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FOREWORD

The **International Bulletin on Atomic and Molecular Data for Fusion** ("the Bulletin") is prepared by the Atomic and Molecular (A+M) Data Unit of the **International Atomic Energy Agency** (IAEA) and published and distributed free of charge by the IAEA to assist in the development of fusion research and technology. Each issue of the Bulletin contains additions to AMBDAS since the previous issue.

The Bulletin and AMBDAS provide an indexed guide to papers that contain data for atomic structure, spectral lines and intensities (or transition probabilities), atomic and molecular collisions and particle–surface interactions.

The references and indices included in the Bulletin have been provided by atomic data centres of Data Centre network (DCN), collaborators and IAEA interns:

- National Institute of Standards and Technology (NIST), Gaithersburg, USA;
- Korea Atomic Energy Research Institute, Daejeon, Republic of Korea;
- National Fusion Research Institute, Gunsan, Republic of Korea;
- National Institute of Fusion Science, Toki, Japan;
- Max Planck Institute of Plasma Physics, Garching, Germany;
- University of Helsinki, Helsinki, Finland.

The present edition of the Bulletin contains data mainly on atomic structure, spectra and transition probabilities published in the years 2013–2014, electron collisions and surface interaction that appeared in the years 2009–2014. Data for heavy particle and photon collisions will be considered for the next Bulletin.

Information in this Bulletin is presented in four chapters. The Atomic and Molecular Data Information System (AMDIS) of the International Atomic Energy Agency is briefly presented in Chapter 1.

The indexed papers are listed separately for structure and spectra, atomic and molecular collisions, and surface interactions in Chapter 2. The structure and spectra index lines are grouped by process. The first column gives the reactants, the second one the process and then the character of the data contained (Th for theoretical, Ex for experimental, and E/T for both experimental and theoretical). The number in the last column is the reference number in Chapter 3 of the Bulletin.

The atomic and molecular index lines are grouped by one collision partner (photon, electron or heavy particle). The first column gives the reactants, the second column gives the process, the third column gives the energy range with the appropriate units, and the last two columns are the same as in the structure and spectra index lines. The particle–surface interactions index lines are grouped by process. The first column gives the reactants, the second the energy range with the appropriate units, and the last two columns are the same as in the structure and spectra index lines.

Chapter 3 contains the bibliographic data for both the indexed and non-indexed references. Under each entry in Chapter 3 index lines (if any) refer back to the classified entries in Chapter 2.

Chapter 4 contains the Author Index with references to bibliographic entries contained in Chapter 3.

Contributions are solicited on data generation work in progress and on new data in the course of publication. Contributions should include an explanation of their applicability to fusion research and should be sent to:

Atomic and Molecular Data Unit
Nuclear Data Section, NAPC Division
International Atomic Energy Agency
Vienna International Centre
P.O. Box 100
A-1400 Vienna, Austria

e-mail: H.Chung@iaea.org
Web: **https://www-amdis.iaea.org/**

All data published in the Bulletin are included in AMBDAS, the IAEA Atomic and Molecular Data Unit bibliographic database. AMBDAS is freely available on-line at

https://www-amdis.iaea.org/AMBDAS/

DISCLAIMER

NEWS ON THE ATOMIC AND MOLECULAR DATA UNIT

Coordinated Reasearch Projects (CRP) are the main tool by which the Atomic and Molecular Data Unit collects and evaluates data for the establishment of recommended numerical databases for use in fusion energy research. A CRP is a three to five-year joint project involving approximately 7 to 12 laboratories, research teams or institutes performing coordinated research to achieve a well defined goal (establishment of a particular database, data generation, compilation and assessment for specific types of atomic and molecular (A+M) collision processes, particle surface interaction (PSI) or classes of such processes, etc.).

In the years of 2013–2016, two CRPs have concluded and two CRPs have started. The final reports of completed CRPs on Light Element Atom, Molecule and Radical Behaviour in the Divertor and Edge Plasma Regions and on Spectroscopic and Collisional Data for Tungsten from 1 eV to 20 keV are published in Journal of Physics: Conference Series, Vol 576 (2015) and Atoms, Vol 3 (2015). The CRP on Atomic and Molecular Data for State-Resolved Modelling of Hydrogen and Helium and Their Isotopes in Fusion Plasma held its second RCM in July 2013 and the final RCM in March 2016. The CRP on Data for Erosion and Tritium Retention in Beryllium Plasma-Facing Materials held the second RCM in August 2014. The new CRP on Plasma-Wall Interaction with Irradiated Tungsten and Tungsten Alloys in Fusion Devices held the first and second RCMs in November 2013 and September 2015 and the new CRP on Plasma-wall Interaction with Reduced-activation Steel Surfaces in Fusion Devices held the first RCM on December 2015. More information about the CRPs is available on the A+M Data Unit web site.

https://www-amdis.iaea.org/CRP/

The 22nd and 23rd meetings of the Data Centre Network on Technical Aspects of Atomic and Molecular Data Processing and Exchange were held on 4–6 September 2013 and 2–4 November 2015. Currently the Data Centre Network (DCN) includes about 10 national data centres for collection, critical assessment (evaluation) and partly for generation of A+M, PSI and bulk material properties data for fusion and other applications. More information on the DCN activities is available on the A+M Data Unit web site.

https://www-amdis.iaea.org/DCN/

Upon recommendations of the Data Centre Network, the A+M Data Unit organized a series of meetings to address the needs of critical assessment of atomic, molecular and particle-surface interaction data. The 3rd TM of the Code Centre Network (CCN) on General Guidelines for Uncertainty Assessments was held in May 2013 in order to discuss the uncertainty quantification (UQ) of theoretical A+M data. The CM on Evaluation of Data for Collisions of Electrons with Nitrogen Molecule and Nitrogen Molecular Ionwas held in December 2013 in cooperation with the eMOL project to provide evaluated data for electron-molecule collisions. Following the recommendation from the 3rd TM of CCN, a TM on Uncertainty Assessment for Theoretical Atomic Molecular Scattering Data was held in Cambridge, MA, USA at the Harvard-Smithsonian Center for Astrophysics in collaboration with the Institute of Theoretical Atomic, Molecular and Optical Physics (ITAMP), where more than 20 participants discussed the UQ issues of theoretical A+M data. In 2015, three CMs were held on the data evaluation topics: CM on Guidelines for Uncertainty Quantification of Theoretical Atomic and Molecular Datain June 2015, CM on Evaluation & Uncertainty Assessment for Be, C, Nein July 2015 and a joint IAEA-KAERI CM on Recommended Data for Processes of Tungsten, September 2015. More information on the data evaluation activities is available on the A+M Data Unit web site.

https://www-amdis.iaea.org/DCN/Evaluation/

The A+M Data Unit organized two joint ICTP-IAEA workshops: Joint ICTP-IAEA Conference on Models and Data for Plasma-Material Interaction in Fusion Devices, Trieste, Italy, 03-07 November 2014 and Joint ICTP-IAEA Advanced School and Workshop on Modern Methods in Plasma Spectroscopy, Trieste, Italy, 16-27 March 2015. Additional information may be found on the A+M Data Unit web site.

https://www-amdis.iaea.org/Workshops/ICTP2012/

The A+M Data Unit cooperated to host the second and third Spectral Line Shapes in Plasmas (SLSP) Code Comparison Workshop on 5-9 August 2013 and 2-6 March 2015.

The A+M Data Unit now provides access to two widely used atomic physics codes, the Flexible Atomic Code and GRASP2K codes.

https://www-amdis.iaea.org/FAC and https://www-amdis.iaea.org/GRASP2K

CONTENTS

Chapter 1

The Atomic and Molecular Data Information System

AMDIS is the **A**tomic and **M**olecular **D**ata **I**nformation **S**ystem of the International Atomic Energy Agency, established and maintained by the Atomic and Molecular Data Unit, Nuclear Data Section. AMDIS contains two main databases: AMBDAS, a bibliographic database for atomic and molecular data for fusion research and ALADDIN, a numerical database of recommended and evaluated atomic, molecular and plasma-surface interaction data.

AMBDAS, **A**tomic and **M**olecular **B**ibliographic **D**ata **S**ystem, is an on-line bibliographic database **https://www-amdis.iaea.org/AMBDAS** that contains more than 47,000 bibliographic entries with atomic, molecular and plasma-surface interaction data of interest to fusion research, and dating back to 1918. Entries may be retrieved by author, process, reactants, type of reference, year of publication and data source (theoretical or experimental). The interface is a web-based application, easy to use with no required registration. AMBDAS data are regularly published in the International Bulletin on Atomic and Molecular Data for Fusion.

ALADDIN is the online numerical database of the Atomic and Molecular Data Unit of the IAEA **https://www-amdis.iaea.org/ALADDIN**, providing atomic, molecular and plasma-material interaction data of interest to fusion research. ALADDIN provides two similar interfaces, one for collisional data and one for particle surface interactions. An ALADDIN entry consists of searchable labels that characterize the process and reactants; the source of the data, date, laboratory or data centre, and reference; comment lines and the numerical data. When possible all requested data are displayed in the same units to permit easy comparison. A unit conversion tool is available and all results can be displayed in tabular and graphical mode.

In addition to AMBDAS and ALADDIN databases, AMDIS distributes atomic physics codes and code generated data, provides an access to online codes and database search engine and hosts meeting pages and presentations which contain most recent datasets.

Chapter 2
Process Index

2.1 Structure and Spectra

H	Th	269
H^{-}	Th	269
He	Th	7
He-Fe	Th	78
He^{0+--+}	Exp	144
He^{0+--+}	Exp	145
He	Th	315
He	Th	340
He	Th	466
Li	Th	7
Li^{+}	Th	7
Li^{0+--+}	Exp	17
Li	E/T	24
Li	E/T	26
Li	Th	32
Li	Th	34
Li	E/T	51
Li	Th	62
Li	Th	79
Li	Th	88
Li	E/T	89
Li	Exp	95
Li	Th	96
Li	Exp	123
Li	Th	192
Li	Th	200
Li	Th	210
Li^{+}	Th	233
Li	Th	234
Li	Th	269
Li^{-}	Th	269
Li	Th	315
Li	Exp	322
Li	Th	340
Li	Th	349
Li^{0+--+}	Th	350
Li^{+}	Th	352
Li^{-}	Th	374
Li^{0+--+}	Th	389
Li^{+}	Th	389
Li	Th	390
Li	Th	391
Li	Th	435
Li	Th	466
Be	Th	6
Be^{0+--2+}	Th	7
Be^{+}	Th	79
Be^{+}	Th	97
Be	Th	122
Be^{+}	Th	163
Be	Th	183
Be^{+}	Th	191
Be	Th	200
Be	Th	239
Be	Th	264
Be^{+}	Th	287
Be	Exp	293
Be^{+}	Th	316
Be^{+}	Th	340

$\mathbf{Be}^{2+}$	Th	352
$\mathbf{Be}^{+}$	Th	359
Be	Th	374
Be	E/T	382
Be	Th	390
$\mathbf{Be}^{+}$	Th	484
$\mathbf{B}^{0+--3+}$	Th	7
B	Th	57
$\mathbf{B}^{-}$	Th	81
B	E/T	261
$\mathbf{B}^{+}$	Exp	337
B	Th	390
B	Th	422
$\mathbf{B}^{+}$	Th	479
$\mathbf{C}^{0+--4+}$	Th	7
$\mathbf{C}^{+}$	Th	43
$\mathbf{C}^{+}$	Th	57
$\mathbf{C}^{+--3+}$	Exp	144
$\mathbf{C}^{+--3+}$	Exp	145
$\mathbf{C}^{+}$	Th	165
$\mathbf{C}^{3+}$	Th	186
$\mathbf{C}^{4+}$	Th	209
$\mathbf{C}^{4+}$	Th	282
$\mathbf{C}^{3+}$	Th	287
$\mathbf{C}^{5+}$	Exp	320
$\mathbf{C}^{+--2+}$	Exp	321
$\mathbf{C}^{4+--5+}$	Exp	363
$\mathbf{C}^{2+}$	Th	374
$\mathbf{C}^{5+}$	Th	455
$\mathbf{C}^{2+}$	Th	486
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N	E/T	51
$\mathbf{N}^{3+--4+}$	E/T	108
$\mathbf{N}^{0+--+}$	Exp	142
$\mathbf{N}^{+--3+}$	Exp	144
$\mathbf{N}^{0+--2+}$	Exp	145
$\mathbf{N}^{4+}$	Th	186
$\mathbf{N}^{4+}$	Exp	235
$\mathbf{N}^{4+}$	Exp	297
N	Th	307
$\mathbf{N}^{-}$	Th	307
$\mathbf{N}^{+--2+}$	Exp	321
$\mathbf{N}^{2+}$	Exp	344
$\mathbf{N}^{5+--6+}$	Exp	387
$\mathbf{N}^{+}$	Th	440
N	Th	452
$\mathbf{O}^{0+--6+}$	Th	7
O	Exp	9
O	Th	53
$\mathbf{O}^{3+}$	E/T	102
$\mathbf{O}^{0+--3+}$	Exp	144
$\mathbf{O}^{0+--4+}$	Exp	145
$\mathbf{O}^{5+}$	Th	186
$\mathbf{O}^{3+}$	Th	194
$\mathbf{O}^{6+}$	Th	209
$\mathbf{O}^{3+--4+}$	Exp	235
$\mathbf{O}^{3+--6+}$	Exp	235
$\mathbf{O}^{3+--7+}$	Exp	248
$\mathbf{O}^{4+--6+}$	Exp	253

O^{5+}	Th	287
O^{+--3+}	Exp	321
O^{7+}	Exp	355
O^{6+--7+}	Exp	387
O^{6+--7+}	Exp	388
O	Th	390
O	Th	411
O^{2+}	Th	411
O^{3+}	Th	464
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F^{0+--7+}	Th	7
F	Th	67
F	Th	111
F^{3+}	Exp	145
F^{4+}	Exp	235
F^{4+--8+}	Exp	235
F^{6+}	Th	238
F^{4+--7+}	Exp	248
F^{5+--6+}	Exp	253
F	Th	309
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F	Th	454
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Ne	Th	37
Ne^{5+}	E/T	102
Ne^{7+}	Th	113
Ne^{+--4+}	Exp	144
Ne^{2+--4+}	Exp	145
Ne^{5+}	Th	194
Ne^{8+}	Th	209
Ne^{3+}	Exp	235
Ne^{3+--8+}	Exp	235
Ne^{5+--8+}	Exp	248
Ne^{4+--6+}	Exp	253
Ne^{0+--+}	Exp	254
Ne^{7+}	Th	287
Ne	Th	288
Ne^{8+}	Th	315
Ne^{7+}	Th	315
Ne	Exp	329
Ne^{6+}	Th	374
Ne	Exp	386
Ne	Th	390
Ne	Exp	413
Ne^{3+}	Th	431
Ne^{6+}	Th	486
Ne	Exp	488
Na	E/T	51
Na^{3+}	Exp	144
Na	Th	192
Na	E/T	247
Na	Th	269
Na^{-}	Th	269
Na	Exp	322
Na	Th	340
Na^{0+--+}	Th	350
Mg	Exp	12
Mg^{7+}	E/T	102

Mg^{0+--+}	Exp	144
Mg	Exp	145
Mg	Th	152
Mg^{2+}	Th	154
Mg^{+}	Th	163
Mg	Th	183
Mg^{2+}	Th	184
Mg^{7+}	Th	194
Mg^{10+}	Th	209
Mg^{+}	E/T	247
Mg	E/T	247
Mg	Th	288
Mg^{2+}	Th	291
Mg	Th	318
Mg^{2+}	Th	327
Mg^{+}	Th	340
Mg^{9+}	Exp	370
Mg$^{9+--11+}$	Exp	370
Mg	Th	392
Mg^{2+}	Th	448
Mg^{2+}	Th	463
Al^{11+}	Th	99
Al	Exp	133
Al^{11+}	Th	193
Al^{2+}	E/T	247
Al^{+}	E/T	247
Al^{4+}	Th	265
Al$^{11+--12+}$	Th	282
Al^{9+}	Th	285
Al^{3+}	Th	327
Al^{3+}	Th	463
Si^{12+}	E/T	33
Si^{11+}	E/T	41
Si^{3+}	Th	56
Si^{11+}	Th	59
Si	Exp	61
Si^{9+}	E/T	102
Si^{+}	Exp	144
Si^{+--2+}	Exp	145
Si^{11+}	Th	175
Si^{4+}	Th	184
Si^{9+}	Th	194
Si^{12+}	Th	209
Si^{6+}	Th	237
Si^{8+}	Th	241
Si^{+}	E/T	247
Si^{3+}	E/T	247
Si^{4+--6+}	Exp	253
Si^{11+}	Th	268
Si^{11+}	Th	287
Si	Th	310
^{29}**Si**$^{-}$	Th	310
Si^{-}	Th	310
Si^{9+}	Th	358
Si^{11+}	Th	364
Si^{13+}	Exp	377
Si^{6+}	Th	400
Si^{8+}	Th	403
Si^{9+}	Th	481

P^{4+}	Th	56
P + Fe^{16+}	Th	492
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S^{5+}	Th	56
S$^{12+--14+}$	Exp	76
S^{+--2+}	Exp	144
S^{0+--2+}	Exp	145
S^{6+}	Th	184
S	Th	199
S^{14+}	Th	209
S^{7+}	Exp	235
S$^{9+--11+}$	Exp	235
S$^{7+--14+}$	Exp	235
S$^{7+--11+}$	Exp	248
S$^{14+--15+}$	Exp	292
S^{14+}	E/T	353
S$^{10+--13+}$	Exp	387
S^{12+}	E/T	449
S^{12+}	E/T	480
Cl^{15+}	E/T	33
Cl^{6+}	Th	56
Cl	E/T	58
Cl^{0+--+}	E/T	58
Cl^{13+}	Exp	76
Cl^{14+}	Exp	76
Cl	Th	112
Cl^{-}	Th	112
Cl^{2+--3+}	Exp	145
Cl	Th	169
Cl$^{7+--15+}$	Th	267
Cl^{13+}	Th	300
Cl^{3+}	Th	384
Cl$^{7+--15+}$	Th	424
Cl^{13+}	Th	446
Cl^{3+}	Th	490
Ar$^{14+--16+}$	Exp	8
Ar^{16+}	E/T	39
Ar^{2+}	Exp	40
Ar^{7+}	Th	56
Ar^{15+}	Th	59
Ar^{+}	Exp	75
Ar$^{14+--16+}$	Exp	76
Ar	Th	92
Ar^{13+}	Th	98
Ar^{9+}	Th	109
Ar$^{14+--16+}$	E/T	114
Ar	Exp	117
Ar^{16+}	Exp	125
Ar^{0+--+}	Exp	135
Ar^{2+--4+}	Exp	143
Ar^{2+--4+}	Exp	144
Ar^{2+--4+}	Exp	145
Ar^{15+}	Th	175
Ar^{8+}	Th	184
Ar^{8+}	Th	197
Ar$^{14+--16+}$	Th	201
Ar^{16+}	Th	201
Ar^{5+}	Th	212
Ar^{8+}	E/T	227

Ar$^{11+--12+}$	Exp	235
Ar$^{11+--16+}$	Exp	235
Ar$^{10+--13+}$	Exp	248
Ar$^{14+--16+}$	Exp	281
Ar$^{16+--17+}$	Th	282
Ar^{15+}	Th	287
Ar	Th	288
Ar$^{16+--17+}$	Exp	292
Ar^{16+}	Exp	303
Ar^{+}	Th	306
Ar	Th	314
Ar^{+}	Th	324
Ar^{14+}	Th	328
Ar^{16+}	Exp	342
Ar^{16+}	Exp	360
Ar^{13+}	Th	366
Ar$^{16+--17+}$	Exp	371
Ar^{13+}	Exp	372
Ar^{14+}	Th	374
Ar^{5+}	E/T	381
Ar^{+}	Exp	409
Ar	Exp	413
Ar^{14+}	Th	465
Ar^{+}	Exp	468
K	E/T	51
K^{8+}	Th	56
K^{3+--5+}	Exp	143
K^{3+}	Exp	144
K^{3+--5+}	Exp	145
K	Th	192
K	Th	269
K^{-}	Th	269
K^{15+}	Th	300
K	Exp	322
K	Th	340
K^{0+--+}	Th	350
K^{15+}	Th	446
Ca	Exp	12
Ca^{9+}	Th	56
Ca^{17+}	Th	59
Ca^{4+--6+}	Exp	143
Ca^{+}	Exp	144
Ca^{4+--5+}	Exp	144
Ca^{4+}	Exp	145
Ca^{6+}	Exp	145
Ca	Th	152
Ca^{17+}	Th	159
Ca^{+}	Th	163
Ca^{17+}	Th	175
Ca	Th	183
Ca^{10+}	Th	184
Ca^{+}	E/T	247
Ca$^{9+--17+}$	Exp	253
Ca$^{12+--13+}$	Exp	253
Ca^{17+}	Th	268
Ca	Th	288
Ca	Th	318
Ca^{17+}	Th	335
Ca^{+}	Th	340

Ca$^{16+\text{–}19+}$	Exp	342
Ca^{17+}	Th	470
Sc^{10+}	Th	56
Sc^{+}	Exp	144
Sc^{15+}	E/T	258
Ti^{20+}	Exp	38
Ti^{11+}	Th	56
Ti^{19+}	Th	59
Ti^{9+}	E/T	72
Ti^{5+}	Th	73
Ti^{+}	Th	86
Ti	Exp	110
Ti^{2+}	Th	140
Ti^{2+}	Th	141
Ti^{+}	Exp	144
Ti	Exp	158
Ti^{19+}	Th	175
Ti^{9+}	Th	178
Ti^{5+}	Th	179
Ti^{12+}	Th	184
Ti^{13+}	Th	245
Ti^{+}	E/T	247
Ti^{+}	Th	256
Ti^{19+}	Th	287
Ti^{20+}	Exp	303
Ti^{18+}	Th	323
Ti^{19+}	Exp	334
Ti^{20+}	Exp	334
Ti^{19+}	Th	335
Ti^{20+}	Exp	351
Ti^{21+}	Exp	351
Ti^{+}	Th	419
Ti^{12+}	E/T	434
Ti^{18+}	E/T	449
Ti^{19+}	Th	470
Ti^{18+}	E/T	480
Ti^{+}	Exp	483
V^{+}	Exp	18
V^{+}	Exp	19
V	E/T	51
V^{12+}	Th	56
V^{11+}	Th	74
V	Exp	110
V^{3+}	Th	140
V^{3+}	Th	141
V$^{+\text{–}3+}$	Exp	144
V^{+}	Th	155
V^{11+}	Th	180
V^{14+}	Th	245
V	Exp	249
V^{17+}	E/T	258
V	E/T	415
Cr	Exp	15
Cr$^{0+\text{–}+}$	Exp	129
Cr^{+}	Th	140
Cr$^{3+\text{–}4+}$	Exp	143
Cr$^{+\text{–}4+}$	Exp	144
Cr^{14+}	Th	184
Cr^{15+}	Th	245

$\mathbf{Cr}^{+}$	E/T	247
$\mathbf{Cr}^{+}$	Exp	250
$\mathbf{Cr}^{11+}$	Th	319
$\mathbf{Cr}^{11+}$	Th	460
$\mathbf{Mn}^{+}$	Exp	21
$\mathbf{Mn}$	Exp	64
$\mathbf{Mn}^{2+--5+}$	Th	140
$\mathbf{Mn}^{2+}$	Th	141
$\mathbf{Mn}^{4+}$	Th	141
$\mathbf{Mn}^{2+--5+}$	Exp	143
$\mathbf{Mn}^{+}$	Exp	144
$\mathbf{Mn}^{3+--4+}$	Exp	144
$\mathbf{Mn}^{4+--5+}$	Exp	145
$\mathbf{Mn}^{+}$	E/T	157
$\mathbf{Mn}^{0+--+}$	Exp	217
$\mathbf{Mn}^{16+}$	Th	245
$\mathbf{Mn}^{+}$	E/T	247
$\mathbf{Mn}^{11+}$	Th	276
$\mathbf{Mn}$	E/T	332
$\mathbf{Mn}^{11+}$	Th	432
$\mathbf{Mn}$	Th	469
$\mathbf{Fe}^{17+--18+}$	Exp	10
$\mathbf{Fe}^{10+}$	E/T	13
$\mathbf{Fe}^{15+}$	Th	20
$\mathbf{Fe}^{+}$	Exp	22
$\mathbf{Fe}^{17+--22+}$	E/T	35
$\mathbf{Fe}^{17+--24+}$	E/T	35
$\mathbf{Fe}^{4+}$	Exp	36
$\mathbf{Fe}^{10+}$	Th	42
$\mathbf{Fe}^{21+}$	Th	46
$\mathbf{Fe}^{23+}$	Th	59
$\mathbf{Fe}^{4+}$	Th	60
$\mathbf{Fe}^{24+}$	Th	84
$\mathbf{Fe}$	Exp	106
$\mathbf{Fe}^{16+}$	Th	109
$\mathbf{Fe}^{+}$	Exp	115
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$\mathbf{Fe}$	Exp	133
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$\mathbf{Fe}^{2+--5+}$	Th	141
$\mathbf{Fe}^{+--6+}$	Exp	143
$\mathbf{Fe}^{+--7+}$	Exp	144
$\mathbf{Fe}^{2+}$	Exp	145
$\mathbf{Fe}^{4+--6+}$	Exp	145
$\mathbf{Fe}$	Exp	150
$\mathbf{Fe}^{10+}$	Th	153
$\mathbf{Fe}^{15+}$	Th	156
$\mathbf{Fe}^{23+}$	Th	159
$\mathbf{Fe}^{10+}$	Th	164
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$\mathbf{Fe}^{24+}$	Th	187
$\mathbf{Fe}^{16+}$	Th	197
$\mathbf{Fe}^{+}$	E/T	205
$\mathbf{Fe}^{14+}$	Th	208
$\mathbf{Fe}^{16+}$	Exp	211
$\mathbf{Fe}^{22+}$	Th	232
$\mathbf{Fe}^{6+--13+}$	Exp	235

$\mathbf{Fe}^{16+--17+}$	Exp	235
$\mathbf{Fe}^{6+--17+}$	Exp	235
$\mathbf{Fe}^{6+}$	Th	236
$\mathbf{Fe}^{8+}$	E/T	243
$\mathbf{Fe}^{17+}$	Th	245
$\mathbf{Fe}$	E/T	247
$\mathbf{Fe}^{+}$	E/T	247
$\mathbf{Fe}^{6+--16+}$	Exp	248
$\mathbf{Fe}^{20+}$	Exp	248
$\mathbf{Fe}^{4+}$	E/T	251
$\mathbf{Fe}^{6+--7+}$	Exp	253
$\mathbf{Fe}^{19+--20+}$	Exp	253
$\mathbf{Fe}^{22+}$	Exp	253
$\mathbf{Fe}^{10+}$	Th	280
$\mathbf{Fe}^{23+}$	Th	287
$\mathbf{Fe}^{24+--25+}$	Exp	292
$\mathbf{Fe}^{22+}$	Th	294
$\mathbf{Fe}^{13+}$	E/T	295
$\mathbf{Fe}^{14+}$	E/T	295
$\mathbf{Fe}^{24+}$	Exp	351
$\mathbf{Fe}^{25+}$	Exp	351
$\mathbf{Fe}^{8+--14+}$	Exp	357
$\mathbf{Fe}^{7+--13+}$	Exp	363
$\mathbf{Fe}^{13+--15+}$	E/T	369
$\mathbf{Fe}^{23+}$	Exp	386
$\mathbf{Fe}^{3+--16+}$	Exp	388
$\mathbf{Fe}^{22+}$	Th	398
$\mathbf{Fe}^{6+}$	Th	399
$\mathbf{Fe}^{7+}$	Th	401
$\mathbf{Fe}^{8+}$	Th	405
$\mathbf{Fe}^{+}$	Th	408
$\mathbf{Fe}$	Exp	410
$\mathbf{Fe}^{4+}$	Th	414
$\mathbf{Fe}$	E/T	425
$\mathbf{Fe}^{10+}$	Th	436
$\mathbf{Fe}^{4+}$	Th	476
$\mathbf{Fe}^{13+}$	E/T	477
$\mathbf{Fe}^{22+}$	Th	486
$\mathbf{Co}^{+}$	Exp	18
$\mathbf{Co}^{25+}$	Th	84
$\mathbf{Co}^{+}$	Th	140
$\mathbf{Co}^{3+}$	Th	140
$\mathbf{Co}^{4+}$	Th	140
$\mathbf{Co}^{+--2+}$	Exp	143
$\mathbf{Co}^{5+--6+}$	Exp	143
$\mathbf{Co}^{+}$	Th	155
$\mathbf{Co}^{18+}$	Th	245
$\mathbf{Ni}^{16+}$	Th	31
$\mathbf{Ni}^{4+}$	Exp	36
$\mathbf{Ni}^{14+}$	Th	52
$\mathbf{Ni}^{4+}$	Th	60
$\mathbf{Ni}^{22+}$	Th	77
$\mathbf{Ni}^{26+}$	Th	80
$\mathbf{Ni}^{26+}$	Th	84
$\mathbf{Ni}^{20+}$	Th	100
$\mathbf{Ni}^{18+}$	E/T	121
$\mathbf{Ni}^{3+--5+}$	Th	140
$\mathbf{Ni}^{3+}$	Th	141
$\mathbf{Ni}^{4+}$	Th	141

Ni^{2+--4+}	Exp	143
Ni^{6+}	Exp	143
Ni^{+}	Exp	144
Ni^{3+}	Exp	144
Ni^{14+}	Th	172
Ni^{18+}	Th	184
Ni^{26+}	Th	185
Ni^{10+}	Exp	235
Ni$^{13+--16+}$	Exp	235
Ni$^{10+--17+}$	Exp	235
Ni^{14+}	E/T	240
Ni^{10+}	E/T	242
Ni^{19+}	Th	245
Ni^{+}	E/T	247
Ni$^{9+--17+}$	Exp	248
Ni^{9+}	Exp	253
Ni$^{9+--26+}$	Exp	253
Ni^{14+}	E/T	258
Ni^{22+}	E/T	258
Ni^{20+}	Th	283
Ni^{+}	Th	341
Ni^{14+}	Th	402
Ni^{10+}	Th	404
Ni	Exp	417
Ni^{20+}	Th	437
Cu	E/T	51
Cu^{27+}	Th	84
Cu^{19+}	E/T	121
Cu	Exp	128
Cu	Exp	133
Cu^{3+--5+}	Th	140
Cu^{+}	Exp	143
Cu^{3+}	Exp	143
Cu^{+}	Exp	144
Cu^{20+}	Th	245
Cu	Th	252
Cu	Th	269
Cu^{-}	Th	269
Cu^{27+}	Exp	351
Cu^{28+}	Exp	351
Cu$^{25+--26+}$	Exp	386
Cu	Th	416
Cu	E/T	462
Zn^{16+}	Th	52
Zn^{27+}	Th	59
Zn^{28+}	Th	84
Zn	Exp	133
Zn^{3+--5+}	Th	140
Zn^{27+}	Th	159
Zn^{+}	Th	163
Zn^{16+}	Th	172
Zn^{27+}	Th	175
Zn^{20+}	Th	184
Zn^{9+}	Th	245
Zn^{+}	E/T	247
Zn^{27+}	Th	287
Ga^{26+}	Th	46
Ga	E/T	51
Ga^{17+}	Th	52

Ga$^{3+\text{--}5+}$	Th	140
Ga^{26+}	Th	168
Ga^{17+}	Th	172
Ga	Th	373
Ge^{18+}	Th	52
Ge^{29+}	Th	59
Ge$^{4+\text{--}5+}$	Th	140
Ge^{18+}	Th	172
Ge^{29+}	Th	175
Ge^{18+}	Th	276
Ge^{28+}	Th	300
Ge^{30+}	Exp	351
Ge^{31+}	Exp	351
Ge^{30+}	E/T	353
Ge	Th	373
Ge^{18+}	Th	432
Ge^{28+}	Th	446
As^{19+}	Th	52
As^{5+}	Th	140
As^{19+}	Th	172
As	Th	373
Se^{2+}	E/T	258
Se	Th	373
Br	E/T	51
Br^{27+}	E/T	258
Br	Th	373
Kr^{+}	E/T	3
Kr^{+}	Th	14
Kr^{5+}	Th	14
Kr^{6+}	Th	14
Kr^{10+}	Th	14
Kr^{15+}	Th	14
Kr^{17+}	Th	14
Kr^{2+}	Th	14
Kr^{11+}	Th	14
Kr^{16+}	Th	14
Kr^{6+}	Th	54
Kr^{33+}	Th	59
Kr^{32+}	Th	85
Kr^{33+}	Th	85
Kr	Exp	105
Kr$^{+\text{--}3+}$	Th	107
Kr^{26+}	Th	109
Kr^{34+}	Th	119
Kr^{31+}	Th	126
Kr^{6+}	Th	173
Kr^{33+}	Th	175
Kr^{26+}	Th	197
Kr^{26+}	Th	203
Kr^{34+}	Th	207
Kr^{6+}	E/T	259
Kr^{31+}	E/T	277
Kr^{31+}	Th	278
Kr^{33+}	Th	287
Kr	Th	288
Kr	Th	314
Kr$^{20+\text{--}21+}$	Exp	339
Kr^{24+}	Exp	339
Kr$^{26+\text{--}33+}$	Exp	339

Kr^{34+}	E/T	353
Kr^{32+}	Th	365
Kr	Th	373
Kr	Exp	413
Kr^{17+}	E/T	459
Kr^{23+}	Th	472
Kr^{2+}	Exp	485
Rb	E/T	51
Rb^{34+}	Th	59
Rb^{34+}	Th	175
Rb^{23+}	E/T	258
Rb	Th	269
Rb^{-}	Th	269
Rb	Exp	322
Rb	Th	340
Rb^{0+--+}	Th	350
Sr^{35+}	Th	59
Sr^{+}	Th	163
Sr^{35+}	Th	175
Sr	Th	183
Sr^{24+}	E/T	258
Sr	Th	288
Sr^{3+}	Th	298
Sr	Th	318
Sr^{+}	Th	340
Sr^{3+}	Th	444
Y^{36+}	Th	59
Y^{36+}	Th	175
Y^{4+}	Th	298
Y^{4+}	Th	444
Zr^{37+}	Th	59
Zr^{+}	Exp	144
Zr^{37+}	Th	175
Zr-Sn^{2+}	Th	246
Zr	Th	290
Zr^{2+}	Th	290
Zr^{5+}	Th	298
Zr^{0+--+}	Exp	378
Zr^{5+}	Th	444
Nb^{+}	E/T	90
Nb^{+}	Th	91
Nb^{12+}	Th	104
Nb^{12+}	Th	195
Nb	Th	230
Nb	Exp	231
Nb^{6+}	Th	298
Nb^{11+}	Th	433
Nb^{6+}	Th	444
Mo	E/T	51
Mo^{39+}	Th	59
Mo^{39+}	Th	159
Mo^{39+}	Th	175
Mo	Exp	204
Mo^{2+}	Th	228
Mo^{33+}	Th	245
Mo^{37+}	E/T	277
Mo^{35+}	E/T	277
Mo^{37+}	Th	278
Mo^{35+}	Th	278

Mo^{39+}	Th	287
Mo^{7+}	Th	298
Mo^{32+}	Exp	342
Mo^{40+}	Exp	379
Mo^{41+}	Exp	379
Mo^{2+}	Th	396
Mo^{33+}	Th	407
Mo^{12+}	Th	433
Mo^{40+}	Th	442
Mo^{41+}	Th	442
Mo^{7+}	Th	444
Ru	E/T	51
Ru^{41+}	Th	59
Ru^{41+}	Th	175
Ag	E/T	51
Ag	Exp	128
Ag	Th	269
Ag^{-}	Th	269
Ag	E/T	462
Cd	E/T	51
Cd^{45+}	Th	59
Cd^{+}	Th	163
Cd^{45+}	Th	175
In^{3+}	E/T	25
In	E/T	28
In^{+}	E/T	29
In^{2+}	E/T	29
In	E/T	51
In^{+}	E/T	161
In	E/T	188
In^{2+}	Th	313
In	Exp	347
In	Exp	376
In^{2+}	Th	458
In	Th	474
Sn	E/T	51
Sn^{47+}	Th	59
Sn^{+}	Exp	139
Sn^{47+}	Th	159
Sn^{47+}	Th	175
Sn	Th	290
Sn^{+}	E/T	301
Sn^{13+}	Th	311
Sn$^{13+--14+}$	Th	311
Sn$^{4+--19+}$	Exp	355
Sn^{+}	E/T	447
Sb	E/T	51
Te^{2+}	E/T	258
Te	Th	290
Te^{3+}	E/T	301
I^{+}	Th	290
Xe^{51+}	Th	59
Xe^{43+}	E/T	83
Xe^{44+}	Th	109
Xe	Exp	116
Xe^{49+}	Th	126
Xe^{51+}	Th	175
Xe^{44+}	Th	197
Xe	Th	199

Xe^{49+}	Th	214
Xe^{51+}	Th	287
Xe	Th	288
Xe^{2+}	Th	290
Xe	Th	314
Xe	Exp	317
Xe^{7+}	E/T	331
Xe	Th	345
Xe^{52+}	E/T	353
Xe$^{8+\text{–}18+}$	Exp	355
Xe	Exp	413
Xe	Th	457
Xe^{50+}	Th	486
Xe$^{17+\text{–}20+}$	Exp	487
Xe$^{22+\text{–}24+}$	Exp	487
Cs	E/T	51
Cs	Th	269
Cs^{-}	Th	269
Cs	Exp	322
Cs	Th	340
Cs$^{0+\text{–}+}$	Th	350
Ba	E/T	51
Ba^{45+}	E/T	83
Ba^{+}	Th	163
Ba	Th	183
Ba	Th	318
Ba^{+}	Th	340
La	E/T	51
La-Lu	Th	314
Nd	E/T	51
Nd^{57+}	Th	287
Sm^{51+}	E/T	83
Eu	E/T	51
Eu	Exp	329
Eu	Exp	468
Gd	E/T	51
Gd^{53+}	E/T	83
Gd^{59+}	Th	126
Gd^{59+}	Th	214
Gd$^{33+\text{–}35+}$	Exp	357
Gd$^{18+\text{–}27+}$	Exp	367
Gd^{30+}	Exp	367
Gd^{31+}	Exp	367
Gd^{32+}	Exp	367
Dy	E/T	51
Dy^{55+}	E/T	83
Er^{57+}	E/T	83
Er	Th	290
Er^{2+}	Th	290
Tm^{66+}	Th	159
Tm^{3+}	Th	290
Yb	E/T	51
Yb^{67+}	Th	159
Yb	Th	183
Yb^{67+}	Th	287
Yb^{23+}	E/T	333
Lu	E/T	51
Lu^{+}	Th	290
Hf$^{44+\text{–}54+}$	E/T	127

Hf$^{44+--55+}$	E/T	127
Hf^{44+}	Th	198
Hf	Th	290
Hf^{12+}	Th	290
Ta	E/T	16
Ta$^{45+--56+}$	E/T	127
Ta$^{45+--57+}$	E/T	127
Ta^{+}	Exp	255
Ta^{6+}	E/T	299
Ta$^{45+--57+}$	Exp	361
Ta^{6+}	Th	445
W$^{42+--51+}$	E/T	1
W$^{48+--50+}$	E/T	1
W^{62+}	Th	27
W^{36+}	Th	45
W$^{24+--30+}$	Th	49
W^{39+}	Th	55
W$^{47+--61+}$	Exp	82
W^{63+}	E/T	83
W$^{27+--37+}$	Th	103
W^{0+--3+}	Th	130
W$^{0+--73+}$	Th	131
W$^{42+--51+}$	Th	146
W^{62+}	Th	160
W^{36+}	Th	167
W^{39+}	Th	174
W^{13+}	E/T	177
W^{46+}	Th	198
W^{3+}	Th	202
W$^{65+--71+}$	Th	215
W$^{42+--46+}$	Th	262
W^{25+}	Th	266
W^{57+}	Th	270
W^{35+}	E/T	271
W^{39+}	Th	272
W^{67+}	E/T	277
W^{67+}	Th	278
W^{57+}	Th	284
W^{57+}	Th	286
W^{26+}	E/T	289
W^{14+}	Th	290
W$^{14+--45+}$	Exp	302
W$^{62+--66+}$	Th	304
W	Exp	320
W^{5+}	Exp	321
W^{43+}	Th	325
W^{44+}	Th	330
W^{28+}	E/T	336
W	Exp	338
W^{65+}	Th	348
W^{39+}	Th	354
W$^{24+--33+}$	Exp	356
W^{26+}	Exp	356
W$^{22+--26+}$	Exp	357
W$^{42+--45+}$	Exp	357
W^{26+}	Exp	362
W$^{27+--29+}$	Exp	367
W^{26+}	Exp	368
W^{28+}	Exp	368

W^{7+}	E/T	375
W^{45+}	Th	383
W$^{20+--37+}$	Exp	385
W^{25+}	Th	423
W^{57+}	Th	426
W^{35+}	Th	427
W^{39+}	Th	428
W^{57+}	Th	438
W^{57+}	Th	439
W^{26+}	Th	441
W$^{62+--66+}$	Th	451
W^{43+}	Th	461
W^{44+}	Th	467
W^{28+}	Th	471
W^{65+}	Th	475
W^{39+}	Th	478
W^{45+}	Th	489
Re	E/T	51
Re^{+}	Exp	196
Re^{47+}	Th	198
Os^{48+}	Th	198
Os^{13+}	Th	290
Ir	E/T	51
Ir^{49+}	Th	198
Pt^{67+}	E/T	83
Pt^{50+}	Th	198
Pt^{20+}	Th	290
Au$^{66+--67+}$	Th	44
Au	E/T	51
Au$^{71+--76+}$	Th	63
Au$^{41+--53+}$	Th	120
Au$^{62+--67+}$	Th	124
Au^{74+}	Th	126
Au$^{51+--60+}$	E/T	127
Au$^{51+--62+}$	E/T	127
Au	Exp	128
Au$^{0+--78+}$	Th	131
Au$^{41+--51+}$	Exp	134
Au$^{44+--51+}$	Exp	136
Au$^{47+--53+}$	Exp	137
Au$^{47+--52+}$	Exp	138
Au$^{66+--67+}$	Th	166
Au^{18+}	E/T	177
Au^{51+}	Th	198
Au$^{62+--67+}$	Th	213
Au^{74+}	Th	214
Au$^{47+--50+}$	Th	229
Au^{67+}	Th	260
Au	Th	269
Au^{-}	Th	269
Au$^{45+--52+}$	Th	273
Au$^{19+--42+}$	E/T	343
Au$^{20+--42+}$	E/T	343
Au$^{32+--33+}$	E/T	343
Au$^{32+--34+}$	E/T	343
Au$^{47+--50+}$	Th	397
Au^{67+}	Th	421
Au$^{45+--52+}$	Th	429
Au^{77+}	Th	442

$\mathbf{Au}^{78+}$		Th	442
Hg		E/T	51
$\mathbf{Hg}^{+}$		Th	163
$\mathbf{Hg}^{77+}$		Th	287
$\mathbf{Hg}^{22+}$		Th	290
Tl		E/T	51
$\mathbf{Pb}^{79+}$		Th	268
$\mathbf{Pb}^{24+}$		Th	290
$\mathbf{Bi}^{72+}$		E/T	83
$\mathbf{Bi}^{78+}$		Th	126
$\mathbf{Bi}^{78+}$		Th	214
$\mathbf{Bi}^{80+}$		Th	287
$\mathbf{Bi}^{80+}$		Th	364
$\mathbf{Bi}^{82+}$		Th	364
Po		Th	290
$\mathbf{Po}^{26+}$		Th	290
Fr		E/T	51
Fr		Th	269
$\mathbf{Fr}^{-}$		Th	269
$\mathbf{Fr}^{84+}$		Th	287
$\mathbf{Fr}^{0+--+}$		Th	350
$\mathbf{Ra}^{30+}$		Th	290
Ra		Th	318
Ac-NO		Th	314
$\mathbf{Th}^{0+--+}$		Exp	135
$\mathbf{Th}^{0+--2+}$		Exp	254
$\mathbf{Th}^{87+}$		Th	287
Th		Th	290
$\mathbf{Th}^{32+}$		Th	290
$\mathbf{Pa}^{88+}$		Th	287
$\mathbf{Pa}^{2+--3+}$		Th	290
U		E/T	51
$\mathbf{U}^{87+}$		Th	126
$\mathbf{U}^{87+}$		Th	214
$\mathbf{U}^{89+}$		Th	268
$\mathbf{U}^{89+}$		Th	287
$\mathbf{U}^{33+}$		Th	290
$\mathbf{U}^{89+}$		Th	315
$\mathbf{U}^{90+}$		Th	315
$\mathbf{U}^{90+}$		E/T	353
$\mathbf{U}^{90+}$		Th	442
$\mathbf{U}^{91+}$		Th	442
$\mathbf{U}^{88+}$		Th	486
$\mathbf{e + Li}^{+}$	1E4−1E6 K	Th	218
$\mathbf{e + Be}^{2+}$	1E4−1E6 K	Th	218
$\mathbf{e + B}^{3+}$	1E4−1E6 K	Th	218
$\mathbf{e + C}^{4+}$	1E4−1E6 K	Th	218
$\mathbf{e + Li}^{+}$	1E4−1E6 K	Th	218
$\mathbf{e + Be}^{2+}$	1E4−1E6 K	Th	218
$\mathbf{e + B}^{3+}$	1E4−1E6 K	Th	218
$\mathbf{e + C}^{4+}$	1E4−1E6 K	Th	218
$\mathbf{e + W}^{26+}$		Th	220
$\mathbf{e + W}^{26+}$		Th	220
e + HD		Th	222
e + e		Th	223
$\mathbf{e + W}^{71+}$		Th	224
$\mathbf{e + W}^{72+}$		Th	224
$\mathbf{e + W}^{73+}$		Th	224
$\mathbf{e + W}^{37+}$		Th	224

e + W^{71+}		Th	224
e + W^{72+}		Th	224
e + W^{73+}		Th	224
e + W^{37+}		Th	224
e + Ca^{8+}	0−60 RYD	Th	491
e + Fe^{16+}		Th	492
e + Ni^{10+}	threshold−1000 eV	Th	493
e + Ni^{10+}	threshold−1000 eV	Th	493
e + Ni^{16+}	threshold−1700 eV	Th	494
e + Ni^{16+}	threshold−1700 eV	Th	494
e + Fe^{14+}	threshold−1670 eV	Th	495
e + Fe^{14+}	threshold−1670 eV	Th	495
He Z= 1-3		Th	87
He Z= 2-3		Th	87
He Z= 2-10		Th	225
He Z= 6-8		Exp	305
He Z= 18-24		E/T	353
He Z= 26-27		E/T	353
He Z= 2-10		Th	380
He Z= 3-54		E/T	477
Li Z= 3-13		Th	23
Li Z= 12-20		Th	50
Li Z= 41-50		Th	65
Li Z= 12-20		Th	171
Li Z= 3-9		Th	238
Li Z= 3-7		Th	238
Li Z= 7-30		Th	274
Li Z= 6-8		Exp	305
Li Z= 21-30		Th	346
Li Z= 7-30		Th	430
Be Z= 8-28 step 2		Th	30
Be Z= 26-92		Th	48
Be Z= 8-18		E/T	68
Be Z= 8-28 step 2		Th	162
Be Z= 5-92		Th	182
Be Z= 4-110		Th	263
Be Z= 5-74		E/T	277
Be Z= 5-74		Th	278
Be Z= 4-54		E/T	449
Be Z= 4-92		Th	450
Be Z= 4-36		E/T	477
Be Z= 6-92		E/T	480
B Z= 6-10		Th	4
B Z= 5-19		Th	23
B Z= 17-100		Th	70
B Z= 6-10 step 2		E/T	93
B Z= 6-14 step 2		E/T	93
B Z= 14-35		Th	126
B Z= 6-10		Th	148
B Z= 6-14		Th	189
B Z= 14-36		Th	214
B Z= 8-30		E/T	277
B Z= 8-30		Th	278
B Z= 26-92		Th	279
B Z= 22-29		Th	358
B Z= 6-54		Th	393
B Z= 18-22		E/T	477
B Z= 22-29		Th	481
C Z= 7-92		Th	118

C Z= 7-92	Th	206
C Z= 7-10	Exp	216
C Z= 26-92	Th	226
C Z= 18-30	Th	244
C Z= 7-28	E/T	277
C Z= 7-28	Th	278
C Z= 26-92	Th	394
C Z= 18-30	Th	406
C Z= 6-8	Th	418
C Z= 14-16	E/T	477
e + C Z= 9-28	Th	496
e + C Z= 9-28	Th	496
N Z= 9-36	Th	2
N Z= 9-36	Th	147
N Z= 26-92	Th	275
N Z= 7-36	E/T	277
N Z= 7-36	Th	278
N Z= 7-100	Th	312
N Z= 7-80	Th	412
N Z= 7-100	Th	456
O Z= 9-36	Th	11
O Z= 9-36	Th	151
O Z= 14-16	E/T	477
F Z= 14-74	Th	47
F Z= 14-74	Th	170
F Z= 22-30	Th	245
F Z= 22-30	Th	407
F Z= 17-22	E/T	477
Ne Z= 12-36	Th	5
Ne Z= 12-36	Th	149
Ne Z= 12-30	Th	184
Ne Z= 18-36	E/T	227
Ne Z= 18-36	Th	395
Ne Z= 10-35	Th	450
Na Z= 11-18	Th	23
Na Z= 18-92	E/T	83
Mg Z= 19-92	Th	257
Mg Z= 13-100	Th	296
Mg Z= 19-92	Th	420
Mg Z= 13-100	Th	443
P Z= 22-36	E/T	449
Cl Z= 18-29	E/T	477
K Z= 19-36	Th	23
Ni Z= 72-79	Th	198
Cu Z= 64-66	Exp	302
Zn Z= 50-92	E/T	101
e + Ga Z= 33-41	Th	223
As Z= 38-92	Th	326
Br Z= 38-42	Th	69
Br Z= 38-42	Th	176
Rb Z= 37-54	Th	23
Sr Z= 50-92	Th	181
Mo Z= 50-92	Th	181
Rh Z= 50-92	Th	181
Ag Z= 64-66	Exp	302
Ag Z= 50-94	Th	308
Ag Z= 62-74	E/T	333
Ag Z= 50-94	Th	453
Cs Z= 55-86	Th	23

Pm Z= 74-100		Th	71
Pm Z= 74-100		E/T	177
Sm Z= 74-100		Th	94
Sm Z= 74-100		Th	190
Tm Z= 70-88		Th	473
Fr Z= 87-105		Th	23

2.2 Atomic and Molecular Collisions

2.2.1 Electron Collisions

$H^+ + U^{91+}$	1−15 threshold unit, 1−2000 keV	Th	768
$P + H_2$	16−3000eV	Th	958
$P + D_2$	16−3000eV	Th	958
P + Kr	1E1−1E8 K	Th	1344
$P + Kr^+$	1E1−1E8 K	Th	1344
$P + Kr^{2+}$	1E1−1E8 K	Th	1344
$P + Kr^{3+}$	1E1−1E8 K	Th	1344
$P + Kr^{4+}$	1E1−1E8 K	Th	1344
$P + Kr^{5+}$	1E1−1E8 K	Th	1344
$P + Kr^{6+}$	1E1−1E8 K	Th	1344
$h\nu$ + He	1keV,100MeV	Th	991
$h\nu$ + He	1keV,100MeV	Th	991
e + Es	ned	Th	497
e + Cf	ned	Th	497
e + Bk	ned	Th	497
e + Cm	ned	Th	497
e + Am	ned	Th	497
e + Pu	ned	Th	497
e + Np	ned	Th	497
e + U	ned	Th	497
e + Pa	ned	Th	497
e + Th	ned	Th	497
e + Ac	ned	Th	497
e + Ra	ned	Th	497
e + Fr	ned	Th	497
e + Rn	ned	Th	497
e + At	ned	Th	497
e + Po	ned	Th	497
e + Bi	ned	Th	497
e + Pb	ned	Th	497
e + Tl	ned	Th	497
e + Hg	ned	Th	497
e + Au	ned	Th	497
e + Pt	ned	Th	497
e + Ir	ned	Th	497
e + Os	ned	Th	497
e + Re	ned	Th	497
e + W	ned	Th	497
e + Ta	ned	Th	497
e + Hf	ned	Th	497
e + Lu	ned	Th	497
e + Yb	ned	Th	497
e + Tm	ned	Th	497
e + Er	ned	Th	497
e + Ho	ned	Th	497
e + Dy	ned	Th	497
e + Tb	ned	Th	497

e + Gd	ned	Th	497
e + Eu	ned	Th	497
e + Sm	ned	Th	497
e + Pm	ned	Th	497
e + Nd	ned	Th	497
e + Pr	ned	Th	497
e + Ce	ned	Th	497
e + La	ned	Th	497
e + Ba	ned	Th	497
e + Cs	ned	Th	497
e + Xe	ned	Th	497
e + I	ned	Th	497
e + Te	ned	Th	497
e + Sb	ned	Th	497
e + Sn	ned	Th	497
e + In	ned	Th	497
e + Cd	ned	Th	497
e + Ag	ned	Th	497
e + Pd	ned	Th	497
e + Rh	ned	Th	497
e + Ru	ned	Th	497
e + Tc	ned	Th	497
e + Mo	ned	Th	497
e + Nb	ned	Th	497
e + Zr	ned	Th	497
e + Y	ned	Th	497
e + Sr	ned	Th	497
e + Rb	ned	Th	497
e + Kr	ned	Th	497
e + Br	ned	Th	497
e + Se	ned	Th	497
e + As	ned	Th	497
e + Ge	ned	Th	497
e + Ga	ned	Th	497
e + Zn	ned	Th	497
e + Cu	ned	Th	497
e + Ni	ned	Th	497
e + Co	ned	Th	497
e + Fe	ned	Th	497
e + Mn	ned	Th	497
e + Cr	ned	Th	497
e + V	ned	Th	497
e + Ti	ned	Th	497
e + Sc	ned	Th	497
e + Ca	ned	Th	497
e + K	ned	Th	497
e + Ar	ned	Th	497
e + Cl	ned	Th	497
e + S	ned	Th	497
e + P	ned	Th	497
e + Si	ned	Th	497
e + Al	ned	Th	497
e + Mg	ned	Th	497
e + Na	ned	Th	497
e + Ne	ned	Th	497
e + F	ned	Th	497
e + O	ned	Th	497
e + N	ned	Th	497
e + C	ned	Th	497

e + B	ned	Th	497
e + Be	ned	Th	497
e + Li	ned	Th	497
e + He	ned	Th	497
e + H	ned	Th	497
e + $\mathbf{C_2H_6}$	0−12 eV	Th	498
e + Pb	threshold−10000 eV	Th	499
e + I	threshold−10000 eV	Th	499
e + Te	threshold−10000 eV	Th	499
e + Sb	threshold−10000 eV	Th	499
e + Sn	threshold−10000 eV	Th	499
e + Se	threshold−10000 eV	Th	499
e + As	threshold−10000 eV	Th	499
e + Cu	threshold−10000 eV	Th	499
e + N	threshold−10000 eV	Th	499
e + $\mathbf{N_2}$	0−10 eV	Th	500
e + $\mathbf{N_2}$	0−10 eV	Th	500
e + He	0−25 eV	Th	501
e + $\mathbf{Au^{49+}}$	100−1E4 eV	Th	502
e + $\mathbf{Au^{50+}}$	100−1E4 eV	Th	502
e + $\mathbf{Au^{51+}}$	100−1E4 eV	Th	502
e + $\mathbf{H_2}$	1−10 eV	Th	503
e + $\mathbf{CH_2O}$	50−85 eV	Exp	504
e + $\mathbf{Ar^{7+}}$	0−1E6 eV	Th	505
e + $\mathbf{Ar^{6+}}$	0−1E6 eV	Th	505
e + $\mathbf{Ar^{5+}}$	0−1E6 eV	Th	505
e + $\mathbf{Ar^{4+}}$	0−1E6 eV	Th	505
e + $\mathbf{Ar^{3+}}$	0−1E6 eV	Th	505
e + $\mathbf{Ar^{2+}}$	0−1E6 eV	Th	505
e + $\mathbf{Ar^{+}}$	0−1E6 eV	Th	505
e + Ar	0−1E6 eV	Th	505
e + S	0−1E6 eV	Th	505
e + $\mathbf{Al^{3+}}$	0−1E6 eV	Th	505
e + Mg	0−1E6 eV	Th	505
e + Na	0−1E6 eV	Th	505
e + $\mathbf{Ne^{2+}}$	0−1E6 eV	Th	505
e + $\mathbf{Ne^{+}}$	0−1E6 eV	Th	505
e + Ne	0−1E6 eV	Th	505
e + $\mathbf{O^{3+}}$	0−1E6 eV	Th	505
e + $\mathbf{O^{2+}}$	0−1E6 eV	Th	505
e + O	0−1E6 eV	Th	505
e + $\mathbf{C^{3+}}$	0−1E6 eV	Th	505
e + $\mathbf{C^{+}}$	0−1E6 eV	Th	505
e + $\mathbf{B^{+}}$	0−1E6 eV	Th	505
e + $\mathbf{Li^{+}}$	0−1E6 eV	Th	505
e + Li	0−1E6 eV	Th	505
e + H	0−1E6 eV	Th	505
e + $\mathbf{Gd^{36+}}$	100−5000 eV	Th	506
e + $\mathbf{Sc^{+}}$	40−1000 eV	Th	507
e + $\mathbf{CD_2{}^{+}}$	0−2.5 keV	Exp	508
e + $\mathbf{CD_2{}^{+}}$	0−2.5 keV	Exp	508
e + $\mathbf{CD_2{}^{+}}$	0−2.5 keV	Exp	508
e + $\mathbf{CD_3{}^{+}}$	0−2.5 keV	Exp	509
e + $\mathbf{CD_3{}^{+}}$	0−2.5 keV	Exp	509
e + $\mathbf{CD_3{}^{+}}$	0−2.5 keV	Exp	509
e + $\mathbf{C_2H_4}$	0−1000 eV	Exp	510
e + U	0−2E9 eV	Th	511
e + Bi	0−2E9 eV	Th	511
e + Pb	0−2E9 eV	Th	511

e + Au	0−2E9 eV	Th	511
e + Ta	0−2E9 eV	Th	511
e + Ba	0−2E9 eV	Th	511
e + Sn	0−2E9 eV	Th	511
e + In	0−2E9 eV	Th	511
e + Ag	0−2E9 eV	Th	511
e + Pd	0−2E9 eV	Th	511
e + Mo	0−2E9 eV	Th	511
e + Y	0−2E9 eV	Th	511
e + Sr	0−2E9 eV	Th	511
e + Ga	0−2E9 eV	Th	511
e + Rb	0−2E9 eV	Th	511
e + Zn	0−2E9 eV	Th	511
e + Se	0−2E9 eV	Th	511
e + Cu	0−2E9 eV	Th	511
e + Ni	0−2E9 eV	Th	511
e + Co	0−2E9 eV	Th	511
e + Cr	0−2E9 eV	Th	511
e + V	0−2E9 eV	Th	511
e + Ar	0−2E9 eV	Th	511
e + Si	0−2E9 eV	Th	511
e + Al	0−2E9 eV	Th	511
e + Ne	0−2E9 eV	Th	511
e + N	0−2E9 eV	Th	511
e + C	0−2E9 eV	Th	511
e + He	0−2E9 eV	Th	511
e + H	0−2E9 eV	Th	511
e + U	0−2E9 eV	Th	512
e + Bi	0−2E9 eV	Th	512
e + Pb	0−2E9 eV	Th	512
e + Au	0−2E9 eV	Th	512
e + Ba	0−2E9 eV	Th	512
e + Sb	0−2E9 eV	Th	512
e + Sn	0−2E9 eV	Th	512
e + In	0−2E9 eV	Th	512
e + Ag	0−2E9 eV	Th	512
e + Pd	0−2E9 eV	Th	512
e + Mo	0−2E9 eV	Th	512
e + Y	0−2E9 eV	Th	512
e + Sr	0−2E9 eV	Th	512
e + Se	0−2E9 eV	Th	512
e + Ge	0−2E9 eV	Th	512
e + Zn	0−2E9 eV	Th	512
e + Ni	0−2E9 eV	Th	512
e + Co	0−2E9 eV	Th	512
e + Fe	0−2E9 eV	Th	512
e + Mn	0−2E9 eV	Th	512
e + Cr	0−2E9 eV	Th	512
e + V	0−2E9 eV	Th	512
e + Ca	0−2E9 eV	Th	512
e + Ar	0−2E9 eV	Th	512
e + Si	0−2E9 eV	Th	512
e + Al	0−2E9 eV	Th	512
e + Ne	0−2E9 eV	Th	512
e + C	0−2E9 eV	Th	512
e + He	0−2E9 eV	Th	512
e + H	0−2E9 eV	Th	512
e + Au	0−30 keV	Th	513
e + Ag	0−30 keV	Th	513

e + Cu	0−30 keV	Th	513
e + Si	0−30 keV	Th	513
e + Al	0−30 keV	Th	513
$\mathbf{e + N_2O}$	15−200 eV	Exp	514
$\mathbf{e + C_2N_2}$	300−800 eV	Th	515
$\mathbf{e + C_2}$	300−800 eV	Th	515
$\mathbf{e + Ar^{2+}}$	113 eV	Th	516
$\mathbf{e + Li^{+}}$	0−1000 eV	E/T	517
e + Kr	0−18 eV	E/T	518
e + Cs	0−18 eV	E/T	518
$\mathbf{e + H_2}$	8 keV	Exp	519
e + Be	0−500 keV	Th	520
$\mathbf{e + D_3{}^{+}}$	0−2.5 keV	Exp	521
$\mathbf{e + D_3{}^{+}}$	0−2.5 keV	Exp	521
$\mathbf{e + D_3{}^{+}}$	0−2.5 keV	Exp	521
$\mathbf{e + N_2}$	5−20 eV	Exp	522
e + SiO	0−10 eV	Th	523
$\mathbf{e + H_4O_2}$	0−10 eV	Th	524
e + Xe	14−40 eV	Exp	525
e + Ne	14−40 eV	Exp	525
$\mathbf{e + BF^{+}}$	0−20 eV	Th	526
e + He	102 eV	Th	527
e + He	23.5−35 eV	E/T	528
$\mathbf{e + CH_4}$	500 eV	E/T	529
e + Kr	12.3−16.6 eV	E/T	530
e + Cs	12.3−16.6 eV	E/T	530
$\mathbf{e + H_2}$	33.6 eV−64.6 eV	E/T	531
e + He	33.6 eV−64.6 eV	E/T	531
e + H	33.6 eV−64.6 eV	E/T	531
$\mathbf{e + N_2}$	0−10 eV	Th	532
$\mathbf{e + N_2}$	0−10 eV	Th	532
$\mathbf{e + N_2}$	0−10 eV	Th	532
e + Ne	0−100 eV	Th	533
$\mathbf{e + B^{3+}}$	0−2000 eV	E/T	534
$\mathbf{e + H_2}$	13.5−1000 eV	Th	535
$\mathbf{e + H_2O}$	0−120 eV	Exp	536
e + OH	0−120 eV	Exp	536
$\mathbf{e + H_2O}$	0−120 eV	Exp	536
e + OH	0−120 eV	Exp	536
e + Mg	0−100 eV	Th	537
$\mathbf{e + N_2}$	13−100 eV	Exp	538
$\mathbf{e + O_2}$	0−1000 eV	E/T	539
$\mathbf{e + O_2}$	0−1000 eV	E/T	539
$\mathbf{e + O_2}$	0−1000 eV	E/T	539
$\mathbf{e + O_2}$	0−1000 eV	E/T	539
$\mathbf{e + O_2}$	0−1000 eV	E/T	539
$\mathbf{e + O_2}$	0−1000 eV	E/T	539
$\mathbf{e + O_2}$	0−1000 eV	E/T	539
$\mathbf{e + N_2}$	0−1 keV	E/T	540
e + N	0−1 keV	E/T	540
$\mathbf{e + N_2}$	0−1 keV	E/T	540
e + N	0−1 keV	E/T	540
$\mathbf{e + N_2}$	0−1 keV	E/T	540
e + N	0−1 keV	E/T	540
e + CH	0−30 eV	Th	541
$\mathbf{e + H^{+}}$	0−100 eV	Th	542
e + He	0−100 eV	Th	542
e + H	0−100 eV	Th	542
$\mathbf{e + Li_2}$	0−2.5 eV	Th	543

