$3d^5$ - $3d^4(b^1G)4p$	b^2G - $^2G^o$	9/2 - 9/2		958
	4	552.705	38.8967 - 219.82661	$3d^5$ - $3d^4(a^3F)4p$	a^4D - $^4D^o$	1/2 - 3/2		958
	375	552.739	32.2455 - 213.16259	$3d^5$ - $3d^4(a^3H)4p$	a^4G - $^4H^o$	11/2 - 13/2		958
	80	552.827	38.9382 - 219.82661	$3d^5$ - $3d^4(a^3F)4p$	a^4D - $^4D^o$	3/2 - 3/2		958
	4	553.063	38.7794 - 219.59084	$3d^5$ - $3d^4(a^3F)4p$	a^4D - $^4D^o$	7/2 - 5/2		958
	30	553.201	38.9351 - 219.70053	$3d^5$ - $3d^4(a^3F)4p$	a^4D - $^4D^o$	5/2 - 7/2		958
	50	553.549	38.9382 - 219.59084	$3d^5$ - $3d^4(a^3F)4p$	a^4D - $^4D^o$	3/2 - 5/2		958
	12	553.590	100.1180 - 280.75837	$3d^5$ - $3d^4(b^1D)4p$	a^2P - $^2P^o$	3/2 - 3/2		958
	30	553.935	35.3333 - 215.86050	$3d^5$ - $3d^4(a^3P)4p$	a^4P - $^4P^o$	3/2 - 1/2		958
	12	554.114	32.2455 - 212.71437	$3d^5$ - $3d^4(a^3H)4p$	a^4G - $^4H^o$	11/2 - 11/2		958
	4	554.161	35.4066 - 215.86050	$3d^5$ - $3d^4(a^3P)4p$	a^4P - $^4P^o$	1/2 - 1/2		958
	300	554.257	32.2928 - 212.71437	$3d^5$ - $3d^4(a^3H)4p$	a^4G - $^4H^o$	9/2 - 11/2		958
	80	554.292	51.3942 - 231.80400	$3d^5$ - $3d^4(a^1G)4p$	a^2F - $^2G^o$	7/2 - 9/2		958
	12	554.335	38.9382 - 219.33390	$3d^5$ - $3d^4(a^3P)4p$	a^4D - $^2P^o$	3/2 - 1/2		958
	50	555.254	82.8973 - 262.99501	$3d^5$ - $3d^4(b^1G)4p$	b^2G - $^2G^o$	7/2 - 7/2		958
	1	555.306	32.2928 - 212.37404	$3d^5$ - $3d^4(a^3H)4p$	a^4G - $^4H^o$	9/2 - 9/2		958
	250	555.345	32.3057 - 212.37404	$3d^5$ - $3d^4(a^3H)4p$	a^4G - $^4H^o$	7/2 - 9/2		958
	300	555.658	35.2538 - 215.22067	$3d^5$ - $3d^4(a^3P)4p$	a^4P - $^4D^o$	5/2 - 7/2		958
	4	555.938	57.4080 - 237.28309	$3d^5$ - $3d^4(a^1D)4p$	a^2G - $^2D^o$	7/2 - 5/2		958
	150	556.065	32.3012 - 212.13579	$3d^5$ - $3d^4(a^3H)4p$	a^4G - $^4H^o$	5/2 - 7/2		958
	4	556.199	74.1331 - 253.92359	$3d^5$ - $3d^4(b^3F)4p$	b^2D - $^2F^o$	5/2 - 7/2		958
	12	556.260	74.0966 - 253.86843	$3d^5$ - $3d^4(b^3P)4p$	b^2D - $^2D^o$	3/2 - 3/2		958
	1	556.374	74.1331 - 253.86843	$3d^5$ - $3d^4(b^3P)4p$	b^2D - $^2D^o$	5/2 - 3/2		958
	4	556.551	38.9351 - 218.61388	$3d^5$ - $3d^4(a^3P)4p$	a^4D - $^4S^o$	5/2 - 3/2		958
	30	556.601	82.8973 - 262.55777	$3d^5$ - $3d^4(b^1G)4p$	b^2G - $^2H^o$	7/2 - 9/2		958
	12	556.797	49.5415 - 229.13890	$3d^5$ - $3d^4(a^1G)4p$	a^2D - $^2F^o$	5/2 - 5/2		958
	30	557.281	74.1331 - 253.57565	$3d^5$ - $3d^4(b^3P)4p$	b^2D - $^2D^o$	5/2 - 5/2		958
	12	557.360	38.7794 - 218.19566	$3d^5$ - $3d^4(a^3F)4p$	a^4D - $^4F^o$	7/2 - 5/2		958
	12	557.700	52.1667 - 231.47332	$3d^5$ - $3d^4(a^1G)4p$	a^2F - $^2G^o$	5/2 - 7/2		958
	12	557.853	38.9382 - 218.19566	$3d^5$ - $3d^4(a^3F)4p$	a^4D - $^4F^o$	3/2 - 5/2		958
	80	557.895	38.7794 - 218.02381	$3d^5$ - $3d^4(a^3P)4p$	a^4D - $^4P^o$	7/2 - 5/2		958
	1	558.280	74.1331 - 253.25437	$3d^5$ - $3d^4(b^3F)4p$	b^2D - $^4G^o$	5/2 - 7/2		958
	50	558.383	50.0514 - 229.13890	$3d^5$ - $3d^4(a^1G)4p$	a^2D - $^2F^o$	3/2 - 5/2		958
	110	558.457	35.2538 - 214.31721	$3d^5$ - $3d^4(a^3P)4p$	a^4P - $^4D^o$	5/2 - 5/2		958
	80	558.708	35.3333 - 214.31721	$3d^5$ - $3d^4(a^3P)4p$	a^4P - $^4D^o$	3/2 - 5/2		958
	4	558.943	38.9382 - 217.84529	$3d^5$ - $3d^4(a^3H)4p$	a^4D - $^4G^o$	3/2 - 5/2		958
	12	558.984	50.0514 - 228.94659	$3d^5$ - $3d^4(a^3D)4p$	a^2D - $^2P^o$	3/2 - 1/2		958
	1	559.433	74.1331 - 252.88448	$3d^5$ - $3d^4(b^3F)4p$	b^2D - $^4G^o$	5/2 - 5/2		958
	4	559.558	38.8967 - 217.60771	$3d^5$ - $3d^4(a^3P)4p$	a^4D - $^2S^o$	1/2 - 1/2		958
	50	559.742	49.5415 - 228.19367	$3d^5$ - $3d^4(a^1G)4p$	a^2D - $^2F^o$	5/2 - 7/2		958
	4	561.192	35.2538 - 213.44505	$3d^5$ - $3d^4(a^3P)4p$	a^4P - $^4D^o$	5/2 - 3/2		958
	1	561.373	38.8967 - 217.03189	$3d^5$ - $3d^4(a^3P)4p$	a^4D - $^4P^o$	1/2 - 3/2		958
	50	561.447	35.3333 - 213.44505	$3d^5$ - $3d^4(a^3P)4p$	a^4P - $^4D^o$	3/2 - 3/2		958
	80	561.494	38.9351 - 217.03189	$3d^5$ - $3d^4(a^3P)4p$	a^4D - $^4P^o$	5/2 - 3/2		958
	30	561.678	35.4066 - 213.44505	$3d^5$ - $3d^4(a^3P)4p$	a^4P - $^4D^o$	1/2 - 3/2		958
	1	562.294	108.2421 - 286.08472	$3d^5$ - $3d^4(b^1D)4p$	c^2D - $^2F^o$	5/2 - 7/2		958
	1	562.348	74.1331 - 251.95894	$3d^5$ - $3d^4(b^3P)4p$	b^2D - $^4P^o$	5/2 - 5/2		958
	12	562.492	47.0905 - 224.87085	$3d^5$ - $3d^4(a^3G)4p$	a^2I - $^4G^o$	13/2 - 11/2		958
	150	562.607	56.0583 - 233.80212	$3d^5$ - $3d^4(a^1I)4p$	a^2H - $^2H^o$	9/2 - 9/2		958
	4	563.443	35.3333 - 212.81266	$3d^5$ - $3d^4(a^3P)4p$	a^4P - $^4D^o$	3/2 - 1/2		958
	4	563.589	56.3688 - 233.80212	$3d^5$ - $3d^4(a^1I)4p$	a^2H - $^2H^o$	11/2 - 9/2		958
	30	563.679	35.4066 - 212.81266	$3d^5$ - $3d^4(a^3P)4p$	a^4P - $^4D^o$	1/2 - 1/2		958
	30	564.141	52.1667 - 229.42891	$3d^5$ - $3d^4(a^3D)4p$	a^2F - $^2P^o$	5/2 - 3/2		958
	12	564.285	56.0583 - 233.27284	$3d^5$ - $3d^4(a^1I)4p$	a^2H - $^2H^o$	9/2 - 11/2		958
	200	565.062	52.1667 - 229.13890	$3d^5$ - $3d^4(a^1G)4p$	a^2F - $^2F^o$	5/2 - 5/2		958
	30	565.220	38.9382 - 215.86050	$3d^5$ - $3d^4(a^3P)4p$	a^4D - $^4P^o$	3/2 - 1/2		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	250	565.280	56.3688 - 233.27284	$3d^5$ - $3d^4(a^1I)4p$	a^2H - $^2H^o$	11/2 - 11/2		958
	80	565.374	52.6207 - 229.49474	$3d^5$ - $3d^4(a^3D)4p$	a^4F - $^4F^o$	9/2 - 9/2		958
	200	565.612	51.3942 - 228.19367	$3d^5$ - $3d^4(a^1G)4p$	a^2F - $^2F^o$	7/2 - 7/2		958
	50	566.034	47.0786 - 223.74582	$3d^5$ - $3d^4(a^3G)4p$	a^2I - $^2H^o$	11/2 - 9/2		958
	30	566.274	52.6954 - 229.28802	$3d^5$ - $3d^4(a^3D)4p$	a^4F - $^4F^o$	7/2 - 7/2		958
	30	566.406	47.0786 - 223.62959	$3d^5$ - $3d^4(a^3F)4p$	a^2I - $^2G^o$	11/2 - 9/2		958
	12	566.699	47.0905 - 223.55014	$3d^5$ - $3d^4(a^3G)4p$	a^2I - $^2H^o$	13/2 - 11/2		958
	80	566.912	57.4080 - 233.80212	$3d^5$ - $3d^4(a^1I)4p$	a^2G - $^2H^o$	7/2 - 9/2		958
	12	566.994	52.6954 - 229.06258	$3d^5$ - $3d^4(a^3D)4p$	a^4F - $^4F^o$	7/2 - 5/2		958
	30	567.211	52.8380 - 229.13890	$3d^5$ - $3d^4(a^1G)4p$	a^4F - $^2F^o$	5/2 - 5/2		958
	50	567.323	51.3942 - 227.66025	$3d^5$ - $3d^4(a^3G)4p$	a^2F - $^2G^o$	7/2 - 9/2		958
	4	567.457	52.8380 - 229.06258	$3d^5$ - $3d^4(a^3D)4p$	a^4F - $^4F^o$	5/2 - 5/2		958
	12	567.500	51.3942 - 227.60473	$3d^5$ - $3d^4(a^3G)4p$	a^2F - $^2G^o$	7/2 - 7/2		958
	80	567.718	82.8973 - 259.03972	$3d^5$ - $3d^4(b^3F)4p$	b^2G - $^2G^o$	7/2 - 7/2		958
	4	567.769	61.1565 - 237.28309	$3d^5$ - $3d^4(a^1D)4p$	b^2F - $^2D^o$	5/2 - 5/2		958
	50	567.919	57.7212 - 233.80212	$3d^5$ - $3d^4(a^1I)4p$	a^2G - $^2H^o$	9/2 - 9/2		958
	12	567.987	57.7212 - 233.78086	$3d^5$ - $3d^4(a^3D)4p$	a^2G - $^2F^o$	9/2 - 7/2		958
	200	568.091	61.2544 - 237.28309	$3d^5$ - $3d^4(a^1D)4p$	b^2F - $^2D^o$	7/2 - 5/2		958
	110	568.951	61.1565 - 236.91879	$3d^5$ - $3d^4(a^1D)4p$	b^2F - $^2D^o$	5/2 - 3/2		958
	110	569.246	82.8949 - 258.56602	$3d^5$ - $3d^4(b^3F)4p$	b^2G - $^2G^o$	9/2 - 9/2		958
	50	569.634	57.7212 - 233.27284	$3d^5$ - $3d^4(a^1I)4p$	a^2G - $^2H^o$	9/2 - 11/2		958
	200	569.672	66.7201 - 242.25925	$3d^5$ - $3d^4(a^1D)4p$	a^2S - $^2P^o$	1/2 - 3/2		958
	200	570.010	56.3688 - 231.80400	$3d^5$ - $3d^4(a^1G)4p$	a^2H - $^2G^o$	11/2 - 9/2		958
	200	570.075	56.0583 - 231.47332	$3d^5$ - $3d^4(a^1G)4p$	a^2H - $^2G^o$	9/2 - 7/2		958
	30	571.215	47.0905 - 222.15499	$3d^5$ - $3d^4(a^3G)4p$	a^2I - $^4H^o$	13/2 - 13/2		958
	4	572.189	52.8380 - 227.60473	$3d^5$ - $3d^4(a^3G)4p$	a^4F - $^2G^o$	5/2 - 7/2		958
	80	572.613	52.6207 - 227.25880	$3d^5$ - $3d^4(a^3D)4p$	a^4F - $^4D^o$	9/2 - 7/2		958
	300	572.878	47.0905 - 221.64749	$3d^5$ - $3d^4(a^3G)4p$	a^2I - $^4H^o$	13/2 - 11/2		958
	4	573.050	49.5415 - 224.04602	$3d^5$ - $3d^4(a^3F)4p$	a^2D - $^2F^o$	5/2 - 7/2		958
	30	573.759	52.6954 - 226.98358	$3d^5$ - $3d^4(a^3D)4p$	a^4F - $^4D^o$	7/2 - 5/2		958
	12	574.232	52.8380 - 226.98358	$3d^5$ - $3d^4(a^3D)4p$	a^4F - $^4D^o$	5/2 - 5/2		958
	110	574.441	57.7212 - 231.80400	$3d^5$ - $3d^4(a^1G)4p$	a^2G - $^2G^o$	9/2 - 9/2		958
	200	574.480	47.0905 - 221.16102	$3d^5$ - $3d^4(a^3H)4p$	a^2I - $^2H^o$	13/2 - 11/2	P	958
	50	574.497	57.4080 - 231.47332	$3d^5$ - $3d^4(a^1G)4p$	a^2G - $^2G^o$	7/2 - 7/2	P	958
	12	574.533	52.8380 - 226.89210	$3d^5$ - $3d^4(a^3D)4p$	a^4F - $^4D^o$	5/2 - 3/2		958
	80	574.626	47.0786 - 221.10417	$3d^5$ - $3d^4(a^3G)4p$	a^2I - $^4H^o$	11/2 - 9/2		958
	4	574.770	74.0966 - 248.07797	$3d^5$ - $3d^4(a^1F)4p$	b^2D - $^2D^o$	3/2 - 3/2		958
	1	575.185	49.5415 - 223.39862	$3d^5$ - $3d^4(a^3F)4p$	a^2D - $^2G^o$	5/2 - 7/2		958
	80	575.281	61.1565 - 234.98435	$3d^5$ - $3d^4(a^3D)4p$	b^2F - $^2D^o$	5/2 - 3/2		958
	4	575.534	57.7212 - 231.47332	$3d^5$ - $3d^4(a^1G)4p$	a^2G - $^2G^o$	9/2 - 7/2		958
	12	576.609	50.0514 - 223.47896	$3d^5$ - $3d^4(a^3F)4p$	a^2D - $^2F^o$	3/2 - 5/2		958
	300	576.758	47.0786 - 220.46133	$3d^5$ - $3d^4(a^3H)4p$	a^2I - $^2H^o$	11/2 - 9/2		958
	80	576.903	49.5415 - 222.88023	$3d^5$ - $3d^4(a^3P)4p$	a^2D - $^2D^o$	5/2 - 5/2		958
	80	577.308	61.2544 - 234.47200	$3d^5$ - $3d^4(a^3D)4p$	b^2F - $^2D^o$	7/2 - 5/2		958
	4	577.336						958
	30	577.687	56.3688 - 229.47283	$3d^5$ - $3d^4(a^1I)4p$	a^2H - $^2K^o$	11/2 - 13/2		958
	12	578.199	61.1565 - 234.10672	$3d^5$ - $3d^4(a^3D)4p$	b^2F - $^2F^o$	5/2 - 5/2		958
	110	578.243	56.3688 - 229.30661	$3d^5$ - $3d^4(a^1G)4p$	a^2H - $^2H^o$	11/2 - 11/2		958
	4	578.511	74.1331 - 246.99080	$3d^5$ - $3d^4(a^1F)4p$	b^2D - $^2D^o$	5/2 - 5/2		958
	12	578.604	50.0514 - 222.88023	$3d^5$ - $3d^4(a^3P)4p$	a^2D - $^2D^o$	3/2 - 5/2		958
	50	578.921	56.0583 - 228.79386	$3d^5$ - $3d^4(a^1G)4p$	a^2H - $^2H^o$	9/2 - 9/2		958
	250	579.543	47.0905 - 219.64076	$3d^5$ - $3d^4(a^3H)4p$	a^2I - $^2I^o$	13/2 - 13/2		958
	12	579.624	61.2544 - 233.78086	$3d^5$ - $3d^4(a^3D)4p$	b^2F - $^2F^o$	7/2 - 7/2		958
	300	579.758	47.0786 - 219.56446	$3d^5$ - $3d^4(a^3H)4p$	a^2I - $^2I^o$	11/2 - 11/2		958
	50	579.783	49.5415 - 222.02009	$3d^5$ - $3d^4(a^3P)4p$	a^2D - $^2D^o$	5/2 - 3/2		958
	4	579.956	56.3688 - 228.79386	$3d^5$ - $3d^4(a^1G)4p$	a^2H - $^2H^o$	11/2 - 9/2		958
	50	580.211	51.3942 - 223.74582	$3d^5$ - $3d^4(a^3G)4p$	a^2F - $^2H^o$	7/2 - 9/2		958
	12	580.531	56.0583 - 228.31503	$3d^5$ - $3d^4(a^1I)4p$	a^2H - $^2I^o$	9/2 - 11/2		958
	250	580.551	52.6207 - 224.87085	$3d^5$ - $3d^4(a^3G)4p$	a^4F - $^4G^o$	9/2 - 11/2		958
	4	580.595	51.3942 - 223.62959	$3d^5$ - $3d^4(a^3F)4p$	a^2F - $^2G^o$	7/2 - 9/2		958
	1	581.112	51.3942 - 223.47896	$3d^5$ - $3d^4(a^3F)4p$	a^2F - $^2F^o$	7/2 - 5/2		958
	1	581.176	52.1667 - 224.23060	$3d^5$ - $3d^4(a^3G)4p$	a^2F - $^4G^o$	5/2 - 7/2		958
	80	581.502	50.0514 - 222.02009	$3d^5$ - $3d^4(a^3P)4p$	a^2D - $^2D^o$	3/2 - 3/2		958
	30	581.543	52.6207 - 224.57643	$3d^5$ - $3d^4(a^3G)4p$	a^4F - $^4G^o$	9/2 - 9/2		958
	150	581.798	52.6954 - 224.57643	$3d^5$ - $3d^4(a^3G)4p$	a^4F - $^4G^o$	7/2 - 9/2		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	50	581.950	56.3688 - 228.20433	$3d^5 - 3d^4(a^1I)4p$	$a^2H - {}^2I^o$	$\frac{11}{2} - \frac{13}{2}$		958
	1	582.142	49.5415 - 221.32054	$3d^5 - 3d^4(a^3G)4p$	$a^2D - {}^4F^o$	$\frac{5}{2} - \frac{3}{2}$		958
	4	582.306	57.4080 - 229.13890	$3d^5 - 3d^4(a^1G)4p$	$a^2G - {}^2F^o$	$\frac{7}{2} - \frac{5}{2}$		958
	1	582.480	49.5415 - 221.21929	$3d^5 - 3d^4(a^3G)4p$	$a^2D - {}^4F^o$	$\frac{3}{2} - \frac{3}{2}$		958
	1	582.567	57.4080 - 229.06258	$3d^5 - 3d^4(a^3D)4p$	$a^2G - {}^4F^o$	$\frac{7}{2} - \frac{5}{2}$		958
	12	582.742	56.0583 - 227.66025	$3d^5 - 3d^4(a^1G)4p$	$a^2H - {}^2G^o$	$\frac{9}{2} - \frac{9}{2}$		958
	50	582.972	52.6954 - 224.23060	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4G^o$	$\frac{7}{2} - \frac{7}{2}$		958
	150	583.138	51.3942 - 222.88023	$3d^5 - 3d^4(a^3P)4p$	$a^2F - {}^2D^o$	$\frac{5}{2} - \frac{5}{2}$		958
	4	583.342	52.6207 - 224.04602	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^2F^o$	$\frac{5}{2} - \frac{7}{2}$		958
	110	583.458	52.8380 - 224.23060	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4G^o$	$\frac{5}{2} - \frac{7}{2}$		958
	12	583.799	56.3688 - 227.66025	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^2G^o$	$\frac{11}{2} - \frac{9}{2}$		958
	50	583.869	82.8973 - 254.16913	$3d^5 - 3d^4(b^3F)4p$	$b^2G - {}^2F^o$	$\frac{7}{2} - \frac{5}{2}$		958
	80	584.002	52.1667 - 223.39862	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^2G^o$	$\frac{5}{2} - \frac{7}{2}$		958
	110	584.083	52.8371 - 224.04596	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4G^o$	$\frac{3}{2} - \frac{5}{2}$		958
	50	584.222	50.0514 - 221.21929	$3d^5 - 3d^4(a^3G)4p$	$a^2D - {}^4F^o$	$\frac{5}{2} - \frac{5}{2}$		958
	12	584.366	52.6207 - 223.74582	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^2H^o$	$\frac{9}{2} - \frac{9}{2}$		958
	110	584.428	49.5415 - 220.64922	$3d^5 - 3d^4(a^3G)4p$	$a^2D - {}^2F^o$	$\frac{5}{2} - \frac{5}{2}$		958
	30	584.542	57.7212 - 228.79386	$3d^5 - 3d^4(a^1G)4p$	$a^2G - {}^2H^o$	$\frac{9}{2} - \frac{9}{2}$		958
	30	584.623	52.6954 - 223.74582	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^2H^o$	$\frac{7}{2} - \frac{9}{2}$		958
	80	584.698	82.8949 - 253.92359	$3d^5 - 3d^4(b^3F)4p$	$b^2G - {}^2F^o$	$\frac{7}{2} - \frac{7}{2}$		958
	150	585.036	52.6207 - 223.55014	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^2H^o$	$\frac{9}{2} - \frac{11}{2}$		958
	80	585.416	49.5415 - 220.36044	$3d^5 - 3d^4(a^3P)4p$	$a^2D - {}^2P^o$	$\frac{3}{2} - \frac{3}{2}$		958
	50	585.777	52.1667 - 222.88023	$3d^5 - 3d^4(a^3P)4p$	$a^2F - {}^2D^o$	$\frac{5}{2} - \frac{5}{2}$		958
	30	585.976	49.5415 - 220.19725	$3d^5 - 3d^4(a^3G)4p$	$a^2D - {}^2F^o$	$\frac{3}{2} - \frac{5}{2}$		958
	1	586.018	52.8371 - 223.47896	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^2F^o$	$\frac{3}{2} - \frac{5}{2}$		958
	1	586.184	57.7212 - 228.31503	$3d^5 - 3d^4(a^1I)4p$	$a^2G - {}^2I^o$	$\frac{9}{2} - \frac{11}{2}$		958
	12	586.337	61.2544 - 231.80400	$3d^5 - 3d^4(a^1G)4p$	$b^2F - {}^2G^o$	$\frac{7}{2} - \frac{9}{2}$		958
	30	586.604	57.7212 - 228.19367	$3d^5 - 3d^4(a^1G)4p$	$a^2G - {}^2F^o$	$\frac{9}{2} - \frac{7}{2}$		958
	80	586.993	82.8949 - 253.25437	$3d^5 - 3d^4(b^3F)4p$	$b^2G - {}^4G^o$	$\frac{9}{2} - \frac{7}{2}$		958
	12	587.140	61.1565 - 231.47332	$3d^5 - 3d^4(a^1G)4p$	$b^2F - {}^2G^o$	$\frac{5}{2} - \frac{7}{2}$		958
	4	587.364	57.4080 - 227.66025	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^2G^o$	$\frac{7}{2} - \frac{9}{2}$		958
	150	587.556	57.4080 - 227.60473	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^2G^o$	$\frac{9}{2} - \frac{9}{2}$		958
	30	587.686	49.5415 - 219.70053	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^4D^o$	$\frac{5}{2} - \frac{7}{2}$		958
	80	587.734	50.0514 - 220.19725	$3d^5 - 3d^4(a^3G)4p$	$a^2D - {}^2F^o$	$\frac{5}{2} - \frac{5}{2}$		958
	30	588.088	52.8380 - 222.88023	$3d^5 - 3d^4(a^3P)4p$	$a^4F - {}^2D^o$	$\frac{5}{2} - \frac{3}{2}$		958
	4	588.208	50.0514 - 220.05933	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^4D^o$	$\frac{3}{2} - \frac{1}{2}$		958
	30	588.280	82.8973 - 252.88448	$3d^5 - 3d^4(b^3F)4p$	$b^2G - {}^4G^o$	$\frac{7}{2} - \frac{5}{2}$		958
	110	588.447	57.7212 - 227.66025	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^2G^o$	$\frac{9}{2} - \frac{9}{2}$		958
	1	588.639	57.7212 - 227.60473	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^2G^o$	$\frac{7}{2} - \frac{7}{2}$		958
	110	588.745	52.1667 - 222.02009	$3d^5 - 3d^4(a^3P)4p$	$a^2F - {}^2D^o$	$\frac{5}{2} - \frac{3}{2}$		958
	30	589.795	49.5415 - 219.09167	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^2D^o$	$\frac{5}{2} - \frac{3}{2}$		958
	80	589.833	50.0514 - 219.59084	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^4D^o$	$\frac{5}{2} - \frac{5}{2}$		958
	110	590.566	49.5415 - 218.87121	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^2D^o$	$\frac{3}{2} - \frac{3}{2}$		958
	30	590.733	50.0514 - 219.33390	$3d^5 - 3d^4(a^3P)4p$	$a^2D - {}^2P^o$	$\frac{3}{2} - \frac{1}{2}$		958
	110	590.828	51.3942 - 220.64922	$3d^5 - 3d^4(a^3G)4p$	$a^2F - {}^2F^o$	$\frac{7}{2} - \frac{7}{2}$		958
	30	591.076	52.8380 - 222.02009	$3d^5 - 3d^4(a^3P)4p$	$a^4F - {}^2D^o$	$\frac{5}{2} - \frac{3}{2}$		958
	4	591.180	52.1667 - 221.32054	$3d^5 - 3d^4(a^3G)4p$	$a^2F - {}^4F^o$	$\frac{5}{2} - \frac{7}{2}$		958
	50	591.465	49.5415 - 218.61388	$3d^5 - 3d^4(a^3P)4p$	$a^2D - {}^4S^o$	$\frac{5}{2} - \frac{3}{2}$		958
	4	591.529	52.1667 - 221.21929	$3d^5 - 3d^4(a^3G)4p$	$a^2F - {}^4F^o$	$\frac{5}{2} - \frac{5}{2}$		958
	4	591.574	50.0514 - 219.09167	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^2D^o$	$\frac{3}{2} - \frac{5}{2}$		958
	1	592.300	74.1331 - 242.96562	$3d^5 - 3d^4(a^1F)4p$	$b^2D - {}^2F^o$	$\frac{5}{2} - \frac{7}{2}$		958
	4	592.371	56.0583 - 224.87085	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^4G^o$	$\frac{9}{2} - \frac{11}{2}$		958
	1	592.699	47.0905 - 215.80891	$3d^5 - 3d^4(a^3H)4p$	$a^2I - {}^4I^o$	$\frac{13}{2} - \frac{11}{2}$		958
	80	592.942	52.6954 - 221.34606	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4F^o$	$\frac{7}{2} - \frac{7}{2}$		958
	80	593.053	52.6207 - 221.23921	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4F^o$	$\frac{9}{2} - \frac{9}{2}$		958
	4	593.255	50.0514 - 218.61388	$3d^5 - 3d^4(a^3P)4p$	$a^2D - {}^4S^o$	$\frac{3}{2} - \frac{3}{2}$		958
	4	593.315	52.6954 - 221.23921	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4F^o$	$\frac{7}{2} - \frac{5}{2}$		958
	50	593.409	56.0583 - 224.57643	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^4G^o$	$\frac{9}{2} - \frac{9}{2}$		958
	110	593.533	52.8380 - 221.32054	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4F^o$	$\frac{5}{2} - \frac{7}{2}$		958
	4	593.792	52.6954 - 221.10417	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4H^o$	$\frac{7}{2} - \frac{9}{2}$		958
	30	593.888	52.8371 - 221.21929	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4F^o$	$\frac{3}{2} - \frac{3}{2}$		958
	110	594.162	49.5415 - 217.84529	$3d^5 - 3d^4(a^3H)4p$	$a^2D - {}^4G^o$	$\frac{5}{2} - \frac{5}{2}$		958
	50	594.502	56.3688 - 224.57643	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^4G^o$	$\frac{11}{2} - \frac{9}{2}$		958
	4	594.543	51.3942 - 219.59084	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^4D^o$	$\frac{7}{2} - \frac{5}{2}$		958
	30	594.626	56.0583 - 224.23060	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^4G^o$	$\frac{9}{2} - \frac{7}{2}$		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	12	594.664	74.0966 - 242.25925	$3d^5 - 3d^4(a^1D)4p$	$b^2D - {}^2P^o$	$\frac{3}{2} - \frac{3}{2}$		958
	50	594.795	74.1331 - 242.25925	$3d^5 - 3d^4(a^1D)4p$	$b^2D - {}^2P^o$	$\frac{5}{2} - \frac{3}{2}$		958
	1	594.968	47.0786 - 215.15569	$3d^5 - 3d^4(a^3H)4p$	$a^2I - {}^4I^o$	$\frac{11}{2} - \frac{9}{2}$		958
	30	595.133	52.1667 - 220.19725	$3d^5 - 3d^4(a^3G)4p$	$a^2F - {}^2F^o$	$\frac{5}{2} - \frac{5}{2}$		958
	110	595.289	61.1565 - 229.13890	$3d^5 - 3d^4(a^1G)4p$	$b^2F - {}^2F^o$	$\frac{5}{2} - \frac{5}{2}$		958
	4	595.644	61.2544 - 229.13890	$3d^5 - 3d^4(a^1G)4p$	$b^2F - {}^2F^o$	$\frac{7}{2} - \frac{5}{2}$		958
	4	595.906	52.8380 - 220.64922	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^2F^o$	$\frac{5}{2} - \frac{7}{2}$		958
	80	596.349	56.0583 - 223.74582	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^2H^o$	$\frac{9}{2} - \frac{9}{2}$		958
	1	596.446	52.1667 - 219.82661	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^4D^o$	$\frac{5}{2} - \frac{3}{2}$		958
	50	596.764	56.0583 - 223.62959	$3d^5 - 3d^4(a^3F)4p$	$a^2H - {}^2G^o$	$\frac{9}{2} - \frac{9}{2}$		958
	12	596.815	50.0514 - 217.60771	$3d^5 - 3d^4(a^3P)4p$	$a^2D - {}^2S^o$	$\frac{3}{2} - \frac{1}{2}$		958
	30	596.893	52.1667 - 219.70053	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^4D^o$	$\frac{5}{2} - \frac{7}{2}$		958
	12	597.010	52.6954 - 220.19725	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^2F^o$	$\frac{7}{2} - \frac{5}{2}$		958
	12	597.288	52.1667 - 219.59084	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^4D^o$	$\frac{5}{2} - \frac{5}{2}$		958
	110	597.321	50.0514 - 217.46619	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^4F^o$	$\frac{3}{2} - \frac{3}{2}$		958
	200	597.456	56.3688 - 223.74582	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^2H^o$	$\frac{11}{2} - \frac{9}{2}$		958
	80	597.535	35.2538 - 202.60833	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4D^o$	$\frac{5}{2} - \frac{7}{2}$		958
	200	597.589	56.0583 - 223.39862	$3d^5 - 3d^4(a^3F)4p$	$a^2H - {}^2G^o$	$\frac{9}{2} - \frac{7}{2}$		958
	110	597.871	56.3688 - 223.62959	$3d^5 - 3d^4(a^3F)4p$	$a^2H - {}^2G^o$	$\frac{11}{2} - \frac{9}{2}$		958
	12	598.062	66.7201 - 233.92712	$3d^5 - 3d^4(a^1S)4p$	$a^2S - {}^2P^o$	$\frac{1}{2} - \frac{1}{2}$		958
	80	598.156	56.3688 - 223.55014	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^2H^o$	$\frac{11}{2} - \frac{11}{2}$		958
	30	598.198	57.4080 - 224.57643	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^4G^o$	$\frac{7}{2} - \frac{9}{2}$		958
	50	598.267	57.7212 - 224.87085	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^4G^o$	$\frac{9}{2} - \frac{11}{2}$		958
	150	598.532	35.2538 - 202.32853	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4D^o$	$\frac{5}{2} - \frac{5}{2}$		958
	30	598.669	61.1565 - 228.19367	$3d^5 - 3d^4(a^1G)4p$	$b^2F - {}^2F^o$	$\frac{5}{2} - \frac{7}{2}$		958
	110	598.825	35.3333 - 202.32853	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4D^o$	$\frac{3}{2} - \frac{5}{2}$		958
	30	599.020	61.2544 - 228.19367	$3d^5 - 3d^4(a^1G)4p$	$b^2F - {}^2F^o$	$\frac{7}{2} - \frac{7}{2}$		958
	1	599.075	52.1667 - 219.09167	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^2D^o$	$\frac{5}{2} - \frac{3}{2}$		958
	12	599.180	52.6954 - 219.59084	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4D^o$	$\frac{7}{2} - \frac{5}{2}$		958
	4	599.324	57.7212 - 224.57643	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^4G^o$	$\frac{9}{2} - \frac{9}{2}$		958
	12	599.407	35.2538 - 202.08522	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4D^o$	$\frac{5}{2} - \frac{3}{2}$		958
	1	599.441	57.4080 - 224.23060	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^4G^o$	$\frac{7}{2} - \frac{7}{2}$		958
	50	599.692	35.3333 - 202.08522	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4D^o$	$\frac{3}{2} - \frac{3}{2}$		958
	30	599.958	35.4066 - 202.08522	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4D^o$	$\frac{1}{2} - \frac{3}{2}$		958
	12	600.105	57.4080 - 224.04602	$3d^5 - 3d^4(a^3F)4p$	$a^2G - {}^2F^o$	$\frac{7}{2} - \frac{7}{2}$		958
	12	600.290	35.3333 - 201.91938	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4D^o$	$\frac{3}{2} - \frac{1}{2}$		958
	80	600.348	49.5415 - 216.11169	$3d^5 - 3d^4(a^3H)4p$	$a^2D - {}^2G^o$	$\frac{5}{2} - \frac{7}{2}$		958
	50	600.557	35.4066 - 201.91938	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4D^o$	$\frac{1}{2} - \frac{1}{2}$		958
	12	600.610	52.8371 - 219.33390	$3d^5 - 3d^4(a^3P)4p$	$a^4F - {}^2P^o$	$\frac{3}{2} - \frac{1}{2}$		958
	50	600.788	61.1565 - 227.60473	$3d^5 - 3d^4(a^3G)4p$	$b^2F - {}^2G^o$	$\frac{5}{2} - \frac{7}{2}$		958
	110	600.944	61.2544 - 227.66025	$3d^5 - 3d^4(a^3G)4p$	$b^2F - {}^2G^o$	$\frac{7}{2} - \frac{9}{2}$		958
	1	601.141	61.2544 - 227.60473	$3d^5 - 3d^4(a^3G)4p$	$b^2F - {}^2G^o$	$\frac{7}{2} - \frac{7}{2}$		958
	150	601.237	57.7212 - 224.04602	$3d^5 - 3d^4(a^3F)4p$	$a^2G - {}^2F^o$	$\frac{9}{2} - \frac{7}{2}$		958
	12	601.493	52.8380 - 219.09167	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^2D^o$	$\frac{5}{2} - \frac{3}{2}$		958
	50	601.609	57.4080 - 223.62959	$3d^5 - 3d^4(a^3F)4p$	$a^2G - {}^2G^o$	$\frac{7}{2} - \frac{9}{2}$		958
	4	601.651	100.1260 - 266.33524	$3d^5 - 3d^4(b^3F)4p$	$a^2P - {}^2D^o$	$\frac{1}{2} - \frac{3}{2}$		958
	1	601.773	52.6954 - 218.87121	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^2D^o$	$\frac{7}{2} - \frac{5}{2}$		958
	150	602.155	57.4080 - 223.47896	$3d^5 - 3d^4(a^3F)4p$	$a^2G - {}^2F^o$	$\frac{7}{2} - \frac{5}{2}$		958
	80	602.295	52.1667 - 218.19566	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^4F^o$	$\frac{5}{2} - \frac{5}{2}$		958
	50	602.319	57.7212 - 223.74582	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^2H^o$	$\frac{9}{2} - \frac{9}{2}$		958
	110	602.444	57.4080 - 223.39862	$3d^5 - 3d^4(a^3F)4p$	$a^2G - {}^2G^o$	$\frac{7}{2} - \frac{7}{2}$		958
	110	602.481	52.6207 - 218.60103	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4F^o$	$\frac{9}{2} - \frac{9}{2}$		958
	50	602.744	57.7212 - 223.62959	$3d^5 - 3d^4(a^3F)4p$	$a^2G - {}^2G^o$	$\frac{9}{2} - \frac{9}{2}$		958
	80	603.033	57.7212 - 223.55014	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^2H^o$	$\frac{9}{2} - \frac{11}{2}$		958
	80	603.199	52.6954 - 218.47836	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4F^o$	$\frac{7}{2} - \frac{7}{2}$		958
	50	603.301	52.6207 - 218.37512	$3d^5 - 3d^4(a^3H)4p$	$a^4F - {}^4G^o$	$\frac{9}{2} - \frac{11}{2}$		958
	50	603.582	57.7212 - 223.39862	$3d^5 - 3d^4(a^3F)4p$	$a^2G - {}^2G^o$	$\frac{9}{2} - \frac{7}{2}$		958
	80	604.072	52.6954 - 218.23851	$3d^5 - 3d^4(a^3H)4p$	$a^4F - {}^4G^o$	$\frac{7}{2} - \frac{9}{2}$		958
	12	604.255	49.5415 - 215.03381	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^4G^o$	$\frac{5}{2} - \frac{7}{2}$		958
	30	604.750	52.8380 - 218.19566	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4F^o$	$\frac{5}{2} - \frac{5}{2}$		958
	50	604.885	52.8380 - 218.15977	$3d^5 - 3d^4(a^3H)4p$	$a^4F - {}^4G^o$	$\frac{5}{2} - \frac{7}{2}$		958
	150	605.038	56.3688 - 221.64749	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^4H^o$	$\frac{11}{2} - \frac{11}{2}$		958
	1	605.138	100.1180 - 265.36948	$3d^5 - 3d^4(b^1G)4p$	$a^2P - {}^2F^o$	$\frac{3}{2} - \frac{5}{2}$		958
	30	605.382	52.8380 - 218.02381	$3d^5 - 3d^4(a^3P)4p$	$a^4F - {}^4P^o$	$\frac{5}{2} - \frac{5}{2}$		958
	12	605.682	56.0583 - 221.16102	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^2H^o$	$\frac{9}{2} - \frac{11}{2}$		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	30	605.890	56.0583 - 221.10417	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^4H^o$	9/2 - 9/2		958
	110	605.934	51.3942 - 216.42844	$3d^5 - 3d^4(a^3H)4p$	$a^2F - {}^2G^o$	7/2 - 9/2		958
	4	606.031	52.8371 - 217.84529	$3d^5 - 3d^4(a^3H)4p$	$a^4F - {}^4G^o$	3/2 - 5/2		958
	30	606.290	74.1331 - 239.07140	$3d^5 - 3d^4(a^1D)4p$	$b^2D - {}^2F^o$	5/2 - 7/2		958
	12	606.534	56.3688 - 221.23921	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^4F^o$	11/2 - 9/2		958
	110	606.824	56.3688 - 221.16102	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^2H^o$	11/2 - 11/2		958
	1	607.036	56.3688 - 221.10417	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^4H^o$	11/2 - 9/2		958
	12	607.100	51.3942 - 216.11169	$3d^5 - 3d^4(a^3H)4p$	$a^2F - {}^2G^o$	7/2 - 7/2		958
	1	607.427	52.8371 - 217.46619	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4F^o$	3/2 - 3/2		958
	600	607.533	56.0583 - 220.65804	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^4H^o$	9/2 - 7/2		958
	80	607.702	32.2928 - 196.84682	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^4F^o$	9/2 - 9/2		958
	12	608.213	74.0966 - 238.51284	$3d^5 - 3d^4(a^1D)4p$	$b^2D - {}^2F^o$	3/2 - 5/2		958
	80	608.264	56.0583 - 220.46133	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^2H^o$	9/2 - 9/2		958
	520	608.805	32.2928 - 196.54959	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^4F^o$	9/2 - 7/2		958
	80	608.851	32.3057 - 196.54959	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^4F^o$	7/2 - 7/2		958
	300	609.648	32.3057 - 196.33463	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^4F^o$	7/2 - 5/2		958
	50	609.963	52.1667 - 216.11169	$3d^5 - 3d^4(a^3H)4p$	$a^2F - {}^2G^o$	5/2 - 7/2		958
	4	610.082	57.4080 - 221.32054	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^4F^o$	7/2 - 5/2		958
	250	610.181	32.3012 - 196.18688	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^4F^o$	5/2 - 3/2		958
	200	610.393	38.7794 - 202.60833	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4D^o$	7/2 - 7/2		958
	1	610.471	52.6207 - 216.42844	$3d^5 - 3d^4(a^3H)4p$	$a^4F - {}^2G^o$	9/2 - 9/2		958
	30	610.644	51.3942 - 215.15569	$3d^5 - 3d^4(a^3H)4p$	$a^2F - {}^4I^o$	7/2 - 9/2		958
	30	610.886	57.4080 - 221.10417	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^4H^o$	7/2 - 9/2		958
	80	610.972	38.9351 - 202.60833	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4D^o$	5/2 - 7/2		958
	50	611.436	38.7794 - 202.32853	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4D^o$	7/2 - 5/2		958
	110	611.599	56.0583 - 219.56446	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^2I^o$	9/2 - 11/2		958
	50	611.846	57.7212 - 221.16102	$3d^5 - 3d^4(a^3H)4p$	$a^2G - {}^2H^o$	9/2 - 11/2		958
	150	612.024	38.9351 - 202.32853	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4D^o$	5/2 - 5/2		958
	80	612.060	52.6207 - 216.00272	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4G^o$	9/2 - 11/2		958
	110	612.477	56.3688 - 219.64076	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^2I^o$	11/2 - 13/2		958
	1	612.555	57.4080 - 220.65804	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^4H^o$	7/2 - 7/2		958
	80	612.790	38.8967 - 202.08522	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4D^o$	1/2 - 3/2		958
	150	612.937	38.9382 - 202.08522	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4D^o$	3/2 - 3/2		958
	50	613.299	57.4080 - 220.46133	$3d^5 - 3d^4(a^3H)4p$	$a^2G - {}^2H^o$	7/2 - 9/2		958
	30	613.409	38.8967 - 201.91938	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4D^o$	1/2 - 1/2		958
	50	613.570	38.9382 - 201.91938	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4D^o$	3/2 - 1/2		958
	4	613.765	57.7212 - 220.64922	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^2F^o$	9/2 - 7/2		958
	4	613.913	61.1565 - 224.04596	$3d^5 - 3d^4(a^3G)4p$	$b^2F - {}^4G^o$	5/2 - 5/2		958
	12	614.071	82.8949 - 245.74229	$3d^5 - 3d^4(a^1F)4p$	$b^2G - {}^2G^o$	9/2 - 9/2		958
	80	614.169	74.0966 - 236.91879	$3d^5 - 3d^4(a^1D)4p$	$b^2D - {}^2D^o$	3/2 - 3/2		958
	50	614.284	57.4080 - 220.19725	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^2F^o$	7/2 - 5/2		958
	30	614.475	57.7212 - 220.46133	$3d^5 - 3d^4(a^3H)4p$	$a^2G - {}^2H^o$	9/2 - 9/2		958
	80	614.595	66.7201 - 229.42891	$3d^5 - 3d^4(a^3D)4p$	$a^2S - {}^2P^o$	1/2 - 3/2		958
	30	614.665	52.6954 - 215.38523	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4G^o$	7/2 - 9/2		958
	30	615.417	61.2544 - 223.74582	$3d^5 - 3d^4(a^3G)4p$	$b^2F - {}^2H^o$	7/2 - 9/2		958
	12	615.536	52.6954 - 215.15569	$3d^5 - 3d^4(a^3H)4p$	$a^4F - {}^4I^o$	7/2 - 9/2		958
	12	615.858	61.2544 - 223.62959	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^2G^o$	7/2 - 9/2		958
	80	616.060	61.1565 - 223.47896	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^2F^o$	5/2 - 5/2		958
	30	616.366	61.1565 - 223.39862	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^2G^o$	5/2 - 7/2		958
	50	616.404	100.1180 - 262.34836	$3d^5 - 3d^4(b^3P)4p$	$a^2P - {}^2S^o$	3/2 - 1/2		958
	30	616.438	100.1260 - 262.34836	$3d^5 - 3d^4(b^3P)4p$	$a^2P - {}^2S^o$	1/2 - 1/2		958
	30	616.538	52.8380 - 215.03381	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4G^o$	5/2 - 7/2		958
	12	616.591	56.0583 - 218.23851	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^4G^o$	9/2 - 9/2		958
	1	616.734	61.2544 - 223.39862	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^2G^o$	7/2 - 7/2		958
	1	617.264	56.3688 - 218.37512	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^4G^o$	11/2 - 11/2		958
	4	617.341	52.8371 - 214.82174	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4G^o$	3/2 - 5/2		958
	4	617.810	82.8973 - 244.75925	$3d^5 - 3d^4(a^1F)4p$	$b^2G - {}^2G^o$	7/2 - 7/2		958
	4	618.337	61.1565 - 222.88023	$3d^5 - 3d^4(a^3P)4p$	$b^2F - {}^2D^o$	5/2 - 5/2		958
	80	618.712	61.2544 - 222.88023	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^2D^o$	7/2 - 5/2		958
	50	619.032	32.2455 - 193.78919	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^6D^o$	11/2 - 9/2		958
	1	619.207	32.2928 - 193.78919	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^6D^o$	9/2 - 9/2		958
	4	619.979	35.2538 - 196.54959	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4F^o$	5/2 - 7/2		958
	12	620.756	32.2928 - 193.38617	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^6D^o$	9/2 - 7/2		958
	1	620.804	32.3057 - 193.38617	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^6D^o$	7/2 - 7/2		958
	1	621.110	35.3333 - 196.33463	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4F^o$	3/2 - 5/2		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	12	621.553	74.0966 - 234.98435	$3d^5$ - $3d^4(a^3D)4p$	b^2D - $^2D^o$	3/2 - 3/2		958
	30	621.643	61.1565 - 222.02009	$3d^5$ - $3d^4(a^3P)4p$	b^2F - $^2D^o$	5/2 - 3/2		958
	12	621.691	74.1331 - 234.98435	$3d^5$ - $3d^4(a^3D)4p$	b^2D - $^2D^o$	5/2 - 3/2		958
	30	623.680	74.1331 - 234.47200	$3d^5$ - $3d^4(a^3D)4p$	b^2D - $^2D^o$	5/2 - 5/2		958
	4	624.724	82.8949 - 242.96562	$3d^5$ - $3d^4(a^1F)4p$	b^2G - $^2F^o$	9/2 - 7/2		958
	4	624.768	56.3688 - 216.42844	$3d^5$ - $3d^4(a^3H)4p$	a^2H - $^2G^o$	11/2 - 9/2		958
	4	624.791	56.0583 - 216.11169	$3d^5$ - $3d^4(a^3H)4p$	a^2H - $^2G^o$	9/2 - 7/2		958
	30	624.960	74.0966 - 234.10672	$3d^5$ - $3d^4(a^3D)4p$	b^2D - $^2F^o$	3/2 - 5/2		958
	50	625.662	74.0966 - 233.92712	$3d^5$ - $3d^4(a^1S)4p$	b^2D - $^2P^o$	3/2 - 1/2		958
	1	626.107	82.8973 - 242.61460	$3d^5$ - $3d^4(a^1F)4p$	b^2G - $^2F^o$	7/2 - 5/2		958
	4	626.211	74.0966 - 233.78672	$3d^5$ - $3d^4(a^1S)4p$	b^2D - $^2P^o$	3/2 - 3/2		958
	40	626.356	74.1331 - 233.78672	$3d^5$ - $3d^4(a^1S)4p$	b^2D - $^2P^o$	5/2 - 3/2	P	958
	50	626.379	74.1331 - 233.78086	$3d^5$ - $3d^4(a^3D)4p$	b^2D - $^2F^o$	5/2 - 7/2	P	958
	4	627.134	100.1260 - 259.58164	$3d^5$ - $3d^4(b^3P)4p$	a^2P - $^2P^o$	1/2 - 1/2		958
	1	627.195	56.3688 - 215.80891	$3d^5$ - $3d^4(a^3H)4p$	a^2H - $^4I^o$	11/2 - 11/2		958
	30	627.373	61.2544 - 220.64922	$3d^5$ - $3d^4(a^3G)4p$	b^2F - $^2F^o$	7/2 - 7/2		958
	30	628.767	61.1565 - 220.19725	$3d^5$ - $3d^4(a^3G)4p$	b^2F - $^2F^o$	5/2 - 5/2		958
	12	629.350	100.1180 - 259.01148	$3d^5$ - $3d^4(b^3P)4p$	a^2P - $^2P^o$	3/2 - 3/2		958
	50	630.096	57.7212 - 216.42844	$3d^5$ - $3d^4(a^3H)4p$	a^2G - $^2G^o$	9/2 - 9/2		958
	12	631.130	61.2544 - 219.70053	$3d^5$ - $3d^4(a^3F)4p$	b^2F - $^4D^o$	7/2 - 7/2		958
	4	631.175	61.1565 - 219.59084	$3d^5$ - $3d^4(a^3F)4p$	b^2F - $^4D^o$	5/2 - 5/2		958
	150	631.733	35.2538 - 193.54925	$3d^5$ - $3d^4(a^5D)4p$	a^4P - $^6D^o$	5/2 - 5/2		958
	80	632.051	35.3333 - 193.54925	$3d^5$ - $3d^4(a^5D)4p$	a^4P - $^6D^o$	3/2 - 5/2		958
	4	632.539	108.2421 - 266.33524	$3d^5$ - $3d^4(b^3F)4p$	c^2D - $^2D^o$	5/2 - 3/2		958
	12	632.604	108.2583 - 266.33524	$3d^5$ - $3d^4(b^3F)4p$	c^2D - $^2D^o$	3/2 - 3/2		958
	80	632.646	38.7794 - 196.84682	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^4F^o$	7/2 - 9/2		958
	110	632.843	35.2538 - 193.27127	$3d^5$ - $3d^4(a^5D)4p$	a^4P - $^6D^o$	5/2 - 3/2		958
	50	633.159	108.2421 - 266.18109	$3d^5$ - $3d^4(b^3F)4p$	c^2D - $^2D^o$	5/2 - 5/2		958
	12	633.220	108.2583 - 266.18109	$3d^5$ - $3d^4(b^3F)4p$	c^2D - $^2D^o$	3/2 - 5/2		958
	30	633.456	35.4066 - 193.27127	$3d^5$ - $3d^4(a^5D)4p$	a^4P - $^6D^o$	1/2 - 3/2		958
	50	633.768	35.3333 - 193.12034	$3d^5$ - $3d^4(a^5D)4p$	a^4P - $^6D^o$	3/2 - 1/2		958
	30	633.832	38.7794 - 196.54959	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^4F^o$	7/2 - 7/2		958
	4	634.059	35.4066 - 193.12034	$3d^5$ - $3d^4(a^5D)4p$	a^4P - $^6D^o$	1/2 - 1/2		958
	50	634.452	38.9351 - 196.54959	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^4F^o$	5/2 - 7/2		958
	1	635.092	61.1565 - 218.61388	$3d^5$ - $3d^4(a^3P)4p$	b^2F - $^4S^o$	5/2 - 3/2		958
	12	635.184	57.7212 - 215.15569	$3d^5$ - $3d^4(a^3H)4p$	a^2G - $^4I^o$	9/2 - 9/2		958
	80	635.332	38.9382 - 196.33463	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^4F^o$	3/2 - 5/2		958
	150	635.560	35.2538 - 192.59528	$3d^5$ - $3d^4(a^5D)4p$	a^4P - $^4P^o$	5/2 - 5/2		958
	30	635.766	38.8967 - 196.18688	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^4F^o$	1/2 - 3/2		958
	50	635.881	35.3333 - 192.59528	$3d^5$ - $3d^4(a^5D)4p$	a^4P - $^4P^o$	3/2 - 5/2		958
	30	635.933	38.9382 - 196.18688	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^4F^o$	3/2 - 3/2		958
	12	636.428	108.2421 - 265.36948	$3d^5$ - $3d^4(b^1G)4p$	c^2D - $^2F^o$	5/2 - 5/2		958
	12	636.493	108.2583 - 265.36948	$3d^5$ - $3d^4(b^1G)4p$	c^2D - $^2F^o$	3/2 - 5/2		958
	80	636.928	61.1565 - 218.15977	$3d^5$ - $3d^4(a^3H)4p$	b^2F - $^4G^o$	5/2 - 7/2		958
	50	637.581	108.2421 - 265.08477	$3d^5$ - $3d^4(b^1G)4p$	c^2D - $^2F^o$	5/2 - 7/2		958
	1	638.522	32.2928 - 188.90455	$3d^5$ - $3d^4(a^5D)4p$	a^4G - $^6F^o$	9/2 - 7/2		958
	150	639.223	35.2538 - 191.69411	$3d^5$ - $3d^4(a^5D)4p$	a^4P - $^4P^o$	5/2 - 3/2		958
	12	639.547	35.3333 - 191.69411	$3d^5$ - $3d^4(a^5D)4p$	a^4P - $^4P^o$	3/2 - 3/2		958
	50	639.846	35.4066 - 191.69411	$3d^5$ - $3d^4(a^5D)4p$	a^4P - $^4P^o$	1/2 - 3/2		958
	80	642.312	35.3333 - 191.02118	$3d^5$ - $3d^4(a^5D)4p$	a^4P - $^4P^o$	3/2 - 1/2		958
	30	642.609	82.8973 - 238.51284	$3d^5$ - $3d^4(a^1D)4p$	b^2G - $^2F^o$	7/2 - 5/2		958
	4	643.931	74.1331 - 229.42891	$3d^5$ - $3d^4(a^3D)4p$	b^2D - $^2P^o$	5/2 - 3/2		958
	150	644.435	61.2544 - 216.42844	$3d^5$ - $3d^4(a^3H)4p$	b^2F - $^2G^o$	7/2 - 9/2		958
	4	644.985	74.0966 - 229.13890	$3d^5$ - $3d^4(a^1G)4p$	b^2D - $^2F^o$	3/2 - 5/2		958
	4	645.121	38.7794 - 193.78919	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^6D^o$	7/2 - 9/2		958
	80	645.349	61.1565 - 216.11169	$3d^5$ - $3d^4(a^3H)4p$	b^2F - $^2G^o$	5/2 - 7/2		958
	110	646.120	38.7794 - 193.54925	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^6D^o$	7/2 - 5/2		958
	30	646.185	35.2538 - 190.00828	$3d^5$ - $3d^4(a^5D)4p$	a^4P - $^6P^o$	5/2 - 5/2		958
	12	646.702	35.2538 - 189.88511	$3d^5$ - $3d^4(a^5D)4p$	a^4P - $^6P^o$	5/2 - 3/2		958
	50	646.771	38.9351 - 193.54925	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^6D^o$	5/2 - 5/2		958
	1	647.340	35.4066 - 189.88511	$3d^5$ - $3d^4(a^5D)4p$	a^4P - $^6P^o$	1/2 - 3/2		958
	12	647.777	38.8967 - 193.27127	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^6D^o$	1/2 - 3/2		958
	80	647.939	38.9382 - 193.27127	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^6D^o$	3/2 - 3/2		958
	12	648.408	38.8967 - 193.12034	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^6D^o$	1/2 - 1/2		958
	4	648.581	38.9382 - 193.12034	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^6D^o$	3/2 - 1/2		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	30	648.799	61.2544 - 215.38523	$3d^5$ - $3d^4(a^3F)4p$	b^2F - $^4G^o$	7/2 - 9/2		958
	12	649.766	61.2544 - 215.15569	$3d^5$ - $3d^4(a^3H)4p$	b^2F - $^4I^o$	7/2 - 9/2		958
	12	649.869	61.1565 - 215.03381	$3d^5$ - $3d^4(a^3F)4p$	b^2F - $^4G^o$	5/2 - 7/2		958
	110	650.129	38.7794 - 192.59528	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^4P^o$	7/2 - 5/2		958
	4	650.409	100.1180 - 253.86843	$3d^5$ - $3d^4(b^3P)4p$	a^2P - $^2D^o$	3/2 - 3/2		958
	30	650.439	100.1260 - 253.86843	$3d^5$ - $3d^4(b^3P)4p$	a^2P - $^2D^o$	1/2 - 3/2		958
	80	650.785	38.9351 - 192.59528	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^4P^o$	5/2 - 5/2		958
	4	651.589	74.1331 - 227.60473	$3d^5$ - $3d^4(a^3G)4p$	b^2D - $^2G^o$	5/2 - 7/2		958
	30	651.644	100.1180 - 253.57565	$3d^5$ - $3d^4(b^3P)4p$	a^2P - $^2D^o$	3/2 - 5/2		958
	4	654.460	38.8967 - 191.69411	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^4P^o$	1/2 - 3/2		958
	200	654.629	38.9351 - 191.69411	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^4P^o$	5/2 - 3/2		958
	1	655.555	49.5415 - 202.08522	$3d^5$ - $3d^4(a^5D)4p$	a^2D - $^4D^o$	5/2 - 3/2		958
	1	655.860	35.4066 - 187.87881	$3d^5$ - $3d^4(a^5D)4p$	a^4P - $^6F^o$	1/2 - 1/2		958
	50	657.357	38.8967 - 191.02118	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^4P^o$	1/2 - 1/2		958
	12	657.538	38.9382 - 191.02118	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^4P^o$	3/2 - 1/2		958
	1	657.749	50.0514 - 202.08522	$3d^5$ - $3d^4(a^5D)4p$	a^2D - $^4D^o$	3/2 - 3/2		958
	12	658.467	50.0514 - 201.91938	$3d^5$ - $3d^4(a^5D)4p$	a^2D - $^4D^o$	3/2 - 1/2		958
	4	658.582	100.1180 - 251.95894	$3d^5$ - $3d^4(b^3P)4p$	a^2P - $^4P^o$	3/2 - 3/2		958
	12	660.836	108.2583 - 259.58164	$3d^5$ - $3d^4(b^3P)4p$	c^2D - $^2P^o$	3/2 - 1/2		958
	12	661.250	38.7794 - 190.00828	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^6P^o$	7/2 - 5/2		958
	50	661.337	82.8973 - 234.10672	$3d^5$ - $3d^4(a^3D)4p$	b^2G - $^2F^o$	7/2 - 5/2		958
	1	662.475	38.9351 - 189.88511	$3d^5$ - $3d^4(a^5D)4p$	a^4D - $^6P^o$	5/2 - 3/2		958
	1	662.538	51.3942 - 202.32853	$3d^5$ - $3d^4(a^5D)4p$	a^2F - $^4D^o$	7/2 - 5/2		958
	50	662.672	82.8973 - 233.80212	$3d^5$ - $3d^4(a^1I)4p$	b^2G - $^2H^o$	9/2 - 9/2		958
	50	662.754	82.8949 - 233.78086	$3d^5$ - $3d^4(a^3D)4p$	b^2G - $^2F^o$	9/2 - 7/2		958
	30	663.264	108.2421 - 259.01148	$3d^5$ - $3d^4(b^3P)4p$	c^2D - $^2P^o$	5/2 - 3/2		958
	1	663.334	108.2583 - 259.01148	$3d^5$ - $3d^4(b^3P)4p$	c^2D - $^2P^o$	3/2 - 3/2		958
	80	664.992	82.8949 - 233.27284	$3d^5$ - $3d^4(a^1I)4p$	b^2G - $^2H^o$	9/2 - 11/2		958
	12	665.945	52.1667 - 202.32853	$3d^5$ - $3d^4(a^5D)4p$	a^2F - $^4D^o$	5/2 - 5/2		958
	1	666.236	74.1331 - 224.23060	$3d^5$ - $3d^4(a^3G)4p$	b^2D - $^4G^o$	5/2 - 7/2		958
	250	666.722	52.6207 - 202.60833	$3d^5$ - $3d^4(a^5D)4p$	a^4F - $^4D^o$	9/2 - 7/2		958
	4	666.894	74.0966 - 224.04596	$3d^5$ - $3d^4(a^3G)4p$	b^2D - $^4G^o$	3/2 - 5/2		958
	200	667.054	52.6954 - 202.60833	$3d^5$ - $3d^4(a^5D)4p$	a^4F - $^4D^o$	7/2 - 7/2		958
	1	667.689	52.8380 - 202.60833	$3d^5$ - $3d^4(a^5D)4p$	a^4F - $^4D^o$	5/2 - 7/2		958
	250	668.301	52.6954 - 202.32853	$3d^5$ - $3d^4(a^5D)4p$	a^4F - $^4D^o$	7/2 - 5/2		958
	50	668.938	52.8380 - 202.32853	$3d^5$ - $3d^4(a^5D)4p$	a^4F - $^4D^o$	5/2 - 5/2		958
	50	669.423	74.0966 - 223.47896	$3d^5$ - $3d^4(a^3F)4p$	b^2D - $^2F^o$	5/2 - 5/2		958
	1	669.585	74.1331 - 223.47896	$3d^5$ - $3d^4(a^3F)4p$	b^2D - $^2F^o$	3/2 - 5/2		958
	1	669.948	74.1331 - 223.39862	$3d^5$ - $3d^4(a^3F)4p$	b^2D - $^2G^o$	5/2 - 7/2		958
	200	670.028	52.8380 - 202.08522	$3d^5$ - $3d^4(a^5D)4p$	a^4F - $^4D^o$	5/2 - 3/2		958
	110	670.768	52.8371 - 201.91938	$3d^5$ - $3d^4(a^5D)4p$	a^4F - $^4D^o$	3/2 - 1/2		958
	12	671.549	82.8949 - 231.80400	$3d^5$ - $3d^4(a^1G)4p$	b^2G - $^2G^o$	9/2 - 9/2		958
	1	672.279	74.1331 - 222.88023	$3d^5$ - $3d^4(a^3P)4p$	b^2D - $^2D^o$	5/2 - 5/2		958
	30	673.056	82.8973 - 231.47332	$3d^5$ - $3d^4(a^1G)4p$	b^2G - $^2G^o$	7/2 - 7/2		958
	4	683.003	82.8949 - 229.30661	$3d^5$ - $3d^4(a^1G)4p$	b^2G - $^2H^o$	9/2 - 11/2		958
	1	684.293	50.0514 - 196.18688	$3d^5$ - $3d^4(a^5D)4p$	a^2D - $^4F^o$	3/2 - 3/2		958
	4	685.350	108.2583 - 254.16913	$3d^5$ - $3d^4(b^3F)4p$	c^2D - $^2F^o$	3/2 - 5/2		958
	30	685.415	82.8973 - 228.79386	$3d^5$ - $3d^4(a^1G)4p$	b^2G - $^2H^o$	7/2 - 9/2		958
	4	686.430	108.2421 - 253.92359	$3d^5$ - $3d^4(b^3F)4p$	c^2D - $^2F^o$	5/2 - 7/2		958
	1	686.764	108.2583 - 253.86843	$3d^5$ - $3d^4(b^3P)4p$	c^2D - $^2D^o$	5/2 - 3/2		958
	1	688.072	108.2421 - 253.57565	$3d^5$ - $3d^4(b^3P)4p$	c^2D - $^2D^o$	3/2 - 5/2		958
	4	688.245	82.8973 - 228.19367	$3d^5$ - $3d^4(a^1G)4p$	b^2G - $^2F^o$	7/2 - 7/2		958
	4	689.597	108.2421 - 253.25437	$3d^5$ - $3d^4(b^3F)4p$	c^2D - $^4G^o$	5/2 - 7/2		958
	1	689.678	74.0966 - 219.09167	$3d^5$ - $3d^4(a^3F)4p$	b^2D - $^2D^o$	3/2 - 3/2		958
	1	690.190	57.7212 - 202.60833	$3d^5$ - $3d^4(a^5D)4p$	a^2G - $^4D^o$	9/2 - 7/2		958
	80	690.772	82.8949 - 227.66025	$3d^5$ - $3d^4(a^3G)4p$	b^2G - $^2G^o$	9/2 - 9/2		958
	12	690.903	74.1331 - 218.87121	$3d^5$ - $3d^4(a^3F)4p$	b^2D - $^2D^o$	5/2 - 5/2		958
	50	691.051	82.8973 - 227.60473	$3d^5$ - $3d^4(a^3G)4p$	b^2G - $^2G^o$	7/2 - 7/2		958
	4	691.437	108.2583 - 252.88448	$3d^5$ - $3d^4(b^3F)4p$	c^2D - $^4G^o$	3/2 - 5/2		958
	1	692.602	52.1667 - 196.54959	$3d^5$ - $3d^4(a^5D)4p$	a^2F - $^4F^o$	5/2 - 7/2		958
	200	693.356	52.6207 - 196.84682	$3d^5$ - $3d^4(a^5D)4p$	a^4F - $^4F^o$	9/2 - 9/2		958
	12	693.635	52.1667 - 196.33463	$3d^5$ - $3d^4(a^5D)4p$	a^2F - $^4F^o$	5/2 - 5/2		958
	30	693.713	52.6954 - 196.84682	$3d^5$ - $3d^4(a^5D)4p$	a^4F - $^4F^o$	7/2 - 9/2		958
	4	694.343	52.1667 - 196.18688	$3d^5$ - $3d^4(a^5D)4p$	a^2F - $^4F^o$	5/2 - 3/2		958
	30	694.786	52.6207 - 196.54959	$3d^5$ - $3d^4(a^5D)4p$	a^4F - $^4F^o$	9/2 - 7/2		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	110	695.150	52.6954 - 196.54959	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4F^o$	7/2 - 7/2		958
	50	695.837	52.8380 - 196.54959	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4F^o$	5/2 - 7/2		958
	30	696.188	52.6954 - 196.33463	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4F^o$	7/2 - 5/2		958
	110	696.880	52.8380 - 196.33463	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4F^o$	5/2 - 5/2		958
	4	697.499	74.0966 - 217.46619	$3d^5 - 3d^4(a^3F)4p$	$b^2D - {}^4F^o$	3/2 - 3/2		958
	80	697.598	52.8371 - 196.18688	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4F^o$	3/2 - 3/2		958
	12	708.373	52.6207 - 193.78919	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^6D^o$	9/2 - 9/2		958
	4	709.980	82.8973 - 223.74582	$3d^5 - 3d^4(a^3G)4p$	$b^2G - {}^2H^o$	7/2 - 9/2		958
	12	710.566	82.8949 - 223.62959	$3d^5 - 3d^4(a^3F)4p$	$b^2G - {}^2G^o$	9/2 - 9/2		958
	1	711.737	82.8973 - 223.39862	$3d^5 - 3d^4(a^3F)4p$	$b^2G - {}^2G^o$	7/2 - 7/2		958
	4	720.711	82.8949 - 221.64749	$3d^5 - 3d^4(a^3G)4p$	$b^2G - {}^4H^o$	9/2 - 11/2		958
	12	723.243	82.8949 - 221.16102	$3d^5 - 3d^4(a^3H)4p$	$b^2G - {}^2H^o$	9/2 - 11/2		958
	4	723.553	82.8973 - 221.10417	$3d^5 - 3d^4(a^3G)4p$	$b^2G - {}^4H^o$	7/2 - 9/2		958
	4	726.935	82.8973 - 220.46133	$3d^5 - 3d^4(a^3H)4p$	$b^2G - {}^2H^o$	7/2 - 9/2		958
	4	728.337	82.8973 - 220.19725	$3d^5 - 3d^4(a^3G)4p$	$b^2G - {}^2F^o$	7/2 - 5/2		958
	4	729.048	100.1180 - 237.28309	$3d^5 - 3d^4(a^1D)4p$	$a^2P - {}^2D^o$	3/2 - 5/2		958
	4	738.857	82.8949 - 218.23851	$3d^5 - 3d^4(a^3H)4p$	$b^2G - {}^4G^o$	9/2 - 9/2		958
	4	744.305	100.1180 - 234.47200	$3d^5 - 3d^4(a^3D)4p$	$a^2P - {}^2D^o$	3/2 - 5/2		958
	1	747.331	100.1180 - 233.92712	$3d^5 - 3d^4(a^1S)4p$	$a^2P - {}^2P^o$	3/2 - 1/2		958
	30	748.873	82.8949 - 216.42844	$3d^5 - 3d^4(a^3H)4p$	$b^2G - {}^2G^o$	9/2 - 9/2		958
	1	750.670	82.8973 - 216.11169	$3d^5 - 3d^4(a^3H)4p$	$b^2G - {}^2G^o$	7/2 - 7/2		958
	12	754.784	82.8973 - 215.38523	$3d^5 - 3d^4(a^3F)4p$	$b^2G - {}^4G^o$	7/2 - 9/2		958
	4	789.107	108.2583 - 234.98435	$3d^5 - 3d^4(a^3D)4p$	$c^2D - {}^2D^o$	3/2 - 3/2		958
	30	1247.823	138.33883 - 218.47836	$3d^4(a^5D)4s - 3d^4(a^3F)4p$	${}^4D - {}^4F^o$	5/2 - 7/2		958
	80	1253.807	138.84403 - 218.60103	$3d^4(a^5D)4s - 3d^4(a^3F)4p$	${}^4D - {}^4F^o$	7/2 - 9/2		958
	1	1308.238	162.07442 - 238.51284	$3d^4(a^3F)4s - 3d^4(a^1D)4p$	${}^2F - {}^2F^o$	5/2 - 5/2		958
	1	1320.800	161.57159 - 237.28309	$3d^4(a^3P)4s - 3d^4(a^1D)4p$	${}^2P - {}^2D^o$	3/2 - 5/2		958
	4	1328.842	167.71250 - 242.96562	$3d^4(a^1G)4s - 3d^4(a^1F)4p$	${}^2G - {}^2F^o$	9/2 - 7/2		958
	30	1329.868	162.08781 - 237.28309	$3d^4(a^3F)4s - 3d^4(a^1D)4p$	${}^2F - {}^2D^o$	7/2 - 5/2		958
	4	1336.099	162.07442 - 236.91879	$3d^4(a^3F)4s - 3d^4(a^1D)4p$	${}^2F - {}^2D^o$	5/2 - 3/2		958
	12	1357.247	165.39258 - 239.07140	$3d^4(a^3G)4s - 3d^4(a^1D)4p$	${}^2G - {}^2F^o$	9/2 - 7/2		958
	1	1370.08	35.2538 - 108.2421	$3d^5 - 3d^5$	$a^4P - c^2D$	5/2 - 5/2	F,P	958
	30	1371.561	162.07442 - 234.98435	$3d^4(a^3F)4s - 3d^4(a^3D)4p$	${}^2F - {}^2D^o$	5/2 - 3/2		958
	80	1381.523	162.08781 - 234.47200	$3d^4(a^3F)4s - 3d^4(a^3D)4p$	${}^2F - {}^2D^o$	7/2 - 5/2		958
	80	1394.829	162.08781 - 233.78086	$3d^4(a^3F)4s - 3d^4(a^3D)4p$	${}^2F - {}^2F^o$	7/2 - 7/2		958
	4	1396.252	171.34533 - 242.96562	$3d^4(a^3D)4s - 3d^4(a^1F)4p$	${}^2D - {}^2F^o$	5/2 - 7/2		958
	4	1401.366	167.71250 - 239.07140	$3d^4(a^1G)4s - 3d^4(a^1D)4p$	${}^2G - {}^2F^o$	9/2 - 7/2		958
	12	1405.708	171.47639 - 242.61460	$3d^4(a^3D)4s - 3d^4(a^1F)4p$	${}^2D - {}^2F^o$	3/2 - 5/2		958
	12	1407.774	156.22488 - 227.25880	$3d^4(a^3F)4s - 3d^4(a^3D)4p$	${}^4F - {}^4D^o$	9/2 - 7/2		958
	4	1408.227	177.06672 - 248.07797	$3d^4(a^1D)4s - 3d^4(a^1F)4p$	${}^2D - {}^2D^o$	3/2 - 3/2		958
	12	1410.156	171.34533 - 242.25925	$3d^4(a^3D)4s - 3d^4(a^1D)4p$	${}^2D - {}^2P^o$	5/2 - 3/2		958
	50	1411.237	156.12377 - 226.98358	$3d^4(a^3F)4s - 3d^4(a^3D)4p$	${}^4F - {}^4D^o$	7/2 - 5/2		958
	30	1412.778	171.47639 - 242.25925	$3d^4(a^3D)4s - 3d^4(a^1D)4p$	${}^2D - {}^2P^o$	3/2 - 3/2		958
	200	1414.255	183.15961 - 253.86843	$3d^4(a^1F)4s - 3d^4(b^3P)4p$	${}^2F - {}^2D^o$	5/2 - 3/2		958
	50	1420.224	183.16449 - 253.57565	$3d^4(a^1F)4s - 3d^4(b^3P)4p$	${}^2F - {}^2D^o$	7/2 - 5/2		958
	4	1421.305	154.51267 - 224.87085	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	${}^4H - {}^4G^o$	11/2 - 11/2		958
	4	1421.986	158.73869 - 229.06258	$3d^4(a^3G)4s - 3d^4(a^3D)4p$	${}^4G - {}^4F^o$	5/2 - 5/2		958
	150	1422.131	195.86415 - 266.18109	$3d^4(b^3P)4s - 3d^4(b^3F)4p$	${}^2P - {}^2D^o$	3/2 - 5/2		958
	50	1422.927	159.01039 - 229.28802	$3d^4(a^3G)4s - 3d^4(a^3D)4p$	${}^4G - {}^4F^o$	7/2 - 7/2		958
	80	1423.145	159.22790 - 229.49474	$3d^4(a^3G)4s - 3d^4(a^3D)4p$	${}^4G - {}^4F^o$	9/2 - 9/2		958
	12	1423.475	154.32596 - 224.57643	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	${}^4H - {}^4G^o$	9/2 - 9/2		958
	375	1425.480	159.34288 - 229.49474	$3d^4(a^3G)4s - 3d^4(a^3D)4p$	${}^4G - {}^4F^o$	11/2 - 9/2		958
	450	1425.728	154.73129 - 224.87085	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	${}^4H - {}^4G^o$	13/2 - 11/2		958
	200	1426.040	158.73869 - 228.86261	$3d^4(a^3G)4s - 3d^4(a^3D)4p$	${}^4G - {}^4F^o$	5/2 - 3/2		958
	200	1426.234	196.22071 - 266.33524	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	${}^2F - {}^2D^o$	5/2 - 3/2		958
	300	1427.268	154.51267 - 224.57643	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	${}^4H - {}^4G^o$	11/2 - 9/2		958
	250	1427.346	159.22790 - 229.28802	$3d^4(a^3G)4s - 3d^4(a^3D)4p$	${}^4G - {}^4F^o$	9/2 - 7/2		958
	250	1427.511	159.01039 - 229.06258	$3d^4(a^3G)4s - 3d^4(a^3D)4p$	${}^4G - {}^4F^o$	7/2 - 5/2		958
	250	1427.553	196.13119 - 266.18109	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	${}^2F - {}^2D^o$	7/2 - 5/2		958
	30	1427.657	154.18585 - 224.23060	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	${}^4H - {}^4G^o$	7/2 - 7/2		958
	80	1428.884	177.00597 - 246.99080	$3d^4(a^1D)4s - 3d^4(a^1F)4p$	${}^2D - {}^2D^o$	5/2 - 5/2		958
	200	1430.517	154.32596 - 224.23060	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	${}^4H - {}^4G^o$	9/2 - 7/2		958
	520	1431.432	154.18585 - 224.04596	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	${}^4H - {}^4G^o$	7/2 - 5/2		958
	80	1434.314	154.32596 - 224.04602	$3d^4(a^3H)4s - 3d^4(a^3F)4p$	${}^4H - {}^2F^o$	9/2 - 7/2		958
	150	1434.387	162.08781 - 231.80400	$3d^4(a^3F)4s - 3d^4(a^1G)4p$	${}^2F - {}^2G^o$	7/2 - 9/2		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	80	1439.688	196.87562 - 266.33524	$3d^4(b^3P)4s - 3d^4(b^3F)4p$	$^2P - ^2D^o$	$\frac{1}{2} - \frac{3}{2}$		958
	110	1440.946	162.07442 - 231.47332	$3d^4(a^3F)4s - 3d^4(a^1G)4p$	$^2F - ^2G^o$	$\frac{5}{2} - \frac{7}{2}$		958
	30	1444.294	196.13119 - 265.36948	$3d^4(b^3F)4s - 3d^4(b^1G)4p$	$^2F - ^2F^o$	$\frac{7}{2} - \frac{5}{2}$		958
	200	1444.403	154.51267 - 223.74582	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^4H - ^2H^o$	$\frac{11}{2} - \frac{9}{2}$		958
	150	1446.000	164.95050 - 234.10672	$3d^4(a^3G)4s - 3d^4(a^3D)4p$	$^2G - ^2F^o$	$\frac{7}{2} - \frac{5}{2}$		958
	30	1446.154	196.22071 - 265.36948	$3d^4(b^3F)4s - 3d^4(b^1G)4p$	$^2F - ^2F^o$	$\frac{5}{2} - \frac{5}{2}$		958
	50	1447.742	154.32596 - 223.39862	$3d^4(a^3H)4s - 3d^4(a^3F)4p$	$^4H - ^2G^o$	$\frac{9}{2} - \frac{7}{2}$		958
	30	1449.028	189.97501 - 258.98664	$3d^4(b^3P)4s - 3d^4(b^3F)4p$	$^4P - ^4D^o$	$\frac{5}{2} - \frac{5}{2}$		958
	12	1450.252	196.13119 - 265.08477	$3d^4(b^3F)4s - 3d^4(b^1G)4p$	$^2F - ^2F^o$	$\frac{7}{2} - \frac{7}{2}$		958
	150	1452.393	164.95050 - 233.80212	$3d^4(a^3G)4s - 3d^4(a^1I)4p$	$^2G - ^2H^o$	$\frac{7}{2} - \frac{9}{2}$		958
	150	1452.478	190.40645 - 259.25434	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4D^o$	$\frac{3}{2} - \frac{1}{2}$		958
	300	1453.089	154.73129 - 223.55014	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^4H - ^2H^o$	$\frac{13}{2} - \frac{11}{2}$		958
	80	1453.962	190.40645 - 259.18382	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4D^o$	$\frac{3}{2} - \frac{3}{2}$		958
	250	1454.585	190.43547 - 259.18382	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4D^o$	$\frac{5}{2} - \frac{3}{2}$		958
	30	1455.712	160.77860 - 229.47283	$3d^4(a^3H)4s - 3d^4(a^1I)4p$	$^2H - ^2K^o$	$\frac{11}{2} - \frac{13}{2}$		958
	150	1456.751	156.22488 - 224.87085	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - ^4G^o$	$\frac{9}{2} - \frac{11}{2}$		958
	300	1457.369	189.97501 - 258.59192	$3d^4(b^3P)4s - 3d^4(b^3F)4p$	$^4P - ^4D^o$	$\frac{5}{2} - \frac{7}{2}$		958
	250	1458.524	190.42414 - 258.98664	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4D^o$	$\frac{7}{2} - \frac{5}{2}$		958
	110	1458.763	190.43547 - 258.98664	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4D^o$	$\frac{5}{2} - \frac{5}{2}$		958
	250	1459.257	160.77860 - 229.30661	$3d^4(a^3H)4s - 3d^4(a^1G)4p$	$^2H - ^2H^o$	$\frac{11}{2} - \frac{11}{2}$		958
	200	1460.229	160.31164 - 228.79386	$3d^4(a^3H)4s - 3d^4(a^1G)4p$	$^2H - ^2H^o$	$\frac{9}{2} - \frac{9}{2}$		958
	150	1460.859	156.12377 - 224.57643	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - ^4G^o$	$\frac{7}{2} - \frac{9}{2}$		958
	200	1462.240	165.39258 - 233.78086	$3d^4(a^3G)4s - 3d^4(a^3D)4p$	$^2G - ^2F^o$	$\frac{9}{2} - \frac{7}{2}$		958
	12	1463.751	159.34288 - 227.66025	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^2G^o$	$\frac{11}{2} - \frac{9}{2}$		958
	300	1464.694	190.31834 - 258.59192	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4D^o$	$\frac{9}{2} - \frac{7}{2}$		958
	200	1466.820	190.81179 - 258.98664	$3d^4(b^3P)4s - 3d^4(b^3F)4p$	$^4P - ^4D^o$	$\frac{3}{2} - \frac{5}{2}$		958
	110	1466.966	190.42414 - 258.59192	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4D^o$	$\frac{7}{2} - \frac{7}{2}$		958
	12	1467.501	128.19154 - 196.33463	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^4F^o$	$\frac{5}{2} - \frac{5}{2}$		958
	80	1470.421	128.54185 - 196.54959	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^4F^o$	$\frac{7}{2} - \frac{7}{2}$		958
	110	1470.514	160.31164 - 228.31503	$3d^4(a^3H)4s - 3d^4(a^1I)4p$	$^2H - ^2I^o$	$\frac{9}{2} - \frac{11}{2}$		958
	50	1472.395	191.33782 - 259.25434	$3d^4(b^3P)4s - 3d^4(b^3F)4p$	$^4P - ^4D^o$	$\frac{1}{2} - \frac{1}{2}$		958
	450	1473.201	128.96767 - 196.84682	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^4F^o$	$\frac{9}{2} - \frac{9}{2}$		958
	80	1473.926	191.33782 - 259.18382	$3d^4(b^3P)4s - 3d^4(b^3F)4p$	$^4P - ^4D^o$	$\frac{1}{2} - \frac{3}{2}$		958
	150	1480.863	189.97501 - 257.50326	$3d^4(b^3P)4s - 3d^4(b^3P)4p$	$^4P - ^4S^o$	$\frac{5}{2} - \frac{3}{2}$		958
	12	1481.017	156.22488 - 223.74582	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - ^2H^o$	$\frac{9}{2} - \frac{9}{2}$		958
	375	1483.145	154.73129 - 222.15499	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^4H - ^4H^o$	$\frac{13}{2} - \frac{13}{2}$		958
	110	1486.040	160.31164 - 227.60473	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^2H - ^2G^o$	$\frac{9}{2} - \frac{7}{2}$		958
	1	1488.810	171.34533 - 238.51284	$3d^4(a^3D)4s - 3d^4(a^1D)4p$	$^2D - ^2F^o$	$\frac{3}{2} - \frac{5}{2}$		958
	450	1489.534	154.51267 - 221.64749	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^4H - ^4H^o$	$\frac{11}{2} - \frac{11}{2}$		958
	250	1491.095	162.07442 - 229.13890	$3d^4(a^3F)4s - 3d^4(a^1G)4p$	$^2F - ^2F^o$	$\frac{5}{2} - \frac{5}{2}$		958
	250	1493.026	222.84058 - 289.81877	$3d^4(b^1D)4s - 3d^4(b^1D)4p$	$^2D - ^2D^o$	$\frac{5}{2} - \frac{5}{2}$		958
	30	1493.270	222.85168 - 289.81877	$3d^4(b^1D)4s - 3d^4(b^1D)4p$	$^2D - ^2D^o$	$\frac{3}{2} - \frac{5}{2}$		958
	150	1494.467	154.32596 - 221.23921	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^4H - ^4F^o$	$\frac{9}{2} - \frac{9}{2}$		958
	450	1495.185	160.77860 - 227.66025	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^2H - ^2G^o$	$\frac{11}{2} - \frac{9}{2}$		958
	250	1497.492	154.32596 - 221.10417	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^4H - ^4H^o$	$\frac{9}{2} - \frac{9}{2}$		958
	200	1499.439	190.81179 - 257.50326	$3d^4(b^3P)4s - 3d^4(b^3P)4p$	$^4P - ^4S^o$	$\frac{3}{2} - \frac{3}{2}$		958
	200	1500.412	154.51267 - 221.16102	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^2H^o$	$\frac{11}{2} - \frac{11}{2}$		958
	50	1501.688	154.51267 - 221.10417	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^4H - ^4H^o$	$\frac{11}{2} - \frac{9}{2}$		958
	110	1502.652	222.85168 - 289.40072	$3d^4(b^1D)4s - 3d^4(b^1D)4p$	$^2D - ^2D^o$	$\frac{3}{2} - \frac{3}{2}$		958
	250	1503.243	164.95050 - 231.47332	$3d^4(a^3G)4s - 3d^4(a^1G)4p$	$^2G - ^2G^o$	$\frac{7}{2} - \frac{7}{2}$		958
	50	1504.118	195.86415 - 262.34836	$3d^4(b^3P)4s - 3d^4(b^3P)4p$	$^2P - ^2S^o$	$\frac{3}{2} - \frac{1}{2}$		958
	300	1504.379	154.18585 - 220.65804	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^4H - ^4H^o$	$\frac{7}{2} - \frac{7}{2}$		958
	200	1505.766	165.39258 - 231.80400	$3d^4(a^3G)4s - 3d^4(a^1G)4p$	$^2G - ^2G^o$	$\frac{9}{2} - \frac{9}{2}$		958
	80	1505.848	153.65174 - 220.05933	$3d^4(a^3P)4s - 3d^4(a^3F)4p$	$^4P - ^4D^o$	$\frac{1}{2} - \frac{1}{2}$		958
	50	1508.049	167.79592 - 234.10672	$3d^4(a^1G)4s - 3d^4(a^3D)4p$	$^2G - ^2F^o$	$\frac{7}{2} - \frac{5}{2}$		958
	110	1508.856	154.18585 - 220.46133	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^2H^o$	$\frac{7}{2} - \frac{9}{2}$		958
	50	1511.365	191.33782 - 257.50326	$3d^4(b^3P)4s - 3d^4(b^3P)4p$	$^4P - ^4S^o$	$\frac{1}{2} - \frac{3}{2}$		958
	80	1512.728	162.08781 - 228.19367	$3d^4(a^3F)4s - 3d^4(a^1G)4p$	$^2F - ^2F^o$	$\frac{7}{2} - \frac{7}{2}$		958
	150	1513.587	167.71250 - 233.78086	$3d^4(a^1G)4s - 3d^4(a^3D)4p$	$^2G - ^2F^o$	$\frac{9}{2} - \frac{7}{2}$		958
	30	1515.012	167.79592 - 233.80212	$3d^4(a^1G)4s - 3d^4(a^1I)4p$	$^2G - ^2H^o$	$\frac{7}{2} - \frac{9}{2}$		958
	250	1516.081	177.00597 - 242.96562	$3d^4(a^1D)4s - 3d^4(a^1F)4p$	$^2D - ^2F^o$	$\frac{5}{2} - \frac{7}{2}$		958
	250	1516.577	171.34533 - 237.28309	$3d^4(a^3D)4s - 3d^4(a^1D)4p$	$^2D - ^2D^o$	$\frac{5}{2} - \frac{5}{2}$		958
	200	1517.780	154.47485 - 220.36044	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^4P - ^2P^o$	$\frac{3}{2} - \frac{3}{2}$		958
	375	1523.921	127.92912 - 193.54925	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6D^o$	$\frac{3}{2} - \frac{5}{2}$		958
	50	1524.368	155.74487 - 221.34606	$3d^4(a^3P)4s - 3d^4(a^3G)4p$	$^4P - ^4F^o$	$\frac{5}{2} - \frac{7}{2}$		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	375	1526.066	159.34288 - 224.87085	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4G^o$	11/2 - 11/2		958
	520	1526.598	127.76615 - 193.27127	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6D^o$	1/2 - 3/2		958
	150	1528.067	171.47639 - 236.91879	$3d^4(a^3D)4s - 3d^4(a^1D)4p$	$^2D - ^2D^o$	3/2 - 3/2		958
	80	1528.529	156.22488 - 221.64749	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - ^4H^o$	9/2 - 11/2		958
	150	1530.040	128.19154 - 193.54925	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6D^o$	5/2 - 5/2		958
	150	1530.125	127.76615 - 193.12034	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6D^o$	1/2 - 1/2		958
	520	1530.256	159.22790 - 224.57643	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4G^o$	9/2 - 9/2		958
	375	1531.220	158.73869 - 224.04596	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4G^o$	5/2 - 5/2		958
	200	1531.474	156.04932 - 221.34606	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - ^4F^o$	5/2 - 7/2		958
	150	1532.069	156.04932 - 221.32054	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - ^4F^o$	5/2 - 5/2		958
	250	1532.485	177.00597 - 242.25925	$3d^4(a^1D)4s - 3d^4(a^1D)4p$	$^2D - ^2P^o$	5/2 - 3/2		958
	600	1532.634	128.54185 - 193.78919	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6D^o$	7/2 - 9/2		958
	520	1532.907	168.56643 - 233.80212	$3d^4(a^1I)4s - 3d^4(a^1I)4p$	$^2I - ^2H^o$	11/2 - 9/2		958
	375	1533.265	159.01039 - 224.23060	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4G^o$	7/2 - 7/2		958
	200	1533.576	156.01229 - 221.21929	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - ^4F^o$	3/2 - 3/2		958
	700	1533.863	128.19154 - 193.38617	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6D^o$	5/2 - 7/2		958
	520	1533.952	127.92912 - 193.12034	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6D^o$	3/2 - 1/2		958
	150	1535.723	154.47485 - 219.59084	$3d^4(a^3P)4s - 3d^4(a^3F)4p$	$^4P - ^4D^o$	3/2 - 5/2		958
	600	1536.584	128.19154 - 193.27127	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6D^o$	5/2 - 3/2		958
	200	1538.120	156.22488 - 221.23921	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - ^4F^o$	9/2 - 9/2		958
	450	1538.289	128.54185 - 193.54925	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6D^o$	7/2 - 5/2		958
	375	1540.393	183.15961 - 248.07797	$3d^4(a^1F)4s - 3d^4(a^1F)4p$	$^2F - ^2D^o$	5/2 - 3/2		958
	250	1540.731	155.74487 - 220.64922	$3d^4(a^3P)4s - 3d^4(a^3G)4p$	$^4P - ^2F^o$	5/2 - 7/2		958
	520	1542.157	128.54185 - 193.38617	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6D^o$	7/2 - 7/2		958
	600	1542.696	128.96767 - 193.78919	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6D^o$	9/2 - 9/2		958
	300	1544.489	168.52637 - 233.27284	$3d^4(a^1I)4s - 3d^4(a^1I)4p$	$^2I - ^2H^o$	13/2 - 11/2		958
	80	1544.636	158.73869 - 223.47896	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^4G - ^2F^o$	5/2 - 5/2		958
	150	1545.438	168.56643 - 233.27284	$3d^4(a^1I)4s - 3d^4(a^1I)4p$	$^2I - ^2H^o$	11/2 - 11/2		958
	450	1546.400	127.92912 - 192.59528	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^4P^o$	3/2 - 5/2		958
	250	1549.959	159.22790 - 223.74582	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^2H^o$	9/2 - 9/2		958
	150	1551.535	155.74487 - 220.19725	$3d^4(a^3P)4s - 3d^4(a^3G)4p$	$^4P - ^2F^o$	5/2 - 5/2		958
	300	1552.211	156.22488 - 220.64922	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - ^2F^o$	9/2 - 7/2		958
	450	1552.353	128.96767 - 193.38617	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6D^o$	9/2 - 7/2		958
	450	1552.709	128.19154 - 192.59528	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^4P^o$	5/2 - 5/2		958
	200	1553.172	137.70081 - 202.08522	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4D^o$	1/2 - 3/2		958
	300	1553.296	137.94929 - 202.32853	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4D^o$	3/2 - 5/2		958
	200	1554.667	159.22790 - 223.55014	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^2H^o$	9/2 - 11/2		958
	50	1554.934	156.04932 - 220.36044	$3d^4(a^3F)4s - 3d^4(a^3P)4p$	$^4F - ^2P^o$	5/2 - 3/2		958
	250	1555.950	138.33883 - 202.60833	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4D^o$	5/2 - 7/2		958
	300	1556.069	160.31164 - 224.57643	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^2H - ^4G^o$	9/2 - 9/2		958
	30	1556.306	170.72949 - 234.98435	$3d^4(a^1S)4s - 3d^4(a^3D)4p$	$^2S - ^2D^o$	1/2 - 3/2		958
	300	1557.184	137.70081 - 201.91938	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4D^o$	1/2 - 1/2		958
	300	1557.450	159.34288 - 223.55014	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^2H^o$	11/2 - 11/2		958
	200	1558.668	201.21222 - 265.36948	$3d^4(b^1G)4s - 3d^4(b^1G)4p$	$^2G - ^2F^o$	7/2 - 5/2		958
	30	1558.909	156.04932 - 220.19725	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - ^2F^o$	5/2 - 5/2		958
	375	1559.191	137.94929 - 202.08522	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4D^o$	3/2 - 3/2		958
	375	1560.272	167.71250 - 231.80400	$3d^4(a^1G)4s - 3d^4(a^1G)4p$	$^2G - ^2G^o$	9/2 - 9/2		958
	375	1561.193	128.54185 - 192.59528	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^4P^o$	7/2 - 5/2		958
	375	1561.355	156.01229 - 220.05933	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4D^o$	3/2 - 1/2		958
	375	1562.259	154.18585 - 218.19566	$3d^4(a^3H)4s - 3d^4(a^3F)4p$	$^4H - ^4F^o$	7/2 - 5/2		958
	450	1562.458	165.49310 - 229.49474	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - ^4F^o$	7/2 - 9/2		958
	375	1562.753	138.33883 - 202.32853	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4D^o$	5/2 - 5/2		958
	150	1563.133	154.18585 - 218.15977	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4G^o$	7/2 - 7/2		958
	200	1563.229	137.94929 - 201.91938	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4D^o$	3/2 - 1/2		958
	375	1563.579	155.74487 - 219.70053	$3d^4(a^3P)4s - 3d^4(a^3F)4p$	$^4P - ^4D^o$	5/2 - 7/2		958
	300	1564.263	127.76615 - 191.69411	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^4P^o$	1/2 - 3/2		958
	100	1564.602	165.39258 - 229.30661	$3d^4(a^3G)4s - 3d^4(a^1G)4p$	$^2G - ^2H^o$	9/2 - 11/2	P	958
	150	1564.638	154.32596 - 218.23851	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4G^o$	9/2 - 9/2	P	958
	300	1564.780	201.17805 - 265.08477	$3d^4(b^1G)4s - 3d^4(b^1G)4p$	$^2G - ^2F^o$	9/2 - 7/2		958
	250	1565.867	154.51267 - 218.37512	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4G^o$	11/2 - 11/2		958
	520	1566.256	190.31834 - 254.16484	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4G^o$	9/2 - 11/2		958
	200	1566.464	154.18585 - 218.02381	$3d^4(a^3H)4s - 3d^4(a^3P)4p$	$^4H - ^4P^o$	7/2 - 5/2		958
	300	1566.572	154.32596 - 218.15977	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4G^o$	9/2 - 7/2		958
	250	1566.747	183.16449 - 246.99080	$3d^4(a^1F)4s - 3d^4(a^1F)4p$	$^2F - ^2D^o$	7/2 - 5/2		958
	30	1567.046	156.01229 - 219.82661	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4D^o$	3/2 - 3/2		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	375	1567.955	156.04932 - 219.82661	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4D^o$	5/2 - 3/2		958
	600	1568.274	138.84403 - 202.60833	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4D^o$	3/2 - 1/2		958
	375	1568.711	138.33883 - 202.08522	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4D^o$	5/2 - 3/2		958
	375	1569.221	154.51267 - 218.23851	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4G^o$	11/2 - 9/2		958
	80	1569.427	195.86415 - 259.58164	$3d^4(b^3P)4s - 3d^4(b^3P)4p$	$^2P - ^2P^o$	3/2 - 1/2		958
	450	1570.178	165.60096 - 229.28802	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - ^4F^o$	5/2 - 7/2		958
	450	1570.418	167.79592 - 231.47332	$3d^4(a^1G)4s - 3d^4(a^1G)4p$	$^2G - ^2G^o$	7/2 - 7/2		958
	450	1571.245	154.73129 - 218.37512	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4G^o$	11/2 - 11/2		958
	150	1573.770	156.04932 - 219.59084	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4D^o$	5/2 - 5/2		958
	250	1574.602	171.47639 - 234.98435	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^2D - ^2D^o$	5/2 - 3/2		958
	200	1574.736	128.19154 - 191.69411	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^4P^o$	5/2 - 3/2		958
	200	1575.105	190.43547 - 253.92359	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^2F^o$	7/2 - 7/2		958
	300	1575.190	138.84403 - 202.32853	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4D^o$	3/2 - 5/2		958
	250	1575.409	156.22488 - 219.70053	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4D^o$	3/2 - 1/2		958
	250	1575.613	156.12377 - 219.59084	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4D^o$	3/2 - 5/2		958
	200	1576.442	160.31164 - 223.74582	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^2H - ^2H^o$	9/2 - 9/2		958
	4	1576.845	165.72094 - 229.13890	$3d^4(a^3D)4s - 3d^4(a^1G)4p$	$^4D - ^2F^o$	5/2 - 5/2		958
	450	1577.205	190.42414 - 253.82743	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4G^o$	7/2 - 9/2		958
	450	1577.758	153.65174 - 217.03189	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^4P - ^4P^o$	3/2 - 3/2		958
	250	1578.023	154.47485 - 217.84529	$3d^4(a^3P)4s - 3d^4(a^3H)4p$	$^4P - ^4G^o$	5/2 - 5/2		958
	110	1578.611	155.74487 - 219.09167	$3d^4(a^3P)4s - 3d^4(a^3F)4p$	$^4P - ^2D^o$	5/2 - 3/2		958
	375	1578.743	165.72094 - 229.06258	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - ^4F^o$	3/2 - 5/2		958
	200	1579.236	156.01229 - 219.33390	$3d^4(a^3F)4s - 3d^4(a^3P)4p$	$^4F - ^2P^o$	3/2 - 1/2		958
	375	1579.368	165.72094 - 229.03702	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - ^4P^o$	3/2 - 1/2		958
	200	1580.904	127.76615 - 191.02118	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^4P^o$	1/2 - 1/2		958
	250	1581.174	222.84058 - 286.08472	$3d^4(b^1D)4s - 3d^4(b^1D)4p$	$^2D - ^2F^o$	5/2 - 7/2		958
	200	1581.471	165.80447 - 229.03702	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - ^4P^o$	1/2 - 1/2		958
	150	1582.330	170.72949 - 233.92712	$3d^4(a^1S)4s - 3d^4(a^1S)4p$	$^2S - ^2P^o$	1/2 - 1/2		958
	12	1583.049	190.40645 - 253.57565	$3d^4(b^3F)4s - 3d^4(b^3P)4p$	$^4F - ^2D^o$	3/2 - 5/2		958
	150	1583.600	195.86415 - 259.01148	$3d^4(b^3P)4s - 3d^4(b^3P)4p$	$^2P - ^2P^o$	3/2 - 3/2		958
	200	1583.741	165.72094 - 228.86261	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - ^4F^o$	3/2 - 3/2		958
	250	1583.960	154.47485 - 217.60771	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^4P - ^2S^o$	3/2 - 1/2		958
	200	1584.117	171.34533 - 234.47200	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^2D - ^2D^o$	5/2 - 5/2		958
	375	1584.969	127.92912 - 191.02118	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^4P^o$	3/2 - 1/2		958
	300	1585.116	160.31164 - 223.39862	$3d^4(a^3H)4s - 3d^4(a^3F)4p$	$^2H - ^2G^o$	9/2 - 7/2		958
	375	1585.841	165.80447 - 228.86261	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - ^4F^o$	1/2 - 3/2		958
	300	1587.594	165.60096 - 228.58967	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - ^4P^o$	5/2 - 3/2		958
	250	1588.127	160.77860 - 223.74582	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^2H - ^2H^o$	11/2 - 9/2		958
	450	1590.616	155.74487 - 218.61388	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^4P - ^4S^o$	5/2 - 3/2		958
	150	1590.863	156.01229 - 218.87121	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^2D^o$	3/2 - 5/2		958
	375	1591.062	160.77860 - 223.62959	$3d^4(a^3H)4s - 3d^4(a^3F)4p$	$^2H - ^2G^o$	11/2 - 9/2		958
	520	1591.509	201.17805 - 264.01154	$3d^4(b^1G)4s - 3d^4(b^1G)4p$	$^2G - ^2H^o$	9/2 - 11/2		958
	300	1591.802	156.04932 - 218.87121	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^2D^o$	5/2 - 5/2		958
	300	1591.878	190.43547 - 253.25437	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4G^o$	5/2 - 7/2		958
	520	1592.048	159.34288 - 222.15499	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4H^o$	11/2 - 13/2		958
	200	1592.333	165.39258 - 228.19367	$3d^4(a^3G)4s - 3d^4(a^1G)4p$	$^2G - ^2F^o$	9/2 - 7/2		958
	150	1592.724	165.80447 - 228.58967	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - ^4P^o$	1/2 - 3/2		958
	300	1593.089	160.77860 - 223.55014	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^2H - ^2H^o$	11/2 - 11/2		958
	12	1593.276	190.81179 - 253.57565	$3d^4(b^3P)4s - 3d^4(b^3P)4p$	$^4P - ^2D^o$	3/2 - 3/2		958
	30	1593.343	171.34533 - 234.10672	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^2D - ^2F^o$	5/2 - 5/2		958
	30	1594.744	196.87562 - 259.58164	$3d^4(b^3P)4s - 3d^4(b^3P)4p$	$^2P - ^2P^o$	1/2 - 1/2		958
	200	1594.921	201.17805 - 263.87691	$3d^4(b^1G)4s - 3d^4(b^1G)4p$	$^2G - ^2G^o$	9/2 - 9/2		958
	300	1595.800	201.21222 - 263.87691	$3d^4(b^1G)4s - 3d^4(b^1G)4p$	$^2G - ^2G^o$	7/2 - 9/2		958
	375	1596.065	164.95050 - 227.60473	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^2G - ^2G^o$	7/2 - 7/2		958
	450	1596.668	171.47639 - 234.10672	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^2D - ^2F^o$	3/2 - 5/2		958
	250	1597.397	156.01229 - 218.61388	$3d^4(a^3F)4s - 3d^4(a^3P)4p$	$^4F - ^4S^o$	3/2 - 3/2		958
	30	1597.907	158.73869 - 221.32054	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4F^o$	5/2 - 5/2		958
	520	1598.012	183.16449 - 245.74229	$3d^4(a^1F)4s - 3d^4(a^1F)4p$	$^2F - ^2G^o$	7/2 - 9/2		958
	150	1598.350	156.04932 - 218.61388	$3d^4(a^3F)4s - 3d^4(a^3P)4p$	$^4F - ^4S^o$	5/2 - 3/2		958
	200	1598.543	154.47485 - 217.03189	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^4P - ^4P^o$	5/2 - 3/2		958
	250	1600.294	162.08781 - 224.57643	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^2F - ^4G^o$	7/2 - 9/2		958
	450	1600.503	158.73869 - 221.21929	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4F^o$	5/2 - 3/2		958
	520	1600.580	156.12377 - 218.60103	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4F^o$	7/2 - 9/2		958
	150	1601.503	171.34533 - 233.78672	$3d^4(a^3D)4s - 3d^4(a^1S)4p$	$^2D - ^2P^o$	3/2 - 1/2		958
	520	1601.670	196.13119 - 258.56602	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^2F - ^2G^o$	7/2 - 9/2		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	250	1601.826	156.04932 - 218.47836	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^4F - $^4F^o$	$\frac{5}{2}$ - $\frac{7}{2}$		958
	375	1601.900	165.49310 - 227.91905	$3d^4(a^3D)4s$ - $3d^4(a^3D)4p$	^4D - $^4P^o$	$\frac{7}{2}$ - $\frac{5}{2}$		958
	450	1602.078	159.22790 - 221.64749	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^4G - $^4H^o$	$\frac{9}{2}$ - $\frac{11}{2}$		958
	520	1603.181	156.22488 - 218.60103	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^4F - $^4F^o$	$\frac{9}{2}$ - $\frac{9}{2}$		958
	520	1603.730	156.12377 - 218.47836	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^4F - $^4F^o$	$\frac{7}{2}$ - $\frac{7}{2}$		958
	375	1604.669	165.60096 - 227.91905	$3d^4(a^3D)4s$ - $3d^4(a^3D)4p$	^4D - $^4P^o$	$\frac{5}{2}$ - $\frac{5}{2}$		958
	520	1604.885	159.01039 - 221.32054	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^4G - $^4F^o$	$\frac{7}{2}$ - $\frac{5}{2}$		958
	150	1605.018	159.34288 - 221.64749	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^4G - $^4H^o$	$\frac{11}{2}$ - $\frac{11}{2}$		958
	520	1605.678	155.74487 - 218.02381	$3d^4(a^3P)4s$ - $3d^4(a^3P)4p$	^4P - $^4P^o$	$\frac{5}{2}$ - $\frac{5}{2}$		958
	700	1605.970	165.39258 - 227.66025	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^2G - $^2G^o$	$\frac{9}{2}$ - $\frac{9}{2}$		958
	200	1606.333	156.22488 - 218.47836	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^4F - $^4F^o$	$\frac{9}{2}$ - $\frac{7}{2}$		958
	520	1606.980	159.01039 - 221.23921	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^4G - $^4F^o$	$\frac{7}{2}$ - $\frac{9}{2}$		958
	50	1607.402	165.39258 - 227.60473	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^2G - $^2G^o$	$\frac{9}{2}$ - $\frac{7}{2}$		958
	150	1608.855	162.07442 - 224.23060	$3d^4(a^3F)4s$ - $3d^4(a^3G)4p$	^2F - $^4G^o$	$\frac{5}{2}$ - $\frac{7}{2}$		958
	375	1609.003	156.22488 - 218.37512	$3d^4(a^3F)4s$ - $3d^4(a^3H)4p$	^4F - $^4G^o$	$\frac{9}{2}$ - $\frac{11}{2}$		958
	900	1609.100	154.73129 - 216.87783	$3d^4(a^3H)4s$ - $3d^4(a^3H)4p$	^4H - $^4I^o$	$\frac{13}{2}$ - $\frac{15}{2}$		958
	600	1609.832	159.22790 - 221.34606	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^4G - $^4F^o$	$\frac{9}{2}$ - $\frac{7}{2}$		958
	375	1609.928	156.12377 - 218.23851	$3d^4(a^3F)4s$ - $3d^4(a^3H)4p$	^4F - $^4G^o$	$\frac{7}{2}$ - $\frac{9}{2}$		958
	375	1610.041	156.04932 - 218.15977	$3d^4(a^3F)4s$ - $3d^4(a^3H)4p$	^4F - $^4G^o$	$\frac{5}{2}$ - $\frac{7}{2}$		958
	250	1610.300	155.74487 - 217.84529	$3d^4(a^3P)4s$ - $3d^4(a^3H)4p$	^4P - $^4G^o$	$\frac{5}{2}$ - $\frac{5}{2}$		958
	520	1610.472	159.01039 - 221.10417	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^4G - $^4H^o$	$\frac{7}{2}$ - $\frac{9}{2}$		958
	200	1610.850	127.92912 - 190.00828	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6P^o$	$\frac{3}{2}$ - $\frac{5}{2}$		958
	12	1611.037	156.12377 - 218.19566	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^4F - $^4F^o$	$\frac{7}{2}$ - $\frac{9}{2}$		958
	520	1611.202	177.00597 - 239.07140	$3d^4(a^1D)4s$ - $3d^4(a^1D)4p$	^2D - $^2F^o$	$\frac{5}{2}$ - $\frac{7}{2}$		958
	150	1611.988	128.19154 - 190.22687	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6P^o$	$\frac{5}{2}$ - $\frac{7}{2}$		958
	375	1612.550	156.22488 - 218.23851	$3d^4(a^3F)4s$ - $3d^4(a^3H)4p$	^4F - $^4G^o$	$\frac{9}{2}$ - $\frac{9}{2}$		958
	200	1612.599	159.22790 - 221.23921	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^4G - $^4F^o$	$\frac{9}{2}$ - $\frac{9}{2}$		958
	375	1612.798	160.01588 - 222.02009	$3d^4(a^3P)4s$ - $3d^4(a^3P)4p$	^2P - $^2D^o$	$\frac{1}{2}$ - $\frac{3}{2}$		958
	110	1613.326	189.97501 - 251.95894	$3d^4(b^3P)4s$ - $3d^4(b^3P)4p$	^4P - $^4P^o$	$\frac{3}{2}$ - $\frac{5}{2}$		958
	520	1613.643	162.07442 - 224.04596	$3d^4(a^3F)4s$ - $3d^4(a^3G)4p$	^2F - $^4G^o$	$\frac{5}{2}$ - $\frac{7}{2}$		958
	600	1613.991	162.08781 - 224.04602	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^2F - $^2F^o$	$\frac{7}{2}$ - $\frac{7}{2}$	P	958
	100	1614.049	127.92912 - 189.88511	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6P^o$	$\frac{3}{2}$ - $\frac{3}{2}$	P	958
	520	1614.645	159.22790 - 221.16102	$3d^4(a^3G)4s$ - $3d^4(a^3H)4p$	^4G - $^2H^o$	$\frac{9}{2}$ - $\frac{11}{2}$		958
	520	1615.005	158.73869 - 220.65804	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^4G - $^4H^o$	$\frac{5}{2}$ - $\frac{7}{2}$		958
	110	1615.103	154.51267 - 216.42844	$3d^4(a^3H)4s$ - $3d^4(a^3H)4p$	^4H - $^2G^o$	$\frac{11}{2}$ - $\frac{9}{2}$		958
	450	1615.609	159.34288 - 221.23921	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^4G - $^4F^o$	$\frac{11}{2}$ - $\frac{9}{2}$		958
	150	1616.130	159.22790 - 221.10417	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^4G - $^4H^o$	$\frac{9}{2}$ - $\frac{9}{2}$		958
	800	1616.682	154.51267 - 216.36780	$3d^4(a^3H)4s$ - $3d^4(a^3H)4p$	^4H - $^4I^o$	$\frac{11}{2}$ - $\frac{13}{2}$		958
	150	1617.269	156.01229 - 217.84529	$3d^4(a^3F)4s$ - $3d^4(a^3H)4p$	^4F - $^4G^o$	$\frac{3}{2}$ - $\frac{5}{2}$		958
	600	1617.682	128.19154 - 190.00828	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6P^o$	$\frac{5}{2}$ - $\frac{5}{2}$		958
	150	1618.225	156.04932 - 217.84529	$3d^4(a^3F)4s$ - $3d^4(a^3H)4p$	^4F - $^4G^o$	$\frac{5}{2}$ - $\frac{5}{2}$		958
	300	1618.571	201.21222 - 262.99501	$3d^4(b^1G)4s$ - $3d^4(b^1G)4p$	^2G - $^2G^o$	$\frac{7}{2}$ - $\frac{7}{2}$		958
	600	1619.025	165.49310 - 227.25880	$3d^4(a^3D)4s$ - $3d^4(a^3D)4p$	^4D - $^4D^o$	$\frac{7}{2}$ - $\frac{7}{2}$		958
	300	1619.141	159.34288 - 221.10417	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^4G - $^4H^o$	$\frac{11}{2}$ - $\frac{9}{2}$		958
	450	1620.912	128.19154 - 189.88511	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6P^o$	$\frac{5}{2}$ - $\frac{3}{2}$		958
	520	1621.155	128.54185 - 190.22687	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6P^o$	$\frac{7}{2}$ - $\frac{7}{2}$		958
	300	1621.362	154.32596 - 216.00272	$3d^4(a^3H)4s$ - $3d^4(a^3F)4p$	^4H - $^4G^o$	$\frac{9}{2}$ - $\frac{11}{2}$		958
	600	1621.570	168.52637 - 230.19502	$3d^4(a^1I)4s$ - $3d^4(a^1I)4p$	^2I - $^2K^o$	$\frac{13}{2}$ - $\frac{15}{2}$		958
	375	1621.854	162.08781 - 223.74582	$3d^4(a^3F)4s$ - $3d^4(a^3G)4p$	^2F - $^2H^o$	$\frac{7}{2}$ - $\frac{9}{2}$		958
	150	1622.126	159.01039 - 220.65804	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^4G - $^4H^o$	$\frac{7}{2}$ - $\frac{7}{2}$		958
	520	1623.385	183.15961 - 244.75925	$3d^4(a^1F)4s$ - $3d^4(a^1F)4p$	^2F - $^2G^o$	$\frac{5}{2}$ - $\frac{7}{2}$		958
	520	1623.532	167.71250 - 229.30661	$3d^4(a^1G)4s$ - $3d^4(a^1G)4p$	^2G - $^2H^o$	$\frac{9}{2}$ - $\frac{11}{2}$		958
	50	1623.964	190.40645 - 251.98420	$3d^4(b^3F)4s$ - $3d^4(b^3P)4p$	^4F - $^4D^o$	$\frac{3}{2}$ - $\frac{1}{2}$		958
	375	1624.918	162.08781 - 223.62959	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^2F - $^2G^o$	$\frac{7}{2}$ - $\frac{9}{2}$		958
	12	1625.025	190.40645 - 251.94403	$3d^4(b^3F)4s$ - $3d^4(b^3P)4p$	^4F - $^4D^o$	$\frac{3}{2}$ - $\frac{3}{2}$		958
	50	1625.098	190.42414 - 251.95894	$3d^4(b^3F)4s$ - $3d^4(b^3P)4p$	^4F - $^4P^o$	$\frac{7}{2}$ - $\frac{5}{2}$		958
	80	1625.395	190.43547 - 251.95894	$3d^4(b^3F)4s$ - $3d^4(b^3P)4p$	^4F - $^4P^o$	$\frac{5}{2}$ - $\frac{5}{2}$		958
	80	1625.788	190.43547 - 251.94403	$3d^4(b^3F)4s$ - $3d^4(b^3P)4p$	^4F - $^4D^o$	$\frac{5}{2}$ - $\frac{3}{2}$		958
	375	1626.270	154.51267 - 216.00272	$3d^4(a^3H)4s$ - $3d^4(a^3F)4p$	^4H - $^4G^o$	$\frac{11}{2}$ - $\frac{11}{2}$		958
	700	1626.470	154.32596 - 215.80891	$3d^4(a^3H)4s$ - $3d^4(a^3H)4p$	^4H - $^4I^o$	$\frac{9}{2}$ - $\frac{11}{2}$		958
	600	1626.903	128.54185 - 190.00828	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6P^o$	$\frac{7}{2}$ - $\frac{5}{2}$		958
	200	1627.237	156.01229 - 217.46619	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^4F - $^4F^o$	$\frac{3}{2}$ - $\frac{3}{2}$		958
	110	1627.319	159.01039 - 220.46133	$3d^4(a^3G)4s$ - $3d^4(a^3H)4p$	^4G - $^2H^o$	$\frac{7}{2}$ - $\frac{9}{2}$		958
	300	1627.451	177.06672 - 238.51284	$3d^4(a^1D)4s$ - $3d^4(a^1D)4p$	^2D - $^2F^o$	$\frac{3}{2}$ - $\frac{5}{2}$		958
	80	1628.217	156.04932 - 217.46619	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^4F - $^4F^o$	$\frac{5}{2}$ - $\frac{3}{2}$		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	520	1628.535	162.07442 - 223.47896	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^2F - $^2F^o$	$\frac{5}{2}$ - $\frac{5}{2}$		958
	80	1628.898	162.08781 - 223.47896	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^2F - $^2F^o$	$\frac{7}{2}$ - $\frac{5}{2}$		958
	250	1629.045	154.47485 - 215.86050	$3d^4(a^3P)4s$ - $3d^4(a^3P)4p$	^4P - $^4P^o$	$\frac{3}{2}$ - $\frac{1}{2}$		958
	375	1629.294	160.77860 - 222.15499	$3d^4(a^3H)4s$ - $3d^4(a^3G)4p$	^2H - $^4H^o$	$\frac{11}{2}$ - $\frac{13}{2}$		958
	375	1630.110	201.21222 - 262.55777	$3d^4(b^1G)4s$ - $3d^4(b^1G)4p$	^2G - $^2H^o$	$\frac{7}{2}$ - $\frac{9}{2}$		958
	520	1630.183	167.79592 - 229.13890	$3d^4(a^1G)4s$ - $3d^4(a^1G)4p$	^2G - $^2F^o$	$\frac{7}{2}$ - $\frac{5}{2}$		958
	50	1630.266	190.31834 - 251.65834	$3d^4(b^3F)4s$ - $3d^4(b^3P)4p$	^4F - $^4D^o$	$\frac{9}{2}$ - $\frac{7}{2}$		958
	300	1630.363	160.31164 - 221.64749	$3d^4(a^3H)4s$ - $3d^4(a^3G)4p$	^2H - $^4H^o$	$\frac{9}{2}$ - $\frac{11}{2}$		958
	375	1630.679	162.07442 - 223.39862	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^2F - $^2G^o$	$\frac{5}{2}$ - $\frac{7}{2}$		958
	900	1631.077	128.96767 - 190.27685	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6F^o$	$\frac{9}{2}$ - $\frac{11}{2}$		958
	50	1631.421	154.51267 - 215.80891	$3d^4(a^3H)4s$ - $3d^4(a^3H)4p$	^4H - $^4I^o$	$\frac{11}{2}$ - $\frac{11}{2}$		958
	250	1631.558	165.60096 - 226.89210	$3d^4(a^3D)4s$ - $3d^4(a^3D)4p$	^4D - $^4D^o$	$\frac{5}{2}$ - $\frac{3}{2}$		958
	200	1631.664	155.74487 - 217.03189	$3d^4(a^3P)4s$ - $3d^4(a^3P)4p$	^4P - $^4P^o$	$\frac{5}{2}$ - $\frac{3}{2}$		958
	450	1632.079	154.73129 - 216.00272	$3d^4(a^3H)4s$ - $3d^4(a^3F)4p$	^4H - $^4G^o$	$\frac{13}{2}$ - $\frac{11}{2}$		958
	50	1632.209	167.79592 - 229.06258	$3d^4(a^1G)4s$ - $3d^4(a^3D)4p$	^2G - $^4F^o$	$\frac{7}{2}$ - $\frac{5}{2}$		958
	600	1632.404	128.96767 - 190.22687	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6P^o$	$\frac{9}{2}$ - $\frac{7}{2}$		958
	300	1633.065	190.42414 - 251.65834	$3d^4(b^3F)4s$ - $3d^4(b^3P)4p$	^4F - $^4D^o$	$\frac{7}{2}$ - $\frac{7}{2}$		958
	520	1634.006	154.18585 - 215.38523	$3d^4(a^3H)4s$ - $3d^4(a^3F)4p$	^4H - $^4G^o$	$\frac{7}{2}$ - $\frac{9}{2}$		958
	300	1634.758	165.72094 - 226.89210	$3d^4(a^3D)4s$ - $3d^4(a^3D)4p$	^4D - $^4D^o$	$\frac{3}{2}$ - $\frac{5}{2}$		958
	375	1635.396	190.81179 - 251.95894	$3d^4(b^3P)4s$ - $3d^4(b^3P)4p$	^4P - $^4P^o$	$\frac{3}{2}$ - $\frac{5}{2}$		958
	250	1635.797	190.81179 - 251.94403	$3d^4(b^3P)4s$ - $3d^4(b^3P)4p$	^4P - $^4D^o$	$\frac{3}{2}$ - $\frac{3}{2}$		958
	150	1636.992	165.80447 - 226.89210	$3d^4(a^3D)4s$ - $3d^4(a^3D)4p$	^4D - $^4D^o$	$\frac{1}{2}$ - $\frac{3}{2}$		958
	250	1637.262	154.73129 - 215.80891	$3d^4(a^3H)4s$ - $3d^4(a^3H)4p$	^4H - $^4I^o$	$\frac{13}{2}$ - $\frac{11}{2}$		958
	450	1638.070	165.80447 - 226.85193	$3d^4(a^3D)4s$ - $3d^4(a^3D)4p$	^4D - $^4D^o$	$\frac{1}{2}$ - $\frac{1}{2}$		958
	450	1638.296	189.97501 - 251.01402	$3d^4(b^3P)4s$ - $3d^4(b^3P)4p$	^4P - $^4D^o$	$\frac{5}{2}$ - $\frac{5}{2}$		958
	600	1639.404	167.79592 - 228.79386	$3d^4(a^1G)4s$ - $3d^4(a^1G)4p$	^2G - $^2H^o$	$\frac{7}{2}$ - $\frac{9}{2}$		958
	800	1640.039	128.54185 - 189.51588	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6F^o$	$\frac{7}{2}$ - $\frac{9}{2}$		958
	600	1640.165	154.18585 - 215.15569	$3d^4(a^3H)4s$ - $3d^4(a^3H)4p$	^4H - $^4I^o$	$\frac{7}{2}$ - $\frac{9}{2}$		958
	300	1640.782	168.52637 - 229.47283	$3d^4(a^1I)4s$ - $3d^4(a^1I)4p$	^2I - $^2K^o$	$\frac{13}{2}$ - $\frac{13}{2}$		958
	30	1641.292	160.31164 - 221.23921	$3d^4(a^3H)4s$ - $3d^4(a^3G)4p$	^2H - $^4F^o$	$\frac{9}{2}$ - $\frac{9}{2}$		958
	300	1641.600	189.97501 - 250.89105	$3d^4(b^3P)4s$ - $3d^4(b^3P)4p$	^4P - $^4P^o$	$\frac{5}{2}$ - $\frac{3}{2}$		958
	700	1641.866	168.56643 - 229.47283	$3d^4(a^1I)4s$ - $3d^4(a^1I)4p$	^2I - $^2K^o$	$\frac{11}{2}$ - $\frac{13}{2}$		958
	375	1642.786	154.51267 - 215.38523	$3d^4(a^3H)4s$ - $3d^4(a^3F)4p$	^4H - $^4G^o$	$\frac{11}{2}$ - $\frac{9}{2}$		958
	450	1642.880	160.77860 - 221.64749	$3d^4(a^3H)4s$ - $3d^4(a^3G)4p$	^2H - $^4H^o$	$\frac{11}{2}$ - $\frac{11}{2}$		958
	375	1644.944	162.08781 - 222.88023	$3d^4(a^3F)4s$ - $3d^4(a^3P)4p$	^2F - $^2D^o$	$\frac{7}{2}$ - $\frac{5}{2}$		958
	700	1647.093	128.19154 - 188.90455	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6F^o$	$\frac{5}{2}$ - $\frac{7}{2}$		958
	375	1647.241	154.32596 - 215.03381	$3d^4(a^3H)4s$ - $3d^4(a^3F)4p$	^4H - $^4G^o$	$\frac{9}{2}$ - $\frac{7}{2}$		958
	150	1648.902	191.33782 - 251.98420	$3d^4(b^3P)4s$ - $3d^4(b^3P)4p$	^4P - $^4D^o$	$\frac{1}{2}$ - $\frac{1}{2}$		958
	250	1648.993	154.51267 - 215.15569	$3d^4(a^3H)4s$ - $3d^4(a^3H)4p$	^4H - $^4I^o$	$\frac{11}{2}$ - $\frac{9}{2}$		958
	250	1649.189	154.18585 - 214.82174	$3d^4(a^3H)4s$ - $3d^4(a^3F)4p$	^4H - $^4G^o$	$\frac{7}{2}$ - $\frac{5}{2}$		958
	200	1649.996	191.33782 - 251.94403	$3d^4(b^3P)4s$ - $3d^4(b^3P)4p$	^4P - $^4D^o$	$\frac{1}{2}$ - $\frac{3}{2}$		958
	150	1650.091	167.71250 - 228.31503	$3d^4(a^1G)4s$ - $3d^4(a^1I)4p$	^2G - $^2I^o$	$\frac{9}{2}$ - $\frac{11}{2}$		958
	80	1650.749	190.43547 - 251.01402	$3d^4(b^3F)4s$ - $3d^4(b^3P)4p$	^4F - $^4D^o$	$\frac{5}{2}$ - $\frac{5}{2}$		958
	700	1651.578	128.96767 - 189.51588	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6F^o$	$\frac{9}{2}$ - $\frac{9}{2}$		958
	700	1652.901	127.92912 - 188.42878	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6F^o$	$\frac{3}{2}$ - $\frac{5}{2}$		958
	520	1653.406	167.71250 - 228.19367	$3d^4(a^1G)4s$ - $3d^4(a^1G)4p$	^2G - $^2F^o$	$\frac{9}{2}$ - $\frac{7}{2}$		958
	80	1653.643	159.22790 - 219.70053	$3d^4(a^3G)4s$ - $3d^4(a^3F)4p$	^4G - $^4D^o$	$\frac{9}{2}$ - $\frac{7}{2}$		958
	200	1654.291	161.57159 - 222.02009	$3d^4(a^3P)4s$ - $3d^4(a^3P)4p$	^2P - $^2D^o$	$\frac{3}{2}$ - $\frac{3}{2}$		958
	520	1656.106	160.77860 - 221.16102	$3d^4(a^3H)4s$ - $3d^4(a^3H)4p$	^2H - $^2H^o$	$\frac{11}{2}$ - $\frac{11}{2}$		958
	700	1656.649	128.54185 - 188.90455	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6F^o$	$\frac{7}{2}$ - $\frac{7}{2}$		958
	300	1657.133	190.81179 - 251.15694	$3d^4(b^3P)4s$ - $3d^4(b^3P)4p$	^4P - $^4P^o$	$\frac{3}{2}$ - $\frac{1}{2}$		958
	200	1657.370	159.22790 - 219.56446	$3d^4(a^3G)4s$ - $3d^4(a^3H)4p$	^4G - $^2I^o$	$\frac{9}{2}$ - $\frac{11}{2}$		958
	150	1657.667	160.77860 - 221.10417	$3d^4(a^3H)4s$ - $3d^4(a^3G)4p$	^2H - $^4H^o$	$\frac{11}{2}$ - $\frac{9}{2}$		958
	450	1657.824	127.76615 - 188.08605	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6F^o$	$\frac{1}{2}$ - $\frac{3}{2}$		958
	375	1658.247	156.12377 - 216.42844	$3d^4(a^3F)4s$ - $3d^4(a^3H)4p$	^4F - $^2G^o$	$\frac{7}{2}$ - $\frac{9}{2}$		958
	450	1658.433	159.34288 - 219.64076	$3d^4(a^3G)4s$ - $3d^4(a^3H)4p$	^4G - $^2I^o$	$\frac{11}{2}$ - $\frac{13}{2}$		958
	375	1659.012	177.00597 - 237.28309	$3d^4(a^1D)4s$ - $3d^4(a^1D)4p$	^2D - $^2D^o$	$\frac{5}{2}$ - $\frac{5}{2}$		958
	600	1660.101	128.19154 - 188.42878	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6F^o$	$\frac{5}{2}$ - $\frac{5}{2}$		958
	30	1661.037	156.22488 - 216.42844	$3d^4(a^3F)4s$ - $3d^4(a^3H)4p$	^4F - $^2G^o$	$\frac{9}{2}$ - $\frac{9}{2}$		958
	450	1661.573	190.31834 - 250.50229	$3d^4(b^3F)4s$ - $3d^4(b^3F)4p$	^4F - $^4F^o$	$\frac{9}{2}$ - $\frac{9}{2}$		958
	520	1662.319	127.92912 - 188.08605	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6F^o$	$\frac{3}{2}$ - $\frac{3}{2}$		958
	520	1662.520	160.31164 - 220.46133	$3d^4(a^3H)4s$ - $3d^4(a^3H)4p$	^2H - $^2H^o$	$\frac{9}{2}$ - $\frac{9}{2}$		958
	520	1663.542	127.76615 - 187.87881	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6F^o$	$\frac{1}{2}$ - $\frac{1}{2}$		958
	200	1664.471	190.81179 - 250.89105	$3d^4(b^3P)4s$ - $3d^4(b^3P)4p$	^4P - $^4P^o$	$\frac{3}{2}$ - $\frac{3}{2}$		958
	200	1664.928	156.04932 - 216.11169	$3d^4(a^3F)4s$ - $3d^4(a^3H)4p$	^4F - $^2G^o$	$\frac{5}{2}$ - $\frac{7}{2}$		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	110	1667.000	156.12377 - 216.11169	$3d^4(a^3F)4s$ - $3d^4(a^3H)4p$	^4F - $^2G^o$	7/2 - 7/2		958
	150	1667.752	190.31834 - 250.27906	$3d^4(b^3F)4s$ - $3d^4(b^3F)4p$	^4F - $^4F^o$	9/2 - 7/2		958
	520	1668.089	127.92912 - 187.87881	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6F^o$	3/2 - 1/2		958
	4	1668.181	222.02009 - 128.96767	$3d^4(a^3P)4p$ - $3d^4(a^5D)4s$	$^2D^o$ - ^6D	5/2 - 3/2		958
9	)4P	1668.426	177.00597 - 236.91879	$3d^4(a^1D)4s$ - $3d^4(a^1D)4p$	^2D - $^2D^o$	5/2 - 3/2		43D,58
	450	1669.606	128.19154 - 188.08605	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6F^o$	5/2 - 3/2		958
	375	1669.816	128.54185 - 188.42878	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^6D - $^6F^o$	7/2 - 5/2		958
	150	1670.711	190.42414 - 250.27906	$3d^4(b^3F)4s$ - $3d^4(b^3F)4p$	^4F - $^4F^o$	7/2 - 7/2		958
	50	1670.782	177.06672 - 236.91879	$3d^4(a^1D)4s$ - $3d^4(a^1D)4p$	^2D - $^2D^o$	3/2 - 3/2		958
	600	1671.041	190.40645 - 250.24939	$3d^4(b^3F)4s$ - $3d^4(b^3F)4p$	^4F - $^4F^o$	3/2 - 3/2		958
	150	1671.990	167.79592 - 227.60473	$3d^4(a^1G)4s$ - $3d^4(a^3G)4p$	^2G - $^2G^o$	7/2 - 7/2		958
	300	1672.211	183.16449 - 242.96562	$3d^4(a^1F)4s$ - $3d^4(a^1F)4p$	^2F - $^2F^o$	7/2 - 7/2		958
	250	1672.427	153.65174 - 213.44505	$3d^4(a^3P)4s$ - $3d^4(a^3P)4p$	^4P - $^4D^o$	1/2 - 3/2		958
	80	1672.561	168.52637 - 228.31503	$3d^4(a^1I)4s$ - $3d^4(a^1I)4p$	^2I - $^2I^o$	13/2 - 11/2		958
	450	1672.858	156.22488 - 216.00272	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^4F - $^4G^o$	9/2 - 11/2		958
	150	1673.059	190.42414 - 250.19507	$3d^4(b^3F)4s$ - $3d^4(b^3F)4p$	^4F - $^4F^o$	7/2 - 5/2		958
	150	1673.365	190.43547 - 250.19507	$3d^4(b^3F)4s$ - $3d^4(b^3F)4p$	^4F - $^4F^o$	5/2 - 5/2		958
	520	1673.683	168.56643 - 228.31503	$3d^4(a^1I)4s$ - $3d^4(a^1I)4p$	^2I - $^2I^o$	11/2 - 11/2		958
	50	1675.535	160.77860 - 220.46133	$3d^4(a^3H)4s$ - $3d^4(a^3H)4p$	^2H - $^2H^o$	11/2 - 9/2		958
	600	1675.661	168.52637 - 228.20433	$3d^4(a^1I)4s$ - $3d^4(a^1I)4p$	^2I - $^2I^o$	13/2 - 13/2		958
	450	1676.784	168.56643 - 228.20433	$3d^4(a^1I)4s$ - $3d^4(a^1I)4p$	^2I - $^2I^o$	11/2 - 13/2		958
	450	1677.124	164.95050 - 224.57643	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^2G - $^4G^o$	7/2 - 9/2		958
	110	1681.285	165.39258 - 224.87085	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^2G - $^4G^o$	9/2 - 11/2		958
	520	1681.356	155.74487 - 215.22067	$3d^4(a^3P)4s$ - $3d^4(a^3P)4p$	^4P - $^4D^o$	5/2 - 7/2		958
	30	1681.573	159.01039 - 218.47836	$3d^4(a^3G)4s$ - $3d^4(a^3F)4p$	^4G - $^4F^o$	7/2 - 7/2		958
	450	1681.948	183.15961 - 242.61460	$3d^4(a^1F)4s$ - $3d^4(a^1F)4p$	^2F - $^2F^o$	5/2 - 5/2		958
	30	1682.082	183.16449 - 242.61460	$3d^4(a^1F)4s$ - $3d^4(a^1F)4p$	^2F - $^2F^o$	7/2 - 5/2		958
	12	1684.263	159.22790 - 218.60103	$3d^4(a^3G)4s$ - $3d^4(a^3F)4p$	^4G - $^4F^o$	9/2 - 9/2		958
	30	1685.829	160.01588 - 219.33390	$3d^4(a^3P)4s$ - $3d^4(a^3P)4p$	^2P - $^2P^o$	1/2 - 1/2		958
	80	1686.770	158.73869 - 218.02381	$3d^4(a^3G)4s$ - $3d^4(a^3P)4p$	^4G - $^4P^o$	5/2 - 5/2		958
	300	1687.439	156.12377 - 215.38523	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^4F - $^4G^o$	7/2 - 9/2		958
	150	1687.534	159.34288 - 218.60103	$3d^4(a^3G)4s$ - $3d^4(a^3F)4p$	^4G - $^4F^o$	11/2 - 9/2		958
	700	1687.689	160.31164 - 219.56446	$3d^4(a^3H)4s$ - $3d^4(a^3H)4p$	^2H - $^2I^o$	9/2 - 11/2		958
	150	1689.612	159.01039 - 218.19566	$3d^4(a^3G)4s$ - $3d^4(a^3F)4p$	^4G - $^4F^o$	7/2 - 5/2		958
	375	1690.304	153.65174 - 212.81266	$3d^4(a^3P)4s$ - $3d^4(a^3P)4p$	^4P - $^4D^o$	1/2 - 1/2		958
	300	1690.628	159.01039 - 218.15977	$3d^4(a^3G)4s$ - $3d^4(a^3H)4p$	^4G - $^4G^o$	7/2 - 7/2		958
	12	1691.871	158.73869 - 217.84529	$3d^4(a^3G)4s$ - $3d^4(a^3H)4p$	^4G - $^4G^o$	5/2 - 5/2		958
	50	1692.172	164.95050 - 224.04602	$3d^4(a^3G)4s$ - $3d^4(a^3F)4p$	^2G - $^2F^o$	7/2 - 7/2		958
	250	1693.988	159.34288 - 218.37512	$3d^4(a^3G)4s$ - $3d^4(a^3H)4p$	^4G - $^4G^o$	11/2 - 11/2		958
	110	1694.611	159.22790 - 218.23851	$3d^4(a^3G)4s$ - $3d^4(a^3H)4p$	^4G - $^4G^o$	9/2 - 9/2		958
	300	1695.035	156.22488 - 215.22067	$3d^4(a^3F)4s$ - $3d^4(a^3P)4p$	^4F - $^4D^o$	9/2 - 7/2		958
	375	1695.357	156.04932 - 215.03381	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^4F - $^4G^o$	5/2 - 7/2		958
	300	1695.770	154.47485 - 213.44505	$3d^4(a^3P)4s$ - $3d^4(a^3P)4p$	^4P - $^4D^o$	3/2 - 3/2		958
	200	1696.904	156.22488 - 215.15569	$3d^4(a^3F)4s$ - $3d^4(a^3H)4p$	^4F - $^4I^o$	9/2 - 9/2		958
	375	1697.501	156.12377 - 215.03381	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^4F - $^4G^o$	7/2 - 7/2		958
	700	1698.878	160.77860 - 219.64076	$3d^4(a^3H)4s$ - $3d^4(a^3H)4p$	^2H - $^2I^o$	11/2 - 13/2		958
	50	1699.664	159.01039 - 217.84529	$3d^4(a^3G)4s$ - $3d^4(a^3H)4p$	^4G - $^4G^o$	7/2 - 5/2		958
	450	1700.405	156.01229 - 214.82174	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^4F - $^4G^o$	3/2 - 5/2		958
	375	1700.815	164.95050 - 223.74582	$3d^4(a^3G)4s$ - $3d^4(a^3G)4p$	^2G - $^2H^o$	7/2 - 9/2		958
	300	1701.011	161.57159 - 220.36044	$3d^4(a^3P)4s$ - $3d^4(a^3P)4p$	^2P - $^2P^o$	3/2 - 3/2		958
	150	1701.084	160.77860 - 219.56446	$3d^4(a^3H)4s$ - $3d^4(a^3H)4p$	^2H - $^2I^o$	11/2 - 11/2		958
	375	1701.483	156.04932 - 214.82174	$3d^4(a^3F)4s$ - $3d^4(a^3F)4p$	^4F - $^4G^o$	5/2 - 5/2		958
	3	1703.09	49.5415 - 108.2583	$3d^5$ - $3d^5$	a^2D - c^2D	5/2 - 3/2	F,P	958
	1	1703.56	49.5415 - 108.2421	$3d^5$ - $3d^5$	a^2D - c^2D	5/2 - 5/2	F,P	958
	375	1703.592	170.72949 - 229.42891	$3d^4(a^1S)4s$ - $3d^4(a^3D)4p$	^2S - $^2P^o$	1/2 - 3/2		958
	375	1704.186	164.95050 - 223.62959	$3d^4(a^3G)4s$ - $3d^4(a^3F)4p$	^2G - $^2G^o$	7/2 - 9/2		958
	450	1704.932	165.39258 - 224.04602	$3d^4(a^3G)4s$ - $3d^4(a^3F)4p$	^2G - $^2F^o$	9/2 - 7/2		958
	50	1706.066						958
	200	1706.542	160.01588 - 218.61388	$3d^4(a^3P)4s$ - $3d^4(a^3P)4p$	^2P - $^4S^o$	1/2 - 3/2		958
		1706.641	222.85168 - 281.44630	$3d^4(b^1D)4s$ - $3d^4(b^1D)4p$	^2D - $^2P^o$	3/2 - 1/2	P	958
	80	1706.965	162.07442 - 220.65804	$3d^4(a^3F)4s$ - $3d^4(a^3G)4p$	^2F - $^4H^o$	5/2 - 7/2		958
	375	1707.284	155.74487 - 214.31721	$3d^4(a^3P)4s$ - $3d^4(a^3P)4p$	^4P - $^4D^o$	5/2 - 5/2		958
	375	1707.606	162.08781 - 220.64922	$3d^4(a^3F)4s$ - $3d^4(a^3G)4p$	^2F - $^2F^o$	7/2 - 7/2		958
	375	1708.579	164.95050 - 223.47896	$3d^4(a^3G)4s$ - $3d^4(a^3F)4p$	^2G - $^2F^o$	7/2 - 5/2		958
	520	1709.808	137.70081 - 196.18688	$3d^4(a^5D)4s$ - $3d^4(a^5D)4p$	^4D - $^4F^o$	1/2 - 3/2		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	700	1711.410	154.73129 - 213.16259	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4H^o$	13/2 - 13/2		958
	600	1712.757	137.94929 - 196.33463	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4F^o$	7/2 - 5/2		958
	110	1714.156	154.47485 - 212.81266	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^4P - ^4D^o$	3/2 - 1/2		958
	80	1716.215	156.04932 - 214.31721	$3d^4(a^3F)4s - 3d^4(a^3P)4p$	$^4F - ^4D^o$	5/2 - 5/2		958
	450	1717.109	137.94929 - 196.18688	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4F^o$	5/2 - 3/2		958
	200	1717.709	170.72949 - 228.94659	$3d^4(a^1S)4s - 3d^4(a^3D)4p$	$^2S - ^2P^o$	1/2 - 1/2		958
	600	1717.899	138.33883 - 196.54959	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4F^o$	5/2 - 7/2		958
	600	1718.155	154.51267 - 212.71437	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4H^o$	11/2 - 11/2		958
	450	1718.417	156.12377 - 214.31721	$3d^4(a^3F)4s - 3d^4(a^3P)4p$	$^4F - ^4D^o$	7/2 - 5/2		958
	600	1719.464	165.39258 - 223.55014	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^2G - ^2H^o$	9/2 - 11/2		958
	150	1720.492	162.07442 - 220.19725	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^2F - ^2F^o$	5/2 - 5/2		958
	375	1721.660	171.34533 - 229.42891	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^2D - ^2P^o$	5/2 - 3/2		958
	600	1722.710	154.32596 - 212.37404	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4H^o$	9/2 - 9/2		958
	30	1723.010	196.13119 - 254.16913	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^2F - ^2F^o$	7/2 - 5/2		958
	150	1723.568	161.57159 - 219.59084	$3d^4(a^3P)4s - 3d^4(a^3F)4p$	$^2P - ^4D^o$	3/2 - 5/2		958
	600	1724.057	138.84403 - 196.84682	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4F^o$	7/2 - 9/2		958
	450	1724.265	138.33883 - 196.33463	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4F^o$	5/2 - 5/2		958
	375	1724.644	154.73129 - 212.71437	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4H^o$	13/2 - 11/2		958
	800	1725.629	154.18585 - 212.13579	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4H^o$	7/2 - 7/2		958
	375	1726.584	222.84058 - 280.75837	$3d^4(b^1D)4s - 3d^4(b^1D)4p$	$^2D - ^2P^o$	5/2 - 3/2		958
	250	1728.265	154.51267 - 212.37404	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4H^o$	11/2 - 9/2		958
	150	1729.430	160.77860 - 218.60103	$3d^4(a^3H)4s - 3d^4(a^3F)4p$	$^2H - ^4F^o$	11/2 - 9/2		958
	250	1729.809	154.32596 - 212.13579	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4H^o$	9/2 - 7/2		958
	375	1730.324	196.13119 - 253.92359	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^2F - ^2F^o$	7/2 - 7/2		958
	300	1731.235	161.57159 - 219.33390	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^2P - ^2P^o$	3/2 - 1/2		958
	250	1732.756	195.86415 - 253.57565	$3d^4(b^3P)4s - 3d^4(b^3P)4p$	$^2P - ^2D^o$	3/2 - 5/2		958
	375	1732.932	138.84403 - 196.54959	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4F^o$	5/2 - 7/2		958
	110	1733.095	155.74487 - 213.44505	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^4P - ^4D^o$	5/2 - 3/2		958
	110	1734.677	196.22071 - 253.86843	$3d^4(b^3F)4s - 3d^4(b^3P)4p$	$^2F - ^2D^o$	5/2 - 3/2		958
	250	1735.728	162.08781 - 219.70053	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^2F - ^4D^o$	7/2 - 7/2		958
	300	1736.356	160.01588 - 217.60771	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^2P - ^2S^o$	1/2 - 1/2		958
	80	1738.637	162.07442 - 219.59084	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^2F - ^4D^o$	5/2 - 5/2		958
	200	1740.153	177.00597 - 234.47200	$3d^4(a^1D)4s - 3d^4(a^3D)4p$	$^2D - ^2D^o$	5/2 - 5/2		958
	50	1740.634	160.01588 - 217.46619	$3d^4(a^3P)4s - 3d^4(a^3F)4p$	$^2P - ^4F^o$	1/2 - 3/2		958
	110	1740.816	196.13119 - 253.57565	$3d^4(b^3F)4s - 3d^4(b^3P)4p$	$^2F - ^2D^o$	7/2 - 5/2		958
	1	1741.171	156.01229 - 213.44505	$3d^4(a^3F)4s - 3d^4(a^3P)4p$	$^4F - ^4D^o$	3/2 - 3/2		958
	300	1741.611	159.01039 - 216.42844	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^2G^o$	7/2 - 5/2		958
	150	1742.289	156.04932 - 213.44505	$3d^4(a^3F)4s - 3d^4(a^3P)4p$	$^4F - ^4D^o$	5/2 - 3/2		958
	110	1742.984	158.73869 - 216.11169	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^2G^o$	5/2 - 7/2		958
	80	1745.209	161.57159 - 218.87121	$3d^4(a^3P)4s - 3d^4(a^3F)4p$	$^2P - ^2D^o$	3/2 - 5/2		958
	30	1748.233	159.22790 - 216.42844	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^2G^o$	9/2 - 9/2		958
	300	1750.602	196.13119 - 253.25437	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^2F - ^4G^o$	7/2 - 7/2		958
	300	1751.755	159.34288 - 216.42844	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^2G^o$	11/2 - 9/2		958
	150	1753.082	161.57159 - 218.61388	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^2P - ^4S^o$	3/2 - 3/2		958
	4	1753.351	196.22071 - 253.25437	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^2F - ^4G^o$	5/2 - 7/2		958
	200	1753.619	159.34288 - 216.36780	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^4I^o$	11/2 - 13/2		958
	200	1753.857	162.07442 - 219.09167	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^2F - ^2D^o$	5/2 - 3/2		958
	110	1754.602	196.87562 - 253.86843	$3d^4(b^3P)4s - 3d^4(b^3P)4p$	$^2P - ^2D^o$	1/2 - 3/2		958
	80	1757.972	159.22790 - 216.11169	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^2G^o$	9/2 - 7/2		958
	2	1758.58	51.3942 - 108.2583	$3d^5 - 3d^5$	$a^2F - c^2D$	7/2 - 3/2	F,P	958
	30	1758.695	177.06672 - 233.92712	$3d^4(a^1D)4s - 3d^4(a^1S)4p$	$^2D - ^2P^o$	3/2 - 1/2		958
	22	1759.08	51.3942 - 108.2421	$3d^5 - 3d^5$	$a^2F - c^2D$	7/2 - 5/2	F,P	958
	110	1760.552	156.01229 - 212.81266	$3d^4(a^3F)4s - 3d^4(a^3P)4p$	$^4F - ^4D^o$	3/2 - 1/2		958
	30	1760.658	162.07442 - 218.87121	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^2F - ^2D^o$	5/2 - 5/2		958
	520	1761.085	162.08781 - 218.87121	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^2F - ^2D^o$	7/2 - 5/2		958
	200	1764.795	196.22071 - 252.88448	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^2F - ^4G^o$	5/2 - 5/2		958
	450	1764.920	159.34288 - 216.00272	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^4G - ^4G^o$	11/2 - 11/2		958
	450	1767.355	159.22790 - 215.80891	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^4I^o$	9/2 - 11/2		958
	250	1768.681	162.07442 - 218.61388	$3d^4(a^3F)4s - 3d^4(a^3P)4p$	$^2F - ^4S^o$	5/2 - 3/2		958
	110	1774.794	168.52637 - 224.87085	$3d^4(a^1I)4s - 3d^4(a^3G)4p$	$^2I - ^4G^o$	13/2 - 11/2		958
	50	1776.349	158.73869 - 215.03381	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^4G - ^4G^o$	5/2 - 7/2		958
	300	1780.708	159.22790 - 215.38523	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^4G - ^4G^o$	9/2 - 9/2		958
	110	1781.090	159.01039 - 215.15569	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^4I^o$	7/2 - 9/2		958
	150	1782.264	162.08781 - 218.19566	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^2F - ^4F^o$	7/2 - 5/2		958
	11	1782.80	52.1667 - 108.2583	$3d^5 - 3d^5$	$a^2F - c^2D$	5/2 - 3/2	F,P	958

Multiplet	Rel. Int.	λ_{air} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	12	1782.944	156.04932 - 212.13579	$3d^4(a^3F)4s - 3d^4(a^3H)4p$	$^4F - ^4H^o$	$\frac{5}{2} - \frac{7}{2}$		958
	375	1783.066	158.73869 - 214.82174	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^4G - ^4G^o$	$\frac{5}{2} - \frac{5}{2}$		958
	3	1783.31	52.1667 - 108.2421	$3d^5 - 3d^5$	$a^2F - c^2D$	$\frac{5}{2} - \frac{5}{2}$	F,P	958
	250	1784.647	167.71250 - 223.74582	$3d^4(a^1G)4s - 3d^4(a^3G)4p$	$^2G - ^2H^o$	$\frac{9}{2} - \frac{9}{2}$		958
	375	1784.967	159.01039 - 215.03381	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^4G - ^4G^o$	$\frac{7}{2} - \frac{7}{2}$		958
	4	1785.394	168.56643 - 224.57643	$3d^4(a^1I)4s - 3d^4(a^3G)4p$	$^2I - ^4G^o$	$\frac{11}{2} - \frac{9}{2}$		958
	1	1787.758	162.08781 - 218.02381	$3d^4(a^3F)4s - 3d^4(a^3P)4p$	$^2F - ^4P^o$	$\frac{7}{2} - \frac{5}{2}$		958
	1	1788.361	167.71250 - 223.62959	$3d^4(a^1G)4s - 3d^4(a^3F)4p$	$^2G - ^2G^o$	$\frac{9}{2} - \frac{9}{2}$		958
	200	1788.685	183.16449 - 239.07140	$3d^4(a^1F)4s - 3d^4(a^1D)4p$	$^2F - ^2F^o$	$\frac{7}{2} - \frac{7}{2}$		958
	150	1790.681	160.01588 - 215.86050	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^2P - ^4P^o$	$\frac{1}{2} - \frac{1}{2}$		958
	1	1790.911	167.71250 - 223.55014	$3d^4(a^1G)4s - 3d^4(a^3G)4p$	$^2G - ^2H^o$	$\frac{9}{2} - \frac{11}{2}$		958
	1	1791.751	159.01039 - 214.82174	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^4G - ^4G^o$	$\frac{7}{2} - \frac{5}{2}$		958
	520	1792.102	160.31164 - 216.11169	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^2H - ^2G^o$	$\frac{9}{2} - \frac{7}{2}$		958
	375	1793.127	165.39258 - 221.16102	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^2G - ^2H^o$	$\frac{9}{2} - \frac{11}{2}$		958
	300	1793.477	162.08781 - 217.84529	$3d^4(a^3F)4s - 3d^4(a^3H)4p$	$^2F - ^4G^o$	$\frac{7}{2} - \frac{5}{2}$		958
	250	1793.876	165.60096 - 221.34606	$3d^4(a^3D)4s - 3d^4(a^3G)4p$	$^4D - ^4F^o$	$\frac{5}{2} - \frac{7}{2}$		958
	1	1794.695	165.60096 - 221.32054	$3d^4(a^3D)4s - 3d^4(a^3G)4p$	$^4D - ^4F^o$	$\frac{5}{2} - \frac{5}{2}$		958
	520	1796.932	160.77860 - 216.42844	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^2H - ^2G^o$	$\frac{11}{2} - \frac{9}{2}$		958
	200	1798.457	167.79592 - 223.39862	$3d^4(a^1G)4s - 3d^4(a^3F)4p$	$^2G - ^2G^o$	$\frac{7}{2} - \frac{7}{2}$		958
	250	1798.563	137.94929 - 193.54925	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^6D^o$	$\frac{3}{2} - \frac{5}{2}$		958
	50	1799.514	137.70081 - 193.27127	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^6D^o$	$\frac{1}{2} - \frac{3}{2}$		958
	1	1800.29	52.6954 - 108.2421	$3d^5 - 3d^5$	$a^4F - c^2D$	$\frac{7}{2} - \frac{5}{2}$	F,P	958
	300	1801.444	164.95050 - 220.46133	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^2G - ^2H^o$	$\frac{7}{2} - \frac{9}{2}$		958
	1	1804.39	52.8380 - 108.2583	$3d^5 - 3d^5$	$a^4F - c^2D$	$\frac{5}{2} - \frac{3}{2}$	F,P	958
	250	1804.416	137.70081 - 193.12034	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^6D^o$	$\frac{1}{2} - \frac{1}{2}$		958
	110	1804.570	165.80447 - 221.21929	$3d^4(a^3D)4s - 3d^4(a^3G)4p$	$^4D - ^4F^o$	$\frac{1}{2} - \frac{3}{2}$		958
	450	1805.319	162.07442 - 217.46619	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^2F - ^4F^o$	$\frac{5}{2} - \frac{3}{2}$		958
	110	1806.577	183.15961 - 238.51284	$3d^4(a^1F)4s - 3d^4(a^1D)4p$	$^2F - ^2F^o$	$\frac{5}{2} - \frac{5}{2}$		958
	375	1807.597	137.94929 - 193.27127	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^6D^o$	$\frac{3}{2} - \frac{3}{2}$		958
	110	1808.087	159.01039 - 214.31721	$3d^4(a^3G)4s - 3d^4(a^3P)4p$	$^4G - ^4D^o$	$\frac{7}{2} - \frac{5}{2}$		958
	375	1809.734	165.39258 - 220.64922	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^2G - ^2F^o$	$\frac{9}{2} - \frac{7}{2}$		958
	300	1810.055	164.95050 - 220.19725	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^2G - ^2F^o$	$\frac{7}{2} - \frac{5}{2}$		958
	375	1811.247	138.33883 - 193.54925	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^6D^o$	$\frac{5}{2} - \frac{5}{2}$		958
	4	1812.267	168.56643 - 223.74582	$3d^4(a^1I)4s - 3d^4(a^3G)4p$	$^2I - ^2H^o$	$\frac{11}{2} - \frac{9}{2}$		958
	200	1812.544	137.94929 - 193.12034	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^6D^o$	$\frac{3}{2} - \frac{1}{2}$		958
	200	1816.094	168.56643 - 223.62959	$3d^4(a^1I)4s - 3d^4(a^3F)4p$	$^2I - ^2G^o$	$\frac{11}{2} - \frac{9}{2}$		958
	50	1816.620	138.33883 - 193.38617	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^6D^o$	$\frac{5}{2} - \frac{7}{2}$		958
	250	1817.391	168.52637 - 223.55014	$3d^4(a^1I)4s - 3d^4(a^3G)4p$	$^2I - ^2H^o$	$\frac{13}{2} - \frac{11}{2}$		958
	300	1819.994	138.84403 - 193.78919	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^6D^o$	$\frac{7}{2} - \frac{9}{2}$		958
	450	1820.417	138.33883 - 193.27127	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^6D^o$	$\frac{5}{2} - \frac{3}{2}$		958
	80	1823.348	160.31164 - 215.15569	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^2H - ^4I^o$	$\frac{9}{2} - \frac{9}{2}$		958
	250	1827.417	160.31164 - 215.03381	$3d^4(a^3H)4s - 3d^4(a^3F)4p$	$^2H - ^4G^o$	$\frac{9}{2} - \frac{7}{2}$		958
	520	1827.982	138.84403 - 193.54925	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^6D^o$	$\frac{7}{2} - \frac{5}{2}$		958
	250	1830.149	164.95050 - 219.59084	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^2G - ^4D^o$	$\frac{7}{2} - \frac{5}{2}$		958
	4	1831.629	165.60096 - 220.19725	$3d^4(a^3D)4s - 3d^4(a^3G)4p$	$^4D - ^2F^o$	$\frac{5}{2} - \frac{5}{2}$		958
	250	1839.009	160.77860 - 215.15569	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^2H - ^4I^o$	$\frac{11}{2} - \frac{9}{2}$		958
	450	1840.240	162.08781 - 216.42844	$3d^4(a^3F)4s - 3d^4(a^3H)4p$	$^2F - ^2G^o$	$\frac{7}{2} - \frac{9}{2}$		958
	150	1843.102	138.33883 - 192.59528	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4P^o$	$\frac{5}{2} - \frac{5}{2}$		958
	300	1850.578	162.07442 - 216.11169	$3d^4(a^3F)4s - 3d^4(a^3H)4p$	$^2F - ^2G^o$	$\frac{5}{2} - \frac{7}{2}$		958
	80	1852.085	137.70081 - 191.69411	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4P^o$	$\frac{1}{2} - \frac{3}{2}$		958
	80	1854.084	167.71250 - 221.64749	$3d^4(a^1G)4s - 3d^4(a^3G)4p$	$^2G - ^4H^o$	$\frac{9}{2} - \frac{11}{2}$		958
	375	1858.057	159.34288 - 213.16259	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^4H^o$	$\frac{11}{2} - \frac{13}{2}$		958
	450	1860.422	138.84403 - 192.59528	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4P^o$	$\frac{7}{2} - \frac{5}{2}$		958
	375	1860.645	137.94929 - 191.69411	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4P^o$	$\frac{3}{2} - \frac{3}{2}$		958
	450	1869.635	159.22790 - 212.71437	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^4H^o$	$\frac{9}{2} - \frac{11}{2}$		958
	300	1870.964	167.71250 - 221.16102	$3d^4(a^1G)4s - 3d^4(a^3H)4p$	$^2G - ^2H^o$	$\frac{9}{2} - \frac{11}{2}$		958
	300	1872.761	158.73869 - 212.13579	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^4H^o$	$\frac{5}{2} - \frac{7}{2}$		958
	300	1873.938	159.01039 - 212.37404	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^4H^o$	$\frac{7}{2} - \frac{9}{2}$		958
	450	1874.226	138.33883 - 191.69411	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4P^o$	$\frac{5}{2} - \frac{3}{2}$		958
	300	1875.457	137.70081 - 191.02118	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4P^o$	$\frac{1}{2} - \frac{1}{2}$		958
	12	1875.884	167.79592 - 221.10417	$3d^4(a^1G)4s - 3d^4(a^3G)4p$	$^2G - ^4H^o$	$\frac{7}{2} - \frac{9}{2}$		958
	150	1876.259	162.08781 - 215.38523	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^2F - ^4G^o$	$\frac{7}{2} - \frac{9}{2}$		958
	300	1884.234	137.94929 - 191.02118	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4P^o$	$\frac{3}{2} - \frac{1}{2}$		958
	150	1884.381	162.08781 - 215.15569	$3d^4(a^3F)4s - 3d^4(a^3H)4p$	$^2F - ^4I^o$	$\frac{7}{2} - \frac{9}{2}$		958
	80	1889.050	167.71250 - 220.64922	$3d^4(a^1G)4s - 3d^4(a^3G)4p$	$^2G - ^2F^o$	$\frac{9}{2} - \frac{7}{2}$		958

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	250	1895.896	201.17805 - 253.92359	$3d^4(b^1G)4s$ - $3d^4(b^3F)4p$	${}^2G$ - ${}^2F^o$	$\frac{9}{2}$ - $\frac{7}{2}$		958
	110	1898.772	167.79592 - 220.46133	$3d^4(a^1G)4s$ - $3d^4(a^3H)4p$	${}^2G$ - ${}^2H^o$	$\frac{7}{2}$ - $\frac{9}{2}$		958
	30	1908.980	160.77860 - 213.16259	$3d^4(a^3H)4s$ - $3d^4(a^3H)4p$	${}^2H$ - ${}^4H^o$	$\frac{11}{2}$ - $\frac{13}{2}$		958
	50	1953.038	196.87562 - 248.07797	$3d^4(b^3P)4s$ - $3d^4(a^1F)4p$	${}^2P$ - ${}^2D^o$	$\frac{1}{2}$ - $\frac{3}{2}$		958
	110	1954.615	164.95050 - 216.11169	$3d^4(a^3G)4s$ - $3d^4(a^3H)4p$	${}^2G$ - ${}^2G^o$	$\frac{7}{2}$ - $\frac{7}{2}$		958
	110	1956.400	168.52637 - 219.64076	$3d^4(a^1I)4s$ - $3d^4(a^3H)4p$	${}^2I$ - ${}^2I^o$	$\frac{13}{2}$ - $\frac{13}{2}$		958
	80	1960.860	168.56643 - 219.56446	$3d^4(a^1I)4s$ - $3d^4(a^3H)4p$	${}^2I$ - ${}^2I^o$	$\frac{11}{2}$ - $\frac{11}{2}$		958
	1	1974.36	32.2455 - 82.8949	$3d^5$ - $3d^5$	a^4G - b^2G	$\frac{11}{2}$ - $\frac{9}{2}$	F,P	958
	110	1975.647	183.16449 - 233.78086	$3d^4(a^1F)4s$ - $3d^4(a^3D)4p$	${}^2F$ - ${}^2F^o$	$\frac{7}{2}$ - $\frac{7}{2}$		958
	1	1976.44	32.3012 - 82.8973	$3d^5$ - $3d^5$	a^4G - b^2G	$\frac{5}{2}$ - $\frac{7}{2}$	F,P	958
	2	1976.89	49.5415 - 100.1260	$3d^5$ - $3d^5$	a^2D - a^2P	$\frac{5}{2}$ - $\frac{1}{2}$	F,P	958
	7	1977.20	49.5415 - 100.1180	$3d^5$ - $3d^5$	a^2D - a^2P	$\frac{5}{2}$ - $\frac{3}{2}$	F,P	958
	3	1997.02	50.0514 - 100.1260	$3d^5$ - $3d^5$	a^2D - a^2P	$\frac{3}{2}$ - $\frac{1}{2}$	F,P	958
	3	1997.34	50.0514 - 100.1180	$3d^5$ - $3d^5$	a^2D - a^2P	$\frac{3}{2}$ - $\frac{3}{2}$	F,P	958

IRON V (Fe^{+4}), Z = 26

Ground State $1s^22s^22p^63s^23p^63d^4$ (${}^5D_0$) (22 electrons)

Ionization Potential [605 000] cm^{-1}; [75.0] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	302.543	.8031 - 331.3338	$3d^4$ - $3d^3(b^2D)4p$	ga^5D - ${}^3F^o$	3 - 2		229
	5	305.313	0.0000 - 327.5338	$3d^4$ - $3d^3(b^2D)4p$	ga^5D - ${}^3D^o$	0 - 1		229
	15	321.321	24.0554 - 335.2678	$3d^4$ - $3d^3(b^2D)4p$	a^3P - ${}^3P^o$	0 - 1		229
	2	322.275	24.9729 - 335.2678	$3d^4$ - $3d^3(b^2D)4p$	a^3P - ${}^3P^o$	1 - 1		229
	1	323.835	26.4683 - 335.2678	$3d^4$ - $3d^3(b^2D)4p$	a^3P - ${}^3P^o$	2 - 1		229
	15	324.634	26.4683 - 334.5091	$3d^4$ - $3d^3(b^2D)4p$	a^3P - ${}^3P^o$	2 - 2		229
	5	325.027	26.8423 - 334.5091	$3d^4$ - $3d^3(b^2D)4p$	a^3F - ${}^3P^o$	3 - 2		229
	5	326.658	29.8171 - 335.9474	$3d^4$ - $3d^3(b^2D)4p$	a^3G - ${}^1F^o$	3 - 3		229
	3	327.029	1.2828 - 307.0644	$3d^4$ - $3d^3(a^2F)4p$	ga^5D - ${}^3G^o$	4 - 5		229
	5	327.823	26.9740 - 332.0173	$3d^4$ - $3d^3(b^2D)4p$	a^3F - ${}^3F^o$	4 - 4		229
	40	329.514	24.0554 - 327.5338	$3d^4$ - $3d^3(b^2D)4p$	a^3P - ${}^3D^o$	0 - 1		229
	40	330.434	24.9729 - 327.6054	$3d^4$ - $3d^3(b^2D)4p$	a^3P - ${}^3D^o$	1 - 2		229
	2	330.512	24.9729 - 327.5338	$3d^4$ - $3d^3(b^2D)4p$	a^3P - ${}^3D^o$	1 - 1		229
	125	331.579	30.4301 - 332.0173	$3d^4$ - $3d^3(b^2D)4p$	a^3G - ${}^3F^o$	5 - 4		229
	80	331.656	29.8171 - 331.3338	$3d^4$ - $3d^3(b^2D)4p$	a^3G - ${}^3F^o$	3 - 2		229
	80	331.723	26.4683 - 327.9244	$3d^4$ - $3d^3(b^2D)4p$	a^3P - ${}^3D^o$	2 - 3		229
	30	331.874	1.2828 - 302.6025	$3d^4$ - $3d^3(a^2F)4p$	ga^5D - ${}^3F^o$	4 - 4		229
	100	331.986	30.1470 - 331.3670	$3d^4$ - $3d^3(b^2D)4p$	a^3G - ${}^3F^o$	4 - 3		229
	1	332.074	26.4683 - 327.6054	$3d^4$ - $3d^3(b^2D)4p$	a^3P - ${}^3D^o$	2 - 2		229
	10	332.135	26.8423 - 327.9244	$3d^4$ - $3d^3(b^2D)4p$	a^3F - ${}^3D^o$	3 - 3		229
	150	332.280	26.9740 - 327.9244	$3d^4$ - $3d^3(b^2D)4p$	a^3F - ${}^3D^o$	4 - 3		229
	50	332.476	26.7607 - 327.5338	$3d^4$ - $3d^3(b^2D)4p$	a^3F - ${}^3D^o$	2 - 1	P	229
	100	332.488	26.8423 - 327.6054	$3d^4$ - $3d^3(b^2D)4p$	a^3F - ${}^3D^o$	3 - 2	P	229
	5	333.297	29.8171 - 329.8486	$3d^4$ - $3d^3(b^2D)4p$	a^3G - ${}^1D^o$	3 - 2		229
	100	334.045	36.5863 - 335.9474	$3d^4$ - $3d^3(b^2D)4p$	a^1G - ${}^1F^o$	4 - 3		229
	25	334.763	36.9254 - 335.6427	$3d^4$ - $3d^3(b^2D)4p$	a^3D - ${}^3P^o$	1 - 0		229
	70	334.997	36.7585 - 335.2678	$3d^4$ - $3d^3(b^2D)4p$	a^3D - ${}^3P^o$	2 - 1		229
	25	335.185	36.9254 - 335.2678	$3d^4$ - $3d^3(b^2D)4p$	a^3D - ${}^3P^o$	1 - 1		229
	125	335.709	36.6301 - 334.5091	$3d^4$ - $3d^3(b^2D)4p$	a^3D - ${}^3P^o$	3 - 2		229
	25	335.853	36.7585 - 334.5091	$3d^4$ - $3d^3(b^2D)4p$	a^3D - ${}^3P^o$	2 - 2		229
	2	339.235	36.5863 - 331.3670	$3d^4$ - $3d^3(b^2D)4p$	a^1G - ${}^3F^o$	4 - 3		229
	5	339.871	.4173 - 294.6440	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - ${}^3S^o$	2 - 1		229
	2	341.192	36.7585 - 329.8486	$3d^4$ - $3d^3(b^2D)4p$	a^3D - ${}^1D^o$	2 - 2		229
	30	343.295	36.6301 - 327.9244	$3d^4$ - $3d^3(b^2D)4p$	a^3D - ${}^3D^o$	3 - 3		229
	1	343.446	36.7585 - 327.9244	$3d^4$ - $3d^3(b^2D)4p$	a^3D - ${}^3D^o$	2 - 3		229
	20	343.824	36.7585 - 327.6054	$3d^4$ - $3d^3(b^2D)4p$	a^3D - ${}^3D^o$	2 - 2		229
	5	344.022	36.9254 - 327.6054	$3d^4$ - $3d^3(b^2D)4p$	a^3D - ${}^3D^o$	1 - 2		229
	5	344.106	36.9254 - 327.5338	$3d^4$ - $3d^3(b^2D)4p$	a^3D - ${}^3D^o$	1 - 1		229
	100	345.236	46.2912 - 335.9474	$3d^4$ - $3d^3(b^2D)4p$	a^1D - ${}^1F^o$	2 - 3		229
	15	348.772	.1421 - 286.8627	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - ${}^3D^o$	1 - 2		229

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	351.349	24.0554 - 308.6715	$3d^4$ - $3d^3(a^2F)4p$	a^3P - $^3D^o$	0 - 1		229
	200	353.087	52.7327 - 335.9474	$3d^4$ - $3d^3(b^2D)4p$	a^1F - $^1F^o$	3 - 3		229
	150	354.679	0.0000 - 281.9449	$3d^4$ - $3d^3(a^2P)4p$	ga^5D - $^3P^o$	0 - 1		229
	100	354.813	25.2259 - 307.0644	$3d^4$ - $3d^3(a^2F)4p$	a^3H - $^3G^o$	5 - 5		229
	100	354.999	24.9325 - 306.6228	$3d^4$ - $3d^3(a^2F)4p$	a^3H - $^3G^o$	4 - 4		229
	250	355.196	25.5285 - 307.0644	$3d^4$ - $3d^3(a^2F)4p$	a^3H - $^3G^o$	6 - 5		229
	200	355.370	25.2259 - 306.6228	$3d^4$ - $3d^3(a^2F)4p$	a^3H - $^3G^o$	5 - 4		229
	10	355.411	29.8171 - 311.1809	$3d^4$ - $3d^3(a^2F)4p$	a^3G - $^1G^o$	3 - 4		229
	15	355.466	26.8423 - 308.1650	$3d^4$ - $3d^3(a^2F)4p$	a^3F - $^3D^o$	3 - 2		229
	150	355.542	24.9325 - 306.1939	$3d^4$ - $3d^3(a^2F)4p$	a^3H - $^3G^o$	4 - 3		229
	200	357.029	26.9740 - 307.0644	$3d^4$ - $3d^3(a^2F)4p$	a^3F - $^3G^o$	4 - 5		229
	200	357.425	26.8423 - 306.6228	$3d^4$ - $3d^3(a^2F)4p$	a^3F - $^3G^o$	3 - 4		229
	150	357.870	26.7607 - 306.1939	$3d^4$ - $3d^3(a^2F)4p$	a^3F - $^3G^o$	2 - 3		229
	5	357.970	26.8423 - 306.1939	$3d^4$ - $3d^3(a^2F)4p$	a^3F - $^3G^o$	3 - 3		229
	5	358.892	52.7327 - 331.3670	$3d^4$ - $3d^3(b^2D)4p$	a^1F - $^3F^o$	3 - 3		229
	50	359.227	.4173 - 278.7942	$3d^4$ - $3d^3(a^2G)4p$	ga^5D - $^3G^o$	2 - 3		229
	30	359.937	29.8171 - 307.6444	$3d^4$ - $3d^3(a^2F)4p$	a^3G - $^1D^o$	3 - 2		229
	50	360.434	24.9325 - 302.3771	$3d^4$ - $3d^3(a^2F)4p$	a^3H - $^3F^o$	4 - 3		229
	80	360.521	25.2259 - 302.6025	$3d^4$ - $3d^3(a^2F)4p$	a^3H - $^3F^o$	5 - 4		229
	150	360.658	.8031 - 278.0758	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5D^o$	3 - 4		229
	30	360.827	30.1470 - 307.2887	$3d^4$ - $3d^3(a^2F)4p$	a^3G - $^3D^o$	4 - 3		229
	40	360.857	52.7327 - 329.8486	$3d^4$ - $3d^3(b^2D)4p$	a^1F - $^1D^o$	3 - 2		229
	300	361.281	1.2828 - 278.0758	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5D^o$	4 - 4		229
	150	361.470	.4173 - 277.0685	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5D^o$	2 - 3		229
	200	361.486	30.4301 - 307.0644	$3d^4$ - $3d^3(a^2F)4p$	a^3G - $^3G^o$	5 - 5		229
	50	361.512	.1421 - 276.7592	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5D^o$	1 - 2		229
	150	361.694	30.1470 - 306.6228	$3d^4$ - $3d^3(a^2F)4p$	a^3G - $^3G^o$	4 - 4		229
	150	361.823	29.8171 - 306.1939	$3d^4$ - $3d^3(a^2F)4p$	a^3G - $^3G^o$	3 - 3		229
	100	361.863	.4173 - 276.7659	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^3P^o$	2 - 1		229
	50	361.935	.1421 - 276.4349	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^3P^o$	1 - 0		229
	100	361.972	.8031 - 277.0685	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5D^o$	3 - 3		229
	150	362.064	30.4301 - 306.6228	$3d^4$ - $3d^3(a^2F)4p$	a^3G - $^3G^o$	5 - 4		229
	150	362.256	30.1470 - 306.1939	$3d^4$ - $3d^3(a^2F)4p$	a^3G - $^3G^o$	4 - 3		229
	200	362.376	.8031 - 276.7592	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5D^o$	3 - 2		229
	200	362.601	1.2828 - 277.0685	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5D^o$	4 - 3		229
	40	362.631	26.8423 - 302.6025	$3d^4$ - $3d^3(a^2F)4p$	a^3F - $^3F^o$	3 - 4		229
	200	362.806	26.9740 - 302.6025	$3d^4$ - $3d^3(a^2F)4p$	a^3F - $^3F^o$	4 - 4		229
	50	362.821	26.7607 - 302.3771	$3d^4$ - $3d^3(a^2F)4p$	a^3F - $^3F^o$	2 - 3		229
	200	362.930	26.8423 - 302.3771	$3d^4$ - $3d^3(a^2F)4p$	a^3F - $^3F^o$	3 - 3		229
	20	363.102	26.9740 - 302.3771	$3d^4$ - $3d^3(a^2F)4p$	a^3F - $^3F^o$	4 - 3		229
	150	363.332	.1421 - 275.3743	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^3P^o$	1 - 2		229
	70	363.444	0.0000 - 275.1466	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5D^o$	0 - 1		229
	50	363.630	.1421 - 275.1466	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5D^o$	1 - 1		229
	100	363.693	.4173 - 275.3743	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^3P^o$	2 - 2	P	229
	100	363.699	36.5863 - 311.5387	$3d^4$ - $3d^3(a^2F)4p$	a^1G - $^1F^o$	4 - 3	P	229
	50	363.760	36.6301 - 311.5387	$3d^4$ - $3d^3(a^2F)4p$	a^3D - $^1F^o$	3 - 3		229
	20	363.999	.4173 - 275.1466	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5D^o$	2 - 1		229
	80	364.148	.1421 - 274.7533	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5D^o$	1 - 0		229
	50	364.170	36.5863 - 311.1809	$3d^4$ - $3d^3(a^2F)4p$	a^1G - $^1G^o$	4 - 4		229
	150	364.202	.8031 - 275.3743	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^3P^o$	3 - 2		229
	200	364.280	.4173 - 274.9303	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5P^o$	2 - 3		229
	250	364.795	.8031 - 274.9303	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5P^o$	3 - 3		229
	200	364.974	.1421 - 274.1361	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5P^o$	1 - 2		229
	250	365.338	.4173 - 274.1361	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5P^o$	2 - 2		229
	300	365.434	1.2828 - 274.9303	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5P^o$	4 - 3		229
	250	365.632	.1421 - 273.6431	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5P^o$	1 - 1		229
	100	365.742	61.8544 - 335.2678	$3d^4$ - $3d^3(b^2D)4p$	b^3P - $^3P^o$	2 - 1		229
	300	365.855	.8031 - 274.1361	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5P^o$	3 - 2		229
	250	365.997	.4173 - 273.6431	$3d^4$ - $3d^3(a^4P)4p$	ga^5D - $^5P^o$	2 - 1		229
	150	366.663	62.9142 - 335.6427	$3d^4$ - $3d^3(b^2D)4p$	b^3P - $^3P^o$	1 - 0		229
	200	366.764	61.8544 - 334.5091	$3d^4$ - $3d^3(b^2D)4p$	b^3P - $^3P^o$	2 - 2		229
	100	366.890	29.8171 - 302.3771	$3d^4$ - $3d^3(a^2F)4p$	a^3G - $^3F^o$	3 - 3		229
	200	367.007	29.8171 - 302.2927	$3d^4$ - $3d^3(a^2F)4p$	a^3G - $^3F^o$	3 - 2		229
	150	367.033	30.1470 - 302.6025	$3d^4$ - $3d^3(a^2F)4p$	a^3G - $^3F^o$	4 - 4		229
	100	367.168	62.9142 - 335.2678	$3d^4$ - $3d^3(b^2D)4p$	b^3P - $^3P^o$	1 - 1		229

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	250	367.338	30.1470 - 302.3771	$3d^4 - 3d^3(a^2F)4p$	$a^3G - {}^3F^o$	4 - 3		229
	250	367.415	30.4301 - 302.6025	$3d^4 - 3d^3(a^2F)4p$	$a^3G - {}^3F^o$	5 - 4		229
	10	367.453	62.3644 - 334.5091	$3d^4 - 3d^3(b^2D)4p$	$b^3F - {}^3P^o$	3 - 2		229
	150	367.852	63.4200 - 335.2678	$3d^4 - 3d^3(b^2D)4p$	$b^3P - {}^3P^o$	0 - 1		229
	100	367.992	36.9254 - 308.6715	$3d^4 - 3d^3(a^2F)4p$	$a^3D - {}^3D^o$	1 - 1		229
	150	368.196	62.9142 - 334.5091	$3d^4 - 3d^3(b^2D)4p$	$b^3P - {}^3P^o$	1 - 2		229
	150	368.451	36.7585 - 308.1650	$3d^4 - 3d^3(a^2F)4p$	$a^3D - {}^3D^o$	2 - 2		229
	5	368.677	36.9254 - 308.1650	$3d^4 - 3d^3(a^2F)4p$	$a^3D - {}^3D^o$	1 - 2		229
	200	369.470	36.6301 - 307.2887	$3d^4 - 3d^3(a^2F)4p$	$a^3D - {}^3D^o$	3 - 3		229
	2	369.565	24.0554 - 294.6440	$3d^4 - 3d^3(a^4P)4p$	$a^3P - {}^3S^o$	0 - 1		229
	7	370.381	36.6301 - 306.6228	$3d^4 - 3d^3(a^2F)4p$	$a^3D - {}^3G^o$	3 - 4		229
	130	370.589						432
	250	370.673	62.2381 - 332.0173	$3d^4 - 3d^3(b^2D)4p$	$b^3F - {}^3F^o$	4 - 4		229
	125	370.847	62.3644 - 332.0173	$3d^4 - 3d^3(b^2D)4p$	$b^3F - {}^3F^o$	3 - 4		229
	5	371.083	61.8544 - 331.3338	$3d^4 - 3d^3(b^2D)4p$	$b^3P - {}^3F^o$	2 - 2		229
	15	371.454	26.7607 - 295.9732	$3d^4 - 3d^3(a^2P)4p$	$a^3F - {}^1P^o$	2 - 1		229
	200	371.568	62.2381 - 331.3670	$3d^4 - 3d^3(b^2D)4p$	$b^3F - {}^3F^o$	4 - 3		229
	100	371.683	62.3211 - 331.3670	$3d^4 - 3d^3(b^2D)4p$	$b^3F - {}^3F^o$	2 - 3		229
	250	371.732	62.3211 - 331.3338	$3d^4 - 3d^3(b^2D)4p$	$b^3F - {}^3F^o$	2 - 2		229
	200	371.742	62.3644 - 331.3670	$3d^4 - 3d^3(b^2D)4p$	$b^3F - {}^3F^o$	3 - 3		229
	150	371.788	62.3644 - 331.3338	$3d^4 - 3d^3(b^2D)4p$	$b^3F - {}^3F^o$	3 - 2		229
	70	372.890	26.4683 - 294.6440	$3d^4 - 3d^3(a^4P)4p$	$a^3P - {}^3S^o$	2 - 1		229
	70	373.720	24.9325 - 292.5132	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^3G^o$	4 - 3		229
	250	373.795	62.3211 - 329.8486	$3d^4 - 3d^3(b^2D)4p$	$b^3F - {}^1D^o$	2 - 2		229
	100	373.835	24.9325 - 292.4307	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^3G^o$	4 - 4		229
	300	374.244	25.2259 - 292.4307	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^3G^o$	5 - 4		229
	20	374.356	.8031 - 267.9286	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^3F^o$	3 - 4		229
	150	374.444	25.2259 - 292.2876	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^3G^o$	5 - 5		229
	10	374.761	25.5285 - 292.3659	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^1I^o$	6 - 6		229
	300	374.870	25.5285 - 292.2876	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^3G^o$	6 - 5		229
	80	375.030	1.2828 - 267.9286	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^3F^o$	4 - 4		229
	15	375.196	24.0554 - 290.5837	$3d^4 - 3d^3(a^2D)4p$	$a^3P - {}^3P^o$	0 - 1		229
	150	375.518	24.9325 - 291.2314	$3d^4 - 3d^3(a^2D)4p$	$a^3H - {}^1F^o$	4 - 3		229
	20	375.837	61.8544 - 327.9244	$3d^4 - 3d^3(b^2D)4p$	$b^3P - {}^3D^o$	2 - 3		229
	300	375.979	36.6301 - 302.6025	$3d^4 - 3d^3(a^2F)4p$	$a^3D - {}^3F^o$	3 - 4		229
	5	376.038	24.9729 - 290.9034	$3d^4 - 3d^3(a^2D)4p$	$a^3P - {}^3P^o$	1 - 0		229
	1	376.209	.8031 - 266.6128	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^3F^o$	3 - 2		229
	50	376.290	26.7607 - 292.5132	$3d^4 - 3d^3(a^2H)4p$	$a^3F - {}^3G^o$	2 - 3	P	229
	50	376.298	36.6301 - 302.3771	$3d^4 - 3d^3(a^2F)4p$	$a^3D - {}^3F^o$	3 - 3	P	229
	200	376.382	62.2381 - 327.9244	$3d^4 - 3d^3(b^2D)4p$	$b^3F - {}^3D^o$	4 - 3		229
	150	376.404	26.8423 - 292.5132	$3d^4 - 3d^3(a^2H)4p$	$a^3F - {}^3G^o$	3 - 3		229
	200	376.481	36.7585 - 302.3771	$3d^4 - 3d^3(a^2F)4p$	$a^3D - {}^3F^o$	2 - 3		229
	150	376.560	62.3644 - 327.9244	$3d^4 - 3d^3(b^2D)4p$	$b^3F - {}^3D^o$	3 - 3		229
	70	376.596	36.7585 - 302.2927	$3d^4 - 3d^3(a^2F)4p$	$a^3D - {}^3F^o$	2 - 2		229
	40	376.708	26.9740 - 292.4307	$3d^4 - 3d^3(a^2H)4p$	$a^3F - {}^3G^o$	4 - 4		229
	1	376.741	24.9729 - 290.4077	$3d^4 - 3d^3(a^2D)4p$	$a^3P - {}^3P^o$	1 - 2		229
	200	376.837	36.9254 - 302.2927	$3d^4 - 3d^3(a^2F)4p$	$a^3D - {}^3F^o$	1 - 2		229
	150	376.952	62.3211 - 327.6054	$3d^4 - 3d^3(b^2D)4p$	$b^3F - {}^3D^o$	2 - 2		229
	50	377.006	46.2912 - 311.5387	$3d^4 - 3d^3(a^2F)4p$	$a^1D - {}^1F^o$	2 - 3	P	229
	200	377.016	62.3644 - 327.6054	$3d^4 - 3d^3(b^2D)4p$	$b^3F - {}^3D^o$	3 - 2	P	229
	250	377.054	62.3211 - 327.5338	$3d^4 - 3d^3(b^2D)4p$	$b^3F - {}^3D^o$	2 - 1		229
	40	377.386	24.9325 - 289.9130	$3d^4 - 3d^3(a^2D)4p$	$a^3H - {}^3D^o$	4 - 3		229
	1	377.800	62.9142 - 327.6054	$3d^4 - 3d^3(b^2D)4p$	$b^3P - {}^3D^o$	1 - 2		229
	200	377.829	71.2803 - 335.9474	$3d^4 - 3d^3(b^2D)4p$	$b^1G - {}^1F^o$	4 - 3		229
	125	377.909	24.0554 - 288.6698	$3d^4 - 3d^3(a^2D)4p$	$a^3P - {}^3D^o$	0 - 1		229
	200	377.970	25.5285 - 290.0991	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^1H^o$	6 - 5		229
	200	378.191	24.9729 - 289.3897	$3d^4 - 3d^3(a^2D)4p$	$a^3P - {}^3D^o$	1 - 2		229
	70	378.327	25.2259 - 289.5459	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^1G^o$	5 - 4		229
	150	378.419	26.9740 - 291.2314	$3d^4 - 3d^3(a^2D)4p$	$a^3F - {}^1F^o$	4 - 3		229
	5	378.622	26.4683 - 290.5837	$3d^4 - 3d^3(a^2D)4p$	$a^3P - {}^3P^o$	2 - 1		229
	80	378.875	26.4683 - 290.4077	$3d^4 - 3d^3(a^2D)4p$	$a^3P - {}^3P^o$	2 - 2		229
	200	379.032	1.2828 - 265.1126	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^3G^o$	4 - 5		229
	150	379.223	24.9729 - 288.6698	$3d^4 - 3d^3(a^2D)4p$	$a^3P - {}^3D^o$	1 - 1		229
	250	379.300	25.5285 - 289.1719	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^3I^o$	6 - 7		229
	5	379.414	26.8423 - 290.4077	$3d^4 - 3d^3(a^2D)4p$	$a^3F - {}^3P^o$	3 - 2		229

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	300	379.586	26.4683 - 289.9130	$3d^4 - 3d^3(a^2D)4p$	$a^3P - {}^3D^o$	2 - 3		229
	30	380.009	26.7607 - 289.9130	$3d^4 - 3d^3(a^2D)4p$	$a^3F - {}^3D^o$	2 - 3		229
	100	380.131	26.8423 - 289.9130	$3d^4 - 3d^3(a^2D)4p$	$a^3F - {}^3D^o$	3 - 3		229
	200	380.313	25.2259 - 288.1672	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^3I^o$	5 - 6	P	229
	100	380.316	26.9740 - 289.9130	$3d^4 - 3d^3(a^2D)4p$	$a^3F - {}^3D^o$	4 - 3	P	229
	250	380.340	26.4683 - 289.3897	$3d^4 - 3d^3(a^2D)4p$	$a^3P - {}^3D^o$	2 - 2		229
	250	380.667	29.8171 - 292.5132	$3d^4 - 3d^3(a^2H)4p$	$a^3G - {}^3G^o$	3 - 3		229
	150	380.752	25.5285 - 288.1672	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^3I^o$	6 - 6		229
	150	380.764	26.7607 - 289.3897	$3d^4 - 3d^3(a^2D)4p$	$a^3F - {}^3D^o$	2 - 2		229
	125	380.786	29.8171 - 292.4307	$3d^4 - 3d^3(a^2H)4p$	$a^3G - {}^3G^o$	3 - 4		229
	250	380.883	26.8423 - 289.3897	$3d^4 - 3d^3(a^2D)4p$	$a^3F - {}^3D^o$	3 - 2		229
	200	380.940	24.9325 - 287.4405	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^3I^o$	4 - 5		229
	100	381.104	25.2259 - 287.6202	$3d^4 - 3d^3(a^2D)4p$	$a^3H - {}^3F^o$	5 - 4		229
	150	381.147	30.1470 - 292.5132	$3d^4 - 3d^3(a^2H)4p$	$a^3G - {}^3G^o$	4 - 3		229
	300	381.266	30.1470 - 292.4307	$3d^4 - 3d^3(a^2H)4p$	$a^3G - {}^3G^o$	4 - 4		229
	250	381.366	25.2259 - 287.4405	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^3I^o$	5 - 5		229
	150	381.475	30.1470 - 292.2876	$3d^4 - 3d^3(a^2H)4p$	$a^3G - {}^3G^o$	4 - 5		229
	200	381.680	30.4301 - 292.4307	$3d^4 - 3d^3(a^2H)4p$	$a^3G - {}^3G^o$	5 - 4		229
	5	381.771	30.4301 - 292.3659	$3d^4 - 3d^3(a^2H)4p$	$a^3G - {}^1I^o$	5 - 6		229
	250	381.812	26.7607 - 288.6698	$3d^4 - 3d^3(a^2D)4p$	$a^3F - {}^3D^o$	2 - 1		229
	250	381.887	30.4301 - 292.2876	$3d^4 - 3d^3(a^2H)4p$	$a^3G - {}^3G^o$	5 - 5		229
	20	382.411	24.9325 - 286.4313	$3d^4 - 3d^3(a^4P)4p$	$a^3H - {}^3D^o$	4 - 3		229
	200	382.536	29.8171 - 291.2314	$3d^4 - 3d^3(a^2D)4p$	$a^3G - {}^1F^o$	3 - 3		229
	250	382.624	46.2912 - 307.6444	$3d^4 - 3d^3(a^2F)4p$	$a^1D - {}^1D^o$	2 - 2		229
	200	382.827	24.9729 - 286.1877	$3d^4 - 3d^3(a^2P)4p$	$a^3P - {}^3S^o$	1 - 1		229
	150	383.159	24.9729 - 285.9617	$3d^4 - 3d^3(a^2D)4p$	$a^3P - {}^1P^o$	1 - 1		229
	200	383.491	.4173 - 261.1796	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^3D^o$	2 - 3		229
	40	383.817	24.9325 - 285.4740	$3d^4 - 3d^3(a^2P)4p$	$a^3H - {}^3D^o$	4 - 3		229
	150	384.033	26.4683 - 286.8627	$3d^4 - 3d^3(a^4P)4p$	$a^3P - {}^3D^o$	2 - 2		229
	200	384.058	.8031 - 261.1796	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^3D^o$	3 - 3		229
	250	384.219	26.8423 - 287.1096	$3d^4 - 3d^3(a^2D)4p$	$a^3F - {}^3F^o$	3 - 3		229
	250	384.416	26.9740 - 287.1096	$3d^4 - 3d^3(a^2D)4p$	$a^3F - {}^3F^o$	4 - 3		229
	200	384.479	26.7607 - 286.8553	$3d^4 - 3d^3(a^4P)4p$	$a^3F - {}^3D^o$	2 - 1		229
	200	384.585	26.8423 - 286.8627	$3d^4 - 3d^3(a^4P)4p$	$a^3F - {}^3D^o$	3 - 2		229
	200	384.622	.4173 - 260.4114	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^3D^o$	2 - 2		229
	200	384.659	25.2259 - 285.1961	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^3H^o$	5 - 6		229
	150	384.707	24.9729 - 284.9112	$3d^4 - 3d^3(a^2P)4p$	$a^3P - {}^3D^o$	1 - 2		229
	150	384.768	1.2828 - 261.1796	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^3D^o$	4 - 3		229
	150	384.825	24.9325 - 284.7908	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^3H^o$	4 - 5	P	229
	100	384.833	.1421 - 259.9952	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^3D^o$	1 - 1	P	229
	300	384.958	1.2828 - 261.0519	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5F^o$	4 - 5		229
	300	384.972	24.9325 - 284.6903	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^3H^o$	4 - 4		229
	200	385.031	26.4683 - 286.1877	$3d^4 - 3d^3(a^2P)4p$	$a^3P - {}^3S^o$	2 - 1	P	229
	100	385.033	.8031 - 260.5210	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5F^o$	3 - 4	P	229
	300	385.108	25.5285 - 285.1961	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^3H^o$	6 - 6		229
	100	385.196	.8031 - 260.4114	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^3D^o$	3 - 2		229
	100	385.226	26.8423 - 286.4313	$3d^4 - 3d^3(a^4P)4p$	$a^3F - {}^3D^o$	3 - 3		229
	300	385.251	29.8171 - 289.3897	$3d^4 - 3d^3(a^2D)4p$	$a^3G - {}^3D^o$	3 - 2		229
	300	385.262	25.2259 - 284.7908	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^3H^o$	5 - 5		229
	300	385.300	.4173 - 259.9547	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5F^o$	2 - 3		229
	200	385.420	26.9740 - 286.4313	$3d^4 - 3d^3(a^4P)4p$	$a^3F - {}^3D^o$	4 - 3		229
	100	385.507	26.7607 - 286.1549	$3d^4 - 3d^3(a^2D)4p$	$a^3F - {}^3F^o$	2 - 2		229
	70	385.637	26.8423 - 286.1549	$3d^4 - 3d^3(a^2D)4p$	$a^3F - {}^3F^o$	3 - 2		229
	30	385.712	25.5285 - 284.7908	$3d^4 - 3d^3(a^2H)4p$	$a^3H - {}^3H^o$	6 - 5		229
	100	385.746	1.2828 - 260.5210	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5F^o$	4 - 4	P	229
	200	385.752	.1421 - 259.3761	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5F^o$	1 - 2	P	229
	300	385.875	.8031 - 259.9547	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5F^o$	3 - 3		229
	150	385.928	30.4301 - 289.5459	$3d^4 - 3d^3(a^2H)4p$	$a^3G - {}^1G^o$	5 - 4		229
	100	386.093	26.4683 - 285.4740	$3d^4 - 3d^3(a^2P)4p$	$a^3P - {}^3D^o$	2 - 3		229
	100	386.162	.4173 - 259.3761	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5F^o$	2 - 2	P	229
	250	386.163	36.7585 - 295.7164	$3d^4 - 3d^3(a^2D)4p$	$a^3D - {}^1D^o$	2 - 2	P	229
	250	386.261	0.0000 - 258.8915	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5D^o$	0 - 1		229
	200	386.389	52.7327 - 311.5387	$3d^4 - 3d^3(a^2F)4p$	$a^1F - {}^1F^o$	3 - 3		229
	150	386.428	24.9729 - 283.7540	$3d^4 - 3d^3(a^2P)4p$	$a^3P - {}^3D^o$	1 - 1		229
	200	386.476	.1421 - 258.8915	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5D^o$	1 - 1		229

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	250	386.528	24.9729 - 283.6863	$3d^4 - 3d^3(a^2P)4p$	$a^3P - {}^3P^o$	1 - 2		229
	250	386.590	1.2828 - 259.9547	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5F^o$	4 - 3		229
	200	386.652	26.8423 - 285.4740	$3d^4 - 3d^3(a^2P)4p$	$a^3F - {}^3D^o$	3 - 3		229
	300	386.739	.8031 - 259.3761	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5F^o$	3 - 2		229
	300	386.785	.8031 - 259.3448	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5D^o$	3 - 4		229
	300	386.847	26.9740 - 285.4740	$3d^4 - 3d^3(a^2P)4p$	$a^3F - {}^3D^o$	4 - 3		229
	300	386.878	.1421 - 258.6195	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5D^o$	1 - 0		229
	350	386.885	.4173 - 258.8915	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5D^o$	2 - 1		229
	100	386.924	52.7327 - 311.1809	$3d^4 - 3d^3(a^2F)4p$	$a^1F - {}^1G^o$	3 - 4		229
	400	387.202	.4173 - 258.6800	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5D^o$	2 - 3		229
	200	387.371	26.7607 - 284.9112	$3d^4 - 3d^3(a^2P)4p$	$a^3F - {}^3D^o$	2 - 2		229
	100	387.493	26.8423 - 284.9112	$3d^4 - 3d^3(a^2P)4p$	$a^3F - {}^3D^o$	3 - 2	P	229
	300	387.504	1.2828 - 259.3448	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5D^o$	4 - 4	P	229
	300	387.618	.1421 - 258.1285	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5D^o$	1 - 2		229
	100	387.689	24.9325 - 282.8719	$3d^4 - 3d^3(a^2G)4p$	$a^3H - {}^1H^o$	4 - 5		229
	200	387.763	24.0554 - 281.9449	$3d^4 - 3d^3(a^2P)4p$	$a^3P - {}^3P^o$	0 - 1	P	229
	200	387.769	36.7585 - 294.6440	$3d^4 - 3d^3(a^4P)4p$	$a^3D - {}^3S^o$	2 - 1	P	229
	400	387.781	.8031 - 258.6800	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5D^o$	3 - 3		229
	20	387.895	29.8171 - 287.6202	$3d^4 - 3d^3(a^2D)4p$	$a^3G - {}^3F^o$	3 - 4		229
	300	387.984	0.0000 - 257.7423	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5F^o$	0 - 1		229
	150	388.030	.4173 - 258.1285	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5D^o$	2 - 2		229
	100	388.129	25.2259 - 282.8719	$3d^4 - 3d^3(a^2G)4p$	$a^3H - {}^1H^o$	5 - 5	P	229
	100	388.140	24.9325 - 282.5716	$3d^4 - 3d^3(a^2G)4p$	$a^3H - {}^1F^o$	4 - 3	P	229
	100	388.199	.1421 - 257.7423	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5F^o$	1 - 1		229
	200	388.390	30.1470 - 287.6202	$3d^4 - 3d^3(a^2D)4p$	$a^3G - {}^3F^o$	4 - 4		229
	250	388.504	1.2828 - 258.6800	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5D^o$	4 - 3		229
	200	388.586	25.5285 - 282.8719	$3d^4 - 3d^3(a^2G)4p$	$a^3H - {}^1H^o$	6 - 5		229
	300	388.613	.8031 - 258.1285	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5D^o$	3 - 2		229
	150	388.661	30.1470 - 287.4405	$3d^4 - 3d^3(a^2H)4p$	$a^3G - {}^3I^o$	4 - 5		229
	200	388.709	24.9729 - 282.2345	$3d^4 - 3d^3(a^2P)4p$	$a^3P - {}^3P^o$	1 - 0		229
	200	388.775	26.4683 - 283.6863	$3d^4 - 3d^3(a^2P)4p$	$a^3P - {}^3P^o$	2 - 2		229
	300	388.817	30.4301 - 287.6202	$3d^4 - 3d^3(a^2D)4p$	$a^3G - {}^3F^o$	5 - 4		229
	200	388.947	24.9325 - 282.0381	$3d^4 - 3d^3(a^2G)4p$	$a^3H - {}^1G^o$	4 - 4		229
	250	389.035	29.8171 - 286.8627	$3d^4 - 3d^3(a^4P)4p$	$a^3G - {}^3D^o$	3 - 2		229
	200	389.115	26.7607 - 283.7540	$3d^4 - 3d^3(a^2P)4p$	$a^3F - {}^3D^o$	2 - 1		229
	200	389.146	24.9729 - 281.9449	$3d^4 - 3d^3(a^2P)4p$	$a^3P - {}^3P^o$	1 - 1		229
	200	389.161	30.1470 - 287.1096	$3d^4 - 3d^3(a^2D)4p$	$a^3G - {}^3F^o$	4 - 3		229
	7	389.339	26.8423 - 283.6863	$3d^4 - 3d^3(a^2P)4p$	$a^3F - {}^3P^o$	3 - 2		229
	200	389.390	25.2259 - 282.0381	$3d^4 - 3d^3(a^2G)4p$	$a^3H - {}^1G^o$	5 - 4		229
	70	389.642	71.2803 - 327.9244	$3d^4 - 3d^3(b^2D)4p$	$b^1G - {}^3D^o$	4 - 3		229
	80	389.689	29.8171 - 286.4313	$3d^4 - 3d^3(a^4P)4p$	$a^3G - {}^3D^o$	3 - 3		229
	150	390.107	39.6334 - 295.9732	$3d^4 - 3d^3(a^2P)4p$	$a^1S - {}^1P^o$	0 - 1	P	229
	150	390.110	29.8171 - 286.1549	$3d^4 - 3d^3(a^2D)4p$	$a^3G - {}^3F^o$	3 - 2	P	229
	300	390.191	30.1470 - 286.4313	$3d^4 - 3d^3(a^4P)4p$	$a^3G - {}^3D^o$	4 - 3		229
	5	390.621	46.2912 - 302.2927	$3d^4 - 3d^3(a^2F)4p$	$a^1D - {}^3F^o$	2 - 2		229
	200	390.692	26.4683 - 282.4235	$3d^4 - 3d^3(a^2P)4p$	$a^3P - {}^1D^o$	2 - 2		229
	200	390.735	36.5863 - 292.5132	$3d^4 - 3d^3(a^2H)4p$	$a^1G - {}^3G^o$	4 - 3		229
	300	390.777	24.9325 - 280.8322	$3d^4 - 3d^3(a^2G)4p$	$a^3H - {}^3F^o$	4 - 3		229
	200	390.845	1.2828 - 257.1380	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5G^o$	4 - 5		229
	200	390.861	36.5863 - 292.4307	$3d^4 - 3d^3(a^2H)4p$	$a^1G - {}^3G^o$	4 - 4		229
	150	390.913	26.7607 - 282.5716	$3d^4 - 3d^3(a^2G)4p$	$a^3F - {}^1F^o$	2 - 3		229
	40	390.985	26.8423 - 282.6048	$3d^4 - 3d^3(a^4P)4p$	$a^3F - {}^5S^o$	3 - 2		229
	200	391.038	26.8423 - 282.5716	$3d^4 - 3d^3(a^2G)4p$	$a^3F - {}^1F^o$	3 - 3		229
	200	391.141	26.7607 - 282.4235	$3d^4 - 3d^3(a^2P)4p$	$a^3F - {}^1D^o$	2 - 2		229
	150	391.239	26.9740 - 282.5716	$3d^4 - 3d^3(a^2G)4p$	$a^3F - {}^1F^o$	4 - 3		229
	150	391.424	26.4683 - 281.9449	$3d^4 - 3d^3(a^2P)4p$	$a^3P - {}^3P^o$	2 - 1		229
	250	391.489	24.9325 - 280.3672	$3d^4 - 3d^3(a^2G)4p$	$a^3H - {}^3F^o$	4 - 4		229
	50	391.580	.8031 - 256.1779	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5G^o$	3 - 4		229
	250	391.650	30.1470 - 285.4740	$3d^4 - 3d^3(a^2P)4p$	$a^3G - {}^3D^o$	4 - 3		229
	5	391.856	26.8423 - 282.0381	$3d^4 - 3d^3(a^2G)4p$	$a^3F - {}^1G^o$	3 - 4		229
	300	391.938	25.2259 - 280.3672	$3d^4 - 3d^3(a^2G)4p$	$a^3H - {}^3F^o$	5 - 4		229
	30	392.010	29.8171 - 284.9112	$3d^4 - 3d^3(a^2P)4p$	$a^3G - {}^3D^o$	3 - 2		229
	300	392.058	26.9740 - 282.0381	$3d^4 - 3d^3(a^2G)4p$	$a^3F - {}^1G^o$	4 - 4		229
	40	392.137	39.6334 - 294.6440	$3d^4 - 3d^3(a^4P)4p$	$a^1S - {}^3S^o$	0 - 1		229
	5	392.183	.4173 - 255.3992	$3d^4 - 3d^3(a^4F)4p$	$ga^5D - {}^5G^o$	2 - 3		229

