ORNL-6551/V3

Spectroscopic Data for Titanium, Chromium, and Nickel

Volume 3. Nickel

W. L. Wiese and A. Musgrove, Editors

ATOMIC DATA FOR FUSION

Oak Ridge National Laboratory operated by Martin Marietta Energy Systems, Inc.
Prepared for: Office of Fusion Energy • U.S. Department of Energy
by National Institute of Standards and Technology

ORNL-6551/V3

Physics Division

ATOMIC DATA FOR FUSION - VOLUME VI

SPECTROSCOPIC DATA FOR TITANIUM, CHROMIUM, AND NICKEL
Volume 3. Nickel

W. L. Wiese and A. Musgrove
National Institute for Standards and Technology

Date Published - September 1989

Prepared for the
Office of Fusion Energy
U.S. Department of Energy
Washington, DC 20545
Budget Activity No. AT 05 30 04 0

Published by the
Controlled Fusion Atomic Data Center
H. T. Hunter and M. I. Kirkpatrick, Series Technical Editors
at the
OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37831-6372
Operated by
MARTIN MARIETTA ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under Contract DE-AC05-84OR21400

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 (December 1989).

Vol. 2, "Collisions of Electrons with Atoms and Molecules," J. W. Gallagher, National Institute of Standards and Technology; and D. C. Gregory, ORNL (December 1990).

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 (January 1987).

Vol. 6, "Spectroscopic Data for Titanium, Chromium, and Nickel," W. L. Wiese and A. Musgrove, National Institute for Standards and Technology (September 1989).

C. F. Barnett
D. C. Gregory
H. T. Hunter
M. I. Kirkpatrick
R. A. Phaneuf

Abstract

Comprehensive spectroscopic data tables are presented for all ionization stages of titanium, chromium, and nickel. Tables of ionization potentials, spectral lines, energy levels, and transition probabilities are presented. These tables contain data which have been excerpted from general critical compilations prepared under the sponsorship of the National Standard Reference Data System (NSRDS).

Spectroscopic Data for Titanium, Chromium, and Nickel — Volume 3. Nickel

W. L. Wiese and A. Musgrove, Editors

Table of Contents

General Introduction

This compendium contains a collection of recent spectroscopic data tables for titanium, chromium, and nickel. The tables are issued in three separate volumes, each containing one element. The individual volumes are identified as Oak Ridge National Laboratory ORNL 6551/V1 (titanium); ORNL 6551/V2 (chromium); and ORNL 6551/V3 (nickel). These chemical elements, together with the earlier tabulated[1] element iron, are the principal heavy metals which are widely used as first-wall materials (including limiters, armor plates, etc.) of magnetic fusion research machines, particularly tokamaks. Spectral radiation data for both high and low stages of ionization for Ti, Cr and Ni have thus become important for the assessment and modeling of the effects of impurities on plasma properties and power balance, for the study of plasma-wall interactions as well as for the application of plasma diagnostic techniques.

Numerical data are tabulated for those spectroscopic quantities which are of principal importance for such plasma studies and for plasma diagnostics. The specific spectroscopic quantities are ionization energies, wavelengths of allowed and forbidden lines, atomic energy levels, and atomic transition probabilities. Most of the critical evaluation and compilation work for these data has been done at the National Institute of Standards and Technology, formerly the National Bureau of Standards. The tables are usually parts of larger tabulations[2–7] containing many other chemical elements besides Ti, Cr, and Ni. Excerpting the data from these larger compilations required some modifications in the reprinted material, especially the modification of the introductory remarks with comments and explanations that specifically refer to the Ti, Cr, and Ni spectra. All of the material is quite recent, and is under the sponsorship of the National Standard Reference Data System (NSRDS). Since the various data tables have been completed at different times, there may be occasional slight inconsistencies between overlapping material when the data are based on different sources. Also, sometimes there may be different judgments of independent evaluators on the quality of the source material. For example, wavelengths which are derived from atomic energy levels may be sometimes slightly different from the observed data in the wavelength tables. There also may be slight inconsistencies between the energy level data contained in the wavelength and transition probability tables when compared to the data in the energy level table itself. But any such differences are so small that they do not matter for any plasma applications, and therefore the use of any of the recent tabulations is appropriate. But we generally recommend to use the *primary* tables to obtain data on a specific atomic quantity.

Each of the three volumes of this compendium is divided into six sections which cover:

Ionization energies,
General spectral line lists,
Vacuum ultraviolet lines,
Magnetic dipole lines,
Atomic energy levels, and
Atomic transition probabilities.

The editors gratefully acknowledge the cooperation of the data compilers. We also thank NSRDS, the American Institute of Physics, and American Chemical Society for permission to reprint excerpts of these tables.

References

1. W. L. Wiese, Editor, *Spectroscopic Data for Iron*, ORNL-6089 [1985], Fourth Volume of Oak Ridge Natl. Lab. Series 6086.
2. J. Reader, C. H. Corliss, W. L. Wiese, and G. A. Martin, *Wavelengths and Transition Probabilities for Atoms and Atomic Ions*, Natl. Stand. Ref. Data Ser., Natl. Bur. Stand. (U.S.), 68, 415 pgs. [1980].
3. R. L. Kelly, *Atomic and Ionic Spectral Lines Below 2000 Å (H through Kr)*, J. Phys. Chem. Ref. Data 16, Suppl. 1 (1987).
4. J. Sugar and C. Corliss, *Atomic Energy Levels of the Iron-Period Elements: Potassium through Nickel*, J. Phys. Chem. Ref. Data 14, Suppl. 2 [1985].
5. V. Kaufman and J. Sugar, *Forbidden Lines in ns^2np^k Ground Configurations and nsnp Excitation Configurations of Be through Mo Atoms and Ions*, J. Phys. Chem. Ref. Data 15, 321 – 416 [1986].
6. G. A. Martin, J. R. Fuhr, and W. L. Wiese, *Atomic Transition Probabilities—Scandium through Manganese*, J. Phys. Chem. Ref. Data 17, Suppl. 3 [1988].
7. J. R. Fuhr, G. A. Martin, and W. L. Wiese, *Atomic Transition Probabilities—Iron through Nickel*, J. Phys. Chem. Ref. Data 17, Suppl. 4 [1988].

A. Ionization Energies of Nickel Ions

A. Ionization Energies of Nickel Ions

[Excerpted from: J. Sugar and C. Corliss, J. Phys. Chem. Ref. Data 14, Suppl. 2 (1985)]

Spectrum	Ground State Configuration	Ground Level	Ionization Energy (eV)
Ni I	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^8 4s^2$	$^3F_4$	7.6375
Ni II	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^9$	$^2D_{5/2}$	18.16898
Ni III	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^8$	$^3F_4$	35.19
Ni IV	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^7$	$^4F_{9/2}$	54.9
Ni V	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^6$	$^5D_4$	76.06
Ni VI	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^5$	$^6S_{5/2}$	108
Ni VII	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^4$	$^5D_0$	133
Ni VIII	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^3$	$^4F_{3/2}$	162
Ni IX	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^2$	$^3F_2$	193
Ni X	$1s^2 2s^2 2p^6 3s^2 3p^6 3d$	$^2D_{3/2}$	224.6
Ni XI	$1s^2 2s^2 2p^6 3s^2 3p^6$	$^1S_0$	321.0
Ni XII	$1s^2 2s^2 2p^6 3s^2 3p^5$	$^2P^\circ_{3/2}$	352
Ni XIII	$1s^2 2s^2 2p^6 3s^2 3p^4$	$^3P_2$	384
Ni XIV	$1s^2 2s^2 2p^6 3s^2 3p^3$	$^4S^\circ_{3/2}$	430
Ni XV	$1s^2 2s^2 2p^6 3s^2 3p^2$	$^3P_0$	464
Ni XVI	$1s^2 2s^2 2p^6 3s^2 3p$	$^2P^\circ_{1/2}$	499
Ni XVII	$1s^2 2s^2 2p^6 3s^2$	$^1S_0$	571.08
Ni XVIII	$1s^2 2s^2 2p^6 3s$	$^2S_{1/2}$	607.06
Ni XIX	$1s^2 2s^2 2p^6$	$^1S_0$	1541
Ni XX	$1s^2 2s^2 2p^5$	$^2P^\circ_{3/2}$	1648
Ni XXI	$1s^2 2s^2 2p^4$	$^3P_2$	1756
Ni XXII	$1s^2 2s^2 2p^3$	$^4S^\circ_{3/2}$	1894
Ni XXIII	$1s^2 2s^2 2p^2$	$^3P_0$	2011
Ni XXIV	$1s^2 2s^2 2p$	$^2P^\circ_{1/2}$	2131
Ni XXV	$1s^2 2s^2$	$^1S_0$	2295
Ni XXVI	$1s^2 2s$	$^2S_{1/2}$	2399.2
Ni XXVII	$1s^2$	$^1S_0$	10 288.8
Ni XXVIII	$1s$	$^2S_{1/2}$	10 775.48

B. Prominent Spectral Lines for Ni I to Ni V
(Wavelengths for Vacuum Ultraviolet to Near Infrared Regions)

B. Prominent Spectral Lines for Ni I to Ni V

(Vacuum Ultraviolet to Near Infrared Regions)

[Excerpted from: J. Reader, C. H. Corliss, W. L. Wiese, and G. A. Martin, Natl. Stand. Ref. Data Ser., Natl. Bur. Stand. (U.S.) 68, 415 pgs. (1980); and J. Reader and C. H. Corliss, in *Handbook of Chemistry and Physics*, 70th Edition (1989)]

These lists were recently prepared under the auspices of the Committee of 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) nickel 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 Charles H. Corliss, NBS (Ni I - Ni V). For Ni I and II, the following literature references were used as the principal sources of data:

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

A. G. Shenstone, J. Res. Nat. Bur. Stand. (U.S.) 74A, 801 (1970).

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

A. G. Shenstone, J. Opt. Soc. Am. 44, 749 (1954).

R. Poppe, Physica (Utrecht) 81C, 351 (1976).

A. J. J. Raassen, T. A. M. van Kleef, B. C. Metsch, Physica (Utrecht) 84C, 133 (1976).

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 normally estimates of the relative strengths of lines which are not greatly separated in wavelength. However, because different sources are involved, based on different scales for the intensity estimates,these intensities are only useful as a rough indication of the appearances of the spectra. Furthermore, in the tables of first and second spectra the intensities of the lines of the singly ionized atoms 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
D – line consists of two unresolved lines
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*, Natl. Stand. Ref. Data Ser., Natl. Bur. Stand. (U.S.), 68, 415 pgs. (1980).
2. J. Reader and C. H. Corliss, in *Handbook of Chemistry and Physics*, 70th Edition (R. C. Weast, Ed.), CRC Press, Inc., Boca Raton, FL (1989).

Nickel (Ni)

Z=28

Intensity	Wavelength (Å)	Spectrum	Intensity	Wavelength (Å)	Spectrum
	Ni I and II		1400	2313.98	I
	Vacuum		1000	2316.04	II
			1400	2317.16	I
500	1317.22	II	500	2319.75	II
400	1335.20	II	2600	2320.03	I
500	1370.14	II	1900	2321.38	I
1000	1741.55	II	240	2322.68	I
500	1748.28	II	1400	2325.79	I
	Air		940	2329.96	I
			500	2334.58	II
1000	2165.55	II	460	2337.49	I
2000	2169.10	II	160	2337.82	I
2000	2174.67	II	500	2341.20	II
1500	2175.15	II	1200	2345.54	I
500	2177.09	II	190	2346.63	I
400	2177.36	II	400	2347.52	I
400	2179.35	II	160	2360.63	I
800	2180.47	II	200	2362.06	I
800	2184.60	II	1000	2375.42	II
2500	2185.50	II	240	2386.58	I
3000	2192.09	II	1000	2394.52	II
600	2201.41	II	2000	2416.13	I
5000	2205.55	II	240	2419.31	I
4000	2206.72	II	85	2421.23	I
6000	2216.48	II	70	2423.33	I
800	2220.40	II	70	2423.66	I
500	2221.06	II	70	2424.03	I
900	2222.96	II	500	2437.89	II
500	2242.68	II	85	2453.99	I
500	2253.85	II	160	2472.06	I
1000	2264.46	II	85	2476.87	I
2000	2270.21	II	500	2510.87	II
800	2277.28	II	500	2565.92	II
400	2278.32	II	500	2606.26	II
800	2278.77	II	500	2609.94	II
500	2287.65	II	500	2615.06	II
1600	2289.98	I	45	2696.49	I
400	2296.55	II	150	2798.65	I
400	2297.14	II	250	2821.29	I
630	2300.78	I	500	2864.02	II
1000	2303.00	II	50	2865.50	I
2000	2310.96	I	60	2907.46	I
1700	2312.34	I	25	2914.01	I
1400	2313.66	I	500	2943.91	I

Intensity	Wavelength (Å)	Spectrum	Intensity	Wavelength (Å)	Spectrum
570	2981.65	I	400	3335.64	II
250	2984.13	I	500	3338.09	II
500	2992.60	I	500	3348.84	II
1000	2994.46	I	500	3349.24	II
4000	3002.49	I	600	3358.68	II
2200	3003.63	I	330	3361.56	I
3700	3012.00	I	500	3363.45	II
350	3019.14	I	330	3365.77	I
120	3031.87	I	330	3366.17	I
1700	3037.94	I	65	3366.81	I
150	3045.01	I	65	3367.89	I
3500	3050.82	I	2900	3369.57	I
1500	3054.32	I	400	3371.99	I
1900	3057.64	I	260	3374.22	I
500	3064.62	I	130	3374.64	I
420	3080.76	I	500	3378.97	II
260	3097.12	I	3300	3380.57	I
210	3099.12	I	240	3380.85	I
2600	3101.55	I	1300	3391.05	I
1300	3101.88	I	3300	3392.99	I
220	3105.47	I	500	3401.05	II
270	3114.12	I	130	3409.58	I
2900	3134.11	I	330	3413.48	I
55	3145.72	I	330	3413.94	I
55	3181.74	I	8200	3414.76	I
100	3184.37	I	1600	3423.71	I
55	3195.57	I	2600	3433.56	I
150	3197.11	I	990	3437.28	I
55	3202.14	I	4800	3446.26	I
180	3214.06	I	1300	3452.89	I
180	3217.83	I	5000	3458.47	I
100	3221.27	I	5000	3461.65	I
150	3221.65	I	200	3467.50	I
210	3225.02	I	240	3469.49	I
1100	3232.96	I	1600	3472.54	I
290	3234.65	I	550	3483.77	I
600	3243.06	I	130	3485.89	I
100	3248.46	I	5500	3492.96	I
120	3250.74	I	660	3500.85	I
100	3271.12	I	65	3502.60	I
120	3282.70	I	55	3507.69	I
400	3292.87	II	2600	3510.34	I
500	3297.60	II	260	3513.93	I
400	3305.71	II	6600	3515.05	I
660	3315.66	I	660	3519.77	I
330	3320.26	I	8200	3524.54	I
310	3322.31	I	110	3527.98	I
2000	3331.88	II	330	3548.18	I

Intensity		Wavelength (Å)	Spectrum
55		3551.53	I
65		3561.75	I
5000		3566.37	I
990		3571.87	I
130		3587.93	I
1300		3597.70	I
1300		3610.46	I
530		3612.74	I
6600		3619.39	I
130		3624.73	I
200		3664.10	I
130		3669.24	I
180		3670.43	I
260		3674.15	I
160		3688.42	I
80		3693.93	I
120		3722.48	I
150		3736.81	I
60		3739.23	I
600		3775.57	I
700		3783.53	I
700		3807.14	I
110		3831.69	I
1200		3858.30	I
30		3889.67	I
35		3972.17	I
110		3973.56	I
110		4401.55	I
85		4459.04	I
18		4462.46	I
55		4470.48	I
35		4592.53	I
18		4600.37	I
65		4605.00	I
18		4606.23	I
75		4648.66	I
23		4686.22	I
110		4714.42	I
22		4715.78	I
30		4756.52	I
15		4763.95	I
45		4786.54	I
22		4807.00	I
22	H	4829.03	I
19		4831.18	I
45		4855.41	I
30		4866.27	I
17		4873.44	I
40		4904.41	I
22		4918.36	I
16		4935.83	I
45		4980.16	I
45		4984.13	I
500		4992.02	II
16	H	5000.34	I
18		5012.46	I
50		5017.59	I
100		5035.37	I
16		5048.85	I
100		5080.52	I
65		5081.11	I
26	H	5084.08	I
18		5099.32	I
26	H	5099.95	I
21		5115.40	I
18	H	5129.38	I
23		5137.08	I
23	H	5142.77	I
40	H	5146.48	I
40	H	5155.76	I
16		5168.66	I
13		5176.56	I
8		5435.87	I
180		5476.91	I
6		5510.00	I
6		5578.73	I
9		5587.86	I
13		5592.28	I
9		5614.79	I
5	H	5625.33	I
4		5649.70	I
5		5664.02	I
12		5682.20	I
8		5695.00	I
23		5709.56	I
10		5711.90	I
10		5715.09	I
16		5754.68	I
8		5760.85	I
10		5857.76	I
10		5892.88	I
10		6108.12	I
10		6176.81	I
10		6191.18	I
13		6256.36	I
10		6314.66	I

Intensity	Wavelength (Å)	Spectrum
16	6643.64	I
22	6767.77	I
9	6772.32	I
10	6914.56	I
5	7110.90	I
26	7122.20	I
6	7182.00	I
5	7197.02	I
5	7261.93	I
5	7291.45	I
4	7385.24	I
16	7393.60	I
16	7409.35	I
5	7414.51	I
23	7422.28	I
13	7522.76	I
9	7525.12	I
19	7555.60	I
8	7574.05	I
23	7617.00	I
9	7619.21	I
16	7714.32	I
5 H	7715.58	I
19	7727.61	I
19	7748.89	I
10	7788.94	I
13	7797.59	I
2	7917.44	I
1000	8096.75	II
500	8114.21	II
700	8121.48	II
2	8809.42	I
9	8862.55	I
500 W	9900.92	II

Ni III

Vacuum

Intensity	Wavelength (Å)	Spectrum
100	625.68	III
500	630.71	III
200	637.54	III
200	662.37	III
150	663.57	III
500	676.94	III
200	700.17	III
300	713.33	III
300	713.38	III
500	718.48	III
200	721.26	III
300	722.09	III
250	725.20	III
500	729.82	III
250	730.11	III
400	731.70	III
300	732.16	III
200	738.26	III
300	747.99	III
200	749.68	III
300	750.05	III
200	752.02	III
300	757.80	III
250	758.73	III
250	758.27	III
400	770.22	III
200	772.04	III
500	778.81	III
200 D	785.02	III
300	788.04	III
200	788.30	III
200	805.01	III
500	811.57	III
500	826.14	III
200	826.50	III
500	842.14	III
400	845.24	III
300	847.43	III
200	857.09	III
300	860.64	III
300	862.88	III
300	863.22	III
300	867.51	III
200	869.70	III
200	870.84	III
300	973.79	III
400	979.59	III
200	1428.87	III
200	1434.31	III
200	1451.50	III
300	1604.54	III
300	1652.87	III
200	1653.12	III
250	1656.13	III
200	1661.79	III
400	1687.90	III
1000	1692.51	III
200	1707.35	III
200	1707.43	III

Intensity	Wavelength (Å)	Spectrum
800	1709.90	III
650	1715.30	III
500	1719.46	III
200	1721.26	III
400	1722.28	III
250	1733.13	III
500	1738.25	III
300	1739.78	III
300	1741.96	III
550	1747.01	III
300	1752.43	III
400	1753.01	III
800	1764.69	III
500	1767.94	III
2000	1769.64	III
400	1776.07	III
200	1788.30	III
250	1790.40	III
200	1790.93	III
200	1791.64	III
200	1794.90	III
300	1807.24	III
200	1811.69	III
300	1819.28	III
800	1823.06	III
400	1830.01	III
200	1830.08	III
650	1847.28	III
800	1854.15	III
300	1858.75	III
200	1930.43	III
200	1952.54	III

Ni IV

Vacuum

Intensity	Wavelength (Å)	Spectrum
33	392.68	IV
32	393.24	IV
49	424.40	IV
57	444.21	IV
67	469.67	IV
65	471.24	IV
65	485.42	IV
66	536.28	IV
67	537.96	IV
58	1345.72	IV
69	1357.07	IV
76	1398.19	IV
74	1411.45	IV
69	1419.58	IV
74	1421.22	IV
70	1427.45	IV
67	1428.93	IV
67	1435.24	IV
70	1438.82	IV
73	1449.01	IV
76	1452.22	IV
70	1455.42	IV
69	1472.63	IV
68	1476.82	IV
73	1482.25	IV
67	1489.53	IV
72	1489.83	IV
69	1493.01	IV
74	1493.67	IV
68	1498.71	IV
71	1498.77	IV
72	1498.90	IV
67	1499.97	IV
70	1512.74	IV
70	1516.66	IV
73	1520.63	IV
75	1525.31	IV
74	1527.68	IV
74	1527.80	IV
76	1534.71	IV
73	1537.25	IV
69	1538.93	IV
75	1543.41	IV
74	1546.23	IV
68	1548.04	IV
69	1557.28	IV
67	1560.18	IV

Ni V

Vacuum

Intensity	Wavelength (Å)	Spectrum
29	304.02	V
55	315.24	V
56	315.71	V
63	336.79	V
68	343.93	V
78	347.34	V
70	347.46	V
67	347.72	V
71	348.10	V
69	350.77	V
69	353.59	V

Intensity	Wavelength (Å)	Spectrum	Intensity	Wavelength (Å)	Spectrum
72	354.18	v	70	370.62	v
76	354.42	v	67	371.31	v
68	354.49	v	68	371.76	v
68	355.61	v	67	373.60	v
70	355.78	v	72	377.68	v
65	357.37	v	70	393.91	v
69	358.57	v	66	394.31	v
68	358.58	v	66	395.24	v
66	359.47	v	41	400.59	v
69	365.62	v			

C. Vacuum Ultraviolet Lines for Ni I through Ni XXVIII (Wavelengths and Classifications)

C. Vacuum Ultraviolet Lines for Ni I through Ni XXVIII

[Excerpted from: R. L. Kelly, J. Phys. Chem. Ref. Data **16**, Supplement 1 (1987)]

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 (Ni XXVII and Ni XXVIII) as notable exceptions. But also in some 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. Where more than one publication reports the wavelength of the line, the decision as to which to retain was based primarily on the present author's judgement of the best value. This judgement was based on consideration of the dates of publication, on probable accuracy from the type of instrumentation used and the wavelength standards employed, on the spectroscopic source used, and on the comparison of the observations with the wavelengths predicted from the best known values of energy levels as described above.

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 Postgraduate 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
- 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 **16**, Supplement 1 [1987].
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. Sugar and C. Corliss, *Atomic Energy Levels of the Iron-Period Elements: Potassium through Nickel*, J. Phys. Chem. Ref. Data **14**, Suppl. 2 [1985].
5. R. D. Cowan and K. L. Andrew, J. Opt. Soc. Am. **55**, 502 [1965].

General Reference List for Section C

3. E. E. Anderson and J. E. Mack, Phys. Rev. **59**, 717 [1941].
207. M. Even-Zohar and B. S. Fraenkel, J. Opt. Soc. Am. **58**, 1420 [1968].
237. U. Feldman, L. Katz, W. Behring, and L. Cohen, J. Opt. Soc. Am. **61**, 91 [1971].
240. B. C. Fawcett and R. W. Hayes, J. Phys. B **5**, 366 [1972].
256. B. C. Fawcett and A. H. Gabriel, Astrophys. J. **141**, 343 [1965].
265. U. Feldman and L. Cohen, J. Opt. Soc. Am. **57**, 1128 [1967].
266. B. C. Fawcett, A. H. Gabriel, F. E. Irons, N. J. Peacock, and P. A. H. Saunders, Proc. Phys. Soc. **88**, 1051 [1966].
295. A. H. Gabriel, B. C. Fawcett, and C. Jordan, Proc. Phys. Soc. **87**, 825 [1966].
299. O. Garcia-Riquelme, Physica **40**, 27 [1968].
302. S. Goldsmith and B. S. Fraenkel, Astrophys. J. **161**, 317 [1970].
315. S. Hoory, S. Goldsmith, B. S. Fraenkel, and V. Feldman, Astrophys. J. **160**, 781 [1970].
375. R. L. Kelly, unpublished work prepared for this report.
395. S. O. Kastner W. E. Behring, and L. Cohen, Astrophys. J. **199**, 777 [1975].
437. K. P. Dere, Astrophys. J. **221**, 1062 [1978].
442. G. D. Sandlin, G. E. Brueckner, and R. Tousey, Astrophys. J. **214**, 898 [1977].
464. J. H. Parkinson, Sol. Phys. **42**, 183 [1975].
548. L. W. Phillips and P. G. Kruger, Phys. Rev. **54**, 839 [1938].
602. H. N. Russell, Phys. Rev. **34**, 821 [1929].
619. V. A. Boiko, S. A. Pikuz, U. I. Safronova, and A. Ya. Faenov, J. Phys. B **10**, 1253 [1977].
622. H. F. Henrichs, Astron. Astrophys. **44**, 41 [1975].
634. V. A. Boiko, S. A. Pikuz, A. S. Safronova, and A. Ya. Faenov, Preprint No. 191, Lebedev Phys. Inst. [1977].
643. V. A. Boiko, A. Ya. Faenov, and S. A. Pikuz, J. Quant. Spectrosc. Radiat. Transfer **19**, 11 [1978].
661. A. G. Shenstone, J. Opt. Soc. Am. **44**, 749 [1954].
716. M. Swartz, S. Kastner, E. Rothe, and W. Neupert, J. Phys. B **4**, 1747 [1971].
726. R. Smitt, L. A. Svensson, and M. Outred, Phys. Scr. **13**, 293 [1976].
728. J. H. Scofield, Report UCID–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 [1976].
730. G. D. Sandlin, G. E. Brueckner, V. E. Scherrer, and R. Tousey, Astrophys. J. **205**, L47 [1976].
753. B. Edlen, Phys. Scr. **17**, 565 [1978].
835. A. G. Shenstone, J. Res. Natl. Bur. Stand. A **74**, 801 [1970].
839. G. A. Doschek, Spac Sci. Rev. **13**, 765 [1972].
851. B. C. Fawcett, R. D. Cowan, and R. W. Hayes, unpublished.
854. B. C. Fawcett, R. D. Cowan, and R. W. Hayes, J. Phys. B **5**, 2143 [1972].
856. B. C. Fawcett, Advances Atomic and Molecular Physics, Vol. 10, Academic Press [1974].
877. B. C. Fawcett and R. W. Hayes, Mon. Not. R. Astron. Soc. **170**, 185 [1975].
903. R. Poppe, Physica **81C**, 351 [1976].
922. A. J. J. Raassen, T. A. M. van Kleef, and B. C. Metsch, Physica **84C**, 133 [1976].
927. A. J. J. Raassen and T. A. M. van Kleef, Physica **85C**, 180 [1977].
940. U. Feldman and G. A. Doschek, J. Opt. Soc. Am. **67**, 726 [1977].
964. V. A. Boiko, S. A. Pikuz, A. S. Safronova, and A. Ya. Faenov, Opt. Spectrosc. **44**, 498 [1979].
970. S. O. Kastner, M. Swartz, A. K. Bhatia, and J. Lapides, J. Opt. Soc. Am. **68**, 1558 [1978].
977. B. Edlen, Phys. Scr. **19**, 255 [1979].
988. A. K. Bhatia and S. O. Kastner, to be published [1980].
1042. G. W. Erickson, J. Phys. Chem. Ref. Data **6**, 831 [1977].
1051. B. Warner and R. C. Kirkpatrick, Mon. Not. R. Astron. Soc. **144**, 397 [1969].
1055. B. C. Fawcett, G. E. Bromage, and R. W. Hayes, Mon. Not. R. Astron. Soc. **186**, 113 [1979].
1056. B. C. Fawcett, A. Ridgeley, and J. O. Ekberg, Phys. Scr. **21**, 155 [1980].
1057. B. C. Fawcett, A. Ridgeley, and T. P Hughes, Mon. Not. R. Astron. Soc. **188**, 365 [1979].
1067. P. B. Landecker McKenzie, R. M. Broussard, H. R. Rugge, R. M. Young, U. Feldman, and G. A. Doschek, Astrophys. J. **241**, 409 [1980].
1085. A. A. Ramonas and A. N. Ryabtsev, Opt. Spectrosc. **48**, 348 [1980].
1089. N. Spector, A. Zigler, H. Zmora, and J. L. Schwob, J. Opt. Soc. Am. **70**, 857 [1980].
1091. K. D. Lawson and N. J. Peacock, J. Phys. B **13**, 3313 [1980].
1093. A. J. J. Raassen, Physica **100C**, 404 [1980].
1094. H. Gordon, M. G. Hobby, and N. J. Peacock, J. Phys. B **13**, 1985 [1980].
1104. B. Edlen, Phys. Scr. **22**, 593 [1980].
1105. U. I. Safronova, Phys. Scr. **23**, 241 [1981].
1108. C. Corliss and J. Sugar, J. Phys. Chem. Ref. Data **10**, 197 [1981].
1120. E. Hinnov, S. Suckewer, S. Cohen, and K. Sato, Phys. Rev. A **25**, 2293 [1982].
1131. M. Finkenthal, E. Hinnov, S. Cohen, and S. Suckewer, Phys. Lett. A **91**, 284 [1982].

NICKEL, Z = 28
Unclassified Lines

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	0	8.516						716
	30	8.549						716
	30	8.605						716
	20	8.649						716
	20	8.694						716
	3	9.135						1089
	10	9.482						1089
	20	10.215						716
	10	10.500						716
	10	10.580						716
	20	10.762						716
	20	10.902						716
	20	11.636						716
	20	12.250						716
	0	12.315						716
	30	12.552						716
	30	12.581						716
	20	12.759						716
	10	13.120						716
	10	13.658						716
	20	139.55						256
	20	140.52						256
	30	140.83						256
	50	141.06						256
	60	141.35						256
	30	141.70						256
	60	141.87						256
	40	142.22						256
	50	142.42						256
	50	143.80						256
	70	147.00						256
	50	148.62						256
	40	148.83						256
	30	149.21						256
	50	149.47						256
	40	149.97						256
	40	150.56						256
	30	151.70						256
	30	151.85						256
	30	155.62						256
	30	156.30						256
	40	156.68						256
	40	157.24						256
	40	158.00						256
	50	158.54						256
	30	160.38						256
	30	161.94						256
	40	162.16						256
	50	162.90						256
	70	165.43						256
	30	165.69						256
	40	165.81						256
	50	166.08						256
	50	166.29						256

NI UNCLASSIFIED LINES — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	50	166.46						256

NICKEL I (Ni^{0+}), Z = 28
Ground State $1s^22s^22p^63s^23p^63d^84s^2(^3F_4)$ (28 electrons)
Ionization Potential 61 600 cm^{-1}; 7.638 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
47	50	1963.85	0.204786 – 51.1248	$3d^9(a^2D)4s - 3d^8(a^1G)4s4p(^3P°)$	$a^3D - u^3F°$	3 – 3		602
23	50	1968.90	0.0 – 50.7895	$3d^84s^2 - 3d^8(a^1G)4s4p(^3P°)$	$ga^3F - u^3F°$	4 – 4		602
47	150	1976.87	0.204786 – 50.7895	$3d^9(a^2D)4s - 3d^8(a^1G)4s4p(^3P°)$	$a^3D - u^3F°$	3 – 4		602
47	100	1981.61	0.879813 – 51.34380	$3d^9(a^2D)4s - 3d^8(a^1G)4s4p(^3P°)$	$a^3D - u^3F°$	2 – 2		602
47	200	1990.25	0.879813 – 51.1248	$3d^9(a^2D)4s - 3d^8(a^1G)4s4p(^3P°)$	$a^3D - u^3F°$	2 – 3		602
	100	1994.29	0.0 – 50.1428	$3d^84s^2 - 3d^9(a^2D)5p$	$ga^3F - 5°$	4 – 3		602
23	0	1999.53	1.332153 – 51.34380	$3d^84s^2 - 3d^8(a^1G)4s4p(^3P°)$	$ga^3F - u^3F°$	3 – 2		602

NICKEL II (Ni^{1+}), Z = 28
Ground State $1s^22s^22p^63s^23p^63d^9(^2D_{5/2})$ (27 electrons)
Ionization Potential 146 541.56 cm^{-1}; 18.16898 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	2	727.100	0.0 – 137.53596	$3d^9 - 3d^8(a^3F_4)7f$	$g^2D - 4[4]°$	$\frac{5}{2} - \frac{7}{2}$		835
	5	737.300	0.0 – 135.62940	$3d^9 - 3d^8(a^3F_3)6f$	$g^2D - 3[4]°$	$\frac{5}{2} - \frac{7}{2}$		835
	2	738.201	0.0 – 135.46486	$3d^9 - 3d^8(a^3P)4f$	$g^2D - {}^2G°$	$\frac{5}{2} - \frac{7}{2}$		835
	1	738.548	0.0 – 135.40067	$3d^9 - 3d^8(a^3P_2)4f$	$g^2D - 2[4]°$	$\frac{5}{2} - \frac{7}{2}$		835
	2	744.636	0.0 – 134.29499	$3d^9 - 3d^8(a^3F_4)6f$	$g^2D - 4[3]°$	$\frac{5}{2} - \frac{5}{2}$		835
	5	744.867	0.0 – 134.25285	$3d^9 - 3d^8(a^3F_4)6f$	$g^2D - 4[3]°$	$\frac{5}{2} - \frac{7}{2}$		835
	1	745.640	1.50694 – 135.61991	$3d^9 - 3d^8(a^3F_3)6f$	$g^2D - 3[1]°$	$\frac{3}{2} - \frac{3}{2}$		835
	5	746.241	1.50694 – 135.51292	$3d^9 - 3d^8(a^3P_2)4f$	$g^2D - 2[2]°$	$\frac{3}{2} - \frac{5}{2}$		835
	0	746.525	1.50694 – 135.46155	$3d^9 - 3d^8(a^3P_2)4f$	$g^2D - 2[3]°$	$\frac{3}{2} - \frac{5}{2}$		835
	0	752.403						835
	4	752.626	0.0 – 132.86916	$3d^9 - 3d^8(a^1D_2)4f$	$g^2D - 2[3]°$	$\frac{5}{2} - \frac{7}{2}$		835
	1	767.898	0.0 – 130.22587	$3d^9 - 3d^8(a^3F_3)5f$	$g^2D - 3[4]°$	$\frac{5}{2} - \frac{7}{2}$		835
	1	771.626	1.50694 – 131.10318	$3d^9 - 3d^8(a^3F_2)5f$	$g^2D - 2[2]°$	$\frac{3}{2} - \frac{5}{2}$		835
	3	776.000	0.0 – 128.86700	$3d^9 - 3d^8(a^3F_4)5f$	$g^2D - 4[4]°$	$\frac{5}{2} - \frac{7}{2}$		835
	5	776.078	0.0 – 128.85387	$3d^9 - 3d^8(a^3F_4)5f$	$g^2D - 4[3]°$	$\frac{5}{2} - \frac{5}{2}$		835
	10	795.506	8.39390 – 134.10016	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P°)$	$^4F - v^4G°$	$\frac{9}{2} - \frac{11}{2}$		835
	200	797.074	8.39390 – 133.85304	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P°)$	$^4F - v^4F°$	$\frac{9}{2} - \frac{9}{2}$		835
	150	797.088	8.39390 – 133.85083	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P°)$	$^4F - s^4D°$	$\frac{9}{2} - \frac{7}{2}$		835
	30	798.518	1.50694 – 126.73882	$3d^9 - 3d^7(a^4P)4s4p(^1P°)$	$g^2D - x^4S°$	$\frac{3}{2} - \frac{3}{2}$		835
	2	799.145	8.39390 – 133.52802	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P°)$	$^4F - v^4F°$	$\frac{9}{2} - \frac{7}{2}$		835
	100	802.292	9.33004 – 133.97333	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P°)$	$^4F - s^4D°$	$\frac{7}{2} - \frac{5}{2}$		835
	15	803.064	9.33004 – 133.85304	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P°)$	$^4F - v^4F°$	$\frac{7}{2} - \frac{9}{2}$		835
	150	805.168	9.33004 – 133.52802	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P°)$	$^4F - v^4F°$	$\frac{7}{2} - \frac{7}{2}$		835
	30	806.188	10.11566 – 134.15628	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P°)$	$^4F - s^4D°$	$\frac{5}{2} - \frac{3}{2}$		835

NI II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	0	807.391	10.11566 – 133.97333	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4F - s^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	5	808.933	10.66389 – 134.28376	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4F - s^4D^\circ$	$\frac{3}{2}-\frac{1}{2}$		835
	0	809.772	10.66389 – 134.15628	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4F - s^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	20	810.292	10.11566 – 133.52802	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4F - v^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	2	811.389						835
	100	812.388	10.11566 – 133.20930	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4F - v^4F^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	2	813.602						835
	5	814.050	13.55039 – 136.39285	$3d^8(a^3F)4s - 3d^8(^1D)6p$	$^2F - {}^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	5	815.570	10.11566 – 132.72948	$3d^8(a^3F)4s - 3d^8(a^1D_2)4f$	$^4F - 2[3]^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	8	816.024	10.66389 – 133.20930	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4F - v^4F^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	30	816.150	10.66389 – 133.19019	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4F - v^4F^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	150	816.156	13.55039 – 136.07626	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2F - v^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	1	816.864						835
	1	817.884	8.39390 – 130.66132	$3d^8(a^3F)4s - 3d^8(a^3F_4)7p$	$^4F - {}^4G^\circ$	$\frac{9}{2}-\frac{11}{2}$		835
	5	819.090	8.39390 – 130.48055	$3d^8(a^3F)4s - 3d^8(a^3F_4)7p$	$^4F - {}^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	1	821.612	13.55039 – 135.26199	$3d^8(a^3F)4s - 3d^8(a^3F_4)8p$	$^2F - {}^4G^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	20	821.634	13.55039 – 135.25892	$3d^8(a^3F)4s - 3d^7(a^2P)4s4p(^1P^\circ)$	$^2F - v^2D^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	1	821.875						835
	3	823.277	14.99557 – 136.46110	$3d^8(a^3F)4s - 3d^7(a^2P)4s4p(^1P^\circ)$	$^2F - v^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	2	824.856	13.55039 – 134.78314	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2F - w^2D^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	10	828.152	14.99557 – 135.74606	$3d^8(a^3F)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2F - v^2G^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	1	828.786	9.33004 – 129.98805	$3d^8(a^3F)4s - 3d^7(a^4P)4s4p(^1P^\circ)$	$^4F - t^4D^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	2	830.677						835
	2	831.475	0.0 – 120.26881	$3d^9 - 3d^8(a^3F_3)4f$	$g^2D - 3[4]^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	100	834.059	13.55039 – 133.44575	$3d^8(a^3F)4s - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2F - w^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	0	835.739	1.50694 – 121.16181	$3d^9 - 3d^8(a^3F_2)4f$	$g^2D - 2[2]^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	75	835.983	13.55039 – 133.16992	$3d^8(a^3F)4s - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2F - w^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	1	836.954	13.55039 – 133.03100	$3d^8(a^3F)4s - 3d^8(a^1D_2)4f$	$^2F - 2[5]^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	50	837.624	14.99557 – 134.38082	$3d^8(a^3F)4s - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2F - w^2G^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	10	838.224	14.99557 – 134.29499	$3d^8(a^3F)4s - 3d^8(a^3F_4)6f$	$^2F - 4[3]^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	1	838.524	14.99557 – 134.25285	$3d^8(a^3F)4s - 3d^8(a^3F_4)6f$	$^2F - 4[3]^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	50	838.834	14.99557 – 134.20830	$3d^8(a^3F)4s - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2F - w^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	5	840.878	0.0 – 118.92320	$3d^9 - 3d^8(a^3F_4)4f$	$g^2D - 4[4]^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	10	841.056	0.0 – 118.89794	$3d^9 - 3d^8(a^3F_4)4f$	$g^2D - 4[3]^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	0	841.205	0.0 – 118.87709	$3d^9 - 3d^8(a^3F_4)4f$	$g^2D - 4[2]^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	2	844.748	13.55039 – 131.92877	$3d^8(a^3F)4s - 3d^8(a^3F_3)7p$	$^2F - {}^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	3	845.033						835
	5	849.086						835
	5	849.398						835
	3	854.604						835
	5	855.282	13.55039 – 130.47090	$3d^8(a^3F)4s - 3d^8(a^3F_4)7p$	$^2F - {}^4F^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	2	858.562						835
	0	876.829	8.39390 – 122.44122	$3d^8(a^3F)4s - 3d^8(a^3F_4)6p$	$^4F - {}^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	2	881.608	8.39390 – 121.82297	$3d^8(a^3F)4s - 3d^8(a^3F_4)6p$	$^4F - {}^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	1	882.337						835
	5	888.818	8.39390 – 120.90320	$3d^8(a^3F)4s - 3d^8(a^3P)5p$	$^4F - {}^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	3	893.630						835
	2	894.004	23.10828 – 134.96478	$3d^8(a^1D)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2D - w^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	1	895.093	9.33004 – 121.05066	$3d^8(a^3F)4s - 3d^8(a^3P)5p$	$^4F - {}^4D^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	15	895.458	23.10828 – 134.78314	$3d^8(a^1D)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2D - w^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	5	896.168	23.79618 – 135.38253	$3d^8(a^1D)4s - 3d^7(a^2P)4s4p(^1P^\circ)$	$^2D - w^2P^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	2	898.716	10.11566 – 121.38580	$3d^8(a^3F)4s - 3d^8(a^3P)5p$	$^4F - {}^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	5	898.821	23.79618 – 135.05314	$3d^8(a^1D)4s - 3d^7(a^2P)4s4p(^1P^\circ)$	$^2D - w^2P^\circ$	$\frac{3}{2}-\frac{1}{2}$		835
	0	900.510	23.10828 – 134.15628	$3d^8(a^1D)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2D - s^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	10	901.007	23.79618 – 134.78314	$3d^8(a^1D)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2D - w^2D^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	2	901.737	10.66389 – 121.56106	$3d^8(a^3F)4s - 3d^8(a^3P)5p$	$^4F - ^4D^\circ$	$\frac{3}{2}-\frac{1}{2}$		835
	50	901.999	23.10828 – 133.97333	$3d^8(a^1D)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2D - s^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	1	902.687						835
	75	902.996	23.10828 – 133.85083	$3d^8(a^1D)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2D - s^4D^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	2	904.205	24.78820 – 135.38253	$3d^8(a^3P)4s - 3d^7(a^2P)4s4p(^1P^\circ)$	$^4P - w^2P^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	1	904.986	8.39390 – 118.89299	$3d^8(a^3F)4s - 3d^8(a^3F_4)4f$	$^4F - 4[\frac{11}{2}]^\circ$	$\frac{9}{2}-\frac{11}{2}$		835
	100	905.634	23.10828 – 133.52802	$3d^8(a^1D)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2D - v^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	3	905.696	23.79618 – 134.20830	$3d^8(a^1D)4s - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2D - w^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	15	906.123	23.79618 – 134.15628	$3d^8(a^1D)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2D - s^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	2	906.237	25.03638 – 135.38253	$3d^8(a^3P)4s - 3d^7(a^2P)4s4p(^1P^\circ)$	$^4P - w^2P^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	1	906.730						835
	1	906.906	24.78820 – 135.05314	$3d^8(a^3P)4s - 3d^7(a^2P)4s4p(^1P^\circ)$	$^4P - w^2P^\circ$	$\frac{3}{2}-\frac{1}{2}$		835
	50	907.630	23.79618 – 133.97333	$3d^8(a^1D)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2D - s^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	10	907.692	8.39390 – 118.56339	$3d^8(a^3F)4s - 3d^8(a^1D)5p$	$^4F - ^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	40	908.258	23.10828 – 133.20930	$3d^8(a^1D)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2D - v^4F^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	20	908.584	23.10828 – 133.16992	$3d^8(a^1D)4s - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2D - w^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	10	909.683	25.03638 – 134.96478	$3d^8(a^3P)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - w^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	15	911.187	25.03638 – 134.78314	$3d^8(a^3P)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - w^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	2	913.187	24.78820 – 134.29499	$3d^8(a^3P)4s - 3d^8(a^3F_4)6f$	$^4P - 4[3]^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	3	913.279	24.78820 – 134.28376	$3d^8(a^3P)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - s^4D^\circ$	$\frac{3}{2}-\frac{1}{2}$		835
	75	913.678	24.83593 – 134.28376	$3d^8(a^3P)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - s^4D^\circ$	$\frac{1}{2}-\frac{1}{2}$		835
	15	913.909	24.78820 – 134.20830	$3d^8(a^3P)4s - 3d^7(a^2G)4s4p(^1P^\circ)$	$^4P - w^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	50	914.343	24.78820 – 134.15628	$3d^8(a^3P)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - s^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	40	914.743	24.83593 – 134.15628	$3d^8(a^3P)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - s^4D^\circ$	$\frac{1}{2}-\frac{3}{2}$		835
	1	915.471	9.33004 – 118.56339	$3d^8(a^3F)4s - 3d^8(a^1D)5p$	$^4F - ^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	75	915.877	24.78820 – 133.97333	$3d^8(a^3P)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - s^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	30	915.920	8.39390 – 117.57368	$3d^8(a^3F)4s - 3d^7(a^2D)4s4p(^3P^\circ)$	$^4F - w^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	1	916.449	23.10828 – 132.22515	$3d^8(a^1D)4s - 3d^7(a^4P)4s4p(^1P^\circ)$	$^2D - v^4P^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	10	917.017	9.33004 – 118.37911	$3d^8(a^3F)4s - 3d^8(a^1D)5p$	$^4F - ^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	15	917.962	25.03638 – 133.97333	$3d^8(a^3P)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - s^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	3	918.022						835
	4	918.946						835
	150	918.994	25.03638 – 133.85083	$3d^8(a^3P)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - s^4D^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	10	920.451	9.33004 – 117.97247	$3d^8(a^3F)4s - 3d^7(a^2D)4s4p(^3P^\circ)$	$^4F - w^4F^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	2	921.228						835
	1	921.299	9.33004 – 117.87278	$3d^8(a^3F)4s - 3d^8(a^1D)5p$	$^4F - ^2D^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	75	921.730	25.03638 – 133.52802	$3d^8(a^3P)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - v^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	5	922.176						835
	15	922.331	24.78820 – 133.20930	$3d^8(a^3P)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - v^4F^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	1	922.571						835
	1	924.710	13.55039 – 121.69255	$3d^8(a^3F)4s - 3d^7(a^2H)4s4p(^3P^\circ)$	$^2F - x^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	10	924.783	25.03638 – 133.16992	$3d^8(a^3P)4s - 3d^7(a^2G)4s4p(^1P^\circ)$	$^4P - w^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	20	924.912	8.39390 – 116.51206	$3d^8(a^3F)4s - 3d^7(a^2D)4s4p(^3P^\circ)$	$^4F - v^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	2	925.100						835
	3	925.544						835
	1	925.578	23.79618 – 131.83494	$3d^8(a^1D)4s - 3d^7(a^4P)4s4p(^1P^\circ)$	$^2D - v^4P^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	5	927.820	10.66389 – 118.44281	$3d^8(a^3F)4s - 3d^8(a^1D)5p$	$^4F - ^2P^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	3	928.953	10.11566 – 117.76391	$3d^8(a^3F)4s - 3d^8(a^1D)5p$	$^4F - ^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	1	929.586	13.55039 – 121.12541	$3d^8(a^3F)4s - 3d^8(a^3F_2)4f$	$^2F - 2[5]^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	3	929.681	9.33004 – 116.89398	$3d^8(a^3F)4s - 3d^7(a^2D)4s4p(^3P^\circ)$	$^4F - v^4D^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	5	929.831	10.11566 – 117.66211	$3d^8(a^3F)4s - 3d^7(a^2D)4s4p(^3P^\circ)$	$^4F - v^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	10	930.351						835
	3	930.707	29.07093 – 136.51720	$3d^8(a^3P)4s - 3d^8(a^3F_2)6f$	$^2P - 2[1]^\circ$	$\frac{3}{2}-\frac{1}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	931.191	24.83593 – 132.22515	$3d^8(a^3P)4s - 3d^7(a^4P)4s4p(^1P^\circ)$	$^4P - v^4P^\circ$	$\frac{1}{2}-\frac{3}{2}$		835
	2	931.501	13.55039 – 120.90320	$3d^8(a^3F)4s - 3d^8(a^3P)5p$	$^2F - {}^4D^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	2	932.321						835
	2	933.339	0.0 – 107.14221	$3d^9 - 3d^8(a^3F_2)5p$	$g^2D - {}^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	1	933.421						835
	1	933.866	0.0 – 107.08221	$3d^9 - 3d^8(a^3F_2)5p$	$g^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	2	935.085						835
	1	935.200						835
	1	936.188	8.39390 – 115.20985	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4G^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	15	936.704						835
	30	939.276	8.39390 – 114.85888	$3d^8(a^3F)4s - 3d^7(a^2H)4s4p(^3P^\circ)$	$^4F - w^4G^\circ$	$\frac{9}{2}-\frac{11}{2}$		835
	20	940.886	9.33004 – 115.61288	$3d^8(a^3F)4s - 3d^7(a^2H)4s4p(^3P^\circ)$	$^4F - w^4G^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	10	941.972	10.11566 – 116.27581	$3d^8(a^3F)4s - 3d^7(a^2H)4s4p(^3P^\circ)$	$^4F - w^4G^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	4	941.996						835
	2	942.360						835
	5	942.587	10.66389 – 116.75493	$3d^8(a^3F)4s - 3d^7(a^2H)4s4p(^3P^\circ)$	$^4F - w^4G^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	1	944.343	29.07093 – 134.96478	$3d^8(a^3P)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2P - w^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	30	944.634	0.0 – 105.86119	$3d^9 - 3d^8(a^3F_3)5p$	$g^2D - {}^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	10	944.842	0.0 – 105.83806	$3d^9 - 3d^8(a^3F_3)5p$	$g^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	75	945.965	29.07093 – 134.78314	$3d^8(a^3P)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2P - w^2D^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	15	946.657	1.50694 – 107.14221	$3d^9 - 3d^8(a^3F_2)5p$	$g^2D - {}^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	3	946.769	32.49953 – 138.12188	$3d^8(a^1G)4s - 3d^8(a^3F_4)9p$	$^2G - {}^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	2	947.195	1.50694 – 107.08221	$3d^9 - 3d^8(a^3F_2)5p$	$g^2D - {}^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	0	949.024	29.59346 – 134.96478	$3d^8(a^3P)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2P - w^2D^\circ$	$\frac{1}{2}-\frac{3}{2}$		835
	1	949.137	8.39390 – 113.75304	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4G^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	1	952.027	32.52354 – 137.56274	$3d^8(a^1G)4s - 3d^8(a^3F_2)8p$	$^2G - {}^2G^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	8	952.266	13.55039 – 118.56339	$3d^8(a^3F)4s - 3d^8(a^1D)5p$	$^2F - {}^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	1	952.340	10.11566 – 115.12000	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4F^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	10	953.033	8.39390 – 113.32195	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	2	953.937	13.55039 – 118.37911	$3d^8(a^3F)4s - 3d^8(a^1D)5p$	$^2F - {}^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	1	954.911	9.33004 – 114.05204	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4F^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	10	955.601	0.0 – 104.64652	$3d^9 - 3d^8(a^3F_4)5p$	$g^2D - {}^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	3	956.912	0.0 – 104.50322	$3d^9 - 3d^8(a^3F_4)5p$	$g^2D - {}^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	5	959.931	32.49953 – 136.67364	$3d^8(a^1G)4s - 3d^8(a^3F_3)8p$	$^2G - {}^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	5	960.261	29.07093 – 133.20930	$3d^8(a^3P)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2P - v^4F^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	5	960.269	29.07093 – 133.20930	$3d^8(a^3P)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2P - v^4F^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	1	961.516	32.52354 – 136.52442	$3d^8(a^1G)4s - 3d^8(a^3F_2)6f$	$^2G - 2[5]^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	1	962.526	32.49953 – 136.39285	$3d^8(a^1G)4s - 3d^8(^1D)6p$	$^2G - {}^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	1	962.750	32.52354 – 136.39285	$3d^8(a^1G)4s - 3d^8(^1D)6p$	$^2G - {}^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	15	963.855						835
	20	965.470	32.49953 – 136.07626	$3d^8(a^1G)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2G - v^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	20	968.784	32.52354 – 135.74606	$3d^8(a^1G)4s - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2G - v^2G^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	50	971.415	32.52354 – 135.46486	$3d^8(a^1G)4s - 3d^8(a^3P)4f$	$^2G - {}^2G^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	1	973.121	32.49953 – 135.26199	$3d^8(a^1G)4s - 3d^8(a^3F_4)8p$	$^2G - {}^4G^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	10	977.276						835
	25	978.108						835
	3	980.290						835
	50	981.768	32.52354 – 134.38082	$3d^8(a^1G)4s - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2G - w^2G^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	3	983.004	32.52354 – 134.25285	$3d^8(a^1G)4s - 3d^8(a^3F_4)6f$	$^2G - 4[3]^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	1	983.431	32.52354 – 134.20830	$3d^8(a^1G)4s - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2G - w^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	2	983.592	10.11566 – 111.78379	$3d^8(a^3F)4s - 3d^7(a^2G)4s4p(^3P^\circ)$	$^4F - y^4G^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	10	985.918						835
	2	986.992						835
	4	987.339						835

NI II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	10	988.338						835
	100	990.626	32.49953 – 133.44575	$3d^8(a^1G)4s - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2G - w^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	20	992.516	8.39390 – 109.14805	$3d^8(a^3F)4s - 3d^7(a^2G)4s4p(^3P^\circ)$	$^4F - y^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	15	993.128	9.33004 – 110.02192	$3d^8(a^3F)4s - 3d^7(a^2G)4s4p(^3P^\circ)$	$^4F - y^4G^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	1	993.341	32.49953 – 133.16992	$3d^8(a^1G)4s - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2G - w^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	10	994.867	9.33004 – 109.84600	$3d^8(a^3F)4s - 3d^7(a^2G)4s4p(^3P^\circ)$	$^4F - y^4F^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	30	995.256						835
	4	995.445	10.11566 – 110.57336	$3d^8(a^3F)4s - 3d^7(a^2G)4s4p(^3P^\circ)$	$^4F - y^4F^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	3	995.453	10.66389 – 111.12054	$3d^8(a^3F)4s - 3d^7(a^2G)4s4p(^3P^\circ)$	$^4F - y^4F^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	1	997.974	13.55039 – 113.75304	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^1P^\circ)$	$^2F - x^4G^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	5	1004.170						835
	8	1005.021						835
	1	1006.712						835
	10	1008.218						835
	20	1016.622						835
	8	1016.677						835
	5	1019.067						835
	5	1021.060						835
	3	1023.961	23.79618 – 121.45632	$3d^8(a^1D)4s - 3d^8(a^3P)5p$	$^2D - {}^4S^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	15	1023.999						835
	50	1024.720	8.39390 – 105.98150	$3d^8(a^3F)4s - 3d^7(a^4P)4s4p(^3P^\circ)$	$^4F - y^6D^\circ$	$\frac{9}{2}-\frac{11}{2}$		835
	2	1025.591						835
	5	1025.641						835
	5	1026.981						835
	20	1028.208						835
	1	1031.306	24.83593 – 121.80034	$3d^8(a^3P)4s - 3d^8(a^3P)5p$	$^4P - {}^2D^\circ$	$\frac{1}{2}-\frac{3}{2}$		835
	2	1032.749						835
	10	1033.443	25.03638 – 121.80034	$3d^8(a^3P)4s - 3d^8(a^3P)5p$	$^4P - {}^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	15	1034.155						835
	10	1034.249	23.10828 – 119.79698	$3d^8(a^1D)4s - 3d^8(a^3P)5p$	$^2D - {}^4P^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	2	1036.182	9.33004 – 105.83806	$3d^8(a^3F)4s - 3d^8(a^3F_3)5p$	$^4F - {}^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	5	1038.866	9.33004 – 105.58889	$3d^8(a^3F)4s - 3d^8(a^3F_3)5p$	$^4F - {}^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	1	1040.668						835
	2	1042.704	8.39390 – 104.29823	$3d^8(a^3F)4s - 3d^8(a^3F_4)5p$	$^4F - {}^4G^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	30	1044.349	8.39390 – 104.14729	$3d^8(a^3F)4s - 3d^8(a^3F_4)5p$	$^4F - {}^4G^\circ$	$\frac{9}{2}-\frac{11}{2}$		835
	2	1044.871	10.66389 – 106.36930	$3d^8(a^3F)4s - 3d^8(a^3F_2)5p$	$^4F - {}^4F^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	15	1045.073	8.39390 – 104.08104	$3d^8(a^3F)4s - 3d^8(a^3F_4)5p$	$^4F - {}^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	5	1045.813	10.66389 – 106.28316	$3d^8(a^3F)4s - 3d^8(a^3F_2)5p$	$^4F - {}^4G^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	8	1046.537	10.11566 – 105.66878	$3d^8(a^3F)4s - 3d^8(a^3F_3)5p$	$^4F - {}^4F^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	1	1047.497						835
	6	1048.400	10.11566 – 105.49905	$3d^8(a^3F)4s - 3d^8(a^3F_3)5p$	$^4F - {}^4G^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	1	1048.936	23.10828 – 118.44281	$3d^8(a^1D)4s - 3d^8(a^1D)5p$	$^2D - {}^2P^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	3	1048.982	24.83593 – 120.16652	$3d^8(a^3P)4s - 3d^8(a^3P)5p$	$^4P - {}^4P^\circ$	$\frac{1}{2}-\frac{3}{2}$		835
	1	1049.051	10.11566 – 105.43985	$3d^8(a^3F)4s - 3d^8(a^3F_3)5p$	$^4F - {}^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	8	1049.137	9.33004 – 104.64652	$3d^8(a^3F)4s - 3d^8(a^3F_4)5p$	$^4F - {}^4F^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	100	1049.755	8.39390 – 103.65303	$3d^8(a^3F)4s - 3d^8(a^3F_4)5p$	$^4F - {}^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	3	1050.718	9.33004 – 104.50322	$3d^8(a^3F)4s - 3d^8(a^3F_4)5p$	$^4F - {}^4D^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	10	1052.534	24.78820 – 119.79698	$3d^8(a^3P)4s - 3d^8(a^3P)5p$	$^4P - {}^4P^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	2	1052.983	9.33004 – 104.29823	$3d^8(a^3F)4s - 3d^8(a^3F_4)5p$	$^4F - {}^4G^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	15	1053.729						835
	15	1055.246	23.10828 – 117.87278	$3d^8(a^1D)4s - 3d^8(a^1D)5p$	$^2D - {}^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	30	1055.291	25.03638 – 119.79698	$3d^8(a^3P)4s - 3d^8(a^3P)5p$	$^4P - {}^4P^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	2	1056.837						835
	1	1062.243						835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	1062.965	23.79618 – 117.87278	$3d^8(a^1D)4s - 3d^8(a^1D)5p$	$^2D - ^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		835
	1	1066.476						835
	10	1070.590	25.03638 – 118.44281	$3d^8(a^3P)4s - 3d^8(a^1D)5p$	$^4P - ^2P^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	1	1074.224						835
	3	1075.551	24.78820 – 117.76391	$3d^8(a^3P)4s - 3d^8(a^1D)5p$	$^4P - ^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	2	1076.006	25.03638 – 117.97247	$3d^8(a^3P)4s - 3d^7(a^2D)4s4p(^3P^\circ)$	$^4P - w^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	4	1077.163	25.03638 – 117.87278	$3d^8(a^3P)4s - 3d^8(a^1D)5p$	$^4P - ^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	200	1081.035	32.49953 – 125.00344	$3d^8(a^1G)4s - 3d^7(a^2H)4s4p(^3P^\circ)$	$^2G - y^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		835
	150	1085.441	32.52354 – 124.65200	$3d^8(a^1G)4s - 3d^7(a^2H)4s4p(^3P^\circ)$	$^2G - y^2H^\circ$	$\frac{7}{2} - \frac{9}{2}$		835
	4	1086.503	13.55039 – 105.58889	$3d^8(a^3F)4s - 3d^8(a^3F_3)5p$	$^2F - ^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		835
	4	1091.407	14.99557 – 106.62053	$3d^8(a^3F)4s - 3d^8(a^3F_2)5p$	$^2F - ^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	1	1099.471	13.55039 – 104.50322	$3d^8(a^3F)4s - 3d^8(a^3F_4)5p$	$^2F - ^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		835
	2	1101.893						835
	5	1101.956	13.55039 – 104.29823	$3d^8(a^3F)4s - 3d^8(a^3F_4)5p$	$^2F - ^4G^\circ$	$\frac{7}{2} - \frac{9}{2}$		835
	1	1104.602	13.55039 – 104.08104	$3d^8(a^3F)4s - 3d^8(a^3F_4)5p$	$^2F - ^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		835
	1	1105.315						835
	30	1108.729						835
	1	1109.022						835
	2	1114.260						835
	40	1116.557	29.07093 – 118.63195	$3d^8(a^3P)4s - 3d^8(a^1D)5p$	$^2P - ^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		835
	20	1118.404						835
	25	1118.547						835
	10	1118.921	29.07093 – 118.44281	$3d^8(a^3P)4s - 3d^8(a^1D)5p$	$^2P - ^2P^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	75	1119.330	32.52354 – 121.86257	$3d^8(a^1G)4s - 3d^7(a^2H)4s4p(^3P^\circ)$	$^2G - x^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		835
	125	1121.162	32.49953 – 121.69255	$3d^8(a^1G)4s - 3d^7(a^2H)4s4p(^3P^\circ)$	$^2G - x^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		835
	2	1123.113	29.59346 – 118.63195	$3d^8(a^3P)4s - 3d^8(a^1D)5p$	$^2P - ^2P^\circ$	$\frac{1}{2} - \frac{1}{2}$		835
	4	1127.112						835
	5	1127.486	29.07093 – 117.76391	$3d^8(a^3P)4s - 3d^8(a^1D)5p$	$^2P - ^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	75	1133.730	13.55039 – 101.75480	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2F - z^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		835
	150	1134.533	8.39390 – 96.53587	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		835
	1	1135.412						835
	1	1136.360						835
	100	1137.091	9.33004 – 97.27383	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		835
	10	1138.547						835
	3	1139.009	51.04546 – 138.84100	$3d^74s^2 - 3d^8(a^3P)6p$	$^4F - ^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		835
	75	1139.638	14.99557 – 102.74274	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2F - z^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	75	1140.459	10.11566 – 97.79966	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	2	1141.579						835
	1	1141.891						835
	50	1143.397	10.66389 – 98.12263	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$		835
	5	1144.874						835
	1	1147.633	10.66389 – 97.79966	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	1	1149.239						835
	2	1153.439						835
	150	1154.416	8.39390 – 95.01771	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4G^\circ$	$\frac{9}{2} - \frac{9}{2}$		835
	2	1156.319						835
	1	1157.132	10.11566 – 96.53587	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	100	1158.830	13.55039 – 99.84413	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2F - z^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		835
	150	1159.510	9.33004 – 95.57339	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4G^\circ$	$\frac{7}{2} - \frac{7}{2}$		835
	2	1160.776	51.55785 – 137.70726	$3d^8(a^3F)4p - 3d^8(a^3F_4)8d$	$^4D^\circ - ^4D$	$\frac{7}{2} - \frac{7}{2}$		835
	1	1160.823						835
	15	1161.297						835
	1	1161.927	32.49953 – 118.56339	$3d^8(a^1G)4s - 3d^8(a^1D)5p$	$^2G - ^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		835
	1	1162.361						835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	8	1162.492						835
	1	1162.601						835
	150	1162.748	8.39390 – 94.39674	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		835
	50	1163.645	10.11566 – 96.05248	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4G^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	8	1163.729	23.10828 – 109.03884	$3d^8(a^1D)4s - 3d^7(a^4P)4s4p(^3P^\circ)$	$^2D - z^6P^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	4	1163.880						835
	150	1164.279	8.39390 – 94.28394	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		835
	100	1164.574	13.55039 – 99.41861	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2F - z^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		835
	5	1165.646						835
	12	1165.798	10.11566 – 95.89376	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4F^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	25	1167.030	9.33004 – 95.01771	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4G^\circ$	$\frac{7}{2} - \frac{9}{2}$		835
	10	1167.803	51.55785 – 137.18858	$3d^8(a^3F)4p - 3d^8(a^3F_4)9s$	$^4D^\circ - {^4F}$	$\frac{7}{2} - \frac{9}{2}$		835
	75	1168.040	14.99557 – 100.60901	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2F - z^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	3	1169.919						835
	20	1170.169	10.11566 – 95.57339	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4G^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	15	1171.117	10.66389 – 96.05248	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4G^\circ$	$\frac{3}{2} - \frac{5}{2}$		835
	100	1171.291	9.33004 – 94.70593	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		835
	1	1173.121	23.79618 – 109.03884	$3d^8(a^1D)4s - 3d^7(a^4P)4s4p(^3P^\circ)$	$^2D - z^6P^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	50	1173.298	10.66389 – 95.89376	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4F^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	75	1173.477	10.11566 – 95.33253	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	1	1177.006	51.55785 – 136.51928	$3d^8(a^3F)4p - 3d^8(a^3P)5d$	$^4D^\circ - {^4F}$	$\frac{7}{2} - \frac{9}{2}$		835
	50	1177.109	9.33004 – 94.28394	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		835
	8	1178.224						835
	30	1178.571	14.99557 – 99.84413	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2F - z^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	150	1180.271	13.55039 – 98.27670	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2F - z^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		835
	30	1181.075	10.66389 – 95.33253	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4F^\circ$	$\frac{3}{2} - \frac{5}{2}$		835
	15	1181.620	23.10828 – 107.73781	$3d^8(a^1D)4s - 3d^7(a^4P)4s4p(^3P^\circ)$	$^2D - z^4S^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	75	1182.169	10.11566 – 94.70593	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	20	1184.512	14.99557 – 99.41861	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2F - z^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	3	1184.980	53.36517 – 137.75478	$3d^8(a^3F)4p - 3d^8(a^3F_4)8d$	$^4G^\circ - {^4G}$	$\frac{9}{2} - \frac{11}{2}$		835
	2	1185.146	53.36517 – 137.74295	$3d^8(a^3F)4p - 3d^8(a^3F_4)8d$	$^4G^\circ - {^4H}$	$\frac{9}{2} - \frac{11}{2}$		835
	1	1186.347	51.04546 – 135.33801	$3d^74s^2 - 3d^8(a^3F_4)8p$	$^4F - {^4G^\circ}$	$\frac{9}{2} - \frac{11}{2}$		835
	8	1186.933	24.78820 – 109.03884	$3d^8(a^3P)4s - 3d^7(a^4P)4s4p(^3P^\circ)$	$^4P - z^6P^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	1	1186.993	53.49649 – 137.74295	$3d^8(a^3F)4p - 3d^8(a^3F_4)8d$	$^4G^\circ - {^4H}$	$\frac{11}{2} - \frac{11}{2}$		835
	20	1187.102	53.49649 – 137.73522	$3d^8(a^3F)4p - 3d^8(a^3F_4)8d$	$^4G^\circ - {^4H}$	$\frac{11}{2} - \frac{13}{2}$		835
	15	1187.608	24.83593 – 109.03884	$3d^8(a^3P)4s - 3d^7(a^4P)4s4p(^3P^\circ)$	$^4P - z^6P^\circ$	$\frac{1}{2} - \frac{3}{2}$		835
	1	1190.442	25.03638 – 109.03884	$3d^8(a^3P)4s - 3d^7(a^4P)4s4p(^3P^\circ)$	$^4P - z^6P^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	5	1192.306	53.36517 – 137.23628	$3d^8(a^3F)4p - 3d^8(a^3F_4)9s$	$^4G^\circ - {^4F}$	$\frac{9}{2} - \frac{7}{2}$		835
	0	1192.596	52.73845 – 136.58935	$3d^8(a^3F)4p - 3d^8(a^3P)5d$	$^4D^\circ - {^4F}$	$\frac{5}{2} - \frac{7}{2}$		835
	3	1192.983	53.36517 – 137.18858	$3d^8(a^3F)4p - 3d^8(a^3F_4)9s$	$^4G^\circ - {^4F}$	$\frac{9}{2} - \frac{9}{2}$		835
	2	1193.028						835
	5	1193.267	55.29965 – 139.10305	$3d^8(a^3F)4p - 3d^8(a^3F_3)8d$	$^2G^\circ - {^2H}$	$\frac{9}{2} - \frac{11}{2}$		835
	15	1194.857	53.49649 – 137.18858	$3d^8(a^3F)4p - 3d^8(a^3F_4)9s$	$^4G^\circ - {^4F}$	$\frac{11}{2} - \frac{9}{2}$		835
	1	1200.077						835
	1	1200.307	52.73845 – 136.05053	$3d^8(a^3F)4p - 3d^8(a^3F_2)8s$	$^4D^\circ - {^2F}$	$\frac{5}{2} - \frac{5}{2}$		835
	3	1201.002	55.29965 – 138.56371	$3d^8(a^3F)4p - 3d^8(a^3F_3)9s$	$^2G^\circ - {^2F}$	$\frac{9}{2} - \frac{7}{2}$		835
	8	1201.119	52.20595 – 135.46155	$3d^74s^2 - 3d^8(a^3P_2)4f$	$^4F - 2[3]^\circ$	$\frac{7}{2} - \frac{5}{2}$		835
	5	1201.838	52.73845 – 135.94440	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^4D^\circ - {^2F}$	$\frac{5}{2} - \frac{7}{2}$		835
	3	1201.957	54.55705 – 137.75478	$3d^8(a^3F)4p - 3d^8(a^3F_4)8d$	$^4F^\circ - {^4G}$	$\frac{9}{2} - \frac{11}{2}$		835
	8	1202.452	52.73845 – 135.90196	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^4D^\circ - {^4F}$	$\frac{5}{2} - \frac{5}{2}$		835
	10	1202.511						835
	3	1202.911	53.63462 – 136.76649	$3d^8(a^3F)4p - 3d^8(a^3P)5d$	$^4D^\circ - {^4F}$	$\frac{3}{2} - \frac{5}{2}$		835
	30	1204.102	51.55785 – 134.60737	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4D^\circ - {^4F}$	$\frac{7}{2} - \frac{9}{2}$		835
	15	1205.088	51.55785 – 134.53937	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4D^\circ - {^4P}$	$\frac{7}{2} - \frac{5}{2}$		835

NI II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	1205.201	54.26263 – 137.23628	$3d^8(a^3F)4p - 3d^8(a^3F_4)9s$	$^4G^\circ - ^4F$	$\frac{7}{2} - \frac{7}{2}$		835
	20	1205.266	51.55785 – 134.52724	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4D^\circ - ^4D$	$\frac{7}{2} - \frac{7}{2}$		835
	8	1205.314						835
	10	1205.552	24.78820 – 107.73781	$3d^8(a^3P)4s - 3d^7(a^4P)4s4p(^3P^\circ)$	$^4P - z^4S^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	7	1206.246	24.83593 – 107.73781	$3d^8(a^3P)4s - 3d^7(a^4P)4s4p(^3P^\circ)$	$^4P - z^4S^\circ$	$\frac{1}{2} - \frac{3}{2}$		835
	0	1207.567	53.03793 – 135.84941	$3d^74s^2 - 3d^8(a^3P_1)4f$	$^4F - 1[3]^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	4	1207.620	51.04546 – 133.85304	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4F - v^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		835
	3	1207.654	51.04546 – 133.85083	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4F - s^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		835
	1	1208.433	23.10828 – 105.86119	$3d^8(a^1D)4s - 3d^8(a^3F_3)5p$	$^2D - ^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	7	1209.170	25.03638 – 107.73781	$3d^8(a^3P)4s - 3d^7(a^4P)4s4p(^3P^\circ)$	$^4P - z^4S^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	1	1209.492	54.55705 – 137.23628	$3d^8(a^3F)4p - 3d^8(a^3F_4)9s$	$^4F^\circ - ^4F$	$\frac{9}{2} - \frac{7}{2}$		835
	10	1210.192	54.55705 – 137.18858	$3d^8(a^3F)4p - 3d^8(a^3F_4)9s$	$^4F^\circ - ^4F$	$\frac{9}{2} - \frac{9}{2}$		835
	3	1210.729	53.36517 – 135.96008	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^4G^\circ - ^4H$	$\frac{9}{2} - \frac{9}{2}$		835
	1	1210.790	53.36517 – 135.95601	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^4G^\circ - ^2H$	$\frac{9}{2} - \frac{11}{2}$		835
	1	1211.403	54.17626 – 136.72533	$3d^8(a^3F)4p - 3d^8(a^3P)5d$	$^4D^\circ - ^4P$	$\frac{1}{2} - \frac{1}{2}$		835
	0	1212.959	55.29965 – 137.74295	$3d^8(a^3F)4p - 3d^8(a^3F_4)8d$	$^2G^\circ - ^4H$	$\frac{9}{2} - \frac{11}{2}$		835
	7	1213.149						835
	7	1213.361	53.63462 – 136.05053	$3d^8(a^3F)4p - 3d^8(a^3F_2)8s$	$^4D^\circ - ^2F$	$\frac{3}{2} - \frac{5}{2}$		835
	3	1214.104	55.41783 – 137.78250	$3d^8(a^3F)4p - 3d^8(a^3F_4)8d$	$^4F^\circ - ^4G$	$\frac{7}{2} - \frac{9}{2}$		835
	40	1214.153	52.73845 – 135.10045	$3d^8(a^3F)4p - 3d^8(a^3F_3)8s$	$^4D^\circ - ^2F$	$\frac{5}{2} - \frac{7}{2}$		835
	1	1214.350	53.63462 – 135.98322	$3d^8(a^3F)4p - 3d^8(a^3F_2)8s$	$^4D^\circ - ^4F$	$\frac{3}{2} - \frac{3}{2}$		835
	100	1217.180	51.55785 – 133.71513	$3d^8(a^3F)4p - 3d^8(a^3F_4)8s$	$^4D^\circ - ^4F$	$\frac{7}{2} - \frac{9}{2}$		835
	1	1217.692						835
	3	1220.530	52.73845 – 134.67007	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4D^\circ - ^4P$	$\frac{5}{2} - \frac{3}{2}$		835
	1	1220.950	52.73845 – 134.64209	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4D^\circ - ^4F$	$\frac{5}{2} - \frac{7}{2}$		835
	1	1221.213	51.55785 – 133.44389	$3d^8(a^3F)4p - 3d^8(a^3P)6s$	$^4D^\circ - ^4P$	$\frac{7}{2} - \frac{5}{2}$		835
	1	1221.289	55.01871 – 136.89934	$3d^8(a^3F)4p - 3d^8(a^3F_2)7d$	$^4G^\circ - ^4G$	$\frac{5}{2} - \frac{5}{2}$		835
	40	1221.992	55.01871 – 136.85244	$3d^8(a^3F)4p - 3d^8(a^3F_2)7d$	$^4G^\circ - ^4F$	$\frac{5}{2} - \frac{3}{2}$		835
	1	1222.220	55.41783 – 137.23628	$3d^8(a^3F)4p - 3d^8(a^3F_4)9s$	$^4F^\circ - ^4F$	$\frac{7}{2} - \frac{7}{2}$		835
	20	1222.395	54.17626 – 135.98322	$3d^8(a^3F)4p - 3d^8(a^3F_2)8s$	$^4D^\circ - ^4F$	$\frac{1}{2} - \frac{3}{2}$		835
	1	1222.678	54.26263 – 136.05053	$3d^8(a^3F)4p - 3d^8(a^3F_2)8s$	$^4G^\circ - ^2F$	$\frac{7}{2} - \frac{5}{2}$		835
	1	1222.989	52.20595 – 133.97333	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4F - s^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		835
	2	1223.466	53.36517 – 135.10045	$3d^8(a^3F)4p - 3d^8(a^3F_3)8s$	$^4G^\circ - ^2F$	$\frac{9}{2} - \frac{7}{2}$		835
	5	1223.643	54.26263 – 135.98606	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^4G^\circ - ^4G$	$\frac{7}{2} - \frac{7}{2}$		835
	1	1223.775	55.01871 – 136.73274	$3d^8(a^3F)4p - 3d^8(a^3P)5d$	$^4G^\circ - ^4F$	$\frac{5}{2} - \frac{3}{2}$		835
	75	1224.033	54.26263 – 135.96008	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^4G^\circ - ^4H$	$\frac{7}{2} - \frac{9}{2}$		835
	1	1224.268	54.26263 – 135.94440	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^4G^\circ - ^2F$	$\frac{7}{2} - \frac{7}{2}$		835
	2	1224.839	23.79618 – 105.43985	$3d^8(a^1D)4s - 3d^8(a^3F_3)5p$	$^2D - ^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	25	1226.628	8.39390 – 89.91847	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^6G^\circ$	$\frac{9}{2} - \frac{9}{2}$		835
	15	1227.267	53.63462 – 135.11672	$3d^8(a^3F)4p - 3d^8(a^3F_3)8s$	$^4D^\circ - ^4F$	$\frac{3}{2} - \frac{5}{2}$		835
	5	1227.491	13.55039 – 95.01771	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2F - z^4G^\circ$	$\frac{7}{2} - \frac{9}{2}$		835
	0	1228.581	23.10828 – 104.50322	$3d^8(a^1D)4s - 3d^8(a^3F_4)5p$	$^2D - ^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	10	1229.684	52.20595 – 133.52802	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4F - v^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		835
	8	1230.116	53.36517 – 134.65860	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4G^\circ - ^4G$	$\frac{9}{2} - \frac{9}{2}$		835
	1	1230.367	53.36517 – 134.64209	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4G^\circ - ^4F$	$\frac{9}{2} - \frac{7}{2}$		835
	40	1230.782	53.36517 – 134.61455	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4G^\circ - ^4G$	$\frac{9}{2} - \frac{11}{2}$		835
	50	1230.869	53.36517 – 134.60737	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4G^\circ - ^4F$	$\frac{9}{2} - \frac{9}{2}$		835
	25	1230.889	53.36517 – 134.60737	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4G^\circ - ^4F$	$\frac{9}{2} - \frac{9}{2}$		835
	100	1231.041	53.36517 – 134.59743	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4G^\circ - ^4H$	$\frac{9}{2} - \frac{11}{2}$		835
	1	1232.107	53.49649 – 134.65860	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4G^\circ - ^4G$	$\frac{11}{2} - \frac{9}{2}$		835
	2	1232.773	53.49649 – 134.61455	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4G^\circ - ^4G$	$\frac{11}{2} - \frac{11}{2}$		835
	3	1232.886	53.49649 – 134.60737	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4G^\circ - ^4F$	$\frac{11}{2} - \frac{9}{2}$		835
	15	1233.036	53.49649 – 134.59743	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4G^\circ - ^4H$	$\frac{11}{2} - \frac{11}{2}$		835
	150	1233.250	53.49649 – 134.58307	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4G^\circ - ^4H$	$\frac{11}{2} - \frac{13}{2}$		835

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	10	1233.484	52.73845 – 133.80976	$3d^8(a^3F)4p - 3d^8(a^3F_4)8s$	$^4D^\circ - {}^4F$	$\frac{5}{2} - \frac{7}{2}$		835
	100	1233.557	8.39390 – 89.46035	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^6G^\circ$	$\frac{9}{2} - \frac{11}{2}$		835
	0	1234.092	55.01871 – 136.05053	$3d^8(a^3F)4p - 3d^8(a^3F_2)8s$	$^4G^\circ - {}^2F$	$\frac{5}{2} - \frac{5}{2}$		835
	4	1234.375	55.01871 – 136.03143	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^4G^\circ - {}^2D$	$\frac{5}{2} - \frac{5}{2}$		835
	1	1234.659						835
	6	1235.069	55.01871 – 135.98606	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^4G^\circ - {}^4G$	$\frac{5}{2} - \frac{7}{2}$		835
	20	1235.112	55.01871 – 135.98322	$3d^8(a^3F)4p - 3d^8(a^3F_2)8s$	$^4G^\circ - {}^4F$	$\frac{5}{2} - \frac{3}{2}$		835
	10	1235.405	9.33004 – 90.27530	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^6G^\circ$	$\frac{7}{2} - \frac{7}{2}$		835
	0	1236.474	52.73845 – 133.61399	$3d^8(a^3F)4p - 3d^8(a^3P)6s$	$^4D^\circ - {}^4P$	$\frac{5}{2} - \frac{3}{2}$		835
	25	1236.799	54.26263 – 135.11672	$3d^8(a^3F)4p - 3d^8(a^3F_3)8s$	$^4G^\circ - {}^4F$	$\frac{7}{2} - \frac{5}{2}$		835
	10	1237.049	54.26263 – 135.10045	$3d^8(a^3F)4p - 3d^8(a^3F_3)8s$	$^4G^\circ - {}^2F$	$\frac{7}{2} - \frac{7}{2}$		835
	1	1237.247	25.03638 – 105.86119	$3d^8(a^3P)4s - 3d^8(a^3F_3)5p$	$^4P - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	1	1237.260	56.07526 – 136.89934	$3d^8(a^3F)4p - 3d^8(a^3F_2)7d$	$^4F^\circ - {}^4G$	$\frac{5}{2} - \frac{5}{2}$		835
	4	1237.961	56.07526 – 136.85244	$3d^8(a^3F)4p - 3d^8(a^3F_2)7d$	$^4F^\circ - {}^4F$	$\frac{5}{2} - \frac{3}{2}$		835
	8	1237.976	56.07526 – 136.85244	$3d^8(a^3F)4p - 3d^8(a^3F_2)7d$	$^4F^\circ - {}^4F$	$\frac{5}{2} - \frac{3}{2}$		835
	1	1238.919	54.26263 – 134.97847	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4G^\circ - {}^4D$	$\frac{7}{2} - \frac{5}{2}$		835
	25	1239.061	8.39390 – 89.10049	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^6D^\circ$	$\frac{9}{2} - \frac{7}{2}$		835
	12	1239.506	55.29965 – 135.97731	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^2G^\circ - {}^2G$	$\frac{9}{2} - \frac{9}{2}$		835
	60	1239.832	55.29965 – 135.95601	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^2G^\circ - {}^2H$	$\frac{9}{2} - \frac{11}{2}$		835
	1	1240.012	55.29965 – 135.94440	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^2G^\circ - {}^2F$	$\frac{9}{2} - \frac{7}{2}$		835
	2	1240.029						835
	50	1240.877	9.33004 – 89.91847	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^6G^\circ$	$\frac{7}{2} - \frac{9}{2}$		835
	1	1241.189	55.41783 – 135.98606	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^4F^\circ - {}^4G$	$\frac{7}{2} - \frac{7}{2}$		835
	2	1241.233	53.36517 – 133.92988	$3d^8(a^3F)4p - 3d^8(a^1D)5d$	$^4G^\circ - {}^2G$	$\frac{9}{2} - \frac{7}{2}$		835
	10	1241.320	55.41783 – 135.97731	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^4F^\circ - {}^2G$	$\frac{7}{2} - \frac{9}{2}$		835
	3	1241.548	23.10828 – 103.65303	$3d^8(a^1D)4s - 3d^8(a^3F_4)5p$	$^2D - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	10	1241.588	55.41783 – 135.96008	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^4F^\circ - {}^4H$	$\frac{7}{2} - \frac{9}{2}$		835
	1	1241.827	55.41783 – 135.94440	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^4F^\circ - {}^2F$	$\frac{7}{2} - \frac{7}{2}$		835
	30	1242.099	56.37141 – 136.88056	$3d^8(a^3F)4p - 3d^8(a^3F_2)7d$	$^2G^\circ - {}^2H$	$\frac{7}{2} - \frac{9}{2}$		835
	6	1242.627	56.42449 – 136.89934	$3d^8(a^3F)4p - 3d^8(a^3F_2)7d$	$^4F^\circ - {}^4G$	$\frac{3}{2} - \frac{5}{2}$		835
	75	1243.093	53.36517 – 133.80976	$3d^8(a^3F)4p - 3d^8(a^3F_4)8s$	$^4G^\circ - {}^4F$	$\frac{9}{2} - \frac{7}{2}$		835
	6	1243.126						835
	1	1243.345	56.42449 – 136.85244	$3d^8(a^3F)4p - 3d^8(a^3F_2)7d$	$^4F^\circ - {}^4F$	$\frac{3}{2} - \frac{3}{2}$		835
	3	1243.622	10.11566 – 90.52618	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^6G^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	5	1243.848	54.26263 – 134.65860	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4G^\circ - {}^4G$	$\frac{7}{2} - \frac{9}{2}$		835
	3	1244.104	54.26263 – 134.64209	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4G^\circ - {}^4F$	$\frac{7}{2} - \frac{7}{2}$		835
	5	1244.255	53.36517 – 133.73498	$3d^8(a^3F)4p - 3d^8(a^1D)5d$	$^4G^\circ - {}^2F$	$\frac{9}{2} - \frac{7}{2}$		835
	50	1244.560	53.36517 – 133.71513	$3d^8(a^3F)4p - 3d^8(a^3F_4)8s$	$^4G^\circ - {}^4F$	$\frac{9}{2} - \frac{9}{2}$		835
	100	1244.811						835
	1	1245.977						835
	150	1246.598	53.49649 – 133.71513	$3d^8(a^3F)4p - 3d^8(a^3F_4)8s$	$^4G^\circ - {}^4F$	$\frac{11}{2} - \frac{9}{2}$		835
	20	1247.333	53.03793 – 133.20930	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4F - v^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	6	1247.509	10.11566 – 90.27530	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^6G^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	1	1247.568	57.08055 – 137.23628	$3d^8(a^3F)4p - 3d^8(a^3F_4)9s$	$^2F^\circ - {}^4F$	$\frac{7}{2} - \frac{7}{2}$		835
	9	1248.413	54.55705 – 134.65860	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4F^\circ - {}^4G$	$\frac{9}{2} - \frac{9}{2}$		835
	10	1248.467	55.01871 – 135.11672	$3d^8(a^3F)4p - 3d^8(a^3F_3)8s$	$^4G^\circ - {}^4F$	$\frac{5}{2} - \frac{5}{2}$		835
	4	1248.844	54.26263 – 134.33668	$3d^8(a^3F)4p - 3d^8(a^3F_4)6g$	$^4G^\circ - 4[5]^\circ$	$\frac{7}{2} - \frac{9}{2}$		835
	100	1249.101	54.55705 – 134.61455	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4F^\circ - {}^4G$	$\frac{9}{2} - \frac{11}{2}$		835
	8	1249.213	54.55705 – 134.60737	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4F^\circ - {}^4F$	$\frac{9}{2} - \frac{9}{2}$		835
	3	1249.369	54.55705 – 134.59743	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4F^\circ - {}^4H$	$\frac{9}{2} - \frac{11}{2}$		835
	6	1250.467	54.55705 – 134.52724	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4F^\circ - {}^4D$	$\frac{9}{2} - \frac{7}{2}$		835
	4	1250.685	56.07526 – 136.03143	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^4F^\circ - {}^2D$	$\frac{5}{2} - \frac{5}{2}$		835
	1	1250.901						835
	10	1251.394	56.07526 – 135.98606	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^4F^\circ - {}^4G$	$\frac{5}{2} - \frac{7}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	16	1251.438	56.07526 - 135.98322	$3d^8(a^3F)4p - 3d^8(a^3F_2)8s$	$^4F^\circ - ^4F$	$\frac{5}{2} - \frac{3}{2}$		835
	1	1252.879	57.42016 - 137.23628	$3d^8(a^3F)4p - 3d^8(a^3F_4)9s$	$^2D^\circ - ^4F$	$\frac{5}{2} - \frac{7}{2}$		835
	50	1253.122	55.29965 - 135.10045	$3d^8(a^3F)4p - 3d^8(a^3F_3)8s$	$^2G^\circ - ^2F$	$\frac{9}{2} - \frac{7}{2}$		835
	75	1253.477	8.39390 - 88.17188	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^6D^\circ$	$\frac{9}{2} - \frac{9}{2}$		835
	4	1253.599	9.33004 - 89.10049	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^6D^\circ$	$\frac{7}{2} - \frac{7}{2}$		835
	2	1254.290	54.17626 - 133.90300	$3d^8(a^3F)4p - 3d^8(a^1D)5d$	$^4D^\circ - ^2D$	$\frac{1}{2} - \frac{3}{2}$		835
	0	1254.346	52.20595 - 131.92877	$3d^74s^2 - 3d^8(a^3F_3)7p$	$^4F - ^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		835
	1	1254.471	24.78820 - 104.50322	$3d^8(a^3P)4s - 3d^8(a^3F_4)5p$	$^4P - ^4D^\circ$	$\frac{3}{2} - \frac{5}{2}$		835
	50	1254.721	55.41783 - 135.11672	$3d^8(a^3F)4p - 3d^8(a^3F_3)8s$	$^4F^\circ - ^4F$	$\frac{7}{2} - \frac{5}{2}$		835
	7	1254.978	55.41783 - 135.10045	$3d^8(a^3F)4p - 3d^8(a^3F_3)8s$	$^4F^\circ - ^2F$	$\frac{7}{2} - \frac{7}{2}$		835
	8	1255.034	56.37141 - 136.05053	$3d^8(a^3F)4p - 3d^8(a^3F_2)8s$	$^2G^\circ - ^2F$	$\frac{7}{2} - \frac{5}{2}$		835
	6	1255.335	56.37141 - 136.03143	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^2G^\circ - ^2D$	$\frac{7}{2} - \frac{5}{2}$		835
	5	1256.029	51.04546 - 130.66132	$3d^74s^2 - 3d^8(a^3F_4)7p$	$^4F - ^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		835
	6	1256.187	56.37141 - 135.97731	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^2G^\circ - ^2G$	$\frac{7}{2} - \frac{9}{2}$		835
	0	1256.459	53.60119 - 133.19019	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4F - v^4F^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	1	1256.708	56.37141 - 135.94440	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^2G^\circ - ^2F$	$\frac{7}{2} - \frac{7}{2}$		835
	1	1256.764						835
	6	1256.905	55.41783 - 134.97847	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4F^\circ - ^4D$	$\frac{7}{2} - \frac{5}{2}$		835
	40	1256.930	56.42449 - 135.98322	$3d^8(a^3F)4p - 3d^8(a^3F_2)8s$	$^4F^\circ - ^4F$	$\frac{3}{2} - \frac{3}{2}$		835
	8	1257.116	54.26263 - 133.80976	$3d^8(a^3F)4p - 3d^8(a^3F_4)8s$	$^4G^\circ - ^4F$	$\frac{7}{2} - \frac{7}{2}$		835
	2	1257.829						835
	0	1258.303	54.26263 - 133.73498	$3d^8(a^3F)4p - 3d^8(a^1D)5d$	$^4G^\circ - ^2F$	$\frac{7}{2} - \frac{7}{2}$		835
	1	1259.506						835
	1	1259.886	54.55705 - 133.92988	$3d^8(a^3F)4p - 3d^8(a^1D)5d$	$^4F^\circ - ^2G$	$\frac{9}{2} - \frac{7}{2}$		835
	1	1261.068	55.29965 - 134.59743	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^2G^\circ - ^4H$	$\frac{9}{2} - \frac{11}{2}$		835
	12	1261.786	54.55705 - 133.80976	$3d^8(a^3F)4p - 3d^8(a^3F_4)8s$	$^4F^\circ - ^4F$	$\frac{9}{2} - \frac{7}{2}$		835
	10	1261.975	55.41783 - 134.65860	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4F^\circ - ^4G$	$\frac{7}{2} - \frac{9}{2}$		835
	8	1262.239	55.41783 - 134.64209	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^4F^\circ - ^4F$	$\frac{7}{2} - \frac{7}{2}$		835
	2	1262.979	54.55705 - 133.73498	$3d^8(a^3F)4p - 3d^8(a^1D)5d$	$^4F^\circ - ^2F$	$\frac{9}{2} - \frac{7}{2}$		835
	100	1263.294	54.55705 - 133.71513	$3d^8(a^3F)4p - 3d^8(a^3F_4)8s$	$^4F^\circ - ^4F$	$\frac{9}{2} - \frac{9}{2}$		835
	14	1265.157	56.07526 - 135.11672	$3d^8(a^3F)4p - 3d^8(a^3F_3)8s$	$^4F^\circ - ^4F$	$\frac{5}{2} - \frac{5}{2}$		835
	1	1266.065	10.11566 - 89.10049	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^6D^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	8	1266.608	57.08055 - 136.03143	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^2F^\circ - ^2D$	$\frac{7}{2} - \frac{5}{2}$		835
	6	1267.478	57.08055 - 135.97731	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^2F^\circ - ^2G$	$\frac{7}{2} - \frac{9}{2}$		835
	8	1268.007	57.08055 - 135.94440	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^2F^\circ - ^2F$	$\frac{7}{2} - \frac{7}{2}$		835
	2	1268.359	9.33004 - 88.17188	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^6D^\circ$	$\frac{7}{2} - \frac{9}{2}$		835
	1	1269.059	9.33004 - 88.12856	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^6F^\circ$	$\frac{7}{2} - \frac{5}{2}$		835
	2	1269.917	56.37141 - 135.11672	$3d^8(a^3F)4p - 3d^8(a^3F_3)8s$	$^2G^\circ - ^4F$	$\frac{7}{2} - \frac{5}{2}$		835
	1	1270.061	51.04546 - 129.78207	$3d^74s^2 - 3d^7(a^4P)4s4p(^1P^\circ)$	$^4F - t^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		835
	15	1270.180	56.37141 - 135.10045	$3d^8(a^3F)4p - 3d^8(a^3F_3)8s$	$^2G^\circ - ^2F$	$\frac{7}{2} - \frac{7}{2}$		835
	1	1271.993	25.03638 - 103.65303	$3d^8(a^3P)4s - 3d^8(a^3F_4)5p$	$^4P - ^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	1	1272.080	57.42016 - 136.03143	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^2D^\circ - ^2D$	$\frac{5}{2} - \frac{5}{2}$		835
	2	1272.634						835
	2	1273.488	57.42016 - 135.94440	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^2D^\circ - ^2F$	$\frac{5}{2} - \frac{7}{2}$		835
	1	1273.717	55.29965 - 133.80976	$3d^8(a^3F)4p - 3d^8(a^3F_4)8s$	$^2G^\circ - ^4F$	$\frac{9}{2} - \frac{7}{2}$		835
	2	1274.180	57.42016 - 135.90196	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^2D^\circ - ^4F$	$\frac{5}{2} - \frac{5}{2}$		835
	100	1274.270	8.39390 - 86.87003	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4F - z^6F^\circ$	$\frac{9}{2} - \frac{9}{2}$		835
	10	1274.802	58.49321 - 136.93682	$3d^8(a^3F)4p - 3d^8(a^3F_2)7d$	$^2F^\circ - ^2G$	$\frac{5}{2} - \frac{7}{2}$		835
	10	1275.640	55.41783 - 133.80976	$3d^8(a^3F)4p - 3d^8(a^3F_4)8s$	$^4F^\circ - ^4F$	$\frac{7}{2} - \frac{7}{2}$		835
	2	1276.602						835
	1	1276.859	55.41783 - 133.73526	$3d^8(a^3F)4p - 3d^8(a^1D)5d$	$^4F^\circ - ^2F$	$\frac{7}{2} - \frac{5}{2}$		835
	1	1277.086						835
	20	1277.243	52.73845 - 131.03201	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4D^\circ - ^2D$	$\frac{5}{2} - \frac{5}{2}$		835
	1	1277.344	56.37141 - 134.65860	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^2G^\circ - ^4G$	$\frac{7}{2} - \frac{9}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	1277.617	56.37141 – 134.64209	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^2G^\circ - {}^4F$	$\frac{7}{2} - \frac{7}{2}$		835
	2	1277.725	52.20595 – 130.47090	$3d^74s^2 - 3d^8(a^3F_4)7p$	$^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		835
	18	1277.967	58.70595 – 136.95528	$3d^8(a^3F)4p - 3d^8(a^3F_2)7d$	$^2D^\circ - {}^2P$	$\frac{3}{2} - \frac{1}{2}$		835
	100	1278.637	9.33004 – 87.53809	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^5P^\circ)$	$^4F - z^6F^\circ$	$\frac{7}{2} - \frac{7}{2}$		835
	1	1279.400	53.63462 – 131.79626	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^4D^\circ - {}^2F$	$\frac{3}{2} - \frac{5}{2}$		835
	1	1281.056	58.70595 – 136.76649	$3d^8(a^3F)4p - 3d^8(a^3P)5d$	$^2D^\circ - {}^4F$	$\frac{3}{2} - \frac{5}{2}$		835
	5	1281.609	52.73845 – 130.76526	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4D^\circ - {}^2F$	$\frac{5}{2} - \frac{7}{2}$		835
	4	1281.704	53.63462 – 131.65583	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^4D^\circ - {}^2P$	$\frac{3}{2} - \frac{1}{2}$		835
	12	1281.723	52.20595 – 130.22587	$3d^74s^2 - 3d^8(a^3F_3)5f$	$^4F - 3[4]^\circ$	$\frac{7}{2} - \frac{7}{2}$		835
	50	1281.834	10.11566 – 88.12856	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^5P^\circ)$	$^4F - z^6F^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	2	1282.179	52.73845 – 130.73053	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4D^\circ - {}^4F$	$\frac{5}{2} - \frac{5}{2}$		835
	1	1282.732	23.79618 – 101.75480	$3d^8(a^1D)4s - 3d^7(a^4F)4s4p(^5P^\circ)$	$^2D - z^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		835
	10	1282.825	52.73845 – 130.69135	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4D^\circ - {}^2P$	$\frac{5}{2} - \frac{3}{2}$		835
	12	1283.399	10.66389 – 88.58201	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^5P^\circ)$	$^4F - z^6F^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	3	1283.731	57.08055 – 134.97847	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^2F^\circ - {}^4D$	$\frac{7}{2} - \frac{5}{2}$		835
	25	1284.327	51.55785 – 129.41958	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4D^\circ - {}^4F$	$\frac{7}{2} - \frac{9}{2}$		835
	50	1286.338	51.55785 – 129.29791	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4D^\circ - {}^4D$	$\frac{7}{2} - \frac{7}{2}$		835
	3	1286.396	51.55785 – 129.29451	$3d^8(a^3F)4p - 3d^8(a^3F_3)7s$	$^4D^\circ - {}^4F$	$\frac{7}{2} - \frac{5}{2}$		835
	50	1286.561	51.55785 – 129.28450	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4D^\circ - {}^4P$	$\frac{7}{2} - \frac{5}{2}$		835
	15	1287.329	57.42016 – 135.10045	$3d^8(a^3F)4p - 3d^8(a^3F_3)8s$	$^2D^\circ - {}^2F$	$\frac{5}{2} - \frac{7}{2}$		835
	8	1287.432						835
	9	1289.024	57.08055 – 134.65860	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^2F^\circ - {}^4G$	$\frac{7}{2} - \frac{9}{2}$		835
	3	1289.298	57.08055 – 134.64209	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^2F^\circ - {}^4F$	$\frac{7}{2} - \frac{7}{2}$		835
	7	1289.354	56.37141 – 133.92988	$3d^8(a^3F)4p - 3d^8(a^1D)5d$	$^2G^\circ - {}^2G$	$\frac{7}{2} - \frac{7}{2}$		835
	11	1289.369	58.49321 – 136.05053	$3d^8(a^3F)4p - 3d^8(a^3F_2)8s$	$^2F^\circ - {}^2F$	$\frac{5}{2} - \frac{5}{2}$		835
	2	1289.513	29.59346 – 107.14221	$3d^8(a^3P)4s - 3d^8(a^3F_2)5p$	$^2P - {}^2D^\circ$	$\frac{1}{2} - \frac{3}{2}$		835
	6	1289.656	9.33004 – 86.87003	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^5P^\circ)$	$^4F - z^6F^\circ$	$\frac{7}{2} - \frac{9}{2}$		835
	1	1289.682	56.07526 – 133.61399	$3d^8(a^3F)4p - 3d^8(a^3P)6s$	$^4F^\circ - {}^4P$	$\frac{5}{2} - \frac{3}{2}$		835
	1	1290.442	58.49321 – 135.98606	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^2F^\circ - {}^4G$	$\frac{5}{2} - \frac{7}{2}$		835
	4	1290.908	10.66389 – 88.12856	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^5P^\circ)$	$^4F - z^6F^\circ$	$\frac{3}{2} - \frac{5}{2}$		835
	10	1291.251	54.17626 – 131.62045	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^4D^\circ - {}^4F$	$\frac{1}{2} - \frac{3}{2}$		835
	10	1291.614	10.11566 – 87.53809	$3d^8(a^3F)4s - 3d^7(a^4F)4s4p(^5P^\circ)$	$^4F - z^6F^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	2	1292.033	53.63462 – 131.03201	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4D^\circ - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		835
	2	1292.224	53.36517 – 130.75103	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4G^\circ - {}^2H$	$\frac{9}{2} - \frac{11}{2}$		835
	6	1292.331						835
	5	1292.669						835
	5	1293.232	58.70595 – 136.03143	$3d^8(a^3F)4p - 3d^8(a^3F_3)7d$	$^2D^\circ - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		835
	6	1293.533	53.63462 – 130.94230	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4D^\circ - {}^4D$	$\frac{3}{2} - \frac{3}{2}$		835
	10	1294.500	57.42016 – 134.67007	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^2D^\circ - {}^4P$	$\frac{5}{2} - \frac{3}{2}$		835
	2	1294.968	57.42016 – 134.64209	$3d^8(a^3F)4p - 3d^8(a^3F_4)7d$	$^2D^\circ - {}^4F$	$\frac{5}{2} - \frac{7}{2}$		835
	1	1296.126						835
	13	1296.950	52.73845 – 129.84233	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4D^\circ - {}^4D$	$\frac{5}{2} - \frac{5}{2}$		835
	2	1297.087	53.63462 – 130.73053	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4D^\circ - {}^4F$	$\frac{3}{2} - \frac{5}{2}$		835
	3	1297.417	53.63462 – 130.71085	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4D^\circ - {}^4P$	$\frac{3}{2} - \frac{1}{2}$		835
	1	1297.442						835
	10	1302.246	29.07093 – 105.86119	$3d^8(a^3P)4s - 3d^8(a^3F_3)5p$	$^2P - {}^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		835
	1	1302.603	54.26263 – 131.03201	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4G^\circ - {}^2D$	$\frac{7}{2} - \frac{5}{2}$		835
	4	1303.078	52.73845 – 129.47973	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4D^\circ - {}^4P$	$\frac{5}{2} - \frac{3}{2}$		835
	2	1303.170	52.73845 – 129.47427	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4D^\circ - {}^4F$	$\frac{5}{2} - \frac{7}{2}$		835
	0	1303.237	55.01871 – 131.75073	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^4G^\circ - {}^2G$	$\frac{5}{2} - \frac{7}{2}$		835
	5	1303.283	57.08055 – 133.80976	$3d^8(a^3F)4p - 3d^8(a^3F_4)8s$	$^2F^\circ - {}^4F$	$\frac{7}{2} - \frac{7}{2}$		835
	1	1304.555	57.08055 – 133.73498	$3d^8(a^3F)4p - 3d^8(a^1D)5d$	$^2F^\circ - {}^2F$	$\frac{7}{2} - \frac{7}{2}$		835
	10	1304.594	55.01871 – 131.67087	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^4G^\circ - {}^4G$	$\frac{5}{2} - \frac{5}{2}$		835
	6	1305.083	58.49321 – 135.11672	$3d^8(a^3F)4p - 3d^8(a^3F_3)8s$	$^2F^\circ - {}^4F$	$\frac{5}{2} - \frac{5}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	25	1305.169	55.01871 – 131.63710	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^4G^\circ - {}^4H$	$\frac{5}{2}-\frac{7}{2}$		835
	4	1306.279	54.26263 – 130.81591	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4G^\circ - {}^4G$	$\frac{7}{2}-\frac{7}{2}$		835
	1	1306.528	54.26263 – 130.80133	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4G^\circ - {}^2G$	$\frac{7}{2}-\frac{9}{2}$		835
	6	1306.621	52.73845 – 129.27172	$3d^8(a^3F)4p - 3d^8(a^3F_3)7s$	$^4D^\circ - {}^2F$	$\frac{5}{2}-\frac{7}{2}$		835
	10	1307.146	54.26263 – 130.76526	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4G^\circ - {}^2F$	$\frac{7}{2}-\frac{7}{2}$		835
	50	1307.276	54.26263 – 130.75751	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4G^\circ - {}^4H$	$\frac{7}{2}-\frac{9}{2}$		835
	8	1308.714	58.70595 – 135.11672	$3d^8(a^3F)4p - 3d^8(a^3F_3)8s$	$^2D^\circ - {}^4F$	$\frac{3}{2}-\frac{5}{2}$		835
10	16	1308.869	0.0 – 76.40203	$3d^9 - 3d^8(a^1G)4p$	$g^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	0	1309.079	57.42016 – 133.80976	$3d^8(a^3F)4p - 3d^8(a^3F_4)8s$	$^2D^\circ - {}^4F$	$\frac{5}{2}-\frac{7}{2}$		835
	1	1310.358	57.42016 – 133.73498	$3d^8(a^3F)4p - 3d^8(a^1D)5d$	$^2D^\circ - {}^2F$	$\frac{5}{2}-\frac{7}{2}$		835
	15	1310.457	51.55785 – 127.86713	$3d^8(a^3F)4p - 3d^8(a^3F_4)7s$	$^4D^\circ - {}^4F$	$\frac{7}{2}-\frac{9}{2}$		835
	1	1311.152	55.41783 – 131.68656	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^4F^\circ - {}^2H$	$\frac{7}{2}-\frac{9}{2}$		835
	5	1311.365						835
	7	1313.403	53.36517 – 129.50324	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4G^\circ - {}^4G$	$\frac{9}{2}-\frac{9}{2}$		835
	2	1313.903	53.36517 – 129.47427	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4G^\circ - {}^4F$	$\frac{9}{2}-\frac{7}{2}$		835
	12	1314.771	53.36517 – 129.42403	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4G^\circ - {}^4G$	$\frac{9}{2}-\frac{11}{2}$		835
	12	1314.847	53.36517 – 129.41958	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4G^\circ - {}^4F$	$\frac{9}{2}-\frac{9}{2}$		835
	70	1315.255	53.36517 – 129.39604	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4G^\circ - {}^4H$	$\frac{9}{2}-\frac{11}{2}$		835
	3	1315.558	55.01871 – 131.03201	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4G^\circ - {}^2D$	$\frac{5}{2}-\frac{5}{2}$		835
	4	1316.502	54.17626 – 130.13519	$3d^8(a^3F)4p - 3d^8(a^3F_2)7s$	$^4D^\circ - {}^4F$	$\frac{1}{2}-\frac{3}{2}$		835
	6	1317.045	53.49649 – 129.42403	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4G^\circ - {}^4G$	$\frac{11}{2}-\frac{11}{2}$		835
	10	1317.122	53.49649 – 129.41958	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4G^\circ - {}^4F$	$\frac{11}{2}-\frac{9}{2}$		835
10	500	1317.220	0.0 – 75.91763	$3d^9 - 3d^8(a^1G)4p$	$g^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	15	1317.531	53.49649 – 129.39604	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4G^\circ - {}^4H$	$\frac{11}{2}-\frac{11}{2}$		835
	100	1318.017	53.49649 – 129.36791	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4G^\circ - {}^4H$	$\frac{11}{2}-\frac{13}{2}$		835
	8	1319.310	55.01871 – 130.81591	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4G^\circ - {}^4G$	$\frac{5}{2}-\frac{7}{2}$		835
	0	1320.799	55.01871 – 130.73053	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4G^\circ - {}^4F$	$\frac{5}{2}-\frac{5}{2}$		835
	3	1321.432	56.07526 – 131.75073	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^4F^\circ - {}^2G$	$\frac{5}{2}-\frac{7}{2}$		835
	2	1321.704	53.63462 – 129.29451	$3d^8(a^3F)4p - 3d^8(a^3F_3)7s$	$^4D^\circ - {}^4F$	$\frac{3}{2}-\frac{5}{2}$		835
	2	1322.825	56.07526 – 131.67087	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^4F^\circ - {}^4G$	$\frac{5}{2}-\frac{5}{2}$		835
	1	1323.107	54.26263 – 129.84233	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4G^\circ - {}^4D$	$\frac{7}{2}-\frac{5}{2}$		835
	25	1323.417	56.07526 – 131.63710	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^4F^\circ - {}^4H$	$\frac{5}{2}-\frac{7}{2}$		835
	25	1324.475	55.29965 – 130.80133	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^2G^\circ - {}^2G$	$\frac{9}{2}-\frac{9}{2}$		835
	1	1325.105	55.29965 – 130.76526	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^2G^\circ - {}^2F$	$\frac{9}{2}-\frac{7}{2}$		835
	1	1325.242	55.29965 – 130.75751	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^2G^\circ - {}^4H$	$\frac{9}{2}-\frac{9}{2}$		835
	100	1325.359	55.29965 – 130.75103	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^2G^\circ - {}^2H$	$\frac{9}{2}-\frac{11}{2}$		835
	4	1325.691	29.07093 – 104.50322	$3d^8(a^3P)4s - 3d^8(a^3F_4)5p$	$^2P - {}^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	7	1326.292	55.41783 – 130.81591	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4F^\circ - {}^4G$	$\frac{7}{2}-\frac{7}{2}$		835
	11	1326.548	55.41783 – 130.80133	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4F^\circ - {}^2G$	$\frac{7}{2}-\frac{9}{2}$		835
	12	1326.623	56.37141 – 131.75073	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^2G^\circ - {}^2G$	$\frac{7}{2}-\frac{7}{2}$		835
	3	1327.187	58.70595 – 134.05305	$3d^8(a^3F)4p - 3d^8(a^1D)5d$	$^2D^\circ - {}^2D$	$\frac{3}{2}-\frac{5}{2}$		835
	20	1327.319	55.41783 – 130.75751	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4F^\circ - {}^4H$	$\frac{7}{2}-\frac{9}{2}$		835
	8	1327.730	58.49321 – 133.80976	$3d^8(a^3F)4p - 3d^8(a^3F_4)8s$	$^2F^\circ - {}^4F$	$\frac{5}{2}-\frac{7}{2}$		835
	50	1327.755	56.37141 – 131.68656	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^2G^\circ - {}^2H$	$\frac{7}{2}-\frac{9}{2}$		835
	3	1328.847	52.73845 – 127.99156	$3d^8(a^3F)4p - 3d^8(a^3F_4)7s$	$^4D^\circ - {}^4F$	$\frac{5}{2}-\frac{7}{2}$		835
	25	1328.964	56.42449 – 131.67087	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^4F^\circ - {}^4G$	$\frac{3}{2}-\frac{5}{2}$		835
	13	1329.857	56.42449 – 131.62045	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^4F^\circ - {}^4F$	$\frac{3}{2}-\frac{3}{2}$		835
	9	1331.264	55.01871 – 130.13519	$3d^8(a^3F)4p - 3d^8(a^3F_2)7s$	$^4G^\circ - {}^4F$	$\frac{5}{2}-\frac{3}{2}$		835
	1	1332.706	54.26263 – 129.29791	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4G^\circ - {}^4D$	$\frac{7}{2}-\frac{7}{2}$		835
	6	1332.766	54.26263 – 129.29451	$3d^8(a^3F)4p - 3d^8(a^3F_3)7s$	$^4G^\circ - {}^4F$	$\frac{7}{2}-\frac{5}{2}$		835
	7	1332.808	58.70595 – 133.73526	$3d^8(a^3F)4p - 3d^8(a^1D)5d$	$^2D^\circ - {}^2F$	$\frac{3}{2}-\frac{5}{2}$		835
	3	1333.171	54.26263 – 129.27172	$3d^8(a^3F)4p - 3d^8(a^3F_3)7s$	$^4G^\circ - {}^2F$	$\frac{7}{2}-\frac{7}{2}$		835
	10	1334.101	56.07526 – 131.03201	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^4F^\circ - {}^2D$	$\frac{5}{2}-\frac{5}{2}$		835
	12	1334.287	54.55705 – 129.50324	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^4F^\circ - {}^4G$	$\frac{9}{2}-\frac{9}{2}$		835

NI II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	7	1334.320						835
	1	1334.656						835
	1	1334.689						835
10	400	1335.203	1.50694 – 76.40203	$3d^9 - 3d^8(a^1G)4p$	$g^2D - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		835
	18	1335.779	54.55705 – 129.41958	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	${}^4F^\circ - {}^4F$	$\frac{9}{2} - \frac{9}{2}$		835
	2	1336.201	54.55705 – 129.39604	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	${}^4F^\circ - {}^4H$	$\frac{9}{2} - \frac{11}{2}$		835
	15	1337.958	54.55705 – 129.29791	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	${}^4F^\circ - {}^4D$	$\frac{9}{2} - \frac{7}{2}$		835
	10	1338.195						835
	1	1338.402	57.08055 – 131.79626	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	${}^2F^\circ - {}^2F$	$\frac{7}{2} - \frac{5}{2}$		835
	3	1339.221	57.08055 – 131.75073	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	${}^2F^\circ - {}^2G$	$\frac{7}{2} - \frac{7}{2}$		835
	1	1339.394	56.37141 – 131.03201	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	${}^2G^\circ - {}^2D$	$\frac{7}{2} - \frac{5}{2}$		835
	3	1339.487	56.07526 – 130.73053	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	${}^4F^\circ - {}^4F$	$\frac{5}{2} - \frac{5}{2}$		835
	15	1340.007	53.36517 – 127.99156	$3d^8(a^3F)4p - 3d^8(a^3F_4)7s$	${}^4G^\circ - {}^4F$	$\frac{9}{2} - \frac{7}{2}$		835
	20	1340.374	57.08055 – 131.68656	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	${}^2F^\circ - {}^2H$	$\frac{7}{2} - \frac{9}{2}$		835
	0	1341.226	32.52354 – 107.08221	$3d^8(a^1G)4s - 3d^8(a^3F_3)5p$	${}^2G - {}^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		835
	20	1342.242	53.36517 – 127.86713	$3d^8(a^3F)4p - 3d^8(a^3F_4)7s$	${}^4G^\circ - {}^4F$	$\frac{9}{2} - \frac{9}{2}$		835
	10	1343.544	56.37141 – 130.80133	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	${}^2G^\circ - {}^2G$	$\frac{7}{2} - \frac{9}{2}$		835
	2	1343.642	55.41783 – 129.84233	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	${}^4F^\circ - {}^4D$	$\frac{7}{2} - \frac{5}{2}$		835
	2	1344.196	56.37141 – 130.76526	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	${}^2G^\circ - {}^2F$	$\frac{7}{2} - \frac{7}{2}$		835
	1	1344.334	56.37141 – 130.75751	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	${}^2G^\circ - {}^4H$	$\frac{7}{2} - \frac{9}{2}$		835
	50	1344.614	53.49649 – 127.86713	$3d^8(a^3F)4p - 3d^8(a^3F_4)7s$	${}^4G^\circ - {}^4F$	$\frac{11}{2} - \frac{9}{2}$		835
	50	1345.882	0.0 – 74.30093	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^4S^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	1	1346.334	55.01871 – 129.29451	$3d^8(a^3F)4p - 3d^8(a^3F_3)7s$	${}^4G^\circ - {}^4F$	$\frac{5}{2} - \frac{5}{2}$		835
	30	1348.333	23.10828 – 97.27383	$3d^8(a^1D)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	${}^2D - z^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	0	1349.594	55.29965 – 129.39604	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	${}^2G^\circ - {}^4H$	$\frac{9}{2} - \frac{11}{2}$		835
	12	1349.791	55.41783 – 129.50324	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	${}^4F^\circ - {}^4G$	$\frac{7}{2} - \frac{9}{2}$		835
	5	1350.256	56.07526 – 130.13519	$3d^8(a^3F)4p - 3d^8(a^3F_2)7s$	${}^4F^\circ - {}^4F$	$\frac{5}{2} - \frac{3}{2}$		835
	10	1350.321	55.41783 – 129.47427	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	${}^4F^\circ - {}^4F$	$\frac{7}{2} - \frac{7}{2}$		835
	10	1351.287	23.79618 – 97.79966	$3d^8(a^1D)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	${}^2D - z^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	35	1351.862	55.29965 – 129.27172	$3d^8(a^3F)4p - 3d^8(a^3F_3)7s$	${}^2G^\circ - {}^2F$	$\frac{9}{2} - \frac{7}{2}$		835
	10	1352.237	57.08055 – 131.03201	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	${}^2F^\circ - {}^2D$	$\frac{7}{2} - \frac{5}{2}$		835
	8	1353.606	55.41783 – 129.29451	$3d^8(a^3F)4p - 3d^8(a^3F_3)7s$	${}^4F^\circ - {}^4F$	$\frac{7}{2} - \frac{5}{2}$		835
	15	1353.821	56.37141 – 130.23626	$3d^8(a^3F)4p - 3d^8(a^3F_2)7s$	${}^2G^\circ - {}^2F$	$\frac{7}{2} - \frac{5}{2}$		835
	2	1354.023	55.41783 – 129.27172	$3d^8(a^3F)4p - 3d^8(a^3F_3)7s$	${}^4F^\circ - {}^2F$	$\frac{7}{2} - \frac{7}{2}$		835
	10	1355.849						835
	5	1356.318	54.26263 – 127.99156	$3d^8(a^3F)4p - 3d^8(a^3F_4)7s$	${}^4G^\circ - {}^4F$	$\frac{7}{2} - \frac{7}{2}$		835
	20	1356.469	57.08055 – 130.80133	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	${}^2F^\circ - {}^2G$	$\frac{7}{2} - \frac{9}{2}$		835
	9	1356.653	56.42449 – 130.13519	$3d^8(a^3F)4p - 3d^8(a^3F_2)7s$	${}^4F^\circ - {}^4F$	$\frac{3}{2} - \frac{3}{2}$		835
	11	1357.132	57.08055 – 130.76526	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	${}^2F^\circ - {}^2F$	$\frac{7}{2} - \frac{7}{2}$		835
	5	1357.371	29.07093 – 102.74274	$3d^8(a^3P)4s - 3d^7(a^4F)4s4p(^1P^\circ)$	${}^2P - z^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	25	1358.475	57.42016 – 131.03201	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	${}^2D^\circ - {}^2D$	$\frac{5}{2} - \frac{5}{2}$		835
	15	1358.992						835
	14	1360.956	23.79618 – 97.27383	$3d^8(a^1D)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	${}^2D - z^4D^\circ$	$\frac{3}{2} - \frac{5}{2}$		835
	5	1361.757	54.55705 – 127.99156	$3d^8(a^3F)4p - 3d^8(a^3F_4)7s$	${}^4F^\circ - {}^4F$	$\frac{9}{2} - \frac{7}{2}$		835
	50	1361.885	23.10828 – 96.53587	$3d^8(a^1D)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	${}^2D - z^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	20	1362.926						835
	3	1363.421	57.42016 – 130.76526	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	${}^2D^\circ - {}^2F$	$\frac{5}{2} - \frac{7}{2}$		835
	2	1363.540	32.49953 – 105.83806	$3d^8(a^1G)4s - 3d^8(a^3F_3)5p$	${}^2G - {}^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		835
	2	1363.617	24.78820 – 98.12263	$3d^8(a^3P)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	${}^4P - z^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$		835
	1	1363.861						835
	25	1364.067	54.55705 – 127.86713	$3d^8(a^3F)4p - 3d^8(a^3F_4)7s$	${}^4F^\circ - {}^4F$	$\frac{9}{2} - \frac{9}{2}$		835
	25	1364.202	58.49321 – 131.79626	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	${}^2F^\circ - {}^2F$	$\frac{5}{2} - \frac{5}{2}$		835
	1	1364.440						835
	20	1364.505	24.83593 – 98.12263	$3d^8(a^3P)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	${}^4P - z^4D^\circ$	$\frac{1}{2} - \frac{1}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	2	1364.793	57.42016 – 130.69135	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^2D^\circ - {}^2P$	$\frac{5}{2}-\frac{3}{2}$		835
	25	1365.048	58.49321 – 131.75073	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^2F^\circ - {}^2G$	$\frac{5}{2}-\frac{7}{2}$		835
	4	1365.760	56.07526 – 129.29451	$3d^8(a^3F)4p - 3d^8(a^3F_3)7s$	$^4F^\circ - {}^4F$	$\frac{5}{2}-\frac{5}{2}$		835
	5	1366.947	57.08055 – 130.23626	$3d^8(a^3F)4p - 3d^8(a^3F_2)7s$	$^2F^\circ - {}^2F$	$\frac{7}{2}-\frac{5}{2}$		835
	20	1367.067	29.59346 – 102.74274	$3d^8(a^3P)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2P - z^2D^\circ$	$\frac{1}{2}-\frac{3}{2}$		835
	1	1367.394	56.37141 – 129.50324	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^2G^\circ - {}^4G$	$\frac{7}{2}-\frac{9}{2}$		835
	10	1368.171	58.70595 – 131.79626	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^2D^\circ - {}^2F$	$\frac{3}{2}-\frac{5}{2}$		835
	1	1369.560						835
	20	1369.651	24.78820 – 97.79966	$3d^8(a^3P)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4P - z^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	500	1370.136	0.0 – 72.98565	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^2P^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	25	1370.549	24.83593 – 97.79966	$3d^8(a^3P)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4P - z^4D^\circ$	$\frac{1}{2}-\frac{3}{2}$		835
	4	1370.804	58.70595 – 131.65583	$3d^8(a^3F)4p - 3d^8(a^3F_2)6d$	$^2D^\circ - {}^2P$	$\frac{3}{2}-\frac{1}{2}$		835
	1	1371.733	56.37141 – 129.27172	$3d^8(a^3F)4p - 3d^8(a^3F_3)7s$	$^2G^\circ - {}^2F$	$\frac{7}{2}-\frac{7}{2}$		835
	4	1373.746	1.50694 – 74.30093	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^4S^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
9	150	1374.075	1.50694 – 74.28333	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^2S^\circ$	$\frac{3}{2}-\frac{1}{2}$		835
	50	1375.822	29.07093 – 101.75480	$3d^8(a^3P)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2P - z^2D^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	10	1377.001						835
	7	1377.912	55.41783 – 127.99156	$3d^8(a^3F)4p - 3d^8(a^3F_4)7s$	$^4F^\circ - {}^4F$	$\frac{7}{2}-\frac{7}{2}$		835
	1	1378.578	58.49321 – 131.03201	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^2F^\circ - {}^2D$	$\frac{5}{2}-\frac{5}{2}$		835
	50	1379.586	24.78820 – 97.27383	$3d^8(a^3P)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4P - z^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	12	1379.980	23.10828 – 95.57339	$3d^8(a^1D)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2D - z^4G^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	2	1380.440						835
	20	1380.793	57.42016 – 129.84233	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^2D^\circ - {}^4D$	$\frac{5}{2}-\frac{5}{2}$		835
	200	1381.295	1.50694 – 73.90325	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^2P^\circ$	$\frac{3}{2}-\frac{1}{2}$		835
	6	1381.423	51.04546 – 123.43460	$3d^7 4s^2 - 3d^8(a^3F_4)6p$	$^4F - {}^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	4	1381.694	0.0 – 72.37542	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	2	1382.695	58.49321 – 130.81591	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^2F^\circ - {}^4G$	$\frac{5}{2}-\frac{7}{2}$		835
	1	1383.356						835
	0	1383.966	23.79618 – 96.05248	$3d^8(a^1D)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2D - z^4G^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	12	1384.327	25.03638 – 97.27383	$3d^8(a^3P)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4P - z^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	1	1385.179						835
	6	1385.216	57.08055 – 129.27172	$3d^8(a^3F)4p - 3d^8(a^3F_3)7s$	$^2F^\circ - {}^2F$	$\frac{7}{2}-\frac{7}{2}$		835
	1	1386.063	32.49953 – 104.64652	$3d^8(a^1G)4s - 3d^8(a^3F_4)5p$	$^2G - {}^4F^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	10	1387.745	57.42016 – 129.47973	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^2D^\circ - {}^4P$	$\frac{5}{2}-\frac{3}{2}$		835
	5	1387.851	57.42016 – 129.47427	$3d^8(a^3F)4p - 3d^8(a^3F_4)6d$	$^2D^\circ - {}^4F$	$\frac{5}{2}-\frac{7}{2}$		835
	1	1388.796	58.70595 – 130.71085	$3d^8(a^3F)4p - 3d^8(a^3F_3)6d$	$^2D^\circ - {}^4P$	$\frac{3}{2}-\frac{1}{2}$		835
	2	1391.761	57.42016 – 129.27172	$3d^8(a^3F)4p - 3d^8(a^3F_3)7s$	$^2D^\circ - {}^2F$	$\frac{5}{2}-\frac{7}{2}$		835
	100	1393.330	0.0 – 71.77083	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	12	1393.867	58.49321 – 130.23626	$3d^8(a^3F)4p - 3d^8(a^3F_2)7s$	$^2F^\circ - {}^2F$	$\frac{5}{2}-\frac{5}{2}$		835
	10	1396.695	23.10828 – 94.70593	$3d^8(a^1D)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2D - z^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	14	1396.790						835
	2	1397.480	32.52354 – 104.08104	$3d^8(a^1G)4s - 3d^8(a^3F_4)5p$	$^2G - {}^4F^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	2	1397.858	29.07093 – 100.60901	$3d^8(a^3P)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2P - z^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	3	1398.009	58.70595 – 130.23626	$3d^8(a^3F)4p - 3d^8(a^3F_2)7s$	$^2D^\circ - {}^2F$	$\frac{3}{2}-\frac{5}{2}$		835
	40	1398.612	25.03638 – 96.53587	$3d^8(a^3P)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4P - z^4D^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	16	1398.758	57.42016 – 128.91281	$3d^8(a^3F)4p - 3d^8(a^3F_4)5g$	$^2D^\circ - {}^4P$	$\frac{5}{2}-\frac{5}{2}$		835
8	80	1399.026	1.50694 – 72.98565	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^2P^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	12	1399.361						835
	30	1400.644	51.04546 – 122.44122	$3d^7 4s^2 - 3d^8(a^3F_4)6p$	$^4F - {}^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	20	1402.379						835
	7	1406.970	51.04546 – 122.12057	$3d^7 4s^2 - 3d^8(a^3F_4)6p$	$^4F - {}^4G^\circ$	$\frac{9}{2}-\frac{11}{2}$		835
	10	1408.796						835
	15	1409.612						835
	4	1410.219	57.08055 – 127.99156	$3d^8(a^3F)4p - 3d^8(a^3F_4)7s$	$^2F^\circ - {}^4F$	$\frac{7}{2}-\frac{7}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	100	1411.071	1.50694 – 72.37542	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	30	1412.868	0.0 – 70.77812	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^4D^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	10	1413.679						835
	15	1414.299	0.0 – 70.70677	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	1	1414.444	66.57971 – 137.27822	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	${}^4P^\circ - {}^2P$	$\frac{3}{2}-\frac{3}{2}$		835
	20	1415.728	0.0 – 70.63546	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	1	1415.846						835
	12	1416.060	51.55785 – 122.17542	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	${}^4D^\circ - {}^2F$	$\frac{7}{2}-\frac{5}{2}$		835
	0	1416.660	58.70595 – 129.29451	$3d^8(a^3F)4p - 3d^8(a^3F_3)7s$	${}^2D^\circ - {}^4F$	$\frac{3}{2}-\frac{5}{2}$		835
	10	1417.007	57.42016 – 127.99156	$3d^8(a^3F)4p - 3d^8(a^3F_4)7s$	${}^2D^\circ - {}^4F$	$\frac{5}{2}-\frac{7}{2}$		835
	1	1417.553	24.78820 – 95.33253	$3d^8(a^3P)4s - 3d^7(a^4F)4s4p({}^3P^\circ)$	${}^4P - z^4F^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	10	1417.699	25.03638 – 95.57339	$3d^8(a^3P)4s - 3d^7(a^4F)4s4p({}^3P^\circ)$	${}^4P - z^4G^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	5	1420.674	66.57134 – 136.96075	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	${}^4P^\circ - {}^4P$	$\frac{5}{2}-\frac{5}{2}$		835
	18	1420.843	66.57971 – 136.96075	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	${}^4P^\circ - {}^4P$	$\frac{3}{2}-\frac{5}{2}$		835
	1	1421.913	66.57134 – 136.89934	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	${}^4P^\circ - {}^4P$	$\frac{5}{2}-\frac{3}{2}$		835
	8	1422.320						835
7	16	1423.212	1.50694 – 71.77083	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^2D^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	11	1423.786	52.20595 – 122.44122	$3d^74s^2 - 3d^8(a^3F_4)6p$	${}^4F - {}^4F^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	1	1423.994						835
	3	1424.890	67.03102 – 137.21193	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	${}^4P^\circ - {}^2P$	$\frac{1}{2}-\frac{1}{2}$		835
	10	1425.025						835
	6	1425.579	51.04546 – 121.19232	$3d^74s^2 - 3d^8(a^3F_2)4f$	${}^4F - 2[3]^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	3	1425.604	66.57971 – 136.72533	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	${}^4P^\circ - {}^4P$	$\frac{3}{2}-\frac{1}{2}$		835
	5	1426.783						835
	1	1427.448						835
	10	1427.782						835
	8	1431.270	67.03102 – 136.89934	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	${}^4P^\circ - {}^4P$	$\frac{1}{2}-\frac{3}{2}$		835
	25	1431.492	51.04546 – 120.90320	$3d^74s^2 - 3d^8(a^3P)5p$	${}^4F - {}^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	1	1433.745	66.57971 – 136.32755	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	${}^4P^\circ - {}^4D$	$\frac{3}{2}-\frac{3}{2}$		835
	1	1433.893						835
	1	1434.317						835
	12	1434.373	66.57134 – 136.28860	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	${}^4P^\circ - {}^4D$	$\frac{5}{2}-\frac{5}{2}$		835
	14	1434.493	66.57971 – 136.29083	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	${}^4P^\circ - {}^4D$	$\frac{3}{2}-\frac{1}{2}$		835
	12	1434.546	66.57971 – 136.28860	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	${}^4P^\circ - {}^4D$	$\frac{3}{2}-\frac{5}{2}$		835
	1	1434.688	67.03102 – 136.73274	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	${}^4P^\circ - {}^4F$	$\frac{1}{2}-\frac{3}{2}$		835
	1	1434.837	67.03102 – 136.72533	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	${}^4P^\circ - {}^4P$	$\frac{1}{2}-\frac{1}{2}$		835
	5	1435.348	25.03638 – 94.70593	$3d^8(a^3P)4s - 3d^7(a^4F)4s4p({}^3P^\circ)$	${}^4P - z^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	50	1436.165	66.57134 – 136.20146	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	${}^4P^\circ - {}^4D$	$\frac{5}{2}-\frac{7}{2}$		835
	8	1439.094						835
	1	1439.283	66.57134 – 136.05053	$3d^8(a^3P)4p - 3d^8(a^3F_2)8s$	${}^4P^\circ - {}^2F$	$\frac{5}{2}-\frac{5}{2}$		835
	8	1439.352	66.57971 – 136.05450	$3d^8(a^3P)4p - 3d^8(a^3F_3)7d$	${}^4P^\circ - {}^4D$	$\frac{3}{2}-\frac{3}{2}$		835
	13	1443.080	67.03102 – 136.32755	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	${}^4P^\circ - {}^4D$	$\frac{1}{2}-\frac{3}{2}$		835
	10	1443.838	67.03102 – 136.29083	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	${}^4P^\circ - {}^4D$	$\frac{1}{2}-\frac{1}{2}$		835
	1	1444.940						835
	13	1445.098	1.50694 – 70.70677	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	14	1445.460						835
	20	1446.589	1.50694 – 70.63546	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
8	14	1450.005	0.0 – 68.96565	$3d^9 - 3d^8(a^1D)4p$	$g^2D - {}^2P^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	15	1452.558	52.20595 – 121.05066	$3d^74s^2 - 3d^8(a^3P)5p$	${}^4F - {}^4D^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	15	1453.359	68.15431 – 136.96075	$3d^8(a^1D)4p - 3d^8(a^3P)5d$	${}^2D^\circ - {}^4P$	$\frac{3}{2}-\frac{5}{2}$		835
	2	1454.292	53.03793 – 121.80034	$3d^74s^2 - 3d^8(a^3P)5p$	${}^4F - {}^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
7	200	1454.852	0.0 – 68.73598	$3d^9 - 3d^8(a^1D)4p$	$g^2D - {}^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	16	1456.913						835
	5	1457.359	68.28162 – 136.89934	$3d^8(a^1D)4p - 3d^8(a^3P)5d$	${}^2P^\circ - {}^4P$	$\frac{1}{2}-\frac{3}{2}$		835

NI II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	4	1457.863	67.69464 – 136.28860	$3d^8(a^1D)4p - 3d^8(a^3P)5d$	$^2F^\circ - ^4D$	$\frac{5}{2} - \frac{5}{2}$		835
	4	1458.170	52.73845 – 121.31789	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4D^\circ - ^4G$	$\frac{5}{2} - \frac{7}{2}$		835
	4	1458.342	68.15431 – 136.72533	$3d^8(a^1D)4p - 3d^8(a^3P)5d$	$^2D^\circ - ^4P$	$\frac{3}{2} - \frac{1}{2}$		835
	4	1459.459						835
	1	1459.611						835
	1	1459.640	53.63462 – 122.14499	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^4D^\circ - ^4G$	$\frac{3}{2} - \frac{5}{2}$		835
	12	1459.715	67.69464 – 136.20146	$3d^8(a^1D)4p - 3d^8(a^3P)5d$	$^2F^\circ - ^4D$	$\frac{5}{2} - \frac{7}{2}$		835
	9	1459.809	52.73845 – 121.24090	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4D^\circ - ^2F$	$\frac{5}{2} - \frac{7}{2}$		835
	6	1460.078	52.73845 – 121.22780	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4D^\circ - ^4F$	$\frac{5}{2} - \frac{5}{2}$		835
	1	1460.136	51.55785 – 120.04495	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4D^\circ - ^4G$	$\frac{7}{2} - \frac{9}{2}$		835
	1	1460.312	53.63462 – 122.11294	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^4D^\circ - ^2P$	$\frac{3}{2} - \frac{1}{2}$		835
	2	1460.408	68.13121 – 136.60479	$3d^8(a^1D)4p - 3d^8(a^3F_2)6g$	$^2F^\circ - 2[4]^\circ$	$\frac{7}{2} - \frac{7}{2}$		835
	8	1461.840	66.57134 – 134.97847	$3d^8(a^3P)4p - 3d^8(a^3F_4)7d$	$^4P^\circ - ^4D$	$\frac{5}{2} - \frac{5}{2}$		835
	8	1462.482	52.73845 – 121.11559	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4D^\circ - ^2P$	$\frac{5}{2} - \frac{3}{2}$		835
	20	1462.944	51.55785 – 119.91333	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4D^\circ - ^4F$	$\frac{7}{2} - \frac{9}{2}$		835
	14	1463.113	53.03793 – 121.38580	$3d^74s^2 - 3d^8(a^3P)5p$	$^4F - ^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	8	1464.301	67.69464 – 135.98606	$3d^8(a^1D)4p - 3d^8(a^3F_3)7d$	$^2F^\circ - ^4G$	$\frac{5}{2} - \frac{7}{2}$		835
	10	1464.369	67.69464 – 135.98322	$3d^8(a^1D)4p - 3d^8(a^3F_2)8s$	$^2F^\circ - ^4F$	$\frac{5}{2} - \frac{3}{2}$		835
7	60	1467.265	0.0 – 68.15431	$3d^9 - 3d^8(a^1D)4p$	$g^2D - ^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	10	1467.637	68.15431 – 136.29083	$3d^8(a^1D)4p - 3d^8(a^3P)5d$	$^2D^\circ - ^4D$	$\frac{3}{2} - \frac{1}{2}$		835
	10	1467.694	68.15431 – 136.28860	$3d^8(a^1D)4p - 3d^8(a^3P)5d$	$^2D^\circ - ^4D$	$\frac{3}{2} - \frac{5}{2}$		835
6	100	1467.762	0.0 – 68.13121	$3d^9 - 3d^8(a^1D)4p$	$g^2D - ^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	30	1468.268	51.55785 – 119.66529	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4D^\circ - ^4P$	$\frac{7}{2} - \frac{5}{2}$		835
	25	1468.465	51.55785 – 119.65625	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4D^\circ - ^4D$	$\frac{7}{2} - \frac{7}{2}$		835
	10	1469.200	53.63462 – 121.69902	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4D^\circ - ^4D$	$\frac{3}{2} - \frac{3}{2}$		835
	3	1469.601	68.28162 – 136.32755	$3d^8(a^1D)4p - 3d^8(a^3P)5d$	$^2P^\circ - ^4D$	$\frac{1}{2} - \frac{3}{2}$		835
	1	1469.847						835
	1	1470.322	53.03793 – 121.05066	$3d^74s^2 - 3d^8(a^3P)5p$	$^4F - ^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	2	1470.386	68.28162 – 136.29083	$3d^8(a^1D)4p - 3d^8(a^3P)5d$	$^2P^\circ - ^4D$	$\frac{1}{2} - \frac{1}{2}$		835
	5	1470.666	68.73598 – 136.73274	$3d^8(a^1D)4p - 3d^8(a^3P)5d$	$^2D^\circ - ^4F$	$\frac{5}{2} - \frac{3}{2}$		835
	10	1471.466	66.57971 – 134.53937	$3d^8(a^3P)4p - 3d^8(a^3F_4)7d$	$^4P^\circ - ^4P$	$\frac{3}{2} - \frac{5}{2}$		835
	1	1471.961	54.17626 – 122.11294	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^4D^\circ - ^2P$	$\frac{1}{2} - \frac{1}{2}$		835
	10	1472.571	54.17626 – 122.08479	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^4D^\circ - ^4F$	$\frac{1}{2} - \frac{3}{2}$		835
	5	1472.835	68.15431 – 136.05053	$3d^8(a^1D)4p - 3d^8(a^3F_2)8s$	$^2D^\circ - ^2F$	$\frac{3}{2} - \frac{5}{2}$		835
	2	1472.889	51.04546 – 118.93953	$3d^74s^2 - 3d^8(a^3F_4)4f$	$^4F - 4[5]^\circ$	$\frac{9}{2} - \frac{11}{2}$		835
	1	1473.249	68.15431 – 136.03143	$3d^8(a^1D)4p - 3d^8(a^3F_3)7d$	$^2D^\circ - ^2D$	$\frac{3}{2} - \frac{5}{2}$		835
	1	1474.312	51.04546 – 118.87411	$3d^74s^2 - 3d^8(a^3F_4)4f$	$^4F - 4[3]^\circ$	$\frac{9}{2} - \frac{7}{2}$		835
	4	1474.597	53.36517 – 121.18055	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4G^\circ - ^2H$	$\frac{9}{2} - \frac{11}{2}$		835
	2	1474.901						835
	1	1474.910	68.96565 – 136.76649	$3d^8(a^1D)4p - 3d^8(a^3P)5d$	$^2P^\circ - ^4F$	$\frac{3}{2} - \frac{5}{2}$		835
	3	1475.270	53.60119 – 121.38580	$3d^74s^2 - 3d^8(a^3P)5p$	$^4F - ^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	1	1475.645	68.96565 – 136.73274	$3d^8(a^1D)4p - 3d^8(a^3P)5d$	$^2P^\circ - ^4F$	$\frac{3}{2} - \frac{3}{2}$		835
	3	1475.734	70.35894 – 138.12188	$3d^74s^2 - 3d^8(a^3F_4)9p$	$^2G - ^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		835
	2	1475.801	68.96565 – 136.72533	$3d^8(a^1D)4p - 3d^8(a^3P)5d$	$^2P^\circ - ^4P$	$\frac{3}{2} - \frac{1}{2}$		835
	25	1476.043	54.17626 – 121.92516	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^4D^\circ - ^4D$	$\frac{1}{2} - \frac{1}{2}$		835
	1	1477.063	68.28162 – 135.98322	$3d^8(a^1D)4p - 3d^8(a^3F_2)8s$	$^2P^\circ - ^4F$	$\frac{1}{2} - \frac{3}{2}$		835
6	4	1477.227	0.0 – 67.69464	$3d^9 - 3d^8(a^1D)4p$	$g^2D - ^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	1	1477.264	68.15657 – 135.84941	$3d^74s^2 - 3d^8(a^3P_1)4f$	$^4P - 1[3]^\circ$	$\frac{3}{2} - \frac{5}{2}$		835
	10	1479.443	53.63462 – 121.22780	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4D^\circ - ^4F$	$\frac{3}{2} - \frac{5}{2}$		835
	4	1480.274						835
	30	1480.331	68.73598 – 136.28860	$3d^8(a^1D)4p - 3d^8(a^3P)5d$	$^2D^\circ - ^4D$	$\frac{5}{2} - \frac{5}{2}$		835
	75	1481.091	51.04546 – 118.56339	$3d^74s^2 - 3d^8(a^1D)5p$	$^4F - ^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		835
	9	1481.210						835
	15	1481.560	66.57134 – 134.06776	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^4P^\circ - ^2P$	$\frac{5}{2} - \frac{3}{2}$		835

NI II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	15	1481.744	66.57971 – 134.06776	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^4P^\circ - ^2P$	$\frac{3}{2} - \frac{3}{2}$		835
	12	1481.883	66.57134 – 134.05305	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^4P^\circ - ^2D$	$\frac{5}{2} - \frac{5}{2}$		835
	4	1481.898	53.63462 – 121.11559	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4D^\circ - ^2P$	$\frac{3}{2} - \frac{3}{2}$		835
	10	1481.982	53.63462 – 121.11190	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4D^\circ - ^4P$	$\frac{3}{2} - \frac{1}{2}$		835
	100	1482.240	68.73598 – 136.20146	$3d^8(a^1D)4p - 3d^8(a^3P)5d$	$^2D^\circ - ^4D$	$\frac{5}{2} - \frac{7}{2}$		835
	8	1482.393	1.50694 – 68.96565	$3d^9 - 3d^8(a^1D)4p$	$g^2D - ^2P^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	40	1483.277	23.10828 – 90.52618	$3d^8(a^1D)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2D - z^6G^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	15	1483.554	52.73845 – 120.14417	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4D^\circ - ^4D$	$\frac{5}{2} - \frac{5}{2}$		835
	1	1483.760						835
	25	1484.227	66.57971 – 133.95485	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^4P^\circ - ^2P$	$\frac{3}{2} - \frac{1}{2}$		835
	1	1484.592	66.57134 – 133.92988	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^4P^\circ - ^2G$	$\frac{5}{2} - \frac{7}{2}$		835
	10	1485.185	66.57134 – 133.90300	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^4P^\circ - ^2D$	$\frac{5}{2} - \frac{3}{2}$		835
	60	1485.375	66.57971 – 133.90300	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^4P^\circ - ^2D$	$\frac{3}{2} - \frac{3}{2}$		835
	2	1485.987	68.73598 – 136.03143	$3d^8(a^1D)4p - 3d^8(a^3F_3)7d$	$^2D^\circ - ^2D$	$\frac{5}{2} - \frac{5}{2}$		835
	5	1486.372	66.57971 – 133.85773	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4P^\circ - ^4P$	$\frac{3}{2} - \frac{1}{2}$		835
	7	1486.668	52.73845 – 120.00286	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4D^\circ - ^4F$	$\frac{5}{2} - \frac{7}{2}$		835
	50	1487.242	66.57134 – 133.80976	$3d^8(a^3P)4p - 3d^8(a^3F_4)8s$	$^4P^\circ - ^4F$	$\frac{5}{2} - \frac{7}{2}$		835
	5	1487.438	1.50694 – 68.73598	$3d^9 - 3d^8(a^1D)4p$	$g^2D - ^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		835
7	6	1487.455	1.50694 – 68.73598	$3d^9 - 3d^8(a^1D)4p$	$g^2D - ^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		835
	5	1487.778						835
	2	1487.970						835
	1	1488.109						835
	16	1488.730	52.73845 – 119.90972	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4D^\circ - ^4P$	$\frac{5}{2} - \frac{3}{2}$		835
	5	1488.845	68.73598 – 135.90196	$3d^8(a^1D)4p - 3d^8(a^3F_3)7d$	$^2D^\circ - ^4F$	$\frac{5}{2} - \frac{5}{2}$		835
	100	1488.896	66.57134 – 133.73498	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^4P^\circ - ^2F$	$\frac{5}{2} - \frac{7}{2}$		835
	35	1489.079	66.57971 – 133.73526	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^4P^\circ - ^2F$	$\frac{3}{2} - \frac{5}{2}$		835
	5	1489.729	55.01871 – 122.14499	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^4G^\circ - ^4G$	$\frac{5}{2} - \frac{5}{2}$		835
	7	1490.262	68.15657 – 135.25892	$3d^74s^2 - 3d^7(a^2P)4s4p(^1P^\circ)$	$^4P - v^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		835
	5	1491.176	55.01871 – 122.08025	$3d^8(a^3F)4p - 3d^8(a^1G)4d$	$^4G^\circ - ^2F$	$\frac{5}{2} - \frac{5}{2}$		835
	4	1491.308	54.26263 – 121.31789	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4G^\circ - ^4G$	$\frac{7}{2} - \frac{7}{2}$		835
	4	1491.588	66.57134 – 133.61399	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4P^\circ - ^4P$	$\frac{5}{2} - \frac{3}{2}$		835
	6	1491.776	66.57971 – 133.61399	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4P^\circ - ^4P$	$\frac{3}{2} - \frac{3}{2}$		835
	3	1491.823	54.26263 – 121.29467	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4G^\circ - ^2G$	$\frac{7}{2} - \frac{9}{2}$		835
	40	1491.899	55.01871 – 122.04729	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^4G^\circ - ^4H$	$\frac{5}{2} - \frac{7}{2}$		835
	15	1493.022	54.26263 – 121.24090	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4G^\circ - ^2F$	$\frac{7}{2} - \frac{7}{2}$		835
	2	1493.315	54.26263 – 121.22780	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4G^\circ - ^4F$	$\frac{7}{2} - \frac{5}{2}$		835
	50	1494.151	54.26263 – 121.19034	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4G^\circ - ^4H$	$\frac{7}{2} - \frac{9}{2}$		835
	6	1494.236	67.03102 – 133.95485	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^4P^\circ - ^2P$	$\frac{1}{2} - \frac{1}{2}$		835
	10	1494.701	67.88016 – 134.78314	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - w^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	40	1495.383	66.57134 – 133.44389	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4P^\circ - ^4P$	$\frac{5}{2} - \frac{5}{2}$		835
	20	1495.570	66.57971 – 133.44389	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4P^\circ - ^4P$	$\frac{3}{2} - \frac{5}{2}$		835
	10	1496.308	67.03102 – 133.86221	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4P^\circ - ^2P$	$\frac{1}{2} - \frac{3}{2}$		835
	2	1496.409	67.03102 – 133.85773	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4P^\circ - ^4P$	$\frac{1}{2} - \frac{1}{2}$		835
	1	1496.463	68.15431 – 134.97847	$3d^8(a^1D)4p - 3d^8(a^3F_4)7d$	$^2D^\circ - ^4D$	$\frac{3}{2} - \frac{5}{2}$		835
	1	1498.734	55.41783 – 122.14071	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^4F^\circ - ^2H$	$\frac{7}{2} - \frac{9}{2}$		835
	15	1499.704	53.36517 – 120.04495	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4G^\circ - ^4G$	$\frac{9}{2} - \frac{9}{2}$		835
7	200	1500.437	1.50694 – 68.15431	$3d^9 - 3d^8(a^1D)4p$	$g^2D - ^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	7	1500.651	53.36517 – 120.00286	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4G^\circ - ^4F$	$\frac{9}{2} - \frac{7}{2}$		835
	20	1501.885	67.03102 – 133.61399	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4P^\circ - ^4P$	$\frac{1}{2} - \frac{3}{2}$		835
	6	1501.962	0.0 – 66.57971	$3d^9 - 3d^8(a^3P)4p$	$g^2D - ^4P^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	75	1502.150	0.0 – 66.57134	$3d^9 - 3d^8(a^3P)4p$	$g^2D - ^4P^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	20	1502.669	53.49649 – 120.04495	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4G^\circ - ^4G$	$\frac{11}{2} - \frac{9}{2}$		835
	7	1503.123	51.04546 – 117.57368	$3d^74s^2 - 3d^7(a^2D)4s4p(^3P^\circ)$	$^4F - w^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		835
	12	1503.209	53.36517 – 119.88947	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4G^\circ - ^4G$	$\frac{9}{2} - \frac{11}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	75	1504.485	53.36517 – 119.83300	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4G^\circ - {}^4H$	$\frac{9}{2}-\frac{11}{2}$		835
	5	1504.590	70.74870 – 137.21193	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4D^\circ - {}^2P$	$\frac{1}{2}-\frac{1}{2}$		835
	13	1505.642	53.49649 – 119.91333	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4G^\circ - {}^4F$	$\frac{11}{2}-\frac{9}{2}$		835
	16	1506.184	53.49649 – 119.88947	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4G^\circ - {}^4G$	$\frac{11}{2}-\frac{11}{2}$		835
	25	1506.585	67.88016 – 134.25605	$3d^74s^2 - 3d^8(a^3F_4)6f$	$^4P - 4[2]^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	7	1506.851						835
	10	1506.968	67.69464 – 134.05305	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2F^\circ - {}^2D$	$\frac{5}{2}-\frac{5}{2}$		835
	5	1506.995	52.20595 – 118.56339	$3d^74s^2 - 3d^8(a^1D)5p$	$^4F - {}^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	18	1507.465	53.49649 – 119.83300	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4G^\circ - {}^4H$	$\frac{11}{2}-\frac{11}{2}$		835
	15	1507.961	70.35894 – 136.67364	$3d^74s^2 - 3d^8(a^3F_3)8p$	$^2G - {}^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	10	1508.249						835
	7	1508.262	70.63546 – 136.93682	$3d^8(a^3P)4p - 3d^8(a^3F_2)7d$	$^4D^\circ - {}^2G$	$\frac{5}{2}-\frac{7}{2}$		835
	10	1508.315	55.01871 – 121.31789	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4G^\circ - {}^4G$	$\frac{5}{2}-\frac{7}{2}$		835
	7	1508.352						835
	4	1508.498	53.36517 – 119.65625	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4G^\circ - {}^4D$	$\frac{9}{2}-\frac{7}{2}$		835
	100	1508.816	53.49649 – 119.77360	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4G^\circ - {}^4H$	$\frac{11}{2}-\frac{13}{2}$		835
	1	1509.113	70.63546 – 136.89934	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4D^\circ - {}^4P$	$\frac{5}{2}-\frac{3}{2}$		835
	12	1509.308	68.70976 – 134.96478	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - w^2D^\circ$	$\frac{1}{2}-\frac{3}{2}$		835
	8	1509.345	70.70677 – 136.96075	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4D^\circ - {}^4P$	$\frac{3}{2}-\frac{5}{2}$		835
	4	1509.602	68.73598 – 134.97847	$3d^8(a^1D)4p - 3d^8(a^3F_4)7d$	$^2D^\circ - {}^4D$	$\frac{5}{2}-\frac{5}{2}$		835
	100	1509.767	67.69464 – 133.92988	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2F^\circ - {}^2G$	$\frac{5}{2}-\frac{7}{2}$		835
	1	1510.067	55.01871 – 121.24090	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4G^\circ - {}^2F$	$\frac{5}{2}-\frac{7}{2}$		835
	16	1510.232						835
	4	1510.366	55.01871 – 121.22780	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4G^\circ - {}^4F$	$\frac{5}{2}-\frac{5}{2}$		835
	3	1510.690	56.07526 – 122.27005	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^4F^\circ - {}^2G$	$\frac{5}{2}-\frac{7}{2}$		835
	5	1510.741	70.70677 – 136.89934	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4D^\circ - {}^4P$	$\frac{3}{2}-\frac{3}{2}$		835
	75	1510.859	1.50694 – 67.69464	$3d^9 - 3d^8(a^1D)4p$	$g^2D - {}^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	8	1511.185	52.20595 – 118.37911	$3d^74s^2 - 3d^8(a^1D)5p$	$^4F - {}^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	3	1511.314	67.69464 – 133.86221	$3d^8(a^1D)4p - 3d^8(a^3P)6s$	$^2F^\circ - {}^2P$	$\frac{5}{2}-\frac{3}{2}$		835
	10	1511.467						835
	1	1512.237	68.15657 – 134.28376	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - s^4D^\circ$	$\frac{3}{2}-\frac{1}{2}$		835
	11	1512.742	71.45774 – 137.56274	$3d^74s^2 - 3d^8(a^3F_2)8p$	$^2G - {}^2G^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	11	1513.016	67.88016 – 133.97333	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - s^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	1	1513.550	56.07526 – 122.14499	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^4F^\circ - {}^4G$	$\frac{5}{2}-\frac{5}{2}$		835
	15	1513.783	70.70677 – 136.76649	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4D^\circ - {}^4F$	$\frac{3}{2}-\frac{5}{2}$		835
	50	1514.222	67.69464 – 133.73526	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2F^\circ - {}^2F$	$\frac{5}{2}-\frac{5}{2}$		835
	10	1514.336						835
	80	1514.372	70.35894 – 136.39285	$3d^74s^2 - 3d^8(^1D)6p$	$^2G - {}^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	17	1514.411						835
	5	1514.552	70.70677 – 136.73274	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4D^\circ - {}^4F$	$\frac{3}{2}-\frac{3}{2}$		835
	6	1514.633						835
	2	1514.644						835
	8	1514.856	68.96565 – 134.97847	$3d^8(a^1D)4p - 3d^8(a^3F_4)7d$	$^2P^\circ - {}^4D$	$\frac{3}{2}-\frac{5}{2}$		835
	15	1515.157	68.15657 – 134.15628	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - s^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	25	1515.269	55.29965 – 121.29467	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^2G^\circ - {}^2G$	$\frac{9}{2}-\frac{9}{2}$		835
	8	1515.329	23.10828 – 89.10049	$3d^8(a^1D)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2D - z^6D^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	5	1515.518	70.74870 – 136.73274	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4D^\circ - {}^4F$	$\frac{1}{2}-\frac{3}{2}$		835
	1	1515.692	70.74870 – 136.72533	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4D^\circ - {}^4P$	$\frac{1}{2}-\frac{1}{2}$		835
	30	1515.791	56.07526 – 122.04729	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^4F^\circ - {}^4H$	$\frac{5}{2}-\frac{7}{2}$		835
	40	1515.825	67.88016 – 133.85083	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - s^4D^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	17	1516.048	68.28162 – 134.24196	$3d^8(a^1D)4p - 3d^8(a^3P)6s$	$^2P^\circ - {}^2P$	$\frac{1}{2}-\frac{1}{2}$		835
	50	1516.215	70.63546 – 136.58935	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4D^\circ - {}^4F$	$\frac{5}{2}-\frac{7}{2}$		835
	3	1516.503	55.29965 – 121.24090	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^2G^\circ - {}^2F$	$\frac{9}{2}-\frac{7}{2}$		835
	25	1517.449	55.41783 – 121.31789	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4F^\circ - {}^4G$	$\frac{7}{2}-\frac{7}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	40	1517.480	56.37141 – 122.27005	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^2G^\circ - ^2G$	$\frac{7}{2}-\frac{7}{2}$		835
	100	1517.894	55.29965 – 121.18055	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^2G^\circ - ^2H$	$\frac{9}{2}-\frac{11}{2}$		835
	15	1517.984	55.41783 – 121.29467	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4F^\circ - ^2G$	$\frac{7}{2}-\frac{9}{2}$		835
	40	1519.371	68.15657 – 133.97333	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - s^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	15	1519.513	55.41783 – 121.22780	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4F^\circ - ^4F$	$\frac{7}{2}-\frac{5}{2}$		835
	4	1519.745	68.15431 – 133.95485	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2D^\circ - ^2P$	$\frac{3}{2}-\frac{1}{2}$		835
	100	1519.935	68.13121 – 133.92291	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2F^\circ - ^2G$	$\frac{7}{2}-\frac{9}{2}$		835
	2	1520.008						835
	4	1520.077	68.28162 – 134.06776	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2P^\circ - ^2P$	$\frac{1}{2}-\frac{3}{2}$		835
	14	1520.168	54.26263 – 120.04495	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4G^\circ - ^4G$	$\frac{7}{2}-\frac{9}{2}$		835
	10	1520.294	32.49953 – 98.27670	$3d^8(a^1G)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2G - z^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	30	1520.392	55.41783 – 121.19034	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4F^\circ - ^4H$	$\frac{7}{2}-\frac{9}{2}$		835
	40	1520.467	56.37141 – 122.14071	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^2G^\circ - ^2H$	$\frac{7}{2}-\frac{9}{2}$		835
	10	1520.932	67.69464 – 133.44389	$3d^8(a^1D)4p - 3d^8(a^3P)6s$	$^2F^\circ - ^4P$	$\frac{5}{2}-\frac{5}{2}$		835
	20	1520.944	68.15431 – 133.90300	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2D^\circ - ^2D$	$\frac{3}{2}-\frac{3}{2}$		835
	100	1521.119	70.77812 – 136.51928	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4D^\circ - ^4F$	$\frac{7}{2}-\frac{9}{2}$		835
	15	1521.596	56.42449 – 122.14499	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^4F^\circ - ^4G$	$\frac{3}{2}-\frac{5}{2}$		835
	18	1521.673	70.35894 – 136.07626	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2G - v^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	12	1521.889	68.15431 – 133.86221	$3d^8(a^1D)4p - 3d^8(a^3P)6s$	$^2D^\circ - ^2P$	$\frac{3}{2}-\frac{3}{2}$		835
	10	1521.992	68.15431 – 133.85773	$3d^8(a^1D)4p - 3d^8(a^3P)6s$	$^2D^\circ - ^4P$	$\frac{3}{2}-\frac{1}{2}$		835
	2	1522.506	53.63462 – 119.31544	$3d^8(a^3F)4p - 3d^8(a^3F_2)6s$	$^4D^\circ - ^2F$	$\frac{3}{2}-\frac{5}{2}$		835
	0	1522.517	53.63462 – 119.31544	$3d^8(a^3F)4p - 3d^8(a^3F_2)6s$	$^4D^\circ - ^2F$	$\frac{3}{2}-\frac{5}{2}$		835
	30	1522.569	68.13121 – 133.80976	$3d^8(a^1D)4p - 3d^8(a^3F_4)8s$	$^2F^\circ - ^4F$	$\frac{7}{2}-\frac{7}{2}$		835
	10	1522.691	68.28162 – 133.95485	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2P^\circ - ^2P$	$\frac{1}{2}-\frac{1}{2}$		835
	12	1522.846	52.20595 – 117.87278	$3d^74s^2 - 3d^8(a^1D)5p$	$^4F - ^2D^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	11	1522.990	56.42449 – 122.08479	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^4F^\circ - ^4F$	$\frac{3}{2}-\frac{3}{2}$		835
	3	1523.102	56.42449 – 122.08025	$3d^8(a^3F)4p - 3d^8(a^1G)4d$	$^4F^\circ - ^2F$	$\frac{3}{2}-\frac{5}{2}$		835
	6	1523.160	70.63546 – 136.28860	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4D^\circ - ^4D$	$\frac{5}{2}-\frac{5}{2}$		835
	30	1523.278	67.88016 – 133.52802	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - v^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	15	1523.897	70.70677 – 136.32755	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4D^\circ - ^4D$	$\frac{3}{2}-\frac{3}{2}$		835
	50	1524.302	68.13121 – 133.73498	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2F^\circ - ^2F$	$\frac{7}{2}-\frac{7}{2}$		835
	4	1524.758	70.70677 – 136.29083	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4D^\circ - ^4D$	$\frac{3}{2}-\frac{1}{2}$		835
	22	1524.834	68.15431 – 133.73526	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2D^\circ - ^2F$	$\frac{3}{2}-\frac{5}{2}$		835
	14	1524.996	68.96565 – 134.53937	$3d^8(a^1D)4p - 3d^8(a^3F_4)7d$	$^2P^\circ - ^4P$	$\frac{3}{2}-\frac{5}{2}$		835
	8	1525.422	52.73845 – 118.29417	$3d^8(a^3F)4p - 3d^8(a^3F_3)6s$	$^4D^\circ - ^2F$	$\frac{5}{2}-\frac{7}{2}$		835
	4	1526.480	70.77812 – 136.28860	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4D^\circ - ^4D$	$\frac{7}{2}-\frac{5}{2}$		835
	20	1526.999	54.55705 – 120.04495	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4F^\circ - ^4G$	$\frac{9}{2}-\frac{9}{2}$		835
	15	1527.497	51.04546 – 116.51206	$3d^74s^2 - 3d^7(a^2D)4s4p(^3P^\circ)$	$^4F - v^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	1	1527.661	68.15431 – 133.61399	$3d^8(a^1D)4p - 3d^8(a^3P)6s$	$^2D^\circ - ^4P$	$\frac{3}{2}-\frac{3}{2}$		835
	18	1527.968	68.70976 – 134.15628	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^4P - s^4D^\circ$	$\frac{1}{2}-\frac{3}{2}$		835
	3	1528.158						835
	22	1528.508	70.77812 – 136.20146	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4D^\circ - ^4D$	$\frac{7}{2}-\frac{7}{2}$		835
	1	1528.703	70.63546 – 136.05053	$3d^8(a^3P)4p - 3d^8(a^3F_2)8s$	$^4D^\circ - ^2F$	$\frac{5}{2}-\frac{5}{2}$		835
	4	1529.148	70.63546 – 136.03143	$3d^8(a^3P)4p - 3d^8(a^3F_3)7d$	$^4D^\circ - ^2D$	$\frac{5}{2}-\frac{5}{2}$		835
	0	1529.812	52.20595 – 117.57368	$3d^74s^2 - 3d^7(a^2D)4s4p(^3P^\circ)$	$^4F - w^4F^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	18	1530.080	54.55705 – 119.91333	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4F^\circ - ^4F$	$\frac{9}{2}-\frac{9}{2}$		835
	10	1530.428	53.03793 – 118.37911	$3d^74s^2 - 3d^8(a^1D)5p$	$^4F - ^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	75	1530.636	54.55705 – 119.88947	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4F^\circ - ^4G$	$\frac{9}{2}-\frac{11}{2}$		835
	30	1530.663	68.73598 – 134.06776	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2D^\circ - ^2P$	$\frac{5}{2}-\frac{3}{2}$		835
	16	1530.995	68.73598 – 134.05305	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2D^\circ - ^2D$	$\frac{5}{2}-\frac{5}{2}$		835
	3	1531.288						835
	1	1531.336						835
	14	1531.408						835
	18	1531.640	68.15431 – 133.44389	$3d^8(a^1D)4p - 3d^8(a^3P)6s$	$^2D^\circ - ^4P$	$\frac{3}{2}-\frac{5}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	1531.720	70.35894 – 135.64510	$3d^7 4s^2 - 3d^8(a^3F_3)6f$	$^2G - 3[5]^\circ$	$\frac{9}{2}-\frac{11}{2}$		835
	16	1531.952	54.55705 – 119.83300	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4F^\circ - {}^4H$	$\frac{9}{2}-\frac{11}{2}$		835
	20	1531.972	51.55785 – 116.83315	$3d^8(a^3F)4p - 3d^8(a^3F_4)6s$	$^4D^\circ - {}^4F$	$\frac{7}{2}-\frac{9}{2}$		835
	14	1532.741	56.07526 – 121.31789	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4F^\circ - {}^4G$	$\frac{5}{2}-\frac{7}{2}$		835
	17	1533.669						835
	12	1533.885	68.73598 – 133.92988	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2D^\circ - {}^2G$	$\frac{5}{2}-\frac{7}{2}$		835
	20	1533.991	57.08055 – 122.27005	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^2F^\circ - {}^2G$	$\frac{7}{2}-\frac{7}{2}$		835
	5	1534.424						835
	12	1534.484						835
	11	1534.546	56.07526 – 121.24090	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4F^\circ - {}^2F$	$\frac{5}{2}-\frac{7}{2}$		835
	1	1534.628						835
	10	1534.861	56.07526 – 121.22780	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4F^\circ - {}^4F$	$\frac{5}{2}-\frac{5}{2}$		835
	2	1535.083						835
	12	1535.477	68.73598 – 133.86221	$3d^8(a^1D)4p - 3d^8(a^3P)6s$	$^2D^\circ - {}^2P$	$\frac{5}{2}-\frac{3}{2}$		835
	15	1535.961	70.35894 – 135.46486	$3d^7 4s^2 - 3d^8(a^3P)4f$	$^2G - {}^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	30	1536.051	68.96565 – 134.06776	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2P^\circ - {}^2P$	$\frac{3}{2}-\frac{3}{2}$		835
	15	1536.118	54.55705 – 119.65625	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4F^\circ - {}^4D$	$\frac{9}{2}-\frac{7}{2}$		835
	1	1536.367	71.45774 – 136.54650	$3d^7 4s^2 - 3d^8(a^3F_2)6f$	$^2G - 2[4]^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	20	1536.398	68.96565 – 134.05305	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2P^\circ - {}^2D$	$\frac{3}{2}-\frac{5}{2}$		835
	15	1536.717	68.73598 – 133.80976	$3d^8(a^1D)4p - 3d^8(a^3F_4)8s$	$^2D^\circ - {}^4F$	$\frac{5}{2}-\frac{7}{2}$		835
	25	1536.746	1.50694 – 66.57971	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^4P^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	10	1536.779						835
	12	1536.944	1.50694 – 66.57134	$3d^9 - 3d^8(a^3P)4p$	$g^2D - {}^4P^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	12	1537.038	57.08055 – 122.14071	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^2F^\circ - {}^2H$	$\frac{7}{2}-\frac{9}{2}$		835
	20	1537.216	54.26263 – 119.31544	$3d^8(a^3F)4p - 3d^8(a^3F_2)6s$	$^4G^\circ - {}^2F$	$\frac{7}{2}-\frac{5}{2}$		835
	2	1537.322	67.88016 – 132.92797	$3d^7 4s^2 - 3d^8(a^1D_2)4f$	$^4P - 2[2]^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	15	1537.477	70.35894 – 135.40067	$3d^7 4s^2 - 3d^8(a^3P_2)4f$	$^2G - 2[4]^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	1	1537.776	72.98565 – 138.01453	$3d^8(a^3P)4p - 3d^8(a^3F_4)8d$	$^2P^\circ - {}^4D$	$\frac{3}{2}-\frac{5}{2}$		835
	25	1537.859						835
	6	1538.022						835
	30	1538.388						835
	30	1538.483	68.73598 – 133.73498	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2D^\circ - {}^2F$	$\frac{5}{2}-\frac{7}{2}$		835
	4	1538.567	71.77083 – 136.76649	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^2D^\circ - {}^4F$	$\frac{5}{2}-\frac{5}{2}$		835
	0	1538.722	68.96565 – 133.95485	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2P^\circ - {}^2P$	$\frac{3}{2}-\frac{1}{2}$		835
	3	1538.831	55.01871 – 120.00286	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4G^\circ - {}^4F$	$\frac{5}{2}-\frac{7}{2}$		835
	1	1538.956	70.35894 – 135.33801	$3d^7 4s^2 - 3d^8(a^3F_4)8p$	$^2G - {}^4G^\circ$	$\frac{9}{2}-\frac{11}{2}$		835
	15	1539.649						835
	1	1539.731	56.37141 – 121.31789	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^2G^\circ - {}^4G$	$\frac{7}{2}-\frac{7}{2}$		835
	2	1539.949	68.96565 – 133.90300	$3d^8(a^1D)4p - 3d^8(a^1D)5d$	$^2P^\circ - {}^2D$	$\frac{3}{2}-\frac{3}{2}$		835
	1	1540.015	53.03793 – 117.97247	$3d^7 4s^2 - 3d^7(a^2D)4s4p(^3P^\circ)$	$^4F - w^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	25	1540.281	56.37141 – 121.29467	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^2G^\circ - {}^2G$	$\frac{7}{2}-\frac{9}{2}$		835
	1	1540.656						835
	35	1540.760	72.37542 – 137.27822	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^2D^\circ - {}^2P$	$\frac{3}{2}-\frac{3}{2}$		835
	4	1540.908	68.96565 – 133.86221	$3d^8(a^1D)4p - 3d^8(a^3P)6s$	$^2P^\circ - {}^2P$	$\frac{3}{2}-\frac{3}{2}$		835
	14	1541.324						835
	11	1541.356	68.73598 – 133.61399	$3d^8(a^1D)4p - 3d^8(a^3P)6s$	$^2D^\circ - {}^4P$	$\frac{5}{2}-\frac{3}{2}$		835
	4	1541.560	56.37141 – 121.24090	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^2G^\circ - {}^2F$	$\frac{7}{2}-\frac{7}{2}$		835
	2	1541.801	75.14948 – 140.00876	$3d^8(a^1G)4p - 3d^8(a^1G)6s$	$^2H^\circ - {}^2G$	$\frac{9}{2}-\frac{7}{2}$		835
	1	1542.024	57.42016 – 122.27005	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^2D^\circ - {}^2G$	$\frac{5}{2}-\frac{7}{2}$		835
	18	1542.208	53.60119 – 118.44281	$3d^7 4s^2 - 3d^8(a^1D)5p$	$^4F - {}^2P^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	2	1542.238	53.60119 – 118.44281	$3d^7 4s^2 - 3d^8(a^1D)5p$	$^4F - {}^2P^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	3	1542.263						835
	1	1542.388	53.03793 – 117.87278	$3d^7 4s^2 - 3d^8(a^1D)5p$	$^4F - {}^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	3	1542.401	71.77083 – 136.60479	$3d^8(a^3P)4p - 3d^8(a^3F_2)6g$	$^2D^\circ - 2[4]^\circ$	$\frac{5}{2}-\frac{7}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	15	1542.773	71.77083 – 136.58935	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^2D^\circ - ^4F$	$\frac{5}{2}-\frac{7}{2}$		835
	1	1543.132	56.42449 – 121.22780	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^4F^\circ - ^4F$	$\frac{3}{2}-\frac{5}{2}$		835
	3	1543.806						835
	3	1544.273	57.42016 – 122.17542	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^2D^\circ - ^2F$	$\frac{5}{2}-\frac{5}{2}$		835
	5	1544.968	55.41783 – 120.14417	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4F^\circ - ^4D$	$\frac{7}{2}-\frac{5}{2}$		835
	10	1544.980	53.03793 – 117.76391	$3d^74s^2 - 3d^8(a^1D)5p$	$^4F - ^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	30	1545.408	68.73598 – 133.44389	$3d^8(a^1D)4p - 3d^8(a^3P)6s$	$^2D^\circ - ^4P$	$\frac{5}{2}-\frac{5}{2}$		835
	12	1545.453						835
	16	1545.717						835
	5	1545.881	52.20595 – 116.89398	$3d^74s^2 - 3d^7(a^2D)4s4p(^3P^\circ)$	$^4F - v^4D^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	1	1546.053	53.63462 – 118.31482	$3d^8(a^3F)4p - 3d^8(a^3F_3)6s$	$^4D^\circ - ^4F$	$\frac{3}{2}-\frac{5}{2}$		835
	4	1546.070	53.63462 – 118.31482	$3d^8(a^3F)4p - 3d^8(a^3F_3)6s$	$^4D^\circ - ^4F$	$\frac{3}{2}-\frac{5}{2}$		835
	15	1547.337	55.41783 – 120.04495	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4F^\circ - ^4G$	$\frac{7}{2}-\frac{9}{2}$		835
	13	1547.407	53.03793 – 117.66211	$3d^74s^2 - 3d^7(a^2D)4s4p(^3P^\circ)$	$^4F - v^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	5	1547.513						835
	3	1547.547	71.45774 – 136.07626	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2G - v^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	16	1548.344	55.41783 – 120.00286	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4F^\circ - ^4F$	$\frac{7}{2}-\frac{7}{2}$		835
	7	1548.416						835
	1	1549.588	55.29965 – 119.83300	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^2G^\circ - ^4H$	$\frac{9}{2}-\frac{11}{2}$		835
	0	1549.818	72.37542 – 136.89934	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^2D^\circ - ^4P$	$\frac{3}{2}-\frac{3}{2}$		835
	4	1549.964	71.77083 – 136.28860	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^2D^\circ - ^4D$	$\frac{5}{2}-\frac{5}{2}$		835
	3	1550.479	71.45774 – 135.95409	$3d^74s^2 - 3d^8(a^3P_0)4f$	$^2G - 0[3]^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	2	1550.495	55.41783 – 119.91333	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4F^\circ - ^4F$	$\frac{7}{2}-\frac{9}{2}$		835
	10	1550.912	68.96565 – 133.44389	$3d^8(a^1D)4p - 3d^8(a^3P)6s$	$^2P^\circ - ^4P$	$\frac{3}{2}-\frac{5}{2}$		835
	5	1552.276						835
	0	1553.012	72.37542 – 136.76649	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^2D^\circ - ^4F$	$\frac{3}{2}-\frac{5}{2}$		835
	4	1553.346						835
	5	1554.108						835
	50	1554.124	67.88016 – 132.22515	$3d^74s^2 - 3d^7(a^4P)4s4p(^1P^\circ)$	$^4P - v^4P^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	8	1554.293	70.77812 – 135.11672	$3d^8(a^3P)4p - 3d^8(a^3F_3)8s$	$^4D^\circ - ^4F$	$\frac{7}{2}-\frac{5}{2}$		835
	8	1554.332	52.73845 – 117.07470	$3d^8(a^3F)4p - 3d^8(a^3F_4)6s$	$^4D^\circ - ^4F$	$\frac{5}{2}-\frac{7}{2}$		835
	6	1554.509	66.57134 – 130.90065	$3d^8(a^3P)4p - 3d^8(a^1D)6s$	$^4P^\circ - ^2D$	$\frac{5}{2}-\frac{5}{2}$		835
	2	1555.062	52.20595 – 116.51206	$3d^74s^2 - 3d^7(a^2D)4s4p(^3P^\circ)$	$^4F - v^4D^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	16	1555.398	72.98565 – 137.27822	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^2P^\circ - ^2P$	$\frac{3}{2}-\frac{3}{2}$		835
	30	1555.496	71.45774 – 135.74606	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2G - v^2G^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	8	1555.585	75.72168 – 140.00617	$3d^8(a^1G)4p - 3d^8(a^1G)6s$	$^2H^\circ - ^2G$	$\frac{11}{2}-\frac{9}{2}$		835
	13	1555.957	51.55785 – 115.82712	$3d^8(a^3F)4p - 3d^8(a^3P)4d$	$^4D^\circ - ^4F$	$\frac{7}{2}-\frac{7}{2}$		835
	7	1556.350						835
	10	1556.766						835
	4	1556.997	72.98565 – 137.21193	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^2P^\circ - ^2P$	$\frac{3}{2}-\frac{1}{2}$		835
	1	1557.194	68.70976 – 132.92797	$3d^74s^2 - 3d^8(a^1D_2)4f$	$^4P - 2[2]^\circ$	$\frac{1}{2}-\frac{3}{2}$		835
	12	1557.290	57.08055 – 121.29467	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^2F^\circ - ^2G$	$\frac{7}{2}-\frac{9}{2}$		835
	1	1557.380						835
	10	1558.087	51.55785 – 115.73915	$3d^8(a^3F)4p - 3d^8(a^3P)4d$	$^4D^\circ - ^4F$	$\frac{7}{2}-\frac{9}{2}$		835
	12	1558.443						835
	2	1558.501	51.04546 – 115.20985	$3d^74s^2 - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4G^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	5	1558.544	53.60119 – 117.76391	$3d^74s^2 - 3d^8(a^1D)5p$	$^4F - ^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	15	1558.597	57.08055 – 121.24090	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^2F^\circ - ^2F$	$\frac{7}{2}-\frac{7}{2}$		835
	40	1558.655						835
	18	1559.159						835
	1	1559.822	57.08055 – 121.19034	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^2F^\circ - ^4H$	$\frac{7}{2}-\frac{9}{2}$		835
	6	1560.341	75.91763 – 140.00617	$3d^8(a^1G)4p - 3d^8(a^1G)6s$	$^2F^\circ - ^2G$	$\frac{7}{2}-\frac{9}{2}$		835
	25	1560.459						835
	10	1560.517	55.01871 – 119.10006	$3d^8(a^3F)4p - 3d^8(a^3F_2)6s$	$^4G^\circ - ^4F$	$\frac{5}{2}-\frac{3}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	4	1560.562						835
	5	1560.796	52.20595 - 116.27581	$3d^74s^2 - 3d^7(a^2H)4s4p(^3P^\circ)$	$^4F - w^4G^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	15	1560.831	68.15657 - 132.22515	$3d^74s^2 - 3d^7(a^4P)4s4p(^1P^\circ)$	$^4P - v^4P^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	4	1560.935	25.03638 - 89.10049	$3d^8(a^3P)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^4P - z^6D^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	4	1561.015	53.60119 - 117.66211	$3d^74s^2 - 3d^7(a^2D)4s4p(^3P^\circ)$	$^4F - v^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	15	1561.229	54.26263 - 118.31482	$3d^8(a^3F)4p - 3d^8(a^3F_3)6s$	$^4G^\circ - {}^4F$	$\frac{7}{2}-\frac{5}{2}$		835
	2	1561.733	54.26263 - 118.29417	$3d^8(a^3F)4p - 3d^8(a^3F_3)6s$	$^4G^\circ - {}^2F$	$\frac{7}{2}-\frac{7}{2}$		835
	11	1561.968	70.35894 - 134.38082	$3d^74s^2 - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2G - w^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	18	1562.329	70.63546 - 134.64209	$3d^8(a^3P)4p - 3d^8(a^3F_4)7d$	$^4D^\circ - {}^4F$	$\frac{5}{2}-\frac{7}{2}$		835
	7	1563.111	72.98565 - 136.96075	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^2P^\circ - {}^4P$	$\frac{3}{2}-\frac{5}{2}$		835
	50	1563.376	68.15657 - 132.12070	$3d^74s^2 - 3d^7(a^4P)4s4p(^1P^\circ)$	$^4P - v^4P^\circ$	$\frac{3}{2}-\frac{1}{2}$		835
	120	1563.604	51.04546 - 115.00025	$3d^74s^2 - 3d^7(a^2P)4s4p(^3P^\circ)$	$^4F - w^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	1	1563.837						835
	15	1564.273	56.07526 - 120.00286	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^4F^\circ - {}^4F$	$\frac{5}{2}-\frac{7}{2}$		835
	8	1564.389	70.35894 - 134.28166	$3d^74s^2 - 3d^8(a^3F_4)6f$	$^2G - 4[5]^\circ$	$\frac{9}{2}-\frac{11}{2}$		835
	1	1565.001	55.41783 - 119.31544	$3d^8(a^3F)4p - 3d^8(a^3F_2)6s$	$^4F^\circ - {}^2F$	$\frac{7}{2}-\frac{5}{2}$		835
	20	1565.399						835
	3	1565.970						835
	7	1566.019	53.03793 - 116.89398	$3d^74s^2 - 3d^7(a^2D)4s4p(^3P^\circ)$	$^4F - v^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	1	1566.890	57.42016 - 121.24090	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^2D^\circ - {}^2F$	$\frac{5}{2}-\frac{7}{2}$		835
	15	1567.069	51.04546 - 114.85888	$3d^74s^2 - 3d^7(a^2H)4s4p(^3P^\circ)$	$^4F - w^4G^\circ$	$\frac{9}{2}-\frac{11}{2}$		835
	10	1567.220	57.42016 - 121.22780	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^2D^\circ - {}^4F$	$\frac{5}{2}-\frac{5}{2}$		835
	3	1567.298	71.45774 - 135.26199	$3d^74s^2 - 3d^8(a^3F_4)8p$	$^2G - {}^4G^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	10	1567.323						835
	12	1567.336						835
	3	1567.370	71.45774 - 135.25892	$3d^74s^2 - 3d^7(a^2P)4s4p(^1P^\circ)$	$^2G - v^2D^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	1	1567.872	72.98565 - 136.76649	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^2P^\circ - {}^4F$	$\frac{3}{2}-\frac{5}{2}$		835
	4	1567.966	58.49321 - 122.27005	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^2F^\circ - {}^2G$	$\frac{5}{2}-\frac{7}{2}$		835
	1	1568.698	72.98565 - 136.73274	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^2P^\circ - {}^4F$	$\frac{3}{2}-\frac{3}{2}$		835
	16	1569.172	66.57971 - 130.30697	$3d^8(a^3P)4p - 3d^8(a^3F_3)5g$	$^4P^\circ - 3[2]^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	1	1569.415						835
	13	1569.624	53.36517 - 117.07470	$3d^8(a^3F)4p - 3d^8(a^3F_4)6s$	$^4G^\circ - {}^4F$	$\frac{9}{2}-\frac{7}{2}$		835
	2	1569.972	57.42016 - 121.11559	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^2D^\circ - {}^2P$	$\frac{5}{2}-\frac{3}{2}$		835
	10	1570.302	58.49321 - 122.17542	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^2F^\circ - {}^2F$	$\frac{5}{2}-\frac{5}{2}$		835
	60	1570.392	68.15657 - 131.83494	$3d^74s^2 - 3d^7(a^4P)4s4p(^1P^\circ)$	$^4P - v^4P^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	3	1570.512	56.37141 - 120.04495	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^2G^\circ - {}^4G$	$\frac{7}{2}-\frac{9}{2}$		835
	1	1570.701	68.13121 - 131.79626	$3d^8(a^1D)4p - 3d^8(a^3F_2)6d$	$^2F^\circ - {}^2F$	$\frac{7}{2}-\frac{5}{2}$		835
	1	1570.879						835
	12	1571.145						835
	12	1571.162						835
	10	1571.257						835
	2	1571.532	56.37141 - 120.00286	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^2G^\circ - {}^4F$	$\frac{7}{2}-\frac{7}{2}$		835
	2	1571.550	56.37141 - 120.00286	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^2G^\circ - {}^4F$	$\frac{7}{2}-\frac{7}{2}$		835
	4	1572.018						835
	4	1572.062						835
	25	1572.540	58.49321 - 122.08479	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^2F^\circ - {}^4F$	$\frac{5}{2}-\frac{3}{2}$		835
	4	1572.646	58.49321 - 122.08025	$3d^8(a^3F)4p - 3d^8(a^1G)4d$	$^2F^\circ - {}^2F$	$\frac{5}{2}-\frac{5}{2}$		835
	1	1572.993						835
	10	1573.071						835
	18	1574.202	51.55785 - 115.08136	$3d^8(a^3F)4p - 3d^8(a^1G)5s$	$^4D^\circ - {}^2G$	$\frac{7}{2}-\frac{9}{2}$		835
	100	1574.423	68.70976 - 132.22515	$3d^74s^2 - 3d^7(a^4P)4s4p(^1P^\circ)$	$^4P - v^4P^\circ$	$\frac{1}{2}-\frac{3}{2}$		835
	20	1574.942	70.35894 - 133.85304	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2G - v^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	5	1574.976	70.74870 - 134.24196	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4D^\circ - {}^2P$	$\frac{1}{2}-\frac{1}{2}$		835
	16	1575.003	70.35894 - 133.85083	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2G - s^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	15	1575.090						835
	1	1575.559	58.70595 – 122.17542	$3d^8(a^3F)4p - 3d^8(a^3F_2)5d$	$^2D^\circ - ^2F$	$\frac{3}{2}-\frac{5}{2}$		835
	9	1575.597	53.36517 – 116.83315	$3d^8(a^3F)4p - 3d^8(a^3F_4)6s$	$^4G^\circ - ^4F$	$\frac{9}{2}-\frac{9}{2}$		835
	1	1576.747						835
	30	1577.015	68.70976 – 132.12070	$3d^74s^2 - 3d^7(a^4P)4s4p(^1P^\circ)$	$^4P - v^4P^\circ$	$\frac{1}{2}-\frac{1}{2}$		835
	16	1577.115	52.20595 – 115.61288	$3d^74s^2 - 3d^7(a^2H)4s4p(^3P^\circ)$	$^4F - w^4G^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	7	1577.210						835
	14	1577.933	58.70595 – 122.08025	$3d^8(a^3F)4p - 3d^8(a^1G)4d$	$^2D^\circ - ^2F$	$\frac{3}{2}-\frac{5}{2}$		835
	20	1578.865	53.49649 – 116.83315	$3d^8(a^3F)4p - 3d^8(a^3F_4)6s$	$^4G^\circ - ^4F$	$\frac{11}{2}-\frac{9}{2}$		835
	60	1578.990						835
	18	1579.073						835
	18	1579.563	73.90325 – 137.21193	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^2P^\circ - ^2P$	$\frac{1}{2}-\frac{1}{2}$		835
	17	1579.791						835
	2	1579.877	55.01871 – 118.31482	$3d^8(a^3F)4p - 3d^8(a^3F_3)6s$	$^4G^\circ - ^4F$	$\frac{5}{2}-\frac{5}{2}$		835
	3	1579.959	53.60119 – 116.89398	$3d^74s^2 - 3d^7(a^2D)4s4p(^3P^\circ)$	$^4F - v^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	8	1580.588	70.63546 – 133.90300	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^4D^\circ - ^2D$	$\frac{5}{2}-\frac{3}{2}$		835
	1	1580.674						835
	2	1580.698	66.57971 – 129.84233	$3d^8(a^3P)4p - 3d^8(a^3F_4)6d$	$^4P^\circ - ^4D$	$\frac{3}{2}-\frac{5}{2}$		835
	6	1581.085	67.69464 – 130.94236	$3d^8(a^1D)4p - 3d^8(a^1D)6s$	$^2F^\circ - ^2D$	$\frac{5}{2}-\frac{3}{2}$		835
	25	1581.334	53.03793 – 116.27581	$3d^74s^2 - 3d^7(a^2H)4s4p(^3P^\circ)$	$^4F - w^4G^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	10	1581.704	67.88016 – 131.10318	$3d^74s^2 - 3d^8(a^3F_2)5f$	$^4P - 2[2]^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	6	1581.826	52.73845 – 115.95671	$3d^8(a^3F)4p - 3d^8(a^3P)4d$	$^4D^\circ - ^4F$	$\frac{5}{2}-\frac{5}{2}$		835
	2	1582.135	67.69464 – 130.90065	$3d^8(a^1D)4p - 3d^8(a^1D)6s$	$^2F^\circ - ^2D$	$\frac{5}{2}-\frac{5}{2}$		835
	0	1582.373	70.70677 – 133.90300	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^4D^\circ - ^2D$	$\frac{3}{2}-\frac{3}{2}$		835
	2	1582.571						835
	10	1582.689						835
	17	1583.051	70.35894 – 133.52802	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2G - v^4F^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	1	1583.398	70.70677 – 133.86221	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4D^\circ - ^2P$	$\frac{3}{2}-\frac{3}{2}$		835
	10	1583.436	53.60119 – 116.75493	$3d^74s^2 - 3d^7(a^2H)4s4p(^3P^\circ)$	$^4F - w^4G^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	15	1583.509	70.70677 – 133.85773	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4D^\circ - ^4P$	$\frac{3}{2}-\frac{1}{2}$		835
	10	1584.530						835
	16	1584.563	70.74870 – 133.85773	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4D^\circ - ^4P$	$\frac{1}{2}-\frac{1}{2}$		835
	1	1584.761	68.13121 – 131.23283	$3d^8(a^1D)4p - 3d^8(a^3F_2)5g$	$^2F^\circ - 2[4]^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	200	1585.117	70.35894 – 133.44575	$3d^74s^2 - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2G - w^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	4	1585.702	57.08055 – 120.14417	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^2F^\circ - ^4D$	$\frac{7}{2}-\frac{5}{2}$		835
	4	1586.677	56.07526 – 119.10006	$3d^8(a^3F)4p - 3d^8(a^3F_2)6s$	$^4F^\circ - ^4F$	$\frac{5}{2}-\frac{3}{2}$		835
	3	1587.138	51.04546 – 114.05204	$3d^74s^2 - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4F^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	8	1587.207	52.20595 – 115.20985	$3d^74s^2 - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4G^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	18	1587.443	55.29965 – 118.29417	$3d^8(a^3F)4p - 3d^8(a^3F_3)6s$	$^2G^\circ - ^2F$	$\frac{9}{2}-\frac{7}{2}$		835
	35	1587.845	70.63546 – 133.61399	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4D^\circ - ^4P$	$\frac{5}{2}-\frac{3}{2}$		835
	10	1588.200	57.08055 – 120.04495	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^2F^\circ - ^4G$	$\frac{7}{2}-\frac{9}{2}$		835
	15	1588.369	70.77812 – 133.73526	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^4D^\circ - ^2F$	$\frac{7}{2}-\frac{5}{2}$		835
	10	1588.464	68.15657 – 131.11019	$3d^74s^2 - 3d^8(a^3F_2)5f$	$^4P - 2[2]^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	9	1588.715	56.37141 – 119.31544	$3d^8(a^3F)4p - 3d^8(a^3F_2)6s$	$^2G^\circ - ^2F$	$\frac{7}{2}-\frac{5}{2}$		835
	20	1588.798						835
	40	1589.061	68.28162 – 131.21185	$3d^8(a^1D)4p - 3d^8(a^3F_2)5g$	$^2P^\circ - 2[2]^\circ$	$\frac{1}{2}-\frac{3}{2}$		835
	80	1589.116	74.28333 – 137.21193	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^2S^\circ - ^2P$	$\frac{1}{2}-\frac{1}{2}$		835
	200	1589.246	71.45774 – 134.38082	$3d^74s^2 - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2G - w^2G^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	5	1589.474	52.20595 – 115.12000	$3d^74s^2 - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4F^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	1	1589.547	74.30093 – 137.21193	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4S^\circ - ^2P$	$\frac{3}{2}-\frac{1}{2}$		835
	3	1589.563	74.30093 – 137.21193	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4S^\circ - ^2P$	$\frac{3}{2}-\frac{1}{2}$		835
	20	1589.644	70.70677 – 133.61399	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4D^\circ - ^4P$	$\frac{3}{2}-\frac{3}{2}$		835
	80	1589.772	52.20595 – 115.10809	$3d^74s^2 - 3d^7(a^2P)4s4p(^1P^\circ)$	$^1F - w^4D^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	8	1589.903	55.41783 – 118.31482	$3d^8(a^3F)4p - 3d^8(a^3F_3)6s$	$^4F^\circ - ^4F$	$\frac{7}{2}-\frac{5}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	7	1589.948						835
	0	1590.422	55.41783 – 118.29417	$3d^8(a^3F)4p - 3d^8(a^3F_3)6s$	$^4F^\circ - ^2F$	$\frac{7}{2}-\frac{7}{2}$		835
	10	1590.529						835
	1	1590.703	70.74870 – 133.61399	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4D^\circ - ^4P$	$\frac{1}{2}-\frac{3}{2}$		835
	50	1591.041	13.55039 – 76.40203	$3d^8(a^3F)4s - 3d^8(a^1G)4p$	$^2F - ^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	16	1591.099						835
	10	1591.350						835
	80	1591.415	71.45774 – 134.29499	$3d^74s^2 - 3d^8(a^3F_4)6f$	$^2G - 4[3]^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	2	1591.732	58.49321 – 121.31789	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^2F^\circ - ^4G$	$\frac{5}{2}-\frac{7}{2}$		835
	200	1592.080	70.35894 – 133.16992	$3d^74s^2 - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2G - w^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	15	1592.144	70.63546 – 133.44389	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4D^\circ - ^4P$	$\frac{5}{2}-\frac{5}{2}$		835
	25	1592.248	71.45774 – 134.26207	$3d^74s^2 - 3d^8(a^3F_4)6f$	$^2G - 4[4]^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	50	1592.479	71.45774 – 134.25285	$3d^74s^2 - 3d^8(a^3F_4)6f$	$^2G - 4[3]^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	15	1592.502	52.20595 – 115.00025	$3d^74s^2 - 3d^7(a^2P)4s4p(^3P^\circ)$	$^4F - w^4D^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	1	1592.662	68.15431 – 130.94236	$3d^8(a^1D)4p - 3d^8(a^1D)6s$	$^2D^\circ - ^2D$	$\frac{3}{2}-\frac{3}{2}$		835
	1	1593.132	68.13121 – 130.90065	$3d^8(a^1D)4p - 3d^8(a^1D)6s$	$^2F^\circ - ^2D$	$\frac{7}{2}-\frac{5}{2}$		835
	15	1593.200						835
	15	1593.522						835
	150	1593.611	71.45774 – 134.20830	$3d^74s^2 - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2G - w^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	40	1593.698	53.03793 – 115.78506	$3d^74s^2 - 3d^7(a^2P)4s4p(^3P^\circ)$	$^4F - t^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	1	1594.019	58.49321 – 121.22780	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^2F^\circ - ^4F$	$\frac{5}{2}-\frac{5}{2}$		835
	6	1594.287	57.42016 – 120.14417	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^2D^\circ - ^4D$	$\frac{5}{2}-\frac{5}{2}$		835
	35	1594.346						835
	1	1594.575	66.57134 – 129.28450	$3d^8(a^3P)4p - 3d^8(a^3F_4)6d$	$^4P^\circ - ^4P$	$\frac{5}{2}-\frac{5}{2}$		835
	12	1594.703	51.04546 – 113.75304	$3d^74s^2 - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4G^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	1	1595.332						835
	8	1595.519	56.42449 – 119.10006	$3d^8(a^3F)4p - 3d^8(a^3F_2)6s$	$^4F^\circ - ^4F$	$\frac{3}{2}-\frac{3}{2}$		835
	70	1595.608	74.28333 – 136.95528	$3d^8(a^3P)4p - 3d^8(a^3F_2)7d$	$^2S^\circ - ^2P$	$\frac{1}{2}-\frac{1}{2}$		835
	70	1595.768	70.77812 – 133.44389	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4D^\circ - ^4P$	$\frac{7}{2}-\frac{5}{2}$		835
	15	1595.919	74.30093 – 136.96075	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4S^\circ - ^4P$	$\frac{3}{2}-\frac{5}{2}$		835
	60	1596.074	74.30093 – 136.95528	$3d^8(a^3P)4p - 3d^8(a^3F_2)7d$	$^4S^\circ - ^2P$	$\frac{3}{2}-\frac{1}{2}$		835
	1	1596.874	58.49321 – 121.11559	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^2F^\circ - ^2P$	$\frac{5}{2}-\frac{3}{2}$		835
	1	1597.031	74.28333 – 136.89934	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^2S^\circ - ^4P$	$\frac{1}{2}-\frac{3}{2}$		835
	25	1597.101						835
	9	1597.484	74.30093 – 136.89934	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4S^\circ - ^4P$	$\frac{3}{2}-\frac{3}{2}$		835
	7	1597.886	57.42016 – 120.00286	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^2D^\circ - ^4F$	$\frac{5}{2}-\frac{7}{2}$		835
	40	1598.282	73.89373 – 136.46110	$3d^74s^2 - 3d^7(a^2P)4s4p(^1P^\circ)$	$^2P - v^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	4	1598.315						835
	30	1598.371	71.77083 – 134.33446	$3d^8(a^3P)4p - 3d^8(a^3F_4)6g$	$^2D^\circ - 4[2]^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	18	1598.860						835
	40	1599.251						835
	12	1599.282	53.03793 – 115.56598	$3d^74s^2 - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4G^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	1	1599.439	58.70595 – 121.22780	$3d^8(a^3F)4p - 3d^8(a^3F_3)5d$	$^2D^\circ - ^4F$	$\frac{3}{2}-\frac{5}{2}$		835
	10	1599.549	54.55705 – 117.07470	$3d^8(a^3F)4p - 3d^8(a^3F_4)6s$	$^4F^\circ - ^4F$	$\frac{9}{2}-\frac{7}{2}$		835
	25	1599.603	71.45774 – 133.97333	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2G - s^4D^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	10	1600.268	57.42016 – 119.90972	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^2D^\circ - ^4P$	$\frac{5}{2}-\frac{3}{2}$		835
	18	1600.565						835
	3	1600.753	54.26263 – 116.73251	$3d^8(a^3F)4p - 3d^8(a^3P)4d$	$^4G^\circ - ^4P$	$\frac{7}{2}-\frac{5}{2}$		835
	16	1601.045	70.35894 – 132.81816	$3d^74s^2 - 3d^8(a^1D_2)4f$	$^2G - 2[4]^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	10	1601.240	67.88016 – 130.33178	$3d^74s^2 - 3d^7(a^4P)4s4p(^1P^\circ)$	$^4P - t^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	8	1601.288	74.28333 – 136.73274	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^2S^\circ - ^4F$	$\frac{1}{2}-\frac{3}{2}$		835
	3	1601.400						835
	1	1601.518	9.33004 – 71.77083	$3d^8(a^3F)4s - 3d^8(a^3P)4p$	$^4F - ^2D^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	4	1601.742	74.30093 – 136.73274	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4S^\circ - ^4F$	$\frac{3}{2}-\frac{3}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	10	1601.928	74.30093 – 136.72533	$3d^8(a^3P)4p - 3d^8(a^3P)5d$	$^4S^\circ - {}^4P$	$\frac{3}{2}-\frac{1}{2}$		835
	12	1602.209	68.15657 – 130.57042	$3d^74s^2 - 3d^7(a^4P)4s4p(^1P^\circ)$	$^4P - t^4D^\circ$	$\frac{3}{2}-\frac{1}{2}$		835
	1	1602.679	71.45774 – 133.85304	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2G - v^4F^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	20	1602.973	8.39390 – 70.77812	$3d^8(a^3F)4s - 3d^8(a^3P)4p$	$^4F - {}^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	1	1603.224	53.36517 – 115.73915	$3d^8(a^3F)4p - 3d^8(a^3P)4d$	$^4G^\circ - {}^4F$	$\frac{9}{2}-\frac{9}{2}$		835
	20	1603.410	13.55039 – 75.91763	$3d^8(a^3F)4s - 3d^8(a^1G)4p$	$^2F - {}^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	25	1603.555						835
	16	1603.728	68.70976 – 131.06385	$3d^74s^2 - 3d^8(a^3F_2)5f$	$^4P - 2[1]^\circ$	$\frac{1}{2}-\frac{1}{2}$		835
	5	1603.917	52.73845 – 115.08536	$3d^8(a^3F)4p - 3d^8(a^1G)5s$	$^4D^\circ - {}^2G$	$\frac{5}{2}-\frac{7}{2}$		835
	2	1604.394	67.88016 – 130.20889	$3d^74s^2 - 3d^8(a^3F_3)5f$	$^4P - 3[3]^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	18	1604.482						835
	5	1604.570	53.63462 – 115.95671	$3d^8(a^3F)4p - 3d^8(a^3P)4d$	$^4D^\circ - {}^4F$	$\frac{3}{2}-\frac{5}{2}$		835
	3	1604.696	67.88016 – 130.19723	$3d^74s^2 - 3d^8(a^3F_3)5f$	$^4P - 3[2]^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	9	1605.027	67.88016 – 130.18439	$3d^74s^2 - 3d^8(a^3F_3)5f$	$^4P - 3[2]^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	4	1605.217	71.77083 – 134.06776	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^2D^\circ - {}^2P$	$\frac{5}{2}-\frac{3}{2}$		835
	35	1605.744	51.04546 – 113.32195	$3d^74s^2 - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	3	1605.795						835
	60	1605.910						835
	12	1606.280						835
	30	1606.469						835
	8	1606.695	56.07526 – 118.31482	$3d^8(a^3F)4p - 3d^8(a^3F_3)6s$	$^4F^\circ - {}^4F$	$\frac{5}{2}-\frac{5}{2}$		835
	15	1606.729						835
	18	1606.902						835
	1	1607.477						835
	20	1607.849						835
	3	1607.987	68.13121 – 130.32094	$3d^8(a^1D)4p - 3d^8(a^3F_3)5g$	$^2F^\circ - 3[4]^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	60	1608.134	53.60119 – 115.78506	$3d^74s^2 - 3d^7(a^2P)4s4p(^3P^\circ)$	$^4F - t^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	80	1608.177	32.52354 – 94.70593	$3d^8(a^1G)4s - 3d^7(a^4F)4s4p(^3P^\circ)$	$^2G - z^4F^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	4	1608.244						835
	30	1608.358	68.15657 – 130.33178	$3d^74s^2 - 3d^7(a^4P)4s4p(^1P^\circ)$	$^4P - t^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	25	1608.442	53.03793 – 115.20985	$3d^74s^2 - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4G^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	1	1608.708	76.40203 – 138.56371	$3d^8(a^1G)4p - 3d^8(a^3F_3)9s$	$^2F^\circ - {}^2F$	$\frac{5}{2}-\frac{7}{2}$		835
	1	1609.343	52.73845 – 114.87488	$3d^8(a^3F)4p - 3d^8(a^3P)4d$	$^4D^\circ - {}^4D$	$\frac{5}{2}-\frac{5}{2}$		835
	12	1609.474	71.77083 – 133.90300	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^2D^\circ - {}^2D$	$\frac{5}{2}-\frac{3}{2}$		835
	20	1610.102	67.88016 – 129.98805	$3d^74s^2 - 3d^7(a^4P)4s4p(^3P^\circ)$	$^4P - t^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	18	1610.532	71.77083 – 133.86221	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^2D^\circ - {}^2P$	$\frac{5}{2}-\frac{3}{2}$		835
	8	1611.061	68.15657 – 130.22752	$3d^74s^2 - 3d^8(a^3F_3)5f$	$^4P - 3[3]^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	6	1611.079	53.03793 – 115.10809	$3d^74s^2 - 3d^7(a^2P)4s4p(^1P^\circ)$	$^4F - w^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	2	1611.238						835
	25	1611.390						835
	2	1611.927						835
	1	1612.163	68.15657 – 130.18439	$3d^74s^2 - 3d^8(a^3F_3)5f$	$^4P - 3[2]^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	20	1612.450	68.15657 – 130.17403	$3d^74s^2 - 3d^8(a^3F_3)5f$	$^4P - 3[1]^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	2	1613.132	53.60119 – 115.59225	$3d^74s^2 - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4F^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	60	1613.216	71.45774 – 133.44575	$3d^74s^2 - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2G - w^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	20	1613.820	53.60119 – 115.56598	$3d^74s^2 - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4G^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	1	1613.949						835
	2	1614.218						835
	10	1614.495						835
	30	1614.824						835
	90	1614.911	56.37141 – 118.29417	$3d^8(a^3F)4p - 3d^8(a^3F_3)6s$	$^2G^\circ - {}^2F$	$\frac{7}{2}-\frac{7}{2}$		835
	120	1615.459	67.88016 – 129.78207	$3d^74s^2 - 3d^7(a^4P)4s4p(^1P^\circ)$	$^4P - t^4D^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	9	1615.704						835
	15	1616.387	72.37542 – 134.24196	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^2D^\circ - {}^2P$	$\frac{3}{2}-\frac{1}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	2	1616.456						835
	25	1616.536	68.70976 – 130.57042	$3d^7 4s^2 - 3d^7(a^4P)4s4p(^1P^\circ)$	$^4P - t^4D^\circ$	$\frac{1}{2}-\frac{1}{2}$		835
	25	1616.917	52.20595 – 114.05204	$3d^7 4s^2 - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4F^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	2	1616.993	71.77083 – 133.61399	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^2D^\circ - ^4P$	$\frac{5}{2}-\frac{3}{2}$		835
	50	1617.088						835
	40	1617.144						835
	40	1617.299	53.03793 – 114.86935	$3d^7 4s^2 - 3d^7(a^2P)4s4p(^3P^\circ)$	$^4F - w^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	20	1618.950	76.72736 – 138.49584	$3d^7 4s^2 - 3d^7(a^2F)4s4p(^1P^\circ)$	$^2H - w^2G^\circ$	$\frac{11}{2}-\frac{9}{2}$		835
	1	1619.193	73.89373 – 135.65293	$3d^7 4s^2 - 3d^8(a^3P_2)4f$	$^2P - 2[1]^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	6	1619.395	71.45774 – 133.20930	$3d^7 4s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2G - v^4F^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	7	1619.607						835
	20	1619.857						835
	6	1619.964	73.89373 – 135.62359	$3d^7 4s^2 - 3d^8(a^3F_3)6f$	$^2P - 3[2]^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	5	1619.989						835
	18	1620.331	53.36517 – 115.08136	$3d^8(a^3F)4p - 3d^8(a^1G)5s$	$^4G^\circ - ^2G$	$\frac{9}{2}-\frac{9}{2}$		835
	1	1620.428	71.45774 – 133.16992	$3d^7 4s^2 - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2G - w^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	3	1620.842						835
	1	1620.946	72.37542 – 134.06776	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^2D^\circ - ^2P$	$\frac{3}{2}-\frac{3}{2}$		835
	40	1621.460	71.77083 – 133.44389	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^2D^\circ - ^4P$	$\frac{5}{2}-\frac{5}{2}$		835
	6	1621.880	55.41783 – 117.07470	$3d^8(a^3F)4p - 3d^8(a^3F_4)6s$	$^4F^\circ - ^4F$	$\frac{7}{2}-\frac{7}{2}$		835
	18	1621.926	10.11566 – 71.77083	$3d^8(a^3F)4s - 3d^8(a^3P)4p$	$^4F - ^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	80	1622.106						835
	2	1622.164						835
	20	1622.796	68.70976 – 130.33178	$3d^7 4s^2 - 3d^7(a^4P)4s4p(^1P^\circ)$	$^4P - t^4D^\circ$	$\frac{1}{2}-\frac{3}{2}$		835
	1	1622.923						835
	1	1622.981	51.55785 – 113.17296	$3d^8(a^3F)4p - 3d^8(a^1D)4d$	$^4D^\circ - ^2G$	$\frac{7}{2}-\frac{9}{2}$		835
	60	1624.084	71.45774 – 133.03100	$3d^7 4s^2 - 3d^8(a^1D_2)4f$	$^2G - 2[5]^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	20	1624.172	70.35894 – 131.92877	$3d^7 4s^2 - 3d^8(a^3F_3)7p$	$^2G - ^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	0	1624.435						835
	16	1624.773	52.20595 – 113.75304	$3d^7 4s^2 - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4G^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	25	1625.233						835
	2	1625.288	72.37542 – 133.90300	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^2D^\circ - ^2D$	$\frac{3}{2}-\frac{3}{2}$		835
	12	1626.161						835
	20	1626.309	73.89373 – 135.38253	$3d^7 4s^2 - 3d^7(a^2P)4s4p(^1P^\circ)$	$^2P - w^2P^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	15	1626.320	73.89373 – 135.38253	$3d^7 4s^2 - 3d^7(a^2P)4s4p(^1P^\circ)$	$^2P - w^2P^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	6	1626.366	72.37542 – 133.86221	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^2D^\circ - ^2P$	$\frac{3}{2}-\frac{3}{2}$		835
	12	1626.961	68.70976 – 130.17403	$3d^7 4s^2 - 3d^8(a^3F_3)5f$	$^4P - 3[1]^\circ$	$\frac{1}{2}-\frac{3}{2}$		835
	12	1627.396	9.33004 – 70.77812	$3d^8(a^3F)4s - 3d^8(a^3P)4p$	$^4F - ^4D^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	4	1627.656	58.70595 – 120.14417	$3d^8(a^3F)4p - 3d^8(a^3F_4)5d$	$^2D^\circ - ^4D$	$\frac{3}{2}-\frac{5}{2}$		835
	15	1628.126	66.57134 – 127.99156	$3d^8(a^3P)4p - 3d^8(a^3F_4)7s$	$^4P^\circ - ^4F$	$\frac{5}{2}-\frac{7}{2}$		835
	10	1628.497	14.99557 – 76.40203	$3d^8(a^3F)4s - 3d^8(a^1G)4p$	$^2F - ^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	15	1628.726						835
	20	1628.810	76.72736 – 138.12188	$3d^7 4s^2 - 3d^8(a^3F_4)9p$	$^2H - ^4F^\circ$	$\frac{11}{2}-\frac{9}{2}$		835
	100	1629.282	51.04546 – 112.42219	$3d^7 4s^2 - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4G^\circ$	$\frac{9}{2}-\frac{11}{2}$		835
	11	1629.445						835
	70	1629.591	73.89373 – 135.25892	$3d^7 4s^2 - 3d^7(a^2P)4s4p(^1P^\circ)$	$^2P - v^2D^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	1	1629.718	71.45774 – 132.81816	$3d^7 4s^2 - 3d^8(a^1D_2)4f$	$^2G - 2[4]^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	20	1630.130						835
	10	1630.356	53.63462 – 114.97019	$3d^8(a^3F)4p - 3d^8(a^3P)4d$	$^4D^\circ - ^4D$	$\frac{3}{2}-\frac{1}{2}$		835
	25	1631.024						835
	12	1631.182	9.33004 – 70.63546	$3d^8(a^3F)4s - 3d^8(a^3P)4p$	$^4F - ^4D^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	15	1632.152	53.60119 – 114.86935	$3d^7 4s^2 - 3d^7(a^2P)4s4p(^3P^\circ)$	$^4F - w^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	30	1632.171	53.60119 – 114.86935	$3d^7 4s^2 - 3d^7(a^2P)4s4p(^3P^\circ)$	$^4F - w^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	1	1632.416						835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	6	1632.488	72.98565 – 134.24196	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^2P^\circ - ^2P$	$\frac{3}{2}-\frac{1}{2}$		835
	2	1632.960	72.37542 – 133.61399	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^2D^\circ - ^4P$	$\frac{3}{2}-\frac{3}{2}$		835
	4	1633.189						835
	10	1633.625	57.08055 – 118.29417	$3d^8(a^3F)4p - 3d^8(a^3F_3)6s$	$^2F^\circ - ^2F$	$\frac{7}{2}-\frac{7}{2}$		835
	35	1633.988						835
	30	1635.070	73.89373 – 135.05314	$3d^74s^2 - 3d^7(a^2P)4s4p(^1P^\circ)$	$^2P - w^2P^\circ$	$\frac{1}{2}-\frac{1}{2}$		835
	100	1635.340	55.01871 – 116.16776	$3d^8(a^3F)4p - 3d^8(a^3P)4d$	$^4G^\circ - ^4F$	$\frac{5}{2}-\frac{3}{2}$		835
	1	1636.068						835
	4	1636.231	52.20595 – 113.32195	$3d^74s^2 - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4F^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	3	1636.488	10.66389 – 71.77083	$3d^8(a^3F)4s - 3d^8(a^3P)4p$	$^4F - ^2D^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	20	1637.072						835
	2	1637.140	72.98565 – 134.06776	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^2P^\circ - ^2P$	$\frac{3}{2}-\frac{3}{2}$		835
	10	1637.267						835
	100	1637.439	73.89373 – 134.96478	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2P - w^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	20	1637.509	72.37542 – 133.44389	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^2D^\circ - ^4P$	$\frac{3}{2}-\frac{5}{2}$		835
	300	1637.589	70.35894 – 131.42432	$3d^74s^2 - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2G - x^2H^\circ$	$\frac{9}{2}-\frac{11}{2}$		835
	4	1638.963	53.03793 – 114.05204	$3d^74s^2 - 3d^7(a^4F)4s4p(^1P^\circ)$	$^4F - x^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	8	1639.987						835
	7	1640.769	67.88016 – 128.82715	$3d^74s^2 - 3d^8(a^3F_4)5f$	$^4P - 4[3]^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	10	1641.418	67.88016 – 128.80323	$3d^74s^2 - 3d^8(a^3F_4)5f$	$^4P - 4[2]^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	20	1642.299						835
	40	1642.324	73.89373 – 134.78314	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2P - w^2D^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	15	1642.351						835
	5	1642.670	72.98565 – 133.86221	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^2P^\circ - ^2P$	$\frac{3}{2}-\frac{3}{2}$		835
	2	1642.739	57.42016 – 118.29417	$3d^8(a^3F)4p - 3d^8(a^3F_3)6s$	$^2D^\circ - ^2F$	$\frac{5}{2}-\frac{7}{2}$		835
	2	1642.792	70.74870 – 131.62045	$3d^8(a^3P)4p - 3d^8(a^3F_2)6d$	$^4D^\circ - ^4F$	$\frac{1}{2}-\frac{3}{2}$		835
	80	1643.271	71.45774 – 132.31198	$3d^74s^2 - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2G - x^2H^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	20	1643.334	67.88016 – 128.73203	$3d^74s^2 - 3d^8(a^3F_4)5f$	$^4P - 4[1]^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	14	1644.040						835
	6	1644.137	58.49321 – 119.31544	$3d^8(a^3F)4p - 3d^8(a^3F_2)6s$	$^2F^\circ - ^2F$	$\frac{5}{2}-\frac{5}{2}$		835
	0	1645.654	54.17626 – 114.94242	$3d^8(a^3F)4p - 3d^8(a^3P)4d$	$^4D^\circ - ^4D$	$\frac{1}{2}-\frac{3}{2}$		835
	10	1647.637						835
	3	1648.353						835
	1	1648.381	68.15657 – 128.82223	$3d^74s^2 - 3d^8(a^3F_4)5f$	$^4P - 4[2]^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	13	1649.396	72.98565 – 133.61399	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^2P^\circ - ^4P$	$\frac{3}{2}-\frac{3}{2}$		835
	3	1649.905	58.70595 – 119.31544	$3d^8(a^3F)4p - 3d^8(a^3F_2)6s$	$^2D^\circ - ^2F$	$\frac{3}{2}-\frac{5}{2}$		835
	14	1650.412	10.11566 – 70.70677	$3d^8(a^3F)4s - 3d^8(a^3P)4p$	$^4F - ^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	4	1650.636						835
	10	1650.835	68.15657 – 128.73203	$3d^74s^2 - 3d^8(a^3F_4)5f$	$^4P - 4[1]^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	13	1652.270						835
	3	1652.355	10.11566 – 70.63546	$3d^8(a^3F)4s - 3d^8(a^3P)4p$	$^4F - ^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	3	1652.477						835
	10	1652.726						835
	15	1652.839						835
	18	1653.369						835
	10	1653.687	71.45774 – 131.92877	$3d^74s^2 - 3d^8(a^3F_3)7p$	$^2G - ^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	10	1653.779						835
	1	1654.667						835
	1	1655.749						835
	0	1655.903	73.89373 – 134.28376	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2P - s^4D^\circ$	$\frac{3}{2}-\frac{1}{2}$		835
	3	1656.840	73.89373 – 134.24972	$3d^74s^2 - 3d^8(a^3F_4)6f$	$^2P - 4[1]^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	2	1657.273						835
	10	1657.313	73.90325 – 134.24196	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^2P^\circ - ^2P$	$\frac{1}{2}-\frac{1}{2}$		835
	20	1661.018	77.33247 – 137.53596	$3d^74s^2 - 3d^8(a^3F_4)7f$	$^2D - 4[4]^\circ$	$\frac{5}{2}-\frac{7}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	3	1662.063						835
	20	1662.423						835
	25	1662.892						835
	16	1663.563	70.35894 – 130.47090	$3d^7 4s^2 - 3d^8(a^3F_4)7p$	$^2G - {}^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	10	1664.316	10.66389 – 70.74870	$3d^8(a^3F)4s - 3d^8(a^3P)4p$	$^4F - {}^4D^\circ$	$\frac{3}{2}-\frac{1}{2}$		835
	2	1664.384	79.92388 – 140.00617	$3d^8(a^1G)4p - 3d^8(a^1G)6s$	$^2G^\circ - {}^2G$	$\frac{9}{2}-\frac{9}{2}$		835
	8	1664.459	73.89373 – 133.97333	$3d^7 4s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2P - s^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	4	1665.477	10.66389 – 70.70677	$3d^8(a^3F)4s - 3d^8(a^3P)4p$	$^4F - {}^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		835
	1	1665.860						835
	0	1666.045	68.70976 – 128.73203	$3d^7 4s^2 - 3d^8(a^3F_4)5f$	$^4P - 4[1]^\circ$	$\frac{1}{2}-\frac{3}{2}$		835
	4	1666.828	57.08055 – 117.07470	$3d^8(a^3F)4p - 3d^8(a^3F_4)6s$	$^2F^\circ - {}^4F$	$\frac{7}{2}-\frac{7}{2}$		835
	4	1667.930	73.90325 – 133.85773	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^2P^\circ - {}^4P$	$\frac{1}{2}-\frac{1}{2}$		835
	1	1668.122	52.73845 – 112.68630	$3d^8(a^3F)4p - 3d^8(a^1D)4d$	$^4D^\circ - {}^2F$	$\frac{5}{2}-\frac{5}{2}$		835
	7	1670.935	70.35894 – 130.20562	$3d^7 4s^2 - 3d^8(a^3F_3)5f$	$^2G - 3[5]^\circ$	$\frac{9}{2}-\frac{11}{2}$		835
	12	1671.514	77.73679 – 137.56274	$3d^7 4s^2 - 3d^8(a^3F_2)8p$	$^2H - {}^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	10	1674.000	8.39390 – 68.13121	$3d^8(a^3F)4s - 3d^8(a^1D)4p$	$^4F - {}^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	3	1676.317	57.42016 – 117.07470	$3d^8(a^3F)4p - 3d^8(a^3F_4)6s$	$^2D^\circ - {}^4F$	$\frac{5}{2}-\frac{7}{2}$		835
	2	1676.671						835
	1	1677.297	74.28333 – 133.90300	$3d^8(a^3P)4p - 3d^8(a^1D)5d$	$^2S^\circ - {}^2D$	$\frac{1}{2}-\frac{3}{2}$		835
	5	1678.447	74.28333 – 133.86221	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^2S^\circ - {}^2P$	$\frac{1}{2}-\frac{3}{2}$		835
	10	1678.476	52.20595 – 111.78379	$3d^7 4s^2 - 3d^7(a^2G)4s4p(^3P^\circ)$	$^4F - y^4G^\circ$	$\frac{7}{2}-\frac{7}{2}$		835
	1	1678.941	74.30093 – 133.86221	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4S^\circ - {}^2P$	$\frac{3}{2}-\frac{3}{2}$		835
	7	1679.068	74.30093 – 133.85773	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4S^\circ - {}^4P$	$\frac{3}{2}-\frac{1}{2}$		835
	70	1684.952	76.72736 – 136.07626	$3d^7 4s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2H - v^2G^\circ$	$\frac{11}{2}-\frac{9}{2}$		835
	8	1685.465	74.28333 – 133.61399	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^2S^\circ - {}^4P$	$\frac{1}{2}-\frac{3}{2}$		835
	9	1685.965	74.30093 – 133.61399	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4S^\circ - {}^4P$	$\frac{3}{2}-\frac{3}{2}$		835
	9	1686.934						835
	12	1690.814	74.30093 – 133.44389	$3d^8(a^3P)4p - 3d^8(a^3P)6s$	$^4S^\circ - {}^4P$	$\frac{3}{2}-\frac{5}{2}$		835
	11	1691.231	77.33247 – 136.46110	$3d^7 4s^2 - 3d^7(a^2P)4s4p(^1P^\circ)$	$^2D - v^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	10	1693.177	77.33247 – 136.39285	$3d^7 4s^2 - 3d^8(^1D)6p$	$^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
	2	1694.384	73.89373 – 132.91215	$3d^7 4s^2 - 3d^8(a^1D_2)4f$	$^2P - 2[2]^\circ$	$\frac{3}{2}-\frac{5}{2}$		835
	8	1695.594	51.04546 – 110.02192	$3d^7 4s^2 - 3d^7(a^2G)4s4p(^3P^\circ)$	$^4F - y^4G^\circ$	$\frac{9}{2}-\frac{9}{2}$		835
	1	1695.897						835
	2	1696.527						835
	4	1698.400	76.72736 – 135.60630	$3d^7 4s^2 - 3d^8(a^3F_3)6f$	$^2H - 3[6]^\circ$	$\frac{11}{2}-\frac{13}{2}$		835
	2	1699.772	76.72736 – 135.55880	$3d^7 4s^2 - 3d^8(a^3P)4f$	$^2H - {}^4G^\circ$	$\frac{11}{2}-\frac{9}{2}$		835
	1	1700.665	51.04546 – 109.84600	$3d^7 4s^2 - 3d^7(a^2G)4s4p(^3P^\circ)$	$^4F - y^4F^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	2	1701.504	57.42016 – 116.19147	$3d^8(a^3F)4p - 3d^8(a^3P)4d$	$^2D^\circ - {}^2F$	$\frac{5}{2}-\frac{5}{2}$		835
	1	1702.150	71.45774 – 130.20690	$3d^7 4s^2 - 3d^8(a^3F_3)5f$	$^2G - 3[5]^\circ$	$\frac{7}{2}-\frac{9}{2}$		835
	7	1702.265	53.03793 – 111.78379	$3d^7 4s^2 - 3d^7(a^2G)4s4p(^3P^\circ)$	$^4F - y^4G^\circ$	$\frac{5}{2}-\frac{7}{2}$		835
5	25	1703.408	0.0 – 58.70595	$3d^9 - 3d^8(a^3F)4p$	$g^2D - {}^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		835
	100	1704.54						089
	11	1705.581						835
	8	1705.739						835
	2	1706.170	76.72736 – 135.33801	$3d^7 4s^2 - 3d^8(a^3F_4)8p$	$^2H - {}^4G^\circ$	$\frac{11}{2}-\frac{11}{2}$		835
	25	1708.386	76.72736 – 135.26199	$3d^7 4s^2 - 3d^8(a^3F_4)8p$	$^2H - {}^4G^\circ$	$\frac{11}{2}-\frac{9}{2}$		835
	1	1708.570						835
4	200	1709.598	0.0 – 58.49321	$3d^9 - 3d^8(a^3F)4p$	$g^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		835
	3	1710.032	70.35894 – 128.83711	$3d^7 4s^2 - 3d^8(a^3F_4)5f$	$^2G - 4[6]^\circ$	$\frac{9}{2}-\frac{11}{2}$		835
	2	1713.285	52.20595 – 110.57336	$3d^7 4s^2 - 3d^7(a^2G)4s4p(^3P^\circ)$	$^4F - y^4F^\circ$	$\frac{7}{2}-\frac{5}{2}$		835
	1	1716.148						835
	3	1717.700	77.73679 – 135.95409	$3d^7 4s^2 - 3d^8(a^3P_0)4f$	$^2H - 0[3]^\circ$	$\frac{9}{2}-\frac{7}{2}$		835
	5	1719.906						835
	15	1721.092	51.04546 – 109.14805	$3d^7 4s^2 - 3d^7(a^2G)4s4p(^3P^\circ)$	$^4F - y^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		835