$\mathbf{e + N_2}$	13−100 eV	Exp	544
$\mathbf{e + N_2}$	13−100 eV	Exp	545
$\mathbf{e + Al}$	0−25 keV	Exp	546
$\mathbf{e + NO_2}$	1−12 eV	Th	547
$\mathbf{e + NO_2}$	1−12 eV	Th	547
$\mathbf{e + Al^{+}}$	1−1000 eV	Th	548
$\mathbf{e + Mg}$	1−1000 eV	Th	548
$\mathbf{e + Zn}$	0−300 eV	E/T	549
$\mathbf{e + H_2S}$	0−300 eV	Exp	550
$\mathbf{e + H_2S}$	0−300 eV	Exp	550
$\mathbf{e + Hg}$	0−80 eV	E/T	551
$\mathbf{e + Hg}$	0−200 eV	E/T	552
$\mathbf{e + CH_3{}^{+}}$	0−100 eV	Exp	553
$\mathbf{e + CD_3{}^{+}}$	0−100 eV	Exp	553
$\mathbf{e + H_2}$	35.4 eV	Th	554
$\mathbf{e + Si}$	3−25 keV	Exp	555
$\mathbf{e + H_2O}$	0−100 eV	E/T	556
$\mathbf{e + CF_4}$	0−1.5 eV	Th	557
$\mathbf{e + H_2}$	2−18 eV	Th	558
$\mathbf{e + H_2}$	2−18 eV	Th	558
$\mathbf{e + SO}$	1−500 eV	Th	559
$\mathbf{e + Cu}$	0−100 eV	E/T	560
$\mathbf{e + Cs}$	5−15 eV	Th	561
$\mathbf{e + Cs}$	5−15 eV	Th	561
$\mathbf{e + AlH}$		Th	562
$\mathbf{e + AlH}$		Th	562
$\mathbf{e + AlH}$		Th	562
$\mathbf{e + U^{91+}}$	0−600 eV	Th	563
$\mathbf{e + N_2}$	75, 150 eV	E/T	564
$\mathbf{e + Xe}$		Exp	565
$\mathbf{e + H_2O}$	0.1−10 eV	Th	566
$\mathbf{e + CH_2O}$	0.1−10 eV	Th	566
$\mathbf{e + H_2}$	4081 eV	Th	567
$\mathbf{e + W}$	50 eV	Exp	568
$\mathbf{e + W^{6+}}$	0−5000 eV	Exp	569
$\mathbf{e + W^{4+}}$	0−5000 eV	Exp	569
$\mathbf{e + W^{2+}}$	0−5000 eV	Exp	569
$\mathbf{e + W}$	0−5000 eV	Exp	569
$\mathbf{e + Mg^{+}}$	0−1000 K	Th	570
$\mathbf{e + Na^{+}}$	0−1000 K	Th	570
$\mathbf{e + O^{+}}$	0−1000 K	Th	570
$\mathbf{e + N^{+}}$	0−1000 K	Th	570
$\mathbf{e + C^{+}}$	0−1000 K	Th	570
$\mathbf{e + He^{+}}$	0−1000 K	Th	570
$\mathbf{e + Ta^{46+}}$	1−1E5 eV	Th	571
$\mathbf{e + Kr^{30+}}$	8.6−9.6 keV	Exp	572
$\mathbf{e + Kr^{31+}}$	8.6−9.6 keV	Exp	572
$\mathbf{e + Kr^{32+}}$	8.6−9.6 keV	Exp	572
$\mathbf{e + Kr^{33+}}$	8.6−9.6 keV	Exp	572
$\mathbf{e + Kr^{34+}}$	8.6−9.6 keV	Exp	572
$\mathbf{e + He}$	9.5 eV	Th	573
$\mathbf{e + Ar}$	8−10.5 eV	Th	574
$\mathbf{e + Ar^{16+}}$	1e2−1e5 eV	E/T	575
$\mathbf{e + O^{6+}}$	1e2−1e5 eV	E/T	575
$\mathbf{e + N^{5+}}$	1e2−1e5 eV	E/T	575
$\mathbf{e + B^{3+}}$	1e2−1e5 eV	E/T	575
$\mathbf{e + Na}$	50?150 eV	Th	576
$\mathbf{e + Li}$	50?150 eV	Th	576
$\mathbf{e + Xe}$	750−7000 eV	Th	577

e + H	750−7000 eV	Th	577
e + Ar	5−300 eV	E/T	578
e + CO_2	0−25 eV	Th	579
e + H_2	0−25 eV	Th	579
e + U^{65+}	0.5Et − 15Et	Th	580
e + At^{58+}	0.5Et − 15Et	Th	580
e + Au^{52+}	0.5Et − 15Et	Th	580
e + W^{47+}	0.5Et − 15Et	Th	580
e + Dy^{39+}	0.5Et − 15Et	Th	580
e + Pr^{32+}	0.5Et − 15Et	Th	580
e + Xe^{27+}	0.5Et − 15Et	Th	580
e + Ag^{20+}	0.5Et − 15Et	Th	580
e + Mo^{15+}	0.5Et − 15Et	Th	580
e + Kr^{9+}	0.5Et − 15Et	Th	580
e + Xe		E/T	581
e + Kr		E/T	581
e + Ar		E/T	581
e + ${Ne_2}^+$	300−10000K	Th	582
e + ${Ne_2}^+$	300−10000K	Th	582
e + Au	50−2000 eV	Th	583
e + Nd	50−2000 eV	Th	583
e + Ag	50−2000 eV	Th	583
e + Cu	50−2000 eV	Th	583
e + Al	50−2000 eV	Th	583
e + H	50−2000 eV	Th	583
e + K	6−60 eV	Th	584
e + CS_2	30 eV to 500 eV	Exp	585
e + SF_6	30 eV to 500 eV	Exp	585
e + CS_2	30 eV to 500 eV	Exp	585
e + SF_6	30 eV to 500 eV	Exp	585
e + Xe	150 eV	E/T	586
e + Ne	150 eV	E/T	586
e + HD^+	0.0001−1 eV	Th	587
e + HD^+	0.0001−1 eV	Th	587
e + HeD	0.0001−1 eV	Th	588
e + HeH	0.0001−1 eV	Th	588
e + HeD	0.0001−1 eV	Th	588
e + HeH	0.0001−1 eV	Th	588
e + Ar	39, 23, and 16.5 eV	Th	589
e + CF_2	2?20 eV,	Exp	590
e + $C_6H_5CH_3$	1.5−200 eV	Exp	591
e + C_6H_6	1.5−200 eV	Exp	591
e + Tm	0−1 eV	Th	592
e + Dy	0−1 eV	Th	592
e + Gd	0−1 eV	Th	592
e + Eu	0−1 eV	Th	592
e + Nd	0−1 eV	Th	592
e + Pr	0−1 eV	Th	592
e + Ce	0−1 eV	Th	592
e + La	0−1 eV	Th	592
e + BeH^+	0−5 eV	Th	593
e + BeH^+	0−5 eV	Th	593
e + C_2D_2	0−10 eV	Exp	594
e + C_2H_2	0−10 eV	Exp	594
e + C_2D_2	0−10 eV	Exp	594
e + C_2H_2	0−10 eV	Exp	594
e + HNC	0−7 eV	Th	595
e + HCN	0−7 eV	Th	595
e + HNC	0−7 eV	Th	595

e + HCN	0−7 eV	Th	595
e + C_2D_2	0−7 eV	Th	596
e + C_2H_2	0−7 eV	Th	596
e + C_2D_2	0−7 eV	Th	596
e + C_2H_2	0−7 eV	Th	596
e + Hg^{76+}	49.0−50.2 eV	Th	597
e + HCO^+	0.001−1 eV	E/T	598
e + HCO^+	0.001−1 eV	E/T	598
e + $D_3{}^+$	0.001−1 eV	E/T	599
e + D_2H	0.001−1 eV	E/T	599
e + H_2D^+	0.001−1 eV	E/T	599
e + $H_3{}^+$	0.001−1 eV	E/T	599
e + $D_3{}^+$	0.001−1 eV	E/T	599
e + D_2H	0.001−1 eV	E/T	599
e + H_2D^+	0.001−1 eV	E/T	599
e + $H_3{}^+$	0.001−1 eV	E/T	599
e + Ca	10.11− 24.6 eV	E/T	600
e + $HCNH^+$	100−700 K	E/T	601
e + $HCNH^+$	100−700 K	E/T	601
e + $Ne_2{}^+$	200−700 K	E/T	602
e + $Ne_2{}^+$	200−700 K	E/T	602
e + Ca^{16+}	15−225 Ry	Th	603
e + Na	0.5− 6.5 eV	Th	604
e + CS	1−100 eV	Th	605
e + CS	1−100 eV	Th	605
e + SF_6	30−5000 eV	Th	606
e + SF_4	30−5000 eV	Th	606
e + SO_2	30−5000 eV	Th	606
e + N_2	0.1?1.0 eV	E/T	607
e + N_2	0.1?1.0 eV	E/T	607
e + $N_2{}^-$	10 eV	E/T	608
e + N_2	10 eV	E/T	608
e + $N_2{}^-$	10 eV	E/T	608
e + N_2	10 eV	E/T	608
e + $N_2{}^-$	10 eV	E/T	608
e + N_2	10 eV	E/T	608
e + C_4H_6	200−4500 eV	Exp	609
e + C_4H_8	200−4500 eV	Exp	609
e + C_3H_6	200−4500 eV	Exp	609
e + C_2H_4	200−4500 eV	Exp	609
e + C_2H_4O	0.7−20 eV	Th	610
e + C_2H_4O	0.7−20 eV	Th	610
e + U^{82+}	150 eV, 30000 eV	Th	611
e + SiH_4	1e−3 − 1e3 eV	Exp	612
e + CH_4	1e−3 − 1e3 eV	Exp	612
e + CF_4	1e−3 − 1e3 eV	Exp	612
e + N_2O	1e−3 − 1e3 eV	Exp	612
e + SF_6	1e−3 − 1e3 eV	Exp	612
e + Xe	1e−3 − 1e3 eV	Exp	612
e + Kr	1e−3 − 1e3 eV	Exp	612
e + Ar	1e−3 − 1e3 eV	Exp	612
e + He	102 eV	E/T	613
e + Cl_2	300−1100 K	Exp	614
e + Cl_2	300−1100 K	Exp	614
e + HCOOH	0.5−2.5 eV	Th	615
e + HCOOH	0.5−2.5 eV	Th	615
e + CH_3Cl	300−1200K	Exp	616
e + NF_3	300−1200K	Exp	616
e + CH_3Cl	300−1200K	Exp	616

$\mathbf{e + NF_3}$	300−1200K	Exp	616
$\mathbf{e + K^+}$	1000−1000000K	Th	617
$\mathbf{e + Ni^+}$	10−100000K	Th	618
$\mathbf{e + Cr^+}$	1000−100000K	Th	619
$\mathbf{e + Zn^{29+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Cu^{28+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Ni}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Co^{26+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Fe^{25+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Mn^{24+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Cr^{23+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + V^{22+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Ti^{21+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Sc^{20+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Ca^{19+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + K^{18+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Ar^{17+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Cl^{16+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + S^{15+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + P^{14+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Si^{13+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Al^{12+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Mg^{11+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Na^{10+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Ne^{9+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + F^{8+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + O^{7+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + N^{6+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + C^{5+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + B^{4+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Be}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Li^{2+}}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + He^+}$	1E−6/Z^2-10/Z^2K	Th	620
$\mathbf{e + Mg^{7+}}$	200−1800eV	Exp	621
$\mathbf{e + S^+}$	5000−100000K	Th	622
$\mathbf{e + N^+}$	2−12eV	Th	623
$\mathbf{e + Li}$	0−25eV	Th	624
$\mathbf{e + CH}$	10−90eV	Exp	625
$\mathbf{e + H_2}$	10−100eV	Th	626
$\mathbf{e + H_2}$	10−100eV	Th	626
$\mathbf{e + CO}$	0−50eV	Th	627
$\mathbf{e + CO}$	0−50eV	Th	627
$\mathbf{e + C_2D_2{}^+}$	6.5−2498.5eV	Exp	628
$\mathbf{e + C_2H_2{}^+}$	6.5−2498.5eV	Exp	628
$\mathbf{e + C_2D_2{}^+}$	6.5−2498.5eV	Exp	628
$\mathbf{e + C_2H_2{}^+}$	6.5−2498.5eV	Exp	628
$\mathbf{e + C_2D_2{}^+}$	6.5−2498.5eV	Exp	629
$\mathbf{e + C_2H_2{}^+}$	6.5−2498.5eV	Exp	629
$\mathbf{e + C_2D_2{}^+}$	6.5−2498.5eV	Exp	630
$\mathbf{e + C_2H_2{}^+}$	6.5−2498.5eV	Exp	630
$\mathbf{e + Ti^{21+}}$	5400−24000eV	Th	631
$\mathbf{e + NH_3}$	15−2000eV	Th	632
$\mathbf{e + NO}$	15−2000eV	Th	632
$\mathbf{e + F}$	15−2000eV	Th	632
$\mathbf{e + O}$	15−2000eV	Th	632
$\mathbf{e + N}$	15−2000eV	Th	632
$\mathbf{e + C}$	15−2000eV	Th	632
$\mathbf{e + C_2D_2{}^+}$	2.1− 2495.1eV	Exp	633
$\mathbf{e + C_2H_2{}^+}$	2.1− 2495.1eV	Exp	633

e + $C_2D_2{}^+$	2.1− 2495.1eV	Exp	633
e + $C_2H_2{}^+$	2.1− 2495.1eV	Exp	633
e + HI	15 – 2000eV	Th	634
e + HBr	15 – 2000eV	Th	634
e + HCl	15 – 2000eV	Th	634
e + HF	15 – 2000eV	Th	634
e + I	15 – 2000eV	Th	634
e + Br	15 – 2000eV	Th	634
e + Cl	15 – 2000eV	Th	634
e + F	15 – 2000eV	Th	634
e + K	0−2000eV	Th	635
e + Na	0−2000eV	Th	635
e + Li	0−2000eV	Th	635
e + K	0−2000eV	Th	635
e + Na	0−2000eV	Th	635
e + Li	0−2000eV	Th	635
e + CH_3Br	50,100,200eV		636
e + CH_3Cl	50,100,200eV		636
e + CH_3I	50,100,200eV		636
e + CH_3F	50,100,200eV		636
e + CH_3Br	50,100,200eV		636
e + CH_3Cl	50,100,200eV		636
e + CH_3I	50,100,200eV		636
e + CH_3F	50,100,200eV		636
e + N_2O	6−5000eV	Exp	637
e + S_2	15−5000eV	Th	638
e + OCS	15−5000eV	Th	638
e + CS_2	15−5000eV	Th	638
e + CS	15−5000eV	Th	638
e + CO_2	15−5000eV	Th	638
e + CO	15−5000eV	Th	638
e + Xe^{24+}	750−1250eV	Th	639
e + He	0−200eV	Th	640
e + C_2	0− 50eV	Th	641
e + CH_3I	6.5eV, 5.9eV, 5.5eV, 4.7eV	Exp	642
e + CH_3Br	6.5eV, 5.9eV, 5.5eV, 4.7eV	Exp	642
e + CH_3Cl	6.5eV, 5.9eV, 5.5eV, 4.7eV	Exp	642
e + CH_3F	6.5eV, 5.9eV, 5.5eV, 4.7eV	Exp	642
e + S^{4+}	10−16eV	Th	643
e + Xe	0−12.5eV	Th	644
e + Kr	0−12.5eV	Th	644
e + NH^+	2.1−2495.1eV	Exp	645
e + NH^+	2.1−2495.1eV	Exp	645
e + Be	0−500eV	Th	646
e + Pu	10−1E9eV	Th	647
e + Np	10−1E9eV	Th	647
e + U	10−1E9eV	Th	647
e + Pa	10−1E9eV	Th	647
e + Th	10−1E9eV	Th	647
e + Ac	10−1E9eV	Th	647
e + Ra	10−1E9eV	Th	647
e + Fr	10−1E9eV	Th	647
e + Rn	10−1E9eV	Th	647
e + At	10−1E9eV	Th	647
e + Po	10−1E9eV	Th	647
e + Bi	10−1E9eV	Th	647
e + Pb	10−1E9eV	Th	647
e + Tl	10−1E9eV	Th	647
e + Hg	10−1E9eV	Th	647

e + Au	10−1E9eV	Th	647
e + Pt	10−1E9eV	Th	647
e + Ir	10−1E9eV	Th	647
e + Os	10−1E9eV	Th	647
e + Re	10−1E9eV	Th	647
e + W	10−1E9eV	Th	647
e + Ta	10−1E9eV	Th	647
e + Hf	10−1E9eV	Th	647
e + Lu	10−1E9eV	Th	647
e + Yb	10−1E9eV	Th	647
e + Tm	10−1E9eV	Th	647
e + Er	10−1E9eV	Th	647
e + Ho	10−1E9eV	Th	647
e + Dy	10−1E9eV	Th	647
e + Tb	10−1E9eV	Th	647
e + Gd	10−1E9eV	Th	647
e + Eu	10−1E9eV	Th	647
e + Sm	10−1E9eV	Th	647
e + Pm	10−1E9eV	Th	647
e + Nd	10−1E9eV	Th	647
e + Pr	10−1E9eV	Th	647
e + Ce	10−1E9eV	Th	647
e + La	10−1E9eV	Th	647
e + Ba	10−1E9eV	Th	647
e + Cs	10−1E9eV	Th	647
e + Xe	10−1E9eV	Th	647
e + I	10−1E9eV	Th	647
e + Te	10−1E9eV	Th	647
e + Sb	10−1E9eV	Th	647
e + Sn	10−1E9eV	Th	647
e + In	10−1E9eV	Th	647
e + Cd	10−1E9eV	Th	647
e + Ag	10−1E9eV	Th	647
e + Pd	10−1E9eV	Th	647
e + Rh	10−1E9eV	Th	647
e + Ru	10−1E9eV	Th	647
e + Tc	10−1E9eV	Th	647
e + Mo	10−1E9eV	Th	647
e + Nb	10−1E9eV	Th	647
e + Zr	10−1E9eV	Th	647
e + Y	10−1E9eV	Th	647
e + Sr	10−1E9eV	Th	647
e + Rb	10−1E9eV	Th	647
e + Kr	10−1E9eV	Th	647
e + Br	10−1E9eV	Th	647
e + Se	10−1E9eV	Th	647
e + As	10−1E9eV	Th	647
e + Ge	10−1E9eV	Th	647
e + Ga	10−1E9eV	Th	647
e + Zn	10−1E9eV	Th	647
e + Cu	10−1E9eV	Th	647
e + Ni	10−1E9eV	Th	647
e + Co	10−1E9eV	Th	647
e + Fe	10−1E9eV	Th	647
e + Mn	10−1E9eV	Th	647
e + Cr	10−1E9eV	Th	647
e + V	10−1E9eV	Th	647
e + Ti	10−1E9eV	Th	647
e + Sc	10−1E9eV	Th	647

e + Ca	10−1E9eV	Th	647
e + K	10−1E9eV	Th	647
e + Ar	10−1E9eV	Th	647
e + Cl	10−1E9eV	Th	647
e + S	10−1E9eV	Th	647
e + P	10−1E9eV	Th	647
e + Si	10−1E9eV	Th	647
e + Al	10−1E9eV	Th	647
e + Mg	10−1E9eV	Th	647
e + Na	10−1E9eV	Th	647
e + Ne	10−1E9eV	Th	647
e + F	10−1E9eV	Th	647
e + O	10−1E9eV	Th	647
e + N	10−1E9eV	Th	647
e + C	10−1E9eV	Th	647
e + B	10−1E9eV	Th	647
e + Be	10−1E9eV	Th	647
e + Li	10−1E9eV	Th	647
e + He	10−1E9eV	Th	647
e + H	10−1E9eV	Th	647
e + W	9keV−40keV	Exp	648
e + Gd	9keV−40keV	Exp	648
$\mathbf{e + H_2}$		Th	649
$\mathbf{e + H_2}$		Th	649
e + Mg		Th	650
e + Mg		Th	650
$\mathbf{e + Ni^{13+}}$	0−100eV	Th	651
$\mathbf{e + In^{+}}$	33−120eV	Exp	652
$\mathbf{e + Ar^{+}}$	25−2495eV	Exp	653
e + Be	10−50eV	Exp	654
e + Be	10−50eV	Exp	654
e + Ar	113.5 eV − 600 eV	E/T	655
e + Ne	113.5 eV − 600 eV	E/T	655
$\mathbf{e + GeH_4}$	20eV− 100eV		656
$\mathbf{e + Si_2H_6}$	20eV− 100eV		656
$\mathbf{e + SiH_4}$	20eV− 100eV		656
$\mathbf{e + SF_6}$	20eV− 100eV		656
$\mathbf{e + NF_3}$	20eV− 100eV		656
$\mathbf{e + CF_3I}$	20eV− 100eV		656
e + F	20eV− 100eV		656
$\mathbf{e + CH_3}$	20eV− 100eV		656
$\mathbf{e + CH_2F_2}$	20eV− 100eV		656
$\mathbf{e + CHF_3}$	20eV− 100eV		656
$\mathbf{e + C_6F_6}$	20eV− 100eV		656
$\mathbf{e + C_4F_8}$	20eV− 100eV		656
$\mathbf{e + C_3F_8}$	20eV− 100eV		656
$\mathbf{e + C_3F_6}$	20eV− 100eV		656
$\mathbf{e + F_6}$	20eV− 100eV		656
$\mathbf{e + C_2}$	20eV− 100eV		656
$\mathbf{e + C_2F_4}$	20eV− 100eV		656
$\mathbf{e + CF_4}$	20eV− 100eV		656
$\mathbf{e + CF_2}$	20eV− 100eV		656
e + C	5−5000K	Th	657
e + C	5−5000K	Th	657
$\mathbf{e + H_3{}^{+}}$	1−7000K	Th	658
e + Kr	10−3000eV	Th	659
e + Fe	10−3000eV	Th	659
e + Ne	10−3000eV	Th	659
e + H	10−3000eV	Th	659

e + Bi	7−30keV	Exp	660
e + Zn	7−30keV	Exp	661
e + Ca	7−30keV	Exp	661
e + S	7−30keV	Exp	661
$\mathbf{e + C_6H_6}$	1−1000eV	Th	662
$\mathbf{e + SF_6}$	1−1000eV	Th	662
$\mathbf{e + CF_4}$	1−1000eV	Th	662
$\mathbf{e + CO_2}$	1−1000eV	Th	662
e + Na	0−5.5eV	Th	663
e + He	10−500eV	Th	664
e + He	10−500eV	Th	664
e + He	20−500eV	Th	665
e + He	20−500eV	Th	665
$\mathbf{e + C^+}$	5−20000eV	Th	666
e + C	5−20000eV	Th	666
e + H	10−80eV	Th	667
e + H	0−12eV	Th	668
e + CO	0−5eV	Exp	669
e + CO	0−5eV	Exp	669
$\mathbf{e + Mo^{41+}}$	1−15u(scaled unit)	Exp	670
$\mathbf{e + Dy^{65+}}$	1−15u(scaled unit)	Exp	670
$\mathbf{e + Fe^{25+}}$	1−15u(scaled unit)	Exp	670
$\mathbf{e + Ar^{17+}}$	1−15u(scaled unit)	Exp	670
$\mathbf{e + Ne^{9+}}$	1−15u(scaled unit)	Exp	670
e + Na	0−6eV	Th	671
e + He		Th	672
e + Cu	1−5eV		673
$\mathbf{e + H_2}$	1−5eV	Exp	674
$\mathbf{e + N_2}$	400−1500eV	Exp	675
e + H	0−150eV	Th	676
$\mathbf{e + C_4H_4O}$	0.6−400eV	Exp	677
$\mathbf{e + C_4H_4O}$	0.6−400eV	Exp	677
e + SO	1−10eV	Th	678
e + SO	1−10eV	Th	678
$\mathbf{e + H_2O}$	10−10000eV	Th	679
$\mathbf{e + O_2}$	5.9−5000eV	Exp	680
$\mathbf{e + FD_2{}^+}$	2−100eV	Exp	681
$\mathbf{e + OD_2{}^+}$	2−100eV	Exp	681
$\mathbf{e + ND_2{}^+}$	2−100eV	Exp	681
$\mathbf{e + BD_2{}^+}$	2−100eV	Exp	681
$\mathbf{e + CH_2{}^+}$	2−100eV	Exp	681
$\mathbf{e + FD_2{}^+}$	2−100eV	Exp	681
$\mathbf{e + OD_2{}^+}$	2−100eV	Exp	681
$\mathbf{e + ND_2{}^+}$	2−100eV	Exp	681
$\mathbf{e + BD_2{}^+}$	2−100eV	Exp	681
$\mathbf{e + CH_2{}^+}$	2−100eV	Exp	681
$\mathbf{e + B^{2+}}$	0−40eV	Th	682
$\mathbf{e + B^+}$	0−40eV	Th	682
e + B	0−40eV	Th	682
$\mathbf{e + CO_2}$	10−26keV	Exp	683
$\mathbf{e + CO_2}$	10−26keV	Exp	683
e + H	0−250eV	Th	684
e + H	0−250eV	Th	684
e + NH	0−10eV	Th	685
e + NH	0−10eV	Th	685
$\mathbf{e + BH_2}$	0−10eV	Th	686
$\mathbf{e + BH_2}$	0−10eV	Th	686
$\mathbf{e + O_3{}^+}$	3−100eV	Exp	687
e + H	9.52−10.26eV	Th	688

e + H_2	1−10eV	Th	689
e + He	10−4000eV		690
e + He	10−4000eV		690
e + D_2	0.1−100eV		691
e + H_2	0.1−100eV		691
e + HD	0.1−100eV		691
e + D_2	0.1−100eV		691
e + H_2	0.1−100eV		691
e + HD	0.1−100eV		691
e + Zn^{12+}	0.1−10000eV	Th	692
e + Cu^{11+}	0.1−10000eV	Th	692
e + Ni^{10+}	0.1−10000eV	Th	692
e + Co^{9+}	0.1−10000eV	Th	692
e + Fe^{8+}	0.1−10000eV	Th	692
e + Mn^{7+}	0.1−10000eV	Th	692
e + Cr^{6+}	0.1−10000eV	Th	692
e + V^{5+}	0.1−10000eV	Th	692
e + Ti^{4+}	0.1−10000eV	Th	692
e + Sc^{3+}	0.1−10000eV	Th	692
e + Ca^{2+}	0.1−10000eV	Th	692
e + K^{+}	0.1−10000eV	Th	692
e + Ca	20−500eV	Th	693
e + Ca	20−500eV	Th	693
e + Ba^{48+}	8.7−24keV	Th	694
e + Ba^{49+}	8.7−24keV	Th	694
e + Ba^{50+}	8.7−24keV	Th	694
e + Ba^{51+}	8.7−24keV	Th	694
e + Ba^{52+}	8.7−24keV	Th	694
e + Ba^{53+}	8.7−24keV	Th	694
e + Ba^{54+}	8.7−24keV	Th	694
e + I^{45+}	8.7−24keV	Th	694
e + I^{46+}	8.7−24keV	Th	694
e + I^{47+}	8.7−24keV	Th	694
e + I^{48+}	8.7−24keV	Th	694
e + I^{49+}	8.7−24keV	Th	694
e + I^{50+}	8.7−24keV	Th	694
e + I^{51+}	8.7−24keV	Th	694
e + Kr^{28+}	8.7−24keV	Th	694
e + Kr^{29+}	8.7−24keV	Th	694
e + Kr^{30+}	8.7−24keV	Th	694
e + Kr^{31+}	8.7−24keV	Th	694
e + Kr^{32+}	8.7−24keV	Th	694
e + Kr^{33+}	8.7−24keV	Th	694
e + Kr^{34+}	8.7−24keV	Th	694
e + H_2O	6−50eV	Th	695
e + U^{64+}	5−69000eV	Th	696
e + At^{57+}	5−69000eV	Th	696
e + Pb^{54+}	5−69000eV	Th	696
e + Au^{51+}	5−69000eV	Th	696
e + W^{46+}	5−69000eV	Th	696
e + Yb^{42+}	5−69000eV	Th	696
e + Gd^{36+}	5−69000eV	Th	696
e + Nd^{32+}	5−69000eV	Th	696
e + Xe^{26+}	5−69000eV	Th	696
e + Sn^{22+}	5−69000eV	Th	696
e + Ag^{19+}	5−69000eV	Th	696
e + Mo^{14+}	5−69000eV	Th	696
e + Kr^{8+}	5−69000eV	Th	696
e + Eu	10eV, 20eV	Th	697

e + Mn	10eV, 20eV	Th	697
e + Sb	10eV, 20eV	Th	697
e + Ag	10eV, 20eV	Th	697
e + Fr	2−300eV	Th	698
e + Cs	2−300eV	Th	698
e + Rb	2−300eV	Th	698
$\mathbf{e + CF_3H}$	1.5−30eV	Exp	699
$\mathbf{e + CF_3I}$	1.5−30eV	Exp	699
$\mathbf{e + W^{35+}}$	5−3000eV	Th	700
e + Sb	6−1000eV	Th	701
e + Sb	6−1000eV	Th	701
e + Kr	5−10eV	Exp	702
$\mathbf{e + CF_3I}$	10−50eV	Exp	703
e + Er	0−1eV	Th	704
e + Ho	0−1eV	Th	704
e + Sm	0−1eV	Th	704
e + Dy	0−1eV	Th	704
e + Hf	0−1eV	Th	704
e + Tm	0−1eV	Th	704
e + Pr	0−1eV	Th	704
$\mathbf{e + CD_5{}^+}$	0.0001− 1eV	Exp	705
$\mathbf{e + CH_5{}^+}$	0.0001− 1eV	Exp	705
$\mathbf{e + D_2H^+}$	0.0001 − 10eV	Exp	706
$\mathbf{e + U^{91+}}$	1−700MeV/nucleon	Th	707
$\mathbf{e + C_4H_4O}$	1−50eV	Exp	708
$\mathbf{e + C_4H_4O}$	1−50eV	Exp	708
e + DCN	1.2−3.1eV	Exp	709
e + HCN	1.2−3.1eV	Exp	709
$\mathbf{e + N_2}$	400−1600eV	Exp	710
e + Hg	0−200eV	Th	711
$\mathbf{e + H_3{}^+}$	0.00001−30eV	Exp	712
e + Ne	0−200eV	Th	713
$\mathbf{e + Ni^{5+}}$	10−1000000eV	Th	714
$\mathbf{e + Ar^{5+}}$	10−1000000eV	Th	714
$\mathbf{e + Ti^{2+}}$	10−1000000eV	Th	714
$\mathbf{e + S^{4+}}$	10−1000000eV	Th	714
$\mathbf{e + Cr^{8+}}$	10−1000000eV	Th	714
$\mathbf{e + Si^{3+}}$	10−1000000eV	Th	714
$\mathbf{e + U^{82+}}$	10−1000000eV	Th	714
$\mathbf{e + N^{3+}}$	10−1000000eV	Th	714
$\mathbf{e + Ne^{3+}}$	10−1000000eV	Th	714
$\mathbf{e + Ne^{8+}}$	10−1000000eV	Th	714
$\mathbf{e + U^{89+}}$	10−1000000eV	Th	714
$\mathbf{e + C^{5+}}$	10−1000000eV	Th	714
e + CNN	0−10eV	Th	715
e + NCN	0−10eV	Th	715
e + HBr	0−1000eV	Th	716
e + HBr	0−1000eV	Th	716
$\mathbf{e + CH_4}$	5−1000eV	Th	717
$\mathbf{e + CH_3}$	5−1000eV	Th	717
$\mathbf{e + CH_2}$	5−1000eV	Th	717
e + CH	5−1000eV	Th	717
$\mathbf{e + CH_4}$	5−1000eV	Th	717
$\mathbf{e + CH_3}$	5−1000eV	Th	717
$\mathbf{e + CH_2}$	5−1000eV	Th	717
e + CH	5−1000eV	Th	717
$\mathbf{e + CH_4}$	5−1000eV	Th	717
$\mathbf{e + CH_3}$	5−1000eV	Th	717
$\mathbf{e + CH_2}$	5−1000eV	Th	717

$\mathbf{e + CH}$	5−1000eV	Th	717
$\mathbf{e + C_2H_5OH}$	60−500eV	Exp	718
$\mathbf{e + CH_3OH}$	60−500eV	Exp	718
$\mathbf{e + C_4H_4N_2}$	0.1−1000eV	Th	719
$\mathbf{e + C_2H_6}$	40−100eV		720
$\mathbf{e + C_2H_6}$	40−100eV		720
$\mathbf{e + C_4H_{10}}$	10−1000eV	Th	721
$\mathbf{e + C_3H_8}$	10−1000eV	Th	721
$\mathbf{e + C_2H_6}$	10−1000eV	Th	721
$\mathbf{e + C_4H_8}$	10−1000eV	Th	721
$\mathbf{e + C_3H_6}$	10−1000eV	Th	721
$\mathbf{e + C_2H_4}$	10−1000eV	Th	721
$\mathbf{e + C_3H_4}$	200−4500eV	Exp	722
$\mathbf{e + C_2H_2}$	200−4500eV	Exp	722
$\mathbf{e + CS_2}$	1−1000eV	Th	723
$\mathbf{e + CS_2}$	1−1000eV	Th	723
$\mathbf{e + HCl}$	0−4eV	Th	724
$\mathbf{e + C_3H_8}$	40−500eV		725
$\mathbf{e + C_3H_8}$	40−500eV		725
$\mathbf{e + Kr}$	0.014− 20eV	Exp	726
$\mathbf{e + C_4H_9OH}$	1−50eV	Th	727
$\mathbf{e + C_4H_9OH}$	1−50eV	Th	727
$\mathbf{e + S^{8+}}$	2E2−2E6 (Z+1)^2 K	Th	730
$\mathbf{e + S^{9+}}$	2E2−2E6 (Z+1)^2 K	Th	730
$\mathbf{e + S^{10+}}$	2E2−2E6 (Z+1)^2 K	Th	730
$\mathbf{e + S^{11+}}$	2E2−2E6 (Z+1)^2 K	Th	730
$\mathbf{e + Kr^{27+}}$	1E7−1E9 K	Th	731
$\mathbf{e + Se^{24+}}$	100−10000 eV	Th	732
$\mathbf{e + Ni^{+}}$	30 − 1E6 K	Th	733
$\mathbf{e + Fe^{7+}}$	5E3−5E6 K	Th	734
$\mathbf{e + N^{+}}$	500 − 1E5 K	Th	735
$\mathbf{e + Cr^{+}}$	2E3−1E5 K	Th	736
$\mathbf{e + H}$	50−300 eV	Th	737
$\mathbf{e + H}$	50−300 eV	Th	737
$\mathbf{e^{+} + U^{91+}}$	1−10 threshold unit	Th	738
$\mathbf{e + H}$	50−300 eV	Th	739
$\mathbf{e + H}$	50−300 eV	Th	739
$\mathbf{e + Ar}$	2500 eV	Exp	740
$\mathbf{e + N_2}$	5−30 eV	Th	741
$\mathbf{e + N_2}$	5−30 eV	Th	741
$\mathbf{e + HD^{+}}$	1−12 eV	Th	742
$\mathbf{e + CH_4}$	0.01−2E3 eV	Th	743
$\mathbf{e + SiH_4}$	0.01−2E3 eV	Th	743
$\mathbf{e + H_2O}$	0.01−2E3 eV	Th	743
$\mathbf{e + Xe}$	threshold−200 eV	Th	744
$\mathbf{e + Ar}$	4−12 eV, 50−400 eV	Th	745
$\mathbf{e + Nd^{+}}$	threshold−2.5 keV	E/T	746
$\mathbf{e + H}$	150, 250 eV	Th	747
$\mathbf{e + H}$	150, 250 eV	Th	747
$\mathbf{e}$	threshold−1 keV	Th	748
$\mathbf{e + e}$	0−300 eV	Exp	749
$\mathbf{e + H_2S}$	20−200 eV	Exp	750
$\mathbf{e}$	threshold−2 keV	Th	751
$\mathbf{e + e}$	threshold−2 keV	Th	751
$\mathbf{e + e}$	threshold−2 keV	Th	752
$\mathbf{e + HCOOH}$	threshold−2 keV	Th	752
$\mathbf{e + PH_3}$	threshold−2 keV	Th	752
$\mathbf{e + H_2S}$	threshold−2 keV	Th	752
$\mathbf{e + Ba^{46+}}$	5.69, 8.2 keV	Th	753

$\mathbf{e + U}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Bi}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Pb}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Au}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Ta}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Ni}^{4+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Ni}^{7+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Fe}^{5+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Ni}^{8+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Fe}^{6+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Ti}^{2+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + e}^{+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Ar}^{3+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Cr}^{10+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Ar}^{4+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Ar}^{5+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Cl}^{4+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Ar}^{6+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Cl}^{5+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + S}^{4+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Mg}^{2+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Si}^{5+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Ne}^{+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Si}^{6+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Ne}^{2+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + F}^{2+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + O}^{+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + O}^{2+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + N}^{+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + O}^{3+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + N}^{2+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + C}^{+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + U}^{88+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Ne}^{6+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + C}^{2+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Li}^{+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + B}^{3+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + C}^{4+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + N}^{5+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + O}^{6+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + U}^{90+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Be}^{+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + B}^{2+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + N}^{4+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + O}^{5+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Ne}^{7+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + U}^{89+}$	threshold−200 MeV, −1GeV	Th	754
$\mathbf{e + Ne}$	threshold−200 eV	Th	755
$\mathbf{e + CH}_4$	30−200 eV	Exp	756
$\mathbf{e + SiCl}_4$	30−200 eV	Exp	757
$\mathbf{e + C}_6\mathbf{H}_6$	10−200 eV	E/T	758
$\mathbf{e + C}_6\mathbf{H}_6$	10−200 eV	E/T	758
$\mathbf{e + C}_4\mathbf{H}_8\mathbf{O}$	15−50 eV	Exp	759
$\mathbf{e + C}_4\mathbf{H}_8\mathbf{O}$	15−50 eV	Exp	759
$\mathbf{e + e}$	threshold−360 eV	Exp	760
$\mathbf{e + e}$	0.4−20 eV	Exp	761
$\mathbf{e + e}$	0.4−20 eV	Exp	761
$\mathbf{e + e}$	0.4−20 eV	Exp	761
$\mathbf{e + CF}_4$		Th	762

e + C_4H_8O	5.5−10 eV	Exp	763
e + $C_4H_4N_2$	0−20 eV	Th	764
e + CCl_4	1.5−100 eV	Exp	765
e + e	threshold−2 keV	Th	766
e + $P(CH_3)_3$	threshold−2 keV	Th	766
e^+ + H	20 eV	Th	767
e^+ + H	20 eV	Th	767
e + U^{91+}	1−15 threshold unit, 1−2000 keV	Th	768
e + Yb	20 eV	E/T	769
e + Yb	20 eV	E/T	769
e^+ + H	250 eV	Th	770
e + H	250 eV	Th	770
e^+ + H	250 eV	Th	770
e + H	250 eV	Th	770
e^+ + H_2	0−10 eV	Th	771
e + Ar	threshold−100 eV	Exp	772
e + Ar	threshold−100 eV	Exp	772
e + He	80, 100, 120 eV	E/T	773
e + He	80, 100, 120 eV	E/T	773
e + He	500 eV	E/T	774
e + He	500 eV	E/T	774
e + C_4H_8O	5−150 eV	Exp	775
e + Mg	10, 15, 20, 40, 60 eV	Exp	776
e + Mg	10, 15, 20, 40, 60 eV	Exp	776
e + He	threshold−1 keV	Th	777
e + Kr	10−15 eV	E/T	778
e + Kr	10−15 eV	E/T	778
e + He	28.6 eV	Th	779
e + He	28.6 eV	Th	779
e + D_2H^+	5 eV−2.5 keV	Exp	780
e + Ar	20−100 eV	Th	781
e + Ne	20−100 eV	Th	781
e + Ar	20−100 eV	Th	781
e + Ne	20−100 eV	Th	781
e + ${H_2}^+$	1−12 eV	Th	782
e + B^+	63−750 eV	Th	783
e + Ca	10−12 eV	Exp	784
e + Ca	10−12 eV	Exp	784
e + Xe	threshold−2000 eV	Th	785
e + I	threshold−2000 eV	Th	785
e + Te	threshold−2000 eV	Th	785
e + Sb	threshold−2000 eV	Th	785
e + Sn	threshold−2000 eV	Th	785
e + In	threshold−2000 eV	Th	785
e + N_2	600−700 eV	Exp	786
e + Ar	600−700 eV	Exp	786
e + Ne	600−700 eV	Exp	786
e + N_2	600−700 eV	Exp	786
e + Ar	600−700 eV	Exp	786
e + Ne	600−700 eV	Exp	786
e + W^+	threshold−500 eV	Th	787
e + W	threshold−500 eV	Th	787
e	threshold−2000 eV	Th	788
e + Cs	10−600 eV	Exp	789
e + H	$E_a/E = 0.1$, 0.3 (ratio of outgoing electron energy to incid	Th	790
e + W^{17+}	threshold−1000 eV	E/T	791
e + Ar	13 eV	Exp	792
e + Ar	13 eV	Exp	792
e^+ + H	10−200 eV	Th	793

$\mathbf{e + Ne^{2+}}$	1E3−1E6 K	Th	794
$\mathbf{e + H_2O}$	100 eV	Exp	795
$\mathbf{e + C_8H_{16}}$	10−200 eV	Exp	796
$\mathbf{e + C_6H_{12}}$	10−200 eV	Exp	796
$\mathbf{e^+ + C_2H_2}$	0−5 eV	Th	797
$\mathbf{e + N_2}$	0−250 meV	E/T	798
$\mathbf{e + N_2}$	500−600 eV	Th	799
$\mathbf{e + N_2}$	500−600 eV	Th	799
$\mathbf{e + N_2O}$	0.65−4.55 eV	Exp	800
$\mathbf{e + N_2O}$	0.65−4.55 eV	Exp	800
e + e	1−400 eV	E/T	801
e + e	1−400 eV	E/T	801
$\mathbf{e + Xe^{10+}}$	threshold−1000 eV	E/T	802
$\mathbf{e + S_2}$	threshold−370 eV	E/T	803
$\mathbf{e + C_2H_2CL_2}$	0−20 eV	Th	804
$\mathbf{e + N_2}$	18.8−300 eV	Exp	806
$\mathbf{e + D_2}$	1−12 eV	Th	808
e + Ba	6−30 keV	Exp	809
e + Cl	6−30 keV	Exp	809
e + He	500, 1240−4260 eV	Th	810
e + He	500, 1240−4260 eV	Th	810
e + Hf	0−1.0 eV	Th	811
e + Lu	0−1.0 eV	Th	811
e + Tm	0−1.0 eV	Th	811
$\mathbf{e + CH_4}$	threshold−1000 eV	Th	812
$\mathbf{e + NH_3}$	threshold−1000 eV	Th	812
$\mathbf{e + H_2O}$	threshold−1000 eV	Th	812
e + Hf	threshold−1000 eV	Th	812
e + He	1000 eV	Th	813
e + He	1000 eV	Th	813
e + In	10−100 eV	Th	814
e + In	10−100 eV	Th	814
e + Hg	4−10 eV	Exp	815
e + Na	10−65 eV	Th	816
e + Na	10−65 eV	Th	816
$\mathbf{e + Cs_2}$	100 eV	E/T	817
$\mathbf{e + H_2O}$	2055 eV	E/T	818
$\mathbf{e + H_2O}$	2055 eV	E/T	818
$\mathbf{e + H_2O}$	1 keV	Th	819
$\mathbf{e + H_2O}$	1 keV	Th	819
e + Bi	threshold−50 keV	Th	820
e + Pb	threshold−50 keV	Th	820
e + Au	threshold−50 keV	Th	820
e + Os	threshold−50 keV	Th	820
e + Re	threshold−50 keV	Th	820
e + W	threshold−50 keV	Th	820
e + Ta	threshold−50 keV	Th	820
e + Hf	threshold−50 keV	Th	820
e + Pd	threshold−18 keV	Exp	821
e + Kr	0.3−9.8 eV	Th	822
e + Na	6−60 eV	Th	823
e + Na	6−60 eV	Th	823
e + H	11.2−12.1 eV	Th	824
e + Zn	6.5−8.5 eV	Exp	825
e + I	1−50 eV	E/T	826
$\mathbf{e + PH_3}$	0.01−2000 eV	Th	827
$\mathbf{e + H_2S}$	0.01−2000 eV	Th	827
$\mathbf{e + NH_3}$	0.01−2000 eV	Th	827
e + Kr	15−30 eV	Exp	828

$\mathbf{e + Ar}$	15−30 eV	Exp	828
$\mathbf{e + Kr}$	15−30 eV	Exp	828
$\mathbf{e + Ar}$	15−30 eV	Exp	828
$\mathbf{e + Co}$	threshold−10 eV	Exp	829
$\mathbf{e + Co}$	threshold−10 eV	Exp	829
$\mathbf{e + C_4H_2}$	1−10 eV	Exp	830
$\mathbf{e + C_4H_2}$	1−10 eV	Exp	830
$\mathbf{e + CH_4}$	54 eV	Exp	831
$\mathbf{e + He}$	5500−5600 eV	Th	832
$\mathbf{e + He}$	5500−5600 eV	Th	832
$\mathbf{e + Yb}$	threshold−200 eV	Th	833
$\mathbf{e + Yb}$	threshold−200 eV	Th	833
$\mathbf{e + He}$	70.6 eV	E/T	834
$\mathbf{e + He}$	70.6 eV	E/T	834
$\mathbf{e + Ar}$	195 eV	E/T	835
$\mathbf{e + Ar}$	195 eV	E/T	835
$\mathbf{e + Ba^+}$	threshold−300 eV	Th	836
$\mathbf{e + Cd^+}$	threshold−300 eV	Th	836
$\mathbf{e + Zn^+}$	threshold−300 eV	Th	836
$\mathbf{e + Ca^+}$	threshold−300 eV	Th	836
$\mathbf{e + Mg^+}$	threshold−300 eV	Th	836
$\mathbf{e + C_4H_2}$	1−15 eV	E/T	837
$\mathbf{e + C^{3+}}$	threshold−50 eV	Th	838
$\mathbf{e + e}$	500−30000 K	Th	839
$\mathbf{e + e}$	500−30000 K	Th	839
$\mathbf{e + e}$	500−30000 K	Th	839
$\mathbf{e + H_2O}$	310−340 eV	Th	840
$\mathbf{e + H_2O}$	310−340 eV	Th	840
$\mathbf{e + Fe^{16+}}$	820−1150 eV	Th	841
$\mathbf{e + H_2}$	1−1000 eV	Th	842
$\mathbf{e + Ne^{3+}}$	1E4−1E6, 1E7 K	Th	843
$\mathbf{e + Ne^{6+}}$	1E4−1E6, 1E7 K	Th	843
$\mathbf{e + He}$	250 eV	E/T	844
$\mathbf{e + He}$	250 eV	E/T	844
$\mathbf{e + e}$	0−10 eV	Th	845
$\mathbf{e + e}$	0−10 eV	Th	845
$\mathbf{e + Ne}$	threshold−100 eV	Th	846
$\mathbf{e + Ar}$	threshold−100 eV	Th	846
$\mathbf{e + Ne}$	threshold−100 eV	Th	846
$\mathbf{e + Ar}$	threshold−100 eV	Th	846
$\mathbf{e + He}$	40.84−45.60 eV	Th	847
$\mathbf{e + SO_2}$	100−1000 eV	E/T	848
$\mathbf{e^+ + H_2O}$	250 eV	Th	849
$\mathbf{e + H_2O}$	250 eV	Th	849
$\mathbf{e^+ + H_2O}$	250 eV	Th	849
$\mathbf{e + H_2O}$	250 eV	Th	849
$\mathbf{e + Nd^{56+}}$	(1−5)?threshold	Th	850
$\mathbf{e + Mo^{38+}}$	(1−5)?threshold	Th	850
$\mathbf{e + Bi^{79+}}$	(1−5)?threshold	Th	850
$\mathbf{e + N_2D^+}$	5−100 eV	Exp	851
$\mathbf{e + H_2}$	4087 eV	Th	852
$\mathbf{e + CO_2}$	12 keV	Exp	853
$\mathbf{e + C_3H_7OH}$	1.5−30 eV	E/T	854
$\mathbf{e + S_2}$	0−10 eV	Th	855
$\mathbf{e + S_2}$	0−10 eV	Th	855
$\mathbf{e + S_2}$	0−10 eV	Th	855
$\mathbf{e + H_2CO}$	1−1000 eV	Th	856
$\mathbf{e + HCOOH}$	1−1000 eV	Th	856
$\mathbf{e + CF_3Cl}$	0.4−2.4 eV	Th	857

e + He	112−319 eV	Th	858
e + He	112−319 eV	Th	858
e + He	112−319 eV	Th	858
e + SiBR$_4$	1−10 eV	Th	859
e + SiI$_4$	1−10 eV	Th	859
e + SiCl$_4$	1−10 eV	Th	859
e + C$_4$H$_4$O	5−15 eV	Exp	860
e + C$^+$	threshold−25 eV	Th	861
e + C$^+$	threshold−25 eV	Th	861
e	1−6 eV	Th	862
e + e	1−6 eV	Th	862
e + Mg	47.65 eV	Exp	863
e + Mg	47.65 eV	Exp	863
e + He	70 − 150 eV	Th	864
e + He	70 − 150 eV	Th	864
e + He	70 − 150 eV	Th	864
e + Li$^+$	1E4−1E6 K	Th	865
e + Be^{2+}	1E4−1E6 K	Th	865
e + B^{3+}	1E4−1E6 K	Th	865
e + C^{4+}	1E4−1E6 K	Th	865
e + Co^{3+}	40−70 eV	Th	866
e + C$_{60}$	threshold−1000 eV	Th	867
e + Ca^{9+}	1−5000 eV	Th	868
e + Ti^{11+}	1−5000 eV	Th	868
e + Cr^{13+}	1−5000 eV	Th	868
e + Fe^{15+}	1−5000 eV	Th	868
e + Ni^{17+}	1−5000 eV	Th	868
e + Zn^{19+}	1−5000 eV	Th	868
e + Fe^{12+}	1E5−1E8 K	Exp	869
e + Ne^{2+}	100−700 K	Exp	870
e + Ne^{2+}	100−700 K	Exp	870
e + H$_3{}^+$	10−2000 K	Th	871
e + CH$_4$	8−12 eV	Exp	872
e + Ar^{2+}	3E3−1E4 K	Exp	873
e + C$_2$H$_2$	threshold−1000 eV	Th	874
e + C$_2$H$_4$	threshold−1000 eV	Th	874
e + C$_3$H$_6$	threshold−1000 eV	Th	874
e + Mg^{6+}	1E5 K	Th	875
e + Na^{6+}	1E5 K	Th	875
e + Al^{7+}	1E5 K	Th	875
e + Na^{7+}	1E5 K	Th	875
e + Mg^{8+}	1E5 K	Th	875
e + Al^{9+}	1E5 K	Th	875
e + Mg^{9+}	1E5 K	Th	875
e + Al^{10+}	1E5 K	Th	875
e + Si^{10+}	1E5 K	Th	875
e + Ti^{10+}	1E5 K	Th	875
e + Cr^{12+}	1E5 K	Th	875
e + Cr^{13+}	1E5 K	Th	875
e + Fe^{14+}	1E5 K	Th	875
e + Fe^{15+}	1E5 K	Th	875
e + Ni^{17+}	1E5 K	Th	875
e + Fe^{22+}	1E5 K	Th	875
e + e	0−30 eV	Exp	876
e + N$_2$H	300−500 K	Exp	877
e + e$^+$	300 K	Exp	878
e + GeH$_4$	6−11 eV	Exp	879
e + CH$_4$	6−11 eV	Exp	879
e + SiH$_4$	6−11 eV	Exp	879

$\mathbf{e + e}$	300 K	Exp	880
$\mathbf{e + CF_3}$	300−600 K	E/T	881
$\mathbf{e + CH_2Cl_2}$	0−2.0 eV	Th	882
$\mathbf{e + C_2H_4Cl_2}$	0−2.0 eV	Th	882
$\mathbf{e + e}$	0−2.0 eV	Th	882
$\mathbf{e + W^{28+}}$	0.1−10000 eV	Th	883
$\mathbf{e + CH_3I}$	5−50 eV	Exp	884
$\mathbf{e + Ar}$	80−220 eV	Exp	885
$\mathbf{e + Ar^{17+}}$	(2−28)*threshold, threshold−100 eV	Th	886
$\mathbf{e + Ti^{21+}}$	(2−28)*threshold, threshold−100 eV	Th	886
$\mathbf{e + Fe^{25+}}$	(2−28)*threshold, threshold−100 eV	Th	886
$\mathbf{e + Hg}$	(2−28)*threshold, threshold−100 eV	Th	886
$\mathbf{e + Sn^{4+}}$	1−1000 eV	Th	887
$\mathbf{e + Sn^{5+}}$	1−1000 eV	Th	887
$\mathbf{e + Sn^{6+}}$	1−1000 eV	Th	887
$\mathbf{e + Sn^{7+}}$	1−1000 eV	Th	887
$\mathbf{e + Sn^{8+}}$	1−1000 eV	Th	887
$\mathbf{e + Sn^{9+}}$	1−1000 eV	Th	887
$\mathbf{e + Sn^{10+}}$	1−1000 eV	Th	887
$\mathbf{e + Sn^{11+}}$	1−1000 eV	Th	887
$\mathbf{e + Sn^{12+}}$	1−1000 eV	Th	887
$\mathbf{e + Sn^{13+}}$	1−1000 eV	Th	887
$\mathbf{e + Y}$	0−7 eV	Th	888
$\mathbf{e + Ru}$	0−7 eV	Th	888
$\mathbf{e + Pd}$	0−7 eV	Th	888
$\mathbf{e + Ag}$	0−7 eV	Th	888
$\mathbf{e + Pt}$	0−7 eV	Th	888
$\mathbf{e + CO_2}$	8.2 eV	E/T	889
$\mathbf{e + Ni^{10+}}$	0.1−5000 eV	Th	890
$\mathbf{e + S_2}$	threshold−100 eV	E/T	891
$\mathbf{e + Ar}$	100−500 eV	Th	892
$\mathbf{e^+ + Ar}$	100−500 eV	Th	892
$\mathbf{e + Ar}$	100−500 eV	Th	892
$\mathbf{e^+ + Ar}$	100−500 eV	Th	892
$\mathbf{e + Fe^{15+}}$	300−900 eV	Th	893
$\mathbf{e + C_4H_4N_2O_2}$	0.7−2.3 eV	Th	894
$\mathbf{e + e}$	0.7−2.3 eV	Th	894
$\mathbf{e + W^{20+}}$	0−140 eV	Exp	895
$\mathbf{e + U^{91+}}$	63−90 keV	E/T	896
$\mathbf{e + HCN}$	0−4 eV	Th	897
$\mathbf{e + DCN}$	0−4 eV	Th	897
$\mathbf{e + H^{3+}}$	1E−5−1E0 eV	E/T	898
$\mathbf{e + C^{3+}}$	threshold	Th	899
$\mathbf{e + Mn}$	0−1 eV	Th	900
$\mathbf{e + Ni}$	0−1 eV	Th	900
$\mathbf{e + Cu}$	0−1 eV	Th	900
$\mathbf{e + Zn}$	0−1 eV	Th	900
$\mathbf{e + Ag}$	0−1 eV	Th	900
$\mathbf{e + Cd}$	0−1 eV	Th	900
$\mathbf{e + Sn^{12+}}$	1−1000 eV	Th	901
$\mathbf{e^+ + Mg}$	0.01−100 eV	Th	902
$\mathbf{e + e}$	0−10 eV	Th	903
$\mathbf{e + HD^+}$	1E−4−20 eV	E/T	904
$\mathbf{e + H_2O}$	11.3 eV	E/T	905
$\mathbf{e + HeH^+}$	0.01−1 eV	Th	906
$\mathbf{e + C_4H_5N_3O}$	60−500 eV	E/T	907
$\mathbf{e + e}$	60−500 eV	E/T	907
$\mathbf{e + Cl_2{}^+}$	1E1−1E5 K	Th	908
$\mathbf{e + H_2}$	200−600 eV	Th	909