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	250	408.079	62.2381 - 307.2887	$3d^4 - 3d^3(a^2F)4p$	$b^3F - {}^3D^o$	4 - 3		229
	1	408.131	36.9254 - 281.9449	$3d^4 - 3d^3(a^2P)4p$	$a^3D - {}^3P^o$	1 - 1		229
	10	408.261	46.2912 - 291.2314	$3d^4 - 3d^3(a^2D)4p$	$a^1D - {}^1F^o$	2 - 3		229
	10	408.288	62.3644 - 307.2887	$3d^4 - 3d^3(a^2F)4p$	$b^3F - {}^3D^o$	3 - 3		229
	250	408.453	62.2381 - 307.0644	$3d^4 - 3d^3(a^2F)4p$	$b^3F - {}^3G^o$	4 - 5		229
	1	408.613	62.9142 - 307.6444	$3d^4 - 3d^3(a^2F)4p$	$b^3P - {}^1D^o$	1 - 2		229
	60	409.190	62.2381 - 306.6228	$3d^4 - 3d^3(a^2F)4p$	$b^3F - {}^3G^o$	4 - 4		229
	10	409.265	61.8544 - 306.1939	$3d^4 - 3d^3(a^2F)4p$	$b^3P - {}^3G^o$	2 - 3		229
	150	409.400	62.3644 - 306.6228	$3d^4 - 3d^3(a^2F)4p$	$b^3F - {}^3G^o$	3 - 4		229
	50	409.419	36.5863 - 280.8322	$3d^4 - 3d^3(a^2G)4p$	$a^1G - {}^3F^o$	4 - 3		229
	40	409.496	36.6301 - 280.8322	$3d^4 - 3d^3(a^2G)4p$	$a^3D - {}^3F^o$	3 - 3		229
	50	409.638	39.6334 - 283.7540	$3d^4 - 3d^3(a^2P)4p$	$a^1S - {}^3D^o$	0 - 1		229
	400	409.712	36.7585 - 280.8322	$3d^4 - 3d^3(a^2G)4p$	$a^3D - {}^3F^o$	2 - 3		229
	200	410.049	62.3211 - 306.1939	$3d^4 - 3d^3(a^2F)4p$	$b^3F - {}^3G^o$	2 - 3		229
	70	410.121	62.3644 - 306.1939	$3d^4 - 3d^3(a^2F)4p$	$b^3F - {}^3G^o$	3 - 3		229
	400	410.204	36.7585 - 280.5397	$3d^4 - 3d^3(a^2G)4p$	$a^3D - {}^3F^o$	2 - 2		229
	250	410.278	36.6301 - 280.3672	$3d^4 - 3d^3(a^2G)4p$	$a^3D - {}^3F^o$	3 - 4		229
	250	410.483	36.9254 - 280.5397	$3d^4 - 3d^3(a^2G)4p$	$a^3D - {}^3F^o$	1 - 2		229
	600	411.549	52.7327 - 295.7164	$3d^4 - 3d^3(a^2D)4p$	$a^1F - {}^1D^o$	3 - 2		229
	10	411.665	36.5863 - 279.5026	$3d^4 - 3d^3(a^2G)4p$	$a^1G - {}^3G^o$	4 - 4		229
	100	411.739	36.6301 - 279.5026	$3d^4 - 3d^3(a^2G)4p$	$a^3D - {}^3G^o$	3 - 4		229
	20	412.577	46.2912 - 288.6698	$3d^4 - 3d^3(a^2D)4p$	$a^1D - {}^3D^o$	2 - 1		229
	50	412.693	39.6334 - 281.9449	$3d^4 - 3d^3(a^2P)4p$	$a^1S - {}^3P^o$	0 - 1		229
	30	413.025	93.8323 - 335.9474	$3d^4 - 3d^3(b^2D)4p$	$b^1D - {}^1F^o$	2 - 3		229
	50	413.162	36.7585 - 278.7942	$3d^4 - 3d^3(a^2G)4p$	$a^3D - {}^3G^o$	2 - 3		229
	125	414.787	26.8423 - 267.9286	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3F^o$	3 - 4		229
	300	415.013	26.9740 - 267.9286	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3F^o$	4 - 4		229
	30	415.689	46.2912 - 286.8553	$3d^4 - 3d^3(a^4P)4p$	$a^1D - {}^3D^o$	2 - 1		229
	10	415.763	61.8544 - 302.3771	$3d^4 - 3d^3(a^2F)4p$	$b^3P - {}^3F^o$	2 - 3		229
	150	415.834	26.7607 - 267.2401	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3F^o$	2 - 3		229
	5	415.906	36.6301 - 277.0685	$3d^4 - 3d^3(a^4P)4p$	$a^3D - {}^5D^o$	3 - 3		229
	150	415.977	26.8423 - 267.2401	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3F^o$	3 - 3		229
	150	416.037	62.2381 - 302.6025	$3d^4 - 3d^3(a^2F)4p$	$b^3F - {}^3F^o$	4 - 4		229
	50	416.205	26.9740 - 267.2401	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3F^o$	4 - 3	P	229
	150	416.218	71.2803 - 311.5387	$3d^4 - 3d^3(a^2F)4p$	$b^1G - {}^1F^o$	4 - 3	P	229
	50	416.253	62.3644 - 302.6025	$3d^4 - 3d^3(a^2F)4p$	$b^3F - {}^3F^o$	3 - 4		229
	200	416.444	36.6301 - 276.7592	$3d^4 - 3d^3(a^4P)4p$	$a^3D - {}^5D^o$	3 - 2		229
	60	416.568	62.3211 - 302.3771	$3d^4 - 3d^3(a^2F)4p$	$b^3F - {}^3F^o$	2 - 3		229
	300	416.655	36.7585 - 276.7659	$3d^4 - 3d^3(a^4P)4p$	$a^3D - {}^3P^o$	2 - 1		229
	125	416.717	62.3211 - 302.2927	$3d^4 - 3d^3(a^2F)4p$	$b^3F - {}^3F^o$	2 - 2		229
	100	416.839	71.2803 - 311.1809	$3d^4 - 3d^3(a^2F)4p$	$b^1G - {}^1G^o$	4 - 4	P	229
	200	416.846	46.2912 - 286.1877	$3d^4 - 3d^3(a^2P)4p$	$a^1D - {}^3S^o$	2 - 1	P	229
	100	416.864	25.2259 - 265.1126	$3d^4 - 3d^3(a^4F)4p$	$a^3H - {}^3G^o$	5 - 5		229
	250	416.925	26.7607 - 266.6128	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3F^o$	2 - 2		229
	100	416.944	36.9254 - 276.7659	$3d^4 - 3d^3(a^4P)4p$	$a^3D - {}^3P^o$	1 - 1		229
	200	417.064	26.8423 - 266.6128	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3F^o$	3 - 2		229
	5	417.194	52.7327 - 292.4307	$3d^4 - 3d^3(a^2H)4p$	$a^1F - {}^3G^o$	3 - 4		229
	200	417.241	46.2912 - 285.9617	$3d^4 - 3d^3(a^2D)4p$	$a^1D - {}^1P^o$	2 - 1		229
	700	417.391	25.5285 - 265.1126	$3d^4 - 3d^3(a^4F)4p$	$a^3H - {}^3G^o$	6 - 5		229
	40	417.520	36.9254 - 276.4349	$3d^4 - 3d^3(a^4P)4p$	$a^3D - {}^3P^o$	1 - 0	P	229
	40	417.534	24.9325 - 264.4342	$3d^4 - 3d^3(a^4F)4p$	$a^3H - {}^3G^o$	4 - 4	P	229
	700	418.045	25.2259 - 264.4342	$3d^4 - 3d^3(a^4F)4p$	$a^3H - {}^3G^o$	5 - 4		229
	500	418.472	24.9325 - 263.8986	$3d^4 - 3d^3(a^4F)4p$	$a^3H - {}^3G^o$	4 - 3		229
	250	418.862	36.6301 - 275.3743	$3d^4 - 3d^3(a^4P)4p$	$a^3D - {}^3P^o$	3 - 2		229
	80	419.082	36.7585 - 275.3743	$3d^4 - 3d^3(a^4P)4p$	$a^3D - {}^3P^o$	2 - 2		229
	150	419.291	52.7327 - 291.2314	$3d^4 - 3d^3(a^2D)4p$	$a^1F - {}^1F^o$	3 - 3		229
	150	419.487	36.7585 - 275.1466	$3d^4 - 3d^3(a^4P)4p$	$a^3D - {}^5D^o$	2 - 1		229
	40	419.782	36.9254 - 275.1466	$3d^4 - 3d^3(a^4P)4p$	$a^3D - {}^5D^o$	1 - 1		229
	200	419.924	26.9740 - 265.1126	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3G^o$	4 - 5		229
	100	420.475	36.9254 - 274.7533	$3d^4 - 3d^3(a^4P)4p$	$a^3D - {}^5D^o$	1 - 0		229
	300	420.559	30.1470 - 267.9286	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3F^o$	4 - 4		229
	200	420.892	26.8423 - 264.4342	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3G^o$	3 - 4		229
	700	421.055	30.4301 - 267.9286	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3F^o$	5 - 4		229
	200	421.124	26.9740 - 264.4342	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3G^o$	4 - 4		229
	250	421.188	29.8171 - 267.2401	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3F^o$	3 - 3		229

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	70	421.240	46.2912 - 283.6863	$3d^4 - 3d^3(a^2F)4p$	$a^1D - {}^3F^o$	2 - 2		229
	30	421.622	52.7327 - 289.9130	$3d^4 - 3d^3(a^2D)4p$	$a^1F - {}^3D^o$	3 - 3		229
	200	421.697	26.7607 - 263.8986	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3G^o$	2 - 3		229
	500	421.777	30.1470 - 267.2401	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3F^o$	4 - 3		229
	150	421.842	26.8423 - 263.8986	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3G^o$	3 - 3		229
	300	422.277	52.7327 - 289.5459	$3d^4 - 3d^3(a^2H)4p$	$a^1F - {}^1G^o$	3 - 4		229
	500	422.306	29.8171 - 266.6128	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3F^o$	3 - 2		229
	90	423.168	46.2912 - 282.6048	$3d^4 - 3d^3(a^4P)4p$	$a^1D - {}^5S^o$	2 - 2		229
	300	423.229	46.2912 - 282.5716	$3d^4 - 3d^3(a^2G)4p$	$a^1D - {}^1F^o$	2 - 3		229
	10	423.286	24.9325 - 261.1796	$3d^4 - 3d^3(a^4F)4p$	$a^3H - {}^3D^o$	4 - 3		229
	70	423.494	46.2912 - 282.4235	$3d^4 - 3d^3(a^2P)4p$	$a^1D - {}^1D^o$	2 - 2		229
	100	423.700	93.8323 - 329.8486	$3d^4 - 3d^3(b^2D)4p$	$b^1D - {}^1D^o$	2 - 2	P	229
	150	423.714	71.2803 - 307.2887	$3d^4 - 3d^3(a^2F)4p$	$b^1G - {}^3D^o$	4 - 3	P	229
	150	423.835	24.0554 - 259.9952	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^3D^o$	0 - 1		229
	20	424.354	46.2912 - 281.9449	$3d^4 - 3d^3(a^2P)4p$	$a^1D - {}^3P^o$	2 - 1		229
	100	424.587	25.5285 - 261.0519	$3d^4 - 3d^3(a^4F)4p$	$a^3H - {}^5F^o$	6 - 5		229
	200	424.741	24.9729 - 260.4114	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^3D^o$	1 - 2		229
	40	424.914	71.2803 - 306.6228	$3d^4 - 3d^3(a^2F)4p$	$b^1G - {}^3G^o$	4 - 4		229
	70	425.000	25.2259 - 260.5210	$3d^4 - 3d^3(a^4F)4p$	$a^3H - {}^5F^o$	5 - 4		229
	150	425.491	24.9729 - 259.9952	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^3D^o$	1 - 1		229
	125	425.595	30.1470 - 265.1126	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3G^o$	4 - 5		229
	1	425.689	71.2803 - 306.1939	$3d^4 - 3d^3(a^2F)4p$	$b^1G - {}^3G^o$	4 - 3		229
	50	425.840	24.0554 - 258.8915	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^5D^o$	0 - 1	Q	047
	500	426.056	26.4683 - 261.1796	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^3D^o$	2 - 3		229
	500	426.108	30.4301 - 265.1126	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3G^o$	5 - 5		229
	100	426.229	29.8171 - 264.4342	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3G^o$	3 - 4		229
	70	426.364	46.2912 - 280.8322	$3d^4 - 3d^3(a^2G)4p$	$a^1D - {}^3F^o$	2 - 3		229
	80	426.614	24.9729 - 259.3761	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^5F^o$	1 - 2		229
	5	426.663	52.7327 - 287.1096	$3d^4 - 3d^3(a^2D)4p$	$a^1F - {}^3F^o$	3 - 3		229
	150	426.740	26.8423 - 261.1796	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3D^o$	3 - 3		229
	300	426.829	30.1470 - 264.4342	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3G^o$	4 - 4		229
	350	426.974	26.9740 - 261.1796	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3D^o$	4 - 3		229
	10	427.115	52.7327 - 286.8627	$3d^4 - 3d^3(a^4P)4p$	$a^1F - {}^3D^o$	3 - 2		229
	80	427.135	61.8544 - 295.9732	$3d^4 - 3d^3(a^2P)4p$	$b^3P - {}^1P^o$	2 - 1		229
	250	427.201	29.8171 - 263.8986	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3G^o$	3 - 3		229
	30	427.343	30.4301 - 264.4342	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3G^o$	5 - 4		229
	200	427.453	26.4683 - 260.4114	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^3D^o$	2 - 2		229
	1	427.498	24.9729 - 258.8915	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^5D^o$	1 - 1		229
	710	427.772	93.8323 - 327.6054	$3d^4 - 3d^3(b^2D)4p$	$b^1D - {}^3D^o$	2 - 2		432
	30	427.804	30.1470 - 263.8986	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3G^o$	4 - 3		229
	150	427.924	24.0554 - 257.7423	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^5F^o$	0 - 1		229
	70	427.987	26.7607 - 260.4114	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3D^o$	2 - 2		229
	30	428.138	26.8423 - 260.4114	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3D^o$	3 - 2		229
	1	428.218	26.4683 - 259.9952	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^3D^o$	2 - 1		229
	70	428.290	26.4683 - 259.9547	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^5F^o$	2 - 3		229
	5	428.540	62.3644 - 295.7164	$3d^4 - 3d^3(a^2D)4p$	$b^3F - {}^1D^o$	3 - 2		229
	200	428.752	26.7607 - 259.9952	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3D^o$	2 - 1		229
	150	428.898	24.9729 - 258.1285	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^5D^o$	1 - 2		229
	40	429.077	62.9142 - 295.9732	$3d^4 - 3d^3(a^2P)4p$	$b^3P - {}^1P^o$	1 - 1		229
	5	429.223	26.9740 - 259.9547	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^5F^o$	4 - 3		229
	5	429.353	26.4683 - 259.3761	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^5F^o$	2 - 2		229
	150	429.573	61.8544 - 294.6440	$3d^4 - 3d^3(a^4P)4p$	$b^3P - {}^3S^o$	2 - 1		229
	125	429.609	24.9729 - 257.7423	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^5F^o$	1 - 1		229
	50	430.042	26.8423 - 259.3761	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^5F^o$	3 - 2		229
	70	430.103	46.2912 - 278.7942	$3d^4 - 3d^3(a^2G)4p$	$a^1D - {}^3G^o$	2 - 3		229
	150	430.640	26.4683 - 258.6800	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^5D^o$	2 - 3		229
	1	430.792	26.7607 - 258.8915	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^5D^o$	2 - 1		229
	2	431.116	52.7327 - 284.6903	$3d^4 - 3d^3(a^2H)4p$	$a^1F - {}^3H^o$	3 - 4		229
	150	431.538	62.9142 - 294.6440	$3d^4 - 3d^3(a^4P)4p$	$b^3P - {}^3S^o$	1 - 1		229
	125	431.580	26.9740 - 258.6800	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^5D^o$	4 - 3		229
	100	431.666	26.4683 - 258.1285	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^5D^o$	2 - 2		229
	5	431.759	25.5285 - 257.1380	$3d^4 - 3d^3(a^4F)4p$	$a^3H - {}^5G^o$	6 - 5		229
	125	432.341	36.6301 - 267.9286	$3d^4 - 3d^3(a^4F)4p$	$a^3D - {}^3F^o$	3 - 4		229
	100	432.363	26.8423 - 258.1285	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^5D^o$	3 - 2		229
	125	432.483	63.4200 - 294.6440	$3d^4 - 3d^3(a^4P)4p$	$b^3P - {}^3S^o$	0 - 1		229

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	150	432.935	26.7607 - 257.7423	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^5F^o$	2 - 1		229
	5	432.988	52.7327 - 283.6863	$3d^4 - 3d^3(a^2P)4p$	$a^1F - {}^3P^o$	3 - 2		229
	70	433.610	30.4301 - 261.0519	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^5F^o$	5 - 5		229
	30	433.629	36.6301 - 267.2401	$3d^4 - 3d^3(a^4F)4p$	$a^3D - {}^3F^o$	3 - 3		229
	150	433.872	36.7585 - 267.2401	$3d^4 - 3d^3(a^4F)4p$	$a^3D - {}^3F^o$	2 - 3		229
	300	434.418	62.3211 - 292.5132	$3d^4 - 3d^3(a^2H)4p$	$b^3F - {}^3G^o$	2 - 3		229
	70	434.499	62.3644 - 292.5132	$3d^4 - 3d^3(a^2H)4p$	$b^3F - {}^3G^o$	3 - 3		229
	200	434.658	62.3644 - 292.4307	$3d^4 - 3d^3(a^2H)4p$	$b^3F - {}^3G^o$	3 - 4		229
	250	434.686	62.2381 - 292.2876	$3d^4 - 3d^3(a^2H)4p$	$b^3F - {}^3G^o$	4 - 5		229
	125	435.374	36.9254 - 266.6128	$3d^4 - 3d^3(a^4F)4p$	$a^3D - {}^3F^o$	1 - 2		229
	1	435.623	29.8171 - 259.3761	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^5F^o$	3 - 2		229
	20	436.697	62.2381 - 291.2314	$3d^4 - 3d^3(a^2D)4p$	$b^3F - {}^1F^o$	4 - 3		229
	30	436.851	62.3211 - 291.2314	$3d^4 - 3d^3(a^2D)4p$	$b^3F - {}^1F^o$	2 - 3		229
	100	437.200	61.8544 - 290.5837	$3d^4 - 3d^3(a^2D)4p$	$b^3P - {}^3P^o$	2 - 1		229
	150	437.538	61.8544 - 290.4077	$3d^4 - 3d^3(a^2D)4p$	$b^3P - {}^3P^o$	2 - 2		229
	3	438.516	62.3644 - 290.4077	$3d^4 - 3d^3(a^2D)4p$	$b^3F - {}^3P^o$	3 - 2		229
	50	438.618	62.9142 - 290.9034	$3d^4 - 3d^3(a^2D)4p$	$b^3P - {}^3P^o$	1 - 0		229
	80	438.865	62.2381 - 290.0991	$3d^4 - 3d^3(a^2H)4p$	$b^3F - {}^1H^o$	4 - 5		229
	300	439.225	62.2381 - 289.9130	$3d^4 - 3d^3(a^2D)4p$	$b^3F - {}^3D^o$	4 - 3		229
	5	439.469	62.3644 - 289.9130	$3d^4 - 3d^3(a^2D)4p$	$b^3F - {}^3D^o$	3 - 3		229
	70	439.574	62.9142 - 290.4077	$3d^4 - 3d^3(a^2D)4p$	$b^3P - {}^3P^o$	1 - 2		229
	20	440.213	63.4200 - 290.5837	$3d^4 - 3d^3(a^2D)4p$	$b^3P - {}^3P^o$	0 - 1		229
	10	440.400	62.3211 - 289.3897	$3d^4 - 3d^3(a^2D)4p$	$b^3F - {}^3D^o$	2 - 2		229
	250	440.479	62.3644 - 289.3897	$3d^4 - 3d^3(a^2D)4p$	$b^3F - {}^3D^o$	3 - 2		229
	200	441.799	62.3211 - 288.6698	$3d^4 - 3d^3(a^2D)4p$	$b^3F - {}^3D^o$	2 - 1		229
	5	443.690	62.2381 - 287.6202	$3d^4 - 3d^3(a^2D)4p$	$b^3F - {}^3F^o$	4 - 4		229
	300	444.701	62.2381 - 287.1096	$3d^4 - 3d^3(a^2D)4p$	$b^3F - {}^3F^o$	4 - 3		229
	150	445.334	36.6301 - 261.1796	$3d^4 - 3d^3(a^4F)4p$	$a^3D - {}^3D^o$	3 - 3		229
	200	445.368	62.3211 - 286.8553	$3d^4 - 3d^3(a^4P)4p$	$b^3F - {}^3D^o$	2 - 1		229
	300	445.438	62.3644 - 286.8627	$3d^4 - 3d^3(a^4P)4p$	$b^3F - {}^3D^o$	3 - 2		229
	5	445.588	36.7585 - 261.1796	$3d^4 - 3d^3(a^4F)4p$	$a^3D - {}^3D^o$	2 - 3		229
	300	446.042	62.2381 - 286.4313	$3d^4 - 3d^3(a^4P)4p$	$b^3F - {}^3D^o$	4 - 3		229
	80	446.295	62.3644 - 286.4313	$3d^4 - 3d^3(a^4P)4p$	$b^3F - {}^3D^o$	3 - 3		229
	40	446.762	62.3211 - 286.1549	$3d^4 - 3d^3(a^2D)4p$	$b^3F - {}^3F^o$	2 - 2		229
	150	446.846	62.3644 - 286.1549	$3d^4 - 3d^3(a^2D)4p$	$b^3F - {}^3F^o$	3 - 2		229
	80	447.119	36.7585 - 260.4114	$3d^4 - 3d^3(a^4F)4p$	$a^3D - {}^3D^o$	2 - 2		229
	5	447.781	36.6301 - 259.9547	$3d^4 - 3d^3(a^4F)4p$	$a^3D - {}^5F^o$	3 - 3		229
	250	447.959	62.2381 - 285.4740	$3d^4 - 3d^3(a^2P)4p$	$b^3F - {}^3D^o$	4 - 3		229
	5	448.212	62.3644 - 285.4740	$3d^4 - 3d^3(a^2P)4p$	$b^3F - {}^3D^o$	3 - 3		229
	20	448.286	36.9254 - 259.9952	$3d^4 - 3d^3(a^4F)4p$	$a^3D - {}^3D^o$	1 - 1		229
	100	449.347	62.3644 - 284.9112	$3d^4 - 3d^3(a^2P)4p$	$b^3F - {}^3D^o$	3 - 2		229
	30	450.350	36.6301 - 258.6800	$3d^4 - 3d^3(a^4F)4p$	$a^3D - {}^5D^o$	3 - 3		229
	60	450.795	61.8544 - 283.6863	$3d^4 - 3d^3(a^2P)4p$	$b^3P - {}^3P^o$	2 - 2		229
	50	451.734	36.7585 - 258.1285	$3d^4 - 3d^3(a^4F)4p$	$a^3D - {}^5D^o$	2 - 2		229
	200	451.810	121.1302 - 342.4622	$3d^4 - 3d^3(b^2D)4p$	$b^1S - {}^1P^o$	0 - 1		229
	60	452.474	71.2803 - 292.2876	$3d^4 - 3d^3(a^2H)4p$	$b^1G - {}^3G^o$	4 - 5		229
	10	452.864	36.9254 - 257.7423	$3d^4 - 3d^3(a^4F)4p$	$a^3D - {}^5F^o$	1 - 1		229
	5	454.360	61.8544 - 281.9449	$3d^4 - 3d^3(a^2P)4p$	$b^3P - {}^3P^o$	2 - 1		229
	70	454.648	71.2803 - 291.2314	$3d^4 - 3d^3(a^2D)4p$	$b^1G - {}^1F^o$	4 - 3		229
	70	455.220	62.3644 - 282.0381	$3d^4 - 3d^3(a^2G)4p$	$b^3F - {}^1G^o$	3 - 4		229
	250	457.001	71.2803 - 290.0991	$3d^4 - 3d^3(a^2H)4p$	$b^1G - {}^1H^o$	4 - 5		229
	5	457.736	62.3644 - 280.8322	$3d^4 - 3d^3(a^2G)4p$	$b^3F - {}^3F^o$	3 - 3		229
	300	458.158	71.2803 - 289.5459	$3d^4 - 3d^3(a^2H)4p$	$b^1G - {}^1G^o$	4 - 4		229
	20	458.251	62.3211 - 280.5397	$3d^4 - 3d^3(a^2G)4p$	$b^3F - {}^3F^o$	2 - 2		229
	20	459.135	62.2381 - 280.0396	$3d^4 - 3d^3(a^2G)4p$	$b^3F - {}^3G^o$	4 - 5		229
	150	459.338	93.8323 - 311.5387	$3d^4 - 3d^3(a^2F)4p$	$b^1D - {}^1F^o$	2 - 3		229
	50	465.309	61.8544 - 276.7659	$3d^4 - 3d^3(a^4P)4p$	$b^3P - {}^3P^o$	2 - 1		229
	70	465.319	61.8544 - 276.7592	$3d^4 - 3d^3(a^4P)4p$	$b^3P - {}^5D^o$	2 - 2		229
	150	467.701	93.8323 - 307.6444	$3d^4 - 3d^3(a^2F)4p$	$b^1D - {}^1D^o$	2 - 2		229
	200	468.339	61.8544 - 275.3743	$3d^4 - 3d^3(a^4P)4p$	$b^3P - {}^3P^o$	2 - 2		229
	70	468.577	71.2803 - 284.6903	$3d^4 - 3d^3(a^2H)4p$	$b^1G - {}^3H^o$	4 - 4		229
	10	468.717	63.4200 - 276.7659	$3d^4 - 3d^3(a^4P)4p$	$b^3P - {}^3P^o$	0 - 1		229
	40	468.839	61.8544 - 275.1466	$3d^4 - 3d^3(a^4P)4p$	$b^3P - {}^5D^o$	2 - 1		229
	30	469.464	62.3644 - 275.3743	$3d^4 - 3d^3(a^4P)4p$	$b^3F - {}^3P^o$	3 - 2		229
	50	470.678	62.9142 - 275.3743	$3d^4 - 3d^3(a^4P)4p$	$b^3P - {}^3P^o$	1 - 2		229

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	20	471.178	62.9142 - 275.1466	$3d^4 - 3d^3(a^4P)4p$	$b^3P - {}^5D^o$	1 - 1		229
	10	472.059	62.9142 - 274.7533	$3d^4 - 3d^3(a^4P)4p$	$b^3P - {}^5D^o$	1 - 0		229
	5	472.309	63.4200 - 275.1466	$3d^4 - 3d^3(a^4P)4p$	$b^3P - {}^5D^o$	0 - 1		229
	100	472.608	71.2803 - 282.8719	$3d^4 - 3d^3(a^2G)4p$	$b^1G - {}^1H^o$	4 - 5		229
	2	474.481	71.2803 - 282.0381	$3d^4 - 3d^3(a^2G)4p$	$b^1G - {}^1G^o$	4 - 4		229
	100	481.899	71.2803 - 278.7942	$3d^4 - 3d^3(a^2G)4p$	$b^1G - {}^3G^o$	4 - 3		229
	300	486.168	62.2381 - 267.9286	$3d^4 - 3d^3(a^4F)4p$	$b^3F - {}^3F^o$	4 - 4		229
	5	486.464	62.3644 - 267.9286	$3d^4 - 3d^3(a^4F)4p$	$b^3F - {}^3F^o$	3 - 4		229
	10	487.796	62.2381 - 267.2401	$3d^4 - 3d^3(a^4F)4p$	$b^3F - {}^3F^o$	4 - 3		229
	2	487.996	62.3211 - 267.2401	$3d^4 - 3d^3(a^4F)4p$	$b^3F - {}^3F^o$	2 - 3		229
	250	488.100	62.3644 - 267.2401	$3d^4 - 3d^3(a^4F)4p$	$b^3F - {}^3F^o$	3 - 3		229
	150	489.498	62.3211 - 266.6128	$3d^4 - 3d^3(a^4F)4p$	$b^3F - {}^3F^o$	2 - 2		229
	5	489.600	62.3644 - 266.6128	$3d^4 - 3d^3(a^4F)4p$	$b^3F - {}^3F^o$	3 - 2		229
	10	492.913	62.2381 - 265.1126	$3d^4 - 3d^3(a^4F)4p$	$b^3F - {}^3G^o$	4 - 5		229
	100	494.566	62.2381 - 264.4342	$3d^4 - 3d^3(a^4F)4p$	$b^3F - {}^3G^o$	4 - 4		229
	2	494.705	93.8323 - 295.9732	$3d^4 - 3d^3(a^2P)4p$	$b^1D - {}^1P^o$	2 - 1		229
	1	529.832	93.8323 - 282.5716	$3d^4 - 3d^3(a^2G)4p$	$b^1D - {}^1F^o$	2 - 3		229
		1039.96	24.9729 - 121.1302	$3d^4 - 3d^4$	$a^3P - b^1S$	1 - 0	F,P	229
		1056.39	26.4683 - 121.1302	$3d^4 - 3d^4$	$a^3P - b^1S$	2 - 0	F,P	375
	5	1062.976	233.8489 - 327.9244	$3d^3(a^2F)4s - 3d^3(b^2D)4p$	${}^3F - {}^3D^o$	3 - 3		229
	1	1101.921	216.5381 - 307.2887	$3d^3(a^2D)4s - 3d^3(a^2F)4p$	${}^3D - {}^3D^o$	3 - 3		229
	40	1111.830	217.1225 - 307.0644	$3d^3(a^2H)4s - 3d^3(a^2F)4p$	${}^3H - {}^3G^o$	6 - 5		229
	40	1112.651	221.3052 - 311.1809	$3d^3(a^2H)4s - 3d^3(a^2F)4p$	${}^1H - {}^1G^o$	5 - 4		229
	30	1114.054	216.8604 - 306.6228	$3d^3(a^2H)4s - 3d^3(a^2F)4p$	${}^3H - {}^3G^o$	5 - 4		229
	30	1118.384	216.7791 - 306.1939	$3d^3(a^2H)4s - 3d^3(a^2F)4p$	${}^3H - {}^3G^o$	4 - 3		229
	1	1122.734	213.5341 - 302.6025	$3d^3(a^2G)4s - 3d^3(a^2F)4p$	${}^1G - {}^3F^o$	4 - 4		229
	20	1123.865	195.9330 - 284.9112	$3d^3(a^4F)4s - 3d^3(a^2P)4p$	${}^3F - {}^3D^o$	3 - 2		229
	10	1149.118	220.6210 - 307.6444	$3d^3(a^2D)4s - 3d^3(a^2F)4p$	${}^1D - {}^1D^o$	2 - 2		229
		1185.23	36.7585 - 121.1302	$3d^4 - 3d^4$	$a^3D - b^1S$	2 - 0	F,P	229
		1187.6	36.9254 - 121.1302	$3d^4 - 3d^4$	$a^3D - b^1S$	1 - 0	F,P	375,229
	60	1195.103	208.8382 - 292.5132	$3d^3(a^2G)4s - 3d^3(a^2H)4p$	${}^3G - {}^3G^o$	3 - 3		229
	50	1198.593	212.5421 - 295.9732	$3d^3(a^4P)4s - 3d^3(a^2P)4p$	${}^3P - {}^1P^o$	0 - 1		229
	30	1200.183	209.1101 - 292.4307	$3d^3(a^2G)4s - 3d^3(a^2H)4p$	${}^3G - {}^3G^o$	4 - 4		229
	10	1207.115	209.5239 - 292.3659	$3d^3(a^2G)4s - 3d^3(a^2H)4p$	${}^3G - {}^1I^o$	5 - 6		229
	40	1208.257	209.5239 - 292.2876	$3d^3(a^2G)4s - 3d^3(a^2H)4p$	${}^3G - {}^3G^o$	5 - 5		229
	20	1214.711	213.6492 - 295.9732	$3d^3(a^4P)4s - 3d^3(a^2P)4p$	${}^3P - {}^1P^o$	2 - 1		229
	50	1217.993	212.5421 - 294.6440	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	${}^3P - {}^3S^o$	0 - 1		229
	10	1224.417	220.6210 - 302.2927	$3d^3(a^2D)4s - 3d^3(a^2F)4p$	${}^1D - {}^3F^o$	2 - 2		229
	20	1228.126	204.7299 - 286.1549	$3d^3(a^4P)4s - 3d^3(a^2D)4p$	${}^5P - {}^3F^o$	1 - 2		229
	150	1234.648	213.6492 - 294.6440	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	${}^3P - {}^3S^o$	2 - 1		229
	20	1237.221	195.9330 - 276.7592	$3d^3(a^4F)4s - 3d^3(a^4P)4p$	${}^3F - {}^5D^o$	3 - 2		229
	20	1249.496	214.6114 - 294.6440	$3d^3(a^2P)4s - 3d^3(a^4P)4p$	${}^3P - {}^3S^o$	1 - 1		229
	200	1250.736	262.5093 - 342.4622	$3d^3(b^2D)4s - 3d^3(b^2D)4p$	${}^1D - {}^1P^o$	2 - 1		229
	10	1257.531	187.7190 - 267.2401	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	${}^5F - {}^3F^o$	4 - 3		229
	2	1258.564	187.1575 - 266.6128	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	${}^5F - {}^3F^o$	3 - 2		229
	20	1259.759	216.5927 - 295.9732	$3d^3(a^2D)4s - 3d^3(a^2P)4p$	${}^3D - {}^1P^o$	2 - 1		229
	10	1263.844	216.5927 - 295.7164	$3d^3(a^2D)4s - 3d^3(a^2D)4p$	${}^3D - {}^1D^o$	2 - 2		229
	20	1266.524	204.7299 - 283.6863	$3d^3(a^4P)4s - 3d^3(a^2P)4p$	${}^5P - {}^3P^o$	1 - 2		229
	20	1269.784	213.5341 - 292.2876	$3d^3(a^2G)4s - 3d^3(a^2H)4p$	${}^1G - {}^3G^o$	4 - 5		229
	30	1270.470	204.9754 - 283.6863	$3d^3(a^4P)4s - 3d^3(a^2P)4p$	${}^5P - {}^3P^o$	2 - 2		229
	30	1276.647	209.1101 - 287.4405	$3d^3(a^2G)4s - 3d^3(a^2H)4p$	${}^3G - {}^3I^o$	4 - 5		229
	50	1279.591	205.5364 - 283.6863	$3d^3(a^4P)4s - 3d^3(a^2P)4p$	${}^5P - {}^3P^o$	3 - 2		229
	100	1280.471	209.5239 - 287.6202	$3d^3(a^2G)4s - 3d^3(a^2D)4p$	${}^3G - {}^3F^o$	5 - 4		229
	50	1280.650	212.8181 - 290.9034	$3d^3(a^4P)4s - 3d^3(a^2D)4p$	${}^3P - {}^3P^o$	1 - 0		229
	50	1281.367	212.5421 - 290.5837	$3d^3(a^4P)4s - 3d^3(a^2D)4p$	${}^3P - {}^3P^o$	0 - 1		229
	20	1281.652	208.8382 - 286.8627	$3d^3(a^2G)4s - 3d^3(a^4P)4p$	${}^3G - {}^3D^o$	3 - 2		229
	70	1282.058	209.1101 - 287.1096	$3d^3(a^2G)4s - 3d^3(a^2D)4p$	${}^3G - {}^3F^o$	4 - 3		229
	20	1283.613	233.6336 - 311.5387	$3d^3(a^2F)4s - 3d^3(a^2F)4p$	${}^3F - {}^1F^o$	4 - 3		229
	80	1284.109	204.7299 - 282.6048	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	${}^5P - {}^5S^o$	1 - 2		229
	70	1285.918	212.8181 - 290.5837	$3d^3(a^4P)4s - 3d^3(a^2D)4p$	${}^3P - {}^3P^o$	1 - 1		229
	125	1287.101	204.7299 - 282.4235	$3d^3(a^4P)4s - 3d^3(a^2P)4p$	${}^5P - {}^1D^o$	1 - 2		229
	125	1288.169	204.9754 - 282.6048	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	${}^5P - {}^5S^o$	2 - 2		229
	2	1288.720	204.9754 - 282.5716	$3d^3(a^4P)4s - 3d^3(a^2G)4p$	${}^5P - {}^1F^o$	2 - 2		229
	20	1289.533	233.6336 - 311.1809	$3d^3(a^2F)4s - 3d^3(a^2F)4p$	${}^3F - {}^1G^o$	4 - 4		229
	125	1291.191	204.9754 - 282.4235	$3d^3(a^4P)4s - 3d^3(a^2P)4p$	${}^5P - {}^1D^o$	2 - 2		229

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	20	1293.125	233.8489 - 311.1809	$3d^3(a^2F)4s$ - $3d^3(a^2F)4p$	^3F - $^1G^o$	3 - 4		229
	100	1293.305	209.1101 - 286.4313	$3d^3(a^2G)4s$ - $3d^3(a^4P)4p$	^3G - $^3D^o$	4 - 3		229
	100	1293.377	208.8382 - 286.1549	$3d^3(a^2G)4s$ - $3d^3(a^2D)4p$	^3G - $^3F^o$	3 - 2		229
	250	1297.547	205.5364 - 282.6048	$3d^3(a^4P)4s$ - $3d^3(a^4P)4p$	^5P - $^5S^o$	3 - 2		229
	200	1300.608	205.5364 - 282.4235	$3d^3(a^4P)4s$ - $3d^3(a^2P)4p$	^5P - $^3D^o$	3 - 2		229
	150	1300.846	258.7695 - 335.6427	$3d^3(b^2D)4s$ - $3d^3(b^2D)4p$	^3D - $^3P^o$	1 - 0		229
	10	1303.081	187.1575 - 263.8986	$3d^3(a^4F)4s$ - $3d^3(a^4F)4p$	^5F - $^3G^o$	3 - 3		229
	150	1303.489	188.3953 - 265.1126	$3d^3(a^4F)4s$ - $3d^3(a^4F)4p$	^5F - $^5G^o$	5 - 5		229
	200	1304.816	258.6285 - 335.2678	$3d^3(b^2D)4s$ - $3d^3(b^2D)4p$	^3D - $^3P^o$	2 - 1		229
	100	1305.971	212.8181 - 289.3897	$3d^3(a^4P)4s$ - $3d^3(a^2D)4p$	^3P - $^3D^o$	1 - 2		229
	150	1306.080	213.5341 - 290.0991	$3d^3(a^2G)4s$ - $3d^3(a^2H)4p$	^1G - $^1H^o$	4 - 5		229
	100	1307.219	258.7695 - 335.2678	$3d^3(b^2D)4s$ - $3d^3(b^2D)4p$	^3D - $^3P^o$	1 - 1		229
	200	1307.424	219.4869 - 295.9732	$3d^3(a^2P)4s$ - $3d^3(a^2P)4p$	^1P - $^1P^o$	1 - 1		229
	70	1309.521	209.1101 - 285.4740	$3d^3(a^2G)4s$ - $3d^3(a^2P)4p$	^3G - $^3D^o$	4 - 3		229
	2	1310.751	214.6114 - 290.9034	$3d^3(a^2P)4s$ - $3d^3(a^2D)4p$	^3P - $^3P^o$	1 - 0		229
	150	1311.239	213.6492 - 289.9130	$3d^3(a^4P)4s$ - $3d^3(a^2D)4p$	^3P - $^3D^o$	2 - 3		229
	150	1311.828	219.4869 - 295.7164	$3d^3(a^2P)4s$ - $3d^3(a^2D)4p$	^1P - $^1D^o$	1 - 2		229
	80	1313.585	212.5421 - 288.6698	$3d^3(a^4P)4s$ - $3d^3(a^2D)4p$	^3P - $^3D^o$	0 - 1		229
	200	1314.529	208.8382 - 284.9112	$3d^3(a^2G)4s$ - $3d^3(a^2P)4p$	^3G - $^3D^o$	3 - 2		229
	400	1317.862	258.6285 - 334.5091	$3d^3(b^2D)4s$ - $3d^3(b^2D)4p$	^3D - $^3P^o$	2 - 2		229
	300	1318.354	208.8382 - 284.6903	$3d^3(a^2G)4s$ - $3d^3(a^2H)4p$	^3G - $^3H^o$	3 - 4		229
	100	1320.312	258.7695 - 334.5091	$3d^3(b^2D)4s$ - $3d^3(b^2D)4p$	^3D - $^3P^o$	1 - 2		229
	300	1320.410	216.7791 - 292.5132	$3d^3(a^2H)4s$ - $3d^3(a^2H)4p$	^3H - $^3G^o$	4 - 3		229
	300	1321.341	209.1101 - 284.7998	$3d^3(a^2G)4s$ - $3d^3(a^2H)4p$	^3G - $^3H^o$	4 - 5		229
	300	1321.490	209.5239 - 285.1961	$3d^3(a^2G)4s$ - $3d^3(a^2H)4p$	^3G - $^3H^o$	5 - 6		229
	100	1321.850	216.7791 - 292.4307	$3d^3(a^2H)4s$ - $3d^3(a^2H)4p$	^3H - $^3G^o$	4 - 4		229
	10	1323.097	209.1101 - 284.6903	$3d^3(a^2G)4s$ - $3d^3(a^2H)4p$	^3G - $^3H^o$	4 - 4		229
	400	1323.269	216.8604 - 292.4307	$3d^3(a^2H)4s$ - $3d^3(a^2H)4p$	^3H - $^3G^o$	5 - 4		229
	80	1324.403	216.8604 - 292.3659	$3d^3(a^2H)4s$ - $3d^3(a^2H)4p$	^3H - $^3I^o$	5 - 6		229
	125	1325.781	216.8604 - 292.2876	$3d^3(a^2H)4s$ - $3d^3(a^2H)4p$	^3H - $^3G^o$	5 - 5		229
	125	1327.101	220.6210 - 295.9732	$3d^3(a^2D)4s$ - $3d^3(a^2P)4p$	^1D - $^1P^o$	2 - 1		229
	50	1329.025	217.1225 - 292.3659	$3d^3(a^2H)4s$ - $3d^3(a^2H)4p$	^3H - $^3I^o$	6 - 6		229
	400	1330.401	217.1225 - 292.2876	$3d^3(a^2H)4s$ - $3d^3(a^2H)4p$	^3H - $^3G^o$	6 - 5		229
	150	1331.185	215.7826 - 290.9034	$3d^3(a^2D)4s$ - $3d^3(a^2D)4p$	^3D - $^3P^o$	1 - 0		229
	150	1331.640	220.6210 - 295.7164	$3d^3(a^2D)4s$ - $3d^3(a^2D)4p$	^1D - $^1D^o$	2 - 2		229
	2	1332.968	213.6492 - 288.6698	$3d^3(a^4P)4s$ - $3d^3(a^2D)4p$	^3P - $^3D^o$	2 - 1		229
	80	1336.039	208.8382 - 283.6863	$3d^3(a^2G)4s$ - $3d^3(a^2P)4p$	^3G - $^3P^o$	3 - 2		229
		1336.20	46.2912 - 121.1302	$3d^4$ - $3d^4$	a^1D - b^1S	2 - 0	F,P	229
	70	1337.287	214.6114 - 289.3897	$3d^3(a^2P)4s$ - $3d^3(a^2D)4p$	^3P - $^3D^o$	1 - 2		229
	150	1338.808	216.5381 - 291.2314	$3d^3(a^2D)4s$ - $3d^3(a^2D)4p$	^3D - $^1F^o$	3 - 3		229
	200	1339.691	234.0274 - 308.6715	$3d^3(a^2F)4s$ - $3d^3(a^2F)4p$	^3F - $^3D^o$	2 - 1		229
	100	1343.121	186.7255 - 261.1796	$3d^3(a^4F)4s$ - $3d^3(a^4F)4p$	^5F - $^3D^o$	2 - 3		229
	300	1345.611	233.8489 - 308.1656	$3d^3(a^2F)4s$ - $3d^3(a^2F)4p$	^3F - $^3D^o$	3 - 2		229
	70	1348.838	234.0274 - 308.1650	$3d^3(a^2F)4s$ - $3d^3(a^2F)4p$	^3F - $^3D^o$	2 - 2		229
	125	1350.535	212.8181 - 286.8627	$3d^3(a^4P)4s$ - $3d^3(a^4P)4p$	^3P - $^3D^o$	1 - 2		229
	50	1350.677	212.8181 - 286.8553	$3d^3(a^4P)4s$ - $3d^3(a^4P)4p$	^3P - $^3D^o$	1 - 1		229
	10	1350.948	187.1575 - 261.1796	$3d^3(a^4F)4s$ - $3d^3(a^4F)4p$	^5F - $^5D^o$	3 - 3		229
	100	1351.755	186.4336 - 260.4114	$3d^3(a^4F)4s$ - $3d^3(a^4F)4p$	^5F - $^3D^o$	1 - 2		229
	150	1354.847	237.7296 - 311.5387	$3d^3(a^2F)4s$ - $3d^3(a^2F)4p$	^1F - $^1F^o$	3 - 3		229
	100	1355.624	208.8382 - 282.6048	$3d^3(a^2G)4s$ - $3d^3(a^4P)4p$	^3G - $^5S^o$	3 - 2		229
	70	1356.232	208.8382 - 282.5716	$3d^3(a^2G)4s$ - $3d^3(a^2G)4p$	^3G - $^1F^o$	3 - 3		229
	100	1357.114	186.7255 - 260.4114	$3d^3(a^4F)4s$ - $3d^3(a^4F)4p$	^5F - $^3D^o$	2 - 2		229
	200	1357.675	233.6336 - 307.2887	$3d^3(a^2F)4s$ - $3d^3(a^2F)4p$	^3F - $^3D^o$	4 - 3		229
	50	1357.857	212.5421 - 286.1877	$3d^3(a^4P)4s$ - $3d^3(a^2P)4p$	^3P - $^3S^o$	0 - 1		229
	50	1358.386	234.0274 - 307.6444	$3d^3(a^2F)4s$ - $3d^3(a^2F)4p$	^3F - $^3D^o$	2 - 2		229
	125	1358.567	215.7826 - 289.3897	$3d^3(a^2D)4s$ - $3d^3(a^2D)4p$	^3D - $^3D^o$	1 - 2		229
	400	1359.006	258.4341 - 332.0173	$3d^3(b^2D)4s$ - $3d^3(b^2D)4p$	^3D - $^3F^o$	3 - 4		229
	150	1359.406	186.4336 - 259.9952	$3d^3(a^4F)4s$ - $3d^3(a^4F)4p$	^5F - $^3D^o$	1 - 1		229
	300	1361.279	187.7190 - 261.1796	$3d^3(a^4F)4s$ - $3d^3(a^4F)4p$	^5F - $^5D^o$	4 - 3		229
	300	1361.447	237.7296 - 311.1809	$3d^3(a^2F)4s$ - $3d^3(a^2F)4p$	^1F - $^1G^o$	3 - 4		229
	200	1361.692	262.5093 - 335.9474	$3d^3(b^2D)4s$ - $3d^3(b^2D)4p$	^1D - $^1F^o$	2 - 3		229
	600	1361.825	233.6336 - 307.0644	$3d^3(a^2F)4s$ - $3d^3(a^2F)4p$	^3F - $^3G^o$	4 - 5		229
	250	1362.864	216.5381 - 289.9130	$3d^3(a^2D)4s$ - $3d^3(a^2D)4p$	^3D - $^3D^o$	3 - 3		229
	300	1363.077	187.1575 - 260.5210	$3d^3(a^4F)4s$ - $3d^3(a^4F)4p$	^5F - $^5F^o$	3 - 4		229
	100	1363.376	209.5239 - 282.8719	$3d^3(a^2G)4s$ - $3d^3(a^2G)4p$	^3G - $^1H^o$	5 - 5		229

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	300	1363.642	187.7190 - 261.0519	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5F^o$	4 - 5		229
	200	1364.824	186.7255 - 259.9952	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^3D^o$	2 - 1		229
	250	1364.984	234.0274 - 307.2887	$3d^3(a^2F)4s - 3d^3(a^2F)4p$	$^3F - ^3D^o$	2 - 3		229
	250	1365.115	187.1575 - 260.4114	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^3D^o$	3 - 2		229
	300	1365.571	186.7255 - 259.9547	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5F^o$	2 - 3		229
	100	1365.876	213.6492 - 286.8627	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^3P - ^3D^o$	2 - 2		229
	50	1367.183	212.8181 - 285.9617	$3d^3(a^4P)4s - 3d^3(a^2D)4p$	$^3P - ^1P^o$	1 - 1		229
	125	1370.303	217.1225 - 290.0991	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^3H - ^1H^o$	6 - 5		229
	250	1370.947	186.4336 - 259.3761	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5F^o$	1 - 2		229
	50	1371.217	209.1101 - 282.0381	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - ^1G^o$	4 - 4		229
	150	1371.987	215.7826 - 288.6698	$3d^3(a^2D)4s - 3d^3(a^2D)4p$	$^3D - ^3D^o$	1 - 1		229
	70	1372.651	216.5381 - 289.3897	$3d^3(a^2D)4s - 3d^3(a^2D)4p$	$^3D - ^3D^o$	3 - 2		229
	700	1373.587	187.7190 - 260.5210	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5F^o$	4 - 4		229
	600	1373.674	187.1575 - 259.9547	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5F^o$	3 - 3		229
	250	1373.967	213.6492 - 286.4313	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^3P - ^3D^o$	2 - 3		229
	300	1374.116	233.8489 - 306.6228	$3d^3(a^2F)4s - 3d^3(a^2F)4p$	$^3F - ^3G^o$	3 - 4		229
	30	1374.261	216.7791 - 289.5459	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^3H - ^1G^o$	4 - 4		229
	250	1374.789	258.6285 - 331.3670	$3d^3(b^2D)4s - 3d^3(b^2D)4p$	$^3D - ^3F^o$	2 - 3		229
	80	1375.784	216.8604 - 289.5459	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^3H - ^1G^o$	5 - 4		229
	500	1376.337	188.3953 - 261.0519	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5F^o$	5 - 5		229
	300	1376.455	186.7255 - 259.3761	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5F^o$	2 - 2		229
	60	1377.723	214.5258 - 287.1096	$3d^3(a^2P)4s - 3d^3(a^2D)4p$	$^3P - ^3F^o$	2 - 3		229
	250	1378.092	258.7695 - 331.3338	$3d^3(b^2D)4s - 3d^3(b^2D)4p$	$^3D - ^3F^o$	1 - 2		229
	500	1378.560	205.5364 - 278.0758	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^5D^o$	3 - 4		229
	20	1379.206	213.6492 - 286.1549	$3d^3(a^4P)4s - 3d^3(a^2D)4p$	$^3P - ^3F^o$	2 - 2		229
	250	1380.112	186.4336 - 258.8915	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5D^o$	1 - 1		229
	20	1382.270	233.8489 - 306.1939	$3d^3(a^2F)4s - 3d^3(a^2F)4p$	$^3F - ^3G^o$	3 - 3		432
	60	1382.414	214.5258 - 286.8627	$3d^3(a^2P)4s - 3d^3(a^4P)4p$	$^3P - ^3D^o$	2 - 2		229
	40	1382.560	214.5258 - 286.8553	$3d^3(a^2P)4s - 3d^3(a^4P)4p$	$^3P - ^3D^o$	2 - 1		229
	80	1384.055	214.6114 - 286.8627	$3d^3(a^2P)4s - 3d^3(a^4P)4p$	$^3P - ^3D^o$	1 - 2		229
	80	1384.201	214.6114 - 286.8553	$3d^3(a^2P)4s - 3d^3(a^4P)4p$	$^3P - ^3D^o$	1 - 1		229
	80	1384.688	187.1575 - 259.3761	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5F^o$	3 - 2		229
	200	1385.313	186.4336 - 258.6195	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5D^o$	1 - 0		229
	300	1385.685	234.0274 - 306.1939	$3d^3(a^2F)4s - 3d^3(a^2F)4p$	$^3F - ^3G^o$	2 - 3		229
	10	1386.467	188.3953 - 260.5210	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5F^o$	5 - 4		229
	200	1387.092	204.9754 - 277.0685	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^5D^o$	2 - 3		229
	800	1387.938	217.1225 - 289.1719	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^3H - ^3I^o$	6 - 7		229
	10	1388.040	195.1963 - 267.2401	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^3F - ^3F^o$	2 - 3		229
	200	1388.195	204.7299 - 276.7659	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^3P^o$	1 - 1		229
	250	1388.328	204.7299 - 276.7592	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^5D^o$	1 - 2		229
	200	1389.000	208.8382 - 280.8322	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - ^3F^o$	3 - 3		229
	25	1389.762	186.7255 - 258.6800	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5D^o$	2 - 3		229
	80	1390.713	214.5258 - 286.4313	$3d^3(a^2P)4s - 3d^3(a^4P)4p$	$^3P - ^3D^o$	2 - 3		229
	70	1390.972	220.6210 - 292.5132	$3d^3(a^2D)4s - 3d^3(a^2H)4p$	$^1D - ^3G^o$	2 - 3		229
	100	1392.269	213.6492 - 285.4740	$3d^3(a^4P)4s - 3d^3(a^2P)4p$	$^3P - ^3D^o$	2 - 3		229
	50	1392.941	204.9754 - 276.7659	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^3P^o$	2 - 1		229
	200	1393.073	204.9754 - 276.7592	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^5D^o$	2 - 2		229
	250	1394.272	209.1101 - 280.8322	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - ^3F^o$	4 - 3		229
	50	1394.599	204.7299 - 276.4349	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^3P^o$	1 - 0		229
	250	1394.665	208.8382 - 280.5397	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - ^3F^o$	3 - 2		229
	80	1395.442	214.5258 - 286.1877	$3d^3(a^2P)4s - 3d^3(a^2P)4p$	$^3P - ^3S^o$	2 - 1		229
	150	1397.106	214.6114 - 286.1877	$3d^3(a^2P)4s - 3d^3(a^2P)4p$	$^3P - ^3S^o$	1 - 1		229
	100	1397.753	214.6114 - 286.1549	$3d^3(a^2P)4s - 3d^3(a^2D)4p$	$^3P - ^3F^o$	1 - 2		229
	400	1397.972	205.5364 - 277.0685	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^5D^o$	3 - 3		229
	2	1398.166	187.1575 - 258.6800	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5D^o$	3 - 3		229
	600	1400.243	195.1963 - 266.6128	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^3F - ^3F^o$	2 - 2		229
	50	1401.535	214.6114 - 285.9617	$3d^3(a^2P)4s - 3d^3(a^2D)4p$	$^3P - ^1P^o$	1 - 1		229
	800	1402.388	195.9330 - 267.2401	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^3F - ^3F^o$	3 - 3		229
	200	1403.370	213.5341 - 284.7908	$3d^3(a^2G)4s - 3d^3(a^2H)4p$	$^1G - ^3H^o$	4 - 5		229
	10	1404.048	205.5364 - 276.7592	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^5D^o$	3 - 2		229
	100	1404.260	212.5421 - 283.7540	$3d^3(a^4P)4s - 3d^3(a^2P)4p$	$^3P - ^3D^o$	0 - 1		229
	400	1406.669	196.8386 - 267.9286	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^3F - ^3F^o$	4 - 4		229
	500	1406.824	216.5381 - 287.6202	$3d^3(a^2D)4s - 3d^3(a^2D)4p$	$^3D - ^3F^o$	3 - 4		229
	100	1407.007	215.7826 - 286.8553	$3d^3(a^2D)4s - 3d^3(a^4P)4p$	$^3D - ^3D^o$	1 - 1		229
	400	1407.246	221.3052 - 292.3659	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^1H - ^1I^o$	5 - 6		229

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	150	1407.568	217.1225 - 288.1672	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^3H - ^3I^o$	6 - 6		229
	250	1408.117	186.7255 - 257.7423	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5F^o$	2 - 1		229
	150	1408.801	221.3052 - 292.2876	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^1H - ^3G^o$	5 - 5		229
	300	1409.026	187.1575 - 258.1285	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5D^o$	3 - 2		229
	300	1409.220	187.7190 - 258.6800	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5D^o$	4 - 3		229
	600	1409.451	188.3953 - 259.3448	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5D^o$	5 - 4		229
	80	1409.723	212.8181 - 283.7540	$3d^3(a^4P)4s - 3d^3(a^2P)4p$	$^3P - ^3D^o$	1 - 1		229
	150	1409.846	209.1101 - 280.0396	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - ^3G^o$	4 - 5		229
	80	1411.069	212.8181 - 283.6863	$3d^3(a^4P)4s - 3d^3(a^2P)4p$	$^3P - ^3P^o$	1 - 2		229
	200	1411.566	209.5239 - 280.3672	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - ^3F^o$	5 - 4		229
	200	1414.832	195.9330 - 266.6128	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^3F - ^3F^o$	3 - 2		229
	200	1415.146	208.8382 - 279.5026	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - ^3G^o$	3 - 4		229
	400	1415.196	216.7791 - 287.4405	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^3H - ^3I^o$	4 - 5		229
	200	1416.216	220.6210 - 291.2314	$3d^3(a^2D)4s - 3d^3(a^2D)4p$	$^1D - ^1F^o$	2 - 3		229
	40	1416.832	216.8604 - 287.4405	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^3H - ^3I^o$	5 - 5		229
	100	1417.001	216.5381 - 287.1096	$3d^3(a^2D)4s - 3d^3(a^2D)4p$	$^3D - ^3F^o$	3 - 3		229
	300	1418.123	209.5239 - 280.0396	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - ^3G^o$	5 - 5		229
	200	1420.124	204.7299 - 275.1466	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^5D^o$	1 - 1		229
	470	1420.419	196.8386 - 267.2401	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^3F - ^3F^o$	4 - 3		432
	600	1420.465	204.9754 - 275.3743	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^5P^o$	2 - 2		229
	200	1420.602	209.1101 - 279.5026	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - ^3G^o$	4 - 4		229
	100	1420.749	214.5258 - 284.9112	$3d^3(a^2P)4s - 3d^3(a^2P)4p$	$^3P - ^3D^o$	2 - 2		229
	150	1421.016	215.7826 - 286.1549	$3d^3(a^2D)4s - 3d^3(a^2D)4p$	$^3D - ^3F^o$	1 - 2		229
	25	1421.981	216.5381 - 286.8627	$3d^3(a^2D)4s - 3d^3(a^4P)4p$	$^3D - ^3D^o$	3 - 2		229
	200	1422.481	214.6114 - 284.9112	$3d^3(a^2P)4s - 3d^3(a^2P)4p$	$^3P - ^3D^o$	1 - 2		229
	50	1423.082	216.5927 - 286.8627	$3d^3(a^2D)4s - 3d^3(a^4P)4p$	$^3D - ^3D^o$	2 - 2		229
	50	1423.233	216.5927 - 286.8553	$3d^3(a^2D)4s - 3d^3(a^4P)4p$	$^3D - ^3D^o$	2 - 1		229
	150	1425.088	204.9754 - 275.1466	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^5D^o$	2 - 1		229
	10	1426.432	213.6492 - 283.7540	$3d^3(a^4P)4s - 3d^3(a^2P)4p$	$^3P - ^3D^o$	2 - 1		229
	100	1427.815	213.6492 - 283.6863	$3d^3(a^4P)4s - 3d^3(a^2P)4p$	$^3P - ^3P^o$	2 - 2		229
	125	1428.090	204.7299 - 274.7533	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^5D^o$	1 - 0		229
	150	1429.004	209.5239 - 279.5026	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - ^3G^o$	5 - 4		229
	30	1429.330	220.6210 - 290.5837	$3d^3(a^2D)4s - 3d^3(a^2D)4p$	$^1D - ^3P^o$	2 - 1		229
	250	1429.472	208.8382 - 278.7942	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - ^3G^o$	3 - 3		229
	150	1430.309	237.7296 - 307.6444	$3d^3(a^2F)4s - 3d^3(a^2F)4p$	$^1F - ^1D^o$	3 - 2		229
	800	1430.573	188.3953 - 258.2974	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5G^o$	5 - 6		229
	150	1430.751	216.5381 - 286.4313	$3d^3(a^2D)4s - 3d^3(a^4P)4p$	$^3D - ^3D^o$	3 - 3		229
	100	1431.891	205.5364 - 275.3743	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^5P^o$	3 - 2		229
	100	1432.936	220.6210 - 290.4077	$3d^3(a^2D)4s - 3d^3(a^2D)4p$	$^1D - ^3P^o$	2 - 2		229
		1433.1	24.0554 - 93.8323	$3d^4 - 3d^4$	$a^3P - b^1D$	0 - 2	F,P	375,229
	150	1435.046	209.1101 - 278.7942	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - ^3G^o$	4 - 3		229
	70	1437.561	216.5927 - 286.1549	$3d^3(a^2D)4s - 3d^3(a^2D)4p$	$^3D - ^3F^o$	2 - 2		229
	200	1439.052	258.4341 - 327.9244	$3d^3(b^2D)4s - 3d^3(b^2D)4p$	$^3D - ^3D^o$	3 - 3		229
	800	1440.528	187.7190 - 257.1380	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5G^o$	4 - 5		229
	300	1440.792	204.7299 - 274.1361	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^5P^o$	1 - 2		229
	250	1441.049	205.5364 - 274.9303	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^5P^o$	3 - 3		229
	400	1442.221	213.5341 - 282.8719	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^1G - ^1H^o$	4 - 5		229
	100	1443.163	220.6210 - 289.9130	$3d^3(a^2D)4s - 3d^3(a^2D)4p$	$^1D - ^3D^o$	2 - 3		229
	200	1445.686	258.4341 - 327.6054	$3d^3(b^2D)4s - 3d^3(b^2D)4p$	$^3D - ^3D^o$	3 - 2		229
	150	1445.910	204.9754 - 274.1361	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^5P^o$	2 - 2		229
	80	1446.285	214.6114 - 283.7540	$3d^3(a^2P)4s - 3d^3(a^2P)4p$	$^3P - ^3D^o$	1 - 1		229
	800	1446.618	209.5239 - 278.6507	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - ^3H^o$	5 - 6		229
	100	1447.709	214.6114 - 283.6863	$3d^3(a^2P)4s - 3d^3(a^2P)4p$	$^3P - ^3P^o$	1 - 2		229
	250	1448.494	213.5341 - 282.5716	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^1G - ^1F^o$	4 - 3		229
	700	1448.846	187.1575 - 256.1779	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - ^5G^o$	3 - 4		229
	100	1449.757	258.6285 - 327.6054	$3d^3(b^2D)4s - 3d^3(b^2D)4p$	$^3D - ^3D^o$	2 - 2		229
	400	1449.928	233.6336 - 302.6025	$3d^3(a^2F)4s - 3d^3(a^2F)4p$	$^3F - ^3F^o$	4 - 4		229
	100	1451.103	204.7299 - 273.6431	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - ^5P^o$	1 - 1		229
	80	1451.264	258.6285 - 327.5338	$3d^3(b^2D)4s - 3d^3(b^2D)4p$	$^3D - ^3D^o$	2 - 1		229
		1451.38	24.9325 - 93.8323	$3d^4 - 3d^4$	$a^3H - b^1D$	4 - 2	F,P	229
		1452.2	24.9729 - 93.8323	$3d^4 - 3d^4$	$a^3P - b^1D$	1 - 2	F,P	375,229
	10	1452.252						229
	70	1452.967	262.5093 - 331.3338	$3d^3(b^2D)4s - 3d^3(b^2D)4p$	$^1D - ^3F^o$	2 - 2		229
	250	1453.618	221.3052 - 290.0991	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^1H - ^1H^o$	5 - 5		229
	100	1454.243	258.7695 - 327.5338	$3d^3(b^2D)4s - 3d^3(b^2D)4p$	$^3D - ^3D^o$	1 - 1		229

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	2	1454.471	233.8489 - 302.6025	$3d^3(a^2F)4s - 3d^3(a^2F)4p$	$^3F - {}^3F^o$	3 - 4		229
	200	1454.701	188.3953 - 257.1380	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - {}^5G^o$	5 - 5		229
	300	1455.559	195.1963 - 263.8986	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^3F - {}^3G^o$	2 - 3		229
	50	1455.707	216.7791 - 285.4740	$3d^3(a^2H)4s - 3d^3(a^2P)4p$	$^3H - {}^3D^o$	4 - 3		229
	700	1456.161	186.7255 - 255.3992	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - {}^5G^o$	2 - 3		229
	150	1456.285	204.9754 - 273.6431	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - {}^5P^o$	2 - 1		229
	250	1457.727	205.5364 - 274.1361	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	$^5P - {}^5P^o$	3 - 2		229
	250	1459.254	233.8489 - 302.3771	$3d^3(a^2F)4s - 3d^3(a^2F)4p$	$^3F - {}^3F^o$	3 - 3		229
	150	1459.763	213.5341 - 282.0381	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^1G - {}^1G^o$	4 - 4		229
	500	1459.831	195.9330 - 264.4342	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^3F - {}^3G^o$	3 - 4		229
	400	1460.726	187.7190 - 256.1779	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - {}^5G^o$	4 - 4		229
	125	1461.050	233.8489 - 302.2927	$3d^3(a^2F)4s - 3d^3(a^2F)4p$	$^3F - {}^3F^o$	3 - 2		229
	100	1462.563	216.5381 - 284.9112	$3d^3(a^2D)4s - 3d^3(a^2P)4p$	$^3D - {}^3D^o$	3 - 2		229
	500	1462.631	186.4336 - 254.8033	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - {}^5G^o$	1 - 2		229
	30	1463.067	234.0274 - 302.3771	$3d^3(a^2F)4s - 3d^3(a^2F)4p$	$^3F - {}^3F^o$	2 - 3		229
	70	1463.364	216.8604 - 285.1961	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^3H - {}^3H^o$	5 - 6	P	432
	40	1464.224	213.6492 - 281.9449	$3d^3(a^4P)4s - 3d^3(a^2P)4p$	$^3P - {}^3P^o$	2 - 1		229
	700	1464.683	196.8386 - 265.1126	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^3F - {}^3G^o$	4 - 5		229
	200	1464.876	234.0274 - 302.2927	$3d^3(a^2F)4s - 3d^3(a^2F)4p$	$^3F - {}^3F^o$	2 - 2		229
	100	1465.380	187.1575 - 255.3992	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - {}^5G^o$	3 - 3	P	229
	400	1465.401	221.3052 - 289.5459	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^1H - {}^1G^o$	5 - 4	P	229
	400	1466.649	209.1101 - 277.2927	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - {}^3H^o$	4 - 5		229
	150	1468.870	214.5258 - 282.6048	$3d^3(a^2P)4s - 3d^3(a^4P)4p$	$^3P - {}^5S^o$	2 - 2		229
	150	1468.911	186.7255 - 254.8033	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - {}^5G^o$	2 - 2		229
	500	1469.000	217.1225 - 285.1961	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^3H - {}^3H^o$	6 - 6		229
	100	1469.599	214.5258 - 282.5716	$3d^3(a^2P)4s - 3d^3(a^2G)4p$	$^3P - {}^1F^o$	2 - 3		229
	70	1471.205	215.7826 - 283.7540	$3d^3(a^2D)4s - 3d^3(a^2P)4p$	$^3D - {}^3D^o$	1 - 1		229
	80	1471.331	195.9330 - 263.8986	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^3F - {}^3G^o$	3 - 3		229
	250	1472.098	216.8604 - 284.7908	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^3H - {}^3H^o$	5 - 5		229
	250	1472.512	216.7791 - 284.6903	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^3H - {}^3H^o$	4 - 4		229
	100	1472.805	214.5258 - 282.4235	$3d^3(a^2P)4s - 3d^3(a^2P)4p$	$^3P - {}^1D^o$	2 - 2		229
	100	1474.275	216.8604 - 284.6903	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^3H - {}^3H^o$	5 - 4		229
	70	1475.302	188.3953 - 256.1779	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - {}^5G^o$	5 - 4		229
	300	1475.604	209.5239 - 277.2927	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - {}^3H^o$	5 - 5		229
	80	1477.536	187.7190 - 255.3992	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - {}^5G^o$	4 - 3		229
	100	1477.798	217.1225 - 284.7908	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^3H - {}^3H^o$	6 - 5		229
	70	1478.288	187.1575 - 254.8033	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^5F - {}^5G^o$	3 - 2		229
	200	1478.785	214.6114 - 282.2345	$3d^3(a^2P)4s - 3d^3(a^2P)4p$	$^3P - {}^3P^o$	1 - 0		229
	20	1479.388	196.8386 - 264.4342	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^3F - {}^3G^o$	4 - 4		229
	500	1479.471	208.8382 - 276.4297	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - {}^3H^o$	3 - 4		229
	200	1483.259	214.5258 - 281.9449	$3d^3(a^2P)4s - 3d^3(a^2P)4p$	$^3P - {}^3P^o$	2 - 1		229
	80	1484.209	219.4869 - 286.8627	$3d^3(a^2P)4s - 3d^3(a^4P)4p$	$^1P - {}^3D^o$	1 - 2		229
	10	1484.372	219.4869 - 286.8553	$3d^3(a^2P)4s - 3d^3(a^4P)4p$	$^1P - {}^3D^o$	1 - 1		229
		1484.47	26.4683 - 93.8323	$3d^4 - 3d^4$	$a^3P - b^1D$	2 - 2	F,P	229
	150	1485.017	262.5093 - 329.8486	$3d^3(b^2D)4s - 3d^3(b^2D)4p$	$^1D - {}^1D^o$	2 - 2		229
	150	1485.450	209.1101 - 276.4297	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - {}^3H^o$	4 - 4		229
	80	1485.927	213.5341 - 280.8322	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^1G - {}^3F^o$	4 - 3		229
	150	1489.237	216.5381 - 283.6863	$3d^3(a^2D)4s - 3d^3(a^2P)4p$	$^3D - {}^3P^o$	3 - 2		229
	5	1490.454	216.5927 - 283.6863	$3d^3(a^2D)4s - 3d^3(a^2P)4p$	$^3D - {}^3P^o$	2 - 2		229
		1490.9	26.7607 - 93.8323	$3d^4 - 3d^4$	$a^3F - b^1D$	2 - 2	F,P	375,229
		1492.8	26.8423 - 93.8323	$3d^4 - 3d^4$	$a^3F - b^1D$	3 - 2	F,P	375,229
	40	1494.639	209.5239 - 276.4297	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^3G - {}^3H^o$	5 - 4		229
	80	1495.616	221.3052 - 288.1672	$3d^3(a^2H)4s - 3d^3(a^2H)4p$	$^1H - {}^3I^o$	5 - 6		229
		1495.70	26.9740 - 93.8323	$3d^4 - 3d^4$	$a^3F - b^1D$	4 - 2	F,P	229
	250	1496.266	213.5341 - 280.3672	$3d^3(a^2G)4s - 3d^3(a^2G)4p$	$^1G - {}^3F^o$	4 - 4		229
	10	1499.233	219.4869 - 286.1877	$3d^3(a^2P)4s - 3d^3(a^2P)4p$	$^1P - {}^3S^o$	1 - 1		229
	40	1500.581	215.7826 - 282.4235	$3d^3(a^2D)4s - 3d^3(a^2P)4p$	$^3D - {}^1D^o$	1 - 2		229
	60	1504.329	219.4869 - 285.9617	$3d^3(a^2P)4s - 3d^3(a^2D)4p$	$^1P - {}^1P^o$	1 - 1		229
	20	1504.848	215.7826 - 282.2345	$3d^3(a^2D)4s - 3d^3(a^2P)4p$	$^3D - {}^3P^o$	1 - 0		229
	70	1508.153	214.5258 - 280.8322	$3d^3(a^2P)4s - 3d^3(a^2G)4p$	$^3P - {}^3F^o$	2 - 3		229
	70	1509.792	220.6210 - 286.8553	$3d^3(a^2D)4s - 3d^3(a^4P)4p$	$^1D - {}^3D^o$	2 - 1		229
	60	1511.429	215.7826 - 281.9449	$3d^3(a^2D)4s - 3d^3(a^2P)4p$	$^3D - {}^3P^o$	1 - 1		229
	70	1514.834	214.5258 - 280.5397	$3d^3(a^2P)4s - 3d^3(a^2G)4p$	$^3P - {}^3F^o$	2 - 2		229
	40	1514.881	216.8604 - 282.8719	$3d^3(a^2H)4s - 3d^3(a^2G)4p$	$^3H - {}^1H^o$	5 - 5		229
	10	1515.533	195.1963 - 261.1796	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	$^3F - {}^3D^o$	2 - 3		229

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	100	1516.804	214.6114 - 280.5397	3d^3(a^{2}P)4s - 3d^3(a^{2}G)4p	^{3}P - ^{3}F^o	1 - 2		229
	50	1519.519	220.6210 - 286.4313	3d^3(a^{2}D)4s - 3d^3(a^{4}P)4p	^{1}D - ^{3}D^o	2 - 3		229
	70	1525.165	220.6210 - 286.1877	3d^3(a^{2}D)4s - 3d^3(a^{2}P)4p	^{1}D - ^{3}S^o	2 - 1		229
	80	1528.490	219.4869 - 284.9112	3d^3(a^{2}P)4s - 3d^3(a^{2}P)4p	^{1}P - ^{3}D^o	1 - 2		229
	150	1530.439	220.6210 - 285.9617	3d^3(a^{2}D)4s - 3d^3(a^{2}D)4p	^{1}D - ^{1}P^o	2 - 1		229
	80	1532.330	213.5341 - 278.7942	3d^3(a^{2}G)4s - 3d^3(a^{2}G)4p	^{1}G - ^{3}G^o	4 - 3		229
	740	1532.647	195.9330 - 261.1796	3d^3(a^{4}F)4s - 3d^3(a^{4}F)4p	^{3}F - ^{3}D^o	3 - 3	P	432
	630	1533.387	195.1963 - 260.4114	3d^3(a^{4}F)4s - 3d^3(a^{4}F)4p	^{3}F - ^{3}D^o	2 - 2	P	432
	2	1535.034	213.6492 - 278.7942	3d^3(a^{4}P)4s - 3d^3(a^{2}G)4p	^{3}P - ^{3}G^o	2 - 3		229
	200	1543.234	195.1963 - 259.9952	3d^3(a^{4}F)4s - 3d^3(a^{4}F)4p	^{3}F - ^{3}D^o	2 - 1		229
	760	1550.907	195.9330 - 260.4114	3d^3(a^{4}F)4s - 3d^3(a^{4}F)4p	^{3}F - ^{3}D^o	3 - 2	P	432
	300	1554.219	196.8386 - 261.1796	3d^3(a^{4}F)4s - 3d^3(a^{4}F)4p	^{3}F - ^{3}D^o	4 - 3		229
	100	1555.442	220.6210 - 284.9112	3d^3(a^{2}D)4s - 3d^3(a^{2}P)4p	^{1}D - ^{3}D^o	2 - 2		229
	100	1557.051	212.5421 - 276.7659	3d^3(a^{4}P)4s - 3d^3(a^{4}P)4p	^{3}P - ^{3}P^o	0 - 1		229
	100	1557.311	196.8386 - 261.0519	3d^3(a^{4}F)4s - 3d^3(a^{4}F)4p	^{3}F - ^{5}F^o	4 - 5		229
	50	1557.645	219.4869 - 283.6863	3d^3(a^{2}P)4s - 3d^3(a^{2}P)4p	^{1}P - ^{3}P^o	1 - 2		229
	70	1558.114	195.1963 - 259.3761	3d^3(a^{4}F)4s - 3d^3(a^{4}F)4p	^{3}F - ^{5}F^o	2 - 2		229
	10	1561.978	195.9330 - 259.9547	3d^3(a^{4}F)4s - 3d^3(a^{4}F)4p	^{3}F - ^{5}F^o	3 - 3		229
		1562.1	29.8171 - 93.8323	3d^4 - 3d^4	a^{3}G - b^{1}D	3 - 2	F,P	375,229
	100	1563.778	212.8181 - 276.7659	3d^3(a^{4}P)4s - 3d^3(a^{4}P)4p	^{3}P - ^{3}P^o	1 - 1		229
	80	1563.934	212.8181 - 276.7592	3d^3(a^{4}P)4s - 3d^3(a^{4}P)4p	^{3}P - ^{5}D^o	1 - 2		229
	60	1568.407	213.5341 - 277.2927	3d^3(a^{2}G)4s - 3d^3(a^{2}G)4p	^{1}G - ^{3}H^o	4 - 5		229
	50	1569.985	195.1963 - 258.8915	3d^3(a^{4}F)4s - 3d^3(a^{4}F)4p	^{3}F - ^{5}D^o	2 - 1		229
		1570.22	30.1470 - 93.8323	3d^4 - 3d^4	a^{3}G - b^{1}D	4 - 2	F,P	229
	125	1571.910	212.8181 - 276.4349	3d^3(a^{4}P)4s - 3d^3(a^{4}P)4p	^{3}P - ^{3}P^o	1 - 0		229
	100	1576.212	195.9330 - 259.3761	3d^3(a^{4}F)4s - 3d^3(a^{4}F)4p	^{3}F - ^{5}F^o	3 - 2		229
		1580.3	.1421 - 63.4200	3d^4 - 3d^4	ga^{5}D - b^{3}P	1 - 0	F,P	375,229
	30	1582.802	216.8604 - 280.0396	3d^3(a^{2}H)4s - 3d^3(a^{2}G)4p	^{3}H - ^{3}G^o	5 - 5		229
	80	1583.958	220.6210 - 283.7540	3d^3(a^{2}D)4s - 3d^3(a^{2}P)4p	^{1}D - ^{3}D^o	2 - 1		229
	125	1584.337	219.4869 - 282.6048	3d^3(a^{2}P)4s - 3d^3(a^{4}P)4p	^{1}P - ^{5}S^o	1 - 2	P	229
	125	1584.367	213.6492 - 276.7659	3d^3(a^{4}P)4s - 3d^3(a^{4}P)4p	^{3}P - ^{3}P^o	2 - 1	P	229
	150	1584.530	213.6492 - 276.7592	3d^3(a^{4}P)4s - 3d^3(a^{4}P)4p	^{3}P - ^{5}D^o	2 - 2		229
	60	1585.655	220.6210 - 283.6863	3d^3(a^{2}D)4s - 3d^3(a^{2}P)4p	^{1}D - ^{3}P^o	2 - 2		229
		1587.2	.4173 - 63.4200	3d^4 - 3d^4	ga^{5}D - b^{3}P	2 - 0	F,P	375,229
	100	1588.199	216.5381 - 279.5026	3d^3(a^{2}D)4s - 3d^3(a^{2}G)4p	^{3}D - ^{3}G^o	3 - 4		229
	100	1588.906	219.4869 - 282.4235	3d^3(a^{2}P)4s - 3d^3(a^{2}P)4p	^{1}P - ^{1}D^o	1 - 2		229
	80	1589.013	195.1963 - 258.1285	3d^3(a^{4}F)4s - 3d^3(a^{4}F)4p	^{3}F - ^{5}D^o	2 - 2		229
	70	1589.390	217.1225 - 280.0396	3d^3(a^{2}H)4s - 3d^3(a^{2}G)4p	^{3}H - ^{3}G^o	6 - 5		229
		1589.47	0.0000 - 62.9142	3d^4 - 3d^4	ga^{5}D - b^{3}P	0 - 1	F,P	229
	10	1589.941	213.5341 - 276.4297	3d^3(a^{2}G)4s - 3d^3(a^{2}G)4p	^{1}G - ^{3}H^o	4 - 4		229
		1593.1	.1421 - 62.9142	3d^4 - 3d^4	ga^{5}D - b^{3}P	1 - 1	F,P	375,229
	100	1593.708	195.9330 - 258.6800	3d^3(a^{4}F)4s - 3d^3(a^{4}F)4p	^{3}F - ^{5}D^o	3 - 3		229
	40	1596.365	216.8604 - 279.5026	3d^3(a^{2}H)4s - 3d^3(a^{2}G)4p	^{3}H - ^{3}G^o	5 - 4		229
	100	1598.556	212.8181 - 275.3743	3d^3(a^{4}P)4s - 3d^3(a^{4}P)4p	^{3}P - ^{3}P^o	1 - 2		229
	100	1598.824	195.1963 - 257.7423	3d^3(a^{4}F)4s - 3d^3(a^{4}F)4p	^{3}F - ^{5}F^o	2 - 1		229
	10	1599.842	196.8386 - 259.3448	3d^3(a^{4}F)4s - 3d^3(a^{4}F)4p	^{3}F - ^{5}D^o	4 - 4		229
		1600.08	.4173 - 62.9142	3d^4 - 3d^4	ga^{5}D - b^{3}P	2 - 1	F,P	229
	60	1602.766	205.5364 - 267.9286	3d^3(a^{4}P)4s - 3d^3(a^{4}F)4p	^{5}P - ^{3}F^o	3 - 4		229
		1604.6	0.0000 - 62.3211	3d^4 - 3d^4	ga^{5}D - b^{3}F	0 - 2	F,P	375,229
	50	1606.675	214.5258 - 276.7659	3d^3(a^{2}P)4s - 3d^3(a^{4}P)4p	^{3}P - ^{3}P^o	2 - 1		229
		1607.1	.1421 - 62.3644	3d^4 - 3d^4	ga^{5}D - b^{3}F	1 - 3	F,P	375,229
	150	1607.830	195.9330 - 258.1285	3d^3(a^{4}F)4s - 3d^3(a^{4}F)4p	^{3}F - ^{5}D^o	3 - 2		229
		1608.26	.1421 - 62.3211	3d^4 - 3d^4	ga^{5}D - b^{3}F	1 - 2	F,P	229
		1610.0	.8031 - 62.9142	3d^4 - 3d^4	ga^{5}D - b^{3}P	3 - 1	F,P	375,229
	100	1614.186	220.6210 - 282.5716	3d^3(a^{2}D)4s - 3d^3(a^{2}G)4p	^{1}D - ^{1}F^o	2 - 3		229
		1614.28	.4173 - 62.3644	3d^4 - 3d^4	ga^{5}D - b^{3}F	2 - 3	F,P	229
		1615.41	.4173 - 62.3211	3d^4 - 3d^4	ga^{5}D - b^{3}F	2 - 2	F,P	229
	100	1617.039	196.8386 - 258.6800	3d^3(a^{4}F)4s - 3d^3(a^{4}F)4p	^{3}F - ^{5}D^o	4 - 3		229
		1617.6	.4173 - 62.2381	3d^4 - 3d^4	ga^{5}D - b^{3}F	2 - 4	F,P	375,229
	70	1618.057	220.6210 - 282.4235	3d^3(a^{2}D)4s - 3d^3(a^{2}P)4p	^{1}D - ^{1}D^o	2 - 2		229
	30	1618.383	216.8604 - 278.6507	3d^3(a^{2}H)4s - 3d^3(a^{2}G)4p	^{3}H - ^{3}H^o	5 - 6		229
	150	1620.087	213.6492 - 275.3743	3d^3(a^{4}P)4s - 3d^3(a^{4}P)4p	^{3}P - ^{3}P^o	2 - 2		229
		1620.42	.1421 - 61.8544	3d^4 - 3d^4	ga^{5}D - b^{3}P	1 - 2	F,P	229
	200	1624.251	221.3052 - 282.8719	3d^3(a^{2}H)4s - 3d^3(a^{2}G)4p	^{1}H - ^{1}H^o	5 - 5		229
		1624.40	.8031 - 62.3644	3d^4 - 3d^4	ga^{5}D - b^{3}F	3 - 3	F,P	229

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	250	1625.264	217.1225 - 278.6507	$3d^3(a^2H)4s - 3d^3(a^2G)4p$	${}^3H - {}^3H^o$	6 - 6		229
		1625.54	.8031 - 62.3211	$3d^4 - 3d^4$	$ga^5D - b^3F$	3 - 2	F,P	229
	100	1626.077	213.6492 - 275.1466	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	${}^3P - {}^5D^o$	2 - 1		229
		1627.7	.4173 - 61.8544	$3d^4 - 3d^4$	$ga^5D - b^3P$	2 - 2	F,P	375,229
		1627.74	.8031 - 62.2381	$3d^4 - 3d^4$	$ga^5D - b^3F$	3 - 4	F,P	229
	1	1630.841	212.8181 - 274.1361	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	${}^3P - {}^5P^o$	1 - 2		229
		1637.15	1.2828 - 62.3644	$3d^4 - 3d^4$	$ga^5D - b^3F$	4 - 3	F,P	229
		1638.0	.8031 - 61.8544	$3d^4 - 3d^4$	$ga^5D - b^3P$	3 - 2	F,P	375,229
	10	1639.794	215.7826 - 276.7659	$3d^3(a^2D)4s - 3d^3(a^4P)4p$	${}^3D - {}^3P^o$	1 - 1		229
		1640.55	1.2828 - 62.2381	$3d^4 - 3d^4$	$ga^5D - b^3F$	4 - 4	F,P	229
	2	1643.427	214.5258 - 275.3743	$3d^3(a^2P)4s - 3d^3(a^4P)4p$	${}^3P - {}^3P^o$	2 - 2		229
	50	1645.742	214.6114 - 275.3743	$3d^3(a^2P)4s - 3d^3(a^4P)4p$	${}^3P - {}^3P^o$	1 - 2		229
	10	1648.743	215.7826 - 276.4349	$3d^3(a^2D)4s - 3d^3(a^4P)4p$	${}^3D - {}^3P^o$	1 - 0		229
		1650.9	1.2828 - 61.8544	$3d^4 - 3d^4$	$ga^5D - b^3P$	4 - 2	F,P	375,229
	15	1651.927	214.6114 - 275.1466	$3d^3(a^2P)4s - 3d^3(a^4P)4p$	${}^3P - {}^5D^o$	1 - 1		229
	15	1652.531	216.7791 - 277.2927	$3d^3(a^2H)4s - 3d^3(a^2G)4p$	${}^3H - {}^3H^o$	4 - 5		229
	70	1653.257	213.6492 - 274.1361	$3d^3(a^4P)4s - 3d^3(a^4P)4p$	${}^3P - {}^5P^o$	2 - 2		229
	150	1654.744	216.8604 - 277.2927	$3d^3(a^2H)4s - 3d^3(a^2G)4p$	${}^3H - {}^3H^o$	5 - 5		229
	40	1659.897	195.9330 - 256.1779	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	${}^3F - {}^5G^o$	3 - 4		229
	50	1660.551	216.5381 - 276.7592	$3d^3(a^2D)4s - 3d^3(a^4P)4p$	${}^3D - {}^5D^o$	3 - 2		229
	30	1661.048	195.1963 - 255.3992	$3d^3(a^4F)4s - 3d^3(a^4F)4p$	${}^3F - {}^5G^o$	2 - 3		229
	1	1661.959	217.1225 - 277.2927	$3d^3(a^2H)4s - 3d^3(a^2G)4p$	${}^3H - {}^3H^o$	6 - 5		229
	10	1662.742	214.6114 - 274.7533	$3d^3(a^2P)4s - 3d^3(a^4P)4p$	${}^3P - {}^5D^o$	1 - 0		229
	200	1668.926	220.6210 - 280.5397	$3d^3(a^2D)4s - 3d^3(a^2G)4p$	${}^1D - {}^3F^o$	2 - 2		229
	150	1676.441	216.7791 - 276.4297	$3d^3(a^2H)4s - 3d^3(a^2G)4p$	${}^3H - {}^3H^o$	4 - 4		229
	2	1678.726	216.8604 - 276.4297	$3d^3(a^2H)4s - 3d^3(a^2G)4p$	${}^3H - {}^3H^o$	5 - 4		229
		1687.0	61.8544 - 121.1302	$3d^4 - 3d^4$	$b^3P - b^1S$	2 - 0	F,P	375,229
	70	1699.636	216.5381 - 275.3743	$3d^3(a^2D)4s - 3d^3(a^4P)4p$	${}^3D - {}^3P^o$	3 - 2		229
	100	1704.923	233.6336 - 292.2876	$3d^3(a^2F)4s - 3d^3(a^2H)4p$	${}^3F - {}^3G^o$	4 - 5		229
	150	1709.809	234.0274 - 292.5132	$3d^3(a^2F)4s - 3d^3(a^2H)4p$	${}^3F - {}^3G^o$	2 - 3		229
	60	1713.694	215.7826 - 274.1361	$3d^3(a^2D)4s - 3d^3(a^4P)4p$	${}^3D - {}^5P^o$	1 - 2		229
	50	1714.157	216.5927 - 274.9303	$3d^3(a^2D)4s - 3d^3(a^4P)4p$	${}^3D - {}^5P^o$	2 - 3		229
		1717.74	62.9142 - 121.1302	$3d^4 - 3d^4$	$b^3P - b^1S$	1 - 0	F,P	229
		1720.282	209.1101 - 267.2401	$3d^3(a^2G)4s - 3d^3(a^4F)4p$	${}^3G - {}^3F^o$	4 - 3	P	375
		1730.864	208.8382 - 266.6128	$3d^3(a^2G)4s - 3d^3(a^4F)4p$	${}^3G - {}^3F^o$	3 - 2	P	375
		1746.85	36.5863 - 93.8323	$3d^4 - 3d^4$	$a^1G - b^1D$	4 - 2	F,P	229
		1748.18	36.6301 - 93.8323	$3d^4 - 3d^4$	$a^3D - b^1D$	3 - 2	F,P	229
		1752.12	36.7585 - 93.8323	$3d^4 - 3d^4$	$a^3D - b^1D$	2 - 2	F,P	229
		1757.26	36.9254 - 93.8323	$3d^4 - 3d^4$	$a^3D - b^1D$	1 - 2	F,P	229
		1776.849	233.6336 - 289.9130	$3d^3(a^2F)4s - 3d^3(a^2D)4p$	${}^3F - {}^3D^o$	4 - 3	P	375
		1785.635	209.1101 - 265.1126	$3d^3(a^2G)4s - 3d^3(a^4F)4p$	${}^3G - {}^3G^o$	4 - 5	P	375
		1798.691	208.8382 - 264.4342	$3d^3(a^2G)4s - 3d^3(a^4F)4p$	${}^3G - {}^3G^o$	3 - 4	P	375
		1798.927	209.5239 - 265.1126	$3d^3(a^2G)4s - 3d^3(a^4F)4p$	${}^3G - {}^3G^o$	5 - 5	P	375
		1800.478	233.8489 - 289.3897	$3d^3(a^2F)4s - 3d^3(a^2D)4p$	${}^3F - {}^3D^o$	3 - 2	P	375
		1807.530	209.1101 - 264.4342	$3d^3(a^2G)4s - 3d^3(a^4F)4p$	${}^3G - {}^3G^o$	4 - 4	P	375
		1816.137	208.8382 - 263.8986	$3d^3(a^2G)4s - 3d^3(a^4F)4p$	${}^3G - {}^3G^o$	3 - 3	P	375
		1821.152	209.5239 - 264.4342	$3d^3(a^2G)4s - 3d^3(a^4F)4p$	${}^3G - {}^3G^o$	5 - 4	P	375
		1825.200	209.1101 - 263.8986	$3d^3(a^2G)4s - 3d^3(a^4F)4p$	${}^3G - {}^3G^o$	4 - 3	P	375
		1830.081	234.0274 - 288.6698	$3d^3(a^2F)4s - 3d^3(a^2D)4p$	${}^3F - {}^3D^o$	2 - 1	P	375
		1845.06	39.6334 - 93.8323	$3d^4 - 3d^4$	$a^1S - b^1D$	0 - 2	F,P	229
		1852.311	233.6336 - 287.6202	$3d^3(a^2F)4s - 3d^3(a^2D)4p$	${}^3F - {}^3F^o$	4 - 4	P	375
		1858.446	205.5364 - 259.3448	$3d^3(a^4P)4s - 3d^3(a^4F)4p$	${}^5P - {}^5D^o$	3 - 4	P	375
		1859.728	233.8489 - 287.6202	$3d^3(a^2F)4s - 3d^3(a^2D)4p$	${}^3F - {}^3F^o$	3 - 4	P	375
		1862.038	204.9754 - 258.6800	$3d^3(a^4P)4s - 3d^3(a^4F)4p$	${}^5P - {}^5D^o$	2 - 3	P	375
		1869.096	237.7296 - 291.2314	$3d^3(a^2F)4s - 3d^3(a^2D)4p$	${}^1F - {}^1F^o$	3 - 3	P	375
		1869.998	233.6336 - 287.1096	$3d^3(a^2F)4s - 3d^3(a^2D)4p$	${}^3F - {}^3F^o$	4 - 3	P	375
		1872.708	204.7299 - 258.1285	$3d^3(a^4P)4s - 3d^3(a^4F)4p$	${}^5P - {}^5D^o$	1 - 2	P	375
		1877.557	233.8489 - 287.1096	$3d^3(a^2F)4s - 3d^3(a^2D)4p$	${}^3F - {}^3F^o$	3 - 3	P	375
		1883.871	234.0274 - 287.1096	$3d^3(a^2F)4s - 3d^3(a^2D)4p$	${}^3F - {}^3F^o$	2 - 3	P	375
		1886.301	233.8489 - 286.8627	$3d^3(a^2F)4s - 3d^3(a^4P)4p$	${}^3F - {}^3D^o$	3 - 2	P	375
		1892.939	234.0274 - 286.8553	$3d^3(a^2F)4s - 3d^3(a^4P)4p$	${}^3F - {}^3D^o$	2 - 1	P	375
		1894.022	233.6336 - 286.4313	$3d^3(a^2F)4s - 3d^3(a^4P)4p$	${}^3F - {}^3D^o$	4 - 3	P	375
		1911.827	233.8489 - 286.1549	$3d^3(a^2F)4s - 3d^3(a^2D)4p$	${}^3F - {}^3F^o$	3 - 2	P	375
		1918.373	234.0274 - 286.1549	$3d^3(a^2F)4s - 3d^3(a^2D)4p$	${}^3F - {}^3F^o$	2 - 2	P	375
		1928.997	233.6336 - 285.4740	$3d^3(a^2F)4s - 3d^3(a^2P)4p$	${}^3F - {}^3D^o$	4 - 3	P	375

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		1945.885	216.5381 - 267.9286	$3d^3(a^2D)4s - 3d^3(a^4F)4p$	$^3D - ^3F^o$	3 - 4	P	375
		1958.392	233.8489 - 284.9112	$3d^3(a^2F)4s - 3d^3(a^2P)4p$	$^3F - ^3D^o$	3 - 2	P	375
		1960.896	209.5239 - 260.5210	$3d^3(a^2G)4s - 3d^3(a^4F)4p$	$^3G - ^5F^o$	5 - 4	P	375
		1974.435	216.5927 - 267.2401	$3d^3(a^2D)4s - 3d^3(a^4F)4p$	$^3D - ^3F^o$	2 - 3	P	375
		1998.281	258.6285 - 308.6715	$3d^3(b^2D)4s - 3d^3(a^2F)4p$	$^3D - ^3D^o$	2 - 1	P	375

IRON VI (Fe^{+5}), Z = 26

Ground State $1s^22s^22p^63s^23p^63d^3$ ($^4F_{3/2}$) (21 electrons)

Ionization Potential [799 000] cm^{-1}; [99.1] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	2	255.461	18.9420 - 410.3895	$3d^3 - 3d^2(^1S)4p$	$a^4P - x^2P^o$	3/2 - 3/2		228
	20	260.289	26.2149 - 410.3895	$3d^3 - 3d^2(^1S)4p$	$a^2P - x^2P^o$	3/2 - 3/2	Q	856
	200	261.786	26.2149 - 408.2074	$3d^3 - 3d^2(^1S)4p$	$a^2P - x^2P^o$	3/2 - 1/2		228
	250	261.846	28.4843 - 410.3895	$3d^3 - 3d^2(^1S)4p$	$a^2D - x^2P^o$	5/2 - 3/2		228
	150	261.944	28.6279 - 410.3895	$3d^3 - 3d^2(^1S)4p$	$a^2D - x^2P^o$	3/2 - 3/2		228
	50	261.977	26.4955 - 408.2074	$3d^3 - 3d^2(^1S)4p$	$a^2P - x^2P^o$	1/2 - 1/2		228
	100	263.449	28.6279 - 408.2074	$3d^3 - 3d^2(^1S)4p$	$a^2D - x^2P^o$	3/2 - 1/2		228
	2	269.879	0.0000 - 370.5381	$3d^3 - 3d^2(^3P)4p$	$ga^4F - x^2D^o$	3/2 - 3/2		228
		273.60	0.0000 - 365.4940	$3d^3 - 3d^2(^3P)4p$	$ga^4F - z^4P^o$	3/2 - 5/2	Q	437
	10	274.494	1.1883 - 365.4940	$3d^3 - 3d^2(^3P)4p$	$ga^4F - z^4P^o$	7/2 - 5/2		228
	80	276.173	.5113 - 362.6029	$3d^3 - 3d^2(^1D)4p$	$ga^4F - y^2D^o$	5/2 - 5/2		228
	50	276.352	0.0000 - 361.8582	$3d^3 - 3d^2(^1D)4p$	$ga^4F - y^2D^o$	3/2 - 3/2		228
	40	276.427	.5113 - 362.2700	$3d^3 - 3d^2(^3P)4p$	$ga^4F - y^4D^o$	5/2 - 7/2		228
	150	276.690	1.1883 - 362.6029	$3d^3 - 3d^2(^1D)4p$	$ga^4F - y^2D^o$	7/2 - 5/2		228
	50	276.742	.5113 - 361.8582	$3d^3 - 3d^2(^1D)4p$	$ga^4F - y^2D^o$	5/2 - 3/2		228
	250	276.945	1.1883 - 362.2700	$3d^3 - 3d^2(^3P)4p$	$ga^4F - y^4D^o$	7/2 - 7/2		228
	50	277.232	0.0000 - 360.7071	$3d^3 - 3d^2(^3P)4p$	$ga^4F - y^4D^o$	3/2 - 5/2		228
	800	277.570	2.0006 - 362.2700	$3d^3 - 3d^2(^3P)4p$	$ga^4F - y^4D^o$	9/2 - 7/2		228
	300	277.626	.5113 - 360.7071	$3d^3 - 3d^2(^3P)4p$	$ga^4F - y^4D^o$	5/2 - 5/2		228
	300	277.947	0.0000 - 359.7813	$3d^3 - 3d^2(^3P)4p$	$ga^4F - y^4D^o$	3/2 - 3/2		228
	800	278.150	1.1883 - 360.7071	$3d^3 - 3d^2(^3P)4p$	$ga^4F - y^4D^o$	7/2 - 5/2		228
	300	278.244	0.0000 - 359.3959	$3d^3 - 3d^2(^3P)4p$	$ga^4F - y^4D^o$	3/2 - 1/2		228
	500	278.343	.5113 - 359.7813	$3d^3 - 3d^2(^3P)4p$	$ga^4F - y^4D^o$	5/2 - 3/2		228
	300	278.474	0.0000 - 359.0993	$3d^3 - 3d^2(^1D)4p$	$ga^4F - y^2P^o$	3/2 - 1/2		228
	100	278.787	1.1883 - 359.8840	$3d^3 - 3d^2(^1D)4p$	$ga^4F - y^2F^o$	7/2 - 7/2		228
	300	278.970	20.6164 - 379.0776	$3d^3 - 3d^2(^1G)4p$	$a^2G - x^2F^o$	7/2 - 5/2		228
	250	279.421	2.0006 - 359.8840	$3d^3 - 3d^2(^1D)4p$	$ga^4F - y^2F^o$	9/2 - 7/2		228
	20	279.466	.5113 - 358.3346	$3d^3 - 3d^2(^1D)4p$	$ga^4F - y^2F^o$	5/2 - 5/2		228
	100	279.997	1.1883 - 358.3346	$3d^3 - 3d^2(^1D)4p$	$ga^4F - y^2F^o$	7/2 - 5/2		228
	300	280.397	21.3150 - 377.9518	$3d^3 - 3d^2(^1G)4p$	$a^2G - x^2F^o$	9/2 - 7/2		228
	2	281.572	.5113 - 355.6571	$3d^3 - 3d^2(^3P)4p$	$ga^4F - z^4S^o$	5/2 - 3/2		228
	150	283.396	26.2149 - 379.0776	$3d^3 - 3d^2(^1G)4p$	$a^2P - x^2F^o$	3/2 - 5/2		228
	300	283.776	21.3150 - 373.7061	$3d^3 - 3d^2(^1G)4p$	$a^2G - z^2H^o$	9/2 - 11/2		228
	50	284.385	18.9420 - 370.5796	$3d^3 - 3d^2(^3P)4p$	$a^4P - x^2D^o$	3/2 - 5/2		228
	250	284.513	20.6164 - 372.0956	$3d^3 - 3d^2(^1G)4p$	$a^2G - z^2H^o$	7/2 - 9/2		228
	10	284.928	19.6108 - 370.5796	$3d^3 - 3d^2(^3P)4p$	$a^4P - x^2D^o$	5/2 - 5/2		228
	5	285.079	21.3150 - 372.0956	$3d^3 - 3d^2(^1G)4p$	$a^2G - z^2H^o$	9/2 - 9/2		228
	5	285.231	28.4843 - 379.0776	$3d^3 - 3d^2(^1G)4p$	$a^2D - x^2F^o$	5/2 - 5/2		228
	150	285.349	28.6279 - 379.0776	$3d^3 - 3d^2(^1G)4p$	$a^2D - x^2F^o$	3/2 - 5/2		228
	5	285.746	20.6164 - 370.5796	$3d^3 - 3d^2(^3P)4p$	$a^2G - x^2D^o$	7/2 - 5/2		228
	250	286.150	28.4843 - 377.9518	$3d^3 - 3d^2(^1G)4p$	$a^2D - x^2F^o$	5/2 - 7/2		228
	100	286.347	28.7243 - 377.9518	$3d^3 - 3d^2(^1G)4p$	$a^2H - x^2F^o$	9/2 - 7/2		228
	70	286.674	1.1883 - 350.0178	$3d^3 - 3d^2(^3F)4p$	$ga^4F - z^2G^o$	7/2 - 9/2		228
	10	286.986	.5113 - 348.9621	$3d^3 - 3d^2(^3F)4p$	$ga^4F - z^2G^o$	5/2 - 7/2		228
	250	287.182	26.2149 - 374.4256	$3d^3 - 3d^2(^3P)4p$	$a^2P - y^2P^o$	3/2 - 3/2		228

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	100	287.343	2.0006 - 350.0178	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^2G^o	$\frac{9}{2}$ - $\frac{9}{2}$		228
	150	287.415	26.4955 - 374.4256	$3d^3$ - $3d^2(^3P)4p$	a^2P - y^2P^o	$\frac{1}{2}$ - $\frac{3}{2}$		228
	300	287.461	26.2149 - 374.0883	$3d^3$ - $3d^2(^3P)4p$	a^2P - y^2P^o	$\frac{3}{2}$ - $\frac{1}{2}$		228
	40	287.545	1.1883 - 348.9621	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^2G^o	$\frac{7}{2}$ - $\frac{7}{2}$		228
	200	287.694	26.4955 - 374.0883	$3d^3$ - $3d^2(^3P)4p$	a^2P - y^2P^o	$\frac{1}{2}$ - $\frac{1}{2}$		228
	500	288.557	18.9420 - 365.4940	$3d^3$ - $3d^2(^3P)4p$	a^4P - z^4P^o	$\frac{3}{2}$ - $\frac{5}{2}$		228
	400	289.066	28.4843 - 374.4256	$3d^3$ - $3d^2(^3P)4p$	a^2D - y^2P^o	$\frac{5}{2}$ - $\frac{3}{2}$		228
	100	289.096	0.0000 - 345.9071	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^2D^o	$\frac{3}{2}$ - $\frac{5}{2}$		228
	800	289.115	19.6108 - 365.4940	$3d^3$ - $3d^2(^3P)4p$	a^4P - z^4P^o	$\frac{5}{2}$ - $\frac{5}{2}$		228
	300	289.187	28.6279 - 374.4256	$3d^3$ - $3d^2(^3P)4p$	a^2D - y^2P^o	$\frac{3}{2}$ - $\frac{3}{2}$		228
	250	289.307	18.7383 - 364.3929	$3d^3$ - $3d^2(^3P)4p$	a^4P - z^4P^o	$\frac{1}{2}$ - $\frac{3}{2}$		228
	200	289.469	28.6279 - 374.0883	$3d^3$ - $3d^2(^3P)4p$	a^2D - y^2P^o	$\frac{3}{2}$ - $\frac{1}{2}$	P	228
	200	289.478	18.9420 - 364.3929	$3d^3$ - $3d^2(^3P)4p$	a^4P - z^4P^o	$\frac{3}{2}$ - $\frac{3}{2}$	P	228
	400	289.524	.5113 - 345.9071	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^2D^o	$\frac{5}{2}$ - $\frac{5}{2}$		228
	200	289.682	18.7383 - 363.9457	$3d^3$ - $3d^2(^3P)4p$	a^4P - z^4P^o	$\frac{1}{2}$ - $\frac{1}{2}$		228
	700	289.853	18.9420 - 363.9457	$3d^3$ - $3d^2(^3P)4p$	a^4P - z^4P^o	$\frac{3}{2}$ - $\frac{1}{2}$		228
	100	289.871	28.7243 - 373.7061	$3d^3$ - $3d^2(^1G)4p$	a^2H - z^2H^o	$\frac{9}{2}$ - $\frac{11}{2}$		228
	30	289.959	20.6164 - 365.4940	$3d^3$ - $3d^2(^3P)4p$	a^2G - z^4P^o	$\frac{7}{2}$ - $\frac{5}{2}$		228
	800	290.040	19.6108 - 364.3929	$3d^3$ - $3d^2(^3P)4p$	a^4P - z^4P^o	$\frac{5}{2}$ - $\frac{3}{2}$		228
	600	290.092	1.1883 - 345.9071	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^2D^o	$\frac{7}{2}$ - $\frac{5}{2}$		228
	300	290.147	0.0000 - 344.6526	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^2D^o	$\frac{3}{2}$ - $\frac{3}{2}$	P	228
	400	290.149	20.6164 - 365.2666	$3d^3$ - $3d^2(^1G)4p$	a^2G - y^2G^o	$\frac{7}{2}$ - $\frac{9}{2}$	P	228
	900	290.273	29.2029 - 373.7061	$3d^3$ - $3d^2(^1G)4p$	a^2H - z^2H^o	$\frac{11}{2}$ - $\frac{11}{2}$		228
	700	290.309	20.6164 - 365.0770	$3d^3$ - $3d^2(^1G)4p$	a^2G - y^2G^o	$\frac{7}{2}$ - $\frac{7}{2}$		228
	200	290.390	26.2149 - 370.5796	$3d^3$ - $3d^2(^3P)4p$	a^2P - x^2D^o	$\frac{3}{2}$ - $\frac{5}{2}$		228
	300	290.500	1.1883 - 345.4226	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^4D^o	$\frac{7}{2}$ - $\frac{7}{2}$		228
	800	290.579	.5113 - 344.6526	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^2D^o	$\frac{5}{2}$ - $\frac{3}{2}$		228
	125	290.661	26.4955 - 370.5381	$3d^3$ - $3d^2(^3P)4p$	a^2P - x^2D^o	$\frac{1}{2}$ - $\frac{3}{2}$		228
	400	290.739	21.3150 - 365.2666	$3d^3$ - $3d^2(^1G)4p$	a^2G - y^2G^o	$\frac{9}{2}$ - $\frac{9}{2}$		228
	200	290.900	.5113 - 344.2733	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^4D^o	$\frac{5}{2}$ - $\frac{5}{2}$		228
	80	290.985	18.9420 - 362.6029	$3d^3$ - $3d^2(^1D)4p$	a^4P - y^2D^o	$\frac{3}{2}$ - $\frac{5}{2}$		228
	700	291.020	0.0000 - 343.6193	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^4D^o	$\frac{3}{2}$ - $\frac{1}{2}$		228
	800	291.187	2.0006 - 345.4226	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^4D^o	$\frac{9}{2}$ - $\frac{7}{2}$		228
	800	291.229	28.7243 - 372.0956	$3d^3$ - $3d^2(^1G)4p$	a^2H - z^2H^o	$\frac{9}{2}$ - $\frac{9}{2}$		228
	100	291.365	0.0000 - 343.2109	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^4D^o	$\frac{3}{2}$ - $\frac{3}{2}$		228
	100	291.444	18.7383 - 361.8582	$3d^3$ - $3d^2(^1D)4p$	a^4P - y^2D^o	$\frac{1}{2}$ - $\frac{3}{2}$		228
	900	291.473	1.1883 - 344.2733	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^4D^o	$\frac{7}{2}$ - $\frac{5}{2}$		228
	300	291.552	19.6108 - 362.6029	$3d^3$ - $3d^2(^1D)4p$	a^4P - y^2D^o	$\frac{5}{2}$ - $\frac{5}{2}$		228
	60	291.617	18.9420 - 361.8582	$3d^3$ - $3d^2(^1D)4p$	a^4P - y^2D^o	$\frac{3}{2}$ - $\frac{3}{2}$		228
	250	291.635	29.2029 - 372.0956	$3d^3$ - $3d^2(^1G)4p$	a^2H - z^2H^o	$\frac{11}{2}$ - $\frac{9}{2}$		228
	800	291.801	.5113 - 343.2109	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^4D^o	$\frac{5}{2}$ - $\frac{3}{2}$		228
	600	291.835	19.6108 - 362.2700	$3d^3$ - $3d^2(^3P)4p$	a^4P - y^4D^o	$\frac{5}{2}$ - $\frac{7}{2}$		228
	70	291.909	0.0000 - 342.5715	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^2F^o	$\frac{3}{2}$ - $\frac{5}{2}$		228
	200	292.039	1.1883 - 343.6082	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^2F^o	$\frac{7}{2}$ - $\frac{7}{2}$		228
	50	292.185	19.6108 - 361.8582	$3d^3$ - $3d^2(^1D)4p$	a^4P - y^2D^o	$\frac{5}{2}$ - $\frac{3}{2}$		228
	30	292.314	28.4843 - 370.5796	$3d^3$ - $3d^2(^3P)4p$	a^2D - x^2D^o	$\frac{5}{2}$ - $\frac{5}{2}$		228
	60	292.346	.5113 - 342.5715	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^2F^o	$\frac{5}{2}$ - $\frac{5}{2}$	P	228
	20	292.352	28.4843 - 370.5381	$3d^3$ - $3d^2(^3P)4p$	a^2D - x^2D^o	$\frac{5}{2}$ - $\frac{3}{2}$	P	228
	200	292.409	20.6164 - 362.6029	$3d^3$ - $3d^2(^1D)4p$	a^2G - y^2D^o	$\frac{7}{2}$ - $\frac{5}{2}$		228
	100	292.437	28.6279 - 370.5796	$3d^3$ - $3d^2(^3P)4p$	a^2D - x^2D^o	$\frac{3}{2}$ - $\frac{5}{2}$		228
	300	292.599	18.9420 - 360.7071	$3d^3$ - $3d^2(^3P)4p$	a^4P - y^4D^o	$\frac{3}{2}$ - $\frac{5}{2}$		228
	100	292.693	20.6164 - 362.2700	$3d^3$ - $3d^2(^3P)4p$	a^2G - y^4D^o	$\frac{7}{2}$ - $\frac{7}{2}$		228
	800	292.733	2.0006 - 343.6082	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^2F^o	$\frac{9}{2}$ - $\frac{7}{2}$		228
	300	293.043	1.1883 - 342.4344	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^4F^o	$\frac{7}{2}$ - $\frac{9}{2}$		228
	150	293.171	18.7383 - 359.7813	$3d^3$ - $3d^2(^3P)4p$	a^4P - y^4D^o	$\frac{1}{2}$ - $\frac{3}{2}$		228
	200	293.217	18.7383 - 359.7813	$3d^3$ - $3d^2(^3P)4p$	a^4P - y^4D^o	$\frac{1}{2}$ - $\frac{3}{2}$		228
	300	293.293	21.3150 - 362.2700	$3d^3$ - $3d^2(^3P)4p$	a^2G - y^4D^o	$\frac{9}{2}$ - $\frac{7}{2}$		228
	300	293.380	.5113 - 341.3653	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^4F^o	$\frac{5}{2}$ - $\frac{7}{2}$		228
	200	293.391	18.9420 - 359.7813	$3d^3$ - $3d^2(^3P)4p$	a^4P - y^4D^o	$\frac{3}{2}$ - $\frac{3}{2}$		228
	800	293.488	2.0006 - 342.7306	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^4G^o	$\frac{9}{2}$ - $\frac{11}{2}$		228
	200	293.549	18.7383 - 359.3959	$3d^3$ - $3d^2(^3P)4p$	a^4P - y^4D^o	$\frac{1}{2}$ - $\frac{1}{2}$		228
	900	293.742	2.0006 - 342.4344	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^4F^o	$\frac{9}{2}$ - $\frac{9}{2}$		228
	100	293.806	18.7383 - 359.0993	$3d^3$ - $3d^2(^1D)4p$	a^4P - y^2P^o	$\frac{1}{2}$ - $\frac{1}{2}$		228
	700	293.820	0.0000 - 340.3440	$3d^3$ - $3d^2(^3F)4p$	ga^4F - z^4F^o	$\frac{3}{2}$ - $\frac{5}{2}$		228
	300	293.881	19.6108 - 359.8840	$3d^3$ - $3d^2(^1D)4p$	a^4P - y^2F^o	$\frac{5}{2}$ - $\frac{7}{2}$		228

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	800	293.965	1.1883 - 341.3653	$3d^3 - 3d^2(^3F)4p$	$ga^4F - z^4F^o$	7/2 - 7/2		228
	300	294.039	20.6164 - 360.7071	$3d^3 - 3d^2(^3P)4p$	$a^2G - y^4D^o$	7/2 - 5/2		228
	900	294.262	.5113 - 340.3440	$3d^3 - 3d^2(^3F)4p$	$ga^4F - z^4F^o$	5/2 - 5/2		228
	800	294.337	1.1883 - 340.9350	$3d^3 - 3d^2(^3F)4p$	$ga^4F - z^4G^o$	7/2 - 9/2		228
	700	294.516	0.0000 - 339.5398	$3d^3 - 3d^2(^3F)4p$	$ga^4F - z^4F^o$	3/2 - 3/2		228
	100	294.645	18.9420 - 358.3346	$3d^3 - 3d^2(^1D)4p$	$a^4P - y^2F^o$	3/2 - 5/2		228
	200	294.668	2.0006 - 341.3653	$3d^3 - 3d^2(^3F)4p$	$ga^4F - z^4F^o$	9/2 - 7/2		228
	500	294.751	20.6164 - 359.8840	$3d^3 - 3d^2(^1D)4p$	$a^2G - y^2F^o$	7/2 - 7/2		228
	250	294.850	1.1883 - 340.3440	$3d^3 - 3d^2(^3F)4p$	$ga^4F - z^4F^o$	7/2 - 5/2		228
	300	294.960	.5113 - 339.5398	$3d^3 - 3d^2(^3F)4p$	$ga^4F - z^4F^o$	5/2 - 3/2		228
	700	295.015	.5113 - 339.4770	$3d^3 - 3d^2(^3F)4p$	$ga^4F - z^4G^o$	5/2 - 7/2		228
	700	295.042	2.0006 - 340.9350	$3d^3 - 3d^2(^3F)4p$	$ga^4F - z^4G^o$	9/2 - 9/2		228
	150	295.147	18.9420 - 357.7552	$3d^3 - 3d^2(^1D)4p$	$a^4P - y^2P^o$	3/2 - 3/2		228
	30	295.224	19.6108 - 358.3346	$3d^3 - 3d^2(^1D)4p$	$a^4P - y^2F^o$	5/2 - 5/2		228
	500	295.262	71.7076 - 410.3895	$3d^3 - 3d^2(^1S)4p$	$b^2D - x^2P^o$	5/2 - 3/2		228
	800	295.360	21.3150 - 359.8840	$3d^3 - 3d^2(^1D)4p$	$a^2G - y^2F^o$	9/2 - 7/2		228
	150	295.560	72.0489 - 410.3895	$3d^3 - 3d^2(^1S)4p$	$b^2D - x^2P^o$	3/2 - 3/2		228
	200	295.606	1.1883 - 339.4770	$3d^3 - 3d^2(^3F)4p$	$ga^4F - z^4G^o$	7/2 - 7/2		228
	500	295.634	0.0000 - 338.2564	$3d^3 - 3d^2(^3F)4p$	$ga^4F - z^4G^o$	3/2 - 5/2		228
	80	295.702	26.2149 - 364.3929	$3d^3 - 3d^2(^3P)4p$	$a^2P - z^4P^o$	3/2 - 3/2		228
	200	295.732	19.6108 - 357.7552	$3d^3 - 3d^2(^1D)4p$	$a^4P - y^2P^o$	5/2 - 3/2		228
	80	295.947	26.4955 - 364.3929	$3d^3 - 3d^2(^3P)4p$	$a^2P - z^4P^o$	1/2 - 3/2		228
	70	296.077	.5113 - 338.2564	$3d^3 - 3d^2(^3F)4p$	$ga^4F - z^4G^o$	5/2 - 5/2		388
	900	296.106	20.6164 - 358.3346	$3d^3 - 3d^2(^1D)4p$	$a^2G - y^2F^o$	7/2 - 5/2		228
	200	296.317	2.0006 - 339.4770	$3d^3 - 3d^2(^3F)4p$	$ga^4F - z^4G^o$	9/2 - 7/2		228
	80	296.676	1.1883 - 338.2564	$3d^3 - 3d^2(^3F)4p$	$ga^4F - z^4G^o$	7/2 - 5/2		228
	200	296.725	28.4843 - 365.4940	$3d^3 - 3d^2(^3P)4p$	$a^2D - z^4P^o$	5/2 - 5/2		228
	400	296.807	18.7383 - 355.6571	$3d^3 - 3d^2(^3P)4p$	$a^4P - z^4S^o$	1/2 - 3/2		228
	70	296.851	28.6279 - 365.4940	$3d^3 - 3d^2(^3P)4p$	$a^2D - z^4P^o$	3/2 - 5/2		228
	500	296.988	18.9420 - 355.6571	$3d^3 - 3d^2(^3P)4p$	$a^4P - z^4S^o$	3/2 - 3/2		228
	200	297.139	28.7243 - 365.2666	$3d^3 - 3d^2(^1G)4p$	$a^2H - y^2G^o$	9/2 - 9/2		228
	250	297.275	26.2149 - 362.6029	$3d^3 - 3d^2(^1D)4p$	$a^2P - y^2D^o$	3/2 - 5/2		228
	800	297.307	28.7243 - 365.0770	$3d^3 - 3d^2(^1G)4p$	$a^2H - y^2G^o$	9/2 - 7/2		228
	300	297.479	72.0489 - 408.2074	$3d^3 - 3d^2(^1S)4p$	$b^2D - x^2P^o$	3/2 - 1/2		228
	800	297.561	29.2029 - 365.2666	$3d^3 - 3d^2(^1G)4p$	$a^2H - y^2G^o$	11/2 - 9/2		228
	500	297.579	19.6108 - 355.6571	$3d^3 - 3d^2(^3P)4p$	$a^4P - z^4S^o$	5/2 - 3/2		228
	100	297.828	28.6279 - 364.3929	$3d^3 - 3d^2(^3P)4p$	$a^2D - z^4P^o$	3/2 - 3/2		228
	200	297.934	26.2149 - 361.8582	$3d^3 - 3d^2(^1D)4p$	$a^2P - y^2D^o$	3/2 - 3/2		228
	100	298.184	26.4955 - 361.8582	$3d^3 - 3d^2(^1D)4p$	$a^2P - y^2D^o$	1/2 - 3/2		228
	150	298.224	28.6279 - 363.9457	$3d^3 - 3d^2(^3P)4p$	$a^2D - z^4P^o$	3/2 - 1/2		228
	10	298.960	26.2149 - 360.7071	$3d^3 - 3d^2(^3P)4p$	$a^2P - y^4D^o$	3/2 - 5/2		228
	400	299.295	28.4843 - 362.6029	$3d^3 - 3d^2(^1D)4p$	$a^2D - y^2D^o$	5/2 - 5/2		228
	100	299.593	28.4843 - 362.2700	$3d^3 - 3d^2(^3P)4p$	$a^2D - y^4D^o$	5/2 - 7/2		228
	100	299.803	26.2149 - 359.7813	$3d^3 - 3d^2(^3P)4p$	$a^2P - y^4D^o$	3/2 - 3/2		046
	300	299.963	28.4843 - 361.8582	$3d^3 - 3d^2(^1D)4p$	$a^2D - y^2D^o$	5/2 - 3/2		228
	100	300.043	26.4955 - 359.7813	$3d^3 - 3d^2(^3P)4p$	$a^2P - y^4D^o$	1/2 - 3/2		228
	400	300.092	28.6279 - 361.8582	$3d^3 - 3d^2(^1D)4p$	$a^2D - y^2D^o$	3/2 - 3/2		228
	10	300.136	26.2149 - 359.3959	$3d^3 - 3d^2(^3P)4p$	$a^2P - y^4D^o$	3/2 - 1/2		228
	30	300.240	18.7383 - 351.8058	$3d^3 - 3d^2(^3P)4p$	$a^4P - z^2S^o$	1/2 - 1/2		228
	200	300.390	26.4955 - 359.3959	$3d^3 - 3d^2(^3P)4p$	$a^2P - y^4D^o$	1/2 - 1/2		228
	100	300.423	18.9420 - 351.8058	$3d^3 - 3d^2(^3P)4p$	$a^4P - z^2S^o$	3/2 - 1/2	P	228
	50	300.426	46.2173 - 379.0776	$3d^3 - 3d^2(^1G)4p$	$a^2F - x^2F^o$	5/2 - 7/2	P	228
	300	300.657	26.4955 - 359.0993	$3d^3 - 3d^2(^1D)4p$	$a^2P - y^2P^o$	1/2 - 1/2		228
	500	300.776	46.6037 - 379.0776	$3d^3 - 3d^2(^1G)4p$	$a^2F - x^2F^o$	7/2 - 7/2		228
	200	301.002	28.4843 - 360.7071	$3d^3 - 3d^2(^3P)4p$	$a^2D - y^4D^o$	5/2 - 5/2		228
	100	301.095	26.2149 - 358.3346	$3d^3 - 3d^2(^1D)4p$	$a^2P - y^2F^o$	3/2 - 5/2		228
	800	301.445	46.2173 - 377.9518	$3d^3 - 3d^2(^1G)4p$	$a^2F - x^2F^o$	5/2 - 5/2		228
	800	301.622	26.2149 - 357.7552	$3d^3 - 3d^2(^1D)4p$	$a^2P - y^2P^o$	3/2 - 3/2		228
	100	301.750	28.4843 - 359.8840	$3d^3 - 3d^2(^1D)4p$	$a^2D - y^2F^o$	5/2 - 7/2		228
	100	301.796	46.6037 - 377.9518	$3d^3 - 3d^2(^1G)4p$	$a^2F - x^2F^o$	7/2 - 5/2		228
	100	301.844	28.4843 - 359.7813	$3d^3 - 3d^2(^3P)4p$	$a^2D - y^4D^o$	5/2 - 3/2		228
	250	301.878	26.4955 - 357.7552	$3d^3 - 3d^2(^1D)4p$	$a^2P - y^2P^o$	1/2 - 3/2		228
	100	301.969	28.7243 - 359.8840	$3d^3 - 3d^2(^1D)4p$	$a^2H - y^2F^o$	9/2 - 7/2	P	228
	50	301.975	28.6279 - 359.7813	$3d^3 - 3d^2(^3P)4p$	$a^2D - y^4D^o$	3/2 - 3/2	P	228
	250	302.327	28.6279 - 359.3959	$3d^3 - 3d^2(^3P)4p$	$a^2D - y^4D^o$	3/2 - 1/2		228

Multiplet	Rel. Int.	λ_{air} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	300	302.598	28.6279 - 359.0993	$3d^3 - 3d^2(^1D)4p$	$a^2D - y^2P^o$	3/2 - 1/2		228
	200	303.167	28.4843 - 358.3346	$3d^3 - 3d^2(^1D)4p$	$a^2D - y^2F^o$	5/2 - 5/2		228
	150	303.299	28.6279 - 358.3346	$3d^3 - 3d^2(^1D)4p$	$a^2D - y^2F^o$	3/2 - 5/2		228
	100	303.543	26.2149 - 355.6571	$3d^3 - 3d^2(^3P)4p$	$a^2P - z^4S^o$	3/2 - 3/2		228
	300	303.580	20.6164 - 350.0178	$3d^3 - 3d^2(^3F)4p$	$a^2G - z^2G^o$	7/2 - 9/2		228
	20	303.833	28.6279 - 357.7552	$3d^3 - 3d^2(^1D)4p$	$a^2D - y^2P^o$	3/2 - 3/2		228
	800	304.227	21.3150 - 350.0178	$3d^3 - 3d^2(^3F)4p$	$a^2G - z^2G^o$	9/2 - 9/2		228
	800	304.558	20.6164 - 348.9621	$3d^3 - 3d^2(^3F)4p$	$a^2G - z^2G^o$	7/2 - 7/2		228
	100	305.043	46.6037 - 374.4256	$3d^3 - 3d^2(^3P)4p$	$a^2F - y^2P^o$	5/2 - 3/2		228
	300	305.206	21.3150 - 348.9621	$3d^3 - 3d^2(^3F)4p$	$a^2G - z^2G^o$	9/2 - 7/2		228
07	100	305.837	18.9420 - 345.9071	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^2D^o$	3/2 - 5/2		046
	200	306.470	19.6108 - 345.9071	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^2D^o$	5/2 - 5/2		228
	300	306.829	18.7383 - 344.6526	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^2D^o$	1/2 - 3/2		228
	70	306.862	46.2173 - 372.0956	$3d^3 - 3d^2(^1G)4p$	$a^2F - z^2H^o$	7/2 - 9/2		228
	500	306.926	19.6108 - 345.4226	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^4D^o$	5/2 - 7/2		228
	250	307.021	18.9420 - 344.6526	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^2D^o$	3/2 - 3/2		228
	300	307.134	26.2149 - 351.8058	$3d^3 - 3d^2(^3P)4p$	$a^2P - z^2S^o$	3/2 - 1/2		228
	300	307.380	18.9420 - 344.2733	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^4D^o$	3/2 - 5/2		228
	250	307.398	26.4955 - 351.8058	$3d^3 - 3d^2(^3P)4p$	$a^2P - z^2S^o$	1/2 - 1/2		228
	200	307.415	20.6164 - 345.9071	$3d^3 - 3d^2(^3F)4p$	$a^2G - z^2D^o$	7/2 - 5/2		228
	70	307.653	19.6108 - 344.6526	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^2D^o$	5/2 - 3/2		228
	250	307.805	18.7383 - 343.6193	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^4D^o$	1/2 - 1/2		228
	40	307.875	20.6164 - 345.4226	$3d^3 - 3d^2(^3F)4p$	$a^2G - z^4D^o$	7/2 - 7/2		228
	100	307.999	18.9420 - 343.6193	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^4D^o$	3/2 - 1/2		228
	300	308.012	19.6108 - 344.2733	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^4D^o$	5/2 - 5/2		228
	300	308.191	18.7383 - 343.2109	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^4D^o$	1/2 - 3/2		228
	900	308.296	46.2173 - 370.5796	$3d^3 - 3d^2(^3P)4p$	$a^2F - x^2D^o$	7/2 - 5/2		228
	300	308.385	18.9420 - 343.2109	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^4D^o$	3/2 - 3/2		228
	700	308.539	21.3150 - 345.4226	$3d^3 - 3d^2(^3F)4p$	$a^2G - z^4D^o$	9/2 - 7/2		228
	700	308.644	19.6108 - 343.6082	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^2F^o$	5/2 - 7/2		228
	100	308.666	46.6037 - 370.5796	$3d^3 - 3d^2(^3P)4p$	$a^2F - x^2D^o$	5/2 - 5/2		228
	800	308.704	46.6037 - 370.5381	$3d^3 - 3d^2(^3P)4p$	$a^2F - x^2D^o$	5/2 - 3/2		228
	200	308.969	20.6164 - 344.2733	$3d^3 - 3d^2(^3F)4p$	$a^2G - z^4D^o$	7/2 - 5/2		228
	200	308.995	18.9420 - 342.5715	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^2F^o$	3/2 - 5/2		228
	80	309.022	19.6108 - 343.2109	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^4D^o$	5/2 - 3/2		228
	200	309.426	28.6279 - 351.8058	$3d^3 - 3d^2(^3P)4p$	$a^2D - z^2S^o$	3/2 - 1/2		228
	50	309.604	20.6164 - 343.6082	$3d^3 - 3d^2(^3F)4p$	$a^2G - z^2F^o$	7/2 - 7/2		228
	200	309.635	19.6108 - 342.5715	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^2F^o$	5/2 - 5/2		228
	700	310.276	21.3150 - 343.6082	$3d^3 - 3d^2(^3F)4p$	$a^2G - z^2F^o$	9/2 - 7/2		228
	700	310.602	20.6164 - 342.5715	$3d^3 - 3d^2(^3F)4p$	$a^2G - z^2F^o$	7/2 - 5/2		228
	10	310.736	20.6164 - 342.4344	$3d^3 - 3d^2(^3F)4p$	$a^2G - z^4F^o$	7/2 - 9/2		228
	100	310.796	19.6108 - 341.3653	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^4F^o$	5/2 - 7/2		228
	100	311.137	18.9420 - 340.3440	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^4F^o$	3/2 - 5/2		228
	300	311.241	28.7243 - 350.0178	$3d^3 - 3d^2(^3F)4p$	$a^2H - z^2G^o$	9/2 - 9/2		228
	50	311.410	21.3150 - 342.4344	$3d^3 - 3d^2(^3F)4p$	$a^2G - z^4F^o$	9/2 - 9/2		228
	900	311.706	29.2029 - 350.0178	$3d^3 - 3d^2(^3F)4p$	$a^2H - z^2G^o$	11/2 - 9/2		228
	80	311.786	19.6108 - 340.3440	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^4F^o$	5/2 - 5/2		228
	70	311.918	18.9420 - 339.5398	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^4F^o$	3/2 - 3/2		228
	800	312.268	28.7243 - 348.9621	$3d^3 - 3d^2(^3F)4p$	$a^2H - z^2G^o$	9/2 - 7/2		228
	10	312.769	20.6164 - 340.3440	$3d^3 - 3d^2(^3F)4p$	$a^2G - z^4F^o$	7/2 - 5/2		228
	300	312.801	26.2149 - 345.9071	$3d^3 - 3d^2(^3F)4p$	$a^2P - z^2D^o$	3/2 - 5/2		228
	100	312.872	21.3150 - 340.9350	$3d^3 - 3d^2(^3F)4p$	$a^2G - z^4G^o$	9/2 - 9/2		228
	80	313.170	18.9420 - 338.2564	$3d^3 - 3d^2(^3F)4p$	$a^4P - z^4G^o$	3/2 - 5/2		228
	300	313.207	46.2173 - 365.4940	$3d^3 - 3d^2(^3P)4p$	$a^2F - z^4P^o$	7/2 - 5/2		228
	500	313.432	46.2173 - 365.2666	$3d^3 - 3d^2(^1G)4p$	$a^2F - y^2G^o$	7/2 - 9/2		228
	20	313.587	46.6037 - 365.4940	$3d^3 - 3d^2(^3P)4p$	$a^2F - z^4P^o$	5/2 - 5/2		228
	300	313.999	46.6037 - 365.0770	$3d^3 - 3d^2(^1G)4p$	$a^2F - y^2G^o$	5/2 - 7/2		228
	300	314.033	26.2149 - 344.6526	$3d^3 - 3d^2(^3F)4p$	$a^2P - z^2D^o$	3/2 - 3/2		228
	500	314.310	26.4955 - 344.6526	$3d^3 - 3d^2(^3F)4p$	$a^2P - z^2D^o$	1/2 - 3/2		228
	150	314.408	26.2149 - 344.2733	$3d^3 - 3d^2(^3F)4p$	$a^2P - z^4D^o$	3/2 - 5/2		228
	20	314.675	46.6037 - 364.3929	$3d^3 - 3d^2(^3P)4p$	$a^2F - z^4P^o$	5/2 - 3/2		228
	300	314.824	20.6164 - 338.2564	$3d^3 - 3d^2(^3F)4p$	$a^2G - z^4G^o$	7/2 - 5/2		228
	500	315.038	28.4843 - 345.9071	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^2D^o$	5/2 - 5/2		228
	700	315.182	28.6279 - 345.9071	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^2D^o$	3/2 - 5/2		228
	500	315.462	26.2149 - 343.2109	$3d^3 - 3d^2(^3F)4p$	$a^2P - z^4D^o$	3/2 - 3/2		228

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	300	315.521	28.4843 - 345.4226	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^4D^o$	5/2 - 7/2		228
	250	315.742	26.4955 - 343.2109	$3d^3 - 3d^2(^3F)4p$	$a^2P - z^4D^o$	1/2 - 3/2		228
	200	316.071	46.2173 - 362.6029	$3d^3 - 3d^2(^1D)4p$	$a^2F - y^2D^o$	7/2 - 5/2		228
	300	316.100	26.2149 - 342.5715	$3d^3 - 3d^2(^3F)4p$	$a^2P - z^2F^o$	3/2 - 5/2		228
	150	316.289	28.4843 - 344.6526	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^2D^o$	5/2 - 3/2		228
	50	316.404	46.2173 - 362.2700	$3d^3 - 3d^2(^3P)4p$	$a^2F - y^4D^o$	7/2 - 7/2		228
	200	316.433	28.6279 - 344.6526	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^2D^o$	3/2 - 3/2		228
	20	316.669	28.4843 - 344.2733	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^4D^o$	5/2 - 5/2		228
	300	316.813	28.6279 - 344.2733	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^4D^o$	3/2 - 5/2		228
	200	317.205	46.6037 - 361.8582	$3d^3 - 3d^2(^1D)4p$	$a^2F - y^2D^o$	5/2 - 3/2		228
	500	317.337	28.4843 - 343.6082	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^2F^o$	5/2 - 7/2		228
	70	317.737	28.4843 - 343.2109	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^4D^o$	5/2 - 3/2		228
	150	317.883	28.6279 - 343.2109	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^4D^o$	3/2 - 3/2		228
	70	318.342	26.2149 - 340.3440	$3d^3 - 3d^2(^3F)4p$	$a^2P - z^4F^o$	3/2 - 5/2		228
	300	318.384	28.4843 - 342.5715	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^2F^o$	5/2 - 5/2		228
	80	318.530	28.6279 - 342.5715	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^2F^o$	3/2 - 5/2		228
	250	318.811	46.2173 - 359.8840	$3d^3 - 3d^2(^1D)4p$	$a^2F - y^2F^o$	7/2 - 7/2		228
	100	319.159	26.2149 - 339.5398	$3d^3 - 3d^2(^3F)4p$	$a^2P - z^4F^o$	3/2 - 3/2		228
	100	319.254	29.2029 - 342.4344	$3d^3 - 3d^2(^3F)4p$	$a^2H - z^4F^o$	11/2 - 9/2		228
	80	319.445	26.4955 - 339.5398	$3d^3 - 3d^2(^3F)4p$	$a^2P - z^4F^o$	1/2 - 3/2		228
	30	319.856	28.7243 - 341.3653	$3d^3 - 3d^2(^3F)4p$	$a^2H - z^4F^o$	9/2 - 7/2		228
	5	320.395	46.2173 - 358.3346	$3d^3 - 3d^2(^1D)4p$	$a^2F - y^2F^o$	7/2 - 5/2		228
	100	320.472	26.2149 - 338.2564	$3d^3 - 3d^2(^3F)4p$	$a^2P - z^4G^o$	3/2 - 5/2		228
	100	320.658	28.4843 - 340.3440	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^4F^o$	5/2 - 5/2		228
	250	320.791	28.6279 - 340.3440	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^4F^o$	3/2 - 5/2		228
	20	321.389	46.6037 - 357.7552	$3d^3 - 3d^2(^1D)4p$	$a^2F - y^2P^o$	5/2 - 3/2		228
	100	321.552	28.4843 - 339.4770	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^4G^o$	5/2 - 7/2		228
	50	321.635	28.6279 - 339.5398	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^4F^o$	3/2 - 3/2		228
	30	321.798	28.7243 - 339.4770	$3d^3 - 3d^2(^3F)4p$	$a^2H - z^4G^o$	9/2 - 7/2		228
	100	322.969	28.6279 - 338.2564	$3d^3 - 3d^2(^3F)4p$	$a^2D - z^4G^o$	3/2 - 5/2		228
	200	325.342	71.7076 - 379.0776	$3d^3 - 3d^2(^1G)4p$	$b^2D - x^2F^o$	5/2 - 5/2		228
	500	325.704	72.0489 - 379.0776	$3d^3 - 3d^2(^1G)4p$	$b^2D - x^2F^o$	3/2 - 5/2		228
	500	326.538	71.7076 - 377.9518	$3d^3 - 3d^2(^1G)4p$	$b^2D - x^2F^o$	5/2 - 7/2		228
	500	330.341	71.7076 - 374.4256	$3d^3 - 3d^2(^3P)4p$	$b^2D - y^2P^o$	5/2 - 3/2		228
	200	330.714	72.0489 - 374.4256	$3d^3 - 3d^2(^3P)4p$	$b^2D - y^2P^o$	3/2 - 3/2		228
	300	331.084	72.0489 - 374.0883	$3d^3 - 3d^2(^3P)4p$	$b^2D - y^2P^o$	3/2 - 1/2		228
	70	333.678	46.2173 - 345.9071	$3d^3 - 3d^2(^3F)4p$	$a^2F - z^2D^o$	7/2 - 5/2		228
	40	334.108	46.6037 - 345.9071	$3d^3 - 3d^2(^3F)4p$	$a^2F - z^2D^o$	5/2 - 5/2		228
	200	334.219	46.2173 - 345.4226	$3d^3 - 3d^2(^3F)4p$	$a^2F - z^4D^o$	7/2 - 7/2		228
	300	334.593	71.7076 - 370.5796	$3d^3 - 3d^2(^3P)4p$	$b^2D - x^2D^o$	5/2 - 3/2		228
	150	334.639	71.7076 - 370.5381	$3d^3 - 3d^2(^3P)4p$	$b^2D - x^2D^o$	5/2 - 5/2		228
	250	334.974	72.0489 - 370.5796	$3d^3 - 3d^2(^3P)4p$	$b^2D - x^2D^o$	3/2 - 3/2		228
	300	335.021	72.0489 - 370.5381	$3d^3 - 3d^2(^3P)4p$	$b^2D - x^2D^o$	3/2 - 5/2		228
	5	335.514	46.6037 - 344.6526	$3d^3 - 3d^2(^3F)4p$	$a^2F - z^2D^o$	5/2 - 3/2		228
	150	335.945	46.6037 - 344.2733	$3d^3 - 3d^2(^3F)4p$	$a^2F - z^4D^o$	5/2 - 5/2		228
	250	336.258	46.2173 - 343.6082	$3d^3 - 3d^2(^3F)4p$	$a^2F - z^2F^o$	7/2 - 7/2		228
	5	336.696	46.6037 - 343.6082	$3d^3 - 3d^2(^3F)4p$	$a^2F - z^2F^o$	5/2 - 7/2		228
	10	337.434	46.2173 - 342.5715	$3d^3 - 3d^2(^3F)4p$	$a^2F - z^2F^o$	7/2 - 5/2		228
	200	337.875	46.6037 - 342.5715	$3d^3 - 3d^2(^3F)4p$	$a^2F - z^2F^o$	5/2 - 5/2		228
	50	340.994	46.2173 - 339.4770	$3d^3 - 3d^2(^3F)4p$	$a^2F - z^4G^o$	7/2 - 7/2		228
	2	341.368	46.6037 - 339.5398	$3d^3 - 3d^2(^3F)4p$	$a^2F - z^4F^o$	5/2 - 3/2		228
	60	342.871	46.6037 - 338.2564	$3d^3 - 3d^2(^3F)4p$	$a^2F - z^4G^o$	5/2 - 5/2		228
	80	343.766	71.7076 - 362.6029	$3d^3 - 3d^2(^1D)4p$	$b^2D - y^2D^o$	5/2 - 5/2		228
	60	344.161	71.7076 - 362.2700	$3d^3 - 3d^2(^3P)4p$	$b^2D - y^4D^o$	5/2 - 7/2		228
	100	345.054	72.0489 - 361.8582	$3d^3 - 3d^2(^1D)4p$	$b^2D - y^2D^o$	3/2 - 3/2		228
	5	346.021	71.7076 - 360.7071	$3d^3 - 3d^2(^3P)4p$	$b^2D - y^4D^o$	5/2 - 5/2		228
	10	346.430	72.0489 - 360.7071	$3d^3 - 3d^2(^3P)4p$	$b^2D - y^4D^o$	3/2 - 5/2		228
	150	347.010	71.7076 - 359.8840	$3d^3 - 3d^2(^1D)4p$	$b^2D - y^2F^o$	5/2 - 7/2		228
	50	348.886	71.7076 - 358.3346	$3d^3 - 3d^2(^1D)4p$	$b^2D - y^2F^o$	5/2 - 5/2		228
	60	349.303	72.0489 - 358.3346	$3d^3 - 3d^2(^1D)4p$	$b^2D - y^2F^o$	3/2 - 5/2		228
	2	349.592	71.7076 - 357.7552	$3d^3 - 3d^2(^1D)4p$	$b^2D - y^2P^o$	5/2 - 3/2		228
	100	364.696	71.7076 - 345.9071	$3d^3 - 3d^2(^3F)4p$	$b^2D - z^2D^o$	5/2 - 5/2		228
	40	365.152	72.0489 - 345.9071	$3d^3 - 3d^2(^3F)4p$	$b^2D - z^2D^o$	3/2 - 5/2		228
	80	366.833	72.0489 - 344.6526	$3d^3 - 3d^2(^3F)4p$	$b^2D - z^2D^o$	3/2 - 3/2		228
	100	367.777	71.7076 - 343.6082	$3d^3 - 3d^2(^3F)4p$	$b^2D - z^2F^o$	5/2 - 7/2		228

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	40	368.780	72.0489 - 343.2109	$3d^3 - 3d^2(^3F)4p$	$b^2D - z^4D^o$	$\frac{3}{2} - \frac{3}{2}$		228
	50	369.187	71.7076 - 342.5715	$3d^3 - 3d^2(^3F)4p$	$b^2D - z^2F^o$	$\frac{5}{2} - \frac{5}{2}$		228
	50	369.652	72.0489 - 342.5715	$3d^3 - 3d^2(^3F)4p$	$b^2D - z^2F^o$	$\frac{3}{2} - \frac{5}{2}$		228
	150	372.72	72.0489 - 340.3440	$3d^3 - 3d^2(^3F)4p$	$b^2D - z^4F^o$	$\frac{3}{2} - \frac{5}{2}$	Q	730
	10	1018.835	264.1183 - 362.2700	$3d^2(^3F)4s - 3d^2(^3P)4p$	$b^4F - y^4D^o$	$\frac{9}{2} - \frac{7}{2}$		228
	40	1024.898	263.1359 - 360.7071	$3d^2(^3F)4s - 3d^2(^3P)4p$	$b^4F - y^4D^o$	$\frac{7}{2} - \frac{5}{2}$		228
	10	1026.560	262.3684 - 359.7813	$3d^2(^3F)4s - 3d^2(^3P)4p$	$b^4F - y^4D^o$	$\frac{5}{2} - \frac{3}{2}$		228
	5	1042.352	269.1402 - 365.0770	$3d^2(^3F)4s - 3d^2(^1G)4p$	$b^2F - y^2G^o$	$\frac{5}{2} - \frac{7}{2}$		228
	10	1057.153	270.6726 - 365.2666	$3d^2(^3F)4s - 3d^2(^1G)4p$	$b^2F - y^2G^o$	$\frac{7}{2} - \frac{9}{2}$		228
	5	1078.541	269.1402 - 361.8582	$3d^2(^3F)4s - 3d^2(^1D)4p$	$b^2F - y^2D^o$	$\frac{5}{2} - \frac{3}{2}$		228
	50	1115.094	280.9015 - 370.5796	$3d^2(^1D)4s - 3d^2(^3P)4p$	$c^2D - x^2D^o$	$\frac{5}{2} - \frac{5}{2}$		228
	20	1120.934	270.6726 - 359.8840	$3d^2(^3F)4s - 3d^2(^1D)4p$	$b^2F - y^2F^o$	$\frac{7}{2} - \frac{7}{2}$		228
	300	1152.770	292.3301 - 379.0776	$3d^2(^1G)4s - 3d^2(^1G)4p$	$b^2G - x^2F^o$	$\frac{7}{2} - \frac{5}{2}$		228
	50	1160.504	287.9192 - 374.0883	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^2P - y^2P^o$	$\frac{1}{2} - \frac{1}{2}$		228
	250	1165.672	288.6383 - 374.4256	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^2P - y^2P^o$	$\frac{3}{2} - \frac{3}{2}$		228
	500	1167.699	292.3130 - 377.9518	$3d^2(^1G)4s - 3d^2(^1G)4p$	$b^2G - x^2F^o$	$\frac{9}{2} - \frac{7}{2}$		228
	40	1167.923	292.3301 - 377.9518	$3d^2(^1G)4s - 3d^2(^1G)4p$	$b^2G - x^2F^o$	$\frac{7}{2} - \frac{7}{2}$		228
	50	1170.279	288.6383 - 374.0883	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^2P - y^2P^o$	$\frac{3}{2} - \frac{1}{2}$		228
	100	1182.140	280.9015 - 365.4940	$3d^2(^1D)4s - 3d^2(^3P)4p$	$c^2D - z^4P^o$	$\frac{5}{2} - \frac{5}{2}$		228
	200	1186.580	281.2178 - 365.4940	$3d^2(^1D)4s - 3d^2(^3P)4p$	$c^2D - z^4P^o$	$\frac{3}{2} - \frac{5}{2}$		228
	300	1189.550	261.8414 - 345.9071	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^2D^o$	$\frac{3}{2} - \frac{5}{2}$		228
	80	1197.728	280.9015 - 364.3929	$3d^2(^1D)4s - 3d^2(^3P)4p$	$c^2D - z^4P^o$	$\frac{5}{2} - \frac{3}{2}$		228
	30	1202.281	281.2178 - 364.3929	$3d^2(^1D)4s - 3d^2(^3P)4p$	$c^2D - z^4P^o$	$\frac{3}{2} - \frac{3}{2}$		228
	500	1206.032	281.4770 - 364.3929	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - z^4P^o$	$\frac{1}{2} - \frac{3}{2}$		228
	60	1207.566	261.8414 - 344.6526	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^2D^o$	$\frac{3}{2} - \frac{3}{2}$		228
	250	1208.151	263.1359 - 345.9071	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^2D^o$	$\frac{7}{2} - \frac{5}{2}$		228
	80	1208.781	281.2178 - 363.9457	$3d^2(^1D)4s - 3d^2(^3P)4p$	$c^2D - z^4P^o$	$\frac{3}{2} - \frac{1}{2}$		228
	200	1210.379	287.9192 - 370.5381	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^2P - x^2D^o$	$\frac{1}{2} - \frac{3}{2}$		228
	400	1211.503	282.9519 - 365.4940	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - z^4P^o$	$\frac{5}{2} - \frac{5}{2}$	P	228
	150	1212.577	281.4770 - 363.9457	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - z^4P^o$	$\frac{1}{2} - \frac{1}{2}$		228
	80	1214.212	282.0350 - 364.3929	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - z^4P^o$	$\frac{3}{2} - \frac{3}{2}$		228
	400	1215.296	262.3684 - 344.6526	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^2D^o$	$\frac{5}{2} - \frac{3}{2}$		228
	400	1220.388	288.6383 - 370.5796	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^2P - x^2D^o$	$\frac{3}{2} - \frac{5}{2}$		228
	300	1220.841	282.0350 - 363.9457	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - z^4P^o$	$\frac{3}{2} - \frac{1}{2}$		228
	200	1220.926	262.3684 - 344.2733	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4D^o$	$\frac{5}{2} - \frac{5}{2}$		228
	100	1221.002	288.6383 - 370.5381	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^2P - x^2D^o$	$\frac{3}{2} - \frac{3}{2}$		228
	300	1222.824	261.8414 - 343.6193	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4D^o$	$\frac{3}{2} - \frac{1}{2}$		228
	400	1223.969	280.9015 - 362.6029	$3d^2(^1D)4s - 3d^2(^1D)4p$	$c^2D - y^2D^o$	$\frac{5}{2} - \frac{5}{2}$		228
	300	1227.882	282.9519 - 364.3929	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - z^4P^o$	$\frac{5}{2} - \frac{3}{2}$		228
	500	1228.604	292.3130 - 373.7061	$3d^2(^1G)4s - 3d^2(^1G)4p$	$b^2G - z^2H^o$	$\frac{9}{2} - \frac{11}{2}$		228
	200	1228.725	281.2178 - 362.6029	$3d^2(^1D)4s - 3d^2(^1D)4p$	$c^2D - y^2D^o$	$\frac{3}{2} - \frac{5}{2}$		228
	250	1228.961	261.8414 - 343.2109	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4D^o$	$\frac{3}{2} - \frac{3}{2}$		228
	400	1229.948	264.1183 - 345.4226	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4D^o$	$\frac{9}{2} - \frac{7}{2}$		228
	150	1230.926	262.3684 - 343.6082	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^2F^o$	$\frac{5}{2} - \frac{7}{2}$		228
	300	1232.479	263.1359 - 344.2733	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4D^o$	$\frac{7}{2} - \frac{5}{2}$		228
	200	1236.967	262.3684 - 343.2109	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4D^o$	$\frac{5}{2} - \frac{3}{2}$		228
	150	1238.698	261.8414 - 342.5715	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^2F^o$	$\frac{3}{2} - \frac{5}{2}$		228
	250	1240.067	281.2178 - 361.8582	$3d^2(^1D)4s - 3d^2(^1D)4p$	$c^2D - y^2D^o$	$\frac{3}{2} - \frac{3}{2}$		228
	50	1241.192	282.0350 - 362.6029	$3d^2(^3P)4s - 3d^2(^1D)4p$	$b^4P - y^2D^o$	$\frac{3}{2} - \frac{5}{2}$		228
	150	1242.664	263.1359 - 343.6082	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^2F^o$	$\frac{7}{2} - \frac{7}{2}$		228
	30	1244.068	281.4770 - 361.8582	$3d^2(^3P)4s - 3d^2(^1D)4p$	$b^4P - y^2D^o$	$\frac{1}{2} - \frac{3}{2}$		228
	200	1246.833	262.3684 - 342.5715	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^2F^o$	$\frac{5}{2} - \frac{5}{2}$		228
	200	1252.769	282.0350 - 361.8582	$3d^2(^3P)4s - 3d^2(^1D)4p$	$b^4P - y^2D^o$	$\frac{3}{2} - \frac{3}{2}$	P	228
	500	1252.789	269.1402 - 348.9621	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^2F - z^2G^o$	$\frac{5}{2} - \frac{7}{2}$	P	228
	200	1253.054	280.9015 - 360.7071	$3d^2(^1D)4s - 3d^2(^3P)4p$	$c^2D - y^4D^o$	$\frac{5}{2} - \frac{5}{2}$		228
	400	1253.676	292.3301 - 372.0956	$3d^2(^1G)4s - 3d^2(^1G)4p$	$b^2G - z^2H^o$	$\frac{7}{2} - \frac{9}{2}$		228
	200	1255.476	282.9519 - 362.6029	$3d^2(^3P)4s - 3d^2(^1D)4p$	$b^4P - y^2D^o$	$\frac{5}{2} - \frac{5}{2}$		228
	100	1258.022	264.1183 - 343.6082	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^2F^o$	$\frac{9}{2} - \frac{7}{2}$	P	228
	200	1258.031	281.2178 - 360.7071	$3d^2(^1D)4s - 3d^2(^3P)4p$	$c^2D - y^4D^o$	$\frac{3}{2} - \frac{5}{2}$	P	228
	200	1258.879	263.1359 - 342.5715	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^2F^o$	$\frac{7}{2} - \frac{5}{2}$		228
	700	1260.314	270.6726 - 350.0178	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^2F - z^2G^o$	$\frac{7}{2} - \frac{9}{2}$		228
	600	1260.741	282.9519 - 362.2700	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - y^4D^o$	$\frac{5}{2} - \frac{7}{2}$		228
	500	1261.060	263.1359 - 342.4344	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4F^o$	$\frac{7}{2} - \frac{9}{2}$		228
	400	1265.874	262.3684 - 341.3653	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4F^o$	$\frac{5}{2} - \frac{7}{2}$		228
	500	1266.103	280.9015 - 359.8840	$3d^2(^1D)4s - 3d^2(^1D)4p$	$c^2D - y^2F^o$	$\frac{5}{2} - \frac{7}{2}$		228

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	10	1267.748	280.9015 - 359.7813	$3d^2(^1D)4s - 3d^2(^3P)4p$	$c^2D - y^4D^o$	$\frac{5}{2} - \frac{3}{2}$		228
	250	1271.095	282.0350 - 360.7071	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - y^4D^o$	$\frac{3}{2} - \frac{5}{2}$		228
	800	1272.065	264.1183 - 342.7306	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4G^o$	$\frac{9}{2} - \frac{11}{2}$		228
	200	1272.859	281.2178 - 359.7813	$3d^2(^1D)4s - 3d^2(^3P)4p$	$c^2D - y^4D^o$	$\frac{3}{2} - \frac{3}{2}$		228
	200	1273.837	261.8414 - 340.3440	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4F^o$	$\frac{3}{2} - \frac{5}{2}$		228
	700	1276.876	264.1183 - 342.4344	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4F^o$	$\frac{9}{2} - \frac{9}{2}$		228
	250	1277.077	281.4770 - 359.7813	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - y^4D^o$	$\frac{1}{2} - \frac{3}{2}$		228
	200	1277.316	270.6726 - 348.9521	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^2F - z^2G^o$	$\frac{7}{2} - \frac{7}{2}$		228
	600	1278.291	263.1359 - 341.3653	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4F^o$	$\frac{7}{2} - \frac{7}{2}$		228
	100	1279.129	281.2178 - 359.3959	$3d^2(^1D)4s - 3d^2(^3P)4p$	$c^2D - y^4D^o$	$\frac{3}{2} - \frac{1}{2}$		228
	500	1282.452	262.3684 - 340.3440	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4F^o$	$\frac{5}{2} - \frac{5}{2}$		228
	200	1283.388	281.4770 - 359.3959	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - y^4D^o$	$\frac{1}{2} - \frac{1}{2}$		228
	150	1283.998	281.2178 - 359.0993	$3d^2(^1D)4s - 3d^2(^1D)4p$	$c^2D - y^2P^o$	$\frac{3}{2} - \frac{1}{2}$		228
	700	1285.366	263.1359 - 340.9350	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4G^o$	$\frac{7}{2} - \frac{9}{2}$		228
	200	1286.092	282.9519 - 360.7071	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - y^4D^o$	$\frac{5}{2} - \frac{5}{2}$		228
	200	1286.235	282.0350 - 359.7813	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - y^4D^o$	$\frac{3}{2} - \frac{3}{2}$		228
	300	1287.030	261.8414 - 339.5398	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4F^o$	$\frac{3}{2} - \frac{3}{2}$		228
	200	1288.294	281.4770 - 359.0993	$3d^2(^3P)4s - 3d^2(^1D)4p$	$b^4P - y^2P^o$	$\frac{1}{2} - \frac{1}{2}$		228
	200	1291.436	280.9015 - 358.3346	$3d^2(^1D)4s - 3d^2(^1D)4p$	$c^2D - y^2F^o$	$\frac{5}{2} - \frac{5}{2}$		228
	100	1292.638	282.0350 - 359.3959	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - y^4D^o$	$\frac{3}{2} - \frac{1}{2}$		228
	600	1294.545	264.1183 - 341.3653	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4F^o$	$\frac{9}{2} - \frac{7}{2}$		228
	400	1295.201	263.1359 - 340.3440	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4F^o$	$\frac{7}{2} - \frac{5}{2}$		228
	300	1295.813	262.3684 - 339.5398	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4F^o$	$\frac{5}{2} - \frac{3}{2}$		228
	300	1296.738	281.2178 - 358.3346	$3d^2(^1D)4s - 3d^2(^1D)4p$	$c^2D - y^2F^o$	$\frac{3}{2} - \frac{5}{2}$		228
	600	1296.871	262.3684 - 339.4770	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4G^o$	$\frac{5}{2} - \frac{7}{2}$		228
	100	1299.844	282.9519 - 359.8840	$3d^2(^3P)4s - 3d^2(^1D)4p$	$b^4P - y^2F^o$	$\frac{5}{2} - \frac{7}{2}$		228
	200	1301.172	280.9015 - 357.7552	$3d^2(^1D)4s - 3d^2(^1D)4p$	$c^2D - y^2P^o$	$\frac{5}{2} - \frac{3}{2}$		228
	150	1301.584	282.9519 - 359.7813	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - y^4D^o$	$\frac{5}{2} - \frac{3}{2}$		228
	600	1301.796	264.1183 - 340.9350	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4G^o$	$\frac{9}{2} - \frac{9}{2}$		228
	5	1302.646	269.1402 - 345.9071	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^2F - z^2D^o$	$\frac{5}{2} - \frac{5}{2}$		228
	500	1308.645	261.8414 - 338.2564	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4G^o$	$\frac{3}{2} - \frac{5}{2}$		228
	600	1309.911	263.1359 - 339.4770	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4G^o$	$\frac{7}{2} - \frac{7}{2}$		228
	150	1310.621	282.0350 - 358.3346	$3d^2(^3P)4s - 3d^2(^1D)4p$	$b^4P - y^2F^o$	$\frac{3}{2} - \frac{5}{2}$		228
	60	1310.917	269.1402 - 345.4226	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^2F - z^4D^o$	$\frac{5}{2} - \frac{7}{2}$		228
	40	1310.986	281.4770 - 357.7552	$3d^2(^3P)4s - 3d^2(^1D)4p$	$b^4P - y^2P^o$	$\frac{1}{2} - \frac{3}{2}$		228
	20	1315.339	287.9192 - 363.9457	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^2P - z^4P^o$	$\frac{1}{2} - \frac{1}{2}$		228
	400	1317.736	262.3684 - 338.2564	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4G^o$	$\frac{5}{2} - \frac{5}{2}$		228
	10	1320.058	288.6383 - 364.3929	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^2P - z^4P^o$	$\frac{3}{2} - \frac{3}{2}$		228
	60	1320.649	282.0350 - 357.7552	$3d^2(^3P)4s - 3d^2(^1D)4p$	$b^4P - y^2P^o$	$\frac{3}{2} - \frac{3}{2}$		228
	300	1324.283	269.1402 - 344.6526	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^2F - z^2D^o$	$\frac{5}{2} - \frac{3}{2}$		228
	70	1326.988	264.1183 - 339.4770	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4G^o$	$\frac{9}{2} - \frac{7}{2}$		228
	500	1329.172	270.6726 - 345.9071	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^2F - z^2D^o$	$\frac{7}{2} - \frac{5}{2}$		228
	300	1330.968	269.1402 - 344.2733	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^2F - z^4D^o$	$\frac{5}{2} - \frac{5}{2}$		228
	250	1331.184	263.1359 - 338.2564	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^4F - z^4G^o$	$\frac{7}{2} - \frac{5}{2}$		228
	250	1336.843	282.9519 - 357.7552	$3d^2(^3P)4s - 3d^2(^1D)4p$	$b^4P - y^2P^o$	$\frac{5}{2} - \frac{3}{2}$		228
	250	1337.695	280.9015 - 355.6571	$3d^2(^1D)4s - 3d^2(^3P)4p$	$c^2D - z^4S^o$	$\frac{5}{2} - \frac{3}{2}$		228
	400	1337.788	270.6726 - 345.4226	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^2F - z^4D^o$	$\frac{7}{2} - \frac{7}{2}$		228
	100	1342.859	269.1402 - 343.6082	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^2F - z^2F^o$	$\frac{5}{2} - \frac{7}{2}$		228
	150	1343.380	281.2178 - 355.6571	$3d^2(^1D)4s - 3d^2(^3P)4p$	$c^2D - z^4S^o$	$\frac{3}{2} - \frac{3}{2}$		228
	100	1348.074	281.4770 - 355.6571	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - z^4S^o$	$\frac{1}{2} - \frac{3}{2}$		228
	300	1350.072	269.1402 - 343.2109	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^2F - z^4D^o$	$\frac{5}{2} - \frac{3}{2}$		228
	40	1352.000	288.6383 - 362.6029	$3d^2(^3P)4s - 3d^2(^1D)4p$	$b^2P - y^2D^o$	$\frac{3}{2} - \frac{5}{2}$		228
	20	1352.478	287.9192 - 361.8582	$3d^2(^3P)4s - 3d^2(^1D)4p$	$b^2P - y^2D^o$	$\frac{1}{2} - \frac{3}{2}$		228
	150	1358.280	282.0350 - 355.6571	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - z^4S^o$	$\frac{3}{2} - \frac{3}{2}$		228
	80	1358.679	270.6726 - 344.2733	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^2F - z^4D^o$	$\frac{7}{2} - \frac{5}{2}$		228
	600	1361.819	269.1402 - 342.5715	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^2F - z^2F^o$	$\frac{5}{2} - \frac{5}{2}$		228
	500	1370.728	292.3130 - 365.2666	$3d^2(^1G)4s - 3d^2(^1G)4p$	$b^2G - y^2G^o$	$\frac{9}{2} - \frac{9}{2}$		228
	100	1371.056	292.3301 - 365.2666	$3d^2(^1G)4s - 3d^2(^1G)4p$	$b^2G - y^2G^o$	$\frac{7}{2} - \frac{9}{2}$	P	228
	300	1371.073	270.6726 - 343.6082	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^2F - z^2F^o$	$\frac{7}{2} - \frac{7}{2}$	P	228
	300	1374.627	292.3301 - 365.0770	$3d^2(^1G)4s - 3d^2(^1G)4p$	$b^2G - y^2G^o$	$\frac{7}{2} - \frac{7}{2}$		228
	100	1375.412	282.9519 - 355.6571	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^4P - z^4S^o$	$\frac{5}{2} - \frac{3}{2}$		228
		1387.95	0.0000 - 72.0489	$3d^3 - 3d^3$	$a^4F - b^2D$	$\frac{3}{2} - \frac{3}{2}$	F,P	228
	60	1390.840	270.6726 - 342.5715	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^2F - z^2F^o$	$\frac{7}{2} - \frac{5}{2}$		228
	60	1391.548	287.9192 - 359.7813	$3d^2(^3P)4s - 3d^2(^3P)4p$	$b^2P - y^4D^o$	$\frac{1}{2} - \frac{3}{2}$		228
	20	1393.499	270.6726 - 342.4344	$3d^2(^3F)4s - 3d^2(^3F)4p$	$b^2F - z^4F^o$	$\frac{7}{2} - \frac{9}{2}$		228

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		1394.55	0.0000 - 71.7076	$3d^3$ - $3d^3$	ga^4F - b^2D	3/2 - 5/2	F,P	228
		1397.87	.5113 - 72.0489	$3d^3$ - $3d^3$	ga^4F - b^2D	5/2 - 3/2	F,P	228
	50	1404.420	269.1402 - 340.3440	$3d^2(^3F)4s$ - $3d^2(^3F)4p$	b^2F - z^4F^o	5/2 - 5/2		228
		1404.57	.5113 - 71.7076	$3d^3$ - $3d^3$	ga^4F - b^2D	5/2 - 5/2	F,P	228
		1411.22	1.1883 - 72.0489	$3d^3$ - $3d^3$	ga^4F - b^2D	7/2 - 3/2	F,P	228
	20	1413.281	288.6383 - 359.3959	$3d^2(^3P)4s$ - $3d^2(^3P)4p$	b^2P - y^4D^o	3/2 - 1/2		228
	40	1414.578	270.6726 - 341.3653	$3d^2(^3F)4s$ - $3d^2(^3F)4p$	b^2F - z^4F^o	7/2 - 7/2		228
	5	1416.678	281.2178 - 351.8058	$3d^2(^1D)4s$ - $3d^2(^1P)4p$	c^2D - z^2S^o	3/2 - 1/2		228
		1418.05	1.1883 - 71.7076	$3d^3$ - $3d^3$	ga^4F - b^2D	7/2 - 5/2	F,P	228
	60	1433.272	282.0350 - 351.8058	$3d^2(^3P)4s$ - $3d^2(^3P)4p$	b^4P - z^2S^o	3/2 - 1/2		228
		1434.58	2.0006 - 71.7076	$3d^3$ - $3d^3$	ga^4F - b^2D	9/2 - 5/2	F,P	228
	150	1565.263	287.9192 - 351.8058	$3d^2(^3P)4s$ - $3d^2(^3P)4p$	b^2P - z^2S^o	1/2 - 1/2		228
	200	1583.089	288.6383 - 351.8058	$3d^2(^3P)4s$ - $3d^2(^3P)4p$	b^2P - z^2S^o	3/2 - 1/2		228
		1732.958	292.3130 - 350.0178	$3d^2(^1G)4s$ - $3d^2(^1F)4p$	b^2G - z^2G^o	9/2 - 9/2	P	375
		1733.472	292.3301 - 350.0178	$3d^2(^1G)4s$ - $3d^2(^3F)4p$	b^2G - z^2G^o	7/2 - 9/2	P	375
		1746.151	288.6383 - 345.9071	$3d^2(^3P)4s$ - $3d^2(^3F)4p$	b^2P - z^2D^o	3/2 - 5/2	P	375
		1762.630	287.9192 - 344.6526	$3d^2(^3P)4s$ - $3d^2(^3F)4p$	b^2P - z^2D^o	1/2 - 3/2	P	375
		1765.253	292.3130 - 348.9621	$3d^2(^1G)4s$ - $3d^2(^3F)4p$	b^2G - z^2G^o	9/2 - 7/2	P	375
		1765.786	292.3301 - 348.9621	$3d^2(^1G)4s$ - $3d^2(^3F)4p$	b^2G - z^2G^o	7/2 - 7/2	P	375
		1875.80	18.7383 - 72.0489	$3d^3$ - $3d^3$	a^4P - b^2D	1/2 - 3/2	F,P	228
		1882.99	18.9420 - 72.0489	$3d^3$ - $3d^3$	a^4P - b^2D	3/2 - 3/2	F,P	228
		1887.89	18.7383 - 71.7076	$3d^3$ - $3d^3$	a^4P - b^2D	1/2 - 5/2	F,P	228
		1895.17	18.9420 - 71.7076	$3d^3$ - $3d^3$	a^4P - b^2D	3/2 - 5/2	F,P	228
		1907.01	19.6108 - 72.0489	$3d^3$ - $3d^3$	a^4P - b^2D	5/2 - 3/2	F,P	228
		1919.50	19.6108 - 71.7076	$3d^3$ - $3d^3$	a^4P - b^2D	5/2 - 5/2	F,P	228
		1944.30	20.6164 - 72.0489	$3d^3$ - $3d^3$	a^2G - b^2D	7/2 - 3/2	F,P	228
		1949.500	292.3130 - 343.6082	$3d^2(^1G)4s$ - $3d^2(^3F)4p$	b^2G - z^2F^o	9/2 - 7/2	P	375
		1957.28	20.6164 - 71.7076	$3d^3$ - $3d^3$	a^2G - b^2D	7/2 - 5/2	F,P	228
		1984.42	21.3150 - 71.7076	$3d^3$ - $3d^3$	a^2G - b^2D	9/2 - 5/2	F,P	228
		1990.390	292.3301 - 342.5715	$3d^2(^1G)4s$ - $3d^2(^3F)4p$	b^2G - z^2F^o	7/2 - 5/2	P	375

IRON VII (Fe^{+6}), Z = 26

Ground State $1s^22s^22p^63s^23p^63d^2$ ($^3F_2$) (20 electrons)

Ionization Potential 1 008 000 cm^{-1}; 125.0 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	104.838	1.0515 - 954.904	$3p^63d^2$ - $3p^63d10f$	g^3F - $^3G^o$	3 - 4		1103
	1	104.972	2.3315 - 954.966	$3p^63d^2$ - $3p^63d10f$	g^3F - $^3G^o$	4 - 5		1103
	1	106.285	1.0515 - 941.918	$3p^63d^2$ - $3p^63d9f$	g^3F - $^3G^o$	3 - 4		1103
	1	106.418	2.3315 - 942.022	$3p^63d^2$ - $3p^63d9f$	g^3F - $^3G^o$	4 - 5		1103
	1	107.947	28.9273 - 955.307	$3p^63d^2$ - $3p^63d10f$	^1G - $^1H^o$	4 - 5		1103
	10	108.381	1.0515 - 923.716	$3p^63d^2$ - $3p^63d8f$	g^3F - $^3G^o$	3 - 4		1103
	1	108.495	0.0 - 921.694	$3p^63d^2$ - $3p^63d8f$	g^3F - $^3F^o$	2 - 3		1103
	25	108.519	2.3315 - 923.838	$3p^63d^2$ - $3p^63d8f$	g^3F - $^3G^o$	4 - 5		1103
	4	108.533	2.3315 - 923.716	$3p^63d^2$ - $3p^63d8f$	g^3F - $^3G^o$	4 - 4		1103
	10	108.584	2.3315 - 923.282	$3p^63d^2$ - $3p^63d8f$	g^3F - $^3F^o$	4 - 4		1103
	4	108.620	1.0515 - 921.694	$3p^63d^2$ - $3p^63d8f$	g^3F - $^3F^o$	3 - 3		1103
	4	109.463	28.9273 - 942.477	$3p^63d^2$ - $3p^63d9f$	^1G - $^1H^o$	4 - 5		1103
	1	109.742	17.4755 - 928.684	$3p^63d^2$ - $3p^5(3d^24s(^4P))$	^1D - $^3P^o$	2 - 2		1103
	1	110.103	20.4301 - 928.684	$3p^63d^2$ - $3p^5(3d^24s(^4P))$	^3P - $^3P^o$	1 - 2		1103
	1	110.205	21.2786 - 928.684	$3p^63d^2$ - $3p^5(3d^24s(^4P))$	^3P - $^3P^o$	2 - 2		1103
	1	110.593	17.4755 - 921.694	$3p^63d^2$ - $3p^63d8f$	^1D - $^3F^o$	2 - 3		1103
	25	111.604	1.0515 - 897.077	$3p^63d^2$ - $3p^63d7f$	g^3F - $^3G^o$	3 - 4		1103
	10	111.638	0.0 - 895.744	$3p^63d^2$ - $3p^63d7f$	g^3F - $^3G^o$	2 - 3		1103
	1	111.663	28.9273 - 924.479	$3p^63d^2$ - $3p^63d8f$	^1G - $^1H^o$	4 - 5		1103
	1	111.691	1.0515 - 896.382	$3p^63d^2$ - $3p^63d7f$	g^3F - $^3F^o$	3 - 4		1103

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	40	111.742	2.3315 - 897.254	$3p^63d^2 - 3p^63d7f$	$g^3F - {}^3G^o$	4 - 5		1103
	4	111.767	1.0515 - 895.744	$3p^63d^2 - 3p^63d7f$	$g^3F - {}^3G^o$	3 - 3		1103
	1	111.812	28.9273 - 923.282	$3p^63d^2 - 3p^63d8f$	${}^1G - {}^3F^o$	4 - 4		1103
	10	111.849	2.3315 - 896.382	$3p^63d^2 - 3p^63d7f$	$g^3F - {}^3F^o$	4 - 4		1103
	4	112.012	28.9273 - 921.694	$3p^63d^2 - 3p^63d8f$	${}^1G - {}^3F^o$	4 - 3		1103
	4	112.030	2.3315 - 894.944	$3p^63d^2 - 3p^63d7f$	$g^3F - {}^3F^o$	4 - 3		1103
	10	113.861	17.4755 - 895.744	$3p^63d^2 - 3p^63d7f$	${}^1D - {}^3G^o$	2 - 3		1103
	25	113.964	17.4755 - 894.944	$3p^63d^2 - 3p^63d7f$	${}^1D - {}^3F^o$	2 - 3		1103
	4	114.356	21.2786 - 895.744	$3p^63d^2 - 3p^63d7f$	${}^3P - {}^3G^o$	2 - 3		1103
	1	114.490	21.2786 - 894.718	$3p^63d^2 - 3p^63d7f$	${}^3P - {}^3F^o$	2 - 2		1103
	40	115.033	28.9273 - 898.243	$3p^63d^2 - 3p^63d7f$	${}^1G - {}^1H^o$	4 - 5		1103
	1	115.164	28.9273 - 897.254	$3p^63d^2 - 3p^63d7f$	${}^1G - {}^3G^o$	4 - 5		1103
	4	115.281	28.9273 - 896.382	$3p^63d^2 - 3p^63d7f$	${}^1G - {}^3F^o$	4 - 4		1103
	4	115.472	28.9273 - 894.944	$3p^63d^2 - 3p^63d7f$	${}^1G - {}^3F^o$	4 - 3		1103
	4	116.715	0.0 - 856.797	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^1F^o$	2 - 3		1103
	25	116.809	0.0 - 856.109	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^3D^o$	2 - 3		1103
	1	116.836	0.0 - 855.903	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^3D^o$	2 - 2		1103
	1	116.853	1.0515 - 856.811	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^3P^o$	3 - 2		1103
	4	116.882	2.3315 - 857.881	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^1H^o$	4 - 5		1103
	4	116.951	1.0515 - 856.109	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^3D^o$	3 - 3		1103
	40	116.970	1.0515 - 855.969	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^3G^o$	3 - 4		1103
	40	116.993	0.0 - 854.760	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^3G^o$	2 - 3		1103
	1	117.034	2.3315 - 856.797	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^1F^o$	4 - 3		1103
	60	117.104	2.3315 - 856.260	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^3G^o$	4 - 5		1103
	25	117.135	1.0515 - 854.767	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^3F^o$	3 - 4		1103
	10	117.144	2.3315 - 855.969	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^3G^o$	4 - 4		1103
	10	117.174	0.0 - 853.433	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^3F^o$	2 - 2		1103
	10	117.281	1.0515 - 853.697	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^3F^o$	3 - 3		1103
	10	117.310	2.3315 - 854.767	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^3F^o$	4 - 4		1103
	10	117.335	1.0515 - 853.307	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^1G^o$	3 - 4		1103
	1	117.432	1.0515 - 852.601	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^3H^o$	3 - 4		1103
	1	117.459	2.3315 - 853.697	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^3F^o$	4 - 3		1103
	4	117.512	2.3315 - 853.307	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^1G^o$	4 - 4		1103
	1	117.610	2.3315 - 852.601	$3p^63d^2 - 3p^63d6f$	$g^3F - {}^3H^o$	4 - 4		1103
	25	119.144	17.4755 - 856.797	$3p^63d^2 - 3p^63d6f$	${}^1D - {}^1F^o$	2 - 3		1103
	25	119.240	17.4755 - 856.109	$3p^63d^2 - 3p^63d6f$	${}^1D - {}^3D^o$	2 - 3		1103
	10	119.273	17.4755 - 855.903	$3p^63d^2 - 3p^63d6f$	${}^1D - {}^3D^o$	2 - 2		1103
	10	119.422	17.4755 - 854.838	$3p^63d^2 - 3p^63d6f$	${}^1D - {}^1D^o$	2 - 2		1103
	10	119.435	17.4755 - 854.760	$3p^63d^2 - 3p^63d6f$	${}^1D - {}^3G^o$	2 - 3		1103
	1	119.482	20.0403 - 856.975	$3p^63d^2 - 3p^63d6f$	${}^3P - {}^3P^o$	0 - 1		1103
	4	119.524	20.4301 - 857.082	$3p^63d^2 - 3p^63d6f$	${}^3P - {}^3P^o$	1 - 0		1103
	4	119.541	20.4301 - 856.975	$3p^63d^2 - 3p^63d6f$	${}^3P - {}^3P^o$	1 - 1		1103
	1	119.561	20.4301 - 856.811	$3p^63d^2 - 3p^63d6f$	${}^3P - {}^3P^o$	1 - 2		1103
	1	119.587	17.4755 - 853.697	$3p^63d^2 - 3p^63d6f$	${}^1D - {}^3F^o$	2 - 3		1103
	4	119.623	17.4755 - 853.433	$3p^63d^2 - 3p^63d6f$	${}^1D - {}^3F^o$	2 - 2		1103
	60	119.686	21.2786 - 856.811	$3p^63d^2 - 3p^63d6f$	${}^3P - {}^3P^o$	2 - 2		1103
	4	119.692	20.4301 - 855.903	$3p^63d^2 - 3p^63d6f$	${}^3P - {}^3D^o$	1 - 2		1103
	25	119.715	20.0403 - 855.346	$3p^63d^2 - 3p^63d6f$	${}^3P - {}^3D^o$	0 - 1		1103
	25	119.785	21.2786 - 856.109	$3p^63d^2 - 3p^63d6f$	${}^3P - {}^3D^o$	2 - 3		1103
	4	119.813	21.2786 - 855.903	$3p^63d^2 - 3p^63d6f$	${}^3P - {}^3D^o$	2 - 2		1103
	25	119.846	20.4301 - 854.838	$3p^63d^2 - 3p^63d6f$	${}^3P - {}^1D^o$	1 - 2		1103
	1	119.896	21.2786 - 855.346	$3p^63d^2 - 3p^63d6f$	${}^3P - {}^3D^o$	2 - 1		1103
	1	119.978	21.2786 - 854.760	$3p^63d^2 - 3p^63d6f$	${}^3P - {}^3G^o$	2 - 3		1103
	4	120.030	0.0 - 833.128	$3p^63d^2 - 3p^5(3d^24s(^2G))$	$g^3F - {}^3G^o$	2 - 3		1103
	4	120.131	21.2786 - 853.697	$3p^63d^2 - 3p^63d6f$	${}^3P - {}^3F^o$	2 - 3		1103
	4	120.181	1.0515 - 833.128	$3p^63d^2 - 3p^5(3d^24s(^2G))$	$g^3F - {}^3G^o$	3 - 3		1103
	10	120.214	1.0515 - 832.893	$3p^63d^2 - 3p^5(3d^24s(^2G))$	$g^3F - {}^3G^o$	3 - 4		1103
	25	120.401	2.3315 - 832.889	$3p^63d^2 - 3p^5(3d^24s(^2G))$	$g^3F - {}^3G^o$	4 - 5		1103
	120	120.636	28.9273 - 857.881	$3p^63d^2 - 3p^63d6f$	${}^1G - {}^1H^o$	4 - 5		1103
	1	120.789	28.9273 - 856.797	$3p^63d^2 - 3p^63d6f$	${}^1G - {}^1F^o$	4 - 3		1103
	4	120.872	28.9273 - 856.260	$3p^63d^2 - 3p^63d6f$	${}^1G - {}^3G^o$	4 - 5		1103
	1	120.915	28.9273 - 855.969	$3p^63d^2 - 3p^63d6f$	${}^1G - {}^3G^o$	4 - 4		1103
	25	121.090	28.9273 - 854.767	$3p^63d^2 - 3p^63d6f$	${}^1G - {}^3F^o$	4 - 4		1103
	4	121.183	2.3315 - 827.533	$3p^63d^2 - 3p^5(3d^24s(^4P))$	$g^3F - {}^3D^o$	4 - 3		1103
	25	121.304	28.9273 - 853.307	$3p^63d^2 - 3p^63d6f$	${}^1G - {}^1G^o$	4 - 4		1103

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	121.331	0.0 - 824.184	$3p^63d^2 - 3p^5(3d^24s(^4P))$	$g^3F - {}^3D^o$	2 - 2		1103
	4	121.408	28.9273 - 852.601	$3p^63d^2 - 3p^63d6f$	$^1G - {}^3H^o$	4 - 4		1103
	4	121.490	1.0515 - 824.184	$3p^63d^2 - 3p^5(3d^24s(^4P))$	$g^3F - {}^3D^o$	3 - 2		1103
	1	121.555	0.0 - 822.689	$3p^63d^2 - 3p^5(3d^24s(^4P))$	$g^3F - {}^3D^o$	2 - 1		1103
	1	121.952	17.4755 - 837.472	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$^1D - {}^3S^o$	2 - 1		1103
	4	122.335	20.0403 - 837.472	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$^3P - {}^3S^o$	0 - 1		1103
	4	122.370	0.0 - 817.195	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$g^3F - {}^3D^o$	2 - 1		1103
	4	122.392	20.4301 - 837.472	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$^3P - {}^3S^o$	1 - 1		1103
	10	122.520	21.2786 - 837.472	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$^3P - {}^3S^o$	2 - 1		1103
	10	123.029	1.0515 - 813.877	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$g^3F - {}^3D^o$	3 - 2		1103
	10	123.130	17.4755 - 829.626	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$^1D - {}^1D^o$	2 - 2		1103
	10	123.496	2.3315 - 812.086	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$g^3F - {}^3D^o$	4 - 3		1103
	1	123.667	17.4755 - 826.106	$3p^63d^2 - 3p^5(3d^24s(^4P))$	$^1D - {}^3S^o$	2 - 1		1103
	4	123.709	21.2786 - 829.626	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$^3P - {}^1D^o$	2 - 2		1103
	1	123.822	0.0 - 807.627	$3p^63d^2 - 3p^5(3d^24s(^2D))$	$g^3F - {}^1F^o$	2 - 3		1103
	40	124.030	21.2786 - 827.533	$3p^63d^2 - 3p^5(3d^24s(^4P))$	$^3P - {}^3D^o$	2 - 3		1103
	1	124.058	20.0403 - 826.106	$3p^63d^2 - 3p^5(3d^24s(^4P))$	$^3P - {}^3S^o$	0 - 1		1103
	4	124.120	20.4301 - 826.106	$3p^63d^2 - 3p^5(3d^24s(^4P))$	$^3P - {}^3S^o$	1 - 1		1103
	4	124.250	21.2786 - 826.106	$3p^63d^2 - 3p^5(3d^24s(^4P))$	$^3P - {}^3S^o$	2 - 1		1103
	10	124.384	28.9273 - 832.889	$3p^63d^2 - 3p^5(3d^24s(^2G))$	$^1G - {}^3G^o$	4 - 5		1103
	10	124.415	20.4301 - 824.184	$3p^63d^2 - 3p^5(3d^24s(^4P))$	$^3P - {}^3D^o$	1 - 2		1103
	4	124.425	2.3315 - 806.033	$3p^63d^2 - 3p^5(3d^24s(^2G))$	$g^3F - {}^1H^o$	4 - 5		1103
	10	124.547	21.2786 - 824.184	$3p^63d^2 - 3p^5(3d^24s(^4P))$	$^3P - {}^3D^o$	2 - 2		1103
	4	124.586	20.0403 - 822.689	$3p^63d^2 - 3p^5(3d^24s(^4P))$	$^3P - {}^3D^o$	0 - 1		1103
	4	124.648	20.4301 - 822.689	$3p^63d^2 - 3p^5(3d^24s(^4P))$	$^3P - {}^3D^o$	1 - 1		1103
	10	124.779	1.0515 - 802.462	$3p^63d^2 - 3p^5(3d^24s(^2F))$	$g^3F - {}^1G^o$	3 - 4		1103
	10	124.979	2.3315 - 802.462	$3p^63d^2 - 3p^5(3d^24s(^2F))$	$g^3F - {}^1G^o$	4 - 4		1103
	60	125.266	2.3315 - 800.633	$3p^63d^2 - 3p^5(3d^24s(^4F))$	$g^3F - {}^3G^o$	4 - 5		1103
	25	125.431	0.0 - 797.257	$3p^63d^2 - 3p^5(3d^24s(^2D))$	$g^3F - {}^3F^o$	2 - 3		1103
	25	125.447	20.0403 - 817.195	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$^3P - {}^3D^o$	0 - 1		1103
	10	125.508	20.4301 - 817.195	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$^3P - {}^3D^o$	1 - 1		1103
	60	125.524	1.0515 - 797.712	$3p^63d^2 - 3p^5(3d^24s(^4F))$	$g^3F - {}^3G^o$	3 - 4		1103
	4	125.565	17.4755 - 813.877	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$^1D - {}^3D^o$	2 - 2		1103
	4	125.596	1.0515 - 797.257	$3p^63d^2 - 3p^5(3d^24s(^2D))$	$g^3F - {}^3F^o$	3 - 3		1103
	1	125.640	21.2786 - 817.195	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$^3P - {}^3D^o$	2 - 1		1103
	4	125.798	2.3315 - 797.257	$3p^63d^2 - 3p^5(3d^24s(^2D))$	$g^3F - {}^3F^o$	4 - 3		1103
	1	125.846	17.4755 - 812.086	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$^1D - {}^3D^o$	2 - 3		1103
	10	125.922	0.0 - 794.149	$3p^63d^2 - 3p^5(3d^24s(^4F))$	$g^3F - {}^3G^o$	2 - 3		1103
	40	126.032	20.4301 - 813.877	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$^3P - {}^3D^o$	1 - 2		1103
	1	126.088	1.0515 - 794.149	$3p^63d^2 - 3p^5(3d^24s(^4F))$	$g^3F - {}^3G^o$	3 - 3		1103
	10	126.166	21.2786 - 813.877	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$^3P - {}^3D^o$	2 - 2		1103
	40	126.453	21.2786 - 812.086	$3p^63d^2 - 3p^5(3d^24s(^2P))$	$^3P - {}^3D^o$	2 - 3		1103
	60	126.559	17.4755 - 807.627	$3p^63d^2 - 3p^5(3d^24s(^2D))$	$^1D - {}^1F^o$	2 - 3		1103
	4	126.705	0.0 - 789.215	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^1F^o$	2 - 3		1103
	1	126.743	0.0 - 788.995	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3P^o$	2 - 2		1103
	4	126.768	2.3315 - 791.168	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^1H^o$	4 - 5		1103
	40	126.855	0.0 - 788.303	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3D^o$	2 - 3		1103
	1	126.875	1.0515 - 789.215	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^1F^o$	3 - 3		1103
	1	126.898	0.0 - 788.030	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3D^o$	2 - 2		1103
	10	126.913	0.0 - 787.945	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3D^o$	2 - 1		1103
	60	127.026	1.0515 - 788.303	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3D^o$	3 - 3		1103
	4	127.069	1.0515 - 788.030	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3D^o$	3 - 2		1103
	150	127.118	1.0515 - 787.737	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3G^o$	3 - 4		1103
	4	127.169	21.2786 - 807.627	$3p^63d^2 - 3p^5(3d^24s(^2D))$	$^3P - {}^1F^o$	2 - 3		1103
	10	127.230	2.3315 - 788.303	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3D^o$	4 - 3		1103
	200	127.258	2.3315 - 788.146	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3G^o$	4 - 5		1103
	10	127.278	1.0515 - 786.732	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3G^o$	3 - 3		1103
	90	127.324	2.3315 - 787.737	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3G^o$	4 - 4		1103
	120	127.388	0.0 - 785.012	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3F^o$	2 - 3		1103
	90	127.429	1.0515 - 785.809	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3F^o$	3 - 4		1103
	150	127.559	1.0515 - 785.012	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3F^o$	3 - 3		1103
	10	127.604	1.0515 - 784.733	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3F^o$	3 - 2		1103
	200	127.636	2.3315 - 785.809	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3F^o$	4 - 4		1103
	90	127.645	1.0515 - 784.477	$3p^63d^2 - 3p^63d5f$	$g^3F - {}^3H^o$	3 - 4		1103
	90	127.694	0.0 - 783.119	$3p^63d^2 - 3p^5(3d^24s(^2F))$	$g^3F - {}^3F^o$	2 - 3		1103

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	4	127.763	2.3315 - 785.012	$3p^63d^2$ - $3p^63d5f$	g^3F - $^3F^o$	4 - 3		1103
	4	127.852	2.3315 - 784.477	$3p^63d^2$ - $3p^63d5f$	g^3F - $^3H^o$	4 - 4		1103
	90	127.867	1.0515 - 783.119	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	g^3F - $^3F^o$	3 - 3		1103
	150	128.147	2.3315 - 782.690	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	g^3F - $^3F^o$	4 - 4		1103
	10	128.240	17.4755 - 797.257	$3p^63d^2$ - $3p^5(3d^24s(^2D))$	^1D - $^3F^o$	2 - 3		1103
	25	128.368	0.0 - 779.009	$3p^63d^2$ - $3p^5(3d^24s(^2D))$	g^3F - $^1D^o$	2 - 2		1103
	1	128.417	28.9273 - 807.627	$3p^63d^2$ - $3p^5(3d^24s(^2D))$	^1G - $^1F^o$	4 - 3		1103
	4	128.449	1.0515 - 779.575	$3p^63d^2$ - $3p^5(3d^24s(^2G))$	g^3F - $^3F^o$	3 - 4		1103
	1	128.538	1.0515 - 779.009	$3p^63d^2$ - $3p^5(3d^24s(^2D))$	g^3F - $^1D^o$	3 - 2		1103
	40	128.638	1.0515 - 778.420	$3p^63d^2$ - $3p^5(3d^24s(^2G))$	g^3F - $^3F^o$	3 - 3		1103
	40	128.659	2.3315 - 779.575	$3p^63d^2$ - $3p^5(3d^24s(^2G))$	g^3F - $^3F^o$	4 - 4		1103
	120	128.682	28.9273 - 806.033	$3p^63d^2$ - $3p^5(3d^24s(^2G))$	^1G - $^1H^o$	4 - 5		1103
	90	128.753	17.4755 - 794.149	$3p^63d^2$ - $3p^5(3d^24s(^4F))$	^1D - $^3G^o$	2 - 3		1103
	10	128.852	2.3315 - 778.420	$3p^63d^2$ - $3p^5(3d^24s(^2G))$	g^3F - $^3F^o$	4 - 3		1103
	4	129.278	28.9273 - 802.462	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	^1G - $^1G^o$	4 - 4		1103
	90	129.330	17.4755 - 790.708	$3p^63d^2$ - $3p^63d5f$	^1D - $^1P^o$	2 - 1		1103
	90	129.579	17.4755 - 789.215	$3p^63d^2$ - $3p^63d5f$	^1D - $^1F^o$	2 - 3		1103
	60	129.730	17.4755 - 788.303	$3p^63d^2$ - $3p^63d5f$	^1D - $^3D^o$	2 - 3		1103
	10	129.777	17.4755 - 788.030	$3p^63d^2$ - $3p^63d5f$	^1D - $^3D^o$	2 - 2		1103
	1	129.789	17.4755 - 787.945	$3p^63d^2$ - $3p^63d5f$	^1D - $^3D^o$	2 - 1		1103
	1	129.822	20.4301 - 790.708	$3p^63d^2$ - $3p^63d5f$	^3P - $^1P^o$	1 - 1		1103
	120	129.872	0.0 - 769.991	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	g^3F - $^3G^o$	2 - 3		1103
	150	129.980	17.4755 - 786.830	$3p^63d^2$ - $3p^63d5f$	^1D - $^1D^o$	2 - 2		1103
	10	129.996	17.4755 - 786.732	$3p^63d^2$ - $3p^63d5f$	^1D - $^3G^o$	2 - 3		1103
	40	130.017	20.0403 - 789.172	$3p^63d^2$ - $3p^63d5f$	^3P - $^3P^o$	0 - 1		1103
	40	130.050	1.0515 - 769.991	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	g^3F - $^3G^o$	3 - 3		1103
	25	130.112	20.4301 - 788.995	$3p^63d^2$ - $3p^63d5f$	^3P - $^3P^o$	1 - 2		1103
	60	130.221	20.0403 - 787.945	$3p^63d^2$ - $3p^63d5f$	^3P - $^3D^o$	0 - 1		1103
	60	130.226	21.2786 - 789.172	$3p^63d^2$ - $3p^63d5f$	^3P - $^3P^o$	2 - 1		1103
	250	130.248	1.0515 - 768.813	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	g^3F - $^3G^o$	3 - 4		1103
	60	130.257	21.2786 - 788.995	$3p^63d^2$ - $3p^63d5f$	^3P - $^3P^o$	2 - 2		1103
	40	130.277	20.4301 - 788.030	$3p^63d^2$ - $3p^63d5f$	^3P - $^3D^o$	1 - 2		1103
	10	130.336	17.4755 - 784.733	$3p^63d^2$ - $3p^63d5f$	^1D - $^3F^o$	2 - 2		1103
	90	130.374	21.2786 - 788.303	$3p^63d^2$ - $3p^63d5f$	^3P - $^3D^o$	2 - 3		1103
	10	130.419	21.2786 - 788.030	$3p^63d^2$ - $3p^63d5f$	^3P - $^3D^o$	2 - 2		1103
	25	130.467	2.3315 - 768.813	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	g^3F - $^3G^o$	4 - 4		1103
	10	130.481	20.4301 - 786.830	$3p^63d^2$ - $3p^63d5f$	^3P - $^1D^o$	1 - 2		1103
	1	130.608	17.4755 - 783.119	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	^1D - $^3F^o$	2 - 3		1103
	1	130.623	21.2786 - 786.830	$3p^63d^2$ - $3p^63d5f$	^3P - $^1D^o$	2 - 2		1103
	300	130.779	2.3315 - 766.991	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	g^3F - $^3G^o$	4 - 5		1103
	4	130.838	20.4301 - 784.733	$3p^63d^2$ - $3p^63d5f$	^3P - $^3F^o$	1 - 2		1103
	250	131.193	28.9273 - 791.168	$3p^63d^2$ - $3p^63d5f$	^1G - $^1H^o$	4 - 5		1103
	120	131.318	17.4755 - 779.009	$3p^63d^2$ - $3p^5(3d^24s(^2D))$	^1D - $^1D^o$	2 - 2		1103
	25	131.531	28.9273 - 789.215	$3p^63d^2$ - $3p^63d5f$	^1G - $^1F^o$	4 - 3		1103
	10	131.713	28.9273 - 788.146	$3p^63d^2$ - $3p^63d5f$	^1G - $^3G^o$	4 - 5		1103
	1	131.782	28.9273 - 787.737	$3p^63d^2$ - $3p^63d5f$	^1G - $^3G^o$	4 - 4		1103
	40	132.120	28.9273 - 785.809	$3p^63d^2$ - $3p^63d5f$	^1G - $^3F^o$	4 - 4		1103
	25	132.355	28.9273 - 784.477	$3p^63d^2$ - $3p^63d5f$	^1G - $^3H^o$	4 - 4		1103
	150	132.407	28.9273 - 784.174	$3p^63d^2$ - $3p^63d5f$	^1G - $^1G^o$	4 - 4		1103
	25	132.593	28.9273 - 783.119	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	^1G - $^3F^o$	4 - 3		1103
	10	132.667	28.9273 - 782.690	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	^1G - $^3F^o$	4 - 4		1103
	25	132.792	20.4301 - 773.488	$3p^63d^2$ - $3p^5(3d^24s(^2P))$	^3P - $^3P^o$	1 - 0		1103
	25	133.055	20.0403 - 771.612	$3p^63d^2$ - $3p^5(3d^24s(^2P))$	^3P - $^3P^o$	0 - 1		1103
	25	133.123	20.4301 - 771.612	$3p^63d^2$ - $3p^5(3d^24s(^2P))$	^3P - $^3P^o$	1 - 1		1103
	25	133.165	17.4755 - 768.425	$3p^63d^2$ - $3p^5(3d^24s(^2P))$	^1D - $^3P^o$	2 - 2		1103
	25	133.274	21.2786 - 771.612	$3p^63d^2$ - $3p^5(3d^24s(^2P))$	^3P - $^3P^o$	2 - 1		1103
	1	133.424	28.9273 - 778.420	$3p^63d^2$ - $3p^5(3d^24s(^2G))$	^1G - $^3F^o$	4 - 3		1103
	25	133.670	1.0515 - 749.166	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	g^3F - $^3D^o$	3 - 3		1103
	40	133.691	20.4301 - 768.425	$3p^63d^2$ - $3p^5(3d^24s(^2P))$	^3P - $^3P^o$	1 - 2		1103
	90	133.842	21.2786 - 768.425	$3p^63d^2$ - $3p^5(3d^24s(^2P))$	^3P - $^3P^o$	2 - 2		1103
	25	133.874	0.0 - 746.965	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	g^3F - $^3D^o$	2 - 2		1103
	90	133.899	2.3315 - 749.166	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	g^3F - $^3D^o$	4 - 3		1103
	60	134.063	1.0515 - 746.965	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	g^3F - $^3D^o$	3 - 2		1103
	40	134.128	0.0 - 745.556	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	g^3F - $^3D^o$	2 - 1		1103
	10	134.940	28.9273 - 769.991	$3p^63d^2$ - $3p^5(3d^24s(^2F))$	^1G - $^3G^o$	4 - 3		1103