Ni II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	1722.113	77.33247 – 135.40067	$3d^74s^2 - 3d^8(a^3P_2)4f$	$^2D - 2[4]^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	2	1722.646	77.33247 – 135.38253	$3d^74s^2 - 3d^7(a^2P)4s4p(^1P^\circ)$	$^2D - w^2P^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	20	1723.859	77.73679 – 135.74606	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2H - v^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$		835
	1	1723.957						835
	1	1724.818						835
	4	1726.324	77.33247 – 135.25892	$3d^74s^2 - 3d^7(a^2P)4s4p(^1P^\circ)$	$^2D - v^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	1	1728.022	77.73679 – 135.60620	$3d^74s^2 - 3d^8(a^3F_3)6f$	$^2H - 3[\frac{11}{2}]^\circ$	$\frac{9}{2} - \frac{11}{2}$		835
	2	1728.133						835
	6	1728.625						835
	1	1732.620						835
	8	1734.904	52.20595 – 109.84600	$3d^74s^2 - 3d^7(a^2G)4s4p(^3P^\circ)$	$^4F - y^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		835
	5	1735.135	77.33247 – 134.96478	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2D - w^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	3	1738.059	53.03793 – 110.57336	$3d^74s^2 - 3d^7(a^2G)4s4p(^3P^\circ)$	$^4F - y^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	12	1738.311	70.35894 – 127.88586	$3d^74s^2 - 3d^8(a^1G)5p$	$^2G - {^2G^\circ}$	$\frac{9}{2} - \frac{9}{2}$		835
	1	1738.549	53.60119 – 111.12054	$3d^74s^2 - 3d^7(a^2G)4s4p(^3P^\circ)$	$^4F - y^4F^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	4	1738.793	76.72736 – 134.23844	$3d^74s^2 - 3d^8(a^3F_4)6f$	$^2H - 4[\frac{13}{2}]^\circ$	$\frac{11}{2} - \frac{13}{2}$		835
	30	1740.619	77.33247 – 134.78314	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2D - w^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
5	1000	1741.547	0.0 – 57.42016	$3d^9 - 3d^8(a^3F)4p$	$g^2D - {^2D^\circ}$	$\frac{5}{2} - \frac{5}{2}$		835
	1	1746.989	9.33004 – 66.57134	$3d^8(a^3F)4s - 3d^8(a^3P)4p$	$^4F - {^4P^\circ}$	$\frac{7}{2} - \frac{5}{2}$		835
	500	1748.285	1.50694 – 58.70595	$3d^9 - 3d^8(a^3F)4p$	$g^2D - {^2D^\circ}$	$\frac{3}{2} - \frac{3}{2}$		835
	300	1751.911	0.0 – 57.08055	$3d^9 - 3d^8(a^3F)4p$	$g^2D - {^2F^\circ}$	$\frac{5}{2} - \frac{7}{2}$		835
	50	1754.808	1.50694 – 58.49321	$3d^9 - 3d^8(a^3F)4p$	$g^2D - {^2F^\circ}$	$\frac{3}{2} - \frac{5}{2}$		835
	2	1756.829	77.33247 – 134.25285	$3d^74s^2 - 3d^8(a^3F_4)6f$	$^2D - 4[3]^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	1	1763.097	76.72736 – 133.44575	$3d^74s^2 - 3d^7(a^2G)4s4p(^1P^\circ)$	$^2H - w^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		835
	2	1769.940	70.35894 – 126.85797	$3d^74s^2 - 3d^8(a^1G)5p$	$^2G - {^2H^\circ}$	$\frac{9}{2} - \frac{11}{2}$		835
	4	1771.865	71.45774 – 127.89533	$3d^74s^2 - 3d^8(a^1G)5p$	$^2G - {^2G^\circ}$	$\frac{7}{2} - \frac{7}{2}$		835
	1	1772.197	78.95545 – 135.38253	$3d^74s^2 - 3d^7(a^2P)4s4p(^1P^\circ)$	$^2D - w^2P^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	25	1773.949	0.0 – 56.37141	$3d^9 - 3d^8(a^3F)4p$	$g^2D - {^2G^\circ}$	$\frac{5}{2} - \frac{7}{2}$		835
2	1	1783.317	0.0 – 56.07526	$3d^9 - 3d^8(a^3F)4p$	$g^2D - {^4F^\circ}$	$\frac{5}{2} - \frac{5}{2}$		835
5	100	1788.485	1.50694 – 57.42016	$3d^9 - 3d^8(a^3F)4p$	$g^2D - {^2D^\circ}$	$\frac{3}{2} - \frac{5}{2}$		835
	1	1789.640	77.33247 – 133.20930	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2D - v^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	1	1791.219	78.95545 – 134.78314	$3d^74s^2 - 3d^7(a^2F)4s4p(^3P^\circ)$	$^2D - w^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		835
	1	1804.451						835
2	30	1804.473	0.0 – 55.41783	$3d^9 - 3d^8(a^3F)4p$	$g^2D - {^4F^\circ}$	$\frac{5}{2} - \frac{7}{2}$		835
	2	1808.330	57.42016 – 112.71975	$3d^8(a^3F)4p - 3d^8(a^1D)4d$	$^2D^\circ - {^2F}$	$\frac{5}{2} - \frac{7}{2}$		835
	30	1812.065	13.55039 – 68.73598	$3d^8(a^3F)4s - 3d^8(a^1D)4p$	$^2F - {^2D^\circ}$	$\frac{7}{2} - \frac{5}{2}$		835
	1	1817.112						835
2	1	1820.916	1.50694 – 56.42449	$3d^9 - 3d^8(a^3F)4p$	$g^2D - {^4F^\circ}$	$\frac{3}{2} - \frac{3}{2}$		835
	1	1825.068	51.04546 – 105.83806	$3d^74s^2 - 3d^8(a^3F_3)5p$	$^4F - {^2F^\circ}$	$\frac{9}{2} - \frac{7}{2}$		835
	1	1832.144	13.55039 – 68.13121	$3d^8(a^3F)4s - 3d^8(a^1D)4p$	$^2F - {^2F^\circ}$	$\frac{7}{2} - \frac{7}{2}$		835
2	1	1832.566	1.50694 – 56.07526	$3d^9 - 3d^8(a^3F)4p$	$g^2D - {^4F^\circ}$	$\frac{3}{2} - \frac{5}{2}$		835
	5	1833.403	51.04546 – 105.58889	$3d^74s^2 - 3d^8(a^3F_3)5p$	$^4F - {^2G^\circ}$	$\frac{9}{2} - \frac{9}{2}$		835
	1	1837.744	52.20595 – 106.62053	$3d^74s^2 - 3d^8(a^3F_2)5p$	$^4F - {^2G^\circ}$	$\frac{7}{2} - \frac{7}{2}$		835
	2	1837.985	75.91763 – 130.32472	$3d^8(a^1G)4p - 3d^8(a^3F_3)5g$	$^2F^\circ - 3[5]^\circ$	$\frac{7}{2} - \frac{9}{2}$		835
	1	1842.889	0.0 – 54.26263	$3d^9 - 3d^8(a^3F)4p$	$g^2D - {^4G^\circ}$	$\frac{5}{2} - \frac{7}{2}$		835
	2	1852.522	58.70595 – 112.68630	$3d^8(a^3F)4p - 3d^8(a^1D)4d$	$^2D^\circ - {^2F}$	$\frac{3}{2} - \frac{5}{2}$		835
	2	1852.875	14.99557 – 68.96565	$3d^8(a^3F)4s - 3d^8(a^1D)4p$	$^2F - {^2P^\circ}$	$\frac{5}{2} - \frac{3}{2}$		835
	6	1857.587						835
	1	1860.689	76.72736 – 130.47090	$3d^74s^2 - 3d^8(a^3F_4)7p$	$^2H - {^4F^\circ}$	$\frac{11}{2} - \frac{9}{2}$		835
	1	1860.796	14.99557 – 68.73598	$3d^8(a^3F)4s - 3d^8(a^1D)4p$	$^2F - {^2D^\circ}$	$\frac{5}{2} - \frac{5}{2}$		835
	6	1864.558	52.20595 – 105.83806	$3d^74s^2 - 3d^8(a^3F_3)5p$	$^4F - {^2F^\circ}$	$\frac{7}{2} - \frac{7}{2}$		835
	5	1865.637	51.04546 – 104.64652	$3d^74s^2 - 3d^8(a^3F_4)5p$	$^4F - {^4F^\circ}$	$\frac{9}{2} - \frac{7}{2}$		835
	5	1866.499	67.88016 – 121.45632	$3d^74s^2 - 3d^8(a^3P)5p$	$^4P - {^4S^\circ}$	$\frac{5}{2} - \frac{3}{2}$		835
	8	1870.460	52.20595 – 105.66878	$3d^74s^2 - 3d^8(a^3F_3)5p$	$^4F - {^4F^\circ}$	$\frac{7}{2} - \frac{5}{2}$		835

NI II — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	3	1875.069	53.03793 – 106.36930	$3d^74s^2 - 3d^8(a^3F_2)5p$	$^4F - ^4F^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	1	1876.180	68.15657 – 121.45632	$3d^74s^2 - 3d^8(a^3P)5p$	$^4P - ^4S^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	2	1876.418	52.20595 – 105.49905	$3d^74s^2 - 3d^8(a^3F_3)5p$	$^4F - ^4G^\circ$	$\frac{7}{2} - \frac{7}{2}$		835
	40	1877.838	51.04546 – 104.29823	$3d^74s^2 - 3d^8(a^3F_4)5p$	$^4F - ^4G^\circ$	$\frac{9}{2} - \frac{9}{2}$		835
	2	1878.103	53.03793 – 106.28316	$3d^74s^2 - 3d^8(a^3F_2)5p$	$^4F - ^4G^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	25	1881.155	14.99557 – 68.15431	$3d^8(a^3F)4s - 3d^8(a^1D)4p$	$^2F - ^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	4	1883.170	51.04546 – 104.14729	$3d^74s^2 - 3d^8(a^3F_4)5p$	$^4F - ^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		835
	20	1885.525	51.04546 – 104.08104	$3d^74s^2 - 3d^8(a^3F_4)5p$	$^4F - ^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		835
	12	1886.043	13.55039 – 66.57134	$3d^8(a^3F)4s - 3d^8(a^3P)4p$	$^2F - ^4P^\circ$	$\frac{7}{2} - \frac{5}{2}$		835
	1	1893.600	23.10828 – 75.91763	$3d^8(a^1D)4s - 3d^8(a^1G)4p$	$^2D - ^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	6	1895.082	53.60119 – 106.36930	$3d^74s^2 - 3d^8(a^3F_2)5p$	$^4F - ^4F^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
1	2	1896.147	0.0 – 52.73845	$3d^9 - 3d^8(a^3F)4p$	$g^2D - ^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	4	1900.025	53.03793 – 105.66878	$3d^74s^2 - 3d^8(a^3F_3)5p$	$^4F - ^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	15	1900.865	51.04546 – 103.65303	$3d^74s^2 - 3d^8(a^3F_4)5p$	$^4F - ^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		835
	2	1900.921	23.79618 – 76.40203	$3d^8(a^1D)4s - 3d^8(a^1G)4p$	$^2D - ^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		835
	1	1907.612	53.60119 – 106.02279	$3d^74s^2 - 3d^8(a^3F_2)5p$	$^4F - ^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$		835
	1	1908.326	53.03793 – 105.43985	$3d^74s^2 - 3d^8(a^3F_3)5p$	$^4F - ^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	2	1912.146	52.20595 – 104.50322	$3d^74s^2 - 3d^8(a^3F_4)5p$	$^4F - ^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		835
	1	1920.582	53.60119 – 105.66878	$3d^74s^2 - 3d^8(a^3F_3)5p$	$^4F - ^4F^\circ$	$\frac{3}{2} - \frac{5}{2}$		835
	2	1927.707	52.20595 – 104.08104	$3d^74s^2 - 3d^8(a^3F_4)5p$	$^4F - ^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		835
	1	1929.063	53.60119 – 105.43985	$3d^74s^2 - 3d^8(a^3F_3)5p$	$^4F - ^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	1	1930.493						835
	1	1937.661	53.03793 – 104.64652	$3d^74s^2 - 3d^8(a^3F_4)5p$	$^4F - ^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	2	1938.579	14.99557 – 66.57971	$3d^8(a^3F)4s - 3d^8(a^3P)4p$	$^2F - ^4P^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	10	1939.901						835
	2	1943.060	53.03793 – 104.50322	$3d^74s^2 - 3d^8(a^3F_4)5p$	$^4F - ^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		835
	2	1943.744	52.20595 – 103.65303	$3d^74s^2 - 3d^8(a^3F_4)5p$	$^4F - ^4D^\circ$	$\frac{7}{2} - \frac{7}{2}$		835
	40	1953.407	23.10828 – 74.30093	$3d^8(a^1D)4s - 3d^8(a^3P)4p$	$^2D - ^4S^\circ$	$\frac{5}{2} - \frac{3}{2}$		835
	1	1954.709	76.72736 – 127.88586	$3d^74s^2 - 3d^8(a^1G)5p$	$^2H - ^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		835
	8	1965.357	25.03638 – 75.91763	$3d^8(a^3P)4s - 3d^8(a^1G)4p$	$^4P - ^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		835
	15	1980.010	23.79618 – 74.30093	$3d^8(a^1D)4s - 3d^8(a^3P)4p$	$^2D - ^4S^\circ$	$\frac{3}{2} - \frac{3}{2}$		835
	3	1980.699	23.79618 – 74.28333	$3d^8(a^1D)4s - 3d^8(a^3P)4p$	$^2D - ^2S^\circ$	$\frac{3}{2} - \frac{1}{2}$		835
	2	1993.570	66.57134 – 116.73251	$3d^8(a^3P)4p - 3d^8(a^3P)4d$	$^4P^\circ - ^4P$	$\frac{5}{2} - \frac{5}{2}$		835
	1	1993.906	66.57971 – 116.73251	$3d^8(a^3P)4p - 3d^8(a^3P)4d$	$^4P^\circ - ^4P$	$\frac{3}{2} - \frac{5}{2}$		835
	15	1995.723	23.79618 – 73.90325	$3d^8(a^1D)4s - 3d^8(a^3P)4p$	$^2D - ^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		835

NICKEL III (Ni^{2+}), Z = 28
Ground State $1s^22s^22p^63s^23p^63d^8(^3F_4)$ (26 electrons)
Ionization Potential 284 900 cm^{-1}; 35.32 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	0	615.164						661
	5	615.554	14.0316 – 176.48710	$3d^8 - 3d^7(b^2D)4p$	$a^1D - ^3P^\circ$	2 – 2		661
	15	625.306	16.6616 – 176.58320	$3d^8 - 3d^7(b^2D)4p$	$a^3P - ^3P^\circ$	2 – 1		661
	100	625.682	16.6616 – 176.48710	$3d^8 - 3d^7(b^2D)4p$	$a^3P - ^3P^\circ$	2 – 2		661
	15	625.938	16.9778 – 176.73640	$3d^8 - 3d^7(b^2D)4p$	$a^3P - ^3P^\circ$	1 – 0		661
	10	626.548	16.9778 – 176.58320	$3d^8 - 3d^7(b^2D)4p$	$a^3P - ^3P^\circ$	1 – 1		661
	30	626.923	16.9778 – 176.48710	$3d^8 - 3d^7(b^2D)4p$	$a^3P - ^3P^\circ$	1 – 2		661
	15	627.541	17.2307 – 176.58320	$3d^8 - 3d^7(b^2D)4p$	$a^3P - ^3P^\circ$	0 – 1		661
	500	630.711	23.1087 – 181.6584	$3d^8 - 3d^7(b^2D)4p$	$a^1G - ^1F^\circ$	4 – 3		661
	1	635.406	0.0 – 157.37542	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - ^1G^\circ$	4 – 4		661
	15	637.057	0.0 – 156.97208	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - ^3F^\circ$	4 – 4		661
	200	637.535	0.0 – 156.85300	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - ^3D^\circ$	4 – 3		661

Ni III — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	2	637.703	0.0 – 156.80870	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - {}^3G^\circ$	4 – 5		661
	10	639.338	0.0 – 156.41120	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - {}^3F^\circ$	4 – 3		661
	5	641.689	0.0 – 155.84140	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - {}^3G^\circ$	4 – 4		661
	100	641.866	1.3607 – 157.15427	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - {}^3D^\circ$	3 – 2		661
	1	642.611	1.3607 – 156.97208	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - {}^3F^\circ$	3 – 4		661
	0	644.488	1.3607 – 156.52287	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - {}^3F^\circ$	3 – 2		661
	20	644.948	1.3607 – 156.41120	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - {}^3F^\circ$	3 – 3		661
	30	645.305	2.2696 – 157.23516	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - {}^3D^\circ$	2 – 1		661
	2	645.632	2.2696 – 157.15427	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - {}^3D^\circ$	2 – 2		661
	1	646.890	2.2696 – 156.85300	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - {}^3D^\circ$	2 – 3		661
	0	647.319	1.3607 – 155.84140	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - {}^3G^\circ$	3 – 4		661
	3	648.271	2.2696 – 156.52287	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - {}^3F^\circ$	2 – 2		661
	2	648.745	2.2696 – 156.41120	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - {}^3F^\circ$	2 – 3		661
	2	649.006	1.3607 – 155.44330	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - {}^3G^\circ$	3 – 3		661
	2	650.701	53.70393 – 207.38210	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5F^\circ$	5 – 4		661
	30	652.652	53.70393 – 206.92518	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5F^\circ$	5 – 5		661
	1	652.837	2.2696 – 155.44330	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - {}^3G^\circ$	2 – 3		661
	10	653.496						661
	10	654.445	2.2696 – 155.07100	$3d^8 - 3d^7(a^2F)4p$	$ga^3F - {}^1D^\circ$	2 – 2		661
	5	654.768	54.65783 – 207.38210	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5F^\circ$	4 – 4		661
	0	655.120	61.33858 – 213.97967	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^3F - {}^3F^\circ$	4 – 3		661
	1	656.431	55.40629 – 207.74430	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5F^\circ$	3 – 3		661
	1	656.724	54.65783 – 206.92518	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5F^\circ$	4 – 5		661
	1	657.304	62.60558 – 214.7440	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^3F - {}^3F^\circ$	3 – 2		661
	0	657.668	55.95221 – 208.0057	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5F^\circ$	2 – 2		661
	0	657.998	55.40629 – 207.38210	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5F^\circ$	3 – 4		661
	0	658.810	55.95221 – 207.74430	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5F^\circ$	2 – 3		661
	30	660.079	61.33858 – 212.8377	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^3F - {}^3F^\circ$	4 – 4		661
	10	660.620	62.60558 – 213.97967	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^3F - {}^3F^\circ$	3 – 3		661
	5	661.061	63.47193 – 214.7440	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^3F - {}^3F^\circ$	2 – 2		661
	200	662.366	61.33858 – 212.3125	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^3F - {}^3D^\circ$	4 – 3		661
	150	663.568	53.70393 – 204.40412	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5D^\circ$	5 – 4		661
	100	664.851	62.60558 – 213.0168	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^3F - {}^3D^\circ$	3 – 2		661
	50	666.417	54.65783 – 204.71493	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5D^\circ$	4 – 3		661
	30	666.585	63.47193 – 213.4900	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^3F - {}^3D^\circ$	2 – 1		661
	5	667.783	54.65783 – 204.40412	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5D^\circ$	4 – 4		661
	1	667.976	62.60558 – 212.3125	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^3F - {}^3D^\circ$	3 – 3		661
	10	668.195	55.40629 – 205.06251	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5D^\circ$	3 – 2		661
	1	668.697	63.47193 – 213.0168	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^3F - {}^3D^\circ$	2 – 2		661
	5	669.458	55.95221 – 205.32700	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5D^\circ$	2 – 1		661
	5	669.755	55.40629 – 204.71493	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5D^\circ$	3 – 3		661
	0	670.440	56.30824 – 205.46600	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5D^\circ$	1 – 0		661
	2	670.640	55.95221 – 205.06251	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5D^\circ$	2 – 2		661
	0	671.065	56.30824 – 205.32700	$3d^7(a^4F)4s - 3d^6(a^5D)4s4p$	${}^5F - {}^5D^\circ$	1 – 1		661
	500	676.941	14.0316 – 161.75489	$3d^8 - 3d^7(a^2F)4p$	$a^1D - {}^1F^\circ$	2 – 3		661
	5	682.947	55.40629 – 201.82946	$3d^7(a^4F)4s - 3d^7(a^4F)5p$	${}^5F - {}^5D^\circ$	3 – 3		661
	10	683.186	53.70393 – 200.07635	$3d^7(a^4F)4s - 3d^7(a^4F)5p$	${}^5F - {}^5F^\circ$	5 – 4		661
	10	683.455	55.40629 – 201.72523	$3d^7(a^4F)4s - 3d^7(a^4F)5p$	${}^5F - {}^5F^\circ$	3 – 2		661
	10	683.590						661
	10	683.918	53.70393 – 199.91908	$3d^7(a^4F)4s - 3d^7(a^4F)5p$	${}^5F - {}^5F^\circ$	5 – 5		661
	100	689.210	16.6616 – 161.75489	$3d^8 - 3d^7(a^2F)4p$	$a^3P - {}^1F^\circ$	2 – 3		661
	200	700.168	14.0316 – 156.85300	$3d^8 - 3d^7(a^2F)4p$	$a^1D - {}^3D^\circ$	2 – 3		661
	1	701.361	0.0 – 142.57560	$3d^8 - 3d^7(a^2H)4p$	$ga^3F - {}^3H^\circ$	4 – 5		661
	100	701.778	14.0316 – 156.52287	$3d^8 - 3d^7(a^2F)4p$	$a^1D - {}^3F^\circ$	2 – 2		661

Ni III — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	0	705.991	1.3607 – 143.00270	$3d^8 - 3d^7(a^2H)4p$	$ga^3F - {}^3H^\circ$	3 – 4		661
	0	707.754	2.2696 – 143.56016	$3d^8 - 3d^7(a^2D)4p$	$ga^3F - {}^3P^\circ$	2 – 2		661
	5	708.853	1.3607 – 142.43395	$3d^8 - 3d^7(a^2D)4p$	$ga^3F - {}^1D^\circ$	3 – 2		661
	100	709.027	14.0316 – 155.07100	$3d^8 - 3d^7(a^2F)4p$	$a^1D - {}^1D^\circ$	2 – 2		661
	20	711.518	0.0 – 140.54452	$3d^8 - 3d^7(a^2D)4p$	$ga^3F - {}^3F^\circ$	4 – 3		661
	100	711.772	16.6616 – 157.15427	$3d^8 - 3d^7(a^2F)4p$	$a^3P - {}^3D^\circ$	2 – 2		661
	100	712.976	16.9778 – 157.23516	$3d^8 - 3d^7(a^2F)4p$	$a^3P - {}^3D^\circ$	1 – 1		661
	300	713.332	0.0 – 140.18465	$3d^8 - 3d^7(a^2D)4p$	$ga^3F - {}^3F^\circ$	4 – 4		661
	300	713.385	16.9778 – 157.15427	$3d^8 - 3d^7(a^2F)4p$	$a^3P - {}^3D^\circ$	1 – 2		661
	100	714.254	17.2307 – 157.23516	$3d^8 - 3d^7(a^2F)4p$	$a^3P - {}^3D^\circ$	0 – 1		661
	1	714.965						661
	100	715.563	16.6616 – 156.41120	$3d^8 - 3d^7(a^2F)4p$	$a^3P - {}^3F^\circ$	2 – 3		661
	20	716.608	16.9778 – 156.52287	$3d^8 - 3d^7(a^2F)4p$	$a^3P - {}^3F^\circ$	1 – 2		661
	2	717.318						661
	10	718.287	62.60558 – 201.82946	$3d^7(a^4F)4s - 3d^7(a^4F)5p$	${}^3F - {}^5D^\circ$	3 – 3		661
	500	718.480	1.3607 – 140.54452	$3d^8 - 3d^7(a^2D)4p$	$ga^3F - {}^3F^\circ$	3 – 3		661
	100	718.674	2.2696 – 141.41410	$3d^8 - 3d^7(a^2P)4p$	$ga^3F - {}^1P^\circ$	2 – 1		661
	15	720.337	1.3607 – 140.18465	$3d^8 - 3d^7(a^2D)4p$	$ga^3F - {}^3F^\circ$	3 – 4		661
	200	721.259	23.1087 – 161.75489	$3d^8 - 3d^7(a^2F)4p$	$a^1G - {}^1F^\circ$	4 – 3		661
	100	721.418	2.2696 – 140.88540	$3d^8 - 3d^7(a^2D)4p$	$ga^3F - {}^3F^\circ$	2 – 2		661
12	300	722.094	0.0 – 138.48740	$3d^8 - 3d^7(a^2D)4p$	$ga^3F - {}^3D^\circ$	4 – 3		661
	3	724.155	16.9778 – 155.07100	$3d^8 - 3d^7(a^2F)4p$	$a^3P - {}^1D^\circ$	1 – 2		661
	20	724.471	0.0 – 138.03090	$3d^8 - 3d^7(a^2H)4p$	$ga^3F - {}^3G^\circ$	4 – 4		661
12	250	725.196	1.3607 – 139.25370	$3d^8 - 3d^7(a^2D)4p$	$ga^3F - {}^3D^\circ$	3 – 2		661
	2	725.806						661
	15	727.313	1.3607 – 138.85220	$3d^8 - 3d^7(a^2H)4p$	$ga^3F - {}^3G^\circ$	3 – 3		661
12	100	729.249	1.3607 – 138.48740	$3d^8 - 3d^7(a^2D)4p$	$ga^3F - {}^3D^\circ$	3 – 3		661
	500	729.820	0.0 – 137.02020	$3d^8 - 3d^7(a^2H)4p$	$ga^3F - {}^3G^\circ$	4 – 5		661
	50	730.014	2.2696 – 139.25370	$3d^8 - 3d^7(a^2D)4p$	$ga^3F - {}^3D^\circ$	2 – 2		661
11	250	730.109	0.0 – 136.96700	$3d^8 - 3d^7(a^2P)4p$	$ga^3F - {}^3D^\circ$	4 – 3		661
	150	731.481	2.2696 – 138.97920	$3d^8 - 3d^7(a^2D)4p$	$ga^3F - {}^3D^\circ$	2 – 1		661
	400	731.696	1.3607 – 138.03090	$3d^8 - 3d^7(a^2H)4p$	$ga^3F - {}^3G^\circ$	3 – 4		661
	300	732.158	2.2696 – 138.85220	$3d^8 - 3d^7(a^2H)4p$	$ga^3F - {}^3G^\circ$	2 – 3		661
	20	733.807						661
12	5	734.100	2.2696 – 138.48740	$3d^8 - 3d^7(a^2D)4p$	$ga^3F - {}^3D^\circ$	2 – 3		661
11	50	737.419	1.3607 – 136.96700	$3d^8 - 3d^7(a^2P)4p$	$ga^3F - {}^3D^\circ$	3 – 3		661
11	200	738.258	1.3607 – 136.81320	$3d^8 - 3d^7(a^2P)4p$	$ga^3F - {}^3D^\circ$	3 – 2		661
11	100	740.235	2.2696 – 137.36236	$3d^8 - 3d^7(a^2P)4p$	$ga^3F - {}^3D^\circ$	2 – 1		661
	30	740.620	0.0 – 135.02320	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^1F^\circ$	4 – 3		661
11	3	742.391	2.2696 – 136.96700	$3d^8 - 3d^7(a^2P)4p$	$ga^3F - {}^3D^\circ$	2 – 3		661
1	2	743.275	2.2696 – 136.81320	$3d^8 - 3d^7(a^2P)4p$	$ga^3F - {}^3D^\circ$	2 – 2		661
	100	743.955	0.0 – 134.41477	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^3G^\circ$	4 – 4		661
	5	744.400	0.0 – 134.33479	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^3G^\circ$	4 – 3		661
	100	744.784	23.1087 – 157.37542	$3d^8 - 3d^7(a^2F)4p$	$a^1G - {}^1G^\circ$	4 – 4		661
	40	745.058	0.0 – 134.21760	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^1H^\circ$	4 – 5		661
	50	746.319	1.3607 – 135.35033	$3d^8 - 3d^7(a^4P)4p$	$ga^3F - {}^3P^\circ$	3 – 2		661
	30	747.015	23.1087 – 156.97208	$3d^8 - 3d^7(a^2F)4p$	$a^1G - {}^3F^\circ$	4 – 4		661
	20	747.213	2.2696 – 136.09870	$3d^8 - 3d^7(a^4P)4p$	$ga^3F - {}^3P^\circ$	2 – 1		661
	3	747.697	23.1087 – 156.85300	$3d^8 - 3d^7(a^2F)4p$	$a^1G - {}^3D^\circ$	4 – 3		661
9	300	747.989	0.0 – 133.69200	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^3G^\circ$	4 – 5		661
6	200	749.677	0.0 – 133.39094	$3d^8 - 3d^7(a^4P)4p$	$ga^3F - {}^3D^\circ$	4 – 3		661
	300	750.053	0.0 – 133.32470	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^1G^\circ$	4 – 4		661
4	150	750.983	0.0 – 133.15850	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^3F^\circ$	4 – 3		661
8	150	751.333	0.0 – 133.09589	$3d^8 - 3d^7(a^4P)4p$	$ga^3F - {}^5P^\circ$	4 – 3		661

Ni III — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
9	150	751.573	1.3607 – 134.41477	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^3G^\circ$	3 – 4		661
9	200	752.023	1.3607 – 134.33479	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^3G^\circ$	3 – 3		661
4	100	752.603	1.3607 – 134.23190	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^3F^\circ$	3 – 2		661
	30	753.252	2.2696 – 135.02320	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^1F^\circ$	2 – 3		661
	10	753.378	23.1087 – 155.84140	$3d^8 - 3d^7(a^2F)4p$	$a^1G - {}^3G^\circ$	4 – 4		661
5	100	756.687	0.0 – 132.15650	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^3H^\circ$	4 – 4		661
9	50	757.201	2.2696 – 134.33479	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^3G^\circ$	2 – 3		661
6	5	757.397	1.3607 – 133.39094	$3d^8 - 3d^7(a^4P)4p$	$ga^3F - {}^3D^\circ$	3 – 3		661
	10	757.689	71.38410 – 203.36052	$3d^7(a^4P)4s - 3d^7(a^4F)5p$	$^5P - {}^3F^\circ$	2 – 3		661
4	300	757.795	2.2696 – 134.23190	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^3F^\circ$	2 – 2		661
	150	758.039	14.0316 – 145.95015	$3d^8 - 3d^7(a^2D)4p$	$a^1D - {}^1P^\circ$	2 – 1		661
4	250	758.733	1.3607 – 133.15850	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^3F^\circ$	3 – 3		661
4	250	758.773	0.0 – 131.79202	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^3F^\circ$	4 – 4		661
8	100	759.098	1.3607 – 133.09589	$3d^8 - 3d^7(a^4P)4p$	$ga^3F - {}^5P^\circ$	3 – 3		661
	15	760.024						661
	10	760.452	0.0 – 131.50050	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^3H^\circ$	4 – 5		661
8	5	760.684	1.3607 – 132.81826	$3d^8 - 3d^7(a^4P)4p$	$ga^3F - {}^5P^\circ$	3 – 2		661
8	5	762.951	2.2696 – 133.33970	$3d^8 - 3d^7(a^4P)4p$	$ga^3F - {}^5P^\circ$	2 – 1		661
	2	763.313	2.2696 – 133.27670	$3d^8 - 3d^7(a^2P)4p$	$ga^3F - {}^3P^\circ$	2 – 1		661
4	100	764.014	2.2696 – 133.15850	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^3F^\circ$	2 – 3		661
8	50	764.354	2.2696 – 133.09589	$3d^8 - 3d^7(a^4P)4p$	$ga^3F - {}^5P^\circ$	2 – 3		661
	50	765.726	14.0316 – 144.62455	$3d^8 - 3d^7(a^2D)4p$	$a^1D - {}^3P^\circ$	2 – 1		661
8	5	766.000	2.2696 – 132.81826	$3d^8 - 3d^7(a^4P)4p$	$ga^3F - {}^5P^\circ$	2 – 2		661
4	100	766.693	1.3607 – 131.79202	$3d^8 - 3d^7(a^2G)4p$	$ga^3F - {}^3F^\circ$	3 – 4		661
	5	767.400	0.0 – 130.31230	$3d^8 - 3d^7(a^4P)4p$	$ga^3F - {}^5D^\circ$	4 – 4		661
	2	767.901	115.27226 – 245.49536	$3d^7(a^4F)4p - 3d^7(a^4F_{7/2})5g$	$^3G^\circ - {}^2[\frac{11}{2}]^\circ$	5 – 6		661
	400	770.216	14.0316 – 143.86480	$3d^8 - 3d^7(a^2D)4p$	$a^1D - {}^1F^\circ$	2 – 3		661
	200	772.040	14.0316 – 143.56016	$3d^8 - 3d^7(a^2D)4p$	$a^1D - {}^3P^\circ$	2 – 2		661
	100	773.464	16.6616 – 145.95015	$3d^8 - 3d^7(a^2D)4p$	$a^3P - {}^1P^\circ$	2 – 1		661
	5	775.364	16.9778 – 145.95015	$3d^8 - 3d^7(a^2D)4p$	$a^3P - {}^1P^\circ$	1 – 1		661
	5	776.884	17.2307 – 145.95015	$3d^8 - 3d^7(a^2D)4p$	$a^3P - {}^1P^\circ$	0 – 1		661
	100	777.181	52.5320 – 181.2034	$3d^8 - 3d^7(b^2D)4p$	$a^1S - {}^1P^\circ$	0 – 1		661
	500	778.806	14.0316 – 142.43395	$3d^8 - 3d^7(a^2D)4p$	$a^1D - {}^1D^\circ$	2 – 2		661
	30	780.572	16.9778 – 145.08845	$3d^8 - 3d^7(a^2D)4p$	$a^3P - {}^3P^\circ$	1 – 0		661
	50	781.486	16.6616 – 144.62455	$3d^8 - 3d^7(a^2D)4p$	$a^3P - {}^3P^\circ$	2 – 1		661
	30	783.419	2.2696 – 129.91310	$3d^8 - 3d^7(a^4P)4p$	$ga^3F - {}^5D^\circ$	2 – 2		661
	200	785.020	14.0316 – 141.41410	$3d^8 - 3d^7(a^2P)4p$	$a^1D - {}^1P^\circ$	2 – 1		661
	20	786.145	16.6616 – 143.86480	$3d^8 - 3d^7(a^2D)4p$	$a^3P - {}^1F^\circ$	2 – 3		661
	300	788.039	16.6616 – 143.56016	$3d^8 - 3d^7(a^2D)4p$	$a^3P - {}^3P^\circ$	2 – 2		661
	200	788.298	14.0316 – 140.88540	$3d^8 - 3d^7(a^2D)4p$	$a^1D - {}^3F^\circ$	2 – 2		661
	20	790.000	16.9778 – 143.56016	$3d^8 - 3d^7(a^2D)4p$	$a^3P - {}^3P^\circ$	1 – 2		661
	20	790.450	14.0316 – 140.54452	$3d^8 - 3d^7(a^2D)4p$	$a^1D - {}^3F^\circ$	2 – 3		661
	30	797.092	16.9778 – 142.43395	$3d^8 - 3d^7(a^2D)4p$	$a^3P - {}^1D^\circ$	1 – 2		661
	2	798.572	14.0316 – 139.25370	$3d^8 - 3d^7(a^2D)4p$	$a^1D - {}^3D^\circ$	2 – 2		661
	100	800.332	14.0316 – 138.97920	$3d^8 - 3d^7(a^2D)4p$	$a^1D - {}^3D^\circ$	2 – 1		661
	20	801.145	14.0316 – 138.85220	$3d^8 - 3d^7(a^2H)4p$	$a^1D - {}^3G^\circ$	2 – 3		661
	100	801.591	16.6616 – 141.41410	$3d^8 - 3d^7(a^2P)4p$	$a^3P - {}^1P^\circ$	2 – 1		661
	20	803.490	14.0316 – 138.48740	$3d^8 - 3d^7(a^2D)4p$	$a^1D - {}^3D^\circ$	2 – 3		661
	3	803.612	16.9778 – 141.41410	$3d^8 - 3d^7(a^2P)4p$	$a^3P - {}^1P^\circ$	1 – 1		661
	200	805.007	16.6616 – 140.88515	$3d^8 - 3d^7(a^2P)4p$	$a^3P - {}^3S^\circ$	2 – 1		661
	20	805.263	17.2307 – 141.41410	$3d^8 - 3d^7(a^2P)4p$	$a^3P - {}^1P^\circ$	0 – 1		661
	100	807.055	16.9778 – 140.88515	$3d^8 - 3d^7(a^2P)4p$	$a^3P - {}^3S^\circ$	1 – 1		661
	30	807.213	16.6616 – 140.54452	$3d^8 - 3d^7(a^2D)4p$	$a^3P - {}^3F^\circ$	2 – 3		661
	10	808.711	17.2307 – 140.88515	$3d^8 - 3d^7(a^2P)4p$	$a^3P - {}^3S^\circ$	0 – 1		661

Ni III — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	500	811.568	23.1087 – 146.32580	$3d^8 - 3d^7(a^2H)4p$	$a^1G - {}^1H^\circ$	4 – 5		661
	10	813.426	14.0316 – 136.96700	$3d^8 - 3d^7(a^2P)4p$	$a^1D - {}^3D^\circ$	2 – 3		661
	5	815.718	16.6616 – 139.25370	$3d^8 - 3d^7(a^2D)4p$	$a^3P - {}^3D^\circ$	2 – 2		661
	5	817.544	16.6616 – 138.97920	$3d^8 - 3d^7(a^2D)4p$	$a^3P - {}^3D^\circ$	2 – 1		661
	20	817.833	16.9778 – 139.25370	$3d^8 - 3d^7(a^2D)4p$	$a^3P - {}^3D^\circ$	1 – 2		661
	1	818.389	16.6616 – 138.85220	$3d^8 - 3d^7(a^2H)4p$	$a^3P - {}^3G^\circ$	2 – 3		661
	10	819.237	14.0316 – 136.09870	$3d^8 - 3d^7(a^4P)4p$	$a^1D - {}^3P^\circ$	2 – 1		661
	5	819.665	16.9778 – 138.97920	$3d^8 - 3d^7(a^2D)4p$	$a^3P - {}^3D^\circ$	1 – 1		661
	50	820.851	16.6616 – 138.48740	$3d^8 - 3d^7(a^2D)4p$	$a^3P - {}^3D^\circ$	2 – 3		661
	15	821.373	17.2307 – 138.97920	$3d^8 - 3d^7(a^2D)4p$	$a^3P - {}^3D^\circ$	0 – 1		661
	20	824.292	14.0316 – 135.35033	$3d^8 - 3d^7(a^4P)4p$	$a^1D - {}^3P^\circ$	2 – 2		661
	3	824.850						661
	10	825.300	16.9778 – 138.14648	$3d^8 - 3d^7(a^2P)4p$	$a^3P - {}^1S^\circ$	1 – 0		661
	500	826.138	23.1087 – 144.15300	$3d^8 - 3d^7(a^2H)4p$	$a^1G - {}^1G^\circ$	4 – 4		661
	200	826.501	14.0316 – 135.02320	$3d^8 - 3d^7(a^2G)4p$	$a^1D - {}^1F^\circ$	2 – 3		661
	2	827.792	82.27726 – 203.07846	$3d^7(a^2D)4s - 3d^7(a^4F)5p$	${}^3D - {}^5D^\circ$	1 – 0		661
	100	828.109	23.1087 – 143.86480	$3d^8 - 3d^7(a^2D)4p$	$a^1G - {}^1F^\circ$	4 – 3		661
	3	828.491	16.6616 – 137.36236	$3d^8 - 3d^7(a^2P)4p$	$a^3P - {}^3D^\circ$	2 – 1		661
	10	830.666	16.9778 – 137.36236	$3d^8 - 3d^7(a^2P)4p$	$a^3P - {}^3D^\circ$	1 – 1		661
	100	831.229	16.6616 – 136.96700	$3d^8 - 3d^7(a^2P)4p$	$a^3P - {}^3D^\circ$	2 – 3		661
	5	831.487						661
	5	832.284	16.6616 – 136.81320	$3d^8 - 3d^7(a^2P)4p$	$a^3P - {}^3D^\circ$	2 – 2		661
	20	834.058	23.1087 – 143.00270	$3d^8 - 3d^7(a^2H)4p$	$a^1G - {}^3H^\circ$	4 – 4		661
	20	837.025	14.0316 – 133.50097	$3d^8 - 3d^7(a^4P)4p$	$a^1D - {}^3D^\circ$	2 – 2		661
	50	837.266	16.6616 – 136.09870	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^3P^\circ$	2 – 1		661
	5	839.478	16.9778 – 136.09870	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^3P^\circ$	1 – 1		661
	20	841.256	17.2307 – 136.09870	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^3P^\circ$	0 – 1		661
	2	841.825	82.17260 – 200.96297	$3d^7(a^2D)4s - 3d^7(a^4F)5p$	${}^3D - {}^5F^\circ$	3 – 3		661
3	500	842.142	0.0 – 118.74525	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^3D^\circ$	4 – 3		661
	50	842.546	16.6616 – 135.35033	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^3P^\circ$	2 – 2		661
	50	844.787	16.9778 – 135.35033	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^3P^\circ$	1 – 2		661
	100	844.859	16.6616 – 135.02320	$3d^8 - 3d^7(a^2G)4p$	$a^3P - {}^1F^\circ$	2 – 3		661
3	400	845.242	1.3607 – 119.66954	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^3D^\circ$	3 – 2		661
3	300	847.433	2.2696 – 120.27232	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^3D^\circ$	2 – 1		661
	5	849.810	16.6616 – 134.33479	$3d^8 - 3d^7(a^2G)4p$	$a^3P - {}^3G^\circ$	2 – 3		661
	15	851.521	23.1087 – 140.54452	$3d^8 - 3d^7(a^2D)4p$	$a^1G - {}^3F^\circ$	4 – 3		661
3	15	851.788	2.2696 – 119.66954	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^3D^\circ$	2 – 2		661
2	10	852.867	0.0 – 117.25080	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^3F^\circ$	4 – 3		661
	5	853.398	16.6616 – 133.83954	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^3D^\circ$	2 – 1		661
	2	855.719	16.9778 – 133.83954	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^3D^\circ$	1 – 1		661
	100	855.922	14.0316 – 130.86350	$3d^8 - 3d^7(a^4P)4p$	$a^1D - {}^3S^\circ$	2 – 1		661
2	50	856.506	1.3607 – 118.11495	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^3F^\circ$	3 – 2		661
	50	856.684	16.6616 – 133.39094	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^3D^\circ$	2 – 3		661
1	200	857.087	0.0 – 116.67439	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^3G^\circ$	4 – 4		661
	50	857.550	17.2307 – 133.83954	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^3D^\circ$	0 – 1		661
	20	858.198	16.9778 – 133.50097	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^3D^\circ$	1 – 2		661
	20	858.861	16.6616 – 133.09589	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^5P^\circ$	2 – 3		661
	20	859.387	16.9778 – 133.33970	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^5P^\circ$	1 – 1		661
	50	859.854	16.9778 – 133.27670	$3d^8 - 3d^7(a^2P)4p$	$a^3P - {}^3P^\circ$	1 – 1		661
1	150	860.238	1.3607 – 117.60635	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^3G^\circ$	3 – 3		661
2	300	860.642	0.0 – 116.19193	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^3F^\circ$	4 – 4		661
	10	860.905	16.6616 – 132.81826	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^5P^\circ$	2 – 2		661
2	300	862.882	1.3607 – 117.25080	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^3F^\circ$	3 – 3		661
2	300	863.217	2.2696 – 118.11495	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^3F^\circ$	2 – 2		661

Ni III — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
1	50	867.023	2.2696 – 117.60635	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^3G°$	2 – 3		661
1	100	867.194	1.3607 – 116.67439	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^3G°$	3 – 4		661
1	300	867.508	0.0 – 115.27226	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^3G°$	4 – 5		661
2	200	869.702	2.2696 – 117.25080	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^3F°$	2 – 3		661
	10	869.926	23.1087 – 138.06040	$3d^8 - 3d^7(a^2H)4p$	$a^1G - {}^3I°$	4 – 5		661
2	200	870.845	1.3607 – 116.19193	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^3F°$	3 – 4		661
	150	875.641	16.6616 – 130.86350	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^3S°$	2 – 1		661
		877.852	23.1087 – 137.02020	$3d^8 - 3d^7(a^2H)4p$	$a^1G - {}^3G°$	4 – 5		661
	30	878.078	16.9778 – 130.86350	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^3S°$	1 – 1		661
	50	879.471	0.0 – 113.70512	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^5G°$	4 – 4		661
	20	880.028	17.2307 – 130.86350	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^3S°$	0 – 1		661
	20	882.642	16.6616 – 129.95795	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^5D°$	2 – 1		661
	50	883.849	0.0 – 113.14092	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^5G°$	4 – 5		661
	3	885.103	16.9778 – 129.95795	$3d^8 - 3d^7(a^4P)4p$	$a^3P - {}^5D°$	1 – 1		661
	2	885.455	0.0 – 112.93543	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^5D°$	4 – 3		661
	10	886.924	1.3607 – 114.11020	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^5G°$	3 – 3		661
	5	890.131	1.3607 – 113.70512	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^5G°$	3 – 4		661
	3	892.041	2.2696 – 114.37101	$3d^8 - 3d^7(a^4F)4p$	$ga^3F - {}^5G°$	2 – 2		661
	50	893.533	23.1087 – 135.02320	$3d^8 - 3d^7(a^2G)4p$	$a^1G - {}^1F°$	4 – 3		661
	100	900.008	23.1087 – 134.21760	$3d^8 - 3d^7(a^2G)4p$	$a^1G - {}^1H°$	4 – 5		661
	50	904.294	23.1087 – 133.69200	$3d^8 - 3d^7(a^2G)4p$	$a^1G - {}^3G°$	4 – 5		661
13	20	968.100	16.9778 – 120.27232	$3d^8 - 3d^7(a^4F)4p$	$a^3P - {}^3D°$	1 – 1		661
13	50	970.478	17.2307 – 120.27232	$3d^8 - 3d^7(a^4F)4p$	$a^3P - {}^3D°$	0 – 1		661
13	20	970.790	16.6616 – 119.66954	$3d^8 - 3d^7(a^4F)4p$	$a^3P - {}^3D°$	2 – 2		661
13	300	973.786	16.9778 – 119.66954	$3d^8 - 3d^7(a^4F)4p$	$a^3P - {}^3D°$	1 – 2		661
13	400	979.589	16.6616 – 118.74525	$3d^8 - 3d^7(a^4F)4p$	$a^3P - {}^3D°$	2 – 3		661
	100	1305.344	53.70393 – 130.31230	$3d^7(a^4F)4s - 3d^7(a^4P)4p$	${}^5F - {}^5D°$	5 – 4		661
	3	1315.085						661
	10	1321.804	54.65783 – 130.31230	$3d^7(a^4F)4s - 3d^7(a^4P)4p$	${}^5F - {}^5D°$	4 – 4		661
		1321.94	0.0 – 75.64661	$3d^8 - 3d^7(a^2G)4s$	$ga^3F - {}^3G$	4 – 4	F,P	375,1108
	75	1328.084	54.65783 – 129.95400	$3d^7(a^4F)4s - 3d^7(a^4P)4p$	${}^5F - {}^5D°$	4 – 3		661
	2	1330.787						661
		1331.14	0.0 – 75.12365	$3d^8 - 3d^7(a^2G)4s$	$ga^3F - {}^3G$	4 – 5	F,P	375,1108
	3	1331.153	81.68680 – 156.80870	$3d^7(a^2H)4s - 3d^7(a^2F)4p$	${}^3H - {}^3G°$	6 – 5		661
		1335.53	1.3607 – 76.23725	$3d^8 - 3d^7(a^2G)4s$	$ga^3F - {}^3G$	3 – 3	F,P	375,1108
	10	1341.421	55.40629 – 129.95400	$3d^7(a^4F)4s - 3d^7(a^4P)4p$	${}^5F - {}^5D°$	3 – 3		661
	50	1342.148	55.40629 – 129.91310	$3d^7(a^4F)4s - 3d^7(a^4P)4p$	${}^5F - {}^5D°$	3 – 2		661
		1346.15	1.3607 – 75.64661	$3d^8 - 3d^7(a^2G)4s$	$ga^3F - {}^3G$	3 – 4	F,P	375,1108
	30	1351.256	55.95221 – 129.95795	$3d^7(a^4F)4s - 3d^7(a^4P)4p$	${}^5F - {}^5D°$	2 – 1		661
		1351.94	2.2696 – 76.23725	$3d^8 - 3d^7(a^2G)4s$	$ga^3F - {}^3G$	2 – 3	F,P	375,1108
	20	1352.052	55.95221 – 129.91310	$3d^7(a^4F)4s - 3d^7(a^4P)4p$	${}^5F - {}^5D°$	2 – 2		661
	20	1353.512	56.30824 – 130.19005	$3d^7(a^4F)4s - 3d^7(a^4P)4p$	${}^5F - {}^5D°$	1 – 0		661
		1355.69	1.3607 – 75.12365	$3d^8 - 3d^7(a^2G)4s$	$ga^3F - {}^3G$	3 – 5	F,P	375,1108
	50	1357.802	56.30824 – 129.95795	$3d^7(a^4F)4s - 3d^7(a^4P)4p$	${}^5F - {}^5D°$	1 – 1		661
	3	1362.783						661
		1362.82	2.2696 – 75.64661	$3d^8 - 3d^7(a^2G)4s$	$ga^3F - {}^3G$	2 – 4	F,P	375,1108
	10	1365.151	110.21280 – 183.46488	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	${}^5F° - {}^5D$	5 – 4		661
	5	1374.491						661
	10	1374.660	112.40165 – 185.14723	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	${}^5F° - {}^5D$	1 – 0		661
	15	1376.183	112.40165 – 185.06715	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	${}^5F° - {}^5D$	1 – 2		661
	15	1377.077	82.82640 – 155.44330	$3d^7(a^2H)4s - 3d^7(a^2F)4p$	${}^3H - {}^3G°$	4 – 3		661
	10	1382.077	111.22120 – 183.57558	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	${}^5F° - {}^5P$	3 – 2		661
	3	1387.870	61.33858 – 133.39094	$3d^7(a^4F)4s - 3d^7(a^4P)4p$	${}^3F - {}^3D°$	4 – 3		661
	5	1388.629						661

Ni III — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	1389.149	61.33858 – 133.32470	$3d^7(a^4F)4s - 3d^7(a^2G)4p$	$^3F - {}^1G^\circ$	4 – 4		661
	20	1389.735	110.37135 – 182.32713	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5F^\circ - {}^5G$	4 – 5		661
	30	1392.377	111.22120 – 183.04145	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5F^\circ - {}^5G$	3 – 4		661
	10	1395.459	111.91453 – 183.57558	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5F^\circ - {}^5P$	2 – 2		661
	15	1401.214	111.22120 – 182.58783	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5F^\circ - {}^5F$	3 – 2		661
	15	1403.113	110.21280 – 181.48295	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5F^\circ - {}^5F$	5 – 4		661
	10	1405.279	116.19193 – 187.35188	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3F^\circ - {}^3F$	4 – 4		661
	10	1405.421	111.89865 – 183.05220	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5D^\circ - {}^3G$	4 – 5		661
	3	1406.061	111.91453 – 183.03525	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5F^\circ - {}^5F$	2 – 1		661
	50	1406.250	110.37135 – 181.48295	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5F^\circ - {}^5F$	4 – 4		661
	15	1409.000	114.09560 – 185.06715	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5D^\circ - {}^5D$	1 – 2		661
	2	1409.471						661
	5	1409.974	112.93543 – 183.85972	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5D^\circ - {}^3G$	3 – 4		661
	10	1410.126	157.37542 – 228.29097	$3d^7(a^2F)4p - 3d^7(a^4F)6s$	$^1G^\circ - {}^3F$	4 – 3		661
	15	1410.344	112.93543 – 183.83947	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5D^\circ - {}^3D$	3 – 3		661
	3	1410.446	111.89865 – 182.79820	$3d^7(a^4F)4p - 3d^7(a^4F)5s$	$^5D^\circ - {}^5F$	4 – 4		661
	5	1410.642	117.25080 – 188.14054	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3F^\circ - {}^3F$	3 – 3		661
	50	1412.304	110.21280 – 181.01908	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5F^\circ - {}^5F$	5 – 5		661
	5	1413.211	63.47193 – 134.23190	$3d^7(a^4F)4s - 3d^7(a^2G)4p$	$^3F - {}^3F^\circ$	2 – 2		661
	3	1413.938	113.65147 – 184.37568	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5D^\circ - {}^5P$	2 – 1		661
	20	1414.389	112.93543 – 183.63776	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5D^\circ - {}^5G$	3 – 3		661
	15	1414.916	155.44330 – 226.11880	$3d^7(a^2F)4p - 3d^7(a^4F)5d$	$^3G^\circ - {}^5F$	3 – 4		661
	3	1415.467	110.37135 – 181.01908	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5F^\circ - {}^5F$	4 – 5		661
	5	1415.909	111.89865 – 182.52469	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5D^\circ - {}^5P$	4 – 3		661
	75	1416.956	114.37101 – 184.94495	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5G^\circ - {}^5H$	2 – 3		661
	2	1417.249						661
	2	1417.387	62.60558 – 133.15850	$3d^7(a^4F)4s - 3d^7(a^2G)4p$	$^3F - {}^3F^\circ$	3 – 3		661
	20	1417.736	117.60635 – 188.14054	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3G^\circ - {}^3F$	3 – 3		661
	10	1417.841	112.93543 – 183.46488	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5D^\circ - {}^5D$	3 – 4		661
	3	1418.105						661
	5	1418.292	118.11495 – 188.62287	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3F^\circ - {}^3F$	2 – 2		661
	10	1419.382	61.33858 – 131.79202	$3d^7(a^4F)4s - 3d^7(a^2G)4p$	$^3F - {}^3F^\circ$	4 – 4		661
	75	1420.448	114.11020 – 184.51075	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5G^\circ - {}^5H$	3 – 4		661
	10	1421.082						661
	2	1422.143	156.97208 – 227.28870	$3d^7(a^2F)4p - 3d^7(a^4F)6s$	$^3F^\circ - {}^5F$	4 – 4		661
	10	1423.722	114.37101 – 184.60957	$3d^7(a^4F)4p - 3d^7(a^4F)5s$	$^5G^\circ - {}^5F$	2 – 1		661
	100	1424.511	113.70512 – 183.90488	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5G^\circ - {}^5H$	4 – 5		661
	5	1425.737						661
	5	1427.087	153.25635 – 223.32977	$3d^64s^2 - 3d^7(a^4F_{5/2})4f$	$^5D - {}^5_2[\frac{7}{2}]^\circ$	4 – 3		661
	20	1427.639						661
	3	1427.914						661
	200	1428.870	113.14092 – 183.12619	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5G^\circ - {}^5H$	5 – 6		661
	10	1430.438	113.70512 – 183.61267	$3d^7(a^4F)4p - 3d^7(a^4F)5s$	$^5G^\circ - {}^5F$	4 – 3		661
	10	1430.630						661
	30	1434.133	114.11020 – 183.83947	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5G^\circ - {}^3D$	3 – 3		661
	200	1434.306	112.78785 – 182.50830	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5G^\circ - {}^5H$	6 – 7		661
	2	1434.446						661
	10	1435.609	113.14092 – 182.79820	$3d^7(a^4F)4p - 3d^7(a^4F)5s$	$^5G^\circ - {}^5F$	5 – 4		661
	2	1438.152	115.27226 – 184.80562	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3G^\circ - {}^3H$	5 – 5		661
	20	1439.809						661
	3	1439.938	116.19193 – 185.63913	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3F^\circ - {}^3H$	4 – 4		661
	2	1441.159						661
	5	1442.235	113.70512 – 183.04145	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5G^\circ - {}^5G$	4 – 4		661
	40	1445.374	62.60558 – 131.79202	$3d^7(a^4F)4s - 3d^7(a^2G)4p$	$^3F - {}^3F^\circ$	3 – 4		661

Ni III — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	2	1446.154						661
35	15	1446.748	111.89865 – 181.01908	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5D^\circ - {}^5F$	4 – 5		661
	30	1448.175	112.78785 – 181.84000	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5G^\circ - {}^5G$	6 – 6		661
	200	1451.504	115.27226 – 184.16657	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3G^\circ - {}^3H$	5 – 6		661
	20	1452.532						661
	2	1453.603						661
	50	1453.882						661
	10	1457.430	116.19193 – 184.80562	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3F^\circ - {}^3H$	4 – 5		661
	10	1457.575	118.74525 – 187.35188	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3D^\circ - {}^3F$	3 – 4		661
	50	1457.829						661
	5	1458.284	116.67439 – 185.24815	$3d^7(a^4F)4p - 3d^7(a^4F)5s$	$^3G^\circ - {}^3F$	4 – 3		661
	10	1461.649	161.75489 – 230.16990	$3d^7(a^2F)4p - 3d^7(a^4F)5d$	$^1F^\circ - {}^3F$	3 – 4		561
	5	1462.239	117.25080 – 185.63913	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3F^\circ - {}^3H$	3 – 4		661
	2	1464.778	120.27232 – 188.54282	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3D^\circ - {}^3P$	1 – 1		661
	5	1464.989						661
36	10	1465.606	112.78785 – 181.01908	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^5G^\circ - {}^5F$	6 – 5		661
	5	1466.027						661
	5	1466.156						661
	3	1469.836						661
	2	1470.642	117.25080 – 185.24815	$3d^7(a^4F)4p - 3d^7(a^4F)5s$	$^3F^\circ - {}^3F$	3 – 3		661
	2	1471.468	118.11495 – 186.07340	$3d^7(a^4F)4p - 3d^7(a^4F)5s$	$^3F^\circ - {}^3F$	2 – 2		661
	5	1473.939	116.19193 – 184.03762	$3d^7(a^4F)4p - 3d^7(a^4F)5s$	$^3F^\circ - {}^3F$	4 – 4		661
	5	1474.402	119.66954 – 187.49338	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3D^\circ - {}^3P$	2 – 2		661
37	15	1475.368	115.27226 – 183.05220	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3G^\circ - {}^3G$	5 – 5		661
	5	1475.662						661
	3	1476.527						661
38	10	1477.801	116.19193 – 183.85972	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3F^\circ - {}^3G$	4 – 4		661
	10	1478.252	116.19193 – 183.83947	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3F^\circ - {}^3D$	4 – 3		661
	10	1478.854						661
	5	1481.923						661
	10	1483.044	118.11495 – 185.54370	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3F^\circ - {}^3D$	2 – 1		661
	3	1484.268	117.25080 – 184.62354	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3F^\circ - {}^3D$	3 – 2		661
	3	1486.456						661
37	3	1488.424	116.67439 – 183.85972	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3G^\circ - {}^3G$	4 – 4		661
	1	1491.111	75.12365 – 142.18780	$3d^7(a^2G)4s - 3d^7(a^2H)4p$	$^3G - {}^3H^\circ$	5 – 6		661
	2	1491.309	115.27226 – 182.32713	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3G^\circ - {}^5G$	5 – 5		661
	10	1491.899						661
	30	1492.622						661
	30	1492.990						661
38	20	1495.641	116.19193 – 183.05220	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3F^\circ - {}^3G$	4 – 5		661
	5	1498.338	117.60635 – 184.34650	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3G^\circ - {}^3G$	3 – 3		661
	3	1501.063						661
38	5	1501.311	117.25080 – 183.85972	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3F^\circ - {}^3G$	3 – 4		661
	2	1503.850						661
	5	1505.165						661
37	1	1506.518	116.67439 – 183.05220	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3G^\circ - {}^3G$	4 – 5		661
	10	1512.046	116.19193 – 182.32713	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3F^\circ - {}^5G$	4 – 5		661
	2	1524.891	119.66954 – 185.24815	$3d^7(a^4F)4p - 3d^7(a^4F)5s$	$^3D^\circ - {}^3F$	2 – 3		661
	5	1526.305						661
	3	1529.096	119.66954 – 185.06715	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3D^\circ - {}^5D$	2 – 2		661
	5	1536.246	118.74525 – 183.83947	$3d^7(a^4F)4p - 3d^7(a^4F)4d$	$^3D^\circ - {}^3D$	3 – 3		661
	50	1540.759	79.25011 – 144.15300	$3d^7(a^2G)4s - 3d^7(a^2H)4p$	$^1G - {}^1G^\circ$	4 – 4		661
	20	1547.641	79.25011 – 143.86480	$3d^7(a^2G)4s - 3d^7(a^2D)4p$	$^1G - {}^1F^\circ$	4 – 3		661
	10	1552.365	79.14301 – 143.56016	$3d^7(a^2P)4s - 3d^7(a^2D)4p$	$^3P - {}^3P^\circ$	2 – 2		661

Ni III — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	2	1555.598	71.06735 - 135.35033	3d^7(a^{4}P)4s - 3d^7(a^{4}P)4p	^{5}P - ^{3}P°	3 - 2		661
	3	1568.269						661
	5	1568.569	79.25011 - 143.00270	3d^7(a^{2}G)4s - 3d^7(a^{2}H)4p	^{1}G - ^{3}H°	4 - 4		661
		1575.50	0.0 - 63.47193	3d^8 - 3d^7(a^{4}F)4s	ga^{3}F - ^{3}F	4 - 2	F,P	375,1108
	15	1579.999	79.14301 - 142.43395	3d^7(a^{2}P)4s - 3d^7(a^{2}D)4p	^{3}P - ^{1}D°	2 - 2		661
	1	1586.909	76.23725 - 139.25370	3d^7(a^{2}G)4s - 3d^7(a^{2}D)4p	^{3}G - ^{3}D°	3 - 2		661
	2	1589.625	75.12365 - 138.03090	3d^7(a^{2}G)4s - 3d^7(a^{2}H)4p	^{3}G - ^{3}G°	5 - 4		661
	3	1597.077	76.23725 - 138.85220	3d^7(a^{2}G)4s - 3d^7(a^{2}H)4p	^{3}G - ^{3}G°	3 - 3		661
		1597.30	0.0 - 62.60558	3d^8 - 3d^7(a^{4}F)4s	ga^{3}F - ^{3}F	4 - 3	F,P	375,1108
	3	1597.899	78.30354 - 140.88515	3d^7(a^{4}P)4s - 3d^7(a^{2}P)4p	^{3}P - ^{3}S°	2 - 1		661
	15	1598.073	71.06735 - 133.64258	3d^7(a^{4}P)4s - 3d^7(a^{2}P)4p	^{5}P - ^{3}P°	3 - 2		661
	10	1600.294	53.70393 - 116.19193	3d^7(a^{4}F)4s - 3d^7(a^{4}F)4p	^{5}F - ^{3}F°	5 - 4		661
	2	1601.025	121.41160 - 183.87200	3d^7(b^{2}D)4s - 3d^7(b^{2}D)4p	^{3}D - ^{3}D°	2 - 2		661
	15	1602.505	78.48243 - 140.88515	3d^7(a^{4}P)4s - 3d^7(a^{2}P)4p	^{3}P - ^{3}S°	1 - 1		661
	300	1604.537	71.06735 - 133.39094	3d^7(a^{4}P)4s - 3d^7(a^{4}P)4p	^{5}P - ^{3}D°	3 - 3		661
	5	1607.000	78.65755 - 140.88515	3d^7(a^{4}P)4s - 3d^7(a^{2}P)4p	^{3}P - ^{3}S°	0 - 1		661
	100	1609.876	71.38410 - 133.50097	3d^7(a^{4}P)4s - 3d^7(a^{4}P)4p	^{5}P - ^{3}D°	2 - 2		661
		1610.01	1.3607 - 63.47193	3d^8 - 3d^7(a^{4}F)4s	ga^{3}F - ^{3}F	3 - 2	F,P	375,1108
	20	1610.534	71.06735 - 133.15850	3d^7(a^{4}P)4s - 3d^7(a^{2}G)4p	^{5}P - ^{3}F°	3 - 3		661
	30	1612.165	71.06735 - 133.09589	3d^7(a^{4}P)4s - 3d^7(a^{4}P)4p	^{5}P - ^{5}P°	3 - 3		661
17	10	1612.474	54.65783 - 116.67439	3d^7(a^{4}F)4s - 3d^7(a^{4}F)4p	^{5}F - ^{3}G°	4 - 4		661
	30	1612.730	71.38410 - 133.39094	3d^7(a^{4}P)4s - 3d^7(a^{4}P)4p	^{5}P - ^{3}D°	2 - 3		661
	1	1612.966	71.84242 - 133.83954	3d^7(a^{4}P)4s - 3d^7(a^{4}P)4p	^{5}P - ^{3}D°	1 - 1		661
	2	1615.597	75.12365 - 137.02020	3d^7(a^{2}G)4s - 3d^7(a^{2}H)4p	^{3}G - ^{3}G°	5 - 5		661
	15	1618.127	71.84242 - 133.64258	3d^7(a^{4}P)4s - 3d^7(a^{2}P)4p	^{5}P - ^{3}P°	1 - 2		661
	20	1618.801	71.38410 - 133.15850	3d^7(a^{4}P)4s - 3d^7(a^{2}G)4p	^{5}P - ^{3}F°	2 - 3		661
	20	1619.414	71.06735 - 132.81826	3d^7(a^{4}P)4s - 3d^7(a^{4}P)4p	^{5}P - ^{5}P°	3 - 2		661
	30	1619.642	79.14301 - 140.88515	3d^7(a^{2}P)4s - 3d^7(a^{2}P)4p	^{3}P - ^{3}S°	2 - 1		661
	100	1620.443	71.38410 - 133.09589	3d^7(a^{4}P)4s - 3d^7(a^{4}P)4p	^{5}P - ^{5}P°	2 - 3		661
	50	1621.830	71.84242 - 133.50097	3d^7(a^{4}P)4s - 3d^7(a^{4}P)4p	^{5}P - ^{3}D°	1 - 2		661
17	50	1621.942	55.95221 - 117.60635	3d^7(a^{4}F)4s - 3d^7(a^{4}F)4p	^{5}F - ^{3}G°	2 - 3		661
	35	1623.622	83.03345 - 144.62455	3d^7(a^{2}D)4s - 3d^7(a^{2}D)4p	^{3}D - ^{3}P°	2 - 1		661
17	20	1624.220	53.70393 - 115.27226	3d^7(a^{4}F)4s - 3d^7(a^{4}F)4p	^{5}F - ^{3}G°	5 - 5		661
	100	1626.096	71.84242 - 133.33970	3d^7(a^{4}P)4s - 3d^7(a^{4}P)4p	^{5}P - ^{5}P°	1 - 1		661
	3	1627.751	71.38410 - 132.81826	3d^7(a^{4}P)4s - 3d^7(a^{4}P)4p	^{5}P - ^{5}P°	2 - 2		661
	25	1629.000	82.17260 - 143.56016	3d^7(a^{2}D)4s - 3d^7(a^{2}D)4p	^{3}D - ^{3}P°	3 - 2		661
	3	1630.120	84.60410 - 145.95015	3d^7(a^{2}P)4s - 3d^7(a^{2}D)4p	^{1}P - ^{1}P°	1 - 1		661
		1630.30	0.0 - 61.33858	3d^8 - 3d^7(a^{4}F)4s	ga^{3}F - ^{3}F	4 - 4	F,P	375,1108
	5	1630.602	82.82640 - 144.15300	3d^7(a^{2}H)4s - 3d^7(a^{2}H)4p	^{3}H - ^{1}G°	4 - 4		661
	2	1631.479	79.25011 - 140.54452	3d^7(a^{2}G)4s - 3d^7(a^{2}D)4p	^{1}G - ^{3}F°	4 - 3		661
	2	1631.754	82.27726 - 143.56016	3d^7(a^{2}D)4s - 3d^7(a^{2}D)4p	^{1}D - ^{3}P°	1 - 2		661
17	100	1632.166	55.40629 - 116.67439	3d^7(a^{4}F)4s - 3d^7(a^{4}F)4p	^{5}F - ^{3}G°	3 - 4		661
		1632.79	1.3607 - 62.60558	3d^8 - 3d^7(a^{4}F)4s	ga^{3}F - ^{3}F	3 - 3	F,P	375,1108
		1633.92	2.2696 - 63.47193	3d^8 - 3d^7(a^{4}F)4s	ga^{3}F - ^{3}F	2 - 2	F,P	375,1108
	5	1635.717	79.74922 - 140.88515	3d^7(a^{2}P)4s - 3d^7(a^{2}P)4p	^{3}P - ^{3}S°	1 - 1		661
	25	1639.996	71.84242 - 132.81826	3d^7(a^{4}P)4s - 3d^7(a^{4}P)4p	^{5}P - ^{5}P°	1 - 2		661
	1	1644.466						661
	1	1647.484						661
17	100	1649.771	54.65783 - 115.27226	3d^7(a^{4}F)4s - 3d^7(a^{4}F)4p	^{5}F - ^{3}G°	4 - 5		661
	300	1652.866	81.68680 - 142.18780	3d^7(a^{2}H)4s - 3d^7(a^{2}H)4p	^{3}H - ^{3}H°	6 - 6		661
	200	1653.119	85.83420 - 146.32580	3d^7(a^{2}H)4s - 3d^7(a^{2}H)4p	^{1}H - ^{1}H°	5 - 5		661
	250	1656.126	82.19380 - 142.57560	3d^7(a^{2}H)4s - 3d^7(a^{2}H)4p	^{3}H - ^{3}H°	5 - 5		661
		1657.39	2.2696 - 62.60558	3d^8 - 3d^7(a^{4}F)4s	ga^{3}F - ^{3}F	2 - 3	F,P	375,1108
	10	1659.438	82.17260 - 142.43395	3d^7(a^{2}D)4s - 3d^7(a^{2}D)4p	^{3}D - ^{1}D°	3 - 2		661

Ni III — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	200	1661.786	82.82640 – 143.00270	3d^7(a^{2}H)4s – 3d^7(a^{2}H)4p	^{3}H – ^{3}H°	4 – 4		661
	1	1662.311	82.27726 – 142.43395	3d^7(a^{2}D)4s – 3d^7(a^{2}D)4p	^{3}D – ^{1}D°	1 – 2		661
	20	1665.859						661
	20	1666.102	84.60410 – 144.62455	3d^7(a^{2}P)4s – 3d^7(a^{2}D)4p	^{1}P – ^{3}P°	1 – 1		661
	20	1666.828	82.19380 – 142.18780	3d^7(a^{2}H)4s – 3d^7(a^{2}H)4p	^{3}H – ^{3}H°	5 – 6		661
		1667.28	1.3607 – 61.33858	3d^8 – 3d^7(a^{4}F)4s	ga^{3}F – ^{3}F	3 – 4	F,P	375,1108
	50	1672.213						661
	10	1673.659	82.82640 – 142.57560	3d^7(a^{2}H)4s – 3d^7(a^{2}H)4p	^{3}H – ^{3}H°	4 – 5		661
	1	1676.054	78.48243 – 138.14648	3d^7(a^{4}P)4s – 3d^7(a^{2}P)4p	^{3}P – ^{1}S°	1 – 0		661
	10	1680.532	79.74922 – 139.25370	3d^7(a^{2}P)4s – 3d^7(a^{2}D)4p	^{3}P – ^{3}D°	1 – 2		661
16	10	1682.029	54.65783 – 114.11020	3d^7(a^{4}F)4s – 3d^7(a^{4}F)4p	^{5}F – ^{5}G°	4 – 3		661
16	1	1682.443	53.70393 – 113.14092	3d^7(a^{4}F)4s – 3d^7(a^{4}F)4p	^{5}F – ^{5}G°	5 – 5		661
	2	1683.471	83.03345 – 142.43395	3d^7(a^{2}D)4s – 3d^7(a^{2}D)4p	^{1}D – ^{1}D°	2 – 2		661
	30	1683.688	97.84160 – 157.23516	3d^7(a^{2}F)4s – 3d^7(a^{2}F)4p	^{3}F – ^{3}D°	2 – 1		661
	1	1684.515						661
	5	1685.085	79.14301 – 138.48740	3d^7(a^{2}P)4s – 3d^7(a^{2}D)4p	^{3}P – ^{3}D°	2 – 3		661
	3	1685.546	78.30354 – 137.63160	3d^7(a^{4}P)4s – 3d^7(a^{2}P)4p	^{3}P – ^{1}D°	2 – 2		661
	5	1685.977	97.84160 – 157.15427	3d^7(a^{2}F)4s – 3d^7(a^{2}F)4p	^{3}F – ^{3}D°	2 – 2		661
	75	1686.216	86.64588 – 145.95015	3d^7(a^{2}D)4s – 3d^7(a^{2}D)4p	^{1}D – ^{1}P°	2 – 1		661
25	400	1687.897	71.06735 – 130.31230	3d^7(a^{4}P)4s – 3d^7(a^{4}P)4p	^{5}P – ^{5}D°	3 – 4		661
	5	1689.121						661
	1	1689.596						661
	20	1690.372	97.99581 – 157.15427	3d^7(a^{2}F)4s – 3d^7(a^{2}F)4p	^{3}F – ^{3}D°	3 – 2		661
	5	1690.634	78.48243 – 137.63160	3d^7(a^{4}P)4s – 3d^7(a^{2}P)4p	^{3}P – ^{1}D°	1 – 2		661
	15	1690.974	98.23793 – 157.37542	3d^7(a^{2}F)4s – 3d^7(a^{2}F)4p	^{3}F – ^{1}G°	4 – 4		661
	1	1691.275						661
	3	1692.219	75.12365 – 134.21760	3d^7(a^{2}G)4s – 3d^7(a^{2}G)4p	^{3}G – ^{1}H°	5 – 5		661
16	1000	1692.514	53.70393 – 112.78785	3d^7(a^{4}F)4s – 3d^7(a^{4}F)4p	^{5}F – ^{5}G°	5 – 6		661
		1692.94	2.2696 – 61.33858	3d^8 – 3d^7(a^{4}F)4s	ga^{3}F – ^{3}F	2 – 4	F,P	375,1108
16	3	1693.559	54.65783 – 113.70512	3d^7(a^{4}F)4s – 3d^7(a^{4}F)4p	^{5}F – ^{5}G°	4 – 4		661
	5	1694.307	71.84242 – 130.86350	3d^7(a^{4}P)4s – 3d^7(a^{4}P)4p	^{5}P – ^{3}S°	1 – 1		661
	2	1694.582	97.84160 – 156.85300	3d^7(a^{2}F)4s – 3d^7(a^{2}F)4p	^{3}F – ^{3}D°	2 – 3		661
	30	1695.599	97.99581 – 156.97208	3d^7(a^{2}F)4s – 3d^7(a^{2}F)4p	^{3}F – ^{3}F°	3 – 4		661
16	5	1695.910	55.40629 – 114.37101	3d^7(a^{4}F)4s – 3d^7(a^{4}F)4p	^{5}F – ^{5}G°	3 – 2		661
	5	1696.195	84.60410 – 143.56016	3d^7(a^{2}P)4s – 3d^7(a^{2}D)4p	^{1}P – ^{3}P°	1 – 2		661
25	50	1698.176	71.06735 – 129.95400	3d^7(a^{4}P)4s – 3d^7(a^{4}P)4p	^{5}P – ^{5}D°	3 – 3		661
	5	1698.381	78.48243 – 137.36236	3d^7(a^{4}P)4s – 3d^7(a^{2}P)4p	^{3}P – ^{3}D°	1 – 1		661
	10	1699.024	97.99581 – 156.85300	3d^7(a^{2}F)4s – 3d^7(a^{2}F)4p	^{3}F – ^{3}D°	3 – 3		661
	8	1699.349	71.06735 – 129.91310	3d^7(a^{4}P)4s – 3d^7(a^{4}P)4p	^{5}P – ^{5}D°	3 – 2		661
	10	1701.081	76.23725 – 135.02320	3d^7(a^{2}G)4s – 3d^7(a^{2}G)4p	^{1}G – ^{1}F°	3 – 3		661
30	60	1701.599	75.64661 – 134.41477	3d^7(a^{2}G)4s – 3d^7(a^{2}G)4p	^{3}G – ^{3}G°	4 – 4		661
	10	1702.591	98.23793 – 156.97208	3d^7(a^{2}F)4s – 3d^7(a^{2}F)4p	^{3}F – ^{3}F°	4 – 4		661
16	50	1703.467	55.40629 – 114.11020	3d^7(a^{4}F)4s – 3d^7(a^{4}F)4p	^{5}F – ^{5}G°	3 – 3		661
	3	1703.925	75.64661 – 134.33479	3d^7(a^{2}G)4s – 3d^7(a^{2}G)4p	^{3}G – ^{3}G°	4 – 3		661
	10	1704.128	97.84160 – 156.52287	3d^7(a^{2}F)4s – 3d^7(a^{2}F)4p	^{3}F – ^{3}F°	2 – 2		661
	60	1704.641	78.30354 – 136.96700	3d^7(a^{4}P)4s – 3d^7(a^{2}P)4p	^{3}P – ^{3}D°	2 – 3		661
	10	1706.041	98.23793 – 156.85300	3d^7(a^{2}F)4s – 3d^7(a^{2}F)4p	^{3}F – ^{3}D°	4 – 3		661
	15	1706.246	82.27726 – 140.88540	3d^7(a^{2}D)4s – 3d^7(a^{2}D)4p	^{3}D – ^{3}F°	1 – 2		661
25	10	1707.242	71.38410 – 129.95795	3d^7(a^{4}P)4s – 3d^7(a^{4}P)4p	^{5}P – ^{5}D°	2 – 1		661
25	200	1707.346	71.38410 – 129.95400	3d^7(a^{4}P)4s – 3d^7(a^{4}P)4p	^{5}P – ^{5}D°	2 – 3		661
30	200	1707.426	75.12365 – 133.69200	3d^7(a^{2}G)4s – 3d^7(a^{2}G)4p	^{3}G – ^{3}G°	5 – 5		661
25	50	1708.552	71.38410 – 129.91310	3d^7(a^{4}P)4s – 3d^7(a^{4}P)4p	^{5}P – ^{5}D°	2 – 2		661
16	800	1709.901	54.65783 – 113.14092	3d^7(a^{4}F)4s – 3d^7(a^{4}F)4p	^{5}F – ^{5}G°	4 – 5		661
16	10	1711.779	55.95221 – 114.37101	3d^7(a^{4}F)4s – 3d^7(a^{4}F)4p	^{5}F – ^{5}G°	2 – 2		661

Ni III — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	5	1712.893	83.03345 – 141.41410	$3d^7(a^2D)4s - 3d^7(a^2P)4p$	$^3D - {}^1P^\circ$	2 – 1		661
	10	1713.864	71.84242 – 130.19005	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^5P - {}^5D^\circ$	1 – 0		661
	100	1714.698	85.83420 – 144.15300	$3d^7(a^2H)4s - 3d^7(a^2H)4p$	$^1H - {}^1G^\circ$	5 – 4		661
16	650	1715.303	55.40629 – 113.70512	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5G^\circ$	3 – 4		661
15	100	1715.931	54.65783 – 112.93543	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5D^\circ$	4 – 3		661
15	75	1716.886	55.40629 – 113.65147	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5D^\circ$	3 – 2		661
	20	1718.184	75.12365 – 133.32470	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^3G - {}^1G^\circ$	5 – 4		661
15	150	1718.365	53.70393 – 111.89865	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5D^\circ$	5 – 4		661
30	20	1718.873	76.23725 – 134.41477	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^3G - {}^3G^\circ$	3 – 4		661
	20	1719.008	98.23793 – 156.41120	$3d^7(a^2F)4s - 3d^7(a^2F)4p$	$^3F - {}^3F^\circ$	4 – 3		661
16	500	1719.458	55.95221 – 114.11020	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5G^\circ$	2 – 3		661
15	50	1719.892	55.95221 – 114.09560	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5D^\circ$	2 – 1		661
25	20	1720.708	71.84242 – 129.95795	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^5P - {}^5D^\circ$	1 – 1		661
30	200	1721.256	76.23725 – 134.33479	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^3G - {}^3G^\circ$	3 – 3		661
	0	1721.799						661
	15	1722.038	71.84242 – 129.91310	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^5P - {}^5D^\circ$	1 – 2		661
16	400	1722.283	56.30824 – 114.37101	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5G^\circ$	1 – 2		661
30	20	1722.790	75.64661 – 133.69200	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^3G - {}^3G^\circ$	4 – 5		661
	150	1723.793	82.17260 – 140.18465	$3d^7(a^2D)4s - 3d^7(a^2D)4p$	$^3D - {}^3F^\circ$	3 – 4		661
28	75	1724.291	76.23725 – 134.23190	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^3G - {}^3F^\circ$	3 – 2		661
15	50	1724.523	56.30824 – 114.29545	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5D^\circ$	1 – 0		661
	20	1727.640	79.74922 – 137.63160	$3d^7(a^2P)4s - 3d^7(a^2P)4p$	$^3P - {}^1D^\circ$	1 – 2		661
	1	1728.127						661
	20	1728.738	97.99581 – 155.84140	$3d^7(a^2F)4s - 3d^7(a^2F)4p$	$^3F - {}^3G^\circ$	3 – 4		661
	2	1729.219	84.60410 – 142.43395	$3d^7(a^2P)4s - 3d^7(a^2D)4p$	$^1P - {}^1D^\circ$	1 – 2		661
	20	1729.384	79.14301 – 136.96700	$3d^7(a^2P)4s - 3d^7(a^2P)4p$	$^3P - {}^3D^\circ$	2 – 3		661
	10	1730.255	78.30354 – 136.09870	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - {}^3P^\circ$	2 – 1		661
15	75	1730.483	56.30824 – 114.09560	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5D^\circ$	1 – 1		661
	2	1731.733						661
15	250	1733.129	55.95221 – 113.65147	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5D^\circ$	2 – 2		661
	50	1733.762	75.64661 – 133.32470	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^3G - {}^1G^\circ$	4 – 4		661
	2	1735.628	78.48243 – 136.09870	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - {}^3P^\circ$	1 – 1		661
	5	1735.713	79.74922 – 137.36236	$3d^7(a^2P)4s - 3d^7(a^2P)4p$	$^3P - {}^3D^\circ$	1 – 1		661
	50	1736.011	98.23793 – 155.84140	$3d^7(a^2F)4s - 3d^7(a^2F)4p$	$^3F - {}^3G^\circ$	4 – 4		661
	50	1736.051	97.84160 – 155.44330	$3d^7(a^2F)4s - 3d^7(a^2F)4p$	$^3F - {}^3G^\circ$	2 – 3		661
	2	1736.569						661
15	500	1738.252	55.40629 – 112.93543	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5D^\circ$	3 – 3		661
28	300	1738.785	75.64661 – 133.15850	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^3G - {}^3F^\circ$	4 – 3		661
	5	1739.747	121.80245 – 179.28200	$3d^7(b^2D)4s - 3d^7(b^2D)4p$	$^3D - {}^3F^\circ$	3 – 4		661
	1	1739.979						661
	15	1740.671	75.64661 – 133.09589	$3d^7(a^2G)4s - 3d^7(a^4P)4p$	$^3G - {}^5P^\circ$	4 – 3		661
	10	1740.718	97.99581 – 155.44330	$3d^7(a^2F)4s - 3d^7(a^2F)4p$	$^3F - {}^3G^\circ$	3 – 3		661
	30	1740.944	82.19380 – 139.63390	$3d^7(a^2H)4s - 3d^7(a^2H)4p$	$^3H - {}^1I^\circ$	5 – 6		661
21	300	1741.963	61.33858 – 118.74525	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - {}^3D^\circ$	4 – 3		661
15	1	1743.903	56.30824 – 113.65147	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5D^\circ$	1 – 2		661
	1	1745.436						661
15	550	1747.011	54.65783 – 111.89865	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5D^\circ$	4 – 4		661
	1	1747.356	97.84160 – 155.07100	$3d^7(a^2F)4s - 3d^7(a^2F)4p$	$^3F - {}^1D^\circ$	2 – 2		661
	50	1747.680	86.64588 – 143.86480	$3d^7(a^2D)4s - 3d^7(a^2D)4p$	$^1D - {}^1F^\circ$	2 – 3		661
	1	1749.203	85.83420 – 143.00270	$3d^7(a^2H)4s - 3d^7(a^2H)4p$	$^1H - {}^3H^\circ$	5 – 4		661
21	300	1752.427	62.60558 – 119.66954	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - {}^3D^\circ$	3 – 2		661
	400	1753.011	75.12365 – 132.16860	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^3G - {}^3H^\circ$	5 – 6		661
	3	1753.150	121.41160 – 178.45150	$3d^7(b^2D)4s - 3d^7(b^2D)4p$	$^3D - {}^3F^\circ$	2 – 3		661
29	10	1753.377	75.12365 – 132.15650	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^3G - {}^3H^\circ$	5 – 4		661

Ni III — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	1755.757	79.14301 – 136.09870	$3d^7(a^2P)4s - 3d^7(a^4P)4p$	$^3P - {}^3P^\circ$	2 – 1		661
	1	1756.151						661
	2	1756.801	76.23725 – 133.15850	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^3G - {}^3F^\circ$	3 – 3		661
	25	1757.034	86.64588 – 143.56016	$3d^7(a^2D)4s - 3d^7(a^2D)4p$	$^1D - {}^3P^\circ$	2 – 2		661
	10	1758.468	78.48243 – 135.35033	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - {}^3P^\circ$	1 – 2		661
	3	1758.940	78.48243 – 135.33490	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - {}^3P^\circ$	1 – 0		661
	20	1760.260	84.60410 – 141.41410	$3d^7(a^2P)4s - 3d^7(a^2P)4p$	$^1P - {}^1P^\circ$	1 – 1		661
21	150	1760.560	63.47193 – 120.27232	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - {}^3D^\circ$	2 – 1		661
	20	1762.394	80.62110 – 137.36236	$3d^7(a^2P)4s - 3d^7(a^2P)4p$	$^3P - {}^3D^\circ$	0 – 1		661
	2	1763.069	78.30354 – 135.02320	$3d^7(a^4P)4s - 3d^7(a^2G)4p$	$^3P - {}^1F^\circ$	2 – 3		661
	20	1763.607	82.27726 – 138.97920	$3d^7(a^2D)4s - 3d^7(a^2D)4p$	$^3D - {}^3D^\circ$	1 – 1		661
14	800	1764.688	53.70393 – 110.37135	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5F^\circ$	5 – 4		661
	1	1765.229						661
	10	1766.387	121.19293 – 177.80560	$3d^7(b^2D)4s - 3d^7(b^2D)4p$	$^3D - {}^3F^\circ$	1 – 2		661
14	500	1767.938	54.65783 – 111.22120	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5F^\circ$	4 – 3		661
14	1000	1769.634	53.70393 – 110.21280	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5F^\circ$	5 – 5	P	661
14	200	1769.653	55.40629 – 111.91453	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5F^\circ$	3 – 2	P	661
	1	1770.153	55.40629 – 111.89865	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5D^\circ$	3 – 4		661
14	100	1771.492	55.95221 – 112.40165	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5F^\circ$	2 – 1		661
	1	1772.499						661
27	40	1773.788	75.12365 – 131.50050	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^3G - {}^3H^\circ$	5 – 5		661
	10	1774.640	79.74922 – 136.09870	$3d^7(a^2P)4s - 3d^7(a^4P)4p$	$^3P - {}^3P^\circ$	1 – 1		661
	2	1774.992						661
	150	1775.750	82.17260 – 138.48740	$3d^7(a^2D)4s - 3d^7(a^2D)4p$	$^3D - {}^3D^\circ$	3 – 3		661
	400	1776.068	81.68680 – 137.99140	$3d^7(a^2H)4s - 3d^7(a^2H)4p$	$^3H - {}^3I^\circ$	6 – 7		661
	30	1776.802	84.60410 – 140.88515	$3d^7(a^2P)4s - 3d^7(a^2P)4p$	$^1P - {}^3S^\circ$	1 – 1		661
	10	1777.227	61.33858 – 117.60635	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - {}^3G^\circ$	4 – 3		661
	10	1778.583	125.43355 – 181.6584	$3d^7(b^2D)4s - 3d^7(b^2D)4p$	$^1D - {}^1F^\circ$	2 – 3		661
	30	1778.730	83.03345 – 139.25370	$3d^7(a^2D)4s - 3d^7(a^2D)4p$	$^3D - {}^3D^\circ$	2 – 2		661
	20	1779.127	79.14301 – 135.35033	$3d^7(a^2P)4s - 3d^7(a^4P)4p$	$^3P - {}^3P^\circ$	2 – 2		661
21	30	1779.442	63.47193 – 119.66954	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - {}^3D^\circ$	2 – 2		661
	1	1779.607						661
	15	1781.088	75.64661 – 131.79202	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^3G - {}^3F^\circ$	4 – 4		661
21	50	1781.279	62.60558 – 118.74525	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - {}^3D^\circ$	3 – 3		661
14	60	1782.747	56.30824 – 112.40165	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5F^\circ$	1 – 1		661
	75	1784.882	82.82640 – 138.85220	$3d^7(a^2H)4s - 3d^7(a^2H)4p$	$^3H - {}^3G^\circ$	4 – 3		661
14	60	1786.927	55.95221 – 111.91453	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5F^\circ$	2 – 2		661
	2	1787.456	83.03345 – 138.97920	$3d^7(a^2D)4s - 3d^7(a^2D)4p$	$^3D - {}^3D^\circ$	2 – 1		661
27	200	1788.301	76.23725 – 132.15650	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^3G - {}^3H^\circ$	3 – 4		661
	150	1788.502	61.33858 – 117.25080	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - {}^3F^\circ$	4 – 3		661
	3	1789.888	82.27726 – 138.14648	$3d^7(a^2D)4s - 3d^7(a^2P)4p$	$^3D - {}^1S^\circ$	1 – 0		661
	5	1789.983	82.19380 – 138.06040	$3d^7(a^2H)4s - 3d^7(a^2H)4p$	$^3H - {}^3I^\circ$	5 – 5		661
27	250	1790.402	75.64661 – 131.50050	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^3G - {}^3H^\circ$	4 – 5		661
	200	1790.934	82.19380 – 138.03090	$3d^7(a^2H)4s - 3d^7(a^2H)4p$	$^3H - {}^3G^\circ$	5 – 4		661
14	200	1791.644	55.40629 – 111.22120	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5F^\circ$	3 – 3		661
	25	1792.513	86.64588 – 142.43395	$3d^7(a^2D)4s - 3d^7(a^2D)4p$	$^1D - {}^1D^\circ$	2 – 2		661
	100	1792.994	79.25011 – 135.02320	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^1G - {}^1F^\circ$	4 – 3		661
	1	1793.972						661
14	200	1794.904	54.65783 – 110.37135	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5F^\circ$	4 – 4		661
	20	1795.192	81.68680 – 137.39130	$3d^7(a^2H)4s - 3d^7(a^2H)4p$	$^3H - {}^3I^\circ$	6 – 6		661
14	20	1798.366	56.30824 – 111.91453	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5F^\circ$	1 – 2		661
	5	1799.023	79.74922 – 135.33490	$3d^7(a^2P)4s - 3d^7(a^4P)4p$	$^3P - {}^3P^\circ$	1 – 0		661
14	20	1800.031	54.65783 – 110.21280	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - {}^5F^\circ$	4 – 5		661
	1	1800.404	121.19293 – 176.73640	$3d^7(b^2D)4s - 3d^7(b^2D)4p$	$^3D - {}^3P^\circ$	1 – 0		661

Ni III — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
20	50	1801.506	62.60558 – 118.11495	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - ^3F^\circ$	3 – 2		661
	2	1802.546	80.62110 – 136.09870	$3d^7(a^2P)4s - 3d^7(a^4P)4p$	$^3P - ^3P^\circ$	0 – 1		661
	1	1803.615						661
	30	1804.394	101.95490 – 157.37542	$3d^7(a^2F)4s - 3d^7(a^2F)4p$	$^1F - ^1G^\circ$	3 – 4		661
	30	1806.457	78.48243 – 133.83954	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - ^3D^\circ$	1 – 1		661
	30	1806.550	82.27726 – 137.63160	$3d^7(a^2D)4s - 3d^7(a^2P)4p$	$^3D - ^1D^\circ$	1 – 2		661
	50	1807.056	78.30354 – 133.64258	$3d^7(a^4P)4s - 3d^7(a^2P)4p$	$^3P - ^3P^\circ$	2 – 2		661
	300	1807.245	81.68680 – 137.02020	$3d^7(a^2H)4s - 3d^7(a^2H)4p$	$^3H - ^3G^\circ$	6 – 5		661
	5	1809.200	63.47193 – 118.74525	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - ^3D^\circ$	2 – 3		661
14	15	1809.335	55.95221 – 111.22120	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - ^5F^\circ$	2 – 3		661
	150	1810.489	82.82640 – 138.06040	$3d^7(a^2H)4s - 3d^7(a^2H)4p$	$^3H - ^3I^\circ$	4 – 5		661
	200	1811.689	78.30354 – 133.50097	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - ^3D^\circ$	2 – 2		661
	10	1812.190	78.65755 – 133.83954	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - ^3D^\circ$	0 – 1		661
	3	1812.539	121.41160 – 176.58320	$3d^7(b^2D)4s - 3d^7(b^2D)4p$	$^3D - ^3P^\circ$	2 – 1		661
	20	1812.769	79.25011 – 134.41477	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^1G - ^3G^\circ$	4 – 4		661
	1	1814.082						661
	20	1815.307	78.30354 – 133.39094	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - ^3D^\circ$	2 – 3		661
	15	1815.398	79.25011 – 134.33479	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^1G - ^3G^\circ$	4 – 3		661
	2	1815.650						661
	1	1816.990	78.30354 – 133.33970	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - ^5P^\circ$	2 – 1		661
	15	1817.598	101.95490 – 156.97208	$3d^7(a^2F)4s - 3d^7(a^2F)4p$	$^1F - ^3F^\circ$	3 – 4		661
	300	1819.275	79.25011 – 134.21760	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^1G - ^1H^\circ$	4 – 5		661
14	3	1819.325	55.40629 – 110.37135	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^5F - ^5F^\circ$	3 – 4		661
	25	1822.918	78.48243 – 133.33970	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - ^5P^\circ$	1 – 1		661
20	800	1823.061	61.33858 – 116.19193	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - ^3F^\circ$	4 – 4		661
	1	1823.936	82.19380 – 137.02020	$3d^7(a^2H)4s - 3d^7(a^2H)4p$	$^3H - ^3G^\circ$	5 – 5		661
	20	1825.084	78.30354 – 133.09589	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - ^5P^\circ$	2 – 3		661
	15	1828.279	129.91310 – 184.60957	$3d^7(a^4P)4p - 3d^7(a^4F)5s$	$^5D^\circ - ^5F$	2 – 1		661
	15	1828.672	121.80245 – 176.48710	$3d^7(b^2D)4s - 3d^7(b^2D)4p$	$^3D - ^3P^\circ$	3 – 2		661
		1829.56	0.0 – 54.65783	$3d^8 - 3d^7(a^4F)4s$	$ga^3F - ^5F$	4 – 4	F,P	375,1108
20	400	1830.006	62.60558 – 117.25080	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - ^3F^\circ$	3 – 3		661
20	200	1830.075	63.47193 – 118.11495	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - ^3F^\circ$	2 – 2		661
	15	1830.859	78.65755 – 133.27670	$3d^7(a^4P)4s - 3d^7(a^2P)4p$	$^3P - ^3P^\circ$	0 – 1		661
	5	1831.578	83.03345 – 137.63160	$3d^7(a^2D)4s - 3d^7(a^2P)4p$	$^3D - ^1D^\circ$	2 – 2		661
	1	1831.850						661
	20	1833.669	82.27726 – 136.81320	$3d^7(a^2D)4s - 3d^7(a^2P)4p$	$^3D - ^3D^\circ$	1 – 2		661
	15	1834.381	78.30354 – 132.81826	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - ^5P^\circ$	2 – 2		661
	20	1834.890	79.14301 – 133.64258	$3d^7(a^2P)4s - 3d^7(a^2P)4p$	$^3P - ^3P^\circ$	2 – 2		661
	30	1836.843	79.25011 – 133.69200	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^1G - ^3G^\circ$	4 – 5		661
	1	1839.092	84.60410 – 138.97920	$3d^7(a^2P)4s - 3d^7(a^2D)4p$	$^1P - ^3D^\circ$	1 – 1		661
	40	1840.421	133.15850 – 187.49338	$3d^7(a^2G)4p - 3d^7(a^4F)4d$	$^3F^\circ - ^3P$	3 – 2		661
	15	1841.866						661
34	50	1843.406	79.14301 – 133.39094	$3d^7(a^2P)4s - 3d^7(a^4P)4p$	$^3P - ^3D^\circ$	2 – 3		661
	1	1843.689	86.64588 – 140.88540	$3d^7(a^2D)4s - 3d^7(a^2D)4p$	$^1D - ^3F^\circ$	2 – 2		661
	15	1845.141	79.14301 – 133.33970	$3d^7(a^2P)4s - 3d^7(a^4P)4p$	$^3P - ^5P^\circ$	2 – 1		661
19	650	1847.275	63.47193 – 117.60635	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - ^3G^\circ$	2 – 3		661
	100	1849.319	79.25011 – 133.32470	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^1G - ^1G^\circ$	4 – 4		661
	50	1849.473	62.60558 – 116.67439	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - ^3G^\circ$	3 – 4		661
19	75	1849.540						661
		1850.29	1.3607 – 55.40629	$3d^8 - 3d^7(a^4F)4s$	$ga^3F - ^5F$	3 – 3	F,P	375,1108
	30	1853.480	79.14301 – 133.09589	$3d^7(a^2P)4s - 3d^7(a^4P)4p$	$^3P - ^5P^\circ$	2 – 3		661
19	800	1854.149	61.33858 – 115.27226	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - ^3G^\circ$	4 – 5		661
	1	1855.525	79.74922 – 133.64258	$3d^7(a^2P)4s - 3d^7(a^2P)4p$	$^3P - ^3P^\circ$	1 – 2		661
	1	1855.755	101.95490 – 155.84140	$3d^7(a^2F)4s - 3d^7(a^2F)4p$	$^1F - ^3G^\circ$	3 – 4		661

Ni III — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	0	1857.158	79.25011 – 133.09589	$3d^7(a^2G)4s - 3d^7(a^4P)4p$	$^1G - ^5P^\circ$	4 – 3		661
	300	1858.750	85.83420 – 139.63390	$3d^7(a^2H)4s - 3d^7(a^2H)4p$	$^1H - ^1I^\circ$	5 – 6		661
	2	1859.480	63.47193 – 117.25080	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - ^3F^\circ$	2 – 3		661
		1862.06	0.0 – 53.70393	$3d^8 - 3d^7(a^4F)4s$	ga$^3F - ^5F$	4 – 5	F,P	375,1108
		1862.80	2.2696 – 55.95221	$3d^8 - 3d^7(a^4F)4s$	ga$^3F - ^5F$	2 – 2	F,P	375,1108
	3	1866.008	79.74922 – 133.33970	$3d^7(a^2P)4s - 3d^7(a^4P)4p$	$^3P - ^5P^\circ$	1 – 1		661
	5	1866.163	62.60558 – 116.19193	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - ^3F^\circ$	3 – 4		661
	3	1867.706						661
	20	1868.201	79.74922 – 133.27670	$3d^7(a^2P)4s - 3d^7(a^2P)4p$	$^3P - ^3P^\circ$	1 – 1		661
		1876.27	1.3607 – 54.65783	$3d^8 - 3d^7(a^4F)4s$	ga$^3F - ^5F$	3 – 4	F,P	375,1108
	5	1879.063	80.62110 – 133.83954	$3d^7(a^2P)4s - 3d^7(a^4P)4p$	$^3P - ^3D^\circ$	0 – 1		661
	5	1880.498	82.17260 – 135.35033	$3d^7(a^2D)4s - 3d^7(a^4P)4p$	$^3D - ^3P^\circ$	3 – 2		661
		1881.94	2.2696 – 55.40629	$3d^8 - 3d^7(a^4F)4s$	ga$^3F - ^5F$	2 – 3	F,P	375,1108
	25	1882.686	79.74922 – 132.8648	$3d^7(a^2P)4s - 3d^7(a^2P)4p$	$^3P - ^3P^\circ$	1 – 0		661
	1	1884.723	82.27726 – 135.33490	$3d^7(a^2D)4s - 3d^7(a^4P)4p$	$^3D - ^3P^\circ$	1 – 0		661
	10	1885.864						661
	15	1890.155	79.25011 – 132.15650	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^1G - ^3H^\circ$	4 – 4		661
	5	1895.479						661
	1	1899.098						661
	50	1902.607	78.30354 – 130.86350	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - ^3S^\circ$	2 – 1		661
	15	1903.262	79.25011 – 131.79202	$3d^7(a^2G)4s - 3d^7(a^2G)4p$	$^1G - ^3F^\circ$	4 – 4		661
	5	1909.091	78.48243 – 130.86350	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - ^3S^\circ$	1 – 1		661
	30	1913.890						661
	3	1914.076						661
	1	1914.75	85.83420 – 138.06040	$3d^7(a^2H)4s - 3d^7(a^2H)4p$	$^1H - ^3I^\circ$	5 – 5		661
	1	1914.919	82.19380 – 134.41477	$3d^7(a^2H)4s - 3d^7(a^2G)4p$	$^3H - ^3G^\circ$	5 – 4		661
	5	1915.409						661
	5	1915.497	78.65755 – 130.86350	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - ^3S^\circ$	0 – 1		661
	2	1915.834	85.83420 – 138.03090	$3d^7(a^2H)4s - 3d^7(a^2H)4p$	$^1H - ^3G^\circ$	5 – 4		661
	1	1922.91						661
	5	1923.463	83.03345 – 135.02320	$3d^7(a^2D)4s - 3d^7(a^2G)4p$	$^3D - ^1F^\circ$	2 – 3		661
18	200	1930.431	61.33858 – 113.14092	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - ^5G^\circ$	4 – 5		661
		1933.47	79.14301 – 130.86350	$3d^7(a^2P)4s - 3d^7(a^4P)4p$	$^3P - ^3S^\circ$	2 – 1	P	375
	5	1935.947	78.30354 – 129.95795	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - ^5D^\circ$	2 – 1		661
	2	1936.10	78.30354 – 129.95400	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - ^5D^\circ$	2 – 3		661
	3	1939.40	82.27726 – 133.83954	$3d^7(a^2D)4s - 3d^7(a^4P)4p$	$^3D - ^3D^\circ$	1 – 1		661
	100	1939.588	85.83420 – 137.39130	$3d^7(a^2H)4s - 3d^7(a^2H)4p$	$^1H - ^3I^\circ$	5 – 6		661
	0	1941.41	82.82640 – 134.33479	$3d^7(a^2H)4s - 3d^7(a^2G)4p$	$^3H - ^3G^\circ$	4 – 3		661
18	0	1941.58	62.60558 – 114.11020	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - ^5G^\circ$	3 – 3		661
	0	1942.64	176.48710 – 227.96302	$3d^7(b^2D)4p - 3d^7(a^4F)5d$	$^3P^\circ - ^5G$	2 – 3		661
	10	1942.886	82.17260 – 133.64258	$3d^7(a^2D)4s - 3d^7(a^2P)4p$	$^3D - ^3P^\circ$	3 – 2		661
	2	1944.36	78.48243 – 129.91310	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^3P - ^5D^\circ$	1 – 2		661
	3	1946.81						661
	0	1950.90						661
24	200	1952.540	71.06735 – 122.28240	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^5P - ^5S^\circ$	3 – 2		661
	0	1955.74	82.19380 – 133.32470	$3d^7(a^2H)4s - 3d^7(a^2G)4p$	$^3H - ^1G^\circ$	5 – 4		661
	3	1956.402	79.74922 – 130.86350	$3d^7(a^2P)4s - 3d^7(a^4P)4p$	$^3P - ^3S^\circ$	1 – 1		661
18	20	1956.964	62.60558 – 113.70512	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - ^5G^\circ$	3 – 4		661
	5	1961.324	86.64588 – 137.63160	$3d^7(a^2D)4s - 3d^7(a^2P)4p$	$^1D - ^1D^\circ$	2 – 2		661
	2	1963.73	82.17260 – 133.09589	$3d^7(a^2D)4s - 3d^7(a^4P)4p$	$^3D - ^5P^\circ$	3 – 3		661
24	100	1964.689	71.38410 – 122.28240	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^5P - ^5S^\circ$	2 – 2		661
	3	1968.053						661
	0	1969.62						661
	0	1970.54						661

Ni III — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	15	1974.493	82.17260 – 132.81826	$3d^7(a^2D)4s - 3d^7(a^4P)4p$	$^3D - ^5P^\circ$	3 – 2		661
18	15	1974.780	63.47193 – 114.11020	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - ^5G^\circ$	2 – 3		661
	1	1977.84	61.33858 – 111.89865	$3d^7(a^4F)4s - 3d^7(a^4F)4p$	$^3F - ^5D^\circ$	4 – 4		661
	2	1980.248	82.82640 – 133.32470	$3d^7(a^2H)4s - 3d^7(a^2G)4p$	$^3H - ^1G^\circ$	4 – 4		661
24	50	1982.538	71.84242 – 122.28240	$3d^7(a^4P)4s - 3d^7(a^4P)4p$	$^5P - ^5S^\circ$	1 – 2		661
	1	1987.83	83.03345 – 133.33970	$3d^7(a^2D)4s - 3d^7(a^4P)4p$	$^3D - ^5P^\circ$	2 – 1		661
	10	1993.362						661

NICKEL IV (Ni^{3+}), Z = 28
Ground State $1s^22s^22p^63s^23p^63d^7(^4F_{9/2})$ (25 electrons)
Ionization Potential [443 000] cm^{-1}; [54.9] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	330	392.680	0. – 254.6634	$3d^7 - 3d^6(b^3P)4p$	$ga^4F - ^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	320	393.236	0. – 254.3000	$3d^7 - 3d^6(b^3F)4p$	$ga^4F - ^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	120	394.526	1.1897 – 254.6634	$3d^7 - 3d^6(b^3P)4p$	$ga^4F - ^4D^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	20	395.087	1.1897 – 254.3000	$3d^7 - 3d^6(b^3F)4p$	$ga^4F - ^4F^\circ$	$\frac{7}{2}-\frac{9}{2}$		903
	130	395.369	1.1897 – 254.1237	$3d^7 - 3d^6(b^3F)4p$	$ga^4F - ^4F^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	200	396.127	1.1897 – 253.6391	$3d^7 - 3d^6(b^3F)4p$	$ga^4F - ^4F^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	40	397.557	2.0425 – 253.5793	$3d^7 - 3d^6(b^3F)4p$	$ga^4F - ^4F^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	140	397.967	2.0425 – 253.3262	$3d^7 - 3d^6(b^3P)4p$	$ga^4F - ^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	60	398.473	2.6211 – 253.5793	$3d^7 - 3d^6(b^3F)4p$	$ga^4F - ^4F^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	120	398.521	2.0425 – 252.9754	$3d^7 - 3d^6(b^3P)4p$	$ga^4F - ^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	50	398.886	2.6211 – 253.3262	$3d^7 - 3d^6(b^3P)4p$	$ga^4F - ^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	110	399.444	2.6211 – 252.9754	$3d^7 - 3d^6(b^3P)4p$	$ga^4F - ^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	80	399.487	2.0425 – 252.3540	$3d^7 - 3d^6(b^3P)4p$	$ga^4F - ^4P^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	230	401.299						903
	20	407.035	2.0425 – 247.7317	$3d^7 - 3d^6(b^3F)4p$	$ga^4F - ^4G^\circ$	$\frac{5}{2}-\frac{7}{2}$	Q	903
	20	407.967						903
	60	412.460	19.8296 – 262.2755	$3d^7 - 3d^6(b^1G)4p$	$a^2G - ^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	240	413.331	0. – 241.9390	$3d^7 - 3d^6(b^3F)4p$	$ga^4F - ^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	140	415.588	1.1897 – 241.8179	$3d^7 - 3d^6(b^3F)4p$	$ga^4F - ^4D^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	110	417.547	2.0425 – 241.5400	$3d^7 - 3d^6(b^3F)4p$	$ga^4F - ^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	90	418.703	19.8296 – 258.6728	$3d^7 - 3d^6(b^1G)4p$	$a^2G - ^2H^\circ$	$\frac{9}{2}-\frac{9}{2}$	Q	903
	230	418.785	43.8586 – 282.6452	$3d^7 - 3d^6(b^1D)4p$	$a^2F - ^2D^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	180	418.866	43.4375 – 282.1795	$3d^7 - 3d^6(b^1D)4p$	$a^2F - ^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	60	419.198	2.6211 – 241.1724	$3d^7 - 3d^6(b^3P)4p$	$ga^4F - ^4D^\circ$	$\frac{3}{2}-\frac{1}{2}$		903
	120	421.543						903
	50	421.608	19.8296 – 257.0180	$3d^7 - 3d^6(b^3F)4p$	$a^2G - ^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	250	422.747	18.1186 – 254.6634	$3d^7 - 3d^6(b^3P)4p$	$a^4P - ^4D^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	60	422.924	20.9476 – 257.4064	$3d^7 - 3d^6(b^3F)4p$	$a^2G - ^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$	Q	903
	80	423.713	18.1186 – 254.1237	$3d^7 - 3d^6(b^3F)4p$	$a^4P - ^4F^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	80	423.765						903
	60	423.806						903
	60	423.921						903
	40	424.122						903
	100	424.158	18.3668 – 254.1237	$3d^7 - 3d^6(b^3F)4p$	$a^4P - ^4F^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	490	424.405	26.6491 – 262.2755	$3d^7 - 3d^6(b^1G)4p$	$a^2H - ^2G^\circ$	$\frac{11}{2}-\frac{9}{2}$		903
	120	424.583	18.1186 – 253.6391	$3d^7 - 3d^6(b^3F)4p$	$a^4P - ^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	100	425.148	18.3668 – 253.5793	$3d^7 - 3d^6(b^3F)4p$	$a^4P - {}^4F^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	20	425.197						903
	40	425.593	18.3668 – 253.3262	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	380	425.782	27.6776 – 262.5387	$3d^7 - 3d^6(b^1G)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	110	426.230	18.9584 – 253.5793	$3d^7 - 3d^6(b^3F)4p$	$a^4P - {}^4F^\circ$	$\frac{1}{2}-\frac{3}{2}$		903
	70	426.924	18.1186 – 252.3540	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4P^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	50	427.308	18.9584 – 252.9754	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{1}{2}-\frac{3}{2}$		903
	170	427.372	18.3668 – 252.3540	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4P^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	230	428.420	26.6491 – 260.0651	$3d^7 - 3d^6(b^1G)4p$	$a^2H - {}^2H^\circ$	$\frac{11}{2}-\frac{11}{2}$		903
	40	429.017						903
	150	429.775	27.6776 – 260.3555	$3d^7 - 3d^6(b^1G)4p$	$a^2H - {}^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	60	430.994	26.6491 – 258.6728	$3d^7 - 3d^6(b^1G)4p$	$a^2H - {}^2H^\circ$	$\frac{11}{2}-\frac{9}{2}$		903
	410	432.880	18.1186 – 249.1300	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4S^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	200	432.912	27.6776 – 258.6728	$3d^7 - 3d^6(b^1G)4p$	$a^2H - {}^2H^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	260	433.345	18.3668 – 249.1300	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4S^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	140	434.461	18.9584 – 249.1300	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4S^\circ$	$\frac{1}{2}-\frac{3}{2}$		903
	60	434.938	27.0965 – 257.0180	$3d^7 - 3d^6(b^3F)4p$	$a^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	80	438.185						903
	150	439.261	26.6491 – 254.3000	$3d^7 - 3d^6(b^3F)4p$	$a^2H - {}^4F^\circ$	$\frac{11}{2}-\frac{9}{2}$		903
	100	442.552	27.6776 – 253.6391	$3d^7 - 3d^6(b^3F)4p$	$a^2H - {}^4F^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	190	444.178	0. – 225.1369	$3d^7 - 3d^6(a^3D)4p$	$ga^4F - {}^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	570	444.208	26.6491 – 251.7736	$3d^7 - 3d^6(b^3F)4p$	$a^2H - {}^2G^\circ$	$\frac{11}{2}-\frac{9}{2}$		903
	540	444.747	27.6776 – 252.5230	$3d^7 - 3d^6(b^3F)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	120	446.281	0. – 224.0753	$3d^7 - 3d^6(a^1G)4p$	$ga^4F - {}^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	610	446.778	18.1186 – 241.9390	$3d^7 - 3d^6(b^3F)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	180	447.029	18.1186 – 241.8179	$3d^7 - 3d^6(b^3F)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	460	447.523	1.1897 – 224.6457	$3d^7 - 3d^6(a^3D)4p$	$ga^4F - {}^4D^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	180	448.079	18.3668 – 241.5400	$3d^7 - 3d^6(b^3F)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	70	448.779	1.1897 – 224.0213	$3d^7 - 3d^6(a^3D)4p$	$ga^4F - {}^4F^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	20	448.821	18.3668 – 241.1724	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2}-\frac{1}{2}$		903
	20	449.238	2.0425 – 224.6457	$3d^7 - 3d^6(a^3D)4p$	$ga^4F - {}^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	160	449.273	18.9584 – 241.5400	$3d^7 - 3d^6(b^3F)4p$	$a^4P - {}^4D^\circ$	$\frac{1}{2}-\frac{3}{2}$		903
	180	450.017	18.9584 – 241.1724	$3d^7 - 3d^6(b^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{1}{2}-\frac{1}{2}$		903
	120	450.183	2.0425 – 224.1740	$3d^7 - 3d^6(a^3D)4p$	$ga^4F - {}^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	30	451.009	18.3668 – 240.0942	$3d^7 - 3d^6(a^1F)4p$	$a^4P - {}^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	20	451.363	2.6211 – 224.1740	$3d^7 - 3d^6(a^3D)4p$	$ga^4F - {}^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	210	451.500						903
	40	451.690	2.6211 – 224.0213	$3d^7 - 3d^6(a^3D)4p$	$ga^4F - {}^4F^\circ$	$\frac{3}{2}-\frac{5}{2}$	Q	903
	50	452.157	2.6211 – 223.7854	$3d^7 - 3d^6(a^3D)4p$	$ga^4F - {}^4D^\circ$	$\frac{3}{2}-\frac{1}{2}$		903
	40	452.212	1.1897 – 222.3333	$3d^7 - 3d^6(a^3D)4p$	$ga^4F - {}^4P^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	200	452.464						903
	30	452.714	18.1186 – 239.0087	$3d^7 - 3d^6(a^1F)4p$	$a^4P - {}^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	80	453.227	18.3668 – 239.0087	$3d^7 - 3d^6(a^1F)4p$	$a^4P - {}^2D^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	70	454.432	27.6776 – 247.7317	$3d^7 - 3d^6(b^3F)4p$	$a^2H - {}^4G^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	60	456.361	19.8296 – 238.9578	$3d^7 - 3d^6(a^1F)4p$	$a^2G - {}^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	190	456.419	43.4375 – 262.5387	$3d^7 - 3d^6(b^1G)4p$	$a^2F - {}^2G^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	50	456.913	0. – 218.8606	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^2H^\circ$	$\frac{9}{2}-\frac{11}{2}$		903
	120	457.293	43.8586 – 262.5387	$3d^7 - 3d^6(b^1G)4p$	$a^2F - {}^2G^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	350	457.850	43.8586 – 262.2755	$3d^7 - 3d^6(b^1G)4p$	$a^2F - {}^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		903
	170	458.356	23.6489 – 241.8179	$3d^7 - 3d^6(b^3F)4p$	$a^2P - {}^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	260	459.164	43.4375 – 261.2263	$3d^7 - 3d^6(b^1G)4p$	$a^2F - {}^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	210	461.010	43.4375 – 260.3555	$3d^7 - 3d^6(b^1G)4p$	$a^2F - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	110	461.061	24.6514 – 241.5400	$3d^7 - 3d^6(b^3F)4p$	$a^2P - {}^4D^\circ$	$\frac{1}{2}-\frac{3}{2}$		903
	120	461.082	24.6514 – 241.5400	$3d^7 - 3d^6(b^3F)4p$	$a^2P - {}^4D^\circ$	$\frac{1}{2}-\frac{3}{2}$	Q	903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	60	461.764						903
	80	461.832	20.9476 – 237.4803	$3d^7 - 3d^6(a^1F)4p$	$a^2G - {}^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	150	461.907	43.8586 – 260.3555	$3d^7 - 3d^6(b^1G)4p$	$a^2F - {}^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	340	462.009	27.0965 – 243.5420	$3d^7 - 3d^6(a^1F)4p$	$a^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	120	462.058	27.0965 – 243.5201	$3d^7 - 3d^6(a^1F)4p$	$a^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	80	463.527	0. – 215.7361	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4H^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	70	463.588						903
	20	463.708	18.3668 – 234.0195	$3d^7 - 3d^6(a^1S)4p$	$a^4P - {}^2P^\circ$	$\frac{3}{2} - \frac{3}{2}$		903
	110	464.160	24.6514 – 240.0942	$3d^7 - 3d^6(a^1F)4p$	$a^2P - {}^2D^\circ$	$\frac{1}{2} - \frac{3}{2}$		903
	210	464.309	2.0425 – 217.4143	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	250	464.334	23.6489 – 239.0087	$3d^7 - 3d^6(a^1F)4p$	$a^2P - {}^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	160	464.423	2.6211 – 217.9397	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		903
	80	464.483	0. – 215.2929	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4G^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	440	465.307	0. – 214.9105	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4G^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	180	465.504	67.3600 – 282.1795	$3d^7 - 3d^6(b^1D)4p$	$b^2D - {}^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		903
	220	465.673	28.7777 – 243.5201	$3d^7 - 3d^6(a^1F)4p$	$a^2D - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	210	465.862	67.9898 – 282.6452	$3d^7 - 3d^6(b^1D)4p$	$b^2D - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	310	466.009	0. – 214.5874	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^2H^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	110	466.124	1.1897 – 215.7245	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4H^\circ$	$\frac{7}{2} - \frac{7}{2}$	Q	903
	220	466.572	1.1897 – 215.5168	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	560	467.061	0. – 214.1010	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4F^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	300	467.373	43.4375 – 257.4064	$3d^7 - 3d^6(b^3F)4p$	$a^2F - {}^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	30	467.495	18.3668 – 232.2727	$3d^7 - 3d^6(a^1D)4p$	$a^4P - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	280	467.856	0. – 213.7397	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	130	468.149	0. – 213.6069	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	230	468.318	1.1897 – 214.7181	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4G^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	380	468.395	2.0425 – 215.5413	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4F^\circ$	$\frac{5}{2} - \frac{3}{2}$		903
	560	468.437	2.0425 – 215.5168	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	630	468.586	0. – 213.4086	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	200	468.931	2.0425 – 215.2929	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4G^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	420	469.133	43.8586 – 257.0180	$3d^7 - 3d^6(b^3F)4p$	$a^2F - {}^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	20	469.193	0. – 213.1311	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	30	469.492	27.0965 – 240.0942	$3d^7 - 3d^6(a^1F)4p$	$a^2D - {}^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		903
	670	469.669	1.1897 – 214.1010	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	360	469.706	2.6211 – 215.5168	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4F^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	70	470.000	28.7777 – 241.5400	$3d^7 - 3d^6(b^3F)4p$	$a^2D - {}^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		903
	20	470.084	18.3668 – 231.0918	$3d^7 - 3d^6(a^1D)4p$	$a^4P - {}^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	140	470.124	19.8296 – 232.5395	$3d^7 - 3d^6(a^1D)4p$	$a^2G - {}^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	440	470.194	2.0425 – 214.7181	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4G^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	20	470.301						903
	340	470.407	2.0425 – 214.6228	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	230	470.473	1.1897 – 213.7397	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	530	471.016	26.6491 – 238.9578	$3d^7 - 3d^6(a^1F)4p$	$a^2H - {}^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	140	471.071	0. – 212.2818	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4G^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	630	471.211	1.1897 – 213.4086	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	650	471.236	0. – 212.2070	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	520	471.360	0. – 212.1509	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4G^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	490	471.476	2.6211 – 214.7181	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4G^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	510	471.565	2.0425 – 214.1010	$3d^7 - 3d^6(a^3G)4p$	$ga^4F - {}^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	210	471.825	1.1897 – 213.1311	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	410	471.894	27.0965 – 239.0087	$3d^7 - 3d^6(a^1F)4p$	$a^2D - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	140	472.538	43.4375 – 255.0640	$3d^7 - 3d^6(b^3P)4p$	$a^2F - {}^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		903
	20	472.608	20.9476 – 232.5395	$3d^7 - 3d^6(a^1D)4p$	$a^2G - {}^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	350	473.104	2.0425 – 213.4121	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4G^\circ$	$\frac{5}{2} - \frac{5}{2}$		903

NI IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	410	473.225	28.7777 – 240.0942	$3d^7 - 3d^6(a^1F)4p$	$a^2D - {}^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	40	473.308	27.6776 – 238.9578	$3d^7 - 3d^6(a^1F)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	560	473.727	1.1897 – 212.2818	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4G^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	320	473.963	0. – 210.9875	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^2I^\circ$	$\frac{9}{2}-\frac{11}{2}$		903
	580	474.017	1.1897 – 212.1509	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4G^\circ$	$\frac{7}{2}-\frac{9}{2}$		903
	350	474.399	2.6211 – 213.4121	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4G^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	440	475.351	23.6489 – 234.0195	$3d^7 - 3d^6(a^1S)4p$	$a^2P - {}^2P^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	580	475.649	2.0425 – 212.2818	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4G^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	80	475.855	20.9476 – 231.0918	$3d^7 - 3d^6(a^1D)4p$	$a^2G - {}^2D^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	530	475.912	0. – 210.1218	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	480	476.640	27.6776 – 237.4803	$3d^7 - 3d^6(a^1F)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	530	476.970	2.6211 – 212.2759	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	50	477.240	43.4375 – 252.9754	$3d^7 - 3d^6(b^3P)4p$	$a^2F - {}^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	60	477.395	43.8586 – 253.3262	$3d^7 - 3d^6(b^3P)4p$	$a^2F - {}^4D^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	60	477.475	18.1186 – 227.5494	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	620	477.550	1.1897 – 210.5906	$3d^7 - 3d^6(a^3P)4p$	$ga^4F - {}^4D^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	460	477.573	0. – 209.3914	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	100	477.623	24.6514 – 234.0195	$3d^7 - 3d^6(a^1S)4p$	$a^2P - {}^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$		903
	170	477.897	23.6489 – 232.8970	$3d^7 - 3d^6(a^1D)4p$	$a^2P - {}^2P^\circ$	$\frac{3}{2}-\frac{1}{2}$		903
	240	477.998	2.0425 – 211.2468	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	20	478.162	0. – 209.1319	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$	Q	903
	580	478.501	2.0425 – 211.0276	$3d^7 - 3d^6(a^3P)4p$	$ga^4F - {}^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	420	478.618	0. – 208.9336	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	570	478.668	0. – 208.9121	$3d^7 - 3d^6(a^3P)4p$	$ga^4F - {}^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	450	479.088	2.6211 – 211.3517	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4D^\circ$	$\frac{3}{2}-\frac{1}{2}$		903
	580	479.175	19.8296 – 228.5185	$3d^7 - 3d^6(a^3D)4p$	$a^2G - {}^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	320	479.331	2.6211 – 211.2468	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	260	479.504	2.0425 – 210.5906	$3d^7 - 3d^6(a^3P)4p$	$ga^4F - {}^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	260	479.828	2.6211 – 211.0276	$3d^7 - 3d^6(a^3P)4p$	$ga^4F - {}^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	630	480.003	0. – 208.3307	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	610	480.026	20.9476 – 229.2695	$3d^7 - 3d^6(a^3D)4p$	$a^2G - {}^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	300	480.197	24.6514 – 232.8970	$3d^7 - 3d^6(a^1D)4p$	$a^2P - {}^2P^\circ$	$\frac{1}{2}-\frac{1}{2}$		903
	310	480.908	1.1897 – 209.1319	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		903
	420	481.151	43.8586 – 251.6943	$3d^7 - 3d^6(b^3F)4p$	$a^2F - {}^2D^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	460	481.359	1.1897 – 208.9336	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{7}{2}-\frac{9}{2}$		903
	40	481.410	1.1897 – 208.9121	$3d^7 - 3d^6(a^3P)4p$	$ga^4F - {}^4D^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	390	481.485	2.6211 – 210.3133	$3d^7 - 3d^6(a^3P)4p$	$ga^4F - {}^4D^\circ$	$\frac{3}{2}-\frac{1}{2}$		903
	100	481.756	20.9476 – 228.5185	$3d^7 - 3d^6(a^3D)4p$	$a^2G - {}^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	360	481.907	43.4375 – 250.9510	$3d^7 - 3d^6(b^3F)4p$	$a^2F - {}^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	340	482.055	23.6489 – 231.0918	$3d^7 - 3d^6(a^1D)4p$	$a^2P - {}^2D^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	160	482.123	1.1897 – 208.6057	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	300	482.279	2.0425 – 209.3914	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^2G^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	430	482.765	1.1897 – 208.3307	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	320	482.877	24.6514 – 231.7420	$3d^7 - 3d^6(a^1D)4p$	$a^2P - {}^2D^\circ$	$\frac{1}{2}-\frac{3}{2}$		903
	330	483.043	18.1186 – 225.1369	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	220	483.276	27.0965 – 234.0195	$3d^7 - 3d^6(a^1S)4p$	$a^2D - {}^2P^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	70	483.388	19.8296 – 226.7025	$3d^7 - 3d^6(a^1I)4p$	$a^2G - {}^2I^\circ$	$\frac{9}{2}-\frac{11}{2}$		903
	190	483.515	18.1186 – 224.9369	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^2P^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	30	483.699	0. – 206.7407	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^4I^\circ$	$\frac{9}{2}-\frac{11}{2}$		903
	50	483.774	18.1186 – 224.8249	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	40	484.020	20.9476 – 227.5494	$3d^7 - 3d^6(a^3D)4p$	$a^2G - {}^2D^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	300	484.114	2.0425 – 208.6057	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	330	484.201	18.1186 – 224.6457	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	340	484.456	2.0425 – 208.4610	$3d^7 - 3d^6(a^3P)4p$	$ga^4F - {}^4P^\circ$	$\frac{5}{2}-\frac{3}{2}$		903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	470	484.637	0. – 206.3409	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^4G^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	270	484.759	2.0425 – 208.3307	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	260	484.778	18.3668 – 224.6457	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	330	485.091	2.6211 – 208.7669	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	190	485.310	18.1186 – 224.1740	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	50	485.350	18.9584 – 224.9965	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^2P^\circ$	$\frac{1}{2}-\frac{1}{2}$		903
	650	485.425	0. – 206.0053	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^4G^\circ$	$\frac{9}{2}-\frac{11}{2}$		903
	360	485.472	2.6211 – 208.6057	$3d^7 - 3d^6(a^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	310	485.536	18.1186 – 224.0753	$3d^7 - 3d^6(a^1G)4p$	$a^4P - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	20	485.604	19.8296 – 225.7585	$3d^7 - 3d^6(a^1G)4p$	$a^2G - {}^2H^\circ$	$\frac{9}{2}-\frac{11}{2}$		903
	100	485.670	18.1186 – 224.0213	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^4F^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	30	485.814	2.6211 – 208.4610	$3d^7 - 3d^6(a^3P)4p$	$ga^4F - {}^4P^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	290	485.892	18.3668 – 224.1740	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	20	486.117						903
	100	486.204	1.1897 – 206.8655	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^4H^\circ$	$\frac{7}{2}-\frac{9}{2}$		903
	80	486.254	18.3668 – 224.0213	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^4F^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	530	486.725	1.1897 – 206.6457	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^4G^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	330	486.758	27.0965 – 232.5395	$3d^7 - 3d^6(a^1D)4p$	$a^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	330	486.812	18.3668 – 223.7854	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2}-\frac{1}{2}$		903
	480	487.014	1.1897 – 206.5232	$3d^7 - 3d^6(a^3P)4p$	$ga^4F - {}^4P^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	470	487.071	19.8296 – 225.1369	$3d^7 - 3d^6(a^3D)4p$	$a^2G - {}^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	250	487.170	19.8296 – 225.0964	$3d^7 - 3d^6(a^3D)4p$	$a^2G - {}^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	270	487.234	28.7777 – 234.0195	$3d^7 - 3d^6(a^1S)4p$	$a^2D - {}^2P^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	90	487.270	2.6211 – 207.8462	$3d^7 - 3d^6(a^3P)4p$	$ga^4F - {}^4P^\circ$	$\frac{3}{2}-\frac{1}{2}$		903
	380	487.396	27.0965 – 232.2727	$3d^7 - 3d^6(a^1D)4p$	$a^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	600	487.446	1.1897 – 206.3409	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^4G^\circ$	$\frac{7}{2}-\frac{9}{2}$		903
	100	487.584	2.0425 – 207.1360	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^4H^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	80	487.819	19.8296 – 224.8249	$3d^7 - 3d^6(a^3D)4p$	$a^2G - {}^4F^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	400	487.910	20.9476 – 225.9037	$3d^7 - 3d^6(a^1I)4p$	$a^2G - {}^2H^\circ$	$\frac{7}{2}-\frac{9}{2}$		903
	590	487.967	19.8296 – 224.7615	$3d^7 - 3d^6(a^1G)4p$	$a^2G - {}^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	270	488.141	18.3668 – 223.2254	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^4P^\circ$	$\frac{3}{2}-\frac{1}{2}$		903
	380	488.274	2.0425 – 206.8470	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^4G^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	290	488.653	27.0965 – 231.7420	$3d^7 - 3d^6(a^1D)4p$	$a^2D - {}^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	570	488.754	2.0425 – 206.6457	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^4G^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	340	488.842	23.6489 – 228.2142	$3d^7 - 3d^6(a^1D)4p$	$a^2P - {}^2P^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	410	488.892	18.1186 – 222.6629	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^4P^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	470	489.036	20.9476 – 225.4316	$3d^7 - 3d^6(a^1G)4p$	$a^2G - {}^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	30	489.486	18.3668 – 222.6629	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^4P^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	250	489.558	18.9584 – 223.2254	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^4P^\circ$	$\frac{1}{2}-\frac{1}{2}$		903
	350	489.608	19.8296 – 224.0753	$3d^7 - 3d^6(a^1G)4p$	$a^2G - {}^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	590	489.658	2.6211 – 206.8470	$3d^7 - 3d^6(a^3H)4p$	$ga^4F - {}^4G^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	580	489.682	18.1186 – 222.3333	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^4P^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	20	489.915	28.7777 – 232.8970	$3d^7 - 3d^6(a^1D)4p$	$a^2D - {}^2P^\circ$	$\frac{3}{2}-\frac{1}{2}$		903
	30	490.213	27.0965 – 231.0918	$3d^7 - 3d^6(a^1D)4p$	$a^2D - {}^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	420	490.275	18.3668 – 222.3333	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^4P^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	160	490.429	23.6489 – 227.5494	$3d^7 - 3d^6(a^3D)4p$	$a^2P - {}^2D^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	380	490.494	20.9476 – 224.8249	$3d^7 - 3d^6(a^3D)4p$	$a^2G - {}^4F^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	430	490.906	18.9584 – 222.6629	$3d^7 - 3d^6(a^3D)4p$	$a^4P - {}^4P^\circ$	$\frac{1}{2}-\frac{3}{2}$		903
	320	491.253	24.6514 – 228.2142	$3d^7 - 3d^6(a^1D)4p$	$a^2P - {}^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$		903
	300	491.328	23.6489 – 227.1811	$3d^7 - 3d^6(a^1D)4p$	$a^2P - {}^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	590	491.364	20.9476 – 224.4636	$3d^7 - 3d^6(a^1G)4p$	$a^2G - {}^2G^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	280	491.422	28.7777 – 232.2727	$3d^7 - 3d^6(a^1D)4p$	$a^2D - {}^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	550	492.216	19.8296 – 222.9933	$3d^7 - 3d^6(a^1I)4p$	$a^2G - {}^2H^\circ$	$\frac{9}{2}-\frac{11}{2}$		903
	70	492.305	20.9476 – 224.0753	$3d^7 - 3d^6(a^1G)4p$	$a^2G - {}^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	160	492.441	2.0425 – 205.1141	3d^7 – 3d^6(a^{3}P)4p	ga^{4}F – ^{4}S°	$\frac{5}{2}-\frac{3}{2}$		903
	170	492.705	28.7777 – 231.7420	3d^7 – 3d^6(a^{1}D)4p	a^{2}D – ^{2}D°	$\frac{3}{2}-\frac{3}{2}$		903
	360	492.917	19.8296 – 222.7055	3d^7 – 3d^6(a^{1}G)4p	a^{2}G – ^{2}H°	$\frac{9}{2}-\frac{9}{2}$		903
	40	493.756	24.6514 – 227.1811	3d^7 – 3d^6(a^{3}D)4p	a^{2}P – ^{2}D°	$\frac{1}{2}-\frac{3}{2}$		903
	220	494.286	28.7777 – 231.0918	3d^7 – 3d^6(a^{1}D)4p	a^{2}D – ^{2}D°	$\frac{3}{2}-\frac{5}{2}$		903
	20	494.565	19.8296 – 222.0293	3d^7 – 3d^6(a^{3}G)4p	a^{2}G – ^{2}G°	$\frac{9}{2}-\frac{7}{2}$		903
	120	494.658	19.8296 – 221.9910	3d^7 – 3d^6(a^{3}G)4p	a^{2}G – ^{2}G°	$\frac{9}{2}$ – [illegible]		903
	30	494.871						903
	50	495.584	23.6489 – 225.4316	3d^7 – 3d^6(a^{1}G)4p	a^{2}P – ^{2}F°	$\frac{3}{2}-\frac{5}{2}$		903
	520	495.648	20.9476 – 222.7055	3d^7 – 3d^6(a^{1}G)4p	a^{2}G – ^{2}H°	$\frac{7}{2}-\frac{9}{2}$		903
	100	496.470	27.0965 – 228.5185	3d^7 – 3d^6(a^{3}D)4p	a^{2}D – ^{2}F°	$\frac{5}{2}-\frac{7}{2}$		903
	80	496.660	23.6489 – 224.9965	3d^7 – 3d^6(a^{3}D)4p	a^{2}P – ^{2}P°	$\frac{3}{2}-\frac{1}{2}$		903
	170	496.806	23.6489 – 224.9369	3d^7 – 3d^6(a^{3}D)4p	a^{2}P – ^{2}P°	$\frac{3}{2}-\frac{3}{2}$		903
	410	497.233	27.0965 – 228.2142	3d^7 – 3d^6(a^{1}D)4p	a^{2}D – ^{2}P°	$\frac{5}{2}-\frac{3}{2}$		903
	290	497.315	20.9476 – 222.0293	3d^7 – 3d^6(a^{3}G)4p	a^{2}G – ^{2}G°	$\frac{7}{2}-\frac{7}{2}$		903
	400	498.706	28.7777 – 229.2975	3d^7 – 3d^6(a^{1}S)4p	a^{2}D – ^{2}P°	$\frac{3}{2}-\frac{1}{2}$		903
	80	498.783	28.7777 – 229.2695	3d^7 – 3d^6(a^{3}D)4p	a^{2}D – ^{2}F°	$\frac{3}{2}-\frac{5}{2}$		903
	390	498.873	27.0965 – 227.5494	3d^7 – 3d^6(a^{3}D)4p	a^{2}D – ^{2}D°	$\frac{5}{2}-\frac{5}{2}$		903
	150	499.141	24.6514 – 224.9965	3d^7 – 3d^6(a^{3}D)4p	a^{2}P – ^{2}P°	$\frac{1}{2}-\frac{1}{2}$		903
	470	499.805	43.4375 – 243.5201	3d^7 – 3d^6(a^{1}F)4p	a^{2}F – ^{2}F°	$\frac{5}{2}-\frac{5}{2}$		903
	620	499.840	19.8296 – 219.8960	3d^7 – 3d^6(a^{3}G)4p	a^{2}G – ^{2}F°	$\frac{9}{2}-\frac{7}{2}$		903
	550	499.873	26.6491 – 226.7025	3d^7 – 3d^6(a^{1}I)4p	a^{2}H – ^{2}I°	$\frac{11}{2}-\frac{11}{2}$		903
	600	499.915	26.6491 – 226.6850	3d^7 – 3d^6(a^{1}I)4p	a^{2}H – ^{2}I°	$\frac{11}{2}-\frac{13}{2}$		903
	410	500.165	19.8296 – 219.7650	3d^7 – 3d^6(a^{3}G)4p	a^{2}G – ^{2}H°	$\frac{9}{2}-\frac{9}{2}$		903
	350	500.799	43.8586 – 243.5420	3d^7 – 3d^6(a^{1}F)4p	a^{2}F – ^{2}F°	$\frac{7}{2}-\frac{7}{2}$		903
	70	500.856	43.8586 – 243.5201	3d^7 – 3d^6(a^{1}F)4p	a^{2}F – ^{2}F°	$\frac{7}{2}-\frac{5}{2}$		903
	120	501.065	18.3668 – 217.9397	3d^7 – 3d^6(a^{3}F)4p	a^{4}P – ^{2}D°	$\frac{3}{2}-\frac{3}{2}$		903
	120	502.179	24.6514 – 223.7854	3d^7 – 3d^6(a^{3}D)4p	a^{2}P – ^{4}D°	$\frac{1}{2}-\frac{1}{2}$		903
	540	502.243	26.6491 – 225.7585	3d^7 – 3d^6(a^{1}G)4p	a^{2}H – ^{2}H°	$\frac{11}{2}-\frac{11}{2}$		903
	90	502.391	18.3668 – 217.4143	3d^7 – 3d^6(a^{3}F)4p	a^{4}P – ^{2}D°	$\frac{3}{2}-\frac{5}{2}$		903
	600	502.447	19.8296 – 218.8606	3d^7 – 3d^6(a^{3}H)4p	a^{2}G – ^{2}H°	$\frac{9}{2}-\frac{11}{2}$		903
	290	502.978	20.9476 – 219.7650	3d^7 – 3d^6(a^{3}G)4p	a^{2}G – ^{2}H°	$\frac{7}{2}-\frac{9}{2}$		903
	130	503.089	28.7777 – 227.5494	3d^7 – 3d^6(a^{3}D)4p	a^{2}D – ^{2}D°	$\frac{3}{2}-\frac{5}{2}$		903
	480	503.512	20.9476 – 219.5534	3d^7 – 3d^6(a^{3}G)4p	a^{2}G – ^{2}F°	$\frac{7}{2}-\frac{5}{2}$		903
	90	503.931	26.6491 – 225.0964	3d^7 – 3d^6(a^{3}D)4p	a^{2}H – ^{4}F°	$\frac{11}{2}-\frac{9}{2}$		903
	250	504.032	28.7777 – 227.1811	3d^7 – 3d^6(a^{3}D)4p	a^{2}D – ^{2}D°	$\frac{3}{2}-\frac{3}{2}$		903
	610	504.477	27.6776 – 225.9037	3d^7 – 3d^6(a^{1}I)4p	a^{2}H – ^{2}H°	$\frac{9}{2}-\frac{9}{2}$		903
	210	504.770	26.6491 – 224.7615	3d^7 – 3d^6(a^{1}G)4p	a^{2}H – ^{2}G°	$\frac{11}{2}-\frac{9}{2}$		903
	360	504.847	27.6776 – 225.7585	3d^7 – 3d^6(a^{1}G)4p	a^{2}H – ^{2}H°	$\frac{9}{2}-\frac{11}{2}$		903
	320	504.951	27.0965 – 225.1369	3d^7 – 3d^6(a^{3}D)4p	a^{2}D – ^{4}D°	$\frac{5}{2}-\frac{7}{2}$		903
	220	505.467	27.0965 – 224.9369	3d^7 – 3d^6(a^{3}D)4p	a^{2}D – ^{2}P°	$\frac{5}{2}-\frac{3}{2}$		903
	190	505.750	27.0965 – 224.8249	3d^7 – 3d^6(a^{3}D)4p	a^{2}D – ^{4}F°	$\frac{5}{2}-\frac{7}{2}$		903
	120	506.434	27.6776 – 225.1369	3d^7 – 3d^6(a^{3}D)4p	a^{2}H – ^{4}D°	$\frac{9}{2}-\frac{7}{2}$		903
	60	506.539	27.6776 – 225.0964	3d^7 – 3d^6(a^{3}D)4p	a^{2}H – ^{4}F°	$\frac{9}{2}-\frac{9}{2}$		903
	60	506.675	27.0965 – 224.4636	3d^7 – 3d^6(a^{1}G)4p	a^{2}D – ^{2}G°	$\frac{5}{2}-\frac{7}{2}$		903
	120	507.207	18.3668 – 215.5310	3d^7 – 3d^6(a^{3}P)4p	a^{4}P – ^{2}S°	$\frac{3}{2}-\frac{1}{2}$		903
	480	507.400	27.6776 – 224.7615	3d^7 – 3d^6(a^{1}G)4p	a^{2}H – ^{2}G°	$\frac{9}{2}-\frac{9}{2}$		903
	590	508.179	27.6776 – 224.4636	3d^7 – 3d^6(a^{1}G)4p	a^{2}H – ^{2}G°	$\frac{9}{2}-\frac{7}{2}$		903
	330	508.510	28.7777 – 225.4316	3d^7 – 3d^6(a^{1}G)4p	a^{2}D – ^{2}F°	$\frac{3}{2}-\frac{5}{2}$		903
	200	509.170	27.6776 – 224.0753	3d^7 – 3d^6(a^{1}G)4p	a^{2}H – ^{2}F°	$\frac{9}{2}-\frac{7}{2}$		903
	610	509.313	26.6491 – 222.9933	3d^7 – 3d^6(a^{1}I)4p	a^{2}H – ^{2}H°	$\frac{11}{2}-\frac{11}{2}$		903
	40	509.796	28.7777 – 224.9369	3d^7 – 3d^6(a^{3}D)4p	a^{2}D – ^{2}P°	$\frac{3}{2}-\frac{3}{2}$		903
	50	510.061	26.6491 – 222.7055	3d^7 – 3d^6(a^{1}G)4p	a^{2}H – ^{2}H°	$\frac{11}{2}-\frac{9}{2}$		903
	70	510.449	19.8296 – 215.7361	3d^7 – 3d^6(a^{3}G)4p	a^{2}G – ^{4}H°	$\frac{9}{2}-\frac{9}{2}$		903

NI IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	310	510.584	19.8296 – 215.6845	$3d^7$ – $3d^6(a^3G)4p$	a^2G – $^4H°$	$\frac{9}{2}$ – $\frac{11}{2}$		903
	30	511.025	18.3668 – 214.0558	$3d^7$ – $3d^6(a^3P)4p$	a^4P – $^2P°$	$\frac{3}{2}$ – $\frac{3}{2}$		903
	80	511.339	27.0965 – 222.6629	$3d^7$ – $3d^6(a^3D)4p$	a^2D – $^4P°$	$\frac{5}{2}$ – $\frac{3}{2}$		903
	580	511.925	26.6491 – 221.9910	$3d^7$ – $3d^6(a^3G)4p$	a^2H – $^2G°$	$\frac{11}{2}$ – $\frac{9}{2}$		903
	130	512.432	43.8586 – 239.0087	$3d^7$ – $3d^6(a^1F)4p$	a^2F – $^2D°$	$\frac{7}{2}$ – $\frac{5}{2}$		903
	70	512.568	43.8586 – 238.9578	$3d^7$ – $3d^6(a^1F)4p$	a^2F – $^2G°$	$\frac{7}{2}$ – $\frac{9}{2}$		903
	200	512.747	27.6776 – 222.7055	$3d^7$ – $3d^6(a^1G)4p$	a^2H – $^2H°$	$\frac{9}{2}$ – $\frac{9}{2}$		903
	60	512.786	18.1186 – 213.1311	$3d^7$ – $3d^6(a^3F)4p$	a^4P – $^2F°$	$\frac{5}{2}$ – $\frac{7}{2}$		903
	80	512.999	27.0965 – 222.0293	$3d^7$ – $3d^6(a^3G)4p$	a^2D – $^2G°$	$\frac{5}{2}$ – $\frac{7}{2}$		903
	230	513.371	19.8296 – 214.6228	$3d^7$ – $3d^6(a^3F)4p$	a^2G – $^2G°$	$\frac{9}{2}$ – $\frac{7}{2}$		903
	90	513.458	19.8296 – 214.5874	$3d^7$ – $3d^6(a^3H)4p$	a^2G – $^2H°$	$\frac{9}{2}$ – $\frac{9}{2}$		903
	150	514.023	67.9898 – 262.5387	$3d^7$ – $3d^6(b^1G)4p$	b^2D – $^2G°$	$\frac{5}{2}$ – $\frac{7}{2}$		903
	290	514.173	19.8296 – 214.3168	$3d^7$ – $3d^6(a^3G)4p$	a^2G – $^4G°$	$\frac{9}{2}$ – $\frac{11}{2}$		903
	510	514.525	27.6776 – 222.0293	$3d^7$ – $3d^6(a^3G)4p$	a^2H – $^2G°$	$\frac{9}{2}$ – $\frac{7}{2}$		903
	90	514.628	27.6776 – 221.9910	$3d^7$ – $3d^6(a^3G)4p$	a^2H – $^2G°$	$\frac{9}{2}$ – $\frac{9}{2}$		903
	260	514.684	23.6489 – 217.9397	$3d^7$ – $3d^6(a^3F)4p$	a^2P – $^2D°$	$\frac{3}{2}$ – $\frac{3}{2}$		903
	90	515.164	26.6491 – 220.7626	$3d^7$ – $3d^6(a^1I)4p$	a^2H – $^2K°$	$\frac{11}{2}$ – $\frac{13}{2}$		903
	120	515.358	43.4375 – 237.4803	$3d^7$ – $3d^6(a^1F)4p$	a^2F – $^2G°$	$\frac{5}{2}$ – $\frac{7}{2}$		903
	230	515.560	20.9476 – 214.9105	$3d^7$ – $3d^6(a^3G)4p$	a^2G – $^4G°$	$\frac{7}{2}$ – $\frac{9}{2}$		903
	550	515.701	19.8296 – 213.7397	$3d^7$ – $3d^6(a^3F)4p$	a^2G – $^2G°$	$\frac{9}{2}$ – $\frac{9}{2}$		903
	280	515.823	67.3600 – 261.2263	$3d^7$ – $3d^6(b^1G)4p$	b^2D – $^2F°$	$\frac{3}{2}$ – $\frac{5}{2}$		903
	550	516.057	19.8296 – 213.6069	$3d^7$ – $3d^6(a^3G)4p$	a^2G – $^2H°$	$\frac{9}{2}$ – $\frac{11}{2}$		903
	570	516.070	23.6489 – 217.4143	$3d^7$ – $3d^6(a^3F)4p$	a^2P – $^2D°$	$\frac{3}{2}$ – $\frac{5}{2}$		903
	490	516.324	20.9476 – 214.6228	$3d^7$ – $3d^6(a^3F)4p$	a^2G – $^2G°$	$\frac{7}{2}$ – $\frac{7}{2}$		903
	360	516.420	20.9476 – 214.5874	$3d^7$ – $3d^6(a^3H)4p$	a^2G – $^2H°$	$\frac{7}{2}$ – $\frac{9}{2}$		903
	470	517.328	19.8296 – 213.1311	$3d^7$ – $3d^6(a^3F)4p$	a^2G – $^2F°$	$\frac{9}{2}$ – $\frac{7}{2}$		903
	430	517.347	24.6514 – 217.9397	$3d^7$ – $3d^6(a^3F)4p$	a^2P – $^2D°$	$\frac{1}{2}$ – $\frac{3}{2}$		903
	80	517.719	20.9476 – 214.1010	$3d^7$ – $3d^6(a^3G)4p$	a^2G – $^4F°$	$\frac{7}{2}$ – $\frac{7}{2}$		903
	80	518.175	18.3668 – 211.3517	$3d^7$ – $3d^6(a^3F)4p$	a^4P – $^4D°$	$\frac{3}{2}$ – $\frac{1}{2}$		903
	190	518.449	18.3668 – 211.2468	$3d^7$ – $3d^6(a^3F)4p$	a^4P – $^4D°$	$\frac{3}{2}$ – $\frac{3}{2}$		903
	150	518.602	18.1186 – 210.9436	$3d^7$ – $3d^6(a^3F)4p$	a^4P – $^4D°$	$\frac{5}{2}$ – $\frac{5}{2}$		903
	510	518.670	27.0965 – 219.8960	$3d^7$ – $3d^6(a^3G)4p$	a^2D – $^2F°$	$\frac{5}{2}$ – $\frac{7}{2}$		903
	150	519.041	18.3668 – 211.0276	$3d^7$ – $3d^6(a^3P)4p$	a^4P – $^4D°$	$\frac{3}{2}$ – $\frac{3}{2}$		903
	190	519.265	18.3668 – 210.9436	$3d^7$ – $3d^6(a^3F)4p$	a^4P – $^4D°$	$\frac{3}{2}$ – $\frac{5}{2}$		903
	290	519.556	18.1186 – 210.5906	$3d^7$ – $3d^6(a^3P)4p$	a^4P – $^4D°$	$\frac{5}{2}$ – $\frac{5}{2}$		903
	340	519.572	20.9476 – 213.4121	$3d^7$ – $3d^6(a^3F)4p$	a^2G – $^4G°$	$\frac{7}{2}$ – $\frac{5}{2}$		903
	200	519.605	19.8296 – 212.2818	$3d^7$ – $3d^6(a^3F)4p$	a^2G – $^4G°$	$\frac{9}{2}$ – $\frac{7}{2}$		903
	230	519.767	18.9584 – 211.3517	$3d^7$ – $3d^6(a^3F)4p$	a^4P – $^4D°$	$\frac{1}{2}$ – $\frac{1}{2}$		903
	340	519.848	67.9898 – 260.3555	$3d^7$ – $3d^6(b^1G)4p$	b^2D – $^2F°$	$\frac{5}{2}$ – $\frac{7}{2}$		903
	330	519.959	19.8296 – 212.1509	$3d^7$ – $3d^6(a^3F)4p$	a^2G – $^4G°$	$\frac{9}{2}$ – $\frac{9}{2}$		903
	140	520.042	18.9584 – 211.2468	$3d^7$ – $3d^6(a^3F)4p$	a^4P – $^4D°$	$\frac{1}{2}$ – $\frac{3}{2}$		903
	410	520.218	18.3668 – 210.5906	$3d^7$ – $3d^6(a^3P)4p$	a^4P – $^4D°$	$\frac{3}{2}$ – $\frac{5}{2}$		903
	550	520.256	26.6491 – 218.8606	$3d^7$ – $3d^6(a^3H)4p$	a^2H – $^2H°$	$\frac{11}{2}$ – $\frac{11}{2}$		903
	430	520.587	27.6776 – 219.7650	$3d^7$ – $3d^6(a^3G)4p$	a^2H – $^2H°$	$\frac{9}{2}$ – $\frac{9}{2}$		903
	80	520.638	18.9584 – 211.0276	$3d^7$ – $3d^6(a^3P)4p$	a^4P – $^4D°$	$\frac{1}{2}$ – $\frac{3}{2}$		903
	390	520.817	18.1186 – 210.1218	$3d^7$ – $3d^6(a^3F)4p$	a^4P – $^4D°$	$\frac{5}{2}$ – $\frac{7}{2}$		903
	350	521.156	23.6489 – 215.5310	$3d^7$ – $3d^6(a^3P)4p$	a^2P – $^2S°$	$\frac{3}{2}$ – $\frac{1}{2}$		903
	260	522.646	20.9476 – 212.2818	$3d^7$ – $3d^6(a^3F)4p$	a^2G – $^4G°$	$\frac{7}{2}$ – $\frac{7}{2}$		903
	60	523.051	27.6776 – 218.8606	$3d^7$ – $3d^6(a^3H)4p$	a^2H – $^2H°$	$\frac{9}{2}$ – $\frac{11}{2}$		903
	180	523.892	24.6514 – 215.5310	$3d^7$ – $3d^6(a^3P)4p$	a^2P – $^2S°$	$\frac{1}{2}$ – $\frac{1}{2}$		903
	40	523.983	27.0965 – 217.9397	$3d^7$ – $3d^6(a^3F)4p$	a^2D – $^2D°$	$\frac{5}{2}$ – $\frac{3}{2}$		903
	410	524.164	28.7777 – 219.5534	$3d^7$ – $3d^6(a^3G)4p$	a^2D – $^2F°$	$\frac{3}{2}$ – $\frac{5}{2}$		903
	50	524.956	18.1186 – 208.6057	$3d^7$ – $3d^6(a^3F)4p$	a^4P – $^4F°$	$\frac{5}{2}$ – $\frac{5}{2}$		903
	340	525.185	23.6489 – 214.0558	$3d^7$ – $3d^6(a^3P)4p$	a^2P – $^2P°$	$\frac{3}{2}$ – $\frac{3}{2}$		903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	70	525.362	18.1186 – 208.4610	$3d^7 - 3d^6(a^3P)4p$	$a^4P - {}^4P^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	460	525.423	27.0965 – 217.4143	$3d^7 - 3d^6(a^3F)4p$	$a^2D - {}^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	50	525.500	19.8296 – 210.1218	$3d^7 - 3d^6(a^3F)4p$	$a^2G - {}^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	120	525.641	18.3668 – 208.6057	$3d^7 - 3d^6(a^3F)4p$	$a^4P - {}^4F^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	250	525.718	18.1186 – 208.3307	$3d^7 - 3d^6(a^3F)4p$	$a^4P - {}^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	510	525.793						903
	180	526.199	67.3600 – 257.4064	$3d^7 - 3d^6(b^3F)4p$	$b^2D - {}^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	250	526.341	23.6489 – 213.6402	$3d^7 - 3d^6(a^3P)4p$	$a^2P - {}^2P^\circ$	$\frac{3}{2}-\frac{1}{2}$		903
	490	528.248	19.8296 – 209.1319	$3d^7 - 3d^6(a^3H)4p$	$a^2G - {}^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	300	528.608	20.9476 – 210.1218	$3d^7 - 3d^6(a^3F)4p$	$a^2G - {}^4D^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	360	528.636	28.7777 – 217.9397	$3d^7 - 3d^6(a^3F)4p$	$a^2D - {}^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	210	528.804	43.4375 – 232.5395	$3d^7 - 3d^6(a^1D)4p$	$a^2F - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	350	528.994	26.6491 – 215.6845	$3d^7 - 3d^6(a^3G)4p$	$a^2H - {}^4H^\circ$	$\frac{11}{2}-\frac{11}{2}$		903
	270	529.022	67.9898 – 257.0180	$3d^7 - 3d^6(b^3F)4p$	$b^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	220	529.131	24.6514 – 213.6402	$3d^7 - 3d^6(a^3P)4p$	$a^2P - {}^2P^\circ$	$\frac{1}{2}-\frac{1}{2}$		903
	200	529.341						903
	20	529.493	26.6491 – 215.5066	$3d^7 - 3d^6(a^3G)4p$	$a^2H - {}^4H^\circ$	$\frac{11}{2}-\frac{13}{2}$		903
	160	529.566	43.4375 – 232.2727	$3d^7 - 3d^6(a^1D)4p$	$a^2F - {}^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	450	529.992	43.8586 – 232.5395	$3d^7 - 3d^6(a^1D)4p$	$a^2F - {}^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	80	530.107	28.7777 – 217.4143	$3d^7 - 3d^6(a^3F)4p$	$a^2D - {}^2D^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	50	530.133	23.6489 – 212.2759	$3d^7 - 3d^6(a^3F)4p$	$a^2P - {}^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	120	530.307						903
	440	530.656	20.9476 – 209.3914	$3d^7 - 3d^6(a^3H)4p$	$a^2G - {}^2G^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	110	530.749	43.8586 – 232.2727	$3d^7 - 3d^6(a^1D)4p$	$a^2F - {}^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	390	531.293	19.8296 – 208.0468	$3d^7 - 3d^6(a^3H)4p$	$a^2G - {}^4I^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	120	531.386	20.9476 – 209.1319	$3d^7 - 3d^6(a^3H)4p$	$a^2G - {}^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		903
	180	531.697						903
	230	531.737	27.6776 – 215.7361	$3d^7 - 3d^6(a^3G)4p$	$a^2H - {}^4H^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	110	532.008	20.9476 – 208.9121	$3d^7 - 3d^6(a^3P)4p$	$a^2G - {}^4D^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	170	532.754	67.3600 – 255.0640	$3d^7 - 3d^6(b^3P)4p$	$b^2D - {}^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	540	532.847	26.6491 – 214.3168	$3d^7 - 3d^6(a^3G)4p$	$a^2H - {}^4G^\circ$	$\frac{11}{2}-\frac{11}{2}$		903
	450	532.887	20.9476 – 208.6057	$3d^7 - 3d^6(a^3F)4p$	$a^2G - {}^4F^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	160	532.981	27.0965 – 214.7181	$3d^7 - 3d^6(a^3G)4p$	$a^2D - {}^4G^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	480	533.137	0. – 187.5703	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4F^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	110	533.248	27.0965 – 214.6228	$3d^7 - 3d^6(a^3F)4p$	$a^2D - {}^2G^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	220	533.903	23.6489 – 210.9436	$3d^7 - 3d^6(a^3F)4p$	$a^2P - {}^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	430	534.080	43.8586 – 231.0918	$3d^7 - 3d^6(a^1D)4p$	$a^2F - {}^2D^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	120	534.339						903
	460	534.388	1.1897 – 188.3201	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4F^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	270	534.491	26.6491 – 213.7397	$3d^7 - 3d^6(a^3F)4p$	$a^2H - {}^2G^\circ$	$\frac{11}{2}-\frac{9}{2}$		903
	210	534.648	19.8296 – 206.8655	$3d^7 - 3d^6(a^3H)4p$	$a^2G - {}^4H^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	170	534.742	27.0965 – 214.1010	$3d^7 - 3d^6(a^3G)4p$	$a^2D - {}^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	170	534.759	18.1186 – 205.1141	$3d^7 - 3d^6(a^3P)4p$	$a^4P - {}^4S^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	640	534.874	27.0965 – 214.0558	$3d^7 - 3d^6(a^3P)4p$	$a^2D - {}^2P^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	400	534.905	27.6776 – 214.6228	$3d^7 - 3d^6(a^3F)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	540	535.003	19.8296 – 206.7407	$3d^7 - 3d^6(a^3H)4p$	$a^2G - {}^4I^\circ$	$\frac{9}{2}-\frac{11}{2}$		903
	200	535.131						903
	370	535.386	2.0425 – 188.8242	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4F^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	140	535.441	28.7777 – 215.5413	$3d^7 - 3d^6(a^3G)4p$	$a^2D - {}^4F^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	280	535.472	18.3668 – 205.1141	$3d^7 - 3d^6(a^3P)4p$	$a^4P - {}^4S^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	160	535.903	24.6514 – 211.2468	$3d^7 - 3d^6(a^3F)4p$	$a^2P - {}^4D^\circ$	$\frac{1}{2}-\frac{3}{2}$		903
	80	535.986						903
	70	536.084						903
	660	536.282	0. – 186.4701	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	590	536.535	1.1897 – 187.5703	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4F^\circ$	7/2 – 7/2		903
	20	536.659	23.6489 – 209.9851	$3d^7 - 3d^6(a^3P)4p$	$a^2P - {}^2D^\circ$	3/2 – 3/2		903
	20	536.754						903
	540	536.832	2.0425 – 188.3201	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4F^\circ$	5/2 – 5/2		903
	20	536.927						903
	560	537.048	2.6211 – 188.8242	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4F^\circ$	3/2 – 3/2		903
	430	537.080	20.9476 – 207.1360	$3d^7 - 3d^6(a^3H)4p$	$a^2G - {}^4H^\circ$	7/2 – 7/2		903
	330	537.441	27.6776 – 213.7397	$3d^7 - 3d^6(a^3F)4p$	$a^2H - {}^2G^\circ$	9/2 – 9/2		903
	370	537.522	27.0965 – 213.1311	$3d^7 - 3d^6(a^3F)4p$	$a^2D - {}^2F^\circ$	5/2 – 7/2		903
	290	537.825	27.6776 – 213.6069	$3d^7 - 3d^6(a^3G)4p$	$a^2H - {}^2H^\circ$	9/2 – 11/2		903
	670	537.955	0. – 185.8900	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4D^\circ$	9/2 – 7/2		903
	90	538.051						903
	370	538.257						903
	90	538.312						903
	50	538.404	27.6776 – 213.4086	$3d^7 - 3d^6(a^3G)4p$	$a^2H - {}^4F^\circ$	9/2 – 9/2	Q	903
	340	538.503	2.6211 – 188.3201	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4F^\circ$	3/2 – 5/2		903
	70	538.590	24.6514 – 210.3133	$3d^7 - 3d^6(a^3P)4p$	$a^2P - {}^4D^\circ$	1/2 – 1/2		903
	370	539.005	2.0425 – 187.5703	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4F^\circ$	5/2 – 7/2		903
	200	539.072	26.6491 – 212.1509	$3d^7 - 3d^6(a^3F)4p$	$a^2H - {}^4G^\circ$	11/2 – 9/2		903
	20	539.339	43.8586 – 229.2695	$3d^7 - 3d^6(a^3D)4p$	$a^2F - {}^2F^\circ$	7/2 – 5/2		903
	30	539.476						903
	490	539.558	24.6514 – 209.9851	$3d^7 - 3d^6(a^3P)4p$	$a^2P - {}^2D^\circ$	1/2 – 3/2		903
	640	539.590	1.1897 – 186.5161	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4D^\circ$	7/2 – 5/2		903
	370	539.727	1.1897 – 186.4701	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4F^\circ$	7/2 – 9/2		903
	50	539.849						903
	220	539.989	27.0965 – 212.2818	$3d^7 - 3d^6(a^3F)4p$	$a^2D - {}^4G^\circ$	5/2 – 7/2		903
	20	540.450						903
	590	540.792	2.0425 – 186.9572	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4D^\circ$	5/2 – 3/2		903
	200	540.947	28.7777 – 213.6402	$3d^7 - 3d^6(a^3P)4p$	$a^2D - {}^2P^\circ$	3/2 – 1/2		903
	20	541.193	43.4375 – 228.2142	$3d^7 - 3d^6(a^1D)4p$	$a^2F - {}^2P^\circ$	5/2 – 3/2		903
	20	541.342						903
	460	541.421	1.1897 – 185.8900	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4D^\circ$	7/2 – 7/2		903
	80	541.521	43.8586 – 228.5185	$3d^7 - 3d^6(a^3D)4p$	$a^2F - {}^2F^\circ$	7/2 – 7/2		903
	140	541.600	28.7777 – 213.4121	$3d^7 - 3d^6(a^3F)4p$	$a^2D - {}^4G^\circ$	3/2 – 5/2		903
	550	541.697	2.6211 – 187.2257	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4D^\circ$	3/2 – 1/2		903
	40	541.908	27.6776 – 212.2070	$3d^7 - 3d^6(a^3F)4p$	$a^2H - {}^4G^\circ$	9/2 – 11/2		903
	490	542.088	2.0425 – 186.5161	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4D^\circ$	5/2 – 5/2		903
	280	542.305	2.0425 – 186.4414	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^6P^\circ$	5/2 – 3/2		903
	410	542.405	23.6489 – 208.0091	$3d^7 - 3d^6(a^3P)4p$	$a^2P - {}^2D^\circ$	3/2 – 5/2		903
	470	542.488	2.6211 – 186.9572	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4D^\circ$	3/2 – 3/2		903
	450	542.549	1.1897 – 185.5053	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^6P^\circ$	7/2 – 5/2		903
	20	543.024	27.0965 – 211.2468	$3d^7 - 3d^6(a^3F)4p$	$a^2D - {}^4D^\circ$	5/2 – 3/2		903
	500	543.189	0. – 184.0991	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^6P^\circ$	9/2 – 7/2		903
	20	543.676	27.0965 – 211.0276	$3d^7 - 3d^6(a^3P)4p$	$a^2D - {}^4D^\circ$	5/2 – 3/2		903
	70	543.789	2.6211 – 186.5161	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4D^\circ$	3/2 – 5/2		903
	110	543.928	2.0425 – 185.8900	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^4D^\circ$	5/2 – 7/2		903
	150	544.013	2.6211 – 186.4414	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^6P^\circ$	3/2 – 3/2		903
	210	544.232	43.4375 – 227.1811	$3d^7 - 3d^6(a^3D)4p$	$a^2F - {}^2D^\circ$	5/2 – 3/2		903
	470	544.351	67.9898 – 251.6943	$3d^7 - 3d^6(b^3F)4p$	$b^2D - {}^2D^\circ$	5/2 – 5/2		903
	400	544.375	43.8586 – 227.5494	$3d^7 - 3d^6(a^3D)4p$	$a^2F - {}^2D^\circ$	7/2 – 5/2		903
	320	544.695	67.3600 – 250.9510	$3d^7 - 3d^6(b^3F)4p$	$b^2D - {}^2D^\circ$	3/2 – 3/2		903
	500	544.867	26.6491 – 210.1770	$3d^7 - 3d^6(a^3H)4p$	$a^2H - {}^2I^\circ$	11/2 – 13/2		903
	170	544.950	28.7777 – 212.2759	$3d^7 - 3d^6(a^3F)4p$	$a^2D - {}^2F^\circ$	3/2 – 5/2		903
	230	545.066	2.0425 – 185.5053	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^6P^\circ$	5/2 – 5/2		903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	450	545.509	27.6776 – 210.9875	$3d^7 - 3d^6(a^3H)4p$	$a^2H - {}^2I^\circ$	$\frac{9}{2}-\frac{11}{2}$		903
	20	545.652						903
	40	546.565	67.9898 – 250.9510	$3d^7 - 3d^6(b^3F)4p$	$b^2D - {}^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	150	546.717	1.1897 – 184.0991	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^6P^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	60	546.804	2.6211 – 185.5053	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^6P^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	20	546.866						903
	20	546.974						903
	20	547.256						903
	20	547.330						903
	20	547.426						903
	40	547.669						903
	50	547.897						903
	240	547.984	26.6491 – 209.1319	$3d^7 - 3d^6(a^3H)4p$	$a^2H - {}^2G^\circ$	$\frac{11}{2}-\frac{9}{2}$		903
	90	548.101	27.6776 – 210.1218	$3d^7 - 3d^6(a^3F)4p$	$a^2H - {}^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	70	548.155						903
	60	548.294						903
	90	548.546	27.0965 – 209.3914	$3d^7 - 3d^6(a^3H)4p$	$a^2D - {}^2G^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	70	549.013						903
	290	549.073	0. – 182.1256	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^6F^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	70	549.161						903
	270	549.315	0. – 182.0449	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^6F^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	70	549.366						903
	270	549.457	43.4375 – 225.4316	$3d^7 - 3d^6(a^1G)4p$	$a^2F - {}^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	180	549.496	26.6491 – 208.6313	$3d^7 - 3d^6(a^3H)4p$	$a^2H - {}^4H^\circ$	$\frac{11}{2}-\frac{13}{2}$	Q	903
	140	550.303	27.6776 – 209.3914	$3d^7 - 3d^6(a^3H)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	70	551.089	27.6776 – 209.1319	$3d^7 - 3d^6(a^3H)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	100	551.268	26.6491 – 208.0468	$3d^7 - 3d^6(a^3H)4p$	$a^2H - {}^4I^\circ$	$\frac{11}{2}-\frac{9}{2}$		903
	150	551.627	43.8586 – 225.1369	$3d^7 - 3d^6(a^3D)4p$	$a^2F - {}^4D^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	110	551.755	43.8586 – 225.0964	$3d^7 - 3d^6(a^3D)4p$	$a^2F - {}^4F^\circ$	$\frac{7}{2}-\frac{9}{2}$		903
	260	552.401	43.4375 – 224.4636	$3d^7 - 3d^6(a^1G)4p$	$a^2F - {}^2G^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	270	552.437	1.1897 – 182.2068	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^6F^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	120	552.685	1.1897 – 182.1256	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^6F^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	260	552.779	43.8586 – 224.7615	$3d^7 - 3d^6(a^1G)4p$	$a^2F - {}^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		903
	160	554.379						903
	250	554.893	43.8586 – 224.0753	$3d^7 - 3d^6(a^1G)4p$	$a^2F - {}^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	100	555.062	2.0425 – 182.2068	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^6F^\circ$	$\frac{5}{2}-\frac{5}{2}$	Q	903
	20	556.604	2.6211 – 182.2884	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^6F^\circ$	$\frac{3}{2}-\frac{1}{2}$		903
	30	557.243	27.6776 – 207.1360	$3d^7 - 3d^6(a^3H)4p$	$a^2H - {}^4H^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	10	557.401						903
	10	557.566	26.6491 – 206.0053	$3d^7 - 3d^6(a^3H)4p$	$a^2H - {}^4G^\circ$	$\frac{11}{2}-\frac{11}{2}$		903
	10	557.949	28.7777 – 208.0091	$3d^7 - 3d^6(a^3P)4p$	$a^2D - {}^2D^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	10	558.469	27.6776 – 206.7407	$3d^7 - 3d^6(a^3H)4p$	$a^2H - {}^4I^\circ$	$\frac{9}{2}-\frac{11}{2}$		903
	250	559.935	43.4375 – 222.0293	$3d^7 - 3d^6(a^3G)4p$	$a^2F - {}^2G^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	300	561.378	43.8586 – 221.9910	$3d^7 - 3d^6(a^3G)4p$	$a^2F - {}^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		903
	40	566.714	43.4375 – 219.8960	$3d^7 - 3d^6(a^3G)4p$	$a^2F - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	100	567.811	43.4375 – 219.5534	$3d^7 - 3d^6(a^3G)4p$	$a^2F - {}^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	150	568.056	43.8586 – 219.8960	$3d^7 - 3d^6(a^3G)4p$	$a^2F - {}^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	20	568.489	43.8586 – 219.7650	$3d^7 - 3d^6(a^3G)4p$	$a^2F - {}^2H^\circ$	$\frac{7}{2}-\frac{9}{2}$		903
	10	568.621	0. – 175.8691	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^6D^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	20	569.165	43.8586 – 219.5534	$3d^7 - 3d^6(a^3G)4p$	$a^2F - {}^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	20	569.564	0. – 175.5695	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^6D^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	10	571.262	1.1897 – 176.2471	$3d^7 - 3d^6(a^5D)4p$	$ga^4F - {}^6D^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	60	573.063	43.4375 – 217.9397	$3d^7 - 3d^6(a^3F)4p$	$a^2F - {}^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	10	573.970						903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	30	574.799	43.4375 - 217.4143	$3d^7 - 3d^6(a^3F)4p$	$a^2F - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	250	575.818	18.3668 - 192.0335	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^4P^\circ$	$\frac{3}{2} - \frac{1}{2}$		903
	70	576.180	43.8586 - 217.4143	$3d^7 - 3d^6(a^3F)4p$	$a^2F - {}^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	250	576.376	18.1186 - 191.6182	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^4P^\circ$	$\frac{5}{2} - \frac{3}{2}$		903
	100	577.201	18.3668 - 191.6182	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^4P^\circ$	$\frac{3}{2} - \frac{3}{2}$		903
	80	577.788	18.9584 - 192.0335	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^4P^\circ$	$\frac{1}{2} - \frac{1}{2}$		903
	400	579.009	18.1186 - 190.8303	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^4P^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	300	579.183	18.9584 - 191.6182	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^4P^\circ$	$\frac{1}{2} - \frac{3}{2}$		903
	20	579.337						903
	300	579.835	18.3668 - 190.8303	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^4P^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	100	580.423	43.4375 - 215.7245	$3d^7 - 3d^6(a^3G)4p$	$a^2F - {}^4H^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	20	581.818	43.8586 - 215.7361	$3d^7 - 3d^6(a^3G)4p$	$a^2F - {}^4H^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	10	582.167						903
	10	582.544	43.8586 - 215.5168	$3d^7 - 3d^6(a^3G)4p$	$a^2F - {}^4F^\circ$	$\frac{7}{2} - \frac{5}{2}$	Q	903
	30	584.167	43.4375 - 214.6228	$3d^7 - 3d^6(a^3F)4p$	$a^2F - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	10	584.559						903
	10	584.741	67.9898 - 239.0087	$3d^7 - 3d^6(a^1F)4p$	$b^2D - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	20	588.426						903
	20	588.654	43.8586 - 213.7397	$3d^7 - 3d^6(a^3F)4p$	$a^2F - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	30	589.299	43.4375 - 213.1311	$3d^7 - 3d^6(a^3F)4p$	$a^2F - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	10	589.803	43.8586 - 213.4086	$3d^7 - 3d^6(a^3G)4p$	$a^2F - {}^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	10	590.152	18.1186 - 187.5703	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	10	590.943						903
	30	592.224	18.3668 - 187.2257	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$		903
	20	592.280	43.4375 - 212.2759	$3d^7 - 3d^6(a^3F)4p$	$a^2F - {}^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	60	593.148	18.3668 - 186.9572	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		903
	60	593.842	18.1186 - 186.5161	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	60	594.294	18.9584 - 187.2257	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^4D^\circ$	$\frac{1}{2} - \frac{1}{2}$		903
	150	594.707	18.3668 - 186.5161	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	20	595.008						903
	80	595.249	18.9584 - 186.9572	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^4D^\circ$	$\frac{1}{2} - \frac{3}{2}$		903
	20	595.327	23.6489 - 191.6182	$3d^7 - 3d^6(a^5D)4p$	$a^2P - {}^4P^\circ$	$\frac{3}{2} - \frac{3}{2}$		903
	30	595.447						903
	20	595.621						903
	300	596.058	18.1186 - 185.8900	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	10	596.338						903
	10	597.083	18.9584 - 186.4414	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^6P^\circ$	$\frac{1}{2} - \frac{3}{2}$	Q	903
	30	597.436	24.6514 - 192.0335	$3d^7 - 3d^6(a^5D)4p$	$a^2P - {}^4P^\circ$	$\frac{1}{2} - \frac{1}{2}$		903
	30	598.154	23.6489 - 190.8303	$3d^7 - 3d^6(a^5D)4p$	$a^2P - {}^4P^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	30	598.319	18.3668 - 185.5053	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^6P^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	20	598.932	24.6514 - 191.6182	$3d^7 - 3d^6(a^5D)4p$	$a^2P - {}^4P^\circ$	$\frac{1}{2} - \frac{3}{2}$		903
	30	599.197						903
	20	599.761	43.8586 - 210.5906	$3d^7 - 3d^6(a^3P)4p$	$a^2F - {}^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$	Q	903
	20	599.930	43.4375 - 210.1218	$3d^7 - 3d^6(a^3F)4p$	$a^2F - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	10	601.063						903
	20	602.323	67.9898 - 234.0195	$3d^7 - 3d^6(a^1S)4p$	$b^2D - {}^2P^\circ$	$\frac{5}{2} - \frac{3}{2}$		903
	100	602.482	18.1186 - 184.0991	$3d^7 - 3d^6(a^5D)4p$	$a^4P - {}^6P^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	100	602.573	43.4375 - 209.3914	$3d^7 - 3d^6(a^3H)4p$	$a^2F - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	10	603.770						903
	20	604.106	43.8586 - 209.3914	$3d^7 - 3d^6(a^3H)4p$	$a^2F - {}^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	10	604.738						903
	150	605.045	43.8586 - 209.1319	$3d^7 - 3d^6(a^3H)4p$	$a^2F - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	30	605.785	43.8586 - 208.9336	$3d^7 - 3d^6(a^3F)4p$	$a^2F - {}^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	20	606.130						903

NI IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	10	606.597						903
	10	606.811						903
	20	607.260	23.6489 - 188.3201	3d^7 - 3d^6(a^{5}D)4p	a^{2}P - ^{4}F°	$\frac{3}{2}-\frac{5}{2}$		903
	10	607.781						903
	10	608.709	67.9898 - 232.2727	3d^7 - 3d^6(a^{1}D)4p	b^{2}D - ^{2}F°	$\frac{5}{2}-\frac{5}{2}$		903
	50	609.058	43.8586 - 208.0468	3d^7 - 3d^6(a^{3}H)4p	a^{2}F - ^{4}I°	$\frac{7}{2}-\frac{9}{2}$		903
	50	609.448	18.1186 - 182.2068	3d^7 - 3d^6(a^{5}D)4p	a^{4}P - ^{6}F°	$\frac{5}{2}-\frac{5}{2}$		903
	10	609.593						903
	250	610.043	18.3668 - 182.2884	3d^7 - 3d^6(a^{5}D)4p	a^{4}P - ^{6}F°	$\frac{3}{2}-\frac{1}{2}$	Q	903
	10	610.255						903
	10	610.366	18.3668 - 182.2068	3d^7 - 3d^6(a^{5}D)4p	a^{4}P - ^{6}F°	$\frac{3}{2}-\frac{5}{2}$		903
	20	612.351	18.9584 - 182.2599	3d^7 - 3d^6(a^{5}D)4p	a^{4}P - ^{6}F°	$\frac{1}{2}-\frac{3}{2}$		903
	10	613.474	43.8586 - 206.8655	3d^7 - 3d^6(a^{3}H)4p	a^{2}F - ^{4}H°	$\frac{7}{2}-\frac{9}{2}$		903
	20	614.005	23.6489 - 186.5161	3d^7 - 3d^6(a^{5}D)4p	a^{2}P - ^{4}D°	$\frac{3}{2}-\frac{5}{2}$		903
	20	617.635	67.3600 - 229.2695	3d^7 - 3d^6(a^{3}D)4p	b^{2}D - ^{2}F°	$\frac{3}{2}-\frac{5}{2}$		903
	10	621.238						903
	10	621.690	67.3600 - 228.2142	3d^7 - 3d^6(a^{1}D)4p	b^{2}D - ^{2}P°	$\frac{3}{2}-\frac{3}{2}$		903
	20	622.940	67.9898 - 228.5185	3d^7 - 3d^6(a^{3}D)4p	b^{2}D - ^{2}F°	$\frac{5}{2}-\frac{7}{2}$		903
	10	624.130	67.9898 - 228.2142	3d^7 - 3d^6(a^{1}D)4p	b^{2}D - ^{2}P°	$\frac{5}{2}-\frac{3}{2}$		903
	10	624.243	67.3600 - 227.5494	3d^7 - 3d^6(a^{1}D)4p	b^{2}D - ^{2}D°	$\frac{3}{2}-\frac{5}{2}$		903
	30	626.712	67.9898 - 227.5494	3d^7 - 3d^6(a^{1}D)4p	b^{2}D - ^{2}D°	$\frac{5}{2}-\frac{5}{2}$		903
	10	631.158	18.1186 - 176.5544	3d^7 - 3d^6(a^{5}D)4p	a^{4}P - ^{6}D°	$\frac{5}{2}-\frac{3}{2}$		903
	30	631.421						903
	30	632.415	18.1186 - 176.2471	3d^7 - 3d^6(a^{5}D)4p	a^{4}P - ^{6}D°	$\frac{5}{2}-\frac{5}{2}$		903
	50	632.615	67.3600 - 225.4316	3d^7 - 3d^6(a^{1}G)4p	b^{2}D - ^{2}F°	$\frac{3}{2}-\frac{5}{2}$		903
	10	632.835						903
	10	632.923						903
	10	633.910	18.1186 - 175.8691	3d^7 - 3d^6(a^{5}D)4p	a^{4}P - ^{6}D°	$\frac{5}{2}-\frac{7}{2}$		903
	80	634.276	28.7777 - 186.4414	3d^7 - 3d^6(a^{5}D)4p	a^{2}D - ^{6}P°	$\frac{3}{2}-\frac{3}{2}$	Q	903
	20	634.377	67.3600 - 224.9965	3d^7 - 3d^6(a^{3}D)4p	b^{2}D - ^{2}P°	$\frac{3}{2}-\frac{1}{2}$		903
	30	636.343	67.9898 - 225.1369	3d^7 - 3d^6(a^{3}D)4p	b^{2}D - ^{4}D°	$\frac{5}{2}-\frac{7}{2}$		903
	20	637.158	67.9898 - 224.9369	3d^7 - 3d^6(a^{3}D)4p	b^{2}D - ^{2}P°	$\frac{5}{2}-\frac{3}{2}$		903
	20	638.329	67.3600 - 224.0213	3d^7 - 3d^6(a^{3}D)4p	b^{2}D - ^{4}F°	$\frac{3}{2}-\frac{5}{2}$		903
	20	639.080	67.9898 - 224.4636	3d^7 - 3d^6(a^{1}G)4p	b^{2}D - ^{2}G°	$\frac{5}{2}-\frac{7}{2}$		903
	30	640.668	67.9898 - 224.0753	3d^7 - 3d^6(a^{1}G)4p	b^{2}D - ^{2}F°	$\frac{5}{2}-\frac{7}{2}$		903
	20	649.870						903
		651.32	0. - 153.5336	3d^7 - 3d^6(a^{3}D)4s	ga^{4}F - ^{4}D	$\frac{9}{2}-\frac{7}{2}$	F,P	375,903
		652.15	0. - 153.3388	3d^7 - 3d^6(a^{3}D)4s	ga^{4}F - ^{4}D	$\frac{9}{2}-\frac{5}{2}$	F,P	375,903
		656.41	1.1897 - 153.5336	3d^7 - 3d^6(a^{3}D)4s	ga^{4}F - ^{4}D	$\frac{7}{2}-\frac{7}{2}$	F,P	375,903
	100	657.043	67.3600 - 219.5534	3d^7 - 3d^6(a^{3}G)4p	b^{2}D - ^{2}F°	$\frac{3}{2}-\frac{5}{2}$		903
		657.25	1.1897 - 153.3388	3d^7 - 3d^6(a^{3}D)4s	ga^{4}F - ^{4}D	$\frac{7}{2}-\frac{5}{2}$	F,P	375,903
		657.36	1.1897 - 153.3138	3d^7 - 3d^6(a^{3}D)4s	ga^{4}F - ^{4}D	$\frac{7}{2}-\frac{3}{2}$	F,P	375,903
	150	658.285	67.9898 - 219.8960	3d^7 - 3d^6(a^{3}G)4p	b^{2}D - ^{2}F°	$\frac{5}{2}-\frac{7}{2}$		903
		659.73	19.8296 - 171.4060	3d^7 - 3d^6(a^{1}F)4s	a^{2}G - ^{2}F	$\frac{9}{2}-\frac{7}{2}$	F,P	375,903
	30	659.783	67.9898 - 219.5534	3d^7 - 3d^6(a^{3}G)4p	b^{2}D - ^{2}F°	$\frac{5}{2}-\frac{5}{2}$		903
		660.91	2.0425 - 153.3494	3d^7 - 3d^6(a^{3}D)4s	ga^{4}F - ^{4}D	$\frac{5}{2}-\frac{1}{2}$	F,P	375,903
		660.95	2.0425 - 153.3388	3d^7 - 3d^6(a^{3}D)4s	ga^{4}F - ^{4}D	$\frac{5}{2}-\frac{5}{2}$	F,P	375,903
		661.06	2.0425 - 153.3138	3d^7 - 3d^6(a^{3}D)4s	ga^{4}F - ^{4}D	$\frac{5}{2}-\frac{3}{2}$	F,P	375,903
		663.45	2.6211 - 153.3494	3d^7 - 3d^6(a^{3}D)4s	ga^{4}F - ^{4}D	$\frac{3}{2}-\frac{1}{2}$	F,P	375,903
		663.60	2.6211 - 153.3138	3d^7 - 3d^6(a^{3}D)4s	ga^{4}F - ^{4}D	$\frac{3}{2}-\frac{3}{2}$	F,P	375,903
	30	664.086	67.3600 - 217.9397	3d^7 - 3d^6(a^{3}F)4p	b^{2}D - ^{2}D°	$\frac{3}{2}-\frac{3}{2}$		903
		664.63	20.9476 - 171.4080	3d^7 - 3d^6(a^{1}F)4s	a^{2}G - ^{2}F	$\frac{7}{2}-\frac{5}{2}$	F,P	375,903
	40	669.223	67.9898 - 217.4143	3d^7 - 3d^6(a^{3}F)4p	b^{2}D - ^{2}D°	$\frac{5}{2}-\frac{5}{2}$		903
	150	672.957						903

NI IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	20	678.122	28.7777 – 176.2471	3d^7 – 3d^6(a^{5}D)4p	a^{2}D – ^{6}D°	$\frac{3}{2}-\frac{5}{2}$	Q	903
	10	683.321						903
	30	683.639	67.3600 – 213.6402	3d^7 – 3d^6(a^{3}P)4p	b^{2}D – ^{2}P°	$\frac{3}{2}-\frac{1}{2}$	Q	903
	40	684.631	67.9898 – 214.0558	3d^7 – 3d^6(a^{3}P)4p	b^{2}D – ^{2}P°	$\frac{5}{2}-\frac{3}{2}$		903
		686.33	0. – 145.7022	3d^7 – 3d^6(a^{3}G)4s	ga^{4}F – ^{4}G	$\frac{9}{2}-\frac{9}{2}$	F,P	375,903
	100	688.947						903
	10	689.741						903
		690.27	1.1897 – 146.0615	3d^7 – 3d^6(a^{3}G)4s	ga^{4}F – ^{4}G	$\frac{7}{2}-\frac{7}{2}$	F,P	375,903
		690.54	0. – 144.8151	3d^7 – 3d^6(a^{3}G)4s	ga^{4}F – ^{4}G	$\frac{9}{2}-\frac{11}{2}$	F,P	375,903
	50	690.689						903
	10	690.851						903
		691.98	1.1897 – 145.7022	3d^7 – 3d^6(a^{3}G)4s	ga^{4}F – ^{4}G	$\frac{7}{2}-\frac{9}{2}$	F,P	375,903
		692.96	27.0965 – 171.4060	3d^7 – 3d^6(a^{1}F)4s	a^{2}D – ^{2}F	$\frac{5}{2}-\frac{7}{2}$	F,P	375,903
		693.91	2.0425 – 146.1538	3d^7 – 3d^6(a^{3}G)4s	ga^{4}F – ^{4}G	$\frac{5}{2}-\frac{5}{2}$	F,P	375,903
		694.35	2.0425 – 146.0615	3d^7 – 3d^6(a^{3}G)4s	ga^{4}F – ^{4}G	$\frac{5}{2}-\frac{7}{2}$	F,P	375,903
		696.09	2.0425 – 145.7022	3d^7 – 3d^6(a^{3}G)4s	ga^{4}F – ^{4}G	$\frac{5}{2}-\frac{9}{2}$	F,P	375,903
		696.26	1.1897 – 144.8151	3d^7 – 3d^6(a^{3}G)4s	ga^{4}F – ^{4}G	$\frac{7}{2}-\frac{11}{2}$	F,P	375,903
		696.71	2.6211 – 146.1538	3d^7 – 3d^6(a^{3}G)4s	ga^{4}F – ^{4}G	$\frac{3}{2}-\frac{5}{2}$	F,P	375,903
		697.15	2.6211 – 146.0615	3d^7 – 3d^6(a^{3}G)4s	ga^{4}F – ^{4}G	$\frac{3}{2}-\frac{7}{2}$	F,P	375,903
	30	698.105						903
	10	698.344						903
		701.11	28.7777 – 171.4080	3d^7 – 3d^6(a^{1}F)4s	a^{2}D – ^{2}F	$\frac{3}{2}-\frac{5}{2}$	F,P	375,903
		705.06	0. – 141.8320	3d^7 – 3d^6(a^{3}F)4s	ga^{4}F – ^{4}F	$\frac{9}{2}-\frac{5}{2}$	F,P	375,903
		706.33	0. – 141.5772	3d^7 – 3d^6(a^{3}F)4s	ga^{4}F – ^{4}F	$\frac{9}{2}-\frac{7}{2}$	F,P	375,903
	10	707.779						903
		708.11	0. – 141.2203	3d^7 – 3d^6(a^{3}F)4s	ga^{4}F – ^{4}F	$\frac{9}{2}-\frac{9}{2}$	F,P	375,903
	10	708.185						903
	10	708.567						903
		710.06	1.1897 – 142.0235	3d^7 – 3d^6(a^{3}F)4s	ga^{4}F – ^{4}F	$\frac{7}{2}-\frac{3}{2}$	F,P	375,903
		711.02	1.1897 – 141.8320	3d^7 – 3d^6(a^{3}F)4s	ga^{4}F – ^{4}F	$\frac{7}{2}-\frac{5}{2}$	F,P	375,903
		712.31	1.1897 – 141.5772	3d^7 – 3d^6(a^{3}F)4s	ga^{4}F – ^{4}F	$\frac{7}{2}-\frac{7}{2}$	F,P	375,903
		714.13	1.1897 – 141.2203	3d^7 – 3d^6(a^{3}F)4s	ga^{4}F – ^{4}F	$\frac{7}{2}-\frac{9}{2}$	F,P	375,903
		714.38	2.0425 – 142.0235	3d^7 – 3d^6(a^{3}F)4s	ga^{4}F – ^{4}F	$\frac{5}{2}-\frac{3}{2}$	F,P	375,903
		715.36	2.0425 – 141.8320	3d^7 – 3d^6(a^{3}F)4s	ga^{4}F – ^{4}F	$\frac{5}{2}-\frac{5}{2}$	F,P	375,903
		716.67	2.0425 – 141.5772	3d^7 – 3d^6(a^{3}F)4s	ga^{4}F – ^{4}F	$\frac{5}{2}-\frac{7}{2}$	F,P	375,903
		717.35	2.6211 – 142.0235	3d^7 – 3d^6(a^{3}F)4s	ga^{4}F – ^{4}F	$\frac{3}{2}-\frac{3}{2}$	F,P	375,903
		718.33	2.6211 – 141.8320	3d^7 – 3d^6(a^{3}F)4s	ga^{4}F – ^{4}F	$\frac{3}{2}-\frac{5}{2}$	F,P	375,903
		718.51	2.0425 – 141.2203	3d^7 – 3d^6(a^{3}F)4s	ga^{4}F – ^{4}F	$\frac{5}{2}-\frac{9}{2}$	F,P	375,903
		719.65	2.6211 – 141.5772	3d^7 – 3d^6(a^{3}F)4s	ga^{4}F – ^{4}F	$\frac{3}{2}-\frac{7}{2}$	F,P	375,903
		732.48	19.8296 – 156.3512	3d^7 – 3d^6(a^{1}G)4s	a^{2}G – ^{2}G	$\frac{9}{2}-\frac{7}{2}$	F,P	375,903
		732.79	19.8296 – 156.2940	3d^7 – 3d^6(a^{1}G)4s	a^{2}G – ^{2}G	$\frac{9}{2}-\frac{9}{2}$	F,P	375,903
		734.38	23.6489 – 159.8184	3d^7 – 3d^6(a^{3}D)4s	a^{2}P – ^{2}D	$\frac{3}{2}-\frac{5}{2}$	F,P	375,903
		736.11	23.6489 – 159.4985	3d^7 – 3d^6(a^{3}D)4s	a^{2}P – ^{2}D	$\frac{3}{2}-\frac{3}{2}$	F,P	375,903
		738.47	18.1186 – 153.5336	3d^7 – 3d^6(a^{3}D)4s	a^{4}P – ^{4}D	$\frac{5}{2}-\frac{7}{2}$	F,P	375,903
		738.53	20.9476 – 156.3512	3d^7 – 3d^6(a^{1}G)4s	a^{2}G – ^{2}G	$\frac{7}{2}-\frac{7}{2}$	F,P	375,903
		738.84	20.9476 – 156.2940	3d^7 – 3d^6(a^{1}G)4s	a^{2}G – ^{2}G	$\frac{7}{2}-\frac{9}{2}$	F,P	375,903
		739.53	18.1186 – 153.3388	3d^7 – 3d^6(a^{3}D)4s	a^{4}P – ^{4}D	$\frac{5}{2}-\frac{5}{2}$	F,P	375,903
		739.83	18.3668 – 153.5336	3d^7 – 3d^6(a^{3}D)4s	a^{4}P – ^{4}D	$\frac{3}{2}-\frac{7}{2}$	F,P	375,903
		740.89	18.3668 – 153.3388	3d^7 – 3d^6(a^{3}D)4s	a^{4}P – ^{4}D	$\frac{3}{2}-\frac{5}{2}$	F,P	375,903
		741.03	18.3668 – 153.3138	3d^7 – 3d^6(a^{3}D)4s	a^{4}P – ^{4}D	$\frac{3}{2}-\frac{3}{2}$	F,P	375,903
		741.58	24.6514 – 159.4985	3d^7 – 3d^6(a^{3}D)4s	a^{2}P – ^{2}D	$\frac{1}{2}-\frac{3}{2}$	F,P	375,903
		744.10	18.9584 – 153.3494	3d^7 – 3d^6(a^{3}D)4s	a^{4}P – ^{4}D	$\frac{1}{2}-\frac{1}{2}$	F,P	375,903
		744.16	18.9584 – 153.3388	3d^7 – 3d^6(a^{3}D)4s	a^{4}P – ^{4}D	$\frac{1}{2}-\frac{5}{2}$	F,P	375,903
		744.29	18.9584 – 153.3138	3d^7 – 3d^6(a^{3}D)4s	a^{4}P – ^{4}D	$\frac{1}{2}-\frac{3}{2}$	F,P	375,903