$\mathbf{e + N_2}$	200−600 eV	Th	909
$\mathbf{e + e}$	100−1000 eV	E/T	910
$\mathbf{e + H_2O}$	8.5,9.5 eV	Th	911
$\mathbf{e + H_2O}$	8.5,9.5 eV	Th	911
$\mathbf{e + H_2}$	0−20 eV	Exp	912
$\mathbf{e + D_2}$	0−20 eV	Exp	912
$\mathbf{e + H^+}$	362,687 eV	Exp	913
$\mathbf{e + D^+}$	362,687 eV	Exp	913
$\mathbf{e + Cd}$	0.3−9.0 eV	Th	914
$\mathbf{e + U^{91+}}$	63−73.5, 0−31.3 keV	Th	915
$\mathbf{e + Gd^{63+}}$	63−73.5, 0−31.3 keV	Th	915
$\mathbf{e + Kr^{35+}}$	9.22, 9.24 keV	E/T	916
$\mathbf{e + Ni^{16+}}$	1E4.5−1E8 K	Th	917
$\mathbf{e + Si^{7+}}$	1E4−1E6.5 K	Th	918
$\mathbf{e + Kr^{31+}}$	0−−400 Ryd	Th	919
$\mathbf{e + Fe^{21+}}$	0−−400 Ryd	Th	919
$\mathbf{e + Ar^{13+}}$	0−−400 Ryd	Th	919
$\mathbf{e + Ne^{5+}}$	0−−400 Ryd	Th	919
$\mathbf{e + Mg^{5+}}$	10000−200000 K	Th	920
$\mathbf{e + Ne^{6+}}$	1E5.8−1E7 K	Th	921
$\mathbf{e + Ni^{13+}}$	1E5 1E8 K	Th	922
$\mathbf{e + S^{2+}}$	0−2 RYD	Th	923
$\mathbf{e + S^{15+}}$	1.4−3.0 keV	Exp	924
$\mathbf{e + S^{14+}}$	1.4−3.0 keV	Exp	924
$\mathbf{e + S^{15+}}$	1.4−3.0 keV	Exp	924
$\mathbf{e + S^{14+}}$	1.4−3.0 keV	Exp	924
$\mathbf{e + Fe^{10+}}$	250−1200 eV	Exp	925
$\mathbf{e + Fe^{9+}}$	250−1200 eV	Exp	925
$\mathbf{e + Cl^{2+}}$	5E3−1E6 K	Th	926
$\mathbf{e + He}$	1keV	Th	927
$\mathbf{e + He}$	50, 102eV	Th	928
$\mathbf{e + Ar}$	37,74,205eV	Th	929
$\mathbf{e + H_2}$	8−18eV	Th	930
$\mathbf{e + Co}$	0−17eV	Th	931
$\mathbf{e + N_2}$	4−15eV	Th	932
$\mathbf{e + C_4H_4N_2}$	10−150eV	Exp	933
$\mathbf{e + H_2O}$	250eV	Th	934
$\mathbf{e + H_2O}$	250eV	Th	934
$\mathbf{e + BeH^+}$	0−24eV	Th	935
$\mathbf{e + H_2}$	0.01−1000eV	Exp	936
$\mathbf{e + H_2O}$	0.01−1000eV	Exp	936
$\mathbf{e + N_2O}$	0.01−1000eV	Exp	936
$\mathbf{e + CO_2}$	0.01−1000eV	Exp	936
$\mathbf{e + Co}$	0.01−1000eV	Exp	936
$\mathbf{e + O_2}$	0.01−1000eV	Exp	936
$\mathbf{e + H_2}$	0.01−1000eV	Exp	936
$\mathbf{e + H_2O}$	0.01−1000eV	Exp	936
$\mathbf{e + N_2O}$	0.01−1000eV	Exp	936
$\mathbf{e + CO_2}$	0.01−1000eV	Exp	936
$\mathbf{e + Co}$	0.01−1000eV	Exp	936
$\mathbf{e + O_2}$	0.01−1000eV	Exp	936
$\mathbf{e + H_2}$	0.01−1000eV	Exp	936
$\mathbf{e + H_2O}$	0.01−1000eV	Exp	936
$\mathbf{e + N_2O}$	0.01−1000eV	Exp	936
$\mathbf{e + CO_2}$	0.01−1000eV	Exp	936
$\mathbf{e + Co}$	0.01−1000eV	Exp	936
$\mathbf{e + O_2}$	0.01−1000eV	Exp	936
$\mathbf{e + C_3H_3NO}$	8−3000eV	Exp	937
$\mathbf{e + C_3H_3NO}$	8−3000eV	Exp	937

e + C_3H_8	0−20eV	Exp	938
e + C_2H_6	0−20eV	Exp	938
e + C_2H_4	0−20eV	Exp	938
e + C_2H_2	0−20eV	Exp	938
e + CH_4	0−20eV	Exp	938
e + C_3H_8	0−20eV	Exp	938
e + C_2H_6	0−20eV	Exp	938
e + C_2H_4	0−20eV	Exp	938
e + C_2H_2	0−20eV	Exp	938
e + CH_4	0−20eV	Exp	938
e + HBr	0.1−2000 eV	Th	939
e + HCl	0.1−2000 eV	Th	939
e + Mg^+	100−1000 eV	Th	940
e + Ne^{6+}	450−5000 eV	Th	941
e + Ne^{5+}	450−5000 eV	Th	941
e + C_2H_5OH	0−10 eV	Th	942
e + C_2H_5OH	0−10 eV	Th	942
e + OD^+	20−2500 eV	Th	943
e + OH^+	20−2500 eV	Th	943
e + OD^+	20−2500 eV	Th	943
e + OH^+	20−2500 eV	Th	943
e + Zn	0.1−1E6 keV	Th	944
e + Fe	0.1−1E6 keV	Th	944
e + Cr	0.1−1E6 keV	Th	944
e + V	0.1−1E6 keV	Th	944
e + Ti	0.1−1E6 keV	Th	944
e + Sc	0.1−1E6 keV	Th	944
e + Si	0.1−1E6 keV	Th	944
e + Ne	0.1−1E6 keV	Th	944
e + C	0.1−1E6 keV	Th	944
e + Bi	0.1−1E6 keV	Th	944
e + Pb	0.1−1E6 keV	Th	944
e + Ba	0.1−1E6 keV	Th	944
e + Xe	0.1−1E6 keV	Th	944
e + Sb	0.1−1E6 keV	Th	944
e + Ag	0.1−1E6 keV	Th	944
e + Kr	0.1−1E6 keV	Th	944
e + Se	0.1−1E6 keV	Th	944
e + Sr	0.1−1E6 keV	Th	944
e + Co	0.1−1E6 keV	Th	944
e + $W(CO)_6$	0−150eV	Exp	945
e + NF_3	20−500eV	E/T	946
e + BF	10−2000eV	Th	947
e + HNC	10−2000eV	Th	947
e + HCN	10−2000eV	Th	947
e + C_2N_2	10−2000eV	Th	947
e + CN	10−2000eV	Th	947
e + GeF_4	3−200eV	Exp	948
e + C_2H_2	1−5000eV	Th	949
e + C_2H_4	5−50eV	Exp	950
e + CH_4	10−30eV	Th	951
e + CH_4	10−30eV	Th	951
e + N_2O	0.1−2000eV	Th	952
e + H_2	0−360 Deg.	Th	953
e + CN	0−10eV	Th	954
e + CN	0−10eV	Th	954
e + H_2O	0−360 Deg.	Th	955
e + H_2O	0−360 Deg.	Th	955
e + Al	0−30eV	Th	956

e + H_2O	0−360 Deg.	Th	957
e + H_2O	0−360 Deg.	Th	957
e + D_2	16−3000eV	Th	958
e + H_2	16−3000eV	Th	958
e + SiF_4	1.5−200eV	Th	959
e + SiF_4	1.5−200eV	Th	959
e + Xe	20−1E4 keV	Th	960
e + Kr	20−1E4 keV	Th	960
e + Ar	20−1E4 keV	Th	960
e + Ne	20−1E4 keV	Th	960
e + N_2	0−360 Deg.	Th	961
e + N_2	0−360 Deg.	Th	961
e + CN	0.1−4eV	Th	962
e + H_2O	9−20eV	Th	963
e + He	9eV	Th	964
e + He	9eV	Th	964
e + Xe	1−35eV	Th	965
e + C_2H_4O	0−300eV	E/T	966
e + H_2	0.01−1000eV	Th	967
e + Si^{3+}	0−20E4 K	Th	968
e + Sc^+	1E1−1E5 K	Th	969
e + NOCl	200 eV	Th	970
e + H_2	200 eV	Th	971
e + H_2	200 eV	Th	971
e + H	0−20eV	Th	972
e + Ag	10−100eV	Th	973
e + Ag	10−100eV	Th	973
e + HBr	0.2−1eV	Th	974
e + HCl	0.2−1eV	Th	974
e + Li	6−10eV,0−2eV	Th	975
e + H	6−10eV,0−2eV	Th	975
e + N_2	250eV	Exp	976
e + N	3000−20000 K	Th	977
e + C	3000−20000 K	Th	977
e + Ar	3000−20000 K	Th	977
e + O	3000−20000 K	Th	977
e + N	3000−20000 K	Th	977
e + C	3000−20000 K	Th	977
e + Ar	3000−20000 K	Th	977
e + O	3000−20000 K	Th	977
e + Na	6−60eV	Th	978
e + BeH^+	1−1E4 eV	Th	979
e + Li_2	5−25eV	Th	980
e + NH_2CHO	5−10eV,0−180eV,0−10eV,0−10eV	Th	981
e + NH_2CHO	5−10eV,0−180eV,0−10eV,0−10eV	Th	981
e + NH_2CHO	5−10eV,0−180eV,0−10eV,0−10eV	Th	981
e + NH_2CHO	5−10eV,0−180eV,0−10eV,0−10eV	Th	981
e + Al^{2+}	20−200eV	Th	982
e + Na	5−50eV	Th	983
e + Ar	5−50eV	Th	983
e + Ne	5−50eV	Th	983
e + Na	5−50eV	Th	983
e + Ar	5−50eV	Th	983
e + Ne	5−50eV	Th	983
e + Ar	3−15eV	Th	984
e + Ar	3−15eV	Th	984
e + Ar	195eV	Th	985
e + Ar	195eV	Th	985
e + N_2O	10−25keV	Exp	986

$\mathbf{e + He^{+}}$	40−46eV	Th	987
e + Cd	3−85eV	Th	988
e + Ne	25eV	E/T	989
e + NCO	0−10eV,10−5000eV,0−10eV	Th	990
e + NCO	0−10eV,10−5000eV,0−10eV	Th	990
e + NCO	0−10eV,10−5000eV,0−10eV	Th	990
e + He	1keV,100MeV	Th	991
e + He	1keV,100MeV	Th	991
e + He	250−2000eV	Exp	992
$\mathbf{e + N_2}$	17.5−100eV	Th	993
$\mathbf{e + C_4H_4O}$	0−30eV	E/T	994
$\mathbf{e + C_4H_4O}$	0−30eV	E/T	994
$\mathbf{e + C_4H_4O}$	0−30eV	E/T	994
e + He	20−500eV	Th	995
e + He	20−500eV	Th	995
e + Ne	0.1−200eV	Th	996
e + Ne	0.1−200eV	Th	996
e + Ne	0.1−200eV	Th	996
e + Ne	0.1−200eV	Th	996
$\mathbf{e + Cs_2}$	0−20eV	Th	997
$\mathbf{e + Fe^{11+}}$	300−2500eV	Th	998
$\mathbf{e + C_3H_3NO}$	2−20eV	Exp	999
$\mathbf{e + C_3H_3NO}$	2−20eV	Exp	999
$\mathbf{e + C_3H_3NO}$	2−20eV	Exp	999
e + Yb	10−100eV	Th	1000
e + Zn	10−100eV	Th	1000
e + Yb	10−100eV	Th	1000
e + Zn	10−100eV	Th	1000
$\mathbf{e + Au^{49+}}$	100−10000eV	Th	1001
$\mathbf{e + Au^{48+}}$	100−10000eV	Th	1001
$\mathbf{e + Au^{47+}}$	100−10000eV	Th	1001
$\mathbf{e + Au^{46+}}$	100−10000eV	Th	1001
$\mathbf{e + Au^{45+}}$	100−10000eV	Th	1001
$\mathbf{e + Au^{50+}}$	100−10000eV	Th	1001
e + Ne	10−300eV	Th	1002
e + Ne	10−300eV	Th	1002
$\mathbf{e + B_2}$	300−30000K	Th	1003
$\mathbf{e + B_2}$	300−30000K	Th	1003
$\mathbf{e + B_2}$	300−30000K	Th	1003
e + Ti	2.5−25keV	Exp	1004
e + Si	2.5−25keV	Exp	1004
e + Al	2.5−25keV	Exp	1004
e + O	2.5−25keV	Exp	1004
e + C	2.5−25keV	Exp	1004
e + He	19−24eV,25−60eV	Th	1005
e + He	19−24eV,25−60eV	Th	1005
$\mathbf{e + C_3H_6}$	5.5eV	Exp	1006
$\mathbf{e + C_3H_6}$	5.5eV	Exp	1006
$\mathbf{e + H_2}$	18eV	Th	1007
$\mathbf{e + H_2}$	18eV	Th	1007
e + He	1−1000eV	Th	1008
e + H	1−1000eV	Th	1008
e + He	1−1000eV	Th	1008
e + H	1−1000eV	Th	1008
e + U	10−1E6eV	Th	1009
$\mathbf{e + Ba^{2+}}$	10−1E6eV	Th	1009
$\mathbf{e + Cs^{+}}$	10−1E6eV	Th	1009
$\mathbf{e + Xe^{4+}}$	10−1E6eV	Th	1009
e + In	10−1E6eV	Th	1009

$\mathbf{e} + \mathbf{Sb}^{+}$	10−1E6eV	Th	1009
$\mathbf{e} + \mathbf{Bi}^{+}$	10−1E6eV	Th	1009
$\mathbf{e} + \mathbf{Ag}$	10−1E6eV	Th	1009
$\mathbf{e} + \mathbf{Mo}^{3+}$	10−1E6eV	Th	1009
$\mathbf{e} + \mathbf{Rb}^{+}$	10−1E6eV	Th	1009
$\mathbf{e} + \mathbf{Kr}^{4+}$	10−1E6eV	Th	1009
$\mathbf{e} + \mathbf{Ga}$	10−1E6eV	Th	1009
$\mathbf{e} + \mathbf{Pb}$	10−1E6eV	Th	1009
$\mathbf{e} + \mathbf{Ni}^{3+}$	10−1E6eV	Th	1009
$\mathbf{e} + \mathbf{Fe}^{6+}$	10−1E6eV	Th	1009
$\mathbf{e} + \mathbf{Ti}^{5+}$	10−1E6eV	Th	1009
$\mathbf{e} + \mathbf{Sc}^{+}$	10−1E6eV	Th	1009
$\mathbf{e} + \mathbf{Hg}$	10−1E6eV	Th	1009
$\mathbf{e} + \mathbf{W}^{6+}$	10−1E6eV	Th	1009
$\mathbf{e} + \mathbf{Sm}^{6+}$	10−1E6eV	Th	1009
$\mathbf{e} + \mathbf{Pr}^{3+}$	10−1E6eV	Th	1009
$\mathbf{e} + \mathbf{S}^{14+}$	130−550 RYD	Th	1010
$\mathbf{e} + \mathbf{P}^{13+}$	130−550 RYD	Th	1010
$\mathbf{e} + \mathbf{Al}^{11+}$	130−550 RYD	Th	1010
$\mathbf{e} + \mathbf{Mg}^{10+}$	130−550 RYD	Th	1010
$\mathbf{e} + \mathbf{Ca}^{18+}$	359−900 RYD	Th	1011
$\mathbf{e} + \mathbf{K}^{17+}$	359−900 RYD	Th	1011
$\mathbf{e} + \mathbf{Cl}^{15+}$	359−900 RYD	Th	1011
$\mathbf{e} + \mathbf{Sc}^{19+}$	359−900 RYD	Th	1011
$\mathbf{e} + \mathbf{Mn}^{23+}$	500−1200 RYD	Th	1012
$\mathbf{e} + \mathbf{Cr}^{22+}$	500−1200 RYD	Th	1012
$\mathbf{e} + \mathbf{V}^{21+}$	500−1200 RYD	Th	1012
$\mathbf{e} + \mathbf{Ti}^{20+}$	500−1200 RYD	Th	1012
$\mathbf{e} + \mathbf{S}^{6+}$	20−120 RYD	Th	1013
$\mathbf{e} + \mathbf{W}^{44+}$	0−50keV	Th	1014
$\mathbf{e} + \mathbf{W}^{47+}$	0−50keV	Th	1014
$\mathbf{e} + \mathbf{W}^{46+}$	0−50keV	Th	1014
$\mathbf{e} + \mathbf{W}^{45+}$	0−50keV	Th	1014
$\mathbf{e} + \mathbf{Kr}^{34+}$	1E5.4−1E8.1 K	Th	1015
$\mathbf{e} + \mathbf{Ti}^{18+}$	100−1100 RYD	Th	1016
$\mathbf{e} + \mathbf{Co}$	1−10eV	Th	1017
$\mathbf{e} + \mathbf{NO}$	0.1−100eV	Th	1018
$\mathbf{e} + \mathbf{N}_2$	0.1−100eV	Th	1018
$\mathbf{e} + \mathbf{S}^{3+}$	0.1−1000eV	Th	1019
$\mathbf{e} + \mathbf{Zn}^{17+}$	0.1−1000eV	Th	1019
$\mathbf{e} + \mathbf{Cu}^{16+}$	0.1−1000eV	Th	1019
$\mathbf{e} + \mathbf{Ni}^{15+}$	0.1−1000eV	Th	1019
$\mathbf{e} + \mathbf{Co}^{14+}$	0.1−1000eV	Th	1019
$\mathbf{e} + \mathbf{Mn}^{12+}$	0.1−1000eV	Th	1019
$\mathbf{e} + \mathbf{Cr}^{11+}$	0.1−1000eV	Th	1019
$\mathbf{e} + \mathbf{V}^{10+}$	0.1−1000eV	Th	1019
$\mathbf{e} + \mathbf{Ti}^{9+}$	0.1−1000eV	Th	1019
$\mathbf{e} + \mathbf{Sc}^{8+}$	0.1−1000eV	Th	1019
$\mathbf{e} + \mathbf{Ca}^{7+}$	0.1−1000eV	Th	1019
$\mathbf{e} + \mathbf{K}^{6+}$	0.1−1000eV	Th	1019
$\mathbf{e} + \mathbf{Ar}^{5+}$	0.1−1000eV	Th	1019
$\mathbf{e} + \mathbf{Cl}^{4+}$	0.1−1000eV	Th	1019
$\mathbf{e} + \mathbf{P}^{2+}$	0.1−1000eV	Th	1019
$\mathbf{e} + \mathbf{Si}^{+}$	0.1−1000eV	Th	1019
$\mathbf{e} + \mathbf{N}_2\mathbf{H}^{+}$	10−1000 K	Exp	1020
$\mathbf{e} + \mathbf{CH}_3{}^{+}$	1E−1−10eV	Exp	1021
$\mathbf{e} + \mathbf{Mg}^{7+}$	250−1500eV	Exp	1022
$\mathbf{e} + \mathbf{Fe}^{11+}$	300−2000eV	Exp	1023
$\mathbf{e} + \mathbf{Fe}^{12+}$	350−1910eV	Exp	1024

e + $\mathbf{Xe}^{52+}$	20−22.4keV	Th	1025
e + $\mathbf{Xe}^{51+}$	20−22.4keV	Th	1025
e + $\mathbf{Xe}^{50+}$	20−22.4keV	Th	1025
e + $\mathbf{Xe}^{49+}$	20−22.4keV	Th	1025
e + $\mathbf{Xe}^{48+}$	20−22.4keV	Th	1025
e + $\mathbf{Xe}^{47+}$	20−22.4keV	Th	1025
e + $\mathbf{Xe}^{46+}$	20−22.4keV	Th	1025
e + K	6−60eV	Th	1026
e + $\mathbf{Ag}^{+}$	50−1000eV	Th	1027
e + $\mathbf{Kr}^{34+}$	8−13keV	Th	1028
e + HBr	0.001−1E4eV	Th	1029
e + HBr	0.001−1E4eV	Th	1029
e + HBr	0.001−1E4eV	Th	1029
e + $\mathbf{CF_3Cl}$	300−800K	Th	1030
e + $\mathbf{H_2O}$	300−800K	Th	1030
e + $\mathbf{SF_6}$	1−2eV	Th	1031
e + $\mathbf{NH_3}$	0−20eV	Exp	1032
e + $\mathbf{C_2F_5}$	300−600K	Exp	1033
e + $\mathbf{N_2}^{+}$	0.001−0.1eV	Th	1034
e + $\mathbf{D_3O}$	0.0001−1eV	Exp	1035
e + $\mathbf{H_3O}$	0.0001−1eV	Exp	1035
e + $\mathbf{ND_4}^{+}$	0.0001−1eV	Exp	1035
e + $\mathbf{NH_4}^{+}$	0.0001−1eV	Exp	1035
e + $\mathbf{N_2D}^{+}$	0.0001−1eV	Exp	1035
e + $\mathbf{N_2H}^{+}$	0.0001−1eV	Exp	1035
e + $\mathbf{C_4H_4N_2}$	3−50eV	Exp	1036
e + $\mathbf{N_2}$	500−600eV	Th	1037
e + $\mathbf{H_2}$	500−600eV	Th	1037
e + $\mathbf{Au}^{20+}$	1−1000eV	Th	1038
e + At	0.01−10eV	Th	1039
e + Ga	0.01−10eV	Th	1039
e + Tl	0.01−10eV	Th	1039
e + In	0.01−10eV	Th	1039
e + He	110−270eV	Th	1040
e + He	110−270eV	Th	1040
e + He	110−270eV	Th	1040
e + $\mathbf{W}^{4+}$	0.1−5000eV	Th	1041
e + Hg	0.1−2000eV	Th	1042
e + Hg	0.1−2000eV	Th	1042
e + Hg	0.1−2000eV	Th	1042
e + U	20−200MeV	Th	1043
e + Pb	20−200MeV	Th	1043
e + Zn	20−200MeV	Th	1043
e + $\mathbf{H_2O}$	0.01−1E4eV	Th	1044
e + $\mathbf{Al}^{10+}$	0−0.1 RYD	Th	1045
e + $\mathbf{Gd}^{18+}$	1−50000eV	Th	1046
e + Se	0.4-0.8 cm^{-}1	Exp	1047
e + $\mathbf{W}^{6+}$	0.1−575eV	Th	1048
e + $\mathbf{HOC}^{+}$	0−10eV	Th	1049
e + $\mathbf{HCO}^{+}$	0−10eV	Th	1049
e + $\mathbf{S}^{12+}$	500−3000eV	Exp	1050
e + $\mathbf{Gd}^{19+}$	1−5000eV	Th	1051
e + $\mathbf{W}^{29+}$	1−5000eV	Th	1051
e + $\mathbf{W}^{20+}$	1−1000eV	E/T	1052
e + Hg	1−14eV	Th	1053
e + Zn	1−14eV	Th	1053
e + C	1−6eV	Exp	1054
e + Ta	4−180eV	Th	1055
e + $\mathbf{NO_2}^{+}$	0−10eV	Th	1056

$\mathbf{e + CH_3^+}$	0.0001−1eV	Th	1057
$\mathbf{e + H_3O^+}$	0.0001−1eV	Th	1057
$\mathbf{e + Au^{76+}}$	45eV	Exp	1058
$\mathbf{e + Kr_2^+}$	300−19000K	Exp	1059
$\mathbf{e + F_2^-}$	0.01−1.4eV	Th	1060
$\mathbf{e + F_2}$	0.01−1.4eV	Th	1060
$\mathbf{e + F_2^-}$	0.01−1.4eV	Th	1060
$\mathbf{e + F_2}$	0.01−1.4eV	Th	1060
$\mathbf{e + H_3^+}$	0.00001−1000eV	Exp	1061
$\mathbf{e + H_3^+}$	0.00001−10eV	Exp	1062
$\mathbf{e + Ar}$	9.5−19.5eV	Th	1063
$\mathbf{e + Fe^{8+}}$	0−80 RYD	Th	1064
$\mathbf{e + Fe^{7+}}$	0−80 RYD	Th	1064
$\mathbf{e + Fe^{9+}}$	10−60 RYD	Th	1065
$\mathbf{e + Fe^{11+}}$	10−60 RYD	Th	1066
$\mathbf{e + Fe^{12+}}$	10−50 RYD	Th	1067
$\mathbf{e + PH_3}$	10−5000eV	Th	1068
$\mathbf{e + SiH_4}$	10−5000eV	Th	1068
$\mathbf{e + CH_3F}$	1E2−2E3 eV	Th	1069
$\mathbf{e + CH_2F_2}$	1E2−2E3 eV	Th	1069
$\mathbf{e + CF_3H}$	1E2−2E3 eV	Th	1069
$\mathbf{e + CF_4}$	1E2−2E3 eV	Th	1069
$\mathbf{e + C_6H_6}$	20−500eV	Th	1070
$\mathbf{e + Ar}$	40−1000Td	Th	1071
$\mathbf{e + He}$	20−1000eV	Th	1072
$\mathbf{e + He}$	20−1000eV	Th	1072
$\mathbf{e + He}$	20−1000eV	Th	1072
$\mathbf{e + He}$	20−1000eV	Th	1072
$\mathbf{e + C_4H_4N_2}$	15−30eV	Exp	1073
$\mathbf{e + C_4H_4N_2}$	15−30eV	Exp	1073
$\mathbf{e + C_4H_4N_2}$	15−30eV	Exp	1073
$\mathbf{e + Xe}$	0.005−20eV	Exp	1074
$\mathbf{e + Kr}$	0.005−20eV	Exp	1074
$\mathbf{e + Ar}$	0.005−20eV	Exp	1074
$\mathbf{e + Xe}$	0.005−20eV	Exp	1074
$\mathbf{e + Kr}$	0.005−20eV	Exp	1074
$\mathbf{e + Ar}$	0.005−20eV	Exp	1074
$\mathbf{e + C_2H_5OH}$	1−1000eV	E/T	1075
$\mathbf{e + CH_3OH}$	1−1000eV	E/T	1075
$\mathbf{e + HCN}$	0.1−10000eV	Th	1076
$\mathbf{e + HCN}$	0.1−10000eV	Th	1076
$\mathbf{e + He}$	0.1−1000eV	Th	1077
$\mathbf{e + HeH^{2+}}$	10−150eV	Th	1078
$\mathbf{e + H_2^+}$	10−150eV	Th	1078
$\mathbf{e + Si}$	0−60eV	Th	1079
$\mathbf{e + Si}$	0−60eV	Th	1079
$\mathbf{e + Si}$	0−60eV	Th	1079
$\mathbf{e + Xe}$	500,750eV	E/T	1080
$\mathbf{e + C_3H_7NO_2}$	0−8eV	Th	1081
$\mathbf{e + C_2H_5NO_2}$	0−8eV	Th	1081
$\mathbf{e + C_2H_3NO_2}$	0−8eV	Th	1081
$\mathbf{e + SO_2}$	0.1−2000eV	Th	1082
$\mathbf{e + U^{91+}}$	100−120eV	Th	1083
$\mathbf{e + Ar}$		Th	1084
$\mathbf{e + Kr^{34+}}$	1000−3500eV	Th	1085
$\mathbf{e + Ne}$	0.5−50eV	E/T	1086
$\mathbf{e + CH_4}$	0.5−50eV	E/T	1086
$\mathbf{e + CF_3Cl}$	0−2.5 eV	Th	1087
$\mathbf{e + CF_2Cl_2}$	0−2.5 eV	Th	1087

e + CH_4	10−20eV	E/T	1088
e + CH_4	10−20eV	E/T	1088
e + CF_3Br	100−20000K	Th	1089
e + C_3F_5	300−550K	Exp	1090
e + C_2F_3	300−550K	Exp	1090
e + CF_2	300−550K	Exp	1090
e + Xe	5−40eV	Exp	1091
e + Xe	5−40eV	Exp	1091
e + C_4	0−220 eV	E/T	1092
e + C_2	0−220 eV	E/T	1092
e + He	100−600eV	Th	1093
e + W^{2+}	10−1000 eV	Th	1094
e + W^+	10−1000 eV	Th	1094
e + $H_2{}^+$	0−1000eV	Th	1095
e + Ni^{10+}	0−450eV	Th	1096
e + D_2	178 eV	E/T	1097
e + D_2	178 eV	E/T	1097
e + H_2	0−100eV	Th	1098
e + Fe	5−2000eV	Th	1099
e + Ti	5−2000eV	Th	1099
e + B	5−2000eV	Th	1099
e + Be	5−2000eV	Th	1099
e + Li	5−2000eV	Th	1099
e + O^{5+}	1−140 RYD	Th	1100
e + O^{4+}	1−140 RYD	Th	1100
e + H	1E−6−10 A.U.	Th	1101
e + He^+	40−1000eV	Th	1102
e + C^{5+}	40−1000eV	Th	1102
e + C^{3+}	40−1000eV	Th	1102
e + Ni	50 eV	Exp	1103
e + Rb	0−400eV	Th	1104
e + GeO	45−55eV	Exp	1105
e + HfO	45−55eV	Exp	1105
e + YO	45−55eV	Exp	1105
e + VO_2	45−55eV	Exp	1105
e + VO	45−55eV	Exp	1105
e + TiO_2	45−55eV	Exp	1105
e + TiO	45−55eV	Exp	1105
e + Ne	20−300eV	Exp	1106
e + Li	10−600eV	Exp	1107
e + Cs	10−600eV	Exp	1107
e + Rb	10−600eV	Exp	1107
e + K	10−600eV	Exp	1107
e + Na	10−600eV	Exp	1107
e + Li	10−600eV	Exp	1107
e + Cs	10−600eV	Exp	1107
e + Rb	10−600eV	Exp	1107
e + K	10−600eV	Exp	1107
e + Na	10−600eV	Exp	1107
e + Xe^{12+}	100−1000eV	Th	1108
e + Xe^{11+}	100−1000eV	Th	1108
e + Xe^{17+}	100−1000eV	Th	1108
e + Xe^{10+}	100−1000eV	Th	1108
e + Xe^{16+}	100−1000eV	Th	1108
e + Xe^{15+}	100−1000eV	Th	1108
e + Xe^{14+}	100−1000eV	Th	1108
e + Xe^{13+}	100−1000eV	Th	1108
e + CN	0−1000 K	Th	1109
e + Kr_2	0−2000eV	Th	1110

$\mathbf{e + He_2}$	0−2000eV	Th	1110
$\mathbf{e + Ar_2}$	0−2000eV	Th	1110
$\mathbf{e + Ne_2}$	0−2000eV	Th	1110
$\mathbf{e + He_2}$	0−2000eV	Th	1110
$\mathbf{e + Kr_2}$	0−2000eV	Th	1110
$\mathbf{e + Ar_2}$	0−2000eV	Th	1110
$\mathbf{e + Ne_2}$	0−2000eV	Th	1110
$\mathbf{e + C_3H_8}$	10−10000eV	Th	1111
$\mathbf{e + N_2}$	10−10000eV	Th	1111
$\mathbf{e + N^+}$	10−10000eV	E/T	1112
$\mathbf{e + C^+}$	10−10000eV	E/T	1112
$\mathbf{e + O^+}$	10−10000eV	E/T	1112
$\mathbf{e + H_2O}$	50−500eV	Th	1113
$\mathbf{e + Ne}$	20−300eV	Exp	1114
$\mathbf{e + He}$	5.5−570eV	Th	1115
$\mathbf{e + He}$	5.5−570eV	Th	1115
$\mathbf{e + He}$	645−676eV	Th	1116
$\mathbf{e + He}$	645−676eV	Th	1116
$\mathbf{e + Ne^{4+}}$	0−2.5 RYD	Th	1117
$\mathbf{e + Au}$	0−1E8 keV	Th	1118
$\mathbf{e + Ne^{8+}}$	0−1E8 keV	Th	1118
$\mathbf{e + Ne^{7+}}$	0−1E8 keV	Th	1118
$\mathbf{e + Be^+}$	0−1E8 keV	Th	1118
$\mathbf{e + Li^+}$	0−1E8 keV	Th	1118
$\mathbf{e + Ag}$	0−1E8 keV	Th	1118
$\mathbf{e + Ne^{6+}}$	0−1E8 keV	Th	1118
$\mathbf{e + O^{6+}}$	0−1E8 keV	Th	1118
$\mathbf{e + Li}$	0−1E8 keV	Th	1118
$\mathbf{e + He^+}$	0−1E8 keV	Th	1118
$\mathbf{e + Cu}$	0−1E8 keV	Th	1118
$\mathbf{e + O^{4+}}$	0−1E8 keV	Th	1118
$\mathbf{e + N^{6+}}$	0−1E8 keV	Th	1118
$\mathbf{e + He}$	0−1E8 keV	Th	1118
$\mathbf{e + H}$	0−1E8 keV	Th	1118
$\mathbf{e + Ar}$	0−1E8 keV	Th	1118
$\mathbf{e + N^{4+}}$	0−1E8 keV	Th	1118
$\mathbf{e + N^{3+}}$	0−1E8 keV	Th	1118
$\mathbf{e + U^{90+}}$	0−1E8 keV	Th	1118
$\mathbf{e + U^{91+}}$	0−1E8 keV	Th	1118
$\mathbf{e + C^{4+}}$	0−1E8 keV	Th	1118
$\mathbf{e + C^{2+}}$	0−1E8 keV	Th	1118
$\mathbf{e + U^{89+}}$	0−1E8 keV	Th	1118
$\mathbf{e + U^{88+}}$	0−1E8 keV	Th	1118
$\mathbf{e + C}$	0−1E8 keV	Th	1118
$\mathbf{e + B^{4+}}$	0−1E8 keV	Th	1118
$\mathbf{e + U}$	0−1E8 keV	Th	1118
$\mathbf{e + Mo^{41+}}$	0−1E8 keV	Th	1118
$\mathbf{e + B^{2+}}$	0−1E8 keV	Th	1118
$\mathbf{e + B^+}$	0−1E8 keV	Th	1118
$\mathbf{e + Xe}$	540eV	Th	1119
$\mathbf{e + Mo}$	540eV	Th	1119
$\mathbf{e + Ca}$	540eV	Th	1119
$\mathbf{e + NF_3}$	1−5keV	Th	1120
$\mathbf{e + NF_3}$	1−5keV	Th	1120
$\mathbf{e + Co}$	0−1000 Td	Th	1121
$\mathbf{e + In^+}$	0−120eV	Exp	1122
$\mathbf{e + Sn^{7+}}$	0−1000eV	E/T	1123
$\mathbf{e + Sn^{13+}}$	0−1000eV	E/T	1123
$\mathbf{e + Sn^{6+}}$	0−1000eV	E/T	1123

$\mathbf{e + Sn}^{12+}$	0−1000eV	E/T	1123
$\mathbf{e + Sn}^{5+}$	0−1000eV	E/T	1123
$\mathbf{e + Sn}^{11+}$	0−1000eV	E/T	1123
$\mathbf{e + Sn}^{4+}$	0−1000eV	E/T	1123
$\mathbf{e + Sn}^{10+}$	0−1000eV	E/T	1123
$\mathbf{e + Sn}^{9+}$	0−1000eV	E/T	1123
$\mathbf{e + Sn}^{8+}$	0−1000eV	E/T	1123
e + I	0−10eV	Th	1124
e + Ar	0−10eV	Th	1124
e + Ne	0−10eV	Th	1124
e + He	0−10eV	Th	1124
e + He	0−10eV	Th	1124
e + Hg	0−10eV	Th	1124
e + Kr	0−10eV	Th	1124
e + I	0−10eV	Th	1124
e + Ar	0−10eV	Th	1124
e + Ne	0−10eV	Th	1124
e + He	0−10eV	Th	1124
e + Hg	0−10eV	Th	1124
e + Kr	0−10eV	Th	1124
e + I	0−10eV	Th	1124
e + Ar	0−10eV	Th	1124
e + Ne	0−10eV	Th	1124
e + Hg	0−10eV	Th	1124
e + He	0−10eV	Th	1124
e + Hg	0−10eV	Th	1124
e + Kr	0−10eV	Th	1124
e + Kr	0−10eV	Th	1124
e + I	0−10eV	Th	1124
e + Ar	0−10eV	Th	1124
e + Ne	0−10eV	Th	1124
$\mathbf{e + Ar}^{6+}$	0−1000keV	Th	1125
$\mathbf{e + Ar}^{5+}$	0−1000keV	Th	1125
$\mathbf{e + Ar}^{4+}$	0−1000keV	Th	1125
$\mathbf{e + Ar}^{3+}$	0−1000keV	Th	1125
$\mathbf{e + Ar}^{2+}$	0−1000keV	Th	1125
$\mathbf{e + Ar}^{7+}$	0−1000keV	Th	1125
$\mathbf{e + CH_3I}$	20−5000 eV	Th	1126
$\mathbf{e + CH_3Br}$	20−5000 eV	Th	1126
$\mathbf{e + CH_3Cl}$	20−5000 eV	Th	1126
$\mathbf{e + CH_3F}$	20−5000 eV	Th	1126
$\mathbf{e + Mg}^{8+}$	1E4−1E7 K	Th	1127
$\mathbf{e + S}^{12+}$	1E4−1E8 K	Th	1128
$\mathbf{e + N_2}$	0−40 eV	Th	1129
$\mathbf{e + N_2}$	0−40 eV	Th	1129
e + H	250eV	Th	1130
e + He	64−600eV	Th	1131
$\mathbf{e + U}^{91+}$	0−160eV	Th	1132
$\mathbf{e + Xe}^{53+}$	0−160eV	Th	1132
$\mathbf{e + Ni}^{27+}$	0−160eV	Th	1132
$\mathbf{e + O_2}$	30−400eV	Exp	1133
$\mathbf{e + H_2O}$	0−30eV	Th	1134
e + Ar	4−200eV	Th	1135
e + Ne	4−200eV	Th	1135
$\mathbf{e + N_2}$	550−600eV	Th	1136
e + He	550−600eV	Th	1136
$\mathbf{e + H_2}$	550−600eV	Th	1136
$\mathbf{e + H_2}$	20−30eV	Th	1137
$\mathbf{e + H_2}$	20−30eV	Th	1137

e + Ni^{22+}	100−500 RYD	Th	1138
e + U^{89+}	0−150 keV	Th	1139
e + Xe^{51+}	0−150 keV	Th	1139
e + H_2O	9−20eV	E/T	1140
e + Pb	3−38keV	E/T	1141
e + H_2O	52−107eV	Th	1142
e + Xe	20−40eV	Th	1143
e + Ar	200eV	E/T	1144
e + Xe	2−500eV	Th	1145
e + Kr	2−500eV	Th	1145
e + Ar	2−500eV	Th	1145
e + Ne	2−500eV	Th	1145
e + He	2−500eV	Th	1145
e + Xe	2−500eV	Th	1145
e + Kr	2−500eV	Th	1145
e + Ar	2−500eV	Th	1145
e + Ne	2−500eV	Th	1145
e + He	2−500eV	Th	1145
e + Xe	2−500eV	Th	1145
e + Kr	2−500eV	Th	1145
e + Ar	2−500eV	Th	1145
e + Ne	2−500eV	Th	1145
e + He	2−500eV	Th	1145
e + PO_2	0−10eV	Th	1146
e + PO_2	0−10eV	Th	1146
e + PO_2	0−10eV	Th	1146
e + PO_2	0−10eV	Th	1146
e + C_3H_4	0.1−2000eV	Th	1147
e + Ho^{63+}	0−5 TH	Th	1148
e + Mo^{38+}	0−5 TH	Th	1148
e + U^{88+}	0−5 TH	Th	1148
e + SO_2	0−200eV	Exp	1149
e + Zn^{18+}	700−1300 RYD	Th	1150
e + Cu^{17+}	700−1300 RYD	Th	1150
e + Ni^{16+}	700−1300 RYD	Th	1150
e + Co^{15+}	700−1300 RYD	Th	1150
e + Fe^{14+}	700−1300 RYD	Th	1150
e + He	500−5600eV	Th	1151
e + Fe^{17+}	0−3000eV	Th	1152
e + Fe^{16+}	0−3000eV	Th	1152
e + Fe^{13+}	0−3000eV	Th	1152
e + Ne	100eV	E/T	1153
e + Gd	0−200eV	E/T	1154
e + O_2	0−18eV	Th	1155
e + As^{31+}	1E5.2−1E7.7 K	Th	1156
e + Ge^{30+}	1E5.2−1E7.7 K	Th	1156
e + Ga^{29+}	1E5.2−1E7.7 K	Th	1156
e + Br^{33+}	1E5.2−1E7.7 K	Th	1156
e + Se^{32+}	1E5.2−1E7.7 K	Th	1156
e + W^{3+}	0−100eV	Th	1157
e + W^{3+}	0−100eV	Th	1157
e + U^{91+}	0−500keV	Th	1158
e + Bi^{80+}	0−500keV	Th	1158
e + Xe^{53+}	0−500keV	Th	1158
e + Er^{67+}	0−500keV	Th	1158
e + Ni^{27+}	0−500keV	Th	1158
e + Ca^{17+}	1E4.5−1E7.5 K	Th	1159
e + K^{16+}	1E4.5−1E7.5 K	Th	1159
e + Ar^{15+}	1E4.5−1E7.5 K	Th	1159

e + Cl^{14+}	1E4.5−1E7.5 K	Th	1159
e + S^{13+}	1E4.5−1E7.5 K	Th	1159
e + P^{12+}	1E4.5−1E7.5 K	Th	1159
e + Al^{10+}	1E4.5−1E7.5 K	Th	1159
e + Mg^{9+}	1E4.5−1E7.5 K	Th	1159
e + BF_3	0.1−200eV	Th	1160
e + BF_3	0.1−200eV	Th	1160
e + BeH^+	0.001−3eV	Th	1161
e + He	1.2−200eV	Th	1162
e + Xe	1.2−200eV	Th	1162
e + Kr	1.2−200eV	Th	1162
e + Ne	1.2−200eV	Th	1162
e + C	0−60eV	Th	1163
e + C^{4+}	20−130eV	Th	1164
e + C^{3+}	20−130eV	Th	1164
e + C^{4+}	20−130eV	Th	1164
e + C^{3+}	20−130eV	Th	1164
e + Pb	9−10eV	Th	1165
e + Cl	0.01−100eV	Th	1166
e + Cl	0.01−100eV	Th	1166
e + Co	2−10eV	Th	1167
e + H_2O	10−25keV	Exp	1168
e + He	100−300eV	Exp	1169
e + H_2	9.2−3000eV	Th	1170
e + H_2	9.2−3000eV	Th	1170
e + BeH	1−1000eV	Th	1171
e + CH_3Br	13−1000eV	Th	1172
e + CH_3Cl	13−1000eV	Th	1172
e + CH_3F	13−1000eV	Th	1172
e + Rb	15−50eV	E/T	1173
e + C	0−100eV	Th	1174
e + C	0−100eV	Th	1174
e + C	0−100eV	Th	1174
e + CH_3OH	0.1−2000eV	Th	1175
e + CH_3OH	0.1−2000eV	Th	1175
e + CH_3OH	0.1−2000eV	Th	1175
e + CH_3OH	0.1−2000eV	Th	1175
e + CH_4	200−250 eV	Exp	1176
e + H_2	200−250 eV	Exp	1176
e + Ar	200−250 eV	Exp	1176
e + He	200−250 eV	Exp	1176
e + Co^{3+}	3−5 RYD	Th	1177
e + He	1−8eV	Th	1178
e + Be_2H_4	0−1000eV	Th	1179
e + Be_2H_2	0−1000eV	Th	1179
e + BeH_2	0−1000eV	Th	1179
e + BeH	0−1000eV	Th	1179
e + Be	0−1000eV	Th	1179
e + Si_2C	10−2000eV	Th	1180
e + SiC_2	10−2000eV	Th	1180
e + SiC	10−2000eV	Th	1180
e + Si_3	10−2000eV	Th	1180
e + Si_2	10−2000eV	Th	1180
e + C_3	10−2000eV	Th	1180
e + C_2	10−2000eV	Th	1180
e + Pb	5−30keV	Exp	1181
e + C_4H_6	1000 eV	E/T	1182
e + OCS	1.2−200eV	E/T	1183
e + Cs_2	1.2−200eV	E/T	1183

e + NO$_2$	1−1000eV	Exp	1184
e + C$_2$H$_2$	1−1000eV	E/T	1185
e + C$_2$H$_2$	1−1000eV	E/T	1185
e + CF$_3$	7−50eV	E/T	1186
e + Ne	300−2500eV	E/T	1187
e + He	56−60eV	E/T	1188
e + He	56−60eV	E/T	1188
e + Fe^{10+}	1E5−1E7 K	Th	1189
e + Mn	0−25eV	Th	1190
e + Mn	0−25eV	Th	1190
e + CF$_3$Br	300−890K	Exp	1191
e + CF$_3$	300−890K	Exp	1191
e + HCOOH	1−3.5eV	Exp	1192
e + CH$_4$	11−28eV	E/T	1193
e + NH$_3$	11−28eV	E/T	1193
e + CH$_4$	11−28eV	E/T	1193
e + NH$_3$	11−28eV	E/T	1193
e + HCl$^+$	1E−5−5eV	Exp	1194
e + C$^+$	1E3−1E4.8 K	Th	1195
e + Mg	10−60eV	Th	1196
e + Na	10−60eV	Th	1196
e + SF$_6$	0.−3000eV	Exp	1197
e + CO$_2$	10−30eV	Th	1198
e + N$_2$$^+$	0.001−1eV	Th	1199
e + W^{42+}	100−10000eV	Th	1200
e + W^{41+}	100−10000eV	Th	1200
e + W^{46+}	100−10000eV	Th	1200
e + W^{45+}	100−10000eV	Th	1200
e + W^{44+}	100−10000eV	Th	1200
e + W^{436+}	100−10000eV	Th	1200
e + W^{42+}	100−10000eV	Th	1200
e + W^{41+}	100−10000eV	Th	1200
e + W^{46+}	100−10000eV	Th	1200
e + W^{45+}	100−10000eV	Th	1200
e + W^{44+}	100−10000eV	Th	1200
e + W^{436+}	100−10000eV	Th	1200
e + K^{35+}		E/T	1201
e + C^{3+}	0.01−30eV	Th	1202
e + H$_2$O	1−100eV	Exp	1203
e + HD$^+$	0−14eV	Th	1204
e + H$_2$$^+$	0−14eV	Th	1204
e + LiHe$^+$	0.02−500eV	Th	1205
e + HCl$^+$	1E−5−4.06eV	Exp	1206
e + H$_2$	9.2−3000eV	Th	1207
e + He	200eV	Exp	1208
e + CH$_4$	25−300eV	Exp	1209
e + Fe^{8+}	1E5−1E6.4 K	Th	1210
e + Fe^{7+}	1E5−1E6.4 K	Th	1211
e + Ni^{14+}	1E5.6−1E6.7 K	Th	1212
e + Ni^{10+}	1E5−1E7 K	Th	1213
e + Mg^{7+}	1E4−1E7 K	Th	1214
e + Ne^{6+}	1−1E9 K	Th	1215
e + C^{2+}	1−1E9 K	Th	1215
e + Fe^{22+}	1−1E9 K	Th	1215
e + Mg^{8+}	1−1E9 K	Th	1215
e + S^{12+}	0−150 RYD	Th	1216
e + Sn$^-$	0−10eV	Exp	1217
e + U^{88+}	0−1E5 eV	Th	1218
e + Xe^{50+}	0−1E5 eV	Th	1218

e + Ca^{8+}	0−60 RYD	Th	1219
e + CH_4	300−350eV	E/T	1220
e + Co	0−1000 Td	Th	1221
e + PH_3	14−1000eV	Th	1222
e + Ne	20−300eV	Th	1223
e + CF_3	7−50eV	E/T	1224
e + O^{5+}	8−17eV	Th	1225
e + N^{4+}	8−17eV	Th	1225
e + C^{3+}	8−17eV	Th	1225
e + Xe	0−200eV	Th	1226
e + Fe^{24+}	0−100 eV	Th	1227
e + Ar	50−200eV	Th	1228
e + Ne	50−200eV	Th	1228
e + SO_2	0−3000eV	Th	1229
e + SO	0−3000eV	Th	1229
e + Bi	9−40 keV	Exp	1230
e + Pb	9−40 keV	Exp	1230
e + Fr		Th	1231
e + Cs		Th	1231
e + Rb		Th	1231
e + K		Th	1231
e + Na		Th	1231
e + Li		Th	1231
e + Ar	2−10eV	Th	1232
e + Mg	3−10eV	Th	1233
e + H_2	20−30eV	Th	1234
e + H_2	20−30eV	Th	1234
e + U^{88+}	0−5eV	Th	1235
e + Ho^{63+}	0−5eV	Th	1235
e + Mo^{38+}	0−5eV	Th	1235
e + O_2		E/T	1236
e + Ni^{20+}	1E6.4−1E7.4	Th	1237
e + Au^{-}		Th	1238
e + Ag^{-}		Th	1238
e + Cu^{-}		Th	1238
e + Fr^{-}		Th	1238
e + Cs^{-}		Th	1238
e + Rb^{-}		Th	1238
e + K^{-}		Th	1238
e + Na^{-}		Th	1238
e + Li^{-}		Th	1238
e + H^{-}		Th	1238
e + C_2H_6	0.01−100eV	Th	1239
e + C_2H_4	0.01−100eV	Th	1239
e + CH_4	0.01−100eV	Th	1239
e + $C\text{-}C_4F_8$	0.01−100eV	Th	1239
e + C_3F_8	0.01−100eV	Th	1239
e + CF_3I	0.01−100eV	Th	1239
e + CF_3Cl	0.01−100eV	Th	1239
e + C_2F_6	0.01−100eV	Th	1239
e + Si_2H_6	0.1−100eV	E/T	1240
e + CF_4	0.1−100eV	E/T	1240
e + CCl_4	0.1−100eV	E/T	1240
e + H_2O	0.1−100eV	E/T	1240
e + HCl	0.1−100eV	E/T	1240
e + BCl_3	0.1−100eV	E/T	1240
e + BF_3	0.1−100eV	E/T	1240
e + CO_2	0.1−100eV	E/T	1240
e + NO	0.1−100eV	E/T	1240

$\mathbf{e + CF_3Br}$	0.1−100eV	E/T	1240
$\mathbf{e + CH_4}$	0.1−100eV	E/T	1240
$\mathbf{e + WF_6}$	0.1−100eV	E/T	1240
$\mathbf{e + H_2O}$	0.1−100eV	E/T	1240
$\mathbf{e + CH_3Br}$	0.1−100eV	E/T	1240
$\mathbf{e + CCl_2F_2}$	0.1−100eV	E/T	1240
$\mathbf{e + SF_6}$	0.1−100eV	E/T	1240
$\mathbf{e + C_2F_6}$	0.1−100eV	E/T	1240
$\mathbf{e + HCl}$	0.1−100eV	E/T	1240
$\mathbf{e + BCl_3}$	0.1−100eV	E/T	1240
$\mathbf{e + BF_3}$	0.1−100eV	E/T	1240
$\mathbf{e + Si_2H_6}$	0.1−100eV	E/T	1240
$\mathbf{e + CF_4}$	0.1−100eV	E/T	1240
$\mathbf{e + CCl_4}$	0.1−100eV	E/T	1240
$\mathbf{e + CH_4}$	0.1−100eV	E/T	1240
$\mathbf{e + CO_2}$	0.1−100eV	E/T	1240
$\mathbf{e + NO}$	0.1−100eV	E/T	1240
$\mathbf{e + CF_3Br}$	0.1−100eV	E/T	1240
$\mathbf{e + WF_6}$	0.1−100eV	E/T	1240
$\mathbf{e + H_2O}$	0.1−100eV	E/T	1240
$\mathbf{e + HCl}$	0.1−100eV	E/T	1240
$\mathbf{e + BCl_3}$	0.1−100eV	E/T	1240
$\mathbf{e + CH_3Br}$	0.1−100eV	E/T	1240
$\mathbf{e + CCl_2F_2}$	0.1−100eV	E/T	1240
$\mathbf{e + SF_6}$	0.1−100eV	E/T	1240
$\mathbf{e + BF_3}$	0.1−100eV	E/T	1240
$\mathbf{e + CO_2}$	0.1−100eV	E/T	1240
$\mathbf{e + NO}$	0.1−100eV	E/T	1240
$\mathbf{e + CF_3Br}$	0.1−100eV	E/T	1240
$\mathbf{e + C_2F_6}$	0.1−100eV	E/T	1240
$\mathbf{e + Si_2H_6}$	0.1−100eV	E/T	1240
$\mathbf{e + CF_4}$	0.1−100eV	E/T	1240
$\mathbf{e + CH_3Br}$	0.1−100eV	E/T	1240
$\mathbf{e + CCl_2F_2}$	0.1−100eV	E/T	1240
$\mathbf{e + SF_6}$	0.1−100eV	E/T	1240
$\mathbf{e + C_2F_6}$	0.1−100eV	E/T	1240
$\mathbf{e + CCl_4}$	0.1−100eV	E/T	1240
$\mathbf{e + CH_4}$	0.1−100eV	E/T	1240
$\mathbf{e + WF_6}$	0.1−100eV	E/T	1240
$\mathbf{e + Ar}^{15+}$	800−1200eV	Th	1241
$\mathbf{e + Fe}^{16+}$	800−1200eV	Th	1241
$\mathbf{e + Ar}^{4+}$	10eV−5E3keV	Th	1242
$\mathbf{e + Kr}^{5+}$	10eV−5E3keV	Th	1242
$\mathbf{e + Kr}^{+}$	10eV−5E3keV	Th	1242
$\mathbf{e + Fe}$	10eV−5E3keV	Th	1242
$\mathbf{e + Ar}$	10eV−5E3keV	Th	1242
$\mathbf{e + Ar}^{3+}$	10eV−5E3keV	Th	1242
$\mathbf{e + Kr}$	10eV−5E3keV	Th	1242
$\mathbf{e + Ar}^{2+}$	10eV−5E3keV	Th	1242
$\mathbf{e + Kr}^{17+}$	10eV−5E3keV	Th	1242
$\mathbf{e + Kr}^{15+}$	10eV−5E3keV	Th	1242
$\mathbf{e + Fe}^{13+}$	10eV−5E3keV	Th	1242
$\mathbf{e + Fe}^{11+}$	10eV−5E3keV	Th	1242
$\mathbf{e + Fe}^{9+}$	10eV−5E3keV	Th	1242
$\mathbf{e + Fe}^{6+}$	10eV−5E3keV	Th	1242
$\mathbf{e + Kr}^{10+}$	10eV−5E3keV	Th	1242
$\mathbf{e + Fe}^{5+}$	10eV−5E3keV	Th	1242
$\mathbf{e + Fe}^{2+}$	10eV−5E3keV	Th	1242
$\mathbf{e + Ar}^{7+}$	10eV−5E3keV	Th	1242

e + Ar^{6+}	10eV−5E3keV	Th	1242
e + Ar^{5+}	10eV−5E3keV	Th	1242
e + Kr^{6+}	10eV−5E3keV	Th	1242
e + CF$_4$	10−1000 eV	Exp	1243
e + CHF$_3$	10−1000 eV	Exp	1243
e + CH$_2$**F**$_2$	10−1000 eV	Exp	1243
e + CH$_3$**F**	10−1000 eV	Exp	1243
e + CF$_2$**Cl**$_2$	0−4E19 mole/cm^3	Exp	1244
e + CH$_3$**Br**	330−1100 K	Exp	1245
e + CH$_2$**O**	85eV	Th	1246
e + C$_{60}$		Exp	1247
e + N$_2{}^+$	100−3000 K	Th	1248
e + Pt	5−1E6 keV	Th	1249
e + Os	5−1E6 keV	Th	1249
e + Re	5−1E6 keV	Th	1249
e + Hf	5−1E6 keV	Th	1249
e + Dy	5−1E6 keV	Th	1249
e + I	5−1E6 keV	Th	1249
e + U	5−1E6 keV	Th	1249
e + Pb	5−1E6 keV	Th	1249
e + Au	5−1E6 keV	Th	1249
e + W	5−1E6 keV	Th	1249
e + Ta	5−1E6 keV	Th	1249
e + Y	5−1E6 keV	Th	1249
e + Tm	5−1E6 keV	Th	1249
e + Er	5−1E6 keV	Th	1249
e + Ho	5−1E6 keV	Th	1249
e + Gd	5−1E6 keV	Th	1249
e + Eu	5−1E6 keV	Th	1249
e + Sm	5−1E6 keV	Th	1249
e + Nd	5−1E6 keV	Th	1249
e + Pr	5−1E6 keV	Th	1249
e + Ce	5−1E6 keV	Th	1249
e + La	5−1E6 keV	Th	1249
e + Te	5−1E6 keV	Th	1249
e + Xe	5−1E6 keV	Th	1249
e + Sb	5−1E6 keV	Th	1249
e + Sn	5−1E6 keV	Th	1249
e + In	5−1E6 keV	Th	1249
e + Cd	5−1E6 keV	Th	1249
e + Pd	5−1E6 keV	Th	1249
e + Mo	5−1E6 keV	Th	1249
e + Nb	5−1E6 keV	Th	1249
e + Zr	5−1E6 keV	Th	1249
e + Sr	5−1E6 keV	Th	1249
e + Rb	5−1E6 keV	Th	1249
e + Kr	5−1E6 keV	Th	1249
e + Br	5−1E6 keV	Th	1249
e + Se	5−1E6 keV	Th	1249
e + As	5−1E6 keV	Th	1249
e + Ge	5−1E6 keV	Th	1249
e + Ga	5−1E6 keV	Th	1249
e + Zn	5−1E6 keV	Th	1249
e + Cu	5−1E6 keV	Th	1249
e + Ni	5−1E6 keV	Th	1249
e + Co	5−1E6 keV	Th	1249
e + Mn	5−1E6 keV	Th	1249
e + Cr	5−1E6 keV	Th	1249
e + V	5−1E6 keV	Th	1249

e + Ti	5−1E6 keV	Th	1249
e + Sc	5−1E6 keV	Th	1249
e + Ca	5−1E6 keV	Th	1249
e + K	5−1E6 keV	Th	1249
e + Ar	5−1E6 keV	Th	1249
e + Cl	5−1E6 keV	Th	1249
e + S	5−1E6 keV	Th	1249
e + Al	5−1E6 keV	Th	1249
e + Mg	5−1E6 keV	Th	1249
e + Na	5−1E6 keV	Th	1249
e + O	5−1E6 keV	Th	1249
e + H	5−1E6 keV	Th	1249
e + C	5−1E6 keV	Th	1249
e + Bi	5−1E6 keV	Th	1249
e + Ag	5−1E6 keV	Th	1249
e + Fe	5−1E6 keV	Th	1249
e + Si	5−1E6 keV	Th	1249
e + N	5−1E6 keV	Th	1249
e + Ne	20−300eV	Exp	1250
e + O_2	30−400eV	Exp	1251
e + $CFCl_3$	1.5−100eV	E/T	1252
e + CF_2Cl_2	1.5−100eV	E/T	1252
e + CF_3Cl	1.5−100eV	E/T	1252
e + CH_3I	20−5000eV	Th	1253
e + CH_3Br	20−5000eV	Th	1253
e + CH_3Cl	20−5000eV	Th	1253
e + CH_3F	20−5000eV	Th	1253
e + CH_3F	15−500eV	Th	1254
e + $CHCl_3$	20−5000eV	Th	1255
e + CH_2Cl_2	20−5000eV	Th	1255
e + Cl_2O	0.1−2000eV	Th	1256
e + N_2D^+	5−3000eV	Exp	1257
e + N_2H^+	5−3000eV	Exp	1257
e + Pb	3−38keV	E/T	1258
e + Rb	15−50eV	E/T	1259
e + W^{3+}	0.2−100eV	Th	1260
e + W^{3+}	0.2−100eV	Th	1260
e + CF_3	7−50eV	Exp	1261
e + Na	30−400eV	Exp	1262
e + Sn^{13+}	40−1000eV	Exp	1263
e + Sn^{12+}	40−1000eV	Exp	1263
e + Sn^{11+}	40−1000eV	Exp	1263
e + Sn^{10+}	40−1000eV	Exp	1263
e + Sn^{9+}	40−1000eV	Exp	1263
e + Sn^{8+}	40−1000eV	Exp	1263
e + Sn^{7+}	40−1000eV	Exp	1263
e + Sn^{6+}	40−1000eV	Exp	1263
e + Sn^{5+}	40−1000eV	Exp	1263
e + Sn^{4+}	40−1000eV	Exp	1263
e + HeH^+	10−3000eV	Exp	1264
e + Ge^+	0−200eV	Exp	1265
e + U	4−40keV	Exp	1266
e + Bi	80−100keV	Exp	1267
e + Au	80−100keV	Exp	1267
e + Se^{3+}	30−1000eV	Exp	1268
e + Se^{2+}	30−500eV	Exp	1269
e + Ar	0.1−10keV	Th	1270
e + Ne	0.1−10keV	Th	1270
e + Xe	0.1−10keV	Th	1270

e + Kr	0.1−10keV	Th	1270
e + $\mathbf{CH_4}$	500eV	E/T	1271
e + Ne	500eV	E/T	1271
e + Xe	0.01−400eV	E/T	1272
e + Kr	0.01−400eV	E/T	1272
e + Xe	0.01−400eV	E/T	1272
e + Kr	0.01−400eV	E/T	1272
e + Xe	0.01−400eV	E/T	1272
e + Kr	0.01−400eV	E/T	1272
e + Xe	0.01−400eV	E/T	1272
e + Kr	0.01−400eV	E/T	1272
e + He	20−1000eV	E/T	1273
e + Ne	20−1000eV	E/T	1273
e + He	20−1000eV	E/T	1273
e + Ne	20−1000eV	E/T	1273
e + He	20−1000eV	E/T	1273
e + Ne	20−1000eV	E/T	1273
e + He	20−1000eV	E/T	1273
e + Ne	20−1000eV	E/T	1273
e + Ar	0.01−200eV	E/T	1274
e + Ar	0.01−200eV	E/T	1274
e + Ar	0.01−200eV	E/T	1274
e + $\mathbf{W}^{46+}$	0−12 keV	Th	1275
e + $\mathbf{W}^{45+}$	0−12 keV	Th	1275
e + $\mathbf{W}^{44+}$	0−12 keV	Th	1275
e + $\mathbf{W}^{43+}$	0−12 keV	Th	1275
e + $\mathbf{W}^{42+}$	0−12 keV	Th	1275
e + Ne	0.06−20eV	Exp	1276
e + He	0.06−20eV	Exp	1276
e + $\mathbf{Cd}^{+}$	20−200eV	Th	1277
e + $\mathbf{N}^{5+}$	100−1000eV	Exp	1278
e + $\mathbf{Fe}^{14+}$	0.5−1000eV	Exp	1279
e + $\mathbf{Fe}^{14+}$	0.5−1000eV	Exp	1279
e + $\mathbf{LiH_2}^{+}$	0.001−20eV	E/T	1280
e + $\mathbf{W}^{5+}$	50−10000eV	Th	1281
e + $\mathbf{Ar}^{2+}$	50−10000eV	Th	1281
e + $\mathbf{C}^{+}$	50−10000eV	Th	1281
e + $\mathbf{O}^{3+}$	50−10000eV	Th	1281
e + $\mathbf{O}^{2+}$	50−10000eV	Th	1281
e + $\mathbf{O}^{+}$	50−10000eV	Th	1281
e + Ar	200 eV	E/T	1282
e + $\mathbf{H_2O}$	0−50eV	Th	1283
e + $\mathbf{CH_4}$	500 eV	Th	1284
e + Mg	10−25eV	Th	1285
e + H	25−250eV	Th	1286
e + Cs	7−12eV	Th	1287
e + Ar	195eV	E/T	1288
e + $\mathbf{CH_3CHO}$	1−50eV	E/T	1289
e + $\mathbf{Kr}^{+}$	0−5eV	Th	1290
e + $\mathbf{H_2O}$	4−40eV	Th	1291
e + $\mathbf{N_2}$	0.088−10 A.U.	Th	1292
e + $\mathbf{O}^{-}$	0.088−10 A.U.	Th	1292
e + $\mathbf{CN}^{-}$	0.088−10 A.U.	Th	1292
e + $\mathbf{HD}^{+}$	0−1000eV	Th	1293
e + $\mathbf{T_2}^{+}$	0−1000eV	Th	1293
e + $\mathbf{D_2}^{+}$	0−1000eV	Th	1293
e + $\mathbf{H_2}^{+}$	0−1000eV	Th	1293
e + $\mathbf{T_2}^{+}$	0−1000eV	Th	1293
e + $\mathbf{D_2}^{+}$	0−1000eV	Th	1293