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	135.488	28.9273 - 766.991	$3p^63d^2 - 3p^5(3d^24s(^2F))$	$^1G - ^3G^o$	4 - 5		1103
	10	136.671	17.4755 - 749.166	$3p^63d^2 - 3p^5(3d^24s(^2F))$	$^1D - ^3D^o$	2 - 3		1103
	90	137.384	21.2786 - 749.166	$3p^63d^2 - 3p^5(3d^24s(^2F))$	$^3P - ^3D^o$	2 - 3		1103
	40	137.640	20.4301 - 746.965	$3p^63d^2 - 3p^5(3d^24s(^2F))$	$^3P - ^3D^o$	1 - 2		1103
	4	137.802	21.2786 - 746.965	$3p^63d^2 - 3p^5(3d^24s(^2F))$	$^3P - ^3D^o$	2 - 2		1103
	10	137.833	20.0403 - 745.556	$3p^63d^2 - 3p^5(3d^24s(^2F))$	$^3P - ^3D^o$	0 - 1		1103
	4	137.907	20.4301 - 745.556	$3p^63d^2 - 3p^5(3d^24s(^2F))$	$^3P - ^3D^o$	1 - 1		1103
	60	138.191	67.0783 - 790.708	$3p^63d^2 - 3p^63d5f$	$^1S - ^1P^o$	0 - 1		1103
	1	138.841	28.9273 - 749.166	$3p^63d^2 - 3p^5(3d^24s(^2F))$	$^1G - ^3D^o$	4 - 3		1103
	4	150.186	0.0 - 665.832	$3p^63d^2 - 3p^63d4f$	$g^3F - ^3D^o$	2 - 1		1103
	10	150.282	0.0 - 665.417	$3p^63d^2 - 3p^63d4f$	$g^3F - ^1F^o$	2 - 3		1103
	4	150.403	1.0515 - 665.923	$3p^63d^2 - 3p^63d4f$	$g^3F - ^3D^o$	3 - 2		1103
	25	150.521	1.0515 - 665.417	$3p^63d^2 - 3p^63d4f$	$g^3F - ^1F^o$	3 - 3		1103
	25	150.530	2.3315 - 666.651	$3p^63d^2 - 3p^63d4f$	$g^3F - ^3D^o$	4 - 3		1103
	90	150.807	0.0 - 663.097	$3p^63d^2 - 3p^63d4f$	$g^3F - ^3G^o$	2 - 3		1103
	90	150.852	1.0515 - 663.950	$3p^63d^2 - 3p^63d4f$	$g^3F - ^3G^o$	3 - 4		1103
	150	151.023	2.3315 - 664.482	$3p^63d^2 - 3p^63d4f$	$g^3F - ^3G^o$	4 - 5		1103
	10	151.046	1.0515 - 663.097	$3p^63d^2 - 3p^63d4f$	$g^3F - ^3G^o$	3 - 3		1103
	40	151.145	2.3315 - 663.950	$3p^63d^2 - 3p^63d4f$	$g^3F - ^3G^o$	4 - 4		1103
	50	151.268						209
	40	151.432	0.0 - 660.358	$3p^63d^2 - 3p^63d4f$	$g^3F - ^3F^o$	2 - 3		1103
	25	151.488	1.0515 - 661.169	$3p^63d^2 - 3p^63d4f$	$g^3F - ^3F^o$	3 - 4		1103
	60	151.512	0.0 - 660.015	$3p^63d^2 - 3p^63d4f$	$g^3F - ^3F^o$	2 - 2		1103
	90	151.675	1.0515 - 660.358	$3p^63d^2 - 3p^63d4f$	$g^3F - ^3F^o$	3 - 3		1103
	4	151.754	1.0515 - 660.015	$3p^63d^2 - 3p^63d4f$	$g^3F - ^3F^o$	3 - 2		1103
	120	151.782	2.3315 - 661.169	$3p^63d^2 - 3p^63d4f$	$g^3F - ^3F^o$	4 - 4		1103
	4	151.971	2.3315 - 660.358	$3p^63d^2 - 3p^63d4f$	$g^3F - ^3F^o$	4 - 3		1103
	40	152.072	2.3315 - 659.917	$3p^63d^2 - 3p^63d4f$	$g^3F - ^1G^o$	4 - 4		1103
	50	152.906						209
	1	153.663	17.4755 - 668.253	$3p^63d^2 - 3p^63d4f$	$^1D - ^3P^o$	2 - 1		1103
	1	153.747	17.4755 - 667.899	$3p^63d^2 - 3p^63d4f$	$^1D - ^3P^o$	2 - 2		1103
	25	154.042	17.4755 - 666.651	$3p^63d^2 - 3p^63d4f$	$^1D - ^3D^o$	2 - 3		1103
	1	154.216	17.4755 - 665.923	$3p^63d^2 - 3p^63d4f$	$^1D - ^3D^o$	2 - 2		1103
	4	154.271	20.0403 - 668.253	$3p^63d^2 - 3p^63d4f$	$^3P - ^3P^o$	0 - 1		1103
	10	154.307	20.4301 - 668.489	$3p^63d^2 - 3p^63d4f$	$^3P - ^3P^o$	1 - 0		1103
	120	154.335	17.4755 - 665.417	$3p^63d^2 - 3p^63d4f$	$^1D - ^1F^o$	2 - 3		1103
	25	154.363	20.4301 - 668.253	$3p^63d^2 - 3p^63d4f$	$^3P - ^3P^o$	1 - 1		1103
	1	154.447	20.4301 - 667.899	$3p^63d^2 - 3p^63d4f$	$^3P - ^3P^o$	1 - 2		1103
	25	154.565	21.2786 - 668.253	$3p^63d^2 - 3p^63d4f$	$^3P - ^3P^o$	2 - 1		1103
	90	154.650	21.2786 - 667.899	$3p^63d^2 - 3p^63d4f$	$^3P - ^3P^o$	2 - 2		1103
	90	154.705	17.4755 - 663.871	$3p^63d^2 - 3p^63d4f$	$^1D - ^1D^o$	2 - 2		1103
	25	154.848	20.0403 - 665.832	$3p^63d^2 - 3p^63d4f$	$^3P - ^3D^o$	0 - 1		1103
	4	154.888	17.4755 - 663.097	$3p^63d^2 - 3p^63d4f$	$^1D - ^3G^o$	2 - 3		1103
	60	154.921	20.4301 - 665.923	$3p^63d^2 - 3p^63d4f$	$^3P - ^3D^o$	1 - 2		1103
	40	154.941	20.4301 - 665.832	$3p^63d^2 - 3p^63d4f$	$^3P - ^3D^o$	1 - 1		1103
	90	154.949	21.2786 - 666.651	$3p^63d^2 - 3p^63d4f$	$^3P - ^3D^o$	2 - 3		1103
	1	155.124	21.2786 - 665.923	$3p^63d^2 - 3p^63d4f$	$^3P - ^3D^o$	2 - 2		1103
	1	155.150	21.2786 - 665.832	$3p^63d^2 - 3p^63d4f$	$^3P - ^3D^o$	2 - 1		1103
	10	155.247	21.2786 - 665.417	$3p^63d^2 - 3p^63d4f$	$^3P - ^1F^o$	2 - 3		1103
	1	155.414	20.4301 - 663.871	$3p^63d^2 - 3p^63d4f$	$^3P - ^1D^o$	1 - 2		1103
	1	155.549	17.4755 - 660.358	$3p^63d^2 - 3p^63d4f$	$^1D - ^3F^o$	2 - 3		1103
	1	155.619	21.2786 - 663.871	$3p^63d^2 - 3p^63d4f$	$^3P - ^1D^o$	2 - 2		1103
	1	155.632	17.4755 - 660.015	$3p^63d^2 - 3p^63d4f$	$^1D - ^3F^o$	2 - 2		1103
	120	155.994	28.9273 - 669.978	$3p^63d^2 - 3p^63d4f$	$^1G - ^1H^o$	4 - 5		1103
	4	156.808	28.9273 - 666.651	$3p^63d^2 - 3p^63d4f$	$^1G - ^3D^o$	4 - 3		1103
	10	157.112	28.9273 - 665.417	$3p^63d^2 - 3p^63d4f$	$^1G - ^1F^o$	4 - 3		1103
	150	157.689	28.9273 - 663.097	$3p^63d^2 - 3p^63d4f$	$^1G - ^3G^o$	4 - 3		1103
	150	158.168	28.9273 - 661.169	$3p^63d^2 - 3p^63d4f$	$^1G - ^3F^o$	4 - 4		1103
	120	158.481	28.9273 - 659.917	$3p^63d^2 - 3p^63d4f$	$^1G - ^1G^o$	4 - 4		1103
	120	163.183	17.4755 - 630.283	$3p^63d^2 - 3p^5(^2P^o)(3d^3(b^2D))$	$^1D - ^1P^o$	2 - 1		
	4	163.974	20.4301 - 630.283	$3p^63d^2 - 3p^5(^2P^o)(3d^3(b^2D))$	$^3P - ^1P^o$	1 - 1		1103
	25	164.203	21.2786 - 630.283	$3p^63d^2 - 3p^5(^2P^o)(3d^3(b^2D))$	$^3P - ^1P^o$	2 - 1		1103
	25	164.955	17.4755 - 623.699	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4P))$	$^1D - ^3S^o$	2 - 1		1103
	90	165.087	67.0783 - 672.820	$3p^63d^2 - 3p^63d4f$	$^1S - ^1P^o$	0 - 1		1103
	1	165.444	1.0515 - 605.489	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2H))$	$g^3F - ^1G^o$	3 - 4		1103

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	150	165.490	0.0 - 604.270	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$g^3F - {}^3D^o$	2 - 1		1103
	60	165.630	0.0 - 603.757	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$g^3F - {}^3D^o$	2 - 2		1103
	40	165.658	20.0403 - 623.699	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4P))$	$^3P - {}^3S^o$	0 - 1		1103
	1	165.724	0.0 - 603.419	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$g^3F - {}^3D^o$	2 - 3		1103
	60	165.764	20.4301 - 623.699	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4P))$	$^3P - {}^3S^o$	1 - 1		1103
	150	165.919	1.0515 - 603.757	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$g^3F - {}^3D^o$	3 - 2		1103
	60	165.996	21.2786 - 623.699	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4P))$	$^3P - {}^3S^o$	2 - 1		1103
	40	166.010	1.0515 - 603.419	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$g^3F - {}^3D^o$	3 - 3		1103
	200	166.365	2.3315 - 603.419	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$g^3F - {}^3D^o$	4 - 3		1103
	50	166.629						209
	40	167.047	0.0 - 598.638	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2P))$	$g^3F - {}^1P^o$	2 - 1		1103
	25	170.417	17.4755 - 604.270	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$^1D - {}^3D^o$	2 - 1		1103
	4	170.565	17.4755 - 603.757	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$^1D - {}^3D^o$	2 - 2		1103
	25	170.664	17.4755 - 603.419	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$^1D - {}^3D^o$	2 - 3		1103
	40	171.166	20.0403 - 604.270	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$^3P - {}^3D^o$	0 - 1		1103
	25	171.279	20.4301 - 604.270	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$^3P - {}^3D^o$	1 - 1		1103
	60	171.432	20.4301 - 603.757	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$^3P - {}^3D^o$	1 - 2		1103
	40	171.529	21.2786 - 604.270	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$^3P - {}^3D^o$	2 - 1		1103
	40	171.680	21.2786 - 603.757	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$^3P - {}^3D^o$	2 - 2		1103
	90	171.779	21.2786 - 603.419	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$^3P - {}^3D^o$	2 - 3		1103
	90	172.069	17.4755 - 598.638	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2P))$	$^1D - {}^1P^o$	2 - 1		1103
	4	172.831	20.0403 - 598.638	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2P))$	$^3P - {}^1P^o$	0 - 1		1103
	1	172.948	20.4301 - 598.638	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2P))$	$^3P - {}^1P^o$	1 - 1		1103
	25	173.203	21.2786 - 598.638	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2P))$	$^3P - {}^1P^o$	2 - 1		1103
	200	173.441	28.9273 - 605.489	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2H))$	$^1G - {}^1G^o$	4 - 4		1103
	4	174.069	28.9273 - 603.419	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$^1G - {}^3D^o$	4 - 3		1103
	90	176.345	1.0515 - 568.118	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$g^3F - {}^3F^o$	3 - 4		1103
	60	176.599	0.0 - 566.256	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$g^3F - {}^3F^o$	2 - 3		1103
	250	176.744	2.3315 - 568.118	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$g^3F - {}^3F^o$	4 - 4		1103
	40	176.904	0.0 - 565.275	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4P))$	$g^3F - {}^3P^o$	2 - 2		1103
	250	176.928	1.0515 - 566.256	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$g^3F - {}^3F^o$	3 - 3		1103
	200	177.172	0.0 - 564.425	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$g^3F - {}^3F^o$	2 - 2		1103
	10	177.235	1.0515 - 565.275	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4P))$	$g^3F - {}^3P^o$	3 - 2		1103
	120	177.329	2.3315 - 566.256	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$g^3F - {}^3F^o$	4 - 3		1103
	60	177.503	1.0515 - 564.425	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$g^3F - {}^3F^o$	3 - 2		1103
	60	177.555	67.0783 - 630.283	$3p^63d^2 - 3p^5(^2P^o)(3d^3(b^2D))$	$^1S - {}^1P^o$	0 - 1		1103
	4	179.656	67.0783 - 623.699	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4P))$	$^1S - {}^3S^o$	0 - 1		1103
	4	179.720	0.0 - 556.422	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2G))$	$g^3F - {}^1F^o$	2 - 3		1103
	60	180.059	1.0515 - 556.422	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2G))$	$g^3F - {}^1F^o$	3 - 3		1103
	25	180.477	2.3315 - 556.422	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2G))$	$g^3F - {}^1F^o$	4 - 3		1103
	10	180.760	0.0 - 553.220	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2F))$	$g^3F - {}^1D^o$	2 - 2		1103
	25	181.104	1.0515 - 553.220	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2F))$	$g^3F - {}^1D^o$	3 - 2		1103
	25	181.646	1.0515 - 551.568	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2F))$	$g^3F - {}^3D^o$	3 - 3		1103
	60	182.071	2.3315 - 551.568	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2F))$	$g^4F - {}^3D^o$	4 - 3		1103
	10	182.221	17.4755 - 566.256	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4F))$	$^1D - {}^3F^o$	2 - 3		1103
	40	182.740	1.0515 - 548.274	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2F))$	$g^3F - {}^3D^o$	3 - 2		1103
	90	183.539	20.4301 - 565.275	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4P))$	$^3P - {}^3P^o$	1 - 2		1103
	200	183.825	21.2786 - 565.275	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4P))$	$^3P - {}^3P^o$	2 - 2		1103
	40	183.884	561.303 - 21.2786	$3p^5(^2P^o)(3d^3(a^4P)) - 3p^63d^2$	$^3P^o - {}^3P$	2 - 1		1103
	)(3D3	184.114	20.0403 - 561.303	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4P))$	$^3P - {}^3P^o$	0 - 1	F	03
	40	184.886	20.4301 - 561.303	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4P))$	$^3P - {}^3P^o$	1 - 1		1103
	25	185.176	21.2786 - 561.303	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^4P))$	$^3P - {}^3P^o$	2 - 1		1103
	4	185.465	568.118 - 17.4755	$3p^5(^2P^o)(3d^3(a^4F)) - 3p^63d^2$	$^3F^o - {}^1D$	4 - 4		1103
	)(3D3	185.547	538.290 - 17.4755	$3p^5(^2P^o)(3d^3(a^2D)) - 3p^63d^2$	$^1D^o - {}^1D$	2 - 2	F	03
	)(3D3	186.657	556.422 - 17.4755	$3p^5(^2P^o)(3d^3(a^2G)) - 3p^63d^2$	$^1F^o - {}^1D$	2 - 3	F	03
	)(3D3	187.235	20.4301 - 553.220	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2F))$	$^3P - {}^1D^o$	1 - 2	F	03
	40	187.990	21.2786 - 553.220	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2F))$	$^3P - {}^1D^o$	2 - 2		1103
	40	188.125	67.0783 - 598.638	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2P))$	$^1S - {}^1P^o$	0 - 1		1103
	150	188.396	17.4755 - 548.274	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2F))$	$^1D - {}^3D^o$	2 - 2		1103
	150	188.576	21.2786 - 551.568	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2F))$	$^3P - {}^3D^o$	2 - 3		1103
	90	189.450	20.4301 - 28.9273	$3p^63d^2 - 3p^63d^2$	$^3P - {}^1G$	1 - 2		1103
	)(3D3	189.573	21.2786 - 548.274	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2F))$	$^3P - {}^3D^o$	2 - 2	F	03
	150	192.006	17.4755 - 538.290	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2D))$	$^1D - {}^1D^o$	2 - 2		1103
	4	193.421	21.2786 - 538.290	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2D))$	$^3P - {}^1D^o$	2 - 2		1103
	350	195.391	2.3315 - 514.133	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2H))$	$g^3F - {}^3G^o$	4 - 5		1103

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	150	196.046	0.0 - 510.086	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2H))$	$g^3F - {}^3G^o$	2 - 3		1103
	120	196.423	1.0515 - 510.158	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2H))$	$g^3F - {}^3G^o$	3 - 4		1103
	40	196.453	2.3315 - 510.158	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2H))$	$g^3F - {}^3G^o$	4 - 4		1103
	25	196.944	2.3315 - 510.086	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2H))$	$g^3F - {}^3G^o$	4 - 3		1103
	60	201.855	1.0515 - 2.3315	$3p^63d^2 - 3p^63d^2$	$g^3F - g^3F$	3 - 4		1103
	)(3D3	202.378	21.2786 - 510.086	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2H))$	$^3P - {}^3G^o$	2 - 3	F	03
	25	206.096	28.9273 - 514.133	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2H))$	$^1G - {}^3G^o$	4 - 5		1103
	300	207.712	0.0 - 481.435	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2F))$	$g^3F - {}^3G^o$	2 - 3		1103
	1	207.831	28.9273 - 510.086	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2H))$	$^1G - {}^3G^o$	4 - 3		1103
	90	208.167	1.0515 - 481.435	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2F))$	$g^3F - {}^3G^o$	3 - 3		1103
	4	208.724	2.3315 - 481.435	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2F))$	$g^3F - {}^3G^o$	4 - 3		1103
	150	211.930	1.0515 - 2.3315	$3p^63d^2 - 3p^63d^2$	$g^3F - g^3F$	3 - 4		1103
	)(3D3	212.509	2.3315 - 472.559	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2F))$	$g^3F - {}^3G^o$	4 - 5	F	03
	25	213.893	28.9273 - 496.454	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2F))$	$^1G - {}^1G^o$	4 - 4		1103
	150	216.591	2.3315 - 464.034	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2G))$	$g^3F - {}^1H^o$	4 - 5		1103
	150	225.411	28.9273 - 472.559	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2F))$	$^1G - {}^3G^o$	4 - 5		1103
	4	225.505	0.0 - 443.4470	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^1P^o$	2 - 1		1103
	1	227.918	1.0515 - 439.8116	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^1F^o$	3 - 3		1103
	4	228.584	2.3315 - 439.8116	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^1F^o$	4 - 3		1103
	20	228.866	0.0 - 436.9522	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^3P^o$	2 - 1	Q	93
	90	229.828	28.9273 - 464.034	$3p^63d^2 - 3p^5(^2P^o)(3d^3(a^2G))$	$^1G - {}^1H^o$	4 - 5		1103
	120	231.044	1.0515 - 433.8712	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^3F^o$	3 - 4		1103
	4	231.693	0.0 - 431.6095	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^3F^o$	2 - 3		1103
	400	231.728	2.3315 - 433.8712	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^3F^o$	4 - 4		1103
	60	232.047	0.0 - 430.9486	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^3D^o$	2 - 3		1103
	200	232.256	1.0515 - 431.6095	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^3F^o$	3 - 3		1103
	300	232.442	0.0 - 430.2134	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^3F^o$	2 - 2		1103
	10	232.613	1.0515 - 430.9486	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^3D^o$	3 - 3		1103
	60	232.946	2.3315 - 431.6095	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^3F^o$	4 - 3		1103
	400	233.015	1.0515 - 430.2134	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^3F^o$	3 - 2		1103
	250	233.308	2.3315 - 430.9486	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^3D^o$	4 - 3		1103
	90	233.762	0.0 - 427.7847	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^3D^o$	2 - 2		1103
	300	234.337	1.0515 - 427.7847	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^3D^o$	3 - 2		1103
	150	234.757	17.4755 - 443.4470	$3p^63d^2 - 3p^63d4p$	$^1D - {}^1P^o$	2 - 1		1103
	25	235.081	0.0 - 425.3861	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^1D^o$	2 - 2		1103
	90	235.221	0.0 - 425.1286	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^3D^o$	2 - 1		1103
	200	235.662	1.0515 - 425.3861	$3p^63d^2 - 3p^63d4p$	$g^3F - {}^1D^o$	3 - 2		1103
	10	236.180	20.0403 - 443.4470	$3p^63d^2 - 3p^63d4p$	$^3P - {}^1P^o$	0 - 1		1103
	50	236.388	20.4301 - 443.4470	$3p^63d^2 - 3p^63d4p$	$^3P - {}^1P^o$	1 - 1		209
	60	236.778	17.4755 - 439.8116	$3p^63d^2 - 3p^63d4p$	$^1D - {}^1F^o$	2 - 3		1103
	60	236.872	21.2786 - 443.4470	$3p^63d^2 - 3p^63d4p$	$^3P - {}^1P^o$	2 - 1		1103
	25	238.048	17.4755 - 437.5580	$3p^63d^2 - 3p^63d4p$	$^1D - {}^3P^o$	2 - 2		1103
	40	238.393	17.4755 - 436.9522	$3p^63d^2 - 3p^63d4p$	$^1D - {}^3P^o$	2 - 1		1103
	25	238.929	21.2786 - 439.8116	$3p^63d^2 - 3p^63d4p$	$^3P - {}^1F^o$	2 - 3		1103
	120	239.734	20.4301 - 437.5580	$3p^63d^2 - 3p^63d4p$	$^3P - {}^3P^o$	1 - 2		1103
	120	239.860	20.0403 - 436.9522	$3p^63d^2 - 3p^63d4p$	$^3P - {}^3P^o$	0 - 1		1103
	90	240.053	20.4301 - 437.0013	$3p^63d^2 - 3p^63d4p$	$^3P - {}^3P^o$	1 - 0		1103
	90	240.083	20.4301 - 436.9522	$3p^63d^2 - 3p^63d4p$	$^3P - {}^3P^o$	1 - 1		1103
	300	240.223	21.2786 - 437.5580	$3p^63d^2 - 3p^63d4p$	$^3P - {}^3P^o$	2 - 2		1103
	120	240.572	21.2786 - 436.9522	$3p^63d^2 - 3p^63d4p$	$^3P - {}^3P^o$	2 - 1		1103
	120	241.467	17.4755 - 431.6095	$3p^63d^2 - 3p^63d4p$	$^1D - {}^3F^o$	2 - 3		1103
	125	241.853	17.4755 - 430.9486	$3p^63d^2 - 3p^63d4p$	$^1D - {}^3D^o$	2 - 3		1103
	120	242.284	17.4755 - 430.2134	$3p^63d^2 - 3p^63d4p$	$^1D - {}^3F^o$	2 - 2		1103
	400	243.379	28.9273 - 439.8116	$3p^63d^2 - 3p^63d4p$	$^1C - {}^1F^o$	4 - 3		1103
	120	243.705	21.2786 - 431.6095	$3p^63d^2 - 3p^63d4p$	$^3P - {}^3F^o$	2 - 3		1103
	4	244.030	20.4301 - 430.2134	$3p^63d^2 - 3p^63d4p$	$^3P - {}^3F^o$	1 - 2		1103
	90	244.098	21.2786 - 430.9486	$3p^63d^2 - 3p^63d4p$	$^3P - {}^3D^o$	2 - 3		1103
	120	244.541	21.2786 - 430.2134	$3p^63d^2 - 3p^63d4p$	$^3P - {}^3F^o$	2 - 2		1103
	350	245.153	17.4755 - 425.3861	$3p^63d^2 - 3p^63d4p$	$^1D - {}^1D^o$	2 - 2		1103
	120	245.488	20.4301 - 427.7847	$3p^63d^2 - 3p^63d4p$	$^3P - {}^3D^o$	1 - 2		1103
	60	246.000	21.2786 - 427.7847	$3p^63d^2 - 3p^63d4p$	$^3P - {}^3D^o$	2 - 2		1103
	40	246.859	20.0403 - 425.1286	$3p^63d^2 - 3p^63d4p$	$^3P - {}^3D^o$	0 - 1		1103
	25	246.943	20.4301 - 425.3861	$3p^63d^2 - 3p^63d4p$	$^3P - {}^1D^o$	1 - 2		1103
	25	247.098	20.4301 - 425.1286	$3p^63d^2 - 3p^63d4p$	$^3P - {}^3D^o$	1 - 1		1103
	120	247.458	21.2786 - 425.3861	$3p^63d^2 - 3p^63d4p$	$^3P - {}^1D^o$	2 - 2		1103

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	10	248.743	28.9273 - 430.9486	$3p^63d^2$ - $3p^63d4p$	^1G - $^3D^o$	4 - 3		1103
	150	265.697	67.0783 - 443.4470	$3p^63d^2$ - $3p^63d4p$	^1S - $^1P^o$	0 - 1		1103
	1	270.363	67.0783 - 436.9522	$3p^63d^2$ - $3p^63d4p$	^1S - $^3P^o$	0 - 1		1103
		289.68	1.0515 - 346.2622	$3p^63d^2$ - $3p^63d4s$	g^3F - ^3D	3 - 3	F,P	375,1103
		289.83	0.0 - 345.0287	$3p^63d^2$ - $3p^63d4s$	g^3F - ^3D	2 - 2	F,P	375,1103
		290.31	0.0 - 344.4633	$3p^63d^2$ - $3p^63d4s$	g^3F - ^3D	2 - 1	F,P	375,1103
		290.72	1.0515 - 345.0287	$3p^63d^2$ - $3p^63d4s$	g^3F - ^3D	3 - 2	F,P	375,1103
		290.76	2.3315 - 346.2622	$3p^63d^2$ - $3p^63d4s$	g^3F - ^3D	4 - 3	F,P	375,1103
		291.20	1.0515 - 344.4633	$3p^63d^2$ - $3p^63d4s$	g^3F - ^3D	3 - 1	F,P	375,1103
		291.80	2.3315 - 345.0287	$3p^63d^2$ - $3p^63d4s$	g^3F - ^3D	4 - 2	F,P	375,1103
		300.43	17.4755 - 350.3326	$3p^63d^2$ - $3p^63d4s$	^1D - ^1D	2 - 2	F,P	375,1103
		306.91	20.4301 - 346.2622	$3p^63d^2$ - $3p^63d4s$	^3P - ^3D	1 - 3	F,P	375,1103
		307.70	20.0403 - 345.0287	$3p^63d^2$ - $3p^63d4s$	^3P - ^3D	0 - 2	F,P	375,1103
		307.71	21.2786 - 346.2622	$3p^63d^2$ - $3p^63d4s$	^3P - ^3D	2 - 3	F,P	375,1103
		308.07	20.4301 - 345.0287	$3p^63d^2$ - $3p^63d4s$	^3P - ^3D	1 - 2	F,P	375,1103
		308.24	20.0403 - 344.4633	$3p^63d^2$ - $3p^63d4s$	^3P - ^3D	0 - 1	F,P	375,1103
		311.13	28.9273 - 350.3326	$3p^63d^2$ - $3p^63d4s$	^1G - ^1D	4 - 2	F,P	375,1103
		353.04	67.0783 - 350.3326	$3p^63d^2$ - $3p^63d4s$	^1S - ^1D	0 - 2	F,P	375,1103
	4	1010.260	344.4633 - 443.4470	$3p^63d4s$ - $3p^63d4p$	^3D - $^1P^o$	1 - 1		1103
	1	1016.072	345.0287 - 443.4470	$3p^63d4s$ - $3p^63d4p$	^3D - $^1P^o$	2 - 1		1103
	40	1073.953	350.3326 - 443.4470	$3p^63d4s$ - $3p^63d4p$	^1D - $^1P^o$	2 - 1		1103
	10	1080.637	344.4633 - 437.0013	$3p^63d4s$ - $3p^63d4p$	^3D - $^3P^o$	1 - 0		1103
	1	1080.736	345.0287 - 437.5580	$3p^63d4s$ - $3p^63d4p$	^3D - $^3P^o$	2 - 2		1103
	10	1087.861	345.0287 - 436.9522	$3p^63d4s$ - $3p^63d4p$	^3D - $^3P^o$	2 - 1		1103
	90	1095.343	346.2622 - 437.5580	$3p^63d4s$ - $3p^63d4p$	^3D - $^3P^o$	3 - 2		1103
	90	1117.580	350.3326 - 439.8116	$3p^63d4s$ - $3p^63d4p$	^1D - $^1F^o$	2 - 3		1103
	250	1141.435	346.2622 - 433.8712	$3p^63d4s$ - $3p^63d4p$	^3D - $^3F^o$	3 - 4		1103
	40	1154.992	345.0287 - 431.6095	$3p^63d4s$ - $3p^63d4p$	^3D - $^3F^o$	2 - 3		1103
	60	1163.879	345.0287 - 430.9486	$3p^63d4s$ - $3p^63d4p$	^3D - $^3D^o$	2 - 3		1103
	150	1166.183	344.4633 - 430.2134	$3p^63d4s$ - $3p^63d4p$	^3D - $^3F^o$	1 - 2		1103
	4	1173.915	345.0287 - 430.2134	$3p^63d4s$ - $3p^63d4p$	^3D - $^3F^o$	2 - 2		1103
	40	1180.823	346.2622 - 430.9486	$3p^63d4s$ - $3p^63d4p$	^3D - $^3D^o$	3 - 3		1103
	40	1208.375	345.0287 - 427.7847	$3p^63d4s$ - $3p^63d4p$	^3D - $^3D^o$	2 - 2		1103
	60	1226.653	346.2622 - 427.7847	$3p^63d4s$ - $3p^63d4p$	^3D - $^3D^o$	3 - 2		1103
	60	1239.690	344.4633 - 425.1286	$3p^63d4s$ - $3p^63d4p$	^3D - $^3D^o$	1 - 1		1103
	1	1244.442	345.0287 - 425.3861	$3p^63d4s$ - $3p^63d4p$	^3D - $^1D^o$	2 - 2		1103
	10	1263.844	346.2622 - 425.3861	$3p^63d4s$ - $3p^63d4p$	^3D - $^1D^o$	3 - 2		1103
	90	1332.381	350.3326 - 425.3861	$3p^63d4s$ - $3p^63d4p$	^1D - $^1D^o$	2 - 2		1103
	0	1490.80	0.0 - 67.0783	$3p^63d^2$ - $3p^63d^2$	g^3F - ^1S	2 - 0	F,P	1103

IRON VIII (Fe^{+7}), Z = 26

Ground State $1s^22s^22p^63s^23p^63d$ ($^2D_{3/2}$) (19 electrons)

Ionization Potential 1 218 400 cm^{-1}; 151.06 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	4	93.469	0.000 - 1069.87	$3p^63d$ - $3p^67f$	g^2D - $^2F^o$	$\frac{3}{2}$ - $\frac{5}{2}$		1085
	5	93.616	1.836 - 1070.03	$3p^63d$ - $3p^67f$	g^2D - $^2F^o$	$\frac{5}{2}$ - $\frac{7}{2}$		1085
	8	98.371	0.000 - 1016.56	$3p^63d$ - $3p^66f$	g^2D - $^2F^o$	$\frac{3}{2}$ - $\frac{5}{2}$		1085
	10	98.548	1.836 - 1016.57	$3p^63d$ - $3p^66f$	g^2D - $^2F^o$	$\frac{5}{2}$ - $\frac{7}{2}$		1085
	25	107.868	0.000 - 927.059	$3p^63d$ - $3p^65f$	g^2D - $^2F^o$	$\frac{3}{2}$ - $\frac{5}{2}$		1085
	30	108.077	1.836 - 927.102	$3p^63d$ - $3p^65f$	g^2D - $^2F^o$	$\frac{5}{2}$ - $\frac{7}{2}$		1085
	1	112.252	0.000 - 890.845	$3p^63d$ - $3p^53d(^3D^o)4s$	g^2D - $^2D^o$	$\frac{3}{2}$ - $\frac{5}{2}$		1085
	15	112.472	0.0 - 889.113	$3p^63d$ - $3p^53d(^3D^o)4s$	g^2D - $^2D^o$	$\frac{3}{2}$ - $\frac{3}{2}$		1085
	20	112.486	1.836 - 890.845	$3p^63d$ - $3p^53d(^3D^o)4s$	g^2D - $^2D^o$	$\frac{5}{2}$ - $\frac{5}{2}$		1085
	2	112.704	1.836 - 889.113	$3p^63d$ - $3p^53d(^3D^o)4s$	g^2D - $^2D^o$	$\frac{5}{2}$ - $\frac{3}{2}$		1085
	25	112.932	1.836 - 887.325	$3p^63d$ - $3p^53d(^1F^o)4s$	g^2D - $^2F^o$	$\frac{5}{2}$ - $\frac{7}{2}$		1085
	1	113.081	0.000 - 884.331	$3p^63d$ - $3p^53d(^1D^o)4s$	g^2D - $^2D^o$	$\frac{3}{2}$ - $\frac{5}{2}$		1085
	10	113.315	1.836 - 884.331	$3p^63d$ - $3p^53d(^1D^o)4s$	g^2D - $^2D^o$	$\frac{5}{2}$ - $\frac{5}{2}$		1085
	5	113.463	0.000 - 881.345	$3p^63d$ - $3p^53d(^1D^o)4s$	g^2D - $^2D^o$	$\frac{3}{2}$ - $\frac{3}{2}$		1085
	7	113.763	0.000 - 879.021	$3p^63d$ - $3p^53d(^1F^o)4s$	g^2D - $^2F^o$	$\frac{3}{2}$ - $\frac{5}{2}$		1085

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	113.861	0.000 - 878.264	$3p^63d - 3p^53d(^3D^o)4s$	$g^2D - ^4D^o$	3/2 - 1/2		1085
	2	113.963	0.000 - 877.476	$3p^63d - 3p^53d(^3D^o)4s$	$g^2D - ^4D^o$	3/2 - 3/2		1085
	5	114.295	1.836 - 876.765	$3p^63d - 3p^53d(^3D^o)4s$	$g^2D - ^4D^o$	5/2 - 5/2		1085
	4	114.564	1.836 - 874.711	$3p^63d - 3p^53d(^3D^o)4s$	$g^2D - ^4D^o$	5/2 - 3/2		1085
	35	116.196	0.000 - 860.615	$3p^63d - 3p^53d(^3F^o)4s$	$g^2D - ^2F^o$	3/2 - 5/2		1085
	1	116.442	1.836 - 860.615	$3p^63d - 3p^53d(^3F^o)4s$	$g^2D - ^2F^o$	5/2 - 5/2		1085
	60	117.197	1.836 - 855.100	$3p^63d - 3p^53d(^3F^o)4s$	$g^2D - ^2F^o$	5/2 - 7/2		1085
	1	117.254	0.000 - 852.849	$3p^63d - 3p^53d(^3F^o)4s$	$g^2D - ^4F^o$	3/2 - 3/2		1085
	8	117.661	0.000 - 849.899	$3p^63d - 3p^53d(^3F^o)4s$	$g^2D - ^4F^o$	3/2 - 5/2		1085
	8	118.300	1.836 - 847.145	$3p^63d - 3p^53d(^3F^o)4s$	$g^2D - ^4F^o$	5/2 - 7/2		1085
	3	118.648	0.000 - 842.829	$3p^63d - 3p^53d(^3P^o)4s$	$g^2D - ^2P^o$	3/2 - 3/2		1085
	25	118.907	1.836 - 842.829	$3p^63d - 3p^53d(^3P^o)4s$	$g^2D - ^2P^o$	5/2 - 3/2		1085
	15	119.380	0.000 - 837.661	$3p^63d - 3p^53d(^3P^o)4s$	$g^2D - ^2P^o$	3/2 - 1/2		1085
	150	120.31	1.836 - 833.000	$3p^63d - 3p^53d(^3P^o)4s$	$g^2D - ^4P^o$	5/2 - 5/2	Q	261
	150	130.941	0.000 - 763.703	$3p^63d - 3p^64f$	$g^2D - ^2F^o$	3/2 - 5/2		1085
	200	131.240	1.836 - 763.799	$3p^63d - 3p^64f$	$g^2D - ^2F^o$	5/2 - 7/2		1085
	80	131.255	1.836 - 763.703	$3p^63d - 3p^64f$	$g^2D - ^2F^o$	5/2 - 5/2		1085
	400	167.486	0.000 - 597.065	$3p^63d - 3p^5(3d^2(^3F))$	$g^2D - ^2D^o$	3/2 - 5/2		1085
	200	167.656	0.000 - 596.463	$3p^63d - 3p^5(3d^2(^3F))$	$g^2D - ^2D^o$	3/2 - 3/2		1085
	150	168.002	1.836 - 597.065	$3p^63d - 3p^5(3d^2(^3F))$	$g^2D - ^2D^o$	5/2 - 5/2		1085
	100	168.024	0.000 - 595.152	$3p^63d - 3p^5(3d^2(^3P))$	$g^2D - ^2P^o$	3/2 - 3/2		1085
	500	168.172	1.836 - 596.463	$3p^63d - 3p^5(3d^2(^3F))$	$g^2D - ^2D^o$	5/2 - 3/2		1085
	450	168.545	1.836 - 595.152	$3p^63d - 3p^5(3d^2(^3P))$	$g^2D - ^2P^o$	5/2 - 3/2		1085
	250	168.929	0.000 - 591.964	$3p^63d - 3p^5(3d^2(^3P))$	$g^2D - ^2P^o$	3/2 - 1/2		1085
	100	174.02						010
	700	176.94						010
	700	185.213	1.836 - 541.755	$3p^63d - 3p^5(3d^2(^3F))$	$g^2D - ^2F^o$	5/2 - 7/2		1085
	600	186.601	0.000 - 535.909	$3p^63d - 3p^5(3d^2(^3F))$	$g^2D - ^2F^o$	3/2 - 5/2		1085
	300	187.237	1.836 - 535.909	$3p^63d - 3p^5(3d^2(^3F))$	$g^2D - ^2F^o$	5/2 - 5/2		1085
	200	192.004	0.000 - 520.822	$3p^63d - 3p^5(3d^2(^1S))$	$g^2D - ^2P^o$	3/2 - 1/2		1085
	100	193.967	0.000 - 515.550	$3p^63d - 3p^64p$	$g^2D - ^2P^o$	3/2 - 3/2		1085
	500	194.662	1.836 - 515.550	$3p^63d - 3p^64p$	$g^2D - ^2P^o$	5/2 - 3/2		1085
	400	195.972	0.000 - 510.277	$3p^63d - 3p^64p$	$g^2D - ^2P^o$	3/2 - 1/2		1085
	40	196.650	0.000 - 508.518	$3p^63d - 3p^5(3d^2(^1S))$	$g^2D - ^2P^o$	3/2 - 3/2		1085
	230	197.362	1.836 - 508.518	$3p^63d - 3p^5(3d^2(^1S))$	$g^2D - ^2P^o$	5/2 - 3/2		1085
	300	217.691	0.000 - 459.367	$3p^63d - 3p^5(3d^2(^1D))$	$g^2D - ^2F^o$	3/2 - 5/2		1085
	60	218.564	1.836 - 459.367	$3p^63d - 3p^5(3d^2(^1D))$	$g^2D - ^2F^o$	5/2 - 5/2		1085
	500	224.305	1.836 - 447.658	$3p^63d - 3p^5(3d^2(^1D))$	$g^2D - ^2F^o$	5/2 - 7/2		1085
	260	231.097	1.836 - 434.555	$3p^63d - 3p^5(3d^2(^1G))$	$g^2D - ^2F^o$	5/2 - 7/2		1085
	200	231.884	0.000 - 431.250	$3p^63d - 3p^5(3d^2(^1G))$	$g^2D - ^2F^o$	3/2 - 5/2		1085
	20	232.876	1.836 - 431.250	$3p^63d - 3p^5(3d^2(^1G))$	$g^2D - ^2F^o$	5/2 - 5/2		1085
		370.427	515.550 - 785.51	$3p^64p - 3p^65s$	$^2P^o - ^2S$	3/2 - 1/2	Q	009

IRON IX (Fe^{+8}), Z = 26

Ground State $1s^22s^22p^63s^23p^6$ ($^1S_0$) (18 electrons)

Ionization Potential 1 884 000 cm^{-1}; 233.6 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
01	10	72.85	0.000 - 1372.67	$3s^23p^6 - 3s^23p^5(^2P^o_1)5s$	$g^1S - (_{1/2},_{1/2})^o$	0 - 1		009
		72.891	0.000 - 1371.9	$3s^23p^6 - 3s3p^64p$	$g^1S - ^1P^o$	0 - 1	A	440
	20	73.618	0.000 - 1358.36	$3s^23p^6 - 3s^23p^5(^2P^o_2)5s$	$g^1S - (_{3/2},_{1/2})^o$	0 - 1		729,9
	30	82.430	0.000 - 1213.15	$3s^23p^6 - 3s^23p^54d$	$g^1S - ^1P^o$	0 - 1		241,9
	40	83.457	0.000 - 1198.22	$3s^23p^6 - 3s^23p^54d$	$g^1S - ^3P^o$	0 - 1		241,9
	80	103.566	0.000 - 965.57	$3s^23p^6 - 3s^23p^5(^2P^o_1)4s$	$g^1S - (_{1/2},_{1/2})^o$	0 - 1		241,366
	60	105.208	0.000 - 950.500	$3s^23p^6 - 3s^23p^5(^2P^o_2)4s$	$g^1S - (_{3/2},_{1/2})^o$	0 - 1		241,366
	25	111.557	413.662 - 1310.15	$3s^23p^53d - 3s^23p^5(^2P^o_2)4f$	$^3P^o - {}_{3/2}[_{7/2}]^o$	2 - 3	Q	856
	10	111.713	405.765 - 1300.92	$3s^23p^53d - 3s^23p^5(^2P^o_2)4f$	$^3P^o - {}_{3/2}[_{3/2}]^o$	0 - 1		241,806
	20	111.791	408.307 - 1302.83	$3s^23p^53d - 3s^23p^5(^2P^o_2)4f$	$^3P^o - {}_{3/2}[_{3/2}]^o$	1 - 2		241,806

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	40	112.017	408.307 - 1300.92	$3s^23p^53d$ - $3s^23p^5(^2P^o_{3/2})4f$	$^3P^o$ - ${}_{3/2}[3/2]^o$	1 - 1		729
	40	112.096	413.662 - 1305.76	$3s^23p^53d$ - $3s^23p^5(^2P^o_{3/2})4f$	$^3P^o$ - ${}_{3/2}[5/2]^o$	2 - 3	Q	241,806
	50	112.375	433.807 - 1323.65	$3s^23p^53d$ - $3s^23p^5(^2P^o_{1/2})4f$	$^3F^o$ - ${}_{1/2}[5/2]^o$	2 - 3	Q	729
	20	113.793	425.800 - 1304.59	$3s^23p^53d$ - $3s^23p^5(^2P^o_{3/2})4f$	$^3F^o$ - ${}_{3/2}[9/2]^o$	4 - 5		241,856
	40	114.024	429.311 - 1306.32	$3s^23p^53d$ - $3s^23p^5(^2P^o_{3/2})4f$	$^3F^o$ - ${}_{3/2}[9/2]^o$	3 - 4		241,806
	20	114.111	433.807 - 1310.15	$3s^23p^53d$ - $3s^23p^5(^2P^o_{3/2})4f$	$^3F^o$ - ${}_{3/2}[7/2]^o$	2 - 3		241,806
	30	115.353	456.744 - 1323.65	$3s^23p^53d$ - $3s^23p^5(^2P^o_{1/2})4f$	$^1D^o$ - ${}_{1/2}[5/2]^o$	2 - 3		241,806
	30	115.996	462.609 - 1324.71	$3s^23p^53d$ - $3s^23p^5(^2P^o_{1/2})4f$	$^3D^o$ - ${}_{1/2}[7/2]^o$	2 - 3		241,806
	60	116.408	465.8217 - 1324.80	$3s^23p^53d$ - $3s^23p^5(^2P^o_{1/2})4f$	$^1F^o$ - ${}_{1/2}[7/2]^o$	3 - 4		729
	50	116.803	455.612 - 1311.75	$3s^23p^53d$ - $3s^23p^5(^2P^o_{3/2})4f$	$^3D^o$ - ${}_{3/2}[7/2]^o$	3 - 4		241,806
	90	171.075	0.000 - 584.547	$3s^23p^6$ - $3s^23p^53d$	g^1S - $^1P^o$	0 - 1		856
	40	217.108	0.000 - 460.609	$3s^23p^6$ - $3s^23p^53d$	g^1S - $^3D^o$	0 - 1		856
	5	218.935	0.0+G - 456.744	$3s^23p^6$ - $3s^23p^53d$	^1S - $^1D^o$	0 - 2	F	923
	60	241.739	0.0+G - 413.662	$3s^23p^6$ - $3s^23p^53d$	^1S - $^3P^o$	0 - 2	F	856
	40	244.912	0.000 - 408.307	$3s^23p^6$ - $3s^23p^53d$	g^1S - $^3P^o$	0 - 1		856
		585.2	413.662 - 584.547	$3s^23p^53d$ - $3s^23p^53d$	$^3P^o$ - $^1P^o$	2 - 1	F,P	375,616
		663.4	433.807 - 584.547	$3s^23p^53d$ - $3s^23p^53d$	$^3F^o$ - $^1P^o$	2 - 1	F,P	375,616
		775.6	455.612 - 584.547	$3s^23p^53d$ - $3s^23p^53d$	$^3D^o$ - $^1P^o$	3 - 1	F,P	375,616
		782.5	456.744 - 584.547	$3s^23p^53d$ - $3s^23p^53d$	$^1D^o$ - $^1P^o$	2 - 1	F,P	375,616
		806.9	460.609 - 584.547	$3s^23p^53d$ - $3s^23p^53d$	$^3D^o$ - $^1P^o$	1 - 1	F,P	375,616
		820.1	462.609 - 584.547	$3s^23p^53d$ - $3s^23p^53d$	$^3D^o$ - $^1P^o$	2 - 1	F,P	375,616
		842.3	465.8217 - 584.547	$3s^23p^53d$ - $3s^23p^53d$	$^1F^o$ - $^1P^o$	3 - 1	F,P	375,616
		1739.	408.307 - 465.8217	$3s^23p^53d$ - $3s^23p^53d$	$^3P^o$ - $^1F^o$	1 - 3	F,P	375,616
		1759.	405.765 - 462.609	$3s^23p^53d$ - $3s^23p^53d$	$^3P^o$ - $^3D^o$	0 - 2	F,P	375,616
		1823.	405.765 - 460.609	$3s^23p^53d$ - $3s^23p^53d$	$^3P^o$ - $^3D^o$	0 - 1	F,P	375,616
	1	1841.55	408.307 - 462.609	$3s^23p^53d$ - $3s^23p^53d$	$^3P^o$ - $^3D^o$	1 - 2	F	940
		1912.	408.307 - 460.609	$3s^23p^53d$ - $3s^23p^53d$	$^3P^o$ - $^3D^o$	1 - 1	F,P	375,616
	3	1917.21	413.662 - 465.8217	$3s^23p^53d$ - $3s^23p^53d$	$^3P^o$ - $^1F^o$	2 - 3	F	940
		1962.	405.765 - 456.744	$3s^23p^53d$ - $3s^23p^53d$	$^3P^o$ - $^1D^o$	0 - 2	F,P	375,616

IRON X (Fe^{+9}), Z = 26
Ground State $1s^22s^22p^63s^23p^5$ ($^2P^o_{3/2}$) (17 electrons)
Ionization Potential 2 114 000 cm^{-1}; 262.1 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		62.8	0. - 1592.4	$3s^23p^5$ - $3s^23p^4(^1D)5s$	g^2P^o - ^2D	3/2 - 5/2		271
		75.685	0. - 1321.27	$3s^23p^5$ - $3s^23p^4(^1D)4d$	g^2P^o - ^2D	3/2 - 5/2		241
		76.006	0. - 1315.69	$3s^23p^5$ - $3s^23p^4(^1D)4d$	g^2P^o - ^2P	3/2 - 3/2		241
	30	76.495	15.6832 - 1322.96	$3s^23p^5$ - $3s^23p^4(^1D)4d$	g^2P^o - ^2D	1/2 - 3/2		241,93
		76.53	0. - 1306.68	$3s^23p^5$ - $3s^23p^4(^1D)4d$	g^2P^o - ^2S	3/2 - 1/2		271
	10	76.822	15.6832 - 1317.39	$3s^23p^5$ - $3s^23p^4(^1D)4d$	g^2P^o - ^2P	1/2 - 1/2	P	856
	20	76.923	15.6832 - 1315.69	$3s^23p^5$ - $3s^23p^4(^1D)4d$	g^2P^o - ^2P	1/2 - 3/2	P	856
		77.45	15.6832 - 1306.68	$3s^23p^5$ - $3s^23p^4(^1D)4d$	g^2P^o - ^2S	1/2 - 1/2		271
		77.627	0. - 1288.21	$3s^23p^5$ - $3s^23p^4(^3P)4d$	g^2P^o - ^2F	3/2 - 5/2		241
		77.728	0. - 1286.54	$3s^23p^5$ - $3s^23p^4(^3P)4d$	g^2P^o - ^4F	3/2 - 5/2		241
		77.812	0. - 1285.18	$3s^23p^5$ - $3s^23p^4(^3P)4d$	g^2P^o - ^2D	3/2 - 3/2		241
	20	77.865	0. - 1284.27	$3s^23p^5$ - $3s^23p^4(^3P)4d$	g^2P^o - ^2D	3/2 - 5/2		241,93
		78.151	15.6832 - 1295.26	$3s^23p^5$ - $3s^23p^4(^3P)4d$	g^2P^o - ^2P	1/2 - 3/2		241
	20	78.769	15.6832 - 1285.18	$3s^23p^5$ - $3s^23p^4(^3P)4d$	g^2P^o - ^2D	1/2 - 3/2		241,93
03	400	94.012	0. - 1063.69	$3s^23p^5$ - $3s^23p^4(^1D)4s$	g^2P^o - ^2D	3/2 - 5/2		182
02	100	95.338	0. - 1048.90	$3s^23p^5$ - $3s^23p^4(^3P)4s$	g^2P^o - ^2P	3/2 - 1/2		182
03	300	95.374	15.6832 - 1064.19	$3s^23p^5$ - $3s^23p^4(^1D)4s$	g^2P^o - ^2D	1/2 - 3/2		182
02	400	96.122	0. - 1040.35	$3s^23p^5$ - $3s^23p^4(^3P)4s$	g^2P^o - ^2P	3/2 - 3/2		182
02	200	96.788	15.6832 - 1048.90	$3s^23p^5$ - $3s^23p^4(^3P)4s$	g^2P^o - ^2P	1/2 - 1/2		182
01	300	97.122	0. - 1029.63	$3s^23p^5$ - $3s^23p^4(^3P)4s$	g^2P^o - ^4P	3/2 - 3/2		182
02	10	97.591	15.6832 - 1040.35	$3s^23p^5$ - $3s^23p^4(^3P)4s$	g^2P^o - ^2P	1/2 - 3/2		182
01	10	97.838	0. - 1022.10	$3s^23p^5$ - $3s^23p^4(^3P)4s$	g^2P^o - ^4P	3/2 - 5/2		182
	15	100.026	388.7080+B - 1388.44+B	$3s^23p^4(^3P)3d$ - $3s^23p^4(^3P)4f$	^4D - $^4F^o$	7/2 - 9/2		241,93
		101.733	426.765+B - 1409.73+B	$3s^23p^4(^3P)3d$ - $3s^23p^4(^3P)4f$	^4F - $^4G^o$	5/2 - 7/2		241
		101.846	428.297+B - 1410.17+B	$3s^23p^4(^3P)3d$ - $3s^23p^4(^3P)4f$	^4F - $^4G^o$	3/2 - 5/2		241

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		102.095	417.6500+B - 1397.13+B	$3s^23p^4(^3P)3d - 3s^23p^4(^3P)4f$	$^4F - ^4G^o$	$\frac{9}{2} - \frac{11}{2}$		241
		102.192	450.7527+B - 1429.30+B	$3s^23p^4(^1D)3d - 3s^23p^4(^1D)4f$	$^2G - ^2H^o$	$\frac{9}{2} - \frac{11}{2}$		241
		102.348	422.7931+B - 1399.85+B	$3s^23p^4(^3P)3d - 3s^23p^4(^3P)4f$	$^4F - ^4G^o$	$\frac{7}{2} - \frac{9}{2}$		241
		102.829	511.77 - 1484.26	$3s^23p^4(^1S)3d - 3s^23p^4(^1S)4f$	$^2D - ^2F^o$	$\frac{3}{2} - \frac{5}{2}$		241
		103.164	440.8393+B - 1410.17+B	$3s^23p^4(^3P)3d - 3s^23p^4(^3P)4f$	$^2F - ^2G^o$	$\frac{7}{2} - \frac{9}{2}$		241
		103.319	521.30 - 1489.18	$3s^23p^4(^1S)3d - 3s^23p^4(^1S)4f$	$^2D - ^2F^o$	$\frac{5}{2} - \frac{7}{2}$	Q	241
		103.724	452.73 - 1416.83	$3s^23p^4(^3P)3d - 3s^23p^4(^3P)4f$	$^2F - ^2G^o$	$\frac{5}{2} - \frac{7}{2}$		241
		104.221	450.7527+B - 1410.17+B	$3s^23p^4(^1D)3d - 3s^23p^4(^3P)4f$	$^2G - ^2G^o$	$\frac{9}{2} - \frac{9}{2}$	Q	900
		104.248	476.70 - 1435.95	$3s^23p^4(^1D)3d - 3s^23p^4(^1D)4f$	$^2F - ^2G^o$	$\frac{5}{2} - \frac{7}{2}$		241
		104.638	485.9800+B - 1441.65+B	$3s^23p^4(^1D)3d - 3s^23p^4(^1D)4f$	$^2F - ^2G^o$	$\frac{7}{2} - \frac{9}{2}$		241
		108.697	564.208 - 1484.26	$3s^23p^4(^3P)3d - 3s^23p^4(^1S)4f$	$^2P - ^2F^o$	$\frac{3}{2} - \frac{5}{2}$	Q	900
		109.160	572.964 - 1489.18	$3s^23p^4(^3P)3d - 3s^23p^4(^1S)4f$	$^2D - ^2F^o$	$\frac{5}{2} - \frac{7}{2}$	Q	900
		137.027	388.7080+B - 1118.49+B	$3s^23p^4(^3P)3d - 3s^23p^4(^3P)4p$	$^4D - ^4P^o$	$\frac{7}{2} - \frac{5}{2}$		241
		139.868	450.7527+B - 1165.71+B	$3s^23p^4(^1D)3d - 3s^23p^4(^1D)4p$	$^2G - ^2F^o$	$\frac{9}{2} - \frac{7}{2}$		241
		140.296	443.90 - 1156.68	$3s^23p^4(^3P)3d - 3s^23p^4(^3P)4p$	$^4P - ^4D^o$	$\frac{5}{2} - \frac{7}{2}$		241
		140.678	451.0827+B - 1161.92+B	$3s^23p^4(^1D)3d - 3s^23p^4(^1D)4p$	$^2G - ^2F^o$	$\frac{7}{2} - \frac{5}{2}$		241
		144.328	485.9800+B - 1178.84+B	$3s^23p^4(^1D)3d - 3s^23p^4(^1D)4p$	$^2F - ^2D^o$	$\frac{7}{2} - \frac{5}{2}$		241
		170.58	0. - 586.254	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^o - ^2D$	$\frac{3}{2} - \frac{3}{2}$		944
	90	174.534	0. - 572.964	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^o - ^2D$	$\frac{3}{2} - \frac{5}{2}$		944,856
	50	175.266	15.6832 - 586.254	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^o - ^2D$	$\frac{1}{2} - \frac{3}{2}$		944,856
	30	175.474	0. - 569.882	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^o - ^2P$	$\frac{3}{2} - \frac{1}{2}$		944,856
	80	177.243	0. - 564.208	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^o - ^2P$	$\frac{3}{2} - \frac{3}{2}$		944,856
		180.45	15.6832 - 569.882	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^o - ^2P$	$\frac{1}{2} - \frac{1}{2}$		260
	30	182.310	15.6832 - 564.208	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^o - ^2P$	$\frac{1}{2} - \frac{3}{2}$		944,856
	60	184.542	0. - 541.880	$3s^23p^5 - 3s^23p^4(^1D)3d$	$g^2P^o - ^2S$	$\frac{3}{2} - \frac{1}{2}$		944,856
	50	190.044	15.6832 - 541.880	$3s^23p^5 - 3s^23p^4(^1D)3d$	$g^2P^o - ^2S$	$\frac{1}{2} - \frac{1}{2}$		944,856
		195.399	0. - 511.77	$3s^23p^5 - 3s^23p^4(^1S)3d$	$g^2P^o - ^2D$	$\frac{3}{2} - \frac{3}{2}$		944
	30	201.556	15.6832 - 511.77	$3s^23p^5 - 3s^23p^4(^1S)3d$	$g^2P^o - ^2D$	$\frac{1}{2} - \frac{3}{2}$		944,856
	30	209.776	0. - 476.70	$3s^23p^5 - 3s^23p^4(^1D)3d$	$g^2P^o - ^2F$	$\frac{3}{2} - \frac{5}{2}$	Q	944,856
	7	220.882	0. - 452.73	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^o - ^2F$	$\frac{3}{2} - \frac{5}{2}$	Q	944,923
	10	226.320	0. - 441.87	$3s^23p^5 - 3s^23p^4(^1D)3d$	$g^2P^o - ^2D$	$\frac{3}{2} - \frac{5}{2}$	Q	923
		229.99	0. - 434.80	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^o - ^4P$	$\frac{3}{2} - \frac{1}{2}$		944
		230.089	0. - 434.61	$3s^23p^5 - 3s^23p^4(^1D)3d$	$g^2P^o - ^2D$	$\frac{3}{2} - \frac{3}{2}$		944
		234.356	1165.71+B - 1592.4	$3s^23p^4(^1D)4p - 3s^23p^4(^1D)5s$	$^2F^o - ^2D$	$\frac{7}{2} - \frac{5}{2}$	Q	944
		238.72	15.6832 - 434.61	$3s^23p^5 - 3s^23p^4(^1D)3d$	$g^2P^o - ^2D$	$\frac{1}{2} - \frac{3}{2}$		944
		240.243	15.6832 - 431.93	$3s^23p^5 - 3s^23p^4(^1D)3d$	$g^2P^o - ^2P$	$\frac{1}{2} - \frac{3}{2}$		944
		256.38	0. - 390.019+B	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^o - ^4D$	$\frac{3}{2} - \frac{3}{2}$	Q	944
	45	257.262	0. - 388.7080+B	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^o - ^4D$	$\frac{3}{2} - \frac{5}{2}$	Q	923
	1	317.043	390.019+B - 705.429+B	$3s^23p^4(^3P)3d - 3s3p^5(^3P^o)3d$	$^4D - ^4F^o$	$\frac{3}{2} - \frac{3}{2}$		746
	25	318.599	391.554+B - 705.429+B	$3s^23p^4(^3P)3d - 3s3p^5(^3P^o)3d$	$^4D - ^4F^o$	$\frac{1}{2} - \frac{3}{2}$		746
	10	319.936	390.019+B - 702.584+B	$3s^23p^4(^3P)3d - 3s3p^5(^3P^o)3d$	$^4D - ^4F^o$	$\frac{3}{2} - \frac{5}{2}$		746
	60	321.766	388.7080+B - 699.491+B	$3s^23p^4(^3P)3d - 3s3p^5(^3P^o)3d$	$^4D - ^4F^o$	$\frac{5}{2} - \frac{7}{2}$		746
		324.71	388.7080+B - 696.660+B	$3s^23p^4(^3P)3d - 3s3p^5(^3P^o)3d$	$^4D - ^4F^o$	$\frac{7}{2} - \frac{9}{2}$	Q	437
	220	345.723	0. - 289.2488	$3s^23p^5 - 3s3p^6$	$g^2P^o - ^2S$	$\frac{3}{2} - \frac{1}{2}$		726
	1	354.824	417.6500+B - 699.491+B	$3s^23p^4(^3P)3d - 3s3p^5(^3P^o)3d$	$^4F - ^4F^o$	$\frac{9}{2} - \frac{7}{2}$		746
	40	358.414	417.6500+B - 696.660+B	$3s^23p^4(^3P)3d - 3s3p^5(^3P^o)3d$	$^4F - ^4F^o$	$\frac{9}{2} - \frac{9}{2}$		746
	1	358.867	426.765+B - 705.429+B	$3s^23p^4(^3P)3d - 3s3p^5(^3P^o)3d$	$^4F - ^4F^o$	$\frac{5}{2} - \frac{3}{2}$		746
	4	360.833	428.297+B - 705.429+B	$3s^23p^4(^3P)3d - 3s3p^5(^3P^o)3d$	$^4F - ^4F^o$	$\frac{3}{2} - \frac{3}{2}$		746
	10	361.409	422.7931+B - 699.491+B	$3s^23p^4(^3P)3d - 3s3p^5(^3P^o)3d$	$^4F - ^4F^o$	$\frac{7}{2} - \frac{7}{2}$		746
	10	362.547	426.765+B - 702.584+B	$3s^23p^4(^3P)3d - 3s3p^5(^3P^o)3d$	$^4F - ^4F^o$	$\frac{5}{2} - \frac{5}{2}$		746
	1	364.589	428.297+B - 702.584+B	$3s^23p^4(^3P)3d - 3s3p^5(^3P^o)3d$	$^4F - ^4F^o$	$\frac{3}{2} - \frac{5}{2}$		746
	1	365.144	422.7931+B - 696.660+B	$3s^23p^4(^3P)3d - 3s3p^5(^3P^o)3d$	$^4F - ^4F^o$	$\frac{7}{2} - \frac{9}{2}$		746
	5	365.543	15.6832 - 289.2488	$3s^23p^5 - 3s3p^6$	$g^2P^o - ^2S$	$\frac{1}{2} - \frac{1}{2}$		726
	4	366.667	426.765+B - 699.491+B	$3s^23p^4(^3P)3d - 3s3p^5(^3P^o)3d$	$^4F - ^4F^o$	$\frac{5}{2} - \frac{7}{2}$		746
		1028.04	388.7080+B - 485.9800+B	$3s^23p^4(^3P)3d - 3s^23p^4(^1D)3d$	$^4D - ^2F$	$\frac{7}{2} - \frac{7}{2}$	F,P	746
	2	1463.50	417.6500+B - 485.9800+B	$3s^23p^4(^3P)3d - 3s^23p^4(^1D)3d$	$^4F - ^2F$	$\frac{9}{2} - \frac{7}{2}$	F	940
	1	1582.60	422.7931+B - 485.9800+B	$3s^23p^4(^3P)3d - 3s^23p^4(^1D)3d$	$^4F - ^2F$	$\frac{7}{2} - \frac{7}{2}$	F	940
	2	1603.21	388.7080+B - 451.0827+B	$3s^23p^4(^3P)3d - 3s^23p^4(^1D)3d$	$^4D - ^2G$	$\frac{5}{2} - \frac{7}{2}$	F	442,940
	0	1611.70	388.7080+B - 450.7527+B	$3s^23p^4(^3P)3d - 3s^23p^4(^1D)3d$	$^4D - ^2G$	$\frac{7}{2} - \frac{9}{2}$	F	442,940
	5	1918.25	388.7080+B - 440.8393+B	$3s^23p^4(^3P)3d - 3s^23p^4(^3P)3d$	$^4D - ^2F$	$\frac{7}{2} - \frac{7}{2}$	F	442,940

IRON XI (Fe^{+10}), Z = 26

Ground State $1s^22s^22p^63s^23p^4$ ($^3P_2$) (16 electrons)

Ionization Potential 2 341 000 cm^{-1}; 290.3 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		71.029	12.6678 - 1420.68	$3s^23p^4 - 3s^23p^3(^2D^o)4d$	$g\,^3P - {}^1D^o$	1 - 2	Q	241
		72.166	37.7427 - 1423.44	$3s^23p^4 - 3s^23p^3(^2D^o)4d$	$^1D - {}^1F^o$	2 - 3		241
		72.310	37.7427 - 1420.68	$3s^23p^4 - 3s^23p^3(^2D^o)4d$	$^1D - {}^1D^o$	2 - 2		241
	10	72.635	0. - 1376.75	$3s^23p^4 - 3s^23p^3(^4S^o)4d$	$g\,^3P - {}^3D^o$	2 - 3		241,856
	80	77.00	80.8305 - 1379.5	$3s^23p^4 - 3s^23p^3(^4S^o)4d$	$^1S - {}^3D^o$	0 - 1	Q	271
	10	86.149						181
	100	86.513	37.7427 - 1193.64	$3s^23p^4 - 3s^23p^3(^2P^o)4s$	$^1D - {}^1P^o$	2 - 1		181
02	200	86.772	0. - 1152.45	$3s^23p^4 - 3s^23p^3(^2D^o)4s$	$g\,^3P - {}^3D^o$	2 - 3		181
02	120	87.025	0. - 1149.10	$3s^23p^4 - 3s^23p^3(^2D^o)4s$	$g\,^3P - {}^3D^o$	2 - 2		181
02	10	87.995	12.6678 - 1149.10	$3s^23p^4 - 3s^23p^3(^2D^o)4s$	$g\,^3P - {}^3D^o$	1 - 2		181
02	10	88.029	12.6678 - 1148.58	$3s^23p^4 - 3s^23p^3(^2D^o)4s$	$g\,^3P - {}^3D^o$	1 - 1		181
02	10	88.167	14.3073 - 1148.58	$3s^23p^4 - 3s^23p^3(^2D^o)4s$	$g\,^3P - {}^3D^o$	0 - 1		181
	200	89.104	37.7427 - 1160.03	$3s^23p^4 - 3s^23p^3(^2D^o)4s$	$^1D - {}^1D^o$	2 - 2		181
	100	89.185	0. - 1121.260	$3s^23p^4 - 3s^23p^3(^4S^o)4s$	$g\,^3P - {}^3S^o$	2 - 1		181
	10	89.703	37.7427 - 1152.45	$3s^23p^4 - 3s^23p^3(^2D^o)4s$	$^1D - {}^3D^o$	2 - 3	Q	93
	10	89.771						181
01	100	90.205	12.6678 - 1121.260	$3s^23p^4 - 3s^23p^3(^4S^o)4s$	$g\,^3P - {}^3S^o$	1 - 1		181
01	10	90.345	14.3073 - 1121.260	$3s^23p^4 - 3s^23p^3(^4S^o)4s$	$g\,^3P - {}^3S^o$	0 - 1		181
		91.394	428.6+Y - 1522.76+Y	$3s^23p^3(^2D^o)3d - 3s^23p^3(^2D^o)4f$	$^3F^o - {}^3G$	2 - 3		241
		91.472	431.9+Y - 1525.13+Y	$3s^23p^3(^2D^o)3d - 3s^23p^3(^2D^o)4f$	$^3F^o - {}^3G$	3 - 4		241
		91.63	394.8+Z - 1486.10+Z	$3s^23p^3(^4S^o)3d - 3s^23p^3(^4S^o)4f$	$^5D^o - {}^5F$	3 - 4		241
		91.733	396.0+Z - 1486.12+Z	$3s^23p^3(^4S^o)3d - 3s^23p^3(^4S^o)4f$	$^5D^o - {}^5F$	4 - 5		241
		92.81	453.8+W - 1531.30+W	$3s^23p^3(^2D^o)3d - 3s^23p^3(^2D^o)4f$	$^3G^o - {}^3H$	4 - 5		241
		92.87	456.2+W - 1533.00+W	$3s^23p^3(^2D^o)3d - 3s^23p^3(^2D^o)4f$	$^3G^o - {}^3H$	5 - 6		241
		93.018	490.3+S - 1565.36+S	$3s^23p^3(^2P^o)3d - 3s^23p^3(^2P^o)4f$	$^3F^o - {}^3G$	2 - 3		241
		93.433	462.2+U - 1532.49+U	$3s^23p^3(^2D^o)3d - 3s^23p^3(^2D^o)4f$	$^1G^o - {}^3F$	4 - 4		241
		121.419	396.0+Z - 1219.59+Z	$3s^23p^3(^4S^o)3d - 3s^23p^3(^4S^o)4p$	$^5D^o - {}^5P$	4 - 3		241
		121.747	394.8+Z - 1216.18+Z	$3s^23p^3(^4S^o)3d - 3s^23p^3(^4S^o)4p$	$^5D^o - {}^5P$	3 - 2		241
		123.470	453.8+W - 1263.71+W	$3s^23p^3(^2D^o)3d - 3s^23p^3(^2D^o)4p$	$^3G^o - {}^3F$	4 - 3	P	241
		123.504	456.2+W - 1265.89+W	$3s^23p^3(^2D^o)3d - 3s^23p^3(^2D^o)4p$	$^3G^o - {}^3F$	5 - 4	P	241
		123.572	488.1+S - 1297.34+S	$3s^23p^3(^2P^o)3d - 3s^23p^3(^2P^o)4p$	$^3F^o - {}^3D$	3 - 2		241
		123.822	451.9+W - 1259.51+W	$3s^23p^3(^2D^o)3d - 3s^23p^3(^2D^o)4p$	$^3G^o - {}^3F$	3 - 2		241
		124.725	462.2+U - 1263.96+U	$3s^23p^3(^2D^o)3d - 3s^23p^3(^2D^o)4p$	$^1G^o - {}^1F$	4 - 3		241
		176.620	12.6678 - 578.87	$3s^23p^4 - 3s^23p^3(^2D^o)3d$	$g\,^3P - {}^1D^o$	1 - 2		944
	40	178.060	0. - 561.601	$3s^23p^4 - 3s^23p^3(^4S^o)3d$	$g\,^3P - {}^3D^o$	2 - 2		944,856
	40	179.762	37.7427 - 594.04	$3s^23p^4 - 3s^23p^3(^2D^o)3d$	$^1D - {}^1F^o$	2 - 3		944,856
	90	180.407	0. - 554.302	$3s^23p^4 - 3s^23p^3(^4S^o)3d$	$g\,^3P - {}^3D^o$	2 - 3		944,856
	30	180.600	12.6678 - 566.370	$3s^23p^4 - 3s^23p^3(^4S^o)3d$	$g\,^3P - {}^3D^o$	1 - 1		944,856
	40	181.140	14.3073 - 566.370	$3s^23p^4 - 3s^23p^3(^4S^o)3d$	$g\,^3P - {}^3D^o$	0 - 1		944,856
	60	182.173	12.6678 - 561.601	$3s^23p^4 - 3s^23p^3(^4S^o)3d$	$g\,^3P - {}^3D^o$	1 - 2		944,856
		184.41	80.8305 - 623.08	$3s^23p^4 - 3s^23p^3(^2P^o)3d$	$^1S - {}^1P^o$	0 - 1		944
		184.70	0. - 541.41	$3s^23p^4 - 3s^23p^3(^2D^o)3d$	$g\,^3P - {}^3P^o$	2 - 1	P	375
	30	184.800	37.7427 - 578.87	$3s^23p^4 - 3s^23p^3(^2D^o)3d$	$^1D - {}^1D^o$	2 - 2		944,856
		187.446	0. - 533.46	$3s^23p^4 - 3s^23p^3(^2D^o)3d$	$g\,^3P - {}^3S^o$	2 - 1		944
	70	188.219	0. - 531.294	$3s^23p^4 - 3s^23p^3(^2D^o)3d$	$g\,^3P - {}^3P^o$	2 - 2		944,856
	30	189.017	12.6678 - 541.72	$3s^23p^4 - 3s^23p^3(^2D^o)3d$	$g\,^3P - {}^3P^o$	1 - 0		944,856
	30	189.129	12.6678 - 541.41	$3s^23p^4 - 3s^23p^3(^2D^o)3d$	$g\,^3P - {}^3P^o$	1 - 1		944,856
	30	189.735	14.3073 - 541.41	$3s^23p^4 - 3s^23p^3(^2D^o)3d$	$g\,^3P - {}^3P^o$	0 - 1		944,856
	30	189.940	0. - 526.48	$3s^23p^4 - 3s^23p^3(^2D^o)3d$	$g\,^3P - {}^1P^o$	2 - 1		944,856
		192.020	12.6678 - 533.46	$3s^23p^4 - 3s^23p^3(^2D^o)3d$	$g\,^3P - {}^3S^o$	1 - 1		944
	20	192.641	14.3073 - 533.46	$3s^23p^4 - 3s^23p^3(^2D^o)3d$	$g\,^3P - {}^3S^o$	0 - 1		944,856
	50	192.819	12.6678 - 531.294	$3s^23p^4 - 3s^23p^3(^2D^o)3d$	$g\,^3P - {}^3P^o$	1 - 2		944,856
		198.549	37.7427 - 541.41	$3s^23p^4 - 3s^23p^3(^2D^o)3d$	$^1D - {}^3P^o$	2 - 1		944
		201.575	0. - 496.09	$3s^23p^4 - 3s^23p^3(^2P^o)3d$	$g\,^3P - {}^3P^o$	2 - 2		944
		201.737	37.7427 - 533.46	$3s^23p^4 - 3s^23p^3(^2D^o)3d$	$^1D - {}^3S^o$	2 - 1		944
		224.39	80.8305 - 526.48	$3s^23p^4 - 3s^23p^3(^2D^o)3d$	$^1S - {}^1P^o$	0 - 1	P	375
		308.534	37.7427 - 361.857	$3s^23p^4 - 3s3p^5$	$^1D - {}^1P^o$	2 - 1	P	726
	40	341.113	0. - 293.158	$3s^23p^4 - 3s3p^5$	$g\,^3P - {}^3P^o$	2 - 1		726
	20	349.046	12.6678 - 299.163	$3s^23p^4 - 3s3p^5$	$g\,^3P - {}^3P^o$	1 - 0		726
	160	352.661	0. - 283.558	$3s^23p^4 - 3s3p^5$	$g\,^3P - {}^3P^o$	2 - 2		726

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	355.837	80.8305 - 361.857	$3s^23p^4 - 3s3p^5$	$^1S - ^1P^o$	0 - 1		726
	5	356.519	12.6678 - 293.158	$3s^23p^4 - 3s3p^5$	$g^3P - ^3P^o$	1 - 1		726
	20	358.621	14.3073 - 293.158	$3s^23p^4 - 3s3p^5$	$g^3P - ^3P^o$	0 - 1		726
	20	369.154	12.6678 - 283.558	$3s^23p^4 - 3s3p^5$	$g^3P - ^3P^o$	1 - 2		726
		1237.2	0. - 80.8305	$3s^23p^4 - 3s^23p^4$	$g^3P - ^1S$	2 - 0	F,P	375,940
	6	1467.08	12.6678 - 80.8305	$3s^23p^4 - 3s^23p^4$	$g^3P - ^1S$	1 - 0	F	940

IRON XII (Fe^{+11}), Z = 26
Ground State $1s^22s^22p^63s^23p^3$ ($^4S^o_{3/2}$) (15 electrons)
Ionization Potential [2 668 000] cm^{-1}; [330.8] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	60	63.56	46.0891 - 1619.3	$3s^23p^3 - 3s^23p^2(^1S)4d$	$^2D^o - ^2D$	5/2 - 5/2		271
	40	65.608	41.5551 - 1565.75	$3s^23p^3 - 3s^23p^2(^1D)4d$	$^2D^o - ^2P$	3/2 - 3/2	P	271
		65.805	46.0891 - 1565.75	$3s^23p^3 - 3s^23p^2(^1D)4d$	$^2D^o - ^2P$	5/2 - 3/2		241
		65.905	0. - 1517.34	$3s^23p^3 - 3s^23p^2(^3P)4d$	$g^4S^o - ^4P$	3/2 - 3/2		241
	10	66.047	0. - 1514.07	$3s^23p^3 - 3s^23p^2(^3P)4d$	$g^4S^o - ^4F$	3/2 - 5/2		241,93
		66.225	41.5551 - 1551.45	$3s^23p^3 - 3s^23p^2(^1D)4d$	$^2D^o - ^2F$	3/2 - 5/2		241
	40	66.297	0. - 1508.36	$3s^23p^3 - 3s^23p^2(^3P)4d$	$g^4S^o - ^4P$	3/2 - 5/2		241,271
		66.43	46.0891 - 1551.45	$3s^23p^3 - 3s^23p^2(^1D)4d$	$^2D^o - ^2F$	5/2 - 5/2	Q	241
		66.526	46.0891 - 1549.28	$3s^23p^3 - 3s^23p^2(^1D)4d$	$^2D^o - ^2F$	5/2 - 7/2		241
		66.960	41.5551 - 1534.99	$3s^23p^3 - 3s^23p^2(^3P)4d$	$^2D^o - ^2D$	3/2 - 3/2		241
		67.164	80.5147 - 1569.41	$3s^23p^3 - 3s^23p^2(^1D)4d$	$^2P^o - ^2S$	3/2 - 1/2		241
		67.291	46.0891 - 1532.19	$3s^23p^3 - 3s^23p^2(^3P)4d$	$^2D^o - ^4D$	5/2 - 7/2		241
		67.702	46.0891 - 1523.17	$3s^23p^3 - 3s^23p^2(^3P)4d$	$^2D^o - ^2F$	5/2 - 7/2		241
	20	67.78	41.5551 - 1517.34	$3s^23p^3 - 3s^23p^2(^3P)4d$	$^2D^o - ^4P$	3/2 - 3/2	Q	271
		67.821	41.5551 - 1516.03	$3s^23p^3 - 3s^23p^2(^3P)4d$	$^2D^o - ^2F$	3/2 - 5/2		241
		67.972	80.5147 - 1551.64	$3s^23p^3 - 3s^23p^2(^1D)4d$	$^2P^o - ^2D$	3/2 - 5/2		241
		68.382	74.1081 - 1536.48	$3s^23p^3 - 3s^23p^2(^3P)4d$	$^2P^o - ^2D$	1/2 - 3/2		241
	100	69.60	80.5147 - 1517.34	$3s^23p^3 - 3s^23p^2(^3P)4d$	$^2P^o - ^4P$	3/2 - 3/2	Q	271
	60	70.01	80.5147 - 1508.36	$3s^23p^3 - 3s^23p^2(^3P)4d$	$^2P^o - ^4P$	3/2 - 5/2	Q	271
	60	77.58	0. - 1289.06	$3s^23p^3 - 3s^23p^2(^1D)4s$	$g^4S^o - ^2D$	3/2 - 3/2	Q	271
	30	79.488	0. - 1258.05	$3s^23p^3 - 3s^23p^2(^3P)4s$	$g^4S^o - ^4P$	3/2 - 5/2		241,93
	15	80.022	0. - 1249.66	$3s^23p^3 - 3s^23p^2(^3P)4s$	$g^4S^o - ^4P$	3/2 - 3/2		241,93
		80.160	41.5551 - 1289.06	$3s^23p^3 - 3s^23p^2(^1D)4s$	$^2D^o - ^2D$	3/2 - 3/2		241
	120	80.23	41.5551 - 1287.70	$3s^23p^3 - 3s^23p^2(^1D)4s$	$^2D^o - ^2D$	3/2 - 5/2	Q	271
	35	80.510	0. - 1242.20	$3s^23p^3 - 3s^23p^2(^3P)4s$	$g^4S^o - ^4P$	3/2 - 1/2		241,93
	80	81.651	41.5551 - 1266.38	$3s^23p^3 - 3s^23p^2(^3P)4s$	$^2D^o - ^2P$	3/2 - 3/2		241,812
	93	81.943	46.0891 - 1266.38	$3s^23p^3 - 3s^23p^2(^3P)4s$	$^2D^o - ^2P$	5/2 - 3/2		241,812
		82.226	41.5551 - 1257.72	$3s^23p^3 - 3s^23p^2(^3P)4s$	$^2D^o - ^2P$	3/2 - 1/2		241
		82.744	80.5147 - 1289.06	$3s^23p^3 - 3s^23p^2(^1D)4s$	$^2P^o - ^2D$	3/2 - 3/2		241
	160	82.837	80.5147 - 1287.70	$3s^23p^3 - 3s^23p^2(^1D)4s$	$^2P^o - ^2D$	3/2 - 5/2		241,271
	4	84.456	427.4+B - 1611.45+B	$3s^23p^2(^3P)3d - 3s^23p^2(^3P)4f$	$^4F - ^4G^o$	3/2 - 5/2	P	241,93
	7	84.490	437.2+B - 1620.77+B	$3s^23p^2(^3P)3d - 3s^23p^2(^3P)4f$	$^4F - ^4G^o$	7/2 - 9/2	P	241,93
	10	84.517	444.3+B - 1627.49+B	$3s^23p^2(^3P)3d - 3s^23p^2(^3P)4f$	$^4F - ^4G^o$	9/2 - 11/2	P	241,93
	5	84.533	431.4+B - 1614.37+B	$3s^23p^2(^3P)3d - 3s^23p^2(^3P)4f$	$^4F - ^4G^o$	5/2 - 7/2	P	241,93
		84.768	448.0+B - 1627.69+B	$3s^23p^2(^3P)3d - 3s^23p^2(^3P)4f$	$^4D - ^4F^o$	7/2 - 9/2		241
		84.85	453.4+B - 1632.00+B	$3s^23p^2(^3P)3d - 3s^23p^2(^3P)4f$	$^4D - ^4F^o$	5/2 - 7/2		241
		84.86	443.8+B - 1622.2+B	$3s^23p^2(^1D)3d - 3s^23p^2(^3P)4f$	$^2F - ^2G^o$	5/2 - 7/2		241
		85.14	494.9+B - 1669.40+B	$3s^23p^2(^1D)3d - 3s^23p^2(^1D)4f$	$^2G - ^2H^o$	7/2 - 9/2		241
	50	85.477	498.2+B - 1668.11+B	$3s^23p^2(^1D)3d - 3s^23p^2(^1D)4f$	$^2G - ^2H^o$	9/2 - 11/2		241,93
		85.669	603.95 - 1771.21	$3s^23p^2(^3P)3d - 3s^23p^2(^1S)4f$	$^2D - ^2F^o$	5/2 - 7/2		241
		108.440	444.3+B - 1366.47+B	$3s^23p^2(^3P)3d - 3s^23p^2(^3P)4p$	$^4F - ^4D^o$	9/2 - 7/2		241
		108.605	437.2+B - 1357.97+B	$3s^23p^2(^3P)3d - 3s^23p^2(^3P)4p$	$^4F - ^4D^o$	7/2 - 5/2		241
		108.862	431.4+B - 1349.99+B	$3s^23p^2(^3P)3d - 3s^23p^2(^3P)4p$	$^4F - ^4D^o$	5/2 - 3/2		241
		109.015	448.0+B - 1365.30+B	$3s^23p^2(^3P)3d - 3s^23p^2(^3P)4p$	$^4D - ^4P^o$	7/2 - 5/2		241
		109.509	463.3+B - 1376.47+B	$3s^23p^2(^1D)3d - 3s^23p^2(^1D)4p$	$^2F - ^2D^o$	7/2 - 5/2		241

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		109.712	453.4+B - 1364.88+B	$3s^23p^2(^3P)3d$ - $3s^23p^2(^3P)4p$	^4D - $^2D^o$	5/2 - 3/2		241
		110.591	498.2+B - 1402.43+B	$3s^23p^2(^1D)3d$ - $3s^23p^2(^1D)4p$	^2G - $^2F^o$	9/2 - 7/2		241
		110.732	494.9+B - 1397.98+B	$3s^23p^2(^1D)3d$ - $3s^23p^2(^1D)4p$	^2G - $^2F^o$	7/2 - 5/2		241
	20	178.725	46.0891 - 605.54	$3s^23p^3$ - $3s^23p^2(^3P)3d$	$^2D^o$ - ^2D	5/2 - 3/2	Q	856
		179.265	46.0891 - 603.95	$3s^23p^3$ - $3s^23p^2(^3P)3d$	$^2D^o$ - ^2D	5/2 - 5/2		943
		186.856	41.5551 - 576.73	$3s^23p^3$ - $3s^23p^2(^3P)3d$	$^2D^o$ - ^2F	3/2 - 5/2		943
	17	186.880	46.0891 - 581.19	$3s^23p^3$ - $3s^23p^2(^3P)3d$	$^2D^o$ - ^2F	5/2 - 7/2		943,923
		188.170	74.1081 - 605.54	$3s^23p^3$ - $3s^23p^2(^3P)3d$	$^2P^o$ - ^2D	1/2 - 3/2		943
		188.45	46.0891 - 576.73	$3s^23p^3$ - $3s^23p^2(^3P)3d$	$^2D^o$ - ^2F	5/2 - 5/2		943
		189.561						943
		190.06	0. - 526.14	$3s^23p^3$ - $3s^23p^2(^1S)3d$	g^4S^o - ^2D	3/2 - 3/2		943
		190.459	80.5147 - 605.54	$3s^23p^3$ - $3s^23p^2(^3P)3d$	$^2P^o$ - ^2D	3/2 - 3/2		943
	20	191.045	80.5147 - 603.95	$3s^23p^3$ - $3s^23p^2(^3P)3d$	$^2P^o$ - ^2D	3/2 - 5/2		943,856
	25	192.394	0. - 519.766	$3s^23p^3$ - $3s^23p^2(^3P)3d$	g^4S^o - ^4P	3/2 - 1/2		943,923
	60	193.509	0. - 516.772	$3s^23p^3$ - $3s^23p^2(^3P)3d$	g^4S^o - ^4P	3/2 - 3/2		943,923
		194.61	0. - 513.84	$3s^23p^3$ - $3s^23p^2(^3P)3d$	g^4S^o - ^2P	3/2 - 1/2		943
		194.920	41.5551 - 554.60	$3s^23p^3$ - $3s^23p^2(^1D)3d$	$^2D^o$ - ^2D	3/2 - 5/2		943
	90	195.119	0. - 512.508	$3s^23p^3$ - $3s^23p^2(^3P)3d$	g^4S^o - ^4P	3/2 - 5/2		943,923
		195.19	41.5551 - 553.90	$3s^23p^3$ - $3s^23p^2(^1D)3d$	$^2D^o$ - ^2D	3/2 - 3/2		943
	6	196.640	46.0891 - 554.60	$3s^23p^3$ - $3s^23p^2(^1D)3d$	$^2D^o$ - ^2D	5/2 - 5/2		943,923
		196.923	46.0891 - 553.90	$3s^23p^3$ - $3s^23p^2(^1D)3d$	$^2D^o$ - ^2D	5/2 - 3/2		943
	200	198.58	74.1081 - 577.72	$3s^23p^3$ - $3s^23p^2(^1D)3d$	$^2P^o$ - ^2P	1/2 - 3/2		463
		199.26	0. - 501.80	$3s^23p^3$ - $3s^23p^2(^3P)3d$	g^4S^o - ^2P	3/2 - 3/2	Q	814
		200.356	80.5147 - 579.62	$3s^23p^3$ - $3s^23p^2(^1D)3d$	$^2P^o$ - ^2S	3/2 - 1/2		943
		201.121	80.5147 - 577.72	$3s^23p^3$ - $3s^23p^2(^1D)3d$	$^2P^o$ - ^2P	3/2 - 3/2		943
		201.413	41.5551 - 538.04	$3s^23p^3$ - $3s^23p^2(^1S)3d$	$^2D^o$ - ^2D	3/2 - 5/2		943
		201.540	80.5147 - 576.73	$3s^23p^3$ - $3s^23p^2(^3P)3d$	$^2P^o$ - ^2F	3/2 - 5/2	Q	923
		202.090	74.1081 - 568.93	$3s^23p^3$ - $3s^23p^2(^1D)3d$	$^2P^o$ - ^2P	1/2 - 1/2		943
		203.272	46.0891 - 538.04	$3s^23p^3$ - $3s^23p^2(^1S)3d$	$^2D^o$ - ^2D	5/2 - 5/2		943
		204.743	80.5147 - 568.93	$3s^23p^3$ - $3s^23p^2(^1D)3d$	$^2P^o$ - ^2P	3/2 - 1/2		943
	30	206.368	41.5551 - 526.14	$3s^23p^3$ - $3s^23p^2(^1S)3d$	$^2D^o$ - ^2D	3/2 - 3/2		943,856
	20	208.318	46.0891 - 526.14	$3s^23p^3$ - $3s^23p^2(^1S)3d$	$^2D^o$ - ^2D	5/2 - 3/2		943,856
	20	208.410	74.1081 - 553.90	$3s^23p^3$ - $3s^23p^2(^1D)3d$	$^2P^o$ - ^2D	1/2 - 3/2		943,856
		209.14	41.5551 - 519.766	$3s^23p^3$ - $3s^23p^2(^3P)3d$	$^2D^o$ - ^4P	3/2 - 1/2	P	1076
		210.932	80.5147 - 554.60	$3s^23p^3$ - $3s^23p^2(^1D)3d$	$^2P^o$ - ^2D	3/2 - 5/2		943
	30	211.738	41.5551 - 513.84	$3s^23p^3$ - $3s^23p^2(^3P)3d$	$^2D^o$ - ^2P	3/2 - 1/2		943,856
	20	214.415	46.0891 - 512.508	$3s^23p^3$ - $3s^23p^2(^3P)3d$	$^2D^o$ - ^4P	5/2 - 5/2	Q	93
	30	217.271	41.5551 - 501.80	$3s^23p^3$ - $3s^23p^2(^3P)3d$	$^2D^o$ - ^2P	3/2 - 3/2		943,856
		218.562	80.5147 - 538.04	$3s^23p^3$ - $3s^23p^2(^1S)3d$	$^2P^o$ - ^2D	3/2 - 5/2		943
	11	219.438	46.0891 - 501.80	$3s^23p^3$ - $3s^23p^2(^3P)3d$	$^2D^o$ - ^2P	5/2 - 3/2		943,923
		230.79	80.5147 - 513.84	$3s^23p^3$ - $3s^23p^2(^3P)3d$	$^2P^o$ - ^2P	3/2 - 1/2		943
		283.64	41.5551 - 394.12	$3s^23p^3$ - $3s3p^4$	$^2D^o$ - ^2P	3/2 - 1/2		943
		287.23	41.5551 - 389.72	$3s^23p^3$ - $3s3p^4$	$^2D^o$ - ^2P	3/2 - 3/2	Q	437
	8	291.010	46.0891 - 389.72	$3s^23p^3$ - $3s3p^4$	$^2D^o$ - ^2P	5/2 - 3/2		943,923
		335.06	41.5551 - 340.01	$3s^23p^3$ - $3s3p^4$	$^2D^o$ - ^2D	3/2 - 3/2		943
	8	338.263	46.0891 - 341.73	$3s^23p^3$ - $3s3p^4$	$^2D^o$ - ^2D	5/2 - 5/2		943,923
	20	346.852	0. - 288.307	$3s^23p^3$ - $3s3p^4$	g^4S^o - ^4P	3/2 - 1/2		943,856
	30	352.107	0. - 284.005	$3s^23p^3$ - $3s3p^4$	g^4S^o - ^4P	3/2 - 3/2		943,856
	40	364.468	0. - 274.372	$3s^23p^3$ - $3s3p^4$	g^4S^o - ^4P	3/2 - 5/2		943,856
	150	382.83	80.5147 - 341.73	$3s^23p^3$ - $3s3p^4$	$^2P^o$ - ^2D	3/2 - 5/2		943,437
	14	1242.03	0. - 80.5147	$3s^23p^3$ - $3s^23p^3$	g^4S^o - $^2P^o$	3/2 - 3/2	F	940
	8	1349.38	0. - 74.1081	$3s^23p^3$ - $3s^23p^3$	g^4S^o - $^2P^o$	3/2 - 1/2	F	940

IRON XIII (Fe^{+12}), Z = 26

Ground State $1s^22s^22p^63s^23p^2$ ($^3P_0$) (14 electrons)

Ionization Potential [2 912 000] cm^{-1}; [361.0] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		61.659						241
		61.876						241
	60	62.099	9.3025 - 1619.6	$3s^23p^2 - 3s^23p4d$	$g^3P - {}^3P^o$	1 - 0	Q	241,271,970
	60	62.354	0. - 1603.75	$3s^23p^2 - 3s^23p4d$	$g^3P - {}^3D^o$	0 - 1	Q	241,271,970
		62.387	48.0691 - 1650.62	$3s^23p^2 - 3s^23p4d$	$^1D - {}^1P^o$	2 - 1	Q	241
		62.466	18.5610 - 1619.43	$3s^23p^2 - 3s^23p4d$	$g^3P - {}^3F^o$	2 - 3	Q	241,970
	100	62.694	9.3025 - 1604.22	$3s^23p^2 - 3s^23p4d$	$g^3P - {}^3D^o$	1 - 2		241,271
		62.72	9.3025 - 1603.75	$3s^23p^2 - 3s^23p4d$	$g^3P - {}^3D^o$	1 - 1	Q	970
		62.963	18.5610 - 1606.79	$3s^23p^2 - 3s^23p4d$	$g^3P - {}^3D^o$	2 - 3		970
		63.188	48.0691 - 1630.65	$3s^23p^2 - 3s^23p4d$	$^1D - {}^1F^o$	2 - 3		970
		64.139	91.5102 - 1650.62	$3s^23p^2 - 3s^23p4d$	$^1S - {}^1P^o$	0 - 1		970
	92	74.327	9.3025 - 1354.68	$3s^23p^2 - 3s^23p4s$	$g^3P - {}^3P^o$	1 - 2		241,812
		74.629	362.33 - 1702.30+K	$3s3p^3 - 3s^23p4f$	$^1D^o - {}^3G$	2 - 3	Q	970
	25	74.845	18.5610 - 1354.68	$3s^23p^2 - 3s^23p4s$	$g^3P - {}^3P^o$	2 - 2		241,856
		75.241						970
	93	75.892	9.3025 - 1327.2	$3s^23p^2 - 3s^23p4s$	$g^3P - {}^3P^o$	1 - 0		241,812
	20	76.117	48.0691 - 1361.83	$3s^23p^2 - 3s^23p4s$	$^1D - {}^1P^o$	2 - 1		241,93
	80	78.462	446.9+K - 1721.40+K	$3s^23p3d - 3s^23p4f$	$^3F^o - {}^3G$	4 - 5		241,271
		78.56	429.4+K - 1702.30+K	$3s^23p3d - 3s^23p4f$	$^3F^o - {}^3G$	2 - 3		241
	20	78.770	436.4+K - 1705.92+K	$3s^23p3d - 3s^23p4f$	$^3F^o - {}^3G$	3 - 4		241,93
		81.154	503.34 - 1735.57	$3s^23p3d - 3s^23p4f$	$^3P^o - {}^3D$	0 - 1	Q	970
		82.010	509.250 - 1728.61	$3s^23p3d - 3s^23p4f$	$^3D^o - {}^3F$	2 - 3	Q	970
		84.275	556.91 - 1743.46	$3s^23p3d - 3s^23p4f$	$^1F^o - {}^1G$	3 - 4		241
		85.461	570.715 - 1740.84	$3s^23p3d - 3s^23p4f$	$^1P^o - {}^1D$	1 - 2		970
		98.128	446.9+K - 1466.00+K	$3s^23p3d - 3s^23p4p$	$^3F^o - {}^3D$	4 - 3		241
		98.387	498.87 - 1515.26	$3s^23p3d - 3s^23p4p$	$^1D^o - {}^1P$	2 - 1		241
		98.523	436.4+K - 1451.39+K	$3s^23p3d - 3s^23p4p$	$^3F^o - {}^3D$	3 - 2		241
		98.826	429.4+K - 1441.28+K	$3s^23p3d - 3s^23p4p$	$^3F^o - {}^3D$	2 - 1		241
		107.384	556.91 - 1488.11	$3s^23p3d - 3s^23p4p$	$^1F^o - {}^1D$	3 - 2		241
	50	196.525	48.0691 - 556.91	$3s^23p^2 - 3s^23p3d$	$^1D - {}^1F^o$	2 - 3		943,856
	30	197.434	0. - 506.502	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3D^o$	0 - 1		943,856
	60	200.021	9.3025 - 509.250	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3D^o$	1 - 2		943,856
	70	201.121	9.3025 - 506.502	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3D^o$	1 - 1		943,856
	80	202.044	0. - 494.942	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3P^o$	0 - 1		943,856
	40	202.424	9.3025 - 503.34	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3P^o$	1 - 0		943,856
	8	203.793	18.5610 - 509.250	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3D^o$	2 - 2		943,923
	70	203.826	18.5610 - 509.176	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3D^o$	2 - 3		943,856
	40	204.263	9.3025 - 498.87	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^1D^o$	1 - 2		943,856
	50	204.942	18.5610 - 506.502	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3D^o$	2 - 1		943,856
	20	208.679	91.5102 - 570.715	$3s^23p^2 - 3s^23p3d$	$^1S - {}^1P^o$	0 - 1		943,856
	40	209.617	9.3025 - 486.358	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3P^o$	1 - 2		943,856
	50	209.916	18.5610 - 494.942	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3P^o$	2 - 1		943,856
	40	213.770	18.5610 - 486.358	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3P^o$	2 - 2		943,856
		216.88	48.0691 - 509.176	$3s^23p^2 - 3s^23p3d$	$^1D - {}^3D^o$	2 - 3		804
	40	221.822	48.0691 - 498.87	$3s^23p^2 - 3s^23p3d$	$^1D - {}^1D^o$	2 - 2		943,856
	10	228.18	48.0691 - 486.358	$3s^23p^2 - 3s^23p3d$	$^1D - {}^3P^o$	2 - 2		620
	30	233.234	9.3025 - 438.05	$3s^23p^2 - 3s3p^3$	$g^3P - {}^1P^o$	1 - 1		943,856
	50	240.713	0. - 415.462	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3S^o$	0 - 1		943,856
	50	246.208	9.3025 - 415.462	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3S^o$	1 - 1		943,856
	50	251.953	18.5610 - 415.462	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3S^o$	2 - 1		943,856
		256.42	48.0691 - 438.05	$3s^23p^2 - 3s3p^3$	$^1D - {}^1P^o$	2 - 1		943
	2	311.552	9.3025 - 330.279	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3P^o$	1 - 2		923
	8	312.164	9.3025 - 329.647	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3P^o$	1 - 1		923
	3	318.21	48.0691 - 362.33	$3s^23p^2 - 3s3p^3$	$^1D - {}^1D^o$	2 - 2		943,923
	7	320.800	18.5610 - 330.279	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3P^o$	2 - 2		923
	120	321.47	18.5610 - 329.647	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3P^o$	2 - 1	Q	437
	20	348.184	0. - 287.205	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3D^o$	0 - 1		923
	10	359.638	9.3025 - 287.360	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3D^o$	1 - 2		923,856
	4	359.837	9.3025 - 287.205	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3D^o$	1 - 1		923
	50	368.12	18.5610 - 290.21	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3D^o$	2 - 3		943,856

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	6	1216.43	9.3025 - 91.5102	$3s^23p^2$ - $3s^23p^2$	g^3P - ^1S	1 - 0	F	442
		1370.8	18.5610 - 91.5102	$3s^23p^2$ - $3s^23p^2$	g^3P - ^1S	2 - 0	F,P	375,442

IRON XIV (Fe^{+13}), Z = 26

Ground State $1s^22s^22p^63s^23p$ ($^2P^o_{1/2}$) (13 electrons)

Ionization Potential [3 163 000] cm^{-1}; [392.2] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
01	200	58.963	0.00 - 1695.98	$3s^23p$ - $3s^24d$	g^2P^o - ^2D	$\frac{1}{2}$ - $\frac{3}{2}$		180
01	300	59.579	18.8506 - 1697.29	$3s^23p$ - $3s^24d$	g^2P^o - ^2D	$\frac{3}{2}$ - $\frac{5}{2}$		180
		69.176	356.71+K - 1802.30+K	$3s3p^2$ - 3s3p4s	^4P - $^4P^o$	$\frac{3}{2}$ - $\frac{5}{2}$		241
		69.386	348.52+K - 1789.73+K	$3s3p^2$ - 3s3p4s	^4P - $^4P^o$	$\frac{1}{2}$ - $\frac{3}{2}$		241
		69.636	366.26+K - 1802.30+K	$3s3p^2$ - 3s3p4s	^4P - $^4P^o$	$\frac{5}{2}$ - $\frac{5}{2}$	P	241
		69.685	0.00 - 1435.02	$3s^23p$ - $3s^24s$	g^2P^o - ^2S	$\frac{1}{2}$ - $\frac{1}{2}$	P	241
		70.251	366.26+K - 1789.73+K	$3s3p^2$ - 3s3p4s	^4P - $^4P^o$	$\frac{5}{2}$ - $\frac{3}{2}$		241
		70.613	18.8506 - 1435.02	$3s^23p$ - $3s^24s$	g^2P^o - ^2S	$\frac{3}{2}$ - $\frac{1}{2}$		241
	10	71.377	301.472 - 1702.49	$3s3p^2$ - 3s3p4s	^2D - $^2P^o$	$\frac{5}{2}$ - $\frac{3}{2}$		241,93
	80	71.87	396.515 - 1788.+K	$3s3p^2$ - 3s3p4s	^2P - $^4P^o$	$\frac{3}{2}$ - $\frac{1}{2}$	Q	271
		72.796	800.+K - 2173.7+K	3s3p3d - 3s3p4f	$^4F^o$ - ^4G	$\frac{9}{2}$ - $\frac{11}{2}$		241
		72.95	800.+K - 2170.8+K	3s3p3d - 3s3p4f	$^4F^o$ - ^4G	$\frac{7}{2}$ - $\frac{9}{2}$		241
		73.08	800.+K - 2168.36+K	3s3p3d - 3s3p4f	$^4F^o$ - ^4G	$\frac{5}{2}$ - $\frac{7}{2}$		241
	35	76.022	473.227 - 1788.64	$3s^23d$ - $3s^24f$	^2D - $^2F^o$	$\frac{3}{2}$ - $\frac{5}{2}$		241,93
		76.152	475.217 - 1788.38	$3s^23d$ - $3s^24f$	^2D - $^2F^o$	$\frac{5}{2}$ - $\frac{7}{2}$		241
	20	91.009	475.217 - 1574.01	$3s^23d$ - $3s^24p$	^2D - $^2P^o$	$\frac{5}{2}$ - $\frac{3}{2}$		241,93
		91.273	473.227 - 1568.84	$3s^23d$ - $3s^24p$	^2D - $^2P^o$	$\frac{3}{2}$ - $\frac{1}{2}$		241
	80	211.328	0.00 - 473.227	$3s^23p$ - $3s^23d$	g^2P^o - ^2D	$\frac{1}{2}$ - $\frac{3}{2}$		856
		216.95	356.71+K - 817.64+K	$3s3p^2$ - 3s3p3d	^4P - $^4D^o$	$\frac{3}{2}$ - $\frac{5}{2}$		239
		217.9	301.472 - 760.4+S	$3s3p^2$ - 3s3p3d	^2D - $^2F^o$	$\frac{5}{2}$ - $\frac{7}{2}$	P	1075
		218.21	366.26+K - 824.53+K	$3s3p^2$ - 3s3p3d	^4P - $^4D^o$	$\frac{5}{2}$ - $\frac{7}{2}$		239
	60	219.135	18.8506 - 475.217	$3s^23p$ - $3s^23d$	g^2P^o - ^2D	$\frac{3}{2}$ - $\frac{5}{2}$		856
	60	220.095	18.8506 - 473.227	$3s^23p$ - $3s^23d$	g^2P^o - ^2D	$\frac{3}{2}$ - $\frac{3}{2}$		856
		223.9	299.248 - 745.9+S	$3s3p^2$ - 3s3p3d	^2D - $^2F^o$	$\frac{3}{2}$ - $\frac{5}{2}$	P	1075
	40	252.190	0.00 - 396.515	$3s^23p$ - $3s3p^2$	g^2P^o - ^2P	$\frac{1}{2}$ - $\frac{3}{2}$		856
	50	257.385	0.00 - 388.510	$3s^23p$ - $3s3p^2$	g^2P^o - ^2P	$\frac{1}{2}$ - $\frac{1}{2}$		856
	60	264.779	18.8506 - 396.515	$3s^23p$ - $3s3p^2$	g^2P^o - ^2P	$\frac{3}{2}$ - $\frac{3}{2}$		856
	50	270.512	18.8506 - 388.510	$3s^23p$ - $3s3p^2$	g^2P^o - ^2P	$\frac{3}{2}$ - $\frac{1}{2}$		856
	60	274.203	0.00 - 364.693	$3s^23p$ - $3s3p^2$	g^2P^o - ^2S	$\frac{1}{2}$ - $\frac{1}{2}$		923,856
		280.69	356.71+K - 712.96+K	$3s3p^2$ - $3p^3$	^4P - $^4S^o$	$\frac{3}{2}$ - $\frac{3}{2}$		239
		288.45	366.26+K - 712.96+K	$3s3p^2$ - $3p^3$	^4P - $^4S^o$	$\frac{5}{2}$ - $\frac{3}{2}$		239
	10	289.160	18.8506 - 364.693	$3s^23p$ - $3s3p^2$	g^2P^o - ^2S	$\frac{3}{2}$ - $\frac{1}{2}$		923,856
	50	334.178	0.00 - 299.248	$3s^23p$ - $3s3p^2$	g^2P^o - ^2D	$\frac{1}{2}$ - $\frac{3}{2}$		856
	30	353.838	18.8506 - 301.472	$3s^23p$ - $3s3p^2$	g^2P^o - ^2D	$\frac{3}{2}$ - $\frac{5}{2}$		856
	5	356.59	18.8506 - 299.248	$3s^23p$ - $3s3p^2$	g^2P^o - ^2D	$\frac{3}{2}$ - $\frac{3}{2}$		856

IRON XV (Fe^{+14}), Z = 26

Ground State $1s^2 2s^2 2p^6 3s^2$ ($^1S_0$) (12 electrons)

Ionization Potential 3 686 000 cm^{-1}; 457.0 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	0	15.498	0. - 6452.44	$3s^2 - 2p^5 3s^2 3d$	$g^1S - {}^1P^o$	0 - 1		716
	5	17.300	253.82 - 6034.2	$3s3p - 2p^5 3s^2 3p$	${}^3P^o - {}^3P$	2 - 1		979
	1	17.345	0. - 5765.35	$3s^2 - 2p^5 3s^2 3d$	$g^1S - {}^3P^o$	0 - 1		643
	7	17.555	253.82 - 5950.2	$3s3p - 2p^5 3s^2 3p$	${}^3P^o - {}^3P$	2 - 2		979
	0	17.57	762.103 - 6452.44	$3s3d - 2p^5 3s^2 3d$	${}^1D - {}^1P^o$	2 - 1	Q	208
	19	17.593	351.914 - 6035.0	$3s3p - 2p^5 3s^2 3p$	${}^1P^o - {}^3D$	1 - 2		979
	19	17.620	253.82 - 5929.2	$3s3p - 2p^5 3s^2 3p$	${}^3P^o - {}^3D$	2 - 3		979
	11	17.880	351.914 - 5950.2	$3s3p - 2p^5 3s^2 3p$	${}^1P^o - {}^3P$	1 - 2		979
	7	17.917	351.914 - 5933.2	$3s3p - 2p^5 3s^2 3p$	${}^1P^o - {}^1P$	1 - 1		979
		38.95	0. - 2567.40	$3s^2 - 3s5p$	$g^1S - {}^1P^o$	0 - 1	•	266
	3	41.559	233.95 - 2640.17	$3s3p - 3s5d$	${}^3P^o - {}^3D$	0 - 1		237
	10	41.663	239.67 - 2639.88	$3s3p - 3s5d$	${}^3P^o - {}^3D$	1 - 2		237
	20	41.903	253.82 - 2640.28	$3s3p - 3s5d$	${}^3P^o - {}^3D$	2 - 3		237
		42.93	762.103 - 3091.50	$3s3d - 3s6f$	${}^1D - {}^1F^o$	2 - 3		266
		43.39	681.41 - 2986.10	$3s3d - 3s6f$	${}^3D - {}^3F^o$	3 - 4		266
		43.65	253.82 - 2544.80	$3s3p - 3s5s$	${}^3P^o - {}^3S$	2 - 1		266
		49.49	762.103 - 2782.70	$3s3d - 3s5f$	${}^1D - {}^1F^o$	2 - 3		266
03	1	50.062	678.86 - 2676.38	$3s3d - 3s5f$	${}^3D - {}^3F^o$	1 - 2		180
03	10	50.085	679.79 - 2676.40	$3s3d - 3s5f$	${}^3D - {}^3F^o$	2 - 3		180
03	100	50.120	681.41 - 2676.62	$3s3d - 3s5f$	${}^3D - {}^3F^o$	3 - 4		180
	300	52.911	0. - 1889.97	$3s^2 - 3s4p$	$g^1S - {}^1P^o$	0 - 1		180
02	100	55.635	233.95 - 2031.34	$3s3p - 3s4d$	${}^3P^o - {}^3D$	0 - 1		180
02	200	55.793	239.67 - 2032.02	$3s3p - 3s4d$	${}^3P^o - {}^3D$	1 - 2		180
02	10	55.815	239.67 - 2031.34	$3s3p - 3s4d$	${}^3P^o - {}^3D$	1 - 1		180
02	300	56.200	253.82 - 2033.18	$3s3p - 3s4d$	${}^3P^o - {}^3D$	2 - 3		180
02	1	56.236	253.82 - 2032.02	$3s3p - 3s4d$	${}^3P^o - {}^3D$	2 - 2		180
	12	59.404	351.914 - 2035.32	$3s3p - 3s4d$	${}^1P^o - {}^1D$	1 - 2		241,856
		63.96	559.61 - 2123.17	$3p^2 - 3s4f$	${}^1D - {}^1F^o$	2 - 3		137
	1	65.370	233.95 - 1763.67	$3s3p - 3s4s$	${}^3P^o - {}^3S$	0 - 1		237
	3	65.612	239.67 - 1763.67	$3s3p - 3s4s$	${}^3P^o - {}^3S$	1 - 1		237
	3	66.238	253.82 - 1763.67	$3s3p - 3s4s$	${}^3P^o - {}^3S$	2 - 1		237
		68.860	949.66 - 2401.88	$3p3d - 3p4f$	${}^3F^o - {}^3G$	4 - 5		970
		68.884	938.19 - 2389.91+R	$3p3d - 3p4f$	${}^3F^o - {}^3F$	3 - 3	Q	970
		68.897	928.45 - 2380.00	$3p3d - 3p4f$	${}^3F^o - {}^3G$	2 - 3		970
		69.049	938.19 - 2386.44	$3p3d - 3p4f$	${}^3F^o - {}^3G$	3 - 4		970
		69.534	1090.00+T - 2528.15+T	$3p3d - 3p4f$	${}^1D^o - {}^1F$	2 - 3		970
		69.66	351.914 - 1787.4	$3s3p - 3s4s$	${}^1P^o - {}^1S$	1 - 0		137
01	200	69.945	678.86 - 2108.55	$3s3d - 3s4f$	${}^3D - {}^3F^o$	1 - 2		180
01	300	69.987	679.79 - 2108.63	$3s3d - 3s4f$	${}^3D - {}^3F^o$	2 - 3		180
01	400	70.054	681.41 - 2108.88	$3s3d - 3s4f$	${}^3D - {}^3F^o$	3 - 4		180
		70.224	976.13+R - 2400.14+R	$3p3d - 3p4f$	${}^3P^o - {}^3D$	0 - 1		970
		70.519	982.43+R - 2400.49+R	$3p3d - 3p4f$	${}^3P^o - {}^3D$	1 - 2		970
		70.53	982.69+R - 2400.49+R	$3p3d - 3p4f$	${}^3D^o - {}^3D$	2 - 2		241
		70.59	982.69+R - 2399.16+R	$3p3d - 3p4f$	${}^3D^o - {}^3D$	3 - 3		241
		70.601	982.69+R - 2399.16+R	$3p3d - 3p4f$	${}^3D^o - {}^3D$	2 - 3		970
		71.062	982.69+R - 2389.91+R	$3p3d - 3p4f$	${}^3D^o - {}^3F$	3 - 4		970
		71.267	982.69+R - 2386.44	$3p3d - 3p4f$	${}^3D^o - {}^3G$	3 - 4		970
		73.199	1079.86+S - 2446.00+S	$3p3d - 3p4f$	${}^1F^o - {}^1G$	3 - 4		970
	30	73.471	762.103 - 2123.17	$3s3d - 3s4f$	${}^1D - {}^1F^o$	2 - 3		970,856
	40	224.745	233.95 - 678.86	$3s3p - 3s3d$	${}^3P^o - {}^3D$	0 - 1	Q	856
	20	227.208	239.67 - 679.79	$3s3p - 3s3d$	${}^3P^o - {}^3D$	1 - 2		988,856
		227.70	239.67 - 678.86	$3s3p - 3s3d$	${}^3P^o - {}^3D$	1 - 1		242
	30	233.865	253.82 - 681.41	$3s3p - 3s3d$	${}^3P^o - {}^3D$	2 - 3		856
		234.73	253.82 - 679.79	$3s3p - 3s3d$	${}^3P^o - {}^3D$	2 - 2	Q	437
	50	243.783	351.914 - 762.103	$3s3p - 3s3d$	${}^1P^o - {}^1D$	1 - 2		856
	80	284.147	0. - 351.914	$3s^2 - 3s3p$	$g^1S - {}^1P^o$	0 - 1		856
		292.36	239.67 - 581.71	$3s3p - 3p^2$	${}^3P^o - {}^3P$	1 - 2		242
		302.45	233.95 - 564.58	$3s3p - 3p^2$	${}^3P^o - {}^3P$	0 - 1		242
		303.40						241
		305.00	351.914 - 679.79	$3s3p - 3s3d$	${}^1P^o - {}^3D$	1 - 2		242

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		307.78	239.67 - 564.58	$3s3p - 3p^2$	$^3P^o - ^3P$	1 - 1		242
	5	312.55	239.67 - 559.61	$3s3p - 3p^2$	$^3P^o - ^1D$	1 - 2		856
	120	317.61	239.67 - 554.51	$3s3p - 3p^2$	$^3P^o - ^3P$	1 - 0		437
	200	321.78	253.82 - 564.58	$3s3p - 3p^2$	$^3P^o - ^3P$	2 - 1		437
	120	324.97	351.914 - 659.64	$3s3p - 3p^2$	$^1P^o - ^1S$	1 - 0	Q	437,983
		327.03	253.82 - 559.61	$3s3p - 3p^2$	$^3P^o - ^1D$	2 - 2		137
		372.78	681.41 - 949.66	$3s3d - 3p3d$	$^3D - ^3F^o$	3 - 4		242
		387.00	679.79 - 938.19	$3s3d - 3p3d$	$^3D - ^3F^o$	2 - 3		242
		400.65	678.86 - 928.45	$3s3d - 3p3d$	$^3D - ^3F^o$	1 - 2		242
	14	417.24	0. - 239.67	$3s^2 - 3s3p$	$g^1S - ^3P^o$	0 - 1		856
	150	481.46	351.914 - 559.61	$3s3p - 3p^2$	$^1P^o - ^1D$	1 - 2		437

IRON XVI (Fe^{+15}), Z = 26

Ground State $1s^2 2s^2 2p^6 3s$ ($^2S_{1/2}$) (11 electrons)

Ionization Potential 3 946 300 cm^{-1}; 489.27 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	15.158	0. - 6596.1	$2p^6 3s - 2p^5 3s(^3P^o)3d$	$g^2S - ^2P^o$	$\frac{1}{2} - \frac{3}{2}$	Q	643
	17	15.313	0. - 6530.8	$2p^6 3s - 2p^5(^2P^o_{1/2})3s3d(^3D_{3/2})$	$g^2S - ^2P^o$	$\frac{1}{2} - \frac{3}{2}$	Q	945
	77	15.508	277.163 - 6724.7	$2p^6 3p - 2p^5 3s(^3P^o)3p$	$^2P^o - ^2S$	$\frac{1}{2} - \frac{1}{2}$	Q	643
	88	15.536	0. - 6436.8	$2p^6 3s - 2p^5 3s(^1P^o_{1/2})3d$	$g^2S - ^2P^o$	$\frac{1}{2} - \frac{3}{2}$	Q	643
	1	15.558	298.145 - 6724.7	$2p^6 3p - 2p^5 3s(^3P^o)3p$	$^2P^o - ^2S$	$\frac{3}{2} - \frac{1}{2}$	Q	643
	1	15.567	0. - 6422.9	$2p^6 3s - 2p^5 3s(^1P^o_{1/2})3d$	$g^2S - ^2P^o$	$\frac{1}{2} - \frac{1}{2}$	Q	643
	5	16.696	277.163 - 6266.6	$2p^6 3p - 2p^5(^2P^o_{1/2})3s3p(^1P_{1/2})$	$^2P^o - ^2S$	$\frac{1}{2} - \frac{1}{2}$		979
	7	16.839	277.163 - 6216.0	$2p^6 3p - 2p^5(^2P^o_{1/2})3s3p(^1P_{1/2})$	$^2P^o - ^2D$	$\frac{1}{2} - \frac{3}{2}$		979
	13	16.890	675.477 - 6596.1	$2p^6 3d - 2p^5 3s(^3P^o)3d$	$^2D - ^2P^o$	$\frac{3}{2} - \frac{3}{2}$		979
	2	16.952	675.477 - 6574.5	$2p^6 3d - 2p^5(^2P^o_{1/2})3s3d(^3D_{1/2})$	$^2D - ^2P^o$	$\frac{3}{2} - \frac{1}{2}$		979
	7	16.993	675.477 - 6560.2	$2p^6 3d - 2p^5(^2P^o_{1/2})3s3d(^1D_{3/2})$	$^2D - ^2F^o$	$\frac{3}{2} - \frac{5}{2}$		979
	9	17.025	0. - 5873.7	$2p^6 3s - 2p^5 3s^2$	$g^2S - ^2P^o$	$\frac{1}{2} - \frac{1}{2}$		979
	15	17.087	678.421 - 6530.8	$2p^6 3d - 2p^5(^2P^o_{1/2})3s3d(^3D_{3/2})$	$^2D - ^2P^o$	$\frac{5}{2} - \frac{3}{2}$		979
	25	17.124	678.421 - 6518.2	$2p^6 3d - 2p^5(^2P^o_{1/2})3s3d(^3D_{5/2})$	$^2D - ^2F^o$	$\frac{5}{2} - \frac{7}{2}$		979
	16	17.161	298.145 - 6125.3	$2p^6 3p - 2p^5(^2P^o_{3/2})3s3p(^1P^o_{1/2})$	$^2P^o - ^2P$	$\frac{3}{2} - \frac{3}{2}$		979
	17	17.206	298.145 - 6110.1	$2p^6 3p - 2p^5 3s(^3P^o)3p$	$^2P^o - ^2D$	$\frac{3}{2} - \frac{5}{2}$		979
	10	17.249	298.145 - 6095.6	$2p^6 3p - 2p^5(^2P^o_{1/2})3s3p(^3P^o_{3/2})$	$^2P^o - ^4P$	$\frac{3}{2} - \frac{3}{2}$		979
	3	17.285	678.421 - 6463.8	$2p^6 3d - 2p^5(^2P^o_{3/2})3s3d(^1D_{3/2})$	$^2D - ^2D^o$	$\frac{5}{2} - \frac{5}{2}$		979
	2	17.323	0. - 5772.7	$2p^6 3s - 2p^5 3s^2$	$g^2S - ^2P^o$	$\frac{1}{2} - \frac{3}{2}$		979
	8	17.337	678.421 - 6446.4	$2p^6 3d - 2p^5(^2P^o_{3/2})3s3d(^1D_{3/2})$	$^2D - ^2F^o$	$\frac{5}{2} - \frac{7}{2}$		979
	16	17.366	678.421 - 6436.8	$2p^6 3d - 2p^5 3s(^1P^o_{1/2})3d$	$^2D - ^2P^o$	$\frac{5}{2} - \frac{3}{2}$		979
	18	17.399	675.477 - 6422.9	$2p^6 3d - 2p^5 3s(^1P^o_{1/2})3d$	$^2D - ^2P^o$	$\frac{3}{2} - \frac{1}{2}$		979
	14	17.413	298.145 - 6041.0	$2p^6 3p - 2p^5(^2P^o_{3/2})3s3p(^3P^o_{3/2})$	$^2P^o - ^2S$	$\frac{3}{2} - \frac{1}{2}$		979
	16	17.449	675.477 - 6406.5	$2p^6 3d - 2p^5(^2P^o_{3/2})3s3d(^3D_{1/2})$	$^2D - ^4F^o$	$\frac{3}{2} - \frac{3}{2}$		979
	13	17.467	277.163 - 6002.2	$2p^6 3p - 2p^5(^2P^o_{3/2})3s3p(^3P^o_{1/2})$	$^2P^o - ^2P$	$\frac{1}{2} - \frac{1}{2}$		979
	40	17.498	298.145 - 6013.1	$2p^6 3p - 2p^5(^2P^o_{3/2})3s3p(^3P^o_{3/2})$	$^2P^o - ^4P$	$\frac{3}{2} - \frac{5}{2}$		979
	40	17.59	298.145 - 5982.2	$2p^6 3p - 2p^5(^2P^o_{3/2})3s3p(^3P^o_{1/2})$	$^2P^o - ^4D$	$\frac{3}{2} - \frac{3}{2}$	Q	736
		27.88	0. - 3587.	$2p^6 3s - 2p^6 9p$	$g^2S - ^2P^o$	$\frac{1}{2} - \frac{3}{2}$		266
		28.67	0. - 3487.97	$2p^6 3s - 2p^6 8p$	$g^2S - ^2P^o$	$\frac{1}{2} - \frac{3}{2}$		266
		29.93	0. - 3341.	$2p^6 3s - 2p^6 7p$	$g^2S - ^2P^o$	$\frac{1}{2} - \frac{3}{2}$		266
		30.10	277.163 - 3599.	$2p^6 3p - 2p^6 9d$	$^2P^o - ^2D$	$\frac{1}{2} - \frac{3}{2}$		266
		30.33	298.145 - 3595.	$2p^6 3p - 2p^6 9d$	$^2P^o - ^2D$	$\frac{3}{2} - \frac{5}{2}$		266
	3	31.041	277.163 - 3498.71	$2p^6 3p - 2p^6 8d$	$^2P^o - ^2D$	$\frac{1}{2} - \frac{3}{2}$		237
	20	31.242	298.145 - 3498.96	$2p^6 3p - 2p^6 8d$	$^2P^o - ^2D$	$\frac{3}{2} - \frac{5}{2}$		237
	10	32.166	0. - 3108.87	$2p^6 3s - 2p^6 6p$	$g^2S - ^2P^o$	$\frac{1}{2} - \frac{3}{2}$		237
	6	32.192	0. - 3106.36	$2p^6 3s - 2p^6 6p$	$g^2S - ^2P^o$	$\frac{1}{2} - \frac{1}{2}$		237
	10	32.433	277.163 - 3360.44	$2p^6 3p - 2p^6 7d$	$^2P^o - ^2D$	$\frac{1}{2} - \frac{3}{2}$		237
	35	32.652	298.145 - 3360.74	$2p^6 3p - 2p^6 7d$	$^2P^o - ^2D$	$\frac{3}{2} - \frac{5}{2}$		237
		32.84	277.163 - 3323.5	$2p^6 3p - 2p^6 7s$	$^2P^o - ^2S$	$\frac{1}{2} - \frac{1}{2}$		266
		33.04	298.145 - 3323.5	$2p^6 3p - 2p^6 7s$	$^2P^o - ^2S$	$\frac{3}{2} - \frac{1}{2}$		266

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		34.21	678.421 - 3602.	$2p^63d - 2p^69f$	$^2D - {}^2F^o$	$\frac{5}{2} - \frac{7}{2}$		266
	20	34.857	277.163 - 3146.03	$2p^63p - 2p^66d$	$^2P^o - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		237
	60	35.106	298.145 - 3146.66	$2p^63p - 2p^66d$	$^2P^o - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		237
	1	35.333	675.477 - 3505.70	$2p^63d - 2p^68f$	$^2D - {}^2F^o$	$\frac{3}{2} - \frac{5}{2}$		237
	3	35.368	678.421 - 3505.83	$2p^63d - 2p^68f$	$^2D - {}^2F^o$	$\frac{5}{2} - \frac{7}{2}$		237
		35.59	678.421 - 3487.97	$2p^63d - 2p^68p$	$^2D - {}^2P^o$	$\frac{5}{2} - \frac{3}{2}$	P	375
		35.71	277.163 - 3076.3	$2p^63p - 2p^66s$	$^2P^o - {}^2S$	$\frac{1}{2} - \frac{1}{2}$		266
		36.01	298.145 - 3076.3	$2p^63p - 2p^66s$	$^2P^o - {}^2S$	$\frac{3}{2} - \frac{1}{2}$		266
	60	36.749	0. - 2721.16	$2p^63s - 2p^65p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{3}{2}$		237
	20	36.803	0. - 2717.17	$2p^63s - 2p^65p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{1}{2}$		237
	6	37.096	675.477 - 3371.19	$2p^63d - 2p^67f$	$^2D - {}^2F^o$	$\frac{3}{2} - \frac{5}{2}$		237
	10	37.138	678.421 - 3371.07	$2p^63d - 2p^67f$	$^2D - {}^2F^o$	$\frac{5}{2} - \frac{7}{2}$		237
06		39.827	277.163 - 2788.02	$2p^63p - 2p^65d$	$^2P^o - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		178
06		40.153	298.145 - 2788.62	$2p^63p - 2p^65d$	$^2P^o - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		178
	10	40.199	675.477 - 3163.10	$2p^63d - 2p^66f$	$^2D - {}^2F^o$	$\frac{3}{2} - \frac{5}{2}$		237
	10	40.245	678.421 - 3163.19	$2p^63d - 2p^66f$	$^2D - {}^2F^o$	$\frac{5}{2} - \frac{7}{2}$		237
		41.14	678.421 - 3108.87	$2p^63d - 2p^66p$	$^2D - {}^2P^o$	$\frac{5}{2} - \frac{3}{2}$	P	266
		41.91	277.163 - 2663.3	$2p^63p - 2p^65s$	$^2P^o - {}^2S$	$\frac{1}{2} - \frac{1}{2}$		266
		42.30	298.145 - 2663.3	$2p^63p - 2p^65s$	$^2P^o - {}^2S$	$\frac{3}{2} - \frac{1}{2}$		266
05		46.661	675.477 - 2818.54	$2p^63d - 2p^65f$	$^2D - {}^2F^o$	$\frac{3}{2} - \frac{5}{2}$		178
05		46.718	678.421 - 2818.86	$2p^63d - 2p^65f$	$^2D - {}^2F^o$	$\frac{5}{2} - \frac{7}{2}$		178
		48.95	678.421 - 2721.16	$2p^63d - 2p^65p$	$^2D - {}^2P^o$	$\frac{5}{2} - \frac{3}{2}$	P	266
		48.98	675.477 - 2717.17	$2p^63d - 2p^65p$	$^2D - {}^2P^o$	$\frac{3}{2} - \frac{1}{2}$	P	266
04	23	50.350	0. - 1985.75	$2p^63s - 2p^64p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{3}{2}$		178,856
04		50.555	0. - 1977.77	$2p^63s - 2p^64p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{1}{2}$		178
03		54.142	277.163 - 2124.37	$2p^63p - 2p^64d$	$^2P^o - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		178
03	24	54.728	298.145 - 2125.60	$2p^63p - 2p^64d$	$^2P^o - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		178,856
03		54.769	298.145 - 2124.37	$2p^63p - 2p^64d$	$^2P^o - {}^2D$	$\frac{3}{2} - \frac{3}{2}$		178
02	20	62.879	277.163 - 1867.53	$2p^63p - 2p^64s$	$^2P^o - {}^2S$	$\frac{1}{2} - \frac{1}{2}$		178,93
02	30	63.719	298.145 - 1867.53	$2p^63p - 2p^64s$	$^2P^o - {}^2S$	$\frac{3}{2} - \frac{1}{2}$		178,93
01	20	66.263	675.477 - 2184.61	$2p^63d - 2p^64f$	$^2D - {}^2F^o$	$\frac{3}{2} - \frac{5}{2}$		178,93
01	30	66.368	678.421 - 2185.17	$2p^63d - 2p^64f$	$^2D - {}^2F^o$	$\frac{5}{2} - \frac{7}{2}$		178,93
	30	76.502	678.421 - 1985.75	$2p^63d - 2p^64p$	$^2D - {}^2P^o$	$\frac{5}{2} - \frac{3}{2}$		241,93
		76.796	675.477 - 1977.77	$2p^63d - 2p^64p$	$^2D - {}^2P^o$	$\frac{3}{2} - \frac{1}{2}$		241
	10	144.06	2124.37 - 2818.54	$2p^64d - 2p^65f$	$^2D - {}^2F^o$	$\frac{3}{2} - \frac{5}{2}$		1091
	10	144.25	2125.60 - 2818.86	$2p^64d - 2p^65f$	$^2D - {}^2F^o$	$\frac{5}{2} - \frac{7}{2}$		1091
	10	156.80	2185.17 - 2822.93	$2p^64f - 2p^65g$	$^2F^o - {}^2G$	$\frac{7}{2} - \frac{9}{2}$		1091
	50	156.88	2184.61 - 2822.04	$2p^64f - 2p^65g$	$^2F^o - {}^2G$	$\frac{5}{2} - \frac{7}{2}$		1091
	300	171.66	2788.62 - 3371.07	$2p^65d - 2p^67f$	$^2D - {}^2F^o$	$\frac{5}{2} - \frac{7}{2}$	Q	256
	40	251.058	277.163 - 675.477	$2p^63p - 2p^63d$	$^2P^o - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		237,856
	40	262.967	298.145 - 678.421	$2p^63p - 2p^63d$	$^2P^o - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		237,856
	3	265.007	298.145 - 675.477	$2p^63p - 2p^63d$	$^2P^o - {}^2D$	$\frac{3}{2} - \frac{3}{2}$		237
	60	335.407	0. - 298.145	$2p^63s - 2p^63p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{3}{2}$		237,856
	60	360.798	0. - 277.163	$2p^63s - 2p^63p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{1}{2}$		237,856

IRON XVII (Fe^{+16}), Z = 26

Ground State $1s^22s^22p^6$ ($^1S_0$) (10 electrons)

Ionization Potential [10 180 000] cm^{-1}; [1262] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		9.324	0.0 - 10725.	$2s^22p^6 - 2s2p^68p$	$g^1S - {}^3P^o$	0 - 1	P	1144
		9.468	0.0 - 10562.	$2s^22p^6 - 2s2p^67p$	$g^1S - {}^3P^o$	0 - 1	P	1144
		9.703	0.0 - 10306.	$2s^22p^6 - 2s2p^66p$	$g^1S - {}^3P^o$	0 - 1	P	1144
		10.120	0.0 - 9881.4	$2s^22p^6 - 2s2p^65p$	$g^1S - {}^1P^o$	0 - 1	P	1144
	40	10.134	0.0 - 9874.6	$2s^22p^6 - 2s2p^65p$	$g^1S - {}^3P^o$	0 - 1		643,1067
	14	10.221	0.0 - 9783.8	$2s^22p^6 - 2s^22p^5(^2P^o_{1/2})8d$	$g^1S - {}_{1/2}[3/2]^o$	0 - 1		1144
	31	10.252	0.0 - 9751.3	$2s^22p^6 - 2s^22p^5(^2P^o_{1/2})8s$	$g^1S - ({}_{1/2,1/2})^o$	0 - 1	Q	643,1144
	19	10.332	0.0 - 9678.7	$2s^22p^6 - 2s^22p^5(^2P^o_{3/2})8d$	$g^1S - {}_{3/2}[3/2]^o$	0 - 1		1144
		10.337	0.0 - 9674.0	$2s^22p^6 - 2s^22p^5(^2P^o_{3/2})8d$	$g^1S - {}_{3/2}[1/2]^o$	0 - 1	P	1144
	18	10.367	0.0 - 9648.8	$2s^22p^6 - 2s^22p^5(^2P^o_{3/2})8s$	$g^1S - ({}_{3/2,1/2})^o$	0 - 1	Q	945,1144

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	14	10.386	0.0 - 9628.4	$2s^22p^6 - 2s^22p^5(^2P^o)7d$	$g^1S - {}_{1/2}[3/2]^o$	0 - 1		643
	17	10.436	0.0 - 9582.2	$2s^22p^6 - 2s^22p^5(^2P^o_1)7s$	$g^1S - ({}_{1/2},{}_{1/2})^o$	0 - 1		1144
	28	10.506	0.0 - 9518.4	$2s^22p^6 - 2s^22p^5(^2P^o_2)7d$	$g^1S - {}_{3/2}[3/2]^o$	0 - 1		643
	17	10.550	0.0 - 9478.7	$2s^22p^6 - 2s^22p^5(^2P^o_2)7s$	$g^1S - ({}_{3/2},{}_{1/2})^o$	0 - 1		1144
	30	10.655	0.0 - 9382.6	$2s^22p^6 - 2s^22p^5(^2P^o_1)6d$	$g^1S - {}_{1/2}[3/2]^o$	0 - 1		1144
		10.737	0.0 - 9313.6	$2s^22p^6 - 2s^22p^5(^2P^o)6s$	$g^1S - ({}_{1/2},{}_{1/2})^o$	0 - 1	P	1144
	37	10.770	0.0 - 9285.1	$2s^22p^6 - 2s^22p^5(^2P^o_2)6d$	$g^1S - {}_{3/2}[3/2]^o$	0 - 1		945,1094
		10.782	0.0 - 9274.7	$2s^22p^6 - 2s^22p^5(^2P^o_2)6d$	$g^1S - {}_{3/2}[1/2]^o$	0 - 1	P	1144
	12	10.851	0.0 - 9215.7	$2s^22p^6 - 2s^22p^5(^2P^o_2)6s$	$g^1S - ({}_{3/2},{}_{1/2})^o$	0 - 1		1144
	4	11.025	0.0 - 9070.3	$2s^22p^6 - 2s2p^64p$	$g^1S - {}^1P^o$	0 - 1	P	447
	2	11.041	0.0 - 9057.2	$2s^22p^6 - 2s2p^64p$	$g^1S - {}^3P^o$	0 - 1	P	447
	32	11.132	0.0 - 8982.3	$2s^22p^6 - 2s^22p^5(^2P^o_1)5d$	$g^1S - {}_{1/2}[3/2]^o$	0 - 1		643
	44	11.253	0.0 - 8886.5	$2s^22p^6 - 2s^22p^5(^2P^o_2)5d$	$g^1S - {}_{3/2}[3/2]^o$	0 - 1		945,094
	26	11.287	0.0 - 8859.8	$2s^22p^6 - 2s^22p^5(^2P^o_1)5s$	$g^1S - ({}_{1/2},{}_{1/2})^o$	0 - 1		945,1094
	25	11.420	0.0 - 8756.6	$2s^22p^6 - 2s^22p^5(^2P^o_2)5s$	$g^1S - ({}_{3/2},{}_{1/2})^o$	0 - 1		1144
	63	12.125	0.0 - 8248.8	$2s^22p^6 - 2s^22p^5(^2P^o_1)4d$	$g^1S - {}_{1/2}[3/2]^o$	0 - 1		643
	64	12.264	0.0 - 8153.9	$2s^22p^6 - 2s^22p^5(^2P^o_2)4d$	$g^1S - {}_{3/2}[3/2]^o$	0 - 1		945
	37	12.322	0.0 - 8115.6	$2s^22p^6 - 2s^22p^5(^2P^o_2)4d$	$g^1S - {}_{3/2}[1/2]^o$	0 - 1		945
	31	12.526	0.0 - 7984.0	$2s^22p^6 - 2s^22p^5(^2P^o_1)4s$	$g^1S - ({}_{1/2},{}_{1/2})^o$	0 - 1		945
	75	12.678	0.0 - 7887.7	$2s^22p^6 - 2s^22p^5(^2P^o_2)4s$	$g^1S - ({}_{3/2},{}_{1/2})^o$	0 - 1		643
	91	13.834	0.0 - 7228.6	$2s^22p^6 - 2s2p^63p$	$g^1S - {}^1P^o$	0 - 1		643
	48	13.892	0.0 - 7198.4	$2s^22p^6 - 2s2p^63p$	$g^1S - {}^3P^o$	0 - 1		643
	112	15.013	0.0 - 6660.9	$2s^22p^6 - 2s^22p^5(^2P^o_1)3d$	$g^1S - {}_{1/2}[3/2]^o$	0 - 1		643
	96	15.260	0.0 - 6553.1	$2s^22p^6 - 2s^22p^5(^2P^o_2)3d$	$g^1S - {}_{3/2}[3/2]^o$	0 - 1		643
	59	15.449	0.0 - 6472.9	$2s^22p^6 - 2s^22p^5(^2P^o_2)3d$	$g^1S - {}_{3/2}[1/2]^o$	0 - 1		643
	20	16.775	0.0 - 5961.3	$2s^22p^6 - 2s^22p^5(^2P^o_1)3s$	$g^1S - ({}_{1/2},{}_{1/2})^o$	0 - 1		643
	20	17.051	0.0 - 5864.7	$2s^22p^6 - 2s^22p^5(^2P^o_2)3s$	$g^1S - ({}_{3/2},{}_{1/2})^o$	0 - 1		643
	50	17.100	0.0 - 5848.0	$2s^22p^6 - 2s^22p^5(^2P^o_2)3s$	$g^1S - ({}_{3/2},{}_{1/2})^o$	0 - 2	F	1112,447
		41.37	6484.0+C - 8901.2+C	$2s^22p^5(^2P^o)3d - 2s^22p^5(^2P^o_2)5f$	$^3F^o - {}_{3/2}[9/2]^o$	4 - 5		1055
		49.787	6136.6+C - 8145.2+C	$2s^22p^5(^2P^o)3p - 2s^22p^5(^2P^o)4d$	$^1P - {}^1D^o$	1 - 2		395
		49.880	6113.3+C - 8118.1+C	$2s^22p^5(^2P^o)3p - 2s^22p^5(^2P^o)4d$	$^3D - {}^3D^o$	2 - 3		395
		50.262	6127.9+C - 8117.5+C	$2s^22p^5(^2P^o)3p - 2s^22p^5(^2P^o)4d$	$^3D - {}^3F^o$	3 - 4		395
		50.33	6248.8+C - 8235.7+C	$2s^22p^5(^2P^o)3p - 2s^22p^5(^2P^o)4d$	$^3P - {}^3F^o$	1 - 2	P	395
		50.397	6251.9+C - 8236.2+C	$2s^22p^5(^2P^o)3p - 2s^22p^5(^2P^o)4d$	$^1D - {}^1F^o$	2 - 3		395
		50.60	6151.1+C - 8127.4+C	$2s^22p^5(^2P^o)3p - 2s^22p^5(^2P^o)4d$	$^3P - {}^3F^o$	2 - 3	P	395
		52.815	6251.9+C - 8145.2+C	$2s^22p^5(^2P^o)3p - 2s^22p^5(^2P^o)4d$	$^1D - {}^1D^o$	2 - 2	Q	900
		57.32	6127.9+C - 7872.5+C	$2s^22p^5(^2P^o)3p - 2s^22p^5(^2P^o_2)4s$	$^3D - {}_{3/2}[3/2]^o$	3 - 2		1055
		58.62	6461.9+C - 8167.8+C	$2s^22p^5(^2P^o)3d - 2s^22p^5(^2P^o_2)4f$	$^3P^o - {}_{3/2}[5/2]^o$	2 - 3		1055
		58.76	6461.9+C - 8163.7+C	$2s^22p^5(^2P^o)3d - 2s^22p^5(^2P^o_2)4f$	$^3P^o - {}_{3/2}[3/2]^o$	2 - 2		1055
		58.91	6546.1+C - 8243.6+C	$2s^22p^5(^2P^o)3d - 2s^22p^5(^2P^o_1)4f$	$^3F^o - {}_{1/2}[7/2]^o$	2 - 3		1055
		58.98	6489.3+C - 8184.8+C	$2s^22p^5(^2P^o)3d - 2s^22p^5(^2P^o_2)4f$	$^3F^o - {}_{3/2}[9/2]^o$	3 - 4		1055
		59.26	6611.6+C - 8299.1+C	$2s^22p^5(^2P^o)3d - 2s^22p^5(^2P^o_1)4f$	$^1F^o - {}_{1/2}[7/2]^o$	3 - 4		1055
		59.59	6511.4+C - 8189.5+C	$2s^22p^5(^2P^o)3d - 2s^22p^5(^2P^o_2)4f$	$^3D^o - {}_{3/2}[7/2]^o$	3 - 4		1055
	60	67.21	6615.3+C - 8103.3+C	$2s^22p^5(^2P^o)3d - 2s^22p^5(^2P^o)4p$	$^1D^o - {}^1D$	2 - 2	Q	271
		91.96	5864.7 - 6952.3	$2s^22p^5(^2P^o_{<2})3s\text{-}2s2p^63s$	$({}_{3/2},{}_{1/2})^o - {}^1S$	1 - 0		390
		97.04	6660.9 - 7691.4	$2s^22p^5(^2P^o_{<1})3d\text{-}2s2p^63d$	${}_{1/2}[3/2]^o - {}^1D$	1 - 2	Q	390
		100.89	5961.3 - 6952.3	$2s^22p^5(^2P^o_{<1})3s\text{-}2s2p^63s$	$({}_{1/2},{}_{1/2})^o - {}^1S$	1 - 0		390
	30	197.029	5864.7 - 6372.2	$2s^22p^5(^2P^o_{<2})3s\text{-}2s^22p^5(^2P^o)3p$	$({}_{3/2},{}_{1/2})^o - {}^1S$	1 - 0		923,93
		243.39	5961.3 - 6372.2	$2s^22p^5(^2P^o_{<1})3s\text{-}2s^22p^5(^2P^o)3p$	$({}_{1/2},{}_{1/2})^o - {}^1S$	1 - 0	Q	437

IRON XVIII (Fe^{+17}), Z = 26

Ground State $1s^22s^22p^5$ ($^2P^o_{3/2}$) (9 electrons)

Ionization Potential [10 950 000] cm^{-1}; [1358] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	15	10.192	0.0 - 9813.3	$2s^22p^5 - 2s^22p^4(^1S)5d$	$g^2P^o - {}^2D$	3/2 - 3/2	Q	945
	10	10.298	102.579 - 9813.3	$2s^22p^5 - 2s^22p^4(^1S)5d$	$g^2P^o - {}^2D$	1/2 - 3/2		945
	31	10.352	0.0 - 9660.0	$2s^22p^5 - 2s^22p^4(^1D)5d$	$g^2P^o - {}^2S$	3/2 - 1/2		945
	26	10.437	0.0 - 9581.3	$2s^22p^5 - 2s^22p^4(^3P)5d$	$g^2P^o - {}^2D$	3/2 - 3/2		945
	23	10.460	102.579 - 9662.9	$2s^22p^5 - 2s^22p^4(^1D)5d$	$g^2P^o - {}^2D$	1/2 - 3/2		945

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	32	10.529	0.0 - 9497.6	$2s^22p^5 - 2s^22p^4(^3P)5d$	$g^2P^o - {}^4F$	3/2 - 5/2		945
	21	10.543	102.579 - 9587.6	$2s^22p^5 - 2s^22p^4(^3P)5d$	$g^2P^o - {}^2D$	1/2 - 3/2		945
	2	11.021	0.0 - 9073.6	$2s^22p^5 - 2s^22p^4(^1S)4d$	$g^2P^o - {}^2D$	3/2 - 5/2		643
	44	11.253	102.579 - 8989.1	$2s^22p^5 - 2s^22p^4(^1S)4d$	$g^2P^o - {}^2D$	1/2 - 3/2		945
	47	11.280	0.0 - 8865.2	$2s^22p^5 - 2s^22p^4(^1D)4d$	$g^2P^o - {}^2D$	3/2 - 5/2		643
	27	11.309	0.0 - 8843.9	$2s^22p^5 - 2s^22p^4(^1D)4d$	$g^2P^o - {}^2P$	3/2 - 1/2	Q	945
	3	11.318	0.0 - 8835.5	$2s^22p^5 - 2s^22p^4(^1D)4d$	$g^2P^o - {}^2S$	3/2 - 1/2		643
	57	11.326	0.0 - 8829.2	$2s^22p^5 - 2s^22p^4(^1D)4d$	$g^2P^o - {}^2P$	3/2 - 3/2		945
	10	11.384	102.579 - 8886.5	$2s^22p^5 - 2s^22p^4(^1D)4d$	$g^2P^o - {}^2D$	1/2 - 3/2	Q	643
	49	11.420	0.0 - 8757.0	$2s^22p^5 - 2s^22p^4(^3P)4d$	$g^2P^o - {}^2F$	3/2 - 5/2		945
	49	11.440	0.0 - 8742.5	$2s^22p^5 - 2s^22p^4(^3P)4d$	$g^2P^o - {}^4P$	3/2 - 3/2		945
	28	11.458	0.0 - 8727.5	$2s^22p^5 - 2s^22p^4(^3P)4d$	$g^2P^o - {}^4F$	3/2 - 5/2		945
	52	11.526	0.0 - 8676.0	$2s^22p^5 - 2s^22p^4(^3P)4d$	$g^2P^o - {}^2D$	3/2 - 5/2		945
	27	11.551	102.579 - 8759.9	$2s^22p^5 - 2s^22p^4(^3P)4d$	$g^2P^o - {}^2D$	1/2 - 3/2		945
	21	11.575	102.579 - 8742.5	$2s^22p^5 - 2s^22p^4(^3P)4d$	$g^2P^o - {}^2P$	1/2 - 3/2	Q	945
	17	11.640	0.0 - 8591.1	$2s^22p^5 - 2s^22p^4(^1D)4s$	$g^2P^o - {}^2D$	3/2 - 5/2		945
	11	11.741	0.0 - 8517.2	$2s^22p^5 - 2s^22p^4(^3P)4s$	$g^2P^o - {}^2P$	3/2 - 3/2		945
	10	11.762	0.0 - 8502.0	$2s^22p^5 - 2s^22p^4(^3P)4s$	$g^2P^o - {}^4P$	3/2 - 1/2		945
	13	11.778	102.579 - 8593.1	$2s^22p^5 - 2s^22p^4(^1D)4s$	$g^2P^o - {}^2D$	1/2 - 3/2		945
	20	11.865	102.579 - 8530.7	$2s^22p^5 - 2s^22p^4(^3P)4s$	$g^2P^o - {}^2P$	1/2 - 1/2		945
	23	12.003	102.579 - 8433.8	$2s^22p^5 - 2s^22p^4(^3P)4s$	$g^2P^o - {}^4P$	1/2 - 3/2		945
	48	12.847	0.0 - 7783.9	$2s^22p^5 - 2s2p^5(^1P^o)3p$	$g^2P^o - {}^2D$	3/2 - 5/2		945
		13.001	102.579 - 7794.4	$2s^22p^5 - 2s2p^5(^1P^o)3p$	$g^2P^o - {}^2P$	1/2 - 3/2		945
	38	13.015	102.579 - 7786.1	$2s^22p^5 - 2s2p^5(^1P^o)3p$	$g^2P^o - {}^2P$	1/2 - 1/2		945
	47	13.049	102.579 - 7766.1	$2s^22p^5 - 2s2p^5(^1P^o)3p$	$g^2P^o - {}^2D$	1/2 - 3/2		945
	30	13.159	0.0 - 7599.4	$2s^22p^5 - 2s2p^5(^1P^o)3p$	$g^2P^o - {}^2S$	3/2 - 1/2		945
	51	13.319	0.0 - 7508.1	$2s^22p^5 - 2s2p^5(^3P^o)3p$	$g^2P^o - {}^4P$	3/2 - 5/2		945
	48	13.355	0.0 - 7487.8	$2s^22p^5 - 2s2p^5(^3P^o)3p$	$g^2P^o - {}^2P$	3/2 - 3/2		945
	48	13.374	0.0 - 7477.2	$2s^22p^5 - 2s2p^5(^3P^o)3p$	$g^2P^o - {}^2D$	3/2 - 5/2		945
	55	13.397	102.579 - 7567.0	$2s^22p^5 - 2s2p^5(^3P^o)3p$	$g^2P^o - {}^2D$	1/2 - 3/2		945
	59	13.464	0.0 - 7427.2	$2s^22p^5 - 2s2p^5(^3P^o)3p$	$g^2P^o - {}^4D$	3/2 - 5/2		945
	20	13.91	0.0 - 7184.2	$2s^22p^5 - 2s^22p^4(^1S)3d$	$g^2P^o - {}^2D$	3/2 - 3/2	Q	736
	30	13.954	0.0 - 7166.4	$2s^22p^5 - 2s^22p^4(^1S)3d$	$g^2P^o - {}^2D$	3/2 - 5/2		850
	50	14.121	102.579 - 7184.2	$2s^22p^5 - 2s^22p^4(^1S)3d$	$g^2P^o - {}^2D$	1/2 - 3/2		850
	40	14.150	0.0 - 7067.0	$2s^22p^5 - 2s^22p^4(^1D)3d$	$g^2P^o - {}^2D$	3/2 - 3/2		850
	90	14.202	0.0 - 7042.0	$2s^22p^5 - 2s^22p^4(^1D)3d$	$g^2P^o - {}^2D$	3/2 - 5/2		850
	60	14.255	0.0 - 7015.1	$2s^22p^5 - 2s^22p^4(^1D)3d$	$g^2P^o - {}^2S$	3/2 - 1/2		850
	52	14.344	102.579 - 7074.2	$2s^22p^5 - 2s^22p^4(^1D)3d$	$g^2P^o - {}^2P$	1/2 - 1/2		945
	70	14.361	102.579 - 7067.0	$2s^22p^5 - 2s^22p^4(^1D)3d$	$g^2P^o - {}^2D$	1/2 - 3/2		850
	70	14.373	0.0 - 6957.5	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^o - {}^2D$	3/2 - 3/2		850
	60	14.419	0.0 - 6935.3	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^o - {}^4P$	3/2 - 5/2		850
	34	14.453	0.0 - 6919.0	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^o - {}^4D$	3/2 - 3/2		945
	30	14.467	102.579 - 7015.1	$2s^22p^5 - 2s^22p^4(^1D)3d$	$g^2P^o - {}^2S$	1/2 - 1/2		850
	28	14.485	0.0 - 6903.7	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^o - {}^4F$	3/2 - 5/2		850
	61	14.536	0.0 - 6879.5	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^o - {}^2F$	3/2 - 5/2		850
	56	14.551	0.0 - 6872.5	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^o - {}^4P$	3/2 - 3/2		850
	49	14.581	0.0 - 6858.2	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^o - {}^4P$	3/2 - 1/2		850
	37	14.610	102.579 - 6947.2	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^o - {}^2P$	1/2 - 3/2		945
	6	14.772	102.579 - 6872.5	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^o - {}^4P$	1/2 - 3/2		850
	25	14.868	102.579 - 6828.4	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^o - {}^2P$	1/2 - 1/2	Q	945
	50	15.491	102.579 - 6557.9	$2s^22p^5 - 2s^22p^4(^1S)3s$	$g^2P^o - {}^2S$	1/2 - 1/2		850
	78	15.611	0.0 - 6404.4	$2s^22p^5 - 2s^22p^4(^1D)3s$	$g^2P^o - {}^2D$	3/2 - 3/2	Q	643
	90	15.623	0.0 - 6400.8	$2s^22p^5 - 2s^22p^4(^1D)3s$	$g^2P^o - {}^2D$	3/2 - 5/2		850,643
	16	15.764	0.0 - 6343.6	$2s^22p^5 - 2s^22p^4(^3P)3s$	$g^2P^o - {}^2P$	3/2 - 1/2		850
	46	15.826	0.0 - 6318.7	$2s^22p^5 - 2s^22p^4(^3P)3s$	$g^2P^o - {}^4P$	3/2 - 3/2		850
	53	15.869	102.579 - 6404.4	$2s^22p^5 - 2s^22p^4(^1D)3s$	$g^2P^o - {}^2D$	1/2 - 3/2		850
	56	16.003	0.0 - 6248.8	$2s^22p^5 - 2s^22p^4(^3P)3s$	$g^2P^o - {}^2P$	3/2 - 3/2		850
	30	16.024	102.579 - 6343.6	$2s^22p^5 - 2s^22p^4(^3P)3s$	$g^2P^o - {}^2P$	1/2 - 1/2		850
	41	16.073	0.0 - 6221.6	$2s^22p^5 - 2s^22p^4(^3P)3s$	$g^2P^o - {}^4P$	3/2 - 5/2		850
	3	16.087	102.579 - 6318.7	$2s^22p^5 - 2s^22p^4(^3P)3s$	$g^2P^o - {}^4P$	1/2 - 3/2		850
	18	16.109	102.579 - 6310.3	$2s^22p^5 - 2s^22p^4(^3P)3s$	$g^2P^o - {}^4P$	1/2 - 1/2		850
	14	16.166	1064.697 - 7250.4	$2s2p^6 - 2s2p^53s$	${}^2S - {}^2P^o$	1/2 - 3/2		945
	3	16.270	102.579 - 6248.8	$2s^22p^5 - 2s^22p^4(^3P)3s$	$g^2P^o - {}^2P$	1/2 - 3/2		850
	16	16.306	1064.697 - 7197.3	$2s2p^6 - 2s2p^53s$	${}^2S - {}^2P^o$	1/2 - 1/2		945
	400	93.923	0.0 - 1064.697	$2s^22p^5 - 2s2p^6$	$g^2P^o - {}^2S$	3/2 - 1/2	P	1104,849

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	200	103.937	102.579 - 1064.697	$2s^22p^5 - 2s2p^6$	$g^2P^o - {}^2S$	$\frac{1}{2} - \frac{1}{2}$	P	1104,849
		974.86	0.0 - 102.579	$2s^22p^5 - 2s^22p^5$	$g^2P^o - g^2P^o$	$\frac{3}{2} - \frac{1}{2}$	F	442

IRON XIX (Fe^{+18}), Z = 26
Ground State $1s^22s^22p^4$ ($^3P_2$) (8 electrons)
Ionization Potential [11 740 000] cm^{-1}; [1456] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		1.918	0.0 - 52138.	$1s^22s^22p^4 - 1s2s^22p^5$	$g^3P - {}^3P^o$	2 - 2		429
		1.931	325.143 - 52138.	$1s^22s^22p^4 - 1s2s^22p^5$	$^1S - {}^3P^o$	0 - 1		956
	28	9.547	0.0 - 10472.8	$2s^22p^4 - 2s^22p^3(^2P^o)5d$	$g^3P - {}^1F^o$	2 - 3	Q	643
	35	9.599	0.0 - 10423.2	$2s^22p^4 - 2s^22p^3(^2P^o)5d$	$g^3P - {}^3F^o$	2 - 3	Q	643
	13	9.688	0.0 - 10322.0	$2s^22p^4 - 2s^22p^3(^2D^o)5d$	$g^3P - {}^3D^o$	2 - 3		945
	27	9.696	168.870 - 10482.6	$2s^22p^4 - 2s^22p^3(^2P^o)5d$	$^1D - {}^1P^o$	2 - 1		643
	14	9.705	168.870 - 10472.8	$2s^22p^4 - 2s^22p^3(^2P^o)5d$	$^1D - {}^1F^o$	2 - 3		945
	37	9.713	0.0 - 10294.6	$2s^22p^4 - 2s^22p^3(^2D^o)5d$	$g^3P - {}^3D^o$	2 - 2	Q	643
	13	9.724	0.0 - 10283.8	$2s^22p^4 - 2s^22p^3(^2D^o)5d$	$g^3P - {}^3F^o$	2 - 3		945
	17	9.752	168.870 - 10423.2	$2s^22p^4 - 2s^22p^3(^2P^o)5d$	$^1D - {}^3F^o$	2 - 3	Q	643
	4	9.766	89.439 - 10327.4	$2s^22p^4 - 2s^22p^3(^2D^o)5d$	$g^3P - {}^3S^o$	1 - 1	Q	945
	10	9.799	89.439 - 10294.6	$2s^22p^4 - 2s^22p^3(^2D^o)5d$	$g^3P - {}^3D^o$	1 - 2		945
	20	9.842	0.0 - 10163.0	$2s^22p^4 - 2s^22p^3(^4S^o)5d$	$g^3P - {}^3D^o$	2 - 3		945
	1	9.911	75.263 - 10165.0	$2s^22p^4 - 2s^22p^3(^4S^o)5d$	$g^3P - {}^3D^o$	0 - 1	P	945
	1	9.926	89.439 - 10164.0	$2s^22p^4 - 2s^22p^3(^4S^o)5d$	$g^3P - {}^3D^o$	1 - 2	P	945
	33	10.564	89.439 - 9555.6	$2s^22p^4 - 2s^22p^3(^2P^o)4d$	$g^3P - {}^3D^o$	1 - 2		945
	28	10.580	89.439 - 9541.2	$2s^22p^4 - 2s^22p^3(^2P^o)4d$	$g^3P - {}^3P^o$	1 - 1		945
	25	10.617	75.263 - 9494.2	$2s^22p^4 - 2s^22p^3(^2P^o)4d$	$g^3P - {}^3D^o$	0 - 1		945
	38	10.635	0.0 - 9402.9	$2s^22p^4 - 2s^22p^3(^2D^o)4d$	$g^3P - {}^3S^o$	2 - 1		945
	34	10.644	0.0 - 9395.0	$2s^22p^4 - 2s^22p^3(^2D^o)4d$	$g^3P - {}^3P^o$	2 - 2		945
	36	10.658	0.0 - 9382.6	$2s^22p^4 - 2s^22p^3(^2D^o)4d$	$g^3P - {}^3D^o$	2 - 3		945
	25	10.685	0.0 - 9358.9	$2s^22p^4 - 2s^22p^3(^2D^o)4d$	$g^3P - {}^3F^o$	2 - 3		945
	20	10.735	89.439 - 9402.9	$2s^22p^4 - 2s^22p^3(^2D^o)4d$	$g^3P - {}^3S^o$	1 - 1		945
	37	10.770	89.439 - 9374.5	$2s^22p^4 - 2s^22p^3(^2D^o)4d$	$g^3P - {}^3D^o$	1 - 2		945
	54	10.813	0.0 - 9248.1	$2s^22p^4 - 2s^22p^3(^4S^o)4d$	$g^3P - {}^3D^o$	2 - 3		945
	12	10.824	168.870 - 9407.6	$2s^22p^4 - 2s^22p^3(^2D^o)4d$	$^1D - {}^1D^o$	2 - 2		945
	20	10.851	325.143 - 9541.2	$2s^22p^4 - 2s^22p^3(^2P^o)4d$	$^1S - {}^3P^o$	0 - 1	Q	945
		10.907	75.263 - 9244.0	$2s^22p^4 - 2s^22p^3(^4S^o)4d$	$g^3P - {}^3D^o$	0 - 1		1094
	25	10.933	89.439 - 9236.1	$2s^22p^4 - 2s^22p^3(^4S^o)4d$	$g^3P - {}^3D^o$	1 - 2		945
	19	11.980	2134.121 - 10482.6	$2p^6 - 2s^22p^3(^2P^o)5d$	$^1S - {}^1P^o$	0 - 1	Q	945
	10	11.988	2134.121 - 10476.9	$2p^6 - 2s^22p^3(^2P^o)5d$	$^1S - {}^3P^o$	0 - 1		1089
	38	12.990	168.870 - 7867.1	$2s^22p^4 - 2s2p^4(^2D)3p$	$^1D - {}^1F^o$	2 - 3		945
	10	13.237	0.0 - 7553.8	$2s^22p^4 - 2s^22p^3(^2P^o)3d$	$g^3P - {}^3D^o$	2 - 2	Q	643
	11	13.264	0.0 - 7539.2	$2s^22p^4 - 2s^22p^3(^2P^o)3d$	$g^3P - {}^3D^o$	2 - 3		945
	55	13.397	89.439 - 7553.8	$2s^22p^4 - 2s^22p^3(^2P^o)3d$	$g^3P - {}^3D^o$	1 - 2		945
	48	13.424	0.0 - 7449.4	$2s^22p^4 - 2s^22p^3(^2D^o)3d$	$g^3P - {}^1F^o$	2 - 3		945
	43	13.440	89.439 - 7529.9	$2s^22p^4 - 2s^22p^3(^2P^o)3d$	$g^3P - {}^3D^o$	1 - 1		945
	59	13.464	0.0 - 7427.2	$2s^22p^4 - 2s^22p^3(^2D^o)3d$	$g^3P - {}^3S^o$	2 - 1		945
	55	13.504	0.0 - 7405.2	$2s^22p^4 - 2s^22p^3(^2D^o)3d$	$g^3P - {}^3P^o$	2 - 2		945
	75	13.520	0.0 - 7396.4	$2s^22p^4 - 2s^22p^3(^2D^o)3d$	$g^3P - {}^3D^o$	2 - 3		945
	42	13.555	89.439 - 7467.0	$2s^22p^4 - 2s^22p^3(^2P^o)3d$	$g^3P - {}^3P^o$	1 - 2		945
	25	13.607	922.908 - 8272.0	$2s2p^5 - 2s2p^4(^2D)3d$	$^3P^o - {}^3D$	2 - 3	Q	945
	10	13.631	89.439 - 7427.2	$2s^22p^4 - 2s^22p^3(^2D^o)3d$	$g^3P - {}^3S^o$	1 - 1	Q	146
	48	13.648	0.0 - 7327.6	$2s^22p^4 - 2s^22p^3(^2D^o)3d$	$g^3P - {}^3F^o$	2 - 3	Q	945
	51	13.669	1267.586 - 8583.3	$2s2p^5 - 2s2p^4(^2P)3d$	$^1P^o - {}^1D$	1 - 2		945
	45	13.700	1267.586 - 8566.8	$2s2p^5 - 2s2p^4(^2P)3d$	$^1P^o - {}^1P$	1 - 1		945
	45	13.735	984.760 - 168.870	$2s2p^5 - 2s^22p^4$	$^3P^o - {}^1D$	1 - 2		945
	2D	13.735	8265.4 - 168.870	$2s2p^4(^2D)3d - 2s^22p^4$	$^3D - {}^1D$	1 - 2		3D,45
	2P	13.750	0.0 - 7249.0	$2s^22p^4 - 2s^22p^3(^4S^o)3d$	$g^3P - {}^3D^o$	2 - 3		3D,77
	69	13.851	168.870 - 7388.6	$2s^22p^4 - 2s^22p^3(^2D^o)3d$	$^1D - {}^1D^o$	2 - 2	Q	643

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	48	13.936	922.908 - 8098.5	$2s2p^5 - 2s2p^4(^4P)3d$	$^3P^o - ^3D$	2 - 3		945
	43	14.021	984.760 - 8116.9	$2s2p^5 - 2s2p^4(^4P)3d$	$^3P^o - ^3P$	1 - 2		945
	12	14.293	325.143 - 7321.6	$2s^22p^4 - 2s^22p^3(^2D^o)3d$	$^1S - ^1P^o$	0 - 1	Q	464
	53	14.668	0.0 - 6817.6	$2s^22p^4 - 2s^22p^3(^2D^o)3s$	$g^3P - ^3D^o$	2 - 3		945
	49	14.706	168.870 - 6968.8	$2s^22p^4 - 2s^22p^3(^2P^o)3s$	$^1D - ^3P^o$	2 - 2	Q	945
	38	14.735	0.0 - 6787.8	$2s^22p^4 - 2s^22p^3(^2D^o)3s$	$g^3P - ^3D^o$	2 - 2		945
	21	14.806	168.870 - 6922.9	$2s^22p^4 - 2s^22p^3(^2P^o)3s$	$^1D - ^3P^o$	2 - 1	Q	945
	20	14.90	75.263 - 6789.2	$2s^22p^4 - 2s^22p^3(^2D^o)3s$	$g^3P - ^3D^o$	0 - 1	Q	736
	28	14.929	89.439 - 6787.8	$2s^22p^4 - 2s^22p^3(^2D^o)3s$	$g^3P - ^3D^o$	1 - 2		945
	33	14.966	0.0 - 6681.2	$2s^22p^4 - 2s^22p^3(^4S^o)3s$	$g^3P - ^3S^o$	2 - 1		945
	53	14.995	168.870 - 6837.7	$2s^22p^4 - 2s^22p^3(^2D^o)3s$	$^1D - ^1D^o$	2 - 2		945
	5	15.042	168.870 - 6817.6	$2s^22p^4 - 2s^22p^3(^2D^o)3s$	$^1D - ^3D^o$	2 - 3	Q	643
	11	15.111	168.870 - 6787.8	$2s^22p^4 - 2s^22p^3(^2D^o)3s$	$^1D - ^3D^o$	2 - 2	Q	945
	5	15.138	75.263 - 6681.2	$2s^22p^4 - 2s^22p^3(^4S^o)3s$	$g^3P - ^3S^o$	0 - 1		945
	26	15.172	89.439 - 6681.2	$2s^22p^4 - 2s^22p^3(^4S^o)3s$	$g^3P - ^3S^o$	1 - 1		945
	26	15.193	0.0 - 6580.0+K	$2s^22p^4 - 2s^22p^3(^4S^o)3s$	$g^3P - ^5S^o$	2 - 2	Q	945,680
	2	15.413	89.439 - 6580.0+K	$2s^22p^4 - 2s^22p^3(^4S^o)3s$	$g^3P - ^5S^o$	1 - 2	Q	643,680
	50	78.90	0.0 - 1267.586	$2s^22p^4 - 2s2p^5$	$g^3P - ^1P^o$	2 - 1		1091
	4	83.89	75.263 - 1267.586	$2s^22p^4 - 2s2p^5$	$g^3P - ^1P^o$	0 - 1		1091
	4	84.89	7405.2 - 8583.3	$2s^22p^3(^2D^o)3d - 2s2p^4(^2P)3d$	$^3P^o - ^1D$	2 - 2		1091
	4	87.02	984.760 - 2134.121	$2s2p^5 - 2p^6$	$^3P^o - ^1S$	1 - 0		1091
	250	91.02	168.870 - 1267.586	$2s^22p^4 - 2s2p^5$	$^1D - ^1P^o$	2 - 1		1091
	200	101.55	0.0 - 984.760	$2s^22p^4 - 2s2p^5$	$g^3P - ^3P^o$	2 - 1		1091
	50	106.12	325.143 - 1267.586	$2s^22p^4 - 2s2p^5$	$^1S - ^1P^o$	0 - 1		1091
	110	106.33	89.439 - 1030.019	$2s^22p^4 - 2s2p^5$	$g^3P - ^3P^o$	1 - 0		1091
	300	108.37	0.0 - 922.908	$2s^22p^4 - 2s2p^5$	$g^3P - ^3P^o$	2 - 2		1091
	110	109.97	75.263 - 984.760	$2s^22p^4 - 2s2p^5$	$g^3P - ^3P^o$	0 - 1		1091
	80	111.70	89.439 - 984.760	$2s^22p^4 - 2s2p^5$	$g^3P - ^3P^o$	1 - 1		1091
	150	115.42	1267.586 - 2134.121	$2s2p^5 - 2p^6$	$^1P^o - ^1S$	1 - 0		1091
	200	120.00	89.439 - 922.908	$2s^22p^4 - 2s2p^5$	$g^3P - ^3P^o$	1 - 2		1091
	50	132.63	168.870 - 922.908	$2s^22p^4 - 2s2p^5$	$^1D - ^3P^o$	2 - 2		1091
		307.56	0.0 - 325.143	$2s^22p^4 - 2s^22p^4$	$g^3P - ^1S$	2 - 0	F,P	375,1104
		424.26	89.439 - 325.143	$2s^22p^4 - 2s^22p^4$	$g^3P - ^1S$	1 - 0	F,P	375,1104
	150	592.24	0.0 - 168.870	$2s^22p^4 - 2s^22p^4$	$g^3P - ^1D$	2 - 2	F	437
		639.91	168.870 - 325.143	$2s^22p^4 - 2s^22p^4$	$^1D - ^1S$	2 - 0	F,P	375,1104
		1068.3	75.263 - 168.870	$2s^22p^4 - 2s^22p^4$	$g^3P - ^1D$	0 - 2	F,P	375,1104
		1118.07	0.0 - 89.439	$2s^22p^4 - 2s^22p^4$	$g^3P - g^3P$	2 - 1	F	442
		1259.0	89.439 - 168.870	$2s^22p^4 - 2s^22p^4$	$g^3P - ^1D$	1 - 2	F,P	375,1104
		1328.7	0.0 - 75.263	$2s^22p^4 - 2s^22p^4$	$g^3P - g^3P$	2 - 0	F,P	375,1104

IRON XX (Fe^{+19}), Z = 26

Ground State $1s^22s^22p^3$ ($^4S^o_{3/2}$) (7 electrons)

Ionization Potential [12 760 000] cm^{-1}; [1582] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		1.9051	323.18 - 175.80	$1s^22s^22p^3 - 1s^22s^22p^3$	$^2P^o - ^2D^o$	$\frac{3}{2} - \frac{1}{2}$		1059
	4	1.9051	52667. - 0.0	$1s2s^22p^4 - 1s^22s^22p^3$	$^2P - g^4S^o$	$\frac{5}{2} - \frac{3}{2}$		59
	3	1.9075	52425. - 52601.	$1s2s^22p^4 - 1s2s^22p^4$	$^4P - ^2D$	$\frac{3}{2} - \frac{3}{2}$		91
	38	9.065	0.0 - 11031.	$2s^22p^3 - 2s^22p^2(^3P)5d$	$g^4S^o - ^4P$	$\frac{3}{2} - \frac{3}{2}$		945
	21	9.073	138.29 - 11160.	$2s^22p^3 - 2s^22p^2(^1D)5d$	$^2D^o - ^2D$	$\frac{3}{2} - \frac{3}{2}$		945
	38	9.082	138.29 - 11152.	$2s^22p^3 - 2s^22p^2(^1D)5d$	$^2D^o - ^2D$	$\frac{3}{2} - \frac{5}{2}$	Q	643
	41	9.110	0.0 - 10977.	$2s^22p^3 - 2s^22p^2(^3P)5d$	$g^4S^o - ^4F$	$\frac{3}{2} - \frac{5}{2}$		945
	28	9.163	0.0 - 10913.	$2s^22p^3 - 2s^22p^2(^3P)5d$	$g^4S^o - ^4P$	$\frac{3}{2} - \frac{5}{2}$		945
	28	9.199	175.80 - 11046.	$2s^22p^3 - 2s^22p^2(^3P)5d$	$^2D^o - ^2F$	$\frac{5}{2} - \frac{7}{2}$		945
	26	9.208	175.80 - 11036.	$2s^22p^3 - 2s^22p^2(^3P)5d$	$^2D^o - ^2D$	$\frac{5}{2} - \frac{5}{2}$		945
	28	9.220	323.18 - 11169.	$2s^22p^3 - 2s^22p^2(^1D)5d$	$^2P^o - ^2F$	$\frac{3}{2} - \frac{5}{2}$		945
	37	9.231	323.18 - 11152.	$2s^22p^3 - 2s^22p^2(^1D)5d$	$^2P^o - ^2D$	$\frac{3}{2} - \frac{5}{2}$	Q	643
	18	9.331	323.18 - 11036.	$2s^22p^3 - 2s^22p^2(^3P)5d$	$^2P^o - ^2D$	$\frac{3}{2} - \frac{5}{2}$	Q	643
	18	9.344	323.18 - 11027.	$2s^22p^3 - 2s^22p^2(^3P)5d$	$^2P^o - ^4D$	$\frac{3}{2} - \frac{5}{2}$	Q	643
	33	9.364	323.18 - 11000.	$2s^22p^3 - 2s^22p^2(^3P)5d$	$^2P^o - ^2F$	$\frac{3}{2} - \frac{5}{2}$	Q	643

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	41	9.389	323.18 - 10977.	$2s^22p^3 - 2s^22p^2(^3P)5d$	$^2P^o - ^4F$	3/2 - 5/2	Q	643
	37	9.440	323.18 - 10913.	$2s^22p^3 - 2s^22p^2(^3P)5d$	$^2P^o - ^4P$	3/2 - 5/2	Q	643
	5	9.871	0.0 - 10130.	$2s^22p^3 - 2s^22p^2(^1D)4d$	$g^4S^o - ^2D$	3/2 - 5/2	Q	945
	11	9.953	0.0 - 10043.	$2s^22p^3 - 2s^22p^2(^3P)4d$	$g^4S^o - ^2D$	3/2 - 5/2	Q	643
	21	9.981	0.0 - 10020.	$2s^22p^3 - 2s^22p^2(^3P)4d$	$g^4S^o - ^2D$	3/2 - 3/2	Q	643
	27	9.991	0.0 - 10009.	$2s^22p^3 - 2s^22p^2(^3P)4d$	$g^4S^o - ^4P$	3/2 - 5/2		945
	20	10.008	138.29 - 10130.	$2s^22p^3 - 2s^22p^2(^1D)4d$	$^2D^o - ^2D$	3/2 - 5/2		945
	62	10.034	175.80 - 10142.	$2s^22p^3 - 2s^22p^2(^1D)4d$	$^2D^o - ^2D$	5/2 - 5/2		945
	78	10.047	175.80 - 10130.	$2s^22p^3 - 2s^22p^2(^1D)4d$	$^2D^o - ^2D$	5/2 - 5/2		643
	25	10.058	0.0 - 9942.3	$2s^22p^3 - 2s^22p^2(^3P)4d$	$g^4S^o - ^4F$	3/2 - 5/2		945
	25	10.095	138.29 - 10043.	$2s^22p^3 - 2s^22p^2(^3P)4d$	$^2D^o - ^2D$	3/2 - 5/2	Q	643
	42	10.116	138.29 - 10020.	$2s^22p^3 - 2s^22p^2(^3P)4d$	$^2D^o - ^2D$	3/2 - 3/2	Q	643
	25	10.121	0.0 - 9880.5	$2s^22p^3 - 2s^22p^2(^3P)4d$	$g^4S^o - ^4P$	3/2 - 5/2		945
	52	10.128	138.29 - 10009.	$2s^22p^3 - 2s^22p^2(^3P)4d$	$^2D^o - ^4P$	3/2 - 5/2	Q	643
	22	10.159	175.80 - 10020.	$2s^22p^3 - 2s^22p^2(^3P)4d$	$^2D^o - ^2F$	5/2 - 5/2		945
	20	10.177	138.29 - 9964.5	$2s^22p^3 - 2s^22p^2(^3P)4d$	$^2D^o - ^2F$	3/2 - 5/2		945
	22	10.222	260.09 - 10043.	$2s^22p^3 - 2s^22p^2(^3P)4d$	$^2P^o - ^2D$	1/2 - 3/2		945
	27	10.322	323.18 - 10009.	$2s^22p^3 - 2s^22p^2(^3P)4d$	$^2P^o - ^4P$	3/2 - 5/2	Q	643
	27	10.344	323.18 - 9992.0	$2s^22p^3 - 2s^22p^2(^3P)4d$	$^2P^o - ^4D$	3/2 - 5/2	Q	643
	126	12.393	752.73 - 8821.3	$2s2p^4 - 2s2p^3(^3D^o)3d$	$^4P - ^4P^o$	5/2 - 5/2	Q	643
	36	12.494	820.68 - 8821.3	$2s2p^4 - 2s2p^3(^3D^o)3d$	$^4P - ^4P^o$	3/2 - 5/2	Q	945
	30	12.763	138.29 - 7973.4	$2s^22p^3 - 2s^22p^2(^1D)3d$	$^2D^o - ^2F$	3/2 - 5/2		945
	115	12.812	752.73 - 8557.2	$2s2p^4 - 2s2p^3(^3D^o)3d$	$^4P - ^2F^o$	5/2 - 7/2	Q	643
	48	12.818	0.0 - 7801.5	$2s^22p^3 - 2s^22p^2(^3P)3d$	$g^4S^o - ^4P$	3/2 - 5/2		945
	107	12.834	175.80 - 7967.3	$2s^22p^3 - 2s^22p^2(^1D)3d$	$^2D^o - ^2P$	5/2 - 3/2		643
	30	12.857	138.29 - 7916.1	$2s^22p^3 - 2s^22p^2(^1D)3d$	$^2D^o - ^2D$	3/2 - 3/2		945
	44	12.888	175.80 - 7935.0	$2s^22p^3 - 2s^22p^2(^1D)3d$	$^2D^o - ^2F$	5/2 - 7/2		945
	108	12.909	752.73 - 8499.3	$2s2p^4 - 2s2p^3(^3D^o)3d$	$^4P - ^4S^o$	5/2 - 3/2		643
	55	12.924	175.80 - 7913.3	$2s^22p^3 - 2s^22p^2(^1D)3d$	$^2D^o - ^2D$	5/2 - 5/2		945
	49	12.946	323.18 - 8047.6	$2s^22p^3 - 2s^22p^2(^1S)3d$	$^2P^o - ^2D$	3/2 - 5/2		945
		12.958	752.73 - 8470.0	$2s2p^4 - 2s2p^3(^3D^o)3d$	$^4P - ^4D^o$	5/2 - 7/2	P	945
	60	12.970	175.80 - 7884.9	$2s^22p^3 - 2s^22p^2(^1D)3d$	$^2D^o - ^2G$	5/2 - 7/2	Q	643
	80	12.983	138.29 - 7843.6	$2s^22p^3 - 2s^22p^2(^3P)3d$	$^2D^o - ^2D$	3/2 - 5/2		643
	72	12.995	752.73 - 8447.9	$2s2p^4 - 2s2p^3(^3D^o)3d$	$^4P - ^4D^o$	5/2 - 5/2		643
	60	13.07	323.18 - 7974.6	$2s^22p^3 - 2s^22p^2(^1D)3d$	$^2P^o - ^2S$	3/2 - 1/2		736
	53	13.082	175.80 - 7819.9	$2s^22p^3 - 2s^22p^2(^3P)3d$	$^2D^o - ^2F$	5/2 - 7/2		945
		13.111	1042.21 - 8669.6	$2s2p^4 - 2s2p^3(^3P^o)3d$	$^2D - ^2D^o$	3/2 - 5/2	P	945
	37	13.138	1058.13 - 8669.6	$2s2p^4 - 2s2p^3(^3P^o)3d$	$^2D - ^2D^o$	5/2 - 5/2		945
	30	13.159	1058.13 - 8657.5	$2s2p^4 - 2s2p^3(^3P^o)3d$	$^2D - ^2F^o$	5/2 - 7/2		945
	2	13.183	138.29 - 7725.4	$2s^22p^3 - 2s^22p^2(^3P)3d$	$^2D^o - ^2P$	3/2 - 3/2		643
	23	13.194	1242.08 - 8821.3	$2s2p^4 - 2s2p^3(^3D^o)3d$	$^2P - ^4P^o$	3/2 - 3/2		945
	182	13.232	1242.08 - 8801.4	$2s2p^4 - 2s2p^3(^1D^o)3d$	$^2P - ^2F^o$	3/2 - 5/2	Q	1067
	23	13.247	175.80 - 7725.4	$2s^22p^3 - 2s^22p^2(^3P)3d$	$^2D^o - ^2P$	5/2 - 3/2		945
		13.279	1194.85 - 8725.5	$2s2p^4 - 2s2p^3(^5S^o)3d$	$^2S - ^4D^o$	1/2 - 3/2	P	945
		13.292	1339.68 - 8863.0	$2s2p^4 - 2s2p^3(^1D^o)3d$	$^2P - ^2S^o$	1/2 - 1/2	P	945
	49	13.298	323.18 - 7843.6	$2s^22p^3 - 2s^22p^2(^3P)3d$	$^2P^o - ^2D$	3/2 - 5/2		643
		13.329	1058.13 - 8560.6	$2s2p^4 - 2s2p^3(^3D^o)3d$	$^2D - ^2F^o$	5/2 - 5/2	P	945
		13.335	1058.13 - 8557.2	$2s2p^4 - 2s2p^3(^3D^o)3d$	$^2D - ^2F^o$	5/2 - 7/2	P	945
	50	13.361	752.73 - 8237.2	$2s2p^4 - 2s2p^3(^5S^o)3d$	$^4P - ^4D^o$	5/2 - 7/2	P	945,736
	3	13.387	260.09 - 7731.4	$2s^22p^3 - 2s^22p^2(^3P)3d$	$^2P^o - ^2P$	1/2 - 1/2	Q	643
	59	13.464	1242.08 - 8669.6	$2s2p^4 - 2s2p^3(^3P^o)3d$	$^2P - ^2D^o$	3/2 - 5/2		945
	45	13.735	0.0 - 7280.1	$2s^22p^3 - 2s^22p^2(^3P)3s$	$g^4S^o - ^4P$	3/2 - 5/2		945
	51	13.770	1242.08 - 8506.6	$2s2p^4 - 2s2p^3(^3D^o)3d$	$^2P - ^2D^o$	3/2 - 5/2		643
	0	13.780	175.80 - 7433.5	$2s^22p^3 - 2s^22p^2(^1D)3s$	$^2D^o - ^2D$	5/2 - 5/2	Q	643
		13.810	175.80 - 7416.9	$2s^22p^3 - 2s^22p^2(^1D)3s$	$^2D^o - ^2D$	5/2 - 3/2	P	945
		13.818	0.0 - 7236.9	$2s^22p^3 - 2s^22p^2(^3P)3s$	$g^4S^o - ^4P$	3/2 - 3/2	P	945
		13.945	0.0 - 7171.0	$2s^22p^3 - 2s^22p^2(^3P)3s$	$g^4S^o - ^4P$	3/2 - 1/2	P	945
		14.009	175.80 - 7314.1	$2s^22p^3 - 2s^22p^2(^3P)3s$	$^2D^o - ^2P$	5/2 - 3/2	P	945
		14.014	138.29 - 7274.0	$2s^22p^3 - 2s^22p^2(^3P)3s$	$^2D^o - ^2P$	3/2 - 1/2	P	945
	30	14.064	323.18 - 7433.5	$2s^22p^3 - 2s^22p^2(^1D)3s$	$^2P^o - ^2D$	3/2 - 3/2		945
	75	14.387	323.18 - 7274.0	$2s^22p^3 - 2s^22p^2(^3P)3s$	$^2P^o - ^2P$	3/2 - 1/2	Q	643
	7	16.935	1954.15 - 7859.5	$2p^5 - 2s^22p^2(^3P)3d$	$^2P^o - ^2D$	3/2 - 5/2	Q	979
	13	17.660	2061.73 - 7725.4	$2p^5 - 2s^22p^2(^3P)3d$	$^2P^o - ^2P$	1/2 - 3/2	Q	979
	10	80.51	0.0 - 1242.08	$2s^22p^3 - 2s2p^4$	$g^4S^o - ^2P$	3/2 - 3/2		1091
	4	80.59	7416.9 - 8657.5	$2s^22p^2(^1D)3s - 2s2p^3(^3P^o)3d$	$^2D - ^2F^o$	5/2 - 7/2		1091

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	50	83.24	138.29 - 1339.68	$2s^22p^3 - 2s2p^4$	${}^2D^o - {}^2P$	$\frac{3}{2} - \frac{1}{2}$		1091
	4	83.69	0.0 - 1194.85	$2s^22p^3 - 2s2p^4$	$g\,{}^4S^o - {}^2S$	$\frac{3}{2} - \frac{1}{2}$		1091
	4	88.24	820.68 - 1954.15	$2s2p^4 - 2p^5$	${}^4P - {}^2P^o$	$\frac{3}{2} - \frac{3}{2}$		1091
	50	90.60	138.29 - 1242.08	$2s^22p^3 - 2s2p^4$	${}^2D^o - {}^2P$	$\frac{3}{2} - \frac{3}{2}$		1091
	4	92.63	260.09 - 1339.68	$2s^22p^3 - 2s2p^4$	${}^2P^o - {}^2P$	$\frac{1}{2} - \frac{1}{2}$		1091
	200	93.78	175.80 - 1242.08	$2s^22p^3 - 2s2p^4$	${}^2D^o - {}^2P$	$\frac{5}{2} - \frac{3}{2}$		1091
	80	94.64	138.29 - 1194.85	$2s^22p^3 - 2s2p^4$	${}^2D^o - {}^2S$	$\frac{3}{2} - \frac{1}{2}$		1091
	10	95.95	0.0 - 1042.21	$2s^22p^3 - 2s2p^4$	$g\,{}^4S^o - {}^2D$	$\frac{3}{2} - \frac{3}{2}$		1091
	50	98.09	1042.21 - 2061.73	$2s2p^4 - 2p^5$	${}^2D - {}^2P^o$	$\frac{3}{2} - \frac{1}{2}$		1091
	250	98.38	323.18 - 1339.68	$2s^22p^3 - 2s2p^4$	${}^2P^o - {}^2P$	$\frac{3}{2} - \frac{1}{2}$		1091
	30	101.83	260.09 - 1242.08	$2s^22p^3 - 2s2p^4$	${}^2P^o - {}^2P$	$\frac{1}{2} - \frac{3}{2}$		1091
		106.173	7859.5 - 8801.4	$2s^22p^2({}^3P)3d - 2s2p^3({}^1D^o)3d$	${}^2D - {}^2F^o$	$\frac{3}{2} - \frac{5}{2}$	Q	900
	80	106.98	260.09 - 1194.85	$2s^22p^3 - 2s2p^4$	${}^2P^o - {}^2S$	$\frac{1}{2} - \frac{1}{2}$		1091
	50	108.83	323.18 - 1242.08	$2s^22p^3 - 2s2p^4$	${}^2P^o - {}^2P$	$\frac{3}{2} - \frac{3}{2}$		1091
	50	109.66	1042.21 - 1954.15	$2s2p^4 - 2p^5$	${}^2D - {}^2P^o$	$\frac{3}{2} - \frac{3}{2}$		1091
	200	110.63	138.29 - 1042.21	$2s^22p^3 - 2s2p^4$	${}^2D^o - {}^2D$	$\frac{3}{2} - \frac{3}{2}$		1091
	110	111.60	1058.13 - 1954.15	$2s2p^4 - 2p^5$	${}^2D - {}^2P^o$	$\frac{5}{2} - \frac{3}{2}$		1091
	300	113.34	175.80 - 1058.13	$2s^22p^3 - 2s2p^4$	${}^2D^o - {}^2D$	$\frac{5}{2} - \frac{5}{2}$		1091
	27	113.45	8058.7 - 8940.3	$2s^22p^2({}^1S)3d - 2s2p^3({}^1P^o)3d$	${}^2D - {}^2F^o$	$\frac{3}{2} - \frac{5}{2}$	Q	390
	4	114.72	323.18 - 1194.85	$2s^22p^3 - 2s2p^4$	${}^2P^o - {}^2S$	$\frac{3}{2} - \frac{1}{2}$		1091
	200	118.66	0.0 - 842.74	$2s^22p^3 - 2s2p^4$	$g\,{}^4S^o - {}^4P$	$\frac{3}{2} - \frac{1}{2}$		1091
	29	120.89	7973.4 - 8800.5	$2s^22p^2({}^1D)3d - 2s2p^3({}^1D^o)3d$	${}^2F - {}^2F^o$	$\frac{5}{2} - \frac{7}{2}$	Q	390
	150	121.83	0.0 - 820.68	$2s^22p^3 - 2s2p^4$	$g\,{}^4S^o - {}^4P$	$\frac{3}{2} - \frac{3}{2}$		1091
	30	122.00	1242.08 - 2061.73	$2s2p^4 - 2p^5$	${}^2P - {}^2P^o$	$\frac{3}{2} - \frac{1}{2}$		1091
	4	127.86	260.09 - 1042.21	$2s^22p^3 - 2s2p^4$	${}^2P^o - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		1091
	10	131.70	1194.85 - 1954.15	$2s2p^4 - 2p^5$	${}^2S - {}^2P^o$	$\frac{1}{2} - \frac{3}{2}$		1091
	325	132.67	8047.6 - 8801.4	$2s^22p^2({}^1S)3d - 2s2p^3({}^1D^o)3d$	${}^2D - {}^2F^o$	$\frac{5}{2} - \frac{5}{2}$	Q	390
	300	132.85	0.0 - 752.73	$2s^22p^3 - 2s2p^4$	$g\,{}^4S^o - {}^4P$	$\frac{3}{2} - \frac{5}{2}$		1091
	30	136.06	323.18 - 1058.13	$2s^22p^3 - 2s2p^4$	${}^2P^o - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		1091
	10	138.49	1339.68 - 2061.73	$2s2p^4 - 2p^5$	${}^2P - {}^2P^o$	$\frac{1}{2} - \frac{1}{2}$		1091
	43	139.47	7843.6 - 8560.6	$2s^22p^2({}^3P)3d - 2s2p^3({}^3D^o)3d$	${}^2D - {}^2F^o$	$\frac{5}{2} - \frac{5}{2}$	Q	390
	50	140.44	1242.08 - 1954.15	$2s2p^4 - 2p^5$	${}^2P - {}^2P^o$	$\frac{3}{2} - \frac{3}{2}$		1091
		309.4	0.0 - 323.18	$2s^22p^3 - 2s^22p^3$	$g\,{}^4S^o - {}^2P^o$	$\frac{3}{2} - \frac{3}{2}$	F,P	375,1091
		384.5	0.0 - 260.09	$2s^22p^3 - 2s^22p^3$	$g\,{}^4S^o - {}^2P^o$	$\frac{3}{2} - \frac{1}{2}$	F,P	375,1091
		540.9	138.29 - 323.18	$2s^22p^3 - 2s^22p^3$	${}^2D^o - {}^2P^o$	$\frac{3}{2} - \frac{3}{2}$	F,P	375,1091
		569.	0.0 - 175.80	$2s^22p^3 - 2s^22p^3$	$g\,{}^4S^o - {}^2D^o$	$\frac{3}{2} - \frac{5}{2}$	F,P	375,1091
		678.5	175.80 - 323.18	$2s^22p^3 - 2s^22p^3$	${}^2D^o - {}^2P^o$	$\frac{5}{2} - \frac{3}{2}$	F,P	375,1091
		723.1	0.0 - 138.29	$2s^22p^3 - 2s^22p^3$	$g\,{}^4S^o - {}^2D^o$	$\frac{3}{2} - \frac{3}{2}$	F,P	375,1091
		821.0	138.29 - 260.09	$2s^22p^3 - 2s^22p^3$	${}^2D^o - {}^2P^o$	$\frac{3}{2} - \frac{1}{2}$	F,P	375,1091
		1186.	175.80 - 260.09	$2s^22p^3 - 2s^22p^3$	${}^2D^o - {}^2P^o$	$\frac{5}{2} - \frac{1}{2}$	F,P	375,1091
		1585.0	260.09 - 323.18	$2s^22p^3 - 2s^22p^3$	${}^2P^o - {}^2P^o$	$\frac{1}{2} - \frac{3}{2}$	F	1082

IRON XXI (Fe^{+20}), Z = 26

Ground State $1s^22s^22p^2$ (${}^3P_0$) (6 electrons)

Ionization Potential [13 620 000] cm^{-1}; [1689] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		1.8916	243.94 - 53100.	$1s^22s^22p^2 - 1s2s^22p^3$	${}^1D - {}^1P^o$	2 - 1		1059
		1.8942	73.851 - 52870.	$1s^22s^22p^2 - 1s2s^22p^3$	$g\,{}^3P - {}^3S^o$	1 - 1		1059
		1.8966	117.240 - 52840.	$1s^22s^22p^2 - 1s2s^22p^3$	$g\,{}^3P - {}^3D^o$	2 - 3		1059
	18	8.472	0.0 - 11809.6	$1s^22s^22p^2 - 1s^22s^22p5d$	$g\,{}^3P - {}^3P^o$	0 - 1	Q	643
	21	8.521	73.851 - 11809.6	$1s^22s^22p^2 - 1s^22s^22p5d$	$g\,{}^3P - {}^3P^o$	1 - 1		945
	21	8.558	73.851 - 11758.8	$1s^22s^22p^2 - 1s^22s^22p5d$	$g\,{}^3P - {}^3D^o$	1 - 2		945
	26	8.590	117.240 - 11758.8	$1s^22s^22p^2 - 1s^22s^22p5d$	$g\,{}^3P - {}^3D^o$	2 - 2	Q	643
		8.610	73.851 - 11688.3	$1s^22s^22p^2 - 1s^22s^22p5d$	$g\,{}^3P - {}^3P^o$	1 - 2	P	945
	18	8.643	117.240 - 11687.3	$1s^22s^22p^2 - 1s^22s^22p5d$	$g\,{}^3P - {}^3F^o$	2 - 3		946
	22	8.741	371.52 - 11809.6	$1s^22s^22p^2 - 1s^22s^22p5d$	${}^1S - {}^3P^o$	0 - 1	Q	643