NI IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		753.46	27.0965 – 159.8184	$3d^7 - 3d^6(a^3D)4s$	$a^2D - {}^2D$	$\frac{5}{2} - \frac{5}{2}$	F,P	375,903
		754.64	19.8296 – 152.3437	$3d^7 - 3d^6(a^3G)4s$	$a^2G - {}^2G$	$\frac{9}{2} - \frac{7}{2}$	F,P	375,903
		755.28	27.0965 – 159.4985	$3d^7 - 3d^6(a^3D)4s$	$a^2D - {}^2D$	$\frac{5}{2} - \frac{3}{2}$	F,P	375,903
		759.04	19.8296 – 151.5747	$3d^7 - 3d^6(a^3G)4s$	$a^2G - {}^2G$	$\frac{9}{2} - \frac{9}{2}$	F,P	375,903
		761.06	20.9476 – 152.3437	$3d^7 - 3d^6(a^3G)4s$	$a^2G - {}^2G$	$\frac{7}{2} - \frac{7}{2}$	F,P	375,903
		763.12	28.7777 – 159.8184	$3d^7 - 3d^6(a^3D)4s$	$a^2D - {}^2D$	$\frac{3}{2} - \frac{5}{2}$	F,P	375,903
		764.99	28.7777 – 159.4985	$3d^7 - 3d^6(a^3D)4s$	$a^2D - {}^2D$	$\frac{3}{2} - \frac{3}{2}$	F,P	375,903
		771.00	26.6491 – 156.3512	$3d^7 - 3d^6(a^1G)4s$	$a^2H - {}^2G$	$\frac{11}{2} - \frac{7}{2}$	F,P	375,903
		771.34	26.6491 – 156.2940	$3d^7 - 3d^6(a^1G)4s$	$a^2H - {}^2G$	$\frac{11}{2} - \frac{9}{2}$	F,P	375,903
		777.16	27.6776 – 156.3512	$3d^7 - 3d^6(a^1G)4s$	$a^2H - {}^2G$	$\frac{9}{2} - \frac{7}{2}$	F,P	375,903
		777.25	26.6491 – 155.3087	$3d^7 - 3d^6(a^1I)4s$	$a^2H - {}^2I$	$\frac{11}{2} - \frac{11}{2}$	F,P	375,903
		777.51	27.6776 – 156.2940	$3d^7 - 3d^6(a^1G)4s$	$a^2H - {}^2G$	$\frac{9}{2} - \frac{9}{2}$	F,P	375,903
		777.58	26.6491 – 155.2537	$3d^7 - 3d^6(a^1I)4s$	$a^2H - {}^2I$	$\frac{11}{2} - \frac{13}{2}$	F,P	375,903
		778.04	19.8296 – 148.3582	$3d^7 - 3d^6(a^3F)4s$	$a^2G - {}^2F$	$\frac{9}{2} - \frac{5}{2}$	F,P	375,903
		781.43	43.4375 – 171.4080	$3d^7 - 3d^6(a^1F)4s$	$a^2F - {}^2F$	$\frac{5}{2} - \frac{5}{2}$	F,P	375,903
		783.51	27.6776 – 155.3087	$3d^7 - 3d^6(a^1I)4s$	$a^2H - {}^2I$	$\frac{9}{2} - \frac{11}{2}$	F,P	375,903
		783.85	27.6776 – 155.2537	$3d^7 - 3d^6(a^1I)4s$	$a^2H - {}^2I$	$\frac{9}{2} - \frac{13}{2}$	F,P	375,903
		784.02	43.8586 – 171.4060	$3d^7 - 3d^6(a^1F)4s$	$a^2F - {}^2F$	$\frac{7}{2} - \frac{7}{2}$	F,P	375,903
		784.86	20.9476 – 148.3582	$3d^7 - 3d^6(a^3F)4s$	$a^2G - {}^2F$	$\frac{7}{2} - \frac{5}{2}$	F,P	375,903
		789.34	20.9476 – 147.6359	$3d^7 - 3d^6(a^3F)4s$	$a^2G - {}^2F$	$\frac{7}{2} - \frac{7}{2}$	F,P	375,903
		791.36	19.8296 – 146.1943	$3d^7 - 3d^6(a^3H)4s$	$a^2G - {}^2H$	$\frac{9}{2} - \frac{9}{2}$	F,P	375,903
		792.81	19.8296 – 145.9625	$3d^7 - 3d^6(a^3H)4s$	$a^2G - {}^2H$	$\frac{9}{2} - \frac{11}{2}$	F,P	375,903
		795.58	26.6491 – 152.3437	$3d^7 - 3d^6(a^3G)4s$	$a^2H - {}^2G$	$\frac{11}{2} - \frac{7}{2}$	F,P	375,903
		798.42	20.9476 – 146.1943	$3d^7 - 3d^6(a^3H)4s$	$a^2G - {}^2H$	$\frac{7}{2} - \frac{9}{2}$	F,P	375,903
		799.90	20.9476 – 145.9625	$3d^7 - 3d^6(a^3H)4s$	$a^2G - {}^2H$	$\frac{7}{2} - \frac{11}{2}$	F,P	375,903
		800.48	26.6491 – 151.5747	$3d^7 - 3d^6(a^3G)4s$	$a^2H - {}^2G$	$\frac{11}{2} - \frac{9}{2}$	F,P	375,903
		810.09	18.1186 – 141.5612	$3d^7 - 3d^6(a^3P)4s$	$a^4P - {}^4P$	$\frac{5}{2} - \frac{1}{2}$	F,P	375,903
		811.73	18.3668 – 141.5612	$3d^7 - 3d^6(a^3P)4s$	$a^4P - {}^4P$	$\frac{3}{2} - \frac{1}{2}$	F,P	375,903
		815.64	18.9584 – 141.5612	$3d^7 - 3d^6(a^3P)4s$	$a^4P - {}^4P$	$\frac{1}{2} - \frac{1}{2}$	F,P	375,903
		818.17	18.1186 – 140.3430	$3d^7 - 3d^6(a^3P)4s$	$a^4P - {}^4P$	$\frac{5}{2} - \frac{3}{2}$	F,P	375,903
		819.83	18.3668 – 140.3430	$3d^7 - 3d^6(a^3P)4s$	$a^4P - {}^4P$	$\frac{3}{2} - \frac{3}{2}$	F,P	375,903
		822.75	23.6489 – 145.1921	$3d^7 - 3d^6(a^3P)4s$	$a^2P - {}^2P$	$\frac{3}{2} - \frac{3}{2}$	F,P	375,903
		823.83	18.9584 – 140.3430	$3d^7 - 3d^6(a^3P)4s$	$a^4P - {}^4P$	$\frac{1}{2} - \frac{3}{2}$	F,P	375,903
		825.11	1.1897 – 122.3861	$3d^7 - 3d^6(a^5D)4s$	$ga^4F - {}^4D$	$\frac{7}{2} - \frac{3}{2}$	F,P	375,903
		827.06	0. – 120.9095	$3d^7 - 3d^6(a^5D)4s$	$ga^4F - {}^4D$	$\frac{9}{2} - \frac{7}{2}$	F,P	375,903
		828.67	2.0425 – 122.7174	$3d^7 - 3d^6(a^5D)4s$	$ga^4F - {}^4D$	$\frac{5}{2} - \frac{1}{2}$	F,P	375,903
		829.06	1.1897 – 121.8077	$3d^7 - 3d^6(a^5D)4s$	$ga^4F - {}^4D$	$\frac{7}{2} - \frac{5}{2}$	F,P	375,903
		829.60	27.0965 – 147.6359	$3d^7 - 3d^6(a^3F)4s$	$a^2D - {}^2F$	$\frac{5}{2} - \frac{7}{2}$	F,P	375,903
		830.95	2.0425 – 122.3861	$3d^7 - 3d^6(a^5D)4s$	$ga^4F - {}^4D$	$\frac{5}{2} - \frac{3}{2}$	F,P	375,903
		831.06	18.1186 – 138.4462	$3d^7 - 3d^6(a^3P)4s$	$a^4P - {}^4P$	$\frac{5}{2} - \frac{5}{2}$	F,P	375,903
		832.67	2.6211 – 122.7174	$3d^7 - 3d^6(a^5D)4s$	$ga^4F - {}^4D$	$\frac{3}{2} - \frac{1}{2}$	F,P	375,903
		832.78	18.3668 – 138.4462	$3d^7 - 3d^6(a^3P)4s$	$a^4P - {}^4P$	$\frac{3}{2} - \frac{5}{2}$	F,P	375,903
		834.97	2.0425 – 121.8077	$3d^7 - 3d^6(a^5D)4s$	$ga^4F - {}^4D$	$\frac{5}{2} - \frac{5}{2}$	F,P	375,903
		835.28	1.1897 – 120.9095	$3d^7 - 3d^6(a^5D)4s$	$ga^4F - {}^4D$	$\frac{7}{2} - \frac{7}{2}$	F,P	375,903
		836.26	28.7777 – 148.3582	$3d^7 - 3d^6(a^3F)4s$	$a^2D - {}^2F$	$\frac{3}{2} - \frac{5}{2}$	F,P	375,903
		836.50	26.6491 – 146.1943	$3d^7 - 3d^6(a^3H)4s$	$a^2H - {}^2H$	$\frac{11}{2} - \frac{9}{2}$	F,P	375,903
		836.90	18.9584 – 138.4462	$3d^7 - 3d^6(a^3P)4s$	$a^4P - {}^4P$	$\frac{1}{2} - \frac{5}{2}$	F,P	375,903
		838.13	26.6491 – 145.9625	$3d^7 - 3d^6(a^3H)4s$	$a^2H - {}^2H$	$\frac{11}{2} - \frac{11}{2}$	F,P	375,903
		841.34	28.7777 – 147.6359	$3d^7 - 3d^6(a^3F)4s$	$a^2D - {}^2F$	$\frac{3}{2} - \frac{7}{2}$	F,P	375,903
		843.76	27.6776 – 146.1943	$3d^7 - 3d^6(a^3H)4s$	$a^2H - {}^2H$	$\frac{9}{2} - \frac{9}{2}$	F,P	375,903
		845.42	27.6776 – 145.9625	$3d^7 - 3d^6(a^3H)4s$	$a^2H - {}^2H$	$\frac{9}{2} - \frac{11}{2}$	F,P	375,903
		846.77	27.0965 – 145.1921	$3d^7 - 3d^6(a^3P)4s$	$a^2D - {}^2P$	$\frac{5}{2} - \frac{3}{2}$	F,P	375,903
		859.00	28.7777 – 145.1921	$3d^7 - 3d^6(a^3P)4s$	$a^2D - {}^2P$	$\frac{3}{2} - \frac{3}{2}$	F,P	375,903
		859.25	43.4375 – 159.8184	$3d^7 - 3d^6(a^3D)4s$	$a^2F - {}^2D$	$\frac{5}{2} - \frac{5}{2}$	F,P	375,903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		861.62	43.4375 – 159.4985	$3d^7$ – $3d^6(a^3D)4s$	a^2F – ^2D	$\frac{5}{2}$ – $\frac{3}{2}$	F,P	375,903
		862.37	43.8586 – 159.8184	$3d^7$ – $3d^6(a^3D)4s$	a^2F – ^2D	$\frac{7}{2}$ – $\frac{5}{2}$	F,P	375,903
		864.75	43.8586 – 159.4985	$3d^7$ – $3d^6(a^3D)4s$	a^2F – ^2D	$\frac{7}{2}$ – $\frac{3}{2}$	F,P	375,903
		885.63	43.4375 – 156.3512	$3d^7$ – $3d^6(a^1G)4s$	a^2F – ^2G	$\frac{5}{2}$ – $\frac{7}{2}$	F,P	375,903
		886.08	43.4375 – 156.2940	$3d^7$ – $3d^6(a^1G)4s$	a^2F – ^2G	$\frac{5}{2}$ – $\frac{9}{2}$	F,P	375,903
		888.95	43.8586 – 156.3512	$3d^7$ – $3d^6(a^1G)4s$	a^2F – ^2G	$\frac{7}{2}$ – $\frac{7}{2}$	F,P	375,903
		889.40	43.8586 – 156.2940	$3d^7$ – $3d^6(a^1G)4s$	a^2F – ^2G	$\frac{7}{2}$ – $\frac{9}{2}$	F,P	375,903
		894.75	0. – 111.7633	$3d^7$ – $3d^6(a^5D)4s$	ga^4F – ^6D	$\frac{9}{2}$ – $\frac{5}{2}$	F,P	375,903
		899.31	0. – 111.1958	$3d^7$ – $3d^6(a^5D)4s$	ga^4F – ^6D	$\frac{9}{2}$ – $\frac{7}{2}$	F,P	375,903
		901.21	1.1897 – 112.1519	$3d^7$ – $3d^6(a^5D)4s$	ga^4F – ^6D	$\frac{7}{2}$ – $\frac{3}{2}$	F,P	375,903
		904.38	1.1897 – 111.7633	$3d^7$ – $3d^6(a^5D)4s$	ga^4F – ^6D	$\frac{7}{2}$ – $\frac{5}{2}$	F,P	375,903
		905.71	0. – 110.4106	$3d^7$ – $3d^6(a^5D)4s$	ga^4F – ^6D	$\frac{9}{2}$ – $\frac{9}{2}$	F,P	375,903
		906.32	2.0425 – 112.3793	$3d^7$ – $3d^6(a^5D)4s$	ga^4F – ^6D	$\frac{5}{2}$ – $\frac{1}{2}$	F,P	375,903
		908.19	2.0425 – 112.1519	$3d^7$ – $3d^6(a^5D)4s$	ga^4F – ^6D	$\frac{5}{2}$ – $\frac{3}{2}$	F,P	375,903
		909.04	1.1897 – 111.1958	$3d^7$ – $3d^6(a^5D)4s$	ga^4F – ^6D	$\frac{7}{2}$ – $\frac{7}{2}$	F,P	375,903
		911.09	2.6211 – 112.3793	$3d^7$ – $3d^6(a^5D)4s$	ga^4F – ^6D	$\frac{3}{2}$ – $\frac{1}{2}$	F,P	375,903
		911.40	2.0425 – 111.7633	$3d^7$ – $3d^6(a^5D)4s$	ga^4F – ^6D	$\frac{5}{2}$ – $\frac{5}{2}$	F,P	375,903
		912.99	2.6211 – 112.1519	$3d^7$ – $3d^6(a^5D)4s$	ga^4F – ^6D	$\frac{3}{2}$ – $\frac{3}{2}$	F,P	375,903
		918.22	43.4375 – 152.3437	$3d^7$ – $3d^6(a^3G)4s$	a^2F – ^2G	$\frac{5}{2}$ – $\frac{7}{2}$	F,P	375,903
		921.79	43.8586 – 152.3437	$3d^7$ – $3d^6(a^3G)4s$	a^2F – ^2G	$\frac{7}{2}$ – $\frac{7}{2}$	F,P	375,903
		924.75	43.4375 – 151.5747	$3d^7$ – $3d^6(a^3G)4s$	a^2F – ^2G	$\frac{5}{2}$ – $\frac{9}{2}$	F,P	375,903
		928.37	43.8586 – 151.5747	$3d^7$ – $3d^6(a^3G)4s$	a^2F – ^2G	$\frac{7}{2}$ – $\frac{9}{2}$	F,P	375,903
		953.10	43.4375 – 148.3582	$3d^7$ – $3d^6(a^3F)4s$	a^2F – ^2F	$\frac{5}{2}$ – $\frac{5}{2}$	F,P	375,903
		956.94	43.8586 – 148.3582	$3d^7$ – $3d^6(a^3F)4s$	a^2F – ^2F	$\frac{7}{2}$ – $\frac{5}{2}$	F,P	375,903
		959.71	43.4375 – 147.6359	$3d^7$ – $3d^6(a^3F)4s$	a^2F – ^2F	$\frac{5}{2}$ – $\frac{7}{2}$	F,P	375,903
		961.09	67.3600 – 171.4080	$3d^7$ – $3d^6(a^1F)4s$	b^2D – ^2F	$\frac{3}{2}$ – $\frac{5}{2}$	F,P	375,903
		961.11	67.3600 – 171.4060	$3d^7$ – $3d^6(a^1F)4s$	b^2D – ^2F	$\frac{3}{2}$ – $\frac{7}{2}$	F,P	375,903
		961.36	18.3668 – 122.3861	$3d^7$ – $3d^6(a^5D)4s$	a^4P – ^4D	$\frac{3}{2}$ – $\frac{3}{2}$	F,P	375,903
		963.60	43.8586 – 147.6359	$3d^7$ – $3d^6(a^3F)4s$	a^2F – ^2F	$\frac{7}{2}$ – $\frac{7}{2}$	F,P	375,903
		963.77	18.9584 – 122.7174	$3d^7$ – $3d^6(a^5D)4s$	a^4P – ^4D	$\frac{1}{2}$ – $\frac{1}{2}$	F,P	375,903
		964.42	18.1186 – 121.8077	$3d^7$ – $3d^6(a^5D)4s$	a^4P – ^4D	$\frac{5}{2}$ – $\frac{5}{2}$	F,P	375,903
		966.74	18.3668 – 121.8077	$3d^7$ – $3d^6(a^5D)4s$	a^4P – ^4D	$\frac{3}{2}$ – $\frac{5}{2}$	F,P	375,903
		966.86	18.9584 – 122.3861	$3d^7$ – $3d^6(a^5D)4s$	a^4P – ^4D	$\frac{1}{2}$ – $\frac{3}{2}$	F,P	375,903
		966.97	67.9898 – 171.4060	$3d^7$ – $3d^6(a^1F)4s$	b^2D – ^2F	$\frac{5}{2}$ – $\frac{7}{2}$	F,P	375,903
		972.30	18.9584 – 121.8077	$3d^7$ – $3d^6(a^5D)4s$	a^4P – ^4D	$\frac{1}{2}$ – $\frac{5}{2}$	F,P	375,903
		972.85	18.1186 – 120.9095	$3d^7$ – $3d^6(a^5D)4s$	a^4P – ^4D	$\frac{5}{2}$ – $\frac{7}{2}$	F,P	375,903
		975.20	18.3668 – 120.9095	$3d^7$ – $3d^6(a^5D)4s$	a^4P – ^4D	$\frac{3}{2}$ – $\frac{7}{2}$	F,P	375,903
		1081.6	67.3600 – 159.8184	$3d^7$ – $3d^6(a^3D)4s$	b^2D – ^2D	$\frac{3}{2}$ – $\frac{5}{2}$	F,P	375,903
		1085.3	67.3600 – 159.4985	$3d^7$ – $3d^6(a^3D)4s$	b^2D – ^2D	$\frac{3}{2}$ – $\frac{3}{2}$	F,P	375,903
		1089.0	67.9898 – 159.8184	$3d^7$ – $3d^6(a^3D)4s$	b^2D – ^2D	$\frac{5}{2}$ – $\frac{5}{2}$	F,P	375,903
		1092.8	67.9898 – 159.4985	$3d^7$ – $3d^6(a^3D)4s$	b^2D – ^2D	$\frac{5}{2}$ – $\frac{3}{2}$	F,P	375,903
	0	1210.116						903
		1234.6	67.3600 – 148.3582	$3d^7$ – $3d^6(a^3F)4s$	b^2D – ^2F	$\frac{3}{2}$ – $\frac{5}{2}$	F,P	375,903
		1244.3	67.9898 – 148.3582	$3d^7$ – $3d^6(a^3F)4s$	b^2D – ^2F	$\frac{5}{2}$ – $\frac{5}{2}$	F,P	375,903
	60	1245.631	144.8151 – 225.0964	$3d^6(a^3G)4s$ – $3d^6(a^3D)4p$	^4G – $^4F^{\circ}$	$\frac{11}{2}$ – $\frac{9}{2}$		903
		1245.7	67.3600 – 147.6359	$3d^7$ – $3d^6(a^3F)4s$	b^2D – ^2F	$\frac{3}{2}$ – $\frac{7}{2}$	F,P	375,903
		1255.5	67.9898 – 147.6359	$3d^7$ – $3d^6(a^3F)4s$	b^2D – ^2F	$\frac{5}{2}$ – $\frac{7}{2}$	F,P	375,903
	10	1263.863	145.7022 – 224.8249	$3d^6(a^3G)4s$ – $3d^6(a^3D)4p$	^4G – $^4F^{\circ}$	$\frac{9}{2}$ – $\frac{7}{2}$		903
	10	1269.056	145.9625 – 224.7615	$3d^6(a^3H)4s$ – $3d^6(a^1G)4p$	^2H – $^2G^{\circ}$	$\frac{11}{2}$ – $\frac{9}{2}$		903
	60	1282.750						903
	20	1287.406						903
	0	1288.316						903
		1295.3	67.9898 – 145.1921	$3d^7$ – $3d^6(a^3P)4s$	b^2D – ^2P	$\frac{5}{2}$ – $\frac{3}{2}$	F,P	375,903
	10	1295.736	144.8151 – 221.9910	$3d^6(a^3G)4s$ – $3d^6(a^3G)4p$	^4G – $^2G^{\circ}$	$\frac{11}{2}$ – $\frac{9}{2}$		903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	0	1297.481	140.3430 – 217.4143	$3d^6(a^3P)4s - 3d^6(a^3F)4p$	$^4P - ^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	140	1306.225	111.7633 – 188.3201	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	20	1309.332	111.1958 – 187.5703	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	30	1311.573	156.2940 – 232.5395	$3d^6(a^1G)4s - 3d^6(a^1D)4p$	$^2G - ^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	260	1312.028	139.2894 – 215.5066	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^4H - ^4H^\circ$	$\frac{13}{2} - \frac{13}{2}$		903
	20	1313.750	139.6192 – 215.7361	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^4H - ^4H^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	240	1314.660	139.6192 – 215.6845	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^4H - ^4H^\circ$	$\frac{11}{2} - \frac{11}{2}$		903
	20	1314.757	110.4106 – 186.4701	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	20	1315.286	145.9625 – 221.9910	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^2H - ^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	0	1317.738	139.6192 – 215.5066	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^4H - ^4H^\circ$	$\frac{11}{2} - \frac{13}{2}$		903
	100	1318.379	139.8867 – 215.7361	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^4H - ^4H^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	40	1318.652	146.1943 – 222.0293	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^2H - ^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	120	1323.031	140.1409 – 215.7245	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^4H - ^4H^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	200	1324.867	110.4106 – 185.8900	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	40	1327.665	111.1958 – 186.5161	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	20	1328.480	111.1958 – 186.4701	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	10	1329.885	111.7633 – 186.9572	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		299
	210	1332.843	139.2894 – 214.3168	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^4H - ^4G^\circ$	$\frac{13}{2} - \frac{11}{2}$		903
	0	1335.030						903
	220	1335.623	179.7920 – 254.6634	$3d^6(b^3F)4s - 3d^6(b^3P)4p$	$^4F - ^4D^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	170	1336.164						903
	30	1336.805	112.1519 – 186.9572	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		903
	100	1337.751	111.7633 – 186.5161	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	40	1337.973	156.3512 – 231.0918	$3d^6(a^1G)4s - 3d^6(a^1D)4p$	$^2G - ^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	70	1338.796	111.1958 – 185.8900	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^4D^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	430	1339.070	111.7633 – 186.4414	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6P^\circ$	$\frac{5}{2} - \frac{3}{2}$		903
	350	1339.674	179.6550 – 254.3000	$3d^6(b^3F)4s - 3d^6(b^3F)4p$	$^4F - ^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	10	1342.060						903
	140	1344.099	179.7240 – 254.1237	$3d^6(b^3F)4s - 3d^6(b^3F)4p$	$^4F - ^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	0	1344.702						903
	580	1345.718	111.1958 – 185.5053	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6P^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	470	1346.083	112.1519 – 186.4414	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6P^\circ$	$\frac{3}{2} - \frac{3}{2}$		903
	0	1347.447	139.8867 – 214.1010	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^4H - ^4F^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	20	1349.151	139.6192 – 213.7397	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^4H - ^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	510	1350.218	112.3793 – 186.4414	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6P^\circ$	$\frac{1}{2} - \frac{3}{2}$		903
	90	1350.515	144.8151 – 218.8606	$3d^6(a^1G)4s - 3d^6(a^3H)4p$	$^4G - ^2H^\circ$	$\frac{11}{2} - \frac{11}{2}$		903
	170	1351.419	179.5830 – 253.5793	$3d^6(b^3F)4s - 3d^6(b^3F)4p$	$^4F - ^4F^\circ$	$\frac{3}{2} - \frac{3}{2}$		903
	20	1351.574	139.6192 – 213.6069	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^4H - ^2H^\circ$	$\frac{11}{2} - \frac{11}{2}$		903
	50	1351.733	141.5612 – 215.5413	$3d^6(a^3P)4s - 3d^6(a^3G)4p$	$^4P - ^4F^\circ$	$\frac{1}{2} - \frac{3}{2}$		903
	40	1354.149	179.7920 – 253.6391	$3d^6(b^3F)4s - 3d^6(b^3F)4p$	$^4F - ^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	0	1354.975	145.9625 – 219.7650	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^2H - ^2H^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	570	1356.087	111.7633 – 185.5053	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6P^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	20	1356.550	141.5772 – 215.2929	$3d^6(a^3F)4s - 3d^6(a^3G)4p$	$^4F - ^4G^\circ$	$\frac{7}{2} - \frac{7}{2}$	Q	903
	0	1356.813	146.1943 – 219.8960	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^2H - ^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	690	1357.068	110.4106 – 184.0991	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6P^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	60	1357.679						903
	390	1359.242	146.1943 – 219.7650	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^2H - ^2H^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	40	1359.442	152.3437 – 225.9037	$3d^6(a^3G)4s - 3d^6(a^1I)4p$	$^2G - ^2H^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	60	1359.911	179.7920 – 253.3262	$3d^6(b^3F)4s - 3d^6(b^3P)4p$	$^4F - ^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	0	1362.426	159.4985 – 232.8970	$3d^6(a^3D)4s - 3d^6(a^1D)4p$	$^2D - ^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		903
	10	1363.012	141.2203 – 214.5874	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - ^2H^\circ$	$\frac{9}{2} - \frac{9}{2}$	Q	903
	60	1363.135						903
	450	1363.267	112.1519 – 185.5053	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6P^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	40	1363.475						903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	200	1364.795	140.1409 – 213.4121	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^4H - ^4G^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	70	1365.162	179.7240 – 252.9754	$3d^6(b^3F)4s - 3d^6(b^3P)4p$	$^4F - ^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		903
	30	1365.283	139.8867 – 213.1311	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^4H - ^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	0	1366.895	145.7022 – 218.8606	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - ^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	40	1368.208	152.3437 – 225.4316	$3d^6(a^3G)4s - 3d^6(a^1G)4p$	$^2G - ^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	10	1368.987	141.5772 – 214.6228	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - ^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$	Q	903
	0	1369.212						903
	0	1369.690	141.5772 – 214.5874	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - ^2H^\circ$	$\frac{7}{2} - \frac{9}{2}$	Q	903
	10	1370.062	140.1409 – 213.1311	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^4H - ^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$	Q	903
	240	1371.411	139.2894 – 212.2070	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^4H - ^4G^\circ$	$\frac{13}{2} - \frac{11}{2}$		903
	600	1371.697	111.1958 – 184.0991	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6P^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	540	1371.780	145.9625 – 218.8606	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^2H - ^2H^\circ$	$\frac{11}{2} - \frac{11}{2}$		903
	10	1372.006	141.8320 – 214.7181	$3d^6(a^3F)4s - 3d^6(a^3G)4p$	$^4F - ^4G^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	20	1373.774	152.3437 – 225.1369	$3d^6(a^3G)4s - 3d^6(a^3D)4p$	$^2G - ^4D^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	20	1377.644	139.6192 – 212.2070	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^4H - ^4G^\circ$	$\frac{11}{2} - \frac{11}{2}$		903
	160	1378.708	139.6192 – 212.1509	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^4H - ^4G^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	0	1379.337	138.4462 – 210.9436	$3d^6(a^3P)4s - 3d^6(a^3F)4p$	$^4P - ^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	10	1381.051						903
	150	1381.307	139.8867 – 212.2818	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^4H - ^4G^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	20	1381.905						903
	30	1382.290						903
	400	1382.459	111.7633 – 184.0991	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6P^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	10	1382.745	139.8867 – 212.2070	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^4H - ^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	20	1383.727	141.8320 – 214.1010	$3d^6(a^3F)4s - 3d^6(a^3G)4p$	$^4F - ^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	50	1383.805	139.8867 – 212.1509	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^4H - ^4G^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	20	1383.899	147.6359 – 219.8960	$3d^6(a^3F)4s - 3d^6(a^3G)4p$	$^2F - ^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	50	1384.574	156.2940 – 228.5185	$3d^6(a^1G)4s - 3d^6(a^3D)4p$	$^2G - ^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	20	1385.274	141.2203 – 213.4086	$3d^6(a^3F)4s - 3d^6(a^3G)4p$	$^4F - ^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	20	1385.763	141.5772 – 213.7397	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - ^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	470	1386.230						903
	290	1386.711	171.4060 – 243.5201	$3d^6(a^1F)4s - 3d^6(a^1F)4p$	$^2F - ^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	70	1386.991						903
	20	1388.702	140.1409 – 212.1509	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^4H - ^4G^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	20	1390.614	141.2203 – 213.1311	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - ^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	60	1394.103	152.3437 – 224.0753	$3d^6(a^3G)4s - 3d^6(a^1G)4p$	$^2G - ^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	30	1394.739	139.2894 – 210.9875	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - ^2I^\circ$	$\frac{13}{2} - \frac{11}{2}$		903
	10	1395.031	153.3138 – 224.9965	$3d^6(a^3D)4s - 3d^6(a^3D)4p$	$^4D - ^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		903
	30	1395.190	138.4462 – 210.1218	$3d^6(a^3P)4s - 3d^6(a^3F)4p$	$^4P - ^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	20	1395.734	153.3494 – 224.9965	$3d^6(a^3D)4s - 3d^6(a^3D)4p$	$^4D - ^2P^\circ$	$\frac{1}{2} - \frac{1}{2}$		903
	450	1395.993	110.4106 – 182.0449	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6F^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	400	1396.560	153.5336 – 225.1369	$3d^6(a^3D)4s - 3d^6(a^3D)4p$	$^4D - ^4D^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	620	1397.364	153.5336 – 225.0964	$3d^6(a^3D)4s - 3d^6(a^3D)4p$	$^4D - ^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	760	1398.193	110.4106 – 181.9315	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6F^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	450	1398.838						903
	30	1399.604	155.2537 – 226.7025	$3d^6(a^1I)4s - 3d^6(a^1I)4p$	$^2I - ^2I^\circ$	$\frac{13}{2} - \frac{11}{2}$		903
	660	1399.947	155.2537 – 226.6850	$3d^6(a^1I)4s - 3d^6(a^1I)4p$	$^2I - ^2I^\circ$	$\frac{13}{2} - \frac{13}{2}$		903
	100	1400.211	151.5747 – 222.9933	$3d^6(a^3G)4s - 3d^6(a^1I)4p$	$^2G - ^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	270	1400.376	185.9970 – 257.4064	$3d^6(b^3F)4s - 3d^6(b^1F)4p$	$^2F - ^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	310	1400.570						903
	630	1400.678	155.3087 – 226.7025	$3d^6(a^1I)4s - 3d^6(a^1I)4p$	$^2I - ^2I^\circ$	$\frac{11}{2} - \frac{11}{2}$		903
	290	1400.782	142.0235 – 213.4121	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - ^4G^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	20	1401.027	155.3087 – 226.6850	$3d^6(a^1I)4s - 3d^6(a^1I)4p$	$^2I - ^2I^\circ$	$\frac{11}{2} - \frac{13}{2}$		903
	360	1401.895	153.3138 – 224.6457	$3d^6(a^3D)4s - 3d^6(a^3D)4p$	$^4D - ^4D^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	30	1402.133						903

NI IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	120	1402.391	153.3388 – 224.6457	3d^6(a^{3}D)4s – 3d^6(a^{3}D)4p	^{4}D – ^{4}D°	5/2 – 5/2		903
	150	1402.542	141.8320 – 213.1311	3d^6(a^{3}F)4s – 3d^6(a^{3}F)4p	^{4}F – ^{2}F°	5/2 – 7/2		903
	30	1403.944	153.5336 – 224.7615	3d^6(a^{3}D)4s – 3d^6(a^{1}G)4p	^{4}D – ^{2}G°	7/2 – 9/2		903
	30	1404.084						903
	20	1404.609	148.3582 – 219.5534	3d^6(a^{3}F)4s – 3d^6(a^{3}G)4p	^{2}F – ^{2}F°	5/2 – 5/2		903
	30	1405.940						903
	40	1406.058						903
	90	1406.458	139.8867 – 210.9875	3d^6(a^{3}H)4s – 3d^6(a^{3}H)4p	^{4}H – ^{2}I°	9/2 – 11/2		903
	180	1407.440	185.9670 – 257.0180	3d^6(b^{3}F)4s – 3d^6(b^{3}F)4p	^{2}F – ^{2}F°	7/2 – 7/2		903
	20	1408.231	111.1958 – 182.2068	3d^6(a^{5}D)4s – 3d^6(a^{5}D)4p	^{6}D – ^{6}F°	7/2 – 5/2		903
	630	1408.711	141.2203 – 212.2070	3d^6(a^{3}F)4s – 3d^6(a^{3}F)4p	^{4}F – ^{4}G°	9/2 – 11/2		903
	640	1409.847	111.1958 – 182.1256	3d^6(a^{5}D)4s – 3d^6(a^{5}D)4p	^{6}D – ^{6}F°	7/2 – 7/2		903
	30	1410.953						903
	20	1411.229	153.3138 – 224.1740	3d^6(a^{3}D)4s – 3d^6(a^{3}D)4p	^{4}D – ^{4}D°	3/2 – 3/2		903
	740	1411.453	111.1958 – 182.0449	3d^6(a^{5}D)4s – 3d^6(a^{5}D)4p	^{6}D – ^{6}F°	7/2 – 9/2		903
	110	1411.941	153.3494 – 224.1740	3d^6(a^{3}D)4s – 3d^6(a^{3}D)4p	^{4}D – ^{4}D°	1/2 – 3/2		903
	0	1413.124						903
	20	1413.673	153.3388 – 224.0753	3d^6(a^{3}D)4s – 3d^6(a^{1}G)4p	^{4}D – ^{2}F°	5/2 – 7/2		903
	90	1414.279	153.3138 – 224.0213	3d^6(a^{3}D)4s – 3d^6(a^{3}D)4p	^{4}D – ^{4}F°	3/2 – 5/2		903
	650	1414.603	144.8151 – 215.5066	3d^6(a^{3}G)4s – 3d^6(a^{3}G)4p	^{4}G – ^{4}H°	11/2 – 13/2		903
	390	1414.773	153.3388 – 224.0213	3d^6(a^{3}D)4s – 3d^6(a^{3}D)4p	^{4}D – ^{4}F°	5/2 – 5/2		903
	190	1414.899						903
	390	1416.403	140.3430 – 210.9436	3d^6(a^{3}P)4s – 3d^6(a^{3}F)4p	^{4}P – ^{4}D°	3/2 – 5/2		903
	430	1416.535	155.3087 – 225.9037	3d^6(a^{1}I)4s – 3d^6(a^{1}I)4p	^{2}I – ^{2}H°	11/2 – 9/2		903
	590	1416.960	141.5772 – 212.1509	3d^6(a^{3}F)4s – 3d^6(a^{3}F)4p	^{4}F – ^{4}G°	7/2 – 9/2		903
	380	1417.282	139.6192 – 210.1770	3d^6(a^{3}H)4s – 3d^6(a^{3}H)4p	^{4}H – ^{2}I°	11/2 – 13/2		903
	410	1417.587	153.5336 – 224.0753	3d^6(a^{3}D)4s – 3d^6(a^{1}G)4p	^{4}D – ^{2}F°	7/2 – 7/2		903
	290	1418.076						903
	230	1418.337	155.2537 – 225.7585	3d^6(a^{1}I)4s – 3d^6(a^{1}G)4p	^{2}I – ^{2}H°	13/2 – 11/2		903
	130	1418.508	111.7633 – 182.2599	3d^6(a^{5}D)4s – 3d^6(a^{5}D)4p	^{6}D – ^{6}F°	5/2 – 3/2		903
	60	1418.786						903
	610	1419.124	138.4462 – 208.9121	3d^6(a^{3}P)4s – 3d^6(a^{3}P)4p	^{4}P – ^{4}D°	5/2 – 7/2		903
	590	1419.456	141.8320 – 212.2818	3d^6(a^{3}F)4s – 3d^6(a^{3}F)4p	^{4}F – ^{4}G°	5/2 – 7/2		903
	690	1419.577	111.7633 – 182.2068	3d^6(a^{5}D)4s – 3d^6(a^{5}D)4p	^{6}D – ^{6}F°	5/2 – 5/2		903
	130	1419.725	153.3494 – 223.7854	3d^6(a^{3}D)4s – 3d^6(a^{3}D)4p	^{4}D – ^{4}D°	1/2 – 1/2		903
	540	1420.136	151.5747 – 221.9910	3d^6(a^{3}G)4s – 3d^6(a^{3}G)4p	^{2}G – ^{2}G°	9/2 – 9/2		903
	80	1420.281	156.2940 – 226.7025	3d^6(a^{1}G)4s – 3d^6(a^{1}I)4p	^{2}G – ^{2}I°	9/2 – 11/2		903
	740	1421.218	111.7633 – 182.1256	3d^6(a^{5}D)4s – 3d^6(a^{5}D)4p	^{6}D – ^{6}F°	5/2 – 7/2		903
	0	1421.806						903
	160	1422.607	190.9328 – 261.2263	3d^6(b^{1}G)4s – 3d^6(b^{1}G)4p	^{2}G – ^{2}F°	7/2 – 5/2		903
	220	1423.437	142.0235 – 212.2759	3d^6(a^{3}F)4s – 3d^6(a^{3}F)4p	^{4}F – ^{2}F°	3/2 – 5/2		903
	190	1423.524	140.3430 – 210.5906	3d^6(a^{3}P)4s – 3d^6(a^{3}P)4p	^{4}P – ^{4}D°	3/2 – 5/2		903
	230	1425.791	112.1519 – 182.2884	3d^6(a^{5}D)4s – 3d^6(a^{5}D)4p	^{6}D – ^{6}F°	3/2 – 1/2		903
	660	1426.369	112.1519 – 182.2599	3d^6(a^{5}D)4s – 3d^6(a^{5}D)4p	^{6}D – ^{6}F°	3/2 – 3/2		903
	80	1426.505						903
	390	1426.794						903
	30	1426.941						903
	700	1427.450	112.1519 – 182.2068	3d^6(a^{5}D)4s – 3d^6(a^{5}D)4p	^{6}D – ^{6}F°	3/2 – 5/2		903
	50	1427.906						903
	670	1428.929	145.7022 – 215.6845	3d^6(a^{3}G)4s – 3d^6(a^{3}G)4p	^{4}G – ^{4}H°	9/2 – 11/2		903
	660	1430.188	120.9095 – 190.8303	3d^6(a^{5}D)4s – 3d^6(a^{5}D)4p	^{4}D – ^{4}P°	7/2 – 5/2		903
	630	1430.431	112.3793 – 182.2884	3d^6(a^{5}D)4s – 3d^6(a^{5}D)4p	^{6}D – ^{6}F°	1/2 – 1/2		903
	520	1430.935	138.4462 – 208.3307	3d^6(a^{3}P)4s – 3d^6(a^{3}F)4p	^{4}P – ^{4}F°	5/2 – 7/2		903
	600	1431.016	112.3793 – 182.2599	3d^6(a^{5}D)4s – 3d^6(a^{5}D)4p	^{6}D – ^{6}F°	1/2 – 3/2		903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	120	1431.818						903
	110	1432.283						903
	520	1432.453	121.8077 - 191.6182	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4P^\circ$	$\frac{5}{2} - \frac{3}{2}$		903
	440	1433.088	147.6359 - 217.4143	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^2F - ^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	180	1433.260	159.4985 - 229.2695	$3d^6(a^3D)4s - 3d^6(a^3D)4p$	$^2D - ^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	80	1433.338	141.2203 - 210.9875	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - ^2I^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	10	1434.665						903
	230	1434.953						903
	480	1435.031	152.3437 - 222.0293	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^2G - ^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	670	1435.235	146.0615 - 215.7361	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^4G - ^4H^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	170	1435.385						903
	240	1435.793	152.3437 - 221.9910	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^2G - ^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	170	1436.984	145.7022 - 215.2929	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^4G - ^4G^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	470	1437.168	148.3582 - 217.9397	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^2F - ^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		903
	610	1437.393	146.1538 - 215.7245	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^4G - ^4H^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	200	1437.552	138.4462 - 208.0091	$3d^6(a^3P)4s - 3d^6(a^3P)4p$	$^4P - ^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	180	1437.761	156.3512 - 225.9037	$3d^6(a^1G)4s - 3d^6(a^1I)4p$	$^2G - ^2H^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	660	1437.943	145.9625 - 215.5066	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^2H - ^4H^\circ$	$\frac{11}{2} - \frac{13}{2}$		903
	20	1438.590	139.6192 - 209.1319	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - ^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	700	1438.816	144.8151 - 214.3168	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^4G - ^4G^\circ$	$\frac{11}{2} - \frac{11}{2}$		903
	560	1439.060	146.1943 - 215.6845	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^2H - ^4H^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	260	1439.497						903
	580	1439.584	156.2940 - 225.7585	$3d^6(a^1G)4s - 3d^6(a^1G)4p$	$^2G - ^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	290	1439.773	146.0615 - 215.5168	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^4G - ^4F^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	230	1440.617	141.8320 - 211.2468	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - ^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		903
	290	1441.269						903
	480	1441.620	141.5772 - 210.9436	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - ^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$	P	903
	640	1442.134	139.2894 - 208.6313	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - ^4H^\circ$	$\frac{13}{2} - \frac{13}{2}$		903
	200	1442.414	142.0235 - 211.3517	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - ^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$	P	903
	270	1442.500	153.3388 - 222.6629	$3d^6(a^3D)4s - 3d^6(a^3D)4p$	$^4D - ^4P^\circ$	$\frac{5}{2} - \frac{3}{2}$	P	903
	370	1442.675	122.7174 - 192.0335	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4P^\circ$	$\frac{1}{2} - \frac{1}{2}$		903
	90	1444.043	140.1409 - 209.3914	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - ^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	220	1444.137	139.8867 - 209.1319	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - ^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	620	1444.425	146.0615 - 215.2929	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^4G - ^4G^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	110	1444.604	142.0235 - 211.2468	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - ^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		903
	660	1444.899	145.7022 - 214.9105	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^4G - ^4G^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	540	1445.078	179.6550 - 248.8554	$3d^6(b^3F)4s - 3d^6(b^3F)4p$	$^4F - ^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	210	1446.376	146.1538 - 215.2929	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^4G - ^4G^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	60	1446.935	141.8320 - 210.9436	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - ^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	20	1447.193	146.1943 - 215.2929	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^2H - ^4G^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	240	1447.576	156.3512 - 225.4316	$3d^6(a^1G)4s - 3d^6(a^1G)4p$	$^2G - ^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	320	1448.805	121.8077 - 190.8303	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4P^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	730	1449.011	139.6192 - 208.6313	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - ^4H^\circ$	$\frac{11}{2} - \frac{13}{2}$		903
	90	1449.193	142.0235 - 211.0276	$3d^6(a^3F)4s - 3d^6(a^3P)4p$	$^4F - ^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		903
	230	1449.464	140.1409 - 209.1319	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - ^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	550	1449.782	139.6192 - 208.5953	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - ^4H^\circ$	$\frac{11}{2} - \frac{11}{2}$		903
	40	1450.366	145.9625 - 214.9105	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^2H - ^4G^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	20	1450.926	145.7022 - 214.6228	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^4G - ^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$	Q	903
	470	1451.347	141.2203 - 210.1218	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - ^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	760	1452.220	139.2894 - 208.1495	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - ^4I^\circ$	$\frac{13}{2} - \frac{15}{2}$		903
	330	1452.549						903
	470	1453.495	153.5336 - 222.3333	$3d^6(a^3D)4s - 3d^6(a^3D)4p$	$^4D - ^4P^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	50	1453.653	144.8151 - 213.6069	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^4G - ^2H^\circ$	$\frac{11}{2} - \frac{11}{2}$		903
	220	1454.376	141.8320 - 210.5906	$3d^6(a^3F)4s - 3d^6(a^3P)4p$	$^4F - ^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	310	1454.501	141.5612 – 210.3133	$3d^6(a^3P)4s - 3d^6(a^3P)4p$	$^4P - {}^4D°$	$\frac{1}{2}-\frac{1}{2}$		903
	700	1455.424	139.8867 – 208.5953	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4H°$	$\frac{9}{2}-\frac{11}{2}$		903
	410	1455.602	159.8184 – 228.5185	$3d^6(a^3D)4s - 3d^6(a^3D)4p$	$^2D - {}^2F°$	$\frac{5}{2}-\frac{7}{2}$		903
	140	1455.897	171.4080 – 240.0942	$3d^6(a^1F)4s - 3d^6(a^1F)4p$	$^2F - {}^2D°$	$\frac{5}{2}-\frac{3}{2}$		903
	20	1456.314	185.9970 – 254.6634	$3d^6(b^3F)4s - 3d^6(b^3P)4p$	$^2F - {}^4D°$	$\frac{5}{2}-\frac{7}{2}$	Q	903
	380	1456.516	146.0615 – 214.7181	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^4G - {}^4G°$	$\frac{7}{2}-\frac{5}{2}$		903
	130	1456.862						903
	10	1457.165						903
	90	1457.422	145.7022 – 214.3168	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^4G - {}^4G°$	$\frac{9}{2}-\frac{11}{2}$		903
	500	1457.862	144.8151 – 213.4086	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^4G - {}^4F°$	$\frac{11}{2}-\frac{9}{2}$		903
	80	1458.483	146.1538 – 214.7181	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^4G - {}^4G°$	$\frac{5}{2}-\frac{5}{2}$		903
	380	1458.904	141.5772 – 210.1218	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - {}^4D°$	$\frac{7}{2}-\frac{7}{2}$		903
	10	1459.211	156.2940 – 224.8249	$3d^6(a^1G)4s - 3d^6(a^3D)4p$	$^2G - {}^4F°$	$\frac{9}{2}-\frac{7}{2}$		903
	400	1460.430	156.3512 – 224.8249	$3d^6(a^1G)4s - 3d^6(a^3D)4p$	$^2G - {}^4F°$	$\frac{7}{2}-\frac{7}{2}$		903
	590	1460.543	156.2940 – 224.7615	$3d^6(a^1G)4s - 3d^6(a^1G)4p$	$^2G - {}^2G°$	$\frac{9}{2}-\frac{9}{2}$		903
	220	1461.068	139.8867 – 208.3307	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^4H - {}^4F°$	$\frac{9}{2}-\frac{7}{2}$		903
	460	1461.478	141.5612 – 209.9851	$3d^6(a^3P)4s - 3d^6(a^3P)4p$	$^4P - {}^2D°$	$\frac{1}{2}-\frac{3}{2}$		903
	130	1461.762	156.3512 – 224.7615	$3d^6(a^1G)4s - 3d^6(a^1G)4p$	$^2G - {}^2G°$	$\frac{7}{2}-\frac{9}{2}$		903
	460	1462.005	145.7022 – 214.1010	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^4G - {}^4F°$	$\frac{9}{2}-\frac{7}{2}$		903
	470	1462.144	146.1943 – 214.5874	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^2H - {}^2H°$	$\frac{9}{2}-\frac{9}{2}$		903
	540	1463.248						903
	380	1463.683	151.5747 – 219.8960	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^2G - {}^2F°$	$\frac{9}{2}-\frac{7}{2}$		903
	50	1464.335	141.8320 – 210.1218	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - {}^4D°$	$\frac{5}{2}-\frac{7}{2}$		903
	80	1466.501	140.1409 – 208.3307	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^4H - {}^4F°$	$\frac{7}{2}-\frac{7}{2}$		903
	20	1466.932	156.2940 – 224.4636	$3d^6(a^1G)4s - 3d^6(a^1G)4p$	$^2G - {}^2G°$	$\frac{9}{2}-\frac{7}{2}$		903
	120	1467.140	139.8867 – 208.0468	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4I°$	$\frac{9}{2}-\frac{9}{2}$		903
	90	1467.881						903
	570	1468.041	140.3430 – 208.4610	$3d^6(a^3P)4s - 3d^6(a^3P)4p$	$^4P - {}^4P°$	$\frac{3}{2}-\frac{3}{2}$		903
	400	1468.159	156.3512 – 224.4636	$3d^6(a^1G)4s - 3d^6(a^1G)4p$	$^2G - {}^2G°$	$\frac{7}{2}-\frac{7}{2}$		903
	130	1468.422	147.6359 – 215.7361	$3d^6(a^3F)4s - 3d^6(a^3G)4p$	$^2F - {}^4H°$	$\frac{7}{2}-\frac{9}{2}$		903
	620	1468.925	138.4462 – 206.5232	$3d^6(a^3P)4s - 3d^6(a^3P)4p$	$^4P - {}^4P°$	$\frac{5}{2}-\frac{5}{2}$		903
	80	1469.737	146.0615 – 214.1010	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^4G - {}^4F°$	$\frac{7}{2}-\frac{7}{2}$		903
	440	1470.422	179.7240 – 247.7317	$3d^6(b^3F)4s - 3d^6(b^3F)4p$	$^4F - {}^4G°$	$\frac{5}{2}-\frac{7}{2}$		903
	30	1471.893	179.7920 – 247.7317	$3d^6(b^3F)4s - 3d^6(b^3F)4p$	$^4F - {}^4G°$	$\frac{7}{2}-\frac{7}{2}$		903
	40	1472.500	141.2203 – 209.1319	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - {}^2G°$	$\frac{9}{2}-\frac{9}{2}$		903
	690	1472.633	140.1409 – 208.0468	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4I°$	$\frac{7}{2}-\frac{9}{2}$		903
	220	1474.626	141.5772 – 209.3914	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - {}^2G°$	$\frac{7}{2}-\frac{7}{2}$		903
	150	1475.338	156.2940 – 224.0753	$3d^6(a^1G)4s - 3d^6(a^1G)4p$	$^2G - {}^2F°$	$\frac{9}{2}-\frac{7}{2}$		903
	660	1476.233	155.2537 – 222.9933	$3d^6(a^1I)4s - 3d^6(a^1I)4p$	$^2I - {}^2H°$	$\frac{13}{2}-\frac{11}{2}$		903
	660	1476.296						903
	490	1476.429	159.8184 – 227.5494	$3d^6(a^3D)4s - 3d^6(a^3D)4p$	$^2D - {}^2D°$	$\frac{5}{2}-\frac{5}{2}$		903
	680	1476.815	141.2203 – 208.9336	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - {}^4F°$	$\frac{9}{2}-\frac{9}{2}$		903
	80	1476.954	145.7022 – 213.4086	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^4G - {}^4F°$	$\frac{9}{2}-\frac{9}{2}$		903
	80	1477.284	141.2203 – 208.9121	$3d^6(a^3F)4s - 3d^6(a^3P)4p$	$^4F - {}^4D°$	$\frac{9}{2}-\frac{7}{2}$		903
	250	1477.485	159.4985 – 227.1811	$3d^6(a^3D)4s - 3d^6(a^3D)4p$	$^2D - {}^2D°$	$\frac{3}{2}-\frac{3}{2}$		903
	160	1477.576	146.0615 – 213.7397	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^4G - {}^2G°$	$\frac{7}{2}-\frac{9}{2}$		903
	500	1477.838	140.3430 – 208.0091	$3d^6(a^3P)4s - 3d^6(a^3P)4p$	$^4P - {}^2D°$	$\frac{3}{2}-\frac{5}{2}$		903
	110	1478.041	147.6359 – 215.2929	$3d^6(a^3F)4s - 3d^6(a^3G)4p$	$^2F - {}^4G°$	$\frac{7}{2}-\frac{7}{2}$		903
	620	1478.323	145.9625 – 213.6069	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^2H - {}^2H°$	$\frac{11}{2}-\frac{11}{2}$		903
	20	1478.743						903
	320	1479.209	171.4060 – 239.0087	$3d^6(a^1F)4s - 3d^6(a^1F)4p$	$^2F - {}^2D°$	$\frac{7}{2}-\frac{5}{2}$		903
	570	1480.345	171.4060 – 238.9578	$3d^6(a^1F)4s - 3d^6(a^1F)4p$	$^2F - {}^2G°$	$\frac{7}{2}-\frac{9}{2}$		903
	260	1480.490	146.1943 – 213.7397	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^2H - {}^2G°$	$\frac{9}{2}-\frac{9}{2}$		903
	440	1481.411	140.3430 – 207.8462	$3d^6(a^3P)4s - 3d^6(a^3P)4p$	$^4P - {}^4P°$	$\frac{3}{2}-\frac{1}{2}$		903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	730	1482.246	139.2894 – 206.7545	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4I^\circ$	$\frac{13}{2} - \frac{13}{2}$		903
	30	1482.556	139.2894 – 206.7407	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4I^\circ$	$\frac{13}{2} - \frac{11}{2}$		903
	450	1482.670	145.9625 – 213.4086	$3d^6(a^3H)4s - 3d^6(a^3G)4p$	$^2H - {}^4F^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	510	1483.211	152.3437 – 219.7650	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^2G - {}^2H^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	30	1483.432	120.9095 – 188.3201	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - {}^4F^\circ$	$\frac{7}{2} - \frac{5}{2}$		299
	180	1483.754	155.3087 – 222.7055	$3d^6(a^1I)4s - 3d^6(a^1G)4p$	$^2I - {}^2H^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	110	1483.849	144.8151 – 212.2070	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^4G - {}^4G^\circ$	$\frac{11}{2} - \frac{11}{2}$		903
	230	1484.232	141.2203 – 208.5953	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - {}^4H^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	330	1484.442	148.3582 – 215.7245	$3d^6(a^3F)4s - 3d^6(a^3G)4p$	$^2F - {}^4H^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	200	1484.640	141.5772 – 208.9336	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	60	1485.121	141.5772 – 208.9121	$3d^6(a^3F)4s - 3d^6(a^3P)4p$	$^4F - {}^4D^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	530	1486.204	151.5747 – 218.8606	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^2G - {}^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	40	1486.461	147.6359 – 214.9105	$3d^6(a^3F)4s - 3d^6(a^3G)4p$	$^2F - {}^4G^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	20	1486.805	146.1538 – 213.4121	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^4G - {}^4G^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	410	1487.011	139.8867 – 207.1360	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4H^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	420	1487.064	139.6192 – 206.8655	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4H^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	300	1487.865	152.3437 – 219.5534	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^2G - {}^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	20	1489.006	148.3582 – 215.5168	$3d^6(a^3F)4s - 3d^6(a^3G)4p$	$^2F - {}^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	670	1489.534	139.6192 – 206.7545	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4I^\circ$	$\frac{11}{2} - \frac{13}{2}$		903
	720	1489.833	139.6192 – 206.7407	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4I^\circ$	$\frac{11}{2} - \frac{11}{2}$		903
	390	1490.080	141.2203 – 208.3307	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - {}^4F^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	20	1490.748	141.8320 – 208.9121	$3d^6(a^3F)4s - 3d^6(a^3P)4p$	$^4F - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	20	1490.982	146.0615 – 213.1311	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^4G - {}^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	430	1491.907	141.5772 – 208.6057	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	0	1492.168	121.8077 – 188.8242	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - {}^4F^\circ$	$\frac{5}{2} - \frac{3}{2}$		903
	610	1492.649	140.1409 – 207.1360	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4H^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	690	1493.007	139.8867 – 206.8655	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4H^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	740	1493.672	155.2537 – 222.2028	$3d^6(a^1I)4s - 3d^6(a^1I)4p$	$^2I - {}^2K^\circ$	$\frac{13}{2} - \frac{15}{2}$		903
	290	1493.993	141.8320 – 208.7669	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - {}^4F^\circ$	$\frac{5}{2} - \frac{3}{2}$		903
	640	1495.795	139.8867 – 206.7407	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4I^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	60	1496.412	141.2203 – 208.0468	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - {}^4I^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	0	1496.623	179.5830 – 246.4 + P	$3d^6(b^3F)4s - 3d^6(b^3P)4p$	$^4F - {}^2S^\circ$	$\frac{3}{2} - \frac{1}{2}$	Q	903
	380	1497.596	141.8320 – 208.6057	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - {}^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	530	1497.930	139.8867 – 206.6457	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4G^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	150	1498.051	141.5772 – 208.3307	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	490	1498.278	142.0235 – 208.7669	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - {}^4F^\circ$	$\frac{3}{2} - \frac{3}{2}$		903
	680	1498.707	140.1409 – 206.8655	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4H^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	710	1498.774	139.6192 – 206.3409	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4G^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	720	1498.898	139.2894 – 206.0053	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4G^\circ$	$\frac{13}{2} - \frac{11}{2}$		903
	510	1499.136	140.1409 – 206.8470	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4G^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	380	1499.248	156.2940 – 222.9933	$3d^6(a^1G)4s - 3d^6(a^1I)4p$	$^2G - {}^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	0	1499.754						903
	670	1499.972	138.4462 – 205.1141	$3d^6(a^3P)4s - 3d^6(a^3P)4p$	$^4P - {}^4S^\circ$	$\frac{5}{2} - \frac{3}{2}$		903
	350	1500.130	120.9095 – 187.5703	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - {}^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	110	1500.292						903
	30	1501.204						903
	100	1501.898	142.0235 – 208.6057	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - {}^4F^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	20	1502.867						903
	290	1503.172	185.9970 – 252.5230	$3d^6(b^3F)4s - 3d^6(b^3F)4p$	$^2F - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	430	1503.479	121.8077 – 188.3201	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - {}^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		903
	110	1503.653	140.1409 – 206.6457	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - {}^4G^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	20	1503.787	141.8320 – 208.3307	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^4F - {}^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	10	1504.470	141.5772 – 208.0468	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - {}^4I^\circ$	$\frac{7}{2} - \frac{9}{2}$	Q	903
	10	1504.544	147.6359 – 214.1010	$3d^6(a^3F)4s - 3d^6(a^3G)4p$	$^2F - {}^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	170	1504.800	139.8867 – 206.3409	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - ^4G^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	20	1504.900	145.7022 – 212.1509	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^4G - ^4G^\circ$	$\frac{9}{2}-\frac{9}{2}$	Q	903
	360	1505.170	122.3861 – 188.8242	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4F^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	180	1505.763	156.2940 – 222.7055	$3d^6(a^1G)4s - 3d^6(a^1G)4p$	$^2G - ^2H^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	220	1506.946	148.3582 – 214.7181	$3d^6(a^3F)4s - 3d^6(a^3G)4p$	$^2F - ^4G^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	500	1507.055	156.3512 – 222.7055	$3d^6(a^1G)4s - 3d^6(a^1G)4p$	$^2G - ^2H^\circ$	$\frac{7}{2}-\frac{9}{2}$		903
	0	1507.338						903
	570	1509.108	148.3582 – 214.6228	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^2F - ^2G^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	70	1510.106	146.0615 – 212.2818	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^4G - ^4G^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	10	1510.569	140.1409 – 206.3409	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^4H - ^4G^\circ$	$\frac{7}{2}-\frac{9}{2}$	Q	903
	10	1511.597						903
	190	1512.351	146.1538 – 212.2759	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^4G - ^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		903
	350	1512.704	122.7174 – 188.8242	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4F^\circ$	$\frac{1}{2}-\frac{3}{2}$	P	903
	350	1512.772	147.6359 – 213.7397	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^2F - ^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$	P	903
	10	1513.132	146.1943 – 212.2818	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^2H - ^4G^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	530	1513.494	171.4080 – 237.4803	$3d^6(a^1F)4s - 3d^6(a^1F)4p$	$^2F - ^2G^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	90	1513.904	145.1921 – 211.2468	$3d^6(a^3P)4s - 3d^6(a^3F)4p$	$^2P - ^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$	Q	903
	20	1514.862	146.1943 – 212.2070	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^2H - ^4G^\circ$	$\frac{9}{2}-\frac{11}{2}$		903
	700	1516.666	122.3861 – 188.3201	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4F^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	20	1517.080	141.2203 – 207.1360	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - ^4H^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	20	1518.951	145.1921 – 211.0276	$3d^6(a^3P)4s - 3d^6(a^3P)4p$	$^2P - ^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		903
	400	1519.604	185.9670 – 251.7736	$3d^6(b^3F)4s - 3d^6(b^3F)4p$	$^2F - ^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		903
	730	1520.626	121.8077 – 187.5703	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		903
	220	1520.864	145.1921 – 210.9436	$3d^6(a^3P)4s - 3d^6(a^3F)4p$	$^2P - ^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	0	1521.250	156.2940 – 222.0293	$3d^6(a^1G)4s - 3d^6(a^3G)4p$	$^2G - ^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	20	1521.438	185.9670 – 251.6943	$3d^6(b^3F)4s - 3d^6(b^3F)4p$	$^2F - ^2D^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	10	1522.209						903
	360	1524.239	120.9095 – 186.5161	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4D^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	10	1524.527						903
	10	1525.088						903
	750	1525.306	120.9095 – 186.4701	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4F^\circ$	$\frac{7}{2}-\frac{9}{2}$		903
	100	1526.505	155.2537 – 220.7626	$3d^6(a^1I)4s - 3d^6(a^1I)4p$	$^2I - ^2K^\circ$	$\frac{13}{2}-\frac{13}{2}$		903
	310	1526.764	159.4985 – 224.9965	$3d^6(a^3D)4s - 3d^6(a^3D)4p$	$^2D - ^2P^\circ$	$\frac{3}{2}-\frac{1}{2}$		903
	520	1526.834	147.6359 – 213.1311	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^2F - ^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	60	1527.487						903
	740	1527.685	110.4106 – 175.8691	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6D^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	740	1527.795	155.3087 – 220.7626	$3d^6(a^1I)4s - 3d^6(a^1I)4p$	$^2I - ^2K^\circ$	$\frac{11}{2}-\frac{13}{2}$		903
	160	1527.933						903
	10	1528.138	159.4985 – 224.9369	$3d^6(a^3D)4s - 3d^6(a^3D)4p$	$^2D - ^2P^\circ$	$\frac{3}{2}-\frac{3}{2}$	Q	903
	40	1528.454	141.2203 – 206.6457	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - ^4G^\circ$	$\frac{9}{2}-\frac{7}{2}$		903
	20	1529.092	145.1921 – 210.5906	$3d^6(a^3P)4s - 3d^6(a^3P)4p$	$^2P - ^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		903
	0	1529.691						903
	660	1529.943	144.8151 – 210.1770	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - ^2I^\circ$	$\frac{11}{2}-\frac{13}{2}$		903
	10	1530.250						903
	10	1530.981	159.8184 – 225.1369	$3d^6(a^3D)4s - 3d^6(a^3D)4p$	$^2D - ^4D^\circ$	$\frac{5}{2}-\frac{7}{2}$	Q	903
	520	1531.734	145.7022 – 210.9875	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - ^2I^\circ$	$\frac{9}{2}-\frac{11}{2}$		903
	40	1532.086	141.5772 – 206.8470	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - ^4G^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	760	1534.710	110.4106 – 175.5695	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6D^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	460	1534.926	121.8077 – 186.9572	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		903
	320	1535.612	141.2203 – 206.3409	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - ^4G^\circ$	$\frac{9}{2}-\frac{9}{2}$		903
	300	1535.733						903
	310	1536.847	141.5772 – 206.6457	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - ^4G^\circ$	$\frac{7}{2}-\frac{7}{2}$		903
	730	1537.246	111.1958 – 176.2471	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6D^\circ$	$\frac{7}{2}-\frac{5}{2}$		903
	20	1537.875	145.9625 – 210.9875	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^2H - ^2I^\circ$	$\frac{11}{2}-\frac{11}{2}$		903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	190	1538.123	141.8320 – 206.8470	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - ^4G°$	$\frac{5}{2} - \frac{5}{2}$		903
	690	1538.933	120.9095 – 185.8900	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4D°$	$\frac{7}{2} - \frac{7}{2}$		903
	20	1539.726	141.5772 – 206.5232	$3d^6(a^3F)4s - 3d^6(a^3P)4p$	$^4F - ^4P°$	$\frac{7}{2} - \frac{5}{2}$	Q	903
	0	1541.435	146.1538 – 211.0276	$3d^6(a^3G)4s - 3d^6(a^3P)4p$	$^4G - ^4D°$	$\frac{5}{2} - \frac{3}{2}$		903
	260	1542.263	122.3861 – 187.2257	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4D°$	$\frac{3}{2} - \frac{1}{2}$		903
	410	1542.662	142.0235 – 206.8470	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - ^4G°$	$\frac{3}{2} - \frac{5}{2}$		903
	410	1542.886	141.8320 – 206.6457	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - ^4G°$	$\frac{5}{2} - \frac{7}{2}$		903
	750	1543.412	111.7633 – 176.5544	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6D°$	$\frac{5}{2} - \frac{3}{2}$		903
	560	1543.562	141.2203 – 206.0053	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - ^4G°$	$\frac{9}{2} - \frac{11}{2}$		903
	140	1544.082	141.5772 – 206.3409	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^4F - ^4G°$	$\frac{7}{2} - \frac{9}{2}$		903
	610	1545.402	121.8077 – 186.5161	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4D°$	$\frac{5}{2} - \frac{5}{2}$		903
	740	1546.231	111.1958 – 175.8691	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6D°$	$\frac{7}{2} - \frac{7}{2}$		903
	0	1546.695						903
	20	1546.889	147.6359 – 212.2818	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^2F - ^4G°$	$\frac{7}{2} - \frac{7}{2}$		903
	40	1547.121						903
	680	1548.043	112.1519 – 176.7490	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6D°$	$\frac{3}{2} - \frac{1}{2}$		903
	410	1548.680	122.3861 – 186.9572	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4D°$	$\frac{3}{2} - \frac{3}{2}$		903
	20	1548.990						903
	0	1549.275						903
	100	1550.030	147.6359 – 212.1509	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^2F - ^4G°$	$\frac{7}{2} - \frac{9}{2}$		903
	260	1550.191	122.7174 – 187.2257	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4D°$	$\frac{1}{2} - \frac{1}{2}$		903
	630	1550.779	111.7633 – 176.2471	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6D°$	$\frac{5}{2} - \frac{5}{2}$		903
	10	1551.419	155.3087 – 219.7650	$3d^6(a^1I)4s - 3d^6(a^1G)4p$	$^2I - ^2H°$	$\frac{11}{2} - \frac{9}{2}$		903
	0	1552.002						903
	0	1552.065						903
	70	1552.306	145.7022 – 210.1218	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^4G - ^4D°$	$\frac{9}{2} - \frac{7}{2}$		903
	10	1552.749	112.1519 – 176.5544	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6D°$	$\frac{3}{2} - \frac{3}{2}$		903
	620	1553.427	111.1958 – 175.5695	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6D°$	$\frac{7}{2} - \frac{9}{2}$		903
	520	1553.495						903
	20	1553.958						903
	470	1554.789	144.8151 – 209.1319	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - ^2G°$	$\frac{11}{2} - \frac{9}{2}$		903
	10	1555.534	159.4985 – 223.7854	$3d^6(a^3D)4s - 3d^6(a^3D)4p$	$^2D - ^4D°$	$\frac{3}{2} - \frac{1}{2}$		903
	30	1556.277	159.8184 – 224.0753	$3d^6(a^3D)4s - 3d^6(a^3G)4p$	$^2D - ^2F°$	$\frac{5}{2} - \frac{7}{2}$		903
	180	1556.675	122.7174 – 186.9572	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4D°$	$\frac{1}{2} - \frac{3}{2}$		903
	690	1557.276	145.9625 – 210.1770	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^2H - ^2I°$	$\frac{11}{2} - \frac{13}{2}$		903
	610	1558.244	112.3793 – 176.5544	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6D°$	$\frac{1}{2} - \frac{3}{2}$		903
	260	1559.340	122.3861 – 186.5161	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4D°$	$\frac{3}{2} - \frac{5}{2}$		903
	660	1559.924	111.7633 – 175.8691	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6D°$	$\frac{5}{2} - \frac{7}{2}$		903
	670	1560.177	112.1519 – 176.2471	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^6D - ^6D°$	$\frac{3}{2} - \frac{5}{2}$		903
	120	1560.501	121.8077 – 185.8900	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^4D°$	$\frac{5}{2} - \frac{7}{2}$		903
	30	1561.158	122.3861 – 186.4414	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^6P°$	$\frac{3}{2} - \frac{3}{2}$		903
	20	1564.277	146.1943 – 210.1218	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^2H - ^4D°$	$\frac{9}{2} - \frac{7}{2}$		903
	0	1564.377	148.3582 – 212.2818	$3d^6(a^1F)4s - 3d^6(a^3F)4p$	$^2F - ^4G°$	$\frac{5}{2} - \frac{7}{2}$		903
	70	1564.522	148.3582 – 212.2759	$3d^6(a^1F)4s - 3d^6(a^3F)4p$	$^2F - ^2F°$	$\frac{5}{2} - \frac{5}{2}$		903
	20	1566.234						903
	460	1566.998	144.8151 – 208.6313	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - ^4H°$	$\frac{11}{2} - \frac{13}{2}$		903
	0	1569.179	159.4985 – 223.2254	$3d^6(a^3D)4s - 3d^6(a^3D)4p$	$^2D - ^4P°$	$\frac{3}{2} - \frac{1}{2}$	Q	903
	0	1569.272	122.7174 – 186.4414	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^6P°$	$\frac{1}{2} - \frac{3}{2}$		903
	0	1569.403	151.5747 – 215.2929	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^2G - ^4G°$	$\frac{9}{2} - \frac{7}{2}$	Q	903
	260	1569.913	121.8077 – 185.5053	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^6P°$	$\frac{5}{2} - \frac{5}{2}$		903
	30	1570.108	145.7022 – 209.3914	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - ^2G°$	$\frac{9}{2} - \frac{7}{2}$		903
	10	1571.655						903
	0	1572.132	155.2537 – 218.8606	$3d^6(a^1I)4s - 3d^6(a^3H)4p$	$^2I - ^2H°$	$\frac{13}{2} - \frac{11}{2}$	Q	903
	0	1572.260	156.2940 – 219.8960	$3d^6(a^1G)4s - 3d^6(a^3G)4p$	$^2G - ^2F°$	$\frac{9}{2} - \frac{7}{2}$		903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm $^{-1}$)	Configurations	Terms	J - J	Notes	References
	30	1575.662						903
	0	1576.539	145.7022 – 209.1319	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$	Q	903
	20	1579.040	146.0615 – 209.3914	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - {}^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$	Q	903
	0	1579.220						903
	0	1579.584	147.6359 – 210.9436	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^2F - {}^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$	Q	903
	0	1580.695						903
	50	1581.343	146.1538 – 209.3914	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	270	1581.483	145.7022 – 208.9336	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^4G - {}^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	50	1582.063						903
	440	1582.356	146.1943 – 209.3914	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^2H - {}^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	410	1582.531	120.9095 – 184.0991	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - {}^6P^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	420	1583.030	145.9625 – 209.1319	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^2H - {}^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	20	1584.299	122.3861 – 185.5053	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - {}^6P^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	70	1585.522	146.0615 – 209.1319	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	120	1588.025	145.9625 – 208.9336	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^2H - {}^4F^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	20	1589.017						903
	320	1589.984	145.7022 – 208.5953	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - {}^4H^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	10	1590.126	148.3582 – 211.2468	$3d^6(a^3F)4s - 3d^6(a^3F)4p$	$^2F - {}^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$	Q	903
	0	1590.564						903
	490	1591.933	145.1921 – 208.0091	$3d^6(a^3P)4s - 3d^6(a^3P)4p$	$^2P - {}^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	110	1593.836	151.5747 – 214.3168	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^2G - {}^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	140	1597.898						903
	20	1598.274	152.3437 – 214.9105	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^2G - {}^4G^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	10	1605.345	121.8077 – 184.0991	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - {}^6P^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	280	1605.549	179.6550 – 241.9390	$3d^6(b^3F)4s - 3d^6(b^3F)4p$	$^4F - {}^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	20	1606.415	185.9670 – 248.2180	$3d^6(b^3F)4s - 3d^6(b^3F)4p$	$^2F - {}^4G^\circ$	$\frac{7}{2} - \frac{9}{2}$	Q	903
	300	1606.575	152.3437 – 214.5874	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^2G - {}^2H^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	10	1607.505						903
	0	1607.926	153.3494 – 215.5413	$3d^6(a^3D)4s - 3d^6(a^3G)4p$	$^4D - {}^4F^\circ$	$\frac{1}{2} - \frac{3}{2}$		903
	0	1608.159						903
	10	1608.625	151.5747 – 213.7397	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^2G - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	20	1609.352	146.1943 – 208.3307	$3d^6(a^3H)4s - 3d^6(a^3F)4p$	$^2H - {}^4F^\circ$	$\frac{9}{2} - \frac{7}{2}$	Q	903
	100	1610.711	145.9625 – 208.0468	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^2H - {}^4I^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	20	1611.570	144.8151 – 206.8655	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - {}^4H^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	600	1612.071	151.5747 – 213.6069	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^2G - {}^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	230	1612.230	179.7920 – 241.8179	$3d^6(b^3F)4s - 3d^6(b^3F)4p$	$^4F - {}^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	10	1613.273	146.0615 – 208.0468	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - {}^4I^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	0	1613.476						903
	10	1614.119	153.3388 – 215.2929	$3d^6(a^3D)4s - 3d^6(a^3G)4p$	$^4D - {}^4G^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	10	1616.747	146.1943 – 208.0468	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^2H - {}^4I^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	30	1617.113						903
	20	1617.225	151.5747 – 213.4086	$3d^6(a^3G)4s - 3d^6(a^3G)4p$	$^2G - {}^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$	Q	903
	30	1617.678						903
	20	1617.924						903
	20	1619.297	147.6359 – 209.3914	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^2F - {}^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	10	1622.765						903
	10	1623.801						903
	150	1624.524	151.5747 – 213.1311	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^2G - {}^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	30	1628.757	152.3437 – 213.7397	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^2G - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	120	1630.489	145.1921 – 206.5232	$3d^6(a^3P)4s - 3d^6(a^3P)4p$	$^2P - {}^4P^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	100	1631.376	120.9095 – 182.2068	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - {}^6F^\circ$	$\frac{7}{2} - \frac{5}{2}$		299
	0	1633.555	120.9095 – 182.1256	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - {}^6F^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	50	1634.246	144.8151 – 206.0053	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - {}^4G^\circ$	$\frac{11}{2} - \frac{11}{2}$		903
	130	1635.703	120.9095 – 182.0449	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - {}^6F^\circ$	$\frac{7}{2} - \frac{9}{2}$		903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	20	1637.511	152.3437 – 213.4121	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^2G - ^4G^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	10	1637.717						903
	0	1638.482						903
	20	1639.820	146.1538 – 207.1360	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - ^4H^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	210	1640.913	146.1943 – 207.1360	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^2H - ^4H^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	10	1641.961	145.9625 – 206.8655	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^2H - ^4H^\circ$	$\frac{11}{2} - \frac{9}{2}$		903
	10	1642.953	171.4060 – 232.2727	$3d^6(a^1F)4s - 3d^6(a^1D)4p$	$^2F - ^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	20	1644.629	146.0615 – 206.8655	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - ^4H^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	360	1644.951	145.9625 – 206.7545	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^2H - ^4I^\circ$	$\frac{11}{2} - \frac{13}{2}$		903
	20	1647.251	151.5747 – 212.2818	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^2G - ^4G^\circ$	$\frac{9}{2} - \frac{7}{2}$		903
	10	1649.112	145.7022 – 206.3409	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - ^4G^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	0	1651.012						903
	140	1651.629	146.1943 – 206.7407	$3d^6(a^3H)4s - 3d^6(a^3H)4p$	$^2H - ^4I^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	10	1651.740						903
	30	1652.390						903
	0	1654.843						903
	0	1655.432						903
	0	1655.643	121.8077 – 182.2068	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^6F^\circ$	$\frac{5}{2} - \frac{5}{2}$	Q	903
	60	1656.392						903
	80	1657.874	121.8077 – 182.1256	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^6F^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	0	1658.292	145.7022 – 206.0053	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^4G - ^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		903
	0	1663.866						903
	40	1664.536	159.8184 – 219.8960	$3d^6(a^3D)4s - 3d^6(a^3G)4p$	$^2D - ^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		903
	170	1665.040						903
	10	1668.549	152.3437 – 212.2759	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^2G - ^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		903
	10	1669.669						903
	100	1671.282						903
	20	1671.659	122.3861 – 182.2068	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^6F^\circ$	$\frac{3}{2} - \frac{5}{2}$		903
	0	1672.632						903
	0	1672.946						903
	0	1674.105						903
	0	1674.823						903
	0	1675.379						903
	10	1679.478	122.7174 – 182.2599	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - ^6F^\circ$	$\frac{1}{2} - \frac{3}{2}$		903
	10	1680.678	147.6359 – 207.1360	$3d^6(a^3F)4s - 3d^6(a^3H)4p$	$^2F - ^4H^\circ$	$\frac{7}{2} - \frac{7}{2}$		903
	0	1684.338						903
	10	1693.087	155.2537 – 214.3168	$3d^6(a^1I)4s - 3d^6(a^3G)4p$	$^2I - ^4G^\circ$	$\frac{13}{2} - \frac{11}{2}$		903
	130	1713.687	155.2537 – 213.6069	$3d^6(a^1I)4s - 3d^6(a^3G)4p$	$^2I - ^2H^\circ$	$\frac{13}{2} - \frac{11}{2}$		903
	0	1727.113						903
	0	1737.206						903
	110	1737.420	151.5747 – 209.1319	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^2G - ^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	10	1743.427	151.5747 – 208.9336	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^2G - ^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	0	1745.764						903
	0	1746.603						903
	10	1747.824						903
	40	1751.706						903
	10	1759.389						903
	20	1767.122	152.3437 – 208.9336	$3d^6(a^3G)4s - 3d^6(a^3F)4p$	$^2G - ^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		903
	20	1770.805	151.5747 – 208.0468	$3d^6(a^3G)4s - 3d^6(a^3H)4p$	$^2G - ^4I^\circ$	$\frac{9}{2} - \frac{9}{2}$		903
	0	1783.949						903
	20	1805.012						903
	10	1808.488						903
	10	1818.360						903
	0	1829.304						903

Ni IV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	20	1829.498	120.9095 – 175.5695	$3d^6(a^5D)4s - 3d^6(a^5D)4p$	$^4D - {}^6D°$	$\frac{7}{2} - \frac{9}{2}$		903

NICKEL V (Ni^{4+}), Z = 28
Ground State $1s^22s^22p^63s^23p^63d^6(^5D_4)$ (24 electrons)
Ionization Potential 613 500 cm^{-1}; 76.1 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	410	199.154	0.0 – 502.124	$3d^6 - 3d^5(a^6S)5f$	$ga^5D - {}^5F°$	4 – 5		927
	370	199.504	0.8897 – 502.133	$3d^6 - 3d^5(a^6S)5f$	$ga^5D - {}^5F°$	3 – 4		927
	230	199.742	1.4899 – 502.137	$3d^6 - 3d^5(a^6S)5f$	$ga^5D - {}^5F°$	2 – 3		927
	120	199.890	1.8715 – 502.148	$3d^6 - 3d^5(a^6S)5f$	$ga^5D - {}^5F°$	1 – 2		927
	250	199.966	2.0576 – 502.143	$3d^6 - 3d^5(a^6S)5f$	$ga^5D - {}^5F°$	0 – 1		927
	820	227.565	0.0 – 439.434	$3d^6 - 3d^5(a^6S)4f$	$ga^5D - {}^5F°$	4 – 5		927
	780	228.031	0.8897 – 439.427	$3d^6 - 3d^5(a^6S)4f$	$ga^5D - {}^5F°$	3 – 4		927
	660	228.346	1.4899 – 439.423	$3d^6 - 3d^5(a^6S)4f$	$ga^5D - {}^5F°$	2 – 3		927
	580	228.547	1.8715 – 439.419	$3d^6 - 3d^5(a^6S)4f$	$ga^5D - {}^5F°$	1 – 2		927
	300	228.644	2.0576 – 439.420	$3d^6 - 3d^5(a^6S)4f$	$ga^5D - {}^5F°$	0 – 1		927
	420	236.110	0.0 – 423.533	$3d^6 - 3d^5(a^6S)5p$	$ga^5D - {}^5P°$	4 – 3		927
	290	236.467	0.8897 – 423.782	$3d^6 - 3d^5(a^6S)5p$	$ga^5D - {}^5P°$	3 – 2		927
	200	236.606	0.8897 – 423.533	$3d^6 - 3d^5(a^6S)5p$	$ga^5D - {}^5P°$	3 – 3		927
	230	236.716	1.4899 – 423.935	$3d^6 - 3d^5(a^6S)5p$	$ga^5D - {}^5P°$	2 – 1		927
	120	236.802	1.4899 – 423.782	$3d^6 - 3d^5(a^6S)5p$	$ga^5D - {}^5P°$	2 – 2		927
	100	236.932	1.8715 – 423.935	$3d^6 - 3d^5(a^6S)5p$	$ga^5D - {}^5P°$	1 – 1		927
	290	304.018	27.1112 – 356.0363	$3d^6 - 3d^5(b^2G)4p$	$a^3H - {}^3G°$	6 – 5		922
	210	304.702	27.5782 – 355.7652	$3d^6 - 3d^5(b^2G)4p$	$a^3H - {}^3G°$	5 – 4		922
	20	304.854	41.6269 – 369.6491	$3d^6 - 3d^5(a^2P)4p$	$a^3D - {}^3P°$	2 – 2		922
	130	304.991	27.1112 – 354.9896	$3d^6 - 3d^5(b^2G)4p$	$a^3H - {}^3H°$	6 – 6		922
	100	305.129	41.9202 – 369.6491	$3d^6 - 3d^5(a^2P)4p$	$a^3D - {}^3P°$	3 – 2		922
	80	305.305	27.8588 – 355.3980	$3d^6 - 3d^5(b^2G)4p$	$a^3H - {}^3G°$	4 – 3		922
	30	305.891	29.1237 – 356.0363	$3d^6 - 3d^5(b^2G)4p$	$a^3F - {}^3G°$	4 – 5		922
	20	306.054	41.7011 – 368.4405	$3d^6 - 3d^5(a^2P)4p$	$a^3D - {}^3P°$	1 – 0		922
	70	306.338	27.1112 – 353.5487	$3d^6 - 3d^5(b^2G)4p$	$a^3H - {}^3H°$	6 – 5		922
	20	306.488	29.1237 – 355.3980	$3d^6 - 3d^5(b^2G)4p$	$a^3F - {}^3G°$	4 – 3		922
	20	306.565	29.5708 – 355.7652	$3d^6 - 3d^5(b^2G)4p$	$a^3F - {}^3G°$	3 – 4		922
	120	306.669	27.8588 – 353.9441	$3d^6 - 3d^5(b^2G)4p$	$a^3H - {}^3F°$	4 – 3		922
	160	306.776	27.5782 – 353.5487	$3d^6 - 3d^5(b^2G)4p$	$a^3H - {}^3H°$	5 – 5		922
	180	307.225	29.8992 – 355.3980	$3d^6 - 3d^5(b^2G)4p$	$a^3F - {}^3G°$	2 – 3		922
	130	307.492	27.8588 – 353.0716	$3d^6 - 3d^5(b^2G)4p$	$a^3H - {}^3H°$	4 – 4		922
	20	308.387						922
	80	308.994						922
	30	309.351	69.1561 – 392.4135	$3d^6 - 3d^5(c^2D)4p$	$b^3P - {}^3P°$	2 – 2		927
	20	309.769	0.0 – 322.8208	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5F°$	4 – 4		922
	210	309.811	33.2565 – 356.0363	$3d^6 - 3d^5(b^2G)4p$	$a^3G - {}^3G°$	5 – 5		922
	130	310.071	33.2565 – 355.7652	$3d^6 - 3d^5(b^2G)4p$	$a^3G - {}^3G°$	5 – 4		922
	70	310.538	67.5479 – 389.5718	$3d^6 - 3d^5(c^2D)4p$	$b^3P - {}^3D°$	1 – 2		922
	230	310.791	68.7187 – 390.4782	$3d^6 - 3d^5(c^2D)4p$	$b^3F - {}^3D°$	4 – 3		922
	160	310.846	34.0617 – 355.7652	$3d^6 - 3d^5(b^2G)4p$	$a^3G - {}^3G°$	4 – 4		922
	10	311.024	69.1561 – 390.6751	$3d^6 - 3d^5(c^2D)4p$	$b^3P - {}^1D°$	2 – 2		922
	240	311.201	34.0617 – 355.3980	$3d^6 - 3d^5(b^2G)4p$	$a^3G - {}^3G°$	4 – 3		922

NI V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	170	311.547	34.4164 – 355.3980	$3d^6 - 3d^5(b^2G)4p$	$a^3G - {}^3G^\circ$	3 – 3		922
	260	311.788	34.4164 – 355.1500	$3d^6 - 3d^5(b^2G)4p$	$a^3G - {}^3F^\circ$	3 – 2		922
	250	311.800	68.8547 – 389.5718	$3d^6 - 3d^5(c^2D)4p$	$b^3F - {}^3D^\circ$	3 – 2		922
	100	312.217	33.2565 – 353.5487	$3d^6 - 3d^5(b^2G)4p$	$a^3G - {}^3H^\circ$	5 – 5		922
	220	312.388	68.6321 – 388.7461	$3d^6 - 3d^5(c^2D)4p$	$b^3F - {}^3D^\circ$	2 – 1		927
	240	312.412	33.2565 – 353.3471	$3d^6 - 3d^5(b^2G)4p$	$a^3G - {}^3F^\circ$	5 – 4		922
	160	312.520	68.7187 – 388.6989	$3d^6 - 3d^5(c^2D)4p$	$b^3F - {}^3F^\circ$	4 – 4		927
	120	312.615	34.0617 – 353.9441	$3d^6 - 3d^5(b^2G)4p$	$a^3G - {}^3F^\circ$	4 – 3		922
	130	312.680	33.2565 – 353.0716	$3d^6 - 3d^5(b^2G)4p$	$a^3G - {}^3H^\circ$	5 – 4		922
	90	312.839	0.0 – 319.6527	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^3G^\circ$	4 – 5		922
	170	312.962	34.4164 – 353.9441	$3d^6 - 3d^5(b^2G)4p$	$a^3G - {}^3F^\circ$	3 – 3		922
	100	313.000	34.0617 – 353.5487	$3d^6 - 3d^5(b^2G)4p$	$a^3G - {}^3H^\circ$	4 – 5		922
	80	313.059	67.5479 – 386.9688	$3d^6 - 3d^5(c^2D)4p$	$b^3P - {}^3F^\circ$	1 – 2		922
	120	313.993	68.8547 – 387.3334	$3d^6 - 3d^5(c^2D)4p$	$b^3F - {}^3F^\circ$	3 – 3		927
	110	314.132	68.6321 – 386.9688	$3d^6 - 3d^5(c^2D)4p$	$b^3F - {}^3F^\circ$	2 – 2		927
	130	315.082	0.0 – 317.3768	$3d^6 - 3d^5(a^2H)4p$	$ga^5D - {}^3G^\circ$	4 – 3		922
	550	315.235	41.2522 – 358.4756	$3d^6 - 3d^5(b^2G)4p$	$a^1I - {}^1H^\circ$	6 – 5		922
	240	315.573	57.9241 – 374.8037	$3d^6 - 3d^5(a^2P)4p$	$a^1F - {}^3D^\circ$	3 – 2		927
	560	315.712	0.0 – 316.7440	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5D^\circ$	4 – 4		922
	380	315.829	0.8897 – 317.5175	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5D^\circ$	3 – 2		922
	210	315.905	42.2081 – 358.7600	$3d^6 - 3d^5(b^2G)4p$	$a^1G - {}^1G^\circ$	4 – 4		922
	300	315.969	0.8897 – 317.3768	$3d^6 - 3d^5(a^2H)4p$	$ga^5D - {}^3G^\circ$	3 – 3		922
	420	316.113	0.8897 – 317.2320	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5D^\circ$	3 – 3		922
	210	316.189	42.2081 – 358.4756	$3d^6 - 3d^5(b^2G)4p$	$a^1G - {}^1H^\circ$	4 – 5		922
	310	316.428	1.4899 – 317.5175	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5D^\circ$	2 – 2		922
	330	316.468	1.4899 – 317.4779	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5D^\circ$	2 – 1		922
	60	316.569	1.4899 – 317.3768	$3d^6 - 3d^5(a^2H)4p$	$ga^5D - {}^3G^\circ$	2 – 3		922
	60	316.668	29.1237 – 344.9112	$3d^6 - 3d^5(b^2D)4p$	$a^3F - {}^3F^\circ$	4 – 4		922
	90	316.714	1.4899 – 317.2320	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5D^\circ$	2 – 3		922
	140	316.776	29.1237 – 344.8053	$3d^6 - 3d^5(b^2D)4p$	$a^3F - {}^3D^\circ$	4 – 3		922
	210	316.810	1.8715 – 317.5175	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5D^\circ$	1 – 2		922
	240	316.853	1.8715 – 317.4779	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5D^\circ$	1 – 1		922
	270	316.866	1.8715 – 317.4623	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5D^\circ$	1 – 0		922
	190	317.037	2.0576 – 317.4779	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5D^\circ$	0 – 1		922
	410	317.291	0.0 – 315.1682	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5F^\circ$	4 – 5		922
	290	317.402	77.8995 – 392.9571	$3d^6 - 3d^5(c^2D)4p$	$b^1G - {}^1F^\circ$	4 – 3		922
	160	317.865	0.0 – 314.5992	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5F^\circ$	4 – 4		922
	20	317.901	0.0 – 314.5628	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5F^\circ$	4 – 3		922
	80	318.260	0.0 – 314.2088	$3d^6 - 3d^5(a^2F)4p$	$ga^5D - {}^3F^\circ$	4 – 4		922
	40	318.528	0.8897 – 314.8347	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5F^\circ$	3 – 2		922
	20	318.703	41.6269 – 355.3980	$3d^6 - 3d^5(b^2G)4p$	$a^3D - {}^3G^\circ$	2 – 3		922
	390	318.766	0.8897 – 314.5992	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5F^\circ$	3 – 4		922
	20	318.803	0.8897 – 314.5628	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5F^\circ$	3 – 3		922
	80	318.900	29.8992 – 343.4782	$3d^6 - 3d^5(b^2D)4p$	$a^3F - {}^3D^\circ$	2 – 1		922
	110	319.015	0.0 – 313.4647	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5G^\circ$	4 – 5		922
	90	319.031	41.7011 – 355.1500	$3d^6 - 3d^5(b^2G)4p$	$a^3D - {}^3F^\circ$	1 – 2		922
	200	319.163	0.8897 – 314.2088	$3d^6 - 3d^5(a^2F)4p$	$ga^5D - {}^3F^\circ$	3 – 4		922
	20	319.202	1.8715 – 315.1528	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5F^\circ$	1 – 1		922
	20	319.241	2.0576 – 315.3007	$3d^6 - 3d^5(a^2F)4p$	$ga^5D - {}^3D^\circ$	0 – 1		922
	260	319.392	2.0576 – 315.1528	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5F^\circ$	0 – 1		922
	480	319.414	1.4899 – 314.5628	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5F^\circ$	2 – 3		922
	360	319.526	1.8715 – 314.8347	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5F^\circ$	1 – 2		922
	50	320.111	0.8897 – 313.2813	$3d^6 - 3d^5(a^4F)4p$	$ga^5D - {}^5G^\circ$	3 – 4		927
	220	320.185	41.6269 – 353.9441	$3d^6 - 3d^5(b^2G)4p$	$a^3D - {}^3F^\circ$	2 – 3		922

Ni V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm $^{-1}$)	Configurations	Terms	J - J	Notes	References
	110	320.208	41.2522 – 353.5487	$3d^6 - 3d^5(b^2G)4p$	$a^1I - {}^1H^\circ$	6 – 5		922
	20	320.351						922
	30	320.702	66.7378 – 378.5550	$3d^6 - 3d^5(a^2P)4p$	$b^3P - {}^3S^\circ$	0 – 1		922
	20	320.815	1.8715 – 313.5773	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - {}^5P^\circ$	1 – 0		922
	290	320.868	33.2565 – 344.9112	$3d^6 - 3d^5(b^2D)4p$	$a^3G - {}^3F^\circ$	5 – 4		922
	170	321.102	41.9202 – 353.3471	$3d^6 - 3d^5(b^2G)4p$	$a^3D - {}^3F^\circ$	3 – 4		922
	80	321.385	41.9202 – 353.0716	$3d^6 - 3d^5(b^2G)4p$	$a^3D - {}^3H^\circ$	3 – 4		922
	60	321.535	67.5479 – 378.5550	$3d^6 - 3d^5(a^2P)4p$	$b^3P - {}^3S^\circ$	1 – 1		922
	100	321.809	34.0617 – 344.8053	$3d^6 - 3d^5(b^2D)4p$	$a^3G - {}^3D^\circ$	4 – 3		922
	50	323.113	34.4164 – 343.9057	$3d^6 - 3d^5(b^2D)4p$	$a^3G - {}^3D^\circ$	3 – 2		922
	40	323.168	77.8995 – 387.3334	$3d^6 - 3d^5(c^2D)4p$	$b^1G - {}^1F^\circ$	4 – 3		927
	180	323.208	69.1561 – 378.5550	$3d^6 - 3d^5(a^2P)4p$	$b^3P - {}^3S^\circ$	2 – 1		922
	160	323.394	34.0617 – 343.2810	$3d^6 - 3d^5(b^2D)4p$	$a^3G - {}^3F^\circ$	4 – 3		922
	130	324.172	34.4164 – 342.8946	$3d^6 - 3d^5(b^2D)4p$	$a^3G - {}^3F^\circ$	3 – 2		922
	120	324.460	68.8547 – 377.0591	$3d^6 - 3d^5(a^2P)4p$	$b^3F - {}^1D^\circ$	3 – 2		922
	340	324.936	68.7187 – 376.4716	$3d^6 - 3d^5(a^2P)4p$	$b^3F - {}^3D^\circ$	4 – 3		922
	20	325.082	68.8547 – 376.4716	$3d^6 - 3d^5(a^2P)4p$	$b^3F - {}^3D^\circ$	3 – 3		922
	280	326.588	68.6321 – 374.8281	$3d^6 - 3d^5(a^2P)4p$	$b^3F - {}^3D^\circ$	2 – 1		927
	10	326.614	68.6321 – 374.8037	$3d^6 - 3d^5(a^2P)4p$	$b^3F - {}^3D^\circ$	2 – 2		927
	220	326.852	68.8547 – 374.8037	$3d^6 - 3d^5(a^2P)4p$	$b^3F - {}^3D^\circ$	3 – 2		927
	20	327.510	41.6269 – 346.9595	$3d^6 - 3d^5(b^2D)4p$	$a^3D - {}^3P^\circ$	2 – 1		922
	20	327.876	41.9202 – 346.9124	$3d^6 - 3d^5(b^2D)4p$	$a^3D - {}^3P^\circ$	3 – 2		922
	40	328.613	41.6269 – 345.9361	$3d^6 - 3d^5(b^2D)4p$	$a^3D - {}^1F^\circ$	2 – 3		927
	20	329.251	26.1530 – 329.8729	$3d^6 - 3d^5(b^2F)4p$	$a^3P - {}^3D^\circ$	2 – 3		922
	180	330.043	41.9202 – 344.9112	$3d^6 - 3d^5(b^2D)4p$	$a^3D - {}^3F^\circ$	3 – 4		922
	210	330.158	41.9202 – 344.8053	$3d^6 - 3d^5(b^2D)4p$	$a^3D - {}^3D^\circ$	3 – 3		922
	160	330.820	41.6269 – 343.9057	$3d^6 - 3d^5(b^2D)4p$	$a^3D - {}^3D^\circ$	2 – 2		922
	150	331.017	67.5479 – 369.6491	$3d^6 - 3d^5(a^2P)4p$	$b^3P - {}^3P^\circ$	1 – 2		922
	120	331.113	66.7378 – 368.7497	$3d^6 - 3d^5(a^2P)4p$	$b^3P - {}^3P^\circ$	0 – 1		922
	40	331.141	41.9202 – 343.9057	$3d^6 - 3d^5(b^2D)4p$	$a^3D - {}^3D^\circ$	3 – 2		922
	110	331.370	41.7011 – 343.4782	$3d^6 - 3d^5(b^2D)4p$	$a^3D - {}^3D^\circ$	1 – 1		922
	200	331.507	41.6269 – 343.2810	$3d^6 - 3d^5(b^2D)4p$	$a^3D - {}^3F^\circ$	2 – 3		922
	160	331.571	29.1237 – 330.7181	$3d^6 - 3d^5(b^2F)4p$	$a^3F - {}^3G^\circ$	4 – 5		922
	200	332.012	41.7011 – 342.8946	$3d^6 - 3d^5(b^2D)4p$	$a^3D - {}^3F^\circ$	1 – 2		922
	40	332.140	28.6976 – 329.7763	$3d^6 - 3d^5(b^2F)4p$	$a^3P - {}^3D^\circ$	1 – 2		922
	230	332.293	48.6070 – 349.5460	$3d^6 - 3d^5(b^2D)4p$	$a^1D - {}^1D^\circ$	2 – 2		922
	200	332.316	0.0 – 300.9181	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - {}^5F^\circ$	4 – 4		922
	70	332.345	67.5479 – 368.4405	$3d^6 - 3d^5(a^2P)4p$	$b^3P - {}^3P^\circ$	1 – 0		922
	20	332.410	57.9241 – 358.7600	$3d^6 - 3d^5(b^2G)4p$	$a^1F - {}^1G^\circ$	3 – 4		922
	220	332.471	47.6997 – 348.4779	$3d^6 - 3d^5(b^2D)4p$	$a^1S - {}^1P^\circ$	0 – 1		922
	150	332.504	29.1237 – 329.8729	$3d^6 - 3d^5(b^2F)4p$	$a^3F - {}^3D^\circ$	4 – 3		922
	220	332.528	29.5708 – 330.2976	$3d^6 - 3d^5(b^2F)4p$	$a^3F - {}^3G^\circ$	3 – 4		922
	60	332.689	0.8897 – 301.4702	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - {}^5F^\circ$	3 – 3		922
	290	332.788	69.1561 – 369.6491	$3d^6 - 3d^5(a^2P)4p$	$b^3P - {}^3P^\circ$	2 – 2		922
	330	333.109	0.0 – 300.2010	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - {}^5P^\circ$	4 – 3		922
	110	333.302	0.8897 – 300.9181	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - {}^5F^\circ$	3 – 4		922
	150	333.360	1.4899 – 301.4702	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - {}^5F^\circ$	2 – 3		922
	40	333.475	48.6070 – 348.4779	$3d^6 - 3d^5(b^2D)4p$	$a^1D - {}^1P^\circ$	2 – 1		922
	140	333.651	29.8992 – 329.6143	$3d^6 - 3d^5(b^2F)4p$	$a^3F - {}^3G^\circ$	2 – 3		922
	180	334.116	27.5782 – 326.8763	$3d^6 - 3d^5(b^2F)4p$	$a^3H - {}^3F^\circ$	5 – 4		922
	20	334.429	27.8588 – 326.8763	$3d^6 - 3d^5(b^2F)4p$	$a^3H - {}^3F^\circ$	4 – 4		922
	150	334.479	0.0 – 298.9723	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - {}^5D^\circ$	4 – 3		922
	420	335.382	27.8588 – 326.0299	$3d^6 - 3d^5(b^2F)4p$	$a^3H - {}^3F^\circ$	4 – 3		922
	420	335.395	0.8897 – 299.0456	$3d^6 - 3d^5(a^4D)4p$	$ga^5D - {}^5P^\circ$	3 – 2		922

NI V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	390	335.478	0.8897 – 298.9723	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{3}D°	3 – 3		922
	240	335.529	27.1112 – 325.1484	3d^6 – 3d^5(a^{2}G)4p	a^{3}H – ^{3}H°	6 – 6		922
	240	335.593	27.5782 – 325.5586	3d^6 – 3d^5(b^{2}F)4p	a^{3}H – ^{1}G°	5 – 4		922
	570	335.718	27.1112 – 324.9802	3d^6 – 3d^5(a^{2}G)4p	a^{3}H – ^{3}G°	6 – 5		922
	220	335.851	29.1237 – 326.8763	3d^6 – 3d^5(b^{2}F)4p	a^{3}F – ^{3}F°	4 – 4		922
	90	335.911	26.1530 – 323.8531	3d^6 – 3d^5(a^{4}F)4p	a^{3}P – ^{3}F°	2 – 2		922
	510	335.971	27.5782 – 325.2229	3d^6 – 3d^5(a^{2}G)4p	a^{3}H – ^{3}G°	5 – 4		922
	160	336.072	1.4899 – 299.0456	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}P°	2 – 2		922
	280	336.154	1.4899 – 298.9723	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{3}D°	2 – 3		922
	460	336.301	27.8588 – 325.2119	3d^6 – 3d^5(a^{2}G)4p	a^{3}H – ^{3}G°	4 – 3		922
	90	336.446	29.8992 – 327.1227	3d^6 – 3d^5(b^{2}F)4p	a^{3}F – ^{1}D°	2 – 2		922
	290	336.504	1.8715 – 299.0456	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}P°	1 – 2		922
	360	336.575	1.4899 – 298.6006	3d^6 – 3d^5(a^{4}P)4p	ga^{5}D – ^{3}D°	2 – 1		922
	630	336.792	0.0 – 296.9193	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}D°	4 – 4		922
	570	336.818	0.0 – 296.8970	3d^6 – 3d^5(a^{4}G)4p	ga^{5}D – ^{3}G°	4 – 4		927
	320	336.930	27.1112 – 323.9086	3d^6 – 3d^5(a^{2}G)4p	a^{3}H – ^{3}H°	6 – 5		922
	380	337.184	0.0 – 296.5740	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}D°	4 – 3		922
	230	337.236	0.8897 – 297.4181	3d^6 – 3d^5(a^{4}P)4p	ga^{5}D – ^{3}D°	3 – 3		922
	250	337.276	1.4899 – 297.9828	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}P°	2 – 1		922
	220	337.315	29.5708 – 326.0299	3d^6 – 3d^5(b^{2}F)4p	a^{3}F – ^{3}F°	3 – 3		922
	100	337.340	29.1237 – 325.5586	3d^6 – 3d^5(b^{2}F)4p	a^{3}F – ^{1}G°	4 – 4		922
	230	337.441	27.5782 – 323.9263	3d^6 – 3d^5(a^{2}H)4p	a^{3}H – ^{3}H°	5 – 4		922
	340	337.461	27.5782 – 323.9086	3d^6 – 3d^5(a^{2}G)4p	a^{3}H – ^{3}H°	5 – 5		922
	310	337.623	1.8715 – 298.0600	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}D°	1 – 0		927
	360	337.696	0.8897 – 297.0139	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}D°	3 – 2		922
	240	337.726	29.1237 – 325.2229	3d^6 – 3d^5(a^{2}G)4p	a^{3}F – ^{3}G°	4 – 4		922
	330	337.743	29.8992 – 325.9822	3d^6 – 3d^5(b^{2}F)4p	a^{3}F – ^{3}F°	2 – 2		922
	350	337.761	27.8588 – 323.9263	3d^6 – 3d^5(a^{2}H)4p	a^{3}H – ^{3}H°	4 – 4		922
	370	337.804	0.8897 – 296.9193	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}D°	3 – 4		922
	160	337.830	0.8897 – 296.8970	3d^6 – 3d^5(a^{4}G)4p	ga^{5}D – ^{3}G°	3 – 4		922
	250	337.920	1.4899 – 297.4179	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}D°	2 – 1		922
	20	337.978	34.4164 – 330.2976	3d^6 – 3d^5(b^{2}F)4p	a^{3}G – ^{3}G°	3 – 4		922
	490	338.198	0.8897 – 296.5740	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}D°	3 – 3		922
	230	338.357	1.8715 – 297.4179	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}D°	1 – 1		922
	350	338.382	1.4899 – 297.0139	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}D°	2 – 2		922
	550	338.473	0.0 – 295.4443	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}F°	4 – 5		922
	300	338.569	2.0576 – 297.4179	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}D°	0 – 1		922
	90	338.738	27.1112 – 322.3242	3d^6 – 3d^5(a^{2}H)4p	a^{3}H – ^{1}I°	6 – 6		922
	410	338.819	1.8715 – 297.0139	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}D°	1 – 2		922
	440	338.886	1.4899 – 296.5740	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}D°	2 – 3		922
	220	339.052	0.0 – 294.9396	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}F°	4 – 4		922
	40	339.213	29.1237 – 323.9263	3d^6 – 3d^5(a^{2}H)4p	a^{3}F – ^{3}H°	4 – 4		922
	40	339.277	27.5782 – 322.3242	3d^6 – 3d^5(a^{2}H)4p	a^{3}H – ^{1}I°	5 – 6		922
	60	339.674	29.1237 – 323.5232	3d^6 – 3d^5(a^{4}F)4p	a^{3}F – ^{5}F°	4 – 3		922
	20	339.716	26.1530 – 320.5138	3d^6 – 3d^5(a^{2}G)4p	a^{3}P – ^{3}F°	2 – 3		922
	60	339.810	29.5708 – 323.8531	3d^6 – 3d^5(a^{4}F)4p	a^{3}F – ^{3}F°	3 – 2		922
	490	340.079	0.8897 – 294.9396	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}F°	3 – 4		922
	160	340.189	29.8992 – 323.8531	3d^6 – 3d^5(a^{4}F)4p	a^{3}F – ^{3}F°	2 – 2		922
	290	340.487	29.1237 – 322.8208	3d^6 – 3d^5(a^{4}F)4p	a^{3}F – ^{3}F°	4 – 4		922
	460	340.516	27.1112 – 320.7831	3d^6 – 3d^5(a^{2}H)4p	a^{3}H – ^{3}I°	6 – 7		922
	90	340.577	33.2565 – 326.8763	3d^6 – 3d^5(b^{2}F)4p	a^{3}G – ^{3}F°	5 – 4		922
	360	340.653	0.8897 – 294.4433	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}F°	3 – 3		922
	140	340.742	27.5782 – 321.0564	3d^6 – 3d^5(a^{2}G)4p	a^{3}H – ^{3}F°	5 – 4		922
	30	340.897	29.6400 – 322.9845	3d^6 – 3d^5(a^{4}F)4p	a^{3}P – ^{3}D°	0 – 1		922

NI V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	60	341.039	27.8588 – 321.0819	3d^6 – 3d^5(a^{2}F)4p	a^{3}H – ^{1}F°	4 – 3		922
	90	341.068	0.8897 – 294.0860	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}F°	3 – 2		922
	30	341.242	29.5708 – 322.6176	3d^6 – 3d^5(a^{4}F)4p	a^{3}F – ^{3}D°	3 – 3		922
	430	341.351	1.4899 – 294.4433	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}F°	2 – 3		922
	270	341.589	27.1112 – 319.8604	3d^6 – 3d^5(a^{2}H)4p	a^{3}H – ^{3}I°	6 – 6		922
	180	341.674	34.0617 – 326.7390	3d^6 – 3d^5(a^{2}G)4p	a^{3}G – ^{1}F°	4 – 3		922
	380	341.701	27.8588 – 320.5138	3d^6 – 3d^5(a^{2}G)4p	a^{3}H – ^{3}F°	4 – 3		922
	360	341.768	1.4899 – 294.0860	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}F°	2 – 2		922
	500	341.832	27.1112 – 319.6527	3d^6 – 3d^5(a^{4}F)4p	a^{3}H – ^{3}G°	6 – 5		922
	320	341.858	42.2081 – 334.7276	3d^6 – 3d^5(b^{2}F)4p	a^{1}G – ^{1}F°	4 – 3		922
	440	342.090	27.5782 – 319.8991	3d^6 – 3d^5(a^{4}F)4p	a^{3}H – ^{3}G°	5 – 4		922
	350	342.135	27.5782 – 319.8604	3d^6 – 3d^5(a^{2}H)4p	a^{3}H – ^{3}I°	5 – 6		922
	370	342.215	1.8715 – 294.0860	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}F°	1 – 2		922
	100	342.355	0.8897 – 292.9830	3d^6 – 3d^5(a^{4}P)4p	ga^{5}D – ^{3}P°	3 – 2		922
	220	342.379	27.5782 – 319.6527	3d^6 – 3d^5(a^{4}F)4p	a^{3}H – ^{3}G°	5 – 5		922
	180	342.418	27.8588 – 319.8991	3d^6 – 3d^5(a^{4}F)4p	a^{3}H – ^{3}G°	4 – 4		922
	110	342.472	1.8715 – 293.8670	3d^6 – 3d^5(a^{4}P)4p	ga^{5}D – ^{3}P°	1 – 0		922
	500	342.506	27.1112 – 319.0762	3d^6 – 3d^5(a^{2}H)4p	a^{3}H – ^{3}I°	6 – 5		927
	360	342.545	1.4899 – 293.4200	3d^6 – 3d^5(a^{4}P)4p	ga^{5}D – ^{3}P°	2 – 1		922
	500	342.592	33.2565 – 325.1484	3d^6 – 3d^5(a^{2}G)4p	a^{3}G – ^{3}H°	5 – 6		922
	340	342.728	2.0576 – 293.8338	3d^6 – 3d^5(a^{4}D)4p	ga^{5}D – ^{5}F°	0 – 1		927
	200	342.747	27.8588 – 319.6202	3d^6 – 3d^5(a^{4}F)4p	a^{3}H – ^{3}G°	4 – 3		922
	400	342.790	33.2565 – 324.9802	3d^6 – 3d^5(a^{2}G)4p	a^{3}G – ^{3}G°	5 – 5		922
	420	342.910	57.9241 – 349.5460	3d^6 – 3d^5(b^{2}D)4p	a^{1}F – ^{1}D°	3 – 2		922
	420	342.976	34.4164 – 325.9822	3d^6 – 3d^5(b^{2}F)4p	a^{3}G – ^{3}F°	3 – 2		922
	350	342.996	1.8715 – 293.4200	3d^6 – 3d^5(a^{4}P)4p	ga^{5}D – ^{3}P°	1 – 1		922
	440	343.044	29.5708 – 321.0819	3d^6 – 3d^5(a^{2}F)4p	a^{3}F – ^{1}F°	3 – 3		922
	510	343.057	27.5782 – 319.0762	3d^6 – 3d^5(a^{2}H)4p	a^{3}H – ^{3}I°	5 – 5		922
	90	343.182	29.1237 – 320.5138	3d^6 – 3d^5(a^{2}G)4p	a^{3}F – ^{3}F°	4 – 3		922
	140	343.215	2.0576 – 293.4200	3d^6 – 3d^5(a^{4}P)4p	ga^{5}D – ^{3}P°	0 – 1		922
	180	343.256	0.0 – 291.3285	3d^6 – 3d^5(a^{4}G)4p	ga^{5}D – ^{3}F°	4 – 3		922
	340	343.385	27.8588 – 319.0762	3d^6 – 3d^5(a^{2}H)4p	a^{3}H – ^{3}I°	4 – 5		922
	140	343.427	29.8992 – 321.0819	3d^6 – 3d^5(a^{2}F)4p	a^{3}F – ^{1}F°	2 – 3		922
	460	343.454	34.0617 – 325.2229	3d^6 – 3d^5(a^{2}G)4p	a^{3}G – ^{3}G°	4 – 4		922
	430	343.464	34.0617 – 325.2119	3d^6 – 3d^5(a^{2}G)4p	a^{3}G – ^{3}G°	4 – 3		922
	390	343.503	29.8992 – 321.0183	3d^6 – 3d^5(a^{2}G)4p	a^{3}F – ^{3}F°	2 – 2		922
	380	343.711	29.5708 – 320.5138	3d^6 – 3d^5(a^{2}G)4p	a^{3}F – ^{3}F°	3 – 3		922
	310	343.739	34.0617 – 324.9802	3d^6 – 3d^5(a^{2}G)4p	a^{3}G – ^{3}G°	4 – 5		922
	360	343.869	34.4164 – 325.2229	3d^6 – 3d^5(a^{2}G)4p	a^{3}G – ^{3}G°	3 – 4		922
	450	343.883	34.4164 – 325.2119	3d^6 – 3d^5(a^{2}G)4p	a^{3}G – ^{3}G°	3 – 3		922
	680	343.930	0.0 – 290.7570	3d^6 – 3d^5(a^{4}P)4p	ga^{5}D – ^{5}P°	4 – 3		922
	320	344.038	0.8897 – 291.5546	3d^6 – 3d^5(a^{4}G)4p	ga^{5}D – ^{3}F°	3 – 4		922
	370	344.053	33.2565 – 323.9086	3d^6 – 3d^5(a^{2}G)4p	a^{3}G – ^{3}H°	5 – 5		922
	360	344.200	29.1237 – 319.6527	3d^6 – 3d^5(a^{4}F)4p	a^{3}F – ^{3}G°	4 – 5		922
	590	344.234	0.8897 – 291.3900	3d^6 – 3d^5(a^{4}P)4p	ga^{5}D – ^{5}P°	3 – 2		922
	250	344.438	29.5708 – 319.8991	3d^6 – 3d^5(a^{4}F)4p	a^{3}F – ^{3}G°	3 – 4		922
	60	344.516	0.0 – 290.2620	3d^6 – 3d^5(a^{4}P)4p	ga^{5}D – ^{5}D°	4 – 4		922
	600	344.571	27.1112 – 317.3273	3d^6 – 3d^5(a^{2}H)4p	a^{3}H – ^{3}H°	6 – 6		922
	60	344.676	26.1530 – 316.2803	3d^6 – 3d^5(a^{2}F)4p	a^{3}P – ^{3}F°	2 – 3		922
	530	344.767	1.4899 – 291.5417	3d^6 – 3d^5(a^{4}P)4p	ga^{5}D – ^{5}P°	2 – 1		922
	330	344.810	29.1237 – 319.1387	3d^6 – 3d^5(a^{2}G)4p	a^{3}F – ^{1}G°	4 – 4		922
	130	344.881	29.1237 – 319.0762	3d^6 – 3d^5(a^{2}H)4p	a^{3}F – ^{3}I°	4 – 5		922
	490	344.947	1.4899 – 291.3900	3d^6 – 3d^5(a^{4}P)4p	ga^{5}D – ^{5}P°	2 – 2		922
	500	344.986	0.8897 – 290.7570	3d^6 – 3d^5(a^{4}P)4p	ga^{5}D – ^{5}P°	3 – 3		922

Ni V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	460	345.011	34.0617 – 323.9086	$3d^6 - 3d^5(a^2G)4p$	$a^3G - {}^3H^\circ$	4 – 5		922
	540	345.120	27.5782 – 317.3273	$3d^6 - 3d^5(a^2H)4p$	$a^3H - {}^3H^\circ$	5 – 6		922
	280	345.160	29.8992 – 319.6202	$3d^6 - 3d^5(a^4F)4p$	$a^3F - {}^3G^\circ$	2 – 3		922
	460	345.219	1.8715 – 291.5417	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - {}^5P^\circ$	1 – 1		922
	330	345.287	27.1112 – 316.7266	$3d^6 - 3d^5(a^2H)4p$	$a^3H - {}^3G^\circ$	6 – 5		922
	500	345.345	33.2565 – 322.8208	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^3F^\circ$	5 – 4		922
	550	345.406	34.4164 – 323.9263	$3d^6 - 3d^5(a^2H)4p$	$a^3G - {}^3H^\circ$	3 – 4		922
	360	345.442	2.0576 – 291.5417	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - {}^5P^\circ$	0 – 1		922
	380	345.469	34.0617 – 323.5232	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^3F^\circ$	4 – 3		922
	380	345.500	34.4164 – 323.8531	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^3F^\circ$	3 – 2		922
	590	345.576	0.8897 – 290.2620	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - {}^5D^\circ$	3 – 4		922
	520	345.652	27.5782 – 316.8878	$3d^6 - 3d^5(a^2H)4p$	$a^3H - {}^3G^\circ$	5 – 4		922
	510	345.662	27.5782 – 316.8878	$3d^6 - 3d^5(a^2H)4p$	$a^3H - {}^3G^\circ$	5 – 4		922
	340	345.701	1.4899 – 290.7570	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - {}^5P^\circ$	2 – 3		922
	290	345.821	27.5782 – 316.7440	$3d^6 - 3d^5(a^4F)4p$	$a^3H - {}^5D^\circ$	5 – 4		922
	280	345.843	27.5782 – 316.7266	$3d^6 - 3d^5(a^2H)4p$	$a^3H - {}^3G^\circ$	5 – 5		922
	160	345.892	34.4164 – 323.5232	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^3F^\circ$	3 – 3		922
	200	345.939	33.2565 – 322.3242	$3d^6 - 3d^5(a^2H)4p$	$a^3G - {}^1I^\circ$	5 – 6		922
	90	345.987	27.8588 – 316.8878	$3d^6 - 3d^5(a^2H)4p$	$a^3H - {}^3G^\circ$	4 – 4		922
	80	346.036	57.9241 – 346.9124	$3d^6 - 3d^5(b^2D)4p$	$a^1F - {}^3P^\circ$	3 – 2		922
	320	346.165	27.1112 – 315.9905	$3d^6 - 3d^5(a^2H)4p$	$a^3H - {}^3H^\circ$	6 – 5		922
	160	346.239	28.6976 – 317.5175	$3d^6 - 3d^5(a^4F)4p$	$a^3P - {}^5D^\circ$	1 – 2		922
	300	346.309	34.0617 – 322.8208	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^3F^\circ$	4 – 4		922
	250	346.327	41.6269 – 330.3707	$3d^6 - 3d^5(a^2S)4p$	$a^3D - {}^3P^\circ$	2 – 1		922
	340	346.417	41.7011 – 330.3707	$3d^6 - 3d^5(a^2S)4p$	$a^3D - {}^3P^\circ$	1 – 1		922
	240	346.553	34.0617 – 322.6176	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^3D^\circ$	4 – 3		922
	130	346.577	104.4205 – 392.9571	$3d^6 - 3d^5(c^2D)4p$	$b^1D - {}^1F^\circ$	2 – 3		922
	130	346.632	27.5782 – 316.0688	$3d^6 - 3d^5(a^2F)4p$	$a^3H - {}^3G^\circ$	5 – 4		922
	630	346.730	0.8897 – 289.2980	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - {}^5D^\circ$	3 – 3		922
	110	346.925	41.6269 – 329.8729	$3d^6 - 3d^5(b^2F)4p$	$a^3D - {}^3D^\circ$	2 – 3		922
	270	346.970	27.8588 – 316.0688	$3d^6 - 3d^5(a^2F)4p$	$a^3H - {}^3G^\circ$	4 – 4		922
	600	347.028	0.0 – 288.1616	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - {}^5F^\circ$	4 – 4		922
	400	347.064	27.8588 – 315.9905	$3d^6 - 3d^5(a^2H)4p$	$a^3H - {}^3H^\circ$	4 – 5		922
	260	347.134	41.7011 – 329.7763	$3d^6 - 3d^5(b^2F)4p$	$a^3D - {}^3D^\circ$	1 – 2		922
	410	347.156	27.1112 – 315.1682	$3d^6 - 3d^5(a^4F)4p$	$a^3H - {}^5F^\circ$	6 – 5		922
	190	347.200	34.4164 – 322.4364	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^3D^\circ$	3 – 2		927
	240	347.236	0.8897 – 288.8779	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - {}^5S^\circ$	3 – 2		927
	620	347.275	41.9202 – 329.8729	$3d^6 - 3d^5(b^2F)4p$	$a^3D - {}^3D^\circ$	3 – 3		922
	740	347.335	0.0 – 287.9069	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - {}^5F^\circ$	4 – 5		927
	410	347.397	41.9202 – 329.7763	$3d^6 - 3d^5(b^2F)4p$	$a^3D - {}^3D^\circ$	3 – 2		922
	490	347.422	41.6269 – 329.4623	$3d^6 - 3d^5(b^2F)4p$	$a^3D - {}^3D^\circ$	2 – 1		922
	700	347.456	1.4899 – 289.2980	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - {}^5D^\circ$	2 – 3		922
	630	347.505	26.1530 – 313.9198	$3d^6 - 3d^5(a^2D)4p$	$a^3P - {}^3D^\circ$	2 – 3		922
	610	347.515	1.4899 – 289.2471	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - {}^5F^\circ$	2 – 2		922
	450	347.592	41.9202 – 329.6143	$3d^6 - 3d^5(b^2F)4p$	$a^3D - {}^3G^\circ$	3 – 3		922
	640	347.702	29.1237 – 316.7266	$3d^6 - 3d^5(a^2H)4p$	$a^3F - {}^3G^\circ$	4 – 5		922
	670	347.716	27.1112 – 314.7022	$3d^6 - 3d^5(a^2F)4p$	$a^3H - {}^3G^\circ$	6 – 5		922
	460	347.788	26.1530 – 313.6866	$3d^6 - 3d^5(a^2D)4p$	$a^3P - {}^3D^\circ$	2 – 2		922
	630	347.811	27.8588 – 315.3701	$3d^6 - 3d^5(a^2G)4p$	$a^3H - {}^3H^\circ$	4 – 4		922
	530	347.865	28.6976 – 316.1654	$3d^6 - 3d^5(a^2F)4p$	$a^3P - {}^3F^\circ$	1 – 2		922
	610	347.977	1.8715 – 289.2471	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - {}^5F^\circ$	1 – 2		922
	610	348.047	68.7187 – 356.0363	$3d^6 - 3d^5(b^2G)4p$	$b^3F - {}^3G^\circ$	4 – 5		922
	630	348.080	1.8715 – 289.1630	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - {}^5F^\circ$	1 – 1		922
	710	348.102	0.8897 – 288.1616	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - {}^5F^\circ$	3 – 4		922

Ni V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	220	348.226	29.5708 - 316.7440	$3d^6 - 3d^5(a^4F)4p$	$a^3F - {}^5D^\circ$	3 - 4		922
	230	348.245	29.1237 - 316.2803	$3d^6 - 3d^5(a^2F)4p$	$a^3F - {}^3F^\circ$	4 - 3		922
	620	348.278	0.0 - 287.1280	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - {}^5H^\circ$	4 - 5		922
	530	348.303	2.0576 - 289.1630	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - {}^5F^\circ$	0 - 1		922
	420	348.347	0.8897 - 287.9600	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - {}^5F^\circ$	3 - 3		922
	310	348.375	68.7187 - 355.7652	$3d^6 - 3d^5(b^2G)4p$	$b^3F - {}^3G^\circ$	4 - 4		922
	410	348.409	34.0617 - 321.0819	$3d^6 - 3d^5(a^2F)4p$	$a^3G - {}^1F^\circ$	4 - 3		922
	370	348.422	1.8715 - 288.8779	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - {}^5S^\circ$	1 - 2		927
	450	348.498	29.1237 - 316.0688	$3d^6 - 3d^5(a^2F)4p$	$a^3F - {}^3G^\circ$	4 - 4		922
	330	348.541	68.8547 - 355.7652	$3d^6 - 3d^5(b^2G)4p$	$b^3F - {}^3G^\circ$	3 - 4		922
	400	348.563	0.8897 - 287.7821	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - {}^5D^\circ$	3 - 2		922
	140	348.594	29.1237 - 315.9905	$3d^6 - 3d^5(a^2H)4p$	$a^3F - {}^3H^\circ$	4 - 5		922
	50	348.623	27.8588 - 314.7022	$3d^6 - 3d^5(a^2F)4p$	$a^3H - {}^3G^\circ$	4 - 5		922
	500	348.674	26.1530 - 312.9536	$3d^6 - 3d^5(a^2F)4p$	$a^3P - {}^3D^\circ$	2 - 3		922
	70	348.716	68.6321 - 355.3980	$3d^6 - 3d^5(b^2G)4p$	$b^3F - {}^3G^\circ$	2 - 3		922
	280	348.752	26.1530 - 312.8894	$3d^6 - 3d^5(a^4F)4p$	$a^3P - {}^5G^\circ$	2 - 3		927
	320	348.786	29.5708 - 316.2803	$3d^6 - 3d^5(a^2F)4p$	$a^3F - {}^3F^\circ$	3 - 3		927
	410	348.836	28.6976 - 315.3661	$3d^6 - 3d^5(a^2F)4p$	$a^3P - {}^3D^\circ$	1 - 2		922
	310	348.883	27.5782 - 314.2088	$3d^6 - 3d^5(a^2F)4p$	$a^3H - {}^3F^\circ$	5 - 4		927
	410	348.915	34.4164 - 321.0183	$3d^6 - 3d^5(a^2G)4p$	$a^3G - {}^3F^\circ$	3 - 2		922
	320	348.987	68.8547 - 355.3980	$3d^6 - 3d^5(b^2G)4p$	$b^3F - {}^3G^\circ$	3 - 3		922
	380	349.019	68.6321 - 355.1500	$3d^6 - 3d^5(b^2G)4p$	$b^3F - {}^3F^\circ$	2 - 2		922
	340	349.043	29.5708 - 316.0688	$3d^6 - 3d^5(a^2F)4p$	$a^3F - {}^3G^\circ$	3 - 4		922
	550	349.076	1.4899 - 287.9600	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - {}^5F^\circ$	2 - 3		922
	390	349.096	34.0617 - 320.5138	$3d^6 - 3d^5(a^2G)4p$	$a^3G - {}^3F^\circ$	4 - 3		922
	160	349.184	29.8992 - 316.2803	$3d^6 - 3d^5(a^2F)4p$	$a^3F - {}^3F^\circ$	2 - 3		922
	60	349.220	27.1112 - 313.4647	$3d^6 - 3d^5(a^4F)4p$	$a^3H - {}^5G^\circ$	6 - 5		922
	180	349.293	1.4899 - 287.7821	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - {}^5D^\circ$	2 - 2		922
	360	349.326	1.4899 - 287.7555	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - {}^5D^\circ$	2 - 1		927
	330	349.339	104.4205 - 390.6751	$3d^6 - 3d^5(c^2D)4p$	$b^1D - {}^1D^\circ$	2 - 2		922
	120	349.403	29.1237 - 315.3262	$3d^6 - 3d^5(a^2D)4p$	$a^3F - {}^1F^\circ$	4 - 3		922
	210	349.485	28.6976 - 314.8347	$3d^6 - 3d^5(a^4F)4p$	$a^3P - {}^5F^\circ$	1 - 2		922
	230	349.500	48.6070 - 334.7276	$3d^6 - 3d^5(b^2F)4p$	$a^1D - {}^1F^\circ$	2 - 3		922
	240	349.522	41.2522 - 327.3566	$3d^6 - 3d^5(a^2H)4p$	$a^1I - {}^1H^\circ$	6 - 5		922
	40	349.576	27.8588 - 313.9198	$3d^6 - 3d^5(a^2D)4p$	$a^3H - {}^3D^\circ$	4 - 3		922
	310	349.759	1.8715 - 287.7821	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - {}^5D^\circ$	1 - 2		922
	490	349.794	1.8715 - 287.7555	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - {}^5D^\circ$	1 - 1		927
	490	349.809	48.6070 - 334.4772	$3d^6 - 3d^5(a^2S)4p$	$a^1D - {}^1P^\circ$	2 - 1		922
	570	349.879	26.1530 - 311.9665	$3d^6 - 3d^5(a^2D)4p$	$a^3P - {}^3P^\circ$	2 - 2		927
	270	349.900	29.5708 - 315.3661	$3d^6 - 3d^5(a^2F)4p$	$a^3F - {}^3D^\circ$	3 - 2		922
	190	349.950	29.5708 - 315.3262	$3d^6 - 3d^5(a^2D)4p$	$a^3F - {}^1F^\circ$	3 - 3		922
	240	350.019	2.0576 - 287.7555	$3d^6 - 3d^5(a^4P)4p$	$ga^5D - {}^5D^\circ$	0 - 1		927
	310	350.065	29.6400 - 315.3007	$3d^6 - 3d^5(a^2F)4p$	$a^3P - {}^3D^\circ$	0 - 1		922
	80	350.133	27.8588 - 313.4647	$3d^6 - 3d^5(a^4F)4p$	$a^3H - {}^5G^\circ$	4 - 5		922
	290	350.166	29.1237 - 314.7022	$3d^6 - 3d^5(a^2F)4p$	$a^3F - {}^3G^\circ$	4 - 5		922
	160	350.191	34.0617 - 319.6202	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^3G^\circ$	4 - 3		922
	260	350.249	34.4164 - 319.9265	$3d^6 - 3d^5(a^2F)4p$	$a^3G - {}^1D^\circ$	3 - 2		922
	470	350.302	29.8992 - 315.3661	$3d^6 - 3d^5(a^2F)4p$	$a^3F - {}^3D^\circ$	2 - 2		922
	350	350.352	27.8588 - 313.2813	$3d^6 - 3d^5(a^4F)4p$	$a^3H - {}^5G^\circ$	4 - 4		927
	20	350.439	57.9241 - 343.2810	$3d^6 - 3d^5(b^2D)4p$	$a^1F - {}^3F^\circ$	3 - 3		922
	220	350.493	68.6321 - 353.9441	$3d^6 - 3d^5(b^2G)4p$	$b^3F - {}^3F^\circ$	2 - 3		922
	430	350.557	29.5708 - 314.8347	$3d^6 - 3d^5(a^4F)4p$	$a^3F - {}^5F^\circ$	3 - 2		922
	390	350.566	29.8992 - 315.1528	$3d^6 - 3d^5(a^4F)4p$	$a^3F - {}^5F^\circ$	2 - 1		922
	210	350.600	68.7187 - 353.9441	$3d^6 - 3d^5(b^2G)4p$	$b^3F - {}^3F^\circ$	4 - 3		922

NI V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	150	350.626	34.4164 – 319.6202	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^3G^\circ$	3 – 3		922
	460	350.694	42.2081 – 327.3566	$3d^6 - 3d^5(a^2H)4p$	$a^1G - {}^1H^\circ$	4 – 5		922
	690	350.773	41.2522 – 326.3371	$3d^6 - 3d^5(a^2G)4p$	$a^1I - {}^1H^\circ$	6 – 5		922
	310	350.841	27.8588 – 312.8894	$3d^6 - 3d^5(a^4F)4p$	$a^3H - {}^5G^\circ$	4 – 3		927
	320	350.900	28.6976 – 313.6866	$3d^6 - 3d^5(a^2D)4p$	$a^3P - {}^3D^\circ$	1 – 2		922
	220	350.931	41.9202 – 326.8763	$3d^6 - 3d^5(b^2F)4p$	$a^3D - {}^3F^\circ$	3 – 4		922
	270	351.026	28.6976 – 313.5773	$3d^6 - 3d^5(a^2D)4p$	$a^3P - {}^3P^\circ$	1 – 0		922
	220	351.085	68.7187 – 353.5487	$3d^6 - 3d^5(b^2G)4p$	$b^3F - {}^3H^\circ$	4 – 5		922
	350	351.128	29.1237 – 313.9198	$3d^6 - 3d^5(a^2D)4p$	$a^3F - {}^3D^\circ$	4 – 3		927
	320	351.286	42.2081 – 326.8763	$3d^6 - 3d^5(b^2F)4p$	$a^1G - {}^3F^\circ$	4 – 4		922
	430	351.335	68.7187 – 353.3471	$3d^6 - 3d^5(b^2G)4p$	$b^3F - {}^3F^\circ$	4 – 4		922
	400	351.365	27.8588 – 312.4633	$3d^6 - 3d^5(a^2F)4p$	$a^3H - {}^3G^\circ$	4 – 3		922
	450	351.455	42.2081 – 326.7390	$3d^6 - 3d^5(a^2G)4p$	$a^1G - {}^1F^\circ$	4 – 3		922
	60	351.503	68.8547 – 353.3471	$3d^6 - 3d^5(b^2G)4p$	$b^3F - {}^3F^\circ$	3 – 4		922
	60	351.581	27.5782 – 312.0083	$3d^6 - 3d^5(a^2F)4p$	$a^3H - {}^1G^\circ$	5 – 4		922
	300	351.613	0.0 – 284.4025	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - {}^5G^\circ$	4 – 5		927
	330	351.677	29.5708 – 313.9198	$3d^6 - 3d^5(a^2D)4p$	$a^3F - {}^3D^\circ$	3 – 3		922
	200	351.691	29.1237 – 313.4647	$3d^6 - 3d^5(a^4F)4p$	$a^3F - {}^5G^\circ$	4 – 5		922
	40	351.730	0.0 – 284.3089	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - {}^5G^\circ$	4 – 4		927
	120	351.762	41.7011 – 325.9822	$3d^6 - 3d^5(b^2F)4p$	$a^3D - {}^3F^\circ$	1 – 2		922
	200	351.844	68.8547 – 353.0716	$3d^6 - 3d^5(b^2G)4p$	$b^3F - {}^3H^\circ$	3 – 4		922
	270	351.926	27.8588 – 312.0083	$3d^6 - 3d^5(a^2F)4p$	$a^3H - {}^1G^\circ$	4 – 4		922
	500	351.969	29.5708 – 313.6866	$3d^6 - 3d^5(a^2D)4p$	$a^3F - {}^3D^\circ$	3 – 2		922
	130	352.241	41.2522 – 325.1484	$3d^6 - 3d^5(a^2G)4p$	$a^1I - {}^3H^\circ$	6 – 6		922
	530	352.324	29.1237 – 312.9536	$3d^6 - 3d^5(a^2F)4p$	$a^3F - {}^3D^\circ$	4 – 3		922
	380	352.386	29.8992 – 313.6790	$3d^6 - 3d^5(a^2D)4p$	$a^3F - {}^3D^\circ$	2 – 1		922
	60	352.451	41.2522 – 324.9802	$3d^6 - 3d^5(a^2G)4p$	$a^1I - {}^3G^\circ$	6 – 5		922
	140	352.561	41.9202 – 325.5586	$3d^6 - 3d^5(b^2F)4p$	$a^3D - {}^1G^\circ$	3 – 4		922
	210	352.618	28.6976 – 312.2910	$3d^6 - 3d^5(a^2D)4p$	$a^3P - {}^3P^\circ$	1 – 1		922
	570	352.769	33.2565 – 316.7266	$3d^6 - 3d^5(a^2H)4p$	$a^3G - {}^3G^\circ$	5 – 5		922
	210	352.834	0.8897 – 284.3089	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - {}^5G^\circ$	3 – 4		927
	70	352.879	29.5708 – 312.9536	$3d^6 - 3d^5(a^2F)4p$	$a^3F - {}^3D^\circ$	3 – 3		922
	400	352.919	42.2081 – 325.5586	$3d^6 - 3d^5(b^2F)4p$	$a^1G - {}^1G^\circ$	4 – 4		922
	120	352.960	29.5708 – 312.8894	$3d^6 - 3d^5(a^4F)4p$	$a^3F - {}^5G^\circ$	3 – 3		927
	260	353.099	29.5708 – 312.7782	$3d^6 - 3d^5(a^4F)4p$	$a^3F - {}^5G^\circ$	3 – 2		927
	160	353.368	29.8992 – 312.8894	$3d^6 - 3d^5(a^4F)4p$	$a^3F - {}^5G^\circ$	2 – 3		927
	410	353.407	34.4164 – 317.3768	$3d^6 - 3d^5(a^2H)4p$	$a^3G - {}^3G^\circ$	3 – 3		922
	330	353.492	29.5708 – 312.4633	$3d^6 - 3d^5(a^2F)4p$	$a^3F - {}^3G^\circ$	3 – 3		922
	200	353.507	29.8992 – 312.7782	$3d^6 - 3d^5(a^4F)4p$	$a^3F - {}^5G^\circ$	2 – 2		927
	620	353.573	34.0617 – 316.8878	$3d^6 - 3d^5(a^2H)4p$	$a^3G - {}^3G^\circ$	4 – 4		922
	690	353.588	33.2565 – 316.0688	$3d^6 - 3d^5(a^2F)4p$	$a^3G - {}^3G^\circ$	5 – 4		922
	280	353.619	26.1530 – 308.9430	$3d^6 - 3d^5(a^2D)4p$	$a^3P - {}^1D^\circ$	2 – 2		922
	170	353.655	1.4899 – 284.2490	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - {}^5G^\circ$	2 – 3		927
	230	353.689	33.2565 – 315.9905	$3d^6 - 3d^5(a^2H)4p$	$a^3G - {}^3H^\circ$	5 – 5		922
	170	353.754	47.6997 – 330.3707	$3d^6 - 3d^5(a^2S)4p$	$a^1S - {}^3P^\circ$	0 – 1		922
	410	353.788	41.2522 – 323.9086	$3d^6 - 3d^5(a^2G)4p$	$a^1I - {}^3H^\circ$	6 – 5		922
	160	353.815	27.5782 – 310.2126	$3d^6 - 3d^5(a^2D)4p$	$a^3H - {}^3F^\circ$	5 – 4		922
	30	353.901	29.8992 – 312.4633	$3d^6 - 3d^5(a^2F)4p$	$a^3F - {}^3G^\circ$	2 – 3		922
	20	354.013	34.4164 – 316.8878	$3d^6 - 3d^5(a^2H)4p$	$a^3G - {}^3G^\circ$	3 – 4		922
	220	354.061	29.5708 – 312.0083	$3d^6 - 3d^5(a^2F)4p$	$a^3F - {}^1G^\circ$	3 – 4		922
	440	354.118	29.8992 – 312.2910	$3d^6 - 3d^5(a^2D)4p$	$a^3F - {}^3P^\circ$	2 – 1		922
	400	354.140	27.5782 – 309.9525	$3d^6 - 3d^5(a^2I)4p$	$a^3H - {}^3H^\circ$	5 – 4		922
	720	354.181	1.8715 – 284.2155	$3d^6 - 3d^5(a^4G)4p$	$ga^5D - {}^5G^\circ$	1 – 2		927
	410	354.335	34.0617 – 316.2803	$3d^6 - 3d^5(a^2F)4p$	$a^3G - {}^3F^\circ$	4 – 3		922

NI V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	760	354.418	27.1112 – 309.2640	$3d^6 - 3d^5(a^2I)4p$	$a^3H - {}^3H^\circ$	6 – 6		922
	360	354.467	33.2565 – 315.3701	$3d^6 - 3d^5(a^2G)4p$	$a^3G - {}^3H^\circ$	5 – 4		922
	680	354.493	27.8588 – 309.9525	$3d^6 - 3d^5(a^2I)4p$	$a^3H - {}^3H^\circ$	4 – 4		922
	180	354.533	27.8588 – 309.9195	$3d^6 - 3d^5(a^2I)4p$	$a^3H - {}^3H^\circ$	4 – 5		922
	370	354.721	33.2565 – 315.1682	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^5F^\circ$	5 – 5		922
	290	354.780	34.4164 – 316.2803	$3d^6 - 3d^5(a^2F)4p$	$a^3G - {}^3F^\circ$	3 – 3		922
	250	354.925	34.4164 – 316.1654	$3d^6 - 3d^5(a^2F)4p$	$a^3G - {}^3F^\circ$	3 – 2		922
	350	354.964	42.2081 – 323.9263	$3d^6 - 3d^5(a^2H)4p$	$a^1G - {}^3H^\circ$	4 – 4		922
	0	354.994	27.1112 – 308.8041	$3d^6 - 3d^5(a^2I)4p$	$a^3H - {}^1H^\circ$	6 – 5		922
	70	355.046	34.4164 – 316.0688	$3d^6 - 3d^5(a^2F)4p$	$a^3G - {}^3G^\circ$	3 – 4		922
	250	355.140	26.1530 – 307.7311	$3d^6 - 3d^5(a^2D)4p$	$a^3P - {}^3F^\circ$	2 – 2		922
	120	355.240	33.2565 – 314.7564	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^5G^\circ$	5 – 6		922
	220	355.309	33.2565 – 314.7022	$3d^6 - 3d^5(a^2F)4p$	$a^3G - {}^3G^\circ$	5 – 5		922
	90	355.439	33.2565 – 314.5992	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^5F^\circ$	5 – 4		922
	50	355.471	42.2081 – 323.5232	$3d^6 - 3d^5(a^4F)4p$	$a^1G - {}^3F^\circ$	4 – 3		922
	420	355.537	34.0617 – 315.3262	$3d^6 - 3d^5(a^2D)4p$	$a^3G - {}^1F^\circ$	4 – 3		922
	400	355.586	27.5782 – 308.8041	$3d^6 - 3d^5(a^2I)4p$	$a^3H - {}^1H^\circ$	5 – 5		922
	680	355.611	27.1112 – 308.3173	$3d^6 - 3d^5(a^2I)4p$	$a^3H - {}^3I^\circ$	6 – 7		922
	700	355.780	41.2522 – 322.3242	$3d^6 - 3d^5(a^2H)4p$	$a^1I - {}^1I^\circ$	6 – 6		922
	580	355.935	33.2565 – 314.2088	$3d^6 - 3d^5(a^2F)4p$	$a^3G - {}^3F^\circ$	5 – 4		922
	140	355.986	34.4164 – 315.3262	$3d^6 - 3d^5(a^2D)4p$	$a^3G - {}^1F^\circ$	3 – 3		922
	580	356.047	77.8995 – 358.7600	$3d^6 - 3d^5(b^2G)4p$	$b^1G - {}^1G^\circ$	4 – 4		922
	160	356.090	29.1237 – 309.9525	$3d^6 - 3d^5(a^2I)4p$	$a^3F - {}^3H^\circ$	4 – 4		922
	20	356.134	29.1237 – 309.9195	$3d^6 - 3d^5(a^2I)4p$	$a^3F - {}^3H^\circ$	4 – 5		922
	130	356.208	27.8588 – 308.5920	$3d^6 - 3d^5(a^2D)4p$	$a^3H - {}^3F^\circ$	4 – 3		922
	40	356.253	41.9202 – 322.6176	$3d^6 - 3d^5(a^4F)4p$	$a^3D - {}^3D^\circ$	3 – 3		922
	220	356.328	34.0617 – 314.7022	$3d^6 - 3d^5(a^2F)4p$	$a^3G - {}^3G^\circ$	4 – 5		922
	20	356.359	42.2081 – 322.8208	$3d^6 - 3d^5(a^4F)4p$	$a^1G - {}^3F^\circ$	4 – 4		922
	250	356.410	77.8995 – 358.4756	$3d^6 - 3d^5(b^2G)4p$	$b^1G - {}^1H^\circ$	4 – 5		922
	60	356.460	34.0617 – 314.5992	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^5F^\circ$	4 – 4		922
	70	356.506	34.0617 – 314.5628	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^5F^\circ$	4 – 3		922
	390	356.621	42.2081 – 322.6176	$3d^6 - 3d^5(a^4F)4p$	$a^1G - {}^3D^\circ$	4 – 3		922
	490	356.775	27.1112 – 307.3997	$3d^6 - 3d^5(a^2I)4p$	$a^3H - {}^3I^\circ$	6 – 6		922
	70	356.831	28.6976 – 308.9430	$3d^6 - 3d^5(a^2D)4p$	$a^3P - {}^1D^\circ$	1 – 2		922
	170	356.860	26.1530 – 306.3778	$3d^6 - 3d^5(a^4D)4p$	$a^3P - {}^3P^\circ$	2 – 2		922
	330	356.876	33.2565 – 313.4647	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^5G^\circ$	5 – 5		922
	30	356.957	34.4164 – 314.5628	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^5F^\circ$	3 – 3		922
	650	357.371	27.5782 – 307.3997	$3d^6 - 3d^5(a^2I)4p$	$a^3H - {}^3I^\circ$	5 – 6		922
	230	357.550	26.1530 – 305.8381	$3d^6 - 3d^5(a^4D)4p$	$a^3P - {}^3P^\circ$	2 – 1		922
	20	357.743	41.2522 – 320.7831	$3d^6 - 3d^5(a^2H)4p$	$a^1I - {}^3I^\circ$	6 – 7		922
	400	357.822	29.1237 – 308.5920	$3d^6 - 3d^5(a^2D)4p$	$a^3F - {}^3F^\circ$	4 – 3		922
	110	357.897	34.0617 – 313.4647	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^5G^\circ$	4 – 5		922
	130	357.921	41.6269 – 321.0183	$3d^6 - 3d^5(a^2G)4p$	$a^3D - {}^3F^\circ$	2 – 2		922
	160	357.946	29.5708 – 308.9430	$3d^6 - 3d^5(a^2D)4p$	$a^3F - {}^1D^\circ$	3 – 2		927
	360	358.014	41.7011 – 321.0183	$3d^6 - 3d^5(a^2G)4p$	$a^3D - {}^3F^\circ$	1 – 2		922
	50	358.142	34.0617 – 313.2813	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^5G^\circ$	4 – 4		927
	370	358.248	41.9202 – 321.0564	$3d^6 - 3d^5(a^2G)4p$	$a^3D - {}^3F^\circ$	3 – 4		922
	100	358.368	29.8992 – 308.9430	$3d^6 - 3d^5(a^2D)4p$	$a^3F - {}^1D^\circ$	2 – 2		922
	140	358.396	29.5708 – 308.5920	$3d^6 - 3d^5(a^2D)4p$	$a^3F - {}^3F^\circ$	3 – 3		922
	70	358.503	27.1112 – 306.0490	$3d^6 - 3d^5(a^2I)4p$	$a^3H - {}^3I^\circ$	6 – 5		922
	690	358.570	27.1112 – 305.9963	$3d^6 - 3d^5(a^2I)4p$	$a^3H - {}^3K^\circ$	6 – 7		927
	680	358.583	42.2081 – 321.0819	$3d^6 - 3d^5(a^2F)4p$	$a^1G - {}^1F^\circ$	4 – 3		922
	530	358.618	42.2081 – 321.0564	$3d^6 - 3d^5(a^2G)4p$	$a^1G - {}^3F^\circ$	4 – 4		922
	260	358.742	33.2565 – 312.0083	$3d^6 - 3d^5(a^2F)4p$	$a^3G - {}^1G^\circ$	5 – 4		922

Ni V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	60	358.819	29.8992 – 308.5920	$3d^6 - 3d^5(a^2D)4p$	$a^3F - {}^3F^\circ$	2 – 3		922
	260	358.927	41.2522 – 319.8604	$3d^6 - 3d^5(a^2H)4p$	$a^1I - {}^3I^\circ$	6 – 6		922
	120	358.944	41.9202 – 320.5138	$3d^6 - 3d^5(a^2G)4p$	$a^3D - {}^3F^\circ$	3 – 3		922
	240	359.020	34.4164 – 312.9536	$3d^6 - 3d^5(a^2F)4p$	$a^3G - {}^3D^\circ$	3 – 3		922
	380	359.047	48.6070 – 327.1227	$3d^6 - 3d^5(b^2F)4p$	$a^1D - {}^1D^\circ$	2 – 2		922
	190	359.101	34.4164 – 312.8894	$3d^6 - 3d^5(a^4F)4p$	$a^3G - {}^5G^\circ$	3 – 3		927
	150	359.194	34.0617 – 312.4633	$3d^6 - 3d^5(a^2F)4p$	$a^3G - {}^3G^\circ$	4 – 3		922
	150	359.316	42.2081 – 320.5138	$3d^6 - 3d^5(a^2G)4p$	$a^1G - {}^3F^\circ$	4 – 3		922
	70	359.420	41.7011 – 319.9265	$3d^6 - 3d^5(a^2F)4p$	$a^3D - {}^1D^\circ$	1 – 2		922
	660	359.467	27.8588 – 306.0490	$3d^6 - 3d^5(a^2I)4p$	$a^3H - {}^3I^\circ$	4 – 5		922
	330	359.505	29.5708 – 307.7311	$3d^6 - 3d^5(a^2D)4p$	$a^3F - {}^3F^\circ$	3 – 2		922
	330	359.542	48.6070 – 326.7390	$3d^6 - 3d^5(a^2G)4p$	$a^1D - {}^1F^\circ$	2 – 3		922
	580	359.696	27.5782 – 305.5908	$3d^6 - 3d^5(a^2I)4p$	$a^3H - {}^3K^\circ$	5 – 6		922
	260	359.720	41.6269 – 319.6202	$3d^6 - 3d^5(a^4F)4p$	$a^3D - {}^3G^\circ$	2 – 3		922
	170	359.737	41.9202 – 319.8991	$3d^6 - 3d^5(a^4F)4p$	$a^3D - {}^3G^\circ$	3 – 4		922
	350	359.781	34.0617 – 312.0083	$3d^6 - 3d^5(a^2F)4p$	$a^3G - {}^1G^\circ$	4 – 4		922
	140	359.967	69.1561 – 346.9595	$3d^6 - 3d^5(b^2D)4p$	$b^3P - {}^3P^\circ$	2 – 1		922
	350	360.028	69.1561 – 346.9124	$3d^6 - 3d^5(b^2D)4p$	$b^3P - {}^3P^\circ$	2 – 2		922
	220	360.112	42.2081 – 319.8991	$3d^6 - 3d^5(a^4F)4p$	$a^1G - {}^3G^\circ$	4 – 4		922
	60	360.242	34.4164 – 312.0083	$3d^6 - 3d^5(a^2F)4p$	$a^3G - {}^1G^\circ$	3 – 4		922
	410	360.474	42.2081 – 319.6202	$3d^6 - 3d^5(a^4F)4p$	$a^1G - {}^3G^\circ$	4 – 3		922
	270	360.726	41.9202 – 319.1387	$3d^6 - 3d^5(a^2G)4p$	$a^3D - {}^1G^\circ$	3 – 4		927
	90	360.827	28.6976 – 305.8381	$3d^6 - 3d^5(a^4D)4p$	$a^3P - {}^3P^\circ$	1 – 1		922
	550	360.886	26.1530 – 303.2495	$3d^6 - 3d^5(a^4P)4p$	$a^3P - {}^3S^\circ$	2 – 1		922
	550	361.101	42.2081 – 319.1387	$3d^6 - 3d^5(a^2G)4p$	$a^1G - {}^1G^\circ$	4 – 4		922
	580	361.266	57.9241 – 334.7276	$3d^6 - 3d^5(b^2F)4p$	$a^1F - {}^1F^\circ$	3 – 3		922
	80	361.349	66.7378 – 343.4782	$3d^6 - 3d^5(b^2D)4p$	$b^3P - {}^3D^\circ$	0 – 1		922
	70	361.416	28.6976 – 305.3869	$3d^6 - 3d^5(a^4D)4p$	$a^3P - {}^3P^\circ$	1 – 0		927
	140	361.450	33.2565 – 309.9195	$3d^6 - 3d^5(a^2I)4p$	$a^3G - {}^3H^\circ$	5 – 5		922
	110	361.526	48.6070 – 325.2119	$3d^6 - 3d^5(a^2G)4p$	$a^1D - {}^3G^\circ$	2 – 3		922
	170	361.851	67.5479 – 343.9057	$3d^6 - 3d^5(b^2D)4p$	$b^3P - {}^3D^\circ$	1 – 2		922
	70	362.058	29.6400 – 305.8381	$3d^6 - 3d^5(a^4D)4p$	$a^3P - {}^3P^\circ$	0 – 1		922
	130	362.120	34.0617 – 310.2126	$3d^6 - 3d^5(a^2D)4p$	$a^3G - {}^3F^\circ$	4 – 4		922
	550	362.219	68.7187 – 344.8053	$3d^6 - 3d^5(b^2D)4p$	$b^3F - {}^3D^\circ$	4 – 3		922
	590	362.309	33.2565 – 309.2640	$3d^6 - 3d^5(a^2I)4p$	$a^3G - {}^3H^\circ$	5 – 6		922
	560	362.506	34.0617 – 309.9195	$3d^6 - 3d^5(a^2I)4p$	$a^3G - {}^3H^\circ$	4 – 5		922
	280	362.654	104.4205 – 380.1656	$3d^6 - 3d^5(a^2P)4p$	$b^1D - {}^1P^\circ$	2 – 1		922
	220	362.779	69.1561 – 344.8053	$3d^6 - 3d^5(b^2D)4p$	$b^3P - {}^3D^\circ$	2 – 3		922
	530	362.928	34.4164 – 309.9525	$3d^6 - 3d^5(a^2I)4p$	$a^3G - {}^3H^\circ$	3 – 4		922
	40	363.043	77.8995 – 353.3471	$3d^6 - 3d^5(b^2G)4p$	$b^1G - {}^3F^\circ$	4 – 4		922
	20	363.182	67.5479 – 342.8946	$3d^6 - 3d^5(b^2D)4p$	$b^3P - {}^3F^\circ$	1 – 2		922
	50	363.309	48.6070 – 323.8531	$3d^6 - 3d^5(a^4F)4p$	$a^1D - {}^3F^\circ$	2 – 2		922
	340	363.541	57.9241 – 332.9956	$3d^6 - 3d^5(a^2H)4p$	$a^1F - {}^1G^\circ$	3 – 4		922
	60	363.568	68.8547 – 343.9057	$3d^6 - 3d^5(b^2D)4p$	$b^3F - {}^3D^\circ$	3 – 2		922
	20	363.839	68.6321 – 343.4782	$3d^6 - 3d^5(b^2D)4p$	$b^3F - {}^3D^\circ$	2 – 1		922
	60	363.975	34.0617 – 308.8041	$3d^6 - 3d^5(a^2I)4p$	$a^3G - {}^1H^\circ$	4 – 5		922
	80	364.059	42.2081 – 316.8878	$3d^6 - 3d^5(a^2H)4p$	$a^1G - {}^3G^\circ$	4 – 4		922
	20	364.094	41.6269 – 316.2803	$3d^6 - 3d^5(a^2F)4p$	$a^3D - {}^3F^\circ$	2 – 3		922
	360	364.229	28.6976 – 303.2495	$3d^6 - 3d^5(a^4P)4p$	$a^3P - {}^3S^\circ$	1 – 1		922
	160	364.262	34.0617 – 308.5920	$3d^6 - 3d^5(a^2D)4p$	$a^3G - {}^3F^\circ$	4 – 3		922
	20	364.345	41.7011 – 316.1654	$3d^6 - 3d^5(a^2F)4p$	$a^3D - {}^3F^\circ$	1 – 2		922
	50	364.485	41.9202 – 316.2803	$3d^6 - 3d^5(a^2F)4p$	$a^3D - {}^3F^\circ$	3 – 3		922
	240	364.773	33.2565 – 307.3997	$3d^6 - 3d^5(a^2I)4p$	$a^3G - {}^3I^\circ$	5 – 6		922
	120	364.797	69.1561 – 343.2810	$3d^6 - 3d^5(b^2D)4p$	$b^3P - {}^3F^\circ$	2 – 3		922

Ni V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	110	364.867	26.1530 – 300.2249	$3d^6 - 3d^5(a^4D)4p$	$a^3P - {}^3D^\circ$	2 – 2		922
	340	364.899	26.1530 – 300.2010	$3d^6 - 3d^5(a^4D)4p$	$a^3P - {}^5P^\circ$	2 – 3		922
	50	365.148	42.2081 – 316.0688	$3d^6 - 3d^5(a^2F)4p$	$a^1G - {}^3G^\circ$	4 – 4		922
	100	365.189	48.6070 – 322.4364	$3d^6 - 3d^5(a^4F)4p$	$a^1D - {}^3D^\circ$	2 – 2		922
	60	365.363	41.6269 – 315.3262	$3d^6 - 3d^5(a^2D)4p$	$a^3D - {}^1F^\circ$	2 – 3		922
	80	365.410	41.7011 – 315.3661	$3d^6 - 3d^5(a^2F)4p$	$a^3D - {}^3D^\circ$	1 – 2		922
	190	365.485	29.6400 – 303.2495	$3d^6 - 3d^5(a^4P)4p$	$a^3P - {}^3S^\circ$	0 – 1		922
	180	366.085	42.2081 – 315.3701	$3d^6 - 3d^5(a^2G)4p$	$a^1G - {}^3H^\circ$	4 – 4		922
	620	366.113	41.2522 – 314.3920	$3d^6 - 3d^5(a^2I)4p$	$a^1I - {}^1I^\circ$	6 – 6		922
	80	366.386	41.6269 – 314.5628	$3d^6 - 3d^5(a^4F)4p$	$a^3D - {}^5F^\circ$	2 – 3		922
	140	366.541	26.1530 – 298.9723	$3d^6 - 3d^5(a^4D)4p$	$a^3P - {}^3D^\circ$	2 – 3		922
	410	367.005	48.6070 – 321.0819	$3d^6 - 3d^5(a^2F)4p$	$a^1D - {}^1F^\circ$	2 – 3		922
	30	367.093	48.6070 – 321.0183	$3d^6 - 3d^5(a^2G)4p$	$a^1D - {}^3F^\circ$	2 – 2		922
	150	367.182	29.1237 – 301.4702	$3d^6 - 3d^5(a^4D)4p$	$a^3F - {}^3F^\circ$	4 – 3		922
	280	367.258	41.9202 – 314.2088	$3d^6 - 3d^5(a^2F)4p$	$a^3D - {}^3F^\circ$	3 – 4		922
	110	367.567	41.6269 – 313.6866	$3d^6 - 3d^5(a^2D)4p$	$a^3D - {}^3D^\circ$	2 – 2		922
	130	367.648	41.9202 – 313.9198	$3d^6 - 3d^5(a^2D)4p$	$a^3D - {}^3D^\circ$	3 – 3		922
	120	367.664	34.0617 – 306.0490	$3d^6 - 3d^5(a^2I)4p$	$a^3G - {}^3I^\circ$	4 – 5		922
	90	367.778	29.5708 – 301.4702	$3d^6 - 3d^5(a^4D)4p$	$a^3F - {}^3F^\circ$	3 – 3		922
	50	367.826	28.6976 – 300.5633	$3d^6 - 3d^5(a^4D)4p$	$a^3P - {}^3D^\circ$	1 – 1		922
	130	367.923	29.1237 – 300.9181	$3d^6 - 3d^5(a^4D)4p$	$a^3F - {}^3F^\circ$	4 – 4		922
	50	368.037	42.2081 – 313.9198	$3d^6 - 3d^5(a^2D)4p$	$a^1G - {}^3D^\circ$	4 – 3		922
	20	368.115	29.8992 – 301.5530	$3d^6 - 3d^5(a^4D)4p$	$a^3F - {}^3F^\circ$	2 – 2		922
	320	368.286	28.6976 – 300.2249	$3d^6 - 3d^5(a^4D)4p$	$a^3P - {}^3D^\circ$	1 – 2		922
	420	368.496	47.6997 – 319.0734	$3d^6 - 3d^5(a^2D)4p$	$a^1S - {}^1P^\circ$	0 – 1		922
	580	368.569	48.6070 – 319.9265	$3d^6 - 3d^5(a^2F)4p$	$a^1D - {}^1D^\circ$	2 – 2		922
	40	368.641	26.1530 – 297.4181	$3d^6 - 3d^5(a^4P)4p$	$a^3P - {}^3D^\circ$	2 – 3		922
	510	368.898	29.1237 – 300.2010	$3d^6 - 3d^5(a^4D)4p$	$a^3F - {}^5P^\circ$	4 – 3		927
	90	368.958	41.9202 – 312.9536	$3d^6 - 3d^5(a^2F)4p$	$a^3D - {}^3D^\circ$	3 – 3		922
	230	368.986	48.6070 – 319.6202	$3d^6 - 3d^5(a^4F)4p$	$a^1D - {}^3G^\circ$	2 – 3		922
	150	369.108	29.6400 – 300.5633	$3d^6 - 3d^5(a^4D)4p$	$a^3P - {}^3D^\circ$	0 – 1		922
	80	369.192	26.1530 – 297.0139	$3d^6 - 3d^5(a^4D)4p$	$a^3P - {}^5D^\circ$	2 – 2		922
	150	369.226	41.6269 – 312.4633	$3d^6 - 3d^5(a^2F)4p$	$a^3D - {}^3G^\circ$	2 – 3		922
	210	369.475	29.5708 – 300.2249	$3d^6 - 3d^5(a^4D)4p$	$a^3F - {}^3D^\circ$	3 – 2		922
	120	369.508	29.5708 – 300.2010	$3d^6 - 3d^5(a^4D)4p$	$a^3F - {}^5P^\circ$	3 – 3		922
	80	369.562	41.7011 – 312.2910	$3d^6 - 3d^5(a^2D)4p$	$a^3D - {}^3P^\circ$	1 – 1		922
	120	369.733	48.6070 – 319.0734	$3d^6 - 3d^5(a^2D)4p$	$a^1D - {}^1P^\circ$	2 – 1		922
	70	369.906	41.6269 – 311.9665	$3d^6 - 3d^5(a^2D)4p$	$a^3D - {}^3P^\circ$	2 – 2		922
	40	369.925	29.8992 – 300.2249	$3d^6 - 3d^5(a^4D)4p$	$a^3F - {}^3D^\circ$	2 – 2		922
	60	370.021	42.2081 – 312.4633	$3d^6 - 3d^5(a^2F)4p$	$a^1G - {}^3G^\circ$	4 – 3		922
	700	370.616	27.1112 – 296.9329	$3d^6 - 3d^5(a^4G)4p$	$a^3H - {}^3G^\circ$	6 – 5		922
	220	370.975	27.8588 – 297.4181	$3d^6 - 3d^5(a^4P)4p$	$a^3H - {}^3D^\circ$	4 – 3		922
	290	371.091	29.5708 – 299.0456	$3d^6 - 3d^5(a^4D)4p$	$a^3F - {}^5P^\circ$	3 – 2		922
	590	371.275	27.5782 – 296.9193	$3d^6 - 3d^5(a^4D)4p$	$a^3H - {}^5D^\circ$	5 – 4		927
	670	371.306	27.5782 – 296.8970	$3d^6 - 3d^5(a^4G)4p$	$a^3H - {}^3G^\circ$	5 – 4		922
	330	371.473	57.9241 – 327.1227	$3d^6 - 3d^5(b^2F)4p$	$a^1F - {}^1D^\circ$	3 – 2		922
	100	371.543	29.8992 – 299.0456	$3d^6 - 3d^5(a^4D)4p$	$a^3F - {}^5P^\circ$	2 – 2		922
	120	371.643	29.8992 – 298.9723	$3d^6 - 3d^5(a^4D)4p$	$a^3F - {}^3D^\circ$	2 – 3		922
	680	371.763	27.8588 – 296.8471	$3d^6 - 3d^5(a^4G)4p$	$a^3H - {}^3G^\circ$	4 – 3		922
	250	371.812	29.6400 – 298.6006	$3d^6 - 3d^5(a^4P)4p$	$a^3P - {}^3D^\circ$	0 – 1		922
	430	372.002	57.9241 – 326.7390	$3d^6 - 3d^5(a^2G)4p$	$a^1F - {}^1F^\circ$	3 – 3		922
	390	372.159	29.8992 – 298.6006	$3d^6 - 3d^5(a^4P)4p$	$a^3F - {}^3D^\circ$	2 – 1		922
	610	372.451	41.2522 – 309.7436	$3d^6 - 3d^5(a^2I)4p$	$a^1I - {}^1K^\circ$	6 – 7		922
	620	372.724	29.1237 – 297.4181	$3d^6 - 3d^5(a^4P)4p$	$a^3F - {}^3D^\circ$	4 – 3		922

Ni V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	560	372.756	29.5708 – 297.8425	3d^6 – 3d^5(a^{4}P)4p	a^{3}F – ^{3}D°	3 – 2		922
	300	372.987	57.9241 – 326.0299	3d^6 – 3d^5(b^{2}F)4p	a^{1}F – ^{3}F°	3 – 3		922
	410	373.018	29.8992 – 297.9828	3d^6 – 3d^5(a^{4}D)4p	a^{3}F – ^{5}P°	2 – 1		922
	230	373.083	77.8995 – 345.9361	3d^6 – 3d^5(b^{2}D)4p	b^{1}G – ^{1}F°	4 – 3		927
	170	373.213	29.8992 – 297.8425	3d^6 – 3d^5(a^{4}P)4p	a^{3}F – ^{3}D°	2 – 2		922
	140	373.347	29.5708 – 297.4181	3d^6 – 3d^5(a^{4}P)4p	a^{3}F – ^{3}D°	3 – 3		922
	540	373.401	29.1237 – 296.9329	3d^6 – 3d^5(a^{4}G)4p	a^{3}F – ^{3}G°	4 – 5		922
	270	373.418	29.1237 – 296.9193	3d^6 – 3d^5(a^{4}D)4p	a^{3}F – ^{5}D°	4 – 4		927
	140	373.449	29.1237 – 296.8970	3d^6 – 3d^5(a^{4}G)4p	a^{3}F – ^{3}G°	4 – 4		922
	220	373.521	234.4127 – 502.137	3d^5(a^{4}F)4s – 3d^5(a^{6}S)5f	^{5}F – ^{5}F°	2 – 3		922
	230	373.536	42.2081 – 309.9195	3d^6 – 3d^5(a^{2}I)4p	a^{1}G – ^{3}H°	4 – 5		922
	670	373.605	33.2565 – 300.9181	3d^6 – 3d^5(a^{4}D)4p	a^{3}G – ^{3}F°	5 – 4		922
	400	373.644	57.9241 – 325.5586	3d^6 – 3d^5(b^{2}F)4p	a^{1}F – ^{1}G°	3 – 4		922
	180	373.690	47.6997 – 315.3007	3d^6 – 3d^5(a^{2}F)4p	a^{1}S – ^{3}D°	0 – 1		922
	390	373.760	41.2522 – 308.8041	3d^6 – 3d^5(a^{2}I)4p	a^{1}I – ^{1}H°	6 – 5		922
	400	373.804	29.8992 – 297.4179	3d^6 – 3d^5(a^{4}D)4p	a^{3}F – ^{5}D°	2 – 1		922
	370	373.903	29.1237 – 296.5740	3d^6 – 3d^5(a^{4}D)4p	a^{3}F – ^{5}D°	4 – 3		922
	640	373.960	34.0617 – 301.4702	3d^6 – 3d^5(a^{4}D)4p	a^{3}G – ^{3}F°	4 – 3		922
	390	374.045	29.5708 – 296.9193	3d^6 – 3d^5(a^{4}D)4p	a^{3}F – ^{5}D°	3 – 4		927
	640	374.075	29.5708 – 296.8970	3d^6 – 3d^5(a^{4}G)4p	a^{3}F – ^{3}G°	3 – 4		922
	500	374.159	26.1530 – 293.4200	3d^6 – 3d^5(a^{4}P)4p	a^{3}P – ^{3}P°	2 – 1		922
	620	374.340	34.4164 – 301.5530	3d^6 – 3d^5(a^{4}D)4p	a^{3}G – ^{3}F°	3 – 2		922
	210	374.454	34.4164 – 301.4702	3d^6 – 3d^5(a^{4}D)4p	a^{3}G – ^{3}F°	3 – 3		922
	240	374.581	41.6269 – 308.5920	3d^6 – 3d^5(a^{2}D)4p	a^{3}D – ^{3}F°	2 – 3		922
	480	374.604	29.8992 – 296.8471	3d^6 – 3d^5(a^{4}G)4p	a^{3}F – ^{3}G°	2 – 3		922
	130	374.733	34.0617 – 300.9181	3d^6 – 3d^5(a^{4}D)4p	a^{3}G – ^{3}F°	4 – 4		922
	590	374.770	26.1530 – 292.9830	3d^6 – 3d^5(a^{4}P)4p	a^{3}P – ^{3}P°	2 – 2		922
	50	374.963	48.6070 – 315.3007	3d^6 – 3d^5(a^{2}F)4p	a^{1}D – ^{3}D°	2 – 1		922
	40	374.992	41.9202 – 308.5920	3d^6 – 3d^5(a^{2}D)4p	a^{3}D – ^{3}F°	3 – 3		922
	580	375.100	42.2081 – 308.8041	3d^6 – 3d^5(a^{2}I)4p	a^{1}G – ^{1}H°	4 – 5		922
	20	375.733	41.2522 – 307.3997	3d^6 – 3d^5(a^{2}I)4p	a^{1}I – ^{3}I°	6 – 6		922
	160	375.898	41.7011 – 307.7311	3d^6 – 3d^5(a^{2}D)4p	a^{3}D – ^{3}F°	1 – 2		922
	20	376.119	68.8547 – 334.7276	3d^6 – 3d^5(b^{2}F)4p	b^{1}F – ^{1}F°	3 – 3		922
	70	376.211	34.4164 – 300.2249	3d^6 – 3d^5(a^{4}D)4p	a^{3}G – ^{3}D°	3 – 2		922
	20	376.509	57.9241 – 323.5232	3d^6 – 3d^5(a^{4}F)4p	a^{1}F – ^{3}F°	3 – 3		922
	110	376.810	28.6976 – 294.0860	3d^6 – 3d^5(a^{4}D)4p	a^{3}P – ^{5}F°	1 – 2		922
	110	377.015	27.1112 – 292.3534	3d^6 – 3d^5(a^{4}G)4p	a^{3}H – ^{3}H°	6 – 5		922
	240	377.117	28.6976 – 293.8670	3d^6 – 3d^5(a^{4}P)4p	a^{3}P – ^{3}P°	1 – 0		922
	20	377.251	48.6070 – 313.6866	3d^6 – 3d^5(a^{2}D)4p	a^{1}D – ^{3}D°	2 – 2		922
	60	377.283	27.5782 – 292.6310	3d^6 – 3d^5(a^{4}G)4p	a^{3}H – ^{3}H°	5 – 4		922
	100	377.486	34.0617 – 298.9723	3d^6 – 3d^5(a^{4}D)4p	a^{3}G – ^{3}D°	4 – 3		922
	290	377.646	41.2522 – 306.0490	3d^6 – 3d^5(a^{2}I)4p	a^{1}I – ^{3}I°	6 – 5		922
	720	377.676	27.1112 – 291.8914	3d^6 – 3d^5(a^{4}G)4p	a^{3}H – ^{3}H°	6 – 6		922
	320	377.713	41.6269 – 306.3778	3d^6 – 3d^5(a^{4}D)4p	a^{3}D – ^{3}P°	2 – 2		927
	220	377.754	28.6976 – 293.4200	3d^6 – 3d^5(a^{4}P)4p	a^{3}P – ^{3}P°	1 – 1		922
	50	377.795	57.9241 – 322.6176	3d^6 – 3d^5(a^{4}F)4p	a^{1}F – ^{3}D°	3 – 3		922
	70	378.054	57.9241 – 322.4364	3d^6 – 3d^5(a^{4}F)4p	a^{1}F – ^{3}D°	3 – 2		922
	520	378.133	41.9202 – 306.3778	3d^6 – 3d^5(a^{4}D)4p	a^{3}D – ^{3}P°	3 – 2		922
	190	378.379	28.6976 – 292.9830	3d^6 – 3d^5(a^{4}P)4p	a^{3}P – ^{3}P°	1 – 2		922
	370	378.485	41.6269 – 305.8381	3d^6 – 3d^5(a^{4}D)4p	a^{3}D – ^{3}P°	2 – 1		922
	150	378.591	41.7011 – 305.8381	3d^6 – 3d^5(a^{4}D)4p	a^{3}D – ^{3}P°	1 – 1		922
	40	378.820	27.5782 – 291.5546	3d^6 – 3d^5(a^{4}G)4p	a^{3}H – ^{3}F°	5 – 4		922
	310	379.018	42.2081 – 306.0490	3d^6 – 3d^5(a^{2}I)4p	a^{1}G – ^{3}I°	4 – 5		922
	160	379.104	29.6400 – 293.4200	3d^6 – 3d^5(a^{4}P)4p	a^{3}P – ^{3}P°	0 – 1		922

NI V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	190	379.225	27.8588 - 291.5546	$3d^6 - 3d^5(a^4G)4p$	$a^3H - {}^3F^o$	4 - 4		922
	560	379.252	33.2565 - 296.9329	$3d^6 - 3d^5(a^4G)4p$	$a^3G - {}^3G^o$	5 - 5		927
	80	379.497	29.1237 - 292.6310	$3d^6 - 3d^5(a^4G)4p$	$a^3F - {}^3H^o$	4 - 4		922
	70	379.550	27.8588 - 291.3285	$3d^6 - 3d^5(a^4G)4p$	$a^3H - {}^3F^o$	4 - 3		922
	40	379.895	29.1237 - 292.3534	$3d^6 - 3d^5(a^4G)4p$	$a^3F - {}^3H^o$	4 - 5		922
	30	380.037	57.9241 - 321.0564	$3d^6 - 3d^5(a^2G)4p$	$a^1F - {}^3F^o$	3 - 4		922
	20	380.141	29.5708 - 292.6310	$3d^6 - 3d^5(a^4G)4p$	$a^3F - {}^3H^o$	3 - 4		922
	270	380.417	34.0617 - 296.9329	$3d^6 - 3d^5(a^4G)4p$	$a^3G - {}^3G^o$	4 - 5		922
	330	380.433	34.0617 - 296.9193	$3d^6 - 3d^5(a^4D)4p$	$a^3G - {}^5D^o$	4 - 4		927
	370	380.467	34.0617 - 296.8970	$3d^6 - 3d^5(a^4G)4p$	$a^3G - {}^3G^o$	4 - 4		922
	220	380.626	66.7378 - 329.4623	$3d^6 - 3d^5(b^2F)4p$	$b^3P - {}^3D^o$	0 - 1		927
	140	380.920	69.1561 - 331.6782	$3d^6 - 3d^5(a^2S)4p$	$b^3P - {}^3P^o$	2 - 2		922
	60	380.948	34.4164 - 296.9193	$3d^6 - 3d^5(a^4D)4p$	$a^3G - {}^5D^o$	3 - 4		927
	80	380.981	34.4164 - 296.8970	$3d^6 - 3d^5(a^4G)4p$	$a^3G - {}^3G^o$	3 - 4		922
	620	381.052	29.1237 - 291.5546	$3d^6 - 3d^5(a^4G)4p$	$a^3F - {}^3F^o$	4 - 4		922
	210	381.346	67.5479 - 329.7763	$3d^6 - 3d^5(b^2F)4p$	$b^3P - {}^3D^o$	1 - 2		922
	130	381.380	29.1237 - 291.3285	$3d^6 - 3d^5(a^4G)4p$	$a^3F - {}^3F^o$	4 - 3		922
	20	381.577	67.5479 - 329.6185	$3d^6 - 3d^5(a^2S)4p$	$b^3P - {}^3P^o$	1 - 0		927
	400	381.678	68.7187 - 330.7181	$3d^6 - 3d^5(b^2F)4p$	$b^3F - {}^3G^o$	4 - 5		922
	130	381.702	29.5708 - 291.5546	$3d^6 - 3d^5(a^4G)4p$	$a^3F - {}^3F^o$	3 - 4		922
	500	382.032	29.5708 - 291.3285	$3d^6 - 3d^5(a^4G)4p$	$a^3F - {}^3F^o$	3 - 3		922
	30	382.142	33.2565 - 294.9396	$3d^6 - 3d^5(a^4D)4p$	$a^3G - {}^5F^o$	5 - 4		922
	20	382.294	68.7187 - 330.2976	$3d^6 - 3d^5(b^2F)4p$	$b^3F - {}^3G^o$	4 - 4		922
	170	382.370	29.5708 - 291.0977	$3d^6 - 3d^5(a^4G)4p$	$a^3F - {}^3F^o$	3 - 2		922
	310	382.493	68.8547 - 330.2976	$3d^6 - 3d^5(b^2F)4p$	$b^3F - {}^3G^o$	3 - 4		922
	160	382.509	29.8992 - 291.3285	$3d^6 - 3d^5(a^4G)4p$	$a^3F - {}^3F^o$	2 - 3		922
	120	382.788	68.6321 - 329.8729	$3d^6 - 3d^5(b^2F)4p$	$b^3F - {}^3D^o$	2 - 3		922
	240	382.827	57.9241 - 319.1387	$3d^6 - 3d^5(a^2G)4p$	$a^1F - {}^1G^o$	3 - 4		922
	480	382.849	29.8992 - 291.0977	$3d^6 - 3d^5(a^4G)4p$	$a^3F - {}^3F^o$	2 - 2		922
	90	382.914	68.7187 - 329.8729	$3d^6 - 3d^5(b^2F)4p$	$b^3F - {}^3D^o$	4 - 3		922
	80	383.167	68.6321 - 329.6143	$3d^6 - 3d^5(b^2F)4p$	$b^3F - {}^3G^o$	2 - 3		922
	30	383.255	68.8547 - 329.7763	$3d^6 - 3d^5(b^2F)4p$	$b^3F - {}^3D^o$	3 - 2		922
	50	383.293	68.7187 - 329.6143	$3d^6 - 3d^5(b^2F)4p$	$b^3F - {}^3G^o$	4 - 3		922
	20	383.496	68.8547 - 329.6143	$3d^6 - 3d^5(b^2F)4p$	$b^3F - {}^3G^o$	3 - 3		922
	230	383.557	69.1561 - 329.8729	$3d^6 - 3d^5(b^2F)4p$	$b^3P - {}^3D^o$	2 - 3		922
	70	383.826	27.1112 - 287.6459	$3d^6 - 3d^5(a^4G)4p$	$a^3H - {}^5H^o$	6 - 6		927
	220	383.938	69.1561 - 329.6143	$3d^6 - 3d^5(b^2F)4p$	$b^3P - {}^3G^o$	2 - 3		922
	70	384.594	27.1112 - 287.1280	$3d^6 - 3d^5(a^4G)4p$	$a^3H - {}^5H^o$	6 - 5		922
	20	385.245	67.5479 - 327.1227	$3d^6 - 3d^5(b^2F)4p$	$b^3P - {}^1D^o$	1 - 2		922
	70	385.283	27.5782 - 287.1280	$3d^6 - 3d^5(a^4G)4p$	$a^3H - {}^5H^o$	5 - 5		922
	20	385.910	27.5782 - 286.7066	$3d^6 - 3d^5(a^4G)4p$	$a^3H - {}^5H^o$	5 - 4		927
	20	386.044	29.1237 - 288.1616	$3d^6 - 3d^5(a^4G)4p$	$a^3F - {}^5F^o$	4 - 4		922
	20	386.106	41.9202 - 300.9181	$3d^6 - 3d^5(a^4D)4p$	$a^3D - {}^3F^o$	3 - 4		922
	90	386.196	41.6269 - 300.5633	$3d^6 - 3d^5(a^4D)4p$	$a^3D - {}^3D^o$	2 - 1		922
	230	386.306	41.7011 - 300.5633	$3d^6 - 3d^5(a^4D)4p$	$a^3D - {}^3D^o$	1 - 1		922
	480	386.645	33.2565 - 291.8914	$3d^6 - 3d^5(a^4G)4p$	$a^3G - {}^3H^o$	5 - 6		922
	400	386.702	41.6269 - 300.2249	$3d^6 - 3d^5(a^4D)4p$	$a^3D - {}^3D^o$	2 - 2		922
	120	386.738	34.0617 - 292.6310	$3d^6 - 3d^5(a^4G)4p$	$a^3G - {}^3H^o$	4 - 4		922
	90	386.945	27.8588 - 286.2936	$3d^6 - 3d^5(a^4G)4p$	$a^3H - {}^5H^o$	4 - 3		927
	60	387.074	57.9241 - 316.2803	$3d^6 - 3d^5(a^2F)4p$	$a^1F - {}^3F^o$	3 - 3		922
	580	387.154	34.0617 - 292.3534	$3d^6 - 3d^5(a^4G)4p$	$a^3G - {}^3H^o$	4 - 5		922
	530	387.176	41.9202 - 300.2010	$3d^6 - 3d^5(a^4D)4p$	$a^3D - {}^5P^o$	3 - 3		922
	340	387.274	34.4164 - 292.6310	$3d^6 - 3d^5(a^4G)4p$	$a^3G - {}^3H^o$	3 - 4		922
	310	387.360	68.7187 - 326.8763	$3d^6 - 3d^5(b^2F)4p$	$b^3F - {}^3F^o$	4 - 4		922

Ni V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	130	387.563	68.7187 – 326.7390	$3d^6 - 3d^5(a^2G)4p$	$b^3F - {}^1F^\circ$	4 – 3		922
	160	387.771	68.8547 – 326.7390	$3d^6 - 3d^5(a^2G)4p$	$b^3F - {}^1F^\circ$	3 – 3		922
	20	388.224	29.1237 – 286.7066	$3d^6 - 3d^5(a^4G)4p$	$a^3F - {}^5H^\circ$	4 – 4		927
	130	388.360	34.0617 – 291.5546	$3d^6 - 3d^5(a^4G)4p$	$a^3G - {}^3F^\circ$	4 – 4		922
	60	388.398	27.1112 – 284.5795	$3d^6 - 3d^5(a^4G)4p$	$a^3H - {}^5G^\circ$	6 – 6		927
	120	388.503	68.6321 – 326.0299	$3d^6 - 3d^5(b^2F)4p$	$b^3F - {}^3F^\circ$	2 – 3		922
	360	388.576	68.6321 – 325.9822	$3d^6 - 3d^5(b^2F)4p$	$b^3F - {}^3F^\circ$	2 – 2		922
	280	388.702	34.0617 – 291.3285	$3d^6 - 3d^5(a^4G)4p$	$a^3G - {}^3F^\circ$	4 – 3		922
	210	388.841	68.8547 – 326.0299	$3d^6 - 3d^5(b^2F)4p$	$b^3F - {}^3F^\circ$	3 – 3		922
	240	389.026	41.9202 – 298.9723	$3d^6 - 3d^5(a^4D)4p$	$a^3D - {}^3D^\circ$	3 – 3		922
	100	389.239	34.4164 – 291.3285	$3d^6 - 3d^5(a^4G)4p$	$a^3G - {}^3F^\circ$	3 – 3		922
	80	389.259	41.7011 – 298.6006	$3d^6 - 3d^5(a^4P)4p$	$a^3D - {}^3D^\circ$	1 – 1		922
	230	389.350	68.7187 – 325.5586	$3d^6 - 3d^5(b^2F)4p$	$b^3F - {}^1G^\circ$	4 – 4		922
	260	389.365	77.8995 – 334.7276	$3d^6 - 3d^5(b^2F)4p$	$b^1G - {}^1F^\circ$	4 – 3		927
	60	389.554	68.8547 – 325.5586	$3d^6 - 3d^5(b^2F)4p$	$b^3F - {}^1G^\circ$	3 – 4		922
	250	389.588	34.4164 – 291.0977	$3d^6 - 3d^5(a^4G)4p$	$a^3G - {}^3F^\circ$	3 – 2		922
	160	389.855	68.7187 – 325.2229	$3d^6 - 3d^5(a^2G)4p$	$b^3F - {}^3G^\circ$	4 – 4		922
	130	390.082	68.8547 – 325.2119	$3d^6 - 3d^5(a^2G)4p$	$b^3F - {}^3G^\circ$	3 – 3		922
	90	390.158	67.5479 – 323.8531	$3d^6 - 3d^5(a^4F)4p$	$b^3P - {}^3F^\circ$	1 – 2		922
	90	390.197	41.7011 – 297.9828	$3d^6 - 3d^5(a^4D)4p$	$a^3D - {}^5P^\circ$	1 – 1		922
	180	390.226	68.7187 – 324.9802	$3d^6 - 3d^5(a^2G)4p$	$b^3F - {}^3G^\circ$	4 – 5		922
	150	390.249	66.7378 – 322.9845	$3d^6 - 3d^5(a^4F)4p$	$b^3P - {}^3D^\circ$	0 – 1		922
	90	390.296	41.6269 – 297.8425	$3d^6 - 3d^5(a^4P)4p$	$a^3D - {}^3D^\circ$	2 – 2		922
	30	390.410	41.7011 – 297.8425	$3d^6 - 3d^5(a^4P)4p$	$a^3D - {}^3D^\circ$	1 – 2		922
	50	390.744	41.9202 – 297.8425	$3d^6 - 3d^5(a^4P)4p$	$a^3D - {}^3D^\circ$	3 – 2		922
	30	390.943	41.6269 – 297.4181	$3d^6 - 3d^5(a^4P)4p$	$a^3D - {}^3D^\circ$	2 – 3		922
	300	391.177	104.4205 – 360.0597	$3d^6 - 3d^5(b^2G)4p$	$b^1D - {}^1F^\circ$	2 – 3		922
	120	391.394	41.9202 – 297.4181	$3d^6 - 3d^5(a^4P)4p$	$a^3D - {}^3D^\circ$	3 – 3		922
	130	391.487	67.5479 – 322.9845	$3d^6 - 3d^5(a^4F)4p$	$b^3P - {}^3D^\circ$	1 – 1		922
	230	391.816	68.6321 – 323.8531	$3d^6 - 3d^5(a^4F)4p$	$b^3F - {}^3F^\circ$	2 – 2		922
	480	392.010	77.8995 – 332.9956	$3d^6 - 3d^5(a^2H)4p$	$b^1G - {}^1G^\circ$	4 – 4		922
	250	392.159	68.8547 – 323.8531	$3d^6 - 3d^5(a^4F)4p$	$b^3F - {}^3F^\circ$	3 – 2		922
	250	392.328	68.6321 – 323.5232	$3d^6 - 3d^5(a^4F)4p$	$b^3F - {}^3F^\circ$	2 – 3		922
	310	392.458	68.7187 – 323.5232	$3d^6 - 3d^5(a^4F)4p$	$b^3F - {}^3F^\circ$	4 – 3		922
	80	392.623	69.1561 – 323.8531	$3d^6 - 3d^5(a^4F)4p$	$b^3P - {}^3F^\circ$	2 – 2		922
	370	392.659	68.8547 – 323.5232	$3d^6 - 3d^5(a^4F)4p$	$b^3F - {}^3F^\circ$	3 – 3		922
	190	393.134	69.1561 – 323.5232	$3d^6 - 3d^5(a^4F)4p$	$b^3P - {}^3F^\circ$	2 – 3		922
	250	393.155	29.8992 – 284.2490	$3d^6 - 3d^5(a^4G)4p$	$a^3F - {}^5G^\circ$	2 – 3		922
	100	393.211	29.8992 – 284.2155	$3d^6 - 3d^5(a^4G)4p$	$a^3F - {}^5G^\circ$	2 – 2		927
	440	393.543	68.7187 – 322.8208	$3d^6 - 3d^5(a^4F)4p$	$b^3F - {}^3F^\circ$	4 – 4		922
	140	393.573	57.9241 – 312.0083	$3d^6 - 3d^5(a^2F)4p$	$a^1F - {}^1G^\circ$	3 – 4		922
	240	393.858	68.7187 – 322.6176	$3d^6 - 3d^5(a^4F)4p$	$b^3F - {}^3D^\circ$	4 – 3		922
	700	393.914	0.0 – 253.8627	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - {}^5P^\circ$	4 – 3		922
	130	394.005	68.6321 – 322.4364	$3d^6 - 3d^5(a^4F)4p$	$b^3F - {}^3D^\circ$	2 – 2		922
	180	394.070	68.8547 – 322.6176	$3d^6 - 3d^5(a^4F)4p$	$b^3F - {}^3D^\circ$	3 – 3		922
	660	394.313	0.8897 – 254.4956	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - {}^5P^\circ$	3 – 2		922
	260	394.350	68.8547 – 322.4364	$3d^6 - 3d^5(a^4F)4p$	$b^3F - {}^3D^\circ$	3 – 2		922
	270	394.537	69.1561 – 322.6176	$3d^6 - 3d^5(a^4F)4p$	$b^3P - {}^3D^\circ$	2 – 3		922
	520	394.641	1.4899 – 254.8850	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - {}^5P^\circ$	2 – 1		922
	90	394.819	69.1561 – 322.4364	$3d^6 - 3d^5(a^4F)4p$	$b^3P - {}^3D^\circ$	2 – 2		922
	660	395.242	1.4899 – 254.4956	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - {}^5P^\circ$	2 – 2		922
	580	395.299	0.8897 – 253.8627	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - {}^5P^\circ$	3 – 3		922
	420	395.527	2.0576 – 254.8850	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - {}^5P^\circ$	0 – 1		922
	340	395.845	1.8715 – 254.4956	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - {}^5P^\circ$	1 – 2		922

Ni V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	210	396.239	1.4899 - 253.8627	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - {}^5P°$	2 - 3		922
	70	396.256	68.7187 - 321.0819	$3d^6 - 3d^5(a^2F)4p$	$b^3F - {}^1F°$	4 - 3		922
	30	397.015	68.6321 - 320.5138	$3d^6 - 3d^5(a^2G)4p$	$b^3F - {}^3F°$	2 - 3		922
	230	398.336	68.8547 - 319.8991	$3d^6 - 3d^5(a^4F)4p$	$b^3F - {}^3G°$	3 - 4		922
	310	398.514	68.7187 - 319.6527	$3d^6 - 3d^5(a^4F)4p$	$b^3F - {}^3G°$	4 - 5		922
	410	400.588	41.9202 - 291.5546	$3d^6 - 3d^5(a^4G)4p$	$a^3D - {}^3F°$	3 - 4		922
	250	400.871	77.8995 - 327.3566	$3d^6 - 3d^5(a^2H)4p$	$b^1G - {}^1H°$	4 - 5		922
	120	400.952	41.9202 - 291.3285	$3d^6 - 3d^5(a^4G)4p$	$a^3D - {}^3F°$	3 - 3		922
	260	400.969	41.7011 - 291.0977	$3d^6 - 3d^5(a^4G)4p$	$a^3D - {}^3F°$	1 - 2		922
	20	401.644	77.8995 - 326.8763	$3d^6 - 3d^5(b^2F)4p$	$b^1G - {}^3F°$	4 - 4		922
	20	402.024	68.6321 - 317.3768	$3d^6 - 3d^5(a^2H)4p$	$b^3F - {}^3G°$	2 - 3		922
	210	402.515	77.8995 - 326.3371	$3d^6 - 3d^5(a^2G)4p$	$b^1G - {}^1H°$	4 - 5		922
	60	403.172	68.8547 - 316.8878	$3d^6 - 3d^5(a^2H)4p$	$b^3F - {}^3G°$	3 - 4		922
	50	403.211	68.7187 - 316.7266	$3d^6 - 3d^5(a^2H)4p$	$b^3F - {}^3G°$	4 - 5		922
	60	403.781	77.8995 - 325.5586	$3d^6 - 3d^5(b^2F)4p$	$b^1G - {}^1G°$	4 - 4		922
	20	404.954	66.7378 - 313.6790	$3d^6 - 3d^5(a^2D)4p$	$b^3P - {}^3D°$	0 - 1		922
	110	407.953	104.4205 - 349.5460	$3d^6 - 3d^5(b^2D)4p$	$b^1D - {}^1D°$	2 - 2		922
	80	408.443	68.8547 - 313.6866	$3d^6 - 3d^5(a^2D)4p$	$b^3F - {}^3D°$	3 - 2		922
	20	409.127	67.5479 - 311.9665	$3d^6 - 3d^5(a^2D)4p$	$b^3P - {}^3P°$	1 - 2		922
	80	409.451	68.7187 - 312.9536	$3d^6 - 3d^5(a^2F)4p$	$b^3F - {}^3D°$	4 - 3		922
	180	410.495	0.0 - 243.6085	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - {}^7P°$	4 - 3		927
	220	413.321	0.8897 - 242.8370	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - {}^7P°$	3 - 2		927
	20	414.344	1.4899 - 242.8370	$3d^6 - 3d^5(a^6S)4p$	$ga^5D - {}^7P°$	2 - 2		927
	70	418.237	68.6321 - 307.7311	$3d^6 - 3d^5(a^2D)4p$	$b^3F - {}^3F°$	2 - 2		922
	120	418.704	67.5479 - 306.3778	$3d^6 - 3d^5(a^4D)4p$	$b^3P - {}^3P°$	1 - 2		922
	50	420.456	67.5479 - 305.3869	$3d^6 - 3d^5(a^4D)4p$	$b^3P - {}^3P°$	1 - 0		927
	120	421.547	69.1561 - 306.3778	$3d^6 - 3d^5(a^4D)4p$	$b^3P - {}^3P°$	2 - 2		922
	50	422.510	69.1561 - 305.8381	$3d^6 - 3d^5(a^4D)4p$	$b^3P - {}^3P°$	2 - 1		922
	20	424.273	67.5479 - 303.2495	$3d^6 - 3d^5(a^4P)4p$	$b^3P - {}^3S°$	1 - 1		922
		461.69	0.0 - 216.5960	$3d^6 - 3d^5(a^4D)4s$	$ga^5D - {}^5D$	4 - 3	F,P	375,927
		462.56	0.0 - 216.1899	$3d^6 - 3d^5(a^4D)4s$	$ga^5D - {}^5D$	4 - 4	F,P	375,927
		463.59	0.8897 - 216.5960	$3d^6 - 3d^5(a^4D)4s$	$ga^5D - {}^5D$	3 - 3	F,P	375,927
		463.61	0.8897 - 216.5905	$3d^6 - 3d^5(a^4D)4s$	$ga^5D - {}^5D$	3 - 2	F,P	375,927
		463.94	0.8897 - 216.4347	$3d^6 - 3d^5(a^4D)4s$	$ga^5D - {}^5D$	3 - 1	F,P	375,927
		464.27	27.1112 - 242.5043	$3d^6 - 3d^5(a^2G)4s$	$a^1H - {}^3G$	6 - 4	F,P	375,927
		464.47	0.8897 - 216.1899	$3d^6 - 3d^5(a^4D)4s$	$ga^5D - {}^5D$	3 - 4	F,P	375,927
		464.89	1.4899 - 216.5960	$3d^6 - 3d^5(a^4D)4s$	$ga^5D - {}^5D$	2 - 3	F,P	375,927
		465.24	1.4899 - 216.4347	$3d^6 - 3d^5(a^4D)4s$	$ga^5D - {}^5D$	2 - 1	F,P	375,927
		465.52	1.4899 - 216.3054	$3d^6 - 3d^5(a^4D)4s$	$ga^5D - {}^5D$	2 - 0	F,P	375,927
		465.72	1.8715 - 216.5905	$3d^6 - 3d^5(a^4D)4s$	$ga^5D - {}^5D$	1 - 2	F,P	375,927
		465.77	1.4899 - 216.1899	$3d^6 - 3d^5(a^4D)4s$	$ga^5D - {}^5D$	2 - 4	F,P	375,927
		466.06	1.8715 - 216.4347	$3d^6 - 3d^5(a^4D)4s$	$ga^5D - {}^5D$	1 - 1	F,P	375,927
		466.13	2.0576 - 216.5905	$3d^6 - 3d^5(a^4D)4s$	$ga^5D - {}^5D$	0 - 2	F,P	375,927
		466.34	1.8715 - 216.3054	$3d^6 - 3d^5(a^4D)4s$	$ga^5D - {}^5D$	1 - 0	F,P	375,927
		466.47	2.0576 - 216.4347	$3d^6 - 3d^5(a^4D)4s$	$ga^5D - {}^5D$	0 - 1	F,P	375,927
		471.14	0.0 - 212.2534	$3d^6 - 3d^5(a^4P)4s$	$ga^5D - {}^5P$	4 - 2	F,P	375,927
		471.49	0.0 - 212.0958	$3d^6 - 3d^5(a^4P)4s$	$ga^5D - {}^5P$	4 - 3	F,P	375,927
		472.67	0.8897 - 212.4557	$3d^6 - 3d^5(a^4P)4s$	$ga^5D - {}^5P$	3 - 1	F,P	375,927
		473.12	0.8897 - 212.2534	$3d^6 - 3d^5(a^4P)4s$	$ga^5D - {}^5P$	3 - 2	F,P	375,927
		473.47	0.8897 - 212.0958	$3d^6 - 3d^5(a^4P)4s$	$ga^5D - {}^5P$	3 - 3	F,P	375,927
		474.01	1.4899 - 212.4557	$3d^6 - 3d^5(a^4P)4s$	$ga^5D - {}^5P$	2 - 1	F,P	375,927
		474.47	1.4899 - 212.2534	$3d^6 - 3d^5(a^4P)4s$	$ga^5D - {}^5P$	2 - 2	F,P	375,927
		474.87	1.8715 - 212.4557	$3d^6 - 3d^5(a^4P)4s$	$ga^5D - {}^5P$	1 - 1	F,P	375,927
		480.39	0.0 - 208.1637	$3d^6 - 3d^5(a^4G)4s$	$ga^5D - {}^5G$	4 - 4	F,P	375,927

Ni V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		480.47	0.0 – 208.1310	$3d^6$ – $3d^5(a^4G)4s$	ga^{5}D – ^{5}G	4 – 5	F,P	375,927
		480.66	0.0 – 208.0464	$3d^6$ – $3d^5(a^4G)4s$	ga^{5}D – ^{5}G	4 – 6	F,P	375,927
		482.45	0.8897 – 208.1637	$3d^6$ – $3d^5(a^4G)4s$	ga^{5}D – ^{5}G	3 – 4	F,P	375,927
		482.53	0.8897 – 208.1310	$3d^6$ – $3d^5(a^4G)4s$	ga^{5}D – ^{5}G	3 – 5	F,P	375,927
		483.85	1.4899 – 208.1646	$3d^6$ – $3d^5(a^4G)4s$	ga^{5}D – ^{5}G	2 – 3	F,P	375,927
		483.88	1.4899 – 208.1515	$3d^6$ – $3d^5(a^4G)4s$	ga^{5}D – ^{5}G	2 – 2	F,P	375,927
		484.75	1.8715 – 208.1646	$3d^6$ – $3d^5(a^4G)4s$	ga^{5}D – ^{5}G	1 – 3	F,P	375,927
		484.78	1.8715 – 208.1515	$3d^6$ – $3d^5(a^4G)4s$	ga^{5}D – ^{5}G	1 – 2	F,P	375,927
		485.22	2.0576 – 208.1515	$3d^6$ – $3d^5(a^4G)4s$	ga^{5}D – ^{5}G	0 – 2	F,P	375,927
		607.81	0.0 – 164.5259	$3d^6$ – $3d^5(a^6S)4s$	ga^{5}D – ^{7}S	4 – 3	F,P	375,927
		611.11	0.8897 – 164.5259	$3d^6$ – $3d^5(a^6S)4s$	ga^{5}D – ^{7}S	3 – 3	F,P	375,927
	30	990.816	216.5905 – 317.5175	$3d^5(a^4D)4s$ – $3d^5(a^4F)4p$	^{5}D – ^{5}D°	2 – 2		927
	90	990.867	216.5960 – 317.5175	$3d^5(a^4D)4s$ – $3d^5(a^4F)4p$	^{5}D – ^{5}D°	3 – 2		927
	110	993.676	216.5960 – 317.2320	$3d^5(a^4D)4s$ – $3d^5(a^4F)4p$	^{5}D – ^{5}D°	3 – 3		927
	180	1002.410	217.1291 – 316.8878	$3d^5(a^4G)4s$ – $3d^5(a^2H)4p$	^{3}G – ^{3}G°	4 – 4		927
	270	1003.233	217.0487 – 316.7266	$3d^5(a^4G)4s$ – $3d^5(a^2H)4p$	^{3}G – ^{3}G°	5 – 5		927
	140	1008.269	217.1010 – 316.2803	$3d^5(a^4G)4s$ – $3d^5(a^2F)4p$	^{3}G – ^{3}F°	3 – 3		927
	540	1010.338	216.1899 – 315.1682	$3d^5(a^4D)4s$ – $3d^5(a^4F)4p$	^{5}D – ^{5}F°	4 – 5		927
	340	1020.382	208.0464 – 306.0490	$3d^5(a^4G)4s$ – $3d^5(a^2I)4p$	^{5}G – ^{3}I°	6 – 5		927
	320	1020.707	216.5905 – 314.5628	$3d^5(a^4D)4s$ – $3d^5(a^4F)4p$	^{5}D – ^{5}F°	2 – 3		927
	140	1021.536	251.6549 – 349.5460	$3d^5(b^2F)4s$ – $3d^5(b^2D)4p$	^{1}F – ^{1}D°	3 – 2		927
	50	1024.462	216.5960 – 314.2088	$3d^5(a^4D)4s$ – $3d^5(a^2F)4p$	^{5}D – ^{3}F°	3 – 4		927
	280	1026.306						927
	220	1026.504	225.2007 – 322.6176	$3d^5(a^4D)4s$ – $3d^5(a^4F)4p$	^{3}D – ^{3}D°	3 – 3		927
	150	1043.230	225.2007 – 321.0564	$3d^5(a^4D)4s$ – $3d^5(a^2G)4p$	^{3}D – ^{3}F°	3 – 4		927
	20	1044.633	247.1650 – 342.8946	$3d^5(b^2F)4s$ – $3d^5(b^2D)4p$	^{3}F – ^{3}F°	2 – 2		927
	550	1047.429	225.5451 – 321.0183	$3d^5(a^4D)4s$ – $3d^5(a^2G)4p$	^{3}D – ^{3}F°	1 – 2		927
	110	1058.190	229.4088 – 323.9086	$3d^5(a^2I)4s$ – $3d^5(a^2G)4p$	^{3}I – ^{3}H°	6 – 5		927
	100	1064.534	221.4290 – 315.3661	$3d^5(a^4P)4s$ – $3d^5(a^2F)4p$	^{3}P – ^{3}D°	1 – 2		927
	150	1074.646	253.9052 – 346.9595	$3d^5(a^2S)4s$ – $3d^5(b^2D)4p$	^{3}S – ^{3}P°	1 – 1		927
	300	1075.182	253.9052 – 346.9124	$3d^5(a^2S)4s$ – $3d^5(b^2D)4p$	^{3}S – ^{3}P°	1 – 2		927
	640	1081.097	233.8392 – 326.3371	$3d^5(a^2I)4s$ – $3d^5(a^2G)4p$	^{1}I – ^{1}H°	6 – 5		927
	170	1089.481	268.2739 – 360.0597	$3d^5(b^2D)4s$ – $3d^5(b^2G)4p$	^{1}D – ^{1}F°	2 – 3		927
	230	1094.767	229.4406 – 320.7831	$3d^5(a^2I)4s$ – $3d^5(a^2H)4p$	^{3}I – ^{3}I°	7 – 7		927
	600	1105.561	229.4088 – 319.8604	$3d^5(a^2I)4s$ – $3d^5(a^2H)4p$	^{3}I – ^{3}I°	6 – 6		927
	420	1115.298	229.4130 – 319.0762	$3d^5(a^2I)4s$ – $3d^5(a^2H)4p$	^{3}I – ^{3}I°	5 – 5		927
	580	1119.345	164.5259 – 253.8627	$3d^5(a^6S)4s$ – $3d^5(a^6S)4p$	^{7}S – ^{5}P°	3 – 3		927
	820	1120.894	241.0822 – 330.2976	$3d^5(a^2H)4s$ – $3d^5(b^2F)4p$	^{3}H – ^{3}G°	5 – 4		927
	820	1124.311	241.7736 – 330.7181	$3d^5(a^2H)4s$ – $3d^5(b^2F)4p$	^{3}H – ^{3}G°	6 – 5		927
	540	1125.053	208.0464 – 296.9329	$3d^5(a^4G)4s$ – $3d^5(a^4G)4p$	^{5}G – ^{5}G°	6 – 5		927
	440	1135.020	212.0958 – 300.2010	$3d^5(a^4P)4s$ – $3d^5(a^4D)4p$	^{5}P – ^{5}P°	3 – 3		927
	180	1137.829	229.4406 – 317.3273	$3d^5(a^2I)4s$ – $3d^5(a^2H)4p$	^{3}I – ^{3}H°	7 – 6		927
	530	1139.055	242.5043 – 330.2976	$3d^5(a^2G)4s$ – $3d^5(b^2F)4p$	^{3}G – ^{3}G°	4 – 4		927
	90	1141.140	239.1077 – 326.7390	$3d^5(a^2D)4s$ – $3d^5(a^2G)4p$	^{1}D – ^{1}F°	2 – 3		927
	20	1141.758	242.2904 – 329.8729	$3d^5(a^2G)4s$ – $3d^5(b^2F)4p$	^{3}G – ^{3}D°	3 – 3		927
	50	1143.576	247.2818 – 334.7276	$3d^5(b^2F)4s$ – $3d^5(b^2F)4p$	^{3}F – ^{1}F°	4 – 3		927
	690	1144.197	208.0464 – 295.4443	$3d^5(a^4G)4s$ – $3d^5(a^4D)4p$	^{5}G – ^{5}F°	6 – 5		927
	450	1144.602						927
	450	1145.318	208.1310 – 295.4443	$3d^5(a^4G)4s$ – $3d^5(a^4D)4p$	^{5}G – ^{5}F°	5 – 5		927
	310	1149.889	243.3315 – 330.2976	$3d^5(a^4F)4s$ – $3d^5(b^2F)4p$	^{3}F – ^{3}G°	4 – 4		927
	540	1150.096	212.0958 – 299.0456	$3d^5(a^4P)4s$ – $3d^5(a^4D)4p$	^{5}P – ^{5}P°	3 – 2		927
	170	1150.482						927
	690	1151.066	212.0958 – 298.9723	$3d^5(a^4P)4s$ – $3d^5(a^4D)4p$	^{5}P – ^{3}D°	3 – 3		927
	660	1151.972	208.1310 – 294.9396	$3d^5(a^4G)4s$ – $3d^5(a^4D)4p$	^{5}G – ^{5}F°	5 – 4		927

Ni V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	310	1152.179	212.2534 – 299.0456	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	${}^5P - {}^5P^\circ$	2 – 2		927
	460	1152.403	208.1637 – 294.9396	$3d^5(a^4G)4s - 3d^5(a^4D)4p$	${}^5G - {}^5F^\circ$	4 – 4		927
	490	1152.533	225.2007 – 311.9665	$3d^5(a^4D)4s - 3d^5(a^2D)4p$	${}^3D - {}^3P^\circ$	3 – 2		927
	780	1152.687	246.2409 – 332.9956	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	${}^1H - {}^1G^\circ$	5 – 4		927
	70	1153.994	229.4130 – 316.0688	$3d^5(a^2I)4s - 3d^5(a^2F)4p$	${}^3I - {}^3G^\circ$	5 – 4		927
	280	1154.888	212.4557 – 299.0456	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	${}^5P - {}^5P^\circ$	1 – 2		927
	40	1155.471	240.1938 – 326.7390	$3d^5(a^2F)4s - 3d^5(a^2G)4p$	${}^1F - {}^1F^\circ$	3 – 3		927
	30	1155.929	243.2662 – 329.7763	$3d^5(a^4F)4s - 3d^5(b^2F)4p$	${}^3F - {}^3D^\circ$	2 – 2		927
	150	1157.343	243.3705 – 329.7763	$3d^5(a^4F)4s - 3d^5(b^2F)4p$	${}^3F - {}^3D^\circ$	3 – 2		927
	260	1157.450	240.9596 – 327.3566	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	${}^3H - {}^1H^\circ$	4 – 5		927
	420	1158.127	212.2534 – 298.6006	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	${}^5P - {}^3D^\circ$	2 – 1		927
	790	1159.021	208.1637 – 294.4433	$3d^5(a^4G)4s - 3d^5(a^4D)4p$	${}^5G - {}^5F^\circ$	4 – 3		927
	190	1159.521	243.3705 – 329.6143	$3d^5(a^4F)4s - 3d^5(b^2F)4p$	${}^3F - {}^3G^\circ$	3 – 3		927
	320	1160.120						927
	130	1163.362	229.4130 – 315.3701	$3d^5(a^2I)4s - 3d^5(a^2G)4p$	${}^3I - {}^3H^\circ$	5 – 4		927
	450	1163.523	247.0491 – 332.9956	$3d^5(a^2G)4s - 3d^5(a^2H)4p$	${}^1G - {}^1G^\circ$	4 – 4		927
	260	1163.688	208.1515 – 294.0860	$3d^5(a^4G)4s - 3d^5(a^4D)4p$	${}^5G - {}^5F^\circ$	2 – 2		927
	630	1163.865	208.1646 – 294.0860	$3d^5(a^4G)4s - 3d^5(a^4D)4p$	${}^5G - {}^5F^\circ$	3 – 2		927
	70	1165.596	241.0822 – 326.8763	$3d^5(a^2H)4s - 3d^5(b^2F)4p$	${}^3H - {}^3F^\circ$	5 – 4		927
	180	1165.861	234.1254 – 319.8991	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	${}^5F - {}^3G^\circ$	4 – 4		927
	240	1166.226	212.0958 – 297.8425	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	${}^5P - {}^3D^\circ$	3 – 2		927
	320	1166.475	212.2534 – 297.9828	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	${}^5P - {}^5P^\circ$	2 – 1		927
	370	1166.683	247.2818 – 332.9956	$3d^5(b^2F)4s - 3d^5(a^2H)4p$	${}^3F - {}^1G^\circ$	4 – 4		927
	650	1167.113	208.1515 – 293.8338	$3d^5(a^4G)4s - 3d^5(a^4D)4p$	${}^5G - {}^5F^\circ$	2 – 1		927
	20	1167.893	234.2752 – 319.8991	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	${}^5F - {}^3G^\circ$	3 – 4		927
	50	1168.166	212.4557 – 298.0600	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	${}^5P - {}^5D^\circ$	1 – 0		927
	390	1168.626	234.0821 – 319.6527	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	${}^5F - {}^3G^\circ$	5 – 5		927
	290	1170.254	306.9629 – 392.4135	$3d^5(c^2D)4s - 3d^5(c^2D)4p$	${}^3D - {}^3P^\circ$	3 – 2		927
	450	1171.138	212.4557 – 297.8425	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	${}^5P - {}^3D^\circ$	1 – 2		927
	350	1171.450	240.1938 – 325.5586	$3d^5(a^2F)4s - 3d^5(b^2F)4p$	${}^1F - {}^1G^\circ$	3 – 4		927
	240	1171.712	234.2752 – 319.6202	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	${}^5F - {}^3G^\circ$	3 – 3		927
	150	1172.128	229.4406 – 314.7564	$3d^5(a^2I)4s - 3d^5(a^4F)4p$	${}^3I - {}^5G^\circ$	7 – 6		927
	420	1172.468	221.0876 – 306.3778	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	${}^3P - {}^3P^\circ$	2 – 2		927
	800	1174.202	212.2534 – 297.4181	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	${}^5P - {}^3D^\circ$	2 – 3		927
	760	1176.986	212.4557 – 297.4179	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	${}^5P - {}^5D^\circ$	1 – 1		927
	180	1177.178	221.4290 – 306.3778	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	${}^3P - {}^3P^\circ$	1 – 2		927
	160	1177.601	212.0958 – 297.0139	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	${}^5P - {}^5D^\circ$	3 – 2		927
	610	1178.227	216.5960 – 301.4702	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	${}^5D - {}^3F^\circ$	3 – 3		927
	170	1178.382	234.2752 – 319.1387	$3d^5(a^4F)4s - 3d^5(a^2G)4p$	${}^5F - {}^1G^\circ$	3 – 4		927
	20	1178.806	232.5459 – 317.3768	$3d^5(a^2D)4s - 3d^5(a^2H)4p$	${}^3D - {}^3G^\circ$	3 – 3		927
	710	1178.914	212.0958 – 296.9193	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	${}^5P - {}^5D^\circ$	3 – 4		927
	560	1179.234	212.0958 – 296.8970	$3d^5(a^4P)4s - 3d^5(a^4G)4p$	${}^5P - {}^3G^\circ$	3 – 4		927
	700	1179.970						927
	570	1180.256	216.1899 – 300.9181	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	${}^5D - {}^3F^\circ$	4 – 4		927
	70	1182.506	232.9108 – 317.4779	$3d^5(a^2D)4s - 3d^5(a^4F)4p$	${}^3D - {}^5D^\circ$	1 – 1		927
	620	1182.615	212.4557 – 297.0139	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	${}^5P - {}^5D^\circ$	1 – 2		927
	20	1182.724	232.9108 – 317.4623	$3d^5(a^2D)4s - 3d^5(a^4F)4p$	${}^3D - {}^5D^\circ$	1 – 0		927
	260	1183.767	241.0822 – 325.5586	$3d^5(a^2H)4s - 3d^5(b^2F)4p$	${}^3H - {}^1G^\circ$	5 – 4		927
	30	1185.236	242.5043 – 326.8763	$3d^5(a^2G)4s - 3d^5(b^2F)4p$	${}^3G - {}^3F^\circ$	4 – 4		927
	770	1185.948	212.2534 – 296.5740	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	${}^5P - {}^5D^\circ$	2 – 3		927
	20	1187.197	235.4206 – 319.6527	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	${}^3F - {}^3G^\circ$	4 – 5		927
	200	1187.321	208.1310 – 292.3534	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	${}^5G - {}^3H^\circ$	5 – 5		927
	350	1187.781	235.7365 – 319.9265	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	${}^3F - {}^1D^\circ$	2 – 2		927
	550	1189.544	241.0822 – 325.1484	$3d^5(a^2H)4s - 3d^5(a^2G)4p$	${}^3H - {}^3H^\circ$	5 – 6		927

NI V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	20	1189.687	229.4088 – 313.4647	$3d^5(a^2I)4s - 3d^5(a^4F)4p$	$^3I - ^5G^\circ$	6 – 5		927
	550	1190.334	216.1899 – 300.2010	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - ^5P^\circ$	4 – 3		927
	220	1191.082	221.4290 – 305.3869	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	$^3P - ^3P^\circ$	1 – 0		927
	330	1192.687	208.0464 – 291.8914	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^3H^\circ$	6 – 6		927
	20	1192.849	242.5043 – 326.3371	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^3G - ^1H^\circ$	4 – 5		927
	90	1193.612	274.6954 – 358.4756	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$^3G - ^1H^\circ$	5 – 5		927
	440	1193.887	208.1310 – 291.8914	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^3H^\circ$	5 – 6		927
	550	1194.282	240.1938 – 323.9263	$3d^5(a^2F)4s - 3d^5(a^2H)4p$	$^1F - ^3H^\circ$	3 – 4		927
	30	1194.498	235.4206 – 319.1387	$3d^5(a^2F)4s - 3d^5(a^2G)4p$	$^3F - ^1G^\circ$	4 – 4		927
	20	1194.576	306.9629 – 390.6751	$3d^5(c^2D)4s - 3d^5(c^2D)4p$	$^3D - ^1D^\circ$	3 – 2		927
	390	1194.862	242.2904 – 325.9822	$3d^5(a^2G)4s - 3d^5(b^2F)4p$	$^3G - ^3F^\circ$	3 – 2		927
	710	1195.192	247.0491 – 330.7181	$3d^5(a^2G)4s - 3d^5(b^2F)4p$	$^1G - ^3G^\circ$	4 – 5		927
	120	1195.825	232.6556 – 316.2803	$3d^5(a^2D)4s - 3d^5(a^2F)4p$	$^3D - ^3F^\circ$	2 – 3		927
	100	1196.036	216.5905 – 300.2010	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - ^5P^\circ$	2 – 3		927
	630	1196.118	216.5960 – 300.2010	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - ^5P^\circ$	3 – 3		927
	300	1196.975	243.3315 – 326.8763	$3d^5(a^4F)4s - 3d^5(b^2F)4p$	$^3F - ^3F^\circ$	4 – 4		927
	370	1197.274	232.5459 – 316.0688	$3d^5(a^2D)4s - 3d^5(a^2F)4p$	$^3D - ^3G^\circ$	3 – 4		927
	370	1197.378	306.9629 – 390.4782	$3d^5(c^2D)4s - 3d^5(c^2D)4p$	$^3D - ^3D^\circ$	3 – 3		927
	230	1197.975	242.8626 – 326.3371	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^3G - ^1H^\circ$	5 – 5		927
	230	1197.998	236.4541 – 319.9265	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$^3F - ^1D^\circ$	3 – 2		927
	410	1198.278	307.0252 – 390.4782	$3d^5(c^2D)4s - 3d^5(c^2D)4p$	$^3D - ^3D^\circ$	2 – 3		927
	710	1198.525	247.2818 – 330.7181	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$^3F - ^3G^\circ$	4 – 5		927
	210	1198.699	208.1310 – 291.5546	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^3F^\circ$	5 – 4		927
	270	1198.898						927
	800	1199.402	241.7736 – 325.1484	$3d^5(a^2H)4s - 3d^5(a^2G)4p$	$^3H - ^3H^\circ$	6 – 6		927
	230	1200.947	242.2904 – 325.5586	$3d^5(a^2G)4s - 3d^5(b^2F)4p$	$^3G - ^1G^\circ$	3 – 4		927
	290	1201.087	263.7009 – 346.9595	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$^3D - ^3P^\circ$	1 – 1		927
	440	1201.197	234.1254 – 317.3768	$3d^5(a^4F)4s - 3d^5(a^2H)4p$	$^5F - ^3G^\circ$	4 – 3		927
	460	1201.324	234.2752 – 317.5175	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5D^\circ$	3 – 2		927
	340	1201.594	263.7357 – 346.9595	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$^3D - ^3P^\circ$	2 – 1		927
	240	1201.644	263.7009 – 346.9202	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$^3D - ^3P^\circ$	1 – 0		927
	460	1201.760	263.7009 – 346.9124	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$^3D - ^3P^\circ$	1 – 2		927
	350	1201.834	241.7736 – 324.9802	$3d^5(a^2H)4s - 3d^5(a^2G)4p$	$^3H - ^3G^\circ$	6 – 5		927
	290	1201.857	247.1650 – 330.3707	$3d^5(b^2F)4s - 3d^5(a^2S)4p$	$^3F - ^3P^\circ$	2 – 1		927
	750	1202.040	247.1049 – 330.2976	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$^3F - ^3G^\circ$	3 – 4		927
	380	1202.261	263.7357 – 346.9124	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$^3D - ^3P^\circ$	2 – 2		927
	290	1202.427	208.1637 – 291.3285	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^3F^\circ$	4 – 3		927
	780	1203.285	263.8058 – 346.9124	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$^3D - ^3P^\circ$	3 – 2		927
	790	1203.314	234.4127 – 317.5175	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5D^\circ$	2 – 2		927
	630	1203.361	217.1010 – 300.2010	$3d^5(a^4G)4s - 3d^5(a^4D)4p$	$^3G - ^5P^\circ$	3 – 3		927
	740	1203.776	217.1291 – 300.2010	$3d^5(a^4G)4s - 3d^5(a^4D)4p$	$^3G - ^5P^\circ$	4 – 3		927
	720	1203.871	234.4127 – 317.4779	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5D^\circ$	2 – 1		927
	120	1204.738	243.3315 – 326.3371	$3d^5(a^4F)4s - 3d^5(a^2G)4p$	$^3F - ^1H^\circ$	4 – 5		927
	600	1205.310	240.9596 – 323.9263	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	$^3H - ^3H^\circ$	4 – 4		927
	640	1205.453	234.2752 – 317.2320	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5D^\circ$	3 – 3		927
	640	1205.559	240.9596 – 323.9086	$3d^5(a^2H)4s - 3d^5(a^2G)4p$	$^3H - ^3H^\circ$	4 – 5		927
	210	1205.794	242.2904 – 325.2229	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^3G - ^3G^\circ$	3 – 4		927
	530	1205.957	242.2904 – 325.2119	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^3G - ^3G^\circ$	3 – 3		927
	800	1207.345	241.0822 – 323.9086	$3d^5(a^2H)4s - 3d^5(a^2G)4p$	$^3H - ^3H^\circ$	5 – 5		927
	670	1207.394	247.0491 – 329.8729	$3d^5(a^2G)4s - 3d^5(b^2F)4p$	$^1G - ^3D^\circ$	4 – 3		927
	490	1207.452	234.4127 – 317.2320	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5D^\circ$	2 – 3		927
	90	1207.636	234.0821 – 316.8878	$3d^5(a^4F)4s - 3d^5(a^2H)4p$	$^5F - ^3G^\circ$	5 – 4		927
	210	1207.989	216.1899 – 298.9723	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - ^3D^\circ$	4 – 3		927
	130	1208.210	247.1049 – 329.8729	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$^3F - ^3D^\circ$	3 – 3		927

NI V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	20	1208.266	234.1254 – 316.8878	$3d^5(a^4F)4s - 3d^5(a^2H)4p$	$^5F - ^3G^\circ$	4 – 4		927
	650	1208.908	242.5043 – 325.2229	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^3G - ^3G^\circ$	4 – 4		927
	480	1208.966	243.2662 – 325.9822	$3d^5(a^4F)4s - 3d^5(b^2F)4p$	$^3F - ^3F^\circ$	2 – 2		927
	530	1209.099	247.1650 – 329.8729	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$^3F - ^3D^\circ$	2 – 3		927
	300	1209.225	243.3315 – 326.0299	$3d^5(a^4F)4s - 3d^5(b^2F)4p$	$^3F - ^3F^\circ$	4 – 3		927
	220	1209.431	236.4541 – 319.1387	$3d^5(a^2F)4s - 3d^5(a^2G)4p$	$^3F - ^1G^\circ$	3 – 4		927
	700	1209.607	247.1049 – 329.7763	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$^3F - ^3D^\circ$	3 – 2		927
	790	1209.771	234.0821 – 316.7440	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5D^\circ$	5 – 4		927
	810	1210.399	234.1254 – 316.7440	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5D^\circ$	4 – 4		927
	850	1210.509	247.1650 – 329.7763	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$^3F - ^3D^\circ$	2 – 2		927
	190	1210.638	234.1254 – 316.7266	$3d^5(a^4F)4s - 3d^5(a^2H)4p$	$^5F - ^3G^\circ$	4 – 5		927
	480	1210.736	229.4130 – 312.0083	$3d^5(a^2I)4s - 3d^5(a^2F)4p$	$^3I - ^1G^\circ$	5 – 4		927
	420	1210.799	247.2818 – 329.8729	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$^3F - ^3D^\circ$	4 – 3		927
	240	1211.424	307.0252 – 389.5718	$3d^5(c^2D)4s - 3d^5(c^2D)4p$	$^3D - ^3D^\circ$	2 – 2		927
	210	1211.999	247.1049 – 329.6143	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$^3F - ^3G^\circ$	3 – 3		927
	150	1212.474	242.5043 – 324.9802	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^3G - ^3G^\circ$	4 – 5		927
	590	1212.592	307.1051 – 389.5718	$3d^5(c^2D)4s - 3d^5(c^2D)4p$	$^3D - ^3D^\circ$	1 – 2		927
	780	1212.780	216.5905 – 299.0456	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - ^5P^\circ$	2 – 2		927
	460	1212.889	247.1650 – 329.6143	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$^3F - ^3G^\circ$	2 – 3		927
	200	1213.237	240.1938 – 322.6176	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	$^1F - ^3D^\circ$	3 – 3		927
	520	1213.589	235.1165 – 317.5175	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5D^\circ$	1 – 2		927
	660	1213.859	216.5905 – 298.9723	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - ^3D^\circ$	2 – 3		927
	780	1213.943	216.5960 – 298.9723	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - ^3D^\circ$	3 – 3		927
	710	1214.174	242.8626 – 325.2229	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^3G - ^3G^\circ$	5 – 4		927
	700	1214.410	235.1165 – 317.4623	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5D^\circ$	1 – 0		927
	630	1214.595	247.2818 – 329.6143	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$^3F - ^3G^\circ$	4 – 3		927
	690	1215.133	216.3054 – 298.6006	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$^5D - ^3D^\circ$	0 – 1		927
	750	1215.272	242.8626 – 325.1484	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^3G - ^3H^\circ$	5 – 6		927
	670	1216.151	243.3315 – 325.5586	$3d^5(a^4F)4s - 3d^5(b^2F)4p$	$^3F - ^1G^\circ$	4 – 4		927
	280	1216.539	263.7357 – 345.9361	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$^3D - ^1F^\circ$	2 – 3		927
	640	1217.062	216.4347 – 298.6006	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$^5D - ^3D^\circ$	1 – 1		927
	740	1217.112	221.0876 – 303.2495	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$^3P - ^3S^\circ$	2 – 1		927
	320	1217.502	241.7736 – 323.9086	$3d^5(a^2H)4s - 3d^5(a^2G)4p$	$^3H - ^3H^\circ$	6 – 5		927
	750	1217.576	208.1310 – 290.2620	$3d^5(a^4G)4s - 3d^5(a^4P)4p$	$^5G - ^5D^\circ$	5 – 4		927
	810	1217.761	242.8626 – 324.9802	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^3G - ^3G^\circ$	5 – 5		927
	410	1218.061	208.1637 – 290.2620	$3d^5(a^4G)4s - 3d^5(a^4P)4p$	$^5G - ^5D^\circ$	4 – 4		927
	160	1218.726	232.5459 – 314.5992	$3d^5(a^2D)4s - 3d^5(a^4F)4p$	$^3D - ^5F^\circ$	3 – 4		927
	250	1219.886	239.1077 – 321.0819	$3d^5(a^2D)4s - 3d^5(a^2F)4p$	$^1D - ^1F^\circ$	2 – 3		927
	360	1220.317	243.2662 – 325.2119	$3d^5(a^4F)4s - 3d^5(a^2G)4p$	$^3F - ^3G^\circ$	2 – 3		927
	250	1220.836	239.1077 – 321.0183	$3d^5(a^2D)4s - 3d^5(a^2G)4p$	$^1D - ^3F^\circ$	2 – 2		927
	300	1220.879	232.6556 – 314.5628	$3d^5(a^2D)4s - 3d^5(a^4F)4p$	$^3D - ^5F^\circ$	2 – 3		927
	640	1221.113	243.3315 – 325.2229	$3d^5(a^4F)4s - 3d^5(a^2G)4p$	$^3F - ^3G^\circ$	4 – 4		927
	810	1221.699	243.3705 – 325.2229	$3d^5(a^4F)4s - 3d^5(a^2G)4p$	$^3F - ^3G^\circ$	3 – 4		927
	320	1221.870	243.3705 – 325.2119	$3d^5(a^4F)4s - 3d^5(a^2G)4p$	$^3F - ^3G^\circ$	3 – 3		927
	540	1222.189	221.4290 – 303.2495	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$^3P - ^3S^\circ$	1 – 1		927
	510	1222.788	235.7365 – 317.5175	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	$^3F - ^5D^\circ$	2 – 2		927
	380	1223.204	234.4127 – 316.1654	$3d^5(a^4F)4s - 3d^5(a^2F)4p$	$^5F - ^3F^\circ$	2 – 2		927
	520	1223.390	241.0822 – 322.8208	$3d^5(a^2H)4s - 3d^5(a^4F)4p$	$^3H - ^3F^\circ$	5 – 4		927
	760	1223.444	306.9629 – 388.6989	$3d^5(c^2D)4s - 3d^5(c^2D)4p$	$^3D - ^3F^\circ$	3 – 4		927
	60	1223.685	307.0252 – 388.7461	$3d^5(c^2D)4s - 3d^5(c^2D)4p$	$^3D - ^3D^\circ$	2 – 1		927
	500	1224.335	216.3054 – 297.9828	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - ^5P^\circ$	0 – 1		927
	680	1224.558	232.5459 – 314.2088	$3d^5(a^2D)4s - 3d^5(a^2F)4p$	$^3D - ^3F^\circ$	3 – 4		927
	580	1224.758	243.3315 – 324.9802	$3d^5(a^4F)4s - 3d^5(a^2G)4p$	$^3F - ^3G^\circ$	4 – 5		927
	510	1224.875	235.7365 – 317.3768	$3d^5(a^2F)4s - 3d^5(a^2H)4p$	$^3F - ^3G^\circ$	2 – 3		927