e + $H_2{}^+$	0−1000eV	Th	1293
e + He^+	0−1000eV	Th	1293
e + $D_2{}^+$	0−1000eV	Th	1293
e + $H_2{}^+$	0−1000eV	Th	1293
e + He^+	0−1000eV	Th	1293
e + $H_2{}^+$	0−1000eV	Th	1293
e + He^+	0−1000eV	Th	1293
e + HT^+	0−1000eV	Th	1293
e + He^+	0−1000eV	Th	1293
e + HT^+	0−1000eV	Th	1293
e + HD^+	0−1000eV	Th	1293
e + HT^+	0−1000eV	Th	1293
e + HD^+	0−1000eV	Th	1293
e + $T_2{}^+$	0−1000eV	Th	1293
e + HT^+	0−1000eV	Th	1293
e + HD^+	0−1000eV	Th	1293
e + $T_2{}^+$	0−1000eV	Th	1293
e + $D_2{}^+$	0−1000eV	Th	1293
e + Br^{33+}	900−2100 RYD	Th	1294
e + Se^{32+}	900−2100 RYD	Th	1294
e + As^{31+}	900−2100 RYD	Th	1294
e + Ge^{30+}	900−2100 RYD	Th	1294
e + Ga^{29+}	900−2100 RYD	Th	1294
e + C_3H_4	0.1−2000eV	Th	1295
e + C	0−100eV	Th	1296
e + C	0−100eV	Th	1296
e + C	0−100eV	Th	1296
e + C	0−100eV	Th	1296
e + CH_3OH	0.1−2000eV	Th	1297
e + CH_3OH	0.1−2000eV	Th	1297
e + CH_3OH	0.1−2000eV	Th	1297
e + Ar^{16+}	1−1000eV	Th	1298
e + Ne^{8+}	1−1000eV	Th	1298
e + O^{6+}	1−1000eV	Th	1298
e + N^{5+}	1−1000eV	Th	1298
e + C^{4+}	1−1000eV	Th	1298
e + B^{3+}	1−1000eV	Th	1298
e + Li^+	1−1000eV	Th	1298
e + He	1−1000eV	Th	1298
e + $H_2{}^+$	0−1000eV	Th	1299
e + D_2	178eV	E/T	1300
e + D_2	178eV	E/T	1300
e + H_2	0−100eV	Th	1301
e + U	0−160 keV	Th	1302
e + Xe	0−160 keV	Th	1302
e + Ni	0−160 keV	Th	1302
e + H_2O	9−20eV	Th	1303
e + Al^{12+}	100 eV	Th	1304
e + Ar	0.01−300eV	Th	1305
e + Ar	0.01−300eV	Th	1305
e + Ar	0.01−300eV	Th	1305
e + U	0−1000eV	Th	1306
e + N	0.01−140eV	Th	1307
e + N	0.01−140eV	Th	1307
e + N	0.01−140eV	Th	1307
e + F	0.01−120eV	Th	1308
e + F	0.01−120eV	Th	1308
e + F	0.01−120eV	Th	1308
e + Sn^{13+}	0−4000eV	Th	1309

e + Sn^{13+}	0−4000eV	Th	1309
e + N$_2{}^+$	0.1−1eV	Th	1310
e + Si^{9+}	1330−1550eV	E/T	1311
e + Si^{8+}	1330−1550eV	E/T	1311
e + Si^{7+}	1330−1550eV	E/T	1311
e + Si^{6+}	1330−1550eV	E/T	1311
e + Si^{12+}	1330−1550eV	E/T	1311
e + Si^{11+}	1330−1550eV	E/T	1311
e + Si^{10+}	1330−1550eV	E/T	1311
e + HDO$^+$	10−2500eV	Exp	1312
e + Bi^{79+}		Th	1313
e + Ho^{53+}		Th	1313
e + Ag^{43+}		Th	1313
e + W^{39+}	1−50000eV	Th	1314
e + N$_2$	0−22eV	Th	1315
e + O$_2$	0−100eV	Th	1316
e + BeH	0−1000eV	Th	1317
e + N$_2$	0−100eV	Th	1318
e + N$_2$	0−100eV	Th	1318
e + SF$_6$	0.1−5000eV	Th	1319
e + SF$_6$	0.1−5000eV	Th	1319
e + S	0−10eV	Exp	1320
e + NH$^+$	1.71E−5−2EeV	Exp	1321
e + Fe^{6+}	0.01−40eV	Th	1322
e + Fe^{2+}	1E3−1E5 K	Th	1323
e + Zn^{15+}	1E4−1E7 K	Th	1324
e + Cu^{14+}	1E4−1E7 K	Th	1324
e + Ni^{13+}	1E4−1E7 K	Th	1324
e + Co^{12+}	1E4−1E7 K	Th	1324
e + Fe^{11+}	1E4−1E7 K	Th	1324
e + Mn^{10+}	1E4−1E7 K	Th	1324
e + Cr^{9+}	1E4−1E7 K	Th	1324
e + V^{8+}	1E4−1E7 K	Th	1324
e + Ti^{7+}	1E4−1E7 K	Th	1324
e + Sc^{6+}	1E4−1E7 K	Th	1324
e + Ca^{5+}	1E4−1E7 K	Th	1324
e + K^{4+}	1E4−1E7 K	Th	1324
e + Ar^{3+}	1E4−1E7 K	Th	1324
e + Cl^{2+}	1E4−1E7 K	Th	1324
e + P$^+$	1E4−1E7 K	Th	1324
e + S$^+$	1E4−1E7 K	Th	1324
e + Ar	0.01−1000eV	Th	1325
e + Xe	0.01−1000eV	Th	1325
e + Xe	0.01−1000eV	Th	1325
e + Kr	0.01−1000eV	Th	1325
e + Kr	0.01−1000eV	Th	1325
e + Ar	0.01−1000eV	Th	1325
e + Ar	0.01−1000eV	Th	1325
e + Xe	0.01−1000eV	Th	1325
e + Xe	0.01−1000eV	Th	1325
e + Kr	0.01−1000eV	Th	1325
e + Kr	0.01−1000eV	Th	1325
e + Ar	0.01−1000eV	Th	1325
e + BF$_3$	0−10eV	Th	1326
e + H$_2$**O**	2−20eV	Th	1327
e + H$_2$**O**	30−100eV	Th	1328
e + Zn^{28+}	450−1300 RYD	Th	1329
e + Cu^{27+}	450−1300 RYD	Th	1329
e + Ni^{26+}	450−1300 RYD	Th	1329

e + Co^{25+}	450−1300 RYD	Th	1329
e + Fe^{24+}	450−1300 RYD	Th	1329
e + Al^{9+}	0−350 RYD	Th	1330
e + Si^{+}	1E3.7−1E5.5 K	Th	1331
e + Be	1E−7−1E1 eV	Th	1332
e + He	10−10000eV	Th	1333
e + H	10−10000eV	Th	1333
e + O^{2+}	0−40eV	Th	1334
e + S^{+}	0−20000K	Th	1335
e + N^{+}	0−20000K	Th	1335
e + He^{+}	40−70eV	Th	1336
e + He^{+}	0−1000eV	Th	1337
e + C	1801eV	Th	1338
e + Kr^{+}	3.3eV	Th	1339
e + Ho^{64+}	20−40keV	Th	1340
e + Ho^{65+}	20−40keV	Th	1340
e + Pr^{56+}	20−40keV	Th	1340
e + Pr^{57+}	20−40keV	Th	1340
e + W^{28+}	0−4000eV	Th	1341
e + Yb^{24+}	0−4000eV	Th	1341
e + Tb^{19+}	0−4000eV	Th	1341
e + Nd^{14+}	0−4000eV	Th	1341
e + Ba^{10+}	0−4000eV	Th	1341
e + Sn^{4+}	0−4000eV	Th	1341
e + Gd^{18+}	0−4000eV	Th	1341
e + U	0−40keV	Exp	1342
e + Bi	0−40keV	Exp	1342
e + Pb	0−40keV	Exp	1342
e + Au	0−40keV	Exp	1342
e + Ar$_2$$^{+}$	300−10400 K	E/T	1343
e + Kr^{2+}	1E1−1E8 K	Th	1344
e + Kr^{+}	1E1−1E8 K	Th	1344
e + Kr	1E1−1E8 K	Th	1344
e + Kr^{4+}	1E1−1E8 K	Th	1344
e + Kr^{3+}	1E1−1E8 K	Th	1344
e + Kr^{5+}	1E1−1E8 K	Th	1344
e + Kr^{6+}	1E1−1E8 K	Th	1344
e + Ni^{10+}	threshold−1000 eV	Th	1345
e + Ni^{16+}	threshold−1700 eV	Th	1346
e + Fe^{14+}	threshold−1670 eV	Th	1347
e + K	4−100 eV	Th	1348
e^{+} + K	4−100 eV	Th	1348
e + K	4−100 eV	Th	1348
e^{+} + K	4−100 eV	Th	1348
e + CH$_3$Cl	5, 10, 20 eV	Exp	1349
e + CH$_3$Cl	5, 10, 20 eV	Exp	1349
e + Rb	10−100 eV	Th	1350
e + Ar	0−9 eV	E/T	1351
e + Xe	0−9 eV	E/T	1351
e^{+} + Ar	0−9 eV	E/T	1351
e^{+} + Xe	0−9 eV	E/T	1351
e + Ar	0−9 eV	E/T	1351
e + Xe	0−9 eV	E/T	1351
e^{+} + Ar	0−9 eV	E/T	1351
e^{+} + Xe	0−9 eV	E/T	1351
e + CH$_2$O	0.26−50.3 eV	E/T	1352
e^{+} + CH$_2$O	0.26−50.3 eV	E/T	1352
e + CH$_3$OH	10−1000 eV	Th	1353
e + e	10−1000 eV	Th	1353

e + e	0.15−50.15 eV	E/T	1354
e^+ + e	0.15−50.15 eV	E/T	1354
e^+ + N_2	0.2−40 eV	Exp	1355
e^+ + Co	0.2−40 eV	Exp	1355
e^+ + C_2H_2	0.2−40 eV	Exp	1355
e^+ + Ne	0.3−60 eV	E/T	1356
e^+ + Ar	0.3−60 eV	E/T	1356
e + CH_3OH	100−1000 eV	E/T	1357
e + CH_3OH	100−1000 eV	E/T	1357
e^+ + Ne	0−200 eV	Th	1358
e^+ + Ar	0−200 eV	Th	1358
e^+ + Be	0−200 eV	Th	1358
e^+ + Mg	0−200 eV	Th	1358
e^+ + Ne	0−200 eV	Th	1358
e^+ + Ar	0−200 eV	Th	1358
e^+ + Be	0−200 eV	Th	1358
e^+ + Mg	0−200 eV	Th	1358
e + He	0.1−1000 eV	Th	1359
e + He	0.1−1000 eV	Th	1359
e + He	0.1−1000 eV	Th	1359
e + He	threshold−1000 eV	Th	1360
e + He	threshold−1000 eV	Th	1360
e + Ar	7 meV− 20 eV	Exp	1361
e + Kr	7 meV− 20 eV	Exp	1361
e + Xe	7 meV− 20 eV	Exp	1361
e + Ar	100 eV	Exp	1362
e + Ar	100 eV	Exp	1362
e^+ + H	20−300 eV	Th	1363
e^+ + H	20−300 eV	Th	1363
e + Ne	threshold−20 eV	Th	1364
e + Ar	threshold−20 eV	Th	1364
e + Kr	threshold−20 eV	Th	1364
e + Xe	threshold−20 eV	Th	1364
e + Ne	threshold−20 eV	Th	1364
e + Ar	threshold−20 eV	Th	1364
e + Kr	threshold−20 eV	Th	1364
e + Xe	threshold−20 eV	Th	1364
e^+ + He	100−500, 600−1500, 1500−4000, 3000−5500, 6000−12500 e	Th	1365
e^+ + C	100−500, 600−1500, 1500−4000, 3000−5500, 6000−12500 e	Th	1365
e^+ + Ne	100−500, 600−1500, 1500−4000, 3000−5500, 6000−12500 e	Th	1365
e^+ + Na	100−500, 600−1500, 1500−4000, 3000−5500, 6000−12500 e	Th	1365
e^+ + Ar	100−500, 600−1500, 1500−4000, 3000−5500, 6000−12500 e	Th	1365
e^+ + He	100−500, 600−1500, 1500−4000, 3000−5500, 6000−12500 e	Th	1365
e^+ + C	100−500, 600−1500, 1500−4000, 3000−5500, 6000−12500 e	Th	1365
e^+ + Ne	100−500, 600−1500, 1500−4000, 3000−5500, 6000−12500 e	Th	1365
e^+ + Na	100−500, 600−1500, 1500−4000, 3000−5500, 6000−12500 e	Th	1365
e^+ + Ar	100−500, 600−1500, 1500−4000, 3000−5500, 6000−12500 e	Th	1365
e + e	0−15 eV	Exp	1366
e + H Z= 24-28	7E5−1E9 K	Th	728
e + Li Z= 4-36	2E2−2E6 $(Z+1)^2$ K	Th	729
e + Li Z= 3-6	1−1.5 threshold unit	Th	805
e + Li Z= 3-6	1−1.5 threshold unit	Th	805
e + Na Z= 12-14	threshold−20 eV	Th	807

2.2.2 Heavy Particles Collisions

H^+ + He	1−100keV/u	Th	1368
H^+ + H_2	5−600eV	Th	1369
H^+ + Kr	10 − 1000keV/amu	Th	1371

$\mathbf{H^{+} + Xe}$	10 − 1000keV/amu	Th	1371
$\mathbf{H^{+} + Ar}$	10 − 1000keV/amu	Th	1371
$\mathbf{H^{+} + Ne}$	10 − 1000keV/amu	Th	1371
$\mathbf{H^{+} + U^{91+}}$	1−15 threshold unit, 1−2000 keV	Th	1372
$\mathbf{H^{-} + Li}$	0−100 keV	Th	1374
$\mathbf{H^{-} + He}$	0−100 keV	Th	1374
$\mathbf{H^{-} + H}$	0−100 keV	Th	1374
$\mathbf{H^{+} + H_2}$	75 keV	Th	1376
$\mathbf{H^{+} + H_2}$	75 keV	Th	1376
$\mathbf{H^{+} + He}$	100−1000 eV	Th	1377
$\mathbf{H^{-} + He}$	700−1000 keV	Th	1378
$\mathbf{H^{+} + He}$	700−1000 keV	Th	1378
$\mathbf{H^{-} + He}$	700−1000 keV	Th	1378
$\mathbf{H^{+} + He}$	700−1000 keV	Th	1378
$\mathbf{H^{+} + H}$	1−100 keV	Th	1379
$\mathbf{H^{2+} + H}$	1−100 keV	Th	1379
$\mathbf{H^{+} + H_2O}$	100−1000 keV	Th	1380
$\mathbf{H^{+} + H}$	1.0 MeV	Exp	1381
$\mathbf{H^{+} + H}$	1.0 MeV	Exp	1381
$\mathbf{H^{-} + He}$	1−1000 keV	Th	1386
$\mathbf{H + H_2}$	0.5−1.4 eV	Th	1389
$\mathbf{H^{-} + H}$	30−500, 30−200 keV	Th	1391
$\mathbf{H^{-} + H}$	30−500, 30−200 keV	Th	1391
$\mathbf{H^{+} + Li}$	0−50 keV	Th	1392
$\mathbf{He^{+} + Kr}$	10 − 1000keV/amu	Th	1371
$\mathbf{He^{+} + Xe}$	10 − 1000keV/amu	Th	1371
$\mathbf{He^{+} + Ar}$	10 − 1000keV/amu	Th	1371
$\mathbf{He^{+} + Ne}$	10 − 1000keV/amu	Th	1371
$\mathbf{He^{2+} + He}$	700−1000 keV	Th	1378
$\mathbf{He^{2+} + He}$	700−1000 keV	Th	1378
$\mathbf{He^{2+} + H_2}$	0.3−4.6 keV	E/T	1383
$\mathbf{He^{2+} + He}$	0.3−4.6 keV	E/T	1383
$\mathbf{He^{2+} + H_2}$	0.01−25 keV	Th	1385
$\mathbf{Li^{3+} + He}$	700−1000 keV	Th	1378
$\mathbf{Li^{3+} + He}$	700−1000 keV	Th	1378
$\mathbf{B^{5+} + H}$	0.1− 200keV/amu	Th	1370
$\mathbf{C^{3+} + H}$	0−700keV/u	Th	1367
$\mathbf{C^{6+} + He}$	100 MeV	Th	1373
$\mathbf{C^{6+} + He}$	100 MeV	Th	1373
$\mathbf{C^{6+} + He}$	700−1000 keV	Th	1378
$\mathbf{C^{6+} + He}$	700−1000 keV	Th	1378
$\mathbf{Ne^{4+} + CO_2}$	60−1200 eV	E/T	1387
$\mathbf{Ne^{6+} + CO_2}$	450−2400 eV	E/T	1388
$\mathbf{Ne^{6+} + H_2O}$	450−2400 eV	E/T	1388
$\mathbf{P + P}$	0.5−2 MeV	E/T	1384
$\mathbf{Ar^{18+} + Ar}$	5−4000 eV	Th	1375
$\mathbf{e + U^{91+}}$	1−15 threshold unit, 1−2000 keV	Th	1372
$\mathbf{N_2 + U^{91+}}$	300−1000 MeV	Th	1382
$\mathbf{N_2 + Fe^{25+}}$	300−1000 MeV	Th	1382
$\mathbf{N_2 + Xe^{53+}}$	300−1000 MeV	Th	1382
$\mathbf{O_2 + O_2}$	4−34 K	E/T	1390

2.3 Surface Interactions

$\mathbf{H + W}$	30−85eV(Te), T: 420K	Exp	1408
$\mathbf{H + C}$	30−85eV(Te), T: 420K	Exp	1408
$\mathbf{H + W}$	¡100eV, T: undef	Exp	1413
$\mathbf{H + W}$	¡100eV, T: undef	Exp	1413

H + W	¡100eV, T: undef	Exp	1413
H + W	¡100eV, T: undef	Exp	1413
H + W	¡100eV, T: undef	Exp	1413
H$^+$ + C	25−200eV, T: 300−1000K	Th	1419
H + SiC	20eV(Te), T: undef	Th	1420
H + C	20eV(Te), T: undef	Th	1420
H + SiC	20eV(Te), T: undef	Th	1420
H + C	20eV(Te), T: undef	Th	1420
H$^+$ + W	50−250eV, T: 320−370K	Exp	1421
H + H	1−100eV, T: undef	Th	1424
H + C	1−100eV, T: undef	Th	1424
H + H	1−100eV, T: undef	Th	1424
H + C	1−100eV, T: undef	Th	1424
H + H	1−100eV, T: undef	Th	1424
H + C	1−100eV, T: undef	Th	1424
H + H	1−100eV, T: undef	Th	1424
H + C	1−100eV, T: undef	Th	1424
H + H	1−100eV, T: undef	Th	1424
H + C	1−100eV, T: undef	Th	1424
H + B	1−75eV, T: 900−2000K	Exp	1435
H + C	1−75eV, T: 900−2000K	Exp	1435
H + C	1000−4000eV, T: undef	Exp	1437
H + W	333−1000eV, T: 1000−1050K	E/T	1439
H + W	333−1000eV, T: 1000−1050K	E/T	1439
H + C	0.35−200eV, T: undef	Th	1441
H + C	0.35−200eV, T: undef	Th	1441
H + C	0.35−200eV, T: undef	Th	1441
H + H	undef, T: 300−830K	Exp	1442
H + C	undef, T: 300−830K	Exp	1442
H + C	0.2−2eV(Te), T: 400−1200K	Exp	1444
H + C	undef, T: 300−1200K	Exp	1448
H + C	undef, T: 300−1200K	Exp	1448
H + C	undef, T: 300−1200K	Exp	1448
H + C	undef, T: 300−1200K	Exp	1448
H + C	undef, T: 300−1200K	Exp	1448
H + C	undef, T: 300−1200K	Exp	1448
H + W	2.8−10eV(Te), T: 350−600K	Exp	1456
H + W	2.8−10eV(Te), T: 350−600K	Exp	1456
H + W	undef, T: 330−470K	Exp	1459
H + W	undef, T: 330−470K	Exp	1459
H + W	undef, T: 330−470K	Exp	1459
H + W	undef, T: 330−470K	Exp	1459
H + Si	0.1−3eV(Te), T: 500−1700K	Exp	1460
H + C	0.1−3eV(Te), T: 500−1700K	Exp	1460
H + Be	undef, T: 300K	Exp	1461
H + C	30eV, T: 300−1500K	Th	1466
H + W	undef, T: undef	Exp	1469
H + W	333−1000eV, T: 453−1050K	Th	1470
H + W	333−1000eV, T: 453−1050K	Th	1470
H + W	333−1000eV, T: 453−1050K	Th	1470
H + W	333−1000eV, T: 453−1050K	Th	1470
H + W	333−1000eV, T: 453−1050K	Th	1470
H + WC	undef, T: undef	Th	1474
H + EUROFER$_{97}$	undef, T: 673K	E/T	1476
H + W	undef, T: 673K	E/T	1476
H + Be	undef, T: undef	Th	1478
H + W	undef, T: undef	Th	1479
H + C	undef, T: undef	Th	1479
H + Ni	undef, T: 285−1000K	Exp	1482

H + W	undef, T: 285−1000K	Exp	1482
H + Fe	undef, T: undef	Th	1487
H + W	undef, T: undef	Th	1487
H + Mo	undef, T: undef	Th	1487
H + Cr	undef, T: undef	Th	1487
H + Ta	undef, T: undef	Th	1487
H + Nb	undef, T: undef	Th	1487
H + V	undef, T: undef	Th	1487
H + W	undef, T: 300−1000K	Th	1489
H + Mo	undef, T: 273−323K	Exp	1490
H + W	undef, T: 273−323K	Exp	1490
H + W	undef, T: undef	Th	1492
H + EUROFER$_{97}$	undef, T: 1323K	Exp	1495
H + W	undef, T: undef	Th	1498
H + W	undef, T: ¿300K	Th	1500
H + Be	undef, T: 673K	Exp	1503
H + C	1−75eV, T: undef	Exp	1510
H + H	10−10000eV, T: 300−1300K	Th	1511
H + C	10−10000eV, T: 300−1300K	Th	1511
$\mathbf{H}^+$ **+ C**	10−10000eV, T: 300−1300K	Th	1511
$\mathbf{H}^+$ **+ C**	10−1000eV, T: 200−1000K	Th	1516
$\mathbf{H}^+$ **+ C**	10−1000eV, T: 200−1000K	Th	1516
H + W	38eV, T: 285−1000K	E/T	1526
H + W	2.8−10eV(Te), T: 573K	Exp	1527
H + W	2.8−10eV(Te), T: 573K	Exp	1527
H + W	2.8−10eV(Te), T: 573K	Exp	1527
H + W	2.8−10eV(Te), T: 573K	Exp	1527
H + W	undef, T: 373−1073K	Exp	1528
H + O	undef, T: 373−1073K	Exp	1528
H + W	undef, T: 373−1073K	Exp	1528
H + O	undef, T: 373−1073K	Exp	1528
H + O	undef, T: 373−1073K	Exp	1528
H + W	undef, T: 373−1073K	Exp	1528
H + O	undef, T: 373−1073K	Exp	1528
H + W	undef, T: 373−1073K	Exp	1528
H + WC	¡25eV, T: 400−1000K	Exp	1535
H + WC	¡25eV, T: 400−1000K	Exp	1535
H + WC	¡25eV, T: 400−1000K	Exp	1535
H + WC	¡25eV, T: 400−1000K	Exp	1535
$\mathbf{H}^+$ **+ H**	undef, T: undef	Exp	1541
$\mathbf{H}^+$ **+ C**	undef, T: undef	Exp	1541
$\mathbf{H}^+$ **+ H**	undef, T: undef	Exp	1541
$\mathbf{H}^+$ **+ C**	undef, T: undef	Exp	1541
$\mathbf{H}^+$ **+ H**	undef, T: undef	Exp	1541
$\mathbf{H}^+$ **+ C**	undef, T: undef	Exp	1541
$\mathbf{H}^+$ **+ H**	undef, T: undef	Exp	1541
$\mathbf{H}^+$ **+ C**	undef, T: undef	Exp	1541
H + C	50−1000eV, T: 300K	Exp	1555
H + C	50−1000eV, T: 300K	Exp	1555
H + C	50−1000eV, T: 300K	Exp	1555
H + C	50−1000eV, T: 300K	Exp	1555
H + Mo	undef, T: 600−2000K	Th	1563
H + H	undef, T: undef	Th	1566
H + Be	undef, T: undef	Th	1566
H + W	38−200eV, T: 300−750K	Exp	1567
H + W	38−200eV, T: 300−750K	Exp	1567
H + W	38−200eV, T: 300−750K	Exp	1567
H + W	38−200eV, T: 300−750K	Exp	1567
H + W	undef, T: 673−873K	Exp	1568

$\mathbf{H^+ + W}$	700−2000eV, T: undef	Th	1570
$\mathbf{H^+ + H}$	700−2000eV, T: undef	Th	1570
$\mathbf{H^+ + C}$	700−2000eV, T: undef	Th	1570
H + W	0.5−50eV, T: 298K	Th	1571
H + W	0.5−50eV, T: 298K	Th	1571
H + H	undef, T: undef	Th	1573
H + Be	undef, T: undef	Th	1573
H + W	undef, T: undef	Th	1575
H + W	undef, T: undef	Th	1576
H + W	undef, T: undef	Th	1578
H + Fe	undef, T: undef	Th	1581
H + W	undef, T: undef	Th	1581
H + W	undef, T: undef	Exp	1582
H + C	200−1500eV, T: 300−1000K	E/T	1594
H + W	200−1500eV, T: 300−1000K	E/T	1594
H + C	200−1500eV, T: 300−1000K	E/T	1594
H + W	200−1500eV, T: 300−1000K	E/T	1594
H + W	200−1500eV, T: 300−1000K	E/T	1594
H + C	200−1500eV, T: 300−1000K	E/T	1594
H + W	200−1500eV, T: 300−1000K	E/T	1594
H + C	200−1500eV, T: 300−1000K	E/T	1594
H + W	undef, T: 273−2000K	Exp	1597
H + W	undef, T: 500−1450K	Th	1598
H + W	undef, T: undef	Th	1600
$\mathbf{H^+ + W}$	15−25eV, T: 450−900K	Exp	1612
$\mathbf{H^+ + W}$	15−25eV, T: 450−900K	Exp	1612
$\mathbf{H^+ + W}$	15−25eV, T: 450−900K	Exp	1612
$\mathbf{H^+ + W}$	15−25eV, T: 450−900K	Exp	1612
H + W	undefined		1614
H + W	200−300eV, T: 373−773K		1621
H + SS	200−300eV, T: 373−773K		1621
H + W	200−300eV, T: 373−773K		1621
H + SS	200−300eV, T: 373−773K		1621
H + W	200−300eV, T: 373−773K		1621
H + SS	200−300eV, T: 373−773K		1621
H + W	200−300eV, T: 373−773K		1621
H + SS	200−300eV, T: 373−773K		1621
H + W	200−300eV, T: 373−773K		1621
H + SS	200−300eV, T: 373−773K		1621
H + W	20000eV, T: undef		1625
H + C	undef, T: undef		1629
H + C	undef, T: undef		1629
H + C	undef, T: undef		1629
H + C	undef, T: undef		1629
H + Mo	undef, T: 50−1500K		1637
H + W	undef, T: 50−1500K		1637
H + Mo	undef, T: 50−1500K		1637
H + W	undef, T: 50−1500K		1637
H + Mo	undef, T: 50−1500K		1637
H + W	undef, T: 50−1500K		1637
H + Mo	undef, T: 50−1500K		1637
H + W	undef, T: 50−1500K		1637
H + Mo	undef, T: 50−1500K		1637
H + W	undef, T: 50−1500K		1637
H + SS	10−1000eV, T: undef		1640
H + C	10−1000eV, T: undef		1640
H + SS	10−1000eV, T: undef		1640
H + C	10−1000eV, T: undef		1640
H + SS	10−1000eV, T: undef		1640

H + C	10−1000eV, T: undef		1640
H + SS	10−1000eV, T: undef		1640
H + C	10−1000eV, T: undef		1640
H + Be	undef, T: 673K		1642
H + BeO	undef, T: 673K		1642
H + Be	undef, T: 673K		1642
H + BeO	undef, T: 673K		1642
H + Be	undef, T: 673K		1642
H + BeO	undef, T: 673K		1642
H + Be	undef, T: 673K		1642
H + BeO	undef, T: 673K		1642
H + Be	undef, T: 673K		1642
H + BeO	undef, T: 673K		1642
H + W	1000eV, T: ¡373K		1646
H + W	1000eV, T: ¡373K		1646
H + W	1000eV, T: ¡373K		1646
H + W	1000eV, T: ¡373K		1646
H + W	200eV, T: 320−450K		1647
H + W	200eV, T: 320−450K		1647
H + W	200eV, T: 320−450K		1647
H + W	200eV, T: 320−450K		1647
H + W	200eV, T: 320−450K		1647
He + W	60eV, T: 1123K	Exp	1394
He + W	2−2000eV, T: undef	Th	1405
He + W	160−320eV, T: 570−1070K	Exp	1407
He + W	160−320eV, T: 570−1070K	Exp	1407
He + W	160−320eV, T: 570−1070K	Exp	1407
He + W	160−320eV, T: 570−1070K	Exp	1407
He + W	160−320eV, T: 570−1070K	Exp	1407
He + WC	100−300eV, T: 600K	Th	1410
He + C	30−126eV, T: 700K	Exp	1416
He + W	15−70eV, T: 293−1100K	Exp	1422
He + W	15−70eV, T: 293−1100K	Exp	1422
He + W	15−70eV, T: 293−1100K	Exp	1422
He + W	15−70eV, T: 293−1100K	Exp	1422
He + W	10−1000eV, T: undef	Th	1430
He + C	1000−4000eV, T: undef	Exp	1437
He + H	3eV(Te), T: undef	Exp	1445
He + C	3eV(Te), T: undef	Exp	1445
He + Li	10−5000eV, T: undef	Exp	1452
He + C	10−5000eV, T: undef	Exp	1452
He + W	10−500eV, T: 300−500K	Exp	1464
He + O	10−500eV, T: 300−500K	Exp	1464
He + C	10−500eV, T: 300−500K	Exp	1464
He + W	10−500eV, T: 300−500K	Exp	1464
He + O	10−500eV, T: 300−500K	Exp	1464
He + C	10−500eV, T: 300−500K	Exp	1464
He + O	10−500eV, T: 300−500K	Exp	1464
He + C	10−500eV, T: 300−500K	Exp	1464
He + W	10−500eV, T: 300−500K	Exp	1464
He + W	10−500eV, T: 300−500K	Exp	1464
He + C	10−500eV, T: 300−500K	Exp	1464
He + O	10−500eV, T: 300−500K	Exp	1464
He + W	320−6000eV, T: 1873K	Exp	1473
He + W	30−1500eV, T: 300−873K	Th	1475
He + Be	undef, T: undef	Th	1478
He + W	undef, T: 1−1000K	Th	1494
He + W	¡75eV, T: 1070−1320K	Exp	1501
He + WC	100−300eV, T: 600K	Th	1507

He + WC	100−300eV, T: 600K	Th	1507
He + W	20−60eV, T: 320−593K	Exp	1508
He + W	20−60eV, T: 320−593K	Exp	1508
He + W	20−60eV, T: 320−593K	Exp	1508
He + W	20−60eV, T: 320−593K	Exp	1508
He + Be	10−10000eV, T: 300−1300K	Th	1511
He^{+} + W	100−6000eV, T: 300−2000K	E/T	1513
He + W	undef, T: undef	Th	1515
He^{+} + W	undef, T: 298−823K	Exp	1518
He + W	170−340eV, T: 300−700K	Exp	1522
He + W	170−340eV, T: 300−700K	Exp	1522
He + W	170−340eV, T: 300−700K	Exp	1522
He + W	170−340eV, T: 300−700K	Exp	1522
He^{+} + W	30−60eV, T: 300−700K	Exp	1525
He^{+} + W	30−60eV, T: 300−700K	Exp	1525
He^{+} + W	30−60eV, T: 300−700K	Exp	1525
He^{+} + W	30−60eV, T: 300−700K	Exp	1525
He + W	38eV, T: 285−1000K	E/T	1526
He + W	38eV, T: 285−1000K	E/T	1526
He + W	38eV, T: 285−1000K	E/T	1526
He + W	38eV, T: 285−1000K	E/T	1526
He + W	undef, T: 200−2000K	Exp	1529
He + He	undef, T: 200−2000K	Exp	1529
He + W	undef, T: 200−2000K	Exp	1529
He + He	undef, T: 200−2000K	Exp	1529
He + WC	¡25eV, T: 400−1000K	Exp	1535
He + WC	¡25eV, T: 400−1000K	Exp	1535
He + WC	¡25eV, T: 400−1000K	Exp	1535
He + WC	¡25eV, T: 400−1000K	Exp	1535
He^{+} + W	76eV, T: 400−750K	Exp	1538
He^{+} + W	76eV, T: 400−750K	Exp	1538
He^{+} + W	76eV, T: 400−750K	Exp	1538
He^{+} + W	76eV, T: 400−750K	Exp	1538
He + W	undef, T: 300−1873K	Exp	1539
He + W	undef, T: 300−1873K	Exp	1539
He + W	undef, T: 300−1873K	Exp	1539
He + W	undef, T: 300−1873K	Exp	1539
He^{+} + W	76eV, T: 300−800K	Exp	1545
He^{+} + W	76eV, T: 300−800K	Exp	1545
He^{+} + W	76eV, T: 300−800K	Exp	1545
He^{+} + W	76eV, T: 300−800K	Exp	1545
He + Be	undef, T: 1123−1273K	Exp	1565
He^{+} + W	30000eV, T: 1273−1423K	Exp	1569
He^{+} + W	30000eV, T: 1273−1423K	Exp	1569
He^{+} + W	30000eV, T: 1273−1423K	Exp	1569
He^{+} + W	30000eV, T: 1273−1423K	Exp	1569
He + He	undef, T: undef	Th	1573
He + Be	undef, T: undef	Th	1573
He + W	30−1000eV, T: 837−873K	Th	1574
He + W	undef, T: undef	Th	1576
He^{+} + W	undef, T: 773−1173K	Exp	1577
He^{+} + W	undef, T: 773−1173K	Exp	1577
He^{+} + W	undef, T: 773−1173K	Exp	1577
He^{+} + W	60−250eV, T: 1120−1320K	Exp	1585
He^{+} + Be	20−160eV, T: undef	E/T	1586
He + W	1000−5000eV, T: 300−873K	E/T	1599
He + W	1000−5000eV, T: 300−873K	E/T	1599
He + W	1000−5000eV, T: 300−873K	E/T	1599
He + W	1000−5000eV, T: 300−873K	E/T	1599

He + W	undef, T: undef	Th	1600
He + W	30−200eV, T: 420−1100K	Exp	1601
He + W	30−200eV, T: 420−1100K	Exp	1601
He + W	30−200eV, T: 420−1100K	Exp	1601
He + W	30−200eV, T: 420−1100K	Exp	1601
He^{+} + Mo	undef, T: undef	Exp	1602
He^{+} + W	undef, T: undef	Exp	1602
He^{+} + Mo	undef, T: undef	Exp	1602
He^{+} + W	undef, T: undef	Exp	1602
He^{+} + Mo	undef, T: undef	Exp	1602
He^{+} + W	undef, T: undef	Exp	1602
He^{+} + Mo	undef, T: undef	Exp	1602
He^{+} + W	undef, T: undef	Exp	1602
He + W	40−70eV, T: ¡573K	Exp	1603
He + W	40−70eV, T: ¡573K	Exp	1603
He + W	40−70eV, T: ¡573K	Exp	1603
He + W	40−70eV, T: ¡573K	Exp	1603
He + W	undef, T: 314−773K	Exp	1607
He + W	undef, T: 314−773K	Exp	1607
He + W	undef, T: 314−773K	Exp	1607
He + W	undef, T: 314−773K	Exp	1607
He^{+} + W	undef, T: 1123−1273K	Exp	1611
He^{+} + W	undef, T: 1123−1273K	Exp	1611
He^{+} + W	undef, T: 1123−1273K	Exp	1611
He^{+} + W	undef, T: 1123−1273K	Exp	1611
He^{+} + W	15−25eV, T: 450−900K	Exp	1612
He^{+} + W	15−25eV, T: 450−900K	Exp	1612
He^{+} + W	15−25eV, T: 450−900K	Exp	1612
He^{+} + W	15−25eV, T: 450−900K	Exp	1612
He + W	T: 50−3000K		1616
He + W	300−1000eV, T: 298K		1623
He + Cd	210eV, T: 300−773K		1627
He + Cd	210eV, T: 300−773K		1627
He + Cd	210eV, T: 300−773K		1627
He + Cd	210eV, T: 300−773K		1627
He + WC	undef, T: undef		1631
He + WC	undef, T: undef		1631
He + WC	undef, T: undef		1631
He + WC	undef, T: undef		1631
He + WC	undef, T: undef		1631
He + W	320eV, T: undef		1638
He + W	320eV, T: undef		1638
He + W	320eV, T: undef		1638
He + W	320eV, T: undef		1638
He + W	undef, T: 700−1600K		1643
He + He	undef, T: 700−1600K		1643
He + W	undef, T: 700−1600K		1643
He + He	undef, T: 700−1600K		1643
He + W	undef, T: 700−1600K		1643
He + He	undef, T: 700−1600K		1643
He + W	undef, T: 700−1600K		1643
He + He	undef, T: 700−1600K		1643
He + Be	undef, T: undef		1644
He + Be	undef, T: 570−1333K		1649
He + W	60eV, T: 500−2000K		1658
He^{+} + W	10−10000eV, T: 298−1600K		1665
He^{+} + W	10−10000eV, T: 298−1600K		1665
He^{+} + W	10−10000eV, T: 298−1600K		1665
He^{+} + W	10−10000eV, T: 298−1600K		1665

He + W	200eV, T: 1223K	1668
He + W	60eV, T: 573K	1672
He + W	60eV, T: 573K	1672
He + W	60eV, T: 573K	1672
He + W	60eV, T: 573K	1672
He + W	60eV, T: 573−1603K	1673
He + W	undef, T: undef	1679
He + Be	undef, T: undef	1679
He + C	undef, T: undef	1679
He + N	undef, T: undef	1679
He + O	undef, T: undef	1679
He + Re	undef, T: undef	1679
He + Ta	undef, T: undef	1679
He + Nb	undef, T: undef	1679
He + V	undef, T: undef	1679
He + Ti	undef, T: undef	1679
He + Si	undef, T: undef	1679
He + Zr	undef, T: undef	1679
He + Y	undef, T: undef	1679
He + Sc	undef, T: undef	1679
He + W	undef, T: undef	1679
He + Be	undef, T: undef	1679
He + C	undef, T: undef	1679
He + N	undef, T: undef	1679
He + O	undef, T: undef	1679
He + Re	undef, T: undef	1679
He + Ta	undef, T: undef	1679
He + Nb	undef, T: undef	1679
He + V	undef, T: undef	1679
He + Os	undef, T: undef	1679
He + Ti	undef, T: undef	1679
He + Si	undef, T: undef	1679
He + Zr	undef, T: undef	1679
He + Y	undef, T: undef	1679
He + Sc	undef, T: undef	1679
He + W	undef, T: undef	1679
He + Be	undef, T: undef	1679
He + C	undef, T: undef	1679
He + N	undef, T: undef	1679
He + O	undef, T: undef	1679
He + Re	undef, T: undef	1679
He + Ta	undef, T: undef	1679
He + Nb	undef, T: undef	1679
He + V	undef, T: undef	1679
He + Os	undef, T: undef	1679
He + Ti	undef, T: undef	1679
He + Si	undef, T: undef	1679
He + Zr	undef, T: undef	1679
He + Y	undef, T: undef	1679
He + Sc	undef, T: undef	1679
He + W	undef, T: undef	1679
He + Be	undef, T: undef	1679
He + C	undef, T: undef	1679
He + N	undef, T: undef	1679
He + O	undef, T: undef	1679
He + Re	undef, T: undef	1679
He + Ta	undef, T: undef	1679
He + Nb	undef, T: undef	1679
He + V	undef, T: undef	1679

He + Os	undef, T: undef		1679
He + Ti	undef, T: undef		1679
He + Si	undef, T: undef		1679
He + Zr	undef, T: undef		1679
He + Y	undef, T: undef		1679
He + Sc	undef, T: undef		1679
He + W	undef, T: undef		1679
He + Be	undef, T: undef		1679
He + C	undef, T: undef		1679
He + N	undef, T: undef		1679
He + O	undef, T: undef		1679
He + Re	undef, T: undef		1679
He + Ta	undef, T: undef		1679
He + Nb	undef, T: undef		1679
He + V	undef, T: undef		1679
He + Ti	undef, T: undef		1679
He + Si	undef, T: undef		1679
He + Zr	undef, T: undef		1679
He + Y	undef, T: undef		1679
He + Sc	undef, T: undef		1679
Be + W	60eV, T: 1123K	Exp	1394
Be + C	10−250eV, T: undef	Th	1396
Be + Be	10−250eV, T: undef	Th	1396
Be + C	10−250eV, T: undef	Th	1396
Be + Be	10−250eV, T: undef	Th	1396
Be + Be	10−250eV, T: undef	Th	1396
Be + C	10−250eV, T: undef	Th	1396
Be + C	10−250eV, T: undef	Th	1396
Be + Be	10−250eV, T: undef	Th	1396
Be + C	10−250eV, T: undef	Th	1396
Be + Be	10−250eV, T: undef	Th	1396
Be + C	10−250eV, T: undef	Th	1396
Be + Be	10−250eV, T: undef	Th	1396
Be + W	undef, T: 670−1470K	E/T	1397
Be + W	undef, T: 670−1470K	E/T	1397
Be + Be	10−1000eV, T: undef	E/T	1400
Be + Be	10−100eV, T: 300K	Th	1401
Be + C	30−126eV, T: 700K	Exp	1416
Be + W	15−70eV, T: 293−1100K	Exp	1422
Be + H	1−100eV, T: undef	Th	1424
Be + C	1−100eV, T: undef	Th	1424
Be + H	1−100eV, T: undef	Th	1424
Be + C	1−100eV, T: undef	Th	1424
Be + H	1−100eV, T: undef	Th	1424
Be + C	1−100eV, T: undef	Th	1424
Be + H	1−100eV, T: undef	Th	1424
Be + C	1−100eV, T: undef	Th	1424
Be + H	1−100eV, T: undef	Th	1424
Be + C	1−100eV, T: undef	Th	1424
Be + C	7eV(Te), T: undef	Th	1425
Be + C	7eV(Te), T: undef	Th	1425
Be + Be	20−500eV, T: 320−670K	E/T	1433
Be + Be	20−500eV, T: 320−670K	E/T	1433
Be + W	undef, T: undef	Th	1471
Be + W	undef, T: undef	Th	1472
Be + W	¡75eV, T: 1070−1320K	Exp	1501
Be + C	13.3−48.5eV, T: undef	Th	1502
Be + Be	200eV, T: 300−1023K	Exp	1506
Be + O	200eV, T: 300−1023K	Exp	1506

Be + C	200eV, T: 300−1023K	Exp	1506
Be + Be	50−60eV, T: 573K	Exp	1519
Be + W	50−60eV, T: 573K	Exp	1519
Be + Be	50−60eV, T: 573K	Exp	1519
Be + W	50−60eV, T: 573K	Exp	1519
Be + Be	50−60eV, T: 573K	Exp	1519
Be + W	50−60eV, T: 573K	Exp	1519
Be + Be	50−60eV, T: 573K	Exp	1519
Be + W	50−60eV, T: 573K	Exp	1519
Be + Be	undef, T: 1123−1273K	Exp	1565
Be + H	undef, T: undef	Th	1566
Be + Be	undef, T: undef	Th	1566
Be + Be	20−160eV, T: undef	E/T	1586
Be + C	undefined		1615
Be + BeC	undefined		1615
Be + C	undefined		1615
Be + BeC	undefined		1615
Be + C	undefined		1615
Be + BeC	undefined		1615
Be + C	undefined		1615
Be + BeC	undefined		1615
Be + C	undefined		1615
Be + BeC	undefined		1615
Be + Be	300−500eV, T: undef		1662
Be + Be	300−500eV, T: undef		1662
Be + Be	300−500eV, T: undef		1662
Be + Be	300−500eV, T: undef		1662
Be + Be	300−500eV, T: undef		1662
Be + Be	5−100eV, T: 300K		1671
Be + W	60eV, T: 573K		1672
Be + W	60eV, T: 573K		1672
Be + W	60eV, T: 573K		1672
Be + W	60eV, T: 573K		1672
B + W	undef, T: undef	Exp	1531
B + W	undef, T: undef	Exp	1531
B + W	undef, T: undef	Exp	1531
B + W	undef, T: undef	Exp	1531
C + Be	10−250eV, T: undef	Th	1396
C + C	10−250eV, T: undef	Th	1396
C + C	10−250eV, T: undef	Th	1396
C + Be	10−250eV, T: undef	Th	1396
C + C	10−250eV, T: undef	Th	1396
C + Be	10−250eV, T: undef	Th	1396
C + Be	10−250eV, T: undef	Th	1396
C + C	10−250eV, T: undef	Th	1396
C + Be	10−250eV, T: undef	Th	1396
C + C	10−250eV, T: undef	Th	1396
C + Be	10−250eV, T: undef	Th	1396
C + C	10−250eV, T: undef	Th	1396
C + W	undef, T: 670−1470K	E/T	1397
C + W	undef, T: 670−1470K	E/T	1397
C + W	2−2000eV, T: undef	Th	1405
C + WC	100−300eV, T: 600K	Th	1410
C + W	1−100eV, T: undef	Th	1424
C + C	1−100eV, T: undef	Th	1424
C + C	1−100eV, T: undef	Th	1424
C + W	1−100eV, T: undef	Th	1424
C + C	1−100eV, T: undef	Th	1424
C + W	1−100eV, T: undef	Th	1424

C + W	1−100eV, T: undef	Th	1424
C + C	1−100eV, T: undef	Th	1424
C + W	1−100eV, T: undef	Th	1424
C + C	1−100eV, T: undef	Th	1424
C + W	333−1000eV, T: 1000−1050K	E/T	1439
C + W	333−1000eV, T: 1000−1050K	E/T	1439
C + W	1−200eV, T: 300K	E/T	1468
C + W	333−1000eV, T: 453−1050K	Th	1470
C + W	333−1000eV, T: 453−1050K	Th	1470
C + W	333−1000eV, T: 453−1050K	Th	1470
C + W	333−1000eV, T: 453−1050K	Th	1470
C + W	333−1000eV, T: 453−1050K	Th	1470
C + WC	undef, T: undef	Th	1477
C + Be	undef, T: undef	Th	1478
C + W	undef, T: 300−1000K	Th	1480
C + W	undef, T: undef	Th	1485
C + W	undef, T: 100−1200K	Th	1491
C + He	undef, T: 300−573K	Th	1493
C + Fe	undef, T: 300−573K	Th	1493
C + EUROFER$_{97}$	undef, T: 1323K	Exp	1495
C + ZrO$_2$	undef, T: 1173−1273K	Exp	1497
C + C	13.3−48.5eV, T: undef	Th	1502
C + W	1000eV, T: 550−1050K	Exp	1505
C + Be	200eV, T: 300−1023K	Exp	1506
C + O	200eV, T: 300−1023K	Exp	1506
C + C	200eV, T: 300−1023K	Exp	1506
C + WC	100−300eV, T: 600K	Th	1507
C$^+$ **+ W**	100−6000eV, T: 300−2000K	E/T	1513
C + WC	100−6000eV, T: 300−2000K	E/T	1513
C + C	100−6000eV, T: 300−2000K	E/T	1513
C + W	100−6000eV, T: 300−2000K	E/T	1513
C + C	undef, T: 1073K	Exp	1523
C + W	undef, T: 1073K	Exp	1523
C + C	undef, T: undef	Exp	1524
C + W	undef, T: undef	Exp	1524
C + C	undef, T: undef	Exp	1524
C + W	undef, T: undef	Exp	1524
C + C	undef, T: undef	Exp	1524
C + W	undef, T: undef	Exp	1524
C + C	undef, T: undef	Exp	1524
C + W	undef, T: undef	Exp	1524
C + W	undef, T: undef	Exp	1531
C + W	undef, T: undef	Exp	1531
C + W	undef, T: undef	Exp	1531
C + W	undef, T: undef	Exp	1531
C + C	1−200eV, T: undef	Th	1562
C + Be	1−200eV, T: undef	Th	1562
C + H	1−200eV, T: undef	Th	1562
C + W	undef, T: undef	Th	1572
C + W	undef, T: 300−1000K	Th	1580
C + C	0.1−1000eV, T: 400−1400K	E/T	1587
C + W	0.1−1000eV, T: 400−1400K	E/T	1587
C + C	0.1−1000eV, T: 400−1400K	E/T	1587
C + W	0.1−1000eV, T: 400−1400K	E/T	1587
C + W	1−250eV, T: 300−1500K		1619
C + WC	1−250eV, T: 300−1500K		1619
C + W	60eV, T: 573−1603K		1673
N + W	2−2000eV, T: undef	Th	1405
N + W	undef, T: undef	Th	1485

N + W	undef, T: 300−1000K	Exp	1496
N + C	undef, T: 300−1000K	Exp	1496
N + N	undef, T: 300−1000K	Exp	1496
N + W	20−500V, T: 350K	E/T	1591
N + W	20−500V, T: 350K	E/T	1591
N + W	20−500V, T: 350K	E/T	1591
N + W	20−500V, T: 350K	E/T	1591
O + WC	undef, T: 800K	Exp	1428
O + C	undef, T: 800K	Exp	1428
O + W	undef, T: 330−470K	Exp	1459
O + W	undef, T: 330−470K	Exp	1459
O + W	undef, T: 330−470K	Exp	1459
O + W	undef, T: 330−470K	Exp	1459
O + Be	undef, T: undef	Th	1478
O + W	undef, T: 300−1000K	Th	1499
O + Be	200eV, T: 300−1023K	Exp	1506
O + O	200eV, T: 300−1023K	Exp	1506
O + C	200eV, T: 300−1023K	Exp	1506
O + W	700−2000eV, T: undef	Th	1570
O + CH	undef, T: 473−623K		1617
O + W	undef, T: undef		1635
O + W	undef, T: undef		1635
O + W	undef, T: undef		1635
O + W	undef, T: undef		1635
O + W	undef, T: undef		1635
O + SS	10−1000eV, T: undef		1640
O + C	10−1000eV, T: undef		1640
O + SS	10−1000eV, T: undef		1640
O + C	10−1000eV, T: undef		1640
O + SS	10−1000eV, T: undef		1640
O + C	10−1000eV, T: undef		1640
O + SS	10−1000eV, T: undef		1640
O + C	10−1000eV, T: undef		1640
Ne + W	2−2000eV, T: undef	Th	1405
Ne + WC	100−300eV, T: 600K	Th	1410
Ne + Fe	30−300eV, T: ¡373K	Exp	1463
Ne + W	1−200eV, T: 300K	E/T	1468
Ne + WC	100−300eV, T: 600K	Th	1507
P + EUROFER$_{97}$	undef, T: 1323K	Exp	1495
S + EUROFER$_{97}$	undef, T: 1323K	Exp	1495
Ar + C	300eV, T: 400K	Exp	1402
Ar + W	300eV, T: 400K	Exp	1402
Ar + W	300eV, T: 400K	Exp	1402
Ar + C	300eV, T: 400K	Exp	1402
Ar + W	undef, T: undef	Exp	1403
Ar + W	undef, T: undef	Exp	1403
Ar + C	undef, T: undef	Exp	1403
Ar + H	undef, T: undef	Exp	1403
Ar + H	undef, T: undef	Exp	1403
Ar + C	undef, T: undef	Exp	1403
Ar + W	2−2000eV, T: undef	Th	1405
Ar + WC	100−300eV, T: 600K	Th	1410
Ar + C	30−126eV, T: 700K	Exp	1416
Ar + W	30−120eV, T: undef	Exp	1427
Ar + W	1−1000eV, T: 300−900K	E/T	1429
Ar + C	undef, T: undef	Exp	1454
Ar + W	undef, T: undef	Exp	1454
Ar + Fe	30−300eV, T: ¡373K	Exp	1463
Ar + W	30−300eV, T: ¡373K	Exp	1463

Ar + Mo	30−300eV, T: ¡373K	Exp	1463
Ar + W	1−200eV, T: 300K	E/T	1468
Ar + WC	100−300eV, T: 600K	Th	1507
Ar + WC	100−300eV, T: 600K	Th	1507
Ar + W	10−10000eV, T: 300−1300K	Th	1511
Ar + Be	10−10000eV, T: 300−1300K	Th	1511
Ar$^+$ + H	10−1000eV, T: 200−1000K	Th	1516
Ar$^+$ + C	10−1000eV, T: 200−1000K	Th	1516
Ar$^+$ + H	10−1000eV, T: 200−1000K	Th	1516
Ar$^+$ + C	10−1000eV, T: 200−1000K	Th	1516
Ar + W	170−340eV, T: 300−700K	Exp	1522
Ar + W	170−340eV, T: 300−700K	Exp	1522
Ar + W	170−340eV, T: 300−700K	Exp	1522
Ar + W	170−340eV, T: 300−700K	Exp	1522
Ar + W	20−180eV, T: undef	Exp	1595
Ar + W	30−200eV, T: 420−1100K	Exp	1601
Ar + W	30−200eV, T: 420−1100K	Exp	1601
Ar + W	30−200eV, T: 420−1100K	Exp	1601
Ar + W	30−200eV, T: 420−1100K	Exp	1601
Ar + W	200−300eV, T: 373−773K		1621
Ar + SS	200−300eV, T: 373−773K		1621
Ar + W	200−300eV, T: 373−773K		1621
Ar + SS	200−300eV, T: 373−773K		1621
Ar + W	200−300eV, T: 373−773K		1621
Ar + SS	200−300eV, T: 373−773K		1621
Ar + W	200−300eV, T: 373−773K		1621
Ar + SS	200−300eV, T: 373−773K		1621
Ar + W	200−300eV, T: 373−773K		1621
Ar + SS	200−300eV, T: 373−773K		1621
Ar + Be	300−500eV, T: undef		1662
Ar + Be	300−500eV, T: undef		1662
Ar + Be	300−500eV, T: undef		1662
Ar + Be	300−500eV, T: undef		1662
Ar + Be	300−500eV, T: undef		1662
Ar$^+$ + Be	15−70eV, T: 298−573K		1670
Ar$^+$ + W	15−70eV, T: 298−573K		1670
Ar$^+$ + BeW	15−70eV, T: 298−573K		1670
Ca + EUROFER$_{97}$	undef, T: 1323K	Exp	1495
Cr + EUROFER$_{97}$	undef, T: 1323K	Exp	1495
Fe + EUROFER$_{97}$	undef, T: 1323K	Exp	1495
Cu + W	undef, T: 300−1000K	Exp	1496
Cu + C	undef, T: 300−1000K	Exp	1496
Cu + N	undef, T: 300−1000K	Exp	1496
Kr + W	2−2000eV, T: undef	Th	1405
Kr + CuBe	2000−10000eV, T: undef	E/T	1434
Kr + W	1−200eV, T: 300K	E/T	1468
W + WC	100−300eV, T: 600K	Th	1410
W + W	5000eV, T: 300K	Th	1418
W + Be	undef, T: undef	Th	1472
W + WC	undef, T: undef	Th	1477
W + Re	undef, T: 1373−1673K	Exp	1484
W + W	undef, T: 1373−1673K	Exp	1484
W + EUROFER$_{97}$	undef, T: 1323K	Exp	1495
W + WC	100−300eV, T: 600K	Th	1507
W + W	undefined		1613
W + W	undef, T: undef		1669
Re + Re	undef, T: 1373−1673K	Exp	1484
Re + W	undef, T: 1373−1673K	Exp	1484
Re + W	undef, T: 673−873K	Exp	1568

$\mathbf{H_2 + C}$	300eV, T: 400K	Exp	1402
$\mathbf{H_2 + W}$	300eV, T: 400K	Exp	1402
$\mathbf{H_2 + C}$	300eV, T: 400K	Exp	1402
$\mathbf{H_2 + W}$	300eV, T: 400K	Exp	1402
$\mathbf{H_2 + W}$	undef, T: undef	Exp	1403
$\mathbf{H_2 + C}$	undef, T: undef	Exp	1403
$\mathbf{H_2 + H}$	undef, T: undef	Exp	1403
$\mathbf{H_2 + H}$	undef, T: undef	Exp	1403
$\mathbf{H_2 + C}$	undef, T: undef	Exp	1403
$\mathbf{H_2 + W}$	undef, T: undef	Exp	1403
$\mathbf{H_2 + C}$	undef, T: 300−600K	Exp	1411
$\mathbf{H_2 + D}$	undef, T: 300−600K	Exp	1411
$\mathbf{H_2 + B}$	undef, T: 300−600K	Exp	1411
$\mathbf{H_2 + C}$	0.1−2.4eV(Te), T: ¡1000K	Exp	1440
$\mathbf{H_2^+ + W}$	700−2000eV, T: undef	Th	1570
$\mathbf{H_2 + C}$	5−8eV		1632
$\mathbf{H_2 + C}$	5−8eV		1632
$\mathbf{H_2 + C}$	5−8eV		1632
$\mathbf{H_2 + C}$	5−8eV		1632
$\mathbf{H_2^+ + W}$	110eV, T: ¡373K		1657
$\mathbf{H_2^+ + W}$	110eV, T: ¡373K		1657
$\mathbf{H_2^+ + W}$	110eV, T: ¡373K		1657
$\mathbf{H_2^+ + W}$	110eV, T: ¡373K		1657
HD + C	5−8eV		1632
HD + C	5−8eV		1632
HD + C	5−8eV		1632
HD + C	5−8eV		1632
$\mathbf{D^+ + W}$	30−100 eV, T: 350K	Exp	1393
$\mathbf{D^+ + C}$	30−100 eV, T: 350K	Exp	1393
D + W	60eV, T: 1123K	Exp	1394
D + WC	10−1000eV, T: 300−600K	Th	1395
D + W	10−1000eV, T: 300−600K	Th	1395
$\mathbf{D + W_2C}$	10−1000eV, T: 300−600K	Th	1395
$\mathbf{D + W_2C}$	10−1000eV, T: 300−600K	Th	1395
D + WC	10−1000eV, T: 300−600K	Th	1395
D + W	10−1000eV, T: 300−600K	Th	1395
$\mathbf{D + W_2C}$	10−1000eV, T: 300−600K	Th	1395
D + WC	10−1000eV, T: 300−600K	Th	1395
D + W	10−1000eV, T: 300−600K	Th	1395
$\mathbf{D + W_2C}$	10−1000eV, T: 300−600K	Th	1395
D + WC	10−1000eV, T: 300−600K	Th	1395
D + W	10−1000eV, T: 300−600K	Th	1395
$\mathbf{D + W_2C}$	10−1000eV, T: 300−600K	Th	1395
D + WC	10−1000eV, T: 300−600K	Th	1395
D + W	10−1000eV, T: 300−600K	Th	1395
D + C	10−250eV, T: undef	Th	1396
D + C	10−250eV, T: undef	Th	1396
D + Be	10−250eV, T: undef	Th	1396
D + Be	10−250eV, T: undef	Th	1396
D + Be	10−250eV, T: undef	Th	1396
D + C	10−250eV, T: undef	Th	1396
D + C	10−250eV, T: undef	Th	1396
D + C	10−250eV, T: undef	Th	1396
D + Be	10−250eV, T: undef	Th	1396
D + Be	10−250eV, T: undef	Th	1396
D + C	10−250eV, T: undef	Th	1396
D + Be	10−250eV, T: undef	Th	1396
D + W	10−1000eV, T: undef	Th	1398
D + Be	10−1000eV, T: undef	Th	1398