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	33	9.355	0.0 - 10688.4	$1s^22s^22p^2 - 1s^22s^22p4d$	$g^3P - ^3P^o$	0 - 1		643
	19	9.421	73.851 - 10688.4	$1s^22s^22p^2 - 1s^22s^22p4d$	$g^3P - ^3P^o$	1 - 1		945
	26	9.433	73.851 - 10674.9	$1s^22s^22p^2 - 1s^22s^22p4d$	$g^3P - ^1D^o$	1 - 2		945
	34	9.451	73.851 - 10654.7	$1s^22s^22p^2 - 1s^22s^22p4d$	$g^3P - ^3D^o$	1 - 2		945
	50	9.460	117.240 - 10688.1	$1s^22s^22p^2 - 1s^22s^22p4d$	$g^3P - ^3D^o$	2 - 3		945
	32	9.475	117.240 - 10674.9	$1s^22s^22p^2 - 1s^22s^22p4d$	$g^3P - ^1D^o$	2 - 2	Q	643
	46	9.518	73.851 - 10580.3	$1s^22s^22p^2 - 1s^22s^22p4d$	$g^3P - ^3P^o$	1 - 2		945
	21	9.559	117.240 - 10580.3	$1s^22s^22p^2 - 1s^22s^22p4d$	$g^3P - ^3P^o$	2 - 2	Q	643
	55	9.581	243.94 - 10681.0	$1s^22s^22p^2 - 1s^22s^22p4d$	$^1D - ^1F^o$	2 - 3		945
	36	11.219	1740.42 - 10654.7	$1s^22p^4 - 1s^22s^22p4d$	$^3P - ^3D^o$	1 - 2	Q	643
	5	12.088	942.27 - 9214.8	$1s^22s2p^3 - 1s^22s2p^2(^2P)3d$	$^3P^o - ^1D$	2 - 2	Q	945
	1	12.145	0.0 - 8232.9	$1s^22s^22p^2 - 1s^22s^22p3d$	$g^3P - ^3P^o$	0 - 1	Q	643
	23	12.201	803.82 - 8999.7	$1s^22s2p^3 - 1s^22s2p^2(^2P)3d$	$^3D^o - ^3D$	3 - 3	Q	945
	40	12.248	73.851 - 8238.4	$1s^22s^22p^2 - 1s^22s^22p3d$	$g^3P - ^3P^o$	1 - 2	Q	945
	64	12.264	73.851 - 8227.8	$1s^22s^22p^2 - 1s^22s^22p3d$	$g^3P - ^3P^o$	1 - 0		945
	37	12.291	486.94 - 8623.0	$1s^22s2p^3 - 1s^22s2p^2(^4P)3d$	$^5S^o - ^5P$	2 - 2		945
		12.312	486.94 - 8609.1+F	$1s^22s2p^3 - 1s^22s2p^2(^4P)3d$	$^5S^o - ^5P$	2 - 3	P	945
	37	12.322	117.240 - 8232.9	$1s^22s^22p^2 - 1s^22s^22p3d$	$g^3P - ^3P^o$	2 - 1		945,1094
		12.346	777.30 - 8876.8	$1s^22s2p^3 - 1s^22s2p^2(^2D)3d$	$^3D^o - ^3D$	2 - 3	P	945
	27	12.355	777.30 - 8871.3	$1s^22s2p^3 - 1s^22s2p^2(^2D)3d$	$^3D^o - ^3D$	2 - 2		945
	5	12.371	777.30 - 8861.2	$1s^22s2p^3 - 1s^22s2p^2(^2D)3d$	$^3D^o - ^3F$	2 - 3	P	945,856
	54	12.387	803.82 - 8876.8	$1s^22s2p^3 - 1s^22s2p^2(^2D)3d$	$^3D^o - ^3D$	3 - 3	Q	945
	16	12.398	803.82 - 8869.0	$1s^22s2p^3 - 1s^22s2p^2(^2D)3d$	$^3D^o - ^3F$	3 - 4	Q	464
	38	12.411	803.82 - 8861.2	$1s^22s2p^3 - 1s^22s2p^2(^2D)3d$	$^3D^o - ^3F$	3 - 3		945
	41	12.429	243.94 - 8289.6	$1s^22s^22p^2 - 1s^22s^22p3d$	$^1D - ^1P^o$	2 - 1		945
	84	12.436	243.94 - 8285.1	$1s^22s^22p^2 - 1s^22s^22p3d$	$^1D - ^1F^o$	2 - 3		643
		12.451	1126.53 - 9158.4	$1s^22s2p^3 - 1s^22s2p^2(^2P)3d$	$^1D^o - ^1F$	2 - 3	P	945
	37	12.463	942.27 - 8966.0	$1s^22s2p^3 - 1s^22s2p^2(^2P)3d$	$^3P^o - ^3F$	2 - 3		945
		12.519	73.851 - 8061.6+B	$1s^22s^22p^2 - 1s^22s^22p3d$	$g^3P - ^3F^o$	1 - 2	P	949
	36	12.548	942.27 - 8911.6	$1s^22s2p^3 - 1s^22s2p^2(^2D)3d$	$^3P^o - ^1F$	2 - 3	Q	945
	30	12.575	1260.65 - 9214.8	$1s^22s2p^3 - 1s^22s2p^2(^2P)3d$	$^1P^o - ^1D$	1 - 2	Q	464
	40	12.581	777.30 - 8725.9	$1s^22s2p^3 - 1s^22s2p^2(^4P)3d$	$^3D^o - ^3D$	2 - 3		945
	107	12.586	924.85 - 8871.3	$1s^22s2p^3 - 1s^22s2p^2(^2D)3d$	$^3P^o - ^3D$	1 - 2	Q	643
	53	12.606	942.27 - 8876.8	$1s^22s2p^3 - 1s^22s2p^2(^2D)3d$	$^3P^o - ^3D$	2 - 3		643
	44	12.623	803.82 - 8725.9	$1s^22s2p^3 - 1s^22s2p^2(^4P)3d$	$^3D^o - ^3D$	3 - 3	Q	643
	18	12.681	803.82 - 8689.6	$1s^22s2p^3 - 1s^22s2p^2(^4P)3d$	$^3D^o - ^3F$	3 - 4		945
		12.699	777.30 - 8652.0+F	$1s^22s2p^3 - 1s^22s2p^2(^4P)3d$	$^3D^o - ^3F$	2 - 3	P	945
	22	12.714	243.94 - 8109.3	$1s^22s^22p^2 - 1s^22s^22p3d$	$^1D - ^1D^o$	2 - 2		945
	1	12.726	371.52 - 8232.9	$1s^22s^22p^2 - 1s^22s^22p3d$	$^1S - ^3P^o$	0 - 1	Q	643
	32	12.743	776.78 - 8623.3	$1s^22s2p^3 - 1s^22s2p^2(^4P)3d$	$^3D^o - ^3F$	1 - 2		945
	1	12.756	1126.53 - 8966.0	$1s^22s2p^3 - 1s^22s2p^2(^2P)3d$	$^1D^o - ^3F$	2 - 3	Q	643
		12.777	1126.53 - 8953.1+F	$1s^22s2p^3 - 1s^22s2p^2(^2D)3d$	$^1D^o - ^1D$	2 - 2	P	945
	52	12.789	803.82 - 8623.3	$1s^22s2p^3 - 1s^22s2p^2(^4P)3d$	$^3D^o - ^3F$	3 - 2	Q	643
		12.796	243.94 - 8061.6+B	$1s^22s^22p^2 - 1s^22s^22p3d$	$^1D - ^3F^o$	2 - 2	P	949
	60	13.07	117.240 - 7768.4	$1s^22s^22p^2 - 1s^22s2p^23p$	$g^3P - ^3P^o$	2 - 2		736
	53	13.146	117.240 - 7724.9	$1s^22s^22p^2 - 1s^22s2p^23p$	$g^3P - ^3P^o$	2 - 1	Q	643
	230	17.617	2047.76 - 7724.9	$1s^22p^4 - 1s^22s2p^23p$	$^1S - ^3P^o$	0 - 1	Q	1067
	4	84.26	73.851 - 1260.65	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^1P^o$	1 - 1		1091
	4	86.26	486.94 - 1646.26	$1s^22s2p^3 - 1s^22p^4$	$^5S^o - ^3P$	2 - 2		1091
	30	91.28	0.0 - 1095.52	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^3S^o$	0 - 1		1091
		96.12	776.78 - 1817.14	$1s^22s2p^3 - 1s^22p^4$	$^3D^o - ^1D$	1 - 2	P	955
	80	97.88	73.851 - 1095.52	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^3S^o$	1 - 1		1091
	250	98.36	243.94 - 1260.65	$1s^22s^22p^2 - 1s^22s2p^3$	$^1D - ^1P^o$	2 - 1		1091
	30	98.69	803.82 - 1817.14	$1s^22s2p^3 - 1s^22p^4$	$^3D^o - ^1D$	3 - 2		1091
	30	99.08	117.240 - 1126.53	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^1D^o$	2 - 2		1091
	150	102.22	117.240 - 1095.52	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^3S^o$	2 - 1		1091
	30	103.77	776.78 - 1740.42	$1s^22s2p^3 - 1s^22p^4$	$^3D^o - ^3P$	1 - 1		1091
	50	103.83	777.30 - 1740.42	$1s^22s2p^3 - 1s^22p^4$	$^3D^o - ^3P$	2 - 1		1091
	30	104.29	776.78 - 1735.67	$1s^22s2p^3 - 1s^22p^4$	$^3D^o - ^3P$	1 - 0		1091
		105.01	1095.52 - 2047.76	$1s^22s2p^3 - 1s^22p^4$	$^3S^o - ^1S$	1 - 0	P	955
	10	108.12	0.0 - 924.85	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^3P^o$	0 - 1		1091
	50	112.47	371.52 - 1260.65	$1s^22s^22p^2 - 1s^22s2p^3$	$^1S - ^1P^o$	0 - 1		1091
	300	113.30	243.94 - 1126.53	$1s^22s^22p^2 - 1s^22s2p^3$	$^1D - ^1D^o$	2 - 2		1091
	4	114.30	942.27 - 1817.14	$1s^22s2p^3 - 1s^22p^4$	$^3P^o - ^1D$	2 - 2		1091
	10	115.01	776.78 - 1646.26	$1s^22s2p^3 - 1s^22p^4$	$^3D^o - ^3P$	1 - 2		1091

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	30	115.08	777.30 - 1646.26	$1s^22s2p^3 - 1s^22p^4$	$^3D^o - ^3P$	2 - 2		1091
	50	115.15	73.851 - 942.27	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^3P^o$	1 - 2		1091
	110	117.51	73.851 - 924.85	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^3P^o$	1 - 1		1091
	50	118.69	73.851 - 916.38	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^3P^o$	1 - 0		1091
	150	118.71	803.82 - 1646.26	$1s^22s2p^3 - 1s^22p^4$	$^3D^o - ^3P$	3 - 2		1091
	200	121.21	117.240 - 942.27	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^3P^o$	2 - 2		1091
	4	121.36	916.38 - 1740.42	$1s^22s2p^3 - 1s^22p^4$	$^3P^o - ^1P$	0 - 1		1091
	10	123.33	924.85 - 1735.67	$1s^22s2p^3 - 1s^22p^4$	$^3P^o - ^3P$	1 - 0		1091
	4	123.83	117.240 - 924.85	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^3P^o$	2 - 1		1091
	30	125.29	942.27 - 1740.42	$1s^22s2p^3 - 1s^22p^4$	$^3P^o - ^3P$	2 - 1		1091
	30	127.04	1260.65 - 2047.76	$1s^22s2p^3 - 1s^22p^4$	$^1P^o - ^1S$	1 - 0		1091
	80	128.73	0.0 - 776.78	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^3D^o$	0 - 1		1091
		138.57	1095.52 - 1817.14	$1s^22s2p^3 - 1s^22p^4$	$^3S^o - ^1D$	1 - 2	P	955
	4	138.61	924.85 - 1646.26	$1s^22s2p^3 - 1s^22p^4$	$^3P^o - ^3P$	1 - 2		1091
	80	142.05	942.27 - 1646.26	$1s^22s2p^3 - 1s^22p^4$	$^3P^o - ^3P$	2 - 2		1091
	110	142.16	73.851 - 777.30	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^3D^o$	1 - 2		1091
	4	142.27	73.851 - 776.78	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^3D^o$	1 - 1		1091
	110	144.79	1126.53 - 1817.14	$1s^22s2p^3 - 1s^22p^4$	$^1D^o - ^1D$	2 - 2		1091
	50	145.65	117.240 - 803.82	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^3D^o$	2 - 3		1091
		151.50	117.240 - 777.30	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^3D^o$	2 - 2		1091
	176	152.15	8211.8 - 8869.0	$1s^22s^22p3d - 1s^22s2p^2(^2D)3d$	$^3D^o - ^3F$	3 - 4	Q	390
	10	155.06	1095.52 - 1740.42	$1s^22s2p^3 - 1s^22p^4$	$^3S^o - ^3P$	1 - 1		1091
	4	156.21	1095.52 - 1735.67	$1s^22s2p^3 - 1s^22p^4$	$^3S^o - ^3P$	1 - 0		1091
	4	181.57	1095.52 - 1646.26	$1s^22s2p^3 - 1s^22p^4$	$^3S^o - ^3P$	1 - 2		1091
		192.40	1126.53 - 1646.26	$1s^22s2p^3 - 1s^22p^4$	$^1D^o - ^3P$	2 - 2	P	955
	85	242.07	73.851 - 486.94	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^5S^o$	1 - 2	Q	437
		259.33	1260.65 - 1646.26	$1s^22s2p^3 - 1s^22p^4$	$^1P^o - ^3P$	1 - 2	P	955
		270.52	117.240 - 486.94	$1s^22s^22p^2 - 1s^22s2p^3$	$g^3P - ^5S^o$	2 - 2	Q	437
		335.9	73.851 - 371.52	$1s^22s^22p^2 - 1s^22s^22p^2$	$g^3P - ^1S$	1 - 0	F,P	375,1091
		393.3	117.240 - 371.52	$1s^22s^22p^2 - 1s^22s^22p^2$	$g^3P - ^1S$	2 - 0	F,P	375,1091
		409.9	0.0 - 243.94	$1s^22s^22p^2 - 1s^22s^22p^2$	$g^3P - ^1D$	0 - 2	F,P	375,1091
		587.9	73.851 - 243.94	$1s^22s^22p^2 - 1s^22s^22p^2$	$g^3P - ^1D$	1 - 2	F,P	375,1091
		783.8	243.94 - 371.52	$1s^22s^22p^2 - 1s^22s^22p^2$	$^1D - ^1S$	2 - 0	F,P	375,1091
		789.3	117.240 - 243.94	$1s^22s^22p^2 - 1s^22s^22p^2$	$g^3P - ^1D$	2 - 2	F,P	375,1091
		853.0	0.0 - 117.240	$1s^22s^22p^2 - 1s^22s^22p^2$	$g^3P - g^3P$	0 - 2	F,P	375,1091
		1354.08	0.0 - 73.851	$1s^22s^22p^2 - 1s^22s^22p^2$	$g^3P - g^3P$	0 - 1	F	442

IRON XXII (Fe^{+21}), Z = 26

Ground State $1s^22s^22p$ ($^2P^o_{1/2}$) (5 electrons)

Ionization Potential [14 510 000] cm^{-1}; [1799] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		1.8754	0.0 - 53326.	$1s^22s^22p - 1s2s^22p^2$	$g^2P^o - ^2S$	$\frac{1}{2} - \frac{1}{2}$	Q	1059
		1.8779	0.0 - 53242.	$1s^22s^22p - 1s2s^22p^2$	$g^2P^o - ^2P$	$\frac{1}{2} - \frac{3}{2}$	Q	1059
		1.8794	118.26 - 53326.	$1s^22s^22p - 1s2s^22p^2$	$g^2P^o - ^2S$	$\frac{3}{2} - \frac{1}{2}$		1059
		1.8824	118.26 - 53242.	$1s^22s^22p - 1s2s^22p^2$	$g^2P^o - ^2P$	$\frac{3}{2} - \frac{3}{2}$		1059
		1.8851	118.26 - 53166.	$1s^22s^22p - 1s2s^22p^2$	$g^2P^o - ^2D$	$\frac{3}{2} - \frac{5}{2}$		1059
		1.8867	118.26 - 53121.	$1s^22s^22p - 1s2s^22p^2$	$g^2P^o - ^2P$	$\frac{3}{2} - \frac{1}{2}$		1059
		1.936	1627.71 - 53242.	$1s^22p^3 - 1s2s^22p^2$	$^2P^o - ^2P$	$\frac{3}{2} - \frac{3}{2}$	Q	716
	28	8.736	460.19 - 11906.	$1s^22s2p^2 - 1s^22s2p(^1P^o)4d$	$^4P - ^2D^o$	$\frac{3}{2} - \frac{5}{2}$	Q	643
	13	8.786	512.90 - 11899.	$1s^22s2p^2 - 1s^22s2p(^3P^o)4d$	$^4P - ^2F^o$	$\frac{5}{2} - \frac{7}{2}$	Q	643
	44	8.960	736.51 - 11897.	$1s^22s2p^2 - 1s^22s2p(^1P^o)4d$	$^2D - ^2F^o$	$\frac{3}{2} - \frac{5}{2}$		946
	25	8.977	759.61 - 11899.	$1s^22s2p^2 - 1s^22s2p(^3P^o)4d$	$^2D - ^2F^o$	$\frac{5}{2} - \frac{7}{2}$		946
	37	8.992	404.55 - 11526.	$1s^22s2p^2 - 1s^22s2p(^3P^o)4d$	$^4P - ^4D^o$	$\frac{1}{2} - \frac{3}{2}$		946
	50	9.006	512.90 - 11617.	$1s^22s2p^2 - 1s^22s2p(^3P^o)4d$	$^4P - ^4D^o$	$\frac{5}{2} - \frac{7}{2}$		946
	26	9.013	460.19 - 11558.	$1s^22s2p^2 - 1s^22s2p(^3P^o)4d$	$^4P - ^2F^o$	$\frac{3}{2} - \frac{5}{2}$	Q	643
	11	9.033	460.19 - 11526.	$1s^22s2p^2 - 1s^22s2p(^3P^o)4d$	$^4P - ^4D^o$	$\frac{3}{2} - \frac{3}{2}$	Q	643

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	13	9.053	512.90 - 11558.	$1s^22s2p^2$ - $1s^22s2p(^3P^o)4d$	^4P - $^2F^o$	$\frac{5}{2}$ - $\frac{5}{2}$	Q	643
	17	9.058	118.26 - 11161.	$1s^22s^22p$ - $1s^22s^24d$	g^2P^o - ^2D	$\frac{3}{2}$ - $\frac{3}{2}$	Q	643
	17	9.093	0.0 - 10999.	$1s^22s^22p$ - $1s^22s^24s$	g^2P^o - ^2S	$\frac{1}{2}$ - $\frac{1}{2}$	Q	643
	28	9.163	992.28 - 11906.	$1s^22s2p^2$ - $1s^22s2p(^1P^o)4d$	^2P - $^2D^o$	$\frac{3}{2}$ - $\frac{5}{2}$		946
	59	9.183	759.61 - 11649.	$1s^22s2p^2$ - $1s^22s2p(^1P^o)4d$	^2D - $^2F^o$	$\frac{5}{2}$ - $\frac{7}{2}$		946
	31	9.190	118.26 - 10999.	$1s^22s^22p$ - $1s^22s^24s$	g^2P^o - ^2S	$\frac{3}{2}$ - $\frac{1}{2}$	Q	643
	36	9.215	759.61 - 11611.	$1s^22s2p^2$ - $1s^22s2p(^3P^o)4d$	^2D - $^2D^o$	$\frac{5}{2}$ - $\frac{5}{2}$		946
	45	9.241	736.51 - 11558.	$1s^22s2p^2$ - $1s^22s2p(^3P^o)4d$	^2D - $^2F^o$	$\frac{3}{2}$ - $\frac{5}{2}$		946
	37	9.262	759.61 - 11558.	$1s^22s2p^2$ - $1s^22s2p(^3P^o)4d$	^2D - $^2F^o$	$\frac{5}{2}$ - $\frac{5}{2}$	Q	643
	27	9.299	736.51 - 11492.	$1s^22s2p^2$ - $1s^22s2p(^3P^o)4d$	^2D - $^4F^o$	$\frac{3}{2}$ - $\frac{3}{2}$	Q	643
	15	9.320	759.61 - 11492.	$1s^22s2p^2$ - $1s^22s2p(^3P^o)4d$	^2D - $^4F^o$	$\frac{5}{2}$ - $\frac{5}{2}$	Q	643
	27	9.412	992.28 - 11617.	$1s^22s2p^2$ - $1s^22s2p(^3P^o)4d$	^2P - $^4D^o$	$\frac{3}{2}$ - $\frac{5}{2}$	Q	643
	17	9.663	736.51 - 11085.	$1s^22s2p^2$ - $1s^22s^24p$	^2D - $^2P^o$	$\frac{3}{2}$ - $\frac{3}{2}$	Q	643
	19	9.675	736.51 - 11073.	$1s^22s2p^2$ - $1s^22s^24p$	^2D - $^2P^o$	$\frac{3}{2}$ - $\frac{1}{2}$	Q	643
	11	9.785	853.48 - 11073.	$1s^22s2p^2$ - $1s^22s^24p$	^2S - $^2P^o$	$\frac{1}{2}$ - $\frac{1}{2}$	Q	643
	5	9.894	978.22 - 11085.	$1s^22s2p^2$ - $1s^22s^24p$	^2P - $^2P^o$	$\frac{1}{2}$ - $\frac{3}{2}$	Q	945
	49	11.440	0.0 - 8739.7	$1s^22s^22p$ - $1s^22s2p3p$	g^2P^o - ^2D	$\frac{1}{2}$ - $\frac{3}{2}$		945,946
	28	11.458	118.26 - 8845.0	$1s^22s^22p$ - $1s^22s2p3p$	g^2P^o - ^2D	$\frac{3}{2}$ - $\frac{5}{2}$		945,946
	29	11.650	0.0 - 8583.7	$1s^22s^22p$ - $1s^22s2p3p$	g^2P^o - ^2P	$\frac{1}{2}$ - $\frac{1}{2}$		946
	59	11.669	118.26 - 8687.9	$1s^22s^22p$ - $1s^22s2p3p$	g^2P^o - ^2P	$\frac{3}{2}$ - $\frac{3}{2}$		946
	14	11.707	512.90 - 9054.9	$1s^22s2p^2$ - $1s^22s2p(^3P^o)3d$	^4P - $^2P^o$	$\frac{5}{2}$ - $\frac{3}{2}$	Q	945
	59	11.718	759.61 - 9294.5	$1s^22s2p^2$ - $1s^22s2p(^1P^o)3d$	^2D - $^2P^o$	$\frac{5}{2}$ - $\frac{3}{2}$	Q	643
	130	11.748	460.19 - 8972.3	$1s^22s2p^2$ - $1s^22s2p(^3P^o)3d$	^4P - $^4D^o$	$\frac{3}{2}$ - $\frac{5}{2}$		946
	100	11.767	0.0 - 8498.3	$1s^22s^22p$ - $1s^22s^23d$	g^2P^o - ^2D	$\frac{1}{2}$ - $\frac{3}{2}$		946
	130	11.789	759.61 - 9242.0	$1s^22s2p^2$ - $1s^22s2p(^1P^o)3d$	^2D - $^2F^o$	$\frac{5}{2}$ - $\frac{7}{2}$		946
	128	11.797	404.55 - 8881.3	$1s^22s2p^2$ - $1s^22s2p(^3P^o)3d$	^4P - $^4D^o$	$\frac{1}{2}$ - $\frac{3}{2}$		946
	82	11.815	118.26 - 8583.7	$1s^22s^22p$ - $1s^22s2p3p$	g^2P^o - ^2P	$\frac{3}{2}$ - $\frac{1}{2}$	Q	643
	92	11.823	512.90 - 8972.3	$1s^22s2p^2$ - $1s^22s2p(^3P^o)3d$	^4P - $^4D^o$	$\frac{5}{2}$ - $\frac{5}{2}$		946
	135	11.837	512.90 - 8961.0	$1s^22s2p^2$ - $1s^22s2p(^3P^o)3d$	^4P - $^4D^o$	$\frac{5}{2}$ - $\frac{7}{2}$		946
	82	11.846	853.48 - 9294.5	$1s^22s2p^2$ - $1s^22s2p(^1P^o)3d$	^2S - $^2P^o$	$\frac{1}{2}$ - $\frac{3}{2}$	Q	643
	92	11.886	460.19 - 8873.4	$1s^22s2p^2$ - $1s^22s2p(^3P^o)3d$	^4P - $^4P^o$	$\frac{3}{2}$ - $\frac{5}{2}$		946
	120	11.921	118.26 - 8506.8	$1s^22s^22p$ - $1s^22s^23d$	g^2P^o - ^2D	$\frac{3}{2}$ - $\frac{5}{2}$		946
	90	11.960	512.90 - 8873.4	$1s^22s2p^2$ - $1s^22s2p(^3P^o)3d$	^4P - $^4P^o$	$\frac{5}{2}$ - $\frac{5}{2}$		643
	23	11.969	0.0 - 8357.0	$1s^22s^22p$ - $1s^22s^23s$	g^2P^o - ^2S	$\frac{1}{2}$ - $\frac{1}{2}$	Q	945
	125	11.976	512.90 - 8862.9	$1s^22s2p^2$ - $1s^22s2p(^3P^o)3d$	^4P - $^4F^o$	$\frac{5}{2}$ - $\frac{7}{2}$		946
	72	12.027	853.48 - 9168.1	$1s^22s2p^2$ - $1s^22s2p(^1P^o)3d$	^2S - $^2P^o$	$\frac{1}{2}$ - $\frac{1}{2}$		643
	150	12.045	759.61 - 9061.8	$1s^22s2p^2$ - $1s^22s2p(^3P^o)3d$	^2D - $^2F^o$	$\frac{5}{2}$ - $\frac{7}{2}$		946
	60	12.053	736.51 - 9033.2	$1s^22s2p^2$ - $1s^22s2p(^3P^o)3d$	^2D - $^2F^o$	$\frac{3}{2}$ - $\frac{5}{2}$		946
	97	12.077	992.28 - 9272.5	$1s^22s2p^2$ - $1s^22s2p(^1P^o)3d$	^2P - $^2D^o$	$\frac{3}{2}$ - $\frac{5}{2}$		946
	91	12.095	759.61 - 9033.2	$1s^22s2p^2$ - $1s^22s2p(^3P^o)3d$	^2D - $^2F^o$	$\frac{5}{2}$ - $\frac{5}{2}$		946
	70	12.193	853.48 - 9054.9	$1s^22s2p^2$ - $1s^22s2p(^3P^o)3d$	^2S - $^2P^o$	$\frac{1}{2}$ - $\frac{3}{2}$		946
	40	12.231	992.28 - 9168.1	$1s^22s2p^2$ - $1s^22s2p(^1P^o)3d$	^2P - $^2P^o$	$\frac{3}{2}$ - $\frac{1}{2}$		945
	5	12.259	978.22 - 9133.7	$1s^22s2p^2$ - $1s^22s2p(^1P^o)3d$	^2P - $^2D^o$	$\frac{1}{2}$ - $\frac{3}{2}$	Q	643
	37	12.322	853.48 - 8969.0	$1s^22s2p^2$ - $1s^22s2p(^3P^o)3d$	^2S - $^2P^o$	$\frac{1}{2}$ - $\frac{1}{2}$		945,946
	135	12.380	978.22 - 9054.9	$1s^22s2p^2$ - $1s^22s2p(^3P^o)3d$	^2P - $^2P^o$	$\frac{1}{2}$ - $\frac{3}{2}$		643
	32	12.653	978.22 - 8881.3	$1s^22s2p^2$ - $1s^22s2p(^3P^o)3d$	^2P - $^4D^o$	$\frac{1}{2}$ - $\frac{3}{2}$	Q	643
	1	13.095	736.51 - 8371.6	$1s^22s2p^2$ - $1s^22s^23p$	^2D - $^2P^o$	$\frac{3}{2}$ - $\frac{3}{2}$	Q	643
	1	13.547	992.28 - 8371.6	$1s^22s2p^2$ - $1s^22s^23p$	^2P - $^2P^o$	$\frac{3}{2}$ - $\frac{3}{2}$	Q	146
	48	13.578	978.22 - 8341.2	$1s^22s2p^2$ - $1s^22s^23p$	^2P - $^2P^o$	$\frac{1}{2}$ - $\frac{1}{2}$	Q	945
		14.082	1396.42 - 8498.3	$1s^22p^3$ - $1s^22s^23d$	$^2D^o$ - ^2D	$\frac{3}{2}$ - $\frac{3}{2}$	Q	1067
	54	14.859	1627.71 - 8357.0	$1s^22p^3$ - $1s^22s^23s$	$^2P^o$ - ^2S	$\frac{3}{2}$ - $\frac{1}{2}$		643
	50	100.78	0.0 - 992.28	$1s^22s^22p$ - $1s^22s2p^2$	g^2P^o - ^2P	$\frac{1}{2}$ - $\frac{3}{2}$		1091
	150	102.23	0.0 - 978.22	$1s^22s^22p$ - $1s^22s2p^2$	g^2P^o - ^2P	$\frac{1}{2}$ - $\frac{1}{2}$		1091
	30	109.53						1091
	10	112.21	736.51 - 1627.71	$1s^22s2p^2$ - $1s^22p^3$	^2D - $^2P^o$	$\frac{3}{2}$ - $\frac{3}{2}$		1091
	200	114.41	118.26 - 992.28	$1s^22s^22p$ - $1s^22s2p^2$	g^2P^o - ^2P	$\frac{3}{2}$ - $\frac{3}{2}$		1091
	50	115.19	759.61 - 1627.71	$1s^22s2p^2$ - $1s^22p^3$	^2D - $^2P^o$	$\frac{5}{2}$ - $\frac{3}{2}$		1091
	110	116.28	118.26 - 978.22	$1s^22s^22p$ - $1s^22s2p^2$	g^2P^o - ^2P	$\frac{3}{2}$ - $\frac{1}{2}$		1091
	150	117.17	0.0 - 853.48	$1s^22s^22p$ - $1s^22s2p^2$	g^2P^o - ^2S	$\frac{1}{2}$ - $\frac{1}{2}$		1091
	110	117.52	404.55 - 1255.57	$1s^22s2p^2$ - $1s^22p^3$	^4P - $^4S^o$	$\frac{1}{2}$ - $\frac{3}{2}$		1091
	200	120.03	736.51 - 1569.63	$1s^22s2p^2$ - $1s^22p^3$	^2D - $^2P^o$	$\frac{3}{2}$ - $\frac{1}{2}$		1091
	110	125.71	460.19 - 1255.57	$1s^22s2p^2$ - $1s^22p^3$	^4P - $^4S^o$	$\frac{3}{2}$ - $\frac{3}{2}$		1091
	4	129.17	853.48 - 1627.71	$1s^22s2p^2$ - $1s^22p^3$	^2S - $^2P^o$	$\frac{1}{2}$ - $\frac{3}{2}$		1091
	110	134.65	512.90 - 1255.57	$1s^22s2p^2$ - $1s^22p^3$	^4P - $^4S^o$	$\frac{5}{2}$ - $\frac{3}{2}$		1091
	110	135.78	0.0 - 736.51	$1s^22s^22p$ - $1s^22s2p^2$	g^2P^o - ^2D	$\frac{1}{2}$ - $\frac{3}{2}$		1091

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	30	136.01	118.26 - 853.48	$1s^22s^22p$ - $1s^22s2p^2$	g^2P^o - ^2S	3/2 - 1/2		1091
	4	139.64	853.48 - 1569.63	$1s^22s2p^2$ - $1s^22p^3$	^2S - $^2P^o$	1/2 - 1/2		1091
		143.30	8357.0 - 9054.9	$1s^22s^23s$ - $1s^22s2p(^3P^o)3d$	^2S - $^2P^o$	1/2 - 3/2	Q	390
	110	144.85	736.51 - 1426.87	$1s^22s2p^2$ - $1s^22p^3$	^2D - $^2D^o$	3/2 - 5/2		1091
	80	149.87	759.61 - 1426.87	$1s^22s2p^2$ - $1s^22p^3$	^2D - $^2D^o$	5/2 - 5/2		1091
	30	151.54	736.51 - 1396.42	$1s^22s2p^2$ - $1s^22p^3$	^2D - $^2D^o$	3/2 - 3/2		1091
	4	153.96	978.22 - 1627.71	$1s^22s2p^2$ - $1s^22p^3$	^2P - $^2P^o$	1/2 - 3/2		1091
	50	155.92	118.26 - 759.61	$1s^22s^22p$ - $1s^22s2p^2$	g^2P^o - ^2D	3/2 - 5/2		1091
	50	157.03	759.61 - 1396.42	$1s^22s2p^2$ - $1s^22p^3$	^2D - $^2D^o$	5/2 - 3/2		1091
	50	157.37	992.28 - 1627.71	$1s^22s2p^2$ - $1s^22p^3$	^2P - $^2P^o$	3/2 - 3/2		1091
	4	161.74	118.26 - 736.51	$1s^22s^22p$ - $1s^22s2p^2$	g^2P^o - ^2D	3/2 - 3/2		1091
	4	169.08	978.22 - 1569.63	$1s^22s2p^2$ - $1s^22p^3$	^2P - $^2P^o$	1/2 - 1/2		1091
	4	173.21	992.28 - 1569.63	$1s^22s2p^2$ - $1s^22p^3$	^2P - $^2P^o$	3/2 - 1/2		1091
	10	217.30	0.0 - 460.19	$1s^22s^22p$ - $1s^22s2p^2$	g^2P^o - ^4P	1/2 - 3/2		730
	40	230.129	992.28 - 1426.87	$1s^22s2p^2$ - $1s^22p^3$	^2P - $^2D^o$	3/2 - 5/2	Q	856
	120	247.19	0.0 - 404.55	$1s^22s^22p$ - $1s^22s2p^2$	g^2P^o - ^4P	1/2 - 1/2		730
		253.38	118.26 - 512.90	$1s^22s^22p$ - $1s^22s2p^2$	g^2P^o - ^4P	3/2 - 5/2	P	375
	120	292.46	118.26 - 460.19	$1s^22s^22p$ - $1s^22s2p^2$	g^2P^o - ^4P	3/2 - 3/2		730
	150	349.3	118.26 - 404.55	$1s^22s^22p$ - $1s^22s2p^2$	g^2P^o - ^4P	3/2 - 1/2		730
		845.6	0.0 - 118.26	$1s^22s^22p$ - $1s^22s^22p$	g^2P^o - g^2P^o	1/2 - 3/2	F	1137

IRON XXIII (Fe^{+22}), Z = 26

Ground State $1s^22s^2$ ($^1S_0$) (4 electrons)

Ionization Potential [15 730 000] cm^{-1}; [1950] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	2	1.8704	0.0 - 53464.	$1s^22s^2$ - $1s2s^22p$	g^1S - $^1P^o$	0 - 1		1059,856
	28	7.445	472.13 - 13902.	$1s^22s2p$ - $1s^22p5p$	$^3P^o$ - ^3D	2 - 3		946
	20	7.472	0.0 - 13383.	$1s^22s^2$ - $1s^22s5p$	g^1S - $^1P^o$	0 - 1		946
	20	7.680	379.16 - 13400.	$1s^22s2p$ - $1s^22s5d$	$^3P^o$ - ^3D	1 - 2		946
	17	7.733	472.13 - 13404.	$1s^22s2p$ - $1s^22s5d$	$^3P^o$ - ^3D	2 - 3		946
	23	7.755	1027.37 - 13922.	$1s^22p^2$ - $1s^22p5d$	^3P - $^1D^o$	1 - 2		946
	28	7.778	1071.87 - 13929.	$1s^22p^2$ - $1s^22p5d$	^3P - $^3D^o$	2 - 3		946
	16	7.826	1027.37 - 13805.	$1s^22p^2$ - $1s^22p5d$	^3P - $^3D^o$	1 - 2		946
	37	7.849	1204.57 - 13945.	$1s^22p^2$ - $1s^22p5d$	^1D - $^1F^o$	2 - 3		946
	32	7.854	1071.87 - 13805.	$1s^22p^2$ - $1s^22p5d$	^3P - $^3D^o$	2 - 2		946
	32	7.883	752.76 - 13438.	$1s^22s2p$ - $1s^22s5d$	$^1P^o$ - ^1D	1 - 2		946
		7.935	1204.57 - 13805.	$1s^22p^2$ - $1s^22p5d$	^1D - $^3D^o$	2 - 2	Q	839
	15	8.159	1027.37 - 13291.+K	$1s^22p^2$ - $1s^22s5p$	^3P - $^3P^o$	1 - 1	Q	643
	19	8.180	1071.87 - 13291.+K	$1s^22p^2$ - $1s^22s5p$	^3P - $^3P^o$	2 - 1	Q	643
	17	8.210	1204.57 - 13383.	$1s^22p^2$ - $1s^22s5p$	^1D - $^1P^o$	2 - 1	Q	643
	40	8.273	472.13 - 12560.	$1s^22s2p$ - $1s^22p4p$	$^3P^o$ - ^3D	2 - 3		946
		8.289	379.16 - 12440.	$1s^22s2p$ - $1s^22p4p$	$^3P^o$ - ^3D	1 - 2		1057
	30	8.303	0.0 - 12044.	$1s^22s^2$ - $1s^22s4p$	g^1S - $^1P^o$	0 - 1		946
		8.316	0.0 - 12025.	$1s^22s^2$ - $1s^22s4p$	g^1S - $^3P^o$	0 - 1		1057
	24	8.529	348.21 - 12073.	$1s^22s2p$ - $1s^22s4d$	$^3P^o$ - ^3D	0 - 1		946
	40	8.550	379.16 - 12075.	$1s^22s2p$ - $1s^22s4d$	$^3P^o$ - ^3D	1 - 2		946
	22	8.575	956.16 - 12615.	$1s^22p^2$ - $1s^22p4d$	^3P - $^3P^o$	0 - 1	Q	643
	20	8.601	472.13 - 12099.	$1s^22s2p$ - $1s^22s4d$	$^3P^o$ - ^1D	2 - 2	Q	643
	45	8.614	472.13 - 12081.	$1s^22s2p$ - $1s^22s4d$	$^3P^o$ - ^3D	2 - 3		946
	24	8.630	1027.37 - 12614.	$1s^22p^2$ - $1s^22p4d$	^3P - $^3P^o$	1 - 2		946
	18	8.643	1027.37 - 12597.	$1s^22p^2$ - $1s^22p4d$	^3P - $^1D^o$	1 - 2		946
	34	8.664	1071.87 - 12614.	$1s^22p^2$ - $1s^22p4d$	^3P - $^3P^o$	2 - 2		946
	61	8.672	1071.87 - 12603.	$1s^22p^2$ - $1s^22p4d$	^3P - $^3D^o$	2 - 3		946
	16	8.723	1027.37 - 12487.	$1s^22p^2$ - $1s^22p4d$	^3P - $^3D^o$	1 - 1	Q	643
	35	8.731	1027.37 - 12481.	$1s^22p^2$ - $1s^22p4d$	^3P - $^3D^o$	1 - 2		946

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	42	8.752	1204.57 - 12631.	$1s^22p^2 - 1s^22p4d$	$^1D - ^1F^o$	2 - 3		946
	32	8.763	1071.87 - 12483.	$1s^22p^2 - 1s^22p4d$	$^3P - ^3F^o$	2 - 3		946
	15	8.775	1204.57 - 12597.	$1s^22p^2 - 1s^22p4d$	$^1D - ^1D^o$	2 - 2	Q	643
	34	8.814	752.76 - 12099.	$1s^22s2p - 1s^22s4d$	$^1P^o - ^1D$	1 - 2		946
	16	8.862	1204.57 - 12481.	$1s^22p^2 - 1s^22p4d$	$^1D - ^3D^o$	2 - 2	Q	643
	12	8.870	1204.57 - 12481.	$1s^22p^2 - 1s^22p4d$	$^1D - ^3D^o$	2 - 2	Q	643
	22	8.935	1422.91 - 12615.	$1s^22p^2 - 1s^22p4d$	$^1S - ^3P^o$	0 - 1	Q	643
		10.83	472.13 - 9705.7	$1s^22s2p - 1s^22p3p$	$^3P^o - ^3S$	2 - 1		1057
	76	10.903	472.13 - 9643.9	$1s^22s2p - 1s^22p3p$	$^3P^o - ^3P$	2 - 2		946
	94	10.927	472.13 - 9623.8	$1s^22s2p - 1s^22p3p$	$^3P^o - ^3D$	2 - 3		946
	25	10.933	379.16 - 9524.1	$1s^22s2p - 1s^22p3p$	$^3P^o - ^3D$	1 - 2		945,946
	53	10.980	0.0 - 9107.5	$1s^22s^2 - 1s^22s3p$	$g^1S - ^1P^o$	0 - 1		946
	88	11.018	0.0 - 9076.1	$1s^22s^2 - 1s^22s3p$	$g^1S - ^3P^o$	0 - 1		946
	15	11.070	752.76 - 9786.2	$1s^22s2p - 1s^22s3s$	$^1P^o - ^1S$	1 - 0	Q	945
	25	11.145	752.76 - 9725.5	$1s^22s2p - 1s^22p3p$	$^1P^o - ^1D$	1 - 2		643
	45	11.298	348.21 - 9198.9	$1s^22s2p - 1s^22s3d$	$^3P^o - ^3D$	0 - 1		946
	57	11.326	379.16 - 9209.2	$1s^22s2p - 1s^22s3d$	$^3P^o - ^3D$	1 - 2		945,946
		11.333	379.16 - 9198.9	$1s^22s2p - 1s^22s3d$	$^3P^o - ^3D$	1 - 1		1057
	49	11.361	472.13 - 9272.9	$1s^22s2p - 1s^22s3d$	$^3P^o - ^1D$	2 - 2	Q	643
	30	11.399	752.76 - 9527.9	$1s^22s2p - 1s^22p3p$	$^1P^o - ^1P$	1 - 1		643
		11.422	1071.87 - 9827.3	$1s^22p^2 - 1s^22p3d$	$^3P - ^1P^o$	2 - 1		1057
		11.440	472.13 - 9211.9	$1s^22s2p - 1s^22s3d$	$^3P^o - ^3D$	2 - 3		1057
	138	11.493	1027.37 - 9728.3	$1s^22p^2 - 1s^22p3d$	$^3P - ^3D^o$	1 - 2		946
	135	11.519	1071.87 - 9753.1	$1s^22p^2 - 1s^22p3d$	$^3P - ^3P^o$	2 - 2		643
	142	11.594	1204.57 - 9827.8	$1s^22p^2 - 1s^22p3d$	$^1D - ^1F^o$	2 - 3		946
	85	11.614	1027.37 - 9637.4	$1s^22p^2 - 1s^22p3d$	$^3P - ^3D^o$	1 - 1		946
		11.668	1071.87 - 9637.4	$1s^22p^2 - 1s^22p3d$	$^3P - ^3D^o$	2 - 1	Q	1057
	115	11.692	1071.87 - 9624.7	$1s^22p^2 - 1s^22p3d$	$^3P - ^3F^o$	2 - 3		643,946
	145	11.737	752.76 - 9272.9	$1s^22s2p - 1s^22s3d$	$^1P^o - ^1D$	1 - 2		946
	130	11.748	1204.57 - 9716.7	$1s^22p^2 - 1s^22p3d$	$^1D - ^1D^o$	2 - 2		946
	82	11.870	472.13 - 8396.7	$1s^22s2p - 1s^22s3s$	$^3P^o - ^3S$	2 - 1		643
	78	11.898	1422.91 - 9827.3	$1s^22p^2 - 1s^22p3d$	$^1S - ^1P^o$	0 - 1		946
	20	12.174	1422.91 - 9637.4	$1s^22p^2 - 1s^22p3d$	$^1S - ^3D^o$	0 - 1	Q	643
	300	132.85	0.0 - 752.76	$1s^22s^2 - 1s^22s2p$	$g^1S - ^1P^o$	0 - 1		1091,443
	50	136.53	472.13 - 1204.57	$1s^22s2p - 1s^22p^2$	$^3P^o - ^1D$	2 - 2		1091
	50	144.36	379.16 - 1071.87	$1s^22s2p - 1s^22p^2$	$^3P^o - ^3P$	1 - 2		1091
	30	147.24	348.21 - 1027.37	$1s^22s2p - 1s^22p^2$	$^3P^o - ^3P$	0 - 1		1091
	30	149.22	752.76 - 1422.91	$1s^22s2p - 1s^22p^2$	$^1P^o - ^1S$	1 - 0		1091
	10	154.27	379.16 - 1027.37	$1s^22s2p - 1s^22p^2$	$^3P^o - ^3P$	1 - 1		1091
	50	166.74	472.13 - 1071.87	$1s^22s2p - 1s^22p^2$	$^3P^o - ^3P$	2 - 2		1091
	10	173.31	379.16 - 956.16	$1s^22s2p - 1s^22p^2$	$^3P^o - ^3P$	1 - 0		1091
	4	180.10	472.13 - 1027.37	$1s^22s2p - 1s^22p^2$	$^3P^o - ^3P$	2 - 1		1091
	80	221.33	752.76 - 1204.57	$1s^22s2p - 1s^22p^2$	$^1P^o - ^1D$	1 - 2		1091
	120	263.76	0.0 - 379.16	$1s^22s^2 - 1s^22s2p$	$g^1S - ^3P^o$	0 - 1		437

IRON XXIV (Fe^{+23}), Z = 26
Ground State $1s^22s$ ($^2S_{1/2}$) (3 electrons)
Ionization Potential 16 500 000 cm^{-1}; 2046 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		1.588	0.00 - 62972.	$1s^22s - 1s2s(^1S_{<0})3p(^2P^o_{1/2})$	$g^2S - (0,_{1/2})^o$	$\frac{1}{2} - \frac{1}{2}$		741
		1.5926	0.00 - 62790.	$1s^22s - 1s2s(^3S_{1/2})3p(^2P^{o}_{3/2})$	$g^2S - (_{1/2},_{3/2})^o$	$\frac{1}{2} - \frac{3}{2}$		741
		1.5960	392.02 - 63050.11	$1s^22p - 1s2p(^3P^o_{1/2})3p(^2P^{3/2}_{1/2})$	$^2P^o - (_{1/2},_{3/2})^o$	$\frac{1}{2} - \frac{3}{2}$		741
	19	1.8520	392.02 - 54394.	$1s^22p - 1s2p^2$	$^2P^o - ^2S$	$\frac{1}{2} - \frac{1}{2}$		643,305
	21	1.8560	520.79 - 54394.	$1s^22p - 1s2p^2$	$^2P^o - ^2S$	$\frac{3}{2} - \frac{1}{2}$		643,305
		1.8567	0.00 - 53856.	$1s^22s - 1s(^2S)(2s2p(^1P^o))$	$g^2S - ^2P^o$	$\frac{1}{2} - \frac{3}{2}$		1106
	13	1.8579	392.02 - 54230.	$1s^22p - 1s2p^2$	$^2P^o - ^2P$	$\frac{1}{2} - \frac{3}{2}$		643,305
		1.8589	0.00 - 53795.	$1s^22s - 1s(^2S)(2s2p(^3P^o))$	$g^2S - ^2P^o$	$\frac{1}{2} - \frac{3}{2}$		643
	22	1.8609	0.00 - 53735.	$1s^22s - 1s(^2S)(2s2p(^3P^o))$	$g^2S - ^2P^o$	$\frac{1}{2} - \frac{1}{2}$		643,305
	19	1.8620	520.79 - 54230.	$1s^22p - 1s2p^2$	$^2P^o - ^2P$	$\frac{3}{2} - \frac{3}{2}$		643,305

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	12	1.8631	392.02 - 54066.	$1s^22p - 1s2p^2$	$^2P^o - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		643,305
	43	1.8655	520.79 - 54126.	$1s^22p - 1s2p^2$	$^2P^o - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		643,305
		1.8729	520.79 - 53904.	$1s^22p - 1s2p^2$	$^2P^o - {}^4P$	$\frac{3}{2} - \frac{5}{2}$		1059
		1.8735	520.79 - 53880.	$1s^22p - 1s2p^2$	$^2P^o - {}^4P$	$\frac{3}{2} - \frac{3}{2}$		1059
	5	6.365	0.00 - 15711.	$1s^22s - 1s^29p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{3}{2}$	P	643,736
	40	6.451	0.00 - 15501.	$1s^22s - 1s^28p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{3}{2}$	P	643,736
		6.527	392.02 - 15715.	$1s^22p - 1s^29d$	$^2P^o - {}^2D$	$\frac{1}{2} - \frac{3}{2}$	P	643
	5	6.583	0.00 - 15191.	$1s^22s - 1s^27p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{3}{2}$		643
		6.617	392.02 - 15508.	$1s^22p - 1s^28d$	$^2P^o - {}^2D$	$\frac{1}{2} - \frac{3}{2}$	P	643
		6.672	520.79 - 15510.	$1s^22p - 1s^28d$	$^2P^o - {}^2D$	$\frac{3}{2} - \frac{5}{2}$	P	643
		6.752	392.02 - 15202.	$1s^22p - 1s^27d$	$^2P^o - {}^2D$	$\frac{1}{2} - \frac{3}{2}$	P	643
	5	6.787	520.79 - 15255.	$1s^22p - 1s^27d$	$^2P^o - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		643
	5	6.808	0.00 - 14689.	$1s^22s - 1s^26p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{3}{2}$		643
	5	6.972	392.02 - 14735.	$1s^22p - 1s^26d$	$^2P^o - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		643
	5	7.000	392.02 - 14675.	$1s^22p - 1s^26s$	$^2P^o - {}^2S$	$\frac{1}{2} - \frac{1}{2}$	Q	643
	15	7.033	520.79 - 14740.	$1s^22p - 1s^26d$	$^2P^o - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		643
	18	7.066	520.79 - 14675.	$1s^22p - 1s^26s$	$^2P^o - {}^2S$	$\frac{3}{2} - \frac{1}{2}$	Q	643
	18	7.169	0.00 - 13949.	$1s^22s - 1s^25p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{3}{2}$		643
	25	7.370	392.02 - 13961.	$1s^22p - 1s^25d$	$^2P^o - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		643
		7.391	392.02 - 13922.	$1s^22p - 1s^25s$	$^2P^o - {}^2S$	$\frac{1}{2} - \frac{1}{2}$	P	986
	36	7.438	520.79 - 13965.	$1s^22p - 1s^25d$	$^2P^o - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		643
		7.462	520.79 - 13922.	$1s^22p - 1s^25s$	$^2P^o - {}^2S$	$\frac{3}{2} - \frac{1}{2}$	P	986
	34	7.983	0.00 - 12527.	$1s^22s - 1s^24p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{3}{2}$		643
	25	7.993	0.00 - 12511.	$1s^22s - 1s^24p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{1}{2}$		643
	35	8.231	392.02 - 12541.	$1s^22p - 1s^24d$	$^2P^o - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		643
	25	8.285	392.02 - 12465.	$1s^22p - 1s^24s$	$^2P^o - {}^2S$	$\frac{1}{2} - \frac{1}{2}$		643
	58	8.315	520.79 - 12547.	$1s^22p - 1s^24d$	$^2P^o - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		643
	19	8.371	520.79 - 12465.	$1s^22p - 1s^24s$	$^2P^o - {}^2S$	$\frac{3}{2} - \frac{1}{2}$	Q	643
	103	10.619	0.00 - 9417.1	$1s^22s - 1s^23p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{3}{2}$		643
	80	10.663	0.00 - 9378.2	$1s^22s - 1s^23p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{1}{2}$		643
	120	11.030	392.02 - 9459.7	$1s^22p - 1s^23d$	$^2P^o - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		643
	185	11.171	520.79 - 9472.5	$1s^22p - 1s^23d$	$^2P^o - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		643
	42	11.187	520.79 - 9459.7	$1s^22p - 1s^23d$	$^2P^o - {}^2D$	$\frac{3}{2} - \frac{3}{2}$	Q	643
	61	11.261	392.02 - 9272.6	$1s^22p - 1s^23s$	$^2P^o - {}^2S$	$\frac{1}{2} - \frac{1}{2}$		643
	125	11.426	520.79 - 9272.6	$1s^22p - 1s^23s$	$^2P^o - {}^2S$	$\frac{3}{2} - \frac{1}{2}$		643
	300	192.017	0.00 - 520.79	$1s^22s - 1s^22p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{3}{2}$	P	977,730
	300	255.090	0.00 - 392.02	$1s^22s - 1s^22p$	$g^2S - {}^2P^o$	$\frac{1}{2} - \frac{1}{2}$	P	977,730

IRON XXV (Fe^{+24}), Z = 26

Ground State $1s^2$ ($^1S_0$) (2 electrons)

Ionization Potential 71 208 000 cm^{-1}; 8828.8 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		1.443	0. - 69300.	$1s^2 - 1s6p$	$g^1S - {}^1P^o$	0 - 1	P	728
		1.461	0. - 68459.	$1s^2 - 1s5p$	$g^1S - {}^1P^o$	0 - 1	P	918,839
		1.495	0. - 66912.	$1s^2 - 1s4p$	$g^1S - {}^1P^o$	0 - 1	P	918,956
		1.5731	0. - 63571.	$1s^2 - 1s3p$	$g^1S - {}^1P^o$	0 - 1	P	918,956
		1.5750	0. - 63496.	$1s^2 - 1s3p$	$g^1S - {}^3P^o$	0 - 1	P	918,956
		1.7824	54047. - 110151.	$1s2p - 2p^2$	$^1P^o - {}^1S$	1 - 0	P	626
		1.7866	53787. - 109759.	$1s2s - 2s2p$	$^1S - {}^1P^o$	0 - 1	P	626
		1.7875	53534. - 109478.	$1s2s - 2s2p$	$^3S - {}^3P^o$	1 - 2	P	626
		1.7913	54047. - 109872.	$1s2p - 2p^2$	$^1P^o - {}^1D$	1 - 2	P	626
		1.7919	53901. - 109708.	$1s2p - 2p^2$	$^3P^o - {}^3P$	2 - 2	P	626
	90	1.8503	0. - 54047.	$1s^2 - 1s2p$	$g^1S - {}^1P^o$	0 - 1	P	918,305
	19	1.8553	0. - 53901.	$1s^2 - 1s2p$	$g^1S - {}^3P^o$	0 - 2	F,P	375,305,918
	6	1.8594	0. - 53785.	$1s^2 - 1s2p$	$g^1S - {}^3P^o$	0 - 1	P	918,305
	34	1.8680	0. - 53534.	$1s^2 - 1s2s$	$g^1S - {}^3S$	0 - 1	F,P	375,305,918
		7.795	54047. - 66879.	$1s2p - 1s4s$	$^1P^o - {}^1S$	1 - 0	Q	956

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	180	10.003	53534. - 63531.	1s2s - 1s3p	^3S - $^3P^o$	1 - 2	P	918,736
		10.038	53534. - 63496.	1s2s - 1s3p	^3S - $^3P^o$	1 - 1	P	918
		10.221	53787. - 63571.	1s2s - 1s3p	^1S - $^1P^o$	0 - 1	P	918
		272.48	53534. - 53901.	1s2s - 1s2p	^3S - $^3P^o$	1 - 2	P	918
		384.62	53787. - 54047.	1s2s - 1s2p	^1S - $^1P^o$	0 - 1	P	918
		398.41	53534. - 53785.	1s2s - 1s2p	^3S - $^3P^o$	1 - 1	P	918
		961.5	63427. - 63531.	1s3s - 1s3p	^3S - $^3P^o$	1 - 2	P	918
		1298.7	63494. - 63571.	1s3s - 1s3p	^1S - $^1P^o$	0 - 1	P	918
		1449.3	63427. - 63496.	1s3s - 1s3p	^3S - $^3P^o$	1 - 1	P	918

IRON XXVI (Fe^{+25}), Z = 26

Ground State 1s ($^2S_{1/2}$) (1 electrons)

Ionization Potential 74 828 700 cm^{-1}; 9277.65 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		1.392	0.0 - 71853.9380	1s - 5p	g^2S - $^2P^o$	$\frac{1}{2}$ - $\frac{3}{2}$	P	1042
		1.425	0.0 - 70179.2740	1s - 4p	g^2S - $^2P^o$	$\frac{1}{2}$ - $\frac{3}{2}$	P	1042
		1.502	0.0 - 66561.5150	1s - 3p	g^2S - $^2P^o$	$\frac{1}{2}$ - $\frac{3}{2}$	P	1042
		1.504	0.0 - 66510.7870	1s - 3p	g^2S - $^2P^o$	$\frac{1}{2}$ - $\frac{1}{2}$	P	1042
		1.778	0.0 - 56241.5800	1s - 2p	g^2S - $^2P^o$	$\frac{1}{2}$ - $\frac{3}{2}$	P	1042
		1.784	0.0 - 56070.5000	1s - 2p	g^2S - $^2P^o$	$\frac{1}{2}$ - $\frac{1}{2}$	P	1042
		6.338	56075.2200 - 71853.9380	2s - 5p	^2S - $^2P^o$	$\frac{1}{2}$ - $\frac{3}{2}$	P	1042
		6.404	56241.5800 - 71857.5115	2p - 5d	$^2P^o$ - ^2D	$\frac{3}{2}$ - $\frac{5}{2}$	P	1042
		7.090	56075.2200 - 70179.2740	2s - 4p	^2S - $^2P^o$	$\frac{1}{2}$ - $\frac{3}{2}$	P	1042
		7.171	56241.5800 - 70186.2543	2p - 4d	$^2P^o$ - ^2D	$\frac{3}{2}$ - $\frac{5}{2}$	P	1042
		9.536	56075.2200 - 66561.5150	2s - 3p	^2S - $^2P^o$	$\frac{1}{2}$ - $\frac{3}{2}$	P	1042
		9.674	56241.5800 - 66578.0490	2p - 3d	$^2P^o$ - ^2D	$\frac{3}{2}$ - $\frac{5}{2}$	P	1042
		9.674	56241.5800 - 66578.0490	2p - 3d	$^2P^o$ - ^2D	$\frac{3}{2}$ - $\frac{5}{2}$	P	1042

E. Energy Levels of Iron, Fe I through Fe XXVI

E. Energy Levels of Iron, Fe I through Fe XXVI

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This is a revision of the compilation of energy levels of iron for all ionization stages make in 1975 by Reader and Sugar. New material has since been provided for all but two of these ions. The present compilation includes electron configurations, energy levels, term designations, calculated leading percentages for most ions, experimental *g*-values, and ionization energies.

[Source: C. Corliss and J. Sugar, J. Phys. Chem. Ref. Data **11**(1), 135–241 (1982)]

CONTENTS

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ENERGY LEVELS OF IRON

1. Introduction

The NBS Atomic Energy Levels Data Center has undertaken to provide new compilations of atomic energy levels, the program at present being concentrated on the elements hydrogen through nickel. The data for each atom and its ions are being published as a separate paper. Already completed are the compilations for the following elements: calcium, chromium, cobalt, scandium, and vanadium by Sugar and Corliss (1979, 1977, 1981, 1980, 1978); manganese, nickel, titanium, and potassium by Corliss and Sugar (1977, 1981, 19791, 1979b); and aluminum, magnesium, and sodium by Martin and Zalubas (1979, 1980, 1981). The present work on iron is a revision of the compilation by Reader and Sugar (1975) and completes a new set of compilations for the iron period (K through Ni) which we plan to publish as a single volume. Since the publication by Reader and Sugar appeared, new data have been added for every spectrum except Fe III and Fe V.

Generally we have used only published papers as sources of data. Unpublished data are included when they constitute a substantial improvement over material in the literature. For many of the higher ions the original papers do not give energy level values, but only classifications of observed lines. In these cases we have derived the level values. All energy levels are given in units of cm^{-1}.

Ionization energies found in the literature are usually given in eV or in cm^{-1}. The conversion factor, 8065.479 ± 0.021 cm^{-1}/eV, given by Cohen and Taylor (1973), is used here. In a few cases where adequate data were available but the ionization energy had not been derived, we carried out the calculation. For a number of the ions, no suitable series are known. In these cases we have quoted values obtained by Lotz (1967) by a method of successive differences along isoelectronic sequences. Although uncertainties are not provided with these extrapolated values, we find that they are accurate to 0.2% by comparing them with recently determined values.

Nearly all of the data result from observations of various types of laboratory light sources. However, the laboratory data are sometimes supplemented by data obtained from solar observations. This is particularly true where spin-forbidden lines are needed to establish the absolute energy of a system of excited levels and where parity-forbidden transitions between levels of a ground configuration are used to obtain accurate relative energies for the low levels. Whenever both solar data and equivalent laboratory data are available preference is generally given to the laboratory measurements.

When no observations are available to connect independent systems of levels, an estimate of the connecting energy is adopted. Those level values affected by the estimate are denoted by $+x$ following the value. The value of x is the systematic error of the estimate.

For Fe XXV and Fe XXVI, which are isoelectronic with He I and H I, respectively, we give (in brackets) only calculated level values since they are at present more accurate than experimental x-ray wavelengths from which level values may be obtained.

For convenient general sources of wavelengths of iron lines we refer the reader to the compilation by Kelly and Palumbo (1973) for the range 1–2000 Å. An accurate set of measurements of Fe I and Fe II in the range of 1900–9000 Å was given by Crosswhite (1975).

We have included under the heading "Leading Percentages" the results of calculations that express the eigenvector percentage composition of levels in terms of the basis states of a single configuration, or more than one configuration where configuration interaction has been included.

In the "Leading percentages" column we give first the percentage of the basis state corresponding to the level's name; next the second largest percentage together with the related basis state. Sometimes the leading percentage in an alternative coupling scheme is given. Generally, when the leading percentage is less than 40%, no name is given; for an unnamed level, the term symbol follows the percentage.

The user should of course bear in mind that the percentages are model dependent, so that the results of different calculations can yield notably different percentages. In the present tables, the percentages are taken mostly from published parametric calculations. When only *ab initio* calculations are found in the literature, we have used them if the calculated levels can be identified with the observed levels.

For configurations of equivalent d-electrons, several terms of the same LS type may occur. These are theoretically distinguished by their seniority number. In the present compilations they are designated in the notation o Nielson and Koster (1963). For example, in the $3d^5$ configuration there are three ^{2}D terms with seniorities of 1, 3, and 5. These terms are denoted as ^{2}D1, ^{2}D2, and ^{2}D3, respectively, by Nielson and Koster. Martin, Zalubas, and Hagan (1978) give a complete summary of the coupling notations used here, tables of the allowed terms for equivalent electrons, etc. The prefixing of terms by lower case letters (for example *a*, ^{5}D, *z*, ^{5}G, etc.) has been dropped except for Fe I and Fe II, where its use in connection with tables of classified lines is established in the literature.

The text for each ion does not include a complete review of the literature but is intended to credit the major contributions. In assembling the data for each spectrum, we referred to the following bibliographies:

i. Papers cited by Moore (1952)
ii. C. E. Moore (1969)
iii. L. Hagen and W. C. Martin (1972)
iv. J. Reader and J. Sugar (1975)
v. L. Hagan (1977)
vi. R. Zalubas and A. Albright (1980)
vii. Card file of publications since June 1979 maintained by the NBS Atomic Energy Levels Data Center

This compilation includes all material available to us as of April, 1981.

Acknowledgments

Throughout this work we have made extensive use of the bibliographical files and reprint collection maintained in the Atomic Energy Levels Data Center by Romuald Zalubas and Arlene Albright. Out thanks are extended to them for generous cooperation. The compilation has also benefited greated from the preprints that were provided by many of our colleagues.

We thank W. C. Martin for his critical reading and G. A. Martin for her careful review of the manuscript.

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References for Introduction

Cohen, E. R., and Taylor, B. N. (1973), J. Phys. Chem. Ref. Data **2**, 663.

Corliss, C., and Sugar, J. (1977), Energy Levels of Manganese, Mn I through Mn XXV, J. Phys. Chem. Ref. Data **6**, 1253.

Corliss, C., and Sugar, J. (1979a), Energy Levels of Titanium, Ti I through Ti XXII, J. Phys. Chem. Ref. Data **8**, 1.

Corliss, C., and Sugar, J. (1979b), Energy Levels of Potassium, K I through K XIX, J. Phys. Chem. Ref. Data **8**, 1109.

Corliss, C., and Sugar, J. (1981), Energy Levels of Nickel, Ni I through Ni XXVIII, J. Phys. Chem. Ref. Data **10**, 197.

CRC Handbook of Chemistry and Physics, 61st Ed. (1980), pp. E-219 to 348, Line Spectra of the Elements, Ed. by J. Reader and C. H. Corliss (CRC Press, Inc., Boca Raton, FL).

Crosswhite, H. M. (1975), J. Res. Nat. Bur. Stand. **79A**, 17.

Hagan, L. (1977), Bibliography on Atomic Energy Levels and Spectra, July 1971 through June 1975, Nat. Bur. Stand. (U.S.) Spec. Publ. 363, Suppl. 1 (U.S. Gov't Printing Office, Washington, DC).

Hagan L., and Martin, W. C. (1972), Bibliography on Atomic Energy Levels and Spectra, July 1968 through June 1971, Nat. Bur. Stand. (U.S.) Spec. Publ. 363 (U.S. Gov't Printing Office, Washington, DC).

Kelly, R. L., and Palumbo, L. J. (1973), Atomic and Ionic Emission Lines Below 2000 Angstroms—Hydrogen through Krypton, NRL Report 7599 (U.S. Gov't Printing Office, Washington, DC).

Lotz, W. (1967), J. Opt. Soc. Am. **57**, 873.

Martin, W. C., and Zalubas, R. (1979), Energy Levels of Aluminum, Al I through Al XIII, J. Phys. Chem. Ref. Data **8**, 817.

Martin, W. C., and Zalubas, R. (1980), Energy Levels of Magnesium, Mg I through Mg XII, J. Phys. Chem. Ref. Data **9**, 1. Martin, W. C., and Zalubas, R. (1981), Energy Levels of Sodium, Na I through Na XI, J. Phys. Chem. Ref. Data **10**, 153.

Martin, W. C., Zalubas, R., and Hagan, L. (1978), Atomic Energy Levels—The Rare-Earth Elements, Nat. Stand. Ref. Data Ser., Nat Bur. Stand. (U.S.), 60.

Meggers, W. F., Corliss, C. H., and Scribner, B. F. (1975), Nat. Bur. Stand. Monogr. 145.

Moore, C. E. (1952), Atomic Energy Levels, Nat. Bur. Stand. (U.S.) Circ. 467, Vol. II (reissued in 1971 as Nat. Stand. Ref. Data Ser., Nat. Bur. Stand. (U.S.), 35, Vol. II).

Moore, C. E. (1969), Bibliography on the Analyses of Optical Atomic Spectra, Section 2, Nat. Bur. Stand. (U.S.), Spec. Publ. 306-2 (U.S. Gov't Printing Office, Washington, DC).

Nielson, C. W., and Koster, G. F., Spectroscopic Coefficients for the p^n, d^n, and f^n Configurations, 275 pp. (M.I.T. Press, Cambridge, MA, 1963).

Reader, J., and Sugar, J. (1975), Energy Levels of Iron, Fe I through Fe XXVI, J. Phys. Chem. Ref. Data **4**,353.

Sugar, J., and Corliss, C. (1977), Energy Levels of Chromium, Cr I through Cr XXIV, J. Phys. Chem. Ref. Data **6**, 317.

Sugar, J., and Corliss, C. (1978), Energy Levels of Vanadium, V I through V XXIII, J. Phys. Chem. Ref. Data **7**, 1191.

Sugar, J., and Corliss, C. (1979), Energy Levels of Calcium, Ca I through Ca XX, J. Phys. Chem. Ref. Data **8**, 865.

Sugar, J., and Corliss, C. (1980), Energy Levels of Scandium, Sc I through Sc XXI, J. Phys. Chem. Ref. Data **9**, 473.

Sugar, J., and Corliss, C. (1981), Energy Levels of Cobalt, Co I through Co XXVII, J. Phys. Chem. Ref. Data, **10**.

Zalubas, R., and Albright, A. (1980), Bibliography on Atomic Energy Levels and Spectra, July 1975 through June 1979, Nat. Bur. Stand. (U.S.) Spec. Publ. 363, Suppl. 2 (U.S. Gov't Printing Office, Washington, DC).

Fe I

$Z=26$

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6 4s^2\ {}^5D_4$

Ionization energy $= 63\,480 \pm 500\ cm^{-1}$ (7.870 ± 0.06 eV)

The principal contributors to the analysis of Fe I are Walters, Laporte, Burns, and Catalán, who together provided 404 energy levels. Following their work and utilizing new Zeeman effect data from the Massachusetts Institute of Technology, Russell, Moore, and Weeks (1944) were able to extend the analysis by the addition of 60 levels and to confirm the older analysis. A few high levels were later found by Kiess, Rubin, and Moore (1961). The five-place g-values are from Childs and Goodman (1965), who give uncertainties of about ± 0.00005 with the values. The rest, from Russell et al., have an uncertainty of ± 0.001 to 0.009 depending on the determination.

Redetermined values for many of the levels have been provided by Crosswhite (1975). His revisions result from a new set of observations made with a low pressure hollow cathode discharge. The values given below to three decimal places are due to Crosswhite. He ascribes an accuracy of $\pm 0.002\ cm^{-1}$ to these levels. A comparison of his results with the earlier data, which were derived from arc sources at atmospheric pressure, shows that the earlier values of levels belonging to the $3d^8$, $3d^7 4s$, $3d^7 4p$, $3d^7 4d$, $3d^6 4s4p$, $3d^6 4s4d$, and $3d^5 4s^2 4p/wf$ configuration should be reduced by $0.04\ cm^{-1}$ to obtain values consistent with observations from low pressure sources. This correction has been applied by us to all levels of these configurations whose values were not already revised by Crosswhite. These are given below to two decimal places. Insufficient information is available to establish corresponding corrections for levels of the $3d^6 4s5s$, $3d^6 4s6s$, $3d^6 4s7s$, $3d^6 4s5d$, $3d^7 5s$, and $3d^6 4s5p$ configurations. The uncorrected values rounded off to two decimal places are given below.

Litzen (1976) observed the spectrum from 13 350 to 24 924 Å and identified new terms in $3d^6 4s5p$ and $3d^7 5p$. He also determined revised level values for a few high even terms. His results are included here.

A calculation of the even configurations $3d^6 4s^2$, $3d^7 4s$, and $3d^8$ in intermediate coupling by Dembczynski (1980) provided leading percentages for these levels.

The leading percentages for the levels of odd parity are from Roth (1981). He has calculated the $3d^7 4p$, $3d^6 4s4p$, and $3d^5 4s^2 4p$ groups of levels with configuration interaction. Roth distinguished repeating terms of the $3d^n$ core by the letters a, b ... rather than by seniority. His percentage composition for a given level is the sum of the percentages of states that differ only in the seniority of the core term.

The alphabetic prefixing of final terms with lower case letters, which served to distinguish final terms of the same type, has been repeated here from the literature except for levels that have been redesignated as a result of a new theoretical interpretation. Similarly, the authors' numerical designations for uninterpreted levels have been retained.

The ionization energy was derived from the $3d^7 ns$ series ($n=4,5$) by Catalán and Velasco (1952).

References

Burns, K., and Walters, Jr., F. M. (1929), Publ. Allegheny Observ. **6**, 159.
Catalán, M. A. (1930), Anales Soc. Espan. Fis. Quim. **28**, 1239.
Catalán, M. A., and Velasco, R. (1952), Anales Real Soc. Espan. Fis. Quim. (Madrid) **48A**, 247.
Childs, W. J., and Goodman, L. S. (1965), Phys. Rev. **140 A**, 447.
Crosswhite, H. M. (1975), J. Res. Nat. Bur. Stand. (U.S.) **79A**, 17.
Dembczynski, J. (1980), Physica **100 C**, 105.
Kiess, C. C., Rubin, V. C., and Moore, C. E. (1961), J. Res. Nat. Bur. Stand. (U.S.) **65A**, 1.
Laporte, O. (1924), Z. Physik **23**, 135; **26**, 1.
Litzén, U. (1976), Phys. Scr. **14**, 165.
Roth, C. (1981), At. Data Nucl. Data Tables.
Russell, H. N., Moore, C. E., and Weeks, D. W. (1944), Trans. Am. Phil. Soc. **34-II**, 111.
Walters, F. M. (1924), J. Opt. Soc. Am. **8**, 245.
Walters, F. M. (1923), J. Wash. Acad. Sci. **13**, 243.

Fe I

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages
$3d^6 4s^2$	$a\ {}^5D$	4	0.000	1.50020	100
		3	415.932	1.50034	100
		2	704.004	1.50041	100
		1	888.129	1.50022	100
		0	978.072		100

ENERGY LEVELS OF IRON

Fe I—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^7(^4F)4s$	$a\ ^5F$	5	6 928.266	1.40021	100		
		4	7 376.760	1.35004	100		
		3	7 728.056	1.24988	100		
		2	7 985.780	0.99953	100		
		1	8 154.710	-0.014	100		
$3d^7(^4F)4s$	$a\ ^3F$	4	11 976.234	1.254	98	1	$3d^64s^2\ ^3F2$
		3	12 560.930	1.086	98	1	
		2	12 968.549	0.670	98	1	
$3d^7(^4P)4s$	$a\ ^5P$	3	17 550.175	1.666	99		
		2	17 726.981	1.820	99		
		1	17 927.376	2.499	99		
$3d^6\,4s^2$	$a\ ^3P2$	2	18 378.181	1.506	55	32	$^3P1$
		1	19 552.473	1.500	55	32	
		0	20 037.813		55	32	
$3d^6(^5D)4s4p(^3P^\circ)$	$z\ ^7D^\circ$	5	*19 350.892*	1.597	99		
		4	*19 562.440*	1.642	98		
		3	*19 757.033*	1.746	99		
		2	*19 912.494*	2.008	99		
		1	*20 019.635*	2.999	100		
$3d^6\,4s^2$	$a\ ^3H$	6	19 390.164	1.163	100		
		5	19 621.005	1.038	100		
		4	19 788.245	0.811	100		
$3d^6\,4s^2$	$b\ ^3F2$	4	20 641.109	1.235	71	21	$^3F1$
		3	20 874.484	1.073	71	21	
		2	21 038.985	0.663	71	21	
$3d^7(^2G)4s$	$a\ ^3G$	5	21 715.730	1.197	88	10	$3d^64s^2\ ^3G$
		4	21 999.127	1.051	88	10	
		3	22 249.428	0.756	88	10	
$3d^6(^5D)4s4p(^3P^\circ)$	$z\ ^7F^\circ$	6	*22 650.421*	1.498	100		
		5	*22 845.868*	1.498	99		
		4	*22 996.676*	1.493	99		
		3	*23 110.937*	1.513	99		
		2	*23 192.497*	1.504	99		
		1	*23 244.834*	1.549	100		
		0	*23 270.374*		100		
$3d^7(^4P)4s$	$b\ ^3P$	2	22 838.318	1.498	92	4	$3d^64s^2\ ^3P1$
		1	22 946.808	1.489	79	10	$3d^7(^2P)4s\ ^3P$
		0	23 051.742		79	12	$3d^7(^2P)4s\ ^3P$
$3d^6(^5D)4s4p(^3P^\circ)$	$z\ ^7P^\circ$	4	*23 711.457*	1.747	98		
		3	*24 180.864*	1.908	99		
		2	*24 506.919*	2.333	98		
$3d^6\,4s^2$	$b\ ^3G$	5	23 783.614	1.200	88	10	$3d^7(^2G)4s\ ^3G$
		4	24 118.814	1.048	88	10	
		3	24 338.762	0.761	88	10	

Fe I—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^7(^2P)4s$	$c\ ^3P$	2	24 335.759	1.484	90	4	$(^2D2)\ ^3D$
		1	24 772.017	1.466	81	7	$(^4P)\ ^3P$
		0	25 091.597		79	12	$(^4P)\ ^3P$
$3d^7(^2G)4s$	$a\ ^1G$	4	24 574.650	1.001	90	3	$(^2H)\ ^3H$
$3d^6(^5D)4s4p(^3P^\circ)$	$z\ ^5D^\circ$	4	*25 899.987*	1.502	91	6	$3d^7(^4F)4p\ ^5D^\circ$
		3	*26 140.177*	1.500	91	6	
		2	*26 339.691*	1.503	92	6	
		1	*26 479.376*	1.495	92	6	
		0	*26 550.476*		93	5	
$3d^7(^2H)4s$	$b\ ^3H$	6	26 105.904	1.165	100		
		5	26 351.039	1.032	98	2	$(^2H)\ ^1H$
		4	26 627.604	0.811	98	2	$(^2G)\ ^1G$
$3d^7(^2D2)4s$	$a\ ^3D$	3	26 224.966	1.335	74	3	$(^2D1)\ ^3D$
		1	26 406.470	0.731	45	35	$(^2P)\ ^1P$
		2	26 623.730	1.178	67	18	$(^2D1)\ ^3D$
$3d^6(^5D)4s4p(^3P^\circ)$	$z\ ^5F^\circ$	5	*26 874.549*	1.399	95	4	$3d^7(^4F)4p\ ^5F^\circ$
		4	*27 166.819*	1.355	94	4	
		3	*27 394.688*	1.250	94	4	
		2	*27 559.581*	1.004	95	4	
		1	*27 666.346*	−0.012	95	4	
$3d^7(^2P)4s$	$a\ ^1P$	1	27 543.004	0.817	62	23	$(^2D2)\ ^3D$
$3d^7(^2D2)4s$	$a\ ^1D$	2	28 604.606	1.028	64	16	$(^2D1)\ ^1D$
$3d^7(^2H)4s$	$a\ ^1H$	5	28 819.946	1.000	98		
$3d^6(^5D)4s4p(^3P^\circ)$	$z\ ^5P^\circ$	3	*29 056.321*	1.657	98		
		2	*29 469.020*	1.835	97		
		1	*29 732.733*	2.487	97		
$3d^6\,4s^2$	$a\ ^1I$	6	29 313.003	1.014	100		
$3d^6\,4s^2$	$b\ ^3D$	1	29 320.028		88	8	$3d^7(^2D2)4s\ ^3D$
		2	29 356.740		81	7	
		3	29 371.811	1.326	94	4	
$3d^6\,4s^2$	$b\ ^1G2$	4	29 798.933	0.979	62	35	$^1G1$
$3d^6(^5D)4s4p(^3P^\circ)$	$z\ ^3F^\circ$	4	*31 307.243*	1.250	94	5	$3d^7(^4F)4p\ ^3F^\circ$
		3	*31 805.067*	1.086	97		
		2	*32 133.986*	0.682	93	5	$3d^7(^4F)4p\ ^3F^\circ$
$3d^6(^5D)4s4p(^3P^\circ)$	$z\ ^3D^\circ$	3	*31 322.611*	1.321	90	8	$3d^7(^4F)4p\ ^3D^\circ$
		2	*31 686.346*	1.168	90	8	
		1	*31 937.316*	0.513	91	8	
$3d^8$	$c\ ^3F$	4	32 873.619	1.264	92	3	$3d^7(^2F)4s\ ^3F$
		3	33 412.713	1.066	92	5	
		2	33 765.304	0.677	86	6	

ENERGY LEVELS OF IRON

Fe I—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^7(^4F)4p$	$y\ ^5D°$	4	33 095.937	1.496	61	34	$3d^6(^5D)4s4p(^1P°)\ ^5D°$
		3	33 507.120	1.492	60	34	$3d^6(^5D)4s4p(^1P°)\ ^5D°$
		2	33 801.567	1.495	56	34	$3d^6(^5D)4s4p(^1P°)\ ^5D°$
		1	34 017.098	1.492	47	30	$3d^6(^5D)4s4p(^3P°)\ ^3P°$
		0	34 121.58		42	28	$3d^6(^5D)4s4p(^3P°)\ ^3P°$
$3d^7(^4F)4p$	$y\ ^5F°$	5	33 695.394	1.417	84	11	$3d^6(^5D)4s4p(^1P°)\ ^5F°$
		4	34 039.513	1.344	81	12	
		3	34 328.749	1.244	81	11	
		2	34 547.206	0.998	82	13	
		1	34 692.144	-0.016	84	12	
$3d^6(^5D)4s4p(^3P°)$	$z\ ^3P°$	2	33 946.929	1.493	91	4	$3d^7(^4F)4p\ ^5D°$
		1	34 362.871	1.496	50	30	
		0	34 555.60		69	18	
$3d^6\,4s^2$	$b\ ^1D2$	2	34 636.78		67	20	$^1D1$
$3d^7(^4F)4p$	$z\ ^5G°$	5	34 782.416	1.218	58	35	$3d^7(^4F)4p\ ^3G°$
		6	34 843.94	1.332	94	4	$3d^6(^3H)4s4p(^3P°)\ ^5G°$
		4	35 257.319	1.103	75	16	$3d^7(^4F)4p\ ^3G°$
		3	35 611.619	0.887	86	6	$3d^7(^4F)4p\ ^3G°$
		2	35 856.400	0.335	92	5	$3d^6(^3H)4s4p(^3P°)\ ^5G°$
$3d^7(^4F)4p$	$z\ ^3G°$	5	35 379.206	1.248	61	33	$^5G°$
		4	35 767.561	1.100	78	16	
		3	36 079.366	0.791	89	6	
$3d^7(^4F)4p$	$y\ ^3F°$	4	36 686.164	1.246	86	5	$3d^6(^5D)4s4p(^3P°)\ ^3F°$
		3	37 162.740	1.086	84	5	
		2	37 521.157	0.688	87	5	
$3d^6(^5D)4s4p(^1P°)$	$y\ ^5P°$	3	36 766.962	1.661	60	34	$3d^5(^6S)4s^24p\ ^5P°$
		2	37 157.557	1.836	60	35	
		1	37 409.542	2.502	59	36	
$3d^7(^2F)4s$	$d\ ^3F$	2	36 940.56		92	6	$3d^8\ ^3F$
		3	36 975.60		94	5	
		4	37 045.96		96	3	
$3d^7(^4F)4p$	$y\ ^3D°$	3	38 175.350	1.324	84	8	$3d^6(^5D)4s4p(^3P°)\ ^3D°$
		2	38 678.032	1.151	85	7	
		1	38 995.730	0.493	86	7	
$3d^6(^5D)4s4p(^1P°)$	$x\ ^5D°$	4	39 625.800	1.489	55	18	$3d^7(^4F)4p\ ^5D°$
		3	39 969.844	1.504	54	19	
		2	40 231.332	1.501	53	19	
		1	40 404.506	1.498	53	20	
		0	40 491.274		53	20	
$3d^5(^6S)4s^2\,4p$	$y\ ^7P°$	2	40 052.030	2.340	97		
		3	40 207.086	1.908	98		
		4	40 421.85	1.75?	91	7	$3d^6(^5D)4s4p(^1P°)\ ^5F°$
$3d^6(^5D)4s4p(^1P°)$	$x\ ^5F°$	5	40 257.307	1.390	90	5	$3d^7(^4F)4p\ ^5F°$
		4	40 594.429	1.328	82	5	
		3	40 842.151	1.254	88	5	
		2	41 018.050	0.998	88	5	
		1	41 130.627	-0.006	88	5	

Fe I—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages			
$3d^8$	^{3}P	2	40 871.410		85		6	$3d^64s^2\ ^3$P2
		1	41 178.406		85		8	
		0	41 234.498		83		8	
$3d^6(a\ ^3\mathrm{P})4s4p(^3\mathrm{P}^\circ)$	$z\ ^5\mathrm{S}^\circ$	2	*40 894.986*	1.985	59		36	$3d^7(^4\mathrm{P})4p\ ^5\mathrm{S}^\circ$
$3d^6(a\ ^3\mathrm{P})4s4p(^3\mathrm{P}^\circ)$	$x\ ^5\mathrm{P}^\circ$	3	*42 532.736*	1.650	86		5	$3d^7(^4\mathrm{P})4p\ ^5\mathrm{P}^\circ$
		2	*42 859.770*	1.822	76		10	$3d^7(^4\mathrm{P})4p\ ^5\mathrm{S}^\circ$
		1	*43 079.026*	2.464	85		7	$3d^7(^4\mathrm{P})4p\ ^5\mathrm{P}^\circ$
$3d^6(^3\mathrm{H})4s4p(^3\mathrm{P}^\circ)$	$y\ ^5\mathrm{G}^\circ$	6	*42 784.35*	1.342	60		30	$(a\ ^3\mathrm{F})(^3\mathrm{P}^\circ)\ ^5\mathrm{G}^\circ$
		5	*42 911.908*	1.203	53		33	$(a\ ^3\mathrm{F})(^3\mathrm{P}^\circ)\ ^5\mathrm{G}^\circ$
		4	*43 022.975*	1.024	44		37	$(a\ ^3\mathrm{F})(^3\mathrm{P}^\circ)\ ^5\mathrm{G}^\circ$
		3	*43 137.479*	0.905	38		39	$(^3\mathrm{H})(^3\mathrm{P}^\circ)\ ^5\mathrm{H}^\circ$
		2	*43 210.021*	0.331	46		45	$(a\ ^3\mathrm{F})(^3\mathrm{P}^\circ)\ ^5\mathrm{G}^\circ$
$3d^6(^5\mathrm{D})4s\ (^6\mathrm{D})5s$	$e\ ^7\mathrm{D}$	5	42 815.858	1.585				
		4	43 163.327	1.655				
		3	43 434.629	1.755				
		2	43 633.534	2.009				
		1	43 763.980	3.002				
$3d^6(^3\mathrm{H})4s4p(^3\mathrm{P}^\circ)$	$z\ ^5\mathrm{H}^\circ$	5	*42 991.62*	1.054	65		27	$^5\mathrm{I}^\circ$
		4	*43 108.90*	0.871	67		17	$^5\mathrm{I}^\circ$
		6	*43 321.08?*		64		30	$^5\mathrm{I}^\circ$
		3	*43 325.958*	0.509	48		26	$^5\mathrm{G}^\circ$
$3d^6(a\ ^3\mathrm{P})4s4p(^3\mathrm{P}^\circ)$	$w\ ^5\mathrm{D}^\circ$	4	*43 499.496*	1.492	51		28	$(a\ ^3\mathrm{F})(^3\mathrm{P}^\circ)\ ^5\mathrm{D}^\circ$
		3	*43 922.664*	1.481	35		28	
		2	*44 183.620*	1.533	44		22	
		1	*44 411.151*	1.315	48		19	
		0	*44 458.92*		45		19	
$3d^6(a\ ^3\mathrm{F})4s4p(^3\mathrm{P}^\circ)$	$^5\mathrm{D}^\circ$	4	*44 022.535*	1.444	42		23	$(a\ ^3\mathrm{P})(^3\mathrm{P}^\circ)\ ^5\mathrm{D}^\circ$
		3	*44 166.203*	1.351	39		24	
		2	*44 664.068*	1.378	41		22	
		1	*44 760.75*	1.389	40		20	
		0	*44 826.88*		60		25	
$3d^6(a\ ^3\mathrm{F})4s4p(^3\mathrm{P}^\circ)$	$^5\mathrm{F}^\circ$	5	*44 243.673*	1.382	84		4	$(^3\mathrm{D})(^3\mathrm{P}^\circ)\ ^5\mathrm{F}^\circ$
		2	*44 285.443*	1.117	59		10	$(a\ ^3\mathrm{F})(^3\mathrm{P}^\circ)\ ^5\mathrm{D}^\circ$
		1	*44 378.38?*	0.283	81		6	$(^3\mathrm{D})(^3\mathrm{P}^\circ)\ ^5\mathrm{F}^\circ$
		4	*44 415.070*	1.401	62		18	$(a\ ^3\mathrm{F})(^3\mathrm{P}^\circ)\ ^5\mathrm{D}^\circ$
		3	*44 551.330*	1.386	45		20	$(a\ ^3\mathrm{F})(^3\mathrm{P}^\circ)\ ^5\mathrm{D}^\circ$
$3d^7(^4\mathrm{P})4p$	$y\ ^5\mathrm{S}^\circ$	2	*44 511.806*	1.888	38		32	$3d^6(a\ ^3\mathrm{P})4s4p(^3\mathrm{P}^\circ)\ ^5\mathrm{S}^\circ$
$3d^6(^5\mathrm{D})4s\ (^6\mathrm{D})5s$	$e\ ^5\mathrm{D}$	4	44 677.004	1.502				
		3	45 061.327	1.508				
		2	45 333.874	1.503				
		1	45 509.150	1.518				
		0	45 595.08					
$3d^6(a\ ^3\mathrm{P})4s4p(^3\mathrm{P}^\circ)$		3	*45 220.676*	1.352	29	$^3\mathrm{D}^\circ$	29	$^5\mathrm{D}^\circ$
$3d^6(a\ ^3\mathrm{P})4s4p(^3\mathrm{P}^\circ)$		2	*45 281.831*	1.200	31	$^3\mathrm{D}^\circ$	33	$^5\mathrm{D}^\circ$

ENERGY LEVELS OF IRON

Fe I—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages			
$3d^6(^3H)4s4p(^3P^\circ)$	$y\ ^3G^\circ$	5	*45 294.846*	1.207	57		21	$3d^7(^2G)4p\ ^3G^\circ$
		4	*45 428.397*	1.053	55		20	
		3	*45 562.970*	0.765	54		19	
$3d^6(a\ ^3P)4s4p(^3P^\circ)$		1	*45 551.763*	0.556	30	$^3D^\circ$	32	$^5D^\circ$
$3d^6(a\ ^3F)4s4p(^3P^\circ)$	$x\ ^5G^\circ$	6	*45 608.31?*	1.336	65		30	$(^3H)(^3P^\circ)\ ^5G^\circ$
		5	*45 726.117*	1.269	60		32	
		4	*45 833.20*	1.158	55		36	
		3	*45 913.488*	0.928	53		40	
		2	*45 964.959*	0.323	52		45	
$3d^6(^3H)4s4p(^3P^\circ)$	$z\ ^3I^\circ$	7	*45 978.00?*	1.149	93		3	$3d^7(^2H)4p\ ^3I^\circ$
		6	*46 026.94*	1.040	91		3	
		5	*46 135.88*	0.833	94		4	
$3d^7(^4P)4p$	$w\ ^5P^\circ$	3	*46 137.10*	1.658	45		35	$3d^5(^6S)4s^24p\ ^5P^\circ$
		2	*46 313.57*	1.822	41		31	
		1	*46 410.40*	2.436	38		20	
$3d^6(a\ ^3P)4s4p(^3P^\circ)$	$z\ ^3S^\circ$	1	*46 600.814*	1.888	49		14	$3d^7(^2P)4p\ ^3S^\circ$
$3d^6(a\ ^3P)4s4p(^3P^\circ)$	$y\ ^3P^\circ$	0	*46 672.527*		37		24	$3d^7(^4P)4p\ ^3P^\circ$
		2	*46 727.068*	1.444	32		36	
		1	*46 901.820*	1.600	31		21	
$3d^7(^4P)4p$	$^5D^\circ$	4	*46 720.836*	1.341	50		17	$3d^6(a\ ^3F)4s4p(^3P^\circ)\ ^5D^\circ$
		3	*46 744.988*	1.397	54		14	
		2	*47 136.072*	1.216	53		19	
		0	*47 171.48?*		52		20	
		1	*47 177.225*	1.410	55		21	
$3d^7(^4P)4p$	$^3D^\circ$	2	*46 888.510*	1.260	51		15	$3d^6(a\ ^3F)4s4p(^3P^\circ)\ ^3D^\circ$
		3	*47 017.188*	1.346	54		18	
		1	*47 272.016*	0.767	47		20	
$3d^6(a\ ^3F)4s4p(^3P^\circ)$	$^3F^\circ$	4	*46 889.143*	1.344	38		17	$3d^7(^2G)4p\ ^3F^\circ$
		3	*47 092.707*	1.159	51		25	$3d^7(^2G)4p\ ^3G^\circ$
		2	*47 197.014*	0.743	41		24	$3d^6(^3G)4s4p(^3P^\circ)\ ^5G^\circ$
$3d^6(^3H)4s4p(^3P^\circ)$	$z\ ^3H^\circ$	6	*46 982.34*	1.200	36		37	$3d^7(^2G)4p\ ^3H^\circ$
		5	*47 008.366*	1.060	34		36	
		4	*47 106.477*	0.880	31		18	
$3d^7(^4F)5s$	$e\ ^5F$	5	47 005.508	1.421				
		4	47 377.962	1.331				
		3	47 755.539	1.236				
		2	48 036.666	0.991				
		1	48 221.314	0.007				
$3d^6(^3G)4s4p(^3P^\circ)$	$w\ ^5G^\circ$	6	*47 363.369*	1.306	78		11	$3d^7(^2G)4p\ ^3H^\circ$
		5	*47 420.229*	1.305	73		7	$3d^6(^3G)4s4p(^3P^\circ)\ ^5F^\circ$
		4	*47 590.047*	1.145	73		10	$3d^6(a\ ^3F)4s4p(^1P^\circ)\ ^3G^\circ$
		3	*47 693.227*	0.931	42		18	$3d^6(a\ ^3F)4s4p(^1P^\circ)\ ^3G^\circ$
		2	*47 831.150*	0.472	65		16	$3d^7(^2G)4p\ ^3F^\circ$
$3d^6(a\ ^3P)4s4p(^3P^\circ)$	$^1D^\circ$	2	*47 419.674*	1.137	36		12	$3d^7(^2P)4p\ ^1D^\circ$
$3d^7(^2G)4p$	$z\ ^1G^\circ$	4	*47 452.716*	1.025	31		23	$3d^6(^3H)4s4p(^3P^\circ)\ ^1G^\circ$

Fe I—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^7(^4P)4p$	$y\,^3S^\circ$	1	47 555.598	1.884	60	9	$^3D^\circ$
$3d^6(^3G)4s4p(^3P^\circ)$	$v\,^5F^\circ$	5	47 606.094	1.317	61	11	$(^3G)(^3P^\circ)\,^5H^\circ$
		4	47 929.999	1.264	55	20	$(^3G)(^3P^\circ)\,^5H^\circ$
		3	48 122.928	1.236	70	7	$(^3D)(^3P^\circ)\,^5F^\circ$
		2	48 238.844	1.267	74	7	$(^3D)(^3P^\circ)\,^5F^\circ$
		1	48 350.601	0.230	70	7	$(^3D)(^3P^\circ)\,^5F^\circ$
$3d^6(a\,^3F)4s4p(^3P^\circ)$	$x\,^3G^\circ$	4	47 812.118	1.061	51	22	$(^3G)(^3P^\circ)\,^5H^\circ$
		3	47 834.218	0.668	39	37	$(^3G)(^3P^\circ)\,^5G^\circ$
		5	47 834.542	1.203	49	18	$(^3G)(^3P^\circ)\,^5H^\circ$
$3d^7(^4F)5s$	$e\,^3F$	4	47 960.941	1.288			
		3	48 531.864	1.107			
		2	48 928.389	0.622			
	$v\,^5P^\circ$	3	47 966.59	1.646			
		2	48 163.438	1.740			
		1	48 289.865	2.213			
$3d^6(^3G)4s4p(^3P^\circ)$	$^5H^\circ$	5	48 231.270	1.27?	67	10	$(a\,^3F)(^3P^\circ)\,^3G^\circ$
		4	48 361.878	0.934	44	18	
		3	48 475.668	0.584	54	31	
$3d^7(^4P)4p$	$x\,^3P^\circ$	2	48 304.638	1.263	36	21	$(^2P)\,^3P^\circ$
		0	48 460.098		42	23	
		1	48 516.135	1.547	39	18	
$3d^7(^2G)4p$	$z\,^1H^\circ$	5	48 382.597	1.018	68	10	$3d^6(^3H)4s4p(^3P^\circ)\,^1H^\circ$
$3d^6(^3H)4s4p(^3P^\circ)$	$y\,^1G^\circ$	4	48 702.526	1.063	36	20	$3d^7(^2G)4p\,^1G^\circ$
$3d^7(^2G)4p$	$w\,^3F^\circ$	4	49 108.890	1.181	39	26	$3d^6(a\,^3F)4s4p(^3P^\circ)\,^3F^\circ$
		3	49 242.881	1.165	37	25	$3d^6(a\,^3F)4s4p(^3P^\circ)\,^3F^\circ$
		2	49 433.121	0.677	50	21	$3d^6(a\,^3F)4s4p(^3P^\circ)\,^3F^\circ$
$3d^6(a\,^3F)4s4p(^3P^\circ)$	$v\,^3D^\circ$	3	49 135.022	1.211	31	19	$3d^7(^2G)4p\,^3F^\circ$
		2	49 242.593	0.954	52	12	$3d^7(^2P)4p\,^3D^\circ$
		1	49 297.620	0.562	47	13	$3d^7(^2P)4p\,^3D^\circ$
$3d^6(a\,^3F)4s4p(^3P^\circ)$	$^1F^\circ$	3	49 227.12		40	39	$3d^7(^2G)4p\,^1F^\circ$
$3d^6(^5D)4s\,(^6D)5p$	$^7D^\circ$	5	49 352.335				
		4	49 558.724				
		3	49 805.249				
		2	50 008.515				
		1	50 152.609				
$3d^7(^2G)4p$	$y\,^3H^\circ$	6	49 434.156	1.17?	43	43	$3d^6(^3H)4s4p(^3P^\circ)\,^3H^\circ$
		5	49 604.415	1.075	38	26	
		4	49 726.977	0.929	42	29	
$3d^7(^2G)4p$	$v\,^3G^\circ$	5	49 460.890	1.163	38	24	$3d^6(a\,^3F)4s4p(^3P^\circ)\,^3G^\circ$
		4	49 627.877	0.914	41	18	$3d^6(^3H)4s4p(^3P^\circ)\,^3G^\circ$
		3	49 850.581	0.763	43	25	$3d^6(a\,^3F)4s4p(^3P^\circ)\,^3G^\circ$
	$z\,^1D^\circ$	2	49 477.10	0.92?			

ENERGY LEVELS OF IRON

Fe I—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^6(^5D)4s\ (^6D)5p$	$^7F°$	6	*49 758.133*				
		5	*50 052.184*				
		4	*50 303.216*				
		3	*50 433.015*				
		2	*50 555.750*				
		1	*50 627.429*				
		0	*50 659.672*				
$3d^7(^2P)4p$	$w\ ^3P°$	0	*49 951.341*		52	24	$3d^6(a\ ^3P)4s4p(^1P°)\ ^3P°$
		1	*50 043.205*	1.389	50	11	$3d^5(^6S)4s^24p\ ^5P°$
		2	*50 186.830*	1.469	46	10	$3d^7(^4P)4p\ ^5P°$
		2	*50 045.9*				
$3d^6(^5D)4s\ (^6D)5p$	$^7P°$	4	*50 185.730*				
		3	*50 628.360*				
		2	*50 901.157*				
$3d^6(^5D)4s\ (^6D)4d$	$e\ ^7F$	6	50 342.14	1.490			
		5	50 833.428	1.505			
		3	51 148.859	1.499			
		4	51 192.270	1.617			
		1	51 207.991	2.490			
		2	51 331.044				
$3d^6(^5D)4s\ (^6D)4d$	$f\ ^7D$	5	50 377.913	1.510			
		4	50 807.991	1.574			
		3	50 861.816				
		2	50 998.641	1.844			
		1	51 048.113				
$3d^6(^5D)4s\ (^6D)4d$	$f\ ^5D$	4	50 423.136	1.514			
		3	50 534.391	1.615			
		2	50 698.624	1.614			
		1	50 880.098	1.662			
		0	50 980.98				
$3d^6(^5D)4s\ (^6D)4d$	$e\ ^7P$	4	50 475.287	1.585			
		3	50 611.260	1.687			
		2	50 861.321				
$3d^6(^5D)4s\ (^6D)4d$	$e\ ^5G$	6	50 522.946	1.351			
		5	50 703.866	1.360			
		4	50 979.578	1.238			
		3	51 219.017	1.294			
		2	51 370.130	0.953			
$3d^7(^2G)4p$	$z\ ^1F°$	3	*50 586.874*	1.018	36	23	$(a\ ^2D)\ ^1F°$
$3d^6(a\ ^3F)4s4p(^3P°)$	$x\ ^1G°$	4	*50 613.972*	0.978	64	9	$3d^7(^2H)4p\ ^1G°$
$3d^6(^5D)4s\ (^6D)4d$	$e\ ^7G$	7	50 651.72?				
		6	50 967.826	1.415			
		5	51 228.555	1.379			
		4	51 334.909	1.338			
		3	51 460.516	1.244			
		2	51 539.712				
		1	51 566.82	-0.374			

Fe I—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^6(^5D)4s\,(^6D)5p$	$u\,^5F^\circ$	5	*51 016.660*				
		4	*51 381.460*				
		3	*51 619.078*				
		2	*51 827.413*				
		1	*51 945.819*				
$3d^6(^3G)4s4p(^3P^\circ)$	$x\,^3H^\circ$	6	*51 023.152*	1.161	80	15	$(^3H)(^3P^\circ)\,^3H^\circ$
		5	*51 068.710*	1.038	74	13	$(^3H)(^3P^\circ)\,^3H^\circ$
		4	*51 409.117*	0.953	67	15	$(a\,^3F)(^3P^\circ)\,^1G^\circ$
$3d^6(^5D)4s\,(^6D)5p$	$t\,^5D^\circ$	4	*51 076.622*	1.486			
		3	*51 361.390*				
		2	*51 629.998*				
		1	*51 827.854*				
		0	*51 941.531*				
$3d^6(^5D)4s\,(^6D)4d$	$f\,^5F$	5	51 103.187	1.384			
		4	51 461.672	1.355?			
		3	51 604.102				
		2	51 705.007	0.967			
		1	51 754.490				
$3d^6(^5D)4s\,(^6D)4d$	$e\,^5S$	2	51 148.883	1.952			
$3d^7(a\,^2D)4p$	$v\,^3F^\circ$	2	*51 201.284*	0.803	31	23	$3d^6(^3G)4s4p(^3P^\circ)\,^3F^\circ$
		4	*51 304.603*	1.122	34	30	$3d^7(a\,^2D)4p\,^3F^\circ$
		3	*51 365.308*	1.096	36	26	$3d^6(^3G)4s4p(^3P^\circ)\,^3F^\circ$
$3d^6(^5D)4s\,(^4D)5s$	$e\,^3D$	3	51 294.222	1.345			
		2	51 739.920	1.125			
		1	52 039.886	0.801			
$3d^6(^5D)4s\,(^4D)5s$	$g\,^5D$	4	51 350.491	1.487			
		3	51 770.554	1.492			
		2	52 049.814	1.57?			
		1	52 214.336				
		0	52 257.33				
$3d^7(^2H)4p$	$u\,^3G^\circ$	5	*51 373.909*	1.140	30	17	$3d^6(^3G)4s4p(^3P^\circ)\,^3G^\circ$
		4	*51 668.189*	1.067	35	32	$3d^6(^3G)4s4p(^3P^\circ)\,^3G^\circ$
		3	*51 825.773*	0.801	35	32	$3d^6(^3G)4s4p(^3P^\circ)\,^3G^\circ$
$3d^6(^5D)4s\,(^6D)4d$	$e\,^7S$	3	51 570.084	1.92?			
$3d^6(^3H)4s4p(^3P^\circ)$	$^1H^\circ$	5	*51 630.172*	1.061	39	10	$3d^7(^2G)4p\,^1H^\circ$
$3d^6(^5D)4s\,(^6D)5p$	$u\,^5P^\circ$	3	*51 692.007*				
		2	*51 944.784*				
		1	*52 110.607*	2.633			
$3d^7(^2P)4p$	$y\,^1D^\circ$	2	*51 708.309*	1.025	49	18	$(a\,^2D)\,^1D^\circ$
$3d^6(a\,^3F)4s4p(^3P^\circ)$	$x\,^1D^\circ$	2	*51 762.067*	0.883	56	15	$3d^7(a\,^2D)4p\,^1D^\circ$
$3d^6(^5D)4s\,(^6D)4d$	$e\,^5P$	3	51 837.24	1.664			
		1	52 019.67	2.432			
		2	52 067.460				

ENERGY LEVELS OF IRON

Fe I—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^7(^2P)4p$	$u\ ^3D^\circ$	3	*51 969.079*	1.306	61	19	$3d^6(a\ ^3F)4s4p(^1P^\circ)\ ^3D^\circ$
		2	*52 296.899*	1.156	53	21	$3d^6(a\ ^3F)4s4p(^1P^\circ)\ ^3D^\circ$
		1	*52 512.445*	0.700	48	22	$3d^6(a\ ^3P)4s4p(^1P^\circ)\ ^3D^\circ$
$3d^7(^2P)4p$	$^1P^\circ$	1	*52 180.804*	0.801	47	20	$(a\ ^2D)\ ^3D^\circ$
$3d^7(a\ ^2D)4p$	$^3D^\circ$	3	*52 213.226*	1.317	75	19	$3d^6(a\ ^3F)4s4p(^1P^\circ)\ ^3D^\circ$
		2	*52 682.915*	1.145	60	11	$3d^7(^2P)4p\ ^3D^\circ$
		1	*52 857.790*	1.246	45	10	$3d^7(^2P)4p\ ^3D^\circ$
$3d^7(^2H)4p$	$w\ ^3H^\circ$	6	*52 431.418*	1.177	63	17	$3d^6(^3H)4s4p(^1P^\circ)\ ^3H^\circ$
		5	*52 613.084*	1.033	60	14	
		4	*52 768.721*	0.810	61	18	
$3d^7(^2H)4p$	$y\ ^3I^\circ$	6	*52 513.549*	1.019	65	22	$3d^7(^2H)4p\ ^1I^\circ$
		7	*52 655.00?*	1.147	88	8	$3d^6(^1I)4s4p(^3P^\circ)\ ^3I^\circ$
		5	*52 898.971*	0.830	85	9	$3d^6(^1I)4s4p(^3P^\circ)\ ^3I^\circ$
$3d^7(a\ ^2D)4p$	$^3P^\circ$	2	*52 916.292*	1.495	55	19	$3d^6(a\ ^3P)4s4p(^1P^\circ)\ ^3P^\circ$
		1	*53 229.942*	1.266	41	13	$3d^7(^2P)4p\ ^1P^\circ$
$3d^7(^4F)5p$	$^5F^\circ$	4	*52 953.625*				
		5	*53 084.791*				
		3	*53 357.508*				
		2	*53 749.405*				
$3d^7(^4F)4d$	$g\ ^5F$	5	53 061.24				
		4	53 393.68				
		3	53 830.973				
		2	54 257.505				
		1	54 386.189				
$3d^7(^4F)5p$	$^5G^\circ$	6	*53 069.350*				
		5	*53 586.501*				
		4	*53 610.414*				
		3	*53 852.108*				
$3d^7(^2H)4p$	$z\ ^1I^\circ$	6	*53 093.521*	1.010	65	21	$^3I^\circ$
$3d^7(^4F)4d$	$h\ ^5D$	4	53 155.09	1.435			
		3	53 545.847				
		2	53 966.68				
		1	54 132.550				
$3d^7(^4F)4d$	$f\ ^5P$	3	53 160.49				
		2	53 568.68				
		1	53 925.22				
$3d^7(^4F)4d$	$f\ ^5G$	6	53 169.17	1.323			
		5	53 281.70	1.221			
		4	53 768.969				
		3	54 161.132	1.142			
		2	54 375.68				

Fe I—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^7(^4F)4d$	$e\ ^5H$	7	53 275.16?	1.30?			
		6	53 352.98?	1.191			
		5	53 874.26?	1.102			
		4	54 237.16	0.90?			
		3	54 491.04	0.484			
$3d^6(^3D)4s4p(^3P^\circ)$	$^5F^\circ$	2	*53 275.23*		84	11	$(^3G)(^3P^\circ)\ ^5F^\circ$
		3	*53 661.09*	1.21?	84	10	
		5	*54 013.747*	1.356	88	8	
$3d^7(^4F)5p$	$^5D^\circ$	4	*53 328.827*				
		3	*53 733.583*				
		2	*54 042.516*				
		1	*54 224.402*				
$3d^6(^3G)4s4p(^3P^\circ)$	$y\ ^1H^\circ$	5	*53 722.40*	1.03?	77	15	$(^3H)(^3P^\circ)\ ^1H^\circ$
$3d^7(^4F)4d$	$e\ ^3G$	5	53 739.433	1.248			
		4	54 066.53	1.096			
		3	54 379.40	0.842			
$3d^7(^4F)4d$	$f\ ^3D$	3	53 747.51	1.258			
		2	54 066.758				
		1	54 449.29				
$3d^6(^3G)4s4p(^3P^\circ)$	$x\ ^3F^\circ$	3	*53 763.272*	1.079	34	30	$3d^7(a\ ^2D)4p\ ^3F^\circ$
$3d^6(^5D)4s\ (^6D)6s$	$g\ ^7D$	5	53 800.841	1.586			
		4	54 124.724	1.65?			
		3	54 404.765				
		2	54 611.691				
		1	54 747.581				
$3d^6(^3D)4s4p(^3P^\circ)$	$^5D^\circ$	1	*53 808.353*	1.418	72	14	$(^3D)(^3P^\circ)\ ^5P^\circ$
		3	*53 891.520*	1.476	74	13	$(^3D)(^3P^\circ)\ ^5P^\circ$
		4	*54 301.334*		89	6	$(b\ ^3F)(^3P^\circ)\ ^5D^\circ$
$3d^7(^4F)5p$	$^3D^\circ$	3	*53 837.847*				
		2	*54 342.762*				
$3d^7(^4F)4d$	$e\ ^3H$	6	53 840.64?	1.225			
		5	54 266.72?	1.109			
		4	54 555.41?	0.871			
$3d^6(^3G)4s4p(^3P^\circ)$	$t\ ^3G^\circ$	5	*53 983.284*	1.234	39	35	$3d^7(^2H)4p\ ^3G^\circ$
		4	*54 237.415*	1.183	34	36	
		3	*54 600.346*	0.922	32	31	
$3d^6(^3D)4s4p(^3P^\circ)$	$^5P^\circ$	3	*54 004.78*		68	13	$^5D^\circ$
		2	*54 112.218*	1.70?	47	31	$^5D^\circ$
		1	*54 271.057*		57	9	$3d^7(^2P)4p\ ^3S^\circ$
$3d^7(^4F)5p$	$^3G^\circ$	4	*54 017.573*				
		3	*54 357.398*				
		3	*54 289.09*				

ENERGY LEVELS OF IRON

Fe I—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages			
$3d^7(^4F)4d$	$f\,^3F$	4	54 683.35	1.141				
		3	55 124.93	1.071				
		2	55 378.80	0.676				
$3d^6(^3G)4s4p(^3P^\circ)$	$w\,^1G^\circ$	4	*54 810.841*	1.001	44		22	$3d^7(^2G)4p\,^1G^\circ$
$3d^7(^4F)4d$	$e\,^3P$	2	54 879.68	1.459				
		1	55 376.08	1.459				
		0	55 726.50?					
$3d^6(a\,^1G)4s4p(^3P^\circ)$	$^3G^\circ$	5	*55 429.815*	1.057	46		23	$3d^7(^2H)4p\,^1H^\circ$
		3	*55 790.673*	0.908	53		21	$3d^6(^3G)4s4p(^3P^\circ)\,^1F^\circ$
		4	*55 905.538*		61		17	$3d^6(a\,^1G)4s4p(^3P^\circ)\,^3H^\circ$
$3d^6(a\,^1G)4s4p(^3P^\circ)$	$^3H^\circ$	4	*55 446.000*	0.804	59		11	$3d^6(^1I)4s4p(^3P^\circ)\,^3H^\circ$
		6	*55 489.77*	1.169	48		33	$3d^6(^1I)4s4p(^3P^\circ)\,^3H^\circ$
		5	*55 525.54*	1.018	47		23	$3d^7(^2H)4p\,^1H^\circ$
$3d^7(a\,^2D)4p$	$w\,^1D^\circ$	2	*55 754.239*	0.990	62		15	$(^2P)\,^1D^\circ$
$3d^7(^2H)4p$		5	*55 907.171*	1.145	33	$^1H^\circ$	31	$3d^6(a\,^1G)4s4p(^3P^\circ)\,^3G^\circ$
$3d^6(^3G)4s4p(^3P^\circ)$	$^1F^\circ$	3	*56 097.829*	0.857	45		25	$(a\,^1G)(^3P^\circ)\,^3G^\circ$
$3d^6(^1I)4s4p(^3P^\circ)$	$u\,^3H^\circ$	6	*56 333.957*	1.166	44		47	$(a\,^1G)(^3P^\circ)\,^3H^\circ$
		5	*56 382.662*	1.029	46		26	$(a\,^1G)(^3P^\circ)\,^3H^\circ$
		4	*56 423.279*	0.859	50		18	$(^3H)(^1P^\circ)\,^3H^\circ$
$3d^6\,4s5d$	1	5	56 428.06					
$3d^6\,4s5d$	2	4,5	56 452.04					
$3d^6(a\,^1G)4s4p(^3P^\circ)$	$u\,^3F^\circ$	4	*56 592.699*	1.148	47		17	$3d^7(a\,^2D)4p\,^3F^\circ$
		3	*56 783.317*	1.077	54		20	
		2	*56 858.659*	0.687	47		26	
$3d^6\,4s5d$	3	4	56 842.70					
$3d^7(^2H)4p$	$v\,^1G^\circ$	4	*56 951.286*	1.053	39		23	$3d^6(^3G)4s4p(^3P^\circ)\,^1G^\circ$
$3d^6(^1I)4s4p(^3P^\circ)$	$x\,^3I^\circ$	7	*57 027.52?*	1.145	86		6	$3d^7(^2H)4p\,^3I^\circ$
		6	*57 070.21*	1.028	85		7	
		5	*57 104.22*	0.832	84		7	
$3d^6(^3D)4s4p(^3P^\circ)$	$t\,^3F^\circ$	4	*57 550.000*	1.235	67		15	$(a\,^3F)(^1P^\circ)\,^3F^\circ$
		3	*57 641.000*		60		17	
		2	*57 708.747*	0.698	61		16	
$3d^6(^5D)4s\,(^4D)4d$	$i\,^5D$	4	57 697.55	1.384				
		3	57 813.940	1.415				
		2	57 974.129					
$3d^6(^5D)4s\,(^6D)7s$	$h\,^7D$	5	57 897.17					
$3d^6(^5D)4s\,(^4D)4d$	$g\,^5G$	6	58 001.84	1.40?				
		5	58 271.46?					
		4	58 520.14?					
		3	58 710.05?					
		2	58 824.77	0.343				

Fe I—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^6 4s5d$	4	2	58 213.121				
$3d^6(a\ ^3F)4s4p(^1P°)$	$r\ ^3G°$	5	*59 926.62?*	1.190	81	8	$(^3H)(^1P°)\ ^3H°$
		4	*60 172.06*	1.030	65	25	$(a\ ^1D)(^3P°)\ ^3F°$
		3	*60 364.76?*	0.780	63	17	$(a\ ^1D)(^3P°)\ ^3F°$
$3d^6(^3H)4s4p(^1P°)$	$t\ ^3H°$	6	*60 365.70?*	1.163	59	25	$3d^7(^2H)4p\ ^3H°$
		5	*60 549.18*	1.040	49	22	
		4	*60 757.68*	0.805	50	22	
		3	*60 563.61*				
$3d^6(a\ ^3F)4s4p(^1P°)$	$^3F°$	4	*60 754.71?*		32	33	$(a\ ^1D)(^3P°)\ ^3F°$
		3	*60 806.654*		29	28	
Fe II ($^6D_{9/2}$)	***Limit***		**63 480**				

ENERGY LEVELS OF IRON

Fe II

$Z=26$

Mn I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6 4s\ ^6D_{9/2}$

Ionization energy = 130 563±10 cm^{-1} (16.1879±0.0012 eV)

The earlier work on this spectrum was mainly by Dobbie (1938), Green (1939), and unpublished material of Edlén. Johansson and Litzén (1974) found the complete set of $3d^6(^5D)4f$ levels as well as many new $3d^6 4d$ levels.

The spectrum has now been reobserved in the regions 900–2200 Å and 4800–11 200 Å by Johansson (1978) by using a pulsed hollow cathode discharge. With the new measurements and Dobbie's list in the region 2200–4800 Å, Johansson has contributed some 250 new levels to the presently known 576 levels. He has redetermined all the level values and discarded 23 earlier levels. The accuracy of levels given to three decimal places is about ±0.01 cm^{-1}, those with two places are about 0.1 cm^{-1}, and with one place, ±0.5 cm^{-1}.

The $3d^7$, $3d^6 4s$, and $3d^5 4s^2$ configurations have been treated theoretically by Shadmi, Oreg, and Stein (1968), whose results confirm the assignments given by Johansson. The configurations $3d^6 4p$, $3d^6 5p$, and $3d^5 4s4p$ were calculated by Sinzelle and Wyart (1978, unpublished) with configuration interaction. Since $3d^5 4s4p$ was not recoupled in the scheme which exhibits the highest percentages, we give only its admixture with the other two configurations. Experience has shown that $3d^5 4s4p$ should be coupled $3d^5(S_1,L_1)4s4p\ (S_2,L_2)S_3,L_3$. A discussion of their calculations is given by Johansson, Litzén, Sinzelle, and Wyart (1980). Johansson's designations for the $3d^5 4s4p$ levels are quoted here.

The g-values were derived by Weeks in 1949 and are taken from Moore (1952). The observations were made at M.I.T. The uncertainty in the g-value determinations varies from ±0.002 to ±0.009.

The ionization energy was determined by Johansson from the $3d^6(^5D)ns\ ^6D_{9/2}$ series.

References

Dobbie, J. C. (1938), Ann. Solar Phys. Obs. Cambridge **5**, 1.
Green, L. C. (1939), Phys. Rev. **55**, 1211.
Johansson, S. (1978), Phys. Scr. **18**, 217.
Johansson, S., and Litzén, U. (1974), Phys. Scr. **10**, 121.
Johansson, S., Litzén, U., Sinzelle, J., and Wyart, J.-F. (1980), Phys. Scr. **21**, 40.
Moore, C. E. (1952), Atomic Energy Levels, Vol. II, Nat. Bur. Stand. Circ. 467, (reissued as NSRDS-NBS35) U.S. Govt. Printing Office, Washington, DC.
Shadmi, Y., Oreg, J., and Stein, J. (1968), J. Opt. Soc. Am. **58**, 909.

Fe II

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages
$3d^6(^5D)4s$	$a\ ^6D$	9/2	0.000	1.58	
		7/2	384.790	1.58	
		5/2	667.683	1.655	
		3/2	862.613	1.862	
		1/2	977.053	3.31	
$3d^7$	$a\ ^4F$	9/2	1 872.567	1.33	
		7/2	2 430.097	1.223	
		5/2	2 837.950	1.02	
		3/2	3 117.461	0.385	
$3d^6(^5D)4s$	$a\ ^4D$	7/2	7 955.299	1.419	
		5/2	8 391.938	1.365	
		3/2	8 680.454	1.200	
		1/2	8 846.768	-0.05	
$3d^7$	$a\ ^4P$	5/2	13 474.411	1.609	
		3/2	13 673.185	1.737	
		1/2	13 904.824	2.67	
$3d^7$	$a\ ^2G$	9/2	15 844.65		
		7/2	16 369.36		
$3d^7$	$a\ ^2P$	3/2	18 360.646	1.28	
		1/2	18 886.780		

Fe II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages
$3d^7$	$a\ ^2H$	$11/2$	20 340.30		
		$9/2$	20 805.77	0.92	
$3d^7$	$a\ ^2D2$	$5/2$	20 516.960	1.22	
		$3/2$	21 308.04		
$3d^6(^3P2)4s$	$b\ ^4P$	$5/2$	20 830.582	1.583	
		$3/2$	21 812.055	1.720	
		$1/2$	22 409.852	2.68	
$3d^6(^3H)4s$	$a\ ^4H$	$13/2$	21 251.608	1.20	
		$11/2$	21 430.359	1.119	
		$9/2$	21 581.638	0.951	
		$7/2$	21 711.917	0.661	
$3d^6(^3F2)4s$	$b\ ^4F$	$9/2$	22 637.205	1.307	
		$7/2$	22 810.357	1.210	
		$5/2$	22 939.358	1.019	
		$3/2$	23 031.300	0.398	
$3d^5\ 4s^2$	$a\ ^6S$	$5/2$	23 317.633	1.996	
$3d^6(^3G)4s$	$a\ ^4G$	$11/2$	25 428.784	1.237	
		$9/2$	25 805.328	1.15	
		$7/2$	25 981.629	0.98	
		$5/2$	26 055.423	0.574	
$3d^6(^3P2)4s$	$b\ ^2P$	$3/2$	25 787.598	1.33	
		$1/2$	26 932.748	0.67	
$3d^6(^3H)4s$	$b\ ^2H$	$11/2$	26 170.181	1.09	
		$9/2$	26 352.766	0.927	
$3d^6(^3F2)4s$	$a\ ^2F$	$7/2$	27 314.922	1.129	
		$5/2$	27 620.412	0.851	
$3d^6(^3G)4s$	$b\ ^2G$	$9/2$	30 388.542	1.10	
		$7/2$	30 764.485	0.898	
$3d^6(^3D)4s$	$b\ ^4D$	$3/2$	31 364.440		
		$1/2$	31 368.450		
		$5/2$	31 387.948	1.327	
		$7/2$	31 483.176	1.41	
$3d^7$	$b\ ^2F$	$5/2$	31 811.822	0.86	
		$7/2$	31 999.048	1.124	
$3d^6(^1I)4s$	$a\ ^2I$	$13/2$	32 875.646	1.062	
		$11/2$	32 909.905	0.92	
$3d^6(^1G2)4s$	$c\ ^2G$	$9/2$	33 466.463	1.099	
		$7/2$	33 501.253	0.88	
$3d^6(^3D)4s$	$b\ ^2D$	$3/2$	36 126.387	0.799	
		$5/2$	36 252.918	1.179	
$3d^6(^1S2)4s$	$a\ ^2S$	$1/2$	37 227.326	2.06	

ENERGY LEVELS OF IRON

Fe II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^6(^1D2)4s$	$c\ ^2D$	$5/2$	38 164.194	1.176			
		$3/2$	38 214.507	0.79			
$3d^6(^5D)4p$	$z\ ^6D°$	$9/2$	*38 458.981*	1.542	99		
		$7/2$	*38 660.043*	1.584	98		
		$5/2$	*38 858.958*	1.653	98		
		$3/2$	*39 013.206*	1.86	99		
		$1/2$	*39 109.307*	3.35	99		
$3d^6(^5D)4p$	$z\ ^6F°$	$11/2$	*41 968.046*		99		
		$9/2$	*42 114.818*	1.43	96		
		$7/2$	*42 237.033*	1.399	96		
		$5/2$	*42 334.822*	1.304	97		
		$3/2$	*42 401.302*	1.04	98		
		$1/2$	*42 439.822*	-0.647	98		
$3d^6(^5D)4p$	$z\ ^6P°$	$7/2$	*42 658.224*	1.702	93	3	$3d^54s4p$
		$5/2$	*43 238.586*	1.869	95	3	
		$3/2$	*43 620.957*	2.398	96	3	
$3d^6(^5D)4p$	$z\ ^4F°$	$9/2$	*44 232.512*	1.32	96	2	$(^5D)\ ^6F°$
		$7/2$	*44 753.799*	1.29	91	5	$(^5D)\ ^4D°$
		$5/2$	*45 079.879*	1.069	93	4	$(^5D)\ ^4D°$
		$3/2$	*45 289.801*	0.445	96	2	$(^5D)\ ^4D°$
$3d^6(^5D)4p$	$z\ ^4D°$	$7/2$	*44 446.878*	1.40	90	5	$^4F°$
		$5/2$	*44 784.761*	1.35	91	4	$^4F°$
		$3/2$	*45 044.168*	1.15	93	2	$^4F°$
		$1/2$	*45 206.450*	-0.021	95		
$3d^6(^1F)4s$	$c\ ^2F$	$7/2$	44 915.046				
		$5/2$	44 929.55				
$3d^6(^5D)4p$	$z\ ^4P°$	$5/2$	*46 967.444*	1.592	96	2	$3d^54s4p$
		$3/2$	*47 389.779*	1.717	96	2	
		$1/2$	*47 626.076*	2.70	96	2	
$3d^7$	$d\ ^2D1$	$3/2$	47 674.721				
		$5/2$	48 039.090				
$3d^6(^3P1)4s$	$c\ ^4P$	$1/2$	49 100.976				
		$3/2$	49 506.934				
		$5/2$	50 212.826				
$3d^6(^3F1)4s$	$c\ ^4F$	$3/2$	50 075.910				
		$5/2$	50 142.786				
		$9/2$	50 157.452				
		$7/2$	50 187.813				
$3d^5(^6S)4s4p(^3P°)$	$z\ ^8P°$	$5/2$	*52 299.39*				
		$7/2$	*52 582.51*				
		$9/2$	*52 965.82*				
$3d^6(^3P1)4s$	$c\ ^2P$	$1/2$	54 063.459				
		$3/2$	54 902.315				
$3d^5\ 4s^2$	$b\ ^4G$	$11/2$	54 232.195				
		$9/2$	54 273.641				
		$5/2$	54 275.637				
		$7/2$	54 283.220				

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Fe II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages			
$3d^6(^3F1)4s$	$d\ ^2F$	5/2	54 870.528					
		7/2	54 904.222					
$3d^5\,4s^2$	$d\ ^4P$	5/2	57 411.065					
		3/2	57 493.321					
		1/2	57 578.484					
$3d^6(^1G1)4s$	$d\ ^2G$	9/2	58 631.531					
		7/2	58 666.258					
$3d^6(^3P2)4p$	$z\ ^4S^\circ$	3/2	*59 663.456*	1.89	46		19	$(^3P1)\ ^4S^\circ$
$3d^5\,4s^2$	$c\ ^4D$	7/2	60 270.339					
		1/2	60 384.370					
		3/2	60 441.033					
		5/2	60 445.275					
$3d^6(^3P2)4p$	$y\ ^4P^\circ$	5/2	*60 402.342*	1.58	46		36	$(^3P1)\ ^4P^\circ$
		1/2	*61 035.287*	2.613	52		42	
		3/2	*61 332.764*	1.74	28		22	
$3d^6(^3H)4p$	$z\ ^4G^\circ$	11/2	*60 625.449*	1.24	66		24	$(^3F2)\ ^4G^\circ$
		9/2	*60 807.230*	1.155	53		29	
		7/2	*60 956.781*	0.969	50		33	
		5/2	*61 041.748*	0.799	48		35	
$3d^6(^3H)4p$	$z\ ^4H^\circ$	13/2	*60 837.569*		47		42	$(^3H)\ ^4I^\circ$
		11/2	*60 887.598*		44		44	$(^3H)\ ^4I^\circ$
		9/2	*60 989.444*		45		37	$(^3H)\ ^4I^\circ$
		7/2	*61 156.835*	0.720	66		12	$(^3H)\ ^2G^\circ$
$3d^6(^3P2)4p$	$z\ ^2D^\circ$	5/2	*61 093.413*	1.01	42		27	$(^3P1)\ ^2D^\circ$
		3/2	*62 125.600*	1.019	35		23	
$3d^6(^3H)4p$	$z\ ^4I^\circ$	15/2	*61 347.614*		100			
		9/2	*61 512.634*		56		26	$(^3H)\ ^4H^\circ$
		13/2	*61 527.616*		49		43	
		11/2	*61 587.214*		51		42	
$3d^6(^3P2)4p$	$y\ ^4D^\circ$	7/2	*61 726.077*	1.411	56		33	$(^3P1)\ ^4D^\circ$
		5/2	*62 689.880*	1.349	49		27	
		1/2	*62 829.075*		60		32	
		3/2	*62 962.205*	1.14	45		25	
$3d^5(^6S)4s4p(^3P^\circ)$	$y\ ^6P^\circ$	3/2	*61 974.933*					
		5/2	*62 049.025*					
		7/2	*62 171.615*	1.68				
$3d^6(^3F2)4p$		7/2	*62 065.521*	1.198	31	$^4F^\circ$	13	$(^3H)\ ^2G^\circ$
$3d^6(^3H)4p$	$z\ ^2G^\circ$	9/2	*62 083.108*	1.097	61		15	$(^3G)\ ^2G^\circ$
		7/2	*62 322.431*		38		23	$(^3F2)\ ^4F^\circ$
$3d^6(^3F2)4p$	$y\ ^4F^\circ$	5/2	*62 151.561*	1.025	61		19	$(^3F1)\ ^4F^\circ$
		9/2	*62 158.110*	1.33	63		21	
		3/2	*62 244.520*	0.43	66		21	
$3d^6(^3H)4p$	$z\ ^2I^\circ$	13/2	*62 293.164*	1.069	90		8	$(^3H)\ ^4I^\circ$
		11/2	*62 662.244*	0.910	93		4	

ENERGY LEVELS OF IRON

Fe II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^6(^3F2)4p$	$x\ ^4D^\circ$	7/2	62 945.038	1.385	60	14	$(^3F1)\ ^4D^\circ$
		5/2	63 272.976	1.351	67	15	
		3/2	63 465.109	1.21	71	16	
		1/2	63 559.488	0.013	71	15	
$3d^6(^3F2)4p$	$y\ ^4G^\circ$	11/2	63 876.317	1.24	50	28	$(^3H)\ ^4G^\circ$
		9/2	63 948.790	1.15	41	30	
		7/2	64 040.886	0.975	29	25	
		5/2	64 087.418	0.617	26	29	
$3d^6(^3F2)4p$	$z\ ^2F^\circ$	7/2	64 286.345	1.135	30	13	$(^3F1)\ ^2F^\circ$
		5/2	64 425.408	0.82	32	13	
$3d^6(^3P2)4p$	$z\ ^2P^\circ$	1/2	64 806.487		45	31	$(^3P1)\ ^2P^\circ$
		3/2	64 834.073	1.329	54	34	
$3d^6(^3F2)4p$	$y\ ^2G^\circ$	9/2	64 831.943	1.101	62	16	$(^3F1)\ ^2G^\circ$
		7/2	65 109.679	0.896	67	16	
$3d^6(^3H)4p$	$z\ ^2H^\circ$	11/2	65 363.595	1.066	39	37	$(^3G)\ ^4G^\circ$
		9/2	65 556.280	0.913	51	20	$(^3G)\ ^2H^\circ$
$3d^6(^3G)4p$	$x\ ^4G^\circ$	11/2	65 580.041		53	20	$(^3G)\ ^2H^\circ$
		9/2	65 696.038		48	27	$(^3G)\ ^4F^\circ$
		7/2	65 931.334	1.00	76	10	$(^3G)\ ^4F^\circ$
		5/2	66 078.269	0.62	83	6	$(^3F2)\ ^4G^\circ$
$3d^6(^3G)4p$	$x\ ^4F^\circ$	9/2	66 012.750		53	33	$(^3G)\ ^4G^\circ$
		7/2	66 377.283	1.21	71	11	$(^3G)\ ^4G^\circ$
		5/2	66 522.304	1.02	67	9	$(^3F2)\ ^2D^\circ$
		3/2	66 612.656		67	12	$(^3F2)\ ^2D^\circ$
$3d^6(^3P2)4p$	$z\ ^2S^\circ$	1/2	66 248.66		58	28	$(^3P1)\ ^2S^\circ$
$3d^6(^3G)4p$	$y\ ^4H^\circ$	13/2	66 411.686		89	9	$(^3H)\ ^4H^\circ$
		11/2	66 463.528	1.13	79	8	
		9/2	66 589.008	0.959	83	9	
		7/2	66 672.334	0.69	85	11	
$3d^6(^3F2)4p$	$y\ ^2D^\circ$	5/2	67 000.517	1.16	64	10	$(^3G)\ ^4F^\circ$
		3/2	67 273.826	0.719	59	14	
$3d^6(^3G)4p$	$y\ ^2H^\circ$	11/2	67 516.332	1.07	55	32	$(^3H)\ ^2H^\circ$
		9/2	68 000.788	0.907	59	31	
$3d^5(^6S)4s4p(^3P^\circ)$	$x\ ^4P^\circ$	5/2	69 102.38				
		3/2	69 302.09				
		1/2	69 426.98				
$3d^6(^3G)4p$	$y\ ^2F^\circ$	7/2	69 606.552	1.13	62	12	$(^3F2)\ ^2F^\circ$
		5/2	69 650.484	0.857	63	12	$(^3D)\ ^2F^\circ$
$3d^6(^3G)4p$	$x\ ^2G^\circ$	9/2	70 314.604	1.11	78	17	$(^3H)\ ^2G^\circ$
		7/2	70 523.706	0.87	73	14	
$3d^6(^1I)4p$	$z\ ^2K^\circ$	13/2	70 986.677		99		
		15/2	71 432.680	1.05	100		

Fe II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages			
$3d^6(^3D)4p$	$^4P°$	5/2	71 964.710		86		5	$^4D°$
		3/2	72 043.026	1.66	54		23	$^4F°$
		1/2	72 429.711		51		35	$^4D°$
$3d^6(^1G2)4p$	$x\ ^2H°$	9/2	72 130.39	0.91	51		22	$(^1G1)\ ^2H°$
		11/2	72 261.729	1.08	42		35	$(^1I)\ ^2H°$
$3d^6(^3D)4p$	$w\ ^4F°$	3/2	72 168.998		58		16	$(^3D)\ ^4P°$
		5/2	72 238.513		77		11	$(^3G)\ ^4F°$
		7/2	72 352.024		67		9	$(^3G)\ ^4F°$
		9/2	72 650.658		86		9	$(^3G)\ ^4F°$
$3d^6(^3D)4p$		1/2	72 212.978		41	$^4P°$	38	$(^3D)\ ^4D°$
$3d^6(^3D)4p$	$w\ ^4D°$	3/2	72 524.566		63		20	$^4P°$
		5/2	72 619.490		79		5	$^4P°$
		7/2	72 651.876		49		16	$^4F°$
$3d^6(^3D)4p$		7/2	73 016.147		31	$^4D°$	20	$(^1G2)\ ^2F°$
$3d^6(^3D)4p$		5/2	73 054.881		32	$^2F°$	30	$(^1G2)\ ^2F°$
$3d^6(^1G2)4p$	$w\ ^2G°$	9/2	73 091.590		58		26	$(^1G1)\ ^2G°$
		7/2	73 143.288	0.91	55		25	
$3d^6(^3D)4p$	$y\ ^2P°$	1/2	73 187.280		66		15	$(^3D)\ ^4D°$
		3/2	73 189.11		70		10	
$3d^5\,4s^2$	^4F	9/2	73 393.745					
		5/2	73 395.93					
		7/2	73 492.215					
		3/2	73 637.34					
$3d^6(^1I)4p$	$w\ ^2H°$	11/2	73 603.50		44		21	$(^1G2)\ ^2H°$
		9/2	73 751.282		68		8	
$3d^6(^1I)4p$	$y\ ^2I°$	13/2	73 966.832		98			
		11/2	73 969.767		89		7	$(^1I)\ ^2H°$
$3d^6(^3D)4p$	$x\ ^2D°$	3/2	74 498.057		91		3	$(^1F)\ ^2D°$
		5/2	74 606.841		91		2	
$3d^6(^3D)4p$	$w\ ^2F°$	7/2	75 600.931	1.125	57		16	$(^1G2)\ ^2F°$
		5/2	75 915.215	0.844	50		22	
$3d^6(^1S2)4p$	$x\ ^2P°$	3/2	76 129.446	1.34	37		31	$(^1D2)\ ^2P°$
		1/2	76 577.482		41		21	$(^3D)\ ^2P°$
$3d^5\,4s^2$	^2H	9/2	77 230.90					
$3d^6(^1D2)4p$	$v\ ^2F°$	5/2	77 742.730		60		16	$(^1D1)\ ^2F°$
		7/2	78 137.364	1.13	65		18	
$3d^6(^5D)5s$	$e\ ^6D$	9/2	77 861.625					
		7/2	78 237.685					
		5/2	78 525.407					
		3/2	78 725.790					
		1/2	78 843.992					

ENERGY LEVELS OF IRON

Fe II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages
$3d^5 4s^2$	^{2}G	7/2	78 185.03		
		9/2	78 577.28		
$3d^6(^1D2)4p$	$w\ ^2D°$	3/2	*78 487.153*		68 15 $(^1D1)\ ^2D°$
		5/2	*78 690.846*		64 15
$3d^6(^1D2)4p$	$w\ ^2P°$	1/2	*78 841.96*		48 20 $(^1S2)\ ^2P°$
		3/2	*79 243.60*		36 25
$3d^5(^6S)4s4p(^1P°)$	$x\ ^6P°$	3/2	*79 246.17*		
		5/2	*79 285.11*		
		7/2	*79 331.50*		
$3d^6(^5D)5s$	$e\ ^4D$	7/2	79 439.467		
		5/2	79 885.493		
		3/2	80 177.975		
		1/2	80 346.016		
$3d^5 4s^2$	^{2}F2	5/2	81 639.26		
		7/2	81 734.75		
$3d^6(^5D)4d$	$e\ ^6F$	11/2	82 853.658		
		9/2	82 978.677		
		7/2	83 136.487		
		5/2	83 308.194		
		3/2	83 459.67		
		1/2	83 558.54		
$3d^6(^1F)4p$	$v\ ^2G°$	7/2	*83 305.251*		92
		9/2	*83 871.184*		94
$3d^6(^5D)4d$	^{6}D	7/2	83 713.536		
		9/2	83 726.364		
		5/2	83 812.316		
		3/2	83 990.063		
		1/2	84 131.563		
$3d^6(^1F)4p$	$v\ ^2D°$	5/2	*83 868.45*		80 6 $(^1D2)\ ^2D°$
		3/2	*84 359.80*		85 4
$3d^6(^5D)4d$	$e\ ^6G$	13/2	84 035.14		
		11/2	84 296.83	1.33	
		9/2	84 527.778		
		7/2	84 710.685		
		5/2	84 844.834		
		3/2	84 938.18		
$3d^6(^5D)4d$	^{6}P	7/2	84 266.556		
		5/2	84 326.912		
		3/2	84 424.37		
$3d^6(^5D)4d$	$f\ ^4D$	7/2	84 685.198		
		5/2	84 870.863		
		3/2	85 048.602		
		1/2	85 172.809		
$3d^6(^5D)4d$	$e\ ^4G$	11/2	84 863.351	1.27	
		9/2	85 184.734		
		7/2	85 462.862		
		5/2	85 679.698		

Fe II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages			
$3d^6(^5D)4d$	^6S	5/2	85 495.304					
$3d^6(^5D)4d$	^4S	3/2	85 728.806					
$3d^6(^5D)4d$	$e\,^4F$	9/2	86 124.301	1.29				
		7/2	86 416.333					
		5/2	86 599.738					
		3/2	86 710.837					
$3d^6(^3P1)4p$	$v\,^4D°$	1/2	*86 388.82*		35		36	$(^3F1)\ ^4D°$
		3/2	*86 543.974*		33		38	
		5/2	*86 767.577*		30		40	
		7/2	*86 929.649*		25		45	
$3d^6(^1F)4p$	$u\,^2F°$	7/2	*86 482.75*		88		2	$(^1G2)\ ^2F°$
		5/2	*86 547.49*		90		2	
$3d^5(^4G)4s4p(^3P°)$	$y\,^6F°$	11/2	*87 340.983*					
		9/2	*87 471.765*					
		7/2	*87 537.652*					
		5/2	*87 572.431*					
		3/2	*87 602.25*					
		1/2	*87 898.12*					
$3d^5(^4P)4s4p(^3P°)$	$^6D°$	1/2	*87 635.92*					
		3/2	*87 964.65*					
		5/2	*88 059.38*					
		7/2	*88 209.45*					
		9/2	*88 614.52*					
$3d^6(^5D)4d$	^4P	5/2	87 985.628					
		3/2	88 157.116					
		1/2	88 189.030					
$3d^6(^5D)5p$	$^6D°$	9/2	*88 723.400*		90		8	$3d^54s4p$
		7/2	*88 853.533*		53		19	$(^5D)\ ^6P°$
		5/2	*89 119.457*		71		12	$(^5D)\ ^6P°$
		3/2	*89 331.195*		84		6	$(^5D)\ ^6P°$
		1/2	*89 471.365*		97		2	$3d^54s4p$
$3d^6(^3P1)4p$	$^2S°$	1/2	*89 003.46*		61		32	$(^3P2)\ ^2S°$
$3d^6(^5D)5p$		7/2	*89 128.561*		40	$^6D°$	22	$^6P°$
$3d^5(^4P)4s4p(^3P°)$	$^6P°$	5/2	*89 444.458*					
		3/2	*89 625.940*					
$3d^6(^3F1)4p$	$^4G°$	5/2	*89 727.342*		77		17	$(^3F2)\ ^4G°$
		7/2	*89 890.373*		76		17	
		9/2	*90 042.779*		70		16	
		11/2	*90 211.70*		75		18	
$3d^6(^5D)5p$	$^6F°$	11/2	*89 924.175*		87		12	$3d^54s4p$
		9/2	*90 067.347*		39		45	$(^5D)\ ^4F°$
		7/2	*90 300.625*		59		26	$(^5D)\ ^4F°$
		5/2	*90 487.810*		77		9	$(^5D)\ ^4F°$
		3/2	*90 593.497*		82		13	$3d^54s4p$
		1/2	*90 648.217*		83		15	$3d^54s4p$

ENERGY LEVELS OF IRON

Fe II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages			
$3d^6(^5D)5p$	$^4F^\circ$	$9/2$	*90 386.528*		48		44	$(^5D)\ ^6F^\circ$
		$7/2$	*90 780.621*		6[illegible]		18	$(^5D)\ ^4D^\circ$
		$5/2$	*91 070.547*		67		13	$(^5D)\ ^4D^\circ$
		$3/2$	*91 208.887*		64		28	$(^5D)\ ^4D^\circ$
$3d^6(^5D)5p$	$^4D^\circ$	$7/2$	*90 397.868*		77		12	$^6F^\circ$
		$5/2$	*90 638.822*		69		19	$^4F^\circ$
		$3/2$	*91 048.256*		65		30	$^4F^\circ$
		$1/2$	*91 199.746*		97		1	$^4P^\circ$
$3d^6(^3P1)4p$	$^4S^\circ$	$3/2$	*90 629.902*		61		27	$(^3P2)\ ^4S^\circ$
$3d^6(^3P1)4p$	$^4P^\circ$	$1/2$	*90 839.486*		52		37	$(^3P2)\ ^4P^\circ$
		$3/2$	*90 898.873*		28		20	
		$5/2$	*92 274.12*		45		31	
$3d^6(^5D)5p$	$^4P^\circ$	$5/2$	*90 901.124*		79		16	$^4D^\circ$
		$3/2$	*92 225.538*		91		5	
		$1/2$	*92 314.758*		95		1	
$3d^6(^5D)5p$	$w\ ^6P^\circ$	$7/2$	*91 167.937*		53		39	$3d^54s4p$
		$5/2$	*91 575.139*		55		38	
$3d^6(^3P1)4p$		$3/2$	*91 843.470*		28	$^4P^\circ$	24	$3d^6(^5D)5p\ ^6P^\circ$
$3d^5(^4D)4s4p(^3P^\circ)$	$^6F^\circ$	$1/2$	*91 850.722*					
		$3/2$	*91 915.95*					
		$5/2$	*92 018.729*					
		$7/2$	*92 154.165*					
		$9/2$	*92 300.277*					
		$11/2$	*92 432.136*					
$3d^5(^4G)4s4p(^3P^\circ)$	$x\ ^4H^\circ$	$7/2$	*92 089.26*					
		$9/2$	*92 116.78*					
		$11/2$	*92 166.60*					
		$13/2$	*92 250.21*					
$3d^6(^3F1)4p$	$u\ ^2G^\circ$	$9/2$	*92 171.716*		50		13	$(^3F2)\ ^2G^\circ$
		$7/2$	*92 602.703*		62		15	
$3d^6(^3F1)4p$	$u\ ^2D^\circ$	$3/2$	*92 216.32*		46		20	$(^3P1)\ ^2D^\circ$
		$5/2$	*92 695.374*		50		17	
$3d^5(^4G)4s4p(^3P^\circ)$	$v\ ^4F^\circ$	$7/2$	*92 282.46*					
		$5/2$	*92 329.89*					
		$3/2$	*92 358.61*					
		$9/2$	*92 426.98*					
$3d^6(^3F1)4p$	$^4D^\circ$	$1/2$	*92 453.46*		42		25	$(^3P1)\ ^4D^\circ$
		$3/2$	*92 647.51*		36		25	
		$5/2$	*92 899.20*		26		23	
		$7/2$	*93 129.90*		18		22	
$3d^6(^3F1)4p$	$u\ ^4F^\circ$	$3/2$	*93 328.48*		46		17	$(^3F2)\ ^4F^\circ$
		$5/2$	*93 395.36*		45		17	
		$9/2$	*93 484.58*		54		21	
		$7/2$	*93 487.65*		35		13	

Fe II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^5(^4D)4s4p(^3P^\circ)$	$^6D^\circ$	5/2	*93 830.979*				
		3/2	*93 840.34*				
		7/2	*93 987.457*				
		1/2	*94 031.378*				
		9/2	*94 057.773*				
$3d^5(^4G)4s4p(^3P^\circ)$	$w\,^4G^\circ$	5/2	*93 988.17*				
		7/2	*94 073.24*				
		9/2	*94 148.51*				
		11/2	*94 189.88*				
$3d^5(^4P)4s4p(^3P^\circ)$	$^4P^\circ$	5/2	*94 211.739*				
		3/2	*94 739.17*				
		1/2	*94 880.74*		37		
$3d^5(^4D)4s4p(^3P^\circ)$	$^6P^\circ$	5/2	*94 685.09*		43		
		7/2	*94 763.219*				
					56		
$3d^6(^3P1)4p$	$^2D^\circ$	5/2	*94 700.66*		54	27	$(^3P2)\,^2D^\circ$
$3d^6(^3P1)4p$	$^2P^\circ$	3/2	*95 039.2*			26	$(^3P2)\,^2P^\circ$
$3d^6(^3F1)4p$	$^2F^\circ$	5/2	*95 046.10*			20	$3d^54s4p$
		7/2	*95 079.64*			20	
$3d^5(^4P)4s4p(^3P^\circ)$	$^4D^\circ$	1/2	*95 767.70*				
		3/2	*95 858.05*				
		5/2	*95 995.69*				
		7/2	*96 217.42*				
$3d^5(^4G)4s4p(^3P^\circ)$	$v\,^2H^\circ$	11/2	*96 062.06*				
		9/2	*96 239.20*				
$3d^5(^4G)4s4p(^3P^\circ)$	$t\,^2F^\circ$	5/2	*96 279.49*		62		
		7/2	*96 356.96*		63		
$3d^5(^4P)4s4p(^3P^\circ)$	$^2P^\circ$	3/2	*97 326.27*				
$3d^6(^1G1)4p$	$^2H^\circ$	9/2	*97 851.35*			33	$(^1G2)\,^2H^\circ$
		11/2	*98 278.77*			34	
$3d^6(^3H)5s$	$e\,^4H$	13/2	98 130.131				
		11/2	98 294.401				
		9/2	98 445.400				
		7/2	98 568.912				
$3d^5(^4D)4s4p(^3P^\circ)$	$^4F^\circ$	3/2	*98 196.00*				
		5/2	*98 354.66*				
		7/2	*98 535.85*				
		9/2	*98 596.65*				
$3d^5(^4P)4s4p(^3P^\circ)$	$^4S^\circ$	3/2	*98 338.28*				
$3d^5(^4D)4s4p(^3P^\circ)$	$^4D^\circ$	7/2	*98 391.33*		43		
		5/2	*98 505.10*				
		3/2	*98 770.14*				
		1/2	*99 007.70*				
$3d^6(^1G1)4p$	$^2F^\circ$	7/2	*98 898.71*			22	$(^1G2)\,^2F^\circ$

ENERGY LEVELS OF IRON

Fe II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages
$3d^6(^3H)5s$	$e\ ^2H$	$11/2$	99 093.452		
		$9/2$	99 332.102		
$3d^6(^3F2)5s$	$f\ ^4F$	$9/2$	99 573.225		
		$7/2$	99 688.337		
		$5/2$	99 824.045		
		$3/2$	99 918.569		
$3d^5(^4G)4s4p(^3P^\circ)$	$^2G^\circ$	$7/2$	*99 635.52*		
		$9/2$	*99 653.22*		
$3d^6(^1G1)4p$	$^2G^\circ$	$9/2$	*99 757.12*		42 31 $3d^54s4p$
		$7/2$	*99 808.40*		44 20 $3d^6(^1G2)4p\ ^2G^\circ$
$3d^5(^4P)4s4p(^3P^\circ)$	$^2D^\circ$	$5/2$	*100 400.36*		
$3d^6(^3F2)5s$	$e\ ^2F$	$7/2$	100 492.02		
		$5/2$	100 749.81		
$3d^5(^4D)4s4p(^3P^\circ)$	$^4P^\circ$	$1/2$	*101 402.38*		
		$3/2$	*101 573.90*		
$3d^6(^5D)6s$	^6D	$9/2$	101 698.489		
		$7/2$	102 030.912		
		$5/2$	102 334.112		
		$3/2$	102 543.648		
		$1/2$	102 666.694		
$3d^5(^2I)4s4p(^3P^\circ)$	$^4K^\circ$	$11/2$	*102 340.3*		
		$13/2$	*102 489.9*		
		$15/2$	*102 851.2?*		
$3d^6(^5D)6s$	^4D	$7/2$	102 394.718		
		$5/2$	102 802.312		
		$3/2$	103 118.400		
		$1/2$	103 265.694		
$3d^5(^4D)4s4p(^3P^\circ)$	$^2D^\circ$	$5/2$	*102 449.10*		
		$3/2$	*102 503.81*		
$3d^6(^3G)5s$	$f\ ^4G$	$11/2$	102 584.963		
		$9/2$	102 842.119		
$3d^6(^5D_4)4f$	$^2[5]^\circ$	$11/2$	*102 831.32*		
		$9/2$	*102 851.36*		
$3d^6(^5D_4)4f$	$^2[6]^\circ$	$13/2$	*102 840.25*		
		$11/2$	*102 893.38*		
$3d^6(^5D_4)4f$	$^2[4]^\circ$	$9/2$	*102 882.37*		
		$7/2$	*102 887.12*		
$3d^6(^5D_4)4f$	$^2[3]^\circ$	$7/2$	*102 942.20*		
		$5/2$	*102 952.12*		
$3d^5(^2I)4s4p(^3P^\circ)$	$^4I^\circ$	$9/2$	*102 951.5*		
		$11/2$	*102 980.3*		
		$13/2$	*103 120.9*		
		$15/2$	*103 232.1*		

Fe II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages
$3d^6(^5D_4)4f$	$^2[7]°$	$^{13}/_2$	*103 019.67*		
		$^{15}/_2$	*103 040.32*		
$3d^6(^5D_4)4f$	$^2[2]°$	$^5/_2$	*103 024.29*		
		$^3/_2$	*103 034.76*		
$3d^5(^6S)4s\ (^7S)5s$	^8S	$^7/_2$	103 094.73		
$3d^6(^5D_4)4f$	$^2[1]°$	$^3/_2$	*103 110.79*		
		$^1/_2$	*103 125.65*		
$3d^5(^4D)4s4p(^3P°)$	$^2F°$	$^7/_2$	*103 183.7*		
		$^5/_2$	*103 334.1*		
$3d^6(^5D_3)4f$	$^2[5]°$	$^{11}/_2$	*103 325.95*		
		$^9/_2$	*103 352.68*		
$3d^6(^5D_3)4f$	$^2[4]°$	$^9/_2$	*103 326.41*		
		$^7/_2$	*103 340.64*		
$3d^6(^5D_3)4f$	$^2[3]°$	$^5/_2$	*103 364.84*		
		$^7/_2$	*103 385.73*		
$3d^6(^5D_3)4f$	$^2[2]°$	$^3/_2$	*103 391.29*		
		$^5/_2$	*103 406.25*		
$3d^6(^5D_3)4f$	$^2[1]°$	$^3/_2$	*103 417.91*		
		$^1/_2$	*103 437.28*		
$3d^6(^5D_3)4f$	$^2[0]°$	$^1/_2$	*103 418.08*		
$3d^6(^5D_3)4f$	$^2[6]°$	$^{11}/_2$	*103 420.16*		
		$^{13}/_2$	*103 421.18*		
$3d^6(^3H)4d$	^4H	$^{13}/_2$	103 600.44		
		$^{11}/_2$	103 751.66		
$3d^6(^3G)5s$	^2G	$^9/_2$	103 608.909		
		$^7/_2$	103 983.51		
$3d^6(^5D_2)4f$	$^2[2]°$	$^3/_2$	*103 645.22*		
		$^5/_2$	*103 660.98*		
$3d^6(^5D_2)4f$	$^2[1]°$	$^3/_2$	*103 668.69*		
		$^1/_2$	*103 676.22*		
$3d^6(^5D_2)4f$	$^2[3]°$	$^7/_2$	*103 676.78*		
		$^5/_2$	*103 698.44*		
$3d^6(^5D_2)4f$	$^2[4]°$	$^9/_2$	*103 680.64*		
		$^7/_2$	*103 711.57*		
$3d^6(^5D_2)4f$	$^2[5]°$	$^{11}/_2$	*103 691.05*		
		$^9/_2$	*103 701.72*		
$3d^6(^5D_1)4f$	$^2[2]°$	$^5/_2$	*103 857.74*		
		$^3/_2$	*103 869.02*		

ENERGY LEVELS OF IRON

Fe II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages
$3d^6(^5D_1)4f$	$^2[4]°$	9/2	*103 873.99*		
		7/2	*103 882.68*		
$3d^6(^3H)4d$	^4I	15/2	103 878.34		
		13/2	104 064.67		
		11/2	104 174.27		
$3d^6(^5D)5d$	^6F	11/2	103 936.60		
		9/2	103 950.59		
		7/2	104 380.94		
		5/2	104 426.46		
$3d^5(^4P)4s4p(^3P°)$	$^2S°$	1/2	*103 967.49*		
$3d^6(^5D_1)4f$	$^2[3]°$	7/2	*103 969.76*		
		5/2	*103 987.93*		
$3d^6(^5D)5d$	^6P	7/2	104 000.81		
		5/2	104 120.27		
		3/2	104 630.43		
$3d^6(^5D_0)4f$	$^2[3]°$	7/2	*104 022.89*		
		5/2	*104 046.35*		
$3d^6(^3H)4d$	^2K	15/2	104 119.71		
		13/2	104 315.37		
$3d^6(^3H)4d$	^4F	3/2	104 189.38		
$3d^6(^5D)5d$	^6G	13/2	104 366.82		
		11/2	104 593.27		
		9/2	104 868.50		
		7/2	105 065.63		
		5/2	105 205.79		
		3/2	105 288.53		
$3d^6(^5D)5d$	^6D	9/2	104 411.69		
		3/2	104 588.71		
		7/2	104 705.42		
		1/2	104 757.11		
		5/2	104 828.16		
		5/2	104 569.23		
$3d^5(^2I)4s4p(^3P°)$	$^4H°$	13/2	*104 659.26*		
		11/2	*104 816.80*		
		9/2	*104 937.8*		
		7/2	*105 028.6*		
		5/2	104 761.10		
		3/2	104 840.02		
$3d^6(^5D)5d$	^4G	11/2	104 863.43		
		9/2	105 211.14		
		7/2	105 449.54		
		5/2	105 630.75		

Fe II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages
$3d^6(^5D)5d$	^4D	7/2	104 873.23		
		5/2	105 127.77		
		1/2	105 230.29		
$3d^6(^3F2)4d$	^4G	11/2	105 063.55		
		9/2	105 155.09		
		7/2	105 291.01		
		5/2	105 414.18		
		5/2	105 234.06		
		5/2	105 238.77		
$3d^6(^3F2)4d$	^4H	13/2	105 288.847		
		11/2	105 398.852		
		9/2	105 524.461		
		7/2	105 589.42		
$3d^6(^5D)5d$	^6S	5/2	105 711.73		
$3d^6(^3F2)4d$	^2H	11/2	105 763.270		
		9/2	106 018.643		
$3d^5(^2I)4s4p(^3P^\circ)$	$^2K^\circ$	13/2	*106 183.1*		
		15/2	*106 524.4*		
$3d^5(^2I)4s4p(^3P^\circ)$	$^2H^\circ$	11/2	*106 690.17*		
		9/2	*107 006.35*		
$3d^5(^6S)4p^2(^3P)$	^8P	7/2	106 836.0		
		9/2	107 219.5		
$3d^5(^4G)4s4p(^1P^\circ)$	$^4G^\circ$	11/2	*108 483.87*		
		9/2	*108 570.56*		
		5/2	*108 629.25*		
		7/2	*108 631.09*		
$3d^6(^1I)5s$	$e\,^2I$	11/2	108 630.429		
		13/2	108 648.695		
$3d^5(^4G)4s4p(^1P^\circ)$	$^4H^\circ$	13/2	*108 729.16*		
		11/2	*108 809.31*		
		9/2	*108 868.98*		
		7/2	*108 906.64*		
$3d^6(^3D)5s$	^4D	7/2	108 804.667		
$3d^5(^2I)4s4p(^3P^\circ)$	$^2I^\circ$	13/2	*109 149.68*		
		11/2	*109 271.71*		
$3d^5(^6S)4s\ (^7S)4d$	^8D	3/2	109 449.53		
		5/2	109 455.25		
		7/2	109 463.22		
		9/2	109 473.65		
		11/2	109 486.15		
Fe III ($^5D_4$)	*Limit*		130 563		

ENERGY LEVELS OF IRON

Fe III

$Z=26$

Cr I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6\ {}^5D_4$

Ionization energy = 247 220±100 cm^{-1} (30.652±0.01 eV)

The present list of energy levels for Fe III is a combination of the results of Edlén and Swings (1942), who observed the spectrum from 500 to 6500 Å, and those of Glad (1956), who reobserved the long wavelength portion from 2600 to 8600 Å. A correction of 0.8 cm^{-1} has been added to the published level values to place the ground state at zero. No discussion of the level accuracy was given.

The percentage compositions for levels of the $3d^6$ configuration were taken from the theoretical work of Pasternak and Goldschmidt (1972). For the $3d^5 4s$ configuration, we have used the percentages given by Shadmi, Caspi, and Oreg (1969), who listed compositions only for highly mixed states. Although no statement was made concerning the percentage compositions of the remaining levels, it appears that their purity is at least 90%. For the $3d^5 4p$ configuration we have used the results of Roth (1968). Roth distinguished repeating terms of $3d^n$ by the letters a, b ... rather than by seniority. Each of his percentages is the sum of LS term contributions differing only in the seniority of the core term.

Transitions among levels of the $3d^6$ configuration observed in nebular spectra have been given by Bowen (1960).

The ionization energy was determined by Glad from the $3d^5(^6S)ns\ {}^7S$ levels ($n=5,6,7$).

References

Bowen, I. S., (1960), Astrophys. J. **132**, 1.
Edlén, B., and Swings, P. (1942), Astrophys. J. **95**, 532.
Glad, S. (1956), Arkiv Fysik **10**, 21.
Pasternak, A., and Goldschmidt, Z. B. (1972), Phys. Rev. **A6**, 55.
Roth, C. (1968), J. Res. Nat. Bur. Stand (U.S.) **72A**, 505.
Shadmi, Y., Caspi, E., and Oreg, J. (1969), J. Res. Nat. Bur. Stand. (U.S.) **73A**, 173.

Fe III

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^6$	^5D	4	0.0	100		
		3	436.2	100		
		2	738.9	100		
		1	932.4	100		
		0	1 027.3	100		
$3d^6$	$^3P2$	2	19 404.8	61	38	$^3P1$
		1	20 688.4	62	38	
		0	21 208.5	62	37	
$3d^6$	^3H	6	20 051.1	100		
		5	20 300.8	99		
		4	20 481.9	97		
$3d^6$	$^3F2$	4	21 462.2	74	21	$^3F1$
		3	21 699.9	77	21	
		2	21 857.2	79	20	
$3d^6$	^3G	5	24 558.8	99		
		4	24 940.9	97		
		3	25 142.4	98		
$3d^5(^6S)4s$	^7S	3	30 088.84			
$3d^6$	^1I	6	30 356.2	100		
$3d^6$	^3D	2	30 716.2	99		
		1	30 725.8	100		
		3	30 857.8	100		

Fe III–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^6$	^{1}G2	4	30 886.4	65	34	^{1}G1
$3d^6$	^{1}S2	0	34 812.4	76	23	^{1}S1
$3d^6$	^{1}D2	2	35 803.7	77	22	^{1}D1
$3d^5(^6S)4s$	^{5}S	2	40 999.87			
$3d^6$	^{1}F	3	42 896.9	99		
$3d^6$	^{3}P1	0	49 148	62	38	^{3}P2
		1	49 576.9	62	38	
		2	50 412.3	61	39	
$3d^6$	^{3}F1	2	50 184.9	80	20	^{3}F2
		4	50 276.1	78	22	
		3	50 295.2	78	21	
$3d^6$	^{1}G1	4	57 221.7	65	35	^{1}G2
$3d^5(^4G)4s$	^{5}G	6	63 425.17			
		5	63 466.39			
		4	63 486.78			
		3	63 494.00			
		2	63 494.56			
$3d^5(^4P)4s$	^{5}P	3	66 464.64			
		2	66 522.95			
		1	66 591.68			
$3d^5(^4D)4s$	^{5}D	4	69 695.73			
		0	69 747.40			
		1	69 788.19			
		3	69 836.83			
		2	69 837.76			
$3d^5(^4G)4s$	^{3}G	5	70 694.03			
		3	70 725.01			
		4	70 728.75			
$3d^5(^4P)4s$	^{3}P	2	73 727.64			
		1	73 849.10			
		0	73 935.96			
$3d^5(^4D)4s$	^{3}D	3	76 956.79			
		1	77 075.30			
		2	77 102.43			
$3d^5(^2I)4s$	^{3}I	7	79 840.12			
		6	79 844.74			
		5	79 860.42			
$3d^5(^6S)4p$	^{7}P°	2	*82 001.73*	100		
		3	*82 333.92*	99		
		4	*82 846.59*	100		
$3d^5(^2D3)4s$	^{3}D	3	82 382.87	76	16	(^{2}F2) ^{3}F
		2	82 410.94	69	17	(^{4}F) ^{5}F
		1	82 494.88	66	34	(^{4}F) ^{5}F

ENERGY LEVELS OF IRON

Fe III–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^5(^4\mathrm{F})4s$	$^5\mathrm{F}$	5	83 138.23			
		4	83 161.48			
		3	83 237.86			
		2	83 358.88	77	15	$(^2\mathrm{F}2)\ ^3\mathrm{F}$
		1	83 646.98	66	34	$(^2\mathrm{D}3)\ ^3\mathrm{D}$
$3d^5(^2\mathrm{I})4s$	$^1\mathrm{I}$	6	83 429.61			
$3d^5(^2\mathrm{F}2)4s$	$^3\mathrm{F}$	4	84 159.55			
		2	84 369.92	60	17	$(^2\mathrm{D}3)\ ^3\mathrm{D}$
		3	84 671.87	77	18	$(^2\mathrm{D}3)\ ^3\mathrm{D}$
$3d^5(^2\mathrm{D}3)4s$	$^1\mathrm{D}$	2	86 847.11			
$3d^5(^2\mathrm{F}2)4s$	$^1\mathrm{F}$	3	87 901.87			
$3d^5(^2\mathrm{H})4s$	$^3\mathrm{H}$	4	88 663.87			
		5	88 694.67			
		6	88 923.07			
$3d^5(^6\mathrm{S})4p$	$^5\mathrm{P}^\circ$	3	*89 084.79*	98		
		2	*89 334.51*	98		
		1	*89 491.39*	98		
$3d^5(^2\mathrm{G}2)4s$	$^3\mathrm{G}$	3	89 697.52			
		4	89 783.59			
		5	89 907.85			
$3d^5(^4\mathrm{F})4s$	$^3\mathrm{F}$	2	90 423.68			
		4	90 472.53			
		3	90 483.94			
$3d^5(^2\mathrm{H})4s$	$^1\mathrm{H}$	5	92 523.91			
$3d^5(^2\mathrm{F}1)4s$	$^3\mathrm{F}$	4	93 388.75	58	41	$(^2\mathrm{G}2)\ ^1\mathrm{G}$
		3	93 392.45			
		2	93 412.93			
$3d^5(^2\mathrm{G}2)4s$	$^1\mathrm{G}$	4	93 512.64	55	40	$(^2\mathrm{F}1)\ ^3\mathrm{F}$
$3d^5(^2\mathrm{F}1)4s$	$^1\mathrm{F}$	3	97 041.38			
$3d^5(^2\mathrm{S})4s$	$^3\mathrm{S}$	1	98 662.68			
$3d^5(^2\mathrm{D}2)4s$	$^3\mathrm{D}$	1	105 895.35			
		2	105 906.23			
		3	105 929.16			
$3d^5(^2\mathrm{D}2)4s$	$^1\mathrm{D}$	2	109 570.84			
$3d^5(^4\mathrm{G})4p$	$^5\mathrm{G}^\circ$	2	*113 584.20*	96		
		3	*113 605.37*	91	5	$(^4\mathrm{G})\ ^5\mathrm{H}^\circ$
		4	*113 635.34*	89	8	
		5	*113 677.01*	88	9	
		6	*113 739.62*	90	7	
$3d^5(^2\mathrm{G}1)4s$	$^3\mathrm{G}$	5	114 325.35			
		4	114 339.95			
		3	114 351.92			

Fe III—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^5(^4G)4p$	$^5H^\circ$	3	114 948.55	94		5	$(^4G)\ ^5G^\circ$
		4	115 110.92	90		8	
		5	115 289.91	90		9	
		6	115 474.25	92		7	
		7	115 642.23	100			
$3d^5(^4G)4p$	$^5F^\circ$	5	116 316.63	90		5	$(^4D)\ ^5F^\circ$
		4	116 467.41	81		7	$(^4D)\ ^5F^\circ$
		3	116 475.44	55		22	$(^4P)\ ^5D^\circ$
		1	116 937.57	76		12	$(^4P)\ ^5D^\circ$
		2	116 975.05	57		28	$(^4P)\ ^5D^\circ$
$3d^5(^4P)4p$	$^5D^\circ$	0	116 364.76	80		16	$(^4D)\ ^5D^\circ$
		1	116 380.07	67		16	$(^4D)\ ^5D^\circ$
		2	116 419.39	46		29	$(^4G)\ ^5F^\circ$
		3	117 068.56	49		32	$(^4G)\ ^5F^\circ$
		4	117 521.91	75		14	$(^4D)\ ^5D^\circ$
$3d^5(^4P)4p$	$^5S^\circ$	2	116 898.22	92			
$3d^5(^2G1)4s$	^1G	4	117 950.32				
$3d^5(^4G)4p$	$^3F^\circ$	2	118 163.56	90			
		3	118 246.52	75		10	$(^4P)\ ^5P^\circ$
		4	118 350.24	89			
$3d^5(^4G)4p$	$^3H^\circ$	6	118 355.01	96			
		5	118 557.25	97			
		4	118 686.25	95			
$3d^5(^4P)4p$	$^5P^\circ$	3	118 442.92	53		22	$(^4D)\ ^5P^\circ$
		2	118 721.60	69		19	
		1	118 867.87	78		14	
$3d^5(^4P)4p$	$^3P^\circ$	2	119 697.64	66		18	$(^4D)\ ^3P^\circ$
		1	119 982.26	71		18	
		0	120 179.95	76		17	
$3d^5(^4D)4p$	$^5F^\circ$	1	120 697.10	85		11	$(^4G)\ ^5F^\circ$
		2	120 826.17	84		10	
		3	121 008.78	84		8	
		4	121 241.67	87		7	
		5	121 468.82	92		6	
$3d^5(^4G)4p$	$^3G^\circ$	3	121 919.74	94			
		4	121 941.29	95			
		5	121 949.62	95			
$3d^5(^4P)4p$	$^3D^\circ$	3	122 346.61	53		29	$(^4D)\ ^5D^\circ$
		2	122 628.34	46		36	
		1	122 843.03	46		35	
$3d^5(^4D)4p$		3	122 829.55	36	$^5D^\circ$	31	$(^4P)\ ^3D^\circ$
$3d^5(^4P)4p$		2	122 898.84	40	$^3D^\circ$	25	$(^4D)\ ^5D^\circ$
$3d^5(^4P)4p$		1	122 921.37	41	$^3D^\circ$	22	$(^4D)\ ^5P^\circ$

ENERGY LEVELS OF IRON

Fe III–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^5(^4D)4p$	$^5D^\circ$	4	122 944.15	78		16	$(^4P)\ ^5D^\circ$
		0	123 455.92	75		19	$(^4P)\ ^5D^\circ$
$3d^5(^4D)4p$	$^5P^\circ$	1	123 552.95	56		20	$(^4D)\ ^5D^\circ$
		2	123 697.18	55		18	$(^4P)\ ^5P^\circ$
		3	123 750.39	45		23	$(^4P)\ ^5P^\circ$
$3d^5(^4D)4p$	$^3D^\circ$	3	124 854.04	71		12	$(^4D)\ ^5P^\circ$
		2	124 903.92	84		7	$(^4F)\ ^3D^\circ$
		1	124 954.88	84		8	$(^4F)\ ^3D^\circ$
$3d^5(^4D)4p$	$^3F^\circ$	4	125 443.58	90		6	$(a\ ^2G)\ ^3F^\circ$
		3	125 637.98	86		6	
		2	125 672.83	88		6	
$3d^5(^4P)4p$	$^3S^\circ$	1	126 390.57	95			
$3d^5(^4D)4p$	$^3P^\circ$	0	128 371.53	77		18	$(^4P)\ ^3P^\circ$
		1	128 605.65	74		19	
		2	128 917.51	72		21	
$3d^5(^2I)4p$	$^3K^\circ$	6	129 854.80	83		15	$(^2I)\ ^3I^\circ$
		7	130 040.56	76		17	
		8	130 852.25	100			
$3d^5(^2I)4p$	$^3I^\circ$	5	130 256.27	82		9	$(^2I)\ ^1H^\circ$
		6	130 756.84	78		16	$(^2I)\ ^3K^\circ$
		7	131 035.07	71		21	$(^2I)\ ^3K^\circ$
$3d^5(a\ ^2D)4p$		2	131 445.03	32	$^1D^\circ$	26	$(a\ ^2F)\ ^3F^\circ$
$3d^5(^2I)4p$	$^1H^\circ$	5	131 710.79	69		13	$(^2I)\ ^3I^\circ$
$3d^5(^2I)4p$	$^1K^\circ$	7	131 991.58	89		9	$(^2I)\ ^3I^\circ$
$3d^5(a\ ^2D)4p$	$^3F^\circ$	3	132 079.91	58		25	$(a\ ^2F)\ ^3F^\circ$
		2	132 104.94	42		26	$(a\ ^2D)\ ^1D^\circ$
		4	132 785.36	58		22	$(a\ ^2F)\ ^3F^\circ$
$3d^5(^2I)4p$	$^3H^\circ$	6	132 262.66	90			
		5	132 564.71	86		6	$(^2I)\ ^1H^\circ$
		4	132 659.17	84			
$3d^5(a\ ^2D)4p$	$^3P^\circ$	2	134 265.42	67		25	$(a\ ^2F)\ ^3D^\circ$
		1	134 549.38	59		20	$(a\ ^2D)\ ^3D^\circ$
		0	135 088.60	90		6	$(^4F)\ ^5D^\circ$
$3d^5(a\ ^2F)4p$	$^1G^\circ$	4	134 360.40	57		17	$(a\ ^2F)\ ^3G^\circ$
$3d^5(a\ ^2F)4p$	$^3G^\circ$	3	134 549.00	53		25	$(a\ ^2D)\ ^1F^\circ$
		5	135 316.42	55		35	$(^4F)\ ^5G^\circ$
		4	135 554.41	54		36	$(a\ ^2F)\ ^3F^\circ$
$3d^5(^4F)4p$	$^5G^\circ$	2	134 937.84	75		10	$(a\ ^2F)\ ^3F^\circ$
		3	135 096.84	54		27	$(a\ ^2D)\ ^3D^\circ$
		4	135 239.74	81		8	$(a\ ^2F)\ ^1G^\circ$
		6	135 582.08	50		44	$(^2I)\ ^1I^\circ$
		5	135 735.31	58		39	$(a\ ^2F)\ ^3G^\circ$

Fe III–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^5(a\ ^2D)4p$	$^3D^\circ$	3	*134 976.22*	32		25	$(a\ ^2F)\ ^3D^\circ$
		1	*135 217.17*	60		22	$(a\ ^2D)\ ^3P^\circ$
		2	*135 279.04*	62		12	$(^4F)\ ^5G^\circ$
$3d^5(a\ ^2F)4p$	$^3D^\circ$	3	*135 705.57*	65		11	$(a\ ^2D)\ ^3D^\circ$
		1	*136 464.9*	66		19	$(a\ ^2D)\ ^1P^\circ$
		2	*136 793.82*	36		37	$(^4F)\ ^5F^\circ$
$3d^5(^2I)4p$	$^1I^\circ$	6	*135 739.47*	50		46	$(^4F)\ ^5G^\circ$
$3d^5(^4F)4p$	$^5F^\circ$	4	*135 990.62*	74		17	$(^4F)\ ^5D^\circ$
		3	*136 008.74*	65		13	$(^4F)\ ^5D^\circ$
		2	*136 117.94*	38		36	$(a\ ^2F)\ ^3D^\circ$
		5	*136 185.17*	88			
		1	*136 235.84*	76		10	$(a\ ^2D)\ ^3D^\circ$
$3d^5(a\ ^2D)4p$		3	*136 200.13*	31	$^1F^\circ$	24	$(a\ ^2F)\ ^3G^\circ$
$3d^5(a\ ^2F)4p$	$^3F^\circ$	2	*136 532.45*	46		19	$(a\ ^2D)\ ^3F^\circ$
		4	*136 612.78*	42		28	
		3	*136 797.05*	41		14	
$3d^5(^4F)4p$	$^5D^\circ$	4	*137 209.73*	75		16	$(^4F)\ ^5F^\circ$
		3	*137 423.00*	74		14	$(^4F)\ ^5F^\circ$
		2	*137 544.60*	77		9	$(^4F)\ ^5F^\circ$
		1	*137 561.1*	85		6	$(a\ ^2D)\ ^3P^\circ$
		0	*137 573.2*	91		6	$(a\ ^2D)\ ^3P^\circ$
$3d^5(^2H)4p$	$^3H^\circ$	4	*137 527.92*	46		44	$(a\ ^2G)\ ^3H^\circ$
		5	*137 763.70*	43		42	
		6	*138 264.47*	46		41	
$3d^5(^2H)4p$	$^3G^\circ$	5	*138 054.59*	47		29	$(^4F)\ ^3G^\circ$
		4	*138 103.12*	43		30	
		3	*138 187.93*	41		28	
$3d^5(a\ ^2D)4p$	$^1P^\circ$	1	*138 691.81*	71		17	$(a\ ^2F)\ ^3D^\circ$
$3d^5(^4F)4p$	$^3G^\circ$	5	*139 463.36*	43		25	$(a\ ^2G)\ ^3G^\circ$
		4	*139 625.17*	42		36	
		3	*139 680.47*	42		41	
$3d^5(^2H)4p$	$^3I^\circ$	5	*139 509.44*	79		8	$(^2H)\ ^3H^\circ$
		6	*139 846.18*	87		5	
		7	*140 196.33*	96			
$3d^5(a\ ^2F)4p$	$^1D^\circ$	2	*139 764.48*	56		38	$(a\ ^2D)\ ^1D^\circ$
$3d^5(a\ ^2G)4p$	$^1G^\circ$	4	*139 827.17*	40		19	$(a\ ^2F)\ ^1G^\circ$
$3d^5(a\ ^2F)4p$	$^1F^\circ$	3	*140 453.10*	72		8	$(a\ ^2D)\ ^1F^\circ$
$3d^5(a\ ^2G)4p$	$^3F^\circ$	3	*140 693.36*	42		26	$(^4F)\ ^3F^\circ$
		2	*140 750.98*	42		31	
		4	*141 002.99*	45		26	
$3d^5(^4F)4p$	$^3D^\circ$	2	*141 399.04*	68		8	$(a\ ^2G)\ ^3F^\circ$
		3	*141 466.53*	64		7	$(a\ ^2G)\ ^3F^\circ$
		1	*141 469.45*	84		6	$(^4D)\ ^3D^\circ$

ENERGY LEVELS OF IRON

Fe III–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^5(^2H)4p$	$^1I°$	6	*141 539.55*	88	5	$(^2H)\ ^3H°$
$3d^5(^4F)4p$	$^3F°$	4	*142 047.0*	50	25	$(a\ ^2G)\ ^3F°$
		3	*142 312.90*	50	24	
		2	*142 535.07*	48	24	
$3d^5(a\ ^2G)4p$	$^3H°$	4	*142 855.59*	45	47	$(^2H)\ ^3H°$
		5	*142 908.48*	46	38	
		6	*143 320.85*	50	40	
$3d^5(a\ ^2G)4p$	$^3G°$	5	*143 883.74*	40	20	$(a\ ^2F)\ ^3G°$
		4	*144 085.97*	42	23	
		3	*144 116.64*	43	24	
$3d^5(b\ ^2F)4p$		4	*144 332.21*	35 $^1G°$	30	$(a\ ^2F)\ ^3F°$
$3d^5(b\ ^2F)4p$	$^3F°$	2	*144 501.74*	66	19	$(a\ ^2G)\ ^3F°$
		3	*144 570.53*	73	11	$(a\ ^2G)\ ^3F°$
		4	*144 968.50*	48	20	$(b\ ^2F)\ ^1G°$
$3d^5(a\ ^2G)4p$	$^1H°$	5	*144 586.83*	66	18	$(^2H)\ ^1H°$
$3d^5(^2H)4p$	$^1H°$	5	*144 843.24*	70	23	$(a\ ^2G)\ ^1H°$
$3d^5(a\ ^2G)4p$	$^1F°$	3	*145 038.61*	76	5	$(b\ ^2F)\ ^1F°$
$3d^5(b\ ^2F)4p$	$^1D°$	2	*145 618.39*	82	7	$(b\ ^2F)\ ^3F°$
$3d^5(b\ ^2F)4p$	$^3G°$	3	*146 891.04*	55	36	$(^2H)\ ^3G°$
		4	*147 161.36*	59	32	
		5	*147 406.14*	66	28	
$3d^5(^6S)4d$	^7D	1	147 281.69			
		2	147 291.21			
		3	147 305.97			
		4	147 326.85			
		5	147 354.70			
$3d^5(b\ ^2F)4p$	$^3D°$	1	*147 556.45*	90		
		2	*147 614.65*	89		
		3	*147 635.95*	86	7	$(^4F)\ ^3D°$
$3d^5(^2S)4p$	$^3P°$	0	*148 655*	85	12	$(b\ ^2D)\ ^3P°$
		1	*148 915.3*	82	13	
		2	*149 525.63*	82	14	
$3d^5(b\ ^2F)4p$	$^1G°$	4	*149 013.36*	44	34	$(^2H)\ ^1G°$
$3d^5(^6S)5s$	^7S	3	149 285.00			
$3d^5(b\ ^2F)4p$	$^1F°$	3	*150 654.9*	93		
$3d^5(^6S)4d$	^5D	3	151 534.13			
		2	151 534.90			
		1	151 536.68			
		4	151 537.80			
		0	151 537.91			

Fe III–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^5(^2S)4p$	$^1P^\circ$	1	*151 637.3?*	78	19	$(b\,^2D)\,^1P^\circ$
$3d^5(^6S)5s$	^5S	2	151 757.67			
$3d^5(b\,^2D)4p$	$^3F^\circ$	2	*157 684.3*	75	18	$(b\,^2D)\,^3D^\circ$
		3	*157 982.0*	61	27	
		4	*158 562.7*	94		
$3d^5(b\,^2D)4p$	$^3D^\circ$	1	*158 257.37*	95		
		2	*158 417.31*	76	18	$(b\,^2D)\,^3F^\circ$
		3	*158 729.89*	67	29	
$3d^5(b\,^2D)4p$	$^1F^\circ$	3	*159 493.0*	82	12	$(b\,^2G)\,^1F^\circ$
$3d^5(b\,^2D)4p$	$^3P^\circ$	2	*160 037.9*	81	14	$(^2S)\,^3P^\circ$
$3d^5(b\,^2D)4p$	$^1D^\circ$	2	*162 084.8?*	92	6	$(b\,^2F)\,^1D^\circ$
$3d^5(b\,^2G)4p$	$^3H^\circ$	4	*165 719.20*	93	5	$(b\,^2G)\,^3G^\circ$
		5	*165 939.47*	90	6	
		6	*166 187.50*	98		
$3d^5(^6S)5p$	$^7P^\circ$	2	*166 144.63*			
		3	*166 252.74*			
		4	*166 421.33*			
$3d^5(b\,^2G)4p$	$^3F^\circ$	4	*166 222.2*	81	11	$(b\,^2G)\,^3G^\circ$
		3	*166 498*	50	46	$(b\,^2G)\,^3G^\circ$
		2	*167 002*	93	5	$(c\,^2D)\,^3F^\circ$
$3d^5(b\,^2G)4p$	$^3G^\circ$	3	*167 085.12*	53	44	$(b\,^2G)\,^3F^\circ$
		4	*167 207.30*	85	11	$(b\,^2G)\,^3F^\circ$
		5	*167 299.60*	91	7	$(b\,^2G)\,^3H^\circ$
$3d^5(^6S)5p$	$^5P^\circ$	3	*168 329.67*			
		2	*168 420.99*			
		1	*168 477.36*			
$3d^5(b\,^2G)4p$	$^1H^\circ$	5	*168 780.1*	95		
$3d^5(b\,^2G)4p$	$^1G^\circ$	4	*169 277.6?*	96		
$3d^5(b\,^2G)4p$	$^1F^\circ$	3	*170 310.6?*	87	12	$(c\,^2D)\,^1F^\circ$
$3d^5(^4G)4d$	^5H	3	179 178.62			
		4	179 194.22			
		5	179 207.57			
		6	179 216.47			
		7	179 221.45			
$3d^5(^4G)4d$	^5F	5	179 579.83			
		4	179 630.77			
		3	179 661.48			
		2	179 676.89			
		1	179 682.94			

ENERGY LEVELS OF IRON

Fe III–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$3d^5(^4G)4d$	^5G	6	179 725.31	
		5	179 748.17	
		4	179 757.98	
		2	179 759.49	
		3	179 760.72	
$3d^5(^4G)4d$	^5I	4	179 876.71	
		8	179 889.03	
		5	179 893.56	
		7	179 904.56	
		6	179 904.56	
$3d^5(^4G)5s$	^5G	6	181 772.59	
		5	181 808.70	
		4	181 825.67	
		2	181 828.66	
		3	181 830.02	
$3d^5(^4P)4d$	^5F	5	182 379.86	
		4	182 412.65	
		3	182 444.70	
		2	182 480.72	
		1	182 486.40	
$3d^5(^4G)4d$	^3F	2	182 392.55	
		3	182 408.91	
		4	182 418.70	
$3d^5(^4G)4d$	^3I	5	182 810.66	
		6	182 830.76	
		7	182 852.05	
$3d^5(^4G)5s$	^3G	5	183 431.28	
		3	183 456.69	
		4	183 457.15	
$3d^5(^6S)4f$	$^7F^\circ$	1	*184 181.39*	
		2	*184 247.16*	
		3	*184 316.58*	
		4	*184 374.59*	
		5	*184 417.27*	
		6	*184 447.38*	
$3d^5(^6S)4f$	$^5F^\circ$	1	*184 777.3*	
		2	*184 777.6*	
		3	*184 778.5*	
		4	*184 779.5*	
		5	*184 780.8*	
$3d^5(^4P)5s$	^5P	3	184 951.62	
		2	185 003.35	
		1	185 061.35	
$3d^5(^4D)4d$	^5G	2	186 268.69	
		3	186 303.44	
		4	186 378.94	
		5	186 454.09	
		6	186 597.30	

Fe III–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$3d^5(^4D)4d$	^5D	1	186 712.02	
		2	186 791.78	
		3	186 882.98	
		4	186 998.60	
$3d^5(^4D)5s$	^5D	4	188 013.40	
		0	188 109.32	
		3	188 109.58	
		1	188 131.70	
		2	188 142.64	
$3d^5(^4D)4d$	^3G	3	188 955.56	
		4	189 011.84	
		5	189 024.53	
$3d^5(^4D)5s$	^3D	3	189 679.07	
		2	189 784.52	
		1	189 796.03	
$3d^5(^6S)5d$	^7D	1	190 393.27	
		2	190 397.71	
		3	190 404.31	
		4	190 413.57	
		5	190 425.72	
$3d^5(^6S)6s$	^7S	3	190 918.17	
$3d^5(^6S)6s$	^5S	2	192 006.94	
$3d^5(^6S)5d$	^5D	0	193 595.30	
		1	193 599.54	
		2	193 605.99	
		3	193 610.92	
		4	193 611.37	
$3d^5(^2I)5s$	^3I	7	196 881.47	
		6	196 886.01	
		5	196 901.27	
$3d^5(^4G)5p$	$^5G°$	2	*198 333.56*	
		6	*198 333.76*	
		5	*198 336.58*	
		3	*198 337.06*	
		4	*198 338.62*	
$3d^5(^6S)6p$	$^7P°$	2	*198 606.37*	
		3	*198 655.66*	
		4	*198 737.05*	
$3d^5(^4G)5p$	$^5H°$	3	*198 658.80*	
		4	*198 717.60*	
		5	*198 773.95*	
		6	*198 821.39*	
		7	*198 848.38*	
$3d^5(^4G)5p$	$^5F°$	5	*199 139.76*	
		4	*199 212.72*	
		3	*199 262.44*	
		2	*199 300.15*	
		1	*199 327.95*	

ENERGY LEVELS OF IRON

Fe III–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$3d^5(^4G)5p$	$^3F^\circ$	2	*199 577.71*	
		3	*199 595.30*	
		4	*199 603.61*	
$3d^5(^4G)5p$	$^3H^\circ$	6	*199 634.92*	
		5	*199 660.84*	
		4	*199 700.83*	
$3d^5(^4F)4d$	^5H	3	199 701.82	
		4	199 804.81	
		5	199 884.39	
		6	199 906.03	
		7	200 003.70	
$3d^5(^4F)4d$	^5G	4	200 325.56	
		3	200 384.28	
		5	200 395.33	
		2	200 437.94	
		6	200 656.02	
$3d^5(^4G)5p$	$^3G^\circ$	3	*200 504.99*	
		4	*200 514.46*	
		5	*200 524.12*	
$3d^5(^4P)5p$	$^5D^\circ$	2	*201 164.21*	
		3	*201 166.35*	
		0	*201 170.10*	
		1	*201 178.01*	
		4	*201 207.29*	
$3d^5(^4P)5p$	$^5S^\circ$	2	*201 293.75*	
$3d^5(^4F)5s$	^5F	5	201 892.44	
		4	201 919.53	
		3	202 030.38	
		2	202 156.13	
		1	202 429.04	
$3d^5(^4P)5p$	$^5P^\circ$	3	*202 200.51*	
		2	*202 282.65*	
		1	*202 334.39*	
$3d^5(^4D)5p$	$^5F^\circ$	1	*204 907.13*	
		2	*204 943.26*	
		3	*205 002.47*	
		4	*205 092.53*	
		5	*205 195.15*	
$3d^5(^4D)5p$	$^5D^\circ$	4	*205 672.01*	
		1	*205 694.09*	
		3	*205 732.37*	
		2	*205 737.51*	
$3d^5(^4D)5p$	$^3D^\circ$	3	*206 180.41*	
		2	*206 233.31*	
		1	*206 295.81*	

Fe III–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$3d^5(^4D)5p$	$^3F°$	4	*206 261.33*	
		2	*206 324.89*	
		3	*206 328.22*	
$3d^5(^6S)5f$	$^7F°$	6	*207 118.1*	
		5	*207 118.6*	
		4	*207 119.1*	
		3	*207 119.6*	
		2	*207 120.1*	
$3d^5(^6S)5f$	$^5F°$	1	*207 252.5*	
		2	*207 257.8*	
		3	*207 263.0*	
		4	*207 268.2*	
		5	*207 273.23*	
$3d^5(^6S)5g$	^7G	7	207 640.8	
		6	207 640.8	
		5	207 640.9	
		4	207 640.9	
		3	207 641.1	
		2	207 641.3	
$3d^5(^6S)5g$	^5G	6	207 642.9	
		5	207 643.1	
		4	207 643.3	
		3	207 643.3	
		2	207 643.5	
$3d^5(^6S)6d$	^7D	1	210 393.67	
		2	210 396.00	
		3	210 399.57	
		4	210 404.61	
		5	210 411.32	
$3d^5(^6S)7s$	^7S	3	210 615.21	
$3d^5(^2I)5p$	$^3I°$	7	*213 457.82*	
		6	*213 505.73*	
		5	*213 563.08*	
$3d^5(^2I)5p$	$^3H°$	6	*213 974.42*	
		5	*214 010.32*	
		4	*214 047.38*	
$3d^5(^4F)5p$	$^5G°$	2	*218 860.43*	
		3	*218 923.08*	
		4	*219 004.53*	
		5	*219 092.86*	
		6	*219 162.42*	
$3d^5(^4F)5p$	$^5F°$	5	*219 415.61*	
		4	*219 471.97*	
		3	*219 566.08*	
		2	*219 655.55*	
		1	*219 743.04*	
$3d^5(^6S)6g$	^7G	1–7	219 740	

ENERGY LEVELS OF IRON

Fe III–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$3d^5(^6S)6g$	^5G	6	219 741.9	
		5	219 741.9	
		4	219 742.0	
		3	219 742.1	
		2	219 742.1	
$3d^5(^6S)6h$	$^7H°$	2-8	*219 780.2*	
$3d^5(^6S)6h$	$^5H°$	3–7	*219 780.6*	
$3d^5(^4G)5d$	^5H	7	222 590.86	
		6	222 602.50	
		3	222 605.24	
		4	222 605.82	
		5	222 611.16	
$3d^5(^4G)5d$	^5F	5	222 699.09	
		4	222 734.33	
		3	222 750.23	
		2	222 774.22	
		1	222 776.89	
$3d^5(^4G)5d$	^5G	6	222 714.30	
		5	222 744.69	
		2	222 758.28	
		4	222 765.97	
		3	222 766.04	
$3d^5(^4G)5d$	^5I	8	222 797.97	
		4	222 823.33	
		7	222 824.71	
		5	222 832.48	
		6	222 834.77	
$3d^5(^4G)6s$	^5G	6	223 272.06	
		5	223 309.37	
		4	223 326.76	
		2	223 327.87	
		3	223 330.71	
$3d^5(^4G)6s$	^3G	5	224 038.73	
		3	224 051.63	
		4	224 058.70	
$3d^5(^4P)6s$	^5P	3	226 381.91	
		2	226 447.88	
		1	226 506.54	
$3d^5(^4D)6s$	^5D	4	229 421.73	
		3	229 509.56	
		1	229 530.67	
		2	229 570.36	
$3d^5(^4D)6s$	^3D	3	230 192.86	
		1	230 248.26	
		2	230 257.15	
Fe IV ($^6S_{5/2}$)	***Limit***		**247 220**	

Fe IV

$Z=26$

V I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5\ ^6S_{5/2}$

Ionization energy = 442 000±1000 cm^{-1} (54.8±0.1 eV)

The early work of Kruger and Gilroy (1935) and Edlén (1969) has now been superseded by that of Ekberg and Edlén (1978), who have made a nearly complete analysis of the three lowest configurations. They have classified 706 lines from the transition array $3d^5$–$3d^4 4p$ in the region 446–789 Å and 560 lines of the $3d^4 4s$–$3d^4 4p$ array in the region 1247–2028 Å. Only four of the 280 possible levels are undiscovered. The uncertainty of the $3d^5$ level values is ±0.4 cm^{-1} and of the $3d^4 4s$ and $3d^4 4p$ levels is ±0.2 cm^{-1}.

The leading percentages for $3d^5$ were provided to Ekberg and Edlén by R. Poppe, A. J. J. Raassen, and Th. A. M. van Kleef. The rest were calculated by the authors.

Transitions among levels of the $3d^5$ configuration observed in nebular spectra have been identified by Bowen (1960).

The ionization energy is taken from an isoelectronic extrapolation by Lotz (1967).

References

Bowen, I. S. (1960), Astrophys. J. **132**, 1.
Edlén, B. (1969), Mon. Not. R. Astron. Soc. **144**, 391.
Ekberg, J. O., and Edlén, B. (1978), Phys. Scr. **18**, 107.
Kruger, P. G., and Gilroy, H. T. (1935), Phys. Rev. **48**, 720.
Lotz, W. (1967), J. Opt. Soc. Am. **57**, 873.