Ni V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	810	1224.948	242.2904 – 323.9263	$3d^5(a^2G)4s - 3d^5(a^2H)4p$	$^3G - ^3H^\circ$	3 – 4		927
	530	1225.112	216.4347 – 298.0600	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - ^5D^\circ$	1 – 0		927
	380	1226.276	216.4347 – 297.9828	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - ^5P^\circ$	1 – 1		927
	240	1227.057	235.7365 – 317.2320	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	$^3F - ^5D^\circ$	2 – 3		927
	420	1227.196	311.4703 – 392.9571	$3d^5(c^2D)4s - 3d^5(c^2D)4p$	$^1D - ^1F^\circ$	2 – 3		927
	20	1227.480	235.4206 – 316.8878	$3d^5(a^2F)4s - 3d^5(a^2H)4p$	$^3F - ^3G^\circ$	4 – 4		927
	190	1228.168	242.5043 – 323.9263	$3d^5(a^2G)4s - 3d^5(a^2H)4p$	$^3G - ^3H^\circ$	4 – 4		927
	700	1228.426	242.5043 – 323.9086	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^3G - ^3H^\circ$	4 – 5		927
	810	1229.400	251.6549 – 332.9956	$3d^5(b^2F)4s - 3d^5(a^2H)4p$	$^1F - ^1G^\circ$	3 – 4		927
	810	1229.400	274.6954 – 356.0363	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$^3G - ^3G^\circ$	5 – 5		927
	200	1229.680	235.4206 – 316.7440	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	$^3F - ^5D^\circ$	4 – 4		927
	600	1230.062	274.7386 – 356.0363	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$^3G - ^3G^\circ$	4 – 5		927
	640	1230.439	268.2739 – 349.5460	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$^1D - ^1D^\circ$	2 – 2		927
	320	1230.731	216.5905 – 297.8425	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$^5D - ^3D^\circ$	2 – 2		927
	580	1230.821	216.5960 – 297.8425	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$^5D - ^3D^\circ$	3 – 2		927
	760	1230.875	241.0822 – 322.3242	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	$^3H - ^1I^\circ$	5 – 6		927
	600	1231.030	242.2904 – 323.5232	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$^3G - ^3F^\circ$	3 – 3		927
	720	1231.090	216.1899 – 297.4181	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$^5D - ^3D^\circ$	4 – 3		927
	760	1231.881	225.2007 – 306.3778	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^3D - ^3P^\circ$	3 – 2		927
	180	1232.341	208.1515 – 289.2980	$3d^5(a^4G)4s - 3d^5(a^4P)4p$	$^5G - ^5D^\circ$	2 – 3		927
	860	1232.517	208.1637 – 289.2980	$3d^5(a^4G)4s - 3d^5(a^4P)4p$	$^5G - ^5D^\circ$	4 – 3		927
	850	1232.801	246.2409 – 327.3566	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	$^1H - ^1H^\circ$	5 – 5		927
	850	1232.965	263.8058 – 344.9112	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$^3D - ^3F^\circ$	3 – 4		927
	710	1233.120	208.1515 – 289.2471	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^5F^\circ$	2 – 2		927
	860	1233.268	234.0821 – 315.1682	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5F^\circ$	5 – 5		927
	810	1233.324	208.1646 – 289.2471	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^5F^\circ$	3 – 2		927
	750	1233.500	274.6954 – 355.7652	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$^3G - ^3G^\circ$	5 – 4		927
	690	1233.596	236.4541 – 317.5175	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	$^3F - ^5D^\circ$	3 – 2		927
	440	1233.850	242.8626 – 323.9086	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^3G - ^3H^\circ$	5 – 5		927
	880	1233.884	242.8626 – 323.9086	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^3G - ^3H^\circ$	5 – 5		927
	820	1234.163	274.7386 – 355.7652	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$^3G - ^3G^\circ$	4 – 4		927
	300	1234.257	242.5043 – 323.5232	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$^3G - ^3F^\circ$	4 – 3		927
	810	1234.390	208.1515 – 289.1630	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^5F^\circ$	2 – 1		927
	770	1234.579	263.8058 – 344.8053	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$^3D - ^3D^\circ$	3 – 3		927
	440	1234.697	274.7735 – 355.7652	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$^3G - ^3G^\circ$	3 – 4		927
	270	1235.305						927
	160	1235.430	311.4703 – 392.4135	$3d^5(c^2D)4s - 3d^5(c^2D)4p$	$^1D - ^3P^\circ$	2 – 2		927
	680	1235.764	236.4541 – 317.3768	$3d^5(a^2F)4s - 3d^5(a^2H)4p$	$^3F - ^3G^\circ$	3 – 3		927
	860	1235.831	233.8392 – 314.7564	$3d^5(a^2I)4s - 3d^5(a^4F)4p$	$^1I - ^5G^\circ$	6 – 6		927
	810	1236.267	240.1938 – 321.0819	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$^1F - ^1F^\circ$	3 – 3		927
	620	1236.664	240.1938 – 321.0564	$3d^5(a^2F)4s - 3d^5(a^2G)4p$	$^1F - ^3F^\circ$	3 – 4		927
	690	1236.696	279.1995 – 360.0597	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$^1G - ^1F^\circ$	4 – 3		927
	270	1237.119	225.5451 – 306.3778	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^3D - ^3P^\circ$	1 – 2		927
	740	1237.197	216.5905 – 297.4179	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - ^5D^\circ$	2 – 1		927
	560	1237.328	239.1077 – 319.9265	$3d^5(a^2D)4s - 3d^5(a^2F)4p$	$^1D - ^1D^\circ$	2 – 2		927
	380	1237.972	232.9108 – 313.6866	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$^3D - ^3D^\circ$	1 – 2		927
	640	1238.111	232.9108 – 313.6790	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$^3D - ^3D^\circ$	1 – 1		927
	490	1238.209	225.6165 – 306.3778	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^3D - ^3P^\circ$	2 – 2		927
	380	1238.548	234.4127 – 315.1528	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5F^\circ$	2 – 1		927
	600	1238.637	232.5459 – 313.2813	$3d^5(a^2D)4s - 3d^5(a^4F)4p$	$^3D - ^5G^\circ$	3 – 4		927
	830	1238.698	216.1899 – 296.9193	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - ^5D^\circ$	4 – 4		927
	690	1238.962	208.1646 – 288.8779	$3d^5(a^4G)4s - 3d^5(a^4P)4p$	$^5G - ^5S^\circ$	3 – 2		927
	700	1239.051	216.1899 – 296.8970	$3d^5(a^4D)4s - 3d^5(a^4G)4p$	$^5D - ^3G^\circ$	4 – 4		927
	780	1239.549	234.0821 – 314.7564	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5G^\circ$	5 – 6		927

Ni V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	400	1239.664	232.9108 – 313.5773	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$^3D - ^3P^\circ$	1 – 0		927
	240	1239.769	274.7386 – 355.3980	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$^3G - ^3G^\circ$	4 – 3		927
	660	1239.950	235.4206 – 316.0688	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$^3F - ^3G^\circ$	4 – 4		927
	210	1240.152	246.2409 – 326.8763	$3d^5(a^2H)4s - 3d^5(b^2F)4p$	$^1H - ^3F^\circ$	5 – 4		927
	650	1240.309	274.7735 – 355.3980	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$^3G - ^3G^\circ$	3 – 3		927
	590	1241.044	243.3315 – 323.9086	$3d^5(a^4F)4s - 3d^5(a^2G)4p$	$^3F - ^3H^\circ$	4 – 5		927
	120	1241.166	235.4206 – 315.9905	$3d^5(a^2F)4s - 3d^5(a^2H)4p$	$^3F - ^3H^\circ$	4 – 5		927
	780	1241.326	234.2752 – 314.8347	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5F^\circ$	3 – 2		927
	810	1241.422	233.8392 – 314.3920	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^1I - ^1I^\circ$	6 – 6		927
	840	1241.630	229.4130 – 309.9525	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^3I - ^3H^\circ$	5 – 4		927
	810	1241.975	234.0821 – 314.5992	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5F^\circ$	5 – 4		927
	860	1242.072	229.4088 – 309.9195	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^3I - ^3H^\circ$	6 – 5		927
	700	1242.134	229.4130 – 309.9195	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^3I - ^3H^\circ$	5 – 5		927
	540	1242.645	234.1254 – 314.5992	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5F^\circ$	4 – 4		927
	800	1243.218	234.1254 – 314.5628	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5F^\circ$	4 – 3		927
	560	1243.326	235.7365 – 316.1654	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$^3F - ^3F^\circ$	2 – 2		927
	530	1243.407	216.5905 – 297.0139	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - ^5D^\circ$	2 – 2		927
	770	1243.495	216.5960 – 297.0139	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - ^5D^\circ$	3 – 2		927
	230	1243.660	232.5459 – 312.9536	$3d^5(a^2D)4s - 3d^5(a^2F)4p$	$^3D - ^3D^\circ$	3 – 3		927
	750	1244.015	216.1899 – 296.5740	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - ^5D^\circ$	4 – 3		927
	880	1244.174	164.5259 – 244.9005	$3d^5(a^6S)4s - 3d^5(a^6S)4p$	$^7S - ^7P^\circ$	3 – 4		927
	520	1244.272						927
	170	1244.650	232.5459 – 312.8894	$3d^5(a^2D)4s - 3d^5(a^4F)4p$	$^3D - ^5G^\circ$	3 – 3		927
	610	1244.772	229.4088 – 309.7436	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^3I - ^1K^\circ$	6 – 7		927
	790	1244.955	234.2752 – 314.5992	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5F^\circ$	3 – 4		927
	690	1245.054	242.5043 – 322.8208	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$^3G - ^3F^\circ$	4 – 4		927
	870	1245.176	234.0821 – 314.3920	$3d^5(a^4F)4s - 3d^5(a^2I)4p$	$^5F - ^1I^\circ$	5 – 6		927
	530	1245.263	229.4406 – 309.7436	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^3I - ^1K^\circ$	7 – 7		927
	690	1245.353	232.6556 – 312.9536	$3d^5(a^2D)4s - 3d^5(a^2F)4p$	$^3D - ^3D^\circ$	2 – 3		927
	850	1245.439	225.5451 – 305.8381	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^3D - ^3P^\circ$	1 – 1		927
	650	1245.522	234.2752 – 314.5628	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5F^\circ$	3 – 3		927
	80	1245.988	243.2662 – 323.5232	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^3F - ^3F^\circ$	2 – 3		927
	350	1246.115	235.1165 – 315.3661	$3d^5(a^4F)4s - 3d^5(a^2F)4p$	$^5F - ^3D^\circ$	1 – 2		927
	250	1246.353	232.6556 – 312.8894	$3d^5(a^2D)4s - 3d^5(a^4F)4p$	$^3D - ^5G^\circ$	2 – 3		927
	570	1246.535	225.6165 – 305.8381	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^3D - ^3P^\circ$	2 – 1		927
	710	1246.821	268.2739 – 348.4779	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$^1D - ^1P^\circ$	2 – 1		927
	830	1247.368	263.7357 – 343.9057	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$^3D - ^3D^\circ$	2 – 2		927
	740	1247.600	243.3705 – 323.5232	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^3F - ^3F^\circ$	3 – 3		927
	570	1247.664	234.4127 – 314.5628	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5F^\circ$	2 – 3		927
	650	1248.031	234.0821 – 314.2088	$3d^5(a^4F)4s - 3d^5(a^2F)4p$	$^5F - ^3F^\circ$	5 – 4		927
	380	1248.081	232.6556 – 312.7782	$3d^5(a^2D)4s - 3d^5(a^4F)4p$	$^3D - ^5G^\circ$	2 – 2		927
	240	1248.217	242.5043 – 322.6176	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$^3G - ^3D^\circ$	4 – 3		927
	550	1248.435	263.8058 – 343.9057	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$^3D - ^3D^\circ$	3 – 2		927
	730	1248.485	246.2409 – 326.3371	$3d^5(a^2H)4s - 3d^5(a^2G)4p$	$^1H - ^1H^\circ$	5 – 5		927
	630	1248.814	247.2818 – 327.3566	$3d^5(b^2F)4s - 3d^5(a^2H)4p$	$^3F - ^1H^\circ$	4 – 5		927
	930	1249.432	235.1165 – 315.1528	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5F^\circ$	1 – 1		927
	860	1249.520	208.1310 – 288.1616	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^5F^\circ$	5 – 4		927
	830	1250.033	208.1637 – 288.1616	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^5F^\circ$	4 – 4		927
	890	1250.384	208.0464 – 288.0216	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^5H^\circ$	6 – 7		927
	740	1250.541	239.1077 – 319.0734	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$^1D - ^1P^\circ$	2 – 1		927
	430	1250.675	242.8626 – 322.8208	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$^3G - ^3F^\circ$	5 – 4		927
	480	1250.772	235.4206 – 315.3701	$3d^5(a^2F)4s - 3d^5(a^2G)4p$	$^3F - ^3H^\circ$	4 – 4		927
	260	1250.893	307.0252 – 386.9688	$3d^5(c^2D)4s - 3d^5(c^2D)4p$	$^3D - ^3F^\circ$	2 – 2		927
	220	1251.283	232.5459 – 312.4633	$3d^5(a^2D)4s - 3d^5(a^2F)4p$	$^3D - ^3G^\circ$	3 – 3		927

NI V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	890	1251.821	217.0487 – 296.9329	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^3G - ^3G^\circ$	5 – 5		927
	790	1252.055	232.9108 – 312.7782	$3d^5(a^2D)4s - 3d^5(a^4F)4p$	$^3D - ^5G^\circ$	1 – 2		927
	880	1252.155	307.1051 – 386.9688	$3d^5(c^2D)4s - 3d^5(c^2D)4p$	$^3D - ^3F^\circ$	1 – 2		927
	830	1252.267	229.4088 – 309.2640	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^3I - ^3H^\circ$	6 – 6		927
	680	1252.336	229.4130 – 309.2640	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^3I - ^3H^\circ$	5 – 6		927
	620	1252.383	217.0487 – 296.8970	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^3G - ^3G^\circ$	5 – 4		927
	440	1252.467	225.5451 – 305.3869	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^3D - ^3P^\circ$	1 – 0		927
	720	1252.707	236.4541 – 316.2803	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$^3F - ^3F^\circ$	3 – 3		927
	870	1252.765	229.4406 – 309.2640	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^3I - ^3H^\circ$	7 – 6		927
	680	1253.004	232.6556 – 312.4633	$3d^5(a^2D)4s - 3d^5(a^2F)4p$	$^3D - ^3G^\circ$	2 – 3		927
	580	1253.086	217.1291 – 296.9329	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^3G - ^3G^\circ$	4 – 5		927
	850	1253.191	208.1637 – 287.9600	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^5F^\circ$	4 – 3		927
	810	1253.290	217.1291 – 296.9193	$3d^5(a^4G)4s - 3d^5(a^4D)4p$	$^3G - ^5D^\circ$	4 – 4		927
	820	1253.486	263.7009 – 343.4782	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$^3D - ^3D^\circ$	1 – 1		927
	610	1253.588	247.1049 – 326.8763	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$^3F - ^3F^\circ$	3 – 4		927
	850	1253.654	217.1291 – 296.8970	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^3G - ^3G^\circ$	4 – 4		927
	870	1253.983	217.1010 – 296.8471	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^3G - ^3G^\circ$	3 – 3		927
	710	1254.187	240.1938 – 319.9265	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$^1F - ^1D^\circ$	3 – 2		927
	790	1254.412	243.2662 – 322.9845	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^3F - ^3D^\circ$	2 – 1		927
	470	1254.530	236.4541 – 316.1654	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$^3F - ^3F^\circ$	3 – 2		927
	550	1254.850	247.0491 – 326.7390	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^1G - ^1F^\circ$	4 – 3		927
	220	1255.565	234.2752 – 313.9198	$3d^5(a^4F)4s - 3d^5(a^2D)4p$	$^5F - ^3D^\circ$	3 – 3		927
	740	1255.732	232.6556 – 312.2910	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$^3D - ^3P^\circ$	2 – 1		927
	520	1255.810	235.7365 – 315.3661	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$^3F - ^3D^\circ$	2 – 2		927
	760	1256.019	208.1646 – 287.7821	$3d^5(a^4G)4s - 3d^5(a^4P)4p$	$^5G - ^5D^\circ$	3 – 2		927
	170	1256.209	208.1515 – 287.7555	$3d^5(a^4G)4s - 3d^5(a^4P)4p$	$^5G - ^5D^\circ$	2 – 1		927
	210	1256.292	208.0464 – 287.6459	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^5H^\circ$	6 – 6		927
	590	1256.422	235.7365 – 315.3262	$3d^5(a^2F)4s - 3d^5(a^2D)4p$	$^3F - ^1F^\circ$	2 – 3		927
	490	1256.818						927
	730	1256.900	279.1995 – 358.7600	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$^1G - ^1G^\circ$	4 – 4		927
	410	1256.989	240.9596 – 320.5138	$3d^5(a^2H)4s - 3d^5(a^2G)4p$	$^3H - ^3F^\circ$	4 – 3		927
	500	1257.129	263.7357 – 343.2810	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$^3D - ^3F^\circ$	2 – 3		927
	860	1257.620	208.1310 – 287.6459	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^5H^\circ$	5 – 6		927
	660	1258.014	243.3315 – 322.8208	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^3F - ^3F^\circ$	4 – 4		927
	620	1258.238	263.8058 – 343.2810	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	$^3D - ^3F^\circ$	3 – 3		927
	460	1258.452	232.5459 – 312.0083	$3d^5(a^2D)4s - 3d^5(a^2F)4p$	$^3D - ^1G^\circ$	3 – 4		927
	620	1258.525	247.2818 – 326.7390	$3d^5(b^2F)4s - 3d^5(a^2G)4p$	$^3F - ^1F^\circ$	4 – 3		927
	530	1259.024	240.1938 – 319.6202	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	$^1F - ^3G^\circ$	3 – 3		927
	780	1259.118	232.5459 – 311.9665	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$^3D - ^3P^\circ$	3 – 2		927
	650	1259.183	235.7365 – 315.1528	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	$^3F - ^5F^\circ$	2 – 1		927
	800	1259.576	229.4130 – 308.8041	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^3I - ^1H^\circ$	5 – 5		927
	800	1259.716	234.0821 – 313.4647	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5G^\circ$	5 – 5		927
	820	1260.401	234.1254 – 313.4647	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5G^\circ$	4 – 5		927
	180	1260.748	246.2409 – 325.5586	$3d^5(a^2H)4s - 3d^5(b^2F)4p$	$^1H - ^1G^\circ$	5 – 4		927
	80	1260.870	232.6556 – 311.9665	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$^3D - ^3P^\circ$	2 – 2		927
	100	1261.109	212.0958 – 291.3900	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$^5P - ^5P^\circ$	3 – 2		927
	820	1261.222	247.0491 – 326.3371	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^1G - ^1H^\circ$	4 – 5		927
	850	1261.330	235.4206 – 314.7022	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$^3F - ^3G^\circ$	4 – 5		927
	800	1261.430	279.1995 – 358.4756	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$^1G - ^1H^\circ$	4 – 5		927
	90	1261.564	234.4127 – 313.6790	$3d^5(a^4F)4s - 3d^5(a^2D)4p$	$^5F - ^3D^\circ$	2 – 1		927
	850	1261.745	216.1899 – 295.4443	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - ^5F^\circ$	4 – 5		927
	20	1262.134						927
	700	1262.535	274.7386 – 353.9441	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$^3G - ^3F^\circ$	4 – 3		927
	200	1262.644	234.0821 – 313.2813	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - ^5G^\circ$	5 – 4		927

Ni V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	490	1262.727	263.7009 – 342.8946	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	${}^3D - {}^3F^\circ$	1 – 2		927
	20	1262.974	235.4206 – 314.5992	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	${}^3F - {}^5F^\circ$	4 – 4		927
	110	1263.090	274.7735 – 353.9441	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	${}^3G - {}^3F^\circ$	3 – 3		927
	690	1263.290	263.7357 – 342.8946	$3d^5(b^2D)4s - 3d^5(b^2D)4p$	${}^3D - {}^3F^\circ$	2 – 2		927
	770	1263.333	234.1254 – 313.2813	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	${}^5F - {}^5G^\circ$	4 – 4		927
	410	1263.569	235.4206 – 314.5628	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	${}^3F - {}^5F^\circ$	4 – 3		927
	330	1263.622	212.2534 – 291.3900	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	${}^5P - {}^5P^\circ$	2 – 2		927
	20	1264.002	221.0876 – 300.2010	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	${}^3P - {}^5P^\circ$	2 – 3		927
	90	1264.245	235.7365 – 314.8347	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	${}^3F - {}^5F^\circ$	2 – 2		927
	90	1264.253	235.7365 – 314.8347	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	${}^3F - {}^5F^\circ$	2 – 2		927
	710	1264.426	212.4557 – 291.5417	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	${}^5P - {}^5P^\circ$	1 – 1		927
	870	1264.518	164.5259 – 243.6085	$3d^5(a^6S)4s - 3d^5(a^6S)4p$	${}^7S - {}^7P^\circ$	3 – 3		927
	430	1264.629	212.2534 – 291.3285	$3d^5(a^4P)4s - 3d^5(a^4G)4p$	${}^5P - {}^3F^\circ$	2 – 3		927
	700	1264.739						927
	670	1264.920	247.2818 – 326.3371	$3d^5(b^2F)4s - 3d^5(a^2G)4p$	${}^3F - {}^1H^\circ$	4 – 5		927
	860	1265.655	241.7736 – 320.7831	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	${}^3H - {}^3I^\circ$	6 – 7		927
	830	1265.722	234.2752 – 313.2813	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	${}^5F - {}^5G^\circ$	3 – 4		927
	290	1265.874	208.1310 – 287.1280	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	${}^5G - {}^5H^\circ$	5 – 5		927
	280	1266.124	247.0491 – 326.0299	$3d^5(a^2G)4s - 3d^5(b^2F)4p$	${}^1G - {}^3F^\circ$	4 – 3		927
	870	1266.395	208.1637 – 287.1280	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	${}^5G - {}^5H^\circ$	4 – 5		927
	510	1266.697	240.1938 – 319.1387	$3d^5(a^2F)4s - 3d^5(a^2G)4p$	${}^1F - {}^1G^\circ$	3 – 4		927
	800	1266.859	212.4557 – 291.3900	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	${}^5P - {}^5P^\circ$	1 – 2		927
	470	1267.027	247.1049 – 326.0299	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	${}^3F - {}^3F^\circ$	3 – 3		927
	260	1267.140						927
	860	1267.275	229.4088 – 308.3173	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	${}^3I - {}^3I^\circ$	6 – 7		927
	850	1267.803	229.4406 – 308.3173	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	${}^3I - {}^3I^\circ$	7 – 7		927
	780	1267.885	236.4541 – 315.3262	$3d^5(a^2F)4s - 3d^5(a^2D)4p$	${}^3F - {}^1F^\circ$	3 – 3		927
	390	1267.985	247.1650 – 326.0299	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	${}^3F - {}^3F^\circ$	2 – 3		927
	640	1268.170	274.6954 – 353.5487	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	${}^3G - {}^3H^\circ$	5 – 5		927
	480	1268.746	247.1650 – 325.9822	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	${}^3F - {}^3F^\circ$	2 – 2		927
	750	1268.871	274.7386 – 353.5487	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	${}^3G - {}^3H^\circ$	4 – 5		927
	710	1269.243	235.4206 – 314.2088	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	${}^3F - {}^3F^\circ$	4 – 4		927
	810	1269.372	241.0822 – 319.8604	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	${}^3H - {}^3I^\circ$	5 – 6		927
	580	1269.620	234.1254 – 312.8894	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	${}^5F - {}^5G^\circ$	4 – 3		927
	600	1270.186	242.2904 – 321.0183	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	${}^3G - {}^3F^\circ$	3 – 2		927
	870	1270.677	229.4406 – 308.1388	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	${}^3I - {}^3K^\circ$	7 – 8		927
	640	1271.252	212.0958 – 290.7570	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	${}^5P - {}^5P^\circ$	3 – 3		927
	720	1271.432	274.6954 – 353.3471	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	${}^3G - {}^3F^\circ$	5 – 4		927
	660	1272.025	234.2752 – 312.8894	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	${}^5F - {}^5G^\circ$	3 – 3		927
	50	1272.148	274.7386 – 353.3471	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	${}^3G - {}^3F^\circ$	4 – 4		927
	700	1272.637	208.1310 – 286.7066	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	${}^5G - {}^5H^\circ$	5 – 4		927
	660	1272.710	274.7735 – 353.3471	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	${}^3G - {}^3F^\circ$	3 – 4		927
	110	1272.775						927
	30	1272.857	235.1165 – 313.6790	$3d^5(a^4F)4s - 3d^5(a^2D)4p$	${}^5F - {}^3D^\circ$	1 – 1		927
	870	1273.198	208.1646 – 286.7066	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	${}^5G - {}^5H^\circ$	3 – 4		927
	560	1273.728	247.0491 – 325.5586	$3d^5(a^2G)4s - 3d^5(b^2F)4p$	${}^1G - {}^1G^\circ$	4 – 4		927
	830	1273.809	212.2534 – 290.7570	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	${}^5P - {}^5P^\circ$	2 – 3		927
	780	1274.252	234.4127 – 312.8894	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	${}^5F - {}^5G^\circ$	2 – 3		927
	20	1274.491						927
	720	1275.906	274.6954 – 353.0716	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	${}^3G - {}^3H^\circ$	5 – 4		927
	850	1276.415	216.5960 – 294.9396	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	${}^5D - {}^5F^\circ$	3 – 4		927
	160	1276.603	274.7386 – 353.0716	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	${}^3G - {}^3H^\circ$	4 – 4		927
	360	1276.882	217.1291 – 295.4443	$3d^5(a^4G)4s - 3d^5(a^4D)4p$	${}^3G - {}^5F^\circ$	4 – 5		927
	690	1276.945	164.5259 – 242.8370	$3d^5(a^6S)4s - 3d^5(a^6S)4p$	${}^7S - {}^7P^\circ$	3 – 2		927

NI V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	220	1277.183	274.7735 – 353.0716	$3d^5(b^2G)4s - 3d^5(b^2G)4p$	$^3G - {}^3H^\circ$	3 – 4		927
	290	1277.658	239.1077 – 317.3768	$3d^5(a^2D)4s - 3d^5(a^2H)4p$	$^1D - {}^3G^\circ$	2 – 3		927
	20	1278.387	242.2904 – 320.5138	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^3G - {}^3F^\circ$	3 – 3		927
	140	1278.874	242.8626 – 321.0564	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^3G - {}^3F^\circ$	5 – 4		927
	170	1279.050	235.7365 – 313.9198	$3d^5(a^2F)4s - 3d^5(a^2D)4p$	$^3F - {}^3D^\circ$	2 – 3		927
	590	1279.329	212.0958 – 290.2620	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$^5P - {}^5D^\circ$	3 – 4		927
	650	1279.708	208.1515 – 286.2936	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - {}^5H^\circ$	2 – 3		927
	120	1279.926	208.1646 – 286.2936	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - {}^5H^\circ$	3 – 3		927
	520	1280.105	247.1049 – 325.2229	$3d^5(b^2F)4s - 3d^5(a^2G)4p$	$^3F - {}^3G^\circ$	3 – 4		927
	80	1280.274	247.1049 – 325.2119	$3d^5(b^2F)4s - 3d^5(a^2G)4p$	$^3F - {}^3G^\circ$	3 – 3		927
	210	1281.269	247.1650 – 325.2119	$3d^5(b^2F)4s - 3d^5(a^2G)4p$	$^3F - {}^3G^\circ$	2 – 3		927
	60	1281.875	242.5043 – 320.5138	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^3G - {}^3F^\circ$	4 – 3		927
	600	1282.247	229.4130 – 307.3997	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^3I - {}^3I^\circ$	5 – 6		927
	550	1282.740	229.4406 – 307.3997	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^3I - {}^3I^\circ$	7 – 6		927
	120	1283.177	247.0491 – 324.9802	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^1G - {}^3G^\circ$	4 – 5		927
	160	1283.941	221.0876 – 298.9723	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	$^3P - {}^3D^\circ$	2 – 3		927
	560	1284.470	216.5905 – 294.4433	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - {}^5F^\circ$	2 – 3		927
	470	1284.550	216.5960 – 294.4433	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - {}^5F^\circ$	3 – 3		927
	300	1285.808	253.9052 – 331.6782	$3d^5(a^2S)4s - 3d^5(a^2S)4p$	$^3S - {}^3P^\circ$	1 – 2		927
	270	1286.111	236.4541 – 314.2088	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$^3F - {}^3F^\circ$	3 – 4		927
	20	1286.465	234.2752 – 312.0083	$3d^5(a^4F)4s - 3d^5(a^2F)4p$	$^5F - {}^1G^\circ$	3 – 4		927
	610	1287.576	232.5459 – 310.2126	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$^3D - {}^3F^\circ$	3 – 4		927
	590	1287.656	235.1165 – 312.7782	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^5F - {}^5G^\circ$	1 – 2		927
	480	1287.800	216.4347 – 294.0860	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - {}^5F^\circ$	1 – 2		927
	30	1288.519	242.2904 – 319.8991	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$^3G - {}^3G^\circ$	3 – 4		927
	310	1289.830	216.3054 – 293.8338	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - {}^5F^\circ$	0 – 1		927
	380	1290.393	216.5905 – 294.0860	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - {}^5F^\circ$	2 – 2		927
	220	1290.479	216.5960 – 294.0860	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - {}^5F^\circ$	3 – 2		927
	20	1290.872	236.4541 – 313.9198	$3d^5(a^2F)4s - 3d^5(a^2D)4p$	$^3F - {}^3D^\circ$	3 – 3		927
	320	1292.013	216.4347 – 293.8338	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^5D - {}^5F^\circ$	1 – 1		927
	50	1293.178	242.2904 – 319.6202	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$^3G - {}^3G^\circ$	3 – 3		927
	420	1295.286	212.0958 – 289.2980	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$^5P - {}^5D^\circ$	3 – 3		927
	490	1295.761	235.1165 – 312.2910	$3d^5(a^4F)4s - 3d^5(a^2D)4p$	$^5F - {}^3P^\circ$	1 – 1		927
	490	1296.198	242.5043 – 319.6527	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$^3G - {}^3G^\circ$	4 – 5		927
	30	1297.731	239.1077 – 316.1654	$3d^5(a^2D)4s - 3d^5(a^2F)4p$	$^1D - {}^3F^\circ$	2 – 2		927
	70	1297.983	235.7365 – 312.7782	$3d^5(a^2F)4s - 3d^5(a^4F)4p$	$^3F - {}^5G^\circ$	2 – 2		927
	630	1298.733	242.8626 – 319.8604	$3d^5(a^2G)4s - 3d^5(a^2H)4p$	$^3G - {}^3I^\circ$	5 – 6		927
	160	1300.224	212.2534 – 289.1630	$3d^5(a^4P)4s - 3d^5(a^4G)4p$	$^5P - {}^5F^\circ$	2 – 1		927
	610	1300.981	178.0198 – 254.8850	$3d^5(a^6S)4s - 3d^5(a^6S)4p$	$^5S - {}^5P^\circ$	2 – 1		927
	90	1301.600	216.5905 – 293.4200	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$^5D - {}^3P^\circ$	2 – 1		927
	490	1302.175						927
	530	1302.380	212.0958 – 288.8779	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$^5P - {}^5S^\circ$	3 – 2		927
	100	1302.833	221.0876 – 297.8425	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$^3P - {}^3D^\circ$	2 – 2		927
	660	1303.317	235.7365 – 312.4633	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$^3F - {}^3G^\circ$	2 – 3		927
	170	1303.968	247.1650 – 323.8531	$3d^5(b^2F)4s - 3d^5(a^4F)4p$	$^3F - {}^3F^\circ$	2 – 2		927
	630	1304.866	229.4130 – 306.0490	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^3I - {}^3I^\circ$	5 – 5		927
	420	1305.061	212.2534 – 288.8779	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$^5P - {}^5S^\circ$	2 – 2		927
	610	1305.696	229.4088 – 305.9963	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^3I - {}^3K^\circ$	6 – 7		927
	550	1305.933						927
	660	1306.237	229.4406 – 305.9963	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^3I - {}^3K^\circ$	7 – 7		927
	700	1306.614	208.0464 – 284.5795	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - {}^5G^\circ$	6 – 6		927
	590	1307.595	178.0198 – 254.4956	$3d^5(a^6S)4s - 3d^5(a^6S)4p$	$^5S - {}^5P^\circ$	2 – 2		927
	100	1307.755	253.9052 – 330.3707	$3d^5(a^2S)4s - 3d^5(a^2S)4p$	$^3S - {}^3P^\circ$	1 – 1		927
	460	1308.649	221.4290 – 297.8425	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$^3P - {}^3D^\circ$	1 – 2		927

NI V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	100	1309.149						927
	530	1309.656	208.0464 – 284.4025	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^5G^\circ$	6 – 5		927
	530	1310.082	221.0876 – 297.4181	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$^3P - ^3D^\circ$	2 – 3		927
	480	1310.249	243.3315 – 319.6527	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^3F - ^3G^\circ$	4 – 5		927
	250	1310.819	243.3315 – 319.6202	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^3F - ^3G^\circ$	4 – 3		927
	670	1311.106	208.1310 – 284.4025	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^5G^\circ$	5 – 5		927
	580	1311.551	241.0822 – 317.3273	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	$^3H - ^3H^\circ$	5 – 6		927
	610	1312.031	239.1077 – 315.3262	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$^1D - ^1F^\circ$	2 – 3		927
	650	1312.706	229.4130 – 305.5908	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^3I - ^3K^\circ$	5 – 6		927
	630	1313.303	208.1637 – 284.3089	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^5G^\circ$	4 – 4		927
	710	1314.330	208.1646 – 284.2490	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^5G^\circ$	3 – 3		927
	710	1314.330	246.2409 – 322.3242	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	$^1H - ^1I^\circ$	5 – 6		927
	700	1314.681	208.1515 – 284.2155	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^5G^\circ$	2 – 2		927
	330	1314.909	208.1646 – 284.2155	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^5G - ^5G^\circ$	3 – 2	P	927
	300	1314.992	232.5459 – 308.5920	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$^3D - ^3F^\circ$	3 – 3	P	927
	550	1315.269						927
	450	1315.663	225.5451 – 301.5530	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^3D - ^3F^\circ$	1 – 2		927
	110	1315.975	221.4290 – 297.4179	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	$^3P - ^5D^\circ$	1 – 1		927
	50	1316.307						927
	590	1316.912	232.6556 – 308.5920	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$^3D - ^3F^\circ$	2 – 3		927
	420	1317.035	240.9596 – 316.8878	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	$^3H - ^3G^\circ$	4 – 4		927
	670	1317.436	233.8392 – 309.7436	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^1I - ^1K^\circ$	6 – 7		927
	330	1317.962	240.1938 – 316.0688	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$^1F - ^3G^\circ$	3 – 4		927
	520	1318.148	212.0958 – 287.9600	$3d^5(a^4P)4s - 3d^5(a^4G)4p$	$^5P - ^5F^\circ$	3 – 3		927
	670	1318.360						927
	690	1318.513	178.0198 – 253.8627	$3d^5(a^6S)4s - 3d^5(a^6S)4p$	$^5S - ^5P^\circ$	2 – 3		927
	70	1318.920	247.1650 – 322.9845	$3d^5(b^2F)4s - 3d^5(a^4F)4p$	$^3F - ^3D^\circ$	2 – 1		927
	420	1319.153	241.0822 – 316.8878	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	$^3H - ^3G^\circ$	5 – 4		927
	220	1319.745	247.0491 – 322.8208	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$^1G - ^3F^\circ$	4 – 4		927
	100	1320.200	243.3315 – 319.0762	$3d^5(a^4F)4s - 3d^5(a^2H)4p$	$^3F - ^3I^\circ$	4 – 5		927
	560	1320.707	225.2007 – 300.9181	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^3D - ^3F^\circ$	3 – 4		927
	240	1320.896	212.2534 – 287.9600	$3d^5(a^4P)4s - 3d^5(a^4G)4p$	$^5P - ^5F^\circ$	2 – 3		927
	350	1321.252	212.0958 – 287.7821	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$^5P - ^5D^\circ$	3 – 2		927
	60	1323.296	247.0491 – 322.6176	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$^1G - ^3D^\circ$	4 – 3		927
	560	1323.550	241.7736 – 317.3273	$3d^5(a^2H)4s - 3d^5(a^2H)4p$	$^3H - ^3H^\circ$	6 – 6		927
	650	1323.986	217.1010 – 292.6310	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^3G - ^3H^\circ$	3 – 4		927
	440	1324.466	217.1291 – 292.6310	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^3G - ^3H^\circ$	4 – 4		927
	440	1324.751	221.0876 – 296.5740	$3d^5(a^4P)4s - 3d^5(a^4D)4p$	$^3P - ^5D^\circ$	2 – 3		927
	420	1325.081	251.6549 – 327.1227	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$^1F - ^1D^\circ$	3 – 2		927
	20	1325.822	233.8392 – 309.2640	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^1I - ^3H^\circ$	6 – 6		927
	210	1327.473	247.1049 – 322.4364	$3d^5(b^2F)4s - 3d^5(a^4F)4p$	$^3F - ^3D^\circ$	3 – 2		927
	590	1327.640	240.9596 – 316.2803	$3d^5(a^2H)4s - 3d^5(a^2F)4p$	$^3H - ^3F^\circ$	4 – 3		927
	610	1328.019	212.4557 – 287.7555	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$^5P - ^5D^\circ$	1 – 1		927
	640	1329.372	217.1291 – 292.3534	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^3G - ^3H^\circ$	4 – 5		927
	150	1330.063	232.5459 – 307.7311	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$^3D - ^3F^\circ$	3 – 2		927
	70	1331.413	216.4347 – 291.5417	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$^5D - ^5P^\circ$	1 – 1		927
	230	1332.005	232.6556 – 307.7311	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$^3D - ^3F^\circ$	2 – 2		927
	610	1332.845						927
	470	1332.989	225.5451 – 300.5633	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^3D - ^3D^\circ$	1 – 1		927
	500	1333.351	225.2007 – 300.2010	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^3D - ^5P^\circ$	3 – 3		927
	120	1333.561	241.0822 – 316.0688	$3d^5(a^2H)4s - 3d^5(a^2F)4p$	$^3H - ^3G^\circ$	5 – 4		927
	540	1333.958	233.8392 – 308.8041	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^1I - ^1H^\circ$	6 – 5		927
	510	1334.184	216.5905 – 291.5417	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$^5D - ^5P^\circ$	2 – 1		927
	560	1334.992						927

NI V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	650	1336.157	217.0487 – 291.8914	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^3G - ^3H^\circ$	5 – 6		927
	180	1336.539	232.9108 – 307.7311	$3d^5(a^2D)4s - 3d^5(a^2D)4p$	$^3D - ^3F^\circ$	1 – 2		927
	170	1336.636	246.2409 – 321.0564	$3d^5(a^2H)4s - 3d^5(a^2G)4p$	$^1H - ^3F^\circ$	5 – 4		927
	560	1337.049	235.4206 – 310.2126	$3d^5(a^2F)4s - 3d^5(a^2D)4p$	$^3F - ^3F^\circ$	4 – 4		927
	670	1339.072	225.5451 – 300.2249	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^3D - ^3D^\circ$	1 – 2		927
	370	1340.350	225.6165 – 300.2249	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^3D - ^3D^\circ$	2 – 2		927
	360	1341.074	216.1899 – 290.7570	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$^5D - ^5P^\circ$	4 – 3		927
	630	1342.177	217.0487 – 291.5546	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^3G - ^3F^\circ$	5 – 4		927
	230	1342.902	242.8626 – 317.3273	$3d^5(a^2G)4s - 3d^5(a^2H)4p$	$^3G - ^3H^\circ$	5 – 6		927
	190	1343.633	217.1291 – 291.5546	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^3G - ^3F^\circ$	4 – 4		927
	380	1343.898	240.9596 – 315.3701	$3d^5(a^2H)4s - 3d^5(a^2G)4p$	$^3H - ^3H^\circ$	4 – 4		927
	170	1347.222	217.1010 – 291.3285	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^3G - ^3F^\circ$	3 – 3		927
	550	1347.743	217.1291 – 291.3285	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^3G - ^3F^\circ$	4 – 3		927
	110	1348.683	243.3705 – 317.5175	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^3F - ^5D^\circ$	3 – 2		927
	560	1350.065						927
	190	1350.868	242.8626 – 316.8878	$3d^5(a^2G)4s - 3d^5(a^2H)4p$	$^3G - ^3G^\circ$	5 – 4		927
	220	1351.070	240.1938 – 314.2088	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$^1F - ^3F^\circ$	3 – 4		927
	640	1351.419	217.1010 – 291.0977	$3d^5(a^4G)4s - 3d^5(a^4G)4p$	$^3G - ^3F^\circ$	3 – 2		927
	180	1353.134	251.6549 – 325.5586	$3d^5(b^2F)4s - 3d^5(b^2F)4p$	$^1F - ^1G^\circ$	3 – 4		927
	260	1353.878	243.3705 – 317.2320	$3d^5(a^4F)4s - 3d^5(a^4F)4p$	$^3F - ^5D^\circ$	3 – 3		927
	120	1354.535	235.1165 – 308.9430	$3d^5(a^4F)4s - 3d^5(a^2D)4p$	$^5F - ^1D^\circ$	1 – 2		927
	370	1355.541	225.2007 – 298.9723	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^3D - ^3D^\circ$	3 – 3		927
	350	1357.493	216.5960 – 290.2620	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$^5D - ^5D^\circ$	3 – 4		927
	100	1358.166	217.1291 – 290.7570	$3d^5(a^4G)4s - 3d^5(a^4P)4p$	$^3G - ^5P^\circ$	4 – 3		927
	150	1358.339	241.0822 – 314.7022	$3d^5(a^2H)4s - 3d^5(a^2F)4p$	$^3H - ^3G^\circ$	5 – 5		927
	50	1360.815	242.5043 – 315.9905	$3d^5(a^2G)4s - 3d^5(a^2H)4p$	$^3G - ^3H^\circ$	4 – 5		927
	20	1361.880	225.6165 – 299.0456	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^3D - ^5P^\circ$	2 – 2		927
	80	1363.929	234.4127 – 307.7311	$3d^5(a^4F)4s - 3d^5(a^2D)4p$	$^5F - ^3F^\circ$	2 – 2		927
	150	1366.027	242.8626 – 316.0688	$3d^5(a^2G)4s - 3d^5(a^2F)4p$	$^3G - ^3G^\circ$	5 – 4		927
	70	1366.690						927
	270	1368.371	242.2904 – 315.3701	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^3G - ^3H^\circ$	3 – 4		927
	130	1372.552	216.3054 – 289.1630	$3d^5(a^4D)4s - 3d^5(a^4G)4p$	$^5D - ^5F^\circ$	0 – 1		927
	290	1373.413	216.4347 – 289.2471	$3d^5(a^4D)4s - 3d^5(a^4G)4p$	$^5D - ^5F^\circ$	1 – 2		927
	200	1375.376	216.5905 – 289.2980	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$^5D - ^5D^\circ$	2 – 3		927
	440	1376.195	242.5043 – 315.1682	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$^3G - ^5F^\circ$	4 – 5		927
	240	1376.315	216.5905 – 289.2471	$3d^5(a^4D)4s - 3d^5(a^4G)4p$	$^5D - ^5F^\circ$	2 – 2		927
	160	1379.217	240.9596 – 313.4647	$3d^5(a^2H)4s - 3d^5(a^4F)4p$	$^3H - ^5G^\circ$	4 – 5		927
	30	1379.556						927
	100	1380.514	225.5451 – 297.9828	$3d^5(a^4D)4s - 3d^5(a^4D)4p$	$^3D - ^5P^\circ$	1 – 1		927
	170	1383.017	242.8626 – 315.1682	$3d^5(a^2G)4s - 3d^5(a^4F)4p$	$^3G - ^5F^\circ$	5 – 5		927
	20	1383.489	216.5960 – 288.8779	$3d^5(a^4D)4s - 3d^5(a^4P)4p$	$^5D - ^5S^\circ$	3 – 2		927
	540	1384.873	233.8392 – 306.0490	$3d^5(a^2I)4s - 3d^5(a^2I)4p$	$^1I - ^3I^\circ$	6 – 5		927
	530	1385.923	212.0958 – 284.2490	$3d^5(a^4P)4s - 3d^5(a^4G)4p$	$^5P - ^5G^\circ$	3 – 3		927
	70	1387.174	247.0491 – 319.1387	$3d^5(a^2G)4s - 3d^5(a^2G)4p$	$^1G - ^1G^\circ$	4 – 4		927
	20	1388.879	243.3705 – 315.3701	$3d^5(a^4F)4s - 3d^5(a^2G)4p$	$^3F - ^3H^\circ$	3 – 4		927
	240	1389.047	221.4290 – 293.4200	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$^3P - ^3P^\circ$	1 – 1		927
	220	1389.447	216.1899 – 288.1616	$3d^5(a^4D)4s - 3d^5(a^4G)4p$	$^5D - ^5F^\circ$	4 – 4		927
	490	1390.921	221.0876 – 292.9830	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$^3P - ^3P^\circ$	2 – 2		927
	120	1391.672	247.2818 – 319.1387	$3d^5(b^2F)4s - 3d^5(a^2G)4p$	$^3F - ^1G^\circ$	4 – 4		927
	600	1392.484	240.1938 – 312.0083	$3d^5(a^2F)4s - 3d^5(a^2F)4p$	$^1F - ^1G^\circ$	3 – 4		927
	560	1394.375	216.1899 – 287.9069	$3d^5(a^4D)4s - 3d^5(a^4G)4p$	$^5D - ^5F^\circ$	4 – 5		927
	460	1397.550	221.4290 – 292.9830	$3d^5(a^4P)4s - 3d^5(a^4P)4p$	$^3P - ^3P^\circ$	1 – 2		927
		1446.0	0.0 – 69.1561	$3d^6 - 3d^6$	$ga^5D - b^3P$	4 – 2	F,P	375,927
		1455.2	0.0 – 68.7187	$3d^6 - 3d^6$	$ga^5D - b^3F$	4 – 4	F,P	375,927

Ni V — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		1464.8	0.8897 – 69.1561	$3d^6 - 3d^6$	$ga^5D - b^3P$	3 – 2	F,P	375,927
		1471.3	0.8897 – 68.8547	$3d^6 - 3d^6$	$ga^5D - b^3F$	3 – 3	F,P	375,927
		1474.3	0.8897 – 68.7187	$3d^6 - 3d^6$	$ga^5D - b^3F$	3 – 4	F,P	375,927
		1477.8	1.4899 – 69.1561	$3d^6 - 3d^6$	$ga^5D - b^3P$	2 – 2	F,P	375,927
		1484.4	1.4899 – 68.8547	$3d^6 - 3d^6$	$ga^5D - b^3F$	2 – 3	F,P	375,927
		1487.5	1.4899 – 68.7187	$3d^6 - 3d^6$	$ga^5D - b^3F$	2 – 4	F,P	375,927
		1489.4	1.4899 – 68.6321	$3d^6 - 3d^6$	$ga^5D - b^3F$	2 – 2	F,P	375,927
		1492.9	1.8715 – 68.8547	$3d^6 - 3d^6$	$ga^5D - b^3F$	1 – 3	F,P	375,927
		1497.9	1.8715 – 68.6321	$3d^6 - 3d^6$	$ga^5D - b^3F$	1 – 2	F,P	375,927
		1500.2	0.8897 – 67.5479	$3d^6 - 3d^6$	$ga^5D - b^3P$	3 – 1	F,P	375,927
		1502.1	2.0576 – 68.6321	$3d^6 - 3d^6$	$ga^5D - b^3F$	0 – 2	F,P	375,927
		1513.8	1.4899 – 67.5479	$3d^6 - 3d^6$	$ga^5D - b^3P$	2 – 1	F,P	375,927
		1522.6	1.8715 – 67.5479	$3d^6 - 3d^6$	$ga^5D - b^3P$	1 – 1	F,P	375,927
		1532.6	1.4899 – 66.7378	$3d^6 - 3d^6$	$ga^5D - b^3P$	2 – 0	F,P	375,927
		1541.6	1.8715 – 66.7378	$3d^6 - 3d^6$	$ga^5D - b^3P$	1 – 0	F,P	375,927
		1791.7	48.6070 – 104.4205	$3d^6 - 3d^6$	$a^1D - b^1D$	2 – 2	F,P	375,927
		1830.3	178.0198 – 232.6556	$3d^5(a^6S)4s - 3d^5(a^2D)4s$	$^5S - {}^3D$	2 – 2	F,P	375,927
		1834.0	178.0198 – 232.5459	$3d^5(a^6S)4s - 3d^5(a^2D)4s$	$^5S - {}^3D$	2 – 3	F,P	375,927
		1920.5	164.5259 – 216.5960	$3d^5(a^6S)4s - 3d^5(a^4D)4s$	$^7S - {}^5D$	3 – 3	F,P	375,927
		1935.6	164.5259 – 216.1899	$3d^5(a^6S)4s - 3d^5(a^4D)4s$	$^7S - {}^5D$	3 – 4	F,P	375,927

NICKEL VI (Ni^{5+}), Z = 28
Ground State $1s^22s^22p^63s^23p^63d^5(^6S_{5/2})$ (23 electrons)
Ionization Potential [870 000] cm^{-1}; [108] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	180	224.703	67.0851 – 512.1132	$3d^5 - 3d^4(b^1D)4p$	$a^2F - {}^2D°$	$\frac{7}{2} - \frac{5}{2}$		1093
	60	227.162	67.0851 – 507.3004	$3d^5 - 3d^4(b^1D)4p$	$a^2F - {}^2F°$	$\frac{7}{2} - \frac{7}{2}$		1093
	160	231.556	75.4417 – 507.3004	$3d^5 - 3d^4(b^1D)4p$	$a^2G - {}^2F°$	$\frac{9}{2} - \frac{7}{2}$		1093
	100	231.574	79.3914 – 511.2174	$3d^5 - 3d^4(b^1D)4p$	$b^2F - {}^2D°$	$\frac{5}{2} - \frac{3}{2}$		1093
	160	232.275	74.6277 – 505.1505	$3d^5 - 3d^4(b^1D)4p$	$a^2G - {}^2F°$	$\frac{7}{2} - \frac{5}{2}$		1093
	180	233.890	46.1044 – 473.6564	$3d^5 - 3d^4(b^3F)4p$	$a^4P - {}^4D°$	$\frac{3}{2} - \frac{3}{2}$		1093
	220	233.969	45.8842 – 473.2924	$3d^5 - 3d^4(b^3F)4p$	$a^4P - {}^4D°$	$\frac{5}{2} - \frac{5}{2}$		1093
	130	234.010	46.3248 – 473.6564	$3d^5 - 3d^4(b^3F)4p$	$a^4P - {}^4D°$	$\frac{1}{2} - \frac{3}{2}$		1093
	190	234.088	46.1044 – 473.2924	$3d^5 - 3d^4(b^3F)4p$	$a^4P - {}^4D°$	$\frac{3}{2} - \frac{5}{2}$		1093
	300	234.403	45.8842 – 472.4973	$3d^5 - 3d^4(b^3F)4p$	$a^4P - {}^4D°$	$\frac{5}{2} - \frac{7}{2}$		1093
	330	235.170	45.8842 – 471.1068	$3d^5 - 3d^4(b^3P)4p$	$a^4P - {}^4S°$	$\frac{5}{2} - \frac{3}{2}$		1093
	280	235.293	46.1044 – 471.1068	$3d^5 - 3d^4(b^3P)4p$	$a^4P - {}^4S°$	$\frac{3}{2} - \frac{3}{2}$		1093
	130	235.386	41.9209 – 466.7543	$3d^5 - 3d^4(b^3F)4p$	$a^4G - {}^4G°$	$\frac{11}{2} - \frac{11}{2}$		1093
	140	235.414	46.3248 – 471.1068	$3d^5 - 3d^4(b^3P)4p$	$a^4P - {}^4S°$	$\frac{1}{2} - \frac{3}{2}$		1093
	90	235.769	41.9209 – 466.0652	$3d^5 - 3d^4(b^3F)4p$	$a^4G - {}^4G°$	$\frac{11}{2} - \frac{9}{2}$		1093
	50	235.790	42.0232 – 466.1337	$3d^5 - 3d^4(b^3F)4p$	$a^4G - {}^2F°$	$\frac{9}{2} - \frac{7}{2}$		1093
	70	235.825	42.0232 – 466.0652	$3d^5 - 3d^4(b^3F)4p$	$a^4G - {}^4G°$	$\frac{9}{2} - \frac{9}{2}$		1093
	40	236.399	50.6435 – 473.6564	$3d^5 - 3d^4(b^3F)4p$	$a^4D - {}^4D°$	$\frac{1}{2} - \frac{3}{2}$		1093
	130	236.871	50.3310 – 472.4973	$3d^5 - 3d^4(b^3F)4p$	$a^4D - {}^4D°$	$\frac{7}{2} - \frac{7}{2}$		1093
	150	237.124	50.7776 – 472.4973	$3d^5 - 3d^4(b^3F)4p$	$a^4D - {}^4D°$	$\frac{5}{2} - \frac{7}{2}$		1093
	150	237.857	42.0232 – 462.4431	$3d^5 - 3d^4(b^3P)4p$	$a^4G - {}^4D°$	$\frac{9}{2} - \frac{7}{2}$		1093
	190	237.909	50.7776 – 471.1068	$3d^5 - 3d^4(b^3P)4p$	$a^4D - {}^4S°$	$\frac{5}{2} - \frac{3}{2}$		1093
	10	238.476	64.1524 – 483.4809	$3d^5 - 3d^4(b^3F)4p$	$a^2D - {}^2D°$	$\frac{5}{2} - \frac{3}{2}$		1093
	390	238.550	41.9209 – 461.1183	$3d^5 - 3d^4(b^3F)4p$	$a^4G - {}^4F°$	$\frac{11}{2} - \frac{9}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	260	238.890	42.0036 – 460.6036	$3d^5 - 3d^4(b^3F)4p$	$a^4G - {}^4F^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	390	238.941	42.0232 – 460.5359	$3d^5 - 3d^4(b^3F)4p$	$a^4G - {}^4F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	210	239.029	42.0036 – 460.3646	$3d^5 - 3d^4(b^3F)4p$	$a^4G - {}^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	310	239.046	42.0351 – 460.3646	$3d^5 - 3d^4(b^3F)4p$	$a^4G - {}^4F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	80	239.071	61.1960 – 479.4818	$3d^5 - 3d^4(b^1G)4p$	$a^2I - {}^2H^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	360	239.118	61.2795 – 479.4818	$3d^5 - 3d^4(b^1G)4p$	$a^2I - {}^2H^\circ$	$\frac{13}{2} - \frac{11}{2}$		1093
	180	239.320	61.1960 – 479.0463	$3d^5 - 3d^4(b^1G)4p$	$a^2I - {}^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	70	239.808	45.8842 – 462.8841	$3d^5 - 3d^4(b^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	140	239.941	46.1044 – 462.8841	$3d^5 - 3d^4(b^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	110	240.063	45.8842 – 462.4431	$3d^5 - 3d^4(b^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	140	240.410	67.0851 – 483.0434	$3d^5 - 3d^4(b^3F)4p$	$a^2F - {}^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	120	240.536	45.8842 – 461.6226	$3d^5 - 3d^4(b^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	60	240.582	96.4612 – 512.1132	$3d^5 - 3d^4(b^1D)4p$	$b^2D - {}^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	210	240.647	65.1735 – 480.7242	$3d^5 - 3d^4(b^1G)4p$	$a^2D - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	130	240.771	46.1044 – 461.4378	$3d^5 - 3d^4(b^3P)4p$	$a^4P - {}^4P^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	90	240.830	50.3310 – 465.5527	$3d^5 - 3d^4(b^3P)4p$	$a^4D - {}^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	300	240.885	61.1960 – 476.3321	$3d^5 - 3d^4(b^1G)4p$	$a^2I - {}^2H^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	90	240.946	68.4449 – 483.4809	$3d^5 - 3d^4(b^3F)4p$	$a^2F - {}^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	180	241.104	96.4612 – 511.2174	$3d^5 - 3d^4(b^1D)4p$	$b^2D - {}^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	100	241.167	45.8842 – 460.5359	$3d^5 - 3d^4(b^3F)4p$	$a^4P - {}^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	160	241.268	50.3310 – 464.8078	$3d^5 - 3d^4(b^3F)4p$	$a^4D - {}^4G^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	90	241.527	50.7776 – 464.8078	$3d^5 - 3d^4(b^3F)4p$	$a^4D - {}^4G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	440	242.148	50.3310 – 463.3015	$3d^5 - 3d^4(b^3P)4p$	$a^4D - {}^4P^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	100	242.412	50.7805 – 463.3015	$3d^5 - 3d^4(b^3P)4p$	$a^4D - {}^4P^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	180	242.576	86.5321 – 498.7730	$3d^5 - 3d^4(b^1D)4p$	$a^2S - {}^2P^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	480	242.653	50.3310 – 462.4431	$3d^5 - 3d^4(b^3P)4p$	$a^4D - {}^4D^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	60	242.741	67.0851 – 479.0463	$3d^5 - 3d^4(b^1G)4p$	$a^2F - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	130	242.917	50.7776 – 462.4431	$3d^5 - 3d^4(b^3P)4p$	$a^4D - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	60	243.084	61.1960 – 472.5795	$3d^5 - 3d^4(b^3F)4p$	$a^2I - {}^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	270	243.403	50.7776 – 461.6226	$3d^5 - 3d^4(b^3P)4p$	$a^4D - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	90	243.432	50.3310 – 461.1183	$3d^5 - 3d^4(b^3F)4p$	$a^4D - {}^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	200	243.512	50.7776 – 461.4378	$3d^5 - 3d^4(b^3P)4p$	$a^4D - {}^4P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	60	243.683	130.0259 – 540.3941	$3d^5 - 3d^4(b^1S)4p$	$a^2P - {}^2P^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
	270	243.781	50.3310 – 460.5359	$3d^5 - 3d^4(b^3F)4p$	$a^4D - {}^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	110	243.927	50.6435 – 460.6036	$3d^5 - 3d^4(b^3F)4p$	$a^4D - {}^4F^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	160	244.008	50.7805 – 460.6036	$3d^5 - 3d^4(b^3F)4p$	$a^4D - {}^4F^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	150	244.051	50.7776 – 460.5359	$3d^5 - 3d^4(b^3F)4p$	$a^4D - {}^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	210	244.150	50.7805 – 460.3646	$3d^5 - 3d^4(b^3F)4p$	$a^4D - {}^4F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	50	244.270	64.1524 – 473.5319	$3d^5 - 3d^4(b^3F)4p$	$a^2D - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	60	244.350	67.0851 – 476.3321	$3d^5 - 3d^4(b^1G)4p$	$a^2F - {}^2H^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	70	244.688	64.1524 – 472.8330	$3d^5 - 3d^4(b^3P)4p$	$a^2D - {}^2P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	20	245.407	69.4470 – 476.9356	$3d^5 - 3d^4(b^1G)4p$	$a^4F - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	180	246.249	74.6277 – 480.7242	$3d^5 - 3d^4(b^1G)4p$	$a^2G - {}^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	400	246.473	73.7566 – 479.4818	$3d^5 - 3d^4(b^1G)4p$	$a^2H - {}^2H^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	80	246.614	67.0851 – 472.5795	$3d^5 - 3d^4(b^3F)4p$	$a^2F - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	490	246.738	73.7566 – 479.0463	$3d^5 - 3d^4(b^1G)4p$	$a^2H - {}^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	110	246.785	68.4449 – 473.6564	$3d^5 - 3d^4(b^3F)4p$	$a^2F - {}^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	60	246.861	68.4449 – 473.5319	$3d^5 - 3d^4(b^3F)4p$	$a^2F - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	280	247.069	75.4417 – 480.1893	$3d^5 - 3d^4(b^1G)4p$	$a^2G - {}^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	140	247.186	69.1735 – 473.7276	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	180	247.225	68.8017 – 473.2924	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	40	247.396	69.4470 – 473.6564	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	50	247.472	79.3914 – 483.4809	$3d^5 - 3d^4(b^3F)4p$	$b^2F - {}^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	370	247.508	72.9088 – 476.9356	$3d^5 - 3d^4(b^1G)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	150	247.560	68.5512 – 472.4973	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	40	247.639	96.4612 – 500.2752	$3d^5 - 3d^4(b^1D)4p$	$b^2D - {}^2P^\circ$	$\frac{3}{2}-\frac{1}{2}$		1093
	190	247.767	75.4417 – 479.0463	$3d^5 - 3d^4(b^1G)4p$	$a^2G - {}^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
	340	247.878	72.9088 – 476.3321	$3d^5 - 3d^4(b^1G)4p$	$a^2H - {}^2H^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
	270	248.400	73.7566 – 476.3321	$3d^5 - 3d^4(b^1G)4p$	$a^2H - {}^2H^\circ$	$\frac{11}{2}-\frac{9}{2}$		1093
	300	248.568	74.6277 – 476.9356	$3d^5 - 3d^4(b^1G)4p$	$a^2G - {}^2G^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	350	248.635	140.9222 – 543.1156	$3d^5 - 3d^4(b^1S)4p$	$c^2D - {}^2P^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	40	248.689	141.0068 – 543.1156	$3d^5 - 3d^4(b^1S)4p$	$c^2D - {}^2P^\circ$	$\frac{3}{2}-\frac{3}{2}$		1093
	140	249.069	75.4417 – 476.9356	$3d^5 - 3d^4(b^1G)4p$	$a^2G - {}^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	20	249.170	79.3914 – 480.7242	$3d^5 - 3d^4(b^1G)4p$	$b^2F - {}^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	510	249.611	72.9088 – 473.5319	$3d^5 - 3d^4(b^3F)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	50	249.636	79.6083 – 480.1893	$3d^5 - 3d^4(b^1G)4p$	$b^2F - {}^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	250	250.206	72.9088 – 472.5795	$3d^5 - 3d^4(b^3F)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
	560	250.344	79.6083 – 479.0463	$3d^5 - 3d^4(b^1G)4p$	$b^2F - {}^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	220	250.384	141.0068 – 540.3941	$3d^5 - 3d^4(b^1S)4p$	$c^2D - {}^2P^\circ$	$\frac{3}{2}-\frac{1}{2}$		1093
	50	250.504	42.0232 – 441.2161	$3d^5 - 3d^4(a^3D)4p$	$a^4G - {}^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	330	250.686	74.6277 – 473.5319	$3d^5 - 3d^4(b^3F)4p$	$a^2G - {}^2G^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	540	250.738	73.7566 – 472.5795	$3d^5 - 3d^4(b^3F)4p$	$a^2H - {}^2G^\circ$	$\frac{11}{2}-\frac{9}{2}$		1093
	40	250.792	64.1524 – 462.8841	$3d^5 - 3d^4(b^3P)4p$	$a^2D - {}^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	470	251.128	68.5512 – 466.7543	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4G^\circ$	$\frac{9}{2}-\frac{11}{2}$		1093
	380	251.199	75.4417 – 473.5319	$3d^5 - 3d^4(b^3F)4p$	$a^2G - {}^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	120	251.428	65.1735 – 462.9036	$3d^5 - 3d^4(b^3P)4p$	$a^2D - {}^4P^\circ$	$\frac{3}{2}-\frac{1}{2}$		1093
	60	251.452	68.4449 – 466.1337	$3d^5 - 3d^4(b^3F)4p$	$a^2F - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	310	251.544	79.3914 – 476.9356	$3d^5 - 3d^4(b^1G)4p$	$b^2F - {}^2G^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	330	251.564	68.5512 – 466.0652	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4G^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
	180	251.678	79.6083 – 476.9356	$3d^5 - 3d^4(b^1G)4p$	$b^2F - {}^2G^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	520	251.722	107.8870 – 505.1505	$3d^5 - 3d^4(b^1D)4p$	$b^2G - {}^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	60	251.761	69.4470 – 466.6491	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	220	251.802	75.4417 – 472.5795	$3d^5 - 3d^4(b^3F)4p$	$a^2G - {}^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
	70	251.854	75.4417 – 472.4973	$3d^5 - 3d^4(b^3F)4p$	$a^2G - {}^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	420	252.047	68.8017 – 465.5527	$3d^5 - 3d^4(b^3P)4p$	$a^4F - {}^2D^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	340	252.062	79.6083 – 476.3321	$3d^5 - 3d^4(b^1G)4p$	$b^2F - {}^2H^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	130	252.088	69.4470 – 466.1337	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	150	252.151	69.4470 – 466.0342	$3d^5 - 3d^4(b^3P)4p$	$a^4F - {}^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	190	252.291	68.4449 – 464.8078	$3d^5 - 3d^4(b^3F)4p$	$a^2F - {}^4G^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	250	252.362	68.5512 – 464.8078	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4G^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	140	252.386	67.0851 – 463.3015	$3d^5 - 3d^4(b^3P)4p$	$a^2F - {}^4P^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	200	252.523	68.8017 – 464.8078	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4G^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	100	252.792	68.4449 – 464.0278	$3d^5 - 3d^4(b^3F)4p$	$a^2F - {}^4G^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	110	252.888	65.1735 – 460.6036	$3d^5 - 3d^4(b^3F)4p$	$a^2D - {}^4F^\circ$	$\frac{3}{2}-\frac{3}{2}$		1093
	240	253.257	69.1735 – 464.0278	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4G^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	110	253.435	69.4470 – 464.0278	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4G^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	250	253.461	67.0851 – 461.6226	$3d^5 - 3d^4(b^3P)4p$	$a^2F - {}^4D^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	560	253.485	68.8017 – 463.3015	$3d^5 - 3d^4(b^3P)4p$	$a^4F - {}^4P^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	510	253.524	68.4449 – 462.8841	$3d^5 - 3d^4(b^3P)4p$	$a^2F - {}^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	160	253.717	79.3914 – 473.5319	$3d^5 - 3d^4(b^3F)4p$	$b^2F - {}^2G^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	110	253.808	50.7805 – 444.7842	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^2D^\circ$	$\frac{3}{2}-\frac{5}{2}$		1093
	690	253.877	68.5512 – 462.4431	$3d^5 - 3d^4(b^3P)4p$	$a^4F - {}^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	520	253.981	69.1735 – 462.9036	$3d^5 - 3d^4(b^3P)4p$	$a^4F - {}^4P^\circ$	$\frac{3}{2}-\frac{1}{2}$		1093
	280	254.067	65.1735 – 458.7722	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		1093
	540	254.105	41.9209 – 435.4594	$3d^5 - 3d^4(a^3D)4p$	$a^4G - {}^4F^\circ$	$\frac{11}{2}-\frac{9}{2}$		1093
	520	254.168	69.4470 – 462.8841	$3d^5 - 3d^4(b^3P)4p$	$a^4F - {}^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	60	254.273	67.0851 – 460.3646	$3d^5 - 3d^4(b^3F)4p$	$a^2F - {}^4F^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	250	254.308	72.9088 – 466.1337	$3d^5 - 3d^4(b^3F)4p$	$a^2H - {}^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	170	254.353	72.9088 – 466.0652	$3d^5 - 3d^4(b^3F)4p$	$a^2H - {}^4G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	470	254.393	42.0232 – 435.1162	$3d^5 - 3d^4(a^3D)4p$	$a^4G - {}^4F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	420	254.458	69.4470 – 462.4431	$3d^5 - 3d^4(b^3P)4p$	$a^4F - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	270	254.472	79.6083 – 472.5795	$3d^5 - 3d^4(b^3F)4p$	$b^2F - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	660	254.570	68.8017 – 461.6226	$3d^5 - 3d^4(b^3P)4p$	$a^4F - {}^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	220	254.672	64.1524 – 456.8156	$3d^5 - 3d^4(a^1F)4p$	$a^2D - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	690	254.733	68.5512 – 461.1183	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	80	254.810	69.1735 – 461.6226	$3d^5 - 3d^4(b^3P)4p$	$a^4F - {}^4D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	470	254.897	68.8017 – 461.1183	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	230	254.974	42.0036 – 434.2009	$3d^5 - 3d^4(a^3D)4p$	$a^4G - {}^4F^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	300	255.043	68.4449 – 460.5359	$3d^5 - 3d^4(b^3F)4p$	$a^2F - {}^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	370	255.089	74.6277 – 466.6491	$3d^5 - 3d^4(b^3F)4p$	$a^2G - {}^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	450	255.109	68.5512 – 460.5359	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	570	255.155	68.4449 – 460.3646	$3d^5 - 3d^4(b^3F)4p$	$a^2F - {}^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	660	255.274	68.8017 – 460.5359	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	80	255.385	68.8017 – 460.3646	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	120	255.426	74.6277 – 466.1337	$3d^5 - 3d^4(b^3F)4p$	$a^2G - {}^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	590	255.474	69.1735 – 460.6036	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4F^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	60	255.528	42.0232 – 433.3712	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	330	255.630	69.1735 – 460.3646	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	270	255.696	69.4470 – 460.5359	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	510	255.809	69.4470 – 460.3646	$3d^5 - 3d^4(b^3F)4p$	$a^4F - {}^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	110	255.907	42.0351 – 432.8001	$3d^5 - 3d^4(a^1G)4p$	$a^4G - {}^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	150	255.957	75.4417 – 466.1337	$3d^5 - 3d^4(b^3F)4p$	$a^2G - {}^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	130	256.001	50.7776 – 441.4012	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	150	256.196	68.4449 – 458.7722	$3d^5 - 3d^4(a^1F)4p$	$a^2F - {}^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	190	256.571	0.0 – 389.7604	$3d^5 - 3d^4(a^5D)4p$	$ga^6S - {}^4P^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	250	256.587	67.0851 – 456.8156	$3d^5 - 3d^4(a^1F)4p$	$a^2F - {}^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	320	256.675	69.1735 – 458.7722	$3d^5 - 3d^4(a^1F)4p$	$a^4F - {}^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	140	256.716	50.6435 – 440.1686	$3d^5 - 3d^4(a^1S)4p$	$a^4D - {}^2P^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	360	256.806	50.7776 – 440.1686	$3d^5 - 3d^4(a^1S)4p$	$a^4D - {}^2P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	440	256.828	75.4417 – 464.8078	$3d^5 - 3d^4(b^3F)4p$	$a^2G - {}^4G^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	420	256.910	0.0 – 389.2434	$3d^5 - 3d^4(a^5D)4p$	$ga^6S - {}^6D^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	200	257.198	67.0851 – 455.8876	$3d^5 - 3d^4(a^1F)4p$	$a^2F - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	120	257.486	68.4449 – 456.8156	$3d^5 - 3d^4(a^1F)4p$	$a^2F - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	150	257.593	72.9088 – 461.1183	$3d^5 - 3d^4(b^3F)4p$	$a^2H - {}^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	220	257.615	46.1044 – 434.2816	$3d^5 - 3d^4(a^3D)4p$	$a^4P - {}^4P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	280	257.657	41.9209 – 430.0333	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^4G^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	210	257.725	42.0232 – 430.0333	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	70	257.760	46.3248 – 434.2816	$3d^5 - 3d^4(a^3D)4p$	$a^4P - {}^4P^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
	590	257.831	0.0 – 387.8499	$3d^5 - 3d^4(a^5D)4p$	$ga^6S - {}^6D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	200	258.014	41.9209 – 429.4863	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^4G^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	210	258.093	42.0232 – 429.4863	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^4G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	370	258.170	86.5321 – 473.8695	$3d^5 - 3d^4(b^3P)4p$	$a^2S - {}^2P^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
	250	258.222	79.3914 – 466.6491	$3d^5 - 3d^4(b^3F)4p$	$b^2F - {}^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	360	258.306	46.3248 – 433.4625	$3d^5 - 3d^4(a^3D)4p$	$a^4P - {}^4P^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	140	258.371	79.6083 – 466.6491	$3d^5 - 3d^4(b^3F)4p$	$b^2F - {}^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	130	258.397	75.4417 – 462.4431	$3d^5 - 3d^4(b^3P)4p$	$a^2G - {}^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	90	258.474	64.1524 – 451.0413	$3d^5 - 3d^4(a^1F)4p$	$a^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	140	258.505	42.0232 – 428.8665	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^4G^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	80	258.569	79.3914 – 466.1337	$3d^5 - 3d^4(b^3F)4p$	$b^2F - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	480	258.637	79.3914 – 466.0342	$3d^5 - 3d^4(b^3P)4p$	$b^2F - {}^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	40	258.674	96.4612 – 483.0434	$3d^5 - 3d^4(b^3F)4p$	$b^2D - {}^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	210	258.716	79.6083 – 466.1337	$3d^5 - 3d^4(b^3F)4p$	$b^2F - {}^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	210	258.755	42.0351 – 428.4965	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^4G^\circ$	7/2 – 5/2		1093
	510	258.791	45.8842 – 432.2957	$3d^5 - 3d^4(a^3D)4p$	$a^4P - {}^4D^\circ$	5/2 – 5/2		1093
	130	258.867	86.5321 – 472.8330	$3d^5 - 3d^4(b^3P)4p$	$a^2S - {}^2P^\circ$	1/2 – 3/2		1093
	440	258.941	46.1044 – 432.2957	$3d^5 - 3d^4(a^3D)4p$	$a^4P - {}^4D^\circ$	3/2 – 5/2		1093
	610	258.962	0.0 – 386.1573	$3d^5 - 3d^4(a^5D)4p$	$ga^6S - {}^4P^\circ$	5/2 – 3/2		1093
	90	259.047	45.8842 – 431.9126	$3d^5 - 3d^4(a^3D)4p$	$a^4P - {}^4D^\circ$	5/2 – 7/2		1093
	520	259.103	79.6083 – 465.5527	$3d^5 - 3d^4(b^3P)4p$	$b^2F - {}^2D^\circ$	7/2 – 5/2		1093
	290	259.283	42.0232 – 427.7027	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^2H^\circ$	9/2 – 11/2		1093
	150	259.357	42.0036 – 427.5750	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^2G^\circ$	5/2 – 7/2		1093
	190	259.377	68.4449 – 453.9830	$3d^5 - 3d^4(a^1F)4p$	$a^2F - {}^2G^\circ$	5/2 – 7/2		1093
	280	259.615	68.8017 – 453.9830	$3d^5 - 3d^4(a^1F)4p$	$a^4F - {}^2G^\circ$	7/2 – 7/2		1093
	620	259.650	50.3310 – 435.4594	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4F^\circ$	7/2 – 9/2		1093
	210	259.682	42.0036 – 427.0960	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^2F^\circ$	5/2 – 5/2		1093
	190	259.699	42.0351 – 427.0960	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^2F^\circ$	7/2 – 5/2		1093
	360	259.797	46.1044 – 431.0203	$3d^5 - 3d^4(a^3D)4p$	$a^4P - {}^4P^\circ$	3/2 – 5/2		1093
	230	259.830	46.1044 – 430.9719	$3d^5 - 3d^4(a^3D)4p$	$a^4P - {}^4D^\circ$	3/2 – 3/2		1093
	360	259.891	67.0851 – 451.8594	$3d^5 - 3d^4(a^1F)4p$	$a^2F - {}^2F^\circ$	7/2 – 7/2		1093
	210	259.978	46.3248 – 430.9719	$3d^5 - 3d^4(a^3D)4p$	$a^4P - {}^4D^\circ$	1/2 – 3/2		1093
	720	260.057	41.9209 – 426.4519	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^4H^\circ$	11/2 – 13/2		1093
	230	260.131	79.6083 – 464.0278	$3d^5 - 3d^4(b^3F)4p$	$b^2F - {}^4G^\circ$	7/2 – 5/2		1093
	500	260.187	50.7776 – 435.1162	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4F^\circ$	5/2 – 7/2		1093
	290	260.218	50.3310 – 434.6260	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4F^\circ$	7/2 – 5/2		1093
	340	260.238	96.4612 – 480.7242	$3d^5 - 3d^4(b^1G)4p$	$b^2D - {}^2F^\circ$	3/2 – 5/2		1093
	290	260.270	50.7805 – 434.9970	$3d^5 - 3d^4(a^1G)4p$	$a^4D - {}^2F^\circ$	3/2 – 5/2		1093
	790	260.351	0.0 – 384.0965	$3d^5 - 3d^4(a^5D)4p$	$ga^6S - {}^6P^\circ$	5/2 – 7/2		1093
	230	260.446	67.0851 – 451.0413	$3d^5 - 3d^4(a^1F)4p$	$a^2F - {}^2F^\circ$	7/2 – 5/2		1093
	530	260.522	50.7805 – 434.6260	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4F^\circ$	3/2 – 5/2		1093
	790	260.592	0.0 – 383.7398	$3d^5 - 3d^4(a^5D)4p$	$ga^6S - {}^6P^\circ$	5/2 – 5/2		1093
	630	260.661	50.6435 – 434.2816	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4P^\circ$	1/2 – 1/2		1093
	780	260.717	0.0 – 383.5578	$3d^5 - 3d^4(a^5D)4p$	$ga^6S - {}^6P^\circ$	5/2 – 3/2		1093
	590	260.756	50.7805 – 434.2816	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4P^\circ$	3/2 – 1/2		1093
	490	260.808	50.7805 – 434.2009	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4F^\circ$	3/2 – 3/2		1093
	190	260.976	68.4449 – 451.6229	$3d^5 - 3d^4(a^1D)4p$	$a^2F - {}^2P^\circ$	5/2 – 3/2		1093
	280	261.058	68.8017 – 451.8594	$3d^5 - 3d^4(a^1F)4p$	$a^4F - {}^2F^\circ$	7/2 – 7/2		1093
	510	261.109	72.9088 – 455.8876	$3d^5 - 3d^4(a^1F)4p$	$a^2H - {}^2G^\circ$	9/2 – 9/2		1093
	680	261.310	50.7776 – 433.4625	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4P^\circ$	5/2 – 3/2		1093
	660	261.436	42.0351 – 424.5370	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^4H^\circ$	7/2 – 9/2		1093
	210	261.498	69.4470 – 451.8594	$3d^5 - 3d^4(a^1F)4p$	$a^4F - {}^2F^\circ$	5/2 – 7/2		1093
	660	261.547	42.0232 – 424.3637	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^4H^\circ$	9/2 – 11/2		1093
	440	261.622	79.3914 – 461.6226	$3d^5 - 3d^4(b^3P)4p$	$b^2F - {}^4D^\circ$	5/2 – 5/2		1093
	490	261.657	42.0351 – 424.2185	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^4F^\circ$	7/2 – 5/2		1093
	630	261.689	73.7566 – 455.8876	$3d^5 - 3d^4(a^1F)4p$	$a^2H - {}^2G^\circ$	11/2 – 9/2		1093
	680	261.804	50.3310 – 432.2957	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4D^\circ$	7/2 – 5/2		1093
	160	261.842	64.1524 – 446.0612	$3d^5 - 3d^4(a^1D)4p$	$a^2D - {}^2F^\circ$	5/2 – 5/2		1093
	340	261.888	41.9209 – 423.7633	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^4F^\circ$	11/2 – 9/2		1093
	440	261.958	42.0232 – 423.7633	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^4F^\circ$	9/2 – 9/2		1093
	160	261.982	42.0036 – 423.7105	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^4F^\circ$	5/2 – 3/2		1093
	270	262.028	42.0036 – 423.6458	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^2F^\circ$	5/2 – 7/2		1093
	650	262.066	50.3310 – 431.9126	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4D^\circ$	7/2 – 7/2		1093
	280	262.111	50.7776 – 432.2957	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4D^\circ$	5/2 – 5/2		1093
	650	262.235	42.0036 – 423.3414	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^4H^\circ$	5/2 – 7/2		1093
	460	262.255	42.0351 – 423.3414	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^4H^\circ$	7/2 – 7/2		1093
	180	262.287	74.6277 – 455.8876	$3d^5 - 3d^4(a^1F)4p$	$a^2G - {}^2G^\circ$	7/2 – 9/2		1093
	150	262.302	46.1044 – 427.3422	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^2D^\circ$	3/2 – 5/2		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	210	262.335	130.0259 – 511.2174	$3d^5 - 3d^4(b^1D)4p$	$a^2P - {}^2D^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	230	262.372	50.7776 – 431.9126	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	410	262.416	72.9088 – 453.9830	$3d^5 - 3d^4(a^1F)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	510	262.447	42.0351 – 423.0652	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^2H^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	180	262.485	79.3914 – 460.3646	$3d^5 - 3d^4(b^3F)4p$	$b^2F - {}^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	260	262.518	79.6083 – 460.5359	$3d^5 - 3d^4(b^3F)4p$	$b^2F - {}^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	430	262.541	42.0036 – 422.8978	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	280	262.562	42.0351 – 422.8978	$3d^5 - 3d^4(a^3G)4p$	$a^4G - {}^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	290	262.612	41.9209 – 422.7118	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^2I^\circ$	$\frac{11}{2} - \frac{13}{2}$		1093
	290	262.662	41.9209 – 422.6424	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^2I^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	460	262.683	50.3310 – 431.0203	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4P^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	330	262.723	42.0232 – 422.6424	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^2I^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	570	262.850	42.0036 – 422.4372	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	390	262.931	50.6435 – 430.9719	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4D^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	490	262.963	42.0232 – 422.3066	$3d^5 - 3d^4(a^3P)4p$	$a^4G - {}^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	630	262.990	50.7776 – 431.0203	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4P^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	560	263.026	50.7776 – 430.9719	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	330	263.077	50.7805 – 430.8988	$3d^5 - 3d^4(a^3D)4p$	$a^4D - {}^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	490	263.352	61.1960 – 440.9179	$3d^5 - 3d^4(a^1I)4p$	$a^2I - {}^2H^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	400	263.434	42.0036 – 421.6072	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	300	263.605	74.6277 – 453.9830	$3d^5 - 3d^4(a^1F)4p$	$a^2G - {}^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	500	263.653	42.0351 – 421.3243	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	180	263.868	67.0851 – 446.0612	$3d^5 - 3d^4(a^1D)4p$	$a^2F - {}^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	690	263.913	41.9209 – 420.8357	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4F^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	190	263.984	42.0232 – 420.8357	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	520	264.022	61.2795 – 440.0392	$3d^5 - 3d^4(a^1I)4p$	$a^2I - {}^2H^\circ$	$\frac{13}{2} - \frac{11}{2}$		1093
	720	264.060	41.9209 – 420.6234	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	100	264.131	42.0232 – 420.6234	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	700	264.182	42.0232 – 420.5532	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	190	264.228	45.8842 – 424.3461	$3d^5 - 3d^4(a^3G)4p$	$a^4P - {}^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	300	264.358	42.0351 – 420.3089	$3d^5 - 3d^4(a^3P)4p$	$a^4G - {}^4P^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	150	264.440	41.9209 – 420.0800	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4G^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	710	264.512	42.0232 – 420.0800	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	190	264.614	46.3248 – 424.2354	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^2P^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	770	264.669	42.0351 – 419.8633	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4G^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	350	264.718	45.8842 – 423.6458	$3d^5 - 3d^4(a^3G)4p$	$a^4P - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	120	264.746	50.7805 – 428.4965	$3d^5 - 3d^4(a^3G)4p$	$a^4D - {}^4G^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	120	264.825	46.1044 – 423.7105	$3d^5 - 3d^4(a^3G)4p$	$a^4P - {}^4F^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	20	264.868	46.1044 – 423.6468	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	600	264.979	42.0036 – 419.3905	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4G^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	540	265.002	42.0351 – 419.3905	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4G^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	210	265.080	64.1524 – 441.4012	$3d^5 - 3d^4(a^3D)4p$	$a^2D - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	250	265.103	79.6083 – 456.8156	$3d^5 - 3d^4(a^1F)4p$	$b^2F - {}^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	490	265.207	64.1524 – 441.2161	$3d^5 - 3d^4(a^3D)4p$	$a^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	310	265.243	45.8842 – 422.8978	$3d^5 - 3d^4(a^3G)4p$	$a^4P - {}^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	530	265.397	46.1044 – 422.8978	$3d^5 - 3d^4(a^3G)4p$	$a^4P - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	620	265.455	42.0036 – 418.7134	$3d^5 - 3d^4(a^3P)4p$	$a^4G - {}^4P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	600	265.511	41.9209 – 418.5536	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4I^\circ$	$\frac{11}{2} - \frac{13}{2}$		1093
	590	265.525	65.1735 – 441.7857	$3d^5 - 3d^4(a^3D)4p$	$a^2D - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	420	265.565	45.8842 – 422.4372	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	550	265.611	42.0036 – 418.4908	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4F^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	680	265.658	45.8842 – 422.3066	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	730	265.716	42.0232 – 418.3688	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	590	265.765	79.6083 – 455.8876	$3d^5 - 3d^4(a^1F)4p$	$b^2F - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	190	265.795	65.1735 – 441.4012	$3d^5 - 3d^4(a^3D)4p$	$a^2D - {}^2D°$	$\frac{3}{2} - \frac{5}{2}$		1093
	170	265.878	46.3248 – 422.4372	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^4D°$	$\frac{1}{2} - \frac{3}{2}$		1093
	530	265.926	46.3248 – 422.3694	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^4D°$	$\frac{1}{2} - \frac{1}{2}$		1093
	600	265.946	45.8842 – 421.8940	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^4D°$	$\frac{5}{2} - \frac{5}{2}$		1093
	570	266.105	46.1044 – 421.8940	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^4D°$	$\frac{3}{2} - \frac{5}{2}$		1093
	450	266.154	42.0036 – 417.7181	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^2G°$	$\frac{5}{2} - \frac{7}{2}$		1093
	280	266.180	42.0232 – 417.7181	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^2G°$	$\frac{9}{2} - \frac{7}{2}$		1093
	650	266.227	41.9209 – 417.5384	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4G°$	$\frac{11}{2} - \frac{11}{2}$		1093
	500	266.299	42.0232 – 417.5384	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4G°$	$\frac{9}{2} - \frac{11}{2}$		1093
	270	266.354	45.8842 – 421.3243	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^2D°$	$\frac{5}{2} - \frac{5}{2}$		1093
	670	266.473	61.2795 – 436.5503	$3d^5 - 3d^4(a^1I)4p$	$a^2I - {}^2K°$	$\frac{13}{2} - \frac{15}{2}$		1093
	690	266.493	41.9209 – 417.1641	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4I°$	$\frac{11}{2} - \frac{11}{2}$		1093
	590	266.565	42.0232 – 417.1641	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4I°$	$\frac{9}{2} - \frac{11}{2}$		1093
	460	266.670	65.1735 – 440.1686	$3d^5 - 3d^4(a^1S)4p$	$a^2D - {}^2P°$	$\frac{3}{2} - \frac{3}{2}$		1093
	180	266.721	50.7776 – 425.7031	$3d^5 - 3d^4(a^3P)4p$	$a^4D - {}^2D°$	$\frac{5}{2} - \frac{3}{2}$		1093
	410	266.781	45.8842 – 420.7223	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4S°$	$\frac{5}{2} - \frac{3}{2}$		1093
	350	266.805	69.4470 – 444.2522	$3d^5 - 3d^4(a^1D)4p$	$a^4F - {}^2D°$	$\frac{5}{2} - \frac{3}{2}$		1093
	140	266.882	67.0851 – 441.7857	$3d^5 - 3d^4(a^3D)4p$	$a^2F - {}^2F°$	$\frac{7}{2} - \frac{5}{2}$		1093
	670	266.931	46.1044 – 420.7223	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4S°$	$\frac{3}{2} - \frac{3}{2}$		1093
	630	267.026	41.9209 – 416.4225	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G°$	$\frac{11}{2} - \frac{9}{2}$		1093
	590	267.076	45.8842 – 420.3089	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4P°$	$\frac{5}{2} - \frac{5}{2}$		1093
	620	267.094	42.0232 – 416.4225	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G°$	$\frac{9}{2} - \frac{9}{2}$		1093
	510	267.110	42.0351 – 416.4225	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G°$	$\frac{7}{2} - \frac{9}{2}$		1093
	630	267.153	67.0851 – 441.4012	$3d^5 - 3d^4(a^3D)4p$	$a^2F - {}^2D°$	$\frac{7}{2} - \frac{5}{2}$		1093
	130	267.189	61.1960 – 435.4594	$3d^5 - 3d^4(a^3D)4p$	$a^2I - {}^4F°$	$\frac{11}{2} - \frac{9}{2}$		1093
	560	267.232	46.1044 – 420.3089	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4P°$	$\frac{3}{2} - \frac{5}{2}$		1093
	490	267.253	68.4449 – 442.6199	$3d^5 - 3d^4(a^1D)4p$	$a^2F - {}^2D°$	$\frac{5}{2} - \frac{3}{2}$		1093
	90	267.285	67.0851 – 441.2161	$3d^5 - 3d^4(a^3D)4p$	$a^2F - {}^2F°$	$\frac{7}{2} - \frac{7}{2}$		1093
	630	267.367	50.3310 – 424.3461	$3d^5 - 3d^4(a^3G)4p$	$a^4D - {}^4F°$	$\frac{7}{2} - \frac{7}{2}$		1093
	560	267.408	61.1960 – 435.1654	$3d^5 - 3d^4(a^1I)4p$	$a^2I - {}^2K°$	$\frac{11}{2} - \frac{13}{2}$		1093
	670	267.461	61.2795 – 435.1654	$3d^5 - 3d^4(a^1I)4p$	$a^2I - {}^2K°$	$\frac{13}{2} - \frac{13}{2}$		1093
	610	267.498	41.9209 – 415.7543	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4I°$	$\frac{11}{2} - \frac{9}{2}$		1093
	710	267.571	61.2795 – 435.0115	$3d^5 - 3d^4(a^1G)4p$	$a^2I - {}^2H°$	$\frac{13}{2} - \frac{11}{2}$		1093
	510	267.640	42.0036 – 415.6408	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G°$	$\frac{5}{2} - \frac{7}{2}$		1093
	590	267.654	42.0232 – 415.6408	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G°$	$\frac{9}{2} - \frac{7}{2}$		1093
	590	267.688	50.7776 – 424.3461	$3d^5 - 3d^4(a^3G)4p$	$a^4D - {}^4F°$	$\frac{5}{2} - \frac{7}{2}$		1093
	650	267.769	50.7776 – 424.2354	$3d^5 - 3d^4(a^3P)4p$	$a^4D - {}^2P°$	$\frac{5}{2} - \frac{3}{2}$		1093
	700	267.784	50.3310 – 423.7633	$3d^5 - 3d^4(a^3G)4p$	$a^4D - {}^4F°$	$\frac{7}{2} - \frac{9}{2}$		1093
	320	267.825	42.0036 – 415.3820	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G°$	$\frac{5}{2} - \frac{5}{2}$		1093
	390	267.848	42.0351 – 415.3820	$3d^5 - 3d^4(a^3F)4p$	$a^4G - {}^4G°$	$\frac{7}{2} - \frac{5}{2}$		1093
	490	267.972	69.4470 – 442.6199	$3d^5 - 3d^4(a^1D)4p$	$a^4F - {}^2D°$	$\frac{5}{2} - \frac{3}{2}$		1093
	240	267.995	42.0036 – 415.1445	$3d^5 - 3d^4(a^3P)4p$	$a^4G - {}^4D°$	$\frac{5}{2} - \frac{5}{2}$		1093
	170	268.019	42.0351 – 415.1445	$3d^5 - 3d^4(a^3P)4p$	$a^4G - {}^4D°$	$\frac{7}{2} - \frac{5}{2}$		1093
	430	268.048	50.6435 – 423.7105	$3d^5 - 3d^4(a^3G)4p$	$a^4D - {}^4F°$	$\frac{1}{2} - \frac{3}{2}$		1093
	680	268.118	61.1960 – 434.1673	$3d^5 - 3d^4(a^1G)4p$	$a^2I - {}^2H°$	$\frac{11}{2} - \frac{9}{2}$		1093
	330	268.146	50.7805 – 423.7105	$3d^5 - 3d^4(a^3G)4p$	$a^4D - {}^4F°$	$\frac{3}{2} - \frac{3}{2}$		1093
	550	268.193	50.7805 – 423.6468	$3d^5 - 3d^4(a^3P)4p$	$a^4D - {}^2P°$	$\frac{3}{2} - \frac{1}{2}$		1093
	600	268.215	45.8842 – 418.7134	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4P°$	$\frac{5}{2} - \frac{3}{2}$		1093
	190	268.262	68.4449 – 441.2161	$3d^5 - 3d^4(a^3D)4p$	$a^2F - {}^2F°$	$\frac{5}{2} - \frac{7}{2}$		1093
	290	268.288	50.3310 – 423.0652	$3d^5 - 3d^4(a^3H)4p$	$a^4D - {}^2H°$	$\frac{7}{2} - \frac{9}{2}$		1093
	570	268.381	46.1044 – 418.7134	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4P°$	$\frac{3}{2} - \frac{3}{2}$		1093
	190	268.410	50.7776 – 423.3414	$3d^5 - 3d^4(a^3G)4p$	$a^4D - {}^4H°$	$\frac{5}{2} - \frac{7}{2}$		1093
	200	268.479	79.3914 – 451.8594	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^2F°$	$\frac{5}{2} - \frac{7}{2}$		1093
	250	268.539	46.1044 – 418.4908	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^4F°$	$\frac{3}{2} - \frac{3}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	550	268.571	107.8483 – 480.1893	$3d^5 - 3d^4(b^1G)4p$	$b^2G - {}^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	610	268.637	79.6083 – 451.8594	$3d^5 - 3d^4(a^1F)4p$	$b^2F - {}^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	400	268.697	46.3248 – 418.4908	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^4F^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	530	268.732	50.7805 – 422.8978	$3d^5 - 3d^4(a^3G)4p$	$a^4D - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	330	268.835	50.3310 – 422.3066	$3d^5 - 3d^4(a^3P)4p$	$a^4D - {}^4D^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	400	268.939	45.8842 – 417.7181	$3d^5 - 3d^4(a^3H)4p$	$a^4P - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	540	268.967	50.6435 – 422.4372	$3d^5 - 3d^4(a^3F)4p$	$a^4D - {}^4D^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	720	269.007	61.1960 – 432.9320	$3d^5 - 3d^4(a^1I)4p$	$a^2I - {}^2I^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	720	269.026	41.9209 – 413.6316	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4H^\circ$	$\frac{11}{2} - \frac{13}{2}$		1093
	670	269.072	61.2795 – 432.9320	$3d^5 - 3d^4(a^1I)4p$	$a^2I - {}^2I^\circ$	$\frac{13}{2} - \frac{11}{2}$		1093
	430	269.114	50.7805 – 422.3694	$3d^5 - 3d^4(a^3F)4p$	$a^4D - {}^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	550	269.140	50.3310 – 421.8940	$3d^5 - 3d^4(a^3F)4p$	$a^4D - {}^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	570	269.159	50.7776 – 422.3066	$3d^5 - 3d^4(a^3P)4p$	$a^4D - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	710	269.234	61.1960 – 432.6166	$3d^5 - 3d^4(a^1I)4p$	$a^2I - {}^2I^\circ$	$\frac{11}{2} - \frac{13}{2}$		1093
	700	269.298	61.2795 – 432.6166	$3d^5 - 3d^4(a^1I)4p$	$a^2I - {}^2I^\circ$	$\frac{13}{2} - \frac{13}{2}$		1093
	530	269.399	107.8483 – 479.0463	$3d^5 - 3d^4(b^1G)4p$	$b^2G - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	140	269.425	107.8870 – 479.0463	$3d^5 - 3d^4(b^1G)4p$	$b^2G - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	470	269.459	50.7776 – 421.8940	$3d^5 - 3d^4(a^3F)4p$	$a^4D - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	140	269.547	50.3310 – 421.3243	$3d^5 - 3d^4(a^3F)4p$	$a^4D - {}^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	520	269.661	41.9209 – 412.7511	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4H^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	680	269.740	42.0232 – 412.7511	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4H^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	680	269.828	45.8842 – 416.4930	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	350	269.874	50.7776 – 421.3243	$3d^5 - 3d^4(a^3F)4p$	$a^4D - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	90	269.903	50.3310 – 420.8357	$3d^5 - 3d^4(a^3F)4p$	$a^4D - {}^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	10	269.925	64.1524 – 434.6260	$3d^5 - 3d^4(a^3D)4p$	$a^2D - {}^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	510	270.013	46.1044 – 416.4590	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	50	270.035	129.9516 – 500.2752	$3d^5 - 3d^4(b^1D)4p$	$a^2P - {}^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	220	270.090	130.0259 – 500.2752	$3d^5 - 3d^4(b^1D)4p$	$a^2P - {}^2P^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
	150	270.118	141.0068 – 511.2174	$3d^5 - 3d^4(b^1D)4p$	$c^2D - {}^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	310	270.134	96.4612 – 466.6491	$3d^5 - 3d^4(b^3F)4p$	$b^2D - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	480	270.156	74.6277 – 444.7842	$3d^5 - 3d^4(a^1D)4p$	$a^2G - {}^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	390	270.172	46.3248 – 416.4590	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4P^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
	660	270.226	42.0351 – 412.0956	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4H^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	600	270.287	50.3310 – 420.3089	$3d^5 - 3d^4(a^3P)4p$	$a^4D - {}^4P^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	290	270.312	50.7776 – 420.7223	$3d^5 - 3d^4(a^3P)4p$	$a^4D - {}^4S^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	260	270.401	65.1735 – 434.9970	$3d^5 - 3d^4(a^1G)4p$	$a^2D - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	210	270.454	50.3310 – 420.0800	$3d^5 - 3d^4(a^3H)4p$	$a^4D - {}^4G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	640	270.515	42.0036 – 411.6694	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4H^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	270	270.538	42.0351 – 411.6694	$3d^5 - 3d^4(a^3H)4p$	$a^4G - {}^4H^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	480	270.585	96.5665 – 466.1337	$3d^5 - 3d^4(b^3F)4p$	$b^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	500	270.614	50.7776 – 420.3089	$3d^5 - 3d^4(a^3P)4p$	$a^4D - {}^4P^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	360	270.635	45.8842 – 415.3820	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^4G^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	280	270.658	68.4449 – 437.9197	$3d^5 - 3d^4(a^1G)4p$	$a^2F - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	290	270.736	64.1524 – 433.5173	$3d^5 - 3d^4(a^3G)4p$	$a^2D - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	210	270.771	64.1524 – 433.4625	$3d^5 - 3d^4(a^3D)4p$	$a^2D - {}^4P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	510	270.803	46.1044 – 415.3820	$3d^5 - 3d^4(a^3F)4p$	$a^4P - {}^4G^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	520	270.811	45.8842 – 415.1445	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	320	270.941	96.4612 – 465.5527	$3d^5 - 3d^4(b^3P)4p$	$b^2D - {}^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	640	270.971	46.1044 – 415.1445	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	460	271.014	96.5665 – 465.5527	$3d^5 - 3d^4(b^3P)4p$	$b^2D - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	340	271.135	129.9516 – 498.7730	$3d^5 - 3d^4(b^1D)4p$	$a^2P - {}^2P^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	450	271.179	65.1735 – 433.9369	$3d^5 - 3d^4(a^1S)4p$	$a^2D - {}^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	430	271.262	64.1524 – 432.8001	$3d^5 - 3d^4(a^1G)4p$	$a^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	460	271.383	107.8483 – 476.3321	$3d^5 - 3d^4(b^1G)4p$	$b^2G - {}^2H^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	330	271.410	107.8870 – 476.3321	$3d^5 - 3d^4(b^1G)4p$	$b^2G - {}^2H^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	90	271.463	67.0851 – 435.4594	$3d^5 - 3d^4(a^3D)4p$	$a^2F - {}^4F^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	310	271.525	61.1960 – 429.4863	$3d^5 - 3d^4(a^3G)4p$	$a^2I - {}^4G^\circ$	$\frac{11}{2}-\frac{9}{2}$		1093
	210	271.562	96.5665 – 464.8078	$3d^5 - 3d^4(b^3F)4p$	$b^2D - {}^4G^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	140	271.689	50.6435 – 418.7134	$3d^5 - 3d^4(a^3P)4p$	$a^4D - {}^4P^\circ$	$\frac{1}{2}-\frac{3}{2}$		1093
	610	271.733	72.9088 – 440.9179	$3d^5 - 3d^4(a^1I)4p$	$a^2H - {}^2H^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
	320	271.788	50.7776 – 418.7134	$3d^5 - 3d^4(a^3P)4p$	$a^4D - {}^4P^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	40	271.849	50.6435 – 418.4908	$3d^5 - 3d^4(a^3F)4p$	$a^4D - {}^4F^\circ$	$\frac{1}{2}-\frac{3}{2}$		1093
	500	271.953	50.7805 – 418.4908	$3d^5 - 3d^4(a^3F)4p$	$a^4D - {}^4F^\circ$	$\frac{3}{2}-\frac{3}{2}$		1093
	680	271.990	45.8842 – 413.5531	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	610	272.146	46.1044 – 413.5531	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		1093
	680	272.311	46.3248 – 413.5531	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{1}{2}-\frac{3}{2}$		1093
	280	272.361	73.7566 – 440.9179	$3d^5 - 3d^4(a^1I)4p$	$a^2H - {}^2H^\circ$	$\frac{11}{2}-\frac{9}{2}$		1093
	310	272.384	72.9088 – 440.0392	$3d^5 - 3d^4(a^1I)4p$	$a^2H - {}^2H^\circ$	$\frac{9}{2}-\frac{11}{2}$		1093
	550	272.548	68.5512 – 435.4594	$3d^5 - 3d^4(a^3D)4p$	$a^4F - {}^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
	580	272.587	61.1960 – 428.0515	$3d^5 - 3d^4(a^3G)4p$	$a^2I - {}^2H^\circ$	$\frac{11}{2}-\frac{9}{2}$		1093
	280	272.629	61.1960 – 427.9956	$3d^5 - 3d^4(a^3F)4p$	$a^2I - {}^2G^\circ$	$\frac{11}{2}-\frac{9}{2}$		1093
	120	272.648	74.6277 – 441.4012	$3d^5 - 3d^4(a^1D)4p$	$a^2G - {}^2D^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	120	272.678	96.5665 – 463.3015	$3d^5 - 3d^4(b^3P)4p$	$b^2D - {}^4P^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	200	272.726	79.3914 – 446.0612	$3d^5 - 3d^4(a^1D)4p$	$b^2F - {}^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	600	272.811	68.4449 – 434.9970	$3d^5 - 3d^4(a^1G)4p$	$a^2F - {}^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	490	272.887	79.6083 – 446.0612	$3d^5 - 3d^4(a^1D)4p$	$b^2F - {}^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	410	272.901	61.2795 – 427.7027	$3d^5 - 3d^4(a^3G)4p$	$a^2I - {}^2H^\circ$	$\frac{13}{2}-\frac{11}{2}$		1093
	190	272.942	140.9222 – 507.3004	$3d^5 - 3d^4(b^1D)4p$	$c^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	620	272.992	68.8017 – 435.1162	$3d^5 - 3d^4(a^3D)4p$	$a^4F - {}^4F^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	720	273.013	67.0851 – 433.3712	$3d^5 - 3d^4(a^3G)4p$	$a^2F - {}^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	520	273.089	68.4449 – 434.6260	$3d^5 - 3d^4(a^3D)4p$	$a^2F - {}^4F^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	310	273.117	46.1044 – 412.2482	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2}-\frac{1}{2}$		1093
	390	273.281	46.3248 – 412.2482	$3d^5 - 3d^4(a^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{1}{2}-\frac{1}{2}$		1093
	20	273.315	96.5665 – 462.4431	$3d^5 - 3d^4(b^3P)4p$	$b^2D - {}^4D^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	460	273.358	68.8017 – 434.6260	$3d^5 - 3d^4(a^3D)4p$	$a^4F - {}^4F^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	410	273.394	75.4417 – 441.2161	$3d^5 - 3d^4(a^1D)4p$	$a^2G - {}^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	680	273.436	50.7776 – 416.4930	$3d^5 - 3d^4(a^3F)4p$	$a^4D - {}^4D^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	400	273.465	69.4470 – 435.1162	$3d^5 - 3d^4(a^3D)4p$	$a^4F - {}^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	550	273.490	107.8870 – 473.5319	$3d^5 - 3d^4(b^3F)4p$	$b^2G - {}^2G^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	610	273.560	69.4470 – 434.9970	$3d^5 - 3d^4(a^1G)4p$	$a^4F - {}^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	540	273.616	75.4417 – 440.9179	$3d^5 - 3d^4(a^1I)4p$	$a^2G - {}^2H^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
	210	273.636	69.1735 – 434.6260	$3d^5 - 3d^4(a^3D)4p$	$a^4F - {}^4F^\circ$	$\frac{3}{2}-\frac{5}{2}$		1093
	160	273.677	79.3914 – 444.7842	$3d^5 - 3d^4(a^1D)4p$	$b^2F - {}^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	650	273.841	79.6083 – 444.7842	$3d^5 - 3d^4(a^1D)4p$	$b^2F - {}^2D^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	560	273.893	86.5321 – 451.6420	$3d^5 - 3d^4(a^1D)4p$	$a^2S - {}^2P^\circ$	$\frac{1}{2}-\frac{1}{2}$		1093
	580	273.904	86.5321 – 451.6229	$3d^5 - 3d^4(a^1D)4p$	$a^2S - {}^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$		1093
	630	273.965	72.9088 – 437.9197	$3d^5 - 3d^4(a^1G)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	660	274.062	73.7566 – 438.6394	$3d^5 - 3d^4(a^1G)4p$	$a^2H - {}^2G^\circ$	$\frac{11}{2}-\frac{9}{2}$		1093
	610	274.077	79.3914 – 444.2522	$3d^5 - 3d^4(a^1D)4p$	$b^2F - {}^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	170	274.103	67.0851 – 431.9126	$3d^5 - 3d^4(a^3D)4p$	$a^2F - {}^4D^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	520	274.156	69.4470 – 434.2009	$3d^5 - 3d^4(a^3D)4p$	$a^4F - {}^4F^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	590	274.174	107.8483 – 472.5795	$3d^5 - 3d^4(b^3F)4p$	$b^2G - {}^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
	50	274.236	107.8483 – 472.4973	$3d^5 - 3d^4(b^3F)4p$	$b^2G - {}^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	390	274.276	75.4417 – 440.0392	$3d^5 - 3d^4(a^1I)4p$	$a^2G - {}^2H^\circ$	$\frac{9}{2}-\frac{11}{2}$		1093
	160	274.295	68.8017 – 433.3712	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	400	274.444	61.1960 – 425.5676	$3d^5 - 3d^4(a^3H)4p$	$a^2I - {}^2H^\circ$	$\frac{11}{2}-\frac{11}{2}$		1093
	650	274.508	61.2795 – 425.5676	$3d^5 - 3d^4(a^3H)4p$	$a^2I - {}^2H^\circ$	$\frac{13}{2}-\frac{11}{2}$		1093
	120	274.618	141.0068 – 505.1505	$3d^5 - 3d^4(b^1D)4p$	$c^2D - {}^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	260	274.676	64.1524 – 428.2214	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	150	274.726	68.8017 – 432.8001	$3d^5 - 3d^4(a^1G)4p$	$a^4F - {}^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	140	274.838	68.4449 – 432.2957	$3d^5 - 3d^4(a^3D)4p$	$a^2F - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	170	275.108	68.8017 – 432.2957	$3d^5 - 3d^4(a^3D)4p$	$a^4F - {}^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	190	275.163	64.1524 – 427.5750	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	600	275.210	68.5512 – 431.9126	$3d^5 - 3d^4(a^3D)4p$	$a^4F - {}^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	620	275.221	61.1960 – 424.5370	$3d^5 - 3d^4(a^3G)4p$	$a^2I - {}^4H^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	570	275.260	74.6277 – 437.9197	$3d^5 - 3d^4(a^1G)4p$	$a^2G - {}^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	520	275.311	79.3914 – 442.6199	$3d^5 - 3d^4(a^3D)4p$	$b^2F - {}^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	620	275.332	64.1524 – 427.3422	$3d^5 - 3d^4(a^3P)4p$	$a^2D - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	580	275.400	68.8017 – 431.9126	$3d^5 - 3d^4(a^3D)4p$	$a^4F - {}^4D^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	660	275.417	61.2795 – 424.3637	$3d^5 - 3d^4(a^3G)4p$	$a^2I - {}^4H^\circ$	$\frac{13}{2} - \frac{11}{2}$		1093
	510	275.522	64.1524 – 427.0960	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	160	275.597	69.4470 – 432.2957	$3d^5 - 3d^4(a^3D)4p$	$a^4F - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	530	275.810	61.1960 – 423.7633	$3d^5 - 3d^4(a^3G)4p$	$a^2I - {}^4F^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	270	275.838	68.4449 – 430.9719	$3d^5 - 3d^4(a^3D)4p$	$a^2F - {}^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	340	275.879	75.4417 – 437.9197	$3d^5 - 3d^4(a^1G)4p$	$a^2G - {}^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	280	275.941	79.3914 – 441.7857	$3d^5 - 3d^4(a^3D)4p$	$b^2F - {}^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	70	276.005	96.4612 – 458.7722	$3d^5 - 3d^4(a^1F)4p$	$b^2D - {}^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	340	276.077	68.8017 – 431.0203	$3d^5 - 3d^4(a^3D)4p$	$a^4F - {}^4P^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	430	276.114	65.1735 – 427.3422	$3d^5 - 3d^4(a^3P)4p$	$a^2D - {}^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	660	276.342	61.1960 – 423.0652	$3d^5 - 3d^4(a^3H)4p$	$a^2I - {}^2H^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	510	276.402	79.6083 – 441.4012	$3d^5 - 3d^4(a^3D)4p$	$b^2F - {}^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	280	276.452	69.1735 – 430.8988	$3d^5 - 3d^4(a^3D)4p$	$a^4F - {}^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	250	276.542	79.6083 – 441.2161	$3d^5 - 3d^4(a^3D)4p$	$b^2F - {}^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	490	276.587	64.1524 – 425.7031	$3d^5 - 3d^4(a^3P)4p$	$a^2D - {}^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	650	276.639	68.5512 – 430.0333	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	710	276.672	61.2795 – 422.7118	$3d^5 - 3d^4(a^3H)4p$	$a^2I - {}^2I^\circ$	$\frac{13}{2} - \frac{13}{2}$		1093
	550	276.694	73.7566 – 435.1654	$3d^5 - 3d^4(a^1I)4p$	$a^2H - {}^2K^\circ$	$\frac{11}{2} - \frac{13}{2}$		1093
	280	276.730	61.2795 – 422.6424	$3d^5 - 3d^4(a^3H)4p$	$a^2I - {}^2I^\circ$	$\frac{13}{2} - \frac{11}{2}$		1093
	510	276.812	73.7566 – 435.0115	$3d^5 - 3d^4(a^1G)4p$	$a^2H - {}^2H^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	480	277.033	67.0851 – 428.0515	$3d^5 - 3d^4(a^3G)4p$	$a^2F - {}^2H^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	330	277.058	68.5512 – 429.4863	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	240	277.074	67.0851 – 427.9956	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	600	277.250	68.8017 – 429.4863	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	630	277.373	65.1735 – 425.7031	$3d^5 - 3d^4(a^3P)4p$	$a^2D - {}^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	430	277.421	72.9088 – 433.3712	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	600	277.457	73.7566 – 434.1673	$3d^5 - 3d^4(a^1G)4p$	$a^2H - {}^2H^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	590	277.579	67.0851 – 427.3422	$3d^5 - 3d^4(a^3P)4p$	$a^2F - {}^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	80	277.623	64.1524 – 424.3461	$3d^5 - 3d^4(a^3G)4p$	$a^2D - {}^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	410	277.715	64.1524 – 424.2354	$3d^5 - 3d^4(a^3P)4p$	$a^2D - {}^2P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	550	277.735	68.8017 – 428.8665	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4G^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	630	277.765	67.0851 – 427.0960	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	140	277.862	72.9088 – 432.8001	$3d^5 - 3d^4(a^1G)4p$	$a^2H - {}^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	210	277.958	68.4449 – 428.2214	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	280	278.032	68.5512 – 428.2214	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	410	278.075	73.7566 – 433.3712	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	540	278.118	75.4417 – 435.0115	$3d^5 - 3d^4(a^1G)4p$	$a^2G - {}^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	480	278.168	64.1524 – 423.6458	$3d^5 - 3d^4(a^3G)4p$	$a^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	460	278.209	68.5512 – 427.9956	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	550	278.226	69.4470 – 428.8665	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	600	278.301	69.1735 – 428.4965	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4G^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	230	278.341	141.0068 – 500.2752	$3d^5 - 3d^4(b^1D)4p$	$c^2D - {}^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	530	278.401	68.8017 – 427.9956	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	640	278.435	68.5512 – 427.7027	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^2H^\circ$	$\frac{9}{2}-\frac{11}{2}$		1093
	590	278.448	68.4449 – 427.5750	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^2G^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	290	278.511	69.4470 – 428.4965	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4G^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	320	278.526	79.6083 – 438.6394	$3d^5 - 3d^4(a^1G)4p$	$b^2F - {}^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	560	278.636	68.4449 – 427.3422	$3d^5 - 3d^4(a^3P)4p$	$a^2F - {}^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	430	278.660	73.7566 – 432.6166	$3d^5 - 3d^4(a^1I)4p$	$a^2H - {}^2I^\circ$	$\frac{11}{2}-\frac{13}{2}$		1093
	570	278.735	107.8870 – 466.6491	$3d^5 - 3d^4(b^3F)4p$	$b^2G - {}^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	500	278.764	75.4417 – 434.1673	$3d^5 - 3d^4(a^1G)4p$	$a^2G - {}^2H^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
	180	278.829	68.4449 – 427.0960	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	420	278.915	79.3914 – 437.9197	$3d^5 - 3d^4(a^1G)4p$	$b^2F - {}^2G^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	330	278.962	65.1735 – 423.6468	$3d^5 - 3d^4(a^3P)4p$	$a^2D - {}^2P^\circ$	$\frac{3}{2}-\frac{1}{2}$		1093
	520	279.106	107.8483 – 466.1337	$3d^5 - 3d^4(b^3F)4p$	$b^2G - {}^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	470	279.201	74.6277 – 432.8001	$3d^5 - 3d^4(a^1G)4p$	$a^2G - {}^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	350	279.270	75.4417 – 433.5173	$3d^5 - 3d^4(a^1G)4p$	$a^2G - {}^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	450	279.385	75.4417 – 433.3712	$3d^5 - 3d^4(a^1G)4p$	$a^2G - {}^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
	310	279.410	69.4470 – 427.3422	$3d^5 - 3d^4(a^3P)4p$	$a^4F - {}^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	320	279.445	140.9222 – 498.7730	$3d^5 - 3d^4(b^1D)4p$	$c^2D - {}^2P^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	260	279.514	141.0068 – 498.7730	$3d^5 - 3d^4(b^1D)4p$	$c^2D - {}^2P^\circ$	$\frac{3}{2}-\frac{3}{2}$		1093
	490	279.545	65.1735 – 422.8978	$3d^5 - 3d^4(a^3G)4p$	$a^2D - {}^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		1093
	580	279.605	69.4470 – 427.0960	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	240	279.728	75.4417 – 432.9320	$3d^5 - 3d^4(a^1I)4p$	$a^2G - {}^2I^\circ$	$\frac{9}{2}-\frac{11}{2}$		1093
	320	279.756	64.1524 – 421.6072	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	420	279.786	96.5665 – 453.9830	$3d^5 - 3d^4(a^1F)4p$	$b^2D - {}^2G^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	310	279.830	75.4417 – 432.8001	$3d^5 - 3d^4(a^1G)4p$	$a^2G - {}^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	560	279.908	68.4449 – 425.7031	$3d^5 - 3d^4(a^3P)4p$	$a^2F - {}^2D^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	560	279.976	64.1524 – 421.3243	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	370	280.014	72.9088 – 430.0333	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^4G^\circ$	$\frac{9}{2}-\frac{11}{2}$		1093
	510	280.142	107.8483 – 464.8078	$3d^5 - 3d^4(b^3F)4p$	$b^2G - {}^4G^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	490	280.330	65.1735 – 421.8940	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		1093
	620	280.449	67.0851 – 423.6458	$3d^5 - 3d^4(a^1G)4p$	$a^2F - {}^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	340	280.480	69.1735 – 425.7031	$3d^5 - 3d^4(a^3P)4p$	$a^4F - {}^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		1093
	210	280.556	65.1735 – 421.6072	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		1093
	110	280.627	61.1960 – 417.5384	$3d^5 - 3d^4(a^3H)4p$	$a^2I - {}^4G^\circ$	$\frac{11}{2}-\frac{11}{2}$		1093
	500	280.672	45.8842 – 402.1713	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	390	280.696	61.2795 – 417.5384	$3d^5 - 3d^4(a^3H)4p$	$a^2I - {}^4G^\circ$	$\frac{13}{2}-\frac{11}{2}$		1093
	410	280.786	65.1735 – 421.3243	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^2D^\circ$	$\frac{3}{2}-\frac{5}{2}$		1093
	60	280.829	86.5321 – 442.6199	$3d^5 - 3d^4(a^3D)4p$	$a^2S - {}^2D^\circ$	$\frac{1}{2}-\frac{3}{2}$		1093
	420	280.931	72.9088 – 428.8665	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^4G^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	270	280.979	68.4449 – 424.3461	$3d^5 - 3d^4(a^3G)4p$	$a^2F - {}^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	490	281.026	45.8842 – 401.7209	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	340	281.077	68.4449 – 424.2185	$3d^5 - 3d^4(a^3G)4p$	$a^2F - {}^4F^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	480	281.111	73.7566 – 429.4863	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^4G^\circ$	$\frac{11}{2}-\frac{9}{2}$		1093
	230	281.141	64.1524 – 419.8447	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^4F^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	470	281.204	46.1044 – 401.7209	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		1093
	350	281.257	68.8017 – 424.3461	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4F^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	390	281.380	79.6083 – 434.9970	$3d^5 - 3d^4(a^1G)4p$	$b^2F - {}^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	630	281.442	72.9088 – 428.2214	$3d^5 - 3d^4(a^3F)4p$	$a^2H - {}^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	620	281.504	61.1960 – 416.4225	$3d^5 - 3d^4(a^3F)4p$	$a^2I - {}^4G^\circ$	$\frac{11}{2}-\frac{9}{2}$		1093
	640	281.515	68.5512 – 423.7633	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4F^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
	530	281.548	46.1044 – 401.2809	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		1093
	630	281.620	72.9088 – 427.9956	$3d^5 - 3d^4(a^3F)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
	530	281.644	96.5665 – 451.6229	$3d^5 - 3d^4(a^1D)4p$	$b^2D - {}^2P^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	370	281.722	68.8017 – 423.7633	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4F^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	410	281.802	74.6277 – 429.4863	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^4G^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	330	281.843	67.0851 – 421.8940	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	370	281.857	72.9088 – 427.7027	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	610	281.955	72.9088 – 427.5750	$3d^5 - 3d^4(a^3F)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	480	281.975	46.3248 – 400.9621	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4D^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
	560	282.015	75.4417 – 430.0333	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	320	282.038	64.1524 – 418.7134	$3d^5 - 3d^4(a^3P)4p$	$a^2D - {}^4P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	210	282.055	69.1735 – 423.7105	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^4F^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	150	282.075	68.5512 – 423.0652	$3d^5 - 3d^4(a^3H)4p$	$a^4F - {}^2H^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	120	282.118	68.4449 – 422.8978	$3d^5 - 3d^4(a^3G)4p$	$a^2F - {}^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	660	282.250	73.7566 – 428.0515	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^2H^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	400	282.295	67.0851 – 421.3243	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	350	282.327	69.4470 – 423.6458	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	280	282.362	86.5321 – 440.6893	$3d^5 - 3d^4(a^3D)4p$	$a^2S - {}^2P^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
	530	282.385	79.3914 – 433.5173	$3d^5 - 3d^4(a^3G)4p$	$b^2F - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	330	282.410	68.8017 – 422.8978	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	100	282.451	75.4417 – 429.4863	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^4G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	220	282.492	68.4449 – 422.4372	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	570	282.529	73.7566 – 427.7027	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^2H^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	370	282.594	68.4449 – 422.3066	$3d^5 - 3d^4(a^3P)4p$	$a^2F - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	640	282.676	68.5512 – 422.3066	$3d^5 - 3d^4(a^3P)4p$	$a^4F - {}^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	540	282.833	64.1524 – 417.7181	$3d^5 - 3d^4(a^3H)4p$	$a^2D - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	490	282.853	65.1735 – 418.7134	$3d^5 - 3d^4(a^3P)4p$	$a^2D - {}^4P^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	420	282.924	69.4470 – 422.8978	$3d^5 - 3d^4(a^3G)4p$	$a^4F - {}^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	390	282.946	74.6277 – 428.0515	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^2H^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	350	282.990	74.6277 – 427.9956	$3d^5 - 3d^4(a^3F)4p$	$a^2G - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	250	283.032	65.1735 – 418.4908	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^4F^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	160	283.071	69.1735 – 422.4372	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	160	283.107	67.0851 – 420.3089	$3d^5 - 3d^4(a^3P)4p$	$a^2F - {}^4P^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	400	283.131	79.6083 – 432.8001	$3d^5 - 3d^4(a^1G)4p$	$b^2F - {}^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	390	283.213	68.8017 – 421.8940	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	520	283.327	74.6277 – 427.5750	$3d^5 - 3d^4(a^3F)4p$	$a^2G - {}^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	190	283.391	68.4449 – 421.3243	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	570	283.463	75.4417 – 428.2214	$3d^5 - 3d^4(a^3F)4p$	$a^2G - {}^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	540	283.515	74.6277 – 427.3422	$3d^5 - 3d^4(a^3P)4p$	$a^2G - {}^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	520	283.599	75.4417 – 428.0515	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^2H^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	70	283.645	75.4417 – 427.9956	$3d^5 - 3d^4(a^3F)4p$	$a^2G - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	120	283.670	68.8017 – 421.3243	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	510	283.713	74.6277 – 427.0960	$3d^5 - 3d^4(a^3F)4p$	$a^2G - {}^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	390	283.732	69.4470 – 421.8940	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	260	283.816	64.1524 – 416.4930	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	580	283.862	68.5512 – 420.8357	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	530	283.878	75.4417 – 427.7027	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	730	283.977	41.9209 – 394.0610	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^4F^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	410	284.033	68.5512 – 420.6234	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	460	284.059	42.0232 – 394.0610	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	130	284.192	69.4470 – 421.3243	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	680	284.219	50.3310 – 402.1713	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4D^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	620	284.243	73.7566 – 425.5676	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^2H^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	480	284.292	68.8017 – 420.5532	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	450	284.392	72.9088 – 424.5370	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^4H^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	220	284.458	61.1960 – 412.7511	$3d^5 - 3d^4(a^3H)4p$	$a^2I - {}^4H^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	460	284.507	64.1524 – 415.6408	$3d^5 - 3d^4(a^3F)4p$	$a^2D - {}^4G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	730	284.539	42.0232 – 393.4682	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^4F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	650	284.580	50.7776 – 402.1713	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	630	284.671	68.8017 – 420.0800	$3d^5 - 3d^4(a^3H)4p$	$a^4F - {}^4G°$	7/2 – 9/2		1093
	560	284.845	42.0036 – 393.0720	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^4F°$	5/2 – 5/2		1093
	710	284.868	42.0351 – 393.0720	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^4F°$	7/2 – 5/2		1093
	660	284.946	50.7776 – 401.7209	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4D°$	5/2 – 5/2		1093
	710	285.057	42.0036 – 392.8081	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^4F°$	5/2 – 3/2		1093
	230	285.112	72.9088 – 423.6458	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^2F°$	9/2 – 7/2		1093
	510	285.195	50.6435 – 401.2809	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4D°$	1/2 – 3/2		1093
	490	285.220	73.7566 – 424.3637	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^4H°$	11/2 – 11/2		1093
	540	285.304	50.7776 – 401.2809	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4D°$	5/2 – 3/2		1093
	290	285.375	69.4470 – 419.8633	$3d^5 - 3d^4(a^3H)4p$	$a^4F - {}^4G°$	5/2 – 7/2		1093
	430	285.456	50.6435 – 400.9621	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4D°$	1/2 – 1/2		1093
	440	285.471	96.5665 – 446.8638	$3d^5 - 3d^4(a^1D)4p$	$b^2D - {}^2F°$	5/2 – 7/2		1093
	280	285.537	69.1735 – 419.3905	$3d^5 - 3d^4(a^3H)4p$	$a^4F - {}^4G°$	3/2 – 5/2		1093
	430	285.566	50.7805 – 400.9621	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4D°$	3/2 – 1/2		1093
	370	285.587	72.9088 – 423.0652	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^2H°$	9/2 – 9/2		1093
	170	285.611	75.4417 – 425.5676	$3d^5 - 3d^4(a^3H)4p$	$a^2G - {}^2H°$	9/2 – 11/2		1093
	550	285.710	73.7566 – 423.7633	$3d^5 - 3d^4(a^3G)4p$	$a^2H - {}^4F°$	11/2 – 9/2		1093
	280	285.789	74.6277 – 424.5370	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^4H°$	7/2 – 9/2		1093
	610	285.932	72.9088 – 422.6424	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^2I°$	9/2 – 11/2		1093
	170	286.040	96.4612 – 446.0612	$3d^5 - 3d^4(a^1D)4p$	$b^2D - {}^2F°$	3/2 – 5/2		1093
	360	286.127	96.5665 – 446.0612	$3d^5 - 3d^4(a^1D)4p$	$b^2D - {}^2F°$	5/2 – 5/2		1093
	210	286.200	67.0851 – 416.4930	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^4D°$	7/2 – 7/2		1093
	150	286.257	67.0851 – 416.4225	$3d^5 - 3d^4(a^3F)4p$	$a^2F - {}^4G°$	7/2 – 9/2		1093
	370	286.310	68.4449 – 417.7181	$3d^5 - 3d^4(a^3H)4p$	$a^2F - {}^2G°$	5/2 – 7/2		1093
	310	286.421	74.6277 – 423.7633	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^4F°$	7/2 – 9/2		1093
	380	286.448	75.4417 – 424.5370	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^4H°$	9/2 – 9/2		1093
	420	286.547	68.5512 – 417.5384	$3d^5 - 3d^4(a^3H)4p$	$a^4F - {}^4G°$	9/2 – 11/2		1093
	630	286.569	73.7566 – 422.7118	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^2I°$	11/2 – 13/2		1093
	460	286.597	75.4417 – 424.3637	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^4H°$	9/2 – 11/2		1093
	160	286.624	73.7566 – 422.6424	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^2I°$	11/2 – 11/2		1093
	150	286.670	79.3914 – 428.2214	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^2F°$	5/2 – 7/2		1093
	180	286.768	74.6277 – 423.3414	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^4H°$	7/2 – 7/2		1093
	360	286.806	67.0851 – 415.7543	$3d^5 - 3d^4(a^3H)4p$	$a^2F - {}^4I°$	7/2 – 9/2		1093
	610	286.851	79.6083 – 428.2214	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^2F°$	7/2 – 7/2		1093
	610	286.977	86.5321 – 434.9958	$3d^5 - 3d^4(a^3D)4p$	$a^2S - {}^2P°$	1/2 – 3/2		1093
	610	286.991	74.6277 – 423.0652	$3d^5 - 3d^4(a^3H)4p$	$a^2G - {}^2H°$	7/2 – 9/2		1093
	90	287.035	79.6083 – 427.9956	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^2G°$	7/2 – 9/2		1093
	260	287.089	96.4612 – 444.7842	$3d^5 - 3d^4(a^1D)4p$	$b^2D - {}^2D°$	3/2 – 5/2		1093
	430	287.134	74.6277 – 422.8978	$3d^5 - 3d^4(a^3G)4p$	$a^2G - {}^2F°$	7/2 – 5/2		1093
	530	287.176	96.5665 – 444.7842	$3d^5 - 3d^4(a^1D)4p$	$b^2D - {}^2D°$	5/2 – 5/2		1093
	340	287.203	79.3914 – 427.5750	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^2G°$	5/2 – 7/2		1093
	230	287.320	107.8483 – 455.8876	$3d^5 - 3d^4(a^1F)4p$	$b^2G - {}^2G°$	9/2 – 9/2		1093
	640	287.387	79.6083 – 427.5750	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^2G°$	7/2 – 7/2		1093
	220	287.470	68.5512 – 416.4225	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4G°$	9/2 – 9/2		1093
	490	287.530	96.4612 – 444.2522	$3d^5 - 3d^4(a^1D)4p$	$b^2D - {}^2D°$	3/2 – 3/2		1093
	520	287.577	79.6083 – 427.3422	$3d^5 - 3d^4(a^3P)4p$	$b^2F - {}^2D°$	7/2 – 5/2		1093
	480	287.599	79.3914 – 427.0960	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^2F°$	5/2 – 5/2		1093
	480	287.668	68.8017 – 416.4225	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4G°$	7/2 – 9/2		1093
	280	287.701	45.8842 – 393.4682	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4F°$	5/2 – 7/2		1093
	460	287.778	79.6083 – 427.0960	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^2F°$	7/2 – 5/2		1093
	370	287.848	86.5321 – 433.9369	$3d^5 - 3d^4(a^1S)4p$	$a^2S - {}^2P°$	1/2 – 1/2		1093
	150	287.965	74.6277 – 421.8940	$3d^5 - 3d^4(a^3F)4p$	$a^2G - {}^4D°$	7/2 – 5/2		1093
	570	287.999	129.9516 – 477.1771	$3d^5 - 3d^4(a^3P)4p$	$a^2P - {}^2S°$	3/2 – 1/2		1093
	240	288.028	45.8842 – 393.0720	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4F°$	5/2 – 5/2		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	240	288.059	130.0259 – 477.1771	$3d^5 - 3d^4(a^3P)4p$	$a^2P - {}^2S^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
	500	288.222	72.9088 – 419.8633	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^4G^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	90	288.296	73.7566 – 420.6234	$3d^5 - 3d^4(a^3F)4p$	$a^2H - {}^4G^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	150	288.437	46.1044 – 392.8081	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4F^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	110	288.613	46.3248 – 392.8081	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4F^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	400	288.757	79.3914 – 425.7031	$3d^5 - 3d^4(a^3P)4p$	$b^2F - {}^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	400	288.854	69.4470 – 415.6408	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	240	288.885	96.4612 – 442.6199	$3d^5 - 3d^4(a^3D)4p$	$b^2D - {}^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	180	288.937	107.8870 – 453.9830	$3d^5 - 3d^4(a^1F)4p$	$b^2G - {}^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	300	288.971	96.5665 – 442.6199	$3d^5 - 3d^4(a^3D)4p$	$b^2D - {}^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	40	289.038	69.1735 – 415.1445	$3d^5 - 3d^4(a^3P)4p$	$a^4F - {}^4D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	70	289.077	69.4470 – 415.3820	$3d^5 - 3d^4(a^3F)4p$	$a^4F - {}^4G^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	260	289.467	72.9088 – 418.3688	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	430	289.583	96.4612 – 441.7857	$3d^5 - 3d^4(a^3D)4p$	$b^2D - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	300	289.995	96.5665 – 441.4012	$3d^5 - 3d^4(a^3D)4p$	$b^2D - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	240	290.014	72.9088 – 417.7181	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	350	290.149	96.5665 – 441.2161	$3d^5 - 3d^4(a^3D)4p$	$b^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	160	290.181	73.7566 – 418.3688	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	80	290.326	86.5321 – 430.9719	$3d^5 - 3d^4(a^3D)4p$	$a^2S - {}^4D^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	150	290.388	86.5321 – 430.8988	$3d^5 - 3d^4(a^3D)4p$	$a^2S - {}^4D^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
	100	290.429	79.3914 – 423.7105	$3d^5 - 3d^4(a^3G)4p$	$b^2F - {}^4F^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	310	290.504	96.4612 – 440.6893	$3d^5 - 3d^4(a^3D)4p$	$b^2D - {}^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	340	290.666	79.6083 – 423.6458	$3d^5 - 3d^4(a^3G)4p$	$b^2F - {}^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	220	290.687	107.8483 – 451.8594	$3d^5 - 3d^4(a^1F)4p$	$b^2G - {}^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	90	290.739	79.3914 – 423.3414	$3d^5 - 3d^4(a^3G)4p$	$b^2F - {}^4H^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	590	290.802	45.8842 – 389.7604	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4P^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	170	290.830	130.0259 – 473.8695	$3d^5 - 3d^4(b^3P)4p$	$a^2P - {}^2P^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
	520	290.925	50.3310 – 394.0610	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	480	290.988	46.1044 – 389.7604	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4P^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	270	291.035	96.5665 – 440.1686	$3d^5 - 3d^4(a^1S)4p$	$b^2D - {}^2P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	220	291.115	79.3914 – 422.8978	$3d^5 - 3d^4(a^3G)4p$	$b^2F - {}^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	170	291.201	73.7566 – 417.1641	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^4I^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	560	291.264	45.8842 – 389.2140	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^6D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	60	291.297	79.6083 – 422.8978	$3d^5 - 3d^4(a^3G)4p$	$b^2F - {}^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	370	291.427	50.3310 – 393.4682	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	220	291.468	74.6277 – 417.7181	$3d^5 - 3d^4(a^3H)4p$	$a^2G - {}^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	150	291.609	75.4417 – 418.3688	$3d^5 - 3d^4(a^3H)4p$	$a^2G - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	480	291.641	46.3248 – 389.2140	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^6D^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	460	291.703	46.1044 – 388.9186	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^6D^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	420	291.806	50.7776 – 393.4682	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	250	291.891	46.3248 – 388.9186	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^6D^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
	220	291.918	140.9222 – 483.4809	$3d^5 - 3d^4(b^3F)4p$	$c^2D - {}^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	440	291.990	141.0068 – 483.4809	$3d^5 - 3d^4(b^3F)4p$	$c^2D - {}^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	450	292.146	50.7805 – 393.0720	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	30	292.208	79.3914 – 421.6072	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	240	292.256	50.6435 – 392.8081	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4F^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	560	292.294	140.9222 – 483.0434	$3d^5 - 3d^4(b^3F)4p$	$c^2D - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	440	292.367	141.0068 – 483.0434	$3d^5 - 3d^4(b^3F)4p$	$c^2D - {}^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	280	292.402	73.7566 – 415.7543	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^4I^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	510	292.427	45.8842 – 387.8499	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^6D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	140	292.456	79.3914 – 421.3243	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	360	292.616	46.1044 – 387.8499	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^6D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	80	292.784	42.0036 – 383.5578	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^6P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	40	293.059	79.6083 – 420.8357	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	70	293.248	74.6277 – 415.6408	$3d^5 - 3d^4(a^3F)4p$	$a^2G - {}^4G^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	140	293.467	42.0036 – 382.7589	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^6F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	190	293.482	42.0232 – 382.7589	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^6F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	110	293.517	79.6083 – 420.3089	$3d^5 - 3d^4(a^3P)4p$	$b^2F - {}^4P^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	200	293.849	75.4417 – 415.7543	$3d^5 - 3d^4(a^3H)4p$	$a^2G - {}^4I^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	570	293.883	45.8842 – 386.1573	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	60	293.944	75.4417 – 415.6408	$3d^5 - 3d^4(a^3F)4p$	$a^2G - {}^4G^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	140	294.074	46.1044 – 386.1573	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4P^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	290	294.121	79.3914 – 419.3905	$3d^5 - 3d^4(a^3H)4p$	$b^2F - {}^4G^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	110	294.224	73.7566 – 413.6316	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^4H^\circ$	$\frac{11}{2} - \frac{13}{2}$		1093
	480	294.264	42.0036 – 381.8328	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^6F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	330	294.290	42.0351 – 381.8328	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^6F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	350	294.362	141.0068 – 480.7242	$3d^5 - 3d^4(b^1G)4p$	$c^2D - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	190	294.507	50.3310 – 389.8832	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^6D^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	640	294.613	50.3310 – 389.7604	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4P^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	490	294.754	140.9222 – 480.1893	$3d^5 - 3d^4(b^1G)4p$	$c^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	130	294.819	72.9088 – 412.0956	$3d^5 - 3d^4(a^3H)4p$	$a^2H - {}^4H^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	180	294.850	42.0036 – 381.1638	$3d^5 - 3d^4(a^5D)4p$	$a^4G - {}^6F^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	600	295.001	50.7776 – 389.7604	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4P^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	570	295.194	79.6083 – 418.3688	$3d^5 - 3d^4(a^3H)4p$	$b^2F - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	580	295.298	46.1044 – 384.7474	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^4P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	270	295.362	50.6435 – 389.2140	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^6D^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	150	295.389	96.4612 – 434.9970	$3d^5 - 3d^4(a^1G)4p$	$b^2D - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	590	295.480	50.7805 – 389.2140	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^6D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	520	295.573	79.3914 – 417.7181	$3d^5 - 3d^4(a^3H)4p$	$b^2F - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	590	295.622	50.6435 – 388.9186	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^6D^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
	530	296.009	96.4612 – 434.2816	$3d^5 - 3d^4(a^3D)4p$	$b^2D - {}^4P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	210	296.145	45.8842 – 383.5578	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^6P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	100	296.238	64.1524 – 401.7209	$3d^5 - 3d^4(a^5D)4p$	$a^2D - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	570	296.279	50.3310 – 387.8499	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^6D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	110	296.310	96.4612 – 433.9369	$3d^5 - 3d^4(a^1S)4p$	$b^2D - {}^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	70	296.531	46.3248 – 383.5578	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^6P^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	270	296.630	86.5321 – 423.6468	$3d^5 - 3d^4(a^3P)4p$	$a^2S - {}^2P^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
	460	296.672	50.7776 – 387.8499	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^6D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	60	296.831	79.6083 – 416.4930	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^4D^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	50	296.846	45.8842 – 382.7589	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^6F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	70	296.901	79.6083 – 416.4225	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^4G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	150	297.001	129.9516 – 466.6491	$3d^5 - 3d^4(b^3F)4p$	$a^2P - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	250	297.400	79.3914 – 415.6408	$3d^5 - 3d^4(a^3F)4p$	$b^2F - {}^4G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	360	297.490	79.6083 – 415.7543	$3d^5 - 3d^4(a^3H)4p$	$b^2F - {}^4I^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	170	297.526	65.1735 – 401.2809	$3d^5 - 3d^4(a^5D)4p$	$a^2D - {}^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	180	297.544	129.9516 – 466.0342	$3d^5 - 3d^4(b^3P)4p$	$a^2P - {}^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	420	297.612	130.0259 – 466.0342	$3d^5 - 3d^4(b^3P)4p$	$a^2P - {}^2D^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	120	297.659	45.8842 – 381.8328	$3d^5 - 3d^4(a^5D)4p$	$a^4P - {}^6F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	220	297.806	65.1735 – 400.9621	$3d^5 - 3d^4(a^5D)4p$	$a^2D - {}^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	370	297.973	129.9516 – 465.5527	$3d^5 - 3d^4(b^3P)4p$	$a^2P - {}^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	170	298.049	50.6435 – 386.1573	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4P^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	520	298.170	50.7776 – 386.1573	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	210	298.832	67.0851 – 401.7209	$3d^5 - 3d^4(a^5D)4p$	$a^2F - {}^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	410	299.305	50.6435 – 384.7474	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^4P^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
	350	299.341	129.9516 – 464.0278	$3d^5 - 3d^4(b^3F)4p$	$a^2P - {}^4G^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	350	299.417						1093
	580	299.495	107.8870 – 441.7857	$3d^5 - 3d^4(a^3D)4p$	$b^2G - {}^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	700	299.742	68.5512 – 402.1713	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	630	299.967	107.8483 – 441.2161	$3d^5 - 3d^4(a^3D)4p$	$b^2G - {}^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	300	299.996	107.8870 – 441.2161	$3d^5 - 3d^4(a^3D)4p$	$b^2G - {}^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	520	300.053	68.4449 – 401.7209	$3d^5 - 3d^4(a^5D)4p$	$a^2F - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	490	300.272	107.8870 – 440.9179	$3d^5 - 3d^4(a^1I)4p$	$b^2G - {}^2H^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	270	300.334	50.7776 – 383.7398	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^6P^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	670	300.372	68.8017 – 401.7209	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	440	300.426	141.0068 – 473.8695	$3d^5 - 3d^4(b^3P)4p$	$c^2D - {}^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	580	300.447	68.4449 – 401.2809	$3d^5 - 3d^4(a^5D)4p$	$a^2F - {}^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	200	300.499	50.7776 – 383.5578	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^6P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	250	300.545	69.4470 – 402.1713	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	120	300.707	69.1735 – 401.7209	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
		300.89	0.0 – 332.3448	$3d^5 - 3d^4(a^3P)4s$	$ga^6S - {}^4P$	$\frac{5}{2} - \frac{5}{2}$	F,P	375,1093
	360	300.955	69.4470 – 401.7209	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	470	301.031	107.8483 – 440.0392	$3d^5 - 3d^4(a^1I)4p$	$b^2G - {}^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	450	301.107	69.1735 – 401.2809	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	90	301.174	96.4612 – 428.4965	$3d^5 - 3d^4(a^3G)4p$	$b^2D - {}^4G^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	400	301.286	140.9222 – 472.8330	$3d^5 - 3d^4(b^3P)4p$	$c^2D - {}^2P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	520	301.355	69.4470 – 401.2809	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	580	301.396	69.1735 – 400.9621	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	540	301.518	96.5665 – 428.2214	$3d^5 - 3d^4(a^3F)4p$	$b^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	20	301.739	130.0259 – 461.4378	$3d^5 - 3d^4(b^3P)4p$	$a^2P - {}^4P^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	90	302.065	50.7805 – 381.8328	$3d^5 - 3d^4(a^5D)4p$	$a^4D - {}^6F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	140	302.108	96.5665 – 427.5750	$3d^5 - 3d^4(a^3F)4p$	$b^2D - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	370	302.224	96.4612 – 427.3422	$3d^5 - 3d^4(a^3P)4p$	$b^2D - {}^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	370	302.306	107.8483 – 438.6394	$3d^5 - 3d^4(a^1G)4p$	$b^2G - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	230	302.448	96.4612 – 427.0960	$3d^5 - 3d^4(a^3F)4p$	$b^2D - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	180	302.536	96.5665 – 427.0960	$3d^5 - 3d^4(a^3F)4p$	$b^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	180	303.001	107.8870 – 437.9197	$3d^5 - 3d^4(a^1G)4p$	$b^2G - {}^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
		303.03	0.0 – 330.0016	$3d^5 - 3d^4(a^3P)4s$	$ga^6S - {}^4P$	$\frac{5}{2} - \frac{3}{2}$	F,P	375,1093
		304.47	0.0 – 328.4372	$3d^5 - 3d^4(a^3P)4s$	$ga^6S - {}^4P$	$\frac{5}{2} - \frac{1}{2}$	F,P	375,1093
	170	305.220	65.1735 – 392.8081	$3d^5 - 3d^4(a^5D)4p$	$a^2D - {}^4F^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	750	305.658	107.8483 – 435.0115	$3d^5 - 3d^4(a^1G)4p$	$b^2G - {}^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	240	306.056	75.4417 – 402.1713	$3d^5 - 3d^4(a^5D)4p$	$a^2G - {}^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	110	306.388	67.0851 – 393.4682	$3d^5 - 3d^4(a^5D)4p$	$a^2F - {}^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	290	306.489	107.8870 – 434.1673	$3d^5 - 3d^4(a^1G)4p$	$b^2G - {}^2H^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	570	307.097	107.8870 – 433.5173	$3d^5 - 3d^4(a^3G)4p$	$b^2G - {}^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	710	307.207	68.5512 – 394.0610	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	90	307.383	96.5665 – 421.8940	$3d^5 - 3d^4(a^3F)4p$	$b^2D - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	260	307.449	68.8017 – 394.0610	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	420	307.492	140.9222 – 466.1337	$3d^5 - 3d^4(b^3F)4p$	$c^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	90	307.592	140.9222 – 466.0342	$3d^5 - 3d^4(b^3P)4p$	$c^2D - {}^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	160	307.613	107.8483 – 432.9320	$3d^5 - 3d^4(a^1I)4p$	$b^2G - {}^2I^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	250	307.670	68.4449 – 393.4682	$3d^5 - 3d^4(a^5D)4p$	$a^2F - {}^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	370	307.773	68.5512 – 393.4682	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	170	307.819	96.4612 – 421.3243	$3d^5 - 3d^4(a^3F)4p$	$b^2D - {}^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	580	308.009	68.8017 – 393.4682	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	440	308.046	140.9222 – 465.5527	$3d^5 - 3d^4(b^3P)4p$	$c^2D - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	300	308.299	68.4449 – 392.8081	$3d^5 - 3d^4(a^5D)4p$	$a^2F - {}^4F^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	280	308.385	68.8017 – 393.0720	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	180	308.623	69.4470 – 393.4682	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	370	308.755	140.9222 – 464.8078	$3d^5 - 3d^4(b^3F)4p$	$c^2D - {}^4G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	520	308.993	69.4470 – 393.0720	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	110	309.252	69.4470 – 392.8081	$3d^5 - 3d^4(a^5D)4p$	$a^4F - {}^4F^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	110	309.495	140.9222 – 464.0278	$3d^5 - 3d^4(b^3F)4p$	$c^2D - {}^4G^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	220	309.581	141.0068 – 464.0278	3d^5 – 3d^4(b^{3}F)4p	c^{2}D – ^{4}G°	3/2 – 5/2		1093
	110	310.316	96.4612 – 418.7134	3d^5 – 3d^4(a^{3}P)4p	b^{2}D – ^{4}P°	3/2 – 3/2		1093
	120	310.383	107.8483 – 430.0333	3d^5 – 3d^4(a^{3}G)4p	b^{2}G – ^{4}G°	9/2 – 11/2		1093
	120	310.441	79.6083 – 401.7209	3d^5 – 3d^4(a^{5}D)4p	b^{2}F – ^{4}D°	7/2 – 5/2		1093
	50	310.948	107.8870 – 429.4863	3d^5 – 3d^4(a^{3}G)4p	b^{2}G – ^{4}G°	7/2 – 9/2		1093
	170	311.023	140.9222 – 462.4431	3d^5 – 3d^4(b^{3}P)4p	c^{2}D – ^{4}D°	5/2 – 7/2		1093
	580	311.202	68.5512 – 389.8832	3d^5 – 3d^4(a^{5}D)4p	a^{4}F – ^{6}D°	9/2 – 9/2		1093
	300	311.542	65.1735 – 386.1573	3d^5 – 3d^4(a^{5}D)4p	a^{2}D – ^{4}P°	3/2 – 3/2		1093
	100	312.173	107.8870 – 428.2214	3d^5 – 3d^4(a^{3}F)4p	b^{2}G – ^{2}F°	7/2 – 7/2		1093
	170	312.302	107.8483 – 428.0515	3d^5 – 3d^4(a^{3}G)4p	b^{2}G – ^{2}H°	9/2 – 9/2		1093
	120	312.335	107.8870 – 428.0515	3d^5 – 3d^4(a^{3}G)4p	b^{2}G – ^{2}H°	7/2 – 9/2		1093
	510	312.390	107.8870 – 427.9956	3d^5 – 3d^4(a^{3}F)4p	b^{2}G – ^{2}G°	7/2 – 9/2		1093
	270	312.645	107.8483 – 427.7027	3d^5 – 3d^4(a^{3}G)4p	b^{2}G – ^{2}H°	9/2 – 11/2		1093
	170	313.858	75.4417 – 394.0610	3d^5 – 3d^4(a^{5}D)4p	a^{2}G – ^{4}F°	9/2 – 9/2		1093
	310	314.743	107.8483 – 425.5676	3d^5 – 3d^4(a^{3}H)4p	b^{2}G – ^{2}H°	9/2 – 11/2		1093
	350	315.944	107.8483 – 424.3637	3d^5 – 3d^4(a^{3}G)4p	b^{2}G – ^{4}H°	9/2 – 11/2		1093
	130	316.916	68.5512 – 384.0965	3d^5 – 3d^4(a^{5}D)4p	a^{4}F – ^{6}P°	9/2 – 7/2		1093
	660	317.291	68.8017 – 383.9602	3d^5 – 3d^4(a^{5}D)4p	a^{4}F – ^{6}F°	7/2 – 9/2		1093
	150	317.631	129.9516 – 444.7842	3d^5 – 3d^4(a^{1}D)4p	a^{2}P – ^{2}D°	3/2 – 5/2		1093
	420	318.260	68.5512 – 382.7589	3d^5 – 3d^4(a^{5}D)4p	a^{4}F – ^{6}F°	9/2 – 7/2		1093
	100	319.828	129.9516 – 442.6199	3d^5 – 3d^4(a^{3}D)4p	a^{2}P – ^{2}D°	3/2 – 3/2		1093
	210	319.899	130.0259 – 442.6199	3d^5 – 3d^4(a^{3}D)4p	a^{2}P – ^{2}D°	1/2 – 3/2		1093
	190	321.897	130.0259 – 440.6893	3d^5 – 3d^4(a^{3}D)4p	a^{2}P – ^{2}P°	1/2 – 1/2		1093
	180	322.356	129.9516 – 440.1686	3d^5 – 3d^4(a^{1}S)4p	a^{2}P – ^{2}P°	3/2 – 3/2		1093
	160	322.434	130.0259 – 440.1686	3d^5 – 3d^4(a^{1}S)4p	a^{2}P – ^{2}P°	1/2 – 3/2		1093
		322.60	0.0 – 309.9771	3d^5 – 3d^4(a^{5}D)4s	ga^{6}S – ^{4}D	5/2 – 7/2	F,P	375,1093
	170	322.753	107.8870 – 417.7181	3d^5 – 3d^4(a^{3}H)4p	b^{2}G – ^{2}G°	7/2 – 7/2		1093
	180	323.298	107.8483 – 417.1641	3d^5 – 3d^4(a^{3}H)4p	b^{2}G – ^{4}I°	9/2 – 11/2		1093
		323.57	0.0 – 309.0549	3d^5 – 3d^4(a^{5}D)4s	ga^{6}S – ^{4}D	5/2 – 5/2	F,P	375,1093
		324.33	0.0 – 308.3238	3d^5 – 3d^4(a^{5}D)4s	ga^{6}S – ^{4}D	5/2 – 3/2	F,P	375,1093
	450	331.570						1093
	590	332.787						1093
		335.42	0.0 – 298.1305	3d^5 – 3d^4(a^{5}D)4s	ga^{6}S – ^{6}D	5/2 – 9/2	F,P	375,1093
		336.30	0.0 – 297.3505	3d^5 – 3d^4(a^{5}D)4s	ga^{6}S – ^{6}D	5/2 – 7/2	F,P	375,1093
		337.04	0.0 – 296.6967	3d^5 – 3d^4(a^{5}D)4s	ga^{6}S – ^{6}D	5/2 – 5/2	F,P	375,1093
		337.61	0.0 – 296.1981	3d^5 – 3d^4(a^{5}D)4s	ga^{6}S – ^{6}D	5/2 – 3/2	F,P	375,1093
	170	896.886	309.0549 – 420.5532	3d^4(a^{5}D)4s – 3d^4(a^{3}F)4p	^{4}D – ^{4}F°	5/2 – 7/2		1093
	370	902.047	309.9771 – 420.8357	3d^4(a^{5}D)4s – 3d^4(a^{3}F)4p	^{4}D – ^{4}F°	7/2 – 9/2		1093
	130	905.889	308.3238 – 418.7134	3d^4(a^{5}D)4s – 3d^4(a^{3}P)4p	^{4}D – ^{4}P°	3/2 – 3/2		1093
	50	906.380	309.9771 – 420.3089	3d^4(a^{5}D)4s – 3d^4(a^{3}P)4p	^{4}D – ^{4}P°	7/2 – 5/2		1093
	40	948.324	339.3358 – 444.7842	3d^4(a^{3}F)4s – 3d^4(a^{1}D)4p	^{2}F – ^{2}D°	7/2 – 5/2		1093
	20	965.287	347.4452 – 451.0413	3d^4(a^{1}G)4s – 3d^4(a^{1}F)4p	^{2}G – ^{2}F°	7/2 – 5/2		1093
	20	970.672	343.8426 – 446.8638	3d^4(a^{3}G)4s – 3d^4(a^{1}D)4p	^{2}G – ^{2}F°	9/2 – 7/2		1093
	50	979.761	339.3358 – 441.4012	3d^4(a^{3}F)4s – 3d^4(a^{3}D)4p	^{2}F – ^{2}D°	7/2 – 5/2		1093
	20	981.539	339.3358 – 441.2161	3d^4(a^{3}F)4s – 3d^4(a^{3}D)4p	^{2}F – ^{2}F°	7/2 – 7/2		1093
	390	994.120	382.8891 – 483.4809	3d^4(b^{3}F)4s – 3d^4(b^{3}F)4p	^{2}F – ^{2}D°	5/2 – 3/2		1093
	360	996.349	382.6771 – 483.0434	3d^4(b^{3}F)4s – 3d^4(b^{3}F)4p	^{2}F – ^{2}D°	7/2 – 5/2		1093
	280	1002.559	366.2898 – 466.0342	3d^4(a^{1}F)4s – 3d^4(b^{3}P)4p	^{2}F – ^{2}D°	5/2 – 3/2		1093
	430	1004.309	332.3436 – 431.9126	3d^4(a^{3}F)4s – 3d^4(a^{3}D)4p	^{4}F – ^{4}D°	9/2 – 7/2		1093
	580	1005.497	330.5805 – 430.0333	3d^4(a^{3}H)4s – 3d^4(a^{3}G)4p	^{4}H – ^{4}G°	13/2 – 11/2		1093
	420	1006.593	330.1410 – 429.4863	3d^4(a^{3}H)4s – 3d^4(a^{3}G)4p	^{4}H – ^{4}G°	11/2 – 9/2		1093
	320	1007.513	366.2998 – 465.5527	3d^4(a^{1}F)4s – 3d^4(b^{3}P)4p	^{2}F – ^{2}D°	7/2 – 5/2		1093
	20	1008.665	335.9760 – 435.1162	3d^4(a^{3}G)4s – 3d^4(a^{3}D)4p	^{4}G – ^{4}F°	7/2 – 7/2		1093
	780	1008.944	329.7542 – 428.8665	3d^4(a^{3}H)4s – 3d^4(a^{3}G)4p	^{4}H – ^{4}G°	9/2 – 7/2		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	560	1009.797	336.4304 – 435.4594	$3d^4(a^3G)4s - 3d^4(a^3D)4p$	$^4G - ^4F^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	560	1009.992	329.4862 – 428.4965	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^4H - ^4G^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	20	1011.667	332.1754 – 431.0203	$3d^4(a^3F)4s - 3d^4(a^3D)4p$	$^4F - ^4P^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	240	1011.978	335.3845 – 434.2009	$3d^4(a^3G)4s - 3d^4(a^3D)4p$	$^4G - ^4F^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	410	1012.437	336.3449 – 435.1162	$3d^4(a^3G)4s - 3d^4(a^3D)4p$	$^4G - ^4F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	260	1013.680	335.9760 – 434.6260	$3d^4(a^3G)4s - 3d^4(a^3D)4p$	$^4G - ^4F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	60	1015.756	374.8439 – 473.2924	$3d^4(b^3P)4s - 3d^4(b^3F)4p$	$^4P - ^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	20	1015.877	339.4824 – 437.9197	$3d^4(a^3F)4s - 3d^4(a^1G)4p$	$^2F - ^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	170	1021.804	343.0520 – 440.9179	$3d^4(a^3G)4s - 3d^4(a^1I)4p$	$^2G - ^2H^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	600	1021.923	330.1410 – 427.9956	$3d^4(a^3H)4s - 3d^4(a^3F)4p$	$^4H - ^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	140	1022.270	329.7542 – 427.5750	$3d^4(a^3H)4s - 3d^4(a^3F)4p$	$^4H - ^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	200	1023.645	332.3436 – 430.0333	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - ^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	630	1024.030	374.8439 – 472.4973	$3d^4(b^3P)4s - 3d^4(b^3F)4p$	$^4P - ^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	130	1026.968	343.8426 – 441.2161	$3d^4(a^3G)4s - 3d^4(a^3D)4p$	$^2G - ^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	560	1029.628	330.5805 – 427.7027	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^4H - ^2H^\circ$	$\frac{13}{2} - \frac{11}{2}$		1093
	200	1030.722	337.9939 – 435.0115	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^2H - ^2H^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	500	1031.470	376.3437 – 473.2924	$3d^4(b^3P)4s - 3d^4(b^3F)4p$	$^4P - ^4D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	770	1032.799	375.6730 – 472.4973	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	320	1032.908	332.0516 – 428.8665	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - ^4G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	360	1036.166	337.0077 – 433.5173	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^2H - ^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	50	1036.656	332.0318 – 428.4965	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - ^4G^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	120	1038.830	374.8439 – 471.1068	$3d^4(b^3P)4s - 3d^4(b^3P)4p$	$^4P - ^4S^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	410	1039.537	343.8426 – 440.0392	$3d^4(a^3G)4s - 3d^4(a^1I)4p$	$^2G - ^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	260	1040.388	297.3505 – 393.4682	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	650	1042.418	298.1305 – 394.0610	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	280	1042.493	337.0077 – 432.9320	$3d^4(a^3H)4s - 3d^4(a^1I)4p$	$^2H - ^2I^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	680	1043.057	330.5805 – 426.4519	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^4H - ^4H^\circ$	$\frac{13}{2} - \frac{13}{2}$		1093
	20	1043.596	332.1754 – 427.9956	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	220	1047.928	330.1410 – 425.5676	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^2H^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	590	1048.468	337.9939 – 433.3712	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^2H - ^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	170	1048.664	332.3436 – 427.7027	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - ^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
		1052.2	45.8842 – 140.9222	$3d^5 - 3d^5$	$a^4P - c^2D$	$\frac{5}{2} - \frac{5}{2}$	F,P	375,1093
		1053.7	46.1044 – 141.0068	$3d^5 - 3d^5$	$a^4P - c^2D$	$\frac{3}{2} - \frac{3}{2}$	F,P	375,1093
	290	1054.105	343.0520 – 437.9197	$3d^4(a^3G)4s - 3d^4(a^1G)4p$	$^2G - ^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
		1054.7	46.1044 – 140.9222	$3d^5 - 3d^5$	$a^4P - c^2D$	$\frac{3}{2} - \frac{5}{2}$	F,P	375,1093
	270	1054.879	343.8426 – 438.6394	$3d^4(a^3G)4s - 3d^4(a^1G)4p$	$^2G - ^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	510	1055.037	329.7542 – 424.5370	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^4H - ^4H^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	250	1055.260	376.3437 – 471.1068	$3d^4(b^3P)4s - 3d^4(b^3P)4p$	$^4P - ^4S^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
		1056.2	46.3248 – 141.0068	$3d^5 - 3d^5$	$a^4P - c^2D$	$\frac{1}{2} - \frac{3}{2}$	F,P	375,1093
	20	1056.820	337.9939 – 432.6166	$3d^4(a^3H)4s - 3d^4(a^1I)4p$	$^2H - ^2I^\circ$	$\frac{11}{2} - \frac{13}{2}$		1093
		1057.1	46.3248 – 140.9222	$3d^5 - 3d^5$	$a^4P - c^2D$	$\frac{1}{2} - \frac{5}{2}$	F,P	375,1093
	660	1061.319	330.1410 – 424.3637	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^4H - ^4H^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	310	1063.435	339.3358 – 433.3712	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^2F - ^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	810	1063.811	328.4372 – 422.4372	$3d^4(a^3P)4s - 3d^4(a^3F)4p$	$^4P - ^4D^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	20	1064.595	328.4372 – 422.3694	$3d^4(a^3P)4s - 3d^4(a^3F)4p$	$^4P - ^4D^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
	780	1065.478	329.4862 – 423.3414	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^4H - ^4H^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	20	1067.460	389.3625 – 483.0434	$3d^4(b^1G)4s - 3d^4(b^3F)4p$	$^2G - ^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	180	1068.132	330.1410 – 423.7633	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^4H - ^4F^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	760	1068.350	336.4304 – 430.0333	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4G^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	410	1068.606	329.4862 – 423.0652	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^2H^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	730	1068.796	296.1981 – 389.7604	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^4P^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	20	1069.927	339.3358 – 432.8001	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^2F - ^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	280	1070.238	307.8439 – 401.2809	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4D^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	350	1070.695	308.3238 – 401.7209	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	670	1071.450	295.8827 – 389.2140	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - {}^6D^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	310	1071.676	329.7542 – 423.0652	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - {}^2H^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	780	1073.638	336.3449 – 429.4863	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - {}^4G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	670	1073.924	309.0549 – 402.1713	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	700	1073.975	335.3845 – 428.4965	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - {}^4G^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	720	1074.535	296.6967 – 389.7604	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - {}^4P^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	350	1074.856	295.8827 – 388.9186	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - {}^6D^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
	790	1075.781	308.3238 – 401.2809	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - {}^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	370	1076.344	358.7166 – 451.6229	$3d^4(a^1D)4s - 3d^4(a^1D)4p$	$^2D - {}^2P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	780	1076.542	335.9760 – 428.8665	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - {}^4G^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	120	1077.412	358.8279 – 451.6420	$3d^4(a^1D)4s - 3d^4(a^1D)4p$	$^2D - {}^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	70	1077.635	358.8279 – 451.6229	$3d^4(a^1D)4s - 3d^4(a^1D)4p$	$^2D - {}^2P^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	620	1078.035	347.2785 – 440.0392	$3d^4(a^1G)4s - 3d^4(a^1I)4p$	$^2G - {}^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	680	1078.509	296.1981 – 388.9186	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - {}^6D^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	800	1079.144	309.0549 – 401.7209	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	690	1079.472	308.3238 – 400.9621	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - {}^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	180	1080.255	330.1410 – 422.7118	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - {}^2I^\circ$	$\frac{11}{2} - \frac{13}{2}$		1093
	820	1080.537	296.6967 – 389.2434	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - {}^6D^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	810	1080.694	297.3505 – 389.8832	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - {}^6D^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	750	1080.875	296.6967 – 389.2140	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - {}^6D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	650	1081.320	366.2898 – 458.7722	$3d^4(a^1F)4s - 3d^4(a^1F)4p$	$^2F - {}^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	680	1082.141	297.3505 – 389.7604	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - {}^4P^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	430	1083.487	332.0516 – 424.3461	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - {}^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	570	1084.296	309.0549 – 401.2809	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - {}^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	820	1084.672	309.9771 – 402.1713	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - {}^4D^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	590	1084.946	332.1754 – 424.3461	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	790	1085.226	347.8924 – 440.0392	$3d^4(a^1I)4s - 3d^4(a^1I)4p$	$^2I - {}^2H^\circ$	$\frac{13}{2} - \frac{11}{2}$		1093
	130	1086.069	347.9639 – 440.0392	$3d^4(a^1I)4s - 3d^4(a^1I)4p$	$^2I - {}^2H^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	540	1086.489	337.9939 – 430.0333	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^2H - {}^4G^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	40	1086.727	335.9760 – 427.9956	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^4G - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	410	1086.931	332.3436 – 424.3461	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - {}^4F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	190	1087.457	335.3845 – 427.3422	$3d^4(a^3G)4s - 3d^4(a^3P)4p$	$^4G - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	810	1088.223	297.3505 – 389.2434	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - {}^6D^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	830	1089.885	298.1305 – 389.8832	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - {}^6D^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	550	1089.992	309.9771 – 401.7209	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - {}^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	20	1090.445	336.3449 – 428.0515	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - {}^2H^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	810	1091.097	296.1981 – 387.8499	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - {}^6D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	200	1091.509	332.0318 – 423.6468	$3d^4(a^3F)4s - 3d^4(a^3P)4p$	$^4F - {}^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	20	1091.651	330.0016 – 421.6072	$3d^4(a^3P)4s - 3d^4(a^3F)4p$	$^4P - {}^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	70	1091.745	335.9760 – 427.5750	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^4G - {}^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	350	1091.851	332.1754 – 423.7633	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	810	1093.380	343.9996 – 435.4594	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - {}^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	190	1093.853	332.3436 – 423.7633	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - {}^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	780	1094.560	347.2785 – 438.6394	$3d^4(a^1G)4s - 3d^4(a^1G)4p$	$^2G - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	380	1095.092	351.3040 – 442.6199	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^2D - {}^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	510	1095.271	332.3436 – 423.6458	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^4F - {}^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	700	1095.631	336.4304 – 427.7027	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - {}^2H^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	600	1096.875	343.8426 – 435.0115	$3d^4(a^1G)4s - 3d^4(a^1G)4p$	$^2G - {}^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	630	1097.055	296.6967 – 387.8499	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - {}^6D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	660	1097.539	298.1305 – 389.2434	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - {}^6D^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	780	1097.931	375.6730 – 466.7543	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - {}^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	790	1099.960	344.2035 – 435.1162	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - {}^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	300	1100.235	389.2996 – 480.1893	$3d^4(b^1G)4s - 3d^4(b^1G)4p$	$^2G - {}^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	230	1100.991	389.3625 – 480.1893	$3d^4(b^1G)4s - 3d^4(b^1G)4p$	$^2G - {}^2F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	80	1101.585	375.8708 – 466.6491	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		1093
	470	1102.262	375.9271 – 466.6491	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
		1102.8	50.3310 – 141.0068	$3d^5 - 3d^5$	$a^4D - c^2D$	$\frac{7}{2}-\frac{3}{2}$	F,P	375,1093
	650	1103.249	347.2785 – 437.9197	$3d^4(a^1G)4s - 3d^4(a^1G)4p$	$^2G - ^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
		1103.8	50.3310 – 140.9222	$3d^5 - 3d^5$	$a^4D - c^2D$	$\frac{7}{2}-\frac{5}{2}$	F,P	375,1093
		1103.9	50.3310 – 140.9222	$3d^5 - 3d^5$	$a^4D - c^2D$	$\frac{7}{2}-\frac{5}{2}$	F,P	375,1093
	140	1104.150	337.0077 – 427.5750	$3d^4(a^3H)4s - 3d^4(a^3F)4p$	$^2H - ^2G^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	430	1104.773	366.2998 – 456.8156	$3d^4(a^1F)4s - 3d^4(a^1F)4p$	$^2F - ^2D^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	170	1104.977	297.3505 – 387.8499	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6D^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	460	1105.193	351.3040 – 441.7857	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^2D - ^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		1093
	490	1105.284	347.4452 – 437.9197	$3d^4(a^1G)4s - 3d^4(a^1G)4p$	$^2G - ^2G^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	770	1105.393	343.0520 – 433.5173	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^2G - ^2G^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	440	1106.366	332.0516 – 422.4372	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4D^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	230	1106.479	329.4862 – 419.8633	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4G^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	540	1106.948	332.0318 – 422.3694	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4D^\circ$	$\frac{3}{2}-\frac{1}{2}$		1093
	330	1107.102	329.7542 – 420.0800	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4G^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
	200	1107.319	330.0016 – 420.3089	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^4P - ^4P^\circ$	$\frac{3}{2}-\frac{5}{2}$		1093
		1108.3	50.7805 – 141.0068	$3d^5 - 3d^5$	$a^4D - c^2D$	$\frac{3}{2}-\frac{3}{2}$	F,P	375,1093
		1108.3	50.7776 – 141.0068	$3d^5 - 3d^5$	$a^4D - c^2D$	$\frac{5}{2}-\frac{3}{2}$	F,P	375,1093
	710	1108.863	351.0330 – 441.2161	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^2D - ^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	730	1108.909	344.4474 – 434.6260	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - ^4F^\circ$	$\frac{3}{2}-\frac{5}{2}$		1093
		1109.3	50.7776 – 140.9222	$3d^5 - 3d^5$	$a^4D - c^2D$	$\frac{5}{2}-\frac{5}{2}$	F,P	375,1093
	880	1109.410	375.9271 – 466.0652	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4G^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	820	1109.760	329.7542 – 419.8633	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4G^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	900	1110.503						1093
	870	1110.842	336.4304 – 426.4519	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4H^\circ$	$\frac{11}{2}-\frac{13}{2}$		1093
	810	1111.557	332.3448 – 422.3066	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^4P - ^4D^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	790	1111.854	330.1410 – 420.0800	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4G^\circ$	$\frac{11}{2}-\frac{9}{2}$		1093
	780	1112.305	329.4862 – 419.3905	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4G^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	540	1114.236	389.2996 – 479.0463	$3d^4(b^1G)4s - 3d^4(b^1G)4p$	$^2G - ^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
	580	1114.590	332.1754 – 421.8940	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4D^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	580	1115.017	389.3625 – 479.0463	$3d^4(b^1G)4s - 3d^4(b^1G)4p$	$^2G - ^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	840	1116.192	344.6100 – 434.2009	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - ^4F^\circ$	$\frac{1}{2}-\frac{3}{2}$		1093
	790	1116.235	366.2998 – 455.8876	$3d^4(a^1F)4s - 3d^4(a^1F)4p$	$^2F - ^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	510	1116.368	332.0318 – 421.6072	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		1093
	810	1116.962	343.8426 – 433.3712	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^2G - ^2G^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
	20	1117.445	344.4474 – 433.9369	$3d^4(a^3D)4s - 3d^4(a^1S)4p$	$^4D - ^2P^\circ$	$\frac{3}{2}-\frac{1}{2}$		1093
	170	1117.812	296.6967 – 386.1573	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^4P^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	330	1118.783	339.4824 – 428.8665	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^2F - ^4G^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	700	1119.867	336.4048 – 425.7031	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^2P - ^2D^\circ$	$\frac{1}{2}-\frac{3}{2}$		1093
	250	1120.165	332.0516 – 421.3243	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^2D^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	210	1120.334	344.2035 – 433.4625	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - ^4P^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	780	1120.801	336.3449 – 425.5676	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^2H^\circ$	$\frac{9}{2}-\frac{11}{2}$		1093
	620	1121.881	351.0330 – 440.1686	$3d^4(a^3D)4s - 3d^4(a^1S)4p$	$^2D - ^2P^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	340	1122.689	351.0962 – 440.1686	$3d^4(a^1S)4s - 3d^4(a^1S)4p$	$^2S - ^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$		1093
	660	1123.412	344.4474 – 433.4625	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - ^4P^\circ$	$\frac{3}{2}-\frac{3}{2}$		1093
	890	1124.195	330.5805 – 419.5335	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4I^\circ$	$\frac{13}{2}-\frac{15}{2}$		1093
	660	1125.050	339.3358 – 428.2214	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^2F - ^2F^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	370	1125.305	295.8827 – 384.7474	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^4P^\circ$	$\frac{1}{2}-\frac{1}{2}$		1093
	520	1125.395	375.9498 – 464.8078	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4G^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	220	1125.481	335.3845 – 424.2354	$3d^4(a^3G)4s - 3d^4(a^3P)4p$	$^4G - ^2P^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	230	1126.917	339.4824 – 428.2214	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^2F - ^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	750	1127.206	339.3358 – 428.0515	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^2F - ^2H^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	80	1127.766	332.0516 – 420.7223	$3d^4(a^3F)4s - 3d^4(a^3P)4p$	$^4F - ^4S^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	880	1127.935	347.8924 – 436.5503	$3d^4(a^1I)4s - 3d^4(a^1I)4p$	$^2I - ^2K^\circ$	$\frac{13}{2} - \frac{15}{2}$		1093
	840	1129.173	335.9760 – 424.5370	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4H^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	310	1129.325	296.1981 – 384.7474	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^4P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	310	1129.917	332.0516 – 420.5532	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	820	1130.049	332.3436 – 420.8357	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	840	1130.477	337.9939 – 426.4519	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^2H - ^4H^\circ$	$\frac{11}{2} - \frac{13}{2}$		1093
	880	1131.064	330.1410 – 418.5536	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4I^\circ$	$\frac{11}{2} - \frac{13}{2}$		1093
	730	1131.508	332.3448 – 420.7223	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^4P - ^4S^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	730	1131.508	332.1754 – 420.5532	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	160	1132.190	335.3845 – 423.7105	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4F^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	150	1132.550	343.9996 – 432.2957	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - ^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	850	1132.759	332.3436 – 420.6234	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	660	1133.236	335.9760 – 424.2185	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	280	1133.295	339.3358 – 427.5750	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^2F - ^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	270	1133.442	330.1410 – 418.3688	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	460	1133.935						1093
	580	1134.470	358.7166 – 446.8638	$3d^4(a^1D)4s - 3d^4(a^1D)4p$	$^2D - ^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	360	1134.989	336.4304 – 424.5370	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4H^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	820	1135.179	344.2035 – 432.2957	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - ^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	400	1135.299	339.2601 – 427.3422	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^2P - ^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	800	1136.127	336.3449 – 424.3637	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4H^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	270	1136.298	339.3358 – 427.3422	$3d^4(a^3F)4s - 3d^4(a^3P)4p$	$^2F - ^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	660	1136.352	336.3449 – 424.3461	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	680	1136.820	332.3448 – 420.3089	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^4P - ^4P^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	820	1136.922	335.3845 – 423.3414	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4H^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	840	1137.491	343.9996 – 431.9126	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^4D - ^4D^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
	720	1137.598	332.1754 – 420.0800	$3d^4(a^3F)4s - 3d^4(a^3H)4p$	$^4F - ^4G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	360	1138.186	339.4824 – 427.3422	$3d^4(a^3F)4s - 3d^4(a^3P)4p$	$^2F - ^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	620	1138.484	339.2601 – 427.0960	$3d^4(a^3P)4s - 3d^4(a^3F)4p$	$^2P - ^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	520	1138.799	332.0318 – 419.8447	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	500	1139.040	332.0516 – 419.8447	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	860	1139.168	329.7542 – 417.5384	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	800	1139.825	347.2785 – 435.0115	$3d^4(a^1G)4s - 3d^4(a^1G)4p$	$^2G - ^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	780	1140.347	366.2898 – 453.9830	$3d^4(a^1F)4s - 3d^4(a^1F)4p$	$^2F - ^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	320	1140.571	295.8827 – 383.5578	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6P^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	70	1141.084	389.2996 – 476.9356	$3d^4(b^1G)4s - 3d^4(b^1G)4p$	$^2G - ^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	280	1141.386	339.4824 – 427.0960	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^2F - ^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	550	1141.563	374.8439 – 462.4431	$3d^4(b^3P)4s - 3d^4(b^3P)4p$	$^4P - ^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	810	1141.889	337.9939 – 425.5676	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^2H - ^2H^\circ$	$\frac{11}{2} - \frac{11}{2}$		1093
	670	1142.171	347.4452 – 434.9970	$3d^4(a^1G)4s - 3d^4(a^1G)4p$	$^2G - ^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	140	1142.313	296.1981 – 383.7398	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6P^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	290	1142.478	337.0077 – 424.5370	$3d^4(a^3H)4s - 3d^4(a^3G)4p$	$^2H - ^4H^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	740	1144.047	329.7542 – 417.1641	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^4H - ^4I^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	890	1144.290	298.1305 – 385.5209	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6F^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	770	1144.686	332.0318 – 419.3905	$3d^4(a^3F)4s - 3d^4(a^3H)4p$	$^4F - ^4G^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	60	1144.790	375.9498 – 463.3015	$3d^4(b^3F)4s - 3d^4(b^3P)4p$	$^4F - ^4P^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	130	1144.973	332.0516 – 419.3905	$3d^4(a^3F)4s - 3d^4(a^3H)4p$	$^4F - ^4G^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	750	1145.048	336.4304 – 423.7633	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^4F^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	150	1145.398	336.4048 – 423.7105	$3d^4(a^3P)4s - 3d^4(a^3G)4p$	$^2P - ^4F^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
	160	1145.453	336.3449 – 423.6458	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^4G - ^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	620	1145.835	347.8924 – 435.1654	$3d^4(a^1I)4s - 3d^4(a^1I)4p$	$^2I - ^2K^\circ$	$\frac{13}{2} - \frac{13}{2}$		1093
	440	1146.342	358.8279 – 446.0612	$3d^4(a^1D)4s - 3d^4(a^1D)4p$	$^2D - ^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
	840	1146.776	347.9639 – 435.1654	$3d^4(a^1I)4s - 3d^4(a^1I)4p$	$^2I - ^2K^\circ$	$\frac{11}{2} - \frac{13}{2}$		1093
	80	1147.038	347.4452 – 434.6260	$3d^4(a^1G)4s - 3d^4(a^3D)4p$	$^2G - ^4F^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	100	1147.855	347.8924 – 435.0115	3d^4(a^{1}I)4s – 3d^4(a^{1}G)4p	^{2}I – ^{2}H°	13/2 – 11/2		1093
	330	1148.257	335.9760 – 423.0652	3d^4(a^{3}G)4s – 3d^4(a^{3}H)4p	^{4}G – ^{2}H°	7/2 – 9/2		1093
	670	1148.861	296.6967 – 383.7398	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{6}D – ^{6}P°	5/2 – 5/2		1093
	570	1149.000	389.2996 – 476.3321	3d^4(b^{1}G)4s – 3d^4(b^{1}G)4p	^{2}G – ^{2}H°	9/2 – 9/2		1093
	740	1149.153	343.9996 – 431.0203	3d^4(a^{3}D)4s – 3d^4(a^{3}D)4p	^{4}D – ^{4}P°	7/2 – 5/2		1093
	450	1149.828	389.3625 – 476.3321	3d^4(b^{1}G)4s – 3d^4(b^{1}G)4p	^{2}G – ^{2}H°	7/2 – 9/2		1093
	720	1149.979	330.5805 – 417.5384	3d^4(a^{3}H)4s – 3d^4(a^{3}H)4p	^{4}H – ^{4}G°	13/2 – 11/2		1093
	850	1150.267	329.4862 – 416.4225	3d^4(a^{3}H)4s – 3d^4(a^{3}F)4p	^{4}H – ^{4}G°	7/2 – 9/2		1093
	640	1151.253	296.6967 – 383.5578	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{6}D – ^{6}P°	5/2 – 3/2		1093
	130	1151.857	344.2035 – 431.0203	3d^4(a^{3}D)4s – 3d^4(a^{3}D)4p	^{4}D – ^{4}P°	5/2 – 5/2		1093
	570	1152.355	374.8439 – 461.6226	3d^4(b^{3}P)4s – 3d^4(b^{3}P)4p	^{4}P – ^{4}D°	5/2 – 5/2		1093
	640	1152.492	375.6730 – 462.4431	3d^4(b^{3}F)4s – 3d^4(b^{3}P)4p	^{4}F – ^{4}D°	9/2 – 7/2		1093
	710	1152.788	297.3505 – 384.0965	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{6}D – ^{6}P°	7/2 – 7/2		1093
	770	1153.121	347.4452 – 434.1673	3d^4(a^{1}G)4s – 3d^4(a^{1}G)4p	^{2}G – ^{2}H°	7/2 – 9/2		1093
	240	1153.654	332.0318 – 418.7134	3d^4(a^{3}F)4s – 3d^4(a^{3}P)4p	^{4}F – ^{4}P°	3/2 – 3/2		1093
	880	1154.605	297.3505 – 383.9602	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{6}D – ^{6}F°	7/2 – 9/2		1093
	220	1154.804	374.8439 – 461.4378	3d^4(b^{3}P)4s – 3d^4(b^{3}P)4p	^{4}P – ^{4}P°	5/2 – 3/2		1093
	810	1154.960	330.5805 – 417.1641	3d^4(a^{3}H)4s – 3d^4(a^{3}H)4p	^{4}H – ^{4}I°	13/2 – 11/2		1093
	180	1155.735	344.4474 – 430.9719	3d^4(a^{3}D)4s – 3d^4(a^{3}D)4p	^{4}D – ^{4}D°	3/2 – 3/2		1093
	210	1155.857	375.9271 – 462.4431	3d^4(b^{3}F)4s – 3d^4(b^{3}P)4p	^{4}F – ^{4}D°	7/2 – 7/2		1093
	400	1156.632	330.0016 – 416.4590	3d^4(a^{3}P)4s – 3d^4(a^{3}P)4p	^{4}P – ^{4}P°	3/2 – 1/2		1093
	180	1156.730	344.4474 – 430.8988	3d^4(a^{3}D)4s – 3d^4(a^{3}D)4p	^{4}D – ^{4}D°	3/2 – 1/2		1093
	190	1156.844	339.2601 – 425.7031	3d^4(a^{3}P)4s – 3d^4(a^{3}P)4p	^{2}P – ^{2}D°	1/2 – 3/2		1093
	360	1156.955	343.0520 – 429.4863	3d^4(a^{3}G)4s – 3d^4(a^{3}G)4p	^{2}G – ^{4}G°	7/2 – 9/2		1093
	830	1157.552	297.3505 – 383.7398	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{6}D – ^{6}P°	7/2 – 5/2		1093
	760	1157.805	332.3448 – 418.7134	3d^4(a^{3}P)4s – 3d^4(a^{3}P)4p	^{4}P – ^{4}P°	5/2 – 3/2		1093
	590	1158.792	336.3449 – 422.6424	3d^4(a^{3}G)4s – 3d^4(a^{3}H)4p	^{4}G – ^{2}I°	9/2 – 11/2		1093
	860	1158.996	330.1410 – 416.4225	3d^4(a^{3}H)4s – 3d^4(a^{3}F)4p	^{4}H – ^{4}G°	11/2 – 9/2		1093
	780	1159.178	329.4862 – 415.7543	3d^4(a^{3}H)4s – 3d^4(a^{3}H)4p	^{4}H – ^{4}I°	7/2 – 9/2		1093
	80	1159.574	347.2785 – 433.5173	3d^4(a^{1}G)4s – 3d^4(a^{3}G)4p	^{2}G – ^{2}G°	9/2 – 7/2		1093
	680	1160.221	343.8426 – 430.0333	3d^4(a^{3}G)4s – 3d^4(a^{3}G)4p	^{2}G – ^{4}G°	9/2 – 11/2		1093
	400	1160.823	332.3448 – 418.4908	3d^4(a^{3}P)4s – 3d^4(a^{3}F)4p	^{4}P – ^{4}F°	5/2 – 3/2		1093
	440	1161.533	347.2785 – 433.3712	3d^4(a^{1}G)4s – 3d^4(a^{1}G)4p	^{2}G – ^{2}G°	9/2 – 9/2		1093
	500	1161.825	347.4452 – 433.5173	3d^4(a^{1}G)4s – 3d^4(a^{3}G)4p	^{2}G – ^{2}G°	7/2 – 7/2		1093
	250	1161.872	358.7166 – 444.7842	3d^4(a^{1}D)4s – 3d^4(a^{1}D)4p	^{2}D – ^{2}D°	5/2 – 5/2		1093
	880	1161.952	296.6967 – 382.7589	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{6}D – ^{6}F°	5/2 – 7/2		1093
	840	1162.007	337.0077 – 423.0652	3d^4(a^{3}H)4s – 3d^4(a^{3}H)4p	^{2}H – ^{2}H°	9/2 – 9/2		1093
	860	1163.252	298.1305 – 384.0965	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{6}D – ^{6}P°	9/2 – 7/2		1093
	140	1164.200	329.4862 – 415.3820	3d^4(a^{3}H)4s – 3d^4(a^{3}F)4p	^{4}H – ^{4}G°	7/2 – 5/2		1093
	430	1164.329	329.7542 – 415.6408	3d^4(a^{3}H)4s – 3d^4(a^{3}F)4p	^{4}H – ^{4}G°	9/2 – 7/2		1093
	850	1165.098	298.1305 – 383.9602	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{6}D – ^{6}F°	9/2 – 9/2		1093
	120	1165.907	337.9939 – 423.7633	3d^4(a^{3}H)4s – 3d^4(a^{3}G)4p	^{2}H – ^{4}F°	11/2 – 9/2		1093
	90	1167.219	375.9498 – 461.6226	3d^4(b^{3}F)4s – 3d^4(b^{3}P)4p	^{4}F – ^{4}D°	5/2 – 5/2		1093
	30	1167.319	332.0516 – 417.7181	3d^4(a^{3}F)4s – 3d^4(a^{3}H)4p	^{4}F – ^{2}G°	5/2 – 7/2		1093
	870	1167.748	296.1981 – 381.8328	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{6}D – ^{6}F°	3/2 – 5/2		1093
	550	1168.061	330.1410 – 415.7543	3d^4(a^{3}H)4s – 3d^4(a^{3}H)4p	^{4}H – ^{4}I°	11/2 – 9/2		1093
	510	1168.788	366.2998 – 451.8594	3d^4(a^{1}F)4s – 3d^4(a^{1}F)4p	^{2}F – ^{2}F°	7/2 – 7/2		1093
	200	1168.981	332.1754 – 417.7181	3d^4(a^{3}F)4s – 3d^4(a^{3}H)4p	^{4}F – ^{2}G°	7/2 – 7/2		1093
	710	1169.297	347.2785 – 432.8001	3d^4(a^{1}G)4s – 3d^4(a^{1}G)4p	^{2}G – ^{2}F°	9/2 – 7/2		1093
	740	1170.327	375.6730 – 461.1183	3d^4(b^{3}F)4s – 3d^4(b^{3}F)4p	^{4}F – ^{4}F°	9/2 – 9/2		1093
	100	1170.631	358.8279 – 444.2522	3d^4(a^{1}D)4s – 3d^4(a^{1}D)4p	^{2}D – ^{2}D°	3/2 – 3/2		1093
	850	1170.846	297.3505 – 382.7589	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{6}D – ^{6}F°	7/2 – 7/2		1093
	120	1171.324	332.3436 – 417.7181	3d^4(a^{3}F)4s – 3d^4(a^{3}H)4p	^{4}F – ^{2}G°	9/2 – 7/2		1093
	770	1172.591	295.8827 – 381.1638	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{6}D – ^{6}F°	1/2 – 3/2		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	550	1173.786	332.3436 – 417.5384	$3d^4(a^3F)4s - 3d^4(a^3H)4p$	$^4F - ^4G^\circ$	$\frac{9}{2}-\frac{11}{2}$		1093
	720	1174.495	330.0016 – 415.1445	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^4P - ^4D^\circ$	$\frac{3}{2}-\frac{5}{2}$		1093
	860	1174.590	296.6967 – 381.8328	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6F^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	780	1174.885	328.4372 – 413.5531	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^4P - ^4D^\circ$	$\frac{1}{2}-\frac{3}{2}$		1093
	440	1175.926	347.8924 – 432.9320	$3d^4(a^1I)4s - 3d^4(a^1I)4p$	$^2I - ^2I^\circ$	$\frac{13}{2}-\frac{11}{2}$		1093
	220	1176.461	343.0520 – 428.0515	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^2G - ^2H^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	170	1176.803	339.2601 – 424.2354	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^2P - ^2P^\circ$	$\frac{3}{2}-\frac{3}{2}$		1093
	870	1176.937	296.1981 – 381.1638	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6F^\circ$	$\frac{3}{2}-\frac{3}{2}$		1093
	740	1177.256	343.0520 – 427.9956	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^2G - ^2G^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	820	1178.217	295.8827 – 380.7567	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6F^\circ$	$\frac{1}{2}-\frac{1}{2}$		1093
	300	1178.364	375.6730 – 460.5359	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4F^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	310	1178.959	332.3436 – 417.1641	$3d^4(a^3F)4s - 3d^4(a^3H)4p$	$^4F - ^4I^\circ$	$\frac{9}{2}-\frac{11}{2}$		1093
	840	1179.960	308.3238 – 393.0720	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4F^\circ$	$\frac{3}{2}-\frac{5}{2}$		1093
	850	1180.295	347.8924 – 432.6166	$3d^4(a^1I)4s - 3d^4(a^1I)4p$	$^2I - ^2I^\circ$	$\frac{13}{2}-\frac{13}{2}$		1093
	840	1180.363	337.9939 – 422.7118	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^2H - ^2I^\circ$	$\frac{11}{2}-\frac{13}{2}$		1093
	590	1181.293	375.9498 – 460.6036	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4F^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	150	1181.641	298.1305 – 382.7589	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6F^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	370	1181.899	375.9271 – 460.5359	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4F^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	690	1182.605	296.1981 – 380.7567	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6F^\circ$	$\frac{3}{2}-\frac{1}{2}$		1093
	700	1183.671	297.3505 – 381.8328	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6F^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	710	1183.897	296.6967 – 381.1638	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^6D - ^6F^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
	20	1183.991	335.3845 – 419.8447	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^4G - ^4F^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	100	1184.311	375.9271 – 460.3646	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^4F - ^4F^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	20	1184.445	339.3358 – 423.7633	$3d^4(a^3F)4s - 3d^4(a^3G)4p$	$^2F - ^4F^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	860	1184.659	309.0549 – 393.4682	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4F^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	170	1184.753	336.4304 – 420.8357	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^4G - ^4F^\circ$	$\frac{11}{2}-\frac{9}{2}$		1093
	210	1185.024	339.2601 – 423.6468	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^2P - ^2P^\circ$	$\frac{3}{2}-\frac{1}{2}$		1093
	430	1185.140	343.8426 – 428.2214	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^2G - ^2F^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	440	1186.984	332.1754 – 416.4225	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4G^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	570	1187.529	336.3449 – 420.5532	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^4G - ^4F^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
	840	1188.364	332.3436 – 416.4930	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4D^\circ$	$\frac{9}{2}-\frac{7}{2}$		1093
		1188.5	45.8842 – 130.0259	$3d^5 - 3d^5$	$a^4P - a^2P$	$\frac{5}{2}-\frac{1}{2}$	F,P	375,1093
	870	1189.300	309.9771 – 394.0610	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4F^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
		1189.5	45.8842 – 129.9516	$3d^5 - 3d^5$	$a^4P - a^2P$	$\frac{5}{2}-\frac{3}{2}$	F,P	375,1093
	20	1189.859	343.0520 – 427.0960	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^2G - ^2F^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	390	1190.237	309.0549 – 393.0720	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4F^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	310	1190.326						1093
	300	1191.015	351.0330 – 434.9958	$3d^4(a^3D)4s - 3d^4(a^3D)4p$	$^2D - ^2P^\circ$	$\frac{5}{2}-\frac{3}{2}$		1093
		1191.6	46.1044 – 130.0259	$3d^5 - 3d^5$	$a^4P - a^2P$	$\frac{3}{2}-\frac{1}{2}$	F,P	375,1093
	190	1191.898	351.0962 – 434.9958	$3d^4(a^1S)4s - 3d^4(a^3D)4p$	$^2S - ^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$		1093
	560	1192.110	335.9760 – 419.8633	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^4G^\circ$	$\frac{7}{2}-\frac{7}{2}$		1093
	50	1192.346	335.9760 – 419.8447	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^4G - ^4F^\circ$	$\frac{7}{2}-\frac{5}{2}$		1093
	790	1192.469	343.8426 – 427.7027	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^2G - ^2H^\circ$	$\frac{9}{2}-\frac{11}{2}$		1093
		1192.6	46.1044 – 129.9516	$3d^5 - 3d^5$	$a^4P - a^2P$	$\frac{3}{2}-\frac{3}{2}$	F,P	375,1093
	480	1193.159	328.4372 – 412.2482	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^4P - ^4D^\circ$	$\frac{1}{2}-\frac{1}{2}$		1093
	70	1193.458	358.8279 – 442.6199	$3d^4(a^1D)4s - 3d^4(a^1D)4p$	$^2D - ^2D^\circ$	$\frac{3}{2}-\frac{3}{2}$		1093
	400	1193.883	382.8891 – 466.6491	$3d^4(b^3F)4s - 3d^4(b^3F)4p$	$^2F - ^2F^\circ$	$\frac{5}{2}-\frac{5}{2}$		1093
	440	1194.274	336.3449 – 420.0800	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^4G^\circ$	$\frac{9}{2}-\frac{9}{2}$		1093
		1194.7	46.3248 – 130.0259	$3d^5 - 3d^5$	$a^4P - a^2P$	$\frac{1}{2}-\frac{1}{2}$	F,P	375,1093
	20	1195.948	337.0077 – 420.6234	$3d^4(a^3H)4s - 3d^4(a^3F)4p$	$^2H - ^4G^\circ$	$\frac{9}{2}-\frac{11}{2}$		1093
	590	1196.328	332.0516 – 415.6408	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^4F - ^4G^\circ$	$\frac{5}{2}-\frac{7}{2}$		1093
	20	1196.477	332.1754 – 415.7543	$3d^4(a^3F)4s - 3d^4(a^3H)4p$	$^4F - ^4I^\circ$	$\frac{7}{2}-\frac{9}{2}$		1093
	310	1196.788	336.4048 – 419.9615	$3d^4(a^3P)4s - 3d^4(b^3P)4p$	$^2P - ^2S^\circ$	$\frac{1}{2}-\frac{1}{2}$		1093
	540	1196.867	330.0016 – 413.5531	$3d^4(a^3P)4s - 3d^4(a^3P)4p$	$^4P - ^4D^\circ$	$\frac{3}{2}-\frac{3}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	40	1196.967	337.0077 – 420.5532	3d^4(a^{3}H)4s – 3d^4(a^{3}F)4p	^{2}H – ^{4}F°	$\frac{9}{2}$ – $\frac{7}{2}$		1093
	470	1197.754	330.1410 – 413.6316	3d^4(a^{3}H)4s – 3d^4(a^{3}H)4p	^{4}H – ^{4}H°	$\frac{11}{2}$ – $\frac{13}{2}$		1093
	590	1198.111	332.1754 – 415.6408	3d^4(a^{3}F)4s – 3d^4(a^{3}F)4p	^{4}F – ^{4}G°	$\frac{7}{2}$ – $\frac{7}{2}$		1093
	330	1198.239	382.6771 – 466.1337	3d^4(b^{3}F)4s – 3d^4(b^{3}F)4p	^{2}F – ^{2}F°	$\frac{7}{2}$ – $\frac{7}{2}$		1093
	420	1198.893	332.3436 – 415.7543	3d^4(a^{3}F)4s – 3d^4(a^{3}H)4p	^{4}F – ^{4}I°	$\frac{9}{2}$ – $\frac{9}{2}$		1093
	620	1199.764	332.0318 – 415.3820	3d^4(a^{3}F)4s – 3d^4(a^{3}F)4p	^{4}F – ^{4}G°	$\frac{3}{2}$ – $\frac{5}{2}$		1093
	560	1200.041	332.0516 – 415.3820	3d^4(a^{3}F)4s – 3d^4(a^{3}F)4p	^{4}F – ^{4}G°	$\frac{5}{2}$ – $\frac{5}{2}$		1093
	30	1202.128	351.0962 – 434.2816	3d^4(a^{1}S)4s – 3d^4(a^{3}D)4p	^{2}S – ^{4}P°	$\frac{1}{2}$ – $\frac{1}{2}$		1093
	850	1204.085	330.5805 – 413.6316	3d^4(a^{3}H)4s – 3d^4(a^{3}H)4p	^{4}H – ^{4}H°	$\frac{13}{2}$ – $\frac{13}{2}$		1093
	700	1205.264	332.1754 – 415.1445	3d^4(a^{3}F)4s – 3d^4(a^{3}P)4p	^{4}F – ^{4}D°	$\frac{7}{2}$ – $\frac{5}{2}$		1093
	330	1207.107	351.0962 – 433.9369	3d^4(a^{1}S)4s – 3d^4(a^{1}S)4p	^{2}S – ^{2}P°	$\frac{1}{2}$ – $\frac{1}{2}$		1093
	130	1207.735	332.3448 – 415.1445	3d^4(a^{3}P)4s – 3d^4(a^{3}P)4p	^{4}P – ^{4}D°	$\frac{5}{2}$ – $\frac{5}{2}$		1093
	90	1209.427	358.7166 – 441.4012	3d^4(a^{1}D)4s – 3d^4(a^{3}D)4p	^{2}D – ^{2}D°	$\frac{5}{2}$ – $\frac{5}{2}$		1093
	860	1210.512	330.1410 – 412.7511	3d^4(a^{3}H)4s – 3d^4(a^{3}H)4p	^{4}H – ^{4}H°	$\frac{11}{2}$ – $\frac{11}{2}$		1093
	30	1211.271	339.3358 – 421.8940	3d^4(a^{3}F)4s – 3d^4(a^{3}F)4p	^{2}F – ^{4}D°	$\frac{7}{2}$ – $\frac{5}{2}$		1093
	120	1213.704	335.9760 – 418.3688	3d^4(a^{3}G)4s – 3d^4(a^{3}H)4p	^{4}G – ^{2}G°	$\frac{7}{2}$ – $\frac{9}{2}$		1093
	820	1214.453	329.7542 – 412.0956	3d^4(a^{3}H)4s – 3d^4(a^{3}H)4p	^{4}H – ^{4}H°	$\frac{9}{2}$ – $\frac{9}{2}$		1093
	520	1214.581	335.3845 – 417.7181	3d^4(a^{3}G)4s – 3d^4(a^{3}H)4p	^{4}G – ^{2}G°	$\frac{5}{2}$ – $\frac{7}{2}$		1093
	870	1216.798	329.4862 – 411.6694	3d^4(a^{3}H)4s – 3d^4(a^{3}H)4p	^{4}H – ^{4}H°	$\frac{7}{2}$ – $\frac{7}{2}$		1093
	10	1216.977	330.5805 – 412.7511	3d^4(a^{3}H)4s – 3d^4(a^{3}H)4p	^{4}H – ^{4}H°	$\frac{13}{2}$ – $\frac{11}{2}$		1093
	20	1217.419	347.8924 – 430.0333	3d^4(a^{1}I)4s – 3d^4(a^{3}G)4p	^{2}I – ^{4}G°	$\frac{13}{2}$ – $\frac{11}{2}$		1093
	720	1217.572	382.6771 – 464.8078	3d^4(b^{3}F)4s – 3d^4(b^{3}F)4p	^{2}F – ^{4}G°	$\frac{7}{2}$ – $\frac{7}{2}$		1093
	510	1217.672	339.4824 – 421.6072	3d^4(a^{3}F)4s – 3d^4(a^{3}F)4p	^{2}F – ^{2}D°	$\frac{5}{2}$ – $\frac{3}{2}$		1093
	20	1219.164	336.3449 – 418.3688	3d^4(a^{3}G)4s – 3d^4(a^{3}H)4p	^{4}G – ^{2}G°	$\frac{9}{2}$ – $\frac{9}{2}$		1093
	910	1219.662	339.3358 – 421.3243	3d^4(a^{3}F)4s – 3d^4(a^{3}F)4p	^{2}F – ^{2}D°	$\frac{7}{2}$ – $\frac{5}{2}$		1093
	380	1220.191	330.1410 – 412.0956	3d^4(a^{3}H)4s – 3d^4(a^{3}H)4p	^{4}H – ^{4}H°	$\frac{11}{2}$ – $\frac{9}{2}$		1093
	470	1220.428	336.4304 – 418.3688	3d^4(a^{3}G)4s – 3d^4(a^{3}H)4p	^{4}G – ^{2}G°	$\frac{11}{2}$ – $\frac{9}{2}$		1093
	150	1220.709	382.8891 – 464.8078	3d^4(b^{3}F)4s – 3d^4(b^{3}F)4p	^{2}F – ^{4}G°	$\frac{5}{2}$ – $\frac{7}{2}$		1093
	110	1220.781	329.7542 – 411.6694	3d^4(a^{3}H)4s – 3d^4(a^{3}H)4p	^{4}H – ^{4}H°	$\frac{9}{2}$ – $\frac{7}{2}$		1093
	110	1226.961	332.0516 – 413.5531	3d^4(a^{3}F)4s – 3d^4(a^{3}P)4p	^{4}F – ^{4}D°	$\frac{5}{2}$ – $\frac{3}{2}$		1093
	20	1227.556	339.2601 – 420.7223	3d^4(a^{3}P)4s – 3d^4(a^{3}P)4p	^{2}P – ^{4}S°	$\frac{3}{2}$ – $\frac{3}{2}$		1093
	20	1227.957	308.3238 – 389.7604	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{4}D – ^{4}P°	$\frac{3}{2}$ – $\frac{5}{2}$		1093
	300	1228.903	336.3449 – 417.7181	3d^4(a^{3}G)4s – 3d^4(a^{3}H)4p	^{4}G – ^{2}G°	$\frac{9}{2}$ – $\frac{7}{2}$		1093
	20	1229.084	337.0077 – 418.3688	3d^4(a^{3}H)4s – 3d^4(a^{3}H)4p	^{2}H – ^{2}G°	$\frac{9}{2}$ – $\frac{9}{2}$		1093
	800	1232.957	336.4304 – 417.5384	3d^4(a^{3}G)4s – 3d^4(a^{3}H)4p	^{4}G – ^{4}G°	$\frac{11}{2}$ – $\frac{11}{2}$		1093
	160	1233.436	307.8439 – 388.9186	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{4}D – ^{6}D°	$\frac{1}{2}$ – $\frac{1}{2}$		1093
	320	1237.325	336.3449 – 417.1641	3d^4(a^{3}G)4s – 3d^4(a^{3}H)4p	^{4}G – ^{4}I°	$\frac{9}{2}$ – $\frac{11}{2}$		1093
	600	1238.637	336.4304 – 417.1641	3d^4(a^{3}G)4s – 3d^4(a^{3}H)4p	^{4}G – ^{4}I°	$\frac{11}{2}$ – $\frac{11}{2}$		1093
	680	1238.970	337.0077 – 417.7181	3d^4(a^{3}H)4s – 3d^4(a^{3}H)4p	^{2}H – ^{2}G°	$\frac{9}{2}$ – $\frac{7}{2}$		1093
	680	1239.041	309.0549 – 389.7604	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{4}D – ^{4}P°	$\frac{5}{2}$ – $\frac{5}{2}$		1093
	240	1240.767	308.3238 – 388.9186	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{4}D – ^{6}D°	$\frac{3}{2}$ – $\frac{1}{2}$		1093
	230	1241.254	366.2998 – 446.8638	3d^4(a^{1}F)4s – 3d^4(a^{1}D)4p	^{2}F – ^{2}F°	$\frac{7}{2}$ – $\frac{7}{2}$		1093
	250	1241.907	343.8426 – 424.3637	3d^4(a^{3}G)4s – 3d^4(a^{3}G)4p	^{2}G – ^{4}H°	$\frac{9}{2}$ – $\frac{11}{2}$		1093
	850	1244.177	337.9939 – 418.3688	3d^4(a^{3}H)4s – 3d^4(a^{3}H)4p	^{2}H – ^{2}G°	$\frac{11}{2}$ – $\frac{9}{2}$		1093
	20	1247.062	309.0549 – 389.2434	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{4}D – ^{6}D°	$\frac{5}{2}$ – $\frac{7}{2}$		1093
	460	1247.513	309.0549 – 389.2140	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{4}D – ^{6}D°	$\frac{5}{2}$ – $\frac{3}{2}$		1093
	420	1248.807	336.3449 – 416.4225	3d^4(a^{3}G)4s – 3d^4(a^{3}F)4p	^{4}G – ^{4}G°	$\frac{9}{2}$ – $\frac{9}{2}$		1093
		1248.9	295.8827 – 375.9498	3d^4(a^{5}D)4s – 3d^4(b^{3}F)4s	^{6}D – ^{4}F	$\frac{1}{2}$ – $\frac{5}{2}$	F,P	375,1093
	310	1249.792	343.0520 – 423.0652	3d^4(a^{3}G)4s – 3d^4(a^{3}H)4p	^{2}G – ^{2}H°	$\frac{7}{2}$ – $\frac{9}{2}$		1093
	780	1250.031	335.3845 – 415.3820	3d^4(a^{3}G)4s – 3d^4(a^{3}F)4p	^{4}G – ^{4}G°	$\frac{5}{2}$ – $\frac{5}{2}$		1093
		1250.2	295.8827 – 375.8708	3d^4(a^{5}D)4s – 3d^4(b^{3}F)4s	^{6}D – ^{4}F	$\frac{1}{2}$ – $\frac{3}{2}$	F,P	375,1093
	110	1251.240	343.8426 – 423.7633	3d^4(a^{3}G)4s – 3d^4(a^{3}G)4p	^{2}G – ^{4}F°	$\frac{9}{2}$ – $\frac{9}{2}$		1093
	700	1251.467	309.9771 – 389.8832	3d^4(a^{5}D)4s – 3d^4(a^{5}D)4p	^{4}D – ^{6}D°	$\frac{7}{2}$ – $\frac{9}{2}$		1093
	310	1252.411	343.0520 – 422.8978	3d^4(a^{3}G)4s – 3d^4(a^{3}G)4p	^{2}G – ^{2}F°	$\frac{7}{2}$ – $\frac{5}{2}$		1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	400	1253.079	343.8426 – 423.6458	$3d^4(a^3G)4s - 3d^4(a^3G)4p$	$^2G - ^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
	790	1253.398	309.9771 – 389.7604	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4P^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	260	1253.581	344.4474 – 424.2185	$3d^4(a^3D)4s - 3d^4(a^3G)4p$	$^4D - ^4F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1093
		1253.9	296.1981 – 375.9498	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^6D - ^4F$	$\frac{3}{2} - \frac{5}{2}$	F,P	375,1093
		1254.2	296.1981 – 375.9271	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^6D - ^4F$	$\frac{3}{2} - \frac{7}{2}$	F,P	375,1093
		1255.1	296.1981 – 375.8708	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^6D - ^4F$	$\frac{3}{2} - \frac{3}{2}$	F,P	375,1093
	160	1255.260	335.9760 – 415.6408	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^4G - ^4G^\circ$	$\frac{7}{2} - \frac{7}{2}$		1093
		1255.5	296.6967 – 376.3437	$3d^4(a^5D)4s - 3d^4(b^3P)4s$	$^6D - ^4P$	$\frac{5}{2} - \frac{3}{2}$	F,P	375,1093
	110	1255.881	344.6100 – 424.2354	$3d^4(a^3D)4s - 3d^4(a^3P)4p$	$^4D - ^2P^\circ$	$\frac{1}{2} - \frac{3}{2}$		1093
		1256.0	50.3310 – 129.9516	$3d^5 - 3d^5$	$a^4D - a^2P$	$\frac{7}{2} - \frac{3}{2}$	F,P	375,1093
		1259.7	50.6435 – 130.0259	$3d^5 - 3d^5$	$a^4D - a^2P$	$\frac{1}{2} - \frac{1}{2}$	F,P	375,1093
		1261.8	296.6967 – 375.9498	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^6D - ^4F$	$\frac{5}{2} - \frac{5}{2}$	F,P	375,1093
		1261.9	50.7805 – 130.0259	$3d^5 - 3d^5$	$a^4D - a^2P$	$\frac{3}{2} - \frac{1}{2}$	F,P	375,1093
		1262.1	296.6967 – 375.9271	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^6D - ^4F$	$\frac{5}{2} - \frac{7}{2}$	F,P	375,1093
	30	1262.120	339.4824 – 418.7134	$3d^4(a^3F)4s - 3d^4(a^3P)4p$	$^2F - ^4P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
		1263.0	50.7776 – 129.9516	$3d^5 - 3d^5$	$a^4D - a^2P$	$\frac{5}{2} - \frac{3}{2}$	F,P	375,1093
		1263.1	50.7805 – 129.9516	$3d^5 - 3d^5$	$a^4D - a^2P$	$\frac{3}{2} - \frac{3}{2}$	F,P	375,1093
	400	1265.280	339.3358 – 418.3688	$3d^4(a^3F)4s - 3d^4(a^3H)4p$	$^2F - ^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
		1265.9	297.3505 – 376.3437	$3d^4(a^5D)4s - 3d^4(b^3P)4s$	$^6D - ^4P$	$\frac{7}{2} - \frac{3}{2}$	F,P	375,1093
		1266.2	296.6967 – 375.6730	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^6D - ^4F$	$\frac{5}{2} - \frac{9}{2}$	F,P	375,1093
	60	1268.350	343.0520 – 421.8940	$3d^4(a^3G)4s - 3d^4(a^3F)4p$	$^2G - ^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	220	1269.113	309.0549 – 387.8499	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^6D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1093
	100	1269.870	337.0077 – 415.7543	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^2H - ^4I^\circ$	$\frac{9}{2} - \frac{9}{2}$		1093
	120	1271.718	337.0077 – 415.6408	$3d^4(a^3H)4s - 3d^4(a^3F)4p$	$^2H - ^4G^\circ$	$\frac{9}{2} - \frac{7}{2}$		1093
		1272.6	297.3505 – 375.9271	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^6D - ^4F$	$\frac{7}{2} - \frac{7}{2}$	F,P	375,1093
	20	1275.029	337.9939 – 416.4225	$3d^4(a^3H)4s - 3d^4(a^3F)4p$	$^2H - ^4G^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
	90	1278.173	339.4824 – 417.7181	$3d^4(a^3F)4s - 3d^4(a^3H)4p$	$^2F - ^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
		1279.6	296.6967 – 374.8439	$3d^4(a^5D)4s - 3d^4(b^3P)4s$	$^6D - ^4P$	$\frac{5}{2} - \frac{5}{2}$	F,P	375,1093
	560	1284.137	309.9771 – 387.8499	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^6D^\circ$	$\frac{7}{2} - \frac{5}{2}$		1093
	180	1284.782	308.3238 – 386.1573	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4P^\circ$	$\frac{3}{2} - \frac{3}{2}$		1093
	90	1285.975	337.9939 – 415.7543	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^2H - ^4I^\circ$	$\frac{11}{2} - \frac{9}{2}$		1093
		1289.6	298.1305 – 375.6730	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^6D - ^4F$	$\frac{9}{2} - \frac{9}{2}$	F,P	375,1093
		1290.4	297.3505 – 374.8439	$3d^4(a^5D)4s - 3d^4(b^3P)4s$	$^6D - ^4P$	$\frac{7}{2} - \frac{5}{2}$	F,P	375,1093
	210	1295.315	336.4304 – 413.6316	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^4H^\circ$	$\frac{11}{2} - \frac{13}{2}$		1093
	320	1296.970	309.0549 – 386.1573	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1093
	20	1297.239	339.3358 – 416.4225	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^2F - ^4G^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
	110	1300.331	307.8439 – 384.7474	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4P^\circ$	$\frac{1}{2} - \frac{1}{2}$		1093
		1301.2	64.1524 – 141.0068	$3d^5 - 3d^5$	$a^2D - c^2D$	$\frac{5}{2} - \frac{3}{2}$	F,P	375,1093
		1302.6	64.1524 – 140.9222	$3d^5 - 3d^5$	$a^2D - c^2D$	$\frac{5}{2} - \frac{5}{2}$	F,P	375,1093
		1303.5	298.1305 – 374.8439	$3d^4(a^5D)4s - 3d^4(b^3P)4s$	$^6D - ^4P$	$\frac{9}{2} - \frac{5}{2}$	F,P	375,1093
	250	1308.496	308.3238 – 384.7474	$3d^4(a^5D)4s - 3d^4(a^5D)4p$	$^4D - ^4P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1093
	90	1308.781	336.3449 – 412.7511	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^4H^\circ$	$\frac{9}{2} - \frac{11}{2}$		1093
	130	1310.863	335.3845 – 411.6694	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^4H^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	20	1313.049	339.4824 – 415.6408	$3d^4(a^3F)4s - 3d^4(a^3F)4p$	$^2F - ^4G^\circ$	$\frac{5}{2} - \frac{7}{2}$		1093
	210	1313.720	335.9760 – 412.0956	$3d^4(a^3G)4s - 3d^4(a^3H)4p$	$^4G - ^4H^\circ$	$\frac{7}{2} - \frac{9}{2}$		1093
		1318.7	65.1735 – 141.0068	$3d^5 - 3d^5$	$a^2D - c^2D$	$\frac{3}{2} - \frac{3}{2}$	F,P	375,1093
		1320.2	65.1735 – 140.9222	$3d^5 - 3d^5$	$a^2D - c^2D$	$\frac{3}{2} - \frac{5}{2}$	F,P	375,1093
	20	1322.078	337.9939 – 413.6316	$3d^4(a^3H)4s - 3d^4(a^3H)4p$	$^2H - ^4H^\circ$	$\frac{11}{2} - \frac{13}{2}$		1093
		1352.8	67.0851 – 141.0068	$3d^5 - 3d^5$	$a^2F - c^2D$	$\frac{7}{2} - \frac{3}{2}$	F,P	375,1093
		1354.3	67.0851 – 140.9222	$3d^5 - 3d^5$	$a^2F - c^2D$	$\frac{7}{2} - \frac{5}{2}$	F,P	375,1093
		1354.4	309.0549 – 382.8891	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^4D - ^2F$	$\frac{5}{2} - \frac{5}{2}$	F,P	375,1093
		1358.3	309.0549 – 382.6771	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^4D - ^2F$	$\frac{5}{2} - \frac{7}{2}$	F,P	375,1093
		1375.5	309.9771 – 382.6771	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^4D - ^2F$	$\frac{7}{2} - \frac{7}{2}$	F,P	375,1093
		1378.1	68.4449 – 141.0068	$3d^5 - 3d^5$	$a^2F - c^2D$	$\frac{5}{2} - \frac{3}{2}$	F,P	375,1093