D + Be	¡80eV, T: 800−2000K	Exp	1399
D + Be	10−1000eV, T: undef	E/T	1400
D + Be	10−100eV, T: 300K	Th	1401
D + Be$_2$C	10−100eV, T: 300K	Th	1401
D$^+$ + W	30−300eV, T: 300K	Exp	1404
D$^+$ + C	30−300eV, T: 300K	Exp	1404
D + W	2−2000eV, T: undef	Th	1405
D + W	160−320eV, T: 570−1070K	Exp	1407
D + W	160−320eV, T: 570−1070K	Exp	1407
D + W	160−320eV, T: 570−1070K	Exp	1407
D + W	160−320eV, T: 570−1070K	Exp	1407
D + W	160−320eV, T: 570−1070K	Exp	1407
D + W	30−85eV(Te), T: 420K	Exp	1408
D + C	30−85eV(Te), T: 420K	Exp	1408
D + Be	30eV, T: 700−900K	Exp	1409
D + WC	100−300eV, T: 600K	Th	1410
D + Be	2−200eV, T: 300K	Th	1412
D + Be$_2$C	2−200eV, T: 300K	Th	1412
D + WC	2−200eV, T: 300K	Th	1412
D + C	2−200eV, T: 300K	Th	1412
D + Be	7−3000eV, T: 373K	E/T	1415
D + C	30−126eV, T: 700K	Exp	1416
D$^+$ + W	50−250eV, T: 320−370K	Exp	1421
D + W	15−70eV, T: 293−1100K	Exp	1422
D + Be	15−70eV, T: 293−1100K	Exp	1422
D + W	15−70eV, T: 293−1100K	Exp	1422
D + Be	15−70eV, T: 293−1100K	Exp	1422
D + W	15−70eV, T: 293−1100K	Exp	1422
D + Be	15−70eV, T: 293−1100K	Exp	1422
D + W	15−70eV, T: 293−1100K	Exp	1422
D + Be	15−70eV, T: 293−1100K	Exp	1422
D + Be	15−70eV, T: 293−1100K	Exp	1422
D + W	1−100eV, T: undef	Th	1424
D + C	1−100eV, T: undef	Th	1424
D + C	1−100eV, T: undef	Th	1424
D + W	1−100eV, T: undef	Th	1424
D + W	1−100eV, T: undef	Th	1424
D + C	1−100eV, T: undef	Th	1424
D + C	1−100eV, T: undef	Th	1424
D + W	1−100eV, T: undef	Th	1424
D + W	1−100eV, T: undef	Th	1424
D + C	1−100eV, T: undef	Th	1424
D + C	7eV(Te), T: undef	Th	1425
D + C	7eV(Te), T: undef	Th	1425
D + C	1−100eV, T: 300−900K	Th	1426
D + Be	1−100eV, T: 300−900K	Th	1426
D + C	1−100eV, T: 300−900K	Th	1426
D + Be	1−100eV, T: 300−900K	Th	1426
D + C	1−100eV, T: 300−900K	Th	1426
D + Be	1−100eV, T: 300−900K	Th	1426
D + C	1−100eV, T: 300−900K	Th	1426
D + Be	1−100eV, T: 300−900K	Th	1426
D + C	1−100eV, T: 300−900K	Th	1426
D + Be	1−100eV, T: 300−900K	Th	1426
D + C	1−100eV, T: 300−900K	Th	1426
D + Be	1−100eV, T: 300−900K	Th	1426
D + Be	1−1000eV, T: 300−900K	E/T	1429
D + W	1−1000eV, T: 300−900K	E/T	1429
D + C	1−1000eV, T: 300−900K	E/T	1429

D + W	1−1000eV, T: 300−900K	E/T	1429
D + Be	1−1000eV, T: 300−900K	E/T	1429
D + C	1−1000eV, T: 300−900K	E/T	1429
D + BeC	1−1000eV, T: 300−900K	E/T	1429
D + W	1−1000eV, T: 300−900K	E/T	1429
D + Be	1−1000eV, T: 300−900K	E/T	1429
D + C	1−1000eV, T: 300−900K	E/T	1429
D + WC	1−1000eV, T: 300−900K	E/T	1429
D + BeO	1−1000eV, T: 300−900K	E/T	1429
D + BeC	1−1000eV, T: 300−900K	E/T	1429
D + BeO	1−1000eV, T: 300−900K	E/T	1429
D + BeC	1−1000eV, T: 300−900K	E/T	1429
D + W	1−1000eV, T: 300−900K	E/T	1429
D + Be	1−1000eV, T: 300−900K	E/T	1429
D + C	1−1000eV, T: 300−900K	E/T	1429
D + WC	1−1000eV, T: 300−900K	E/T	1429
D + BeO	1−1000eV, T: 300−900K	E/T	1429
D + Be	1−1000eV, T: 300−900K	E/T	1429
D + C	1−1000eV, T: 300−900K	E/T	1429
D + WC	1−1000eV, T: 300−900K	E/T	1429
D + BeO	1−1000eV, T: 300−900K	E/T	1429
D + BeC	1−1000eV, T: 300−900K	E/T	1429
D + W	1−1000eV, T: 300−900K	E/T	1429
D + WC	1−1000eV, T: 300−900K	E/T	1429
D + W	10−1000eV, T: undef	Th	1430
D + W	100−250eV, T: 300K	Exp	1432
D + C	100−250eV, T: 300K	Exp	1432
D + C	15−200eV, T: 300−1000K	Exp	1436
D + C	1000−4000eV, T: undef	Exp	1437
D + W	250eV, T: 400K	Exp	1438
D + W	250eV, T: 400K	Exp	1438
D + W	250eV, T: 400K	Exp	1438
D + W	250eV, T: 400K	Exp	1438
D + W	250eV, T: 400K	Exp	1438
D + Zr	30−200eV	Exp	1443
D + Ti	30−200eV	Exp	1443
D + C	30−200eV	Exp	1443
D + C	0.1−0.4eV(Te), T: 600−1000K	Exp	1446
D + C	undef, T: undef	Exp	1447
D + C	undef, T: undef	Exp	1447
D + C	undef, T: 300−1200K	Exp	1448
D + C	undef, T: 300−1200K	Exp	1448
D + C	undef, T: 300−1200K	Exp	1448
D + C	undef, T: 300−1200K	Exp	1448
D + C	undef, T: 300−1200K	Exp	1448
D + C	undef, T: 300−1200K	Exp	1448
D + C	100eV, T: ¡340K	Exp	1449
D + C	100eV, T: ¡340K	Exp	1449
D + B	44eV(Te), T: 1050−1250K	Exp	1450
D + C	44eV(Te), T: 1050−1250K	Exp	1450
D + B	44eV(Te), T: 1050−1250K	Exp	1450
D + C	44eV(Te), T: 1050−1250K	Exp	1450
D + B	44eV(Te), T: 1050−1250K	Exp	1450
D + C	44eV(Te), T: 1050−1250K	Exp	1450
D + B	44eV(Te), T: 1050−1250K	Exp	1450
D + C	44eV(Te), T: 1050−1250K	Exp	1450
D + C	undef, T: 470K	Exp	1451
D + C	undef, T: 470K	Exp	1451
D + C	undef, T: 470K	Exp	1451

D + C	undef, T: 470K	Exp	1451
D + C	undef, T: 470K	Exp	1451
D + Li	undef, T: 523−673K	Exp	1453
D + Li	undef, T: 523−673K	Exp	1453
D + Li	undef, T: 523−673K	Exp	1453
D + Li	undef, T: 523−673K	Exp	1453
D + C	200eV, T: 300K	Exp	1455
D + Be	200eV, T: 300K	Exp	1455
D + O	200eV, T: 300K	Exp	1455
D + C	200eV, T: 300K	Exp	1455
D + Be	200eV, T: 300K	Exp	1455
D + O	200eV, T: 300K	Exp	1455
D + C	200eV, T: 300K	Exp	1455
D + Be	200eV, T: 300K	Exp	1455
D + O	200eV, T: 300K	Exp	1455
D + C	200eV, T: 300K	Exp	1455
D + Be	200eV, T: 300K	Exp	1455
D + O	200eV, T: 300K	Exp	1455
D + W	2.8−10eV(Te), T: 350−600K	Exp	1456
D + W	2.8−10eV(Te), T: 350−600K	Exp	1456
D + W	250eV, T: undef	Exp	1457
D + W	250eV, T: undef	Exp	1457
D + W	250eV, T: undef	Exp	1457
D + W	250eV, T: undef	Exp	1457
D + C	100−250eV, T: ¡400K	Exp	1458
D + W	100−250eV, T: ¡400K	Exp	1458
D + C	100−250eV, T: ¡400K	Exp	1458
D + W	100−250eV, T: ¡400K	Exp	1458
D + C	100−250eV, T: ¡400K	Exp	1458
D + W	100−250eV, T: ¡400K	Exp	1458
D + C	100−250eV, T: ¡400K	Exp	1458
D + W	100−250eV, T: ¡400K	Exp	1458
D + C	100−250eV, T: ¡400K	Exp	1458
D + W	100−250eV, T: ¡400K	Exp	1458
D + W	undef, T: 330−470K	Exp	1459
D + W	undef, T: 330−470K	Exp	1459
D + W	undef, T: 330−470K	Exp	1459
D + W	undef, T: 330−470K	Exp	1459
D^{+} + Mo	0.1−3eV(Te), T: 500−1700K	Exp	1460
D^{+} + W	0.1−3eV(Te), T: 500−1700K	Exp	1460
D^{+} + Mo	0.1−3eV(Te), T: 500−1700K	Exp	1460
D^{+} + W	0.1−3eV(Te), T: 500−1700K	Exp	1460
D^{+} + Mo	0.1−3eV(Te), T: 500−1700K	Exp	1460
D^{+} + W	0.1−3eV(Te), T: 500−1700K	Exp	1460
D^{+} + Mo	0.1−3eV(Te), T: 500−1700K	Exp	1460
D^{+} + W	0.1−3eV(Te), T: 500−1700K	Exp	1460
D + W	1000eV, T: 300K	Exp	1462
D + W	1000eV, T: 300K	Exp	1462
D + W	1000eV, T: 300K	Exp	1462
D + W	1000eV, T: 300K	Exp	1462
D + O	10−500eV, T: 300−500K	Exp	1464
D + C	10−500eV, T: 300−500K	Exp	1464
D + W	10−500eV, T: 300−500K	Exp	1464
D + O	10−500eV, T: 300−500K	Exp	1464
D + C	10−500eV, T: 300−500K	Exp	1464
D + W	10−500eV, T: 300−500K	Exp	1464
D + O	10−500eV, T: 300−500K	Exp	1464
D + C	10−500eV, T: 300−500K	Exp	1464
D + W	10−500eV, T: 300−500K	Exp	1464

D + W	10−500eV, T: 300−500K	Exp	1464
D + C	10−500eV, T: 300−500K	Exp	1464
D + O	10−500eV, T: 300−500K	Exp	1464
D + Ti	30−200eV, T: 630−820K	Exp	1465
D + C	30−200eV, T: 630−820K	Exp	1465
D + D	25eV, T: 1000K	Th	1467
D + C	25eV, T: 1000K	Th	1467
D + D	25eV, T: 1000K	Th	1467
D + C	25eV, T: 1000K	Th	1467
D + D	25eV, T: 1000K	Th	1467
D + C	25eV, T: 1000K	Th	1467
D + D	25eV, T: 1000K	Th	1467
D + C	25eV, T: 1000K	Th	1467
D + W	1−200eV, T: 300K	E/T	1468
D + Mo	1−200eV, T: 300K	E/T	1468
D + W	1−200eV, T: 300K	E/T	1468
D + Mo	1−200eV, T: 300K	E/T	1468
D + W	1−200eV, T: 300K	E/T	1468
D + Mo	1−200eV, T: 300K	E/T	1468
D + W	1−200eV, T: 300K	E/T	1468
D + Mo	1−200eV, T: 300K	E/T	1468
D + W	1−200eV, T: 300K	E/T	1468
D + O	1000eV, T: 300−1000K	Exp	1481
D + Be	1000eV, T: 300−1000K	Exp	1481
D + O	1000eV, T: 300−1000K	Exp	1481
D + Be	1000eV, T: 300−1000K	Exp	1481
D + O	1000eV, T: 300−1000K	Exp	1481
D + Be	1000eV, T: 300−1000K	Exp	1481
D + O	1000eV, T: 300−1000K	Exp	1481
D + Be	1000eV, T: 300−1000K	Exp	1481
D + O	1000eV, T: 300−1000K	Exp	1481
D + Be	1000eV, T: 300−1000K	Exp	1481
D + W	undef, T: 426−654K	Exp	1483
D + Ta	50eV, T: undef	Exp	1486
D + W	50eV, T: undef	Exp	1486
D^+ + C	13.3−48.5eV, T: undef	Th	1502
D^+ + W	1000eV, T: 550−1050K	Exp	1505
D + Be	200eV, T: 300−1023K	Exp	1506
D + O	200eV, T: 300−1023K	Exp	1506
D + C	200eV, T: 300−1023K	Exp	1506
D + Be	200eV, T: 300−1023K	Exp	1506
D + O	200eV, T: 300−1023K	Exp	1506
D + C	200eV, T: 300−1023K	Exp	1506
D + Be	200eV, T: 300−1023K	Exp	1506
D + O	200eV, T: 300−1023K	Exp	1506
D + C	200eV, T: 300−1023K	Exp	1506
D + Be	200eV, T: 300−1023K	Exp	1506
D + O	200eV, T: 300−1023K	Exp	1506
D + C	200eV, T: 300−1023K	Exp	1506
D + WC	100−300eV, T: 600K	Th	1507
D + WC	100−300eV, T: 600K	Th	1507
D^+ + W	20−60eV, T: 320−593K	Exp	1508
D^+ + W	20−60eV, T: 320−593K	Exp	1508
D^+ + W	20−60eV, T: 320−593K	Exp	1508
D^+ + W	20−60eV, T: 320−593K	Exp	1508
D + W	100eV, T: 300−1000K	E/T	1509
D + W	100eV, T: 300−1000K	E/T	1509
D + W	100eV, T: 300−1000K	E/T	1509
D + W	100eV, T: 300−1000K	E/T	1509

D + Be	10−10000eV, T: 300−1300K	Th	1511
D + W	10−10000eV, T: 300−1300K	Th	1511
D$^+$ + C	10−10000eV, T: 300−1300K	Th	1511
D + W	38−500eV, T: 473−673K	Exp	1512
D + W	38−500eV, T: 473−673K	Exp	1512
D + W	38−500eV, T: 473−673K	Exp	1512
D + W	38−500eV, T: 473−673K	Exp	1512
D$^+$ + C	130−150eV, T: 473K	Exp	1514
D$^+$ + C	130−150eV, T: 473K	Exp	1514
D$^+$ + C	130−150eV, T: 473K	Exp	1514
D$^+$ + C	130−150eV, T: 473K	Exp	1514
D + W	70eV, T: 420−927K	Exp	1517
D + W	70eV, T: 420−927K	Exp	1517
D + W	70eV, T: 420−927K	Exp	1517
D + W	70eV, T: 420−927K	Exp	1517
D + Be	50−60eV, T: 573K	Exp	1519
D + W	50−60eV, T: 573K	Exp	1519
D + W	50−60eV, T: 573K	Exp	1519
D + Be	50−60eV, T: 573K	Exp	1519
D + W	50−60eV, T: 573K	Exp	1519
D + Be	50−60eV, T: 573K	Exp	1519
D + W	50−60eV, T: 573K	Exp	1519
D + Be	50−60eV, T: 573K	Exp	1519
D + W	170−340eV, T: 300−700K	Exp	1522
D + W	170−340eV, T: 300−700K	Exp	1522
D + W	170−340eV, T: 300−700K	Exp	1522
D + W	170−340eV, T: 300−700K	Exp	1522
D + W	undef, T: undef	Exp	1524
D + C	undef, T: undef	Exp	1524
D + W	undef, T: undef	Exp	1524
D + C	undef, T: undef	Exp	1524
D + W	undef, T: undef	Exp	1524
D + C	undef, T: undef	Exp	1524
D + C	undef, T: undef	Exp	1524
D + W	undef, T: undef	Exp	1524
D$^+$ + W	30−60eV, T: 300−700K	Exp	1525
D$^+$ + W	30−60eV, T: 300−700K	Exp	1525
D$^+$ + W	30−60eV, T: 300−700K	Exp	1525
D$^+$ + W	30−60eV, T: 300−700K	Exp	1525
D + W	38eV, T: 285−1000K	E/T	1526
D + W	38eV, T: 285−1000K	E/T	1526
D + W	38eV, T: 285−1000K	E/T	1526
D + W	38eV, T: 285−1000K	E/T	1526
D + W	2.8−10eV(Te), T: 573K	Exp	1527
D + W	2.8−10eV(Te), T: 573K	Exp	1527
D + W	2.8−10eV(Te), T: 573K	Exp	1527
D + W	2.8−10eV(Te), T: 573K	Exp	1527
D + W	undef, T: 373−1073K	Exp	1528
D + O	undef, T: 373−1073K	Exp	1528
D + W	undef, T: 373−1073K	Exp	1528
D + W	undef, T: 373−1073K	Exp	1528
D + O	undef, T: 373−1073K	Exp	1528
D + W	undef, T: 373−1073K	Exp	1528
D + O	undef, T: 373−1073K	Exp	1528
D + O	undef, T: 373−1073K	Exp	1528
D + W	undef, T: undef	Exp	1531
D + W	undef, T: undef	Exp	1531
D + W	undef, T: undef	Exp	1531
D + W	undef, T: undef	Exp	1531

D + W	undef, T: 360−950K	Th	1532
D + W	undef, T: 360−950K	Th	1532
D + W	¡100eV, T: 300−900K	Exp	1533
D + W	¡100eV, T: 300−900K	Exp	1533
D + W	¡100eV, T: 300−900K	Exp	1533
D + W	¡100eV, T: 300−900K	Exp	1533
$\mathbf{D}^+ + \mathbf{Mo}$	3eV(Te), T: undef	Exp	1534
$\mathbf{D}^+ + \mathbf{W}$	3eV(Te), T: undef	Exp	1534
$\mathbf{D}^+ + \mathbf{Mo}$	3eV(Te), T: undef	Exp	1534
$\mathbf{D}^+ + \mathbf{W}$	3eV(Te), T: undef	Exp	1534
$\mathbf{D}^+ + \mathbf{Mo}$	3eV(Te), T: undef	Exp	1534
$\mathbf{D}^+ + \mathbf{W}$	3eV(Te), T: undef	Exp	1534
$\mathbf{D}^+ + \mathbf{Mo}$	3eV(Te), T: undef	Exp	1534
$\mathbf{D}^+ + \mathbf{W}$	3eV(Te), T: undef	Exp	1534
$\mathbf{D}^+ + \mathbf{W}$	38−60eV, T: 300−800K	E/T	1536
$\mathbf{D}^+ + \mathbf{W}$	38−60eV, T: 300−800K	E/T	1536
$\mathbf{D}^+ + \mathbf{W}$	38−60eV, T: 300−800K	E/T	1536
$\mathbf{D}^+ + \mathbf{W}$	38−60eV, T: 300−800K	E/T	1536
$\mathbf{D}^+ + \mathbf{W}$	38−60eV, T: 300−800K	E/T	1536
D + C	200eV, T: 300K	Exp	1537
D + Be	200eV, T: 300K	Exp	1537
D + C	200eV, T: 300K	Exp	1537
D + Be	200eV, T: 300K	Exp	1537
D + C	200eV, T: 300K	Exp	1537
D + Be	200eV, T: 300K	Exp	1537
D + C	200eV, T: 300K	Exp	1537
D + Be	200eV, T: 300K	Exp	1537
$\mathbf{D}^+ + \mathbf{Mo}$	70eV, T: 300−900K	Exp	1540
$\mathbf{D}^+ + \mathbf{W}$	70eV, T: 300−900K	Exp	1540
$\mathbf{D}^+ + \mathbf{Mo}$	70eV, T: 300−900K	Exp	1540
$\mathbf{D}^+ + \mathbf{W}$	70eV, T: 300−900K	Exp	1540
$\mathbf{D}^+ + \mathbf{Mo}$	70eV, T: 300−900K	Exp	1540
$\mathbf{D}^+ + \mathbf{W}$	70eV, T: 300−900K	Exp	1540
$\mathbf{D}^+ + \mathbf{Mo}$	70eV, T: 300−900K	Exp	1540
$\mathbf{D}^+ + \mathbf{W}$	70eV, T: 300−900K	Exp	1540
D + W	2eV(Te), T: ¡1600K	Exp	1543
D + W	2eV(Te), T: ¡1600K	Exp	1543
D + W	2eV(Te), T: ¡1600K	Exp	1543
D + W	2eV(Te), T: ¡1600K	Exp	1543
$\mathbf{D} + \mathbf{WO}_3$	20−250eV, T: 300K	Exp	1546
D + W	20−250eV, T: 300K	Exp	1546
$\mathbf{D} + \mathbf{WO}_3$	20−250eV, T: 300K	Exp	1546
D + W	20−250eV, T: 300K	Exp	1546
$\mathbf{D} + \mathbf{WO}_3$	20−250eV, T: 300K	Exp	1546
D + W	20−250eV, T: 300K	Exp	1546
D + W	20−250eV, T: 300K	Exp	1546
$\mathbf{D} + \mathbf{WO}_3$	20−250eV, T: 300K	Exp	1546
D + W	30000eV,T: 298K	Th	1548
D + W	30000eV,T: 298K	Th	1548
D + W	30000eV,T: 298K	Th	1548
D + W	30000eV,T: 298K	Th	1548
D + Be	undef, T: undef	Exp	1549
D + Be	undef, T: undef	Exp	1549
D + C	undef, T: undef	Exp	1549
D + C	undef, T: undef	Exp	1549
D + Be	undef, T: undef	Exp	1549
D + C	undef, T: undef	Exp	1549
D + Be	undef, T: undef	Exp	1549
D + C	undef, T: undef	Exp	1549

D + W	17−28eV, T: 497−1000K	Exp	1550
D + C	17−28eV, T: 497−1000K	Exp	1550
D + W	17−28eV, T: 497−1000K	Exp	1550
D + C	17−28eV, T: 497−1000K	Exp	1550
D + W	17−28eV, T: 497−1000K	Exp	1550
D + C	17−28eV, T: 497−1000K	Exp	1550
D + W	17−28eV, T: 497−1000K	Exp	1550
D + C	17−28eV, T: 497−1000K	Exp	1550
D + W	40−140eV, T: 323−903K	Exp	1551
D + W	40−140eV, T: 323−903K	Exp	1551
D + W	40−140eV, T: 323−903K	Exp	1551
D + W	40−140eV, T: 323−903K	Exp	1551
D + W	undef, T: 473−773K	Exp	1553
D + W	undef, T: 473−773K	Exp	1553
D + W	undef, T: 473−773K	Exp	1553
D + W	undef, T: 473−773K	Exp	1553
D + C	50−1000eV, T: 300K	Exp	1555
D + C	50−1000eV, T: 300K	Exp	1555
D + C	50−1000eV, T: 300K	Exp	1555
D + C	50−1000eV, T: 300K	Exp	1555
$\mathbf{D}^+$ + W	200−3000eV, T: 300−600K	Th	1556
$\mathbf{D}^+$ + W	200−3000eV, T: 300−600K	Th	1556
$\mathbf{D}^+$ + W	200−3000eV, T: 300−600K	Th	1556
$\mathbf{D}^+$ + W	200−3000eV, T: 300−600K	Th	1556
$\mathbf{D}^+$ + W	38−500eV, T: 300−643K	Exp	1557
$\mathbf{D}^+$ + W	38−500eV, T: 300−643K	Exp	1557
$\mathbf{D}^+$ + W	38−500eV, T: 300−643K	Exp	1557
$\mathbf{D}^+$ + W	38−500eV, T: 300−643K	Exp	1557
$\mathbf{D}^+$ + W	38−68eV, T: 300−800K	Exp	1558
$\mathbf{D}^+$ + W	38−68eV, T: 300−800K	Exp	1558
$\mathbf{D}^+$ + W	38−68eV, T: 300−800K	Exp	1558
$\mathbf{D}^+$ + W	38−68eV, T: 300−800K	Exp	1558
$\mathbf{D}^+$ + W	3−200eV, T: 320−500K	Exp	1559
$\mathbf{D}^+$ + W	3−200eV, T: 320−500K	Exp	1559
$\mathbf{D}^+$ + W	3−200eV, T: 320−500K	Exp	1559
$\mathbf{D}^+$ + W	3−200eV, T: 320−500K	Exp	1559
D + W	undef, T: undef	E/T	1561
D + Mo	undef, T: undef	E/T	1561
D + W	undef, T: undef	E/T	1561
D + Mo	undef, T: undef	E/T	1561
D + W	undef, T: undef	E/T	1561
D + Mo	undef, T: undef	E/T	1561
D + W	undef, T: undef	E/T	1561
D + Mo	undef, T: undef	E/T	1561
D + Mo	undef, T: 600−2000K	Th	1563
D + W	100−200eV, T: 298K	Exp	1564
D + Mo	100−200eV, T: 298K	Exp	1564
D + W	100−200eV, T: 298K	Exp	1564
D + W	100−200eV, T: 298K	Exp	1564
D + Mo	100−200eV, T: 298K	Exp	1564
D + Mo	100−200eV, T: 298K	Exp	1564
D + W	100−200eV, T: 298K	Exp	1564
D + Mo	100−200eV, T: 298K	Exp	1564
D + W	38−200eV, T: 300−750K	Exp	1567
D + W	38−200eV, T: 300−750K	Exp	1567
D + W	38−200eV, T: 300−750K	Exp	1567
D + W	38−200eV, T: 300−750K	Exp	1567
D + W	0.5−50eV, T: 298K	Th	1571
D + W	0.5−50eV, T: 298K	Th	1571

D$^+$ + W	200eV, T: 300−573K	E/T	1579
D$^+$ + W	200eV, T: 300−573K	E/T	1579
D$^+$ + W	200eV, T: 300−573K	E/T	1579
D$^+$ + W	200eV, T: 300−573K	E/T	1579
D$^+$ + Li	20−10000eV, T: 473−693K	Th	1583
D$^+$ + Be	20−160eV, T: undef	E/T	1586
D$^+$ + Be	0.1−1000eV, T: 400−1400K	E/T	1587
D$^+$ + Be	0.1−1000eV, T: 400−1400K	E/T	1587
D + WC	undef, T: 273−873K	Exp	1588
D + BeO	undef, T: 273−873K	Exp	1588
D + BeC	undef, T: 273−873K	Exp	1588
D + W	undef, T: 273−873K	Exp	1588
D + Be	undef, T: 273−873K	Exp	1588
D + C	undef, T: 273−873K	Exp	1588
D + N	2000eV, T: undef	Exp	1589
D + Be	2000eV, T: undef	Exp	1589
D + C	100eV, T: ¡313K	Exp	1590
D + Be	10−100eV, T: undef	E/T	1592
D + Be	10−100eV, T: 273−1073K	E/T	1593
D + W	10−100eV, T: 273−1073K	E/T	1593
D + C	10−100eV, T: 273−1073K	E/T	1593
D + Be	10−100eV, T: 273−1073K	E/T	1593
D + W	10−100eV, T: 273−1073K	E/T	1593
D + C	10−100eV, T: 273−1073K	E/T	1593
D + Be	10−100eV, T: 273−1073K	E/T	1593
D + W	10−100eV, T: 273−1073K	E/T	1593
D + C	10−100eV, T: 273−1073K	E/T	1593
D + Be	10−100eV, T: 273−1073K	E/T	1593
D + W	10−100eV, T: 273−1073K	E/T	1593
D + C	10−100eV, T: 273−1073K	E/T	1593
D + C	200−1500eV, T: 300−1000K	E/T	1594
D + W	200−1500eV, T: 300−1000K	E/T	1594
D + C	200−1500eV, T: 300−1000K	E/T	1594
D + W	200−1500eV, T: 300−1000K	E/T	1594
D + W	200−1500eV, T: 300−1000K	E/T	1594
D + C	200−1500eV, T: 300−1000K	E/T	1594
D + W	200−1500eV, T: 300−1000K	E/T	1594
D + C	200−1500eV, T: 300−1000K	E/T	1594
D + C	50eV, T: 473−973K	Th	1596
D + W	undef, T: 500−1450K	Th	1598
D$^+$ + Mo	undef, T: undef	Exp	1602
D$^+$ + W	undef, T: undef	Exp	1602
D$^+$ + Mo	undef, T: undef	Exp	1602
D$^+$ + W	undef, T: undef	Exp	1602
D$^+$ + Mo	undef, T: undef	Exp	1602
D$^+$ + W	undef, T: undef	Exp	1602
D$^+$ + Mo	undef, T: undef	Exp	1602
D$^+$ + W	undef, T: undef	Exp	1602
D + W	40−70eV, T: ¡573K	Exp	1603
D + W	40−70eV, T: ¡573K	Exp	1603
D + W	40−70eV, T: ¡573K	Exp	1603
D + W	40−70eV, T: ¡573K	Exp	1603
D + W	¡50eV, T: ¡480K	Exp	1605
D + Ta	¡50eV, T: ¡480K	Exp	1605
D + W	¡50eV, T: ¡480K	Exp	1605
D + Ta	¡50eV, T: ¡480K	Exp	1605
D + W	¡50eV, T: ¡480K	Exp	1605
D + Ta	¡50eV, T: ¡480K	Exp	1605
D + W	¡50eV, T: ¡480K	Exp	1605

D + Ta	¡50eV, T: ¡480K	Exp	1605
D + W	0.5−5eV(Te), T: ¡525K	Exp	1606
D + W	0.5−5eV(Te), T: ¡525K	Exp	1606
D + W	0.5−5eV(Te), T: ¡525K	Exp	1606
D + W	0.5−5eV(Te), T: ¡525K	Exp	1606
D + W	undef, T: 314−773K	Exp	1607
D + W	undef, T: 314−773K	Exp	1607
D + W	undef, T: 314−773K	Exp	1607
D + W	undef, T: 314−773K	Exp	1607
D + Mo	¡5eV(Te), T: 600−1600K	Exp	1608
D + W	¡5eV(Te), T: 600−1600K	Exp	1608
D + Mo	¡5eV(Te), T: 600−1600K	Exp	1608
D + W	¡5eV(Te), T: 600−1600K	Exp	1608
D + Mo	¡5eV(Te), T: 600−1600K	Exp	1608
D + W	¡5eV(Te), T: 600−1600K	Exp	1608
D + Mo	¡5eV(Te), T: 600−1600K	Exp	1608
D + W	¡5eV(Te), T: 600−1600K	Exp	1608
D + Mo	¡5eV(Te), T: 600−1600K	Exp	1609
D + W	¡5eV(Te), T: 600−1600K	Exp	1609
D + Mo	¡5eV(Te), T: 600−1600K	Exp	1609
D + W	¡5eV(Te), T: 600−1600K	Exp	1609
D + Mo	¡5eV(Te), T: 600−1600K	Exp	1609
D + W	¡5eV(Te), T: 600−1600K	Exp	1609
D + Mo	¡5eV(Te), T: 600−1600K	Exp	1609
D + W	¡5eV(Te), T: 600−1600K	Exp	1609
D + W	undef, T: undef	Exp	1610
D + W	undef, T: undef	Exp	1610
D + W	undef, T: undef	Exp	1610
D + W	undef, T: undef	Exp	1610
D + W	¡2000eV, T: 1173−1223K		1618
D + W	1−250eV, T: 300−1500K		1619
D + WC	1−250eV, T: 300−1500K		1619
D^+ + Be	10−140eV, T: ¡330K		1620
D^+ + BeD	10−140eV, T: ¡330K		1620
D + W	1−100eV(Te), T: undef		1622
D + W	1−50eV(Te), T: undef		1624
D^+ + BeD	5−100eV, T: 300−725K		1626
D^+ + BeW	5−100eV, T: 300−725K		1626
D + W	3000eV, T: 384−673K		1628
D + W	3000eV, T: 384−673K		1628
D + W	3000eV, T: 384−673K		1628
D + W	3000eV, T: 384−673K		1628
D + W	1eV, T: 300−850K		1630
D + W	1eV, T: 300−850K		1630
D + W	1eV, T: 300−850K		1630
D + W	1eV, T: 300−850K		1630
D + W	undef, T: 673−973K		1633
D + W	undef, T: 673−973K		1633
D + W	undef, T: 673−973K		1633
D + W	undef, T: 673−973K		1633
D + W	1−400eV, T: 473−773K		1634
D + W	1−400eV, T: 473−773K		1634
D + W	1−400eV, T: 473−773K		1634
D + W	1−400eV, T: 473−773K		1634
D + W	5−100eV, T: 600−2000K		1636
D + W	200eV, T: 300−623K		1639
D + W	200eV, T: 300−623K		1639
D + W	200eV, T: 300−623K		1639
D + W	200eV, T: 300−623K		1639

D + W	200eV, T: 300−623K	1639
D + W	¡1.6eV, T: ¡1250K	1641
D + W	¡1.6eV, T: ¡1250K	1641
D + W	¡1.6eV, T: ¡1250K	1641
D + W	¡1.6eV, T: ¡1250K	1641
D + W	200eV, T: 320−450K	1647
D + W	200eV, T: 320−450K	1647
D + W	200eV, T: 320−450K	1647
D + W	200eV, T: 320−450K	1647
D + W	200eV, T: 320−450K	1647
D + W	20eV, T: 300−1200K	1648
D + Be	undef, T: 570−1333K	1649
D + W	1−150eV, T: 403−550K	1653
D + W	1−150eV, T: 403−550K	1653
D + W	1−150eV, T: 403−550K	1653
D + W	1−150eV, T: 403−550K	1653
D + W	30eV, T: 500K	1655
D + W	30eV, T: 500K	1655
D + W	30eV, T: 500K	1655
D + W	30eV, T: 500K	1655
D$^+$ + Be	1−300eV, T: 273−523K	1656
D$^+$ + Be	1−300eV, T: 273−523K	1656
D$^+$ + Be	1−300eV, T: 273−523K	1656
D$^+$ + Be	1−300eV, T: 273−523K	1656
D + W	38−350eV, T: 370−700K	1660
D + W	38−350eV, T: 370−700K	1660
D + W	38−350eV, T: 370−700K	1660
D + W	38−350eV, T: 370−700K	1660
D + W	1−150eV, T: 423−1073K	1661
D + W	1−150eV, T: 423−1073K	1661
D + W	1−150eV, T: 423−1073K	1661
D + W	1−150eV, T: 423−1073K	1661
D + Be	300−500eV, T: undef	1662
D + Be	300−500eV, T: undef	1662
D + Be	300−500eV, T: undef	1662
D + Be	300−500eV, T: undef	1662
D + Be	300−500eV, T: undef	1662
D$^+$ + ReW	76eV, T: 350−750K	1663
D$^+$ + ReW	76eV, T: 350−750K	1663
D$^+$ + ReW	76eV, T: 350−750K	1663
D$^+$ + ReW	76eV, T: 350−750K	1663
D + W	1000eV, T: 473−873K	1664
D + W	1000eV, T: 473−873K	1664
D + W	1000eV, T: 473−873K	1664
D + W	1000eV, T: 473−873K	1664
D$^+$ + W	10−10000eV, T: 298−1600K	1665
D$^+$ + W	10−10000eV, T: 298−1600K	1665
D$^+$ + W	10−10000eV, T: 298−1600K	1665
D$^+$ + W	10−10000eV, T: 298−1600K	1665
D + W	5eV, T: 470−560K	1666
D + W	100−1500eV, T: 300−473K	1667
D + W	100−1500eV, T: 300−473K	1667
D + W	100−1500eV, T: 300−473K	1667
D + W	100−1500eV, T: 300−473K	1667
D + Be	5−100eV, T: 300K	1671
D$^+$ + W	60eV, T: 573K	1672
D$^+$ + W	60eV, T: 573K	1672
D$^+$ + W	60eV, T: 573K	1672
D$^+$ + W	60eV, T: 573K	1672

D + W	250eV, T: ¡373K		1674
D + WC	30−100eV, T: undef		1675
D + WC	30−100eV, T: undef		1675
D + WC	30−100eV, T: undef		1675
D + WC	30−100eV, T: undef		1675
D + W	100eV, T: 373−773K		1676
D + W	100eV, T: 373−773K		1676
D + W	100eV, T: 373−773K		1676
D + W	100eV, T: 373−773K		1676
D + W	100eV, T: 373−773K		1676
D + Be	200eV, T: 398−623K		1678
D + BeW	200eV, T: 398−623K		1678
D + BeC	200eV, T: 398−623K		1678
D + Be	200eV, T: 398−623K		1678
D + BeW	200eV, T: 398−623K		1678
D + BeC	200eV, T: 398−623K		1678
D + Be	200eV, T: 398−623K		1678
D + BeW	200eV, T: 398−623K		1678
D + BeC	200eV, T: 398−623K		1678
D + Be	200eV, T: 398−623K		1678
D + BeW	200eV, T: 398−623K		1678
D + BeC	200eV, T: 398−623K		1678
D + W	50eV, T: 460−510K		1680
D + Ta	50eV, T: 460−510K		1680
D + W	50eV, T: 460−510K		1680
D + Ta	50eV, T: 460−510K		1680
D + W	50eV, T: 460−510K		1680
D + Ta	50eV, T: 460−510K		1680
D + W	50eV, T: 460−510K		1680
D + Ta	50eV, T: 460−510K		1680
$\mathbf{D_2^+}$ **+ W**	30−100 eV, T: 350K	Exp	1393
$\mathbf{D_2^+}$ **+ C**	30−100 eV, T: 350K	Exp	1393
$\mathbf{D_2^+}$ **+ W**	30−300eV, T: 300K	Exp	1404
$\mathbf{D_2^+}$ **+ C**	30−300eV, T: 300K	Exp	1404
$\mathbf{D_2}$ **+ Be**	30−95eV, T: 310−420K	Exp	1406
$\mathbf{D_2}$ **+ Be**	30−95eV, T: 310−420K	Exp	1406
$\mathbf{D_2}$ **+ Be**	30−95eV, T: 310−420K	Exp	1406
$\mathbf{D_2}$ **+ Be**	30−95eV, T: 310−420K	Exp	1406
$\mathbf{D_2}$ **+ Be**	30−95eV, T: 310−420K	Exp	1406
$\mathbf{D_2}$ **+ C**	2−60eV, T: undef	E/T	1417
$\mathbf{D_2}$ **+ C**	2−60eV, T: undef	E/T	1417
$\mathbf{D_2}$ **+ C**	2−60eV, T: undef	E/T	1417
$\mathbf{D_2}$ **+ C**	2−60eV, T: undef	E/T	1417
$\mathbf{D_2}$ **+ C**	2−60eV, T: undef	E/T	1417
$\mathbf{D_2}$ **+ W**	¡75eV, T: 1070−1320K	Exp	1501
$\mathbf{D_2^+}$ **+ C**	13.3−48.5eV, T: undef	Th	1502
$\mathbf{D_2^+}$ **+ Be**	400−3000eV, T: 300K	Exp	1504
$\mathbf{D_2^+}$ **+ Be**	400−3000eV, T: 300K	Exp	1504
$\mathbf{D_2^+}$ **+ Be**	400−3000eV, T: 300K	Exp	1504
$\mathbf{D_2^+}$ **+ Be**	400−3000eV, T: 300K	Exp	1504
$\mathbf{D_2^+}$ **+ W**	1000eV, T: 550−1050K	Exp	1505
$\mathbf{D_2^+}$ **+ W**	20−60eV, T: 320−593K	Exp	1508
$\mathbf{D_2^+}$ **+ W**	20−60eV, T: 320−593K	Exp	1508
$\mathbf{D_2^+}$ **+ W**	20−60eV, T: 320−593K	Exp	1508
$\mathbf{D_2^+}$ **+ W**	20−60eV, T: 320−593K	Exp	1508
$\mathbf{D_2^+}$ **+ W**	30−60eV, T: 300−700K	Exp	1525
$\mathbf{D_2^+}$ **+ W**	30−60eV, T: 300−700K	Exp	1525
$\mathbf{D_2^+}$ **+ W**	30−60eV, T: 300−700K	Exp	1525
$\mathbf{D_2^+}$ **+ W**	30−60eV, T: 300−700K	Exp	1525

D_2^+ + W	76eV, T: 400−750K	Exp	1538
D_2^+ + W	76eV, T: 400−750K	Exp	1538
D_2^+ + W	76eV, T: 400−750K	Exp	1538
D_2^+ + W	76eV, T: 400−750K	Exp	1538
D_2^+ + W	38eV, T: 340−1300K	Exp	1544
D_2^+ + W	38eV, T: 340−1300K	Exp	1544
D_2^+ + W	38eV, T: 340−1300K	Exp	1544
D_2^+ + W	38eV, T: 340−1300K	Exp	1544
D_2^+ + W	76eV, T: 300−800K	Exp	1545
D_2^+ + W	76eV, T: 300−800K	Exp	1545
D_2^+ + W	76eV, T: 300−800K	Exp	1545
D_2^+ + W	76eV, T: 300−800K	Exp	1545
D_2^+ + W	38−68eV, T: 300−800K	Exp	1558
D_2^+ + W	38−68eV, T: 300−800K	Exp	1558
D_2^+ + W	38−68eV, T: 300−800K	Exp	1558
D_2^+ + W	38−68eV, T: 300−800K	Exp	1558
D_2^+ + W	3−200eV, T: 320−500K	Exp	1559
D_2^+ + W	3−200eV, T: 320−500K	Exp	1559
D_2^+ + W	3−200eV, T: 320−500K	Exp	1559
D_2^+ + W	3−200eV, T: 320−500K	Exp	1559
D_2^+ + Be	20−160eV, T: undef	E/T	1586
D_2 + W	30−200eV, T: 420−1100K	Exp	1601
D_2 + W	30−200eV, T: 420−1100K	Exp	1601
D_2 + W	30−200eV, T: 420−1100K	Exp	1601
D_2 + W	30−200eV, T: 420−1100K	Exp	1601
D_2^+ + Be	10−140eV, T: ¡330K		1620
D_2^+ + BeD	10−140eV, T: ¡330K		1620
D_2^+ + BeD	5−100eV, T: 300−725K		1626
D_2^+ + BeW	5−100eV, T: 300−725K		1626
D_2 + Cd	210eV, T: 300−773K		1627
D_2 + Cd	210eV, T: 300−773K		1627
D_2 + Cd	210eV, T: 300−773K		1627
D_2 + Cd	210eV, T: 300−773K		1627
D_2 + C	5−8eV		1632
D_2 + C	5−8eV		1632
D_2 + C	5−8eV		1632
D_2 + C	5−8eV		1632
D_2^+ + W	1000eV, T: ¡373K		1646
D_2^+ + W	1000eV, T: ¡373K		1646
D_2^+ + W	1000eV, T: ¡373K		1646
D_2^+ + W	1000eV, T: ¡373K		1646
D_2^+ + W	500eV, T: 298K		1650
D_2^+ + W	500eV, T: 298K		1650
D_2^+ + W	500eV, T: 298K		1650
D_2^+ + W	500eV, T: 298K		1650
D_2^+ + W	500eV, T: 298K		1650
D_2^+ + Be	1−300eV, T: 273−523K		1656
D_2^+ + Be	1−300eV, T: 273−523K		1656
D_2^+ + Be	1−300eV, T: 273−523K		1656
D_2^+ + Be	1−300eV, T: 273−523K		1656
D_2^+ + W	110eV, T: ¡373K		1657
D_2^+ + W	110eV, T: ¡373K		1657
D_2^+ + W	110eV, T: ¡373K		1657
D_2^+ + W	110eV, T: ¡373K		1657
D_2 + W	1−150eV, T: 423−1073K		1661
D_2 + W	1−150eV, T: 423−1073K		1661
D_2 + W	1−150eV, T: 423−1073K		1661
D_2 + W	1−150eV, T: 423−1073K		1661
D_2^+ + ReW	76eV, T: 350−750K		1663

D_2^+ + ReW	76eV, T: 350−750K		1663
D_2^+ + ReW	76eV, T: 350−750K		1663
D_2^+ + ReW	76eV, T: 350−750K		1663
D_2^+ + W	100−1500eV, T: 300−473K		1667
D_2^+ + W	100−1500eV, T: 300−473K		1667
D_2^+ + W	100−1500eV, T: 300−473K		1667
D_2^+ + W	100−1500eV, T: 300−473K		1667
D_3^+ + W	30−100 eV, T: 350K	Exp	1393
D_3^+ + C	30−100 eV, T: 350K	Exp	1393
D_3^+ + W	30−300eV, T: 300K	Exp	1404
D_3^+ + C	30−300eV, T: 300K	Exp	1404
D_3^+ + C	13.3−48.5eV, T: undef	Th	1502
D_3^+ + Be	400−3000eV, T: 300K	Exp	1504
D_3^+ + Be	400−3000eV, T: 300K	Exp	1504
D_3^+ + Be	400−3000eV, T: 300K	Exp	1504
D_3^+ + Be	400−3000eV, T: 300K	Exp	1504
D_3^+ + W	1000eV, T: 550−1050K	Exp	1505
D_3^+ + W	20−60eV, T: 320−593K	Exp	1508
D_3^+ + W	20−60eV, T: 320−593K	Exp	1508
D_3^+ + W	20−60eV, T: 320−593K	Exp	1508
D_3^+ + W	20−60eV, T: 320−593K	Exp	1508
D_3^+ + Be	600eV, T: 623K	Exp	1521
D_3^+ + C	600eV, T: 623K	Exp	1521
D_3^+ + W	600eV, T: 623K	Exp	1521
D_3^+ + Be	600eV, T: 623K	Exp	1521
D_3^+ + C	600eV, T: 623K	Exp	1521
D_3^+ + W	600eV, T: 623K	Exp	1521
D_3^+ + Be	600eV, T: 623K	Exp	1521
D_3^+ + C	600eV, T: 623K	Exp	1521
D_3^+ + W	600eV, T: 623K	Exp	1521
D_3^+ + Be	600eV, T: 623K	Exp	1521
D_3^+ + W	600eV, T: 623K	Exp	1521
D_3^+ + C	600eV, T: 623K	Exp	1521
D_3^+ + W	30−60eV, T: 300−700K	Exp	1525
D_3^+ + W	30−60eV, T: 300−700K	Exp	1525
D_3^+ + W	30−60eV, T: 300−700K	Exp	1525
D_3^+ + W	30−60eV, T: 300−700K	Exp	1525
D_3^+ + W	100eV, T: ¿298K	Th	1530
D_3^+ + W	100eV, T: ¿298K	Th	1530
D_3^+ + W	100eV, T: ¿298K	Th	1530
D_3^+ + W	100eV, T: ¿298K	Th	1530
D_3^+ + W	20−200eV, T: 320−593K	Exp	1547
D_3^+ + W	20−200eV, T: 320−593K	Exp	1547
D_3^+ + W	20−200eV, T: 320−593K	Exp	1547
D_3^+ + W	20−200eV, T: 320−593K	Exp	1547
D_3^+ + W	38−800eV, T: 320−470K	Exp	1554
D_3^+ + W	38−800eV, T: 320−470K	Exp	1554
D_3^+ + W	38−800eV, T: 320−470K	Exp	1554
D_3^+ + W	38−800eV, T: 320−470K	Exp	1554
D_3^+ + W	3−200eV, T: 320−500K	Exp	1559
D_3^+ + W	3−200eV, T: 320−500K	Exp	1559
D_3^+ + W	3−200eV, T: 320−500K	Exp	1559
D_3^+ + W	3−200eV, T: 320−500K	Exp	1559
D_3^+ + W	38eV, T: 300K	Exp	1560
D_3^+ + W	38eV, T: 300K	Exp	1560
D_3^+ + W	38eV, T: 300K	Exp	1560
D_3^+ + W	38eV, T: 300K	Exp	1560
D_3^+ + Be	20−160eV, T: undef	E/T	1586
D_3^+ + Be	10−140eV, T: ¡330K		1620

D_3^+ + BeD	10−140eV, T: ¡330K		1620
D_3^+ + BeD	5−100eV, T: 300−725K		1626
D_3^+ + BeW	5−100eV, T: 300−725K		1626
D_3^+ + W	38eV, T: 370−600K		1652
D_3^+ + W	38eV, T: 370−600K		1652
D_3^+ + W	38eV, T: 370−600K		1652
D_3^+ + W	38eV, T: 370−600K		1652
D_3^+ + Be	1−300eV, T: 273−523K		1656
D_3^+ + Be	1−300eV, T: 273−523K		1656
D_3^+ + Be	1−300eV, T: 273−523K		1656
D_3^+ + Be	1−300eV, T: 273−523K		1656
D_3^+ + Be	20000−75000eV, T: ¡340K		1677
D_3^+ + Be	20000−75000eV, T: ¡340K		1677
D_3^+ + Be	20000−75000eV, T: ¡340K		1677
D_3^+ + Be	20000−75000eV, T: ¡340K		1677
T + C	undef, T: undef	Th	1423
T + Be	undef, T: undef	Th	1423
T + C	undef, T: undef	Th	1423
T + Be	undef, T: undef	Th	1423
T + C	undef, T: undef	Th	1423
T + Be	undef, T: undef	Th	1423
T + C	undef, T: undef	Th	1423
T + Be	undef, T: undef	Th	1423
T + W	10−1000eV, T: undef	Th	1430
T + C	1000−4000eV, T: undef	Exp	1437
T + Ni	undef, T: 285−1000K	Exp	1482
T + W	undef, T: 285−1000K	Exp	1482
T + W	1000eV, T: 473−873K	Th	1488
T + Mo	undef, T: 273−323K	Exp	1490
T + W	undef, T: 273−323K	Exp	1490
T + C	13.3−48.5eV, T: undef	Th	1502
T + C	10−10000eV, T: 300−1300K	Th	1511
T + C	undef, T: undef	Th	1520
T + C	undef, T: undef	Th	1520
T + C	undef, T: undef	Th	1520
T + C	undef, T: undef	Th	1520
T + Be	undef, T: undef	Exp	1549
T + Be	undef, T: undef	Exp	1549
T + W	undef, T: undef	Exp	1549
T + C	undef, T: undef	Exp	1549
T + W	undef, T: undef	Exp	1549
T + Be	undef, T: undef	Exp	1549
T + C	undef, T: undef	Exp	1549
T + C	undef, T: undef	Exp	1549
T + Be	undef, T: undef	Exp	1549
T + W	undef, T: undef	Exp	1549
T + C	undef, T: undef	Exp	1549
T + W	undef, T: undef	Exp	1549
T + W	undef, T: 300−750K	Th	1552
T + W	undef, T: 300−750K	Th	1552
T + W	undef, T: 300−750K	Th	1552
T + W	undef, T: 300−750K	Th	1552
T + W	undef, T: 300−750K	Th	1552
T + Be	undef, T: undef	E/T	1561
T + W	undef, T: undef	E/T	1561
T + C	undef, T: undef	E/T	1561
T + Be	undef, T: undef	E/T	1561
T + W	undef, T: undef	E/T	1561
T + C	undef, T: undef	E/T	1561

T + Be	undef, T: undef	E/T	1561
T + W	undef, T: undef	E/T	1561
T + C	undef, T: undef	E/T	1561
T + Be	undef, T: undef	E/T	1561
T + W	undef, T: undef	E/T	1561
T + C	undef, T: undef	E/T	1561
T + Mo	undef, T: 600−2000K	Th	1563
T + W	200−1500eV, T: 300−1000K	E/T	1594
T + C	200−1500eV, T: 300−1000K	E/T	1594
T + W	200−1500eV, T: 300−1000K	E/T	1594
T + C	200−1500eV, T: 300−1000K	E/T	1594
T + W	200−1500eV, T: 300−1000K	E/T	1594
T + C	200−1500eV, T: 300−1000K	E/T	1594
T + W	200−1500eV, T: 300−1000K	E/T	1594
T + C	200−1500eV, T: 300−1000K	E/T	1594
T + W	undef, T: 500−1450K	Th	1598
T + F_{82}H	undef, T: undef	Th	1604
T + Be	undef, T: undef	Th	1604
T + W	200eV, T: 300−623K		1639
T + W	200eV, T: 300−623K		1639
T + W	200eV, T: 300−623K		1639
T + W	200eV, T: 300−623K		1639
T + W	200eV, T: 300−623K		1639
T + W	140eV, T: 573K		1645
T + W	140eV, T: 573K		1645
T + W	140eV, T: 573K		1645
T + W	140eV, T: 573K		1645
T + Be	undef, T: 570−1333K		1649
T + Be	undef, T: 298−1373K		1651
T + He	undef, T: 298−1373K		1651
T + Be	undef, T: 298−1373K		1651
T + He	undef, T: 298−1373K		1651
T + Be	undef, T: 298−1373K		1651
T + He	undef, T: 298−1373K		1651
T + Be	undef, T: 298−1373K		1651
T + He	undef, T: 298−1373K		1651
T + W	400eV, T: 453−573K		1659
T + W	400eV, T: 453−573K		1659
T + W	400eV, T: 453−573K		1659
T + W	400eV, T: 453−573K		1659
T + C	undef, T: 1273K		1681
T + C	undef, T: 1273K		1681
T + C	undef, T: 1273K		1681
T + C	undef, T: 1273K		1681
CH + Be	1−200eV, T: undef	Th	1562
CH + H	1−200eV, T: undef	Th	1562
CH + C	1−200eV, T: undef	Th	1562
CH_2 + Be	1−200eV, T: undef	Th	1562
CH_2 + H	1−200eV, T: undef	Th	1562
CH_2 + C	1−200eV, T: undef	Th	1562
CH_3 + Be	1−200eV, T: undef	Th	1562
CH_3 + H	1−200eV, T: undef	Th	1562
CH_3 + C	1−200eV, T: undef	Th	1562
CH_4 + W	undef, T: undef	Exp	1403
CH_4 + C	undef, T: undef	Exp	1403
CH_4 + H	undef, T: undef	Exp	1403
CH_4 + H	undef, T: undef	Exp	1403
CH_4 + C	undef, T: undef	Exp	1403
CH_4 + W	undef, T: undef	Exp	1403

CH_4 + C	3−100eV, T: undef	Th	1414
CH_4 + W	3−100eV, T: undef	Th	1414
CH_4 + H	3−100eV, T: undef	Th	1414
CH_4 + C	3−100eV, T: undef	Th	1414
CH_4 + W	3−100eV, T: undef	Th	1414
CH_4 + H	3−100eV, T: undef	Th	1414
CH_4 + C	1−100eV, T: undef	Th	1424
CH_4 + C	1−100eV, T: undef	Th	1424
CH_4 + W	1−100eV, T: undef	Th	1424
CH_4 + H	1−100eV, T: undef	Th	1424
CH_4 + W	1−100eV, T: undef	Th	1424
CH_4 + H	1−100eV, T: undef	Th	1424
CH_4 + W	1−100eV, T: undef	Th	1424
CH_4 + H	1−100eV, T: undef	Th	1424
CH_4 + C	1−100eV, T: undef	Th	1424
CH_4 + H	1−100eV, T: undef	Th	1424
CH_4 + C	1−100eV, T: undef	Th	1424
CH_4 + W	1−100eV, T: undef	Th	1424
CH_4 + C	1−100eV, T: undef	Th	1424
CH_4 + W	1−100eV, T: undef	Th	1424
CH_4 + H	1−100eV, T: undef	Th	1424
CH_4 + W	1−100eV, T: 1−50eV	Th	1542
CH_4 + H	1−100eV, T: 1−50eV	Th	1542
CH_4 + C	1−100eV, T: 1−50eV	Th	1542
CH_4 + W	undef, T: undef	E/T	1584
CH_4 + C	undef, T: undef	E/T	1584
CH_4 + C	0.1−1000eV, T: 400−1400K	E/T	1587
CH_4 + C	0.1−1000eV, T: 400−1400K	E/T	1587
N_2 + Be	30−95eV, T: 310−420K	Exp	1406
N_2 + Be	30−95eV, T: 310−420K	Exp	1406
N_2 + Be	30−95eV, T: 310−420K	Exp	1406
N_2 + Be	30−95eV, T: 310−420K	Exp	1406
N_2 + Be	30−95eV, T: 310−420K	Exp	1406
N_2 + C	undef, T: 300−600K	Exp	1411
N_2 + D	undef, T: 300−600K	Exp	1411
N_2 + B	undef, T: 300−600K	Exp	1411
N_2 + H	500−1000eV, T: 460K	Exp	1431
N_2 + C	500−1000eV, T: 460K	Exp	1431
N_2^+ + Be	15−70eV, T: 298−573K		1670
N_2^+ + W	15−70eV, T: 298−573K		1670
N_2^+ + BeW	15−70eV, T: 298−573K		1670
O_2 + H	3eV(Te), T: undef	Exp	1445
O_2 + C	3eV(Te), T: undef	Exp	1445
C_2H_4 + W	undef, T: undef	E/T	1584
C_2H_4 + C	undef, T: undef	E/T	1584
C_2H_6 + C	3−100eV, T: undef	Th	1414
C_2H_6 + H	3−100eV, T: undef	Th	1414
C_2H_6 + C	3−100eV, T: undef	Th	1414
C_2H_6 + H	3−100eV, T: undef	Th	1414
undef + W	undef, T: undef		1654

2.4 Data Collection, Bibliographic and Progress Report

e + ND_4^+	0.001−1eV	1682
e + NH_4^+	0.001−1eV	1682
e + CH_5^+	0.001−1eV	1682
e + NO^+	0.001−1eV	1682
e + H_3O^+	0.001−1eV	1682

e + Cl_2	0.01 − 100 eV	Exp	1683
e + Cl_2	0.01−100eV	E/T	1684
e + Cl	5−1E6 keV	Th	1685
e + S	5−1E6 keV	Th	1685
e + Al	5−1E6 keV	Th	1685
e + Mg	5−1E6 keV	Th	1685
e + Na	5−1E6 keV	Th	1685
e + O	5−1E6 keV	Th	1685
e + H	5−1E6 keV	Th	1685
e + C	5−1E6 keV	Th	1685
e + Bi	5−1E6 keV	Th	1685
e + Ta	5−1E6 keV	Th	1685
e + Xe	5−1E6 keV	Th	1685
e + Au	5−1E6 keV	Th	1685
e + Ag	5−1E6 keV	Th	1685
e + Y	5−1E6 keV	Th	1685
e + Fe	5−1E6 keV	Th	1685
e + Si	5−1E6 keV	Th	1685
e + N	5−1E6 keV	Th	1685
e + Pt	5−1E6 keV	Th	1685
e + Os	5−1E6 keV	Th	1685
e + Re	5−1E6 keV	Th	1685
e + Hf	5−1E6 keV	Th	1685
e + Dy	5−1E6 keV	Th	1685
e + I	5−1E6 keV	Th	1685
e + U	5−1E6 keV	Th	1685
e + Pb	5−1E6 keV	Th	1685
e + W	5−1E6 keV	Th	1685
e + Tm	5−1E6 keV	Th	1685
e + Er	5−1E6 keV	Th	1685
e + Ho	5−1E6 keV	Th	1685
e + Gd	5−1E6 keV	Th	1685
e + Eu	5−1E6 keV	Th	1685
e + Sm	5−1E6 keV	Th	1685
e + Nd	5−1E6 keV	Th	1685
e + Pr	5−1E6 keV	Th	1685
e + Ce	5−1E6 keV	Th	1685
e + La	5−1E6 keV	Th	1685
e + Te	5−1E6 keV	Th	1685
e + Sb	5−1E6 keV	Th	1685
e + Sn	5−1E6 keV	Th	1685
e + In	5−1E6 keV	Th	1685
e + Cd	5−1E6 keV	Th	1685
e + Pd	5−1E6 keV	Th	1685
e + Mo	5−1E6 keV	Th	1685
e + Nb	5−1E6 keV	Th	1685
e + Zr	5−1E6 keV	Th	1685
e + Sr	5−1E6 keV	Th	1685
e + Rb	5−1E6 keV	Th	1685
e + Kr	5−1E6 keV	Th	1685
e + Br	5−1E6 keV	Th	1685
e + Se	5−1E6 keV	Th	1685
e + As	5−1E6 keV	Th	1685
e + Ge	5−1E6 keV	Th	1685
e + Ga	5−1E6 keV	Th	1685
e + Zn	5−1E6 keV	Th	1685
e + Cu	5−1E6 keV	Th	1685
e + Ni	5−1E6 keV	Th	1685
e + Co	5−1E6 keV	Th	1685

e + Mn	5−1E6 keV	Th	1685
e + Cr	5−1E6 keV	Th	1685
e + V	5−1E6 keV	Th	1685
e + Ti	5−1E6 keV	Th	1685
e + Sc	5−1E6 keV	Th	1685
e + Ca	5−1E6 keV	Th	1685
e + K	5−1E6 keV	Th	1685
e + Ar	5−1E6 keV	Th	1685
e + Xe	0.01−400eV	E/T	1686
e + Kr	0.01−400eV	E/T	1686
e + Ne	20−1000eV	E/T	1687
e + He	20−1000eV	E/T	1687
e + Ar	0.01−200eV	E/T	1688

2.5 Interactions of Atomic Particles with Fields

$\mathbf{B^{5+} + NO}$	399 −401eV		1689
P + He	80−240 eV	Th	1690
P + He	65−71 eV	Th	1691
P + Kr	1E1−1E8 K	Th	1692
$\mathbf{P + Kr^{+}}$	1E1−1E8 K	Th	1692
$\mathbf{P + Kr^{2+}}$	1E1−1E8 K	Th	1692
$\mathbf{P + Kr^{3+}}$	1E1−1E8 K	Th	1692
$\mathbf{P + Kr^{4+}}$	1E1−1E8 K	Th	1692
$\mathbf{P + Kr^{5+}}$	1E1−1E8 K	Th	1692
$\mathbf{P + Kr^{6+}}$	1E1−1E8 K	Th	1692
e + Kr	1E1−1E8 K	Th	1692
$\mathbf{e + Kr^{+}}$	1E1−1E8 K	Th	1692
$\mathbf{e + Kr^{2+}}$	1E1−1E8 K	Th	1692
$\mathbf{e + Kr^{3+}}$	1E1−1E8 K	Th	1692
$\mathbf{e + Kr^{4+}}$	1E1−1E8 K	Th	1692
$\mathbf{e + Kr^{5+}}$	1E1−1E8 K	Th	1692
$\mathbf{e + Kr^{6+}}$	1E1−1E8 K	Th	1692