Fe IV

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^5$	^{6}S	5/2	0.0	100		
$3d^5$	^{4}G	11/2	32 245.5	100		
		9/2	32 292.8	100		
		5/2	32 301.2	100		
		7/2	32 305.7	100		
$3d^5$	^{4}P	5/2	35 253.8	95		
		3/2	35 333.3	97		
		1/2	35 406.6	99		
$3d^5$	^{4}D	7/2	38 779.4	100		
		1/2	38 896.7	99		
		5/2	38 935.1	96		
		3/2	38 938.2	97		
$3d^5$	^{2}I	11/2	47 078.6	99		
		13/2	47 090.5	100		
$3d^5$	^{2}D3	5/2	49 541.5	57	24	^{2}F2
		3/2	50 051.4	73	23	^{2}D1
$3d^5$	^{2}F2	7/2	51 394.2	97		
		5/2	52 166.7	70	15	^{2}D3
$3d^5$	^{4}F	9/2	52 620.7	98		
		7/2	52 695.4	98		
		3/2	52 837.1	96		
		5/2	52 838.0	89	5	^{2}F2
$3d^5$	^{2}H	9/2	56 058.3	86	14	^{2}G2
		11/2	56 368.8	99		
$3d^5$	^{2}G2	7/2	57 408.0	99		
		9/2	57 721.2	84	14	^{2}H

ENERGY LEVELS OF IRON

Fe IV–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^5$	^{2}F1	5/2	61 156.5	99		
		7/2	61 254.4	98		
$3d^5$	^{2}S	1/2	66 720.1	100		
$3d^5$	^{2}D2	3/2	74 096.6	100		
		5/2	74 133.1	100		
$3d^5$	^{2}G1	9/2	82 894.9	100		
		7/2	82 897.3	100		
$3d^5$	^{2}P	3/2	100 118.0	100		
		1/2	100 126.0	100		
$3d^5$	^{2}D1	5/2	108 242.1	76	24	^{2}D3
		3/2	108 258.3	76	24	
$3d^4(^5D)4s$	^{6}D	1/2	127 766.15	100		
		3/2	127 929.12	100		
		5/2	128 191.54	100		
		7/2	128 541.85	100		
		9/2	128 967.67	100		
$3d^4(^5D)4s$	^{4}D	1/2	137 700.81	100		
		3/2	137 949.29	100		
		5/2	138 338.83	100		
		7/2	138 844.03	100		
$3d^4(^3P2)4s$	^{4}P	1/2	153 651.74	60	39	(^{3}P1) ^{4}P
		3/2	154 474.85	60	39	
		5/2	155 744.87	61	39	
$3d^4(^3H)4s$	^{4}H	7/2	154 185.85	98		
		9/2	154 325.96	98		
		11/2	154 512.67	99		
		13/2	154 731.29	100		
$3d^4(^3F2)4s$	^{4}F	3/2	156 012.29	78	21	(^{3}F1) ^{4}F
		5/2	156 049.32	77	21	
		7/2	156 123.77	76	20	
		9/2	156 224.88	76	19	
$3d^4(^3G)4s$	^{4}G	5/2	158 738.69	96		
		7/2	159 010.39	95		
		9/2	159 227.90	93		
		11/2	159 342.88	92	7	(^{3}H) ^{2}H
$3d^4(^3P2)4s$	^{2}P	1/2	160 015.88	59	39	(^{3}P1) ^{2}P
		3/2	161 571.59	60	38	
$3d^4(^3H)4s$	^{2}H	9/2	160 311.64	96		
		11/2	160 778.60	93	7	(^{3}G) ^{4}G
$3d^4(^3F2)4s$	^{2}F	5/2	162 074.42	77	21	(^{3}F1) ^{2}F
		7/2	162 087.81	74	19	
$3d^4(^3G)4s$	^{2}G	7/2	164 950.50	94		
		9/2	165 392.58	98		

Fe IV–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^4(^3D)4s$	^4D	7/2	165 493.10	100		
		5/2	165 600.96	99		
		3/2	165 720.94	99		
		1/2	165 804.47	99		
$3d^4(^1G2)4s$	^2G	9/2	167 712.50	65	32	$(^1G1)\ ^2G$
		7/2	167 795.92	64	32	
$3d^4(^1I)4s$	^2I	13/2	168 526.37	100		
		11/2	168 566.43	99		
$3d^4(^1S2)4s$	^2S	1/2	170 729.49	78	20	$(^1S1)\ ^2S$
$3d^4(^3D)4s$	^2D	5/2	171 345.33	99		
		3/2	171 476.39	99		
$3d^4(^1D2)4s$	^2D	5/2	177 005.97	78	21	$(^1D1)\ ^2D$
		3/2	177 066.72	78	21	
$3d^4(^1F)4s$	^2F	5/2	183 159.61	99		
		7/2	183 164.49	99		
$3d^4(^5D)4p$	$^6F^\circ$	1/2	*187 878.81*	99		
		3/2	*188 086.05*	99		
		5/2	*188 428.78*	99		
		7/2	*188 904.55*	99		
		9/2	*189 515.88*	99		
		11/2	*190 276.85*	100		
$3d^4(^5D)4p$	$^6P^\circ$	3/2	*189 885.11*	96		
		5/2	*190 008.28*	97		
		7/2	*190 226.87*	99		
$3d^4(^3P1)4s$	^4P	5/2	189 975.01	61	39	$(^3P2)\ ^4P$
		3/2	190 811.79	60	39	
		1/2	191 337.82	60	39	
$3d^4(^3F1)4s$	^4F	9/2	190 318.34	80	20	$(^3F2)\ ^4F$
		3/2	190 406.45	78	22	
		7/2	190 424.14	79	20	
		5/2	190 435.47	78	21	
$3d^4(^5D)4p$	$^4P^\circ$	1/2	*191 021.18*	70	28	$(^5D)\ ^6D^\circ$
		3/2	*191 694.11*	61	33	
		5/2	*193 549.25*	54	44	
$3d^4(^5D)4p$	$^6D^\circ$	5/2	*192 595.28*	55	41	$(^5D)\ ^4P^\circ$
		1/2	*193 120.34*	72	27	$(^5D)\ ^4P^\circ$
		3/2	*193 271.27*	66	33	$(^5D)\ ^4P^\circ$
		7/2	*193 386.17*	97		
		9/2	*193 789.19*	94	5	$(^5D)\ ^4F^\circ$
$3d^4(^3P1)4s$	^2P	3/2	195 864.15	61	39	$(^3P2)\ ^2P$
		1/2	196 875.62	60	39	
$3d^4(^3F1)4s$	^2F	7/2	196 131.19	80	20	$(^3F2)\ ^2F$
		5/2	196 220.71	79	21	

ENERGY LEVELS OF IRON

Fe IV–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^4(^5D)4p$	$^4F^\circ$	3/2	*196 186.88*	96			
		5/2	*196 334.63*	95			
		7/2	*196 549.59*	94			
		9/2	*196 846.82*	91		6	$(^5D)\ ^6D^\circ$
$3d^4(^1G1)4s$	^2G	9/2	201 178.05	66		33	$(^1G2)\ ^2G$
		7/2	201 212.22	66		33	
$3d^4(^5D)4p$	$^4D^\circ$	1/2	*201 919.38*	98			
		3/2	*202 085.22*	98			
		5/2	*202 328.53*	97			
		7/2	*202 608.33*	97			
$3d^4(^3H)4p$	$^4H^\circ$	7/2	*212 135.79*	77		20	$(^3G)\ ^4H^\circ$
		9/2	*212 374.04*	75		19	
		11/2	*212 714.37*	76		17	
		13/2	*213 162.59*	80		15	
$3d^4(^3P2)4p$	$^4D^\circ$	1/2	*212 812.66*	48		33	$(^3P1)\ ^4D^\circ$
		3/2	*213 445.05*	47		32	$(^3P1)\ ^4D^\circ$
		5/2	*214 317.21*	44		30	$(^3P1)\ ^4D^\circ$
		7/2	*215 220.67*	26		19	$(^3F2)\ ^4D^\circ$
$3d^4(^3F2)4p$	$^4G^\circ$	5/2	*214 821.74*	47		21	$(^3F1)\ ^4G^\circ$
		7/2	*215 033.81*	27		13	$(^3G)\ ^4G^\circ$
		9/2	*215 385.23*	24		14	$(^3G)\ ^4G^\circ$
		11/2	*216 002.72*	26		31	$(^3H)\ ^4G^\circ$
$3d^4(^3H)4p$	$^4I^\circ$	9/2	*215 155.69*	87			
		11/2	*215 808.91*	92		6	$(^3H)\ ^4H^\circ$
		13/2	*216 367.80*	94		5	$(^3H)\ ^4H^\circ$
		15/2	*216 877.83*	100			
$3d^4(^3P2)4p$	$^4P^\circ$	1/2	*215 860.50*	32		19	$(^3P1)\ ^4P^\circ$
		3/2	*217 031.89*	56		33	$(^3P1)\ ^4P^\circ$
		5/2	*218 023.81*	26		15	$(^3P1)\ ^4P^\circ$
$3d^4(^3H)4p$	$^2G^\circ$	7/2	*216 111.69*	46		22	$(^3F2)\ ^2G^\circ$
		9/2	*216 428.44*	36		22	
$3d^4(^3F2)4p$	$^4F^\circ$	3/2	*217 466.19*	42		23	$(^3F2)\ ^2D^\circ$
		7/2	*218 478.36*	71		13	$(^3F1)\ ^4F^\circ$
		9/2	*218 601.03*	70		12	$(^3F1)\ ^4F^\circ$
$3d^4(^3P2)4p$		1/2	*217 607.71*	26	$^4P^\circ$	21	$(^3P1)\ ^2S^\circ$
$3d^4(^3H)4p$	$^4G^\circ$	5/2	*217 845.29*	31		20	$(^3F2)\ ^4G^\circ$
		7/2	*218 159.77*	51		28	
		9/2	*218 238.51*	50		33	
		11/2	*218 375.12*	31		26	
$3d^4(^3F2)4p$		5/2	*218 195.66*	30	$^4F^\circ$	28	$(^3P2)\ ^4P^\circ$
$3d^4(^3P2)4p$		3/2	*218 613.88*	25	$^2P^\circ$	15	$(^3P2)\ ^4S^\circ$
$3d^4(^3F2)4p$	$^2D^\circ$	5/2	*218 871.21*	37		13	$(^3D)\ ^2D^\circ$
$3d^4(^3F2)4p$		3/2	*219 091.67*	21	$^2D^\circ$	19	$(^3F2)\ ^4F^\circ$

Fe IV–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^4(^3P2)4p$	$^2P^\circ$	1/2	*219 333.90*	33		15	$(^3P1)\ ^2P^\circ$
		3/2	*220 360.44*	27		11	$(^3P1)\ ^2P^\circ$
$3d^4(^3H)4p$	$^2I^\circ$	11/2	*219 564.46*	89			
		13/2	*219 640.76*	89		6	$(^3G)\ ^4H^\circ$
$3d^4(^3F2)4p$	$^4D^\circ$	5/2	*219 590.84*	30		10	$(^3P2)\ ^4D^\circ$
		7/2	*219 700.53*	23		18	$(^3P2)\ ^4D^\circ$
		3/2	*219 826.61*	39		13	$(^3F1)\ ^4D^\circ$
		1/2	*220 059.33*	43		14	$(^3F1)\ ^4D^\circ$
$3d^4(^3G)4p$	$^2F^\circ$	5/2	*220 197.25*	26		14	$(^3F2)\ ^2F^\circ$
		7/2	*220 649.22*	21		20	$(^3F2)\ ^2F^\circ$
$3d^4(^3H)4p$	$^2H^\circ$	9/2	*220 461.33*	51		16	$(^3G)\ ^4H^\circ$
		11/2	*221 161.02*	40		33	
$3d^4(^3G)4p$	$^4H^\circ$	7/2	*220 658.04*	77		19	$(^3H)\ ^4H^\circ$
		9/2	*221 104.17*	56		16	$(^3H)\ ^2H^\circ$
		11/2	*221 647.49*	46		35	$(^3H)\ ^2H^\circ$
		13/2	*222 154.99*	79		15	$(^3H)\ ^4H^\circ$
$3d^4(^3G)4p$	$^4F^\circ$	3/2	*221 219.29*	44		13	$(^3D)\ ^4F^\circ$
		9/2	*221 239.21*	60		12	
		5/2	*221 320.54*	58		16	
		7/2	*221 346.06*	56		14	
$3d^4(^3P2)4p$	$^2D^\circ$	3/2	*222 020.09*	34		23	$(^3P1)\ ^2D^\circ$
		5/2	*222 880.23*	47		32	
$3d^4(^1D1)4s$	^2D	5/2	222 840.58	79		21	$(^1D2)\ ^2D$
		3/2	222 851.68	79		21	
$3d^4(^3F2)4p$	$^2G^\circ$	7/2	*223 398.62*	32		19	$(^3H)\ ^2G^\circ$
$3d^4(^3F2)4p$	$^2F^\circ$	5/2	*223 478.96*	48		35	$(^3G)\ ^2F^\circ$
		7/2	*224 046.02*	44		42	
$3d^4(^3G)4p$	$^2H^\circ$	11/2	*223 550.14*	50		19	$(^3G)\ ^4G^\circ$
		9/2	*223 745.82*	41		15	$(^3H)\ ^2G^\circ$
$3d^4(^3G)4p$		9/2	*223 629.59*	18	$^4G^\circ$	15	$(^3F2)\ ^2G^\circ$
$3d^4(^3G)4p$	$^4G^\circ$	5/2	*224 045.96*	55		29	$(^3H)\ ^4G^\circ$
		7/2	*224 230.60*	55		25	$(^3H)\ ^4G^\circ$
		9/2	*224 576.43*	42		17	$(^3H)\ ^4G^\circ$
		11/2	*224 870.85*	47		24	$(^3G)\ ^2H^\circ$
$3d^4(^3D)4p$	$^4D^\circ$	1/2	*226 851.93*	86			
		3/2	*226 892.10*	81		7	$(^3D)\ ^4P^\circ$
		5/2	*226 983.58*	60		29	$(^3D)\ ^4P^\circ$
		7/2	*227 258.80*	81			
$3d^4(^3G)4p$	$^2G^\circ$	7/2	*227 604.73*	64		14	$(^3H)\ ^2G^\circ$
		9/2	*227 660.25*	60		20	
$3d^4(^3D)4p$	$^4P^\circ$	5/2	*227 919.05*	63		25	$(^3D)\ ^4D^\circ$
		3/2	*228 589.67*	82		5	$(^3D)\ ^4D^\circ$
		1/2	*229 037.02*	90		5	$(^3P2)\ ^4P^\circ$

ENERGY LEVELS OF IRON

Fe IV—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^4(^1G2)4p$	$^2F^\circ$	7/2	*228 193.67*	53	24	$(^1G1)\ ^2F^\circ$
		5/2	*229 138.90*	53	25	
$3d^4(^1I)4p$	$^2I^\circ$	13/2	*228 204.33*	69	27	$(^1I)\ ^2K^\circ$
		11/2	*228 315.03*	89		
$3d^4(^1G2)4p$	$^2H^\circ$	9/2	*228 793.86*	51	25	$(^1G1)\ ^2H^\circ$
		11/2	*229 306.61*	52	22	
$3d^4(^3D)4p$	$^4F^\circ$	3/2	*228 862.61*	69	20	$(^3G)\ ^4F^\circ$
		5/2	*229 062.58*	68	18	
		7/2	*229 288.02*	71	19	
		9/2	*229 494.74*	80	19	
$3d^4(^1S2)4p$	$^2P^\circ$	1/2	*228 946.59*	39	37	$(^3D)\ ^2P^\circ$
		3/2	*233 786.72*	33	27	
$3d^4(^3D)4p$	$^2P^\circ$	3/2	*229 428.91*	52	32	$(^1S2)\ ^2P^\circ$
		1/2	*233 927.12*	48	29	
$3d^4(^1I)4p$	$^2K^\circ$	13/2	*229 472.83*	72	27	$(^1I)\ ^2I^\circ$
		15/2	*230 195.02*	100		
$3d^4(^1G2)4p$	$^2G^\circ$	7/2	*231 473.32*	47	30	$(^1G1)\ ^2G^\circ$
		9/2	*231 804.00*	44	31	
$3d^4(^1I)4p$	$^2H^\circ$	11/2	*233 272.84*	80	9	$(^3G)\ ^2H^\circ$
		9/2	*233 802.12*	86	9	
$3d^4(^3D)4p$	$^2F^\circ$	7/2	*233 780.86*	70	11	$(^3G)\ ^2F^\circ$
		5/2	*234 106.72*	70	12	
$3d^4(^3D)4p$	$^2D^\circ$	5/2	*234 472.00*	60	19	$(^1D2)\ ^2D^\circ$
		3/2	*234 984.35*	68	9	$(^3F2)\ ^2D^\circ$
$3d^4(^1D2)4p$	$^2D^\circ$	3/2	*236 918.79*	54	18	$(^1D1)\ ^2D^\circ$
		5/2	*237 283.09*	44	18	$(^3D)\ ^2D^\circ$
$3d^4(^1D2)4p$	$^2F^\circ$	5/2	*238 512.84*	59	14	$(^1D1)\ ^2F^\circ$
		7/2	*239 071.40*	59	20	$(^1F)\ ^2F^\circ$
$3d^4(^1D2)4p$	$^2P^\circ$	3/2	*242 259.25*	68	14	$(^1D1)\ ^2P^\circ$
$3d^4(^1F)4p$	$^2F^\circ$	5/2	*242 614.60*	74	10	$(^1D2)\ ^2F^\circ$
		7/2	*242 965.62*	66	16	
$3d^4(^1F)4p$	$^2G^\circ$	7/2	*244 759.25*	91		
		9/2	*245 742.29*	94		
$3d^4(^1F)4p$	$^2D^\circ$	5/2	*246 990.80*	61	15	$(^3P1)\ ^2D^\circ$
		3/2	*248 077.97*	64	13	
$3d^4(^3F1)4p$	$^4F^\circ$	5/2	*250 195.07*	73	11	$(^3F2)\ ^4F^\circ$
		3/2	*250 249.39*	78	13	
		7/2	*250 279.06*	74	11	
		9/2	*250 502.29*	84	12	

Fe IV–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^4(^3P1)4p$	$^4P^\circ$	3/2	*250 891.05*	38		19	$(^3P2)\ ^4P^\circ$
		1/2	*251 156.94*	43		23	
		5/2	*251 958.94*	39		20	
$3d^4(^3P1)4p$		5/2	*251 014.02*	22	$^4D^\circ$	22	$(^3P1)\ ^4P^\circ$
$3d^4(^3P1)4p$	$^4D^\circ$	7/2	*251 658.34*	37		21	$(^3P2)\ ^4D^\circ$
		1/2	*251 984.20*	30		18	
$3d^4(^3P1)4p$		3/2	*251 944.03*	25	$^4D^\circ$	21	$(^3P1)\ ^4P^\circ$
$3d^4(^3F1)4p$	$^4G^\circ$	5/2	*252 884.48*	54		18	$(^3F2)\ ^4G^\circ$
		7/2	*253 254.37*	52		20	$(^3F1)\ ^2F^\circ$
		9/2	*253 827.43*	73		22	$(^3F2)\ ^4G^\circ$
		11/2	*254 164.84*	76		22	$(^3F2)\ ^4G^\circ$
$3d^4(^3P1)4p$	$^2D^\circ$	5/2	*253 575.65*	23		25	$(^1F)\ ^2D^\circ$
		3/2	*253 868.43*	25		26	
$3d^4(^3F1)4p$	$^2F^\circ$	7/2	*253 923.59*	52		21	$(^3F1)\ ^4G^\circ$
		5/2	*254 169.13*	55		16	
$3d^4(^3P1)4p$	$^4S^\circ$	3/2	*257 503.26*	50		45	$(^3P2)\ ^4S^\circ$
$3d^4(^3F1)4p$	$^2G^\circ$	9/2	*258 566.02*	75		21	$(^3F2)\ ^2G^\circ$
		7/2	*259 039.72*	75		22	
$3d^4(^3F1)4p$	$^4D^\circ$	7/2	*258 591.92*	50		17	$(^3F2)\ ^4D^\circ$
		5/2	*258 986.64*	50		18	
		3/2	*259 183.82*	49		18	
		1/2	*259 254.34*	52		20	
$3d^4(^3P1)4p$	$^2P^\circ$	3/2	*259 011.48*	61		29	$(^3P2)\ ^2P^\circ$
		1/2	*259 581.64*	61		29	
$3d^4(^3P2)4p$	$^2S^\circ$	1/2	*262 348.36*	55		43	$(^3P1)\ ^2S^\circ$
$3d^4(^1G1)4p$	$^2H^\circ$	9/2	*262 557.77*	42		21	$(^1G2)\ ^2H^\circ$
		11/2	*264 011.54*	65		32	
$3d^4(^1G1)4p$	$^2G^\circ$	7/2	*262 995.01*	57		35	$(^1G2)\ ^2G^\circ$
		9/2	*263 876.91*	39		23	
$3d^4(^1G1)4p$	$^2F^\circ$	7/2	*265 084.77*	58		21	$(^1G2)\ ^2F^\circ$
		5/2	*265 369.48*	49		18	
$3d^4(^3F1)4p$	$^2D^\circ$	5/2	*266 181.09*	41		15	$(^3F2)\ ^2D^\circ$
		3/2	*266 335.24*	47		18	
$3d^4(^1D1)4p$	$^2P^\circ$	3/2	*280 758.37*	76		16	$(^1D2)\ ^2P^\circ$
		1/2	*281 446.30*	76		17	
$3d^4(^1D1)4p$	$^2F^\circ$	5/2	*285 052.77*	72		19	$(^1D2)\ ^2F^\circ$
		7/2	*286 084.72*	74		19	
$3d^4(^1D1)4p$	$^2D^\circ$	3/2	*289 400.72*	73		26	$(^1D2)\ ^2D^\circ$
		5/2	*289 818.77*	73		25	
Fe V ($^5D_0$)	***Limit***		**442 000**				

ENERGY LEVELS OF IRON

Fe V

$Z=26$

Ti I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^6 3d^4\ {}^5D_0$

Ionization energy $= 605\ 000 \pm 1200$ cm^{-1} (75.0 ± 0.2 eV)

Bowen's contribution in 1937 established terms of $3d^4$, $3d^3 4s$, and $3d^3 4p$, greatly expanding the start made by White (1929). Additions to all three configurations have been made by Fawcett and Henrichs (1974). The analysis of these configurations has been greatly extended by Ekberg (1975), who reobserved the spectrum from 302–1715 Å. He improved the level uncertainty to ± 0.4 cm^{-1}. The leading percentages given below are also due to Ekberg.

Bowen (1960) has observed lines in nebular spectra due to transitions among levels of the $3d^4$ configuration.

The ionization energy is from the isoelectronic extrapolation of Lotz (1967).

References

Bowen, I. S. (1937), Phys. Rev. **52**, 1153.
Bowen, I. S. (1960), Astrophys. J. **132**, 1.
Ekberg, J. O. (1975), Phys. Scr. **12**, 42.
Fawcett, B. C., and Henrichs, H. F. (1974), Astron. Astrophys. **18**, 157.
Lotz, W. (1967), J. Opt. Soc. Am. **57**, 873.
White, H. E. (1929), Phys. Rev. **33**, 914.

Fe V

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^4$	^{5}D	0	0.0	100		
		1	142.1	100		
		2	417.3	100		
		3	803.1	100		
		4	1 282.8	100		
$3d^4$	^{3}P2	0	24 055.4	59	40	^{3}P1
		1	24 972.9	60	40	
		2	26 468.3	60	39	
$3d^4$	^{3}H	4	24 932.5	97		
		5	25 225.9	99		
		6	25 528.5	100		
$3d^4$	^{3}F2	2	26 760.7	78	22	^{3}F1
		3	26 842.3	75	20	
		4	26 974.0	75	19	
$3d^4$	^{3}G	3	29 817.1	96		
		4	30 147.0	94		
		5	30 430.1	99		
$3d^4$	^{1}G2	4	36 586.3	65	33	^{1}G1
$3d^4$	^{3}D	3	36 630.1	100		
		2	36 758.5	99		
		1	36 925.4	100		
$3d^4$	^{1}I	6	37 511.7	100		
$3d^4$	^{1}S2	0	39 633.4	78	21	^{1}S1
$3d^4$	^{1}D2	2	46 291.2	78	21	^{1}D1
$3d^4$	^{1}F	3	52 732.7	99		

Fe v–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^4$	$^3P1$	2	61 854.4	61	39	$^3P2$
		1	62 914.2	60	40	
		0	63 420.0	60	40	
$3d^4$	$^3F1$	4	62 238.1	80	20	$^3F2$
		2	62 321.1	78	22	
		3	62 364.4	78	21	
$3d^4$	$^1G1$	4	71 280.3	66	34	$^1G2$
$3d^4$	$^1D1$	2	93 832.3	78	22	$^1D2$
$3d^4$	$^1S1$	0	121 130.2	79	21	$^1S2$
$3d^3(^4F)4s$	^5F	1	186 433.6	100		
		2	186 725.5	100		
		3	187 157.5	100		
		4	187 719.0	100		
		5	188 395.3	100		
$3d^3(^4F)4s$	^3F	2	195 196.3	100		
		3	195 933.0	100		
		4	196 838.6	100		
$3d^3(^4P)4s$	^5P	1	204 729.9	99		
		2	204 975.4	99		
		3	205 536.4	100		
$3d^3(^2G)4s$	^3G	3	208 838.2	100		
		4	209 110.1	99		
		5	209 523.9	98		
$3d^3(^4P)4s$	^3P	0	212 542.1	85	15	$(^2P)\ ^3P$
		1	212 818.1	88	6	
		2	213 649.2	91	8	
$3d^3(^2G)4s$	^1G	4	213 534.1	94	5	$(^2H)\ ^3H$
$3d^3(^2P)4s$	^3P	2	214 525.8	61	23	$(^2D2)\ ^3D$
		1	214 611.4	72	14	
$3d^3(^2D2)4s$	^3D	1	215 782.6	56	20	$(^2P)\ ^3P$
		3	216 538.1	80	20	$(^2D1)\ ^3D$
		2	216 592.7	55	28	$(^2P)\ ^3P$
$3d^3(^2H)4s$	^3H	4	216 779.1	94	5	$(^2G)\ ^1G$
		5	216 860.4	99		
		6	217 122.5	100		
$3d^3(^2P)4s$	^1P	1	219 486.9	90	5	$(^2D2)\ ^3D$
$3d^3(^2D2)4s$	^1D	2	220 621.0	77	20	$(^2D1)\ ^1D$
$3d^3(^2H)4s$	^1H	5	221 305.2	99		
$3d^3(^2F)4s$	^3F	4	233 633.6	100		
		3	233 848.9	100		
		2	234 027.4	100		

ENERGY LEVELS OF IRON

Fe v–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^3(^2F)4s$	^1F	3	237 729.6	100		
$3d^3(^4F)4p$	$^5G°$	2	*254 803.3*	99		
		3	*255 399.2*	99		
		4	*256 177.9*	99		
		5	*257 138.0*	99		
		6	*258 297.4*	100		
$3d^3(^4F)4p$	$^5F°$	1	*257 742.3*	38	36	$(^4F)\ ^3D°$
		2	*259 376.1*	51	42	$(^4F)\ ^5D°$
		3	*259 954.7*	78	19	$(^4F)\ ^5D°$
		4	*260 521.0*	90	6	$(^4F)\ ^5D°$
		5	*261 051.9*	94		
$3d^3(^4F)4p$	$^5D°$	2	*258 128.5*	48	25	$(^4F)\ ^5F°$
		0	*258 619.5*	96		
		3	*258 680.0*	71	15	$(^4F)\ ^5F°$
		1	*258 891.5*	72	20	$(^4F)\ ^5F°$
		4	*259 344.8*	89	7	$(^4F)\ ^5F°$
$3d^3(^2D1)4s$	^3D	3	258 434.1	80	20	$(^2D2)\ ^3D$
		2	258 628.5	79	21	
		1	258 769.5	78	22	
$3d^3(^4F)4p$	$^3D°$	1	*259 995.2*	49	42	$(^4F)\ ^5F°$
		2	*260 411.4*	62	23	$(^4F)\ ^5F°$
		3	*261 179.6*	76	8	$(^4P)\ ^3D°$
$3d^3(^2D1)4s$	^1D	2	262 509.3	79	21	$(^2D2)\ ^1D$
$3d^3(^4F)4p$	$^3G°$	3	*263 898.6*	92	5	$(^2G)\ ^3G°$
		4	*264 434.2*	91		
		5	*265 112.6*	88	6	$(^4F)\ ^5F°$
$3d^3(^4F)4p$	$^3F°$	2	*266 612.8*	94		
		3	*267 240.1*	94		
		4	*267 928.6*	94		
$3d^3(^4P)4p$	$^5P°$	1	*273 643.1*	98		
		2	*274 136.1*	96		
		3	*274 930.3*	98		
$3d^3(^4P)4p$	$^5D°$	0	*274 753.3*	54	36	$(^4P)\ ^3P°$
		1	*275 146.6*	59	34	
		2	*276 759.2*	58	32	
		3	*277 068.5*	94		
		4	*278 075.8*	96		
$3d^3(^4P)4p$	$^3P°$	2	*275 374.3*	52	36	$(^4P)\ ^5D°$
		0	*276 434.9*	43	40	
		1	*276 765.9*	54	35	
$3d^3(^2G)4p$	$^3H°$	4	*276 429.7*	79	16	$(^2H)\ ^3H°$
		5	*277 292.7*	73	18	
		6	*278 650.7*	78	21	
$3d^3(^2G)4p$	$^3G°$	3	*278 794.2*	77	7	$(^2G)\ ^1F°$
		4	*279 502.6*	78	9	$(^2G)\ ^3F°$
		5	*280 039.6*	79	7	$(^2G)\ ^3H°$

Fe v–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^3(^2G)4p$	$^3F^\circ$	4	280 367.2	46		35	$(^2G)\ ^1G^\circ$
		2	280 539.7	60		17	$(^2D2)\ ^3F^\circ$
		3	280 832.2	64		11	$(^2G)\ ^3G^\circ$
$3d^3(^2P)4p$	$^3P^\circ$	1	281 944.9	52		22	$(^2D2)\ ^3P^\circ$
		0	282 234.5	50		17	$(^2D2)\ ^3P^\circ$
$3d^3(^2G)4p$	$^1G^\circ$	4	282 038.1	50		30	$(^2G)\ ^3F^\circ$
$3d^3(^4P)4p$		2	282 423.5	27	$^5S^\circ$	12	$(^2P)\ ^1D^\circ$
$3d^3(^2G)4p$	$^1F^\circ$	3	282 571.6	67		13	$(^2D2)\ ^1F^\circ$
$3d^3(^4P)4p$	$^5S^\circ$	2	282 604.8	49		21	$(^2P)\ ^1D^\circ$
$3d^3(^2G)4p$	$^1H^\circ$	5	282 871.9	72		18	$(^2H)\ ^1H^\circ$
$3d^3(^2P)4p$		2	283 686.3	27	$^3P^\circ$	22	$(^4P)\ ^5S^\circ$
$3d^3(^2P)4p$	$^3D^\circ$	1	283 754.0	81		8	$(^4P)\ ^3D^\circ$
		2	284 911.2	66		9	$(^2P)\ ^1D^\circ$
		3	285 474.0	54		15	$(^2D2)\ ^3F^\circ$
$3d^3(^2H)4p$	$^3H^\circ$	4	284 690.3	69		15	$(^2G)\ ^3H^\circ$
		5	284 790.8	78		19	
		6	285 196.1	77		21	
$3d^3(^2D2)4p$	$^1P^\circ$	1	285 961.7	40		21	$(^2P)\ ^1P^\circ$
$3d^3(^2D2)4p$	$^3F^\circ$	2	286 154.9	45		15	$(^2G)\ ^3F^\circ$
		4	287 620.2	70		16	$(^2D1)\ ^3F^\circ$
$3d^3(^2P)4p$	$^3S^\circ$	1	286 187.7	83		6	$(^2P)\ ^3P^\circ$
$3d^3(^4P)4p$	$^3D^\circ$	3	286 431.3	41		24	$(^2D2)\ ^3F^\circ$
		1	286 855.3	48		15	$(^2D2)\ ^3D^\circ$
		2	286 862.7	52		20	$(^2P)\ ^3D^\circ$
$3d^3(^2P)4p$		3	287 109.6	33	$^3D^\circ$	23	$(^2D2)\ ^3F^\circ$
$3d^3(^2H)4p$	$^3I^\circ$	5	287 440.5	93		5	$(^2G)\ ^1H^\circ$
		6	288 167.2	98			
		7	289 171.9	100			
$3d^3(^2D2)4p$	$^3D^\circ$	1	288 669.8	58		20	$(^4P)\ ^3D^\circ$
		2	289 389.7	65		15	
		3	289 913.0	57		10	
$3d^3(^2H)4p$	$^1G^\circ$	4	289 545.9	75		17	$(^2F)\ ^1G^\circ$
$3d^3(^2H)4p$	$^1H^\circ$	5	290 099.1	75		17	$(^2G)\ ^1H^\circ$
$3d^3(^2D2)4p$	$^3P^\circ$	2	290 407.7	38		42	$(^2P)\ ^3P^\circ$
		1	290 583.7	43		33	
		0	290 903.4	45		35	
$3d^3(^2D2)4p$	$^1F^\circ$	3	291 231.4	53		16	$(^2D1)\ ^1F^\circ$

ENERGY LEVELS OF IRON

Fe v–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^3(^2H)4p$	$^3G^\circ$	5	*292 287.6*	83	6	$(^2F)\ ^3G^\circ$
		4	*292 430.7*	82	7	
		3	*292 513.2*	82	7	
$3d^3(^2H)4p$	$^1I^\circ$	6	*292 365.9*	98		
$3d^3(^4P)4p$	$^3S^\circ$	1	*294 644.0*	83	8	$(^2P)\ ^1P^\circ$
$3d^3(^2D2)4p$	$^1D^\circ$	2	*295 716.4*	46	41	$(^2P)\ ^1D^\circ$
$3d^3(^2P)4p$	$^1P^\circ$	1	*295 973.2*	62	18	$(^2D2)\ ^1P^\circ$
$3d^3(^2F)4p$	$^3F^\circ$	2	*302 292.7*	92		
		3	*302 377.1*	90		
		4	*302 602.5*	90		
$3d^3(^2F)4p$	$^3G^\circ$	3	*306 193.9*	86	8	$(^2H)\ ^3G^\circ$
		4	*306 622.8*	86	8	
		5	*307 064.4*	93	7	
$3d^3(^2F)4p$	$^3D^\circ$	3	*307 288.7*	85	8	$(^2D1)\ ^3D^\circ$
		2	*308 165.0*	75	12	$(^2F)\ ^1D^\circ$
		1	*308 671.5*	90	8	$(^2D1)\ ^3D^\circ$
$3d^3(^2F)4p$	$^1D^\circ$	2	*307 644.4*	62	18	$(^2D1)\ ^1D^\circ$
$3d^3(^2F)4p$	$^1G^\circ$	4	*311 180.9*	80	18	$(^2H)\ ^1G^\circ$
$3d^3(^2F)4p$	$^1F^\circ$	3	*311 538.7*	92		
$3d^3(^2D1)4p$	$^3D^\circ$	1	*327 533.8*	76	18	$(^2D2)\ ^3D^\circ$
		2	*327 605.4*	75	16	
		3	*327 924.4*	76	15	
$3d^3(^2D1)4p$	$^1D^\circ$	2	*329 848.6*	47	18	$(^2D2)\ ^1D^\circ$
$3d^3(^2D1)4p$	$^3F^\circ$	2	*331 333.8*	57	18	$(^2D2)\ ^3F^\circ$
		3	*331 367.0*	70	21	
		4	*332 017.3*	76	22	
$3d^3(^2D1)4p$	$^3P^\circ$	2	*334 509.1*	75	22	$(^2D2)\ ^3P^\circ$
		1	*335 267.8*	75	24	
		0	*335 642.7*	75	24	
$3d^3(^2D1)4p$	$^1F^\circ$	3	*335 947.4*	75	19	$(^2D2)\ ^1F^\circ$
$3d^3(^2D1)4p$	$^1P^\circ$	1	*342 462.2*	76	23	$(^2D2)\ ^1P^\circ$
Fe VI $(^4F_{3/2})$	*Limit*		605 000			

Fe VI

Z = 26

Sc I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^6 3d^3\ {}^4F_{3/2}$

Ionization energy = 799 000±2000 cm^{-1} (99.1±0.2 eV)

The original analysis was by Bowen (1935), whose observations yielded levels of the $3d^3$ and $3d^2 4p$ configurations. Several levels due to Bowen were published later in a paper by Pasternak (1940). Fawcett and Cowan (1973) observed the $3p^6 3d^3$–$3p^5 3d^4$ transition array between 162 and 180 Å. Fawcett and Henrichs (1974) have classified a number of lines of the $3d^2 4s$–$3d^2 4p$ array. Ekberg (1975) has observed the spectrum from 250 to 1580 Å. He has found all the terms of $3d^3$, $3d^2 4s$ and $3d^2 4p$ except $3d^2(^1S)4s\ ^2S$.

The present list of levels and leading percentages is compiled from Ekberg, except the configuration $3p^5 3d^4$, the levels of which are from Fawcett and Cowan. Ekberg's levels are stated to be uncertain by ±0.4 cm^{-1} and those of Fawcett and Cowan by ±100 cm^{-1}.

Bowen (1960) has observed lines in nebular spectra due to transitions within the $3d^3$ configuration.

The ionization energy is from an isoelectronic extrapolation by Lotz (1967).

References

Bowen, I. S. (1960), Astrophys. J. **132**, 1.
Bowen, I. S. (1935), Phys. Rev. **47**, 924.
Ekberg, J. O. (1975), Phys. Scr. **11**, 23.
Fawcett, B. C., and Cowan, R. D. (1973), Solar Physics **31**, 339.
Fawcett, B. C., and Henrichs, H. F. (1974), Astron. Astrophys. **18**, 157.
Lotz, W. (1967), J. Opt. Soc. Am. **57**, 873.
Pasternak, S. (1940), Astrophys. J. **92**, 140.

Fe VI

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^3$	^4F	3/2	0.0	100		
		5/2	511.3	100		
		7/2	1 188.3	100		
		9/2	2 000.6	100		
$3d^3$	^4P	1/2	18 738.3	99		
		3/2	18 942.0	98		
		5/2	19 610.8	100		
$3d^3$	^2G	7/2	20 616.4	100		
		9/2	21 315.0	98		
$3d^3$	^2P	3/2	26 214.9	58	31	$^2D2$
		1/2	26 495.5	99		
$3d^3$	$^2D2$	5/2	28 484.3	80	20	$^2D1$
		3/2	28 627.9	46	40	^2P
$3d^3$	^2H	9/2	28 724.3	98		
		11/2	29 202.9	100		
$3d^3$	^2F	7/2	46 217.3	100		
		5/2	46 603.7	100		
$3d^3$	$^2D1$	5/2	71 707.6	80	20	$^2D2$
		3/2	72 048.9	78	22	
$3d^2(^3F)4s$	^4F	3/2	261 841.4	100		
		5/2	262 368.4	99		
		7/2	263 135.9	99		
		9/2	264 118.3	100		

ENERGY LEVELS OF IRON

Fe VI–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^2(^3F)4s$	^2F	$5/2$	269 140.2	99		
		$7/2$	270 672.6	99		
$3d^2(^1D)4s$	^2D	$5/2$	280 901.5	61	38	$(^3P)\ ^4P$
		$3/2$	281 217.8	51	49	
$3d^2(^3P)4s$	^4P	$1/2$	281 477.0	100		
		$3/2$	282 035.0	51	47	$(^1D)\ ^2D$
		$5/2$	282 951.9	62	38	$(^1D)\ ^2D$
$3d^2(^3P)4s$	^2P	$1/2$	287 919.2	100		
		$3/2$	288 638.3	98		
$3d^2(^1G)4s$	^2G	$9/2$	292 313.0	100		
		$7/2$	292 330.1	100		
$3d^2(^3F)4p$	$^4G^\circ$	$5/2$	*338 256.4*	91	6	$(^3F)\ ^2F^\circ$
		$7/2$	*339 477.0*	92	5	$(^3F)\ ^4F^\circ$
		$9/2$	*340 935.0*	93	7	$(^3F)\ ^4F^\circ$
		$11/2$	*342 730.6*	100		
$3d^2(^3F)4p$	$^4F^\circ$	$3/2$	*339 539.8*	94		
		$5/2$	*340 344.0*	94		
		$7/2$	*341 365.3*	94	5	$(^3F)\ ^4G^\circ$
		$9/2$	*342 434.4*	91	7	$(^3F)\ ^4G^\circ$
$3d^2(^3F)4p$	$^2F^\circ$	$5/2$	*342 571.5*	58	16	$(^3F)\ ^4D^\circ$
		$7/2$	*343 608.2*	54	40	
$3d^2(^3F)4p$	$^4D^\circ$	$3/2$	*343 210.9*	55	30	$(^3F)\ ^2D^\circ$
		$1/2$	*343 619.3*	92	7	$(^3P)\ ^4D^\circ$
		$5/2$	*344 273.3*	63	23	$(^3F)\ ^2F^\circ$
		$7/2$	*345 422.6*	53	37	$(^3F)\ ^2F^\circ$
$3d^2(^3F)4p$	$^2D^\circ$	$3/2$	*344 652.6*	47	36	$(^3F)\ ^4D^\circ$
		$5/2$	*345 907.1*	62	15	$(^3P)\ ^2D^\circ$
$3d^2(^3F)4p$	$^2G^\circ$	$7/2$	*348 962.1*	94	4	$(^1G)\ ^2G^\circ$
		$9/2$	*350 017.8*	94	4	
$3d^2(^3P)4p$	$^2S^\circ$	$1/2$	*351 805.8*	98		
$3d^2(^3P)4p$	$^4S^\circ$	$3/2$	*355 657.1*	90	9	$(^1D)\ ^2P^\circ$
$3d^2(^1D)4p$	$^2P^\circ$	$3/2$	*357 755.2*	80	9	$(^3P)\ ^4S^\circ$
		$1/2$	*359 099.3*	51	40	$(^3P)\ ^4D^\circ$
$3d^2(^1D)4p$	$^2F^\circ$	$5/2$	*358 334.6*	83	6	$(^3F)\ ^2F^\circ$
		$7/2$	*359 884.0*	77	12	$(^3P)\ ^4D^\circ$
$3d^2(^3P)4p$	$^4D^\circ$	$1/2$	*359 395.9*	52	44	$(^1D)\ ^2P^\circ$
		$3/2$	*359 781.3*	90	7	$(^3F)\ ^4D^\circ$
		$5/2$	*360 707.1*	85	6	$(^3F)\ ^4D^\circ$
		$7/2$	*362 270.0*	82	12	$(^1D)\ ^2F^\circ$
$3d^2(^1D)4p$	$^2D^\circ$	$3/2$	*361 858.2*	80	6	$(^3F)\ ^2D^\circ$
		$5/2$	*362 602.9*	76	11	$(^3P)\ ^4P^\circ$

Fe VI–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^2(^3P)4p$	$^4P^\circ$	1/2	*363 945.7*	98		
		3/2	*364 392.9*	97		
		5/2	*365 494.0*	87	13	$(^1D)\ ^2D^\circ$
$3d^2(^1G)4p$	$^2G^\circ$	7/2	*365 077.0*	93	5	$(^3F)\ ^2G^\circ$
		9/2	*365 266.6*	94	4	
$3d^2(^3P)4p$	$^2D^\circ$	3/2	*370 538.1*	78	12	$(^3F)\ ^2D^\circ$
		5/2	*370 579.6*	80	15	
$3d^2(^1G)4p$	$^2H^\circ$	9/2	*372 095.6*	98		
		11/2	*373 706.1*	100		
$3d^2(^3P)4p$	$^2P^\circ$	1/2	*374 088.3*	98		
		3/2	*374 425.6*	95		
$3d^2(^1G)4p$	$^2F^\circ$	7/2	*377 951.8*	95	4	$(^1D)\ ^2F^\circ$
		5/2	*379 077.6*	97		
$3d^2(^1S)4p$	$^2P^\circ$	1/2	*408 207.4*	97		
		3/2	*410 389.5*	98		
$3p^5(^2P^\circ)3d^4(^1G)$	$^2G^\circ$	7/2	*575 930*			
		9/2	*576 990*			
$3p^5(^2P^\circ)3d^4(^5D)$	$^4D^\circ$	1/2	*603 210*			
		3/2	*604 230*			
		5/2	*605 420*			
		7/2	*606 230*			
$3p^5(^2P^\circ)3d^4(^3H)$	$^2H^\circ$	9/2	*603 340*			
		11/2	*605 740*			
$3p^5(^2P^\circ)3d^4(^3F)$	$^2D^\circ$	5/2	*617 520*			
		3/2	*618 290*			
$3p^5(^2P^\circ)3d^4(^3H)$	$^2G^\circ$	9/2	*630 240*			
		7/2	*631 240*			
$3p^5(^2P^\circ)3d^4(^3G)$	$^2F^\circ$	7/2	*634 170*			
		5/2	*635 430*			
Fe VII $(^3F_2)$	***Limit***		**799 000**			

ENERGY LEVELS OF IRON

Fe VII

$Z=26$

Ca I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^6 3d^2\ ^3F_2$

Ionization energy = 1 008 000±100 cm^{-1} (124.98±0.01 eV)

The initial work by Cady (1933) on this spectrum was gradually extended by numerous contributions. Ekberg (1981) has completely reobserved the spectrum and greatly extended the analysis. His paper gives more than 400 lines in the region 104–270 Å classified as transitions to the lowest configuration, $3p^6 3d^2$, and 20 lines between 1010 and 1362 Å in the $3d4s$–$3d4p$ transition array. He states that the uncertainty of the levels of $3d^2$ is ± 1 cm^{-1}, while for the excited configurations the uncertainty increases from ±4 to ±20 cm^{-1} as the level value rises. He has made parametric calculations for $3d^2$, $3d4s$, $3dnf$, $n=4$–6, and $3p^5 3d^2 4s$. In the calculations for $3d4f$ configuration interaction with $3p^5 3d^3$ was included. The repeating ^2D terms of $3d^3$ were distinguished by the letters A and B by Ekberg. No indication of seniority contributions was given.

The $3d4p$ configuration has been calculated by Warner and Kirkpatrick (1969). Their percentage compositions as communicated privately to us are given here.

A number of forbidden transitions among levels of the $3d^2$ configuration have been listed by Bowen (1960). Their wavelengths are improved by Ekberg.

The ionization energy was determined by Ekberg from five different $3dnf$ series.

References

Bowen, I. S. (1960), Astrophys. J. **132**, 1.

Cady, W. M. (1933), Phys. Rev. **43**, 324.

Ekberg, J. O. (1981), Physica Scripta **23**, 7.

Warner, B., and Kirkpatrick, R. C. (1969), Mon. Not. R. Astron. Soc. **144**, 397.

Fe VII

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3p^6 3d^2$	^3F	2	0.0	100		
		3	1 051.5	100		
		4	2 331.5	100		
$3p^6 3d^2$	^1D	2	17 475.5	93	6	^3P
$3p^6 3d^2$	^3P	0	20 040.3	100		
		1	20 430.1	100		
		2	21 278.6	94	6	^1D
$3p^6 3d^2$	^1G	4	28 927.3	100		
$2p^6 3d^2$	^1S	0	67 078.3	100		
$3p^6 3d 4s$	^3D	1	344 463.3	100		
		2	345 028.7	97		
		3	346 262.2	100		
$3p^6 3d 4s$	^1D	2	350 332.6	97		
$3p^6 3d 4p$	$^3D°$	1	*425 128.6*	97	2	$^1P°$
		2	*427 784.7*	83	7	$^1D°$
		3	*430 948.6*	75	23	$^3F°$
$3p^6 3d 4p$	$^1D°$	2	*425 386.1*	76	21	$^3F°$
$3p^6 3d 4p$	$^3F°$	2	*430 213.4*	72	15	$^1D°$
		3	*431 609.5*	77	23	$^3D°$
		4	*433 871.2*	100		
$3p^6 3d 4p$	$^3P°$	1	*436 952.2*	92	6	$^1P°$
		0	*437 001.3*	100		
		2	*437 558.0*	96		

Fe VII–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3p^6 3d 4p$	$^1F^\circ$	3	*439 811.6*	93		
$3p^6 3d 4p$	$^1P^\circ$	1	*443 447.0*	92	6	$^3P^\circ$
$3p^5(^2P^\circ)3d^3(^2G)$	$^1H^\circ$	5	*464 034*			
$3p^5(^2P^\circ)3d^3(^2F)$	$^3G^\circ$	5	*472 559*			
		4	*472 903*			
		3	*481 435*			
$3p^5(^2P^\circ)3d^3(^2F)$	$^1G^\circ$	4	*496 454*			
$3p^5(^2P^\circ)3d^3(^2H)$	$^3G^\circ$	3	*510 086*			
		4	*510 158*			
		5	*514 133*			
$3p^5(^2P^\circ)3d^3(a^2D)$	$^1D^\circ$	2	*538 290*			
$3p^5(^2P^\circ)3d^3(^2F)$	$^3D^\circ$	2	*548 274*			
		3	*551 568*			
$3p^5(^2P^\circ)3d^3(^2F)$	$^1D^\circ$	2	*553 220*			
$3p^5(^2P^\circ)3d^3(^2G)$	$^1F^\circ$	3	*556 422*			
$3p^5(^2P^\circ)3d^3(^4P)$	$^3P^\circ$	1	*561 303*			
		2	*565 275*			
$3p^5(^2P^\circ)3d^3(^4F)$	$^3F^\circ$	2	*564 425*			
		3	*566 256*			
		4	*568 118*			
$3p^5(^2P^\circ)3d^3(^2P)$	$^1P^\circ$	1	*598 638*			
$3p^5(^2P^\circ)3d^3(^4F)$	$^3D^\circ$	3	*603 419*			
		2	*603 757*			
		1	*604 270*			
$3p^5(^2P^\circ)3d^3(^2H)$	$^1G^\circ$	4	*605 489*			
$3p^5(^2P^\circ)3d^3(^4P)$	$^3S^\circ$	1	*623 699*			
$3p^5(^2P^\circ)3d^3(b^2D)$	$^1P^\circ$	1	*630 283*			
$3p^6 3d4f$	$^1G^\circ$	4	*659 917*	56	25	$^3F^\circ$
$3p^6 3d4f$	$^3F^\circ$	2	*660 015*	94		
		3	*660 358*	94		
		4	*661 169*	70	26	$^1G^\circ$
$3p^6 3d4f$	$^3G^\circ$	3	*663 097*	87	9	$^1F^\circ$
		4	*663 950*	94		
		5	*664 482*	97		
$3p^6 3d4f$	$^1D^\circ$	2	*663 871*	90		
$3p^6 3d4f$	$^1F^\circ$	3	*665 417*	58	30	$^3D^\circ$

ENERGY LEVELS OF IRON

Fe VII–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3p^6 3d4f$	$^3D°$	1	665 832	92	5	$^3P°$
		2	665 923	85	10	$^3P°$
		3	666 651	66	31	$^1F°$
$3p^6 3d4f$	$^3P°$	2	667 899	85	11	$^3D°$
		1	668 253	92	6	$^3D°$
		0	668 489	99		
$3p^6 3d4f$	$^1H°$	5	669 978	98		
$3p^6 3d4f$	$^1P°$	1	672 820	90	8	$3p^5(^2P°)3d^3(b^2D)$ $^1P°$
$3p^5(^2P°)\,3d^2(^3F)4s\,(^2F)$	$^3D°$	1	745 556	78	20	$(^2P°)(^2P)$ $^3D°$
		2	746 965	73	24	
		3	749 166	67	29	
$3p^5(^2P°)\,3d^2(^3F)4s\,(^2F)$	$^3G°$	5	766 991	94	5	$(^2P°)(^4F)$ $^5F°$
		4	768 813	83	7	
		3	769 991	50	16	
$3p^5(^2P°)\,3d^2(^3P)4s\,(^2P)$	$^3P°$	2	768 425	95		
		1	771 612	95		
		0	773 488	97		
$3p^5(^2P°)\,3d^2(^1G)4s\,(^2G)$	$^3F°$	3	778 420	45	36	$(^2P°)(^4F)$ $^3F°$
		4	779 575	36	32	
$3p^5(^2P°)\,3d^2(^1D)4s\,(^2D)$	$^1D°$	2	779 009	45	21	$(^2P°)(^2F)$ $^3F°$
$3p^5(^2P°)\,3d^2(^3F)4s\,(^2F)$	$^3F°$	4	782 690	72	9	$(^2P°)(^2G)$ $^3F°$
		3	783 119	52	13	$(^2P°)(^2F)$ $^3G°$
$3p^6 3d5f$	$^1G°$	4	784 174	48	46	$^3H°$
$3p^6 3d5f$	$^3H°$	4	784 477	50	29	$^1G°$
$3p^6 3d5f$	$^3F°$	2	784 733	86	12	$^1D°$
		3	785 012	90		
		4	785 809	76	21	$^1G°$
$3p^6 3d5f$	$^3G°$	3	786 732	78	16	$^1F°$
		4	787 737	91	5	$^3F°$
		5	788 146	97		
$3p^6 3d5f$	$^1D°$	2	786 830	74	12	$^3P°$
$3p^6 3d5f$	$^3D°$	1	787 945	75	18	$^3P°$
		2	788 030	51	32	$^3P°$
		3	788 303	60	20	$^1F°$
$3p^6 3d5f$	$^3P°$	2	788 995	56	41	$^3D°$
		1	789 172	78	21	$^3D°$
		0	789 365	100		
$3p^6 3d5f$	$^1F°$	3	789 215	64	31	$^3D°$
$3p^6 3d5f$	$^1P°$	1	790 708	93		
$3p^6 3d5f$	$^1H°$	5	791 168	93		

Fe VII–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3p^5(^2P^\circ)\,3d^2(^3F)4s\,(^4F)$	$^3G^\circ$	3	*794 149*	45		30	$(^2P^\circ)(^2D)\ ^3F^\circ$
		4	*797 712*	65		9	$(^2P^\circ)(^2F)\ ^1G^\circ$
		5	*800 633*	69		12	$(^2P^\circ)(^2G)\ ^1H^\circ$
$3p^5(^2P^\circ)\,3d^2(^3F)4s\,(^4F)$		3	*797 257*	38	$^3G^\circ$	33	$(^2P^\circ)(^2D)\ ^3F^\circ$
$3p^5(^2P^\circ)\,3d^2(^3F)4s\,(^2F)$	$^1G^\circ$	4	*802 462*	67		13	$(^2P^\circ)(^4F)\ ^3G^\circ$
$3p^5(^2P^\circ)\,3d^2(^1G)4s\,(^2G)$	$^1H^\circ$	5	*806 033*	61		21	$(^2P^\circ)(^2G)\ ^3H^\circ$
$3p^5(^2P^\circ)\,3d^2(^1D)4s\,(^2D)$	$^1F^\circ$	3	*807 627*	64		30	$(^2P^\circ)(^2D)\ ^3F^\circ$
$3p^5(^2P^\circ)\,3d^2(^3P)4s\,(^2P)$	$^3D^\circ$	3	*812 086*	63		30	$(^2P^\circ)(^2F)\ ^3D^\circ$
		2	*813 877*	65		23	
		1	*817 195*	71		19	
$3p^5(^2P^\circ)\,3d^2(^3P)4s\,(^4P)$	$^3D^\circ$	1	*822 689*	79		8	$(^2P^\circ)(^2P)\ ^3D^\circ$
		2	*824 184*	75		7	$(^2P^\circ)(^2P)\ ^1D^\circ$
		3	*827 533*	81		7	$(^2P^\circ)(^4F)\ ^3D^\circ$
$3p^5(^2P^\circ)\,3d^2(^3P)4s\,(^4P)$	$^3S^\circ$	1	*826 106*	97			
$3p^5(^2P^\circ)\,3d^2(^3P)4s\,(^2P)$	$^1D^\circ$	2	*829 626*	72		8	$(^2P^\circ)(^4P)\ ^3D^\circ$
$3p^5(^2P^\circ)\,3d^2(^1G)4s\,(^2G)$	$^3G^\circ$	5	*832 889*	88		8	$(^2P^\circ)(^4F)\ ^3G^\circ$
		4	*832 893*	91		6	
		3	*833 128*	93		5	
$3p^5(^2P^\circ)\,3d^2(^3P)4s\,(^2P)$	$^3S^\circ$	1	*837 472*	97			
$3p^6\,3d6f$	$^3H^\circ$	4	*852 601*	61		34	$^1G^\circ$
$3p^6\,3d6f$		4	*853 307*	33	$^3H^\circ$	30	$^1G^\circ$
$3p^6\,3d6f$	$^3F^\circ$	2	*853 433*	77		19	$^1D^\circ$
		3	*853 697*	79		11	$^3G^\circ$
		4	*854 767*	63		31	$^1G^\circ$
$3p^6\,3d6f$	$^3G^\circ$	3	*854 760*	65		24	$^1F^\circ$
		4	*855 969*	82		11	$^3F^\circ$
		5	*856 260*	93		6	$^3H^\circ$
$3p^6\,3d6f$	$^1D^\circ$	2	*854 838*	40		34	$^3P^\circ$
$3p^6\,3d6f$	$^3D^\circ$	1	*855 346*	64		22	$^3P^\circ$
		3	*856 109*	49		19	$^3F^\circ$
$3p^6\,3d6f$		2	*855 903*	38	$^1D^\circ$	29	$^3D^\circ$
$3p^6\,3d6f$	$^1F^\circ$	3	*856 797*	61		32	$^3D^\circ$
$3p^6\,3d6f$	$^3P^\circ$	2	*856 811*	48		48	$^3D^\circ$
		1	*856 975*	71		28	$^3D^\circ$
		0	*857 082*	100			
$3p^6\,3d6f$	$^1H^\circ$	5	*857 881*	94			
$3p^6\,3d7f$	$^3F^\circ$	2	*894 718*				
		3	*894 944*				
		4	*896 382*				

ENERGY LEVELS OF IRON

Fe VII–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3p^6 3d7f$	$^3G^\circ$	3	*895 744*			
		4	*897 077*			
		5	*897 254*			
$3p^6 3d7f$	$^1H^\circ$	5	*898 243*			
$3p^6 3d8f$	$^3F^\circ$	3	*921 694*			
		4	*923 282*			
$3p^6 3d8f$	$^3G^\circ$	4	*923 716*			
		5	*923 838*			
$3p^6 3d8f$	$^1H^\circ$	5	*924 479*			
$3p^5(^2P^\circ)3d^2(^3P)4s(^4P)$	$^3P^\circ$	2	*928 684*	75	16	$(^2P^\circ)(^2D)\ ^3P^\circ$
$3p^6 3d9f$	$^3G^\circ$	4	*941 918*			
		5	*942 022*			
$3p^6 3d9f$	$^1H^\circ$	5	*942 477*			
$3p^6 3d10f$	$^3G^\circ$	4	*954 904*			
		5	*954 966*			
$3p^6 3d10f$	$^1H^\circ$	5	*955 307*			
Fe VIII ($^2D_{3/2}$)	*Limit*		**1 008 000**			

Fe VIII

$Z=26$

K I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^6 3d\ ^2D_{3/2}$

Ionization energy = 1 218 380±100 cm^{-1} (151.061±0.012 eV)

The ground-term splitting was determined by Cowan and Peacock (1965) by means of four pairs of lines arising from the $3p^5 3d^2$ configuration. This upper configuration was interpreted by the same authors. Earlier, Kruger and Weissberg (1937) reported the one-electron terms $3p^6(^1S)\ 5s$, $6s$, $4p$, $4f$, $5f$, $6f$, and $7f$. With light sources allowing differentiation among highly ionized species Alexander, Feldman, and Fraenkel (1965) determined that the lines used by Kruger et al. to establish $5s$, $6s$, and $4p$ were erroneously assigned to Fe VIII. This finding has been confirmed privately by Ekberg.

The levels of $3p^5 3d4s$ were deduced by Cowan (1967) from lines reported by Feldman and Fraenkel (1966).

The spectrum has now been remeasured between 93 and 233 Å with an uncertainty of ±0.003 Å by Ramonas and Ryabtsev (1980). They have redetermined all the known level values and extended the analysis. Their results are given below. The leading percentages were supplied privately by Cowan.

We have determined the ionization energy from the new measurements of the nf series. The $7f$ term is predicted to be 590 cm^{-1} below the observed value.

References

Alexander, E., Feldman, U., and Fraenkel, B. S. (1965), J. Opt. Soc. Am. **55**, 650.
Cowan, R. D., and Peacock, N. J. (1965), Astrophys. J. **142**, 390.
Cowan, R. W. (1967), Astrophys. J. **147**, 377.
Feldman, U., and Fraenkel, B. S. (1966), Astrophys. J. **145**, 959.
Kruger, P. G., and Weissberg, S. G. (1937), Phys. Rev. **52**, 314.
Ramonas, A. A., and Ryabtsev, A. N. (1980), Opt. Spectrosc. **48**, 631.

Fe VIII

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3p^6(^1S)3d$	^2D	3/2	0			
		5/2	1 836			
$3p^5(^2P^\circ)3d^2(^1G)$	$^2F^\circ$	5/2	*431 250*	44	37	$(^2P^\circ)(^3F)\ ^2F^\circ$
		7/2	*434 555*	45	41	
$3p^5(^2P^\circ)3d^2(^1D)$	$^2F^\circ$	7/2	*447 656*	72	23	$(^2P^\circ)(^3F)\ ^2G^\circ$
		5/2	*459 367*	91	4	$(^2P^\circ)(^3P)\ ^4D^\circ$
$3p^5(^2P^\circ)3d^2(^1S)$	$^2P^\circ$	3/2	*508 518*	61	23	$3p^6 4p\ ^2P^\circ$
		1/2	*520 822?*	77	14	$3p^5(^2P^\circ)3d^2(^1D)\ ^2P^\circ$
$3p^6(^1S)4p$	$^2P^\circ$	1/2	*510 277*	94	4	$3p^5(^2P^\circ)3d^2(^1S)\ ^2P^\circ$
		3/2	*515 550*	74	18	
$3p^5(^2P^\circ)3d^2(^3F)$	$^2F^\circ$	5/2	*535 909*	53	45	$(^2P^\circ)(^1G)\ ^2F^\circ$
		7/2	*541 755*	50	48	
$3p^5(^2P^\circ)3d^2(^3P)$	$^2P^\circ$	1/2	*591 964*	72	14	$(^2P^\circ)(^1D)\ ^2P^\circ$
		3/2	*595 152*	73	16	
$3p^5(^2P^\circ)3d^2(^3F)$	$^2D^\circ$	5/2	*596 463*	71	17	$(^2P^\circ)(^1D)\ ^2D^\circ$
		3/2	*597 065*	71	17	
$3p^6(^1S)4f$	$^2F^\circ$	5/2	*763 703*	98		
		7/2	*763 799*	98		
$3p^5 3d(^3F^\circ)4s$	$^2P^\circ$	1/2	*837 661*	98		
		3/2	*842 829*	95		

ENERGY LEVELS OF IRON

Fe VIII–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3p^5 3d(^3F^\circ)4s$	$^4F^\circ$	$\frac{7}{2}$	*847 145*	95		
		$\frac{5}{2}$	*849 899*	92		
		$\frac{3}{2}$	*852 849?*	96		
$3p^5 3d(^3F^\circ)4s$	$^2F^\circ$	$\frac{7}{2}$	*855 100*	94		
		$\frac{5}{2}$	*860 615*	89	4	$(^1D^\circ)\ ^2D^\circ$
$3p^5 3d(^3D^\circ)4s$	$^4D^\circ$	$\frac{7}{2}$	*874 711*	81	18	$(^1F^\circ)\ ^2F^\circ$
		$\frac{5}{2}$	*876 765*	74	10	$(^1D^\circ)\ ^2D^\circ$
		$\frac{3}{2}$	*877 476*	76	19	$(^1D^\circ)\ ^2D^\circ$
		$\frac{1}{2}$	*878 264?*	98		
$3p^5 3d(^1D^\circ)4s$	$^2D^\circ$	$\frac{5}{2}$	*879 021*	48	25	$(^3D^\circ)\ ^2D^\circ$
		$\frac{3}{2}$	*881 345*	77	20	$(^3D^\circ)\ ^4D^\circ$
$3p^5 3d(^1F^\circ)4s$	$^2F^\circ$	$\frac{5}{2}$	*884 331*	46	27	$(^1D^\circ)\ ^2D^\circ$
		$\frac{7}{2}$	*887 325*	78	16	$(^3D^\circ)\ ^4D^\circ$
$3p^5 3d(^3D^\circ)4s$	$^2D^\circ$	$\frac{3}{2}$	*889 113*	98		
		$\frac{5}{2}$	*890 845*	68	20	$(^1F^\circ)\ ^2F^\circ$
$3p^6(^1S)5f$	$^2F^\circ$	$\frac{5}{2}$	*927 059*			
		$\frac{7}{2}$	*927 102*			
$3p^6(^1S)6f$	$^2F^\circ$	$\frac{5}{2}$	*1 016 560*			
		$\frac{7}{2}$	*1 016 570*			
$3p^6(^1S)7f$	$^2F^\circ$	$\frac{5}{2}$	*1 069 873*			
		$\frac{7}{2}$	*1 070 029*			
Fe IX $(^1S_0)$	***Limit***		**1 218 380**			

Fe IX

$Z = 26$

Ar I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^6\ ^1S_0$

Ionization energy = 1 884 000±3000 cm^{-1} (233.6±0.4 eV)

This spectrum was first investigated by Kruger, Weissberg, and Phillips (1937), who identified the resonance lines arising from the two $J=1$ levels of the $3p^5 4s$ configuration. The present values of these levels are taken from the paper of Fawcett, Cowan, Kononov, and Hayes (1972).

All levels of the $3s^2 3p^5 3d$ configuration were determined from combinations with $3s3p^6 3d$ by Svensson, Ekberg and Edlén (1974). Using these levels to predict forbidden transitions within $3s^2 3p^5 3d$, Edlén and Smitt (1978) identified a number of well-measured solar lines obtained with Skylab and redetermined most of the level values. Their results are quoted here. The $3s3p^6 3d$ levels are from Smitt and Svensson (1978). The uncertainty of the connection of these two configurations to the ground state is ±5 cm^{-1}.

The $3p^5 4d$ and $3p^5 5s$ levels were found by Alexander, Feldman, and Fraenkel (1965). The present values for the two $3p^5 4d$ levels are obtained from the measurements of Fawcett et al. The uncertainty is less than 100 cm^{-1}.

The $3p^5 4f$ level values given here were derived by combining the $3p^5 3d$–$3p^5 4f$ line identifications of Wagner and House (1971) and of Fawcett et al. with the level values of $3p^5 3d$ of Edlén and Smitt. The $3p^5 4f$ levels clearly follow a $J_1 l$ coupling scheme, the designations having been assigned by comparison with isoelectronic spectra.

The $3s3p^6 4p$ term is from Kastner, Crooker, Behring, and Cohen (1977).

We have derived the ionization energy from the $3p^5 4s$ and $3p^5 5s$ configurations under the assumption of a change in effective quantum number $\Delta n^* = n^*(5s) - n^*(4s) = 1.024$, as observed in similar spectra. The stated uncertainty in the ionization energy is based on an estimated uncertainty of ±0.005 in the value of Δn^*.

References

Alexander, E., Feldman, U., and Fraenkel, B. S. (1965), J. Opt. Soc. Am. **55**, 650.

Edlén, B., and Smitt, R. (1978), Sol. Phys. **57**, 329.

Fawcett, B. C., Cowan, R. D., Kononov, E. Y., and Hayes, R. W. (1972), J. Phys. **B5**, 1255.

Kastner, S. O., Crooker, A. M., Behring, W. E., and Cohen, L. (1977), Phys. Rev. **A16**, 577.

Kruger, P. G., Weissberg, S. G., and Phillips, L. W. (1937), Phys. Rev. **51**, 1090.

Smitt, R., and Svensson, L. A. (1978), Atomic Spectroscopy, Univ. of Lund, Annual Report.

Svensson, L. Å., Ekberg, J. O., and Edlén, B., (1974), Sol. Phys. **34**, 173.

Wagner, W. J., and House, L. L. (1971), Astrophys. J. **166**, 683.

Fe IX

Configuration	Term	J	Level (cm^{-1})
$3p^6$	^1S	0	0
$3p^5 3d$	$^3P°$	0	*405 772*
		1	*408 315.1*
		2	*413 669.2*
$3p^5 3d$	$^3F°$	4	*425 809.8*
		3	*429 310.9*
		2	*433 818.8*
$3p^5 3d$	$^3D°$	3	*455 612.2*
		1	*460 616*
		2	*462 616.6*
$3p^5 3d$	$^1D°$	2	*456 752.7*
$3p^5 3d$	$^1F°$	3	*465 828.4*
$3p^5 3d$	$^1P°$	1	*584 546*

ENERGY LEVELS OF IRON

Fe IX–Continued

Configuration	Term	J	Level (cm^{-1})
$3s3p^6 3d$	^3D	1	726 734
		2	727 560
		3	728 935
$3s3p^6 3d$	^1D	2	749 871
$3p^5(^2P^\circ_{3/2})4s$	$(3/2,1/2)^\circ$	1	*950 500*
$3p^5(^2P^\circ_{1/2})4s$	$(1/2,1/2)^\circ$	1	*965 570*
$3p^5 4d$	$^3P^\circ$	1	*1 198 220*
$3p^5 4d$	$^1P^\circ$	1	*1 213 150*
$3p^5(^2P^\circ_{3/2})4f$	$^2[3/2]$	1	1 300 920
		2	1 302 840
$3p^5(^2P^\circ_{3/2})4f$	$^2[9/2]$	5	1 304 600
		4	1 306 320
$3p^5(^2P^\circ_{3/2})4f$	$^2[5/2]$	3	1 305 760
$3p^5(^2P^\circ_{3/2})4f$	$^2[7/2]$	3	1 310 160
		4	1 311 750
$3p^5(^2P^\circ_{1/2})4f$	$^2[5/2]$	3	1 323 660
$3p^5(^2P^\circ_{1/2})4f$	$^2[7/2]$	3	1 324 720
		4	1 324 800
$3p^5(^2P^\circ_{3/2})5s$	$(3/2,1/2)^\circ$	1	*1 358 140*
$3s3p^6 4p$	$^1P^\circ$	1	*1 371 910*
$3p^5(^2P^\circ_{1/2})5s$	$(1/2,1/2)^\circ$	1	*1 372 670*
Fe X ($^2P^\circ_{3/2}$)	***Limit***		**1 884 000**

Fe X

$Z=26$

Cl I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^5\ ^2P^\circ_{3/2}$

Ionization energy $= 2\ 114\ 000 \pm 1000$ cm^{-1} (262.1 ± 0.1 eV)

The $3s^2 3p^4 4s$ levels and the $3s^2 3p^5\ ^2P^\circ$ term interval were established with an uncertainty of ±50 cm^{-1} by the identification of a group of eight lines at 94–98 Å by Edlén in 1937. The value of the $3s^2 3p^5\ ^2P^\circ$ interval was later more precisely determined by Grotrian (1939) to ±0.1 cm^{-1} through his identification of the solar coronal line at 6374.51 Å as the $3s^2 3p^5$ magnetic dipole transition $^2P^\circ_{3/2}$–$^2P^\circ_{1/2}$ in Fe X, which was confirmed by Edlén (1942). The $3s3p^5 3d\ ^4F^\circ$ term is from Smitt (1977). The $3s3p^6\ ^2S$ term was first located by Fawcett (1971). We use the improved measurements of Smitt, Svensson, and Outred (1976), which provide a level uncertainty of ±5 cm^{-1}.

Edlén and Smitt (1978) derived levels of the $3s^2 3p^4 3d$ configuration relative to its lowest level ($^4D_{7/2}$) using forbidden transitions within this configuration observed in the solar corona. The $^4D_{7/2}$ and $^4D_{5/2}$ levels are unresolved. Bromage, Cowan, and Fawcett (1977) give the connection of $^4D_{5/2}$ to the $3s^2 3p^5\ ^2P_{3/2}$ ground state with an uncertainty of ±10 cm^{-1} and report additional levels of $3s^2 3p^4 3d$. They have also provided the leading percentages for the levels. The $3s^2 3p^4 4p$, $4d$, and $4f$ level values are derived from the identifications of Fawcett, Cowan, Kononov, and Hayes (1972), who also give the percentage composition of the levels. Their levels are uncertain by less than 100 cm^{-1}.

Edlén (1937) derived the ionization energy by isoelectronic extrapolation.

References

Bromage, G. E., Cowan, R. D., and Fawcett, B. C. (1977), Phys. Scr. **15**, 177.

Edlén, B. (1937), Z. Phys. **104**, 407.

Edlén, B. (1942), Z. Astrophys. **22**, 30.

Edlén, B., and Smitt, R. (1978), Sol. Phys. **57**, 329.

Fawcett, B. C. (1971), J. Phys. **B4**, 1577.

Fawcett, B. C., Cowan, R. D., Kononov, E. Y., and Hayes, R. W. (1972), J. Phys. **B5**, 1255.

Grotrian, W. (1939), Naturwiss. **27**, 214.

Smitt, R. (1977), Sol. Phys. **51**, 113.

Smitt R., Svensson, L. A., and Outred, M. (1976), Phys. Scr. **13**, 293.

Fe X

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3s^2 3p^5$	$^2P^\circ$	3/2	*0.0*			
		1/2	*15 683.1*			
$3s3p^6$	^2S	1/2	289 249			
$3s^2 3p^4(^3P)3d$	^4D	7/2	388 709	97		
		5/2	388 709	95		
		3/2	390 050	94		
		1/2	391 555	96		
$3s^2 3p^4(^3P)3d$	^4F	9/2	417 653	94		
		7/2	422 795	89		
		5/2	426 763	94		
		3/2	428 298	90		
$3s^2 3p^4(^1D)3d$	^2P	3/2	431 928	45	33	$(^3P)\ ^2P$
$3s^2 3p^4(^1D)3d$	^2D	3/2	434 614	43	27	$(^3P)\ ^2D$
$3s^2 3p^4(^3P)3d$	^4P	1/2	434 800	96		
		5/2	441 853	45	23	$(^1D)\ ^2D$
$3s^2 3p^4(^3P)3d$	^2F	7/2	440 840	55	28	$(^1D)\ ^2G$
		5/2	452 730?	78	15	$(^1D)\ ^2F$
$3s^2 3p^4(^1D)3d$	^2G	9/2	450 751	94		
		7/2	451 084	67	25	$(^3P)\ ^2F$

ENERGY LEVELS OF IRON

Fe x–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3s^2 3p^4(^1D)3d$	^2F	7/2	485 983	84		
$3s^2 3p^4(^1S)3d$	^2D	3/2	511 800	69	26	$(^1D)\ ^2D$
$3s^2 3p^4(^1D)3d$	^2S	1/2	541 879	73	23	$3s3p^6\ ^2S$
$3s^2 3p^4(^3P)3d$	^2P	3/2	564 198	52	40	$(^1D)\ ^2P$
		1/2	569 985	54	45	
$3s^2 3p^4(^3P)3d$	^2D	5/2	572 954	66	21	$(^1D)\ ^2D$
		3/2	586 244	61	17	
$3s3p^5(^3P^\circ)3d$	$^4F^\circ$	9/2	*696 661*			
		7/2	*699 492*			
		5/2	*702 585*			
		3/2	*705 430*			
$3s^2 3p^4(^3P)4s$	^4P	5/2	1 022 100			
		3/2	1 029 630			
$3s^2 3p^4(^3P)4s$	^2P	3/2	1 040 350			
		1/2	1 048 890			
$3s^2 3p^4(^1D)4s$	^2D	5/2	1 063 690			
		3/2	1 064 190			
$3s^2 3p^4(^3P)4p$	$^4P^\circ$	5/2	*1 118 490?*	84	14	$(^3P)\ 4d$
$3s^2 3p^4(^3P)4p$	$^4D^\circ$	7/2	*1 130 430*			
$3s^2 3p^4(^1D)4p$	$^2F^\circ$	5/2	*1 161 930*			
		7/2	*1 165 710*			
$3s^2 3p^4(^1D)4p$	$^2D^\circ$	5/2	*1 178 850?*			
$3s^2 3p^4(^3P)4d$	^2D	5/2	1 284 270	65	14	^2F
		3/2	1 285 180	58	20	^4P
$3s^2 3p^4(^3P)4d$	^4F	5/2	1 286 540	77	14	$(^3P)\ ^2D$
$3s^2 3p^4(^3P)4d$	^2F	5/2	1 288 210			
$3s^2 3p^4(^3P)4d$	^2P	3/2	1 295 260	82	10	$(^3P)\ ^2D$
$3s^2 3p^4(^1D)4d$	^2P	3/2	1 315 690			
		1/2	1 317 390	79	18	$(^3P)\ ^2P$
$3s^2 3p^4(^1D)4d$	^2D	5/2	1 321 270			
		3/2	1 322 960			
$3s^2 3p^4(^3P)4f$	$^4F^\circ$	9/2	*1 388 450*			
$3s^2 3p^4(^3P)4f$	$^4G^\circ$	11/2	*1 397 130*			
		9/2	*1 399 850*	47	40	$(^3P)\ ^2G^\circ$
		7/2	*1 409 730*	61	14	$(^3P)\ ^2F^\circ$
$3s^2 3p^4(^3P)4f$	$^2G^\circ$	9/2	*1 408 650*	49	42	$(^3P)\ ^4G^\circ$

Fe x–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$3s^2 3p^4(^1D)4f$	$^2H°$	$^{11}/_2$	*1 429 300*	
$3s^2 3p^4(^1D)4f$	$^2G°$	$^9/_2$	*1 441 660*	
$3s^2 3p^4(^1S)4f$	$^2F°$	$^5/_2$	*1 484 290*	
Fe XI ($^3P_2$)	***Limit***		**2 114 000**	

ENERGY LEVELS OF IRON

Fe XI

$Z=26$

S I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^4\ ^3P_2$

Ionization energy = 2 341 000±5000 cm^{-1} (290.3±0.6 eV)

This spectrum was first investigated by Edlén (1937), who observed and identified the group of $3s^2 3p^4$–$3s^2 3p^3 4s$ transitions occurring at about 90 Å. He established most of the levels of these two configurations. Grotrian (1939) identified a solar coronal line at 7891 Å as the transition between the $3s^2 3p^4\ ^3P_2$ and $^3P_1$ levels. This was subsequently confirmed by Edlén (1942), who also identified a coronal line at 3986.9 Å as the $3s^2 3p^4$ transition $^3P_1$–$^1D_2$.

The separations of these levels quoted here are derived from wavelengths from the coronal observations of Jefferies (1969). He assigns an estimated accuracy of ±0.4 Å, which corresponds to about ±1 cm^{-1} in the levels. The $3s^2 3p^4\ ^1S_0$ level is derived from the solar line at 1467.08 Å observed by Doschek et al. (1976), which was identified by both Svensson (1971) and Jordan (1971) as the $3s^2 3p^4$ transition $^3P_1$–$^1S_0$.

The $3s^2 3p^4$–$3s3p^5$ array was analyzed by Fawcett (1971). The more accurate measurements of Smitt, Svensson, and Outred (1976) are used here to obtain the levels of $3s3p^5$ and the $^3P_0$ level of $3s^2 3p^4$ with an uncertainty of ±5 cm^{-1}.

The $3s^2 3p^3 4s$ levels are derived from the 1937 observations of Edlén, with the dropping of the identification of the original singlet-triplet intercombination lines at 86.149 and 89.771 Å, as noted by Edlén in 1942. The level uncertainty for this configuration is ±50 cm^{-1}. The line at 89.771 Å has been given by Fawcett, Cowan, Kononov, and Hayes (1972) as the $3s^2 3p^4\ ^1S_0$–$3s^2 3p^3 4s\ ^1P_1^\circ$ transition in Fe XI. However, this identification is inconsistent with Edlén's identification of the line at 86.513 Å as the $3s^2 3p^4\ ^1D_2$–$3s^2 3p^3 4s\ ^1P_1^\circ$ transition, which fixes the position of the $3s^2 3p^3 4s\ ^1P_1^\circ$ level. The $3s^2 3p^3 4s\ ^5S^\circ$ and $^3P^\circ$ terms have not yet been located.

The classifications for the $3p^4$–$3p^3 3d$ array are from Bromage, Cowan, and Fawcett (1977) and Fawcett (1971). The leading percentages for the $3p^3 3d$ were calculated including configuration interaction with $3s3p^5$, $3p^5 3d$ and $3s3p^3 3d^2$ by Bromage et al., but only the results for $3p^3 3d$ were published. Levels are derived with an uncertainty of ±20 cm^{-1} from the more accurate solar wavelengths (±0.008 Å) of Behring, Cohen, and Feldman (1972).

The $3s^2 3p^3 4d$ levels are taken from the work of Fawcett, Cowan, Kononov, and Hayes and are reliable to ±100 cm^{-1}. These authors have also observed a number of lines identified as $3s^2 3p^3 3d$–$3s^2 3p^3 4f$ and $3s^2 3p^3 3d$–$3s^2 3p^3 4p$ transitions of Fe XI. However, it is not possible to derive level values from these identifications inasmuch as none of the levels involved is part of the system of levels given here. The leading percentages for the $3s^2 3p^3 4d\ ^1D_2^\circ$ level are from Fawcett et al.

The ionization energy is from an isoelectronic extrapolation by Lotz (1967).

References

Behring, W. E., Cohen, L., and Feldman, U. (1972), Astrophys. J. **175**, 493.

Bromage, G. E., Cowan, R. D., and Fawcett, B. C. (1977), Phys. Scr. **15**, 177.

Doschek, G. A., Feldman, U., Van Hoosier, M. E., and Bartoe, J.-D. F. (1976), Astrophys. J. Suppl. Ser. **31**, 417.

Edlén, B. (1937), Z. Phys. **104**, 188.

Edlén, B. (1942), Z. Astrophys. **22**, 30.

Fawcett, B. C. (1971), J. Phys. **B4**, 1577.

Fawcett, B. C., Cowan, R. D., Kononov, E. Y., and Hayes, R. W. (1972), J. Phys. **B5**, 1255.

Grotrian, W. (1939), Naturwiss. **27**, 214.

Jefferies, J. T. (1969), Mem. Soc. Roy. Sci. Liege, Collect. **8**, 17, 213.

Jordan, C. (1971), Solar Phys. **21**, 381.

Lotz, W. (1967), J. Opt. Soc. Am. **57**, 873.

Smitt, R., Svensson, L. A., and Outred, M. (1976), Phys. Scr. **13**, 293.

Svensson, L. Å. (1971), Solar Phys. **18**, 232.

Fe XI

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$3s^2 3p^4$	^3P	2	0.0	
		1	12 667.9	
		0	14 312	
$3s^2 3p^4$	^1D	2	37 743.6	
$3s^2 3p^4$	^1S	0	80 814.7	
$3s3p^5$	$^3P^\circ$	2	*283 558*	
		1	*293 158*	
		0	*299 163*	

Fe XI–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3s3p^5$	$^1P^\circ$	1	*361 842*				
$3s^2 3p^3(^2P^\circ)3d$	$^3P^\circ$	2	*496 090*	80			
$3s^2 3p^3(^2D^\circ)3d$		1	*526 480*	38	$^3S^\circ$	23	$^3P^\circ$
$3s^2 3p^3(^2D^\circ)3d$	$^3P^\circ$	2	*531 290*	74		15	$3s3p^5\ ^3P^\circ$
		1	*541 390*	42		16	$3s^2 3p^3(^2P^\circ)3d\ ^3P^\circ$
		0	*541 720*	62		19	$3s^2 3p^3(^2P^\circ)3d\ ^3P^\circ$
$3s^2 3p^3(^2D^\circ)3d$	$^3S^\circ$	1	*533 450*	53		28	$(^2D^\circ)\ ^1P^\circ$
$3s^2 3p^3(^4S^\circ)3d$	$^3D^\circ$	3	*554 300*	46		31	$(^2P^\circ)\ ^3D^\circ$
		2	*561 610*	41		31	
		1	*566 380*	42		36	
$3s^2 3p^3(^2D^\circ)3d$	$^1D^\circ$	2	*578 860*	70		20	$(^2P^\circ)\ ^1D^\circ$
$3s^2 3p^3(^2D^\circ)3d$	$^1F^\circ$	3	*594 030*	62		33	$(^2P^\circ)\ ^1S^\circ$
$3s^2 3p^3(^2P^\circ)3d$	$^1P^\circ$	1	*623 080*	90			
$3s^2 3p^3(^4S^\circ)4s$	$^3S^\circ$	1	*1 121 230*				
$3s^2 3p^3(^2D^\circ)4s$	$^3D^\circ$	1	*1 148 590*				
		2	*1 149 100*				
		3	*1 152 450*				
$3s^2 3p^3(^2D^\circ)4s$	$^1D^\circ$	2	*1 160 030*				
$3s^2 3p^3(^2P^\circ)4s$	$^1P^\circ$	1	*1 193 640*				
$3s^2 3p^3(^4S^\circ)4d$	$^3D^\circ$	3	*1 376 750*				
$3s^2 3p^3(^2D^\circ)4d$	$^1D^\circ$	2	*1 420 680*	72		10	$(^2D^\circ)\ ^3D^\circ$
$3s^2 3p^3(^2D^\circ)4d$	$^1F^\circ$	3	*1 423 440*				
Fe XII ($^4S^\circ_{3/2}$)	***Limit***		**2 341 000**				

ENERGY LEVELS OF IRON

Fe XII

$Z = 26$

P I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^3\ ^4S^{\circ}_{3/2}$

Ionization energy $= 2\ 668\ 000 \pm 5000\ cm^{-1}$ (330.8 ± 0.6 eV)

The level values of the $3s^2 3p^3$ ground configuration are determined from four solar coronal lines. The lines at 1242 and 1349 Å were identified by Burton, Ridgeley, and Wilson (1967) as $3p^3\ ^4S^{\circ}_{3/2}$–$3p^3\ ^2P^{\circ}_{3/2,1/2}$. New measurements for these lines by Doschek et al. (1976) with an uncertainty of ± 0.05 Å are used here. The line at 2169.7 Å measured by Gabriel et al. (1971) was identified as $3p^3\ ^4S^{\circ}_{3/2}$–$3p^3\ ^2D^{\circ}_{5/2}$. The transition $3p^3\ ^2D_{3/2} - 3P^3\ 2p_{1/2}$ was assigned by Svensson (1971) to the coronal line reported at 3072.0 Å by Jefferies (1969). The level uncertainty in the ground configuration is $\pm 5\ cm^{-1}$.

The classifications of the $3s^2 3p^3$–$3s3p^4$ and $3s^2 3p^3$–$3s^2 3p^2 3d$ transition arrays are due to Fawcett (1971), who points out that they are strong in the solar spectrum between 180 and 390 Å, and to Bromage, Cowan, and Fawcett (1978), who also provided the leading percentages for $3s3p^4$ and $3s^2 3p^2 3d$. Configuration interaction between them was included in the calculation. Improved measurements of these wavelengths by Behring, Cohen, Feldman, and Doschek (1976) with an uncertainty of ± 0.004 Å made from solar observations are used to obtain the levels with an uncertainty of $\pm 10\ cm^{-1}$.

Lines classified as transitions between the $3s^2 3p^3$ configuration and the $3s^2 3p^2 4s$ and $4d$ configurations in the range of 66 Å–81 Å are given by Fawcett, Cowan, Kononov, and Hayes (1972) with an uncertainty of 0.01 Å. The upper levels are derived with these data with an uncertainty of $\pm 200\ cm^{-1}$. Classified lines from $3s^2 3p^2 4p$ and $4f$ are also given but are not connected with known lower levels. The percentage compositions for $3p^2 4s$ and $3p^2 4d$ are given in the same paper.

The ionization energy is an extrapolated value by Lotz (1967).

References

Behring, W. E., Cohen, L. Feldman, U., and Doschek, G.A. (1976), Astrophys. J. **203**, 521.

Bromage, G. E., Cowan, R. D., and Fawcett, B. C. (1978), Mon. Not. R. Astron. Soc. **183**, 19.

Burton, W. M., Ridgeley, A., and Wilson, R. (1967), Mon. Not. R. Astron. Soc. **135**, 207.

Doschek, G. A., Feldman, U., Van Hoosier, M. E., and Bartoe, J.-D. F. (1976), Astrophys. J. Suppl. Ser. **31**, 417.

Fawcett, B. C. (1971), J. Phys. **B4**, 1577.

Fawcett, B. C., Cowan, R. D., Kononov, E. Y., and Hayes, R. W. (1972), J. Phys. **B5**, 1255.

Gabriel, A. H., Garton, W. R. S., Goldberg, L., Jones, T. J. L., Jordan, C., Morgan, F. J., Nicholls, R. W., Parkinson, W. J., Paxton, H. J. B., Reeves, E. M., Shenton, C. B., Speer, R. J., and Wilson, R. (1971), Astrophys. J. **169**, 595.

Jefferies, J. T. (1969), Mem. Soc. Roy. Sci. Liege **17**, 213.

Lotz, W., (1967), J. Opt. Soc. Am. **57**, 873.

Svensson, L. Å. (1971), Solar Phys. **18**, 232.

Fe XII

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3s^2 3p^3$	$^4S^{\circ}$	3/2	*0*				
$3s^2 3p^3$	$^2D^{\circ}$	3/2	*41 566*				
		5/2	*46 075*				
$3s^2 3p^3$	$^2P^{\circ}$	1/2	*74 109*				
		3/2	*80 515*				
$3s3p^4$	^4P	5/2	274 373	89		9	$3p^2(^3P)3d\ ^4P$
		3/2	284 005	89		9	
		1/2	288 307	88		9	
$3s3p^4$	^2D	3/2	340 020	78		16	$3p^2(^1D)3d\ ^2D$
		5/2	341 703	79		16	
$3s3p^4$	^2P	3/2	389 706	48		44	$3p^2(^3P)3d\ ^2P$
$3s3p^4$	^2S	1/2	394 120	41		27	^2P
$3s3p^4$		3/2	501 800	41	^2P	26	$3p^2(^1D)3d\ ^2P$

Fe XII–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3s^2 3p^2(^3P)3d$	^4P	$5/2$	512 510	86		8	$3s3p^4\ ^4P$
		$3/2$	516 740	82		8	
		$1/2$	519 770	80		8	
$3s3p^4$		$1/2$	513 850	35	^2P	32	$3s^2 3p^2(^1D)3d\ ^2P$
$3s^2 3p^2(^1S)3d$	^2D	$3/2$	526 120	46		40	$(^3P)\ ^2D$
		$5/2$	538 040	41		43	
$3s^2 3p^2(^1D)3d$	^2D	$3/2$	554 030	78		14	$3s3p^4\ ^2D$
		$5/2$	554 610	71		17	$3p^2(^1S)3d\ ^2D$
$3s^2 3p^2(^1D)3d$	^2P	$1/2$	568 940	58		24	$(^3P)\ ^2P$
		$3/2$	577 740	61		26	
$3s^2 3p^2(^3P)3d$	^2F	$5/2$	576 740	49		35	$(^1D)\ ^2F$
		$7/2$	581 180	61		37	
$3s^2 3p^2(^1D)3d$	^2S	$1/2$	579 630	72		14	$3s3p^4\ ^2S$
$3s^2 3p^2(^3P)3d$	^2D	$5/2$	603 930	47		31	$(^1S)\ ^2D$
		$3/2$	605 480	55		41	
$3s^2 3p^2(^3P)4s$	^4P	$1/2$	1 242 000				
		$3/2$	1 249 660				
		$5/2$	1 258 050				
$3s^2 3p^2(^3P)4s$	^2P	$1/2$	1 257 730				
		$3/2$	1 266 360	81		17	$(^1D)\ ^2D$
$3s^2 3p^2(^1D)4s$	^2D	$5/2$	1 287 700				
		$3/2$	1 289 060	82		16	$(^3P)\ ^2P$
$3s^2 3p^2(^3P)4d$	^4P	$5/2$	1 508 360	35		35	$(^3P)\ ^4F$
		$3/2$	1 517 340	65		19	$(^3P)\ ^2P$
$3s^2 3p^2(^3P)4d$	^4F	$5/2$	1 514 070	49		48	$(^3P)\ ^4P$
$3s^2 3p^2(^3P)4d$	^2F	$5/2$	1 516 030	77		9	$(^3P)\ ^4F$
		$7/2$	1 523 140	39		12	$(^1D)\ ^2F$
$3s^2 3p^2(^3P)4d$	^4D	$7/2$	1 532 160	48		48	$(^3P)\ ^2F$
$3s^2 3p^2(^3P)4d$	^2D	$5/2$	1 534 990	67		26	$(^1D)\ ^2F$
		$3/2$	1 536 480				
$3s^2 3p^2(^1D)4d$	^2F	$7/2$	1 549 250	81		14	$(^3P)\ ^4D$
		$5/2$	1 551 400?	40		39	$(^1D)\ ^2D$
$3s^2 3p^2(^1D)4d$	^2D	$5/2$	1 551 640	40		24	$(^3P)\ ^2D$
$3s^2 3p^2(^1D)4d$	^2P	$3/2$	1 565 720				
$3s^2 3p^2(^1D)4d$	^2S	$1/2$	1 569 410				
Fe XIII ($^3P_0$)	***Limit***		**2 668 000**				

ENERGY LEVELS OF IRON

Fe XIII

$Z=26$

Si I isoelectronic sequence

Ground state: $1s^22s^22p^63s^23p^2\ ^3P_0$

Ionization energy = 2 912 000±6000 cm^{-1} (361.0±0.7 eV)

The ^{3}P and ^{1}D terms of the $3s^23p^2$ configuration are from solar coronal line identifications by Edlén (1942). We used the improved wavelength measurements given by Jefferies (1969). The level uncertainty is ±0.4 cm^{-1}. The ^{1}S term is due to Doschek et al. (1976). From laboratory observations, Fawcett (1971), interpreted the $3s^23p^2$–$3s3p^3$ array except for the $^3P_0$–$^3D^\circ_1$ transition, which was established through a solar identification by Widing, Sandlin, and Cowan (1971). Fawcett also identified the $3s^23p3d$ configuration.

Behring, Cohen, Feldman, and Doschek (1976) observed the $3s^23p^2$–$3s3p^3$ and $3s^23p3d$ transition arrays with improved accuracy (±0.004 cm^{-1}) in the spectrum of the quiet sun in the region from 200 to 360 Å by using a rocket-borne spectrograph. The level values are mostly from their observations and have an uncertainty of ±10 cm^{-1}. They also identified the $3s3p^3\ ^3P^\circ_1$ level. The leading percentages for $3s3p^3$ and $3s^23p3d$ are taken from the calculations of Bromage, Cowan, and Fawcett (1978), who also identified the $3p3d\ ^3P^\circ_0$ level. Configuration interaction between them was included.

The level values for $3p4d$ and the level values and leading percentages for $3p4f$ are from Kastner, Swartz, Bhatia, and Lapides (1978). The uncertainty of the level values is ±100 cm^{-1}.

The configurations $3s^23p4s$, $4p$, $4d$, and $4f$ were found also by Fawcett, Cowan, Kononov, and Hayes (1972) from observations in the region 60–100 Å. Some of the lines they identified involve transitions to the unknown $^3F^\circ$ term of $3s^23p3d$ from $3s^23p4f$ levels, and therefore cannot be used to establish connected levels of the latter configuration. In the same paper percentage compositions are given for levels whose first component is not "high," generally less than 90%. The uncertainty of the level values is ±200 cm^{-1}.

The ionization energy was taken from Lotz (1967).

References

Behring, W. E., Cohen, L., Feldman, U., and Doschek, G. A. (1976), Astrophys. J. **203**, 521.

Bromage, G. E., Cowan, R. D., and Fawcett, B. C. (1978), Mon. Not. R. Astron. Soc. **183**, 19.

Doschek, G. A., Feldman, U., Van Hoosier, M. E., and Bartoe, J.-D. F. (1976), Astrophys. J. Suppl. Ser. **31**, 417.

Edlén, B. (1942), Z. Astrophys. **22**, 30.

Fawcett, B. C. (1971), J. Phys. **B4**, 1577.

Fawcett, B. C., Cowan, R. D., Kononov, E. Y., and Hayes, R. W. (1972), J. Phys. **B5**, 1255.

Jefferies, J.T. (1969), Mem. Soc. Roy. Sci. Liege, Collect. **17**, 213.

Kastner, S.O., Swartz, M., Bahatia, A.K., and Lapides, J. (1978), J. Opt. Soc. Am. **68**, 1558.

Lotz, W. (1967), J. Opt. Soc. Am. **57**, 873.

Widing, K. G., Sandlin, G. D., and Cowan, R. D. (1971), Astrophys. J. **169**, 405.

Fe XIII

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3s^2 3p^2$	^{3}P	0	0.0			
		1	9 302.5			
		2	18 561.0			
$3s^2 3p^2$	^{1}D	2	48 068			
$3s^2 3p^2$	^{1}S	0	91 508			
$3s3p^3$	^{3}D°	1	*287 205*	85	10	$3p3d\ ^3$D°
		2	*287 360*	83	10	
		3	*290 210*	89	10	
$3s3p^3$	^{3}P°	1	*329 647*	86	9	$3p3d\ ^3$P°
		2	*330 279*	78	9	
$3s3p^3$	^{1}D°	2	*362 330*	54	39	$3p3d\ ^1$D°
$3s3p^3$	^{3}S°	1	*415 462*	78	17	^{1}P°
$3s3p^3$	^{1}P°	1	*438 050*	69	19	^{3}S°

Fe XIII–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3s^2 3p3d$	$^3P°$	2	*486 358*	43	23	$3p3d\ ^1D°$
		1	*494 942*	49	38	$3p3d\ ^3D°$
		0	*503 340*	89	9	$3s3p^3\ ^3P°$
$3s^2 3p3d$	$^1D°$	2	*498 870*	32	21	$3s3p^3\ ^1D°$
$3s^2 3p3d$	$^3D°$	1	*506 502*	48	39	$3p3d\ ^3P°$
		3	*509 176*	86	10	$3s3p^3\ ^3D°$
		2	*509 250*	61	24	$3p3d\ ^3P°$
$3s^2 3p3d$	$^1F°$	3	*556 870*	97		
$3s^2 3p3d$	$^1P°$	1	*570 690*	86	10	$3s3p^3\ ^1P°$
$3s^2 3p4s$	$^3P°$	1	*1 336 220*	84	16	$^1P°$
		2	*1 354 680*			
$3s^2 3p4s$	$^1P°$	1	*1 361 830*	84	16	$^3P°$
$3s^2 3p4p$	^1D	2	1 488 110	86	13	^3P
$3s^2 3p4p$	^1P	1	1 515 260?	39	35	^3D
$3s^2 3p4p$	^3D	1	1 603 770	59	39	^1P
$3s^2 3p4d$	$^3D°$	2	*1 604 220*	61	17	$^3F°$
		3	*1 606 800*	45	41	$^3F°$
$3s^2 3p4d$	$^3F°$	3	*1 619 600*			
$3s^2 3p4d$	$^1F°$	3	*1 630 650*	84	12	$^3F°$
$3s^2 3p4d$	$^1P°$	1	*1 650 620*			
$3s^2 3p4f$	^1D	2	*1 740 800*			
$3s^2 3p4f$	^3F	4	1 741 290	56	44	^3G
$3s^2 3p4f$	^1G	4	1 743 460			
Fe XIV ($^2P°_{1/2}$)	*Limit*		**2 912 000**			

ENERGY LEVELS OF IRON

Fe XIV

$Z=26$

Al I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6 3s^2 3p\ ^2P^\circ_{1/2}$

Ionization energy = 3 163 000±6000 cm^{-1} (392.2±0.8 eV)

The early laboratory work on this one-electron spectrum consisted of Edlén's (1936) identification of the $3p$–$4d$ resonance lines at about 59 Å. Later Edlén (1942) identified the strong solar coronal line at 5302.86 Å as the transition between the $3s^2 3p\ ^2P^\circ_{1/2}$ and $^2P^\circ_{3/2}$ levels. This identification serves as the basis for the ground term splitting in this ion. The uncertainty is ±2 cm^{-1}.

The first excited configuration in Fe XIV, $3s3p^2$, was identified from the laboratory observations of Fawcett and Peacock (1967) and by Fawcett (1970). The $3s^2 3d$ levels were found by Peacock, Cowan, and Sawyer (1967). The level values for these two configurations are derived from the more accurate solar observations of Behring, Cohen, Feldman, and Doschek (1976) in the region 210–290 Å, which give an uncertainty of ±20 cm^{-1}. The $3s^2 4s$, $3s^2 4p$, and $3s^2 4f$ levels are derived from the work of Fawcett, Cowan, Kononov, and Hayes (1972) with a level uncertainty of ±200 cm^{-1}.

The $3s^2 4d$ levels are obtained from Edlén (1936).

Fawcett (1970) has classified the $3s3p^2\ ^4P$–$3p^3\ ^4S^\circ$ group and Fawcett et al. (1972) reported the observation of $3s3p^2\ ^4P$–$3s3p4s\ ^4P^\circ$. The quartet levels depend on these data and the calculated position of $3s3p^2\ ^4P_{1/2}$ by Fischer (1978).

The ionization energy is the value given by Lotz (1967) from his isoelectronic extrapolation.

References

Behring, W. E., Cohen, L., Feldman, U., and Doschek, G. A. (1976), Astrophys. J. **203**, 521.

Edlén, B. (1936), Z. Phys. **103**, 536.

Edlén B. (1942), Z. Astrophys. **22**, 30.

Fawcett, B. C., and Peacock, N. J. (1967), Proc. Phys. Soc. (London) **91**, 973.

Fawcett, B. C. (1970), J. Phys. **B3**, 1732.

Fawcett, B. C., Cowan, R. D., Kononov, E. Y., and Hayes, R. W. (1972), J. Phys. **B5**, 1255.

Fischer, C. F. (1978), Penn. State Univ. Dept. Computer Sci., CS-78-24.

Lotz, W. (1967), J. Opt. Soc. Am. **57**, 873.

Peacock, N. J., Cowan, R. D., and Sawyer, G. A., Proc. 7th Int. Conf. on Ionization Phenomena in Gases, Belgrade, 1967 (Belgrade: Gradevinska Knjiga).

Fe XIV

Configuration	Term	J	Level (cm^{-1})
$3s^2 3p$	$^2P^\circ$	1/2	*0.0*
		3/2	*18 852.5*
$3s3p^2$	^4P	1/2	*221 700+x*
		3/2	*222 986+x*
		5/2	*239 450+x*
$3s3p^2$	^2D	3/2	299 248
		5/2	301 472
$3s3p^2$	^2S	1/2	364 693
$3s3p^2$	^2P	1/2	388 510
		3/2	396 515
$3s^2 3d$	^2D	3/2	473 227
		5/2	475 217
$3p^3$	$^4S^\circ$	3/2	*586 130+x*
$3s^2 4s$	^2S	1/2	1 435 020
$3s^2 4p$	$^2P^\circ$	1/2	*1 568 840*
		3/2	*1 574 010*

Fe XIV–Continued

Configuration	Term	J	Level (cm^{-1})
$2s3p(^3P^\circ)4s$	$^4P^\circ$	$3/2$	*1 662 920+x*
		$5/2$	*1 675 450+x*
$3s^2 4d$	^2D	$3/2$	1 695 980
		$5/2$	1 697 290
$3s^2 4f$	$^2F^\circ$	$7/2$	*1 788 380*
		$5/2$	*1 788 640*
Fe XV ($^1S_0$)	*Limit*		3 163 000

ENERGY LEVELS OF IRON

Fe XV

$Z=26$

Mg I isoelectronic sequence

Ground state: $1s^22s^22p^63s^2\ ^1S_0$

Ionization energy $= 3\ 686\ 000 \pm 20\ 000$ cm^{-1} (457.0 ± 2.5 eV)

Edlén's (1936) work on this spectrum consisted of the observation of the multiplets $3s\,^1S - 3s4p\,^1P°$, $3s3p\,^3P° - 3s4d\,^3D$, $3s3d\,^3D - 3s4f\,^3F°$ and $3s3d\,^3D - 3s5f\,^3F°$. These groups were unconnected and the relative positions of the terms were estimated by isoelectronic extrapolation.

The absolute energy of the system of excited triplet levels is based on the measurement of $3s^2\,^1S_0$–$3s3p\,^3P_1°$ at 417.258 Å in the solar spectrum by Behring, Cohen, Feldman, and Doschek (1976). The error in this wavelength is stated to be <0.01 Å, giving an error in the intersystem connection of 5 cm^{-1}. The error in the levels due to Edlén is about 100 cm^{-1}.

Peacock, Cowan, and Sawyer (1967) gave the classification of the $3s3p$–$3s3d$ array and the $3s^2\,^1S_0$–$3s3p\,^1P_1°$ resonance line measured in the range of 224–284 Å with an accuracy of ±0.05 Å. Several of these lines are found in the list of solar lines of Behring et al. (1976) with improved accuracy and are used here. The resulting level values have an uncertainty of 20 cm^{-1}. They are $3s^2\,^1S_0$–$3s3p\,^1P_1°$ and $3s3p$–$3s3d\,^1P_1°$–$^1D_2$, $^3P_1°$–$^3D_2$, and $^3P_2°$–$^3D_3$ at 284.160 Å, 243.790 Å, 227.208 Å, and 233.857 Å, respectively.

The values of the levels of the $3p^2$ configuration are derived with an uncertainty of 20 cm^{-1} from the classifications of Fawcett (1971) and Fawcett, Cowan, and Hayes (1972). The $3p^2\,^1S_0$ level has been tentatively located by Cowan and Widing (1973). The observations by Fawcett (1970) provide values for the three levels of the $3p3d\,^3F°$ term.

The measurements of Edlén were used to obtain the values of the $3s4f\,^3F°$, $3s4d\,^3D$, and $3s5f\,^3F°$ levels.

The levels of $3s4s\,^3S$ and $3s5d\,^3D$ given here are derived from the work of Feldman, Katz, Behring, and Cohen (1971). The $3s4d\,^1D$ and $3s4f\,^1F°$ levels are taken from the paper of Fawcett, Cowan, Kononov, and Hayes (1972). The $3s5s\,^3S$, $3s5p\,^1P°$, $3s5f\,^1F°$ and $3s6f\,^{1,3}F°$ levels are from Fawcett, Gabriel, Irons, Peacock, and Saunders (1966). Ekberg (1971) has noted that the $3s5f\,^1F°$ and $3s6f\,^1F°$ levels are questionable. We have not included them here.

The transitions $3p3d$–$3p4f$ are classified by Kastner, Swartz, Bhatia, and Lapides (1978), who gave percentages for $3p4f$.

With observations of L-series satellite spectra, Burkhalter, Cohen, Cowan, and Feldman (1979) have made some tentative assignments to $2p^63s3p$–$2p^53s^23p$ transitions. They are not quoted here.

The ionization energy has been derived here from the $3snf\,^3F_4°$ ($n=4$–6) levels. Comparison with lower members of the isoelectronic sequence indicates that the ionization energy has an uncertainty of about ±20 000 cm^{-1} (2.5 eV).

References

Behring, W. E., Cohen, L., Feldman, U., and Doschek, G. A. (1976), Astrophys. J. **203**, 521.

Burkhalter, P. G., Cohen, L., Cowan, R. D., and Feldman, U. (1979), J. Opt. Soc. Am. **69**, 1133.

Cowan, R. D., and Widing, K. C. (1973), Astrophys. J. **180**, 285.

Edlén, . B. (1936), Z. Phys. **103**, 536.

Ekberg, J. O. (1971), Phys. Scr. 4, 101.

Fawcett, B. C. (1970), J. Phys. **B3**, 1732.

Fawcett, B. C. (1971), J. Phys. **B4**, 1577.

Fawcett, B. C., Cowan, R. D., and Hayes (1972), J. Phys. **B5**, 2143.

Fawcett, B. C., Cowan, R. D., Kononov, E. Y., and Hayes, R. W. (1972), J. Phys. **B5**, 1255.

Fawcett, B. C., Gabriel, A. H., Irons, F. E., Peacock, N. J., and Saunders, P. A. H. (1966), Proc. Phys. Soc. (London) **88**, 1051.

Feldman, U., Katz, L., Behring, W., and Cohen L. (1971), J. Opt. Soc. Am. **61**, 91.

Kastner, S. O., Swartz, M., Bhatia, A. K., and Lapides, J. (1978), J. Opt. Soc. Am. **68**, 1558.

Peacock, N. J., Cowan, R. D., and Sawyer, G. A., Proc. 7th Int. Conf. on Ionization Phenomena in Gases, Belgrade, 1967 (Belgrade: Gradevinska Knjiga).

Fe XV

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$3s^2$	^1S	0	0	
$3s3p$	$^3P°$	0	*233 910*	
		1	*239 660*	
		2	*253 820*	
$3s3p$	$^1P°$	1	*351 914*	

Fe xv–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$3p^2$	^{3}P	0	554 500	
		1	564 570	
		2	581 690	
$3p^2$	^{1}D	2	559 590	
$3p^2$	^{1}S	0	660 970?	
$3s3d$	^{3}D	1	678 830	
		2	679 785	
		3	681 410	
$3s3d$	^{1}D	2	762 103	
$3p3d$	^{3}F°	2	*928 420*	
		3	*938 180*	
		4	*949 660*	
$3s4s$	^{3}S	1	1 763 700	
$3s4p$	^{1}P°	1	*1 889 970*	
$3s4d$	^{3}D	1	2 031 310	
		2	2 032 020	
		3	2 033 180	
$3s4d$	^{1}D	2	2 035 280	
$3s4f$	^{3}F°	2	*2 108 520*	
		3	*2 108 620*	
		4	*2 108 880*	
$3s4f$	^{1}F°	3	*2 123 150*	
$3p4f$	^{3}G	3	2 380 160	46 51 ^{1}F
		4	2 386 700	57 39 ^{3}F
		5	2 402 100	
$3s5s$	^{3}S	1	2 544 800	
$3s5p$	^{1}P°	1	*2 567 000*	
$3s5d$	^{3}D	2	2 639 900	
		1	2 640 100	
		3	2 640 300	
$3s5f$	^{3}F°	2	*2 676 400*	
		3	*2 676 400*	
		4	*2 676 600*	
$3s5f$	^{1}F°	3	*2 782 700?*	
$3s6f$	^{3}F°	4	*2 986 100*	
$3s6f$	^{1}F°	3	*3 091 500?*	
Fe XVI (^{2}S$_{1/2}$)	***Limit***		**3 686 000**	

ENERGY LEVELS OF IRON

Fe XVI

$Z=26$

Na I isoelectronic sequence

Ground state: $1s^22s^22p^63s\ ^2S_{1/2}$

Ionization energy $= 3\ 946\ 280 \pm 200$ cm^{-1} (489.264 ± 0.025 eV)

The original work on this spectrum by Edlén (1936) in the region 40–66 Å gave the position of only the $4p\ ^2P°$ term relative to the ground state, but included transitions from $4s$, $4d$, and $5d$ to the $3p\ ^2P°$ term, and transitions from $4f$ and $5f$ to $3d\ ^2D$. Peacock, Cowan, and Sawyer (1967) brought these unconnected systems together by identifying the $3s$–$3p$ and $3p$–$3d$ transitions in the region 250–360 Å. We have used improved wavelengths of Edlén (1978) for the $3s$–$3p$ and $3p$–$3d$ transitions together with his earlier measurements for the level values. The uncertainty of the $n=3$ levels is probably 5 cm^{-1} and the higher ones ± 200 cm^{-1}.

Higher series members of ns, np, nd, and nf were identified by Fawcett, Gabriel, Irons, Peacock, and Saunders (1966) between 27 and 64 A°. The values of the $5p$, $6p$, $6d$, $7d$, and $8d$ terms given below were derived by using the wavelengths of Feldman et al. (1971). Their uncertainty is 800 cm^{-1}. The $5g$ term is from Kononov, Kovalev, Ryabtsev, and Churilov (1977).

The $2p^53s\ nl$ configurations are from classifications of L-series satellite spectra by Burkhalter, Cohen, Cowan, and Feldman (1979). The leading percentages, in two alternate coupling schemes, are taken from this paper. Other inner shell transitions have been tentatively identified by Connerade, Peacock, and Speer (1970).

The ionization energy was determined from a polarization formula applied to the nf series by Edlén (1978). The uncertainty is ± 200 cm^{-1} (0.025 eV).

References

Burkhalter, P. G., Cohen, L., Cowan, R. D., and Feldman, U. (1979), J. Opt. Soc. Am. **69**, 1133.

Connerade, J. P., Peacock, N. J., and Speer, R. J. (1970), Solar Phys. **14**, 159.

Edlén, B. (1936), Z. Phys. **100**, 621.

Edlén, B. (1978), Phys. Scr. **17**, 565.

Fawcett, B. C., Gabriel, A. H., Irons, F. E., Peacock, N. J., and Saunders, P. A. H. (1966), Proc. Phys. Soc. **88**, 1051.

Feldman, U., Katz, L., Behring, W., and Cohen, L. (1971), J. Opt. Soc. Am. **61**, 91.

Kononov, E. Y., Kovalev, V. I., Ryabtsev, A. N., and Churilov, S. S. (1977), Sov. J. Quan. Elec. **7**, 111.

Peacock, N. J., Cowan, R. D., and Sawyer, G. A., Proc. 7th Int. Conf. on Ionization Phenomena in Gases, Belgrade, 1967 (Belgrade: Gradevinska Knjiga).

Fe XVI

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$2p^6(^1S)3s$	^2S	1/2	0	
$2p^6(^1S)3p$	$^2P°$	1/2	*277 206*	
		3/2	*298 155*	
$2p^6(^1S)3d$	^2D	3/2	675 503	
		5/2	678 412	
$2p^6(^1S)4s$	^2S	1/2	1 867 550	
$2p^6(^1S)4p$	$^2P°$	1/2	*1 978 040*	
		3/2	*1 986 100*	
$2p^6(^1S)4d$	^2D	3/2	2 124 200	
		5/2	2 125 370	
$2p^6(^1S)4f$	$^2F°$	5/2	*2 184 640*	
		7/2	*2 185 160*	
$2p^6(^1S)5s$	^2S	1/2	2 662 000	
$2p^6(^1S)5p$	$^2P°$	1/2	*2 717 170*	
		3/2	*2 721 160*	
$2p^6(^1S)5d$	^2D	3/2	2 788 060	
		5/2	2 788 630	

Fe XVI–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$2p^6(^1S)5f$	$^2F°$	$5/2$	*2 818 620*	
		$7/2$	*2 818 910*	
$2p^6(^1S)5g$	^2G	$7/2,9/2$	2 822 100	
$2p^6(^1S)6s$	^2S	$1/2$	3 076 000	
$2p^6(^1S)6p$	$^2P°$	$1/2$	*3 106 400*	
		$3/2$	*3 108 900*	
$2p^6(^1S)6d$	^2D	$3/2$	3 146 070	
		$5/2$	3 146 670	
$2p^6(^1S)6f$	$^2F°$	$5/2$	*3 163 130*	
		$7/2$	*3 163 190*	
$2p^6(^1S)7s$	^2S	$1/2$	3 323 000	
$2p^6(^1S)7p$	$^2P°$	$3/2$	*3 341 000*	
$2p^6(^1S)7d$	^2D	$3/2$	3 360 500	
		$5/2$	3 360 800	
$2p^6(^1S)7f$	$^2F°$	$7/2$	*3 371 070*	
		$5/2$	*3 371 210*	
$2p^6(^1S)8p$	$^2P°$	$3/2$	*3 488 000*	
$2p^6(^1S)8d$	^2D	$3/2$	3 498 800	
		$5/2$	3 499 000	
$2p^6(^1S)8f$	$^2F°$	$5/2$	*3 505 700*	
		$7/2$	*3 505 800*	
$2p^6(^1S)9p$	$^2P°$	$3/2$	*3 587 000*	
$2p^6(^1S)9d$	^2D	$5/2$	3 595 000	
		$3/2$	3 599 000	
$2p^6(^1S)9f$	$^2F°$	$5/2,7/2$	*3 600 000*	
Fe XVII ($^1S_0$)	***Limit***		**3 946 280**	
$2p^5(^2P°)3s^2$	$^2P°$	$3/2$	*5 773 000*	
		$1/2$	*5 873 000*	
$2p^5(^2P°_{3/2})3s3p(^3P_1)$	$(3/2,1)$	$5/2$	5 982 000	98 or 83 $2p^53s(^3P°)3p\ ^4D$
		$1/2$	6 001 000	92 or 35 $2p^53s(^1P°)3p\ ^2P$
$2p^5(^2P°_{3/2})3s3p(^3P_2)$	$(3/2,2)$	$3/2$	6 013 000	69 or 30 $2p^53s(^1P°)3p\ ^2D$
		$5/2$	6 013 000	99 or 65 $2p^53s(^3P°)3p\ ^4P$
		$1/2$	6 042 000	71 or 40 $2p^53s(^1P°)3p\ ^2S$
$2p^5(^2P°_{1/2})3s3p(^3P_0)$	$(1/2,0)$	$1/2$	6 075 000	68 or 65 $2p^53s(^3P°)3p\ ^4D$
$2p^5(^2P°_{1/2})3s3p(^3P_1)$	$(1/2,1)$	$3/2$	6 089 000	88 or 50 $2p^53s(^3P°)3p\ ^4D$

ENERGY LEVELS OF IRON

Fe XVI–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$2p^5(^2P^\circ_{3/2})3s3p(^1P_1)$	$(\frac{3}{2},1)$	$\frac{1}{2}$	6 089 000	44 or 39 $2p^53s(^3P^\circ)3p\ ^4P$
		$\frac{5}{2}$	6 110 000	57 or 69 $2p^53s(^1P^\circ)3p\ ^2D$
		$\frac{3}{2}$	6 129 000	94 or 40 $2p^53s(^3P^\circ)3p\ ^2P$
$2p^5(^2P^\circ_{1/2})3s3p(^3P_2)$	$(\frac{1}{2},2)$	$\frac{3}{2}$	6 096 000	86 or 45 $2p^53s(^3P^\circ)3p\ ^4P$
$2p^5(^2P^\circ_{1/2})3s3p(^1P_1)$	$(\frac{1}{2},1)$	$\frac{1}{2}$	6 197 000	47 or 55 $2p^53s(^3P^\circ)3p\ ^2P$
$2p^5(^2P^\circ_{1/2})3s3p(^1P_1)$	$(\frac{1}{2},1)$	$\frac{3}{2}$	6 217 000	98 or 59 $2p^53s(^3P^\circ)3p\ ^2D$
		$\frac{1}{2}$	6 267 000	50 or 80 $2p^53s(^3P^\circ)3p\ ^2S$
$2p^5(^2P^\circ_{3/2})3s3d(^3D_3)$	$(\frac{3}{2},3)^\circ$	$\frac{5}{2}$	*6 393 000*	50 or 67 $2p^53s(^3P^\circ)3d\ ^4P^\circ$
		$\frac{7}{2}$	*6 422 000*	100 or 66 $2p^53s(^3P^\circ)3d\ ^4D^\circ$
		$\frac{3}{2}$	*6 436 000*	45 or 57 $2p^53s(^1P^\circ)3d\ ^2P^\circ$
$2p^5(^2P^\circ_{3/2})3s3d(^3D_1)$	$(\frac{3}{2},1)^\circ$	$\frac{5}{2}$	*6 406 000*	83 or 54 $2p^53s(^3P^\circ)3d\ ^4F^\circ$
		$\frac{3}{2}$	*6 419 000*	60 or 40 $2p^53s(^3P^\circ)3d\ ^4F^\circ$
$2p^5(^2P^\circ_{3/2})3s3d(^3D_2)$	$(\frac{3}{2},2)^\circ$	$\frac{1}{2}$	*6 423 000*	45 or 61 $2p^53s(^1P^\circ)3d\ ^2P^\circ$
		$\frac{5}{2}$	*6 425 000*	64 or 39 $2p^53s(^1P^\circ)3d\ ^2F^\circ$
$2p^5(^2P^\circ_{3/2})3s3d(^1D_2)$	$(\frac{3}{2},2)^\circ$	$\frac{7}{2}$	*6 445 000*	100 or 72 $2p^53s(^3P^\circ)3d\ ^2F^\circ$
		$\frac{5}{2}$	*6 464 000*	95 or 50 $2p^53s(^3P^\circ)3d\ ^2D^\circ$
		$\frac{3}{2}$	*6 473 000*	44 or 35 $2p^53s(^3P^\circ)3d\ ^4D^\circ$
$2p^5(^2P^\circ_{1/2})3s3d(^3D_3)$	$(\frac{1}{2},3)^\circ$	$\frac{5}{2}$	*6 502 000*	54 or 41 $2p^53s(^3P^\circ)3d\ ^4D^\circ$
		$\frac{7}{2}$	*6 517 000*	98 or 41 $2p^53s(^1P^\circ)3d\ ^2F^\circ$
$2p^5(^2P^\circ_{1/2})3s3d(^3D_1)$	$(\frac{1}{2},1)^\circ$	$\frac{3}{2}$	*6 502 000*	88 or 54 $2p^53s(^3P^\circ)3d\ ^4F^\circ$
		$\frac{1}{2}$	*6 574 000*	74 or 52 $2p^53s(^3P^\circ)3d\ ^2P^\circ$
$2p^5(^2P^\circ_{1/2})3s3d(^3D_2)$	$(\frac{1}{2},2)^\circ$	$\frac{5}{2}$	*6 516 000*	51 or 45 $2p^53s(^1P^\circ)3d\ ^2D^\circ$
		$\frac{3}{2}$	*6 530 000*	46 or 38 $2p^53s(^1P^\circ)3d\ ^2P^\circ$
$2p^5(^2P^\circ_{1/2})3s3d(^1D_2)$	$(\frac{1}{2},2)^\circ$	$\frac{5}{2}$	*6 556 000*	97 or 51 $2p^53s(^3P^\circ)3d\ ^2F^\circ$
		$\frac{3}{2}$	*6 595 000*	61 or 68 $2p^53s(^3P^\circ)3d\ ^2P^\circ$

Fe XVII

$Z=26$

Ne I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6\ ^1S_0$

Ionization energy = 10 180 000±8000 cm^{-1} (1262.2±1.0 eV)

Tyrén (1938) identified resonance lines in the region of 12–17 Å arising from the $2p^5 3s$, $2p^5 3d$, $2p^5 4d$, and $2s2p^6 3p$ configurations. The magnetic quadrupole transition from the $2p^5 3s\ ^3P_2^\circ$ level to the ground state was first observed by Parkinson (1973). New laboratory observations in the region 10–17 Å were reported by Gordon, Hobby, and Peacock (1980), who identified resonance transitions from $2p^5 4s$, $2p^5 4d$, $2p^5 5d$, $2p^5 6d$, and $2s2p^6 4p$. Their results, with a reported wavelength accuracy of ±0.005 Å are used to obtain the present levels (all $J=1$) with an uncertainty of ±3000 cm^{-1}. From solar coronal observations Hutcheon, Pye, and Evans (1976) identified resonance lines from $2p^5 5s$, $6s$, $7s$, $5p$, and $8d$ and obtained the value for the ionization energy quoted here. Their measurement uncertainty is given as ±0.003 Å, giving a level uncertainty of ±2000 cm^{-1}. We use their wavelength for the magnetic quadrupole transition from $2p^5 3s$.

Parametric calculations made by us for Sc XII and Ni XIX show that the $2p^5 3s$ configuration is best described in Jj-coupling and the $2p^5 3d$ in LS-coupling.

Classifications in the $2p^5 3d$–$2p^5 4f$ array at 59 Å by Fawcett, Bromage, and Hayes (1979) could not be used to derive additional levels because they are not connected with the known system.

References

Fawcett, B. C., Bromage, G. E., and Hayes, R. W. (1979), Mon. Not. R. Astron. Soc. **186**, 113.

Gordon, H. Hobby, M. G., and Peacock, N. J. (1980), J. Phys. **B13**, 1985.

Hutcheon, R. J., Pye, J. P., and Evans, K. D. (1976), Astron. Astrophys. **51**, 451.

Parkinson, J. H. (1973), Astron. Astrophys. **24**, 213.

Tyrén, F. (1938), Z. Phys. **111**, 314.

Fe XVII

Configuration	Term	J	Level (cm^{-1})
$2s^2 2p^6$	^1S	0	0
$2s^2 2p^5(^2P^\circ_{3/2})3s$	$(3/2,1/2)^\circ$	2	*5 849 000*
		1	*5 863 700*
$2s^2 2p^5(^2P^\circ_{1/2})3s$	$(1/2,1/2)^\circ$	1	*5 960 500*
$2s^2 2p^5(^2P^\circ)3d$	$^3P^\circ$	1	*6 472 500*
$2s^2 2p^5(^2P^\circ)3d$	$^3D^\circ$	1	*6 552 200*
$2s^2 2p^5(^2P^\circ)3d$	$^1P^\circ$	1	*6 660 000*
$2s2p^6 3p$	$^3P^\circ$	1	*7 198 900*
$2s2p^6 3p$	$^1P^\circ$	1	*7 234 300*
$2s^2 2p^5(^2P^\circ_{3/2})4s$	$(3/2,1/2)^\circ$	1	*7 885 800*
$2s^2 2p^5(^2P^\circ_{1/2})4s$	$(1/2,1/2)^\circ$	1	*7 983 000*
$2s^2 2p^5(^2P^\circ_{3/2})4d$	$^2[1/2]^\circ$	1	*8 116 000*
$2s^2 2p^5(^2P^\circ_{3/2})4d$	$^2[3/2]^\circ$	1	*8 154 000*
$2s^2 2p^5(^2P^\circ_{1/2})4d$	$^2[3/2]^\circ$	1	*8 249 000*
$2s^2 2p^5(^2P^\circ_{3/2})5s$	$(3/2,1/2)^\circ$	1	*8 757 000*

ENERGY LEVELS OF IRON

Fe XVII–Continued

Configuration	Term	J	Level (cm^{-1})
$2s^2 2p^5(^2P^\circ_{1/2})5s$	$(1/2, 1/2)^\circ$	1	*8 860 000*
$2s^2 2p^5(^2P^\circ_{3/2})5d$	$^2[1/2]^\circ$	1	*8 860 000*
$2s^2 2p^5(^2P^\circ_{3/2})5d$	$^2[3/2]^\circ$	1	*8 887 000*
$2s^2 2p^5(^2P^\circ_{1/2})5d$	$^2[3/2]^\circ$	1	*8 982 000*
$2s2p^6 4p$	$^3P^\circ$	1	*9 056 000*
$2s2p^6 4p$	$^1P^\circ$	1	*9 072 000*
$2s^2 2p^5(^2P^\circ_{3/2})6s$	$(3/2, 1/2)^\circ$	1	*9 216 000*
$2s^2 2p^5(^2P^\circ_{3/2})6d$	$^2[3/2]^\circ$	1	*9 285 000*
$2s^2 2p^5(^2P^\circ_{1/2})6d$	$^2[3/2]^\circ$	1	*9 383 000*
$2s^2 2p^5(^2P^\circ_{3/2})7s$	$(3/2, 1/2)^\circ$	1	*9 479 000*
$2s^2 2p^5(^2P^\circ_{3/2})7d$	$^2[3/2]^\circ$	1	*9 524 000*
$2s^2 2p^5(^2P^\circ_{1/2})7d$	$^2[3/2]^\circ$	1	*9 628 000*
$2s^2 2p^5(^2P^\circ_{3/2})8d$	$^2[3/2]^\circ$	1	*9 690 000*
$2s^2 2p^5(^2P^\circ_{1/2})8d$	$^2[3/2]^\circ$	1	*9 784 000*
$2s2p^6 5p$	$^3P^\circ$	1	*9 878 000*
$2s2p^6 5p$	$^1P^\circ$	1	*9 878 000*
Fe XVIII ($^2P^\circ_{3/2}$)	***Limit***		10 180 000

Fe XVIII

$Z=26$

F I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^5\ ^2P^\circ_{3/2}$

Ionization energy = 10 985 000±30 000 cm^{-1} (1362±4 eV)

The $2s^2 2p^5\ ^2P^\circ$–$2s2p^6\ ^2S$ doublet at 93.931 and 103.954 Å was measured in a laser-produced plasma by Feldman, Doschek, Nagel, Behring, and Cohen (1973) with a precision of ±0.003 Å (±30 cm^{-1}) and an estimated absolute (systematic) error of ±0.01 Å (±100 cm^{-1}).

The $2p^4 3s$ and $2p^4 3d$ levels were derived by Feldman, Doschek, Cowan, and Cohen (1973) from measurements at 14–16 Å. The range of observation was extended to 10 Å by Gordon, Hobby, and Peacock (1980), who also obtained the $2p^4 4s$, $2p^4 4d$, and $2s2p^5 3p$ levels. Their measurements, with a reported accuracy of ±0.005 Å, are used to determine these configurations. The uncertainty in the level values is about ±3000 cm^{-1}.

All of the leading percentages are taken from Gordon et al.

The $2p^4 5d$ and $6d$ levels are from observations of exploding wires at 10 Å by Burkhalter, Dozier, Stallings, and Cowan (1978) with a wavenumber uncertainty of ±5000 cm^{-1}. These levels are designated by the authors in LS coupling, although Jj coupling is probably more appropriate. We include designations from both coupling schemes.

The $1s2s^2 2p^6\ ^2S$ level was obtained from the x-ray observations of Fraenkel and Schwob (1972). An uncertainty of ±30 000 cm^{-1} is estimated for this level.

We derived the value for the ionization energy from the $2p^4(^1D)nd\ ^2D_{3/2}$ series for $n=3$-5.

References

Burkhalter, P. G., Dozier, C. M., Stallings, E., and Cowan, R. D. (1978), J. Appl. Phys. **49**, 1092.

Feldman, U., Doschek, G. A., Cowan, R. D., and Cohen, L. (1973), J. Opt. Soc. Am. **63**, 1445.

Feldman, U., Doschek, G. A., Nagel, D. J., Behring, W. E., and Cohen, L. (1973), Astrophys. J. **183**, L43.

Fraenkel, B. S., and Schwob, J. L. (1972), Phys. Lett. **40A**, 83.

Gordon, H., Hobby, M. G., and Peacock, N. J. (1980), J. Phys. **B13**, 1985.

Fe XVIII

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$2s^2 2p^5$	$^2P^\circ$	3/2	*0*				
		1/2	*102 650*				
$2s2p^6$	^2S	1/2	1 064 600				
$2s^2 2p^4(^3P)3s$	^4P	5/2	6 222 000	90		9	$(^1D)\ ^2D$
		1/2	6 301 200	84		15	$(^1S)\ ^2S$
		3/2	6 317 900	68		30	$(^3P)\ ^2P$
$2s^2 2p^4(^3P)3s$	^2P	3/2	6 248 100	57		31	$(^3P)\ ^4P$
		1/2	6 342 600	90		5	$(^1S)\ ^2S$
$2s^2 2p^4(^1D)3s$	^2D	5/2	6 400 000	90		9	$(^3P)\ ^4P$
		3/2	6 403 800	85		13	$(^3P)\ ^2P$
$2s^2 2p^4(^1S)3s$	^2S	1/2	6 575 100	80		11	$(^3P)\ ^4P$
$2s^2 2p^4(^3P)3d$	^4P	1/2	6 858 200	61		22	$(^3P)\ ^2P$
		3/2	6 872 400	48		27	$(^3P)\ ^2D$
		5/2	6 903 700	42		36	$(^3P)\ ^2F$
$2s^2 2p^4(^3P)3d$		5/2	6 880 400	26	^2F	23	$(^3P)\ ^4P$
$2s^2 2p^4(^3P)3d$	^4D	1/2	6 903 200	53		26	$(^3P)\ ^2P$
$2s^2 2p^4(^3P)3d$		3/2	6 919 000	29	^4D	19	$(^3P)\ ^2P$
$2s^2 2p^4(^3P)3d$	^2P	3/2	6 947 300	49		21	$(^1D)\ ^2P$

ENERGY LEVELS OF IRON

Fe XVIII–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$2s^2 2p^4(^3P)3d$	^2D	5/2	6 963 800	42		29	$(^3P)\ ^2F$
$2s^2 2p^4(^1D)3d$	^2S	1/2	7 014 300	83		10	$(^3P)\ ^4P$
$2s^2 2p^4(^1D)3d$	^2P	3/2	7 038 400	66		20	$(^3P)\ ^2P$
		1/2	7 074 200	61		34	
$2s^2 2p^4(^1D)3d$	^2D	5/2	7 040 800	44		26	$(^3P)\ ^2D$
		3/2	7 066 100	65		28	
$2s^2 2p^4(^1S)3d$	^2D	5/2	7 166 400	72		13	$(^3P)\ ^2D$
		3/2	7 184 300	72		13	
$2s2p^5(^3P^\circ)3p$		3/2	7 464 400	38	^4D	29	$(^3P^\circ)\ ^2P$
$2s2p^5(^3P^\circ)3p$	^2D	5/2	7 477 200	50		49	$(^3P^\circ)\ ^4D$
		3/2	7 567 000	45		22	
$2s2p^5(^3P^\circ)3p$	^2P	3/2	7 487 800	59		37	$(^3P^\circ)\ ^4D$
		1/2	7 508 100	58		16	
$2s2p^5(^3P^\circ)3p$	^4P	5/2	7 508 100				
		3/2	7 529 900	44		41	$(^3P^\circ)\ ^2D$
$2s2p^5(^3P^\circ)3p$	^2S	1/2	7 599 400	62		21	$(^3P^\circ)\ ^2P$
$2s2p^5(^1P^\circ)3p$	^2D	3/2	7 763 400	88		7	$(^1P^\circ)\ ^2P$
		5/2	7 783 900	96		2	$(^3P^\circ)\ ^4D$
$2s2p^5(^1P^\circ)3p$	^2P	1/2	7 786 000	93		2	$(^3P^\circ)\ ^2S$
		3/2	7 794 400	89		7	$(^1P^\circ)\ ^2D$
$2s^2 2p^4(^3P_2)4s$	(2,1/2)	3/2	8 428 200	88	or	70	$(^3P)\ ^2P$
$2s^2 2p^4(^3P_1)4s$	(1,1/2)	3/2	8 517 200	99	or	80	$(^3P)\ ^4P$
$2s^2 2p^4(^1D_2)4s$	(2,1/2)	5/2	8 591 100	90	or	90	$(^1D)\ ^2D$
		3/2	8 593 000	88	or	88	
$2s^2 2p^4(^3P_2)4d$	(2,5/2)	5/2	8 676 000	73	or	40	$(^3P)\ ^2D$
		3/2	8 676 000	86	or	32	
$2s^2 2p^4(^3P_0)4d$	(0,3/2)	3/2	8 727 500	73	or	55	$(^3P)\ ^4F$
$2s^2 2p^4(^3P_0)4d$	(0,5/2)	5/2	8 727 500	66	or	44	$(^3P)\ ^4F$
$2s^2 2p^4(^3P_1)4d$	(1,5/2)	5/2	8 756 600	94	or	44	$(^3P)\ ^4P$
		3/2	8 759 900	68	or	51	$(^3P)\ ^2P$
$2s^2 2p^4(^1D_2)4d$	(2,3/2)	5/2	8 829 200	82	or	50	$(^1D)\ ^2F$
		1/2	8 829 200	68	or	78	$(^1D)\ ^2S$
		3/2	8 843 900	49	or	81	$(^1D)\ ^2D$
$2s^2 2p^4(^1D_2)4d$	(2,5/2)	5/2	8 829 200	86	or	54	$(^1D)\ ^2D$
		3/2	8 829 200	52	or	87	$(^1D)\ ^2P$
		1/2	8 843 900	61	or	71	$(^1D)\ ^2P$
$2s^2 2p^4(^1S_0)4d$	(0,3/2)	3/2	8 989 200	79	or	79	$(^1S)\ ^2D$

Fe XVIII–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$2s^2 2p^4(^3P)5d$	^2D	$5/2$	9 510 000	
$2s^2 2p^4(^3P)5d$	^2F	$5/2$	9 610 000	
$2s^2 2p^4(^3P)5d$	^2P	$3/2$	9 640 000	
$2s^2 2p^4(^1D)5d$	^2P	$1/2, 3/2$	9 680 000	
$2s^2 2p^4(^1D)5d$	^2D	$3/2$	9 680 000	
$2s^2 2p^4(^1D)5d$	^2F	$5/2$	9 680 000	
$2s^2 2p^4(^3P)6d$	^2D	$5/2$	9 970 000	
$2s^2 2p^4(^1D)6d$	^2P	$1/2$	10 120 000	
$2s^2 2p^4(^1D)6d$	^2D	$3/2$	10 120 000	
Fe XIX ($^3P_2$)	*Limit*		**10 985 000**	
$1s2s^2 2p^6$	^2S	$1/2$	51 902 000	

ENERGY LEVELS OF IRON

Fe XIX

$Z=26$

O I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^4\ ^3P_2$

Ionization energy = 11 850 000±30 000 cm^{-1} (1469±4 eV)

All levels of the ground configuration except $^3P_0$ are determined from forbidden lines observed in solar flares. These transitions within the $2p^4$ configuration permit the determination of the levels with an uncertainty of 10 cm^{-1}. The transition $^3P_2$–$^3P_1$ at 1118.1±0.1 Å was reported by Doschek et al. (1975). The lines at 592.16 Å and 424.26 Å are classified as $^3P_2$–$^1D_2$ and $^3P_1$–$^1S_0$, respectively, by Widing (1978).

The value for the level $^3P_0$ of the ground configuration and those of the first excited configuration $2s2p^5$ were derived from the spectral observations of iron plasmas produced by high power laser pulses by Feldman, Doschek, Nagel, Behring, and Cohen (1973). They report a wavelength uncertainty of 0.003 Å. Fawcett, Galanti, and Peacock (1974) identified the transition from $2p^6\ ^1S_0$ to $2s2p^5\ ^1P_1^\circ$ at 115.42 Å.

Wavelengths in the range of 10–14 Å observed in a laser-produced plasma by Gordon, Hobby, and Peacock (1980a) were classified in the transition arrays $2p^4$–$2p^3 3s$, $2p^3 3d$, and $2p^3 4d$. A wavelength accuracy of 0.005 Å is reported, permitting an energy level accuracy of ±3000 cm^{-1}. Their calculated leading percentages in Jj and LS coupling appear in a Culham Laboratory Report (1980b).

The $2p^3 5d$ and $6d$ levels are from observations of exploding wires between 9 and 10 Å by Burkhalter et al. (1978). The uncertainty in their level values is ±30 000 cm^{-1}. Designations for these configurations are available only in LS coupling.

A position for the $1s2s^2 2p^5$ configuration of 52 138 000 cm^{-1} was obtained from the observation of Fe XIX by Lie and Elton (1971).

We derived the value for the ionization energy from the $2p^3(^4S)nd\ ^3D_3$ series for $n=3$ to 5.

References

Burkhalter, P. G., Dozier, C. M., Stallings, E., and Cowan, R. D. (1978), J. Appl. Phys. **49**, 1092

Doschek, G. A., Feldman, U. Dere, K. P., Sandlin, G. D., Van Hoosier, M. E. Brueckner, G. E., Purcell, J. D., and Tousey, R. (1975), Astrophys. J. **196**, L83.

Fawcett, B. C., Galanti, M., and Peacock, N. J. (1974), J. Phys. **B7**, 1149.

Feldman, U., Doschek, G. A., Nagel, D. J., Behring, W. E., and Cohen, L. (1973), Astrophys. J. **183**, L43.

Gordon, H., Hobby, M. G., and Peacock, N. J. (1980a), J. Phys. **B13**, 1985.

Gordon, H., Hobby, M. G., and Peacock, N. J. (1980b), Culham Laboratory Report No. CLM-P592, Abingdon, England.

Lie, T. N., and Elton, R. C. (1971), Phys. Rev. **A3**, 865.

Widing, K. G. (1978), Astrophys. J. **222**, 735.

Fe XIX

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$2s^2 2p^4$	^3P	2	0			
		0	75 296			
		1	89 413			
$2s^2 2p^4$	^1D	2	168 873			
$2s^2 2p^4$	^1S	0	325 118			
$2s2p^5$	$^3P^\circ$	2	*922 766*			
		1	*984 651*			
		0	*1 029 837*			
$2s2p^5$	$^1P^\circ$	1	*1 267 450*			
$2p^6$	^1S	0	2 133 900			
$2s^2 2p^3(^4S^\circ)3s$	$^3S^\circ$	1	*6 680 000*	81	8	$(^2P^\circ)\ ^1P^\circ$
$2s^2 2p^3(^2D^\circ)3s$	$^3D^\circ$	2	*6 787 000*	64	17	$(^2P^\circ)\ ^3P^\circ$
		1	*6 788 000*	76	13	$(^4S^\circ)\ ^3S^\circ$
		3	*6 818 000*	99		
$2s^2 2p^3(^2D^\circ)3s$	$^1D^\circ$	2	*6 834 000*	75	22	$(^2D^\circ)\ ^3D^\circ$

Fe XIX–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$2s^2 2p^3(^2P^\circ)3s$	$^3P^\circ$	0	*6 907 000*	99			
		1	*6 923 000*	76		22	$(^2P^\circ)\ ^1P^\circ$
		2	*6 970 000*	72		12	$(^2D^\circ)\ ^3D^\circ$
$2s^2 2p^3(^2P^\circ)3s$	$^1P^\circ$	1	*6 985 000*	63		17	$(^2D^\circ)\ ^3D^\circ$
$2s^2 2p^3(^4S^\circ_{3/2})3d$	$(^3/_2,^5/_2)^\circ$	3	*7 249 000*	52	or	69	$(^4S^\circ)\ ^3D^\circ$
$2s^2 2p^3(^2D^\circ_{3/2})3d$	$(^3/_2,^5/_2)^\circ$	2	*7 370 000*	55	or	27	$(^2D^\circ)\ ^3P^\circ$
$2s^2 2p^3(^2D^\circ_{5/2})3d$	$(^5/_2,^5/_2)^\circ$	3	*7 396 000*	44	or	74	$(^2D^\circ)\ ^3D^\circ$
$2s^2 2p^3(^2D^\circ_{5/2})3d$	$(^5/_2,^3/_2)^\circ$	2	*7 405 000*	73	or	43	$(^2D^\circ)\ ^3D^\circ$
$2s^2 2p^3(^2D^\circ_{5/2})3d$	$(^5/_2,^5/_2)^\circ$	3	*7 449 000*	37	or	59	$(^2D^\circ)\ ^1F^\circ$
$2s^2 2p^3(^2P^\circ_{1/2})3d$	$(^1/_2,^5/_2)^\circ$	3	*7 450 000*	69	or	68	$(^2P^\circ)\ ^3F^\circ$
		2	*7 468 000*	62	or	31	$(^2P^\circ)\ ^3P^\circ$
$2s^2 2p^3(^2P^\circ_{3/2})3d$	$(^3/_2,^3/_2)^\circ$	2	*7 554 000*	57	or	32	$(^2P^\circ)\ ^3D^\circ$
		3	*7 565 000*	51	or	44	$(^2P^\circ)\ ^1F^\circ$
		1	*7 567 000*	48	or	33	$(^2P^\circ)\ ^3P^\circ$
$2s^2 2p^3(^2P^\circ_{3/2})3d$	$(^3/_2,^5/_2)^\circ$	1	*7 606 000*	55	or	68	$(^2P^\circ)\ ^1P^\circ$
$2s^2 2p^3(^4S^\circ_{3/2})4d$	$(^3/_2,^5/_2)^\circ$	2	*9 242 000*	68	or	76	$(^4S^\circ)\ ^3D^\circ$
		1	*9 244 000*	81	or	87	
		3	*9 248 000*	53	or	82	
$2s^2 2p^3(^2D^\circ_{3/2})4d$	$(^3/_2,^3/_2)^\circ$	3	*9 359 000*	37	or	36	$(^2D^\circ)\ ^3F^\circ$
$2s^2 2p^3(^2D^\circ_{3/2})4d$	$(^3/_2,^5/_2)^\circ$	2	*9 374 000*	70	or	41	$(^2D^\circ)\ ^3D^\circ$
$2s^2 2p^3(^2D^\circ_{5/2})4d$	$(^5/_2,^3/_2)^\circ$	3	*9 383 000*	62	or	71	$(^2D^\circ)\ ^3D^\circ$
		2	*9 395 000*	93	or	44	$(^2D^\circ)\ ^3D^\circ$
		1	*9 403 000*	57	or	62	$(^2D^\circ)\ ^3S^\circ$
$2s^2 2p^3(^2D^\circ_{5/2})4d$	$(^5/_2,^5/_2)^\circ$	3	*9 417 000*	64	or	77	$(^2D^\circ)\ ^1F^\circ$
		2	*9 417 000*	93	or	65	$(^2D^\circ)\ ^1D^\circ$
$2s^2 2p^3(^2P^\circ_{1/2})4d$	$(^1/_2,^5/_2)^\circ$	3	*9 483 000*	97	or	55	$(^2P^\circ)\ ^3F^\circ$
		2	*9 492 000*	99	or	45	$(^2P^\circ)\ ^3P^\circ$
$2s^2 2p^3(^2P^\circ_{1/2})4d$	$(^1/_2,^3/_2)^\circ$	1	*9 494 000*	97	or	56	$(^2P^\circ)\ ^3D^\circ$
$2s^2 2p^3(^2P^\circ_{3/2})4d$	$(^3/_2,^3/_2)^\circ$	3	*9 552 000*	72	or	39	$(^2P^\circ)\ ^1F^\circ$
		1	*9 556 000*	56	or	57	$(^2P^\circ)\ ^3P^\circ$
$2s^2 2p^3(^2P^\circ_{3/2})4d$	$(^3/_2,^5/_2)^\circ$	1	*9 573 000*	57	or	59	$(^2P^\circ)\ ^1P^\circ$
$2s^2 2p^3(^4S^\circ)5d$	$^3D^\circ$	3	*10 190 000*				
$2s^2 2p^3(^2D^\circ)5d$	$^3D^\circ$	2	*10 330 000*				
		3	*10 330 000*				
$2s^2 2p^3(^2D^\circ)5d$	$^1D^\circ$	2	*10 360 000*				
$2s^2 2p^3(^2D^\circ)5d$	$^1F^\circ$	3	*10 390 000*				

ENERGY LEVELS OF IRON

Fe XIX–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$2s^2 2p^3(^2D^\circ)5d$	$^3F^\circ$	3	*10 420 000*	
$2s^2 2p^3(^2P^\circ)5d$	$^3D^\circ$	1	*10 450 000*	
		3	*10 500 000*	
$2s^2 2p^3(^2P^\circ)5d$	$^3F^\circ$	3	*10 500 000*	
$2s^2 2p^3(^2P^\circ)5d$	$^3P^\circ$	1	*10 500 000*	
$2s^2 2p^3(^2P^\circ)5d$	$^1F^\circ$	3	*10 500 000*	
$2s^2 2p^3(^2P^\circ)5d$	$^1P^\circ$	1	*10 510 000*	
$2s^2 2p^3(^4S^\circ)6d$	$^5D^\circ$	2	*10 680 000*	
$2s^2 2p^3(^4S^\circ)6d$	$^3D^\circ$	3	*10 710 000*	
$2s^2 2p^3(^2P^\circ)6d$	$^3D^\circ$	1	*10 760 000*	
$2s^2 2p^3(^2D^\circ)6d$	$^1F^\circ$	3	*11 030 000*	
Fe XX ($^4S^\circ_{3/2}$)	***Limit***		**11 850 000**	

Fe XX

$Z=26$
N I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^3\ {}^4S^\circ_{3/2}$

Ionization energy = 12 708 000±4000 cm^{-1} (1582.0±0.5 eV)

The array $2s^2 2p^3$–$2s2p^4$ was identified in the range of 90–132 Å from spectra of a laser-produced plasma by Doschek, Feldman, Cowan, and Cohen (1974) and by Feldman, Doschek, Cowan, and Cohen (1975). Further classifications in the same wavelength region by Doschek, Feldman, Davis, and Cowan (1975) provided the $2p^5\ {}^2P^\circ$ term. These arrays were reobserved by Lawson and Peacock (1980) with improved accuracy of ±0.01 Å. They also identified intersystem transitions connecting the quartet and doublet levels. Their results are used here to obtain level values with an uncertainty of ±100 cm^{-1} for the $2s^2 2p^3$, $2s2p^4$ and $2p^5$ configurations.

A measurement of the $2s^2 2p^3\ {}^2D^\circ_{3/2}$–${}^2D^\circ_{5/2}$ transition at 2665 Å was obtained by Suckewer and Hinnov (1979) from a tokamak discharge.

Transition arrays between the ground configuration and $2p^2 3d$, $4d$, and $5d$ are analyzed in the report of Bromage et al. (1977) who used laser-produced plasma spectra observed in the range of 8–18 Å. The estimated wavelength accuracy is about 0.005 Å. The levels derived from their measurements have an uncertainty of ±3000 cm^{-1}. Bromage and Fawcett (1977) have given the leading percentages for the $2p^2 3d$ levels. Bogdanovich et al. calculated the leading percentages of the levels of the ground configuration, $2s^2 2p^3$, by the Hartree-Fock method.

The identification of the inner shell transitions giving the position of the $1s2s^2 2p^4$ configuration at 52 470 000 cm^{-1} was made by Lie and Elton (1971).

We derived the value for the ionization energy from the $2p^2(^1D)nd\ {}^2F$ series.

References

Bogdanovich, P. O., Bogdanovichene, M. I., Grudzinskas, I. I., Rudzikas, Z. B., Tutlis, V. I., and Shadsjuvene, S. D. On the theory of energy spectra of multielectron atoms and ions, Chapter 2 in Spectroscopy of Multiply Charged Ions, Moscow, Academy of Sciences USSR, 1980, (in Russian).

Bromage, G. E., Cowan, R. D., Fawcett, B. C., Gordon, H., Hobby, M. G., Peacock, N. J., and Ridgley, A. (1977), UKAEA Report CLMR 170, Culham Lab.

Bromage, G. E., and Fawcett, B.C. (1977), Mon. Not. R. Astr. Soc. **179**, 683.

Doschek, G. A., Feldman, U., Cowan, R. D., and Cohen, L. (1974), Astrophys. J. **188**, 417.

Doschek, G. A., Feldman, U., Davis, J., and Cowan, R.D. (1975), Phys. Rev. **A12**, 980.

Feldman, U., Doschek, G. A., Cowan, R. D., and Cohen, L. (1975), Astrophys. J. **196**, 613.

Lawson, K. D., and Peacock, N. J. (1980), J. Phys. **B13**, 3313.

Lie, T. N., and Elton, R. C. (1971) Phys. Rev. **A3**, 865.

Suckewer, S., and Hinnov, E. (1979), Phys. Rev. **A20**, 578.

Fe XX

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$2s^2 2p^3$	$^4S^\circ$	3/2	*0*	90	8	$^2P^\circ$
$2s^2 2p^3$	$^2D^\circ$	3/2	*138 270*	79	15	$^2P^\circ$
		5/2	*175 810*	100		
$2s^2 2p^3$	$^2P^\circ$	1/2	*260 090*	100		
		3/2	*323 180*	79	19	$^2D^\circ$
$2s2p^4$	^4P	5/2	752 730			
		3/2	820 820			
		1/2	842 740			
$2s2p^4$	^2D	3/2	1 042 210			
		5/2	1 058 130			
$2s2p^4$	^2S	1/2	1 194 850			
$2s2p^4$	^2P	3/2	1 242 080			
		1/2	1 339 680			
$2p^5$	$^2P^\circ$	3/2	*1 954 150*			
		1/2	*2 061 730*			

ENERGY LEVELS OF IRON

Fe xx–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$2s^2\,2p^2(^3P)3d$	^4P	$5/2$	7 802 000	54	29	^4D
		$3/2$	7 802 000	77		
$2s^2\,2p^2(^3P)3d$	^2F	$7/2$	7 820 000	40	28	^4D
$2s^2\,2p^2(^3P)3d$	^2D	$5/2$	7 843 000	65	14	$(^1D)\ ^2D$
		$3/2$	7 859 000	72		
$2s^2\,2p^2(^1D)3d$	^2D	$5/2$	7 913 000	54	22	^2F
		$3/2$	7 919 000	80		
$2s^2\,2p^2(^1D)3d$	^2F	$7/2$	7 935 000	41	41	$(^3P)\ ^2F$
		$5/2$	7 983 000	31	30	$(^3P)\ ^2D$
$2s^2\,2p^2(^1D)3d$	^2P	$3/2$	7 967 000	73	11	$(^3P)\ ^2P$
$2s^2\,2p^2(^1S)3d$	^2D	$5/2$	8 047 000	86		
$2s^2\,2p^2(^3P)4d$	^4P	$5/2$	9 880 000			
		$3/2$	10 009 000			
		$1/2$	10 009 000			
$2s^2\,2p^2(^3P)4d$	^4F	$5/2$	9 942 000			
$2s^2\,2p^2(^3P)4d$	^2F	$5/2$	9 964 000			
		$7/2$	10 019 000			
$2s^2\,2p^2(^3P)4d$	^4D	$5/2$	9 992 000			
$2s^2\,2p^2(^3P)4d$	^2D	$5/2$	10 019 000			
		$3/2$	10 043 000			
$2s^2\,2p^2(^1D)4d$	^2D	$3/2$	10 130 000			
		$5/2$	10 142 000			
$2s^2\,2p^2(^1D)4d$	^2G	$7/2$	10 142 000			
$2s^2\,2p^2(^1D)4d$	^2F	$5/2$	10 149 000			
$2s^2\,2p^2(^1D)4d$	^2P	$3/2$	10 149 000			
$2s^2\,2p^2(^1S)4d$	^2D	$3/2$	10 269 000			
		$5/2$	10 289 000			
$2s^2\,2p^2(^3P)5d$	^4P	$5/2$	10 930 000			
		$3/2$	11 048 000			
		$1/2$	11 048 000			
$2s^2\,2p^2(^3P)5d$	^4F	$5/2$	10 994 000			
$2s^2\,2p^2(^3P)5d$	^2F	$5/2$	10 998 000			
		$7/2$	11 047 000			
$2s^2\,2p^2(^3P)5d$	^2D	$5/2$	11 036 000			
$2s^2\,2p^2(^3P)5d$	^4D	$5/2$	11 048 000			
$2s^2\,2p^2(^1D)5d$	^2G	$7/2$	11 153 000			

Fe XX–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$2s^2 2p^2(^1D)5d$	^2D	$5/2$ $3/2$	11 153 000 11 160 000	
$2s^2 2p^2(^1D)5d$	^2F	$5/2$	11 169 000	
$2s^2 2p^2(^1D)5d$	^2P	$3/2$	11 169 000	
Fe XXI ($^3P_0$)	***Limit***		**12 708 000**	

ENERGY LEVELS OF IRON

Fe XXI

$Z=26$

C I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^2\ ^3P_0$

Ionization energy = 13 620 000±30 000 cm^{-1} (1689±4 eV)

Identifications of transitions in the $2s^2 2p^2$–$2s2p^3$ array were reported by Feldman et al. (1975) in the region 91–121 Å. Kononov et al. (1976) extended the analysis and found transitions from $2p^4$, but reported no intersystem lines. Lawson and Peacock (1980) remeasured this spectrum and found the connection among all the terms. Their results, accurate to about ±50 cm^{-1}, are used here. The wavelengths of these groups fall in the range of 84 Å–182 Å.

The $2s^2 2p^2\ ^3P$ splittings are obtained from forbidden transitions within the ^3P term. The $^3P_0$–$^3P_1$ interval is derived from a solar line at 1354.1±0.1 Å observed by Doschek et al. (1975) from Skylab. Hinnov and Suckewer reported privately the observations of the $^3P_1$–$^3P_2$ transition at 2298.0±0.3 Å (in air) using the PLT tokamak. Thus the level values of the ground term have an uncertainty of ±6 cm^{-1}.

Boiko, Faenov, and Pikuz (1978), using their measurements and the predictions of Fawcett and Hayes (1975), give the levels $^3D_3^{\circ}$ and $^1F_3^{\circ}$ of the $2p3d$ configuration. Bromage and Fawcett (1977) add the rest of the levels given here. The $^3F_4$ level of $2s2p^2 3d$ is from Boiko et al.

The transitions $2p^2 - 2p4d$, $2p5d$ in the range of 8.5 Å–9.5 Å were observed by Bromage et al. (1977). Their classifications provide the levels of $2p4d$ and $2p5d$ included here with an uncertainty of ± 6000 cm^{-1}.

The resonance line reported by Lie and Elton (1971) at 1.896 Å arising from the $1s2s^2 2p^3$ configuration was resolved into three components by Feldman, Doschek, and Kreplin (1980), each classified as a blend of three lines. A center of gravity value for the configuration is about 52 910 000 cm^{-1}.

The ionization energy is from Lotz (1967).

References

Boiko, V. A., Faenov, A. Y., and Pikuz, S. A., (1978), J. Quant. Spect. Radiat. Transfer **19**, 11.

Bromage, G. E., Cowan, R. D., Fawcett, B. C., Gordon, H., Hobby, M. G., Peacock, N. J., and Ridgeley, A. (1977), UKAEA Report CLMR170, Culham Lab.

Bromage, G. E., and Fawcett, B. C. (1977), Mon. Not. R. Astron. Soc. **178**, 605.

Doschek, G. A., Feldman, U., Dere, K. P., Sandlin, G. D., Van Hoosier, M. E., Brueckner, G. E., Purcell, J. D., and Tousey, R. (1975), Astrophys. J. **196**, L83.

Fawcett, B. C., and Hayes, R. W. (1975), Mon. Not. R. Astron. Soc. **175**, 185.

Feldman, U., Doschek, G. A., Cowan, R. D., and Cohen, L. (1975), Astrophys. J. **196**, 613.

Feldman, U., Doschek, G. A., and Kreplin, R. W. (1980), Astrophys. J. **238**, 365.

Kononov, E. Y., Koshelev, K. N., Podobedova, L. I., Chekalin, S. V., and Churilov, S. S. (1976), J. Phys. **B9**, 565.

Lawson, K. D., and Peacock, N. J. (1980), J. Phys. **B13**, 3313.

Lie, F. N., and Elton, R. C. (1971), Phys. Rev. **3**, 865.

Lotz, W. (1967), J. Opt. Soc. Am. **57**, 873.

Fe XXI

Configuration	Term	J	Level (cm^{-1})
$2s^2 2p^2$	^3P	0	0
		1	73 850
		2	117 350
$2s^2 2p^2$	^1D	2	244 030
$2s^2 2p^2$	^1S	0	371 520
$2s2p^3$	$^5S^{\circ}$	2	*487 000*
$2s2p^3$	$^3D^{\circ}$	1	*776 780*
		2	*777 280*
		3	*803 930*
$2s2p^3$	$^3P^{\circ}$	0	*916 380*
		1	*924 900*
		2	*942 320*
$2s2p^3$	$^3S^{\circ}$	1	*1 095 520*

Fe XXI–Continued

Configuration	Term	J	Level (cm^{-1})
$2s2p^3$	$^1D^\circ$	2	*1 126 640*
$2s2p^3$	$^1P^\circ$	1	*1 260 650*
$2p^4$	^3P	2	1 646 290
		0	1 735 690
		1	1 740 420
$2p^4$	^1D	2	1 817 240
$2p^4$	^1S	0	2 047 800
$2s^2 2p3d$	$^1D^\circ$	2	*8 098 000*
$2s^2 2p3d$	$^3D^\circ$	2	*8 187 400*
		3	*8 211 800*
$2s^2 2p3d$	$^3P^\circ$	2	*8 230 800*
$2s^2 2p3d$	$^1P^\circ$	1	*8 293 600*
$2s^2 2p3d$	$^1F^\circ$	3	*8 300 700*
$2s2p^2(^4P)3d$	^3F	4	8 669 100
$2s^2 2p4d$	$^3F^\circ$	3	*10 554 000*
$2s^2 2p4d$	$^3P^\circ$	2	*10 580 000*
		1	*10 688 000*
$2s^2 2p4d$	$^3D^\circ$	1	*10 581 000*
		2	*10 655 000*
		3	*10 688 000*
$2s^2 2p4d$	$^1D^\circ$	2	*10 675 000*
$2s^2 2p4d$	$^1F^\circ$	3	*10 681 000*
$2s^2 2p5d$	$^3D^\circ$	3	*11 802 000*
$2s^2 2p5d$	$^3P^\circ$	1	*11 810 000*
$2s^2 2p5d$	$^1D^\circ$	2	*11 810 000*
$2s^2 2p5d$	$^1F^\circ$	3	*11 814 000*
Fe XXII ($^2P^\circ_{1/2}$)	***Limit***		**13 620 000**

ENERGY LEVELS OF IRON

Fe XXII

$Z = 26$

B I isoelectronic sequence

Ground state: $1s^22s^22p\ ^2P^\circ_{1/2}$

Ionization energy = 14 510 000±30 000 cm^{-1} (1799±4 eV)

Spectra in the range of 100–160 Å arising from transitions among configurations $2s^22p$, $2s2p^2$ and $2p^3$ were analyzed by Kononov et al. (1976). New measurements and some corrections to $2p^3$ were made by Lawson and Peacock (1980), whose wavelengths appear to be uncertain by ±0.01 Å, corresponding to a level uncertainty of ±50 cm^{-1}. The results of Lawson and Peacock are used below. They have identified the intersystem line $2s2p^2\ ^4P_{5/2}$–$2p^3\ ^2D^\circ_{5/2}$ at 109.53 Å. Sandlin, Brueckner, Scherrer, and Tousey (1976) identified the intersystem multiplet $2s^22p\ ^2P^\circ$–$2s2p^2\ ^4P$ from solar flare data which predicts the value 109.45±0.03 Å for the line of Lawson and Peacock. We adopt the Lawson and Peacock value.

Bromage, Cowan, Fawcett, and Ridgeley (1978) using the wavelength measurements of Boiko, Faenov, and Pikuz (1978) in the region of 9–12 Å and Hartree-Fock calculations, classified spectra arising from the transition arrays $2s^22p$–$2s^23d$, $2s^22p$–$2s2p3p$, $2s2p^2$–$2s2p3d$, and $2s2p^2 - 2s2p4d$. The uncertainty in the level values derived from these data is ± 2000 cm^{-1}.

Exploding wire spectra were analyzed by Burkhalter et al. (1978), who reported the observation of the $2s^22p\ ^2P^\circ$–$2s^24d\ ^2D$ and $2s^22p\ ^2P^\circ$–$2s^24s\ ^2S$ lines at 9 Å measured with an uncertainty of ±0.03 Å.

The transition array $1s^22s^22p - 1s2s^22p^2$ was measured in solar flare spectra at ~1.8 Å by Feldman, Doschek, and Kreplin (1980) and an uncertainty of ±0.0005 Å was given. The level accuracy is ±14 000 cm^{-1}.

The ionization energy is from the isoelectronic extrapolation by Lotz (1967).

References

Boiko, V. A., Faenov, A. Y., and Pikuz, S. A. (1978), J. Quant. Spectrosc. Radiat. Transfer **19**, 11.

Bromage, G. E., Cowan, R. D., Fawcett, B. C., and Ridgeley, A. (1978), J. Opt. Soc. Am. **68**, 48.

Burkhalter, P. G., Dozier, C. M., Stallings, C., and Cowan, R. D. (1978), J. Appl. Phys. **49**, 1092.

Feldman, U., Doschek, G. A., and Kreplin, R. W. (1980), Astrophys. J. **238**, 365.

Kononov, E. Y., Koshelev, K. N., Podobedova, L. I., Chekalin, S. V., and Churilov, S. S. (1976), J. Phys. **B9**, 565.

Lawson, K. D., and Peacock, N. J. (1980), J. Phys. **B13**, 3313.

Lotz, W. (1967), J. Opt. Soc. Am. **57**, 873.

Sandlin, G. D., Brueckner, G. E., Scherrer, V. E., and Tousey, R. (1976), Astrophys. J. **205**, L 47.

Fe XXII

Configuration	Term	J	Level (cm^{-1})
$1s^2 2s^2 2p$	$^2P^\circ$	½	*0*
		3/2	*118 260*
$1s^2 2s2p^2$	^4P	½	405 590
		3/2	461 030
		5/2	513 840
$1s^2 2s2p^2$	^2D	3/2	736 490
		5/2	759 560
$1s^2 2s2p^2$	^2S	½	853 460
$1s^2 2s2p^2$	^2P	½	978 200
		3/2	992 260
$1s^2 2p^3$	$^4S^\circ$	3/2	*1 256 510*
$1s^2 2p^3$	$^2D^\circ$	3/2	*1 396 380*
		5/2	*1 426 830*
$1s^2 2p^3$	$^2P^\circ$	½	*1 569 610*
		3/2	*1 627 680*
$1s^2 2s^2 3d$	^2D	3/2	8 498 000
		5/2	8 507 000

Fe XXII–Continued

Configuration	Term	J	Level (cm^{-1})
$1s^2 2s2p3p$	^{2}P	1/2	8 584 000
		3/2	8 688 000
$1s^2 2s2p3p$	^{2}D	3/2	8 740 000
		5/2	8 845 000
$1s^2 2s2p(^3P^\circ)3d$	^{4}F°	7/2	*8 864 000*
$1s^2 2s2p(^3P^\circ)3d$	^{4}P°	5/2	*8 874 000*
		3/2	*8 972 000*
		1/2	*8 973 000*
$1s^2 2s2p(^3P^\circ)3d$	^{4}D°	3/2	*8 882 000*
		1/2	*8 888 000*
		7/2	*8 962 000*
		5/2	*8 973 000*
$1s^2 2s2p(^3P^\circ)3d$	^{2}D°	5/2	*8 938 000*
$1s^2 2s2p(^3P^\circ)3d$	^{2}P°	1/2	*8 967 000*
		3/2	*9 180 000*
$1s^2 2s2p(^3P^\circ)3d$	^{2}F°	5/2	*9 030 000*
		7/2	*9 062 000*
$1s^2 2s2p(^1P^\circ)3d$	^{2}D°	3/2	*9 134 000*
		5/2	*9 272 000*
$1s^2 2s2p(^1P^\circ)3d$	^{2}P°	3/2	*9 168 000*
$1s^2 2s2p(^1P^\circ)3d$	^{2}F°	7/2	*9 242 000*
		5/2	9 249 000
$1s^2 2s^2 4s$	^{2}S	1/2	11 050 000
$1s^2 2s^2 4d$	^{2}D	5/2	11 149 000
		3/2	11 161 000
$1s^2 2s2p(^3P^\circ)4d$	^{4}F°	5/2	*11 492 000*
$1s^2 2s2p(^3P^\circ)4d$	^{4}D°	3/2	*11 526 000*
		5/2	*11 618 000*
		7/2	*11 618 000*
$1s^2 2s2p(^3P^\circ)4d$	^{2}F°	5/2	*11 558 000*
		7/2	*11 900 000*
$1s^2 2s2p(^3P^\circ)4d$	^{2}D°	5/2	*11 611 000*
$1s^2 2s2p(^1P^\circ)4d$	^{2}F°	7/2	*11 649 000*
		5/2	*11 897 000*
$1s^2 2s2p(^1P^\circ)4d$	^{2}D°	5/2	*11 906 000*

ENERGY LEVELS OF IRON

Fe XXII–Continued

Configuration	Term	J	Level (cm^{-1})
Fe XXIII ($^1S_0$)	***Limit***		**14 510 000**
$1s2s^2 2p^2$	^2P	$1/2$	53 122 000
		$3/2$	53 242 000
$1s2s^2 2p^2$	^2D	$3/2$	53 124 000
		$5/2$	53 166 000
$1s2s^2 2p^2$	^2S	$1/2$	53 327 000

Fe XXIII

$Z=26$

Be I isoelectronic sequence

Ground state: $1s^2 2s^2\ ^1S_0$

Ionization energy = 15 797 000±30 000 cm^{-1} (1958.6±3.7 eV)

The $2s^2$–$2s2p$ and $2s2p$–$2p^2$ arrays in the range of 132–180 Å classified by Lawson and Peacock (1980) establish all the levels of these configurations with an uncertainty of 50 cm^{-1}. The percentage compositions of the $2s^2$, $2s2p$, and $2p^2$ configurations with mixing of $2s^2$ and $2p^2$ were calculated by Scott and Burke (1980). We give the two leading percentages.

Laser produced spectra of iron in the range of 6–17 Å arising from L-shell excitations were reported by Boiko, Faenov, and Pikuz (1978) with an accuracy of 0.001–0.003 Å. Their classification of a group of these lines with levels of Fe XXIII was revised and extended by Bromage, Cowan, Fawcett, and Ridgeley (1978), who obtained the spectra with improved ionization discrimination. They made new calculations of the energy level structure and used the wavelengths of Boiko, Pikuz, and Faenov (distributed in 1976 in report form). The classifications by Bromage et al. are used to determine the levels of the $2snp$, $2snd$, $2pnp$, and $2pnd$ configurations ($n=3$–5) with an uncertainty of ±5000 cm^{-1}. They also gave percentage compositions for only the highly mixed levels of this group. The $2s3s$ and $2p3s$ levels were given only by Boiko et al.

Spectral lines at ~1.8 Å were identified in the $1s^2 2s2p$–$1s2s2p^2$ array by Kononov, Koshelev, and Sidelnikov (1977). The complete designations are given by Safronova and Lisina (1979). The line at 1.8704 Å was assigned to $1s^2 2s^2\ ^1S_0$–$1s2s^2 2p\ ^1P^\circ_1$ by Feldman, Doschek, and Kreplin (1980). The uncertainty of these level values is about ±10 000 cm^{-1}.

We obtained an average value of 15 797 000±30 000 cm^{-1} for the ionization energy from the $2snp\ ^1P^\circ_1$ and the $2snd\ ^1D_2$ series.

References

Boiko, V. A., Faenov, A. Y., and Pikuz, S. A. (1978), J. Quant. Spectrosc. Radiat. Transfer **19**, 11.

Bromage, G. E., Cowan, R. D., Fawcett, B. C., and Ridgeley, A. (1978), J. Opt. Soc. Am. **68**, 48.

Feldman, U., Doschek, G. A., and Kreplin, R. W. (1980), Astrophys. J. **238**, 365.

Kononov, E. Y., Koshelev, K. N., and Sidelnikov, Y. V. (1977), Sov. J. Plasma Phys. **3**, 375.

Lawson, K. D., and Peacock, N. J. (1980), J. Phys. **B13**, 3313.

Safronova, U. I., and Lisina, T. G. (1979), At. Data Nucl. Data Tables **24**, 49.

Scott, N. S., and Burke, P. G. (1980), J. Phys. **B13**, 4299.

Fe XXIII

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$1s^2 2s^2$	^1S	0	0	96	4	$2p^2\ ^1S$
$1s^2 2s2p$	$^3P^\circ$	0	*348 230*	100		
		1	*379 180*	96	2	$^1P^\circ$
		2	*472 150*	100		
$1s^2 2s2p$	$^1P^\circ$	1	*752 780*	96	2	$^3P^\circ$
$1s^2 2p^2$	^3P	0	956 180	94	6	^1S
		1	1 027 390	100		
		2	1 071 890	76	24	^1D
$1s^2 2p^2$	^1D	2	1 204 590	76	24	^3P
$1s^2 2p^2$	^1S	0	1 422 900	90	6	^3P
$1s^2 2s3s$	^3S	1	8 894 000			
$1s^2 2s3p$	$^3P^\circ$	1	*9 076 000*	70	29	$^1P^\circ$
$1s^2 2s3p$	$^1P^\circ$	1	*9 107 000*	64	30	$^3P^\circ$

ENERGY LEVELS OF IRON

Fe XXIII–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$1s^2 2s3d$	^3D	1	9 199 000				
		2	9 209 000				
		3	9 212 000				
$1s^2 2p3s$	$^3P^\circ$	0	*9 295 000*				
$1s^2 2s3d$	^1D	2	9 273 000				
$1s^2 2p3p$	^3D	1	9 455 000				
		2	9 524 000				
		3	9 624 000				
$1s^2 2p3s$	$^1P^\circ$	1	*9 470 000*				
$1s^2 2p3d$	$^3F^\circ$	3	*9 625 000*				
$1s^2 2p3d$	$^3D^\circ$	1	*9 637 000*				
		3	*9 749 000*				
$1s^2 2p3d$		2	*9 728 000*	35	$^3P^\circ$	29	$^3D^\circ$
$1s^2 2p3d$	$^1D^\circ$	2	*9 638 000*	46		29	$^3D^\circ$
$1s^2 2p3p$	^3P	2	9 644 000				
$1s^2 2p3p$	^1D	2	9 709 000				
$1s^2 2p3d$	$^3P^\circ$	2	*9 753 000*	54		40	$^3D^\circ$
$1s^2 2s3s$	^1S	0	9 783 000				
$1s^2 2p3d$	$^1P^\circ$	1	*9 828 000*				
$1s^2 2p3d$	$^1F^\circ$	3	*9 830 000*				
$1s^2 2s4p$	$^1P^\circ$	1	*12 044 000*				
$1s^2 2s4d$	^3D	1	12 073 000				
		2	12 075 000				
		3	12 081 000				
$1s^2 2s4d$	^1D	2	12 098 000				
$1s^2 2p4d$		2	*12 481 000*	44	$^3P^\circ$	35	$^3D^\circ$
$1s^2 2p4d$	$^3D^\circ$	1	*12 488 000*				
		3	*12 603 000*				
$1s^2 2p4d$	$^3F^\circ$	3	*12 484 000*				
$1s^2 2p4p$	^3D	3	12 560 000				
$1s^2 2p4d$	$^1D^\circ$	2	*12 597 000*	56		21	$^3D^\circ$
$1s^2 2p4d$	$^3P^\circ$	2	*12 614 000*	50		42	$^3D^\circ$
		1	*12 615 000*				
$1s^2 2p4d$	$^1F^\circ$	3	*12 631 000*				

Fe XXIII–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$1s^2 2s5d$	^{3}D	1	13 369 000	
		2	13 400 000	
		3	13 404 000	
$1s^2 2s5p$	^{1}P°	1	*13 383 000*	
$1s^2 2s5d$	^{1}D	2	13 438 000	
$1s^2 2p5d$	^{3}F°	3	*13 804 000*	
$1s^2 2p5d$	^{3}D°	2	*13 805 000*	
		3	*13 929 000*	
$1s^2 2p5p$	^{3}D	3	13 904 000	
$1s^2 2p5d$	^{1}D°	2	*13 922 000*	
$1s^2 2p5d$	^{1}F°	3	*13 945 000*	
Fe XXIV ($^2S_{1/2}$)	*Limit*		15 797 000	
$1s2s^2 2p$	^{1}P°	1	*53 464 000*	
$1s(^2S)2s2p^2(^4P)$	^{3}P	0	53 707 000	
$1s(^2S)2s2p^2(^2D)$	^{3}D	1	53 800 000	
$1s(^2S)2s2p^2(^2S)$	^{3}S	1	53 925 000	
$1s(^2S)2s2p^2(^2D)$	^{1}D	2	54 045 000	
$1s(^2S)2s2p^2(^2P)$	^{1}P	1	54 182 000	
$1s(^2S)2s2p^2(^2S)$	^{1}S	0	54 252 000	

ENERGY LEVELS OF IRON

Fe XXIV

$Z=26$

Li I isoelectronic sequence

Ground state: $1s^2 2s\ ^2S_{1/2}$

Ionization energy = 16 500 000±4000 cm^{-1} (2045.8±0.5 eV)

The $2s$–$2p$ transitions have been observed with an uncertainty of ±0.02 Å at 192.04 and 255.10 Å in solar flares from Skylab as reported by Widing and Purcell (1976).

The transitions to $n=2$ from $n=3$ and 4 were observed by Fawcett, Ridgeley, and Hughes (1979) between 8 and 11 Å by means of a laser-produced plasma. We used their results but substituted for their blended lines the more accurate predicted wavelengths of Edlén (1979) for $2p$–$3s$ and $2p$–$4s$ transitions. Fawcett et al. report a wavelength accuracy of better than 0.001 Å.

The $1s^2np$ and $1s^2nd$ levels with $n>4$ are from the observations of Boiko, Faenov, and Pikuz (1978) at ~7 Å with a laser-produced plasma. They report a measurement uncertainty of ±0.003 Å.

The levels above the ionization energy are from the analysis by Kononov, Koshelev, and Sidelnikov (1977). They obtained the spectrum at ~1.8 Å from the x-ray emitting hot spot in a low inductance spark discharge with a measurement uncertainty of ±0.0003 Å. The designations are obtained from Vainstein and Safronova (1978). Klapisch et al. (1977) reported two resonance lines from the $1s2s3p$ configuration.

The ionization energy was calculated by Edlén (1979).

References

Boiko, V. A., Faenov, A. Y., and Pikuz, S. A. (1978), J. Quant. Spectrosc. Radiat. Transfer **19**, 11.

Edlén, B. (1979), Phys. Scr. **19**, 255.

Fawcett, B. C., Ridgeley, A., and Hughes, T. P. (1979), Mon. Not. R. Astron. Soc. **188**, 365.

Klapisch, M., Schwob, J. L., Fraenkel, B. S., and Oreg. J. (1977), J. Opt. Soc. Am. **67**, 148.

Kononov, E. Y., Koshelev, K. N., and Sidelnikov, Y. V. (1977), Sov. J. Plasma Phys. **3**, 375

Vainstein, L. A., and Safronva, U. I. (1978), At. Data Nucl. Data Tables **21**, 49.

Widing, K. G., and Purcell, J. D. (1976), Astrophys. J. **204**, L151.

Fe XXIV

Configuration	Term	J	Level (cm^{-1})
$1s^2 2s$	^2S	½	0
$1s^2 2p$	$^2P°$	½	*392 000*
		3/2	*520 720*
$1s^2 3s$	^2S	½	9 271 700
$1s^2 3p$	$^2P°$	½	*9 379 000*
		3/2	*9 416 000*
$1s^2 3d$	^2D	3/2	9 460 000
		5/2	9 470 000
$1s^2 4s$	^2S	½	12 464 000
$1s^2 4p$	$^2P°$	½	*12 513 000*
		3/2	*12 525 000*
$1s^2 4d$	^2D	3/2	12 541 000
		5/2	12 546 000
$1s^2 5p$	$^2P°$	½,3/2	*13 949 000*
$1s^2 5d$	^2D	3/2	13 961 000
		5/2	13 965 000
$1s^2 6p$	$^2P°$	½,3/2	*14 734 000*

Fe XXIV–Continued

Configuration	Term	J	Level (cm^{-1})
$1s^2 6d$	^{2}D	$3/2$	*14 735 000*
		$5/2$	14 739 000
$1s^2 7p$	^{2}P°	$1/2,3/2$	*15 188 000*
$1s^2 7d$	^{2}D	$3/2,5/2$	15 209 000
Fe XXV ($^1S_0$)	***Limit***		**16 500 000**
$1s(^2S)2s2p(^3P°)$	^{4}P°	$3/2$	*53 390 000*
$1s(^2S)2s2p(^1P°)$	^{2}P°	$1/2$	*53 657 000*
		$3/2$	*53 752 000*
$1s2p^2$	^{4}P	$1/2$	53 806 000
		$3/2$	53 877 000
		$5/2$	53 937 000
$1s(^2S)2s2p(^3P°)$	^{2}P°	$1/2$	*53 844 000*
		$3/2$	*53 903 000*
$1s2p^2$	^{2}D	$3/2$	54 070 000
		$5/2$	54 126 000
$1s2p^2$	^{2}P	$1/2$	54 077 000
		$3/2$	54 244 000
$1s2p^2$	^{2}S	$1/2$	54 385 000
$1s2s(3s_1)3p$	$(1,1/2)°$	$1/2$	*62 790 000*
$1s2s(1s_0)3p$	$(0,1/2)°$	$1/2$	*62 970 000*
$1s2p3s$	^{2}P°	$3/2$	*63 209 000*
$1s2p(^3P°)3d$	^{4}D°	$3/2$	*63 281 000*
$1s2p3p$	^{2}D	$5/2$	63 543 000
$1s2p3p$	^{2}S	$1/2$	63 572 000
$1s2p3d$	^{2}F°	$7/2$	*63 618 000*

ENERGY LEVELS OF IRON

Fe XXV

$Z = 26$

He I isoelectronic sequence

Ground state: $1s^2\ ^1S_0$

Ionization energy = 71 203 200±2000 cm^{-1} (8828.14±0.25 eV)

Safronova (1981) has calculated the term values for the levels of this ion for $n=1$ and 2, taking into account the leading relativistic and radiative corrections. We have used her results, with an exception noted below, since they are at present probably more accurate than the measurements of the resonance lines occuring at ~1 Å. No estimate of uncertainty is made by Safronova. Her level uncertainty is probably about ±2000 cm^{-1}. Kononov, Koshelev, and Sidelnikov (1977) have measured the wavelengths of the $1s^2$–$1s2p\ ^1P_1^\circ$ and $^3P_1^\circ$ transitions with an estimated uncertainty of $\pm 3\times 10^{-4}$ Å. Their values are 1.8510 Å and 1.8592 Å respectively, compared with calculated values of 1.85048 Å and 1.85945 Å. A beam foil observation of the $1s2s\ ^3S_1$–$1s2p\ ^3P_2^\circ$ line by Buchet et al. (1981) gave a wavelength of 271.02±0.09 Å. The calculated value by Safronova is 270.929 Å. A new calculation of $1s2s\ ^3S_1$–$1s2p\ ^3P_{0,2}^\circ$ by DeSerio (1981) gives the values 428.594 Å and 271.350 Å for these transitions. We use the experimental value for the $^3S_1$–$^3P_2^\circ$ transition by Buchet et al. to set the value of $1s2p\ ^3P_2^\circ$ relative to $1s2s\ ^3S_1$.

For $n=3$ to 5 we give the calculated levels by Ermolaev and Jones (1974). These are obtained by subtracting their binding energies for the excited states from the binding energy of the ground state obtained by Safronova. The radiative corrections are reduced considerably with increasing n, which should bring the two calculations into closer agreement for $n>2$. Resonance transitions from $1s3p\ ^{1,3}P_1^\circ$ were observed by Klapisch et al. (1977) at 1.5738 Å and 1.5755 Å. Values from the present calculated levels are 1.5732 Å and 1.5750 Å.

The mixing coefficients for the $1snp\ ^{1,3}P$ levels were obtained from Ermolaev and Jones.

References

Buchet, J. P., Buchet-Poulizac, M. C., Denis, A., Desesquelles, J., and Druetta, M. (1981), Phys. Rev. **A23**, 3354.

DeSerio, R. (1981), Ph.D. Dissertation "The 2s–2p transitions in helium-like silicon, sulphur, and chlorine," Dept. of Physics, University of Chicago, Chicago, IL.

Ermolaev, A. M., and Jones, M. (1974), J. Phys. **B7**, 199.

Kononov, E. Y., Koshelev, K. N., and Sidelnikov, Y. V. (1977), Sov. J. Plasma Phys. **3**, 375.

Klapisch, M., Schwob, J. L., Fraenkel, B. S., and Oreg, J. (1977), J. Opt. Soc. Am. **67**, 148.

Safronova, U. I. (1981), Phys. Scr. **23**, 241.

Fe XXV

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$1s^2$	^1S	0	0			
$1s2s$	^3S	1	[53 527 100]			
$1s2p$	$^3P^\circ$	0	*[53 760 300]*			
		1	*[53 779 200]*	91	9	$^1P^\circ$
		2	*[53 896 100]*			
$1s2s$	^1S	0	[53 781 300]			
$1s2p$	$^1P^\circ$	1	*[54 040 000]*	91	9	$^3P^\circ$
$1s3s$	^3S	1	[63 421 600]			
$1s3p$	$^3P^\circ$	0	*[63 486 300]*			
		1	*[63 490 700]*	89	11	$^1P^\circ$
		2	*[63 525 700]*			
$1s3s$	^1S	0	[63 488 400]			
$1s3p$	$^1P^\circ$	1	*[63 565 500]*	89	11	$^3P^\circ$
$1s4s$	^3S	1	[66 847 000]			

Fe XXV–Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
1s4p	$^3P^\circ$	0	*[66 874 000]*			
		1	*[66 875 800]*	89	11	$^1P^\circ$
		2	*[66 890 600]*			
1s4s	^1S	0	[66 874 100]			
1s4p	$^1P^\circ$	1	*[66 906 800]*	89	11	$^3P^\circ$
1s5s	^3S	1	[68 423 700]			
1s5s	^1S	0	[68 437 200]			
1s5p	$^3P^\circ$	0	*[68 437 300]*			
		1	*[68 438 200]*	89	11	$^1P^\circ$
		2	*[68 445 800]*			
1s5p	$^1P^\circ$	1	*[68 454 000]*	89	11	$^3P^\circ$
Fe XXVI ($^2S_{1/2}$)	***Limit***		**71 203 200**			

ENERGY LEVELS OF IRON

Fe XXVI

$Z=26$

H I isoelectronic sequence

Ground state: $1s\ ^2S_{1/2}$

Ionization energy = 74 828 700±300 cm^{-1}(9277.65±0.04 eV)

The theoretical values calculated by Erikson for terms of this hydrogen-like ion are given below through $n=5$. The binding energy of the $1s$ electron is reported with an uncertainty of ±300 cm^{-1}; the levels measured from the ground state taken as zero will also have this uncertainty, although relative values should be better.

Lie and Elton (1971) observed the $1s-2p$ transition at 56 210 000 ± 160 000 cm^{-1} by using a spark discharge.

References

Erikson, G. W. (1977), J. Phys. Chem. Ref. Data **6**, 831.
Lie, T. N., and Elton, R. C. (1971), Phys. Rev. **A3**, 865.

Fe XXVI

Configuration	Term	J	Level (cm^{-1})
$1s$	^2S	½	0
$2p$	$^2P°$	½	[*56 070 500*]
		3/2	[*56 241 580*]
$2s$	^2S	½	[56 075 220]
$3p$	$^2P°$	½	[*66 510 790*]
		3/2	[*66 561 520*]
$3s$	^2S	½	[66 512 210]
$3d$	^2D	3/2	[66 561 420]
		5/2	[66 578 050]
$4p$	$^2P°$	½	[*70 157 890*]
		3/2	[*70 179 270*]
$4s$	^2S	½	[70 158 490]
$4d$	^2D	3/2	[70 179 240]
		5/2	[70 186 250]
$4f$	$^2F°$	5/2	[*70 186 240*]
		7/2	[*70 189 740*]
$5p$	$^2P°$	½	[*71 843 000*]
		3/2	[*71 853 940*]
$5s$	^2S	½	[71 843 310]
$5d$	^2D	3/2	[71 853 920]
		5/2	[71 857 510]
$5f$	$^2F°$	5/2	[*71 857 500*]
		7/2	[*71 859 300*]
$5g$	^2G	7/2	[71 859 290]
		9/2	[71 860 360]
	Limit		**74 828 700**

F. Atomic Transition Probabilities for Iron
(A Critical Data Compilation of Allowed Lines)

F. Atomic Transition Probabilities for Iron (A Critical Data Compilation of Allowed Lines)

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Atomic transition probabilities for the element iron in all stages of ionization have been critically evaluated and compiled. All available literature sources have been considered. Systematic trends along isoelectronic sequences have been exploited to predict oscillator strengths (f-values) whenever no data were available in the literature. The data are presented in separate tables for each element and stage of ionization and are arranged according to multiplets and, where appropriate, also according to transition arrays and increasing quantum numbers. For each line the transition probability for spontaneous emission, the absorption oscillator strength, and the line strength are given, along with the spectroscopic designation, the wavelength, the statistical weights, and the energy levels (when available) of the upper and lower atomic states. In addition, the estimated accuracy and the literature reference are indicated. In short introductions which precede the tables for each spectrum, the main justifications for the choice of the adopted data and for the accuracy ratings are discussed. A general introduction contains additional details on the evaluation procedure.

[Source: J. R. Fuhr, G. A. Martin, W. L. Wiese and S. M. Younger, J. Phys. Chem. Ref. Data **10**, 305 (1981)]

Note: The following tables of atomic transition probabilities for iron are excerpted from the recent critical compilation of atomic transition probabilities for iron, cobalt and nickel by Fuhr *et al.* cited above. In the interest of economy the general introduction to these tables is reprinted for this compilation in toto, without making any changes for the fact that only the iron tables are presented here. Since 80 to 90% of the introductory comments pertain to iron, the few remarks which address cases in nickel or cobalt should be disregarded.

TRANSITION PROBABILITIES FOR IRON

Contents

1. Introductory Remarks

This work represents the most recent installment in the NBS series of critical data compilations of atomic transition probabilities [1] for iron group elements. Earlier publications in this series covered forbidden transitions for these elements [1],[2] as well as allowed transitions for scandium and titanium [2] and for vanadium, chromium, and manganese [3]. As this publication goes to press, the earlier compilations are being updated and revised, and it is planned to assemble all this material into a comprehensive compilation of transition probabilities for the iron group elements. This is to be published in book form as Volume III of Atomic Transition Probabilities, in the same (NSRDS-NBS) series as the NBS data compilations for the first twenty elements [4,5].

The literature sources were taken from the bibliographies on atomic transition probabilities which have been published by this NBS data center [6]. In addition, the more recent literature has been taken from a master reference list which is maintained and continually updated in the data center. This material includes some as yet unpublished results which have been communicated to us by researchers in the field.

Inasmuch as iron and nickel (and, to a lesser extent, cobalt) are very important elements both astrophysically and as components in magnetic fusion devices, a large number of data sources are available. The literature on the first spectrum of iron is by far the most abundant of all species covered here. Fairly reliable experimental data are also available for neutral cobalt and nickel, as well as for the singly ionized species of iron and nickel. Beyond the second spectra, few or no reliable experimental data exist, although some results based on theoretical calculations have been published. For several intermediate stages of ionization no results have been tabulated here—either because of the lack of data or because we estimate the results to be of questionable reliability. A fair number of data are available for the higher stages of ionization, and it was possible to predict the oscillator strengths of additional transitions by means of interpolation procedures.

2. Method of Evaluation

In evaluating a source of data, one first considers the general accuracy and reliability of results produced by the theoretical or experimental method used. The next step is to ascertain whether and to what extent certain factors critical to that method have been accounted for in the particular work considered.

A detailed discussion of the critical factors relevant to each technique can be found in one of the earlier NBS data compilations [5]. Some examples of critical factors are the degree of self-absorption present in emission experiments, the presence of line blending and/or cascading in experimental determinations of radiative lifetimes of atomic states, and the mixing of quantum mechanical states in theoretical calculations due to configuration interaction and/or intermediate coupling. In experimental work these critical factors can, for example, be checked and corrected for by means of special tests, modeling, or modifications to the experimental apparatus which serve to minimize sources of systematic error, or they can at least be approximately accounted for in the uncertainty estimates. Improvements to theoretical calculations may entail the inclusion of additional terms in the atomic Hamiltonian and/or the augmentation of the basis set used in calculating wave functions and transition matrix elements.

In addition to evaluating the overall merits of the method applied, as well as allowances made for the pertinent critical factors, one can make judgments regarding the relative significance of those critical factors to the types of transitions treated. For example, certain experimental techniques are better suited to the determination of oscillator strengths for strong lines as opposed to weak ones, or vice versa; others may favor resonance lines over transitions between excited states. In theoretical calculations one expects relativistic effects to be more drastic for certain transitions than for others; likewise, correlation effects are highly dependent upon the complexity of the structure being studied. Thus even in cases where some critical factors have been neglected by an author (or have not been mentioned in the published work) we have nevertheless included the data in this compilation if the method used is considered to be fairly reliable for the types of transitions treated. In the more doubtful cases, however, we are necessarily more conservative with our error estimates.

The comparison of results obtained by different investigators has served as still another helpful technique in the evaluation process. This is particularly true whenever intercomparisons can be made among several sources of data for the transition(s) in common in order to pinpoint serious discrepancies more readily. Another instance is the comparison of sums of transition probabilities out of a common upper level to the reciprocal of the lifetime of that level as measured by an independent technique; in this manner it is possible, for example, to determine whether renormalization of an absolute scale is advisable. Another valuable analytical tool which has been exploited in the critical evaluation procedure is the degree of fit of

[1] Transition probabilities, oscillator strengths (f-values), and line strengths are equivalent quantities. The numerical relationships among these quantities are given in the conversion table (table 5) at the end of this introduction.

[2] Numbers in brackets indicate the literature references.

published results into established systematic trends along isoelectronic sequences of the lighter elements. Applied mainly to the higher ions, this technique becomes in essence an additional critical factor on which the accuracy of the data can be judged.

2.1. Review of Data Sources

Some general remarks on the selected sources of data are given below. A more detailed discussion can be found in the short introductions which accompany the tables for individual spectra.

2.1.1. Experimental Data Sources

The experimental data for iron, cobalt, and nickel are essentially limited to neutral and singly ionized species, as has been the case for other elements of the iron group. For these species the experimental material is the dominant source of information and is far superior to the existing theoretical data. Some additional experimental data are available for more highly ionized species, mainly in the form of lifetime measurements from beam-foil spectroscopy experiments. These data have contributed in an indirect way to this compilation, either by providing checks on theoretical data or by providing material for establishing systematic trends along isoelectronic sequences, which often yield interpolated f-values for highly ionized species.

Relative transition probability data have been supplied by emission experiments and, to a lesser extent, by absorption and anomalous dispersion ("hook") measurements. *Absolute* scales for these data have frequently been determined by experiments of a quite different kind, typically by determinations of atomic mean lives of a few important excited levels, such as lifetimes of the upper levels of resonance lines. It is thus convenient to discuss the experimental data sources for relative and absolute scales separately.

(a) *Relative transition probabilities.* The quantity that is directly measured in the emission, absorption, or hook techniques is proportional to the product of the transition probability and the population of the initial atomic state (i.e., the upper state in emission experiments and the lower state in absorption or hook experiments). Measurements are sometimes restricted to transitions originating from a single atomic state, as in the branching ratio technique. In such a case the population of the initial state is constant and does not enter into relative transition probability measurements. In other experiments, however, the determination of the relative populations of the various atomic states is one of the most critical problems. For the discharges or hot vapors involved, the existence of partial local thermodynamic equilibrium (PLTE), i.e., a Boltzmann distribution of excited atomic levels, may be assumed. Equilibrium criteria have indeed established that PLTE conditions for the excited atomic states hold for the typical experimental situation. But to relate the various level populations quantitatively, knowledge of the temperature is required—and these temperature measurements are often a source of considerable systematic uncertainty.

For the first spectrum of iron there are by far many more data available than for any other species compiled here. For this reason, and also because many of these data are the results of rather advanced experimental work, we feel that Fe I deserves a relatively detailed discussion.

The majority of the compiled data originate from two comprehensive emission experiments, both performed with stabilized arcs: May et al. [7] and Bridges and Kornblith [8] have measured a total of about 1500 fairly accurate f-values (with uncertainties in the 25–50% range), which represent nearly a third of the data tabulated in this compilation. The data overlap for about 170 transitions, and, with the exception of a few lines, the agreement between these two experiments is very good, as is clearly seen from figures 3, 4, and 5 of the Fe I introduction; for example, 84% of the data compared agree to within 25%. These figures also show that no systematic differences between the two sets of data are apparent when f-value ratios are plotted against wavelength (except for four ultraviolet lines, see fig. 3 of that introduction), log gf (intensity) (fig. 4), or upper energy level (fig. 5). (For a more detailed discussion, see the Fe I introduction.) While the two experiments are quite similar in conception, the technical approach used by Bridges and Kornblith is more advanced. In contrast to the photographic recording method used by May et al., the data acquisition technique of Bridges and Kornblith is based on photoelectric detection and digital data processing. Furthermore, the arc source used by the latter authors is equipped with a self-regulating system. Guided by signal monitors, the gas flows in the arc chamber are closely controlled by feedback circuits. When variations in the signals occur, valves are activated to self-stabilize the source. Furthermore, Bridges and Kornblith used a temperature measurement technique which minimized systematic uncertainties associated with the PLTE model. For their determination of the arc temperature, they utilized available lifetime data for about 40 different Fe I energy levels which span a wide range of excitation energies. May et al., in turn, normalized their relative data to the scale established by Bridges and Kornblith.

A third experiment of key importance for the Fe I spectrum is the absorption work of Blackwell et al. [9–11] with a precisely stabilized electric furnace. Their measurements represent a new level of sophistication in experimental f-value determinations of complex atoms. Precisions of about 0.5% have been obtained on a common relative scale for many of the measured lines. Their spectrometric detection system is fully computer-controlled and the data are processed online. Two spectrometers are employed to measure various line pairs, which are then linked together in loops through overlapping lines and are checked and adjusted for internal consistency. Their measurements are, however, limited to groups of lines originating either from low-lying levels or from levels of the ground term itself, so that only about 100 transitions could be treated.

Another important source of data are the "hook" measurements performed by Huber and co-workers [12–14]. In these experiments, an absorbing column of hot Fe atoms has been generated either in an electric furnace or in a shock tube. The shock heating technique could be used to study transitions from highly excited levels, while the electric furnace allowed the measurement of lines originating only from lower excited levels or from levels of the ground term. With shock heating, however, spectroscopic temperature measurements—which again involve the assumption of PLTE—sensitively affect the transition probability data. A comparison with the data of Bridges and Kornblith, illustrated in figure 1, shows an energy dependent trend (plotted here versus *lower* energy level), indicating a likely temperature error. It appears that the source of error lies with the Huber and Parkinson data, since Bridges and Kornblith have minimized their temperature measurement uncertainties by fitting their data to numerous independently determined lifetimes, as discussed earlier. On the other hand, the electric furnace work by Banfield and Huber covers a very limited range of energy levels, and the temperature measurements should be more precise. Thus one would not expect any energy dependent systematic errors, which is indeed borne out by the excellent agreement between their data and those of Bridges and Kornblith, shown in figure 2.

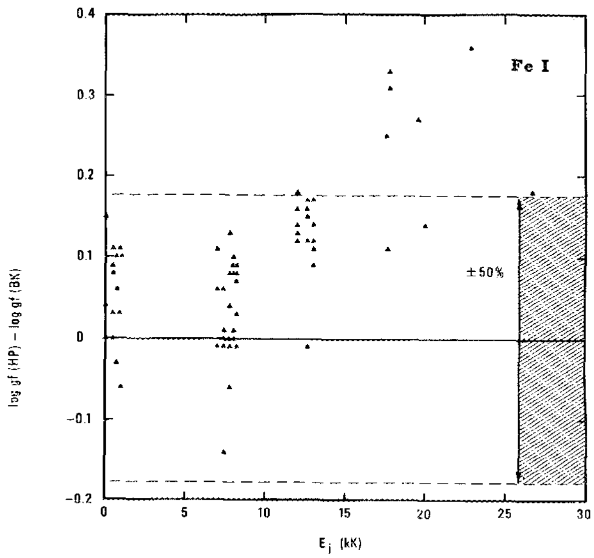

FIGURE 1. Plot of log gf (Huber and Parkinson [14])−log gf (Bridges and Ko- [8]) vs lower energy level.

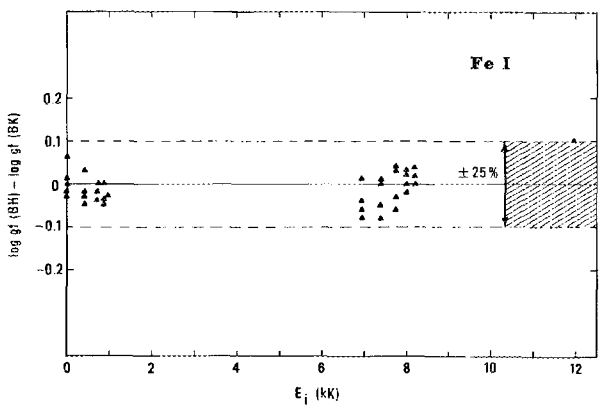

FIGURE 2. Plot of log gf (Banfield and Huber [12])−log gf (Bridges and Kornblith [8]) vs lower energy level.

Next to Fe I, the largest sets of experimental data exist for Ni I and Co I, consisting of approximately 280 and 220 lines, respectively. The selected sources of relative data for Ni I are the anomalous dispersion (hook) work (supplemented by a few weak lines measured by the absorption technique) by Huber and Sandeman [15] and branching ratio measurements by Lennard et al. [16] with a hollow cathode discharge. The two data sets are quite consistent, with three-fourths of the overlapping lines adhering to a common scale to within 25% or better. The data for Co I are from a similar group of experiments; the relative values are results of the hook measurements by Cardon and Smith [17] and the branching ratio technique of Whaling [18] with a hollow cathode discharge. As in the case of Ni I, the two sources of data are fully consistent.

Relative data for the singly ionized species are even less plentiful. Fairly reliable results exist for only about 130 lines of Fe II and are from the following sources: the emission experiments with wall-stabilized arcs by Bridges [19] and Baschek et al. [20]; the shock tube-emission work by Wolnik et al. [21]; the branching ratio measurements by Smith and Whaling [22] with a hollow cathode discharge; the hook experiment by Huber [13]; and the analysis of solar spectra by Blackwell et al. [23] and Phillips [24]. For Ni II, the principal source for the about 50 tabulated lines is the wall-stabilized arc experiment by Bell et al. [25]. For Co II, however, the scatter among the few available (and very limited) sets of experimental data is very large—up to factors of 10—and cannot be definitely traced to any particular source, so that no attempt to tabulate numerical material was made.

(b) *Absolute transition probabilities.* As noted earlier, in emission as well as absorption or hook experiments the quantity that is directly measured is proportional to the product of the transition probability and the initial atomic state population. To obtain absolute data the populations have to be determined on an absolute basis, which is far more complex and involves more-stringent assumptions (e.g., complete LTE) than do relative transition probability measurements, as discussed above. Consequently, the determination of absolute data by any of these approaches is subject to considerable additional uncertainties.

If, however, a *common* relative scale for the transition probabilities of a species is established, the conversion to an absolute basis can be accomplished by an independent absolute measurement for only one transition. Precision measurements for one or a few key lines of a spectrum—primarily resonance transitions—are indeed readily accomplished via atomic lifetime techniques. Thus in recent years the combination of lifetime measurements with one of the methods discussed earlier has emerged as a very useful approach for determining large numbers of absolute transition probabilities in a reliable manner. We have therefore converted relative transition probability data to an absolute scale via the results of lifetime measurements whenever possible.

Before reviewing the sources of lifetime data, we wish to point out that the lifetime method, while representing a conceptually straightforward time-decay measurement, is not without problems of its own. For example, some lifetime techniques are based on the nonselective excitation of atomic states, which leads to cascading effects due to the simultaneous excitation of higher feeder states and the associated lengthening of observed lifetimes. Another limitation is that lifetimes are inverse *sums* of transition probabilities, comprising all possible downward transitions from a given excited atomic state. For complex spectra such as those encountered here, these sums often involve many lines, and the relative transition probability data may be quite incomplete, thus precluding the utilization of lifetime measurements. For the first and second spectra of Fe, Co, and Ni, however, many of the available lifetime data could be utilized, since either the transition probability sums are complete or the missing terms are estimated to be small. Furthermore, a number of the data were obtained with selective excitation techniques, which are very accurate.

Especially for the upper level ($z\ ^5F^\circ_5$) of the Fe I resonance line 3720 Å, some very accurate lifetime data have been obtained, as seen in table 1. A large variety of techniques has been employed: the Hanle effect by Hilborn and de Zafra [26]; the delayed coincidence method by Klose [27]; the optical double resonance technique by Wagner and Otten [28]; and the high frequency deflection technique by Brzozowski et al. [29]. By including the contributions of weak lines originating from the $z\ ^5F_5^o$ level, we have converted these lifetimes to oscillator strengths, which are further supplemented by the precise atomic beam result of Bell and Tubbs [30]. Several other recent lifetime experiments have yielded data for highly excited levels of Fe I, but have not been directly utilized in this compilation since relative transition probability sums were incomplete. These data were, however, used as "upper-limit" checks on the compiled material and were found to be fully consistent with it.

The situation is similar for the other spectra: For Co I, the lifetime measurements by Figger et al. [31], who applied a laser to achieve selective level excitations, provide accurate absolute data which have been utilized to place the earlier cited relative transition probability data on an absolute scale. For Ni I, both the delayed coincidence method incorporating selective laser excitation and the Hanle-effect technique were used by Becker and co-workers [32,33] to determine the absolute scale, and in the case of Fe II, phase-shift lifetime mesurements by Assousa and Smith [34] served the same purpose.

TABLE 1. Selected lifetime oscillator strength data for the Fe I resonance level.

Reference	τ(ns) of the $z\ ^5F_5^o$ level	Oscillator strength of the 3719.93 Å line
Wagner and Otten [28]	59.5 ± 1.6	0.0425
Klose [27]	61.5 ± 0.4	0.0413
Hilborn and de Zafra [26]	63.2 ± 3.6	0.0400
Brzozowski et al. [29]	60.5 ± 1.5	0.0418
Bell and Tubbs [30]		0.041 ± 0.003

2.1.2. Theoretical Data Sources and Systematic Trends

As mentioned earlier, theoretically determined data for ions of iron are fairly abundant in the literature—at least in comparison with the corresponding ions of other iron group elements. Several sources include data for nickel ions as well, but references on cobalt are rather scarce. Thus while our earlier data compilations on scandium through manganese [2,3] relied very heavily on the interpolation or extrapolation of data from graphs of systematic trends of oscillator strengths along isoelectronic sequences, this approach did not constitute the principal means of providing tabulated data in the present work. Systematic trends were nevertheless utilized, both as an analytical tool in evaluating data and as a method of predicting f-values which were nonexistent in the literature. In cases where wavelengths of individual spectral lines were available but only multiplet oscillator strengths were reported in the literature or were derived by interpolation, we have derived f-values for the lines by decomposing the multiplet strength according to LS coupling—but only where we felt that this was a good approximation to the actual physical situation.

One phenomenon that manifests itself in the study of systematic trends along isoelectronic sequences is the change in the quantum character of eigenstates with increasing nuclear charge Z. This can, for example, lead to drastic variations in oscillator strengths, particularly for the member(s) of the sequence at (or nearest) which a designation interchange occurs. It may also result in increasingly greater values of the oscillator strength, as Z increases, for an intercombination line; such transitions are generally too weak to be observed in neutral and weakly ionized species of the light elements, but they may compete with transitions allowed in LS coupling in heavier species isoelectronic with those elements. In addition, it poses the problem of establishing a standard system of nomenclature for "mixed" eigenstates and raises the companion question of how a meaningful comparison of oscillator strength data along the sequence should be made. Because of the growing importance of this phenomenon with increasing nuclear charge, and in view of the magnitude of its effects as indicated in published theoretical work for iron group elements and beyond, this topic is discussed in more detail in section 2.2 below and thus will not be further elaborated on at this point.