Ni VI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		1379.7	68.4449 – 140.9222	$3d^5 - 3d^5$	$a^2F - c^2D$	$\frac{5}{2}-\frac{5}{2}$	F,P	375,1093
		1381.8	68.5512 – 140.9222	$3d^5 - 3d^5$	$a^4F - c^2D$	$\frac{9}{2}-\frac{5}{2}$	F,P	375,1093
		1384.9	68.8017 – 141.0068	$3d^5 - 3d^5$	$a^4F - c^2D$	$\frac{7}{2}-\frac{3}{2}$	F,P	375,1093
		1386.6	68.8017 – 140.9222	$3d^5 - 3d^5$	$a^4F - c^2D$	$\frac{7}{2}-\frac{5}{2}$	F,P	375,1093
		1397.4	69.4470 – 141.0068	$3d^5 - 3d^5$	$a^4F - c^2D$	$\frac{5}{2}-\frac{3}{2}$	F,P	375,1093
		1468.3	307.8439 – 375.9498	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^4D - {}^4F$	$\frac{1}{2}-\frac{5}{2}$	F,P	375,1093
		1470.0	307.8439 – 375.8708	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^4D - {}^4F$	$\frac{1}{2}-\frac{3}{2}$	F,P	375,1093
		1470.2	308.3238 – 376.3437	$3d^4(a^5D)4s - 3d^4(b^3P)4s$	$^4D - {}^4P$	$\frac{3}{2}-\frac{3}{2}$	F,P	375,1093
		1478.7	308.3238 – 375.9498	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^4D - {}^4F$	$\frac{3}{2}-\frac{5}{2}$	F,P	375,1093
		1479.2	308.3238 – 375.9271	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^4D - {}^4F$	$\frac{3}{2}-\frac{7}{2}$	F,P	375,1093
		1480.4	308.3238 – 375.8708	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^4D - {}^4F$	$\frac{3}{2}-\frac{3}{2}$	F,P	375,1093
		1486.1	309.0549 – 376.3437	$3d^4(a^5D)4s - 3d^4(b^3P)4s$	$^4D - {}^4P$	$\frac{5}{2}-\frac{3}{2}$	F,P	375,1093
		1494.9	309.0549 – 375.9498	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^4D - {}^4F$	$\frac{5}{2}-\frac{5}{2}$	F,P	375,1093
		1495.4	309.0549 – 375.9271	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^4D - {}^4F$	$\frac{5}{2}-\frac{7}{2}$	F,P	375,1093
		1501.1	309.0549 – 375.6730	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^4D - {}^4F$	$\frac{5}{2}-\frac{9}{2}$	F,P	375,1093
		1506.8	309.9771 – 376.3437	$3d^4(a^5D)4s - 3d^4(b^3P)4s$	$^4D - {}^4P$	$\frac{7}{2}-\frac{3}{2}$	F,P	375,1093
		1515.9	41.9209 – 107.8870	$3d^5 - 3d^5$	$a^4G - b^2G$	$\frac{11}{2}-\frac{7}{2}$	F,P	375,1093
		1516.3	309.9771 – 375.9271	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^4D - {}^4F$	$\frac{7}{2}-\frac{7}{2}$	F,P	375,1093
		1516.8	41.9209 – 107.8483	$3d^5 - 3d^5$	$a^4G - b^2G$	$\frac{11}{2}-\frac{9}{2}$	F,P	375,1093
		1518.1	64.1524 – 130.0259	$3d^5 - 3d^5$	$a^2D - a^2P$	$\frac{5}{2}-\frac{1}{2}$	F,P	375,1093
		1518.3	42.0232 – 107.8870	$3d^5 - 3d^5$	$a^4G - b^2G$	$\frac{9}{2}-\frac{7}{2}$	F,P	375,1093
		1518.6	42.0351 – 107.8870	$3d^5 - 3d^5$	$a^4G - b^2G$	$\frac{7}{2}-\frac{7}{2}$	F,P	375,1093
		1519.2	42.0232 – 107.8483	$3d^5 - 3d^5$	$a^4G - b^2G$	$\frac{9}{2}-\frac{9}{2}$	F,P	375,1093
		1519.8	64.1524 – 129.9516	$3d^5 - 3d^5$	$a^2D - a^2P$	$\frac{5}{2}-\frac{3}{2}$	F,P	375,1093
		1520.0	309.0549 – 374.8439	$3d^4(a^5D)4s - 3d^4(b^3P)4s$	$^4D - {}^4P$	$\frac{5}{2}-\frac{5}{2}$	F,P	375,1093
		1522.2	309.9771 – 375.6730	$3d^4(a^5D)4s - 3d^4(b^3F)4s$	$^4D - {}^4F$	$\frac{7}{2}-\frac{9}{2}$	F,P	375,1093
		1541.6	309.9771 – 374.8439	$3d^4(a^5D)4s - 3d^4(b^3P)4s$	$^4D - {}^4P$	$\frac{7}{2}-\frac{5}{2}$	F,P	375,1093
		1542.0	65.1735 – 130.0259	$3d^5 - 3d^5$	$a^2D - a^2P$	$\frac{3}{2}-\frac{1}{2}$	F,P	375,1093
		1543.7	65.1735 – 129.9516	$3d^5 - 3d^5$	$a^2D - a^2P$	$\frac{3}{2}-\frac{3}{2}$	F,P	375,1093
		1623.0	79.3914 – 141.0068	$3d^5 - 3d^5$	$b^2F - c^2D$	$\frac{5}{2}-\frac{3}{2}$	F,P	375,1093
		1625.2	79.3914 – 140.9222	$3d^5 - 3d^5$	$b^2F - c^2D$	$\frac{5}{2}-\frac{5}{2}$	F,P	375,1093
		1628.7	79.6083 – 141.0068	$3d^5 - 3d^5$	$b^2F - c^2D$	$\frac{7}{2}-\frac{3}{2}$	F,P	375,1093
		1631.0	79.6083 – 140.9222	$3d^5 - 3d^5$	$b^2F - c^2D$	$\frac{7}{2}-\frac{5}{2}$	F,P	375,1093
		1711.0	307.8439 – 366.2898	$3d^4(a^5D)4s - 3d^4(a^1F)4s$	$^4D - {}^2F$	$\frac{1}{2}-\frac{5}{2}$	F,P	375,1093
		1724.8	308.3238 – 366.2998	$3d^4(a^5D)4s - 3d^4(a^1F)4s$	$^4D - {}^2F$	$\frac{3}{2}-\frac{7}{2}$	F,P	375,1093
		1725.1	308.3238 – 366.2898	$3d^4(a^5D)4s - 3d^4(a^1F)4s$	$^4D - {}^2F$	$\frac{3}{2}-\frac{5}{2}$	F,P	375,1093
		1746.9	309.0549 – 366.2998	$3d^4(a^5D)4s - 3d^4(a^1F)4s$	$^4D - {}^2F$	$\frac{5}{2}-\frac{7}{2}$	F,P	375,1093
		1747.2	309.0549 – 366.2898	$3d^4(a^5D)4s - 3d^4(a^1F)4s$	$^4D - {}^2F$	$\frac{5}{2}-\frac{5}{2}$	F,P	375,1093
		1775.5	309.9771 – 366.2998	$3d^4(a^5D)4s - 3d^4(a^1F)4s$	$^4D - {}^2F$	$\frac{7}{2}-\frac{7}{2}$	F,P	375,1093
		1969.3	0.0 – 50.7805	$3d^5 - 3d^5$	$ga^6S - a^4D$	$\frac{5}{2}-\frac{3}{2}$	F,P	375,1093
		1969.4	0.0 – 50.7776	$3d^5 - 3d^5$	$ga^6S - a^4D$	$\frac{5}{2}-\frac{5}{2}$	F,P	375,1093
		1980.0	308.3238 – 358.8279	$3d^4(a^5D)4s - 3d^4(a^1D)4s$	$^4D - {}^2D$	$\frac{3}{2}-\frac{3}{2}$	F,P	375,1093
		1981.7	46.1044 – 96.5665	$3d^5 - 3d^5$	$a^4P - b^2D$	$\frac{3}{2}-\frac{5}{2}$	F,P	375,1093
		1985.8	46.1044 – 96.4612	$3d^5 - 3d^5$	$a^4P - b^2D$	$\frac{3}{2}-\frac{3}{2}$	F,P	375,1093
		1986.8	0.0 – 50.3310	$3d^5 - 3d^5$	$ga^6S - a^4D$	$\frac{5}{2}-\frac{7}{2}$	F,P	375,1093
		1990.4	46.3248 – 96.5665	$3d^5 - 3d^5$	$a^4P - b^2D$	$\frac{1}{2}-\frac{5}{2}$	F,P	375,1093
		1994.6	46.3248 – 96.4612	$3d^5 - 3d^5$	$a^4P - b^2D$	$\frac{1}{2}-\frac{3}{2}$	F,P	375,1093

NICKEL VII (Ni^{6+}), Z = 28
Ground State $1s^22s^22p^63s^23p^63d^4(^5D_0)$ (22 electrons)
Ionization Potential [1 070 000] cm^{-1}; [133] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	28	204.979	0.804 – 488.665	$3d^4 - 3d^3(a^4P)4p$	ga^{5}D – ^{5}P°	2 – 3		622
	78	205.278	1.520 – 488.665	$3d^4 - 3d^3(a^4P)4p$	ga^{5}D – ^{5}P°	3 – 3		622
	32	205.369	0.279 – 487.207	$3d^4 - 3d^3(a^4P)4p$	ga^{5}D – ^{5}P°	1 – 2		622
	88	205.591	0.804 – 487.207	$3d^4 - 3d^3(a^4P)4p$	ga^{5}D – ^{5}P°	2 – 2		622
	140	205.645	2.392 – 488.665	$3d^4 - 3d^3(a^4P)4p$	ga^{5}D – ^{5}P°	4 – 3		622
	28	205.697	0.0 – 486.151	$3d^4 - 3d^3(a^4P)4p$	ga^{5}D – ^{5}P°	0 – 1		622
	72	205.816	0.279 – 486.151	$3d^4 - 3d^3(a^4P)4p$	ga^{5}D – ^{5}P°	1 – 1		622
	108	205.896	1.520 – 487.207	$3d^4 - 3d^3(a^4P)4p$	ga^{5}D – ^{5}P°	3 – 2		622
	62	206.038	0.804 – 486.151	$3d^4 - 3d^3(a^4P)4p$	ga^{5}D – ^{5}P°	2 – 1		622
	104	208.195	31.672 – 511.991	$3d^4 - 3d^3(a^2H)4p$	a^{3}H – ^{3}G°	4 – 3		622
	104	208.589	32.286 – 511.698	$3d^4 - 3d^3(a^2H)4p$	a^{3}H – ^{3}G°	5 – 4		622
	94	208.691	32.286 – 511.464	$3d^4 - 3d^3(a^2H)4p$	a^{3}H – ^{3}G°	5 – 5		622
	104	208.948	32.877 – 511.464	$3d^4 - 3d^3(a^2H)4p$	a^{3}H – ^{3}G°	6 – 5		622
	98	210.020	2.392 – 478.534	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{3}G°	4 – 5		622
	98	211.046	38.160 – 511.991	$3d^4 - 3d^3(a^2H)4p$	a^{3}G – ^{3}G°	3 – 3		622
	62	211.307	38.746 – 511.991	$3d^4 - 3d^3(a^2H)4p$	a^{3}G – ^{3}G°	4 – 3		622
	104	211.438	38.746 – 511.698	$3d^4 - 3d^3(a^2H)4p$	a^{3}G – ^{3}G°	4 – 4		622
	24	211.541	38.746 – 511.464	$3d^4 - 3d^3(a^2H)4p$	a^{3}G – ^{3}G°	4 – 5		622
	114	211.615	0.804 – 473.360	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{3}D°	2 – 3		622
	126	211.660	39.247 – 511.698	$3d^4 - 3d^3(a^2H)4p$	a^{3}G – ^{3}G°	5 – 4		622
	118	211.767	39.247 – 511.464	$3d^4 - 3d^3(a^2H)4p$	a^{3}G – ^{3}G°	5 – 5		622
	100	212.001	0.279 – 471.976	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{3}D°	1 – 2		622
	70	212.202	0.0 – 471.250	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}F°	0 – 1		622
	70	212.328	2.392 – 473.360	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{3}D°	4 – 3		622
	160	212.521	1.520 – 472.067	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}F°	3 – 4		622
	166	212.533	2.392 – 472.907	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}F°	4 – 5		622
	20	212.56	1.520 – 471.976	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{3}D°	3 – 2		548
	28	212.635	0.804 – 471.096	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}F°	2 – 3		622
	20	212.86	0.279 – 470.056	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}F°	1 – 2		548
	174	212.913	2.392 – 472.067	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}F°	4 – 4		622
	156	212.958	1.520 – 471.096	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}F°	3 – 3		622
	126	213.104	0.804 – 470.056	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}F°	2 – 2		622
	80	213.13	0.0 – 469.175	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}D°	0 – 1		548
	116	213.151	0.0 – 469.175	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}D°	0 – 1		622
	48	213.267	0.279 – 469.175	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}D°	1 – 1		622
	70	213.346	2.392 – 471.096	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}F°	4 – 3		622
	106	213.431	1.520 – 470.056	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}F°	3 – 2		622
	142	213.506	0.804 – 469.175	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}D°	2 – 1		622
	154	213.527	1.520 – 469.844	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}D°	3 – 4		622
	138	213.728	0.804 – 468.690	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}D°	2 – 3		622
	180	213.926	2.392 – 469.844	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}D°	4 – 4		622
	152	213.938	0.279 – 467.705	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}D°	1 – 2		622
	144	214.053	1.520 – 468.690	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}D°	3 – 3		622
	128	214.126	0.0 – 467.015	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{3}D°	0 – 1		622
	98	214.180	0.804 – 467.705	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}D°	2 – 2		622
	52	214.252	0.279 – 467.015	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{3}D°	1 – 1		622
	72	214.456	2.392 – 468.690	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}D°	4 – 3		622
	68	214.507	1.520 – 467.705	$3d^4 - 3d^3(a^4F)4p$	ga^{5}D – ^{5}D°	3 – 2		622
	148	215.767	32.877 – 496.340	$3d^4 - 3d^3(a^2G)4p$	a^{3}H – ^{3}G°	6 – 5		622
	146	216.074	32.286 – 495.087	$3d^4 - 3d^3(a^2G)4p$	a^{3}H – ^{3}G°	5 – 4		622
	120	216.417	31.672 – 493.743	$3d^4 - 3d^3(a^2G)4p$	a^{3}H – ^{3}G°	4 – 3		622
	86	216.562	34.576 – 496.340	$3d^4 - 3d^3(a^2G)4p$	a^{3}F – ^{3}G°	4 – 5		622
	96	217.029	34.317 – 495.087	$3d^4 - 3d^3(a^2G)4p$	a^{3}F – ^{3}G°	3 – 4		622
	110	217.151	34.576 – 495.087	$3d^4 - 3d^3(a^2G)4p$	a^{3}F – ^{3}G°	4 – 4		622

Ni VII — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	72	217.630	34.247 – 493.743	$3d^4 - 3d^3(a^2G)4p$	$a^3F - {}^3G^\circ$	2 – 3		622
	92	217.663	34.317 – 493.743	$3d^4 - 3d^3(a^2G)4p$	$a^3F - {}^3G^\circ$	3 – 3		622
	10	217.78	34.576 – 493.743	$3d^4 - 3d^3(a^2G)4p$	$a^3F - {}^3G^\circ$	4 – 3		548
	100	218.53	38.746 – 496.340	$3d^4 - 3d^3(a^2G)4p$	$a^3G - {}^3G^\circ$	4 – 5		548
	98	218.774	39.247 – 496.340	$3d^4 - 3d^3(a^2G)4p$	$a^3G - {}^3G^\circ$	5 – 5		622
	20	218.85	38.160 – 495.087	$3d^4 - 3d^3(a^2G)4p$	$a^3G - {}^3G^\circ$	3 – 4		548
	50	219.137	38.746 – 495.087	$3d^4 - 3d^3(a^2G)4p$	$a^3G - {}^3G^\circ$	4 – 4		622
	116	219.499	38.160 – 493.743	$3d^4 - 3d^3(a^2G)4p$	$a^3G - {}^3G^\circ$	3 – 3		622
	20	219.78	38.746 – 493.743	$3d^4 - 3d^3(a^2G)4p$	$a^3G - {}^3G^\circ$	4 – 3		548
	20	223.25	34.317 – 482.229	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3F^\circ$	3 – 4		548
	98	223.387	34.576 – 482.229	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3F^\circ$	4 – 4		622
	60	223.76	31.672 – 478.534	$3d^4 - 3d^3(a^4F)4p$	$a^3H - {}^3G^\circ$	4 – 5		548
	26	223.791	34.247 – 481.091	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3F^\circ$	2 – 3		622
	52	223.826	34.317 – 481.091	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3F^\circ$	3 – 3		622
	26	223.954	34.576 – 481.091	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3F^\circ$	4 – 3		622
	82	224.363	34.247 – 479.950	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3F^\circ$	2 – 2		622
	152	224.388	32.877 – 478.534	$3d^4 - 3d^3(a^4F)4p$	$a^3H - {}^3G^\circ$	6 – 5		622
	146	224.733	32.286 – 477.261	$3d^4 - 3d^3(a^4F)4p$	$a^3H - {}^3G^\circ$	5 – 4		622
	136	224.928	31.672 – 476.258	$3d^4 - 3d^3(a^4F)4p$	$a^3H - {}^3G^\circ$	4 – 3		622
	10	225.191	38.160 – 482.229	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3F^\circ$	3 – 4		622
	58	225.246	34.576 – 478.534	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3G^\circ$	4 – 5		622
	40	225.487	38.746 – 482.229	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3F^\circ$	4 – 4		622
	134	225.742	39.247 – 482.229	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3F^\circ$	5 – 4		622
	76	225.767	34.317 – 477.261	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3G^\circ$	3 – 4		622
	38	225.894	34.576 – 477.261	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3G^\circ$	4 – 4		622
	110	226.069	38.746 – 481.091	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3F^\circ$	4 – 3		622
	48	226.238	34.247 – 476.258	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3G^\circ$	2 – 3		622
	46	226.273	34.317 – 476.258	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3G^\circ$	3 – 3		622
	102	226.352	38.160 – 479.950	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3F^\circ$	3 – 2		622
	20	226.40	34.576 – 476.258	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3G^\circ$	4 – 3		548
	44	226.668	30.077 – 471.250	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^5F^\circ$	0 – 1		622
	102	227.200	31.836 – 471.976	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^3D^\circ$	1 – 2		622
	46	227.256	32.877 – 472.907	$3d^4 - 3d^3(a^4F)4p$	$a^3H - {}^5F^\circ$	6 – 5		622
	80	227.377	38.746 – 478.534	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3G^\circ$	4 – 5		622
	90	227.581	31.836 – 471.250	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^5F^\circ$	1 – 1		622
	126	227.642	39.247 – 478.534	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3G^\circ$	5 – 5		622
	50	227.738	38.160 – 477.261	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3G^\circ$	3 – 4		622
	130	227.893	34.555 – 473.360	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^3D^\circ$	2 – 3		622
	116	227.907	34.576 – 473.360	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3D^\circ$	4 – 3		622
	102	228.043	38.746 – 477.261	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3G^\circ$	4 – 4		622
	68	228.262	38.160 – 476.258	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3G^\circ$	3 – 3		622
	10	228.30	39.247 – 477.261	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3G^\circ$	5 – 4		548
	72	228.489	34.317 – 471.976	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3D^\circ$	3 – 2		622
	100	228.54	38.746 – 476.258	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^3G^\circ$	4 – 3		548
	34	228.613	34.555 – 471.976	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^3D^\circ$	2 – 2		622
	34	228.831	34.247 – 471.250	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^5F^\circ$	2 – 1		622
	26	228.865	30.077 – 467.015	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^3D^\circ$	0 – 1		622
	20	228.93	34.247 – 471.096	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^5F^\circ$	2 – 3		548
	30	229.427	31.836 – 467.705	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^5D^\circ$	1 – 2		622
	24	229.795	31.836 – 467.015	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^3D^\circ$	1 – 1		622
	28	230.342	34.555 – 468.690	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^5D^\circ$	2 – 3		622
	18	230.598	39.247 – 472.907	$3d^4 - 3d^3(a^4F)4p$	$a^3G - {}^5F^\circ$	5 – 5		622
	20	230.739	34.317 – 467.705	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^5D^\circ$	3 – 2		622
	16	230.866	34.555 – 467.705	$3d^4 - 3d^3(a^4F)4p$	$a^3P - {}^5D^\circ$	2 – 2		622

NI VII — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	168	231.071	34.247 – 467.015	$3d^4 - 3d^3(a^4F)4p$	$a^3F - {}^3D^\circ$	2 – 1		622

NICKEL VIII (Ni^{7+}), Z = 28
Ground State $1s^22s^22p^63s^23p^63d^3(^4F_{3/2})$ (21 electrons)
Ionization Potential [1 310 000] cm^{-1}; [162] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	80	167.07	0.0 – 598.570	$3d^3 - 3d^2(^3P)4p$	$ga^4F - {}^4P^\circ$	$\frac{3}{2} - \frac{5}{2}$		003
	20	167.35	1.012 – 598.638	$3d^3 - 3d^2(^1G)4p$	$ga^4F - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		003
	10	167.66	2.184 – 598.638	$3d^3 - 3d^2(^1G)4p$	$ga^4F - {}^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		003
	40	167.97	3.721 – 599.079	$3d^3 - 3d^2(^1G)4p$	$ga^4F - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		003
	20	168.08	3.721 – 598.638	$3d^3 - 3d^2(^1G)4p$	$ga^4F - {}^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$		003
	10	168.33	0.0 – 594.068	$3d^3 - 3d^2(^3P)4p$	$ga^4F - {}^4D^\circ$	$\frac{3}{2} - \frac{5}{2}$		003
	150	168.58	3.721 – 596.908	$3d^3 - 3d^2(^3P)4p$	$ga^4F - {}^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		003
	10	168.62	1.012 – 594.068	$3d^3 - 3d^2(^3P)4p$	$ga^4F - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		003
	40	168.87	0.0 – 592.175	$3d^3 - 3d^2(^3P)4p$	$ga^4F - {}^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		003
	20	168.95	2.184 – 594.068	$3d^3 - 3d^2(^3P)4p$	$ga^4F - {}^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		003
	400	169.16	1.012 – 592.175	$3d^3 - 3d^2(^3P)4p$	$ga^4F - {}^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		003
	40	169.27	0.0 – 590.764	$3d^3 - 3d^2(^3P)4p$	$ga^4F - {}^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$		003
	80	170.17	28.068 – 615.725	$3d^3 - 3d^2(^1G)4p$	$a^2G - {}^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		003
	20	170.27	0.0 – 587.305	$3d^3 - 3d^2(^3P)4p$	$ga^4F - {}^4S^\circ$	$\frac{3}{2} - \frac{3}{2}$		003
	250	170.52	26.977 – 613.417	$3d^3 - 3d^2(^1G)4p$	$a^2G - {}^2H^\circ$	$\frac{7}{2} - \frac{9}{2}$		003
	10	170.84	28.068 – 613.417	$3d^3 - 3d^2(^1G)4p$	$a^2G - {}^2H^\circ$	$\frac{9}{2} - \frac{9}{2}$		003
	40	172.10	2.184 – 583.241	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		003
	20	172.32	1.012 – 581.337	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		003
	40	172.67	2.184 – 581.337	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		003
	20	172.93	37.475 – 615.725	$3d^3 - 3d^2(^1G)4p$	$a^2H - {}^2H^\circ$	$\frac{11}{2} - \frac{11}{2}$		003
	750	173.41	36.754 – 613.417	$3d^3 - 3d^2(^1G)4p$	$a^2H - {}^2H^\circ$	$\frac{9}{2} - \frac{9}{2}$		003
	40	173.95	23.710 – 598.570	$3d^3 - 3d^2(^3P)4p$	$a^4P - {}^4P^\circ$	$\frac{3}{2} - \frac{5}{2}$		003
	10	174.22	24.669 – 598.638	$3d^3 - 3d^2(^1G)4p$	$a^4P - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		003
	750	174.24	24.669 – 598.570	$3d^3 - 3d^2(^3P)4p$	$a^4P - {}^4P^\circ$	$\frac{5}{2} - \frac{5}{2}$		003
	400	174.36	23.261 – 596.770	$3d^3 - 3d^2(^3P)4p$	$a^4P - {}^4P^\circ$	$\frac{1}{2} - \frac{1}{2}$		003
	250	174.46	23.710 – 596.905	$3d^3 - 3d^2(^3P)4p$	$a^4P - {}^4P^\circ$	$\frac{3}{2} - \frac{3}{2}$		003
	10	174.50	23.710 – 596.770	$3d^3 - 3d^2(^3P)4p$	$a^4P - {}^4P^\circ$	$\frac{3}{2} - \frac{1}{2}$		003
	40	174.75	24.669 – 596.908	$3d^3 - 3d^2(^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		003
	150	174.79	26.977 – 599.079	$3d^3 - 3d^2(^1G)4p$	$a^2G - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		003
	80	174.88	0.0 – 571.845	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		003
	750	174.92	26.977 – 598.638	$3d^3 - 3d^2(^1G)4p$	$a^2G - {}^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		003
	40	174.95	0.0 – 571.517	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4D^\circ$	$\frac{3}{2} - \frac{5}{2}$		003
	400	175.13	28.068 – 599.079	$3d^3 - 3d^2(^1G)4p$	$a^2G - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		003
	40	175.26	28.068 – 598.638	$3d^3 - 3d^2(^1G)4p$	$a^2G - {}^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$		003
	40	175.28	1.012 – 571.517	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		003
	400	175.32	0.0 – 570.353	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$		003
	20	175.49	0.0 – 569.839	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		003
	40	175.54	2.184 – 571.845	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^2D^\circ$	$\frac{7}{2} - \frac{5}{2}$		003
	750	175.56	3.721 – 573.327	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		003
	20	175.62	24.669 – 594.068	$3d^3 - 3d^2(^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		003
	400	175.64	2.184 – 571.517	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4D^\circ$	$\frac{7}{2} - \frac{5}{2}$		003
	400	175.67	3.721 – 572.969	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		003

Ni VIII — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1000	175.80	1.012 – 569.839	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		003
	1000	175.82	2.184 – 570.960	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		003
	40	175.91	23.710 – 592.175	$3d^3 - 3d^2(^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2} - \frac{3}{2}$		003
	750	175.94	2.184 – 570.546	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^2F^\circ$	$\frac{7}{2} - \frac{5}{2}$		003
	400	176.03	3.721 – 571.804	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^2F^\circ$	$\frac{9}{2} - \frac{7}{2}$		003
	250	176.13	1.012 – 568.746	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		003
	10	176.21	23.261 – 590.764	$3d^3 - 3d^2(^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{1}{2} - \frac{1}{2}$		003
	80	176.25	2.184 – 569.564	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4G^\circ$	$\frac{7}{2} - \frac{9}{2}$		003
	250	176.29	3.721 – 570.960	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{9}{2} - \frac{9}{2}$		003
	20	176.35	23.710 – 590.764	$3d^3 - 3d^2(^3P)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$		003
	40	176.42	0.0 – 566.831	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{3}{2} - \frac{5}{2}$		003
	150	176.50	2.184 – 568.746	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{7}{2}$		003
	80	176.69	1.012 – 566.964	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4G^\circ$	$\frac{5}{2} - \frac{7}{2}$		003
	250	176.74	1.012 – 566.831	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{5}{2} - \frac{5}{2}$		003
	750	176.87	0.0 – 565.388	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{3}{2} - \frac{3}{2}$		003
	250	176.95	0.0 – 565.124	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4G^\circ$	$\frac{3}{2} - \frac{5}{2}$		003
	40	176.98	3.721 – 568.746	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{9}{2} - \frac{7}{2}$		003
	10	177.10	2.184 – 566.831	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{7}{2} - \frac{5}{2}$		003
	400	177.19	1.012 – 565.388	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4F^\circ$	$\frac{5}{2} - \frac{3}{2}$		003
	80	177.29	23.261 – 587.305	$3d^3 - 3d^2(^3P)4p$	$a^4P - {}^4S^\circ$	$\frac{1}{2} - \frac{3}{2}$		003
	40	177.32	34.689 – 598.638	$3d^3 - 3d^2(^1G)4p$	$a^2D - {}^2G^\circ$	$\frac{5}{2} - \frac{7}{2}$		003
	80	177.43	23.710 – 587.305	$3d^3 - 3d^2(^3P)4p$	$a^4P - {}^4S^\circ$	$\frac{3}{2} - \frac{3}{2}$		003
	10	177.63	2.184 – 565.124	$3d^3 - 3d^2(^3F)4p$	$ga^4F - {}^4G^\circ$	$\frac{7}{2} - \frac{5}{2}$		003
	40	177.73	24.669 – 587.305	$3d^3 - 3d^2(^3P)4p$	$a^4P - {}^4S^\circ$	$\frac{5}{2} - \frac{3}{2}$		003
	10	177.83	36.754 – 599.079	$3d^3 - 3d^2(^1G)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		003
	10	177.87	34.689 – 596.905	$3d^3 - 3d^2(^3P)4p$	$a^2D - {}^4P^\circ$	$\frac{5}{2} - \frac{3}{2}$		003
	20	177.97	36.754 – 598.638	$3d^3 - 3d^2(^1G)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$		003
	20	178.06	37.475 – 599.079	$3d^3 - 3d^2(^1G)4p$	$a^2H - {}^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		003
	80	178.52	36.754 – 596.908	$3d^3 - 3d^2(^3P)4p$	$a^2H - {}^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		003
	400	178.77	34.689 – 594.068	$3d^3 - 3d^2(^3P)4p$	$a^2D - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		003
	250	178.91	35.120 – 594.068	$3d^3 - 3d^2(^3P)4p$	$a^2D - {}^4D^\circ$	$\frac{3}{2} - \frac{5}{2}$		003
	40	179.77	26.977 – 583.241	$3d^3 - 3d^2(^3F)4p$	$a^2G - {}^2G^\circ$	$\frac{7}{2} - \frac{9}{2}$		003
	550	179.97	35.120 – 590.764	$3d^3 - 3d^2(^3P)4p$	$a^2D - {}^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$		003
	250	180.12	28.068 – 583.241	$3d^3 - 3d^2(^3F)4p$	$a^2G - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		003
	250	180.39	26.977 – 581.337	$3d^3 - 3d^2(^3F)4p$	$a^2G - {}^2G^\circ$	$\frac{7}{2} - \frac{7}{2}$		003
	40	180.74	28.068 – 581.337	$3d^3 - 3d^2(^3F)4p$	$a^2G - {}^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$		003
	40	181.10	35.120 – 587.305	$3d^3 - 3d^2(^3P)4p$	$a^2D - {}^4S^\circ$	$\frac{3}{2} - \frac{3}{2}$		003
	20	182.27	24.669 – 573.327	$3d^3 - 3d^2(^3F)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		003
	400	182.44	23.710 – 571.845	$3d^3 - 3d^2(^3F)4p$	$a^4P - {}^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		003
	40	182.55	23.710 – 571.517	$3d^3 - 3d^2(^3F)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2} - \frac{5}{2}$		003
	20	182.76	24.669 – 571.845	$3d^3 - 3d^2(^3F)4p$	$a^4P - {}^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		003
	20	182.79	23.261 – 570.353	$3d^3 - 3d^2(^3F)4p$	$a^4P - {}^4D^\circ$	$\frac{1}{2} - \frac{1}{2}$		003
	80	182.87	24.669 – 571.517	$3d^3 - 3d^2(^3F)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		003
	40	182.94	23.710 – 570.353	$3d^3 - 3d^2(^3F)4p$	$a^4P - {}^4D^\circ$	$\frac{3}{2} - \frac{1}{2}$		003
	80	182.96	23.261 – 569.839	$3d^3 - 3d^2(^3F)4p$	$a^4P - {}^4D^\circ$	$\frac{1}{2} - \frac{3}{2}$		003
	40	182.99	36.754 – 583.241	$3d^3 - 3d^2(^3F)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2} - \frac{9}{2}$		003
	40	183.02	23.261 – 569.667	$3d^3 - 3d^2(^3F)4p$	$a^4P - {}^2D^\circ$	$\frac{1}{2} - \frac{3}{2}$		003
	10	183.16	23.710 – 569.667	$3d^3 - 3d^2(^3F)4p$	$a^4P - {}^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		003
	10	183.23	37.475 – 583.241	$3d^3 - 3d^2(^3F)4p$	$a^2H - {}^2G^\circ$	$\frac{11}{2} - \frac{9}{2}$		003
	20	183.39	28.068 – 573.327	$3d^3 - 3d^2(^3F)4p$	$a^2G - {}^4D^\circ$	$\frac{9}{2} - \frac{7}{2}$		003
	40	183.44	24.669 – 569.839	$3d^3 - 3d^2(^3F)4p$	$a^4P - {}^4D^\circ$	$\frac{5}{2} - \frac{3}{2}$		003
	150	183.51	28.068 – 572.969	$3d^3 - 3d^2(^3F)4p$	$a^2G - {}^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		003
	10	183.63	36.754 – 581.337	$3d^3 - 3d^2(^3F)4p$	$a^2H - {}^2G^\circ$	$\frac{9}{2} - \frac{7}{2}$		003
	40	183.80	24.669 – 568.746	$3d^3 - 3d^2(^3F)4p$	$a^4P - {}^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		003

Ni VIII — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	900	183.83	26.977 – 570.960	$3d^3 - 3d^2(^3F)4p$	$a^2G - {}^4F°$	$\frac{7}{2} - \frac{9}{2}$		003
	80	183.91	28.068 – 571.804	$3d^3 - 3d^2(^3F)4p$	$a^2G - {}^2F°$	$\frac{9}{2} - \frac{7}{2}$		003
	20	183.97	26.977 – 570.546	$3d^3 - 3d^2(^3F)4p$	$a^2G - {}^2F°$	$\frac{7}{2} - \frac{5}{2}$		003
	900	184.12	23.710 – 566.831	$3d^3 - 3d^2(^3F)4p$	$a^4P - {}^4F°$	$\frac{3}{2} - \frac{5}{2}$		003
	10	184.20	28.068 – 570.960	$3d^3 - 3d^2(^3F)4p$	$a^2G - {}^4F°$	$\frac{9}{2} - \frac{9}{2}$		003
	10	184.40	24.669 – 566.964	$3d^3 - 3d^2(^3F)4p$	$a^4P - {}^4G°$	$\frac{5}{2} - \frac{7}{2}$		003
	550	184.44	24.669 – 566.831	$3d^3 - 3d^2(^3F)4p$	$a^4P - {}^4F°$	$\frac{5}{2} - \frac{5}{2}$		003
	10	184.58	26.977 – 568.746	$3d^3 - 3d^2(^3F)4p$	$a^2G - {}^4F°$	$\frac{7}{2} - \frac{7}{2}$		003
	10	184.62	23.710 – 565.388	$3d^3 - 3d^2(^3F)4p$	$a^4P - {}^4F°$	$\frac{3}{2} - \frac{3}{2}$		003
	40	184.68	28.068 – 569.564	$3d^3 - 3d^2(^3F)4p$	$a^2G - {}^4G°$	$\frac{9}{2} - \frac{9}{2}$		003
	40	184.95	28.068 – 568.746	$3d^3 - 3d^2(^3F)4p$	$a^2G - {}^4F°$	$\frac{9}{2} - \frac{7}{2}$		003
	20	185.18	26.977 – 566.964	$3d^3 - 3d^2(^3F)4p$	$a^2G - {}^4G°$	$\frac{7}{2} - \frac{7}{2}$		003
	10	185.23	26.977 – 566.831	$3d^3 - 3d^2(^3F)4p$	$a^2G - {}^4F°$	$\frac{7}{2} - \frac{5}{2}$		003
	80	185.65	34.689 – 573.327	$3d^3 - 3d^2(^3F)4p$	$a^2D - {}^4D°$	$\frac{5}{2} - \frac{7}{2}$		003
	10	185.82	26.977 – 565.124	$3d^3 - 3d^2(^3F)4p$	$a^2G - {}^4G°$	$\frac{7}{2} - \frac{5}{2}$		003
	10	186.16	34.689 – 571.845	$3d^3 - 3d^2(^3F)4p$	$a^2D - {}^2D°$	$\frac{5}{2} - \frac{5}{2}$		003
	80	186.18	34.689 – 571.804	$3d^3 - 3d^2(^3F)4p$	$a^2D - {}^2F°$	$\frac{5}{2} - \frac{7}{2}$		003
	10	186.31	35.120 – 571.845	$3d^3 - 3d^2(^3F)4p$	$a^2D - {}^2D°$	$\frac{3}{2} - \frac{5}{2}$		003
	250	186.49	36.754 – 572.969	$3d^3 - 3d^2(^3F)4p$	$a^2H - {}^4G°$	$\frac{9}{2} - \frac{11}{2}$		003
	10	186.76	35.120 – 570.546	$3d^3 - 3d^2(^3F)4p$	$a^2D - {}^2F°$	$\frac{3}{2} - \frac{5}{2}$		003
	10	186.86	34.689 – 569.839	$3d^3 - 3d^2(^3F)4p$	$a^2D - {}^4D°$	$\frac{5}{2} - \frac{3}{2}$		003
	40	186.93	34.689 – 569.667	$3d^3 - 3d^2(^3F)4p$	$a^2D - {}^2D°$	$\frac{5}{2} - \frac{3}{2}$		003
	10	187.08	35.120 – 569.667	$3d^3 - 3d^2(^3F)4p$	$a^2D - {}^2D°$	$\frac{3}{2} - \frac{3}{2}$		003
	20	187.20	36.754 – 570.960	$3d^3 - 3d^2(^3F)4p$	$a^2H - {}^4F°$	$\frac{9}{2} - \frac{9}{2}$		003
	10	187.23	34.689 – 568.746	$3d^3 - 3d^2(^3F)4p$	$a^2D - {}^4F°$	$\frac{5}{2} - \frac{7}{2}$		003
	10	187.87	34.689 – 566.964	$3d^3 - 3d^2(^3F)4p$	$a^2D - {}^4G°$	$\frac{5}{2} - \frac{7}{2}$		003
	20	188.06	35.120 – 566.831	$3d^3 - 3d^2(^3F)4p$	$a^2D - {}^4F°$	$\frac{3}{2} - \frac{5}{2}$		003
	150	188.58	35.120 – 565.388	$3d^3 - 3d^2(^3F)4p$	$a^2D - {}^4F°$	$\frac{3}{2} - \frac{3}{2}$		003

NICKEL IX (Ni^{8+}), Z = 28
Ground State $1s^22s^22p^63s^23p^63d^2(^3F_2)$ (20 electrons)
Ionization Potential [1 560 000] cm^{-1}; [193] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	80	101.657	0.0 – 983.704	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$g^3F - {}^3G°$	2 – 3		207
	80	101.701	1.880 – 985.144	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$g^3F - {}^3G°$	3 – 4		207
	100	101.846	4.070 – 985.944	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$g^3F - {}^3G°$	4 – 5		207
	20	101.932	4.070 – 985.144	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$g^3F - {}^3G°$	4 – 4		207
	10	102.283	0.0 – 977.68	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$g^3F - {}^3F°$	2 – 3		207
	60	102.340	0.0 – 977.13	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$g^3F - {}^3F°$	2 – 2		207
	1	102.364	1.880 – 978.74	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$g^3F - {}^3F°$	3 – 4		207
	60	102.480	1.880 – 977.68	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$g^3F - {}^3F°$	3 – 3		207
	1	102.539	1.880 – 977.13	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$g^3F - {}^3F°$	3 – 2		207
	100	102.602	4.070 – 978.74	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$g^3F - {}^3F°$	4 – 4		207
	1	102.710	4.070 – 977.68	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$g^3F - {}^3F°$	4 – 3		207
	40	103.428	21.900+X – 988.76+X	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$^1D - {}^3D°$	2 – 3		207
	80	103.620	21.900+X – 986.96+X	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$^1D - {}^1F°$	2 – 3		207
	60	103.871	21.900+X – 984.63+X	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$^1D - {}^1D°$	2 – 2		207
	1	103.926	17.80+R – 980.02+R	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$^3P - {}^3D°$	0 – 1		207
	100	103.981	22.00+K – 983.71+K	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$^3P - {}^3D°$	1 – 2		207
	100	103.993	27.160+X – 988.76+X	$3p^6(^1S)3d^2 - 3p^6(^1S)3d4f$	$^3P - {}^3D°$	2 – 3		207
	10	140.542	0.0 – 711.52	$3p^6(^1S)3d^2 - 3p^5(^2P°)3d^3(^4F)$	$g^3F - {}^3D°$	2 – 2		1056

Ni IX — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	85	140.917	1.880 – 711.52	$3p^6(^1S)3d^2 - 3p^5(^2P^\circ)3d^3(^4F)$	$g^3F - ^3D^\circ$	3 – 2		1056
	50	141.002	0.0 – 709.21	$3p^6(^1S)3d^2 - 3p^5(^2P^\circ)3d^3(^4F)$	$g^3F - ^3D^\circ$	2 – 1		1056
	120	141.356	4.070 – 711.51	$3p^6(^1S)3d^2 - 3p^5(^2P^\circ)3d^3(^4F)$	$g^3F - ^3D^\circ$	4 – 3		1056
	85	147.013	35.898+C – 716.11+C	$3p^6(^1S)3d^2 - 3p^5(^2P^\circ)3d^3(^2H)$	$^1G - ^1G^\circ$	4 – 4		1056
	10	150.32	1.880 – 667.08	$3p^6(^1S)3d^2 - 3p^5(^2P^\circ)3d^3(^4F)$	$g^3F - ^3F^\circ$	3 – 4		1056
	10	150.574	0.0 – 664.08	$3p^6(^1S)3d^2 - 3p^5(^2P^\circ)3d^3(^4F)$	$g^3F - ^3F^\circ$	2 – 3		1056
	85	150.836	4.070 – 667.08	$3p^6(^1S)3d^2 - 3p^5(^2P^\circ)3d^3(^4F)$	$g^3F - ^3F^\circ$	4 – 4		1056
	85	151.022	1.880 – 664.08	$3p^6(^1S)3d^2 - 3p^5(^2P^\circ)3d^3(^4F)$	$g^3F - ^3F^\circ$	3 – 3		1056
	50	151.281	0.0 – 661.05	$3p^6(^1S)3d^2 - 3p^5(^2P^\circ)3d^3(^4F)$	$g^3F - ^3F^\circ$	2 – 2		1056
	10	151.700	1.880 – 661.05	$3p^6(^1S)3d^2 - 3p^5(^2P^\circ)3d^3(^4F)$	$g^3F - ^3F^\circ$	3 – 2		1056
	150	165.436	4.070 – 608.53	$3p^6(^1S)3d^2 - 3p^5(^2P^\circ)3d^3(^2H)$	$g^3F - ^3G^\circ$	4 – 5		1056
	85	166.079	1.880 – 604.00	$3p^6(^1S)3d^2 - 3p^5(^2P^\circ)3d^3(^2H)$	$g^3F - ^3G^\circ$	3 – 4		1056
	85	166.306	0.0 – 601.30	$3p^6(^1S)3d^2 - 3p^5(^2P^\circ)3d^3(^2H)$	$g^3F - ^3G^\circ$	2 – 3		1056
		1769.	21.900+X – 78.43+W	$3p^6(^1S)3d^2 - 3p^6(^1S)3d^2$	$^1D - ^1S$	2 – 0	F,P	375,1051
		1772.	22.00+K – 78.43+W	$3p^6(^1S)3d^2 - 3p^6(^1S)3d^2$	$^3P - ^1S$	1 – 0	F,P	375,1051
		1950.	27.160+X – 78.43+W	$3p^6(^1S)3d^2 - 3p^6(^1S)3d^2$	$^3P - ^1S$	2 – 0	F,P	375,1051

NICKEL X (Ni^{9+}), Z = 28
Ground State $1s^22s^22p^63s^23p^63d(^2D_{3/2})$ (19 electrons)
Ionization Potential [1 812 000] cm^{-1}; [224.6] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	1	61.809	0.0 – 1617.89	$3p^6(^1S)3d - 3p^6(^1S)7f$	$g^2D - ^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		207
	1	61.915	3.178 – 1618.31	$3p^6(^1S)3d - 3p^6(^1S)7f$	$g^2D - ^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		207
	10	66.542	0.0 – 1502.81	$3p^6(^1S)3d - 3p^6(^1S)6f$	$g^2D - ^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		207
	10	66.687	3.178 – 1502.72	$3p^6(^1S)3d - 3p^6(^1S)6f$	$g^2D - ^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		207
	20	74.097	0.0 – 1349.58	$3p^6(^1S)3d - 3p^6(^1S)5f$	$g^2D - ^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		207
	30	74.266	3.178 – 1349.69	$3p^6(^1S)3d - 3p^6(^1S)5f$	$g^2D - ^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		207
	2	82.892	0.0 – 1206.41	$3p^6(^1S)3d - 3p^53d(^1D^\circ)4s$	$g^2D - ^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		315
	25	83.108	3.178 – 1206.41	$3p^6(^1S)3d - 3p^53d(^1D^\circ)4s$	$g^2D - ^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		315
	2	83.326	3.178 – 1203.27	$3p^6(^1S)3d - 3p^53d(^1D^\circ)4s$	$g^2D - ^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		315
	10	83.676	3.178 – 1198.26	$3p^6(^1S)3d - 3p^53d(^1F^\circ)4s$	$g^2D - ^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		315
	2	84.194	0.0 – 1187.75	$3p^6(^1S)3d - 3p^53d(^3D^\circ)4s$	$g^2D - ^4D^\circ$	$\frac{3}{2} - \frac{5}{2}$		315
	5	84.418	3.178 – 1187.75	$3p^6(^1S)3d - 3p^53d(^3D^\circ)4s$	$g^2D - ^4D^\circ$	$\frac{5}{2} - \frac{5}{2}$		315
	5	84.659	3.178 – 1184.39	$3p^6(^1S)3d - 3p^53d(^3D^\circ)4s$	$g^2D - ^4D^\circ$	$\frac{5}{2} - \frac{7}{2}$		315
	25	85.523	0.0 – 1169.30	$3p^6(^1S)3d - 3p^53d(^3F^\circ)4s$	$g^2D - ^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		315
	5	85.753	3.178 – 1169.30	$3p^6(^1S)3d - 3p^53d(^3F^\circ)4s$	$g^2D - ^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		315
	60	86.300	3.178 – 1161.93	$3p^6(^1S)3d - 3p^53d(^3F^\circ)4s$	$g^2D - ^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		315
	5	86.464	0.0 – 1156.55	$3p^6(^1S)3d - 3p^53d(^3F^\circ)4s$	$g^2D - ^4F^\circ$	$\frac{3}{2} - \frac{5}{2}$		315
	2	86.865	3.178 – 1154.39	$3p^6(^1S)3d - 3p^53d(^3F^\circ)4s$	$g^2D - ^4F^\circ$	$\frac{5}{2} - \frac{7}{2}$		315
	1	87.077	0.0 – 1148.42	$3p^6(^1S)3d - 3p^53d(^3P^\circ)4s$	$g^2D - ^2P^\circ$	$\frac{3}{2} - \frac{3}{2}$		315
	25	87.317	3.178 – 1148.42	$3p^6(^1S)3d - 3p^53d(^3P^\circ)4s$	$g^2D - ^2P^\circ$	$\frac{5}{2} - \frac{3}{2}$		315
	15	87.680	0.0 – 1140.51	$3p^6(^1S)3d - 3p^53d(^3P^\circ)4s$	$g^2D - ^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		315
	40	91.527	0.0 – 1092.57	$3p^6(^1S)3d - 3p^6(^1S)4f$	$g^2D - ^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		207
	60	91.790	3.178 – 1092.62	$3p^6(^1S)3d - 3p^6(^1S)4f$	$g^2D - ^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		207
	10	128.273	0.0 – 779.600	$3p^6(^1S)3d - 3p^6(^1S)4p$	$g^2D - ^2P^\circ$	$\frac{3}{2} - \frac{3}{2}$		1085
	120	128.796	3.178 – 779.600	$3p^6(^1S)3d - 3p^6(^1S)4p$	$g^2D - ^2P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1085
	70	129.258	0.0 – 773.647	$3p^6(^1S)3d - 3p^6(^1S)4p$	$g^2D - ^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1085
	400	144.216	0.0 – 693.404	$3p^6(^1S)3d - 3p^5(^2P^\circ)3d^2(^3F)$	$g^2D - ^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$		1085
	100	144.323	0.0 – 692.890	$3p^6(^1S)3d - 3p^5(^2P^\circ)3d^2(^3F)$	$g^2D - ^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$		1085
	80	144.880	3.178 – 693.404	$3p^6(^1S)3d - 3p^5(^2P^\circ)3d^2(^3F)$	$g^2D - ^2D^\circ$	$\frac{5}{2} - \frac{3}{2}$		1085
	500	144.988	3.178 – 692.890	$3p^6(^1S)3d - 3p^5(^2P^\circ)3d^2(^3F)$	$g^2D - ^2D^\circ$	$\frac{5}{2} - \frac{5}{2}$		1085

Ni X — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	100	145.061	0.0 – 689.365	$3p^6(^1S)3d - 3p^5(^2P^\circ)3d^2(^3P)$	$g^2D - {}^2P^\circ$	$\frac{3}{2} - \frac{3}{2}$		1085
	400	145.733	3.178 – 689.365	$3p^6(^1S)3d - 3p^5(^2P^\circ)3d^2(^3P)$	$g^2D - {}^2P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1085
	250	146.081	0.0 – 684.552	$3p^6(^1S)3d - 3p^5(^2P^\circ)3d^2(^3P)$	$g^2D - {}^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1085
	600	158.377	3.178 – 634.583	$3p^6(^1S)3d - 3p^5(^2P^\circ)3d^2(^3F)$	$g^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1085
	600	159.977	0.0 – 625.091	$3p^6(^1S)3d - 3p^5(^2P^\circ)3d^2(^3F)$	$g^2D - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1085
	40	160.794	3.178 – 625.091	$3p^6(^1S)3d - 3p^5(^2P^\circ)3d^2(^3F)$	$g^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{5}{2}$		1085
	150	184.937	0.0 – 540.725	$3p^6(^1S)3d - 3p^5(^2P^\circ)3d^2(^1D)$	$g^2D - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1085
	250	192.599	3.178 – 522.391	$3p^6(^1S)3d - 3p^5(^2P^\circ)3d^2(^1D)$	$g^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1085
	170	197.405	3.178 – 509.751	$3p^6(^1S)3d - 3p^5(^2P^\circ)3d^2(^1G)$	$g^2D - {}^2F^\circ$	$\frac{5}{2} - \frac{7}{2}$		1085
	150	197.909	0.0 – 505.283	$3p^6(^1S)3d - 3p^5(^2P^\circ)3d^2(^1G)$	$g^2D - {}^2F^\circ$	$\frac{3}{2} - \frac{5}{2}$		1085

NICKEL XI (Ni^{10+}), Z = 28
Ground State $1s^22s^22p^63s^23p^6(^1S_0)$ (18 electrons)
Ionization Potential [2 589 000] cm^{-1}; [321.0] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	20	62.730	0.0 – 1594.13	$3s^23p^6 - 3s^23p^54d$	$g^1S - (\frac{1}{2},\frac{3}{2})^\circ$	0 – 1		207
	40	63.641	0.0 – 1571.31	$3s^23p^6 - 3s^23p^54d$	$g^1S - (\frac{3}{2},\frac{5}{2})^\circ$	0 – 1		207
	80	77.393	0.0 – 1292.11	$3s^23p^6 - 3s^23p^5(^2P^\circ_{1/2})4s$	$g^1S - \frac{1}{2}[\frac{1}{2}]^\circ$	0 – 1		207
	60	78.744	0.0 – 1269.94	$3s^23p^6 - 3s^23p^5(^2P^\circ_{3/2})4s$	$g^1S - \frac{3}{2}[\frac{3}{2}]^\circ$	0 – 1		207
	30	81.138	469.31 – 1701.8	$3s^23p^53d - 3s^23p^5(^2P^\circ_{3/2})4f$	$^3P^\circ - \frac{3}{2}[\frac{3}{2}]$	0 – 1		729
	50	81.213	472.95 – 1704.3	$3s^23p^53d - 3s^23p^5(^2P^\circ_{3/2})4f$	$^3P^\circ - \frac{3}{2}[\frac{3}{2}]$	1 – 2		729
	40	81.378	472.95 – 1701.8	$3s^23p^53d - 3s^23p^5(^2P^\circ_{3/2})4f$	$^3P^\circ - \frac{3}{2}[\frac{3}{2}]$	1 – 1		729
	70	81.468	480.77 – 1708.3	$3s^23p^53d - 3s^23p^5(^2P^\circ_{3/2})4f$	$^3P^\circ - \frac{3}{2}[\frac{5}{2}]$	2 – 3		729
	50	81.732	480.77 – 1704.3	$3s^23p^53d - 3s^23p^5(^2P^\circ_{3/2})4f$	$^3P^\circ - \frac{3}{2}[\frac{3}{2}]$	2 – 2		729
	100	82.417	493.06 – 1706.4	$3s^23p^53d - 3s^23p^5(^2P^\circ_{3/2})4f$	$^3F^\circ - \frac{3}{2}[\frac{9}{2}]$	4 – 5		729
	70	82.530	496.95 – 1708.6	$3s^23p^53d - 3s^23p^5(^2P^\circ_{3/2})4f$	$^3F^\circ - \frac{3}{2}[\frac{9}{2}]$	3 – 4		729
	60	82.625	500.0+S – 1710.3+S	$3s^23p^53d - 3s^23p^5(^2P^\circ_{3/2})4f$	$^3F^\circ - \frac{3}{2}[\frac{7}{2}]$	2 – 3		729
	10	83.02	534.81 – 1739.4	$3s^23p^53d - 3s^23p^5(^2P^\circ_{1/2})4f$	$^3D^\circ - \frac{1}{2}[\frac{5}{2}]$	1 – 2		729
	60	83.139	530.05 – 1732.9	$3s^23p^53d - 3s^23p^5(^2P^\circ_{1/2})4f$	$^1D^\circ - \frac{1}{2}[\frac{5}{2}]$	2 – 3		729
	40	83.546	539.07 – 1736.0	$3s^23p^53d - 3s^23p^5(^2P^\circ_{1/2})4f$	$^3D^\circ - \frac{1}{2}[\frac{7}{2}]$	2 – 3		729
	60	83.798	543.04 – 1736.4	$3s^23p^53d - 3s^23p^5(^2P^\circ_{1/2})4f$	$^1F^\circ - \frac{1}{2}[\frac{7}{2}]$	3 – 4		729
	70	84.092	527.22 – 1716.4	$3s^23p^53d - 3s^23p^5(^2P^\circ_{3/2})4f$	$^3D^\circ - \frac{3}{2}[\frac{7}{2}]$	3 – 4		729
	10	85.226	543.04 – 1716.4	$3s^23p^53d - 3s^23p^5(^2P^\circ_{3/2})4f$	$^1F^\circ - \frac{3}{2}[\frac{7}{2}]$	3 – 4		729
	20	85.798	543.04 – 1708.6	$3s^23p^53d - 3s^23p^5(^2P^\circ_{3/2})4f$	$^1F^\circ - \frac{3}{2}[\frac{9}{2}]$	3 – 4	Q	729
	10	93.85	673.85 – 1739.4	$3s^23p^53d - 3s^23p^5(^2P^\circ_{1/2})4f$	$^1P^\circ - \frac{1}{2}[\frac{5}{2}]$	1 – 2		729
	100	148.402	0.0 – 673.85	$3s^23p^6 - 3s^23p^53d$	$g^1S - {}^1P^\circ$	0 – 1		207
		497.8	472.95 – 673.85	$3s^23p^53d - 3s^23p^53d$	$^3P^\circ - {}^1P^\circ$	1 – 1	F,P	375,1108
		517.9	480.77 – 673.85	$3s^23p^53d - 3s^23p^53d$	$^3P^\circ - {}^1P^\circ$	2 – 1	F,P	375,1108
		1427.	472.95 – 543.04	$3s^23p^53d - 3s^23p^53d$	$^3P^\circ - {}^1F^\circ$	1 – 3	F,P	375,1108
		1433.	469.31 – 539.07	$3s^23p^53d - 3s^23p^53d$	$^3P^\circ - {}^3D^\circ$	0 – 2	F,P	375,1108
		1512.	472.95 – 539.07	$3s^23p^53d - 3s^23p^53d$	$^3P^\circ - {}^3D^\circ$	1 – 2	F,P	375,1108
		1527.	469.31 – 534.81	$3s^23p^53d - 3s^23p^53d$	$^3P^\circ - {}^3D^\circ$	0 – 1	F,P	375,1108
		1606.	480.77 – 543.04	$3s^23p^53d - 3s^23p^53d$	$^3P^\circ - {}^1F^\circ$	2 – 3	F,P	375,1108
		1617.	472.95 – 534.81	$3s^23p^53d - 3s^23p^53d$	$^3P^\circ - {}^3D^\circ$	1 – 1	F,P	375,1108
		1646.	469.31 – 530.05	$3s^23p^53d - 3s^23p^53d$	$^3P^\circ - {}^1D^\circ$	0 – 2	F,P	375,1108
		1715.	480.77 – 539.07	$3s^23p^53d - 3s^23p^53d$	$^3P^\circ - {}^3D^\circ$	2 – 2	F,P	375,1108
		1751.	472.95 – 530.05	$3s^23p^53d - 3s^23p^53d$	$^3P^\circ - {}^1D^\circ$	1 – 2	F,P	375,1108
		1843.	472.95 – 527.22	$3s^23p^53d - 3s^23p^53d$	$^3P^\circ - {}^3D^\circ$	1 – 3	F,P	375,1108

NICKEL XII (Ni^{11+}), Z = 28
Ground State $1s^22s^22p^63s^23p^5(^2P^\circ_{3/2})$ (17 electrons)
Ionization Potential [2 840 000] cm^{-1}; [352] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		60.02	0.0 - 1666.1	$3s^23p^5 - 3s^23p^4(^3P)4d$	$g^2P^\circ - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		854
		71.4	0.0 - 1401.0	$3s^23p^5 - 3s^23p^4(^1D)4s$	$g^2P^\circ - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		854
		72.17	0.0 - 1385.6	$3s^23p^5 - 3s^23p^4(^3P)4s$	$g^2P^\circ - {}^2P$	$\frac{3}{2} - \frac{1}{2}$		854
		72.57	23.52 - 1401.6	$3s^23p^5 - 3s^23p^4(^1D)4s$	$g^2P^\circ - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		854
		72.77	0.0 - 1374.2	$3s^23p^5 - 3s^23p^4(^3P)4s$	$g^2P^\circ - {}^2P$	$\frac{3}{2} - \frac{3}{2}$		854
		74.44	454.00+X - 1797.4+X	$3s^23p^4(^3P)3d - 3s^23p^4(^3P)4f$	${}^4D - {}^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		854
		75.62	485.57+X - 1808.0+X	$3s^23p^4(^3P)3d - 3s^23p^4(^3P)4f$	${}^4F - {}^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		854
		75.69	527.23+X - 1848.4+X	$3s^23p^4(^1D)3d - 3s^23p^4(^1D)4f$	${}^2G - {}^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		854
		75.83	492.75+X - 1811.4+X	$3s^23p^4(^3P)3d - 3s^23p^4(^3P)4f$	${}^4F - {}^4G^\circ$	$\frac{7}{2} - \frac{9}{2}$		854
	1	147.847	0.0 - 676.37	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^\circ - {}^2D$	$\frac{3}{2} - \frac{3}{2}$		302
	1	152.152	0.0 - 657.24	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^\circ - {}^2P$	$\frac{3}{2} - \frac{1}{2}$		302
	15	152.153	0.0 - 657.23	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^\circ - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		302
	5	153.174	23.52 - 676.37	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^\circ - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		302
	15	154.175	0.0 - 648.62	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^\circ - {}^2P$	$\frac{3}{2} - \frac{3}{2}$		302
	2	157.798	23.52 - 657.24	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^\circ - {}^2P$	$\frac{1}{2} - \frac{1}{2}$		302
	1	159.975	23.52 - 648.62	$3s^23p^5 - 3s^23p^4(^3P)3d$	$g^2P^\circ - {}^2P$	$\frac{1}{2} - \frac{3}{2}$		302
	2	160.554	0.0 - 622.84	$3s^23p^5 - 3s^23p^4(^1D)3d$	$g^2P^\circ - {}^2S$	$\frac{3}{2} - \frac{1}{2}$		302
		166.856	23.52 - 622.84	$3s^23p^5 - 3s^23p^4(^1D)3d$	$g^2P^\circ - {}^2S$	$\frac{1}{2} - \frac{1}{2}$	P	375
		883.4	454.00+X - 567.20+X	$3s^23p^4(^3P)3d - 3s^23p^4(^1D)3d$	${}^4D - {}^2F$	$\frac{7}{2} - \frac{7}{2}$	F,P	375,1108
		1225.	485.57+X - 567.20+X	$3s^23p^4(^3P)3d - 3s^23p^4(^1D)3d$	${}^4F - {}^2F$	$\frac{9}{2} - \frac{7}{2}$	F,P	375,1108
		1343.	492.75+X - 567.20+X	$3s^23p^4(^3P)3d - 3s^23p^4(^1D)3d$	${}^4F - {}^2F$	$\frac{7}{2} - \frac{7}{2}$	F,P	375,1108
		1366.	454.00+X - 527.23+X	$3s^23p^4(^3P)3d - 3s^23p^4(^1D)3d$	${}^4D - {}^2G$	$\frac{7}{2} - \frac{9}{2}$	F,P	375,1108
		1371.	454.00+X - 526.96+X	$3s^23p^4(^3P)3d - 3s^23p^4(^1D)3d$	${}^4D - {}^2G$	$\frac{7}{2} - \frac{7}{2}$	F,P	375,1108
		1687.	454.00+X - 513.29+X	$3s^23p^4(^3P)3d - 3s^23p^4(^3P)3d$	${}^4D - {}^2F$	$\frac{7}{2} - \frac{7}{2}$	F,P	375,1108
		1855.	513.29+X - 567.20+X	$3s^23p^4(^3P)3d - 3s^23p^4(^1D)3d$	${}^2F - {}^2F$	$\frac{7}{2} - \frac{7}{2}$	F,P	375,1108

NICKEL XIII (Ni^{12+}), Z = 28
Ground State $1s^22s^22p^63s^23p^4(^3P_2)$ (16 electrons)
Ionization Potential [3 097 000] cm^{-1}; [384] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		56.18	47.0329 - 1827.01	$3s^23p^4 - 3s^23p^3(^2D^\circ)4d$	${}^1D - {}^1F^\circ$	2 - 3		854
		56.39	47.0329 - 1820.38	$3s^23p^4 - 3s^23p^3(^2D^\circ)4d$	${}^1D - {}^1D^\circ$	2 - 2		854
		56.57	0. - 1767.72	$3s^23p^4 - 3s^23p^3(^4S^\circ)4d$	$g^3P - {}^3D^\circ$	2 - 3		854
		69.25	597.5+D - 2041.55+D	$3s^23p^3(^4S^\circ)3d - 3s^23p^3(^4S^\circ)4f$	${}^5D^\circ - {}^5F$	3 - 4		854
		69.37	600.00+D - 2041.55+D	$3s^23p^3(^4S^\circ)3d - 3s^23p^3(^4S^\circ)4f$	${}^5D^\circ - {}^5F$	4 - 5		854
		70.07	950.00+L - 2377.15+L	$3s^23p^3(^2D^\circ)3d - 3s^23p^3(^2D^\circ)4f$	${}^3G^\circ - {}^3H$	5 - 6		854
		155.12	0. - 644.66	$3s^23p^4 - 3s^23p^3(^4S^\circ)3d$	$g^3P - {}^3D^\circ$	2 - 2		240
	50	157.55	47.0329 - 681.70	$3s^23p^4 - 3s^23p^3(^2D^\circ)3d$	${}^1D - {}^1F^\circ$	2 - 3		240,295
	35	157.730	0. - 634.00	$3s^23p^4 - 3s^23p^3(^4S^\circ)3d$	$g^3P - {}^3D^\circ$	2 - 3		856
	50	158.77	20.0469 - 649.84	$3s^23p^4 - 3s^23p^3(^4S^\circ)3d$	$g^3P - {}^3D^\circ$	0 - 1		240,256
		159.97	19.5418 - 644.66	$3s^23p^4 - 3s^23p^3(^4S^\circ)3d$	$g^3P - {}^3D^\circ$	1 - 2		240
	50	161.56	47.0329 - 665.95	$3s^23p^4 - 3s^23p^3(^2D^\circ)3d$	${}^1D - {}^1D^\circ$	2 - 2		240,256
		161.78	97.8362 - 715.95	$3s^23p^4 - 3s^23p^3(^2D^\circ)3d$	${}^1S - {}^1P^\circ$	0 - 1		240
	35	164.146	0. - 609.20	$3s^23p^4 - 3s^23p^3(^2D^\circ)3d$	$g^3P - {}^3P^\circ$	2 - 2		856
		303.31	0. - 329.70	$3s^23p^4 - 3s3p^5$	$g^3P - {}^3P^\circ$	2 - 2		240
		1022.1	0. - 97.8362	$3s^23p^4 - 3s^23p^4$	$g^3P - {}^1S$	2 - 0	F,P	375,1108
	0	1277.23	19.5418 - 97.8362	$3s^23p^4 - 3s^23p^4$	$g^3P - {}^1S$	1 - 0	F	940
		1968.4	47.0329 - 97.8362	$3s^23p^4 - 3s^23p^4$	${}^1D - {}^1S$	2 - 0	F,P	375,1108

NICKEL XIV (Ni^{13+}), Z = 28
Ground State $1s^22s^22p^63s^23p^3(^4S^\circ_{3/2})$ (15 electrons)
Ionization Potential [3 470 000] cm^{-1}; [430] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		62.52	53.5690 - 1653.07	$3s^23p^3 - 3s^23p^24d$	$^2D^\circ - {}^2D$	$\frac{5}{2} - \frac{5}{2}$		851
		63.50	53.5690 - 1628.37	$3s^23p^3 - 3s^23p^24d$	$^2D^\circ - {}^2P$	$\frac{5}{2} - \frac{3}{2}$		851
		64.79	560.+D - 2103.45+D	$3s^23p^2(^3P)3d - 3s^23p^2(^3P)4f$	$^4F - {}^4G^\circ$	$\frac{9}{2} - \frac{11}{2}$		854
		65.01	580.+R - 2118.2+R	$3s^23p^2(^3P)3d - 3s^23p^2(^3P)4f$	$^4D - {}^4F^\circ$	$\frac{7}{2} - \frac{9}{2}$		854
		65.40	600.+S - 2129.05+S	$3s^23p^2(^1D)3d - 3s^23p^2(^1D)4f$	$^2G - {}^2H^\circ$	$\frac{9}{2} - \frac{11}{2}$		854
		164.146	53.5690 - 662.77	$3s^23p^3 - 3s^23p^2(^1D)3d$	$^2D^\circ - {}^2F$	$\frac{5}{2} - \frac{7}{2}$		240
		164.80	85.1267 - 691.88	$3s^23p^3 - 3s^23p^2(^3P)3d$	$^2P^\circ - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		240
		168.12	0. - 594.81	$3s^23p^3 - 3s^23p^2(^3P)3d$	$g^4S^\circ - {}^4P$	$\frac{3}{2} - \frac{1}{2}$		240
		168.37	96.6738+X - 690.56+X	$3s^23p^3 - 3s^23p^2(^3P)3d$	$^2P^\circ - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		240
	30	169.69	0. - 589.31	$3s^23p^3 - 3s^23p^2(^3P)3d$	$g^4S^\circ - {}^4P$	$\frac{3}{2} - \frac{3}{2}$		240,856
		170.50	45.7678 - 632.29	$3s^23p^3 - 3s^23p^2(^1D)3d$	$^2D^\circ - {}^2D$	$\frac{3}{2} - \frac{3}{2}$		240
	40	171.37	0. - 583.53	$3s^23p^3 - 3s^23p^2(^3P)3d$	$g^4S^\circ - {}^4P$	$\frac{3}{2} - \frac{5}{2}$		240,856
		172.16	53.5690 - 634.41	$3s^23p^3 - 3s^23p^2(^1D)3d$	$^2D^\circ - {}^2D$	$\frac{5}{2} - \frac{5}{2}$		240
		177.28	96.6738+X - 660.71+X	$3s^23p^3 - 3s^23p^2(^1D)3d$	$^2P^\circ - {}^2P$	$\frac{3}{2} - \frac{3}{2}$		240
		177.56	85.1267 - 648.27	$3s^23p^3 - 3s^23p^2(^1D)3d$	$^2P^\circ - {}^2P$	$\frac{1}{2} - \frac{1}{2}$		240
		253.69	53.5690 - 447.74	$3s^23p^3 - 3s3p^4$	$^2D^\circ - {}^2P$	$\frac{5}{2} - \frac{3}{2}$		240
		292.03	53.5690 - 395.99	$3s^23p^3 - 3s3p^4$	$^2D^\circ - {}^2D$	$\frac{5}{2} - \frac{5}{2}$		240
		302.27	0. - 330.83	$3s^23p^3 - 3s3p^4$	$g^4S^\circ - {}^4P$	$\frac{3}{2} - \frac{3}{2}$		240
		316.53	0. - 315.926	$3s^23p^3 - 3s3p^4$	$g^4S^\circ - {}^4P$	$\frac{3}{2} - \frac{5}{2}$		240
		1034.41	0. - 96.6738+X	$3s^23p^3 - 3s^23p^3$	$g^4S^\circ - {}^2P^\circ$	$\frac{3}{2} - \frac{3}{2}$	F,P	726
	0	1174.72	0. - 85.1267	$3s^23p^3 - 3s^23p^3$	$g^4S^\circ - {}^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$	F	442
	1	1866.75	0. - 53.5690	$3s^23p^3 - 3s^23p^3$	$g^4S^\circ - {}^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$	F	442
		1964.	45.7678 - 96.6738+X	$3s^23p^3 - 3s^23p^3$	$^2D^\circ - {}^2P^\circ$	$\frac{3}{2} - \frac{3}{2}$	F,P	375,726

NICKEL XV (Ni^{14+}), Z = 28
Ground State $1s^22s^22p^63s^23p^2(^3P_0)$ (14 electrons)
Ionization Potential [3 740 000] cm^{-1}; [464] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		49.39	14.9175 - 2039.6	$3s^23p^2 - 3s^23p4d$	$g^3P - {}^3P^\circ$	1 - 0		970
		49.58	0. - 2016.9	$3s^23p^2 - 3s^23p4d$	$g^3P - {}^3D^\circ$	0 - 1		970
		49.626	27.3765 - 2042.4	$3s^23p^2 - 3s^23p4d$	$g^3P - {}^3F^\circ$	2 - 3		970
		49.914	14.9175 - 2018.4	$3s^23p^2 - 3s^23p4d$	$g^3P - {}^3D^\circ$	1 - 2		970
		50.172	27.3765 - 2020.5	$3s^23p^2 - 3s^23p4d$	$g^3P - {}^3D^\circ$	2 - 3		970
		50.249	62.8521 - 2052.9	$3s^23p^2 - 3s^23p4d$	$^1D - {}^1F^\circ$	2 - 3		970
		50.947	111.7029+S - 2074.5+S	$3s^23p^2 - 3s^23p4d$	$^1S - {}^1P^\circ$	0 - 1		970
		58.330	574.33 - 2288.7	$3s^23p3d - 3s^23p4f$	$^1D^\circ - {}^1F$	2 - 3		970
		58.715	27.3765 - 1730.52	$3s^23p^2 - 3s^23p4s$	$g^3P - {}^3P^\circ$	2 - 2		970
		59.58	62.8521 - 1741.29	$3s^23p^2 - 3s^23p4s$	$^1D - {}^1P^\circ$	2 - 1		854
		60.890	563.82+D - 2206.1+D	$3s^23p3d - 3s^23p4f$	$^3F^\circ - {}^3G$	4 - 5		970
		61.152	570.00+D - 2205.3+D	$3s^23p3d - 3s^23p4f$	$^3F^\circ - {}^3G$	3 - 4		970
		62.369	570.00+R - 2173.4+R	$3s^23p3d - 3s^23p4f$	$^3P^\circ - {}^3D$	0 - 1		970
		63.069	585.16 - 2170.7	$3s^23p3d - 3s^23p4f$	$^3D^\circ - {}^3F$	3 - 4		970
		64.635	638.46 - 2185.7	$3s^23p3d - 3s^23p4f$	$^1F^\circ - {}^1G$	3 - 4		970
		65.415	590.0+K - 2118.7+K	$3s^23p3d - 3s^23p4f$	$^1P^\circ - {}^1D$	1 - 2		970
		173.73	62.8521 - 638.46	$3s^23p^2 - 3s^23p3d$	$^1D - {}^1F^\circ$	2 - 3		240
		174.99	14.9175 - 586.41	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3D^\circ$	1 - 2		240

NI XV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		176.10	14.9175 - 582.76	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3D°$	1 - 1		240
		176.70	0. - 565.93	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3P°$	0 - 1		240
		178.75	14.9175 - 574.33	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^1D°$	1 - 2		240
		178.87	27.3765 - 586.41	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3D°$	2 - 2		240
	20	179.28	27.3765 - 585.16	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3D°$	2 - 3		240,856
		180.06	27.3765 - 582.76	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3D°$	2 - 1		240
		184.89	14.9175 - 555.84	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3P°$	1 - 2		240
		189.21	27.3765 - 555.84	$3s^23p^2 - 3s^23p3d$	$g^3P - {}^3P°$	2 - 2		240
		195.52	62.8521 - 574.33	$3s^23p^2 - 3s^23p3d$	${}^1D - {}^1D°$	2 - 2		240
		209.18	0. - 478.01	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3S°$	0 - 1		240
		215.94	14.9175 - 478.01	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3S°$	1 - 1		240
		221.93	27.3765 - 478.01	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3S°$	2 - 1		240
		224.04	62.8521 - 509.22	$3s^23p^2 - 3s3p^3$	${}^1D - {}^1P°$	2 - 1		240
		281.4	62.8521 - 418.24+M	$3s^23p^2 - 3s3p^3$	${}^1D - {}^1D°$	2 - 2	P	375
		284.2	27.3765 - 379.24+L	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3P°$	2 - 2	P	375
		311.73	14.9175 - 335.70	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3D°$	1 - 2		240
	200	319.03	27.3765 - 340.84	$3s^23p^2 - 3s3p^3$	$g^3P - {}^3D°$	2 - 3		437
		1033.	14.9175 - 111.7029+S	$3s^23p^2 - 3s^23p^2$	$g^3P - {}^1S$	1 - 0	F,P	375,1108
		1186.	27.3765 - 111.7029+S	$3s^23p^2 - 3s^23p^2$	$g^3P - {}^1S$	2 - 0	F,P	375,1108

NICKEL XVI (Ni^{15+}), Z = 28
Ground State $1s^22s^22p^63s^23p(^2P°_{1/2})$ (13 electrons)
Ionization Potential [4 020 000] cm^{-1}; [499] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		47.184	0.0 - 2119.36	$3s^23p - 3s^24d$	$g^2P° - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		854
		47.772	27.7614 - 2121.04	$3s^23p - 3s^24d$	$g^2P° - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		854
		57.137	1749.82+S - 3500.00+S	$3s3p3d - 3s3p4f$	${}^4F° - {}^4G$	$\frac{9}{2} - \frac{11}{2}$		854
		57.257	1753.49+S - 3500.00+S	$3s3p3d - 3s3p4f$	${}^4F° - {}^4G$	$\frac{5}{2} - \frac{7}{2}$		854
		57.349	1756.29+S - 3500.00+S	$3s3p3d - 3s3p4f$	${}^4F° - {}^4G$	$\frac{7}{2} - \frac{9}{2}$		854
		59.217	539.87 - 2228.57	$3s^23d - 3s^24f$	${}^2D - {}^2F°$	$\frac{3}{2} - \frac{5}{2}$		854
		59.336	543.12 - 2228.49	$3s^23d - 3s^24f$	${}^2D - {}^2F°$	$\frac{5}{2} - \frac{7}{2}$		854
		185.23	0.0 - 539.87	$3s^23p - 3s^23d$	$g^2P° - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		240
		194.04	27.7614 - 543.12	$3s^23p - 3s^23d$	$g^2P° - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		240
		218.39	0.0 - 457.90	$3s^23p - 3s3p^2$	$g^2P° - {}^2P$	$\frac{1}{2} - \frac{3}{2}$		240
		223.09	0.0 - 448.23	$3s^23p - 3s3p^2$	$g^2P° - {}^2P$	$\frac{1}{2} - \frac{1}{2}$		240
	30	232.48	27.7614 - 457.90	$3s^23p - 3s3p^2$	$g^2P° - {}^2P$	$\frac{3}{2} - \frac{3}{2}$		437
	50	237.84	27.7614 - 448.23	$3s^23p - 3s3p^2$	$g^2P° - {}^2P$	$\frac{3}{2} - \frac{1}{2}$		437
		239.53	0.0 - 417.48	$3s^23p - 3s3p^2$	$g^2P° - {}^2S$	$\frac{1}{2} - \frac{1}{2}$		240
		309.40	27.7614 - 350.97	$3s^23p - 3s3p^2$	$g^2P° - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		240

NICKEL XVII (Ni^{16+}), Z = 28
Ground State $1s^22s^22p^63s^2(^1S_0)$ (12 electrons)
Ionization Potential 4 607 800 cm^{-1}; 571.30 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	30	12.830	0.0 – 7794.2	$3s^2 - 2p^53s^23d$	$g^1S - ^1P°$	0 – 1		716
		30.91	0.0 – 3235.2	$3s^2$ – 3s5p	$g^1S - ^1P°$	0 – 1		266
	6	33.249	264.62 – 3272.23	3s3p – 3s5d	$^3P° - ^3D$	0 – 1		237
	3	33.340	272.70 – 3272.10	3s3p – 3s5d	$^3P° - ^3D$	1 – 2		237
	3	33.567	293.77 – 3272.89	3s3p – 3s5d	$^3P° - ^3D$	2 – 3		237
		33.96	775.70 – 3720.4	3s3d – 3s6f	$^3D - ^3F°$	3 – 4		266
		35.698	293.77 – 3095.05	3s3p – 3s5s	$^3P° - ^3S$	2 – 1		851
		38.96	864.52 – 3431.2	3s3d – 3s5f	$^1D - ^1F°$	2 – 3		266
	3	39.346	771.23 – 3312.78	3s3d – 3s5f	$^3D - ^3F°$	1 – 2		237
	6	39.373	773.02 – 3312.81	3s3d – 3s5f	$^3D - ^3F°$	2 – 3		237
	10	39.415	775.70 – 3312.83	3s3d – 3s5f	$^3D - ^3F°$	3 – 4		237
		42.0	293.77 – 2674.8	3s3p – 3p4p	$^3P° - ^3D$	2 – 3		851
	20	42.855	0.0 – 2333.45	$3s^2$ – 3s4p	$g^1S - ^1P°$	0 – 1		237
	6	44.850	264.62 – 2494.25	3s3p – 3s4d	$^3P° - ^3D$	0 – 1		237
	10	44.995	272.70 – 2495.34	3s3p – 3s4d	$^3P° - ^3D$	1 – 2		237
	1	45.018	272.70 – 2494.25	3s3p – 3s4d	$^3P° - ^3D$	1 – 1		237
	20	45.382	293.77 – 2497.35	3s3p – 3s4d	$^3P° - ^3D$	2 – 3		237
	6	45.424	293.77 – 2495.34	3s3p – 3s4d	$^3P° - ^3D$	2 – 2		237
		47.663	401.316 – 2499.38	3s3p – 3s4d	$^1P° - ^1D$	1 – 2		854
		50.958	638.87 – 2601.27	$3p^2$ – 3s4f	$^1D - ^1F°$	2 – 3		854
	6	52.000	264.62 – 2187.70	3s3p – 3s4s	$^3P° - ^3S$	0 – 1		237
	10	52.224	272.70 – 2187.70	3s3p – 3s4s	$^3P° - ^3S$	1 – 1		237
	6	52.802	293.77 – 2187.70	3s3p – 3s4s	$^3P° - ^3S$	2 – 1		237
		54.384	1059.55+N – 2898.32+N	3p3d – 3p4f	$^3F° - ^3F$	3 – 4		970
		54.451	1062.60+D – 2899.11+D	3p3d – 3p4f	$^3F° - ^3G$	4 – 5		970
		54.628	1059.55+N – 2890.11+N	3p3d – 3p4f	$^3F° - ^3G$	3 – 4		970
		55.007	1111.00+L – 2928.95+L	3p3d – 3p4f	$^1D° - ^1F$	2 – 3		970
	6	55.136	771.23 – 2584.93	3s3d – 3s4f	$^3D - ^3F°$	1 – 2		970,237
	10	55.186	773.02 – 2585.07	3s3d – 3s4f	$^3D - ^3F°$	2 – 3		970,237
	20	55.258	775.70 – 2585.39	3s3d – 3s4f	$^3D - ^3F°$	3 – 4		970,237
		55.361	1080.00+P – 2886.33+P	3p3d – 3p4f	$^3P° - ^3D$	0 – 1		970
		55.511	1100.00+P – 2901.44+P	3p3d – 3p4f	$^3P° - ^3D$	1 – 2		970
		55.606	1105.00+N – 2903.37+N	3p3d – 3p4f	$^3D° - ^3D$	2 – 3		970
		55.887	1109.00+N – 2898.32+N	3p3d – 3p4f	$^3D° - ^3F$	3 – 4		970
		55.933	1099.00+N – 2886.85+N	3p3d – 3p4f	$^3D° - ^3F$	1 – 2		970
		56.08	1105.00+N – 2888.10+N	3p3d – 3p4f	$^3D° - ^3G$	2 – 3		970
		57.348	1200.00+S – 2943.74+S	3p3d – 3p4f	$^1F° - ^1G$	3 – 4		970
		57.573	864.52 – 2601.27	3s3d – 3s4f	$^1D - ^1F°$	2 – 3		970
		197.39	264.62 – 771.23	3s3p – 3s3d	$^3P° - ^3D$	0 – 1		854
		199.87	272.70 – 773.02	3s3p – 3s3d	$^3P° - ^3D$	1 – 2		854
		200.59	272.70 – 771.23	3s3p – 3s3d	$^3P° - ^3D$	1 – 1	P	854
		207.50	293.77 – 775.70	3s3p – 3s3d	$^3P° - ^3D$	2 – 3		854
		208.66	293.77 – 773.02	3s3p – 3s3d	$^3P° - ^3D$	2 – 2		854
		215.89	401.316 – 864.52	3s3p – 3s3d	$^1P° - ^1D$	1 – 2		854
		249.180	0.0 – 401.316	$3s^2$ – 3s3p	$g^1S - ^1P°$	0 – 1		240
		251.97	272.70 – 669.52	3s3p – $3p^2$	$^3P° - ^3P$	1 – 2		854
		263.7	264.62 – 643.84	3s3p – $3p^2$	$^3P° - ^3P$	0 – 1	P	854
		266.15	293.77 – 669.52	3s3p – $3p^2$	$^3P° - ^3P$	2 – 2		854
		269.44	272.70 – 643.84	3s3p – $3p^2$	$^3P° - ^3P$	1 – 1		854
		273.10	272.70 – 638.87	3s3p – $3p^2$	$^3P° - ^1D$	1 – 2	P	375,854
		281.50	272.70 – 627.94	3s3p – $3p^2$	$^3P° - ^3P$	1 – 0		854
		283.	401.316 – 754.7	3s3p – $3p^2$	$^1P° - ^1S$	1 – 0	P	375,988
		285.66	293.77 – 643.84	3s3p – $3p^2$	$^3P° - ^3P$	2 – 1		854
		289.77	293.77 – 638.87	3s3p – $3p^2$	$^3P° - ^1D$	2 – 2	P	375,854

Ni XVII — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	12	366.7	0.0 – 272.70	$3s^2 - 3s3p$	$g^1S - {}^1P^\circ$	0 – 1		1131
		420.96	401.316 – 638.87	$3s3p - 3p^2$	${}^1P^\circ - {}^1D$	1 – 2	P	854

NICKEL XVIII (Ni^{17+}), Z = 28
Ground State $1s^22s^22p^63s(^2S_{1/2})$ (11 electrons)
Ionization Potential 4 896 200 cm^{-1}; 607.06 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		14.10	0.0 – 7092.	$2p^63s - 2p^53s^2$	$g^2S - {}^2P^\circ$	$\frac{1}{2}-\frac{1}{2}$		265
		14.37	0.0 – 6959.	$2p^63s - 2p^53s^2$	$g^2S - {}^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$		265
	1	24.881	311.976 – 4330.99	$2p^63p - 2p^68d$	${}^2P^\circ - {}^2D$	$\frac{1}{2}-\frac{3}{2}$		237
	3	25.070	342.501 – 4331.29	$2p^63p - 2p^68d$	${}^2P^\circ - {}^2D$	$\frac{3}{2}-\frac{5}{2}$		237
	6	26.020	0.0 – 3843.2	$2p^63s - 2p^66p$	$g^2S - {}^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$		237
	3	26.046	0.0 – 3839.36	$2p^63s - 2p^66p$	$g^2S - {}^2P^\circ$	$\frac{1}{2}-\frac{1}{2}$		237
	10	26.218	342.501 – 4156.63	$2p^63p - 2p^67d$	${}^2P^\circ - {}^2D$	$\frac{3}{2}-\frac{5}{2}$		237
		27.98	765.64 – 4339.53	$2p^63d - 2p^68f$	${}^2D - {}^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		237
	20	27.982	311.976 – 3885.59	$2p^63p - 2p^66d$	${}^2P^\circ - {}^2D$	$\frac{1}{2}-\frac{3}{2}$		237
	3	28.018	770.30 – 4339.33	$2p^63d - 2p^68f$	${}^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		237
	35	28.220	342.501 – 3886.05	$2p^63p - 2p^66d$	${}^2P^\circ - {}^2D$	$\frac{3}{2}-\frac{5}{2}$		237
	3	29.383	765.64 – 4168.88	$2p^63d - 2p^67f$	${}^2D - {}^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		237
	3	29.422	770.30 – 4169.02	$2p^63d - 2p^67f$	${}^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		237
	35	29.779	0.0 – 3358.07	$2p^63s - 2p^65p$	$g^2S - {}^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$		237
	20	29.829	0.0 – 3352.44	$2p^63s - 2p^65p$	$g^2S - {}^2P^\circ$	$\frac{1}{2}-\frac{1}{2}$		237
	20	31.845	765.64 – 3905.76	$2p^63d - 2p^66f$	${}^2D - {}^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		237
	20	31.890	770.30 – 3905.98	$2p^63d - 2p^66f$	${}^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		237
	60	32.034	311.976 – 3433.54	$2p^63p - 2p^65d$	${}^2P^\circ - {}^2D$	$\frac{1}{2}-\frac{3}{2}$		237
	90	32.340	342.501 – 3434.60	$2p^63p - 2p^65d$	${}^2P^\circ - {}^2D$	$\frac{3}{2}-\frac{5}{2}$		237
	60	36.990	765.64 – 3468.25	$2p^63d - 2p^65f$	${}^2D - {}^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		237
	60	37.049	770.30 – 3468.29	$2p^63d - 2p^65f$	${}^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		237
	125	41.015	0.0 – 2438.13	$2p^63s - 2p^64p$	$g^2S - {}^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$		237
	90	41.218	0.0 – 2426.12	$2p^63s - 2p^64p$	$g^2S - {}^2P^\circ$	$\frac{1}{2}-\frac{1}{2}$		237
	200	43.814	311.976 – 2594.35	$2p^63p - 2p^64d$	${}^2P^\circ - {}^2D$	$\frac{1}{2}-\frac{3}{2}$		237
	250	44.365	342.501 – 2596.53	$2p^63p - 2p^64d$	${}^2P^\circ - {}^2D$	$\frac{3}{2}-\frac{5}{2}$		237
	35	44.405	342.501 – 2594.35	$2p^63p - 2p^64d$	${}^2P^\circ - {}^2D$	$\frac{3}{2}-\frac{3}{2}$		237
	20	50.253	311.976 – 2301.63	$2p^63p - 2p^64s$	${}^2P^\circ - {}^2S$	$\frac{1}{2}-\frac{1}{2}$		237
	35	51.042	342.501 – 2301.63	$2p^63p - 2p^64s$	${}^2P^\circ - {}^2S$	$\frac{3}{2}-\frac{1}{2}$		237
	200	52.615	765.64 – 2666.24	$2p^63d - 2p^64f$	${}^2D - {}^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		237
	250	52.720	770.30 – 2667.11	$2p^63d - 2p^64f$	${}^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		237
		59.950	770.30 – 2438.13	$2p^63d - 2p^64p$	${}^2D - {}^2P^\circ$	$\frac{5}{2}-\frac{3}{2}$		854
		60.212	765.64 – 2426.12	$2p^63d - 2p^64p$	${}^2D - {}^2P^\circ$	$\frac{3}{2}-\frac{1}{2}$		854
	110	114.46	2594.35 – 3468.25	$2p^64d - 2p^65f$	${}^2D - {}^2F^\circ$	$\frac{3}{2}-\frac{5}{2}$		1091
	110	114.74	2596.53 – 3468.29	$2p^64d - 2p^65f$	${}^2D - {}^2F^\circ$	$\frac{5}{2}-\frac{7}{2}$		1091
	200	123.965	2666.24 – 3472.92	$2p^64f - 2p^65g$	${}^2F^\circ - {}^2G$	$\frac{5}{2}-\frac{7}{2}$	P	753,1091
	200	124.050	2667.11 – 3473.24	$2p^64f - 2p^65g$	${}^2F^\circ - {}^2G$	$\frac{7}{2}-\frac{9}{2}$	P	753,1091
	85	220.428	311.976 – 765.64	$2p^63p - 2p^63d$	${}^2P^\circ - {}^2D$	$\frac{1}{2}-\frac{3}{2}$		753,730
	150	233.756	342.501 – 770.30	$2p^63p - 2p^63d$	${}^2P^\circ - {}^2D$	$\frac{3}{2}-\frac{5}{2}$		753,730
	3	236.36	342.501 – 765.64	$2p^63p - 2p^63d$	${}^2P^\circ - {}^2D$	$\frac{3}{2}-\frac{3}{2}$		237
	350	291.970	0.0 – 342.501	$2p^63s - 2p^63p$	$g^2S - {}^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$		753,730
	300	320.537	0.0 – 311.976	$2p^63s - 2p^63p$	$g^2S - {}^2P^\circ$	$\frac{1}{2}-\frac{1}{2}$		753,437

NICKEL XIX (Ni^{18+}), Z = 28
Ground State $1s^22s^22p^6(^1S_0)$ (10 electrons)
Ionization Potential 12 430 000 cm^{-1}; 1541 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		8.487	0.0 - 11783.	$2s^22p^6 - 2s^22p^5(^2P^o_{3/2})8d$	$g^1S - (\frac{3}{2},\frac{5}{2})^o$	0 - 1	P	643
		8.512	0.0 - 11748.	$2s^22p^6 - 2s^22p^5(^2P^o_{1/2})7d$	$g^1S - (\frac{1}{2},\frac{3}{2})^o$	0 - 1	P	643
		8.614	0.0 - 11609.	$2s^22p^6 - 2s^22p^5(^2P^o_{3/2})7d$	$g^1S - (\frac{3}{2},\frac{5}{2})^o$	0 - 1	P	643
	10	8.725	0.0 - 11461.	$2s^22p^6 - 2s^22p^5(^2P^o_{1/2})6d$	$g^1S - (\frac{1}{2},\frac{3}{2})^o$	0 - 1		716
	20	8.838	0.0 - 11315.	$2s^22p^6 - 2s^22p^5(^2P^o_{3/2})6d$	$g^1S - (\frac{3}{2},\frac{5}{2})^o$	0 - 1		716
	30	9.130	0.0 - 10953.	$2s^22p^6 - 2s^22p^5(^2P^o_{1/2})5d$	$g^1S - (\frac{1}{2},\frac{3}{2})^o$	0 - 1		716
		9.140	0.0 - 10941.	$2s^22p^6 - 2s2p^64p$	$g^1S - {}^1P^o$	0 - 1		1094
		9.153	0.0 - 10925.	$2s^22p^6 - 2s2p^64p$	$g^1S - {}^3P^o$	0 - 1		1094
	30	9.236	0.0 - 10827.	$2s^22p^6 - 2s^22p^5(^2P^o_{3/2})5d$	$g^1S - (\frac{3}{2},\frac{5}{2})^o$	0 - 1		716
		9.262	0.0 - 10797.	$2s^22p^6 - 2s^22p^5(^2P^o_{3/2})5d$	$g^1S - (\frac{3}{2},\frac{3}{2})^o$	0 - 1		1094
	8	9.441						1089
	15	9.545						1089
	30	9.967	0.0 - 10033.	$2s^22p^6 - 2s^22p^5(^2P^o_{1/2})4d$	$g^1S - (\frac{1}{2},\frac{3}{2})^o$	0 - 1	P	643,716
	30	10.102	0.0 - 9899.0	$2s^22p^6 - 2s^22p^5(^2P^o_{3/2})4d$	$g^1S - (\frac{3}{2},\frac{5}{2})^o$	0 - 1		716
		10.157	0.0 - 9845.4	$2s^22p^6 - 2s^22p^5(^2P^o_{3/2})4d$	$g^1S - (\frac{3}{2},\frac{3}{2})^o$	0 - 1		1094
	20	10.306	0.0 - 9703.1	$2s^22p^6 - 2s^22p^5(^2P^o_{1/2})4s$	$g^1S - (\frac{1}{2},\frac{1}{2})^o$	0 - 1		716
	20	10.417	0.0 - 9599.7	$2s^22p^6 - 2s^22p^5(^2P^o_{3/2})4s$	$g^1S - (\frac{3}{2},\frac{1}{2})^o$	0 - 1		716
	90	11.529	0.0 - 8673.8	$2s^22p^6 - 2s2p^63p$	$g^1S - {}^1P^o$	0 - 1		643
	70	11.587	0.0 - 8630.4	$2s^22p^6 - 2s2p^63p$	$g^1S - {}^3P^o$	0 - 1		643
	150	12.430	0.0 - 8045.0	$2s^22p^6 - 2s^22p^5(^2P^o_{1/2})3p$	$g^1S - (\frac{1}{2},\frac{3}{2})^o$	0 - 1		643
	120	12.654	0.0 - 7902.6	$2s^22p^6 - 2s^22p^5(^2P^o_{3/2})3d$	$g^1S - (\frac{3}{2},\frac{5}{2})^o$	0 - 1		643
	50	12.809	0.0 - 7807.0	$2s^22p^6 - 2s^22p^5(^2P^o_{3/2})3d$	$g^1S - (\frac{3}{2},\frac{3}{2})^o$	0 - 1		643
	80	13.777	0.0 - 7258.5	$2s^22p^6 - 2s^22p^5(^2P^o_{1/2})3s$	$g^1S - (\frac{1}{2},\frac{1}{2})^o$	0 - 1		643
	100	14.040	0.0 - 7122.5	$2s^22p^6 - 2s^22p^5(^2P^o_{3/2})3s$	$g^1S - (\frac{3}{2},\frac{1}{2})^o$	0 - 1		643
	36	14.081	0.0 - 7101.8	$2s^22p^6 - 2s^22p^5(^2P^o_{3/2})3s$	$g^1S - (\frac{3}{2},\frac{1}{2})^o$	0 - 2	F	464
		33.25	7925.9+C - 10933.+C	$2s^22p^53d - 2s^22p^5(^2P^o_{3/2})5f$	${}^3F^o - \frac{3}{2}[\frac{9}{2}]$	4 - 5	P	1055
		40.650	7436.2+C - 9896.2+C	$2s^22p^53p - 2s^22p^54d$	${}^1P - {}^1D^o$	1 - 2		395
		40.731	7404.2+C - 9859.3+C	$2s^22p^53p - 2s^22p^54d$	${}^3D - {}^3D^o$	2 - 3		395
		41.132	7428.1+C - 9859.3+C	$2s^22p^53p - 2s^22p^54d$	${}^3D - {}^3F^o$	3 - 4		395
		41.385	7453.9+C - 9870.2+C	$2s^22p^53p - 2s^22p^54d$	${}^3P - {}^3F^o$	2 - 3		395

NICKEL XX (Ni^{19+}), Z = 28
Ground State $1s^22s^22p^5(^2P^o_{3/2})$ (9 electrons)
Ionization Potential [13 290 000] cm^{-1}; [1648] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	10	9.338	143.980 - 10853.	$2s^22p^5 - 2s^22p^4(^1S)4d$	$g^2P^o - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		1094,716
	30	9.366	0.0 - 10677.	$2s^22p^5 - 2s^22p^4(^1D)4d$	$g^2P^o - {}^2F$	$\frac{3}{2} - \frac{5}{2}$		1094,716
		9.385	0.0 - 10655.	$2s^22p^5 - 2s^22p^4(^1D)4d$	$g^2P^o - {}^2S$	$\frac{3}{2} - \frac{1}{2}$		1094
		9.385	0.0 - 10655.	$2s^22p^5 - 2s^22p^4(^1D)4d$	$g^2P^o - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		1094
	10	9.446	0.0 - 10581.	$2s^22p^5 - 2s^22p^4(^3P)4d$	$g^2P^o - {}^2P$	$\frac{3}{2} - \frac{3}{2}$	Q	716
		9.455	0.0 - 10576.	$2s^22p^5 - 2s^22p^4(^3P)4d$	$g^2P^o - {}^4P$	$\frac{3}{2} - \frac{5}{2}$		1094
	20	9.497	143.980 - 10674.	$2s^22p^5 - 2s^22p^4(^1D)4d$	$g^2P^o - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		1094,716
	30	9.558	0.0 - 10462.	$2s^22p^5 - 2s^22p^4(^3P)4d$	$g^2P^o - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		1094,716
		9.581	143.980 - 10581.	$2s^22p^5 - 2s^22p^4(^3P)4d$	$g^2P^o - {}^2P$	$\frac{1}{2} - \frac{3}{2}$		1094
	10	9.630	143.980 - 10530.	$2s^22p^5 - 2s^22p^4(^3P)4d$	$g^2P^o - {}^4F$	$\frac{1}{2} - \frac{3}{2}$	Q	716
	10	9.693	0.0 - 10317.	$2s^22p^5 - 2s^22p^4(^3P)4s$	$g^2P^o - {}^4P$	$\frac{3}{2} - \frac{3}{2}$		1094,716
		9.821	0.0 - 10182.	$2s^22p^5 - 2s^22p^4(^3P)4s$	$g^2P^o - {}^2P$	$\frac{3}{2} - \frac{3}{2}$		1094

Ni XX — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		10.772	0.0 – 9283.3	$2s^22p^5 - 2s2p^5(^1P^\circ)3p$	$g^2P^\circ - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		1094
		10.918	143.980 – 9303.2	$2s^22p^5 - 2s2p^5(^1P^\circ)3p$	$g^2P^\circ - {}^2P$	$\frac{1}{2} - \frac{3}{2}$		1094
		10.936	143.980 – 9288.1	$2s^22p^5 - 2s2p^5(^1P^\circ)3p$	$g^2P^\circ - {}^2P$	$\frac{1}{2} - \frac{1}{2}$		1094
		10.982	143.980 – 9249.8	$2s^22p^5 - 2s2p^5(^1P^\circ)3p$	$g^2P^\circ - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		1094
		11.158	0.0 – 8962.2	$2s^22p^5 - 2s2p^5(^3P^\circ)3p$	$g^2P^\circ - {}^2P$	$\frac{3}{2} - \frac{3}{2}$		1094
		11.176	143.980 – 9091.7	$2s^22p^5 - 2s2p^5(^3P^\circ)3p$	$g^2P^\circ - {}^2S$	$\frac{1}{2} - \frac{1}{2}$		1094
		11.226	143.980 – 9051.9	$2s^22p^5 - 2s2p^5(^3P^\circ)3p$	$g^2P^\circ - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		1094
		11.282	143.980 – 9007.7	$2s^22p^5 - 2s2p^5(^3P^\circ)3p$	$g^2P^\circ - {}^4P$	$\frac{1}{2} - \frac{3}{2}$		1094
	6	11.733	143.980 – 8667.0	$2s^22p^5 - 2s^22p^4(^1S)3d$	$g^2P^\circ - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		964
	21	11.779	0.0 – 8495.4	$2s^22p^5 - 2s^22p^4(^1D)3d$	$g^2P^\circ - {}^2P$	$\frac{3}{2} - \frac{1}{2}$		1094,964
		11.787	0.0 – 8483.7	$2s^22p^5 - 2s^22p^4(^1D)3d$	$g^2P^\circ - {}^2D$	$\frac{3}{2} - \frac{3}{2}$		1094
	32	11.832	0.0 – 8451.7	$2s^22p^5 - 2s^22p^4(^1D)3d$	$g^2P^\circ - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		1094,964
		11.846	0.0 – 8441.7	$2s^22p^5 - 2s^22p^4(^1D)3d$	$g^2P^\circ - {}^2P$	$\frac{3}{2} - \frac{3}{2}$		1094
	18	11.874	0.0 – 8422.1	$2s^22p^5 - 2s^22p^4(^1D)3d$	$g^2P^\circ - {}^2S$	$\frac{3}{2} - \frac{1}{2}$		1094,964
	21	11.961	0.0 – 8360.5	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^\circ - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		1094,964
	22	11.974	0.0 – 8353.5	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^\circ - {}^2P$	$\frac{3}{2} - \frac{3}{2}$		1094,964
		11.991	143.980 – 8483.7	$2s^22p^5 - 2s^22p^4(^1D)3d$	$g^2P^\circ - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		1094
	8	12.006	0.0 – 8329.2	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^\circ - {}^4D$	$\frac{3}{2} - \frac{3}{2}$		1094,964
	10	12.042	0.0 – 8304.3	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^\circ - {}^4D$	$\frac{3}{2} - \frac{1}{2}$		1094,964
	10	12.079	143.980 – 8422.1	$2s^22p^5 - 2s^22p^4(^1D)3d$	$g^2P^\circ - {}^2S$	$\frac{1}{2} - \frac{1}{2}$		1094,964
	18	12.112	0.0 – 8256.3	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^\circ - {}^2F$	$\frac{3}{2} - \frac{5}{2}$		1094,964
	15	12.130	0.0 – 8244.0	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^\circ - {}^4P$	$\frac{3}{2} - \frac{3}{2}$		1094,964
	8	12.157	0.0 – 8225.7	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^\circ - {}^4P$	$\frac{3}{2} - \frac{1}{2}$		1094,964
	6	12.181	143.980 – 8353.5	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^\circ - {}^2P$	$\frac{1}{2} - \frac{3}{2}$		1094,964
		12.345	143.980 – 8244.0	$2s^22p^5 - 2s^22p^4(^3P)3d$	$g^2P^\circ - {}^4P$	$\frac{1}{2} - \frac{3}{2}$	Q	1094
	9	12.927	0.0 – 7735.7	$2s^22p^5 - 2s^22p^4(^1D)3s$	$g^2P^\circ - {}^2D$	$\frac{3}{2} - \frac{5}{2}$		1094,964
	5	13.032	0.0 – 7673.3	$2s^22p^5 - 2s^22p^4(^3P)3s$	$g^2P^\circ - {}^2P$	$\frac{3}{2} - \frac{1}{2}$		1094,964
	6	13.075	0.0 – 7648.2	$2s^22p^5 - 2s^22p^4(^3P)3s$	$g^2P^\circ - {}^4P$	$\frac{3}{2} - \frac{3}{2}$		1094,964
		13.135	0.0 – 7613.2	$2s^22p^5 - 2s^22p^4(^3P)3s$	$g^2P^\circ - {}^4P$	$\frac{3}{2} - \frac{1}{2}$		1094
	7	13.161	143.980 – 7742.2	$2s^22p^5 - 2s^22p^4(^1D)3s$	$g^2P^\circ - {}^2D$	$\frac{1}{2} - \frac{3}{2}$		1094,964
	8	13.256	0.0 – 7543.8	$2s^22p^5 - 2s^22p^4(^3P)3s$	$g^2P^\circ - {}^2P$	$\frac{3}{2} - \frac{3}{2}$		1094,964
	5	13.282	143.980 – 7673.3	$2s^22p^5 - 2s^22p^4(^3P)3s$	$g^2P^\circ - {}^2P$	$\frac{1}{2} - \frac{1}{2}$		1094,964
	10	13.309	0.0 – 7513.7	$2s^22p^5 - 2s^22p^4(^3P)3s$	$g^2P^\circ - {}^4P$	$\frac{3}{2} - \frac{5}{2}$		1094,716
		13.39	1202.211 – 8671.+K	$2s2p^6 - 2s2p^5(^3P^\circ)3s$	${}^2S - {}^2P^\circ$	$\frac{1}{2} - \frac{3}{2}$	P	375
	300	83.180	0.0 – 1202.211	$2s^22p^5 - 2s2p^6$	$g^2P^\circ - {}^2S$	$\frac{3}{2} - \frac{1}{2}$	P	1104,1091
	300	94.497	143.980 – 1202.211	$2s^22p^5 - 2s2p^6$	$g^2P^\circ - {}^2S$	$\frac{1}{2} - \frac{1}{2}$	P	1104,1091
		694.54	0.0 – 143.980	$2s^22p^5 - 2s^22p^5$	$g^2P^\circ - g^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$	F,P	1120,1104

NICKEL XXI (Ni^{20+}), Z = 28
Ground State $1s^22s^22p^4(^3P_2)$ (8 electrons)
Ionization Potential [14 160 000] cm^{-1}; [1756] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		8.775	128.290 – 11524.	$2s^22p^4 - 2s^22p^3(^2P^\circ)4d$	$g^3P - {}^3D^\circ$	1 – 2		1094
		8.802	128.290 – 11489.	$2s^22p^4 - 2s^22p^3(^2P^\circ)4d$	$g^3P - {}^3P^\circ$	1 – 1		1094
		8.849	0.0 – 11301.	$2s^22p^4 - 2s^22p^3(^2D^\circ)4d$	$g^3P - {}^3D^\circ$	2 – 3		1094
	10	8.886	128.290 – 11394.	$2s^22p^4 - 2s^22p^3(^2P^\circ)4d$	$g^3P - {}^3D^\circ$	1 – 1	Q	716
		8.960	212.190 – 11373.	$2s^22p^4 - 2s^22p^3(^2P^\circ)4d$	${}^1D - {}^3F^\circ$	2 – 3		1094
	20	9.016	0.0 – 11091.	$2s^22p^4 - 2s^22p^3(^4S^\circ)4d$	$g^3P - {}^3D^\circ$	2 – 3		1094,716

NI XXI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		9.139	128.290 – 11070.	$2s^22p^4 - 2s^22p^3(^4S^\circ)4d$	$g\,^3P - {}^3D^\circ$	1 – 2		1094
	20	11.023	0.0 – 9071.2	$2s^22p^4 - 2s^22p^3(^2P^\circ)3d$	$g\,^3P - {}^1F^\circ$	2 – 3	Q	716
	0	11.073	92.814 – 9123.7	$2s^22p^4 - 2s^22p^3(^2P^\circ)3d$	$g\,^3P - {}^1P^\circ$	0 – 1	Q	716
	20	11.123	0.0 – 8999.8	$2s^22p^4 - 2s^22p^3(^2P^\circ)3d$	$g\,^3P - {}^3P^\circ$	2 – 1	Q	716
	20	11.159	128.290 – 9086.1	$2s^22p^4 - 2s^22p^3(^2P^\circ)3d$	$g\,^3P - {}^1D^\circ$	1 – 2	Q	716
	30	11.203	0.0 – 8924.6	$2s^22p^4 - 2s^22p^3(^2P^\circ)3d$	$g\,^3P - {}^3P^\circ$	2 – 2	Q	716
		11.229	128.290 – 9033.8	$2s^22p^4 - 2s^22p^3(^2P^\circ)3d$	$g\,^3P - {}^3D^\circ$	1 – 2		1094
		11.239	0.0 – 8895.1	$2s^22p^4 - 2s^22p^3(^2D^\circ)3d$	$g\,^3P - {}^1F^\circ$	2 – 3		1094
	30	11.262	212.190 – 9086.1	$2s^22p^4 - 2s^22p^3(^2P^\circ)3d$	$^1D - {}^1D^\circ$	2 – 2	Q	716
		11.272	128.290 – 8999.8	$2s^22p^4 - 2s^22p^3(^2P^\circ)3d$	$g\,^3P - {}^3P^\circ$	1 – 1		1094
		11.288	212.190 – 9071.2	$2s^22p^4 - 2s^22p^3(^2P^\circ)3d$	$^1D - {}^1F^\circ$	2 – 3		634
	40	11.302	0.0 – 8853.5	$2s^22p^4 - 2s^22p^3(^2D^\circ)3d$	$g\,^3P - {}^3D^\circ$	2 – 2		1094,716
		11.310	0.0 – 8850.3	$2s^22p^4 - 2s^22p^3(^2D^\circ)3d$	$g\,^3P - {}^1P^\circ$	2 – 1		634
		11.318	0.0 – 8835.5	$2s^22p^4 - 2s^22p^3(^2D^\circ)3d$	$g\,^3P - {}^3D^\circ$	2 – 3		1094
	214	11.336	0.0 – 8819.3	$2s^22p^4 - 2s^22p^3(^2D^\circ)3d$	$g\,^3P - {}^3P^\circ$	2 – 2		1067
		11.345	0.0 – 8814.5	$2s^22p^4 - 2s^22p^3(^2D^\circ)3d$	$g\,^3P - {}^3P^\circ$	2 – 1		634
		11.416	0.0 – 8759.6	$2s^22p^4 - 2s^22p^3(^2D^\circ)3d$	$g\,^3P - {}^3F^\circ$	2 – 3		634
		11.435	128.290 – 8872.3	$2s^22p^4 - 2s^22p^3(^2D^\circ)3d$	$g\,^3P - {}^3S^\circ$	1 – 1		634
		11.452	212.190 – 8944.3	$2s^22p^4 - 2s^22p^3(^2P^\circ)3d$	$^1D - {}^3F^\circ$	2 – 2		634
		11.478	212.190 – 8924.6	$2s^22p^4 - 2s^22p^3(^2P^\circ)3d$	$^1D - {}^3P^\circ$	2 – 2		1094
		11.517	212.190 – 8895.1	$2s^22p^4 - 2s^22p^3(^2D^\circ)3d$	$^1D - {}^1F^\circ$	2 – 3		1094
		11.539	0.0 – 8666.3	$2s^22p^4 - 2s^22p^3(^4S^\circ)3d$	$g\,^3P - {}^3D^\circ$	2 – 3		1094
		11.656	92.814 – 8672.1	$2s^22p^4 - 2s^22p^3(^4S^\circ)3d$	$g\,^3P - {}^3D^\circ$	0 – 1		634
	20	11.691	212.190 – 8759.6	$2s^22p^4 - 2s^22p^3(^2D^\circ)3d$	$^1D - {}^3F^\circ$	2 – 3	Q	716
	60	11.818	212.190 – 8674.1	$2s^22p^4 - 2s^22p^3(^4S^\circ)3d$	$^1D - {}^3D^\circ$	2 – 2	Q	716
		12.079	128.290 – 8407.1	$2s^22p^4 - 2s^22p^3(^2P^\circ)3s$	$g\,^3P - {}^3P^\circ$	1 – 2		1094
		12.181	212.190 – 8421.8	$2s^22p^4 - 2s^22p^3(^2P^\circ)3s$	$^1D - {}^1P^\circ$	2 – 1		1094
		12.208	0.0 – 8191.3	$2s^22p^4 - 2s^22p^3(^2D^\circ)3s$	$g\,^3P - {}^3D^\circ$	2 – 3		1094
		12.245	128.290 – 8294.9	$2s^22p^4 - 2s^22p^3(^2P^\circ)3s$	$g\,^3P - {}^3P^\circ$	1 – 0		1094
		12.277	0.0 – 8145.3	$2s^22p^4 - 2s^22p^3(^2D^\circ)3s$	$g\,^3P - {}^3D^\circ$	2 – 2		1094
		12.370	128.290 – 8211.0	$2s^22p^4 - 2s^22p^3(^2D^\circ)3s$	$g\,^3P - {}^1D^\circ$	1 – 2		1094
		12.435	0.0 – 8035.0	$2s^22p^4 - 2s^22p^3(^4S^\circ)3s$	$g\,^3P - {}^3S^\circ$	2 – 1		1094
	30	12.472	128.290 – 8145.3	$2s^22p^4 - 2s^22p^3(^2D^\circ)3s$	$g\,^3P - {}^3D^\circ$	1 – 2		1094,716
		12.502	212.190 – 8211.0	$2s^22p^4 - 2s^22p^3(^2D^\circ)3s$	$^1D - {}^1D^\circ$	2 – 2		1094
		12.592	92.814 – 8035.0	$2s^22p^4 - 2s^22p^3(^4S^\circ)3s$	$g\,^3P - {}^3S^\circ$	0 – 1		1094
		12.656	128.290 – 8035.0	$2s^22p^4 - 2s^22p^3(^4S^\circ)3s$	$g\,^3P - {}^3S^\circ$	1 – 1		1094
	50	69.62	0.0 – 1436.35	$2s^22p^4 - 2s2p^5$	$g\,^3P - {}^1P^\circ$	2 – 1		1091
	10	74.43	92.814 – 1436.35	$2s^22p^4 - 2s2p^5$	$g\,^3P - {}^1P^\circ$	0 – 1		1091
	4	76.45	128.290 – 1436.35	$2s^22p^4 - 2s2p^5$	$g\,^3P - {}^1P^\circ$	1 – 1		1091
	30	78.28	1125.98 – 2403.45	$2s2p^5 - 2p^6$	$^3P^\circ - {}^1S$	1 – 0		1091
	250	81.69	212.190 – 1436.35	$2s^22p^4 - 2s2p^5$	$^1D - {}^1P^\circ$	2 – 1		1091
	250	88.81	0.0 – 1125.98	$2s^22p^4 - 2s2p^5$	$g\,^3P - {}^3P^\circ$	2 – 1		1091
	200	93.91	128.290 – 1193.14	$2s^22p^4 - 2s2p^5$	$g\,^3P - {}^3P^\circ$	1 – 0		1091
	375	95.85	0.0 – 1043.27	$2s^22p^4 - 2s2p^5$	$g\,^3P - {}^3P^\circ$	2 – 2		1091
	250	96.79	92.814 – 1125.98	$2s^22p^4 - 2s2p^5$	$g\,^3P - {}^3P^\circ$	0 – 1		1091
	110	97.13	406.75 – 1436.35	$2s^22p^4 - 2s2p^5$	$^1S - {}^1P^\circ$	0 – 1		1091
	150	100.23	128.290 – 1125.98	$2s^22p^4 - 2s2p^5$	$g\,^3P - {}^3P^\circ$	1 – 1		1091
	250	103.40	1436.35 – 2403.45	$2s2p^5 - 2p^6$	$^1P^\circ - {}^1S$	1 – 0		1091
	300	109.29	128.290 – 1043.27	$2s^22p^4 - 2s2p^5$	$g\,^3P - {}^3P^\circ$	1 – 2		1091
	4	109.44	212.190 – 1125.98	$2s^22p^4 - 2s2p^5$	$^1D - {}^3P^\circ$	2 – 1		1091
	80	120.33	212.190 – 1043.27	$2s^22p^4 - 2s2p^5$	$^1D - {}^3P^\circ$	2 – 2		1091
		245.9	0.0 – 406.75	$2s^22p^4 - 2s^22p^4$	$g\,^3P - {}^1S$	2 – 0	F,P	375,1104
		359.1	128.290 – 406.75	$2s^22p^4 - 2s^22p^4$	$g\,^3P - {}^1S$	1 – 0	F,P	375,1120
		471.3	0.0 – 212.190	$2s^22p^4 - 2s^22p^4$	$g\,^3P - {}^1D$	2 – 2	F	1120

Ni XXI — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		514.0	212.190 – 406.75	$2s^22p^4 - 2s^22p^4$	$^1D - ^1S$	2 – 0	F,P	375,1104
		779.5	0.0 – 128.290	$2s^22p^4 - 2s^22p^4$	$g^3P - g^3P$	2 – 1	F	1120
		837.69	92.814 – 212.190	$2s^22p^4 - 2s^22p^4$	$g^3P - ^1D$	0 – 2	F,P	375,1104
		1077.	0.0 – 92.814	$2s^22p^4 - 2s^22p^4$	$g^3P - g^3P$	2 – 0	F,P	375,1104
		1192.	128.290 – 212.190	$2s^22p^4 - 2s^22p^4$	$g^3P - ^1D$	1 – 2	F,P	375,1104

NICKEL XXII (Ni^{21+}), Z = 28
Ground State $1s^22s^22p^3(^4S^\circ_{3/2})$ (7 electrons)
Ionization Potential [15 280 000] cm^{-1}; [1894] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	140	10.791	0.0 – 9267.0	$2s^22p^3 - 2s^22p^2(^3P)3d$	$g^4S^\circ - ^4P$	$\frac{3}{2} - \frac{5}{2}$		1067
	20	10.820	400.12 – 9642.3	$2s^22p^3 - 2s^22p^2(^1S)3d$	$^2P^\circ - ^2D$	$\frac{3}{2} - \frac{5}{2}$		716
	20	10.841	209.38 – 9426.0	$2s^22p^3 - 2s^22p^2(^1D)3d$	$^2D^\circ - ^2D$	$\frac{5}{2} - \frac{5}{2}$	Q	716
		10.94	209.38 – 9350.2	$2s^22p^3 - 2s^22p^2(^3P)3d$	$^2D^\circ - ^2D$	$\frac{5}{2} - \frac{5}{2}$	P	877
	20	11.002	209.38 – 9300.3	$2s^22p^3 - 2s^22p^2(^3P)3d$	$^2D^\circ - ^2F$	$\frac{5}{2} - \frac{7}{2}$	Q	716
		11.170	400.12 – 9350.2	$2s^22p^3 - 2s^22p^2(^3P)3d$	$^2P^\circ - ^2D$	$\frac{3}{2} - \frac{5}{2}$	Q	634
	10	71.48	0.0 – 1398.94	$2s^22p^3 - 2s2p^4$	$g^4S^\circ - ^2P$	$\frac{3}{2} - \frac{3}{2}$		1091
	4	71.54	943.04 – 2340.89	$2s2p^4 - 2p^5$	$^4P - ^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1091
	30	72.52	157.52 – 1536.48	$2s^22p^3 - 2s2p^4$	$^2D^\circ - ^2P$	$\frac{3}{2} - \frac{1}{2}$		1091
	4	74.37	0.0 – 1344.63	$2s^22p^3 - 2s2p^4$	$g^4S^\circ - ^2S$	$\frac{3}{2} - \frac{1}{2}$		1091
	10	74.49	848.10 – 2190.55	$2s2p^4 - 2p^5$	$^4P - ^2P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1091
	4	80.16	943.04 – 2190.55	$2s2p^4 - 2p^5$	$^4P - ^2P^\circ$	$\frac{3}{2} - \frac{3}{2}$		1091
	50	80.55	157.52 – 1398.94	$2s^22p^3 - 2s2p^4$	$^2D^\circ - ^2P$	$\frac{3}{2} - \frac{3}{2}$		1091
	4	81.04	302.45 – 1536.48	$2s^22p^3 - 2s2p^4$	$^2P^\circ - ^2P$	$\frac{1}{2} - \frac{1}{2}$		1091
	250	84.06	209.38 – 1398.94	$2s^22p^3 - 2s2p^4$	$^2D^\circ - ^2P$	$\frac{5}{2} - \frac{3}{2}$		1091
	110	84.24	157.52 – 1344.63	$2s^22p^3 - 2s2p^4$	$^2D^\circ - ^2S$	$\frac{3}{2} - \frac{1}{2}$		1091
	30	85.02	0.0 – 1176.18	$2s^22p^3 - 2s2p^4$	$g^4S^\circ - ^2D$	$\frac{3}{2} - \frac{3}{2}$		1091
	50	85.86	1176.18 – 2340.89	$2s2p^4 - 2p^5$	$^2D - ^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1091
	250	88.00	400.12 – 1536.48	$2s^22p^3 - 2s2p^4$	$^2P^\circ - ^2P$	$\frac{3}{2} - \frac{1}{2}$		1091
	50	91.20	302.45 – 1398.94	$2s^22p^3 - 2s2p^4$	$^2P^\circ - ^2P$	$\frac{1}{2} - \frac{3}{2}$		1091
	150	95.95	302.45 – 1344.63	$2s^22p^3 - 2s2p^4$	$^2P^\circ - ^2S$	$\frac{1}{2} - \frac{1}{2}$		1091
	300	98.16	157.52 – 1176.18	$2s^22p^3 - 2s2p^4$	$^2D^\circ - ^2D$	$\frac{3}{2} - \frac{3}{2}$		1091
	80	98.58	1176.18 – 2190.55	$2s2p^4 - 2p^5$	$^2D - ^2P^\circ$	$\frac{3}{2} - \frac{3}{2}$		1091
	80	100.12	400.12 – 1398.94	$2s^22p^3 - 2s2p^4$	$^2P^\circ - ^2P$	$\frac{3}{2} - \frac{3}{2}$		1091
	300	100.60	209.38 – 1203.46	$2s^22p^3 - 2s2p^4$	$^2D^\circ - ^2D$	$\frac{5}{2} - \frac{5}{2}$		1091
	150	101.31	1203.46 – 2190.55	$2s2p^4 - 2p^5$	$^2D - ^2P^\circ$	$\frac{5}{2} - \frac{3}{2}$		1091
	110	103.31	0.0 – 967.96	$2s^22p^3 - 2s2p^4$	$g^4S^\circ - ^4P$	$\frac{3}{2} - \frac{1}{2}$		1091
	4	105.88	400.12 – 1344.63	$2s^22p^3 - 2s2p^4$	$^2P^\circ - ^2S$	$\frac{3}{2} - \frac{1}{2}$		1091
	375	106.04	0.0 – 943.04	$2s^22p^3 - 2s2p^4$	$g^4S^\circ - ^4P$	$\frac{3}{2} - \frac{3}{2}$		1091
	80	106.16	1398.94 – 2340.89	$2s2p^4 - 2p^5$	$^2P - ^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$		1091
	110	114.45	302.45 – 1176.18	$2s^22p^3 - 2s2p^4$	$^2P^\circ - ^2D$	$\frac{1}{2} - \frac{3}{2}$		1091
	300	117.91	0.0 – 848.10	$2s^22p^3 - 2s2p^4$	$g^4S^\circ - ^4P$	$\frac{3}{2} - \frac{5}{2}$		1091
	30	118.21	1344.63 – 2190.55	$2s2p^4 - 2p^5$	$^2S - ^2P^\circ$	$\frac{1}{2} - \frac{3}{2}$		1091
	50	124.31	1536.48 – 2340.89	$2s2p^4 - 2p^5$	$^2P - ^2P^\circ$	$\frac{1}{2} - \frac{1}{2}$		1091
	30	124.48	400.12 – 1203.46	$2s^22p^3 - 2s2p^4$	$^2P^\circ - ^2D$	$\frac{3}{2} - \frac{5}{2}$		1091
	110	126.32	1398.94 – 2190.55	$2s2p^4 - 2p^5$	$^2P - ^2P^\circ$	$\frac{3}{2} - \frac{3}{2}$		1091
		249.9	0.0 – 400.12	$2s^22p^3 - 2s^22p^3$	$g^4S^\circ - ^2P^\circ$	$\frac{3}{2} - \frac{3}{2}$	F,P	375,1091
		330.6	0.0 – 302.45	$2s^22p^3 - 2s^22p^3$	$g^4S^\circ - ^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$	F,P	375,1091
		412.2	157.52 – 400.12	$2s^22p^3 - 2s^22p^3$	$^2D^\circ - ^2P^\circ$	$\frac{3}{2} - \frac{3}{2}$	F,P	375,1120
		477.6	0.0 – 209.38	$2s^22p^3 - 2s^22p^3$	$g^4S^\circ - ^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$	F	1120
		524.3	209.38 – 400.12	$2s^22p^3 - 2s^22p^3$	$^2D^\circ - ^2P^\circ$	$\frac{5}{2} - \frac{3}{2}$	F,P	375,1091
		634.8	0.0 – 157.52	$2s^22p^3 - 2s^22p^3$	$g^4S^\circ - ^2D^\circ$	$\frac{3}{2} - \frac{3}{2}$	F	1120

Ni XXII — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		689.9	157.52 – 302.45	$2s^22p^3 - 2s^22p^3$	${}^2D^\circ - {}^2P^\circ$	$\frac{3}{2} - \frac{1}{2}$	F,P	375,1091
		1024.	302.45 – 400.12	$2s^22p^3 - 2s^22p^3$	${}^2P^\circ - {}^2P^\circ$	$\frac{1}{2} - \frac{3}{2}$	F,P	375,1091
		1074.	209.38 – 302.45	$2s^22p^3 - 2s^22p^3$	${}^2D^\circ - {}^2P^\circ$	$\frac{5}{2} - \frac{1}{2}$	F,P	375,1091
		1928.	157.52 – 209.38	$2s^22p^3 - 2s^22p^3$	${}^2D^\circ - {}^2D^\circ$	$\frac{3}{2} - \frac{5}{2}$	F,P	375,1120

NICKEL XXIII (Ni^{22+}), Z = 28
Ground State $1s^22s^22p^2({}^3P_0)$ (6 electrons)
Ionization Potential [16 220 000] cm^{-1}; [2011] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	20	10.450	161.99 – 9739.7	$2s^22p^2 - 2s^22p3d$	$g\,{}^3P - {}^3D^\circ$	2 – 3	Q	716
	10	10.49	324.64 – 9857.4	$2s^22p^2 - 2s^22p3d$	${}^1D - {}^1F^\circ$	2 – 3	Q	716
		10.71	941.29 – 10277.7	$2s2p^3 - 2s2p^2({}^4P)3d$	${}^3D^\circ - {}^3F$	3 – 4		877
	20	10.967	109.77 – 9227.7	$2s^22p^2 - 2s^22p3s$	$g\,{}^3P - {}^1P^\circ$	1 – 1		716
	20	11.403	463.77 – 9227.7	$2s^22p^2 - 2s^22p3s$	${}^1S - {}^1P^\circ$	0 – 1	Q	716
	30	12.693	1864.71 – 9739.7	$2p^4 - 2s^22p3d$	${}^3P - {}^3D^\circ$	2 – 3	Q	716
	10	74.07	109.77 – 1459.67	$2s^22p^2 - 2s2p^3$	$g\,{}^3P - {}^1P^\circ$	1 – 1		1091
	4	78.21	586.10 – 1864.71	$2s2p^3 - 2p^4$	${}^5S^\circ - {}^3P$	2 – 2		1091
	10	79.99	0.0 – 1250.54	$2s^22p^2 - 2s2p^3$	$g\,{}^3P - {}^3S^\circ$	0 – 1		1091
	50	87.50	161.99 – 1304.59	$2s^22p^2 - 2s2p^3$	$g\,{}^3P - {}^1D^\circ$	2 – 2		1091
	110	87.66	109.77 – 1250.54	$2s^22p^2 - 2s2p^3$	$g\,{}^3P - {}^3S^\circ$	1 – 1		1091
	10	87.77	941.29 – 2080.63	$2s2p^3 - 2p^4$	${}^3D^\circ - {}^1D$	3 – 2		1091
	80	88.11	324.64 – 1459.67	$2s^22p^2 - 2s2p^3$	${}^1D - {}^1P^\circ$	2 – 1		1091
	30	90.49	894.24 – 1999.42	$2s2p^3 - 2p^4$	${}^3D^\circ - {}^3P$	1 – 1		1091
	10	90.96	900.06 – 1999.42	$2s2p^3 - 2p^4$	${}^3D^\circ - {}^3P$	2 – 1		1091
	150	91.83	161.99 – 1250.54	$2s^22p^2 - 2s2p^3$	$g\,{}^3P - {}^3S^\circ$	2 – 1		1091
	10	92.32	894.24 – 1977.49	$2s2p^3 - 2p^4$	${}^3D^\circ - {}^3P$	1 – 0		1091
	10	92.75	0.0 – 1078.52	$2s^22p^2 - 2s2p^3$	$g\,{}^3P - {}^3P^\circ$	0 – 1		1091
	80	100.42	463.77 – 1459.67	$2s^22p^2 - 2s2p^3$	${}^1S - {}^1P^\circ$	0 – 1		1091
	30	100.50	109.77 – 1104.93	$2s^22p^2 - 2s2p^3$	$g\,{}^3P - {}^3P^\circ$	1 – 2		1091
	300	102.08	324.64 – 1304.59	$2s^22p^2 - 2s2p^3$	${}^1D - {}^1D^\circ$	2 – 2		1091
	4	102.50	1104.93 – 2080.63	$2s2p^3 - 2p^4$	${}^3P^\circ - {}^1D$	2 – 2		1091
	10	103.07	894.24 – 1864.71	$2s2p^3 - 2p^4$	${}^3D^\circ - {}^3P$	1 – 2		1091
	110	103.23	109.77 – 1078.52	$2s^22p^2 - 2s2p^3$	$g\,{}^3P - {}^3P^\circ$	1 – 1		1091
	50	103.67	900.06 – 1864.71	$2s2p^3 - 2p^4$	${}^3D^\circ - {}^3P$	2 – 2		1091
	30	104.70	109.77 – 1064.86	$2s^22p^2 - 2s2p^3$	$g\,{}^3P - {}^3P^\circ$	1 – 0		1091
	375	106.02	161.99 – 1104.93	$2s^22p^2 - 2s2p^3$	$g\,{}^3P - {}^3P^\circ$	2 – 2		1091
	4	107.00	1064.86 – 1999.42	$2s2p^3 - 2p^4$	${}^3P^\circ - {}^3P$	0 – 1		1091
	150	108.27	941.29 – 1864.71	$2s2p^3 - 2p^4$	${}^3D^\circ - {}^3P$	3 – 2		1091
	10	109.06	161.99 – 1078.52	$2s^22p^2 - 2s2p^3$	$g\,{}^3P - {}^3P^\circ$	2 – 1		1091
	80	111.23	1078.52 – 1977.49	$2s2p^3 - 2p^4$	${}^3P^\circ - {}^3P$	1 – 0		1091
	80	111.78	1104.93 – 1999.42	$2s2p^3 - 2p^4$	${}^3P^\circ - {}^3P$	2 – 1		1091
	200	111.86	0.0 – 894.24	$2s^22p^2 - 2s2p^3$	$g\,{}^3P - {}^3D^\circ$	0 – 1		1091
	30	112.55	1459.67 – 2348.17	$2s2p^3 - 2p^4$	${}^1P^\circ - {}^1S$	1 – 0		1091
	110	126.54	109.77 – 900.06	$2s^22p^2 - 2s2p^3$	$g\,{}^3P - {}^3D^\circ$	1 – 2		1091
	10	127.21	1078.52 – 1864.71	$2s2p^3 - 2p^4$	${}^3P^\circ - {}^3P$	1 – 2		1091
	4	127.46	109.77 – 894.24	$2s^22p^2 - 2s2p^3$	$g\,{}^3P - {}^3D^\circ$	1 – 1		1091
	110	128.30	161.99 – 941.29	$2s^22p^2 - 2s2p^3$	$g\,{}^3P - {}^3D^\circ$	2 – 3		1091
	200	128.87	1304.59 – 2080.63	$2s2p^3 - 2p^4$	${}^1D^\circ - {}^1D$	2 – 2		1091
	10	131.60	1104.93 – 1864.71	$2s2p^3 - 2p^4$	${}^3P^\circ - {}^3P$	2 – 2		1091
	30	133.54	1250.54 – 1999.42	$2s2p^3 - 2p^4$	${}^3S^\circ - {}^3P$	1 – 1		1091
	10	137.55	1250.54 – 1977.49	$2s2p^3 - 2p^4$	${}^3S^\circ - {}^3P$	1 – 0		1091

Ni XXIII — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		235.8	161.99 – 586.10	$2s^22p^2 - 2s2p^3$	$g^3P - {}^5S^\circ$	2 – 2	P	375,1091
		282.5	109.77 – 463.77	$2s^22p^2 - 2s^22p^2$	$g^3P - {}^1S$	1 – 0	F,P	375,1091
		308.0	0.0 – 324.64	$2s^22p^2 - 2s^22p^2$	$g^3P - {}^1D$	0 – 2	F,P	375,1120
		331.4	161.99 – 463.77	$2s^22p^2 - 2s^22p^2$	$g^3P - {}^1S$	2 – 0	F,P	375,1120
		465.4	109.77 – 324.64	$2s^22p^2 - 2s^22p^2$	$g^3P - {}^1D$	1 – 2	F	1120
		614.8	161.99 – 324.64	$2s^22p^2 - 2s^22p^2$	$g^3P - {}^1D$	2 – 2	F	1120
		617.3	0.0 – 161.99	$2s^22p^2 - 2s^22p^2$	$g^3P - g^3P$	0 – 2	F,P	375,1120
		718.8	324.64 – 463.77	$2s^22p^2 - 2s^22p^2$	${}^1D - {}^1S$	2 – 0	F,P	375,1120
		911.0	0.0 – 109.77	$2s^22p^2 - 2s^22p^2$	$g^3P - g^3P$	0 – 1	F	1120
		1915.0	109.77 – 161.99	$2s^22p^2 - 2s^22p^2$	$g^3P - g^3P$	1 – 2	F	1120

NICKEL XXIV (Ni^{23+}), Z = 28
Ground State $1s^22s^22p(^2P^\circ_{1/2})$ (5 electrons)
Ionization Potential [17 190 000] cm^{-1}; [2131] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		9.69	0.0 – 10320.	$2s^22p - 2s2p(^3P^\circ)3p$	$g^2P^\circ - {}^2P$	1/2 – 1/2	P	877
		9.74	163.950 – 10431.	$2s^22p - 2s2p(^3P^\circ)3p$	$g^2P^\circ - {}^2P$	3/2 – 3/2	P	877
	0	9.883	843.81 – 10951.	$2s2p^2 - 2s2p(^1P^\circ)3d$	${}^2D - {}^2D^\circ$	3/2 – 5/2	Q	716
		9.90	0.0 – 10101.	$2s^22p - 2s2p(^3P^\circ)3p$	$g^2P^\circ - {}^2D$	1/2 – 3/2	P	877
		9.92	163.950 – 10244.	$2s^22p - 2s2p(^3P^\circ)3p$	$g^2P^\circ - {}^2D$	3/2 – 5/2	P	877
	2	9.933	884.25 – 10951.	$2s2p^2 - 2s2p(^1P^\circ)3d$	${}^2D - {}^2D^\circ$	5/2 – 5/2		1089
	15	9.966	610.08+L – 10644.+L	$2s2p^2 - 2s2p(^3P^\circ)3d$	${}^4P - {}^4D^\circ$	5/2 – 7/2		1089
		10.00	884.25 – 10884.	$2s2p^2 - 2s2p(^1P^\circ)3d$	${}^2D - {}^2F^\circ$	5/2 – 7/2	P	877
		10.10	610.08+L – 10511.+L	$2s2p^2 - 2s2p(^3P^\circ)3d$	${}^4P - {}^4P^\circ$	5/2 – 5/2	P	877
	20	10.195	1143.08 – 10951.	$2s2p^2 - 2s2p(^1P^\circ)3d$	${}^2P - {}^2D^\circ$	3/2 – 5/2	Q	716
	10	10.261	843.81 – 10581.	$2s2p^2 - 2s2p(^3P^\circ)3d$	${}^2D - {}^2F^\circ$	3/2 – 5/2	Q	716
		10.35	884.25 – 10546.	$2s2p^2 - 2s2p(^3P^\circ)3d$	${}^2D - {}^2D^\circ$	5/2 – 5/2	P	877
	10	10.680	1143.08 – 10511.+L	$2s2p^2 - 2s2p(^3P^\circ)3d$	${}^2P - {}^4P^\circ$	3/2 – 5/2	Q	716
	60	11.946	1872.97 – 10244.	$2p^3 - 2s2p(^3P^\circ)3p$	${}^2P^\circ - {}^2D$	3/2 – 5/2	Q	716
	50	87.50	0.0 – 1143.08	$2s^22p - 2s2p^2$	$g^2P^\circ - {}^2P$	1/2 – 3/2		1091
	4	88.54	0.0 – 1129.65	$2s^22p - 2s2p^2$	$g^2P^\circ - {}^2P$	1/2 – 1/2		1091
	110	97.17	843.81 – 1872.97	$2s2p^2 - 2p^3$	${}^2D - {}^2P^\circ$	3/2 – 3/2		1091
	4	98.39	610.08+L – 1626.44	$2s2p^2 - 2p^3$	${}^4P - {}^2D^\circ$	5/2 – 5/2	Q	1091
	10	101.13	884.25 – 1872.97	$2s2p^2 - 2p^3$	${}^2D - {}^2P^\circ$	5/2 – 3/2		1091
	300	102.11	163.950 – 1143.08	$2s^22p - 2s2p^2$	$g^2P^\circ - {}^2P$	3/2 – 3/2		1091
	250	103.43	458.10+L – 1424.94+L	$2s2p^2 - 2p^3$	${}^4P - {}^4S^\circ$	1/2 – 3/2		1091
	110	103.53	163.950 – 1129.65	$2s^22p - 2s2p^2$	$g^2P^\circ - {}^2P$	3/2 – 1/2		1091
	110	104.64	0.0 – 955.73	$2s^22p - 2s2p^2$	$g^2P^\circ - {}^2S$	1/2 – 1/2		1091
	30	106.68	843.81 – 1781.17	$2s2p^2 - 2p^3$	${}^2D - {}^2P^\circ$	3/2 – 1/2		1091
	10	109.03	955.73 – 1872.97	$2s2p^2 - 2p^3$	${}^2S - {}^2P^\circ$	1/2 – 3/2		1091
	50	113.14	541.08+L – 1424.94+L	$2s2p^2 - 2p^3$	${}^4P - {}^4S^\circ$	3/2 – 3/2		1091
	80	118.52	0.0 – 843.81	$2s^22p - 2s2p^2$	$g^2P^\circ - {}^2D$	1/2 – 3/2		1091
	4	121.15	955.73 – 1781.17	$2s2p^2 - 2p^3$	${}^2S - {}^2P^\circ$	1/2 – 1/2		1091
	80	122.72	610.08+L – 1424.94+L	$2s2p^2 - 2p^3$	${}^4P - {}^4S^\circ$	5/2 – 3/2		1091
	10	127.78	843.81 – 1626.44	$2s2p^2 - 2p^3$	${}^2D - {}^2D^\circ$	3/2 – 5/2		1091
	10	134.53	1129.65 – 1872.97	$2s2p^2 - 2p^3$	${}^2P - {}^2P^\circ$	1/2 – 3/2		1091
	50	134.73	884.25 – 1626.44	$2s2p^2 - 2p^3$	${}^2D - {}^2D^\circ$	5/2 – 5/2		1091
	10	135.47	843.81 – 1582.01	$2s2p^2 - 2p^3$	${}^2D - {}^2D^\circ$	3/2 – 3/2		1091
	10	137.01	1143.08 – 1872.97	$2s2p^2 - 2p^3$	${}^2P - {}^2P^\circ$	3/2 – 3/2		1091
	50	138.80	163.950 – 884.25	$2s^22p - 2s2p^2$	$g^2P^\circ - {}^2D$	3/2 – 5/2		1091
	10	143.30	884.25 – 1582.01	$2s2p^2 - 2p^3$	${}^2D - {}^2D^\circ$	5/2 – 3/2		1091

Ni XXIV — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	4	159.69	955.73 - 1582.01	$2s2p^2 - 2p^3$	$^2S - ^2D°$	$\frac{1}{2} - \frac{3}{2}$		1091
		609.9	0.0 - 163.950	$2s^22p - 2s^22p$	$g^2P° - g^2P°$	$\frac{1}{2} - \frac{3}{2}$	F	1120

NICKEL XXV (Ni^{24+}), Z = 28
Ground State $1s^22s^2(^1S_0)$ (4 electrons)
Ionization Potential [18 510 000] cm^{-1}; [2295] eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
	2	9.194	419.19 - 11306.	$1s^22s2p - 1s^22p3p$	$^3P° - ^3S$	1 - 1	Q	1089
	0	9.215	419.19 - 11271.	$1s^22s2p - 1s^22p3p$	$^3P° - ^3P$	1 - 2		643
	5	9.238	378.63 - 11206.	$1s^22s2p - 1s^22p3p$	$^3P° - ^3P$	0 - 1	Q	1089
	11	9.297	549.98 - 11306.	$1s^22s2p - 1s^22p3p$	$^3P° - ^3S$	2 - 1		1057
	16	9.306	549.98 - 11296.	$1s^22s2p - 1s^22p3p$	$^3P° - ^3D$	2 - 3		1057
	12	9.316	419.19 - 11153.	$1s^22s2p - 1s^22p3p$	$^3P° - ^3D$	1 - 2		1057
	15	9.340	0.0 - 10707.	$1s^22s^2 - 1s^22s3p$	$g^1S - ^1P°$	0 - 1		1057
	30	9.355	378.63 - 11068.	$1s^22s2p - 1s^22p3p$	$^3P° - ^3D$	0 - 1		643
	8	9.39	0.0 - 10650.	$1s^22s^2 - 1s^22s3p$	$g^1S - ^3P°$	0 - 1		1057
	10	9.407	848.10 - 11478.	$1s^22s2p - 1s^22s3s$	$^1P° - ^1S$	1 - 0		643
		9.471	848.10 - 11407.	$1s^22s2p - 1s^22p3p$	$^1P° - ^1D$	1 - 2	P	619
	18	9.601	378.63 - 10795.	$1s^22s2p - 1s^22s3d$	$^3P° - ^3D$	0 - 1		1057
	30	9.633	419.19 - 10800.	$1s^22s2p - 1s^22s3d$	$^3P° - ^3D$	1 - 2		1057
	30	9.695	848.10 - 11163.	$1s^22s2p - 1s^22p3p$	$^1P° - ^1P$	1 - 1		643
	18	9.707	1154.73 - 11456.	$1s^22p^2 - 1s^22p3d$	$^3P - ^3P°$	1 - 2		1057
	45	9.744	549.98 - 10812.	$1s^22s2p - 1s^22s3d$	$^3P° - ^3D$	2 - 3		1057
	20	9.753	549.98 - 10800.	$1s^22s2p - 1s^22s3d$	$^3P° - ^3D$	2 - 2		1057
	20	9.759	1208.29 - 11456.	$1s^22p^2 - 1s^22p3d$	$^3P - ^3P°$	2 - 2		1057
	45	9.776	1208.29 - 11437.	$1s^22p^2 - 1s^22p3d$	$^3P - ^3D°$	2 - 3		1057
	60	9.860	1379.65 - 11521.	$1s^22p^2 - 1s^22p3d$	$^1D - ^1F°$	2 - 3		1057
	30	9.873	1208.29 - 11343.	$1s^22p^2 - 1s^22p3d$	$^3P - ^3D°$	2 - 2		1057
	20	9.934	1208.29 - 11270.	$1s^22p^2 - 1s^22p3d$	$^3P - ^3F°$	2 - 3		643
	80	9.967	848.10 - 10878.	$1s^22s2p - 1s^22s3d$	$^1P° - ^1D$	1 - 2		643
	80	10.103	549.98 - 10449.	$1s^22s2p - 1s^22s3s$	$^3P° - ^3S$	2 - 1		643
	10	10.276	1379.65 - 11110.	$1s^22p^2 - 1s^22p3s$	$^1D - ^1P°$	2 - 1		643
	20	10.354	1048.75 - 10707.	$1s^22p^2 - 1s^22s3p$	$^3P - ^1P°$	0 - 1	Q	716
	20	10.529	1611.52 - 11110.	$1s^22p^2 - 1s^22p3s$	$^1S - ^1P°$	0 - 1		643
	10	10.724	1379.65 - 10707.	$1s^22p^2 - 1s^22s3p$	$^1D - ^1P°$	2 - 1	Q	716
	300	117.91	0.0 - 848.10	$1s^22s^2 - 1s^22s2p$	$g^1S - ^1P°$	0 - 1		1091
	30	120.53	549.98 - 1379.65	$1s^22s2p - 1s^22p^2$	$^3P° - ^1D$	2 - 2		1091
	30	126.73	419.19 - 1208.29	$1s^22s2p - 1s^22p^2$	$^3P° - ^3P$	1 - 2		1091
	200	128.85	378.63 - 1154.73	$1s^22s2p - 1s^22p^2$	$^3P° - ^3P$	0 - 1		1091
	10	130.99	848.10 - 1611.52	$1s^22s2p - 1s^22p^2$	$^1P° - ^1S$	1 - 0		1091
	10	135.95	419.19 - 1154.73	$1s^22s2p - 1s^22p^2$	$^3P° - ^3P$	1 - 1		1091
	30	151.90	549.98 - 1208.29	$1s^22s2p - 1s^22p^2$	$^3P° - ^3P$	2 - 2		1091
	4	158.84	419.19 - 1048.75	$1s^22s2p - 1s^22p^2$	$^3P° - ^3P$	1 - 0		1091
	10	165.36	549.98 - 1154.73	$1s^22s2p - 1s^22p^2$	$^3P° - ^3P$	2 - 1		1091
	10	188.13	848.10 - 1379.65	$1s^22s2p - 1s^22p^2$	$^1P° - ^1D$	1 - 2		1091
		238.56	0.0 - 419.19	$1s^22s^2 - 1s^22s2p$	$g^1S - ^3P°$	0 - 1	P	375,1091

NICKEL XXVI (Ni^{25+}), Z = 28
Ground State $1s^22s(^2S_{1/2})$ (3 electrons)
Ionization Potential 19 351 000 cm^{-1}; 2399.2 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		6.811	0.0 – 14682.	$1s^22s - 1s^24p$	$g^2S - ^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$	P	977
		6.821	0.0 – 14661.	$1s^22s - 1s^24p$	$g^2S - ^2P^\circ$	$\frac{1}{2}-\frac{1}{2}$	P	977
		7.006	426.98 – 14700.	$1s^22p - 1s^24d$	$^2P^\circ - ^2D$	$\frac{1}{2}-\frac{3}{2}$	P	977
		7.048	426.98 – 14615.	$1s^22p - 1s^24s$	$^2P^\circ - ^2S$	$\frac{1}{2}-\frac{1}{2}$	P	977
		7.091	604.52 – 14707.	$1s^22p - 1s^24d$	$^2P^\circ - ^2D$	$\frac{3}{2}-\frac{5}{2}$	P	977
		7.138	604.52 – 14615.	$1s^22p - 1s^24s$	$^2P^\circ - ^2S$	$\frac{3}{2}-\frac{1}{2}$	P	977
	14	9.061	0.0 – 11036.	$1s^22s - 1s^23p$	$g^2S - ^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$		1057
	9	9.105	0.0 – 10983.	$1s^22s - 1s^23p$	$g^2S - ^2P^\circ$	$\frac{1}{2}-\frac{1}{2}$		1057
	27	9.390	426.98 – 11077.	$1s^22p - 1s^23d$	$^2P^\circ - ^2D$	$\frac{1}{2}-\frac{3}{2}$		1057
	39	9.535	604.52 – 11092.	$1s^22p - 1s^23d$	$^2P^\circ - ^2D$	$\frac{3}{2}-\frac{5}{2}$		1057
	9	9.55	604.52 – 11077.	$1s^22p - 1s^23d$	$^2P^\circ - ^2D$	$\frac{3}{2}-\frac{3}{2}$		1057
	2	9.564	426.98 – 10880.	$1s^22p - 1s^23s$	$^2P^\circ - ^2S$	$\frac{1}{2}-\frac{1}{2}$	Q	1089
	4	9.732	604.52 – 10880.	$1s^22p - 1s^23s$	$^2P^\circ - ^2S$	$\frac{3}{2}-\frac{1}{2}$		1057
		165.42	0.0 – 604.52	$1s^22s - 1s^22p$	$g^2S - ^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$		730
	85	234.20	0.0 – 426.98	$1s^22s - 1s^22p$	$g^2S - ^2P^\circ$	$\frac{1}{2}-\frac{1}{2}$		730

NICKEL XXVII (Ni^{26+}), Z = 28
Ground State $1s^2(^1S_0)$ (2 electrons)
Ionization Potential 82 990 000 cm^{-1}; 10289.5 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		1.238	0.0 – 80745.	$1s^2 - 1s6p$	$g^1S - ^3P^\circ$	0 – 1	P	728
		1.254	0.0 – 79762.64	$1s^2 - 1s5p$	$g^1S - ^3P^\circ$	0 – 1	P	728
		1.283	0.0 – 77938.24	$1s^2 - 1s4p$	$g^1S - ^3P^\circ$	0 – 1	P	728
		1.350	0.0 – 74076.25	$1s^2 - 1s3p$	$g^1S - ^1P^\circ$	0 – 1	P	728
		1.352	0.0 – 73985.01	$1s^2 - 1s3p$	$g^1S - ^3P^\circ$	0 – 1	P	728
	3	1.588	0.0 – 62961.52	$1s^2 - 1s2p$	$g^1S - ^1P^\circ$	0 – 1	P	856
		1.596	0.0 – 62644.18	$1s^2 - 1s2p$	$g^1S - ^3P^\circ$	0 – 1	P	839
		1.603	0.0 – 62367.86	$1s^2 - 1s2s$	$g^1S - ^3S$	0 – 1	F,P	1105

NICKEL XXVIII (Ni^{27+}), Z = 28
Ground State $1s(^2S_{1/2})$ (1 electron)
Ionization Potential 86 908 200 cm^{-1}; 10775.3 eV

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		1.198	0.0 – 83456.7830	1s – 5p	$^2S - ^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$	P	1042
		1.227	0.0 – 81513.5300	1s – 4p	$^2S - ^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$	P	1042
		1.293	0.0 – 77315.6040	1s – 3p	$^2S - ^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$	P	1042
		1.295	0.0 – 77247.1100	1s – 3p	$^2S - ^2P^\circ$	$\frac{1}{2}-\frac{1}{2}$	P	1042
		1.530	0.0 – 65343.7700	1s – 2p	$^2S - ^2P^\circ$	$\frac{1}{2}-\frac{3}{2}$	P	1042
		1.536	0.0 – 65112.8100	1s – 2p	$^2S - ^2P^\circ$	$\frac{1}{2}-\frac{1}{2}$	P	1042

NI XXVIII — Continued

Multiplet	Rel. Int.	λ_{vac} (in Å)	Levels (in 10^3 cm^{-1})	Configurations	Terms	J - J	Notes	References
		5.453	65118.9400 – 83456.7830	2s – 5p	$^2S - ^2P°$	$\frac{1}{2} - \frac{3}{2}$	P	1042
		5.519	65343.7700 – 83461.5951	2p – 5d	$^2P° - ^2D$	$\frac{3}{2} - \frac{5}{2}$	P	1042
		6.100	65118.9400 – 81513.5300	2s – 4p	$^2S - ^2P°$	$\frac{1}{2} - \frac{3}{2}$	P	1042
		6.181	65343.7700 – 81522.9289	2p – 4d	$^2P° - ^2D$	$\frac{3}{2} - \frac{5}{2}$	P	1042
		8.199	65118.9400 – 77315.6040	2s – 3p	$^2S - ^2P°$	$\frac{1}{2} - \frac{3}{2}$	P	1042
		8.337	65343.7700 – 77337.8641	2p – 3d	$^2P° - ^2D$	$\frac{3}{2} - \frac{5}{2}$	P	1042

D. Magnetic Dipole Lines for Nickel Ions
(Wavelengths, Classifications, and Transition Probabilities)

D. Magnetic Dipole Lines for Nickel Ions

[Excerpted from: V. Kaufman and J. Sugar, J. Phys. Chem. Ref. Data **15**, 321 (1986)]

1. Introduction

The following tables, including the introductory comments, are excerpted from the above cited compilation of observed and predicted wavelengths of magnetic dipole lines arising within ground configurations of the type ns^2np^k ($n=2$ and 3, $k=1$ to 5). The compilation work was done by V. Kaufman and J. Sugar of the National Institute of Standards and Technology (formerly the National Bureau of Standards).

All measured lines that are correctly identified are included. Some are only tentatively classified by the authors, but appear to be reasonable on the basis of predictions along isoelectronic sequences.

Also included is a selected group of electric quadrupole lines (E2) that are frequently observed in ns^2np^2 and ns^2np^4 configurations; these are the ${}^1D_2-{}^1S_0$ transitions.

It will probably be difficult to observe the $nsnp$ (${}^3P_{0,1,2}-{}^1P_1$) transitions in the Be and Mg isoelectronic sequences because the very large electric-dipole transition probability of the $ns^2\,{}^1S_0-nsnp\,{}^1P_1$ resonant transition will tend to rapidly deplete the $nsnp\,{}^1P_1$ level. Similarly, but to a lesser extent, the ${}^3P_0-{}^3P_1$ transition can be expected to be weak because of the $ns^2\,{}^1S_0-nsnp\,{}^3P_1$ transition. However, these magnetic-dipole transitions have been included for the sake of completeness.

Calculations of line strengths and transition probabilities have been made for all of these lines by both relativistic and non-relativistic methods. Preference has been given to the relativistic results. Calculations by both methods for the $n=3$ shell differ on the average by only 5%.[1]

2. Predicted Wavelengths

For the nickel ions, predicted values for the wavelengths of the M1 and E2 lines were obtained from the known energy levels by the Ritz principle of deriving wavelengths from energy differences. Their uncertainties are derived from the reported level uncertainties. The source of data is given in Sec. 7 below.

3. Observed Wavelengths

The most common laboratory source generating copious forbidden lines is the tokamak, which contains a magnetically-confined, high-temperature plasma with an ion density similar to that of the solar corona. By injecting any impurity element, magnetic dipole lines of that element may be seen in stages of ionization determined by the plasma temperature. Most of the nickel data are from tokamak observations. The other wavelength data are from astronomical sources, including gaseous nebulae, stars and the solar corona.

The sources of observed data that have been credited are those providing the best measurements.

4. Predicted Transition Probabilities

In most cases multiconfiguration Dirac-Fock calculations of line strengths are available. These calculations do not generally converge for neutral and singly ionized atoms, but non-relativistic calculations have been made in every such case. Line strengths for the magnetic-dipole lines of the isoelectronic sequences of B I, C I, N I, and F I were taken from Cheng *et al.*[2] Those for the Al I, Si I, and P I sequences were taken from Huang.[3-5] Those for the Cl I sequence, with a few exceptions, are from Huang *et al.*[6] The relativistic calculations are not available for the Be, Mg, and S isoelectronic sequences. The transition probabilities for all magnetic-dipole lines of the Be-like, Mg-like, and S-like ions were therefore calculated in the manner described by Sugar and Kaufman.[1] These are non-relativistic calculations in intermediate coupling. They agree within a few percent with relativistic calculations in the $n=3$ sequences for which both are available.

Line strengths for the electric-quadrupole lines of $2s^22p^k$ (${}^1D_2-{}^1S_0$) [$k=2$] and [$k=4$] are for the carbon and oxygen sequences from Cheng *et al.*[2] The transition probabilities for these lines in the sulfur sequence, $3s^23p^4$, are from Mendoza and Zeippen.[7]

Relations between transition probabilities $A(s^{-1})$ and line strengths S are given explicitly as

$$A = \frac{2.697 \times 10^{13}}{\lambda^3 g}\, S(\mathrm{M1}),$$

$$A = \frac{1.680 \times 10^{18}}{\lambda^5 g}\, S(\mathrm{E2}),$$

where λ is the transition wavelength in Å and g is the $2J+1$ degeneracy of the upper level. S(M1) in Bohr magneton units (μ_B) and S(E2) in atomic units (ea_0^2) are the magnetic-dipole and electric-quadrupole line strengths, respectively.

The magnetic-dipole transition rate in almost all cases is a few orders of magnitude greater than the electric-quadrupole transition rate. The E2 rate has been added the M1 rate in those cases for which the former is greater than 1% of the latter. This is true only for some of the N I ($2p^3$) and P I ($3p^3$) sequence transitions. An asterisk following the transition rate in the tables shows where this occurs.

5. Data Table Information

The tables contain the predicted and observed wavelengths and predicted transition probabilities for magnetic-dipole transitions within ns^2np^k ($k = 1-5$) and $nsnp$ configurations for $n = 2, 3$. The electric quadrupole transition $^1D_2$–$^1S_0$ for $k = 2, 4$ is included because it is frequently observed. The data are presented in order of increasing wavelength. The columns from left to right in order of appearance contain the following information:

Column No.	Description
1	Wavelengths (observed and predicted) in Å below 20 000 Å, and in micrometers (μm) between 2 and 1000 μm. Wavelengths given without units are in Å. Wavelengths in vacuum are given below 2000 Å, in air between 2000 Å and 5 μm, and in vacuum above 5 μm. Each wavelength is followed by its uncertainty in parentheses. Tentative identifications are preceded by "T". E2 transitions are denoted by "Q".
2	Transition probabilities (A) are written as a factor times 10 to a power. The power of ten follows the decimal factor. For example, 2.20 +4 means 2.20×10^4. An asterisk following the transition probability indicates that the E2 rate for the transition is greater than 1% of the M1 rate and has been added to that value.
3	Spectrum.
4	Electronic configuration.
5	Line classification. Lower level is given first.
6	Ionization energy in thousands of electron volts (keV).[8-10]
7	References for observed wavelengths. Definitions of symbols are given in Sec. 8, "References for Observed Wavelengths".

6. References to Text

[1]J. Sugar and V. Kaufman, J. Opt. Soc. Am. B **1**, 218 (1984).
[2]K. T. Cheng, Y. -K. Kim, and J. P. Desclaux, At. Data Nucl. Data Tables **24**, 111 (1979).
[3]K. -N. Huang, private communication (1985).
[4]K. -N. Huang, At. Data Nucl. Data Tables **32**, 503 (1985).
[5]K. -N. Huang, At. Data Nucl. Data Tables **30**, 313 (1984).
[6]K. -N. Huang, Y. -K. Kim, K. T. Cheng, and J. P. Desclaux, At. Data Nucl. Data Tables **28**, 355 (1983).
[7]C. Mendoza and C. J. Zeippen, Mon. Not. R. Astron. Soc. **202**, 981 (1983).
[8]C. E. Moore, Natl. Stand. Ref. Data Ser., Natl. Bur. Stand. (U.S.) 34, for Be through Ar (1970).
[9]J. Sugar and C. Corliss, J. Phys. Chem. Ref. Data **14**, Suppl. 2, for K through Ni (1985).
[10]T. A. Carlson, C. W. Nestor, N. Wasserman and J. D. McDowell, At. Data **2**, 63, for Cu through Mo (1970).

7. Reference for Energy Levels

Sugar, J., and Corliss, C. (1985), J. Phys. Chem. Ref. Data **14**, Suppl. 2.

8. References for Observed Wavelengths

FBM	Finkenthal, M., Bell, R. E., Moos, H. W., and TFR Group [1984], J. Appl. Phys. **56**, 2012.
H	Hinnov, E. (Oct. 1985), private communication.
HSCS	Hinnov, E., Suckewer, S., Cohen, S., and Sato, K. (1982), Phys. Rev. A **25**, 2293.
J	Jefferies, J. T. (1969), Mem. Soc. R. Sci. Liege **17**, 213.
P	Pryce, M. H. L. (1964), Astrophys. J. **140**, 1192.
PSS	Peacock, N. J., Stamp, M. F., and Silver, J. D. (1984), Phys. Scr. **T8**, 10.
SBT	Sandlin, G. D., Brueckner, G. E., and Tousey, R. (1977), Astrophys. J. **214**, 898.
W	Widing, K. G. (1978), Astrophys. J. **222**, 735.

D-3

Magnetic Dipole Lines for Nickel

Wavelength Observed	Wavelength Calculated	A (s^{-1})	Spectrum	Config.	Classification	I.E. (keV)	Ref. (obs. H)
	212.81(16)	6.91 +4	Ni XXV	2s 2p	$^3P_0$ - $^1P_1$	2.30	
	232.89(11)	3.79 +4	Ni XXV	2s 2p	$^3P_1$ - $^1P_1$	2.30	
	249.94(19)	4.60 +4	Ni XXII	$2s^2$ $2p^3$	$^4S_{3/2}$ - $^2P_{3/2}$	1.89	
	282.4(3)	3.02 +5	Ni XXIII	$2s^2$ $2p^2$	$^3P_1$ - $^1S_0$	2.01	
	330.6(4)	7.80 +4	Ni XXII	$2s^2$ $2p^3$	$^4S_{3/2}$ - $^2P_{1/2}$	1.89	
	334.9(4)	2.21 +4	Ni XXV	2s 2p	$^3P_2$ - $^1P_1$	2.30	
	359.1(5)	3.31 +5	Ni XXI	$2s^2$ $2p^4$	$^3P_1$ - $^1S_0$	1.76	
	412.3(5)	1.20 +5	Ni XXII	$2s^2$ $2p^3$	$^2D_{3/2}$ - $^2P_{3/2}$	1.89	
465.4(3)	465.40(17)	4.15 +4	Ni XXIII	$2s^2$ $2p^2$	$^3P_1$ - $^1D_2$	2.01	HSCS
471.15(5)	471.14(6)	4.24 +4	Ni XXI	$2s^2$ $2p^4$	$^3P_2$ - $^1D_2$	1.76	W
477.6(3)	477.6(3)	4.48 +3	Ni XXII	$2s^2$ $2p^3$	$^4S_{3/2}$ - $^2D_{5/2}$	1.89	HSCS
	Q 514.0(8)	1.44 +2	Ni XXI	$2s^2$ $2p^4$	$^1D_2$ - $^1S_0$	1.76	
	524.3(9)	2.99 +4	Ni XXII	$2s^2$ $2p^3$	$^2D_{5/2}$ - $^2P_{3/2}$	1.89	
609.9(3)	609.9(3)	3.94 +4	Ni XXIV	$2s^2$ 2p	$^2P_{1/2}$ - $^2P_{3/2}$	2.13	HSCS
614.8(3)	614.8(3)	3.71 +4	Ni XXIII	$2s^2$ $2p^2$	$^3P_2$ - $^1D_2$	2.01	HSCS
634.8(3)	634.8(3)	4.11 +4	Ni XXII	$2s^2$ $2p^3$	$^4S_{3/2}$ - $^2D_{3/2}$	1.89	HSCS
	689.8(1.5)	9.11 +3	Ni XXII	$2s^2$ $2p^3$	$^2D_{3/2}$ - $^2P_{1/2}$	1.89	
694.64(3)	694.64(3)	5.34 +4	Ni XX	$2s^2$ $2p^5$	$^2P_{3/2}$ - $^2P_{1/2}$	1.65	PSS
	Q 718.1(2.1)	2.37 +1	Ni XXIII	$2s^2$ $2p^2$	$^1D_2$ - $^1S_0$	2.01	
	730.35(16)	5.37 +2	Ni XVII	3s 3p	$^3P_0$ - $^1P_1$	0.57	
	764.6(1.8)	2.87 +4	Ni XXV	2s 2p	$^3P_1$ - $^3P_2$	2.30	
	777.06(19)	3.30 +2	Ni XVII	3s 3p	$^3P_1$ - $^1P_1$	0.57	
779.5(3)	779.48(12)	4.14 +4	Ni XXI	$2s^2$ $2p^4$	$^3P_2$ - $^3P_1$	1.76	HSCS
911.0(3)	911.00(25)	2.07 +4	Ni XXIII	$2s^2$ $2p^2$	$^3P_0$ - $^3P_1$	2.01	HSCS
	928.76(27)	3.26 +2	Ni XVII	3s 3p	$^3P_2$ - $^1P_1$	0.57	
	1025.(5)	5.61 +3	Ni XXII	$2s^2$ $2p^3$	$^2P_{1/2}$ - $^2P_{3/2}$	1.89	
	1033.2(5)	2.50 +3	Ni XV	$3s^2$ $3p^2$	$^3P_1$ - $^1S_0$	0.46	
	1034.9(5)	7.17 +2	Ni XIV	$3s^2$ $3p^3$	$^4S_{3/2}$ - $^2P_{3/2}$	0.43	
1174.72(5)	1174.720(7)	4.66 +2	Ni XIV	$3s^2$ $3p^3$	$^4S_{3/2}$ - $^2P_{1/2}$	0.43	SBT
1191.1(4)	1191.0(3)	1.01 +3	Ni XXI	$2s^2$ $2p^4$	$^3P_1$ - $^1D_2$	1.76	FBM
1277.23(1)	1277.231(18)	2.57 +3	Ni XIII	$3s^2$ $3p^4$	$^3P_1$ - $^1S_0$	0.38	SBT
1866.75(1)	1866.751(17)	8.27 +0*	Ni XIV	$3s^2$ $3p^3$	$^4S_{3/2}$ - $^2D_{5/2}$	0.43	SBT
1917.3(2)	1914.98(21)	1.32 +3	Ni XXIII	$2s^2$ $2p^2$	$^3P_1$ - $^3P_2$	2.01	H
1928.7(3)	1929.(6)	1.03 +3	Ni XXII	$2s^2$ $2p^3$	$^2D_{3/2}$ - $^2D_{5/2}$	1.89	H
	1966.1(1.9)	5.97 +2	Ni XIV	$3s^2$ $3p^3$	$^2D_{3/2}$ - $^2P_{3/2}$	0.43	
	Q 1968.38(4)	1.16 +1	Ni XIII	$3s^2$ $3p^4$	$^1D_2$ - $^1S_0$	0.38	
	Q 2046.5(2.1)	1.34 +1	Ni XV	$3s^2$ $3p^2$	$^1D_2$ - $^1S_0$	0.46	
2085.51(5)	2085.51(3)	1.94 +2	Ni XV	$3s^2$ $3p^2$	$^3P_1$ - $^1D_2$	0.46	SBT
2125.50(2)	2125.500(23)	2.58 +2	Ni XIII	$3s^2$ $3p^4$	$^3P_2$ - $^1D_2$	0.38	SBT
2184.26(5)	2184.259(24)	1.63 +2	Ni XIV	$3s^2$ $3p^3$	$^4S_{3/2}$ - $^2D_{3/2}$	0.43	SBT
	2321.6(2.7)	2.11 +2*	Ni XIV	$3s^2$ $3p^3$	$^2D_{5/2}$ - $^2P_{3/2}$	0.43	

Magnetic Dipole Lines for Nickel – Continued

Wavelength Observed	Wavelength Calculated		A (s^{-1})	Spectrum	Config.	Classification	I.E. (keV)	Ref. (obs. H)
	2467.(19)		1.23 +3	Ni XXV	2s 2p	$^3P_0$ - $^3P_1$	2.30	
	2539.96(5)		1.59 +2	Ni XIV	$3s^2$ $3p^3$	$^2D_{3/2}$ - $^2P_{1/2}$	0.43	
2818.2(3)	2817.7(3)		5.72 +2	Ni XXI	$2s^2$ $2p^4$	$^3P_0$ - $^3P_1$	1.76	HSCS
	2818.01(6)		2.05 +2	Ni XV	$3s^2$ $3p^2$	$^3P_2$ - $^1D_2$	0.46	
3601.1(4)	3600.0(2.6)		1.93 +2	Ni XVI	$3s^2$ 3p	$^2P_{1/2}$ - $^2P_{3/2}$	0.50	J
	3636.50(9)		1.84 +1	Ni XIII	$3s^2$ $3p^4$	$^3P_1$ - $^1D_2$	0.38	
4231.2(4)	4230.9(1.8)		2.37 +2	Ni XII	$3s^2$ $3p^5$	$^2P_{3/2}$ - $^2P_{1/2}$	0.35	J
T 4744.	4756.(10)		1.23 +2	Ni XVII	3s 3p	$^3P_1$ - $^3P_2$	0.57	P
5115.8(4)	5115.81(10)		1.57 +2	Ni XIII	$3s^2$ $3p^4$	$^3P_2$ - $^3P_1$	0.38	J
6701.7(4)	6701.68(22)		5.65 +1	Ni XV	$3s^2$ $3p^2$	$^3P_0$ - $^3P_1$	0.46	J
8024.1(4)	8024.1(5)		2.27 +1	Ni XV	$3s^2$ $3p^2$	$^3P_1$ - $^3P_2$	0.46	J
	8690.(40)		1.11 +1	Ni XIV	$3s^2$ $3p^3$	$^2P_{1/2}$ - $^2P_{3/2}$	0.43	
	12150.(60)		1.00 +1	Ni XVII	3s 3p	$^3P_0$ - $^3P_1$	0.57	
	12815.0(1.2)		4.27 +0	Ni XIV	$3s^2$ $3p^3$	$^2D_{3/2}$ - $^2D_{5/2}$	0.43	
	19.3(4)	μm	5.90 -3	Ni XIII	$3s^2$ $3p^4$	$^3P_1$ - $^3P_0$	0.38	

E. Atomic Energy Levels of Nickel, Ni I through Ni XXVIII

E. Atomic Energy Levels of Nickel, Ni I through Ni XXVIII

[Excerpted from: J. Sugar and C. Corliss, J. Phys. Chem. Ref. Data 14, Suppl. 2 (1985)].

1. Introduction

The following tables, including the introductory comments, are excerpted from the iron-period compilation of atomic energy levels by J. Sugar and C. Corliss (1985) of the Atomic Energy Levels Data Center at the National Institute of Standards and Technology (formerly the National Bureau of Standards).

Generally, only published papers have been used 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 the level values have been derived from the given data.

All energy levels are given in units of cm^{-1}, beginning with a value of zero for the ground level. Ionization energies found in the literature are usually given in eV or cm^{-1}. The conversion factor, 8065.479(21) 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, this calculation was carried out. For a number of the ions, no suitable series are known. In these cases values obtained by Lotz (1967), by a method of successive differences along isoelectronic sequences, have been quoted. Although uncertainties are not provided with these extrapolated values, it is estimated that they are accurate to 0.2% by comparing them with recently determined values.

Nearly all of the data are based on 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.

Included under the heading "Leading Percentages" are the results of calculations that express the eigenvector percentage composition of levels (rounded to the nearest %) in terms of the basis states of a single configuration, or more than one configuration where configuration interaction has been included. First the percentage of the basis state corresponding to the level's name is given; 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. When the first and second resultant terms are the same and sum to ≥40% the first name is given. When the first and second resultant terms are the same but have different parentages, and their share of the eigenvector composition sums to 40% or more, the level will be named as the higher percentage term. In cases where these percentages differ by one or two units (an insignificant difference), either term may be selected for the level name, and the lower percentage may appear first. For the 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 case of Cr, the 1969 results by Roth are adopted. It was intended to use his new 1980 calculations as well, but it was found that the sum of percentages for a number of states exceeded 100 by significant amounts.

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 of 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 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 the following bibliographies were used:

i. Papers cited by Moore (1949, 1952)

ii. C. E. Moore (1968, 1969)

iii. L. Hagan and W. C. Martin (1972)

iv. L. Hagan (1977)

v. R. Zalubas and A. Albright (1980)

vi. Card file of publications since June 1979 maintained by the NBS Atomic Energy Levels Data Center

He I Isoelectronic Sequence

Spectra of K, Ca, Ti, and V were obtained by Aglitskii *et al.* (1974) with a laser-heated plasma in third and fifth orders of a crystal spectrograph. Reference lines of Mg XI and Al XII published by Flemberg (1942) were used, and an uncertainty of ± 0.0005 Å was reported for the lines of the He I isoelectronic sequence, which fall in the range of 2.3 − 3.6 Å. Flemberg's reference wavelengths were in x-units. The equivalence to Å that he used must be increased by 8 parts in 10^5, according to the more recent conversion determined by Deslattes and Henins (1973). With this correction, the data of Aglitskii *et al.* deviate randomly from the calculated wavelengths of Safronova (1981) by ± 0.0008 Å.

In a beam-foil experiment the He-like argon spectrum was observed by Briand et al. (1983a). Their wavelengths for the $1s^2\ {}^1S_0 - 1s2p\ {}^3P_1^\circ$ and ${}^1P_1^\circ$ transitions were 3.9693(3) Å and 3.9491(3) Å, in agreement with the calculated values by Safronova.

The $1s2s\ {}^3S_1 - 1s2p\ {}^3P_2^\circ$ transition has been measured in Ca XIX by Livingston (1983) and in Fe XXV by Buchet *et al.* (1982). The measured wavelengths are 466.78(8) Å for Ca and 271.04(10) Å for Fe. The corresponding energy differences are greater than those predicted by Safronova by 162(37) and 123(136) cm^{-1}, respectively, or 0.07% and 0.03% of the energy difference. A new calculation of these energies by Hata and Grant (1983) predicted values that were 60 cm^{-1} lower in Ca and 154 cm^{-1} lower in Fe than the observed values.

Because of the excellent agreement of Safronova's calculations with the best experimental data available and the paucity of these data, the compilation of this sequence was based on her results. Her calculated energies were quoted for the $1s2s$ and $1s2p$ levels of the He I isoelectronic sequence and for the principal ionization energies (with correction to the Rydberg for finite atomic mass). The observed $1s2s\ {}^3S_1 - 1s2p\ {}^3P_2^\circ$ intervals in Ca XIX mentioned above are incorporated in the respective level lists. For $n = 3-5$ the calculated binding energies reported by Ermolaev and Jones (1974) are subtracted from the binding energy of the ground state by Safronova to arrive at energy level values. The uncertainty in the calculated energy levels and the ionization energies is assumed conservatively to be 2 parts in 10^4, corresponding to the deviations from the Aglitskii *et al.* (corrected) observations. (The deviation from the measurements in Ar is 1 part in 10^4.) The uncertainties in energy differences for levels of the same n-value are estimated to be 2 parts in 10^3. The deviation of the $1s2p\ {}^3P_1^\circ - {}^1P_1^\circ$ intervals measured by Aglitskii *et al.* with resonance lines differ randomly from the calculated values of Safronova by 3%.

The singlet-triplet mixing coefficients for the $1snp\ {}^{1,3}P^\circ$ states are quoted from Ermolaev and Jones.

H I Isoelectronic Sequence

No observations of $1s - np$ transitions have been sufficiently accurate to test the theoretical values. The best measurement available is for the $1s - 2p$ energies for Fe XXVI with an uncertainty of $\pm 5000\ cm^{-1}$, or 1 part in 10^4, by Briand, Tavernier, and Indelicato (1983b). Erickson (1977) has calculated the absolute binding energies for each of the levels through $n = 5$ and for the ns and np states through $n = 13$. An improved calculation of the Lamb-shift effects was reported by Mohr (1983), who gave the energy separations among the $n = 1$ and 2 levels. Gould and Marrus (1983) have measured the Lamb-shift of the $2s\ {}^2S_{1/2}$ state of Ar XVIII, obtaining the value 1264(13) cm^{-1}. Their results agrees with the value 1275.8(0.8) cm^{-1} calculated by Mohr and is three standard deviations lower than Erickson's value of 1301(2) cm^{-1}.

Mohr's results for the energy separations of $n = 1$ and 2 levels have been compiled, and Erickson's for $n = 3-5$ relative to the $2p\ {}^2P_{3/2}^\circ$ level. This increases Erickson's values for the levels, or, equivalently, increases the binding energy of the ground state (the ionization energy). Assuming that the uncertainty in these compiled values is mainly due to the error in the Lamb shift, the fractional error is taken as equal to the experimental fractional error in the Ar measurement. This contribution to the level values relative to the ground state is about 4 parts in 10^6 for the iron period. This is about 10 times the error estimated by Mohr for his calculated $1s - 2p$ intervals. The corresponding intervals calculated by Erickson are lower than those of Mohr by about the same fractional amount.

References for Introduction

Aglitskii, E. V., Boiko, V. A., Zakharov, S. M., Pikuz, S. A., and Faenov, A. Y. (1974), Kvant. Elektron. **1**, 908.

Briand, J. P., Mossé, J. P., Indelicato, P., Chevallier, P., Girard-Vernhet, D., Chetioui, A., Ramos, M. T., and Desclaux, J. P. (1983a), Phys. Rev. **A28**, 1413.

Briand, J. P., Tavernier, M., and Indelicato, P. (1983b), Phys. Rev. Lett. **50**, 832.

Buchet, J. P., Buchet-Poulizac, M. C., Denis, A., Desequelles, J., Druetta, M., Knystautas, E. J., and Lecler, D. (1982), Nucl. Instrum. Meth. **202**, 79.

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.

Corliss, C., and Sugar, J. (1982), Energy Levels of Iron, Fe I through Fe XXVI, J. Phys. Chem. Ref. Data **11**, 135.

CRC Handbook of Chemistry and Physics, 65th Ed. (1984-1985), pp. E-187 to E-313, Line Spectra of the Elements, Ed. by J. Reader and C. H. Corliss (CRC Press, Inc., Boca Raton, FL).

Deslattes, R. D. and Henins, A. (1973), Phys. Rev. Lett. **31**, 972.

Erickson, G. W. (1977), J. Phys. Chem. Ref. Data **6**, 831.

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

Flemberg, H. (1942), Ark. Mat. Astron. Fys. **28**, 1.

Gould, H., and Marrus, R. (1983), Phys. Rev. **28**, 2001.

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

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

Hata, J., and Grant, I. P. (1983), J. Phys. **B16**, 523.

Kelly, R. L. (1985), Atomic and Ionic Spectrum Lines Below 2000 Angstroms Vol. II—Potassium through Zinc, J. Phys. Chem. Ref. Data.

Kelly, R. (1979), Atomic Emission Lines in the Near Ultraviolet; Hydrogen through Krypton, Sections I and II, NASA Technical Memorandum 80268.

Livingston, A. E. (1983), private communication.

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

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

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., and Zalubas, R. (1983), Energy Levels of Silicon, Si I through Si XIV, J. Phys. Chem Ref. Data **12**, 323.

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

Mohr, P. J. (1983), At. Data Nucl. Data Tables, **29**, 453.

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

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

Moore, C. E. (1968), Bibliography on the Analyses of Atomic Spectra, Section 1, Natl. Bur. Stand. (U.S.) Spec. Publ. 306 (U.S. Gov't Printing Office, Washington, DC).

Moore, C. E. (1949), Atomic Energy Levels, Natl. Bur. Stand. (U.S.) Circ. 467, Vol. I (reissued in 1971 as Natl. Bur. Stand. (U.S.) Natl. Stand. Ref. Data Ser. 35, Vol. I).

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.

Roth, C. (1969), J. Res. Natl. Bur. Stand. (U.S.) **73A**, 497.

Roth, C. (1970), J. Res. Natl. Bur. Stand. (U.S.) **74A**, 141.

Roth, C. (1980), At. Nucl. Data Tables **25**, 95.

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

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**, 1097.

Sugar, J., and Corliss, C. (1985), *Atomic Energy Levels of the Iron-Period Elements: Potassium through Nickel*, J. Phys. Chem. Ref. Data 14, Suppl. 2.

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

Ni I

$Z=28$

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^6 3d^8 4s^2\ {}^3F_4$

Ionization energy = 61 600±10 cm^{-1} (7.6375±0.0012 eV)

The analysis of this spectrum is by Russell (1929), with a few changes of interpretation taken from recent theoretical studies. No energy levels have been found since his work 50 years ago. He outlined the previous work in his paper and increased the number of classified lines from 622 to 1071. His line list extends from 1963–18 040 Å.

The spectrum was reobserved by Burns and Sullivan (1947, 1948) with a vacuum arc and a Fabry-Perot interferometer. Three decimal place wavelengths were measured from 2173–8968 Å. From these they derived the three decimal place energy levels with a level uncertainty of ±0.01 cm^{-1}. Except for 10 level values retained from Russell, their values are given here. In the course of their work they measured about 400 lines not previously observed.

The five place g-values from the three lowest terms are from Childs, Fred, and Goodman (1966), Childs and Goodman (1968), and Childs and Greenebaum (1972). The three place g-values are from measurements of M.I.T. Zeeman patterns reported by Lindsley (1942). The remaining (two place) values are from Marvin and Baragar (1933) or Dijkstra (1937).

The percentage compositions of the $J=2$ levels of $3d^8 4s^2$ and $3d^9 4s$ were calculated with configuration interaction by Childs, Fred, and Goodman. Those of $3d^9 4p$, $3d^8 4s4p$, and $3d^7 4s^2 4p$ were calculated with configuration interaction by Roth (1980).

We derived the ionization energy from the three member $3d^9 ns$ series by means of a Ritz formula, giving the value 61 579 cm^{-1}. We added a correction of 21 cm^{-1} obtained from comparisons with a corresponding longer ns-series in Cu I.

References

Burns, K., and Sullivan, F. (1947), Science Studies St. Bonaventure College **13**, No. 3; (1948), ibid. **14**, No. 3.

Childs, W. J., Fred, M., and Goodman, L. S. (1966), Phys. Rev. **141**, 44.

Childs, W. J., and Goodman, L. S. (1968), Phys. Rev. **170**, 136.

Childs, W. J., and Greenebaum, B. (1972), Phys. Rev. **6A**, 105.

Dijkstra, H. (1937), Physica **4**, 81.

Lindsley, C. H. (1942), J. Opt. Soc. Am. **32**, 94.

Marvin, H. H., and Baragar, A. E. (1933), Phys. Rev. **43**, 973.

Roth, C. (1980), At. Data Nucl. Data Tables **25**, 91.

Russell, H. N. (1929), Phys. Rev. **34**, 821.

Ni I

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^8\,4s^2$	$a\,{}^3F$	4	0.000	1.24965			
		3	1 332.153	1.08280			
		2	2 216.519	0.66956	95	1	^1D
$3d^9(^2D)4s$	$a\,{}^3D$	3	204.786	1.33354			
		2	879.813	1.15105	91	9	^1D
		1	1 713.080	0.49804			
$3d^9(^2D)4s$	$a\,{}^1D$	2	3 409.925	1.01297	89	9	^3D
$3d^8\,4s^2$	$b\,{}^1D$	2	13 521.352	1.143	70	26	^3P
$3d^{10}$	$a\,{}^1S$	0	14 728.847				
$3d^8\,4s^2$	$a\,{}^3P$	2	15 609.861	1.356	71	25	^1D
		1	15 734.018	1.497			
		0	16 017.317				
$3d^8\,4s^2$	$a\,{}^1G$	4	22 102.349	0.99			
$3d^8(^3F)4s4p(^3P^\circ)$	$z\,{}^5D^\circ$	4	*25 753.578*	1.51	95		
		3	*26 665.903*	1.495	93		
		2	*27 414.893*	1.494	93		
		1	*27 943.543*	1.486	95		
		0	*28 212.997*		96		

Ni I—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages			
$3d^8(^3F)4s4p(^3P^\circ)$	$z\ ^5G^\circ$	6	27 260.891	1.32	100			
		5	27 580.411	1.276	81		16	$^5F^\circ$
		4	28 068.091	1.171	82		13	$^5F^\circ$
		3	28 578.046	0.945	87		9	$^5F^\circ$
		2	29 013.228	0.364	94		5	$^5F^\circ$
$3d^8(^3F)4s4p(^3P^\circ)$	$z\ ^5F^\circ$	5	28 542.113	1.377	83		15	$3d^8(^3F)4s4p(^3P^\circ)\ ^5G^\circ$
		4	29 084.478	1.288	70		12	$3d^9(^2D)4p\ ^3F^\circ$
		3	29 832.810	1.208	40		26	$3d^9(^2D)4p\ ^3F^\circ$
		2	30 163.140	0.985	76		6	$3d^9(^2D)4p\ ^3D^\circ$
		1	30 392.052	0.006	97			
$3d^9(^2D)4p$	$z\ ^3P^\circ$	2	28 569.210	1.485	91		4	$3d^9(^2D)4p\ ^3D^\circ$
		1	29 500.690	1.426	86		5	$3d^9(^2D)4p\ ^3D^\circ$
		0	30 192.268		96			
$3d^9(^2D)4p$	$z\ ^3F^\circ$	3	29 320.782	1.086	34		27	$3d^9(^2D)4p\ ^3D^\circ$
		4	29 481.020	1.287	74		13	$3d^8(^3F)4s4p(^3P^\circ)\ ^5F^\circ$
		2	30 619.440	0.740	73		16	$3d^8(^3F)4s4p(^3P^\circ)\ ^3F^\circ$
$3d^9(^2D)4p$		3	29 668.918	1.300	30	$^3D^\circ$	30	$3d^8(^3F)4s4p(^3P^\circ)\ ^5F^\circ$
$3d^9(^2D)4p$	$z\ ^3D^\circ$	2	29 888.505	1.044	33		22	$3d^8(^3F)4s4p(^3P^\circ)\ ^3D^\circ$
		1	30 912.838	0.552	51		38	$3d^8(^3F)4s4p(^3P^\circ)\ ^5F^\circ$
$3d^8(^3F)4s4p(^3P^\circ)$	$z\ ^3G^\circ$	5	30 922.763	1.214	95		5	$(^3F)(^3P^\circ)\ ^5G^\circ$
		4	30 979.789	1.052	79		13	$(^3F)(^3P^\circ)\ ^1G^\circ$
		3	31 786.210	0.761	95			
$3d^9(^2D)4p$	$z\ ^1F^\circ$	3	31 031.042	1.048	58		26	$3d^9(^2D)4p\ ^3F^\circ$
$3d^9(^2D)4p$	$z\ ^1D^\circ$	2	31 441.665	1.060	62		13	$3d^8(^3F)4s4p(^3P^\circ)\ ^1D^\circ$
$3d^8(^3F)4s4p(^3P^\circ)$	$^3F^\circ$	4	32 973.414	1.222	77		13	$3d^9(^2D)4p\ ^3F^\circ$
		3	33 112.368	1.193	46		19	$3d^8(^3F)4s4p(^3P^\circ)\ ^3D^\circ$
		2	33 610.916	0.973	42		30	$3d^8(^3F)4s4p(^3P^\circ)\ ^3D^\circ$
$3d^9(^2D)4p$	$z\ ^1P^\circ$	1	32 982.280	1.005	94			
$3d^8(^3F)4s4p(^3P^\circ)$	$y\ ^3D^\circ$	3	33 500.854	1.198	48		23	$3d^8(^3F)4s4p(^3P^\circ)\ ^3F^\circ$
		2	34 163.29	1.19	45		40	$3d^8(^3F)4s4p(^3P^\circ)\ ^3F^\circ$
		1	34 408.574	0.511	62		33	$3d^9(^2D)4p\ ^3D^\circ$
$3d^8(^3F)4s4p(^3P^\circ)$	$z\ ^1G^\circ$	4	33 590.159		79		14	$(^3F)(^3P^\circ)\ ^3G^\circ$
$3d^8(^3F)4s4p(^3P^\circ)$	$y\ ^1F^\circ$	3	35 639.148	1.013	81		8	$(^3F)(^3P^\circ)\ ^3F^\circ$
$3d^8(^3F)4s4p(^3P^\circ)$	$y\ ^1D^\circ$	2	36 600.805	1.013	75		16	$3d^9(^2D)4p\ ^1D^\circ$
$3d^8(^3P)4s4p(^3P^\circ)$	$^5P^\circ$	3	40 361.254		86		11	$(^1D)(^3P^\circ)\ ^3D^\circ$
		2	40 484.282		89		7	
$3d^8(^1D)4s4p(^3P^\circ)$	$^3F^\circ$	4	42 585.296	1.346	52		36	$(^3P)(^3P^\circ)\ ^5D^\circ$
		3	42 767.900	1.218	66		19	$(^3P)(^3P^\circ)\ ^5D^\circ$
		2	42 954.234	0.840	79		6	$(^1D)(^3P^\circ)\ ^3D^\circ$
$3d^9(^2D)5s$	$e\ ^3D$	3	42 605.964	1.34				
		2	42 790.027	1.085				
		1	44 112.192					

Ni I—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages			
$3d^8(^1D)4s4p(^3P^\circ)$	$^3D^\circ$	3	*42 621.048*		42		36	$(^3F)(^1P^\circ)\ ^3D^\circ$
		2	*42 653.723*		66		15	
		1	*42 656.317*	1.320	77		10	
$3d^8(^3F)4s4p(^1P^\circ)$	$^3G^\circ$	5	*43 089.636*	1.226	99			
		4	*44 314.980*	1.182	66		18	$(^3P)(^3P^\circ)\ ^5D^\circ$
		3	*44 565.10*	1.044	55		24	$(^3F)(^1P^\circ)\ ^3F^\circ$
$3d^8(^3F)4s4p(^1P^\circ)$	$^3F^\circ$	4	*43 258.792*	1.247	62		19	$(^3F)(^1P^\circ)\ ^3G^\circ$
		3	*45 281.152*	0.779	45		40	$(^1P)(^1P^\circ)\ ^3G^\circ$
		2	*45 418.858*	0.677	80		7	$(^3F)(^3P^\circ)\ ^3D^\circ$
$3d^8(^1D)4s4p(^3P^\circ)$	$^3P^\circ$	1	*43 464.019*	1.390	64		20	$(^3P)(^3P^\circ)\ ^3P^\circ$
		2	*43 933.428*	1.476	59		18	$(^3P)(^3P^\circ)\ ^5D^\circ$
$3d^8(^3F)4s4p(^1P^\circ)$		3	*43 654.974*	1.243	35	$^3D^\circ$	34	$(^3P)(^3P^\circ)\ ^5D^\circ$
$3d^8(^3P)4s4p(^3P^\circ)$	$^5D^\circ$	3	*44 206.185*		40		26	$(^3F)(^1P^\circ)\ ^3D^\circ$
$3d^9(^2D)5s$	$e\ ^1D$	2	44 262.619	1.09				
$3d^8(^3P)4s4p(^3P^\circ)$		4	*44 336.10*		38	$^5D^\circ$	37	$(^1D)(^3P^\circ)\ ^3F^\circ$
$3d^8(^3F)4s4p(^1P^\circ)$	$^3D^\circ$	2	*44 475.158*	1.155	56		14	$(^1D)(^3P^\circ)\ ^3D^\circ$
		1	*45 122.460*	0.566	69		13	$(^3P)(^3P^\circ)\ ^3D^\circ$
$3d^8(^3P)4s4p(^3P^\circ)$	$x\ ^3P^\circ$	2	*46 522.965*		66		21	$(^3P)(^3P^\circ)\ ^5S^\circ$
		1	*47 208.228*		67		20	$(^1D)(^3P^\circ)\ ^3P^\circ$
		0	*47 686.625*		69		28	$(^1D)(^3P^\circ)\ ^3P^\circ$
$3d^8(^3P)4s4p(^3P^\circ)$	$v\ ^3D^\circ$	3	*47 030.148*	1.331	93			
		2	*47 139.392*	1.209	72		8	$(^3P)(^3P^\circ)\ ^5S^\circ$
		1	*47 424.830*	0.726	83		8	$(^3F)(^1P^\circ)\ ^3D^\circ$
$3d^8(^3P)4s4p(^3P^\circ)$	$^5S^\circ$	2	*47 328.85*		67		12	$(^3P)(^3P^\circ)\ ^3P^\circ$
$3d^8\ 4s(^4F)5s$	$e\ ^5F$	5	48 466.530	1.40				
		4	49 086.030	1.33				
		3	49 777.619	1.23				
		2	50 346.477	0.95				
		1	50 744.593	0.20				
$3d^9(^2D)5p$	$^1F^\circ$	3	*48 671.9*					
$3d^9(^2D)5p$	$^3F^\circ$	4	*48 715.2*					
		2	*50 039.18*					
$3d^9(^2D)5p$	$w\ ^3P^\circ$	2	*48 735.308*					
		1	*49 403.42*					
		0	*50 138.53*					
$3d^8(^3P)4s4p(^3P^\circ)$	$^1P^\circ$	1	*48 817.6*		89		3	$(^1D)(^1P^\circ)\ ^1P^\circ$
$3d^9(^2D)4d$	$e\ ^3S$	1	48 953.344	1.92				
$3d^8(^3P)4s4p(^3P^\circ)$	$^1D^\circ$	2	*49 032.589*		93		4	$(^1D)(^3P^\circ)\ ^3D^\circ$
$3d^9(^2D)4d$	$e\ ^3G$	5	49 158.529	1.20				
		4	49 174.811	1.05				
		3	50 677.599	0.77				

Ni I—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages
$3d^9(^2D)4d$	$e\,^3P$	2	49 159.060	1.43	
		1	49 171.187	1.00	
		0	50 276.354		
$3d^9(^2D)5p$	$^1D^\circ$	2	*49 185.146*		
$3d^9(^2D)4d$	$f\,^3D$	3	49 271.578	1.32	
		2	49 327.845		
		1	50 716.927	0.45	
$3d^9(^2D)4d$	$e\,^3F$	3	49 313.851		
		4	49 332.643		
		2	50 834.435		
$3d^9(^2D)5p$	$^3D^\circ$	3	*49 327.56*		
		2	*50 689.490*		
		1	*50 851.22*		
$3d^9(^2D)5p$		3	*50 142.8*		
$3d^9(^2D)5p$	$x\,^1P^\circ$	1	*50 458.187*		
$3d^8\,4s(^4F)5s$	$f\,^3F$	4	50 466.172	1.27	
		3	51 306.085	1.08	
		2	52 040.568	0.67	
$3d^9(^2D)4d$	$e\,^1P$	1	50 536.742	1.54	
$3d^9(^2D)4d$	$e\,^1G$	4	50 706.310	1.02	
$3d^9(^2D)4d$	$f\,^1D$	2	50 754.137		
$3d^8(^1G)4s4p(^3P^\circ)$	$u\,^3F^\circ$	4	*50 789.5*		94 4 $(^1D)(^3P^\circ)\,^3F^\circ$
		3	*51 124.8*		94
		2	*51 343.80*		93 4 $(^1D)(^3P^\circ)\,^3F^\circ$
$3d^9(^2D)4d$	$e\,^1F$	3	50 832.039		
$3d^8\,4s^2$	$e\,^1S$	0	51 457.285		
$3d^9(^2D)6s$	$g\,^3D$	3	52 197.482		
		2	52 271.716		
		1	53 703.899		
$3d^9(^2D)6s$	$g\,^1D$	2	53 754.036		
$3d^8\,4s(^2F)5s$	$g\,^3F$	4	54 237.136	1.27	
		3	54 251.353	1.00	
		2	55 873.78		
$3d^9(^2D)5d$	$f\,^3S$	1	54 574.64		
$3d^9(^2D)5d$	$f\,^3G$	5	54 659.759		
		4	54 667.928	1.03	
		3	56 172.704		
$3d^9(^2D)5d$	$h\,^3D$	3	54 699.852		
		2	54 732.425		

Ni I—Continued

Configuration	Term	*J*	Level (cm^{-1})	*g*	Leading percentages
$3d^9(^2D)5d$	$h\ ^3F$	4	54 761.346		
		3	54 772.940		
		2	56 274.516		
$3d^8\ 4s(^2F)5s$	$f\ ^1F$	3	55 576.905	1.07	
$3d^9(^2D)5d$	$f\ ^1G$	4	56 183.51		
$3d^9(^2D)5d$	$g\ ^1F$	3	56 262.92		
$3d^8\ 4s(^4F)4d$	$e\ ^3H$	6	56 624.668		
		5	57 677.649		
		4	58 518.11		
$3d^8\ 4s(^4F)4d$	$f\ ^3P$	2	56 710.889		
		1	57 767.83		
		0	58 448.79		
$3d^8\ 4s(^4F)4d$	$i\ ^3F$	4	56 766.523		
		3	57 968.08		
		2	58 629.84		
$3d^8\ 4s(^4F)4d$	$g\ ^3G$	5	56 801.654		
		4	57 789.611		
		3	58 530.35		
$3d^8\ 4s(^4F)4d$	$e\ ^5P$	3	56 821.553		
		2	57 586.7		
		1	58 525.507		
$3d^8\ 4s(^4F)4d$	$e\ ^5D$	4	56 857.933		
		3	57 743.596		
$3d^8\ 4s(^4F)4d$	$e\ ^5H$	7	56 885.249	1.26	
		6	57 762.106		
		5	58 520.923		
		4	59 039.693		
		3	59 188.78		
$3d^8\ 4s(^4F)4d$	$e\ ^5G$	6	56 954.167		
		5	57 829.405		
		3	58 629.55		
		4	58 872.31		
		2	59 118.06		
$3d^8\ 4s(^4F)4d$	$f\ ^5F$	5	56 973.707		
		4	57 810.494		
		3	58 588.168		
		2	58 992.52		
		1	59 226.03		
$3d^8\ 4s(^4F)4d$	$i\ ^3D$	3	57 103.946		
$3d^8\ 4s(^4F)6s$	$g\ ^5F$	5	59 862.756		
Ni II ($^2D_{5/2}$)	***Limit***		**61 600**		
$3d^8\ 4s(^2F)4d$	$j\ ^3F$	4	61 832.47		

Ni I—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages
$3d^8\,4s(^2F)4d$	$h\ ^3G$	5	61 843.28		
$3d^8\,4s(^2F)4d$	$f\ ^3H$	6	61 957.517		
$3d^8\,4s(^4F)5d$	$f\ ^5H$	7	62 782.614		
$3d^8\,4s(^4F)5d$	$f\ ^5G$	6	62 808.03		
$3d^8\,4s(^4F)5d$	$h\ ^5F$	5	62 815.34		

Ni II

$Z=28$

Co I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^6 3d^9\ ^2D_{5/2}$

Ionization energy = 146 541.56±0.2 cm^{-1} (18.16898±0.00005 eV)

This compilation is based on the very extensive analysis by Shenstone (1970, 1971) with recent unpublished additions by him to $4d^8 5g$. He has observed 4300 lines between 700 and 10 000 Å with a hollow cathode discharge and has established 320 even and 336 odd levels. The low configurations $3d^8 4s$ and $3d^7 4s^2$ are nearly complete. Series in $3d^8$ns, *nd*, *nf*, and *ng* were observed. About half of the levels of the complex configuration $3d^7 4s 4p$ are known. Shenstone gave no uncertainty estimate for his level values. We estimate that it is ±0.05 cm^{-1}.

This work has been extended by Brault and Litzén (1983) with infrared observations above 10 000 Å. They found the $3d^8(^3F)6h$ configuration, and made corrections and additions to $3d^8 5f$ and $3d^8 6g$. In $3d^8 5f$ the level $131122.28_{11/2}$ was replaced by $131094.02_{11/2}$, two new levels $131115.15_{3/2}$ and $131131.15_{7/2}$ were added, and the designation of $131124.96_{7/2}$ was changed to $3d^8(^3F_2)5f\ ^2[3]^\circ_{7/2}$. In $3d^8 6g$ a number of new levels were added and some previously reported were discarded. The levels and designations given below for $3d^8 6g$ and $3d^8 6h$ are from Brault and Litzén. The level uncertainties are limited to those of Shenstone's levels on which these new results are based. All percentages for these configurations are reported to be 99 or 100%, but were not given.

The Zeeman effect data are from observations at M.I.T. reported by Lindsley (1942).

The leading percentages given here for the levels of $3d^8 4p$ were calculated by Roth (1969). Those for $3d^8 5p$ and $3d^7 4s 4p$ are from Shadmi and Caspi (1972). These authors given percentage only for cases where the coupling is not pure. Repeating terms of the $3d^7$ parent configuration are distinguished by alphabetic prefixes. In these cases the percentage includes the sum over all contributing seniority states.

We have calculated the compositions of $3d^8 4s$, $5s$, $4d$, $5d$, $4f$, $5f$, $6f$, $5g$, $6g$, and $3d^7 4s^2$ and give the leading percentages.

Shenstone found the limits of the $3d^8 ns$ and *nd* series at 146 532.0 cm^{-1} and of the ng series at 146 541.56 cm^{-1}. He has adopted the latter limit, which is used here.

References

Brault, J. W., and Litzén, U. (1983), Phys. Scr. **28**, 475.
Lindsley, C. H. (1942), J. Opt. Soc. Am. **32**, 387.
Roth, C. (1969), J. Res. Natl. Bur. Stand. **73A**, 125.
Shadmi, Y., and Caspi, E. (1972), J. Res. Natl. Bur. Stand. **76A**, 125.
Shenstone, A. G. (1970), J. Res. Natl. Bur. Stand. **74A**, 801.
Shenstone, A. G. (1971), J. Res. Natl. Bur. Stand. **75A**, 335.