Chapter 3
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   $\mathbf{C}^{0+--4+}$ Th
   $\mathbf{F}^{0+--7+}$ Th

He	Th
Li	Th
Li^{+}	Th
N^{0+--5+}	Th
Ne^{0+--8+}	Th
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Ca	Exp
Mg	Exp

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Kr^{5+}	Th
Kr^{6+}	Th
Kr^{10+}	Th
Kr^{15+}	Th
Kr^{17+}	Th
Kr^{2+}	Th
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Energies of the 1s^{2}nd Rydberg States for the Lithium Atom
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Li E/T

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W^{62+} Th

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In E/T

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In^{+} E/T
In^{2+} E/T

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Decay Processes of the Core-Excited States 1s2s2p^2 for Be-like Systems
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Be Z= 8-28 step 2 Th

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Fine-Structure Energy Levels and Autoionizing Width Calculations of Magnesium-like Ni XVII
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Ni^{16+} Th

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High-Precision Calculations of the Hyperfine Constants and Some Selected Transition Energies for the Low-Lying ^{4}S Levels of the Lithium Atom
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Li Th

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Phys. Rev. Lett. 111, 243201 (2013)

Cl^{15+}	E/T
S^{14+}	E/T
Si^{12+}	E/T

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Ground State Hyperfine Splitting in ^{6,7}Li Atoms and the Nuclear Structure
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Li	Th

35. J. K. Rudolph, S. Bernitt, S. W. Epp, R. Steinbrügge, C. Beilmann, G. V. Brown, S. Eberle, A. Graf, Z. Harman, N. Hell, M. Leutenegger, A. Müller, K. Schlage, H.-C. Wille, H. Yavaş, J. Ullrich, J. R. Crespo López-Urrutia
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Phys. Rev. Lett. 111, 103002 (2013)

Fe^{17+}–$^{22+}$	E/T
Fe^{17+}–$^{24+}$	E/T

36. J. C. Berengut, V. V. Flambaum, A. Ong, J. K. Webb, J. D. Barrow, M. A. Barstow, S. P. Preval, J. B. Holberg
Limits on the Dependence of the Fine-Structure Constant on Gravitational Potential from White-Dwarf Spectra
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Fe^{4+}	Exp
Ni^{4+}	Exp

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The Møller-Plesset Perturbation Revisited: Origin of High-Order Divergences
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Ne	Th

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Phys. Rev. Lett. 110, 159302 (2013)

Ti^{20+}	Exp

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Comment on "Testing Three-Body Quantum Electrodynamics with Trapped Ti^{20+} Ions: Evidence for a Z-Dependent Divergence Between Experiment and Calculation"
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Ar^{16+}	E/T

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Decay of a 2p Inner-Shell Hole in an Ar$^+$ Ion
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Ar^{2+} Exp

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g Factor of Lithiumlike Silicon $^{28}Si^{11+}$
Phys. Rev. Lett. 110, 033003 (2013)

Si^{11+} E/T

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Breit-Pauli Atomic Structure Calculations for Fe XI
At. Data Nucl. Data Tables 99, 704-732 (2013)

Fe^{10+} Th

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Dielectronic Recombination Lines of C^{+}
At. Data Nucl. Data Tables 99, 633-650 (2013)

C^{+} Th

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Energy Levels, Wavelengths, and Transition Rates of Multipole Transitions (E1, E2, M1, M2) in Au^{67+} and Au^{66+} Ions
At. Data Nucl. Data Tables 99, 595-632 (2013)

$Au^{66+--67+}$ Th

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Theoretical Energy Level Spectra and Transition Data for $4p^64d^2$, $4p^64d4f$, and $4p^54d^3$ Configurations of W^{36+}
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W^{36+} Th

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Fe^{21+} Th
Ga^{26+} Th

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Energies and E1, M1, E2 Transition Rates for States of the $2s^22p^5$ and $2s2p^6$ Configurations in Fluorine-like Ions Between Si VI and W LXVI
At. Data Nucl. Data Tables 99, 431-446 (2013)

F Z= 14-74 Th

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Relativistic Distorted-Wave Collision Strengths for the 16 $\Delta n = 0$ Optically Allowed Transitions with $n = 2$ in the 67 Be-like Ions with $26 \leq Z \leq 92$
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Be Z= 26-92 Th

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Radiative Recombination Data for Tungsten Ions: I. W^{24+}–W^{45+}
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$W^{24+--30+}$	Th

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Energy Levels, Radiative Rates, and Electron Impact Excitation Rates for Transitions in Li-like Ions with 12≤Z≤20
At. Data Nucl. Data Tables 99, 156-248 (2013)

Li Z= 12-20	Th

51. J. R. Persson
Table of Hyperfine Anomaly in Atomic Systems
At. Data Nucl. Data Tables 99, 62-68 (2013)

Ru	E/T
Ag	E/T
Cd	E/T
In	E/T
Sn	E/T
Sb	E/T
Cs	E/T
Ba	E/T
La	E/T
Nd	E/T
Eu	E/T
N	E/T
Gd	E/T
Dy	E/T
Yb	E/T
Lu	E/T
Re	E/T
Ir	E/T
Hg	E/T
Au	E/T
Tl	E/T
Fr	E/T
U	E/T
Na	E/T
K	E/T
V	E/T
Cu	E/T
Ga	E/T
Li	E/T
Br	E/T
Rb	E/T
Mo	E/T

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The 4d-4p Transitions and Soft X-ray Laser Wavelengths in Si-like Ions
Can. J. Phys. 91, 981-993 (2013)

As^{19+}	Th
Ga^{17+}	Th
Ge^{18+}	Th
Ni^{14+}	Th
Zn^{16+}	Th

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Using Perturbatively Selected Configuration Interaction in Quantum Monte Carlo Calculations
Can. J. Chem. 91, 879-885 (2013)

O	Th

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Energy Levels, Oscillator Strengths, Radiative Decay Rates, and Fine Structure Collision Strengths for Kr VII Lines
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Kr^{6+}	Th

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Multiconfigurational Dirac-Fock Energy Levels and Radiative Rates for Br-like Tungsten
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W^{39+}	Th

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Electron-Correlation Trends in the Hyperfine A and B Constants of the Na Isoelectronic Sequence
Phys. Rev. A 88, 062507 (2013)

Si^{3+}	Th
P^{4+}	Th
S^{5+}	Th
Cl^{6+}	Th
Ar^{7+}	Th
K^{8+}	Th
Ca^{9+}	Th
Sc^{10+}	Th
Ti^{11+}	Th
V^{12+}	Th

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Doublet-Quartet Energy Separation in Boron: A Partitioned-Correlation-Function-Interaction Method
Phys. Rev. A 88, 062506 (2013)

B	Th
C^{+}	Th

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Inner-Shell Photoionization of Atomic Chlorine
Phys. Rev. A 88, 053425 (2013)

Cl	E/T
Cl^{0+--+}	E/T

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Two-Electron One-Photon Transitions in Li-like Ions
Phys. Rev. A 88, 052522 (2013)

Ar^{15+}	Th
Ca^{17+}	Th
Cd^{45+}	Th
Fe^{23+}	Th
Ge^{29+}	Th
Kr^{33+}	Th
Mo^{39+}	Th
Rb^{34+}	Th

Ru^{41+}	Th
Si^{11+}	Th
Sn^{47+}	Th
Sr^{35+}	Th
Ti^{19+}	Th
Xe^{51+}	Th
Y^{36+}	Th
Zn^{27+}	Th
Zr^{37+}	Th

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Measuring Chemical Evolution and Gravitational Dependence of α Using Ultraviolet Fe V and Ni V Transitions in White-Dwarf Spectra
Phys. Rev. A 88, 052517 (2013)

Fe^{4+}	Th
Ni^{4+}	Th

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Hyperfine Structure and Isotope Shift in the 3s^{2}3p2 ^{3}P$_{0,1,2}$ → 3s^{2}3p4p ^{3}P$_{0,1,2}$ Transitions in Silicon by Doppler-Free In-Source Two-Photon Resonance-Ionization Spectroscopy
Phys. Rev. A 88, 052510 (2013)

Si	Exp

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Term Energies of 1s^{2}nf High Rydberg States for the Lithium Atom
Phys. Scr. 88, 045303 (2013)

Li	Th

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KLL Dielectronic-Recombination Measurement for Li-like to O-like Gold
Phys. Rev. A 88, 042704 (2013)

Au$^{71+--76+}$	Th

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Collinear Laser Spectroscopy on the Ground State and an Excited State in Neutral ^{55}Mn
Phys. Rev. A 88, 042701 (2013)

Mn	Exp

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Excited-State Energies and Fine Structure of Highly Charged Lithiumlike Ions
Phys. Rev. A 88, 042511 (2013)

Li Z= 41-50	Th

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Higher Ionization Energies of Atoms in Density-Functional Theory
Phys. Rev. A 88, 042504 (2013)

H-Cu$^{0+--28+}$	Th

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Relativistic Effects on the Hyperfine Structures of 2p^4(^{3}P)3p ^{2}D$^\circ$, ^{4}D$^\circ$, and ^{4}P$^\circ$ in ^{19}F I
Phys. Rev. A 88, 042501 (2013)

F	Th

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Energy Resonances and Widths of the (2pns)^{1}P$^\circ$ and (2pnd) ^{1}P$^\circ$ Rydberg Series of Be-like Ions
Phys. Scr. 88, 035302 (2013)

Be Z= 8-18 E/T

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Level Energies, Lifetimes and Radiative Rates in the 4p^{4}4d Configurations of Bromine-like Ions
Phys. Scr. 88, 035301 (2013)

Br Z= 38-42 Th

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Ab Initio Calculations of the 2p$_{3/2}$-2p$_{1/2}$ Fine-Structure Splitting in Boronlike Ions
Phys. Rev. A 88, 032518 (2013)

B Z= 17-100 Th

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Contribution of the 4f-Core-Excited States in Determination of Atomic Properties in the Promethium Isoelectronic Sequence
Phys. Rev. A 88, 032512 (2013)

Pm Z= 74-100 Th

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Energy Levels and Radiative Rates for Transitions in Ti X
Phys. Scr. 88, 025303 (2013)

Ti^{9+} E/T

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Energy Levels and Radiative Rates for Transitions in Ti VI
Phys. Scr. 88, 025302 (2013)

Ti^{5+} Th

74. G. P. Gupta, A. Z. Msezane
Excitation Energies, Oscillator Strengths and Lifetimes in Mg-like Vanadium
Phys. Scr. 88, 025301 (2013)

V^{11+} Th

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Resonances in Three-Photon Double Ionization of Ar in Intense Extreme-Ultraviolet Free-Electron Laser Fields Studied by Shot-By-Shot Photoelectron Spectroscopy
Phys. Rev. A 88, 023421 (2013)

Ar$^+$ Exp

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High-Accuracy X-ray Line Standards in the 3-keV Region
Phys. Rev. A 88, 022503 (2013)

Ar$^{14+--16+}$	Exp
Cl^{13+}	Exp
Cl^{14+}	Exp
S$^{12+--14+}$	Exp

77. Q.-P. Fan, G. Jiang, L.-F. Cao, B.-L. Deng
    Collision Strength Calculations of Ni XXIII
    Phys. Scr. 88, 015302 (2013)

Ni^{22+}	Th

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    Atomic Ground States in Strong Magnetic Fields: Electron Configurations and Energy Levels
    Phys. Rev. A 88, 012509 (2013)

He-Fe	Th

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    Hylleraas-Configuration-Interaction Analysis of the Low-Lying States in the Three-Electron Li Atom and Be^{+} Ion
    Phys. Rev. A 88, 012505 (2013)

Be^{+}	Th
Li	Th

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    Radiative Decay from Doubly and Singly Excited States of He-like Nickel
    Phys. Rev. A 88, 012501 (2013)

Ni^{26+}	Th

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    Near-Threshold Photodetachment Cross Section of Negative Atomic Boron Ions
    Phys. Rev. A 87, 065402 (2013)

B^{-}	Th

82. T. Lennartsson, J. Clementson, P. Beiersdorfer
    Experimental Wavelengths for Intrashell Transitions in Tungsten Ions with Partially Filled 3p and 3d Subshells
    Phys. Rev. A 87, 062505 (2013)

W$^{47+--61+}$	Exp

83. J. D. Gillaspy, D. Osin, Yu. Ralchenko, J. Reader, S. A. Blundell
    Transition Energies of the D Lines in Na-like Ions
    Phys. Rev. A 87, 062503 (2013)

Na Z= 18-92	E/T
Ba^{45+}	E/T
Bi^{72+}	E/T
Dy^{55+}	E/T
Er^{57+}	E/T
Gd^{53+}	E/T
Pt^{67+}	E/T
Sm^{51+}	E/T
W^{63+}	E/T
Xe^{43+}	E/T

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Energy Levels, Radiative Rates and Electron Impact Excitation Rates for Transitions in He-like Fe XXV, Co XXVI, Ni XXVII, Cu XXVIII and Zn XXIX
Phys. Scr. 87, 055302 (2013)

Co^{25+}	Th
Cu^{27+}	Th
Fe^{24+}	Th
Ni^{26+}	Th
Zn^{28+}	Th

85. Z.-M. Hu, Y.-M. Li, N. Nakamura
Resonance Strength for KLL Dielectronic Recombination of Hydrogenlike Krypton
Phys. Rev. A 87, 052706 (2013)

Kr^{32+}	Th
Kr^{33+}	Th

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Hyperfine Structure and Isotope Shift Analysis of Singly Ionized Titanium
Phys. Scr. 87, 045301 (2013)

Ti^{+}	Th

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Hybrid Theory of P-Wave Electron-Li^{2+} Elastic Scattering and Photoabsorption in Two-Electron Systems
Phys. Rev. A 87, 042705 (2013)

He Z= 1-3	Th
He Z= 2-3	Th

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Bound-State Energies of Lithium in Magnetic Fields Using Hylleraas Basis Functions
Phys. Rev. A 87, 042518 (2013)

Li	Th

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Prediction of ^{2}S Rydberg Energy Levels of ^{6}Li and ^{7}Li Based on Quantum-Mechanical Calculations Performed with Explicitly Correlated Gaussian Functions
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Li	E/T

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The Second Spectrum of Niobium: II. Accurate Fine Structure Study of Odd-Parity Levels
Phys. Scr. 87, 035303 (2013)

Nb^{+}	E/T

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The Second Spectrum of Niobium: I. Accurate Fine Structure Study of Even-Parity Levels
Phys. Scr. 87, 035302 (2013)

Nb^{+}	Th

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Level-To-Level and Total Probability for Auger Decay Including Direct Double Processes of Ar $2p^{-1}$ Hole States
Phys. Rev. A 87, 033419 (2013)

Ar Th

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Energies and the Radiative and Auger Transition Rates of $1s2p^4$ Resonances of B-like Ions
Phys. Rev. A 87, 032509 (2013)

B Z= 6-10 step 2 E/T
B Z= 6-14 step 2 E/T

94. U. I. Safronova, A. S. Safronova, P. Beiersdorfer
Relativistic Many-Body Calculations of Excitation Energies, Oscillator Strengths, Transition Rates, and Lifetimes in Samariumlike Ions
Phys. Rev. A 87, 032508 (2013)

Sm Z= 74-100 Th

95. R. C. Brown, S.-J. Wu, J. V. Porto, C. J. Sansonetti, C. E. Simien, S. M. Brewer, J. N. Tan, J. D. Gillaspy
Quantum Interference and Light Polarization Effects in Unresolvable Atomic Lines: Application to a Precise Measurement of the ^{6,7}Li D_2 Lines
Phys. Rev. A 88, 069902 (2013)

Li Exp

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D_1 and D_2 Lines in ^{6}Li and ^{7}Li Including QED Effects
Phys. Rev. A 87, 032503 (2013)

Li Th

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Relativistic Many-Body Calculation of Energies, Lifetimes, Polarizabilities, and Hyperpolarizabilities in Li-like Be^+
Phys. Rev. A 87, 032502 (2013)

Be^+ Th

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Experimental Access to Higher-Order Zeeman Effects by Precision Spectroscopy of Highly Charged Ions in a Penning Trap
Phys. Rev. A 87, 023412 (2013)

Ar^{13+} Th

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Fine-Structure Electric-Dipole Matrix Elements of He-like Ions for X-ray Line-Shape Calculations
Phys. Rev. A 87, 022515 (2013)

Al^{11+} Th

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Collision Strengths for Transitions of Ni XXI
Eur. Phys. J. D 67, 255 (2013)

Ni^{20+} Th

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The Study of the 4s4p Configuration of the Zn Isoelectronic Sequence Using the Relativistic jj-Coupling Approach
Eur. Phys. J. D 67, 158 (2013)

Zn Z= 50-92 E/T

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Radiative and Auger Transitions of Core-Excited States for the Boron Isoelectronic Sequence
Eur. Phys. J. D 67, 88 (2013)

Mg^{7+} E/T
Ne^{5+} E/T
O^{3+} E/T
Si^{9+} E/T

103. T. I. Madeira, P. Amorim, F. Parente, P. Indelicato, J. P. Marques
Analysis of the Quasicontinuum Band Emitted by Highly Ionised Tungsten Atoms in the 4–7 nm Range
Eur. Phys. J. D 67, 12 (2013)

$W^{27+-37+}$ Th

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Theoretical Study of Level Structure and Transitions of Configurations $3d^94s^2$, $3d^94s4p$, $3d^94p^2$ for Nb XIII
Acta Phys. Sin. 62, 103101 (2013)

Nb^{12+} Th

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Line-Profile Analysis of Excitation Spectroscopy in the Even $4p^5(^2P_{1/2})nl'$ $[K']_J$ (l' = 1,3) Autoionizing Resonances of Kr
Sci. China Chemistry 56, 1623-1632 (2013)

Kr Exp

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Resonant Three-Photon Ionization Spectroscopy of Atomic Fe
J. Phys. B 46, 245003 (2013)

Fe Exp

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Complete Auger Decay Pathways of Kr $3d^{-1}$ Hole Levels Including Direct Double Processes
J. Phys. B 46, 215002 (2013)

Kr^{+-3+} Th

108. M. M. Al Shorman, M. F. Gharaibeh, J. M. Bizau, D. Cubaynes, S. Guilbaud, N. El Hassan, C. Miron, C. Nicolas, E. Robert, I. Sakho, C. Blancard, B. M. McLaughlin
K-Shell Photoionization of Be-like and Li-like Ions of Atomic Nitrogen: Experiment and Theory
J. Phys. B 46, 195701 (2013)

N^{3+-4+} E/T

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Theoretical Study of the Photoionization Process of Ne-like Ar, Fe, Kr and Xe Ions
J. Phys. B 46, 175402 (2013)

Ar^{9+}	Th
Fe^{16+}	Th
Kr^{26+}	Th
Xe^{44+}	Th

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Characterization of the Titanium Kβ Spectral Profile
J. Phys. B 46, 145601 (2013)

Ti	Exp
V	Exp

111. O. Zatsarinny, K. Bartschat
The B-Spline R-Matrix Method for Atomic Processes: Application to Atomic Structure, Electron Collisions and Photoionization
J. Phys. B 46, 112001 (2013)

F	Th

112. T. Carette, M. R. Godefroid
Isotope Shift on the Chlorine Electron Affinity Revisited by an MCHF/CI Approach
J. Phys. B 46, 095003 (2013)

Cl	Th
Cl^{-}	Th

113. O. Zabaydullin, J. Dubau
Photoionization and Photoabsorption of Li-like Neon Near 1s2p(^{1}P)2s ^{2}P Autoionizing States
J. Phys. B 46, 075005 (2013)

Ne^{7+}	Th

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Analysis of the Charge State Distribution in an ECRIS Ar Plasma Using High-Resolution X-ray Spectra
J. Phys. B 46, 065701 (2013)

Ar$^{14+-16+}$	E/T

115. N. G. Shchukina, I. E. Vasil'eva
Oscillator Strengths for Selected Fe II Lines in the Range $\lambda\lambda$ 300–400 nm
Kinemat. Phys. Celest. Bodies 29, 53-65 (2013)

Fe^{+}	Exp

116. C.-Y. Li, T.-T. Wang, J.-F. Zhen, Y. Chen, Z.-W. He
Line-Profile Analysis of Excitation Spectroscopy in Even 5p^5(^{2}P$_{1/2}$)nl$'$ [K$'$]$_J$ (l$'$ = 1, 3) Autoionizing Resonances of Xe
Chin. J. Chem. Phys. 26, 374-380 (2013)

Xe	Exp

117. C.-Y. Li, Z.-W. He, T.-T. Wang, J.-F. Zhen, Y. Chen, J.-S. Zhang
Resonance-Enhanced Photon Excitation Spectroscopy of the Even-Parity 3p^5(^{2}P$_{1/2}$)nl$'$ [K$'$]$_J$ (l$'$ = 1, 3) Autoionizing Rydberg States of Ar
Chin. J. Chem. Phys. 26, 259-264 (2013)

Ar Exp

118. H. Liu, G. Jiang, F. Hu, C.-K. Wang, Z.-B. Wang, J.-M. Yang
Intercombination Transitions of the Carbon-like Isoelectronic Sequence
Chin. Phys. B 22, 073202 (2013)

C Z= 7-92 Th

119. S. Aggarwal, J. Singh, M. Mohan
New Atomic Data for Kr XXXV Useful in Fusion Plasma
Chin. Phys. B 22, 033201 (2013)

Kr^{34+} Th

120. C. Gao, F.-T. Jin, J.-L. Zeng, J.-M. Yuan
Population Kinetics and M Band Emission Spectra of Gold Plasmas in Non-Local Thermodynamic Equilibrium by Using a Detailed Relativistic Configuration Approach
New J. Phys. 15, 015022 (2013)

Au$^{41+--53+}$ Th

121. A. Dasgupta, R. W. Clark, A. Giuliani, N. D. Ouart, B. Jones, D. J. Ampleford, S. B. Hansen
K-α Emission Spectroscopic Analysis from a Cu Z-Pinch
High En. Dens. Phys. 9, 347-353 (2013)

Cu^{19+} E/T
Fe^{16+} E/T
Ni^{18+} E/T

122. C. Chen
Energies, Fine Structures, and Hyperfine Structures of the 1s^{2}2snp ^{3}P (n = 2–4) States for the Beryllium Atom
J. At. Mol. Opt. Phys. (Hindawi) 2012, 569876 (2012)

Be Th

123. S. Civiš, M. Ferus, P. Kubelík, V. E. Chernov, E. M. Zanozina
Li I Spectra in the 4.65–8.33 Micron Range: High-L States and Oscillator Strengths
Astron. Astrophys. 545, p.A61 (2012)

Li Exp

124. S. Hamasha, R. Alshaiub
Constructing Theoretical M-Shell Spectra for Mg-like Au through Cl-like Au Ions in Gold Plasma Diagnostics
Phys. Scr. 86, 065302 (2012)

Au$^{62+--67+}$ Th

125. K. Kubiček, J. Braun, H. Bruhns, J. R. Crespo López-Urrutia, P. H. Mokler, J. Ullrich
High-Precision Laser-Assisted Absolute Determination of X-ray Diffraction Angles
Rev. Sci. Instrum. 83, 013102 (2012)

Ar^{16+} Exp

126. J. P. Marques, P. Indelicato, F. Parente
Relativistic Multiconfiguration Calculations of the 2s^{2}2p ^{2}P$_{3/2}$ Level Lifetime Along the Boron Isoelectronic Sequence
Eur. Phys. J. D 66, 324 (2012)

Au^{74+}	Th
Bi^{78+}	Th
Gd^{59+}	Th
Kr^{31+}	Th
B Z= 14-35	Th
U^{87+}	Th
Xe^{49+}	Th

127. D. Osin, J. D. Gillaspy, J. Reader, Yu. Ralchenko
EUV Magnetic-Dipole Lines from Highly-Charged High-Z Ions with an Open 3d Shell
Eur. Phys. J. D 66, 286 (2012)

Au$^{51+--60+}$	E/T
Au$^{51+--62+}$	E/T
Hf$^{44+--54+}$	E/T
Hf$^{44+--55+}$	E/T
Ta$^{45+--56+}$	E/T
Ta$^{45+--57+}$	E/T

128. S. Civiš, I. Matulková, J. Cihelka, P. Kubelík, K. Kawaguchi, V. E. Chernov
Low-Excited f-, g- and h-States in Au, Ag and Cu Observed by Fourier-Transform Infrared Spectroscopy in the 1000–7500 cm^{-1} Region
J. Phys. B 44, 105002 (2012)

Ag	Exp
Au	Exp
Cu	Exp

129. E. B. Saloman
Energy Levels and Observed Spectral Lines of Neutral and Singly Ionized Chromium, Cr I and Cr II
J. Phys. Chem. Ref. Data 41, 043103 (2012)

Cr^{0+--+}	Exp

130. X.-N. Cao, M.-G. Su, D.-X. Sun, Y.-B. Fu, C.-Z. Dong
Theoretical Analysis of 4f and 5p Inner-Shell Excitations of W–W^{3+} Ions
Chin. Phys. Lett. 29, 113202 (2012)

W^{0+--3+}	Th

131. P. Beiersdorfer, M. J. May, J. H. Scofield, S. B. Hansen
Atomic Physics and Ionization Balance of High-Z Ions: Critical Ingredients for Characterizing and Understanding High-Temperature Plasmas
High En. Dens. Phys. 8, 271-283 (2012)

Au$^{0+--78+}$	Th
W$^{0+--73+}$	Th

132. E. Kraisler, G. Makov, I. Kelson
Ensemble v-Representable Ab Initio Density-Functional Calculation of Energy and Spin in Atoms: A Test of Exchange-Correlation Approximations
Phys. Rev. A 82, 042516 (2010)

H-Rn	Th

133. K. Kawaguchi, N. Sanechika, Y. Nishimura, R. Fujimori, T. N. Oka, Y. Hirahara, A. I. Jaman, S. Civiš
Time-Resolved Fourier Transform Infrared Emission Spectroscopy of Laser Ablation Products
Chem. Phys. Lett. 463, 38-41 (2008)

Al	Exp
Cu	Exp
Fe	Exp
Zn	Exp

134. R. F. Heeter, S. B. Hansen, K. B. Fournier, M. E. Foord, D. H. Froula, A. J. Mackinnon, M. J. May, M. B. Schneider, B. K. F. Young
Benchmark Measurements of the Ionization Balance of Non-Local-Thermodynamic-Equilibrium Gold Plasmas
Phys. Rev. Lett. 99, 195001 (2007)

Au$^{41+–51+}$	Exp

135. F. Kerber, G. Nave, C. J. Sansonetti, P. Bristow, A. Rosa, H.-U. Käufl, M. R. Rosa
The Spectrum of Th-Ar Hollow Cathode Lamps in the 900–4500 nm Region: Establishing Wavelength Standards for the Calibration of VLT Spectrographs
Proc. SPIE 6269, p.62692O (2006)

Ar$^{0+–+}$	Exp
Th$^{0+–+}$	Exp

136. K. L. Wong, M. J. May, P. Beiersdorfer, K. B. Fournier, B. Wilson, G. V. Brown, P. Springer, P. A. Neill, C. L. Harris
Determination of the Charge State Distribution of a Highly Ionized Coronal Au Plasma
Phys. Rev. Lett. 90, 235001 (2003)

Au$^{44+–51+}$	Exp

137. S. H. Glenzer, K. B. Fournier, B. G. Wilson, R. W. Lee, L. J. Suter
Ionization Balance in Inertial Confinement Fusion Hohlraums
Phys. Rev. Lett. 87, 045002 (2001)

Au$^{47+–53+}$	Exp

138. M. E. Foord, S. H. Glenzer, R. S. Thoe, K. L. Wong, K. B. Fournier, B. G. Wilson, P. T. Springer
Ionization Processes and Charge-State Distribution in a Highly Ionized High-Z Laser-Produced Plasma
Phys. Rev. Lett. 85, 992-995 (2000)

Au$^{47+–52+}$	Exp

139. A. Alonso-Medina, C. Colón
Interpretation of the Spectrum of Sn II: Experimental and Theoretical Transition Probabilities
Phys. Scr. 61, 646-651 (2000)

Sn^{+}	Exp

140. A. J. J. Raassen, P. H. M. Uylings
Critical Evaluation of Calculated and Experimental Transition Probabilities and Lifetimes for Singly Ionized Iron Group Elements
J. Phys. B 31, 3137-3146 (1998)

As^{5+}	Th
Co^{+}	Th
Co^{3+}	Th
Co^{4+}	Th
Cr^{+}	Th
Cu$^{3+–5+}$	Th
Fe$^{+–5+}$	Th

Ga^{3+--5+}	Th
Ge^{4+--5+}	Th
Mn^{2+--5+}	Th
Ni^{3+--5+}	Th
Ti^{2+}	Th
V^{3+}	Th
Zn^{3+--5+}	Th

141. A. J. J. Raassen, P. H. M. Uylings
The Use of Complete Sets of Orthogonal Operators in Spectroscopic Studies
Phys. Scr. T65, 84-87 (1996)

Fe^{2+--5+}	Th
Mn^{2+}	Th
Mn^{4+}	Th
Ni^{3+}	Th
Ni^{4+}	Th
Ti^{2+}	Th
V^{3+}	Th

142. S. Bashkin, E. Träbert, D. A. Thiede, P. C. Sercel, P.-C. Lin, M.-L. Li, D. G. Jenkins, D. E. Shemansky, K. Wells, R. Bruch, S. Fülling, D. DeWitt
Excitation of Nitrogen by Fast $\mathbf{H_3^+}$ Ions
Phys. Rev. A 43, 3553-3562 (1991)

N^{0+--+}	Exp

143. A. D. Thackeray
The Evolution of the Nebular Spectrum of the Slow Nova RR Telescopii
Mem. R. Astron. Soc. 83, 1-68 (1977)

Ar^{2+--4+}	Exp
Ca^{4+--6+}	Exp
Co^{+--2+}	Exp
Co^{5+--6+}	Exp
Cr^{3+--4+}	Exp
Cu^{+}	Exp
Cu^{3+}	Exp
Fe^{+--6+}	Exp
K^{3+--5+}	Exp
Mn^{2+--5+}	Exp
Ni^{2+--4+}	Exp
Ni^{6+}	Exp

144. L. H. Aller, R. S. Polidan, E. J. Rhodes Jr., G. W. Wares
The Spectrum of RR Telescopii in 1968
Astrophys. Space Sci. 20, 93-110 (1973)

Ar^{2+--4+}	Exp
C^{+--3+}	Exp
Ca^{+}	Exp
Ca^{4+--5+}	Exp
Cr^{+--4+}	Exp
Cu^{+}	Exp
Fe^{+--7+}	Exp
He^{0+--+}	Exp
K^{3+}	Exp
Mg^{0+--+}	Exp
Mn^{+}	Exp
Mn^{3+--4+}	Exp

N$^{+\text{–}3+}$	Exp
Na^{3+}	Exp
Ne$^{+\text{–}4+}$	Exp
Ni^{+}	Exp
Ni^{3+}	Exp
O$^{0+\text{–}3+}$	Exp
S$^{+\text{–}2+}$	Exp
Sc^{+}	Exp
Si^{+}	Exp
Ti^{+}	Exp
V$^{+\text{–}3+}$	Exp
Zr^{+}	Exp

145. L. H. Aller, I. S. Bowen, R. Minkowski
The Spectrum of NGC 7027
Astrophys. J. 122, 62-71 (1955)

Ar$^{2+\text{–}4+}$	Exp
C$^{+\text{–}3+}$	Exp
Ca^{4+}	Exp
Ca^{6+}	Exp
Cl$^{2+\text{–}3+}$	Exp
F^{3+}	Exp
Fe^{2+}	Exp
Fe$^{4+\text{–}6+}$	Exp
He$^{0+\text{–}+}$	Exp
K$^{3+\text{–}5+}$	Exp
Mg	Exp
Mn$^{4+\text{–}5+}$	Exp
N$^{0+\text{–}2+}$	Exp
Ne$^{2+\text{–}4+}$	Exp
O$^{0+\text{–}4+}$	Exp
S$^{0+\text{–}2+}$	Exp
Si$^{+\text{–}2+}$	Exp

146. J. Clementson, P. Beiersdorfer, T. Brage, M. F. Gu
Atomic data and theoretical X-ray spectra of Ge-like through V-like W ions
At. Data Nucl. Data Tables 100, 577-649 (2014)

W$^{42+\text{–}51+}$	Th

147. P. Rynkun, P. Jönsson, G. Gaigalas, C. Froese Fischer
Energies and E1, M1, E2, and M2 transition rates for states of the 2s^{2}2p^{3}, 2s2p^{4}, and 2p^{5} configurations in nitrogen-like ions between F III and Kr XXX
At. Data Nucl. Data Tables 100, 315-402 (2014)

N Z= 9-36	Th

148. Y. Sun, F. Chen, C. Chen, B. C. Gou
Energies, fine structure, and radiative transitions of the high-lying core-excited states ^{6}S^{e,o}(n) and ^{6}P^{e,o}(n) (n = 1–5) for the boron isoelectronic sequence
At. Data Nucl. Data Tables 100, 286-296 (2014)

B Z= 6-10	Th

149. P. Jönsson, P. Bengtsson, J. Ekman, S. Gustafsson, L. B. Karlsson, G. Gaigalas, C. Froese Fischer, D. Kato, I. Murakami, H. A. Sakaue, H. Hara, T. Watanabe, N. Nakamura, N. Yamamoto
Relativistic CI calculations of spectroscopic data for the 2p^{6} and 2p^{5}3l configurations in Ne-like ions between Mg III and Kr XXVII
At. Data Nucl. Data Tables 100, 1-154 (2014)

Ne Z= 12-36 Th

150. M. P. Ruffoni, C. Allende Prieto, G. Nave, J. C. Pickering
Infrared laboratory oscillator strengths of Fe I in the H-band
Astrophys. J. 779, 17 (2013)

Fe Exp

151. P. Rynkun, P. Jönsson, G. Gaigalas, C. Froese Fischer
Energies and E1, M1, E2, and M2 transition rates for states of the $2s^22p^4$, $2s2p^5$, and $2p^6$ configurations in oxygen-like ions between F II and Kr XXIX
Astron. Astrophys. 557, p.A136 (2013)

O Z= 9-36 Th

152. S. Civiš, M. Ferus, V. E. Chernov, E. M. Zanozina
Infrared transitions and oscillator strengths of Ca and Mg
Astron. Astrophys. 554, p.A24 (2013)

Ca Th
Mg Th

153. G. Del Zanna, P. J. Storey
Atomic data for astrophysics: Fe XI soft X-ray lines
Astron. Astrophys. 549, p.A42 (2013)

Fe^{10+} Th

154. C. Colón, C. Moreno-Díaz, A. Alonso-Medina
Theoretical Stark broadening parameters for spectral lines arising from the $2p^5$ns, $2p^5$np and $2p^5$nd electronic configurations of Mg III
Mon. Not. R. Astron. Soc. 435, 1749-1757 (2013)

Mg^{2+} Th

155. M. P. Ruffoni, J. C. Pickering
Accurate Ritz wavelengths of parity-forbidden [Co II] and [V II] lines of astrophysical interest
Astrophys. J., Suppl. Ser. 207, 20 (2013)

Co^+ Th
V^+ Th

156. F. Díaz, M. J. Vilkas, Y. Ishikawa, P. Beiersdorfer
High-Accuracy MR-MP perturbation theory energy and radiative rates calculations for core-excited transitions in Fe XVI
Astrophys. J., Suppl. Ser. 207, 11 (2013)

Fe^{15+} Th

157. A. Kramida, J. E. Sansonetti
Energy levels and spectral lines of singly ionized manganese (Mn II)
Astrophys. J., Suppl. Ser. 205, 14 (2013)

Mn^+ E/T

158. J. E. Lawler, A. Guzman, M. P. Wood, C. Sneden, J. J. Cowan
Improved log(gf) values for lines of Ti I and abundance determinations in the photospheres of the sun and metal-poor star HD 84937 (accurate transition probabilities for Ti I)
Astrophys. J., Suppl. Ser. 205, 11 (2013)

Ti	Exp

159. O. Yu. Khetselius, T. A. Florko, A. A. Svinarenko, T. B. Tkach
Radiative and collisional spectroscopy of hyperfine lines of the Li-like heavy ions and Tl atom in an atmosphere of inert gases
Phys. Scr. T153, 014037 (2013)

Ca^{17+}	Th
Fe^{23+}	Th
Mo^{39+}	Th
Sn^{47+}	Th
Tm^{66+}	Th
Yb^{67+}	Th
Zn^{27+}	Th

160. L. Özdemir, G. G. Konan, S. Kabakçi
Energies and radiative transition parameters for Mg-like tungsten
Acta Phys. Pol. A 124, 649-657 (2013)

W^{62+}	Th

161. A. Kramida
Critically evaluated energy levels and spectral lines of singly ionized indium (In II)
J. Res. Nat. Inst. Stand. Technol. 118, 52-104 (2013)

In^{+}	E/T

162. C. C. Sang, B. C. Gou, F. Wang
Decay processes of the core-excited states 1s2s2p^2 for Be-like systems
J. Quant. Spectrosc. Radiat. Transfer 116, 17-23 (2013)

Be Z= 8-28 step 2	Th

163. I. L. Glukhov, E. A. Nikitina, V. D. Ovsiannikov
Lifetimes of Rydberg states in ions of the group II elements
Opt. Spectrosc. 115, 9-17 (2013)

Ba^{+}	Th
Be^{+}	Th
Ca^{+}	Th
Cd^{+}	Th
Hg^{+}	Th
Mg^{+}	Th
Sr^{+}	Th
Zn^{+}	Th

164. S. Aggarwal, J. Singh, M. Mohan
Breit-Pauli atomic structure calculations for Fe XI
At. Data Nucl. Data Tables 99, 704-732 (2013)

Fe^{10+}	Th

165. T. Sochi, P. J. Storey
Dielectronic recombination lines of C^{+}
At. Data Nucl. Data Tables 99, 633-650 (2013)

C^{+}	Th

166. S. Hamasha
Energy levels, wavelengths, and transition rates of multipole transitions (E1, E2, M1, M2) in Au^{67+} and Au^{66+} ions
At. Data Nucl. Data Tables 99, 595-632 (2013)

Au$^{66+--67+}$	Th

167. P. Bogdanovich, R. Kisielius
Theoretical energy level spectra and transition data for $4p^64d^2$, $4p^64d4f$, and $4p^54d^3$ configurations of W^{36+}
At. Data Nucl. Data Tables 99, 580-594 (2013)

W^{36+}	Th

168. F. El-Sayed
Energies, wavelengths, and multipole transition probabilities for B-like Fe and Ga ions
At. Data Nucl. Data Tables 99, 545-579 (2013)

Fe^{21+}	Th
Ga^{26+}	Th

169. P. Oliver, A. Hibbert
E1 oscillator strengths and transition rates among levels of Cl I
At. Data Nucl. Data Tables 99, 459-496 (2013)

Cl	Th

170. P. Jönsson, A. Alkauskas, G. Gaigalas
Energies and E1, M1, E2 transition rates for states of the $2s^22p^5$ and $2s2p^6$ configurations in fluorine-like ions between Si VI and W LXVI
At. Data Nucl. Data Tables 99, 431-446 (2013)

F Z= 14-74	Th

171. K. M. Aggarwal, F. P. Keenan
Energy levels, radiative rates, and electron impact excitation rates for transitions in Li-like ions with $12 \leq Z \leq 20$
At. Data Nucl. Data Tables 99, 156-243 (2013)

Li Z= 12-20	Th

172. A. Abou El-Maaref, M. A. M. Uosif, S. H. Allam, Th. M. El-Sherbini
The 4d-4p transitions and soft X-ray laser wavelengths in Si-like ions
Can. J. Phys. 91, 981-993 (2013)

As^{19+}	Th
Ga^{17+}	Th
Ge^{18+}	Th
Ni^{14+}	Th
Zn^{16+}	Th

173. L. Liang, W.-J. Gao, C. Zhou
Energy levels, oscillator strengths, radiative decay rates, and fine structure collision strengths for Kr VII lines
Can. J. Phys. 91, 554-559 (2013)

Kr^{6+}	Th

174. S. Aggarwal, A. K. S. Jha, M. Mohan
Multiconfigurational Dirac-Fock energy levels and radiative rates for Br-like tungsten
Can. J. Phys. 91, 394-400 (2013)

W^{39+}	Th

175. L. Natarajan
Two-Electron one-photon transitions in Li-like ions
Phys. Rev. A 88, 052522 (2013)

Ar^{15+}	Th
Ca^{17+}	Th
Cd^{45+}	Th
Fe^{23+}	Th
Ge^{29+}	Th
Kr^{33+}	Th
Mo^{39+}	Th
Rb^{34+}	Th
Ru^{41+}	Th
Si^{11+}	Th
Sn^{47+}	Th
Sr^{35+}	Th
Ti^{19+}	Th
Xe^{51+}	Th
Y^{36+}	Th
Zn^{27+}	Th
Zr^{37+}	Th

176. A. K. Singh, S. Aggarwal, M. Mohan
Level energies, lifetimes and radiative rates in the 4p^{4}4d configurations of bromine-like ions
Phys. Scr. 88, 035301 (2013)

Br Z= 38-42	Th

177. U. I. Safronova, A. S. Safronova, P. Beiersdorfer
Contribution of the 4f-core-excited states in determination of atomic properties in the promethium isoelectronic sequence
Phys. Rev. A 88, 032512 (2013)

Au^{18+}	E/T
W^{13+}	E/T
Pm Z= 74-100	E/T

178. K. M. Aggarwal, F. P. Keenan
Energy levels and radiative rates for transitions in Ti X
Phys. Scr. 88, 025303 (2013)

Ti^{9+}	Th

179. K. M. Aggarwal, F. P. Keenan, A. Z. Msezane
Energy levels and radiative rates for transitions in Ti VI
Phys. Scr. 88, 025302 (2013)

Ti^{5+}	Th

180. G. P. Gupta, A. Z. Msezane
Excitation energies, oscillator strengths and lifetimes in Mg-like vanadium
Phys. Scr. 88, 025301 (2013)

V^{11+}	Th

181. R. Karpuškienė, P. Bogdanovich, R. Kisielius
Significance of M2 and E3 transitions for 4p^{5}4d^{N+1}- and 4p^{6}4d^{N-1}4f-configuration metastable-level lifetimes
Phys. Rev. A 88, 022519 (2013)

Mo Z= 50-92	Th
Rh Z= 50-92	Th
Sr Z= 50-92	Th

182. J. Grumer, W.-X. Li, D. Bernhardt, J.-G. Li, S. Schippers, T. Brage, P. Jönsson, R. Hutton, Y.-M. Zou
Effect of an external magnetic field on the determination of E1M1 two-photon decay rates in Be-like ions
Phys. Rev. A 88, 022513 (2013)

Be Z= 5-92	Th

183. Y.-J. Cheng, J. Jiang, J. Mitroy
Tune-out wavelengths for the alkaline-earth-metal atoms
Phys. Rev. A 88, 022511 (2013)

Ba	Th
Be	Th
Ca	Th
Mg	Th
Sr	Th
Yb	Th

184. J.-G. Li, J. Grumer, W.-X. Li, M. Andersson, T. Brage, R. Hutton, P. Jönsson, Y. Yang, Y.-M. Zou
Theoretical investigation of magnetic-field-induced $\mathbf{2p^5 3s}$ $\mathbf{^3P_{0,2}}$ – $\mathbf{2p^6}$ $\mathbf{^1S_0}$ transitions in Ne-like ions without nuclear spin
Phys. Rev. A 88, 013416 (2013)

$\mathbf{Mg}^{2+}$	Th
$\mathbf{Si}^{4+}$	Th
$\mathbf{S}^{6+}$	Th
$\mathbf{Ar}^{8+}$	Th
$\mathbf{Ca}^{10+}$	Th
$\mathbf{Ti}^{12+}$	Th
$\mathbf{Cr}^{14+}$	Th
$\mathbf{Fe}^{16+}$	Th
$\mathbf{Ni}^{18+}$	Th
$\mathbf{Zn}^{20+}$	Th
Ne Z= 12-30	Th

185. L. Natarajan, R. Kadrekar
Radiative decay from doubly and singly excited states of He-like nickel
Phys. Rev. A 88, 012501 (2013)

$\mathbf{Ni}^{26+}$	Th

186. P. K. Mondal, N. N. Dutta, G. Dixit, S. Majumder
Effect of screening on spectroscopic properties of Li-like ions in a plasma environment
Phys. Rev. A 87, 062502 (2013)

$\mathbf{C}^{3+}$	Th
$\mathbf{N}^{4+}$	Th
$\mathbf{O}^{5+}$	Th

187. K. M. Aggarwal, F. P. Keenan
Energy levels, radiative rates and electron impact excitation rates for transitions in He-like Fe XXV, Co XXVI, Ni XXVII, Cu XXVIII and Zn XXIX
Phys. Scr. 87, 055302 (2013)

$\mathbf{Fe}^{24+}$	Th

188. M. S. Safronova, U. I. Safronova, S. G. Porsev
Polarizabilities, Stark shifts, and lifetimes of the In atom
Phys. Rev. A 87, 032513 (2013)

In E/T

189. Y. Sun, B. C. Gou, C. Chen
Energies and the radiative and Auger transition rates of 1s2p^4 resonances of B-like ions
Phys. Rev. A 87, 032509 (2013)

B Z= 6-14 Th

190. U. I. Safronova, A. S. Safronova, P. Beiersdorfer
Relativistic many-body calculations of excitation energies, oscillator strengths, transition rates, and lifetimes in samariumlike ions
Phys. Rev. A 87, 032508 (2013)

Sm Z= 74-100 Th

191. U. I. Safronova, M. S. Safronova
Relativistic many-body calculation of energies, lifetimes, polarizabilities, and hyperpolarizabilities in Li-like Be$^+$
Phys. Rev. A 87, 032502 (2013)

Be$^+$ Th

192. B. K. Sahoo, B. Arora
Magic wavelengths for trapping the alkali-metal atoms with circularly polarized light
Phys. Rev. A 87, 023402 (2013)

K Th
Li Th
Na Th

193. F. B. Rosmej, B. Deschaud, K. Bennadji, P. Indelicato, J. P. Marques
Fine-Structure electric-dipole matrix elements of He-like ions for x-ray line-shape calculations
Phys. Rev. A 87, 022515 (2013)

Al^{11+} Th

194. Y. Sun, F. Chen, C. Chen, B. C. Gou
Radiative and Auger transitions of core-excited states for the boron isoelectronic sequence
Eur. Phys. J. D 67, 88 (2013)

Mg^{7+} Th
Ne^{5+} Th
O^{3+} Th
Si^{9+} Th

195. Z.-D. Mu, Q.-Y. Wei
Theoretical study of level structure and transitions of configurations 3d^{9}4s^2, 3d^{9}4s4p, 3d^{9}4p^2 for Nb XIII
Acta Phys. Sin. 62, 103101 (2013)

Nb^{12+} Th

196. M. Ortiz, C. Aragón, J. A. Aguilera, J. Rodríguez-García, R. Mayo-García
Experimental transition probabilities for spectral lines of Re II
J. Phys. B 46, 185702 (2013)

Re$^+$ Exp

197. L. C. Gao, D. H. Zhang, L. Y. Xie, J. G. Wang, Y. L. Shi, C. Z. Dong
Theoretical study of the photoionization process of Ne-like Ar, Fe, Kr and Xe ions
J. Phys. B 46, 175402 (2013)

Ar^{8+}	Th
Fe^{16+}	Th
Kr^{26+}	Th
Xe^{44+}	Th

198. W.-J. Du, M. Andersson, K. Yao, T. Brage, R. Hutton, Y.-M. Zou
Lifetimes of the hyperfine levels of 3d^{9}4s ^{3}D$_3$ in high-Z Ni-like ions
J. Phys. B 46, 145001 (2013)

Hf^{44+}	Th
W^{46+}	Th
Re^{47+}	Th
Os^{48+}	Th
Ir^{49+}	Th
Pt^{50+}	Th
Au^{51+}	Th
Ni Z= 72-79	Th

199. O. Zatsarinny, K. Bartschat
The B-spline R-matrix method for atomic processes: Application to atomic structure, electron collisions and photoionization
J. Phys. B 46, 112001 (2013)

S	Th
Xe	Th

200. S. Verdebout, P. Rynkun, P. Jönsson, G. Gaigalas, C. Froese Fischer, M. Godefroid
A partitioned correlation function interaction approach for describing electron correlation in atoms
J. Phys. B 46, 085003 (2013)

Be	Th
Li	Th

201. M. Guerra, P. Amaro, C. I. Szabo, A. Gumberidze, P. Indelicato, J. P. Santos
Analysis of the charge state distribution in an ECRIS Ar plasma using high-resolution x-ray spectra
J. Phys. B 46, 065701 (2013)

Ar$^{14+--16+}$	Th
Ar^{16+}	Th

202. C. P. Ballance, S. D. Loch, M. S. Pindzola, D. C. Griffin
Electron-Impact excitation and ionization of W^{3+} for the determination of tungsten influx in a fusion plasma
J. Phys. B 46, 055202 (2013)

W^{3+}	Th

203. W. S. Abdelaziz
Energy levels, transition probabilities, collision strength, and reduced population calculations for high gain predictions in neon-like krypton
J. Russ. Laser Res. 34, 488-495 (2013)

Kr^{26+}	Th

204. L.-Y. Jiang, Q. Wang, X. Shang, Y.-S. Tian, J.-R. Yin, Z.-K. Jiang, S.-H. Pei, Z.-W. Dai
Experimental radiative lifetimes, branching fractions, and oscillator strengths of odd-parity levels in Mo I
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Mo	Exp

205. N. G. Shchukina, I. E. Vasil'eva
Oscillator strengths for selected Fe II lines in the range $\lambda\lambda$ 300–400 nm
Kinemat. Phys. Celest. Bodies 29, 53-65 (2013)

Fe^{+}	E/T

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Intercombination transitions of the carbon-like isoelectronic sequence
Chin. Phys. B 22, 073202 (2013)

C Z= 7-92	Th

207. S. Aggarwal, J. Singh, M. Mohan
New atomic data for Kr XXXV useful in fusion plasma
Chin. Phys. B 22, 033201 (2013)

Kr^{34+}	Th

208. S. N. Nahar
Fine structure transitions in Fe XIV
New Astron. 21, 8-16 (2013)

Fe^{14+}	Th

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Effect of strongly coupled plasma on the magnetic dipolar and quadrupolar transitions of two-electron ions
Phys. Plasmas 20, 042703 (2013)

C^{4+}	Th
Mg^{10+}	Th
Ne^{8+}	Th
O^{6+}	Th
S^{14+}	Th
Si^{12+}	Th

210. S. Civiš, M. Ferus, P. Kubelík, V. E. Chernov, E. M. Zanozina
Li I spectra in the 4.65–8.33 micron range: High-L states and oscillator strengths
Astron. Astrophys. 545, p.A61 (2012)

Li	Th

211. S. Bernitt, G. V. Brown, J. K. Rudolph, R. Steinbrügge, A. Graf, M. Leutenegger, S. W. Epp, S. Eberle, K. Kubiček, V. Mäckel, M. C. Simon, E. Träbert, E. W. Magee, C. Beilmann, N. Hell, S. Schippers, A. Müller, S. M. Kahn, A. Surzhykov, Z. Harman, C. H. Keitel, J. Clementson, F. S. Porter, W. Schlotter, J. J. Turner, J. Ullrich, P. Beiersdorfer, J. R. Crespo López-Urrutia
An unexpectedly low oscillator strength as the origin of the Fe VII emission problem
Nature 492, 225-228 (2012)

Fe^{16+}	Exp

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Electron impact excitation for Ar VI
J. Phys.: Conf. Ser. 397, 012055 (2012)

Ar^{5+}	Th

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Constructing theoretical M-shell spectra for Mg-like Au through Cl-like Au ions in gold plasma diagnostics
Phys. Scr. 86, 065302 (2012)

$Au^{62+--67+}$	Th

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Relativistic multiconfiguration calculations of the $2s^22p\ ^2P_{3/2}$ level lifetime along the boron isoelectronic sequence
Eur. Phys. J. D 66, 324 (2012)

Au^{74+}	Th
Bi^{78+}	Th
Gd^{59+}	Th
B Z= 14-36	Th
U^{87+}	Th
Xe^{49+}	Th

215. X.-Y. Ma, C.-Z. Dong, Z.-W. Wu, J. Jiang, L.-Y. Xie
Theoretical study on electron-impact excitation processes and the relevant polarization of radiation of $2s_{1/2}$-$2p_{3/2}$ in W^{65+} through W^{71+}
Acta Phys. Sin. 61, 213401 (2012)

$W^{65+--71+}$	Th

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M1 and E2 decay-dependent lifetime of the lowest $^1S_0$ level in C-like ions up to Ne^{4+} measured at a heavy-ion storage ring
New J. Phys. 14, 023061 (2012)

C Z= 7-10	Exp

217. E. A. Den Hartog, J. E. Lawler, J. S. Sobeck, C. Sneden, J. J. Cowan
Improved log(gf) values of selected lines in Mn I and Mn II for abundance determinations in FGK dwarfs and giants
Astrophys. J., Suppl. Ser. 194, 35 (2011)

Mn^{0+--+}	Exp

218. K. M. Aggarwal, T. Kato, F. P. Keenan, I. Murakami
Energy levels, radiative rates and electron impact excitation rates for transitions in He-like Li II, Be III, B IV and C V
Phys. Scr. 83, 015302 (2011)

e + Li^{+}	1E4−1E6 K	Th
e + Be^{2+}	1E4−1E6 K	Th
e + B^{3+}	1E4−1E6 K	Th
e + C^{4+}	1E4−1E6 K	Th
e + Li^{+}	1E4−1E6 K	Th
e + Be^{2+}	1E4−1E6 K	Th
e + B^{3+}	1E4−1E6 K	Th
e + C^{4+}	1E4−1E6 K	Th

219. X. Wang, G. Jiang, L. H. Hao, L. Zhang, B. Deng
Systematic multi-configuration Dirac-Fock calculations of the K alpha and K beta X-ray spectra of silicon ions
Eur. Phys. J. D 65, 505 (2011)

H + Si^{4+}	Th
H + Si^{5+}	Th
H + Si^{6+}	Th
H + Si^{7+}	Th
H + Si^{8+}	Th
H + Si^{9+}	Th
H + Si^{10+}	Th
H + Si^{11+}	Th
H + Si^{12+}	Th
H + Si^{4+}	Th
H + Si^{5+}	Th
H + Si^{6+}	Th
H + Si^{7+}	Th
H + Si^{8+}	Th
H + Si^{9+}	Th
H + Si^{10+}	Th
H + Si^{11+}	Th
H + Si^{12+}	Th

220. Xiao-Bin Ding, Fumihiro Koike, Izumi Murakami, Daiji Kato, Hiroyuki A. Sakaue, Chen-Zhong Dong, Nobuyuki Nakamura, Akihiro Komatsu, Junpei Sakoda
Ab initio multi-configuration Dirac-Fock calculation of M1 visible transitions among the ground state multiplets of the W26+ ion
J. Phys. B 44, 145004 (2011)

e + W^{26+}	Th
e + W^{26+}	Th

221. Quinet, Pascal
Dirac-Fock calculations of forbidden transitions within the 3p(k) and 3d(k) ground configurations of highly charged tungsten ions (W47+-W61+)
J. Phys. B 44, 195007 (2011)

H^{-} + W^{47+}	Th
H^{-} + W^{48+}	Th
H^{-} + W^{49+}	Th
H^{-} + W^{50+}	Th
H^{-} + W^{51+}	Th
H^{-} + W^{52+}	Th
H^{-} + W^{53+}	Th
H^{-} + W^{54+}	Th
H^{-} + W^{55+}	Th
H^{-} + W^{56+}	Th
H^{-} + W^{57+}	Th
H^{-} + W^{58+}	Th
H^{-} + W^{59+}	Th
H^{-} + W^{60+}	Th
H^{-} + W^{61+}	Th
H^{-} + W^{47+}	Th
H^{-} + W^{48+}	Th
H^{-} + W^{49+}	Th
H^{-} + W^{50+}	Th
H^{-} + W^{51+}	Th
H^{-} + W^{52+}	Th
H^{-} + W^{53+}	Th
H^{-} + W^{54+}	Th
H^{-} + W^{55+}	Th
H^{-} + W^{56+}	Th
H^{-} + W^{57+}	Th
H^{-} + W^{58+}	Th

H^- + W^{59+} Th
H^- + W^{60+} Th
H^- + W^{61+} Th

222. Sergiy Bubin, Monika Stanke, Ludwik Adamowicz
Complete pure vibrational spectrum of HD calculated without the Born-Oppenheimer approximation and including relativistic corrections
Phys. Rev. A 83, 042520 (2011)

e + HD Th

223. Feng Hu, Jiamin Yang, Chuanke Wang, Longfei Jing, Shubo Chen, Gang Jiang, Hao Liu, Lianghuan Hao
Multiconfiguration Dirac-Fock calculations on multi-valence-electron systems: Benchmarks on Ga-like ions
Phys. Rev. A 84, 042506 (2011)

e + Ga Z= 33-41 Th
e + e Th

224. Feng Hu, Chuangke Wang, Jiamin Yang, Gang Jiang, Lianghuan Hao
Multiconfiguration Dirac-Fock calculations of transition probabilities of some tungsten ions
Phys. Scr. 84, 015302 (2011)

e + W^{71+} Th
e + W^{72+} Th
e + W^{73+} Th
e + W^{37+} Th
e + W^{71+} Th
e + W^{72+} Th
e + W^{73+} Th
e + W^{37+} Th

225. Y. Gning, M. Sow, A. Traoré, M. Dieng, B. Diakhate, M. Biaye, A. Wagué
Calculations of Resonances Parameters for the ((2s^2) $^1S^e$, (2s2p) $^{1,3}P^\circ$) and ((3s^2) $^1S^e$, (3s3p) $^{1,3}P^\circ$) Doubly Excited States of Helium-like Ions with Z≤10 Using a Complex Rotation Method Implemented in Scilab
Radiat. Phys. Chem. 106, 1-6 (2015)

He Z= 2-10 Th

226. H. L. Zhang, C. J. Fontes
Relativistic Distorted-Wave Collision Strengths and Oscillator Strengths for the 185 $\Delta n = 0$ Transitions with n = 2 in the 67 C-like Ions with 26≤Z≤92
At. Data Nucl. Data Tables 101, 41-142 (2015)

C Z= 26-92 Th

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Electron-Correlation Effects on the 3C to 3D Line-Intensity Ratio in the Ne-like Ions Ar^{8+} to Kr^{26+}
Phys. Rev. A 91, 012502 (2015)

Ar^{8+} E/T
Ne Z= 18-36 E/T

228. P. Quinet
Atomic Structure, Radiative Lifetime and Oscillator Strength Calculations in Doubly Ionized Molybdenum (Mo III)
Phys. Scr. 90, 015404 (2015)

Mo^{2+} Th

229. G.-J. Bian, F. He, G. Jiang, Q.-P. Fan, F. Hu
Influence of Electron Correlation on Transition Energy of Gold Ions
Phys. Scr. 90, 015403 (2015)

Au$^{47+--50+}$ Th

230. J. Dembczyński, M. Elantkowska, J. Ruczkowski, I. K. Öztürk, A. Er, F. Güzelçimen, Gö. Başar, S. Kröger
Parametric Study of the Fine and Hyperfine Structure for the Even Parity Configurations of Atomic Niobium
J. Phys. B 48, 015006 (2015)

Nb Th

231. I. K. Öztürk, Gö. Başar, A. Er, F. Güzelçimen, Gü. Başar, S. Kröger
New Energy Levels of Atomic Niobium by Laser Induced Fluorescence Spectroscopy in the Near Infrared
J. Phys. B 48, 015005 (2015)

Nb Exp

232. A. Abou El-Maaref, S. Schippers, A. Müller
Ab-Initio Calculations of Level Energies, Oscillator Strengths and Radiative Rates for E1 Transitions in Beryllium-like Iron
Atoms 3, 2-52 (2015)

Fe^{22+} Th

233. S. Kar, M. Z. M. Kamali, K. Ratnavelu
Dynamic Dipole Polarizability of Li^{+} Embedded in Plasmas
AIP Conf. Proc. 1588, 87-93 (2014)

Li^{+} Th

234. K. Sowmya, K. N. Nagendra, M. Sampoorna, J. O. Stenflo
Polarized Light Scattering with the Paschen-Back Effect, Level-Crossing of Fine Structure States, and Partial Frequency Redistribution
Astrophys. J. 793, 71 (2014)

Li Th

235. P. Beiersdorfer, E. Träbert, J. K. Lepson, N. S. Brickhouse, L. Golub
High-Resolution Laboratory Measurements of Coronal Lines in the 198–218 Å Region
Astrophys. J. 788, 25 (2014)

Ar$^{11+--12+}$	Exp
Ar$^{11+--16+}$	Exp
F^{4+}	Exp
F^{4+--8+}	Exp
Fe$^{6+--13+}$	Exp
Fe$^{16+--17+}$	Exp
Fe$^{6+--17+}$	Exp
N^{4+}	Exp
Ne^{3+}	Exp
Ne^{3+--8+}	Exp
Ni^{10+}	Exp
Ni$^{13+--16+}$	Exp
Ni$^{10+--17+}$	Exp