We shall now turn to a brief review of the principal sources of theoretical data that have been selected for inclusion in this tabulation, or that have been major determining factors in arriving at our own predicted f-values.

Advanced techniques that have been used in calculating transition probabilities are the relativistic random phase approximation (RRPA), the multiconfiguration Dirac-Fock (MCDF) method, and the diverse variational approaches which allow for extensive configuration interaction and at least some relativistic effects.

Of the RRPA calculations reported for ions of iron group elements, the most advanced is that of Shorer [35] for resonance transitions in Ne-like ions, in which significant configuration interaction in the upper state was accounted for. Other sources using this same technique, but with a more limited configuration basis, include the work of Lin and co-workers [36–39] for Be-like and He-like ions, and that of Shorer et al. [40] for Mg-like species.

The (relativistic) MCDF technique has been applied by Cheng et al. [41] to the determination of f-values for all transitions of the type $2s^n2p^b$–$2s^{n-1}2p^{b+1}$ in isoelectronic sequences of Li through F. It has also been used by Cheng and Johnson [42,43] for Be-like and Mg-like species; Armstrong and co-workers [44,45] for Li, Be, and Ar sequences; Cheng and Kim [46] for Ne-like ions; and Kim and Desclaux [47] for Be-like ions. In addition, Kim and co-workers [47–49] have applied the single-configuration Dirac-Fock method to calculate f-values for the Li and Na sequences.

Comprehensive variational calculations incorporating a large number of configurations as well as relativistic effects have been reported by Glass [50–53] for Be-like ions and B-like Fe. Also, superposition-of-configurations (SOC) calculations have been carried out in intermediate coupling by Weiss [54,55] for ions of the Be, Mg, and Ar sequences; he has also determined multiplet f-values via the nonrelativistic SOC approach for the Al sequence [54,55]. The nonrelativistic multiconfiguration Hartree-Fock (MCHF) method has been used by Froese Fischer [56–59] to calculate multiplet oscillator strengths for the isoelectronic sequences of Na, Mg, and Al. The (nonrelativistic) non-closed shell many-electron theory (NCMET) was used by Sinanoglu and Beck [60] to predict one multiplet oscillator strength for Si-like ions. Also, the sophisticated nonrelativistic variational calculations of Weiss [61] for low ions of the He sequence enabled us to extrapolate oscillator strengths for a few multiplets in He-like Fe through Ni.

The scaled Thomas-Fermi (STF) approximation has been exploited in several transition probability calculations on iron-group elements. Of these, the most advanced are the multiconfiguration approaches, including relativistic effects, of Bely-Dubau et al. [62] for Li-like (Fe XXIV) satellite lines of He-like resonance lines and of Nussbaumer and Storey [63] for numerous transitions in Be-like species. Additional, somewhat less-sophisticated sources of data based on the STF method are the calculations of Nussbaumer and co-workers [64–67] for Cl- and Ne-like Fe and Ni, as well as Fe XIII and XXIII; Mason and co-workers [68,69] for Fe XI, XIV, and XXI; Kastner and co-workers [70–72] in Fe XIII, XV, and XIX, as well as Co XVI; Hayes [73] for Fe XXIV; both Biemont [74] and Kurucz and Peytremann [75] for Fe III and Ni III; and Warner and Kirkpatrick [76] for Fe VII and Co VIII.

In addition to the MCDF and MCHF calculations mentioned earlier, the results of several somewhat less-sophisticated Hartree-Fock (HF) approximations have been used. These include the intermediate coupling approaches, with limited allowance for configuration interaction, of Chapman and Shadmi [77] for F-like ions, of Shamey [78] for Be-like ions, and of Dankwort and Trefftz [79] for B-like ions; the Hartree-Fock-Pauli (HFP) approximations of Weiss [80] for the Li sequence, and of Bogdanovicius et al. [81] for Fe XIX; the single-configuration HF calculations of Biemont [82] and Tull et al. [83] for Na-like ions, and of Chapman [84] for Fe XXII and XXIII.

A number of Hartree-Fock calculations have incorporated empirical adjustments to radial integrals. This technique has been used in conjunction with Cowan's HX (Hartree-Fock with statistical exchange) and Hartree-XR (HX with relativistic effects) programs, with explicit allowance for configuration interaction in some cases, to calculate gf-values for many ions of Fe as well as a few of Ni: Fe VIII [85]; Fe IX–XV [86]; Fe X,XI [87]; Fe XI, Ni XIII, XIV [88]; Fe XII, XIII [89]; Fe XV [90]; Fe XVII [91]; Fe XVIII, XIX [92]; Fe XIX [93]; Fe XX [94]; Fe XXII, XXIII [95]; Fe XXIII, XXIV [96]; Fe XXIV [97]; and Ni XXV, XXVI [98]. The calculations of Blaha [99] for Fe XIV also utilized a semi-empirical Hartree-Fock approach.

A relativistic multiconfiguration parametric-potential method has been applied by Aymar and Luc-Koenig [100] to the calculation of f-values for the Mg sequence. A single-configuration parametric-potential calculation has been performed in intermediate coupling by Crance [101] for Ne-like ions.

The nuclear-charge (Z-)expansion approach has been applied by several authors to the determination of oscillator strengths for He-like ions: the "unified relativistic" calculations of Drake [102]; the method of Brown and Cortez [103] based on variational wave functions for low-Z ions; and the less sophisticated approach of Laughlin [104]. A nonrelativistic multiconfiguration Z-expansion calculation has been reported by Fox and Dalgarno [105] for a few multiplets involving doubly excited states in Li-like species. Z-expansion perturbation theory has been applied by Vainshtein and Safronova [106] to the determination of transition probabilities for He- and Li-like satellites to resonance lines in H- and He-like species, respectively. Froese Fischer [107] has used a "simulated Z-expansion technique" to parametrize transition integrals for numerous multiplets in the Na sequence.

A number of f-values for Li-like ions are the results of studies by Smith and Wiese [108] and Martin and Wiese [109] of systematic trends of oscillator strengths along the isoelectronic sequence.

Quite a few sources of theoretically derived data have been rejected by us in the course of our critical evaluation process. One source in particular contains f-value data for numerous transitions: the scaled Thomas-Fermi (STF) approximation of Kurucz and Peytremann [75] for the neutral atoms, as well as the singly to quadruply ionized species, of Fe-group elements. Their work has already been critically reviewed in a previous compilation [3], which included several graphical comparisons of the data of ref. [75] with the more reliable experimentally determined values. In view of the outcome of those comparisons, as well as the rather crude nature of the theoretical method used by Kurucz and Peytremann to calculate oscillator strengths for lines of the complex transition arrays found in Fe-group elements, we quote their results for only two of the spectra (Fe III and Ni III) covered in the present compilation.

2.2. Spectroscopic Designations and Electron Coupling

One of the recurring problems encountered in evaluating and compiling data for these tables was the assignment of spectroscopic designations to the upper and lower states of transitions. Spectroscopists have somewhat divided opinions on the subject. One possibility is to label a state according to the largest component of its (calculated) eigenvector, although this approach does not yield unique designations if there exist two or more states with a common leading component. Alternatively, the systematic behavior of wavelengths and intensities of a "given transition" along an isoelectronic sequence suggests that a common name be applied to the upper or lower state of all ions, regardless of changes in the quantum mechanical character of that state along the sequence.

There are problems which arise in both of these approaches. Certainly calculated eigenvectors provide a quantitative, and therefore supposedly more objective, framework on which to base decisions concerning nomenclature. The accuracy and reliability of results of such calculations, however, depends quite heavily on the theoretical or semi-empirical method used to produce them. (Even quite sophisticated theoretical approaches can yield erroneous results if applied to atomic or ionic systems in which two or more eigenstates are very nearly degenerate energetically.) The alternative approach of applying the same notation to a given state of all ions in an isoelectronic sequence, based on systematic trends in wavelengths and intensities of observed spectral lines, fails to recognize the true quantum character of the state in question. Changes in the eigenvector along the sequence may lead to a reversal of the dominant component in ions of nuclear charge Z beyond some minimum value Z_{min}. In some cases, moreover, a change in the coupling notation at some point in the sequence may be desirable.

In the process of evaluating and compiling transition probability data several problem areas related to the designation of energy levels and to changes in electron coupling come to light. It is particularly perplexing, for example, to find that calculated oscillator strengths, energy levels, and eigenvectors available from one source of data cannot be unequivocally matched with experimentally determined energy levels from another because of differences in nomenclature. Further difficulties arise whenever interpolation techniques are used to predict f-values for an ion which lies within an interval in the pertinent isoelectronic sequence where a change in the coupling scheme takes place. In such cases the uncertainties in calculated eigenvector components would probably be of such a magnitude as to preclude a definitive assignment. Certainly the interpolated f-values would have to be considered to be quite unreliable, and the pairing of such predicted oscillator strengths with particular spectroscopic designations could be misleading.

For the present compilation we have designated the eigenstates according to the dominant eigenvector component whenever such information was available and sufficiently unambiguous. For certain states of several species we have adopted notations such as J_1j

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and/or J_1l coupling if this constituted an improvement over the Russell-Saunders (LS) designation. This was particularly true for the Ne-like ions of Fe through Ni, for example, where the LS-coupling designations given by Loulergue and Nussbaumer [65] for the two $J = 1$ levels of the $2p^5 3s$ configuration in Fe XVII and Ni XIX were indicated by them to be representative of the corresponding levels in lower-Z ions. Their calculated eigenvectors for these levels in suggest that the names should be interchanged, but that the purity in LS coupling is rather low. A transformation to the J_1j-coupling scheme clearly demonstrates a significant improvement, as seen in table 2 below. The validity of such a transformation is borne out by

TABLE 2. Eigenvector components and percentage compositions from ref. [65] for $J = 1$ states of the $2p^5 3s$ configuration in Fe XVII.

	LS coupling		J_1j coupling	
	$^3P^o_1$	$^1P^o_1$	$(\frac{3}{2}, \frac{1}{2})^o$	$(\frac{1}{2}, \frac{1}{2})^o$
Lower state	0.679 (46%)	0.733 (54%)	0.991 (98%)	0.131 (2%)
Upper state	0.733 (54%)	−0.678 (46%)	−0.130 (2%)	0.990 (98%)

the calculations of Crance [101], who labeled the $2p^5ns$ ($n \geq 3$) states of these ions in J_1j-coupling notation (although he did not publish his calculated eigenvectors). Crance's calculated f-value data support this action as well, since in pure LS coupling the oscillator strength for a $^1S_0$–$^3P_1$ (i.e., intercombination) transition is zero, while Crance's results predict virtual equality of the f-values for transitions to the two $J = 1$ levels in Ne-like chromium.

One of the more striking examples in which the reported existence of state mixing influenced us in the preparation of this compilation was the evaluation of f-value data for resonance transitions to states of the $2p^4 3s$ and $2p^4 3d$ configurations of F-like ions. Oscillator strengths and eigenvectors were calculated by Chapman and Shadmi [77] for F-like Sc, Fe, and Cu. According to their results the purity of some states is less than 50%. In certain of those cases the same basis state constitutes the dominant component of two different eigenvectors, so that the corresponding levels cannot be labeled uniquely. In other cases a single basis state is distributed among so many eigenstates that no one level could be labeled as such. The mixing becomes more severe along the isoelectronic sequence, so that the interpolation of f-value data for F-like Co and Ni was a difficult undertaking.

An example of Chapman and Shadmi's published results is presented in table 3 below. Energy levels for $J = \frac{1}{2}$ states of the $2p^4 3d$ configuration are tabulated in ascending order for each of the

TABLE 3. Calculated energy levels and percentage compositions from ref. [77] for $J = \frac{1}{2}$ states of the $2p^4 3d$ configuration in F-like Sc, Fe, and Cu; also, f-values from the same source for resonance transitions to those states.

Energy level	Percentage compositions					f-values	
	$(^3P)^4D$	$(^3P)^2P$	$(^3P)^4P$	$(^1D)^2P$	$(^1D)^2S$	$\frac{3}{2}^a$–$\frac{1}{2}$	$\frac{1}{2}^b$–$\frac{1}{2}$
Sc XIII							
3900900	86					0.0019	9.0(−5)[c]
3935200			91			3.5(−6)	2.6(−4)
3947200		58		28		0.021	0.0016
4031700					92	2.4(−5)	0.088
4083200		33		61		0.031	0.43
Fe XVIII							
6775800	52	15	17			0.0089	2.7(−4)
6817300		17	64			0.0032	3.4(−4)
6856300	42	30		18		0.013	9.1(−4)
6967100					81	1.7(−4)	0.068
7040100		34		57		0.031	0.53
Cu XXI							
8768000	38	19	22			0.012	2.2(−4)
8817500		23	55	15		0.0043	4.6(−4)
8900000	57	21				0.0099	7.1(−4)
9031700			14		75	1.9(−4)	0.056
9123100		32		52		0.020	0.52

[a] $2p^5\ ^2P^o_{3/2}$

[b] $2p^5\ ^2P^o_{1/2}$

[c] The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

LS coupling and f-values for transitions from the ground-term levels ($2p^5\ ^2P^o_{1/2,3/2}$). (Chapman and Shadmi tabulated only the dominant eigenvector components for each state by terminating the process when at least 75% of the eigenstate was accounted for. Thus the sum of percentage compositions for any given eigenstate (row) or basis state (column) is in general less than 100%.) The only level that seems to be unambiguously identifiable for all three ions presented is the $(^1D)^2S$, although the f-value for the $3/2$–$1/2$ transition undergoes a rather drastic increase in the interval between Sc and Fe. Designation of the remaining states in Sc is rather straightforward, but in the case of Fe and Cu the average purity (i.e., the percentage of the largest component averaged over all levels) reduces to 59% and 55%, respectively. Intermixing is so severe that it is virtually impossible to predict oscillator strength data for Co and Ni by interpolating along the sequence. Predicted f-values have been tabulated in this compilation for a few of these transitions, but they must be considered rather uncertain. Even the published data for transitions to the $(^3P)^1D_{1/2}$ and $(^3P)^2P_{1/2}$ levels in F-like iron have been excluded—in the former case because of the relatively small difference (52% vs 42%) in $(^3P)^1D$ character between two of the eigenvectors, and in the latter because of the lack of any one eigenvector containing a significant percentage of $(^3P)^2P$ character. A similar but somewhat more intricate situation is found for the levels of the $2p^43d$ configuration having $J = 3/2$ and $J = 5/2$, since each eigenvector contains eight basis states and (in some cases significant) mixing with states of the $2s2p^53p$ configuration is indicated. Transformation of Chapman and Shadmi's calculated eigenvectors to another basis set resulted in significant improvements in the purities of only a few levels, while others became more diluted, so that the overall advantage was questionable at best. Additional difficulties arose in attempting to match observed wavelengths for these transitions with the calculated ones, since the energy levels are fairly closely spaced and the relative positions determined by theory may be in error. A result of the totality of problems and uncertainties involved in the study of high ions in the fluorine isoelectronic sequence is the possibility of considerable error in our tabulated results, which is reflected in the accuracy ratings, and the essentially inevitable exclusion of possible oscillator strength data for many transitions at this time.

This rather extensive discussion of the Ne-like and F-like ions is not intended as a criticism of the work of the authors referenced herein, but rather as an exposition of some of the peripheral factors that enter into the evaluation and compilation of transition probability data—particularly for heavier species, where relativistic (such as spin-orbit) effects begin to play an important role. It is hoped that, in the future, producers of theoretical f-value data will accompany their published results with as much information as possible (especially eigenvector components!) so that evaluators can make better and informed judgments as to the suitability of including such f-value data in compilations of this type.

Probably the most outstanding presentation of eigenvector data relevant to this compilation is the work of Shorer [35] on the Ne sequence. He provides graphs of percentage compositions in LS, and J_1l coupling for the $J = 1$ levels of the configurations $2p^53s$ $2p^53d$. (For the sake of convenience, he also supplies matrices of transformation coefficients indicating the relationships among these three pure coupling schemes.) Thus the reader can see at a glance how the electronic coupling varies along the isoelectronic sequence, and particularly how it is affected in regions of significant level-crossing-induced configuration interaction. This mode of presentation, together with the relatively high level of sophistication of the f-value calculations and the detailed comparison of results according to the size of the various configuration bases used, could be considered as a model.

3. General Arrangement of the Tables

The same general format has been maintained throughout the series of NBS compilations [1–5]. For the more complex spectra, we have omitted the transition array column, and the multiplet designation scheme introduced by Moore [110–112], which labels the terms with lower case letters ($a,b,c, \ldots ,x,y,z$), has been used to identify the upper and lower states of a transition. In some special cases, we have designated the transition, where appropriate, in a coupling scheme other than Russell-Saunders (LS), such as the J_1j coupling encountered in Ne-like ions and J_1j or J_1l coupling for Ar-like species.

The major sources of wavelength and energy level data are the tables of Moore [110–112], Kelly and Palumbo [113], and Reader and Sugar [114]. For some spectra, particularly for the highly ionized species, few or no data were available from these sources. We thus had to search through the literature on these species to obtain the appropriate data. To this end, the bibliographies on atomic energy levels and spectra [115] were quite helpful. In addition, we made use of the facilities of the NBS Data Center on Atomic Energy Levels in locating the most recent sources of original data. All sources of wavelengths and energy levels other than refs. [110] through [114] which have been used in this compilation are given in table 4.

In the main tables, calculated or extrapolated energy levels are enclosed in square brackets, as are experimentally derived energy levels which are uncertain with respect to the ground state. The same is true of wavelengths that have been calculated from energy level differences rather than obtained from experiment.

TABLE 4. Special source material for wavelength and energy level data. Complete citations are given below.

Spectrum	Reference	Spectrum	Reference	Spectrum	Reference
Fe I	1	Fe XIII	5,11,12,13,14	Fe XXIII	37,36,37,38,39,40,41
Fe II	2	Fe XV	5,12,15	Fe XXIV	39,42,43,44,45,46
Fe VII	3	Fe XVII	16,17,18,19,20	Fe XXV	47,48
Fe VIII	4	Fe XVIII	21,22,23,26	Co VIII	49
Fe IX	5,6,7	Fe XIX	24,25,26,27,28	Co X	50
Fe X	5,8,9	Fe XX	24,27,29,30	Co XIV	12,51,52
Fe XI	5,9,10	Fe XXI	27,29,31,32,33,34	Co XVI	12,53,54
Fe XII	5,11	Fe XXII	27,29,35,36,37	Co XVII	53,55

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TABLE 4. Special source material for wavelength and energy level data. Complete citations are given below.—Continued

Spectrum	Reference	Spectrum	Reference	Spectrum	Reference
Co XIX	21,56	Ni II	61	Ni XXI	24,27,57
Co XX	24,27,57	Ni XV	12,51,52	Ni XXII	27,56
Co XXI	27,56,57	Ni XVI	53	Ni XXIII	27,58
Co XXII	27,58	Ni XVII	12,53	Ni XXIV	27,59
Co XXIII	27,59	Ni XVIII	53,55	Ni XXV	27,38,39
Co XXIV	27,38	Ni XIX	17,18,19,62,63	Ni XXVI	39,47,64
Co XXV	27,47,60	Ni XX	56	Ni XXVII	47,48
Co XXVI	47,48				

[1] Crosswhite, H. M., J. Res. Nat. Bur. Stand., Sect. A **79**, 17 (1975).
[2] Johansson, S., Phys. Scr. **18**, 217 (1978).
[3] Cady, W. M., Phys. Rev. **43**, 322 (1933).
[4] Feldman, U., and Fraenkel, B. S., Astrophys. J. **145**, 959 (1966).
[5] Fawcett, B. C., Cowan, R. D., Kononov, E. Y., and Hayes, R. W., J. Phys. B **5**, 1255 (1972).
[6] Jordan, C., Space Sci. Rev. **13**, 595 (1972).
[7] Svensson, L. A., Ekberg, J. O., and Edlen, B., Sol. Phys. **34**, 173 (1974).
[8] Smitt, R., Sol. Phys. **51**, 113 (1977).
[9] Bromage, G. E., Cowan, R. D., and Fawcett, B. C., Phys Scr. **15**, 177 (1977).
[10] Fawcett, B. C., Peacock, N. J., and Cowan, R. D., J. Phys. B **1**, 295 (1968).
[11] Bromage, G. E., Cowan, R. D., and Fawcett, B. C., Mon. Not. R. Astron. Soc. **183**, 19 (1978).
[12] Kastner, S. O., Swartz, M., Bhatia, A. K., and Lapides, J., J. Opt. Soc. Am. **68**, 1558 (1978).
[13] Behring, W. E., Cohen, L., Feldman, U., and Doschek, G. A., Astrophys. J. **203**, 521 (1976).
[14] Fawcett, B. C., J. Phys. B **4**, 1577 (1971).
[15] Cowan, R. D., and Widing, K. G., Astrophys. J. **180**, 285 (1973).
[16] Fawcett, B. C., Bromage, G. E., and Hayes, R. W., Mon. Not. R. Astron. Soc. **186**, 113 (1979).
[17] Parkinson, J. H., Sol. Phys. **42**, 183 (1975).
[18] Loulergue, M., and Nussbaumer, H., Astron. Astrophys. **45**, 125 (1975).
[19] Kastner, S. O., Behring, W. E., and Cohen, L., Astrophys. J. **199**, 777 (1975).
[20] Hutcheon, R. J., Pye, J. P., and Evans, K. D., Mon. Not. R. Astron. Soc. **175**, 489 (1976).
[21] Feldman, U., Doschek, G. A., Cowan, R. D., and Cohen, L., J. Opt. Soc. Am. **63**, 1445 (1973).
[22] Feldman, U., Doschek, G. A., Nagel, D. J., Behring, W. E., and Cohen, L., Astrophys. J. **183**, L43 (1973).
[23] Chapman, R. D., and Shadmi, Y., J. Opt. Soc. Am. **63**, 1440 (1973).
[24] Fawcett, B. C., At. Data Nucl. Data Tables **16**, 135 (1975).
[25] Bromage, G. E., and Fawcett, B. C., Mon. Not. R. Astron. Soc. **178**, 591 (1977).
[26] Bromage, G. E., Fawcett, B. C., and Cowan, R. D., Mon. Not. R. Astron. Soc. **178**, 599 (1977).
[27] Cheng, K. T., Kim, Y.-K., and Desclaux, J. P., At. Data Nucl. Data Tables **24**, 111 (1979).
[28] Kastner, S. O., Bhatia, A. K., and Cohen, L., Phys. Scr. **15**, 259 (1977).
[29] Kononov, E. Ya., Koshelev, K. N., Podobedova, L. I., Chekalin, S. V., and Churilov, S. S., J. Phys. B **9**, 565 (1976).
[30] Bromage, G. E., and Fawcett, B. C., Mon. Not. R. Astron. Soc. **179**, 683 (1977).
[31] Doschek, G. A., Feldman, U., Dere, K. P., Sandlin, G. D., Van Hoosier, M. E., Brueckner, G. E., Purcell, J. D., and Tousey, R., Astrophys. J. **196**, L83 (1975).
[32] Widing, K. G., Astrophys. J. **222**, 735 (1978).
[33] Bromage, G. E., and Fawcett, B. C., Mon. Not. R. Astron. Soc. **178**, 605 (1977).
[34] Mason, H. E., Doschek, G. A., Feldman, U., and Bhatia, A. K., Astron. Astrophys. **73**, 74 (1979).
[35] Sharney, L. J., J. Opt. Soc. Am. **61**, 942 (1971).
[36] Chapman, R. D., Astrophys. J. **156**, 87 (1969).
[37] Bromage, G. E., Cowan, R. D., Fawcett, B. C., and Ridgeley, A., J. Opt. Soc. Am. **68**, 48 (1978).
[38] Boiko, V. A., Pikuz, S. A., Safronova, U. I., and Faenov, A. Ya., J. Phys. B **10**, 1253 (1977).
[39] Fawcett, B. C., Ridgeley, A., and Hughes, T. P., Mon. Not. R. Astron. Soc. **188**, 365 (1979).
[40] Widing, K. G., Astrophys. J. **197**, L33 (1975).
[41] Kastner, S. O., Neupert, W. M., and Swartz, M., Astrophys. J. **191**, 261 (1974).
[42] Widing, K. G., and Purcell, J. D., Astrophys. J. **204**, L151 (1976).
[43] Aglitskii, E. V., Boiko, V. A., Pikuz, S. A., and Faenov, A. Ya., Lebedev Phys. Inst., Preprint No. 56, Moscow (1974) as referenced in: Boiko, V. A., Faenov, A. Ya., and Pikuz, S. A., J. Quant. Spectrosc. Radiat. Transfer **19**, 11 (1978).
[44] Kononov, E. Ya., Koshelev, K. N., and Sidel'nikov, Yu. V., Sov. J. Plasma Phys. **3**, 375 (1977).
[45] Grineva, Yu. I., Karev, V. I., Korneev, V. V., Krutov, V. V., Mandel'shtam, S. L., Vainshtein, L. A., Vasilyev, B. N., and Zhitnik, I. A., Sol. Phys. **29**, 441 (1973).
[46] Bely-Dubau, F., Gabriel, A. H., and Volonte, S., Mon. Not. R. Astron. Soc. **186**, 405 (1979).
[47] Vainshtein, L. A., and Safronova, U. I., At. Data Nucl. Data Tables **21**, 49 (1978).
[48] Ermolaev, A. M., and Jones, M., J. Phys. B **7**, 199 (1974) and supplement.
[49] Alexander, E., Feldman, U., Fraenkel, B. S., and Hoory, S., J. Opt. Soc. Am. **56**, 651 (1966).
[50] Goldsmith, S., J. Opt. Soc. Am. **59**, 1678 (1969).
[51] Fawcett, B. C., and Hayes, R. W., J. Phys. B **5**, 366 (1972).
[52] Svensson, L. A., Sol. Phys. **18**, 232 (1971).
[53] Fawcett, B. C., Cowan, R. D., and Hayes, R. W., J. Phys. B **5**, 2143 (1972).
[54] Kastner, S. O., and Bhatia, A. K., J. Opt. Soc. Am. **69**, 1391 (1979).
[55] Tull, C. E., McEachran, R. P., and Cohen, M., At. Data **3**, 169 (1971).

[56] Doschek, G. A., Feldman, U., Cowan, R. D., and Cohen, L., Astrophys. J. **188**, 417 (1974).
[57] Doschek, G. A., Feldman, U., Davis, J., and Cowan, R. D., Phys. Rev. A **12**, 980 (1975).
[58] Feldman, U., Doschek, G. A. Cowan, R. D., and Cohen, L., Astrophys. J. **196**, 613 (1975).
[59] Doschek, G. A., Feldman, U., and Cohen, L., J. Opt. Soc. Am. **65**, 463 (1975).
[60] Safronova, U. I., J. Quant. Spectrosc. Radiat. Transfer **14**, 251 (1974).
[61] Shenstone, A. G., J. Res. Nat. Bur. Stand., Sect. A **74**, 801 (1970).
[62] Swartz, M., Kastner, S., Rothe, E., and Neupert, W., J. Phys. B **4**, 1747 (1971).
[63] Feldman, U., and Cohen, L., Astrophys. J. **149**, 265 (1967).
[64] Sandlin, G. D., Brueckner, G. E., Scherrer, V. E., and Tousey, R., Astrophys. J. **205**, 147 (1976).

We have again classified the uncertainties in the atomic transition probability data with the same notation used in our earlier compilations, i.e.,

A . . . . for uncertainties within 3 percent,[3]
B . . . . for uncertainties within 10 percent,
C . . . . for uncertainties within 25 percent,
D . . . . for uncertainties within 50 percent,
E . . . . for uncertainties greater than 50 percent.

The word *uncertainty* is used here with the connotation "estimated extent of the deviation from the true value." The estimation procedure is based on our evaluation of random errors as well as our estimates of the maximum effect of possible systematic errors (see sec. 2). We have often made a further differentiation in the classification scheme by assigning plus or minus signs to some transitions to indicate that these lines are estimated to be somewhat better or worse than similar lines. These should therefore be the first or last choice among similar transitions.

A summary of the abbreviations and special symbols used in the tables is given in section 4. Also, for convenience, we have included the relations between line and multiplet values in the case of LS coupling. In table 5, we provide a table of conversion factors which we have used throughout this compilation to convert from transition probabilities to oscillator strengths and line strengths, and vice versa.

TABLE 5. Conversion factors

The factor in each box converts by multiplication the quantity above it into the one at its left.

	A_{ki}	f_{ik}	S
A_{ki}	1	$\frac{6.670_2 \times 10^{15}}{\lambda^2}\frac{g_i}{g_k}$	$\frac{2.026_1 \times 10^{18}}{g_k\lambda^3}$
f_{ik}	$1.4992 \times 10^{-16}\,\frac{\lambda^2 g_k}{g_i}$	1	$\frac{303.7_6}{g_i\lambda}$
S	$4.935_5 \times 10^{-19}\, g_k\lambda^3$	$3.292_1 \times 10^{-3}\, g_i\lambda$	1

The line strength is given in atomic units, which are $a_0^2e^2 = 7.188_4 \times 10^{-59}\ m^2C^2$ for electric dipole transitions. The transition probability is in units s^{-1}, and the f-value is dimensionless. The wavelength λ is given in angström units, and g_i and g_k are the statistical weights of the lower and upper state, respectively. For the atomic constants entering into the relations, we have used the recommendations of the CODATA Task Group on Fundamental Constants (J. Phys. Chem. Ref. Data **2**, 663 (1973)).

[3] No transition probabilities of "A" accuracy are reported in this compilation.
[4] In keeping with the tradition in this field, we have tabulated the spectroscopic quantities in customary units rather than in SI units; e.g., energy levels are expressed in their equivalence in cm^{-1}.

4. Key to Abbreviations and Symbols Used in the Tables[4]

1. Symbols for indication of accuracy:

A . . . . uncertainties within 3 percent,[3]
B . . . . uncertainties within 10 percent,
C . . . . uncertainties within 25 percent,
D . . . . uncertainties within 50 percent,
E . . . . uncertainties greater than 50 percent.

2. Abbreviations appearing in the source column of allowed transitions:

ls = LS-coupling rules applied

n = normalized to a scale different than that of the author (as explained in the introductory remarks to the pertinent spectrum)

interp. = derived by an interpolation technique, rather than taken directly from the literature

3. Special symbols used in the wavelength and energy level columns:

The number in parentheses under the multiplet designation refers to the running number of ref. [110] (Revised Multiplet Table). If letters "uv" are added, we refer to the running number of ref. [111] (Ultraviolet Multiplet Table).

Numbers in italics indicate multiplet values, i.e., weighted averages of *line* values.

Numbers in square brackets indicate approximate calculated or extrapolated values.

Useful Relations

(A) Statistical Weights:

The statistical weights are related to the inner quantum number J_L (for one-electron spectra: j_L) of a level (i.e., initial or final state of a *line*) by

$$g_L = 2J_L + 1,$$

and to the quantum numbers of a term (initial or final state of a *multiplet*) by

$$g_M = (2L + 1)(2S + 1).$$

(The "multiplet" values g_M may also be obtained by summing over all possible "line" values g_L. S is the resultant spin.)

(B) Relations between the strengths of lines and the total multiplet strength:

1. Line strength S:

$$S(i,k) = \sum_{J_i J_k} S(J_i,J_k)$$

or

$$S(\text{Multiplet}) = \sum S(\text{line})$$

(k denotes the upper and i the lower term).

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2. Absorption oscillator strength f_{ik}:

$$f_{ik}^{\text{multiplet}} = \frac{1}{\lambda_{ik} \sum_{J_i} (2J_i + 1)} \sum_{J_i J_k} (2J_i + 1) \times \lambda(J_i J_k) \times f(J_i J_k).$$

The mean wavelength for the multiplet, $\overline{\lambda}_{ik}$, may be obtained the *weighted* energy levels. Often the wavelength differences for the lines within a multiplet are small, so that the wavelength factors may be neglected.

3. Transition probability A_{ki}:

$$A_{ki}^{\text{multiplet}} = \frac{1}{(\lambda_{ik})^3 \sum_{J_k} (2J_k + 1)} \sum_{J_i J_k} (2J_k + 1) \times \lambda(J_i J_k)^3 \times A(J_i J_k).$$

Relative strengths $S(J_i J_k)$ of the components of a multiplet are listed for the case of *LS* coupling in Allen, C. W., *Astrophysical Quantities*, 3rd Ed. (The Athlone Press, London, 1973); White, H. E., and Eliason, A. Y., Phys. Rev. **44**, 753 (1933); Shore, B. W., and Menzel, D. H., *Principles of Atomic Structure*, p. 447 (John Wiley & Sons, Inc., New York, 1968); Goldberg, L., Astrophys. J. **82**, 1 (1935) and **84**, 11 (1936).

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5. References

[1] Smith, M. W., and Wiese, W. L., J. Phys. Chem. Ref. Data **2**, 85 (1973).
[2] Wiese, W. L., and Fuhr, J. R., J. Phys. Chem. Ref. Data **4**, 263 (1975).
[3] Younger, S. M., Fuhr, J. R., Martin, G. A., and Wiese, W. L., J. Phys. Chem. Ref. Data **7**, 495 (1978).
[4] Wiese, W. L., Smith, M. W., and Glennon, B. M., Atomic Transition Probabilities—Hydrogen through Neon (A Critical Data Compilation), Vol. I, 157 pp., Nat. Stand. Ref. Data Ser., Nat. Bur. Stand. (U.S.), 4 (May 1966).
[5] Wiese, W. L., Smith, M. W., and Miles, B. M., Atomic Transition Probabilities—Sodium through Calcium (A Critical Data Compilation), Vol. II, 306 pp., Nat. Stand. Ref. Data Ser., Nat. Bur. Stand. (U.S.), 22 (Oct. 1969).
[6] Fuhr, J. R., Miller, B. J., and Martin, G. A., Bibliography on Atomic Transition Probabilities (1914 through October 1977), 283 pp., Nat. Bur. Stand. (U.S.), Spec. Publ. 505 (April 1978); Miller, B. J., Fuhr, J. R., and Martin, G. A., Bibliography on Atomic Transition Probabilities (November 1977 through March 1980), Nat. Bur. Stand. (U.S.), Spec. Publ. 505, Suppl. 1 (Aug. 1980).
[7] May, M., Richter, J., and Wichelmann, J., Astron. Astrophys. Suppl. Ser. **18**, 405 (1974).
[8] Bridges, J. M., and Kornblith, R. L., Astrophys. J. **192**, 793 (1974).
[9] Blackwell, D. E., Ibbetson, P. A., Petford, A. D., and Shallis, M. J., Mon. Not. R. Astron. Soc. **186**, 633 (1979).
[10] Blackwell, D. E., Ibbetson, P. A., Petford, A. D., and Willis, R. B., Mon. Not. R. Astron. Soc. **177**, 219 (1976).
[11] Blackwell, D. E., Petford, A. D., and Shallis, M. J., Mon. Not. R. Astron. Soc. **186**, 657 (1979).
[12] Banfield, F. P., and Huber, M. C. E., Astrophys. J. **186**, 335 (1973).
[13] Huber, M. C. E., Astrophys. J **190**, 237 (1974).
[14] Huber, M. C. E., and Parkinson, W. H., Astrophys. J. **172**, 229 (1972).
[15] Huber, M. C. E., and Sandeman, R. J., Astron. Astrophys. **86**, 95 (1980).
[16] Lennard, W. N., Whaling, W., Scalo, J. M., and Testerman, L., Astrophys. J. **197**, 517 (1965).
[17] Cardon, B. L., and Smith, P. L., private communication with preliminary data (1978) (to be published jointly with ref. [18]).
[18] Whaling, W., private communication with preliminary data (1978) (to be published jointly with ref. [17]).
[19] Bridges, J. M., Contributed Papers—International Conference on Phenomena in Ionized Gases, 11th, 418, Ed. Stoll, I., Czech. Acad. Sci., Inst. Phys., Prague, Czech. (1973).
[20] Baschek, B., Garz, T., Holweger, H., and Richter, J., Astron. Astrophys. **4**, 229 (1970).
[21] Wolnik, S. J., Berthel, R. O., and Wares, G. W., Astrophys. J. **166**, L31 (1971).
[22] Smith, P. L., and Whaling, W., Astrophys. J. **183**, 313 (1973).
[23] Blackwell, D. E., Shallis, M. J., and Simmons, G. J. Astron. Astrophys. **81**, 340 (1980).
[24] Phillips, M. M., Astrophys. J. Suppl. Ser. **39**, 377 (1979).
[25] Bell, G. D., Paquette, D. R., and Wiese, W. L., Astrophys. J. **143**, 559 (1966).
[26] Hilborn, R. C., and de Zafra, R., Astrophys. J. **183**, 347 (1973).
[27] Klose, J. Z., Astrophys. J. **165**, 637 (1971).
[28] Wagner, R., and Otten, E. W., Z. Phys. **220**, 349 (1969).
[29] Brzozowski, J., Erman, P., Lyyra, M., and Smith, W. H., Phys. Scr. **14**, 48 (1976).
[30] Bell, G. D., and Tubbs, E. F., Astrophys. J. **159**, 1093 (1970).
[31] Figger, H., Heldt, J., Siomos, K., and Walther, H., Astron. Astrophys. **43**, 389 (1975).
[32] Becker, U., Kerkhoff, H., Schmidt, M., and Zimmermann, P., private communication (1980).
[33] Becker, U., Göbel, L. H., and Klotz, W.-D., Astron. Astrophys. **33**, 241 (1974).
[34] Assousa, G. E., and Smith, W. H., Astrophys. J. **176**, 259 (1972).
[35] Shorer, P., Phys. Rev. A **20**, 642 (1979).
[36] Lin, C. D., and Johnson, W. R., Phys. Rev. A **15**, 1046 (1977).
[37] Johnson, W. R., and Lin, C. D., Phys. Rev. A **14**, 565 (1976).
[38] Lin, C. D., Johnson, W. R., and Dalgarno, A., Phys. Rev. A **15**, 154 (1977).
[39] Lin, C. D., Johnson, W. R., and Dalgarno, A., Astrophys. J. **217**, 1011 (1977).
[40] Shorer, P., Lin, C. D., and Johnson, W. R., Phys. Rev. A **16**, 1109 (1977).
[41] Cheng, K. T., Kim, Y.-K., and Desclaux, J. P., At. Data Nucl. Data Tables **24**, 111 (1979).
[42] Cheng, K. T., and Johnson, W. R., Phys. Rev. A **15**, 1326 (1977).
[43] Cheng, K. T., and Johnson, W. R., Phys. Rev. A **16**, 263 (1977).

[44] Armstrong, L., Jr., Fielder, W. R., and Lin, D. L., Phys. Rev. A **14**, 1114 (1976).
[45] Lin, D. L., Fielder, W. Jr., and Armstrong, L., Jr., Phys. Rev. A **16**, 589 (1977).
[46] Cheng, K. T., and Kim, Y.-K., Argonne National Laboratory Report ANL-78-65, 168 (1978).
[47] Kim, Y.-K., and Desclaux, J. P., Phys. Rev. Lett. **36**, 139 (1976).
[48] Kim., Y.-K., and Cheng, K.-T., J. Opt. Soc. Am. **68**, 836 (1978).
[49] Kim., Y.-K., private communication.
[50] Glass, R., J. Phys. B **12**, 689 (1979).
[51] Glass, R., J. Phys. B **12**, 697 (1979).
[52] Glass, R., J. Phys. B **13**, 15 (1980).
[53] Glass, R., J. Phys. B **13**, 899 (1980).
[54] Weiss, A. W., *Beam-Foil Spectroscopy*, Vol. 1, 51–68 (Eds. Sellin, I. A., Pegg, D. J., Plenum Press, New York, 1976).
[55] Weiss, A. W., private communication.
[56] Froese Fischer, C., *Beam-Foil Spectroscopy*, Vol. 1, 69–76 (Eds. Sellin, I. A., and Pegg, D. J., Plenum Press, New York, 1976).
[57] Froese Fischer, C., J. Opt. Soc. Am. **69**, 118 (1979).
[58] Froese Fischer, C., Can. J. Phys. **54**, 740 (1976).
[59] Froese Fischer, C., Can. J. Phys. **56**, 983 (1978).
[60] Sinanoglu, O., and Beck, D. R., Chem. Phys. Lett. **24**, 20 (1974).
[61] Weiss, A. W., J. Res. Nat. Bur. Stand., Sect. A **71**, 163 (1967).
[62] Bely-Dubau, F., Gabriel, A. H., and Volonte, S., Mon. Not. R. Astron. Soc. **186**, 405 (1979).
[63] Nussbaumer, H., and Storey, P. J., J. Phys. B **12**, 1647 (1979).
[64] Nussbaumer, H., Astron. Astrophys. **48**, 93 (1976).
[65] Loulergue, M., and Nussbaumer, H., Astron. Astrophys. **45**, 125 (1975).
[66] Flower, D. R., and Nussbaumer, H., Astron. Astrophys. **31**, 353 (1974).
[67] Nussbaumer, H., Astron. Astrophys. **16**, 77 (1972).
[68] Mason, H. E., Mon. Not. R. Astron. Soc. **170**, 651 (1975).
[69] Mason, H. E., Doschek, G. A., Feldman, U., and Bhatia, A. K., Astron. Astrophys. **73**, 74 (1979).
[70] Kastner, S. O., Swartz, M., Bhatia, A. K., and Lapides, J., J. Opt. Soc. Am. **68**, 1558 (1978).
[71] Kastner, S. O., Bhatia, A. K., and Cohen, L., Phys. Scr. **15**, 259 (1977).
[72] Kastner, S. O., and Bhatia, A. K., J. Opt. Soc. Am. **69**, 1391 (1979).
[73] Hayes, M. A., Mon. Not. R. Astron. Soc. **189**, 55P (1979).
[74] Biemont, E., J. Quant. Spectrosc. Radiat. Transfer **16**, 137 (1976).
[75] Kurucz, R. L., and Peytremann, E., Smithsonian Astrophysical Observatory Special Report 362 (1975).
[76] Warner, B., and Kirkpatrick, R., Mon. Not. R. Astron. Soc. **144**, 397 (1969) and Publications of the Department of Astronomy, University of Texas at Austin, Vol. 3, No. 2 (1969).
[77] Chapman, R. D., and Shadmi, Y., J. Opt. Soc. Am. **63**, 1440 (1973).
[78] Shamey, L. J., J. Opt. Soc. Am. **61**, 942 (1971).
[79] Dankwort, W., and Trefftz, E., Astron. Astrophys. **65**, 93 (1978).
[80] Weiss, A. W., J. Quant. Spectrosc. Radiat. Transfer **18**, 481 (1977).
[81] Bogdanovicius, P. O., Kyckinas, I. S., Merkelis, G. V., Rudzikas, Z. B., Sivtsev, V. I., and Sadziuviene, S. D., Bull. Acad. Sci. USSR, Phys. Ser. **41**, 121 (1977).
[82] Biemont, E., J. Quant. Spectrosc. Radiat. Transfer **15**, 531 (1975); **16**, 627 (1976).
[83] Tull, C. E., McEachran, R. P., and Cohen, M., At. Data **3**, 169 (1971).
[84] Chapman, R. D., Astrophys. J. **156**, 87 (1969).
[85] Cowan, R. D., Astrophys. J. **147**, 377 (1967).
[86] Fawcett, B. C., Cowan, R. D., Kononov, E. Y., and Hayes, R. W., J. Phys. B **5**, 1255 (1972).
[87] Bromage, G. E., Cowan, R. D., and Fawcett, B. C., Phys. Scr. **15**, 177 (1977).
[88] Fawcett, B. C., Peacock, N. J., and Cowan, R. D., J. Phys. B **1**, 295 (1968).
[89] Bromage, G. E., Cowan, R. D., and Fawcett, B. C., Mon. Not. R. Astron. Soc. **183**, 19 (1978).
[90] Cowan, R. D., and Widing, K. G., Astrophys. J. **180**, 285 (1973).
[91] Fawcett, B. C., Bromage, G. E., and Hayes, R. W., Mon. Not. R. Astron. Soc. **186**, 113 (1979).
[92] Bromage, G. E., Fawcett, B. C., and Cowan, R. D., Mon. Not. R. Astron. Soc. **178**, 599 (1977).
[93] Bromage, G. E., and Fawcett, B. C., Mon. Not. R. Astron. Soc. **178**, 591 (1977).
[94] Bromage, G. E., and Fawcett, B. C., Mon. Not. R. Astron. Soc. **179**, 683 (1977).
[95] Bromage, G. E., Cowan, R. D., Fawcett, B. C., and Ridgeley, A., J. Opt. Soc. Am. **68**, 48 (1978).
[96] Doschek, G. A., Meekins, J. F., and Cowan, R. D., Astrophys. J. **177**, 261 (1972).
[97] Burkhalter, P. G., Dozier, C. M., Stallings, C., and Cowan, R. D., J. Appl. Phys. **49**, 1092 (1978).
[98] Fawcett, B. C., Ridgeley, A., and Hughes, T. P., Mon. Not. R. Astron. Soc. **188**, 365 (1979).
[99] Blaha, M., Sol. Phys. **17**, 99 (1971).
[100] Aymar, M., and Luc-Koenig, E., Phys. Rev. A **15**, 821 (1977).
[101] Crance, M., At. Data **5**, 185 (1973).
[102] Drake, G. W. F., Phys. Rev. A **19**, 1387 (1979).
[103] Brown, R. T., and Cortez, J.-L., Astrophys. J. **176**, 267 (1972).
[104] Laughlin, C., J. Phys. B **6**, 1942 (1973).
[105] Fox, J. L., and Dalgarno, A., Phys. Rev. A **16**, 283 (1977).
[106] Vainshtein, L. A., and Safronova, U. I., At. Data Nucl. Data Tables **21**, 49 (1978).
[107] Froese Fischer, C., Phys. Scr. **14**, 269 (1976).
[108] Smith, M. W., and Wiese, W. L., Astrophys. J. Suppl. Ser. **23**, No. 196, 103 (1971).
[109] Martin, G. A., and Wiese, W. L., J. Phys. Chem. Ref. Data **5**, 537 (1976).
[110] Moore, C. E., A Multiplet Table of Astrophysical Interest, Revised Edition, 253 pp., Nat. Stand. Ref. Data Ser., Nat. Bur. Stand. (U.S.), 40 (Feb. 1972).
[111] Moore, C. E., An Ultraviolet Multiplet Table, Sect. 2, 115 pp., Nat. Bur Stand. (U.S.), Circ. 488 (Aug. 1952).
[112] Moore, C. E., Atomic Energy Levels (As Derived from the Analyses of Optical Spectra), Vol. II, 259 pp., Nat. Stand. Ref. Data Ser., Nat. Bur. Stand. (U.S.), 35 (Dec. 1971), as reprinted from Nat. Bur. Stand. (U.S.), Circ. 467.
[113] Kelly, R. L., and Palumbo, L. J., Atomic and Ionic Emission Lines Below 2000 Angstroms---Hydrogen through Krypton, 1004 pp., Naval Research Laboratory Report 7599 (June 1973).
[114] Reader, J., and Sugar, J., J. Phys. Chem. Ref. Data **4**, 353 (1975).
[115] Moore, C. E., Bibliography on the Analyses of Optical Atomic Spectra, Sect. 2, 57 pp., Nat. Bur. Stand. (U.S.), Spec. Publ. 306 (Feb. 1969); Hagan, L., and Martin, W. C., Bibliography on Atomic Energy Levels and Spectra (July 1968 through June 1971), 103 pp., Nat. Bur. Stand. (U.S.), Spec. Publ. 363 (June 1972); Hagan, L., Bibliography on Atomic Energy Levels and Spectra (July 1971 through June 1975), 186 pp., Nat. Bur. Stand. (U.S.), Spec. Publ. 363, Suppl. 1 (Jan. 1977).

TRANSITION PROBABILITIES FOR IRON

6. Tables of Spectra

Iron

Fe I

Ground State $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6 4s^2\ {}^5D_4$

Ionization Potential $7.870\ \text{eV} = 63480\ \text{cm}^{-1}$

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
1934.54	30	2510.83	14	2980.53	191	3168.85	121
1937.27	29	2512.36	15	2981.45	10	3175.45	116
1940.66	30	2518.10	14	2983.57	8	3176.36	166
2084.12	28	2522.85	14	2986.46	10	3193.23	7
2102.35	28	2524.29	14	2986.65	139	3196.93	116
2112.97	28	2527.43	14	2987.29	45	3199.53	117
2132.02	26	2529.13	14	2990.39	190	3205.40	116
2138.59	27	2535.61	14	2994.43	8	3207.07	120
2145.19	26	2540.97	14	2994.50	10	3215.94	117
2153.01	26	2545.98	14	2996.39	113	3217.38	118
2161.58	26	2549.61	14	2999.51	45	3219.58	117
2166.77	23	2584.54	49	3000.95	8	3222.07	117
2171.30	27	2606.83	49	3005.31	138	3225.79	116
2173.21	27	2618.02	49	3007.28	10	3227.80	118
2176.84	25	2623.53	49	3008.14	8	3228.25	118
2191.20	24	2632.59	13	3009.09	137	3229.99	296
2191.84	23	2656.15	140	3009.57	45	3230.21	119
2196.04	23	2669.49	140	3011.48	190	3230.96	118
2200.72	23	2679.06	48	3015.92	137	3233.05	340
2228.17	22	2719.03	12	3016.18	45	3233.97	119
2250.79	19	2720.90	12	3017.63	8	3246.96	92
2259.28	20	2723.58	12	3018.14	138	3248.20	118
2259.51	19	2733.58	47	3018.98	45	3253.60	370
2265.05	20	2735.48	47	3021.07	8	3254.36	340
2267.08	21	2737.31	12	3024.03	10	3257.59	90
2272.07	19	2742.41	12	3025.84	8	3265.62	91
2276.03	18	2744.07	12	3026.46	45	3268.23	92
2277.11	50	2750.14	12	3031.63	45	3271.00	91
2287.25	18	2756.33	12	3037.39	8	3280.26	340
2292.52	20	2788.10	46	3039.32	138	3282.89	369
2294.41	18	2835.46	11	3040.43	45	3284.59	91
2300.14	19	2869.31	11	3042.02	45	3290.99	92
2301.68	18	2874.17	11	3042.66	45	3292.02	369
2303.42	19	2894.50	113	3047.60	8	3292.59	91
2303.58	19	2899.42	113	3053.07	111	3298.13	90
2309.00	18	2912.16	9	3057.45	44	3305.97	91
2313.10	18	2920.69	66	3059.09	8	3306.36	91
2320.36	18	2923.29	341	3067.24	44	3307.23	339
2371.43	17	2925.36	192	3068.17	65	3314.74	369
2373.62	17	2929.01	9	3075.72	44	3317.12	110
2374.52	17	2936.90	9	3083.74	44	3319.25	259
2381.83	17	2941.34	9	3091.58	44	3322.47	236
2389.97	17	2947.88	9	3098.19	189	3323.74	224
2462.18	16	2953.94	9	3100.67	44	3325.46	135
2462.65	16	2954.65	112	3119.49	136	3328.87	339
2479.78	16	2957.36	9	3120.43	136	3337.66	188
2483.27	16	2965.25	9	3134.11	44	3347.93	109
2488.14	16	2966.90	9	3156.27	318	3354.06	224
2490.64	16	2969.36	10	3160.66	116	3355.23	339
2491.15	16	2973.13	9	3161.95	121	3369.55	188
2501.13	14	2973.24	9	3166.44	167	3370.78	188

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List of tabulated lines—Continued

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
3372.07	86	3531.44	132	3606.68	184	3677.31	415
3380.11	188	3534.53	435	3608.86	41	3677.63	182
3382.40	89	3536.56	200	3610.16	195	3678.86	105
3383.98	86	3537.73	165	3610.70	197	3679.91	5
3392.65	87	3537.90	201	3612.07	199	3681.64	232
3394.58	87	3538.78	435	3613.15	198	3682.24	414
3396.98	43	3540.12	202	3613.45	365	3683.05	5
3399.33	87	3540.71	41	3614.77	235	3684.11	183
3402.26	338	3541.08	200	3615.19	313	3686.00	227
3406.44	368	3542.08	200	3615.66	63	3686.26	105
3407.46	87	3543.39	133	3616.15	313	3687.10	80
3410.17	398	3543.67	397	3616.32	106	3687.46	39
3411.35	187	3544.63	165	3617.79	277	3688.48	364
3413.13	87	3548.02	277	3618.77	41	3688.88	129
3417.27	43	3549.86	64	3620.24	198	3689.02	128
3417.84	87	3551.11	195	3621.46	184	3689.90	294
3418.51	87	3552.11	278	3622.00	185	3690.73	431
3424.28	88	3552.83	195	3623.19	130	3693.01	254
3425.01	295	3553.74	434	3624.06	314	3694.01	234
3427.12	86	3556.88	201	3624.31	107	3697.43	231
3428.19	88	3559.50	278	3627.05	432	3698.60	274
3428.75	447	3560.07	195	3628.09	82	3699.15	273
3440.99	6	3560.70	365	3628.82	256	3701.09	227
3443.88	6	3564.11	64	3630.35	197	3702.03	223
3445.15	88	3565.38	42	3631.46	41	3703.69	231
3447.28	85	3566.31	104	3632.04	277	3703.82	223
3450.33	85	3567.03	199	3632.55	255	3704.01	276
3462.35	84	3567.37	133	3633.84	257	3704.46	181
3463.30	64	3568.42	195	3635.19	273	3705.57	5
3476.70	6	3568.82	366	3636.99	160	3707.82	5
3477.85	85	3568.98	184	3637.25	130	3709.25	39
3483.01	42	3570.10	42	3637.86	227	3711.22	158
3485.34	83	3571.22	63	3638.30	184	3711.41	275
3493.28	64	3572.00	195	3640.39	185	3715.91	103
3493.69	186	3572.59	199	3641.45	197	3718.41	183
3495.29	164	3573.39	366	3644.58	161	3719.93	5
3496.19	134	3576.76	337	3644.80	314	3722.56	5
3497.10	83	3578.38	195	3645.82	277	3724.38	103
3497.84	6	3578.67	104	3647.84	41	3725.49	293
3500.57	164	3581.19	41	3649.51	182	3726.93	227
3504.86	105	3582.20	336	3650.03	234	3727.09	229
3505.07	278	3583.33	317	3651.47	185	3727.62	39
3506.50	108	3585.32	41	3653.76	130	3728.67	156
3508.49	258	3585.71	41	3654.66	82	3730.39	294
3509.12	200	3586.98	41	3655.46	223	3730.95	158
3509.87	83	3589.11	41	3657.14	108	3731.37	154
3510.44	110	3590.08	257	3657.89	235	3732.40	81
3511.74	164	3591.00	316	3658.55	159	3733.32	5
3512.22	200	3591.35	195	3659.52	130	3734.86	39
3513.05	64	3591.48	312	3661.36	128	3735.32	230
3513.82	42	3592.47	163	3663.25	254	3737.13	5
3514.63	133	3592.67	313	3663.95	254	3738.31	335
3516.41	258	3592.89	82	3664.54	233	3739.12	80
3516.56	200	3593.32	315	3664.69	232	3739.32	79
3518.68	201	3594.63	196	3666.94	63	3740.24	362
3518.82	83	3595.30	196	3667.25	314	3742.62	229
3520.85	164	3595.86	131	3668.21	312	3743.36	39
3521.84	83	3596.20	131	3668.89	157	3744.10	227
3522.27	200	3597.02	313	3669.15	255	3745.56	5
3522.90	203	3598.72	367	3669.52	182	3745.90	5
3523.31	200	3599.62	433	3670.09	254	3746.49	78
3524.08	165	3602.08	196	3670.81	108	3746.93	223
3524.24	108	3603.20	185	3672.69	130	3748.26	5
3527.79	200	3603.67	162	3674.77	223	3749.48	39
3529.82	200	3603.82	277	3676.31	158	3751.06	363
3530.39	200	3605.45	184	3676.88	231	3751.82	179

TRANSITION PROBABILITIES FOR IRON

List of tabulated lines—Continued

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
3753.15	127	3813.63	177	3902.95	62	3983.96	172
3753.61	78	3813.88	454	3903.90	251	3985.39	358
3754.51	228	3814.52	40	3906.48	4	3989.86	411
3756.07	79	3815.84	62	3906.75	360	3990.37	290
3756.94	430	3816.34	78	3907.47	178	3994.11	289
3757.45	360	3817.64	384	3907.93	175	3995.20	331
3758.23	39	3819.50	386	3909.66	309	3995.98	173
3760.05	127	3820.43	38	3909.83	221	3996.97	489
3760.53	81	3821.18	334	3910.84	178	3997.39	174
3761.41	156	3821.83	150	3911.00	307	3998.05	172
3762.21	388	3824.44	4	3913.63	101	4000.27	301
3763.79	39	3825.88	38	3914.27	311	4000.46	250
3765.54	334	3826.84	177	3916.73	332	4001.66	77
3766.09	155	3827.82	62	3917.18	38	4003.76	393
3766.67	228	3829.13	490	3919.07	252	4005.24	60
3767.19	39	3829.77	152	3920.26	4	4006.31	330
3768.03	78	3833.31	150	3920.84	311	4007.27	172
3770.30	179	3834.22	38	3922.91	4	4009.71	77
3771.50	333	3836.33	360	3925.20	311	4010.18	475
3773.36	293	3837.13	150	3927.92	4	4011.42	148
3773.70	228	3839.26	292	3930.30	4	4011.71	115
3774.82	78	3839.61	511	3931.12	309	4014.53	428
3775.86	179	3840.44	38	3935.31	219	4017.15	290
3776.45	80	3841.05	62	3937.33	174	4018.28	305
3777.06	253	3843.26	291	3940.88	38	4019.05	149
3777.45	153	3845.17	103	3941.28	307	4020.49	476
3778.32	222	3845.69	413	3942.44	221	4021.87	174
3778.51	360	3846.00	386	3943.34	77	4024.11	172
3778.70	78	3846.41	429	3944.75	220	4024.72	305
3781.19	79	3846.80	360	3944.89	252	4030.18	77
3781.94	478	3848.29	151	3945.12	175	4031.96	357
3782.45	230	3849.96	38	3946.99	306	4032.63	61
3782.61	274	3850.82	40	3948.77	331	4036.37	173
3785.71	334	3852.57	78	3949.14	395	4040.64	357
3785.95	127	3853.46	251	3949.95	77	4044.61	218
3786.19	222	3856.37	4	3951.16	358	4045.81	60
3786.68	40	3859.21	126	3952.60	174	4049.34	148
3787.16	477	3859.91	4	3953.15	252	4051.92	383
3787.88	39	3863.74	175	3953.86	219	4054.18	302
3789.18	180	3865.52	38	3955.34	307	4054.87	382
3789.82	385	3867.22	271	3955.96	271	4055.03	148
3790.09	40	3867.93	150	3956.45	331	4057.34	173
3791.50	153	3871.75	251	3957.02	307	4058.22	303
3791.73	386	3872.50	38	3960.28	476	4058.75	101
3792.15	179	3872.92	178	3961.15	220	4059.73	410
3792.83	79	3873.76	126	3962.35	310	4062.44	218
3793.87	222	3876.04	40	3963.10	307	4063.59	60
3794.34	127	3878.02	38	3964.52	220	4065.40	382
3795.00	39	3878.57	4	3966.06	62	4066.59	249
3797.95	150	3883.28	359	3967.42	331	4067.27	147
3798.51	39	3884.36	176	3967.96	306	4067.98	304
3799.55	39	3885.15	252	3969.26	60	4069.08	302
3801.68	222	3885.51	103	3969.63	356	4070.77	303
3802.00	387	3886.28	4	3970.39	271	4071.74	60
3802.28	361	3887.05	38	3971.32	173	4073.76	303
3804.01	385	3888.51	62	3973.65	412	4074.79	288
3805.35	334	3888.82	271	3974.40	308	4076.23	270
3806.22	396	3890.39	311	3974.77	77	4076.63	303
3806.70	333	3890.84	175	3975.21	115	4078.35	147
3807.54	78	3891.93	394	3975.85	502	4079.18	383
3808.29	272	3893.39	252	3976.61	394	4079.84	218
3808.73	151	3895.66	4	3977.74	77	4080.21	303
3809.04	222	3897.45	251	3979.65	306	4080.89	302
3810.76	361	3899.03	126	3980.65	115	4082.13	382
3811.89	179	3899.71	4	3981.11	102	4082.44	474
3812.96	40	3900.52	309	3981.77	174	4084.49	382

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List of tabulated lines—Continued

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
4085.00	217	4170.90	269	4258.31	3	4377.80	352
4085.30	304	4171.69	488	4258.62	211	4382.77	425
4085.98	550	4171.90	355	4258.95	246	4383.54	58
4087.09	379	4172.12	354	4260.47	114	4384.68	265
4088.57	474	4172.74	37	4264.20	377	4387.89	266
4089.22	247	4173.32	213	4264.74	509	4388.41	446
4090.09	383	4173.92	37	4266.96	170	4389.24	2
4090.98	380	4174.91	37	4267.83	269	4390.46	241
4091.55	216	4175.64	216	4268.75	354	4390.95	242
4092.46	36	4177.59	36	4271.15	114	4391.87	508
4095.27	551	4181.75	216	4271.76	59	4392.58	498
4095.97	147	4182.38	267	4275.72	146	4395.29	444
4097.10	303	4182.79	379	4276.68	501	4401.29	444
4098.18	303	4183.03	381	4277.41	145	4401.44	210
4100.74	36	4184.89	213	4278.23	376	4404.75	58
4101.27	382	4187.04	114	4279.48	509	4407.71	73
4101.68	101	4187.79	114	4279.86	211	4408.41	73
4104.97	379	4189.56	487	4280.53	328	4409.12	352
4106.27	147	4191.68	213	4282.40	76	4413.40	537
4106.44	381	4196.21	378	4284.42	244	4415.12	58
4107.49	215	4196.53	245	4285.44	327	4422.57	210
4108.13	304	4198.30	114	4285.83	471	4423.14	240
4109.07	303	4198.64	378	4286.44	242	4423.84	446
4109.80	216	4199.09	287	4288.15	170	4427.31	2
4112.35	380	4200.09	509	4288.96	145	4430.19	263
4112.96	567	4200.92	375	4290.38	243	4430.61	73
4114.45	215	4202.03	59	4290.87	211	4432.57	424
4114.96	380	4203.67	620	4292.13	75	4433.22	446
4118.54	427	4203.94	453	4292.29	75	4433.78	442
4118.90	304	4205.54	375	4294.12	58	4435.15	2
4120.21	248	4206.70	3	4298.04	285	4436.92	282
4121.80	214	4207.13	212	4300.21	500	4438.34	444
4122.51	214	4210.34	114	4300.83	501	4439.63	281
4125.88	215	4213.65	213	4302.18	285	4439.88	99
4126.18	380	4216.18	3	4304.54	242	4440.48	445
4126.88	215	4217.55	378	4305.20	406	4440.82	508
4127.61	216	4219.36	426	4305.45	266	4442.34	73
4129.22	382	4220.05	510	4307.90	59	4442.83	74
4129.46	380	4220.34	269	4309.03	452	4443.19	210
4132.06	60	4222.21	114	4309.37	242	4445.47	2
4132.90	215	4224.17	375	4310.37	510	4446.83	444
4133.86	382	4224.51	375	4315.08	76	4447.13	74
4134.68	215	4225.45	378	4317.04	408	4447.72	73
4136.51	379	4225.96	286	4325.76	59	4450.32	266
4137.00	392	4226.42	212	4326.75	241	4450.77	497
4137.42	567	4229.75	58	4327.09	407	4452.62	495
4139.93	36	4230.58	268	4327.92	327	4454.38	210
4141.86	247	4232.73	3	4337.05	58	4455.03	499
4142.63	567	4233.60	114	4338.26	75	4456.33	282
4143.87	60	4235.94	114	4343.28	352	4456.63	498
4145.21	171	4237.07	37	4343.70	283	4459.12	73
4146.06	247	4237.67	245	4346.55	328	4461.65	2
4147.67	59	4238.81	378	4347.24	2	4464.77	263
4149.37	379	4239.36	473	4347.85	444	4466.55	210
4150.25	380	4240.37	409	4348.94	242	4466.94	508
4152.17	36	4241.11	211	4351.54	240	4469.37	446
4153.90	380	4242.73	354	4352.73	76	4471.68	2
4154.80	379	4243.79	510	4358.50	240	4478.04	74
4156.80	216	4245.26	212	4360.81	470	4481.61	443
4158.79	380	4246.08	472	4365.90	241	4482.17	2
4161.08	375	4247.43	378	4367.58	242	4482.74	444
4161.48	247	4248.22	269	4367.90	58	4483.78	469
4167.86	329	4249.32	100	4369.77	284	4484.22	444
4168.63	375	4250.12	114	4372.99	264	4485.67	446
4168.94	379	4250.79	59	4374.50	353	4485.97	442
4169.78	378	4253.55	620	4375.93	2	4487.74	326

TRANSITION PROBABILITIES FOR IRON

List of tabulated lines—Continued

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
4488.13	437	4638.01	440	4813.11	347	5012.07	35
4489.74	2	4643.46	438	4817.77	72	5012.68	562
4490.08	262	4647.43	238	4834.51	98	5014.94	492
4492.68	495	4649.82	323	4835.87	547	5021.89	344
4494.05	498	4657.59	206	4838.51	373	5022.24	492
4494.56	73	4658.29	324	4839.55	321	5023.23	564
4495.57	443	4661.53	616	4840.32	547	5023.50	588
4495.95	442	4661.97	238	4841.78	549	5027.76	572
4502.59	423	4663.18	404	4842.79	548	5029.62	389
4504.83	300	4669.17	439	4843.14	373	5030.77	320
4514.18	281	4673.16	438	4844.01	400	5031.90	588
4515.16	194	4673.28	440	4848.90	97	5048.43	505
4517.53	263	4674.65	57	4849.67	421	5049.82	97
4518.43	325	4678.85	439	4854.89	536	5051.63	35
4518.58	74	4679.22	374	4859.13	547	5054.64	465
4523.40	445	4680.29	56	4859.74	193	5056.00	587
4525.88	194	4682.56	226	4860.98	374	5056.86	573
4527.78	351	4683.57	206	4869.45	401	5058.00	494
4528.61	73	4685.03	207	4870.05	506	5058.50	465
4531.15	56	4687.39	207	4871.32	193	5060.08	1
4533.13	351	4690.14	438	4872.14	193	5067.15	561
4537.67	326	4691.41	238	4873.74	347	5068.77	225
4541.94	325	4700.19	486	4875.87	373	5074.75	563
4542.41	468	4701.05	438	4876.19	345	5079.74	35
4547.02	56	4704.95	439	4877.61	226	5080.95	320
4547.85	405	4705.46	402	4878.21	193	5083.34	35
4551.65	497	4707.27	299	4890.75	193	5088.16	546
4554.47	194	4712.10	261	4891.49	193	5090.78	559
4556.93	350	4714.07	615	4892.87	549	5099.09	492
4560.09	441	4714.19	324	4896.44	505	5104.04	260
4565.31	351	4726.14	226	4903.31	193	5104.21	561
4565.66	299	4729.02	532	4905.13	507	5104.44	559
4566.51	351	4729.68	374	4907.73	373	5107.45	35
4566.99	391	4733.59	55	4911.52	566	5109.65	558
4571.44	194	4734.10	580	4911.78	505	5110.41	1
4572.86	437	4735.84	535	4917.23	546	5115.78	419
4574.21	299	4736.77	299	4918.01	549	5121.64	564
4574.72	98	4737.63	322	4918.99	193	5123.72	35
4579.82	262	4740.34	238	4920.50	193	5125.11	559
4580.58	443	4741.53	206	4924.77	97	5126.19	558
4581.51	300	4745.13	72	4927.42	420	5127.36	35
4587.13	422	4749.95	615	4930.31	506	5127.68	1
4587.72	496	4765.48	57	4939.69	35	5129.63	492
4592.65	56	4766.87	374	4945.64	575	5133.69	561
4593.53	496	4771.70	72	4946.38	373	5136.09	530
4595.36	326	4776.07	349	4950.10	373	5137.38	559
4596.06	438	4779.44	390	4961.91	451	5143.73	70
4596.41	441	4780.81	347	4962.56	565	5145.09	71
4600.93	324	4785.96	534	4966.09	373	5146.30	588
4602.00	56	4786.81	261	4968.69	466	5150.84	35
4602.94	56	4787.83	226	4969.92	546	5151.91	35
4603.34	208	4788.76	321	4970.50	464	5159.06	560
4603.95	239	4789.65	403	4973.10	505	5162.27	558
4613.20	299	4790.56	547	4978.60	493	5164.55	596
4614.21	350	4790.75	346	4986.22	549	5166.28	1
4618.76	238	4791.25	348	4988.95	546	5167.49	54
4619.29	439	4793.96	279	4991.27	545	5168.90	1
4625.04	299	4794.36	98	4991.86	563	5171.60	53
4630.12	98	4798.26	535	4992.80	572	5177.23	485
4631.48	589	4798.73	55	4993.68	573	5178.80	596
4632.91	56	4799.41	467	4994.13	35	5180.07	596
4633.76	239	4800.13	226	4995.41	575	5184.26	558
4635.62	194	4800.65	535	4999.11	533	5187.91	530
4635.85	209	4807.71	374	5001.86	492	5197.93	560
4636.66	280	4808.15	347	5002.79	373	5198.71	71
4637.50	299	4809.94	421	5004.04	574	5202.34	71

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List of tabulated lines—Continued

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
5204.58	1	5393.17	298	5559.64	628	5778.47	144
5207.95	463	5394.68	529	5560.23	594	5780.62	297
5208.59	298	5395.25	581	5563.60	543	5784.69	372
5223.19	463	5397.13	34	5567.40	144	5791.04	297
5224.30	70	5398.29	583	5568.81	458	5793.93	555
5225.53	1	5400.50	583	5569.62	372	5798.19	504
5228.41	560	5401.27	584	5572.84	372	5804.06	491
5232.94	225	5405.77	34	5576.09	372	5804.48	556
5236.19	531	5406.77	586	5584.77	416	5805.76	629
5241.90	588	5409.13	585	5586.76	372	5806.73	604
5242.49	450	5410.91	595	5587.58	525	5809.25	504
5243.78	558	5415.20	595	5594.66	606	5811.93	522
5247.05	1	5417.03	586	5598.30	607	5814.80	555
5249.10	596	5421.85	607	5615.64	372	5815.16	540
5250.21	1	5424.07	584	5617.22	342	5816.36	603
5253.03	96	5429.70	34	5618.65	569	5827.89	297
5253.46	298	5432.95	581	5619.60	592	5833.93	144
5254.96	1	5434.52	34	5620.53	542	5835.10	554
5262.89	343	5436.30	592	5624.06	591	5837.71	577
5263.30	298	5436.59	96	5624.54	372	5838.42	491
5263.87	418	5441.32	582	5633.97	630	5849.67	479
5266.55	225	5445.04	593	5635.85	557	5852.19	602
5269.54	34	5446.92	34	5636.71	456	5853.18	52
5270.36	54	5461.54	583	5638.27	556	5855.13	603
5279.65	319	5463.27	593	5640.46	614	5856.08	576
5280.36	463	5464.29	528	5641.46	556	5858.77	554
5281.79	225	5466.39	582	5642.75	608	5873.21	556
5283.62	298	5470.17	582	5643.94	521	5877.77	553
5284.42	449	5472.72	570	5649.66	448	5879.49	613
5284.62	530	5473.18	544	5650.01	630	5880.00	613
5285.12	596	5473.90	543	5650.71	630	5881.28	602
5288.53	484	5478.48	543	5651.47	592	5883.84	504
5293.03	595	5480.87	543	5652.32	570	5892.80	68
5293.97	529	5481.25	541	5653.89	590	5898.21	625
5294.56	461	5481.45	542	5655.18	630	5902.52	618
5295.32	584	5483.11	542	5658.82	372	5905.67	605
5298.79	461	5487.16	581	5660.79	457	5909.99	297
5300.41	619	5487.74	524	5661.36	570	5916.25	125
5302.30	298	5489.85	586	5662.94	480	5927.80	599
5307.36	53	5491.84	529	5667.67	144	5929.70	600
5315.07	585	5493.51	542	5679.02	607	5930.17	604
5319.22	526	5494.46	523	5680.26	525	5934.66	504
5320.05	462	5497.52	34	5686.53	606	5940.97	553
5321.11	595	5501.46	34	5691.51	556	5952.75	491
5322.04	95	5506.78	34	5696.10	603	5956.70	33
5324.18	298	5512.28	581	5698.05	455	6003.03	491
5328.04	34	5517.08	571	5698.37	578	6012.21	69
5329.99	527	5522.46	570	5702.43	458	6016.66	399
5332.67	529	5525.55	543	5705.48	556	6020.17	602
5339.93	298	5528.89	592	5705.99	607	6024.07	602
5341.02	54	5529.15	460	5707.07	457	6027.06	519
5349.74	593	5531.95	627	5708.11	592	6055.99	625
5353.39	543	5532.75	417	5709.38	372	6062.89	68
5361.64	581	5536.59	205	5711.87	556	6065.48	143
5364.87	584	5539.28	459	5712.15	372	6079.02	600
5367.47	584	5539.83	579	5717.85	569	6082.72	69
5369.96	584	5543.15	481	5731.77	556	6085.27	169
5371.49	34	5543.94	543	5732.29	629	6089.57	631
5373.71	596	5546.51	583	5741.86	555	6093.66	601
5376.85	579	5547.00	542	5742.95	554	6094.42	601
5379.57	483	5549.66	630	5747.95	606	6096.69	491
5383.37	584	5549.94	481	5753.12	569	6137.69	143
5385.58	482	5552.70	627	5754.41	458	6141.73	436
5386.34	544	5553.59	592	5760.35	455	6147.85	518
5387.51	529	5554.89	607	5762.43	456	6151.62	67
5389.48	583	5557.95	593	5762.99	569	6157.73	517

TRANSITION PROBABILITIES FOR IRON

List of tabulated lines—Continued

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
6163.56	69	6344.15	124	6581.22	51	6843.67	597
6165.37	519	6355.04	204	6592.91	168	6857.25	515
6170.49	626	6358.69	32	6593.88	123	6858.16	597
6173.34	67	6362.89	520	6597.61	621	6862.48	610
6180.22	169	6364.38	621	6608.03	93	6885.77	597
6188.04	491	6380.75	517	6609.12	142	6916.70	539
6191.56	124	6393.60	123	6627.56	598	6988.53	122
6200.32	143	6400.00	436	6633.44	624	6999.90	538
6215.15	519	6411.65	436	6633.76	612	7000.63	514
6226.77	503	6419.98	624	6634.10	624	7008.01	552
6229.23	204	6421.35	94	6677.99	168	7016.08	93
6230.73	143	6430.85	67	6703.57	168	7016.44	538
6240.66	69	6462.73	123	6713.76	623	7022.98	538
6246.32	436	6469.21	624	6715.41	598	7024.08	513
6252.55	124	6475.63	142	6733.16	611	7024.65	609
6254.26	94	6481.88	93	6750.15	94	7038.25	538
6256.37	124	6494.98	123	6752.72	611	7038.82	552
6270.24	204	6495.78	621	6786.88	539	7068.42	512
6271.29	371	6496.46	624	6806.85	168	7090.40	538
6280.63	32	6498.95	32	6810.28	612	7095.43	568
6297.80	67	6518.38	204	6820.43	612	7107.46	514
6311.51	204	6533.97	612	6828.61	611	7112.18	237
6315.81	516	6546.24	168	6837.00	617	7130.94	538
6330.86	622	6569.23	621	6839.83	141	7132.99	512
6336.84	436	6574.24	32	6841.35	611	7912.87	31
6338.90	624	6575.02	142	6842.67	612	8075.13	31

From the large number of articles containing f-value data on Fe I, we have selected most of the recent experiments (refs. [1–20]) for this tabulation. Most of the material is taken from two very comprehensive sources, the stabilized-arc emission experiments by May et al. [5] and by Bridges and Kornblith [4].

We established the absolute scale by utilizing accurate data for the principal resonance line at 3719.93 Å. The atomic beam work by Bell and Tubbs [20] yields the f-value of this transition directly, and lifetime measurements of its upper level, $z\ ^5F^\circ_5$, may also be converted into f-values, since the other downward transitions contribute—at most—a few additional percent to the total lifetime and can be approximately corrected for. Very accurate lifetime measurements of this upper level have been performed by Wagner and Otten [16], who used the method of optical double resonance; Klose [17], who used the delayed coincidence technique; Hilborn and de Zafra [18], who employed the Hanle effect; and Brzozowski et al. [19], who used the high frequency deflection technique. The average f-value resulting from these four lifetime measurements and the atomic beam experiment is $f = 0.0413$, with a standard deviation of the mean of only $\pm$ 1% (these lifetime data are given in table 1 of the general introduction). This f-value (obtained by including the effects of the other weak transitions involved) is estimated to have an overall uncertainty not to exceed five percent and forms the basis of the absolute scale for this spectrum, to which all other measurements discussed below were normalized. (For most references, changes (usually small) in the absolute scale had to be made, and we have indicated this by an "n" in the reference column.)

The spectrum of Fe I is very rich in lines of moderate strength in the visible and near uv. Recently, two large-scale measurements of relative f-values were carried out by May et al. [5] and by Bridges and Kornblith [4] for this spectral range. Both experiments were performed in emission with stabilized, steady state arc sources. The most comprehensive set of data on this spectrum is the one measured by May et al. [5], who determined relative oscillator strengths for over 1000 lines with a convection stabilized arc and employed photographic detection. Bridges and Kornblith determined data for 534 lines with a more sophisticated photoelectric data acquisition technique; this included a self-regulating system for the arc discharge in which fluctuations in the spectral line signals were monitored and controlled in order to maintain stability in the arc chamber. Since the data of May et al. and of Bridges and Kornblith overlap for 168 lines, we were able to make several graphical comparisons (figs. 3–5), plotting log gf (May et al.) – log gf (Bridges and Kornblith) (in the graphs denoted by Δlog) vs wavelength, vs log gf (of ref. [4]), and vs upper energy level. These studies show that the mutual scatter is only about $\pm$ 0.1 dex and essentially random, i.e., there are no intensity or energy level dependent trends. However, there is some marked disagreement between the f-values of refs. [4] and [5] for the lines of shortest wavelength, especially λ = 3495.29, 3699.15, 3540.12, and 3521.84 Å. This may be due to scattered light problems for the radiometric standards at short wavelengths. Since Bridges and Kornblith took this problem into account by application of appropriate filters, we used their data exclusively in these cases.

The data of Bridges and Kornblith could be subjected to another important check: they overlap for 69 lines with the data of Blackwell et al. [1,3] (to be discussed later) which are of outstanding accuracy. The comparison, illustrated in figure 6, shows quite good agreement; for example, 78% of the data are within 25% of each other. Nevertheless, there are a few differences outside the mutually estimated uncertainties. The graphical comparison also indicates: (a) a systematic trend in the data with line intensity (or log gf), (b) a small

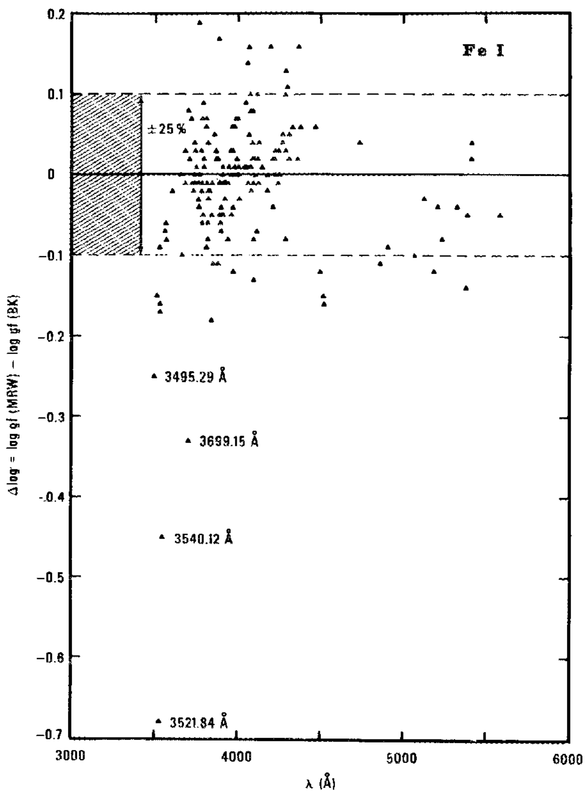

FIGURE 3. Plot of $\Delta\log = \log gf$ (May et al. [5]) − $\log gf$ (Bridges and Kornblith [4]) vs wavelength (Å).

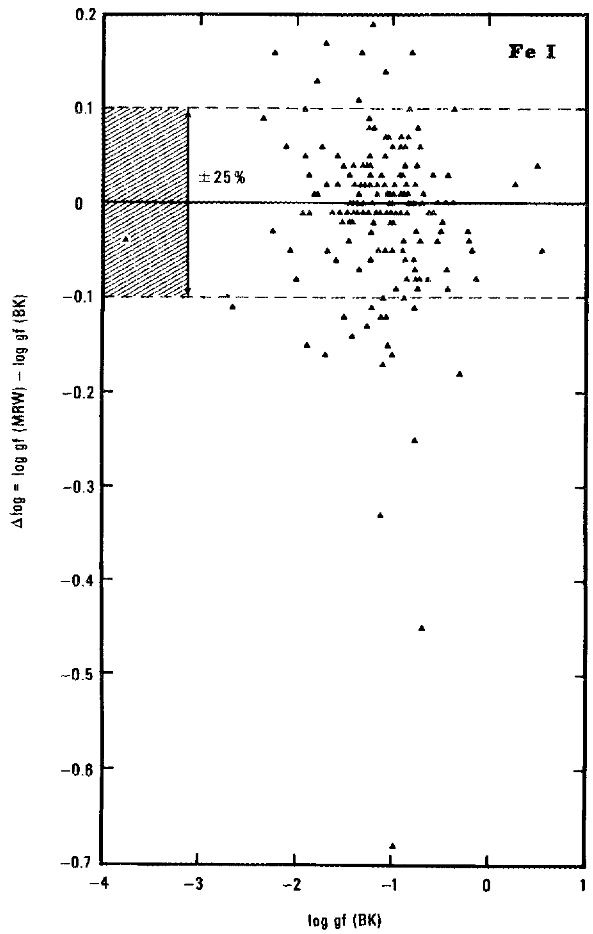

FIGURE 4. Plot of $\Delta\log = \log gf$ (May et al. [5]) − $\log gf$ (Bridges and Kornblith [4]) vs $\log gf$ (Bridges and Kornblith).

difference in absolute scales, and (c) a serious disagreement for the 4427.31 Å line. (a) The trend is probably due to two unrelated facts. First, the weak lines measured by Bridges and Kornblith, which have lower accuracy ratings, appear to be systematically too strong, a tendency which has also been observed for some other emission measurements of iron group elements. Secondly, the log *gf*-values for the strongest lines measured by Bridges and Kornblith may be slightly too small because of undetected minor amounts of self-absorption present (Bridges and Kornblith note that their self-absorption check is good to only a few percent). (b) The small difference in absolute scales is not unexpected, on account of the different normalization procedures employed. Bridges and Kornblith used an average based on various lifetime data involving numerous lines, while Blackwell et al. utilized only the very accurate data for the resonance line at 3719.9 Å. Since the high precision measurements of Blackwell et al. combined with these resonance line data determine the absolute scale very accurately, we have used that scale to renormalize the data of Bridges and Kornblith. Considering only the most accurate data of ref. [4], i.e., those designated by a 10% ("a") accuracy (see fig. 6), we found the log *gf*-values of these lines to be, on the average, about 0.03 dex or 7% greater than those measured by Blackwell et al. We have thus lowered all log *gf*-values of Bridges and Kornblith by this amount. Since May et al. normalized their scale to that of Bridges and Kornblith, we have accordingly lowered all their log *gf*-values by 0.03 as well. (c) A serious disagreement between Blackwell et al. and Bridges and Kornblith is seen in the case of the 4427.31 Å line. Here, the *f*-value of ref. [4] is greater than that of ref. [1] by a factor of 3.5. A likely reason for this discrepancy may be the blending of the 4427.31 Å line, the $a\ ^5D_3 - z\ ^7F_4^o$ transition, with another line at 4427.30 Å, the $z\ ^5P_2^o - g\ ^5D_2$ transition. The arc of Bridges and Kornblith is capable of exciting both the $z\ ^7F_4^o$ and $g\ ^5D_2$ levels, hence producing the blended feature, whereas Blackwell's furnace, operating at a much lower temperature, excites preferentially the $z\ ^7F_4^o$ level. Therefore, we have tabulated only the data of Blackwell et al. for this line.

After the few apparently unreliable *f*-values from ref [4] were eliminated, data for over five hundred lines remained. We have utilized these as the principal reference source of accurate *f*-values for Fe I and have normalized and/or compared the other, much less comprehensive data sources (to be discussed later) to it. Our error estimates for the very weak and very strong lines were adjusted to reflect the possible deficiencies detected by the comparison with the data of Blackwell et al. [1,3], as discussed above. Blackwell et al. [3] also suggest a temperature error in the data of Bridges and Kornblith. However, we have found no indication of this from our detailed graphical comparisons. We should also note that temperature errors in the experiment of Bridges and Kornblith are minimized, since their absolute scale is based on numerous lifetime data for levels spanning a large range of excitation energies.

TRANSITION PROBABILITIES FOR IRON

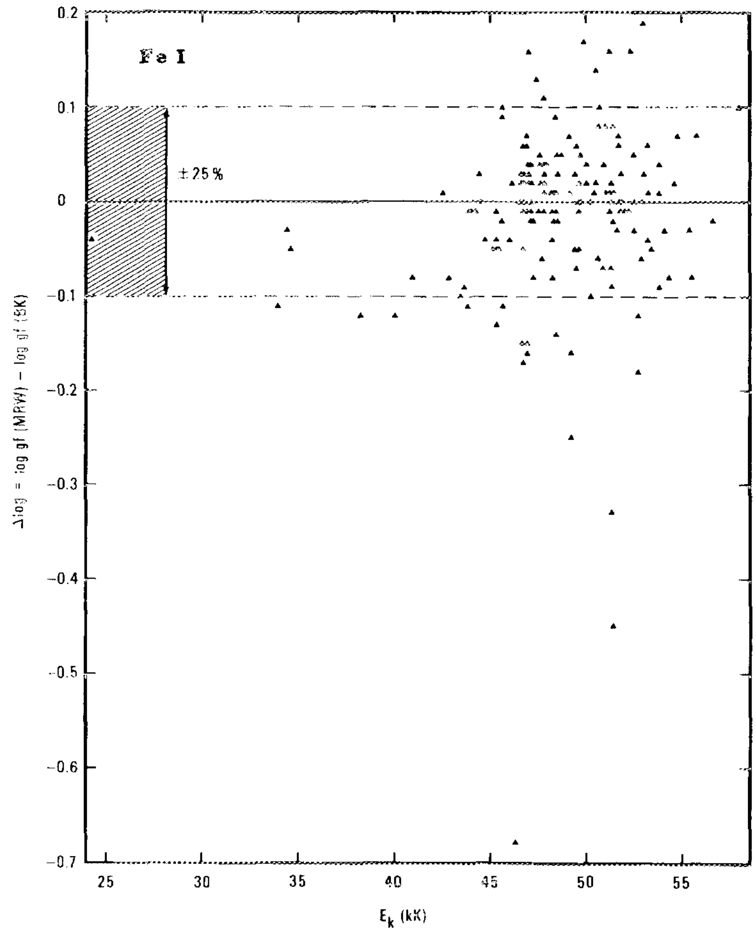

FIGURE 5. Plot of $\Delta\log = \log gf$ (May et al. [5]) $-$ $\log gf$ (Bridges and Kornblith [4]) vs upper energy level.

The most accurate relative oscillator strengths for Fe I are provided by the absorption experiments of Blackwell et al. [1–3]. Their work centers on lines originating from the ground state or states of very low excitation potential. An extremely stable and well diagnosed King-type furnace was used as the absorption tube, and intensity ratios were determined photoelectrically for various line pairs, which by appropriate overlaps were built up to a network that could be cross-checked and optimized for internal consistency. The relative data thus obtained—which span a large range of gf-values—were estimated to be accurate to within 0.5 percent.

The fourth important data source is the experimental work by Huber and co-workers [6,7,11,12,13] which makes use of the anomalous dispersion and absorption techniques. Additional, smaller sources of data, which were utilized to supplement our material, are the branching ratio emission experiment of Martinez-Garcia et al. [8] with a hollow cathode source, the shock tube emission work of Wolnik et al. [9,14,], and the emission experiments with stabilized arcs by Garz and Kock [10] and Richter and Wulff [15].

All these data were extensively intercompared in a series of graphic plots to establish their mutual consistency and, if necessary, to find appropriate renormalization factors. Normally, $\Delta\log$ was plotted versus upper energy level for emission work and versus lower energy level for the anomalous dispersion and absorption experiments. Furthermore, $\Delta\log$ was also plotted versus wavelength and versus $\log gf$. The material by Bridges and Kornblith or by May et al. served as reference material since their work covered so many lines. The graphs, of which figs. 3–6 plus figs. 1 and 2 of the general introduction are samples, are instructive indicators of systematic trends which are dependent on upper or lower energy level, the magnitude of $\log gf$, or the wavelength. Several disagreements in absolute scales were readily detected, and in three cases an energy level dependent trend was noticed and a least squares fit was then performed for a renormalization. In other cases no renormalization was required at all. The resulting renormalization factors are shown in the following table.

References	Normalization: quantities to be added to the original $\log gf$-value, as it appeared in the literature
4	-0.03
5	-0.03
6	$+0.02$
10	$-0.35 + (0.00000789)\ E_k$ *
11	$+0.27$
12	-0.23
13	$-0.06 - (0.00000727)\ E_i$
14	-0.13
15	$-0.61 + (0.0000128)\ E_k$

* The units of E_k (upper energy level) or E_i (lower energy level) are cm^{-1}.

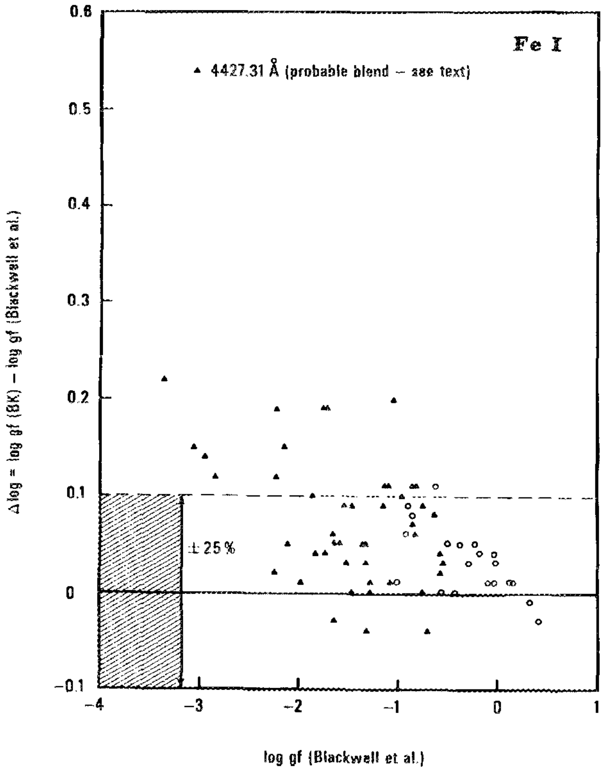

FIGURE 6. Plot of $\Delta \log = \log gf$ (Bridges and Kornblith [4]) − $\log gf$ (Blackwell et al. [1,3]) vs $\log gf$ (Blackwell et al.). Open circles are used to represent lines for which the f-values of Bridges and Kornblith are denoted by them to be accurate to within 10% ("a" accuracy in their notation), while solid triangles are used for lines with uncertainties greater than 10%.

The graphs are also a very good indicator of the scatter in the various sets of data. By intercomparing all overlapping data, one can readily isolate the principal sources of scatter. Our error estimates take this into account, in addition to an evaluation of the critical factors involved in each method and the error statements provided by the authors. When overlaps in the data occur we have selected the very precise data of refs. [1–3] as our first choice. Next, we have given equal weight to the data of refs. [4–8], averaging them when they overlap. Data from refs. [9–15] were tabulated with equal weight too, but only in those cases where no material from the earlier cited authors was available. In toto, we have compiled f-value data for 1630 lines.

In this compilation, we have generally omitted blended lines. Wavelengths have been taken from the work of Crosswhite [21]. Energy level values and term designations as listed in our multiplet column have been taken from the compilation of Reader and Sugar [22]. Particular attention was paid to the fact that the designations of some energy levels and multiplets have changed from the original classifications by Moore [23,24]. Also, some multiplet designations appear to be identical as we have listed them, for example, Nos. 20 and 26 in our tables, since the present setup does not completely identify the multiplets by their respective transition arrays. For further details on multiplet and term designations the reader is referred to ref. [22].

References

[1] Blackwell, D. E., Ibbetson, P. A., Petford, A. D., and Shallis, M. J., Mon. Not. R. Astron. Soc. **186**, 633 (1979).
[2] Blackwell, D. E., Ibbetson, P. A., Petford, A. D., and Willis, R. B., Mon. Not. R. Astron. Soc. **177**, 219 (1976).
[3] Blackwell, D. E., Petford, A. D., and Shallis, M. J., Mon. Not. R. Astron. Soc. **186**, 657 (1979).
[4] Bridges, J. M., and Kornblith, R. L., Astrophys. J. **192**, 793 (1974).
[5] May, M., Richter, J., and Wichelmann, J., Astron. Astrophys. Suppl. Ser. **18**, 405 (1974).
[6] Banfield, F. P., and Huber, M. C. E., Astrophys. J. **186**, 335 (1973).
[7] Huber, M. C. E., Astrophys. J. **190**, 237 (1974).
[8] Martinez-Garcia, M., Whaling, W., Mickey, D. L., and Lawrence, G. M., Astrophys. J. **165**, 213 (1971).
[9] Wolnik, S. J., Berthel, R. O., and Wares, G. W., Astrophys. J. **162**, 1037 (1970).
[10] Garz, T., and Kock, M., Astron. Astrophys. **2**, 274 (1969).
[11] Grasdalen, G. L., Huber, M., and Parkinson, W. H., Astrophys. J. **156**, 1153 (1969).
[12] Huber, M., and Tobey, F. L., Jr., Astrophys. J. **152**, 609 (1968).
[13] Huber, M. C. E., and Parkinson, W. H., Astrophys. J. **172**, 229 (1972).
[14] Wolnik, S. J., Berthel, R. O., and Wares, G. W., Astrophys. J. **166**, L31 (1971).
[15] Richter, J., and Wulff, P., Astron. Astrophys. **9**, 37 (1970).
[16] Wagner, R., and Otten, E. W., Z. Phys. **220**, 349 (1969).
[17] Klose, J. Z., Astrophys. J. **165**, 637 (1971).
[18] Hilborn, R. C., and de Zafra, R., Astrophys. J. **183**, 347 (1973).
[19] Brzozowski, J., Erman, P., Lyyra, M., and Smith, W. H., Phys. Scr. **14**, 48 (1976).
[20] Bell, G. D., and Tubbs, E. F., Astrophys. J. **159**, 1093 (1970).
[21] Crosswhite, H. M., J. Res. Nat. Bur. Stand., Sect. A **79**, 17 (1975).
[22] Reader, J., and Sugar, J., J. Phys. Chem. Ref. Data **4**, 353 (1975).
[23] Moore, C. E., "Atomic Energy Levels (As Derived from the Analyses of Optical Spectra)," Vol. II, Nat. Bur. Stand. (U.S.), Circ. 467, (Aug. 1952).
[24] Moore, C. E., "A Multiplet Table of Astrophysical Interest, Revised Edition," 253 pp., Nat. Stand. Ref. Data Ser., Nat. Bur. Stand. (U.S.), 40 (Feb. 1972).
[25] Blackwell, D. E., private communication (1980).

Note Added in Proof

Dr. Blackwell has informed us (private communication, 1980) that errors due to possible blends may be present in his $\log gf$-values for four lines. He has recommended that the following lines be withdrawn from consideration: 4427.31 Å, 3812.96 Å, 4602.94 Å, and 4733.59 Å. We comply with Dr. Blackwell's analysis and therefore request that the readers of this compilation view the f-values for these lines as being unreliable.

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
1.	$a\ ^5D - z\ ^7D°$ (1)											
		5166.28	0.0	19351	9	11	1.45(−5)[a]	7.09(−6)	0.00109	−4.195	B+	1
		5247.05	704.0	19757	5	7	3.92(−6)	2.26(−6)	1.96(−4)	−4.946	B+	1
		5254.96	888.1	19912	3	5	8.32(−6)	5.74(−6)	2.98(−4)	−4.764	B+	1
		5250.21	978.1	20020	1	3	9.30(−6)	1.15(−5)	1.99(−4)	−4.938	B+	1
		5110.41	0.0	19562	9	9	4.93(−5)	1.93(−5)	0.00292	−3.760	B+	1
		5168.90	415.9	19757	7	7	3.83(−5)	1.53(−5)	0.00183	−3.969	B+	1
		5204.58	704.0	19912	5	5	2.29(−5)	9.31(−6)	7.98(−4)	−4.332	B+	1
		5225.53	888.1	20020	3	3	1.32(−5)	5.42(−6)	2.80(−4)	−4.789	B+	1
		5060.08	0.0	19757	9	7	1.3(−6)	3.9(−7)	5.8(−5)	−5.46	B+	2
		5127.68	415.9	19912	7	5	3.80(−7)	1.07(−7)	1.27(−5)	−6.125	B+	1
2.	$a\ ^5D - z\ ^7F°$ (2)											
		4375.93	0.0	22846	9	11	2.95(−4)	1.03(−4)	0.0134	−3.031	B+	1
		4427.31	415.9	22997	7	9	3.42(−4)	1.29(−4)	0.0132	−3.044	B+	1
		4461.65	704.0	23111	5	7	2.95(−4)	1.23(−4)	0.00906	−3.210	B+	1
		4482.17	888.1	23192	3	5	2.10(−4)	1.05(−4)	0.00466	−3.501	B+	1
		4489.74	978.1	23245	1	3	1.19(−4)	1.08(−4)	0.00160	−3.966	B+	1
		4347.24	0.0	22997	9	9	1.23(−6)	3.49(−7)	4.49(−5)	−5.503	B+	1
		4445.47	704.0	23192	5	5	2.45(−6)	7.24(−7)	5.30(−5)	−5.441	B+	1
		4471.68	888.1	23245	3	3	1.12(−6)	3.37(−7)	1.49(−5)	−5.995	B+	1
		4389.24	415.9	23192	7	5	1.81(−5)	3.73(−6)	3.77(−4)	−4.583	B+	1
		4435.15	704.0	23245	5	3	4.72(−5)	8.36(−6)	6.10(−4)	−4.379	B+	1
3.	$a\ ^5D - z\ ^7P°$ (3)											
		4216.18	0.0	23711	9	9	1.84(−4)	4.90(−5)	0.00611	−3.356	B+	1
		4206.70	415.9	24181	7	7	8.7(−5)	2.3(−5)	0.0022	−3.79	C	4*n*,5*n*
		4258.31	704.0	24181	5	7	2.54(−5)	9.66(−6)	6.77(−4)	−4.316	B+	1
		4232.73	888.1	24507	3	5	8.79(−6)	3.93(−6)	1.64(−4)	−4.928	B+	1
4.	$a\ ^5D - z\ ^5D°$ (4)	*3882.7*	*402.9*	*26151*	25	25	0.103	0.0232	7.41	−0.237	C+	1,4*n*,13*n*
		3859.91	0.0	25900	9	9	0.0970	0.0217	2.48	−0.710	B+	1
		3886.28	415.9	26140	7	7	0.0530	0.0120	1.07	−1.076	B+	1
		3899.71	704.0	26340	5	5	0.0258	0.00589	0.378	−1.531	B+	1
		3906.48	888.1	26479	3	3	0.00833	0.00190	0.0735	−2.243	B+	1
		3824.44	0.0	26140	9	7	0.0283	0.00483	0.547	−1.362	B+	1
		3856.37	415.9	26340	7	5	0.0464	0.00739	0.657	−1.286	B+	1
		3878.57	704.0	26479	5	3	0.072	0.0098	0.63	−1.31	D−	13*n*
		3895.66	888.1	26550	3	1	0.0940	0.00713	0.274	−1.670	B+	1
		3922.91	415.9	25900	7	9	0.0108	0.00319	0.288	−1.651	B+	1
		3930.30	704.0	26140	5	7	0.019	0.0060	0.39	−1.52	C	4*n*
		3927.92	888.1	26340	3	5	0.026	0.010	0.39	−1.52	C	4*n*
		3920.26	978.1	26479	1	3	0.0260	0.0179	0.232	−1.746	B+	1
5.	$a\ ^5D - z\ ^5F°$ (5)											
		3719.93	0.0	26875	9	11	0.163	0.0413	4.55	−0.430	B+	16,17,18, 19,20
		3737.13	415.9	27167	7	9	0.142	0.0381	3.28	−0.574	B+	1
		3745.56	704.0	27395	5	7	0.115	0.0339	2.09	−0.771	B+	1
		3748.26	888.1	27560	3	5	0.0915	0.0321	1.19	−1.016	B+	1
		3745.90	978.1	27666	1	3	0.0733	0.0462	0.570	−1.335	B+	1
		3679.91	0.0	27167	9	9	0.0138	0.00280	0.305	−1.599	B+	1
		3705.57	415.9	27395	7	7	0.0322	0.00662	0.565	−1.334	B+	1
		3722.56	704.0	27560	5	5	0.0497	0.0103	0.633	−1.287	B+	1
		3733.32	888.1	27666	3	3	0.065	0.014	0.50	−1.39	C	4*n*,6*n*
		3683.05	415.9	27560	7	5	0.0030	4.4(−4)	0.037	−2.51	C	4*n*,6*n*
		3707.82	704.0	27666	5	3	0.0072	8.9(−4)	0.055	−2.35	C	6*n*

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
6.	$a\ ^5D - z\ ^5P^o$ (6)											
		3440.99	415.9	29469	7	5	0.098	0.012	0.99	−1.06	C	4n
		3443.88	704.0	29733	5	3	0.073	0.0078	0.44	−1.41	C	4n
		3497.84	888.1	29469	3	5	0.031	0.0094	0.32	−1.55	C	4n
		3476.70	978.1	29733	1	3	0.064	0.035	0.40	−1.46	C	4n
7.	$a\ ^5D - z\ ^3F^o$ (7)											
		3193.23	0.0	31307	9	9	0.0053	8.0(−4)	0.076	−2.14	C	6n
8.	$a\ ^5D - y\ ^5D^o$ (9)											
		3021.07	415.9	33507	7	7	0.456	0.0624	4.34	−0.360	B+	1
		3017.63	888.1	34017	3	3	0.0682	0.00931	0.277	−1.554	B+	1
		2983.57	0.0	33507	9	7	0.280	0.0290	2.57	−0.583	B+	1
		2994.43	415.9	33802	7	5	0.44	0.042	2.9	−0.53	C	6n
		3000.95	704.0	34017	5	3	0.642	0.0520	2.57	−0.585	B+	1
		3008.14	888.1	34122	3	1	1.07	0.0485	1.44	−0.837	B+	1
		3059.09	415.9	33096	7	9	0.18	0.032	2.3	−0.65	C+	4n,6n
		3047.60	704.0	33507	5	7	0.284	0.0553	2.78	−0.558	B+	1
		3037.39	888.1	33802	3	5	0.32	0.075	2.2	−0.65	C+	4n,6n
		3025.84	978.1	34017	1	3	0.348	0.143	1.43	−0.844	B+	1
9.	$a\ ^5D - y\ ^5F^o$ (uv 1)	*2965.2*	*402.9*	*34118*	25	35	0.324	0.0598	14.6	0.175	B	1,4n,6n
		2966.90	0.0	33695	9	11	0.272	0.0438	3.85	−0.404	B+	1
		2973.24	415.9	34040	7	9	0.183	0.0313	2.14	−0.660	B+	1
		2973.13	704.0	34329	5	7	0.135	0.0251	1.23	−0.901	B+	1
		2965.25	978.1	34692	1	3	0.116	0.0460	0.449	−1.337	B+	1
		2936.90	0.0	34040	9	9	0.14	0.018	1.6	−0.79	C+	4n,6n
		2947.88	415.9	34329	7	7	0.20	0.027	1.8	−0.73	C	6n
		2953.94	704.0	34547	5	5	0.189	0.0247	1.20	−0.908	B+	1
		2957.36	888.1	34692	3	3	0.177	0.0232	0.678	−1.157	B+	1
		2912.16	0.0	34329	9	7	0.035	0.0035	0.30	−1.50	C	4n,6n
		2929.01	415.9	34547	7	5	0.073	0.0067	0.45	−1.33	C	6n
		2941.34	704.0	34692	5	3	0.066	0.0051	0.25	−1.59	C	4n
10.	$a\ ^5D - z\ ^3P^o$ (11)											
		2981.45	415.9	33947	7	5	0.0654	0.00622	0.427	−1.361	B+	1
		2969.36	888.1	34556	3	1	0.0366	0.00161	0.0473	−2.315	B+	1
		3007.28	704.0	33947	5	5	0.0273	0.00371	0.184	−1.732	B+	1
		2986.46	888.1	34363	3	3	0.00219	2.92(−4)	0.00862	−3.057	B+	1
		3024.03	888.1	33947	3	5	0.0488	0.0111	0.333	−1.476	B+	1
		2994.50	978.1	34363	1	3	0.0149	0.00601	0.0593	−2.221	B+	1
11.	$a\ ^5D - z\ ^5G^o$ (uv 2)											
		2874.17	0.0	34782	9	11	0.013	0.0020	0.17	−1.74	C	6n
		2869.31	415.9	35257	7	9	0.015	0.0023	0.15	−1.79	C	6n
		2835.46	0.0	35257	9	9	0.0090	0.0011	0.091	−2.01	C	6n

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions – Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
12.	$a\,^5D - y\,^5P^o$ (uv 5)											
		2719.03	0.0	36767	9	7	1.4	0.12	9.6	0.03	C	6*n*
		2720.90	415.9	37158	7	5	1.1	0.084	5.3	−0.23	C	6*n*
		2723.58	704.0	37410	5	3	0.64	0.043	1.9	−0.67	C	6*n*
		2750.14	415.9	36767	7	7	0.39	0.044	2.8	−0.51	C	6*n*
		2742.41	704.0	37158	5	5	0.63	0.071	3.2	−0.45	C	6*n*
		2737.31	888.1	37410	3	3	0.85	0.095	2.6	−0.55	C	6*n*,7
		2756.33	888.1	37158	3	5	0.20	0.038	1.0	−0.94	C	6*n*
		2744.07	978.1	37410	1	3	0.35	0.12	1.1	−0.92	C	6*n*
13.	$a\,^5D - y\,^3D^o$ (uv 6)											
		2632.59	704.0	38678	5	5	0.015	0.0016	0.067	−2.11	C	6*n*
14.	$a\,^5D - x\,^5D^o$ (uv 7)											
		2522.85	0.0	39626	9	9	2.9	0.28	21	0.40	C	6*n*
		2527.43	415.9	39970	7	7	1.9	0.18	10	0.10	C	6*n*
		2529.13	704.0	40231	5	5	0.98	0.094	3.9	−0.33	C	6*n*
		2501.13	0.0	39970	9	7	0.68	0.050	3.7	−0.35	C	6*n*
		2510.83	415.9	40231	7	5	1.3	0.088	5.1	−0.21	C	6*n*
		2518.10	704.0	40405	5	3	1.9	0.11	4.5	−0.27	C	6*n*
		2524.29	888.1	40491	3	1	3.4	0.11	2.7	−0.49	C	6*n*
		2549.61	415.9	39626	7	9	0.36	0.045	2.7	−0.50	C	6*n*
		2545.98	704.0	39970	5	7	0.67	0.091	3.8	−0.34	C	6*n*
		2540.97	888.1	40231	3	5	0.92	0.15	3.7	−0.35	C	6*n*
		2535.61	978.1	40405	1	3	0.97	0.28	2.4	−0.55	C	6*n*
15.	$a\,^5D - y\,^7P^o$ (uv 8)											
		2512.36	415.9	40207	7	7	0.027	0.0025	0.15	−1.75	C	6*n*
16.	$a\,^5D - x\,^5F^o$ (uv 9)											
		2483.27	0.0	40257	9	11	4.9	0.56	41	0.70	C	6*n*
		2488.14	415.9	40594	7	9	4.7	0.56	32	0.59	C	6*n*
		2490.64	704.0	40842	5	7	3.8	0.49	20	0.39	C	6*n*
		2491.15	888.1	41018	3	5	3.0	0.47	12	0.15	C	6*n*
		2462.65	0.0	40594	9	9	0.58	0.053	3.9	−0.32	C	6*n*
		2479.78	704.0	41018	5	5	1.8	0.17	6.9	−0.07	C	6*n*
		2462.18	415.9	41018	7	5	0.15	0.0099	0.56	−1.16	C	6*n*
17.	$a\,^5D - x\,^5P^o$ (uv 11)											
		2373.62	415.9	42533	7	7	0.067	0.0057	0.31	−1.40	C	6*n*
		2371.43	704.0	42860	5	5	0.052	0.0044	0.17	−1.66	C	6*n*
		2389.97	704.0	42533	5	7	0.050	0.0060	0.24	−1.52	C	6*n*
		2381.83	888.1	42860	3	5	0.054	0.0076	0.18	−1.64	C	6*n*
		2374.52	978.1	43079	1	3	0.29	0.074	0.58	−1.13	C	6*n*

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
18.	$a\ ^5D - w\ ^5D^o$ (uv 14)											
		2276.03	0.0	43923	9	7	0.17	0.010	0.68	−1.04	C	6n
		2287.25	704.0	44411	5	3	0.34	0.016	0.60	−1.10	C	6n
		2294.41	888.1	44459	3	1	0.61	0.016	0.36	−1.32	C	6n
		2320.36	415.9	43499	7	9	0.12	0.013	0.68	−1.05	C	6n
		2313.10	704.0	43923	5	7	0.14	0.016	0.59	−1.11	C	6n
		2309.00	888.1	44184	3	5	0.15	0.020	0.46	−1.22	C	6n
		2301.68	978.1	44411	1	3	0.13	0.030	0.23	−1.52	C	6n
19.	$a\ ^5D - \ ^5F^o$											
		2259.51	0.0	44244	9	11	0.070	0.0065	0.44	−1.23	C	6n
		2272.07	415.9	44415	7	9	0.038	0.0038	0.20	−1.58	C	6n
		2300.14	704.0	44166	5	7	0.080	0.0089	0.34	−1.35	C	6n
		2303.58	888.1	44285	3	5	0.076	0.010	0.23	−1.52	C	6n
		2303.42	978.1	44378?	1	3	0.094	0.022	0.17	−1.65	C	6n
		2250.79	0.0	44415	9	9	0.019	0.0014	0.095	−1.89	C	6n
20.	$a\ ^5D - \ ^5D^o$											
		2265.05	415.9	44551	7	7	0.020	0.0015	0.080	−1.97	C	6n
		2259.28	415.9	44664	7	5	0.013	7.0(−4)	0.036	−2.31	C	6n
		2292.52	415.9	44023	7	9	0.043	0.0043	0.23	−1.52	C	6n
21.	$a\ ^5D - y\ ^5S^o$ (uv 17)											
		2267.08	415.9	44512	7	5	0.071	0.0039	0.21	−1.56	C	6n
22.	$a\ ^5D - x\ ^3D^o$ (uv 18)											
		2228.17	415.9	45282	7	5	0.021	0.0011	0.057	−2.11	C	6n
23.	$a\ ^5D - w\ ^5P^o$ (uv 21)											
		2166.77	0.0	46137	9	7	2.7	0.15	9.6	0.13	C	6n
		2191.84	704.0	46314	5	5	1.2	0.083	3.0	−0.38	C	6n
		2196.04	888.1	46410	3	3	1.2	0.086	1.9	−0.59	C	6n
		2200.72	888.1	46314	3	5	0.28	0.034	0.74	−0.99	C	6n
24.	$a\ ^5D - z\ ^3S^o$ (uv 22)											
		2191.20	978.1	46601	1	3	0.073	0.016	0.11	−1.80	C	6n
25.	$a\ ^5D - y\ ^3P^o$ (uv 23)											
		2176.84	978.1	46902	1	3	0.10	0.022	0.16	−1.66	C	6n
26.	$a\ ^5D - \ ^5D^o$											
		2132.02	0.0	46889	9	9	0.076	0.0052	0.33	−1.33	C	6n
		2145.19	415.9	47017	7	7	0.057	0.0039	0.19	−1.56	C	6n
		2153.01	704.0	47136	5	5	0.069	0.0048	0.17	−1.62	C	6n
		2161.58	888.1	47136	3	5	0.050	0.0058	0.12	−1.76	C	6n
27.	$a\ ^5D - \ ^3D^o$											
		2138.59	0.0	46745	9	7	0.028	0.0015	0.095	−1.87	C	6n
		2171.30	704.0	46745	5	7	0.051	0.0050	0.18	−1.60	C	6n
		2173.21	888.1	46889	3	5	0.083	0.0098	0.21	−1.53	C	6n

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
28.	$a\ ^5D - v\ ^5P^o$ (uv 33)											
		2084.12	0.0	47967	9	7	0.37	0.019	1.2	−0.77	C	6n
		2102.35	415.9	47967	7	7	0.088	0.0058	0.28	−1.39	C	6n
		2112.97	978.1	48290	1	3	0.19	0.038	0.26	−1.42	C	6n
29.	$a\ ^5D - u\ ^5F^o$ (uv 35)											
		1937.27	0.0	51619?	9	7	0.22	0.0095	0.54	−1.07	C	6n
30.	$a\ ^5D - u\ ^5P^o$ (uv 37)											
		1934.54	0.0	51692?	9	7	0.25	0.011	0.64	−1.00	C	6n
		1940.66	415.9	51945?	7	5	0.26	0.010	0.46	−1.14	C	6n
31.	$a\ ^5F - z\ ^7D^o$ (12)											
		7912.87	6928	19562	11	9	1.68(−6)	1.29(−6)	3.70(−4)	−4.848	B+	3
		8075.13	7377	19757	9	7	1.27(−6)	9.63(−7)	2.30(−4)	−5.062	B+	3
32.	$a\ ^5F - z\ ^7F^o$ (13)											
		6358.69	6928	22650	11	13	4.32(−6)	3.09(−6)	7.13(−4)	−4.468	B+	3
		6280.63	6928	22846	11	11	6.31(−6)	3.73(−6)	8.48(−4)	−4.387	B+	3
		6498.95	7728	23111	7	7	4.51(−6)	2.86(−6)	4.28(−4)	−4.699	B+	3
		6574.24	7986	23192	5	5	3.3(−6)	2.1(−6)	2.3(−4)	−4.97	C	5n
33.	$a\ ^5F - z\ ^7P^o$ (14)											
		5956.70	6928	23711	11	9	5.19(−6)	2.26(−6)	4.87(−4)	−4.605	B+	3
34.	$a\ ^5F - z\ ^5D^o$ (15)											
		5269.54	6928	25900	11	9	0.0127	0.00434	0.828	−1.321	B+	3
		5328.04	7377	26140	9	7	0.0115	0.00380	0.600	−1.466	B+	3
		5371.49	7728	26340	7	5	0.0105	0.00324	0.400	−1.645	B+	3
		5405.77	7986	26479	5	3	0.0109	0.00286	0.255	−1.844	B+	3
		5434.52	8155	26550	3	1	0.0171	0.00252	0.135	−2.122	B+	3
		5397.13	7377	25900	9	9	0.00259	0.00113	0.181	−1.993	B+	3
		5429.70	7728	26140	7	7	0.00427	0.00189	0.236	−1.879	B+	3
		5446.92	7986	26340	5	5	0.0062	0.0028	0.25	−1.86	C	4n
		5501.46	7728	25900	7	9	3.2(−4)	1.9(−4)	0.024	−2.88	C	4n
		5506.78	7986	26140	5	7	5.01(−4)	3.19(−4)	0.0289	−2.797	B+	3
		5497.52	8155	26340	3	5	6.25(−4)	4.72(−4)	0.0256	−2.849	B+	3
35.	$a\ ^5F - z\ ^5F^o$ (16)											
		5012.07	6928	26875	11	11	5.50(−4)	2.07(−4)	0.0376	−2.642	B+	3
		5051.63	7377	27167	9	9	4.66(−4)	1.78(−4)	0.0267	−2.795	B+	3
		5083.34	7728	27395	7	7	4.06(−4)	1.57(−4)	0.0184	−2.958	B+	3
		5107.45	7986	27560	5	5	4.19(−4)	1.64(−4)	0.0138	−3.087	B+	3
		5123.72	8155	27666	3	3	7.24(−4)	2.85(−4)	0.0144	−3.068	B+	3
		4939.69	6928	27167	11	9	1.39(−4)	4.16(−5)	0.00743	−3.340	B+	3
		4994.13	7377	27395	9	7	3.18(−4)	9.24(−5)	0.0137	−3.080	B+	3
		5079.74	7986	27666	5	3	5.19(−4)	1.21(−4)	0.0101	−3.220	B+	3
		5127.36	7377	26875	9	11	1.14(−4)	5.48(−5)	0.00832	−3.307	B+	3
		5150.84	7986	27395	5	7	3.6(−4)	2.0(−4)	0.017	−3.00	C	4n
		5151.91	8155	27560	3	5	2.39(−4)	1.59(−4)	0.00808	−3.322	B+	3

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
36.	$a\ ^5F - z\ ^3F^o$ (18)											
		4100.74	6928	31307	11	9	2.92(−4)	6.02(−5)	0.00894	−3.179	B+	3
		4092.46	7377	31805	9	7	3.1(−5)	6.1(−6)	7.4(−4)	−4.26	C	5*n*
		4177.59	7377	31307	9	9	3.72(−4)	9.72(−5)	0.0120	−3.058	B+	3
		4152.17	7728	31805	7	7	3.24(−4)	8.37(−5)	0.00801	−3.232	B+	3
		4139.93	7986	32134	5	5	1.83(−4)	4.70(−5)	0.00320	−3.629	B+	3
37.	$a\ ^5F - z\ ^3D^o$ (19)											
		4174.91	7377	31323	9	7	5.87(−4)	1.19(−4)	0.0148	−2.969	B+	3
		4172.74	7728	31686	7	5	6.46(−4)	1.20(−4)	0.0116	−3.074	B+	3
		4173.92	7986	31937	5	3	6.3(−4)	9.8(−5)	0.0067	−3.31	C	5*n*
		4237.07	7728	31323	7	7	2.22(−5)	5.97(−6)	5.83(−4)	−4.379	B+	3
38.	$a\ ^5F - y\ ^5D^o$ (20)											
		3820.43	6928	33096	11	9	0.668	0.120	16.5	0.119	B+	3
		3825.88	7377	33507	9	7	0.598	0.102	11.6	−0.037	B+	3
		3834.22	7728	33802	7	5	0.453	0.0713	6.30	−0.302	B+	3
		3840.44	7986	34017	5	3	0.470	0.0624	3.94	−0.506	B+	3
		3849.96	8155	34122	3	1	0.606	0.0449	1.71	−0.871	B+	3
		3887.05	7377	33096	9	9	0.0352	0.00798	0.919	−1.144	B+	3
		3878.02	7728	33507	7	7	0.0772	0.0174	1.56	−0.914	B+	3
		3872.50	7986	33802	5	5	0.105	0.0236	1.50	−0.928	B+	3
		3865.52	8155	34017	3	3	0.155	0.0347	1.33	−0.982	B+	3
		3940.88	7728	33096	7	9	0.00120	3.59(−4)	0.0326	−2.600	B+	3
		3917.18	7986	33507	5	7	0.00435	0.00140	0.0902	−2.155	B+	3
39.	$a\ ^5F - y\ ^5F^o$ (21)	*3750.2*	*7460*	*34118*	35	35	0.914	0.193	83.3	0.829	B+	3
		3734.86	6928	33695	11	11	0.902	0.189	25.5	0.317	B+	3
		3749.48	7377	34040	9	9	0.764	0.161	17.9	0.161	B+	3
		3758.23	7728	34329	7	7	0.634	0.134	11.6	−0.027	B+	3
		3763.79	7986	34547	5	5	0.544	0.116	7.16	−0.238	B+	3
		3767.19	8155	34692	3	3	0.640	0.136	5.06	−0.389	B+	3
		3687.46	6928	34040	11	9	0.0801	0.0134	1.78	−0.833	B+	3
		3709.25	7377	34329	9	7	0.156	0.0251	2.76	−0.646	B+	3
		3727.62	7728	34547	7	5	0.225	0.0334	2.87	−0.631	B+	3
		3743.36	7986	34692	5	3	0.260	0.0328	2.02	−0.785	B+	3
		3798.51	7377	33695	9	11	0.0323	0.00855	0.962	−1.114	B+	3
		3799.55	7728	34040	7	9	0.0732	0.0204	1.78	−0.846	B+	3
		3795.00	7986	34329	5	7	0.115	0.0347	2.17	−0.761	B+	3
		3787.88	8155	34547	3	5	0.129	0.0461	1.73	−0.859	B+	3
40.	$a\ ^5F - z\ ^3P^o$ (22)											
		3812.96	7728	33947	7	5	0.0792	0.0123	1.08	−1.064	B+	3
		3790.09	7986	34363	5	3	0.0268	0.00347	0.216	−1.761	B+	3
		3786.68	8155	34556	3	1	0.0277	0.00199	0.0743	−2.225	B+	3
		3850.82	7986	33947	5	5	0.0166	0.00369	0.234	−1.734	B+	3
		3814.52	8155	34363	3	3	0.00624	0.00136	0.0513	−2.389	B+	25
		3876.04	8155	33947	3	5	0.0017	6.3(−4)	0.024	−2.72	C	4*n*,5*n*

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
41.	$a\ ^5F - z\ ^5G^\circ$ (23)											
		3581.19	6928	34844	11	13	1.02	0.232	30.0	0.406	B+	3
		3647.84	7377	34782	9	11	0.292	0.0711	7.68	−0.194	B+	3
		3631.46	7728	35257	7	9	0.517	0.131	11.0	−0.036	B+	3
		3618.77	7986	35612	5	7	0.73	0.20	12	0.00	C+	4n,6n
		3608.86	8155	35856	3	5	0.814	0.265	9.44	−0.100	B+	3
		3589.11	6928	34782	11	11	0.00361	6.98(−4)	0.0907	−2.115	B+	3
		3585.71	7377	35257	9	9	0.0375	0.00722	0.767	−1.187	B+	3
		3585.32	7728	35612	7	7	0.13	0.025	2.1	−0.76	C	6n
		3586.98	7986	35856	5	5	0.17	0.032	1.9	−0.80	C+	4n,6n
		3540.71	7377	35612	9	7	0.0017	2.4(−4)	0.026	−2.66	C	5n
42.	$a\ ^5F - z\ ^3G^\circ$ (24)											
		3513.82	6928	35379	11	11	0.0341	0.00630	0.802	−1.159	B+	3
		3483.01	7377	36079	9	7	9.4(−4)	1.3(−4)	0.014	−2.92	D	12n
		3570.10	7377	35379	9	11	0.677	0.158	16.7	0.153	B+	3
		3565.38	7728	35768	7	9	0.39	0.094	7.8	−0.18	C+	4n
43.	$a\ ^5F - y\ ^5P^\circ$ (26)											
		3396.98	7728	37158	7	5	0.0024	2.9(−4)	0.023	−2.69	D	12n
		3417.27	8155	37410	3	3	7.2(−4)	1.3(−4)	0.0043	−3.42	D	12n
44.	$a\ ^5F - x\ ^5D^\circ$ (28)											
		3057.45	6928	39626	11	9	0.45	0.051	5.7	−0.25	C+	4n
		3067.24	7377	39970	9	7	0.35	0.039	3.5	−0.46	C+	4n
		3075.72	7728	40231	7	5	0.30	0.031	2.2	−0.67	C+	4n
		3083.74	7986	40405	5	3	0.35	0.030	1.5	−0.82	C+	4n
		3091.58	8155	40491	3	1	0.64	0.030	0.93	−1.04	C	4n
		3100.67	7728	39970	7	7	0.16	0.023	1.7	−0.79	C+	4n
		3134.11	7728	39626	7	9	0.014	0.0027	0.20	−1.72	C	4n
45.	$a\ ^5F - x\ ^5F^\circ$ (30)											
		2999.51	6928	40257	11	11	0.23	0.032	3.4	−0.46	C+	4n
		3009.57	7377	40594	9	9	0.18	0.024	2.2	−0.66	C+	4n
		3018.98	7728	40842	7	7	0.15	0.020	1.4	−0.85	C+	4n
		3026.46	7986	41018	5	5	0.13	0.018	0.91	−1.04	C	4n
		3031.63	8155	41131	3	3	0.18	0.025	0.74	−1.13	C	4n
		2987.29	7377	40842	9	7	0.077	0.0080	0.71	−1.14	C	4n
		3016.18	7986	41131	5	3	0.10	0.0081	0.40	−1.39	C	4n
		3040.43	7377	40257	9	11	0.035	0.0060	0.54	−1.27	C	4n
		3042.66	7986	40842	5	7	0.066	0.013	0.65	−1.19	C	4n
		3042.02	8155	41018	3	5	0.057	0.013	0.40	−1.40	C	4n
46.	$a\ ^5F - y\ ^5G^\circ$ (uv 44)											
		2788.10	6928	42784	11	13	0.63	0.087	8.8	−0.02	C	6n

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
47.	$a\ ^5F - w\ ^5D°$ (uv 46)											
		2733.58	6928	43499	11	9	0.86	0.079	7.8	−0.06	C	7
		2735.48	7377	43923	9	7	0.62	0.054	4.4	−0.31	C	7
48.	$a\ ^5F - ^5F°$											
		2679.06	6928	44244	11	11	0.19	0.021	2.0	−0.64	C	7
49.	$a\ ^5F - x\ ^5G°$ (uv 52)											
		2584.54	6928	45608?	11	13	0.46	0.054	5.1	−0.23	C	6*n*, 7
		2606.83	7377	45726	9	11	0.42	0.052	4.0	−0.33	C	7
		2623.53	7728	45833	7	9	0.33	0.044	2.7	−0.51	C	7
		2618.02	7728	45913	7	7	0.40	0.041	2.5	−0.54	C	7
50.	$a\ ^5F - t\ ^5D°$ (uv 71)											
		2277.11	7728	51630?	7	5	37	2.1	110	1.16	C	6*n*
51.	$a\ ^3F - z\ ^5F°$ (34)											
		6581.22	11976	27167	9	9	2.8(−6)	1.8(−6)	3.5(−4)	−4.79	C	5*n*
52.	$a\ ^3F - z\ ^5P°$ (35)											
		5853.18	11976	29056	9	7	1.7(−6)	6.9(−7)	1.2(−4)	−5.21	C	5*n*
53.	$a\ ^3F - z\ ^3F°$ (36)											
		5171.60	11976	31307	9	9	0.0045	0.0018	0.28	−1.79	C	4*n*
		5307.36	12969	31805	5	7	1.2(−4)	7.1(−5)	0.0062	−3.45	D	15*n*
54.	$a\ ^3F - z\ ^3D°$ (37)											
		5167.49	11976	31323	9	7	0.023	0.0072	1.1	−1.19	C	4*n*
		5270.36	12969	31937	5	3	0.029	0.0073	0.63	−1.44	C	4*n*
		5341.02	12969	31686	5	5	0.0047	0.0020	0.18	−2.00	D	9
55.	$a\ ^3F - y\ ^5D°$ (38)											
		4733.59	11976	33096	9	9	6.4(−4)	2.2(−4)	0.030	−2.71	C	4*n*
		4798.73	12969	33802	5	5	3.8(−5)	1.3(−5)	0.0010	−4.18	C	5*n*
56.	$a\ ^3F - y\ ^5F°$ (39)											
		4602.94	11976	33695	9	11	0.0032	0.0012	0.17	−1.95	C	4*n*
		4680.29	12969	34329	5	7	7.2(−5)	3.3(−5)	0.0026	−3.78	C	5*n*
		4531.15	11976	34040	9	9	0.0030	9.2(−4)	0.12	−2.08	C	4*n*
		4592.65	12561	34329	7	7	0.0017	5.4(−4)	0.057	−2.42	D−	14*n*
		4632.91	12969	34547	5	5	9.2(−4)	3.0(−4)	0.023	−2.83	C	5*n*
		4547.02	12561	34547	7	5	1.4(−4)	3.1(−5)	0.0033	−3.66	C	5*n*
		4602.00	12969	34692	5	3	6.8(−4)	1.3(−4)	0.0098	−3.19	C	5*n*
57.	$a\ ^3F - z\ ^3P°$ (40)											
		4674.65	12561	33947	7	5	1.2(−5)	2.7(−6)	2.9(−4)	−4.72	C	5*n*
		4765.48	12969	33947	5	5	6.7(−5)	2.3(−5)	0.0018	−3.94	C	5*n*

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
58.	$a\ ^3F - z\ ^5G^\circ$ (41)											
		4383.54	11976	34782	9	11	0.46	0.16	21	0.16	C+	4*n*
		4404.75	12561	35257	7	9	0.25	0.094	9.6	−0.18	C+	4*n*
		4415.12	12969	35612	5	7	0.13	0.053	3.8	−0.58	C+	4*n*
		4294.12	11976	35257	9	9	0.037	0.010	1.3	−1.04	C	4*n*
		4337.05	12561	35612	7	7	0.012	0.0035	0.35	−1.61	C	4*n*
		4367.90	12969	35856	5	5	0.0018	5.3(−4)	0.038	−2.58	C	5*n*
		4229.75	11976	35612	9	7	2.9(−4)	6.1(−5)	0.0077	−3.26	C	5*n*
59.	$a\ ^3F - z\ ^3G^\circ$ (42)	*4293.8*	*12407*	*35690*	21	27	0.41	0.14	43	0.48	D	4*n*,9,13*n*
		4271.76	11976	35379	9	11	0.25	0.082	10	−0.13	D−	13*n*
		4307.90	12561	35768	7	9	0.35	0.12	12	−0.06	C+	4*n*
		4325.76	12969	36079	5	7	0.51	0.20	14	0.00	C+	4*n*
		4202.03	11976	35768	9	9	0.11	0.030	3.7	−0.57	D	9
		4250.79	12561	36079	7	7	0.11	0.029	2.9	−0.69	D−	13*n*
		4147.67	11976	36079	9	7	0.0059	0.0012	0.15	−1.97	C	4*n*
60.	$a\ ^3F - y\ ^3F^\circ$ (43)	*4057.8*	*12407*	*37044*	21	21	0.98	0.24	68	0.71	C+	4*n*,13*n*
		4045.81	11976	36686	9	9	0.75	0.18	22	0.22	C+	4*n*
		4063.59	12561	37163	7	7	0.69	0.17	16	0.08	C+	4*n*
		4071.74	12969	37521	5	5	0.80	0.20	13	0.00	C+	4*n*
		3969.26	11976	37163	9	7	0.24	0.043	5.1	−0.41	C+	4*n*
		4005.24	12561	37521	7	5	0.22	0.038	3.5	−0.57	C+	4*n*
		4143.87	12561	36686	7	9	0.16	0.052	5.0	−0.44	C+	4*n*
		4132.06	12969	37163	5	7	0.13	0.047	3.2	−0.63	D−	13*n*
61.	$a\ ^3F - y\ ^5P^\circ$ (44)											
		4032.63	11976	36767	9	7	0.0025	4.7(−4)	0.057	−2.37	C	5*n*
62.	$a\ ^3F - y\ ^3D^\circ$ (45)	*3830.3*	*12407*	*38507*	21	15	1.5	0.23	62	0.69	C+	4*n*,5*n*,6*n*
		3815.84	11976	38175	9	7	1.3	0.22	25	0.30	C+	4*n*,6*n*
		3827.82	12561	38678	7	5	1.1	0.18	16	0.09	C+	4*n*
		3841.05	12969	38996	5	3	1.4	0.18	12	−0.04	C+	4*n*
		3902.95	12561	38175	7	7	0.24	0.054	4.9	−0.42	C+	4*n*
		3888.51	12969	38678	5	5	0.27	0.060	3.9	−0.52	C+	4*n*
		3966.06	12969	38175	5	7	0.017	0.0055	0.36	−1.56	C	4*n*,5*n*
63.	$a\ ^3F - x\ ^5D^\circ$ (46)											
		3615.66	11976	39626	9	9	7.5(−4)	1.5(−4)	0.016	−2.88	C	5*n*
		3666.94	12969	40231	5	5	6.7(−4)	1.4(−4)	0.0082	−3.17	C	5*n*
		3571.22	11976	39970	9	7	0.0022	3.3(−4)	0.035	−2.53	C	5*n*
64.	$a\ ^3F - x\ ^5F^\circ$ (48)											
		3493.28	11976	40594	9	9	9.2(−4)	1.7(−4)	0.017	−2.82	C	5*n*
		3564.11	12969	41018	5	5	0.0016	3.0(−4)	0.018	−2.82	C	5*n*
		3463.30	11976	40842	9	7	0.0011	1.5(−4)	0.015	−2.87	D	12*n*
		3513.05	12561	41018	7	5	0.0037	5.0(−4)	0.040	−2.46	C	5*n*
		3549.86	12969	41131	5	3	0.0060	6.8(−4)	0.040	−2.47	C	5*n*
65.	$a\ ^3F - x\ ^3D^\circ$ (55)											
		3068.17	12969	45552	5	3	0.12	0.0098	0.49	−1.31	C	4*n*

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i(cm^{-1})	E_k(cm^{-1})	g_i	g_k	A_{ki}(10^8 s^{-1})	f_{ik}	S(at. u.)	log gf	Accuracy	Source
66.	$a\ ^3F - ^3F°$											
		2920.69	12969	47197	5	5	0.061	0.0078	0.37	−1.41	C	4*n*
67.	$a\ ^5P - y\ ^5D°$ (62)											
		6430.85	17550	33096	7	9	0.0017	0.0014	0.20	−2.02	D−	14*n*
		6297.80	17927	33802	3	5	5.6(−4)	5.5(−4)	0.034	−2.78	C	5*n*
		6151.62	17550	33802	7	5	1.6(−4)	6.4(−5)	0.0090	−3.35	C	5*n*
		6173.34	17927	34122	3	1	0.0018	3.4(−4)	0.021	−2.99	C	5*n*
68.	$a\ ^5P - y\ ^5F°$ (63)											
		6062.89	17550	34040	7	9	1.7(−5)	1.2(−5)	0.0017	−4.07	C	5*n*
		5892.80	17727	34692	5	3	7.0(−5)	2.2(−5)	0.0021	−3.96	C	5*n*
69.	$a\ ^5P - z\ ^3P°$ (64)											
		6012.21	17927	34556	3	1	1.5(−4)	2.7(−5)	0.0016	−4.09	C	5*n*
		6163.56	17727	33947	5	5	6.0(−5)	3.4(−5)	0.0034	−3.77	C	5*n*
		6082.72	17927	34363	3	3	1.5(−4)	8.4(−5)	0.0050	−3.60	C	5*n*
		6240.66	17927	33947	3	5	1.5(−4)	1.5(−4)	0.0090	−3.36	C	5*n*
70.	$a\ ^5P - y\ ^3F°$ (65)											
		5224.30	17550	36686	7	9	2.7(−5)	1.4(−5)	0.0017	−4.01	C	5*n*
		5143.73	17727	37163	5	7	6.9(−5)	3.8(−5)	0.0032	−3.72	C	5*n*
71.	$a\ ^5P - y\ ^5P°$ (66)											
		5202.34	17550	36767	7	7	0.0097	0.0039	0.47	−1.56	C	4*n*
		5145.09	17727	37158	5	5	3.5(−4)	1.4(−4)	0.012	−3.16	C	5*n*
		5198.71	17927	37158	3	5	0.0039	0.0026	0.14	−2.10	C	4*n*
72.	$a\ ^5P - y\ ^3D°$ (67)											
		4771.70	17727	38678	5	5	1.1(−4)	3.6(−5)	0.0029	−3.74	C	5*n*
		4745.13	17927	38996	3	3	7.8(−5)	2.6(−5)	0.0012	−4.10	C	5*n*
		4817.77	17927	38678	3	5	2.0(−4)	1.2(−4)	0.0055	−3.46	C	5*n*
73.	$a\ ^5P - x\ ^5D°$ (68)											
		4528.61	17550	39626	7	9	0.063	0.025	2.6	−0.76	C+	4*n*
		4494.56	17727	39970	5	7	0.035	0.015	1.1	−1.12	C	4*n*,5*n*
		4459.12	17550	39970	7	7	0.028	0.0084	0.86	−1.23	C	4*n*
		4442.34	17727	40231	5	5	0.047	0.014	1.0	−1.16	C	4*n*
		4447.72	17927	40405	3	3	0.063	0.019	0.82	−1.25	C	4*n*
		4407.71	17550	40231	7	5	0.0097	0.0020	0.20	−1.85	C	4*n*
		4408.41	17727	40405	5	3	0.026	0.0046	0.33	−1.64	C	4*n*
		4430.61	17927	40491	3	1	0.11	0.010	0.45	−1.51	D	9
74.	$a\ ^5P - y\ ^7P°$ (69)											
		4447.13	17727	40207	5	7	0.0015	6.0(−4)	0.044	−2.52	C	5*n*
		4518.58	17927	40052	3	5	8.8(−5)	4.5(−5)	0.0020	−3.87	C	5*n*
		4478.04	17727	40052	5	5	1.6(−4)	4.7(−5)	0.0035	−3.63	C	5*n*
		4442.83	17550	40052	7	5	0.0019	4.0(−4)	0.041	−2.55	C	5*n*

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
75.	$a\ ^5P - x\ ^5F^\circ$ (70)											
		4338.26	17550	40594	7	9	7.7(−4)	2.8(−4)	0.028	−2.71	C	5*n*
		4292.13	17550	40842	7	7	5.5(−4)	1.5(−4)	0.015	−2.97	C	5*n*
		4292.29	17727	41018	5	5	0.0014	3.9(−4)	0.028	−2.71	C	5*n*
76.	$a\ ^5P - z\ ^5S^\circ$ (71)	*4307.1*	*17681*	40895	15	5	0.26	0.024	5.2	−0.44	C+	4*n*,5*n*
		4282.40	17550	40895	7	5	0.13	0.025	2.5	−0.76	C+	4*n*,5*n*
		4315.08	17727	40895	5	5	0.090	0.025	1.8	−0.90	C+	4*n*
		4352.73	17927	40895	3	5	0.045	0.022	0.93	−1.19	C	4*n*
77.	$a\ ^5P - x\ ^5P^\circ$ (72)	*3988.2*	*17681*	*12751*	15	15	0.081	0.019	3.8	−0.54	C	4*n*,5*n*
		4001.66	17550	42533	7	7	0.0092	0.0022	0.20	−1.81	C	4*n*,5*n*
		3977.74	17727	42860	5	5	0.082	0.020	1.3	−1.01	C	4*n*
		3974.77	17927	43079	3	3	0.0042	9.8(−4)	0.039	−2.53	C	5*n*
		3949.95	17550	42860	7	5	0.070	0.012	1.1	−1.09	C	5*n*
		3943.34	17727	43079	5	3	0.0092	0.0013	0.084	−2.19	C	5*n*
		4030.18	17727	42533	5	7	0.0034	0.0012	0.076	−2.24	C	5*n*
		4009.71	17927	42860	3	5	0.062	0.025	0.98	−1.13	C	4*n*
78.	$a\ ^5P - w\ ^5D^\circ$ (73)											
		3852.57	17550	43499	7	9	0.034	0.0097	0.86	−1.17	C	4*n*
		3816.34	17727	43923	5	7	0.027	0.0081	0.51	−1.39	C	5*n*
		3807.54	17927	44184	3	5	0.097	0.035	1.3	−0.98	C+	4*n*,5*n*
		3778.70	17727	44184	5	5	0.010	0.0022	0.14	−1.96	C	5*n*
		3774.82	17927	44411	3	3	0.061	0.013	0.48	−1.41	C	4*n*,5*n*
		3753.61	17550	44184	7	5	0.11	0.017	1.5	−0.92	C+	4n,5n
		3746.49	17727	44411	5	3	0.013	0.0017	0.10	−2.08	C	5*n*
		3768.03	17927	44459	3	1	0.098	0.0070	0.26	−1.68	C	5*n*
79.	$a\ ^5P - {}^5F^\circ$											
		3781.19	17727	44166	5	7	0.0094	0.0028	0.18	−1.85	C	5*n*
		3792.83	17927	44285	3	5	0.0040	0.0015	0.055	−2.36	C	5*n*
		3756.07	17550	44166	7	7	0.0065	0.0014	0.12	−2.02	C	5*n*
		3739.32	17550	44285	7	5	0.0054	8.0(−4)	0.069	−2.25	C	5*n*
80.	$a\ ^5P - {}^5D^\circ$											
		3776.45	17550	44023	7	9	0.017	0.0048	0.42	−1.47	C	4*n*,5*n*
		3739.12	17927	44664	3	5	0.0071	0.0025	0.091	−2.13	C	5*n*
		3687.10	17550	44664	7	5	0.028	0.0040	0.34	−1.55	C	5*n*
81.	$a\ ^5P - y\ ^5S^\circ$ (76)											
		3732.40	17727	44512	5	5	0.28	0.059	3.6	−0.53	C+	4*n*
		3760.53	17927	44512	3	5	0.057	0.020	0.75	−1.22	C	4*n*,5*n*
82.	$a\ ^5P - x\ ^5D^\circ$ (77)											
		3628.09	17727	45282	5	5	0.0061	0.0012	0.072	−2.22	C	5*n*
		3592.89	17727	45552	5	3	0.0037	4.3(−4)	0.025	−2.67	C	5*n*
		3654.66	17927	45282	3	5	0.0017	5.5(−4)	0.020	−2.78	C	5*n*

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
83.	$a\ ^5P - w\ ^5P°$ (78)											
		3497.10	17550	46137	7	7	0.15	0.027	2.1	−0.73	C+	4*n*
		3509.87	17927	46410	3	3	0.018	0.0033	0.12	−2.00	C	5*n*
		3485.34	17727	46410	5	3	0.16	0.017	1.0	−1.06	C	4*n*
		3518.82	17727	46137	5	7	0.0073	0.0019	0.11	−2.02	C	5*n*
		3521.84	17927	46314	3	5	0.11	0.035	1.2	−0.98	C+	4*n*
84.	$a\ ^5P - z\ ^3S°$ (79)											
		3462.35	17727	46601	5	3	0.013	0.0014	0.083	−2.14	D	12*n*
85.	$a\ ^5P - y\ ^3P°$ (82)											
		3477.85	17927	46673	3	1	0.039	0.0024	0.081	−2.15	D	12*n*
		3447.28	17727	46727	5	5	0.11	0.019	1.1	−1.02	C	4*n*
		3450.33	17927	46902	3	3	0.24	0.043	1.5	−0.89	C+	4*n*
86.	$a\ ^5P - ^5F°$											
		3427.12	17550	46721	7	9	0.56	0.13	10	−0.05	C+	4*n*
		3383.98	17550	47093	7	7	0.11	0.019	1.5	−0.88	C+	4*n*
		3372.07	17550	47197	7	5	0.0093	0.0011	0.088	−2.10	D	12*n*
87.	$a\ ^5P - ^5D°$											
		3407.46	17550	46889	7	9	0.60	0.13	10	−0.03	C+	4*n*
		3413.13	17727	47017	5	7	0.37	0.089	5.0	−0.35	C+	4*n*
		3392.65	17550	47017	7	7	0.26	0.045	3.5	−0.50	C+	4*n*
		3399.33	17727	47136	5	5	0.39	0.068	3.8	−0.47	C+	4*n*
		3417.84	17927	47177	3	3	0.52	0.092	3.1	−0.56	C+	4*n*
		3394.58	17727	47177	5	3	0.12	0.012	0.67	−1.22	C	4*n*
		3418.51	17927	47171?	3	1	1.3	0.078	2.6	−0.63	C+	4*n*
88.	$a\ ^5P - ^3D°$											
		3424.28	17550	46745	7	7	0.21	0.037	2.9	−0.59	C+	4*n*
		3428.19	17727	46889	5	5	0.22	0.038	2.2	−0.72	C+	4*n*
		3445.15	17727	46745	5	7	0.28	0.071	4.0	−0.45	C+	4*n*
89.	$a\ ^5P - z\ ^3H°$ (84)											
		3382.40	17550	47106	7	9	0.0085	0.0019	0.15	−1.88	D	12*n*
90.	$a\ ^5P - v\ ^5F°$ (90)											
		3298.13	17927	48239	3	5	0.095	0.026	0.84	−1.11	C	4*n*
		3257.59	17550	48239	7	5	0.15	0.017	1.3	−0.92	D−	11*n*
91.	$a\ ^5P - v\ ^5P°$ (91)											
		3284.59	17727	48163	5	5	0.063	0.010	0.55	−1.29	C	4*n*
		3292.59	17927	48290	3	3	0.31	0.050	1.6	−0.82	C+	4*n*
		3265.62	17550	48163	7	5	0.39	0.044	3.3	−0.51	C+	4*n*
		3271.00	17727	48290	5	3	0.67	0.065	3.5	−0.49	C+	4*n*
		3305.97	17727	47967	5	7	0.48	0.11	6.0	−0.26	C+	4*n*
		3306.36	17927	48163	3	5	0.66	0.18	5.8	−0.27	D−	11*n*

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
92.	$a\ ^3P - x\ ^3P°$ (95)											
		3246.96	17727	48516	5	3	0.11	0.010	0.54	−1.30	E	11n
		3268.23	17927	48516	3	3	0.055	0.0088	0.28	−1.58	D	12n
		3290.99	17927	48305	3	5	0.071	0.019	0.62	−1.24	C	4n
93.	$a\ ^3P - y\ ^5D°$ (109)											
		6608.03	18378	33507	5	7	2.4(−5)	2.2(−5)	0.0024	−3.96	C	5n
		7016.08	19552	33802	3	5	2.0(−4)	2.4(−4)	0.017	−3.14	C	5n
		6481.88	18378	33802	5	5	3.2(−4)	2.0(−4)	0.022	−2.99	C	5n
94.	$a\ ^3P - z\ ^3P°$ (111)											
		6421.35	18378	33947	5	5	0.0036	0.0022	0.24	−1.95	D−	14n
		6750.15	19552	34363	3	3	0.0013	9.2(−4)	0.061	−2.56	C	5n
		6254.26	18378	34363	5	3	0.0019	6.8(−4)	0.070	−2.47	C	5n
95.	$a\ ^3P - y\ ^3F°$ (112)											
		5322.04	18378	37163	5	7	3.7(−4)	2.2(−4)	0.019	−2.96	C	5n
96.	$a\ ^3P - y\ ^5P°$ (113)											
		5436.59	18378	36767	5	7	1.5(−4)	9.6(−5)	0.0086	−3.32	C	5n
		5253.03	18378	37410	5	3	1.1(−4)	2.7(−5)	0.0023	−3.87	C	5n
97.	$a\ ^3P - y\ ^3D°$ (114)											
		5049.82	18378	38175	5	7	0.017	0.0089	0.74	−1.35	C	4n
		4924.77	18378	38678	5	5	0.0039	0.0014	0.11	−2.15	D	10n
		4848.90	18378	38996	5	3	4.4(−4)	9.4(−5)	0.0075	−3.33	C	5n
98.	$a\ ^3P - x\ ^5D°$ (115)											
		4630.12	18378	39970	5	7	0.0013	5.9(−4)	0.045	−2.53	C	5n
		4834.51	19552	40231	3	5	2.6(−4)	1.5(−4)	0.0073	−3.34	C	5n
		4574.72	18378	40231	5	5	8.0(−4)	2.5(−4)	0.019	−2.90	C	5n
		4794.36	19552	40405	3	3	1.0(−4)	3.5(−5)	0.0017	−3.98	C	5n
99.	$a\ ^3P - z\ ^5S°$ (116)											
		4439.88	18378	40895	5	5	9.1(−4)	2.7(−4)	0.020	−2.87	C	5n
100.	$a\ ^3P - x\ ^5P°$ (117)											
		4249.32	19552	43079	3	3	0.0010	2.8(−4)	0.012	−3.07	C	5n
101.	$a\ ^3P - w\ ^5D°$ (120)											
		3913.63	18378	43923	5	7	0.017	0.0055	0.35	−1.56	C	4n,5n
		4058.75	19552	44184	3	5	0.0083	0.0034	0.14	−1.99	C	4n
		4101.68	20038	44411	1	3	0.0040	0.0030	0.041	−2.52	C	4n
102.	$a\ ^3P - {}^5D°$											
		3981.11	19552	44664	3	5	0.0011	4.4(−4)	0.017	−2.88	C	5n

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
103.	$a\ ^3P - x\ ^3D^o$ (124)											
		3724.38	18378	45221	5	7	0.13	0.037	2.3	−0.73	C+	4*n*
		3885.51	19552	45282	3	5	0.069	0.026	0.99	−1.11	C	4*n*,5*n*
		3715.91	18378	45282	5	5	0.037	0.0076	0.47	−1.42	C	4*n*,5*n*
		3845.17	19552	45552	3	3	0.085	0.019	0.71	−1.25	C	4*n*,5*n*
104.	$a\ ^3P - w\ ^5P^o$ (127)											
		3578.67	18378	46314	5	5	0.019	0.0036	0.21	−1.74	C	5*n*
		3566.31	18378	46410	5	3	0.034	0.0039	0.23	−1.71	C	5*n*
105.	$a\ ^3P - y\ ^3P^o$ (131)											
		3504.86	18378	46902	5	3	0.020	0.0022	0.13	−1.95	C	5*n*
		3686.26	19552	46673	3	1	0.14	0.0094	0.34	−1.55	C	5*n*
		3678.86	19552	46727	3	5	0.047	0.016	0.58	−1.32	C	4*n*,5*n*
106.	$a\ ^3P - ^3F^o$											
		3616.32	19552	47197	3	5	0.0085	0.0028	0.099	−2.08	C	5*n*
107.	$a\ ^3P - ^5D^o$											
		3624.31	19552	47136	3	5	0.012	0.0040	0.14	−1.92	C	5*n*
108.	$a\ ^3P - ^3D^o$											
		3524.24	18378	46745	5	7	0.051	0.013	0.77	−1.18	C	4*n*,5*n*
		3657.14	19552	46889	3	5	0.013	0.0045	0.16	−1.87	C	5*n*
		3670.81	20038	47272	1	3	0.026	0.016	0.19	−1.80	C	5*n*
		3506.50	18378	46889	5	5	0.086	0.016	0.92	−1.10	C	4*n*,5*n*
109.	$a\ ^3P - v\ ^5F^o$ (138)											
		3347.93	18378	48239	5	5	0.047	0.0080	0.44	−1.40	C	4*n*
110.	$a\ ^3P - x\ ^3P^o$ (139)											
		3317.12	18378	48516	5	3	0.033	0.0032	0.18	−1.79	D	12*n*
		3510.44	20038	48516	1	3	0.052	0.029	0.33	−1.54	C	5*n*
111.	$a\ ^3P - u\ ^3D^o$ (146)											
		3053.07	19552	52297	3	5	0.18	0.042	1.3	−0.90	C+	4*n*
112.	$a\ ^3P - ^3D^o$											
		2954.65	18378	52213	5	7	0.12	0.021	1.0	−0.97	C+	4*n*
113.	$a\ ^3P - ^3P^o$											
		2894.50	18378	52916	5	5	0.63	0.080	3.8	−0.40	C+	4*n*
		2899.42	18378	52858	5	3	0.61	0.046	2.2	−0.64	C+	4*n*
		2996.39	19552	52916	3	5	0.19	0.042	1.2	−0.90	C+	4*n*

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
114.	$z\ ^7D^\circ - e\ ^7D$ (152)											
		4260.47	19351	42816	11	11	0.37	0.10	15	0.04	D	9
		4235.94	19562	43163	9	9	0.23	0.062	7.8	−0.25	D	9
		4222.21	19757	43435	7	7	0.063	0.017	1.6	−0.93	C+	4*n*
		4210.34	20020	43764	3	3	0.20	0.053	2.2	−0.80	C+	4*n*
		4198.30	19351	43163	11	9	0.13	0.027	4.2	−0.52	D−	13*n*
		4187.79	19562	43435	9	7	0.16	0.034	4.2	−0.52	C+	4*n*
		4187.04	19757	43634	7	5	0.23	0.043	4.2	−0.52	C+	4*n*
		4271.15	19757	43163	7	9	0.19	0.067	6.6	−0.33	D−	13*n*
		4250.12	19912	43435	5	7	0.23	0.085	6.0	−0.37	C+	4*n*
		4233.60	20020	43634	3	5	0.20	0.092	3.8	−0.56	C+	4*n*
115.	$z\ ^7D^\circ - e\ ^5D$ (153)											
		3980.65	19562	44677	9	9	2.6(−4)	6.2(−5)	0.0074	−3.25	C	5*n*
		4011.71	19757	44677	7	9	0.0011	3.4(−4)	0.032	−2.62	C	5*n*
		3975.21	19912	45061	5	7	0.0012	4.1(−4)	0.027	−2.69	C	5*n*
116.	$z\ ^7D^\circ - e\ ^7F$ (155)											
		3225.79	19351	50342	11	13	1.0	0.19	22	0.32	C+	4*n*
		3196.93	19562	50833	9	11	0.96	0.18	17	0.21	D−	11*n*
		3175.45	19351	50833	11	11	0.13	0.020	2.3	−0.66	C+	4*n*
		3160.66	19562	51192	9	9	0.19	0.029	2.7	−0.59	C+	4*n*
		3205.40	20020	51208	3	3	1.2	0.18	5.8	−0.26	C+	4*n*
117.	$z\ ^7D^\circ - f\ ^7D$ (156)											
		3222.07	19351	50378	11	11	0.35	0.055	6.4	−0.22	D−	11*n*
		3199.53	19562	50808	9	9	0.27	0.041	3.9	−0.43	C+	4*n*
		3215.94	19912	50999	5	5	0.81	0.13	6.7	−0.20	C+	4*n*
		3219.58	19757	50808	7	9	0.67	0.13	9.9	−0.03	D−	11*n*
118.	$z\ ^7D^\circ - f\ ^5D$ (157)											
		3217.38	19351	50423	11	9	0.23	0.029	3.3	−0.50	C+	4*n*
		3227.80	19562	50534	9	7	1.7	0.21	20	0.28	D−	11*n*
		3230.96	19757	50699	7	5	0.39	0.044	3.3	−0.51	C+	4*n*
		3228.25	19912	50880	5	3	0.48	0.045	2.4	−0.65	D−	11*n*
		3248.20	19757	50534	7	7	0.22	0.035	2.6	−0.61	C+	4*n*
119.	$z\ ^7D^\circ - e\ ^7P$ (158)											
		3233.97	19562	50475	9	9	0.20	0.032	3.1	−0.54	C+	4*n*
		3230.21	19912	50861	5	5	0.21	0.032	1.7	−0.79	D−	11*n*
120.	$z\ ^7D^\circ - e\ ^5G$ (159)											
		3207.07	19351	50523	11	13	0.012	0.0021	0.25	−1.63	D	12*n*
121.	$z\ ^7D^\circ - e\ ^7G$ (160)											
		3161.95	19351	50968	11	13	0.12	0.021	2.4	−0.63	C+	4*n*
		3168.85	19912	51461	5	7	0.053	0.011	0.59	−1.25	D	12*n*

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Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
122.	$a\ ^3H - y\ ^5F^\circ$ (167)											
		6988.53	19390	33695	13	11	3.2(−5)	2.0(−5)	0.0059	−3.59	C	5*n*
123.	$a\ ^3H - z\ ^5G^\circ$ (168)											
		6593.88	19621	34782	11	11	4.8(−4)	3.2(−4)	0.075	−2.46	C	5*n*
		6462.73	19788	35257	9	9	5.2(−4)	3.3(−4)	0.063	−2.53	C	5*n*
		6494.98	19390	34782	13	11	0.0067	0.0036	1.0	−1.33	D−	14*n*
		6393.60	19621	35257	11	9	0.0046	0.0023	0.53	−1.60	D−	14*n*
124.	$a\ ^3H - z\ ^3G^\circ$ (169)											
		6252.55	19390	35379	13	11	0.0031	0.0015	0.41	−1.70	D−	14*n*
		6191.56	19621	35768	11	9	0.0052	0.0024	0.55	−1.57	D−	14*n*
		6344.15	19621	35379	11	11	1.8(−4)	1.1(−4)	0.025	−2.92	C	5*n*
		6256.37	19788	35768	9	9	5.3(−4)	3.1(−4)	0.058	−2.55	C	5*n*
125.	$a\ ^3H - y\ ^3F^\circ$ (170)											
		5916.25	19788	36686	9	9	2.5(−4)	1.3(−4)	0.023	−2.93	C	5*n*
126.	$a\ ^3H - y\ ^3G^\circ$ (175)											
		3859.21	19390	45295	13	11	0.087	0.016	2.7	−0.67	C+	4*n*
		3873.76	19621	45428	11	9	0.082	0.015	2.1	−0.78	C+	4*n*
		3899.03	19788	45428	9	9	0.0097	0.0022	0.26	−1.70	C	4*n*,5*n*
127.	$a\ ^3H - z\ ^3I^\circ$ (177)											
		3760.05	19390	45978?	13	15	0.057	0.014	2.3	−0.74	C+	4*n*,5*n*
		3785.95	19621	46027	11	13	0.049	0.013	1.7	−0.86	C	5*n*
		3794.34	19788	46136	9	11	0.046	0.012	1.4	−0.96	C+	4*n*,5*n*
		3753.15	19390	46027	13	13	0.0012	2.5(−4)	0.041	−2.48	C	5*n*
128.	$a\ ^3H - ^3F^\circ$											
		3689.02	19621	46721	11	9	0.0047	7.9(−4)	0.11	−2.06	C	5*n*
		3661.36	19788	47093	9	7	0.0030	4.6(−4)	0.050	−2.38	C	5*n*
129.	$a\ ^3H - ^5D^\circ$											
		3688.88	19788	46889	9	9	0.0046	9.5(−4)	0.10	−2.07	C	5*n*
130.	$a\ ^3H - z\ ^3H^\circ$ (180)											
		3623.19	19390	46982	13	13	0.076	0.015	2.3	−0.71	C+	4*n*
		3659.52	19788	47106	9	9	0.068	0.014	1.5	−0.91	C+	4*n*
		3637.25	19621	47106	11	9	0.0083	0.0013	0.18	−1.83	C	5*n*
		3653.76	19621	46982	11	13	0.0053	0.0013	0.17	−1.86	C	5*n*
		3672.69	19788	47008	9	11	0.0037	9.0(−4)	0.098	−2.09	C	5*n*
131.	$a\ ^3H - w\ ^5G^\circ$ (181)											
		3596.20	19621	47420	11	11	0.0055	0.0011	0.14	−1.93	C	5*n*
		3595.86	19788	47590	9	9	0.0023	4.5(−4)	0.048	−2.39	C	5*n*

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
132.	$a\ ^3H - v\ ^5F°$ (182)											
		3531.44	19621	47930	11	9	0.0028	4.4(−4)	0.056	−2.32	C	5n
133.	$a\ ^3H - ^5H°$											
		3514.63	19390	47835	13	11	0.0044	6.9(−4)	0.10	−2.05	C	5n
		3543.39	19621	47835	11	11	0.0036	6.7(−4)	0.086	−2.13	C	5n
		3567.37	19788	47812	9	9	0.0041	7.9(−4)	0.083	−2.15	C	5n
134.	$a\ ^3H - z\ ^1H°$ (186)											
		3496.19	19788	48383	9	11	2.9(−4)	6.5(−5)	0.0068	−3.23	C	8
135.	$a\ ^3H - v\ ^3G°$ (191)											
		3325.46	19788	49851	9	7	0.020	0.0025	0.25	−1.64	D	12n
136.	$a\ ^3H - u\ ^3G°$ (194)											
		3119.49	19621	51668	11	9	0.096	0.011	1.3	−0.90	C+	4n
		3120.43	19788	51826	9	7	0.10	0.012	1.1	−0.97	C+	4n
137.	$a\ ^3H - w\ ^3H°$ (198)											
		3009.09	19390	52613	13	11	0.079	0.0090	1.2	−0.93	C+	4n
		3015.92	19621	52769	11	9	0.069	0.0077	0.85	−1.07	C	4n
138.	$a\ ^3H - y\ ^3I°$ (199)											
		3005.31	19390	52655?	13	15	0.024	0.0038	0.48	−1.31	C	8
		3039.32	19621	52514	11	13	0.016	0.0026	0.29	−1.54	C	8
		3018.14	19390	52514	13	13	0.012	0.0016	0.21	−1.67	C	8
139.	$a\ ^3H - z\ ^1I°$ (200)											
		2986.65	19621	53094	11	13	0.0085	0.0013	0.15	−1.83	C	8
140.	$a\ ^3H - x\ ^3I°$ (uv 156)											
		2656.15	19390	57028?	13	15	0.28	0.034	3.9	−0.35	C	8
		2669.49	19621	57070	11	13	0.17	0.021	2.1	−0.63	C	8
141.	$b\ ^3F - z\ ^5G°$ (205)											
		6839.83	20641	35257	9	9	6.6(−5)	4.6(−5)	0.0094	−3.38	C	5n
142.	$b\ ^3F - z\ ^3G°$ (206)											
		6609.12	20641	35768	9	9	3.1(−4)	2.0(−4)	0.040	−2.74	C	5n
		6575.02	20874	36079	7	7	3.9(−4)	2.5(−4)	0.038	−2.75	C	5n
		6475.63	20641	36079	9	7	3.1(−4)	1.5(−4)	0.029	−2.87	C	5n

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
143.	$b\ ^3F - y\ ^3F^o$ (207)											
		6230.73	20641	36686	9	9	0.0087	0.0051	0.94	−1.34	D−	14n
		6137.69	20874	37163	7	7	0.0078	0.0044	0.62	−1.51	D−	14n
		6065.48	21039	37521	5	5	0.010	0.0058	0.58	−1.54	D−	14n
		6200.32	21039	37163	5	7	9.4(−4)	7.6(−4)	0.078	−2.42	C	5n
144.	$b\ ^3F - y\ ^1D^o$ (209)											
		5567.40	21039	38996	5	3	0.0013	3.7(−4)	0.034	−2.73	C	5n
		5778.47	20874	38175	7	7	8.6(−5)	4.3(−5)	0.0057	−3.52	C	5n
		5667.67	21039	38678	5	5	4.6(−4)	2.2(−4)	0.020	−2.96	C	5n
		5833.93	21039	38175	5	7	7.2(−5)	5.1(−5)	0.0049	−3.59	C	5n
145.	$b\ ^3F - w\ ^5D^o$ (214)											
		4288.96	20874	44184	7	5	0.0025	5.0(−4)	0.049	−2.46	C	5n
		4277.41	21039	44411	5	3	0.0014	2.2(−4)	0.016	−2.95	C	5n
146.	$b\ ^3F - ^5D^o$											
		4275.72	20641	44023	9	9	6.9(−4)	1.9(−4)	0.024	−2.77	C	5n
147.	$b\ ^3F - x\ ^3D^o$ (217)											
		4067.27	20641	45221	9	7	0.025	0.0049	0.58	−1.36	C	4n
		4095.97	20874	45282	7	5	0.037	0.0067	0.63	−1.33	C	4n,5n
		4078.35	21039	45552	5	3	0.050	0.0074	0.50	−1.43	C	4n,5n
		4106.27	20874	45221	7	7	0.0033	8.4(−4)	0.080	−2.23	C	5n
148.	$b\ ^3F - y\ ^3G^o$ (218)											
		4055.03	20641	45295	9	11	0.0069	0.0021	0.25	−1.73	C	5n
		4049.34	20874	45563	7	7	0.0029	7.2(−4)	0.067	−2.30	C	4n,5n
		4011.42	20641	45563	9	7	0.0028	5.2(−4)	0.062	−2.33	C	5n
149.	$b\ ^3F - x\ ^5G^o$ (219)											
		4019.05	21039	45913	5	7	0.0012	3.9(−4)	0.026	−2.71	C	5n
150.	$b\ ^3F - ^3F^o$											
		3833.31	20641	46721	9	9	0.059	0.013	1.5	−0.93	C+	4n,5n
		3821.83	21039	47197	5	5	0.089	0.020	1.2	−1.01	C+	4n,5n
		3797.95	20874	47197	7	5	0.021	0.0032	0.28	−1.65	C	5n
		3867.93	20874	46721	7	9	0.0072	0.0021	0.18	−1.84	C	4n,5n
		3837.13	21039	47093	5	7	0.015	0.0047	0.30	−1.63	C	4n,5n
151.	$b\ ^3F - ^5D^o$											
		3808.73	20641	46889	9	9	0.048	0.010	1.2	−1.03	C+	4n,5n
		3848.29	21039	47017	5	7	0.0050	0.0016	0.098	−2.11	C	4n
152.	$b\ ^3F - ^3D^o$											
		3829.77	20641	46745	9	7	0.0078	0.0013	0.15	−1.92	C	5n
153.	$b\ ^3F - z\ ^3H^o$ (223)											
		3791.50	20641	47008	9	11	0.0039	0.0010	0.12	−2.03	C	5n
		3777.45	20641	47106	9	9	0.015	0.0033	0.37	−1.53	C	4n,5n

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
154.	$b\ ^3F - w\ ^5G°$ (225)											
		3731.37	21039	47831	5	5	0.049	0.010	0.63	−1.29	C	4n,5n
155.	$b\ ^3F - ^1D°$											
		3766.09	20874	47420	7	5	0.0080	0.0012	0.11	−2.07	C	5n
156.	$b\ ^3F - z\ ^1G°$ (227)											
		3728.67	20641	47453	9	9	0.013	0.0028	0.31	−1.60	C	5n
		3761.41	20874	47453	7	9	0.0077	0.0021	0.18	−1.83	C	5n
157.	$b\ ^3F - v\ ^5F°$ (229)											
		3668.89	20874	48123	7	7	0.0028	5.7(−4)	0.048	−2.40	C	5n
158.	$b\ ^3F - ^5H°$											
		3676.31	20641	47835	9	11	0.061	0.015	1.6	−0.87	C+	4n,5n
		3711.22	20874	47812	7	9	0.039	0.010	0.89	−1.14	C	5n
		3730.95	21039	47834	5	7	0.045	0.013	0.81	−1.18	C	4n,5n
159.	$b\ ^3F - v\ ^5P°$ (231)											
		3658.55	20641	47967	9	7	0.0026	4.1(−4)	0.045	−2.43	C	5n
160.	$b\ ^3F - w\ ^3G°$ (233)											
		3636.99	20874	48362	7	9	0.017	0.0044	0.37	−1.51	C	5n
161.	$b\ ^3F - x\ ^3P°$ (235)											
		3644.58	20874	48305	7	5	0.0042	6.0(−4)	0.050	−2.38	C	5n
162.	$b\ ^3F - z\ ^1H°$											
		3603.67	20641	48383	9	11	0.0023	5.4(−4)	0.058	−2.31	C	8
163.	$b\ ^3F - y\ ^1G°$ (237)											
		3592.47	20874	48703	7	9	0.0023	5.7(−4)	0.047	−2.40	C	5n
164.	$b\ ^3F - w\ ^3F°$ (238)											
		3511.74	20641	49109	9	9	0.0026	4.9(−4)	0.050	−2.36	C	5n
		3520.85	21039	49433	5	5	0.015	0.0028	0.16	−1.85	C	5n
		3495.29	20641	49243	9	7	0.13	0.019	2.0	−0.77	C+	4n
		3500.57	20874	49433	7	5	0.034	0.0044	0.36	−1.51	C	5n
165.	$b\ ^3F - v\ ^3D°$ (239)											
		3524.08	20874	49243	7	5	0.091	0.012	0.99	−1.07	C	4n,5n
		3537.73	21039	49298	5	3	0.13	0.014	0.82	−1.15	C	5n
		3544.63	21039	49243	5	5	0.017	0.0032	0.19	−1.79	C	5n
166.	$b\ ^3F - u\ ^3D°$ (258)											
		3176.36	21039	52512	5	3	0.086	0.0078	0.41	−1.41	D	12n

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i(cm^{-1})	E_k(cm^{-1})	g_i	g_k	A_{ki}(10^8 s^{-1})	f_{ik}	S(at. u.)	log gf	Accuracy	Source
167.	$b\,^3F - ^3D^\circ$											
		3166.44	20641	52213	9	7	0.14	0.016	1.5	−0.84	C+	4n
168.	$a\,^3G - y\,^3F^\circ$ (268)											
		6677.99	21716	36686	11	9	0.0060	0.0033	0.80	−1.44	D−	14n
		6592.91	21999	37163	9	7	0.0059	0.0030	0.58	−1.57	D−	14n
		6546.24	22249	37521	7	5	0.0075	0.0034	0.52	−1.62	D−	14n
		6806.85	21999	36686	9	9	0.0011	7.7(−4)	0.16	−2.16	C	5n
		6703.57	22249	37163	7	7	1.7(−4)	1.2(−4)	0.018	−3.09	C	5n
169.	$a\,^3G - y\,^3D^\circ$ (269)											
		6180.22	21999	38175	9	7	4.9(−4)	2.2(−4)	0.040	−2.71	C	5n
		6085.27	22249	38678	7	5	2.6(−4)	1.0(−4)	0.015	−3.14	C	5n
170.	$a\,^3G - y\,^3G^\circ$ (273)											
		4266.96	21999	45428	9	9	0.010	0.0027	0.34	−1.61	C	5n
		4288.15	22249	45563	7	7	0.0072	0.0020	0.19	−1.86	C	4n,5n
171.	$a\,^3G - x\,^5G^\circ$ (274)											
		4145.21	21716	45833	11	9	8.0(−4)	1.7(−4)	0.025	−2.73	C	5n
172.	$a\,^3G - ^3F^\circ$											
		3998.05	21716	46721	11	9	0.075	0.015	2.1	−0.79	C+	4n,5n
		3983.96	21999	47093	9	7	0.089	0.016	1.9	−0.83	C+	4n,5n
		4007.27	22249	47197	7	5	0.049	0.0084	0.78	−1.23	C	4n
		4024.11	22249	47093	7	7	0.0035	8.4(−4)	0.078	−2.23	C	5n
173.	$a\,^3G - ^5D^\circ$											
		3971.32	21716	46889	11	9	0.068	0.013	1.9	−0.84	C	4n,5n
		3995.98	21999	47017	9	7	0.024	0.0045	0.54	−1.39	C	4n,5n
		4036.37	22249	47017	7	7	9.9(−4)	2.4(−4)	0.023	−2.77	C	5n
		4057.34	22249	46889	7	9	0.0053	0.0017	0.16	−1.93	C	4n,5n
174.	$a\,^3G - z\,^3H^\circ$ (278)											
		3997.39	21999	47008	9	11	0.16	0.046	5.5	−0.38	C+	4n
		4021.87	22249	47106	7	9	0.10	0.032	3.0	−0.65	C+	4n
		3952.60	21716	47008	11	11	0.052	0.012	1.8	−0.87	C	4n,5n
		3981.77	21999	47106	9	9	0.046	0.011	1.3	−1.01	C+	4n,5n
		3937.33	21716	47106	11	9	0.020	0.0038	0.54	−1.38	C	4n,5n
175.	$a\,^3G - w\,^5G^\circ$ (280)											
		3945.12	22249	47590	7	9	0.018	0.0054	0.49	−1.42	C	5n
		3863.74	21716	47590	11	9	0.025	0.0047	0.65	−1.29	C	4n,5n
		3890.84	21999	47693	9	7	0.035	0.0061	0.70	−1.26	C	4n,5n
		3907.93	22249	47831	7	5	0.080	0.013	1.2	−1.04	C	4n,5n
176.	$a\,^3G - z\,^1G^\circ$ (282)											
		3884.36	21716	47453	11	9	0.042	0.0077	1.1	−1.07	C	4n,5n

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
177.	$a\ ^3G - v\ ^5F^\circ$ (283)											
		3813.63	21716	47930	11	9	0.017	0.0030	0.42	−1.48	C	4*n*,5*n*
		3826.84	21999	48123	9	7	0.018	0.0030	0.34	−1.57	C	5*n*
178.	$a\ ^3G - ^5H^\circ$											
		3872.92	21999	47812	9	9	0.010	0.0023	0.27	−1.68	C	5*n*
		3907.47	22249	47834	7	7	0.0094	0.0022	0.19	−1.82	C	5*n*
		3910.84	22249	47812	7	9	0.015	0.0043	0.39	−1.52	C	5*n*
179.	$a\ ^3G - w\ ^3G^\circ$ (287)											
		3770.30	21716	48231	11	11	0.020	0.0044	0.59	−1.32	C	5*n*
		3792.15	21999	48362	9	9	0.023	0.0050	0.56	−1.35	C	4*n*,5*n*
		3811.89	22249	48476	7	7	0.040	0.0086	0.76	−1.22	C	4*n*,5*n*
		3751.82	21716	48362	11	9	0.0050	8.7(−4)	0.12	−2.02	C	5*n*
		3775.86	21999	48476	9	7	0.0026	4.3(−4)	0.048	−2.41	C	5*n*
180.	$a\ ^3G - z\ ^1H^\circ$ (289)											
		3789.18	21999	48383	9	11	0.025	0.0067	0.75	−1.22	C	4*n*,5*n*,8
181.	$a\ ^3G - y\ ^1G^\circ$ (290)											
		3704.46	21716	48703	11	9	0.14	0.023	3.1	−0.60	C+	4*n*
182.	$a\ ^3G - w\ ^3F^\circ$ (291)											
		3649.51	21716	49109	11	9	0.43	0.071	9.3	−0.11	C+	4*n*
		3669.52	21999	49243	9	7	0.30	0.047	5.2	−0.37	C+	4*n*
		3677.63	22249	49433	7	5	0.82	0.12	10	−0.08	C+	4*n*
183.	$a\ ^3G - v\ ^3D^\circ$ (292)											
		3684.11	21999	49135	9	7	0.34	0.054	5.9	−0.31	C+	4*n*
		3718.41	22249	49135	7	7	0.063	0.013	1.1	−1.04	C	4*n*,5*n*
184.	$a\ ^3G - y\ ^3H^\circ$ (294)											
		3606.68	21716	49434	11	13	0.84	0.19	25	0.33	C+	4*n*
		3621.46	21999	49604	9	11	0.52	0.12	13	0.05	C+	4*n*
		3638.30	22249	49727	7	9	0.27	0.068	5.7	−0.32	C+	4*n*
		3605.45	21999	49727	9	9	0.65	0.13	14	0.06	C+	4*n*
		3568.98	21716	49727	11	9	0.035	0.0055	0.71	−1.22	C	5*n*
185.	$a\ ^3G - v\ ^3G^\circ$ (295)											
		3603.20	21716	49461	11	11	0.27	0.052	6.8	−0.24	C+	4*n*
		3622.00	22249	49851	7	7	0.53	0.10	8.6	−0.14	C+	4*n*
		3640.39	21999	49461	9	11	0.39	0.095	10	−0.07	C+	4*n*
		3651.47	22249	49628	7	9	0.64	0.16	14	0.06	C+	4*n*
186.	$a\ ^3G - x\ ^1G^\circ$ (297)											
		3493.69	21999	50614	9	9	0.0054	9.9(−4)	0.10	−2.05	C	5*n*

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
187.	$a\ ^3G - v\ ^3F°$ (301)											
		3411.35	21999	51305	9	9	0.065	0.011	1.1	−0.99	C+	4n
188.	$a\ ^3G - u\ ^3G°$ (304)											
		3370.78	21716	51374	11	11	0.34	0.057	7.0	−0.20	C+	4n
		3369.55	21999	51668	9	9	0.25	0.042	4.2	−0.42	C+	4n
		3380.11	22249	51826	7	7	0.24	0.041	3.2	−0.54	C+	4n
		3337.66	21716	51668	11	9	0.067	0.0091	1.1	−1.00	C+	4n
189.	$a\ ^3G - t\ ^3G°$ (313)											
		3098.19	21716	53983	11	11	0.11	0.016	1.8	−0.76	C+	4n
190.	$a\ ^3G - v\ ^3H°$ (316)											
		2990.39	21999	55430	9	11	0.40	0.065	5.8	−0.23	C+	4n
		3011.48	22249	55446	7	9	0.48	0.084	5.8	−0.23	C+	4n
191.	$a\ ^3G - w\ ^1F°$ (317)											
		2980.53	22249	55791	7	7	0.22	0.030	2.1	−0.68	C+	4n
192.	$a\ ^3G - u\ ^3H°$ (uv 167)											
		2925.36	22249	56423	7	9	0.19	0.031	2.1	−0.67	C+	4n
193.	$z\ ^7F° - e\ ^7D$ (318)											
		4920.50	22846	43163	11	9	0.36	0.11	19	0.07	C+	4n
		4891.49	22997	43435	9	7	0.30	0.082	12	−0.13	C+	4n
		4871.32	23111	43634	7	5	0.22	0.057	6.4	−0.40	C+	4n
		4859.74	23192	43764	5	3	0.15	0.031	2.5	−0.81	C	4n,5n
		4918.99	23111	43435	7	7	0.17	0.062	7.1	−0.36	C+	4n
		4890.75	23192	43634	5	5	0.21	0.076	6.1	−0.42	C+	4n
		4872.14	23245	43764	3	3	0.24	0.086	4.1	−0.59	C+	4n
		4903.31	23245	43634	3	5	0.054	0.033	1.6	−1.01	C	4n,5n
		4878.21	23270	43764	1	3	0.11	0.11	1.8	−0.94	C+	4n
194.	$z\ ^7F° - e\ ^5D$ (319)											
		4554.47	23111	45061	7	7	4.8(−4)	1.5(−4)	0.016	−2.98	C	5n
		4515.16	23192	45334	5	5	4.5(−4)	1.4(−4)	0.010	−3.16	C	5n
		4635.62	23111	44677	7	9	1.0(−4)	4.3(−5)	0.0046	−3.52	C	5n
		4571.44	23192	45061	5	7	2.9(−4)	1.3(−4)	0.0095	−3.20	C	5n
		4525.88	23245	45334	3	5	4.8(−4)	2.5(−4)	0.011	−3.13	C	5n
195.	$z\ ^7F° - e\ ^7F$ (321)											
		3610.16	22650	50342	13	13	0.50	0.097	15	0.10	C+	4n
		3572.00	22846	50833	11	11	0.25	0.048	6.2	−0.28	C+	4n
		3552.83	23192	51331	5	5	0.17	0.032	1.9	−0.80	C	4n,5n
		3551.11	22997	51149	9	7	0.0035	5.2(−4)	0.055	−2.33	C	5n
		3568.42	23192	51208	5	3	0.062	0.0071	0.42	−1.45	C	5n
		3591.35	22997	50833	9	11	0.0084	0.0020	0.21	−1.75	C	5n
		3560.07	23111	51192	7	9	0.0040	9.7(−4)	0.079	−2.17	C	5n
		3578.38	23270	51208	1	3	0.074	0.043	0.50	−1.37	C	5n

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
196.	$z\,^7F^\circ - f\,^7D$ (322)											
		3594.63	22997	50808	9	9	0.28	0.054	5.8	−0.31	C+	4*n*
		3595.30	23192	50999	5	5	0.064	0.012	0.73	−1.21	C	5*n*
		3602.08	23245	50999	3	5	0.035	0.011	0.40	−1.47	C	5*n*
197.	$z\,^7F^\circ - f\,^5D$ (323)											
		3630.35	22997	50534	9	7	0.089	0.014	1.5	−0.91	C	5*n*
		3610.70	23192	50880	5	3	0.084	0.0098	0.58	−1.31	C	5*n*
		3641.45	23245	50699	3	5	0.0061	0.0020	0.072	−2.22	C	5*n*
198.	$z\,^7F^\circ - e\,^7P$ (324)											
		3620.24	22997	50611	9	7	0.014	0.0022	0.23	−1.71	C	5*n*
		3613.15	23192	50861	5	5	0.023	0.0045	0.27	−1.65	C	5*n*
199.	$z\,^7F^\circ - e\,^5G$ (325)											
		3572.59	22997	50980	9	9	0.022	0.0041	0.44	−1.43	C	5*n*
		3612.07	22846	50523	11	13	0.077	0.018	2.3	−0.71	C+	4*n*
		3567.03	23192	51219	5	7	0.077	0.020	1.2	−0.99	C	5*n*
200.	$z\,^7F^\circ - e\,^7G$ (326)											
		3541.08	22997	51229	9	11	0.64	0.15	15	0.12	C+	4*n*
		3542.08	23111	51335	7	9	0.76	0.18	15	0.11	C+	4*n*
		3536.56	23192	51461	5	7	0.80	0.21	12	0.02	C+	4*n*
		3530.39	22650	50968	13	13	0.038	0.0070	1.1	−1.04	C	5*n*
		3522.27	22846	51229	11	11	0.038	0.0071	0.90	−1.11	C	5*n*
		3527.79	22997	51335	9	9	0.20	0.038	3.9	−0.47	C	4*n*,5*n*
		3529.82	23245	51567	3	3	0.78	0.15	5.1	−0.36	C+	4*n*
		3509.12	22846	51335	11	9	0.0054	8.1(−4)	0.10	−2.05	C	5*n*
		3512.22	22997	51461	9	7	0.024	0.0035	0.37	−1.50	C	5*n*
		3516.56	23111	51540	7	5	0.044	0.0058	0.47	−1.39	C	5*n*
		3523.31	23192	51567	5	3	0.090	0.010	0.58	−1.30	C	5*n*
201.	$z\,^7F^\circ - f\,^7F$ (327)											
		3537.90	22846	51103	11	11	0.086	0.016	2.1	−0.75	C	5*n*
		3556.88	22997	51103	9	11	0.45	0.10	11	−0.03	C+	4*n*
		3518.68	23192	51604	5	7	0.018	0.0048	0.28	−1.62	C	5*n*
202.	$z\,^7F^\circ - g\,^7D$ (329)											
		3540.12	23111	51350	7	9	0.12	0.029	2.4	−0.69	C+	4*n*
203.	$z\,^7F^\circ - e\,^7S$ (330)											
		3522.90	23192	51570	5	7	0.025	0.0065	0.38	−1.49	C	5*n*
204.	$b\,^3P - y\,^3D^\circ$ (342)											
		6518.38	22838	38175	5	7	4.7(−4)	4.2(−4)	0.045	−2.68	C	5*n*
		6355.04	22947	38678	3	5	0.0015	0.0015	0.093	−2.35	C	5*n*
		6270.24	23052	38996	1	3	0.0013	0.0023	0.047	−2.64	C	5*n*
		6311.51	22838	38678	5	5	2.3(−4)	1.4(−4)	0.014	−3.16	C	5*n*
		6229.23	22947	38996	3	3	7.2(−4)	4.2(−4)	0.026	−2.90	C	5*n*

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
205.	$b\ ^3P - z\ ^5S^o$ (345)											
		5536.59	22838	40895	5	5	7.9(−5)	3.6(−5)	0.0033	−3.74	C	5*n*
206.	$b\ ^3P - w\ ^5D^o$ (346)											
		4741.53	22838	43923	5	7	0.0049	0.0023	0.18	−1.94	D	10*n*
		4683.57	22838	44184	5	5	0.0021	6.9(−4)	0.053	−2.46	C	5*n*
		4657.59	22947	44411	3	3	0.0015	4.9(−4)	0.023	−2.83	C	5*n*
207.	$b\ ^3P - ^5F^o$											
		4687.39	22838	44166	5	7	7.9(−4)	3.6(−4)	0.028	−2.74	C	5*n*
		4685.03	22947	44285	3	5	3.3(−4)	1.8(−4)	0.0083	−3.27	C	5*n*
208.	$b\ ^3P - ^5D^o$											
		4603.34	22947	44664	3	5	5.4(−4)	2.8(−4)	0.013	−3.07	C	5*n*
209.	$b\ ^3P - y\ ^5S^o$ (349)											
		4635.85	22947	44512	3	5	0.0028	0.0015	0.068	−2.35	C	5*n*
210.	$b\ ^3P - x\ ^3D^o$ (350)											
		4466.55	22838	45221	5	7	0.13	0.053	3.9	−0.58	C+	4*n*
		4443.19	23052	45552	1	3	0.13	0.11	1.6	−0.95	C+	4*n*
		4454.38	22838	45282	5	5	0.044	0.013	0.97	−1.18	C	4*n*
		4422.57	22947	45552	3	3	0.10	0.030	1.3	−1.04	C	4*n*
		4401.44	22838	45552	5	3	0.030	0.0053	0.38	−1.58	C	5*n*
211.	$b\ ^3P - w\ ^5P^o$ (351)											
		4290.87	22838	46137	5	7	0.0052	0.0020	0.14	−2.00	C	5*n*
		4279.86	23052	46410	1	3	0.0067	0.0055	0.077	−2.26	C	5*n*
		4258.62	22838	46314	5	5	0.0083	0.0022	0.16	−1.95	C	5*n*
		4241.11	22838	46410	5	3	0.0045	7.3(−4)	0.051	−2.44	C	5*n*
212.	$b\ ^3P - z\ ^3S^o$ (352)	*4217.7*	*22898*	46601	9	3	0.20	0.018	2.2	−0.80	C	4*n*,5*n*
		4207.13	22838	46601	5	3	0.051	0.0081	0.56	−1.39	C	4*n*,5*n*
		4226.42	22947	46601	3	3	0.044	0.012	0.49	−1.45	C	4*n*,5*n*
		4245.26	23052	46601	1	3	0.096	0.078	1.1	−1.11	C	4*n*,5*n*
213.	$b\ ^3P - y\ ^3P^o$ (355)											
		4184.89	22838	46727	5	5	0.12	0.032	2.2	−0.79	C+	4*n*
		4173.32	22947	46902	3	3	0.024	0.0064	0.26	−1.72	C	5*n*
		4213.65	22947	46673	3	1	0.23	0.021	0.86	−1.21	C	4*n*,5*n*
		4191.68	23052	46902	1	3	0.057	0.045	0.62	−1.35	C	5*n*
214.	$b\ ^3P - ^3F^o$											
		4121.80	22838	47093	5	7	0.034	0.012	0.82	−1.22	C	4*n*,5*n*
		4122.51	22947	47197	3	5	0.034	0.015	0.59	−1.36	C	5*n*

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
215.	$b\ ^3P - {}^5D^o$											
		4134.68	22838	47017	5	7	0.18	0.066	4.5	−0.48	C+	4*n*
		4132.90	22947	47136	3	5	0.11	0.047	1.9	−0.85	C+	4*n*
		4114.45	22838	47136	5	5	0.056	0.014	0.96	−1.15	C	4*n*,5*n*
		4125.88	22947	47177	3	3	0.018	0.0045	0.18	−1.87	C	5*n*
		4107.49	22838	47177	5	3	0.25	0.038	2.6	−0.72	C+	4*n*
		4126.88	22947	47171?	3	1	0.013	0.0011	0.046	−2.47	C	5*n*
216.	$b\ ^3P - {}^3D^o$	*4165.5*	*22898*	*46898*	9	15	0.36	0.15	19	0.14	C	4*n*,5*n*,13*n*
		4181.75	22838	46745	5	7	0.35	0.13	8.9	−0.19	D−	13*n*
		4175.64	22947	46889	3	5	0.17	0.073	3.0	−0.66	C+	4*n*
		4127.61	23052	47272	1	3	0.16	0.12	1.6	−0.92	C+	4*n*
		4156.80	22838	46889	5	5	0.19	0.049	3.4	−0.61	C+	4*n*
		4109.80	22947	47272	3	3	0.19	0.048	2.0	−0.84	C+	4*n*
		4091.55	22838	47272	5	3	0.012	0.0018	0.12	−2.05	C	4*n*,5*n*
217.	$b\ ^3P - {}^1D^o$											
		4085.00	22947	47420	3	5	0.049	0.021	0.83	−1.21	C	5*n*
218.	$b\ ^3P - y\ ^3S^o$ (359)	*4051.3*	*22898*	47556	9	3	0.44	0.036	4.3	−0.49	C	4*n*,5*n*
		4044.61	22838	47556	5	3	0.13	0.020	1.3	−1.01	C	5*n*
		4062.44	22947	47556	3	3	0.23	0.057	2.3	−0.77	C+	4*n*
		4079.84	23052	47556	1	3	0.073	0.055	0.74	−1.26	C	4*n*,5*n*
219.	$b\ ^3P - v\ ^5F^o$ (362)											
		3953.86	22838	48123	5	7	0.0067	0.0022	0.14	−1.96	C	5*n*
		3935.31	22947	48351	3	3	0.023	0.0053	0.21	−1.80	C	5*n*
220.	$b\ ^3P - v\ ^5P^o$ (361)											
		3964.52	22947	48163	3	5	0.029	0.011	0.44	−1.47	C	4*n*,5*n*
		3961.15	23052	48290	1	3	0.027	0.019	0.25	−1.72	C	5*n*
		3944.75	22947	48290	3	3	0.014	0.0032	0.12	−2.02	C	5*n*
221.	$b\ ^3P - x\ ^3P^o$ (364)											
		3909.83	22947	48516	3	3	0.076	0.017	0.68	−1.28	C	5*n*
		3942.44	22947	48305	3	5	0.11	0.042	1.6	−0.90	C	4*n*,5*n*
222.	$b\ ^3P - v\ ^3D^o$ (367)											
		3801.68	22838	49135	5	7	0.077	0.023	1.5	−0.93	C	5*n*
		3809.04	23052	49298	1	3	0.018	0.012	0.15	−1.92	C	5*n*
		3786.19	22838	49243	5	5	0.14	0.030	1.8	−0.83	C	5*n*
		3793.87	22947	49298	3	3	0.087	0.019	0.70	−1.25	C	5*n*
		3778.32	22838	49298	5	3	0.028	0.0036	0.22	−1.75	C	5*n*
223.	$b\ ^3P - w\ ^3P^o$ (369)											
		3655.46	22838	50187	5	5	0.12	0.023	1.4	−0.93	C	4*n*,5*n*
		3674.77	22838	50043	5	3	0.079	0.0096	0.58	−1.32	C	5*n*
		3702.03	22947	49951	3	1	0.40	0.028	1.0	−1.08	C	4*n*,5*n*
		3703.82	23052	50043	1	3	0.14	0.085	1.0	−1.07	C	5*n*

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Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
224.	$b\ ^3P - ^3P^\circ$											
		3323.74	22838	52916	5	5	0.31	0.051	2.8	−0.59	C+	4*n*
		3354.06	23052	52858	1	3	0.11	0.058	0.64	−1.24	C	5*n*
225.	$z\ ^7P^\circ - e\ ^7D$ (383)											
		5232.94	23711	42816	9	11	0.15	0.073	11	−0.18	C	4*n*,5*n*
		5266.55	24181	43163	7	9	0.088	0.047	5.7	−0.48	C+	4*n*
		5281.79	24507	43435	5	7	0.038	0.022	2.0	−0.95	C+	4*n*
		5068.77	23711	43435	9	7	0.026	0.0077	1.2	−1.16	C	4*n*,5*n*
226.	$z\ ^7P^\circ - e\ ^5D$ (384)											
		4787.83	24181	45061	7	7	8.3(−4)	2.9(−4)	0.031	−2.70	C	5*n*
		4800.13	24507	45334	5	5	0.0012	4.3(−4)	0.034	−2.67	C	5*n*
		4682.56	23711	45061	9	7	3.8(−4)	9.7(−5)	0.013	−3.06	C	5*n*
		4726.14	24181	45334	7	5	3.9(−4)	9.4(−5)	0.010	−3.18	C	5*n*
		4877.61	24181	44677	7	9	2.6(−4)	1.2(−4)	0.013	−3.08	C	5*n*
227.	$z\ ^7P^\circ - e\ ^7F$ (385)											
		3686.00	23711	50833	9	11	0.26	0.065	7.1	−0.23	C+	4*n*
		3701.09	24181	51192	7	9	0.49	0.13	11	−0.04	C+	4*n*
		3637.86	23711	51192	9	9	0.064	0.013	1.4	−0.94	C	5*n*
		3726.93	24507	51331	5	5	0.47	0.098	6.0	−0.31	C	5*n*
		3744.10	24507	51208	5	3	0.38	0.048	3.0	−0.62	C+	4*n*,5*n*
228.	$z\ ^7P^\circ - f\ ^7D$ (386)											
		3754.51	24181	50808	7	9	0.028	0.0077	0.66	−1.27	C	5*n*
		3746.93	24181	50862	7	7	0.23	0.048	4.2	−0.47	C	5*n*
		3773.70	24507	50999	5	5	0.039	0.0083	0.52	−1.38	C	5*n*
		3766.67	24507	51048	5	3	0.11	0.014	0.90	−1.14	C	5*n*
229.	$z\ ^7P^\circ - f\ ^5D$ (387)											
		3742.62	23711	50423	9	9	0.11	0.023	2.6	−0.68	C+	4*n*,5*n*
		3727.09	23711	50534	9	7	0.20	0.033	3.6	−0.53	C	5*n*
230.	$z\ ^7P^\circ - e\ ^7P$ (388)											
		3735.32	23711	50475	9	9	0.24	0.051	5.6	−0.34	C	5*n*
		3782.45	24181	50611	7	7	0.015	0.0031	0.27	−1.66	C	5*n*
231.	$z\ ^7P^\circ - e\ ^5G$ (389)											
		3703.69	23711	50704	9	11	0.062	0.016	1.7	−0.85	C	5*n*
		3697.43	24181	51219	7	7	0.21	0.043	3.7	−0.52	C+	4*n*
		3676.88	24181	51370	7	5	0.027	0.0038	0.33	−1.57	C	5*n*
232.	$z\ ^7P^\circ - e\ ^7G$ (390)											
		3681.64	24181	51335	7	9	0.015	0.0040	0.34	−1.55	C	5*n*
		3664.69	24181	51461	7	7	0.025	0.0051	0.43	−1.45	C	5*n*

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
233.	$z\ ^7P^o - f\ ^5F$ (391)											
		3664.54	24181	51462	7	9	0.040	0.010	0.87	−1.14	C	5*n*
234.	$z\ ^7P^o - e\ ^7S$ (394)											
		3650.03	24181	51570	7	7	0.12	0.023	1.9	−0.79	C	5*n*
		3694.01	24507	51570	5	7	0.70	0.20	12	0.00	C+	4*n*
235.	$z\ ^7P^o - e\ ^5P$ (395)											
		3614.77	24181	51837	7	7	0.040	0.0079	0.65	−1.26	C	5*n*
		3657.89	24507	51837	5	7	0.039	0.011	0.66	−1.26	C	5*n*
236.	$z\ ^7P^o - g\ ^7D$ (396)											
		3322.47	23711	53801	9	11	0.058	0.012	1.1	−0.98	D	12*n*
237.	$b\ ^3G - y\ ^3D^o$ (404)											
		7112.18	24119	38175	9	7	1.8(−4)	1.1(−4)	0.022	−3.02	C	5*n*
238.	$b\ ^3G - y\ ^3G^o$ (409)											
		4647.43	23784	45295	11	11	0.015	0.0048	0.80	−1.28	D−	14*n*
		4691.41	24119	45428	9	9	0.013	0.0042	0.59	−1.42	D−	14*n*
		4618.76	23784	45428	11	9	0.0019	4.9(−4)	0.082	−2.27	C	5*n*
		4661.97	24119	45563	9	7	0.0018	4.5(−4)	0.063	−2.39	C	5*n*
		4740.34	24339	45428	7	9	8.1(−4)	3.5(−4)	0.038	−2.61	C	5*n*
239.	$b\ ^3G - x\ ^5G^o$ (410)											
		4603.95	24119	45833	9	9	5.9(−4)	1.9(−4)	0.026	−2.77	C	5*n*
		4633.76	24339	45913	7	7	4.9(−4)	1.6(−4)	0.017	−2.96	C	5*n*
240.	$b\ ^3G - {}^5F^o$											
		4358.50	23784	46721	11	9	0.011	0.0025	0.40	−1.56	C	4*n*,5*n*
		4351.54	24119	47093	9	7	0.017	0.0037	0.47	−1.48	C	5*n*
		4423.14	24119	46721	9	9	0.0014	4.0(−4)	0.053	−2.44	C	5*n*
241.	$b\ ^3G - {}^5D^o$											
		4326.75	23784	46889	11	9	0.0057	0.0013	0.21	−1.84	C	5*n*
		4365.90	24119	47017	9	7	0.0036	8.0(−4)	0.10	−2.14	C	4*n*,5*n*
		4390.46	24119	46889	9	9	0.0014	4.1(−4)	0.054	−2.43	C	5*n*
242.	$b\ ^3G - z\ ^3H^o$ (414)	*4319.6*	*24040*	*47024*	27	33	0.022	0.0075	2.9	−0.69	C	4*n*,5*n*
		4309.37	23784	46982	11	13	0.021	0.0071	1.1	−1.11	C	4*n*
		4367.58	24119	47008	9	11	0.020	0.0070	0.91	−1.20	C	5*n*
		4390.95	24339	47106	7	9	0.016	0.0058	0.59	−1.39	C	5*n*
		4304.54	23784	47008	11	11	0.0038	0.0010	0.16	−1.94	C	5*n*
		4348.94	24119	47106	9	9	0.0034	9.7(−4)	0.12	−2.06	C	5*n*
		4286.44	23784	47106	11	9	0.0017	3.9(−4)	0.060	−2.37	C	5*n*