Ni II

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^9$	^2D	5/2	0.00				
		3/2	1 506.94				
$3d^8(^3F)4s$	^4F	9/2	8 393.90	1.355	100		
		7/2	9 330.04	1.244	98	2	$(^3F)\ ^2F$
		5/2	10 115.66	1.023	99	1	$(^3F)\ ^2F$
		3/2	10 663.89	0.397	99	1	$(^1D)\ ^2D$
$3d^8(^3F)4s$	^2F	7/2	13 550.39	1.141	98	2	$(^3F)\ ^4F$
		5/2	14 995.57	0.866	98	1	$(^1D)\ ^2D$
$3d^8(^3P)4s$	^4P	5/2	23 108.28	1.428	54	46	$(^1D)\ ^2D$
		3/2	24 788.20		78	22	
		1/2	24 835.93	2.667	100		
$3d^8(^1D)4s$	^2D	3/2	23 796.18	1.045	75	22	$(^3P)\ ^4P$
		5/2	25 036.38	1.368	53	46	
$3d^8(^3P)4s$	^2P	3/2	29 070.93	1.322	97	3	$(^1D)\ ^2D$
		1/2	29 593.46	0.670	100		
$3d^8(^1G)4s$	^2G	9/2	32 499.53	1.135	100		
		7/2	32 523.54	0.895	100		

Ni II—Continued

Configuration	Term	*J*	Level (cm^{-1})	*g*	Leading percentages		
$3d^7\,4s^2$	^{4}F	9/2	51 045.46		100		
		7/2	52 205.95		100		
		5/2	53 037.93		100		
		3/2	53 601.19		100		
$3d^8(^3F)4p$	^{4}D°	7/2	*51 557.85*	1.420	94		
		5/2	*52 738.45*	1.365	93		
		3/2	*53 634.62*	1.186	94	4	(^{3}P) ^{4}D°
		1/2	*54 176.26*	−0.005	96		
$3d^8(^3F)4p$	^{4}G°	9/2	*53 365.17*	1.156	67	23	(^{3}F) ^{2}G°
		11/2	*53 496.49*	1.305	100		
		7/2	*54 262.63*	1.025	81	10	(^{3}F) ^{4}F°
		5/2	*55 018.71*	0.616	94	5	(^{3}F) ^{4}F°
$3d^8(^3F)4p$	^{4}F°	9/2	*54 557.05*	1.26	80	19	(^{3}F) ^{2}G°
		7/2	*55 417.83*	1.184	76	10	(^{3}F) ^{2}F°
		5/2	*56 075.26*	0.985	87	6	(^{3}F) ^{4}G°
		3/2	*56 424.49*	0.412	95		
$3d^8(^3F)4p$	^{2}G°	9/2	*55 299.65*	1.152	58	32	(^{3}F) ^{4}G°
		7/2	*56 371.41*	0.940	84	8	(^{3}F) ^{4}G°
$3d^8(^3F)4p$	^{2}F°	7/2	*57 080.55*	1.154	81	11	(^{3}F) ^{4}F°
		5/2	*58 493.21*	0.946	74	20	(^{3}F) ^{2}D°
$3d^8(^3F)4p$	^{2}D°	5/2	*57 420.16*	1.116	74	20	(^{3}F) ^{2}F°
		3/2	*58 705.95*	0.795	89	7	(^{1}D) ^{2}D°
$3d^8(^3P)4p$	^{4}P°	5/2	*66 571.34*	1.48	73	20	(^{1}D) ^{2}D°
		3/2	*66 579.71*	1.550	73	12	(^{1}D) ^{2}P°
		1/2	*67 031.02*	2.331	85	11	(^{1}D) ^{2}P°
$3d^8(^1D)4p$	^{2}F°	5/2	*67 694.64*	0.960	84	8	(^{3}P) ^{4}P°
		7/2	*68 131.21*	1.200	86	9	(^{3}P) ^{4}D°
$3d^7\,4s^2$	^{4}P	5/2	67 880.16		100		
		3/2	68 156.57		94	6	^{2}P
		1/2	68 709.76		98	2	
$3d^8(^1D)4p$	^{2}D°	3/2	*68 154.31*	1.02	65	18	(^{3}P) ^{4}P°
		5/2	*68 735.98*	1.264	74	19	(^{3}P) ^{4}P°
$3d^8(^1D)4p$	^{2}P°	1/2	*68 281.62*	1.008	61	23	(^{3}P) ^{2}P°
		3/2	*68 965.65*	1.305	64	15	(^{1}D) ^{2}D°
$3d^7\,4s^2$	^{2}G	9/2	70 358.94		97	3	^{2}H
		7/2	71 457.74		100		
$3d^8(^3P)4p$	^{4}D°	5/2	*70 635.46*	1.325	83	9	(^{3}P) ^{2}D°
		3/2	*70 706.77*	1.190	91	4	(^{3}F) ^{4}D°
		1/2	*70 748.70*		95	4	(^{3}F) ^{4}D°
		7/2	*70 778.12*	1.385	87	9	(^{1}D) ^{2}F°
$3d^8(^3P)4p$	^{2}D°	5/2	*71 770.83*	1.240	87	10	(^{3}P) ^{4}D°
		3/2	*72 375.42*	0.844	82	11	(^{3}P) ^{2}P°
$3d^8(^3P)4p$	^{2}P°	3/2	*72 985.65*	1.326	67	16	(^{1}D) ^{2}P°
		1/2	*73 903.25*	1.039	70	24	(^{1}D) ^{2}P°

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^7\,4s^2$	^{2}P	3/2	73 893.73		85	8	^{2}D2
$3d^8(^3\mathrm{P})4p$	^{2}S°	1/2	*74 283.33*		94	4	(^{1}D) ^{2}P°
$3d^8(^3\mathrm{P})4p$	^{4}S°	3/2	*74 300.93*		97		
$3d^8(^1\mathrm{G})4p$	^{2}H°	9/2	*75 149.48*	0.903	100		
		11/2	*75 721.68*	1.119	100		
$3d^8(^1\mathrm{G})4p$	^{2}F°	7/2	*75 917.63*	1.165	94	4	(^{1}D) ^{2}F°
		5/2	*76 402.03*		95		
$3d^7\,4s^2$	^{2}H	11/2	76 727.36		100		
		9/2	77 736.79		97	3	^{2}G
$3d^7\,4s^2$	^{2}D2	5/2	77 332.47		77	23	^{2}D1
		3/2	78 955.45		72	18	
$3d^8(^1\mathrm{G})4p$	^{2}G°	7/2	*79 823.03*		99		
		9/2	*79 923.88*		100		
$3d^7(^4\mathrm{F})4s4p(^3\mathrm{P}^\circ)$	^{6}F°	11/2	*86 343.21*				
		9/2	*86 870.03*				
		7/2	*87 538.09*				
		5/2	*88 128.56*				
		3/2	*88 582.01*				
		1/2	*88 881.59*				
$3d^7(^4\mathrm{F})4s4p(^3\mathrm{P}^\circ)$	^{6}D°	9/2	*88 171.88*				
		7/2	*89 100.49*				
$3d^7(^4\mathrm{F})4s4p(^3\mathrm{P}^\circ)$	^{6}G°	11/2	*89 460.35*				
		9/2	*89 918.47*				
		7/2	*90 275.30*				
		5/2	*90 526.18?*				
$3d^8(^3\mathrm{F})5s$	^{4}F	9/2	91 800.05	1.350	100		
		7/2	92 325.85	1.188	61	39	(^{3}F) ^{2}F
		5/2	93 390.06	1.02	88	12	(^{3}F) ^{2}F
		3/2	94 067.14	0.392	99	1	(^{1}D) ^{2}D
$3d^7\,4s^2$	2	5/2	92 373.45		100		
		7/2	92 792.08		100		
$3d^8(^3\mathrm{F})5s$	^{2}F	7/2	93 528.44	1.166	61	39	^{4}F
		5/2	94 729.25	0.865	87	12	
$3d^7(^4\mathrm{F})4s4p(^3\mathrm{P}^\circ)$	^{4}F°	9/2	*94 283.94*				
		7/2	*94 705.93*				
		5/2	*95 332.53*				
		3/2	*95 893.76*				
$3d^7(^4\mathrm{F})4s4p(^3\mathrm{P}^\circ)$	^{4}G°	11/2	*94 396.74*				
		9/2	*95 017.71*				
		7/2	*95 573.39*				
		5/2	*96 052.48*				

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages			
$3d^7(^4F)4s4p(^3P^\circ)$	$^4D^\circ$	7/2	*96 535.87*					
		5/2	*97 273.83*					
		3/2	*97 799.66*					
		1/2	*98 122.63*					
$3d^7(^4F)4s4p(^3P^\circ)$	$^2G^\circ$	9/2	*98 276.70*					
		7/2	*99 844.13*					
$3d^8(^3F)4d$	^4D	7/2	98 467.25		90		7	$(^3F)\ ^4F$
		5/2	99 559.33		42		39	$(^3F)\ ^4P$
		1/2	100 010.17		69		16	$(^3F)\ ^4P$
		3/2	100 078.78		49		45	$(^3F)\ ^2P$
$3d^8(^3F)4d$	^4P	5/2	98 561.22		57		40	$(^3P)\ ^4D$
		1/2	100 845.41		66		26	$(^3F)\ ^4D$
		3/2	100 490.95		73		12	$(^3F)\ ^4D$
$3d^8(^3F)4d$	^4H	13/2	98 822.55		100			
		11/2	100 309.29		54		32	$(^3F)\ ^2H$
		9/2	100 332.09		52		22	$(^3F)\ ^2H$
		7/2	101 144.63		62		28	$(^3F)\ ^4G$
$3d^8(^3F)4d$	^2H	11/2	98 969.44		47		45	$(^3F)\ ^4H$
		9/2	101 357.20		55		19	
$3d^8(^3F)4d$	^2P	3/2	99 040.75		44		29	$(^3F)\ ^4D$
		1/2	101 246.16		77		18	$(^3F)\ ^4P$
$3d^8(^3F)4d$	^4G	11/2	99 132.78		78		21	$(^3F)\ ^2H$
		5/2	101 366.14		68		28	$(^3F)\ ^4F$
$3d^8(^3F)4d$	^4F	9/2	99 154.81		63		31	$(^3F)\ ^4G$
		7/2	100 592.98		40		27	$(^3F)\ ^4H$
		3/2	101 258.01		89		8	$(^3F)\ ^4D$
$3d^8(^3F)4d$	^2F	7/2	99 340.55		58		23	$(^3F)\ ^4F$
		5/2	101 247.37		47		31	
$3d^7(^4F)4s4p(^3P^\circ)$	$^2F^\circ$	7/2	*99 418.61*					
		5/2	*100 609.01*					
$3d^8(^3F)4d$	^2G	9/2	99 442.86		45		21	$(^3F)\ ^4F$
		7/2	101 740.27		72		13	$(^3F)\ ^4G$
$3d^8(^3F)4d$		5/2	100 389.52		42	^2F	25	$(^3F)\ ^4F$
$3d^8(^3F)4d$		7/2	100 475.82		34	^4G	34	$(^3F)\ ^2F$
$3d^8(^3F)4d$		9/2	100 619.26		32	^2G	30	$(^3F)\ ^4G$
$3d^7(^4F)4s4p(^3P^\circ)$	$^2D^\circ$	5/2	*101 754.80*					
		3/2	*102 742.74*					
$3d^8(^3F)4d$	^2D	5/2	103 025.58		85		9	$(^3F)\ ^2F$
		3/2	103 663.50		90		4	$(^1D)\ ^2D$

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages			
$3d^8(^3F)5p$	$^4D^\circ$	$7/2$	*103 653.03*					
		$5/2$	*104 503.22*					
		$3/2$	*105 439.85*					
		$1/2$	*106 022.79*					
$3d^8(^3F)5p$	$^2G^\circ$	$9/2$	*104 081.04*		60		32	$^4G^\circ$
		$7/2$	*106 620.53*		58		24	$^4G^\circ$
$3d^8(^3F)5p$	$^4G^\circ$	$11/2$	*104 147.29*					
		$7/2$	*105 499.05*		55		24	$^2G^\circ$
		$9/2$	*105 588.89*		41		38	$^2G^\circ$
		$5/2$	*106 283.16*					
$3d^8(^3F)5p$	$^4F^\circ$	$9/2$	*104 298.23*					
		$5/2$	*105 668.78*		53		24	$^4G^\circ$
		$3/2$	*106 369.30*					
$3d^8(^3F)5p$		$7/2$	*104 646.52*		39	$^4F^\circ$	33	$^2F^\circ$
$3d^8(^3F)5p$	$^2F^\circ$	$7/2$	*105 838.06*		46		32	$^4F^\circ$
		$5/2$	*107 082.21*					
$3d^8(^3F)5p$	$^2D^\circ$	$5/2$	*105 861.19*					
		$3/2$	*107 142.12*					
$3d^7(^4P)4s4p(^3P^\circ)$	$^6D^\circ$	$9/2$	*105 981.50?*					
$3d^8(^1D)5s$	^2D	$5/2$	106 007.89		80		20	$(^3P)\ ^4P$
		$3/2$	106 133.14		87		9	$(^3P)\ ^2P$
$3d^7(^4P)4s4p(^3P^\circ)$	$^4S^\circ$	$3/2$	*107 737.81*					
$3d^8(^3P)5s$	^4P	$5/2$	108 368.05		80		20	$(^1D)\ ^2D$
		$3/2$	108 548.61		94		5	$(^1D)\ ^2D$
		$1/2$	108 763.32		98		2	$(^3P)\ ^2P$
$3d^7(^4P)4s4p(^3P^\circ)$	$^6P^\circ$	$3/2$	*109 038.84*					
$3d^7(^2G)4s4p(^3P^\circ)$	$^4F^\circ$	$9/2$	*109 148.05*					
		$7/2$	*109 846.00*					
		$5/2$	*110 573.36*					
		$3/2$	*111 120.54*					
$3d^8(^3P)5s$	^2P	$3/2$	109 269.83		90		7	$(^1D)\ ^2D$
		$1/2$	109 675.72		98		2	$(^3P)\ ^4P$
		$9/2$	*110 021.92*					
$3d^7(^2G)4s4p(^3P^\circ)$	$^4G^\circ$	$7/2$	*111 783.79*					
$3d^7(^4F)4s4p(^1P^\circ)$	$^4G^\circ$	$11/2$	*112 422.19?*					
		$9/2$	*113 753.04*		67		28	$^4F^\circ$
		$5/2$	*115 108.09*		50		28	$^2F^\circ$
$3d^8(^1D)4d$	^2F	$5/2$	112 686.30		66		13	$(^1D)\ ^2D$
		$7/2$	112 719.75		77		19	$(^3P)\ ^4D$
$3d^8(^1D)4d$	^2D	$3/2$	112 906.93		62		22	$(^3P)\ ^2D$
		$5/2$	113 407.31		55		25	$(^1D)\ ^2F$

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages			
$3d^8(^1D)4d$	^2G	9/2	113 172.96		84		15	$(^3P)\ ^4F$
		7/2	113 177.61		86		10	$(^3P)\ ^2F$
$3d^8(^1D)4d$	^2P	1/2	113 225.06		78		13	$(^3P)\ ^4D$
		3/2	113 408.71		77		13	
$3d^7(^4F)4s4p(^1P^\circ)$	$^4F^\circ$	9/2	113 321.95		63		34	$^4G^\circ$
		5/2	115 120.00?		61		16	$^2F^\circ$
		3/2	115 592.25?		42		30	$^4D^\circ$
$3d^8(^1D)4d$	^2S	1/2	113 623.10		85		10	$(^3P)\ ^4P$
$3d^7\ 4s4p$		7/2	114 052.04		29	$^4G^\circ$	28	$^4F^\circ$
$3d^8(^3P)4d$	^4D	7/2	114 836.63		79		20	$(^1D)\ ^2F$
		5/2	114 874.88		72		19	$(^1D)\ ^2D$
		3/2	114 942.42		79		11	$(^1D)\ ^2P$
		1/2	114 970.19		87		12	$(^1D)\ ^2P$
$3d^7(^2H)4s4p(^3P^\circ)$	$^4G^\circ$	11/2	114 858.88					
		9/2	115 612.88					
		7/2	116 275.81					
		5/2	116 754.93					
$3d^7(^2P)4s4p(^3P^\circ)$	$^2D^\circ$	3/2	114 869.35		62			
		5/2	116 893.98		50		33	$^4D^\circ$
$3d^7(^2G)4s4p(^3P^\circ)$	$^2F^\circ$	7/2	115 000.25		51		22	$^4D^\circ$
$3d^8(^1G)5s$	^2G	9/2	115 081.36		100			
		7/2	115 085.36		100			
$3d^7\ 4s4p$	$^4D^\circ$	7/2	115 209.85		55		18	$^2F^\circ$
$3d^7\ 4s4p$		5/2	115 565.98		32	$^4D^\circ$	25	$^4F^\circ$
$3d^8(^3P)4d$	^4F	9/2	115 739.15		84		15	$(^1D)\ ^2G$
		7/2	115 827.12		82		8	
		5/2	115 956.71		68		13	$(^3P)\ ^2F$
		3/2	116 167.76		97		1	$(^3P)\ ^4P$
		3/2	115 785.06					
$3d^7\ 4s^2$	$^2D1$	5/2	115 870.28		77		23	$^2D2$
$3d^8(^3P)4d$	^2F	7/2	116 145.69		82		11	$(^3P)\ ^4F$
$3d^8(^3P)4d$		5/2	116 191.47		38	^2D	24	$(^3P)\ ^4F$
$3d^8(^3P)4d$	^4P	1/2	116 261.81		86		11	$(^1D)\ ^2S$
		3/2	116 312.34		85		8	$(^1D)\ ^2P$
		5/2	116 732.51		41		28	$(^3P)\ ^2D$
$3d^7\ 4s4p$	$^4D^\circ$	7/2	116 512.06					
$3d^8(^3P)4d$	^2P	1/2	116 786.42		89		7	$(^1D)\ ^2P$
		3/2	116 838.33		91		4	$(^3P)\ ^2D$

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages
$3d^8(^3F)6s$	^4F	9/2	116 833.15		
		7/2	117 074.70		
		5/2	118 314.82		
		3/2	119 100.06		
$3d^7(a\ ^2D)4s4p(^3P°)$	$^4F°$	9/2	*117 573.68*		
		7/2	*117 972.47*		
$3d^7(^2P)4s4p(^3P°)$		3/2	*117 662.11*		37 $^4S°$ 12 $^2D°$
$3d^8(^1D)5p$		3/2	*117 763.91*		36 $^2D°$ 12 $^2P°$
$3d^8(^1D)5p$	$^2D°$	5/2	*117 872.78*		65
$3d^7(^2H)4s4p(^3P°)$	$^2I°$	11/2	*118 248.98*		
		13/2	*119 010.21*		
$3d^8(^3F)6s$	^2F	7/2	118 294.17		
		5/2	119 315.44		
$3d^8(^1D)5p$	$^2F°$	5/2	*118 379.11*		
		7/2	*118 563.39*		
$3d^8(^1D)5p$		3/2	*118 442.81*		37 $^2P°$ 35 $^2D°$
$3d^8(^1D)5p$	$^2P°$	1/2	*118 631.95*		50 29 $3d^74s4p\ ^4D°$
$3d^8(^3F_4)4f$	$^2[1]°$	1/2	*118 774.76*		100
		3/2	*118 809.34?*		87 13 $^2[2]°$
$3d^8(^3F_4)4f$	$^2[7]°$	13/2	*118 803.82*		100
		15/2	*118 848.92*		100
$3d^8(^3F_4)4f$	$^2[2]°$	5/2	*118 828.61*		92 8 $^2[3]°$
		3/2	*118 877.09*		87 13 $^2[1]°$
$3d^8(^3F_4)4f$	$^2[3]°$	7/2	*118 874.11*		97 3 $^2[4]°$
		5/2	*118 897.94*		92 8 $^2[2]°$
$3d^8(^3F_4)4f$	$^2[6]°$	11/2	*118 892.99*		99
		13/2	*118 893.24*		100
$3d^8(^3F_4)4f$	$^2[4]°$	9/2	*118 914.34*		99
		7/2	*118 923.20*		97 3 $^2[3]°$
$3d^8(^3F_4)4f$	$^2[5]°$	9/2	*118 927.02*		99
		11/2	*118 939.53*		99
$3d^8(^3F)5d$	^4D	7/2	119 656.25		84 13 ^4F
		1/2	121 111.90		48 30 ^2P
		3/2	121 115.59		44 34 ^2P
$3d^8(^3F)5d$	^4P	5/2	119 665.29		67 30 ^4D
		1/2	121 925.16		51 43 ^4D
$3d^8(^3F)5d$	^4H	13/2	119 773.60		100
		11/2	121 180.55		59 30 ^2H
		9/2	121 190.34		59 27 ^2H
		7/2	122 047.29		77 18 ^4G

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages			
$3d^8(^3P)5p$	$^4P^{\circ}$	$5/2$	*119 796.98*		51		19	$(^1D)\ ^2D^{\circ}$
		$3/2$	*120 166.52*		36		17	
		$1/2$	*120 316.02*					
$3d^3(^3F)5d$	^4G	$11/2$	119 833.00		53		34	^4H
		$7/2$	121 240.90		42		30	^2F
		$9/2$	121 294.67		43		25	^2G
		$5/2$	122 144.99		59		35	^4F
$3d^8(^3F)5d$	^2H	$11/2$	119 889.47		56		36	^4G
		$9/2$	122 140.71		59		25	^4H
$3d^8(^3F)5d$	^2P	$3/2$	119 909.72		59		18	^4P
		$1/2$	122 112.94?		65		26	^4P
$3d^8(^3F)5d$	^4F	$9/2$	119 913.33		59		34	^4G
		$7/2$	121 317.89		41		30	^2G
		$3/2$	122 084.79		62		26	^4D
$3d^8(^3F)5d$	^2F	$7/2$	120 002.86		60		20	^4F
		$5/2$	122 175.42?		52		20	^2D
$3d^8(^3F)5d$	^2G	$9/2$	120 044.95		58		23	^4F
		$7/2$	122 270.05		61		18	^4G
$3d^8(^3F)5d$		$5/2$	120 144.17		37	^2D	18	^4D
$3d^8(^3F_3)4f$	$^2[1]^{\circ}$	$1/2$	*120 189.55*		60		40	$^2[0]^{\circ}$
		$3/2$	*120 199.18*		88		12	$^2[2]^{\circ}$
$3d^8(^3F_3)4f$	$^2[2]^{\circ}$	$5/2$	*120 203.49*		99		1	$^2[3]^{\circ}$
		$3/2$	*120 222.89*		88		12	$^2[1]^{\circ}$
$3d^8(^3F_3)4f$	$^2[6]^{\circ}$	$11/2$	*120 211.30*		100			
		$13/2$	*120 218.22*		100			
$3d^8(^3F_3)4f$	$^2[3]^{\circ}$	$7/2$	*120 250.17*		98		1	$^2[4]^{\circ}$
		$5/2$	*120 271.97*		99		1	$^2[2]^{\circ}$
$3d^8(^3F_3)4f$	$^2[4]^{\circ}$	$7/2$	*120 268.81*		98		1	$^2[3]^{\circ}$
		$9/2$	*120 281.11*		97		3	$^2[5]^{\circ}$
$3d^8(^3F_3)4f$	$^2[5]^{\circ}$	$11/2$	*120 270.44*		100			
		$9/2$	*120 272.53*		97		3	$^2[4]^{\circ}$
$3d^8(^3P)5p$	$^4D^{\circ}$	$7/2$	*120 903.31*		81			
		$5/2$	*121 325.09*		63		27	$^2D^{\circ}$
		$3/2$	*121 385.80*		54			
		$1/2$	*121 561.06*		83			
$3d^8(^3F_2)4f$	$^2[1]^{\circ}$	$3/2$	*121 042.52*		90		9	$^2[2]^{\circ}$
		$1/2$	*121 090.71*		99			
$3d^8(^3P)5p$		$3/2$	*121 042.57*		35	$^2P^{\circ}$	18	$^2D^{\circ}$
$3d^8(^3P)5p$	$^2D^{\circ}$	$5/2$	*121 050.66*		57		20	$^4D^{\circ}$
$3d^8(^3F)6p$	$^4G^{\circ}$	$11/2$	*121 120.37*					

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages			
$3d^8(^3F_2)4f$	$^2[5]^\circ$	11/2	*121 120.88*		99			
		9/2	*121 125.41*		99			
$3d^8(^3F_2)4f$	$^2[2]^\circ$	5/2	*121 146.98*		94		5	$^2[3]^\circ$
		3/2	*121 161.81*		90		9	$^2[1]^\circ$
$3d^8(^3F_2)4f$	$^2[4]^\circ$	7/2	*121 178.56*		86		13	$^2[3]^\circ$
		9/2	*121 180.54*		99			
$3d^8(^3F_2)4f$	$^2[3]^\circ$	7/2	*121 192.32*		86		13	$^2[4]^\circ$
		5/2	*121 194.14*		94		5	$^2[2]^\circ$
$3d^8(^3F)5d$		5/2	121 227.80		37	^4D	36	^2F
$3d^8(^1G)4d$	^2I	11/2	121 437.68		100			
		13/2	121 476.56		100			
$3d^8(^3P)5p$	$^4S^\circ$	3/2	*121 456.30*		43		23	$^2D^\circ$
$3d^7(^2H)4s4p(^3P^\circ)$	$^2G^\circ$	9/2	*121 692.55*					
		7/2	*121 862.57*					
		3/2	121 699.02					
$3d^8(^3P)5p$		3/2	*121 800.34*		32	$^2P^\circ$	28	$^2D^\circ$
$3d^8(^1G)4d$	^2F	5/2	122 080.25		99			
		7/2	122 086.58		100			
$3d^8(^3F)6p$	$^4F^\circ$	9/2	*122 441.22*					
$3d^8(^1G)4d$	^2H	9/2	122 790.41		100			
		11/2	122 821.63		100			
$3d^8(^3F)6p$	$^4D^\circ$	7/2	*122 812.97*					
$3d^8(^1G)4d$	^2G	9/2	122 837.33		99			
		7/2	122 847.60		100			
$3d^8(^3F)6p$	$^2G^\circ$	9/2	*123 434.60*					
$3d^7(^2H)4s4p(^3P^\circ)$	$^2H^\circ$	9/2	*124 652.00*					
		11/2	*125 003.41*					
$3d^8(^1G)5p$	$^2H^\circ$	9/2	*126 679.98*					
		11/2	*126 857.97*					
$3d^7(^4P)4s4p(^1P^\circ)$	$^4S^\circ$	3/2	*126 738.82*					
$3d^8(^1G)5p$	$^2F^\circ$	7/2	*127 219.57*					
		5/2	*127 331.60*					
$3d^8(^3F)7s$	^4F	9/2	127 867.13					
		7/2	127 991.56					
		5/2	129 294.51					
		3/2	130 135.19					
$3d^8(^1G)5p$	$^2G^\circ$	9/2	*127 885.86*					
		7/2	*127 895.33*					

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^8(^3F_4)5f$	$^2[1]^\circ$	3/2	*128 732.03*		87	13	$^2[2]^\circ$
		1/2	*128 799.64*		100		
$3d^8(^3F_4)5f$	$^2[2]^\circ$	5/2	*128 803.23*		92	8	$^2[3]^\circ$
		3/2	*128 822.23*		87	13	$^2[1]^\circ$
$3d^8(^3F_4)5f$	$^2[7]^\circ$	13/2	*128 818.41*		100		
		15/2	*128 827.05*		100		
$3d^8(^3F_4)5f$	$^2[3]^\circ$	7/2	*128 827.15*		97		
		5/2	*128 853.87*		92	8	$^2[2]^\circ$
$3d^8(^3F_4)5f$	$^2[6]^\circ$	11/2	*128 837.11*		99		
		13/2	*128 855.60*		100		
$3d^8(^3F_4)5f$	$^2[4]^\circ$	9/2	*128 853.91*		100		
		7/2	*128 867.00*		97		
$3d^8(^3F_4)5f$	$^2[5]^\circ$	9/2	*128 862.49*		100		
		11/2	*128 869.89*		100		
$3d^8(^3F_4)5g$	$^2[0]$	1/2	128 937.47		100		
$3d^8(^3F_4)5g$	$^2[1]$	3/2	128 939.76		100		
		1/2	128 939.76		100		
$3d^8(^3F_4)5g$	$^2[2]$	5/2	128 944.36		100		
		3/2	128 944.36		100		
$3d^8(^3F_4)5g$	$^2[8]$	17/2	128 946.17		100		
		15/2	128 946.15		100		
$3d^8(^3F_4)5g$	$^2[3]$	7/2	128 950.84		100		
		5/2	128 950.89		100		
$3d^8(^3F_4)5g$	$^2[4]$	9/2	128 958.34		100		
		7/2	128 958.40		100		
$3d^8(^3F_4)5g$	$^2[7]$	15/2	128 960.74		100		
		13/2	128 960.74		100		
$3d^8(^3F_4)5g$	$^2[5]$	11/2	128 964.63		100		
		9/2	128 964.62		100		
$3d^8(^3F_4)5g$	$^2[6]$	13/2	128 966.51		100		
		11/2	128 966.51		100		
$3d^8(^3F)7s$	^2F	7/2	129 271.72				
		5/2	130 236.26				
$3d^8(^3F)6d$	^4P	5/2	129 284.50				
		3/2	129 479.73				
		1/2	130 710.85				
$3d^8(^3F)6d$	^4D	7/2	129 297.91				
		5/2	129 842.33				
		3/2	130 942.30				

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^8(^3F)6d$	^4H	13/2	129 367.91				
		11/2	129 396.04				
		9/2	130 757.51				
		7/2	131 637.10				
$3d^8(^3F)6d$	^4F	9/2	129 419.58				
		7/2	129 474.27				
		5/2	130 730.53				
		3/2	131 620.45				
$3d^8(^3F)6d$	^4G	11/2	129 424.03				
		9/2	129 503.24				
		7/2	130 815.91				
		5/2	131 670.87				
$3d^7(^4P)4s4p(^1P^\circ)$	$^4D^\circ$	7/2	*129 782.07*				
		5/2	*129 988.05*				
		3/2	*130 331.78*				
		1/2	*130 570.42*				
$3d^8(^3F_3)5f$	$^2[0]^\circ$	1/2	*130 147.87*		51	49	$^2[1]^\circ$
$3d^8(^3F_3)5f$	$^2[1]^\circ$	3/2	*130 174.03*		88	11	$^2[2]^\circ$
$3d^8(^3F_3)5f$	$^2[2]^\circ$	5/2	*130 184.39*		100		
		3/2	*130 197.23*		88	12	$^2[1]^\circ$
$3d^8(^3F_3)5f$	$^2[6]^\circ$	11/2	*130 184.61*		100		
		13/2	*130 187.81*		100		
$3d^8(^3F_3)5f$	$^2[5]^\circ$	11/2	*130 205.62*		100		
		9/2	*130 206.90*		98		
$3d^8(^3F_3)5f$	$^2[3]^\circ$	7/2	*130 208.89*		97		
		5/2	*130 227.52*		100		
$3d^8(^3F_3)5f$	$^2[4]^\circ$	9/2	*130 215.50*		98		
		7/2	*130 225.87*		97		
$3d^8(^3F_3)5g$	$^2[1]$	3/2	130 301.40		100		
		1/2	130 301.40		100		
$3d^8(^3F_3)5g$	$^2[2]$	5/2	130 306.97		99		
		3/2	130 306.97		99		
$3d^8(^3F_3)5g$	$^2[7]$	15/2	130 308.71		100		
		13/2	130 308.71		100		
$3d^8(^3F_3)5g$	$^2[3]$	7/2	130 314.07		99		
		5/2	130 314.07		99		
$3d^8(^3F_3)5g$	$^2[4]$	9/2	130 320.97		100		
		7/2	130 320.94		100		
$3d^8(^3F_3)5g$	$^2[6]$	11/2	130 321.73		99		
		13/2	130 321.73		99		
$3d^8(^3F_3)5g$	$^2[5]$	11/2	130 324.72		100		
		9/2	130 324.72		100		

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^8(^3F)7p$	$^4F^\circ$	$9/2$	*130 470.90*				
$3d^8(^3F)7p$	$^4D^\circ$	$7/2$	*130 480.55*				
$3d^8(^3F)7p$	$^4G^\circ$	$11/2$	*130 661.32*				
$3d^8(^3F)6d$	^2P	$3/2$	130 691.35				
		$1/2$	131 655.83				
$3d^8(^3F)6d$	^2H	$11/2$	130 751.03				
		$9/2$	131 686.56				
$3d^8(^3F)6d$	^2F	$7/2$	130 765.26				
		$5/2$	131 796.26				
$3d^8(^3F)6d$	^2G	$9/2$	130 801.33				
		$7/2$	131 750.73				
$3d^8(^1D)6s$	^2D	$5/2$	130 900.65				
		$3/2$	130 942.36				
$3d^8(^3F)6d$	^2D	$5/2$	131 032.01				
$3d^8(^3F_2)5f$	$^2[1]^\circ$	$1/2$	*131 063.85*		99		
		$3/2$	*131 075.78*		87	12	$^2[2]^\circ$
$3d^8(^3F_2)5f$	$^2[5]^\circ$	$9/2$	*131 093.30*		99		
		$11/2$	*131 094.02*		99		
$3d^8(^3F_2)5f$	$^2[2]^\circ$	$5/2$	*131 103.18*		91	8	$^2[3]^\circ$
		$7/2$	*131 115.15*		89	10	
$3d^8(^3F_2)5f$	$^2[4]^\circ$	$9/2$	*131 115.28*		99		
		$7/2$	*131 131.15*		66	33	$^2[3]^\circ$
$3d^8(^3F_2)5f$	$^2[3]^\circ$	$7/2$	*131 124.96*		66	33	$^2[4]^\circ$
		$5/2$	*131 133.58*		91	8	$^2[2]^\circ$
$3d^8(^3F_2)5g$	$^2[2]^\circ$	$5/2$	131 211.85		99	1	$(^1D_2)\ ^2[2]$
		$3/2$	131 211.85		99	1	
$3d^8(^3F_2)5g$	$^2[6]^\circ$	$13/2$	131 218.56		99		
		$11/2$	131 218.56		99		
$3d^8(^3F_2)5g$	$^2[3]^\circ$	$7/2$	131 222.98		99		
		$5/2$	131 222.98		99		
$3d^8(^3F_2)5g$	$^2[4]^\circ$	$9/2$	131 232.83		99		
		$7/2$	131 232.83		99		
$3d^8(^3F_2)5g$	$^2[5]^\circ$	$11/2$	131 233.31		99		
		$9/2$	131 233.31		99		
$3d^7(^2G)4s4p(^1P^\circ)$	$^2H^\circ$	$11/2$	*131 424.32?*				
		$9/2$	*132 311.98?*				
$3d^7(^4P)4s4p(^1P^\circ)$	$^4P^\circ$	$5/2$	*131 834.94*				
		$1/2$	*132 120.70*				
		$3/2$	*132 225.15*				

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^8(^3F)7p$	$^2G°$	9/2	*131 928.77*				
$3d^8(^1D_2)4f$	$^2[3]°$	5/2	*132 729.48*		82	16	$(^3P_2)\ ^2[3]°$
		7/2	*132 869.16*		75	14	$(^3P_2)\ ^2[3]°$
$3d^8(^1D_2)4f$	$^2[4]°$	9/2	*132 818.16*		83	16	$(^3P_2)\ ^2[4]°$
		7/2	*132 846.53*		75	15	$(^3P_2)\ ^2[4]°$
$3d^8(^1D_2)4f$	$^2[2]°$	5/2	*132 912.15*		83	15	$(^3P_2)\ ^2[2]°$
		3/2	*132 927.97*		83	15	$(^3P_2)\ ^2[2]°$
$3d^8(^1D_2)4f$	$^2[1]°$	3/2	*132 982.51*		84	16	$(^3P_2)\ ^2[1]°$
		1/2	*133 001.47*				
$3d^8(^1D_2)4f$	$^2[5]°$	11/2	*133 014.08*		83	16	$(^3P_2)\ ^2[5]°$
		9/2	*133 031.00*		83	16	$(^3P_2)\ ^2[5]°$
$3d^7(^2G)4s4p(^1P°)$	$^2F°$	7/2	*133 169.92*				
		5/2	*134 208.30*				
$3d^7(^2F)4s4p(^3P°)$	$^4F°$	3/2	*133 190.19?*				
		5/2	*133 209.30*				
		7/2	*133 528.02*				
		9/2	*133 853.04*				
$3d^8(^3P)6s$	^4P	5/2	133 443.89				
		3/2	133 613.99				
		1/2	133 857.73				
$3d^7(^2G)4s4p(^1P°)$	$^2G°$	9/2	*133 445.75*				
		7/2	*134 380.82*				
$3d^7(^2F)4s4p(^3P°)$	$^4G°$	11/2	*133 625.96*				
$3d^8(^3F)8s$	^4F	9/2	133 715.13				
		7/2	133 809.76				
		5/2	135 116.72				
		3/2	135 983.22				
$3d^8(^1D)5d$	^2F	7/2	133 734.98		81	13	$(^3P)\ ^4D$
		5/2	133 735.26		68	14	$(^1D)\ ^2D$
$3d^7(^2F)4s4p(^3P°)$	$^4D°$	7/2	*133 850.83*				
		5/2	*133 973.33*				
		3/2	*134 156.28*				
		1/2	*134 283.76*				
$3d^8(^3P)6s$	^2P	3/2	133 862.21				
		1/2	134 241.96				
$3d^8(^1D)5d$	^2D	3/2	133 903.00		80	7	$(^3P)\ ^2D$
		5/2	134 053.05		69	16	$(^1D)\ ^2F$
$3d^8(^1D)5d$	^2G	9/2	133 922.91		83	16	$(^3P)\ ^4F$
		7/2	133 929.88		84	11	$(^3P)\ ^2F$
$3d^8(^1D)5d$	^2P	1/2	133 954.85		82	8	$(^3P)\ ^2P$
		3/2	134 067.76		84	9	$(^3P)\ ^4P$

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^8(^3F_4)6f$	$^2[7]^\circ$	13/2	*134 238.44*		100		
		15/2	*134 251.30*		100		
$3d^8(^3F_4)6f$	$^2[1]^\circ$	3/2	*134 249.72*		87	13	$^2[2]^\circ$
$3d^8(^3F_4)6f$	$^2[3]^\circ$	7/2	*134 252.85*		97	3	$^2[4]^\circ$
		5/2	*134 294.99*		91	9	$^2[2]^\circ$
$3d^8(^3F_4)6f$	$^2[2]^\circ$	3/2	*134 254.69*		87	13	$^2[1]^\circ$
		5/2	*134 256.05*		91	9	$^2[3]^\circ$
$3d^8(^3F_4)6f$	$^2[4]^\circ$	7/2	*134 262.07*		97	3	$^2[3]^\circ$
		9/2	*134 271.59*		100		
$3d^8(^3F_4)6f$	$^2[6]^\circ$	13/2	*134 267.20*		100		
		11/2	*134 274.62*		99	1	$^2[5]^\circ$
$3d^8(^3F_4)6f$	$^2[5]^\circ$	11/2	*134 281.66*		99	1	$^2[6]^\circ$
		9/2	*134 286.38*		100		
$3d^8(^3F_4)6g$	$^2[0]$	1/2	134 320.12		100		
$3d^8(^3F_4)6g$	$^2[1]$	1/2	134 321.35		100		
		3/2	134 321.36		100		
$3d^8(^3F_4)6g$	$^2[2]$	5/2	134 323.86		100		
		3/2	134 323.88		100		
$3d^8(^3F_4)6g$	$^2[8]$	15/2	134 325.08		100		
		17/2	134 325.14		100		
$3d^8(^3F_4)6g$	$^2[3]$	7/2	134 327.52		100		
		5/2	134 327.58		100		
$3d^8(^3F_4)6g$	$^2[4]$	9/2	134 331.78		100		
		7/2	134 331.88		100		
$3d^8(^3F_4)6g$	$^2[7]$	13/2	134 333.36		100		
		15/2	134 333.40		100		
$3d^8(^3F_4)6g$	$^2[5]$	11/2	134 335.47		100		
		9/2	134 335.49		100		
$3d^8(^3F_4)6g$	$^2[6]$	11/2	134 336.63		100		
		13/2	134 336.66		100		
$3d^8(^3F_4)6h$	$^2[1]^\circ$	1/2,3/2	134 336.81				
$3d^8(^3F_4)6h$	$^2[2]^\circ$	3/2,5/2	134 338.35				
$3d^8(^3F_4)6h$	$^2[9]^\circ$	17/2,19/2	134 339.71				
$3d^8(^3F_4)6h$	$^2[3]^\circ$	5/2,7/2	134 340.42				
$3d^8(^3F_4)6h$	$^2[4]^\circ$	7/2,9/2	134 342.69				
$3d^8(^3F_4)6h$	$^2[8]^\circ$	15/2,17/2	134 344.32				
$3d^8(^3F_4)6h$	$^2[5]^\circ$	9/2,11/2	134 344.87				

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^8(^3F_4)6h$	$^2[6]^\circ$	$^{11}/_2,^{13}/_2$	134 346.30				
$3d^8(^3F_4)6h$	$^2[7]^\circ$	$^{13}/_2,^{15}/_2$	134 346.34				
$3d^8(^3F)7d$	^4D	$^7/_2$	134 527.24				
		$^5/_2$	134 978.47				
		$^3/_2$	136 054.50				
$3d^8(^3F)7d$	^4P	$^5/_2$	134 539.37				
		$^3/_2$	134 670.07				
$3d^8(^3F)7d$	^4H	$^{13}/_2$	134 583.07				
		$^{11}/_2$	134 597.43				
		$^9/_2$	135 960.08				
		$^7/_2$	136 895.36?				
$3d^8(^3F)7d$	^4F	$^9/_2$	134 607.37				
		$^7/_2$	134 642.09				
		$^5/_2$	135 901.96				
		$^3/_2$	136 852.44				
$3d^8(^3F)7d$	^4G	$^{11}/_2$	134 614.55				
		$^9/_2$	134 658.60				
		$^7/_2$	135 986.06				
		$^5/_2$	136 899.34				
$3d^7(^2F)4s4p(^3P^\circ)$	$^2D^\circ$	$^5/_2$	*134 783.14*				
		$^3/_2$	*134 964.78*				
$3d^7(^2P)4s4p(^1P^\circ)$	$^2P^\circ$	$^1/_2$	*135 053.14*				
		$^3/_2$	*135 382.53*				
$3d^8(^3F)8s$	^2F	$^7/_2$	135 100.45				
		$^5/_2$	136 050.53				
$3d^7(^2P)4s4p(^1P^\circ)$	$^2D^\circ$	$^5/_2$	*135 258.92*				
		$^3/_2$	*136 461.10*				
$3d^8(^3F)8p$	$^4G^\circ$	$^9/_2$	*135 261.99*				
		$^{11}/_2$	*135 338.01*				
$3d^8(^3P_2)4f$	$^2[4]^\circ$	$^7/_2$	*135 400.67*		46	37	$(^3P_2)\ ^2[3]^\circ$
		$^9/_2$	*135 435.26*		83	16	$(^1D_2)\ ^2[4]^\circ$
$3d^8(^3P_2)4f$	$^2[3]^\circ$	$^7/_2$	*135 444.47*		46	38	$(^3P_2)\ ^2[4]^\circ$
		$^5/_2$	*135 461.55*		71	14	$(^1D_2)\ ^2[3]^\circ$
		$^7/_2$	*135 464.86*				
$3d^8(^3P_2)4f$	$^2[2]^\circ$	$^3/_2$	*135 493.26*		82	13	$(^1D_2)\ ^2[2]^\circ$
		$^5/_2$	*135 512.92*		71	12	$(^3P_2)\ ^2[3]^\circ$
$3d^8(^3P_2)4f$	$^2[5]^\circ$	$^{11}/_2$	*135 538.61?*		84	16	$(^1D_2)\ ^2[5]^\circ$
		$^9/_2$	*135 580.25*		84	16	$(^1D_2)\ ^2[5]^\circ$
		$^9/_2$	*135 558.80*				
$3d^8(^3F_3)6f$	$^2[1]^\circ$	$^1/_2$	*135 599.00*		59	41	$^2[0]^\circ$
		$^3/_2$	*135 619.91*		86	14	$^2[2]^\circ$

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^8(^3F_3)6f$	$^2[6]°$	$^{11}/_2$	*135 606.20*		100		
		$^{13}/_2$	*135 606.30*		100		
$3d^8(^3F_3)6f$	$^2[2]°$	$^5/_2$	*135 618.08*		100		
		$^3/_2$	*135 623.59*		85	14	$^2[1]°$
$3d^8(^3F_3)6f$	$^2[3]°$	$^7/_2$	*135 622.60*		97	3	$^2[4]°$
		$^5/_2$	*135 630.63*		100		
$3d^8(^3F_3)6f$	$^2[5]°$	$^9/_2$	*135 628.41*		96	4	$^2[4]°$
		$^{11}/_2$	*135 645.10*		100		
$3d^8(^3F_3)6f$	$^2[4]°$	$^7/_2$	*135 629.40*		97	3	$^2[3]°$
		$^9/_2$	*135 640.53*		96	4	$^2[5]°$
$3d^8(^3P_2)4f$	$^2[1]°$	$^3/_2$	*135 652.93*		84	16	$(^1D_2)\ ^2[1]°$
		$^1/_2$	*135 670.49*		84	16	$(^1D_2)\ ^2[1]°$
$3d^8(^3F_3)6g$	$^2[1]$	$^1/_2$	135 682.28		100		
		$^3/_2$	135 682.29		100		
$3d^8(^3F_3)6g$	$^2[2]$	$^3/_2$	135 685.36		100		
		$^5/_2$	135 685.43		100		
$3d^8(^3F_3)6g$	$^2[7]$	$^{13}/_2$	135 686.63		100		
		$^{15}/_2$	135 686.67		100		
$3d^8(^3F_3)6g$	$^2[3]$	$^7/_2$	135 689.44		99		
		$^5/_2$	135 689.47		99		
$3d^8(^3F_3)6g$	$^2[4]$	$^9/_2$	135 693.38		100		
		$^7/_2$	135 693.45				
$3d^8(^3F_3)6g$	$^2[6]$	$^{11}/_2$	135 694.01		100		
		$^{13}/_2$	135 694.04		100		
$3d^8(^3F_3)6g$	$^2[5]$	$^{11}/_2$	135 695.63		100		
		$^9/_2$	135 695.64		100		
$3d^8(^3F_3)6h$	$^2[3]°$	$^5/_2,^7/_2$	*135 700.04*				
$3d^8(^3F_3)6h$	$^2[8]°$	$^{15}/_2,^{17}/_2$	*135 700.68*				
$3d^8(^3F_3)6h$	$^2[4]°$	$^7/_2,^9/_2$	*135 703.44*				
$3d^8(^3F_3)6h$	$^2[7]°$	$^{13}/_2,^{15}/_2$	*135 704.83*				
$3d^8(^3F_3)6h$	$^2[5]°$	$^9/_2,^{11}/_2$	*135 705.68*				
$3d^8(^3F_3)6h$	$^2[6]$	$^{11}/_2,^{13}/_2$	*135 706.06*				
$3d^7(^2F)4s4p(^3P°)$	$^2G°$	$^7/_2$	*135 746.06*				
		$^9/_2$	*136 076.26*				
$3d^8(^3P_1)4f$	$^2[2]°$	$^3/_2$	*135 746.13*		93	4	$(^1D_2)\ ^2[2]°$
$3d^8(^3P_1)4f$	$^2[3]°$	$^5/_2$	*135 849.41*		100		
		$^7/_2$	*135 879.41*		100		

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages		
$3d^8(^3F)7d$	^2F	7/2	135 944.40				
		5/2	136 959.86				
$3d^8(^3P_0)4f$	$^2[3]°$	7/2	*135 954.09*		99		
		5/2	*136 122.61*		99		
$3d^8(^3F)7d$	^2H	11/2	135 956.01				
		9/2	136 880.56				
$3d^8(^3F)7d$	^2G	9/2	135 977.31				
		7/2	136 936.82				
$3d^8(^3F)7d$	^2D	5/2	136 031.43				
$3d^8(^3P)5d$	^4D	7/2	136 201.46		81	16	$(^1D)\ ^2F$
		5/2	136 288.60		77	14	$(^1D)\ ^2D$
		1/2	136 290.83?		91	8	$(^1D)\ ^2P$
		3/2	136 327.55		83	7	$(^1D)\ ^2D$
$3d^8(^1D)6p$	$^2F°$	7/2	*136 392.85*				
$3d^8(^3F_2)6f$	$^2[5]°$	11/2	*136 508.20*		99	1	$(^1D_2)\ ^2[5]°$
		9/2	*136 524.42*		99	1	$(^1D_2)\ ^2[5]°$
$3d^8(^3F_2)6f$	$^2[1]°$	1/2	*136 517.20*		99	1	$(^1D_2)\ ^2[1]°$
		3/2	*136 531.26*		85	14	$(^3F_2)\ ^2[2]°$
$3d^8(^3P)5d$	^4F	9/2	136 519.28		84	16	$(^1D)\ ^2G$
		7/2	136 589.35		62	24	$(^3P)\ ^2F$
		5/2	136 766.49		74	17	$(^3P)\ ^2D$
$3d^8(^3F_2)6f$	$^2[4]°$	7/2	*136 542.28*		68	31	$(^3F_2)\ ^2[3]°$
		9/2	*136 546.50*		99	1	$(^1D_2)\ ^2[4]°$
$3d^8(^3F_2)6f$	$^2[3]°$	7/2	*136 547.13*		68	31	$^2[4]°$
		5/2	*136 548.55*		89	10	$^2[2]°$
$3d^8(^3F_2)6g$	$^2[6]$	11/2	136 595.99		100		
		13/2	136 596.01		100		
$3d^8(^3F_2)6g$	$^2[3]$	5/2	136 598.31		100		
		7/2	136 598.37		100		
$3d^8(^3F_2)6g$	$^2[4]$	9/2	136 604.02		99		
		7/2	136 604.04		100		
$3d^8(^3F_2)6g$	$^2[5]$	9/2	136 604.38		100		
		11/2	136 604.38		100		
$3d^8(^3F_2)6h$	$^2[3]°$	5/2,7/2	*136 609.26*				
$3d^8(^3F_2)6h$	$^2[7]°$	13/2,15/2	*136 609.93*				
$3d^8(^3F_2)6h$	$^2[4]°$	7/2,9/2	*136 612.27*				
$3d^8(^3F_2)6h$	$^2[6]°$	11/2,13/2	*136 614.71*				
$3d^8(^3F_2)6h$	$^2[5]°$	9/2,11/2	*136 614.89*				

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages
$3d^8(^3F)8p$	$^2G^\circ$	9/2	*136 673.64*		
		7/2	*137 562.74*		
$3d^8(^3P)5d$	^4P	1/2	136 725.33		82 12 $(^1D)\ ^2S$
		5/2	136 960.75		58 37 $(^3P)\ ^2F$
$3d^8(^3P)5d$		3/2	136 732.74		31 ^2D 31 $(^3P)\ ^4P$
$3d^8(^3P)5d$		3/2	136 899.33		38 ^4F 37 ^4P
$3d^8(^3F)7d$	^2P	1/2	136 955.28		
$3d^8(^3F)9s$	^4F	9/2	137 188.58		
		7/2	137 236.28		
		5/2	138 575.69		
		3/2	139 456.75		
$3d^8(^3P)5d$	^2P	1/2	137 211.93		85 8 $(^1D)\ ^2P$
		3/2	137 278.22?		67 19 $(^3P)\ ^2D$
$3d^8(^3F_4)7f$	$^2[2]^\circ$	5/2	*137 519.23*		
$3d^8(^3F_4)7f$	$^2[7]^\circ$	15/2	*137 519.63*		
$3d^8(^3F_4)7f$	$^2[3]^\circ$	7/2	*137 523.51*		
		5/2	*137 526.73*		
$3d^8(^3F_4)7f$	$^2[6]^\circ$	13/2	*137 529.37*		
		11/2	*137 535.83*		
$3d^8(^3F_4)7f$	$^2[4]^\circ$	9/2	*137 531.18*		
		7/2	*137 535.96*		
$3d^8(^3F_4)7g$	$^2[8]$	15/2	137 568.00		
		17/2	137 568.02		
$3d^8(^3F_4)7g$	$^2[6]$	13/2	137 573.19		
		11/2	137 573.19		
$3d^8(^3F_4)7g$	$^2[5]$	11/2	137 575.14		
$3d^8(^3F)8d$	^4P	5/2	137 706.71		
$3d^8(^3F)8d$	^4D	7/2	137 707.26		
		5/2	138 014.53		
$3d^8(^3F)8d$	^4H	13/2	137 735.22		
		11/2	137 742.95		
$3d^8(^3F)8d$	^4F	9/2	137 753.87		
		7/2	137 776.55		
$3d^8(^3F)8d$	^4G	11/2	137 754.78		
		9/2	137 782.50?		
$3d^8(^3F)9p$	$^4F^\circ$	9/2	*138 121.88*		
$3d^7(^2F)4s4p(^1P^\circ)$	$^2G^\circ$	9/2	*138 495.84?*		

Ni II—Continued

Configuration	Term	J	Level (cm^{-1})	g	Leading percentages
$3d^8(^3F)9s$	^2F	$7/2$	138 563.71		
		$5/2$	139 492.10		
$3d^8(^3P)6p$	$^4D°$	$7/2$	*138 841.00*		
$3d^8(^3F_3)7f$	$^2[6]°$	$13/2$	*138 888.93*		
$3d^8(^3F_3)7g$	$^2[7]$	$15/2$	138 928.70		
$3d^8(^3F)8d$	^2H	$11/2$	139 103.05		
$3d^8(^3F_2)7g$	$^2[6]$	$13/2$	139 834.24		
$3d^8(^1G)6s$	^2G	$9/2$	140 006.17		
		$7/2$	140 008.76		
Ni III ($^3F_4$)	*Limit*		**146 541.56**		

Ni III

$Z=28$

Fe I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^6 3d^8\ {}^3F_4$

Ionization energy = 283 800±200 cm^{-1} (35.19±0.02 eV)

This analysis has been made by Shenstone (1954) and extended by Garcia-Riquelme (1958) who has also provided unpublished results.

Shenstone's line list includes the range 600–3000 Å. The spectrum has been reobserved and extended by Garcia-Riquelme and Velasco (1955) in the range 2300–8600 Å.

Some of Shenstone's identifications in $3d^7 4p$ have been changed by Roth (1968) in his theoretical study. He calculated the percentage compositions of the $3d^7 4p$ terms.

The $3d^8$ and $3d^7 4s$ configurations have been studied theoretically by Shadmi (1962) and by Shadmi, Caspi, and Oreg (1969). The leading percentages of the $3d^8$ levels are taken from Pasternak and Goldschmidt (1972).

Some changes in the $3d^7 4s\ {}^3P$ and ${}^3D$ levels suggested by Shadmi (1962) and agreed to by Shenstone are incorporated in this compilation.

Garcia-Riquelme has provided new terms for the known configurations $3d^8$, $3d^7 4s$, and $3d^7\ 4p$ and has extended the analysis further with the discovery of terms from the configurations $3d^6 4s^2$, $3d^7 4d$, $3d^7 5p$, $3d^7 4f$, $3d^7 6s$, $3d^7 5d$, and $3d^7 5g$. With her new measurements, she has determined values for all levels above the ground configuration and has calculated percentage compositions for $3d^7 4d$, $4f$, $5p$, $5d$, and $5g$. In a few cases, we have changed her designations to correspond with her percentages. The uncertainty of the level values is ±0.1 cm^{-1}.

In all the calculations, the percentages for the two ${}^2D$ states of $3d^7$, distinguished by seniority, include the sum of contributions from both states. They are distinguished by the prefixes A and B.

Her value for the ionization energy determined from the $3d^7({}^4F)ns$ (n =4,5,6) series is quoted here.

References

Garcia-Riquelme, O., and Velasco, R. (1955), An. R. Soc. Esp. Fis. Quim. **A51**, 41.

Garcia-Riquelme, O. (1958), J. Opt. Soc. Am. **48**, 183.

Pasternak, A., and Goldschmidt, Z. B. (1972), Phys. Rev. **A6**, 55.

Roth, C. (1968), J. Res. Natl. Bur. Stand. **72A**, 505.

Shadmi, Y. (1962), Bull. Res. Council Israel **10F**, 109.

Shadmi, Y., Caspi, E., and Oreg, J. (1969), J. Res. Natl. Bur. Stand. **73A**, 173.

Shenstone, A. G. (1954), J. Opt. Soc. Am. **44**, 749.

Ni III

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^8$	${}^3F$	4	0.0	100		
		3	1 360.7	100		
		2	2 269.6	99		
$3d^8$	${}^1D$	2	14 031.6	83	16	${}^3P$
$3d^8$	${}^3P$	2	16 661.6	84	16	${}^1D$
		1	16 977.8	100		
		0	17 230.7	100		
$3d^8$	${}^1G$	4	23 108.7	100		
$3d^8$	${}^1S$	0	52 532.0	100		
$3d^7({}^4F)4s$	${}^5F$	5	53 703.93			
		4	54 657.83			
		3	55 406.29			
		2	55 952.21			
		1	56 308.24			
$3d^7({}^4F)4s$	${}^3F$	4	61 338.58			
		3	62 605.58			
		2	63 471.93			

Ni III—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^7(^4P)4s$	^5P	3	71 067.35			
		2	71 384.10			
		1	71 842.42			
$3d^7(^2G)4s$	^3G	5	75 123.65			
		4	75 646.61			
		3	76 237.25			
$3d^7(^4P)4s$	^3P	2	78 303.54	47	53	$(^2P)\ ^3P$
		1	78 482.43	52	35	
		0	78 657.55	48	46	
$3d^7(^2P)4s$	^3P	2	79 143.01	47	53	$(^4P)\ ^3P$
		1	79 749.22	56	39	
		0	80 621.10	43	51	
$3d^7(^2G)4s$	^1G	4	79 250.11			
$3d^7(^2H)4s$	^3H	6	81 686.80			
		5	82 193.80			
		4	82 826.40			
$3d^7(a\ ^2D)4s$	^3D	3	82 172.60			
		1	82 277.26	54	41	$(^2P)\ ^1P$
		2	83 033.45			
$3d^7(^2P)4s$	^1P	1	84 604.10	48	40	$(a\ ^2D)\ ^1D$
$3d^7(^2H)4s$	^1H	5	85 834.20			
$3d^7(a\ ^2D)4s$	^1D	2	86 645.88			
$3d^7(^2F)4s$	^3F	2	97 841.60			
		3	97 995.81			
		4	98 237.93			
$3d^7(^2F)4s$	^1F	3	101 954.90			
$3d^7(^4F)4p$	$^5F^\circ$	5	*110 212.80*	94	5	$(^4F)\ ^5G^\circ$
		4	*110 371.35*	65	29	$(^4F)\ ^5D^\circ$
		3	*111 221.20*	78	17	$(^4F)\ ^5D^\circ$
		2	*111 914.53*	88	9	$(^4F)\ ^5D^\circ$
		1	*112 401.65*	96		
$3d^7(^4F)4p$	$^5D^\circ$	4	*111 898.65*	63	26	$(^4F)\ ^5F^\circ$
		3	*112 935.43*	73	13	$(^4F)\ ^5F^\circ$
		2	*113 651.47*	78	8	$(^4F)\ ^5G^\circ$
		1	*114 095.60*	88	8	$(^4P)\ ^5D^\circ$
		0	*114 295.45*	91	8	$(^4P)\ ^5D^\circ$
$3d^7(^4F)4p$	$^5G^\circ$	6	*112 787.85*	100		
		5	*113 140.92*	82	12	$(^4F)\ ^3G^\circ$
		4	*113 705.12*	84	8	$(^4F)\ ^5G^\circ$
		3	*114 110.20*	86	7	$(^4F)\ ^5F^\circ$
		2	*114 371.01*	88	5	$(^4F)\ ^5D^\circ$
$3d^7(^4F)4p$	$^3G^\circ$	5	*115 272.26*	87	13	$(^4F)\ ^5G^\circ$
		4	*116 674.39*	83	9	$(^4F)\ ^3F^\circ$
		3	*117 606.35*	88	7	$(^4F)\ ^3F^\circ$

Ni III—Continued

Configuration	Term	J	Level (cm⁻¹)	Leading percentages		
$3d^7(^4F)4p$	$^3F°$	4	*116 191.93*	85	10	$(^4F)\ ^3G°$
		3	*117 250.80*	83	8	$(^4F)\ ^3G°$
		2	*118 114.95*	92		
$3d^7(^4F)4p$	$^3D°$	3	*118 745.25*	90	5	$(^4F)\ ^3F°$
		2	*119 669.54*	92		
		1	*120 272.32*	93		
$3d^7(b\ ^2D)4s$	^3D	1	121 192.93			
		2	121 411.60			
		3	121 802.45			
$3d^7(^4P)4p$	$^5S°$	2	*122 282.40*	99		
$3d^7(b\ ^2D)4s$	^1D	2	125 433.55			
$3d^7(^4P)4p$	$^5D°$	2	*129 913.10*	82	7	$(^4F)\ ^5D°$
		3	*129 954.00*	84	7	
		1	*129 957.95*	75	7	
		0	*130 190.05*	86	8	
		4	*130 312.30*	93	6	
$3d^7(^4P)4p$	$^3S°$	1	*130 863.50*	53	12	$(^2P)\ ^3S°$
$3d^7(^2G)4p$	$^3H°$	5	*131 500.50*	74	15	$(^2G)\ ^1H°$
		4	*132 156.50*	61	28	$(^2G)\ ^3F°$
		6	*132 168.60*	96		
$3d^7(^2G)4p$	$^3F°$	4	*131 792.02*	41	33	$(^2G)\ ^3H°$
		3	*133 158.50*	78	11	$(^2G)\ ^3G°$
		2	*134 231.90*	94		
$3d^7(^4P)4p$	$^5P°$	2	*132 818.26*	45	21	$(^2P)\ ^3P°$
		3	*133 095.89*	71	19	$(^4P)\ ^3D°$
		1	*133 339.70*	73	20	$(^4P)\ ^3S°$
$3d^7(^2P)4p$	$^3P°$	0	*132 864.8*	69	19	$(a\ ^2D)\ ^3P°$
		1	*133 276.70*	45	19	$(^4P)\ ^3D°$
		2	*133 642.58*	49	10	$(^2P)\ ^3D°$
$3d^7(^2G)4p$	$^1G°$	4	*133 324.70*	47	24	$(^2G)\ ^3F°$
$3d^7(^4P)4p$	$^3D°$	3	*133 390.94*	65	20	$(^4P)\ ^5P°$
		2	*133 500.97*	42	37	$(^4P)\ ^5P°$
		1	*133 839.54*	54	15	$(^2P)\ ^3D°$
$3d^7(^2G)4p$	$^3G°$	5	*133 692.00*	78	19	$(^2G)\ ^1H°$
		3	*134 334.79*	70	16	$(^2G)\ ^1F°$
		4	*134 414.77*	73	14	$(^2G)\ ^1G°$
$3d^7(^2G)4p$	$^1H°$	5	*134 217.60*	62	23	$(^2G)\ ^3H°$
$3d^7(^2G)4p$	$^1F°$	3	*135 023.20*	57	15	$(^2G)\ ^3G°$
$3d^7(^4P)4p$	$^3P°$	0	*135 334.90*	52	35	$(^2P)\ ^1S°$
		2	*135 350.33*	75	10	$(a\ ^2D)\ ^3P°$
		1	*136 098.70*	78	11	$(^2P)\ ^3D°$

Ni III—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^7(^2P)4p$	$^3D^\circ$	2	*136 813.20*	41		29	$(^2P)\ ^1D^\circ$
		3	*136 967.00*	77		8	$(a\ ^2D)\ ^3F^\circ$
		1	*137 362.36*	54		15	$(a\ ^2D)\ ^3D^\circ$
$3d^7(^2H)4p$	$^3G^\circ$	5	*137 020.20*	94		5	$(^2F)\ ^3G^\circ$
		4	*138 030.90*	90		5	
		3	*138 852.20*	85		6	
$3d^7(^2P)4p$		2	*137 631.60*	24	$^3D^\circ$	20	$^1D^\circ$
$3d^7(^2H)4p$	$^3I^\circ$	6	*137 391.30*	74		25	$(^2H)\ ^1I^\circ$
		7	*137 991.40*	100			
		5	*138 060.40*	95			
$3d^7(^2P)4p$	$^1S^\circ$	0	*138 146.48*	61		39	$(^4P)\ ^3P^\circ$
$3d^7(a\ ^2D)4p$	$^3D^\circ$	3	*138 487.40*	79		11	$(a\ ^2D)\ ^3F^\circ$
		1	*138 979.20*	50		27	$(^2P)\ ^1P^\circ$
		2	*139 253.70*	63		10	$(^2P)\ ^3D^\circ$
$3d^7(^2H)4p$	$^1I^\circ$	6	*139 633.90*	74		24	$(^2H)\ ^3I^\circ$
$3d^7(a\ ^2D)4p$	$^3F^\circ$	4	*140 184.65*	98			
		3	*140 544.52*	71		8	$(^2P)\ ^3D^\circ$
		2	*140 885.40*	73		10	$(a\ ^2D)\ ^3D^\circ$
$3d^7(^2P)4p$	$^3S^\circ$	1	*140 885.15*	67		8	$(^2P)\ ^1P^\circ$
$3d^7(^2P)4p$	$^1P^\circ$	1	*141 414.10*	49		17	$(a\ ^2D)\ ^3D^\circ$
$3d^7(^2H)4p$	$^3H^\circ$	6	*142 187.80*	98			
		5	*142 575.60*	95			
		4	*143 002.70*	95			
$3d^7(a\ ^2D)4p$	$^1D^\circ$	2	*142 433.95*	46		29	$(a\ ^2D)\ ^3P^\circ$
$3d^7(a\ ^2D)4p$	$^3P^\circ$	2	*143 560.16*	48		24	$(a\ ^2D)\ ^1D^\circ$
		1	*144 624.55*	67		11	$(^2P)\ ^3P^\circ$
		0	*145 088.45*	80		15	$(^2P)\ ^3P^\circ$
$3d^7(a\ ^2D)4p$	$^1F^\circ$	3	*143 864.80*	73		16	$(^2G)\ ^1F^\circ$
$3d^7(^2H)4p$	$^1G^\circ$	4	*144 153.00*	70		27	$(^2G)\ ^1G^\circ$
$3d^7(a\ ^2D)4p$	$^1P^\circ$	1	*145 950.15*	88			
$3d^7(^2H)4p$	$^1H^\circ$	5	*146 325.80*	96			
$3d^6\ 4s^2$	^5D	4	153 256.35				
		3	154 170.37				
$3d^7(^2F)4p$	$^1D^\circ$	2	*155 071.00*	60		32	$(^2F)\ ^3F^\circ$
$3d^7(^2F)4p$	$^3G^\circ$	3	*155 443.30*	82		10	$(^2F)\ ^3F^\circ$
		4	*155 841.40*	73		15	$(^2F)\ ^3F^\circ$
		5	*156 808.70*	94		5	$(^2H)\ ^3G^\circ$
$3d^7(^2F)4p$	$^3F^\circ$	3	*156 411.20*	68		19	$(^2F)\ ^3D^\circ$
		2	*156 522.87*	64		29	$(^2F)\ ^1D^\circ$
		4	*156 972.08*	50		28	$(^2F)\ ^1G^\circ$

Ni III—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^7(^2F)4p$	$^3D^\circ$	3	*156 853.00*	72	18	$(^2F)\ ^3F^\circ$
		2	*157 154.27*	85	8	$(^2F)\ ^1D^\circ$
		1	*157 235.16*	93	5	$(b\ ^2D)\ ^3D^\circ$
$3d^7(^2F)4p$	$^1G^\circ$	4	*157 375.42*	65	32	$(^2F)\ ^3F^\circ$
$3d^7(^2F)4p$	$^1F^\circ$	3	*161 754.89*	97		
$3d^7(b\ ^2D)4p$	$^3P^\circ$	2	*176 487.10*	99		
		1	*176 583.20*	98		
		0	*176 736.40*	99		
$3d^7(b\ ^2D)4p$	$^3F^\circ$	2	*177 805.60*	96		
		3	*178 451.50*	96		
		4	*179 282.00*	97		
$3d^7(^4F)4d$	^5F	5	181 019.08	90	8	^5G
		4	181 482.95	83	8	^5G
		3	181 996.70	80	8	^5D
		2	182 587.83	87	5	^5D
		1	183 035.25	95	2	^5D
$3d^7(b\ ^2D)4p$	$^1P^\circ$	1	*181 203.4*	95		
$3d^7(b\ ^2D)4p$	$^1F^\circ$	3	*181 658.4*	97		
$3d^7(^4F)4d$	^5G	6	181 840.00	96	4	^5H
		5	182 327.13	63	26	^3G
		4	183 041.45	71	13	^3G
		3	183 637.76	81	4	^3G
		2	184 124.86	74	17	^5P
$3d^7(^4F)5s$	^5F	5	181 998.15	99		
		4	182 798.20	84	14	^3F
		3	183 612.67	93		
		2	184 220.35	97		
		1	184 609.57	99		
$3d^7(^4F)4d$	^5H	7	182 508.30	99		
		6	183 126.19	59	39	^3H
		5	183 904.88	80	14	^3H
		4	184 510.75	88	5	^3G
		3	184 944.95	81	17	^3G
$3d^7(^4F)4d$	^5P	3	182 524.69	83	9	^5D
		2	183 575.58	55	21	^5G
		1	184 375.68	59	38	^5D
$3d^7(^4F)4d$	^3G	5	183 052.20	66	24	^5G
		4	183 859.72	74	16	^5G
		3	184 346.50	74	15	^5H
$3d^7(^4F)4d$	^5D	4	183 464.88	85	9	^5F
		3	184 518.20	64	13	^3D
		2	185 067.15	55	25	^3D
		1	185 116.05	46	38	^5P
		0	185 147.23	98		

Ni III—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^7(b\ ^2D)4p$	$^3D°$	1	*183 717.00*	95		
		2	*183 872.00*	73	25	$^1D°$
		3	*184 723.10*	96		
$3d^7(^4F)4d$	^3D	3	183 839.47	71	14	^5D
		2	184 623.54	66	15	
		1	185 543.70	82	12	
$3d^7(^4F)5s$	^3F	4	184 037.62	85	14	^5F
		3	185 248.15	93		
		2	186 073.40	97		
$3d^7(^4F)4d$	^3H	6	184 166.57	60	37	^5H
		5	184 805.62	80	15	
		4	185 639.13	91	5	
$3d^7(^4F)4d$	^3F	4	187 351.88	86	5	$(^2G)\ ^3F$
		3	188 140.54	84	6	
		2	188 622.87	85	6	
$3d^7(^4F)4d$	^3P	2	187 493.38	87	5	$(^4P)\ ^3P$
		1	188 542.82	90	6	
		0	189 056.90	91	6	
$3d^7(^4F)5p$	$^5F°$	5	*199 919.08*	91	8	$^5G°$
		4	*200 076.35*	49	42	$^5D°$
		3	*200 962.97*	64	27	$^5D°$
		2	*201 725.23*	80	15	$^5D°$
		1	*202 263.08*	94	6	$^5D°$
$3d^7(^4F)5p$	$^5G°$	6	*200 747.06*	99		
		5	*201 033.68*	48	43	$^3G°$
		4	*201 969.90*	67	14	$^3F°$
		3	*202 608.20*	76	11	$^5F°$
		2	*203 020.07*	78	10	$^5D°$
$3d^7(^4F)5p$	$^5D°$	4	*200 935.60*	54	29	$^5F°$
		3	*201 829.46*	60	19	$^5F°$
		2	*202 487.82*	71	17	$^5G°$
		1	*202 898.94*	92	6	$^5F°$
		0	*203 078.46*	98		
$3d^7(^4F)5p$	$^3F°$	4	*202 074.33*	71	5	$^5F°$
		3	*203 360.52*	57	29	$^3D°$
		2	*203 739.65*	58	38	$^3D°$
$3d^7(^4F)5p$	$^3G°$	5	*202 125.84*	54	44	$^5G°$
		4	*203 197.33*	75	19	
		3	*203 976.35*	85	7	
$3d^7(^4F)5p$	$^3D°$	3	*202 624.51*	62	30	$^3F°$
		2	*204 242.07*	57	38	$^3F°$
		1	*204 677.95*	98		
$3d^6(^5D)4s4p$	$^5D°$	4	*204 404.12*			
		3	*204 714.93*			
		2	*205 062.51*			
		1	*205 327.00*			
		0	*205 466.00*			

Ni III—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^6(^5D)4s4p$	$^5F^\circ$	5	206 925.18			
		4	207 382.10			
		3	207 744.30			
		2	208 005.7			
$3d^6(^5D)4s4p$	$^3D^\circ$	3	212 312.5			
		2	213 016.8			
		1	213 490.0			
$3d^6(^5D)4s4p$	$^3F^\circ$	4	212 837.7			
		3	213 979.67			
		2	214 744.0			
$3d^7(^4F_{9/2})4f$	$^2[11/2]^\circ$	6	221 187.25	99		
		5	221 195.35	88	11	$^2[9/2]^\circ$
$3d^7(^4F_{9/2})4f$	$^2[9/2]^\circ$	4	221 256.08	98		
		5	221 268.50	88	11	$^2[11/2]^\circ$
$3d^7(^4F_{9/2})4f$	$^2[13/2]^\circ$	7	221 286.78	99		
		6	221 292.92	99		
$3d^7(^4F_{9/2})4f$	$^2[7/2]^\circ$	3	221 350.90	99		
		4	221 388.14	98		
$3d^7(^4F_{9/2})4f$	$^2[15/2]^\circ$	8	221 433.20	99		
		7	221 444.15	99		
$3d^7(^4F_{7/2})4f$	$^2[9/2]^\circ$	5	222 455.66	94		
		4	222 466.47	89	9	$^2[7/2]^\circ$
$3d^7(^4F_{9/2})4f$	$^2[5/2]^\circ$	3	221 476.68	99		
$3d^7(^4F_{7/2})4f$	$^2[11/2]^\circ$	6	222 494.65	99		
		5	222 529.55	94		
$3d^7(^4F_{7/2})4f$	$^2[7/2]^\circ$	3	222 516.60	97		
		4	222 547.50	89	10	$^2[9/2]^\circ$
$3d^7(^4F_{7/2})4f$	$^2[5/2]^\circ$	3	222 530.00	97		
		2	222 571.37	98		
$3d^7(^4F_{7/2})4f$	$^2[13/2]^\circ$	7	222 596.30	99		
		6	222 599.70	99		
$3d^7(^4F_{5/2})4f$	$^2[7/2]^\circ$	4	223 387.00	98		
		3	223 329.77	87	12	$^2[5/2]^\circ$
$3d^7(^4F_{5/2})4f$	$^2[5/2]^\circ$	3	223 406.81	85	12	$^2[7/2]^\circ$
		2	223 375.18	97		
$3d^7(^4F_{5/2})4f$	$^2[9/2]^\circ$	5	223 434.10	99		
		4	223 314.77	98		
$3d^7(^4F_{5/2})4f$	$^2[11/2]^\circ$	5	223 461.15	99		
		6	223 469.90	99		
$3d^7(^4F_{5/2})4f$	$^2[3/2]^\circ$	2	223 481.25	99		
		1	223 491.34	99		

Ni III—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^7(^4F_{3/2})4f$	$^2[5/2]°$	3	*223 957.54*	97			
		2	*224 026.05*	97			
$3d^7(^4F_{3/2})4f$	$^2[9/2]°$	4	*223 989.02*	99			
		5	*224 020.91*	99			
$3d^7(^4F)6s$	^5F	5	225 784.20	99			
		3	227 270.07	73		26	^3F
		4	227 288.70	55		44	^3F
		2	227 985.66	90		9	^3F
$3d^7(^4F)5d$	^5F	5	225 918.35	79		20	^5G
		4	226 118.80	55		34	^5D
		1	228 042.24	62		24	^5D
$3d^7(^4F)5d$	^5G	6	226 124.64	91		8	^5H
		5	227 433.80	41		34	^3G
		3	227 963.02	43		17	^5D
		2	228 483.54	68		13	^5F
$3d^7(^4F)6s$	^3F	4	226 290.44	55		44	^5F
		3	228 290.97	73		26	
		2	229 036.43	90		9	
$3d^7(^4F)5d$	^5H	7	226 380.36	99			
		6	227 649.28	60		33	^3H
		5	227 726.91	61		26	^3H
		4	228 434.45	76		10	^3H
		3	228 955.36	55		42	^3G
$3d^7(^4F)5d$	^5P	3	226 532.85	51		30	^5D
		2	227 767.03	53		26	^5F
		1	228 329.40	42		31	^5D
$3d^7(^4F)5d$	^3G	5	226 603.73	51		30	^5G
		4	228 195.11	46		34	^5G
		3	228 858.30	40		34	^5H
$3d^7(^4F)5d$	^3H	6	226 686.28	66		31	^5H
		5	228 609.82	59		29	
		4	229 291.50	79		12	
$3d^7(^4F)5d$		3	226 757.78	37	^3D	27	^5P
$3d^7(^4F)5d$	^5D	4	227 091.99	42		37	^5G
		3	228 363.94	46		23	^5F
		0	228 736.36	99			
		2	228 819.73	56		20	^5P
		1	229 057.39	38		31	^5P
$3d^7(^4F)5d$		2	227 346.84	35	^5F	15	^5P
$3d^7(^4F)5d$	^3D	3	227 459.43	48		26	^5F
		2	228 273.42	62		18	^5G
		1	228 879.50	59		21	^5P
$3d^7(^4F)5d$		4	227 553.40	30	^5F	27	^3G

Ni III—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^7(^4F)5d$	^3F	4	230 169.90	89	6	^3G
		3	231 033.56	84	3	^3G
		2	231 548.58	83	2	^3D
$3d^7(^4F)5d$	^3P	2	230 219.9	87	7	$(^4F)\ ^3D$
		1	231 309.0	93	3	$(^4F)\ ^3D$
		0	231 761.8	97	2	$(^4P)\ ^3P$
$3d^7(^4F_{9/2})5g$	$^2[15/2]$	8	244 262.75	97		
		7	244 267.15	93		
$3d^7(^4F_{9/2})5g$	$^2[11/2]$	6	244 264.23	86	10	$^2[13/2]$
		5	244 264.28	72	27	$^2[9/2]$
$3d^7(^4F_{9/2})5g$	$^2[13/2]$	7	244 289.88	94		
		6	244 290.37	86	13	$^2[11/2]$
$3d^7(^4F_{9/2})5g$	$^2[9/2]$	4	244 306.13	53	46	$^2[7/2]$
		5	244 306.20	71	27	$^2[11/2]$
$3d^7(^4F_{9/2})5g$	$^2[17/2]$	9	244 343.23	99		
		8	244 343.20	98		
$3d^7(^4F_{7/2})5g$	$^2[13/2]$	6	245 471.20	87	11	$^2[11/2]$
$3d^7(^4F_{7/2})5g$	$^2[11/2]$	5	245 488.31	60	38	$^2[9/2]$
		6	245 495.36	89	10	$^2[13/2]$
$3d^7(^4F_{7/2})5g$	$^2[15/2]$	7	245 528.40	96		
$3d^7(^4F_{7/2})5g$	$^2[9/2]$	5	245 532.59	60	39	$^2[11/2]$
		4	245 572.57	70	28	$^2[7/2]$
$3d^7(^4F_{5/2})5g$	$^2[9/2]$	4	246 364.86	96		
		5	246 376.24	55	42	$^2[11/2]$
$3d^7(^4F_{5/2})5g$	$^2[13/2]$	6	246 385.97	97		
$3d^7(^4F_{3/2})5g$	$^2[9/2]$	4	246 938.98	72	26	$^2[7/2]$
		5	246 954.87	58	40	$^2[11/2]$
Ni IV $(^4F_{9/2})$	***Limit***		**283 800**			

Ni IV

$Z=28$

Mn I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^6 3d^7\ ^4F_{9/2}$

Ionization energy = 443 000±2000 cm^{-1} (54.9±0.2 eV)

The first work on Ni IV was reported by Poppe (1968), who found two quartets in the $3d^7$ configuration and quartets and sextets from $3d^6 4s$ and $3d^6 4p$. The sextets and quartets were connected by intercombinations found by Garcia-Riquelme (1968).

The present compilation is taken from an extension of the analysis by Poppe (1976). The $3d^7-3d^6 4p$ array was observed in the region 390–710 Å and the $3d^6 4s-3d^6 4p$ array in the region 1210–1830 Å. All levels of $3d^7$ have been found. The uncertainty of the level values is 3 cm^{-1}.

The leading percentages were calculated by Poppe (1976). We use the designations of Nielson and Koster (see Introduction) to represent the seniorities.

The ionization energy was obtained by extrapolation by Lotz (1967).

References

Garcia-Riquelme, O. (1968), Physica **40**, 27.
Lotz, W. (1967), J. Opt. Soc. Am. **57**, 873.
Poppe, R. (1968), Physica **40**, 17.
Poppe, R. (1976), Physica **81C**, 351.

Ni IV

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^7$	^4F	9/2	0.0	100		
		7/2	1 189.7	100		
		5/2	2 042.5	100		
		3/2	2 621.1	100		
$3d^7$	^4P	5/2	18 118.6	100		
		3/2	18 366.8	93	7	^2P
		1/2	18 958.4	97	3	^2P
$3d^7$	^2G	9/2	19 829.6	97	2	^2H
		7/2	20 947.6	100		
$3d^7$	^2P	3/2	23 648.9	83	8	$^2D2$
		1/2	24 651.4	97	3	^4P
$3d^7$	^2H	11/2	26 649.1	100		
		9/2	27 677.6	98	2	^2G
$3d^7$	$^2D2$	5/2	27 096.5	77	23	$^2D1$
		3/2	28 777.7	72	18	
$3d^7$	^2F	5/2	43 437.5	100		
		7/2	43 858.6	100		
$3d^7$	$^2D1$	3/2	67 360.0	80	20	$^2D2$
		5/2	67 989.8	77	23	
$3d^6(^5D)4s$	^6D	9/2	110 410.6	100		
		7/2	111 195.8	100		
		5/2	111 763.3	100		
		3/2	112 151.9	100		
		1/2	112 379.3	100		
$3d^6(^5D)4s$	^4D	7/2	120 909.5	100		
		5/2	121 807.7	100		
		3/2	122 386.1	100		
		1/2	122 717.4	99		

Ni IV—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^6(^3P2)4s$	^4P	5/2	138 446.2	62	37	$(^3P1)\ ^4P$
		3/2	140 343.0	60	35	
		1/2	141 561.2	60	36	
$3d^6(^3H)4s$	^4H	13/2	139 289.4	100		
		11/2	139 619.2	98	2	$(^3G)\ ^4G$
		9/2	139 886.7	94	3	$(^3G)\ ^4G$
		7/2	140 140.9	96	2	$(^3G)\ ^4G$
$3d^6(^3F2)4s$	^4F	9/2	141 220.3	72	21	$(^3F1)\ ^4F$
		7/2	141 577.2	74	20	
		5/2	141 832.0	77	20	
		3/2	142 023.5	80	19	
$3d^6(^3G)4s$	^4G	11/2	144 815.1	71	28	$(^3H)\ ^2H$
		9/2	145 702.2	76	18	$(^3H)\ ^2H$
		7/2	146 061.5	88	4	$(^3F2)\ ^2F$
		5/2	146 153.8	90	6	$(^3F2)\ ^2F$
$3d^6(^3P2)4s$	^2P	3/2	145 192.1	60	36	$(^3P1)\ ^2P$
$3d^6(^3H)4s$	^2H	11/2	145 962.5	71	27	$(^3G)\ ^4G$
		9/2	146 194.3	78	17	
$3d^6(^3F2)4s$	^2F	7/2	147 635.9	69	19	$(^3F1)\ ^2F$
		5/2	148 358.2	74	18	
$3d^6(^3G)4s$	^2G	9/2	151 574.7	97	3	$(^3H)\ ^2H$
		7/2	152 343.7	95	4	$(^3F2)\ ^2F$
$3d^6(^3D)4s$	^4D	3/2	153 313.8	99		
		5/2	153 338.8	98		
		1/2	153 349.4	99		
		7/2	153 533.6	100		
$3d^6(^1I)4s$	^2I	13/2	155 253.7	100		
		11/2	155 308.7	99		
$3d^6(^1G2)4s$	^2G	9/2	156 294.0	65	32	$(^1G1)\ ^2G$
		7/2	156 351.2	65	32	
$3d^6(^3D)4s$	^2D	3/2	159 498.5	94	4	$(^1D2)\ ^2D$
		5/2	159 818.4	96	2	
$3d^6(^1F)4s$	^2F	7/2	171 406.0	98		
		5/2	171 408.0	98		
$3d^6(^5D)4p$	$^6D^\circ$	9/2	*175 569.5*	98		
		7/2	*175 869.1*	96	2	$(^5D)\ ^6F^\circ$
		5/2	*176 247.1*	97		
		3/2	*176 554.4*	98		
		1/2	*176 749.0*	99		
$3d^6(^3F1)4s$	^4F	3/2	179 583.0	80	20	$(^3F2)\ ^4F$
		9/2	179 655.0	78	22	
		5/2	179 724.0	79	20	
		7/2	179 792.0	78	20	

Ni IV—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^6(^5D)4p$	$^6F^\circ$	11/2	*181 931.5*	100			
		9/2	*182 044.9*	94		4	$(^5D)\ ^4F^\circ$
		7/2	*182 125.6*	93		3	$(^5D)\ ^4F^\circ$
		5/2	*182 206.8*	95		2	$(^5D)\ ^4D^\circ$
		3/2	*182 259.9*	96		2	$(^5D)\ ^4D^\circ$
		1/2	*182 288.4*	97			
$3d^6(^5D)4p$	$^6P^\circ$	7/2	*184 099.1*	84		11	$(^5D)\ ^4D^\circ$
		5/2	*185 505.3*	88		9	
		3/2	*186 441.4*	94		4	
$3d^6(^5D)4p$	$^4D^\circ$	7/2	*185 890.0*	83		13	$(^5D)\ ^6P^\circ$
		5/2	*186 516.1*	84		10	$(^5D)\ ^6P^\circ$
		3/2	*186 957.2*	89		4	$(^5D)\ ^6P^\circ$
		1/2	*187 225.7*	93		3	$(^5D)\ ^6F^\circ$
$3d^6(^3F1)4s$	^2F	7/2	185 967.0	77		21	$(^3F2)\ ^2F$
		5/2	185 997.0	80		20	
$3d^6(^5D)4p$	$^4F^\circ$	9/2	*186 470.1*	94		4	$(^5D)\ ^6F^\circ$
		7/2	*187 570.3*	95		3	$(^5D)\ ^6F^\circ$
		5/2	*188 320.1*	96		2	$(^5D)\ ^6F^\circ$
		3/2	*188 824.2*	97			
$3d^6(^5D)4p$	$^4P^\circ$	5/2	*190 830.3*	97			
		3/2	*191 618.2*	98			
		1/2	*192 033.5*	98			
$3d^6(^1G1)4s$	^2G	9/2	190 864.7	66		33	$(^1G2)\ ^2G$
		7/2	190 932.8	66		33	
$3d^6(^3P2)4p$	$^4S^\circ$	3/2	*205 114.1*	44		19	$(^3P2)\ ^4P^\circ$
$3d^6(^3H)4p$	$^4G^\circ$	11/2	*206 005.3*	68		21	$(^3F2)\ ^4G^\circ$
		9/2	*206 340.9*	51		28	
		7/2	*206 645.7*	45		34	
		5/2	*206 847.0*	42		38	
$3d^6(^3P2)4p$		5/2	*206 523.2*	27	$^4P^\circ$	23	$(^3P1)\ ^4P^\circ$
$3d^6(^3H)4p$	$^4I^\circ$	11/2	*206 740.7*	51		35	$(^3H)\ ^4H^\circ$
		13/2	*206 754.5*	48		38	$(^3H)\ ^4H^\circ$
		9/2	*208 046.8*	46		19	$(^3H)\ ^4H^\circ$
		15/2	*208 149.5*	99			
$3d^6(^3H)4p$		9/2	*206 865.5*	43	$^4I^\circ$	37	$^4H^\circ$
$3d^6(^3H)4p$	$^4H^\circ$	7/2	*207 136.0*	47		20	$(^3H)\ ^2G^\circ$
		11/2	*208 595.3*	45		44	$(^3H)\ ^4I^\circ$
		13/2	*208 631.3*	51		40	$(^3H)\ ^4I^\circ$
$3d^6(^3P2)4p$	$^4P^\circ$	1/2	*207 846.2*	48		41	$(^3P1)\ ^4P^\circ$
$3d^6(^3P2)4p$	$^2D^\circ$	5/2	*208 009.1*	32		20	$(^3P1)\ ^2D^\circ$
$3d^6(^3P2)4p$		7/2	*208 330.7*	22	$^4D^\circ$	19	$(^3F2)\ ^4F^\circ$
$3d^6(^3P2)4p$		3/2	*208 461.0*	22	$^4S^\circ$	13	$^4P^\circ$

Ni IV—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^6(^3F2)4p$	$^4F^\circ$	5/2	*208 605.7*	54		18	$(^3F1)\ ^4F^\circ$
		3/2	*208 766.9*	63		20	
		9/2	*208 933.6*	49		18	
$3d^6(^3P2)4p$	$^4D^\circ$	7/2	*208 912.1*	39		21	$(^3P1)\ ^4D^\circ$
		1/2	*210 313.3*	59		28	$(^3P1)\ ^4D^\circ$
$3d^6(^3H)4p$		9/2	*209 131.9*	37	$^2G^\circ$	23	$(^3H)\ ^4H^\circ$
$3d^6(^3H)4p$		7/2	*209 391.4*	34	$^2G^\circ$	16	$(^3F2)\ ^4F^\circ$
$3d^6(^3P2)4p$		3/2	*209 985.1*	18	$^2D^\circ$	16	$(^3P2)\ ^4P^\circ$
$3d^6(^3F2)4p$	$^4D^\circ$	7/2	*210 121.8*	49		10	$(^3F1)\ ^4D^\circ$
		5/2	*210 943.6*	37		20	$(^3P2)\ ^4D^\circ$
		3/2	*211 246.8*	49		10	$(^3D)\ ^4D^\circ$
		1/2	*211 351.7*	67		12	$(^3F1)\ ^4D^\circ$
$3d^6(^3H)4p$	$^2I^\circ$	13/2	*210 177.0*	86		11	$(^3H)\ ^4I^\circ$
		11/2	*210 987.5*	88		4	
$3d^6(^3F2)4p$		5/2	*210 590.6*	24	$^4D^\circ$	23	$(^3P2)\ ^4D^\circ$
$3d^6(^3P2)4p$		3/2	*211 027.6*	20	$^4D^\circ$	18	$(^3F2)\ ^4D^\circ$
$3d^6(^3F2)4p$	$^4G^\circ$	9/2	*212 150.9*	37		20	$(^3H)\ ^4G^\circ$
		11/2	*212 207.0*	53		17	
$3d^6(^3F2)4p$		5/2	*212 275.9*	24	$^2F^\circ$	19	$(^3F2)\ ^4G^\circ$
$3d^6(^3F2)4p$		7/2	*212 281.8*	26	$^4G^\circ$	17	$(^3H)\ ^4G^\circ$
$3d^6(^3F2)4p$		7/2	*213 131.1*	24	$^2F^\circ$	14	$(^3H)\ ^4G^\circ$
$3d^6(^3G)4p$	$^4F^\circ$	9/2	*213 408.6*	57		25	$(^3G)\ ^4G^\circ$
		5/2	*215 516.8*	43		30	$(^3G)\ ^4G^\circ$
		3/2	*215 541.3*	68		15	$(^3D)\ ^4F^\circ$
$3d^6(^3H)4p$		5/2	*213 412.1*	28	$^4G^\circ$	18	$(^3F2)\ ^4G^\circ$
$3d^6(^3G)4p$		11/2	*213 606.9*	31	$^4G^\circ$	30	$^2H^\circ$
$3d^6(^3P2)4p$		1/2	*213 640.2*	31	$^2P^\circ$	23	$(^3P1)\ ^2P^\circ$
$3d^6(^3F2)4p$		9/2	*213 739.7*	33	$^2G^\circ$	20	$(^3G)\ ^2H^\circ$
$3d^6(^3P2)4p$	$^2P^\circ$	3/2	*214 055.8*	50		33	$(^3P1)\ ^2P^\circ$
$3d^6(^3G)4p$	$^4G^\circ$	7/2	*214 101.0*	41		37	$(^3G)\ ^4F^\circ$
		11/2	*214 316.8*	47		21	$(^3H)\ ^2H^\circ$
		5/2	*214 718.1*	46		27	$(^3G)\ ^4F^\circ$
		9/2	*214 910.5*	40		16	$(^3H)\ ^2H^\circ$
$3d^6(^3F2)4p$		9/2	*214 587.4*	21	$^2G^\circ$	16	$(^3H)\ ^2H^\circ$
$3d^6(^3F2)4p$	$^2G^\circ$	7/2	*214 622.8*	60		14	$(^3F1)\ ^2G^\circ$
$3d^6(^3G)4p$		7/2	*215 292.9*	39	$^4G^\circ$	33	$(^3G)\ ^4F^\circ$

Ni IV—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^6(^3G)4p$	$^4H°$	13/2	*215 506.6*	86		11	$(^3H)\ ^4H°$
		11/2	*215 684.5*	73		10	$(^3H)\ ^2H°$
		7/2	*215 724.5*	73		12	$(^3H)\ ^4H°$
		9/2	*215 736.1*	73		9	$(^3H)\ ^4H°$
$3d^6(^3P2)4p$	$^2S°$	1/2	*215 531.0*	47		19	$(^3P1)\ ^2S°$
$3d^6(^3F2)4p$	$^2D°$	5/2	*217 414.3*	67		10	$(^3P2)\ ^2D°$
		3/2	*217 939.7*	64		15	
$3d^6(^3H)4p$	$^2H°$	11/2	*218 860.6*	48		42	$(^3G)\ ^2H°$
$3d^6(^3G)4p$	$^2F°$	5/2	*219 553.4*	47		19	$(^3D)\ ^2F°$
		7/2	*219 896.0*	52		16	
$3d^6(^3G)4p$	$^2H°$	9/2	*219 765.0*	43		39	$(^3H)\ ^2H°$
$3d^6(^1I)4p$	$^2K°$	13/2	*220 762.6*	97		2	$(^1I)\ ^2I°$
		15/2	*222 202.8*	99			
$3d^6(^3G)4p$	$^2G°$	9/2	*221 991.0*	71		18	$(^3H)\ ^2G°$
		7/2	*222 029.3*	71		12	
$3d^6(^3D)4p$	$^4P°$	5/2	*222 333.3*	87		3	$(^3P2)\ ^4P°$
		3/2	*222 662.9*	74		8	$(^3D)\ ^2P°$
		1/2	*223 225.4*	66		13	$(^3D)\ ^4D°$
$3d^6(^1G2)4p$	$^2H°$	9/2	*222 705.5*	44		17	$(^1I)\ ^2H°$
		11/2	*225 758.5*	36		27	$(^1G1)\ ^2H°$
$3d^6(^1I)4p$	$^2H°$	11/2	*222 993.3*	53		25	$(^1G2)\ ^2H°$
		9/2	*225 903.7*	61		15	$(^1G1)\ ^2H°$
$3d^6(^3D)4p$		1/2	*223 785.4*	33	$^4D°$	26	$(^3D)\ ^4P°$
$3d^6(^3D)4p$	$^4F°$	5/2	*224 021.3*	58		17	$(^3G)\ ^4F°$
		7/2	*224 824.9*	47		12	$(^1G2)\ ^2G°$
		9/2	*225 096.4*	73		11	$(^3G)\ ^4F°$
$3d^6(^3D)4p$		7/2	*224 075.3*	24	$^4F°$	10	$(^1G2)\ ^2F°$
$3d^6(^3D)4p$		3/2	*224 174.0*	30	$^4D°$	30	$(^3D)\ ^2P°$
$3d^6(^1G2)4p$	$^2G°$	7/2	*224 463.6*	44		18	$(^1G1)\ ^2G°$
		9/2	*224 761.5*	50		21	
$3d^6(^3D)4p$	$^4D°$	5/2	*224 645.7*	68		14	$(^3D)\ ^4F°$
		7/2	*225 136.9*	54		13	$(^1G2)\ ^2F°$
$3d^6(^3D)4p$	$^2P°$	3/2	*224 936.9*	41		41	$(^3D)\ ^4D°$
		1/2	*224 996.5*	40		36	
$3d^6(^1G2)4p$		5/2	*225 431.6*	34	$^2F°$	15	$(^1G1)\ ^2F°$
$3d^6(^1I)4p$	$^2I°$	13/2	*226 685.0*	98		2	$(^1I)\ ^2K°$
		11/2	*226 702.5*	82		10	$(^1I)\ ^2H°$
$3d^6(^3D)4p$	$^2D°$	3/2	*227 181.1*	76		7	$(^1D2)\ ^2P°$
		5/2	*227 549.4*	86		3	$(^1F)\ ^2D°$

Ni IV—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^6(^1D2)4p$	$^2P°$	3/2	228 214.2	34		23	$(^1S2)\ ^2P°$
		1/2	232 897.0	40		27	
$3d^6(^3D)4p$	$^2F°$	7/2	228 518.5	62		14	$(^1D2)\ ^2F°$
		5/2	229 269.5	54		20	
$3d^6(^1S2)4p$		1/2	229 297.5	32	$^2P°$	26	$(^1D2)\ ^2P°$
$3d^6(^1D2)4p$		5/2	231 091.8	31	$^2D°$	17	$(^1D2)\ ^2F°$
$3d^6(^1D2)4p$	$^2D°$	3/2	231 742.0	62		12	$(^1D1)\ ^2D°$
$3d^6(^1D2)4p$		5/2	232 272.7	30	$^2D°$	25	$^2F°$
$3d^6(^1D2)4p$	$^2F°$	7/2	232 539.5	51		13	$(^1D1)\ ^2F°$
$3d^6(^1S2)4p$		3/2	234 019.5	37	$^2P°$	24	$(^1D2)\ ^2P°$
$3d^6(^1F)4p$	$^2G°$	7/2	237 480.3	90		2	$(^3G)\ ^2G°$
		9/2	238 957.8	93		2	$(^1G2)\ ^2G°$
$3d^6(^1F)4p$	$^2D°$	5/2	239 009.7	63		15	$(^1D2)\ ^2D°$
		3/2	240 094.2	70		9	
$3d^6(^3P1)4p$	$^4D°$	1/2	241 172.4	37		37	$(^3F1)\ ^4D°$
$3d^6(^3F1)4p$	$^4D°$	3/2	241 540.0	35		32	$(^3P1)\ ^4D°$
		5/2	241 817.9	43		29	
		7/2	241 939.0	50		23	
$3d^6(^1F)4p$	$^2F°$	5/2	243 520.1	83		4	$(^1G2)\ ^2F°$
		7/2	243 542.0	82		4	
$3d^6(^3F1)4p$	$^4G°$	7/2	247 731.7	77		17	$(^3F2)\ ^4G°$
		9/2	248 218.0	74		18	
		11/2	248 855.4	78		20	
$3d^6(^3P1)4p$	$^4S°$	3/2	249 130.0	74		24	$(^3P2)\ ^4S°$
$3d^6(^3F1)4p$	$^2D°$	3/2	250 951.0	49		24	$(^3P1)\ ^2D°$
		5/2	251 694.3	46		23	
$3d^6(^3F1)4p$	$^2G°$	9/2	251 773.6	66		17	$(^3F2)\ ^2G°$
		7/2	252 523.0	69		16	
$3d^6(^3P1)4p$	$^4P°$	5/2	252 354.0	37		29	$(^3P2)\ ^4P°$
$3d^6(^3F1)4p$		3/2	252 975.4	32	$^4D°$	23	$(^3P1)\ ^4D°$
$3d^6(^3F1)4p$		5/2	253 326.2	26	$^4F°$	13	$(^3P1)\ ^4D°$
$3d^6(^3F1)4p$	$^4F°$	3/2	253 579.3	57		18	$(^3F2)\ ^4F°$
		7/2	253 639.1	40		16	$(^3P1)\ ^4D°$
		5/2	254 123.7	40		17	$(^3F1)\ ^4D°$
		9/2	254 300.0	66		24	$(^3F2)\ ^4F°$
$3d^6(^3F1)4p$		7/2	254 663.4	26	$^4F°$	22	$(^3P1)\ ^4D°$
$3d^6(^3F1)4p$		3/2	255 064.0	27	$^2D°$	23	$(^3P1)\ ^2D°$

Ni IV—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^6(^3F1)4p$	$^2F°$	$7/2$	*257 018.0*	54		23	$(^3F2)\ ^2F°$
		$5/2$	*257 406.4*	66		25	
$3d^6(^1G1)4p$	$^2H°$	$9/2$	*258 672.8*	59		33	$(^1G2)\ ^2H°$
		$11/2$	*260 065.1*	62		35	
$3d^6(^1G1)4p$		$7/2$	*260 355.5*	31	$^2F°$	23	$(^1G1)\ ^2G°$
$3d^6(^1G1)4p$	$^2F°$	$5/2$	*261 226.3*	55		26	$(^1G2)\ ^2F°$
$3d^6(^1G1)4p$	$^2G°$	$9/2$	*262 275.5*	64		27	$(^1G2)\ ^2G°$
		$7/2$	*262 538.7*	44		19	
$3d^6(^1D1)4p$	$^2D°$	$3/2$	*282 179.5*	79		17	$(^1D2)\ ^2D°$
		$5/2$	*282 645.2*	79		17	
Ni V ($^5D_4$)	*Limit*		**443 000**				

Ni v

$Z=28$

Cr I isoelectronic sequence

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

Ionization energy = 613 500±500 cm^{-1} (76.06±0.06 eV)

The $3d^6-3d^54p$ transition array between 300 and 425 Å has been observed and analysed by Raassen, van Kleef, and Metsch (1976). They have found all but the high ^{1}S level of $3d^6$ and 177 out of 214 levels of $3d^54p$. The uncertainty of the level values is about ±5 cm^{-1}. They give the percentage compositions for these two configurations.

Raassen and van Kleef (1977) found 37 more levels of $3d^54p$ and observed and analysed the $3d^54s-3d^54p$ transition array between 990 and 1400 Å. They also found one term in each of the configurations $3d^55p$, $3d^54f$ and $3d^55f$. They give the percentage compositions for the $3d^54s$ configuration.

Raassen and van Kleef derived the ionization energy from the two-member $3d^5np$ and nf series. We have confirmed their value to within 300 cm^{-1} by recalculating the $3d^5(^6S)nf\ ^5F$ series limit and assuming a value for $n^*(5f)-n^*(4f)$ of 0.9952 taken from Zn II. Accordingly, we reduced their uncertainty estimate of ±3000 cm^{-1} to ±500 cm^{-1}.

References

Raassen, A. J. J., van Kleef, Th. A. M., and Metsch, B. C. (1976), Physica **84C**, 133.

Raassen, A. J. J., and van Kleef, Th. A. M. (1977), Physica **85C**, 180.

Ni v

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^6$	^{5}D	4	0.0	100		
		3	889.7	100		
		2	1 489.9	100		
		1	1 871.5	100		
		0	2 057.6	100		
$3d^6$	^{3}P2	2	26 153.0	62	38	^{3}P1
		1	28 697.6	63	37	
		0	29 640.0	62	36	
$3d^6$	^{3}H	6	27 111.2	99	1	^{1}I
		5	27 578.2	97	3	^{3}G
		4	27 858.8	88	5	^{3}F2
$3d^6$	^{3}F2	4	29 123.7	68	20	^{3}F1
		3	29 570.8	75	20	
		2	29 899.2	80	20	
$3d^6$	^{3}G	5	33 256.5	97	3	^{3}H
		4	34 061.7	93	4	^{3}F2
		3	34 416.4	96	4	^{3}F2
$3d^6$	^{1}I	6	41 252.2	99	1	^{3}H
$3d^6$	^{3}D	2	41 626.9	97	2	^{1}D2
		1	41 701.1	100		
		3	41 920.2	100		
$3d^6$	^{1}G2	4	42 208.1	65	33	^{1}G1
$3d^6$	^{1}S2	0	47 699.7	76	22	^{1}S1
$3d^6$	^{1}D2	2	48 607.0	76	21	^{1}D1
$3d^6$	^{1}F	3	57 924.1	98	1	^{3}F1

Ni v—Continued

Configuration	Term	*J*	Level (cm^{-1})	Leading percentages		
$3d^6$	^{3}P1	0	66 737.8	64	36	^{3}P2
		1	67 547.9	63	37	
		2	69 156.1	62	38	
$3d^6$	^{3}F1	2	68 632.1	80	20	^{3}F2
		4	68 718.7	77	22	
		3	68 854.7	78	20	
$3d^6$	^{1}G1	4	77 899.5	66	34	^{1}G2
$3d^6$	^{1}D1	2	104 420.5	78	22	^{1}D2
$3d^5(^6S)4s$	^{7}S	3	164 525.9	100		
$3d^5(^6S)4s$	^{5}S	2	178 019.8	100		
$3d^5(^4G)4s$	^{5}G	6	208 046.4	100		
		5	208 131.0	100		
		2	208 151.5	99	1	(^{2}F1) ^{3}F
		4	208 163.7	100		
		3	208 164.6	100		
$3d^5(^4P)4s$	^{5}P	3	212 095.8	90	9	(^{4}D) ^{5}D
		2	212 253.4	91	8	
		1	212 455.7	96	4	
$3d^5(^4D)4s$	^{5}D	4	216 189.9	99	1	(^{4}G) ^{3}G
		0	216 305.7	98	2	(^{4}P) ^{3}P
		1	216 434.7	94	4	(^{4}P) ^{5}P
		2	216 590.5	91	8	(^{4}P) ^{5}P
		3	216 596.0	90	9	(^{4}P) ^{5}P
$3d^5(^4G)4s$	^{3}G	5	217 048.7	100		
		3	217 101.0	99	1	(^{2}F1) ^{1}F
		4	217 129.1	99	1	(^{4}D) ^{5}D
$3d^5(^4P)4s$	^{3}P	2	221 087.6	88	9	(^{4}D) ^{3}D
		1	221 429.0	92	6	
$3d^5(^4D)4s$	^{3}D	3	225 200.7	99		
		1	225 545.1	94	6	(^{4}P) ^{3}P
		2	225 616.5	90	9	(^{4}P) ^{3}P
$3d^5(^2I)4s$	^{3}I	6	229 408.8	99	1	(^{2}H) ^{3}H
		5	229 413.0	99	1	(^{2}H) ^{3}H
		7	229 440.6	100		
$3d^5(^2D3)4s$	^{3}D	3	232 545.9	55	19	(^{2}F1) ^{3}F
		2	232 655.6	50	17	(^{2}F1) ^{3}F
		1	232 910.8	50	34	(^{4}F) ^{5}F
$3d^5(^2I)4s$	^{1}I	6	233 839.2	98	2	(^{2}H) ^{3}H
$3d^5(^4F)4s$	^{5}F	5	234 082.1	98	2	(^{2}G2) ^{3}G
		4	234 125.4	92	5	(^{2}F1) ^{3}F
		3	234 275.2	89	8	(^{2}F1) ^{3}F
		2	234 412.7	70	23	(^{2}F1) ^{3}F
		1	235 116.5	65	27	(^{2}D3) ^{3}D

Ni v—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^5(^2F1)4s$	^3F	4	235 420.6	92	6	$(^4F)\ ^5F$
		2	235 736.5	36	23	$(^2D3)\ ^3D$
		3	236 454.1	69	16	$(^2D3)\ ^3D$
$3d^5(^2D3)4s$	^1D	2	239 107.7	55	23	$(^2F1)\ ^3F$
$3d^5(^2F1)4s$	^1F	3	240 193.8	83	6	$(^2G2)\ ^3G$
$3d^5(^2H)4s$	^3H	4	240 959.6	71	24	$(^2G2)\ ^3G$
		5	241 082.2	69	28	$(^2G2)\ ^3G$
		6	241 773.6	97	2	$(^2I)\ ^1I$
$3d^5(^2G2)4s$	^3G	3	242 290.4	79	12	$(^4F)\ ^3F$
		4	242 504.3	45	28	$(^4F)\ ^3F$
		5	242 862.6	66	30	$(^2H)\ ^3H$
$3d^5(^6S)4p$	$^7P^\circ$	2	*242 837.0*	99	1	$(^6S)\ ^5P^\circ$
		3	*243 608.5*	98	2	$(^6S)\ ^5P^\circ$
		4	*244 900.5*	100		
$3d^5(^4F)4s$	^3F	2	243 266.2	93	3	$(^2F2)\ ^3F$
		4	243 331.5	62	30	$(^2G2)\ ^3G$
		3	243 370.5	83	14	$(^2G2)\ ^3G$
$3d^5(^2H)4s$	^1H	5	246 240.9	96	4	$(^2G2)\ ^3G$
$3d^5(^2G2)4s$	^1G	4	247 049.1	63	33	$(^2F2)\ ^3F$
$3d^5(^2F2)4s$	^3F	3	247 104.9	97	1	$(^4F)\ ^5F$
		2	247 165.0	96	3	$(^4F)\ ^3F$
		4	247 281.8	63	29	$(^2G2)\ ^1G$
$3d^5(^2F2)4s$	^1F	3	251 654.9	96	2	$(^4F)\ ^3F$
$3d^5(^6S)4p$	$^5P^\circ$	3	*253 862.7*	96	2	$(^6S)\ ^7P^\circ$
		2	*254 495.6*	97	1	$(^4D)\ ^5P^\circ$
		1	*254 885.0*	98	1	$(^4D)\ ^5P^\circ$
$3d^5(^2S)4s$	^3S	1	253 905.2	100		
$3d^5(^2D2)4s$	^3D	1	263 700.9	100		
		2	263 735.7	99		
		3	263 805.8	99		
$3d^5(^2D2)4s$	^1D	2	268 273.9	99		
$3d^5(^2G1)4s$	^3G	5	274 695.4	100		
		4	274 738.6	100		
		3	274 773.5	100		
$3d^5(^2G1)4s$	^1G	4	279 199.5	100		
$3d^5(^4G)4p$	$^5G^\circ$	2	*284 215.5*	92	4	$(^4G)\ ^3F^\circ$
		3	*284 249.0*	84	9	$(^4G)\ ^5H^\circ$
		4	*284 308.9*	81	14	$(^4G)\ ^5H^\circ$
		5	*284 402.5*	80	14	$(^4G)\ ^5H^\circ$
		6	*284 579.5*	84	11	$(^4G)\ ^5H^\circ$

Ni v—Continued

Configuration	Term	*J*	Level (cm^{-1})	Leading percentages			
$3d^5(^4G)4p$	$^5H^\circ$	3	*286 293.6*	88		8	$(^4G)\ ^5G^\circ$
		4	*286 706.6*	82		12	$(^4G)\ ^5G^\circ$
		5	*287 127.2*	75		11	$(^4G)\ ^5F^\circ$
		6	*287 645.9*	86		13	$(^4G)\ ^5G^\circ$
		7	*288 021.6*	100			
$3d^5(^4P)4p$	$^5D^\circ$	1	*287 755.5*	63		20	$(^4D)\ ^5D^\circ$
		2	*287 782.1*	45		18	$(^4G)\ ^5F^\circ$
		0	*290 262.0*	64		19	$(^4D)\ ^5D^\circ$
$3d^5(^4G)4p$	$^5F^\circ$	5	*287 906.9*	75		8	$(^4G)\ ^5H^\circ$
		4	*288 161.6*	71		10	$(^4D)\ ^5F^\circ$
		1	*289 163.0*	71		11	$(^4D)\ ^5F^\circ$
		2	*289 247.1*	52		13	$(^4P)\ ^5D^\circ$
		3	*289 298.0*	40		32	$(^4P)\ ^5D^\circ$
$3d^5(^4G)4p$		3	*287 960.0*	39	$^5F^\circ$	25	$(^4P)\ ^5D^\circ$
$3d^5(^4P)4p$		2	*288 877.9*	38	$^5S^\circ$	9	$(^4G)\ ^5F^\circ$
$3d^5(^4P)4p$	$^5P^\circ$	3	*290 757.0*	44		32	$(^4D)\ ^5P^\circ$
		2	*291 390.0*	58		26	
		1	*291 541.7*	71		15	
$3d^5(^4G)4p$	$^3F^\circ$	2	*291 097.7*	84		4	$(^4G)\ ^5G^\circ$
		3	*291 328.5*	81		4	$(^4F)\ ^3F^\circ$
		4	*291 554.6*	88		4	$(^4F)\ ^3F^\circ$
$3d^5(^4G)4p$	$^3H^\circ$	6	*291 891.4*	93		3	$(^4G)\ ^5H^\circ$
		5	*292 353.4*	94		2	$(^4G)\ ^5H^\circ$
		4	*292 631.0*	95		2	$(^2I)\ ^3H^\circ$
$3d^5(^4P)4p$	$^3P^\circ$	2	*292 983.0*	52		18	$(^4D)\ ^3P^\circ$
		1	*293 420.0*	53		18	
		0	*293 867.0*	65		20	
$3d^5(^4D)4p$	$^5F^\circ$	1	*293 833.8*	73		17	$(^4G)\ ^5F^\circ$
		2	*294 086.0*	76		15	
		3	*294 443.3*	76		11	
		4	*294 939.6*	79		8	
		5	*295 444.3*	91		6	
$3d^5(^4D)4p$	$^5D^\circ$	3	*296 574.0*	51		18	$(^4P)\ ^5D^\circ$
		4	*296 919.3*	68		22	
		2	*297 013.9*	54		17	
		1	*297 417.9*	51		17	
		0	*298 060.0*	63		22	
$3d^5(^4G)4p$	$^3G^\circ$	3	*296 847.1*	90		2	$(^4F)\ ^3G^\circ$
		4	*296 897.0*	91		2	$(^4F)\ ^3G^\circ$
		5	*296 932.9*	92		2	$(^4G)\ ^5F^\circ$
$3d^5(^4P)4p$	$^3D^\circ$	3	*297 418.1*	60		14	$(^4D)\ ^5P^\circ$
		2	*297 842.5*	57		18	
$3d^5(^4D)4p$	$^5P^\circ$	1	*297 982.8*	40		36	$(^4P)\ ^3D^\circ$
		2	*299 045.6*	39		19	$(^4P)\ ^5P^\circ$
$3d^5(^4P)4p$		1	*298 600.6*	30	$^3D^\circ$	29	$(^4D)\ ^5P^\circ$

Ni v—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^5(^4D)4p$	$^3D^\circ$	3	298 972.3	43		15	$(^4P)\ ^5P^\circ$
		2	300 224.9	74		8	$(^4F)\ ^3D^\circ$
		1	300 563.3	65		17	$(^4P)\ ^3D^\circ$
$3d^5(^4D)4p$		3	300 201.0	36	$^3D^\circ$	31	$(^4D)\ ^5P^\circ$
$3d^5(^4D)4p$	$^3F^\circ$	4	300 918.1	84		5	$(^2G2)\ ^3F^\circ$
		3	301 470.2	76		8	$(^4P)\ ^3D^\circ$
		2	301 553.0	80		7	$(^4P)\ ^3D^\circ$
$3d^5(^4P)4p$	$^3S^\circ$	1	303 249.5	91		3	$(^4D)\ ^3P^\circ$
$3d^5(^4D)4p$	$^3P^\circ$	0	305 386.9	72		22	$(^4P)\ ^3P^\circ$
		1	305 838.1	66		21	
		2	306 377.8	63		25	
$3d^5(^2I)4p$	$^3K^\circ$	6	305 590.8	69		26	$(^2I)\ ^3I^\circ$
		7	305 996.3	56		34	$(^2I)\ ^3I^\circ$
		8	308 138.8	100			
$3d^5(^2I)4p$	$^3I^\circ$	5	306 049.0	64		19	$(^2I)\ ^1H^\circ$
		6	307 399.7	53		26	$(^2I)\ ^3K^\circ$
		7	308 317.3	62		38	$(^2I)\ ^3K^\circ$
$3d^5(^2D1)4s$	^3D	3	306 962.9	77		23	$(^2D3)\ ^3D$
		2	307 025.2	77		23	
		1	307 105.1	76		23	
$3d^5(^2D3)4p$	$^3F^\circ$	2	307 731.1	21		25	$(^2F1)\ ^3F^\circ$
		3	308 592.0	37		23	
		4	310 212.6	39		25	
$3d^5(^2I)4p$	$^1H^\circ$	5	308 804.1	52		29	$(^2I)\ ^3I^\circ$
$3d^5(^2D3)4p$		2	308 943.0	29	$^3F^\circ$	21	$^1D^\circ$
$3d^5(^2I)4p$	$^3H^\circ$	6	309 264.0	73		17	$(^2I)\ ^3I^\circ$
		5	309 919.5	78		11	$(^2I)\ ^1H^\circ$
		4	309 952.5	79		5	$(^2G2)\ ^3H^\circ$
$3d^5(^2I)4p$	$^1K^\circ$	7	309 743.6	91		5	$(^2I)\ ^3K^\circ$
$3d^5(^2D1)4s$	^1D	2	311 470.3	77		23	$(^2D3)\ ^1D$
$3d^5(^2D3)4p$	$^3P^\circ$	2	311 966.5	40		15	$(^2F1)\ ^3D^\circ$
		0	313 577.3	66		20	$(^2D1)\ ^3P^\circ$
$3d^5(^2F1)4p$	$^1G^\circ$	4	312 008.3	43		12	$(^2H)\ ^1G^\circ$
$3d^5(^2D3)4p$		1	312 291.0	31	$^3P^\circ$	28	$(^2D3)\ ^3D^\circ$
$3d^5(^2F1)4p$	$^3G^\circ$	3	312 463.3	43		20	$(^2F1)\ ^3F^\circ$
		5	314 702.2	70		23	$(^4F)\ ^5G^\circ$
$3d^5(^4F)4p$	$^5G^\circ$	2	312 778.2	78		9	$(^2F1)\ ^3F^\circ$
		3	312 889.4	43		19	$(^2D3)\ ^3D^\circ$
		4	313 281.3	72		5	$(^4F)\ ^5F^\circ$
		5	313 464.7	56		15	$(^2F1)\ ^3G^\circ$
		6	314 756.4	53		42	$(^2I)\ ^1I^\circ$

Ni v—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^5(^2F1)4p$		3	*312 953.6*	33	$^3D^\circ$	31	$(^4F)\ ^5G^\circ$
$3d^5(^2D3)4p$		1	*313 679.0*	29	$^3D^\circ$	27	$(^2D3)\ ^3P^\circ$
$3d^5(^2D3)4p$	$^3D^\circ$	2	*313 686.6*	45		15	$(^2D1)\ ^3D^\circ$
$3d^5(^2F1)4p$		3	*313 919.8*	23	$^3D^\circ$	22	$(^2D3)\ ^3D^\circ$
$3d^5(^2F1)4p$		4	*314 208.8*	30	$^3F^\circ$	30	$(^2F1)\ ^3G^\circ$
$3d^5(^2I)4p$	$^1I^\circ$	6	*314 392.0*	44		38	$(^4F)\ ^5G^\circ$
$3d^5(^4F)4p$	$^5F^\circ$	3	*314 562.8*	61		25	$(^4F)\ ^5D^\circ$
		4	*314 599.2*	39		21	$(^4F)\ ^5D^\circ$
		2	*314 834.7*	42		23	$(^4F)\ ^5D^\circ$
		1	*315 152.8*	74		9	$(^4F)\ ^5D^\circ$
		5	*315 168.2*	65		9	$(^4F)\ ^5G^\circ$
$3d^5(^2F1)4p$	$^3D^\circ$	1	*315 300.7*	51		19	$(^2D3)\ ^1P^\circ$
$3d^5(^2F1)4p$		3	*315 326.2*	25	$^3G^\circ$	14	$(^2D3)\ ^1F^\circ$
$3d^5(^2F1)4p$		2	*315 366.1*	32	$^3D^\circ$	18	$(^4F)\ ^5F^\circ$
$3d^5(^2G2)4p$	$^3H^\circ$	4	*315 370.1*	31		29	$(^2H)\ ^3H^\circ$
		5	*323 908.6*	36		28	
		6	*325 148.4*	45		37	
$3d^5(^2H)4p$	$^3H^\circ$	5	*315 990.5*	30		36	$(^2G2)\ ^3H^\circ$
		6	*317 327.3*	39		35	
		4	*323 926.3*	44		36	
$3d^5(^2D3)4p$		4	*316 068.8*	20	$^3F^\circ$	18	$(^2F1)\ ^3G^\circ$
$3d^5(^2F1)4p$		2	*316 165.4*	31	$^3F^\circ$	17	$(^2F1)\ ^3D^\circ$
$3d^5(^2F1)4p$		3	*316 280.3*	19	$^3F^\circ$	14	$(^2D3)\ ^1F^\circ$
$3d^5(^2H)4p$	$^3G^\circ$	5	*316 726.6*	47		14	$(^2G2)\ ^3G^\circ$
$3d^5(^4F)4p$	$^5D^\circ$	4	*316 744.0*	44		24	$(^4F)\ ^5F^\circ$
		3	*317 232.0*	39		17	$(^4F)\ ^5F^\circ$
		0	*317 462.3*	88		7	$(^2D3)\ ^3P^\circ$
		1	*317 477.9*	76		9	$(^4F)\ ^5F^\circ$
		2	*317 517.5*	65		15	$(^4F)\ ^5F^\circ$
$3d^5(^2H)4p$		4	*316 887.8*	36	$^3G^\circ$	12	$(^2F2)\ ^3G^\circ$
$3d^5(^4F)4p$		3	*317 376.8*	22	$^5D^\circ$	20	$(^2H)\ ^3G^\circ$
$3d^5(^2D3)4p$	$^1P^\circ$	1	*319 073.4*	45		22	$(^2F1)\ ^3D^\circ$
$3d^5(^2H)4p$	$^3I^\circ$	5	*319 076.2*	85		6	$(^2H)\ ^3H^\circ$
		6	*319 860.4*	78		8	$(^2H)\ ^1I^\circ$
		7	*320 783.1*	95		2	$(^2I)\ ^3I^\circ$
$3d^5(^2G2)4p$		4	*319 138.7*	25	$^1G^\circ$	18	$(^2F1)\ ^1G^\circ$

Ni v—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^5(^4F)4p$	$^3G°$	3	*319 620.2*	38	32	$(^2G2)\ ^3G°$
		5	*319 652.7*	65	15	
		4	*319 899.1*	57	15	
$3d^5(^2F1)4p$	$^1D°$	2	*319 926.5*	51	29	$(^2D3)\ ^1D°$
$3d^5(^2G2)4p$	$^3F°$	3	*320 513.8*	41	18	$(^4F)\ ^3G°$
		2	*321 018.3*	57	11	$(^4F)\ ^3F°$
		4	*321 056.4*	54	13	$(^2G2)\ ^1G°$
$3d^5(^2F1)4p$	$^1F°$	3	*321 081.9*	52	17	$(^2G2)\ ^3F°$
$3d^5(^2H)4p$	$^1I°$	6	*322 324.2*	76	9	$(^2H)\ ^3H°$
$3d^5(^4F)4p$	$^3D°$	2	*322 436.4*	54	11	$(^2F2)\ ^3F°$
		3	*322 617.6*	50	10	$(^2F2)\ ^3F°$
		1	*322 984.5*	79	7	$(^4D)\ ^3D°$
$3d^5(^4F)4p$	$^3F°$	4	*322 820.8*	60	28	$(^2F2)\ ^3F°$
		3	*323 532.2*	60	17	
		2	*323 853.1*	53	20	
$3d^5(^2G2)4p$	$^3G°$	5	*324 980.2*	25	21	$(^2F2)\ ^3G°$
		3	*325 211.9*	30	29	
		4	*325 222.9*	27	28	
$3d^5(^2F2)4p$		4	*325 558.6*	32 $^1G°$	13	$(^2G2)\ ^1G°$
$3d^5(^2F2)4p$	$^3F°$	2	*325 982.2*	26	23	$(^4F)\ ^3F°$
		3	*326 029.9*	48	13	
		4	*326 876.3*	44	14	
$3d^5(^2G2)4p$	$^1H°$	5	*326 337.1*	53	26	$(^2H)\ ^1H°$
$3d^5(^2G2)4p$	$^1F°$	3	*326 739.0*	58	6	$(^2G2)\ ^3G°$
$3d^5(^2F2)4p$	$^1D°$	2	*327 122.7*	60	24	$(^2F2)\ ^3F°$
$3d^5(^2H)4p$	$^1H°$	5	*327 356.6*	63	29	$(^2G2)\ ^1H°$
$3d^5(^2F2)4p$	$^3D°$	1	*329 462.3*	55	21	$(^2S)\ ^3P°$
		2	*329 776.3*	70	12	$(^2F1)\ ^3D°$
		3	*329 872.9*	47	12	$(^2F2)\ ^3G°$
$3d^5(^2F2)4p$	$^3G°$	3	*329 614.3*	27	33	$(^2H)\ ^3G°$
		4	*330 297.6*	47	37	
		5	*330 718.1*	58	31	
$3d^5(^2S)4p$	$^3P°$	0	*329 618.5*	83	13	$(^2D2)\ ^3P°$
		1	*330 370.7*	58	23	$(^2F2)\ ^3D°$
		2	*331 678.2*	74	16	$(^2D2)\ ^3P°$
$3d^5(^2H)4p$	$^1G°$	4	*332 995.6*	39	37	$(^2F2)\ ^1G°$
$3d^5(^2S)4p$	$^1P°$	1	*334 477.2*	70	19	$(^2D2)\ ^1P°$
$3d^5(^2F2)4p$	$^1F°$	3	*334 727.6*	88	4	$(^2F1)\ ^1F°$

Ni v—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^5(^2D2)4p$	$^3F°$	2	*342 894.6*	67	21	$(^2D2)\ ^3D°$
		3	*343 281.0*	50	27	$(^2D2)\ ^3D°$
		4	*344 911.2*	92	5	$(^2G2)\ ^3F°$
$3d^5(^2D2)4p$	$^3D°$	1	*343 478.2*	89	2	$(^2D2)\ ^3P°$
		2	*343 905.7*	65	21	$(^2D2)\ ^3F°$
		3	*344 805.3*	60	33	$(^2D2)\ ^3F°$
$3d^5(^2D2)4p$	$^1F°$	3	*345 936.1*	72	12	$(^2G1)\ ^1F°$
$3d^5(^2D2)4p$	$^3P°$	2	*346 912.4*	72	16	$(^2S)\ ^3P°$
		0	*346 920.2*	85	14	
		1	*346 959.5*	76	15	
$3d^5(^2D2)4p$	$^1P°$	1	*348 477.9*	72	17	$(^2S)\ ^1P°$
$3d^5(^2D2)4p$	$^1D°$	2	*349 546.0*	87	5	$(^2F2)\ ^1D°$
$3d^5(^2G1)4p$	$^3H°$	4	*353 071.6*	47	31	$(^2G1)\ ^3F°$
		5	*353 548.7*	76	15	$(^2G1)\ ^3G°$
		6	*354 989.6*	98	2	$(^2I)\ ^3H°$
$3d^5(^2G1)4p$	$^3F°$	4	*353 347.1*	50	40	$(^2G1)\ ^3H°$
		3	*353 944.1*	55	36	$(^2G1)\ ^3G°$
		2	*355 150.0*	90	6	$(^2D1)\ ^3F°$
$3d^5(^2G1)4p$	$^3G°$	3	*355 398.0*	59	36	$(^2G1)\ ^3F°$
		4	*355 765.2*	80	9	$(^2G1)\ ^3F°$
		5	*356 036.3*	78	18	$(^2G1)\ ^3H°$
$3d^5(^2G1)4p$	$^1H°$	5	*358 475.6*	90	4	$(^2G1)\ ^3G°$
$3d^5(^2G1)4p$	$^1G°$	4	*358 760.0*	93	2	$(^2G1)\ ^3F°$
$3d^5(^2G1)4p$	$^1F°$	3	*360 059.7*	78	10	$(^2D2)\ ^1F°$
$3d^5(^2P)4p$	$^3P°$	0	*368 440.5*	75	20	$(^2D1)\ ^3P°$
		1	*368 749.7*	73	21	
		2	*369 649.1*	72	23	
$3d^5(^2P)4p$	$^3D°$	2	*374 803.7*	57	27	$(^2P)\ ^1D°$
		1	*374 828.1*	90	5	$(^2D1)\ ^3D°$
		3	*376 471.6*	89	7	$(^2D1)\ ^3D°$
$3d^5(^2P)4p$	$^1D°$	2	*377 059.1*	49	33	$(^2P)\ ^3D°$
$3d^5(^2P)4p$	$^3S°$	1	*378 555.0*	90	7	$(^2P)\ ^1P°$
$3d^5(^2P)4p$	$^1P°$	1	*380 165.6*	68	16	$(^2D1)\ ^1P°$
$3d^5(^2D1)4p$	$^3F°$	2	*386 968.8*	63	20	$(^2D3)\ ^3F°$
		3	*387 333.4*	60	19	
		4	*388 698.9*	72	22	
$3d^5(^2D1)4p$	$^3D°$	1	*388 746.1*	71	21	$(^2D3)\ ^3D°$
		2	*389 571.8*	60	18	
		3	*390 478.2*	60	18	
$3d^5(^2D1)4p$	$^1D°$	2	*390 675.1*	44	16	$(^2P)\ ^1D°$

Ni v—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^5(^2D1)4p$	$^3P°$	2	*392 413.5*	43	21	$(^2P)\ ^3P°$
$3d^5(^2D1)4p$	$^1F°$	3	*392 957.1*	69	21	$(^2D3)\ ^1F°$
$3d^5(^6S)5p$	$^5P°$	3	*423 533*			
		2	*423 782*			
		1	*423 935*			
$3d^5(^6S)4f$	$^5F°$	2	*439 419*			
		1	*439 420*			
		3	*439 423*			
		4	*439 427*			
		5	*439 434*			
$3d^5(^6S)5f$	$^5F°$	5	*502 124*			
		4	*502 133*			
		3	*502 137*			
		1	*502 143*			
		2	*502 148*			
Ni VI ($^6S_{5/2}$)	***Limit***		**613 500**			

Ni VI

$Z=28$

V I isoelectronic sequence

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

Ionization energy = 870 000±16 000 cm^{-1} (108±2 eV)

The resonance multiplet $3d^5\ ^6S - 3d^4 4p\ ^6P^\circ$ was identified by Kruger and Gilroy (1935). An extensive analysis of this spectrum was carried out by Raassen (1980), who reported all the presently known levels and their percentage compositions. The uncertainty in the level values is probably ±5 cm^{-1}.

The ionization energy was obtained by extrapolation by Lotz (1967).

References

Kruger, P. G., and Gilroy, H. T. (1935), Phys. Rev. **48**, 720.
Lotz, W. (1967), J. Opt. Soc. Am. **57**, 873.
Raassen, A. J. J. (1980), Physica **100C**, 404.

Ni VI

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^5$	^{6}S	5/2	0.0	100			
$3d^5$	^{4}G	11/2	41 920.9	100			
		5/2	42 003.6	99		1	^{2}F1
		9/2	42 023.2	100			
		7/2	42 035.1	100			
$3d^5$	^{4}P	5/2	45 884.2	90		9	^{4}D
		3/2	46 104.4	92		7	
		1/2	46 324.8	97		3	
$3d^5$	^{4}D	7/2	50 331.0	99			
		1/2	50 643.5	97		3	^{4}P
		5/2	50 777.6	90		9	^{4}P
		3/2	50 780.5	92		7	^{4}P
$3d^5$	^{2}I	11/2	61 196.0	98		2	^{2}H
		13/2	61 279.5	100			
$3d^5$	^{2}D3	5/2	64 152.4	52		29	^{2}F1
		3/2	65 173.5	71		22	^{2}D1
$3d^5$	^{2}F1	7/2	67 085.1	93		3	^{4}F
$3d^5$	^{4}F	5/2	68 444.9	51		39	^{2}F1
		9/2	68 551.2	95		4	^{2}G2
		7/2	68 801.7	94		4	^{2}F1
		3/2	69 173.5	92		6	^{2}D3
$3d^5$		5/2	69 447.0	47	^{4}F	31	^{2}F1
$3d^5$	^{2}H	9/2	72 908.8	74		24	^{2}G2
		11/2	73 756.6	98		2	^{2}I
$3d^5$	^{2}G2	7/2	74 627.7	98		1	^{4}F
		9/2	75 441.7	72		25	^{2}H
$3d^5$	^{2}F2	5/2	79 391.4	98		1	^{4}F
		7/2	79 608.3	97		2	

Ni VI—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^5$	^{2}S	1/2	86 532.1	100		
$3d^5$	^{2}D2	3/2	96 461.2	100		
		5/2	96 566.5	99	1	^{2}F2
$3d^5$	^{2}G1	9/2	107 848.3	100		
		7/2	107 887.0	100		
$3d^5$	^{2}P	3/2	129 951.6	99	1	^{2}D1
		1/2	130 025.9	100		
$3d^5$	^{2}D1	5/2	140 922.2	77	23	^{2}D3
		3/2	141 006.8	76	23	
$3d^4(^5D)4s$	^{6}D	1/2	295 882.7	100		
		3/2	296 198.1	100		
		5/2	296 696.7	100		
		7/2	297 350.5	100		
		9/2	298 130.5	100		
$3d^4(^5D)4s$	^{4}D	1/2	307 843.9	99		
		3/2	308 323.8	100		
		5/2	309 054.9	100		
		7/2	309 977.1	100		
$3d^4(^3P2)4s$	^{4}P	1/2	328 437.2	59	38	(^{3}P1) ^{4}P
		3/2	330 001.6	60	38	
		5/2	332 344.8	61	38	
$3d^4(^3H)4s$	^{4}H	7/2	329 486.2	97	2	(^{3}G) ^{4}G
		9/2	329 754.2	96	3	(^{3}G) ^{4}G
		11/2	330 141.0	97	2	(^{3}G) ^{4}G
		13/2	330 580.5	100		
$3d^4(^3F2)4s$	^{4}F	3/2	332 031.8	78	22	(^{3}F1) ^{4}F
		5/2	332 051.6	74	20	
		7/2	332 175.4	72	19	
		9/2	332 343.6	73	18	
$3d^4(^3G)4s$	^{4}G	5/2	335 384.5	91	5	(^{3}F2) ^{4}F
		7/2	335 976.0	90	7	(^{3}F2) ^{4}F
		9/2	336 344.9	73	18	(^{3}H) ^{2}H
		11/2	336 430.4	78	19	(^{3}H) ^{2}H
$3d^4(^3P2)4s$	^{2}P	1/2	336 404.8	59	38	(^{3}P1) ^{2}P
		3/2	339 260.1	60	37	
$3d^4(^3H)4s$	^{2}H	9/2	337 007.7	78	19	(^{3}G) ^{4}G
		11/2	337 993.9	79	20	
$3d^4(^3F2)4s$	^{2}F	5/2	339 482.4	76	20	(^{3}F1) ^{2}F
		7/2	339 335.8	70	17	
$3d^4(^3G)4s$	^{2}G	7/2	343 052.0	90	6	(^{3}F2) ^{2}F
		9/2	343 842.6	96	2	(^{3}H) ^{2}H
$3d^4(^3D)4s$	^{4}D	7/2	343 999.6	99		
		5/2	344 203.5	98		
		3/2	344 447.4	98		

Ni VI—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^4(^1G2)4s$	^2G	9/2	347 278.5	64	31	$(^1G1)\ ^2G$
		7/2	347 445.2	62	30	
$3d^4(^1I)4s$	^2I	13/2	347 892.4	100		
		11/2	347 963.9	99	1	$(^3H)\ ^2H$
$3d^4(^3D)4s$	^2D	5/2	351 033.0	99		
		3/2	351 304.0	98	1	$(^1D2)\ ^2D$
$3d^4(^1S2)4s$	^2S	1/2	351 096.2	78	20	$(^1S1)\ ^2S$
$3d^4(^1D2)4s$	^2D	5/2	358 716.6	77	20	$(^1D1)\ ^2D$
		3/2	358 827.9	77	20	
$3d^4(^1F)4s$	^2F	5/2	366 289.8	98	1	$(^3F1)\ ^4F$
		7/2	366 299.8	98	1	
$3d^4(^3P1)4s$	^4P	5/2	374 843.9	61	38	$(^3P2)\ ^4P$
		3/2	376 343.7	60	38	
$3d^4(^3F1)4s$	^4F	9/2	375 673.0	81	19	$(^3F2)\ ^4F$
		3/2	375 870.8	78	22	
		7/2	375 927.1	79	20	
		5/2	375 949.8	78	21	
$3d^4(^5D)4p$	$^6F^\circ$	1/2	*380 756.7*	99	1	$(^5D)\ ^4D^\circ$
		3/2	*381 163.8*	99		
		5/2	*381 832.8*	99	1	$(^5D)\ ^4F^\circ$
		7/2	*382 758.9*	98	1	$(^5D)\ ^4F^\circ$
		9/2	*383 960.2*	98	1	$(^5D)\ ^4F^\circ$
		11/2	*385 520.9*	100		
$3d^4(^3F1)4s$	^2F	7/2	382 677.1	80	19	$(^3F2)\ ^2F$
		5/2	382 889.1	78	21	
$3d^4(^5D)4p$	$^6P^\circ$	3/2	*383 557.8*	91	6	$(^5D)\ ^4P^\circ$
		5/2	*383 739.8*	94	4	$(^5D)\ ^4P^\circ$
		7/2	*384 096.5*	98	1	$(^5D)\ ^6D^\circ$
$3d^4(^5D)4p$	$^4P^\circ$	1/2	*384 747.4*	68	29	$(^5D)\ ^6D^\circ$
		3/2	*386 157.3*	55	33	
		5/2	*389 760.4*	55	42	
$3d^4(^5D)4p$	$^6D^\circ$	5/2	*387 849.9*	54	38	$(^5D)\ ^4P^\circ$
		1/2	*388 918.6*	71	29	$(^5D)\ ^4P^\circ$
		3/2	*389 214.0*	64	35	$(^5D)\ ^4P^\circ$
		7/2	*389 243.4*	94	4	$(^5D)\ ^4F^\circ$
		9/2	*389 883.2*	88	10	$(^5D)\ ^4F^\circ$
$3d^4(^1G1)4s$	^2G	7/2	389 362.5	66	33	$(^1G2)\ ^2G$
		9/2	389 299.6	67	33	
$3d^4(^5D)4p$	$^4F^\circ$	3/2	*392 808.1*	94	2	$(^3G)\ ^4F^\circ$
		5/2	*393 072.0*	93	2	$(^3G)\ ^4F^\circ$
		7/2	*393 468.2*	91	4	$(^5D)\ ^6D^\circ$
		9/2	*394 061.0*	85	11	$(^5D)\ ^6D^\circ$

Ni VI—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^4(^5\mathrm{D})4p$	$^4\mathrm{D}^\circ$	1/2	400 962.1	96		1	$(^3\mathrm{D})\ ^4\mathrm{D}^\circ$
		3/2	401 280.9	96		1	
		5/2	401 720.9	96		1	
		7/2	402 171.3	96		2	
$3d^4(^3\mathrm{H})4p$	$^4\mathrm{H}^\circ$	7/2	411 669.4	74		20	$(^3\mathrm{G})\ ^4\mathrm{H}^\circ$
		9/2	412 095.6	70		19	
		11/2	412 751.1	72		17	
		13/2	413 631.6	77		13	
$3d^4(^3\mathrm{P2})4p$	$^4\mathrm{D}^\circ$	1/2	412 248.2	47		32	$(^3\mathrm{P1})\ ^4\mathrm{D}^\circ$
		3/2	413 553.1	47		31	
		5/2	415 144.5	38		26	
$3d^4(^3\mathrm{F2})4p$	$^4\mathrm{G}^\circ$	5/2	415 382.0	40		23	$(^3\mathrm{G})\ ^4\mathrm{G}^\circ$
		7/2	415 640.8	25		16	$(^3\mathrm{G})\ ^4\mathrm{G}^\circ$
		9/2	420 080.0	40		40	$(^3\mathrm{H})\ ^4\mathrm{G}^\circ$
		11/2	420 623.4	58		22	$(^3\mathrm{H})\ ^4\mathrm{G}^\circ$
$3d^4(^3\mathrm{H})4p$	$^4\mathrm{I}^\circ$	9/2	415 754.3	45		11	$(^3\mathrm{H})\ ^2\mathrm{G}^\circ$
		11/2	417 164.1	63		14	$(^3\mathrm{H})\ ^4\mathrm{G}^\circ$
		13/2	418 553.6	90		8	$(^3\mathrm{H})\ ^4\mathrm{H}^\circ$
		15/2	419 533.5	99		1	$(^1\mathrm{I})\ ^2\mathrm{K}^\circ$
$3d^4(^3\mathrm{H})4p$		9/2	416 422.3	43	$^4\mathrm{I}^\circ$	11	$(^3\mathrm{F2})\ ^4\mathrm{G}^\circ$
$3d^4(^3\mathrm{P2})4p$	$^4\mathrm{P}^\circ$	1/2	416 459.0	35		20	$(^3\mathrm{P1})\ ^4\mathrm{P}^\circ$
		3/2	418 491.4	45		25	
		5/2	420 308.9	50		28	
$3d^4(^3\mathrm{F2})4p$	$^4\mathrm{D}^\circ$	7/2	416 493.0	31		23	$(^3\mathrm{P2})\ ^4\mathrm{D}^\circ$
		1/2	422 369.4	42		15	$(^3\mathrm{F1})\ ^4\mathrm{D}^\circ$
		3/2	422 437.2	37		12	$(^3\mathrm{F1})\ ^4\mathrm{D}^\circ$
$3d^4(^3\mathrm{H})4p$		11/2	417 538.4	34	$^4\mathrm{G}^\circ$	25	$(^3\mathrm{H})\ ^4\mathrm{I}^\circ$
$3d^4(^3\mathrm{H})4p$	$^2\mathrm{G}^\circ$	7/2	417 717.7	38		16	$(^3\mathrm{F2})\ ^2\mathrm{G}^\circ$
		9/2	418 368.8	32		18	
$3d^4(^3\mathrm{F2})4p$		3/2	418 713.4	28	$^4\mathrm{F}^\circ$	21	$(^3\mathrm{F2})\ ^2\mathrm{D}^\circ$
$3d^4(^3\mathrm{H})4p$		5/2	419 390.5	30	$^4\mathrm{G}^\circ$	26	$(^3\mathrm{F2})\ ^4\mathrm{G}^\circ$
$3d^4(^3\mathrm{F2})4p$		5/2	419 844.7	39	$^4\mathrm{F}^\circ$	14	$(^3\mathrm{H})\ ^4\mathrm{G}^\circ$
$3d^4(^3\mathrm{H})4p$	$^4\mathrm{G}^\circ$	7/2	419 863.3	47		32	$(^3\mathrm{F2})\ ^4\mathrm{G}^\circ$
$3d^4(^3\mathrm{P2})4p$		1/2	419 961.5	23	$^4\mathrm{P}^\circ$	18	$(^3\mathrm{P1})\ ^2\mathrm{S}^\circ$
$3d^4(^3\mathrm{F2})4p$	$^4\mathrm{F}^\circ$	7/2	420 553.2	63		11	$(^3\mathrm{F1})\ ^4\mathrm{F}^\circ$
		9/2	420 835.3	58		13	$(^3\mathrm{G})\ ^4\mathrm{F}^\circ$
$3d^4(^3\mathrm{P2})4p$		3/2	420 722.0	26	$^2\mathrm{P}^\circ$	18	$(^3\mathrm{P2})\ ^4\mathrm{S}^\circ$
$3d^4(^3\mathrm{F2})4p$		5/2	421 324.3	19	$^2\mathrm{D}^\circ$	15	$(^3\mathrm{F2})\ ^4\mathrm{F}^\circ$
$3d^4(^3\mathrm{F2})4p$		3/2	421 607.2	24	$^4\mathrm{F}^\circ$	20	$(^3\mathrm{F2})\ ^2\mathrm{D}^\circ$
$3d^4(^3\mathrm{F2})4p$		5/2	421 894.0	15	$^2\mathrm{D}^\circ$	14	$(^3\mathrm{F2})\ ^4\mathrm{D}^\circ$

Ni VI—Continued

Configuration	Term	J	Level (cm⁻¹)	Leading percentages			
$3d^4(^3P2)4p$		7/2	422 306.6	21	$^4D°$	20	$(^3G)\ ^4F°$
$3d^4(^3H)4p$	$^2I°$	11/2	422 642.4	80		6	$(^1I)\ ^2I°$
		13/2	422 711.8	82		11	$(^3G)\ ^4H°$
$3d^4(^3G)4p$		5/2	422 897.8	22	$^2F°$	16	$(^3F2)\ ^4D°$
$3d^4(^3H)4p$		9/2	423 065.5	36	$^2H°$	20	$(^3G)\ ^4H°$
$3d^4(^3G)4p$	$^4H°$	7/2	423 341.4	70		20	$(^3H)\ ^4H°$
		9/2	424 537.0	54		18	$(^3H)\ ^2H°$
		11/2	425 567.6	39		39	$(^3H)\ ^2H°$
		13/2	426 451.9	75		14	$(^3H)\ ^4H°$
$3d^4(^3G)4p$		7/2	423 645.8	18	$^4F°$	15	$(^3D)\ ^2F°$
$3d^4(^3P2)4p$		1/2	423 646.8	29	$^2P°$	18	$(^3F2)\ ^4D°$
$3d^4(^3G)4p$		3/2	423 710.5	26	$^4F°$	12	$(^3F2)\ ^4F°$
$3d^4(^3G)4p$	$^4F°$	9/2	423 763.3	52		15	$(^3F2)\ ^4F°$
		5/2	424 217.9	39		16	$(^3F2)\ ^4D°$
$3d^4(^3G)4p$		3/2	424 235.1	21	$^4F°$	20	$(^3P2)\ ^2P°$
$3d^4(^3F2)4p$		7/2	424 346.1	25	$^4D°$	20	$(^3G)\ ^4F°$
$3d^4(^3G)4p$		11/2	424 363.7	36	$^4H°$	30	$(^3H)\ ^2H°$
$3d^4(^3P2)4p$	$^2D°$	3/2	425 703.1	39		27	$(^3P1)\ ^2D°$
$3d^4(^3F2)4p$		5/2	427 096.5	26	$^2F°$	20	$(^3P2)\ ^2D°$
$3d^4(^3P2)4p$		5/2	427 342.2	27	$^2D°$	26	$(^3F2)\ ^2F°$
$3d^4(^3F2)4p$		7/2	427 575.0	24	$^2G°$	13	$(^3F1)\ ^2G$
$3d^4(^3G)4p$		11/2	427 702.7	38	$^2H°$	21	$(^3G)\ ^4G°$
$3d^4(^3G)4p$		9/2	427 995.6	22	$^4G°$	15	$(^3H)\ ^4G°$
$3d^4(^3G)4p$		9/2	428 051.5	37	$^2H°$	15	$(^3H)\ ^2G°$
$3d^4(^3F2)4p$	$^2F°$	7/2	428 221.4	46		32	$(^3G)\ ^2F°$
$3d^4(^3G)4p$	$^4G°$	5/2	428 496.5	50		29	$(^3H)\ ^4G°$
		7/2	428 866.5	45		20	$(^3H)\ ^4G°$
		11/2	430 033.3	43		25	$(^3G)\ ^2H°$
$3d^4(^3G)4p$		9/2	429 486.3	36	$^4G°$	15	$(^3G)\ ^2H°$
$3d^4(^3D)4p$	$^4D°$	1/2	430 898.8	78		9	$(^3D)\ ^2P°$
		3/2	430 971.9	69		12	$(^3D)\ ^4P°$
		7/2	431 912.6	77		6	$(^3D)\ ^4F°$
		5/2	432 295.7	46		33	$(^3D)\ ^4P°$
$3d^4(^3D)4p$	$^4P°$	5/2	431 019.9	56		32	$(^3D)\ ^4D°$
		3/2	433 462.5	74		9	$(^3D)\ ^4D°$
		1/2	434 281.6	88		7	$(^3P2)\ ^4P°$

Ni VI—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^4(^1I)4p$	$^2I^\circ$	13/2	432 616.6	66		27	$(^1I)\ ^2K^\circ$
		11/2	432 932.0	88		5	$(^3H)\ ^2I^\circ$
$3d^4(^1G2)4p$	$^2F^\circ$	7/2	432 800.1	46		21	$(^1G1)\ ^2F^\circ$
		5/2	434 997.0	42		20	
$3d^4(^3G)4p$	$^2G^\circ$	9/2	433 371.2	53		20	$(^3H)\ ^2G^\circ$
		7/2	433 517.3	49		17	
$3d^4(^1S2)4p$	$^2P^\circ$	1/2	433 936.9	37		33	$(^3D)\ ^2P^\circ$
		3/2	440 168.6	30		16	
$3d^4(^1G2)4p$	$^2H^\circ$	9/2	434 167.3	47		22	$(^1G1)\ ^2H^\circ$
		11/2	435 011.5	53		20	
$3d^4(^3D)4p$	$^4F^\circ$	3/2	434 200.9	63		21	$(^3G)\ ^4F^\circ$
		5/2	434 625.7	54		15	
		7/2	435 116.2	65		19	
		9/2	435 459.4	77		19	
$3d^4(^3D)4p$	$^2P^\circ$	3/2	434 995.8	54		26	$(^1S2)\ ^2P^\circ$
		1/2	440 689.3	47		27	
$3d^4(^1I)4p$	$^2K^\circ$	13/2	435 165.4	71		28	$(^1I)\ ^2I^\circ$
		15/2	436 550.3	99		1	$(^3H)\ ^4I^\circ$
$3d^4(^1G2)4p$	$^2G^\circ$	7/2	437 919.7	45		29	$(^1G1)\ ^2G^\circ$
		9/2	438 639.4	41		30	
$3d^4(^1I)4p$	$^2H^\circ$	11/2	440 038.7	70		10	$(^3G)\ ^2H^\circ$
		9/2	440 917.9	82		11	
$3d^4(^3D)4p$	$^2F^\circ$	7/2	441 216.1	65		11	$(^3G)\ ^2F^\circ$
		5/2	441 785.7	42		14	$(^3D)\ ^2D^\circ$
$3d^4(^3D)4p$		5/2	441 401.2	30	$^2D^\circ$	21	$(^3D)\ ^2F^\circ$
$3d^4(^3D)4p$	$^2D^\circ$	3/2	442 620.7	53		13	$(^1D2)\ ^2D^\circ$
$3d^4(^1D2)4p$	$^2D^\circ$	3/2	444 252.2	40		22	$(^3D)\ ^2D^\circ$
		5/2	444 784.2	24		26	
$3d^4(^1D2)4p$	$^2F^\circ$	5/2	446 061.2	44		11	$(^1D2)\ ^2D^\circ$
		7/2	446 863.8	47		31	$(^1F)\ ^2F^\circ$
$3d^4(^1F)4p$	$^2F^\circ$	5/2	451 041.3	64		14	$(^1D2)\ ^2F^\circ$
		7/2	451 859.4	47		27	
$3d^4(^1D2)4p$	$^2P^\circ$	3/2	451 622.9	65		13	$(^1D1)\ ^2P^\circ$
		1/2	451 642.0	72		14	
$3d^4(^1F)4p$	$^2G^\circ$	7/2	453 983.0	86		5	$(^1F)\ ^2F^\circ$
		9/2	455 890.5	92		4	$(^1G2)\ ^2G^\circ$
$3d^4(^1F)4p$	$^2D^\circ$	5/2	456 815.6	53		17	$(^3P1)\ ^2D^\circ$
		3/2	458 772.2	49		14	$(^3F1)\ ^4F^\circ$

Ni VI—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages			
$3d^4$(^{3}F1)4p	^{4}F°	5/2	*460 364.6*	61		9	(^{3}P1) ^{4}D°
		7/2	*460 535.9*	66		8	(^{3}F2) ^{4}F°
		3/2	*460 604.0*	57		9	(^{3}F2) ^{4}F°
		9/2	*461 118.3*	83		10	(^{3}F2) ^{4}F°
$3d^4$(^{3}P1)4p	^{4}P°	3/2	*461 437.8*	30		14	(^{3}P2) ^{4}P°
		5/2	*463 301.5*	45		22	
$3d^4$(^{3}P1)4p		5/2	*461 622.6*	21	^{4}D°	20	(^{3}F1) ^{4}F°
$3d^4$(^{3}P1)4p		7/2	*462 443.1*	32	^{4}D°	20	(^{3}F1) ^{4}D°
$3d^4$(^{3}P1)4p		3/2	*462 884.1*	24	^{4}P°	21	(^{3}P1) ^{4}D°
$3d^4$(^{3}P1)4p		1/2	*462 903.6*	31	^{4}P°	21	(^{3}P1) ^{4}D°
$3d^4$(^{3}F1)4p	^{4}G°	5/2	*464 027.8*	44		23	(^{3}F1) ^{2}F°
		9/2	*466 065.2*	70		21	(^{3}F2) ^{4}G°
		11/2	*466 754.3*	76		22	(^{3}F2) ^{4}G°
$3d^4$(^{3}F1)4p		7/2	*464 807.8*	35	^{4}G°	32	(^{3}F1) ^{2}F°
$3d^4$(^{1}F)4p		5/2	*465 552.7*	25	^{2}D°	19	(^{3}P1) ^{2}D°
$3d^4$(^{1}F)4p		3/2	*466 034.2*	29	^{2}D°	21	(^{3}P1) ^{2}D°
$3d^4$(^{3}F1)4p		7/2	*466 133.7*	36	^{2}F°	35	(^{3}F1) ^{4}G°
$3d^4$(^{3}F1)4p	^{2}F°	5/2	*466 649.1*	47		20	(^{3}F1) ^{4}G°
$3d^4$(^{3}P1)4p	^{4}S°	3/2	*471 106.8*	48		44	(^{3}P2) ^{4}S°
$3d^4$(^{3}F1)4p	^{4}D°	7/2	*472 497.3*	47		17	(^{3}P1) ^{4}D°
		5/2	*473 292.4*	48		18	(^{3}F2) ^{4}D°
		3/2	*473 656.4*	48		19	(^{3}F2) ^{4}D°
		1/2	*473 727.6*	51		20	(^{3}F2) ^{4}D°
$3d^4$(^{3}F1)4p	^{2}G°	9/2	*472 579.5*	72		20	(^{3}F2) ^{2}G°
		7/2	*473 531.9*	73		22	
$3d^4$(^{3}P1)4p	^{2}P°	3/2	*472 833.0*	61		27	(^{3}P2) ^{2}P°
		1/2	*473 869.5*	59		26	
$3d^4$(^{1}G1)4p		9/2	*476 332.1*	38	^{2}H°	24	(^{1}G1) ^{2}G°
$3d^4$(^{1}G1)4p	^{2}G°	7/2	*476 935.6*	52		32	(^{1}G2) ^{2}G°
$3d^4$(^{3}P2)4p	^{2}S°	1/2	*477 177.1*	55		41	(^{3}P1) ^{2}S°
$3d^4$(^{1}G1)4p		9/2	*479 046.3*	35	^{2}G°	26	(^{1}G1) ^{2}H°
$3d^4$(^{1}G1)4p	^{2}H°	11/2	*479 481.8*	65		31	(^{1}G2) ^{2}H°
$3d^4$(^{1}G1)4p	^{2}F°	7/2	*480 189.3*	54		18	(^{1}G2) ^{2}F°
		5/2	*480 724.2*	57		19	
$3d^4$(^{3}F1)4p	^{2}D°	5/2	*483 043.4*	47		18	(^{3}F2) ^{2}D°
		3/2	*483 480.9*	45		21	(^{3}P1) ^{2}D°

Ni VI—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$3d^4(^1D1)4p$	$^2P^\circ$	$^3/_2$	*498 773.0*	75	15	$(^1D2)\ ^2P^\circ$
		$^1/_2$	*500 275.2*	75	16	
$3d^4(^1D1)4p$	$^2F^\circ$	$^5/_2$	*505 150.5*	69	18	$(^1D2)\ ^2F^\circ$
		$^7/_2$	*507 300.4*	73	19	
$3d^4(^1D1)4p$	$^2D^\circ$	$^3/_2$	*511 217.4*	72	26	$(^1D2)\ ^2D^\circ$
		$^5/_2$	*512 113.2*	71	25	
$3d^4(^1S1)4p$	$^2P^\circ$	$^1/_2$	*540 394.1*	74	20	$(^1S2)\ ^2P^\circ$
		$^3/_2$	*543 115.6*	74	20	
Ni VII $(^5D_0)$	*Limit*		870 000			

Ni VII

$Z = 28$

Ti I isoelectronic sequence

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

Ionization energy = 1 070 000 ± 16 000 cm^{-1} (133 ± 2 eV)

The $3d^4 - 3d^3 4p$ transition array of this spectrum between 205 and 231 Å was observed and analysed by Phillips and Kruger (1938). Henrichs (1975) has revised that work from new observations and isoelectronic comparisons. His results are given here. The uncertainty of the level values is about ±10 cm^{-1}.

The ionization energy was obtained by extrapolation by Lotz (1967).

References

Henrichs, H. F. (1975), Astron. Astrophys. **44**, 41.
Phillips, L. W., and Kruger, P. G. (1938), Phys. Rev. **54**, 839.
Lotz, W. (1967), J. Opt. Soc. Am. **57**, 873.

Ni VII

Configuration	Term	J	Level (cm^{-1})	Configuration	Term	J	Level (cm^{-1})
$3d^4$	^5D	0	0	$3d^3(^4F)4p$	$^5F°$	2	*470 056*
		1	279			3	*471 096*
		2	804			1	*471 250*
		3	1 520			4	*472 067*
		4	2 392			5	*472 907*
$3d^4$	$^3P2$	0	30 077	$3d^3(^4F)4p$	$^3G°$	3	*476 258*
		1	31 836			4	*477 261*
		2	34 555			5	*478 534*
$3d^4$	^3H	4	31 672	$3d^3(^4F)4p$	$^3F°$	2	*479 950*
		5	32 286			3	*481 091*
		6	32 877			4	*482 229*
$3d^4$	$^3F2$	2	34 247	$3d^3(^4P)4p$	$^5P°$	1	*486 151*
		3	34 317			2	*487 207*
		4	34 576			3	*488 665*
$3d^4$	^3G	3	38 160	$3d^3(^2G)4p$	$^3G°$	3	*493 743*
		4	38 746			4	*495 087*
		5	39 247			5	*496 340*
$3d^3(^4F)4p$	$^3D°$	1	*467 015*	$3d^3(^2H)4p$	$^3G°$	5	*511 464*
		2	*471 976*			4	*511 698*
		3	*473 360*			3	*511 991*
$3d^3(^4F)4p$	$^5D°$	2	*467 705*	Ni VIII ($^4F_{3/2}$)	*Limit*		**1 070 000**
		3	*468 690*				
		1	*469 175*				
		4	*469 844*				

Ni VIII

$Z=28$

Sc I isoelectronic sequence

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

Ionization energy = 1 310 000±16 000 cm^{-1} (162±2 eV)

Anderson and Mack (1941) observed and classified 132 lines between 163 and 189 Å in the $3d^3-3d^2 4p$ transition array. The uncertainty in the level values is ±10 cm^{-1}, which corresponds to an error of about 0.003 Å in the wavelengths.

The separation of the ^{4}F and ^{4}P terms in $3d^3$ is confirmed by the calculations of Racah (1954). The doublet system has been questioned by Bowen (1960), on the basis of isoelectronic extrapolations, but the objection does not seem to be well substantiated.

The configurations $3d^3$, $3d^2 4s$, and $3d^2 4p$ have been calculated by Kancerevicius, Ramonas, and Uspalis (1976), using Hartree-Fock radial integrals.

The ionization energy was obtained by extrapolation by Lotz (1967).

References

Anderson, E. E., and Mack, J. E. (1941), Phys. Rev. **59**, 717.
Bowen, I. S. (1960), Astrophys. J. **132**, 1.
Kancerevicius, A., Ramonas, A., and Uspalis, K. (1976), Lietuvos Fizikos Rinkinys **16**, 49.
Lotz, W. (1967), J. Opt. Soc. Am. **57**, 873.
Racah, G. (1954), Bull. Res. Council Israel **3**, 290.

Ni VIII

Configuration	Term	J	Level (cm^{-1})
$3d^3$	^{4}F	3/2	0
		5/2	1 012
		7/2	2 184
		9/2	3 721
$3d^3$	^{4}P	1/2	23 261
		3/2	23 710
		5/2	24 669
$3d^3$	^{2}G	7/2	26 977
		9/2	28 068
$3d^3$	^{2}D2	5/2	34 689
		3/2	35 120
$3d^3$	^{2}H	9/2	36 754
		11/2	37 475
$3d^2(^3$F$)4p$	^{4}G°	5/2	*565 124*
		7/2	*566 964*
		9/2	*569 564*
		11/2	*572 969*
$3d^2(^3$F$)4p$	^{4}F°	3/2	*565 388*
		5/2	*566 831*
		7/2	*568 746*
		9/2	*570 960*
$3d^2(^3$F$)4p$	^{2}D°	3/2	*569 667*
		5/2	*571 845*
$3d^2(^3$F$)4p$	^{4}D°	3/2	*569 839*
		1/2	*570 353*
		5/2	*571 517*
		7/2	*573 327*
$3d^2(^3$F$)4p$	^{2}F°	5/2	*570 546*
		7/2	*571 804*
$3d^2(^3$F$)4p$	^{2}G°	7/2	*581 337*
		9/2	*583 241*
$3d^2(^3$P$)4p$	^{4}S°	3/2	*587 305*
$3d^2(^3$P$)4p$	^{4}D°	1/2	*590 764*
		3/2	*592 175*
		5/2	*594 068*
		7/2	*596 908*
$3d^2(^3$P$)4p$	^{4}P°	1/2	*596 770*
		3/2	*596 905*
		5/2	*598 570*
$3d^2(^1$G$)4p$	^{2}G°	7/2	*598 638*
		9/2	*599 079*
$3d^2(^1$G$)4p$	^{2}H°	9/2	*613 417*
		11/2	*615 725*
Ni IX (^{3}F$_2$)	*Limit*		1 310 000

Ni IX

$Z=28$

Ca I isoelectronic sequence

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

Ionization energy = 1 560 000±16 000 cm^{-1} (193±2 eV)

The analysis of the $3d^2-3d4f$ array was given by Alexander, Feldman, Fraenkel, and Hoory (1966). The levels are obtained from the improved measurements and corrected classifications by Even-Zohar and Fraenkel (1968). The uncertainty of the level values is about ±50 cm^{-1}. The singlet system, the $^3P_2$ of $3d^2$, and the $^3D_3$ of $3d4f$ are based on an estimated value for the $3d^2\ ^1D$ term by Alexander et al. The value of the systematic shift is expected to be a few hundred cm^{-1}.

Fawcett, Ridgeley, and Ekberg (1980) classified the transition array $3p^6 3d^2-3p^5 3d^3$. Their wavelength accuracy is given as ±0.007 Å, giving a level uncertainty of ±30 cm^{-1}.

The $3d^2\ ^1G$ term is based on a tentative identification of a coronal line at 7144 Å by Pryce (1964).

The ionization energy was obtained by extrapolation by Lotz (1967).

References

Alexander, E., Feldman, U., Fraenkel, B. S., and Hoory, S. (1966), J. Opt. Soc. Am. **56**, 651.

Even-Zohar, M., and Fraenkel, B. S. (1968), J. Opt. Soc. Am. **58**, 1420.

Fawcett, B. C., Ridgeley, A., and Ekberg, J. O. (1980), Phys. Scr. **21**, 155.

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

Pryce, M. H. L. (1964), Astrophys. J. **140**, 1192.

Ni IX

Configuration	Term	J	Level (cm^{-1})	Configuration	Term	J	Level (cm^{-1})
$3p^6(^1S)3d^2$	^3F	2	0	$3p^5(^2P^\circ)3d^3(^2H)$	$^1G^\circ$	4	*716 110+x*
		3	1 880				
		4	4 070	$3p^6(^1S)3d4f$	$^3F^\circ$	2	*977 130*
						3	*977 680*
$3p^6(^1S)3d^2$	^1D	2	21 900+x			4	*978 740*
$3p^6(^1S)3d^2$	^3P	2	27 160+x	$3p^6(^1S)3d4f$	$^3G^\circ$	3	*983 700*
						4	*985 140*
$3p^6(^1S)3d^2$	^1G	4	35 898+x?			5	*985 940*
$3p^5(^2P^\circ)3d^3(^2H)$	$^3G^\circ$	3	*601 300*	$3p^6(^1S)3d4f$	$^1D^\circ$	2	*984 630+x*
		4	*604 000*				
		5	*608 530*	$3p^6(^1S)3d4f$	$^1F^\circ$	3	*986 960+x*
$3p^5(^2P^\circ)3d^3(^2G)$	$^1H^\circ$	5	*640 360+x*	$3p^6(^1S)3d4f$	$^3D^\circ$	3	*988 760+x*
$3p^5(^2P^\circ)3d^3(^4F)$	$^3F^\circ$	2	*661 050*	Ni X ($^2D_{3/2}$)	*Limit*		**1 560 000**
		3	*664 080*				
		4	*667 080*				
$3p^5(^2P^\circ)3d^3(^4F)$	$^3D^\circ$	1	*709 210*				
		3	*711 510*				
		2	*711 520*				

Ni x

$Z=28$

K I isoelectronic sequence

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

Ionization energy = 1 812 000±56 000 cm^{-1} (224.6±0.7 eV)

Observations were first reported by Alexander, Feldman, and Fraenkel (1965), who identified the $3d-4f$ and $5f$ doublets. The series was extended to $7f$ by Even-Zohar and Fraenkel (1968), who noted that the $6f$ and $7f$ terms may be perturbed by the $3p^5 3d 4d$ configuration. Their levels are given here with an uncertainty of ±100 cm^{-1}. We find that the nf terms do not follow a regular Rydberg series.

Gabriel, Fawcett, and Jordan (1966) identified the $3p^5 3d^2(^3F)^2D$ and $(^3F)^2F$ terms. The ^2P term was added by Goldsmith and Fraenkel (1970). With new observations with a reported accuracy of ±0.003 Å, Ramonas and Ryabtsev (1980) determined the $(^1G)^2F$ and $(^1D)^2F$ terms and improved the level values. Their results are given for the $3p^5 3d^2$ levels and for the $3p^6 3d\ ^2D$ ground term interval. They also obtained the $3p^6 4p$ term. Their level value uncertainty is ±10 cm^{-1}.

The analysis of the $3p^5 3d 4s$ configuration is by Hoory, Goldsmith, Fraenkel, and Feldman (1970). These levels have an uncertainty of about ±50 cm^{-1}.

The ionization energy was obtained by extrapolation by Lotz (1967).

References

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

Even-Zohar, M., and Fraenkel, B. S. (1968), J. Opt. Soc. Am. **58**, 1420.

Gabriel, A. H., Fawcett, B. C., and Jordan, C. (1966), Proc. Phys. Soc. **87**, 825.

Goldsmith, S., and Fraenkel, B. S. (1970), Astrophys. J. **161**, 317.

Hoory, S., Goldsmith, S. Fraenkel, B. S., and Feldman, U. (1970), Astrophys. J. **160**, 781.

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

Ramonas, A. A., and Ryabtsev, A. N. (1980), Opt. Spectrosc. **48**, 631.

Ni x

Configuration	Term	J	Level (cm^{-1})	Configuration	Term	J	Level (cm^{-1})
$3p^6 3d$	^2D	$3/2$	0	$3p^5 3d(^3F^\circ)4s$	$^4F^\circ$	$7/2$	*1 154 390*
		$5/2$	3 178			$5/2$	*1 156 550*
$3p^5(^2P^\circ)3d^2(^1G)$	$^2F^\circ$	$5/2$	*505 283*	$3p^5 3d(^3F^\circ)4s$	$^2F^\circ$	$7/2$	*1 161 930*
		$7/2$	*509 751*			$5/2$	*1 169 300*
$3p^5(^2P^\circ)3d^2(^1D)$	$^2F^\circ$	$7/2$	*522 391*	$3p^5 3d(^3D^\circ)4s$	$^4D^\circ$	$7/2$	*1 184 390*
		$5/2$	*540 725*			$5/2$	*1 187 750*
$3p^5(^2P^\circ)3d^2(^3F)$	$^2F^\circ$	$5/2$	*625 091*	$3p^5 3d(^1F^\circ)4s$	$^2F^\circ$	$7/2$	*1 198 260*
		$7/2$	*634 583*	$3p^5 3d(^3D^\circ)4s$	$^2D^\circ$	$3/2$	*1 203 270*
$3p^5(^2P^\circ)3d^2(^3P)$	$^2P^\circ$	$1/2$	*684 552*			$5/2$	*1 206 410*
		$3/2$	*689 365*	$3p^6 5f$	$^2F^\circ$	$5/2$	*1 349 580*
$3p^5(^2P^\circ)3d^2(^3F)$	$^2D^\circ$	$5/2$	*692 890*			$7/2$	*1 349 690*
		$3/2$	*693 404*	$3p^6 6f$	$^2F^\circ$	$7/2$	*1 502 720*
$3p^6 4p$	$^2P^\circ$	$1/2$	*773 647*			$5/2$	*1 502 810*
		$3/2$	*779 600*	$3p^6 7f$	$^2F^\circ$	$5/2$	*1 617 890*
$3p^6 4f$	$^2F^\circ$	$5/2$	*1 093 360*			$7/2$	*1 618 310*
		$7/2$	*1 093 440*	Ni XI ($^1S_0$)	*Limit*		1 812 000
$3p^5 3d(^3P^\circ)4s$	$^2P^\circ$	$1/2$	*1 140 510*				
		$3/2$	*1 148 420*				

Ni XI

$Z = 28$

Ar I isoelectronic sequence

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

Ionization energy = 2 589 000±8000 cm^{-1} (321.0±1.0 eV)

Swartz et al. (1976) identified the transition array $3p^5 3d - 3p^5 4f$ in the region of 81–94 Å. With their classifications and the forbidden transitions within the $3p^5 3d$ configuration, identified in the solar corona by Svensson et al. (1974) and by Sandlin and Tousey (1979), these configurations were determined. The $^1P°$ term is from the laboratory observations of Even-Zohar and Fraenkel (1968). The uncertainty in the $3p^5 3d$ level values varies from ±10 cm^{-1} to ±100 cm^{-1} while that of the $3p^5 4f$ levels is ±100 cm^{-1}.

The $3p^5 4s$ and $4d$ configurations are taken from observations of resonance lines by Even-Zohar and Fraenkel between 60 and 80 Å. The level values are uncertain by about ±300 cm^{-1}.

The ionization energy was obtained by extrapolation by Lotz (1967).

Reference

Even-Zohar, M., and Fraenkel, B. S. (1968), J. Opt. Soc. Am. **58**, 1420.
Lotz, W. (1967), J. Opt. Soc. Am. **57**, 873.
Sandlin, G. D., and Tousey, R. (1979), Astrophys. J. **227**, L107.
Svensson, L. A., Ekberg, J. O., and Edlén, B. (1974), Sol. Phys. **34**, 173.
Swartz, M., Kastner, S. O., Goldsmith, L., and Neupert, W. (1976), J. Opt. Soc. Am. **66**, 240.

Ni XI

Configuration	Term	J	Level (cm^{-1})	Configuration	Term	J	Level (cm^{-1})
$3s^2 3p^6$	^1S	0	0	$3s^2 3p^5 4d$	$^3P°$	1	*1 571 310*
$3s^2 3p^5 3d$	$^3P°$	0	*469 310*	$3s^2 3p^5 4d$	$^1P°$	1	*1 594 130*
		1	*472 950*				
		2	*480 770*	$3s^2 3p^5(^2P°_{3/2})4f$	$^2[3/2]$	1	1 701 800
						2	1 704 300
$3s^2 3p^5 3d$	$^3F°$	4	*493 060*				
		3	*496 950*	$3s^2 3p^5(^2P°_{3/2})4f$	$^2[9/2]$	5	1 706 400
						4	1 708 600
$3s^2 3p^5 3d$	$^3D°$	3	*527 220*				
		1	*534 810*	$3s^2 3p^5(^2P°_{3/2})4f$	$^2[5/2]$	3	1 708 300
		2	*539 070*				
				$3s^2 3p^5(^2P°_{3/2})4f$	$^2[7/2]$	4	1 716 400
$3s^2 3p^5 3d$	$^1D°$	2	*530 050*				
				$3s^2 3p^5(^2P°_{1/2})4f$	$^2[5/2]$	3	1 732 900
$3s^2 3p^5 3d$	$^1F°$	3	*543 040*			2	1 739 400
$3s^2 3p^5 3d$	$^1P°$	1	*673 850*	$3s^2 3p^5(^2P°_{1/2})4f$	$^2[7/2]$	3	1 736 000
						4	1 736 400
$3s^2 3p^5 4s$	$^3P°$	1	*1 269 940*				
				Ni XII ($^2P°_{3/2}$)	***Limit***		**2 589 000**
$3s^2 3p^5 4s$	$^1P°$	1	*1 292 110*				

Ni XII

$Z = 28$

Cl I isoelectronic sequence

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

Ionization energy = 2 840 000±16000 cm^{-1} (352±2 eV)

Fawcett and Hatter (1980) observed the $3s^2 3p^5\ ^2P^\circ - 3s3p^6\ ^2S$ transitions at 295.321 Å and 317.475 Å with an accuracy of ±0.008 Å, or a level uncertainty of ±10 cm^{-1}.

The portion of the $3p^4 3d$ configuration below 600 000 cm^{-1} is taken from the study of coronal spectra by Edlén and Smitt (1978). Their level values are adjusted here to the calculated energies of Nussbaumer (1976), from which we adopted the value 454 000 for the $(^3P)^4D_{7/2}$ level. The value of "x" is estimated to be ±1000 cm^{-1}. The higher $3p^4 3d$ terms are from Goldsmith and Fraenkel (1970); the uncertainty is ±50 cm^{-1}. The designations of the parent terms of $3p^4 3d$ are taken from the calculations of Bromage, Cowan, and Fawcett (1977) for the isoelectronic spectrum Fe X.

The $3p^4 4s$, $3p^4 4d$, and $3p^4 4f$ terms are from the observations of Fawcett, Cowan, and Hayes (1972) near 70 Å and are uncertain by ±500 cm^{-1}.

The ionization energy was obtained by extrapolation by Lotz (1967).

References

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

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

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

Fawcett, B. C., and Hatter, A. T. (1980), Astron. Astrophys. **84**, 78.

Goldsmith, S., and Fraenkel, B. S. (1970), Astrophys. J. **161**, 317.

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

Nussbaumer, H. (1976), Astron. Astrophys. **48**, 93.

Ni XII

Configuration	Term	J	Level (cm^{-1})
$3p^5$	$^2P^\circ$	3/2	*0*
		1/2	*23 629*
$3s3p^6$	^2S	1/2	338 615
$3p^4(^3P)3d$	^4D	7/2	454 000+x
$3p^4(^3P)3d$	^4F	9/2	485 570+x
		7/2	492 750+x
$3p^4(^3P)3d$	^2F	7/2	513 290+x
$3p^4(^1D)3d$	^2G	7/2	526 960+x
		9/2	527 230+x
$3p^4(^1D)3d$	^2F	7/2	567 200+x
$3p^4(^1D)3d$	^2S	1/2	622 840
$3p^4(^3P)3d$	^2P	3/2	648 670
		1/2	657 290
$3p^4(^3P)3d$	^2D	5/2	657 230
		3/2	676 420
$3p^4(^3P)4s$	^2P	3/2	1 374 200
		1/2	1 385 600
$3p^4(^1D)4s$	^2D	5/2	1 401 000
		3/2	1 401 600
$3p^4(^3P)4d$	^2D	5/2	1 666 100
$3p^4(^3P)4f$	$^4F^\circ$	9/2	*1 797 400*+x
$3p^4(^3P)4f$	$^4G^\circ$	11/2	*1 808 000*+x
		9/2	*1 811 400*+x
$3p^4(^1D)4f$	$^2H^\circ$	11/2	*1 848 400*+x
Ni XIII ($^3P_2$)	*Limit*		2 840 000

Ni XIII

$Z=28$

S I isoelectronic sequence

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

Ionization energy = 3 100 000 ± 16 000 cm^{-1} (384 ± 2 eV)

Svensson (1971) calculated the levels of the ground configuration with a stated accuracy of ±10–50 cm^{-1}. From these he made the following classifications of solar coronal lines within this configuration: $^3P_2-{}^1D_2$ at 2126.7 Å (in vac.) and $^3P_2-{}^3P_1$ at 5115.8 Å (in air). New measurements of the coronal spectrum observed from Skylab by Sandlin, Brueckner, and Tousey (1977) provide the more accurate wavelength of 2126.17 ± 0.02 Å for $^3P_2-{}^1D_2$, and a new line at 1277.23 ± 0.01 Å for $^3P_1-{}^1S_0$. The transition array $3s^2 3p^4 - 3s3p^5$ from 267–308 Å was measured by Fawcett and Hatter (1980) with an uncertainty of ±0.008 Å. Their line classifications were used to derive the $3s^2 3p^4\ ^3P_0$ level and the $^3P°$ and $^1P°$ terms of $3s3p^5$.

The $3s^2 3p^3 3d$ levels are from laboratory observations of Fawcett and Hayes (1972) between 155 and 305 Å and are uncertain by about ±50 cm^{-1}.

The $3p^3 4d$ levels are from the observations of Fawcett, Cowan, and Hayes (1972) at 56 Å. The uncertainty is about ±500 cm^{-1}. They also observed levels in $3p^3 4f$, which are not connected with this system.

The ionization energy was obtained by Lotz (1967) by extrapolation.

References

Fawcett, B. C., and Hayes, R. W. (1972), J. Phys. **B5**, 366.

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

Fawcett, B. C., and Hatter, A. T. (1980), Astron. Astrophys. **84**, 78.

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

Sandlin, G. D., Brueckner, G. E., and Tousey, R. (1977), Astrophys. J. **214**, 898.

Svensson, L. A. (1971), Sol. Phys. **18**, 232.

Ni XIII

Configuration	Term	J	Level (cm^{-1})
$3s^2 3p^4$	^3P	2	0.0
		1	19 541.8
		0	20 060
$3s^2 3p^4$	^1D	2	47 032.9
$3s^2 3p^4$	^1S	0	97 836.2
$3s3p^5$	$^3P°$	2	*330 215*
		1	*344 156*
$3s3p^5$	$^1P°$	1	*395 545*
$3s^2 3p^3(^2D°)3d$	$^3P°$	2	*609 200*
$3s^2 3p^3(^4S°)3d$	$^3D°$	3	*634 000*
		2	*644 660*
		1	*649 900*
$3s^2 3p^3(^2D°)3d$	$^1D°$	2	*666 000*
$3s^2 3p^3(^2D°)3d$	$^1F°$	3	*681 750*
$3s^2 3p^3(^2D°)3d$	$^1P°$	1	*715 960*
$3s^2 3p^3(^4S°)4d$	$^3D°$	3	*1 767 700*
$3s^2 3p^3(^2D°)4d$	$^1D°$	2	*1 820 400*
$3s^2 3p^3(^2D°)4d$	$^1F°$	3	*1 827 000*
Ni XIV ($^4S°_{3/2}$)	*Limit*		3 100 000

Ni XIV

$Z=28$

P I isoelectronic sequence

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

Ionization energy $= 3\ 470\ 000 \pm 16\ 000\ \mathrm{cm}^{-1}$ (430 ± 2 eV)

The levels of the $3s^2 3p^3$ configuration are determined from identifications of solar coronal lines by Svensson (1971) and Sandlin, Brueckner, and Tousey (1977). The values are from wavelengths given in the latter paper reporting spectra observed by Skylab measured with an uncertainty of ± 0.01 Å, giving a level uncertainty of ± 0.5 cm^{-1}. The calculated value for $^2P^{\circ}_{3/2}$ is from Svensson, with an estimated uncertainty of ± 50 cm^{-1}.

The $3s^2 3p^3 - 3s3p^4$ array in the range of 245–292 Å was measured by Fawcett and Hatter (1980) with an accuracy of ± 0.008 Å. Their classifications are used to derive the levels of $3s3p^4$ with an uncertainty of ± 10 cm^{-1}. The $3s^2 3p^2 3d$ levels are from the observations of Fawcett and Hayes (1972) between 160 and 320 Å and are uncertain by about ± 60 cm^{-1}.

The $3p^2 4d$ levels are from the observations of Fawcett, Cowan, and Hayes (1972). The uncertainty is about ± 500 cm^{-1}.

The ionization energy was obtained by extrapolation by Lotz (1967).

References

Fawcett, B. C., and Hayes, R. W. (1972), J. Phys. **B5**, 366.

Fawcett, B. C., and Hatter, A. T. (1980), Astron. Astrophys. (1980), **84**, 78.

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

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

Sandlin, G. D., Brueckner, G. E., and Tousey, R. (1977), Astrophys. J. **214**, 898.

Svensson, L. A. (1971), Sol. Phys. **18**, 232.

Ni XIV

Configuration	Term	J	Level (cm^{-1})
$3s^2 3p^3$	$^4S^{\circ}$	3/2	*0.0*
$3s^2 3p^3$	$^2D^{\circ}$	3/2	*45 767.8*
		5/2	*53 569.0*
$3s^2 3p^3$	$^2P^{\circ}$	1/2	*85 126.7*
		3/2	*96 630+x*
$3s3p^4$	^4P	5/2	316 343
		3/2	330 837
$3s3p^4$	^2D	3/2	391 916
		5/2	395 567
$3s3p^4$	^2P	3/2	447 765
		5/2	452 850+x
$3s^2 3p^2(^3P)3d$	^4P	5/2	583 530
		3/2	589 310
		1/2	594 810
$3s^2 3p^2(^1D)3d$	^2D	3/2	632 280
		5/2	634 430
$3s^2 3p^2(^1D)3d$	^2P	1/2	648 320
		3/2	660 710+x
$3s^2 3p^2(^1D)3d$	^2F	7/2	662 780
$3s^2 3p^2(^3P)3d$	^2D	5/2	690 560+x
		3/2	691 930
$3s^2 3p^2 4d$	^2P	3/2	1 628 400
$3s^2 3p^2 4d$	^2D	5/2	1 653 100
Ni XV ($^3P_0$)	*Limit*		3 470 000

Ni XV

$Z = 28$

Si I isoelectronic sequence

Ground state: $1s^2 2s^2 2p^6 3s^2 3p^2\ ^3P_0$

Ionization energy = 3 740 000 ± 16 000 cm^{-1} (464 ± 2 eV)

The levels of the $3s^2 3p^2$ configuration are determined from measurements of solar coronal lines and are uncertain by about ±0.5 cm^{-1}. The ^{3}P values are from Svensson's (1971) compilation and the ^{1}D value is from the measurement by Sandlin, Brueckner, and Tousey (1977) of spectra observed from Skylab.

The transition array $3s^2 3p^2 - 3s3p^3$ was observed in the range of 209–319 Å by Fawcett and Hatter (1980) with an accuracy of ±0.008 Å. Their assignments are used to derive the levels of $3s3p^3$ with an uncertinaty of ±10 cm^{-1}. The $3s^2 3p3d$ levels are from the analysis by Fawcett and Hayes (1972) based on observations between 170 and 320 Å; they are uncertain by about ±60 cm^{-1}.

The $3p4s$, $3p4d$, and $3p4f$ levels are from the observations of Fawcett, Cowan, and Hayes (1972) and of Kastner, Swartz, Bhatia, and Lapides (1978). The uncertainty is about ±500 cm^{-1}.

The ionization energy was obtained by extrapolation by Lotz (1967).

References

Fawcett, B. C., and Hayes, R. W. (1972), J. Phys. **B5**, 366.

Fawcett, B. C., and Hatter, A. T. (1980), Astron. Astrophys. **84**, 78.

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

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

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

Sandlin, G. D., Brueckner, G. E., and Tousey, R. (1977), Astrophys. J. **214**, 898.

Svensson, L. A. (1971), Sol. Phys. **18**, 232.

Ni XV

Configuration	Term	J	Level (cm^{-1})
$3s^2 3p^2$	^{3}P	0	0.0
		1	14 917.5
		2	27 376.5
$3s^2 3p^2$	^{1}D	2	62 852.1
$3s3p^3$	^{3}D°	1	*335 400*
		2	*335 682*
		3	*340 794*
$3s3p^3$	^{3}S°	1	*478 010*
$3s3p^3$	^{1}P°	1	*509 211*
$3s^2 3p3d$	^{3}P°	2	*555 830*
		1	*565 930*
$3s^2 3p3d$	^{1}D°	2	*574 330*
$3s^2 3p3d$	^{3}D°	1	*582 760*
		3	*585 170*
		2	*586 410*
$3s^2 3p3d$	^{1}F°	3	*638 460*
$3s^2 3p4s$	^{3}P°	2	*1 730 700*
$3s^2 3p4s$	^{1}D°	2	1 741 300
$3s^2 3p4d$	^{3}D°	2	*2 018 400*
		3	*2 020 500*
$3s^2 3p4d$	^{3}F°	3	*2 042 500*
$3s^2 3p4d$	^{1}F°	3	*2 053 000*
$3s^2 3p4f$	^{1}G	4	2 185 600
Ni XVI ($^2P^\circ_{1/2}$)	*Limit*		3 740 000

Ni XVI

$Z=28$

Al I isoelectronic sequence

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

Ionization energy = 4 020 000 ± 16 000 cm^{-1} (499 ± 2 eV)

The observations of the transition array $3s^2 3p - 3s 3p^2$ in the range 218–309 Å by Fawcett and Hatter (1980) provided the ^2P ground term interval and the levels of $3s3p^2$ with an accuracy of ±20 cm^{-1}. An isoelectronic plot of the transition energy $3s^2 3p\ ^2P^\circ_{1/2} - 3s 3p^2\ ^2D_{3/2}$ indicates that there is a misprint for the wavelength 288.165 Å. It should be 289.165 Å. The $3s^2 3d$ levels are from the line classifications near 200 Å of Fawcett and Hayes (1972). They estimate the wavelength uncertainty to be ±0.03 Å (±75 cm^{-1}). The $3s^2 4d$ and $4f$ levels are from wavelengths near 50 Å classified by Fawcett, Cowan, and Hayes (1972) and are uncertain by ±300 cm^{-1}.

The ionization energy was obtained by extrapolation by Lotz (1967).

References

Fawcett, B. C., and Hatter, A. T. (1980), Astron. Astrophys. **84**, 78.

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

Fawcett, B. C., and Hayes, R. W. (1972), J. Phys. **B5**, 366.

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

Ni XVI

Configuration	Term	J	Level (cm^{-1})	Configuration	Term	J	Level (cm^{-1})
$3s^2 3p$	$^2P^\circ$	1/2	*0*	$3s^2 3d$	^2D	3/2	539 870
		3/2	*27 770*			5/2	543 170
$3s3p^2$	^2D	3/2	345 820	$3s^2 4d$	^2D	3/2	2 119 400
		5/2	351 210			5/2	2 121 100
$3s3p^2$	^2S	1/2	417 450	$3s^2 4f$	$^2F^\circ$	7/2	*2 228 500*
						5/2	*2 228 600*
$3s3p^2$	^2P	1/2	448 170				
		3/2	457 910	Ni XVII ($^1S_0$)	***Limit***		**4 020 000**

Ni XVII

$Z = 28$

Mg I isoelectronic sequence

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

Ionization energy $= 4\ 606\ 000 \pm 1000$ cm^{-1} (571.08 ± 0.12 eV)

Fawcett et al. (1966) classified lines in the range of 30–55 Å that are transitions among configurations $3s3l$–$3snl'$ for $n > 3$. These were remeasured with improved accuracy of ± 0.01 Å with some additional classifications by Feldman et al. (1971). The uncertainty of level values is ± 1000 cm^{-1}. The transition arrays $3s3p - 3p^2$ and $3s3p - 3s3d$ in the range of 210–302 Å were classified by Fawcett, Cowan, and Hayes (1972). Their measurement uncertainty is reported as ± 0.02 Å, giving a level uncertainty of ± 30 cm^{-1}. They also revised the classification of $3s3d\ ^1D_2$–$3s4f\ ^1F^\circ_3$ and gave new measurements for the lines given in Fawcett et al. (1966) with an acccuracy of ± 0.01 Å. No intersystem lines were identified in these observations. We use the new measurements of Fawcett and Hatter (1980) for the array $3s3p\ ^3P^\circ - 3p^2\ ^3P$. They estimate about the same level uncertainty as Fawcett et al. (1972) but give new values.

Finkenthal et al. (1982) identified the line $3s^2\ ^1S_0 - 3s3p\ ^3P^\circ_1$ in a tokamak plasma at 366.7 ± 0.3 Å, providing the connection between the triplet terms and the ground state. We use the solar flare measurement by Dere (1978) of 366.80 ± 0.03 Å. The $3s^2\ ^1S_0$–$3s3p\ ^1P^\circ_1$ transition was identified by Fawcett and Hayes (1972) at 249.180 ± 0.004 Å; the wavelength was obtained from the solar observations of Behring, Cohen, and Feldman (1972).

The $3p3d - 3p4f$ transition array has been observed at 55 Å by Kastner, Swartz, Bhatia, and Lapides (1978) but it is unconnected with the present configurations.

We derived the ionization energy from the three member $3snd\ ^3D$ series. The $6f$ term does not follow the nf series quantum defect trend.

References

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

Dere, K. P. (1978), Astrophys. J. **221**, 1062.

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

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

Fawcett, B. C., and Hayes, R. W. (1972), J. Phys. **B5**, 366.

Fawcett, B. C., and Hatter, A. T. (1980), Astron. Astrophys. **84**, 78.

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

Finkenthal, M., Hinnov, E., Cohen, S. and Suckewer, S. (1982), Phys. Lett. **A9**, 284.

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

Ni XVII

Configuration	Term	J	Level (cm^{-1})	Configuration	Term	J	Level (cm^{-1})
$3s^2$	^1S	0	0	$3s4d$	^3D	1	2 494 100
						2	2 495 200
$3s3p$	$^3P^\circ$	0	*264 400*			3	2 497 300
		1	*272 630*				
		2	*293 650*	$3s4d$	^1D	2	2 499 400
$3s3p$	$^1P^\circ$	1	*401 320*	$3p4s$	$^3P^\circ$	2	*2 542 800*
$3p^2$	^3P	0	627 870	$3s4f$	$^3F^\circ$	2	*2 585 000*
		1	643 820			3	*2 585 400*
		2	669 500			4	*2 585 700*
$3s3d$	^3D	1	771 290	$3s4f$	$^1F^\circ$	3	*2 601 600*
		2	772 970				
		3	775 670	$3s5p$	$^1P^\circ$	1	*3 234 300*
$3s3d$	^1D	2	864 600	$3s5d$	^3D	1,2	3 272 200
						3	3 272 900
$3s4s$	^3S	1	2 187 600				
				$3s5f$	$^3F^\circ$	2,3,4	*3 312 800*
$3s4p$	$^1P^\circ$	1	*2 333 400*				
				$3s6f$	$^3F^\circ$	4	*3 721 600*
				Ni XVIII ($^2S_{1/2}$)	***Limit***		**4 606 000**

Ni XVIII

$Z=28$

Na I isoelectronic sequence

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

Ionization energy = 4 896 200±500 cm^{-1} (607.06±0.06 eV)

The $3s-3p$ doublet was reported by Fawcett and Hatter (1980); they measured the $^2S_{1/2}-^2P^\circ_{3/2}$ at 291.983±0.008 Å and the $^2S_{1/2}-^2P^\circ_{1/2}$ at 320.56±0.03 Å. The latter has been observed by Peacock, Stamp, and Silver (1984) in a tokamak plasma at 320.565±0.006 Å. Fawcett, Cowan, and Hayes (1972) measured the $3p-3d$ doublet with an uncertainty of ±0.02 Å. Improved values are given by Edlén (1978). The uncertainty of these level values is ±10 cm^{-1}.

Except for the $3d-4f$ doublet measured by Edlén (1936), we obtained the nf terms from the $3d-nf$ measurements reported by Feldman et al. (1971). They also found the $4s$, $np(n=4\text{–}6)$, and $nd(n=4\text{–}8)$ terms. Their measurement uncertainty of ±0.01 Å gives an energy level uncertainty of ±1000 cm^{-1}.

The $4f-5g$ doublet was found by Kononov et al. (1977) and confirmed by Edlén (1978) by using a polarization formula.

Feldman and Cohen (1967) identified the $2p^6 3s-2p^5 3s^2$ transitions at 14.37 Å and 14.10 Å with an uncertainty of ±0.01 Å.

The value for the ionization energy was derived by Edlén (1978) from core polarization theory applied to the nf series.

References

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

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

Fawcett, B. C., and Hatter, A. T. (1980), Astron. Astrophys. **84**, 78.

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

Feldman, U., and Cohen, L. (1967), J. Opt. Soc. Am. **57**, 1128.

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. Quantum Electronics 7, 111.

Peacock, N. J., Stamp, M. F., and Silver, J. D. (1984), Phys. Scr. **T8**, 10.

Sandlin, G. D., Brueckner, G. E., Scherrer, V. E., and Tousey, R. (1976), Astrophys. J. **205**, L47.

Ni XVIII

Configuration	Term	J	Level (cm^{-1})
$2p^6(^1S)3s$	^2S	1/2	0
$2p^6(^1S)3p$	$^2P^\circ$	1/2	*311 949*
		3/2	*342 485*
$2p^6(^1S)3d$	^2D	3/2	765 610
		5/2	770 280
$2p^6(^1S)4s$	^2S	1/2	2 301 800
$2p^6(^1S)4p$	$^2P^\circ$	1/2	*2 426 100*
		3/2	*2 438 100*
$2p^6(^1S)4d$	^2D	3/2	2 594 400
		5/2	2 596 500
$2p^6(^1S)4f$	$^2F^\circ$	5/2	*2 666 230*
		7/2	*2 667 100*
$2p^6(^1S)5p$	$^2P^\circ$	1/2	*3 352 400*
		3/2	*3 358 100*
$2p^6(^1S)5d$	^2D	3/2	3 433 700
		5/2	3 434 600
$2p^6(^1S)5f$	$^2F^\circ$	5/2	*3 469 100*
		7/2	*3 469 400*
$2p^6(^1S)5g$	^2G	7/2	3 473 000
		9/2	3 473 300
$2p^6(^1S)6p$	$^2P^\circ$	1/2	*3 839 400*
		3/2	*3 843 200*
$2p^6(^1S)6d$	^2D	3/2	3 885 700
		5/2	3 886 100
$2p^6(^1S)6f$	$^2F^\circ$	5/2	*3 905 800*
		7/2	*3 906 100*
$2p^6(^1S)7d$	^2D	5/2	4 156 700
$2p^6(^1S)7f$	$^2F^\circ$	5/2	*4 169 000*
		7/2	*4 169 100*
$2p^6(^1S)8d$	^2D	3/2	4 331 100
		5/2	4 331 300
$2p^6(^1S)8f$	$^2F^\circ$	7/2	*4 339 400*
Ni XIX ($^1S_0$)	***Limit***		**4 896 200**
$2p^5 3s^2$	$^2P^\circ$	3/2	*6 959 000*
		1/2	*7 092 000*

Ni XIX

$Z = 28$

Ne I isoelectronic sequence

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

Ionization energy = 12 430 000 ± 10 000 cm^{-1} (1541 ± 1 eV)

Only resonance lines are classified by this system of energy levels. The first line identifications were made by Feldman, Cohen, and Swartz (1967), who reported transitions from the $2p^5 3s$, $2p^5 3d$ and $2s2p^6 3p$ configurations. To these were added terms of $2p^5 4d$ by Feldman and Cohen (1967). These were augmented by the work of Swartz, Kastner, Rothe, and Neupert (1971), who observed lines originating from $2p^5 4s$, $2p^5 5d$, and $2p^5 6d$.

The spectrum was reobserved by Gordon, Hobby, and Peacock (1980) in the range of 8–14 Å with a wavelength uncertainty of ±0.005 Å. Their results, with a level value uncertainty of ±5000 cm^{-1}, are quoted here. They include all the lines previously identified plus transitions from the $^3P_1$ state of $2s^2 2p^5 4d$, $5d$, $6d$, and the levels of $2s2p^6 4p$.

By means of a very low pressure laboratory light source (a tokamak), Klapisch, Bar Shalom, Schwob, Fraenkel, Breton, de Michelis, Finkenthal, and Mattioli (1978) observed the magnetic quadrupole transition from $2p^5 3s\ ^3P^\circ_2$ to the ground state as well as the transitions from the $J = 1$ states of $2p^5 3s$ and $2p^5 3d$. No uncertainty estimate is given, but it is presumably ±0.005 Å, which would give a level uncertainty of ±3000 cm^{-1}.

We have assigned designations and given percentages to the $2p^5 3s$ and $2p^5 3d$ configurations based on our own calculations. Both jj- and LS-leading percentages are listed for the $2p^5 3s$ levels.

Kastner, Behring, and Cohen (1975) identified transitions between $2p^5 3p$ and $2p^5 4d$, but there is no connection with the levels given here.

We derived the ionization energy from the $2s^2 2p^5 nd\ ^3D_1$ series for $n = 3$–6.

References

Feldman, U., Cohen, L., and Swartz, M. (1967), Astrophys. J. **148**, 585.

Feldman, U., and Cohen, R. (1967), Astrophys. J. **149**, 45.

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

Kastner, S. O., Behring, W. E., and Cohen, L. (1975), Astrophys. J. **199**, 777.

Klapisch, M., Bar Shalom, A., Schwob, J. L., Fraenkel, B. S., Breton, C., de Michelis, C., Finkenthal, M., and Mattioli, M. (1978), Phys. Lett. **69A**, 34.

Swartz, M., Kastner, S., Rothe, E., and Neupert, W. (1971), J. Phys. **B4**, 1747.

Ni XIX

Configuration	Term	J	Level (cm^{-1})	Leading percentages				
$2s^2 2p^6$	^1S	0	0					
$2s^2 2p^5(^2P^\circ_{3/2})3s$	$(3/2,1/2)^\circ$	2	*7 104 000*	100	or	100	$^3P^\circ$
		1	*7 121 000*	98	or	53	$^1P^\circ$
$2s^2 2p^5(^2P^\circ_{1/2})3s$	$(1/2,1/2)^\circ$	1	*7 257 400*	98	or	53	$^3P^\circ$
$2s^2 2p^5 3d$	$^3P^\circ$	1	*7 805 200*	91		9	$^3D^\circ$
$2s^2 2p^5 3d$	$^3D^\circ$	1	*7 901 400*	67		28	$^1P^\circ$
$2s^2 2p^5 3d$	$^1P^\circ$	1	*8 041 800*	72		24	$^3D^\circ$
$2s2p^6 3p$	$^3P^\circ$	1	*8 621 400*				
$2s2p^6 3p$	$^1P^\circ$	1	*8 666 300*				
$2s^2 2p^5(^2P^\circ_{3/2})4s$	$(3/2,1/2)^\circ$	1	*9 585 000*				
$2s^2 2p^5(^2P^\circ_{1/2})4s$	$(1/2,1/2)^\circ$	1	*9 725 000*				
$2s^2 2p^5 4d$	$^3P^\circ$	1	*9 845 000*				
$2s^2 2p^5 4d$	$^3D^\circ$	1	*9 891 000*				

Ni XIX—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$2s^2\,2p^5\,4d$	$^1P°$	1	*10 023 000*	
$2s^2\,2p^5\,5d$	$^3P°$	1	*10 797 000*	
$2s^2\,2p^5\,5d$	$^3D°$	1	*10 806 000*	
$2s2p^6\,4p$	$^3P°$	1	*10 925 000*	
$2s2p^6\,4p$	$^1P°$	1	*10 941 000*	
$2s^2\,2p^5\,5d$	$^1P°$	1	*10 942 000*	
$2s^2\,2p^5\,6d$	$^3D°$	1	*11 301 000*	
$2s^2\,2p^5\,6d$	$^1P°$	1	*11 436 000*	
Ni XX ($^2P°_{3/2}$)	*Limit*		**12 430 000**	

Ni XX

$Z = 28$

F I isoelectronic sequence

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

Ionization energy = 13 290 000±27 000 cm^{-1} (1648±3 eV)

The ground term splitting is from a magnetic dipole transition at 694.64±0.03 Å observed in a tokamak discharge by Peacock, Stamp, and Silver (1984). This line was first reported by Hinnov et al. (1982). The $2s2p^6$ configuration was determined from the resonance doublet ${}^2\mathrm{P}^\circ - {}^2\mathrm{S}$ measured by Doschek et al. (1974) with an accuracy of ±0.02 Å, giving a level uncertainty for $2s2p^6\ {}^2\mathrm{S}$ of ±300 cm^{-1}.

The $2p^5 - 2p^4 3s$ and $2p^5 - 2p^4 3d$ arrays were analyzed by Boiko et al. (1978). The region was remeasured from 9–13 Å by Gordon, Hobby, and Peacock (1980) with an accuracy of ±0.005 Å, giving a level value uncertainty of ±5000 cm^{-1}. They identified additional lines of these arrays as well as the higher configurations $2s2p^5 3p$, $2p^4 4d$, and $2p^4 4s$. There results are given here.

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

References

Boiko, V. A., Pikuz, S. A., Safronova, A. S., and Faenov, A. Y. (1978), Opt. Spectrosc. **44**, 498.

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

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

Hinnov, E., Suckewer, S., Cohen, S., and Sato, K. (1982), Phys. Rev. **A25**, 2293.

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

Peacock, N. J., Stamp, M. F., and Silver, J. D. (1984), Phys. Scr. **T8**, 10.

Ni XX

Configuration	Term	J	Level (cm^{-1})	Configuration	Term	J	Level (cm^{-1})
$2s^2 2p^5$	${}^2\mathrm{P}^\circ$	3/2	*0*	$2s^2 2p^4({}^1\mathrm{D})3d$	${}^2\mathrm{P}$	3/2	8 445 000
		1/2	*143 959*			1/2	8 495 000
$2s2p^6$	${}^2\mathrm{S}$	1/2	1 202 300	$2s^2 2p^4({}^1\mathrm{S})3d$	${}^2\mathrm{D}$	3/2	8 634 000
$2s^2 2p^4({}^3\mathrm{P})3s$	${}^2\mathrm{P}$	3/2	7 544 000	$2s2p^5({}^3\mathrm{P}^\circ)3p$	${}^4\mathrm{D}$	3/2	8 908 000
		1/2	7 673 000				
				$2s2p^5({}^3\mathrm{P}^\circ)3p$	${}^2\mathrm{D}$	5/2	8 908 000
$2s^2 2p^4({}^3\mathrm{P})3s$	${}^4\mathrm{P}$	5/2	7 514 000			3/2	9 052 000
		1/2	7 613 000				
		3/2	7 648 000	$2s2p^5({}^3\mathrm{P}^\circ)3p$	${}^2\mathrm{P}$	3/2	8 962 000
						1/2	8 978 000
$2s^2 2p^4({}^1\mathrm{D})3s$	${}^2\mathrm{D}$	5/2	7 736 000				
		3/2	7 742 000	$2s2p^5({}^3\mathrm{P}^\circ)3p$	${}^4\mathrm{P}$	3/2	9 008 000
$2s^2 2p^4({}^1\mathrm{S})3s$	${}^2\mathrm{S}$	1/2	7 949 000	$2s2p^5({}^3\mathrm{P}^\circ)3p$	${}^2\mathrm{S}$	1/2	9 092 000
$2s^2 2p^4({}^3\mathrm{P})3d$	${}^4\mathrm{P}$	1/2	8 226 000	$2s2p^5({}^1\mathrm{P}^\circ)3p$	${}^2\mathrm{D}$	3/2	9 250 000
		3/2	8 244 000			5/2	9 283 000
$2s^2 2p^4({}^3\mathrm{P})3d$	${}^2\mathrm{F}$	5/2	8 256 000	$2s2p^5({}^1\mathrm{P}^\circ)3p$	${}^2\mathrm{P}$	1/2	9 288 000
						3/2	9 303 000
$2s^2 2p^4({}^3\mathrm{P})3d$	${}^4\mathrm{D}$	1/2	8 304 000				
		3/2	8 329 000	$2s^2 2p^4({}^3\mathrm{P})4s$	${}^2\mathrm{P}$	3/2	10 182 000
$2s^2 2p^4({}^3\mathrm{P})3d$	${}^2\mathrm{P}$	3/2	8 353 000	$2s^2 2p^4({}^3\mathrm{P})4s$	${}^4\mathrm{P}$	3/2	10 317 000
$2s^2 2p^4({}^3\mathrm{P})3d$	${}^2\mathrm{D}$	5/2	8 360 000	$2s^2 2p^4({}^3\mathrm{P})4d$	${}^2\mathrm{D}$	3/2,5/2	10 462 000
$2s^2 2p^4({}^1\mathrm{D})3d$	${}^2\mathrm{S}$	1/2	8 423 000	$2s^2 2p^4({}^3\mathrm{P})4d$	${}^4\mathrm{F}$	3/2,5/2	10 530 000
$2s^2 2p^4({}^1\mathrm{D})3d$	${}^2\mathrm{D}$	5/2	8 452 000	$2s^2 2p^4({}^3\mathrm{P})4d$	${}^4\mathrm{P}$	5/2	10 576 000
		3/2	8 484 000				

Ni xx—Continued

Configuration	Term	J	Level (cm^{-1})	Configuration	Term	J	Level (cm^{-1})
$2s^2\,2p^4(^3P)4d$	^2P	3/2	10 581 000				
$2s^2\,2p^4(^1D)4d$	^2D	5/2	10 655 000				
		3/2	10 674 000				
$2s^2\,2p^4(^1D)4d$	^2P	3/2	10 655 000				
		1/2	10 674 000				
$2s^2\,2p^4(^1D)4d$	^2S	1/2	10 655 000				
$2s^2\,2p^4(^1D)4d$	^2F	5/2	10 677 000				
$2s^2\,2p^4(^1D)4d$	^2D	5/2	10 655 000				
$2s^2\,2p^4(^1S)4d$	^2D	3/2	10 853 000				
Ni XXI ($^3P_2$)	***Limit***		**13 290 000**				

Ni XXI

$Z=28$

O I isoelectronic sequence

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

Ionization energy = 14 160 000±28 000 cm^{-1} (1756±4 eV)

The fine structure of the ^{3}P ground term is determined from two magnetic dipole transitions, $^3P_2-{}^3P_1$ at 779.5 Å and $^3P_0-{}^3P_1$ at 2818.2 Å (in air), measured in a tokamak plasma by Hinnov et al. (1982) with an accuracy of ±0.3 Å. A solar flare line at 471.15 Å was identified by Widing (1978) as the intersystem line $2s^2 2p^4\ {}^3P_2-{}^1D_2$.

Doschek et al. (1974) analyzed the $2s^2 2p^4 - 2s 2p^5$ array and Doschek et al. (1975) found the $2p^6\ {}^1S_0$. Lawson and Peacock (1980) remeasured these arrays from 69–120 Å and found several intercombination lines. Lawson and Peacock's data are used to obtain the $^1S_0$ level of $2s^2 2p^4$ and the levels of $2s 2p^5$ with an uncertainty of ±300 cm^{-1}. Percentage compositions of these levels were provided by Kaufman and Sugar (1982), with configuration interaction between $2s^2 2p^4$ and $2p^6$.

The spectral region from 8–11 Å was measured by Gordon, Hobby, and Peacock (1980) with an accuracy of ±0.005 Å, giving a level uncertainty of ±6000 cm^{-1}. They classified lines arising from the $2p^3 3s$, $2p^3 3d$, and $2p^3 4d$ configurations in this range. Only a few lines are assigned to $2p^3 4d$, two of which are assigned to six transitions each. We did not attempt to derive energy levels for this configuration.

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

References

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.

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

Hinnov, E., Suckewer, S., Cohen, S., and Sato, K. (1982), Phys. Rev. **A25**, 2293.

Kaufman, V., and Sugar, J. (1982), private communication.

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

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

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

Ni XXI

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$2s^2 2p^4$	^{3}P	2	0	87	13	^{1}D
		0	92 810	73	27	^{1}S
		1	128 290	100		
$2s^2 2p^4$	^{1}D	2	212 250	87	13	^{3}P
$2s^2 2p^4$	^{1}S	0	406 800	71	27	^{3}P
$2s2p^5$	^{3}P°	2	*1 043 300*	100		
		1	*1 126 000*	95	5	^{1}P°
		0	*1 193 100*	100		
$2s2p^5$	^{1}P°	1	*1 436 400*	95	5	^{3}P°1
$2p^6$	^{1}S	0	2 403 500	98	2	$2s^2 2p^4\ {}^1$S
$2s^2 2p^3(^4S°)3s$	^{3}S°	1	*8 035 000*			
$2s^2 2p^3(^2D°)3s$	^{3}D°	1,2	*8 146 000*			
		3	*8 191 000*			
$2s^2 2p^3(^2D°)3s$	^{1}D°	2	*8 212 000*			
$2s^2 2p^3(^2P°)3s$	^{3}P°	0	*8 295 000*			
		1	*8 313 000*			
		2	*8 405 000*			
$2s^2 2p^3(^2P°)3s$	^{1}P°	1	*8 422 000*			

Ni XXI—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages
$2s^2\,2p^3(^4S°)3d$	$^3D°$	3	*8 666 000*	
$2s^2\,2p^3(^2D°)3d$	$^3D°$	3	*8 835 000*	
$2s^2\,2p^3(^2D°)3d$	$^3P°$	2	*8 848 000*	
$2s^2\,2p^3(^2D°)3d$	$^1F°$	3	*8 896 000*	
$2s^2\,2p^3(^2P°)3d$	$^3F°$	3	*8 895 000*	
$2s^2\,2p^3(^2P°)3d$	$^3P°$	2	*8 924 000*	
		1	*9 000 000*	
$2s^2\,2p^3(^2P°)3d$	$^3D°$	2	*9 034 000*	
$2s^2\,2p^3(^2P°)3d$	$^1F°$	3	*9 048 000*	
$2s^2\,2p^3(^2P°)3d$	$^1D°$	2	*9 048 000*	
$2s^2\,2p^3(^2P°)3d$	$^1P°$	1	*11 086 000*	
Ni XXII	***Limit***		**14 160 000**	

Ni XXII

$Z=28$

N I isoelectronic sequence

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

Ionization energy = 15 280 000±30 000 cm^{-1} (1894±4 eV)

Two magnetic dipole lines observed in a tokamak plasma by Hinnov, Suckewer, Cohen, and Sato (1982) connect the doublet and quartet systems: $2s^2 2p^3\ ^4S^\circ_{3/2}-{}^2D^\circ_{3/2}$ at 634.8±0.3 Å and $^4S^\circ_{3/2}-{}^2D^\circ_{5/2}$ at 477.6±0.3 Å. The earlier analysis of the $2s^2 2p^3-2s2p^4$ array by Doschek, Feldman, Cowan, and Cohen (1974) was extended by Lawson and Peacock (1980) to include intersystem lines as well as the additional array $2s2p^4-2p^5$. Their measurements in the range 71–124 Å, reported with an uncertainty of ±0.03 Å, are used here to derive the energy levels, giving a level value uncertainty of ±400 cm^{-1}. The percentage compositions of the levels were provided by Kaufman and Sugar (1982).

The ionization energy was obtained by Lotz (1967) by extrapolation.

References

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

Hinnov, E., Suckewer, S., Cohen, S., and Sato, K. (1982), Phys. Rev. **A25**, 2293.

Kaufman, V., and Sugar, J. (1982), private communication.

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

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

Ni XXII

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$2s^2 2p^3$	$^4S^\circ$	3/2	*0*	81	15	$^2P^\circ$
$2s^2 2p^3$	$^2D^\circ$	3/2	*157 530*	70	16	$^2P^\circ$
		5/2	*209 380*	100		
$2s^2 2p^3$	$^2P^\circ$	1/2	*302 500*	99	1	$2p^5\ ^2P^\circ$
		3/2	*400 100*	68	25	$2p^3\ ^2D^\circ$
$2s(^2S)2p^4(^3P)$	^4P	5/2	848 100	96	4	$2s(^2S)2p^4(^1D)\ ^2D$
		3/2	943 000	97	2	$2s(^2S)2p^4(^1D)\ ^2D$
		1/2	968 000	92	8	$2s(^2S)2p^4(^1S)\ ^2S$
$2s(^2S)2p^4(^1D)$	^2D	3/2	1 176 200	89	8	$2s(^2S)2p^4(^3P)\ ^2P$
		5/2	1 203 400	96	4	$2s(^2S)2p^4(^3P)\ ^4P$
$2s(^2S)2p^4(^1S)$	^2S	1/2	1 344 600	64	30	$2s(^2S)2p^4(^3P)\ ^2P$
$2s(^2S)2p^4(^3P)$	^2P	3/2	1 399 000	91	9	$2s(^2S)2p^4(^1D)\ ^2D$
		1/2	1 536 500	70	28	$2s(^2S)2p^4(^1S)\ ^2S$
$2p^5$	$^2P^\circ$	3/2	*2 190 500*	98	2	$2s^2 2p^3\ ^2P^\circ$
		1/2	*2 340 900*	99	1	
Ni XXIII ($^3P_0$)	*Limit*		15 280 000			

Ni XXIII

$Z = 28$

C I isoelectronic sequence

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

Ionization energy = 16 220 000±30 000 cm^{-1} (2011±4 eV)

Four magnetic dipole lines observed in a tokamak discharge by Hinnov, Suckewer, Cohen, and Sato (1982) determine the ^{3}P and ^{1}D levels of the ground configuration: the $2s^2 2p^2$ $^3P_0-^3P_1$ at 911.0 Å, $^3P_1-^3P_2$ at 1915.0 Å, $^3P_2-^1D_2$ at 614.8 Å, and $^3P_1-^1D_2$ at 465.4 Å. The uncertainty of these measurements is ±0.3 Å.

The rest of the levels of $2s^2 2p^2$, $2s2p^3$, and $2p^4$ (except for $2s2p^3\ ^5S_2^\circ$) were derived from the lines observed and classified by Lawson and Peacock (1980) in the range of 74–128 Å. Their measurement uncertainty is ±0.03 Å, giving a level value uncertainty of ±400 cm^{-1}. Edlén (1984) has compared the known values of the $^5S_2^\circ$ level in the isoelectronic sequence with the theoretical predictions. He concluded that the values given by Lawson and Peacock are inconsistent with the trend. We give Edlén's predicted value in brackets.

The percentage compositions of these levels were provided by Kaufman and Sugar (1982).

The ionization energy was obtained by Lotz (1967) by extrapolation.

References

Edlén, B. (1984), private communication.

Hinnov, E., Suckewer, S., Cohen, S., and Sato, K. (1982), Phys. Rev. **A25**, 2293.

Kaufman, V., and Sugar, J. (1982), private communication.

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

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

Ni XXIII

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$2s^2 2p^2$	^{3}P	0	0	87	12	$2s^2 2p^2\ ^1$S
		1	109 770	99	1	$2p^4\ ^3$P
		2	161 990	67	32	$2s^2 2p^2\ ^1$D
$2s^2 2p^2$	^{1}D	2	324 640	67	32	^{3}P
$2s^2 2p^2$	^{1}S	0	463 900	85	12	^{3}P
$2s(^2S)2p^3(^4S)$	$^5S^\circ$	2	[*586 890*]	95	5	$2s(^2S)2p^3(^2P^\circ)\ ^3P^\circ$
$2s(^2S)2p^3(^2D)$	$^3D^\circ$	1	*894 100*	81	15	$2s(^2S)2p^3(^2P^\circ)\ ^3P^\circ$
		2	*900 000*	79	18	
		3	*941 400*	100		
$2s(^2S)2p^3(^2P)$	$^3P^\circ$	0	*1 064 900*	100		
		1	*1 078 500*	78	16	$2s(^2S)2p^3(^2D^\circ)\ ^3D^\circ$
		2	*1 105 000*	65	20	
$2s(^2S)2p^3(^4S)$	$^3S^\circ$	1	*1 250 500*	74	19	$2s(^2S)2p^3(^2P^\circ)\ ^1P^\circ$
$2s(^2S)2p^3(^2D)$	$^1D^\circ$	2	*1 304 600*	87	12	$2s(^2S)2p^3(^2P)\ ^3P^\circ$
$2s(^2S)2p^3(^2P)$	$^1P^\circ$	1	*1 459 700*	77	19	$2s(^2S)2p^3(^4S^\circ)\ ^3S^\circ$
$2p^4$	^{3}P	2	1 864 700	85	14	$2p^4\ ^1$D
		0	1 977 400	79	20	$2p^4\ ^1$S
		1	1 999 400	99	1	$2s^2 2p^2\ ^3$P
$2p^4$	^{1}D	2	2 080 600	86	14	^{3}P
$2p^4$	^{1}S	0	2 348 200	77	20	^{3}P
Ni XXIV ($^2P^\circ_{1/2}$)	***Limit***		**16 220 000**			

Ni XXIV

$Z=28$

B I isoelectronic sequence

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

Ionization energy = 17 190 000±34 000 cm^{-1} (2131±4 eV)

Hinnov, Suckewer, Cohen, and Sato (1982) observed the $2s^2 2p\ ^2P_{1/2}$–$^2P_{3/2}$ magnetic dipole transition at 609.9±0.3 Å in a tokamak plasma. The levels of the $2s2p^2$ and $2p^3$ configurations are from the measurements and classifications of Lawson and Peacock (1980) in the range of 87–160 Å with a wavelength uncertainty of ±0.03 Å, giving a level value uncertainty of ±400 cm^{-1}. They identified the transition $2s\ 2p^2\ ^4P_{5/2}$–$2p^3\ ^2D^\circ_{5/2}$ at 98.39 Å that connects the quartet and doublet systems. Edlén (1983) suggested that this identification is inconsistent with the intersystem connection found in a solar flare spectrum by Sandlin et al. (1976) for isoelectronic Fe XXII. Edlén proposes the value 98.282 Å for this line. The percentage compositions of these levels were provided by Kaufman and Sugar. Their calculation includes configuration interaction between $2s^2 2p$ and $2p^3$.

The ionization energy was obtained by Lotz (1967) by extrapolation.

References

Edlén, B. (1983), Phys. Scr. **28**, 483.

Hinnov, E., Suckewer, S., Cohen, S., and Sato, K. (1982), Phys. Rev. **A25**, 2293.

Kaufman, V., and Sugar, J. (1982), private communication.

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**, L47.

Ni XXIV

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$2s^2 2p$	$^2P^\circ$	1/2	*0*	98	2	$2p^3\ ^2P^\circ$
		3/2	*163 960*	98	2	
$2s2p^2$	^4P	1/2	458 100	94	5	^2S
		3/2	541 000	99	1	^2D
		5/2	610 000	91	9	^2D
$2s2p^2$	^2D	3/2	843 700	93	7	^2P
		5/2	884 100	91	9	^4P
$2s2p^2$	^2P	1/2	955 700	66	30	^2S
		3/2	1 143 100	93	6	^2D
$2s2p^2$	^2S	1/2	1 129 600	64	34	^2P
$2p^3$	$^4S^\circ$	3/2	*1 424 900*	84	11	$^2P^\circ$
$2p^3$	$^2D^\circ$	3/2	*1 582 000*	78	12	$^2P^\circ$
		5/2	*1 626 400*	100		
$2p^3$	$^2P^\circ$	1/2	*1 781 100*	98	2	$2s^2 2p\ ^2P^\circ$
		3/2	*1 872 900*	75	18	$2p^3\ ^2D^\circ$
Ni XXV ($^1S_0$)	*Limit*		**17 190 000**			

Ni XXV

$Z=28$

Be I isoelectronic sequence

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

Ionization energy = 18 510 000±37 000 cm^{-1} (2295±5 eV)

The $2s^2\ ^1S_0 - 2s2p\ ^1P_1^\circ$ resonance line was measured by Breton et al. (1979) at 117.90 Å in a tokamak plasma. Sandlin et al. (1976) tentatively identified a faint image at 238.82 Å in a solar flare spectrum as the $^1S_0 - ^3P_1^\circ$ line of the same array. This value is in good agreement with the prediction by Edlén (1983).

The $2s2p - 2p^2$ array was classified by Lawson and Peacock (1980). Their stated measurement accuracy is ±0.03 Å, giving a level value uncertainty of ±400 cm^{-1}. We give their results, although Edlén concludes from his isoelectronic study that some of the identifications are doubtful.

The line identifications establishing the levels of the $n=3$ shell were given by Fawcett, Ridgeley, and Hughes (1979). The wavelengths, given with an accuracy of ±0.003 Å, fall in the range of 9-10 Å. The level value uncertainty is ±4000 cm^{-1}.

The ionization energy was obtained by extrapolation by Lotz (1967).

References

Breton, C., De Michelis, C., Finkenthal, M., and Mattioli, M. (1979), J. Opt. Soc. Am. **69**, 1652.

Edlén, B. (1983), Phys. Scr. **28**, 51.

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

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**, 147.

Ni XXV

Configuration	Term	J	Level (cm^{-1})	Configuration	Term	J	Level (cm^{-1})
$2s^2$	^1S	0	0	$2s3d$	^1D	2	10 880 000
$2s2p$	$^3P^\circ$	0	*378 190*	$2p3p$	^3D	2	11 153 000
		1	*418 720*			3	11 296 000
		2	*549 500*				
				$2p3d$	$^3F^\circ$	3	*11 271 000*
$2s2p$	$^1P^\circ$	1	*848 100*				
				$2p3d$	$^3D^\circ$	2	*11 283 000*
$2p^2$	^3P	0	1 048 300?			1	*11 296 000*
		1	1 154 300			3	*11 437 000*
		2	1 207 800				
				$2p3p$	^3P	2	11 306 000
$2p^2$	^1D	2	1 379 600				
				$2p3p$	^3S	1	11 306 000
$2p^2$	^1S	0	1 611 500				
				$2p3d$	$^1D^\circ$	2	*11 408 000*
$2s3p$	$^3P^\circ$	1	*10 650 000*				
				$2p3d$	$^3P^\circ$	0-2	*11 456 000*
$2s3p$	$^1P^\circ$	1	*10 707 000*				
				$2p3d$	$^1F^\circ$	3	*11 525 000*
$2s3d$	^3D	1	10 794 000				
		2	10 800 000	Ni XXVI ($^2S_{1/2}$)	***Limit***		**18 510 000**
		3	10 813 000				

Ni XXVI

$Z=28$

Li I isoelectronic sequence

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

Ionization energy = 19 351 000±5000 cm^{-1} (2399.2±0.6 eV)

Edlén (1983) has given extrapolated values for the $2s-2p$ transition wavelengths with an estimated uncertainty of ±0.01 Å. He concludes that the solar identification for this transition by Sandlin et al. (1976) is incorrect. Edlén's results are given in brackets. Fawcett, Ridgeley, and Hughes (1979) determined the $3s$, $3p$, and $3d$ terms from observations at 9 Å of a laser-produced plasma. Their measurement uncertainty is ±0.01 Å, giving a level value uncertainty of ±12 000 cm^{-1}.

From measurements of spark spectra at ~1.6 Å, Safronova and Sidelnikov (1977) determined the levels above the ionization energy. No estimated uncertainty is given but wavelengths to four decimal places are reported. The designations are from Vainstein and Safronova (1978).

The ionization energy was calculated by Edlén (1979).