$\mathbf{O}^{3+--4+}$	Exp
$\mathbf{O}^{3+--6+}$	Exp
$\mathbf{S}^{7+}$	Exp
$\mathbf{S}^{9+--11+}$	Exp
$\mathbf{S}^{7+--14+}$	Exp

236. S. S. Tayal, O. Zatsarinny
Electron Impact Excitation Collision Strengths for Extreme Ultraviolet Lines of Fe VII
Astrophys. J. 788, 24 (2014)

$\mathbf{Fe}^{6+}$	Th

237. A. M. Sossah, S. S. Tayal
Effective Collision Strengths for Fine-Structure Transitions in Si VII
Astrophys. J. 787, 2 (2014)

$\mathbf{Si}^{6+}$	Th

238. A. M. Frolov, M. B. Ruiz, D. M. Wardlaw
Bound State Spectra and Properties of the Doublet States in Three-Electron Atomic Systems
Chem. Phys. Lett. 608, 191-200 (2014)

$\mathbf{F}^{6+}$	Th
Li Z= 3-9	Th
Li Z= 3-7	Th

239. A. M. Frolov, M. B. Ruiz
Bound State Spectrum of the Triplet States in the Be Atom
Chem. Phys. Lett. 595-596, 197-202 (2014)

Be	Th

240. G. Del Zanna, P. J. Storey, H. E. Mason
Atomic Data for Astrophysics: Ni XV
Astron. Astrophys. 567, p.A18 (2014)

$\mathbf{Ni}^{14+}$	E/T

241. H. G. Wei, J. R. Shi, F. L. Wang, J. Y. Zhong, G. Y. Liang, G. Zhao
K-Shell Energy Levels and Radiative Rates for Transitions in Si IX
Astron. Astrophys. 566, p.A105 (2014)

$\mathbf{Si}^{8+}$	Th

242. G. Del Zanna, P. J. Storey, N. R. Badnell
Atomic Data for Astrophysics: Ni XI
Astron. Astrophys. 566, p.A123 (2014)

$\mathbf{Ni}^{10+}$	E/T

243. G. Del Zanna, P. J. Storey, N. R. Badnell, H. E. Mason
Atomic Data for Astrophysics: Fe IX
Astron. Astrophys. 565, p.A77 (2014)

$\mathbf{Fe}^{8+}$	E/T

244. J. Ekman, P. Jönsson, S. Gustafsson, H. Hartman, G. Gaigalas, M. R. Godefroid, C. Froese Fischer
Calculations with Spectroscopic Accuracy: Energies, Transition Rates, and Landé $\mathbf{g}_J$-Factors in the Carbon Isoelectronic Sequence from Ar XIII to Zn XXV
Astron. Astrophys. 564, p.A24 (2014)

C Z= 18-30	Th

245. D. K. Nandy, B. K. Sahoo
Spectral Properties of a Few F-like Ions
Astron. Astrophys. 563, p.A25 (2014)

Ti^{13+}	Th
V^{14+}	Th
Cr^{15+}	Th
Mn^{16+}	Th
Fe^{17+}	Th
Co^{18+}	Th
Ni^{19+}	Th
Cu^{20+}	Th
Zn^{9+}	Th
Mo^{33+}	Th
F Z= 22-30	Th

246. R. Kendurkar, B. D. Shrivastava
Origin of the Satellites Lα_3, Lα_4 and Lα_5 in the Elements from $_{40}$Zr to $_{50}$Sn
J. Phys.: Conf. Ser. 534, 012037 (2014)

Zr-Sn^{2+}	Th

247. M. T. Murphy, J. C. Berengut
Laboratory Atomic Transition Data for Precise Optical Quasar Absorption Spectroscopy
Mon. Not. R. Astron. Soc. 438, 388-411 (2014)

Na	E/T
Mg^{+}	E/T
Al^{2+}	E/T
Ca^{+}	E/T
Mn^{+}	E/T
Zn^{+}	E/T
Al^{+}	E/T
Cr^{+}	E/T
Fe	E/T
Fe^{+}	E/T
Mg	E/T
Ni^{+}	E/T
Si^{+}	E/T
Si^{3+}	E/T
Ti^{+}	E/T

248. E. Träbert, P. Beiersdorfer, N. S. Brickhouse, L. Golub
High-Resolution Laboratory Spectra of the λ193 Channel of the Atmospheric Imaging Assembly Instrument on Board Solar Dynamics Observatory
Astrophys. J., Suppl. Ser. 215, 6 (2014)

Ar$^{10+--13+}$	Exp
F^{4+--7+}	Exp
Fe$^{6+--16+}$	Exp
Fe^{20+}	Exp
Ne^{5+--8+}	Exp
Ni$^{9+--17+}$	Exp
O^{3+--7+}	Exp
S$^{7+--11+}$	Exp

249. F. Güzelçimen, B. Yapıcı, G. Demir, A. Er, I. K. Öztürk, Gö. Başar, S. Kröger, M. Tamanis, R. Ferber, D. Docenko, Gü. Başar
Hyperfine Structure Constants of Energetically High-Lying Levels of Odd Parity of Atomic Vanadium
Astrophys. J., Suppl. Ser. 214, 9 (2014)

V	Exp

250. C. J. Sansonetti, G. Nave
Extended Analysis of the Spectrum of Singly Ionized Chromium (Cr II)
Astrophys. J., Suppl. Ser. 213, 28 (2014)

Cr^{+}	Exp

251. A. Kramida
Energy Levels and Spectral Lines of Quadruply Ionized Iron (Fe V)
Astrophys. J., Suppl. Ser. 212, 11 (2014)

Fe^{4+}	E/T

252. Y. P. Liu, C. Gao, J. L. Zeng, J. M. Yuan, J. R. Shi
Atomic Data of Cu I for the Investigation of Element Abundance
Astrophys. J., Suppl. Ser. 211, 30 (2014)

Cu	Th

253. E. Träbert, P. Beiersdorfer, N. S. Brickhouse, L. Golub
High-Resolution Laboratory Spectra on the λ131 Channel of the AIA Instrument on Board the Solar Dynamics Observatory
Astrophys. J., Suppl. Ser. 211, 14 (2014)

Ca$^{9+--17+}$	Exp
Ca$^{12+--13+}$	Exp
F^{5+--6+}	Exp
Fe^{6+--7+}	Exp
Fe$^{19+--20+}$	Exp
Fe^{22+}	Exp
Ne^{4+--6+}	Exp
Ni^{9+}	Exp
Ni$^{9+--26+}$	Exp
O^{4+--6+}	Exp
Si^{4+--6+}	Exp

254. S. L. Redman, G. Nave, C. J. Sansonetti
The Spectrum of Thorium from 250 nm to 5500 nm: Ritz Wavelengths and Optimized Energy Levels
Astrophys. J., Suppl. Ser. 211, 4 (2014)

Ne^{0+--+}	Exp
Th^{0+--2+}	Exp

255. Z. Uddin, L. Windholz
New Levels of Ta II with Energies Higher Than 72,000 cm^{-1}
J. Quant. Spectrosc. Radiat. Transfer 149, 204-210 (2014)

Ta^{+}	Exp

256. J. Ruczkowski, M. Elantkowska, J. Dembczyński
Semi-Empirical Calculations of Oscillator Strengths and Hyperfine Constants for Ti II
J. Quant. Spectrosc. Radiat. Transfer 149, 168-183 (2014)

Ti^{+} Th

257. F. Hu, M.-F. Mei, C. Han, B.-P. Han, G. Jiang, J.-M. Yang
Accurate Multiconfiguration Dirac-Hartree-Fock Calculations of Transition Probabilities for Magnesium-like Ions
J. Quant. Spectrosc. Radiat. Transfer 149, 158-167 (2014)

Mg Z= 19-92 Th

258. J. C. Aguiar, H. O. Di Rocco
An Examination of the Consistency of the Published Levels of the p^2, p^3 and p^4 Isoelectronic Sequences Using jj-Relativistic Expressions
J. Quant. Spectrosc. Radiat. Transfer 149, 1-7 (2014)

Br^{27+}	E/T
Ni^{14+}	E/T
Ni^{22+}	E/T
Rb^{23+}	E/T
Sc^{15+}	E/T
Se^{2+}	E/T
Sr^{24+}	E/T
Te^{2+}	E/T
V^{17+}	E/T

259. M. Raineri, E. E. Farías, J. O. Souza, E. Amorim, M. Gallardo, J. Reyna Almandos
Revised and Extended Analysis of the Zn-like Kr Ion
J. Quant. Spectrosc. Radiat. Transfer 148, 90-98 (2014)

Kr^{6+} E/T

260. G. G. Konan, L. Ozdemir, G. Ürer
Energy Levels and Strong Electric Dipole Transitions in Magnesium-like Gold
J. Quant. Spectrosc. Radiat. Transfer 145, 110-120 (2014)

Au^{67+} Th

261. C. Chen, Y. Sun, B. C. Gou
Energies, Radiative and Auger Transitions of the Core-Excited States for the Boron Atom
J. Quant. Spectrosc. Radiat. Transfer 145, 1-8 (2014)

B E/T

262. L. Y. Xie, X. Y. Ma, C. Z. Dong, Z. W. Wu, Y. L. Shi, J. Jiang
Polarization of the nf → 3d (n = 4, 5, 6) X-rays from Tungsten Ions Following Electron-Impact Excitation and Dielectronic Recombination Processes
J. Quant. Spectrosc. Radiat. Transfer 141, 31-39 (2014)

$W^{42+--46+}$ Th

263. J. S. Sims, S. A. Hagstrom
Hylleraas-Configuration-Interaction Nonrelativistic Energies for the ^{1}S Ground States of the Beryllium Isoelectronic Sequence
J. Chem. Phys. 140, 224312 (2014)

Be Z= 4-110 Th

264. S. Bubin, L. Adamowicz
Prediction of ^{1}P Rydberg Energy Levels of Beryllium Based on Calculations with Explicitly Correlated Gaussians
J. Chem. Phys. 140, 024301 (2014)

Be	Th

265. L. Liang, X.-Y. Liu, C. Zhou
Autoionization Resonances in the Partial Photoionization Cross Sections of Al V
J. Quant. Spectrosc. Radiat. Transfer 137, 51-56 (2014)

Al^{4+}	Th

266. A. Alkauskas, P. Rynkun, G. Gaigalas, A. Kynienė, R. Kisielius, S. Kučas, Š. Masys, G. Merkelis, V. Jonauskas
Theoretical Investigation of Spectroscopic Properties of W^{25+}
J. Quant. Spectrosc. Radiat. Transfer 136, 108-118 (2014)

W^{25+}	Th

267. C. Jiang, F. Hu, Y. Zang, G. Jiang
Properties of the K$_\alpha$ **X-ray Transitions in Highly Ionized Chlorine**
Acta Phys. Pol. A 126-3, 694-699 (2014)

Cl$^{7+--15+}$	Th

268. A. V. Volotka, D. A. Glazov, V. M. Shabaev, I. I. Tupitsyn, G. Plunien
Many-Electron QED Corrections to the g Factor of Lithiumlike Ions
Phys. Rev. Lett. 112, 253004 (2014)

Pb^{79+}	Th
U^{89+}	Th
Si^{11+}	Th
Ca^{17+}	Th

269. J.-Q. Li, Z. Zhao, X.-M. Zhang
MCDHF Calculation of Electron Affinities of Group I and Group IB Atomic Anions
Europhys. Lett. 107, 33001 (2014)

Ag	Th
Ag^{-}	Th
Au	Th
Au^{-}	Th
Cs	Th
Cs^{-}	Th
Cu	Th
Cu^{-}	Th
Fr	Th
Fr^{-}	Th
H	Th
H^{-}	Th
K	Th
K^{-}	Th
Li	Th
Li^{-}	Th
Na	Th
Na^{-}	Th
Rb	Th
Rb^{-}	Th

270. K. M. Aggarwal, F. P. Keenan
Energy Levels, Radiative Rates, and Lifetimes for Transitions in W LVIII
At. Data Nucl. Data Tables 100, 1603-1767 (2014)

W^{57+}	Th

271. P. Bogdanovich, R. Kisielius
Energy Level Properties of $4p^64d^3$, $4p^64d^24f$, and $4p^54d^4$ Configurations of the W^{35+} Ion
At. Data Nucl. Data Tables 100, 1593-1602 (2014)

W^{35+}	E/T

272. K. M. Aggarwal, F. P. Keenan
Energy Levels, Radiative Rates, and Lifetimes for Transitions in W XL
At. Data Nucl. Data Tables 100, 1399-1518 (2014)

W^{39+}	Th

273. M. Xu, G. Jiang, B.-L. Deng, G.-J. Bian
Wavelengths, Transition Probabilities, and Oscillator Strengths for M-Shell Transitions in Co-, Ni-, Cu-, Zn-, Ga-, Ge-, and Se-like Au Ions
At. Data Nucl. Data Tables 100, 1357-1398 (2014)

$Au^{45+--52+}$	Th

274. B.-L. Deng, G. Jiang, C. Zhang
Relativistic Configuration-Interaction Calculations of Electric Dipole $n = 2 - n = 3$ Transitions for Medium-Charge Li-like Ions
At. Data Nucl. Data Tables 100, 1337-1355 (2014)

Li Z= 7-30	Th

275. C. J. Fontes, H. L. Zhang
Relativistic Distorted-Wave Collision Strengths for the 49 $\Delta n = 0$ Optically Allowed Transitions with $n = 2$ in the 67 N-like Ions with $26 \leq Z \leq 92$
At. Data Nucl. Data Tables 100, 1292-1321 (2014)

N Z= 26-92	Th

276. F. El-Sayed
Energy Levels, Lifetimes, and Transition Probabilities for Mn XII and Ge XIX
At. Data Nucl. Data Tables 100, 1250-1276 (2014)

Ge^{18+}	Th
Mn^{11+}	Th

277. C. Nazé, S. Verdebout, P. Rynkun, G. Gaigalas, M. Godefroid, P. Jönsson
Isotope Shifts in Beryllium-, Boron-, Carbon-, and Nitrogen-like Ions from Relativistic Configuration Interaction Calculations
At. Data Nucl. Data Tables 100, 1197-1249 (2014)

Be Z= 5-74	E/T
Kr^{31+}	E/T
Mo^{37+}	E/T
Mo^{35+}	E/T
N Z= 7-36	E/T
C Z= 7-28	E/T
B Z= 8-30	E/T
W^{67+}	E/T

278. S. Verdebout, C. Nazé, P. Jönsson, P. Rynkun, M. Godefroid, G. Gaigalas
Hyperfine Structures and Landé g_J-Factors for $n = 2$ States in Beryllium-, Boron-, Carbon-, and Nitrogen-like Ions from Relativistic Configuration Interaction Calculations
At. Data Nucl. Data Tables 100, 1111-1155 (2014)

Be Z= 5-74	Th
Kr^{31+}	Th
Mo^{37+}	Th
Mo^{35+}	Th
N Z= 7-36	Th
C Z= 7-28	Th
B Z= 8-30	Th
W^{67+}	Th

279. C. J. Fontes, H. L. Zhang
Relativistic Distorted-Wave Collision Strengths for the 49 $\Delta n = 0$ Optically Allowed Transitions with $n = 2$ in the 67 B-like Ions with $26 \leq Z \leq 92$
At. Data Nucl. Data Tables 100, 802-832 (2014)

B Z= 26-92	Th

280. A. Abou El-Maaref, M. Ahmad, S. H. Allam
Fine-Structure Calculations of Energy Levels, Oscillator Strengths, and Transition Probabilities for Sulfur-like Iron, Fe XI
At. Data Nucl. Data Tables 100, 781-791 (2014)

Fe^{10+}	Th

281. P. Amaro, C. I. Szabo, S. Schlesser, A. Gumberidze, E. G. Kessler Jr., A. Henins, E. O. Le Bigot, M. Trassinelli, J. M. Isac, P. Travers, M. Guerra, J. P. Santos, P. Indelicato
A Vacuum Double-Crystal Spectrometer for Reference-Free X-ray Spectroscopy of Highly Charged Ions
Radiat. Phys. Chem. 98, 132-149 (2014)

Ar$^{14+--16+}$	Exp

282. H.-W. Hu, Z.-B. Chen, F.-L. Li, C.-Z. Dong, L.-Y. Xie, W.-C. Chen
Relativistic Energy Levels for Ions in Plasma
Can. J. Phys. 92, 1609-1613 (2014)

Al$^{11+--12+}$	Th
Ar$^{16+--17+}$	Th
C^{4+}	Th

283. S. Aggarwal, N. Verma, A. K. Singh, N. Singh, R. Sharma, M. Mohan
Multiconfigurational Dirac-Fock Energy Levels and Radiative Rates for Ni XXI
Can. J. Phys. 92, 1285-1296 (2014)

Ni^{20+}	Th

284. K. M. Aggarwal, F. P. Keenan
Radiative Rates for E1, E2, M1, and M2 Transitions Among the $3s^23p^5$, $3s3p^6$, and $3s^23p^43d$ Configurations of Cl-like W LVIII
Can. J. Phys. 92, 1166-1177 (2014)

W^{57+}	Th

285. L. Liang, X.-Y. Liu, C. Zhou
Photoionization of Al X from Ground State Using the Relativistic R-Matrix Close-Coupling Method
Can. J. Phys. 92, 241-245 (2014)

Al^{9+}	Th

286. M. Mohan, S. Aggarwal, N. Singh
Multiconfigurational Dirac-Fock Atomic Structure Calculations for Cl-like Tungsten
Can. J. Phys. 92, 177-183 (2014)

W^{57+}	Th

287. N. A. Zubova, Y. S. Kozhedub, V. M. Shabaev, I. I. Tupitsyn, A. V. Volotka, G. Plunien, C. Brandau, Th. Stöhlker
Relativistic Calculations of the Isotope Shifts in Highly Charged Li-like Ions
Phys. Rev. A 90, 062512 (2014)

Ar^{15+}	Th
Be^{+}	Th
Bi^{80+}	Th
C^{3+}	Th
Fe^{23+}	Th
Fr^{84+}	Th
Hg^{77+}	Th
Kr^{33+}	Th
Mo^{39+}	Th
Nd^{57+}	Th
Ne^{7+}	Th
O^{5+}	Th
Pa^{88+}	Th
Si^{11+}	Th
Th^{87+}	Th
Ti^{19+}	Th
U^{89+}	Th
Xe^{51+}	Th
Yb^{67+}	Th
Zn^{27+}	Th

288. C. T. Chantler, T. V. B. Nguyen, J. A. Lowe, I. P. Grant
Convergence of the Breit Interaction in Self-Consistent and Configuration-Interaction Approaches
Phys. Rev. A 90, 062504 (2014)

Ar	Th
Ca	Th
Kr	Th
Mg	Th
Ne	Th
Sr	Th
Xe	Th

289. Z. Fei, W. Li, J. Grumer, Z. Shi, R. Zhao, T. Brage, S. Huldt, K. Yao, R. Hutton, Y. Zou
Forbidden-Line Spectroscopy of the Ground-State Configuration of Cd-like W
Phys. Rev. A 90, 052517 (2014)

W^{26+}	E/T

290. A. Kozlov, V. A. Dzuba, V. V. Flambaum
Optical Atomic Clocks with Suppressed Blackbody-Radiation Shift
Phys. Rev. A 90, 042505 (2014)

Er	Th
Er^{2+}	Th
Hf	Th
Hf^{12+}	Th
Hg^{22+}	Th
I^{+}	Th
Lu^{+}	Th
Os^{13+}	Th
Pa$^{2+\text{--}3+}$	Th

Pb^{24+}	Th
Po	Th
Po^{26+}	Th
Pt^{20+}	Th
Ra^{30+}	Th
Sn	Th
Te	Th
Th	Th
Th^{32+}	Th
Tm^{3+}	Th
U^{33+}	Th
W^{14+}	Th
Xe^{2+}	Th
Zr	Th
Zr^{2+}	Th

291. J.-G. Li, T. Brage, P. Jönsson, Y. Yang
Magnetic-Field-Dependent Angular Distributions and Linear Polarizations of Emissions from the 2p^{5}3s ^{3}P$^\circ_2$ State in Ne-like Ions
Phys. Rev. A 90, 035404 (2014)

Mg^{2+}	Th

292. K. Kubiček, P. H. Mokler, V. Mäckel, J. Ullrich, J. R. Crespo López-Urrutia
Transition Energy Measurements in Hydrogenlike and Heliumlike Ions Strongly Supporting Bound-State QED Calculations
Phys. Rev. A 90, 032508 (2014)

Ar$^{16+\text{--}17+}$	Exp
Fe$^{24+\text{--}25+}$	Exp
S$^{14+\text{--}15+}$	Exp

293. S. Hasegawa, S. Obara, F. Yoshida, Y. Azuma, F. Koike, T. Nagata
K-Shell Photoionization Spectra of Atomic Beryllium Between 1s2s^2 and 1s(2s2p ^{3}P)4s
Phys. Rev. A 90, 032503 (2014)

Be	Exp

294. V. A. Yerokhin, A. Surzhykov, S. Fritzsche
Relativistic Configuration-Interaction Calculation of Kα Transition Energies in Berylliumlike Iron
Phys. Rev. A 90, 022509 (2014)

Fe^{22+}	Th

295. D. Bernhardt, A. Becker, M. Grieser, M. Hahn, C. Krantz, M. Lestinsky, O. Novotný, R. Repnow, D. W. Savin, K. Spruck, A. Wolf, A. Müller, S. Schippers
Absolute Rate Coefficients for Photorecombination and Electron-Impact Ionization of Magnesiumlike Iron Ions from Measurements at a Heavy-Ion Storage Ring
Phys. Rev. A 90, 012702 (2014)

Fe^{13+}	E/T
Fe^{14+}	E/T

296. U. I. Safronova, A. S. Safronova, P. Beiersdorfer
Multipole Transitions to Determine Lifetimes and Polarizabilities in Mg-like Ions from Si^{2+} to Fm^{88+}
Phys. Rev. A 90, 012519 (2014)

Mg Z= 13-100	Th

297. A. Müller, A. Borovik Jr., K. Huber, S. Schippers, D. V. Fursa, I. Bray
Double-K-Vacancy States in Electron-Impact Single Ionization of Metastable Two-Electron N^{5+}(1s2s $^3S_1$) Ions
Phys. Rev. A 90, 010701 (2014)

$\mathbf{N}^{4+}$	Exp

298. K. M. Aggarwal, F. P. Keenan
Energy Levels, Radiative Rates and Lifetimes for Transitions in Br-like Ions with $38 \leq Z \leq 42$
Phys. Scr. 89, 125404 (2014)

$\mathbf{Mo}^{7+}$	Th
$\mathbf{Nb}^{6+}$	Th
$\mathbf{Sr}^{3+}$	Th
$\mathbf{Y}^{4+}$	Th
$\mathbf{Zr}^{5+}$	Th

299. A. N. Ryabtsev, E. Ya. Kononov, R. R. Kildiyarova, W.-Ü L. Tchang-Brillet, J.-F. Wyart, N. Champion, C. Blaess
Spectra of the W VIII Isoelectronic Sequence: II. Ta VII
Phys. Scr. 89, 125403 (2014)

$\mathbf{Ta}^{6+}$	E/T

300. K. M. Aggarwal, F. P. Keenan
Energy Levels, Radiative Rates and Electron Impact Excitation Rates for Transitions in Be-like Cl XIV, K XVI and Ge XXIX
Phys. Scr. 89, 125401 (2014)

$\mathbf{Cl}^{13+}$	Th
$\mathbf{Ge}^{28+}$	Th
$\mathbf{K}^{15+}$	Th

301. K. Haris, A. Kramida, A. Tauheed
Extended and Revised Analysis of Singly Ionized Tin: Sn II
Phys. Scr. 89, 115403 (2014)

$\mathbf{Sn}^{+}$	E/T
$\mathbf{Te}^{3+}$	E/T

302. C. Suzuki, F. Koike, I. Murakami, N. Tamura, S. Sudo, H. A. Sakaue, N. Nakamura, S. Morita, M. Goto, D. Kato, T. Nakano, T. Higashiguchi, C. S. Harte, G. O'Sullivan
EUV Spectroscopy of Highly Charged High Z Ions in the Large Helical Device Plasmas
Phys. Scr. 89, 114009 (2014)

Ag Z= 64-66	Exp
Cu Z= 64-66	Exp
$\mathbf{W}^{14+--45+}$	Exp

303. J. D. Gillaspy
Precision Spectroscopy of Trapped Highly Charged Heavy Elements: Pushing the Limits of Theory and Experiment
Phys. Scr. 89, 114004 (2014)

$\mathbf{Ar}^{16+}$	Exp
$\mathbf{Ti}^{20+}$	Exp

304. Dipti, T. Das, L. Sharma, R. Srivastava
L-Shell Electron Excitations of Mg- through O-like Tungsten Ions
Phys. Scr. 89, 085403 (2014)

W$^{62+-66+}$ Th

305. G. Xiong, J.-Y. Zhang, G.-H. Yang, J.-M. Yang, H. Li, Z.-M. Hu, Y. Zhao, M.-X. Wei, T. Yi
Different Approaches to Precise Wavelength Calibration of a Flat-Field Grating Spectrometer for Laser-Produced Plasmas
Phys. Scr. 89, 065005 (2014)

He Z= 6-8 Exp
Li Z= 6-8 Exp

306. A. O. G. Wallis, L. Lodi, A. Emmanouilidou
Auger Spectra Following Inner-Shell Ionization of Argon by a Free-Electron Laser
Phys. Rev. A 89, 063417 (2014)

Ar^{+} Th

307. Y. Wang, O. Zatsarinny, K. Bartschat
B-Spline R-Matrix-With-Pseudostates Calculations for Electron-Impact Excitation and Ionization of Nitrogen
Phys. Rev. A 89, 062714 (2014)

N Th
N^{-} Th

308. J. Grumer, R.-F. Zhao, T. Brage, W.-X. Li, S. Huldt, R. Hutton, Y.-M. Zou
Coronal Lines and the Importance of Deep-Core-Valence Correlation in Ag-like Ions
Phys. Rev. A 89, 062511 (2014)

Ag Z= 50-94 Th

309. V. Gedeon, S. Gedeon, V. Lazur, E. Nagy, O. Zatsarinny, K. Bartschat
B-Spline R-Matrix-With-Pseudostates Calculations for Electron-Impact Excitation and Ionization of Fluorine
Phys. Rev. A 89, 052713 (2014)

F Th
F^{-} Th

310. T. Carette, M. R. Godefroid
Theoretical Study of the Isotope Effects on the Detachment Thresholds of Si^{-}
Phys. Rev. A 89, 052513 (2014)

Si Th
^{29}**Si^{-}** Th
Si^{-} Th

311. P. F. Liu, Y. P. Liu, J. L. Zeng, J. M. Yuan
Electron-Impact Excitation and Single- and Multiple-Ionization Cross Sections of Heavy Ions: Sn^{13+} As an Example
Phys. Rev. A 89, 042704 (2014)

Sn^{13+} Th
Sn$^{13+-14+}$ Th

312. X.-Y. Han, X. Gao, D.-L. Zeng, R. Jin, J. Yan, J.-M. Li
Scaling Law for Transition Probabilities in 2p^{3} Configuration from LS Coupling to jj Coupling
Phys. Rev. A 89, 042514 (2014)

N Z= 7-100 Th

313. S. Roy, N. N. Dutta, S. Majumder
Relativistic Coupled-Cluster Calculations on Hyperfine Structures and Electromagnetic Transition Amplitudes of In III
Phys. Rev. A 89, 042511 (2014)

In^{2+}	Th

314. V. A. Dzuba, A. Kozlov, V. V. Flambaum
Scalar Static Polarizabilities of Lanthanides and Actinides
Phys. Rev. A 89, 042507 (2014)

Ac-NO	Th
Ar	Th
Kr	Th
La-Lu	Th
Xe	Th

315. L. Głowacki, J. Migdałek
Relativistic Configuration Interaction Calculations for Some Two- and Three-Electron Systems with Screened Hydrogenic Spin Orbitals
Phys. Rev. A 89, 042503 (2014)

He	Th
Li	Th
Ne^{8+}	Th
Ne^{7+}	Th
U^{89+}	Th
U^{90+}	Th

316. M. Puchalski, K. Pachucki
Ground-State Hyperfine Splitting in the Be^{+} Ion
Phys. Rev. A 89, 032510 (2014)

Be^{+}	Th

317. B. Bernhardt, A. R. Beck, X. Li, E. R. Warrick, M. J. Bell, D. J. Haxton, C. M. McCurdy, D. M. Neumark, S. R. Leone
High-Spectral-Resolution Attosecond Absorption Spectroscopy of Autoionization in Xenon
Phys. Rev. A 89, 023408 (2014)

Xe	Exp

318. S. Chattopadhyay, B. K. Mani, D. Angom
Electric Dipole Polarizability of Alkaline-Earth-Metal Atoms from Perturbed Relativistic Coupled-Cluster Theory with Triples
Phys. Rev. A 89, 022506 (2014)

Ba	Th
Ca	Th
Mg	Th
Ra	Th
Sr	Th

319. G. P. Gupta, A. Z. Msezane
Fine-Structure Energy Levels, Oscillator Strengths and Lifetimes in Al-like Chromium
Indian J. Phys. 88, 11-18 (2014)

Cr^{11+}	Th

320. S. Menmuir, C. Giroud, T. M. Biewer, I. H. Coffey, E. Delabie, N. C. Hawkes, M. Sertoli, JET EFDA Contributors
Carbon Charge Exchange Analysis in the ITER-like Wall Environment
Rev. Sci. Instrum. 85, p.11E412 (2014)

C^{5+}	Exp
W	Exp

321. T. Oishi, S. Morita, X. L. Huang, H. M. Zhang, M. Goto
Line Spectrum and Ion Temperature Measurements from Tungsten Ions at Low Ionization Stages in Large Helical Device Based on Vacuum Ultraviolet Spectroscopy in Wavelength Range of 500–2200 Å
Rev. Sci. Instrum. 85, p.11E415 (2014)

C^{+--2+}	Exp
N^{+--2+}	Exp
O^{+--3+}	Exp
W^{5+}	Exp

322. P. V. Kiran Kumar, M. V. Suryanarayana
Precision Two-Photon Spectroscopy of Alkali Elements
Pramana 83, 189-219 (2014)

Cs	Exp
Na	Exp
K	Exp
Li	Exp
Rb	Exp

323. L. Liang, X.-Y. Liu, C. Zhou
Photoionization Processes of Ti XIX with J = 1
J. Appl. Spectrosc. 81, 483-487 (2014)

Ti^{18+}	Th

324. P.-F. Liu, Y.-P. Liu, Jiaolong Zeng, Jianmin Yuan
Auger Decay and the Direct Double Ionization Probability of a 2p Inner-Shell Hole in a Singly Charged Ar^{+} Ion
Eur. Phys. J. D 68, 214 (2014)

Ar^{+}	Th

325. L.-H. Hao, X.-P. Kang
Energy Levels and Spectral Lines in the X-ray Spectra of Highly Charged W XLIV
Eur. Phys. J. D 68, 203 (2014)

W^{43+}	Th

326. M. Cohen, P. Mandelbaum
Ionization Cross Sections and Rate Coefficients for the Ground State of As I-like Ions
Eur. Phys. J. D 68, 2 (2014)

As Z= 38-92	Th

327. H. Elabidi
Structural and Collisional Data for Mg III and Al IV
Adv. Space Res. 54, 1203-1222 (2014)

Al^{3+}	Th
Mg^{2+}	Th

328. H. Elabidi, S. Sahal-Bréchot, M. S. Dimitrijević
Quantum Stark Broadening of Ar XV Lines. Strong Collision and Quadrupolar Potential Contributions
Adv. Space Res. 54, 1184-1189 (2014)

Ar^{14+}	Th

329. V. K. Saini, P. Kumar, S. K. Dixit, S. V. Nakhe
Studies on Pulsed Optogalvanic Effect in Eu/Ne Hollow Cathode Discharge
Appl. Opt. 53, 4320-4326 (2014)

Eu	Exp
Ne	Exp

330. S. Spencer, A. Hibbert, C. A. Ramsbottom
Oscillator Strengths and Transition Probabilities for the W XLV Ion
J. Phys. B 47, 245001 (2014)

W^{44+}	Th

331. A. Müller, S. Schippers, D. Esteves-Macaluso, M. Habibi, A. Aguilar, A. L. D. Kilcoyne, R. A. Phaneuf, C. P. Ballance, B. M. McLaughlin
Valence-Shell Photoionization of Ag-like Xe^{7+} Ions: Experiment and Theory
J. Phys. B 47, 215202 (2014)

Xe^{7+}	E/T

332. T. Nagata, K. Kawajiri, S. Kosugi, N. Suzuki, M. Kemmotsu, T. Nandi, E. Sokell, Y. Azuma, F. Koike
Photoion Spectroscopy on Isolated Mn Atoms in the 2p → 3d Excitation Region: I. Total Photoion-Yield Spectrum
J. Phys. B 47, 185006 (2014)

Mn	E/T

333. R. Zhao, J. Grumer, W. Li, J. Xiao, T. Brage, S. Huldt, R. Hutton, Y. Zou
The M1 Ground State Fine Structure Transition in Ag-like Yb
J. Phys. B 47, 185004 (2014)

Ag Z= 62-74	E/T
Yb^{23+}	E/T

334. A. T. Payne, C. T. Chantler, M. N. Kinnane, J. D. Gillaspy, L. T. Hudson, L. F. Smale, A. Henins, J. A. Kimpton, E. Takacs
Helium-like Titanium X-ray Spectrum As a Probe of QED Computation
J. Phys. B 47, 185001 (2014)

Ti^{19+}	Exp
Ti^{20+}	Exp

335. Madhulita Das, B. K. Sahoo, S. Pal
Relativistic Spectroscopy of Plasma-Embedded Li-like Systems with Screening Effects in Two-Body Debye Potentials
J. Phys. B 47, 175701 (2014)

Ca^{17+}	Th
Ti^{19+}	Th

336. M. L. Qiu, R. F. Zhao, X. L. Guo, Z. Z. Zhao, W. X. Li, S. Y. Du, J. Xiao, K. Yao, C. Y. Chen, R. Hutton, Y. Zou
Investigation of Transitions Between Metastable Levels of the First Excited Configuration of Palladium-like Tungsten
J. Phys. B 47, 175002 (2014)

W^{28+}	E/T

337. A. Müller, S. Schippers, R. A. Phaneuf, S. W. J. Scully, A. Aguilar, C. Cisneros, M. F. Gharaibeh, A. S. Schlachter, B. M. McLaughlin
K-Shell Photoionization of Be-like Boron (B^{+}) Ions: Experiment and Theory
J. Phys. B 47, 135201 (2014)

B^{+}	Exp

338. J. Seely, J. L. Glover, L. Hudson, Yu. Ralchenko, N. Pereira, U. Feldman
Measurement of the O2O3O4 and O3O4O5 Super Coster-Kronig Rates in Tungsten via Asymmetric Diffraction Spectrometry
J. Phys. B 47, 115004 (2014)

W	Exp

339. Y. A. Podpaly, J. D. Gillaspy, J. Reader, Yu. Ralchenko
EUV Measurements of Kr XXI–Kr XXXIV and the Effect of a Magnetic-Dipole Line on Allowed Transitions
J. Phys. B 47, 095702 (2014)

Kr$^{20+\text{--}21+}$	Exp
Kr^{24+}	Exp
Kr$^{26+\text{--}33+}$	Exp

340. A. A. Kamenski, V. D. Ovsiannikov
Formal Approach to Deriving Analytically Asymptotic Formulas for Static Polarizabilities of Atoms and Ions in Rydberg States
J. Phys. B 47, 095002 (2014)

Ba^{+}	Th
Be^{+}	Th
Ca^{+}	Th
Cs	Th
He	Th
K	Th
Li	Th
Mg^{+}	Th
Na	Th
Rb	Th
Sr^{+}	Th

341. M. H. Abdalmoneam, D. R. Beck
Dipole and Quadrupole Polarizabilities of Ni II and Parameters of an Effective Potential for Ni I Rydberg States
J. Phys. B 47, 085003 (2014)

Ni^{+}	Th

342. J. E. Rice, M. L. Reinke, J. M. A. Ashbourn, C. Gao, M. M. Victora, M. A. Chilenski, L. Delgado-Aparicio, N. T. Howard, A. E. Hubbard, J. W. Hughes
X-ray Observations of Ca^{19+}, Ca^{18+} and Satellites from Alcator C-Mod Tokamak Plasmas
J. Phys. B 47, 075701 (2014)

Ar^{16+}	Exp
Ca$^{16+\text{--}19+}$	Exp
Mo^{32+}	Exp

343. B.-W. Li, T. Higashiguchi, T. Otsuka, N. Yugami, P. Dunne, D. Kilbane, E. Sokell, G. O'Sullivan
Analysis of Laser Produced Plasmas of Gold in the 1–7 nm Region
J. Phys. B 47, 075001 (2014)

Au$^{19+--42+}$ E/T
Au$^{20+--42+}$ E/T
Au$^{32+--33+}$ E/T
Au$^{32+--34+}$ E/T

344. M. F. Gharaibeh, N. El Hassan, M. M. Al Shorman, J. M. Bizau, D. Cubaynes, S. Guilbaud, I. Sakho, C. Blancard, B. M. McLaughlin
K-Shell Photoionization of B-like Atomic Nitrogen Ions: Experiment and Theory
J. Phys. B 47, 065201 (2014)

N^{2+} Exp

345. I. D. Petrov, B. M. Lagutin, V. L. Sukhorukov, A. Ehresmann, H. Schmoranzer
Strong Impact of the Giant Resonance on the Radiationless Decay of the 4d-Vacancy in Xe: II. $N_{4,5}$OO Auger Effect
J. Phys. B 47, 055001 (2014)

Xe Th

346. J. Cai, W.-W. Yu, N. Zhang
The Scaling Law in the Fine-Structure Splitting of $1s^2np$ States for the Lithium Isoelectronic Sequence
Chin. Phys. Lett. 31, 093101 (2014)

Li Z= 21-30 Th

347. S. Civiš, P. Kubelík, M. Ferus, V. E. Chernov, E. M. Zanozina, L. Juha
Laser Ablation of an Indium Target: Time-Resolved Fourier-Transform Infrared Spectra of In I in the 700–7700 cm^{-1} Range
J. Anal. At. Spectrom. 29, 2275-2283 (2014)

In Exp

348. S. Aggarwal
Atomic Structure Calculations for F-like Tungsten
Chin. Phys. B 23, 093203 (2014)

W^{65+} Th

349. H.-J. Dong, K.-S. Huang, C.-Y. Li, J.-M. Zhao, L.-J. Zhang, S.-T. Jia
Electric Dipole Moments of Lithium Atoms in Rydberg States
Chin. Phys. B 23, 093202 (2014)

Li Th

350. Y.-B. Tang, C.-B. Li, H.-X. Qiao
Calculations on Polarization Properties of Alkali Metal Atoms Using Dirac-Fock Plus Core Polarization Method
Chin. Phys. B 23, 063101 (2014)

Cs^{0+--+} Th
Fr^{0+--+} Th
K^{0+--+} Th
Li^{0+--+} Th
Na^{0+--+} Th
Rb^{0+--+} Th

351. P. Hakel, G. A. Kyrala, P. A. Bradley, N. S. Krasheninnikova, T. J. Murphy, M. J. Schmitt, I. L. Tregillis, R. J. Kanzleieter, S. H. Batha, C. J. Fontes, M. E. Sherrill, D. P. Kilcrease, S. P. Regan
X-ray Spectroscopic Diagnostics and Modeling of Polar-Drive Implosion Experiments on the National Ignition Facility
Phys. Plasmas 21, 063306 (2014)

Cu^{27+}	Exp
Cu^{28+}	Exp
Fe^{24+}	Exp
Fe^{25+}	Exp
Ge^{30+}	Exp
Ge^{31+}	Exp
Ti^{20+}	Exp
Ti^{21+}	Exp

352. S. Kar, Y. Wang, Z.-S. Jiang, S.-X. Li, K. Ratnavelu
Doubly-Excited ^{1,3}D^{e} Resonance States of Two-Electron Positive Ions Li^{+} and Be^{2+} in Debye Plasmas
Phys. Plasmas 21, 012105 (2014)

Be^{2+}	Th
Li^{+}	Th

353. C. T. Chantler, A. T. Payne, J. D. Gillaspy, L. T. Hudson, L. F. Smale, A. Henins, J. A. Kimpton, E. Takacs
X-ray Measurements in Helium-like Atoms Increased Discrepancy Between Experiment and Theoretical QED
New J. Phys. 16, 123037 (2014)

He Z= 18-24	E/T
He Z= 26-27	E/T
Ge^{30+}	E/T
Kr^{34+}	E/T
S^{14+}	E/T
U^{90+}	E/T
Xe^{52+}	E/T

354. C. Froese Fischer
Evaluation and Comparison of the Configuration Interaction Calculations for Complex Atoms
Atoms 2, 1-14 (2014)

W^{39+}	Th

355. H. Tanuma
Charge Exchange Spectroscopy of Multiply Charged Ions of Industrial and Astrophysical Interest
AIP Conf. Proc. 1545, 196-201 (2013)

O^{7+}	Exp
Sn$^{4+--19+}$	Exp
Xe$^{8+--18+}$	Exp

356. S. Morita, C. F. Dong, M. Goto, D. Kato, I. Murakami, H. A. Sakaue, M. Hasuo, F. Koike, N. Nakamura, T. Oishi, A. Sasaki, E. H. Wang
A Study of Tungsten Spectra Using Large Helical Device and Compact Electron Beam Ion Trap in NIFS
AIP Conf. Proc. 1545, 143-152 (2013)

W$^{24+--33+}$	Exp
W^{26+}	Exp

357. N. Nakamura, X.-B. Ding, C.-Z. Dong, H. Hara, D. Kato, F. Koike, I. Murakami, T. Nakano, H. Ohashi, H. A. Sakaue, H. Watanabe, T. Watanabe, N. Yamamoto
EBIT Spectroscopy of Highly Charged Heavy Ions Relevant to Hot Plasmas
AIP Conf. Proc. 1545, 62-71 (2013)

Fe$^{8+--14+}$	Exp
Gd$^{33+--35+}$	Exp
W$^{22+--26+}$	Exp
W$^{42+--45+}$	Exp

358. P. Jönsson, J. Ekman, S. Gustafsson, H. Hartman, L. B. Karlsson, R. du Rietz, G. Gaigalas, M. R. Godefroid, C. Froese Fischer
Energy Levels and Transition Rates for the Boron Isoelectronic Sequence: Si X, Ti XVIII – Cu XXV
Astron. Astrophys. 559, p.A100 (2013)

Si^{9+}	Th
B Z= 22-29	Th

359. I. L. Glukhov, E. A. Nikitina, V. D. Ovsiannikov
Thermal Shifts and Broadening of Rydberg Levels in Be II Ions
Phys. Scr. T157, 014014 (2013)

Be^{+}	Th

360. P. Amaro, S. Schlesser, M. Guerra, E. Le Bigot, J. P. Santos, C. I. Szabo, A. Gumberidze, P. Indelicato
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Ar^{16+}	Exp

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Phys. Scr. T156, 014082 (2013)

Ta$^{45+--57+}$	Exp

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Observation of Visible Forbidden Lines from Highly Charged Tungsten Ions at the Large Helical Device
Phys. Scr. T156, 014081 (2013)

W^{26+}	Exp

363. J. K. Lepson, P. Beiersdorfer, M. Bitter, A. L. Roquemore, R. Kaita
Emission Lines of Iron in the 150–250 Å Region on National Spherical Torus Experiment
Phys. Scr. T156, 014075 (2013)

C^{4+--5+}	Exp
Fe$^{7+--13+}$	Exp

364. A. V. Volotka, D. A. Glazov, O. V. Andreev, V. M. Shabaev, I. I. Tupitsyn, G. Plunien
Probing Many-Electron QED Effects in the Presence of Magnetic Fields
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Bi^{80+}	Th
Bi^{82+}	Th
Si^{11+}	Th

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Relativistic Calculations of 1s^{2}2s2p Level Splitting in Be-like Kr
Phys. Scr. T156, 014015 (2013)

$\mathbf{Kr}^{32+}$ Th

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g Factor of Boron-like Ions: Ground and Excited States
Phys. Scr. T156, 014014 (2013)

$\mathbf{Ar}^{13+}$ Th

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Extreme Ultraviolet Spectra from N-Shell Ions of Gd, Dy and W
Phys. Scr. T156, 014012 (2013)

$\mathbf{Gd}^{18+--27+}$ Exp
$\mathbf{Gd}^{30+}$ Exp
$\mathbf{Gd}^{31+}$ Exp
$\mathbf{Gd}^{32+}$ Exp
$\mathbf{W}^{27+--29+}$ Exp

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Phys. Scr. T156, 014010 (2013)

$\mathbf{W}^{26+}$ Exp
$\mathbf{W}^{28+}$ Exp

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Measurement and Calculation of L-Shell Transitions in M-Shell Iron Ions
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$\mathbf{Fe}^{13+--15+}$ E/T

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$\mathbf{Mg}^{9+}$ Exp
$\mathbf{Mg}^{9+--11+}$ Exp

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A Step toward Probing Higher-Order Feynman Diagrams in Few-Electron Highly Charged Ions
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$\mathbf{Ar}^{16+--17+}$ Exp

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Laser Spectroscopy of Highly Charged Argon at the Heidelberg Electron Beam Ion Trap
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$\mathbf{Ar}^{13+}$ Exp

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As	Th
Br	Th
Ga	Th
Ge	Th
Kr	Th
Se	Th

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Ar^{14+}	Th
Be	Th
C^{2+}	Th
Li^{-}	Th
Ne^{6+}	Th

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W^{7+}	E/T

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In	Exp

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Si^{13+}	Exp

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Laser-Induced Breakdown Spectroscopy of Zr in Short Ultraviolet Wavelength Range
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Zr^{0+--+}	Exp

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High-Resolution K-Shell Spectra from Laser Excited Molybdenum Plasmas
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Mo^{41+}	Exp

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The Inter-Shell Doubly Excited ^{1,3}S^{e}, ^{1,3}P^{o}, ^{1,3}D^{e}, ^{1,3}F^{o}, and ^{1,3}G^{e} States Energies Calculations of Helium-like Ions Using Special Forms of Hylleraas-Type Wave Functions
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He Z= 2-10	Th

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$\mathbf{Ar}^{5+}$	E/T

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$\mathbf{W}^{20+--37+}$	Exp

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$\mathbf{F}^{3+}$	Exp
$\mathbf{Fe}^{23+}$	Exp
Ne	Exp

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$\mathbf{O}^{6+--7+}$	Exp
$\mathbf{S}^{10+--13+}$	Exp

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$\mathbf{Li}^{+}$	Th

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B Th
Be Th
Li Th
Ne Th
O Th

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Mg Th

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C Z= 26-92 Th

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Atomic structure, radiative lifetime and oscillator strength calculations in doubly ionized molybdenum (Mo III)
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Mo^{2+} Th

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Au$^{47+--50+}$ Th

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Ab-Initio calculations of level energies, oscillator strengths and radiative rates for E1 transitions in beryllium-like iron
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Fe^{22+} Th

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Fe^{6+} Th

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Si^{6+} Th

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Fe^{7+} Th

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Si^{8+} Th

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Ni^{10+} Th

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Mo^{33+} Th
F Z= 22-30 Th

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Fe^+ Th

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Ar^+ Exp

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Fe Exp

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O Th
O^{2+} Th

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Ar Exp
Kr Exp
Ne Exp
Xe Exp

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Energy levels and spectral lines of quadruply ionized iron (Fe V)
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Fe^{4+} Th

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V E/T

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Cu Th

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Ni Exp

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Accurate multiconfiguration Dirac-Hartree-Fock calculations of transition probabilities for magnesium-like ions
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$\mathbf{Au}^{67+}$ Th

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B Th

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$\mathbf{W}^{25+}$ Th

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Fe E/T

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Energy levels, radiative rates, and lifetimes for transitions in W LVIII
At. Data Nucl. Data Tables 100, 1603-1767 (2014)

$\mathbf{W}^{57+}$ Th

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Energy level properties of $4p^6 4d^3$, $4p^6 4d^2 4f$, and $4p^5 4d^4$ configurations of the W^{35+} ion
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W^{35+} Th

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Energy levels, radiative rates, and lifetimes for transitions in W XL
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Wavelengths, transition probabilities, and oscillator strengths for M-shell transitions in Co-, Ni-, Cu-, Zn-, Ga-, Ge-, and Se-like Au ions
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$Au^{45+--52+}$ Th

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Relativistic configuration-interaction calculations of electric dipole $n = 2 - n = 3$ transitions for medium-charge Li-like ions
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Ne^{3+} Th

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Energy levels, lifetimes, and transition probabilities for Mn XII and Ge XIX
At. Data Nucl. Data Tables 100, 1250-1276 (2014)

Ge^{18+} Th
Mn^{11+} Th

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Energy levels, oscillator strengths, radiative decay rates, and fine-structure collision strengths for the Zn-like ions Nb XII and Mo XIII
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Mo^{12+} Th
Nb^{11+} Th

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Electric quadrupole transition probabilities and line strengths of Ti^{11+}
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Ti^{12+} E/T

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Electric quadrupole transition probabilities for atomic lithium
At. Data Nucl. Data Tables 100, 792-801 (2014)

Li Th

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Fe^{10+}	Th

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W^{57+}	Th

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Multiconfigurational Dirac-Fock atomic structure calculations for Cl-like tungsten
Can. J. Phys. 92, 177-183 (2014)

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N^{+}	Th

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Forbidden-Line spectroscopy of the ground-state configuration of Cd-like W
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Au^{78+}	Th
Mo^{40+}	Th
Mo^{41+}	Th
U^{90+}	Th
U^{91+}	Th

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Multipole transitions to determine lifetimes and polarizabilities in Mg-like ions from Si^{2+} to Fm^{88+}
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Mg Z= 13-100	Th

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Energy levels, radiative rates and lifetimes for transitions in Br-like ions with $38 \leq Z \leq 42$
Phys. Scr. 89, 125404 (2014)

Mo^{7+}	Th
Nb^{6+}	Th
Sr^{3+}	Th
Y^{4+}	Th
Zr^{5+}	Th

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Spectra of the W VIII isoelectronic sequence: II. Ta VII
Phys. Scr. 89, 125403 (2014)

Ta^{6+}	Th

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Energy levels, radiative rates and electron impact excitation rates for transitions in Be-like Cl XIV, K XVI and Ge XXIX
Phys. Scr. 89, 125401 (2014)

Cl^{13+}	Th
Ge^{28+}	Th
K^{15+}	Th

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Extended and revised analysis of singly ionized tin: Sn II
Phys. Scr. 89, 115403 (2014)

Sn^{+}	E/T

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Phys. Scr. 89, 115401 (2014)

Mg^{2+}	Th

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E1-forbidden transition rates in ions of astrophysical interest
Phys. Scr. 89, 114003 (2014)

S^{12+}	E/T
Ti^{18+}	E/T
Be Z= 4-54	E/T
P Z= 22-36	E/T

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Ne Z= 10-35	Th

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L-Shell electron excitations of Mg- through O-like tungsten ions
Phys. Scr. 89, 085403 (2014)

W$^{62+--66+}$	Th

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N Th

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Coronal lines and the importance of deep-core-valence correlation in Ag-like ions
Phys. Rev. A 89, 062511 (2014)

Ag Z= 50-94 Th

454. V. Gedeon, S. Gedeon, V. Lazur, E. Nagy, O. Zatsarinny, K. Bartschat
B-spline R-matrix-with-pseudostates calculations for electron-impact excitation and ionization of fluorine
Phys. Rev. A 89, 052713 (2014)

F Th

455. M. Fogle, D. Wulf, K. Morgan, D. McCammon, D. G. Seely, I. N. Draganić, C. C. Havener
X-Ray-Emission measurements following charge exchange between C^{6+} and H_2
Phys. Rev. A 89, 042705 (2014)

C^{5+} Th

456. X.-Y. Han, X. Gao, D.-L. Zeng, R. Jin, J. Yan, J.-M. Li
Scaling law for transition probabilities in $2p^3$ configuration from LS coupling to jj coupling
Phys. Rev. A 89, 042514 (2014)

N Z= 7-100 Th

457. L. Bougas, G. E. Katsoprinakis, D. Sofikitis, T. P. Rakitzis, P. C. Samartzis, T. N. Kitsopoulos, J. Sapirstein, D. Budker, V. A. Dzuba, V. V. Flambaum, M. G. Kozlov
Stark shift and parity nonconservation for near-degenerate states of xenon
Phys. Rev. A 89, 042513 (2014)

Xe Th

458. S. Roy, N. N. Dutta, S. Majumder
Relativistic coupled-cluster calculations on hyperfine structures and electromagnetic transition amplitudes of In III
Phys. Rev. A 89, 042511 (2014)

In^{2+} Th

459. N. D. Guise, J. N. Tan, S. M. Brewer, C. F. Fischer, P. Jönsson
Measurement of the Kr XVIII 3d $^2D_{5/2}$ lifetime at low energy in a unitary Penning trap
Phys. Rev. A 89, 040502 (2014)

Kr^{17+} E/T

460. G. P. Gupta, A. Z. Msezane
Fine-Structure energy levels, oscillator strengths and lifetimes in Al-like chromium
Indian J. Phys. 88, 11-18 (2014)

Cr^{11+} Th

461. L.-H. Hao, X.-P. Kang
Energy levels and spectral lines in the X-ray spectra of highly charged W XLIV
Eur. Phys. J. D 68, 203 (2014)

W^{43+}	Th

462. I. L. Babich, V. F. Boretskij, A. N. Veklich, R. V. Semenyshyn
Spectroscopic data and Stark broadening of Cu I and Ag I spectral lines: Selection and analysis
Adv. Space Res. 54, 1254-1263 (2014)

Ag	E/T
Cu	E/T

463. H. Elabidi
Structural and collisional data for Mg III and Al IV
Adv. Space Res. 54, 1203-1222 (2014)

Al^{3+}	Th
Mg^{2+}	Th

464. N. Ben Nessib, N. Alonizan, R. Qindeel, S. Sahal-Bréchot, M. S. Dimitrijević
The O IV 1407.3 Å/1401.1 Å emission-line ratio in a plasma
Adv. Space Res. 54, 1190-1194 (2014)

O^{3+}	Th

465. H. Elabidi, S. Sahal-Bréchot, M. S. Dimitrijević
Quantum Stark broadening of Ar XV lines. Strong collision and quadrupolar potential contributions
Adv. Space Res. 54, 1184-1189 (2014)

Ar^{14+}	Th

466. P. Bogdanovich, R. Kisielius, D. Stonys
Methods, algorithms, and computer codes for calculation of electron-impact excitation parameters
Lithuanian Phys. J. 54, 67-79 (2014)

He	Th
Li	Th

467. S. Spencer, A. Hibbert, C. A. Ramsbottom
Oscillator strengths and transition probabilities for the W XLV ion
J. Phys. B 47, 245001 (2014)

W^{44+}	Th

468. S. Fan, Q. Wang, X. Shang, Y.-S. Tian, Z.-W. Dai
Experimental branching fractions, transition probabilities and oscillator strengths in Eu I
J. Phys. B 47, 215004 (2014)

Ar^{+}	Exp
Eu	Exp

469. T. Nagata, K. Kawajiri, S. Kosugi, N. Suzuki, M. Kemmotsu, T. Nandi, E. Sokell, Y. Azuma, F. Koike
Photoion spectroscopy on isolated Mn atoms in the 2p → 3d excitation region: I. Total photoion-yield spectrum
J. Phys. B 47, 185006 (2014)

Mn	Th

470. Madhulita Das, B. K. Sahoo, S. Pal
Relativistic spectroscopy of plasma-embedded Li-like systems with screening effects in two-body Debye potentials
J. Phys. B 47, 175701 (2014)

Ca^{17+}	Th
Ti^{19+}	Th

471. M. L. Qiu, R. F. Zhao, X. L. Guo, Z. Z. Zhao, W. X. Li, S. Y. Du, J. Xiao, K. Yao, C. Y. Chen, R. Hutton, Y. Zou
Investigation of transitions between metastable levels of the first excited configuration of palladium-like tungsten
J. Phys. B 47, 175002 (2014)

W^{28+}	Th

472. Y. A. Podpaly, J. D. Gillaspy, J. Reader, Yu. Ralchenko
EUV measurements of Kr XXI–Kr XXXIV and the effect of a magnetic-dipole line on allowed transitions
J. Phys. B 47, 095702 (2014)

Kr^{23+}	Th

473. J. Migdalek, W. Siegel
Relativistic effects in E1 transition oscillator strengths along the Yb^{+} isoelectronic sequence
J. Phys. B 47, 075003 (2014)

Tm Z= 70-88	Th

474. S. Civiš, P. Kubelík, M. Ferus, V. E. Chernov, E. M. Zanozina, L. Juha
Laser ablation of an indium target: Time-resolved Fourier-transform infrared spectra of In I in the 700–7700 cm^{-1} range
J. Anal. At. Spectrom. 29, 2275-2283 (2014)

In	Th

475. S. Aggarwal
Atomic structure calculations for F-like tungsten
Chin. Phys. B 23, 093203 (2014)

W^{65+}	Th

476. A. Kramida
Assessing uncertainties of theoretical atomic transition probabilities with Monte Carlo random trials
Atoms 2, 86-122 (2014)

Fe^{4+}	Th

477. E. Träbert
Critical assessment of theoretical calculations of atomic structure and transition probabilities: An experimenter's view
Atoms 2, 15-85 (2014)

Cl Z= 18-29	E/T
B Z= 18-22	E/T
Be Z= 4-36	E/T
F Z= 17-22	E/T
Fe^{13+}	E/T
He Z= 3-54	E/T
C Z= 14-16	E/T
O Z= 14-16	E/T

478. C. Froese Fischer
Evaluation and comparison of the configuration interaction calculations for complex atoms
Atoms 2, 1-14 (2014)

W^{39+}	Th

479. P. Jönsson, M. Godefroid, G. Gaigalas, J. Bieroń, T. Brage
Accurate transition probabilities from large-scale multiconfiguration calculations – A tribute to Charlotte Froese Fischer
AIP Conf. Proc. 1545, 266-278 (2013)

B^{+}	Th

480. S. Schippers
Storage-ring measurements of hyperfine induced transition rates in berylliumlike ions
AIP Conf. Proc. 1545, 7-16 (2013)

S^{12+}	E/T
Ti^{18+}	E/T
Be Z= 6-92	E/T

481. P. Jönsson, J. Ekman, S. Gustafsson, H. Hartman, L. B. Karlsson, R. du Rietz, G. Gaigalas, M. R. Godefroid, C. Froese Fischer
Energy levels and transition rates for the boron isoelectronic sequence: Si X, Ti XVIII – Cu XXV
Astron. Astrophys. 559, p.A100 (2013)

Si^{9+}	Th
B Z= 22-29	Th

482. H. Elabidi, S. Sahal-Bréchot
Excitation cross-sections by electron impact for O V and O VI levels
Mon. Not. R. Astron. Soc. 436, 1452-1464 (2013)

O^{4+--5+}	Th

483. M. P. Wood, J. E. Lawler, C. Sneden, J. J. Cowan
Improved Ti II log(gf) values and abundance determinations in the photospheres of the Sun and metal-poor star HD 84937
Astrophys. J., Suppl. Ser. 208, 27 (2013)

Ti^{+}	Exp

484. I. L. Glukhov, E. A. Nikitina, V. D. Ovsiannikov
Thermal shifts and broadening of Rydberg levels in Be II ions
Phys. Scr. T157, 014014 (2013)

Be^{+}	Th

485. S. Itoi, H. Kai, M. Saito, Y. Haruyama
Radiative lifetime measurement of the $^1S_0$ metastable state of Kr^{2+} using an electrostatic ion trap
Phys. Scr. T156, 014023 (2013)

Kr^{2+}	Exp

486. J. P. Santos, J. P. Marques, A. M. Costa, M. C. Martins, P. Indelicato, F. Parente
Transition probability values of the $1s^22s3p\ ^3P_0$ level in Be-like ions
Phys. Scr. T156, 014020 (2013)

C^{2+}	Th
Fe^{22+}	Th
Ne^{6+}	Th
U^{88+}	Th
Xe^{50+}	Th

487. J. K. Rudolph, S. Bernitt, S. W. Epp, R. Steinbrügge, C. Beilmann, G. V. Brown, S. Eberle, A. Graf, Z. Harman, N. Hell, M. Leutenegger, A. Müller, K. Schlage, H.-C. Wille, H. Yavaş, J. Ullrich, J. R. Crespo López-Urrutia
X-Ray resonant photoexcitation: Linewidths and energies of Kα transitions in highly charged Fe ions
Phys. Rev. Lett. 111, 103002 (2013)

Xe$^{17+--20+}$	Exp
Xe$^{22+--24+}$	Exp

488. H. Asghar, R. Ali, M. A. Baig
Determination of transition probabilities for the 3p → 3s transition array in neon using laser induced breakdown spectroscopy
Phys. Plasmas 20, 123302 (2013)

Ne	Exp

489. U. I. Safronova, A. S. Safronova, P. Beiersdorfer
Relativistic atomic data for Cu-like tungsten
Phys. Rev. A 86, 042510 (2012)

W^{45+}	Th

490. G. P. Gupta, V. Tayal, A. Z. Msezane
Fine-structure energy levels and radiative rates in Si-like chlorine
Indian J. Phys. 86, 1-8 (2012)