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
243.	$b\ ^3G - w\ ^5G°$ (416)											
		4290.38	24119	47420	9	11	0.0064	0.0022	0.28	−1.71	C	4n,5n
244.	$b\ ^3G - z\ ^1G°$ (417)											
		4284.42	24119	47453	9	9	0.0012	3.3(−4)	0.042	−2.53	C	5n
245.	$b\ ^3G - v\ ^5F°$ (418)											
		4196.53	23784	47606	11	11	0.0031	8.3(−4)	0.13	−2.04	C	5n
		4237.67	24339	47930	7	9	0.0021	7.2(−4)	0.070	−2.30	C	5n
246.	$b\ ^3G - ^5H°$											
		4258.95	24339	47812	7	9	0.0047	0.0016	0.16	−1.94	C	5n
247.	$b\ ^3G - w\ ^3G°$ (422)											
		4089.22	23784	48231	11	11	0.0049	0.0012	0.18	−1.87	C	4n,5n
		4141.86	24339	48476	7	7	0.0082	0.0021	0.20	−1.83	C	5n
		4146.06	24119	48231	9	11	0.0060	0.0019	0.23	−1.77	C	4n,5n
		4161.48	24339	48362	7	9	0.0032	0.0011	0.10	−2.13	C	5n
248.	$b\ ^3G - z\ ^1H°$ (423)											
		4120.21	24119	48383	9	11	0.026	0.0082	1.0	−1.13	C	4n,5n,8
249.	$b\ ^3G - y\ ^1G°$ (424)											
		4066.59	24119	48703	9	9	0.013	0.0032	0.39	−1.54	C	4n,5n
250.	$b\ ^3G - w\ ^3F°$ (426)											
		4000.46	24119	49109	9	9	0.013	0.0031	0.36	−1.56	C	5n
251.	$b\ ^3G - y\ ^3H°$ (429)											
		3897.45	23784	49434	11	13	0.022	0.0060	0.85	−1.18	C	4n,5n
		3871.75	23784	49604	11	11	0.070	0.016	2.2	−0.76	C+	4n,5n
		3903.90	24119	49727	9	9	0.097	0.022	2.6	−0.70	C+	4n,5n
		3853.46	23784	49727	11	9	0.0067	0.0012	0.17	−1.87	C	4n,5n
252.	$b\ ^3G - v\ ^3G°$ (430)											
		3893.39	23784	49461	11	11	0.14	0.031	4.3	−0.47	C+	4n,5n
		3919.07	24119	49628	9	9	0.045	0.010	1.2	−1.03	C+	4n,5n
		3885.15	24119	49851	9	7	0.016	0.0028	0.32	−1.60	C	4n,5n
		3944.89	24119	49461	9	11	0.016	0.0045	0.53	−1.39	C	5n
		3953.15	24339	49628	7	9	0.043	0.013	1.2	−1.04	C+	4n,5n
253.	$b\ ^3G - z\ ^1F°$ (432)											
		3777.06	24119	50587	9	7	0.016	0.0027	0.31	−1.61	C	4n,5n

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
254.	$b\ ^3G - x\ ^3H°$ (435)											
		3670.09	23784	51023	11	13	0.078	0.019	2.5	−0.69	C+	4*n*
		3693.01	24339	51409	7	9	0.022	0.0058	0.50	−1.39	C	5*n*
		3663.95	23784	51069	11	11	0.0057	0.0011	0.15	−1.90	C	5*n*
		3663.25	24119	51409	9	9	0.012	0.0024	0.26	−1.66	C	5*n*
255.	$b\ ^3G - v\ ^3F°$ (437)											
		3632.55	23784	51305	11	9	0.062	0.010	1.3	−0.96	C	5*n*
		3669.15	24119	51365	9	7	0.087	0.014	1.5	−0.91	C	5*n*
256.	$b\ ^3G - u\ ^3G°$ (438)											
		3628.82	24119	51668	9	9	0.0035	6.9(−4)	0.074	−2.21	C	5*n*
257.	$b\ ^3G - {}^1H°$											
		3590.08	23784	51630	11	11	0.012	0.0023	0.30	−1.60	C	5*n*
		3633.84	24119	51630	9	11	0.021	0.0050	0.53	−1.35	C	5*n*
258.	$b\ ^3G - w\ ^3H°$ (442)											
		3508.49	24119	52613	9	11	0.066	0.015	1.6	−0.87	C	5*n*
		3516.41	24339	52769	7	9	0.040	0.0094	0.76	−1.18	C	5*n*
259.	$b\ ^3G - t\ ^3G°$ (449)											
		3319.25	24119	54237	9	9	0.031	0.0052	0.51	−1.33	D	12*n*
260.	$c\ ^3P - w\ ^5D°$ (465)											
		5104.04	24336	43923	5	7	5.8(−4)	3.2(−4)	0.027	−2.80	C	5*n*
261.	$c\ ^3P - x\ ^3D°$ (467)											
		4786.81	24336	45221	5	7	0.013	0.0060	0.48	−1.52	D−	14*n*
		4712.10	24336	45552	5	3	8.7(−4)	1.7(−4)	0.014	−3.06	C	5*n*
262.	$c\ ^3P - z\ ^3S°$ (469)											
		4490.08	24336	46601	5	3	0.034	0.0062	0.46	−1.51	C	5*n*
		4579.82	24772	46601	3	3	0.0018	5.8(−4)	0.026	−2.76	C	5*n*
263.	$c\ ^3P - y\ ^3P°$ (472)											
		4464.77	24336	46727	5	5	0.013	0.0039	0.29	−1.71	C	4*n*,5*n*
		4517.53	24772	46902	3	3	0.019	0.0057	0.25	−1.77	C	4*n*,5*n*
		4430.19	24336	46902	5	3	0.014	0.0025	0.18	−1.90	C	5*n*
264.	$c\ ^3P - {}^3F°$											
		4372.99	24336	47197	5	5	0.0019	5.5(−4)	0.040	−2.56	C	5*n*
265.	$c\ ^3P - {}^5D°$											
		4384.68	24336	47136	5	5	0.0056	0.0016	0.12	−2.09	C	5*n*

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
266.	$c\ ^3P - y\ ^3S^o$ (476)	*4348.3*	*24565*	47556	9	3	0.13	0.012	1.6	−0.95	C	4*n*,5*n*
		4305.45	24336	47556	5	3	0.072	0.012	0.85	−1.22	C	4*n*,5*n*
		4387.89	24772	47556	3	3	0.046	0.013	0.58	−1.40	C	5*n*
		4450.32	25092	47556	1	3	0.012	0.010	0.15	−1.98	C	5*n*
267.	$c\ ^3P - v\ ^5F^o$ (476a)											
		4182.38	24336	48239	5	5	0.058	0.015	1.0	−1.12	C	5*n*
268.	$c\ ^3P - v\ ^5P^o$ (478)											
		4230.58	24336	47967	5	7	0.0016	5.9(−4)	0.041	−2.53	C	5*n*
269.	$c\ ^3P - x\ ^3P^o$ (482)											
		4170.90	24336	48305	5	5	0.072	0.019	1.3	−1.03	C+	4*n*,5*n*
		4220.34	24772	48460	3	1	0.23	0.021	0.86	−1.21	C	4*n*,5*n*
		4248.22	24772	48305	3	5	0.042	0.019	0.79	−1.25	C	5*n*
		4267.83	25092	48516	1	3	0.11	0.089	1.3	−1.05	C	4*n*,5*n*
270.	$c\ ^3P - v\ ^3D^o$ (486)											
		4076.23	24772	49298	3	3	0.015	0.0037	0.15	−1.96	C	5*n*
271.	$c\ ^3P - w\ ^3P^o$ (488)											
		3867.22	24336	50187	5	5	0.35	0.078	5.0	−0.41	C+	4*n*
		3955.96	24772	50043	3	3	0.066	0.016	0.61	−1.33	C	5*n*
		3888.82	24336	50043	5	3	0.27	0.037	2.4	−0.73	C	5*n*
		3970.39	24772	49951	3	1	0.41	0.033	1.3	−1.01	C	5*n*
272.	$c\ ^3P - z\ ^1F^o$ (489)											
		3808.29	24336	50587	5	7	0.014	0.0042	0.26	−1.68	C	5*n*
273.	$c\ ^3P - t\ ^5D^o$ (490)											
		3699.15	24336	51361	5	7	0.053	0.015	0.92	−1.12	C	4*n*
		3635.19	24336	51837?	5	3	0.16	0.019	1.1	−1.02	C	5*n*
274.	$c\ ^3P - v\ ^3F^o$ (491)											
		3698.60	24336	51365	5	7	0.042	0.012	0.73	−1.22	C	4*n*,5*n*
		3782.61	24772	51201	3	5	0.015	0.0054	0.20	−1.79	C	5*n*
275.	$c\ ^3P - y\ ^1D^o$ (494)											
		3711.41	24772	51708	3	5	0.086	0.030	1.1	−1.05	C	5*n*
276.	$c\ ^3P - x\ ^1D^o$ (495)											
		3704.01	24772	51762	3	5	0.018	0.0062	0.23	−1.73	C	5*n*

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
277.	$c\ ^3P - u\ ^3D°$ (496)											
		3617.79	24336	51969	5	7	0.66	0.18	11	−0.04	C+	4n
		3632.04	24772	52297	3	5	0.50	0.16	5.9	−0.31	C+	4n
		3645.82	25092	52512	1	3	0.58	0.35	4.2	−0.46	C+	4n,5n
		3603.82	24772	52512	3	3	0.20	0.038	1.4	−0.94	C	5n
		3548.02	24336	52512	5	3	0.091	0.010	0.60	−1.29	D	12n
278.	$c\ ^3P - ^3P°$											
		3559.50	24772	52858	3	3	0.22	0.042	1.5	−0.90	C+	4n,5n
		3505.07	24336	52858	5	3	0.12	0.013	0.75	−1.19	C	5n
		3552.11	24772	52916	3	5	0.053	0.017	0.59	−1.30	C	5n
279.	$a\ ^1G - y\ ^3G°$ (512)											
		4793.96	24575	45428	9	9	1.1(−4)	3.9(−5)	0.0055	−3.46	C	5n
280.	$a\ ^1G - z\ ^3I°$ (513)											
		4636.66	24575	46136	9	11	5.8(−5)	2.3(−5)	0.0031	−3.69	D	15n
281.	$a\ ^1G - ^3F°$											
		4514.18	24575	46721	9	9	0.0040	0.0012	0.16	−1.96	C	4n,5n
		4439.63	24575	47093	9	7	8.2(−4)	1.9(−4)	0.025	−2.77	C	5n
282.	$a\ ^1G - z\ ^3H°$ (516)											
		4456.33	24575	47008	9	11	0.0024	8.8(−4)	0.12	−2.10	C	5n
		4436.92	24575	47106	9	9	0.0034	0.0010	0.13	−2.04	C	5n
283.	$a\ ^1G - w\ ^5G°$ (517)											
		4343.70	24575	47590	9	9	0.0061	0.0017	0.22	−1.81	C	5n
284.	$a\ ^1G - z\ ^1G°$ (518)	4369.77	24575	47453	9	9	0.074	0.021	2.7	−0.72	C+	4n
285.	$a\ ^1G - ^5H°$											
		4298.04	24575	47835	9	11	0.016	0.0056	0.71	−1.30	C	4n,5n
		4302.18	24575	47812	9	9	0.0084	0.0023	0.30	−1.68	C	4n,5n
286.	$a\ ^1G - w\ ^3G°$ (521)											
		4225.96	24575	48231	9	11	0.016	0.0053	0.67	−1.32	C	4n
287.	$a\ ^1G - z\ ^1H°$ (522)	4199.09	24575	48383	9	11	0.61	0.20	25	0.25	C	8
288.	$a\ ^1G - w\ ^3F°$ (524)											
		4074.79	24575	49109	9	9	0.056	0.014	1.7	−0.90	C+	4n,5n
289.	$a\ ^1G - y\ ^3H°$ (526)											
		3994.11	24575	49604	9	11	0.015	0.0044	0.52	−1.40	C	4n,5n

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Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
290.	$a\ ^1G - v\ ^3G^\circ$ (527)											
		4017.15	24575	49461	9	11	0.053	0.016	1.9	−0.85	C+	4n
		3990.37	24575	49628	9	9	0.019	0.0046	0.55	−1.38	C	4n,5n
291.	$a\ ^1G - z\ ^1F^\circ$ (528)	3843.26	24575	50587	9	7	0.48	0.082	9.4	−0.13	C+	4n
292.	$a\ ^1G - x\ ^1G^\circ$ (529)	3839.26	24575	50614	9	9	0.29	0.064	7.3	−0.24	C+	4n
293.	$a\ ^1G - x\ ^3H^\circ$ (531)											
		3773.36	24575	51069	9	11	0.0034	8.8(−4)	0.099	−2.10	C	5n
		3725.49	24575	51409	9	9	0.018	0.0038	0.42	−1.47	C	4n,5n
294.	$a\ ^1G - u\ ^3G^\circ$ (533)											
		3730.39	24575	51374	9	11	0.13	0.033	3.6	−0.53	C+	4n,5n
		3689.90	24575	51668	9	9	0.020	0.0041	0.45	−1.43	C	5n
295.	$a\ ^1G - x\ ^3F^\circ$											
		3425.01	24575	53763	9	7	0.29	0.039	4.0	−0.45	C+	4n
296.	$a\ ^1G - x\ ^1H^\circ$ (546)	3229.99	24575	55526	9	11	0.48	0.092	8.8	−0.08	D−	11n
297.	$z\ ^5D^\circ - e\ ^7D$ (552)											
		5909.99	25900	42816	9	11	3.4(−4)	2.2(−4)	0.038	−2.71	C	5n
		5827.89	26479	43634	3	5	1.8(−4)	1.5(−4)	0.0088	−3.34	C	5n
		5791.04	25900	43163	9	9	9.0(−4)	4.5(−4)	0.078	−2.39	C	5n
		5780.62	26141	43435	7	7	7.7(−4)	3.8(−4)	0.051	−2.57	C	5n
298.	$z\ ^5D^\circ - e\ ^5D$ (553)											
		5324.18	25900	44677	9	9	0.15	0.065	10	−0.23	C+	4n,5n
		5283.62	26141	45061	7	7	0.092	0.038	4.7	−0.57	D	9
		5263.30	26340	45334	5	5	0.061	0.025	2.2	−0.90	C+	4n
		5253.46	26479	45509	3	3	0.020	0.0084	0.43	−1.60	C	4n
		5208.59	26141	45334	7	5	0.060	0.018	2.1	−0.91	C+	4n,5n
		5393.17	26141	44677	7	9	0.037	0.021	2.6	−0.84	C+	4n
		5339.93	26340	45061	5	7	0.071	0.043	3.8	−0.67	C+	4n
		5302.30	26479	45334	3	5	0.073	0.052	2.7	−0.81	C+	4n
299.	$z\ ^5D^\circ - e\ ^5F$ (554)											
		4736.77	25900	47006	9	11	0.050	0.021	2.9	−0.73	C+	4n,5n
		4707.27	26141	47378	7	9	0.030	0.013	1.4	−1.05	D−	14n
		4637.50	26479	48037	3	5	0.030	0.016	0.73	−1.32	C	5n
		4613.20	26550	48221	1	3	0.026	0.025	0.38	−1.60	C	5n
		4625.04	26141	47756	7	7	0.022	0.0070	0.75	−1.31	D−	14n
		4574.21	25900	47756	9	7	0.0017	4.1(−4)	0.056	−2.43	C	5n
		4565.66	26141	48037	7	5	0.0042	9.4(−4)	0.099	−2.18	C	5n
300.	$z\ ^5D^\circ - e\ ^3F$ (555)											
		4581.51	26141	47961	7	9	0.0061	0.0025	0.26	−1.76	C	5n
		4504.83	26340	48532	5	7	0.0030	0.0013	0.094	−2.20	C	5n

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
301	$z\ ^5D^o - e\ ^7F$ (556)											
		4000.27	26340	51331	5	5	0.023	0.0056	0.37	−1.55	C	5*n*
302.	$z\ ^5D^o - f\ ^7D$ (557)											
		4080.89	26550	51048	1	3	0.025	0.019	0.25	−1.73	C	5*n*
		4054.18	26340	50999	5	5	0.0083	0.0020	0.14	−1.99	C	5*n*
		4069.08	26479	51048	3	3	0.020	0.0050	0.20	−1.82	C	5*n*
303.	$z\ ^5D^o - f\ ^5D$ (558)											
		4076.63	25900	50423	9	9	0.20	0.050	6.0	−0.35	C+	4*n*
		4098.18	26141	50534	7	7	0.082	0.021	2.0	−0.84	C+	4*n*,5*n*
		4097.10	26479	50880	3	3	0.032	0.0080	0.32	−1.62	C	5*n*
		4058.22	25900	50534	9	7	0.058	0.011	1.3	−1.00	C	4*n*,5*n*
		4070.77	26141	50699	7	5	0.14	0.024	2.3	−0.77	C	4*n*,5*n*
		4073.76	26340	50880	5	3	0.19	0.030	1.9	−0.84	C+	4*n*,5*n*
		4080.21	26479	50981	3	1	0.28	0.024	0.95	−1.15	C	4*n*,5*n*
		4109.07	26550	50880	1	3	0.054	0.041	0.55	−1.39	C	4*n*,5*n*
304.	$z\ ^5D^o - e\ ^7P$ (559)											
		4067.98	25900	50475	9	9	0.17	0.042	5.1	−0.42	C+	4*n*
		4085.30	26141	50611	7	7	0.12	0.029	2.7	−0.69	C+	4*n*,5*n*
		4108.13	26141	50475	7	9	0.0037	0.0012	0.12	−2.07	C	5*n*
		4118.90	26340	50611	5	7	0.020	0.0073	0.49	−1.44	C	5*n*
305.	$z\ ^5D^o - e\ ^5G$ (560)											
		4024.72	26141	50980	7	9	0.091	0.029	2.6	−0.70	C	5*n*
		4018.28	26340	51219	5	7	0.030	0.010	0.68	−1.29	C	5*n*
306.	$z\ ^5D^o - e\ ^7G$ (561)											
		3946.99	25900	51229	9	11	0.051	0.015	1.7	−0.88	C	5*n*
		3967.96	26141	51335	7	9	0.075	0.023	2.1	−0.80	C	5*n*
		3979.65	26340	51461	5	7	0.0076	0.0025	0.16	−1.90	C	5*n*
307.	$z\ ^5D^o - f\ ^5F$ (562)											
		3957.02	26340	51604	5	7	0.16	0.053	3.4	−0.58	C	5*n*
		3963.10	26479	51705	3	5	0.17	0.068	2.7	−0.69	C+	4*n*,5*n*
		3911.00	25900	51462	9	9	0.012	0.0027	0.32	−1.61	C	5*n*
		3941.28	26340	51705	5	5	0.099	0.023	1.5	−0.94	C	5*n*
		3955.34	26479	51754	3	3	0.16	0.038	1.5	−0.94	C	5*n*
308.	$z\ ^5D^o - e\ ^3D$ (564)											
		3974.40	26141	51294	7	7	0.0089	0.0021	0.19	−1.83	C	5*n*
309.	$z\ ^5D^o - g\ ^5D$ (565)											
		3900.52	26141	51771	7	7	0.086	0.020	1.8	−0.86	C+	4*n*,5*n*
		3931.12	26340	51771	5	7	0.052	0.017	1.1	−1.07	C	5*n*
		3909.66	26479	52050	3	5	0.062	0.024	0.91	−1.15	C	5*n*

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
310.	$z\ ^5D° - e\ ^7S$ (566)											
		3962.35	26340	51570	5	7	0.013	0.0044	0.29	−1.66	C	5n
311.	$z\ ^5D° - e\ ^5P$ (567)											
		3890.39	26141	51837	7	7	0.017	0.0039	0.35	−1.56	C	5n
		3914.27	26479	52020	3	3	0.063	0.015	0.56	−1.36	C	5n
		3920.84	26340	51837	5	7	0.021	0.0069	0.45	−1.46	C	5n
		3925.20	26550	52020	1	3	0.067	0.047	0.60	−1.33	C	5n
312.	$z\ ^5D° - g\ ^5F$ (568)											
		3668.21	26141	53394	7	9	0.036	0.0092	0.78	−1.19	C	5n
		3591.48	26550	54386	1	3	0.070	0.041	0.48	−1.39	C	5n
313.	$z\ ^5D° - h\ ^5D$ (569)											
		3615.19	26479	54133	3	3	0.068	0.013	0.47	−1.40	C	5n
		3616.15	25900	53546	9	7	0.036	0.0054	0.58	−1.31	C	5n
		3592.67	26141	53967	7	5	0.047	0.0065	0.54	−1.34	C	5n
		3597.02	26340	54133	5	3	0.20	0.023	1.4	−0.93	C	5n
314.	$z\ ^5D° - f\ ^5P$ (570)											
		3667.25	25900	53160	9	7	0.14	0.022	2.4	−0.70	C	5n
		3644.80	26141	53569	7	5	0.092	0.013	1.1	−1.04	C	5n
		3624.06	26340	53925	5	3	0.063	0.0074	0.44	−1.43	C	5n
315.	$z\ ^5D° - f\ ^3G$ (571)											
		3593.32	26340	54161	5	7	0.034	0.0091	0.54	−1.34	C	5n
316.	$z\ ^5D° - e\ ^3G$ (573)											
		3591.00	25900	53739	9	11	0.0088	0.0021	0.22	−1.73	C	5n
317.	$z\ ^5D° - f\ ^3D$ (574)											
		3583.33	26550	54449	1	3	0.27	0.15	1.8	−0.81	C	5n
318.	$z\ ^5D° - i\ ^5D$ (578)											
		3156.27	26141	57814	7	7	0.50	0.075	5.5	−0.28	D	12n
319	$b\ ^3H - y\ ^3G°$ (584)											
		5279.65	26628	45563	9	7	1.5(−4)	4.7(−5)	0.0074	−3.37	C	5n
320.	$b\ ^3H - z\ ^3I°$ (585)											
		5030.77	26106	45978?	13	15	2.3(−4)	1.0(−4)	0.022	−2.88	C	5n
		5080.95	26351	46027	11	13	1.9(−4)	8.7(−5)	0.016	−3.02	C	5n

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
321.	$b\ ^3H - z\ ^3H°$ (588)											
		4788.76	26106	46982	13	13	0.0041	0.0014	0.29	−1.74	C	5n
		4839.55	26351	47008	11	11	0.0046	0.0016	0.28	−1.75	C	5n
322.	$b\ ^3H - z\ ^1G°$ (590)											
		4737.63	26351	47453	11	9	0.0011	3.1(−4)	0.053	−2.47	C	5n
323.	$b\ ^3H - v\ ^5F°$ (592)											
		4649.82	26106	47606	13	11	6.7(−4)	1.8(−4)	0.037	−2.62	C	5n
324.	$b\ ^3H - ^5H°$											
		4600.93	26106	47835	13	11	9.1(−4)	2.4(−4)	0.048	−2.50	C	5n
		4658.29	26351	47812	11	9	3.7(−4)	9.7(−5)	0.016	−2.97	C	5n
		4714.19	26628	47834	9	7	0.0011	2.8(−4)	0.039	−2.60	C	5n
325.	$b\ ^3H - w\ ^3G°$ (593)											
		4518.43	26106	48231	13	11	2.2(−4)	5.7(−5)	0.011	−3.13	C	5n
		4541.94	26351	48362	11	9	3.1(−4)	7.9(−5)	0.013	−3.06	C	5n
326.	$b\ ^3H - z\ ^1H°$ (594)											
		4487.74	26106	48383	13	11	4.7(−4)	1.2(−4)	0.023	−2.81	C	5n,8
		4537.67	26351	48383	11	11	4.3(−4)	1.3(−4)	0.022	−2.84	C	5n,8
		4595.36	26628	48383	9	11	0.0060	0.0023	0.32	−1.68	C	5n,8
327.	$b\ ^3H - y\ ^3H°$ (597)											
		4285.44	26106	49434	13	13	0.021	0.0058	1.1	−1.12	C	4n,5n
		4327.92	26628	49727	9	9	0.0093	0.0026	0.33	−1.63	C	5n
328.	$b\ ^3H - v\ ^3G°$ (598)											
		4280.53	26106	49461	13	11	0.0033	7.7(−4)	0.14	−2.00	C	5n
		4346.55	26628	49628	9	9	0.013	0.0038	0.48	−1.47	C	5n
329.	$b\ ^3H - x\ ^1G°$ (599)											
		4167.86	26628	50614	9	9	0.0062	0.0016	0.20	−1.84	C	5n
330.	$b\ ^3H - v\ ^3F°$ (603)											
		4006.31	26351	51305	11	9	0.056	0.011	1.6	−0.92	C	5n
331.	$b\ ^3H - u\ ^3G°$ (604)											
		3956.45	26106	51374	13	11	0.22	0.043	7.3	−0.25	C	5n
		3948.77	26351	51668	11	9	0.22	0.043	6.1	−0.33	C	5n
		3967.42	26628	51826	9	7	0.24	0.044	5.2	−0.40	C+	4n,5n
		3995.20	26351	51374	11	11	0.0098	0.0023	0.34	−1.59	C	5n

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i(cm^{-1})	E_k(cm^{-1})	g_i	g_k	A_{ki}(10^8 s^{-1})	f_{ik}	S(at. u.)	log gf	Accuracy	Source
332.	$b\ ^3H - ^1H°$											
		3916.73	26106	51630	13	11	0.12	0.023	3.9	−0.52	C+	4n,5n
333.	$b\ ^3H - w\ ^3H°$ (607)											
		3806.70	26351	52613	11	11	0.55	0.12	17	0.12	C+	4n
		3771.50	26106	52613	13	11	0.0071	0.0013	0.21	−1.78	C	5n
334.	$b\ ^3H - y\ ^3I°$ (688)											
		3765.54	26106	52655?	13	15	0.99	0.24	39	0.50	C+	4n,8
		3821.18	26351	52514	11	13	0.70	0.18	25	0.30	C+	4n,8
		3805.35	26628	52899	9	11	1.0	0.27	30	0.38	C+	4n
		3785.71	26106	52514	13	13	0.014	0.0030	0.48	−1.41	C	8
335.	$b\ ^3H - z\ ^1I°$ (609)											
		3738.31	26351	53094	11	13	0.38	0.093	13	0.01	C+	4n,8
336.	$b\ ^3H - ^5F°$											
		3582.20	26106	54014	13	11	0.25	0.041	6.3	−0.27	C+	4n
337.	$b\ ^3H - ^5D°$											
		3576.76	26351	54301	11	9	0.098	0.015	2.0	−0.77	C	5n
338.	$b\ ^3H - v\ ^3H°$ (614)											
		3402.26	26106	55490	13	13	0.29	0.050	7.2	−0.19	C+	4n
339.	$b\ ^3H - u\ ^3H°$ (617)											
		3307.23	26106	56334	13	13	0.20	0.034	4.8	−0.36	C+	4n
		3328.87	26351	56383	11	11	0.27	0.046	5.5	−0.30	C+	4n
		3355.23	26628	56423	9	9	0.33	0.056	5.5	−0.30	C+	4n
340.	$b\ ^3H - x\ ^3I°$ (620)											
		3233.05	26106	57028?	13	15	0.55	0.099	14	0.11	C+	4n,8
		3254.36	26351	57070	11	13	0.51	0.095	11	0.02	C+	4n,8
		3280.26	26628	57104	9	11	0.55	0.11	11	−0.01	C+	4n
341.	$b\ ^3H - t\ ^3H°$ (uv 182)											
		2923.29	26351	60549	11	11	1.7	0.21	23	0.37	C+	4n
342.	$a\ ^3D - ^5D°$											
		5617.22	26225	44023	7	9	3.6(−4)	2.2(−4)	0.029	−2.81	C	5n
343.	$a\ ^3D - x\ ^3D°$ (628)											
		5262.89	26225	45221	7	7	8.8(−4)	3.7(−4)	0.045	−2.59	C	5n
344.	$a\ ^3D - w\ ^5P°$ (629)											
		5021.89	26406	46314	3	5	0.0046	0.0029	0.14	−2.06	C	5n

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
345.	$a\ ^3D - y\ ^3P^o$ (631)											
		4876.19	26225	46727	7	5	2.7(−4)	7.0(−5)	0.0079	−3.31	C	5*n*
346.	$a\ ^3D - ^3F^o$											
		4790.75	26225	47093	7	7	2.8(−4)	9.7(−5)	0.011	−3.17	C	5*n*
347.	$a\ ^3D - ^5D^o$											
		4808.15	26225	47017	7	7	7.9(−4)	2.7(−4)	0.030	−2.72	C	5*n*
		4873.74	26624	47136	5	5	5.7(−4)	2.0(−4)	0.016	−2.99	C	5*n*
		4813.11	26406	47177	3	3	0.0015	5.0(−4)	0.024	−2.82	C	5*n*
		4780.81	26225	47136	7	5	3.0(−4)	7.3(−5)	0.0081	−3.29	D	15*n*
348.	$a\ ^3D - ^3D^o$											
		4791.25	26406	47272	3	3	0.0035	0.0012	0.057	−2.44	C	5*n*
349.	$a\ ^3D - y\ ^3S^o$ (635)											
		4776.07	26624	47556	5	3	0.0023	4.7(−4)	0.037	−2.63	C	5*n*
350.	$a\ ^3D - v\ ^5P^o$ (638)											
		4556.93	26225	48163	7	5	0.0015	3.3(−4)	0.034	−2.64	C	5*n*
		4614.21	26624	48290	5	3	0.0029	5.6(−4)	0.043	−2.55	C	5*n*
351.	$a\ ^3D - x\ ^3P^o$ (641)											
		4527.78	26225	48305	7	5	0.0014	3.1(−4)	0.032	−2.67	C	5*n*
		4566.51	26624	48516	5	3	0.0070	0.0013	0.099	−2.18	C	5*n*
		4533.13	26406	48460	3	1	0.044	0.0045	0.20	−1.87	C	5*n*
		4565.31	26406	48305	3	5	0.0023	0.0012	0.055	−2.44	C	5*n*
352.	$a\ ^3D - v\ ^3D^o$ (645)											
		4343.28	26225	49243	7	5	0.017	0.0033	0.34	−1.63	C	5*n*
		4409.12	26624	49298	5	3	0.0079	0.0014	0.10	−2.16	C	5*n*
		4377.80	26406	49243	3	5	0.0040	0.0019	0.083	−2.24	C	5*n*
353.	$a\ ^3D - z\ ^1D^o$ (648)											
		4374.50	26624	49477	5	5	0.0059	0.0017	0.12	−2.07	C	4*n*,5*n*
354.	$a\ ^3D - w\ ^3P^o$ (649)											
		4172.12	26225	50187	7	5	0.12	0.022	2.1	−0.82	C+	4*n*,5*n*
		4268.75	26624	50043	5	3	0.050	0.0081	0.57	−1.39	C	4*n*,5*n*
		4242.73	26624	50187	5	5	0.021	0.0056	0.39	−1.55	C	5*n*
355.	$a\ ^3D - z\ ^1F^o$ (650)											
		4171.90	26624	50587	5	7	0.015	0.0054	0.37	−1.57	C	5*n*
356.	$a\ ^3D - x\ ^3H^o$											
		3969.63	26225	51409	7	9	0.031	0.0094	0.86	−1.18	C	5*n*

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i(cm^{-1})	E_k(cm^{-1})	g_i	g_k	A_{ki}(10^8 s^{-1})	f_{ik}	S(at. u.)	log gf	Accuracy	Source
357.	$a\ ^3D - v\ ^3F°$ (655)											
		4040.64	26624	51365	5	7	0.054	0.019	1.2	−1.03	C	4n,5n
		4031.96	26406	51201	3	5	0.086	0.035	1.4	−0.98	C+	4n,5n
358.	$a\ ^3D - y\ ^1D°$ (661)											
		3985.39	26624	51708	5	5	0.082	0.020	1.3	−1.01	C	4n,5n
		3951.16	26406	51708	3	5	0.36	0.14	5.4	−0.38	C+	4n,5n
359.	$a\ ^3D - u\ ^3D°$ (663)											
		3883.28	26225	51969	7	7	0.17	0.038	3.4	−0.58	C+	4n,5n
360.	$a\ ^3D - {}^3D°$											
		3846.80	26225	52213	7	7	0.67	0.15	13	0.02	C+	4n
		3836.33	26624	52683	5	5	0.39	0.085	5.4	−0.37	C	4n,5n
		3778.51	26225	52683	7	5	0.14	0.022	1.9	−0.81	C	5n
		3757.45	26624	53230	5	3	0.14	0.017	1.1	−1.06	C	5n
		3906.75	26624	52213	5	7	0.079	0.025	1.6	−0.90	C	5n
361.	$a\ ^3D - {}^3P°$											
		3810.76	26624	52858	5	3	0.24	0.031	1.9	−0.81	C+	4n,5n
		3802.28	26624	52916	5	5	0.058	0.013	0.79	−1.20	C	5n
362.	$a\ ^3D - s\ ^3D°$											
		3740.24	26225	52954?	7	7	0.19	0.039	3.4	−0.56	C+	4n,5n
363.	$a\ ^3D - {}^5F°$											
		3751.06	26624	53275	5	5	0.014	0.0030	0.18	−1.83	C	5n
364.	$a\ ^3D - 9°$ (669)											
		3688.48	26225	53329	7	9	0.081	0.021	1.8	−0.83	C	5n
365.	$a\ ^3D - {}^5D°$											
		3613.45	26225	53892	7	7	0.078	0.015	1.3	−0.97	C	5n
		3560.70	26225	54301	7	9	0.077	0.019	1.5	−0.88	C+	4n,5n
366.	$a\ ^3D - t\ ^3G°$ (673)											
		3568.82	26225	54237	7	9	0.065	0.016	1.3	−0.95	C	5n
		3573.39	26624	54600	5	7	0.088	0.023	1.4	−0.93	C	5n
367.	$a\ ^3D - {}^5P°$											
		3598.72	26225	54005	7	7	0.034	0.0067	0.55	−1.33	C	5n
368.	$a\ ^3D - w\ ^1D°$ (676)											
		3406.44	26406	55754	3	5	0.30	0.088	2.9	−0.58	C+	4n

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
369.	$a\ ^3D - u\ ^3F^\circ$ (680)											
		3292.02	26225	56593	7	9	0.62	0.13	9.9	−0.04	C+	4*n*
		3314.74	26624	56783	5	7	0.70	0.16	8.9	−0.09	C+	4*n*
		3282.89	26406	56859	3	5	0.31	0.084	2.7	−0.60	C+	4*n*
370.	$a\ ^3D - r\ ^1G^\circ$ (681)											
		3253.60	26225	56951	7	9	0.18	0.038	2.8	−0.58	C+	4*n*
371.	$z\ ^5F^\circ - e\ ^7D$ (685)											
		6271.29	26875	42816	11	11	2.0(−4)	1.2(−4)	0.027	−2.88	C	5*n*
372.	$z\ ^5F^\circ - e\ ^5D$ (686)											
		5615.64	26875	44677	11	9	0.17	0.067	14	−0.13	C+	4*n*
		5586.76	27167	45061	9	7	0.19	0.070	12	−0.20	C+	4*n*,5*n*
		5572.84	27395	45334	7	5	0.22	0.072	9.2	−0.30	C+	4*n*
		5569.62	27560	45509	5	3	0.21	0.059	5.4	−0.53	C+	4*n*
		5576.09	27666	45595	3	1	0.25	0.039	2.2	−0.93	C	5*n*
		5709.38	27167	44677	9	9	0.015	0.0075	1.3	−1.17	C	4*n*
		5658.82	27395	45061	7	7	0.042	0.020	2.6	−0.85	C+	4*n*
		5624.54	27560	45334	5	5	0.062	0.030	2.7	−0.83	C+	4*n*
		5784.69	27395	44677	7	9	5.6(−4)	3.6(−4)	0.048	−2.60	C	5*n*
		5712.15	27560	45061	5	7	0.0030	0.0020	0.19	−1.99	C	5*n*
373.	$z\ ^5F^\circ - e\ ^5F$ (687)											
		4966.09	26875	47006	11	11	0.037	0.014	2.5	−0.82	C+	4*n*
		4946.38	27167	47378	9	9	0.022	0.0080	1.2	−1.14	D−	14*n*
		4875.87	26875	47378	11	9	0.0035	0.0010	0.18	−1.95	C	5*n*
		4843.14	27395	48037	7	5	0.0097	0.0024	0.27	−1.77	C	5*n*
		4838.51	27560	48221	5	3	0.013	0.0026	0.21	−1.88	C	5*n*
		5002.79	27395	47378	7	9	0.0092	0.0044	0.51	−1.51	C	5*n*
		4950.10	27560	47756	5	7	0.0083	0.0043	0.35	−1.67	D	10*n*
		4907.73	27666	48037	3	5	0.0084	0.0050	0.24	−1.82	D	10*n*
374.	$z\ ^5F^\circ - e\ ^3F$ (688)											
		4679.22	27167	48532	9	7	0.0037	9.5(−4)	0.13	−2.07	C	5*n*
		4807.71	27167	47961	9	9	0.0024	8.2(−4)	0.12	−2.13	C	5*n*
		4729.68	27395	48532	7	7	0.0017	5.7(−4)	0.062	−2.40	C	5*n*
		4860.98	27395	47961	7	9	0.0014	6.2(−4)	0.070	−2.36	C	5*n*
		4766.87	27560	48532	5	7	0.0024	0.0012	0.090	−2.24	C	5*n*
375.	$z\ ^5F^\circ - e\ ^7F$ (689)											
		4224.17	27167	50833	9	11	0.14	0.044	5.5	−0.40	C+	4*n*
		4200.92	27395	51192	7	9	0.049	0.017	1.6	−0.93	C	5*n*
		4224.51	27666	51331	3	5	0.084	0.037	1.6	−0.95	C	5*n*
		4161.08	27167	51192	9	9	0.010	0.0027	0.33	−1.62	C	5*n*
		4205.54	27560	51331	5	5	0.042	0.011	0.78	−1.25	C	5*n*
		4168.63	27167	51149	9	7	0.0074	0.0015	0.19	−1.87	C	5*n*

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
376.	$z\,^5F^o - f\,^5D$ (691)											
		4278.23	27167	50534	9	7	0.011	0.0024	0.30	−1.67	C	5n
377.	$z\,^5F^o - e\,^7P$ (692)											
		4264.20	27167	50611	9	7	0.020	0.0043	0.55	−1.41	C	5n
378.	$z\,^5F^o - e\,^5G$ (693)											
		4247.43	27167	50704	9	11	0.20	0.067	8.4	−0.22	C+	4n
		4238.81	27395	50980	7	9	0.22	0.077	7.5	−0.27	C+	4n
		4225.45	27560	51219	5	7	0.17	0.065	4.5	−0.49	C+	4n
		4217.55	27666	51370	3	5	0.24	0.11	4.4	−0.50	C+	4n
		4196.21	27395	51219	7	7	0.11	0.028	2.7	−0.71	C	4n,5n
		4198.64	27560	51370	5	5	0.13	0.036	2.5	−0.75	C	5n
		4169.78	27395	51370	7	5	0.011	0.0021	0.20	−1.84	C	5n
379.	$z\,^5F^o - e\,^7G$ (694)											
		4149.37	26875	50968	11	13	0.043	0.013	2.0	−0.84	C+	4n,5n
		4154.80	27167	51229	9	11	0.15	0.049	6.0	−0.36	C+	4n
		4182.79	27560	51461	5	7	0.014	0.0051	0.35	−1.59	C	5n
		4104.97	26875	51229	11	11	0.0028	7.1(−4)	0.10	−2.11	C	5n
		4136.51	27167	51335	9	9	0.015	0.0039	0.47	−1.46	C	5n
		4168.94	27560	51540	5	5	0.020	0.0053	0.36	−1.58	C	5n
		4087.09	26875	51335	11	9	0.021	0.0044	0.64	−1.32	C	4n,5n
380.	$z\,^5F^o - f\,^5F$ (695)											
		4126.18	26875	51103	11	11	0.046	0.012	1.7	−0.89	C	5n
		4114.96	27167	51462	9	9	0.012	0.0030	0.36	−1.57	C	5n
		4129.46	27395	51604	7	7	0.0070	0.0018	0.17	−1.90	C	5n
		4150.25	27666	51754	3	3	0.083	0.022	0.88	−1.19	C	5n
		4090.98	27167	51604	9	7	0.012	0.0023	0.27	−1.69	C	5n
		4112.35	27395	51705	7	5	0.016	0.0030	0.28	−1.68	C	5n
		4153.90	27395	51462	7	9	0.24	0.079	7.5	−0.26	C+	4n
		4158.79	27666	51705	3	5	0.17	0.073	3.0	−0.66	C	5n
381.	$z\,^5F^o - e\,^3D$ (697)											
		4106.44	27395	51740	7	5	0.029	0.0052	0.49	−1.44	C	5n
		4183.03	27395	51294	7	7	0.0043	0.0011	0.11	−2.10	C	5n
382.	$z\,^5F^o - g\,^5D$ (698)											
		4084.49	26875	51350	11	9	0.12	0.024	3.5	−0.58	C+	4n
		4054.87	27560	52214	5	3	0.18	0.027	1.8	−0.87	C	5n
		4065.40	27666	52257	3	1	0.24	0.020	0.79	−1.23	C	4n,5n
		4133.86	27167	51350	9	9	0.026	0.0065	0.80	−1.23	C	4n
		4101.27	27395	51771	7	7	0.028	0.0070	0.66	−1.31	C	4n,5n
		4082.13	27560	52050	5	5	0.027	0.0068	0.46	−1.47	C	5n
		4129.22	27560	51771	5	7	0.0061	0.0022	0.15	−1.96	C	5n
383.	$z\,^5F^o - e\,^5P$ (700)											
		4051.92	27395	52067	7	5	0.035	0.0062	0.58	−1.36	C	5n
		4090.09	27395	51837	7	7	0.011	0.0028	0.26	−1.71	C	5n
		4079.18	27560	52067	5	5	0.059	0.015	1.0	−1.13	C	5n

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
384.	$z\ ^5F^o - g\ ^5F$ (701)											
		3817.64	26875	53061	11	11	0.085	0.019	2.6	−0.69	C	5n
385.	$z\ ^5F^o - h\ ^5D$ (702)											
		3804.01	26875	53155	11	9	0.052	0.0093	1.3	−0.99	C+	4n,5n
		3789.82	27167	53546	9	7	0.046	0.0077	0.86	−1.16	C	5n
386.	$z\ ^5F^o - f\ ^5P$ (703)											
		3846.00	27167	53160	9	7	0.050	0.0086	0.98	−1.11	C	5n
		3819.50	27395	53569	7	5	0.054	0.0084	0.74	−1.23	C	5n
		3791.73	27560	53925	5	3	0.074	0.0096	0.60	−1.32	C	5n
387.	$z\ ^5F^o - f\ ^5G$ (704)											
		3802.00	26875	53169	11	13	0.041	0.010	1.4	−0.94	C	5n
388.	$z\ ^5F^o - e\ ^3G$ (705)											
		3762.21	27167	53739	9	11	0.033	0.0086	0.96	−1.11	C	4n,5n
389.	$a\ ^1P - ^1D^o$	5029.62	27543	47420	3	5	0.0055	0.0035	0.17	−1.98	C	5n
390.	$a\ ^1P - x\ ^3P^o$ (720)											
		4779.44	27543	48460	3	1	0.017	0.0019	0.091	−2.24	C	5n
391.	$a\ ^1P - w\ ^3F^o$ (723)											
		4566.99	27543	49433	3	5	0.0063	0.0033	0.15	−2.01	C	5n
392.	$a\ ^1P - y\ ^1D^o$ (726)	4137.00	27543	51708	3	5	0.23	0.098	4.0	−0.53	C+	4n
393.	$a\ ^1P - u\ ^3D^o$ (728)											
		4003.76	27543	52512	3	3	0.082	0.020	0.78	−1.23	C	4n,5n
394.	$a\ ^1P - ^3D^o$											
		3976.61	27543	52683	3	5	0.18	0.073	2.9	−0.66	C	5n
		3891.93	27543	53230	3	3	0.40	0.090	3.4	−0.57	C+	4n,5n
395.	$a\ ^1P - ^3P^o$											
		3949.14	27543	52858	3	3	0.046	0.011	0.42	−1.49	C	5n
396.	$a\ ^1P - ^3S^o$											
		3806.22	27543	53808	3	3	0,25	0.055	2.1	−0.78	C	4n,5n
397.	$a\ ^1P - w\ ^1D^o$ (734)	3543.67	27543	55754	3	5	0.18	0.058	2.0	−0.76	C	5n
398.	$a\ ^1P - u\ ^3F^o$ (735)											
		3410.17	27543	56859	3	5	0.48	0.14	4.7	−0.38	C+	4n

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
399.	$a\ ^1D - x\ ^3D^o$ (738)											
		6016.66	28605	45221	5	7	0.0047	0.0036	0.35	−1.75	C	5*n*
400.	$a\ ^1D - w\ ^3F^o$ (750)											
		4844.01	28605	49243	5	7	0.0045	0.0022	0.17	−1.96	C	5*n*
401.	$a\ ^1D - v\ ^3D^o$ (751)											
		4869.45	28605	49135	5	7	0.0014	7.1(−4)	0.057	−2.45	C	5*n*
402.	$a\ ^1D - v\ ^3G^o$ (752)											
		4705.46	28605	49851	5	7	0.0025	0.0012	0.089	−2.24	C	5*n*
403.	$a\ ^1D - z\ ^1D^o$ (753)	4789.65	28605	49477	5	5	0.084	0.029	2.3	−0.84	C+	4*n*
404.	$a\ ^1D - w\ ^3P^o$ (754)											
		4663.18	28605	50043	5	3	0.0046	8.9(−4)	0.069	−2.35	C	5*n*
405.	$a\ ^1D - z\ ^1F^o$ (755)	4547.85	28605	50587	5	7	0.078	0.034	2.5	−0.77	C+	4*n*
406.	$a\ ^1D - u\ ^3G^o$ (760)											
		4305.20	28605	51826	5	7	0.0051	0.0020	0.14	−2.00	C	5*n*
407.	$a\ ^1D - y\ ^1D^o$ (761)	4327.09	28605	51708	5	5	0.094	0.026	1.9	−0.88	C+	4*n*,5*n*
408.	$a\ ^1D - x\ ^1D^o$ (762)	4317.04	28605	51762	5	5	0.0057	0.0016	0.11	−2.10	C	5*n*
409.	$a\ ^1D - ^1P^o$	4240.37	28605	52181	5	3?	0.070	0.011	0.79	−1.25	C+	4*n*,5*n*
410.	$a\ ^1D - ^3D^o$											
		4059.73	28605	53230	5	3	0.096	0.014	0.95	−1.15	C+	4*n*,5*n*
411.	$a\ ^1D - y\ ^1F^o$ (768)	3989.86	28605	53661	5	7	0.058	0.020	1.3	−1.01	C	5*n*
412.	$a\ ^1D - x\ ^3F^o$											
		3973.65	28605	53763	5	7	0.080	0.026	1.7	−0.88	C+	4*n*,5*n*
413.	$a\ ^1D - t\ ^3G^o$ (771)											
		3845.69	28605	54600	5	7	0.057	0.018	1.1	−1.05	C	5*n*
414.	$a\ ^1D - w\ ^1D^o$ (772)	3682.24	28605	55754	5	5	1.7	0.36	22	0.25	C+	4*n*
415.	$a\ ^1D - w\ ^1F^o$ (773)	3677.31	28605	55791	5	7	0.31	0.089	5.4	−0.35	C	5*n*

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
416.	$a\ ^1H - ^3F°$											
		5584.77	28820	46721	11	9	0.0013	5.1(−4)	0.10	−2.25	C	5n
417.	$a\ ^1H - ^5D°$											
		5532.75	28820	46889	11	9	0.0020	7.6(−4)	0.15	−2.08	C	5n
418.	$a\ ^1H - ^5H°$											
		5263.87	28820	47812	11	9	0.0023	7.9(−4)	0.15	−2.06	C	5n
419.	$a\ ^1H - w\ ^3G°$ (789)											
		5115.78	28820	48362	11	9	6.1(−4)	1.9(−4)	0.036	−2.67	C	5n
420.	$a\ ^1H - w\ ^3F°$ (792)											
		4927.42	28820	49109	11	9	0.0037	0.0011	0.20	−1.92	C	5n
421.	$a\ ^1H - y\ ^3H°$ (793)											
		4849.67	28820	49434	11	13	5.4(−4)	2.2(−4)	0.039	−2.61	C	5n
		4809.94	28820	49604	11	11	5.9(−4)	2.0(−4)	0.035	−2.65	C	5n
422.	$a\ ^1H - x\ ^1G°$ (795)	4587.13	28820	50614	11	9	0.0069	0.0018	0.29	−1.71	C	5n
423.	$a\ ^1H - x\ ^3H°$ (796)											
		4502.59	28820	51023	11	13	0.0013	4.8(−4)	0.078	−2.28	C	5n
424.	$a\ ^1H - u\ ^3G°$ (797)											
		4432.57	28820	51374	11	11	0.0091	0.0027	0.43	−1.53	C	5n
425.	$a\ ^1H - ^1H°$	4382.77	28820	51630	11	11	0.013	0.0039	0.62	−1.37	C	5n
426.	$a\ ^1H - y\ ^3I°$ (800)											
		4219.36	28820	52514	11	13	0.38	0.12	18	0.12	C+	4n,8
427.	$a\ ^1H - z\ ^1I°$ (801)	4118.54	28820	53094	11	13	0.58	0.17	26	0.28	C	8
428.	$a\ ^1H - y\ ^1H°$ (802)	4014.53	28820	53722	11	11	0.24	0.059	8.5	−0.19	C+	4n
429.	$a\ ^1H - w\ ^1G°$ (804)	3846.41	28820	54811	11	9	0.19	0.035	4.8	−0.42	C	5n
430.	$a\ ^1H - v\ ^3H°$ (805)											
		3756.94	28820	55430	11	11	0.25	0.052	7.1	−0.24	C+	4n,5n
431.	$a\ ^1H - s\ ^3G°$ (807)											
		3690.73	28820	55907	11	11	0.28	0.057	7.7	−0.20	C+	4n

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
432.	$a\ ^1H - u\ ^3H^o$ (808)											
		3627.05	28820	56383	11	11	0.027	0.0052	0.69	−1.24	C	5*n*
433.	$a\ ^1H - u\ ^3F^o$ (809)											
		3599.62	28820	56593	11	9	0.19	0.030	3.9	−0.48	C+	4*n*,5*n*
434.	$a\ ^1H - v\ ^1G^o$ (810)	3553.74	28820	56951	11	9	0.83	0.13	17	0.15	C+	4*n*
435.	$a\ ^1H - x\ ^3I^o$ (811)											
		3538.78	28820	57070	11	13	0.0076	0.0017	0.22	−1.73	C	8
		3534.53	28820	57104	11	11	0.022	0.0042	0.53	−1.34	C	5*n*
436.	$z\ ^5P^o - e\ ^5D$ (816)											
		6400.00	29056	44677	7	9	0.059	0.046	6.8	−0.49	D−	14*n*
		6411.65	29469	45061	5	7	0.038	0.032	3.4	−0.79	D−	14*n*
		6246.32	29056	45061	7	7	0.029	0.017	2.4	−0.93	D−	14*n*
		6336.84	29733	45509	3	3	0.053	0.032	2.0	−1.02	D−	14*n*
		6141.73	29056	45334	7	5	0.010	0.0041	0.58	−1.54	C	5*n*
437.	$z\ ^5P^o - e\ ^7F$ (819)											
		4572.86	29469	51331	5	5	0.0012	3.6(−4)	0.027	−2.74	C	5*n*
		4488.13	29056	51331	7	5	0.015	0.0032	0.33	−1.65	C	5*n*
438.	$z\ ^5P^o - f\ ^7D$ (820)											
		4596.06	29056	50808	7	9	0.0094	0.0038	0.41	−1.57	C	5*n*
		4673.16	29469	50862	5	7	0.049	0.022	1.7	−0.95	D−	14*n*
		4701.05	29733	50999	3	5	0.0078	0.0043	0.20	−1.89	C	5*n*
		4643.46	29469	50999	5	5	0.037	0.012	0.92	−1.22	C	5*n*
		4690.14	29733	51048	3	3	0.025	0.0082	0.38	−1.61	C	5*n*
439.	$z\ ^5P^o - f\ ^5D$ (821)											
		4678.85	29056	50423	7	9	0.085	0.036	3.9	−0.60	D	9
		4619.29	29056	50699	7	5	0.056	0.013	1.4	−1.05	C	5*n*
		4669.17	29469	50880	5	3	0.047	0.0091	0.70	−1.34	C	5*n*
		4704.95	29733	50981	3	1	0.095	0.011	0.49	−1.50	C	5*n*
440.	$z\ ^5P^o - e\ ^7P$ (822)											
		4638.01	29056	50611	7	7	0.039	0.013	1.4	−1.05	C	5*n*
		4673.28	29469	50861	5	5	0.040	0.013	1.0	−1.18	C	5*n*
441.	$z\ ^5P^o - e\ ^5G$ (823)											
		4560.09	29056	50980	7	9	0.0050	0.0020	0.21	−1.85	C	5*n*
		4596.41	29469	51219	5	7	0.0025	0.0011	0.085	−2.25	C	5*n*

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
442.	$z\ ^5P^o - f\ ^5F$ (825)											
		4433.78	29056	51604	7	7	0.031	0.0090	0.92	−1.20	C	5*n*
		4495.95	29469	51705	5	5	0.015	0.0045	0.33	−1.65	C	5*n*
		4485.97	29469	51754	5	3	0.0058	0.0010	0.078	−2.28	C	5*n*
443.	$z\ ^5P^o - e\ ^3D$ (827)											
		4495.57	29056	51294	7	7	0.0042	0.0013	0.13	−2.05	C	5*n*
		4481.61	29733	52040	3	3	0.049	0.015	0.66	−1.35	C	5*n*
		4580.58	29469	51294	5	7	0.0043	0.0019	0.14	−2.02	C	5*n*
444.	$z\ ^5P^o - g\ ^5D$ (828)											
		4484.22	29056	51350	7	9	0.081	0.031	3.2	−0.66	D	9
		4482.74	29469	51771	5	7	0.025	0.010	0.77	−1.28	C	5*n*
		4401.29	29056	51771	7	7	0.069	0.020	2.0	−0.85	C+	4*n*
		4446.83	29733	52214	3	3	0.062	0.018	0.80	−1.26	C	5*n*
		4347.85	29056	52050	7	5	0.018	0.0037	0.37	−1.59	C	5*n*
		4395.29	29469	52214	5	3	0.020	0.0035	0.25	−1.76	C	5*n*
		4438.34	29733	52257	3	1	0.093	0.0092	0.40	−1.56	C	5*n*
445.	$z\ ^5P^o - e\ ^7S$ (829)											
		4440.48	29056	51570	7	7	0.0048	0.0014	0.15	−2.00	C	5*n*
		4523.40	29469	51570	5	7	0.0056	0.0024	0.18	−1.92	C	5*n*
446.	$z\ ^5P^o - e\ ^5P$ (830)											
		4388.41	29056	51837	7	7	0.13	0.038	3.8	−0.58	C+	4*n*
		4423.84	29469	52067	5	5	0.020	0.0058	0.42	−1.54	C	5*n*
		4485.67	29733	52020	3	3	0.12	0.037	1.7	−0.95	C	5*n*
		4433.22	29469	52020	5	3	0.23	0.041	3.0	−0.69	C	5*n*
		4469.37	29469	51837	5	7	0.27	0.11	8.3	−0.25	C+	4*n*
447.	$z\ ^5P^o - 4$ (836)											
		3428.75	29056	58213	7	5	0.25	0.031	2.5	−0.66	D	12*n*
448.	$a\ ^1I - z\ ^3H^o$ (838)											
		5649.66	29313	47008	13	11	3.8(−4)	1.5(−4)	0.037	−2.70	C	5*n*
449.	$a\ ^1I - w\ ^3G^o$ (842)											
		5284.42	29313	48231	13	11	6.7(−4)	2.4(−4)	0.054	−2.51	C	5*n*
450.	$a\ ^1I - z\ ^1H^o$ (843)	5242.49	29313	48383	13	11	0.032	0.011	2.5	−0.84	C+	4*n*,8
451.	$a\ ^1I - v\ ^3G^o$ (845)											
		4961.91	29313	49461	13	11	0.0015	4.6(−4)	0.098	−2.22	C	5*n*

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
452.	$a\ ^1$I – $y\ ^3$I° (849)											
		4309.03	29313	52514	13	13	0.024	0.0067	1.2	−1.06	C+	4*n*,5*n*,8
453.	$a\ ^1$I – $z\ ^1$I° (850)	4203.94	29313	53094	13	13	0.13	0.034	6.2	−0.35	C	8
454.	$a\ ^1$I – $x\ ^1$H° (854)	3813.88	29313	55526	13	11	0.091	0.017	2.7	−0.66	C+	4*n*,5*n*
455.	$b\ ^3$D – $y\ ^3$P° (867)											
		5760.35	29372	46727	7	5	0.0015	5.4(−4)	0.072	−2.42	C	5*n*
		5698.05	29357	46902	5	3	0.0017	4.9(−4)	0.046	−2.61	C	5*n*
456.	$b\ ^3$D – ^{5}F°											
		5762.43	29372	46721	7	9	0.0014	8.8(−4)	0.12	−2.21	C	5*n*
		5636.71	29357	47093	5	7	8.6(−4)	5.8(−4)	0.054	−2.54	C	5*n*
457.	$b\ ^3$D – ^{5}D°											
		5707.07	29372	46889	7	9	0.0011	6.7(−4)	0.088	−2.33	C	5*n*
		5660.79	29357	47017	5	7	4.6(−4)	3.1(−4)	0.029	−2.81	C	5*n*
458.	$b\ ^3$D – ^{3}D°											
		5754.41	29372	46745	7	7	6.7(−4)	3.3(−4)	0.044	−2.63	C	5*n*
		5702.43	29357	46889	5	5	6.5(−4)	3.2(−4)	0.030	−2.80	C	5*n*
		5568.81	29320	47272	3	3	9.5(−4)	4.4(−4)	0.024	−2.88	C	5*n*
459.	$b\ ^3$D – ^{1}D°											
		5539.28	29372	47420	7	5	0.0011	3.7(−4)	0.047	−2.59	C	5*n*
460.	$b\ ^3$D – $z\ ^1$G° (872)											
		5529.15	29372	47453	7	9	5.3(−4)	3.1(−4)	0.040	−2.66	C	5*n*
461.	$b\ ^3$D – $v\ ^5$F° (875)											
		5294.56	29357	48239	5	5	7.7(−4)	3.2(−4)	0.028	−2.79	C	5*n*
		5298.79	29372	48239	7	5	0.0039	0.0012	0.14	−2.09	C	5*n*
462.	$b\ ^3$D – $v\ ^5$P° (877)											
		5320.05	29372	48163	7	5	0.0016	4.8(−4)	0.059	−2.47	C	5*n*
463.	$b\ ^3$D – $x\ ^3$P° (880)											
		5280.36	29372	48305	7	5	0.0052	0.0016	0.19	−1.96	C	5*n*
		5223.19	29320	48460	3	1	0.012	0.0016	0.082	−2.32	C	5*n*
		5207.95	29320	48516	3	3	0.0034	0.0014	0.071	−2.38	C	5*n*
464.	$b\ ^3$D – $w\ ^3$F° (883)											
		4970.50	29320	49433	3	5	0.013	0.0078	0.38	−1.63	C	5*n*

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
465.	$b\ ^3\mathrm{D} - v\ ^3\mathrm{D}^\circ$ (884)											
		5058.50	29372	49135	7	7	6.2(−4)	2.4(−4)	0.028	−2.78	D	15n
		5054.64	29357	49135	5	7	0.0032	0.0017	0.14	−2.07	C	5n
466.	$b\ ^3\mathrm{D} - z\ ^1\mathrm{D}^\circ$ (887)											
		4968.69	29357	49477	5	5	0.011	0.0039	0.32	−1.71	C	5n
467.	$b\ ^3\mathrm{D} - w\ ^3\mathrm{P}^\circ$ (888)											
		4799.41	29357	50187	5	5	0.0040	0.0014	0.11	−2.16	C	5n
468.	$b\ ^3\mathrm{D} - v\ ^3\mathrm{F}^\circ$ (894)											
		4542.41	29357	51365	5	7	0.0048	0.0021	0.16	−1.98	C	5n
469.	$b\ ^3\mathrm{D} - u\ ^3\mathrm{G}^\circ$ (898)											
		4483.78	29372	51668	7	9	0.0015	5.7(−4)	0.059	−2.40	C	5n
470.	$b\ ^3\mathrm{D} - u\ ^3\mathrm{D}^\circ$ (903)											
		4360.81	29372	52297	7	5	0.011	0.0023	0.23	−1.80	C	5n
471.	$b\ ^3\mathrm{D} - \ ^3\mathrm{D}^\circ$											
		4285.83	29357	52683	5	5	0.014	0.0039	0.28	−1.71	C	5n
472.	$b\ ^3\mathrm{D} - \ ^3\mathrm{P}^\circ$											
		4246.08	29372	52916	7	5	0.069	0.013	1.3	−1.03	C+	4n,5n
473.	$b\ ^3\mathrm{D} - s\ ^3\mathrm{D}^\circ$ (907)											
		4239.36	29372	52954?	7	7	0.019	0.0051	0.50	−1.45	C	5n
474.	$b\ ^3\mathrm{D} - \ ^3\mathrm{S}^\circ$											
		4088.57	29357	53808	5	3	0.046	0.0069	0.47	−1.46	C	5n
		4082.44	29320	53808	3	3	0.044	0.011	0.45	−1.48	C	5n
475.	$b\ ^3\mathrm{D} - \ ^5\mathrm{D}^\circ$											
		4010.18	29372	54301	7	9	0.0088	0.0027	0.25	−1.72	C	5n
476.	$b\ ^3\mathrm{D} - t\ ^3\mathrm{G}^\circ$ (913)											
		4020.49	29372	54237	7	9	0.0091	0.0029	0.26	−1.70	C	5n
		3960.28	29357	54600	5	7	0.049	0.016	1.1	−1.09	C	5n
477.	$b\ ^3\mathrm{D} - w\ ^1\mathrm{D}^\circ$ (916)											
		3787.16	29357	55754	5	5	0.12	0.026	1.6	−0.88	C+	4n,5n

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
478.	$b\ ^3D - w\ ^1F°$ (917)											
		3781.94	29357	55791	5	7	0.043	0.013	0.80	−1.19	C	5n
479.	$b\ ^1G - ^5D°$											
		5849.67	29799	46889	9	9	2.6(−4)	1.3(−4)	0.023	−2.92	C	5n
480.	$b\ ^1G - z\ ^1G°$ (924)	5662.94	29799	47453	9	9	0.0012	5.8(−4)	0.098	−2.28	C	5n
481.	$b\ ^1G - ^5H°$											
		5549.94	29799	47812	9	9	3.5(−4)	1.6(−4)	0.026	−2.84	C	5n
		5543.15	29799	47834	9	7	0.0098	0.0035	0.58	−1.50	C	5n
482.	$b\ ^1G - w\ ^3G°$ (927)											
		5385.58	29799	48362	9	9	3.2(−4)	1.4(−4)	0.022	−2.90	C	5n
483.	$b\ ^1G - z\ ^1H°$ (928)	5379.57	29799	48383	9	11	0.0078	0.0041	0.66	−1.43	C	4n,5n,8
484.	$b\ ^1G - y\ ^1G°$ (929)	5288.53	29799	48703	9	9	0.0071	0.0030	0.47	−1.57	D	15n
485.	$b\ ^1G - w\ ^3F°$ (930)											
		5177.23	29799	49109	9	9	0.0012	5.0(−4)	0.076	−2.35	C	5n
486.	$b\ ^1G - x\ ^3H°$ (935)											
		4700.19	29799	51409	9	11	0.0067	0.0027	0.38	−1.61	C	5n
487.	$b\ ^1G - y\ ^1F°$ (940)	4189.56	29799	53661	9	7	0.030	0.0061	0.76	−1.26	C	5n
488.	$b\ ^1G - x\ ^3F°$											
		4171.69	29799	53763	9	7	0.034	0.0069	0.85	−1.21	C	5n
489.	$b\ ^1G - w\ ^1G°$ (945)	3996.97	29799	54811	9	9	0.074	0.018	2.1	−0.80	C+	4n,5n
490.	$b\ ^1G - s\ ^3G°$ (948)											
		3829.13	29799	55907	9	11	0.031	0.0084	0.96	−1.12	C	5n
491.	$z\ ^3F° - e\ ^3F$ (959)											
		6003.03	31307	47961	9	9	0.017	0.0090	1.6	−1.09	D−	14n
		5952.75	32134	48928	5	5	0.016	0.0085	0.84	−1.37	C	5n
		5804.06	31307	48532	9	7	0.0017	6.7(−4)	0.12	−2.22	C	5n
		5838.42	31805	48928	7	5	0.0021	7.7(−4)	0.10	−2.27	C	5n
		6188.04	31805	47961	7	9	0.0043	0.0032	0.46	−1.65	C	5n
		6096.69	32134	48532	5	7	0.0035	0.0028	0.28	−1.86	C	5n

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
492.	$z\ ^3F^o - e\ ^3D$ (965)											
		5001.86	31307	51294	9	7	0.40	0.12	17	0.02	C+	4n
		5014.94	31805	51740	7	5	0.31	0.082	9.5	−0.24	C+	4n
		5022.24	32134	52040	5	3	0.27	0.060	5.0	−0.52	C+	4n
		5129.63	31805	51294	7	7	0.0060	0.0024	0.28	−1.78	C	5n
		5099.09	32134	51740	5	5	0.018	0.0069	0.58	−1.46	C	5n
493.	$z\ ^3F^o - g\ ^5D$ (966)											
		4978.60	32134	52214	5	3	0.11	0.025	2.1	−0.90	D−	14n
494.	$z\ ^3F^o - e\ ^7S$ (967)											
		5058.00	31805	51570	7	7	0.0013	5.0(−4)	0.058	−2.46	C	5n
495.	$z\ ^3F^o - g\ ^5F$ (969)											
		4452.62	31805	54258	7	5	0.0093	0.0020	0.20	−1.86	C	5n
		4492.68	32134	54386	5	3	0.029	0.0053	0.39	−1.58	C	5n
496.	$z\ ^3F^o - f\ ^5P$ (971)											
		4593.53	31805	53569	7	5	0.0065	0.0015	0.15	−1.99	C	5n
		4587.72	32134	53925	5	3	0.0088	0.0017	0.13	−2.08	C	5n
497.	$z\ ^3F^o - f\ ^5G$ (972)											
		4551.65	31805	53769	7	9	0.0037	0.0015	0.15	−1.99	C	5n
		4450.77	31307	53769	9	9	0.0025	7.5(−4)	0.099	−2.17	C	5n
498.	$z\ ^3F^o - e\ ^3G$ (973)											
		4456.63	31307	53739	9	11	0.0075	0.0027	0.36	−1.61	C	5n
		4494.05	32134	54379	5	7	0.0086	0.0036	0.27	−1.74	C	5n
		4392.58	31307	54067	9	9	0.0045	0.0013	0.17	−1.93	C	5n
499.	$z\ ^3F^o - f\ ^3D$ (974)											
		4455.03	31307	53748	9	7	0.046	0.011	1.4	−1.02	C	5n
500.	$z\ ^3F^o - e\ ^3H$ (975)											
		4300.21	31307	54555?	9	9	0.0073	0.0020	0.26	−1.74	C	5n
501.	$z\ ^3F^o - f\ ^3F$ (976)											
		4276.68	31307	54683	9	9	0.029	0.0080	1.0	−1.14	C	5n
		4300.83	32134	55379	5	5	0.055	0.015	1.1	−1.12	C	5n
502.	$z\ ^3F^o - 2$ (977)											
		3975.85	31307	56452	9	9	0.030	0.0070	0.83	−1.20	C	5n

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
503.	$z\ ^3D^o - e\ ^5F$ (981)											
		6226.77	31323	47378	7	9	0.0014	0.0010	0.15	−2.15	C	5*n*
504.	$z\ ^3D^o - e\ ^3F$ (982)											
		5934.66	31686	48532	5	7	0.021	0.016	1.6	−1.10	C	5*n*
		5883.84	31937	48928	3	5	0.020	0.017	0.99	−1.29	C	5*n*
		5809.25	31323	48532	7	7	0.0048	0.0024	0.32	−1.77	C	5*n*
		5798.19	31686	48928	5	5	0.0060	0.0030	0.29	−1.82	C	5*n*
505.	$z\ ^3D^o - e\ ^3D$ (984)											
		4973.10	31937	52040	3	3	0.12	0.044	2.2	−0.88	C+	4*n*
		4896.44	31323	51740	7	5	0.0058	0.0015	0.17	−1.98	C	5*n*
		4911.78	31686	52040	5	3	0.018	0.0038	0.31	−1.72	C	5*n*
		5048.43	31937	51740	3	5	0.034	0.022	1.1	−1.19	C	4*n*
506.	$z\ ^3D^o - g\ ^5D$ (985)											
		4930.31	31937	52214	3	3	0.048	0.017	0.85	−1.28	C	5*n*
		4870.05	31686	52214	5	3	0.0050	0.0011	0.086	−2.27	C	5*n*
507.	$z\ ^3D^o - e\ ^5P$ (986)											
		4905.13	31686	52067	5	5	0.0058	0.0021	0.17	−1.98	C	5*n*
508.	$z\ ^3D^o - f\ ^3D$ (992)											
		4466.94	31686	54067	5	5	0.035	0.010	0.77	−1.28	C	5*n*
		4440.82	31937	54449	3	3	0.033	0.0098	0.43	−1.53	C	5*n*
		4391.87	31686	54449	5	3	0.012	0.0021	0.15	−1.97	C	5*n*
509.	$z\ ^3D^o - f\ ^3F$ (993)											
		4279.48	31323	54683	7	9	0.016	0.0058	0.57	−1.39	C	5*n*
		4264.74	31937	55379	3	5	0.031	0.014	0.59	−1.38	C	5*n*
		4200.09	31323	55125	7	7	0.047	0.012	1.2	−1.06	C	5*n*
510.	$z\ ^3D^o - e\ ^3P$ (994)											
		4243.79	31323	54880	7	5	0.028	0.0053	0.52	−1.43	C	5*n*
		4220.05	31686	55376	5	3	0.032	0.0051	0.36	−1.59	C	5*n*
		4310.37	31686	54880	5	5	0.027	0.0074	0.53	−1.43	C	5*n*
511.	$z\ ^3D^o - i\ ^5D$ (995)											
		3839.61	31937	57974	3	5	0.40	0.15	5.6	−0.35	C	5*n*
512.	$c\ ^3F - ^5D^o$											
		7132.99	32874	46889	9	9	0.0030	0.0023	0.49	−1.68	C	5*n*
		7068.42	32874	47017	9	7	0.0093	0.0054	1.1	−1.31	C	5*n*
513.	$c\ ^3F - z\ ^3H^o$ (1003)											
		7024.08	32874	47106	9	9	0.0014	0.0011	0.22	−2.02	C	5*n*

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
514.	$c\ ^3F - w\ ^5G°$ (1005)											
		7000.63	33413	47693	7	7	0.0014	0.0010	0.17	−2.14	C	5*n*
		7107.46	33765	47831	5	5	0.0028	0.0021	0.25	−1.97	C	5*n*
515.	$c\ ^3F - z\ ^1G°$ (1006)											
		6857.25	32874	47453	9	9	0.0013	9.2(−4)	0.19	−2.08	C	5*n*
516.	$c\ ^3F - y\ ^1G°$ (1014)											
		6315.81	32874	48703	9	9	0.0043	0.0025	0.48	−1.64	C	5*n*
517.	$c\ ^3F - w\ ^3F°$ (1015)											
		6157.73	32874	49109	9	9	0.013	0.0072	1.3	−1.19	C	5*n*
		6380.75	33765	49433	5	5	0.015	0.0094	0.98	−1.33	C	5*n*
518.	$c\ ^3F - v\ ^3D°$ (1016)											
		6147.85	32874	49135	9	7	0.0059	0.0026	0.47	−1.63	C	5*n*
519.	$c\ ^3F - v\ ^3G°$ (1018)											
		6027.06	32874	49461	9	11	0.012	0.0080	1.4	−1.14	C	5*n*
		6165.37	33413	49628	7	9	0.0065	0.0047	0.67	−1.48	C	5*n*
		6215.15	33765	49851	5	7	0.011	0.0085	0.87	−1.37	C	5*n*
520.	$c\ ^3F - z\ ^1D°$ (1019)											
		6362.89	33765	49477	5	5	0.0041	0.0025	0.26	−1.90	C	5*n*
521.	$c\ ^3F - z\ ^1F°$ (1021)											
		5643.94	32874	50587	9	7	0.0031	0.0012	0.19	−1.98	C	5*n*
522.	$c\ ^3F - x\ ^1G°$ (1022)											
		5811.93	33413	50614	7	9	9.6(−4)	6.2(−4)	0.084	−2.36	C	5*n*
523.	$c\ ^3F - x\ ^3H°$ (1024)											
		5494.46	32874	51069	9	11	0.0019	0.0011	0.17	−2.02	C	5*n*
524.	$c\ ^3F - t\ ^5D°$ (1025)											
		5487.74	33413	51630?	7	5	0.093	0.030	3.8	−0.68	D−	14*n*
525.	$c\ ^3F - v\ ^3F°$ (1026)											
		5587.58	33413	51305	7	9	0.0039	0.0024	0.31	−1.78	C	5*n*
		5680.26	33765	51365	5	7	9.1(−4)	6.2(−4)	0.058	−2.51	C	5*n*

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i(cm^{-1})	E_k(cm^{-1})	g_i	g_k	A_{ki}(10^8 s^{-1})	f_{ik}	S(at. u.)	log gf	Accuracy	Source
526.	$c\,^3\mathrm{F} - u\,^3\mathrm{G}^\circ$ (1029)											
		5319.22	32874	51668	9	9	0.0013	5.6(−4)	0.088	−2.30	C	5n
527.	$c\,^3\mathrm{F} - {}^1\mathrm{H}^\circ$											
		5329.99	32874	51630	9	11	0.013	0.0065	1.0	−1.23	C	5n
528.	$c\,^3\mathrm{F} - y\,^1\mathrm{D}^\circ$ (1030)											
		5464.29	33413	51708	7	5	0.010	0.0032	0.40	−1.65	C	5n
529.	$c\,^3\mathrm{F} - u\,^3\mathrm{D}^\circ$ (1031)											
		5293.97	33413	52297	7	5	0.0075	0.0023	0.28	−1.80	C	5n
		5332.67	33765	52512	5	3	0.0075	0.0019	0.17	−2.02	C	5n
		5387.51	33413	51969	7	7	0.0028	0.0012	0.15	−2.07	C	5n
		5394.68	33765	52297	5	5	0.013	0.0056	0.50	−1.55	C	5n
		5491.84	33765	51969	5	7	0.0015	9.4(−4)	0.085	−2.33	C	5n
530.	$c\,^3\mathrm{F} - {}^3\mathrm{D}^\circ$											
		5187.91	33413	52683	7	5	0.032	0.0092	1.1	−1.19	C	4n,5n
		5136.09	33765	53230	5	3	0.0075	0.0018	0.15	−2.05	C	5n
		5284.62	33765	52683	5	5	0.0044	0.0018	0.16	−2.04	C	5n
531.	$c\,^3\mathrm{F} - {}^3\mathrm{P}^\circ$											
		5236.19	33765	52858	5	3	0.018	0.0045	0.39	−1.65	C	5n
532.	$c\,^3\mathrm{F} - {}^5\mathrm{F}^\circ$											
		4729.02	32874	54014	9	11	0.0070	0.0029	0.40	−1.59	C	5n
533.	$c\,^3\mathrm{F} - x\,^3\mathrm{F}^\circ$											
		4999.11	33765	53763	5	7	0.0082	0.0043	0.35	−1.67	C	5n
534.	$c\,^3\mathrm{F} - {}^5\mathrm{D}^\circ$											
		4785.96	33413	54301	7	9	0.0045	0.0020	0.22	−1.86	C	5n
535.	$c\,^3\mathrm{F} - t\,^3\mathrm{G}^\circ$ (1042)											
		4735.84	32874	53983	9	11	0.019	0.0079	1.1	−1.15	C	5n
		4800.65	33413	54237	7	9	0.021	0.0092	1.0	−1.19	C	5n
		4798.26	33765	54600	5	7	0.014	0.0066	0.52	−1.48	C	5n
536.	$c\,^3\mathrm{F} - {}^5\mathrm{P}^\circ$											
		4854.89	33413	54005	7	7	0.0043	0.0015	0.17	−1.97	C	5n
537.	$c\,^3\mathrm{F} - x\,^1\mathrm{H}^\circ$ (1046)											
		4413.40	32874	55526	9	11	0.011	0.0039	0.50	−1.46	C	5n

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
538.	$y\ ^5D° - e\ ^5F$ (1051)											
		7130.94	34017	48037	3	5	0.044	0.055	3.9	−0.78	C	5n
		7090.40	34122	48221	1	3	0.032	0.072	1.7	−1.14	C	5n
		6999.90	33096	47378	9	9	0.0049	0.0036	0.75	−1.49	C	5n
		7016.44	33507	47756	7	7	0.012	0.0092	1.5	−1.19	C	5n
		7022.98	33802	48037	5	5	0.018	0.013	1.5	−1.18	C	5n
		7038.25	34017	48221	3	3	0.026	0.020	1.4	−1.23	C	5n
539.	$y\ ^5D° - e\ ^3F$ (1052)											
		6916.70	33507	47961	7	9	0.0065	0.0060	0.95	−1.38	C	5n
		6786.88	33802	48532	5	7	0.0021	0.0020	0.22	−2.00	C	5n
540.	$y\ ^5D° - f\ ^5D$ (1055)											
		5815.16	33507	50699	7	5	0.0011	4.0(−4)	0.054	−2.55	C	5n
541.	$y\ ^5D° - e\ ^7G$ (1058)											
		5481.25	33096	51335	9	9	0.012	0.0052	0.84	−1.33	C	5n
542.	$y\ ^5D° - e\ ^3D$ (1061)											
		5493.51	33096	51294	9	7	0.0054	0.0019	0.31	−1.77	C	5n
		5483.11	33507	51740	7	5	0.014	0.0044	0.56	−1.51	C	5n
		5381.45	33802	52040	5	3	0.031	0.0083	0.75	−1.38	C	5n
		5620.53	33507	51294	7	7	0.0057	0.0027	0.35	−1.72	C	5n
		5547.00	34017	52040	3	3	0.010	0.0048	0.26	−1.84	C	5n
543.	$y\ ^5D° - g\ ^5D$ (1062)											
		5473.90	33507	51771	7	7	0.057	0.025	3.2	−0.75	C+	4n
		5478.48	33802	52050	5	5	0.0074	0.0033	0.30	−1.78	C	5n
		5353.39	33096	51771	9	7	0.051	0.017	2.7	−0.81	D−	14n
		5480.87	34017	52257	3	1	0.14	0.022	1.2	−1.19	C	5n
		5563.60	33802	51771	5	7	0.037	0.024	2.2	−0.92	C	5n
		5543.94	34017	52050	3	5	0.037	0.028	1.6	−1.07	C	5n
		5525.55	34122	52214	1	3	0.040	0.055	1.0	−1.26	C	5n
544.	$y\ ^5D° - e\ ^5P$ (1064)											
		5386.34	33507	52067	7	5	0.0092	0.0029	0.35	−1.70	C	5n
		5473.18	33802	52067	5	5	0.0038	0.0017	0.15	−2.07	C	5n
545.	$y\ ^5D° - g\ ^5F$ (1065)											
		4991.27	33802	53831	5	7	0.088	0.046	3.8	−0.64	D−	14n
546.	$y\ ^5D° - h\ ^5D$ (1066)											
		4988.95	33507	53546	7	7	0.058	0.022	2.5	−0.82	C+	4n
		4969.92	34017	54133	3	3	0.16	0.061	3.0	−0.74	D+	10n
		4917.23	33802	54133	5	3	0.071	0.016	1.3	−1.11	C	5n
		5088.16	33507	53155	7	9	0.0056	0.0028	0.33	−1.71	C	5n

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
547.	$y\ ^5D^o - f\ ^5G$ (1068)											
		4835.87	33096	53769	9	9	0.012	0.0041	0.59	−1.43	C	5n
		4840.32	33507	54161	7	7	0.019	0.0068	0.76	−1.32	C	5n
		4859.13	33802	54376	5	5	0.012	0.0044	0.35	−1.66	C	5n
		4790.56	33507	54376	7	5	0.0016	3.8(−4)	0.042	−2.57	C	5n
548.	$y\ ^5D^o - e\ ^3G$ (1069)											
		4842.79	33096	53739	9	11	0.0084	0.0036	0.52	−1.49	C	5n
549.	$y\ ^5D^o - f\ ^3D$ (1070)											
		4841.78	33802	54449	5	3	0.015	0.0031	0.25	−1.81	C	5n
		4892.87	34017	54449	3	3	0.057	0.021	0.99	−1.21	D	15n
		4986.22	34017	54067	3	5	0.026	0.016	0.79	−1.32	C	5n
		4918.01	34122	54449	1	3	0.047	0.051	0.83	−1.29	C	5n
550.	$y\ ^5D^o - i\ ^5D$ (1073)											
		4085.98	33507	57974	7	5	0.059	0.011	1.0	−1.13	C	5n
551.	$y\ ^5D^o - 4$ (1075)											
		4095.27	33802	58213	5	5	0.037	0.0094	0.63	−1.33	C	5n
552.	$y\ ^5F^o - e\ ^3F$ (1078)											
		7008.01	33695	47961	11	9	0.0015	9.3(−4)	0.24	−1.99	C	5n
		7038.82	34329	48532	7	7	0.0023	0.0017	0.28	−1.92	C	5n
553.	$y\ ^5F^o - e\ ^5G$ (1083)											
		5940.97	33695	50523	11	13	0.0012	7.6(−4)	0.16	−2.08	C	5n
		5877.77	33695	50704	11	11	0.0012	6.3(−4)	0.13	−2.16	C	5n
554.	$y\ ^5F^o - f\ ^5F$ (1084)											
		5742.95	33695	51103	11	11	6.7(−4)	3.3(−4)	0.069	−2.44	C	5n
		5858.77	34040	51103	9	11	0.0011	7.2(−4)	0.12	−2.19	C	5n
		5835.10	34329	51462	7	9	0.0011	7.2(−4)	0.096	−2.30	C	5n
555.	$y\ ^5F^o - e\ ^3D$ (1086)											
		5793.93	34040	51294	9	7	0.0067	0.0026	0.45	−1.63	C	5n
		5741.86	34329	51740	7	5	0.0089	0.0031	0.41	−1.66	C	5n
		5814.80	34547	51740	5	5	0.0050	0.0025	0.24	−1.90	C	5n
556.	$y\ ^5F^o - g\ ^5D$ (1087)											
		5638.27	34040	51771	9	7	0.048	0.018	2.9	−0.80	C	5n
		5641.46	34329	52050	7	5	0.033	0.011	1.4	−1.11	C	5n
		5691.51	34692	52257	3	1	0.073	0.012	0.66	−1.45	C	5n
		5731.77	34329	51771	7	7	0.017	0.0084	1.1	−1.23	C	5n
		5711.87	34547	52050	5	5	0.017	0.0081	0.77	−1.39	C	5n
		5705.48	34692	52214	3	3	0.020	0.0098	0.55	−1.53	C	5n
		5873.21	34329	51350	7	9	0.0018	0.0012	0.16	−2.07	C	5n
		5804.48	34547	51771	5	7	0.0030	0.0021	0.20	−1.97	C	5n

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i(cm^{-1})	E_k(cm^{-1})	g_i	g_k	A_{ki}(10^8 s^{-1})	f_{ik}	S(at. u.)	log gf	Accuracy	Source
557.	$y\,^5F^\circ - e\,^5P$ (1088)											
		5635.85	34329	52067	7	5	0.0064	0.0022	0.28	−1.82	C	5*n*
558.	$y\,^5F^\circ - g\,^5F$ (1089)											
		5162.27	33695	53061	11	11	0.27	0.11	20	0.08	D	9
		5126.19	34329	53831	7	7	0.035	0.014	1.6	−1.01	C	5*n*
		5243.78	34329	53394	7	9	0.022	0.012	1.4	−1.08	C	5*n*
		5184.26	34547	53831	5	7	0.042	0.023	2.0	−0.93	C	5*n*
		5109.65	34692	54258	3	5	0.063	0.041	2.1	−0.91	C−	15*n*
559.	$y\,^5F^\circ - h\,^5D$ (1090)											
		5137.38	33695	53155	11	9	0.11	0.037	6.9	−0.39	C+	4*n*
		5125.11	34040	53546	9	7	0.30	0.092	14	−0.08	D	9
		5090.78	34329	53967	7	5	0.21	0.058	6.8	−0.39	C+	4*n*
		5104.44	34547	54133	5	3	0.020	0.0048	0.40	−1.62	C	5*n*
560.	$y\,^5F^\circ - f\,^5P$ (1091)											
		5228.41	34040	53160	9	7	0.021	0.0067	1.0	−1.22	C	5*n*
		5159.06	34547	53925	5	3	0.14	0.034	2.9	−0.77	D−	14*n*,15*n*
		5197.93	34692	53925	3	3	0.022	0.0090	0.46	−1.57	C	5*n*
561.	$y\,^5F^\circ - f\,^5G$ (1092)											
		5133.69	33695	53169	11	13	0.31	0.14	27	0.20	D	9
		5104.21	33695	53282	11	11	0.0029	0.0011	0.21	−1.90	C	5*n*
		5067.15	34040	53769	9	9	0.037	0.014	2.1	−0.89	C−	15*n*
562.	$y\,^5F^\circ - e\,^5H$ (1093)											
		5012.68	34547	54491	5	7	0.0072	0.0038	0.31	−1.72	C	5*n*
563.	$y\,^5F^\circ - e\,^3G$ (1094)											
		4991.86	34040	54067	9	9	0.0043	0.0016	0.24	−1.84	C	5*n*
		5074.75	34040	53739	9	11	0.15	0.072	11	−0.19	C+	4*n*
564.	$y\,^5F^\circ - f\,^3D$ (1095)											
		5023.23	34547	54449	5	3	0.026	0.0059	0.49	−1.53	C	5*n*
		5121.64	34547	54067	5	5	0.086	0.034	2.9	−0.77	C+	4*n*,5*n*
565.	$y\,^5F^\circ - e\,^3H$ (1097)											
		4962.56	33695	53841?	11	13	0.013	0.0055	0.98	−1.22	C	5*n*
566.	$y\,^5F^\circ - f\,^3F$ (1098)											
		4911.52	34329	54683	7	9	0.0021	9.7(−4)	0.11	−2.17	C	5*n*
567.	$y\,^5F^\circ - g\,^5G$ (1103)											
		4112.96	33695	58002	11	13	0.15	0.044	6.5	−0.32	C	4*n*,5*n*
		4137.42	34547	58710?	5	7	0.072	0.026	1.8	−0.89	C	5*n*
		4142.63	34692	58825	3	5	0.087	0.037	1.5	−0.95	C	5*n*

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
568.	$z\ ^3P^o - e\ ^5F$ (1105)											
		7095.43	33947	48037	5	5	0.0030	0.0022	0.26	−1.95	C	5n
569.	$z\ ^3P^o - e\ ^3D$ (1107)											
		5762.99	33947	51294	5	7	0.10	0.073	6.9	−0.44	C+	4n
		5753.12	34363	51740	3	5	0.072	0.059	3.4	−0.75	C+	4n
		5717.85	34556	52040	1	3	0.059	0.087	1.6	−1.06	C	5n
		5618.65	33947	51740	5	5	0.021	0.0098	0.91	−1.31	C	5n
570.	$z\ ^3P^o - g\ ^5D$ (1108)											
		5652.32	34363	52050	3	5	0.0055	0.0044	0.25	−1.88	C	5n
		5661.36	34556	52214	1	3	0.0078	0.011	0.21	−1.95	C	5n
		5522.46	33947	52050	5	5	0.014	0.0066	0.60	−1.48	C	5n
		5472.72	33947	52214	5	3	0.017	0.0045	0.40	−1.65	C	5n
571.	$z\ ^3P^o - e\ ^5P$ (1109)											
		5517.08	33947	52067	5	5	0.0022	0.0010	0.091	−2.30	C	5n
572.	$z\ ^3P^o - g\ ^5F$ (1110)											
		5027.76	33947	53831	5	7	0.025	0.013	1.1	−1.18	C	5n
		4992.80	34363	54386	3	3	0.0048	0.0018	0.088	−2.27	D	15n
573.	$z\ ^3P^o - h\ ^5D$ (1111)											
		4993.68	33947	53967	5	5	0.021	0.0080	0.65	−1.40	C	5n
		5056.86	34363	54133	3	3	0.011	0.0043	0.21	−1.89	C	5n
574.	$z\ ^3P^o - f\ ^5P$ (1112)											
		5004.04	33947	53925	5	3	0.042	0.0094	0.77	−1.33	C	5n
575.	$z\ ^3P^o - f\ ^5G$ (1113)											
		4945.64	33947	54161	5	7	0.014	0.0073	0.59	−1.44	C	5n
		4995.41	34363	54376	3	5	0.0081	0.0050	0.25	−1.82	C	5n
576.	$b\ ^1D - y\ ^1D^o$ (1128)	5856.08	34637	51708	5	5	0.010	0.0054	0.52	−1.57	C	5n
577.	$b\ ^1D - x\ ^1D^o$ (1129)	5837.71	34637	51762	5	5	0.0021	0.0011	0.10	−2.27	C	5n
578.	$b\ ^1D - ^1P^o$	5698.37	34637	52181	5	3?	0.0057	0.0017	0.16	−2.08	C	5n
579.	$b\ ^1D - ^3D^o$											
		5539.83	34637	52683	5	5	0.0015	6.9(−4)	0.063	−2.46	C	5n
		5376.85	34637	53230	5	3	0.0044	0.0012	0.10	−2.24	C	5n
580.	$b\ ^1D - w\ ^1D^o$ (1133)	4734.10	34637	55754	5	5	0.018	0.0062	0.48	−1.51	C	5n

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
581.	$z\,^5G^\circ - g\,^5F$ (1143)											
		5361.64	35612	54258	7	5	0.020	0.0062	0.77	−1.36	C	5n
		5395.25	35856	54386	5	3	0.0061	0.0016	0.14	−2.10	C	5n
		5512.28	35257	53394	9	9	0.011	0.0050	0.81	−1.35	C	5n
		5487.16	35612	53831	7	7	0.011	0.0050	0.63	−1.46	C	5n
		5432.95	35856	54258	5	5	0.048	0.021	1.9	−0.97	C	5n
582.	$z\,^5G^\circ - h\,^5D$ (1144)											
		5441.32	34782	53155	11	9	0.0055	0.0020	0.39	−1.66	C	5n
		5466.39	35257	53546	9	7	0.080	0.028	4.5	−0.60	D−	14n
		5470.17	35856	54133	5	3	0.014	0.0036	0.33	−1.74	C	5n
583.	$z\,^5G^\circ - f\,^5G$ (1145)											
		5400.50	35257	53769	9	9	0.20	0.088	14	−0.10	D	9
		5389.48	35612	54161	7	7	0.14	0.060	7.4	−0.38	D−	14n
		5398.29	35856	54376	5	5	0.10	0.044	3.9	−0.66	C	5n
		5546.51	35257	53282	9	11	0.011	0.0064	1.1	−1.24	C	5n
		5461.54	35856	54161	5	7	0.0047	0.0030	0.27	−1.83	C	5n
584.	$z\,^5G^\circ - e\,^5H$ (1146)											
		5424.07	34844	53275?	13	15	0.57	0.29	68	0.58	D	9
		5383.37	34782	53353?	11	13	0.59	0.30	59	0.52	C+	4n,5n
		5369.96	35257	53874?	9	11	0.48	0.25	40	0.36	C+	4n
		5367.47	35612	54237	7	9	0.59	0.33	40	0.36	C+	4n
		5364.87	35856	54491	5	7	0.63	0.38	34	0.28	D	9
		5401.27	34844	53353?	13	13	0.0025	0.0011	0.25	−1.85	C	5n
		5295.32	35612	54491	7	7	0.0082	0.0034	0.42	−1.62	C	5n
585.	$z\,^5G^\circ - e\,^3G$ (1147)											
		5315.07	35257	54067	9	9	0.0087	0.0037	0.58	−1.48	C	5n
		5409.13	35257	53739	9	11	0.012	0.0065	1.0	−1.23	C	5n
586.	$z\,^5G^\circ - f\,^3D$ (1148)											
		5406.77	35257	53748	9	7	0.0073	0.0025	0.40	−1.65	C	5n
		5417.03	35612	54067	7	5	0.011	0.0035	0.44	−1.61	C	5n
		5489.85	35856	54067	5	5	0.0030	0.0014	0.12	−2.17	C	5n
587.	$z\,^5G^\circ - e\,^3H$ (1149)											
		5056.00	34782	54555?	11	9	0.0033	0.0010	0.19	−1.94	C	5n
588.	$z\,^5G^\circ - f\,^3F$ (1150)											
		5023.50	34782	54683	11	9	0.0067	0.0021	0.38	−1.64	C	5n
		5031.90	35257	55125	9	7	0.0095	0.0028	0.42	−1.60	C	5n
		5146.30	35257	54683	9	9	0.0031	0.0012	0.19	−1.96	C	5n
		5241.90	35612	54683	7	9	0.0068	0.0036	0.43	−1.60	C	5n
589.	$z\,^5G^\circ - 3$ (1152)											
		4631.48	35257	56843	9	9	0.0040	0.0013	0.18	−1.94	C	5n

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Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
590.	$z\ ^3G^\circ - g\ ^5F$ (1159)											
		5653.89	35379	53061	11	11	0.0051	0.0024	0.50	−1.57	C	5*n*
591.	$z\ ^3G^\circ - h\ ^5D$ (1160)											
		5624.06	35379	53155	11	9	0.0091	0.0035	0.72	−1.41	C	5*n*
592.	$z\ ^3G^\circ - f\ ^5G$ (1161)											
		5619.60	35379	53169	11	13	0.0038	0.0021	0.43	−1.63	C	5*n*
		5708.11	35768	53282	9	11	0.0059	0.0035	0.59	−1.50	C	5*n*
		5651.47	36079	53769	7	9	0.0027	0.0017	0.22	−1.93	C	5*n*
		5553.59	35768	53769	9	9	0.011	0.0051	0.84	−1.34	C	5*n*
		5528.89	36079	54161	7	7	0.0035	0.0016	0.20	−1.95	C	5*n*
		5436.30	35379	53769	11	9	0.0085	0.0031	0.61	−1.47	C	5*n*
593.	$z\ ^3G^\circ - e\ ^3G$ (1163)											
		5445.04	35379	53739	11	11	0.22	0.10	20	0.04	D	9
		5463.27	35768	54067	9	9	0.33	0.15	24	0.12	C+	4*n*
		5349.74	35379	54067	11	9	0.015	0.0054	1.0	−1.23	C	5*n*
		5557.95	36079	54067	7	9	0.015	0.0088	1.1	−1.21	C	5*n*
594.	$z\ ^3G^\circ - f\ ^3D$ (1164)											
		5560.23	35768	53748	9	7	0.023	0.0084	1.4	−1.12	C	5*n*
595.	$z\ ^3G^\circ - e\ ^3H$ (1165)											
		5415.20	35379	53841?	11	13	0.68	0.35	69	0.59	C+	4*n*,5*n*
		5410.91	36079	54555?	7	9	0.49	0.28	35	0.29	C+	4*n*,5*n*
		5293.03	35379	54267?	11	11	0.0011	4.8(−4)	0.091	−2.28	C	5*n*
		5321.11	35768	54555?	9	9	0.011	0.0047	0.75	−1.37	C	5*n*
596.	$z\ ^3G^\circ - f\ ^3F$ (1166)	*5178.3*	*35690*	*54996*	27	21	0.044	0.014	6.3	−0.43	C	5*n*
		5178.80	35379	54683	11	9	0.0047	0.0015	0.29	−1.77	C	5*n*
		5164.55	35768	55125	9	7	0.018	0.0057	0.87	−1.29	C	5*n*
		5180.07	36079	55379	7	5	0.032	0.0092	1.1	−1.19	C	5*n*
		5285.12	35768	54683	9	9	0.0071	0.0030	0.47	−1.57	C	5*n*
		5249.10	36079	55125	7	7	0.013	0.0056	0.67	−1.41	C	5*n*
		5373.71	36079	54683	7	9	0.042	0.023	2.9	−0.79	C	5*n*
597.	$y\ ^3F^\circ - e\ ^3D$ (1173)											
		6843.67	36686	51294	9	7	0.028	0.015	3.1	−0.86	C	5*n*
		6858.16	37163	51740	7	5	0.029	0.015	2.3	−0.99	C	5*n*
		6885.77	37521	52040	5	3	0.023	0.0098	1.1	−1.31	C	5*n*
598.	$y\ ^3F^\circ - g\ ^5D$ (1174)											
		6627.56	36686	51771	9	7	0.0053	0.0027	0.54	−1.61	C	5*n*
		6715.41	37163	52050	7	5	0.0080	0.0038	0.60	−1.57	C	5*n*
599.	$y\ ^3F^\circ - g\ ^5F$ (1175)											
		5927.80	37521	54386	5	3	0.060	0.019	1.9	−1.02	C	5*n*

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
600.	$y\ ^3F^\circ - h\ ^5D$ (1176)											
		6079.02	37521	53967	5	5	0.032	0.018	1.8	−1.05	C	5*n*
		5929.70	36686	53546	9	7	0.012	0.0051	0.89	−1.34	C	5*n*
601.	$y\ ^3F^\circ - f\ ^5P$ (1177)											
		6093.66	37163	53569	7	5	0.013	0.0053	0.75	−1.43	C	5*n*
		6094.42	37521	53925	5	3	0.0081	0.0027	0.27	−1.87	C	5*n*
602.	$y\ ^3F^\circ - f\ ^5G$ (1178)											
		6024.07	36686	53282	9	11	0.14	0.090	16	−0.09	D−	14*n*
		6020.17	37163	53769	7	9	0.12	0.082	11	−0.24	D−	14*n*
		5852.19	36686	53769	9	9	0.012	0.0061	1.1	−1.26	C	5*n*
		5881.28	37163	54161	7	7	0.0047	0.0024	0.33	−1.77	C	5*n*
603.	$y\ ^3F^\circ - e\ ^5H$ (1179)											
		5816.36	36686	53874?	9	11	0.040	0.025	4.3	−0.65	D−	14*n*
		5855.13	37163	54237	7	9	0.0044	0.0029	0.39	−1.69	C	5*n*
		5696.10	36686	54237	9	9	0.0027	0.0013	0.23	−1.92	C	5*n*
604.	$y\ ^3F^\circ - e\ ^3G$ (1180)											
		5930.17	37521	54379	5	7	0.17	0.13	12	−0.20	D−	14*n*
		5806.73	37163	54379	7	7	0.030	0.015	2.0	−0.98	C	5*n*
605.	$y\ ^3F^\circ - f\ ^3D$ (1181)											
		5905.67	37521	54449	5	3	0.12	0.038	3.7	−0.72	C	5*n*
606.	$y\ ^3F^\circ - e\ ^3H$ (1182)											
		5686.53	36686	54267?	9	11	0.045	0.027	4.5	−0.62	C	5*n*
		5747.95	37163	54555?	7	9	0.0098	0.0062	0.83	−1.36	C	5*n*
		5594.66	36686	54555?	9	9	0.035	0.016	2.7	−0.83	C	5*n*
607.	$y\ ^3F^\circ - f\ ^3F$ (1183)											
		5554.89	36686	54683	9	9	0.093	0.043	7.1	−0.41	D−	14*n*
		5598.30	37521	55379	5	5	0.19	0.091	8.4	−0.34	D−	14*n*
		5421.85	36686	55125	9	7	0.0063	0.0022	0.35	−1.71	C	5*n*
		5705.99	37163	54683	7	9	0.069	0.043	5.7	−0.52	C	5*n*
		5679.02	37521	55125	5	7	0.042	0.028	2.6	−0.85	C	5*n*
608.	$y\ ^3F^\circ - e\ ^3P$ (1184)											
		5642.75	37163	54880	7	5	0.0037	0.0013	0.17	−2.05	C	5*n*
609.	$y\ ^5P^\circ - f\ ^7D$ (1187)											
		7024.65	36767	50999	7	5	0.014	0.0072	1.2	−1.30	C	5*n*
610.	$y\ ^5P^\circ - e\ ^7G$ (1191)											
		6862.48	36767	51335	7	9	0.0050	0.0045	0.71	−1.50	C	5*n*

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
611.	$y\ ^5P^o - g\ ^5D$ (1195)											
		6841.35	37158	51771	5	7	0.037	0.036	4.1	−0.74	C	5n
		6828.61	37410	52050	3	5	0.040	0.047	3.2	−0.85	C	5n
		6752.72	37410	52214	3	3	0.025	0.017	1.1	−1.29	C	5n
		6733.16	37410	52257	3	1	0.045	0.010	0.69	−1.51	C	5n
612.	$y\ ^5P^o - e\ ^5P$ (1197)											
		6633.76	36767	51837	7	7	0.037	0.024	3.7	−0.77	C	5n
		6842.67	37410	52020	3	3	0.027	0.019	1.3	−1.25	C	5n
		6533.97	36767	52067	7	5	0.013	0.0058	0.88	−1.39	C	5n
		6810.28	37158	51837	5	7	0.018	0.018	2.0	−1.05	C	5n
		6820.43	37410	52067	3	5	0.016	0.019	1.3	−1.25	C	5n
613.	$y\ ^5P^o - f\ ^5G$ (1201)											
		5880.00	36767	53769	7	9	0.0029	0.0019	0.26	−1.87	C	5n
		5879.49	37158	54161	5	7	0.0023	0.0017	0.16	−2.07	C	5n
614.	$y\ ^5P^o - e\ ^5H$ (1202)											
		5640.46	36767	54491	7	7	0.0066	0.0031	0.41	−1.66	C	5n
615.	$y\ ^5P^o - i\ ^5D$ (1206)											
		4749.95	36767	57814	7	7	0.023	0.0077	0.84	−1.27	C	5n
		4714.07	36767	57974	7	5	0.020	0.0048	0.53	−1.47	C	5n
616.	$y\ ^5P^o - 4$ (1207)											
		4661.53	36767	58213	7	5	0.039	0.0090	0.97	−1.20	C	5n
617.	$d\ ^3F - u\ ^3G^o$ (1225)											
		6837.00	37046	51668	9	9	0.0029	0.0020	0.41	−1.74	C	5n
618.	$d\ ^3F - t\ ^3G^o$ (1234)											
		5902.52	37046	53983	9	11	0.0032	0.0020	0.35	−1.74	C	5n
619.	$d\ ^3F - s\ ^3G^o$ (1240)											
		5300.41	37046	55907	9	11	0.0045	0.0023	0.36	−1.68	C	5n
620.	$d\ ^3F - t\ ^3H^o$ (1245)											
		4253.55	37046	60549	9	11	0.025	0.0084	1.1	−1.12	C	5n
		4203.67	36976	60758	7	9	0.088	0.030	2.9	−0.68	C	5n
621.	$y\ ^3D^o - g\ ^5F$ (1253)											
		6569.23	38175	53394	7	9	0.067	0.056	8.4	−0.41	C	5n
		6597.61	38678	53831	5	7	0.022	0.020	2.2	−1.00	C	5n
		6495.78	38996	54386	3	3	0.071	0.045	2.9	−0.87	C	5n
		6364.38	38678	54386	5	3	0.024	0.0087	0.91	−1.36	C	5n

TRANSITION PROBABILITIES FOR IRON

Fe I: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
622.	$y\ ^3D^o - h\ ^5D$ (1254)											
		6330.86	38175	53967	7	5	0.0071	0.0031	0.45	−1.67	C	5*n*
623.	$y\ ^3D^o - f\ ^5P$ (1255)											
		6713.76	38678	53569	5	5	0.0087	0.0059	0.65	−1.53	C	5*n*
624.	$y\ ^3D^o - f\ ^3D$ (1258)											
		6419.98	38175	53748	7	7	0.14	0.084	12	−0.23	C	5*n*
		6496.46	38678	54067	5	5	0.087	0.055	5.9	−0.56	C	5*n*
		6469.21	38996	54449	3	3	0.092	0.058	3.7	−0.76	C	5*n*
		6338.90	38678	54449	5	3	0.057	0.020	2.1	−0.99	C	5*n*
		6634.10	38678	53748	5	7	0.0095	0.0087	0.95	−1.36	C	5*n*
		6633.44	38996	54067	3	5	0.012	0.013	0.83	−1.42	C	5*n*
625.	$y\ ^3D^o - f\ ^3F$ (1259)											
		6055.99	38175	54683	7	9	0.075	0.053	7.4	−0.43	D−	14*n*
		5898.21	38175	55125	7	7	0.0048	0.0025	0.34	−1.76	C	5*n*
626.	$y\ ^3D^o - e\ ^3P$ (1260)											
		6170.49	38678	54880	5	5	0.14	0.078	7.9	−0.41	D−	14*n*
627.	$x\ ^5D^o - i\ ^5D$ (1281)											
		5531.95	39626	57698	9	9	0.0070	0.0032	0.53	−1.54	C	5*n*
		5552.70	39970	57974	7	5	0.0052	0.0017	0.22	−1.92	C	5*n*
628.	$x\ ^5D^o - 4$ (1282)											
		5559.64	40231	58213	5	5	0.0075	0.0035	0.32	−1.76	C	5*n*
629.	$x\ ^5F^o - i\ ^5D$ (1313)											
		5732.29	40257	57698	11	9	0.0073	0.0029	0.61	−1.49	C	5*n*
		5805.76	40594	57814	9	7	0.0085	0.0034	0.58	−1.52	C	5*n*
630.	$x\ ^5F^o - g\ ^5G$ (1314)											
		5633.97	40257	58002	11	13	0.089	0.050	10	−0.26	C	5*n*
		5655.18	40842	58520?	7	9	0.054	0.033	4.4	−0.63	C	5*n*
		5650.71	41018	58710?	5	7	0.038	0.026	2.4	−0.89	C	5*n*
		5650.01	41131	58825	3	5	0.059	0.047	2.6	−0.85	C	5*n*
		5549.66	40257	58271?	11	11	0.0047	0.0022	0.44	−1.62	C	5*n*
631.	$a\ ^1F - v\ ^1G^o$ (1327)	6089.57	40534?	56951	7	9	0.023	0.017	2.4	−0.93	C	5*n*

* The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

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Fe II

Ground State $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6 4s\ ^6D_{9/2}$

Ionization Potential 16.183 eV = $130524\ cm^{-1}$

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
2029.84	6	2666.63	35	4416.82	10	5234.62	28
2041.35	6	2684.94	29	4472.92	17	5264.81	27
2051.69	6	2712.39	29	4489.19	17	5276.00	28
2296.66	14	2753.29	32	4491.40	17	5284.10	21
2303.35	14	2879.24	36	4515.34	17	5316.62	28
2369.23	19	2902.46	36	4520.23	17	5325.56	28
2379.00	19	2910.76	36	4522.63	18	5337.73	27
2388.39	7	2934.49	36	4534.17	17	5362.87	27
2414.08	13	2997.75	40	4541.52	18	5414.05	27
2433.50	13	3002.33	41	4549.47	18	5425.25	28
2554.95	30	3044.84	41	4555.89	17	5534.83	31
2559.77	30	3131.72	43	4576.33	18	5627.49	34
2561.58	30	3162.80	45	4582.84	17	5991.37	26
2562.54	3	3186.74	5	4583.83	18	6084.10	26
2573.21	30	3187.29	45	4595.68	18	6113.33	26
2585.88	1	3213.31	5	4601.34	23	6147.77	39
2591.54	3	3277.35	2	4620.51	18	6149.25	39
2592.78	44	3360.10	42	4629.34	17	6239.91	39
2598.03	33	3938.29	4	4656.97	23	6247.55	39
2598.37	1	4087.27	11	4663.70	24	6369.46	20
2599.40	1	4122.64	11	4666.75	17	6383.72	46
2607.09	1	4124.79	8	4670.17	9	6416.92	39
2611.87	1	4128.74	10	4923.93	22	6432.68	20
2613.82	1	4173.45	10	4953.98	47	6446.40	48
2617.62	1	4178.86	11	4993.35	16	6456.39	39
2621.67	1	4227.14	25	5000.74	9	6516.08	20
2623.13	44	4233.17	10	5018.45	22	7224.47	38
2625.49	44	4258.16	11	5019.45	47	7301.56	37
2625.66	1	4303.17	10	5132.66	15	7479.69	37
2628.29	1	4369.40	11	5136.80	15	7515.79	38
2631.32	1	4385.38	10	5169.00	22	7711.71	38
2664.67	35	4413.60	12	5197.56	28		

For this spectrum, unlike that of Fe I, there is an extreme dearth of reliable f-value data. Recent advanced techniques have provided data for relatively few lines. Furthermore, due to the lack of appropriate comparison data, the absolute scale of Fe II is not nearly as well established as that of Fe I.

We chose the following experimental data sources for this compilation: work by Bridges [1] and Baschek et al. [3], who measured relative oscillator strengths in emission with wall-stabilized arc sources; Huber [2], who employed the anomalous dispersion (hook) method; Wolnik et al. [4], who used the shock tube-emission technique; Smith and Whaling [5], who determined absolute f-values by combining beam-foil lifetimes with branching ratios, obtained from a hollow cathode discharge; and f-value data derived from solar spectra, compiled by Blackwell et al. [6] and Phillips [7].

The most accurate set of relative oscillator strengths is probably that of Bridges. In his experiment, he measured all lines photoelectrically and accounted for effects of self-absorption. A calibrated tungsten strip lamp was used as a radiometric standard, and a predisperser served to reduce scattered light. He normalized his relative data to an absolute scale by using the phase-shift lifetime of the $z\ ^6D^o_{9/2}$ level, as measured by Assousa and Smith [8]. As part of this normalization, Bridges measured all of the principal downward decays from this level. The absolute data of ref. [1] should generally be accurate to $\pm$ 25 percent except for the weakest lines.

The lifetime data of Assousa and Smith appear to be quite reliable, and agree within $\pm$ 10 percent with the data of Brzozowski et al. [9], who used the high frequency deflection technique. A further indication of the reliability of the Assousa and Smith data is obtained from the case of Fe I, where these lifetimes agree—within $\pm$ 6.1 percent—with the precise laser-excitation lifetime measurements of Figger et al. [10,11].

The data of refs. [2], [3], [4], and [7] overlap with those of Bridges [1]. We have compared these four sources directly to ref. [1] for subsequent normalization. A consistent absolute scale is

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obtained by multiplying the oscillator strengths of Baschek et al. by a factor of 1.41, those of Huber by 0.52, those of Phillips by 1.56, and those of Blackwell et al. by 1.60. Ref. [6] did not share lines in common with ref. [1]. In this case, we adjusted the log gf-values of Blackwell et al. to agree with the renormalized data of Baschek et al. and Wolnik et al. (The data of Wolnik et al. required no renormalization.) As a consistency check, we have compared the (incomplete) inverse sums of our tabulated transition probabilities, for the downward transitions to the experimental lifetime of refs. [8] and [9]. As the following table shows, the agreement is satisfactory.

Lifetimes (in ns) of excited levels of Fe II

Upper atomic level	τ_k (experiment)	$(\Sigma_i A_{ki})^{-1}$ (this compilation)
$z\ ^6D^o_{5/2}$	3.9[a]	< 5.8[c]
$z\ ^6D^o_{7/2}$	4.0[b]	< 4.9[c]

[a] Ref. [8].

[b] Ref. [9].

[c] All measured downward transitions have been included. The indicated sums may be quite incomplete, since for several of the significant transitions, no reliable data exist. This is especially true for the $z\ ^6D^o_{5/2}$ upper level, where we have omitted the contribution of a blended resonance line.

The data of Smith and Whaling contain no lines in common with Bridges, as they all originate from high-lying levels. Nevertheless, we have included this reference because the beam-foil lifetime-branching ratio technique has been shown to be quite accurate for other members of the iron group, i.e., Ti I, Fe I, and Ni I.

References

[1] Bridges, J. M., Contributed Papers—International Conference on Phenomena in Ionized Gases, 11th, 418, Ed. Stoll, I., Czech. Acad. Sci., Inst. Phys., Prague, Czech. (1973).

[2] Huber, M. C. E., Astrophys. J. **190**, 237 (1974).

[3] Baschek, B., Garz, T., Holweger, H., and Richter, J., Astron. Astrophys. **4**, 229 (1970).

[4] Wolnik, S. J., Berthel, R. O., and Wares, G. W., Astrophys. J. **166**, L31 (1971).

[5] Smith, P. L., and Whaling, W., Astrophys. J. **183**, 313 (1973).

[6] Blackwell, D. E., Shallis, M. J., and Simmons, G. J., Astron. Astrophys. **81**, 340 (1980).

[7] Phillips, M. M., Astrophys. J., Suppl. Ser. **39**, 377 (1979).

[8] Assousa, G. E., and Smith, W. H., Astrophys. J. **176**, 259 (1972).

[9] Brzozowski, J., Erman, P., Lyyra, M., and Smith, W. H., Phys. Scr. **14**, 48 (1976).

[10] Figger, H., Siomos, K., and Walther, H., Z. Phys. **270**, 371 (1974).

[11] Figger, H., Heldt, J., Siomos, K., and Walther, H., Astron. Astrophys. **43**, 389 (1975).

Fe II: Allowed transitions

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
1.	$a\ ^6D - z\ ^6D^o$ (uv 1)											
		2599.40	0.0	38459	10	10	2.22	0.225	19.3	0.352	C	1
		2611.87	384.8	38660	8	8	0.98	0.10	6.9	−0.10	D	2n
		2617.62	667.7	38859	6	6	0.43	0.044	2.3	−0.58	D	2n
		2621.67	977.1	39109	2	2	0.66	0.068	1.2	−0.87	D	2n
		2585.88	0.0	38660	10	8	0.71	0.057	4.9	−0.24	D	2n
		2598.37	384.8	38859	8	6	1.3	0.10	6.8	−0.10	C	1
		2607.09	667.7	39013	6	4	1.5	0.10	5.1	−0.22	D	2n
		2613.82	862.6	39109	4	2	1.9	0.099	3.4	−0.40	D	2n
		2625.66	384.8	38459	8	10	0.34	0.044	3.0	−0.45	C	1
		2631.32	667.7	38660	6	8	0.38	0.052	2.7	−0.51	D	2n
		2628.29	977.1	39013	2	4	0.77	0.16	2.8	−0.49	D	2n
2.	$a\ ^4D - z\ ^6D^o$ (1)											
		3277.35	7955	38459	8	10	0.0023	4.6(−4)[a]	0.040	−2.43	D	1
3.	$a\ ^4D - z\ ^4P^o$ (uv 64)											
		2562.54	7955	46967	8	6	1.5	0.11	7.4	−0.06	D	2n
		2591.54	8392	46967	6	6	0.52	0.052	2.7	−0.51	C	1
4.	$a\ ^4P - z\ ^6D^o$ (3)											
		3938.29	13474	38859	6	6	0.0028	6.5(−4)	0.051	−2.41	D	7n
5.	$a\ ^4P - z\ ^4D^o$ (6)											
		3213.31	13673	44785	4	6	0.065	0.015	0.63	−1.22	C	1
		3186.74	13673	45044	4	4	0.039	0.0060	0.25	−1.62	C	1

Fe II: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
6.	$a\ ^2G - y\ ^2G^\circ$ (uv 93)											
		2041.35	15845	64832	10	10	0.46	0.029	1.9	−0.54	D	5
		2051.69	16369	65110	8	8	0.42	0.026	1.4	−0.67	D	5
		2029.84	15845	65110	10	8	0.076	0.0038	0.25	−1.43	D−	5
7.	$a\ ^2H - z\ ^2I^\circ$ (uv 117)											
		2388.39	20806	62662	10	12	0.14	0.014	1.1	−0.84	D	5
8.	$a\ ^2D - z\ ^4F^\circ$ (22)											
		4124.79	20517	44754	6	8	5.0(−5)	1.7(−5)	0.0014	−3.99	D−	6n
9.	$b\ ^4P - z\ ^6F^\circ$ (25)											
		4670.17	20831	42237	6	8	3.0(−5)	1.3(−5)	0.0012	−4.11	E	3n
		5000.74	22410	42401	2	4	2.0(−5)	1.5(−5)	4.9(−4)	−4.52	E	6n
10.	$b\ ^4P - z\ ^4D^\circ$ (27)											
		4233.17	20831	44447	6	8	0.0064	0.0023	0.19	−1.86	D	7n
		4416.82	22410	45044	2	4	0.0039	0.0023	0.067	−2.34	D	4
		4173.45	20831	44785	6	6	0.0022	5.7(−4)	0.047	−2.47	D	7n
		4303.17	21812	45044	4	4	0.0061	0.0017	0.096	−2.17	D	7n
		4385.38	22410	45206	2	2	0.0059	0.0017	0.049	−2.47	D	7n
		4128.74	20831	45044	6	4	4.2(−4)	7.2(−5)	0.0059	−3.36	D−	7n
11.	$b\ ^4P - z\ ^4F^\circ$ (28)											
		4178.86	20831	44754	6	8	0.0012	4.3(−4)	0.035	−2.59	D	6n,7n
		4369.40	22410	45290	2	4	3.5(−4)	2.0(−4)	0.0058	−3.40	D−	7n
		4122.64	20831	45080	6	6	5.1(−4)	1.3(−4)	0.011	−3.11	D−	7n
		4258.16	21812	45290	4	4	9.2(−4)	2.5(−4)	0.014	−3.00	D−	7n
		4087.27	20831	45290	6	4	5.6(−5)	9.4(−6)	7.6(−4)	−4.25	E	7n
12.	$a\ ^4H - z\ ^4F^\circ$ (32)											
		4413.60	21582	44233	10	10	7.5(−5)	2.2(−5)	0.0032	−3.66	D−	6n
13.	$a\ ^4H - z\ ^2I^\circ$ (uv 164)											
		2414.08	21252	62662	14	12	0.0094	7.0(−4)	0.078	−2.01	E	5
		2433.50	21582	62662	10	12	0.091	0.0097	0.78	−1.01	D	5
14.	$a\ ^4H - y\ ^2G^\circ$ (uv 167)											
		2303.35	21430	64832	12	10	0.054	0.0036	0.33	−1.37	D−	5
		2296.66	21582	65110	10	8	0.037	0.0023	0.18	−1.63	D−	5
15.	$b\ ^4F - z\ ^6F^\circ$ (35)											
		5132.66	22637	42115	10	10	2.8(−5)	1.1(−5)	0.0019	−3.96	D−	6n
		5136.80	22939	42401	6	4	3.3(−5)	8.6(−6)	8.7(−4)	−4.29	E	6n

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Fe II: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
16.	$b\ ^4F - z\ ^6P^o$ (36)											
		4993.35	22637	42658	10	8	7.0(−5)	2.1(−5)	0.0035	−3.68	E	3*n*
17.	$b\ ^4F - z\ ^4F^o$ (37)	*4563.5*	*22807*	*44714*	28	28	0.0024	7.4(−4)	0.31	−1.69	D	1,3*n*,6*n*,7*n*
		4629.34	22637	44233	10	10	0.0013	4.3(−4)	0.066	−2.37	D	1
		4555.89	22810	44754	8	8	0.0019	5.9(−4)	0.071	−2.33	D	6*n*,7*n*
		4515.34	22939	45080	6	6	0.0018	5.5(−4)	0.049	−2.48	D	1
		4491.40	23031	45290	4	4	0.0023	6.9(−4)	0.041	−2.56	D	6*n*,7*n*
		4520.23	22637	44754	10	8	0.0010	2.5(−4)	0.037	−2.60	D	1
		4489.19	22810	45080	8	6	6.6(−4)	1.5(−4)	0.018	−2.92	D	7*n*
		4472.92	22939	45290	6	4	3.4(−4)	6.7(−5)	0.0059	−3.40	D−	7*n*
		4666.75	22810	44233	8	10	1.4(−4)	5.6(−5)	0.0069	−3.35	D−	7*n*
		4582.84	22939	44754	6	8	3.3(−4)	1.4(−4)	0.013	−3.08	D	3*n*
		4534.17	23031	45080	4	6	2.4(−4)	1.1(−4)	0.0066	−3.36	D	3*n*
18.	$b\ ^4F - z\ ^4D^o$ (38)											
		4583.83	22637	44447	10	8	0.0063	0.00159	0.240	−1.80	C	1
		4549.47	22810	44785	8	6	0.0018	4.2(−4)	0.050	−2.47	D	7*n*
		4522.63	22939	45044	6	4	0.0064	0.0013	0.12	−2.11	D	4
		4620.51	22810	44447	8	8	1.8(−4)	5.9(−5)	0.0072	−3.33	E	3*n*
		4576.33	22939	44785	6	6	5.7(−4)	1.8(−4)	0.016	−2.97	D	3*n*
		4541.52	23031	45044	4	4	0.0022	6.8(−4)	0.041	−2.57	D	4
		4595.68	23031	44785	4	6	2.5(−5)	1.2(−5)	7.3(−4)	−4.32	E	7*n*
19.	$b\ ^4F - y\ ^2G^o$ (uv 182)											
		2369.23	22637	64832	10	10	0.026	0.0022	0.17	−1.66	D	5
		2379.00	22810	64832	8	10	0.064	0.0068	0.43	−1.27	D	5
20.	$a\ ^6S - z\ ^6D^o$ (40)											
		6516.08	23318	38660	6	8	1.5(−4)	1.3(−4)	0.017	−3.11	D−	6*n*,7*n*
		6432.68	23318	38859	6	6	8.9(−5)	5.5(−5)	0.0070	−3.48	D−	6*n*,7*n*
		6369.46	23318	39013	6	4	3.9(−5)	1.6(−5)	0.0020	−4.02	E	6*n*,7*n*
21.	$a\ ^6S - z\ ^6F^o$ (41)											
		5284.10	23318	42237	6	8	3.9(−4)	2.2(−4)	0.023	−2.88	D	6*n*,7*n*
22.	$a\ ^6S - z\ ^6P^o$ (42)	*5062.4*	23318	*43066*	6	18	0.020	0.023	2.3	−0.86	C−	1,7*n*
		5169.00	23318	42658	6	8	0.011	0.0057	0.58	−1.47	D	7*n*
		5018.45	23318	43239	6	6	0.026	0.010	0.99	−1.22	C	1
		4923.93	23318	43621	6	4	0.030	0.0073	0.71	−1.36	C	1
23.	$a\ ^6S - z\ ^4D^o$ (43)											
		4656.97	23318	44785	6	6	1.2(−4)	3.8(−5)	0.0035	−3.64	E	3*n*
		4601.34	23318	45044	6	4	3.4(−5)	7.2(−6)	6.5(−4)	−4.36	E	7*n*
24.	$a\ ^6S - z\ ^4F^o$ (44)											
		4663.70	23318	44754	6	8	5.8(−5)	2.5(−5)	0.0023	−3.82	D−	7*n*

Fe II: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
25.	$a\ ^6S - z\ ^4P°$ (45)											
		4227.14	23318	46967	6	6	3.1(−4)	8.4(−5)	0.0070	−3.30	D−	7n
26.	$a\ ^4G - z\ ^6F°$ (46)											
		5991.37	25429	42115	12	10	5.4(−5)	2.4(−5)	0.0057	−3.54	D−	6n
		6084.10	25805	42237	10	8	3.8(−5)	1.7(−5)	0.0034	−3.77	D−	6n
		6113.33	25982	42335	8	6	2.3(−5)	9.8(−6)	0.0016	−4.11	E	6n
27.	$a\ ^4G - z\ ^4D°$ (48)											
		5362.87	25805	44447	10	8	0.0014	4.7(−4)	0.083	−2.33	D	7n
		5264.81	26055	45044	6	4	6.5(−4)	1.8(−4)	0.019	−2.97	D	6n,7n
		5414.05	25982	44447	8	8	1.5(−4)	6.6(−5)	0.0094	−3.28	D−	6n,7n
		5337.73	26055	44785	6	6	1.9(−4)	8.2(−5)	0.0086	−3.31	D−	7n
28.	$a\ ^4G - z\ ^4F°$ (49)											
		5316.62	25429	44233	12	10	0.0045	0.0016	0.34	−1.72	D	4
		5276.00	25805	44754	10	8	0.0033	0.0011	0.19	−1.96	D	4
		5234.62	25982	45080	8	6	0.0032	0.0010	0.14	−2.10	D	7n
		5197.56	26055	45290	6	4	0.0041	0.0011	0.11	−2.18	D	7n
		5425.25	25805	44233	10	10	2.2(−4)	9.5(−5)	0.017	−3.02	D−	6n,7n
		5325.56	25982	44754	8	8	2.8(−4)	1.2(−4)	0.017	−3.02	D−	6n,7n
29.	$a\ ^4G - z\ ^2I°$ (uv 201)											
		2712.39	25805	62662	10	12	0.11	0.015	1.3	−0.84	D+	5
		2684.94	25429	62662	12	12	0.0043	4.6(−4)	0.049	−2.25	D	5
30.	$a\ ^4G - y\ ^2G°$ (uv 205)											
		2561.58	25805	64832	10	10	0.0081	8.0(−4)	0.067	−2.10	D−	5
		2554.95	25982	65110	8	8	0.019	0.0019	0.13	−1.83	D	5
		2573.21	25982	64832	8	10	0.11	0.014	0.93	−0.96	D	5
		2559.77	26055	65110	6	8	0.22	0.029	1.5	−0.76	D+	5
31.	$b\ ^2H - z\ ^4F°$ (55)											
		5534.83	26170	44233	12	10	5.2(−4)	2.0(−4)	0.044	−2.62	D	6n,7n
32.	$b\ ^2H - z\ ^2I°$ (uv 235)											
		2753.29	26353	62662	10	12	1.71	0.233	21.1	0.368	C	5
33.	$b\ ^2H - y\ ^2G°$ (uv 239)											
		2598.03	26353	64832	10	10	0.020	0.0020	0.17	−1.69	D	5
34.	$a\ ^2F - z\ ^4F°$ (57)											
		5627.49	27315	45080	8	6	2.4(−5)	8.7(−6)	0.0013	−4.16	E	6n

TRANSITION PROBABILITIES FOR IRON

Fe II: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
35.	$a\ ^2F - y\ ^2G^\circ$ (uv 263)											
		2664.67	27315	64832	8	10	1.50	0.200	14.0	0.203	C	5
		2666.63	27620	65110	6	8	1.62	0.230	12.1	0.140	C	5
36.	$b\ ^2G - y\ ^2G^\circ$ (uv 278)	*2906.1*	*30556*	*64956*	18	18	0.043	0.0055	0.94	−1.01	D	5
		2902.46	30389	64832	10	10	0.038	0.0048	0.46	−1.32	D	5
		2910.76	30764	65110	8	8	0.0055	7.0(−4)	0.054	−2.25	D	5
		2879.24	30389	65110	10	8	0.029	0.0029	0.27	−1.54	D+	5
		2934.49	30764	64832	8	10	0.013	0.0021	0.16	−1.78	E	5
37.	$b\ ^4D - z\ ^4F^\circ$ (72)											
		7479.69	31388	44754	6	8	3.1(−5)	3.5(−5)	0.0052	−3.68	D−	6*n*
		7301.56	31388	45080	6	6	4.4(−5)	3.5(−5)	0.0050	−3.68	D−	6*n*
38.	$b\ ^4D - z\ ^4D^\circ$ (73)											
		7711.71	31483	44447	8	8	4.0(−4)	3.6(−4)	0.073	−2.54	D	6*n*
		7224.47	31368	45206	2	2	4.1(−4)	3.2(−4)	0.015	−3.19	D−	6*n*
		7515.79	31483	44785	8	6	6.6(−5)	4.2(−5)	0.0083	−3.47	D−	6*n*
39.	$b\ ^4D - z\ ^4P^\circ$ (74)											
		6456.39	31483	46967	8	6	0.0021	0.0010	0.17	−2.10	D	6*n*,7*n*
		6247.55	31388	47390	6	4	0.0023	9.1(−4)	0.11	−2.26	D	6*n*,7*n*
		6147.77	31364	47626	4	2	0.0022	6.2(−4)	0.050	−2.61	D	7*n*
		6416.92	31388	46967	6	6	9.2(−4)	5.7(−4)	0.072	−2.47	D	6*n*,7*n*
		6149.25	31368	47626	2	2	0.0021	0.0012	0.049	−2.62	D	6*n*,7*n*
		6239.91	31368	47390	2	4	1.9(−4)	2.2(−4)	0.0090	−3.36	D−	7*n*
40.	$b\ ^4D - y\ ^2G^\circ$ (uv 292)											
		2997.75	31483	64832	8	10	0.0048	8.1(−4)	0.064	−2.19	E	5
41.	$b\ ^2F - y\ ^2G^\circ$ (98)											
		3044.84	31999	64832	8	10	0.011	0.0019	0.15	−1.82	D	5
		3002.33	31812	65110	6	8	0.018	0.0032	0.19	−1.71	D+	5
42.	$a\ ^2I - z\ ^2I^\circ$ (105)											
		3360.10	32910	62662	12	12	0.0084	0.0014	0.19	−1.77	D	5
43.	$a\ ^2I - y\ ^2G^\circ$ (107)											
		3131.72	32910	64832	12	10	0.012	0.0015	0.18	−1.75	D	5
44.	$a\ ^2I - z\ ^2K^\circ$ (uv 318)	*2607.9*	*32892*	*71225*	26	30	2.2	0.26	58	0.83	C	5
		2592.78	32876	71433	14	16	2.25	0.259	31.0	0.56	C	5
		2625.49	32910	70987	12	14	2.04	0.246	25.5	0.470	C	5
		2623.13	32876	70987	14	14	0.092	0.0095	1.1	−0.88	D+	5

Fe II: Allowed transitions—Continued

No.	Multiplet	λ(Å)	E_i(cm^{-1})	E_k(cm^{-1})	g_i	g_k	A_{ki}(10^8 s^{-1})	f_{ik}	S(at. u.)	log gf	Accuracy	Source
45.	$c\ ^2G - y\ ^2G°$ (120)											
		3187.29	33466	64832	10	10	0.028	0.0043	0.45	−1.37	D+	5
		3162.80	33501	65110	8	8	0.042	0.0063	0.52	−1.30	D+	5
46.	$z\ ^4D° - c\ ^4D$											
		6383.72	44785	60445	6	6	0.0023	0.0014	0.18	−2.08	D	6n
47.	$c\ ^2F - y\ ^2G°$ (168)											
		5019.45	44915	64832	8	10	0.0015	7.1(−4)	0.094	−2.25	D−	5
		4953.98	44930	65110	6	8	0.0016	7.8(−4)	0.077	−2.33	D−	5
48.	$c\ ^4F - x\ ^4G°$ (199)											
		6446.40	50188	65696	8	10	0.0018	0.0014	0.24	−1.95	D	6n

[a] The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Fe III

Ground State $1s^22s^22p^63s^23p^63d^6\ ^5D_4$

Ionization Potential 30.651 eV = 247221 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
1843.4	15	1930.39	2	1961.23	3	2058.2	9
1844.3	15	1931.51	3	1962.72	3	2058.56	12
1845.0	15	1937.35	2	1964.26	3	2059.68	9
1846.9	15	1943.48	2	1966.20	3	2061.75	9
1849.41	11	1945.34	3	1987.50	1	2084.97	8
1854.38	11	1950.33	13	1991.61	1	2087.13	8
1865.20	17	1951.01	6	1994.07	1	2087.91	8
1893.98	10	1951.3	6	1995.27	1	2088.63	5
1896.80	10	1952.3	6	1995.56	1	2089.09	8
1898.9	7	1952.65	6	1996.42	1	2090.1	8
1903.3	7	1953.32	6	2002.5	18	2090.14	5
1904.3	19	1953.5	6	2039.51	14	2091.31	8
1907.58	10	1954.22	3	2053.5	9	2097.48	5
1915.08	2	1954.98	13	2057.06	9	2103.80	4
1922.79	2	1959.32	3	2057.9	16	2107.32	4

For this spectrum we have chosen the calculations of Biemont [1] and of Kurucz and Peytremann [2]. Biemont obtained radial wavefunctions by means of the scaled Thomas-Fermi method and calculated individual line strengths in intermediate coupling. Similarly, Kurucz and Peytremann used a semiempirical scaled Thomas-Fermi-Dirac approach with very limited configuration interaction. Generally, the log gf-values of refs. [1] and [2] are in quite good agreement, particularly for strong lines; e.g., 68% of the data for common lines agree within ± 50%. In this compilation, we have included only those lines showing 50% or better agreement between refs. [1] and [2].

We were able to assess the reliability of Kurucz and Peytremann's (or Biemont's) absolute scale by comparing the calculated inverse transition probability sums with beam-foil lifetimes for four excited levels measured by Andersen et al. [3]. We considered only ref. [2] for this study because its branching ratio data were more complete than those of Biemont. The comparison shows that the beam-foil lifetimes are, on the average, only 14% longer than the corresponding inverse sums of Kurucz and Peytremann.

References

[1] Biemont, E., J. Quant. Spectrosc. Radiat. Transfer **16**, 137 (1976).
[2] Kurucz, R. L., and Peytremann, E., Smithsonian Astrophysical Observatory Special Report 362 (1975).
[3] Andersen, T., Petersen, P., and Biemont, E., J. Quant. Spectrosc. Radiat. Transfer **17**, 389 (1977).

Fe III: Allowed transitions

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
1.	$^5G - ^5G^o$ (uv 50)											
		1987.50	63425	113740	13	13	4.9	0.29	25	0.58	D	1,2
		1991.61	63466	113677	11	11	4.2	0.25	18	0.44	D	1,2
		1994.07	63487	113635	9	9	3.5	0.21	12	0.28	D	1,2
		1995.56	63494	113605	7	7	3.7	0.22	10	0.19	D	1,2
		1996.42	63495	113584	5	5	4.2	0.25	8.2	0.10	D	1,2
		1995.27	63487	113605	9	7	1.0	0.048	2.8	−0.36	D	1,2
		1996.42	63494	113584	7	5	0.96	0.041	1.9	−0.54	D	1,2
2.	$^5G - ^5H^o$ (uv 51)											
		1915.08	63425	115642	13	15	6.0	0.38	31	0.69	D	1,2
		1922.79	63466	115474	11	13	5.5	0.36	25	0.60	D	1,2
		1930.39	63487	115290	9	11	5.1	0.35	20	0.50	D	1,2
		1937.35	63494	115111	7	9	5.1	0.37	17	0.41	D	1,2
		1943.48	63495	114949	5	7	5.0	0.40	13	0.30	D	1,2
3.	$^5D - ^5F^o$ (uv 61)											
		1931.51	69696	121469	9	11	5.3	0.36	21	0.51	D	1,2
		1945.34	69837	121242	7	9	3.7	0.27	12	0.28	D	1,2
		1954.22	69838	121009	5	7	3.5	0.28	9.0	0.15	D	1,2
		1959.32	69788	120826	3	5	2.8	0.27	5.2	−0.09	D	1,2
		1962.72	69747	120697	1	3	2.3	0.39	2.5	−0.41	D	1,2
		1954.22	69837	121009	7	7	1.3	0.074	3.3	−0.29	D	1,2
		1961.23	69838	120826	5	5	1.7	0.10	3.2	−0.30	D	1,2
		1964.26	69788	120697	3	3	2.2	0.13	2.5	−0.42	D	1,2
		1966.20	69838	120697	5	3	0.28	0.0099	0.32	−1.31	D	1,2
4.	$^3G - ^3F^o$ (uv 66)											
		2103.80	70729	118247	9	7	2.9	0.15	9.3	0.13	D	1,2
		2107.32	70725	118164	7	5	3.8	0.18	8.7	0.10	D	1,2
5.	$^3G - ^3H^o$ (uv 67)											
		2097.48	70694	118355	11	13	4.5	0.35	27	0.59	D	1,2
		2090.14	70729	118557	9	11	4.4	0.35	22	0.50	D	1,2
		2088.63	70694	118557	11	11	0.17	0.011	0.83	−0.92	D	1,2
6.	$^3G - ^3G^o$ (uv 68)											
		1951.01	70694	121950	11	11	5.3	0.30	21	0.52	D	1,2
		1952.65	70729	121941	9	9	4.9	0.28	16	0.40	D	1,2
		1953.32	70725	121920	7	7	5.1	0.29	13	0.31	D	1,2
		[1951.3]	70694	121941	11	9	0.34	0.016	1.1	−0.75	D	1,2
		[1953.5]	70729	121920	9	7	0.40	0.018	1.0	−0.79	D	1,2
		[1952.3]	70729	121950	9	11	0.20	0.014	0.81	−0.90	D	1,2

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Fe III: Allowed transitions---Continued

No.	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
7.	^{3}P - ^{3}S°											
		[1898.9]	73728	126391	5	3	3.7	0.12	3.8	−0.22	D	1,2
		[1903.3]	73849	126391	3	3	1.8	0.099	1.9	−0.53	D	1,2
8.	^{3}D - ^{3}D° (uv 77)											
		2087.13	76957	124854	7	7	3.1	0.20	9.6	0.15	D	1,2
		2091.31	77102	124904	5	5	2.6	0.17	5.9	−0.07	D	1,2
		2087.91	77075	124955	3	3	2.9	0.19	3.9	−0.24	D	1,2
		2084.97	76957	124904	7	5	0.75	0.035	1.7	−0.61	D	1,2
		2089.09	77102	124955	5	3	1.1	0.043	1.5	−0.67	D	1,2
		[2090.1]	77075	124904	3	5	0.64	0.070	1.4	−0.68	D	1,2
9.	^{3}D - ^{3}F° (uv 78)											
		2061.75	76957	125444	7	9	4.4	0.36	17	0.40	D	1,2
		2059.68	77102	125638	5	7	3.9	0.35	12	0.24	D	1,2
		2057.06	77075	125673	3	5	3.7	0.39	7.9	0.07	D	1,2
		[2053.5]	76957	125638	7	7	0.44	0.028	1.3	−0.71	D	1,2
		[2058.2]	77102	125673	5	5	0.76	0.048	1.6	−0.62	D	1,2
10.	^{3}I - ^{3}H° (uv 83)											
		1907.58	79840	132263	15	13	5.3	0.25	24	0.57	D	1,2
		1896.80	79845	132565	13	11	5.0	0.23	19	0.48	D	1,2
		1893.98	79860	132659	11	9	5.5	0.24	16	0.42	D	1,2
11.	^{5}F - ^{5}D° (uv 97)											
		1849.41	83138	137210	11	9	4.3	0.18	12	0.30	D	1,2
		1854.38	83647	137573	3	1	5.7	0.098	1.8	−0.53	D	1,2
12.	^{1}I - ^{1}K° (uv 100)	2058.56	83430	131992	13	15	4.5	0.33	29	0.63	D	1,2
13.	^{3}H - ^{3}I° (uv 116)											
		1950.33	88923	140196	13	15	5.5	0.36	30	0.67	D	1,2
		1954.98	88695	139846	11	13	4.3	0.29	21	0.50	D	1,2
14.	^{1}H - ^{1}I° (uv 134)	2039.51	92524	141540	11	13	4.3	0.32	24	0.55	D	1,2
15.	^{3}F - ^{3}D°											
		[1843.4]	93389	147636	9	7	4.8	0.19	10	0.23	D	1,2
		[1844.3]	93392	147615	7	5	4.9	0.18	7.7	0.10	D	1,2
		[1846.9]	93413	147556	5	3	5.5	0.17	5.2	−0.07	D	1,2
		[1845.0]	93413	147615	5	5	0.78	0.040	1.2	−0.70	D	1,2
16.	^{1}F - ^{1}D°	[2057.9]	97041	145618	7	5	3.7	0.17	8.1	0.08	D	1,2
17.	^{1}F - ^{1}F° (uv 154)	1865.20	97041	150655	7	7	6.1	0.32	14	0.35	D	1,2
18.	^{1}D - ^{1}F°	[2002.5]	109571	159493	5	7	4.3	0.36	12	0.26	D	1,2
19.	^{1}D - ^{1}D°	[1904.3]	109571	162085	5	5	5.7	0.31	9.7	0.19	D	1,2

TRANSITION PROBABILITIES FOR IRON

Fe VII

Ground State $1s^2 2s^2 2p^6 3s^2 3p^6 3d^2\ {}^3F_2$

Ionization Potential [126] eV = [1016000] cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
150.19	18	153.74	24	155.55	19	236.78	6
150.28	17	154.04	23	155.99	32	236.87	12
150.40	18	154.21	23	158.16	31	238.04	5
150.52	18	154.27	29	158.48	30	238.39	5
150.81	16	154.30	29	165.08	34	239.73	11
150.85	16	154.33	22	166.63	33	239.85	11
151.02	16	154.36	29	231.04	3	240.05	11
151.04	16	154.45	29	231.64	3	240.08	11
151.14	16	154.56	29	231.73	3	240.22	11
151.49	15	154.65	29	232.26	3	240.57	11
151.51	15	154.70	21	232.44	3	243.37	13
151.67	15	154.85	28	232.95	3	244.09	10
151.75	15	154.89	20	233.02	3	244.52	10
151.78	15	154.92	28	233.76	2	244.54	10
151.97	15	154.95	28	234.34	2	245.15	4
152.07	14	155.12	28	234.75	7	245.49	9
152.91	25	155.24	27	235.66	1	246.01	9
153.66	24	155.41	26	236.39	12	247.46	8

For this ion we have selected the data of Warner and Kirkpatrick [1], who used the single configuration scaled Thomas-Fermi approximation and calculated individual line strengths in intermediate coupling. These authors provided data for a large number of transitions within the $3d^2$–$3d4p$, $3d^2$–$3d4f$, and $3d4s$–$3d4p$ arrays. Of we have tabulated only those lines that have actually been observed, either by Edlén [2], as listed in the compilation of Kelly and Palumbo [3], or by Cady [4].

It is expected that for this relatively simple, essentially two-electron spectrum Warner and Kirkpatrick's data should be fairly reliable (except when configuration interaction effects become appreciable). This conjecture seems to be supported by the good agreement between their calculated data and beam-foil lifetimes available for Ti III (see, for example, ref. [5]), an ion which is isoelectronic with Fe VII.

References

[1] Warner, B., and Kirkpatrick, R., Publications of the Department of Astronomy, University of Texas at Austin, Vol. 3, No. 2 (1969) and Mon. Not. R. Astron. Soc. **144**, 397 (1969).

[2] Edlén, B., private communication.

[3] Kelly, R. L., and Palumbo, L. J., *Atomic and Ionic Emission Lines Below 2000 Angstroms—Hydrogen through Krypton*, Naval Research Laboratory Report 7599 (June 1973).

[4] Cady, W. M., Phys. Rev. **43**, 322 (1933).

[5] Wiese, W. L., and Fuhr, J. R., J. Phys. Chem. Ref. Data **4**, 263 (1975).

Fe VII: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} ($10^8 s^{-1}$)	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$3d^2$–$3d4p$	^3F – $^1D°$											
			235.66	1047	425388	7	5	0.37	2.2(–4)*	0.0012	–2.81	E	1
2.		^3F – $^3D°$											
			234.34	1047	427780	7	5	110	0.067	0.36	–0.33	D	1
			233.76	0	427780	5	5	34	0.028	0.11	–0.86	D	1

Fe VII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
3.		$^3F - {}^3F^o$	*232.07*	*1346*	*432245*	21	21	73	0.059	0.95	0.09	D	1
			231.73	2327	433870	9	9	60	0.049	0.33	−0.36	D	1
			232.26	1047	431606	7	7	21	0.017	0.092	−0.92	D	1
			232.44	0	430215	5	5	21	0.017	0.065	−1.07	D	1
			232.95	2327	431606	9	7	67	0.042	0.29	−0.42	D	1
			233.02	1047	430215	7	5	46	0.027	0.14	−0.73	D	1
			231.04	1047	433870	7	9	4.1	0.0042	0.022	−1.53	E	1
			231.64	0	431606	5	7	2.8	0.0032	0.012	−1.80	E	1
4.		$^1D - {}^1D^o$	245.15	17475	425388	5	5	70	0.063	0.26	−0.50	D	1
5.		$^1D - {}^3P^o$											
			238.04	17475	437567	5	5	0.98	8.3(−4)	0.0033	−2.38	E	1
			238.39	17475	436963	5	3	18	0.0094	0.037	−1.33	D	1
6.		$^1D - {}^1F^o$	236.78	17475	439812	5	7	6.8	0.0080	0.031	−1.40	D	1
7.		$^1D - {}^1P^o$	234.75	17475	443455	5	3	86	0.043	0.17	−0.67	D	1
8.		$^3P - {}^1D^o$											
			247.46	21275	425388	5	5	0.51	4.7(−4)	0.0019	−2.63	E	1
9.		$^3P - {}^3D^o$											
			245.49	20428	427780	3	5	23	0.035	0.085	−0.98	D	1
			246.01	21275	427780	5	5	1.9	0.0017	0.0069	−2.07	E	1
10.		$^3P - {}^3F^o$											
			244.09	21275	431606	5	7	5.5	0.0069	0.028	−1.46	D	1
			244.52	20428	430215	3	5	1.9	0.0028	0.0069	−2.07	E	1
			244.54	21275	430215	5	5	0.024	2.2(−5)	8.8(−5)	−3.96	E	1
11.		$^3P - {}^3P^o$	*240.13*	*20855*	*437304*	9	9	120	0.11	0.75	−0.02	D	1
			240.22	21275	437567	5	5	100	0.087	0.35	−0.36	D	1
			240.08	20428	436963	3	3	35	0.030	0.072	−1.04	D	1
			240.57	21275	436963	5	3	40	0.021	0.083	−0.98	D	1
			240.05	20428	437010	3	1	130	0.037	0.089	−0.95	D	1
			239.73	20428	437567	3	5	25	0.037	0.087	−0.96	D	1
			239.85	20037	436963	1	3	34	0.089	0.070	−1.05	D	1
12.		$^3P - {}^1P^o$											
			236.87	21275	443455	5	3	18	0.0091	0.036	−1.34	D	1
			236.39	20428	443455	3	3	1.2	0.0010	0.0024	−2.52	E	1
13.		$^1G - {}^1F^o$	243.37	28915	439812	9	7	210	0.15	1.1	0.12	D	1
14.	$3d^2$-$3d4f$	$^3F - {}^1G^o$											
			152.07	2327	659923	9	9	49	0.017	0.076	−0.82	D	1
15.		$^3F - {}^3F^o$											
			151.78	2327	661176	9	9	170	0.058	0.26	−0.28	D	1
			151.67	1047	660360	7	7	390	0.13	0.47	−0.03	D	1
			151.51	0	660022	5	5	530	0.18	0.45	−0.04	D	1
			151.97	2327	660360	9	7	29	0.0077	0.035	−1.16	D	1
			151.75	1047	660022	7	5	50	0.012	0.044	−1.06	D	1
			151.49	1047	661176	7	9	200	0.088	0.31	−0.21	D	1

TRANSITION PROBABILITIES FOR IRON

Fe VII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
16.		^{3}F – ^{3}G°											
			151.02	2327	664483	9	11	1600	0.67	3.0	0.78	D	1
			150.85	1047	663953	7	9	1300	0.58	2.0	0.61	D	1
			150.81	0	663104	5	7	1300	0.62	1.5	0.49	D	1
			151.14	2327	663953	9	9	210	0.072	0.32	−0.19	D	1
			151.04	1047	663104	7	7	220	0.077	0.27	−0.27	D	1
17.		^{3}F – ^{1}F°											
			150.28	0	665425	5	7	220	0.10	0.25	−0.79	D	1
18.		^{3}F – ^{3}D°											
			150.52	2327	666663	9	7	68	0.018	0.080	−0.79	D	1
			150.40	1047	665925	7	5	73	0.018	0.061	−0.91	D	1
			150.19	0	665843	5	3	75	0.015	0.038	−1.12	D	1
19.		^{1}D – ^{3}F°											
			155.55	17475	660360	5	7	13	0.0066	0.017	−1.48	D	1
20.		^{1}D – ^{3}G°											
			154.89	17475	663104	5	7	83	0.042	0.11	−0.68	D	1
21.		^{1}D – ^{1}D°	154.70	17475	663882	5	5	700	0.25	0.64	0.10	D	1
22.		^{1}D – ^{1}F°	154.33	17475	665425	5	7	1200	0.58	1.5	0.46	D	1
23.		^{1}D – ^{3}D°											
			154.04	17475	666663	5	7	44	0.022	0.056	−0.96	D	1
			154.21	17475	665925	5	5	24	0.0087	0.022	−1.36	D	1
24.		^{1}D – ^{3}P°											
			153.74	17475	667903	5	5	15	0.0053	0.013	−1.58	E	1
			153.66	17475	668265	5	3	39	0.0083	0.021	−1.38	D	1
25.		^{1}D – ^{1}P°	152.91	17475	671470	5	3	110	0.022	0.056	−0.95	D	1
26.		^{3}P – ^{1}D°											
			155.41	20428	663882	3	5	30	0.018	0.028	−1.26	D	1
27.		^{3}P – ^{1}F°											
			155.24	21275	665425	5	7	17	0.0085	0.022	−1.37	D	1
28.		^{3}P – ^{3}D°											
			154.95	21275	666663	5	7	1000	0.53	1.3	0.42	D	1
			154.92	20428	665925	3	5	970	0.58	0.89	0.24	D	1
			154.85	20037	665843	1	3	770	0.83	0.42	−0.08	D	1
			155.12	21275	665925	5	5	8.2	0.0030	0.0076	−1.83	E	1
29.		^{3}P – ^{3}P°	*154.50*	*20855*	*668090*	9	9	850	0.31	1.4	0.44	D	1
			154.65	21275	667903	5	5	880	0.32	0.81	0.20	D	1
			154.36	20428	668265	3	3	420	0.15	0.23	−0.35	D	1
			154.56	21275	668265	5	3	350	0.076	0.19	−0.42	D	1
			154.30	20428	668497	3	1	890	0.11	0.16	−0.50	D	1
			154.45	20428	667903	3	5	1.5	8.8(−4)	0.0013	−2.58	E	1
			154.27	20037	668265	1	3	81	0.087	0.044	−1.06	D	1

Fe VII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
30.		^{1}G – ^{1}G°	158.48	28915	659923	9	9	230	0.086	0.40	−0.11	D	1
31.		^{1}G – ^{3}F°											
			158.16	28915	661176	9	9	8.9	0.0034	0.016	−1.52	E	1
32.		^{1}G – ^{1}H°	155.99	28915	669978	9	11	1800	0.80	3.7	0.86	D	1
33.		^{1}S – ^{3}D°											
			166.63	65707	665843	1	3	14	0.017	0.0095	−1.76	E	1
34.		^{1}S – ^{1}P°	165.08	65707	671470	1	3	690	0.85	0.46	−0.07	D	1

* The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Fe VIII

Ground State $1s^22s^22p^63s^23p^63d\ ^2D_{3/2}$

Ionization Potential 151.06 eV = 1218400 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
98.39	8	112.49	5	114.29	4	117.65	2
98.58	8	112.57	7	114.56	4	118.28	2
112.26	5	112.70	5	116.18	3	118.63	1
112.27	7	112.81	7	116.43	3	118.89	1
112.29	6	112.83	4	117.18	3	119.37	1
112.47	5	112.93	6				

For this potassium-like ion, we have compiled oscillator strengths taken from Cowan [1], who performed Hartree-Fock-Slater calculations in intermediate coupling. Biemont [2] has applied a single configuration Hartree-Fock approximation to the calculation of multiplet oscillator strengths for transitions of the type $ns-n'p$ and $np-n'd$, where $n,n' = 4, 5, 6, 7,$ and 8. We have not tabulated material, however, because of the strong possibility of configuration interaction of these single-valence-electron states with configurations of the type $3p^53d^2$, $3p^53dns$, $3p^53dnp$, etc.; e.g., the $3p^5(^2P°)3d^2(^3P)\ ^2P°$ state can mix strongly with the $3p^64p\ ^2P°$ state.

A third reference providing f-value data on this spectrum is that by Czyzak and Krueger [3]. These authors calculated radial wavefunctions by the Hartree-Fock self-consistent field method and used LS coupling to provide individual line strengths. Because of intermediate coupling effects found by Cowan, however, we did not tabulate the data of ref. [3].

References

[1] Cowan, R. D., Astrophys. J. **147**, 377 (1967).
[2] Biemont, E., Physica C **81**, 158 (1976).
[3] Czyzak, S. J., and Krueger, T. K., Astrophys J. **144**, 381 (1966).

TRANSITION PROBABILITIES FOR IRON

Fe VIII: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$3p^63d$– $3p^53d(^3F^\circ)4s$	^2D – $^2P^\circ$	*119.03*	*1103*	*841200*	10	6	380	0.048	0.19	−0.31	D	1
			118.89	1838	842930	6	4	330	0.047	0.11	−0.55	D	1
			119.37	0	837750	4	2	380	0.041	0.064	−0.79	D	1
			118.63	0	842930	4	4	52	0.011	0.017	−1.36	D	1
2.	$3p^63d$– $3p^53d(^3F^\circ)4s$	^2D – $^4F^\circ$											
			118.28	1838	847250	6	8	22	0.0062	0.014	−1.43	D	1
			117.65	0	849990	4	6	32	0.010	0.015	−1.40	D	1
3.		^2D – $^2F^\circ$	*116.76*	*1103*	*857560*	10	14	350	0.10	0.39	0.01	D	1
			117.18	1838	855190	6	8	320	0.088	0.20	−0.28	D	1
			116.18	0	860710	4	6	400	0.12	0.18	−0.32	D	1
			116.43	1838	860710	6	6	22	0.0045	0.010	−1.57	D	1
4.	$3p^63d$– $3p^53d(^3D^\circ)4s$	^2D – $^4D^\circ$											
			114.56	1838	874770	6	8	27	0.0072	0.016	−1.36	D	1
			114.29	1838	876810	6	6	50	0.0098	0.022	−1.23	D	1
			[112.83]	0	[886300]	4	4	30	0.0058	0.0086	−1.63	D	1
5.		^2D – $^2D^\circ$	*112.48*	*1103*	*890130*	10	10	430	0.081	0.30	−0.09	D	1
			112.49	1838	890810	6	6	380	0.073	0.16	−0.36	D	1
			112.47	0	889110	4	4	320	0.061	0.090	−0.61	D	1
			112.70	1838	889110	6	4	87	0.011	0.024	−1.18	D	1
			112.26	0	890810	4	6	67	0.019	0.028	−1.12	D	1
6.	$3p^63d$– $3p^53d(^1F^\circ)4s$	^2D – $^2F^\circ$											
			112.93	1838	887320	6	8	220	0.055	0.12	−0.48	D	1
			[112.29]	1838	[892400]	6	6	150	0.028	0.062	−0.77	D	1
7.	$3p^63d$– $3p^53d(^1D^\circ)4s$	^2D – $^2D^\circ$											
			[112.81]	1838	[888300]	6	6	19	0.0037	0.0082	−1.65	D	1
			[112.27]	0	[890700]	4	4	190	0.035	0.052	−0.85	D	1
			[112.57]	0	[888300]	4	6	84	0.024	0.036	−1.02	D	1
8.	$3p^63d$– $3p^53d(^1P^\circ)4s$	^2D – $^2P^\circ$	*98.53*	*1103*	[1016000]	10	6	240	0.021	0.068	−0.68	D	1
			[98.58]	1838	[1016000]	6	4	210	0.020	0.039	−0.92	D	1
			[98.39]	0	[1016000]	4	2	250	0.018	0.023	−1.14	D	1
			[98.39]	0	[1016000]	4	4	33	0.0048	0.0062	−1.72	D	1

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Fe IX

Ground State $1s^2 2s^2 2p^6 3s^2 3p^6\ ^1S_0$

Ionization Potential $235.04\ \mathrm{eV} = 1895800\ \mathrm{cm}^{-1}$

Allowed Transitions

Line strengths for the first three multiplets of this argon-like ion are from the superposition-of-configurations (SOC) calculations of Weiss [1], which are expected to be fairly accurate. Lin et al. [2] have computed transitions to $4s$ and $4d$ states by using the Dirac-Hartree-Fock method, but they have omitted correlation in excited states. Oscillator strengths for $3d-4f$ transitions have been calculated by Fawcett et al. [3] using Cowan's HX (Hartree-Fock with statistical exchange) method.

References

[1] Weiss, A. W., private communication.

[2] Lin, D. L., Fielder, W., Jr., and Armstrong, L., Jr., Phys. Rev. A **16**, 589 (1977).

[3] Fawcett, B. C., Cowan, R. D., Kononov, E. Y., and Hayes, R. W., J. Phys. B **5**, 1255 (1972).

Fe IX: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$3p^6-3p^53d$	$^1S - {}^3P^o$											
			244.912	0	408307	1	3	0.087	2.4(−4)[a]	1.9(−4)	−3.63	E	1
2.		$^1S - {}^3D^o$											
			217.108	0	460609	1	3	2.0	0.0043	0.0031	−2.36	E	1
3.		$^1S - {}^1P^o$	171.075	0	584547	1	3	2010	2.65	1.49	0.423	C+	1
4.	$3p^6-3p^5(^2P^o_{3/2})4s$	$^1S - (3/2,1/2)^o$											
			105.208	0	950500	1	3	320	0.16	0.055	−0.80	D	2
5.	$3p^6-3p^5(^2P^o_{1/2})4s$	$^1S - (1/2,1/2)^o$											
			103.566	0	965570	1	3	520	0.25	0.085	−0.60	D	2
6.	$3p^6-3p^5(^2P^o_{3/2})4d$	$^1S - {}^2[3/2]^o$											
			83.457	0	1198220	1	3	990	0.31	0.085	−0.51	D	2
7.	$3p^6-3p^5(^2P^o_{1/2})4d$	$^1S - {}^2[3/2]^o$											
			82.430	0	1213150	1	3	560	0.17	0.046	−0.77	D	2
8.	$3p^53d-3p^5(^2P^o_{3/2})4f$	$^3P^o - {}^2[3/2]$											
			111.791	408307	1302830	3	5	1200	0.39	0.43	0.07	E	3
			111.713	405765	1300920	1	3	1000	0.56	0.21	−0.25	E	3
9.		$^3P^o - {}^2[5/2]$											
			112.096	413667	1305760	5	7	1600	0.41	0.76	0.31	E	3
10.		$^3F^o - {}^2[9/2]$											
			113.793	425800	1304590	9	11	2000	0.48	1.6	0.64	E	3
			114.024	429311	1306320	7	9	1600	0.40	1.1	0.45	E	3

TRANSITION PROBABILITIES FOR IRON

Fe IX: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
11.		$^3F^\circ - {}^2[7/2]$											
			114.111	433807	1310150	5	7	1400	0.37	0.69	0.27	E	3
12.		$^3D^\circ - {}^2[7/2]$											
			116.803	455612	1311750	7	9	1600	0.41	1.1	0.46	E	3
13.	$3p^53d - 3p^5(^2P^\circ_{1/2})4f$	$^3D^\circ - {}^2[7/2]$											
			115.996	462616	1324710	5	7	1600	0.46	0.88	0.36	E	3
14.		$^1D^\circ - {}^2[5/2]$											
			115.353	456744	1323650	5	7	1400	0.39	0.74	0.29	E	3

[a] The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Fe X

Ground State $1s^22s^22p^63s^23p^5\ ^2P^\circ_{3/2}$

Ionization Potential 262.1 eV = 2114000 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
75.685	17	96.122	10	104.248	23	180.407	6
76.006	16	96.788	10	104.638	23	182.310	6
76.495	17	97.122	9	137.027	20	184.542	2
76.822	16	97.591	10	139.868	18	190.044	2
77.627	14	100.026	24	140.296	21	192	8
77.728	13	101.733	25	140.678	18	195.399	8
77.812	12	101.846	25	144.328	19	201.556	8
77.865	12	102.095	25	170.58	7	220.882	5
78.151	15	102.192	22	174.534	7	229.99	4
78.769	12	102.829	27	175.266	7	234.356	3
94.012	11	103.319	27	175.474	6	345.75	1
95.338	10	103.724	26	177.243	6	365.57	1
95.374	11						

Significant correlation effects in this chlorine-like ion make theoretical oscillator strengths for low-lying transitions somewhat uncertain. Nussbaumer [1] has calculated energy levels and oscillator strengths for many transitions by using a scaled Thomas-Fermi method with configuration interaction and relativistic effects; we quote here his values for the $3s^23p^5$–$3s3p^6$ resonance lines. Bromage et al. [2] have studied the $3p$–$3d$ transitions by using Cowan's semi-empirical HX method. Since they also tabulated percentage compositions of all levels of the $3p^43d$ configuration, we have their results over those of Nussbaumer, because this information allowed us to match the f-value data with the appropriate term designations. We have also employed earlier f-values due to Fawcett et al. [3] for transitions to $n = 4$ levels.

The accuracy ratings for transitions for which the upper or lower level is indicated to be of low purity in LS coupling have been lowered to "E." Transitions involving any level for which the dominant component is significantly less than 50% have been excluded from this compilation.

References

[1] Nussbaumer, H., Astron. Astrophys. **48**, 93 (1976).
[2] Bromage, G. E., Cowan, R. D., and Fawcett, B. C., Phys. Scr. **15**, 177 (1977).
[3] Fawcett, B. C., Cowan, R. D., Kononov, E. Y., and Hayes, R. W., J. Phys. **B 5**, 1255 (1972).

Fe X: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$3s^23p^5 - 3s3p^6$	$^2P^o - {}^2S$	*352.11*	*5228*	289230	6	2	56	0.035	0.24	−0.68	E	1
			345.75	0	289230	4	2	39	0.035	0.16	−0.85	E	1
			365.57	15683	289230	2	2	17	0.035	0.084	−1.15	E	1
2.	$3p^5–3p^4(^1D)3d$	$^2P^o - {}^2S$	*186.34*	*5228*	541882	6	2	1900	0.33	1.2	0.29	D	2
			184.542	0	541882	4	2	1500	0.38	0.92	0.18	D	2
			190.044	15683	541882	2	2	420	0.23	0.29	−0.34	D	2
3.		$^2P^o - {}^4F$											
			234.356	0	426701	4	6		5.3(−4)[a]		−2.67	E	2
4.		$^2P^o - {}^4P$											
			229.99	0	434800	4	2	3.0	0.0012	0.0036	−2.32	D	2
5.		$^2P^o - {}^2F$											
			220.882?	0	452730?	4	6	0.30	3.3(−4)	9.6(−4)	−2.88	E	2
6.	$3p^5–3p^4(^3P)3d$	$^2P^o - {}^2P$	*178.30*	*5228*	*566093*	6	6	1900	0.91	3.2	0.74	E	2
			177.243	0	564197	4	4	1900	0.90	2.1	0.56	E	2
			180.407	15683	569885	2	2	1400	0.70	0.83	0.15	E	2
			175.474	0	569885	4	2	480	0.11	0.25	−0.36	E	2
			182.310	15683	564197	2	4	40	0.04	0.05	−1.1	E	2
7.		$^2P^o - {}^2D$	*174.51*	*5228*	*578270*	6	10	2200	1.7	5.7	1.00	D	2
			174.534	0	572954	4	6	2200	1.5	3.4	0.78	D	2
			175.266	15683	586244	2	4	2100	1.9	2.2	0.58	D	2
			170.58	0	586244	4	4	66	0.029	0.065	−0.94	D	2
8.	$3p^5–3p^4(^1S)3d$	$^2P^o - {}^2D$	*195*	*5228*	*[517000]*	6	10	7.9	0.0075	0.029	−1.35	D−	2
			[192]	0	[521000]	4	6	0.06	5(−5)	1(−4)	−3.7	E	2
			201.556	15683	511773	2	4	11	0.014	0.019	−1.55	D	2
			195.399	0	511773	4	4	6.6	0.0038	0.0098	−1.82	D	2
9.	$3p^5–3p^4(^3P)4s$	$^2P^o - {}^4P$											
			97.122	0	1029600	4	4	350	0.050	0.064	−0.70	D	3
10.		$^2P^o - {}^2P$	*96.342*	*5228*	*1043200*	6	6	1100	0.15	0.28	−0.05	D−	3
			96.122	0	1040300	4	4	870	0.12	0.15	−0.32	D	3
			96.788	15683	1048900	2	2	780	0.11	0.070	−0.66	D	3
			95.338	0	1048900	4	2	590	0.040	0.050	−0.80	D	3
			97.591	15683	1040300	2	4	70	0.02	0.01	−1.4	E	3
11.	$3p^5–3p^4(^1D)4s$	$^2P^o - {}^2D$											
			94.012	0	1063700	4	6	470	0.093	0.12	−0.43	D	3
			95.374	15683	1064200	2	4	550	0.15	0.094	−0.52	D	3
12.	$3p^5–3p^4(^3P)4d$	$^2P^o - {}^2D$	*78.163*	*5228*	*1284600*	6	10	1400	0.22	0.34	0.12	D	3
			77.865	0	1284300	4	6	1600	0.22	0.23	−0.06	D	3
			78.769	15683	1285100	2	4	400	0.075	0.039	−0.82	E	3
			77.812	0	1285100	4	4	800	0.073	0.075	−0.53	E	3
13.		$^2P^o - {}^4F$											
			77.728	0	1286500	4	6	280	0.038	0.039	−0.82	D	3

TRANSITION PROBABILITIES FOR IRON

Fe X: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S(at.u.)	log gf	Accuracy	Source
14.		$^2P^o - ^2F$											
			77.627	0	1288200	4	6	480	0.065	0.066	−0.59	D	3
15.		$^2P^o - ^2P$											
			78.151	15683	1295300	2	4	440	0.080	0.041	−0.80	D	3
16.	$3p^5$–$3p^4(^1D)4d$	$^2P^o - ^2P$											
			76.006	0	1315700	4	4	1300	0.11	0.11	−0.36	D	3
			76.822	15683	1317400	2	2	1800	0.16	0.081	−0.49	D	3
17.		$^2P^o - ^2D$											
			75.685	0	1321300	4	6	780	0.10	0.10	−0.40	D	3
			76.495	15683	1323000	2	4	1400	0.24	0.12	−0.32	D	3
18.	$3p^4(^1D)3d$–$3p^4(^1D)4p$	$^2G - ^2F^o$											
			139.868	450753	1165713	10	8	220	0.052	0.24	−0.28	D	3
			140.678	451081	1161924	8	6	170	0.038	0.14	−0.52	E	3
19.		$^2F - ^2D^o$											
			144.328?	485978	1178844?	8	6	140	0.033	0.13	−0.58	D	3
20.	$3p^4(^3P)3d$–$3p^4(^3P)4p$	$^4D - ^4P^o$											
			137.027?	388708	1118491?	8	6	150	0.031	0.11	−0.61	D	3
21.		$^4F - ^4D^o$											
			140.296	417653	1130432	10	8	220	0.052	0.24	−0.28	D	3
22.	$3p^4(^1D)3d$–$3p^4(^1D)4f$	$^2G - ^2H^o$											
			102.192	450753	1429303	10	12	2900	0.55	1.9	0.74	D	3
23.		$^2F - ^2G^o$											
			104.638	485978	1441654	8	10	2100	0.43	1.2	0.54	D	3
			104.248	[482000]	[1441000]	6	8	1400	0.31	0.64	0.27	D	3
24.	$3p^4(^3P)3d$–$3p^4(^3P)4f$	$^4D - ^4F^o$											
			100.026	388708	1388448	8	10	2600	0.49	1.3	0.59	D	3
25.		$^4F - ^4G^o$											
			102.095	417653	1397133	10	12	2900	0.55	1.8	0.74	D	3
			101.733	426701	1409666	6	8	1300	0.38	0.76	0.36	D	3
			101.846	428297	1410172	4	6	1700	0.39	0.52	0.19	E	3
26.		$^2F - ^2G^o$											
			103.724	452730?	1416827?	6	8	1700	0.36	0.74	0.33	E	3
27.	$3p^4(^1S)3d$–$3p^4(^1S)4f$	$^2D - ^2F^o$											
			103.319	[521000]	[1489000]	6	8	2600	0.55	1.1	0.52	D	3
			102.829	511773	1484261	4	6	2100	0.49	0.66	0.29	D	3

* The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

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Fe XI

Ground State $1s^2 2s^2 2p^6 3s^2 3p^4\ ^3P_2$

Ionization Potential 290.4 eV = 2342000 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
72.166	22	90.205	15	123.822	24	201.737	12
72.310	21	90.345	15	124.725	25	208	7
72.635	20	91.394	28	176.620	11	276.41	2
73.2	20	91.472	28	179.762	14	308.61	4
86.513	18	91.63	27	184.41	8	341.115	1
86.772	16	91.733	27	184.800	13	348.97	1
87.025	16	92.81	31	187.446	10	352.680	1
87.995	16	92.87	29,31	188.219	9	355.92	5
88.029	16	93.433	30	189.017	9	356.55	1
88.167	16	121.419	23	192.020	10	358.64	1
89.104	17	121.747	23	192.641	10	369.23	1
89.185	15	123.49	24	192.819	9	406.84	3
89.865	19	123.572	26	201.575	6		

For the resonance transitions of this highly ionized member of the sulfur isoelectronic sequence, we have chosen the data of Mason [1], computed by using a multiconfiguration scaled Thomas-Fermi method. Substantial correlation is present in these values, reducing them by as much as an order of magnitude below single configuration results.

The remainder of the oscillator strengths were computed by Bromage et al. [2] and Fawcett et al. [3,4] using Cowan's semi-empirical Hartree-Fock-Slater programs. The $3p-3d$ calculations include the effects of configuration interaction [2]. Accuracy ratings for some transitions for which the upper or lower level is indicated to be of low purity in LS coupling have been lowered to "E," while those for which the dominant component is significantly less than 50% have been excluded from this compilation.

References

[1] Mason, H. E., Mon. Not. R. Astron. Soc. **170**, 651 (1975).
[2] Bromage, G. E., Cowan, R. D., and Fawcett, B. C., Phys. Scr. **15**, 177 (1977).
[3] Fawcett, B. C., Cowan, R. D., Kononov, E. Y., and Hayes, R. W., J. Phys. B **5**, 1255 (1972).
[4] Fawcett, B. C., Peacock, N. J., and Cowan, R. D., J. Phys. B **1**, 295 (1968).

Fe XI: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$3s^2 3p^4 - 3s3p^5$	$^3P - ^3P^o$	*353.76*	*5812*	*288490*	9	9	23	0.043	0.45	−0.41	C	1
			352.680	0	283543	5	5	17	0.032	0.19	−0.80	C	1
			356.55	12667.9	293156	3	3	5.2	0.010	0.035	−1.52	C	1
			341.115	0	293156	5	3	11	0.012	0.067	−1.22	C	1
			348.97	12667.9	299230	3	1	23	0.014	0.048	−1.38	C	1
			369.23	12667.9	283543	3	5	5.3	0.018	0.066	−1.27	C	1
			358.64	14300	293156	1	3	7.1	0.041	0.048	−1.39	C	1
2.		$^3P - ^1P^o$											
			[276.41]	0	361780	5	3	2.0	0.0014	0.064	−2.15	E	1

TRANSITION PROBABILITIES FOR IRON

Fe XI: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
3.		$^1D - ^3P^o$											
			[406.84]	37743.6	283543	5	5	0.40	0.0010	0.0067	−2.30	E	1
4.		$^1D - ^1P^o$	308.61	37743.6	361780	5	3	75	0.064	0.33	−0.49	C	1
5.		$^1S - ^1P^o$	[355.92]	80815	361780	1	3	1.6	0.0094	0.011	−2.03	D	1
6.	$3p^4$-$3p^3(^2P^o)3d$	$^3P - ^3P^o$											
			201.575	0	496093	5	5	36	0.022	0.073	−0.96	D	2
7.		$^1D - ^3D^o$											
			[208]	37743.6	[481000]	5	3	160	0.062	0.21	−0.51	E	2
8.		$^1S - ^1P^o$	184.41	80815	623080	1	3	1400	2.2	1.3	0.34	D	2
9.	$3p^4$-$3p^3(^2D^o)3d$	$^3P - ^3P^o$											
			188.219	0	531296	5	5	1100	0.59	1.8	0.47	D	2
			189.017	12667.9	541721	3	1	1400	0.25	0.47	−0.12	D	2
			192.819	12667.9	531296	3	5	220	0.20	0.38	−0.22	D	2
10.		$^3P - ^3S^o$	*189.51*	*5812*	533487	9	3	550	0.098	0.55	−0.05	E	2
			187.446	0	533487	5	3	100	0.032	0.099	−0.80	E	2
			192.020	12667.9	533487	3	3	290	0.16	0.30	−0.32	E	2
			192.641	14300	533487	1	3	140	0.23	0.15	−0.64	E	2
11.		$^3P - ^1D^o$											
			176.620	12667.9	578855	3	5	86	0.067	0.12	−0.70	D	2
12.		$^1D - ^3S^o$											
			201.737	37743.6	533487	5	3	630	0.23	0.76	0.06	E	2
13.		$^1D - ^1D^o$	184.800	37743.6	578855	5	5	1200	0.63	1.9	0.50	D	2
14.		$^1D - ^1F^o$	179.762	37743.6	594035	5	7	1600	1.1	3.3	0.74	D	2
15.	$3p^4$-$3p^3(^4S^o)4s$	$^3P - ^3S^o$	*89.647*	*5812*	1121300	9	3	2100	0.083	0.22	−0.13	D−	3
			89.185	0	1121300	5	3	1300	0.092	0.14	−0.34	D	3
			90.205	12667.9	1121300	3	3	550	0.067	0.060	−0.70	D	3
			90.345	14300	1121300	1	3	200	0.08	0.02	−1.1	E	3
16.	$3p^4$-$3p^3(^2D^o)4s$	$^3P - ^3D^o$											
			86.772	0	1152400	5	7	540	0.086	0.12	−0.37	D	3
			87.995	12667.9	1149100	3	5	220	0.043	0.037	−0.89	D	3
			88.167	14300	1148500	1	3	200	0.06	0.02	−1.2	E	3
			87.025	0	1149100	5	5	350	0.040	0.057	−0.70	D	3
			88.029	12667.9	1148500	3	3	400	0.047	0.041	−0.85	D	3
17.		$^1D - ^1D^o$	89.104	37743.6	1160000	5	5	1300	0.16	0.23	−0.10	D	3

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Fe XI: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
18.	$3p^4$–$3p^3(^2P^o)4s$	^1D – $^1P^o$	86.513	37743.6	1193600	5	3	930	0.056	0.080	−0.55	D	3
19.		^1S – $^1P^o$	[89.865]	80815	1193600	1	3	690	0.25	0.074	−0.60	D	3
20.	$3p^4$–$3p^3(^4S^o)4d$	^3P – $^3D^o$											
			72.635	0	1376700	5	7	1600	0.18	0.22	−0.05	D	3
			[73.2]	12667.9	[1380000]	3	5	820	0.11	0.080	−0.48	D	4
21.	$3p^4$–$3p^3(^2D^o)4d$	^1D – $^1D^o$	72.310	37743.6	1420700	5	5	1500	0.12	0.14	−0.22	D	3
22.		^1D – $^1F^o$	72.166	37743.6	1423400	5	7	2900	0.32	0.38	0.20	D	3
23.	$3p^3(^4S^o)3d$–$3p^3(^4S^o)4p$	$^5D^o$ – ^5P											
			121.419			9	7	290	0.050	0.18	−0.35	D	3
			121.747			7	5	210	0.033	0.093	−0.64	D	3
24.	$3p^3(^2D^o)3d$–$3p^3(^2D^o)4p$	$^3G^o$ – ^3F											
			123.49			11	9	270	0.050	0.22	−0.26	D	3
			123.49			9	7	170	0.030	0.11	−0.57	E	3
			123.822			7	5	220	0.036	0.10	−0.60	E	3
25.		$^1G^o$ – ^1F	124.725			9	7	220	0.040	0.15	−0.44	D	3
26.	$3p^3(^2P^o)3d$–$3p^3(^2P^o)4p$	$^3F^o$ – ^3D											
			123.572			7	5	360	0.059	0.17	−0.38	E	3
27.	$3p^3(^4S^o)3d$–$3p^3(^4S^o)4f$	$^5D^o$ – ^5F											
			91.733			9	11	4100	0.63	1.7	0.75	D	3
			91.63			7	9	3400	0.55	1.2	0.59	D	3
			91.63			5	7	2800	0.49	0.74	0.39	D	3
			91.63		3	5		2300	0.48	0.43	0.16	D	3
28.	$3p^3(^2D^o)3d$–$3p^3(^2D^o)4f$	$^3F^o$ – ^3G											
			91.472			7	9	2500	0.41	0.86	0.46	D	3
			91.394			5	7	2600	0.45	0.68	0.35	D	3
29.		$^3G^o$ – ^3H											
			92.87			11	13	3900	0.60	2.0	0.82	D	3
			92.87			7	9	3400	0.57	1.2	0.60	D	3
30.		$^1G^o$ – ^1H	93.433			9	11	3200	0.51	1.4	0.66	D	3
31.	$3p^3(^2P^o)3d$–$3p^3(^2P^o)4f$	$^3F^o$ – ^3G											
			92.81			9	11	3700	0.59	1.6	0.73	D	3
			92.87			7	9	2800	0.47	1.0	0.52	D	3

TRANSITION PROBABILITIES FOR IRON

Fe XII

Ground State $1s^22s^22p^63s^23p^3\ ^4S^\circ_{3/2}$

Ionization Potential [328] eV = [2646000] cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
65.805	23	82.226	15	185.85	10	200.356	13
65.905	18	82.744	17	186.856	6	201.121	12
66.526	22	82.837	17	186.880	6	202.090	12
66.960	20	84.48	27	188.216	7	204.743	12
67.164	24	84.491	27	188.45	6	208.410	11
67.821	19	84.52	27	189.561	9	209.11	5
68.382	21	84.85	28	190.459	7	210.932	11
79.488	14	85.14	29	192.394	4	335.06	2
80.022	14	85.477	29	193.509	4	338.263	2
80.160	16	108.440	25	194.920	8	346.852	1
80.542	16	108.605	25	195.119	4,8	352.107	1
80.55	14	108.862	25	196.640	8	364.468	1
81.651	15	110.591	26	196.923	8	382.83	3
81.943	15	110.732	26	198.555	12		

Significant correlation effects in this P-like ion make the accurate calculation of oscillator strengths difficult.

Bromage et al. [1] have calculated gf-values of resonance transitions to levels of the $3s3p^4$ and $3s^23p^23d$ configurations by using Cowan's multiconfiguration Hartree-XR approach including exchange (X) and relativistic effects (R) and semiempirically scaled Slater parameters. Fawcett et al. [2] have used Cowan's Hartree-Fock-Slater (HX) method to determine gf-values of transitions to $n = 4$ states.

The accuracy ratings for transitions for which the upper or lower level is indicated to be of low purity in LS coupling have been lowered to "E." Transitions involving any level for which the dominant component is significantly less than 50% have been excluded from this compilation.

References

[1] Bromage, G. E., Cowan, R. D., and Fawcett, B. C., Mon. Not. R. Astron. Soc. **183**, 19 (1978).

[2] Fawcett, B. C., Cowan, R. D., Kononov, E. Y., and Hayes, R. W., J. Phys. B **5**, 1255 (1972).

Fe XII: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$3s^23p^3-3s3p^4$	$^4S^\circ - {^4P}$	*357.26*	0	*279906*	4	12	17	0.096	0.45	−0.42	D	1
			364.468	0	274373	4	6	16	0.048	0.23	−0.72	D	1
			352.107	0	284005	4	4	18	0.033	0.15	−0.88	D	1
			346.852	0	288307	4	2	18	0.016	0.073	−1.19	D	1
2.		$^2D^\circ - {^2D}$											
			338.263	46110	341738	6	6	27	0.047	0.31	−0.55	D	1
			335.06	41560	340010	4	4	34	0.058	0.26	−0.63	D	1

Fe XII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
3.		^{2}P° – ^{2}D											
			382.83	80514	341730	4	6	5.5	0.018	0.091	−1.14	D	1
4.	$3p^3$-$3p^2(^3P)3d$	^{4}S° – ^{4}P	*194.12*	0	*515139*	4	12	950	1.6	4.1	0.81	D	1
			195.119	0	512508	4	6	930	0.80	2.1	0.51	D	1
			193.509	0	516772	4	4	940	0.53	1.4	0.33	D	1
			192.394	0	519767	4	2	900	0.25	0.63	0.00	D	1
5.		^{2}D° – ^{4}P											
			[209.11]	41560	519767	4	2	64	0.021	0.058	−1.08	D	1
6.		^{2}D° – ^{2}F	*186.92*	*44290*	*579292*	10	14	1200	0.85	5.2	0.93	E	1
			186.880	46110	581213	6	8	1100	0.80	3.0	0.68	D	1
			186.856	41560	576731	4	6	1100	0.85	2.1	0.53	E	1
			188.45	46110	576731	6	6	69	0.037	0.14	−0.65	E	1
7.		^{2}P° – ^{2}D											
			188.216	74103	605407	2	4	800	0.85	1.1	0.23	E	1
			190.459	80514	605407	4	4	240	0.13	0.33	−0.28	E	1
8.	$3p^3$–$3p^2(^1D)3d$	^{2}D° – ^{2}D	*196.05*	*44290*	*554362*	10	10	620	0.36	2.3	0.55	D	1
			196.640	46110	554654	6	6	480	0.28	1.1	0.23	D	1
			195.119	41560	553923	4	4	670	0.38	0.98	0.18	D	1
			196.923	46110	553923	6	4	110	0.043	0.17	−0.59	D	1
			194.920	41560	554654	4	6	23	0.020	0.051	−1.10	D	1
9.		^{2}D° – ^{2}P											
			189.561	41560	569095	4	2	45	0.012	0.030	−1.32	E	1
10.		^{2}D° – ^{2}S											
			[185.85]	41560	579626	4	2	50	0.013	0.032	−1.28	D	1
11.		^{2}P° – ^{2}D											
			210.932	80514	554654	4	6	58	0.058	0.16	−0.63	D	1
			208.410	74103	553923	2	4	58	0.075	0.10	−0.82	D	1
12.		^{2}P° – ^{2}P	*201.42*	*78377*	*574850*	6	6	830	0.50	2.0	0.48	E	1
			201.121	80514	577727	4	4	640	0.39	1.0	0.19	D	1
			202.090	74103	569095	2	2	730	0.45	0.60	−0.05	E	1
			204.743	80514	569095	4	2	57	0.018	0.049	−1.14	E	1
			198.555	74103	577727	2	4	210	0.25	0.33	−0.30	D	1
13.		^{2}P° – ^{2}S											
			200.356	80514	579626	4	2	660	0.20	0.53	−0.10	D	1
14.	$3p^3$–$3p^2(^3P)4s$	^{4}S° – ^{4}P	*79.87*	0	*1252000*	4	12	660	0.19	0.20	−0.12	D	2
			79.488	0	1258100	4	6	670	0.095	0.099	−0.42	D	2
			80.022	0	1249700	4	4	680	0.065	0.068	−0.59	D	2
			80.55	0	1241000	4	2	720	0.035	0.037	−0.85	D	2
15.		^{2}D° – ^{2}P	*82.014*	*44290*	*1263600*	10	6	1700	0.10	0.27	0.00	D	2
			81.943	46110	1266500	6	4	1400	0.097	0.16	−0.24	D	2
			82.226	41560	1257700	4	2	1900	0.095	0.10	−0.42	D	2
			81.651	41560	1266500	4	4	100	0.01	0.01	−1.4	E	2

TRANSITION PROBABILITIES FOR IRON

Fe XII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
16.	$3p^3$-$3p^2(^1D)4s$	$^2D^o$ - ^2D											
			[80.542]	46110	1287700	6	6	870	0.085	0.14	−0.29	D	2
			80.160	41560	1289100	4	4	600	0.058	0.061	−0.63	D	2
17.		$^2P^o$ - ^2D											
			82.837	80514	1287700	4	6	190	0.030	0.033	−0.92	D	2
			82.744	80514	1289100	4	4	760	0.078	0.085	−0.51	D	2
18.	$3p^3$-$3p^2(^3P)4d$	$^4S^o$ - ^4P											
			65.905	0	1517300	4	4	2000	0.13	0.11	−0.28	D	2
19.		$^2D^o$ - ^2F											
			67.821	41560	1516000	4	6	1400	0.14	0.13	−0.25	D	2
20.		$^2D^o$ - ^2D											
			66.960	41560	1535000	4	6	1600	0.16	0.14	−0.19	D	2
21.		$^2P^o$ - ^2D											
			68.382	74103	1536840	2	4	1700	0.24	0.11	−0.32	D	2
22.	$3p^3$-$3p^2(^1D)4d$	$^2D^o$ - ^2F											
			66.526	46110	1549280	6	8	1700	0.15	0.20	−0.05	D	2
23.		$^2D^o$ - ^2P											
			65.805	46110	1565750	6	4	510	0.022	0.029	−0.88	D	2
24.		$^2P^o$ - ^2S											
			67.164	80514	1569400	4	2	1100	0.038	0.034	−0.82	D	2
25.	$3p^2(^3P)3d$ - $3p^2(^3P)4p$	^4F - $^4D^o$											
			108.440			10	8	330	0.047	0.17	−0.33	D	2
			108.605			8	6	330	0.044	0.13	−0.45	D	2
			108.862			6	4	320	0.038	0.082	−0.64	D	2
26.	$3p^2(^1D)3d$ - $3p^2(^1D)4p$	^2G - $^2F^o$											
			110.591			10	8	310	0.046	0.17	−0.34	D	2
			110.732			8	6	130	0.018	0.052	−0.84	D	2
27.	$3p^2(^3P)3d$ - $3p^2(^3P)4f$	^4F - $^4G^o$											
			84.491			10	12	5200	0.67	1.9	0.83	D	2
			84.48			8	10	4900	0.66	1.5	0.72	D	2
			84.52			6	8	4000	0.57	0.95	0.53	D	2
			84.48			4	6	4500	0.72	0.80	0.46	D	2
28.		^4D - $^4F^o$											
			84.85			6	8	2300	0.33	0.55	0.30	D	2
29.	$3p^2(^1D)3d$ - $3p^2(^1D)4f$	^2G - $^2H^o$											
			85.477			10	12	4600	0.60	1.7	0.78	D	2
			85.14			8	10	3400	0.46	1.0	0.57	D	2

Fe XIII

Ground State $1s^2 2s^2 2p^6 3s^2 3p^2\ ^3P_0$

Ionization Potential [360.0] eV = [2903700] cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
62.10	33	178.05	20	233.234	6	313	3
62.353	31	181.03	20	237	16	318.21	9
62.46	32	185.75	19	238	16	320.800	3
62.699	31	191.24	25	238.38	6	321.45	3
63.188	34	196.525	24	240.713	5	348.184	2
64.139	35	197.434	18	241.10	27	354.34	8
74.327	29	200.021	18	242	16	355.14	8
74.845	29	201.121	18	246.208	5	359.63	2
75.892	29	202.044	17	248.01	26	359.837	2
76.117	30	202.424	17	251.953	5	368.12	2
78.452	38	203.793	18	256	21	372.03	2
78.760	38	203.826	18	256.42	11	372.24	2
81.154	40	204.942	18	261	21	412.98	7
82.010	41	205.91	17	272.19	10	417.90	7
84.270	42	208.679	28	283.26	4	418.17	7
85.461	43	209.916	17	288.75	15	420.33	13
98.128	36	216.83	23	290.89	4	511.60	12
98.523	36	216.87	23	303.35	3	493	1
98.826	36	218.13	23	308.91	14	517	1
107.384	37	223.78	22	311.552	3		
175.15	20	228.28	6	312.164	3		

Significant correlation effects in this Si-like ion make the accurate calculation of oscillator strengths difficult. Flower and Nussbaumer [1] have studied resonance transitions to the $3s3p^3$ and $3s^23p3d$ configurations by using a variation of the Thomas-Fermi method with allowance for configuration interaction. They remark that their results are quite sensitive to the particular configurations included, causing substantial discrepancies with earlier, more restricted calculations. More recently, Bromage et al. [2] have used Cowan's multiconfiguration Hartree-XR approach including exchange (X) and relativistic effects (R) and semiempirically scaled Slater parameters to calculate gf-values for the strongest lines of these same transition arrays.

With the exception of a few lines of the $3p^2$–$3p3d$ array, the results of these two sources are in excellent agreement for the transitions in common. We have adopted the results of ref. [2] for the transitions treated there, while ref. [1] has been quoted for the remaining ones. Flower and Nussbaumer's A-values have been modified to account for the deviation of their calculated wavelengths from observed ones (or from wavelengths computed from experimentally derived energy levels). In a few cases, the calculated energy levels from ref. [2] have been used to determine wavelengths. The accuracy ratings for the two lines mentioned above have been lowered to "E," as have those for transitions whose upper or lower level is indicated to be of low purity in LS coupling. Transitions involving any level whose dominant component is significantly less than 50% have been excluded from this compilation.

The f-value of 0.055 calculated by Sinanoglu and Beck [3] according to their non-closed shell many-electron theory (NCMET) for the $3s^23p^2\ ^3P$–$3s3p^3\ ^3D°$ multiplet is in good agreement with our tabulated value derived from the results for individual lines.

Transitions to $n = 4$ states have been treated by Fawcett et al. [4] in Cowan's statistical Hartree-Fock approximation, as well as by Kastner et al. [5] in a multiconfiguration scheme. The results have been averaged for transitions in common. The remarks made above concerning accuracy ratings for lines connecting levels of low purity apply to these transitions as well. We should note further that the classifications of some observed spectral lines of these arrays are indicated by the respective authors to be questionable.

References

[1] Flower, D. R., and Nussbaumer, H., Astron. Astrophys. **31**, 353 (1974).

[2] Bromage, G. E., Cowan, R. D., and Fawcett, B. C., Mon. Not. R. Astron. Soc. **183**, 19 (1978).

[3] Sinanoglu, O., and Beck, D. R., Chem. Phys. Lett. **24**, 20 (1974).

[4] Fawcett, B. C., Cowan, R. D., Kononov, E. Y., and Hayes, R. W., J. Phys. B **5**, 1255 (1972).

[5] Kastner, S. O., Swartz, M., Bhatia, A. K., and Lapides, J., J. Opt. Soc. Am. **68**, 1558 (1978).

TRANSITION PROBABILITIES FOR IRON

Fe XIII: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$3s^23p^2$–$3s3p^3$	^{3}P – ^{5}S°											
			[517]	18561.0	[212000]	5	5	0.091	3.6(−4)[a]	0.0031	−2.74	E	1
			[493]	9302.5	[212000]	3	5	0.054	3.3(−4)	0.0016	−3.01	E	1
2.		^{3}P – ^{3}D°	*363.31*	*13412.5*	*288660*	9	15	14	0.047	0.51	−0.37	D−	1,2
			368.12	18561.0	290210	5	7	13	0.036	0.22	−0.74	D	2
			359.63	9302.5	287360	3	5	15	0.050	0.18	−0.82	D	2
			348.184	0.0	287205	1	3	10	0.07	0.08	−1.2	E	2
			[372.03]	18561.0	287360	5	5	0.48	0.0010	0.0061	−2.30	D	1
			359.837	9302.5	287205	3	3	3.5	0.0068	0.024	−1.69	D	1
			[372.24]	18561.0	287205	5	3	0.11	1.4(−4)	8.4(−4)	−3.16	E	1
3.		^{3}P – ^{3}P°	*316*	*13412.5*	*[330000]*	9	9	41	0.061	0.57	−0.26	D	1,2
			320.800	18561.0	330279	5	5	34	0.052	0.27	−0.59	D	2
			312.164	9302.5	329647	3	3	20	0.029	0.089	−1.06	D	2
			[321.45]	18561.0	329647	5	3	10	0.0096	0.051	−1.32	D	1
			[313]	9302.5	[329000]	3	1	41	0.020	0.062	−1.22	D	2
			311.552	9302.5	330279	3	5	4.8	0.012	0.036	−1.45	D	1
			[303.35]	0.0	329647	1	3	14	0.057	0.057	−1.24	D	1
4.		^{3}P – ^{1}D°											
			[290.89]	18561.0	362330	5	5	1.3	0.0016	0.0076	−2.10	E	1
			[283.26]	9302.5	362330	3	5	0.70	0.0014	0.0039	−2.38	E	1
5.		^{3}P – ^{3}S°	*218.73*	*13412.5*	415462	9	3	610	0.19	1.4	0.23	D	2
			251.953	18561.0	415462	5	3	350	0.20	0.83	0.00	D	2
			246.208	9302.5	415462	3	3	180	0.16	0.39	−0.32	D	2
			240.713	0.0	415462	1	3	69	0.18	0.14	−0.74	D	2
6.		^{3}P – ^{1}P°											
			[238.38]	18561.0	438056	5	3	9.5	0.0048	0.019	−1.62	D	1
			233.234	9302.5	438056	3	3	53	0.043	0.099	−0.89	D	2
			[228.28]	0.0	438056	1	3	7.4	0.017	0.013	−1.76	D	1
7.		^{1}D – ^{3}D°											
			[412.98]	48068	290210	5	7	0.90	0.0032	0.022	−1.79	D	1
			[417.90]	48068	287360	5	5	0.11	2.8(−4)	0.0019	−2.86	E	1
			[418.17]	48068	287205	5	3	0.32	5.1(−4)	0.0035	−2.59	E	1
8.		^{1}D – ^{3}P°											
			[354.34]	48068	330279	5	5	0.054	1.0(−4)	5.9(−4)	−3.30	E	1
			[355.14]	48068	329647	5	3	0.53	6.0(−4)	0.0035	−2.52	E	1
9.		^{1}D – ^{1}D°	318.21	48068	362330	5	5	53	0.080	0.42	−0.40	E	2
10.		^{1}D – ^{3}S°											
			[272.19]	48068	415462	5	3	6.0	0.0040	0.018	−1.70	D	1
11.		^{1}D – ^{1}P°	256.42	48068	438056	5	3	300	0.18	0.76	−0.05	D	2
12.		^{1}S – ^{3}D°											
			[511.60]	91740	287205	1	3	0.028	3.3(−4)	5.6(−4)	−3.48	E	1

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Fe XIII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
13.		^{1}S – ^{3}P°											
			[420.33]	91740	329647	1	3	0.24	0.0019	0.0026	−2.73	D	1
14.		^{1}S – ^{3}S°											
			[308.91]	91740	415462	1	3	3.9	0.017	0.017	−1.78	D	1
15.		^{1}S – ^{1}P°	[288.75]	91740	438056	1	3	40	0.15	0.14	−0.82	D	2
16.	$3p^2$–$3p3d$	^{3}P – ^{3}F°											
			[238]	18561.0	[438000]	5	7	3.2	0.0038	0.015	−1.72	E	1
			[237]	9302.5	[431000]	3	5	1.1	0.0016	0.0037	−2.32	E	1
			[242]	18561.0	[431000]	5	5	1.3	0.0011	0.0045	−2.25	E	1
17.		^{3}P – ^{3}P°											
			[205.91]	9302.5	494942	3	3	0.16	1.0(−4)	2.1(−4)	−3.51	E	1
			209.916	18561.0	494942	5	3	61	0.024	0.083	−0.92	E	2
			202.424	9302.5	503315	3	1	490	0.10	0.20	−0.52	D	2
			202.044	0.0	494942	1	3	530	0.97	0.65	−0.01	E	2
18.		^{3}P – ^{3}D°	*201.92*	*13412.5*	*508666*	9	15	640	0.65	3.9	0.77	D	2
			203.826	18561.0	509176	5	7	680	0.59	2.0	0.47	D	2
			200.021	9302.5	509250	3	5	190	0.19	0.38	−0.24	D	2
			197.434	0.0	506502	1	3	50	0.08	0.05	−1.1	E	2
			203.793	18561.0	509250	5	5	370	0.23	0.77	0.06	D	2
			201.121	9302.5	506502	3	3	410	0.25	0.50	−0.12	E	2
			204.942	18561.0	506502	5	3	160	0.060	0.20	−0.52	E	2
19.		^{3}P – ^{1}F°											
			[185.75]	18561.0	556910	5	7	32	0.023	0.071	−0.94	D	1
20.		^{3}P – ^{1}P°											
			[181.03]	18561.0	570944	5	3	0.11	3.4(−5)	1.0(−4)	−3.78	E	1
			[178.05]	9302.5	570944	3	3	1.8	8.5(−4)	0.0015	−2.59	E	1
			[175.15]	0.0	570944	1	3	4.3	0.0059	0.0034	−2.23	D	1
21.		^{1}D – ^{3}F°											
			[256]	48068	[438000]	5	7	0.28	3.8(−4)	0.0016	−2.72	E	1
			[261]	48068	[431000]	5	5	3.2	0.0033	0.014	−1.79	D	1
22.		^{1}D – ^{3}P°											
			[223.78]	48068	494942	5	3	7.2	0.0033	0.012	−1.79	E	1
23.		^{1}D – ^{3}D°											
			[216.87]	48068	509176	5	7	24	0.024	0.086	−0.92	D	2
			[216.83]	48068	509250	5	5	96	0.068	0.24	−0.47	D	2
			[218.13]	48068	506502	5	3	12	0.0050	0.018	−1.60	E	1
24.		^{1}D – ^{1}F°	196.525	48068	556910	5	7	720	0.58	1.9	0.46	D	2
25.		^{1}D – ^{1}P°	191.24	48068	570944	5	3	0.0083	2.7(−6)	8.6(−6)	−4.86	E	1
26.		^{1}S – ^{3}P°											
			[248.01]	91740	494942	1	3	0.89	0.0024	0.0020	−2.61	E	1

TRANSITION PROBABILITIES FOR IRON

Fe XIII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
27.		$^1S - ^3D^o$											
			[241.10]	91740	506502	1	3	0.17	4.4(−4)	3.5(−4)	−3.36	E	1
28.		$^1S - ^1P^o$	208.679	91740	570944	1	3	610	1.2	0.82	0.08	D	2
29.	$3p^2$–$3p4s$	$^3P - ^3P^o$											
			74.845	18561.0	1354700	5	5	1000	0.088	0.11	−0.36	D	4
			75.892	18561.0	1336200	5	3	770	0.040	0.050	−0.70	D	4
			74.327	9302.5	1354700	3	5	410	0.057	0.042	−0.77	D	4
30.		$^1D - ^1P^o$	76.117	48068	1361800	5	3	2100	0.11	0.14	−0.26	D	4
31.	$3p^2$–$3p4d$	$^3P - ^3D^o$											
			62.699	9302.5	1604200	3	5	2300	0.23	0.14	−0.17	D	4,5
			62.353	0.0	1603800	1	3	2000	0.35	0.072	−0.46	D	5
32.		$^3P - ^3F^o$											
			62.46	18561.0	1620000	5	7	1200	0.098	0.10	−0.31	D	5
33.		$^3P - ^3P^o$											
						5	5	1400				D	5
			62.10?	9302.5	1620000?	3	1	1600	0.031	0.019	−1.03	D	5
34.		$^1D - ^1F^o$	63.188	48068	1630600	5	7	3900	0.33	0.34	0.21	D	4,5
35.		$^1S - ^1P^o$	64.139	91740	1650900	1	3	2100	0.39	0.082	−0.41	D	5
36.	$3p3d$–$3p4p$	$^3F^o - ^3D$											
			98.128	[448000]	[1467000]	9	7	410	0.046	0.13	−0.38	D	4
			98.523	[438000]	[1453000]	7	5	380	0.040	0.091	−0.55	D	4
			98.826	[431000]	[1443000]	5	3	390	0.034	0.055	−0.77	E	4
37.		$^1F^o - ^1D$	107.384	556910	1488150	7	5	1800	0.22	0.54	0.19	D	4
38.	$3p3d$–$3p4f$	$^3F^o - ^3G$											
			78.452	[448000]	[1723000]	9	11	6500	0.73	1.7	0.82	D	4,5
			78.760	[438000]	[1708000]	7	9	4100	0.50	0.90	0.54	E	4,5
39.		$^3P^o - ^3F$											
						3	5	1900				E	5
40.		$^3P^o - ^3D$											
			81.154?	503315	1735500?	1	3	2300	0.68	0.18	−0.17	D	5
41.		$^3D^o - ^3F$											
			82.010?	509176	1728500?	7	9	3700	0.48	0.91	0.53	E	4,5
						3	5	1900				E	5
42.		$^1F^o - ^1G$	84.270	556910	1743600	7	9	5600	0.77	1.5	0.73	D	4,5
43.		$^1P^o - ^1D$	85.461?	570944	1741100?	3	5	3400	0.62	0.52	0.27	D	5

[a] The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

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Fe XIV

Ground State $1s^22s^22p^63s^23p\ ^2P^{\circ}_{1/2}$

Ionization Potential [391.0] eV = [3153700] cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
58.963	47	76.022	49	219.13	21	356.60	1
59.579	47	76.137	49	220.09	21	719.58	51
59.626	47	76.152	49	252.190	3	747.38	51
69.176	46	78.449	20	257.385	3	786.41	52
69.386	46	78.584	20	264.799	3	811.03	52
69.66	46	78.769	20	270.512	3	819.74	52
69.685	45	90.845	48	274.22	2	1079	53
70.251	46	91.009	48	280.69	11	1095	53
70.613	45	91.273	48	288.45	11	1098	53
72.796	50	211.32	21	289.17	2		
72.95	50	216.95	24	334.15	1		
73.08	50	218.21	24	353.84	1		

Strong configuration interaction in the Al sequence makes the accurate calculation of oscillator strengths for Fe XIV difficult. In many cases the results are quite sensitive to the particular configurations included.