References

Edlén, B. (1979), Phys. Scr. **19**, 255.
Edlén, B. (1983), Phys. Scr. **28**, 51.
Fawcett, B. C., Ridgeley, A., and Hughes, T. P. (1979), Mon. Not. R. Astron. Soc. **188**, 365.
Safronova, U. I., and Sidelnikov, Y. V. (1977), Prikl. Spektrosk. **5**, 7.
Sandlin, G. D., Breuckner, G. E., Scherrer, V. E., and Tousey, R. (1976), Astrophys. J. **205**, L47.
Vainstein, L. A. and Safronova, U. I. (1978), At. Data Nucl. Data Tables **21**, 49.

Ni XXVI

Configuration	Term	J	Level (cm^{-1})
$1s^2\,2s$	^2S	1/2	0
$1s^2\,2p$	$^2P^\circ$	1/2	[*427 180*]
		3/2	[*604 680*]
$1s^2\,3s$	^2S	1/2	10 880 000
$1s^2\,3p$	$^2P^\circ$	1/2	*10 983 000*
		3/2	*11 036 000*
$1s^2\,3d$	^2D	3/2	11 077 000
		5/2	11 092 000
Ni XXVII ($^1S_0$)	***Limit***		**19 351 000**
$1s(^2S)2s2p(^3P^\circ)$	$^4P^\circ$	1/2	*62 193 000*
		3/2	*62 228 000*
$1s(^2S)2s2p(^3P^\circ)$	$^2P^\circ$	1/2	*62 516 000*
		3/2	*62 617 000*
$1s(^2S)2p^2(^3P)$	^4P	3/2	62 697 000
		1/2	62 783 000
$1s(^2S)2s2p(^1P^\circ)$	$^2P^\circ$	1/2	*62 755 000*
$1s(^2S)2p^2(^3P)$	^2P	1/2	62 997 000
		3/2	63 210 000
$1s(^2S)2p^2(^1D)$	^2D	3/2	63 008 000
		5/2	63 085 000
$1s(^2S)2p^2(^1S)$	^2S	1/2	63 397 000

Ni XXVII

$Z = 28$

He I isoelectronic sequence

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

Ionization energy = 82 984 000±16 000 cm^{-1} (10 288.8±2.0 eV)

Because of the excellent agreement of the calculated energies of the $n = 2$ shell by Safronova (1981) with the few well-measured spectra in the He I sequence, we have compiled her results for the $n = 2$ levels and for the ionization energy. Detailed comparisons are given in the Introduction. Levels of the n = 3–5 shells are from the calculated binding energies by Ermolaev and Jones (1974) subtracted from Safronova's value for the binding energy of the ground state. We have assumed an uncertainty of 2 parts in 10^4 for the excited levels relative to the ground state, and for the ionization energy. For differences between excited levels where $\Delta n = 0$, we assumed an uncertainty of 2 parts in 10^3.

Observations by Safronova and Sidelnikov (1977) place the $1s2p\ ^1P^\circ_1$ at 62 925 000 cm^{-1} with an estimated uncertainty of ±20 000 cm^{-1}.

Percentage compositions are from Ermolaev and Jones.

References

Ermolaev, A. M., and Jones, M. (1974), J. Phys. **B7**, 199.
Safronova, U. I. (1981), Phys. Scr. **23**, 241.
Safronova, U. I., and Sidelnikov, Y. V. (1977), Prikl. Spektrosk. **5**, 7.

Ni XXVII

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
$1s^2$	^1S	0	0			
$1s2s$	^3S	1	[62 358 960]			
$1s2p$	$^3P^\circ$	0	*[62 614 630]*			
		1	*[62 637 380]*	89	11	$^1P^\circ$
		2	*[62 801 270]*			
$1s2s$	^1S	0	[62 637 200]			
$1s2p$	$^1P^\circ$	1	*[62 952 670]*	89	11	$^3P^\circ$
$1s3s$	^3S	1	[73 903 340]			
$1s3p$	$^3P^\circ$	0	*[73 974 350]*			
		1	*[73 979 340]*	88	12	$^1P^\circ$
		2	*[74 028 190]*			
$1s3s$	^1S	0	[73 976 370]			
$1s3p$	$^1P^\circ$	1	*[74 070 580]*	88	12	$^3P^\circ$
$1s4s$	^3S	1	[77 900 890]			
$1s4s$	^1S	0	[77 930 480]			
$1s4p$	$^3P^\circ$	0	*[77 930 500]*			
		1	*[77 932 560]*	88	12	$^1P^\circ$
		2	*[77 953 220]*			
$1s4p$	$^1P^\circ$	1	*[77 970 500]*	88	12	$^3P^\circ$
$1s5s$	^3S	1	[79 740 940]			
$1s5s$	^1S	0	[79 755 710]			

Ni XXVII—Continued

Configuration	Term	J	Level (cm^{-1})	Leading percentages		
1s5p	$^3P^\circ$	0	[*79 755 910*]			
		1	[*79 756 970*]	87	13	$^1P^\circ$
		2	[*79 767 550*]			
1s5p	$^1P^\circ$	1	[*79 776 290*]	87	13	$^3P^\circ$
Ni XXVIII ($^2S_{1/2}$)	***Limit***		**82 984 000**			

Ni XXVIII

$Z = 28$

H I isoelectronic sequence

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

Ionization energy = 86 909 400±500 cm^{-1} (10 775.48±0.06 eV)

No observations of this spectrum are reported. We give calculated values by Mohr (1983) for the $n = 2$ shell and by Erickson (1977) for $n = 3$ to 5 relative to the $2p\ ^2P^{\circ}_{3/2}$ level. Further details are given in the Introduction. Relative to the ground state, the level uncertainty is estimated to be one part in 10^6.

References

Erickson, G. W. (1977), J. Phys. Chem. Ref. Data **6**, 831.
Mohr, P. J. (1983), At. Data Nucl. Data Tables, **29**, 453.

Ni XXVIII

Configuration	Term	J	Level (cm^{-1})
$1s$	^2S	$1/2$	0
$2p$	$^2P^{\circ}$	$1/2$	*[65 113 950]*
		$3/2$	*[65 344 939]*
$2s$	^2S	$1/2$	[65 119 814]
$3p$	$^2P^{\circ}$	$1/2$	*[77 248 280]*
		$3/2$	*[77 316 770]*
$3s$	^2S	$1/2$	[77 250 120]
$3d$	^2D	$3/2$	[77 316 649]
		$5/2$	[77 339 033]
$4p$	$^2P^{\circ}$	$1/2$	*[81 485 832]*
		$3/2$	*[81 514 699]*
$4s$	^2S	$1/2$	[81 486 610]
$4d$	^2D	$3/2$	[81 514 646]
		$5/2$	[81 524 098]

Configuration	Term	J	Level (cm^{-1})
$4f$	$^2F^{\circ}$	$5/2$	*[81 524 081]*
		$7/2$	*[81 528 784]*
$5p$	$^2P^{\circ}$	$1/2$	*[83 443 186]*
		$3/2$	*[83 457 952]*
$5s$	^2S	$1/2$	[83 443 585]
$5d$	^2D	$3/2$	[83 457 924]
		$5/2$	[83 462 764]
$5f$	$^2F^{\circ}$	$5/2$	*[83 462 755]*
		$7/2$	*[83 465 165]*
$5g$	^2G	$7/2$	[83 465 160]
		$9/2$	[83 466 603]
	Limit		**86 909 400**

F. Atomic Transition Probabilities of Nickel, Ni I through Ni XXVIII

F. Atomic Transition Probabilities of Nickel

[Exerpted from: J. R. Fuhr, G. A. Martin, and W. L. Wiese, J. Phys. Chem. Ref. Data 17, Supplement 4 (1988)]

1. Introduction

The following tables, including the introductory comments, are excerpted from the above cited compilation of atomic transition probabilities by J. R. Fuhr, G. A. Martin, and W. L. Wiese of the Data Center on Atomic Transition Probabilities at the National Institute of Standards and Technology (formerly the National Bureau of Standards).

This is part of the third major critical compilation by the NBS Data Center on Atomic Transition Probabilities. A first tabulation[1] containing transition probabilities for about 4,000 spectral lines of the elements hydrogen through neon, atomic numbers $Z=1$ through 10, including the neutral atoms as well as their various ions, was published in 1966. A second data volume[2] was issued in 1969, containing data for about 5,000 lines of the elements sodium ($Z=11$) through calcium ($Z=20$), again for all stages of ionization for which data were available. The data compilation work then continued with a series of smaller tables for the atoms and ions of the elements of the iron group, i.e., Sc and Ti[3]; V, Cr, and Mn[4]; Fe, Co, and Ni[5]; and the forbidden lines of all these elements.[6] From the beginning, it has been the intention to integrate these smaller tabulations into a single volume for the iron-group elements, in updated and expanded form. Unexpectedly, a great deal of new data were generated for these elements during the past few years, often with much improved accuracy, so that the revisions and additions became very extensive. Thus it took a much longer time than anticipated to complete these largely new data tables, and the greatly expanded tabulations had to be split into two separate volumes. Nickel is included in a volume that contains the material on the elements Fe ($Z=26$) through Ni ($Z=28$), and a companion volume[7] contains the material on Sc ($Z=21$) through Mn ($Z=25$).

In the present compilation, the scope and format of the earlier tabulations is maintained, i.e., critically evaluated atomic transition probabilities of allowed and forbidden discrete transitions of all stages of ionization are presented for which reliable data are available. Data are listed for at least the more prominent lines of each spectrum, even if some of these data are of low accuracy. Furthermore, transition-probability data are also presented for weaker transitions if the accuracy of these data has been estimated to be better than ± 50%.

The original literature is continually monitored by this NBS Data Center, and a master reference list is maintained from which all literature sources for this compilation have been taken.

2. Method of Evaluation

For the compilation of data on a critical basis, the central task is the evaluation of the data accuracy and the subsequent choice of the most accurate material. In order to accomplish this task in a consistent manner, general guideposts were established for each experimental and theoretical approach in earlier compilation work, and these criteria were maintained in this work. Specifically, each original literature source was judged by the following principal criteria:

(1) A general evaluation of the capabilities and reliability of the applied experimental or theoretical method.

(2) The author's consideration of the major critical factors in his approach that enter into the results.

(3) The degree of agreement and general consistency between the author's results and other reliable data.

(4) The degree of fit of the data into established systematic trends and, if deviations exist, the reasons for such disagreements.

(5) The author's estimate of his uncertainties.

The general evaluations of each experimental and theoretical method have been discussed in considerable detail in the introductions to previous tabulations.[1–6] Thus, these publications are to be consulted for further details. However, it should be pointed out that in this tabulation, particularly interesting situations are illustrated by providing comparison tables or graphs in the introductions to individual spectra.

With respect to error estimates, one should note that the theoretical literature sources, which provide a large part of the data, generally contain no error estimates, since no reliable assessment of the uncertainties introduced by the various approximations is possible. But even for the experimental papers, where error estimates may often readily be made, the statements by some authors are too imprecise and also incomplete, so that they are not particularly useful as presented. Sometimes only statistical measurement errors have been given, without allowance for systematic errors. It therefore became essential to judge each paper by the principal factors 1–4 listed above, in addition to utilizing the author's error estimate (point (5)) whenever appropriate.

3. General Arrangement of the Tables

The same general arrangement of the tables is used as in earlier volumes,[1,2] i.e., data are included which serve to identify the spectral lines, as well as the actual transition probabilities (and related quantities), accuracy estimates, and references to the sources of the compiled material. However, for most of the spectra of neutral and singly-ionized atoms of the iron-group elements, the transition array column was dropped. Instead, in order to identify the lower and upper levels of a transition, the level designation scheme of C. E. Moore[8] was adopted, who affixed lower-case letters $(a,b,c,...,x,y,z)$ to the term designations. This convention is also retained in the very recent tables of "Atomic Energy Levels" by J. Sugar and C. Corliss.[9] In other special cases, the notation was adapted to the special coupling situations encountered in those spectra, as, for example, the J_1j coupling encountered in Ne-like ions and J_1j and $J_1\ell$ coupling for Ar-like ions.

Material pertaining to spectral-line identifications has been taken from the comprehensive wavelength tabulations of Reader and Corliss,[10] Kelly,[11,12] and Kelly and Palumbo,[13] the multiplet tables of C. E. Moore,[14,15] and the recent energy-level compilation of Sugar and Corliss[9] (this last reference supersedes earlier compilations by Sugar and others[16,17]). The wavelength and energy-level data from these sources have been supplemented by original literature data when needed in the course of preparing the transition-probability tables.

Wavelengths and energy levels which are the results of theoretical calculations, or which were either calculated from experimentally determined data or interpolated or extrapolated from data on similar (e.g., isoelectronic) species, are placed in square brackets in order to distinguish them from the usually more accurate experimental material.

For each transition-probability table which contains a minimum of twenty distinct wavelength values, a "list of tabulated lines," has been provided, in ascending order of wavelength, of the spectral lines contained therein, along with an index to the multiplet number (or numbers) in which each is to be found. Wavelengths that are printed in italics in the transition-probability tables are not included in these line lists.

The uncertainties in the atomic transition-probability data are denoted by letters as follows:

A . . for uncertainties within 3 percent,
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 the evaluation of random errors *as well as estimates of the maximum effect of possible systematic errors*. Often, further distinctions were made in the uncertainty labels 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. Included there for convenience are the relations between line and multiplet values in the case of *LS* coupling. In Table 1, the conversion factors are provided which have been used throughout this compilation to convert from transition probabilities to oscillator strengths and line strengths, and vice versa.

TABLE 1. 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	$\dfrac{6.670_3 \times 10^{15} g_i}{g_k \lambda^2}$	E1 $\dfrac{2.026_1 \times 10^{18}}{g_k \lambda^3}$ E2 $\dfrac{1.679_9 \times 10^{18}}{g_k \lambda^5}$ M1 $\dfrac{2.697_4 \times 10^{13}}{g_k \lambda^3}$ M2 $\dfrac{6.626_5 \times 10^{12}}{g_k \lambda^5}$
f_{ik}	$\dfrac{1.499_2 \times 10^{-16} \lambda^2 g_k}{g_i}$	1	E1 $\dfrac{303.7_6}{g_i \lambda}$
S	E1 $4.935_5 \times 10^{-19}\, g_k \lambda^3$ E2 $5.952_6 \times 10^{-19}\, g_k \lambda^5$ M1 $3.707_3 \times 10^{-14}\, g_k \lambda^3$ M2 $1.509_1 \times 10^{-13}\, g_k \lambda^5$	E1 $3.292_1 \times 10^{-3}\, g_i \lambda$	1

The line strength (S) is given in atomic units; formulas and values for these quantities in SI units are as follows:

For E1 transitions, $a_0^2 e^2 = 7.188_3 \times 10^{-59}$ m^2 C^2

For E2 transitions, $a_0^4 e^2 = 2.012_9 \times 10^{-79}$ m^4 C^2

For M1 transitions, $\mu_B^2 = (eh/4\pi m_e)^2 = 8.600_7 \times 10^{-47}$ J^2 T^{-2}

For M2 transitions, $\mu_B^2 a_0^2 = 2.408_5 \times 10^{-67}$ J^2 m^2 T^{-2}.

where a_0, e, m_e, and h are the Bohr radius, electron charge, electron mass, and Planck constant, respectively, and μ_B is the Bohr magneton.

The transition probability (A_{ki}) is in units of s^{-1}, and the f-value is dimensionless. The wavelength (λ) is given in Ångström units, and g_i and g_k are the statistical weights of the lower and upper level, respectively.

[Note: the definition of the line strength for E2 transitions, which is used by some authors, yields an S-value that is 50% higher than that employed here and in earlier NBS transition-probability compilations. Such line strengths have been multiplied by $\frac{2}{3}$ before tabulating them here, and this fact is indicated in the short introductions to the pertinent data tables.]

For the atomic constants entering into the relations given in this table, the recommendations of the CODATA Task Group on Fundamental Constants (E. R. Cohen and B. N. Taylor, Rev. Mod. Phys. 59, 1121 (1987)) have been used. The 1987 values were not available at the time that most of the data was compiled for this publication; however, differences between these and the earlier (CODATA Task Group, 1973) values of the fundamental constants were utilized, which amount to only 0.002% or less for the E1 transitions and 0.05% or less for the M1, E2, and M2 (forbidden) transitions and have therefore not affected the tabulated data.

4. Key to Abbreviations and Symbols Used in the Tables

1. Symbols for indication of accuracy:

A...... uncertainties within 3 percent,
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 from 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 sequence number of Ref. 14 (Revised Multiplet Table). If letters "uv" are added, they refer to the sequence number of Ref. 15 (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 allowed lines and the total multiplet strength:

1. Line strength S:

$$S(i,k) = \sum_{J_i,J_k} S(J_i,J_k)$$

or

$$S\ (\text{Multiplet}) = \Sigma\, S\ (\text{line})$$

(k denotes the upper and i the lower term).

2. Absorption oscillator strength f_{ik}:

$$f_{ik}^{\text{multiplet}} = \frac{1}{\bar{\lambda}_{ik} \sum_{J_i} (2J+1)} \sum_{J_i,J_k} (2J_i+1) \times \lambda(J_i, J_k) \times f(J_i,J_k).$$

The mean wavelength for the multiplet, $\bar{\lambda}_{ik}$, may be obtained from the *weighted* energy levels. Often the wavelength differences for the lines within a multiplet are small, in which case the wavelength factors may be neglected.

3. Transition probability A_{ki}:

$$A_{ki}^{\text{multiplet}} = \frac{1}{(\bar{\lambda}_{ik})^3 \sum_{J_k} (2J_k+1)} \sum_{J_i,J_k} (2J_k+1) \times \lambda(J_i, J_k)^3 \times A\,(J_i,J_k).$$

Relative strengths $S(J_i,J_k)$ of the components of a multiplet are listed for the case of LS coupling in C. W. Allen, *Astrophysical Quantities*, 3rd ed. (The Athlone Press, London, 1973); H. E. White and A. Y. Eliason, Phys. Rev. **44**, 753 (1933); B. W. Shore and D. H. Menzel, *Principles of Atomic Structure*, p. 447 (John Wiley & Sons, Inc., New York, 1968); L. Goldberg, Astrophys. J. **82**, 1 (1935) and **84**, 11 (1936).

5. References

[1]W. L. Wiese, M. W. Smith, and B. M. Glennon, "Atomic Transition Probabilities—Hydrogen through Neon," Vol. I, NSRDS–NBS 4 (1966).
[2]W. L. Wiese, M. W. Smith, and B. M. Miles, "Atomic Transition Probabilities—Sodium through Calcium," Vol. II, NSRDS–NBS 22 (1969).
[3]W. L. Wiese and J. R. Fuhr, J. Phys. Chem. Ref. Data 4, 263 (1975).
[4]S. M. Younger, J. R. Fuhr, G. A. Martin, and W. L. Wiese, J. Phys. Chem. Ref. Data 7, 495 (1978).
[5]J. R. Fuhr, G. A. Martin, W. L. Wiese, and S. M. Younger, J. Phys. Chem. Ref. Data 10, 305 (1981).
[6]M. W. Smith and W. L. Wiese, J. Phys. Chem. Ref. Data 2, 85 (1973).
[7]G. A. Martin, J. R. Fuhr, and W. L. Wiese, "Atomic Transition Probabilities—Scandium through Manganese," J. Phys. Chem. Ref. Data 17, Suppl. 3 (1988).
[8]C. E. Moore, "Atomic Energy Levels," Vols. I and II, NSRDS–NBS 35 (1971). (Reprints of NBS Circ. 467, originally issued in 1949 and 1952.)

[9]J. Sugar and C. Corliss, "Atomic Energy Levels of the Iron-Period Elements: Potassium through Nickel," J. Phys. Chem. Ref. Data 14, Suppl. 2 (1985).

[10]J. Reader and C. Corliss, CRC Handbook of Chemistry and Physics, 67th Ed. (1986–87), pp. E-187 to E-313 (CRC Press, Inc., Boca Raton, FL).

[11]R. L. Kelly, "Atomic Emission Lines in the Near Ultraviolet; Hydrgen through Krypton," Sects. I and II, NASA Techn. Memorand. 80268 (1979).

[12]R. L. Kelly, "Atomic and Ionic Spectrum Lines Below 2000 Ångströms: Hydrogen through Krypton," J. Phys. Chem. Ref. Data 16, Suppl. 1 (1987).

[13]R. L. Kelly and L. J. Palumbo, "Atomic and Ionic Emission Lines Below 2000 Ångströms—Hydrogen through Krypton," Naval Res. Lab. Rept. 7599 (1973).

[14]C. E. Moore, "A Multiplet Table of Astrophysical Interest," Revised Edition, NSRDS–NBS 40 (1972).

[15]C. E. Moore, "An Ultraviolet Multiplet Table," NBS Circ. 488, U. S. Government Print. Off., Washington, D.C. (1968).

[16]J. Sugar and C. Corliss, J. Phys. Chem. Ref. Data 6, 317 (1977); 7, 1191 (1978); 9, 473 (1980).

[17]C. Corliss and J. Sugar, J. Phys. Chem. Ref. Data 6, 1253 (1977); 8, 1 (1979).

Nickel

Ni I

Ground State: $1s^2 2s^2 2p^6 3s^2 3p^6 3d^8 4s^2\ ^3F_4$

Ionization Energy: 7.6375 eV = 61600 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
1963.85	68	2182.38	28	2907.46	16	3320.26	10
1968.90	34	2183.91	87	2914.01	15	3322.31	79
1976.87	68	2190.22	57	2943.91	47	3337.01	37
1981.61	68	2191.21	86	2981.65	47	3351.06	3
1990.25	68	2197.35	57	2984.13	13	3361.55	39
1994.29	33	2201.59	85	2991.11	15	3362.80	44
2000.49	65	2212.15	27	2992.59	45	3365.76	77
2001.83	66	2220.71	58	2994.46	48	3366.16	9
2007.01	65	2221.94	27	3002.48	47	3367.88	41
2007.69	34	2230.96	57	3003.62	47	3369.56	6
2014.25	68	2244.46	53	3012.00	81	3371.99	8
2025.40	32	2251.48	53	3019.14	11	3374.22	37
2026.62	32	2253.57	52	3031.87	11	3380.57	78
2029.29	66	2254.81	25	3037.93	45	3380.89	8
2033.56	60	2258.15	56	3045.01	13	3391.04	5
2041.16	65	2259.56	56	3050.82	45	3392.98	40
2047.35	63	2261.42	24	3054.31	45	3409.58	5
2050.84	67	2266.35	52	3057.64	47	3413.48	5
2052.04	30	2267.55	21	3064.62	47	3413.94	37
2052.45	30	2271.95	55	3080.75	47	3414.76	39
2053.91	29	2274.66	21	3097.12	11	3420.73	10
2055.50	32	2287.32	53	3099.11	14	3423.71	41
2059.92	61	2288.40	52	3101.56	45	3433.56	39
2060.20	61	2289.98	23	3101.88	80	3437.28	3
2062.37	32	2293.11	56	3105.46	13	3446.26	41
2063.42	65	2300.77	54	3107.71	13	3452.88	37
2064.39	61	2302.97	56	3114.12	46	3458.46	39
2069.52	64	2307.35	55	3129.30	13	3461.66	37
2082.87	32	2312.34	20	3134.11	45	3467.50	3
2085.37	62	2313.98	21	3145.12	8	3469.48	9
2085.57	90	2317.16	26	3145.71	11	3472.55	40
2088.98	61	2320.03	20	3159.52	11	3483.77	7
2089.09	31	2321.38	21	3165.51	42	3485.88	37
2095.13	90	2324.65	25	3184.37	11	3492.96	38
2105.85	64	2325.79	20	3195.57	13	3498.19	2
2109.79	30	2329.96	26	3197.11	46	3500.85	7
2111.73	29	2345.54	19	3200.42	44	3502.60	3
2114.43	88	2346.63	22	3221.65	9	3507.69	3
2121.40	59	2347.51	18	3225.02	79	3510.33	38
2124.80	89	2348.73	51	3226.98	8	3513.93	37
2125.62	28	2419.31	19	3232.93	8	3515.05	39
2128.41	31	2476.88	17	3234.65	42	3519.76	5
2129.96	58	2540.02	83	3235.75	11	3523.07	74
2147.80	58	2553.37	17	3243.05	43	3523.44	36
2151.93	29	2561.42	17	3248.46	42	3524.54	38
2152.23	59	2696.48	82	3249.44	12	3527.98	6
2157.83	57	2746.74	50	3250.74	79	3548.19	41
2158.31	57	2798.65	50	3271.11	44	3551.53	5
2161.04	58	2805.08	15	3282.69	8	3561.75	2
2166.15	58	2821.29	49	3286.94	39	3566.37	76
2173.54	84	2834.55	16	3310.20	77	3571.86	5
2174.48	57	2865.50	50	3315.66	43	3577.24	3

List of tabulated lines — Continued

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
3587.93	36	4729.28	193	5094.42	163	6105.78	206
3597.70	38	4731.81	162	5099.95	154	6108.12	94
3602.28	3	4732.47	193	5102.97	97	6111.06	189
3609.31	36	4740.17	123	5115.40	167	6119.78	200
3610.46	38	4752.43	138	5129.37	153	6128.99	91
3612.74	7	4756.52	122	5137.08	98	6130.17	203
3619.39	75	4758.42	172	5155.14	179	6133.95	188
3620.02	3	4762.63	115	5155.76	182	6175.42	196
3624.73	2	4773.41	164	5157.99	128	6176.81	186
3641.64	6	4786.29	99	5176.57	181	6177.26	103
3664.09	4	4786.54	122	5179.14	175	6186.74	188
3669.24	2	4791.00	115	5187.82	161	6198.65	206
3670.43	4	4793.47	159	5197.17	176	6204.64	185
3674.06	35	4807.00	156	5220.31	131	6223.99	186
3674.15	71	4808.86	160	5262.83	130	6230.09	187
3688.41	5	4812.00	136	5265.71	142	6256.36	92
3722.49	38	4814.62	122	5347.71	147	6271.76	117
3736.81	69	4815.92	137	5353.42	114	6272.65	200
3739.23	2	4817.82	208	5371.33	214	6314.66	111
3749.05	1	4821.14	208	5388.35	114	6316.61	203
3775.57	73	4829.03	137	5392.37	205	6322.17	204
3783.53	69	4831.18	128	5424.65	114	6327.60	93
3792.34	2	4838.64	212	5435.87	114	6364.60	111
3793.61	4	4843.17	99	5452.85	143	6370.38	134
3807.14	72	4843.51	193	5453.26	190	6375.22	210
3831.69	70	4845.17	132	5462.49	171	6378.26	201
3832.87	1	4852.56	136	5468.10	171	6384.67	202
3858.30	71	4855.41	136	5475.57	161	6414.60	200
3885.87	1	4900.97	122	5476.91	104	6421.52	209
3946.19	1	4904.41	135	5494.89	190	6482.80	110
3973.55	70	4912.03	128	5499.41	166	6532.89	109
4009.98	150	4913.97	138	5504.12	165	6586.33	109
4027.67	184	4918.36	167	5514.80	170	6598.59	204
4035.96	150	4925.58	142	5537.11	169	6635.15	213
4093.62	1	4935.83	167	5553.69	112	6643.64	92
4200.46	120	4937.34	131	5578.72	96	6661.39	202
4295.88	168	4945.46	147	5587.87	114	6767.77	102
4331.65	101	4946.04	149	5589.38	178	6772.36	134
4382.87	183	4953.20	128	5592.28	112	6842.07	133
4401.54	118	4967.55	142	5593.74	179	6850.48	152
4410.52	119	4976.16	129	5625.33	199	6914.56	106
4431.03	194	4976.35	97	5637.12	197	6973.52	216
4437.57	157	4976.71	208	5638.82	177	7001.54	109
4450.13	168	4980.17	129	5641.88	192	7030.06	133
4462.46	118	4995.65	147	5642.66	177	7034.42	121
4470.48	118	4996.85	146	5643.10	211	7062.97	109
4513.00	162	4998.23	128	5664.02	215	7110.91	108
4519.99	100	5000.34	147	5682.20	191	7122.24	133
4551.24	195	5003.75	99	5695.00	198	7197.02	106
4553.18	139	5010.96	146	5709.55	95	7220.79	220
4567.42	126	5012.46	128	5711.91	112	7261.93	106
4600.37	122	5017.58	128	5748.34	94	7286.56	127
4604.99	122	5032.75	180	5749.28	166	7291.45	107
4606.23	124	5035.37	144	5754.68	113	7327.67	141
4633.03	123	5039.37	145	5760.85	190	7381.94	219
4648.66	122	5042.20	137	5805.23	192	7385.24	116
4666.99	148	5048.85	174	5847.00	93	7401.13	218
4675.64	132	5079.96	105	5892.88	113	7414.51	106
4686.22	122	5080.53	144	5996.74	204	7422.30	140
4698.39	193	5081.11	173	6007.31	91	7481.49	217
4701.34	125	5082.35	136	6025.73	207	7488.73	158
4701.54	193	5084.08	155	6039.31	203	7714.32	106
4714.42	122	5085.49	136	6053.68	201	7727.66	151
4715.78	122	5088.96	155	6086.29	204	7788.94	106

For this spectrum, we provide data for 465 spectral lines and have utilized four data sources.[1-4] Huber and Sandeman[1] measured relative oscillator strengths by using the anomalous dispersion (hook) method and obtained data for a few additional, weak resonance lines by employing the absorption technique. They normalized their relative f-values to an absolute scale by using lifetime measurements of Becker *et al.*,[5] who used the zero-field level-crossing (Hanle) technique. Doerr and Kock[2] performed emission as well as hook measurements to determine relative oscillator strengths. The emission work was done with a hollow cathode discharge and a Fourier transform spectrometer for the data acquisition. The hook measurements were made in a high-temperature furnace. The absolute scale of Ref. 2 is based on lifetime data of Becker *et al.*[6] who employed selective laser excitation. Another source is the work of Lennard *et al.*,[3] who measured branching ratios in emission with a hollow cathode discharge and then normalized these data to beam-foil lifetimes, which they also determined. In addition, we utilized the data of Kostyk,[4] who derived log gf-values from solar spectra.

Our accuracy ratings for the data of Ref. 1 directly reflect the authors' own uncertainty estimates. The authors considered uncertainties in the relative values due primarily to measurement errors in the distance between line and hook, and also took into account the number of measurements taken, plus the uncertainty in the absolute scale as given by Ref. 5. The accuracies of the absolute log gf-values of Ref. 1 vary between 20 and 85 percent, but they are generally in the 25–30% range.

In their paper, Doerr and Kock separate their data into three distinct sets. Their "basic set" is emission A-values (or branching ratios) which they have normalized directly to the lifetimes of Ref. 6. We view these data as being the most reliable presently available and have assigned accuracies of "C+." The second set contains hook measurements for lines originating from lower levels of the basic set. The final set comprises emission lines starting from the same upper level as lines measured by the hook method. Because of the additional normalizations required for the second and third sets of data, they are not as reliable as the first, and we have reduced the accuracies accordingly. Refs. 1 and 2 have 105 lines in common, and for 91 of these, the f-values agree within ± 50 percent. The situation for strong lines (log $gf > -1.0$) is even better — data for 85 percent of these lines agree within ± 25 percent.

The third data source included in this compilation is the experiment by Lennard *et al.*[3] Their beam-foil lifetimes are, on the average, about 20 percent longer than those of Ref. 5. When Refs. 2 and 3 are compared, considerable scatter is present for weak lines, and the f-values of Lennard *et al.* are much lower (by about 50 percent) than those of Doerr and Kock. Because of likely cascade problems in the beam-foil measurements, we have renormalized the data of Ref. 3 to the lifetimes of Ref. 5 whenever possible. Lennard et al. also provided transition probabilities for lines arising from high-lying upper levels not measured by the authors of Refs. 5 or 6. Thus, in these cases, we had to rely on the somewhat less accurate beam-foil lifetimes of Ref. 3 for the absolute scale, and we have lowered the accuracy ratings accordingly.

Another source we utilized is the paper by Kostyk.[4] This author determined log gf-values for 175 lines from the central intensities of solar Fe I lines. We compared Refs. 2 and 4 and found that the f-values for 11 of 15 overlapping lines agree within $\pm$ 52 percent. There are no apparent systematic trends or shifts in scale. However, because of saturation effects in the sun, Kostyk's f-values for stronger lines (log $gf > -1.5$) are probably not as reliable. We have therefore reduced the accuracies for these lines to "D−."

In this compilation, we have given first priority to either Ref. 1 or 2, depending largely on the authors' own error estimates. For lines not covered by either Ref. 1 or 2, we included the normalized (or unnormalized) data of Lennard *et al.* Finally, for the remaining (generally weak) lines, we tabulated the log gf-values of Kostyk.

References

[1] M. C. E. Huber and R. J. Sandeman, Astron. Astrophys. **86**, 95 (1980).

[2] A. Doerr and M. Kock, J. Quant. Spectrosc. Radiat. Transfer **33**, 307 (1985).

[3] W. N. Lennard, W. Whaling, J. M. Scalo, and L. Testerman, Astrophys. J. **197**, 517 (1975).

[4] R. I. Kostyk, Astrometriya Astrofiz. **46**, 58 (1982).

[5] U. Becker, L. H. Gobel, and W. D. Klotz, Astron. Astrophys. **33**, 241 (1974).

[6] U. Becker, H. Kerkhoff, M. Schmidt, and P. Zimmermann, J. Quant. Spectrosc. Radiat. Transfer **25**, 339 (1981).

Ni 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.	$a\,^3F - z\,^5D^{\circ}$ (1)											
		3946.19	1332.2	26666	7	7	2.1(−6)[a]	4.8(−7)	4.4(−5)	−5.47	C−	1
		3749.05	0.0	26666	9	7	2.7(−4)	4.4(−5)	0.0049	−3.40	C−	1
		3832.87	1332.2	27415	7	5	2.0(−4)	3.1(−5)	0.0028	−3.66	C−	1
		3885.87	2216.5	27944	5	3	4.1(−5)	5.5(−6)	3.5(−4)	−4.56	C	1
		4093.62	1332.2	25754	7	9	9.0(−7)	2.9(−7)	2.8(−5)	−5.69	C	1
2.	$a\,^3F - z\,^5G^{\circ}$ (2)											
		3624.73	0.0	27580	9	11	0.0026	6.2(−4)	0.067	−2.25	C	2
		3739.23	1332.2	28068	7	9	0.0024	6.4(−4)	0.055	−2.35	E	1
		3792.34	2216.5	28578	5	7	3.8(−4)	1.2(−4)	0.0072	−3.24	D+	2
		3561.75	0.0	28068	9	9	0.0029	5.6(−4)	0.059	−2.30	C	2
		3669.24	1332.2	28578	7	7	0.0020	4.0(−4)	0.034	−2.55	D+	2
		3498.19	0.0	28578	9	7	1.1(−5)	1.6(−6)	1.7(−4)	−4.84	C−	1
3.	$a\,^3F - z\,^5F^{\circ}$ (3)											
		3502.60	0.0	28542	9	11	0.0015	3.3(−4)	0.034	−2.53	C	2
		3602.28	1332.2	29084	7	9	0.0044	0.0011	0.092	−2.11	C	2
		3620.02	2216.5	29833	5	7	4.3(−5)	1.2(−5)	7.0(−4)	−4.23	D+	2
		3437.28	0.0	29084	9	9	0.044	0.0079	0.80	−1.15	C	1,2
		3507.69	1332.2	29833	7	7	0.0024	4.4(−4)	0.036	−2.51	C	2
		3577.24	2216.5	30163	5	5	1.6(−4)	3.0(−5)	0.0018	−3.82	D+	2
		3351.06	0.0	29833	9	7	2.8(−5)	3.7(−6)	3.7(−4)	−4.48	D+	2
		3467.50	1332.2	30163	7	5	0.012	0.0015	0.12	−1.98	C	1,2
4.	$a\,^3F - z\,^3P^{\circ}$ (4)											
		3670.43	1332.2	28569	7	5	0.0061	8.8(−4)	0.075	−2.21	D+	2
		3664.09	2216.5	29501	5	3	0.020	0.0024	0.15	−1.92	D+	2
		3793.61	2216.5	28569	5	5	0.0018	4.0(−4)	0.025	−2.70	D+	2
5.	$a\,^3F - z\,^3F^{\circ}$ (5)	*3480.0*	*971.8*	*29699*	21	21	0.066	0.012	2.9	−0.60	C	1,2,3*n*
		3391.04	0.0	29481	9	9	0.066	0.011	1.1	−0.99	C	1,2
		3571.86	1332.2	29321	7	7	0.052	0.0099	0.81	−1.16	C+	1
		3519.76	2216.5	30619	5	5	0.041	0.0076	0.44	−1.42	C	1
		3409.58	0.0	29321	9	7	0.0037	5.0(−4)	0.050	−2.35	C	1,2
		3413.48	1332.2	30619	7	5	0.038	0.0047	0.37	−1.48	C	1
		3551.53	1332.2	29481	7	9	0.0016	3.9(−4)	0.032	−2.56	E	3*n*
		3688.41	2216.5	29321	5	7	0.0045	0.0013	0.078	−2.19	D+	2
6.	$a\,^3F - (\ ^{\circ})$[b]											
		3369.56	0.0	29669	9	7	0.18	0.024	2.4	−0.66	C	1,2
		3527.98	1332.2	29669	7	7	0.0042	7.9(−4)	0.064	−2.26	C	2
		3641.64	2216.5	29669	5	7	8.4(−5)	2.3(−5)	0.0014	−3.93	D+	2
7.	$a\,^3F - z\,^3D^{\circ}$ (6)											
		3500.85	1332.2	29889	7	5	0.046	0.0061	0.49	−1.37	C	1,2
		3483.77	2216.5	30913	5	3	0.14	0.016	0.89	−1.11	C	1
		3612.74	2216.5	29889	5	5	0.042	0.0081	0.48	−1.39	C	1

Ni 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
8.	$a\,^3F - z\,^3G^\circ$ (7)	*3310.9*	*971.8*	*31166*	21	27	0.050	0.010	2.4	−0.66	C	1,2
		3232.93	0.0	30923	9	11	0.073	0.014	1.3	−0.90	C	1,2
		3371.99	1332.2	30980	7	9	0.026	0.0057	0.44	−1.40	C	1
		3380.89	2216.5	31786	5	7	0.038	0.0091	0.51	−1.34	C	1
		3226.98	0.0	30980	9	9	0.0023	3.5(−4)	0.034	−2.50	D	1
		3282.69	1332.2	31786	7	7	0.0060	9.7(−4)	0.073	−2.17	C	2
		3145.12	0.0	31786	9	7	2.1(−4)	2.4(−5)	0.0023	−3.66	D+	2
9.	$a\,^3F - z\,^1F^\circ$ (8)											
		3221.65	0.0	31031	9	7	0.016	0.0019	0.18	−1.76	C	1,2
		3366.16	1332.2	31031	7	7	0.040	0.0068	0.53	−1.32	D+	2
		3469.48	2216.5	31031	5	7	0.013	0.0032	0.18	−1.80	C	1
10.	$a\,^3F - z\,^1D^\circ$ (9)											
		3320.26	1332.2	31442	7	5	0.049	0.0058	0.45	−1.39	C	1,2
		3420.73	2216.5	31442	5	5	9.9(−4)	1.7(−4)	0.0098	−3.06	D+	2
11.	$a\,^3F - {}^3F^\circ$	*3104.8*	*971.8*	*33171*	21	21	0.0390	0.00564	1.21	−0.927	C+	2
		3031.87	0.0	32973	9	9	0.017	0.0024	0.21	−1.67	C+	2
		3145.71	1332.2	33112	7	7	0.0080	0.0012	0.086	−2.08	C+	2
		3184.37	2216.5	33611	5	5	0.0071	0.0011	0.056	−2.27	C+	2
		3019.14	0.0	33112	9	7	0.064	0.0069	0.61	−1.21	C+	2
		3097.12	1332.2	33611	7	5	0.033	0.0033	0.24	−1.63	C+	2
		3159.52	1332.2	32973	7	9	3.0(−4)	5.7(−5)	0.0041	−3.40	C+	2
		3235.75	2216.5	33112	5	7	6.4(−4)	1.4(−4)	0.0075	−3.15	C+	2
12.	$a\,^3F - z\,^1P^\circ$ (10)											
		3249.44	2216.5	32982	5	3	0.0041	3.9(−4)	0.021	−2.71	C+	2
13.	$a\,^3F - y\,^3D^\circ$ (12)	*3035.8*	*971.8*	*33903*	21	15	0.0603	0.00596	1.25	−0.903	C	2
		2984.13	0.0	33501	9	7	0.066	0.0069	0.61	−1.21	C+	2
		3045.01	1332.2	34163	7	5	0.028	0.0028	0.20	−1.71	C	2
		3105.46	2216.5	34409	5	3	0.071	0.0062	0.32	−1.51	D+	2
		3107.71	1332.2	33501	7	7	0.0013	1.9(−4)	0.014	−2.87	C+	2
		3129.30	2216.5	34163	5	5	0.0053	7.8(−4)	0.040	−2.41	D+	2
		3195.57	2216.5	33501	5	7	0.0058	0.0012	0.065	−2.21	C+	2
14.	$a\,^3F - z\,^1G^\circ$ (13)											
		3099.11	1332.2	33590	7	9	0.021	0.0038	0.27	−1.57	C+	2
15.	$a\,^3F - y\,^1F^\circ$ (uv 1)											
		2805.08	0.0	35639	9	7	0.0088	8.0(−4)	0.067	−2.14	C	2
		2914.01	1332.2	35639	7	7	0.0058	7.3(−4)	0.049	−2.29	C	2
		2991.11	2216.5	35639	5	7	0.0012	2.3(−4)	0.011	−2.94	D+	2

Ni 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	Accu-racy	Source
16.	$a\,^3F - y\,^1D^\circ$ (uv 2)											
		2834.55	1332.2	36601	7	5	0.0066	5.7(−4)	0.037	−2.40	D+	2
		2907.46	2216.5	36601	5	5	0.020	0.0025	0.12	−1.90	D+	2
17.	$a\,^3F - ^5P^\circ$											
		2476.88	0.0	40361	9	7	0.026	0.0018	0.14	−1.78	C	1
		2553.37	1332.2	40484	7	5	0.0060	4.2(−4)	0.025	−2.53	D−	1
		2561.42	1332.2	40361	7	7	0.0037	3.7(−4)	0.022	−2.59	D−	1
18.	$a\,^3F - ^3F^\circ$											
		2347.51	0.0	42585	9	9	0.22	0.018	1.3	−0.78	D−	1
19.	$a\,^3F - ^3D^\circ$											
		2345.54	0.0	42621	9	7	2.2	0.14	9.9	0.11	C	1
		2419.31	1332.2	42654	7	5	0.20	0.012	0.69	−1.06	E	1
20.	$a\,^3F - ^3G^\circ$											
		2320.03	0.0	43090	9	11	6.9	0.69	47	0.79	C	1
		2325.79	1332.2	44315	7	9	3.5	0.37	20	0.41	C	1
		2312.34	1332.2	44565	7	7	5.5	0.44	24	0.49	C	1
21.	$a\,^3F - ^3F^\circ$											
		2274.66	1332.2	45281	7	7	0.052	0.0040	0.21	−1.55	D−	1
		2313.98	2216.5	45419	5	5	5.0	0.40	15	0.30	E	1
		2267.55	1332.2	45419	7	5	0.080	0.0044	0.23	−1.51	D−	1
		2321.38	2216.5	45281	5	7	5.6	0.63	24	0.50	E	1
22.	$a\,^3F - ^3P^\circ$											
		2346.63	1332.2	43933	7	5	0.55	0.033	1.8	−0.64	D−	1
23.	$a\,^3F - (\,^\circ)^b$											
		2289.98	0.0	43655	9	7	2.1	0.13	8.7	0.06	C	1
24.	$a\,^3F - ^5D^\circ$											
		2261.42	0.0	44206	9	7	0.091	0.0054	0.36	−1.31	C	1
25.	$a\,^3F - (\,^\circ)^b$											
		2254.81	0.0	44336	9	9	0.096	0.0073	0.49	−1.18	C	1
		2324.65	1332.2	44336	7	9	0.18	0.019	1.0	−0.88	D−	1
26.	$a\,^3F - ^3D^\circ$											
		2317.16	1332.2	44475	7	5	3.8	0.22	12	0.18	C	1
		2329.96	2216.5	45122	5	3	5.3	0.26	9.9	0.11	C	1
27.	$a\,^3F - x\,^3P^\circ$ (uv 15)											
		2212.15	1332.2	46523	7	5	0.058	0.0031	0.16	−1.67	D−	1
		2221.94	2216.5	47208	5	3	0.22	0.0096	0.35	−1.32	D	1

Ni 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.	$a\ ^3F - v\ ^3D°$ (uv 16)											
		2125.62	0.0	47030	9	7	0.051	0.0027	0.17	−1.62	C	1
		2182.38	1332.2	47139	7	5	0.13	0.0068	0.34	−1.32	C	1
29.	$a\ ^3F - ^1F°$											
		2053.91	0.0	48672	9	7	0.0075	3.7(−4)	0.022	−2.48	D	1
		2111.73	1332.2	48672	7	7	0.065	0.0043	0.21	−1.52	C	1
		2151.93	2216.5	48672	5	7	0.032	0.0031	0.11	−1.81	C	1
30.	$a\ ^3F - ^3F°$											
		2052.04	0.0	48715	9	9	0.097	0.0061	0.37	−1.26	C	1
		2052.45	1332.2	50039	7	5	0.032	0.0014	0.068	−2.00	C	1
		2109.79	1332.2	48715	7	9	0.015	0.0013	0.063	−2.04	C	1
31.	$a\ ^3F - ^1D°$											
		2089.09	1332.2	49185	7	5	0.097	0.0045	0.22	−1.50	D	1
		2128.41	2216.5	49185	5	5	0.056	0.0038	0.13	−1.72	C	1
32.	$a\ ^3F - ^3D°$											
		2026.62	0.0	49328	9	7	0.24	0.012	0.70	−0.98	C	1
		2025.40	1332.2	50689	7	5	0.23	0.010	0.47	−1.15	D−	1
		2055.50	2216.5	50851	5	3	0.33	0.013	0.43	−1.20	C	1
		2082.87	1332.2	49328	7	7	0.085	0.0056	0.27	−1.41	C	1
		2062.37	2216.5	50689	5	5	0.046	0.0030	0.10	−1.83	E	1
33.	$a\ ^3F - (\ °)^b$											
		1994.29	0.0	50143	9	7	0.057	0.0027	0.16	−1.62	C	1
34.	$a\ ^3F - u\ ^3F°$ (uv 23)											
		1968.90	0.0	50790	9	9	0.045	0.0026	0.15	−1.63	C	1
		2007.69	1332.2	51125	7	7	0.090	0.0054	0.25	−1.42	C	1
35.	$a\ ^3D - z\ ^5D°$ (15)											
		3674.06	204.8	27415	7	5	0.0027	3.8(−4)	0.033	−2.57	D−	1
36.	$a\ ^3D - z\ ^5G°$ (16)											
		3587.93	204.8	28068	7	9	0.0026	6.5(−4)	0.054	−2.34	C	1,2
		3609.31	879.8	28578	5	7	0.0059	0.0016	0.097	−2.09	C	1,2
		3523.44	204.8	28578	7	7	0.0027	5.1(−4)	0.041	−2.45	D+	2
37.	$a\ ^3D - z\ ^5F°$ (17)											
		3461.66	204.8	29084	7	9	0.27	0.062	5.0	−0.36	C+	1
		3452.88	879.8	29833	5	7	0.098	0.025	1.4	−0.91	C+	1
		3513.93	1713.1	30163	3	5	0.011	0.0033	0.11	−2.01	C−	1
		3374.22	204.8	29833	7	7	0.015	0.0025	0.19	−1.76	C	1,2
		3413.94	879.8	30163	5	5	0.022	0.0038	0.21	−1.72	D+	2
		3485.88	1713.1	30392	3	3	0.013	0.0024	0.081	−2.15	C	1,2
		3337.01	204.8	30163	7	5	8.3(−5)	9.9(−6)	7.6(−4)	−4.16	D+	2

Ni 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
38.	$a\ ^3D - z\ ^3P^\circ$ (18)	*3529.0*	*731.5*	*29060*	15	9	1.1	0.13	22	0.28	C+	1,2
		3524.54	204.8	28569	7	5	1.0	0.13	11	−0.03	C	1,2
		3492.96	879.8	29501	5	3	0.98	0.11	6.2	−0.27	C+	1
		3510.33	1713.1	30192	3	1	1.2	0.071	2.5	−0.67	C+	1
		3610.46	879.8	28569	5	5	0.072	0.014	0.84	−1.15	C+	1
		3597.70	1713.1	29501	3	3	0.14	0.027	0.96	−1.09	C	1,2
		3722.49	1713.1	28569	3	5	0.0080	0.0028	0.10	−2.08	D+	2
39.	$a\ ^3D - z\ ^3F^\circ$ (19)	*3451.2*	*731.5*	*29699*	15	21	0.596	0.149	25.4	0.349	C	1,2
		3414.76	204.8	29481	7	9	0.55	0.12	9.8	−0.06	C	1
		3515.05	879.8	29321	5	7	0.42	0.11	6.4	−0.26	C	1,2
		3458.46	1713.1	30619	3	5	0.61	0.18	6.3	−0.26	C+	1
		3433.56	204.8	29321	7	7	0.17	0.031	2.4	−0.67	C+	1
		3361.55	879.8	30619	5	5	0.048	0.0081	0.45	−1.39	C	1,2
		3286.94	204.8	30619	7	5	0.0047	5.4(−4)	0.041	−2.42	C	1,2
40.	$a\ ^3D - (\ ^\circ)^b$											
		3392.98	204.8	29669	7	7	0.24	0.041	3.2	−0.54	C+	1
		3472.55	879.8	29669	5	7	0.12	0.031	1.8	−0.81	C+	1
41.	$a\ ^3D - z\ ^3D^\circ$ (20)											
		3446.26	879.8	29889	5	5	0.44	0.078	4.4	−0.41	C+	1
		3423.71	1713.1	30913	3	3	0.33	0.058	2.0	−0.76	C	1,2
		3367.88	204.8	29889	7	5	0.0019	2.3(−4)	0.018	−2.79	D+	2
		3548.19	1713.1	29889	3	5	0.029	0.0090	0.31	−1.57	D+	2
42.	$a\ ^3D - z\ ^3G^\circ$ (21)											
		3248.46	204.8	30980	7	9	0.0047	9.7(−4)	0.072	−2.17	C	1
		3234.65	879.8	31786	5	7	0.020	0.0045	0.24	−1.65	C	1,2
		3165.51	204.8	31786	7	7	4.3(−4)	6.5(−5)	0.0048	−3.34	D+	2
43.	$a\ ^3D - z\ ^1F^\circ$ (22)											
		3243.05	204.8	31031	7	7	0.048	0.0075	0.56	−1.28	C	1,2
		3315.66	879.8	31031	5	7	0.053	0.012	0.67	−1.21	C+	1
44.	$a\ ^3D - z\ ^1D^\circ$ (23)											
		3200.42	204.8	31442	7	5	0.0028	3.1(−4)	0.023	−2.66	C	2
		3271.11	879.8	31442	5	5	0.0086	0.0014	0.075	−2.16	C	1,2
		3362.80	1713.1	31442	3	5	0.0021	5.9(−4)	0.020	−2.75	D+	2
45.	$a\ ^3D - \ ^3F^\circ$	*3081.8*	*731.5*	*33171*	15	21	0.841	0.168	25.5	0.400	C+	2
		3050.82	204.8	32973	7	9	0.60	0.11	7.6	−0.12	C+	2
		3101.56	879.8	33112	5	7	0.63	0.13	6.4	−0.20	C+	2
		3134.11	1713.1	33611	3	5	0.73	0.18	5.5	−0.27	C+	2
		3037.93	204.8	33112	7	7	0.28	0.039	2.8	−0.56	C+	2
		3054.31	879.8	33611	5	5	0.40	0.056	2.8	−0.55	C+	2
		2992.59	204.8	33611	7	5	0.054	0.0052	0.36	−1.44	C+	2

Ni 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
46.	$a\,^3$D – $z\,^1$P° (24)											
		3114.12	879.8	32982	5	3	0.058	0.0050	0.26	−1.60	C+	2
		3197.11	1713.1	32982	3	3	0.029	0.0044	0.14	−1.88	C+	2
47.	$a\,^3$D – $y\,^3$D° (uv 24)	*3013.8*	*731.5*	*33903*	15	15	0.982	0.134	19.9	0.302	C−	1,2
		3002.48	204.8	33501	7	7	0.80	0.11	7.5	−0.12	C+	2
		3003.62	879.8	34163	5	5	0.69	0.094	4.6	−0.33	D−	1
		3057.64	1713.1	34409	3	3	1.0	0.14	4.3	−0.37	D−	1
		2943.91	204.8	34163	7	5	0.11	0.0099	0.67	−1.16	C	1
		2981.65	879.8	34409	5	3	0.28	0.022	1.1	−0.95	C	2
		3064.62	879.8	33501	5	7	0.11	0.021	1.1	−0.98	C+	2
		3080.75	1713.1	34163	3	5	0.087	0.021	0.63	−1.21	C	1,2
48.	$a\,^3$D – $z\,^1$G° (27)											
		2994.46	204.8	33590	7	9	0.087	0.015	1.0	−0.98	C+	2
49.	$a\,^3$D – $y\,^1$F° (uv 25)											
		2821.29	204.8	35639	7	7	0.049	0.0058	0.38	−1.39	C	1,2
50.	$a\,^3$D – $y\,^1$D° (uv 26)											
		2746.74	204.8	36601	7	5	0.017	0.0013	0.084	−2.03	C	1,2
		2798.65	879.8	36601	5	5	0.058	0.0068	0.31	−1.47	C	1,2
		2865.50	1713.1	36601	3	5	0.018	0.0037	0.11	−1.95	C	2
51.	$a\,^3$D – ^{3}F°											
		2348.73	204.8	42768	7	7	0.22	0.018	0.97	−0.90	E	1
52.	$a\,^3$D – ^{3}G°											
		2266.35	204.8	44315	7	9	0.023	0.0023	0.12	−1.80	D−	1
		2288.40	879.8	44565	5	7	0.081	0.0089	0.34	−1.35	D−	1
		2253.57	204.8	44565	7	7	0.19	0.015	0.76	−0.99	C	1
53.	$a\,^3$D – ^{3}F°											
		2251.48	879.8	45281	5	7	0.040	0.0043	0.16	−1.67	D	1
		2287.32	1713.1	45419	3	5	0.18	0.024	0.55	−1.14	D−	1
		2244.46	879.8	45419	5	5	0.38	0.029	1.1	−0.84	C	1
54.	$a\,^3$D – (°)^b											
		2300.77	204.8	43655	7	7	0.75	0.060	3.2	−0.38	C	1
55.	$a\,^3$D – ^{5}D°											
		2307.35	879.8	44206	5	7	0.16	0.017	0.66	−1.06	C	1
		2271.95	204.8	44206	7	7	0.050	0.0038	0.20	−1.57	C	1

Ni 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	Accu-racy	Source
56.	$a\ ^3D - ^3D°$											
		2293.11	879.8	44475	5	5	0.38	0.030	1.1	−0.82	C	1
		2302.97	1713.1	45122	3	3	0.45	0.036	0.81	−0.97	C	1
		2258.15	204.8	44475	7	5	0.17	0.0094	0.49	−1.18	C	1
		2259.56	879.8	45122	5	3	0.20	0.0091	0.34	−1.34	C	1
57.	$a\ ^3D - x\ ^3P°$ (uv 36)	*2166.2*	*731.5*	*46881*	15	9	1.1	0.046	4.9	−0.16	C−	1
		2158.31	204.8	46523	7	5	0.69	0.034	1.7	−0.62	C	1
		2157.83	879.8	47208	5	3	0.41	0.017	0.60	−1.07	C	1
		2174.48	1713.1	47687	3	1	0.89	0.021	0.45	−1.20	E	1
		2190.22	879.8	46523	5	5	0.30	0.021	0.77	−0.97	C	1
		2197.35	1713.1	47208	3	3	0.78	0.057	1.2	−0.77	C	1
		2230.96	1713.1	46523	3	5	0.052	0.0065	0.14	−1.71	E	1
58.	$a\ ^3D - v\ ^3D°$ (uv 37)											
		2161.04	879.8	47139	5	5	0.13	0.0089	0.32	−1.35	C	1
		2129.96	204.8	47139	7	5	0.042	0.0020	0.099	−1.85	C	1
		2147.80	879.8	47425	5	3	0.47	0.020	0.69	−1.01	C	1
		2166.15	879.8	47030	5	7	0.066	0.0065	0.23	−1.49	C	1
		2220.71	1713.1	47139	3	5	0.082	0.010	0.22	−1.52	C	1
59.	$a\ ^3D - ^5S°$											
		2121.40	204.8	47329	7	5	0.28	0.014	0.67	−1.02	C	1
		2152.23	879.8	47329	5	5	0.032	0.0022	0.078	−1.96	C	1
60.	$a\ ^3D - ^3F°$											
		2033.56	879.8	50039	5	5	0.030	0.0019	0.062	−2.03	D−	1
61.	$a\ ^3D - w\ ^3P°$ (uv 40)											
		2059.92	204.8	48735	7	5	0.21	0.0097	0.46	−1.17	D−	1
		2060.20	879.8	49403	5	3	0.23	0.0087	0.30	−1.36	E	1
		2064.39	1713.1	50139	3	1	0.40	0.0086	0.17	−1.59	D−	1
		2088.98	879.8	48735	5	5	0.042	0.0028	0.095	−1.86	D−	1
62.	$a\ ^3D - ^1P°$											
		2085.37	879.8	48818	5	3	0.077	0.0030	0.10	−1.82	C	1
63.	$a\ ^3D - ^1D°$											
		2047.35	204.8	49033	7	5	0.18	0.0082	0.39	−1.24	C	1
64.	$a\ ^3D - ^1D°$											
		2069.52	879.8	49185	5	5	0.11	0.0071	0.24	−1.45	D−	1
		2105.85	1713.1	49185	3	5	0.030	0.0033	0.069	−2.00	C	1
65.	$a\ ^3D - ^3D°$											
		2007.01	879.8	50689	5	5	0.17	0.010	0.35	−1.28	C	1
		2000.49	879.8	50851	5	3	0.054	0.0020	0.064	−2.01	C	1
		2063.42	879.8	49328	5	7	0.050	0.0045	0.15	−1.65	D−	1
		2041.16	1713.1	50689	3	5	0.032	0.0033	0.067	−2.00	D−	1

Ni 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.	$a\ ^3D - (\ ^\circ)^b$											
		2001.83	204.8	50143	7	7	0.073	0.0044	0.20	−1.51	C	1
		2029.29	879.8	50143	5	7	0.023	0.0020	0.065	−2.01	C	1
67.	$a\ ^3D - x\ ^1P^\circ$ (uv 45)											
		2050.84	1713.1	50458	3	3	0.076	0.0048	0.098	−1.84	E	1
68.	$a\ ^3D - u\ ^3F^\circ$ (uv 47)											
		1976.87	204.8	50790	7	9	1.1	0.080	3.7	−0.25	C	1
		1990.25	879.8	51125	5	7	0.83	0.069	2.3	−0.46	C	1
		2014.25	1713.1	51344	3	5	0.93	0.094	1.9	−0.55	C	1
		1963.85	204.8	51125	7	7	0.11	0.0064	0.29	−1.35	C	1
		1981.61	879.8	51344	5	5	0.13	0.0078	0.25	−1.41	C	1
69.	$a\ ^1D - z\ ^5F^\circ$ (30)											
		3783.53	3409.9	29833	5	7	0.033	0.0098	0.61	−1.31	C	1
		3736.81	3409.9	30163	5	5	0.014	0.0029	0.18	−1.84	E	1
70.	$a\ ^1D - z\ ^3P^\circ$ (31)											
		3973.55	3409.9	28569	5	5	0.0038	8.9(−4)	0.058	−2.35	D+	2
		3831.69	3409.9	29501	5	3	0.015	0.0020	0.13	−2.00	C	1
71.	$a\ ^1D - z\ ^3F^\circ$ (32)											
		3858.30	3409.9	29321	5	7	0.069	0.021	1.4	−0.97	C	1
		3674.15	3409.9	30619	5	5	0.020	0.0041	0.25	−1.69	D+	2
72.	$a\ ^1D - (\ ^\circ)^b$											
		3807.14	3409.9	29669	5	7	0.043	0.013	0.83	−1.18	C	1
73.	$a\ ^1D - z\ ^3D^\circ$ (33)											
		3775.57	3409.9	29889	5	5	0.042	0.0089	0.56	−1.35	C	1
74.	$a\ ^1D - z\ ^3G^\circ$ (34)											
		3523.07	3409.9	31786	5	7	4.4(−4)	1.2(−4)	0.0067	−3.24	D+	2
75.	$a\ ^1D - z\ ^1F^\circ$ (35)	3619.39	3409.9	31031	5	7	0.66	0.18	11.0	−0.04	C	1,2
76.	$a\ ^1D - z\ ^1D^\circ$ (36)	3566.37	3409.9	31442	5	5	0.56	0.11	6.3	−0.27	C	1
77.	$a\ ^1D - {}^3F^\circ$											
		3365.76	3409.9	33112	5	7	0.054	0.013	0.72	−1.19	C+	2
		3310.20	3409.9	33611	5	5	0.0012	2.0(−4)	0.011	−3.01	C+	2

Ni 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
78.	$a\ ^1D - z\ ^1P°$ (37)	3380.57	3409.9	32982	5	3	1.3	0.14	7.5	−0.17	C+	2
79.	$a\ ^1D - y\ ^3D°$ (39)											
		3322.31	3409.9	33501	5	7	0.058	0.014	0.74	−1.17	C+	2
		3250.74	3409.9	34163	5	5	0.022	0.0035	0.19	−1.76	C	2
		3225.02	3409.9	34409	5	3	0.093	0.0087	0.46	−1.36	C	1,2
80.	$a\ ^1D - y\ ^1F°$ (40)	3101.88	3409.9	35639	5	7	0.49	0.098	5.0	−0.31	C	1
81.	$a\ ^1D - y\ ^1D°$ (41)	3012.00	3409.9	36601	5	5	1.3	0.18	9.0	−0.04	C	1,2
82.	$a\ ^1D - ^5P°$											
		2696.48	3409.9	40484	5	5	0.014	0.0015	0.067	−2.12	D−	1
83.	$a\ ^1D - ^3F°$											
		2540.02	3409.9	42768	5	7	0.026	0.0035	0.15	−1.76	D−	1
84.	$a\ ^1D - w\ ^3P°$ (uv 59)											
		2173.54	3409.9	49403	5	3	0.15	0.0065	0.23	−1.49	E	1
85.	$a\ ^1D - ^1P°$	2201.59	3409.9	48818	5	3	0.73	0.032	1.1	−0.80	C	1
86.	$a\ ^1D - ^1D°$	2191.21	3409.9	49033	5	5	0.046	0.0033	0.12	−1.78	E	1
87.	$a\ ^1D - ^1D°$	2183.91	3409.9	49185	5	5	0.12	0.0089	0.32	−1.35	D	1
88.	$a\ ^1D - ^3D°$											
		2114.43	3409.9	50689	5	5	0.097	0.0065	0.23	−1.49	C	1
89.	$a\ ^1D - x\ ^1P°$ (uv 63)	2124.80	3409.9	50458	5	3	0.38	0.016	0.54	−1.11	C	1
90.	$a\ ^1D - u\ ^3F°$ (uv 65)											
		2095.13	3409.9	51125	5	7	0.11	0.010	0.35	−1.30	E	1
		2085.57	3409.9	51344	5	5	2.6	0.17	5.8	−0.07	D−	1
91.	$b\ ^1D - z\ ^5F°$ (42)											
		6128.99	13521	29833	5	7	1.2(−4)	9.4(−5)	0.0094	−3.33	D+	2
		6007.31	13521	30163	5	5	1.7(−4)	9.4(−5)	0.0093	−3.33	D	4
92.	$b\ ^1D - z\ ^3P°$ (43)											
		6643.64	13521	28569	5	5	0.0015	0.0010	0.11	−2.30	D	3*n*
		6256.36	13521	29501	5	3	0.0019	6.6(−4)	0.068	−2.48	D	3*n*

Ni 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
93.	$b\ ^1D - z\ ^3F^\circ$ (44)											
		6327.60	13521	29321	5	7	1.7(−4)	1.4(−4)	0.015	−3.15	E	3*n*
		5847.00	13521	30619	5	5	2.4(−4)	1.2(−4)	0.012	−3.21	D+	2
94.	$b\ ^1D - z\ ^3D^\circ$ (45)											
		6108.12	13521	29889	5	5	0.0013	7.1(−4)	0.071	−2.45	D+	2
		5748.34	13521	30913	5	3	3.7(−4)	1.1(−4)	0.010	−3.26	D	4
95.	$b\ ^1D - z\ ^1F^\circ$ (46)	5709.55	13521	31031	5	7	0.0020	0.0014	0.13	−2.17	D+	2
96.	$b\ ^1D - z\ ^1D^\circ$ (47)	5578.72	13521	31442	5	5	9.8(−4)	4.6(−4)	0.042	−2.64	D+	2
97.	$b\ ^1D - ^3F^\circ$											
		5102.97	13521	33112	5	7	8.8(−4)	4.8(−4)	0.040	−2.62	C+	2
		4976.35	13521	33611	5	5	4.3(−4)	1.6(−4)	0.013	−3.10	C+	2
98.	$b\ ^1D - z\ ^1P^\circ$ (48)	5137.08	13521	32982	5	3	0.0086	0.0020	0.17	−1.99	C+	2
99.	$b\ ^1D - y\ ^3D^\circ$ (50)											
		5003.75	13521	33501	5	7	6.0(−4)	3.2(−4)	0.026	−2.80	C+	2
		4843.17	13521	34163	5	5	2.9(−4)	1.0(−4)	0.0080	−3.30	D+	2
		4786.29	13521	34409	5	3	7.4(−4)	1.5(−4)	0.012	−3.12	D+	2
100.	$b\ ^1D - y\ ^1F^\circ$ (51)	4519.99	13521	35639	5	7	6.1(−4)	2.6(−4)	0.020	−2.88	D+	2
101.	$b\ ^1D - y\ ^1D^\circ$ (52)	4331.65	13521	36601	5	5	0.0056	0.0016	0.11	−2.10	D+	2
102.	$a\ ^1S - z\ ^3P^\circ$ (57)											
		6767.77	14729	29501	1	3	0.0033	0.0068	0.15	−2.17	D	3*n*
103.	$a\ ^1S - z\ ^3D^\circ$ (58)											
		6177.26	14729	30913	1	3	1.8(−4)	3.2(−4)	0.0064	−3.50	D	4
104.	$a\ ^1S - z\ ^1P^\circ$ (59)	5476.91	14729	32982	1	3	0.095	0.13	2.3	−0.89	C+	2
105.	$a\ ^1S - y\ ^3D^\circ$ (60)											
		5079.96	14729	34409	1	3	0.0015	0.0018	0.030	−2.75	D+	2

Ni 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
106.	$a\ ^3P - z\ ^3P^\circ$ (62)	*7481.3*	*15697*	*29060*	9	9	0.0029	0.0024	0.54	−1.66	D−	3*n*,4
		7714.32	15610	28569	5	5	0.0014	0.0013	0.16	−2.20	D	3*n*
		7261.93	15734	29501	3	3	8.4(−4)	6.7(−4)	0.048	−2.70	E	3*n*
		7197.02	15610	29501	5	3	9.0(−4)	4.2(−4)	0.050	−2.68	E	3*n*
		6914.56	15734	30192	3	1	0.0075	0.0018	0.12	−2.27	D	4
		7788.94	15734	28569	3	5	8.4(−4)	0.0013	0.097	−2.42	D	3*n*
		7414.51	16017	29501	1	3	0.0011	0.0027	0.066	−2.57	E	3*n*
107.	$a\ ^3P - z\ ^3F^\circ$ (63)											
		7291.45	15610	29321	5	7	3.0(−4)	3.3(−4)	0.040	−2.78	E	3*n*
108.	$a\ ^3P - (\ ^\circ)^b$											
		7110.91	15610	29669	5	7	2.0(−4)	2.1(−4)	0.025	−2.98	D	4
109.	$a\ ^3P - z\ ^3D^\circ$ (64)											
		7062.97	15734	29889	3	5	8.5(−5)	1.1(−4)	0.0074	−3.50	E	3*n*
		7001.54	15610	29889	5	5	6.0(−5)	4.4(−5)	0.0050	−3.66	E	3*n*
		6586.33	15734	30913	3	3	7.9(−4)	5.2(−4)	0.034	−2.81	D	4
		6532.89	15610	30913	5	3	2.1(−4)	8.1(−5)	0.0088	−3.39	D	4
110.	$a\ ^3P - z\ ^1F^\circ$ (66)											
		6482.80	15610	31031	5	7	5.3(−4)	4.7(−4)	0.050	−2.63	E	3*n*
111.	$a\ ^3P - z\ ^1D^\circ$ (67)											
		6314.66	15610	31442	5	5	0.0057	0.0034	0.35	−1.77	D	3*n*
		6364.60	15734	31442	3	5	3.5(−5)	3.6(−5)	0.0022	−3.97	E	3*n*
112.	$a\ ^3P - \ ^3F^\circ$											
		5711.91	15610	33112	5	7	0.0016	0.0011	0.10	−2.27	C+	2
		5592.28	15734	33611	3	5	0.0011	9.0(−4)	0.050	−2.57	C+	2
		5553.69	15610	33611	5	5	2.5(−4)	1.2(−4)	0.011	−3.23	C+	2
113.	$a\ ^3P - z\ ^1P^\circ$ (68)											
		5754.68	15610	32982	5	3	0.0031	9.4(−4)	0.089	−2.33	C+	2
		5892.88	16017	32982	1	3	0.0029	0.0045	0.087	−2.35	C+	2
114.	$a\ ^3P - y\ ^3D^\circ$ (70)											
		5587.87	15610	33501	5	7	0.0022	0.0014	0.13	−2.14	C+	2
		5424.65	15734	34163	3	5	7.7(−4)	5.7(−4)	0.030	−2.77	D+	2
		5435.87	16017	34409	1	3	0.0019	0.0026	0.046	−2.59	D+	2
		5388.35	15610	34163	5	5	1.3(−4)	5.5(−5)	0.0049	−3.56	D+	2
		5353.42	15734	34409	3	3	0.0012	5.3(−4)	0.028	−2.80	D+	2

Ni 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
115.	$a\,^3P - y\,^1D°$ (71)											
		4762.63	15610	36601	5	5	0.0022	7.6(−4)	0.060	−2.42	D+	2
		4791.00	15734	36601	3	5	2.3(−4)	1.3(−4)	0.0063	−3.40	D+	2
116.	$a\,^1G - y\,^1F°$ (84)	7385.24	22102	35639	9	7	0.0019	0.0012	0.26	−1.97	D	4
117.	$z\,^5D° - e\,^3D$											
		6271.76	26666	42606	7	7	5.8(−4)	3.4(−4)	0.050	−2.62	D	4
118.	$z\,^5D° - e\,^5F$ (86)											
		4401.54	25754	48467	9	11	0.38	0.13	17	0.08	D	3
		4470.48	27415	49778	5	7	0.19	0.080	5.9	−0.40	D−	4
		4462.46	27944	50346	3	5	0.17	0.084	3.7	−0.60	D−	4
119.	$z\,^5D° - e\,^3F$ (88)											
		4410.52	26666	49333	7	9	0.032	0.012	1.2	−1.08	D−	4
120.	$z\,^5D° - f\,^3F$ (89)											
		4200.46	26666	50466	7	9	0.018	0.0062	0.60	−1.36	D−	4
121.	$z\,^5G° - e\,^3D$ (97)											
		7034.42	28578	42790	7	5	0.0026	0.0014	0.23	−2.01	D	4
122.	$z\,^5G° - e\,^5F$ (98)											
		4714.42	27261	48467	13	11	0.46	0.13	26	0.23	D	3
		4648.66	27580	49086	11	9	0.24	0.063	11	−0.16	D−	4
		4604.99	28068	49778	9	7	0.23	0.057	7.8	−0.29	D−	4
		4600.37	29013	50745	5	3	0.26	0.049	3.7	−0.61	D−	4
		4786.54	27580	48467	11	11	0.18	0.061	11	−0.17	D	3
		4756.52	28068	49086	9	9	0.15	0.051	7.2	−0.34	D−	4
		4715.78	28578	49778	7	7	0.20	0.065	7.1	−0.34	D−	4
		4686.22	29013	50346	5	5	0.14	0.046	3.5	−0.64	D−	4
		4900.97	28068	48467	9	11	0.0050	0.0022	0.32	−1.70	E	3
		4814.62	29013	49778	5	7	0.0086	0.0042	0.33	−1.68	D	4
123.	$z\,^5G° - e\,^3G$ (99)											
		4740.17	28068	49159	9	11	0.0034	0.0014	0.20	−1.90	E	3
		4633.03	27580	49159	11	11	7.8(−4)	2.5(−4)	0.042	−2.56	E	3
124.	$z\,^5G° - f\,^3D$ (100)											
		4606.23	29013	50717	5	3	0.10	0.020	1.5	−1.00	D−	4

Ni 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
125.	$z\,^5G^\circ - e\,^3F$ (101)											
		4701.34	28068	49333	9	9	0.020	0.0067	0.93	−1.22	D−	4
126.	$z\,^5G^\circ - f\,^3F$ (102)											
		4567.42	28578	50466	7	9	0.0014	5.6(−4)	0.058	−2.41	D	4
127.	$z\,^5F^\circ - e\,^3D$ (109)											
		7286.56	30392	44112	3	3	0.0025	0.0020	0.14	−2.22	D	4
128.	$z\,^5F^\circ - e\,^5F$ (111)											
		5017.58	28542	48467	11	11	0.20	0.076	14	−0.08	D	3
		4998.23	29084	49086	9	9	0.049	0.018	2.7	−0.78	D−	4
		5012.46	29833	49778	7	7	0.11	0.041	4.8	−0.54	D−	4
		4953.20	30163	50346	5	5	0.12	0.043	3.5	−0.67	D−	4
		4912.03	30392	50745	3	3	0.15	0.053	2.6	−0.80	D−	4
		4831.18	29084	49778	9	7	0.16	0.042	6.0	−0.42	D−	4
		5157.99	29084	48467	9	11	0.0059	0.0029	0.44	−1.59	E	3
129.	$z\,^5F^\circ - e\,^3G$ (112)											
		4976.16	29084	49175	9	9	0.013	0.0050	0.73	−1.35	D−	4
		4980.17	29084	49159	9	11	0.19	0.086	13	−0.11	D	3
130.	$z\,^5F^\circ - e\,^3P$											
		5262.83	30163	49159	5	5	5.7(−4)	2.3(−4)	0.020	−2.93	E	3
131.	$z\,^5F^\circ - e\,^3F$ (114)											
		4937.34	29084	49333	9	9	0.12	0.045	6.6	−0.39	D−	4
		5220.31	30163	49314	5	7	0.017	0.0098	0.84	−1.31	D−	4
132.	$z\,^5F^\circ - f\,^3F$ (115)											
		4675.64	29084	50466	9	9	0.0062	0.0020	0.28	−1.74	D	4
		4845.17	29833	50466	7	9	0.0016	7.2(−4)	0.080	−2.30	D	4
133.	$z\,^3P^\circ - e\,^3D$ (126)											
		7122.24	28569	42606	5	7	0.21	0.22	26	0.04	D−	4
		7030.06	28569	42790	5	5	0.0050	0.0037	0.43	−1.73	D	4
		6842.07	29501	44112	3	3	0.016	0.011	0.75	−1.48	D−	4
134.	$z\,^3P^\circ - e\,^1D$ (127)											
		6370.38	28569	44263	5	5	0.0038	0.0023	0.24	−1.94	D	4
		6772.36	29501	44263	3	5	0.030	0.035	2.3	−0.98	D−	4

Ni 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
135.	$z\,^3P^\circ - e\,^3S$ (129)											
		4904.41	28569	48953	5	3	0.62	0.14	11	−0.17	D−	4
136.	$z\,^3P^\circ - e\,^3P$ (130)											
		4855.41	28569	49159	5	5	0.57	0.20	16	0.00	D	3
		5082.35	29501	49171	3	3	0.25	0.096	4.8	−0.54	D−	4
		4852.56	28569	49171	5	3	0.080	0.017	1.4	−1.07	D−	4
		4812.00	29501	50276	3	1	0.095	0.011	0.52	−1.48	D−	4
		5085.49	29501	49159	3	5	0.017	0.011	0.55	−1.48	E	3
137.	$z\,^3P^\circ - f\,^3D$ (131)											
		4829.03	28569	49272	5	7	0.19	0.094	7.4	−0.33	D−	4
		5042.20	29501	49328	3	5	0.14	0.088	4.4	−0.58	D−	4
		4815.92	28569	49328	5	5	0.0093	0.0032	0.26	−1.79	D	4
138.	$z\,^3P^\circ - e\,^1P$ (132)											
		4752.43	29501	50537	3	3	0.20	0.067	3.1	−0.70	D−	4
		4913.97	30192	50537	1	3	0.22	0.23	3.8	−0.63	D−	4
139.	$z\,^3P^\circ - e\,^1S$ (135)											
		4553.18	29501	51457	3	1	0.070	0.0073	0.33	−1.66	D	4
140.	$z\,^3F^\circ - e\,^3D$ (139)											
		7422.30	29321	42790	7	5	0.18	0.10	18	−0.14	D−	4
141.	$z\,^3F^\circ - e\,^1D$ (140)											
		7327.67	30619	44263	5	5	0.0042	0.0034	0.41	−1.77	D	4
142.	$z\,^3F^\circ - e\,^5F$ (141)											
		5265.71	29481	48467	9	11	0.0037	0.0019	0.29	−1.77	E	3
		4925.58	29481	49778	9	7	0.059	0.017	2.5	−0.82	D−	4
		4967.55	30619	50745	5	3	0.024	0.0054	0.44	−1.57	D	4
143.	$z\,^3F^\circ - e\,^3S$											
		5452.85	30619	48953	5	3	0.016	0.0044	0.39	−1.66	D	4
144.	$z\,^3F^\circ - e\,^3G$ (143)											
		5080.53	29481	49159	9	11	0.32	0.15	23	0.13	D	3
		5035.37	29321	49175	7	9	0.57	0.28	32	0.29	D−	4
145.	$z\,^3F^\circ - e\,^3P$ (142)											
		5039.37	29321	49159	7	5	0.037	0.010	1.2	−1.15	E	3

Ni 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
146.	$z\,^3F^\circ - f\,^3D$ (144)											
		4996.85	29321	49328	7	5	0.056	0.015	1.7	−0.98	D−	4
		5010.96	29321	49272	7	7	0.051	0.019	2.2	−0.87	D−	4
147.	$z\,^3F^\circ - e\,^3F$ (145)											
		5000.34	29321	49314	7	7	0.14	0.053	6.1	−0.43	D−	4
		4945.46	30619	50834	5	5	0.083	0.030	2.5	−0.82	D−	4
		4995.65	29321	49333	7	9	0.0078	0.0038	0.43	−1.58	D	4
		5347.71	30619	49314	5	7	0.0030	0.0018	0.16	−2.04	D	4
148.	$z\,^3F^\circ - f\,^3F$ (146)											
		4666.99	30619	52041	5	5	0.063	0.020	1.6	−0.99	D−	4
149.	$z\,^3F^\circ - e\,^1F$ (148)											
		4946.04	30619	50832	5	7	0.020	0.010	0.84	−1.29	D−	4
150.	$z\,^3F^\circ - g\,^3F$ (150)											
		4009.98	29321	54251	7	7	0.0086	0.0021	0.19	−1.84	E	3
		4035.96	29481	54251	9	7	0.0048	9.0(−4)	0.11	−2.09	E	3
151.	$(^\circ)^b - e\,^3D$											
		7727.66	29669	42606	7	7	0.11	0.097	17	−0.17	D−	4
152.	$(^\circ)^b - e\,^1D$											
		6850.48	29669	44263	7	5	0.0023	0.0011	0.18	−2.10	D	4
153.	$(^\circ)^b - e\,^3P$											
		5129.37	29669	49159	7	5	0.12	0.033	4.0	−0.63	D	3
154.	$(^\circ)^b - f\,^3D$											
		5099.95	29669	49272	7	7	0.29	0.11	13	−0.10	D−	4
155.	$(^\circ)^b - e\,^3F$											
		5084.08	29669	49333	7	9	0.31	0.15	18	0.03	D−	4
		5088.96	29669	49314	7	7	0.017	0.0065	0.77	−1.34	D−	4
156.	$(^\circ)^b - f\,^3F$											
		4807.00	29669	50466	7	9	0.073	0.033	3.6	−0.64	D−	4
157.	$(^\circ)^b - g\,^3D$											
		4437.57	29669	52197	7	7	0.028	0.0082	0.84	−1.24	D−	4
158.	$z\,^3D^\circ - e\,^1D$ (157)											
		7488.73	30913	44263	3	5	0.0012	0.0017	0.13	−2.29	D	4

Ni 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
159.	$z\,^3D^\circ - e\,^5F$ (158)											
		4793.47	29889	50745	5	3	0.0062	0.0013	0.10	−2.19	D	4
160.	$z\,^3D^\circ - e\,^3G$ (160)											
		4808.86	29889	50678	5	7	0.016	0.0078	0.62	−1.41	D−	4
161.	$z\,^3D^\circ - e\,^3P$ (159)											
		5187.82	29889	49159	5	5	0.0061	0.0025	0.21	−1.91	E	3
		5475.57	30913	49171	3	3	0.0059	0.0026	0.14	−2.10	D	4
162.	$z\,^3D^\circ - f\,^3F$ (163)											
		4731.81	30913	52041	3	5	0.084	0.047	2.2	−0.85	D−	4
		4513.00	29889	52041	5	5	0.022	0.0068	0.50	−1.47	D−	4
163.	$z\,^3D^\circ - e\,^1P$ (164)											
		5094.42	30913	50537	3	3	0.071	0.028	1.4	−1.08	D−	4
164.	$z\,^3D^\circ - e\,^1F$ (167)											
		4773.41	29889	50832	5	7	0.012	0.0059	0.46	−1.53	D	4
165.	$z\,^3G^\circ - e\,^5F$ (175)											
		5504.12	30923	49086	11	9	0.0044	0.0016	0.32	−1.75	D	4
166.	$z\,^3G^\circ - e\,^3G$ (176)											
		5499.41	30980	49159	9	11	6.2(−4)	3.4(−4)	0.056	−2.51	E	3
		5749.28	31786	49175	7	9	0.0023	0.0015	0.19	−1.99	D	4
167.	$z\,^3G^\circ - f\,^3F$ (177)											
		5115.40	30923	50466	11	9	0.22	0.071	13	−0.11	D−	4
		4918.36	30980	51306	9	7	0.23	0.064	9.3	−0.24	D−	4
		4935.83	31786	52041	7	5	0.24	0.064	7.3	−0.35	D−	4
168.	$z\,^3G^\circ - g\,^3F$ (178)											
		4295.88	30980	54251	9	7	0.17	0.037	4.7	−0.48	D	3
		4450.13	31786	54251	7	7	0.0082	0.0024	0.25	−1.77	E	3
169.	$z\,^1F^\circ - e\,^5F$ (188)											
		5537.11	31031	49086	7	9	0.0015	9.0(−4)	0.12	−2.20	D	4

Ni 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
170.	$z\,^1F^{\circ} - e\,^3P$ (189)											
		5514.80	31031	49159	7	5	0.0045	0.0015	0.19	−1.99	E	3
171.	$z\,^1F^{\circ} - e\,^3F$ (192)											
		5462.49	31031	49333	7	9	0.029	0.017	2.1	−0.93	D−	4
		5468.10	31031	49314	7	7	0.0078	0.0035	0.44	−1.61	D	4
172.	$z\,^1F^{\circ} - f\,^3F$ (193)											
		4758.42	31031	52041	7	5	0.0046	0.0011	0.12	−2.11	D	4
173.	$z\,^1F^{\circ} - e\,^1G$ (194)	5081.11	31031	50706	7	9	0.57	0.29	33	0.30	D−	4
174.	$z\,^1F^{\circ} - e\,^1F$ (195)	5048.85	31031	50832	7	7	0.16	0.060	6.9	−0.38	D−	4
175.	$z\,^1D^{\circ} - e\,^5F$ (202)											
		5179.14	31442	50745	5	3	0.028	0.0068	0.58	−1.47	D−	4
176.	$z\,^1D^{\circ} - e\,^3G$ (204)											
		5197.17	31442	50678	5	7	0.023	0.013	1.1	−1.19	D−	4
177.	$z\,^1D^{\circ} - e\,^3P$ (203)											
		5642.66	31442	49159	5	5	0.0040	0.0019	0.18	−2.02	E	3
		5638.82	31442	49171	5	3	0.013	0.0038	0.35	−1.72	D	4
178.	$z\,^1D^{\circ} - f\,^3D$ (205)											
		5589.38	31442	49328	5	5	0.031	0.014	1.3	−1.14	D−	4
179.	$z\,^1D^{\circ} - e\,^3F$ (206)											
		5593.74	31442	49314	5	7	0.044	0.029	2.7	−0.84	D−	4
		5155.14	31442	50834	5	5	0.11	0.045	3.8	−0.65	D−	4
180.	$z\,^1D^{\circ} - f\,^3F$ (207)											
		5032.75	31442	51306	5	7	0.020	0.011	0.89	−1.27	D−	4
181.	$z\,^1D^{\circ} - f\,^1D$ (209)	5176.57	31442	50754	5	5	0.18	0.073	6.2	−0.44	D−	4
182.	$z\,^1D^{\circ} - e\,^1F$ (210)	5155.76	31442	50832	5	7	0.29	0.16	14	−0.09	D-	4
183.	$z\,^1D^{\circ} - g\,^3F$											
		4382.87	31442	54251	5	7	0.015	0.0060	0.44	−1.52	E	3

Ni 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
184.	$z\ ^1D° - g\ ^1F$	4027.67	31442	56263	5	7	0.13	0.046	3.0	−0.64	D−	4
185.	$^3F° - e\ ^5F$											
		6204.64	32973	49086	9	9	0.014	0.0082	1.5	−1.13	D−	4
186.	$^3F° - e\ ^3G$											
		6176.81	32973	49159	9	11	0.047	0.033	6.0	−0.53	D	3
		6223.99	33112	49175	7	9	0.020	0.015	2.1	−0.99	D−	4
187.	$^3F° - e\ ^3P$											
		6230.09	33112	49159	7	5	0.019	0.0079	1.1	−1.26	E	3
188.	$^3F° - f\ ^3D$											
		6133.95	32973	49272	9	7	0.0037	0.0016	0.30	−1.83	D	4
		6186.74	33112	49272	7	7	0.027	0.016	2.2	−0.96	D−	4
189.	$^3F° - e\ ^3F$											
		6111.06	32973	49333	9	9	0.027	0.015	2.7	−0.87	D−	4
190.	$^3F° - f\ ^3F$											
		5494.89	33112	51306	7	7	0.022	0.0099	1.3	−1.16	D−	4
		5453.26	32973	51306	9	7	0.010	0.0036	0.58	−1.49	D−	4
		5760.85	33112	50466	7	9	0.035	0.023	3.0	−0.80	D−	4
191.	$^3F° - e\ ^1G$											
		5682.20	33112	50706	7	9	0.078	0.048	6.3	−0.47	D−	4
192.	$^3F° - e\ ^1F$											
		5641.88	33112	50832	7	7	0.025	0.012	1.6	−1.07	D−	4
		5805.23	33611	50832	5	7	0.065	0.046	4.4	−0.64	D−	4
193.	$^3F° - g\ ^3F$											
		4701.54	32973	54237	9	9	0.14	0.045	6.3	−0.39	D−	4
		4729.28	33112	54251	7	7	0.027	0.0090	0.98	−1.20	E	3
		4698.39	32973	54251	9	7	0.062	0.016	2.2	−0.84	D	3
		4732.47	33112	54237	7	9	0.093	0.040	4.4	−0.55	D−	4
		4843.51	33611	54251	5	7	0.044	0.021	1.7	−0.97	D	3
194.	$^3F° - f\ ^3G$											
		4431.03	33611	56173	5	7	0.041	0.017	1.2	−1.07	D−	4
195.	$^3F° - f\ ^1F$											
		4551.24	33611	55577	5	7	0.061	0.026	2.0	−0.88	D−	4
196.	$z\ ^1P° - e\ ^3P$ (217)											
		6175.42	32982	49171	3	3	0.17	0.098	6.0	−0.53	D−	4

Ni 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
197.	$z\,^1P^\circ - f\,^3D$ (218)											
		5637.12	32982	50717	3	3	0.11	0.050	2.8	−0.82	D−	4
198.	$z\,^1P^\circ - e\,^1P$ (220)	5695.00	32982	50537	3	3	0.17	0.082	4.6	−0.61	D−	4
199.	$z\,^1P^\circ - f\,^1D$ (221)	5625.33	32982	50754	3	5	0.084	0.067	3.7	−0.70	D−	4
200.	$y\,^3D^\circ - e\,^5F$ (244)											
		6414.60	33501	49086	7	9	0.011	0.0086	1.3	−1.22	D−	4
		6272.65	34409	50346	3	5	0.0059	0.0058	0.36	−1.76	D	4
		6119.78	34409	50745	3	3	0.027	0.015	0.90	−1.35	D−	4
201.	$y\,^3D^\circ - e\,^3G$ (247)											
		6378.26	33501	49175	7	9	0.023	0.018	2.7	−0.89	D−	4
		6053.68	34163	50678	5	7	0.022	0.017	1.7	−1.07	D−	4
202.	$y\,^3D^\circ - e\,^3P$ (246)											
		6384.67	33501	49159	7	5	0.024	0.011	1.6	−1.13	E	3
		6661.39	34163	49171	5	3	0.013	0.0054	0.59	−1.57	D	4
203.	$y\,^3D^\circ - f\,^3D$ (248)											
		6130.17	34409	50717	3	3	0.065	0.037	2.2	−0.96	D−	4
		6316.61	33501	49328	7	5	0.0042	0.0018	0.26	−1.90	D	4
		6039.31	34163	50717	5	3	0.0057	0.0019	0.19	−2.03	D	4
204.	$y\,^3D^\circ - e\,^3F$ (249)											
		6598.59	34163	49314	5	7	0.023	0.021	2.3	−0.98	D−	4
		6086.29	34409	50834	3	5	0.11	0.098	5.9	−0.53	D−	4
		6322.17	33501	49314	7	7	0.016	0.0097	1.4	−1.17	D−	4
		5996.74	34163	50834	5	5	0.032	0.017	1.7	−1.06	D−	4
205.	$y\,^3D^\circ - f\,^3F$ (250)											
		5392.37	33501	52041	7	5	0.022	0.0068	0.85	−1.32	D−	4
206.	$y\,^3D^\circ - e\,^1P$											
		6105.78	34163	50537	5	3	0.0058	0.0020	0.20	−2.01	D	4
		6198.65	34409	50537	3	3	0.0046	0.0026	0.16	−2.10	D	4
207.	$y\,^3D^\circ - f\,^1D$ (251)											
		6025.73	34163	50754	5	5	0.0064	0.0035	0.34	−1.76	D	4

Ni 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	Accu-racy	Source
208.	$y\ ^3D^\circ - g\ ^3F$ (254)											
		4821.14	33501	54237	7	9	0.045	0.020	2.2	−0.85	D−	4
		4976.71	34163	54251	5	7	0.016	0.0083	0.68	−1.38	E	3
		4817.82	33501	54251	7	7	0.070	0.024	2.7	−0.77	D	3
209.	$z\ ^1G^\circ - e\ ^3G$ (258)											
		6421.52	33590	49159	9	11	0.0074	0.0056	1.1	−1.30	E	3
210.	$z\ ^1G^\circ - f\ ^3D$											
		6375.22	33590	49272	9	7	0.0020	9.7(−4)	0.18	−2.06	D	4
211.	$z\ ^1G^\circ - f\ ^3F$ (259)											
		5643.10	33590	51306	9	7	0.017	0.0064	1.1	−1.24	D−	4
212.	$z\ ^1G^\circ - g\ ^3F$ (260)											
		4838.64	33590	54251	9	7	0.22	0.060	8.6	−0.27	D	3
213.	$y\ ^1F^\circ - e\ ^1G$ (264)	6635.15	35639	50706	7	9	0.025	0.022	3.3	−0.82	D−	4
214.	$y\ ^1F^\circ - g\ ^3F$											
		5371.33	35639	54251	7	7	0.16	0.070	8.7	−0.31	D	3
215.	$y\ ^1D^\circ - g\ ^3F$ (272)											
		5664.02	36601	54251	5	7	0.11	0.074	6.9	−0.43	D	3
216.	$^3F^\circ - i\ ^3D$											
		6973.52	42768	57104	7	7	0.025	0.018	3.0	−0.89	D−	4
217.	$^3G^\circ - e\ ^3H$											
		7481.49	44315	57678	9	11	0.070	0.072	16	−0.19	D−	4
218.	$^3F^\circ - i\ ^3F$											
		7401.13	43259	56767	9	9	0.089	0.073	16	−0.18	D−	4
219.	$^3F^\circ - g\ ^3G$											
		7381.94	43259	56802	9	11	0.097	0.097	21	−0.06	D−	4
220.	$^3F^\circ - i\ ^3D$											
		7220.79	43259	57104	9	7	0.058	0.035	7.5	−0.50	D−	4

[a] The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.
[b] The *LS*-coupling designation of this term was not provided in the NBS energy level compilation (J. Sugar and C. Corliss, J. Phys. Chem. Ref. Data **14**, Suppl. 2 (1985)), so we have accordingly omitted it from this work.

Ni I

Forbidden Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
1977.2	13	6437.70	11	7464.39	4	31191	8
2030.2	6	6489.61	11	7507.44	9	39513	8
2080.6	18	6604.30	11	7908.30	9	45182	20
2635.2	22	6730.25	11	7929.70	16	47868	20
2788.8	24	6787.00	11	7989.9	3	58917	8
2798.5	24	6941.63	4	8111.97	16	75046	1
4523.16	5	7002.02	4	8194.57	16	82794	19
4565.4	12	7130.24	11	8201.77	2	113040	1
4710.7	12	7193.97	11	8466.38	9	119980	7
4813.27	5	7218.7	10	8832.31	15	148100	7
5027.34	5	7243.99	4	8843.42	2	352890	23
5348.3	17	7393.71	2	9887.18	14	805210	23
6404.46	4	7395.79	4	11650	21		

For this spectrum, we have utilized the work by Garstang,[1] who calculated M1 and E2 transition probabilities for lines arising from the three lowest configurations: $3d^8 4s^2$, $3d^9 4s$, and $3d^{10}$. Garstang included limited configuration interaction in his calculations. As is usually the case, the data for electric quadrupole transitions are expected to be less accurate than those for magnetic dipole transitions.

Reference

[1]R. H. Garstang, J. Res. Nat. Bur. Stand., Sect. A **68**, 61 (1964).

Ni I: Forbidden transitions

No.	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$a\,^3F - a\,^3F$										
		[75046]	0.0	1332.2	9	7	M1	0.062	6.8	C+	1
		[113040]	1332.2	2216.5	7	5	M1	0.025	6.7	C+	1
2.	$a\,^3F - b\,^1D$ (1F)										
		7393.71	0.0	13521	9	5	E2	0.0056	0.37	E	1
		8201.77	1332.2	13521	7	5	M1	0.39	0.040	D	1
		"	"	"	7	5	E2	7.6(−4)[a]	0.084	E	1
		8843.42	2216.5	13521	5	5	M1	0.17	0.022	D	1
		"	"	"	5	5	E2	2.0(−4)	0.032	E	1
3.	$a\,^3F - a\,^1S$										
		[7989.9]	2216.5	14729	5	1	E2	1.8(−4)	0.0035	E	1

Ni I: Forbidden transitions — Continued

No.	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
4.	$a\ ^3F - a\ ^3P$ (2F)										
		6404.46	0.0	15610	9	5	E2	0.032	1.0	E	1
		6941.63	1332.2	15734	7	3	E2	0.025	0.72	E	1
		7243.99	2216.5	16017	5	1	E2	0.031	0.37	E	1
		7002.02	1332.2	15610	7	5	M1	0.15	0.0095	D	1
		〃	〃	〃	7	5	E2	0.0056	0.28	E	1
		7395.79	2216.5	15734	5	3	M1	0.0022	9.9(−5)	D	1
		〃	〃	〃	5	3	E2	0.0090	0.36	E	1
		7464.39	2216.5	15610	5	5	M1	0.039	0.0030	D	1
		〃	〃	〃	5	5	E2	4.0(−4)	0.028	E	1
5.	$a\ ^3F - a\ ^1G$ (3F)										
		4523.16	0.0	22102	9	9	M1	0.32	0.0099	D	1
		〃	〃	〃	9	9	E2	2.2(−4)	0.0022	E	1
		4813.27	1332.2	22102	7	9	M1	0.16	0.0060	D	1
		〃	〃	〃	7	9	E2	3.8(−6)	5.3(−5)	E	1
		5027.34	2216.5	22102	5	9	E2	3.0(−4)	0.0052	E	1
6.	$a\ ^3F - e\ ^1S$										
		[2030.2]	2216.5	51457	5	1	E2	0.17	0.0034	E	1*n*
7.	$a\ ^3D - a\ ^3D$										
		[148100]	204.8	879.8	7	5	M1	0.0070	4.2	C+	1
		[119980]	879.8	1713.1	5	3	M1	0.021	4.0	C+	1
8.	$a\ ^3D - a\ ^1D$										
		[31191]	204.8	3409.9	7	5	M1	0.078	0.44	D	1
		[39513]	879.8	3409.9	5	5	M1	0.0062	0.071	D	1
		[58917]	1713.1	3409.9	3	5	M1	0.011	0.42	D	1
9.	$a\ ^3D - b\ ^1D$ (4F)										
		7507.44	204.8	13521	7	5	E2	0.014	0.99	E	1
		7908.30	879.8	13521	5	5	E2	0.017	1.6	E	1
		8466.38	1713.1	13521	3	5	E2	4.5(−4)	0.058	E	1
10.	$a\ ^3D - a\ ^1S$										
		[7218.7]	879.8	14729	5	1	E2	0.068	0.79	E	1
11.	$a\ ^3D - a\ ^3P$ (5F)										
		6437.70	204.8	15734	7	3	E2	0.092	1.8	E	1
		6604.30	879.8	16017	5	1	E2	0.19	1.4	E	1
		6489.61	204.8	15610	7	5	E2	0.074	2.5	E	1
		6730.25	879.8	15734	5	3	E2	0.012	0.30	E	1
		6787.00	879.8	15610	5	5	E2	0.018	0.77	E	1
		7130.24	1713.1	15734	3	3	E2	0.053	1.7	E	1
		7193.97	1713.1	15610	3	5	E2	0.0093	0.53	E	1
12.	$a\ ^3D - a\ ^1G$										
		[4710.7]	879.8	22102	5	9	E2	0.080	0.99	E	1
		[4565.4]	204.8	22102	7	9	E2	7.9(−4)	0.0084	E	1

Ni I: Forbidden transitions — Continued

No.	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
13.	$a\,^3D - e\,^1S$										
		[1977.2]	879.8	51457	5	1	E2	8.3	0.15	E	1*n*
14.	$a\,^1D - b\,^1D$ (6F)	9887.18	3409.9	13521	5	5	E2	0.012	3.4	E	1
15.	$a\,^1D - a\,^1S$ (7F)	8832.31	3409.9	14729	5	1	E2	0.31	9.9	E	1
16.	$a\,^1D - a\,^3P$ (8F)										
		8194.57	3409.9	15610	5	5	E2	0.024	2.6	E	1
		8111.97	3409.9	15734	5	3	E2	4.7(−4)	0.029	E	1
		7929.70	3409.9	16017	5	1	E2	1.1(−5)	2.1(−4)	E	1
17.	$a\,^1D - a\,^1G$	[5348.3]	3409.9	22102	5	9	E2	0.44	10	E	1
18.	$a\,^1D - e\,^1S$	[2080.6]	3409.9	51457	5	1	E2	82	1.9	E	1*n*
19.	$b\,^1D - a\,^1S$	[82794]	13521	14729	5	1	E2	2.9(−4)	670	E	1
20.	$b\,^1D - a\,^3P$										
		[47868]	13521	15610	5	5	M1	0.072	1.5	D	1
		[45182]	13521	15734	5	3	M1	0.063	0.65	D	1
21.	$b\,^1D - a\,^1G$	[11650]	13521	22102	5	9	E2	4.1(−4)	0.47	E	1
22.	$b\,^1D - e\,^1S$	[2635.2]	13521	51457	5	1	E2	9.4	0.71	E	1*n*
23.	$a\,^3P - a\,^3P$										
		[805210]	15610	15734	5	3	M1	3.2(−5)	1.9	C+	1
		[352890]	15734	16017	3	1	M1	0.0012	2.0	C+	1
24.	$a\,^3P - e\,^1S$										
		[2788.8]	15610	51457	5	1	E2	2.9	0.29	E	1*n*
		[2798.5]	15734	51457	3	1	M1	5.3	0.0043	D	1*n*

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni II

Co Isoelectronic Sequence

Ground State: $1s^22s^22p^63s^23d^9\ ^2D_{5/2}$

Ionization Energy: 18.16898 eV = 146 541.56 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
1751.92	1	2174.67	5	2264.46	3	2375.42	12
2034.05	6	2175.15	4	2270.21	3	2387.76	10
2053.30	6	2184.61	4	2278.77	13	2394.52	11
2080.85	7	2188.05	3	2287.09	13	2410.74	9
2090.10	6	2201.41	4	2296.55	12	2412.27	2
2093.56	6	2206.72	4	2297.14	2	2413.04	10
2125.12	5	2210.38	4	2297.49	2	2416.13	11
2125.91	4	2216.48	3	2298.27	12	2433.56	10
2128.58	6	2220.40	14	2303.00	2	2437.89	10
2138.58	4	2222.96	3	2316.04	2	2510.87	9
2158.74	4	2224.36	12	2326.45	2	2545.90	9
2161.22	5	2224.86	3	2334.58	11	2630.27	8
2165.55	4	2226.33	3	2356.40	13		
2169.10	4	2253.85	3	2367.39	2		

For this spectrum, we have chosen the f-value data of Bell *et al.*,[1] as normalized by Lawler and Salih.[2] Bell *et al.* determined relative oscillator strengths in emission with a wall-stabilized arc operated in argon and small admixtures of nickel carbonyl. All observations were performed photoelectrically, and digital data processing techniques were employed. Since the measured lines are located in the near ultraviolet, the intensity calibrations presented a special problem, which was solved by utilizing the continuous emission of a hydrogen arc operated at well-diagnosed plasma conditions. Lawler and Salih measured radiative lifetimes of twelve levels of Ni II by the laser-induced fluorescence technique. They then used these lifetimes to convert the data of Ref. 1 to an absolute scale.

The f-values tabulated here are consistently 60 percent lower than those published in our earlier NBS compilation,[4] which utilized the data of Bell *et al.* on an absolute basis. The most probable reason for this difference lies in the method with which Bell *et al.* determined their absolute scale. In the absence of reliable lifetime data, they utilized local thermodynamic equilibrium (LTE) relations to tie their Ni II f-value scale to that of Ni I, which they had determined on an absolute scale. Recent LTE studies in stabilized arcs showed however that at the electron densities of their experiment, LTE conditions are not yet achieved, so that this normalization procedure is not applicable. Therefore, in this compilation, we have tabulated the data and accuracy estimates of Lawler and Salih, whenever available. For lines not covered by Ref. 2, we normalized the data of Ref. 1 (which should be quite reliable on a *relative* scale). This normalization consisted of subtracting 0.21 from the original log gf-values of Ref. 1.

For two lines, we did not use Ref. 1 as the original data source. For the 2326.45 Å line, Lawler and Salih found that the branching ratio of Ref. 1 was inconsistent with other measured and calculated data. We therefore used Lawler and Salih's recommended transition probability for this line. The log gf-value for the 1751.92 Å line was determined from the semi-empirical scaled Thomas-Fermi-Dirac calculations of Kurucz and Peytremann.[3] For this line, the branching ratio of Ref. 3 was adjusted to the lifetime of the $3d^8(^3F)4p\ ^2F^{\circ}_{7/2}$ level, as measured by Lawler and Salih.

References

[1] G. D. Bell, D. R. Paquette, and W. L. Wiese, Astrophys. J. **143**, 559 (1966).

[2] J. E. Lawler and S. Salih, Phys. Rev. A **35**, 5046 (1987).

[3] R. L. Kurucz and E. Peytremann, Smithsonian Astrophysical Observatory Special Report 362 (1975).

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

Ni II: 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.	$3d^9$– $3d^8(^3F)4p$	^2D - $^2F°$											
			1751.92	0	57081	6	8	0.48	0.029	1.0	−0.75	C	3*n*
2.	$3d^8(^3F)4s$– $3d^8(^3F)4p$	^4F - $^4D°$											
			2316.04	8394	51558	10	8	2.88	0.185	14.1	0.268	B	1*n*
			2303.00	9330	52738	8	6	2.9	0.17	11	0.14	C	1*n*
			2297.14	10116	53635	6	4	2.70	0.142	6.46	−0.068	B	1*n*
			2297.49	10664	54176	4	2	3.0	0.12	3.6	−0.32	B	1*n*
			2367.39	9330	51558	8	8	0.074	0.0062	0.39	−1.30	B	1*n*
			2326.45	10664	53635	4	4	0.33	0.027	0.82	−0.97	D	2
			2412.27	10116	51558	6	8	0.0024	2.8(−4)[a]	0.013	−2.78	C	1*n*
3.		^4F – $^4G°$											
			2216.48	8394	53496	10	12	3.4	0.30	22	0.48	B	1*n*
			2270.21	9330	53365	8	10	1.56	0.151	9.01	0.081	B	1*n*
			2264.46	10116	54263	6	8	1.43	0.147	6.56	−0.056	B	1*n*
			2253.85	10664	55019	4	6	1.98	0.226	6.71	−0.043	C+	1*n*
			2222.96	8394	53365	10	10	0.98	0.073	5.3	−0.14	B	1*n*
			2224.86	9330	54263	8	8	1.55	0.115	6.74	−0.036	B	1*n*
			2226.33	10116	55019	6	6	1.3	0.097	4.3	−0.24	B	1*n*
			2188.05	9330	55019	8	6	0.057	0.0031	0.18	−1.61	C+	1*n*
4.		^4F – $^4F°$	*2171.3*	*9355*	*55395*	28	28	3.14	0.222	44.4	0.793	C+	1*n*
			2165.55	8394	54557	10	10	2.4	0.17	12	0.23	C	1*n*
			2169.10	9330	55418	8	8	1.58	0.111	6.37	−0.050	B	1*n*
			2175.15	10116	56075	6	6	1.77	0.126	5.39	−0.123	B	1*n*
			2184.61	10664	56424	4	4	2.90	0.207	5.97	−0.081	B	1*n*
			2125.91	8394	55418	10	8	0.050	0.0027	0.19	−1.57	B	1*n*
			2138.58	9330	56075	8	6	0.177	0.00910	0.513	−1.138	C+	1*n*
			2158.74	10116	56424	6	4	0.35	0.016	0.70	−1.01	C	1*n*
			2210.38	9330	54557	8	10	0.39	0.036	2.1	−0.54	C	1*n*
			2206.72	10116	55418	6	8	1.66	0.162	7.04	−0.013	B	1*n*
			2201.41	10664	56075	4	6	1.3	0.14	4.1	−0.25	B	1*n*
5.		^4F – $^2G°$											
			2125.12	9330	56371	8	8	0.064	0.0043	0.24	−1.46	C	1*n*
			2174.67	9330	55300	8	10	1.43	0.127	7.26	0.006	B	1*n*
			2161.22	10116	56371	6	8	0.20	0.019	0.80	−0.95	C	1*n*
6.		^4F – $^2F°$											
			2053.30	8394	57081	10	8	0.025	0.0013	0.086	−1.90	B	1*n*
			2034.05	9330	58493	8	6	0.023	0.0011	0.057	−2.07	C	1*n*
			2093.56	9330	57081	8	8	0.065	0.0043	0.24	−1.47	C+	1*n*
			2128.58	10116	57081	6	8	0.248	0.0225	0.944	−0.870	B	1*n*
			2090.10	10664	58493	4	6	0.070	0.0069	0.19	−1.56	C	1*n*
7.		^4F – $^2D°$											
			2080.85	10664	58706	4	4	0.080	0.0052	0.14	−1.68	C	1*n*
8.		^2F - $^4D°$											
			2630.27	13550	51558	8	8	0.0068	7.1(−4)	0.049	−2.25	C	1*n*

Ni II: 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
9.		^{2}F - ^{4}G°											
			2510.87	13550	53365	8	10	0.58	0.069	4.5	−0.26	B	1*n*
			2545.90	14996	54263	6	8	0.156	0.0202	1.02	−0.916	B	1*n*
			2410.74	13550	55019	8	6	0.010	6.5(−4)	0.042	−2.28	D	1*n*
10.		^{2}F - ^{4}F°											
			2437.89	13550	54557	8	10	0.54	0.060	3.9	−0.32	C	1*n*
			2387.76	13550	55418	8	8	0.159	0.0136	0.855	−0.964	B	1*n*
			2433.56	14996	56075	6	6	0.073	0.0065	0.31	−1.41	B	1*n*
			2413.04	14996	56424	6	4	0.083	0.0048	0.23	−1.54	B	1*n*
11.		^{2}F - ^{2}G°	*2402.8*	*14170*	*55776*	14	18	2.23	0.248	27.5	0.541	C+	1*n*
			2394.52	13550	55300	8	10	1.70	0.183	11.5	0.165	B	1*n*
			2416.13	14996	56371	6	8	2.1	0.25	12	0.17	C	1*n*
			2334.58	13550	56371	8	8	0.80	0.065	4.0	−0.28	C	1*n*
12.		^{2}F - ^{2}F°	*2297.3*	*14170*	*57686*	14	14	3.94	0.312	33.0	0.640	C+	1*n*
			2296.55	13550	57081	8	8	1.98	0.157	9.47	0.098	B	1*n*
			2298.27	14996	58493	6	6	2.8	0.22	10	0.12	C	1*n*
			2224.36	13550	58493	8	6	0.32	0.018	1.0	−0.85	C	1*n*
			2375.42	14996	57081	6	8	0.66	0.074	3.5	−0.35	B	1*n*
13.		^{2}F - ^{2}D°	*2284.3*	*14170*	*57934*	14	10	2.97	0.166	17.5	0.367	C	1*n*
			2278.77	13550	57420	8	6	2.8	0.16	9.8	0.12	C	1*n*
			2287.09	14996	58706	6	4	2.8	0.15	6.6	−0.06	C	1*n*
			2356.40	14996	57420	6	6	0.28	0.023	1.1	−0.85	C	1*n*
14.	$3d^8(^3P)4s$ – $3d^8(^1D)4p$	^{4}P - ^{2}F°											
			2220.40	23108	68131	6	8	2.3	0.23	9.9	0.13	C	1*n*

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni II

Forbidden Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
1020.9	7	5132.6	6	7413.33	22	17646	2
3074.11	26	5269.16	12	7612.7	9	18953	18
3076.1	26	5274.27	6	7694.6	5	19388	2
3223.1	26	5275.83	12	8033.5	5	20487	2
3378.55	24	5281.46	6	8303.23	22	20805	14
3439.29	24	5431.39	6	8703.9	10	21014	14
3559.86	24	5703.64	12	8896.1	7	23079	2
3627.35	24	5711.46	12	9377.33	21	23343	14
3993.1	25	6007.1	9	9757.4	10	23606	14
4025.3	23	6365.1	9	9885.74	21	23688	2
4033.0	23	6441.3	8	9956.6	10	24779	18
4143.17	11	6467.3	5	10460	7	29106	2
4147.30	11	6668.16	22	10618	16	51850	15
4201.2	25	6700.2	9	10645	16	59510	13
4248.8	25	6791.5	5	10718.16	21	66342	1
4285.3	23	6794.2	5	10921.07	21	69177	4
4294.1	23	6813.6	5	11360	10	80610	19
4310.46	11	6848.4	8	11455	20	96151	17
4314.92	11	6910.8	9	11616.88	21	100780	17
4326.2	23	6955.8	9	12323	7	106790	2
4461.54	11	7054.2	5	12779	21	127250	2
4466.33	11	7078.0	5	12924	16	145330	15
4485.2	25	7102.84	8	13353	20	182360	2
4573.45	11	7255.8	5	13396	20	402820	15
4628.0	23	7307.7	9	16766	14		
5064.2	6	7379.57	22	17245	18		

For this ion, we have selected the data of Nussbaumer and Storey,[1] who calculated M1 and E2 transition probabilities for transitions within the $3d^9$ and $3d^84s$ configurations. These comprise the 17 energetically lowest levels of this spectrum. Nussbaumer and Storey included the $3d^9$, $3d^84s$, and $3d^84d$ configurations as the basis of their calculations, and they derived radial wavefunctions by using adjustable Thomas-Fermi potentials. These authors also applied additional empirical corrections to their coupling coefficients, so that their calculated eigenenergies are in close agreement with observed energy levels. Accuracies for M1 transitions within the same term should be quite good—within 25 percent or better. However, data for other magnetic dipole transitions, as well as for all electric quadrupole transitions, are necessarily much less reliable.

Reference

[1] H. Nussbaumer and P. J. Storey, Astron. Astrophys. **110**, 295 (1982).

Ni II: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$3d^9$–$3d^9$	^{2}D - ^{2}D										
			[66342]	0	1507	6	4	M1	0.0554	2.40	C+	1

Ni II: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
2.	$3d^8(^3F)4s - 3d^8(^3F)4s$	$^4F - ^4F$										
			[106790]	8394	9330	10	8	M1	0.0271	9.79	C+	1
			[127250]	9330	10116	8	6	M1	0.0276	12.7	C+	1
			[182360]	10116	10664	6	4	M1	0.0105	9.44	C+	1
3.		$^4F - ^2F$										
			[19388]	8394	13550	10	8	M1	0.087	0.19	D	1
			[17646]	9330	14996	8	6	M1	0.0028	0.0034	D	1
			[23688]	9330	13550	8	8	M1	0.0055	0.022	D	1
			[20487]	10116	14996	6	6	M1	0.0072	0.014	D	1
			[29106]	10116	13550	6	8	M1	0.014	0.10	D	1
			[23079]	10664	14996	4	6	M1	0.029	0.079	D	1
4.		$^2F - ^2F$										
			[69177]	13550	14996	8	6	M1	0.0471	3.47	C+	1
5.	$3d^8(^3F)4s - 3d^8(^3P)4s$	$^4F - ^4P$										
			[6794.2]	8394	23108	10	6	E2	0.0046	0.24	E	1
			[6467.3]	9330	24788	8	4	E2	0.0062	0.17	E	1
			[6791.5]	10116	24836	6	2	E2	0.0049	0.084	E	1
			[7255.8]	9330	23108	8	6	M1	0.16	0.014	E	1
			″	″	″	8	6	E2	0.0010	0.072	E	1
			[6813.6]	10116	24788	6	4	M1	0.092	0.0043	E	1
			″	″	″	6	4	E2	0.0035	0.12	E	1
			[7054.2]	10664	24836	4	2	M1	5.5(−4)[a]	1.4(−5)	E	1
			″	″	″	4	2	E2	0.0060	0.12	E	1
			[7694.6]	10116	23108	6	6	M1	0.014	0.0014	E	1
			″	″	″	6	6	E2	1.6(−4)	0.015	E	1
			[7078.0]	10664	24788	4	4	M1	0.027	0.0014	E	1
			″	″	″	4	4	E2	9.6(−4)	0.041	E	1
			[8033.5]	10664	23108	4	6	M1	0.010	0.0012	E	1
			″	″	″	4	6	E2	1.3(−5)	0.0016	E	1
6.		$^4F - ^2P$ (9F)										
			[5064.2]	9330	29071	8	4	E2	0.0013	0.010	E	1
			[5132.6]	10116	29593	6	2	E2	4.5(−4)	0.0019	E	1
			5274.27	10116	29071	6	4	M1	0.012	2.6(−4)	E	1
			″	″	″	6	4	E2	1.7(−4)	0.0017	E	1
			5281.46	10664	29593	4	2	M1	0.0013	1.4(−5)	E	1
			″	″	″	4	2	E2	5.7(−5)	2.8(−4)	E	1
			5431.39	10664	29071	4	4	M1	0.0019	4.5(−5)	E	1
			″	″	″	4	4	E2	4.3(−5)	4.8(−4)	E	1
7.		$^2F - ^4P$										
			[8896.1]	13550	24788	8	4	E2	4.5(−5)	0.0060	E	1
			[10460]	13550	23108	8	6	M1	0.076	0.019	E	1
			″	″	″	8	6	E2	3.2(−6)	0.0014	E	1
			[10209]	14996	24788	6	4	M1	0.0068	0.0011	E	1
			″	″	″	6	4	E2	1.3(−5)	0.0034	E	1
			[12323]	14996	23108	6	6	M1	0.082	0.034	E	1

Ni II: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
8.		^{2}F - ^{2}P (13F)										
			[6441.3]	13550	29071	8	4	E2	0.031	0.82	E	1
			[6848.4]	14996	29593	6	2	E2	0.029	0.52	E	1
			7102.84	14996	29071	6	4	M1	0.0079	4.2(−4)	E	1
			"	"	"	6	4	E2	0.0026	0.11	E	1
9.	$3d^8(^3F)4s-3d^8(^1D)4s$	^{4}F - ^{2}D										
			[6007.1]	8394	25036	10	6	E2	0.0074	0.21	E	1
			[6910.8]	9330	23796	8	4	E2	0.0012	0.045	E	1
			[6365.1]	9330	25036	8	6	M1	0.19	0.011	E	1
			"	"	"	8	6	E2	0.0018	0.067	E	1
			[7307.7]	10116	23796	6	4	M1	0.38	0.022	E	1
			"	"	"	6	4	E2	5.8(−4)	0.029	E	1
			[6700.2]	10116	25036	6	6	M1	0.0078	5.2(−4)	E	1
			"	"	"	6	6	E2	3.3(−4)	0.016	E	1
			[7612.7]	10664	23796	4	4	M1	0.18	0.012	E	1
			"	"	"	4	4	E2	1.4(−4)	0.0085	E	1
			[6955.8]	10664	25036	4	6	M1	0.0077	5.8(−4)	E	1
			"	"	"	4	6	E2	3.6(−5)	0.0021	E	1
10.		^{2}F - ^{2}D										
			[9757.4]	13550	23796	8	4	E2	6.0(−5)	0.013	E	1
			[8703.9]	13550	25036	8	6	M1	0.089	0.013	E	1
			"	"	"	8	6	E2	4.3(−5)	0.0077	E	1
			[11360]	14996	23796	6	4	M1	0.057	0.012	E	1
			"	"	"	6	4	E2	2.6(−5)	0.012	E	1
			[9956.6]	14996	25036	6	6	M1	0.062	0.014	E	1
11.	$3d^8(^3F)4s-3d^8(^1G)4s$	^{4}F - ^{2}G (10F)										
			4147.30	8394	32500	10	10	M1	0.32	0.0085	E	1
			"	"	"	10	10	E2	1.2(−4)	0.0010	E	1
			4310.46	9330	32524	8	8	M1	0.16	0.0038	E	1
			4143.17	8394	32524	10	8	M1	0.0096	2.0(−4)	E	1
			"	"	"	10	8	E2	1.0(−5)	5.8(−5)	E	1
			4314.92	9330	32500	8	10	M1	0.073	0.0022	E	1
			"	"	"	8	10	E2	2.1(−4)	0.0019	E	1
			4461.54	10116	32524	6	8	M1	0.099	0.0026	E	1
			"	"	"	6	8	E2	1.2(−4)	0.0010	E	1
			4466.33	10116	32500	6	10	E2	1.3(−4)	0.0014	E	1
			4573.45	10664	32524	4	8	E2	4.6(−4)	0.0044	E	1
12.		^{2}F - ^{2}G (14F)										
			5711.46	14996	32500	6	10	E2	5.9(−4)	0.021	E	1
			5275.83	13550	32500	8	10	M1	0.082	0.0045	E	1
			"	"	"	8	10	E2	0.0040	0.097	E	1
			5703.64	14996	32524	6	8	M1	0.042	0.0023	E	1
			"	"	"	6	8	E2	0.0020	0.057	E	1
			5269.16	13550	32524	8	8	M1	0.12	0.0052	E	1
			"	"	"	8	8	E2	2.5(−4)	0.0048	E	1

Ni II: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
13.	$3d^8(^3P)4s-$ $3d^8(^3P)4s$	$^4P - ^4P$										
			[59510]	23108	24788	6	4	M1	0.0192	0.600	C+	1
14.		$^4P - ^2P$										
			[16766]	23108	29071	6	4	M1	0.080	0.056	D	1
			″	″	″	6	4	E2	2.2(−5)	0.069	D	1
			[20805]	24788	29593	4	2	M1	0.0078	0.0052	D	1
			[23343]	24788	29071	4	4	M1	0.021	0.040	D	1
			[21014]	24836	29593	2	2	M1	0.0061	0.0042	D	1
			[23606]	24836	29071	2	4	M1	0.0014	0.0027	D	1
15.	$3d^8(^3P)4s-$ $3d^8(^1D)4s$	$^4P - ^2D$										
			[145330]	23108	23796	6	4	M1	0.0051	2.3	E	1
			[51850]	23108	25036	6	6	M1	0.069	2.1	E	1
			[402820]	24788	25036	4	6	M1	1.9(−4)	2.0	E	1
16.	$3d^8(^3P)4s-$ $3d^8(^1G)4s$	$^4P - ^2G$										
			[10645]	23108	32500	6	10	E2	2.9(−4)	0.24	E	1
			[12924]	24788	32524	4	8	E2	3.7(−5)	0.064	E	1
			[10618]	23108	32524	6	8	M1	8.0(−6)	2.8(−6)	E	1
			″	″	″	6	8	E2	3.8(−5)	0.024	E	1
17.	$3d^8(^1D)4s-$ $3d^8(^3P)4s$	$^2D - ^4P$										
			[100780]	23796	24788	4	4	M1	0.012	1.8	E	1
			[96151]	23796	24836	4	2	M1	0.0085	0.56	E	1
18.		$^2D - ^2P$										
			[24779]	25036	29071	6	4	M1	0.0059	0.013	E	1
			″	″	″	6	4	E2	2.1(−6)	0.047	E	1
			[17245]	23796	29593	4	2	M1	0.077	0.029	E	1
			″	″	″	4	2	E2	2.1(−6)	0.0038	E	1
			[18953]	23796	29071	4	4	M1	0.073	0.074	E	1
			″	″	″	4	4	E2	1.5(−5)	0.087	E	1
19.	$3d^8(^1D)4s-$ $3d^8(^1D)4s$	$^2D - ^2D$										
			[80610]	23796	25036	4	6	M1	0.00163	0.190	C+	1
20.	$3d^8(^1D)4s-$ $3d^8(^1G)4s$	$^2D - ^2G$										
			[13396]	25036	32500	6	10	E2	9.8(−5)	0.25	E	1
			[11455]	23796	32524	4	8	E2	3.2(−4)	0.30	E	1
			[13353]	25036	32524	6	8	M1	2.3(−6)	1.6(−6)	E	1
			″	″	″	6	8	E2	1.2(−5)	0.024	E	1

Ni II: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accu-racy	Source
21.	$3d^9$-$3d^8(^3F)4s$	^2D - ^4F (1F)										
			[12779]	1507	9330	4	8	E2	2.1(−5)	0.034	E	1
			10718.16	0	9330	6	8	M1	6.4(−4)	2.3(−4)	E	1
			″	″	″	6	8	E2	7.8(−4)	0.53	E	1
			11616.88	1507	10116	4	6	M1	9.3(−4)	3.2(−4)	E	1
			″	″	″	4	6	E2	2.7(−4)	0.20	E	1
			9885.74	0	10116	6	6	M1	1.2(−4)	2.6(−5)	E	1
			″	″	″	6	6	E2	1.6(−5)	0.0054	E	1
			10921.07	1507	10664	4	4	M1	7.7(−4)	1.5(−4)	E	1
			″	″	″	4	4	E2	6.1(−5)	0.023	E	1
			9377.33	0	10664	6	4	M1	1.3(−5)	1.6(−6)	E	1
			″	″	″	6	4	E2	7.5(−5)	0.013	E	1
22.		^2D - ^2F (2F)										
			8303.23	1507	13550	4	8	E2	0.013	2.4	E	1
			7379.57	0	13550	6	8	M1	3.7(−4)	4.4(−5)	E	1
			″	″	″	6	8	E2	0.23	24	E	1
			7413.33	1507	14996	4	6	M1	3.3(−5)	3.0(−6)	E	1
			″	″	″	4	6	E2	0.18	14	E	1
			6668.16	0	14996	6	6	M1	6.2(−4)	4.1(−5)	E	1
			″	″	″	6	6	E2	0.098	4.6	E	1
23.	$3d^9$-$3d^8(^3P)4s$	^2D - ^4P										
			[4326.2]	0	23108	6	6	M1	0.0025	4.5(−5)	E	1
			″	″	″	6	6	E2	0.35	1.9	E	1
			[4294.1]	1507	24788	4	4	M1	0.0013	1.5(−5)	E	1
			″	″	″	4	4	E2	0.11	0.38	E	1
			[4033.0]	0	24788	6	4	M1	0.0033	3.2(−5)	E	1
			″	″	″	6	4	E2	0.095	0.24	E	1
			[4285.3]	1507	24836	4	2	M1	0.0010	5.8(−6)	E	1
			″	″	″	4	2	E2	0.0033	0.0057	E	1
			[4628.0]	1507	23108	4	6	M1	1.9(−4)	4.2(−6)	E	1
			″	″	″	4	6	E2	0.13	0.99	E	1
			[4025.3]	0	24836	6	2	E2	2.9(−4)	3.6(−4)	E	1
24.		^2D - ^2P (5F)										
			3378.55	0	29593	6	2	E2	4.1	2.1	E	1
			3439.29	0	29071	6	4	M1	5.7(−4)	3.4(−6)	E	1
			″	″	″	6	4	E2	5.5	6.3	E	1
			3559.86	1507	29593	4	2	M1	0.0011	3.7(−6)	E	1
			″	″	″	4	2	E2	4.6	3.1	E	1
			3627.35	1507	29071	4	4	M1	0.0014	9.9(−6)	E	1
			″	″	″	4	4	E2	2.8	4.2	E	1
25.	$3d^9$-$3d^8(^1D)4s$	^2D - ^2D										
			[3993.1]	0	25036	6	6	M1	0.0022	3.1(−5)	E	1
			″	″	″	6	6	E2	0.52	1.9	E	1
			[4485.2]	1507	23796	4	4	M1	8.4(−4)	1.1(−5)	E	1
			″	″	″	4	4	E2	0.30	1.3	E	1
			[4201.2]	0	23796	6	4	M1	0.0015	1.6(−5)	E	1
			″	″	″	6	4	E2	0.66	2.1	E	1
			4248.8]	1507	25036	4	6	M1	0.0015	2.6(−5)	E	1
			″	″	″	4	6	E2	0.17	0.84	E	1

Ni II: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
26.	$3d^9-3d^8(^1G)4s$	$^2D-^2G$ (6F)										
			[3076.1]	0	32500	6	10	E2	4.6	7.5	E	1
			[3223.1]	1507	32524	4	8	E2	3.5	5.8	E	1
			3074.11	0	32524	6	8	E2	0.35	0.46	E	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni III

Fe Isoelectronic Sequence

Ground State: $1s^22s^22p^63s^23p^63d^8\ ^3F_4$

Ionization Energy: 35.19 eV = 283800 cm^{-1}

Allowed transitions

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 agreement between Refs. 1 and 2 was good, particularly for strong lines: 63% of the log *gf*-values for common lines agreed within ±50 percent. In this compilation, we have included only those lines showing 50 percent or better agreement between Refs. 1 and 2.

As in the case of Fe III, we were able to assess the reliability of Kurucz and Peytremann's (or Biemont's) absolute scale by comparing their theoretical branching ratios to beam-foil lifetime data of Andersen *et al.*[3] This comparison supports the adopted scale: for the $z\ ^3G_3^\circ$ state (the only level measured by Andersen *et al.* for Ni III) the inverse sum of the transition probabilities, $(\Sigma A_{ki})^{-1}$, taken from Ref. 2 is only 17 percent higher than the corresponding beam-foil lifetime.

References

[1]E. Biemont, J. Quant. Spectrosc. Radiat. Transfer **16**, 137 (1976).

[2]R. L. Kurucz and E. Peytremann, Smithsonian Astrophysical Observatory Special Report 362 (1975).

[3]T. Andersen, P. Petersen, and E. Biemont, J. Quant. Spectrosc. Radiat. Transfer **17**, 389 (1977).

Ni III: 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.	$3d^7(^4F)4s - 3d^7(^4F)4p$	$^5F - {^5F^\circ}$											
			1769.64	53704	110213	11	11	6.2	0.29	19	0.50	D	1,2
			1794.90	54658	110371	9	9	2.7	0.13	6.9	0.07	D	1,2
			1791.64	55406	111221	7	7	2.5	0.12	5.0	−0.08	D	1,2
			1786.93	55952	111915	5	5	2.5	0.12	3.5	−0.22	D	1,2
			1782.75	56308	112402	3	3	3.8	0.18	3.2	−0.27	D	1,2
2.		$^5F - {^5D^\circ}$											
			1724.52	56308	114295	3	1	6.7	0.10	1.7	−0.52	D	1,2
3.		$^5F - {^5G^\circ}$											
			1692.51	53704	112788	11	13	7.9	0.40	25	0.64	D	1,2
			1709.90	54658	113141	9	11	6.3	0.34	17	0.49	D	1,2
			1719.46	55952	114110	5	7	6.0	0.37	10	0.27	D	1,2
			1722.28	56308	114371	3	5	5.9	0.44	7.5	0.12	D	1,2
			[1666.6]	53704	113705	11	9	0.038	0.0013	0.078	−1.84	D	1,2
4.		$^3F - {^3G^\circ}$											
			1854.15	61339	115272	9	11	5.4	0.34	19	0.49	D	1,2
			1849.54	62606	116674	7	9	5.3	0.35	15	0.39	D	1,2
5.		$^3F - {^3F^\circ}$											
			1823.06	61339	116192	9	9	5.6	0.28	15	0.40	D	1,2
			1830.01	62606	117251	7	7	4.6	0.23	9.7	0.21	D	1,2
			1830.08	63472	118115	5	5	5.0	0.25	7.5	0.10	D	1,2
6.		$^3F - {^3D^\circ}$											
			1741.96	61339	118745	9	7	5.7	0.20	10	0.26	D	1,2
			1752.43	62606	119670	7	5	5.5	0.18	7.3	0.10	D	1,2
			1760.56	63472	120272	5	3	6.5	0.18	5.2	−0.05	D	1,2

Ni III

Forbidden Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
1989.6	5	6000.2	3	7889.9	2	73472	1
2596.6	8	6401.5	3	8499.6	2	109990	1
2787.0	11	6533.8	3	11014	7	316170	9
2811.8	11	6682.2	3	15507	10	395310	9
4326.2	4	6797.1	3	31250	6		
4596.8	4	6946.4	3	33933	6		
4797.3	4	7124.8	2	38012	6		

For this spectrum, we have selected the data of Garstang,[1] who calculated M1 and E2 transition probabilities for lines arising between levels of the $3d^8$ configuration. Garstang's single configuration approximation should be fairly reasonable, since levels of the $3d^8$ configuration are generally well removed from those of the nearest neighboring configuration—$3d^7 4s$. His calculated energy levels are also in close agreement with observed energy levels. The $3d^8$ ^{1}S level, however, is close to some levels of the $3d^7 4s$ configuration. Nevertheless, we feel that configuration interaction should still play a minor role, since there are no nearby $J=0$ levels within the $3d^7 4s$ configuration. Accuracies for M1 transitions between levels of the same term should be 25 percent or better. However, data for other magnetic dipole transitions, as well as for all E2 transitions, are much less reliable.

Reference

[1] R. H. Garstang, Mon. Not. R. Astron. Soc. **118**, 234 (1958).

Ni III: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$3d^8$–$3d^8$	^{3}F - ^{3}F										
			[73472]	0	1361	9	7	M1	0.065	6.7	C+	1
			[109990]	1361	2270	7	5	M1	0.027	6.7	C+	1
2.		^{3}F - ^{1}D										
			[7124.8]	0	14032	9	5	E2	0.0045	0.25	E	1
			[7889.9]	1361	14032	7	5	M1	0.48	0.044	E	1
			〃	〃	〃	7	5	E2	5.4(−4)[a]	0.049	E	1
			[8499.6]	2270	14032	5	5	M1	0.21	0.024	E	1
			〃	〃	〃	5	5	E2	1.9(−4)	0.025	E	1
3.		^{3}F - ^{3}P										
			[6000.2]	0	16662	9	5	E2	0.050	1.2	E	1
			[6401.5]	1361	16978	7	3	E2	0.038	0.73	E	1
			[6682.2]	2270	17231	5	1	E2	0.046	0.36	E	1
			[6533.8]	1361	16662	7	5	M1	0.11	0.0057	E	1
			[6797.1]	2270	16978	5	3	M1	0.0028	9.8(−5)	E	1
			〃	〃	〃	5	3	E2	0.013	0.34	E	1
			[6946.4]	2270	16662	5	5	M1	0.022	0.0014	E	1
			〃	〃	〃	5	5	E2	7.2(−4)	0.035	E	1
4.		^{3}F - ^{1}G										
			[4326.2]	0	23109	9	9	M1	0.35	0.0095	E	1
			〃	〃	〃	9	9	E2	2.7(−4)	0.0022	E	1
			[4596.8]	1361	23109	7	9	M1	0.18	0.0058	E	1
			[4797.3]	2270	23109	5	9	E2	3.9(−4)	0.0053	E	1
5.		^{3}F - ^{1}S										
			[1989.6]	2270	52532	5	1	E2	0.20	0.0038	E	1*n*
6.		^{1}D - ^{3}P										
			[38012]	14032	16662	5	5	M1	0.098	1.0	E	1
			[33933]	14032	16978	5	3	M1	0.090	0.39	E	1
			〃	〃	〃	5	3	E2	1.8(−6)	0.14	E	1
			[31250]	14032	17231	5	1	E2	2.4(−6)	0.043	E	1
7.		^{1}D - ^{1}G										
			[11014]	14032	23109	5	9	E2	6.2(−4)	0.54	E	1

Ni III: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
8.		$^1D - ^1S$										
			[2596.6]	14032	52532	5	1	E2	10	0.72	E	1*n*
9.		$^3P - ^3P$										
			[316170]	16662	16978	5	3	M1	5.9(−4)	2.1	C+	1
			[395310]	16978	17231	3	1	M1	8.6(−4)	2.0	C+	1
10.		$^3P - ^1G$										
			[15507]	16662	23109	5	9	E2	2.7(−5)	0.13	E	1
11.		$^3P - ^1S$										
			[2787.0]	16662	52532	5	1	E2	1.9	0.19	E	1*n*
			[2811.8]	16978	52532	3	1	M1	2.9	0.0024	E	1*n*

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni IV

Mn Isoelectronic Sequence

Ground State: $1s^22s^22p^63s^23p^63d^7\ ^4F_{9/2}$

Ionization Energy: 54.9 eV = 443000 cm^{-1}

Forbidden Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
1470.8	8	2366.3	7	3987.6	12	5321.6	20
1497.0	8	2390.7	7	3990.3	6	5363.3	3
1511.3	8	2415.0	7	4071.8	29	5517.7	2
1516.4	8	2424.2	7	4084.0	12	5809.1	23
1529.8	8	2444.6	27	4084.6	6	5820.1	2
1531.0	8	2449.3	7	4142.8	29	5905.4	2
1544.7	8	2479.9	24	4160.5	16	5910.0	2
2004.5	13	2482.9	27	4179.0	29	5964.2	26
2014.5	13	2549.5	27	4234.7	16	6117.9	26
2030.2	13	2591.1	27	4253.9	29	6119.3	2
2038.9	13	3612.0	5	4363.5	16	6124.1	2
2040.4	13	3623.7	6	4421.8	4	6178.4	23
2065.4	13	3689.5	6	4445.2	16	6218.7	2
2075.7	17	3739.3	6	4451.3	4	6343.5	23
2125.1	17	3751.4	5	4537.9	4	6349.2	2
2153.9	17	3774.2	5	4627.0	4	6450.9	2
2254.6	21	3822.0	6	4754.3	4	6629.1	26
2279.4	7	3858.9	6	4772.5	3	6819.5	26
2287.0	21	3883.9	12	4946.7	20	9379.1	11
2301.4	7	3899.8	5	5041.6	3	9602.7	11
2306.7	21	3921.7	12	5052.0	20	10181	11
2340.7	21	3926.7	5	5059.9	3	11135	11
2342.9	7	3948.5	12	5288.1	3	11452	11

List of tabulated lines — Continued

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
12739	15	18927	10	84032	1	168990	9
14660	15	19492	19	89421	14	172780	1
14855	15	21314	10	97202	22	237410	28
15908	10	24228	19	99723	18	402790	9
17561	10	28998	19	117230	1		
18077	10	59465	25	158740	30		

For this spectrum, we have chosen the work of Hansen *et al.*,[1] who calculated M1 and E2 transition probabilities for transitions within the $3d^7$ ground configuration. These authors used a single configuration approximation, which should be fairly reliable, since the ground configuration is well separated from other configurations of the same parity. Also, the authors determined eigenvector components by a parametric fitting of theoretical energy expressions to observed energy levels. Finally, Hartree-Fock calculations were used to determine s_q, the radial electric quadrupole integral, which is needed in the calculation of E2 transition probabilities.

Reference

[1]J. E. Hansen, A. J. J. Raassen, and P. H. M. Uylings, Astrophys. J. **277**, 435 (1984).

Ni IV: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$3d^7$–$3d^7$	^{4}F - ^{4}F										
			[84032]	0.0	1189.7	10	8	M1	0.057	10	C+	1
			[117230]	1189.7	2042.5	8	6	M1	0.036	13	C+	1
			[172780]	2042.5	2621.1	6	4	M1	0.013	9.9	C+	1
2.		^{4}F - ^{4}P										
			[5517.7]	0.0	18119	10	6	E2	0.068	1.2	E	1
			[5820.1]	1189.7	18367	8	4	E2	0.035	0.56	E	1
			[5910.0]	2042.5	18958	6	2	E2	0.026	0.22	E	1
			[5905.4]	1189.7	18119	8	6	M1	0.0053	2.4(−4)[a]	E	1
			"	"	"	8	6	E2	0.015	0.38	E	1
			[6124.1]	2042.5	18367	6	4	M1	0.0018	6.1(−5)	E	1
			"	"	"	6	4	E2	0.020	0.41	E	1
			[6119.3]	2621.1	18958	4	2	E2	0.033	0.34	E	1
			[6218.7]	2042.5	18119	6	6	M1	0.0020	1.1(−4)	E	1
			"	"	"	6	6	E2	0.0027	0.090	E	1
			[6349.2]	2621.1	18367	4	4	M1	3.3(−4)	1.3(−5)	E	1
			"	"	"	4	4	E2	0.0054	0.13	E	1
			[6450.9]	2621.1	18119	4	6	M1	6.9(−4)	4.1(−5)	E	1
			"	"	"	4	6	E2	2.5(−4)	0.010	E	1
3.		^{4}F - ^{2}G										
			[5041.6]	0.0	19830	10	10	M1	0.91	0.043	E	1
			"	"	"	10	10	E2	1.3(−4)	0.0025	E	1
			[5059.9]	1189.7	20948	8	8	M1	0.35	0.013	E	1
			[4772.5]	0.0	20948	10	8	M1	0.034	0.0011	E	1
			[5363.3]	1189.7	19830	8	10	M1	0.28	0.016	E	1
			[5288.1]	2042.5	20948	6	8	M1	0.25	0.011	E	1

Ni IV: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
4.		$^4F - ^2P$										
			[4451.3]	1189.7	23649	8	4	E2	0.0099	0.041	E	1
			[4421.8]	2042.5	24651	6	2	E2	0.0042	0.0085	E	1
			[4627.0]	2042.5	23649	6	4	M1	0.17	0.0025	E	1
			〃	〃	〃	6	4	E2	0.0043	0.022	E	1
			[4537.9]	2621.1	24651	4	2	M1	0.0039	2.7(−5)	E	1
			〃	〃	〃	4	2	E2	0.0024	0.0055	E	1
			[4754.3]	2621.1	23649	4	4	M1	0.12	0.0019	E	1
			〃	〃	〃	4	4	E2	0.0011	0.0064	E	1
5.		$^4F - ^2H$										
			[3926.7]	1189.7	26649	8	12	E2	1.7(−5)	1.1(−4)	E	1
			[3899.8]	2042.5	27678	6	10	E2	1.6(−5)	8.6(−5)	E	1
			[3751.4]	0.0	26649	10	12	M1	0.0016	3.8(−5)	E	1
			〃	〃	〃	10	12	E2	2.5(−4)	0.0013	E	1
			[3774.2]	1189.7	27678	8	10	M1	0.0065	1.3(−4)	E	1
			〃	〃	〃	8	10	E2	6.9(−5)	3.1(−4)	E	1
			[3612.0]	0.0	27678	10	10	M1	0.013	2.3(−4)	E	1
			〃	〃	〃	10	10	E2	3.7(−5)	1.4(−4)	E	1
6.		$^4F - ^2D2$										
			[3689.5]	0.0	27097	10	6	E2	0.0011	0.0027	E	1
			[3623.7]	1189.7	28778	8	4	E2	0.0013	0.0019	E	1
			[3858.9]	1189.7	27097	8	6	M1	1.7	0.022	E	1
			〃	〃	〃	8	6	E2	4.0(−4)	0.0012	E	1
			[3739.3]	2042.5	28778	6	4	M1	1.6	0.012	E	1
			〃	〃	〃	6	4	E2	8.4(−4)	0.0015	E	1
			[3990.3]	2042.5	27097	6	6	M1	0.18	0.0025	E	1
			〃	〃	〃	6	6	E2	2.3(−5)	8.3(−5)	E	1
			[3822.0]	2621.1	28778	4	4	M1	0.85	0.0070	E	1
			〃	〃	〃	4	4	E2	4.0(−5)	7.8(−5)	E	1
			[4084.6]	2621.1	27097	4	6	M1	0.081	0.0012	E	1
			〃	〃	〃	4	6	E2	3.1(−6)	1.3(−5)	E	1
7.		$^4F - ^2F$										
			[2301.4]	0.0	43438	10	6	E2	0.0010	2.3(−4)	E	1
			[2279.4]	0.0	43859	10	8	M1	0.28	9.8(−4)	D	1
			〃	〃	〃	10	8	E2	0.0066	0.0019	E	1
			[2366.3]	1189.7	43438	8	6	M1	0.072	2.1(−4)	D	1
			〃	〃	〃	8	6	E2	9.9(−4)	2.6(−4)	E	1
			[2342.9]	1189.7	43859	8	8	M1	0.056	2.1(−4)	D	1
			〃	〃	〃	8	8	E2	7.5(−4)	2.5(−4)	E	1
			[2415.0]	2042.5	43438	6	6	M1	0.055	1.7(−4)	D	1
			〃	〃	〃	6	6	E2	0.0013	3.8(−4)	E	1
			[2390.7]	2042.5	43859	6	8	M1	0.12	4.9(−4)	D	1
			〃	〃	〃	6	8	E2	0.0022	8.2(−4)	E	1
			[2449.3]	2621.1	43438	4	6	M1	0.28	9.2(−4)	D	1
			〃	〃	〃	4	6	E2	0.0049	0.0015	E	1
			[2424.2]	2621.1	43859	4	8	E2	4.9(−4)	2.0(−4)	E	1

Ni IV: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
8.		^{4}F - ^{2}D1										
			[1470.8]	0.0	67990	10	6	E2	0.074	0.0018	E	1
			[1511.3]	1189.7	67360	8	4	E2	0.014	2.6(−4)	E	1
			[1497.0]	1189.7	67990	8	6	M1	0.26	1.9(−4)	E	1
			"	"	"	8	6	E2	0.0055	1.5(−4)	E	1
			[1531.0]	2042.5	67360	6	4	M1	0.29	1.5(−4)	E	1
			"	"	"	6	4	E2	3.4(−5)	6.8(−7)	E	1
			[1516.4]	2042.5	67990	6	6	M1	0.040	3.1(−5)	E	1
			"	"	"	6	6	E2	0.0039	1.1(−4)	E	1
			[1544.7]	2621.1	67360	4	4	M1	0.20	1.1(−4)	E	1
			"	"	"	4	4	E2	0.0026	5.4(−5)	E	1
			[1529.8]	2621.1	67990	4	6	M1	0.019	1.5(−5)	E	1
			"	"	"	4	6	E2	0.0016	4.8(−5)	E	1
9.		^{4}P - ^{4}P										
			[402790]	18119	18367	6	4	M1	3.4(−4)	3.3	C+	1
			[168990]	18367	18958	4	2	M1	0.0089	3.2	C+	1
10.		^{4}P - ^{2}P										
			[18077]	18119	23649	6	4	M1	0.33	0.29	D	1
			[15908]	18367	24651	4	2	M1	6.4(−4)	1.9(−4)	D	1
			[18927]	18367	23649	4	4	M1	0.17	0.17	D	1
			[17561]	18958	24651	2	2	M1	0.42	0.17	D	1
			[21314]	18958	23649	2	4	M1	0.064	0.092	D	1
11.		^{4}P - ^{2}D2										
			[11135]	18119	27097	6	6	M1	0.10	0.031	E	1
			[9602.7]	18367	28778	4	4	M1	0.022	0.0029	E	1
			[9379.1]	18119	28778	6	4	M1	0.0090	0.0011	E	1
			[11452]	18367	27097	4	6	M1	0.065	0.022	E	1
			[10181]	18958	28778	2	4	M1	0.021	0.0033	E	1
12.		^{4}P - ^{2}F										
			[3921.7]	18367	43859	4	8	E2	0.0037	0.016	E	1
			[4084.0]	18958	43438	2	6	E2	0.0010	0.0041	E	1
			[3883.9]	18119	43859	6	8	M1	6.0(−4)	1.0(−5)	E	1
			"	"	"	6	8	E2	3.1(−4)	0.0013	E	1
			[3987.6]	18367	43438	4	6	M1	1.3(−4)	1.8(−6)	E	1
			"	"	"	4	6	E2	0.0020	0.0072	E	1
			[3948.5]	18119	43438	6	6	M1	0.0050	6.8(−5)	E	1
			"	"	"	6	6	E2	6.8(−5)	2.3(−4)	E	1
13.		^{4}P - ^{2}D1										
			[2004.5]	18119	67990	6	6	M1	1.9	0.0034	E	1
			"	"	"	6	6	E2	0.0015	1.7(−4)	E	1
			[2040.4]	18367	67360	4	4	M1	0.72	9.1(−4)	E	1
			"	"	"	4	4	E2	0.13	0.011	E	1
			[2030.2]	18119	67360	6	4	M1	0.27	3.4(−4)	E	1
			"	"	"	6	4	E2	2.9(−4)	2.4(−5)	E	1
			[2014.5]	18367	67990	4	6	M1	0.30	5.5(−4)	E	1
			"	"	"	4	6	E2	0.25	0.030	E	1
			[2065.4]	18958	67360	2	4	M1	0.19	2.5(−4)	E	1
			"	"	"	2	4	E2	0.063	0.0056	E	1
			[2038.9]	18958	67990	2	6	E2	0.022	0.0028	E	1

Ni IV: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
14.		$^2G - ^2G$										
			[89421]	19830	20948	10	8	M1	0.020	4.2	C+	1
15.		$^2G - ^2H$										
			[14660]	19830	26649	10	12	M1	0.094	0.13	E	1
			[14855]	20948	27678	8	10	M1	0.089	0.11	E	1
			[12739]	19830	27678	10	10	M1	0.31	0.24	E	1
16.		$^2G - ^2F$										
			[4234.7]	19830	43438	10	6	E2	0.037	0.18	E	1
			[4160.5]	19830	43859	10	8	M1	0.22	0.0047	E	1
			"	"	"	10	8	E2	0.093	0.55	E	1
			[4445.2]	20948	43438	8	6	M1	0.18	0.0035	E	1
			"	"	"	8	6	E2	0.078	0.48	E	1
			[4363.5]	20948	43859	8	8	M1	0.33	0.0081	E	1
			"	"	"	8	8	E2	0.0075	0.057	E	1
17.		$^2G - ^2D1$										
			[2075.7]	19830	67990	10	6	E2	8.5	1.2	E	1
			[2153.9]	20948	67360	8	4	E2	8.5	0.94	E	1
			[2125.1]	20948	67990	8	6	M1	0.0045	9.6(−6)	E	1
			"	"	"	8	6	E2	0.60	0.093	E	1
18.		$^2P - ^2P$										
			[99723]	23649	24651	4	2	M1	0.017	1.3	C+	1
19.		$^2P - ^2D2$										
			[28998]	23649	27097	4	6	M1	0.037	0.20	E	1
			[24228]	24651	28778	2	4	M1	0.064	0.13	E	1
			[19492]	23649	28778	4	4	M1	0.37	0.41	E	1
20.		$^2P - ^2F$										
			[4946.7]	23649	43859	4	8	E2	0.011	0.16	E	1
			[5321.6]	24651	43438	2	6	E2	0.010	0.15	E	1
			[5052.0]	23649	43438	4	6	M1	0.0035	1.0(−4)	E	1
			"	"	"	4	6	E2	0.018	0.21	E	1
21.		$^2P - ^2D1$										
			[2306.7]	24651	67990	2	6	E2	0.60	0.14	E	1
			[2254.6]	23649	67990	4	6	M1	0.19	4.8(−4)	E	1
			"	"	"	4	6	E2	2.1	0.44	E	1
			[2340.7]	24651	67360	2	4	M1	0.0055	1.0(−5)	E	1
			"	"	"	2	4	E2	1.2	0.20	E	1
			[2287.0]	23649	67360	4	4	M1	0.052	9.2(−5)	E	1
			"	"	"	4	4	E2	0.66	0.098	E	1
22.		$^2H - ^2H$										
			[97202]	26649	27678	12	10	M1	0.016	5.4	C+	1

Ni IV: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
23.		^{2}H - ^{2}F										
			[5809.1]	26649	43859	12	8	E2	0.059	1.9	E	1
			[6343.5]	27678	43438	10	6	E2	0.036	1.3	E	1
			[6178.4]	27678	43859	10	8	M1	0.0016	1.1(−4)	E	1
			″	″	″	10	8	E2	0.0044	0.19	E	1
24.		^{2}H - ^{2}D1										
			[2479.9]	27678	67990	10	6	E2	0.15	0.050	E	1
25.		^{2}D2 - ^{2}D2										
			[59465]	27097	28778	6	4	M1	0.070	2.2	C+	1
26.		^{2}D2 - ^{2}F										
			[6629.1]	28778	43859	4	8	E2	0.0038	0.23	E	1
			[5964.2]	27097	43859	6	8	M1	0.022	0.0014	E	1
			″	″	″	6	8	E2	0.024	0.86	E	1
			[6819.5]	28778	43438	4	6	M1	0.012	8.5(−4)	E	1
			″	″	″	4	6	E2	0.0089	0.47	E	1
			[6117.9]	27097	43438	6	6	M1	0.045	0.0023	E	1
			″	″	″	6	6	E2	0.0047	0.14	E	1
27.		^{2}D2 - ^{2}D1										
			[2444.6]	27097	67990	6	6	M1	0.0099	3.2(−5)	D	1
			″	″	″	6	6	E2	0.54	0.17	E	1
			[2591.1]	28778	67360	4	4	M1	0.0012	3.1(−6)	D	1
			″	″	″	4	4	E2	0.75	0.21	E	1
			[2482.9]	27097	67360	6	4	M1	1.2	0.0027	D	1
			″	″	″	6	4	E2	0.14	0.031	E	1
			[2549.5]	28778	67990	4	6	M1	0.59	0.0022	D	1
			″	″	″	4	6	E2	0.0036	0.0014	E	1
28.		^{2}F - ^{2}F										
			[237410]	43438	43859	6	8	M1	8.6(−4)	3.4	C+	1
29.		^{2}F - ^{2}D1										
			[4253.9]	43859	67360	8	4	E2	0.051	0.17	E	1
			[4142.8]	43859	67990	8	6	M1	0.45	0.0071	E	1
			″	″	″	8	6	E2	0.42	1.8	E	1
			[4179.0]	43438	67360	6	4	M1	0.45	0.0049	E	1
			″	″	″	6	4	E2	0.41	1.2	E	1
			[4071.8]	43438	67990	6	6	M1	0.86	0.013	E	1
			″	″	″	6	6	E2	0.065	0.26	E	1
30.		^{2}D1 - ^{2}D1										
			[158740]	67360	67990	4	6	M1	0.0027	2.4	C+	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni v

Cr Isoelectronic Sequence

Ground State: $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6\ ^5D_4$

Ionization Energy: 76.06 eV = 613500 cm^{-1}

Forbidden Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
2384.8	5	2904.7	4	3485.6	3	3706.9	2
2436.5	5	2935.0	4	3519.0	3	3726.7	1
2454.0	5	2981.8	4	3540.8	3	3752.7	1
2472.6	5	3006.1	4	3560.1	3	3957.2	1
2486.1	5	3013.7	4	3566.9	3	4053.5	1
2490.7	5	3036.2	4	3588.5	2	4117.2	1
2509.9	5	3380.7	3	3600.2	1		
2514.6	5	3432.6	3	3625.0	2		
2521.7	5	3446.2	3	3674.4	1		

For this spectrum, we have chosen the work of Raassen *et al.*,[1] who calculated M1 transition probabilities for transitions within the $3d^6$ ground configuration. These authors used a single configuration approximation in intermediate coupling. They determined eigenvector components by a parametric fitting of theoretical energy expressions to observed energy levels.

Reference

[1] A. J. J. Raassen, Th. A. M. van Kleef, and B. C. Metsch, Physica **84C**, 133 (1976).

Ni v: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$3d^6$–$3d^6$	^{5}D - ^{3}P2										
			[3957.2]	889.7	26153	7	5	M1	2.3	0.026	E	1
			[3674.4]	1489.9	28698	5	3	M1	2.9	0.016	E	1
			[3600.2]	1871.5	29640	3	1	M1	3.8	0.0066	E	1
			[4053.5]	1489.9	26153	5	5	M1	7(−4)[a]	9(−6)	E	1
			[3726.7]	1871.5	28698	3	3	M1	0.0063	3.6(−5)	E	1
			[4117.2]	1871.5	26153	3	5	M1	0.24	0.0031	E	1
			[3752.7]	2057.6	28698	1	3	M1	0.54	0.0032	E	1
2.		^{5}D - ^{3}H										
			[3625.0]	0.0	27578	9	11	M1	1.4(−4)	2.7(−6)	E	1
			[3706.9]	889.7	27859	7	9	M1	0.029	4.9(−4)	E	1
			[3588.5]	0.0	27859	9	9	M1	0.17	0.0026	E	1

Ni v: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
3.		^{5}D - ^{3}F2										
			[3432.6]	0.0	29124	9	9	M1	2.3	0.031	E	1
			[3485.6]	889.7	29571	7	7	M1	1.3	0.014	E	1
			[3519.0]	1489.9	29899	5	5	M1	0.53	0.0043	E	1
			[3380.7]	0.0	29571	9	7	M1	0.23	0.0023	E	1
			[3446.2]	889.7	29899	7	5	M1	0.15	0.0011	E	1
			[3540.8]	889.7	29124	7	9	M1	0.41	0.0061	E	1
			[3560.1]	1489.9	29571	5	7	M1	0.44	0.0052	E	1
			[3566.9]	1871.5	29899	3	5	M1	0.25	0.0021	E	1
4.		^{5}D - ^{3}G										
			[3006.1]	0.0	33257	9	11	M1	0.0030	3.3(−5)	E	1
			[3013.7]	889.7	34062	7	9	M1	0.025	2.3(−4)	E	1
			[3036.2]	1489.9	34416	5	7	M1	0.018	1.3(−4)	E	1
			[2935.0]	0.0	34062	9	9	M1	0.10	8.4(−4)	E	1
			[2981.8]	889.7	34416	7	7	M1	0.046	3.2(−4)	E	1
			[2904.7]	0.0	34416	9	7	M1	0.0070	4.5(−5)	E	1
5.		^{5}D - ^{3}D										
			[2384.8]	0.0	41920	9	7	M1	1.2	0.0042	D	1
			[2454.0]	889.7	41627	7	5	M1	0.12	3.3(−4)	D	1
			[2486.1]	1489.9	41701	5	3	M1	0.018	3.1(−5)	D	1
			[2436.5]	889.7	41920	7	7	M1	0.34	0.0013	D	1
			[2490.7]	1489.9	41627	5	5	M1	0.57	0.0016	D	1
			[2509.9]	1871.5	41701	3	3	M1	0.76	0.0013	D	1
			[2472.6]	1489.9	41920	5	7	M1	0.22	8.6(−4)	D	1
			[2514.6]	1871.5	41627	3	5	M1	0.44	0.0013	D	1
			[2521.7]	2057.6	41701	1	3	M1	0.62	0.0011	D	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni VII

Ti Isoelectronic Sequence

Ground State: $1s^2 2s^2 2p^6 3s^2 3p^6 3d^4\ ^5D_0$

Ionization Energy: 133 eV = 1070000 cm^{-1}

Forbidden Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
2676.2	4	2916.6	1	3026.2	1	3168.0	1
2685.5	4	2943.1	3	3048.2	3	3221.6	1
2712.5	4	2962.0	1	3054.7	3	3315.6	2
2728.5	4	2983.0	3	3106.2	3	3344.2	2
2749.9	4	2989.3	3	3131.4	3	3355.0	1
2795.0	4	3024.3	3	3140.2	1	3414.3	2

For this spectrum, we selected the work of Henrichs,[1] who calculated magnetic dipole transition probabilities for 24 lines within the $3d^4$ configuration. The calculations were performed in intermediate coupling, and the eigenvector components were determined by a least-squares fitting of theoretically derived energies to observed energy levels.

Reference

[1] H. F. Henrichs, Astron. Astrophys. **44**, 41 (1975).

Ni VII: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$3d^4$–$3d^4$	^{5}D - ^{3}P2 (1F)										
			[3026.2]	1520	34555	7	5	M1	3.1	0.016	E	1
			[3221.6]	804	31836	5	3	M1	4.7	0.017	E	1
			[3355.0]	279	30077	3	1	M1	6.1	0.0085	E	1
			[2962.0]	804	34555	5	5	M1	0.005	2(−5)[a]	E	1
			[3168.0]	279	31836	3	3	M1	8(−4)	1(−6)	E	1
			[2916.6]	279	34555	3	5	M1	0.11	5.1(−4)	E	1
			[3140.2]	0	31836	1	3	M1	0.51	0.0018	E	1
2.		^{5}D - ^{3}H (2F)										
			[3344.2]	2392	32286	9	11	M1	2(−4)	3(−6)	E	1
			[3315.6]	1520	31672	7	9	M1	0.01	1(−4)	E	1
			[3414.3]	2392	31672	9	9	M1	0.05	7(−4)	E	1
3.		^{5}D - ^{3}F2 (3F)										
			[3106.2]	2392	34576	9	9	M1	3.2	0.032	E	1
			[3048.2]	1520	34317	7	7	M1	1.9	0.014	E	1
			[2989.3]	804	34247	5	5	M1	0.87	0.0043	E	1
			[3131.4]	2392	34317	9	7	M1	0.26	0.0021	E	1
			[3054.7]	1520	34247	7	5	M1	0.15	7.9(−4)	E	1
			[3024.3]	1520	34576	7	9	M1	0.70	0.0065	E	1
			[2983.0]	804	34317	5	7	M1	0.75	0.0052	E	1
			[2943.1]	279	34247	3	5	M1	0.48	0.0023	E	1
4.		^{5}D - ^{3}G										
			[2712.5]	2392	39247	9	11	M1	0.004	3(−5)	E	1
			[2685.5]	1520	38746	7	9	M1	0.06	4(−4)	E	1
			[2676.2]	804	38160	5	7	M1	0.07	3(−4)	E	1
			[2749.9]	2392	38746	9	9	M1	0.20	0.0014	E	1
			[2728.5]	1520	38160	7	7	M1	0.16	8.4(−4)	E	1
			[2795.0]	2392	38160	9	7	M1	0.02	1(−4)	E	1

[a] The number in parentheses following the tabulated value indicates the power of ten by which the value has to be multiplied.

Ni IX

Ca Isoelectronic Sequence

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

Ionization Energy: 193 eV = 1560000 cm^{-1}

Allowed Transitions

For this spectrum, we have chosen the data of Fawcett, Ridgeley, and Ekberg.[1] These authors experimentally observed and classified sixteen Ni IX lines in the $3p^6 3d^2$–$3p^5 3d^3$ transition array. For fifteen of these lines, Fawcett *et al.* calculated oscillator strengths by the Hartree-XR method (self-consistent-field calculations with exchange, configuration interaction, and relativistic effects). We estimate these data to be accurate within fifty percent.

Reference

[1] B. C. Fawcett, A. Ridgeley, and J. O. Ekberg, Phys. Scr. **21**, 155 (1980).

Ni 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.	$3p^6 3d^2$–$3p^5(^2P^\circ)3d^3(^2H)$	^3F - $^3G^\circ$											
			165.436	4070	608530	9	11	970	0.49	2.4	0.64	D	1
			166.079	1880	604000	7	9	870	0.46	1.8	0.51	D	1
			166.306	0	601300	5	7	430	0.25	0.69	0.10	D	1
2.		^1G - $^1G^\circ$	147.013			9	9	4100	1.3	5.8	1.08	D	1
3.	$3p^6 3d^2$–$3p^5(^2P^\circ)3d^3(^2G)$	^1G - $^1H^\circ$	165.436			9	11	730	0.37	1.8	0.52	D	1
4.	$3p^6 3d^2$–$3p^5(^2P^\circ)3d^3(^4F)$	^3F - $^3F^\circ$											
			150.836	4070	667080	9	9	2800	0.95	4.2	0.93	D	1
			151.022	1880	664080	7	7	2200	0.75	2.6	0.72	D	1
			151.281	0	661050	5	5	2300	0.80	2.0	0.60	D	1
			150.32	1880	667080	7	9	180	0.077	0.27	−0.27	D	1
			150.574	0	664080	5	7	180	0.083	0.21	−0.38	D	1
5.		^3F - $^3D^\circ$											
			141.356	4070	711510	9	7	2600	0.61	2.6	0.74	D	1
			140.917	1880	711520	7	5	2600	0.56	1.8	0.59	D	1
			141.002	0	709210	5	3	1900	0.33	0.77	0.22	D	1
			140.917	1880	711510	7	7	120	0.034	0.11	−0.62	D	1
			140.542	0	711520	5	5	230	0.068	0.16	−0.47	D	1

Ni IX

Forbidden Transitions

For this ion, we selected the work of Warner and Kirkpatrick,[1] who used a single-configuration approximation and calculated radial integrals with scaled Thomas-Fermi wavefunctions. We have tabulated M1 and E2 transition probabilities for 5 lines within the $3d^2$ configuration. Warner and Kirkpatrick also calculated electric quadrupole A-values for transitions within the $3d^2$–$3d4s$ transition array. We have omitted these lines, however, since accurate experimental energy levels within the $3d4s$ configuration were unavailable. For lines within the $3d^2\,{}^3$F term, we have recalculated Warner and Kirkpatrick's A-values by using observed energy-level data instead of theoretically derived values. Due to the lack of reliable observational material, we did not provide energy level values for the ^{1}D, ^{3}P, and ^{1}G terms.

Reference

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

Ni IX: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$3d^2$–$3d^2$	^{3}F - ^{3}F										
			[45650]	1880	4070	7	9	M1	0.21	6.7	C	1*n*
			[53180]	0	1880	5	7	M1	0.17	6.6	C	1*n*
2.		^{1}D - ^{3}P										
			[19010]			5	5	M1	0.51	0.65	E	1
3.		^{1}D - ^{1}G	[7141.9]			5	9	E2	8.1(−4)[a]	0.081	E	1
4.		^{3}P - ^{1}G										
			[11440]			5	9	E2	1.9(−5)	0.020	E	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XI

Ar Isoelectronic Sequence

Ground State: $1s^22s^22p^63s^23p^6\,{}^1S_0$

Ionization Energy: 321.0 eV = 2589000 cm^{-1}

Allowed Transitions

Line strengths for the $3p^6$–$3p^53d$ resonance transitions of this argon-like ion were taken from the superposition-of-configurations (SOC) calculations of Weiss,[1] which are expected to be fairly accurate. The remainder of the oscillator strengths were interpolated from the Dirac-Hartree-Fock data of Lin *et al.*,[2] who included correlation only in the lower state.

References

[1]A. W. Weiss, private communication.
[2]D. L. Lin, W. Fielder, Jr., and L. Armstrong, Jr., Phys. Rev. A **16**, 589 (1977).

Ni 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.	$3p^6$–$3p^5 3d$	^{1}S - ^{3}P°											
			211.428	0	472974	1	3	0.14	2.9(−4)[a]	2.0(−4)	−3.54	E	1
2.		^{1}S - ^{3}D°											
			186.976	0	534828	1	3	4.3	0.0068	0.0042	−2.17	E	1
3.		^{1}S - ^{1}P°	148.374	0	673973	1	3	2340	2.31	1.13	0.364	C+	1
4.	$3p^6$–$3p^5(^2P^\circ_{3/2})4s$	^{1}S - $(^3/_2,^1/_2)^\circ$											
			78.744	0	1269900	1	3	610	0.17	0.044	−0.77	D	*interp.*
5.	$3p^6$–$3p^5(^2P^\circ_{1/2})4s$	^{1}S - $(^1/_2,^1/_2)^\circ$											
			77.393	0	1292100	1	3	850	0.23	0.059	−0.64	D	*interp.*
6.	$3p^6$–$3p^5(^2P^\circ_{3/2})4d$	^{1}S - $^2[^3/_2]^\circ$											
			63.641	0	1571300	1	3	2500	0.45	0.094	−0.35	D	*interp.*
7.	$3p^6$–$3p^5(^2P^\circ_{1/2})4d$	^{1}S - $^2[^3/_2]^\circ$											
			62.730	0	1594100	1	3	1200	0.22	0.045	−0.66	D	*interp.*

[a] The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XII

Cl Isoelectronic Sequence

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

Ionization Energy: 352 eV = 2840000 cm^{-1}

Allowed Transitions

Line strengths for transitions of the arrays $3s^2 3p^5$–$3s 3p^6$ and $3p^5$–$3p^4 3d$ are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Huang *et al.*[1] These relativistic calculations include a perturbative treatment of the Breit interaction and the Lamb shift. Configuration mixing was limited to some configurations within the $n=3$ complex. Those configurations which were assumed to lie far above $3p^5$ or $3p^4 3d$ in energy were excluded, as were all configurations outside the complex.

According to the semi-empirical HX (Hartree-Fock with statistical allowance for exchange) calculations of Bromage *et al.*[2] for Fe X, some levels of the $3p^4 3d$ configuration are strongly mixed in the *LS* basis, and in a few cases the *LS* designations given in Ref. 2 differed from those of Huang *et al*. The level designations used in this compilation are in accord with the theoretical results of Refs. 1 and 2 for Fe X. Percentage compositions published by Bromage[3] for the levels of the $3p^4 3d$ configuration in V VII and Ni XII indicate that the designations for the iron ion are appropriate for the neighboring ions of the chlorine isoelectronic sequence. Transitions involving highly mixed levels have been excluded, as have the very weak transitions.

The calculated wavelengths of Huang *et al.* differ appreciably from the observed ones found in the literature. Thus the available experimentally determined wavelengths were used in making the conversion from line strengths to f- and A-values. (Otherwise, the calculated wavelengths of Huang *et al.* were used, but they provide only a rough idea of the spectral-line positions.) Bromage *et al.* indicate that it was necessary to scale down some configuration-interaction parameters by a greater amount than usual in order to fit their calculated energy levels for Fe X to the experimental data. This could be an indication that neglecting to take configuration interaction into account on a larger scale yields significant errors in the energy levels and/or f-values.

References

[1]K.-N. Huang, Y.-K. Kim, K. T. Cheng, and J. P. Desclaux, At. Data Nucl. Data Tables **28**, 355 (1983).
[2]G. E. Bromage, R. D. Cowan, and B. C. Fawcett, Phys. Scr. **15**, 177 (1977).
[3]G. E. Bromage, Astron. Astrophys., Suppl. Ser. **41**, 79 (1980).

Ni 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.	$3s^23p^5$–$3s3p^6$	$^2P^\circ$ – ^2S	*302.35*	*7877*	338615	6	2	73	0.0332	0.198	−0.70	C−	1
			295.321	0	338615	4	2	52	0.0337	0.131	−0.87	C−	1
			317.475	23630	338615	2	2	21	0.032	0.067	−1.19	C−	1
2.	$3p^5$–$3p^4(^3P)3d$	$^2P^\circ$ – ^4F											
			[193]			4	6	0.66	5.5(−4)[a]	0.0014	−2.66	E	1
3.		$^2P^\circ$ – ^4P											
			[189]			4	4	0.49	2.6(−4)	6.5(−4)	−2.98	E	1
			[201]			2	2	1.2	7.2(−4)	9.5(−4)	−2.84	E	1
			[192]			4	2	5.3	0.0015	0.0037	−2.23	E	1
4.		$^2P^\circ$ – ^2F											
			[182]			4	6	0.27	2.0(−4)	4.8(−4)	−3.10	E	1
5.		$^2P^\circ$ – ^2D	*152.20*	*7877*	*664890*	6	10	2070	1.20	3.61	0.86	C−	1
			152.153	0	657233	4	6	2080	1.08	2.17	0.64	C	1
			153.174	23630	676375	2	4	1990	1.40	1.41	0.447	C	1
			147.847	0	676375	4	4	41	0.013	0.026	−1.27	D	1
6.	$3p^5$–$3p^4(^1D)3d$	$^2P^\circ$ – ^2F											
			[172]			4	6	2.6	0.0017	0.0039	−2.16	E	1
7.		$^2P^\circ$ – ^2S	*162.61*	*7877*	622843	6	2	1900	0.25	0.79	0.17	C−	1
			160.554	0	622843	4	2	1400	0.27	0.58	0.04	C−	1
			166.88	23630	622843	2	2	453	0.189	0.208	−0.422	C−	1
8.	$3p^5$–$3p^4(^1S)3d$	$^2P^\circ$ – ^2D											
			[167]			2	4	14	0.012	0.013	−1.63	D	1
			[161]			4	4	5.7	0.0022	0.0047	−2.05	E	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XII

Forbidden Transitions

Line strengths for the magnetic dipole and electric quadrupole contributions to the transition between the two levels of the $3p^5$ configuration are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Huang *et al.*[1] These relativistic calculations included a perturbative treatment of the Breit interaction and the Lamb shift. Allowance for mixing among odd-parity configurations was limited to the set $3s^23p^5$, $3s3p^53d$, $3p^53d^2$, and $3s^23p^33d^2$. The strength of the electric quadrupole transition as defined in Ref. 1 was multiplied by the factor $^2/_3$ which is needed to bring this value into conformance with the definition of quadrupole strengths used in the NBS tables.

Reference

[1]K.-N. Huang, Y.-K. Kim, K. T. Cheng, and J. P. Desclaux, At. Data Nucl. Data Tables **28**, 355 (1983).

Ni XII: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$3p^5$–$3p^5$	$^2P^\circ$ – $^2P^\circ$										
			4231.4	0	23630	4	2	M1	237	1.33	B	1
			"	"	"	4	2	E2	0.080	0.13	D–	1

Ni XIII

S Isoelectronic Sequence

Ground State: $1s^22s^22p^63s^23p^4\ ^3P_2$

Ionization Energy: 384 eV = 3100000 cm^{-1}

Allowed Transitions

Oscillator strengths are tabulated for a few transitions of the arrays $3s^23p^4$–$3s3p^5$ and $3p^4$–$3p^33d$. These are the results of the Hartree-XR (Hartree-Fock with relativistic effects and statistical allowance for exchange) calculations of Bromage.[1] The percentage compositions are in good agreement with those of Bromage *et al.*[2] for Fe XI. The term designations used here are in accord with the results of these two sources. Transitions involving levels of low purity in *LS* coupling are omitted, as are very weak transitions.

References

[1]G. E. Bromage, Astron. Astrophys., Suppl. Ser. **41**, 79 (1980).
[2]G. E. Bromage, R. D. Cowan, and B. C. Fawcett, Phys. Scr. **15**, 177 (1977).

Ni XIII: 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.	$3s^23p^4$–$3s3p^5$	^{3}P – ^{3}P°											
			302.844	0	330203	5	5	29	0.040	0.20	−0.70	D	1
2.		^{1}D – ^{1}P°	267.468	47033	420910	5	3	100	0.066	0.29	−0.48	D	1
3.	$3p^4$–$3p^3$(^{2}D°)$3d$	^{3}P – ^{3}P°											
			164.15	0	609200	5	5	1300	0.52	1.4	0.41	D	1
			[165.2]			3	1	1700	0.23	0.38	−0.16	D	1
			[169.59]	19542	609200	3	5	210	0.15	0.25	−0.35	D	1
4.		^{3}P – ^{1}D°											
			[154.69]	19542	666000	3	5	150	0.087	0.13	−0.58	D	1
5.		^{1}D – ^{1}D°	161.56	47033	666000	5	5	1400	0.54	1.4	0.43	C	1
6.		^{1}D – ^{1}F°	157.55	47033	681750	5	7	1920	1.00	2.59	0.70	C	1
7.	$3p^4$–$3p^3$(^{2}P°)$3d$	^{3}P – ^{3}P°											
			[174.0]			5	5	88	0.040	0.11	−0.70	D	1
8.		^{1}S – ^{1}P°	161.78	97836	715960	1	3	1640	1.93	1.03	0.286	C	1

Ni XIII

Forbidden Transitions

Transition probabilities for magnetic dipole and electric quadrupole lines within the $3p^4$ configuration are the results of the scaled Thomas-Fermi calculations of Mendoza and Zeippen.[1] They included a number of correlation configurations in their basis set and introduced Breit-Pauli relativistic corrections as a perturbation to the nonrelativistic Hamiltonian.

Reference

[1]C. Mendoza and C. J. Zeippen, Mon. Not. R. Astron. Soc. **202**, 981 (1983).

Ni XIII: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$3p^4$–$3p^4$	^3P - ^3P										
			5116.03	0	19542	5	3	M1	157	2.34	C+	1
			"	"	"	5	3	E2	0.019	0.12	D−	1
			[201000]	19542	20040	3	1	M1	0.0063	1.9	D+	1
			[4988.6]	0	20040	5	1	E2	0.036	0.066	E	1
2.		^3P - ^1D										
			2125.50	0	47033	5	5	M1	260	0.46	E	1
			"	"	"	5	5	E2	0.41	0.053	E	1
			[3636.5]	19542	47033	3	5	M1	18	0.16	E	1
			"	"	"	3	5	E2	0.0044	0.0083	E	1
			[3703.6]	20040	47033	1	5	E2	0.0034	0.0071	E	1
3.		^3P - ^1S										
			[1022.1]	0	97836	5	1	E2	3.1	0.0021	E	1
			1277.23	19542	97836	3	1	M1	2500	0.19	E	1
4.		^1D - ^1S	[1968.4]	47033	97836	5	1	E2	12	0.21	D−	1

Ni XIV

P Isoelectronic Sequence

Ground State: $1s^22s^22p^63s^23p^3\ ^4S^\circ_{3/2}$

Ionization Energy: $430\ eV = 3470000\ cm^{-1}$

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
157	16	172.16	15	191	14	292.399	3
157.62	13	172.80	15	192	5,12	295.55	3
159	16	177.28	18	196	12	297	1
164.13	10	178	17	198	12	302.264	1
168	18	181	17	213	8	316.113	1
168.12	6	182.14	9	216	8	324	4
169.69	6	185.96	9	225	7	332	4
169.88	15	186.66	9	239	11	336	4
170.50	15	188.69	9	285.88	3	369.58	2
171.37	6	189	5	288.894	3		

Line strengths for transitions of the arrays $3s^23p^3$–$3s3p^4$ and $3p^3$–$3p^23d$ are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Huang.[1] These relativistic calculations included a perturbative treatment of the Breit interaction and the Lamb shift. Allowance for configuration mixing was limited to configurations within the $n=3$ complex having no more than two electrons in the $3d$ subshell.

Huang published neither an energy-level diagram nor percentage compositions for levels of the $3s^23p^3$, $3s3p^4$, and $3s^23p^23d$ configurations in Ni XIV. We have used the percentages given by Bromage *et al.*[2] for Fe XII, and by Bromage[3] for V IX and Ni XIV, as a guide to naming the levels; their values resulted from Hartree-Fock calculations with relativistic effects and statistical allowance for exchange (HXR), and incorporated correlation effects due to a few configurations within the $n=3$ complex. Whenever a term designation of a level in Fe XII, as given in Ref. 1, is different from that indicated in Ref. 2, all transitions involving the corresponding level in Ni XIV are omitted from this compilation.

Transitions involving levels which are indicated to be of low purity in LS coupling are omitted here. Lines which are characterized by very small f-values are assigned lower accuracy ratings; the weakest lines have been excluded.

References

[1] K.-N. Huang, At. Data Nucl. Data Tables **30**, 313 (1984).

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

[3] G. E. Bromage, Astron. Astrophys., Suppl. Ser. **41**, 79 (1980).

Ni XIV: 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.	$3s^23p^3$–$3s3p^4$	$^4S°$ - ^4P	*308*			4	12	21	0.091	0.37	−0.44	D	1
			316.113	0	316343	4	6	20	0.046	0.19	−0.74	D	1
			302.264	0	330837	4	4	22	0.030	0.12	−0.92	D	1
			[297]			4	2	24	0.016	0.063	−1.19	D	1
2.		$^2D°$ - ^4P											
			[369.58]	45769	316343	4	6	0.34	0.0010	0.0051	−2.38	E	1
3.		$^2D°$ - ^2D	*290.99*	*50449*	*394107*	10	10	40	0.051	0.49	−0.29	D−	1
			292.399	53569	395567	6	6	36	0.047	0.27	−0.55	D	1
			288.894	45769	391917	4	4	46	0.058	0.22	−0.64	D	1
			[295.55]	53569	391917	6	4	0.16	1.4(−4)[a]	8.3(−4)	−3.07	E	1
			[285.88]	45769	395567	4	6	0.11	2.0(−4)	7.7(−4)	−3.09	E	1
4.		$^2P°$ - ^2D	*330*			6	10	6.2	0.017	0.11	−0.99	E	1
			[332]			4	6	7.8	0.019	0.084	−1.11	D	1
			[324]			2	4	3.7	0.012	0.025	−1.63	D	1
			[336]			4	4	0.44	7.5(−4)	0.0033	−2.53	E	1
5.	$3p^3$–$3p^2(^3P)3d$	$^4S°$ - ^4D											
			[189]			4	6	6.0	0.0048	0.012	−1.71	E	1
			[192]			4	4	5.4	0.0030	0.0075	−1.93	E	1
6.		$^4S°$ - ^4P	*170.26*	0	*587340*	4	12	960	1.2	2.8	0.70	D	1
			171.37	0	583530	4	6	940	0.62	1.4	0.39	D	1
			169.69	0	589310	4	4	980	0.43	0.95	0.23	D	1
			168.12	0	594810	4	2	850	0.18	0.40	−0.14	D	1
7.		$^2D°$ - ^4F											
			[225]			4	4	3.2	0.0025	0.0073	−2.01	E	1

Ni 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
8.		$^2D^\circ - {}^4D$											
			[213]			6	6	1.9	0.0013	0.0055	−2.11	E	1
			[216]			6	4	6.5	0.0030	0.013	−1.74	E	1
			[213]			4	2	8.1	0.0027	0.0077	−1.96	E	1
9.		$^2D^\circ - {}^4P$											
			[188.69]	53569	583530	6	6	19	0.010	0.038	−1.21	E	1
			[186.66]	53569	589310	6	4	9.3	0.0033	0.012	−1.71	E	1
			[182.14]	45769	594810	4	2	150	0.037	0.089	−0.83	E	1
			[185.96]	45769	583530	4	6	10	0.0078	0.019	−1.51	E	1
10.		$^2D^\circ - {}^2F$											
			164.13	53569	662840	6	8	1200	0.65	2.1	0.59	E	1
11.		$^2P^\circ - {}^4D$											
			[239]			4	2	4.7	0.0020	0.0064	−2.09	E	1
12.		$^2P^\circ - {}^4P$											
			[198]			4	4	4.0	0.0023	0.0061	−2.03	E	1
			[192]			2	2	29	0.016	0.020	−1.50	E	1
			[196]			4	2	38	0.011	0.028	−1.36	E	1
13.	$3p^3$–$3p^2(^1D)3d$	$^4S^\circ - {}^2D$											
			[157.62]	0	634430	4	6	2.3	0.0013	0.0027	−2.28	E	1
14.		$^2D^\circ - {}^2G$											
			[191]			6	8	5.1	0.0037	0.014	−1.65	E	1
15.		$^2D^\circ - {}^2D$	*171.49*	*50449*	*633570*	10	10	640	0.28	1.6	0.45	D	1
			172.16	53569	634430	6	6	470	0.21	0.71	0.10	D	1
			170.50	45769	632280	4	4	710	0.31	0.69	0.09	D	1
			[172.80]	53569	632280	6	4	140	0.041	0.14	−0.61	D	1
			[169.88]	45769	634430	4	6	17	0.011	0.025	−1.35	D	1
16.		$^2D^\circ - {}^2P$											
			[159]			6	4	8.4	0.0021	0.0067	−1.89	E	1
			[157]			4	4	22	0.0082	0.017	−1.48	E	1
17.		$^2P^\circ - {}^2D$	*180*			6	10	83	0.068	0.24	−0.39	E	1
			[181]			4	6	74	0.055	0.13	−0.66	D	1
			[178]			2	4	89	0.084	0.099	−0.77	D	1
			[181]			4	4	7.4	0.0037	0.0087	−1.84	E	1
18.		$^2P^\circ - {}^2P$											
			177.28			4	4	560	0.27	0.62	0.03	E	1
			[168]			2	4	240	0.20	0.22	−0.40	E	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XIV

Forbidden Transitions

Line strengths for magnetic dipole and electric quadrupole transitions within the $3p^3$ configuration are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Huang.[1] These relativistic calculations included a perturbative treatment of the Breit interaction and the Lamb shift. Allowance for configuration mixing was limited to configurations within the $n=3$ complex having no more than two electrons in the $3d$ subshell. Strengths of electric quadrupole transitions as defined in Ref. 1 were multiplied by the factor $^2/_3$ which is needed to bring these values into conformance with the definition of quadrupole strengths used in the NBS tables. We have excluded from this compilation the electric quadrupole contributions to the $^4S^\circ_{3/2}-{}^2P^\circ_{3/2}$ and $^4S^\circ_{3/2}-{}^2P^\circ_{1/2}$ transitions, since their strengths are very small and thus subject to considerable uncertainty.

Data for these same transitions calculated by Mendoza and Zeippen[2] with the scaled Thomas-Fermi approach with allowance for correlation are generally in very good agreement with the results of Ref. 1. These latter calculations treated relativistic effects by introducing Breit-Pauli corrections as a perturbation to the nonrelativistic Hamiltonian.

References

[1] K.-N. Huang, At. Data Nucl. Data Tables **30**, 313 (1984).

[2] C. Mendoza and C. J. Zeippen, Mon. Not. R. Astron. Soc. **198**, 127 (1982).

Ni XIV: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$3p^3$–$3p^3$	$^4S^\circ - {}^2D^\circ$										
			1866.75	0	53569	4	6	M1	7.6	0.011	D	1
			"	"	"	4	6	E2	0.23	0.019	E	1
			2184.20	0	45769	4	4	M1	160	0.25	C	1
			"	"	"	4	4	E2	0.077	0.0091	E	1
2.		$^4S^\circ - {}^2P^\circ$										
			[1030]			4	4	M1	740	0.12	C	1
			[1180]			4	2	M1	460	0.056	D	1
3.		$^2D^\circ - {}^2D^\circ$										
			[12817]	45769	53569	4	6	M1	4.27	2.00	C+	1
			"	"	"	4	6	E2	5.3(−5)[a]	0.066	E	1
4.		$^2D^\circ - {}^2P^\circ$										
			[3170]			6	2	E2	0.34	0.13	D−	1
			[2320]			6	4	M1	210	0.39	C	1
			"			6	4	E2	2.3	0.37	D−	1
			[2540]			4	2	M1	160	0.19	C	1
			"			4	2	E2	1.4	0.17	D−	1
			[1960]			4	4	M1	600	0.67	C	1
			"			4	4	E2	1.3	0.087	E	1
5.		$^2P^\circ - {}^2P^\circ$										
			[8620]			2	4	M1	11.4	1.08	C+	1
			"			2	4	E2	2.6(−4)	0.029	E	1

[a] The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XV

Si Isoelectronic Sequence

Ground State: $1s^2 2s^2 2p^6 3s^2 3p^2\ ^3P_0$

Ionization Energy: 464 eV = 3740000 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
50.249	14	179.28	7	258	2	311.756	1
60.890	15	181	13	268	2	312.03	1
64.635	16	191.45	11	269	2	319.063	1
149	9	206	5	269.05	2	324.35	1
163.64	8	208	5	278	2	324.65	1
173.73	12	212	5	278.386	2	359.78	3
175	6	231	10	298.15	1	367	4

Line strengths for transitions of the arrays $3s^23p^2$–$3s3p^3$ and $3p^2$–$3p3d$ are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Huang.[1] These relativistic calculations included a perturbative treatment of the Breit interaction and the Lamb shift. Allowance for configuration mixing included all configurations within the $n = 3$ complex.

Huang published neither an energy-level diagram nor percentage compositions for levels of the $3s^23p^2$, $3s3p^3$, and $3s^23p3d$ configurations in Ni XV. We have used the percentages given by Bromage *et al.*[2] for Fe XIII, and by Bromage[3] for V X and Ni XV, as a guide to naming the levels; their values resulted from Hartree-Fock calculations with relativistic effects and statistical allowance for exchange (HXR), and incorporated correlation effects due to a partial set of configurations within the $n = 3$ complex. Whenever the term designation of a level in Fe XIII, as given in Ref. 1, is different from that indicated in Ref. 2, all transitions involving the corresponding level in Ni XV are omitted from this compilation.

A few f-values for transitions to configurations in which one electron occupies the $n = 4$ shell were interpolated from the results of Kastner *et al.*[4] for Fe XIII and Zn XVII, which were computed by a multiconfiguration scaled Thomas-Fermi approach.

Transitions involving levels which are indicated to be of low purity in *LS* coupling are omitted here. Lines which are characterized by very small f-values are assigned lower accuracy ratings; the weakest lines have been excluded.

References

[1] K.-N. Huang, At. Data Nucl. Data Tables **32**, 503 (1985).

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

[3] G. E. Bromage, Astron. Astrophys., Suppl. Ser. **41**, 79 (1980).

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

Ni XV: 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.	$3s^23p^2$–$3s3p^3$	^3P - $^3D^\circ$	*314.63*	*20181*	*338010*	9	15	18	0.044	0.41	−0.40	E	1
			319.063	27376	340794	5	7	15	0.032	0.17	−0.79	D	1
			311.756	14917	335681	3	5	20	0.049	0.15	−0.84	D	1
			298.15	0	335400	1	3	19	0.074	0.073	−1.13	D	1
			[324.35]	27376	335681	5	5	0.21	3.4(−4)[a]	0.0018	−2.77	E	1
			[312.03]	14917	335400	3	3	3.3	0.0049	0.015	−1.84	D−	1
			[324.65]	27376	335400	5	3	0.20	1.9(−4)	0.0010	−3.03	E	1

Ni XV: Allowed transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
2.		^{3}P - ^{3}P°	*272*			9	9	50	0.056	0.45	−0.30	D	1
			278.386	27376	386589	5	5	43	0.050	0.23	−0.60	D	1
			[268]			3	3	28	0.030	0.079	−1.05	D	1
			[278]			5	3	9.4	0.0066	0.030	−1.48	D−	1
			[269]			3	1	53	0.019	0.051	−1.24	C−	1
			[269.05]	14917	386589	3	5	3.7	0.0068	0.018	−1.69	D−	1
			[258]			1	3	16	0.047	0.040	−1.33	D	1
3.		^{1}D - ^{3}D°											
			[359.78]	62849	340794	5	7	1.7	0.0047	0.028	−1.63	E	1
4.		^{1}S - ^{3}P°											
			[367]			1	3	0.41	0.0025	0.0030	−2.61	E	1
5.	$3p^2$–$3p3d$	^{3}P - ^{3}F°											
			[208]			5	7	6.1	0.0055	0.019	−1.56	E	1
			[206]			3	5	2.0	0.0022	0.0044	−2.19	E	1
			[212]			5	5	3.1	0.0021	0.0074	−1.97	E	1
6.		^{3}P - ^{3}P°											
			[175]			3	1	570	0.087	0.15	−0.58	D	1
7.		^{3}P - ^{3}D°											
			179.28	27376	585170	5	7	750	0.51	1.5	0.41	D	1
8.		^{3}P - ^{1}F°											
			[163.64]	27376	638460	5	7	56	0.032	0.085	−0.80	E	1
9.		^{3}P - ^{1}P°											
			[149]			1	3	7.1	0.0071	0.0035	−2.15	E	1
10.		^{1}D - ^{3}F°											
			[231]			5	5	5.9	0.0047	0.018	−1.63	E	1
11.		^{1}D - ^{3}D°											
			[191.45]	62849	585170	5	7	41	0.032	0.10	−0.80	E	1
12.		^{1}D - ^{1}F°	173.73	62849	638460	5	7	760	0.479	1.37	0.379	C	1
13.		^{1}S - ^{1}P°	[181]			1	3	680	1.0	0.60	0.00	D	1
14.	$3p^2$–$3p4d$	^{1}D - ^{1}F°	50.249	62849	2052900	5	7	6800	0.36	0.30	0.26	D	*interp.*
15.	$3p3d$–$3p4f$	^{3}F° - ^{3}G											
			60.890			9	11	1.0(+4)[a]	0.71	1.3	0.81	D	*interp.*
16.		^{1}F° - ^{1}G	64.635	638460	2185600	7	9	9600	0.77	1.1	0.73	E	*interp.*

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XV

Forbidden Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
335.94	12	720	6	1954	8	2818.2	2
401	10	730	6	1964.3	8	3651.8	1
409.20	11	1030	3	2000	8	6701.7	1
530	9	1100	5	2040	4	8024.1	1
550	9	1190	3	2085.61	2	18500	7
580	9	1200	5	2183.0	8	19550	7
620	9	1900	8	2200	8	360000	7

Line strengths for magnetic dipole and electric quadrupole transitions are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Huang.[1] These relativistic calculations included a perturbative treatment of the Breit interaction and the Lamb shift. Allowance for configuration interaction encompassed all configurations within the $n=3$ complex. Huang calculated line strengths for transitions within the $3p^2$ configuration, as well as for transitions between pairs of odd-parity levels whose lower level is one of the four lowest-lying odd-parity levels in the $n=3$ complex. Transitions involving odd-parity levels which are indicated by Bromage *et al.*[2] (for Fe XIII) or Bromage[3] (for V X and Ni XV) to be of low purity in *LS* coupling in Fe-group species are omitted here, as are lines whose strengths are very small. Strengths of electric quadrupole transitions as reported in Ref. 1 were multiplied by the factor 2/3 which is needed to bring these values into conformance with the definition of quadrupole strengths used in the NBS tables.

References

[1] K.-N. Huang, At. Data Nucl. Data Tables **32**, 503 (1985).
[2] G. E. Bromage, R. D. Cowan, and B. C. Fawcett, Mon. Not. R. Astron. Soc. **183**, 19 (1978).
[3] G. E. Bromage, Astron. Astrophys., Suppl. Ser. **41**, 79 (1980).

Ni XV: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$3p^2$–$3p^2$	^{3}P - ^{3}P										
			8024.1	14917	27376	3	5	M1	22.7	2.17	C+	1
			″	″	″	3	5	E2	9.9(−4)[a]	0.098	E	1
			6701.7	0	14917	1	3	M1	56.5	1.89	C+	1
			[3651.8]	0	27376	1	5	E2	0.030	0.058	E	1
2.		^{3}P - ^{1}D										
			[2818.2]	27376	62849	5	5	M1	200	0.85	E	1
			″	″	″	5	5	E2	0.17	0.091	E	1
			2085.61	14917	62849	3	5	M1	200	0.33	E	1
			″	″	″	3	5	E2	0.12	0.014	E	1
3.		^{3}P - ^{1}S										
			[1190]			5	1	E2	9.2	0.013	E	1
			[1030]			3	1	M1	2500	0.10	E	1
4.		^{1}D - ^{1}S	[2040]			5	1	E2	9.0	0.19	D−	1

Ni XV: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
5.	$3s3p^3$–$3s3p^3$	$^5S^\circ$ - $^3D^\circ$										
			[1100]			5	7	M1	6.4	0.0022	E	1
			″	″	″	5	7	E2	1.1	0.0073	E	1
			[1200]			5	5	M1	130	0.043	E	1
			″	″	″	5	5	E2	0.65	0.0048	E	1
			[1200]			5	3	M1	43	0.0083	E	1
			″	″	″	5	3	E2	0.27	0.0012	E	1
6.		$^5S^\circ$ - $^3P^\circ$										
			[720]			5	5	M1	1400	0.097	E	1
			[730]			5	3	M1	830	0.036	E	1
7.		$^3D^\circ$ - $^3D^\circ$										
			[19550]	335681	340794	5	7	M1	2.20	4.27	C−	1
			″	″	″	5	7	E2	3.4(−6)	0.041	E	1
			[360000]	335400	335681	3	5	M1	5.0(−4)	4.3	E	1
			[18500]	335400	340794	3	7	E2	1.3(−6)	0.012	E	1
8.		$^3D^\circ$ - $^3P^\circ$										
			[2200]			7	3	E2	2.2	0.20	D−	1
			[2000]			5	1	E2	6.8	0.13	D−	1
			[2183.0]	340794	386589	7	5	M1	190	0.37	E	1
			″	″	″	7	5	E2	2.3	0.34	D−	1
			[2000]			5	3	E2	0.54	0.031	E	1
			[2000]			3	1	M1	330	0.099	E	1
			[1964.3]	335681	386589	5	5	M1	180	0.25	E	1
			″	″	″	5	5	E2	2.1	0.18	D−	1
			[1900]			3	3	M1	380	0.29	E	1
			″	″	″	3	3	E2	3.6	0.16	D−	1
			[1954]	335400	386589	3	5	M1	51	0.070	E	1
			″	″	″	3	5	E2	0.86	0.073	E	1
9.	$3s3p^3$–$3s^23p3d$	$^3D^\circ$ - $^3F^\circ$										
			[530]			5	9	E2	23	0.0051	E	1
			[580]			3	7	E2	8.4	0.0023	E	1
			[550]			7	9	M1	1100	0.059	E	1
			[620]			5	5	M1	45	0.0020	E	1
10.		$^3D^\circ$ - $^3P^\circ$										
			[401]			5	1	E2	440	0.0027	E	1
11.		$^3D^\circ$ - $^3D^\circ$										
			[409.20]	340794	585170	7	7	M1	84	0.0015	E	1
12.		$^3D^\circ$ - $^1F^\circ$										
			[335.94]	340794	638460	7	7	M1	130	0.0013	E	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XVI

Al Isoelectronic Sequence

Ground State: $1s^22s^22p^63s^23p\ ^2P^{\circ}_{1/2}$

Ionization Energy: 499 eV = 4020000 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
152	25,34	194	22,31,41,42	228	27	266	16
160	37	194.04	20	231	19	288.165	2
161	37	195.27	20	232.475	4	297	11
162	36,37	196	41	233	18,19	299	9,15
163	36	197	29,42	235	18,19	300	8
166	35	198	29,41	236	18	302	32
167	35	199	31	237.875	4	304	8
168	35	200	22	238	6,18	309.179	2
170	24	204	7,40	239.550	3	313.22	2
171	30	206	33	245	6,17	317	15
172	24	209	7	246	10	320	15
175	30	210	33	247	17	328	13
180	39	212	33	249	10,17	335	13
182	39	215	7,21	250	10	338	13
183	22,38	216	28	254	6,16	346	13
185.23	20	217	21,33	255	5	382	1
187	22,23	218	21	256.62	3	385	1
188	23	218.391	4	257	26	407	14
190	29	219	28	259	26	428	12
192	23	221	21	262	26	447	12
193	23,42	223.119	4	263	16		

Line strengths for transitions of the arrays $3s^23p$–$3s3p^2$, $3s3p^2$–$3p^3$, $3s^23d$–$3s3p3d$, $3s^23p$–$3s^23d$, and $3s3p^2$–$3s3p3d$ are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Huang.[1] These relativistic calculations included a perturbative treatment of the Breit interaction. Allowance for configuration mixing included all configurations within the $n = 3$ complex.

Huang published neither an energy-level diagram nor percentage compositions for levels of the $3s^23p$, $3s3p^2$, $3s^23d$, $3p^3$, and $3s3p3d$ configurations in Ni XVI. We have used the percentages given by Fawcett[2] as a guide to naming the levels; the latter's values resulted from Hartree-Fock calculations with relativistic effects and statistical allowance for exchange (HXR), and incorporated correlation effects due to all configurations within the $n = 3$ complex.

Transitions involving levels which are indicated to be of low purity in *LS* coupling are omitted here. Lines which are characterized by very small f-values are assigned lower accuracy ratings; the weakest lines have been excluded. A few wavelengths computed by Huang differ significantly from those which resulted from the fitting and scaling procedure applied by Fawcett[2]; lines for which the wavelengths are in serious disagreement have been omitted.

References

[1] K.-N. Huang, At. Data Nucl. Data Tables **34**, 1 (1986) and private communication.

[2] B. C. Fawcett, At. Data Nucl. Data Tables **28**, 557 (1983).

Ni 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.	$3s^23p-3s3p^2$	$^2P^\circ - ^4P$											
			[385]			4	6	0.57	0.0019	0.0097	−2.12	E	1
			[382]			2	2	0.58	0.0013	0.0032	−2.59	E	1
2.		$^2P^\circ - ^2D$	*302.10*	*18507*	*349528*	6	10	26	0.059	0.35	−0.45	E	1
			309.179	27761	351198	4	6	23	0.049	0.20	−0.71	D	1
			288.165	0	347023	2	4	32	0.079	0.15	−0.80	D	1
			[313.22]	27761	347023	4	4	0.43	6.3(−4)[a]	0.0026	−2.60	E	1
3.		$^2P^\circ - ^2S$	*250.66*	*18507*	417449	6	2	230	0.073	0.36	−0.36	E	1
			[256.62]	27761	417449	4	2	3.8	0.0019	0.0064	−2.12	E	1
			239.550	0	417449	2	2	260	0.22	0.35	−0.35	E	1
4.		$^2P^\circ - ^2P$	*229.28*	*18507*	*454660*	6	6	480	0.38	1.7	0.35	E	1
			232.475	27761	457894	4	4	407	0.330	1.01	0.120	C−	1
			223.119	0	448191	2	2	130	0.095	0.14	−0.72	E	1
			237.875	27761	448191	4	2	260	0.11	0.35	−0.35	E	1
			218.391	0	457894	2	4	95	0.136	0.195	−0.57	C−	1
5.	$3s3p^2-3p^3$	$^4P - ^2D^\circ$											
			[255]			6	6	1.9	0.0019	0.0094	−1.95	E	1
6.		$^4P - ^4S^\circ$	*248*			12	4	400	0.12	1.2	0.17	D	1
			[254]			6	4	180	0.12	0.59	−0.15	D	1
			[245]			4	4	140	0.13	0.41	−0.29	D	1
			[238]			2	4	75	0.13	0.20	−0.59	D	1
7.		$^4P - ^2P^\circ$											
			[215]			6	4	3.0	0.0014	0.0059	−2.08	E	1
			[209]			4	4	8.3	0.0055	0.015	−1.66	E	1
			[204]			2	4	4.2	0.0053	0.0071	−1.98	E	1
8.		$^2D - ^2D^\circ$											
			[304]			6	6	40	0.055	0.33	−0.48	E	1
			[300]			4	6	4.5	0.0091	0.036	−1.44	E	1
9.		$^2D - ^4S^\circ$											
			[299]			4	4	2.7	0.0036	0.014	−1.85	E	1
10.		$^2D - ^2P^\circ$	*249*			10	6	150	0.083	0.68	−0.08	D	1
			[249]			6	4	120	0.077	0.38	−0.33	D	1
			[250]			4	2	160	0.076	0.25	−0.52	D	1
			[246]			4	4	15	0.014	0.045	−1.26	D	1
11.		$^2S - ^2P^\circ$											
			[297]			2	4	25	0.066	0.13	−0.88	E	1
12.		$^2P - ^4S^\circ$											
			[447]			4	4	1.2	0.0037	0.022	−1.83	E	1
			[428]			2	4	0.34	0.0019	0.0053	−2.42	E	1

Ni 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.		$^2P - ^2P°$	*337*			6	6	43	0.074	0.49	−0.35	E	1
			[338]			4	4	37	0.063	0.28	−0.60	D	1
			[335]			2	2	46	0.077	0.17	−0.81	E	1
			[346]			4	2	8.3	0.0075	0.034	−1.53	E	1
			[328]			2	4	0.46	0.0015	0.0032	−2.53	E	1
14.	$3s^23d-$ $3s3p(^3P°)3d$	$^2D - ^4P°$											
			[407]			6	6	0.50	0.0012	0.010	−2.13	E	1
15.		$^2D - ^2F°$	*307*			10	14	26	0.050	0.51	−0.30	E	1
			[299]			6	8	27	0.049	0.29	−0.53	E	1
			[317]			4	6	17	0.038	0.16	−0.81	E	1
			[320]			6	6	5.7	0.0087	0.055	−1.28	E	1
16.		$^2D - ^2P°$	*262*			10	6	13	0.0082	0.071	−1.08	E	1
			[266]			6	4	7.0	0.0049	0.026	−1.53	E	1
			[254]			4	2	3.3	0.0016	0.0054	−2.19	E	1
			[263]			4	4	11	0.012	0.040	−1.34	E	1
17.	$3s^23d-$ $3s3p(^1P°)3d$	$^2D - ^2F°$	*247*			10	14	330	0.42	3.4	0.62	E	1
			[249]			6	8	330	0.41	2.0	0.39	E	1
			[245]			4	6	320	0.43	1.4	0.24	E	1
			[247]			6	6	9.2	0.0084	0.041	−1.30	E	1
18.		$^2D - ^2D°$	*235*			10	10	250	0.21	1.6	0.32	E	1
			[235]			6	6	250	0.21	0.96	0.09	E	1
			[236]			4	4	120	0.10	0.31	−0.40	E	1
			[238]			6	4	130	0.074	0.35	−0.35	E	1
			[233]			4	6	1.7	0.0020	0.0062	−2.09	E	1
19.		$^2D - ^2P°$	*234*			10	6	400	0.19	1.5	0.29	D	1
			[233]			6	4	240	0.13	0.60	−0.11	D	1
			[235]			4	2	380	0.16	0.49	−0.20	D	1
			[231]			4	4	160	0.13	0.39	−0.29	D	1
20.	$3p-3d$	$^2P° - ^2D$	*191.09*	*18507*	*541820*	6	10	490	0.45	1.7	0.43	D	1
			[194.04]	27761	543120	4	6	460	0.39	0.99	0.19	D	1
			185.23	0	539870	2	4	420	0.43	0.53	−0.06	D	1
			[195.27]	27761	539870	4	4	95	0.054	0.14	−0.66	D	1
21.	$3s3p^2-$ $3s3p(^3P°)3d$	$^4P - ^4F°$											
			[217]			6	8	5.2	0.0049	0.021	−1.53	E	1
			[215]			4	6	2.8	0.0029	0.0082	−1.94	E	1
			[221]			6	6	1.6	0.0012	0.0052	−2.15	E	1
			[218]			4	4	1.7	0.0012	0.0035	−2.31	E	1

Ni 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
22.		^{4}P - ^{4}P°											
			[200]			6	6	32	0.019	0.076	−0.94	E	1
			[183]			2	2	0.31	1.6(−4)	1.9(−4)	−3.50	E	1
			[187]			4	2	330	0.085	0.21	−0.47	D	1
			[194]			4	6	280	0.24	0.61	−0.02	E	1
23.		^{4}P - ^{4}D°											
			[192]			6	8	454	0.335	1.27	0.303	C−	1
			[187]			4	6	120	0.097	0.24	−0.41	D	1
			[192]			6	6	310	0.17	0.64	0.01	D	1
			[188]			2	2	470	0.25	0.31	−0.30	D	1
			[193]			4	2	9.3	0.0026	0.0066	−1.98	E	1
24.		^{4}P - ^{2}F°											
			[170]			6	8	8.2	0.0048	0.016	−1.54	E	1
			[172]			4	6	1.5	0.0010	0.0023	−2.39	E	1
25.		^{4}P - ^{2}P°											
			[152]			2	4	5.6	0.0039	0.0039	−2.11	E	1
26.		^{2}D - ^{4}F°											
			[257]			6	6	1.4	0.0014	0.0072	−2.07	E	1
			[259]			4	4	2.0	0.0021	0.0070	−2.09	E	1
			[262]			6	4	1.6	0.0011	0.0056	−2.19	E	1
27.		^{2}D - ^{4}P°											
			[228]			6	6	14	0.011	0.050	−1.18	E	1
28.		^{2}D - ^{4}D°											
			[219]			6	8	6.8	0.0065	0.028	−1.41	E	1
			[216]			4	6	1.8	0.0019	0.0054	−2.12	E	1
29.		^{2}D - ^{2}F°	*193*			10	14	190	0.15	0.96	0.18	E	1
			[190]			6	8	200	0.14	0.53	−0.07	E	1
			[197]			4	6	150	0.13	0.33	−0.29	E	1
			[198]			6	6	44	0.026	0.10	−0.81	E	1
30.		^{2}D - ^{2}P°											
			[171]			4	2	2.2	4.9(−4)	0.0011	−2.71	E	1
			[175]			4	4	0.45	2.1(−4)	4.8(−4)	−3.08	E	1
31.		^{2}S - ^{2}P°	*197*			2	6	370	0.65	0.84	0.11	E	1
			[199]			2	4	490	0.58	0.76	0.06	E	1
			[194]			2	2	110	0.063	0.080	−0.90	E	1
32.		^{2}P - ^{4}P°											
			[302]			4	6	0.51	0.0011	0.0042	−2.37	E	1

Ni 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
33.		^{2}P - ^{2}P°	*213*			6	6	210	0.14	0.59	−0.07	E	1
			[217]			4	4	110	0.077	0.22	−0.51	D	1
			[206]			2	2	370	0.24	0.32	−0.33	E	1
			[210]			4	2	49	0.016	0.045	−1.19	D	1
			[212]			2	4	1.1	0.0014	0.0020	−2.54	E	1
34.	$3s3p^2$– $3s3p(^1P°)3d$	^{4}P - ^{2}F°											
			[152]			6	8	6.6	0.0030	0.0091	−1.74	E	1
35.		^{2}D - ^{2}F°	*167*			10	14	310	0.18	1.0	0.26	E	1
			[168]			6	8	320	0.18	0.59	0.03	E	1
			[166]			4	6	310	0.19	0.42	−0.11	E	1
			[167]			6	6	15	0.0064	0.021	−1.42	E	1
36.		^{2}D - ^{2}D°											
			[162]			4	4	2.1	8.4(−4)	0.0018	−2.47	E	1
			[163]			6	4	2.5	6.5(−4)	0.0021	−2.41	E	1
37.		^{2}D - ^{2}P°	*161*			10	6	6.1	0.0014	0.0075	−1.85	E	1
			[161]			6	4	4.0	0.0010	0.0033	−2.21	E	1
			[162]			4	2	1.2	2.3(−4)	4.9(−4)	−3.04	E	1
			[160]			4	4	4.6	0.0018	0.0037	−2.15	E	1
38.		^{2}S - ^{2}D°											
			[183]			2	4	21	0.021	0.025	−1.38	E	1
39.		^{2}S - ^{2}P°	*181*			2	6	130	0.19	0.23	−0.41	E	1
			[180]			2	4	71	0.069	0.082	−0.86	E	1
			[182]			2	2	250	0.13	0.15	−0.60	E	1
40.		^{2}P - ^{2}F°											
			[204]			4	6	8.0	0.0074	0.020	−1.53	E	1
41.		^{2}P - ^{2}D°	*195*			6	10	660	0.62	2.4	0.57	E	1
			[196]			4	6	670	0.58	1.5	0.37	E	1
			[194]			2	4	550	0.62	0.79	0.09	E	1
			[198]			4	4	52	0.031	0.080	−0.91	E	1
42.		^{2}P - ^{2}P°											
			[194]			4	4	350	0.20	0.51	−0.10	D	1
			[193]			2	2	55	0.031	0.039	−1.21	E	1
			[197]			4	2	120	0.035	0.090	−0.86	C−	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XVI

Forbidden Transitions

Line strengths for magnetic dipole and electric quadrupole transitions within the $3s^23p\ ^2P^\circ$ and $3s3p^2\ ^4P$ terms are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Huang.[1] These relativistic calculations included a perturbative treatment of the Breit interaction and the Lamb shift. Allowance for configuration mixing included all configurations within the $n=3$ complex. Strengths of electric quadrupole transitions as reported in Ref. 1 were multiplied by the factor $^2/_3$ which is needed to bring these values into conformance with the definition of quadrupole strengths used in the NBS tables.

Reference

[1]K.-N. Huang, At. Data Nucl. Data Tables **34**, 1 (1986).

Ni XVI: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$3p$–$3p$	$^2P^\circ$ - $^2P^\circ$										
			3601.1	0	27761	2	4	M1	192	1.33	C+	1
			"	"	"	2	4	E2	0.067	0.096	E	1
2.	$3s3p^2$–$3s3p^2$	^4P - ^4P										
			[7320]			4	6	M1	40.3	3.52	C	1
			"			4	6	E2	0.0019	0.14	D−	1
			[8500]			2	4	M1	35.8	3.26	C	1
			"			2	4	E2	1.1(−4)[a]	0.012	E	1
			[3930]			2	6	E2	0.033	0.11	D−	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be mulitplied.

Ni XVII

Mg Isoelectronic Sequence

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

Ionization Energy: 571.08 eV = 4606000 cm^{-1}

Allowed Transitions

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
30.919	16	207	5	269.0	19	294	10
42.855	15	207.50	17	269.39	3	296	10
54.451	26	208.66	17	270.4	19	323	9
55.361	27	209.5	17	272	4	339	9
57.348	28	214	21	277	11	343	9
169	18	215.89	20	278	11	355	9
173	24	216	22,25	279	11	358	9
175	18	217	21	280	10	362	9
197.39	17	226	21	281.50	3	366.7	1
199.87	17	227	23	282	8,10	372.7	6
200.53	17	249.180	2	284	14	412.2	6
204	22	251.97	3	285.59	3	419	7
205	22	263.55	3	289	4	441.3	6
206	21	266.06	3	292	13	465	12

Oscillator strengths for the three transitions $3s^2\ ^1S_0 - 3snp\ ^1P_1^\circ$ ($n = 3$–5) are the results of the relativistic random phase approximation (RRPA) calculations of Shorer *et al.*,[1] who allowed for correlation within the context of a frozen core. Oscillator strength data of Fawcett,[2] quoted for most transitions of the arrays $3s3p-3p^2$, $3s3d-3p3d$, $3s3p-3s3d$, and $3p^2-3p3d$, were derived by means of Hartree-Fock calculations which included relativistic effects and statistical allowance for exchange (HXR); he incorporated correlation effects due to all configurations in the $n = 3$ complex. A-values for all intercombination lines tabulated here were determined by Bhatia and Kastner[3] using a scaled Thomas-Fermi (STF) approach with allowance for configuration mixing; these data are included here, but the A-values were first converted to line strengths and then reconverted to oscillator strengths and transition probabilities which incorporate more accurate wavelength values.

Kastner *et al.*[4] calculated A-values for a number of lines of the array $3p3d-3p4f$ in Fe XV and Zn XIX by application of a multiconfiguration STF approach. These transition probabilities were converted to oscillator strengths, from which f-values for a few transitions of this array in Ni XVII were interpolated.

Transitions involving levels which are indicated in Ref. 2 to be of low purity in LS coupling in Ni XVII, or in Ref. 4 to be of low purity in neighboring Mg-like ions, are omitted here. Lines which are characterized by very small f-values are assigned lower accuracy ratings.

References

[1] P. Shorer, C. D. Lin, and W. R. Johnson, Phys. Rev. A **16**, 1109 (1977).

[2] B. C. Fawcett, At. Data Nucl. Data Tables **28**, 579 (1983).

[3] A. K. Bhatia and S. O. Kastner, J. Quant. Spectrosc. Radiat. Transfer **24**, 53 (1980).