Blaha [1] has computed gf-values for a large number of transitions by combining Hartree-Fock wave functions with mixing coefficients which were derived from a diagonalization of a semi-empirical Slater parameter matrix. The accuracy of these data is difficult to assess because of the combination of *ab initio* and semi-empirical methods. Mason [2] has provided f-values for the $3p$-$3d$ transitions by using a scaled Thomas-Fermi method. The Hartree-Fock-Slater calculations of Fawcett et al. [3] might be expected to be reasonably accurate, although they have not explicitly included configuration interaction. It should be noted that all of the above calculations have included the effects of intermediate coupling.

The most sophisticated material available for high ions of the Al sequence consists of Weiss' superposition-of-configurations (SOC) calculations [4] and Froese Fischer's nonrelativistic multiconfiguration Hartree-Fock (MCHF) approach [5,6]. However, only multiplet f-values have been determined by these two investigators, and accurate values of relative strengths within multiplets are not available. Moreover, the accuracies of their multiplet strengths were difficult to assess, on account of the level crossings occurring along the isoelectronic sequence at or near the iron ion.

Multiplet f-values derived from Blaha's data for individual lines are in good agreement with Weiss' results for two of the four multiplets in common, while in the remaining two cases they deviate by 36 and 58 percent, respectively. Blaha's relative values nevertheless indicate that LS coupling is a good approximation in these cases. Weiss' multiplet f-values have thus been quoted here and his multiplet strengths have been distributed according to LS-coupling rules. Froese Fischer has made a detailed study of the $3s^23p\ ^2P^{\circ}$–$3s3p^2\ ^2D$ and $3p\ ^2P^{\circ}$–$3d\ ^2D$ transitions in the Al sequence, and her multiplet values are in good agreement with those presented here. She has used the same method to calculate the oscillator strength of the $4s\ ^2S$ – $4p\ ^2P^{\circ}$ multiplet. The value of 0.48 obtained by using her own calculated energy difference is significantly lower than the value of 0.58 obtained by incorporating the experimentally derived energy difference, and both of these are lower than the multiplet value derived from the results of ref. [1] for individual lines. It is not known whether these discrepanicies arise from the methods used in performing the transition integral calculations or from the classifications of the observed spectral lines from which the energies of the $4s$ and $4p$ levels were derived.

References

[1] Blaha, M., Sol. Phys. **17**, 99 (1971).
[2] Mason, H. E., Mon. Not. R. Astron. Soc., **170**, 651 (1975).
[3] Fawcett, B. C., Cowan, R. D., Kononov, E. Y., and Hayes, R. W., J. Phys. B **5**, 1255 (1972).
[4] Weiss, A. W., *Beam-Foil Spectroscopy*, Vol. 1, 51-68 (Eds. Sellin, I. A., and Pegg, D. J., Plenum Press, New York, 1976) and private communication.
[5] Froese Fischer, C., Can. J. Phys. **54**, 740 (1976).
[6] Froese Fischer, C., Can. J. Phys. **56**, 983 (1978).

TRANSITION PROBABILITIES FOR IRON

Fe XIV: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$3s^23p-3s3p^2$	$^2P^o - {}^2D$	*317.20*	*12568.3*	*300590*	6	10	21	0.063	0.43	−0.42	D	1
			353.84	18852.5	301460	4	6	19	0.054	0.25	−0.67	D	1
			334.15	0.0	299280	2	4	24	0.079	0.17	−0.80	D	1
			356.60	18852.5	299280	4	4	0.63	0.0012	0.0056	−2.32	D	1
2.		$^2P^o - {}^2S$	*281.01*	*12568.3*	364670	6	2	200	0.082	0.46	−0.31	D	1
			289.17	18852.5	364670	4	2	11	0.0069	0.026	−1.56	E	1
			274.22	0.0	364670	2	2	210	0.24	0.43	−0.32	C	1
3.		$^2P^o - {}^2P$	*262.28*	*12568.3*	*393840*	6	6	520	0.54	2.8	0.51	D	1
			264.799	18852.5	396510	4	4	430	0.45	1.6	0.26	D	1
			257.385	0.0	388490	2	2	180	0.18	0.31	−0.44	D	1
			270.512	18852.5	388490	4	2	260	0.14	0.50	−0.25	D	1
			252.190	0.0	396510	2	4	110	0.21	0.35	−0.38	D	1
4.	$3s^23p-3s3d^2$	$^2P^o - {}^2S$				6	2		3.0(−4)[a]		−2.74	C	4
5.	$3s^23d-3s3p(^3P^o)3d$	$^2D - {}^2F^o$											
						6	8		0.032		−0.72	E	1
						4	6		0.029		−0.94	E	1
						6	6		0.0050		−1.52	E	1
6.		$^2D - {}^2D^o$											
						6	6		0.26		0.19	D	1
						4	4		0.27		0.03	D	1
						6	4		6.1(−4)		−2.44	E	1
						4	6		0.0055		−1.66	E	1
7.		$^2D - {}^2P^o$											
						6	4		0.12		−0.14	D	1
						4	2		0.10		−0.40	D	1
						4	4		0.0019		−2.12	E	1
8.	$3s^23d-3s3p(^1P^o)3d$	$^2D - {}^2F^o$											
						6	8		0.52		0.49	D	1
						4	6		0.56		0.35	D	1
						6	6		0.016		−1.02	E	1
9.		$^2D - {}^2D^o$											
						6	6		0.0048		−1.54	E	1
						4	4		0.0062		−1.61	E	1
						4	6		0.0040		−1.80	E	1
10.		$^2D - {}^2P^o$											
						6	4		0.029		−0.76	E	1
						4	2		0.0082		−1.48	E	1
						4	4		6.1(−4)		−2.61	E	1

Fe XIV: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
11.	$3s3p^2$-$3p^3$	^{4}P - ^{4}S°											
			288.45			6	4	170	0.14	0.80	−0.08	D	1
			280.69			4	4	130	0.15	0.55	−0.22	D	1
						2	4		0.15		−0.52	D	1
12.		^{2}D - ^{2}D°											
						6	6		0.050		−0.52	E	1
						4	4		0.037		−0.83	E	1
						6	4		0.0064		−1.42	E	1
						4	6		0.0070		−1.55	E	1
13.		^{2}D - ^{2}P°											
						6	4		0.015		−1.05	E	1
						4	2		0.019		−1.12	E	1
						4	4		0.0075		−1.52	E	1
14.		^{2}S - ^{2}D°											
						2	4		0.019		−1.42	E	1
15.		^{2}S - ^{2}P°											
						2	4		0.043		−1.07	E	1
						2	2		0.0015		−2.52	E	1
16.		^{2}P - ^{2}D°											
						4	6		0.031		−0.91	E	1
						2	4		0.028		−1.25	E	1
						4	4		0.017		−1.17	E	1
17.		^{2}P - ^{2}P°											
						4	4		0.11		−0.36	D	1
						2	2		0.059		−0.93	E	1
						4	2		0.0077		−1.51	E	1
18.	$3s3p(^3$P°$)3d$-$3p^2(^1$D$)3d$	^{2}P° - ^{2}S				6	2		0.0012		−2.14	D	4
19.	$3s3p(^1$P°$)3d$-$3p^2(^1$D$)3d$	^{2}P° - ^{2}S				6	2		0.032		−0.72	D	4
20.	$3s3p^2$-$3s^24p$	^{2}D - ^{2}P°	*78.636*	*300590*	*1572270*	10	6	320	0.018	0.047	−0.74	C	4
			[78.584]	301460	1573990	6	4	290	0.018	0.028	−0.97	C	*ls*
			[78.769]	299280	1568820	4	2	330	0.015	0.016	−1.21	C	*ls*
			[78.449]	299280	1573990	4	4	33	0.0030	0.0031	−1.92	D	*ls*
21.	$3p$-$3d$	^{2}P° - ^{2}D	*216.53*	*12568.3*	*474400*	6	10	440	0.51	2.2	0.49	C	2
			219.13	18852.5	475200	4	6	420	0.45	1.3	0.26	C	2
			211.32	0.0	473210	2	4	370	0.50	0.70	0.00	C	2
			220.09	18852.5	473210	4	4	83	0.060	0.17	−0.62	C	2
22.	$3s^23p$-$3p^2(^1$D$)3d$	^{2}P° - ^{2}S				6	2		1.1(−4)		−3.18	D	4

TRANSITION PROBABILITIES FOR IRON

Fe XIV: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
23.	$3s3p^2$–$3s3p(^3P^o)3d$	$^4P - ^4F^o$											
						6	8		0.0027		−1.79	E	1
						4	6		0.0017		−2.17	E	1
						2	4		0.072		−0.84	E	1
						6	6		6.2(−4)		−2.43	E	1
						4	4		0.022		−1.06	E	1
						6	4		0.0057		−1.47	E	1
24.		$^4P - ^4D^o$											
			218.21			6	8	430	0.41	1.8	0.39	D	1
			216.95			4	6	130	0.14	0.40	−0.25	D	1
						2	4		0.40		−0.10	D	1
						6	6		0.19		0.06	D	1
						4	4		0.034		−0.87	E	1
						2	2		0.29		−0.24	D	1
						6	4		0.0068		−1.39	E	1
						4	2		7.9(−4)		−2.50	E	1
25.		$^4P - ^4P^o$											
						6	6		0.025		−0.82	E	1
						4	4		0.16		−0.19	D	1
						2	2		0.0055		−1.96	E	1
						6	4		0.055		−0.48	E	1
						4	2		0.10		−0.40	D	1
						4	6		0.27		0.03	D	1
						2	4		0.0079		−1.80	E	1
26.		$^2D - ^2F^o$											
						6	8		0.22		0.12	D	1
						4	6		0.20		−0.10	D	1
						6	6		0.029		−0.76	E	1
27.		$^2D - ^2D^o$											
						6	6		8.6(−4)		−2.29	E	1
						4	4		0.0049		−1.71	E	1
						6	4		9.6(−4)		−2.24	E	1
28.		$^2D - ^2P^o$											
						6	4		0.18		0.03	D	1
						4	2		0.068		−0.57	E	1
						4	4		0.020		−1.10	E	1
29.		$^2S - ^2D^o$											
						2	4		0.093		−0.73	E	1
30.		$^2S - ^2P^o$											
						2	4		0.0021		−2.38	E	1
						2	2		0.070		−0.85	E	1

Fe XIV: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
31.		^{2}P – ^{2}F°											
						4	6		3.4(−4)		−2.87	E	1
32.		^{2}P – ^{2}D°											
						4	6		0.79		0.50	D	1
						2	4		0.46		−0.04	D	1
						4	4		0.093		−0.43	E	1
33.		^{2}P – ^{2}P°											
						4	4		0.010		−1.40	E	1
						2	2		0.12		−0.62	D	1
						4	2		0.061		−0.61	D	1
						2	4		0.37		−0.13	D	1
34.	$3s3p^2$–$3s3p(^1P°)3d$	^{2}D – ^{2}F°											
						6	8		0.16		−0.02	D	1
						4	6		0.18		−0.14	D	1
						6	6		0.0067		−1.40	E	1
35.		^{2}D – ^{2}D°											
						6	6		0.30		0.26	D	1
						4	4		0.31		0.09	D	1
						6	4		0.025		−0.82	E	1
						4	6		0.063		−0.60	E	1
36.		^{2}D – ^{2}P°											
						6	4		0.34		0.31	D	1
						4	2		0.38		0.18	D	1
						4	4		0.082		−0.48	E	1
37.		^{2}S – ^{2}D°											
						2	4		0.012		−1.62	E	1
38.		^{2}S – ^{2}P°											
						2	4		0.69		0.14	D	1
						2	2		0.15		−0.52	D	1
39.		^{2}P – ^{2}F°											
						4	6		0.0069		−1.56	E	1
40.		^{2}P – ^{2}D°											
						4	6		0.026		−0.98	E	1
						2	4		0.032		−1.19	E	1
						4	4		0.0060		−1.62	E	1
41.		^{2}P – ^{2}P°											
						4	4		0.0071		−1.55	E	1
						2	2		0.21		−0.38	D	1
						4	2		0.0061		−1.61	E	1
						2	4		0.0014		−2.55	E	1
42.	$3s3p(^3P°)3d$–$3s3d^2$	^{2}P° – ^{2}S				6	2		0.11		−0.18	C	4

TRANSITION PROBABILITIES FOR IRON

Fe XIV: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
43.	$3s3p(^1P^o)3d - 3s3d^2$	$^2P^o - ^2S$				6	2		0.11		−0.18	C	4
44.	$3p^3-3p^2(^1D)3d$	$^2P^o - ^2S$				6	2		0.090		−0.27	C	4
45.	$3p-4s$	$^2P^o - ^2S$	*70.301*	*12568.3*	1435020	6	2	2500	0.062	0.086	−0.43	C	4
			70.613	18852.5	1435020	4	2	1600	0.061	0.057	−0.61	C	*ls*
			[69.685]	0.0	1435020	2	2	870	0.063	0.029	−0.90	C	*ls*
46.	$3s3p^2 - 3s3p(^3P^o)4s$	$^4P - ^4P^o$											
			69.66			6	6	1300	0.092	0.13	−0.26	D	3
			70.251			6	4	810	0.040	0.056	−0.62	D	3
			69.176			4	6	560	0.060	0.055	−0.62	D	3
			69.386			2	4	760	0.11	0.050	−0.66	D	3
47.	$3p-4d$	$^2P^o - ^2D$	*59.375*	*12568.3*	*1696770*	6	10	3200	0.28	0.33	0.23	C	4
			59.579	18852.5	1697290	4	6	3200	0.25	0.20	0.00	C	*ls*
			58.963	0.0	1695980	2	4	2700	0.28	0.11	−0.25	C	*ls*
			[59.626]	18852.5	1695980	4	4	530	0.028	0.022	−0.95	C	*ls*
48.	$3d-4p$	$^2D - ^2P^o$	*91.085*	*474400*	*1572270*	10	6	380	0.028	0.084	−0.55	C	4
			91.009	475200	1573990	6	4	340	0.028	0.050	−0.78	C	*ls*
			91.273	473210	1568820	4	2	370	0.023	0.028	−1.03	C	*ls*
			[90.845]	473210	1573990	4	4	38	0.0047	0.0056	−1.73	D	*ls*
49.	$3d-4f$	$^2D - ^2F^o$	*76.099*	*474400*	*1788470*	10	14	6900	0.84	2.1	0.92	C	1,3
			76.152	475200	1788360	6	8	7000	0.81	1.2	0.69	C	3
			76.022	473210	1788620	4	6	6600	0.86	0.86	0.54	C	3
			[76.137]	475200	1788620	6	6	390	0.034	0.051	−0.69	E	1
50.	$3s3p(^3P^o)3d - 3s3p(^3P^o)4f$	$^4F^o - ^4G$											
			72.796			10	12	7900	0.75	1.8	0.88	D	3
			73.08			8	10	5000	0.50	0.96	0.60	D	3
			72.95			6	8	5100	0.54	0.78	0.51	D	3
51.	$4s-4p$	$^2S - ^2P^o$	*728.60*	1435020	*1572270*	2	6	29	0.69	3.3	0.14	D	1
			[719.58]	1435020	1573990	2	4	30	0.46	2.2	−0.04	D	1
			[747.38]	1435020	1568820	2	2	26	0.22	1.1	−0.36	D	1
52.	$4p-4d$	$^2P^o - ^2D$	*803.21*	*1572270*	*1696770*	6	10	39	0.63	10	0.58	D	1
			[811.03]	1573990	1697290	4	6	39	0.57	6.1	0.36	D	1
			[786.41]	1568820	1695980	2	4	35	0.65	3.4	0.11	D	1
			[819.74]	1573990	1695980	4	4	6.3	0.063	0.68	−0.60	D	1
53.	$4d-4f$	$^2D - ^2F^o$	*1091*	*1696770*	*1788470*	10	14	7.2	0.18	6.5	0.26	D	1
			[1098]	1697290	1788360	6	8	7.1	0.17	3.7	0.01	D	1
			[1079]	1695980	1788620	4	6	6.9	0.18	2.6	−0.14	D	1
			[1095]	1697290	1788620	6	6	0.47	0.0084	0.18	−1.30	D	1

[a] The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Fe XV

Ground State $1s^2 2s^2 2p^6 3s^2\ {}^1S_0$

Ionization Potential [456] eV = [3678000] cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
38.95	11	70.054	20	227.21	12	312.55	4
52.911	10	70.224	28	227.70	12	317.62	3
59.404	19	70.519	28	233.87	12	321.82	3
63.957	22	70.53	27	234.76	12	323.57	7
65.370	17	70.59	27	235.27	12	327.03	4
65.612	17	70.601	27	243.80	15	417.24	1
66.238	17	71.062	26	284.15	2	435.20	5
68.860	23	73.199	25	292.36	3	470.26	5
68.884	24	73.471	29	302.45	3	481.52	6
69.049	23	73.473	21	303.40	14	493.63	5
69.66	18	191.40	13	305.00	3		
69.945	20	196.73	13	305.88	14		
69.987	20	224.76	12	307.78	3		

Results of several accurate theoretical calculations are available for in-shell ($n = 3$) transitions in this highly ionized member of the Mg isoelectronic sequence. Cheng and Johnson [1] have used a relativistic multi-configuration Hartree-Fock (MCHF) approach to determine line strengths for several transitions of the $3s^2$–$3s3p$ and $3s3p$–$3p^2$ arrays. Weiss [2] has performed superposition-of-configurations (SOC) calculations in intermediate coupling to determine line strengths for numerous transitions within the $n = 3$ shell, and his results are tabulated here for several transitions not treated in ref. [1].

We note that, with the exception of the $3s^2\ {}^1S$–$3s3p\ {}^3P_1^\circ$ intercombination line, the results of Aymar and Luc-Koenig [3] obtained by introducing relativistic effects via a parametric potential method are in very good agreement with the data tabulated here. Multiplet strengths which include the effects of configuration interaction have been calculated by Froese [4] and by Crossley and Dalgarno [5] in the Hartree-Fock and Z-expansion approximations, respectively, for many additional $\Delta n = 0$ transitions, but they are not tabulated here since the wavelengths are unknown at this time.

The f-values of the $3s^2\ {}^1S$ – $3snp\ {}^1P^\circ$ ($n = 4,5$) transitions calculated by Shorer et al. [6] in the relativistic random phase approximation (RRPA) are quoted here, and their results for the $3s^2$–$3s3p$ transitions are in good agreement with those of ref. [1].

The multiconfiguration results of Kastner et al. [7] in intermediate coupling have been tabulated for a number of $3p3d$–$3p4f$ transitions. Data for additional lines involving electrons which occupy orbitals of principal quantum number $n = 4$ are from the Hartree-Fock-Slater (HX) results of Cowan and Widing [8] and Fawcett et al. [9]. (The f-value for the $3s3p\ {}^3P_2^\circ$–$3s3d\ {}^3D_3$ transition has also been taken from ref. [8].) Froese Fischer [10] has calculated oscillator strengths in a nonrelativistic MCHF scheme for a few D–F° multiplets. Her f-value of 0.90 for the multiplet could not be directly compared to the results of Cowan and Widing, since they have published gf-values for only the strongest lines of the multiplet.

A single-configuration approximation has been applied by Burkhalter et al. [11] to the calculation of A-values for several inner-shell transitions. Because of the neglect of correlation effects, we have not tabulated these data.

References

[1] Cheng, K. T., and Johnson, W. R., Phys. Rev. A **16**, 263 (1977).
[2] Weiss, A. W., private communication.
[3] Aymar, M., and Luc-Koenig, E., Phys. Rev. A **15**, 821 (1977).
[4] Froese, C., Astrophys. J. **140**, 361 (1964).
[5] Crossley, R. J. S., and Dalgarno, A., Proc. R. Soc. London, Ser. A **286**, 510 (1965).
[6] Shorer, P., Lin, C. D., and Johnson, W. R., Phys. Rev. A **16**, 1109 (1977).
[7] Kastner, S. O., Swartz, M., Bhatia, A. K., and Lapides, J., J. Opt. Soc. Am. **68**, 1558 (1978).
[8] Cowan, R. D., and Widing, K. G., Astrophys, J. **180**, 285 (1973).
[9] Fawcett, B. C., Cowan, R. D., Kononov, E. Y., and Hayes, R. W., J. Phys. B **5**, 1255 (1972).
[10] Froese Fischer, C., J. Opt. Soc. Am. **69**, 118 (1979).
[11] Burkhalter, P. G., Cohen, L., Cowan, R. D., and Feldman, U., J. Opt. Soc. Am. **69**, 1133 (1979).

TRANSITION PROBABILITIES FOR IRON

Fe XV: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$3s^2$–$3s3p$	^{1}S – ^{3}P°											
			417.24	0	239670	1	3	0.41	0.0032	0.0044	−2.49	D	1
2.		^{1}S – ^{1}P°	284.15	0	351930	1	3	220	0.80	0.75	−0.10	C	1
3.	$3s3p$–$3p^2$	^{3}P° – ^{3}P	*306.67*	*246900*	*572980*	9	9	179	0.252	2.29	0.356	C+	1
			305.00	253820	581710	5	5	127	0.177	0.891	−0.052	C+	1
			307.78	239670	564580	3	3	49.1	0.0697	0.212	−0.679	C+	1
			321.82	253820	564580	5	3	71.1	0.0663	0.351	−0.480	C+	1
			317.62	239670	554510	3	1	177	0.0893	0.280	−0.572	C+	1
			292.36	239670	581710	3	5	44.6	0.0952	0.275	−0.544	C+	1
			302.45	233950	564580	1	3	69.3	0.285	0.284	−0.545	C+	1
4.		^{3}P° – ^{1}D											
			327.03	253820	559610	5	5	20	0.032	0.17	−0.80	C	1
			312.55	239670	559610	3	5	11	0.027	0.083	−1.09	D	1
5.		^{1}P° – ^{3}P											
			[435.20]	351930	581710	3	5	4.7	0.022	0.096	−1.17	D	1
			[470.26]	351930	564580	3	3	0.084	2.8(−4)*	0.0013	−3.08	D	1
			[493.63]	351930	554510	3	1	0.64	7.8(−4)	0.0038	−2.63	D	1
6.		^{1}P° – ^{1}D	481.52	351930	559610	3	5	15.5	0.0896	0.426	−0.571	C+	1
7.		^{1}P° – ^{1}S	323.57	351930	660980?	3	1	202	0.105	0.337	−0.50	C	2
8.	$3s3d$–$3p3d$	^{3}D – ^{3}F°	383.98	680360	940790	15	21	48.8	0.151	2.86	0.355	C	10
9.		^{1}D – ^{1}F°				5	7		0.378		0.276	C	10
10.	$3s^2$–$3s4p$	^{1}S – ^{1}P°	52.911	0	1889970	1	3	2940	0.370	0.064	−0.432	C	6
11.	$3s^2$–$3s5p$	^{1}S – ^{1}P°	38.95	0	2567000	1	3	1690	0.115	0.0147	−0.94	C	6
12.	$3s3p$–$3s3d$	^{3}P° – ^{3}D	*230.70*	*246900*	*680360*	9	15	238	0.316	2.16	0.454	C	2,8
			233.87	253820	681410	5	7	239	0.274	1.05	0.137	C	8
			227.21	239670	679790	3	5	180	0.233	0.522	−0.156	C+	2
			224.76	233950	678860	1	3	138	0.314	0.232	−0.504	C+	2
			234.76	253820	679790	5	5	54.5	0.0450	0.174	−0.648	C+	2
			227.70	239670	678860	3	3	99.0	0.0769	0.173	−0.637	C+	2
			[235.27]	253820	678860	5	3	6.2	0.0031	0.012	−1.81	D	2
13.		^{3}P° – ^{1}D											
			[196.73]	253820	762130	5	5	0.11	6.5(−5)	2.1(−4)	−3.49	D−	2
			[191.40]	239670	762130	3	5	3.0	0.0028	0.0052	−2.08	D	2
14.		^{1}P° – ^{3}D											
			303.40	351930	679790	3	5	0.14	3.2(−4)	9.6(−4)	−3.02	D	2
			[305.88]	351930	678860	3	3	0.24	3.3(−4)	0.0010	−3.00	D	2
15.		^{1}P° – ^{1}D	243.80	351930	762130	3	5	419	0.623	1.50	0.272	C+	2
16.	$3p^2$–$3p3d$	^{1}D – ^{1}F°				5	7		0.232		0.064	C	10

Fe XV: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i(cm^{-1})	E_k(cm^{-1})	g_i	g_k	A_{ki}(10^8s^{-1})	f_{ik}	S(at.u.)	log gf	Accuracy	Source
17.	$3s3p$–$3s4s$	^{3}P° – ^{3}S	*65.930*	*246900*	1763670	9	3	2800	0.061	0.12	−0.26	D	8
			66.238	253820	1763670	5	3	1600	0.062	0.068	−0.51	D	8
			65.612	239670	1763670	3	3	980	0.063	0.041	−0.72	D	8
			65.370	233950	1763670	1	3	320	0.062	0.013	−1.21	D	8
18.		^{1}P° – ^{1}S	69.66?	351930	1787000?	3	1	1900	0.047	0.032	−0.85	D	8
19.	$3s3p$–$3s4d$	^{1}P° – ^{1}D	59.404	351930	2035320	3	5	3400	0.30	0.18	−0.05	C	8
20.	$3s3d$–$3s4f$	^{3}D – ^{3}F°											
			70.054	681410	2108880	7	9	8800	0.83	1.3	0.76	C	8
			69.987	679790	2108630	5	7	7900	0.81	0.93	0.61	C	8
			69.945	678860	2108550	3	5	7400	0.91	0.63	0.44	C	8
21.		^{1}D – ^{1}F°	73.473?	762130	2123170	5	7	6100	0.69	0.83	0.54	C	10
22.	$3p^2$–$3s4f$	^{1}D – ^{1}F°	[63.957]	559610	2123170	5	7	2300	0.20	0.21	0.00	D	10
23.	$3p3d$–$3p4f$	^{3}F° – ^{3}G											
			68.860	949660	2402110	9	11	9200	0.80	1.6	0.86	C	7
			69.049	938190	2386710	7	9	6500	0.60	0.95	0.62	D	7
24.		^{3}F° – ^{3}F											
			68.884?	938190	2389900?	7	9	2200	0.20	0.32	0.15	D	7
25.		^{1}F° – ^{1}G	73.199			7	9	8800	0.91	1.5	0.80	C	7
26.		^{3}D° – ^{3}F											
			71.062			7	9	5200	0.51	0.83	0.55	D	7
			71.062			3	5	6400	0.81	0.57	0.38	C	7
27.		^{3}D° – ^{3}D											
			70.59			7	7	1700	0.13	0.21	−0.04	C	9
			70.53			5	5	3100	0.23	0.27	0.06	D	9
			70.53			7	5	260	0.014	0.023	−1.01	D	9
			70.601			5	7	4500	0.47	0.55	0.37	D	7
28.		^{3}P° – ^{3}D											
			70.519			3	5	4400	0.55	0.38	0.21	C	7
			70.224			1	3	4100	0.91	0.21	−0.04	C	7
			70.224			3	3	4200	0.31	0.22	−0.03	C	7
29.		^{1}P° – ^{1}D	73.471?			3	5	7000	0.94	0.69	0.45	C	7

* The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

TRANSITION PROBABILITIES FOR IRON

Fe XVI

Ground State $1s^2 2s^2 2p^6 3s\ ^2S_{1/2}$

Ionization Potential 489.5 eV = 3947840 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
36.749	3	48.979	11	117.70	16	335.407	1
36.803	3	50.350	2	123.46	19	360.798	1
39.827	8	50.555	2	124.61	19	684.74	17
40.153	8	54.142	6	124.70	19	718.08	17
40.163	8	54.728	6	143.99	22	724.74	17
40.199	14	54.769	6	144.18	22	843.38	15
40.245	14	62.879	5	144.25	22	904.90	15
40.247	14	63.719	5	146.2	18	1411	25
41.095	13	66.263	10	148.0	18	1483	25
41.137	13	66.368	10	167.48	21	1496	25
41.17	13	66.393	10	167.84	21	1652	20
41.91	7	76.299	9	168.61	21	1672	20
42.30	7	76.502	9	251.058	4	1688	20
46.661	12	76.796	9	262.967	4	1690	24
46.718	12	96.245	23	265.007	4	1813	24
46.725	12	96.354	23	266.62	26		
48.883	11	96.364	23	266.96	26		
48.97	11	117.15	16	267.04	26		

Oscillator strengths have been computed for a great many transitions of this highly ionized member of the sodium isoelectronic sequence.

Kim and Cheng [1] have applied the relativistic single-configuration Hartree-Fock method to the calculation of f-values of individual lines for all cases in which the valence electron undergoes a transition of the type $nl\ ^2L - n'l'\ ^2L'$ $(n, n' = 3{,}4)$.

Froese Fischer [2] has calculated f-values for a few multiplets of this type by using the nonrelativistic multiconfiguration Hartree-Fock approach, and her results are in very good agreement with the multiplet oscillator strengths derived from the results of ref. [1].

Biemont [3] has computed a large number of Hartree-Fock f-values; because of the small correlation expected in the Na sequence, these results are expected to be quite accurate.

Tull et al. [4] have computed a large number of oscillator strengths for Fe XVI by using the frozen-core HF approximation, of which we have included some strong transitions arising from $3d$ and $4d$ states. Relativistic corrections to the theoretical wavelengths have been used in their calculation.

Froese Fischer [5] has parametrized additional Hartree-Fock data of Biemont, obtaining fits with errors of 1–2% over the isoelectronic sequence.

Burkhalter et al. [6] have published gA-values for numerous transitions involving excitation of a core ($2p$) electron. We have not tabulated these data, however, since the authors apparently have not taken configuration interaction into account.

References

[1] Kim, Y.-K., and Cheng, K.-t., J. Opt. Soc. Am. **68**, 836 (1978).
[2] Froese Fischer, C., *Beam-Foil Spectroscopy*, Vol. 1, 69–76, Ed. Sellin, I. A., and Pegg, D. J., Plenum Press, New York (1976).
[3] Biemont, E., J. Quant. Spectrosc. Radiat. Transfer **15**, 531 (1975); **16**, 627 (1976).
[4] Tull, C. E., McEachran, R. P., and Cohen, M., At. Data **3**, 169 (1971).
[5] Froese Fischer, C., Phys. Scr. **14**, 269 (1976).
[6] Burkhalter, P. G., Cohen, L., Cowan, R. D., and Feldman, U., J. Opt. Soc. Am. **69**, 1133 (1979).

Fe XVI: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$3s-3p$	$^2S - {}^2P°$	343.47	0	291150	2	6	74.8	0.397	0.898	−0.100	B	1
			335.407	0	298140	2	4	80.6	0.272	0.601	−0.264	B	1
			360.798	0	277160	2	2	64.1	0.125	0.297	−0.602	B	1
2.	$3s-4p$	$^2S - {}^2P°$	50.418	0	1983410	2	6	1890	0.217	0.0719	−0.363	B	1
			50.350	0	1986100	2	4	1850	0.141	0.0467	−0.550	B	1
			50.555	0	1978040	2	2	1970	0.0756	0.0252	−0.820	B	1
3.	$3s-5p$	$^2S - {}^2P°$	36.767	0	2719830	2	6	1150	0.0697	0.0169	−0.856	C+	3
			36.749	0	2721160	2	4	1150	0.0467	0.0113	−1.030	C	*ls*
			36.803	0	2717170	2	2	1100	0.023	0.0056	−1.34	D	*ls*
4.	$3p-3d$	$^2P° - {}^2D$	259.01	291150	677240	6	10	170	0.285	1.46	0.234	B	1
			262.967	298140	678420	4	6	163	0.254	0.880	0.007	B	1
			251.058	277160	675470	2	4	156	0.294	0.486	−0.231	B	1
			265.007	298140	675470	4	4	26.5	0.0279	0.0974	−0.952	B	1
5.	$3p-4s$	$^2P° - {}^2S$	63.436	291150	1867530	6	2	3230	0.0649	0.0813	−0.410	B	1
			63.719	298140	1867530	4	2	2170	0.0661	0.0555	−0.578	B	1
			62.879	277160	1867530	2	2	1050	0.0622	0.0258	−0.905	B	1
6.	$3p-4d$	$^2P° - {}^2D$	54.535	291150	2124850	6	10	4150	0.308	0.332	0.267	B	1
			54.728	298140	2125360	4	6	4160	0.280	0.202	0.049	B	1
			54.142	277160	2124080	2	4	3410	0.300	0.107	−0.222	B	1
			54.769	298140	2124080	4	4	698	0.0314	0.0226	−0.901	B	1
7.	$3p-5s$	$^2P° - {}^2S$	42.18	291150	2662000	6	2	1380	0.0123	0.0102	−1.132	C+	3
			42.30	298140	2662000	4	2	910	0.012	0.0068	−1.311	C	*ls*
			41.91	277160	2662000	2	2	468	0.0123	0.00340	−1.61	C	*ls*
8.	$3p-5d$	$^2P° - {}^2D$	40.045	291150	2788370	6	10	2490	0.0996	0.0788	−0.224	C+	3
			40.153	298140	2788610	4	6	2470	0.089	0.0473	−0.446	C	*ls*
			39.827	277160	2788020	2	4	2110	0.100	0.0263	−0.70	C	*ls*
			[40.163]	298140	2788020	4	4	410	0.010	0.0053	−1.40	D	*ls*
9.	$3d-4p$	$^2D - {}^2P°$	76.560	677240	1983410	10	6	750	0.0397	0.100	−0.401	C	1
			76.502	678420	1986100	6	4	668	0.0391	0.0591	−0.630	B	1
			76.796	675470	1978040	4	2	769	0.0340	0.0344	−0.866	B	1
			[76.299]	675470	1986100	4	4	74	0.0065	0.0065	−1.59	D	1
10.	$3d-4f$	$^2D - {}^2F°$	66.327	677240	2184930	10	14	1.00(+4)*	0.925	2.02	0.966	B	1
			66.368	678420	2185170	6	8	1.00(+4)	0.882	1.16	0.724	B	1
			66.263	675470	2184610	4	6	9360	0.924	0.806	0.568	B	1
			[66.393]	678420	2184610	6	6	667	0.0441	0.0578	−0.577	B	1
11.	$3d-5p$	$^2D - {}^2P°$	48.957	677240	2719830	10	6	290	0.0062	0.010	−1.21	D	3
			48.97	678420	2721160	6	4	260	0.0062	0.0060	−1.43	D	*ls*
			[48.979]	675470	2717170	4	2	280	0.0051	0.0033	−1.69	D	*ls*
			[48.883]	675470	2721160	4	4	29	0.0010	6.7(−4)	−2.38	E	*ls*
12.	$3d-5f$	$^2D - {}^2F°$	46.695	677240	2818780	10	14	3740	0.171	0.263	0.233	C+	4
			46.718	678420	2818920	6	8	3730	0.163	0.150	−0.011	C	*ls*
			46.661	675470	2818590	4	6	3490	0.171	0.105	−0.165	C	*ls*
			[46.725]	678420	2818590	6	6	250	0.0081	0.0075	−1.31	D	*ls*

TRANSITION PROBABILITIES FOR IRON

Fe XVI: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^{8}s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
13.	$3d$–$6p$	^{2}D – ^{2}P°	*41.139*	*677240*	*3108030*	10	6	140	0.0022	0.0030	−1.66	D	4
			41.17	678420	3108870	6	4	130	0.0022	0.0018	−1.88	D	*ls*
			[41.137]	675470	3106360	4	2	150	0.0018	0.0010	−2.13	D	*ls*
			[41.095]	675470	3108870	4	4	15	3.7(−4)	2.0(−4)	−2.83	E	*ls*
14.	$3d$–$6f$	^{2}D – ^{2}F°	*40.227*	*677240*	*3163150*	10	14	1860	0.0633	0.0838	−0.199	C+	3
			40.245	678420	3163200	6	8	1860	0.060	0.0479	−0.442	C	*ls*
			40.199	675470	3163090	4	6	1740	0.063	0.0335	−0.60	C	*ls*
			[40.247]	678420	3163090	6	6	120	0.0030	0.0024	−1.74	D	*ls*
15.	$4s$–$4p$	^{2}S – ^{2}P°	*862.96*	1867530	*1983410*	2	6	17.1	0.574	3.26	0.060	B	1
			[843.38]	1867530	1986100	2	4	18.4	0.393	2.18	−0.105	B	1
			[904.90]	1867530	1978040	2	2	14.8	0.182	1.08	−0.439	B	1
16.	$4s$–$5p$	^{2}S – ^{2}P°	*117.33*	1867530	*2719830*	2	6	392	0.243	0.188	−0.313	C+	3
			[117.15]	1867530	2721160	2	4	394	0.162	0.125	−0.489	C	*ls*
			[117.70]	1867530	2717170	2	2	390	0.081	0.063	−0.79	D	*ls*
17.	$4p$–$4d$	^{2}P° – ^{2}D	*707.01*	*1983410*	*2124850*	6	10	36.2	0.453	6.32	0.434	B	1
			[718.08]	1986100	2125360	4	6	34.7	0.402	3.80	0.206	B	1
			[684.74]	1978040	2124080	2	4	33.1	0.466	2.10	−0.031	B	1
			[724.74]	1986100	2124080	4	4	5.60	0.0441	0.421	−0.754	B	1
18.	$4p$–$5s$	^{2}P° – ^{2}S	*147.4*	*1983410*	2662000	6	2	976	0.106	0.309	−0.197	C+	3
			[148.0]	1986100	2662000	4	2	640	0.106	0.206	−0.374	C	*ls*
			[146.2]	1978040	2662000	2	2	334	0.107	0.103	−0.67	C	*ls*
19.	$4p$–$5d$	^{2}P° – ^{2}D	*124.23*	*1983410*	*2788370*	6	10	711	0.274	0.672	0.216	C+	3
			[124.61]	1986100	2788610	4	6	700	0.246	0.403	−0.008	C	*ls*
			[123.46]	1978040	2788020	2	4	600	0.276	0.224	−0.259	C	*ls*
			[124.70]	1986100	2788020	4	4	120	0.027	0.045	−0.96	D	*ls*
20.	$4d$–$4f$	^{2}D – ^{2}F°	*1664*	*2124850*	*2184930*	10	14	1.9	0.11	6.0	0.04	C	1
			[1672]	2125360	2185170	6	8	1.86	0.104	3.43	−0.205	B	1
			[1652]	2124080	2184610	4	6	1.81	0.111	2.41	−0.353	B	1
			[1688]	2125360	2184610	6	6	0.12	0.0052	0.17	−1.51	D	1
21.	$4d$–$5p$	^{2}D – ^{2}P°	*168.07*	*2124850*	*2719830*	10	6	357	0.0907	0.502	−0.042	C+	3
			[167.84]	2125360	2721160	6	4	322	0.091	0.301	−0.264	C	*ls*
			[168.61]	2124080	2717170	4	2	353	0.075	0.167	−0.52	C	*ls*
			[167.48]	2124080	2721160	4	4	36	0.015	0.033	−1.22	D	*ls*
22.	$4d$–$5f$	^{2}D – ^{2}F°	*144.11*	*2124850*	*2818780*	10	14	1670	0.726	3.44	0.861	C+	4
			[144.18]	2125360	2818920	6	8	1660	0.69	1.97	0.62	C	*ls*
			[143.99]	2124080	2818590	4	6	1560	0.73	1.38	0.464	C	*ls*
			[144.25]	2125360	2818590	6	6	110	0.034	0.098	−0.69	D	*ls*
23.	$4d$–$6f$	^{2}D – ^{2}F°	*96.311*	*2124850*	*3163150*	10	14	919	0.179	0.568	0.253	C+	4
			[96.354]	2125360	3163200	6	8	920	0.171	0.325	0.011	C	*ls*
			[96.245]	2124080	3163090	4	6	860	0.179	0.227	−0.145	C	*ls*
			[96.364]	2125360	3163090	6	6	60	0.0084	0.016	−1.30	D	*ls*

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Fe XVI: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i(cm^{-1})	E_k(cm^{-1})	g_i	g_k	A_{ki}(10^8s^{-1})	f_{ik}	S(at.u.)	log gf	Accuracy	Source
24.	$5s$–$5p$	$^2S - {}^2P^\circ$	*1729*	2662000	*2719830*	2	6	5.23	0.703	8.00	0.148	C+	3
			[1690]	2662000	2721160	2	4	5.6	0.48	5.3	−0.02	C	*ls*
			[1813]	2662000	2717170	2	2	4.6	0.23	2.7	−0.34	D	*ls*
25.	$5p$–$5d$	$^2P^\circ - {}^2D$	*1459*	*2719830*	*2788370*	6	10	11.0	0.586	16.9	0.546	C+	3
			[1483]	2721160	2788610	4	6	10.5	0.52	10.1	0.316	C	*ls*
			[1411]	2717170	2788020	2	4	10	0.60	5.6	0.08	C	*ls*
			[1496]	2721160	2788020	4	4	1.7	0.056	1.1	−0.65	D	*ls*
26.	$5d$–$6f$	$^2D - {}^2F^\circ$	*266.82*	*2788370*	*3163150*	10	14	432	0.646	5.67	0.810	C+	3
			[266.96]	2788610	3163200	6	8	431	0.61	3.24	0.57	C	*ls*
			[266.62]	2788020	3163090	4	6	404	0.65	2.27	0.413	C	*ls*
			[267.04]	2788610	3163090	6	6	28	0.030	0.16	−0.74	D	*ls*

[a] The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Fe XVII

Ground State $1s^22s^22p^6\ {}^1S_0$

Ionization Potential 1266 eV = 10210000 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
10.660	52	49.6	98	57.9	95	102.1	7
10.771	51	49.7	98	58.1	89	102.4	16
11.03	33,34	50.1	104,112	58.8	119	103.0	16
11.130	48	50.2	101,103,	61.3	91	103.3	16
11.251	47		106	62.1	92	104.8	4
11.419	46	50.26	102	66.1	97	107.7	19
11.440	45	50.3	104	66.4	120	108.3	21
12.121	44	50.4	101	66.7	120	110.0	9
12.263	43	50.6	110	68.1	122	110.4	9
12.4	42	50.7	105	68.7	121	111.1	3
12.509	41	50.8	102,115,	94.8	5	111.2	10
12.681	40		116	95.3	2	111.7	26
13.824	32	50.9	110,115	95.8	13	111.8	26
13.889	31	51.1	107	96.5	5,15	112.1	25
15.013	39	51.2	107,109	96.9	5	112.3	14
15.259	38	51.3	107	98.6	12	112.6	18
15.449	37	51.5	110	98.8	6,17	113.0	18
16.769	36	52.8	111	99	6	113.2	18
17.041	35	52.9	87,93	99.0	1	113.3	20
41.37	123	53.6	114,118	99.6	8	113.7	6,10,20
46.6	64	53.8	101	99.7	12	116.2	23
47.1	100	55.8	93	99.8	24	122.4	22
47.5	66	55.9	87	99.9	14	122.7	22
47.6	65	56.2	89	100.0	12,24	132.4	11
47.8	65	56.4	117	100.2	29	205.3	57
48.3	108	56.7	90,94	100.6	30	217.5	75
48.7	68	56.8	96	100.7	27,28	232.1	78
49.0	67	57.3	88	100.8	14	247.0	70
49.3	99	57.5	88	101.2	7,26	255.0	62
49.5	98,113	57.6	91,94	101.6	28	255.9	84

TRANSITION PROBABILITIES FOR IRON

List of tabulated lines---Continued

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
260.8	69	286.4	83	316.3	76	379.0	58
264.4	56	287.8	77	320.5	85	386.6	55
267.0	73	288.2	83	322.4	85	396.9	54
269.4	73	288.3	82	326.2	76	403.0	60
272.0	69	289.5	74	332.9	76	404.2	63
274.6	79	292.5	72	345.9	55	410.9	63
277.2	72	292.6	81	364.6	58	420.6	60
278.3	69	295.8	72	373.9	61	448.8	59
281.0	86	298.9	80	375.2	63	450.9	53
283.1	71	302.3	83	376.9	54	484.4	71
284.0	77	314.7	55				

Transition probabilities for the majority of the lines of this neon-like ion were taken from the results of the scaled Thomas-Fermi approach of Loulergue and Nussbaumer [1], which allows for extensive configuration interaction as well as spin-orbit coupling.

For the resonance transitions to $J = 1$ levels of the $2p^5 3s$ and $2p^5 3d$ configurations, we have selected the results of the relativistic random phase approximation (RRPA) calculations of Shorer [2], who has included mixing between $2p^5 3s$ and $2p^5 3d$ as well as correlation effects due to configurations having a vacancy in the $1s$ or $2s$ subshell. His calculations for this sequence provide an illustrative example of the rather drastic changes due to configuration interaction that can result in the values of oscillator strengths of heavy ions. The single-configuration relativistic Hartree-Fock results of Fielder et al. [3] for the same resonance transitions differ significantly (by 35–75 percent) in three of the five cases from the values obtained by Shorer. The multiconfiguration Dirac-Fock method of Cheng and Kim [4] which includes the effects of mixing between the $2p^5 3s$ and $2p^5 3d$ configurations yields oscillator strengths for the two resonance transitions to $J = 1$ levels of $2p^5 3s$ which are in much better agreement with Shorer's results than are those of ref. [3]. Shorer himself illustrates by numerical comparison the effects of including various configurations in his calculations.

Results of the model potential calculations of Crance [5] have been tabulated for other resonance transitions to $2p^5 ns$ and $2p^5 nd$ ($n = 5,6$).

Fawcett et al. [6] have used Cowan's Hartree-XR (i. e., allowing for statistical exchange and relativistic effects) and Slater-Condon programs to calculate f-values for the strongest lines of the $3l$–$4l'$ transition arrays and for one strong $3d$–$5f$ transition. Since they have labeled the levels in $J_1 l$-coupling notation, while those of Loulergue and Nussbaumer are labeled in LS-coupling notation, an unambiguous comparison of their results could be made for only two of the lines in common, and the agreement is excellent. A few transitions treated by Fawcett et al. but excluded from the tabulation of Loulergue and Nussbaumer are presented here.

References

[1] Loulergue, M., and Nussbaumer, H., Astron. Astrophys. **45**, 125 (1975).

[2] Shorer, P., Phys. Rev. A **20**, 642 (1979).

[3] Fielder, W., Jr., Lin, D. L., and Ton-That, D., Phys. Rev. A **19**, 741 (1979).

[4] Cheng, K. T., and Kim, Y.-K., Argonne National Laboratory Report ANL-78-65, 168 (1978).

[5] Crance, M., At. Data **5**, 185 (1973).

[6] Fawcett, B. C., Bromage, G. E., and Hayes, R. W., Mon. Not. R. Astron. Soc. **186**, 113 (1979).

Fe XVII: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$2s^2 2p^5(^2P^o_{3/2})3s$ – $2s2p^6 3s$	$(3/2,1/2)^o$ – ^3S	[99.0]			5	3	750	0.066	0.11	−0.48	C	1
2.		$(3/2,1/2)^o$ – ^1S	[95.3]			3	1	510	0.023	0.022	−1.16	C	1
3.	$2s^2 2p^5(^2P^o_{1/2})3s$ – $2s2p^6 3s$	$(1/2,1/2)^o$ – ^3S	[111.1]			3	3	180	0.033	0.037	−1.00	C	1
4.		$(1/2,1/2)^o$ – ^1S	[104.8]			3	1	310	0.017	0.018	−1.29	C	1

Fe XVII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
5.	$2s^22p^53p-2s2p^63p$	$^3S-{}^3P^o$	*95.6*			3	9	100	0.042	0.040	−0.90	C	1
			[94.8]			3	5	26	0.0058	0.0055	−1.76	C	1
			[96.5]			3	3	120	0.017	0.016	−1.30	C	1
			[96.9]			3	1	390	0.018	0.018	−1.26	C	1
6.		$^3D-{}^3P^o$											
			[98.8]			7	5	630	0.066	0.15	−0.34	C	1
			[99]			5	3	660	0.058	0.095	−0.54	C	1
			[113.7]			3	1	21	0.0014	0.0015	−2.39	D	1
7.		$^3P-{}^3P^o$											
			[101.2]			5	5	170	0.026	0.043	−0.88	C	1
			[102.1]			3	1	400	0.021	0.021	−1.20	C	1
8.		$^3P-{}^1P^o$											
			[99.6]			5	3	310	0.028	0.045	−0.86	C	1
9.		$^1P-{}^3P^o$											
			[110.0]			3	3	190	0.034	0.037	−0.99	C	1
			[110.4]			3	1	290	0.018	0.019	−1.28	C	1
10.		$^1D-{}^3P^o$											
			[111.2]			5	5	150	0.028	0.051	−0.86	C	1
			[113.7]			5	3	8.9	0.0010	0.0019	−2.29	D	1
11.		$^1S-{}^3P^o$											
			[132.4]			1	3	31	0.024	0.011	−1.61	C	1
12.	$2s^22p^53d-2s2p^63d$	$^3P^o-{}^3D$											
			[99.7]			5	7	27	0.0056	0.0092	−1.55	D	1
			[100.0]			5	5	90	0.013	0.022	−1.17	C	1
			[98.6]			3	3	96	0.014	0.014	−1.38	C	1
13.		$^3P^o-{}^1D$											
			[95.8]			5	5	32	0.0044	0.0069	−1.66	D	1
14.		$^3F^o-{}^3D$											
			[99.9]			9	7	540	0.063	0.19	−0.25	C	1
			[100.8]			7	5	430	0.047	0.11	−0.48	C	1
			[112.3]			5	3	190	0.022	0.040	−0.97	C	1
15.		$^3F^o-{}^1D$											
			[96.5]			7	5	150	0.015	0.033	−0.98	C	1
16.		$^3D^o-{}^3D$											
			[103.0]			7	7	130	0.021	0.049	−0.84	C	1
			[103.3]			7	5	56	0.0064	0.015	−1.35	D	1
			[102.4]			5	3	320	0.030	0.051	−0.82	C	1
17.		$^3D^o-{}^1D$											
			[98.8]			7	5	230	0.024	0.055	−0.77	C	1

TRANSITION PROBABILITIES FOR IRON

Fe XVII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} ($10^8 s^{-1}$)	f_{ik}	S (at.u.)	log gf	Accuracy	Source
18.		$^1D^o - {}^3D$											
			[112.6]			5	7	51	0.014	0.025	−1.17	C	1
			[113.0]			5	5	48	0.0092	0.017	−1.34	C	1
			[113.2]			5	3	6.5	7.5(−4)[a]	0.0014	−2.43	D	1
19.		$^1D^o - {}^1D$	[107.7]			5	5	66	0.011	0.020	−1.24	C	1
20.		$^1F^o - {}^3D$											
			[113.3]			7	7	120	0.023	0.060	−0.79	C	1
			[113.7]			7	5	49	0.0068	0.018	−1.32	C	1
21.		$^1F^o - {}^1D$	[108.3]			7	5	190	0.024	0.060	−0.78	C	1
22.		$^1P^o - {}^3D$											
			[122.4]			3	5	9.5	0.0036	0.0043	−1.97	D	1
			[122.7]			3	3	15	0.0034	0.0041	−1.99	D	1
23.		$^1P^o - {}^1D$	[116.2]			3	5	36	0.012	0.014	−1.44	C	1
24.	$2s^22p^54p - 2s2p^64p$	$^3S - {}^3P^o$											
			[99.8]			3	3	110	0.016	0.016	−1.31	C	1
			[100.0]			3	1	460	0.023	0.023	−1.16	C	1
25.		$^3D - {}^3P^o$											
			[112.1]			5	5	140	0.026	0.049	−0.88	C	1
26.		$^3P - {}^3P^o$											
			[101.2]			5	5	170	0.026	0.043	−0.88	C	1
			[111.7]			3	3	170	0.032	0.035	−1.02	C	1
			[111.8]			3	1	290	0.018	0.020	−1.26	C	1
27.		$^3P - {}^1P^o$											
			[100.7]			5	3	280	0.026	0.042	−0.89	C	1
28.		$^1P - {}^3P^o$											
			[100.7]			3	5	24	0.0061	0.0060	−1.74	C	1
			[101.6]			3	1	230	0.012	0.012	−1.45	C	1
29.		$^1P - {}^1P^o$	[100.2]			3	3	250	0.038	0.037	−0.95	C	1
30.		$^1D - {}^3P^o$											
			[100.6]			5	3	590	0.054	0.089	−0.57	C	1
31.	$2s^22p^6 - 2s2p^63p$	$^1S - {}^3P^o$											
			13.889	0	7199900	1	3	3400	0.029	0.0013	−1.53	C	1
32.		$^1S - {}^1P^o$	13.824	0	7233800	1	3	3.3(+4)	0.28	0.013	−0.55	C	1
33.	$2s^22p^6 - 2s2p^64p$	$^1S - {}^3P^o$											
			11.03	0	9066000	1	3	2900	0.016	5.8(−4)	−1.80	C	1

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Fe XVII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
34.		$^1S - ^1P^\circ$	11.03	0	9066000	1	3	2.1(+4)	0.11	0.0042	−0.94	C	1
35.	$2p^6$–$2p^5(^2P^\circ_{3/2})3s$	$^1S - (3/2,1/2)^\circ$											
			17.041	0	5868200	1	3	9340	0.122	0.00684	−0.914	B	2
36.	$2p^6$–$2p^5(^2P^\circ_{1/2})3s$	$^1S - (1/2,1/2)^\circ$											
			16.769	0	5963400	1	3	8300	0.105	0.00580	−0.979	B	2
37.	$2p^6$–$2p^5 3d$	$^1S - ^3P^\circ$											
			15.449	0	6472900	1	3	900	0.00966	4.91(−4)	−2.015	B	2
38.		$^1S - ^3D^\circ$											
			15.259	0	6553500	1	3	6.01(+4)	0.629	0.0316	−0.213	B	2
39.		$^1S - ^1P^\circ$	15.013	0	6660900	1	3	2.28(+5)	2.31	0.114	0.364	B	2
40.	$2p^6$–$2p^5(^2P^\circ_{3/2})4s$	$^1S - (3/2,1/2)^\circ$											
			12.681	0	7885800	1	3	3000	0.022	9.1(−4)	−1.66	C	1
41.	$2p^6$–$2p^5(^2P^\circ_{1/2})4s$	$^1S - (1/2,1/2)^\circ$											
			12.509	0	7994200	1	3	3500	0.025	0.0010	−1.61	C	1
42.	$2p^6$–$2p^5 4d$	$^1S - ^3P^\circ$											
			[12.4]			1	3	530	0.0037	1.5(−4)	−2.44	D	1
43.		$^1S - ^3D^\circ$											
			12.263	0	8154600	1	3	5.9(+4)	0.40	0.016	−0.40	C	1
44.		$^1S - ^1P^\circ$	12.121	0	8250100	1	3	8.0(+4)	0.53	0.021	−0.28	C	1
45.	$2p^6$–$2p^5(^2P^\circ_{3/2})5s$	$^1S - (3/2,1/2)^\circ$											
			11.440	0	8741300	1	3	1100	0.0065	2.4(−4)	−2.19	D	5
46.	$2p^6$–$2p^5(^2P^\circ_{1/2})5s$	$^1S - (1/2,1/2)^\circ$											
			11.419	0	8757300	1	3	600	0.0035	1.3(−4)	−2.46	D	5
47.	$2p^6$–$2p^5 5d$	$^1S - ^3D^\circ$											
			11.251	0	8888100	1	3	2.3(+4)	0.13	0.0048	−0.89	D	5
48.		$^1S - ^1P^\circ$	11.130	0	8984700	1	3	3.2(+4)	0.18	0.0066	−0.74	D	5
49.	$2p^6$–$2p^5(^2P^\circ_{3/2})6s$	$^1S - (3/2,1/2)^\circ$											
						1	3		0.0033		−2.48	D	5
50.	$2p^6$–$2p^5(^2P^\circ_{1/2})6s$	$^1S - (1/2,1/2)^\circ$											
						1	3		0.0017		−2.77	D	5

TRANSITION PROBABILITIES FOR IRON

Fe XVII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
51.	$2p^6-2p^56d$	$^1S - ^3D^o$											
			10.771	0	9284200	1	3	1.1(+4)	0.060	0.0021	−1.22	D	5
52.		$^1S - ^1P^o$	10.660	0	9380900	1	3	1.9(+4)	0.096	0.0034	−1.02	D	5
53.	$2p^5(^2P^o_{3/2})3s - 2p^53p$	$(3/2,1/2)^o - ^3S$											
			[450.9]			5	3	25	0.046	0.34	−0.64	C	1
54.		$(3/2,1/2)^o - ^3D$											
			[376.9]			5	7	51	0.15	0.94	−0.12	C	1
			[396.9]			5	5	21	0.050	0.32	−0.61	C	1
55.		$(3/2,1/2)^o - ^3P$											
			[345.9]			5	5	37	0.066	0.38	−0.48	C	1
			[386.6]			3	3	45	0.10	0.38	−0.52	C	1
			[314.7]			3	1	65	0.032	0.10	−1.02	C	1
56.		$(3/2,1/2)^o - ^1D$											
			[264.4]			5	5	1.0	0.0010	0.0046	−2.28	D	1
57.		$(3/2,1/2)^o - ^1S$											
			[205.3]			3	1	120	0.025	0.051	−1.12	C	1
58.	$2p^5(^2P^o_{1/2})3s - 2p^53p$	$(1/2,1/2)^o - ^3D$											
			[364.6]			1	3	33	0.20	0.24	−0.70	C	1
			[379.0]			3	3	19	0.041	0.15	−0.91	C	1
59.		$(1/2,1/2)^o - ^3P$											
			[448.8]			3	1	9.3	0.0094	0.041	−1.55	C	1
60.		$(1/2,1/2)^o - ^1P$											
			[420.6]			3	3	22	0.058	0.24	−0.76	C	1
			[403.0]			1	3	17	0.12	0.16	−0.91	C	1
61.		$(1/2,1/2)^o - ^1D$											
			[373.9]			3	5	53	0.19	0.68	−0.26	C	1
62.		$(1/2,1/2)^o - ^1S$											
			[255.0]			3	1	130	0.042	0.11	−0.90	C	1
63.	$2s2p^63s - 2s2p^63p$	$^3S - ^3P^o$	*388.2*			3	9	51	0.344	1.32	0.014	C	1
			[375.2]			3	5	59	0.21	0.77	−0.21	C	1
			[404.2]			3	3	41	0.10	0.40	−0.52	C	1
			[410.9]			3	1	44	0.037	0.15	−0.95	C	1
64.	$2p^5(^2P^o_{3/2})3s - 2p^54p$	$(3/2,1/2)^o - ^3D$											
			[46.6]			5	7	2600	0.12	0.092	−0.22	C	6

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Fe XVII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
65.	$2s2p^63s-$ $2s2p^64p$	$^3S-^3P^o$	*47.6*			3	9	2570	0.262	0.123	−0.105	C	1
			[47.6]			3	5	2600	0.15	0.069	−0.35	C	1
			[47.8]			3	3	2400	0.082	0.039	−0.61	C	1
			[47.8]			3	1	2700	0.031	0.015	−1.03	C	1
66.		$^3S-^1P^o$											
			[47.5]			3	3	360	0.012	0.0057	−1.44	D	1
67.		$^1S-^3P^o$											
			[49.0]			1	3	400	0.043	0.0070	−1.36	D	1
68.		$^1S-^1P^o$	[48.7]			1	3	2400	0.26	0.041	−0.59	C	1
69.	$2p^53p-2p^53d$	$^3S-^3P^o$	*266.3*			3	9	70	0.22	0.59	−0.17	C	1
			[260.8]			3	5	51	0.087	0.22	−0.58	C	1
			[272.0]			3	3	88	0.098	0.26	−0.53	C	1
			[278.3]			3	1	100	0.039	0.11	−0.94	C	1
70.		$^3S-^3D^o$											
			[247.0]			3	5	2.6	0.0040	0.0097	−1.92	D	1
71.		$^3D-^3P^o$											
			[484.4]			3	1	1.2	0.0014	0.0067	−2.37	D	1
			[283.1]			5	5	9.1	0.011	0.051	−1.26	D	1
72.		$^3D-^3F^o$											
			[292.5]			7	9	100	0.16	1.1	0.06	C	1
			[277.2]			5	7	100	0.16	0.74	−0.09	C	1
			[295.8]			3	5	2.3	0.0050	0.015	−1.82	C	1
73.		$^3D-^3D^o$											
			[269.4]			7	7	25	0.027	0.17	−0.72	C	1
			[267.0]			5	5	45	0.048	0.21	−0.62	C	1
74.		$^3D-^1D^o$											
			[289.5]			3	5	91	0.19	0.54	−0.24	C	1
75.		$^3D-^1F^o$											
			[217.5]			7	7	1.6	0.0011	0.0057	−2.10	D	1
76.		$^3P-^3P^o$											
			[316.3]			5	5	33	0.049	0.26	−0.61	C	1
			[332.9]			5	3	9.5	0.0095	0.052	−1.32	C	1
			[326.2]			3	1	2.5	0.0013	0.0043	−2.40	D	1
77.		$^3P-^3D^o$											
			[287.8]			5	7	91	0.16	0.75	−0.10	C	1
			[284.0]			3	5	74	0.15	0.42	−0.35	C	1
78.		$^3P-^1D^o$											
			[232.1]			5	5	6.6	0.0053	0.020	−1.57	C	1

TRANSITION PROBABILITIES FOR IRON

Fe XVII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
79.		$^1P - {}^3F^o$											
			[274.6]			3	5	110	0.21	0.56	−0.21	C	1
80.		$^1D - {}^3F^o$											
			[298.9]			5	5	13	0.017	0.086	−1.06	C	1
81.		$^1D - {}^1D^o$	[292.6]			5	5	11	0.014	0.068	−1.15	C	1
82.		$^1D - {}^1F^o$	[288.3]			5	7	110	0.19	0.91	−0.02	C	1
83.	$2s2p^63p-$ $2s2p^63d$	$^3P^o - {}^3D$											
			[302.3]			5	7	100	0.19	0.95	−0.02	C	1
			[288.2]			3	5	81	0.17	0.48	−0.30	C	1
			[286.4]			1	3	66	0.24	0.23	−0.61	C	1
84.		$^3P^o - {}^1D$											
			[255.9]			3	5	14	0.023	0.058	−1.16	C	1
85.		$^1P^o - {}^3D$											
			[320.5]			3	5	4.7	0.012	0.038	−1.44	C	1
			[322.4]			3	3	3.8	0.0059	0.019	−1.75	C	1
86.		$^1P^o - {}^1D$	[281.0]			3	5	120	0.24	0.66	−0.15	C	1
87.	$2p^53p-$ $2p^5(^2P^o_{3/2})4s$	$^3S - (3/2,1/2)^o$											
			[55.9]			3	5	670	0.052	0.029	−0.80	C	1
			[52.9]			3	3	56	0.0023	0.0012	−2.15	D	1
88.		$^3D - (3/2,1/2)^o$											
			[57.3]			7	5	1700	0.060	0.079	−0.38	C	1
			[57.5]			3	3	420	0.021	0.012	−1.20	C	1
89.		$^3P - (3/2,1/2)^o$											
			[58.1]			5	5	740	0.037	0.036	−0.73	C	1
			[56.2]			1	3	120	0.017	0.0032	−1.77	D	1
90.		$^1P - (3/2,1/2)^o$											
			[56.7]			3	3	560	0.027	0.015	−1.09	C	1
91.		$^1D - (3/2,1/2)^o$											
			[61.3]			5	5	11	6.2(−4)	6.3(−4)	−2.51	D	1
			[57.6]			5	3	2100	0.063	0.059	−0.50	C	1
92.		$^1S - (3/2,1/2)^o$											
			[62.1]			1	3	370	0.064	0.013	−1.19	C	1
93.	$2p^53p-$ $2p^5(^2P^o_{1/2})4s$	$^3S - (1/2,1/2)^o$											
			[55.8]			3	3	55	0.0026	0.0014	−2.11	D	1
			[52.9]			3	1	74	0.0010	5.4(−4)	−2.51	D	1

Fe XVII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} ($10^8 s^{-1}$)	f_{ik}	S (at.u.)	log gf	Accuracy	Source
94.		$^3D - (½,½)^o$											
			[56.7]			5	3	910	0.026	0.025	−0.88	C	1
			[57.6]			3	1	2300	0.038	0.022	−0.94	C	1
95.		$^3P - (½,½)^o$											
			[57.9]			5	3	1000	0.030	0.029	−0.82	C	1
96.		$^1P - (½,½)^o$											
			[56.8]			3	1	1300	0.021	0.012	−1.20	C	1
97.		$^1S - (½,½)^o$											
			[66.1]			1	3	290	0.057	0.012	−1.24	C	1
98.	$2p^53p-2p^54d$	$^3S - ^3P^o$	49.5			3	9	2470	0.272	0.133	−0.088	C	1
			[49.5]			3	5	2000	0.12	0.060	−0.43	C	1
			[49.6]			3	3	3900	0.14	0.070	−0.36	C	1
			[49.7]			3	1	510	0.0063	0.0031	−1.72	D	1
99.		$^3S - ^3D^o$											
			[49.3]			3	5	48	0.0029	0.0014	−2.06	D	1
100.		$^3S - ^1D^o$											
			[47.1]			3	5	140	0.0078	0.0036	−1.63	C	1
101.		$^3D - ^3P^o$											
			[50.4]			5	3	570	0.013	0.011	−1.19	C	1
			[53.8]			3	1	270	0.0039	0.0021	−1.93	D	1
			[50.2]			5	5	480	0.018	0.015	−1.04	C	1
102.		$^3D - ^3F^o$											
			50.26			7	9	5800	0.28	0.33	0.30	C	1
			[50.8]			3	5	81	0.0052	0.0026	−1.80	D	1
103.		$^3D - ^1F^o$											
			[50.2]			5	7	4500	0.24	0.20	0.08	C	1
104.		$^3D - ^3D^o$											
			[50.3]			7	7	1000	0.038	0.044	−0.58	C	1
			[50.1]			5	5	1600	0.060	0.050	−0.52	C	1
105.		$^3D - ^1D^o$											
			[50.7]			3	5	4800	0.31	0.15	−0.03	C	1
106.		$^3D - ^1P^o$											
			[50.2]			3	3	830	0.031	0.016	−1.03	C	1
107.		$^3P - ^3P^o$											
			[51.2]			5	5	2500	0.098	0.083	−0.31	C	1
			[51.3]			5	3	860	0.020	0.017	−0.99	C	1
			[51.1]			3	1	260	0.0034	0.0017	−1.99	D	1

TRANSITION PROBABILITIES FOR IRON

Fe XVII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
108.		^{3}P - ^{3}F°											
			[48.3]			3	5	46	0.0027	0.0013	−2.09	D	1
109.		^{3}P - ^{1}F°											
			[51.2]			5	7	54	0.0030	0.0025	−1.83	D	1
110.		^{3}P - ^{3}D°											
			[50.9]			5	7	4700	0.26	0.21	0.11	C	1
			[50.6]			3	5	3600	0.23	0.12	−0.16	C	1
			[51.5]			1	3	2400	0.29	0.049	−0.54	C	1
111.		^{1}P - ^{3}P°											
			[52.8]			3	5	30	0.0021	0.0011	−2.20	D	1
112.		^{1}P - ^{3}F°											
			[50.1]			3	5	4500	0.28	0.14	−0.07	C	1
113.		^{1}P - ^{1}P°	[49.5]			3	3	1200	0.044	0.022	−0.88	C	1
114.		^{1}D - ^{3}P°											
			[53.6]			5	5	40	0.0017	0.0015	−2.06	D	1
115.		^{1}D - ^{3}F°											
			[50.8]			5	7	5800	0.31	0.26	0.20	C	1
			[50.9]			5	5	830	0.032	0.027	−0.79	C	1
116.		^{1}D - ^{1}D°	[50.8]			5	5	610	0.024	0.020	−0.93	C	1
117.		^{1}S - ^{3}D°											
			[56.4]			1	3	770	0.11	0.020	−0.96	C	1
118.		^{1}S - ^{1}P°	[53.6]			1	3	2500	0.32	0.057	−0.49	C	1
119.	$2p^53d-2p^54f$	^{3}F° - ^{3}G											
			58.8			9	11	1.2(+4)	0.78	1.4	0.85	C	6
120.	$2s2p^63d-$ $2s2p^64p$	^{3}D - ^{3}P°											
			[66.4]			7	5	690	0.033	0.050	−0.64	C	1
			[66.7]			5	3	600	0.024	0.026	−0.92	C	1
			[66.7]			3	1	860	0.019	0.013	−1.24	C	1
121.		^{1}D - ^{3}P°											
			[68.7]			5	3	110	0.0047	0.0053	−1.63	D	1
122.		^{1}D - ^{1}P°	[68.1]			5	3	870	0.036	0.041	−0.74	C	1
123.	$2p^53d-2p^55f$	^{3}F° - ^{3}G											
			41.37			9	11	4800	0.15	0.18	0.13	C	6

* The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Fe XVIII

Ground State $1s^2 2s^2 2p^5\ {}^2P^o_{3/2}$

Ionization Potential [1353] eV = [10913000] cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
11.25	27	13.70	6	14.48	16	15.614	10
11.33	24	13.75	5	14.485	15	15.623	10
11.34	25	13.92	4	14.50	18	15.764	9
11.45	24,26	13.954	21	14.53	2	15.826	8
11.50	22	14.07	3	14.551	14	15.847	8
11.55	23	14.11	3	14.57	15	15.869	10
11.64	22	14.12	4	14.581	14	16.003	9
12.00	12	14.150	20	14.70	16	16.024	9
12.15	12	14.20	18	14.772	14	16.087	8
13.43	7	14.255	19	14.78	13	16.109	8
13.49	6	14.28	3,18	14.79	15	16.270	9
13.51	6	14.31	2	14.80	13	93.931	1
13.52	5	14.32	3,17	14.803	14	103.954	1
13.56	5	14.361	20	15.01	13		
13.61	7	14.42	18	15.258	11		
13.63	6	14.467	19	15.491	11		

Oscillator strengths for lines of the multiplet $2s^2 2p^5\ {}^2P^o - 2s2p^6\ {}^2S$ are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Cheng et al. [1], which include a perturbative treatment of the Breit interaction and the Lamb shift.

Data for transitions from the levels of the $2s2p^5\ {}^2P^o$ term to of configurations involving one electron in the $n = 3$ shell are from the comprehensive calculations of Chapman and Shadmi [2], who employed Hartree-Fock wavefunctions including the principal configuration mixing and calculated individual oscillator strengths in intermediate coupling.

The experimentally determined wavelengths and energy levels for the $2p$–$3s$ and $2p$–$3d$ transitions presented here are taken from work of Feldman et al. [3]. In some cases, however, we have permuted the "names" of the levels to coincide with those suggested by the percentage compositions given by Feldman et al. and/or by Chapman and Shadmi [2]. Specifically, within the $2p^4(^3P)3s$ configuration the ${}^2P_{3/2}$ and ${}^4P_{3/2}$ designations given by Feldman et al. have been interchanged; and within the $2p^4(^3P)3d$ configuration ${}^4P_{5/2}$ was changed to ${}^4F_{5/2}$.

Accuracy ratings for the weaker transitions, as well as for those involving levels of relatively low purity in LS coupling, were lowered to "E." Transitions to levels of extremely low purity, or to those for which the two largest components are very nearly equal, were omitted from the present compilation.

Oscillator strengths for a few transitions of the array $2p^5$–$2p^4 4d$ have been calculated by Bromage et al. [4] with the Hartree-Fock method including statistical exchange (HX) and configuration interaction. The above remarks concerning purity of levels in LS coupling apply here as well. Additional data are available for resonance transitions to levels of configurations $2p^4 nl$ ($n \geq 4$) [5,6], but they are not tabulated since the eigenvectors are not reported and such states are expected to be strongly mixed.

References

[1] Cheng, K. T., Kim, Y.-K., and Desclaux, J. P., At. Data Nucl. Data Tables **24**, 111 (1979).

[2] Chapman, R. D., and Shadmi, Y., J. Opt. Soc. Am. **63**, 1440 (1973).

[3] Feldman, U., Doschek, G. A., Cowan, R. D., and Cohen, L., J. Opt. Soc. Am. **63**, 1445 (1973).

[4] Bromage, G. E., Fawcett, B. C., and Cowan, R. D., Mon. Not. R. Astron. Soc. **178**, 599 (1977).

[5] Bromage, G. E., Cowan, R. D., Fawcett, B. C., Gordon, H., Hobby, M. G., Peacock, N. J., and Ridgeley, A., United Kingdom Atomic Energy Authority Report CLM-R170 (August 1977).

[6] Burkhalter, P. G., Dozier, C. M., Stallings, C., and Cowan, R. D., J. Appl. Phys. **49**, 1092 (1978).

TRANSITION PROBABILITIES FOR IRON

Fe XVIII: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$2s^22p^5$–$2s2p^6$	^{2}P° – ^{2}S	*97.051*	*34220*	1064610	6	2	1240	0.0584	0.112	−0.455	C+	1
			93.931	0	1064610	4	2	913	0.0604	0.0747	−0.617	C+	1
			103.954	102650	1064610	2	2	331	0.0537	0.0368	−0.969	C+	1
2.	$2s^22p^5$– $2s2p^5(^3$P°$)3p$	^{2}P° – ^{4}S											
			[14.31]			4	4	590	0.0018	3.4(−4)*	−2.14	E	2
			[14.53]			2	4	1700	0.011	0.0011	−1.66	E	2
3.		^{2}P° – ^{2}P	*14.16*			6	6	3.7(+4)	0.11	0.031	−0.18	E	2
			[14.11]			4	4	3.0(+4)	0.089	0.017	−0.45	D	2
			[14.28]			2	2	1.0(+4)	0.032	0.0030	−1.19	E	2
			[14.07]			4	2	4.1(+4)	0.061	0.011	−0.61	E	2
			[14.32]			2	4	23	1.4(−4)	1.3(−5)	−3.55	E	2
4.		^{2}P° – ^{2}S	*13.99*			6	2	6.7(+4)	0.065	0.018	−0.41	D	2
			[13.92]			4	2	2.0(+4)	0.029	0.0053	−0.94	D	2
			[14.12]			2	2	4.7(+4)	0.14	0.013	−0.55	D	2
5.	$2s^22p^5$– $2s2p^5(^1$P°$)3p$	^{2}P° – ^{2}D	*13.60*			6	10	3.0(+4)	0.14	0.037	−0.08	D	2
			[13.52]			4	6	1.8(+4)	0.075	0.013	−0.52	D	2
			[13.75]			2	4	3.7(+4)	0.21	0.019	−0.38	D	2
			[13.56]			4	4	9800	0.027	0.0048	−0.97	D	2
6.		^{2}P° – ^{2}P	*13.56*			6	6	3.9(+4)	0.11	0.029	−0.19	E	2
			[13.49]			4	4	6600	0.018	0.0032	−1.14	E	2
			[13.70]			2	2	4.3(+4)	0.12	0.011	−0.62	D	2
			[13.51]			4	2	8800	0.012	0.0021	−1.32	D	2
			[13.68]			2	4	2.5(+4)	0.14	0.013	−0.55	D	2
7.		^{2}P° – ^{2}S	*13.49*			6	2	6200	0.0056	0.0015	−1.47	E	2
			[13.43]			4	2	1000	0.0014	2.5(−4)	−2.25	E	2
			[13.61]			2	2	4700	0.013	0.0012	−1.59	D	2
8.	$2p^5$–$2p^4(^3$P$)3s$	^{2}P° – ^{4}P											
			16.087	102650	6318700	2	4	490	0.0038	4.0(−4)	−2.12	E	2
			15.826	0	6318700	4	4	150	5.5(−4)	1.1(−4)	−2.66	E	2
			16.109	102650	6310500	2	2	23	9.0(−5)	9.5(−6)	−3.74	E	2
			[15.847]	0	6310500	4	2	130	2.5(−4)	5.2(−5)	−3.00	E	2
9.		^{2}P° – ^{2}P	*16.010*	*34220*	*6280400*	6	6	9100	0.035	0.011	−0.68	E	2
			16.003	0	6248800	4	4	630	0.0024	5.1(−4)	−2.02	E	2
			16.024	102650	6343600	2	2	1.0(+4)	0.039	0.0041	−1.11	D	2
			15.764	0	6343600	4	2	1.6(+4)	0.029	0.0060	−0.94	D	2
			16.270	102650	6248800	2	4	250	0.0020	2.1(−4)	−2.40	E	2

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Fe XVIII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
10.	$2p^5$-$2p^4(^1D)3s$	$^2P^o$ - ^2D	*15.704*	*34220*	*6402200*	6	10	4700	0.029	0.0089	−0.76	E	2
			15.623	0	6400800	4	6	8.4	4.6(−5)	9.5(−6)	−3.74	E	2
			15.869	102650	6404400	2	4	1.0(+4)	0.078	0.0081	−0.81	D	2
			[15.614]	0	6404400	4	4	1000	0.0038	7.8(−4)	−1.82	E	2
11.	$2p^5$-$2p^4(^1S)3s$	$^2P^o$ - ^2S	*15.328*	*34220*	6558200	6	2	2.2(+4)	0.026	0.0079	−0.81	D	2
			15.258	0	6558200	4	2	1.4(+4)	0.024	0.0048	−1.02	D	2
			15.491	102650	6558200	2	2	8300	0.030	0.0031	−1.22	D	2
12.	$2s^22p^5$-$2p^63s$	$^2P^o$ - ^2S	*12.05*			6	2	35	2.5(−5)	6.0(−6)	−3.82	E	2
			[12.00]			4	2	11	1.2(−5)	1.9(−6)	−4.32	E	2
			[12.15]			2	2	23	5.1(−5)	4.1(−6)	−3.99	E	2
13.	$2p^5$-$2p^4(^3P)3d$	$^2P^o$ - ^4D											
			[14.80]			4	6	3000	0.015	0.0029	−1.22	D	2
			[15.01]			2	4	340	0.0023	2.3(−4)	−2.34	E	2
			[14.78]			4	4	5800	0.019	0.0037	−1.12	D	2
14.		$^2P^o$ - ^4P											
			14.772	102650	6872500	2	4	3400	0.022	0.0021	−1.36	E	2
			14.551	0	6872500	4	4	19	6.1(−5)	1.2(−5)	−3.61	E	2
			[14.803]	102650	6858200	2	2	100	3.4(−4)	3.3(−5)	−3.17	E	2
			14.581	0	6858200	4	2	2000	0.0032	6.1(−4)	−1.89	E	2
15.		$^2P^o$ - ^4F											
			14.485	0	6903700	4	6	81	3.8(−4)	7.2(−5)	−2.82	E	2
			[14.79]			2	4	1200	0.0081	7.9(−4)	−1.79	E	2
			[14.57]			4	4	1700	0.0054	0.0010	−1.67	E	2
16.		$^2P^o$ - ^2P											
			[14.48]			4	4	280	8.9(−4)	1.7(−4)	−2.45	E	2
			[14.70]			2	4	4900	0.032	0.0031	−1.19	E	2
17.	$2p^5$-$2p^4(^1D)3d$	$^2P^o$ - ^2F											
			[14.32]			4	6	2.2(+4)	0.10	0.019	−0.40	E	2
18.		$^2P^o$ - ^2P	*14.32*			6	6	7.7(+4)	0.24	0.067	0.15	E	2
			[14.28]			4	4	3200	0.0098	0.0018	−1.41	E	2
			[14.42]			2	2	1.7(+5)	0.53	0.050	0.03	E	2
			[14.20]			4	2	2.1(+4)	0.031	0.0058	−0.91	E	2
			[14.50]			2	4	1.6(+4)	0.10	0.0095	−0.70	E	2
19.		$^2P^o$ - ^2S	*14.325*	*34220*	7015100	6	2	2.2(+4)	0.023	0.0065	−0.86	D−	2
			14.255	0	7015100	4	2	110	1.7(−4)	3.2(−5)	−3.17	E	2
			14.467	102650	7015100	2	2	2.2(+4)	0.068	0.0065	−0.87	D	2
20.		$^2P^o$ - ^2D											
			14.361	102650	7067100	2	4	8.1(+4)	0.50	0.047	0.00	E	2
			14.150	0	7067100	4	4	1.4(+4)	0.041	0.0076	−0.79	E	2
21.	$2p^5$-$2p^4(^1S)3d$	$^2P^o$ - ^2D											
			13.954	0	7166400	4	6	1.4(+4)	0.061	0.011	−0.61	E	2

TRANSITION PROBABILITIES FOR IRON

Fe XVIII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
22.	$2s^22p^5-2p^63d$	^{2}P° – ^{2}D	*11.54*			6	10	1300	0.0044	0.0010	−1.58	E	2
			[11.50]			4	6	57	1.7(−4)	2.6(−5)	−3.17	E	2
			[11.64]			2	4	1500	0.0059	4.5(−4)	−1.93	E	2
			[11.50]			4	4	1900	0.0037	5.6(−4)	−1.83	E	2
23.	$2p^5-2p^4(^3P)4d$	^{2}P° – ^{2}P											
			[11.55]			2	4	2.4(+4)	0.095	0.0072	−0.72	E	4
24.	$2p^5-2p^4(^1D)4d$	^{2}P° – ^{2}P											
			[11.33]			4	4	4.1(+4)	0.078	0.012	−0.51	D	4
			[11.45]			2	2	7.1(+4)	0.14	0.011	−0.55	D	4
25.		^{2}P° – ^{2}S											
			[11.34]			4	2	4.7(+4)	0.045	0.0067	−0.74	D	4
26.		^{2}P° – ^{2}D											
			[11.45]			2	4	4.3(+4)	0.17	0.013	−0.47	D	4
27.	$2p^5-2p^4(^1S)4d$	^{2}P° – ^{2}D											
			[11.25]			2	4	3.2(+4)	0.12	0.0089	−0.62	D	4

* The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Fe XIX

Ground State $1s^22s^22p^4\ ^3P_2$

Ionization Potential [1451] eV = [11703000] cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
10.58	22	13.45	13	77.6	2	109.97	1
10.62	23	13.49	12	82.5	2	111.70	1
10.63	19	13.54	11	83.4	2	115.42	8
10.65	18	13.74	15,16	84.8	7	120.00	1
10.73	24	13.76	14	91.02	4	132	3
10.80	21,25	13.82	10	101.56	1	149	5
10.81	17,20	14.04	10	106.12	6		
10.89	17	15.2	9	106.33	1		
10.92	17	15.4	9	108.37	1		

Oscillator strengths for $2s-2p$ transitions are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Cheng et al. [1]. These relativistic calculations include a perturbative treatment of the Breit interaction and the Lamb shift. The results should be quite accurate, except in the case of intercombination transitions, for which the f-values should be considered rather uncertain. The

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$2s^2 2p^4\ ^1D_2$–$2s2p^5\ ^3P_1^o$ transition has been omitted from this tabulation, because its f-value as reported in ref. [1] is extremely and therefore even more uncertain.

The results of the scaled Thomas-Fermi calculations of Kastner et al. [2] including configuration interaction and intermediate coupling are quoted for the two $2p^4$–$2p^3 3s$ intercombination lines treatby them.

Oscillator strengths tabulated for a few transitions of the $2p^4$–$2p^3 3d$ array are averages of the semi-empirical results of Bromage and Fawcett [3] and the Hartree-Fock-Pauli (HFP) data of Bogdanovicius et al. [4]. The f-values intercompared very well for the transitions presented here, except in the case of $2p^4\ ^1D_2$–$2p^3(^2D^o)3d\ ^1F_3^o$ and $2p^4\ ^1D_2$–$2p^3(^2P^o)3d\ ^3F_3^o$, for which the authors' published results differ from the values tabulated here by 30% and 50%, respectively. Transitions involving levels of purity less than 50% in LS coupling, as indicated in refs. [3] and [4], have omitted, and the accuracy ratings for transitions to levels of purity less than 60% have been lowered to "E," as have those for the two rather uncertain f-values discussed above.

The oscillator strengths tabulated for transitions of the $2p^4$–$2p^3 4d$ are from the Hartree-Fock calculations with statistical exchange (HX) of Bromage et al. [5] with allowance for configuration interaction. The above remarks concerning purity in LS coupling apply here as well.

The assignment of term designations to observed spectral lines of the rather complex transition arrays $2p^4$–$2p^3 nd$ ($n = 3,4$) is rathdifficult, since these lines are closely spaced. For this reason, we have quoted the theoretical wavelengths of refs. [3] and [5], respectively, in order to provide an indication of the locations of these lines.

Data for additional transitions are available [6,7], but these results are not quoted here since no indication of the percentage compositions is given.

References

[1] Cheng, K. T., Kim, Y.-K., and Desclaux, J. P., At. Data Nucl. Data Tables **24**, 111 (1979).

[2] Kastner, S. O., Bhatia, A. K., and Cohen, L., Phys. Scr. **15**, 259 (1977).

[3] Bromage, G. E., and Fawcett, B. C., Mon. Not. R. Astron. Soc. **178**, 591 (1977).

[4] Bogdanovicius, P. O., Kyckinas, I. S., Merkelis, G. V., Rudzikas, Z. B., Sivtsev, V. I., and Sadziuviene, S. D., Bull. Acad. Sci. USSR, Phys. Ser. **41**, 121 (1977).

[5] Bromage, G. E., Fawcett, B. C., and Cowan, R. D., Mon. Not. R. Astron. Soc. **178**, 599 (1977).

[6] Bromage, G. E., Cowan, R. D., Fawcett, B. C., Gordon, H., Hobby, M. C., Peacock, N. J., and Ridgeley, A., United Kingdom Atomic Energy Authority Report CLM-R170 (August 1977).

[7] Burkhalter, P. G., Dozier, C. M., Stallings, C., and Cowan, R. D., J. Appl. Phys. **49**, 1092 (1978).

Fe XIX: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$2s^2 2p^4$–$2s2p^5$	^3P – $^3P^o$	*109.04*	*38170*	*955290*	9	9	540	0.096	0.31	−0.06	C	1
			108.37	0	922770	5	5	390	0.068	0.12	−0.47	C	1
			111.70	89410	984650	3	3	126	0.0235	0.0259	−1.152	C	1
			101.56	0	984650	5	3	320	0.0294	0.0491	−0.83	C	1
			106.33	89410	1029830	3	1	610	0.0342	0.0359	−0.99	C	1
			120.00	89410	922770	3	5	104	0.0374	0.0443	−0.95	C	1
			109.97	75290	984650	1	3	160	0.087	0.031	−1.06	C	1
2.		^3P – $^1P^o$											
			[77.6]	0	[1268440]	5	3	130	0.0071	0.0091	−1.45	E	1
			[83.4]	89410	[1268440]	3	3	9.6	0.0010	8.2(−4)*	−2.52	E	1
			[82.5]	75290	[1268440]	1	3	16	0.0050	0.0014	−2.30	E	1
3.		^1D – $^3P^o$											
			[132]	[169800]	922770	5	5	23	0.0059	0.013	−1.53	E	1
4.		^1D – $^1P^o$	91.02	[169800]	[1268440]	5	3	1490	0.111	0.166	−0.256	C	1
5.		^1S – $^3P^o$											
			[149]	[326160]	984650	1	3	8.2	0.0082	0.0040	−2.09	E	1
6.		^1S – $^1P^o$	106.12	[326160]	[1268440]	1	3	110	0.054	0.019	−1.27	C	1
7.	$2s2p^5$–$2p^6$	$^3P^o$ – ^1S											
			[84.8]	984650	[2134800]	3	1	130	0.0045	0.0038	−1.87	E	1
8.		$^1P^o$ – ^1S	115.42	[1268440]	[2134800]	3	1	1610	0.107	0.122	−0.493	C	1

TRANSITION PROBABILITIES FOR IRON

Fe XIX: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
9.	$2p^4$-$2p^3(^4S^o)3s$	^3P - $^5S^o$											
			[15.2]			5	5	450	0.0016	3.9(−4)	−2.11	E	2
			[15.4]			3	5	17	1.0(−4)	1.5(−5)	−3.52	E	2
10.	$2p^4$-$2p^3(^4S^o)3d$	^3P - $^3D^o$											
			[13.82]			5	7	5.7(+4)	0.23	0.052	0.06	D	3,4
			[14.04]			3	5	1.4(+4)	0.070	0.0097	−0.68	E	3,4
11.	$2p^4$-$2p^3(^2D^o)3d$	^3P - $^3D^o$											
			[13.54]			5	7	1.9(+5)	0.73	0.16	0.56	D	3,4
12.		^3P - $^3S^o$											
			[13.49]			5	3	1.5(+5)	0.25	0.056	0.10	D	3,4
13.		^3P - $^1F^o$											
			[13.45]			5	7	5.5(+4)	0.21	0.046	0.02	E	3,4
14.		^1D - $^1F^o$	[13.76]			5	7	7.5(+4)	0.30	0.068	0.18	E	3,4
15.	$2p^4$-$2p^3(^2P^o)3d$	^1D - $^3F^o$											
			[13.74]			5	7	2.4(+4)	0.094	0.021	−0.33	E	3,4
16.		^1S - $^1P^o$	[13.74]			1	3	2.6(+5)	2.2	0.10	0.34	D	3,4
17.	$2p^4$-$2p^3(^4S^o)4d$	^3P - $^3D^o$											
			[10.81]			5	7	4.9(+4)	0.12	0.021	−0.22	D	5
			[10.92]			3	5	1.3(+4)	0.040	0.0043	−0.92	D	5
			[10.89]			1	3	2.8(+4)	0.15	0.0054	−0.82	D	5
18.	$2p^4$-$2p^3(^2D^o)4d$	^3P - $^3D^o$											
			[10.65]			5	7	3.2(+4)	0.076	0.013	−0.42	D	5
19.		^3P - $^3S^o$											
			[10.63]			5	3	4.3(+4)	0.044	0.0077	−0.66	D	5
20.		^1D - $^1D^o$	[10.81]			5	5	4.7(+4)	0.082	0.015	−0.39	D	5
21.		^1D - $^1F^o$	[10.80]			5	7	5.3(+4)	0.13	0.023	−0.19	D	5
22.	$2p^4$-$2p^3(^2P^o)4d$	^3P - $^3P^o$											
			[10.58]			3	3	3.2(+4)	0.053	0.0055	−0.80	E	5
23.		^3P - $^3D^o$											
			[10.62]			1	3	4.7(+4)	0.24	0.0084	−0.62	E	5
24.		^1D - $^3F^o$											
			[10.73]			5	7	1.6(+4)	0.038	0.0067	−0.72	E	5
25.		^1S - $^1P^o$	[10.80]			1	3	8.4(+4)	0.44	0.016	−0.36	E	5

[a] The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Fe XX

Ground State $1s^2 2s^2 2p^3\ ^4S^o_{3/2}$

Ionization Potential [1575] eV = [12704000] cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
12.76	23	81.4	13	108.7	6	136.06	10
12.82	17	83.0	3	108.82	12	138.49	16
12.83	20	83.23	8	109.65	14	139	10
12.84	17,20	86.2	13	110.65	6	140.42	16
12.88	23	87.8	13	111.60	14	143	5
12.89	20	90.60	8	113.34	6	148	5
12.94	18	92.59	12	115	11,15	156	5
13.00	18	93.76	8	115.39	6	163	16
13.06	22	94.62	7	118.70	1	164	5
13.14	21	95.1	2	121.85	1	172	9
13.15	19	98.08	14	122.00	16	175	5
78.9	13	98.37	12	128	10	202	9
79.5	4	101.84	12	131.76	15	234	9
80.3	13	106.96	11	132.85	1		

Oscillator strengths for transitions of the arrays $2s^2 2p^3$–$2s2p^4$ and $2s2p^4$–$2p^5$ are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Cheng et al. [1]. These relativistic calculations include a perturbative treatment of the Breit interaction and the Lamb shift. The results should be quite accurate, except in the case of intercombination lines, for which the f-values should be considered rather uncertain. (A few very weak intercombination lines have been omitted from this tabulation.) The f-value listed for the $2s^2 2p^3\ ^2D^o_{3/2}$–$2s2p^4\ ^2S_{1/2}$ transition is quoted with an uncertainty of 50%, since its magnitude is considerably larger than those of the other intercombination lines.

For transitions of the type $2p^3$–$2p^2 3d$, we quote the semi-empirical results of Bromage and Fawcett [2], which include approximate correlation, relativistic, and intermediate coupling effects. Transitions to levels that are of very low purity in LS coupling have been excluded. The f-values for the remaining lines which involve nominally pure levels (i.e., less than 60% pure) have been assigned accuracy ratings of "E."

Oscillator strength data are available for additional transitions [3], but these results are not quoted here since no indication of the percentage compositions is given.

References

[1] Cheng, K. T., Kim, Y.-K., and Desclaux, J. P., At. Data Nucl. Data Tables **24**, 111 (1979).

[2] Bromage, G. E., and Fawcett, B. C., Mon. Not. R. Astron. Soc. **179**, 683 (1977).

[3] Bromage, G. E., Cowan, R. D., Fawcett, B. C., Gordon, H., Hobby, M. G., Peacock, N. J., and Ridgeley, A., United Kingdom Atomic Energy Authority Report CLM-R170 (August 1977).

Fe XX: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$2s^2 2p^3$–$2s2p^4$	$^4S^o$ – ^4P	*126.53*	0	*790340*	4	12	160	0.115	0.192	−0.336	C	1
			132.85	0	752730	4	6	130	0.052	0.091	−0.68	C	1
			121.85	0	820680	4	4	186	0.0413	0.066	−0.78	C	1
			118.70	0	842460	4	2	209	0.0221	0.0345	−1.054	C	1

TRANSITION PROBABILITIES FOR IRON

Fe XX: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
2.		$^4S^o - ^2D$											
			[95.1]	0	[1028100]	4	4	19	0.0026	0.0033	−1.98	E	1
3.		$^4S^o - ^2S$											
			[83.0]	0	[1181000]	4	2	19	0.0010	0.0011	−2.40	E	1
4.		$^4S^o - ^2P$											
			[79.5]	0	[1229000]	4	4	47	0.0045	0.0047	−1.74	E	1
5.		$^2D^o - ^4P$											
			[175]	[162000]	752730	6	6	2.6	0.0012	0.0041	−2.14	E	1
			[148]	[124300]	820680	4	4	1.3	4.2(−4)[a]	8.2(−4)	−2.77	E	1
			[156]	[162000]	820680	6	4	0.45	1.1(−4)	3.4(−4)	−3.18	E	1
			[143]	[124300]	842460	4	2	3.3	5.1(−4)	9.6(−4)	−2.69	E	1
			[164]	[124300]	752730	4	6	6.3	0.0038	0.0082	−1.82	E	1
6.		$^2D^o - ^2D$	*112.2*	*[146900]*	*[1037800]*	10	10	360	0.068	0.25	−0.17	C−	1
			113.34	[162000]	[1044300]	6	6	330	0.063	0.14	−0.42	C	1
			110.65	[124300]	[1028100]	4	4	420	0.078	0.11	−0.51	C	1
			115.39	[162000]	[1028100]	6	4	0.43	5.7(−5)	1.3(−4)	−3.47	E	1
			[108.7]	[124300]	[1044300]	4	6	0.27	7.1(−5)	1.0(−4)	−3.55	E	1
7.		$^2D^o - ^2S$											
			94.62	[124300]	[1181000]	4	2	450	0.030	0.037	−0.92	D	1
8.		$^2D^o - ^2P$	*89.76*	*[146900]*	*[1261000]*	10	6	930	0.068	0.20	−0.17	C	1
			93.76	[162000]	[1229000]	6	4	1000	0.089	0.16	−0.27	C	1
			83.23	[124300]	[1326000]	4	2	291	0.0151	0.0165	−1.219	C	1
			90.60	[124300]	[1229000]	4	4	147	0.0181	0.0216	−1.140	C	1
9.		$^2P^o - ^4P$											
			[234]	[309000]	752730	4	6	0.27	3.3(−4)	0.0010	−2.88	E	1
			[202]	[309000]	820680	4	4	1.8	0.0011	0.0029	−2.36	E	1
			[172]	[246000]	842460	2	2	2.5	0.0011	0.0012	−2.66	E	1
10.		$^2P^o - ^2D$	*133*	*[288000]*	*[1037800]*	6	10	53	0.023	0.061	−0.86	C−	1
			136.06	[309000]	[1044300]	4	6	60	0.0250	0.0448	−1.000	C	1
			[128]	[246000]	[1028100]	2	4	29.7	0.0146	0.0123	−1.53	C	1
			[139]	[309000]	[1028100]	4	4	6.9	0.0020	0.0037	−2.10	D	1
11.		$^2P^o - ^2S$	*112*	*[288000]*	[1181000]	6	2	360	0.023	0.050	−0.87	C−	1
			[115]	[309000]	[1181000]	4	2	30	0.0030	0.0045	−1.92	D	1
			106.96	[246000]	[1181000]	2	2	370	0.064	0.045	−0.89	C	1
12.		$^2P^o - ^2P$	*103*	*[288000]*	*[1261000]*	6	6	423	0.067	0.137	−0.394	C−	1
			108.82	[309000]	[1229000]	4	4	94	0.0167	0.0239	−1.175	C	1
			[92.59]	[246000]	[1326000]	2	2	44	0.0057	0.0035	−1.94	D	1
			98.37	[309000]	[1326000]	4	2	970	0.070	0.091	−0.55	C	1
			101.84	[246000]	[1229000]	2	4	91	0.0284	0.0190	−1.246	C	1

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Fe XX: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
13.	$2s2p^4$–$2p^5$	^{4}P – ^{2}P°											
			[81.4]	752730	[1940400]	6	4	32	0.0021	0.0034	−1.90	E	1
			[78.9]	820680	[2048000]	4	2	2.8	1.3(−4)	1.4(−4)	−3.28	E	1
			[86.2]	820680	[1940400]	4	4	17	0.0019	0.0022	−2.12	E	1
			[80.3]	842460	[2048000]	2	2	10	9.7(−4)	5.1(−4)	−2.71	E	1
			[87.8]	842460	[1940400]	2	4	5.6	0.0013	7.5(−4)	−2.59	E	1
14.		^{2}D – ^{2}P°	*107*	*[1037800]*	*[1976000]*	10	6	580	0.060	0.21	−0.22	C	1
			111.60	[1044300]	[1940400]	6	4	430	0.054	0.12	−0.49	C	1
			98.08	[1028100]	[2048000]	4	2	462	0.0333	0.0430	−0.88	C	1
			109.65	[1028100]	[1940400]	4	4	176	0.0317	0.0458	−0.90	C	1
15.		^{2}S – ^{2}P°	*126*	[1181000]	*[1976000]*	2	6	75	0.053	0.0442	−0.97	C−	1
			131.76	[1181000]	[1940400]	2	4	90	0.0469	0.0407	−1.028	C	1
			[115]	[1181000]	[2048000]	2	2	23	0.0046	0.0035	−2.04	D	1
16.		^{2}P – ^{2}P°	*140*	*[1261000]*	*[1976000]*	6	6	420	0.12	0.34	−0.13	C	1
			140.42	[1229000]	[1940400]	4	4	310	0.092	0.17	−0.43	C	1
			138.49	[1326000]	[2048000]	2	2	320	0.093	0.085	−0.73	C	1
			122.00	[1229000]	[2048000]	4	2	370	0.0413	0.066	−0.78	C	1
			[163]	[1326000]	[1940400]	2	4	17.8	0.0142	0.0152	−1.55	C	1
17.	$2p^3$–$2p^2(^3\mathrm{P})3d$	^{4}S° – ^{4}P											
			[12.84]			4	6	1.5(+5)	0.56	0.095	0.35	E	2
			[12.82]			4	4	2.1(+5)	0.52	0.088	0.32	D	2
18.		^{2}D° – ^{2}D											
			[13.00]			6	6	5.9(+4)	0.15	0.039	−0.05	E	2
			[12.94]			4	6	1.5(+5)	0.56	0.095	0.35	D	2
19.		^{2}P° – ^{2}D											
			[13.15]			2	4	9.6(+4)	0.50	0.043	0.00	D	2
20.	$2p^3$–$2p^2(^1\mathrm{D})3d$	^{2}D° – ^{2}D											
			[12.89]			6	6	9.6(+4)	0.24	0.061	0.16	E	2
			[12.84]			4	4	1.2(+5)	0.30	0.051	0.08	D	2
			[12.83]			4	6	1.1(+5)	0.42	0.071	0.23	E	2
21.		^{2}P° – ^{2}D											
			[13.14]			4	6	1.7(+4)	0.065	0.011	−0.59	E	2
22.		^{2}P° – ^{2}P											
			[13.06]			4	4	1.5(+5)	0.39	0.067	0.19	D	2
23.	$2p^3$–$2p^2(^1\mathrm{S})3d$	^{2}P° – ^{2}D											
			[12.88]			4	6	1.4(+5)	0.53	0.090	0.33	D	2
			[12.76]			2	4	1.5(+5)	0.73	0.061	0.16	D	2

[a] The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

TRANSITION PROBABILITIES FOR IRON

Fe XXI

Ground State $1s^22s^22p^2\ ^3P_0$

Ionization Potential [1685] eV = [13591000] cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
8.47	69	9.68	53	13.25	31	124	19
8.53	67,68	9.69	44,60	13.41	33	124.26	3
8.56	66,68	9.70	53	78.3	16	125.30	28
8.57	67	9.73	44	83.4	6	128.73	2
8.61	66	9.74	46	84.4	16	136	14
8.62	62	9.75	45	86.6	6	137	19
8.63	62	9.79	59	87.7	21	140	19
8.64	65,66	9.85	47	91.29	4	142.14	2
8.65	65,73,74	12.02	37	94.480	5	142.25	2
8.66	71,72	12.10	36	95.656	18	144.46	8
8.68	62	12.13	37	97.89	4	144.82	25
8.71	62	12.192	38	98.140	18	145.66	2
8.72	63	12.21	36	98.525	5	148.79	8
8.74	70,76	12.25	35	99.05	11	151.51	2
8.81	64	12.28	36	102.23	4	151.63	2
8.83	75	12.36	35	103	17	155	22
9.34	52	12.38	35,42	104	23	156	22
9.41	52	12.393	41	108.45	3	164	24
9.42	51	12.43	35	111.02	20	178	27
9.44	50	12.47	40	112.47	15	179	13
9.45	49	12.525	34	113.34	10	180.55	7
9.46	51	12.53	34	113.56	20	182	22
9.47	49,50	12.587	39	114	17	189.61	7
9.52	49	12.623	43	115.16	3	189.81	7
9.54	48	12.91	30	117	17	193	24
9.56	48,49,57,	12.95	29	117.89	3	209	26
	58	12.99	30	118.3	9	244	12
9.58	48,54,56	13.00	29	118.70	3	251	1
9.59	44,55	13.03	29	120	19	260	26
9.62	44	13.13	29	121	19	282	1
9.63	44	13.14	29	121.22	3		
9.67	61	13.20	29,32	122	19		

Oscillator strengths for transitions of the arrays $2s^22p^2$–$2s2p^3$ and $2s2p^3$–$2p^4$ are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Cheng et al. [1]. These relativistic calculations include a perturbative treatment of the Breit interaction and the Lamb shift. The results should be quite accurate, except in the case of intercombination lines, for which the f-values should be considered rather uncertain. (A few very weak intercombination lines have been omitted from this tabulation.) The f-value listed for the $2s^22p^2\ ^3P_2$–$2s2p^3\ ^1D_2^\circ$ transition is quoted with an uncertainty of 50%, since its magnitude is considerably larger than those of the other intercombination lines.

Transition probabilities for the arrays $2p^2$–$2p3s$ and $2p^2$–$2p3d$ are the results of the scaled Thomas-Fermi calculations of Mason et al. [2] in intermediate coupling with limited configuration interaction. Their A-values and f-values were corrected for deviations of the calculated wavelengths from the observed ones wherever possible. Of the intercombination lines, only the stronger ones have been included here, since these values were considered to be more uncertain than those for transitions between terms of the same total spin. Transitions to $J = 2$ levels of the configuration $2p3d$, with the exception of $^3F_2^\circ$, have been omitted since the eigenvectors calculated by Mason et al. for these levels indicate severe mixing of Russell-Saunders states.

Mason et al. [2] have also calculated gf-values for transitions of the arrays $2p^2$–$2pns$ and $2p^2$–$2pnd$ ($n = 4,5$). Again, only the stronger intercombination lines treated by them are tabulated here. Transitions involving the levels $2pnd\ ^3P_2^\circ$ and $2pnd\ ^3D_2^\circ$($n = 4,5$)

have been excluded, since the results of ref. [2] indicate that these levels are of very low purity in LS coupling.

The remaining f-values were derived by interpolation from graphs of systematic trends along the isoelectronic sequence.

Oscillator strength data are available for additional transitions [3], but they have not been tabulated here since no indication of the eigenvectors is provided.

References

[1] Cheng, K. T., Kim, Y.-K., and Desclaux, J. P., At. Data Nucl. Data Tables **24**, 111 (1979).

[2] Mason, H. E., Doschek, G. A., Feldman, U., and Bhatia, A. K., Astron. Astrophys. **73**, 74 (1979).

[3] Bromage, G. E., Cowan, R. D., Fawcett, B. C., Gordon, H., Hobby, M. G., Peacock, N. J., and Ridgeley, A., United Kingdom Atomic Energy Authority Report CLM-R170 (August 1977).

Fe XXI: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$2s^22p^2$-$2s2p^3$	^{3}P - ^{5}S°											
			[282]			5	5	0.32	3.8(−4)[a]	0.0018	−2.72	E	1
			[251]			3	5	0.34	5.3(−4)	0.0013	−2.80	E	1
2.		^{3}P - ^{3}D°	*142.89*	*89790*	*789620*	9	15	88	0.045	0.19	−0.39	D	1
			145.66	117310	803840	5	7	66	0.0295	0.071	−0.83	C	1
			142.14	73850	777380	3	5	100	0.051	0.072	−0.82	C	1
			128.73	0	776820	1	3	120	0.093	0.039	−1.03	C	1
			151.51	117310	777380	5	5	0.13	4.4(−5)	1.1(−4)	−3.66	E	1
			[142.25]	73850	776820	3	3	7.9	0.0024	0.0034	−2.14	D	1
			[151.63]	117310	776820	5	3	0.73	1.5(−4)	3.7(−4)	−3.12	E	1
3.		^{3}P - ^{3}P°	*118.65*	*89790*	*932620*	9	9	237	0.050	0.176	−0.346	C−	1
			121.22	117310	942210	5	5	217	0.0479	0.096	−0.62	C	1
			117.89	73850	922080	3	3	170	0.0354	0.0412	−0.97	C	1
			[124.26]	117310	922080	5	3	32	0.0044	0.0090	−1.66	D	1
			118.70	73850	916310	3	1	241	0.0170	0.0199	−1.292	C	1
			115.16	73850	942210	3	5	3.6	0.0012	0.0014	−2.44	D	1
			108.45	0	922080	1	3	42.5	0.0225	0.0080	−1.65	C	1
4.		^{3}P - ^{3}S°	*99.43*	*89790*	1095500	9	3	1000	0.051	0.15	−0.34	C	1
			102.23	117310	1095500	5	3	640	0.060	0.10	−0.52	C	1
			97.89	73850	1095500	3	3	264	0.0379	0.0366	−0.94	C	1
			91.29	0	1095500	1	3	99	0.0370	0.0111	−1.432	C	1
5.		^{3}P - ^{1}D°											
			[98.525]	117310	1132280	5	5	89	0.013	0.021	−1.19	D	1
			[94.480]	73850	1132280	3	5	4.3	9.5(−4)	8.9(−4)	−2.55	E	1
6.		^{3}P - ^{1}P°											
			[86.6]			5	3	2.4	1.6(−4)	2.3(−4)	−3.10	E	1
			[83.4]			3	3	54	0.0056	0.0046	−1.77	E	1
7.		^{1}D - ^{3}D°											
			[180.55]	249980	803840	5	7	10	0.0070	0.021	−1.46	E	1
			[189.61]	249980	777380	5	5	0.37	2.0(−4)	6.2(−4)	−3.00	E	1
			[189.81]	249980	776820	5	3	2.0	6.4(−4)	0.0020	−2.49	E	1
8.		^{1}D - ^{3}P°											
			[144.46]	249980	942210	5	5	2.4	7.5(−4)	0.0018	−2.43	E	1
			[148.79]	249980	922080	5	3	3.0	5.9(−4)	0.0014	−2.53	E	1
9.		^{1}D - ^{3}S°											
			[118.3]	249980	1095500	5	3	2.9	3.7(−4)	7.2(−4)	−2.73	E	1
10.		^{1}D - ^{1}D°	113.34	249980	1132280	5	5	480	0.092	0.17	−0.34	C	1

TRANSITION PROBABILITIES FOR IRON

Fe XXI: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
11.		^{1}D – ^{1}P°	99.05?			5	3	700	0.062	0.10	−0.51	C	1
12.		^{1}S – ^{3}D°											
			[244]			1	3	0.56	0.0015	0.0012	−2.82	E	1
13.		^{1}S – ^{3}P°											
			[179]			1	3	1.7	0.0024	0.0014	−2.62	E	1
14.		^{1}S – ^{3}S°											
			[136]			1	3	7.1	0.0059	0.0026	−2.23	E	1
15.		^{1}S – ^{1}P°	112.47			1	3	183	0.104	0.0385	−0.98	C	1
16.	$2s2p^3$–$2p^4$	^{5}S° – ^{3}P											
			[84.4]			5	5	15	0.0016	0.0022	−2.10	E	1
			[78.3]			5	3	2.9	1.6(−4)	2.1(−4)	−3.10	E	1
17.		^{3}D° – ^{3}P	*110*			15	9	472	0.051	0.279	−0.113	C	1
			[117]			7	5	319	0.0467	0.126	−0.486	C	1
			[103]			5	3	231	0.0220	0.0373	−0.96	C	1
			[103]			3	1	383	0.0203	0.0207	−1.215	C	1
			[114]			5	5	150	0.0292	0.055	−0.84	C	1
			[103]			3	3	158	0.0252	0.0256	−1.121	C	1
			[114]			3	5	38.5	0.0125	0.0141	−1.426	C	1
18.		^{3}D° – ^{1}D											
			[98.140]	803840	1822790	7	5	60	0.0062	0.014	−1.36	E	1
			[95.656]	777380	1822790	5	5	7.3	0.0010	0.0016	−2.30	E	1
19.		^{3}P° – ^{3}P	*131*			9	9	130	0.033	0.13	−0.52	D	1
			[140]			5	5	37.8	0.0111	0.0256	−1.256	C	1
			[121]			3	3	1.5	3.4(−4)	4.1(−4)	−2.99	E	1
			[124]			5	3	181	0.0250	0.051	−0.90	C	1
			[122]			3	1	208	0.0155	0.0187	−1.333	C	1
			[137]			3	5	39.2	0.0184	0.0249	−1.258	C	1
			[120]			1	3	53	0.0341	0.0135	−1.467	C	1
20.		^{3}P° – ^{1}D											
			[113.56]	942210	1822790	5	5	25	0.0049	0.0092	−1.61	E	1
			[111.02]	922080	1822790	3	5	13	0.0041	0.0045	−1.91	E	1
21.		^{3}P° – ^{1}S											
			[87.7]			3	1	47	0.0018	0.0016	−2.27	E	1
22.		^{3}S° – ^{3}P	*169*			3	9	100	0.13	0.22	−0.40	C	1
			[182]			3	5	68	0.056	0.10	−0.77	C	1
			[155]			3	3	140	0.052	0.080	−0.81	C	1
			[156]			3	1	193	0.0235	0.0362	−1.152	C	1
23.		^{3}S° – ^{1}S											
			[104]			3	1	59	0.0032	0.0033	−2.02	E	1

Fe XXI: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
24.		$^1D^o - {}^3P$											
			[193]			5	5	8.4	0.0047	0.015	−1.63	E	1
			[164]			5	3	3.5	8.5(−4)	0.0023	−2.37	E	1
25.		$^1D^o - {}^1D$	144.82	1132280	1822790	5	5	356	0.112	0.267	−0.252	C	1
26.		$^1P^o - {}^3P$											
			[260]			3	5	1.1	0.0019	0.0049	−2.24	E	1
			[209]			3	3	7.3	0.0048	0.0099	−1.84	E	1
27.		$^1P^o - {}^1D$	[178]			3	5	51	0.0400	0.070	−0.92	C	1
28.		$^1P^o - {}^1S$	125.30			3	1	870	0.068	0.084	−0.69	C	1
29.	$2p^2-2p3s$	$^3P - {}^3P^o$	13.06			9	9	2.0(+4)	0.052	0.020	−0.33	D	2
			[13.03]			5	5	1.3(+4)	0.033	0.0071	−0.78	D	2
			[13.13]			3	3	3900	0.010	0.0013	−1.52	D	2
			[13.20]			5	3	1.2(+4)	0.019	0.0041	−1.03	D	2
			[13.14]			3	1	2.0(+4)	0.017	0.0022	−1.29	D	2
			[12.95]			3	5	6100	0.026	0.0033	−1.12	D	2
			[13.00]			1	3	7300	0.055	0.0024	−1.26	D	2
30.		$^3P - {}^1P^o$											
			[12.99]			5	3	1100	0.0017	3.6(−4)	−2.08	E	2
			[12.91]			3	3	1200	0.0030	3.8(−4)	−2.05	E	2
31.		$^1D - {}^3P^o$											
			[13.25]			5	5	3400	0.0089	0.0020	−1.35	E	2
32.		$^1D - {}^1P^o$	[13.20]			5	3	2.3(+4)	0.036	0.0078	−0.74	D	2
33.		$^1S - {}^1P^o$	[13.41]			1	3	7300	0.059	0.0026	−1.23	E	2
34.	$2p^2-2p3d$	$^3P - {}^3F^o$											
			12.525	117310	8101300	5	7	5.9(+4)	0.19	0.040	−0.01	D	2
			[12.53]			5	5	1.5(+4)	0.035	0.0073	−0.75	D	2
35.		$^3P - {}^3D^o$											
			12.38	117310	8195000	5	7	2.1(+5)	0.69	0.14	0.54	D	2
			[12.25]			1	3	2.1(+5)	1.4	0.057	0.15	D	2
			[12.36]			3	3	3.6(+4)	0.082	0.010	−0.61	D	2
			[12.43]			5	3	2100	0.0029	6.0(−4)	−1.84	E	2
36.		$^3P - {}^3P^o$											
			[12.21]			3	3	1.2(+5)	0.27	0.032	−0.09	D	2
			[12.28]			5	3	5.2(+4)	0.071	0.014	−0.45	D	2
			[12.21]			3	1	1.5(+5)	0.11	0.013	−0.47	D	2
			[12.10]			1	3	230	0.0015	6.0(−5)	−2.82	E	2
37.		$^3P - {}^1P^o$											
			[12.13]			3	3	1.8(+4)	0.040	0.0048	−0.92	E	2
			[12.02]			1	3	1.3(+4)	0.084	0.0033	−1.07	E	2
38.		$^3P - {}^1F^o$											
			[12.192]	117310	8319100	5	7	2.2(+4)	0.070	0.014	−0.46	E	2

TRANSITION PROBABILITIES FOR IRON

Fe XXI: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
39.		^{1}D - ^{3}D°											
			[12.587]	249980	8195000	5	7	1.2(+4)	0.039	0.0081	0.71	E	2
40.		^{1}D - ^{3}P°											
			[12.47]			5	3	1.3(+4)	0.018	0.0037	−1.04	E	2
41.		^{1}D - ^{1}F°	12.393	249980	8319100	5	7	3.2(+5)	1.0	0.21	0.71	D	2
42.		^{1}D - ^{1}P°	[12.38]			5	3	6900	0.0095	0.0019	−1.32	E	2
43.		^{1}S - ^{1}P°	12.623			1	3	7.1(+4)	0.51	0.021	−0.30	E	2
44.	$2p^2$–$2p4s$	^{3}P - ^{3}P°	9.65			9	9	4500	0.0063	0.0018	−1.25	E	2
			[9.63]			5	5	3000	0.0042	6.7(−4)	−1.68	E	2
			[9.69]			3	3	610	8.6(−4)	8.2(−5)	−2.59	E	2
			[9.73]			5	3	2300	0.0020	3.2(−4)	−2.00	E	2
			[9.69]			3	1	3600	0.0017	1.6(−4)	−2.29	E	2
			[9.59]			3	5	1700	0.0040	3.8(−4)	−1.92	E	2
			[9.62]			1	3	1200	0.0049	1.6(−4)	−2.31	E	2
45.		^{1}D - ^{3}P°											
			[9.75]			5	5	770	0.0011	1.8(−4)	−2.26	E	2
46.		^{1}D - ^{1}P°	[9.74]			5	3	5300	0.0045	7.2(−4)	−1.65	E	2
47.		^{1}S - ^{1}P°	[9.85]			1	3	2200	0.0095	3.1(−4)	−2.02	E	2
48.	$2p^2$–$2p4d$	^{3}P - ^{3}F°											
			[9.56]			5	7	3.2(+4)	0.061	0.0096	−0.52	D	2
			[9.54]			3	5	750	0.0017	1.6(−4)	−2.29	E	2
			[9.58]			5	5	5200	0.0071	0.0011	−1.45	E	2
49.		^{3}P - ^{3}D°											
			[9.47]			5	7	4.9(+4)	0.093	0.014	−0.33	D	2
			[9.45]			1	3	5.2(+4)	0.21	0.0065	−0.68	D	2
			[9.52]			3	3	8100	0.011	0.0010	−1.48	D	2
			[9.56]			5	3	850	7.0(−4)	1.1(−4)	−2.46	E	2
50.		^{3}P - ^{1}D°											
			[9.47]			5	5	6100	0.0082	0.0013	−1.39	E	2
			[9.44]			3	5	1.7(+4)	0.037	0.0034	−0.95	D	2
51.		^{3}P - ^{3}P°											
			[9.42]			3	3	3.3(+4)	0.044	0.0041	−0.88	D	2
			[9.46]			5	3	1.5(+4)	0.012	0.0019	−1.22	D	2
			[9.42]			3	1	4.3(+4)	0.019	0.0018	−1.24	D	2
52.		^{3}P - ^{1}P°											
			[9.41]			3	3	1300	0.0017	1.6(−4)	−2.29	E	2
			[9.34]			1	3	2200	0.0086	2.6(−4)	−2.07	E	2
53.		^{1}D - ^{3}F°											
			[9.68]			5	7	4000	0.0079	0.0013	−1.40	E	2
			[9.70]			5	5	1900	0.0027	4.3(−4)	−1.87	E	2

Fe XXI: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
54.		^{1}D – ^{3}D°											
			[9.58]			5	7	1700	0.0033	5.2(−4)	−1.78	E	2
55.		^{1}D – ^{1}D°	[9.59]			5	5	1.0(+4)	0.014	0.0022	−1.15	D	2
56.		^{1}D – ^{3}P°											
			[9.58]			5	3	3900	0.0032	5.0(−4)	−1.80	E	2
57.		^{1}D – ^{1}F°	[9.56]			5	7	8.9(+4)	0.17	0.027	−0.07	D	2
58.		^{1}D – ^{1}P°	[9.56]			5	3	2300	0.0019	3.0(−4)	−2.02	E	2
59.		^{1}S – ^{3}D°											
			[9.79]			1	3	2200	0.0094	3.0(−4)	−2.03	E	2
60.		^{1}S – ^{3}P°											
			[9.69]			1	3	500	0.0021	6.7(−5)	−2.68	E	2
61.		^{1}S – ^{1}P°	[9.67]			1	3	5.7(+4)	0.24	0.0076	−0.62	D	2
62.	$2p^2$–$2p5s$	^{3}P – ^{3}P°											
			[8.63]			5	5	510	5.7(−4)	8.1(−5)	−2.55	E	2
			[8.68]			3	3	160	1.8(−4)	1.5(−5)	−3.27	E	2
			[8.71]			5	3	730	5.0(−4)	7.2(−5)	−2.60	E	2
			[8.68]			3	1	1000	3.9(−4)	3.3(−5)	−2.93	E	2
			[8.62]			1	3	280	9.5(−4)	2.7(−5)	−3.02	E	2
63.		^{1}D – ^{1}P°	[8.72]			5	3	2000	0.0014	2.0(−4)	−2.15	E	2
64.		^{1}S – ^{1}P°	[8.81]			1	3	890	0.0031	9.0(−5)	−2.51	E	2
65.	$2p^2$–$2p5d$	^{3}P – ^{3}F°											
			[8.64]			5	7	1.5(+4)	0.024	0.0034	−0.92	D	2
			[8.65]			5	5	2500	0.0028	4.0(−4)	−1.85	E	2
66.		^{3}P – ^{3}D°											
			[8.56]			5	7	2.0(+4)	0.030	0.0042	−0.82	D	2
			[8.56]			1	3	2.1(+4)	0.070	0.0020	−1.15	D	2
			[8.61]			3	3	3200	0.0036	3.1(−4)	−1.97	E	2
			[8.64]			5	3	400	2.7(−4)	3.8(−5)	−2.87	E	2
67.		^{3}P – ^{1}D°											
			[8.57]			5	5	2800	0.0031	4.4(−4)	−1.81	E	2
			[8.53]			3	5	6100	0.011	9.3(−4)	−1.48	D	2
68.		^{3}P – ^{3}P°											
			[8.53]			3	3	1.5(+4)	0.016	0.0013	−1.32	D	2
			[8.56]			5	3	6500	0.0043	6.1(−4)	−1.67	E	2
			[8.53]			3	1	1.8(+4)	0.0066	5.6(−4)	−1.70	E	2
69.		^{3}P – ^{1}P°											
			[8.47]			1	3	1400	0.0046	1.3(−4)	−2.34	E	2
70.		^{1}D – ^{3}F°											
			[8.74]			5	7	2700	0.0044	6.3(−4)	−1.66	E	2

TRANSITION PROBABILITIES FOR IRON

Fe XXI: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} ($10^8 s^{-1}$)	f_{ik}	S (at.u.)	log gf	Accuracy	Source
71.		$^1D - ^1D^o$	[8.66]			5	5	4400	0.0049	7.0(−4)	−1.61	E	2
72.		$^1D - ^3P^o$											
			[8.66]			5	3	1600	0.0011	1.6(−4)	−2.26	E	2
73.		$^1D - ^1F^o$	[8.65]			5	7	3.9(+4)	0.061	0.0087	−0.52	D	2
74.		$^1D - ^1P^o$	[8.65]			5	3	1000	6.9(−4)	9.8(−5)	−2.46	E	2
75.		$^1S - ^3D^o$											
			[8.83]			1	3	1600	0.0055	1.6(−4)	−2.26	E	2
76.		$^1S - ^1P^o$	[8.74]			1	3	2.5(+4)	0.085	0.0024	−1.07	D	2
77.	$2p3s-2p3p$	$^3P^o - ^3D$				9	15		0.088		−0.10	D	*interp.*
78.		$^3P^o - ^3S$				9	3		0.021		−0.72	D	*interp.*
79.		$^3P^o - ^3P$				9	9		0.073		−0.18	D	*interp.*
80.		$^1P^o - ^1P$				3	3		0.050		−0.82	D	*interp.*
81.		$^1P^o - ^1D$				3	5		0.14		−0.38	D	*interp.*
82.	$2p3p-2p3d$	$^1P - ^1P^o$				3	3		0.030		−1.05	D	*interp.*
83.		$^3D - ^3F^o$				15	21		0.032		−0.32	D−	*interp.*
84.		$^1D - ^1P^o$				5	3		5.8(−4)		−2.54	E	*interp.*
85.		$^1D - ^1F^o$				5	7		0.11		−0.26	D	*interp.*
86.		$^1S - ^1P^o$				1	3		0.067		−1.17	D	*interp.*

* The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Fe XXII

Ground State — $1s^22s^22p\ ^2P^o_{1/2}$

Ionization Potential — [1794] eV = [14470000] cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
8.960	33,38	9.215	37	11.837	21	12.095	23
8.977	36	9.241	36	11.886	20	12.193	22,24
8.992	35	10.25	40	11.898	27	12.22	17
9.006	35	10.30	40	11.921	18	12.325	25
9.057	33	10.31	40	11.933	18	12.38	17
9.065	33,34	11.748	20,21,26	11.976	19	14.05	31
9.08	32	11.767	18	12.027	30	14.14	31
9.16	32	11.789	21,26	12.045	23,28	14.16	31
9.163	39	11.797	21	12.053	23	84.4	7
9.183	38	11.823	20	12.077	27,29	84.6	7

List of tabulated lines—Continued

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
88.4	7	116.29	4	149.90	9	230.05	12
99.3	6	117.17	3	151.30	9	238.53	15
100.78	3	117.52	5	153.95	16	246.82	12
102	6	120.17	10	155.87	2	251	1
102.23	4	125.71	5	156.84	9	255	11
105	6	129.15	13	157.36	13	258	1
108	6	134.65	5	161.75	2	299	1
111	6	135.78	2	169.35	16	358	1
112.20	10	136.02	3	173.49	13	372	14
114.42	3	139.82	13	183.84	12	398	11
115.22	10	144.82	9	195	8		

The tabulated oscillator strengths for transitions of the arrays $2s^22p-2s2p^2$ and $2s2p^2-2p^3$ are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Cheng et al. [1]. These relativistic calculations include a perturbative treatment of the Breit interaction and the Lamb shift. The results should be quite accurate, except in the case of intercombination lines, for which the f-values should be considered rather uncertain. (A few very weak intercombination lines have been omitted from this tabulation.)

Other sources of reliable data for $2s-2p$ transitions are the multiconfiguration Breit-Pauli method of Glass [2,3] (including relativistic effects) and the similar but somewhat less sophisticated approach of Dankwort and Trefftz [4]. With the exception of some weaker lines, they agree very well with the results of Cheng et al. [1], but the latter are quoted exclusively since ref. [1] provides data derived from comprehensive calculations for all outer-shell $2s-2p$ transiin ions of the isoelectronic sequences of Li through F.

According to the sources of data mentioned above, the lower of the two levels $2s2p^2\ ^2P_{1/2}$ and $^2S_{1/2}$ is mostly of ^2P character, "crossed" the $^2S_{1/2}$ level at about V XIX or Cr XX. We have thus labeled these two levels accordingly, in contrast to their labeling by Cheng et al. [1], which is consistent with their ordering at the neutral end of the B sequence.

The results of the Hartree-XR (Hartree-Fock with exchange and relativistic effects) calculations of Bromage et al. [5] are quoted for several $2p-3d$ and $2p-4d$ transitions. The Hartree-Fock (HF) sults of Shamey [6] are tabulated for a few transitions of the type $2p-ns,nd$ ($n = 3,4$). The very weak lines have been omitted, Shamey's calculations accounted for very limited configuration interaction. A few multiplet f-values are the results of Chapman's single-configuration HF calculations [7].

The f-value for the $3p-3d$ multiplet was derived by graphical interpolation along the isoelectronic sequence.

References

[1] Cheng, K. T., Kim, Y.-K., and Desclaux, J. P., At. Data Nucl. Data Tables **24**, 111 (1979) and private communication.
[2] Glass, R., J. Phys. B **13**, 15 (1980).
[3] Glass, R., J. Phys. B **13**, 899 (1980).
[4] Dankwort, W., and Trefftz, E., Astron. Astrophys. **65**, 93 (1978).
[5] Bromage, C. E., Cowan, R. D., Fawcett, B. C., and Ridgeley, A., J. Opt. Soc. Am. **68**, 48 (1978).
[6] Shamey, L. J., J. Opt. Soc. Am. **61**, 942 (1971).
[7] Chapman, R. D., Astrophys. J. **156**, 87 (1969).

Fe XXII: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$2s^22p-2s2p^2$	$^2P^o-{}^4P$											
			[258]			4	6	0.67	0.0010	0.0034	−2.40	E	1
			[299]			4	4	0.082	1.1(−4)*	4.3(−4)	−3.36	E	1
			[251]			2	2	0.84	7.9(−4)	0.0013	−2.80	E	1
			[358]			4	2	0.14	1.3(−4)	6.1(−4)	−3.28	E	1
2.		$^2P^o-{}^2D$	*148.89*	*78850*	*750490*	6	10	77	0.0425	0.125	−0.59	C−	1
			155.87	118270	759830	4	6	62	0.0340	0.070	−0.87	C	1
			135.78	0	736490	2	4	110	0.062	0.055	−0.91	C	1
			[161.75]	118270	736490	4	4	0.38	1.5(−4)	3.2(−4)	−3.22	E	1

TRANSITION PROBABILITIES FOR IRON

Fe XXII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
3.		$^2P^o - ^2P$	*115.32*	*78850*	*945990*	6	6	440	0.088	0.20	−0.28	C−	1
			114.42	118270	992260	4	4	450	0.088	0.13	−0.45	C	1
			117.17	0	853460	2	2	390	0.080	0.062	−0.80	C	1
			[136.02]	118270	853460	4	2	0.12	1.6(−5)	2.9(−5)	−4.19	E	1
			100.78	0	992260	2	4	62	0.0189	0.0125	−1.423	C	1
4.		$^2P^o - ^2S$	*111.19*	*78850*	978190	6	2	430	0.026	0.058	−0.80	C−	1
			116.29	118270	978190	4	2	353	0.0358	0.055	−0.84	C	1
			102.23	0	978190	2	2	27	0.0042	0.0028	−2.08	D	1
5.	$2s2p^2-2p^3$	$^4P - ^4S^o$	*128.48*			12	4	449	0.0370	0.188	−0.352	C	1
			134.65			6	4	196	0.0356	0.095	−0.67	C	1
			125.71			4	4	152	0.0360	0.060	−0.84	C	1
			117.52			2	4	103	0.0428	0.0331	−1.068	C	1
6.		$^4P - ^2D^o$											
			[108]			6	6	20	0.0035	0.0075	−1.68	E	1
			[105]			4	4	24	0.0039	0.0054	−1.81	E	1
			[111]			6	4	2.3	2.8(−4)	6.1(−4)	−2.77	E	1
			[102]			4	6	0.51	1.2(−4)	1.6(−4)	−3.32	E	1
			[99.3]			2	4	0.34	1.0(−4)	6.5(−5)	−3.70	E	1
7.		$^4P - ^2P^o$											
			[88.4]			6	4	1.5	1.2(−4)	2.1(−4)	−3.14	E	1
			[84.4]			4	4	3.0	3.2(−4)	3.6(−4)	−2.89	E	1
			[84.6]			2	2	2.3	2.5(−4)	1.4(−4)	−3.30	E	1
8.		$^2D - ^4S^o$											
			[195]			4	4	1.3	7.4(−4)	0.0019	−2.53	E	1
9.		$^2D - ^2D^o$	*150.46*	*750490*	*1415130*	10	10	149	0.050	0.250	−0.297	C	1
			149.90	759830	1426940	6	6	128	0.0432	0.128	−0.59	C	1
			[151.30]	736490	1397420	4	4	76	0.0260	0.052	−0.98	C	1
			156.84	759830	1397420	6	4	50	0.0124	0.0384	−1.128	C	1
			144.82	736490	1426940	4	6	35.4	0.0167	0.0318	−1.175	C	1
10.		$^2D - ^2P^o$	*116.61*	*750490*	*1608060*	10	6	230	0.029	0.11	−0.54	D	1
			[115.22]	759830	1627750	6	4	142	0.0189	0.0430	−0.95	C	1
			[120.17]	736490	1568670	4	2	296	0.0320	0.051	−0.89	C	1
			[112.20]	736490	1627750	4	4	51	0.0097	0.014	−1.41	D	1
11.		$^2P - ^4S^o$											
			[398]			4	4	0.28	6.7(−4)	0.0035	−2.57	E	1
			[255]			2	4	1.1	0.0022	0.0037	−2.36	E	1
12.		$^2P - ^2D^o$	*213.16*	*945990*	*1415130*	6	10	42	0.048	0.20	−0.55	D	1
			[230.05]	992260	1426940	4	6	33.8	0.0402	0.122	−0.79	C	1
			[183.84]	853460	1397420	2	4	66	0.067	0.081	−0.87	C	1
			[246.82]	992260	1397420	4	4	0.44	4.0(−4)	0.0013	−2.80	E	1

Fe XXII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
13.		^{2}P – ^{2}P°	*151.04*	*945990*	*1608060*	6	6	190	0.064	0.19	−0.42	C−	1
			157.36	992260	1627750	4	4	200	0.075	0.16	−0.52	C	1
			139.82	853460	1568670	2	2	26	0.0075	0.0069	−1.82	D	1
			[173.49]	992260	1568670	4	2	22	0.0050	0.011	−1.70	D	1
			[129.15]	853460	1627750	2	4	37.4	0.0187	0.0159	−1.427	C	1
14.		^{2}S – ^{4}S°											
			[372]			2	4	0.12	4.8(−4)	0.0012	−3.02	E	1
15.		^{2}S – ^{2}D°											
			[238.53]	978190	1397420	2	4	8.6	0.0146	0.0229	−1.53	C	1
16.		^{2}S – ^{2}P°	*158.76*	978190	*1608060*	2	6	58	0.066	0.069	−0.88	C	1
			[153.95]	978190	1627750	2	4	17.4	0.0124	0.0126	−1.61	C	1
			[169.35]	978190	1568670	2	2	120	0.050	0.056	−1.00	C	1
17.	$2p$–$3s$	^{2}P° – ^{2}S	*12.33*			6	2	2.4(+4)	0.018	0.0045	−0.96	D	6
			[12.38]			4	2	1.6(+4)	0.018	0.0030	−1.13	D	6
			[12.22]			2	2	8500	0.019	0.0015	−1.42	D	6
18.	$2p$–$3d$	^{2}P° – ^{2}D	*11.870*	*78850*	*8503500*	6	10	1.8(+5)	0.64	0.15	0.58	D	5,6
			11.921	118270	8506900	4	6	1.8(+5)	0.59	0.093	0.37	D	5
			[11.767]	0	8498300	2	4	1.6(+5)	0.66	0.051	0.12	D	5
			[11.933]	118270	8498300	4	4	3.0(+4)	0.064	0.010	−0.59	D−	6
19.	$2s2p^2$–$2s2p(^3P°)3d$	^{4}P – ^{4}F°											
			11.976			6	8	5.9(+4)	0.17	0.040	0.01	D	5
20.		^{4}P – ^{4}P°											
			11.748			4	4	1.2(+5)	0.25	0.039	0.00	D	5
			11.823			6	4	7.9(+4)	0.11	0.026	−0.18	D	5
			11.748			4	2	1.8(+5)	0.19	0.029	−0.12	D	5
			11.886			4	6	1.3(+5)	0.42	0.066	0.23	D	5
21.		^{4}P – ^{4}D°											
			11.837			6	8	2.3(+5)	0.65	0.15	0.59	D	5
			11.748			4	6	4.8(+4)	0.15	0.023	−0.22	D	5
			11.797			2	4	1.7(+5)	0.70	0.054	0.15	D	5
			11.837			6	6	1.7(+5)	0.35	0.082	0.32	D	5
			11.789			2	2	2.6(+5)	0.55	0.043	0.04	D	5
22.		^{2}D – ^{2}D°											
			12.193	736490	8937900	4	6	9.9(+4)	0.33	0.053	0.12	D	5
23.		^{2}D – ^{2}F°	*12.049*	*750490*	*9049700*	10	14	2.0(+5)	0.61	0.24	0.78	D	5
			12.045	759830	9062000	6	8	2.4(+5)	0.71	0.17	0.63	D	5
			12.053	736490	9033200	4	6	6.1(+4)	0.20	0.032	−0.10	D	5
			12.095	759830	9033200	6	6	7.8(+4)	0.17	0.041	0.01	D	5
24.		^{2}P – ^{2}P°											
			12.193	853460	9054900	2	4	7.2(+4)	0.32	0.026	−0.19	D	5

TRANSITION PROBABILITIES FOR IRON

Fe XXII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
25.		^{2}S - ^{2}P°											
			12.325	978190	9091800	2	2	1.5(+5)	0.35	0.028	−0.15	D	5
26.	$2s2p^2$-$2s2p(^1$P°$)3d$	^{2}D - ^{2}F°											
			11.789	759830	9242300	6	8	1.2(+5)	0.32	0.075	0.28	D	5
			11.748	736490	9248600	4	6	1.6(+5)	0.49	0.076	0.29	D	5
27.		^{2}P - ^{2}D°											
			12.077	992260	9272500	4	6	2.4(+5)	0.78	0.12	0.49	D	5
			11.898	853460	9258200	2	4	8.2(+4)	0.35	0.027	−0.15	D	5
28.		^{2}P - ^{2}P°											
			12.045	992260	9294500	4	4	9.7(+4)	0.21	0.033	−0.08	D	5
29.		^{2}S - ^{2}D°											
			12.077	978190	9258200	2	4	1.0(+5)	0.44	0.035	−0.06	D	5
30.		^{2}S - ^{2}P°											
			12.027	978190	9294500	2	4	6.9(+4)	0.30	0.024	−0.22	D	5
31.	$2p^3$-$2s^23d$	^{2}P° - ^{2}D	*14.11*			6	10	3200	0.016	0.0044	−1.02	D	6
			[14.14]			4	6	3000	0.013	0.0025	−1.27	D	6
			[14.05]			2	4	2900	0.017	0.0016	−1.46	D	6
			[14.16]			4	4	590	0.0018	3.3(−4)	−2.15	E	6
32.	$2p$-$4s$	^{2}P° - ^{2}S	*9.13*			6	2	9700	0.0040	7.3(−4)	−1.61	E	6
			[9.16]			4	2	6400	0.0040	4.9(−4)	−1.79	E	6
			[9.08]			2	2	3300	0.0041	2.4(−4)	−2.09	E	6
33.	$2p$-$4d$	^{2}P° - ^{2}D	*9.032*	*78850*	*11150000*	6	10	6.0(+4)	0.12	0.022	−0.13	D	5,6
			9.065	118270	11150000	4	6	6.0(+4)	0.11	0.013	−0.36	D	5
			8.960	0	11160000	2	4	5.0(+4)	0.12	0.0071	−0.62	D	5
			[9.057]	118270	11160000	4	4	9900	0.012	0.0015	−1.31	D−	6
34.	$2s2p^2$-$2s2p(^3$P°$)4d$	^{4}P - ^{4}F°											
			9.065			4	6	3.5(+4)	0.065	0.0078	−0.59	D	5
35.		^{4}P - ^{4}D°											
			9.006			6	8	5.7(+4)	0.093	0.017	−0.25	D	5
			8.992			2	4	4.9(+4)	0.12	0.0071	−0.62	D	5
			9.006			6	6	5.3(+4)	0.065	0.012	−0.41	D	5
36.		^{2}D - ^{2}F°											
			8.977	759830	11900000	6	8	2.5(+4)	0.040	0.0071	−0.62	D	5
			9.241	736490	11560000	4	6	5.1(+4)	0.098	0.012	−0.41	D	5
37.		^{2}D - ^{2}D°											
			9.215	759830	11610000	6	6	2.7(+4)	0.035	0.0064	−0.68	D	5

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Fe XXII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
38.	$2s2p^2$-$2s2p(^1P^o)4d$	$^2D - ^2F^o$											
			9.183	759830	11650000	6	8	8.3(+4)	0.14	0.025	−0.08	D	5
			8.960	736490	11900000	4	6	3.8(+4)	0.068	0.0080	−0.57	D	5
39.		$^2P - ^2D^o$											
			9.163	992260	11910000	4	6	6.9(+4)	0.13	0.016	−0.28	D	5
40.	$2p^3$–$2s^24d$	$^2P^o - ^2D$	*10.28*			6	10	1000	0.0028	5.6(−4)	−1.78	E	6
			[10.30]			4	6	1000	0.0024	3.2(−4)	−2.02	E	6
			[10.25]			2	4	960	0.0030	2.0(−4)	−2.22	E	6
			[10.31]			4	4	170	2.7(−4)	3.7(−5)	−2.97	E	6
41.	$3s$–$3p$	$^2S - ^2P^o$				2	6		0.17		−0.47	D−	7
42.	$3s$–$4p$	$^2S - ^2P^o$	*34.40*			2	6	7000	0.37	0.084	−0.13	D−	7
43.	$3p$–$3d$	$^2P^o - ^2D$				6	10		0.048		−0.54	E	*interp.*
44.	$3p$–$4s$	$^2P^o - ^2S$	*37.66*			6	2	6300	0.045	0.033	−0.57	D−	7
45.	$3p$–$4d$	$^2P^o - ^2D$	*35.88*			6	10	1.7(+4)	0.54	0.38	0.51	D−	7
46.	$3d$–$4p$	$^2D - ^2P^o$	*38.85*			10	6	1200	0.016	0.020	−0.80	D−	7
47.	$3d$–$4f$	$^2D - ^2F^o$	*37.48*			10	14	3.4(+4)	0.99	1.2	1.00	D−	7

[a] The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Fe XXIII

Ground State $1s^22s^2\ ^1S_0$

Ionization Potential [1950] eV = [15730000] cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
7.45	21	8.63	37	11.44	24	144	3
7.48	20	8.669	36	11.440	24	147	3
7.66	39	8.67	36	11.49	27,28	149	7
7.68	39	8.752	38	11.517	27	154	3
7.73	39	8.764	35	11.594	29	166	3
7.78	42	8.812	34	11.690	26	173	3
7.83	42	8.94	32	11.737	25	179	3
7.85	43	10.903	11	11.84	30	223	6
7.86	41	10.927	10	32.6	47	263.76	1
7.89	40	10.934	10	33.4	53	321	5
8.271	19	10.979	9	35.2	51	377	5
8.303	18	11.07	23	35.4	57	513	5
8.316	17	11.14	12	36.1	55	607.5	49
8.528	33	11.298	24	120	4		
8.547	33	11.33	24	132.83	2		
8.614	33	11.333	24	135	4		

TRANSITION PROBABILITIES FOR IRON

The tabulated oscillator strengths for transitions of the arrays $2s^2–2s2p$ and $2s2p–2p^2$ are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Cheng et al. [1]. These relativistic calculations include a perturbative treatment of the Breit interaction and the Lamb shift. The results should be quite accurate, except in the case of intercombination lines, for which the f-values should be considered more uncertain. (The $2s2p$ $^3P_1^o–2p^2$ $^1S_0$ trantion has been omitted from this tabulation, since its f-value is considerably smaller than those of the other lines of the array.)

Several other sources of reliable data are available for the $2s–2p$ transitions treated by Cheng et al. Those which provide results for most or all of the lines of these arrays are: the superposition-of-configurations calculations of Weiss [2] in intermediate coupling; the multiconfiguration Breit-Pauli method of Glass [3,4] (including relativistic effects); and the scaled Thomas-Fermi approach of Nussbaumer and Storey [5] with extensive allowance for configuration interaction and including a perturbational treatment of relativistic effects. Those which treat only the resonance lines include: the multiconfiguration Dirac-Fock (MCDF) approaches of Armstrong et al. [6] and Cheng and Johnson [7]; and the relativistic random phase approximation (RRPA) of Lin and Johnson [8]. With the exception of some weaker lines, these sources agree very well with the results of Cheng et al. [1], but the latter are quoted exclusively since ref. [1] provides data derived from comprehensive calculations for all outer-shell $2s–2p$ transitions in ions of the isoelectronic sequences Li through F.

A preliminary result derived from the beam-foil lifetime experiment by Dietrich et al. [9] for the $2s^2$ $^1S_0–2s2p$ $^3P_1^o$ transition deviates considerably from the calculated value of Cheng et al. [1] quoted here, although the experimental result with its stated error limits lies within our estimated uncertainty of the theoretical value. Nussbaumer and Storey [5] have calculated A-values for all downward transitions from levels of the configurations $2l'nl$ ($l' = s,p$; $n = 3,4$; $l = s,p,d$), as well as $2s4f$ and $2p4f$, in order to struct simulated decay curves of the levels $2s2p$ $^3P_1^o$and $2s2p$ $^1P_1^o$. They conclude that the suspected blending of $2s^2$ $^1S_0–2s2p$ $^3P_1^o$ the second-order line of $2s^2$ $^1S_0–2s2p$ $^1P_1^o$ in the experiment of Dietrich et al. should not have been a significant factor in the determination of the lifetime, and that there must have been additional problems in their experiment.

Nussbaumer and Storey [5] reported the results of their calculations for only a few of the transitions mentioned above. These results are tabulated here, as are the A-values for two transitions calculated by Nussbaumer [10] in the scaled Thomas-Fermi approximation with limited configuration interaction.

Lin and Johnson [8] have calculated f-values for the transitions $2s^2$ $^1S_0–2snp$ $^1P_1^o$ ($n = 3,4$), which are quoted here. In addition, they determined f-values for the intercombination lines $2s^2$ $^1S_0–2snp$ $^3P_1^o$ ($n = 3,4$), but only for selected ions of the Be sequence (not including Fe XXIII). The Hartree-XR (Hartree-Fock with statistical exchange and relativistic effects) calculations of Bromage et al. [11] yielded a result for $2s^2$ $^1S_0–2s3p$ $^3P_1^o$ which lies outside the interval bracketed by the calculated f-values of Lin and Johnson for V XX and Ni XXV. This transition has thus been omitted from our tabulation, since it is difficult to derive an f-value by interpolation along an isoelectronic sequence for a transition that is increasing rather rapidly in strength, as is the case here. The result of Doschek et al. [12] for the $2s^2$ $^1S_0–2s4p$ $^3P_1^o$ transition calcu- in the same approximation as that used by Bromage et al. [11] lies slightly beyond the interval of f-values given by Lin and Johnson for the corresponding ions of V and Ni; it is thus quoted here, but with an accuracy rating of "E."

Oscillator strengths for several transitions involving electron jumps from the $n = 2$ shell to an upper state characterized by principal quantum number n' ($n' = 3,4,5$) are from the Hartree-XR calculations of Bromage et al. [11] mentioned above. It is indicated there that the $2p3d$ $^3D_2^o$and $^1D_2^o$levels are severely mixed. Thus transitions to these states are omitted here, and the f-value for the single transition to the $2p3d$ $^3P_2^o$ level is given an accuracy of "E," since its purity in LS coupling is slightly greater than 50%. All transitions to the levels $2p4d$ $^3D_2^o$, $^1D_2^o$, and $^3P_2^o$ are omitted, they are even more strongly mixed than those of $2p3d$.

A few multiplet f-values are from the single-configuration Hartree-Fock (HF) calculations of Chapman [13]. The remaining multiplet f-values were derived by interpolation along the Be isoelectronic sequence. Line strengths for the $^3P_2^o–^3D_2$ and $^3P_1^o–^3D_1$ transitions of the array $2s2p–2s3d$ were estimated to be in the proportion to the strongest line of the multiplet ($^3P_2^o–^3D_3$) as they would be in a pure LS-coupled multiplet. The calculated f-values of Fawcett et al. [14] for lines of the same multiplet in Ni XXV are an indication that this is a reasonable assumption to make, since the ratios of line strengths derived from their f-values deviate by only few percent from the LS-coupling ratios.

Transition probabilities are available in graphical form for several transitions involving vacancies in the K shell [15], but they are not tabulated here since relativistic effects were not taken into account.

References

[1] Cheng, K. T., Kim, Y.-K., and Desclaux, J. P., At. Data Nucl. Data Tables **24**, 111 (1979).

[2] Weiss, A. W., *Beam-Foil Spectroscopy*, Vol. 1, 51–68 (Eds. Sellin, I. A., and Pegg, D. J., Plenum Press, New York, 1976) and private communication.

[3] Glass, R., J. Phys. B **12**, 689 (1979).

[4] Glass, R., J. Phys. B **12**, 697 (1979).

[5] Nussbaumer, H., and Storey, P. J., J. Phys. B **12**, 1647 (1979).

[6] Armstrong, L., Jr., Fielder, W. R., and Lin, D. L., Phys. Rev. A **14**, 1114 (1976).

[7] Cheng, K. T., and Johnson, W. R., Phys. Rev. A **15**, 1326 (1977).

[8] Lin, C. D., and Johnson, W. R., Phys. Rev. A **15**, 1046 (1977).

[9] Dietrich, D. D., Leavitt, J. A., Bashkin, S., Conway, J. G., Gould, H., MacDonald, D., Marrus, R., Johnson, B. M., and Pegg, D. J., Phys. Rev. A **18**, 208 (1978).

[10] Nussbaumer, H., Astron. Astrophys. **16**, 77 (1972).

[11] Bromage, G. E., Cowan, R. D., Fawcett, B. C., and Ridgeley, A., J. Opt. Soc. Am. **68**, 48 (1978).

[12] Doschek, G. A. Meekins, J. F., and Cowan, R. D., Astrophys. J. **177**, 261 (1972).

[13] Chapman, R. D., Astrophys. J. **156**, 87 (1969).

[14] Fawcett, B. C., Ridgeley, A., and Hughes, T. P., Mon. Not. R. Astron. Soc. **188**, 365 (1979).

[15] Boiko, V. A., Chugunov, A. Yu., Ivanova, T. G., Faenov, A. Ya., Holin, I. V., Pikuz, S. A., Urnov, A. M., Vainshtein, L. A., and Safronova, U. I., Mon. Not. R. Astron. Soc. **185**, 305 (1978).

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Fe XXIII: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$2s^2$–$2s2p$	^{1}S – ^{3}P°											
			263.76	0	379130	1	3	0.48	0.0015	0.0013	−2.82	D	1
2.		^{1}S – ^{1}P°	132.83	0	752840	1	3	195	0.155	0.0678	−0.810	B	1
3.	$2s2p$–$2p^2$	^{3}P° – ^{3}P	*162*			9	9	132	0.0521	0.250	−0.329	B	1
			[166]			5	5	76.5	0.0316	0.0863	−0.801	B	1
			[154]			3	3	41.9	0.0149	0.0227	−1.350	B	1
			[179]			5	3	45.1	0.0130	0.0383	−1.187	B	1
			[173]			3	1	124	0.0185	0.0316	−1.256	B	1
			[144]			3	5	54.6	0.0283	0.0402	−1.071	B	1
			[147]			1	3	66.2	0.0643	0.0311	−1.192	B	1
4.		^{3}P° – ^{1}D											
			[135]			5	5	49.4	0.0135	0.0300	−1.171	C	1
			[120]			3	5	4.4	0.0016	0.0019	−2.32	D	1
5.		^{1}P° – ^{3}P											
			[321]			3	5	3.5	0.0090	0.029	−1.57	D	1
			[377]			3	3	0.070	1.5(−4)[a]	5.6(−4)	−3.35	E	1
			[513]			3	1	0.21	2.8(−4)	0.0014	−3.08	E	1
6.		^{1}P° – ^{1}D	[223]			3	5	45.4	0.0564	0.124	−0.772	B	1
7.		^{1}P° – ^{1}S	[149]			3	1	328	0.0364	0.0536	−0.962	B	1
8.	$2s3d$–$2p3d$	^{3}D – ^{3}F°											
						7	9	24				C+	5
9.	$2s^2$–$2s3p$	^{1}S – ^{1}P°	10.979	0	9108300	1	3	1.14(+5)	0.620	0.0224	−0.208	B	8
10.	$2s2p$–$2p3p$	^{3}P° – ^{3}D											
			10.927	462000	9614000	5	7	5.2(+4)	0.13	0.023	−0.19	D	11
			10.934	379130	9524900	3	5	5.0(+4)	0.15	0.016	−0.35	D	11
11.		^{3}P° – ^{3}P											
			10.903	462000	9634000	5	5	4.9(+4)	0.088	0.016	−0.36	D	11
12.		^{1}P° – ^{1}D	[11.14]			3	5	6.8(+4)	0.21	0.023	−0.20	D	11
13.	$2p^2$–$2s3p$	^{3}P – ^{3}P°											
						5	5	400				C	5
						3	1	380				C	5
						3	5	300				C	5
14.		^{1}D – ^{3}P°											
						5	5	79				D	5
15.		^{1}D – ^{1}P°				5	3	1700				D	10
16.		^{1}S – ^{1}P°				1	3	1400				D	10
17.	$2s^2$–$2s4p$	^{1}S – ^{3}P°											
			8.316	0	12030000	1	3	1.2(+4)	0.036	9.9(−4)	−1.44	E	12

TRANSITION PROBABILITIES FOR IRON

Fe XXIII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
18.		$^1S - {}^1P^o$	8.303	0	12040000	1	3	4.97(+4)	0.154	0.00421	−0.812	B	8
19.	$2s2p-2p4p$	$^3P^o - {}^3D$											
			8.271	462000	12550000	5	7	2.6(+4)	0.038	0.0052	−0.72	D	11
20.	$2s^2-2s5p$	$^1S - {}^1P^o$	[7.48]			1	3	2.5(+4)	0.063	0.0016	−1.20	D	11
21.	$2s2p-2p5p$	$^3P^o - {}^3D$											
			[7.45]			5	7	1.5(+4)	0.018	0.0022	−1.05	D	11
22.	$2s2p-2s3s$	$^3P^o - {}^3S$				9	3		0.028		−0.60	D	*interp.*
23.		$^1P^o - {}^1S$	[11.07]			3	1	9800	0.0060	6.6(−4)	−1.74	E	*interp.*
24.	$2s2p-2s3d$	$^3P^o - {}^3D$											
			11.440	462000	9203000	5	7	2.2(+5)	0.60	0.11	0.48	C+	5
			11.333	379130	9202900	3	5	1.7(+5)	0.56	0.063	0.23	D	11
			11.298	354000	9205000	1	3	1.3(+5)	0.77	0.029	−0.11	D	11
			11.44	462000	9202900	5	5	5.4(+4)	0.11	0.020	−0.27	D−	*ls*
			11.33	379130	9205000	3	3	9.3(+4)	0.18	0.020	−0.27	D−	*ls*
25.		$^1P^o - {}^1D$	11.737	752840	9272900	3	5	1.7(+5)	0.59	0.068	0.25	D	11
26.	$2p^2-2p3d$	$^3P - {}^3F^o$											
			11.690			5	7	7.7(+4)	0.22	0.042	0.04	D	11
27.		$^3P - {}^3D^o$											
			11.517			5	7	2.3(+5)	0.64	0.12	0.51	D	11
			11.49			1	3	2.4(+5)	1.4	0.053	0.15	D	11
28.		$^3P - {}^3P^o$											
			11.49			5	5	1.2(+5)	0.23	0.044	0.06	E	11
29.		$^1D - {}^1F^o$	11.594			5	7	3.5(+5)	0.99	0.19	0.69	D	11
30.		$^1S - {}^1P^o$	[11.84]			1	3	2.1(+5)	1.3	0.051	0.11	D	11
31.	$2s2p-2s4s$	$^3P^o - {}^3S$	*8.70*			9	3	1.1(+4)	0.0042	0.0011	−1.42	D	13
32.		$^1P^o - {}^1S$	[8.94]			3	1	1.6(+4)	0.0064	5.7(−4)	−1.72	D	13
33.	$2s2p-2s4d$	$^3P^o - {}^3D$											
			8.614	462000	12070000	5	7	7.1(+4)	0.11	0.016	−0.26	D	11
			8.547	379130	12080000	3	5	5.3(+4)	0.097	0.0082	−0.54	D	11
			8.528	354000	12080000	1	3	4.0(+4)	0.13	0.0036	−0.89	D	11
34.		$^1P^o - {}^1D$	8.812	752840	12100000	3	5	6.2(+4)	0.12	0.010	−0.44	D	11
35.	$2p^2-2p4d$	$^3P - {}^3F^o$											
			8.764			5	7	4.6(+4)	0.074	0.011	−0.43	D	11
36.		$^3P - {}^3D^o$											
			8.669			5	7	6.1(+4)	0.096	0.014	−0.32	D	11
			[8.67]			1	3	6.8(+4)	0.23	0.0066	−0.64	D	11

Fe XXIII: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
37.		^{3}P – ^{3}P°											
			[8.63]			3	3	4.5(+4)	0.050	0.0043	−0.82	D	11
38.		^{1}D – ^{1}F°	8.752			5	7	1.2(+5)	0.19	0.027	−0.02	D	11
39.	$2s2p$–$2s5d$	^{3}P° – ^{3}D											
			[7.73]			5	7	3.0(+4)	0.038	0.0048	−0.72	D	11
			[7.68]			3	5	2.5(+4)	0.037	0.0028	−0.95	D	11
			[7.66]			1	3	1.8(+4)	0.047	0.0012	−1.33	D	11
40.		^{1}P° – ^{1}D	[7.89]			3	5	2.8(+4)	0.043	0.0034	−0.89	D	11
41.	$2p^2$–$2p5d$	^{3}P – ^{3}F°											
			[7.86]			5	7	2.3(+4)	0.030	0.0039	−0.82	D	11
42.		^{3}P – ^{3}D°											
			[7.78]			5	7	2.5(+4)	0.032	0.0041	−0.80	D	11
			[7.83]			3	5	2.6(+4)	0.040	0.0031	−0.92	D	11
43.		^{1}D – ^{1}F°	[7.85]			5	7	4.9(+4)	0.064	0.0083	−0.49	D	11
44.	$2s3s$–$2s3p$	^{3}S – ^{3}P°				3	9		0.12		−0.44	D	*interp.*
45.		^{1}S – ^{1}P°				1	3		0.050		−1.30	E	*interp.*
46.	$2s3s$–$2s4p$	^{3}S – ^{3}P°	*32.6*			3	9	8200	0.390	0.126	0.068	C	13
47.		^{1}S – ^{1}P°	[32.6]			1	3	6200	0.294	0.0316	−0.53	C	13
48.	$2s3p$–$2s3d$	^{3}P° – ^{3}D				9	15		0.027		−0.61	E	*interp.*
49.		^{1}P° – ^{1}D	[607.5]	9108300	9272900	3	5	5.1	0.047	0.28	−0.85	E	*interp.*
50.	$2s3p$–$2s4s$	^{3}P° – ^{3}S	*35.1*			9	3	7000	0.0428	0.0445	−0.414	C	13
51.		^{1}P° – ^{1}S	[35.2]			3	1	6200	0.0383	0.0133	−0.94	C	13
52.	$2s3p$–$2s4d$	^{3}P° – ^{3}D	*33.9*			9	15	2.0(+4)	0.57	0.57	0.71	C	13
53.		^{1}P° – ^{1}D	[33.4]	9108300	12100000	3	5	2.0(+4)	0.56	0.18	0.23	C	13
54.	$2s3d$–$2s4p$	^{3}D – ^{3}P°	*35.4*			15	9	1200	0.0135	0.0236	−0.69	C	13
55.		^{1}D – ^{1}P°	[36.1]	9272900	12040000	5	3	1300	0.015	0.0089	−1.12	D	13
56.	$2s3d$–$2s4f$	^{3}D – ^{3}F°	*34.6*			15	21	3.9(+4)	0.99	1.7	1.17	C	13
57.		^{1}D – ^{1}F°	[35.4]			5	7	3.84(+4)	1.01	0.59	0.70	C	13

* The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

TRANSITION PROBABILITIES FOR IRON

Fe XXIV

Ground State $1s^2 2s\ ^2S_{1/2}$

Ionization Potential [2045] eV = [16494000] cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
1.8523	8	1.8739	5	8.280	17	21.8	27
1.8552	2	1.874	1	8.316	18	22.0	27
1.8563	8	1.8767	5	8.369	17	30.7	22
1.8572	2	1.891	4	10.619	10	30.9	22
1.858	7	1.897	4	10.663	10	31.5	26
1.8604	3	6.749	21	11.030	16	31.9	26
1.8614	7	6.787	13	11.171	16	37.0	36
1.8626	6	6.808	21	11.187	16	37.3	36
1.8627	7	6.972	20	11.262	15	44.2	32
1.8637	3	7.033	20	11.422	15	44.8	35
1.8655	6	7.169	12	17.1	29	45.2	35
1.8672	7	7.370	19	17.3	29	67.6	31
1.8678	6	7.438	19	18.3	24	68.5	34
1.8700	5	7.983	11	18.7	28	69.4	34
1.8721	5	7.993	11	18.8	28	192.04	9
1.8730	1	8.231	18	21.4	23	255.10	9

Transition probabilities for the inner-shell transitions to doubly excited $n = 2$ states are the results of the multiconfiguration scaled Thomas-Fermi calculations of Bely-Dubau et al. [1] in intermediate coupling. The multiplet oscillator strengths for the $^2P^o$–^2P and $^2P^o$–^2D transitions of the $1s^22p$–$1s2p^2$ array which were calculated by Fox and Dalgarno [2] in a Z-expansion approximation that allowed for extensive configuration interaction are in good agreement with the results of ref. [1].

Oscillator strengths for lines of the principal ($2s$–$2p$) resonance multiplet are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Cheng et al. [3], which include a perturbative treatment of the Breit interaction and the Lamb shift. Other sources of reliable theoretical data for these $2s$–$2p$ transitions are the Hartree-Fock line strength calculations of Weiss [4] with relativistic corrections and the MCDF approach of Armstrong et al. [5].

Lifetimes of the $2p$ levels have been determined by Dietrich et al. [6] using the beam-foil technique. The associated oscillator strengths for the $2s$–$2p$ transitions are in excellent agreement with the results mentioned above.

The results of the relativistic Hartree-Fock calculations of Kim and Desclaux [7] were averaged with the results of Armstrong et al. [5] for the $2s$–$3p$ transitions. The data of ref. [5] are quoted for the lines of the $2p$–$3d$ multiplet too.

The results of the scaled Thomas-Fermi calculations of Hayes [8] are tabulated for the $2p$–$3s$ transitions. He used the Breit-Pauli approximation to account for relativistic effects. The Hartree-Fock results of Doschek et al. [9] that included configuration interaction and relativistic corrections are quoted for transitions of the type $2l$–$4l'$. The $2p$–$5d$ f-values are the results of the Hartree-Fock calculations with statistical exchange (HX) of Burkhalter et al. [10].

The f-value for the $3d$-$4f$ transition was taken from a study of systematic trends along isoelectronic sequences by Smith and Wiese [11]. The tabulated data for the remaining transitions were taken from the theoretical analysis of Martin and Wiese [12], which was based on a generalized study of systematic trends for several spectral series of the lithium isoelectronic sequence. For these transitions, no relativistic calculations were available. However, the relativistic calculations of Younger and Weiss [13] for the hydrogen isoelectronic sequence provide a means of assessing the magnitude of relativistic corrections since the Li sequence is very similar in structure to the H sequence. For those transitions for which relativistic effects were estimated to be significant (specifically, whenever the ratio of the weighted relativistic hydrogenic f-values g_if_{ik} of any two lines within a multiplet was found to deviate from the corresponding LS-coupling line-strength ratio by more than 5% for the appropriate value of the nuclear charge Z), the f-values were excluded from the compilation. A more detailed discussion of this comparison is given in ref. [12].

Transition probability data are available for numerous transitions between doubly excited states in which one of the electrons occupies the $n = 3$ shell [1] or the $n = 4$ shell [14]. There are A-value data for many transitions involving a vacant K shell as well [15,16]. None of these data have been tabulated, however, since such transition arrays are rather complex and all of the lines are concentrated in a very narrow wavelength range.

References

[1] Bely-Dubau, F., Gabriel, A. H., and Volonté, S., Mon. Not. R. Astron. Soc. **186**, 405 (1979).

[2] Fox, J. L., and Dalgarno, A., Phys. Rev. A **16**, 283 (1977).

[3] Cheng, K. T., Kim, Y.-K., and Desclaux, J. P., At. Data Nucl. Data Tables **24**, 111 (1979).

[4] Weiss, A. W., J. Quant. Spectrosc. Radiat. Transfer **18**, 481 (1977).

[5] Armstrong, L., Jr., Fielder, W. R., and Lin, D. L., Phys. Rev. A **14**, 1114 (1976).

[6] Dietrich, D. D., Leavitt, J. A., Bashkin, S., Conway, J. G., Gould, H., MacDonald, D., Marrus, R., Johnson, B. M., and Pegg, D. J., Phys. Rev. A **18**, 208 (1978).

[7] Kim, Y.-K., and Desclaux, J. P., Phys. Rev. Lett. **36**, 139 (1976) and private communication.

[8] Hayes, M. A., Mon. Not. R. Astron. Soc. **189**, 55P (1979).

[9] Doschek, G. A., Meekins, J. F., and Cowan, R. D., Astrophys. J. **177**, 261 (1972).

[10] Burkhalter, P. G., Dozier, C. M., Stallings, C., and Cowan, R. D., J. Appl. Phys. **49**, 1092 (1978).

[11] Smith, M. W., and Wiese, W. L., Astrophys. J. Suppl. Ser. **23**, No. 196, 103 (1971).

[12] Martin, G. A., and Wiese, W. L., J. Phys. Chem. Ref. Data **5**, 537 (1976).

[13] Younger, S. M., and Weiss, A. W., J. Res. Nat. Bur. Stand., Sect. A **79**, 629 (1975).

[14] Bely-Dubau, F., Gabriel, A. H., and Volonté, S., Mon. Not. R. Astron. Soc. **189**, 801 (1979).

[15] Safronova, U. I., and Senashenko, V. S., J. Phys. B **11**, 2623 (1978).

[16] Nussbaumer, H., J. Phys. B **9**, 1757 (1976).

Fe XXIV: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$1s^22s-1s2p(^3P^o)2s$	$^2S - {}^4P^o$											
			1.8730	0	53390000	2	4	1.5(+5)[a]	0.016	1.9(−4)	−1.50	D+	1
			[1.874]			2	2	4.9(+4)	0.0026	3.2(−5)	−2.29	D+	1
2.		$^2S - {}^2P^o$	*1.8559*	0	*53883000*	2	6	6.9(+5)	0.11	0.0013	−0.67	D	1
			1.8552	0	53903000	2	4	4.4(+4)	0.0045	5.5(−5)	−2.04	E	1
			1.8572	0	53844000	2	2	1.96(+6)	0.101	0.00124	−0.69	C	1
3.	$1s^22s-1s2p(^1P^o)2s$	$^2S - {}^2P^o$	*1.8615*	0	*53720000*	2	6	4.1(+6)	0.64	0.0079	0.11	C	1
			1.8604	0	53752000	2	4	4.74(+6)	0.492	0.0060	−0.007	C	1
			1.8637	0	53657000	2	2	2.93(+6)	0.153	0.00187	−0.52	C	1
4.	$1s^22p-1s2s^2$	$^2P^o - {}^2S$	*1.895*			6	2	1.9(+5)	0.0035	1.3(−4)	−1.68	D+	1
			[1.897]			4	2	9.4(+4)	0.0025	6.3(−5)	−1.99	D+	1
			[1.891]			2	2	9.5(+4)	0.0051	6.3(−5)	−1.99	D+	1
5.	$1s^22p-1s2p^2$	$^2P^o - {}^4P$											
			1.8721	520720	53937000	4	6	3.3(+5)	0.026	6.4(−4)	−0.98	D	1
			1.8700	392000	53877000	2	4	1300	1.4(−4)	1.7(−6)	−3.56	E	1
			1.8739	520720	53877000	4	4	8.1(+4)	0.0043	1.1(−4)	−1.77	D	1
			1.8721	392000	53807000	2	2	1.9(+5)	0.010	1.2(−4)	−1.70	D	1
			1.8767	520720	53807000	4	2	2000	5.3(−5)	1.3(−6)	−3.68	E	1
6.		$^2P^o - {}^2D$	*1.8648*	*477810*	*54104000*	6	10	2.6(+6)	0.23	0.0084	0.14	C	1
			1.8655	520720	54126000	4	6	2.10(+6)	0.164	0.00404	−0.182	C	1
			1.8626	392000	54070000	2	4	3.13(+6)	0.326	0.00399	−0.186	C	1
			1.8678	520720	54070000	4	4	3.0(+5)	0.016	3.9(−4)	−1.20	D	1
7.		$^2P^o - {}^2P$	*1.8618*	*477810*	*54188000*	6	6	6.5(+6)	0.340	0.0125	0.310	C	1
			1.8614	520720	54244000	4	4	6.2(+6)	0.32	0.0079	0.11	C	1
			[1.8627]	392000	54077000	2	2	5.4(+6)	0.28	0.0034	−0.25	C	1
			1.8672	520720	54077000	4	2	1.57(+6)	0.0410	0.00101	−0.78	C	1
			1.858	392000	54244000	2	4	1.3(+5)	0.013	1.6(−4)	−1.57	D	1

TRANSITION PROBABILITIES FOR IRON

Fe XXIV: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
8.		$^2P^o - {}^2S$	*1.8550*	*477810*	54385000	6	2	2.54(+6)	0.0437	0.00160	−0.58	C	1
			1.8563	520720	54385000	4	2	2.44(+6)	0.063	0.00154	−0.60	C	1
			1.8523	392000	54385000	2	2	8.8(+4)	0.0045	5.5(−5)	−2.04	D	1
9.	$2s-2p$	$^2S - {}^2P^o$	*209.29*	0	*477810*	2	6	33.2	0.0654	0.0901	−0.883	B+	3
			192.04	0	520720	2	4	43.2	0.0478	0.0604	−1.020	B+	3
			255.10	0	392000	2	2	18.1	0.0177	0.0297	−1.451	B+	3
10.	$2s-3p$	$^2S - {}^2P^o$	*10.634*	0	*9404100*	2	6	7.36(+4)	0.374	0.0262	−0.126	B+	5,7
			10.619	0	9417100	2	4	7.28(+4)	0.246	0.0172	−0.308	B+	5,7
			10.663	0	9378200	2	2	7.51(+4)	0.128	0.00899	−0.592	B+	5,7
11.	$2s-4p$	$^2S - {}^2P^o$	*7.987*	0	*12520000*	2	6	3.4(+4)	0.097	0.0051	−0.71	C+	9
			7.983	0	12530000	2	4	3.43(+4)	0.0655	0.00344	−0.883	C+	9
			7.993	0	12510000	2	2	3.4(+4)	0.033	0.0017	−1.18	C+	9
12.	$2s-5p$	$^2S - {}^2P^o$	7.169	0	13950000	2	6	1.7(+4)	0.040	0.0019	−1.10	C+	12
13.	$2s-6p$	$^2S - {}^2P^o$	6.787	0	14730000	2	6	1.02(+4)	0.0212	9.47(−4)	−1.373	C+	12
14.	$2s-7p$	$^2S - {}^2P^o$				2	6		0.0125		−1.602	C+	12
15.	$2p-3s$	$^2P^o - {}^2S$	*11.370*	*477810*	9272500	6	2	2.6(+4)	0.017	0.0038	−0.99	D	8
			11.422	520720	9272500	4	2	1.80(+4)	0.0176	0.00265	−1.152	C	8
			11.262	392000	9272500	2	2	7900	0.015	0.0011	−1.52	D	8
16.	$2p-3d$	$^2P^o - {}^2D$	*11.124*	*477810*	*9467100*	6	10	2.19(+5)	0.678	0.149	0.609	B	5
			11.171	520720	9472500	4	6	2.18(+5)	0.611	0.0899	0.388	B	5
			11.030	392000	9459000	2	4	1.84(+5)	0.670	0.0487	0.127	B	5
			11.187	520720	9459000	4	4	3.6(+4)	0.068	0.010	−0.57	B	5
17.	$2p-4s$	$^2P^o - {}^2S$	*8.339*	*477810*	12470000	6	2	1.0(+4)	0.0036	6.0(−4)	−1.66	D	9
			[8.369]	520720	12470000	4	2	6900	0.0036	4.0(−4)	−1.84	D	9
			[8.280]	392000	12470000	2	2	3600	0.0037	2.0(−4)	−2.13	D	9
18.	$2p-4d$	$^2P^o - {}^2D$	*8.284*	*477810*	12550000	6	10	7.16(+4)	0.123	0.0201	−0.133	C+	9
			8.316	520720	12550000	4	6	7.07(+4)	0.110	0.0120	−0.357	C+	9
			8.231	392000	12550000	2	4	6.10(+4)	0.124	0.00672	−0.606	C+	9
			8.316	520720	12550000	4	4	1.18(+4)	0.0122	0.00134	−1.312	C	9
19.	$2p-5d$	$^2P^o - {}^2D$	*7.412*	*477810*	13970000	6	10	3.3(+4)	0.045	0.0066	−0.57	C−	10
			7.438	520720	13970000	4	6	3.26(+4)	0.0405	0.00397	−0.79	C	10
			7.370	392000	13970000	2	4	2.8(+4)	0.046	0.0022	−1.04	C	10
			7.438	520720	13970000	4	4	5400	0.0045	4.4(−4)	−1.74	D	10
20.	$2p-6d$	$^2P^o - {}^2D$	*7.012*	*477810*	14740000	6	10	1.79(+4)	0.0220	0.00305	−0.879	C+	12
			7.033	520720	14740000	4	6	1.78(+4)	0.0198	0.00183	−1.102	C+	*ls*
			6.972	392000	14740000	2	4	1.52(+4)	0.0222	0.00102	−1.352	C+	*ls*
			7.033	520720	14740000	4	4	2900	0.0022	2.0(−4)	−2.06	D	*ls*
21.	$2p-7d$	$^2P^o - {}^2D$	6.788	*477810*	15210000	6	10	1.09(+4)	0.0126	0.00169	−1.121	C+	12
			6.808	520720	15210000	4	6	1.08(+4)	0.0113	0.00101	−1.346	C+	*ls*
			[6.749]	392000	15210000	2	4	9280	0.0127	5.63(−4)	−1.596	C+	*ls*
			6.808	520720	15210000	4	4	1800	0.0012	1.1(−4)	−2.31	D	*ls*

Fe XXIV: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log *gf*	Accuracy	Source
22.	3*s*–4*p*	^{2}S – ^{2}P°	*30.8*	9272500	*12520000*	2	6	1.1(+4)	0.45	0.091	−0.05	C	12
			[30.7]	9272500	12530000	2	4	1.1(+4)	0.30	0.061	−0.22	C	*ls*
			[30.9]	9272500	12510000	2	2	1.0(+4)	0.15	0.030	−0.53	C	*ls*
23.	3*s*–5*p*	^{2}S – ^{2}P°	[21.4]	9272500	13950000	2	6	5200	0.108	0.0152	−0.67	C	12
24.	3*s*–6*p*	^{2}S – ^{2}P°	[18.3]	9272500	14730000	2	6	3200	0.048	0.0058	−1.02	C	12
25.	3*s*–7*p*	^{2}S – ^{2}P°				2	6		0.0250		−1.301	C	12
26.	3*p*–4*d*	^{2}P° – ^{2}D	*31.8*	*9404100*	12550000	6	10	2.4(+4)	0.60	0.38	0.56	B	12
			[31.9]	9417100	12550000	4	6	2.4(+4)	0.55	0.23	0.34	B	*ls*
			[31.5]	9378200	12550000	2	4	2.1(+4)	0.63	0.13	0.10	B	*ls*
			[31.9]	9417100	12550000	4	4	3900	0.060	0.025	−0.62	C+	*ls*
27.	3*p*–5*d*	^{2}P° – ^{2}D	*21.9*	*9404100*	13970000	6	10	1.15(+4)	0.138	0.0597	−0.082	C+	12
			[22.0]	9417100	13970000	4	6	1.14(+4)	0.124	0.0358	−0.306	C+	*ls*
			[21.8]	9378200	13970000	2	4	9730	0.139	0.0199	−0.557	C+	*ls*
			[22.0]	9417100	13970000	4	4	1900	0.014	0.0040	−1.26	D	*ls*
28.	3*p*–6*d*	^{2}P° – ^{2}D	*18.7*	*9404100*	14740000	6	10	6390	0.0558	0.0206	−0.475	C+	12
			[18.8]	9417100	14740000	4	6	6300	0.0501	0.0124	−0.698	C+	*ls*
			[18.7]	9378200	14740000	2	4	5320	0.0558	0.00687	−0.952	C+	*ls*
			[18.8]	9417100	14740000	4	4	1100	0.0057	0.0014	−1.65	D	*ls*
29.	3*p*–7*d*	^{2}P° – ^{2}D	*17.2*	*9404100*	15210000	6	10	3910	0.0289	0.00982	−0.761	C+	12
			[17.3]	9417100	15210000	4	6	3840	0.0259	0.00589	−0.985	C+	*ls*
			[17.1]	9378200	15210000	2	4	3310	0.0290	0.00327	−1.236	C+	*ls*
			[17.3]	9417100	15210000	4	4	640	0.0029	6.5(−4)	−1.94	D	*ls*
30.	3*d*–4*f*	^{2}D – ^{2}F°				10	14		1.00		1.000	B	11
31.	4*s*–5*p*	^{2}S – ^{2}P°	[67.6]	12470000	13950000	2	6	2330	0.478	0.213	−0.020	C	12
32.	4*s*–6*p*	^{2}S – ^{2}P°	[44.2]	12470000	14730000	2	6	1460	0.128	0.0373	−0.59	C	12
33.	4*s*–7*p*	^{2}S – ^{2}P°				2	6		0.056		−0.95	C	12
34.	4*p*–5*d*	^{2}P° – ^{2}D	*69.0*	*12520000*	13970000	6	10	4920	0.585	0.797	0.545	C+	12
			[69.4]	12530000	13970000	4	6	4830	0.523	0.478	0.321	C+	*ls*
			[68.5]	12510000	13970000	2	4	4190	0.590	0.266	0.072	C+	*ls*
			[69.4]	12530000	13970000	4	4	800	0.058	0.053	−0.63	D	*ls*
35.	4*p*–6*d*	^{2}P° – ^{2}D	*45.0*	*12520000*	14740000	6	10	2810	0.142	0.126	−0.070	C+	12
			[45.2]	12530000	14740000	4	6	2760	0.127	0.0756	−0.294	C+	*ls*
			[44.8]	12510000	14740000	2	4	2370	0.142	0.0420	−0.545	C+	*ls*
			[45.2]	12530000	14740000	4	4	460	0.014	0.0084	−1.25	D	*ls*
36.	4*p*–7*d*	^{2}P° – ^{2}D	*37.2*	*12520000*	15210000	6	10	1780	0.0617	0.0453	−0.432	C+	12
			[37.3]	12530000	15210000	4	6	1770	0.0554	0.0272	−0.655	C+	*ls*
			[37.0]	12510000	15210000	2	4	1510	0.0620	0.0151	−0.907	C+	*ls*
			[37.3]	12530000	15210000	4	4	290	0.0061	0.0030	−1.61	D	*ls*

[a] The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

TRANSITION PROBABILITIES FOR IRON

Fe XXV

Ground State $1s^2\ ^1S_0$

Ionization Potential [8828.8] eV = [71208500] cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
1.4607	19	1.792	9	6.9468	38	28.950	41
1.4611	18	1.793	3	7.4924	25	29.253	42
1.4945	17	1.794	9	7.6191	26	29.795	46
1.4952	16	1.797	11	7.6527	33	30.224	47
1.5730	15	1.798	11	7.7930	34	62.846	57
1.5749	14	1.800	5	10.038	23	63.295	58
1.778	4	1.802	7	10.221	24	64.608	60
1.782	13	1.810	8	10.371	29	65.342	61
1.787	6,10	1.8502	2	10.586	30	194.9	21
1.788	3,9	1.8593	1	19.934	43	272.6	20
1.789	9	6.7073	27	20.139	44	384.3	22
1.790	9	6.8157	28	20.272	50	398.9	20
1.791	3,12	6.8288	37	20.527	51	426.6	20

Oscillator strengths for transitions of the $1s^2$–$1s2p$ array are taken from the results of Drake [1], who incorporated accurate nonrelativistic matrix elements and exact Dirac hydrogenic matrix elements into a Z-expansion technique in order to provide f-values which would accurately reflect correlation effects for low-Z ions and relativistic effects for high-Z ions of the He isoelectronic sequence. Results for the stronger transitions to doubly excited $n = 2$ states are from the charge-expansion perturbation theory calculations of Vainshtein and Safronova [2]. The f-values for the ($n = 3$–5) transitions were interpolated from results of the relativistic random phase approximation (RRPA) calculations of Johnson and Lin [3]. Data for numerous other s–p and p–s transitions are from the RRPA results of Lin et al. [4,5].

The Z–expansion results of Laughlin [6] have been tabulated for various p–d and d–p transitions, as well as transitions between $4d$ and $4f$ levels. For those multiplets which involve no change of quantum number ($3p$–$3d$, $4p$–$4d$, $4d$–$4f$) the results should be considered to be rather uncertain, since the f-values are very sensitive to energy differences. It should be noted that, according to Laughlin's calculations, the $nd\ ^1D$ levels ($n = 3,4$) lie below the corresponding $np\ ^1P^o$ levels, and that the $4f\ ^1F^o$ level lies below $4d\ ^1D$. The opposite is true for the triplet states. Oscillator strengths for a few p–d transitions were extrapolated from the variational calculations of Weiss [7].

Brown and Cortez [8] have provided f-values for numerous d–f and f–d transitions for the entire isoelectronic sequence by deriving Z-expansion formulae based on variational calculations for the low-Z ions. Their results for transitions between the lower-lying D and F^o terms are tabulated here.

References

[1] Drake, G. W. F., Phys. Rev. A **19**, 1387 (1979).
[2] Vainshtein, L. A., and Safronova, U. I., At. Data Nucl. Data Tables **21**, 49 (1978).
[3] Johnson, W. R., and Lin, C. D., Phys. Rev. A **14**, 565 (1976).
[4] Lin, C. D., Johnson, W. R., and Dalgarno, A., Astrophys. J. **217**, 1011 (1977).
[5] Lin, C. D., Johnson, W. R., and Dalgarno, A., Phys. Rev. A **15**, 154 (1977).
[6] Laughlin, C., J. Phys. B **6**, 1942 (1973).
[7] Weiss, A. W., J. Res. Nat. Bur. Stand., Sect. A **71**, 163 (1967).
[8] Brown, R. T., and Cortez, J.-L., Astrophys. J. **176**, 267 (1972).

Fe XXV: Allowed transitions

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} ($10^8 s^{-1}$)	f_{ik}	S (at.u.)	log gf	Accuracy	Source
1.	$1s^2$–$1s2p$	$^1S - {^3P^o}$											
			[1.8593]	0	[53785000]	1	3	4.42(+5)*	0.0687	4.21(−4)	−1.163	B	1
2.		$^1S - {^1P^o}$	[1.8502]	0	[54047400]	1	3	4.57(+6)	0.703	0.00428	−0.153	B	1

Fe XXV: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
3.	$1s2s-2s2p$	$^3S - ^3P^o$	*1.790*	[53534300]	*[109400000]*	3	9	2.8(+6)	0.41	0.0072	0.09	C	2
			[1.788]	[53534300]	[109450000]	3	5	2.9(+6)	0.23	0.0041	−0.16	C	2
			[1.791]	[53534300]	[109350000]	3	3	2.7(+6)	0.13	0.0023	−0.41	C	2
			[1.793]	[53534300]	[109300000]	3	1	2.8(+6)	0.045	8.0(−4)	−0.87	C	2
4.		$^3S - ^1P^o$											
			[1.778]	[53534300]	[109760000]	3	3	1.1(+5)	0.0052	9.2(−5)	−1.81	D	2
5.		$^1S - ^3P^o$											
			[1.800]	[53787200]	[109350000]	1	3	1.1(+5)	0.016	9.5(−5)	−1.80	D	2
6.		$^1S - ^1P^o$	[1.787]	[53787200]	[109760000]	1	3	2.8(+6)	0.40	0.0024	−0.40	C	2
7.	$1s2p-2s^2$	$^3P^o - ^1S$											
			[1.802]	[53785000]	[109290000]	3	1	4.9(+5)	0.0080	1.4(−4)	−1.62	D	2
8.		$^1P^o - ^1S$	[1.810]	[54047400]	[109290000]	3	1	5.9(+5)	0.0097	1.7(−4)	−1.54	D	2
9.	$1s2p-2p^2$	$^3P^o - ^3P$	*1.791*	*[53847700]*	*[109670000]*	9	9	5.1(+6)	0.243	0.0129	0.340	C	2
			[1.792]	[53901100]	[109700000]	5	5	2.9(+6)	0.14	0.0041	−0.16	C	2
			[1.790]	[53785000]	[109650000]	3	3	1.3(+6)	0.062	0.0011	−0.73	C	2
			[1.794]	[53901100]	[109650000]	5	3	2.4(+6)	0.069	0.0021	−0.46	C	2
			[1.792]	[53785000]	[109590000]	3	1	5.2(+6)	0.083	0.0015	−0.60	C	2
			[1.788]	[53785000]	[109700000]	3	5	1.8(+6)	0.14	0.0025	−0.37	C	2
			[1.789]	[53768700]	[109650000]	1	3	1.9(+6)	0.27	0.0016	−0.56	C	2
10.		$^3P^o - ^1D$											
			[1.787]	[53901100]	[109870000]	5	5	1.4(+6)	0.067	0.0020	−0.47	C	2
11.		$^1P^o - ^3P$											
			[1.797]	[54047400]	[109700000]	3	5	1.0(+6)	0.081	0.0014	−0.62	C	2
			[1.798]	[54047400]	[109650000]	3	3	1.2(+5)	0.0058	1.0(−4)	−1.76	D	2
12.		$^1P^o - ^1D$	[1.791]	[54047400]	[109870000]	3	5	4.3(+6)	0.34	0.0061	0.01	C	2
13.		$^1P^o - ^1S$	[1.782]	[54047400]	[110160000]	3	1	5.0(+6)	0.079	0.0014	−0.62	C	2
14.	$1s^2-1s3p$	$^1S - ^3P^o$											
			[1.5749]	0	[63496000]	1	3	1.5(+5)	0.017	8.8(−5)	−1.77	E	*interp.*
15.		$^1S - ^1P^o$	[1.5730]	0	[63570800]	1	3	1.24(+6)	0.138	7.15(−4)	−0.860	B	4
16.	$1s^2-1s4p$	$^1S - ^3P^o$											
			[1.4952]	0	[66881100]	1	3	6.0(+4)	0.0060	3.0(−5)	−2.22	E	*interp.*
17.		$^1S - ^1P^o$	[1.4945]	0	[66912100]	1	3	5.05(+5)	0.0507	2.49(−4)	−1.295	B	4
18.	$1s^2-1s5p$	$^1S - ^3P^o$											
			[1.4611]	0	[68443500]	1	3	3.1(+4)	0.0030	1.4(−5)	−2.52	E	*interp.*
19.		$^1S - ^1P^o$	[1.4607]	0	[68459300]	1	3	2.54(+5)	0.0244	1.17(−4)	−1.613	B	

TRANSITION PROBABILITIES FOR IRON

Fe XXV: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
20.	$1s2s-1s2p$	$^3S - ^3P^o$	*319.1*	[53534300]	*[53847700]*	3	9	8.94	0.0409	0.129	−0.911	B	5
			[272.6]	[53534300]	[53901100]	3	5	14.7	0.0273	0.0735	−1.087	B	5
			[398.9]	[53534300]	[53785000]	3	3	4.31	0.0103	0.0405	−1.511	B	5
			[426.6]	[53534300]	[53768700]	3	1	3.82	0.00347	0.0146	−1.982	B	5
21.		$^3S - ^1P^o$											
			[194.9]	[53534300]	[54047400]	3	3	3.46	0.00197	0.00379	−2.228	B	5
22.		$^1S - ^1P^o$	[384.3]	[53787200]	[54047400]	1	3	4.96	0.0329	0.0417	−1.482	B	5
23.	$1s2s-1s3p$	$^3S - ^3P^o$											
			[10.038]	[53534300]	[63496000]	3	3	8.08(+4)	0.122	0.0121	−0.437	B	4
24.		$^1S - ^1P^o$	[10.221]	[53787200]	[63570800]	1	3	7.75(+4)	0.364	0.0122	−0.439	B	4
25.	$1s2s-1s4p$	$^3S - ^3P^o$											
			[7.4924]	[53534300]	[66881100]	3	3	3.6(+4)	0.030	0.0022	−1.05	B	4
26.		$^1S - ^1P^o$	[7.6191]	[53787200]	[66912100]	1	3	3.4(+4)	0.088	0.0022	−1.06	B	4
27.	$1s2s-1s5p$	$^3S - ^3P^o$											
			[6.7073]	[53534300]	[68443500]	3	3	1.8(+4)	0.012	7.9(−4)	−1.44	B	4
28.		$^1S - ^1P^o$	[6.8157]	[53787200]	[68459300]	1	3	1.7(+4)	0.036	8.1(−4)	−1.44	B	4
29.	$1s2p-1s3s$	$^3P^o - ^3S$											
			[10.371]	[53785000]	[63426900]	3	3	8700	0.014	0.0014	−1.38	B	4
30.		$^1P^o - ^1S$	[10.586]	[54047400]	[63493700]	3	1	2.5(+4)	0.014	0.0015	−1.38	B	4
31.	$1s2p-1s3d$	$^3P^o - ^3D$				9	15		0.69		0.79	C+	*interp.*
32.		$^1P^o - ^1D$				3	5		0.70		0.32	C+	*interp.*
33.	$1s2p-1s4s$	$^3P^o - ^3S$											
			[7.6527]	[53785000]	[66852300]	3	3	3500	0.0031	2.3(−4)	−2.03	C	4
34.		$^1P^o - ^1S$	[7.7930]	[54047400]	[66879400]	3	1	1.0(+4)	0.0031	2.4(−4)	−2.03	C	4
35.	$1s2p-1s4d$	$^3P^o - ^3D$				9	15		0.12		0.03	C	6
36.		$^1P^o - ^1D$				3	5		0.12		−0.44	C	6
37.	$1s2p-1s5s$	$^3P^o - ^3S$											
			[6.8288]	[53785000]	[68428900]	3	3	1700	0.0012	8.1(−5)	−2.44	C	4
38.		$^1P^o - ^1S$	[6.9468]	[54047400]	[68442500]	3	1	5000	0.0012	8.2(−5)	−2.44	C	4
39.	$1s3s-1s3p$	$^3S - ^3P^o$											
						3	3		0.016		−1.32	C	4
40.		$^1S - ^1P^o$				1	3		0.056		−1.25	C	4
41.	$1s3s-1s4p$	$^3S - ^3P^o$											
			[28.950]	[63426900]	[66881100]	3	3	1.07(+4)	0.135	0.0386	−0.393	B	4

Fe XXV: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
42.		^{1}S – ^{1}P°	[29.253]	[63493700]	[66912100]	1	3	1.04(+4)	0.400	0.0385	−0.398	B	4
43.	1s3s–1s5p	^{3}S – ^{3}P°											
			[19.934]	[63426900]	[68443500]	3	3	5700	0.034	0.0067	−0.99	B	4
44.		^{1}S – ^{1}P°	[20.139]	[63493700]	[68459300]	1	3	5650	0.103	0.00683	−0.987	B	4
45.	1s3p–1s3d	^{3}P° – ^{3}D				9	15		0.012		−0.97	D	*interp.*
46.	1s3p–1s4s	^{3}P° – ^{3}S											
			[29.795]	[63496000]	[66852300]	3	3	2500	0.033	0.0097	−1.00	B	4
47.		^{1}P° – ^{1}S	[30.224]	[63570800]	[66879400]	3	1	7400	0.034	0.010	−0.99	B	4
48.	1s3p–1s4d	^{3}P° – ^{3}D				9	15		0.60		0.73	C	6
49.		^{1}P° – ^{1}D				3	5		0.62		0.27	C	6
50.	1s3p–1s5s	^{3}P° – ^{3}S											
			[20.272]	[63496000]	[68428900]	3	3	1200	0.0073	0.0015	−1.66	C	4
51.		^{1}P° – ^{1}S	[20.527]	[63570800]	[68442500]	3	1	3700	0.0077	0.0016	−1.64	C	4
52.	1s3d–1s3p	^{1}D – ^{1}P°				5	3		0.0020		−2.00	E	6
53.	1s3d–1s4p	^{3}D – ^{3}P°				15	9		0.012		−0.74	C	6
54.		^{1}D – ^{1}P°				5	3		0.011		−1.26	C	6
55.	1s4s–1s4p	^{3}S – ^{3}P°											
						3	3		0.023		−1.16	E	4
56.		^{1}S – ^{1}P°				1	3		0.078		−1.11	D	4
57.	1s4s–1s5p	^{3}S – ^{3}P°											
			[62.846]	[66852300]	[68443500]	3	3	2530	0.150	0.0931	−0.347	B	4
58.		^{1}S – ^{1}P°	[63.295]	[66879400]	[68459300]	1	3	2480	0.446	0.0929	−0.351	B	4
59.	1s4p–1s4d	^{3}P° – ^{3}D				9	15		0.019		−0.77	D	6
60.	1s4p–1s5s	^{3}P° – ^{3}S											
			[64.608]	[66881100]	[68428900]	3	3	850	0.053	0.034	−0.80	B	4
61.		^{1}P° – ^{1}S	[65.342]	[66912100]	[68442500]	3	1	2600	0.055	0.035	−0.78	B	4
62.	1s4d–1s4p	^{1}D – ^{1}P°				5	3		0.0031		−1.81	E	6
63.	1s4d–1s4f	^{3}D – ^{3}F°				15	21		7.8(−4)		−1.93	E	6
64.	1s4d–1s5f	^{3}D – ^{3}F°				15	21		0.89		1.13	B	8
65.		^{1}D – ^{1}F°				5	7		0.89		0.65	B	8
66.	1s4f–1s4d	^{1}F° – ^{1}D				7	5		4.2(−4)		−2.53	E	6
67.	1s4f–1s5d	^{3}F° – ^{3}D				21	15		0.0089		−0.73	C	8
68.		^{1}F° – ^{1}D				7	5		0.0089		−1.21	C	8

TRANSITION PROBABILITIES FOR IRON

Fe XXV: Allowed transitions—Continued

No.	Transition array	Multiplet	λ(Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at.u.)	log gf	Accuracy	Source
69.	$1s5s-1s5p$	$^3S - ^3P^o$											
						3	3		0.029		−1.06	E	4
70.		$^1S - ^1P^o$				1	3		0.099		−1.00	E	4

* The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Fe XXVI

Ground State $1s\ ^2S_{1/2}$

Ionization Potential [9277.2] eV = [74827600] cm^{-1}

Allowed Transitions

The transition probability data for this hydrogen-like ion may be obtained by scaling the data available for the hydrogen spectrum (see NSRDS-NBS 4 [1]) according to

$$f_{\mathrm{Fe\ XXVI}} = f_{\mathrm{Hydrogen}},$$
$$A_{\mathrm{Fe\ XXVI}} = (26)^4 A_{\mathrm{Hydrogen}},$$
$$S_{\mathrm{Fe\ XXVI}} = (26)^{-2} S_{\mathrm{Hydrogen}}.$$

An uncertainty of a few percent arises from the neglect of relativistic effects. Recent theoretical studies [2,3] indicate that relativistic effects on line strengths for this ion are generally in this range, with the relativistic value usually slightly below the non-relativistic one, although in certain transitions where n increases and l decreases the line strength increases. Younger and Weiss [3] have calculated exact Dirac relativistic hydrogenic line strengths for a number of transitions of interest along the hydrogen isoelectronic sequence.

References

[1] Wiese, W. L., Smith, M. W., and Glennon, B. M., Atomic Transition Probabilities—Hydrogen through Neon (A Critical Data Compilation), Vol. I, 157 pp., Nat. Stand. Ref. Data Ser., Nat. Bur. Stand. (U.S.), 4 (May 1966).

[2] Garstang, R. H., *Topics in Modern Physics* (*A Tribute to Edward U. Condon*), 153-167, Ed. Brittin, W. E., and Odabasi, H., Colorado Associated Univ. Press, Boulder, Colorado (1971).

[3] Younger, S. M., and Weiss, A. W., J. Res. Nat. Bur. Stand., Sect. A **79**, 629 (1975).

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