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

Ni 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.	$3s^2$–$3s3p$	^1S – $^3P^\circ$											
			366.7	0	272700	1	3	0.58	0.0035	0.0042	−2.46	E	3
2.		^1S – $^1P^\circ$	249.180	0	401316	1	3	275	0.767	0.629	−0.115	B	1
3.	$3s3p$–$3p^2$	$^3P^\circ$ – ^3P	*268.2*	*283500*	*656400*	9	9	210	0.23	1.8	0.31	D	2
			266.06	293700	669600	5	5	140	0.15	0.66	−0.12	D	2
			269.39	272700	643900	3	3	58	0.063	0.17	−0.72	C	2
			285.59	293700	643900	5	3	85	0.062	0.29	−0.51	C	2
			281.50	272700	627900	3	1	210	0.083	0.23	−0.60	C	2
			251.97	272700	669600	3	5	50	0.080	0.20	−0.62	D	2
			263.55	264500	643900	1	3	86	0.27	0.23	−0.57	C	2
4.		$^3P^\circ$ – ^1D											
			[289]			5	5	27	0.034	0.16	−0.77	E	3
			[272]			3	5	15	0.028	0.076	−1.07	E	3
5.		$^3P^\circ$ – ^1S											
			[207]			3	1	3.2	6.8(−4)[a]	0.0014	−2.69	E	3
6.		$^1P^\circ$ – ^3P											
			[372.7]	401316	669600	3	5	5.9	0.020	0.075	−1.21	E	3
			[412.2]	401316	643900	3	3	0.14	3.4(−4)	0.0014	−2.99	E	3
			[441.3]	401316	627900	3	1	1.4	0.0014	0.0059	−2.39	E	3
7.		$^1P^\circ$ – ^1D	[419]			3	5	18	0.080	0.33	−0.62	E	2
8.		$^1P^\circ$ – ^1S	[282]			3	1	240	0.097	0.27	−0.54	C	2
9.	$3s3d$–$3p3d$	^3D – $^3F^\circ$	*336*			15	21	64	0.15	2.5	0.35	D	2
			[323]			7	9	75	0.150	1.12	0.021	C	2
			[339]			5	7	50	0.12	0.67	−0.22	C	2
			[355]			3	5	38	0.12	0.42	−0.44	D	2
			[343]			7	7	13	0.023	0.18	−0.79	C	2
			[358]			5	5	10	0.020	0.12	−1.00	D	2
			[362]			7	5	0.10	1.4(−4)	0.0012	−3.01	E	2
10.		^3D – $^3D^\circ$											
			[282]			7	7	84	0.10	0.65	−0.15	C	2
			[294]			3	3	25	0.032	0.093	−1.02	E	2
			[296]			5	3	74	0.058	0.28	−0.54	E	2
			[280]			5	7	26	0.042	0.19	−0.68	C	2
11.		^3D – $^3P^\circ$											
			[279]			5	3	37	0.026	0.12	−0.89	E	2
			[278]			3	1	130	0.050	0.14	−0.82	C	2
			[277]			3	3	96	0.11	0.30	−0.48	E	2
12.		^1D – $^1D^\circ$	[465]			5	5	8.6	0.028	0.21	−0.85	D	2
13.		^1D – $^1F^\circ$	[292]			5	7	220	0.40	1.9	0.30	D	2
14.		^1D – $^1P^\circ$	[284]			5	3	150	0.11	0.51	−0.26	D	2

Ni 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
15.	$3s^2$–$3s4p$	$^1S - {}^1P^\circ$	42.855	0	2333500	1	3	4750	0.392	0.055	−0.407	C	1
16.	$3s^2$–$3s5p$	$^1S - {}^1P^\circ$	30.919	0	3234300	1	3	2770	0.119	0.0121	−0.92	C	1
17.	$3s3p$–$3s3d$	$^3P^\circ - {}^3D$	*204.0*	*283500*	*773800*	9	15	263	0.273	1.65	0.390	C	2
			207.50	293700	775600	5	7	250	0.226	0.77	0.053	C	2
			199.87	272700	773000	3	5	210	0.21	0.41	−0.20	C	2
			197.39	264500	771100	1	3	160	0.28	0.18	−0.55	C	2
			208.66	293700	773000	5	5	61	0.040	0.14	−0.70	C	2
			200.53	272700	771100	3	3	120	0.070	0.14	−0.68	C	2
			[209.5]	293700	771100	5	3	6.6	0.0026	0.0090	−1.89	D	2
18.		$^3P^\circ - {}^1D$											
			[175]	293700	864520	5	5	0.28	1.3(−4)	3.7(−4)	−3.19	E	3
			[169]	272700	864520	3	5	5.1	0.0037	0.0061	−1.96	E	3
19.		$^1P^\circ - {}^3D$											
			[269.0]	401316	773000	3	5	0.20	3.7(−4)	9.7(−4)	−2.96	E	3
			[270.4]	401316	771100	3	3	0.41	4.5(−4)	0.0012	−2.87	E	3
20.		$^1P^\circ - {}^1D$	215.89	401316	864520	3	5	480	0.56	1.2	0.23	D	2
21.	$3p^2$–$3p3d$	$^3P - {}^3D^\circ$											
			[217]			5	7	240	0.24	0.86	0.08	D	2
			[206]			1	3	300	0.57	0.39	−0.24	E	2
			[214]			3	3	48	0.033	0.070	−1.00	E	2
			[226]			5	3	2.6	0.0012	0.0045	−2.22	E	2
22.		$^3P - {}^3P^\circ$											
			[204]			3	3	180	0.11	0.22	−0.48	E	2
			[216]			5	3	71	0.030	0.11	−0.82	E	2
			[205]			3	1	240	0.050	0.10	−0.82	C	2
23.		$^1D - {}^1D^\circ$	[227]			5	5	160	0.12	0.45	−0.22	E	2
24.		$^1D - {}^1P^\circ$	[173]			5	3	4.8	0.0013	0.0037	−2.19	E	2
25.		$^1S - {}^1P^\circ$	[216]			1	3	270	0.57	0.41	−0.24	C	2
26.	$3p3d$–$3p4f$	$^3F^\circ - {}^3G$											
			54.451			9	11	1.5(+4)	0.81	1.3	0.86	C	*interp.*
27.		$^3P^\circ - {}^3D$											
			55.361			1	3	6700	0.93	0.17	−0.03	C	*interp.*
28.		$^1F^\circ - {}^1G$	57.348			7	9	1.4(+4)	0.90	1.2	0.80	C−	*interp.*

[a] The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XVII

Forbidden Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
115.67	9	861	6	2400	3	6250	3
149.3	10	888	4	3330	5	12000	1
156	11	912	7	3420	1	27700	5
731.0	2	929.4	2	3890	3	38000	8
777.6	2	1160	4	4760	1	53000	8

Transition probabilities for forbidden lines involving pairs of levels belonging to the set of configurations $3s^2$, $3s3p$, $3p^2$, and $3s3d$ were computed by Bhatia and Kastner[1] using a scaled Thomas-Fermi approach with allowance for configuration mixing. These data are quoted here, but we first converted the transition probabilities to line strengths, which we then reconverted to A-values in order to incorporate more accurate wavelength values. The weakest lines were excluded from this compilation.

Reference

[1] A. K. Bhatia and S. O. Kastner, J. Quant. Spectrosc. Radiat. Transfer **24**, 53 (1980).

Ni XVII: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$3s3p$–$3s3p$	$^3P^\circ$ - $^3P^\circ$										
			[4760]	272700	293700	3	5	M1	125	2.49	C+	1
			[12000]	264500	272700	1	3	M1	10	2.0	D+	1
			[3420]	264500	293700	1	5	E2	0.037	0.051	E	1
2.		$^3P^\circ$ - $^1P^\circ$										
			[929.4]	293700	401316	5	3	M1	210	0.019	E	1
			[777.6]	272700	401316	3	3	M1	210	0.011	E	1
			[731.0]	264500	401316	1	3	M1	350	0.015	E	1
3.	$3p^2$–$3p^2$	^3P - ^3P										
			[3890]	643900	669600	3	5	M1	190	2.1	D	1
			[6250]	627900	643900	1	3	M1	70	1.91	C	1
			[2400]	627900	669600	1	5	E2	0.13	0.031	E	1
4.		^3P - ^1S										
			[1160]			5	1	E2	26	0.032	E	1
			[888]			3	1	M1	2500	0.066	E	1

Ni XVII: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
5.		$^1D - ^3P$										
			[3330]			5	5	M1	150	1.0	E	1
			[27700]			5	3	M1	0.17	0.41	E	1
6.		$^1D - ^1S$	[861]			5	1	E2	340	0.097	E	1
7.	$3p^2$–$3s3d$	$^1S - ^1D$	[912]			1	5	E2	37	0.070	E	1
8.	$3s3d$–$3s3d$	$^3D - ^3D$										
			[38000]	773000	775600	5	7	M1	0.30	4.3	D+	1
			[53000]	771100	773000	3	5	M1	0.16	4.5	D	1
9.	$3s^2$–$3s3d$	$^1S - ^1D$	[115.67]	0	864520	1	5	E2	2.1(+6)[a]	0.13	D–	1
10.	$3s^2$–$3p^2$	$^1S - ^3P$										
			[149.3]	0	669600	1	5	E2	6.3(+4)	0.014	E	1
11.		$^1S - ^1D$	[156]			1	5	E2	2.1(+5)	0.059	E	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XVIII

Na Isoelectronic Sequence

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

Ionization Energy: 607.06 eV = 4896200 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
24.881	17	38.573	20	67.092	53	130.3	51
25.070	17	38.643	20	67.132	53	130.9	43
25.071	17	38.658	20	67.16	53	131.3	43
26.02	15	41.015	2	68.526	37	131.9	43
26.020	4	41.218	2	69.075	37	136.0	70
26.046	4	43.814	9	69.094	37	136.1	70
26.218	15	44.365	9	76.254	46	136.2	70
26.23	15	44.405	9	76.359	46	145.4	74
27.98	27	52.502	41	76.377	46	145.5	74
27.982	13	52.615	19	80.077	45	146	74
28.01	27	52.720	19	80.212	45	187.5	61
28.018	27	52.745	19	80.321	45	189.4	61
28.220	13	52.829	41	81.974	52	189.5	61
28.223	13	52.835	41	82.001	52	211.8	68
29.383	25	57.27	50	82.034	52	212.1	68
29.422	25	57.37	50	94.661	29	212.2	68
29.424	25	57.376	50	95.175	29	220.43	7
29.779	3	57.84	39	99.275	35	233.75	7
29.829	3	58.197	39	100.4	35	236.31	7
31.845	23	58.24	39	100.5	35	239.8	73
31.890	23	59.780	18	102.2	65	240.0	73
31.893	23	59.950	18	102.8	65	244.2	67
32.034	11	60.056	54	110	72	244.7	67
32.340	11	60.064	54	110.5	72	246.5	67
32.350	11	60.089	54	114.46	44	291.983	1
32.493	22	60.212	18	114.6	44	320.56	1
32.533	22	63.512	48	114.74	44	595.2	33
32.543	22	63.589	48	116.0	75	632.5	33
36.990	21	63.597	48	125	63	641.0	33
37.049	21	64.872	30	125.2	63	731.5	28
37.055	21	65.032	30	130.1	51	801.9	28

Strengths of the lines of the $3s$–$3p$ and $3p$–$3d$ transitions were taken from Edlen's interpolation formulae.[1] These were based on the results of Weiss' Hartree-Fock calculations,[2] in which ratios of relativistic Dirac to nonrelativistic line strengths in hydrogenic ions were applied as scaling factors to the nonrelativistic Hartree-Fock line strengths in the corresponding sodiumlike species. Oscillator strengths for the $4p$–$4d$ transitions were derived by Gruzdev and Sherstyuk[3] using the relativistic variant of their effective orbital quantum number method, which utilizes a Coulomb potential in conjunction with a semiempirical orbital quantum number which is determined from experimental energy levels. Strengths of the lines of the $3s$–$4p$ and $3p$–$4d$ transitions, as well as f-values of the $3d$–$4f$ transitions, were interpolated from the results of the relativistic single-configuration Hartree-Fock calculations of Kim and Cheng[4] for Fe XVI and, depending on the transition, either Kr XXVI or Mo XXXII.

The lifetimes of the $3p_{1/2,3/2}$ and $3d_{5/2}$ levels were measured by Pegg *et al.*[5] using the beam-foil technique. They used a multiexponential fitting procedure to analyze their results, but did not incorporate a simulation of repopulation from higher levels, so that their method of cascade analysis is not so sophisticated as that reported elsewhere[6,7] for the lifetimes of the corresponding levels in Fe XVI. Nevertheless, the reciprocals of the lifetimes determined by Pegg *et al.* agree, to within their error estimates, with the theoretical A-values derived from Edlen's interpolation formulae, with our uncertainty estimates of the theoretical results taken into account.

Multiplet f-values calculated by Tull *et al.*[8] using the frozen-core Hartree-Fock approach are quoted for numerous transitions nl–$n'l'$ ($3 \leqslant n \leqslant 5$; $4 \leqslant n' \leqslant 8$; l, $l' = s,p,d,f$). Data for additional transitions (namely, those for which $n,n' \leqslant 10$, where n,n' are the principal quantum numbers of the lower and upper states, respectively) can be found in Ref. 8. Whenever wavelengths of individual lines within a multiplet either were available directly or could be determined from the energy levels, the multiplet strength was distributed among the lines according to LS-coupling rules, except in the case of the $5f$–$8d$ transition, where the wavelengths for all the lines in the multiplet are identical. The strength of the $3p\ ^2P^\circ$ – $4s\ ^2S$ multiplet was not distributed between the two lines in the multiplet, however, since the calculations of Kim and Cheng indicate that in the corresponding transition in neighboring sodiumlike ions (Fe XVI and Mo XXXII) the ratio of the two line strengths deviates somewhat from the value that would be obtained in the case of pure LS coupling.

Transitions with small f-values were generally assigned lower accuracy ratings.

References

[1]B. Edlen, Phys. Scr. **17**, 565 (1978).
[2]A. W. Weiss, J. Quant. Spectrosc. Radiat. Transfer **18**, 481 (1977).
[3]P. F. Gruzdev and A. I. Sherstyuk, Opt. Spectrosc. (USSR) **46**, 353 (1979).
[4]Y.-K. Kim and K.-T. Cheng, J. Opt. Soc. Am. **68**, 836 (1978).
[5]D. J. Pegg, P. M. Griffin, B. M. Johnson, K. W. Jones, and T. H. Kruse, Astrophys. J. **224**, 1056 (1978).
[6]J. P. Buchet, M. C. Buchet-Poulizac, A. Denis, J. Desesquelles, and M. Druetta, Phys. Rev. A **22**, 2061 (1980).
[7]E. Träbert, K. W. Jones, B. M. Johnson, D. C. Gregory, and T. H. Kruse, Phys. Lett. A **87**, 336 (1982).
[8]C. E. Tull, R. P. McEachran, and M. Cohen, At. Data **3**, 169 (1971).

Ni 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.	$3s$–$3p$	^2S – $^2P^\circ$	*300.92*	0	*332310*	2	6	90.1	0.367	0.727	−0.134	B	1
			291.983	0	342486	2	4	99.1	0.253	0.487	−0.295	B	1
			320.56	0	311950	2	2	73.8	0.114	0.240	−0.643	B	1
2.	$3s$–$4p$	^2S – $^2P^\circ$	*41.078*	0	*2434400*	2	6	3100	0.23	0.063	−0.33	C	*interp.*
			41.015	0	2438400	2	4	2970	0.150	0.0405	−0.52	C	*interp.*
			41.218	0	2426400	2	2	3200	0.0814	0.0221	−0.788	C+	*interp.*
3.	$3s$–$5p$	^2S – $^2P^\circ$	*29.796*	0	*3356200*	2	6	1900	0.074	0.015	−0.83	C	8
			29.779	0	3358100	2	4	1900	0.051	0.010	−0.99	C	*ls*
			29.829	0	3352400	2	2	1900	0.025	0.0050	−1.29	C	*ls*
4.	$3s$–$6p$	^2S – $^2P^\circ$	*26.029*	0	*3841900*	2	6	1100	0.0334	0.0057	−1.175	C	8
			26.020	0	3843200	2	4	1100	0.022	0.0038	−1.35	C	*ls*
			26.046	0	3839400	2	2	1100	0.011	0.0019	−1.65	C	*ls*
5.	$3s$–$7p$	^2S – $^2P^\circ$				2	6		0.0183		−1.437	C	8
6.	$3s$–$8p$	^2S – $^2P^\circ$				2	6		0.0113		−1.65	C	8
7.	$3p$–$3d$	$^2P^\circ$ – ^2D	*229.30*	*332310*	*768420*	6	10	195	0.256	1.16	0.187	B	1
			233.75	342486	770300	4	6	183	0.225	0.694	−0.045	B	1
			220.43	311950	765610	2	4	183	0.266	0.386	−0.274	B	1
			236.31	342486	765610	4	4	29.4	0.0246	0.0766	−1.007	B	1
8.	$3p$–$4s$	$^2P^\circ$ – ^2S	*50.777*	*332310*	2301700	6	2	4600	0.059	0.059	−0.45	C−	8
9.	$3p$–$4d$	$^2P^\circ$ – ^2D	*44.181*	*332310*	*2595700*	6	10	6800	0.330	0.288	0.297	C	*interp.*
			44.365	342486	2596500	4	6	6800	0.301	0.176	0.081	C	*interp.*
			43.814	311950	2594400	2	4	5500	0.32	0.092	−0.20	C	*interp.*
			44.405	342486	2594400	4	4	1140	0.0337	0.0197	−0.87	C	*interp.*

Ni XVIII: Allowed transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
10.	$3p$–$5s$	$^2P^\circ - {}^2S$				6	2		0.0119		−1.146	C	8
11.	$3p$–$5d$	$^2P^\circ - {}^2D$	*32.238*	*332310*	*3434200*	6	10	4000	0.104	0.066	−0.205	C	8
			32.340	342486	3434600	4	6	4000	0.094	0.040	−0.43	C	*ls*
			32.034	311950	3433700	2	4	3400	0.10	0.022	−0.68	C	*ls*
			[32.350]	342486	3433700	4	4	660	0.010	0.0044	−1.38	D	*ls*
12.	$3p$–$6s$	$^2P^\circ - {}^2S$				6	2		0.0047		−1.55	D	8
13.	$3p$–$6d$	$^2P^\circ - {}^2D$	*28.140*	*332310*	*3885900*	6	10	2360	0.0466	0.0259	−0.55	C	8
			28.220	342486	3886100	4	6	2330	0.0417	0.0155	−0.78	C	*ls*
			27.982	311950	3885700	2	4	2000	0.047	0.0086	−1.03	C	*ls*
			[28.223]	342486	3885700	4	4	380	0.0046	0.0017	−1.74	D	*ls*
14.	$3p$–$7s$	$^2P^\circ - {}^2S$				6	2		0.0024		−1.84	D	8
15.	$3p$–$7d$	$^2P^\circ - {}^2D$	*26.15*	*332310*	*4156000*	6	10	1490	0.0254	0.0131	−0.82	C	8
			26.218	342486	4156700	4	6	1500	0.023	0.0079	−1.04	C	*ls*
			26.02	311950	4155000	2	4	1260	0.0255	0.00437	−1.292	C	*ls*
			[26.23]	342486	4155000	4	4	240	0.0025	8.7(−4)[a]	−2.00	D	*ls*
16.	$3p$–$8s$	$^2P^\circ - {}^2S$				6	2		0.0014		−2.08	D	8
17.	$3p$–$8d$	$^2P^\circ - {}^2D$	*25.007*	*332310*	*4331200*	6	10	1000	0.0156	0.0077	−1.029	C	8
			25.070	342486	4331300	4	6	990	0.014	0.0046	−1.25	C	*ls*
			24.881	311950	4331100	2	4	860	0.016	0.0026	−1.50	C	*ls*
			[25.071]	342486	4331100	4	4	160	0.0015	5.1(−4)	−2.21	D	*ls*
18.	$3d$–$4p$	$^2D - {}^2P^\circ$	*60.024*	*768420*	*2434400*	10	6	1080	0.0349	0.069	−0.457	C−	8
			59.950	770300	2438400	6	4	960	0.035	0.041	−0.68	C−	*ls*
			60.212	765610	2426400	4	2	1100	0.029	0.023	−0.94	C−	*ls*
			[59.780]	765610	2438400	4	4	110	0.0058	0.0046	−1.63	D	*ls*
19.	$3d$–$4f$	$^2D - {}^2F^\circ$	*52.679*	*768420*	*2666700*	10	14	1.60(+4)	0.93	1.62	0.97	C	*interp.*
			52.720	770300	2667100	6	8	1.6(+4)	0.89	0.93	0.73	C	*interp.*
			52.615	765610	2666200	4	6	1.5(+4)	0.93	0.64	0.57	C	*interp.*
			[52.745]	770300	2666200	6	6	1060	0.0444	0.0463	−0.57	C	*interp.*
20.	$3d$–$5p$	$^2D - {}^2P^\circ$	*38.643*	*768420*	*3356200*	10	6	420	0.0057	0.0073	−1.24	D	8
			[38.643]	770300	3358100	6	4	390	0.0058	0.0044	−1.46	D	*ls*
			[38.658]	765610	3352400	4	2	420	0.0047	0.0024	−1.72	D	*ls*
			[38.573]	765610	3358100	4	4	43	9.6(−4)	4.9(−4)	−2.41	E	*ls*
21.	$3d$–$5f$	$^2D - {}^2F^\circ$	*37.026*	*768420*	*3469200*	10	14	5900	0.170	0.207	0.230	C	8
			37.049	770300	3469400	6	8	5900	0.161	0.118	−0.014	C	*ls*
			36.990	765610	3469000	4	6	5500	0.17	0.083	−0.17	C	*ls*
			[37.055]	770300	3469000	6	6	390	0.0081	0.0059	−1.32	D	*ls*
22.	$3d$–$6p$	$^2D - {}^2P^\circ$	*32.536*	*768420*	*3841900*	10	6	220	0.0021	0.0022	−1.68	D	8
			[32.543]	770300	3843200	6	4	190	0.0020	0.0013	−1.92	D	*ls*
			[32.533]	765610	3839400	4	2	210	0.0017	7.3(−4)	−2.17	D	*ls*
			[32.493]	765610	3843200	4	4	22	3.5(−4)	1.5(−4)	−2.85	E	*ls*

Ni XVIII: Allowed transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
23.	$3d$–$6f$	^{2}D – ^{2}F°	*31.871*	*768420*	*3906000*	10	14	3000	0.063	0.066	−0.20	C	8
			31.890	770300	3906100	6	8	3000	0.060	0.038	−0.44	C	*ls*
			31.845	765610	3905800	4	6	2700	0.062	0.026	−0.61	C	*ls*
			[31.893]	770300	3905800	6	6	200	0.0030	0.0019	−1.74	D	*ls*
24.	$3d$–$7p$	^{2}D – ^{2}P°				10	6		0.0010		−2.00	D	8
25.	$3d$–$7f$	^{2}D – ^{2}F°	*29.407*	*768420*	*4169000*	10	14	1700	0.0308	0.0298	−0.51	C	8
			29.422	770300	4169100	6	8	1690	0.0293	0.0170	−0.76	C	*ls*
			29.383	765610	4168900	4	6	1580	0.0308	0.0119	−0.91	C	*ls*
			[29.424]	770300	4168900	6	6	110	0.0015	8.5(−4)	−2.06	D	*ls*
26.	$3d$–$8p$	^{2}D – ^{2}P°				10	6		5.8(−4)		−2.24	E	8
27.	$3d$–$8f$	^{2}D – ^{2}F°	*28.00*	*768420*	*4339000*	10	14	1080	0.0177	0.0163	−0.75	C	8
			28.018	770300	4339400	6	8	1100	0.017	0.0093	−1.00	C	*ls*
			27.98	765610	4340000	4	6	1000	0.018	0.0065	−1.15	C	*ls*
			[28.01]	770300	4340000	6	6	72	8.5(−4)	4.7(−4)	−2.29	E	*ls*
28.	$4s$–$4p$	^{2}S – ^{2}P°	*753.6*	2301700	*2434400*	2	6	19.4	0.496	2.46	−0.003	C	8
			[731.5]	2301700	2438400	2	4	21.2	0.341	1.64	−0.167	C	*ls*
			[801.9]	2301700	2426400	2	2	16	0.16	0.82	−0.51	C	*ls*
29.	$4s$–$5p$	^{2}S – ^{2}P°	*94.832*	2301700	*3356200*	2	6	660	0.265	0.165	−0.276	C	8
			[94.661]	2301700	3358100	2	4	660	0.176	0.110	−0.452	C	*ls*
			[95.175]	2301700	3352400	2	2	650	0.088	0.055	−0.76	C	*ls*
30.	$4s$–$6p$	^{2}S – ^{2}P°	*64.927*	2301700	*3841900*	2	6	430	0.081	0.035	−0.79	C	8
			[64.872]	2301700	3843200	2	4	430	0.054	0.023	−0.97	C	*ls*
			[65.032]	2301700	3839400	2	2	440	0.028	0.012	−1.25	C	*ls*
31.	$4s$–$7p$	^{2}S – ^{2}P°				2	6		0.0376		−1.124	C	8
32.	$4s$–$8p$	^{2}S – ^{2}P°				2	6		0.0210		−1.377	C	8
33.	$4p$–$4d$	^{2}P° – ^{2}D	*620.0*	*2434400*	*2595700*	6	10	38	0.37	4.5	0.34	C	3
			[632.5]	2438400	2596500	4	6	37	0.33	2.7	0.12	C	3
			[595.2]	2426400	2594400	2	4	37	0.39	1.5	−0.11	C	3
			[641.0]	2438400	2594400	4	4	5.8	0.036	0.30	−0.84	C	3
34.	$4p$–$5s$	^{2}P° – ^{2}S				6	2		0.101		−0.218	C	8
35.	$4p$–$5d$	^{2}P° – ^{2}D	*100.0*	*2434400*	*3434200*	6	10	1200	0.301	0.59	0.257	C	8
			[100.4]	2438400	3434600	4	6	1200	0.26	0.35	0.02	C	*ls*
			[99.275]	2426400	3433700	2	4	1000	0.31	0.20	−0.21	C	*ls*
			[100.5]	2438400	3433700	4	4	190	0.029	0.039	−0.93	D	*ls*
36.	$4p$–$6s$	^{2}P° – ^{2}S				6	2		0.0203		−0.91	C	8
37.	$4p$–$6d$	^{2}P° – ^{2}D	*68.894*	*2434400*	*3885900*	6	10	830	0.098	0.13	−0.23	C	8
			[69.075]	2438400	3886100	4	6	800	0.086	0.078	−0.46	C	*ls*
			[68.526]	2426400	3885700	2	4	680	0.095	0.043	−0.72	C	*ls*
			[69.094]	2438400	3885700	4	4	130	0.0096	0.0087	−1.42	D	*ls*

Ni XVIII: Allowed transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
38.	$4p$–$7s$	$^2P^\circ - {}^2S$				6	2		0.0080		−1.32	D	8
39.	$4p$–$7d$	$^2P^\circ - {}^2D$	*58.07*	*2434400*	*4156000*	6	10	550	0.0460	0.053	−0.56	C	8
			[58.197]	2438400	4156700	4	6	550	0.042	0.032	−0.78	C	*ls*
			[57.84]	2426400	4155000	2	4	470	0.047	0.018	−1.02	C	*ls*
			[58.24]	2438400	4155000	4	4	90	0.0046	0.0035	−1.74	D	*ls*
40.	$4p$–$8s$	$^2P^\circ - {}^2S$				6	2		0.0041		−1.61	D	8
41.	$4p$–$8d$	$^2P^\circ - {}^2D$	*52.720*	*2434400*	*4331200*	6	10	373	0.0259	0.0270	−0.81	C	8
			[52.829]	2438400	4331300	4	6	371	0.0233	0.0162	−1.031	C	*ls*
			[52.502]	2426400	4331100	2	4	320	0.026	0.0090	−1.28	C	*ls*
			[52.835]	2438400	4331100	4	4	62	0.0026	0.0018	−1.99	D	*ls*
42.	$4d$–$4f$	$^2D - {}^2F^\circ$				10	14		0.102		0.009	C	8
43.	$4d$–$5p$	$^2D - {}^2P^\circ$	*131.5*	*2595700*	*3356200*	10	6	510	0.080	0.35	−0.10	C	8
			[131.3]	2596500	3358100	6	4	470	0.081	0.21	−0.31	C	*ls*
			[131.9]	2594400	3352400	4	2	530	0.069	0.12	−0.56	C	*ls*
			[130.9]	2594400	3358100	4	4	52	0.013	0.023	−1.27	D	*ls*
44.	$4d$–$5f$	$^2D - {}^2F^\circ$	*114.5*	*2595700*	*3469200*	10	14	2700	0.74	2.8	0.87	C	8
			114.74	2596500	3469400	6	8	2700	0.71	1.6	0.63	C	*ls*
			114.46	2594400	3469000	4	6	2500	0.73	1.1	0.47	C	*ls*
			[114.6]	2596500	3469000	6	6	180	0.035	0.080	−0.67	D	*ls*
45.	$4d$–$6p$	$^2D - {}^2P^\circ$	*80.244*	*2595700*	*3841900*	10	6	240	0.0139	0.0367	−0.86	C	8
			[80.212]	2596500	3843200	6	4	216	0.0139	0.0220	−1.079	C	*ls*
			[80.321]	2594400	3839400	4	2	239	0.0115	0.0122	−1.336	C	*ls*
			[80.077]	2594400	3843200	4	4	24	0.0023	0.0024	−2.04	D	*ls*
46.	$4d$–$6f$	$^2D - {}^2F^\circ$	*76.318*	*2595700*	*3906000*	10	14	1470	0.180	0.452	0.255	C	8
			[76.359]	2596500	3906100	6	8	1470	0.171	0.258	0.011	C	*ls*
			[76.254]	2594400	3905800	4	6	1380	0.180	0.181	−0.142	C	*ls*
			[76.377]	2596500	3905800	6	6	99	0.0086	0.013	−1.29	D	*ls*
47.	$4d$–$7p$	$^2D - {}^2P^\circ$				10	6		0.0052		−1.28	D	8
48.	$4d$–$7f$	$^2D - {}^2F^\circ$	*63.561*	*2595700*	*4169000*	10	14	870	0.074	0.15	−0.13	C	8
			[63.589]	2596500	4169100	6	8	850	0.068	0.086	−0.39	C	*ls*
			[63.512]	2594400	4168900	4	6	790	0.072	0.060	−0.54	C	*ls*
			[63.597]	2596500	4168900	6	6	56	0.0034	0.0043	−1.69	D	*ls*
49.	$4d$–$8p$	$^2D - {}^2P^\circ$				10	6		0.0026		−1.59	D	8
50.	$4d$–$8f$	$^2D - {}^2F^\circ$	*57.37*	*2595700*	*4339000*	10	14	560	0.0389	0.073	−0.410	C	8
			[57.376]	2596500	4339400	6	8	560	0.037	0.042	−0.65	C	*ls*
			[57.27]	2594400	4340000	4	6	520	0.038	0.029	−0.81	C	*ls*
			[57.37]	2596500	4340000	6	6	38	0.0019	0.0021	−1.95	D	*ls*
51.	$4f$–$5d$	$^2F^\circ - {}^2D$	*130.3*	*2666700*	*3434200*	14	10	100	0.0181	0.109	−0.60	C	8
			[130.3]	2667100	3434600	8	6	95	0.018	0.062	−0.84	C	*ls*
			[130.3]	2666200	3433700	6	4	100	0.0169	0.0436	−0.99	C	*ls*
			[130.1]	2666200	3434600	6	6	4.8	0.0012	0.0031	−2.14	D	*ls*

Ni XVIII: Allowed transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
52.	4f–6d	${}^2F^\circ - {}^2D$	*82.021*	*2666700*	*3885900*	14	10	42	0.0030	0.011	−1.38	D	8
			[82.034]	2667100	3886100	8	6	39	0.0029	0.0063	−1.63	D	ls
			[82.001]	2666200	3885700	6	4	40	0.0027	0.0044	−1.79	D	ls
			[81.974]	2666200	3886100	6	6	1.9	1.9(−4)	3.1(−4)	−2.94	E	ls
53.	4f–7d	${}^2F^\circ - {}^2D$	*67.16*	*2666700*	*4156000*	14	10	23	0.0011	0.0034	−1.81	D	8
			[67.132]	2667100	4156700	8	6	21	0.0011	0.0019	−2.07	D	ls
			[67.16]	2666200	4155000	6	4	23	0.0011	0.0014	−2.20	D	ls
			[67.092]	2666200	4156700	6	6	1.1	7.3(−5)	9.7(−5)	−3.36	E	ls
54.	4f–8d	${}^2F^\circ - {}^2D$	*60.078*	*2666700*	*4331200*	14	10	13	5.1(−4)	0.0014	−2.15	E	8
			[60.089]	2667100	4331300	8	6	12	5.1(−4)	8.0(−4)	−2.39	E	ls
			[60.064]	2666200	4331100	6	4	13	4.7(−4)	5.6(−4)	−2.55	E	ls
			[60.056]	2666200	4331300	6	6	0.62	3.4(−5)	4.0(−5)	−3.69	E	ls
55.	5s–5p	${}^2S - {}^2P^\circ$				2	6		0.64		0.11	C	8
56.	5s–6p	${}^2S - {}^2P^\circ$				2	6		0.287		−0.241	C	8
57.	5s–7p	${}^2S - {}^2P^\circ$				2	6		0.089		−0.75	C	8
58.	5s–8p	${}^2S - {}^2P^\circ$				2	6		0.0415		−1.081	C	8
59.	5p–5d	${}^2P^\circ - {}^2D$				6	10		0.53		0.50	C	8
60.	5p–6s	${}^2P^\circ - {}^2S$				6	2		0.143		−0.067	C	8
61.	5p–6d	${}^2P^\circ - {}^2D$	*188.8*	*3356200*	*3885900*	6	10	321	0.286	1.07	0.235	C	8
			[189.4]	3358100	3886100	4	6	320	0.26	0.64	0.01	C	ls
			[187.5]	3352400	3885700	2	4	274	0.289	0.357	−0.238	C	ls
			[189.5]	3358100	3885700	4	4	53	0.028	0.071	−0.94	D	ls
62.	5p–7s	${}^2P^\circ - {}^2S$				6	2		0.0288		−0.76	C	8
63.	5p–7d	${}^2P^\circ - {}^2D$	*125*	*3356200*	*4156000*	6	10	250	0.096	0.24	−0.24	C	8
			[125.2]	3358100	4156700	4	6	240	0.085	0.14	−0.47	C	ls
			[125]	3352400	4155000	2	4	210	0.097	0.080	−0.71	C	ls
			[125]	3358100	4155000	4	4	41	0.0097	0.016	−1.41	D	ls
64.	5p–8s	${}^2P^\circ - {}^2S$				6	2		0.0114		−1.165	C	8
65.	5p–8d	${}^2P^\circ - {}^2D$	*102.6*	*3356200*	*4331200*	6	10	175	0.0459	0.093	−0.56	C	8
			[102.8]	3358100	4331300	4	6	170	0.041	0.056	−0.78	C	ls
			[102.2]	3352400	4331100	2	4	150	0.046	0.031	−1.04	C	ls
			[102.8]	3358100	4331100	4	4	29	0.0046	0.0062	−1.74	D	ls
66.	5d–5f	${}^2D - {}^2F^\circ$				10	14		0.181		0.258	C	8
67.	5d–6p	${}^2D - {}^2P^\circ$	*245.3*	*3434200*	*3841900*	10	6	238	0.129	1.04	0.111	C	8
			[244.7]	3434600	3843200	6	4	210	0.13	0.62	−0.11	C	ls
			[246.5]	3433700	3839400	4	2	235	0.107	0.347	−0.369	C	ls
			[244.2]	3433700	3843200	4	4	24	0.021	0.069	−1.07	D	ls

Ni XVIII: Allowed transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} ($10^8 s^{-1}$)	f_{ik}	S (at. u.)	log gf	Accuracy	Source
68.	$5d$–$6f$	^2D – $^2F°$	*212.0*	*3434200*	*3906000*	10	14	700	0.66	4.6	0.82	C	8
			[212.1]	3434600	3906100	6	8	690	0.62	2.6	0.57	C	*ls*
			[211.8]	3433700	3905800	4	6	640	0.65	1.8	0.41	C	*ls*
			[212.2]	3434600	3905800	6	6	46	0.031	0.13	−0.73	D	*ls*
69.	$5d$–$7p$	^2D – $^2P°$				10	6		0.0232		−0.63	C	8
70.	$5d$–$7f$	^2D – $^2F°$	*136.1*	*3434200*	*4169000*	10	14	458	0.178	0.80	0.250	C	8
			[136.1]	3434600	4169100	6	8	460	0.17	0.46	0.01	C	*ls*
			[136.0]	3433700	4168900	4	6	430	0.18	0.32	−0.15	C	*ls*
			[136.2]	3434600	4168900	6	6	31	0.0085	0.023	−1.29	D	*ls*
71.	$5d$–$8p$	^2D – $^2P°$				10	6		0.0087		−1.06	D	8
72.	$5d$–$8f$	^2D – $^2F°$	*110*	*3434200*	*4339000*	10	14	310	0.078	0.28	−0.11	C	8
			[110.5]	3434600	4339400	6	8	300	0.073	0.16	−0.36	C	*ls*
			[110]	3433700	4340000	4	6	280	0.076	0.11	−0.52	C	*ls*
			[110]	3434600	4340000	6	6	20	0.0037	0.0080	−1.66	D	*ls*
73.	$5f$–$6d$	$^2F°$ – ^2D	*240.0*	*3469200*	*3885900*	14	10	72	0.0444	0.491	−0.206	C	8
			[240.0]	3469400	3886100	8	6	69	0.0445	0.281	−0.449	C	*ls*
			[240.0]	3469000	3885700	6	4	72	0.0413	0.196	−0.61	C	*ls*
			[239.8]	3469000	3886100	6	6	3.4	0.0030	0.014	−1.75	D	*ls*
74.	$5f$–$7d$	$^2F°$ – ^2D	*146*	*3469200*	*4156000*	14	10	35	0.0079	0.053	−0.96	D	8
			[145.5]	3469400	4156700	8	6	33	0.0078	0.030	−1.20	D	*ls*
			[146]	3469000	4155000	6	4	34	0.0073	0.021	−1.36	D	*ls*
			[145.4]	3469000	4156700	6	6	1.6	5.2(−4)	0.0015	−2.50	E	*ls*
75.	$5f$–$8d$	$^2F°$ – ^2D	[116.0]	*3469200*	*4331200*	14	10	20	0.0029	0.016	−1.39	D	8

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XVIII

Forbidden Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
29.115	28	77.567	9	142.8	18	303.5	49
31.981	30	80.671	12	142.9	18	306.8	49
38.513	27	80.710	12	143.0	18	307.0	49
38.545	27	85.027	42	144.5	41	339.2	32
42.477	29	88.269	33	144.7	41	341.6	32
43.018	29	88.339	33	145.7	41	369.0	20
43.035	29	95.914	37	180.7	44	369.5	20
47.028	4	96.993	37	182.5	44	372	20
47.712	4	97.031	37	182.6	44	379.8	22
47.987	4	101	46	200	50	380.1	22
52.604	40	101.9	46	201	50	380.2	22
53.908	35	102	46	201.5	50	380.5	22
53.97	35	107.3	6	203.7	13	417.0	36
54.618	5	108.7	6	206.1	13	437.3	36
54.681	5	109.4	6	207.8	13	439.0	36
54.759	5	111.4	16	221.0	14	568	24
54.822	5	111.5	16	221.2	14	572.7	24
57.389	39	114.9	19	221.5	14	573.4	24
57.780	39	115	19	221.7	14	585	25
63.115	34	119.0	8	224.4	21	586.5	25
63.131	34	119.1	8	224.5	21	587.2	25
64.094	10	119.3	8	224.6	21	857.6	43
65.100	31	119.4	8	224.7	21	898.5	43
65.300	31	122.5	45	228.8	17	901.7	43
67.595	38	123.3	45	228.9	17	1510	48
68.134	38	124.5	11	229.0	17	1590	48
68.148	38	124.6	11	229.1	17	1600	48
70.582	7	124.7	11	230	23	3273	1
71.185	7	129.82	26	230.6	23	8330	3
71.378	7	130.61	26	230.8	23	21300	2
77.417	9	138.3	15	267.2	47		
77.441	9	138.5	15	267.5	47		
77.543	9	139	15	270.0	47		

Electric quadrupole strengths for numerous multiplets in this sodiumlike ion were determined by Tull *et al.*[1] using the frozen-core Hartree-Fock approach with no allowance for configuration mixing. *LS*-coupling rules were applied to obtain strengths of lines within multiplets. The strongest lines for which fairly accurate wavelengths could be derived from experimentally determined energy levels are quoted in this compilation.

The strengths given in Ref. 1 for transitions in which both $\Delta n = 0$ and $\Delta l = 0$ (i.e., transitions between the two levels of a given term) are overstated, and had to be reduced as follows:

$$S(np\ ^2P^\circ_{1/2} - np\ ^2P^\circ_{3/2}) = S(\text{Ref. 1}) \times (1/3)$$

$$S(nd\ ^2D_{3/2} - nd\ ^2D_{5/2}) = S(\text{Ref. 1}) \times (3/25)$$

$$S(nf\ ^2F^\circ_{5/2} - nf\ ^2F^\circ_{7/2}) = S(\text{Ref. 1}) \times (3/49).$$

Reference

[1]C. E. Tull, M. Jackson, R. P. McEachran, and M. Cohen, J. Quant. Spectrosc. Radiat. Transfer 12, 893 (1972).

Ni XVIII: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accu-racy	Source
1.	$3p$–$3p$	$^2P^\circ$ - $^2P^\circ$										
			[3273]	311950	342486	2	4	E2	0.11	0.094	D	1
2.	$3d$–$3d$	^2D - ^2D										
			[21300]	7656100	770300	4	6	E2	1.7(−6)[a]	0.027	D−	1
3.	$4p$–$4p$	$^2P^\circ$ - $^2P^\circ$										
			[8330]	2426400	2438400	2	4	E2	0.013	1.2	D−	1
4.	$3p$–$4p$	$^2P^\circ$ - $^2P^\circ$										
			[47.712]	342486	2438400	4	4	E2	6.6(+7)	0.039	D	1,*ls*
			[47.987]	342486	2426400	4	2	E2	1.3(+8)	0.039	D	1,*ls*
			[47.028]	311950	2438400	2	4	E2	7.1(+7)	0.039	D	1,*ls*
5.	$3d$–$4d$	^2D - ^2D										
			[54.759]	770300	2596500	6	6	E2	3.6(+7)	0.063	D	1,*ls*
			[54.681]	765610	2594400	4	4	E2	3.2(+7)	0.037	D	1,*ls*
			[54.822]	770300	2594400	6	4	E2	1.4(+7)	0.016	E	1,*ls*
			[54.618]	765610	2596500	4	6	E2	9.2(+6)	0.016	E	1,*ls*
6.	$4p$–$5p$	$^2P^\circ$ - $^2P^\circ$										
			[108.7]	2438400	3358100	4	4	E2	1.07(+7)	0.387	C	1,*ls*
			[109.4]	2438400	3352400	4	2	E2	2.07(+7)	0.387	C	1,*ls*
			[107.3]	2426400	3358100	2	4	E2	1.14(+7)	0.387	C	1,*ls*
7.	$4p$–$6p$	$^2P^\circ$ - $^2P^\circ$										
			[71.185]	2438400	3843200	4	4	E2	6.9(+6)	0.030	D	1,*ls*
			[71.378]	2438400	3839400	4	2	E2	1.4(+7)	0.030	D	1,*ls*
			[70.582]	2426400	3843200	2	4	E2	7.2(+6)	0.030	D	1,*ls*
8.	$4d$–$5d$	^2D - ^2D										
			[119.3]	2596500	3434600	6	6	E2	8.1(+6)	0.70	C	1,*ls*
			[119.1]	2594400	3433700	4	4	E2	7.1(+6)	0.406	C	1,*ls*
			[119.4]	2596500	3433700	6	4	E2	3.01(+6)	0.174	C−	1,*ls*
			[119.0]	2594400	3434600	4	6	E2	2.04(+6)	0.174	C−	1,*ls*
9.	$4d$–$6d$	^2D - ^2D										
			[77.543]	2596500	3886100	6	6	E2	4.8(+6)	0.048	D	1,*ls*
			[77.441]	2594400	3885700	4	4	E2	4.2(+6)	0.028	D	1,*ls*
			[77.567]	2596500	3885700	6	4	E2	1.8(+6)	0.012	E	1,*ls*
			[77.417]	2594400	3886100	4	6	E2	1.2(+6)	0.012	E	1,*ls*
10.	$4d$–$7d$	^2D - ^2D										
			[64.094]	2596500	4156700	6	6	E2	3.1(+6)	0.012	D	1,*ls*
11.	$4f$–$5f$	$^2F^\circ$ - $^2F^\circ$										
			[124.6]	2667100	3469400	8	8	E2	4.7(+6)	0.67	C	1,*ls*
			[124.6]	2666200	3469000	6	6	E2	4.48(+6)	0.481	C	1,*ls*
			[124.7]	2667100	3469000	8	6	E2	7.4(+5)	0.080	D	1,*ls*
			[124.5]	2666200	3469400	6	8	E2	5.6(+5)	0.080	D	1,*ls*

Ni XVIII: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
12.	$4f$–$6f$	$^2F^\circ$ - $^2F^\circ$										
			[80.710]	2667100	3906100	8	8	E2	2.3(+6)	0.038	D	1,*ls*
			[80.671]	2666200	3905800	6	6	E2	2.2(+6)	0.027	D	1,*ls*
13.	$5p$–$6p$	$^2P^\circ$ - $^2P^\circ$										
			[206.1]	3358100	3843200	4	4	E2	2.50(+6)	2.21	C	1,*ls*
			[207.8]	3358100	3839400	4	2	E2	4.79(+6)	2.21	C	1,*ls*
			[203.7]	3352400	3843200	2	4	E2	2.65(+6)	2.21	C	1,*ls*
14.	$5d$–$6d$	^2D - ^2D										
			[221.5]	3434600	3886100	6	6	E2	2.13(+6)	4.06	C	1,*ls*
			[221.2]	3433700	3885700	4	4	E2	1.88(+6)	2.37	C	1,*ls*
			[221.7]	3434600	3885700	6	4	E2	8.0(+5)	1.02	C–	1,*ls*
			[221.0]	3433700	3886100	4	6	E2	5.4(+5)	1.02	C–	1,*ls*
15.	$5d$–$7d$	^2D - ^2D										
			[138.5]	3434600	4156700	6	6	E2	1.46(+6)	0.266	C	1,*ls*
			[139]	3433700	4155000	4	4	E2	1.25(+6)	0.155	C	1,*ls*
			[139]	3434600	4155000	6	4	E2	5.3(+5)	0.066	D	1,*ls*
			[138.3]	3433700	4156700	4	6	E2	3.7(+5)	0.066	D	1,*ls*
16.	$5d$–$8d$	^2D - ^2D										
			[111.5]	3434600	4331300	6	6	E2	9.9(+5)	0.061	D	1,*ls*
			[111.4]	3433700	4331100	4	4	E2	8.8(+5)	0.036	D	1,*ls*
			[111.5]	3434600	4331100	6	4	E2	3.7(+5)	0.015	E	1,*ls*
			[111.4]	3433700	4331300	4	6	E2	2.4(+5)	0.015	E	1,*ls*
17.	$5f$–$6f$	$^2F^\circ$ - $^2F^\circ$										
			[229.0]	3469400	3906100	8	8	E2	1.63(+6)	4.89	C	1,*ls*
			[228.9]	3469000	3905800	6	6	E2	1.57(+6)	3.52	C	1,*ls*
			[229.1]	3469400	3905800	8	6	E2	2.6(+5)	0.59	C–	1,*ls*
			[228.8]	3469000	3906100	6	8	E2	2.0(+5)	0.59	C–	1,*ls*
18.	$5f$–$7f$	$^2F^\circ$ - $^2F^\circ$										
			[142.9]	3469400	4169100	8	8	E2	1.00(+6)	0.284	C	1,*ls*
			[142.9]	3469000	4168900	6	6	E2	9.6(+5)	0.205	C	1,*ls*
			[143.0]	3469400	4168900	8	6	E2	1.6(+5)	0.034	D	1,*ls*
			[142.8]	3469000	4169100	6	8	E2	1.2(+5)	0.034	D	1,*ls*
19.	$5f$–$8f$	$^2F^\circ$ - $^2F^\circ$										
			[114.9]	3469400	4339400	8	8	E2	6.4(+5)	0.061	D	1,*ls*
			[115]	3469000	4340000	6	6	E2	6.1(+5)	0.044	D	1,*ls*
20.	$6d$–$7d$	^2D - ^2D										
			[369.5]	3886100	4156700	6	6	E2	6.8(+5)	16.8	C	1,*ls*
			[372]	3885700	4155000	4	4	E2	5.8(+5)	9.8	D+	1,*ls*
			[372]	3886100	4155000	6	4	E2	2.5(+5)	4.2	D	1,*ls*
			[369.0]	3885700	4156700	4	6	E2	1.72(+5)	4.21	C–	1,*ls*

Ni XVIII: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accu-racy	Source
21.	6*d*–8*d*	^{2}D – ^{2}D										
			[224.6]	3886100	4331300	6	6	E2	5.1(+5)	1.05	C	1,*ls*
			[224.5]	3885700	4331100	4	4	E2	4.5(+5)	0.61	C	1,*ls*
			[224.7]	3886100	4331100	6	4	E2	1.93(+5)	0.263	C–	1,*ls*
			[224.4]	3885700	4331300	4	6	E2	1.29(+5)	0.263	C–	1,*ls*
22.	6*f*–7*f*	^{2}F° – ^{2}F°										
			[380.2]	3906100	4169100	8	8	E2	5.8(+5)	21.9	C	1,*ls*
			[380.1]	3905800	4168900	6	6	E2	5.6(+5)	15.8	C	1,*ls*
			[380.5]	3906100	4168900	8	6	E2	9.2(+4)	2.63	C–	1,*ls*
			[379.8]	3905800	4169100	6	8	E2	7.0(+4)	2.63	C–	1,*ls*
23.	6*f*–8*f*	^{2}F° – ^{2}F°										
			[230.8]	3906100	4339400	8	8	E2	4.04(+5)	1.26	C	1,*ls*
			[230]	3905800	4340000	6	6	E2	4.0(+5)	0.91	C–	1,*ls*
			[230]	3906100	4340000	8	6	E2	6.5(+4)	0.15	D+	1,*ls*
			[230.6]	3905800	4339400	6	8	E2	4.86(+4)	0.151	C–	1,*ls*
24.	7*d*–8*d*	^{2}D – ^{2}D										
			[572.7]	4156700	4331300	6	6	E2	2.5(+5)	56	C	1,*ls*
			[568]	4155000	4331100	4	4	E2	2.3(+5)	32	D	1,*ls*
			[573.4]	4156700	4331100	6	4	E2	9.4(+4)	13.9	C–	1,*ls*
			[568]	4155000	4331300	4	6	E2	6.6(+4)	14	D	1,*ls*
25.	7*f*–8*f*	^{2}F° – ^{2}F°										
			[587.2]	4169100	4339400	8	8	E2	2.3(+5)	75	C	1,*ls*
			[585]	4168900	4340000	6	6	E2	2.2(+5)	54	D	1,*ls*
			[585]	4169100	4340000	8	6	E2	3.7(+4)	9.0	D	1,*ls*
			[586.5]	4168900	4339400	6	8	E2	2.7(+4)	9.0	C–	1,*ls*
26.	3*s*–3*d*	^{2}S – ^{2}D										
			[129.82]	0	770300	2	6	E2	8.4(+5)	0.110	C	1,*ls*
			[130.61]	0	765610	2	4	E2	8.2(+5)	0.074	D	1,*ls*
27.	3*s*–4*d*	^{2}S – ^{2}D										
			[38.513]	0	2596500	2	6	E2	2.8(+8)	0.086	D	1,*ls*
			[38.545]	0	2594400	2	4	E2	2.9(+8)	0.058	D	1,*ls*
28.	3*s*–5*d*	^{2}S – ^{2}D										
			[29.115]	0	3434600	2	6	E2	1.5(+8)	0.011	D	1,*ls*
29.	3*p*–4*f*	^{2}P° – ^{2}F°										
			[43.018]	342486	2667100	4	8	E2	4.92(+8)	0.345	C	1,*ls*
			[42.477]	311950	2666200	2	6	E2	4.07(+8)	0.201	C	1,*ls*
			[43.035]	342486	2666200	4	6	E2	1.1(+8)	0.057	D	1,*ls*
30.	3*p*–5*f*	^{2}P° – ^{2}F°										
			[31.981]	342486	3469400	4	8	E2	7.5(+7)	0.012	D	1,*ls*
31.	3*d*–4*s*	^{2}D – ^{2}S										
			[65.300]	770300	2301700	6	2	E2	2.7(+7)	0.038	D	1,*ls*
			[65.100]	765610	2301700	4	2	E2	1.8(+7)	0.025	D	1,*ls*

Ni XVIII: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
32.	4s–4d	^{2}S – ^{2}D										
			[339.2]	2301700	2596500	2	6	E2	1.06(+5)	1.70	C	1,ls
			[341.6]	2301700	2594400	2	4	E2	1.02(+5)	1.13	C	1,ls
33.	4s–5d	^{2}S – ^{2}D										
			[88.269]	2301700	3434600	2	6	E2	3.1(+7)	0.59	C	1,ls
			[88.339]	2301700	3433700	2	4	E2	3.07(+7)	0.393	C	1,ls
34.	4s–6d	^{2}S – ^{2}D										
			[63.115]	2301700	3886100	2	6	E2	2.1(+7)	0.074	D	1,ls
			[63.131]	2301700	3885700	2	4	E2	2.1(+7)	0.050	D	1,ls
35.	4s–7d	^{2}S – ^{2}D										
			[53.908]	2301700	4156700	2	6	E2	1.4(+7)	0.022	D	1,ls
			[53.97]	2301700	4155000	2	4	E2	1.4(+7)	0.015	D	1,ls
36.	4p–4f	^{2}P° – ^{2}F°										
			[437.3]	2438400	2667100	4	8	E2	2.36(+4)	1.80	C	1,ls
			[417.0]	2426400	2666200	2	6	E2	2.33(+4)	1.05	C	1,ls
			[439.0]	2438400	2666200	4	6	E2	5200	0.300	C–	1,ls
37.	4p–5f	^{2}P° – ^{2}F°										
			[96.993]	2438400	3469400	4	8	E2	5.8(+7)	2.37	C	1,ls
			[95.914]	2426400	3469000	2	6	E2	4.76(+7)	1.38	C	1,ls
			[97.031]	2438400	3469000	4	6	E2	1.28(+7)	0.394	C–	1,ls
38.	4p–6f	^{2}P° – ^{2}F°										
			[68.134]	2438400	3906100	4	8	E2	2.33(+7)	0.163	C	1,ls
			[67.595]	2426400	3905800	2	6	E2	1.9(+7)	0.095	D	1,ls
			[68.148]	2438400	3905800	4	6	E2	5.1(+6)	0.027	E	1,ls
39.	4p–7f	^{2}P° – ^{2}F°										
			[57.780]	2438400	4169100	4	8	E2	1.0(+7)	0.032	D	1,ls
			[57.389]	2426400	4168900	2	6	E2	8.5(+6)	0.019	D	1,ls
40.	4p–8f	^{2}P° – ^{2}F°										
			[52.604]	2438400	4339400	4	8	E2	5.2(+6)	0.010	D	1,ls
41.	4f–5p	^{2}F° – ^{2}P°										
			[144.7]	2667100	3358100	8	4	E2	1.87(+6)	0.282	C	1,ls
			[145.7]	2666200	3352400	6	2	E2	2.11(+6)	0.165	C	1,ls
			[144.5]	2666200	3358100	6	4	E2	3.1(+5)	0.047	D	1,ls
42.	4f–6p	^{2}F° – ^{2}P°										
			[85.027]	2667100	3843200	8	4	E2	1.1(+6)	0.012	D	1,ls
43.	5p–5f	^{2}P° – ^{2}F°										
			[898.5]	3358100	3469400	4	8	E2	6200	17.2	C	1,ls
			[857.6]	3352400	3469000	2	6	E2	6000	10.0	C	1,ls
			[901.7]	3358100	3469000	4	6	E2	1350	2.87	C–	1,ls

Ni XVIII: Forbidden transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
44.	5p–6f	$^2P^o - ^2F^o$										
			[182.5]	3358100	3906100	4	8	E2	1.06(+7)	10.2	C	1,ls
			[180.7]	3352400	3905800	2	6	E2	8.7(+6)	6.0	C	1,ls
			[182.6]	3358100	3905800	4	6	E2	2.34(+6)	1.70	C−	1,ls
45.	5p–7f	$^2P^o - ^2F^o$										
			[123.3]	3358100	4169100	4	8	E2	6.3(+6)	0.85	C	1,ls
			[122.5]	3352400	4168900	2	6	E2	5.0(+6)	0.493	C	1,ls
			[123.3]	3358100	4168900	4	6	E2	1.39(+6)	0.141	C−	1,ls
46.	5p–8f	$^2P^o - ^2F^o$										
			[101.9]	3358100	4339400	4	8	E2	3.61(+6)	0.189	C	1,ls
			[101]	3352400	4340000	2	6	E2	2.93(+6)	0.110	C	1,ls
			[102]	3358100	4340000	4	6	E2	8.1(+5)	0.032	D	1,ls
47.	5f–6p	$^2F^o - ^2P^o$										
			[267.5]	3469400	3843200	8	4	E2	9.2(+5)	2.99	C	1,ls
			[270.0]	3469000	3839400	6	2	E2	1.02(+6)	1.75	C	1,ls
			[267.2]	3469000	3843200	6	4	E2	1.54(+5)	0.499	C−	1,ls
48.	6p–6f	$^2P^o - ^2F^o$										
			[1590]	3843200	3906100	4	8	E2	1900	91	C−	1,ls
			[1510]	3839400	3905800	2	6	E2	1900	53	C−	1,ls
			[1600]	3843200	3905800	4	6	E2	400	15	D+	1,ls
49.	6p–7f	$^2P^o - ^2F^o$										
			[306.8]	3843200	4169100	4	8	E2	2.63(+6)	34.1	C	1,ls
			[303.5]	3839400	4168900	2	6	E2	2.16(+6)	19.9	C	1,ls
			[307.0]	3843200	4168900	4	6	E2	5.9(+5)	5.7	C−	1,ls
50.	6p–8f	$^2P^o - ^2F^o$										
			[201.5]	3843200	4339400	4	8	E2	1.90(+6)	3.01	C	1,ls
			[200]	3839400	4340000	2	6	E2	1.54(+6)	1.76	C−	1,ls
			[201]	3843200	4340000	4	6	E2	4.3(+5)	0.50	D+	1,ls

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XIX

Ne Isoelectronic Sequence

Ground State: $1s^22s^22p^6\ ^1S_0$

Ionization Energy: 1541 eV = 12430000 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
9.140	12	13.779	14	45.2	33	227	28
9.153	11	14.043	13	45.3	33	237	28
9.977	22	38.8	27	46.0	39	242	28
10.110	21	38.9	26	46.4	34	256	29
10.157	20	39.1	26	77.32	2	257	30
10.283	19	39.3	26	79.81	1	258	32
10.433	18	40.5	36	80	5	305	24
11.539	10	40.7	36	82	6	348	31
11.599	9	41.132	37	86.36	4	359	23
12.435	17	42.3	38	90	7	736	25
12.656	16	42.6	35	91	7,8		
12.812	15	43.4	40	91.02	3		

A-values for numerous transitions involving an electron jump of the type $2s$–np ($n=2$–4), $2p$–ns, $2p$–nd, $3s$–np, $3p$–nd ($n=3,4$), or $3p$–$4s$ were calculated by Loulergue and Nussbaumer[1] using scaled Thomas-Fermi wavefunctions. The following configurations were included in their basis: $2s^22p^6$, $2s^22p^5nl$, and $2s2p^6nl$ (for $n=3$: $l=s,p,d$; for $n=4$: $l=s,p,d,f$). Their results are quoted here, but, in cases where better wavelength data were available, their transition probabilities were first converted to line strengths, which were then reconverted to *f*- and *A*-values by using the more accurate wavelengths. Data for resonance lines were not modified, as the calculated wavelengths of Ref. 1 for these lines are fairly accurate.

Transition probabilities for a few lines for which Loulergue and Nussbaumer did not report results were taken from the work of Pokleba and Safronova,[2] who used wavefunctions calculated by a charge-expansion perturbation theory approach with allowance for mixing of configurations in which a single $2s$ or $2p$ electron is excited to an $n=3$ orbital but with no inclusion of configurations in which an electron occupies the $n=4$ shell.

Transitions involving levels of the $2p^53p$ and $2p^53d$ configurations which are indicated by Jupen and Litzen[3] to be of low to moderate purity in *LS* coupling in Fe XVII are excluded here, as are very weak lines. Transitions involving the corresponding levels in the $2p^54l$ configurations are excluded as well, as no percentage composition data were available for these levels. The pattern of levels within the $2s2p^63d$ configuration resulting from the calculations of Loulergue and Nussbaumer is entirely different from that determined by Vainshtein and Safronova,[4] whose energy levels were apparently used by Pokleba and Safronova in their transition probability calculations. We have thus excluded transitions out of these levels from our tabulation.

References

[1] M. Loulergue and H. Nussbaumer, Astron. Astrophys. **45**, 125 (1975).

[2] A. K. Pokleba and U. I. Safronova, Preprint No. 11, Akad. Nauk SSSR, Ot. Ob. Fiz. Astron., Inst. Spektrosk. (Moscow, 1981).

[3] C. Jupen and U. Litzen, Phys. Scr. **30**, 112 (1984).

[4] L. A. Vainshtein and U. I. Safronova, *Spektroskopicheskie Konstanty Atomov*, 5–122 (Ed. V. B. Belyanin, Akad. Nauk SSSR, Ot. Ob. Fiz. Astron., Nauch. Sov. Spektrosk., Moscow, 1977).

Ni 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.	$2s^22p^5(^2P^\circ_{3/2})3s - 2s2p^63s$	$(^3/_2,^1/_2)^\circ - {}^3S$	[79.81]	7103800	8357000	5	3	1200	0.069	0.090	−0.47	D	1
2.		$(^3/_2,^1/_2)^\circ - {}^1S$	77.32	7121000	8415000	3	1	830	0.025	0.019	−1.13	D	1
3.	$2s^22p^5(^2P^\circ_{1/2})3s - 2s2p^63s$	$(^1/_2,^1/_2)^\circ - {}^3S$	91.02	7257400	8357000	3	3	290	0.036	0.032	−0.97	D	1
4.		$(^1/_2,^1/_2)^\circ - {}^1S$	86.36	7257400	8415000	3	1	440	0.016	0.014	−1.31	D	1
5.	$2s^22p^53p - 2s2p^63p$	$^3S - {}^3P^\circ$	[80]			3	3	170	0.016	0.013	−1.31	E	1
			[80]			3	1	670	0.022	0.017	−1.19	D	1
6.		$^3D - {}^3P^\circ$	[82]			7	5	960	0.069	0.13	−0.32	D	1
7.	$2s^22p^54p - 2s2p^64p$	$^3S - {}^3P^\circ$	[90]			3	3	120	0.015	0.013	−1.36	E	1
			[91]			3	1	580	0.024	0.022	−1.14	E	1
8.		$^3D - {}^3P^\circ$	[91]			7	5	620	0.055	0.12	−0.41	E	1
9.	$2s^22p^6 - 2s2p^63p$	$^1S - {}^3P^\circ$	11.599	0	8621400	1	3	6300	0.038	0.0015	−1.42	E	1
10.		$^1S - {}^1P^\circ$	11.539	0	8666300	1	3	4.8(+4)[a]	0.29	0.011	−0.54	D	1
11.	$2s^22p^6 - 2s2p^64p$	$^1S - {}^3P^\circ$	9.153	0	10930000	1	3	5200	0.020	5.9(−4)	−1.71	E	1
12.		$^1S - {}^1P^\circ$	9.140	0	10940000	1	3	3.1(+4)	0.12	0.0035	−0.93	D	1
13.	$2p^6 - 2p^5(^2P^\circ_{3/2})3s$	$^1S - (^3/_2,^1/_2)^\circ$	14.043	0	7121000	1	3	1.31(+4)	0.116	0.0054	−0.93	C−	1
14.	$2p^6 - 2p^5(^2P^\circ_{1/2})3s$	$^1S - (^1/_2,^1/_2)^\circ$	13.779	0	7257400	1	3	1.23(+4)	0.105	0.00476	−0.98	C−	1
15.	$2p^6 - 2p^53d$	$^1S - {}^3P^\circ$	12.812	0	7805200	1	3	1100	0.0081	3.4(−4)	−2.09	E	1

Ni XIX: Allowed transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} ($10^8 s^{-1}$)	f_{ik}	S (at. u.)	log gf	Accuracy	Source
16.		$^1S - ^3D^\circ$											
			12.656	0	7901400	1	3	1.0(+5)	0.72	0.030	−0.14	D	1
17.		$^1S - ^1P^\circ$	12.435	0	8041800	1	3	3.66(+5)	2.55	0.104	0.406	C−	1
18.	$2p^6 - 2p^5(^2P^\circ_{3/2})4s$	$^1S - (^3/_2,^1/_2)^\circ$											
			10.433	0	9585000	1	3	5100	0.025	8.6(−4)	−1.60	D	1
19.	$2p^6 - 2p^5(^2P^\circ_{1/2})4s$	$^1S - (^1/_2,^1/_2)^\circ$											
			10.283	0	9724800	1	3	4700	0.022	7.6(−4)	−1.65	D	1
20.	$2p^6 - 2p^5 4d$	$^1S - ^3P^\circ$											
			10.157	0	9845400	1	3	700	0.0032	1.1(−4)	−2.49	E	1
21.		$^1S - ^3D^\circ$											
			10.110	0	9891200	1	3	9.4(+4)	0.43	0.014	−0.36	D	1
22.		$^1S - ^1P^\circ$	9.977	0	10020000	1	3	1.1(+5)	0.49	0.016	−0.31	D	1
23.	$2p^5(^2P^\circ_{3/2})3s - 2p^5 3p$	$(^3/_2,^1/_2)^\circ - ^3S$											
			[359]			5	3	44	0.051	0.30	−0.60	D	1
24.		$(^3/_2,^1/_2)^\circ - ^3D$											
			[305]			5	7	80	0.16	0.78	−0.11	D	1
25.	$2p^5(^2P^\circ_{1/2})3s - 2p^5 3p$	$(^1/_2,^1/_2)^\circ - ^3S$											
			[736]			1	3	0.060	0.0015	0.0035	−2.84	E	2
26.	$2s2p^6 3s - 2s2p^6 4p$	$^3S - ^3P^\circ$	*39.1*			3	9	3800	0.26	0.10	−0.11	D	1
			[39.1]			3	5	3900	0.15	0.058	−0.35	D	1
			[38.9]	8357000	10930000	3	3	3700	0.083	0.032	−0.60	D	1
			[39.3]			3	1	4300	0.033	0.013	−1.00	D	1
27.		$^3S - ^1P^\circ$											
			[38.8]	8357000	10940000	3	3	710	0.016	0.0061	−1.32	E	1
28.	$2p^5 3p - 2p^5 3d$	$^3S - ^3P^\circ$	*238*			3	9	78	0.20	0.47	−0.22	E	1
			[227]			3	5	59	0.076	0.17	−0.64	E	1
			[237]			3	3	110	0.090	0.21	−0.57	D	1
			[242]			3	1	130	0.038	0.091	−0.94	D	1
29.		$^3D - ^3P^\circ$											
			[256]			7	5	5.5	0.0039	0.023	−1.57	E	2

Ni XIX: Allowed transitions — Continued

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (at. u.)	log gf	Accuracy	Source
30.		^{3}D - ^{3}F°											
			[257]			7	9	120	0.16	0.93	0.04	D	1
31.		^{3}P - ^{3}P°											
			[348]			1	3	1.3	0.0071	0.0081	−2.15	E	2
32.		^{3}P - ^{3}D°											
			[258]			1	3	54	0.16	0.14	−0.79	D	2
33.	$2p^53p-$ $2p^5(^2P^\circ_{3/2})4s$	^{3}S - ($^3/_2$,$^1/_2$)°											
			[45.3]			3	5	1000	0.051	0.023	−0.81	D	1
			[45.2]			3	3	45	0.0014	6.2(−4)	−2.38	E	1
34.		^{3}D - ($^3/_2$,$^1/_2$)°											
			[46.4]			7	5	2600	0.060	0.064	−0.38	D	1
35.	$2p^53p-$ $2p^5(^2P^\circ_{1/2})4s$	^{3}S - ($^1/_2$,$^1/_2$)°											
			[42.6]			3	3	72	0.0020	8.2(−4)	−2.23	E	1
			[42.6]			3	1	93	8.4(−4)	3.5(−4)	−2.60	E	1
36.	$2p^53p$-$2p^54d$	^{3}S - ^{3}P°	*40.6*			3	9	4700	0.35	0.14	0.02	E	1
			[40.5]			3	5	3000	0.12	0.049	−0.43	E	1
			[40.7]			3	3	6400	0.16	0.064	−0.32	D	1
			[40.7]			3	1	8400	0.070	0.028	−0.68	E	1
37.		^{3}D - ^{3}F°											
			41.132			7	9	9400	0.31	0.29	0.33	D	1
38.		^{3}P - ^{3}D°											
			[42.3]			1	3	3800	0.31	0.043	−0.51	D	1
39.		^{1}S - ^{3}D°											
			[46.0]			1	3	1100	0.10	0.016	−0.98	E	1
40.		^{1}S - ^{1}P°	[43.4]			1	3	4000	0.34	0.048	−0.47	D	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XIX

Forbidden Transitions

The A-value for the single magnetic-dipole transition tabulated here is the result of the Hartree-Fock-Relativistic (HFR) calculations of Cowan.[1] The wavelength is the result of these same calculations and may be somewhat uncertain, as the energy of the $J=0$ level has not been determined experimentally. For the magnetic quadrupole resonance transition to the $J=2$ level of the $2p^5 3s$ configuration, we quote the A-value determined by Loulergue and Nussbaumer[2] using scaled Thomas-Fermi wavefunctions with fairly extensive allowance for configuration mixing.

References

[1] R. D. Cowan, Los Alamos Scientific Laboratory Informal Report LA-6679-MS (Jan. 1977).

[2] M. Loulergue and H. Nussbaumer, Astron. Astrophys. **45**, 125 (1975).

Ni XIX: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$2p^5(^2P^\circ_{3/2})3s-2p^5(^2P^\circ_{1/2})3s$	$(^3/_2,^1/_2)^\circ-(^1/_2,^1/_2)^\circ$	[780]			3	1	M1	4.8(+4)[a]	0.84	D+	1
2.	$2p^6-2p^5(^2P^\circ_{3/2})3s$	$^1S-(^3/_2,^1/_2)^\circ$	14.077	0	7103800	1	5	M2	4.2(+5)	0.18	D+	2

[a] The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XX

F Isoelectronic Sequence

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

Ionization Energy: 1648 eV = 13290000 cm^{-1}

Allowed Transitions

Oscillator strengths for lines of the multiplet $2s^2 2p^5\ ^2P^\circ-2s2p^6\ ^2S$ are the results of the Dirac-Fock calculations of Cheng *et al.*,[1] which included a perturbative treatment of the Breit interaction and the Lamb shift.

For lines of the arrays $2p^5-2p^4 3s$ and $2p^5-2p^4 3d$, we quote the f-values calculated by Fawcett[2] using Cowan's Hartree-Fock-Relativistic (HFR) method and incorporating scaling of energy parameters on the basis of a least-squares fit to observed energies. Fawcett's calculations included fairly extensive allowance for configuration mixing in both odd- and even-parity states. Transitions involving levels which are indicated by Fawcett to be of low to moderate purity in LS coupling in neighboring fluorinelike ions are excluded from this compilation, as are lines characterized by very small f-values.

The ratio of A-values for the two resonance lines out of the $2s2p^6\ ^2S_{1/2}$ level as given in Ref. 1 is in reasonably good agreement with the result of Stratton *et al.*[3] derived from relative-intensity measurements.

References

[1] K. T. Cheng, Y.-K. Kim, and J. P. Desclaux, At. Data Nucl. Data Tables **24**, 111 (1979).

[2] B. C. Fawcett, At. Data Nucl. Data Tables **31**, 495 (1984).

[3] B. C. Stratton, H. W. Moos, S. Suckewer, U. Feldman, J. F. Seely, and A. K. Bhatia, Phys. Rev. A **31**, 2534 (1985).

Ni 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.	$2s^22p^5$–$2s2p^6$	^{2}P° – ^{2}S	*86.66*	*47990*	1202000	6	2	1450	0.0544	0.0932	−0.486	C+	1
			83.17	0	1202000	4	2	1100	0.0571	0.0625	−0.641	C+	1
			94.49	143960	1202000	2	2	368	0.0493	0.0307	−1.006	C+	1
2.	$2p^5$–$2p^4(^3P)3s$	^{2}P° – ^{4}P											
			13.309	0	7513700	4	6	1700	0.0068	0.0012	−1.57	E	2
			13.135	0	7613200	4	2	6000	0.0078	0.0013	−1.51	E	2
3.		^{2}P° – ^{2}P											
			13.282	143960	7673400	2	2	2.0(+4)[a]	0.054	0.0047	−0.97	D	2
			13.032	0	7673400	4	2	1.8(+4)	0.023	0.0039	−1.04	D	2
4.	$2p^5$–$2p^4(^1D)3s$	^{2}P° – ^{2}D	*13.003*	*47990*	*7738300*	6	10	1.8(+4)	0.074	0.019	−0.35	E	2
			12.927	0	7735700	4	6	1.6(+4)	0.060	0.010	−0.62	D	2
			13.161	143960	7742200	2	4	1.9(+4)	0.099	0.0086	−0.70	D	2
			[12.916]	0	7742200	4	4	1000	0.0025	4.3(−4)	−2.00	E	2
5.	$2p^5$–$2p^4(^1S)3s$	^{2}P° – ^{2}S	*12.656*	*47990*	7949200	6	2	2.0(+4)	0.016	0.0041	−1.01	E	2
			[12.580]	0	7949200	4	2	2800	0.0033	5.5(−4)	−1.88	E	2
			12.812	143960	7949200	2	2	1.7(+4)	0.042	0.0035	−1.08	D	2
6.	$2p^5$–$2p^4(^1D)3d$	^{2}P° – ^{2}S	*11.942*	*47990*	8421800	6	2	2.6(+5)	0.19	0.044	0.05	D	2
			11.874	0	8421800	4	2	2.3(+5)	0.24	0.038	−0.02	D	2
			12.079	143960	8421800	2	2	3.4(+4)	0.074	0.0059	−0.83	D	2
7.	$2p^5$–$2p^4(^1S)3d$	^{2}P° – ^{2}D											
			[11.61]			4	6	9600	0.029	0.0044	−0.94	D	2

[a]The number in parentheses following the value indicates the power of ten by which this value has to be multiplied.

Ni XX

Forbidden Transitions

Line strengths for the magnetic dipole and electric quadrupole contributions to the transition between the two levels of the $2p^5$ configuration are the results of the Dirac-Fock calculations of Cheng *et al.*[1] These relativistic calculations included a perturbative treatment of the Breit interaction and the Lamb shift. The strength of the electric quadrupole transition as defined in Ref. 1 was multiplied by the factor 2/3 which is needed to bring this value into conformance with the definition of quadrupole strengths used in the NBS tables.

Reference

[1]K. T. Cheng, Y.-K. Kim, and J. P. Desclaux, At. Data Nucl. Data Tables **24**, 111 (1979).

Ni XX: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$2p^5$–$2p^5$	^{2}P° – ^{2}P°										
			694.64	0	143960	4	2	M1	5.35(+4)[a]	1.33	B	1
			″	″	″	4	2	E2	7.3	0.0014	D	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XXI

O Isoelectronic Sequence

Ground State: $1s^22s^22p^4\ ^3P_2$

Ionization Energy: 1756 eV = 14160000 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
11.13	25	11.67	18	12.502	14	95.85	1
11.23	26	11.72	18	12.533	13	96.79	1
11.239	21	12.079	15	12.592	10	97.13	6
11.28	24	12.166	15	12.656	10	100.23	1
11.318	19	12.179	12	12.8	9	103.40	8
11.48	20,27	12.208	11	69.62	2	109.29	1
11.517	23	12.209	16	74.431	2	109.44	3
11.539	18	12.245	15	76.45	2	120.33	3
11.54	18	12.345	16	78.28	7	139.05	5
11.596	22	12.370	12	81.69	4		
11.65	17	12.454	10	88.81	1		
11.66	17	12.472	11	93.91	1		

The tabulated oscillator strengths for transitions of the arrays $2s^22p^4$–$2s2p^5$ and $2s2p^5$–$2p^6$ are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Cheng *et al.*[1] These relativistic calculations included a perturbative treatment of the Breit interaction and the Lamb shift. Allowance for configuration mixing was limited to the $n=2$ complex. The results should be quite accurate, except in the case of weak lines.

Transition probabilities for lines of the $2s^22p^4$–$2s2p^5$ array were calculated by Froese Fischer and Saha[2] using the multiconfiguration Hartree-Fock (MCHF) method with Breit-Pauli corrections. Their basis set included many configurations outside the $n=2$ complex, but relativistic effects were not treated to the same degree as in Ref. 1. Line strengths derived from these two sources are in reasonably good agreement, particularly for the stronger transitions.

A few experimental data are available for this ion. Stratton *et al.*[3] measured ratios of transition probabilities for two pairs of transitions, one of these pairs originating from the $2s2p^5\ ^3P^\circ_2$ level and the other from the $2s2p^5\ ^3P^\circ_1$ level. The former agrees very well with the theoretical data of Cheng *et al.*; the latter is nearly a factor of two larger than theory.

For lines of the arrays $2p^4$–$2p^33s$ and $2p^4$–$2p^33d$, we quote the f-values calculated by Fawcett[4] using Cowan's Hartree-Fock-Relativistic (HFR) method and incorporating scaling of energy parameters on the basis of a least-squares fit to observed energies. Fawcett's calculations included fairly extensive allowance for configuration mixing in both odd- and even-parity states. The weakest lines were not reported, and thus are not tabulated here. Transitions involving levels which are indicated by Fawcett to be of low to moderate purity in *LS* coupling in neighboring fluorinelike ions are excluded from this compilation.

References

[1]K. T. Cheng, Y.-K. Kim, and J. P. Desclaux, At. Data Nucl. Data Tables **24**, 111 (1979).

[2]C. Froese Fischer and H. P. Saha, J. Phys. B **17**, 943 (1984).

[3]B. C. Stratton, H. W. Moos, S. Suckewer, U. Feldman, J. F. Seely, and A. K. Bhatia, Phys. Rev. A **31**, 2534 (1985).

[4]B. C. Fawcett, At. Data Nucl. Data Tables **34**, 215 (1986).

Ni 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.	$2s^22p^4$–$2s2p^5$	^{3}P – ^{3}P°	*96.671*	*53080*	*1087520*	9	9	640	0.089	0.256	−0.095	C	1
			95.85	0	1043300	5	5	460	0.063	0.099	−0.50	C	1
			100.23	128290	1126000	3	3	143	0.0215	0.0213	−1.190	C	1
			88.81	0	1126000	5	3	419	0.0297	0.0434	−0.83	C	1
			93.91	128290	1193140	3	1	740	0.0325	0.0301	−1.011	C	1
			109.29	128290	1043300	3	5	115	0.0344	0.0371	−0.99	C	1
			96.79	92840	1126000	1	3	190	0.079	0.025	−1.10	C	1
2.		^{3}P – ^{1}P°											
			69.62	0	1436370	5	3	170	0.0076	0.0087	−1.42	E	1
			76.45	128290	1436370	3	3	18	0.0016	0.0012	−2.32	E	1
			[74.431]	92840	1436370	1	3	23	0.0057	0.0014	−2.24	E	1
3.		^{1}D – ^{3}P°											
			120.33	212230	1043300	5	5	32	0.0070	0.014	−1.46	E	1
			[109.44]	212230	1126000	5	3	1.0	1.1(−4)[a]	2.0(−4)	−3.26	E	1
4.		^{1}D – ^{1}P°	81.69	212230	1436370	5	3	1700	0.102	0.137	−0.292	C	1
5.		^{1}S – ^{3}P°											
			[139.05]	406820	1126000	1	3	11	0.0093	0.0043	−2.03	E	1
6.		^{1}S – ^{1}P°	97.13	406820	1436370	1	3	120	0.050	0.016	−1.30	C	1
7.	$2s2p^5$–$2p^6$	^{3}P° – ^{1}S											
			78.28	1126000	2403490	3	1	230	0.0070	0.0054	−1.68	E	1
8.		^{1}P° – ^{1}S	103.40	1436370	2403490	3	1	1800	0.098	0.10	−0.53	C	1
9.	$2p^4$ – $2p^3(^4$S°$)3s$	^{3}P – ^{5}S°											
			[12.8]			5	5	2000	0.0050	0.0011	−1.60	E	4
10.		^{3}P – ^{3}S°	*12.537*	*53080*	8029700	9	3	4.8(+4)	0.038	0.014	−0.47	D	4
			[12.454]	0	8029700	5	3	3.3(+4)	0.046	0.0094	−0.64	D	4
			12.656	128290	8029700	3	3	6700	0.016	0.0020	−1.32	D	4
			12.592	92840	8029700	1	3	7400	0.053	0.0022	−1.28	D	4
11.	$2p^4$ – $2p^3(^2$D°$)3s$	^{3}P – ^{3}D°											
			12.208	0	8191300	5	7	1.41(+4)	0.0442	0.0089	−0.66	C	4
			12.472	128290	8146300	3	3	1.8(+4)	0.042	0.0052	−0.90	D−	4
12.		^{3}P – ^{1}D°											
			[12.179]	0	8210900	5	5	2100	0.0046	9.2(−4)	−1.64	E	4
			12.370	128290	8210900	3	5	3700	0.014	0.0017	−1.38	E	4
13.	$2p^4$ – $2p^3(^2$D°$)3s$	^{1}D – ^{3}D°											
			[12.533]	212230	8191300	5	7	1800	0.0060	0.0012	−1.52	E	4
14.		^{1}D – ^{1}D°	12.502	212230	8210900	5	5	2.8(+4)	0.066	0.014	−0.48	D−	4

Ni 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
15.	$2p^4 - 2p^3(^2P^\circ)3s$	$^3P - ^3P^\circ$											
			12.245	128290	8294900	3	1	1.5(+4)	0.011	0.0013	−1.48	C	4
			12.079	128290	8407100	3	5	9100	0.033	0.0039	−1.00	E	4
			[12.166]	92840	8312600	1	3	1.0(+4)	0.067	0.0027	−1.17	D−	4
16.		$^1D - ^3P^\circ$											
			12.209	212230	8407100	5	5	8900	0.020	0.0040	−1.00	E	4
			12.345	212230	8312600	5	3	8000	0.011	0.0022	−1.26	E	4
17.	$2p^4 - 2p^3(^2P^\circ)3d$	$^3P - ^5D^\circ$											
			[11.66]			5	5	5400	0.011	0.0021	−1.26	E	4
			[11.65]			5	3	6700	0. 0082	0.0016	−1.39	E	4
18.	$2p^4 - 2p^3(^4S^\circ)3d$	$^3P - ^3D^\circ$											
			11.539	0	8666300	5	7	1.2(+5)	0.33	0.063	0.22	D−	4
			[11.67]			1	3	8.0(+4)	0.49	0.019	−0.31	D	4
			[11.72]			3	3	2.3(+4)	0.048	0.0056	−0.84	D	4
			[11.54]			5	3	4200	0.0050	9.5(−4)	−1.60	D−	4
19.	$2p^4 - 2p^3(^2D^\circ)3d$	$^3P - ^3D^\circ$											
			11.318	0	8835500	5	7	2.8(+5)	0.76	0.14	0.58	D−	4
20.		$^3P - ^3P^\circ$											
			[11.48]			3	1	1.1(+5)	0.075	0.0085	−0.65	D−	4
21.	$2p^4 - 2p^3(^2D^\circ)3d$	$^3P - ^1F^\circ$											
			11.239	0	8895000	5	7	5.7(+4)	0.15	0.028	−0.12	E	4
22.		$^1D - ^3D^\circ$											
			[11.596]	212230	8835500	5	7	6400	0.018	0.0034	−1.05	E	4
23.		$^1D - ^1F^\circ$	11.517	212230	8895000	5	7	1.4(+5)	0.39	0.074	0.29	D−	4
24.	$2p^4 - 2p^3(^2P^\circ)3d$	$^3P - ^3P^\circ$											
			[11.28]			3	1	2.2(+5)	0.14	0.016	−0.38	D−	4
25.	$2p^4 - 2p^3(^2P^\circ)3d$	$^3P - ^1P^\circ$											
			[11.13]			3	3	1.7(+4)	0.031	0.0034	−1.03	E	4
26.		$^1D - ^1P^\circ$	[11.23]			5	3	1.7(+4)	0.019	0.0035	−1.02	D	4
27.		$^1S - ^1P^\circ$	[11.48]			1	3	4.0(+5)	2.4	0.091	0.38	D	4

[a]The number in parenthesis following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XXI

Forbidden Transitions

Line strengths tabulated for magnetic dipole and electric quadrupole transitions within the $2p^4$ configuration are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Cheng *et al.*[1] These relativistic calculations included a perturbative treatment of the Breit interaction and the Lamb shift. Allowance for configuration mixing was limited to the $n=2$ complex. Strengths of electric quadrupole transitions as defined in Ref. 1 were multiplied by the factor 2/3 which is needed to bring these values into conformance with the definition of quadrupole strengths used in the NBS tables.

Transition probabilities for these same lines were calculated by Froese Fischer and Saha[2] using the multiconfiguration Hartree-Fock (MCHF) method with Breit-Pauli corrections. Their basis included many configurations outside the $n=2$ complex, but relativistic effects were not treated to the same degree as in Ref. 1. Line strengths derived from these data are in quite good agreement with the data of Cheng *et al*. For this ion of the oxygen isoelectronic sequence, correlation effects due to mixing with configurations outside the complex were found by Froese Fischer and Saha to be rather small, as shown by a comparison of the results of their calculations employing an extensive basis to those derived by the same technique but limited to configurations within the $n=2$ complex.

The weakest lines are excluded from this compilation, as their transition probabilities are considered to be very uncertain.

References

[1] K. T. Cheng, Y.-K Kim, and J. P. Desclaux, At. Data Nucl. Data Tables **24**, 111 (1979).

[2] C. Froese Fischer and H. P. Saha, Phys. Rev. A **28**, 3169 (1983).

Ni XXI: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$2p^4$–$2p^4$	^{3}P - ^{3}P										
			779.5	0	128290	5	3	M1	4.14(+4)[a]	2.18	C	1
			"	"	"	5	3	E2	2.5	0.0013	E	1
			2818.2	92840	128290	1	3	M1	560	1.4	D	1
2.		^{3}P - ^{1}D										
			471.15	0	212230	5	5	M1	4.2(+4)	0.82	D	1
			"	"	"	5	5	E2	16	0.0011	E	1
			1191.1	128290	212230	3	5	M1	1000	0.32	D	1
3.		^{3}P - ^{1}S										
			[359.03]	128290	406820	3	1	M1	3.3(+5)	0.57	D	1
4.		^{1}D - ^{1}S	[513.90]	212230	406820	5	1	E2	98	0.0021	E	1

[a] The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XXII

N Isoelectronic Sequence

Ground State: $1s^22s^22p^3\ ^4S^\circ_{3/2}$

Ionization Energy: 1894 eV = 15280000 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
71.48	4	85.02	2	103.31	1	127.30	5
71.54	13	85.86	14	103.43	6	128.86	10
72.52	8	88.00	12	105.88	11	136.30	5
72.837	13	91.20	12	106.04	1	144.80	5
74.37	3	95.604	6	106.16	16	150.26	9
74.49	13	95.95	11	114.45	10	152.89	16
80.16	13	98.16	6	117.91	1	156.56	5
80.55	8	98.58	14	118.21	15	184.19	9
81.04	12	100.12	12	123.38	5	223.22	9
81.794	13	100.38	15	124.31	16		
84.06	8	100.60	6	124.48	10		
84.24	7	101.31	14	126.32	16		

The tabulated oscillator strengths for transitions of the arrays $2s^22p^3$–$2s2p^4$ and $2s2p^4$–$2p^5$ are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Cheng *et al.*[1] These relativistic calculations included a perturbative treatment of the Breit interaction and the Lamb shift. The results should be quite accurate, except in the case of weak lines. (A few very weak lines have been omitted from this tabulation.)

Reference

[1] K. T. Cheng, Y.-K. Kim, and J. P. Desclaux, At. Data Nucl. Data Tables **24**, 111 (1979).

Ni 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.	$2s^22p^3$–$2s2p^4$	$^4S^\circ$ - ^4P	*111.15*	0	*899720*	4	12	192	0.107	0.156	−0.370	C	1
			117.91	0	848100	4	6	146	0.0458	0.071	−0.74	C	1
			106.04	0	943040	4	4	236	0.0398	0.056	−0.80	C	1
			103.31	0	967960	4	2	266	0.0213	0.0290	−1.070	C	1
2.		$^4S^\circ$ - ^2D											
			85.02	0	1176180	4	4	47	0.0051	0.0057	−1.69	E	1
3.		$^4S^\circ$ - ^2S											
			74.37	0	1344630	4	2	39	0.0016	0.0016	−2.19	E	1
4.		$^4S^\circ$ - ^2P											
			71.48	0	1398940	4	4	76	0.0058	0.0055	−1.63	E	1

Ni 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
5.		^{2}D° - ^{4}P											
			[156.56]	209380	848100	6	6	4.4	0.0016	0.0049	−2.02	E	1
			[127.30]	157480	943040	4	4	2.9	7.0(−4)[a]	0.0012	−2.55	E	1
			[136.30]	209380	943040	6	4	1.1	2.1(−4)	5.7(−4)	−2.90	E	1
			[123.38]	157480	967960	4	2	7.4	8.4(−4)	0.0014	−2.47	E	1
			[144.80]	157480	848100	4	6	13	0.0063	0.012	−1.60	E	1
6.		^{2}D° - ^{2}D	*99.609*	*188620*	*1192550*	10	10	450	0.067	0.22	−0.17	C−	1
			100.60	209380	1203460	6	6	390	0.059	0.12	−0.45	C	1
			98.16	157480	1176180	4	4	520	0.075	0.097	−0.52	C	1
			[103.43]	209380	1176180	6	4	0.48	5.1(−5)	1.0(−4)	−3.51	E	1
			[95.604]	157480	1203460	4	6	1.2	2.4(−4)	3.0(−4)	−3.02	E	1
7.		^{2}D° - ^{2}S											
			84.24	157480	1344630	4	2	560	0.030	0.033	−0.92	E	1
8.		^{2}D° - ^{2}P	*79.607*	*188620*	*1444790*	10	6	1100	0.061	0.16	−0.21	C	1
			84.06	209380	1398940	6	4	1200	0.084	0.14	−0.30	C	1
			72.52	157480	1536480	4	2	284	0.0112	0.0107	−1.349	C	1
			80.55	157480	1398940	4	4	124	0.0121	0.0128	−1.315	C	1
9.		^{2}P° - ^{4}P											
			[223.22]	400120	848100	4	6	0.29	3.3(−4)	9.7(−4)	−2.88	E	1
			[184.19]	400120	943040	4	4	2.8	0.0014	0.0034	−2.25	E	1
			[150.26]	302450	967960	2	2	5.3	0.0018	0.0018	−2.44	E	1
10.		^{2}P° - ^{2}D	*121.21*	*367560*	*1192550*	6	10	57	0.0208	0.0499	−0.90	C−	1
			124.48	400120	1203460	4	6	67	0.0233	0.0382	−1.031	C	1
			114.45	302450	1176180	2	4	30.3	0.0119	0.0090	−1.62	C	1
			[128.86]	400120	1176180	4	4	6.4	0.0016	0.0027	−2.19	D	1
11.		^{2}P° - ^{2}S	*102.35*	*367560*	1344630	6	2	390	0.020	0.041	−0.91	C−	1
			105.88	400120	1344630	4	2	14	0.0012	0.0017	−2.32	D	1
			95.95	302450	1344630	2	2	440	0.061	0.039	−0.91	C	1
12.		^{2}P° - ^{2}P	*92.831*	*367560*	*1444790*	6	6	500	0.065	0.119	−0.410	C−	1
			100.12	400120	1398940	4	4	102	0.0153	0.0202	−1.213	C	1
			81.04	302450	1536480	2	2	40	0.0039	0.0021	−2.11	D	1
			88.00	400120	1536480	4	2	1200	0.068	0.079	−0.57	C	1
			91.20	302450	1398940	2	4	119	0.0297	0.0178	−1.226	C	1
13.	$2s2p^4$–$2p^5$	^{4}P - ^{2}P°											
			74.49	848100	2190550	6	4	52	0.0029	0.0043	−1.76	E	1
			71.54	943040	2340890	4	2	6.0	2.3(−4)	2.2(−4)	−3.04	E	1
			80.16	943040	2190550	4	4	34	0.0033	0.0035	−1.88	E	1
			[72.837]	967960	2340890	2	2	15	0.0012	5.8(−4)	−2.62	E	1
			[81.794]	967960	2190550	2	4	11	0.0023	0.0012	−2.34	E	1
14.		^{2}D - ^{2}P°	*95.410*	*1192550*	*2240660*	10	6	680	0.056	0.176	−0.252	C	1
			101.31	1203460	2190550	6	4	483	0.0495	0.099	−0.53	C	1
			85.86	1176180	2340890	4	2	490	0.0271	0.0306	−0.96	C	1
			98.58	1176180	2190550	4	4	245	0.0357	0.0463	−0.85	C	1

Ni 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
15.		$^2S - ^2P^o$	*111.60*	1344630	*2240660*	2	6	99	0.056	0.0409	−0.95	C−	1
			118.21	1344630	2190550	2	4	111	0.0463	0.0360	−1.033	C	1
			[100.38]	1344630	2340890	2	2	49	0.0074	0.0049	−1.83	D	1
16.		$^2P - ^2P^o$	*125.65*	*1444790*	*2240660*	6	6	460	0.11	0.27	−0.19	C	1
			126.32	1398940	2190550	4	4	330	0.080	0.13	−0.49	C	1
			124.31	1536480	2340890	2	2	370	0.085	0.070	−0.77	C	1
			106.16	1398940	2340890	4	2	510	0.0435	0.061	−0.76	C	1
			[152.89]	1536480	2190550	2	4	15.1	0.0106	0.0107	−1.67	C	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XXII

Forbidden Transitions

Line strengths tabulated for magnetic dipole and electric quadrupole transitions within the $2p^3$ configuration are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Cheng *et al.*[1] These relativistic calculations included a perturbative treatment of the Breit interaction and the Lamb shift. Allowance for configuration mixing was limited to the $n=2$ complex. Strengths of electric quadrupole transitions as defined in Ref. 1 were multiplied by the factor $^2/_3$ which is needed to bring these values into conformance with the definition of quadrupole strengths used in the NBS tables. The weakest lines are excluded from this compilation, as their strengths are considered to be very uncertain.

A-values for the M1 and E2 components of the single transition within the $2p^5$ configuration were obtained by applying Z-expansion formulas published by Oboladze and Safronova.[2] Their values for the magnetic dipole contribution to this line are in very good agreement with the results of the scaled Thomas-Fermi calculations of Bhatia *et al.*[3] and Bhatia[4] for nitrogenlike Ti and Mn, respectively. It is not clear whether Oboladze and Safronova incorporated configuration interaction into their calculations. Thus the A-value for the E2 contribution should be considered rather uncertain.

References

[1]K. T. Cheng, Y.-K. Kim, and J. P. Desclaux, At. Data Nucl. Data Tables **24**, 111 (1979).

[2]N. S. Oboladze and U. I. Safronova, Opt. Spectrosc. (USSR) **48**, 469 (1980).

[3]A. K. Bhatia, U. Feldman, and G. A. Doschek, J. Appl. Phys. **51**, 1464 (1980).

[4]A. K. Bhatia, J. Appl. Phys. **53**, 59 (1982).

Ni XXII: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$2p^3$–$2p^3$	$^4S^\circ$ – $^2D^\circ$										
			477.6	0	209380	4	6	M1	4500	0.11	D	1
			634.8	0	157480	4	4	M1	4.2(+4)[a]	1.6	D	1
2.		$^4S^\circ$ – $^2P^\circ$										
			[249.93]	0	400120	4	4	M1	4.8(+4)	0.11	D	1
			[330.63]	0	302450	4	2	M1	7.8(+4)	0.21	D	1
3.		$^2D^\circ$ – $^2D^\circ$										
			[1927]	157480	209380	4	6	M1	1040	1.65	C	1
4.		$^2D^\circ$ – $^2P^\circ$										
			[1074]	209380	302450	6	2	E2	0.88	0.0015	E	1
			[524.27]	209380	400120	6	4	M1	3.0(+4)	0.64	D	1
			"	"	"	6	4	E2	37	0.0035	E	1
			[689.80]	157480	302450	4	2	M1	9000	0.22	D	1
			"	"	"	4	2	E2	8.6	0.0016	E	1
			[412.13]	157480	400120	4	4	M1	1.2(+5)	1.2	D	1
5.		$^2P^\circ$ – $^2P^\circ$										
			[1024]	302450	400120	2	4	M1	5700	0.90	C–	1
6.	$2p^5$–$2p^5$	$^2P^\circ$ – $^2P^\circ$										
			[665.16]	2190550	2340890	4	2	M1	6.0(+4)	1.3	C+	2
			"	"	"	4	2	E2	8.2	0.0013	E	2

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XXIII

C Isoelectronic Sequence

Ground State: $1s^2 2s^2 2p^2\ {}^3P_0$

Ionization Energy: 2011 eV = 16220000 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
70.752	16	92.32	17	109.06	3	135.42	2
74.07	6	92.75	3	111.23	19	136.47	2
77.027	6	99.812	20	111.78	19	137.55	22
78.21	16	100.42	15	111.86	2	143.89	25
78.751	21	100.50	3	112.55	29	161.15	28
79.99	4	102.08	10	120.51	23	162.30	7
83.707	5	102.50	20	126.54	2	162.74	13
84.721	18	103.07	17	127.14	14	162.85	22
87.50	5	103.23	3	127.21	19	173.86	7
87.66	4	103.67	17	127.46	2	175.59	7
87.77	18	104.70	3	128.22	8	178.51	25
88.11	11	106.02	3	128.30	2	185.33	27
90.49	17	107.00	19	128.87	26	209.98	1
90.96	17	108.03	9	131.60	19	232.37	12
91.094	24	108.27	17	132.69	8	235.61	1
91.83	4	108.59	19	133.54	22	247.04	27

The tabulated oscillator strengths for transitions of the arrays $2s^2 2p^2$–$2s2p^3$ and $2s2p^3$–$2p^4$ are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Cheng *et al.*[1] These relativistic calculations included a perturbative treatment of the Breit interaction and the Lamb shift. Allowance for configuration mixing was limited to the $n = 2$ complex. The results should be quite accurate, except in the case of weak lines. (A few very weak lines have been omitted from this tabulation.)

Transition probabilities for lines of the $2s^2 2p^2$–$2s2p^3$ array were calculated by Froese Fischer and Saha[2] using the multiconfiguration Hartree-Fock (MCHF) method with Breit-Pauli corrections. Their basis included many configurations outside the $n = 2$ complex, but relativistic effects we not treated to the same degree as in Ref. 1. Line strengths derived from these two sources are in reasonably good agreement, particularly for the stronger transitions.

Stratton *et al.*[3] measured the ratio of A-values for two lines out of the $2s2p^3\ {}^3S_1^\circ$ level. Their result agrees very well with the theoretical data of Cheng *et al.*

References

[1] K. T. Cheng, Y.-K. Kim, and J. P. Desclaux, At. Data Nucl. Data Tables 24, 111 (1979).

[2] C. Froese Fischer and H. P. Saha, Phys. Scr. 32, 181 (1985).

[3] B. C. Stratton, H. W. Moos, S. Suckewer, U. Feldman, J. F. Seely, and A. K. Bhatia, Phys. Rev. A 31, 2534 (1985).

Ni 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.	$2s^2 2p^2$–$2s2p^3$	$^3P - {}^5S^\circ$											
			[235.61]	161190	585620	5	5	0.66	5.5(−4)[a]	0.0021	−2.56	E	1
			[209.98]	109390	585620	3	5	0.85	9.4(−4)	0.0019	−2.55	E	1

Ni 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
2.		$^3P - ^3D^\circ$	*126.32*	*126010*	*917630*	9	15	100	0.040	0.15	−0.44	D	1
			128.30	161190	940610	5	7	74	0.0257	0.054	−0.89	C	1
			126.54	109390	899650	3	5	120	0.0482	0.060	−0.84	C	1
			111.86	0	893970	1	3	170	0.098	0.036	−1.01	C	1
			[135.42]	161190	899650	5	5	1.0	2.8(−4)	6.2(−4)	−2.85	E	1
			127.46	109390	893970	3	3	4.9	0.0012	0.0015	−2.44	D	1
			[136.47]	161190	893970	5	3	2.0	3.3(−4)	7.4(−4)	−2.78	E	1
3.		$^3P - ^3P^\circ$	*103.61*	*126010*	*1091190*	9	9	306	0.0492	0.151	−0.354	C−	1
			106.02	161190	1104380	5	5	287	0.0484	0.084	−0.62	C	1
			103.23	109390	1078110	3	3	240	0.0384	0.0391	−0.94	C	1
			109.06	161190	1078110	5	3	29	0.0031	0.0056	−1.81	D	1
			104.70	109390	1064460	3	1	294	0.0161	0.0166	−1.316	C	1
			[100.50]	109390	1104380	3	5	1.1	2.9(−4)	2.9(−4)	−3.06	E	1
			92.75	0	1078110	1	3	45.2	0.0175	0.0053	−1.76	C	1
4.		$^3P - ^3S^\circ$	*88.956*	*126010*	1250160	9	3	1170	0.0463	0.122	−0.380	C	1
			91.83	161190	1250160	5	3	750	0.057	0.086	−0.55	C	1
			87.66	109390	1250160	3	3	280	0.0322	0.0279	−1.015	C	1
			79.99	0	1250160	1	3	107	0.0308	0.0081	−1.51	C	1
			87.50	161190	1304040	5	5	120	0.014	0.020	−1.15	E	1
5.		$^3P - ^1D^\circ$											
			[83.707]	109390	1304040	3	5	6.9	0.0012	9.9(−4)	−2.44	E	1
6.		$^3P - ^1P^\circ$											
			[77.027]	161190	1459440	5	3	5.1	2.7(−4)	3.4(−4)	−2.87	E	1
			74.07	109390	1459440	3	3	72	0.0059	0.0043	−1.75	E	1
7.		$^1D - ^3D^\circ$											
			[162.30]	324460	940610	5	7	16	0.0086	0.023	−1.37	E	1
			[173.86]	324460	899650	5	5	0.40	1.8(−4)	5.2(−4)	−3.05	E	1
			[175.59]	324460	893970	5	3	2.8	7.8(−4)	0.0023	−2.41	E	1
8.		$^1D - ^3P^\circ$											
			[128.22]	324460	1104380	5	5	1.9	4.7(−4)	9.9(−4)	−2.63	E	1
			[132.69]	324460	1078110	5	3	2.5	3.9(−4)	8.5(−4)	−2.71	E	1
9.		$^1D - ^3S^\circ$	[108.03]	324460	1250160	5	3	7.0	7.3(−4)	0.0013	−2.44	E	1
10.		$^1D - ^1D^\circ$	102.08	324460	1304040	5	5	530	0.083	0.14	−0.38	C	1
11.		$^1D - ^1P^\circ$	88.11	324460	1459440	5	3	830	0.058	0.084	−0.54	C	1
12.		$^1S - ^3D^\circ$											
			[232.37]	463620	893970	1	3	0.66	0.0016	0.0012	−2.80	E	1
13.		$^1S - ^3P^\circ$											
			[162.74]	463620	1078110	1	3	2.4	0.0028	0.0015	−2.55	E	1
14.		$^1S - ^3S^\circ$	[127.14]	463620	1250160	1	3	10	0.0075	0.0031	−2.12	E	1
15.		$^1S - ^1P^\circ$	100.42	463620	1459440	1	3	210	0.096	0.032	−1.02	C	1

Ni 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
16.	$2s2p^3$–$2p^4$	$^5S°$ – ^3P											
			78.21	585620	1864230	5	5	29	0.0027	0.0035	−1.87	E	1
			[70.752]	585620	1999010	5	3	3.8	1.7(−4)	2.0(−4)	−3.07	E	1
17.		$^3D°$ – ^3P	*99.595*	*917630*	*1921700*	15	9	530	0.0474	0.233	−0.148	C	1
			108.27	940610	1864230	7	5	332	0.0417	0.104	−0.53	C	1
			90.96	899650	1999010	5	3	250	0.0186	0.0278	−1.032	C	1
			92.32	893970	1977150	3	1	439	0.0187	0.0171	−1.251	C	1
			103.67	899650	1864230	5	5	178	0.0286	0.0488	−0.84	C	1
			90.49	893970	1999010	3	3	177	0.0217	0.0194	−1.186	C	1
			103.07	893970	1864230	3	5	60	0.0158	0.0161	−1.324	C	1
18.		$^3D°$ – ^1D											
			87.77	940610	2079990	7	5	90	0.0074	0.015	−1.29	E	1
			[84.721]	899650	2079990	5	5	9.3	0.0010	0.0014	−2.30	E	1
19.		$^3P°$ – ^3P	*120.41*	*1091190*	*1921700*	9	9	153	0.0334	0.119	−0.52	C−	1
			131.60	1104380	1864230	5	5	39.7	0.0103	0.0223	−1.288	C	1
			[108.59]	1078110	1999010	3	3	8.5	0.0015	0.0016	−2.35	D	1
			[111.78]	1104380	1999010	5	3	219	0.0246	0.0453	−0.91	C	1
			[111.23]	1078110	1977150	3	1	226	0.0140	0.0154	−1.377	C	1
			127.21	1078110	1864230	3	5	44.0	0.0178	0.0224	−1.272	C	1
			[107.00]	1064460	1999010	1	3	64	0.0329	0.0116	−1.483	C	1
20.		$^3P°$ – ^1D											
			102.50	1104380	2079990	5	5	57	0.0089	0.015	−1.35	E	1
			[99.812]	1078110	2079990	3	5	23	0.0058	0.0057	−1.76	E	1
21.		$^3P°$ – ^1S											
			[78.751]	1078110	2347930	3	1	74	0.0023	0.0018	−2.16	E	1
22.		$^3S°$ – ^3P	*148.91*	1250160	*1921700*	3	9	119	0.119	0.175	−0.447	C	1
			[162.85]	1250160	1864230	3	5	72	0.0474	0.076	−0.85	C	1
			133.54	1250160	1999010	3	3	186	0.0497	0.066	−0.83	C	1
			137.55	1250160	1977150	3	1	253	0.0239	0.0325	−1.144	C	1
23.		$^3S°$ – ^1D	[120.51]	1250160	2079990	3	5	0.39	1.4(−4)	1.7(−4)	−3.38	E	1
24.		$^3S°$ – ^1S	[91.094]	1250160	2347930	3	1	70	0.0029	0.0026	−2.06	E	1
25.		$^1D°$ – ^3P											
			[178.51]	1304040	1864230	5	5	9.8	0.0047	0.014	−1.63	E	1
			[143.89]	1304040	1999010	5	3	8.1	0.0015	0.0036	−2.12	E	1
26.		$^1D°$ – ^1D	128.87	1304040	2079990	5	5	402	0.100	0.212	−0.301	C	1
27.		$^1P°$ – ^3P											
			[247.04]	1459440	1864230	3	5	1.2	0.0018	0.0044	−2.27	E	1
			[185.33]	1459440	1999010	3	3	11	0.0055	0.010	−1.78	E	1
28.		$^1P°$ – ^1D	[161.15]	1459440	2079990	3	5	58	0.0378	0.060	−0.95	C	1
29.		$^1P°$ – ^1S	112.55	1459440	2347930	3	1	1000	0.063	0.070	−0.72	C	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XXIII

Forbidden Transitions

Line strengths tabulated for magnetic dipole and electric quadrupole transitions within the $2p^2$ configuration are the results of the multiconfiguration Dirac-Fock (MCDF) calculations of Cheng *et al*.[1] These relativistic calculations included a perturbative treatment of the Breit interaction and the Lamb shift. Allowance for configuration mixing was limited to the $n=2$ complex. Strengths of electric quadrupole transitions as defined in Ref. 1 were multiplied by the factor $^2/_3$ which is needed to bring these values into conformance with the definition of quadrupole strengths used in the NBS tables. The weakest lines are excluded from this compilation, as their strengths are considered to be very uncertain.

Transition probabilities for these same lines were calculated by Froese Fischer and Saha[2] using the multiconfiguration Hartree-Fock (MCHF) method with Breit-Pauli corrections. Their basis included many configurations outside the $n=2$ complex, but relativistic effects were not treated to the same degree as in Ref. 1. Line strengths derived from these data are in good agreement with the data of Cheng *et al*.

References

[1]K. T. Cheng, Y.-K. Kim, and J. P. Desclaux, At. Data Nucl. Data Tables **24**, 111 (1979).

[2]C. Froese Fischer and H. P. Saha, Phys. Scr. **32**, 181 (1985).

Ni XXIII: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$2p^2$-$2p^2$	^{3}P - ^{3}P										
			1915.0	109390	161190	3	5	M1	1320	1.72	C	1
			911.0	0	109390	1	3	M1	2.07(+4)[a]	1.74	C	1
2.		^{3}P - ^{1}D										
			614.8	161190	324460	5	5	M1	3.7(+4)	1.6	C	1
			"	"	"	5	5	E2	7.3	0.0019	E	1
			465.4	109390	324460	3	5	M1	4.1(+4)	0.77	D	1
3.		^{3}P - ^{1}S										
			[282.30]	109390	463620	3	1	M1	3.0(+5)	0.25	D	1
4.		^{1}D - ^{1}S	[718.60]	324460	463620	5	1	E2	16	0.0018	E	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XXIV

B Isoelectronic Sequence

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

Ionization Energy: 2131 eV = 17190000 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
75.083	7	102.89	6	134.53	16	213.15	11
75.580	7	103.43	5	134.73	9	218.35	1
79.185	7	103.53	4	135.47	9	221.06	15
87.50	3	104.64	3	137.01	13	224.02	1
88.54	4	106.68	10	138.80	2	227.82	12
88.977	6	109.03	13	143.30	9	264.98	1
92.138	6	113.14	5	153.47	16	338.62	14
96.070	6	118.52	2	156.70	13	339.66	1
97.17	10	121.15	13	159.69	12	354.74	11
98.39	6	122.72	5	172.09	8		
101.13	10	126.25	3	184.92	8		
102.11	3	127.78	9	206.88	12		

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 included a perturbative treatment of the Breit interaction and the Lamb shift. The results should be quite accurate, except in the case of weak lines. (A few very weak lines have been omitted from this tabulation.)

According to several sources (see, e.g., introduction to Fe XXII), the lower of the two levels $2s2p^2\ ^2P_{1/2}$ and $^2S_{1/2}$ is mostly of ^2P character, having "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.*, which is consistent with their ordering at the neutral end of the B sequence.

Reference

[1]K. T. Cheng, Y.-K. Kim, and J. P. Desclaux, At. Data Nucl. Data Tables **24**, 111 (1979).

Ni XXIV: 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.	$2s^22p$–$2s2p^2$	$^2P^\circ$ – ^4P											
			[224.02]	163570	609950	4	6	1.4	0.0016	0.0047	−2.19	E	1
			[264.98]	163570	540950	4	4	0.13	1.4(−4)[a]	4.9(−4)	−3.25	E	1
			[218.35]	0	457980	2	2	1.7	0.0012	0.0017	−2.62	E	1
			[339.66]	163570	457980	4	2	0.19	1.6(−4)	7.2(−4)	−3.19	E	1
2.		$^2P^\circ$ – ^2D											
			138.80	163570	884030	4	6	72	0.0314	0.057	−0.90	C	1
			118.52	0	843710	2	4	150	0.063	0.049	−0.90	C	1

Ni 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
3.		$^{2}P^{\circ} - {}^{2}P$	*102.94*	*109050*	*1080490*	6	6	530	0.084	0.17	−0.30	C−	1
			102.11	163570	1142910	4	4	540	0.084	0.11	−0.47	C	1
			104.64	0	955660	2	2	470	0.077	0.053	−0.81	C	1
			[126.25]	163570	955660	4	2	1.8	2.2(−4)	3.7(−4)	−3.06	E	1
			87.50	0	1142910	2	4	67	0.0153	0.0088	−1.51	C	1
4.		$^{2}P^{\circ} - {}^{2}S$	*97.997*	*109050*	1129490	6	2	510	0.0243	0.0471	−0.84	C−	1
			103.53	163570	1129490	4	2	417	0.0335	0.0457	−0.87	C	1
			88.54	0	1129490	2	2	20	0.0024	0.0014	−2.32	D	1
5.	$2s2p^2–2p^3$	$^{4}P - {}^{4}S^{\circ}$	*115.85*	*561620*	1424810	12	4	500	0.0339	0.155	−0.391	C	1
			122.72	609950	1424810	6	4	217	0.0326	0.079	−0.71	C	1
			113.14	540950	1424810	4	4	165	0.0316	0.0471	−0.90	C	1
			103.43	457980	1424810	2	4	130	0.0418	0.0285	−1.078	C	1
6.		$^{4}P - {}^{2}D^{\circ}$											
			98.39	609950	1626280	6	6	37	0.0053	0.010	−1.50	E	1
			[96.070]	540950	1581860	4	4	49	0.0068	0.0086	−1.57	E	1
			[102.89]	609950	1581860	6	4	6.6	7.0(−4)	0.0014	−2.38	E	1
			[92.138]	540950	1626280	4	6	0.84	1.6(−4)	1.9(−4)	−3.19	E	1
			[88.977]	457980	1581860	2	4	1.5	3.6(−4)	2.1(−4)	−3.14	E	1
7.		$^{4}P - {}^{2}P^{\circ}$											
			[79.185]	609950	1872810	6	4	1.8	1.1(−4)	1.7(−4)	−3.18	E	1
			[75.083]	540950	1872810	4	4	4.1	3.5(−4)	3.5(−4)	−2.85	E	1
			[75.580]	457980	1781090	2	2	3.4	2.9(−4)	1.4(−4)	−3.24	E	1
8.		$^{2}D - {}^{4}S^{\circ}$											
			[184.92]	884030	1424810	6	4	0.38	1.3(−4)	4.7(−4)	−3.11	E	1
			[172.09]	843710	1424810	4	4	3.4	0.0015	0.0034	−2.22	E	1
9.		$^{2}D - {}^{2}D^{\circ}$	*135.02*	*867900*	*1608510*	10	10	175	0.0477	0.212	−0.322	C	1
			134.73	884030	1626280	6	6	144	0.0393	0.105	−0.63	C	1
			135.47	843710	1581860	4	4	80	0.0221	0.0394	−1.054	C	1
			143.30	884030	1581860	6	4	60	0.0124	0.0351	−1.128	C	1
			127.78	843710	1626280	4	6	52	0.0190	0.0320	−1.119	C	1
10.		$^{2}D - {}^{2}P^{\circ}$	*102.63*	*867900*	*1842240*	10	6	270	0.026	0.088	−0.58	C−	1
			101.13	884030	1872810	6	4	163	0.0167	0.0334	−1.000	C	1
			106.68	843710	1781090	4	2	367	0.0313	0.0440	−0.90	C	1
			97.17	843710	1872810	4	4	59	0.0084	0.011	−1.47	D	1
11.		$^{2}P - {}^{4}S^{\circ}$											
			[354.74]	1142910	1424810	4	4	0.42	7.9(−4)	0.0037	−2.50	E	1
			[213.15]	955660	1424810	2	4	3.3	0.0045	0.0063	−2.05	E	1
12.		$^{2}P - {}^{2}D^{\circ}$	*189.39*	*1080490*	*1608510*	6	10	51	0.045	0.17	−0.56	D	1
			[206.88]	1142910	1626280	4	6	37.4	0.0360	0.098	−0.84	C	1
			159.69	955660	1581860	2	4	89	0.068	0.071	−0.87	C	1
			[227.82]	1142910	1581860	4	4	0.49	3.8(−4)	0.0011	−2.82	E	1

Ni 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
13.		$^2P - ^2P^\circ$	*131.28*	*1080490*	*1842240*	6	6	220	0.058	0.15	−0.46	C−	1
			137.01	1142910	1872810	4	4	260	0.073	0.13	−0.53	C	1
			121.15	955660	1781090	2	2	44	0.0097	0.0077	−1.71	D	1
			[156.70]	1142910	1781090	4	2	21	0.0038	0.0078	−1.82	D	1
			109.03	955660	1872810	2	4	36.8	0.0131	0.0094	−1.58	C	1
14.		$^2S - ^4S^\circ$	[338.62]	1129490	1424810	2	4	0.18	6.2(−4)	0.0014	−2.91	E	1
15.		$^2S - ^2D^\circ$											
			[221.06]	1129490	1581860	2	4	6.3	0.0093	0.014	−1.73	D	1
16.		$^2S - ^2P^\circ$	*140.30*	1129490	*1842240*	2	6	72	0.064	0.059	−0.89	C	1
			134.53	1129490	1872810	2	4	28.4	0.0154	0.0136	−1.51	C	1
			[153.47]	1129490	1781090	2	2	127	0.0447	0.0452	−1.049	C	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XXIV

Forbidden Transitions

The line strengths tabulated for the single magnetic dipole and single electric quadrupole transition within the $2s^22p$ ground state configuration 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. Allowance for configuration mixing is limited to the $n=2$ complex. The strength of the electric quadrupole transition as defined in Ref. 1 was multiplied by the factor 2/3 in order to bring this value into conformance with the definition of the quadrupole strength used in the NBS tables.

Transition probabilities for the same lines were calculated by Froese Fischer and Saha[2] using the multiconfiguration Hartree-Fock (MCHF) method with Breit-Pauli corrections. Their orbital basis includes many configurations outside the $n=2$ complex, but relativistic effects were not treated to the same degree as in Ref. 1. The line strengths for both the M1 and E2 transitions, derived from these data by interpolation between appropriately spaced ions of the B sequence, are in very good agreement with the data of Cheng *et al.*[1]

References

[1]K. T. Cheng, Y.-K. Kim, and J. P. Desclaux, At. Data Nucl. Data Tables **24**, 111 (1979).

[2]C. Froese Fischer and H. P. Saha, Phys. Rev. A **28**, 3169 (1983).

Ni XXIV: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$2p-2p$	$^2P^\circ - ^2P^\circ$										
			609.9	0	163960	2	4	M1	3.95(+4)[a]	1.33	B	1
			″	″	″	2	4	E2	5.1	1.03(−3)	C	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XXV

Be Isoelectronic Sequence

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

Ionization Energy: 2295 eV = 18510000 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
9.19	11	9.70	13	9.94	26	117.91	2
9.27	10	9.71	29	9.95	19	120.47	4
9.30	11	9.74	24	9.97	25,31	126.73	3
9.31	10	9.75	28	10.02	21	128.85	3
9.32	10	9.76	24,27,29	10.07	21	130.99	7
9.34	9	9.77	12	10.08	21,35	135.95	3
9.39	8	9.78	27	10.09	19,30	151.91	3
9.42	16	9.80	28	10.17	21	158.84	3
9.43	10	9.85	33	10.20	21	165.34	3
9.49	15	9.86	27,34	10.21	22	188.15	6
9.56	14	9.87	27	10.23	21	238.82	1
9.60	24	9.91	19,27	10.32	20	278.01	5
9.63	24	9.92	32	10.46	23	326.58	5
9.64	24	9.93	27	104.07	4	499.50	5

Oscillator strengths for transitions of the arrays $2s^2$–$2s2p$ and $2s2p$–$2p^2$ are taken from the multiconfiguration Dirac-Fock (MCDF) calculations of Cheng *et al.*[1] These relativistic calculations include the configuration interaction most relevant for the states of these configurations, as well as a perturbative treatment of the Breit interaction and the Lamb shift. The results should be quite accurate, except for the weakest intercombination lines. (The $^3P_1^\circ$ - $^1S_0$ transition of the $2s2p$–$2p^2$ array has been omitted here, since the f-value is considerably smaller than those of the other lines of this array.)

A number of sources of reliable data, from other relativistic calculations, are available for the $2s$–$2p$ transitions. However, with the exception of some of the weaker lines, they all agree well with the results of Cheng *et al.*[1] The latter are quoted exclusively here since they provide data from a single set of comprehensive calculations, all done at a uniform and reasonably accurate level of approximation, for the valence shell $2s$–$2p$ transitions for all ions of the isoelectronic sequence.

The f-values for the $2s^2$–$2s3p$, $2s2p$–$2p3p$, $2s2p$–$2s3s$, $2p^2$–$2p3s$, $2s2p$–$2s3d$, and $2p^2$–$2p3d$ arrays of transitions are taken from the work of Fawcett,[2] who used Cowan's version of the relativistic Hartree-Fock method with intermediate coupling and configuration interaction. This work provides a comprehensive set of data for the entire isoelectronic sequence, calculated at a uniform level of approximation. Some of these transitions, for some ions of this sequence, have also been calculated by Bhatia *et al.*[3] using the program SUPERSTRUCTURE, which includes configuration interaction and intermediate coupling. Where they overlap, these two sets of calculations agree to within the uncertainties assigned here. Transitions involving the $J=1$ levels of $2p3p$ ^3S and ^3P have been omitted because of erratic behavior of the f-values along the sequence.

Oscillator strengths for the transition array $2s^2$–$2s4p$ are the results of the relativistic random phase approximation (RRPA) calculations of Lin and Johnson.[4]

A few multiplet f-values for transitions involving the outer electron alone, $2s3s$–$2s3p$ and $2s3p$–$2s3d$, have been interpolated along the isoelectronic sequence and assigned a low accuracy.

References

[1]K. T. Cheng, Y.-K. Kim, and J. P. Desclaux, At. Data Nucl. Data Tables **24**, 111 (1979).

[2]B. C. Fawcett, At. Data Nucl. Data Tables **30**, 1 (1984); **33**, 479 (1985).

[3]A. K. Bhatia, U. Feldman, and J. F. Seely, At. Data Nucl. Data Tables **35**, 449 (1986).

[4]C. D. Lin and W. R. Johnson, Phys. Rev. A **15**, 1046 (1977).

Ni 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.	$2s^2$–$2s2p$	^1S - $^3P^\circ$											
			[238.82]	0	418720	1	3	0.82	0.0021	0.0017	−2.68	D	1
2.		^1S - $^1P^\circ$	[117.91]	0	848100	1	3	238	0.149	0.0578	−0.827	B	1
3.	$2s2p$–$2p^2$	$^3P^\circ$ - ^3P	*145.92*	*486870*	*1172200*	9	9	150	0.0479	0.207	−0.366	B	1
			[151.91]	549500	1207800	5	5	76.6	0.0265	0.0663	−0.878	B	1
			[135.95]	418720	1154300	3	3	51.2	0.0142	0.0191	−1.371	B	1
			[165.34]	549500	1154300	5	3	48.8	0.0120	0.0327	−1.222	B	1
			[158.84]	418720	1048300?	3	1	138	0.0174	0.0273	−1.282	B	1
			[126.73]	418720	1207800	3	5	70.0	0.0281	0.0352	−1.074	B	1
			[128.85]	378190	1154300	1	3	83.7	0.0625	0.0265	−1.204	B	1
4.		$^3P^\circ$ - ^1D											
			[120.47]	549500	1379600	5	5	77	0.0167	0.0331	−1.078	C	1
			[104.07]	418720	1379600	3	5	7.4	0.0020	0.0021	−2.22	D	1
5.		$^1P^\circ$ - ^3P											
			[278.01]	848100	1207800	3	5	5.7	0.011	0.030	−1.48	D	1
			[326.58]	848100	1154300	3	3	0.13	2.1(−4)[a]	6.8(−4)	−3.20	E	1
			[499.50]	848100	1048300?	3	1	0.24	3.0(−4)	0.0015	−3.05	E	1
6.		$^1P^\circ$ - ^1D	[188.15]	848100	1379600	3	5	59.1	0.0523	0.0972	−0.804	B	1
7.		$^1P^\circ$ - ^1S	[130.99]	848100	1611500	3	1	399	0.0342	0.0442	−0.989	B	1
8.	$2s^2$–$2s3p$	^1S - $^3P^\circ$											
			[9.39]	0	10650000	1	3	6.6(+4)	0.26	0.0080	−0.59	C−	2
9.		^1S - $^1P^\circ$	[9.34]	0	10707000	1	3	1.1(+5)	0.45	0.014	−0.35	C−	2
10.	$2s2p$–$2p3p$	$^3P^\circ$ - ^3D											
			[9.31]	549500	11296000	5	7	8.2(+4)	0.15	0.023	−0.12	C−	2
			[9.32]	418720	11153000	3	5	7.8(+4)	0.17	0.016	−0.29	C−	2
			[9.27]	378190	[11162000]	1	3	2.2(+4)	0.084	0.0026	−1.08	D	2
			[9.43]	549500	11153000	5	5	1500	0.0020	3.1(−4)	−2.00	D	2
			[9.31]	418720	[11162000]	3	3	4.1(+4)	0.053	0.0049	−0.80	D	2
11.		$^3P^\circ$ - ^3P											
			[9.30]	549500	11306000	5	5	6.9(+4)	0.090	0.014	−0.35	C−	2
			[9.30]	418720	[11173000]	3	1	9.3(+4)	0.040	0.0037	−0.92	D	2
			[9.19]	418720	11306000	3	5	1600	0.0033	3.0(−4)	−2.00	D	2
12.		$^1P^\circ$ - ^1P	[9.77]	848100	[11080000]	3	3	1.7(+4)	0.025	0.0024	−1.12	D	2
13.		$^1P^\circ$ - ^3D											
			[9.70]	848100	[11162000]	3	3	1.8(+4)	0.025	0.0024	−1.12	D	2
14.		$^1P^\circ$ - ^3P											
			[9.56]	848100	11306000	3	5	3.4(+4)	0.077	0.0073	−0.64	D	2
			[9.56]	848100	[11313000]	3	3	5.1(+4)	0.070	0.0066	−0.68	C−	2

Ni 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
15.		$^1P^o - {}^1D$	[9.49]	848100	[11381000]	3	5	8.9(+4)	0.20	0.019	−0.22	C−	2
16.		$^1P^o - {}^1S$	[9.42]	848100	[11460000]	3	1	9.0(+4)	0.040	0.0037	−0.92	D	2
17.	$2s^2$–$2s4p$	$^1S - {}^3P^o$											
						1	3		0.032		−1.49	D	4
18.		$^1S - {}^1P^o$				1	3		0.15		−0.82	D	4
19.	$2s2p$–$2s3s$	$^3P^o - {}^3S$	*10.02*	*486870*	[10465000]	9	3	5.2(+4)	0.026	0.0078	−0.63	D	2
			[10.09]	549500	[10465000]	5	3	2.8(+4)	0.026	0.0043	−0.89	D	2
			[9.95]	418720	[10465000]	3	3	1.8(+4)	0.026	0.0026	−1.11	D	2
			[9.91]	378190	[10465000]	1	3	6100	0.027	8.8(−4)	−1.57	D	2
20.		$^1P^o - {}^1S$	[10.32]	848100	[10536000]	3	1	2.1(+4)	0.011	0.0011	−1.48	D	2
21.	$2p^2$–$2p3s$	$^3P - {}^3P^o$	*10.11*	*1172200*	[*11062000*]	9	9	3.5(+4)	0.053	0.016	−0.32	D	2
			[10.08]	1207800	[11130000]	5	5	2.1(+4)	0.032	0.0053	−0.80	D	2
			[10.17]	1154300	[10983000]	3	3	6000	0.0093	9.3(−4)	−1.55	D	2
			[10.23]	1207800	[10983000]	5	3	1.6(+4)	0.015	0.0025	−1.12	D	2
			[10.20]	1154300	[10963000]	3	1	3.1(+4)	0.016	0.0016	−1.32	D	2
			[10.02]	1154300	[11130000]	3	5	1.5(+4)	0.037	0.0037	−0.95	D	2
			[10.07]	1048300?	[10983000]	1	3	1.2(+4)	0.055	0.0018	−1.26	D	2
22.		$^1D - {}^1P^o$	[10.21]	1379600	[11176000]	5	3	2.8(+4)	0.026	0.0044	−0.89	D	2
23.		$^1S - {}^1P^o$	[10.46]	1611500	[11176000]	1	3	1.1(+4)	0.054	0.0019	−1.27	D	2
24.	$2s2p$–$2s3d$	$^3P^o - {}^3D$	*9.69*	*486870*	*10805000*	9	15	3.09(+5)	0.72	0.208	0.81	C−	2
			[9.74]	549500	10813000	5	7	3.0(+5)	0.60	0.096	0.48	C−	2
			[9.63]	418720	10800000	3	5	2.4(+5)	0.55	0.052	0.22	C−	2
			[9.60]	378190	10794000	1	3	1.8(+5)	0.75	0.024	−0.12	C−	2
			[9.76]	549500	10800000	5	5	7.7(+4)	0.11	0.018	−0.26	C−	2
			[9.64]	418720	10794000	3	3	1.3(+5)	0.18	0.017	−0.27	C−	2
			[9.76]	549500	10794000	5	3	8400	0.0072	0.0012	−1.44	C−	2
25.		$^1P^o - {}^1D$	[9.97]	848100	10880000	3	5	2.5(+5)	0.61	0.060	0.26	C−	2
26.	$2p^2$–$2p3d$	$^3P - {}^3F^o$											
			[9.94]	1207800	11271000	5	7	1.29(+5)	0.268	0.0438	0.127	C−	2
27.		$^3P - {}^3D^o$	*9.82*	*1172200*	*11357000*	9	15	2.84(+5)	0.68	0.199	0.79	C−	2
			[9.78]	1207800	11437000	5	7	2.9(+5)	0.59	0.095	0.47	C−	2
			[9.87]	1154300	11283000	3	5	2.03(+5)	0.493	0.0481	0.170	C−	2
			[9.76]	1048300?	11296000	1	3	3.03(+5)	1.30	0.0418	0.114	C−	2
			[9.93]	1207800	11283000	5	5	2.2(+4)	0.032	0.0052	−0.80	D	2
			[9.86]	1154300	11296000	3	3	5.7(+4)	0.083	0.0081	−0.60	C−	2
			[9.91]	1207800	11296000	5	3	3800	0.0034	5.5(−4)	−1.77	D	2
28.		$^3P - {}^1D^o$											
			[9.80]	1207800	11408000	5	5	4.4(+4)	0.064	0.010	−0.49	C−	2
			[9.75]	1154300	11408000	3	5	1.3(+5)	0.30	0.029	−0.05	D	2

Ni 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
29.		^{3}P - ^{3}P°											
			[9.76]	1207800	11456000	5	5	1.3(+5)	0.19	0.031	−0.02	C−	2
			[9.71]	1154300	11456000	3	3	1.8(+5)	0.25	0.024	−0.12	C−	2
			[9.76]	1207800	11456000	5	3	7.5(+4)	0.064	0.010	−0.49	C−	2
			[9.71]	1154300	11456000	3	1	2.3(+5)	0.11	0.011	−0.48	C−	2
			[9.71]	1154300	11456000	3	5	2.7(+4)	0.063	0.0060	−0.72	D	2
30.		^{1}D - ^{3}F°											
			[10.09]	1379600	[11295000]	5	5	7900	0.012	0.0020	−1.22	D	2
31.		^{1}D - ^{1}D°	[9.97]	1379600	11408000	5	5	2.8(+4)	0.042	0.0069	−0.68	C−	2
32.		^{1}D - ^{3}P°											
			[9.92]	1379600	11456000	5	5	1.3(+5)	0.19	0.031	−0.02	C−	2
33.		^{1}D - ^{1}P°	[9.85]	1379600	[11535000]	5	3	1.7(+4)	0.015	0.0024	−1.12	D	2
34.		^{1}D - ^{1}F°	[9.86]	1379600	11525000	5	7	4.8(+5)	0.98	0.16	0.69	C−	2
35.		^{1}S - ^{1}P°	[10.08]	1611500	[11535000]	1	3	2.80(+5)	1.28	0.0425	0.107	C−	2
36.	$2s3s$–$2s3p$	^{3}S - ^{3}P°				3	9		0.11		−0.48	D	*interp.*
37.		^{1}S - ^{1}P°				1	3		0.050		−1.30	E	*interp.*
38.	$2s3p$–$2s3d$	^{3}P° - ^{3}D				9	15		0.025		−0.65	E	*interp.*
39.		^{1}P° - ^{1}D				3	5		0.043		−0.89	E	*interp.*

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XXV

Forbidden Transitions

Transition probabilities for magnetic dipole and electric quadrupole transitions within the $2s2p$ and $2p^2$ configurations were calculated by Feldman *et al.*[1] using scaled Thomas-Fermi wavefunctions with allowance for configuration interaction and relativistic effects. We modified their transition probability data by the application of experimental wavelengths, i.e., we first converted their A-values into line strength data utilizing their theoretical transition energies and then reconverted the line strengths into A-values with wavelengths derived from experimental data. This approach should normally yield transition probabilities that are more accurate than those based on theoretically determined wavelengths.

The transition probability for the one electric quadrupole transition listed, which is relatively strong compared to other E2 transitions, has been interpolated from the data of Anderson and Anderson[2] and Glass[3,4] for neighboring ions of the Be sequence. This A-value exhibits a smooth nuclear charge dependence.

References

[1]U. Feldman, G. A. Doschek, Ch.-Ch. Cheng, and A. K. Bhatia, J. Appl. Phys. **51**, 190 (1980).

[2]E. K. Anderson and E. M. Anderson, Opt. Spectrosc. (USSR) **52**, 478 (1982).

[3]R. Glass, Z. Phys. A **320**, 545 (1985).

[4]R. Glass, Astrophys. Space Sci. **92**, 307 (1983).

Ni XXV: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$2s2p-2s2p$	$^3P^\circ - {}^3P^\circ$										
			[764.64]	418720	549500	3	5	M1	2.91(+4)[a]	2.41	C+	1
			[2466.6]	378190	418720	1	3	M1	1160	1.93	C+	1
2.		$^3P^\circ - {}^1P^\circ$										
			[334.90]	549500	848100	5	3	M1	2.1(+4)	0.087	D	1
			[232.89]	418720	848100	3	3	M1	3.6(+4)	0.050	D	1
			"	"	"	3	3	E2	100	1.2(−4)	D−	*interp.*
			[212.81]	378190	848100	1	3	M1	6.5(+4)	0.070	D	1
3.	$2p^2-2p^2$	$^3P - {}^3P$										
			[1869.2]	1154300	1207800	3	5	M1	1410	1.71	C	1
			[943.40]	1048300	1154300	1	3	M1	1.96(+4)	1.83	C	1
4.		$^3P - {}^1D$										
			[582.07]	1207800	1379600	5	5	M1	4.4(+4)	1.6	C	1
			[443.85]	1154300	1379600	3	5	M1	4.9(+4)	0.79	D+	1
5.		$^3P - {}^1S$										
			[218.72]	1154300	1611500	3	1	M1	4.4(+5)	0.17	D	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XXVI

Li Isoelectronic Sequence

Ground State: $1s^22s\ ^2S_{1/2}$

Ionization Energy: 2399.2 eV = 19351000 cm^{-1}

Allowed Transitions

Transition probabilities for the strongest inner-shell transitions to doubly excited $n = 2$ states are taken from the multiconfiguration Dirac-/fock (MCDF) calculations of Hata and Grant.[1] Their results are in good agreement with the Z-expansion perturbation calculations of Vainshtein and Safronova,[2] who included relativistic corrections at the level of the Pauli approximation.

Oscillator strengths for lines of the principal ($2s$–$2p$) resonance multiplet are the results of the MCDF calculations of Cheng *et al.*,[3] which include a perturbative treatment of the Breit interaction and the Lamb shift.

The results of the Hartree-XR (Hartree-Fock with statistical exchange and relativistic effects) calculations of Fawcett *et al.*[4] are tabulated for the $2p$–$3s$ and $2p$–$3d$ transitions.

The f-value for the $3d$–$4f$ transition was taken from a study of systematic trends along isoelectronic sequences by Smith and Wiese.[5] The tabulated data for the remaining transitions were taken from the theoretical analysis of Martin and Wiese,[6] which was based on a generalized study of systematic trends for several spectral series of the lithium isoelectronic sequence.

Results of the relativistic Hartree-Fock calculations of Kim and Desclaux[7] for several ions of the Li sequence were incorporated into the data of Ref. 6 for the $2s$–$3p$ transitions. For all other transitions for which the results of Ref. 6 are quoted here, no relativistic calculations were available. However, the relativistic calculations of Younger and Weiss[8] 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. 6.

Transition probability data are available for numerous transitions involving doubly excited states with the spectator electron occupying the $n=3$ shell, or higher.[9] These have not been tabluated, however, since they belong to, or are very close to belonging to, the unresolved satellites of the helium-like ion.

References

[1]J. Hata and I. P. Grant, Mon. Not. R. Astron. Soc. **211**, 549 (1984).

[2]L. A. Vainshtein and U. I. Safronova, At. Data Nucl. Data Tables **21**, 49 (1978).

[3]K. T. Cheng, Y.-K. Kim, and J. P. Desclaux, At. Data Nucl. Data Tables **24**, 111 (1979).

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

[5]M. W. Smith and W. L. Wiese, Astrophys. J. Suppl. Ser. **23**, No. 196, 103 (1971).

[6]G. A. Martin and W. L. Wiese, J. Phys. Chem. Ref. Data **5**, 537 (1976).

[7]Y.-K. Kim and J. P. Desclaux, Phys. Rev. Lett. **36**, 139 (1976) and private communication.

[8]S. M. Younger and A. W. Weiss, J. Res. Nat. Bur. Stand., Sect. A **79**, 629 (1975).

[9]L. A. Vainshtein and U. I. Safronova, At. Data Nucl. Data Tables **25**, 311 (1980).

Ni XXVI: 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.	$1s^22s-1s(^2S)2s2p(^3P^\circ)$	$^2S-{}^2P^\circ$											
			1.5996	0	62516000	2	2	2.7(+6)[a]	0.10	0.0011	−0.68	C	1
2.	$1s^22s-1s(^2S)2s2p(^1P^\circ)$	$^2S-{}^2P^\circ$											
			1.5935	0	62755000	2	2	4.0(+6)	0.15	0.0016	−0.52	C	1
3.	$1s^22p-1s2p^2$	$^2P^\circ-{}^2P$											
			1.5973	604520	63211000	4	4	8.1(+6)	0.31	0.0065	0.09	C	1
			1.5982	426990	62997000	2	2	7.3(+6)	0.28	0.0029	−0.25	C	1
			[1.6036]	604520	62997000	4	2	2.1(+6)	0.040	8.5(−4)	−0.79	C	1
4.		$^2P^\circ-{}^2D$											
			1.6005	604520	63085000	4	6	2.7(+6)	0.16	0.0033	−0.21	C	1
			1.5977	426990	63017000	2	4	4.4(+6)	0.34	0.0035	−0.17	C	1
5.		$^2P^\circ-{}^2S$											
			1.5930	604520	63380000	4	2	3.4(+6)	0.065	0.0014	−0.59	C	1
6.	$2s-2p$	$^2S-{}^2P^\circ$	*183.37*	0	*545340*	2	6	42.0	0.0635	0.0767	−0.896	B+	3
			165.42?	0	604520	2	4	57.5	0.0472	0.0514	−1.025	B+	3
			234.20	0	426990	2	2	19.9	0.0164	0.0253	−1.484	B+	3
7.	$2s-3p$	$^2S-{}^2P^\circ$	*9.074*	0	*11020000*	2	6	1.01(+5)	0.375	0.0224	−0.125	B+	6
			9.061	0	1104000	2	4	9.99(+4)	0.246	0.0147	−0.308	B+	6
			9.105	0	10980000	2	2	1.04(+5)	0.129	0.00773	−0.588	B+	6
8.	$2s-4p$	$^2S-{}^2P^\circ$				2	6		0.101		−0.695	C+	6
9.	$2s-5p$	$^2S-{}^2P^\circ$				2	6		0.040		−1.10	C+	6

Ni XXVI: 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
10.	$2s$–$6p$	$^2S - ^2P^\circ$				2	6		0.0213		−1.371	C+	6
11.	$2s$–$7p$	$^2S - ^2P^\circ$				2	6		0.0125		−1.602	C+	6
12.	$2p$–$3s$	$^2P^\circ - ^2S$	*9.676*	*545340*	10880000	6	2	3.8(+4)	0.018	0.0034	−0.97	C	4
			9.732	604520	10880000	4	2	2.5(+4)	0.018	0.0023	−1.14	C	4
			[9.567]	426990	10880000	2	2	1.3(+4)	0.018	0.0011	−1.44	C	4
13.	$2p$–$3d$	$^2P^\circ - ^2D$	*9.483*	*545340*	*11090000*	6	10	3.02(+5)	0.68	0.127	0.61	C	4
			9.535	604520	11090000	4	6	2.96(+5)	0.605	0.0760	0.384	C+	4
			9.390	426990	11080000	2	4	2.59(+5)	0.685	0.0424	0.137	C+	4
			9.55	604520	11080000	4	4	5.0(+4)	0.068	0.0086	−0.57	C	4
14.	$2p$–$4d$	$^2P^\circ - ^2D$				6	10		0.12		−0.14	C+	6
15.	$2p$–$5d$	$^2P^\circ - ^2D$				6	10		0.0450		−0.569	C+	6
16.	$2p$–$6d$	$^2P^\circ - ^2D$				6	10		0.0220		−0.879	C+	6
17.	$2p$–$7d$	$^2P^\circ - ^2D$				6	10		0.0125		−1.125	C+	6
18.	$3s$–$4p$	$^2S - ^2P^\circ$				2	6		0.45		−0.05	C	6
19.	$3s$–$5p$	$^2S - ^2P^\circ$				2	6		0.108		−0.67	C	6
20.	$3s$–$6p$	$^2S - ^2P^\circ$				2	6		0.048		−1.02	C	6
21.	$3s$–$7p$	$^2S - ^2P^\circ$				2	6		0.0250		−1.301	C	6
22.	$3p$–$4d$	$^2P^\circ - ^2D$				6	10		0.60		0.56	B	6
23.	$3p$–$5d$	$^2P^\circ - ^2D$				6	10		0.138		−0.082	C+	6
24.	$3p$–$6d$	$^2P^\circ - ^2D$				6	10		0.0558		−0.475	C+	6
25.	$3p$–$7d$	$^2P^\circ - ^2D$				6	10		0.0289		−0.761	C+	6
26.	$3d$–$4f$	$^2D - ^2F^\circ$				10	14		1.00		1.000	B	5
27.	$4s$–$5p$	$^2S - ^2P^\circ$				2	6		0.483		−0.015	C	6
28.	$4s$–$6p$	$^2S - ^2P^\circ$				2	6		0.129		−0.59	C	6
29.	$4s$–$7p$	$^2S - ^2P^\circ$				2	6		0.056		−0.95	C	6
30.	$4p$–$5d$	$^2P^\circ - ^2D$				6	10		0.586		0.546	C+	6
31.	$4p$–$6d$	$^2P^\circ - ^2D$				6	10		0.143		−0.067	C+	6
32.	$4p$–$7d$	$^2P^\circ - ^2D$				6	10		0.0618		−0.431	C+	6

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XXVI

Forbidden Transitions

The single magnetic dipole transition within the $1s^22p$ configuration has the line strength of 1.33 in the absence of relativistic effects in the wavefunctions.[1] It is estimated that these effects are negligible, since comprehensive relativistic calculations by Cheng *et al.*[2] for the analogous transition in the $1s^22s^22p$ configuration of the boron sequence show that such relativistic corrections are negligible until much more highly charged ions.

The listed transition probability data are also expected to be quite accurate since the energy levels are derived from experimental data.

An electric quadrupole transition at the same wavelength is estimated to be of negligible strength, as calculated by Bhatia[3] for this transition in the case of Mn XXIII. (He obtains a ratio of about 10^{-3} for the ratio of E2 to M1 line strengths).

References

[1]W. L. Wiese, M. W. Smith, and B. M. Miles, "Atomic Transition Probabilities", Vol. II, NSRDS-NBS 22, U.S. Govt. Print. Office, Washington, DC 1969.

[2]K. T. Cheng, Y.-K. Kim, and J. P. Desclaux, At. Data Nucl. Data Tables **24**, 111 (1979).

[3]A. K. Bhatia, private communication (1986).

Ni XXVI: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$2p$–$2p$	$^2P^\circ$ – $^2P^\circ$										
			[563.38]	[427180]	[604680]	2	4	M1	5.02(+4)[a]	1.33	B	*interp.*

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XXVII

He Isoelectronic Sequence

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

Ionization Energy: 10288.8 eV = 82984000 cm^{-1}

Allowed Transitions

List of tabulated lines

Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.	Wavelength (Å)	No.
1.2534	19	1.543	3,9	6.4225	25	25.500	46
1.2537	18	1.544	9	6.5224	26	25.907	47
1.2824	17	1.546	11	6.5520	33	53.879	57
1.2831	16	1.547	11	6.6779	34	54.177	58
1.3500	15	1.549	5	8.6080	23	55.298	60
1.3516	14	1.550	11	8.7475	24	56.016	61
1.531	4	1.551	7	8.8772	29	168.5	21
1.534	13	1.558	8	9.0740	30	228.0	20
1.537	6,10	1.5883	2	17.084	43	315.5	22
1.538	3	1.5963	1	17.241	44	361.9	20
1.539	9	5.7489	27	17.356	50	388.7	20
1.540	9	5.8352	28	17.590	51		
1.541	12	5.8471	37	24.819	41		
1.542	3,9	5.9524	38	25.036	42		

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 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 helium isoelectronic sequence. The f-values for the $1s^2\ ^1S - 1snp\ ^3P^\circ$ ($n = 3$–5) transitions were interpolated from results of the relativistic random phase approximation (RRPA) calculations of Johnson and Lin.[2] For other s–p and p–s transitions, we tabulate the published RRPA data of Lin *et al.*[3,4]

The charge expansion results of Laughlin[5] are given for various p–d and d–p transitions, as well as transitions between $4d$ and $4f$ levels. For those multiplets involving no change in principal quantum number ($3p$–$3d$, $4p$–$4d$, $4d$–$4f$) the f-values should be considered rather uncertain, since they are sensitive to energy differences. Oscillator strengths for the $2p$–$3d$ transitions, and for $1s3p\ ^3P^\circ - 1s3d\ ^3D$, were interpolated from the variational calculations of Weiss.[6] Both of these calculations indicatethat, unlike the triplets, the $nd\ ^1D$ energy levels ($n = 3,4$) lie below the $np\ ^1P^\circ$ levels, and the $4f\ ^1F^\circ$ lies below the $4d\ ^1D$.

Brown and Cortez[7] have provided f-values for numerous d–f and f–d transitions for the isoelectronic sequence by fitting Z-expansion formulas to the results of variational calculations for the low-Z ions. Their results for transitions between the lower-lying D and F° terms are tabulated here.

Transition probabilities for the stronger transitions involving the doubly excited $n = 2$ states are taken from the comprehensive, charge expansion perturbation theory calculations of Vainshtein and Safronova.[8] Numerous data are also available for transitions involving doubly excited states where the spectator electron has principal quantum number $n = 3$.[9] However, these data are not tabulated here, since most of the transitions are very close to belonging to the unresolved satellites of the H-like ions, if they do not in fact do so.

References

[1] G. W. F. Drake, Phys. Rev. A **19**, 1387 (1979).

[2] W. R. Johnson and C. D. Lin, Phys. Rev. A **14**, 565 (1976).

[3] C. D. Lin, W. R. Johnson, and A. Dalgarno, Astrophys. J. **217**, 1011 (1977).

[4] C. D. Lin, W. R. Johnson, and A. Dalgarno, Phys. Rev. A **15**, 154 (1977).

[5] C. J. Laughlin, J. Phys. B **6**, 1942 (1973).

[6] A. W. Weiss, J. Res. Nat. Bur. Stand., Sect. A **71**, 163 (1967).

[7] R. T. Brown and J.-L. M. Cortez, Astrophys. J. **176**, 267 (1972).

[8] L. A. Vainshtein and U. I. Safronova, At. Data Nucl. Data Tables **21**, 49 (1978).

[9] L. A. Vainshtein and U. I. Safronova, At. Data Nucl. Data Tables **25**, 311 (1980).

Ni XXVII: 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 – $^3P^\circ$											
			[1.5963]	0	[62644200]	1	3	7.70(+5)[a]	0.0883	4.64(−4)	−1.054	B	1
2.		^1S – $^1P^\circ$	[1.5883]	0	[62961500]	1	3	6.02(+6)	0.683	0.00357	−0.166	B	1
3.	$1s2s$–$2s2p$	^3S – $^3P^\circ$	*1.540*	[62367900]	*[127300000]*	3	9	3.8(+6)	0.41	0.0062	0.09	C	8
			[1.538]	[62367900]	[127380000]	3	5	3.9(+6)	0.23	0.0035	−0.16	C	8
			[1.542]	[62367900]	[127210000]	3	3	3.6(+6)	0.13	0.0020	−0.41	C	8
			[1.543]	[62367900]	[127170000]	3	1	3.8(+6)	0.045	6.9(−4)	−0.87	C	8
4.		^3S – $^1P^\circ$											
			[1.531]	[62367900]	[127690000]	3	3	2.0(+5)	0.0070	1.1(−4)	−1.68	D	8
5.		^1S – $^3P^\circ$											
			[1.549]	[62644500]	[127210000]	1	3	2.0(+5)	0.022	1.1(−4)	−1.67	D	8
6.		^1S – $^1P^\circ$	[1.537]	[62644500]	[127690000]	1	3	3.7(+6)	0.39	0.0020	−0.41	C	8
7.	$1s2p$–$2s^2$	$^3P^\circ$ – ^1S											
			[1.551]	[62644200]	[127130000]	3	1	8.2(+5)	0.0099	1.5(−4)	−1.53	D	8
8.		$^1P^\circ$ – ^1S	[1.558]	[62961500]	[127130000]	3	1	6.5(+5)	0.0079	1.2(−4)	−1.63	D	8
9.	$1s2p$–$2p^2$	$^3P^\circ$ – ^3P	*1.542*	*[62732300]*	*[127600000]*	9	9	6.6(+6)	0.236	0.0108	0.328	C	8
			[1.542]	[62806500]	[127640000]	5	5	3.5(+6)	0.12	0.0032	−0.20	C	8
			[1.540]	[62644200]	[127590000]	3	3	1.7(+6)	0.060	9.2(−4)	−0.74	C	8
			[1.544]	[62806500]	[127590000]	5	3	3.2(+6)	0.069	0.0017	−0.46	C	8
			[1.543]	[62644200]	[127460000]	3	1	6.9(+6)	0.082	0.0013	−0.61	C	8
			[1.539]	[62644200]	[127640000]	3	5	2.6(+6)	0.15	0.0023	−0.34	C	8
			[1.539]	[62625200]	[127590000]	1	3	2.6(+6)	0.28	0.0014	−0.56	C	8
10.		$^3P^\circ$ – ^1D											
			[1.537]	[62806500]	[127860000]	5	5	2.3(+6)	0.081	0.0021	−0.39	C	8
11.		$^1P^\circ$ – ^3P											
			[1.546]	[62961500]	[127640000]	3	5	1.6(+6)	0.096	0.0015	−0.54	C	8
			[1.547]	[62961500]	[127590000]	3	3	2.1(+5)	0.0075	1.2(−4)	−1.65	D	8
			[1.550]	[62961500]	[127460000]	3	1	1.2(+5)	0.0014	2.2(−5)	−2.36	D	8
12.		$^1P^\circ$ – ^1D	[1.541]	[62961500]	[127860000]	3	5	5.5(+6)	0.33	0.0050	−0.01	C	8
13.		$^1P^\circ$ – ^1S	[1.534]	[62961500]	[128140000]	3	1	6.9(+6)	0.081	0.0012	−0.61	C	8
14.	$1s^2$–$1s3p$	^1S – $^3P^\circ$											
			[1.3516]	0	[73985000]	1	3	2.4(+5)	0.020	8.9(−5)	−1.70	E	*interp.*
15.		^1S – $^1P^\circ$	[1.3500]	0	[74076300]	1	3	1.63(+6)	0.134	5.96(−4)	−0.873	B	3
16.	$1s^2$–$1s4p$	^1S – $^3P^\circ$											
			[1.2831]	0	[77938200]	1	3	1.0(+5)	0.0074	3.1(−5)	−2.13	E	*interp.*
17.		^1S – $^1P^\circ$	[1.2824]	0	[77976200]	1	3	6.38(+5)	0.0472	1.99(−4)	−1.326	B	3

Ni XXVII: 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.	$1s^2$–$1s5p$	^1S – $^3P^\circ$											
			[1.2537]	0	[79762600]	1	3	5.2(+4)	0.0037	1.5(−5)	−2.43	E	*interp.*
19.		^1S – $^1P^\circ$	[1.2534]	0	[79782000]	1	3	3.35(+5)	0.0237	9.78(−5)	−1.625	B	3
20.	$1s2s$–$1s2p$	^3S – $^3P^\circ$	274.4	[62367900]	[62732300]	3	9	12.0	0.0406	0.110	−0.914	B	4
			[228.0]	[62367900]	[62806500]	3	5	21.7	0.0282	0.0635	−1.073	B	4
			[361.9]	[62367900]	[62644200]	3	3	4.82	0.00946	0.0338	−1.547	B	4
			[388.7]	[62367900]	[62625200]	3	1	4.35	0.00328	0.0126	−2.006	B	4
21.		^3S – $^1P^\circ$											
			[168.5]	[62367900]	[62961500]	3	3	5.95	0.00253	0.00421	−2.119	B	4
22.		^1S – $^1P^\circ$	[315.5]	[62644500]	[62961500]	1	3	7.53	0.0337	0.0350	−1.472	B	4
23.	$1s2s$–$1s3p$	^2S – $^3P^\circ$											
			[8.6080]	[62367900]	[73985000]	3	3	1.07(+5)	0.119	0.0101	−0.447	B	3
24.		^1S – $^1P^\circ$	[8.7475]	[62644500]	[74076300]	1	3	1.03(+5)	0.353	0.0102	−0.452	B	3
25.	$1s2s$–$1s4p$	^2S – $^3P^\circ$											
			[6.4225]	[62367900]	[77938200]	3	3	5.2(+4)	0.032	0.0020	−1.02	B	3
26.		^1S – $^1P^\circ$	[6.5224]	[62644500]	[77976200]	1	3	4.4(+4)	0.085	0.0018	−1.07	B	3
27.	$1s2s$–$1s5p$	^3S – $^3P^\circ$											
			[5.7489]	[62367900]	[79762600]	3	3	2.4(+4)	0.012	6.8(−4)	−1.44	B	3
28.		^1S – $^1P^\circ$	[5.8352]	[62644500]	[79782000]	1	3	2.3(+4)	0.035	6.7(−4)	−1.46	B	3
29.	$1s2p$–$1s3s$	$^3P^\circ$ – ^3S											
			[8.8772]	[62644200]	[73909000]	3	3	1.1(+4)	0.013	0.0011	−1.41	B	3
30.		$^1P^\circ$ – ^1S	[9.0740]	[62961500]	[73982000]	3	1	3.4(+4)	0.014	0.0013	−1.38	B	3
31.	$1s2p$–$1s3d$	$^3P^\circ$ – ^3D				9	15		0.69		0.79	C+	*interp.*
32.		$^1P^\circ$ – ^1D				3	5		0.70		0.32	C+	*interp.*
33.	$1s2p$–$1s4s$	$^3P^\circ$ – ^3S											
			[6.5520]	[62644200]	[77906600]	3	3	4700	0.0030	1.9(−4)	−2.05	C	3
34.		$^1P^\circ$ – ^1S	[6.6779]	[62961500]	[77936200]	3	1	1.3(+4)	0.0030	2.0(−4)	−2.05	C	3
35.	$1s2p$–$1s4d$	$^3P^\circ$ – ^3D				9	15		0.12		0.03	C	5
36.		$^1P^\circ$ – ^1D				3	5		0.12		−0.44	C	5
37.	$1s2p$–$1s5s$	$^3P^\circ$ – ^3S											
			[5.8471]	[62644200]	[79746600]	3	3	2300	0.0012	6.9(−5)	−2.44	C	3
38.		$^1P^\circ$ – ^1S	[5.9524]	[62961500]	[79761400]	3	1	6800	0.0012	7.1(−5)	−2.44	C	3

Ni XXVII: 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
39.	$1s3s-1s3p$	$^3S - ^3P°$											
						3	3		0.015		−1.35	C	3
40.		$^1S - ^1P°$				1	3		0.057		−1.24	C	3
41.	$1s3s-1s4p$	$^3S - ^3P°$											
			[24.819]	[73909000]	[77938200]	3	3	1.42(+4)	0.131	0.0321	−0.406	B	3
42.		$^1S - ^1P°$	[25.036]	[73982000]	[77976200]	1	3	1.37(+4)	0.387	0.0319	−0.412	B	3
43.	$1s3s-1s5p$	$^3S - ^3P°$											
			[17.084]	[73909000]	[79762600]	3	3	7500	0.033	0.0056	−1.00	B	3
44.		$^1S - ^1P°$	[17.241]	[73982000]	[79782000]	1	3	7400	0.099	0.0056	−1.00	B	3
45.	$1s3p-1s3d$	$^3P° - ^3D$				9	15		0.010		−1.05	D	*interp.*
46.	$1s3p-1s4s$	$^3P° - ^3S$											
			[25.500]	[73985000]	[77906600]	3	3	3200	0.031	0.0078	−1.03	B	3
47.		$^1P° - ^1S$	[25.907]	[74076300]	[77936200]	3	1	9800	0.033	0.0084	−1.00	B	3
48.	$1s3p-1s4d$	$^3P° - ^3D$				9	15		0.60		0.73	C	5
49.		$^1P° - ^1D$				3	5		0.62		0.27	C	5
50.	$1s3p-1s5s$	$^3P° - ^3S$											
			[17.356]	[73985000]	[79746600]	3	3	1600	0.0070	0.0012	−1.68	C	3
51.		$^1P° - ^1S$	[17.590]	[74076300]	[79761400]	3	1	4700	0.0073	0.0013	−1.66	C	3
52.	$1s3d-1s3p$	$^1D - ^1P°$				5	3		0.0019		−2.02	E	5
53.	$1s3d-1s4p$	$^3D - ^3P°$				15	9		0.012		−0.74	C	5
54.		$^1D - ^1P°$				5	3		0.011		−1.26	C	5
55.	$1s4s-1s4p$	$^3S - ^3P°$											
						3	3		0.026		−1.11	E	3
56.		$^1S - ^1P°$				1	3		0.062		−1.21	D	3
57.	$1s4s-1s5p$	$^3S - ^3P°$											
			[53.879]	[77906600]	[79762600]	3	3	3380	0.147	0.0782	−0.356	B	3
58.		$^1S - ^1P°$	[54.177]	[77936200]	[79782000]	1	3	3260	0.431	0.0769	−0.366	B	3
59.	$1s4p-1s4d$	$^3P° - ^3D$				9	15		0.018		−0.79	D	5
60.	$1s4p-1s5s$	$^3P° - ^3S$											
			[55.298]	[77938200]	[79746600]	3	3	1100	0.051	0.028	−0.82	B	3
61.		$^1P° - ^1S$	[56.016]	[77976200]	[79761400]	3	1	3400	0.053	0.029	−0.80	B	3

Ni XXVII: 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
62.	$1s4d$–$1s4p$	^{1}D - ^{1}P°				5	3		0.0029		−1.84	E	5
63.	$1s4d$–$1s4f$	^{3}D - ^{3}F°				15	21		7.3(−4)		−1.96	E	5
64.	$1s4d$–$1s5f$	^{3}D - ^{3}F°				15	21		0.89		1.13	B	7
65.		^{1}D - ^{1}F°				5	7		0.89		0.65	B	7
66.	$1s4f$–$1s4d$	^{1}F° - ^{1}D				7	5		3.9(−4)		−2.56	E	5
67.	$1s4f$–$1s5d$	^{3}F° - ^{3}D				21	15		0.0089		−0.73	C	7
68.		^{1}F° - ^{1}D				7	5		0.0089		−1.21	C	7
69.	$1s5s$–$1s5p$	^{3}S - ^{3}P°											
						3	3		0.026		−1.11	E	3
70.		^{1}S - ^{1}P°				1	3		0.10		−1.00	E	3

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XXVII

Forbidden Transitions

The results of multi-configuration Dirac-Fock calculations by Hata and Grant[1] have been selected for this tabulation. Their work includes both a very detailed consideration of configuration interaction—with configurational wavefunction sets containing as many as 51 interacting states—as well as a fully relativistic treatment based on the Dirac Hamiltonian. Their calculated wavelengths are in very close agreement with experimental values. For the ions Ti XXI, V XXII and Fe XXV, where accurate experimental lifetime data are available, the agreement between these and the theoretical results of Hata and Grant[1] is excellent, with differences not exceeding a few percent (see the comparison table in the introduction to the forbidden lines of Ti XXI).

Reference

[1]J. Hata and I. P. Grant, Mon. Not. R. Astr. Soc. **211**, 549 (1984).

Ni XXVII: Forbidden transitions

No.	Transition Array	Multiplet	λ (Å)	E_i (cm^{-1})	E_k (cm^{-1})	g_i	g_k	Type of transition	A_{ki} (s^{-1})	S (at. u.)	Accuracy	Source
1.	$1s^2$–$1s2s$	^{1}S - ^{3}S	[1.6036]	0	[62358960]	1	3	M1	4.52(+8)[a]	2.07(−4)	B	1
2.	$1s^2$–$1s2p$	^{1}S - ^{3}P°										
			[1.5923]	0	[62801270]	1	5	M2	1.22(+10)	0.0942	B	1

[a]The number in parentheses following the tabulated value indicates the power of ten by which this value has to be multiplied.

Ni XXVIII

H Isoelectronic Sequence

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

Ionization Energy: 10775.48 eV = 86909400 cm^{-1}

Allowed Transitions

Electric dipole transition probability data for this hydrogen-like ion can be obtained directly, in a non-relativistic approximation, from the data for neutral hydrogen.[1] The oscillator strength is independent of Z along the entire isoelectronic sequence and is therefore identical to the value for the hydrogen atom. Line strengths scale as Z^{-2} and transition probabilities scale as Z^4, i.e.,

$$S_Z = Z^{-2} S_H, \qquad A_Z = Z^4 A_H.$$

For higher nuclear charges in this sequence, relativistic corrections will cause these values to deviate increasingly from the non-relativistic ones. The first effect of relativity will be to alter the transition energies, or wavelengths, from the non-relativistic, even though the line strength itself is still well approximated by the non-relativistic value. In this case, experimental energies should be used in the standard conversion formulas, given in the general introduction to this volume, to calculate the most accurate values of f and A. It should be noted that the relativistic removal of the j-degeneracy introduces dipole transitions which do not occur in the non-relativistic theory, e.g., $2s_{1/2} - 2p_{3/2}$.

For very high Z, it is necessary to use the four-component Dirac spinors rather than two-component Schroedinger functions in theoretical calculations, and this introduces relativistic corrections to the line strengths themselves. Several recent systematic studies of the problem[2,3] indicate that these corrections are not large for stages of ionization in the range 20–30. Corrections for $Z = 30$ are usually no larger than 5–10% and generally substantially less than 5%. If an accuracy greater than this is required, the reader is referred to these papers[2,3] for a more detailed error analysis.

References

[1] W. L. Wiese, M. W. Smith, and B. M. Glennon, 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] S. M. Younger and A. W. Weiss, J. Res. Nat. Bur. Stand., Sect. A 79, 629 (1975).

[3] S. J. Rose, Rutherford Appleton Laboratory Report RL-82-114 (December 1982).

INTERNAL DISTRIBUTION

1. E. C. Crume
2. S. Datz
3. R. A. Dory
4-8. D. C. Gregory
9. H. H. Haselton
10. C. C. Havener
11. S. Hiroe
12. L. D. Horton
13-17. H. T. Hunter
18. R. C. Isler
19-23. M. I. Kirkpatrick
24. C. C. Klepper
25. H. F. Krause
26. F. W. Meyer
27-31. R. A. Phaneuf
32. I. A. Sellin
33. W. L. Stirling
34. C. C. Tsai
35. J. H. Whealton
36. T. L. White
37. J. B. Wilgen
38. Central Research Library
39. Document Reference Section
40-41. Lab. Records
42. Lab. Records, RC
43. ORNL Patent Section
44. Fusion Energy Div. Library
45. Fusion Engineering Design Center

EXTERNAL DISTRIBUTION

46. Office of Assistant Manager, Energy Research and Development, DOE-ORO
47. Dr. V. A. Abramov, Inst. Atommoi Energii, I. V. Kurchatova, 46 Ulitsa Kurchatova, Moscow D-182,, U.S.S.R.
48. Dr. V. V. Afrosimov, A. F. Ioffe Phys.-Techn. Inst., Leningrad, 194021, U.S.S.R.
49. Dr. I. Alexeff, Dept. Electrical Engineering, Ferris Hall, Univ. of Tennessee, Knoxville, TN 37996-2100
50. Dr. M. A. Ali, Chemistry Dept., Howard Univ., Washington, DC 20059
51. Dr. I. Alvarez-Torre & Dr. C. Cisneros, Instituto de Fisica, Univ. Nacional Autonoma de Mexico, Apartdo Postal 139-B, Cuernavaca, Morelos 62191, Mexico
52. Dr. L. W. Anderson, Dept. of Physics, Univ. of Wisconsin, Madison, WI 53706
53. Dr. K. Ando, Atomic Process Lab., Rikagaku Kenkyusho, The Inst. of Phys. & Chem. Res., Wako-Shi, Saitama, 351, Japan
54. Prof. K. L. Andrew, Dept. of Physics, Purdue Univ., Lafayette, IN 47907
55. Dr. R. J. Armstrong, Univ. of Tromso, Inst. of Mathematical and Physical Sciences, Dept. of Physics, P.O. Box 953, N-9001 Tromso, Norway
56. Mm. Marie-Christine Artru, DAPHE, Observatoire de Paris, Meudon, 92195 Meudon - Cedex, France
57. Atomic Energy Levels Data Center, Attn: Mrs. Arlene F. Musgrove, Physics A-155, National Inst. of Standards and Technology, Gaithersburg, MD 20899
58. Dr. E. H. Avrett, Center for Astrophysics, 60 Garden St., Cambridge, MA 02138
59. Dr. M. Bacal, Laboratoire P.M.I., Ecole Polytechnique, 91128 Palaiseau Cedex, France
60. Dr. A. Barany, Inst. of Theoretical Physics, Uppsala Univ., Thunbergsv. 3, S-752 38 Uppsala, Sweden
61. Dr. W. Bauer, Sandia Labs., Dept. 8340, Livermore, CA 94550
62. Dr. J. F. Baur, General Atomic, P.O. Box 85608, San Diego, CA 92138
63. Dr. H. Behrens, Fachinformationszentrum, Energie Physik Mathematick GMBH, 7514 Eggenstein-Leopoldshafen 2, West Germany
64. Dr. K. Behringer, Max-Planck-Institut fuer Plasmaphysik, 8046 Garching bei Muenchen, West Germany

65. Dr. R. Behrisch, Max-Planck-Institut fuer Plasmaphysik, Boltzmannstr. 2, D-8046 Garching bei Muenchen, West Germany
66. Prof. G. Bekefi, Dept. of Physics, Room 36-213, Massachusetts Inst. of Techn., Cambridge, MA 02139
67. Dr. R. D. Bengtson, Dept. of Physics, Univ. of Texas, Austin, TX 78712
68. Prof. W. R. Bennett, 102 Dunham Lab., Yale Univ., New Haven, CT 06520
69. Dr. D. Berenyi, Inst. of Nuclear Research, The Hungarian Academy of Sci., H-4001 Debrecen PF. 51, 18/C BEM TER, Hungary
70. Prof. R. S. Berry, Dept. of Chemistry, The Univ. of Chicago, 5735 South Ellis Ave., Chicago, IL 60637
71. Dr. P. J. Bertoncini, Argonne National Lab., 9700 South Cass Ave., Argonne, IL 60439
72. Dr. A. K. Bhatia, NASA, Code 680 1, Goddard Space Flight Ctr., Greenbelt, MD 20771
73. Biblioteca - Att. Clelia De Palo, ENEA-Centro Ricerche, C.P. 65, 00044 Frascati, Roma, Italy
74. Dr. E. Biemont, Inst. D-Astrophysique, Universite de Liege, B-2400 Conte - Liege, Belgium
75. Dr. X. Bing, Information Center, Southwestern Inst. of Physics, P.O. Box 16, Leshan, Sichuan, People's Republic of China
76. Dr. M. Bitter, PPPL, Princeton Univ., P.O. Box 451, Princeton, NJ 08544
77. Dr. S. L. Bliman, Centre D'etudes Nucleaires, De Grenoble, 85 X Ave. Des Martyrs, F-38041 Grenoble, Cedex, France
78. Dr. P. Bogen, Kernforschungasanlage Julich GmbH, Postfach 1913, D-5170 Julich, West Germany
79. Dr. D. C. Boice, Space Science Div. 15, Southwest Research Inst., P.O. Drawer 28510, 6220 Culebra Road, San Antonio, TX 78284
80. Dr. R. Bolton, Inst. de Recherche d'Hydro-Quebec, Case Postale 1000, Varennes, Quebec, Canada J0L 2P0
81. Dr. R. Boxman, School of Engineering, Tel-Aviv Univ., Ramat-Aviv, Tel-Aviv 69978, Israel
82. Dr. J. W. Brault, National Solar Observatory, P.O. Box 26732, Tucson, AZ 85726
83. Dr. F. Bresnock, 180 Cedar Ridge Dr., Glastonbury, CT 06033
84. Dr. L. Brewer, MMRD Div., LBL, MS 11-B85, Berkeley, CA 94720
85. Dr. F. Brouillard, Institut De Physique, Chemin Du Cyclotron. 2, Universite De Louvain, B 1348 Louvain-La-Neuve, Belgium
86. Dr. R. Bruch, Dept. of Physics, Univ. Nevada-Reno, Reno, NV 89557-0058
87. Dr. K. H. Burrell, General Atomic, P.O. Box 85608, San Diego, CA 92138
88. Dr. J. Callaway, Dept. of Phys. and Astronomy, Louisiana State Univ., Baton Rouge, LA 70803
89. Dr. J. D. Callen, Nuclear Engineering Dept., ERB, 1500 Johnson Drive, Univ. of Wisconsin, Madison, WI 053706
90. Dr. J. Castracane, MPB Technologies, 1725 Trans-Canada Hwy., Corval, Quebec H9P 1J1
91. Dr. S. Chakrabarti, Space Sciences Lab., Univ. California, Berkeley, Berkeley, CA 94720
92. Dr. F. Chang, Astronaut Office/Code CB, NASA Johnson Space Center, Houston, TX 77058
93. Dr. L. S. Chang, Inst. of Applied Physics and Computational Mathematics, P.O. Box 8009, Beijing, The People's Republic of China
94. Dr. M. H. Chen, LLNL, V Div., P.O. Box 808, Livermore, CA 94550
95. Dr. C. K. Choi, School of Nuclear Engineering, Purdue Univ., West Lafayette, IN 47907
96. Dr. Y. P. Chong, LLNL, P.O. Box 808, MS L-626, Livermore, CA 94550
97. Dr. A. Chutjian, Jet Propulsion Lab., Mail Stop 183-601, California Inst. of Techn., 4800 Oak Grove Drive, Pasadena, CA 91109
98. Daniel L. Claypool, 2355 Old Orchard, Webster Groves, MO 63119

99. Dr. E. J. Clothiaux, Dept. of Physics, Auburn Univ., Auburn, AL 36849-3501
100. Dr. F. H. Coensgen, Radiation Lab., LLNL, P.O. Box 808, Livermore, CA 94550
101. Dr. S. A. Cohen, PPPL, Forrestal Campus, Princeton Univ., Princeton, NJ 08540
102. Dr. G. J. Collins, Colorado State Univ., Dept. Elect. Eng., Fort Collins, CO 80523
103. Dr. J. Comly, LANL, Group X-7, MS B-257, Los Alamos, NM 87545
104. Prof. R. W. Conn, UCLA, 6291 Boelter Hall, Los Angeles, CA 90024
105. Dr. J. L. Cook, AAEC Research Establishment, Physics Div., AAEC - Lucas Heights, Sutherland 2232, N.S.W., Australia
106. Dr. D. H. Crandall, ER-54, G-219 GTN, Office of Fusion Energy, U.S. Dept. of Energy, Washington, DC 20545
107. Dr. R.J.S. Crossley, Dept. of Mathematics, Univ. of York, York Y01 5DD, England
108. Dr. G. Dahlbacka, Plasma Research Corp., 2900 Main St., Alameda, CA 94501
109. Dr. A. Dalgarno, Harvard-Smithsonian Center for Astrophysics, 60 Garden St., MS 14, Cambridge, MA 02138
110. Dr. R. Danford, Intl. Research & Evaluation, Attn: Input Processing Director, 21098 IRE Control Center, Eagan, MN 55121
111. Dr. R. U. Datla, Bldg. 221, MS A-176, National Bureau of Standards, Gaithersburg, MD 20899
112. Mr. B. Davis, Atom Sciences, Inc., 114 Ridgeway Center, Oak Ridge, TN 37830
113. Dr. H. Davis, LANL, P.O. Box 1663, MS E-526, Los Alamos, NM 87545
114. Dr. J. Davis, Code 4720, Plasma Radiation Branch, Naval Research Lab., Washington, DC 20375
115. Dr. F. J. de Heer, FOM-Inst. VOOR Atoom - en Mulecuul Fysica, Postbus 41883, 1009 DB Amsterdam, The Netherlands
116. Prof. J. L. Delcroix, Laboratoire de Physique des Gaz et des Plasmas, Batiment 212, Universite de Paris - Sud, 91405 Orsay Cedex, France
117. Dr. J. Desesquelles, Lab. Spectrom. Ionique et Moleculaire, 43, Bd du 11 Novembre 1918, 69622 Villeurbanne Cedex, France
118. Dr. J. J. Dorning, Dept. of NEEP, Reactor Facility, Univ. of Virginia, Charlottesville, VA 22901
119. Dr. G. Drake, Dept. of Physics, Univ. of Windsor, Windsor, Ontario N9B 3P4, Canada
120. Dr. J. R. Drake, Royal Inst. of Technology, Plasma Physics & Fusion Research, S-100 44, Stockholm 70, Sweden
121. Dr. H. W. Drawin, EURATOM-CEA, DRFC, Cen-Cadarache, F-13108 St-Paul-Lez-Durance, France
122. Dr. P. D. Dumont, Universite De Liege, Faculte Des Sciences, Inst. De Phys. Nucl. Experiment., Sart Tilman B - 4000 Liege 1, Belgium
123. Dr. R. W. Dunford, PHY-203, Argonne National Lab., 9700 S. Call Ave., Argonne, IL 60439
124. Dr. G. H. Dunn, JILA, Campus Box 440, Univ. of Colorado, Boulder, CO 80309-0440
125. Dr. W. Eckstein, Max-Planck Institut fuer Plasmaphysik, 8046 Garching bei Muenchen, West Germany
126. Dr. R. C. Elton, Code 4733, Naval Research Lab., Washington, DC 20375
127. Prof. G. A. Emmert, Nuclear Engineering Dept., Univ. of Wisconsin, 153 Engineering Research Bldg., Madison, WI 53706
128. Dr. M. Fabbriconi, ENEA Energy Research Center, P.O. Box 65, 00044 Frascati, Italy
129. Dr. A. Ya. Faenov, VNIIFTRI, Mendeleevo, Moscow Region, 141570, U.S.S.R.
130. Dr. B. C. Fawcett, Rutherford & Appleton Lab., Chilton, Didcot, Oxfordshire OX11 OQX, United Kingdom
131. Dr. B. Feinberg, LBL, Univ. of California, MS 71259, Berkeley, CA 94720
132. Dr. U. Feldman, Code 4174, Naval Research Lab., Washington, DC 20375
133. Dr. M. Fink, Rlm Bldg. 10.202, Dept. of Physics, Univ. of Texas, Austin, TX 78712

134. Dr. M. Finkenthal, Racah Inst. of Physics, The Hebrew Univ., Jerusalem 91004, Israel
135. Dr. C. F. Fischer, Dept. of Computer Science, Box 6035, Station B, Vanderbilt Univ., Nashville, TN 37235
136. Dr. R. K. Fisher, General Atomic, P.O. Box 85608, L-338, San Diego, CA 92138
137. Dr. R. Fonck, PPPL, Princeton Univ., P.O. Box 451, Princeton, NJ 08544
138. Dr. T. K. Fowler, Univ. of California, Dept. of Nuclear Eng., Etcheverry Hall, Rm. 4153, Berkeley, CA 94720
139. Dr. A. Fukuda, Quantumtechnology Div., Electrotechnical Lab., 1-1-4, Umezono, Sakura-Mura, Niihari-Gun, Ibaraki, Japan
140. Dr. G. Fussmann, Max-Planck Institut fuer Plasmaphysik (IPP), 8046 Garching bei Muenchen, Germany Abtl. E3
141. Dr. J. Gallagher, Physics A-323, National Inst. of Standards and Technology, Gaithersburg, MD 20899
142. Mrs. B. Garton, Dept. of Physics, Imperial College of Science & Technology, London S.W. 7, England
143. Dr. W.R.S. Garton, Dept. of Physics, Imperial College of Science & Technology, London S.W. 7, England
144. Dr. T. J. Gay, Univ. of Missouri-Rolla, Dept. of Physics, 102 Physics Bldg., Rolla, MO 65401-0249
145. Dr. K. W. Gentle, Dept. of Physics, Univ. of Texas, Austin, TX 78712
146. Prof. H. B. Gilbody, Dept. of Pure & Applied Phys., The Queen's Univ. of Belfast, Belfast BT 7, 1NN, Northern Ireland
147. Dr. V. Ye. Golant, A. F. Ioffe Physico - Techn. Inst., Leningrad K-21, U.S.S.R.
148. Dr. Z. Goldschmidt, Racah Inst. of Physics, The Hebrew Univ., Jerusalem 91004, Israel
149. Dr. S. Goldsmith, Dept. of Physics, Tel-Aviv Univ., Tel-Aviv, Israel
150. Dr. I. N. Golovin, I. V. Kurchatov Inst., Atomic Energy, Ulitsa Kurchatova 46, Moscow 123182, U.S.S.R.
151. Dr. W. G. Graham, Dept. Phys., New Univ. of Ulster, Coleraine BT52 1SA, Northern Ireland
152. Dr. E. Greenspan, Atomic Energy Commission, Nuclear Research Centre-Negev, P.O. Box 9001, Beersheva, 84190, Israel
153. Dr. B. C. Gregory, Univ. du Quebec, Inst. National de la Recherche Sci., 1650, Montee Sainte Julie, Case Postal 1020, Varennes, Quebec J0L 2P0, Canada
154. Dr. H. R. Griem, Lab. for Plasma - Fusion, Univ. of Maryland, College Park, MD 20742
155. Dr. D. C. Griffin, Dept. of Physics, Rollins College, Winter Park, FL 32789
156. Dr. L. Grodzins, Dept. of Physics, MIT, Rm 26-421, Cambridge, MA 02139
157. Dr. R. J. Groebner, Doublet III Program, 13/463, General Atomic, P.O. Box 85608, San Diego, CA 92138
158. Dr. R. A. Gross, Dept. of Applied Physics & Nuclear Engineering, Columbia Univ., New York, NY 10027
159. Dr. G. E. Guest, Applied Microwave Plasma Concepts, 2075-N Corte del Nogal, Carlsbad, CA 92009
160. Dr. A. Haasz, Univ. of Toronto, Inst. for Aerospace Studies, 4925 Dufferin St., Downsview, Ontario, Canada M3H 5T6
161. Dr. M. Hack, Dir. Observ. Astron. VIA Tiepolo N 11, Trieste, Italy
162. Dr. H. Hacker, Max Planck Institut fuer Plasmaphysik, 8046 Garching bei Muenchen, West Germany
163. Dr. S. Hagmann, Dept. of Physics, Kansas State Univ., Manhattan, KS 66506
164. Dr. R. Hallin, Fysisk Inst., Box 530, 751 21 Uppsala, Sweden
165. Dr. J. E. Hansen, Zeeman Lab., PL Muidergracht 4, 1018 TV Amsterdam, The Netherlands

166. Dr. M.F.A. Harrison, Culham Lab., UKAEA, Abingdon, Oxfordshire, OX14 3DB, England
167. Dr. S. P. Hatchett II, L-477, LLNL, Livermore, CA 94550
168. Dr. R.J.W. Henry, Dept. of Physics and Astronomy, Louisiana State Univ., Baton Rouge, LA 70803
169. Dr. R. A. Hess, Lab. for Plasma Research, Univ. of Maryland, College Park, MD 20742
170. Dr. J. D. Hey, Dept. of Physics, Univ. of Cape Town, Rondebosch 700, South Africa
171. Dr. K. W. Hill, PPPL, Princeton Univ., P.O. Box 451, Princeton, NJ 08544
172. Dr. G. Himmel, Ruhr-Universitat Bochum, Experimentalphysik, Lehrstuhl II, Universitatsstr. 150, Postfach 102148, 4630 Bochum 1, West Germany
173. Dr. E. Hinnov, PPPL, Princeton Univ., P.O. Box 451, Princeton, NJ 08544
174. Dr. B. Hodge, Fusion Research Center, RLM 11-222, Univ. Texas, Austin, TX 78712
175. Dr. Wang Hongzhang, Dept. of Physics, Huaihai Univ., Lianyungang, Jiangsu Province, The People's Republic of China
176. Dr. Keh-Ning Huang, Inst. of Atomic & Molecular Sci., Academia Sinica, P.O. Box 23-166, Taipei, Taiwan 107
177. Prof. B. A. Huber, DRF-SPHAT, CEN-G 85X, 38041 Grenoble Cedex, France
178. Dr. W. F. Huebner, Southwest Research Inst., Instrum. & Space Research Div., 6220 Culebra Road, San Antonio, TX 78284
179. Dr. J. G. Hughes, Dept. of Computer Science, The Queen's Univ. of Belfast, Belfast BT7 1NN, Northern Ireland
180. Dr. R. Hulse, PPPL, Princeton Univ., Princeton, NJ 08544
181. Inst. of Plasma Physics, Attn: Librarian, Nagoya Univ., Nagoya, 464, Japan
182. Inst. of Theoretical Astrophys., Librarian, Univ. of Oslo, P.O. Box 1029, Blinderen, N-0315 Oslo 3, Norway
183. International Research & Evaluation, Attn: IRE-ITTD Input Processing Dir., 21098 IRE Control Ctr., Eagan, MN 55121
184. Dr. K. Ishii, Dept. of Eng. Science, Faculty of Engineering, Kyoto Univ., Kyoto, Japan
185. Dr. Y. Itikawa, Inst. of Space and Astronautical Science, 3-1-1 Yashinodai, Sagamiharashi 229, Japan
186. Dr. V. L. Jacobs, Plasma Physics Div., Code 4720, Naval Research Lab. , Washington, DC 20375
187. Dr. F. C. Jahoda, CTR Div., LANL, P.O. Box 1663, MS F-639, Los Alamos, NM 87545
188. Dr. R. K. Janev, Nuclear Data Section, IAEA, Wagramerstrasse 5, P.O. Box 100, A-1400 Vienna, Austria
189. Prof. C. Jaschek, Centre de Donnees Stellaires, 11, Rue de L'Universite, 6700 Strasbourg, France
190. Dr. Y. Jinzhan, Chinese Nuclear Data Center A+M, Inst. of Atomic Energy, P.O. Box 275 (41), Biejing, The People's Republic of China
191. Dr. S. Johausson, Dept. of Physics & Spectroscopy, Solvegatau 14, S-22362 Luno, Sweden
192. Dr. B. C. Johnson, Radiation Source & Instrumentation Div., National Inst. of Standards and Technology, Bldg. 245, Gaithersburg, MD 20899
193. Dr. B. M. Johnson, Dept. Appl. Phys., Brookhaven National Lab., Bldg. 901-A, Tandem, Upton, NY 11973
194. Dr. R. R. Johnston, Science Applications, Inc., Suite B-31, 5150 El-Camino Real, Los Altos, CA 94022
195. Dr. E. G. Jones, Systems Research Lab., Inc., 2800 Indian Ripple Rd., Dayton, OH 45440
196. Dr. E. M. Jones, Jet Joint Undertaking, Data Acquisitions Group, Codas Div. J2, Abingdon, Oxfordshire OX14 3EA, England
197. Dr. K. W. Jones, Brookhaven National Lab., DAS - Bldg. 815, Upton, NY 11973
198. Dr. C. Jordan, Dept. Theoretical Physics, Univ. of Oxford, 1 Keble Rd., Oxford OX1 3NP, United Kingdom

199. Dr. E. Kallne, Physics I, Royal Inst. of Technology, S-10044 Stockholm, Sweden
200. Dr. T. Kammash, Dept. of Nuclear Engineering, Univ. of Michigan, Ann Arbor, MI 48104
201. Dr. T. Kato, Research Information Center, Inst. of Plasma Physics, Nagoya Univ., Nagoya 464, Japan
202. Dr. K. Katsonis, Lab. Physique Des Plasmas, Faculte Des Sci. D'Orsay, Batiment 212, F-91400 Orsay, France
203. Dr. H. P. Kelly, Dept. of Physics, Univ. of Virginia, McCormick Rd., Charlottesville, VA 22901
204. Dr. R. A. Kenefick, Dept. of Physics, Texas A&M Univ., College Station, TX 77843
205. Kernforschungszentrum Karlsruhe GMBH, Literaturabteilung, Postfach 3640, D-7500 Karlsruhe, Federal Republic of Germany
206. Dr. H. Kilic, Yale Univ., P.O. Box 2159, New Haven, CT 06520
207. Dr. J. Kim, General Atomic, P.O. Box 85608, San Diego, CA 92138
208. Dr. Y.-K. Kim, Bldg. 221, Rm A-267, National Inst. of Standards and Technology, Gaithersburg, MD 20899
209. Prof. A. E. Kingston, Dept. Appl. Math. & Theor. Phys., The Queen's Univ., Belfast BT7 1NN, Northern Ireland
210. Dr. H. Knudsen, Inst. of Physics, Univ. of Aarhus, DK-8000, Aarhus C, Denmark
211. Prof. E. J. Knystautas, Dept. de Physique, Faculte des Science et de Genie, Pavillon Vachon, Univ. Laval, Quebec, QC, Canada G1K 7P4
212. Dr. K. Kondo, Plasma Physics Lab., Kyoto Univ., Gokashyo Uji, Kyoto, Japan
213. Dr. N. Konjevic, Inst. of Physics, 11001 Beograd, P.O. Box 57, Yugoslavia
214. Dr. L. I. Krupnik, Inst. of Phys. & Techn., The Ukrainian Academy of Science, Kharkov - 310108, U.S.S.R.
215. Dr. W. B. Kunkel, Lawrence Berkeley, Lab., MS 4-230, Univ. of California, Berkeley, CA 94720
216. Dr. H. J. Kunze, Institut Fuer Exp.-Physics, Ruhr-Universitaet, 4630 Bochum, West Germany
217. Dr. R. Kurucz, Smithsonian Astrophys. Obs., Harvard Univ., 60 Garden St., Cambridge, MA 02138
218. Dr. G. Kyrala, MS E526, LANL, P.O. Box 1663, Los Alamos, NM 87545
219. Dr. D. L. Lambert, Dept. of Astronomy, Univ. of Texas, Austin, TX 78712
220. Dr. N. F. Lane, Provost, Rice Univ., P.O. Box 1892, Houston, TX 77251-1892
221. Dr. J. E. Lawler, Dept. of Physics, 1150 University Ave., Univ. of Wisconsin, Madison, WI 53706
222. LLNL, Attn: Magnetic Fusion Energy Library, L-440, P.O. Box 808, Livermore, CA 94550
223. LLNL, Attn: Tech. Infor. Dept., P.O. Box 5500, Livermore, CA 94550
224. Prof. B. Lehnert, The Royal Inst. of Techn., Div. of Plasma Phys. Fusion Res., Stockholm, 70, Sweden
225. Dr. W. N. Lennard, Solid State Science, Chemistry & Materials Div., Atomic Energy of Canada Limited, Nuclear Labs., Chalk River, Ontario, Canada KOJ 1JO
226. Dr. K. Leung, Fusion Engineering, 6291 Boelter Hall, UCLA, Los Angeles, CA 90024
227. Dr. F. Levinton, Princeton Univ., PPPL, P.O. Box 451, Princeton, NJ 08544
228. Dr. S. Li, Inst. of Appl. Phys. & Comp. Math., No. 6 Huayuan Rd., Hai-Dian District, P.O. Box 8009, Beijing, The People's Republic of China
229. Dr. C. C. Lin, Dept. of Physics, Univ. of Wisconsin, Madison, MI 53706
230. Dr. J. L. Linsky, JILA, Campus Box 440, Univ. Colorado, Boulder, CO 80309
231. Dr. U. Litzen, Fysiska Institutionen, Solvegatan, S-22362 Lund, Sweden
232. Dr. A. E. Livingston, Dept. of Physics, Univ. of Notre Dame, Notre Dame, IN 46556

233. Dr. A. Lorenz, Nuclear Data Section, IAEA, Wagramerstrasse 5, P.O. Box 100, A-1400 Vienna, Austria
234. Dr. C. J. Lorenzen, Fried Krupp GmbH, Krupp Forschunginstitut, Postfach 102252, Munchenser Strasse 100, D-4300 Essen 1, West Germany
235. LANL, Attn: Librarian, MS P362, P.O. Box 1663, Los Alamos, NM 87545
236. Ms. H. W. Lovitts, Sci. Information Service, Inc., 7 Woodland Ave., Larchmont, NY 10538
237. S. K. Majumdar, Hot Plasma Project, Saha Inst. Nucl. Phys., Sector I, Block-AF, Bidhan Nagar, Calcutta - 700 091, India
238. Prof. S. L. Mandelstam, Inst. of Spectroscopy, U.S.S.R. Academy of Sciences, 149092, Troitsk, Moscow r-n, U.S.S.R.
239. Dr. J. B. Mann, Theoretical Div., LANL, P.O. Box 1663, MS 212, Los Alamos, NM 87545
240. Dr. S. T. Manson, Dept. of Physics, Georgia State Univ., Atlanta, GA 30303
241. Dr. R. Marchand, Universite du Quebec, Inst. National de la Recherche Scientifique, 1650 Montee Sainte-Julie, Case Postale 1020, Varennes, Quebec J0L 2P0, Canada
242. Dr. Y. Maron, Dept. of Nuclear Physics, K. B. Weissman Inst. of Phys. Sci., The Weizmann Inst. of Sci., Rehovot 76 100, Israel
243. Dr. W. C. Martin, National Inst. of Standards and Technology, Physics A-167, Gaithersburg, MD 20899
244. Dr. J. V. Martinez, Div. of Chemical Sciences, Office of Basic Energy Sci., ER-141 G-337/GTN, U.S. Dept. of Energy, Washington, DC 20545
245. Dr. I. Martinson, Fysiska Institutionen, Lunds Univ., Soelvagatan 14, 223 62 Lund, Sweden
246. Dr. H. E. Mason, Dept. of Applied Mathematics & Theoretical Physics, Univ. of Cambridge, Silver St., Cambridge CB3 9EW, England
247. Dr. M. Mattioli, Association Euratom-CEA Sur La Fusion, Dept. Recherches Sur la Fusion Controlee, Centre d'Etudes Nucl. de Cadarache, 13108 St. Paul lez Durance Cedex, France
248. Max-Planck Inst. fuer Plasmaphysik, Attn: Librarian, 8046 Garching bei Muenchen, West Germany
249. Dr. R. Mayo, Princeton Univ., PPPL, P.O. Box 451, Princeton, NJ 08544
250. Dr. J. W. McConkey, Dept. of Physics, Univ. of Windsor, Windsor, Ontario N9B 3P4, Canada
251. Prof. E. W. McDaniel, School of Physics, Georgia Inst. of Technology, Atlanta, GA 30332
252. Dr. R. McFarland, Dept. of Physics, Univ. of Missouri-Rolla, Rolla, MO 65401
253. Dr. R. T. McGrath, Organization 6514, Sandia National Lab., Albuquerque, NM 87185
254. Dr. E. J. McGuire, 1271 Sandia Natl. Lab., Albuquerque, NM 87185
255. Dr. D. J. McLaughlin, Physics Dept., U-46, Univ. of Connecticut, Storrs, CT 06268
256. Mr. E. A. McLean, Plasma Physics Div., Code 4732, Naval Research Lab., Washington, DC 20375
257. Dr. R.W.P. McWhirter, Rm. 1.61, Bldg. R25, Space and Astrophysics Div., Rutherford Appleton Lab., Chilton, Didcot, Oxfordshire, OX11 OQX, United Kingdom
258. Dr. A. L. Merts, LANL, MS B-212, Los Alamos, NM 87544
259. Dr. G. H. Miley, Univ. of Illinois, 216 Nuclear Engineering Lab., 103 S. Goodwin Ave., Urbana, IL 61801
260. Dr. E. Minquez, J. Gutierrez Abascal 2, 28006 Madrid, Spain
261. Mirror Fusion Experimental Group, LLNL, P.O. Box 808, Livermore, CA 94550
262. Dr. A. Miyahara, Inst. of Plasma Physics, Nagoya Univ., Nagoya 464, Japan
263. Dr. A. A. Mondelli, SAIC, 1710 Goodridge Drive, P.O. Box 1303, McLean, VA 22102
264. Dr. H. W. Moos, Physics Dept., Johns Hopkins Univ., Baltimore, MD 21218

265. Prof. R. Morgenstern, KVI, Univ. Groningen, Zernikelaan 25, 9747 AA Groningen, The Netherlands
266. Dr. K. Mori, 1-508 Shakujii-Koen Danchi, 1-127 Kamishakujii, Nerima-Ku, Tokyo 177, Japan
267. Dr. D. C. Morton, Herzberg Ins. of Astrophysics, National Research Council, 100 Sussex Dr., Ottawa Ontario Canada K1A 0R6
268. Dr. K. Moses, JAYCOR, Plasma Technology Div., 3547 Voyager St., Suite B-104, Torrance, CA 90503-1667
269. Prof. J. R. Mowat, Dept. of Physics, North Carolina State Univ., P.O. Box 8202, Raleigh, NC 27695-8202
270. Dr. A. Muller, Strahlenzentrum, der Justus Liebig-Universitaet, Leihgesterner Weg 217, 6300 Giessen, West Germany
271. Dr. Y. Nakai, Atomic & Molecular Phys. Lab., Japan Atomic Energy Res. Inst., Tokai-mura, Naka-gun, Ibaraki-ken 319-11, Japan
272. Dr. K. Nakamura, Research Inst. Appl. Mechn., Kyushu Univ. 87, Kasugakouen 6-1, Kasuga, Fukuoka, 816, Japan
273. Dr. S. Nakazaki, Dept. of Applied Physics, Faculty of Engineering, Miyazaki Univ., Miyazaki 880, Japan
274. I.M.A. Nasser, Physics Dept., Univ. of Connecticut, Storrs, CT 06268
275. Dr. H. Nguyen, Lab. De Spectroscopie Des Plasmas, Tour 22, Universite Paris Vi, 4 Place Juvieu, 75230 Paris 05, Cedex, France
276. Dr. D. W. Norcross, JILA, Campus Box 440, Univ. of Colorado, Boulder, CO 80309
277. Prof. H. Nussbaumer, Inst. of Astronomy, ETH Zentrum, CH-8092 Zurich, Switzerland
278. Dr. K. W. Ogilvie, Code 692, Goddard Space Flight Center, Greenbelt, MD 20771
279. Ohio State Univ., Attn: Physics Librarian, 174 West 18th Ave., Columbus, OH 43210
280. Dr. T. Ohkawa, General Atomic, P.O. Box 85608, San Diego, CA 92138
281. Dr. K. Ohno, Dept. of Chemistry, Faculty of Science, Hokkaido Univ., Sapporo 060, Japan
282. Dr. S. Ohtani, Inst. of Plasma Physics, Nagoya Univ., Nagoya 464, Japan
283. Dr. R. E. Olson, Dept. of Physics, Univ. of Missouri-Rolla, Rolla, MO 65401
284. Prof. A. Osman, Theoretical Nuclear Physics, Dept. of Physics, Faculty of Science, Cairo Univ., Cairo, Egypt
285. Dr. M. Otsuka, Inst. of Plasma Physics, Nagoya Univ., Nagoya, Japan
286. Dr. E. S. Parilis, Inst. of Electronics, Tashkent, U.S.S.R.
287. Dr. W. H. Parkinson, Center for Astrophysics, MS-50, 60 Garden St., Cambridge, MA 02138
288. Dr. O. S. Pavlichenko, Inst. of Phys. & Techn., The Ukrainian Academy of Sci., Kharkov - 310108, U.S.S.R.
289. Dr. N. J. Peacock, Culham Lab., UKAEA Research Group, Abingdon Oxfordshire OX 14 3DB, England
290. Dr. D. C. Pease, E-601, Delco Systems Operations, 6767 Hollister, Goleta, CA 93117
291. Dr. J. M. Peek, Group T-4, MS B-212, LANL, Los Alamos, NM 97545
292. Perkins Observatory Library, P.O. Box 449, Delaware, OH 43015
293. Dr. R. Petrasso, NW16-112, MIT, Plasma Fusion Center, 167 Albany St., Cambridge, MA 02139
294. Prof. E. Pfender, Dept. of Mechanical Engineering, Univ. of Minnesota, 125 Mechanical Engineering Bldg., Minneapolis, MN 55455
295. Dr. L. G. Phadke, Physics Dept., Northeastern State Univ., Tahlequah, OK 74464
296. Dr. A. V. Phelps, JILA, Univ. of Colorado, Boulder, CO 80309
297. Physical Research Lab., Attn: Librarian, Plasma Physics Programme, Room 563, Navrangpura, Ahmedabad-380 009, India

298. Physics and Applied Maths Library, College Park, The Queen's Univ. of Belfast, Belfast BT 7 1NN, Northern Ireland
299. Physics Astronomy Library, 290 Dennison Bldg., Univ. of Michigan, Ann Arbor, MI 48109-1090
300. Physics Astronomy Library, FM-15, Univ. of Washington, Seattle, WA 98195
301. Physics/Optics/Astron. Attn: Librarian, 374 Bausch & Lomb Building, Univ. of Rochester, Rochester, NY 14627
302. Dr. P. A. Pincosy, LLNL, Mail Code L-35, Bldg. 111, P.O. Box 808, Livermore, CA 94550
303. Dr. M. S. Pindzola, Physics Dept., Auburn Univ., Auburn, AL 36849-3501
304. Dr. E. H. Pinnington, Dept. of Physics, The Univ. of Alberta, Edmonton, Canada T6G 2J1
305. Dr. F. M. Pipkin, Dept. of Physics, Harvard Univ., Cambridge, MA 02138
306. Plasma Fusion Center Library, Massachusetts Inst. of Technology, NW16-153, Cambridge, MA 02139
307. Dr. D. E. Post, Jr., PPPL, P.O. Box 451, Princeton, NJ 08544
308. Dr. R. S. Post, Massachusetts Inst. of Techn., Plasma Fusion Center, 190 Albany St., Cambridge, MA 02139
309. Dr. L. P. Presnyakov, P. N. Lebedev Physical Inst., U.S.S.R. Academy of Science, Leninsky Prospect 53, 117924 Moscow, U.S.S.R.
310. Dr. F. Prevot, Centre D'Etudes Nucleaires, De Fontenay-Aux-Roses, DRFC, B. P. No 6, 92260 Fontenay-Aux-Roses, France
311. Princeton Univ., Attn: C-Site Library, PPPL, P.O. Box 451, Princeton, NJ 08544
312. Dr. G. Proulx, Pulse Sciences, Inc., 600 McCormick St., San Leandro, CA 94577-1110
313. Dr. N. Qi, Lab. of Plasma Studies, Cornell Univ., Ithaca, NY 14853
314. Dr. B. H. Quon, Applied Microwave Plasma Concepts, Inc., 2075-N Corte del Nogal, Carlsbad, CA 92009
315. Dr. J. Reader, Physics Bldg. A-167 SPC, National Inst. of Standards and Technology, Gaithersburg, MD 20899
316. Dr. D. Register, Phillips Petroleum Co., MS-118-Al, PRC, Bartlesville, OK 74004
317. Dr. D. J. Rej, LANL, Ctr. 3, MS 638, P.O. Box 1663, Los Alamos, NM 87545
318. Dr. J. R. Roberts, A-167, Physics Building, National Inst. of Standards and Technology, Gaithersburg, MD 20899
319. Dr. H. Rohr, Max-Planck Inst. fuer Plasmaphysik, Boltzmann Str. 3, D-8046 Garching bei Muenchen, West Germany
320. Dr. T. Romesser, Defense and Space Systems Group of TRW Inc., R1-2104, One Space Park, Redondo Beach, CA 90278
321. Dr. W. L. Rowan, Fusion Research Center, Univ. of Texas, Austin, TX 78712
322. Prof. Z. Rudzikas, Inst. of Physics, K. Pozelos 54, 232600, Vilnius, Lithuanian SSR, U.S.S.R.
323. Dr. J. R. Rumble, Physics Building A323, National Inst. of Standards and Technology, Washington, DC 20234
324. Rutherford Appleton Lab., Attn: Librarian, Chilton, Didcot, Oxfordshire OX11 0QX, England
325. Prof. D. Ruzic, Univ. of Illinois, 214 Nuclear Engineering Lab., 103 S. Goodwin Ave., Urbana, IL 61801
326. Dr. U. I. Safronova, Inst. of Spectroscopy, USSR Academy of Sciences, Troitzk, Moscow Region, 142092, U.S.S.R.
327. Dr. J. Sahade, Instituto Argentino de Radioastronomia, Casilla de Correo No. 5, 1894 Villa Elisa (Bs. As), Argentina
328. Prof. E. Salzborn, Strahlenzentrum, Der Justus LiebigUniversitaet, Leihgesterner Weg 217, D-6300 Giessen, West Germany

329. Dr. D. H. Sampson, Dept. of Astronomy, The Pennsylvania State Univ., 525 Davey Lab., Univ. Park, PA 16802
330. Dr. J.A.R. Samson, Dept. of Physics, Univ. of Nebraska, Lincoln, NB 68588-0111
331. Dr. A. Sanchez, Calle Angostura Quinta-Carmen, Urbanizacion El Marquez, Caracas 1070, Venezuela 348380
332. Dr. F. C. Sanders, Dept. of Physics & Astronomy, Southern Illinois Univ., Carbondale, IL 62901
333. Dr. G. Schilling, PPPL, Princeton Univ., P.O. Box 451, Princeton, NJ 08540
334. Dr. J. J. Schmidt, Nuclear Data Section, IAEA, Wagramerstrasse 5, P.O. Box 100, A-1400 Vienna, Austria
335. Prof. H. A. Schuessler, Dept. of Physics, Texas A&M Univ., College Station, TX 77843
336. Dr. J. Scofield, L-297, LLNL, Livermore, CA 94550
337. Dr. M. J. Seaton, Dept. of Physics, Univ. College London, Gower St., London WC1E 6BT, England
338. Dr. J. F. Seely, Code 4174, Space Science Div., Naval Research Lab., Washington, DC 20375
339. Dr. M. Seidl, Stevens Inst. Techn., Dept. of Physics, Hoboken, NJ 07030
340. Dr. V. S. Senashenko, Inst. of Nuclear Physics, M. V. Lomonosov Moscow State Univ., Moscow 119899, U.S.S.R.
341. Dr. A. S. Sharma, Inst. for Plasma Research, BHAT, Gandhinagar 382 424, India
342. Dr. V. B. Sheorey, 461 Physical Research Lab., Navrangpura, Ahmedabad-380-009, India
343. Dr. J. Sherman, AT-2, MS 818, LANL, Los Alamos, NM 87545
344. Dr. I. Shimamura, Riken, Hirosawa, Wako-Shi, Saitama 351-01, Japan
345. Dr. T. Shirai, Japan Atomic Energy Research Inst., Tokai-Mura, Naka-Gun, Ibaraki-Ken, Japan
346. Prof. H. A. Shugart, Dept. of Physics, Univ. of California, Berkeley, CA 94720
347. Dr. J. S. Sims, Mont Alto Campus, The Pennsylvania State Univ., Mont Alto, PA 17237
348. Mrs. B. W. Sitterly, 3711 Brandywine St., Washington, DC 20016
349. Dr. G. W. Sjolander, Martin Marietta Denver Aerospace, P.O. Box 179, MS M-0487, Denver, CO 80201
350. Dr. C. H. Skinner, PPPL, Princeton Univ., James Forrestal Campus, P.O. Box 451, Princeton, NJ 08543
351. Prof. B. M. Smirnov, Inst. of Thermophysics, Siberian Branch of the USSR Academy of Sciences, PR. AC. Lavrentyeva, 1, 630090 Novosibirski - 90, U.S.S.R.
352. Prof. F. J. Smith, Dept. of Computer Science, The Queen's Univ., Belfast BT7 1NN, Northern Ireland
353. Dr. J. N. Smith, Mail Stop L-520, General Atomic, P.O. Box 85608, San Diego, CA 92138
354. Dr. P. L. Smith, Center for Astrophysics, 60 Garden St., Cambridge, MA 02138
355. Dr. V.M.F. Soares, Intl. Bookseller and Antiquary, Rua Gil Vicente, 32-A, 3000 Coimbra, Portugal
356. Prof. B. Sonntag, II Inst. of Exper. Pphysik, Universitat Hamburg, Luruper Chaussee 149, 2000 Hamburg 50, West Germany
357. Prof. J. C. Sprott, Plasma Physics, Univ. of Wisconsin, 1150 Univ. Ave., Madison, WI 53706
358. Dr. S. K. Srivastava, Jet Propulsion Lab., MS 183-601, California Inst. of Technology, 4800 Oak Grove Dr., Pasadena, CA 91109
359. Dr. K. R. Stalder, SRI International, PS-109, 333 Revenswood Ave., Menlo Park, CA 94025
360. Prof. B. L. Stansfield, Universite du Quebec, Institut National de la Recherche Scientifique, 1650 Montee Sainte-Julie, Case Postale 1020, Varennes, Quebec, J0L 2P0 Canada

361. Dr. P. M. Stone, ER-1, 7B-054/FORS, Office of Energy Research, U.S. Dept. of Energy, Washington, DC 20585
362. Dr. S. Suckewer, PPPL, Princeton Univ., James Forrestal Campus, P.O. Box 451, Princeton, NJ 08544
363. Dr. H. P. Summers, Jet Joint Undertaking, Abingdon, Oxon, OX14 3EA, England
364. Dr. Y. Sun, Inst. of Appl. Phys. & Comp. Math., No. 6 Huayuan Rd., Hai-Dian District, P.O. Box 8009, Beijing, The People's Republic of China
365. Dr. H. Suzuki, Dept. of Physics, Faculty of Science & Technology, Sophia Univ., Chiyoda-Ku, Kioicho 7, Tokyo 102, Japan
366. Prof. K. Takayanagi, Inst. of Space & Astron. Sci., Komaba 4-6-1, Meguro-Ku, Tokyo 153, Japan
367. John Tanis, Western Michigan Univ., Dept. of Physics, Kalamazoo, MI 49008
368. Prof. H. Tawara, Research Information Center, Inst. of Plasma Physics, Nagoya Univ., Nagoya 464, Japan
369. Technical Information Center, Stone & Webster Engineering Corp., 3 Executive Campus, P.O. Box 5200, Cherry Hill, NJ 08034
370. Technical Library, Attn: Librarian, Sandia National Lab., P.O. Box 5800, Albuquerque, NM 87185-5800
371. Dr. A. Temkin, Atomic Physics Office, Code 680.1, Goddard Space Flight Center, Greenbelt, MD 20771
372. Dr. V. I. Tereshin, Inst. of Phys. & Techn., The Ukrainian Academy of Sci., Kharkov - 310108, U.S.S.R.
373. Dr. J. L. Terry, Plasma Fusion Center, NW16-282, 167 Albany St., Cambridge, MA 02139
374. Dr. D. M. Thomas, MS L-530, General Atomic, P.O. Box 85608, San Diego, CA 92138-5608
375. Dr. E. W. Thomas, School of Physics, Georgia Inst. of Technology, Atlanta, GA 30332
376. Dr. D. B. Thomson, CTR-DO, MS F-648, LANL, P.O. Box 1663, Los Alamos, NM 87545
377. Dr. A. P. Thorne, Blackett Lab., Imperial College, Prince Consort Rd., London SW7 2B2, England
378. Prof. G. Tondello, Univ. di Padova, Inst. de Elettrotecnica e di Elettronica, 35131 Pakova, Italy
379. Dr. G. P. Tozzi, Arcetri Astrophysical Observatory, Largo E. Fermi 5, I-50125 Firenze, Italy
380. U.K.A.E.A. Culham Lab., Library Reading Room, Abingdon, Oxfordshire OX14 3DB, United Kingdom
381. Universitaetsbibliothek and Techn., Informationsbibliothek, Welfengarten 1, 3 Hanover, West Germany
382. Univ. of Oxford, Attn: Librarian, Dept. of Astrophysics, South Parks Rd., Oxford OX1 3RQ, England
383. Dr. E. Veje, Physics Lab. II, Univ. of Copenhagen, H. C. Orsted Inst., Universitetsparken 5, DK 2100 Copenhagen, Denmark
384. Dr. H. Verbeek, Max-Planck-Inst. fuer Plasmaphys., 8046 Garching bei Munchen, West Germany
385. Dr. V. A. Vershkov, Inst. Atommoi Energii, I. V. Kurchatova, 46 Ulitsa Kurchatova, Moscow D-182, U.S.S.R.
386. Prof. G. C. Vlases, Aerospace and Energetics, Research Program, FL-10, Univ. of Washington, Seattle, WA 98195
387. Dr. V. S. Voitsenya, Inst. of Phys. & Techn., Ukrainian Academy of Sci., Kharkov 310108, U.S.S.R.
388. Dr. S. E. Von Goeler, PPPL, Princeton Univ., P.O. Box 451, Princeton, NJ 08544

389. Dr. F. Waelbroeck, Institut Fuer Plasmaphysik, Kernforschungsanlage, 517 Juelich, Federal Republic of Germany
390. Dr. J. S. Wang, Univ. of Maryland, Energy Research Bldg., College Park, MD 20740
391. Dr. P. Weber, Group CTR 2, MS F-648, LANL, Los Alamos, NM 08545
392-431. Dr. W. L. Wiese, National Inst. of Standards and Technology, Atomic & Plasma Radiation Div., Gaithersburg, MD 20899
432. Prof. K. Wiesemann, Ruehr-Universitaet, Inst. Exp. Phys. Agii, Postfach 102148, D-4630 Bochum 1, West Germany
433. Dr. J. F. Williams, Dept. of Physics, The Univ. of Western Australia, Nedlands Perth. 6009, Western Australia
434. Dr. B. G. Wilson, L-296, LLNL, P.O. Box 808, Livermore, CA 94550
435. Prof. H. Winter, Institut fuer Allgemeine Physik, Technische Universitaet Wien, Karlsplatz 13/134, A-1040 Wien, Austria
436. John G. Wolbach Library, Attn: Librarian, Harvard College Observatory, 60 Garden St., Cambridge, MA 02138
437. Dr. J. F. Wyart, Lab. Aime Cotton, C.N.R.S. II - Bat. 505, Campus D'Orsay, F-91405 Orsay Cedex, France
438. Dr. Z. Xu, Shanghai Inst. of Optics and Fine Mechanics, P.O. Box 8211, Shanghai, The People's Republic of China
439. Prof. F. Yang, Inst. of Modern Physics, Fudan Univ., Shanghai, The People's Republic of China
440. Dr. T. T. Yang, Rocket Dyne Div., MS FA-38, Rockwell International Corp., 6633 Canoga Park, Canoga, CA 91303
441. Dr. M. Yaseen, Pure Appl. Phys., Univ. Strathclyde, John Anderson Bldg., 107 Rottenrow, Glasgow G4 ONG., Scotland, U.K.
442. Dr. C. E. Young, CHM 200, Argonne National Lab., 9700 South Cass Ave., Argonne, IL 60439
443-469. Technical Information Center, Office of Information Services, P.O. Box 62, Oak Ridge, TN 37831
470-500. Controlled Fusion Atomic Data Center, Bldg. 6003, ORNL

☆U.S. GOVERNMENT PRINTING OFFICE 1989–648-119/00058