Cl^{3+}	Th

491. E. Landi, A. K Bhatia
Atomic data and spectral line intensities for Ca IX
At. Data Nucl. Data Tables 100, 1519 (2014)

e + Ca^{8+}	0−60 RYD	Th

492. Zanna Del, G.
Benchmarking atomic data for astrophysics: Fe XVII X-ray lines
Astron. Astrophys. 536, A59 (2011)

e + Fe^{16+}	Th
P + Fe^{16+}	Th

493. A. K. Bhatia, E. Landi
Atomic data and spectral line intensities for Ni XI
At. Data Nucl. Data Tables 97, 50 (2011)

e + Ni^{10+}	threshold−1000 eV	Th
e + Ni^{10+}	threshold−1000 eV	Th

494. A. K. Bhatia, E. Landi
Atomic data and spectral line intensities for Ni XVII
At. Data Nucl. Data Tables 97, 189 (2011)

e + Ni^{16+}	threshold−1700 eV	Th
e + Ni^{16+}	threshold−1700 eV	Th

495. Landi, E.
Atomic data and spectral line intensities for Fe XV
At. Data Nucl. Data Tables 97, 587 (2011)

e + Fe^{14+}	threshold−1670 eV	Th
e + Fe^{14+}	threshold−1670 eV	Th

496. P. Jonsson, P. Rynkun, G. Gaigalas
Energies, E1, M1, and E2 transition rates, hyperfine structures, and Lande g(J) factors for states of the 2s(2)2p(2), 2s2p(3), and 2p(4) configurations in carbon-like ions between F IV and Ni XXIII
At. Data Nucl. Data Tables 97, 648 (2011)

e + C Z= 9-28		Th
e + C Z= 9-28		Th

3.2 Atomic and Molecular Collisions

3.2.1 Electron Collisions

497. David Bote, Francesc Salvat, Aleksander Jablonski, Cedric J. Powell
Cross sections for ionization of K, L and M shells of atoms by impact of electrons and positrons with energies up to 1 GeV: Analytical formulas
At. Data Nucl. Data Tables 95, 871 (2009)

e + Es	ned	Th
e + Cf	ned	Th
e + Bk	ned	Th
e + Cm	ned	Th
e + Am	ned	Th
e + Pu	ned	Th
e + Np	ned	Th
e + U	ned	Th
e + Pa	ned	Th
e + Th	ned	Th
e + Ac	ned	Th
e + Ra	ned	Th
e + Fr	ned	Th
e + Rn	ned	Th
e + At	ned	Th
e + Po	ned	Th
e + Bi	ned	Th
e + Pb	ned	Th
e + Tl	ned	Th
e + Hg	ned	Th
e + Au	ned	Th
e + Pt	ned	Th
e + Ir	ned	Th
e + Os	ned	Th
e + Re	ned	Th
e + W	ned	Th
e + Ta	ned	Th
e + Hf	ned	Th
e + Lu	ned	Th
e + Yb	ned	Th
e + Tm	ned	Th
e + Er	ned	Th
e + Ho	ned	Th
e + Dy	ned	Th

e + Tb	ned	Th
e + Gd	ned	Th
e + Eu	ned	Th
e + Sm	ned	Th
e + Pm	ned	Th
e + Nd	ned	Th
e + Pr	ned	Th
e + Ce	ned	Th
e + La	ned	Th
e + Ba	ned	Th
e + Cs	ned	Th
e + Xe	ned	Th
e + I	ned	Th
e + Te	ned	Th
e + Sb	ned	Th
e + Sn	ned	Th
e + In	ned	Th
e + Cd	ned	Th
e + Ag	ned	Th
e + Pd	ned	Th
e + Rh	ned	Th
e + Ru	ned	Th
e + Tc	ned	Th
e + Mo	ned	Th
e + Nb	ned	Th
e + Zr	ned	Th
e + Y	ned	Th
e + Sr	ned	Th
e + Rb	ned	Th
e + Kr	ned	Th
e + Br	ned	Th
e + Se	ned	Th
e + As	ned	Th
e + Ge	ned	Th
e + Ga	ned	Th
e + Zn	ned	Th
e + Cu	ned	Th
e + Ni	ned	Th
e + Co	ned	Th
e + Fe	ned	Th
e + Mn	ned	Th
e + Cr	ned	Th
e + V	ned	Th
e + Ti	ned	Th
e + Sc	ned	Th
e + Ca	ned	Th
e + K	ned	Th
e + Ar	ned	Th
e + Cl	ned	Th
e + S	ned	Th
e + P	ned	Th
e + Si	ned	Th
e + Al	ned	Th
e + Mg	ned	Th
e + Na	ned	Th
e + Ne	ned	Th
e + F	ned	Th
e + O	ned	Th
e + N	ned	Th

e + C	ned	Th
e + B	ned	Th
e + Be	ned	Th
e + Li	ned	Th
e + He	ned	Th
e + H	ned	Th

498. M. H. F. Bettega, R. F. daCosta, M. A. P. Lima
Low-energy electron collisions with ethane
Braz. J. Phys. 39, 69 (2009)

e + C_2H_6	0–12 eV	Th

499. Yu-Jun Hou, Xin-Lu Cheng, Heng-Jie Chen
Calculated cross sections for the single ionization of atoms (N, Cu, As, Se, Sn, Sb, Te, I, Pb) by electron impact
Chin. Phys. B 18, 553 (2009)

e + Pb	threshold–10000 eV	Th
e + I	threshold–10000 eV	Th
e + Te	threshold–10000 eV	Th
e + Sb	threshold–10000 eV	Th
e + Sn	threshold–10000 eV	Th
e + Se	threshold–10000 eV	Th
e + As	threshold–10000 eV	Th
e + Cu	threshold–10000 eV	Th
e + N	threshold–10000 eV	Th

500. Hao Feng, Wei-Guo Sun, Yang-Yang Zeng
High order correlation-polarization potential for vibrational excitation scattering of diatomic molecules by low-energy electrons
Chin. Phys. B 18, 4846 (2009)

e + N_2	0–10 eV	Th
e + N_2	0–10 eV	Th

501. Yuan-Cheng Wang, Ya-Jun Zhou, Yong-Jun Cheng, Jia Ma
Coupled-Channels Optical Calculation for Electron Scattering from Metastable Helium
Chin. Phys. Lett. 26, 083401 (2009)

e + He	0–25 eV	Th

502. Ning-Xuan Yang, Chen-Zhong Dong, Jun Jiang
Relativistic Distorted-Wave Collision Strengths of Ni-, Cu- and Zn-like Au Ions
Chin. Phys. Lett. 26, 053401 (2009)

e + Au^{49+}	100–1E4 eV	Th
e + Au^{50+}	100–1E4 eV	Th
e + Au^{51+}	100–1E4 eV	Th

503. Yang-Yang Zeng, Hao Feng, Wei-Guo Sun, Bin Wang
Differential Cross Sections for High-Lying Vibrational Excitations (upsilon=0 -¿upsilon '=1, 2,..., 9, 10) of e-H-2 Scattering
Chin. Phys. Lett. 26, 023402 (2009)

e + H_2	1–10 eV	Th

504. J. R. Vacher, F. Jorand, N. Blin-Simiand, S. Pasquiers
Electron impact ionization of formaldehyde
Chem. Phys. Lett. 476, 178 (2009)

e + CH_2O	50−85 eV	Exp

505. M. R. Talukder, A. K. F. Haque, M. A. Uddin
Electron impact double ionization cross sections of light elements
Eur. Phys. J. D 53, 133 (2009)

e + Ar^{7+}	0−1E6 eV	Th
e + Ar^{6+}	0−1E6 eV	Th
e + Ar^{5+}	0−1E6 eV	Th
e + Ar^{4+}	0−1E6 eV	Th
e + Ar^{3+}	0−1E6 eV	Th
e + Ar^{2+}	0−1E6 eV	Th
e + Ar^{+}	0−1E6 eV	Th
e + Ar	0−1E6 eV	Th
e + S	0−1E6 eV	Th
e + Al^{3+}	0−1E6 eV	Th
e + Mg	0−1E6 eV	Th
e + Na	0−1E6 eV	Th
e + Ne^{2+}	0−1E6 eV	Th
e + Ne^{+}	0−1E6 eV	Th
e + Ne	0−1E6 eV	Th
e + O^{3+}	0−1E6 eV	Th
e + O^{2+}	0−1E6 eV	Th
e + O	0−1E6 eV	Th
e + C^{3+}	0−1E6 eV	Th
e + C^{+}	0−1E6 eV	Th
e + B^{+}	0−1E6 eV	Th
e + Li^{+}	0−1E6 eV	Th
e + Li	0−1E6 eV	Th
e + H	0−1E6 eV	Th

506. T. -M. Shen, C. -Y. Chen, Y. -S. Wang, Y. -M. Zou
Electron impact excitation rate coefficients for Ni-like gadolinium
Eur. Phys. J. D 53, 179 (2009)

e + Gd^{36+}	100−5000 eV	Th

507. S. Kumari, L. K. Jha, B. N. Roy
Double ionization of Sc+ ions by electron impact
Eur. Phys. J. D 55, 93 (2009)

e + Sc^{+}	40−1000 eV	Th

508. J. Lecointre, D. S. Belic, J. J. Jureta, R. K. Janev, P. Defrance
Absolute cross-sections and kinetic-energy-release distributions for electron-impact ionization and dissociation of CD (2) (+)
Eur. Phys. J. D 55, 557 (2009)

e + $CD_2{}^{+}$	0−2.5 keV	Exp
e + $CD_2{}^{+}$	0−2.5 keV	Exp
e + $CD_2{}^{+}$	0−2.5 keV	Exp

509. J. Lecointre, D. S. Belic, J. J. Jureta, R. K. Janev, P. Defrance
Absolute cross-sections and kinetic-energy-release distributions for electron-impact ionization and dissociation of CD3+
Eur. Phys. J. D 55, 569 (2009)

e + $CD_3{}^{+}$	0−2.5 keV	Exp
e + $CD_3{}^{+}$	0−2.5 keV	Exp
e + $CD_3{}^{+}$	0−2.5 keV	Exp

510. N. Endstrasser, F. Zappa, A. Mauracher, A. Bacher, S. Feil, D. K. Bohme, P. Scheier, M. Probst, T. D. Maerk
Absolute partial cross sections and kinetic energy analysis for the electron impact ionization of ethylene
Int. J. Mass Spectrom. 280, 65 (2009)

e + C_2H_4	0−1000 eV	Exp

511. M. A. R. Patoary, M. Alfaz Uddin, A. K. F. Haque, M. Shahjahan, A. K. Basak, M. R. Talukder, B. C. Saha
Empirical Model for the Electron Impact K-Shell Ionization Cross Section of Atoms
Int. J. Quantum Chem. 109, 897 (2009)

e + U	0−2E9 eV	Th
e + Bi	0−2E9 eV	Th
e + Pb	0−2E9 eV	Th
e + Au	0−2E9 eV	Th
e + Ta	0−2E9 eV	Th
e + Ba	0−2E9 eV	Th
e + Sn	0−2E9 eV	Th
e + In	0−2E9 eV	Th
e + Ag	0−2E9 eV	Th
e + Pd	0−2E9 eV	Th
e + Mo	0−2E9 eV	Th
e + Y	0−2E9 eV	Th
e + Sr	0−2E9 eV	Th
e + Ga	0−2E9 eV	Th
e + Rb	0−2E9 eV	Th
e + Zn	0−2E9 eV	Th
e + Se	0−2E9 eV	Th
e + Cu	0−2E9 eV	Th
e + Ni	0−2E9 eV	Th
e + Co	0−2E9 eV	Th
e + Cr	0−2E9 eV	Th
e + V	0−2E9 eV	Th
e + Ar	0−2E9 eV	Th
e + Si	0−2E9 eV	Th
e + Al	0−2E9 eV	Th
e + Ne	0−2E9 eV	Th
e + N	0−2E9 eV	Th
e + C	0−2E9 eV	Th
e + He	0−2E9 eV	Th
e + H	0−2E9 eV	Th

512. A. K. F. Haque, M. S. I. Sarker, M. A. R. Patoary, M. Shahjahan, M. Ismail Hossain, M. Alfaz Uddin, A. K. Basak, B. C. Saha
Modified Version of Revised Deutsch-Mark Model for Electron Impact K-Shell Ionization Cross-Sections of Atoms at Relativistic Energies
Int. J. Quantum Chem. 109, 1442 (2009)

e + U	0−2E9 eV	Th
e + Bi	0−2E9 eV	Th
e + Pb	0−2E9 eV	Th
e + Au	0−2E9 eV	Th
e + Ba	0−2E9 eV	Th
e + Sb	0−2E9 eV	Th
e + Sn	0−2E9 eV	Th
e + In	0−2E9 eV	Th
e + Ag	0−2E9 eV	Th
e + Pd	0−2E9 eV	Th

e + Mo	0–2E9 eV	Th
e + Y	0–2E9 eV	Th
e + Sr	0–2E9 eV	Th
e + Se	0–2E9 eV	Th
e + Ge	0–2E9 eV	Th
e + Zn	0–2E9 eV	Th
e + Ni	0–2E9 eV	Th
e + Co	0–2E9 eV	Th
e + Fe	0–2E9 eV	Th
e + Mn	0–2E9 eV	Th
e + Cr	0–2E9 eV	Th
e + V	0–2E9 eV	Th
e + Ca	0–2E9 eV	Th
e + Ar	0–2E9 eV	Th
e + Si	0–2E9 eV	Th
e + Al	0–2E9 eV	Th
e + Ne	0–2E9 eV	Th
e + C	0–2E9 eV	Th
e + He	0–2E9 eV	Th
e + H	0–2E9 eV	Th

513. A. Jablonski, F. Salvat, C. J. Powell
Practical formulas for inner-shell ionization cross sections by electron impact: Applications in quantitative Auger electron spectroscopy
J. Appl. Phys. 106, 053706 (2009)

e + Au	0–30 keV	Th
e + Ag	0–30 keV	Th
e + Cu	0–30 keV	Th
e + Si	0–30 keV	Th
e + Al	0–30 keV	Th

514. H. Kawahara, D. Suzuki, H. Kato, M. Hoshino, H. Tanaka, O. Ingolfsson, L. Campbell, M. J. Brunger
Cross sections for electron impact excitation of the C (II)-I-1 and D (1)Sigma(+) electronic states in N2O
J. Chem. Phys. 131, 114307 (2009)

$\mathbf{e + N_2O}$	15–200 eV	Exp

515. S. E. Michelin, K. T. Mazon, F. Arretche, W. Tenfen, H. L. Oliveira, A. S. Falck, M. A. Scopel, L. S. S. daSilva, M. M. Fujimoto, I. Iga, M. -T. Lee
Comparative study of electron-impact C(1s) core-excitation processes in C-2 and C2N2 molecules
J. Electron Spectrosc. Relat. Phenom. 171, 30 (2009)

$\mathbf{e + C_2N_2}$	300–800 eV	Th
$\mathbf{e + C_2}$	300–800 eV	Th

516. G. Purohit, Vinod Patidar, K. K. Sud
Importance of polarization effects in electron impact single ionization of argon atom
J. Electron Spectrosc. Relat. Phenom. 175, 1 (2009)

$\mathbf{e + Ar^{2+}}$	113 eV	Th

517. A., Jr. Borovik, A. Mueller, S. Schippers, I. Bray, D. V. Fursa
Electron impact ionization of ground-state and metastable Li+ ions
J. Phys. B 42, 025203 (2009)

$\mathbf{e + Li^{+}}$	0–1000 eV	E/T

518. A. Borovik, O. Zatsarinny, K. Bartschat
Resonance effects in electron and photon impact excitation of the p(6) subvalence subshell in alkali atoms
J. Phys. B 42, 044010 (2009)

e + Kr	0–18 eV	E/T
e + Cs	0–18 eV	E/T

519. S. Chatterjee, S. Kasthurirangan, A. H. Kelkar, C. R. Stia, O. A. Fojon, R. D. Rivarola, L. C. Tribedi
Fast-electron impact ionization of molecular hydrogen: energy and angular distribution of double and single differential cross sections and Young-type interference
J. Phys. B 42, 065201 (2009)

e + $\mathbf{H_2}$	8 keV	Exp

520. M. Becher, B. Joulakian
K-shell (e, 3e) double ionization of beryllium by relativistic electrons
J. Phys. B 42, 065206 (2009)

e + Be	0–500 keV	Th

521. J. Lecointre, M. O. Abdellahi ElGhazaly, J. J. Jureta, D. S. Belic, X. Urbain, P. Defrance
Absolute cross-sections and kinetic energy release distributions for electron-impact dissociation of D-3(+)
J. Phys. B 42, 075201 (2009)

e + $\mathbf{D_3}^+$	0–2.5 keV	Exp
e + $\mathbf{D_3}^+$	0–2.5 keV	Exp
e + $\mathbf{D_3}^+$	0–2.5 keV	Exp

522. Ireneusz Linert, Mariusz Zubek
Differential cross sections for electron elastic scattering and vibrational upsilon=1 excitation in nitrogen in the energy range from 5 to 20 eV measured over an angular range of 10 degrees-180 degrees
J. Phys. B 42, 085203 (2009)

e + $\mathbf{N_2}$	5–20 eV	Exp

523. Hemal N. Varambhia, Monika Gupta, Alexandre Faure, K. L. Baluja, Jonathan Tennyson
Electron collision with the silicon monoxide (SiO) molecule using the R-matrix method
J. Phys. B 42, 095204 (2009)

e + SiO	0–10 eV	Th

524. S. Caprasecca, J. D. Gorfinkiel, D. Bouchiha, L. G. Caron
Multiple scattering approach to elastic electron collisions with molecular clusters
J. Phys. B 42, 095205 (2009)

e + $\mathbf{H_4O_2}$	0–10 eV	Th

525. Brent R. Yates, Kyle Keane, Murtadha A. Khakoo
Near-threshold electron impact doubly differential cross sections for the ionization of neon and xenon
J. Phys. B 42, 095206 (2009)

e + Xe	14–40 eV	Exp
e + Ne	14–40 eV	Exp

526. K. Chakrabarti, Jonathan Tennyson
R-matrix calculation of electron collisions with the BF+ molecular ion
J. Phys. B 42, 105204 (2009)

$\mathbf{e + BF^{+}}$	0−20 eV	Th

527. J. Colgan, M. Foster, M. S. Pindzola, I. Bray, A. T. Stelbovics, D. V. Fursa
Triple differential cross sections for the electron-impact ionization of helium at 102 eV incident energy
J. Phys. B 42, 145002 (2009)

e + He	102 eV	Th

528. M. Hoshino, H. Kato, H. Tanaka, I. Bray, D. V. Fursa, S. J. Buckman, O. Ingolfsson, M. J. Brunger
Benchmark differential cross sections for electron impact excitation of the n=2 states in helium at near-ionization-threshold energies
J. Phys. B 42, 145202 (2009)

e + He	23.5−35 eV	E/T

529. A. Lahmam-Bennani, A. Naja, E. M. Staicu Casagrande, N. Okumus, C. DalCappello, I. Charpentier, S. Houamer
Dynamics of electron impact ionization of the outer and inner valence (1t(2) and 2a(1)) molecular orbitals of CH4 at intermediate and large ion recoil momentum
J. Phys. B 42, 165201 (2009)

$\mathbf{e + CH_4}$	500 eV	E/T

530. A. Borovik, A. Kupliauskiene
The 5p(6) autoionization cross section of cesium atoms: contribution to single ionization by electron impact
J. Phys. B 42, 165202 (2009)

e + Kr	12.3−16.6 eV	E/T
e + Cs	12.3−16.6 eV	E/T

531. J. Colgan, O. Al-Hagan, D. H. Madison, A. J. Murray, M. S. Pindzola
Deep interference minima in non-coplanar triple differential cross sections for the electron-impact ionization of small atoms and molecules
J. Phys. B 42, 171001 (2009)

$\mathbf{e + H_2}$	33.6 eV−64.6 eV	E/T
e + He	33.6 eV−64.6 eV	E/T
e + H	33.6 eV−64.6 eV	E/T

532. Hao Feng, Weiguo Sun, Michael A. Morrison, Andrew N. Feldt
Exact inclusion of exchange in calculations of cross sections for vibrational excitation of N-2 by low-energy electrons
J. Phys. B 42, 175201 (2009)

$\mathbf{e + N_2}$	0−10 eV	Th
$\mathbf{e + N_2}$	0−10 eV	Th
$\mathbf{e + N_2}$	0−10 eV	Th

533. C. P. Ballance, J. A. Ludlow, M. S. Pindzola, S. D. Loch
Electron-impact ionization of ground and metastable neon
J. Phys. B 42, 175202 (2009)

e + Ne	0−100 eV	Th

534. A. C. Renwick, I. Bray, D. V. Fursa, J. Jacobi, H. Knopp, S. Schippers, A. Mueller
Electron-impact ionization of B3+ ions
J. Phys. B 42, 175203 (2009)

$\mathbf{e + B^{3+}}$	0−2000 eV	E/T

535. Xianming Liu, Paul V. Johnson, Charles P. Malone, Jason A. Young, Donald E. Shemansky, Isik Kanik
Electron-impact excitation and emission cross sections of the H-2 B ' (1)Sigma(+)(u) and D (1)Pi(u) states and rotational dependence of photodissociation cross sections of the B ' (1)Sigma(+)(u) and D (1)Pi(u) continua
J. Phys. B 42, 185203 (2009)

e + H_2	13.5–1000 eV	Th

536. M. A. Khodorkovskii, S. V. Murashov, T. O. Artamonova, L. P. Rakcheeva, A. A. Beliaeva, A. L. Shakhmin, D. Michael, N. A. Timofeev, A. S. Mel'nikov, I. A. Shevkunov, G. Zissis
Excitation of water molecules by electron impact with formation of OH-radicals in the A(2)Sigma(+) state
J. Phys. B 42, 215201 (2009)

e + H_2O	0–120 eV	Exp
e + OH	0–120 eV	Exp
e + H_2O	0–120 eV	Exp
e + OH	0–120 eV	Exp

537. M. S. Pindzola, J. A. Ludlow, F. Robicheaux, J. Colgan, D. C. Griffin
Electron-impact double ionization of magnesium
J. Phys. B 42, 215204 (2009)

e + Mg	0–100 eV	Th

538. C. P. Malone, P. V. Johnson, J. A. Young, X. Liu, B. Ajdari, M. A. Khakoo, I. Kanik
Integral cross sections for electron-impact excitation of the C-3 Pi(u), E-3 Sigma(+)(g) and a " (1)Sigma(+)(g) states of N-2
J. Phys. B 42, 225202 (2009)

e + N_2	13–100 eV	Exp

539. Yukikazu Itikawa
Cross Sections for Electron Collisions with Oxygen Molecules
J. Phys. Chem. Ref. Data 38, 1 (2009)

e + O_2	0–1000 eV	E/T
e + O_2	0–1000 eV	E/T
e + O_2	0–1000 eV	E/T
e + O_2	0–1000 eV	E/T
e + O_2	0–1000 eV	E/T
e + O_2	0–1000 eV	E/T
e + O_2	0–1000 eV	E/T

540. K. N. Joshipura, Sumona S. Gangopadhyay, Harshit N. Kothari, Foram A. Shelat
Total electron scattering and ionization of N, N-2 and metastable excited N-2*(A(3)Sigma u(+)): Theoretical cross sections
Phys. Lett. A 373, 2876 (2009)

e + N_2	0–1 keV	E/T
e + N	0–1 keV	E/T
e + N_2	0–1 keV	E/T
e + N	0–1 keV	E/T
e + N_2	0–1 keV	E/T
e + N	0–1 keV	E/T

541. R. Celiberto, R. K. Janev, D. Reiter
Basic molecular processes for hydrocarbon spectroscopy in fusion edge plasmas: vibrationally state-selective excitation of A (2)Delta, B (2)Sigma(-) and C (2)Sigma(+) states of CH by electron impact
Plasma Phys. and Controlled Fusion 51, 085012 (2009)

e + CH	0–30 eV	Th

542. S. D. Loch, C. P. Ballance, M. S. Pindzola, D. P. Stotler
The role of excited state ionization data on H and He generalized collisional-radiative coefficients
Plasma Phys. and Controlled Fusion 51, 105006 (2009)

$\mathbf{e + H^+}$	0–100 eV	Th
e + He	0–100 eV	Th
e + H	0–100 eV	Th

543. Michal Tarana, Bernd M. Nestmann, Jiri Horacek
R-matrix calculations of the (2)A(g) elastic electron scattering off the Li-2 molecule
Phys. Rev. A 79, 012716 (2009)

$\mathbf{e + Li_2}$	0–2.5 eV	Th

544. C. P. Malone, P. V. Johnson, I. Kanik, B. Ajdari, M. A. Khakoo
Electron-impact excitation of molecular nitrogen. I. Excitation of the C (3)Pi(u), E (3)Sigma(+)(g), and a(') (1)Sigma(+)(g) states
Phys. Rev. A 79, 032704 (2009)

$\mathbf{e + N_2}$	13–100 eV	Exp

545. C. P. Malone, P. V. Johnson, I. Kanik, B. Ajdari, S. S. Rahman, S. S. Bata, A. Emigh, M. A. Khakoo
Electron-impact excitation of molecular nitrogen. II. Vibrationally resolved excitation of the C (3)Pi(u)(v(')) state
Phys. Rev. A 79, 032705 (2009)

$\mathbf{e + N_2}$	13–100 eV	Exp

546. K. Fennane, J. -Cl. Dousse, J. Hoszowska, M. Berset, W. Cao, Y. -P. Maillard, J. Szlachetko, M. Szlachetko, M. Kavcic
Double K-shell ionization of Al induced by photon and electron impact
Phys. Rev. A 79, 032708 (2009)

e + Al	0–25 keV	Exp

547. Hema Munjal, K. L. Baluja, Jonathan Tennyson
Electron collisions with the NO2 radical using the R-matrix method
Phys. Rev. A 79, 032712 (2009)

$\mathbf{e + NO_2}$	1–12 eV	Th
$\mathbf{e + NO_2}$	1–12 eV	Th

548. J. A. Ludlow, C. P. Ballance, S. D. Loch, M. S. Pindzola, D. C. Griffin
Electron-impact single ionization of Mg and Al+
Phys. Rev. A 79, 032715 (2009)

$\mathbf{e + Al^+}$	1–1000 eV	Th
e + Mg	1–1000 eV	Th

549. S. A. Napier, D. Cvejanovic, J. F. Williams, L. Pravica, D. Fursa, I. Bray, O. Zatsarinny, K. Bartschat
Emission cross sections for electron-impact excitation of zinc atoms
Phys. Rev. A 79, 042702 (2009)

e + Zn	0–300 eV	E/T

550. S. J. Brotton, E. Vyskocil, W. Kedzierski, J. W. McConkey
Dissociative excitation of H2S by electron impact
Phys. Rev. A 79, 042709 (2009)

e + H_2S	0–300 eV	Exp
e + H_2S	0–300 eV	Exp

551. F. Juettemann, G. F. Hanne, O. Zatsarinny, K. Bartschat
Spin-resolved electron-impact excitation of the 6s6p (J=1) states in mercury
Phys. Rev. A 79, 042712 (2009)

e + Hg	0–80 eV	E/T

552. O. Zatsarinny, K. Bartschat
Fully relativistic B-spline R-matrix calculations for electron collisions with mercury
Phys. Rev. A 79, 042713 (2009)

e + Hg	0–200 eV	E/T

553. E. M. Bahati, M. Fogle, C. R. Vane, M. E. Bannister, R. D. Thomas, V. Zhaunerchyk
Electron-impact dissociation of CD3+ and CH3+ ions producing CD2+, CH+ and C+ fragment ions
Phys. Rev. A 79, 052703 (2009)

e + $CH_3{}^+$	0–100 eV	Exp
e + $CD_3{}^+$	0–100 eV	Exp

554. J. Colgan, O. Al-Hagan, D. H. Madison, C. Kaiser, A. J. Murray, M. S. Pindzola
Triple differential cross sections for the electron-impact ionization of H-2 molecules for equal and unequal outgoing electron energies
Phys. Rev. A 79, 052704 (2009)

e + H_2	35.4 eV	Th

555. Jingjun Zhu, Zhu An, Mantian Liu, Lixia Tian
Measurements of the K-shell ionization cross sections of Si by 3-25-keV electron impact using the thick-target method
Phys. Rev. A 79, 052710 (2009)

e + Si	3–25 keV	Exp

556. M. A. Khakoo, C. Winstead, V. McKoy
Vibrational excitation of water by electron impact
Phys. Rev. A 79, 052711 (2009)

e + H_2O	0–100 eV	E/T

557. J. Franz, I. Baccarelli, S. Caprasecca, F. A. Gianturco
Computed vibrational excitation of CF4 by low-energy electrons and positrons: Comparing calculations and experiments
Phys. Rev. A 80, 012709 (2009)

e + CF_4	0–1.5 eV	Th

558. R. Celiberto, R. K. Janev, J. M. Wadehra, A. Laricchiuta
Cross sections for 14-eV e-H-2 resonant collisions: Dissociative electron attachment
Phys. Rev. A 80, 012712 (2009)

e + H_2	2–18 eV	Th
e + H_2	2–18 eV	Th

559. M. -T. Lee, I. Iga, L. E. Machado, L. M. Brescansin
Theoretical investigation of electron collisions with sulfur monoxide in the low- and intermediate-energy range
Phys. Rev. A 80, 022706 (2009)

e + SO	1–500 eV	Th

560. V. Suvorov, P. J. O. Teubner, V. Karaganov, K. Ratnavelu, Y. Zhou, M. J. Brunger
Integral cross sections for electron-impact excitation of the 4 P-2 state in copper
Phys. Rev. A 80, 022711 (2009)

e + Cu	0–100 eV	E/T

561. Dmitry V. Fursa, Christopher J. Bostock, Igor Bray
Relativistic convergent close-coupling method: Calculations of electron scattering from cesium
Phys. Rev. A 80, 022717 (2009)

e + Cs	5–15 eV	Th
e + Cs	5–15 eV	Th

562. Savinder Kaur, K. L. Baluja
Electron-impact study of AlH using the R-matrix method
Phys. Rev. A 80, 042701 (2009)

e + AlH		Th
e + AlH		Th
e + AlH		Th

563. Christopher J. Bostock, Dmitry V. Fursa, Igor Bray
Relativistic convergent close-coupling method: Calculation of electron scattering from hydrogenlike ions
Phys. Rev. A 80, 052708 (2009)

e + $\mathbf{U^{91+}}$	0–600 eV	Th

564. L. R. Hargreaves, C. Colyer, M. A. Stevenson, B. Lohmann, O. Al-Hagan, D. H. Madison, C. G. Ning
(e, 2e) study of two-center interference effects in the ionization of N-2
Phys. Rev. A 80, 062704 (2009)

e + $\mathbf{N_2}$	75, 150 eV	E/T

565. R. O. Jung, John B. Boffard, L. W. Anderson, Chun C. Lin
Excitation into 5p(5)7p levels from the ground level and the J=2 metastable level of Xe
Phys. Rev. A 80, 062708 (2009)

e + Xe		Exp

566. T. C. Freitas, M. A. P. Lima, S. Canuto, M. H. F. Bettega
Electron collisions with the CH2O-H2O complex
Phys. Rev. A 80, 062710 (2009)

e + $\mathbf{H_2O}$	0.1–10 eV	Th
e + $\mathbf{CH_2O}$	0.1–10 eV	Th

567. Vladislav V. Serov, Boghos B. Joulakian
Implementation of the external complex scaling method in spheroidal coordinates: Impact ionization of molecular hydrogen
Phys. Rev. A 80, 062713 (2009)

e + H_2	4081 eV	Th

568. Yu. M. Smirnov
Electron impact excitation cross sections of tungsten atom
High Temperature 47, 13 (2009)

e + W	50 eV	Exp

569. V. Jonauskas, S. Kucas, R. Karazija
ELECTRON-IMPACT DOUBLE IONIZATION OF TUNGSTEN ATOMS AND IONS AT LOW IONIZATION STAGES
Lithuanian Phys. J. 49, 415 (2009)

e + W^{6+}	0−5000 eV	Exp
e + W^{4+}	0−5000 eV	Exp
e + W^{2+}	0−5000 eV	Exp
e + W	0−5000 eV	Exp

570. P. Bryans, H. Kreckel, E. Roueff, V. Wakelam, D. W. Savin
MOLECULAR CLOUD CHEMISTRY AND THE IMPORTANCE OF DIELECTRONIC RECOMBINATION
Astrophys. J. 694, 286 (2009)

e + Mg^{+}	0−1000 K	Th
e + Na^{+}	0−1000 K	Th
e + O^{+}	0−1000 K	Th
e + N^{+}	0−1000 K	Th
e + C^{+}	0−1000 K	Th
e + He^{+}	0−1000 K	Th

571. Li Zhou, Fan-Chang Meng, Min Huang, Chong-Yang Chen, Yan-Sen Wang
Dielectronic recombination of Co-like tantalum
Chin. Phys. B 18, 3409 (2009)

e + Ta^{46+}	1−1E5 eV	Th

572. Zhi-Min Hu, Jia-Min Yang, Ji-Yan Zhang, Tuo Zhu, Bao-Han Zhang, Yao-Nan Ding, Zhi-Jian Zheng, Bin Duan, Yue-Ming Li, Jun Yan
Measurement of the KLL Dielectronic Recombination Resonances in He-like to C-like Kr Ions
Chin. Phys. Lett. 26, 033401 (2009)

e + Kr^{30+}	8.6−9.6 keV	Exp
e + Kr^{31+}	8.6−9.6 keV	Exp
e + Kr^{32+}	8.6−9.6 keV	Exp
e + Kr^{33+}	8.6−9.6 keV	Exp
e + Kr^{34+}	8.6−9.6 keV	Exp

573. Bin Zhou, Shu-Min Li
Electron-Helium Scattering in a Bichromatic Laser Field in the Second-Order Born Approximation
Chin. Phys. Lett. 26, 043401 (2009)

e + He	9.5 eV	Th

574. Qiu-Bo Hu, Jin-Feng Sun
Laser-Assisted Elastic Electron Scattering from Argon
Commun. Theor. Phys. 51, 131 (2009)

e + Ar	8−10.5 eV	Th

575. V. A. Bernshtam, Yu. Ralchenko, Y. Maron
Electron impact ionization of helium isoelectronic systems
Eur. Phys. J. D 51, 319 (2009)

e + Ar^{16+}	1e2−1e5 eV	E/T
e + O^{6+}	1e2−1e5 eV	E/T
e + N^{5+}	1e2−1e5 eV	E/T
e + B^{3+}	1e2−1e5 eV	E/T

576. S. P. Purohit, K. C. Mathur
Resonant laser assisted elastic scattering of electrons by lithium and sodium atoms
Eur. Phys. J. D 53, 173 (2009)

e + Na	50?150 eV	Th
e + Li	50?150 eV	Th

577. M. Vos, M. R. Went
Elastic electron scattering from hydrogen molecules at high-momentum transfer
J. Phys. B 42, 065204 (2009)

e + Xe	750−7000 eV	Th
e + H	750−7000 eV	Th

578. R. P. McEachran, A. D. Stauffer
An optical potential method for elastic electron and positron scattering from argon
J. Phys. B 42, 075202 (2009)

e + Ar	5−300 eV	E/T

579. A. G. Harvey, J. Tennyson
Electron re-scattering from aligned linear molecules using the R-matrix method
J. Phys. B 42, 095101 (2009)

e + CO$_2$	0−25 eV	Th
e + H$_2$	0−25 eV	Th

580. Fan-Chang Meng, Li Zhou, Min Huang, Chong-Yang Chen, Yan-Sen Wang, Ya-Ming Zou
Dielectronic recombination rate coefficients for the CoI isoelectronic sequence
J. Phys. B 42, 105203 (2009)

e + U^{65+}	0.5Et − 15Et	Th
e + At^{58+}	0.5Et − 15Et	Th
e + Au^{52+}	0.5Et − 15Et	Th
e + W^{47+}	0.5Et − 15Et	Th
e + Dy^{39+}	0.5Et − 15Et	Th
e + Pr^{32+}	0.5Et − 15Et	Th
e + Xe^{27+}	0.5Et − 15Et	Th
e + Ag^{20+}	0.5Et − 15Et	Th
e + Mo^{15+}	0.5Et − 15Et	Th
e + Kr^{9+}	0.5Et − 15Et	Th

581. Toru Morishita, Misaki Okunishi, Kozo Shimada, Georg Pruemper, Zhangjin Chen, Shinichi Watanabe, Kiyoshi Ueda, C. D. Lin
Retrieval of experimental differential electron-ion elastic scattering cross sections from high-energy ATI spectra of rare gas atoms by infrared lasers
J. Phys. B 42, 105205 (2009)

e + Xe		E/T
e + Kr		E/T
e + Ar		E/T

582. L' Malinovsky, P. Lukac, V. Foltin, I. Morva, M. Morvova
On the electron temperature dependence of the dissociative recombination of Ne-2(+) ions with electrons
J. Phys. B 42, 105701 (2009)

$\mathbf{e + Ne_2^+}$	300−10000K	Th
$\mathbf{e + Ne_2^+}$	300−10000K	Th

583. Z. Rouabah, N. Bouarissa, C. Champion
Improved expression for calculating electron transport cross sections
Phys. Lett. A 373, 282 (2009)

e + Au	50−2000 eV	Th
e + Nd	50−2000 eV	Th
e + Ag	50−2000 eV	Th
e + Cu	50−2000 eV	Th
e + Al	50−2000 eV	Th
e + H	50−2000 eV	Th

584. Y. Khajuria, S. Sunil Kumar, P. C. Deshmukh
Triple differential cross section in (e, 2e) collisions for atomic potassium
Phys. Lett. A 373, 4442 (2009)

e + K	6−60 eV	Th

585. K. G. Bhushan, K. C. Rao, S. C. Gadkari, J. V. Yakhmi, S. K. Gupta
Elastic differential cross sections for electron scattering from SF6 and CS2
Phys. Rev. A 79, 012702 (2009)

$\mathbf{e + CS_2}$	30 eV to 500 eV	Exp
$\mathbf{e + SF_6}$	30 eV to 500 eV	Exp
$\mathbf{e + CS_2}$	30 eV to 500 eV	Exp
$\mathbf{e + SF_6}$	30 eV to 500 eV	Exp

586. M. A. Stevenson, L. R. Hargreaves, B. Lohmann, I. Bray, D. V. Fursa, K. Bartschat, A. Kheifets
Fully differential cross-section measurements for electron-impact ionization of neon and xenon
Phys. Rev. A 79, 012709 (2009)

e + Xe	150 eV	E/T
e + Ne	150 eV	E/T

587. H. Takagi, S. Hara, H. Sato
Off-the-energy-shell effect in the dissociative recombination of HD+
Phys. Rev. A 79, 012715 (2009)

$\mathbf{e + HD^+}$	0.0001−1 eV	Th
$\mathbf{e + HD^+}$	0.0001−1 eV	Th

588. Daniel J. Haxton, Chris H. Greene
Ab initio frame-transformation calculations of direct and indirect dissociative recombination rates of HeH++e(-)
Phys. Rev. A 79, 022701 (2009)

e + HeD	0.0001−1 eV	Th
e + HeH	0.0001−1 eV	Th
e + HeD	0.0001−1 eV	Th
e + HeH	0.0001−1 eV	Th

589. A. Cerkic, E. Hasovic, D. B. Milosevic, W. Becker
High-order above-threshold ionization beyond the first-order Born approximation
Phys. Rev. A 79, 033413 (2009)

e + Ar	39, 23, and 16.5 eV	Th

590. J. R. Francis-Staite, T. M. Maddern, M. J. Brunger, S. J. Buckman, C. Winstead, V. McKoy, M. A. Bolorizadeh, H. Cho
Differential and integral cross sections for elastic electron scattering from CF2
Phys. Rev. A 79, 052705 (2009)

e + CF_2	2?20 eV,	Exp

591. H. Kato, M. C. Garcia, T. Asahina, M. Hoshino, C. Makochekanwa, H. Tanaka, F. Blanco, G. Garcia
Absolute elastic differential cross sections for electron scattering by C6H5CH3 and C6H5CF3 at 1.5-200 eV: A comparative experimental and theoretical study with C6H6
Phys. Rev. A 79, 062703 (2009)

e + $C_6H_5CH_3$	1.5−200 eV	Exp
e + C_6H_6	1.5−200 eV	Exp

592. Z. Felfli, A. Z. Msezane, D. Sokolovski
Differential cross sections for low-energy electron elastic scattering by lanthanide atoms: La, Ce, Pr, Nd, Eu, Gd, Dy, and Tm
Phys. Rev. A 79, 062709 (2009)

e + Tm	0−1 eV	Th
e + Dy	0−1 eV	Th
e + Gd	0−1 eV	Th
e + Eu	0−1 eV	Th
e + Nd	0−1 eV	Th
e + Pr	0−1 eV	Th
e + Ce	0−1 eV	Th
e + La	0−1 eV	Th

593. J. B. Roos, M. Larsson, A. Larson, A. E. Orel
Dissociative recombination of BeH+
Phys. Rev. A 80, 012501 (2009)

e + BeH^+	0−5 eV	Th
e + BeH^+	0−5 eV	Th

594. O. May, J. Fedor, M. Allan
Isotope effect in dissociative electron attachment to acetylene
Phys. Rev. A 80, 012706 (2009)

e + C_2D_2	0−10 eV	Exp
e + C_2H_2	0−10 eV	Exp
e + C_2D_2	0−10 eV	Exp
e + C_2H_2	0−10 eV	Exp

595. S. T. Chourou, A. E. Orel
Dissociative electron attachment to HCN and HNC
Phys. Rev. A 80, 032709 (2009)

e + HNC	0−7 eV	Th
e + HCN	0−7 eV	Th
e + HNC	0−7 eV	Th
e + HCN	0−7 eV	Th

596. S. T. Chourou, A. E. Orel
Improved calculation on the isotope effect in dissociative electron attachment to acetylene
Phys. Rev. A 80, 034701 (2009)

e + C_2D_2	0−7 eV	Th
e + C_2H_2	0−7 eV	Th
e + C_2D_2	0−7 eV	Th
e + C_2H_2	0−7 eV	Th

597. X. M. Tong, N. Nakamura, S. Ohtani, T. Watanabe, N. Toshima
Green's function for multielectron ions and its application to radiative recombination involving dielectronic recombinations
Phys. Rev. A 80, 042502 (2009)

e + Hg^{76+}	49.0−50.2 eV	Th

598. Nicolas Douguet, Viatcheslav Kokoouline, Chris H. Greene
Theory of dissociative recombination of a linear triatomic ion with permanent electric dipole moment: Study of HCO+
Phys. Rev. A 80, 062712 (2009)

e + HCO^+	0.001−1 eV	E/T
e + HCO^+	0.001−1 eV	E/T

599. Ch. Jungen, S. T. Pratt
Jahn-Teller Interactions in the Dissociative Recombination of H-3(+)
Phys. Rev. Lett. 102, 023201 (2009)

e + $D_3{}^+$	0.001−1 eV	E/T
e + D_2H	0.001−1 eV	E/T
e + H_2D^+	0.001−1 eV	E/T
e + $H_3{}^+$	0.001−1 eV	E/T
e + $D_3{}^+$	0.001−1 eV	E/T
e + D_2H	0.001−1 eV	E/T
e + H_2D^+	0.001−1 eV	E/T
e + $H_3{}^+$	0.001−1 eV	E/T

600. G. Purohit, Vinod Patidar, K. K. Sud
(e, 2e) triple differential cross sections of Ca atoms at low energies
Phys. Scr. 80, 065301 (2009)

e + Ca	10.11− 24.6 eV	E/T

601. J. L. McLain, N. G. Adams
Flowing afterglow studies of temperature dependencies for electron dissociative recombination of HCNH+, CH3CNH+ and CH3CH2CNH+ and their symmetrical proton-bound dimers
Planet. Space Sci. 57, 1642 (2009)

e + $HCNH^+$	100−700 K	E/T
e + $HCNH^+$	100−700 K	E/T

602. O. Mikus, P. Lukac, I. Morva, Z. Zabudla, J. Trnovec, M. Morvova
Electron and gas temperature dependences of the dissociative recombination coefficient of molecular ions Ne-2(+) with electrons
Plasma Sources Sci. Technol. 18, 025031 (2009)

e + $Ne_2{}^+$	200−700 K	E/T
e + $Ne_2{}^+$	200−700 K	E/T

603. E. Landi, A. K. Bhatia
Atomic data and spectral line intensities for Ca XVII
At. Data Nucl. Data Tables 95, 155 (2009)

e + Ca^{16+}	15−225 Ry	Th

604. Li-Guang Jiao, Ya-Jun Zhou, Rong-Mei Yu
Low Energy Scattering of Electrons by Sodium
Chin. Phys. Lett. 26, 023401 (2009)

e + Na	0.5− 6.5 eV	Th

605. F. Sebastianelli, F. A. Gianturco, T. Stoecklin, I. Baccarelli
Scattering of electrons by gaseous CS((1)Sigma): The role of short-range forces on the very-low energy (2)Pi resonance
Chem. Phys. Lett. 476, 182 (2009)

e + CS	1−100 eV	Th
e + CS	1−100 eV	Th

606. D. H. Shi, J. F. Sun, Y. F. Liu, Z. L. Zhu, H. Ma
Total cross sections of electron scattering by several sulfur-containing molecules OCS, SO2, SF4, SF6, SF5CF3, SO2Cl2 and SO2ClF at 30-5000 eV
Eur. Phys. J. D 54, 43 (2009)

e + $\mathbf{SF_6}$	30−5000 eV	Th
e + $\mathbf{SF_4}$	30−5000 eV	Th
e + $\mathbf{SO_2}$	30−5000 eV	Th

607. Z. Idziaszek, G. Karwasz
Modified effective-range theory for low energy e-N-2 scattering
Eur. Phys. J. D 57, 347 (2009)

e + $\mathbf{N_2}$	0.1?1.0 eV	E/T
e + $\mathbf{N_2}$	0.1?1.0 eV	E/T

608. T. H. Hoffmann, M. Allan, K. Franz, M-W Ruf, H. Hotop, G. Sauter, W. Meyer
Resonance structure in electron-N-2 scattering around 11.5 eV: high-resolution measurements, ab initio calculations and line shape analyses
J. Phys. B 42, 215202 (2009)

e + $\mathbf{N_2}^-$	10 eV	E/T
e + $\mathbf{N_2}$	10 eV	E/T
e + $\mathbf{N_2}^-$	10 eV	E/T
e + $\mathbf{N_2}$	10 eV	E/T
e + $\mathbf{N_2}^-$	10 eV	E/T
e + $\mathbf{N_2}$	10 eV	E/T

609. P. Wickramarachchi, P. Palihawadana, G. Villela, W. M. Ariyasinghe
Electron scattering from alkenes in the energy range 200-4500 eV
Nucl. Instrum. Methods Phys. Res. B 267, 3391 (2009)

e + $\mathbf{C_4H_6}$	200−4500 eV	Exp
e + $\mathbf{C_4H_8}$	200−4500 eV	Exp
e + $\mathbf{C_3H_6}$	200−4500 eV	Exp
e + $\mathbf{C_2H_4}$	200−4500 eV	Exp

610. T. C. Freitas, M. H. F. Bettega
Scattering of low-energy electrons by C2H4O
Phys. Rev. A 79, 042714 (2009)

e + $\mathbf{C_2H_4O}$	0.7−20 eV	Th
e + $\mathbf{C_2H_4O}$	0.7−20 eV	Th

611. Douglas H. Sampson, Hong Lin Zhang, Christopher J. Fontes
A fully relativistic approach for calculating atomic data for highly charged ions
Phys. Rep. 477, 111 (2009)

e + U^{82+}	150 eV, 30000 eV	Th

612. Gorur Govinda Raju
Scaling of Resonance in Total Scattering Cross Section in Gases
IEEE Transactions on Dielectrics and Electrical Insulation 16, 1199 (2009)

e + SiH_4	1e−3 − 1e3 eV	Exp
e + CH_4	1e−3 − 1e3 eV	Exp
e + CF_4	1e−3 − 1e3 eV	Exp
e + N_2O	1e−3 − 1e3 eV	Exp
e + SF_6	1e−3 − 1e3 eV	Exp
e + Xe	1e−3 − 1e3 eV	Exp
e + Kr	1e−3 − 1e3 eV	Exp
e + Ar	1e−3 − 1e3 eV	Exp

613. Shi-Yan Sun, Xiang-Fu Jia, Xiang-Yang Miao, Jun-Fang Zhang, Yi Xie, Xiong-Wei Li, Wen-Qiang Shi
The effect of dynamical screening on helium (e, 2e) fully differential cross-sections
Chin. Phys. B 18, 2744 (2009)

e + He	102 eV	E/T

614. Jeffrey F. Friedman, Thomas M. Miller, Linda C. Schaffer, A. A. Viggiano, Ilya I. Fabrikant
Electron attachment to Cl-2 from 300 to 1100 K: Experiment and theory
Phys. Rev. A 79, 032707 (2009)

e + Cl_2	300−1100 K	Exp
e + Cl_2	300−1100 K	Exp

615. Gordon A. Gallup, Paul D. Burrow, Ilya I. Fabrikant
Electron-induced bond breaking at low energies in HCOOH and glycine: The role of very short-lived sigma(*) anion states
Phys. Rev. A 79, 042701 (2009)

e + HCOOH	0.5−2.5 eV	Th
e + HCOOH	0.5−2.5 eV	Th

616. Thomas M. Miller, Jeffrey F. Friedman, John S. Williamson, Linda C. Schaffer, A. A. Viggiano
A new instrument for thermal electron attachment at high temperature: NF3 and CH3Cl attachment rate constants up to 1100 K
Rev. Sci. Instrum. 80, 034104 (2009)

e + CH_3Cl	300−1200K	Exp
e + NF_3	300−1200K	Exp
e + CH_3Cl	300−1200K	Exp
e + NF_3	300−1200K	Exp

617. S. S. Tayal, O. Zatsarinny
Electron excitation collision strengths for transitions in K II
Astron. Astrophys. 510, A79 (2010)

e + K^+	1000−1000000K	Th

618. C. M. Cassidy, C. A. Ramsbottom, M. P. Scott, al. et
Electron-impact excitation of Ni II Collision strengths and effective collision strengths for low-lying fine-structure forbidden transitions
Astron. Astrophys. 513, A55 (2010)

e + Ni^+	10−100000K	Th

619. I. R. Wasson, C. A. Ramsbottom, P. H. Norrington
Electron-impact excitation of Cr II A theoretical calculation of collision and effective collision strengths for forbidden transitions
Astron. Astrophys. 524, A35 (2010)

e + Cr^{+}	1000−100000K	Th

620. K. Hamada, K. M. Aggarwal, K. Akita, al. et
Effective collision strengths for optically allowed transitions among degenerate levels of hydrogenic ions with 2 ¡= Z ¡= 30
At. Data Nucl. Data Tables 96, 481 (2010)

e + Zn^{29+}	1E−6/Z^2-10/Z^2K	Th
e + Cu^{28+}	1E−6/Z^2-10/Z^2K	Th
e + Ni	1E−6/Z^2-10/Z^2K	Th
e + Co^{26+}	1E−6/Z^2-10/Z^2K	Th
e + Fe^{25+}	1E−6/Z^2-10/Z^2K	Th
e + Mn^{24+}	1E−6/Z^2-10/Z^2K	Th
e + Cr^{23+}	1E−6/Z^2-10/Z^2K	Th
e + V^{22+}	1E−6/Z^2-10/Z^2K	Th
e + Ti^{21+}	1E−6/Z^2-10/Z^2K	Th
e + Sc^{20+}	1E−6/Z^2-10/Z^2K	Th
e + Ca^{19+}	1E−6/Z^2-10/Z^2K	Th
e + K^{18+}	1E−6/Z^2-10/Z^2K	Th
e + Ar^{17+}	1E−6/Z^2-10/Z^2K	Th
e + Cl^{16+}	1E−6/Z^2-10/Z^2K	Th
e + S^{15+}	1E−6/Z^2-10/Z^2K	Th
e + P^{14+}	1E−6/Z^2-10/Z^2K	Th
e + Si^{13+}	1E−6/Z^2-10/Z^2K	Th
e + Al^{12+}	1E−6/Z^2-10/Z^2K	Th
e + Mg^{11+}	1E−6/Z^2-10/Z^2K	Th
e + Na^{10+}	1E−6/Z^2-10/Z^2K	Th
e + Ne^{9+}	1E−6/Z^2-10/Z^2K	Th
e + F^{8+}	1E−6/Z^2-10/Z^2K	Th
e + O^{7+}	1E−6/Z^2-10/Z^2K	Th
e + N^{6+}	1E−6/Z^2-10/Z^2K	Th
e + C^{5+}	1E−6/Z^2-10/Z^2K	Th
e + B^{4+}	1E−6/Z^2-10/Z^2K	Th
e + Be	1E−6/Z^2-10/Z^2K	Th
e + Li^{2+}	1E−6/Z^2-10/Z^2K	Th
e + He^{+}	1E−6/Z^2-10/Z^2K	Th

621. M. Hahn, D. Bernhardt, M. Lestinsky, al. et
STORAGE RING MEASUREMENT OF ELECTRON IMPACT IONIZATION FOR Mg7+ FORMING Mg8+
Astrophys. J. 712, 1166 (2010)

e + Mg^{7+}	200−1800eV	Exp

622. S. S. Tayal, O Zatsarinny
BREIT-PAULI TRANSITION PROBABILITIES AND ELECTRON EXCITATION COLLISION STRENGTHS FOR SINGLY IONIZED SULFUR
Astrophys. J., Suppl. Ser. 188, 32 (2010)

e + S^{+}	5000−100000K	Th

623. Ning-Xuan Yang, Chen-Zhong Dong, Jun Jiang, al. et
Electron impact excitation rate coefficients of N II ion
Chin. Phys. B 19, 093101 (2010)

e + N^{+}	2−12eV	Th

624. Ning-Xuan Yang, Jun Jiang, Chen-Zhong Dong
Differential and Integral Cross Sections for Electron Impact Excitation of Lithium
Chin. Phys. Lett. 27, 113401 (2010)

e + Li	0−25eV	Th

625. Ireneusz Linert, Izabela Lachowicz, Tomasz J. Wasowicz, al. et
Fragmentation of isoxazole molecules by electron impact in the energy range 10-85 eV
Chem. Phys. Lett. 498, 27 (2010)

e + CH	10−90eV	Exp

626. R. Riahi, Ph. Teulet, Z. BenLakhdar, al. et
Cross section and rate coefficient calculations for electron impact excitation, ionisation and dissociation of the X (1)Sigma(+)(g), c (3)Pi(u), a (3)Sigma(+)(g), e (3)Sigma(+)(u) and B ' (1)Sigma(+)(u) states of H-2
Eur. Phys. J. D 56, 61 (2010)

e + H_2	10−100eV	Th
e + H_2	10−100eV	Th

627. R. Riahi, Ph. Teulet, N. Jaidane, al. et
Cross section and rate coefficient calculations for electron impact excitation of the a (3)Pi, a ' (3)Sigma(+), d (3)Delta, e (3)Sigma(-), I (1)Sigma(+) and D (1)Delta states of CO
Eur. Phys. J. D 56, 67 (2010)

e + CO	0−50eV	Th
e + CO	0−50eV	Th

628. H. Cherkani-Hassani, S. Cherkani-Hassani, D. S. Belic, al. et
I. Electron-impact ionization and dissociation of C2H2+ and C2D2+
Eur. Phys. J. D 58, 75 (2010)

e + $C_2D_2{}^+$	6.5−2498.5eV	Exp
e + $C_2H_2{}^+$	6.5−2498.5eV	Exp
e + $C_2D_2{}^+$	6.5−2498.5eV	Exp
e + $C_2H_2{}^+$	6.5−2498.5eV	Exp

629. H. Cherkani-Hassani, D. S. Belic, J. J. Jureta, al et
II. Electron-impact dissociative excitation of C2H2+ and C2D2+
Eur. Phys. J. D 58, 85 (2010)

e + $C_2D_2{}^+$	6.5−2498.5eV	Exp
e + $C_2H_2{}^+$	6.5−2498.5eV	Exp

630. H. Cherkani-Hassani, D. S. Belic, J. J. Jureta, al. et
III. Electron-impact dissociative ionization of C2H2+ and C2D2+
Eur. Phys. J. D 58, 95 (2010)

e + $C_2D_2{}^+$	6.5−2498.5eV	Exp
e + $C_2H_2{}^+$	6.5−2498.5eV	Exp

631. B. W. Li, C. Z. Dong, J. Jiang, al. et
Electron-impact excitation of Ti21+ in Debye plasmas
Eur. Phys. J. D 59, 201 (2010)

e + Ti^{21+}	5400−24000eV	Th

632. M. Vinodkumar, K. Korot, P. C. Vinodkumar
Complex scattering potential - ionization contribution (CSP-ic) method for calculating total ionization cross sections on electron impact
Eur. Phys. J. D 59, 379 (2010)

$\mathbf{e + NH_3}$	15−2000eV	Th
$\mathbf{e + NO}$	15−2000eV	Th
$\mathbf{e + F}$	15−2000eV	Th
$\mathbf{e + O}$	15−2000eV	Th
$\mathbf{e + N}$	15−2000eV	Th
$\mathbf{e + C}$	15−2000eV	Th

633. J. Lecointre, H. Cherkani-Hassani, S. Cherkani-Hassani, al. et
Electron-impact ionization and dissociation of C2D+
Eur. Phys. J. D 60, 331 (2010)

$\mathbf{e + C_2D_2{}^+}$	2.1− 2495.1eV	Exp
$\mathbf{e + C_2H_2{}^+}$	2.1− 2495.1eV	Exp
$\mathbf{e + C_2D_2{}^+}$	2.1− 2495.1eV	Exp
$\mathbf{e + C_2H_2{}^+}$	2.1− 2495.1eV	Exp

634. Minaxi Vinodkumar, Rucha Dave, Harshad Bhutadia, al. et
Electron impact total ionization cross sections for halogens and their hydrides
Int. J. Mass Spectrom. 292, 7 (2010)

$\mathbf{e + HI}$	15 − 2000eV	Th
$\mathbf{e + HBr}$	15 − 2000eV	Th
$\mathbf{e + HCl}$	15 − 2000eV	Th
$\mathbf{e + HF}$	15 − 2000eV	Th
$\mathbf{e + I}$	15 − 2000eV	Th
$\mathbf{e + Br}$	15 − 2000eV	Th
$\mathbf{e + Cl}$	15 − 2000eV	Th
$\mathbf{e + F}$	15 − 2000eV	Th

635. Minaxi Vinodkumar, Kirti Korot, Harshad Bhutadia
Calculations of total and ionization cross-sections on electron impact for alkali metals (Li, Na, K) from threshold to 2 keV
Int. J. Mass Spectrom. 294, 54 (2010)

$\mathbf{e + K}$	0−2000eV	Th
$\mathbf{e + Na}$	0−2000eV	Th
$\mathbf{e + Li}$	0−2000eV	Th
$\mathbf{e + K}$	0−2000eV	Th
$\mathbf{e + Na}$	0−2000eV	Th
$\mathbf{e + Li}$	0−2000eV	Th

636. H. Kato, T. Asahina, H. Masui, al. et
Substitution effects in elastic electron collisions with CH3X (X=F, Cl, Br, I) molecules
J. Chem. Phys. 132, 074309 (2010)

$\mathbf{e + CH_3Br}$	50,100,200eV
$\mathbf{e + CH_3Cl}$	50,100,200eV
$\mathbf{e + CH_3I}$	50,100,200eV
$\mathbf{e + CH_3F}$	50,100,200eV
$\mathbf{e + CH_3Br}$	50,100,200eV
$\mathbf{e + CH_3Cl}$	50,100,200eV
$\mathbf{e + CH_3I}$	50,100,200eV
$\mathbf{e + CH_3F}$	50,100,200eV

637. You-Yan Wang, Jian-Min Sun, Lin-Fan Zhu
Cross sections for the valence shell excitations of nitrous oxide studied by fast electron impact
J. Chem. Phys. 132, 124301 (2010)

e + N_2O	6−5000eV	Exp

638. Minaxi Vinodkumar, Chetan Limbachiya, Harshad Bhutadia
Electron impact calculations of total ionization cross sections for environmentally sensitive diatomic and triatomic molecules from threshold to 5 keV
J. Phys. B 43, 015203 (2010)

e + S_2	15−5000eV	Th
e + OCS	15−5000eV	Th
e + CS_2	15−5000eV	Th
e + CS	15−5000eV	Th
e + CO_2	15−5000eV	Th
e + CO	15−5000eV	Th

639. M. S. Pindzola, C. P. Ballance, J. A. Ludlow, al. et
Electron-impact ionization of Xe24+
J. Phys. B 43, 025201 (2010)

e + Xe^{24+}	750−1250eV	Th

640. Y. C. Wang, Y. Zhou, Y. Cheng, al. et
Coupled channels optical method of electron impact on excited helium 2(1)S
J. Phys. B 43, 045201 (2010)

e + He	0−200eV	Th

641. M. S. Pindzola, C. P. Ballance, J. A. Ludlow, al. et
Electron-impact ionization of C2
J. Phys. B 43, 065201 (2010)

e + C_2	0− 50eV	Th

642. H. Kato, M. Hoshino, Y. Nagai, al. et
Resonant vibrational excitation of CH3X (X = F, Cl, Br and I) by low-energy electron impact
J. Phys. B 43, 065205 (2010)

e + CH_3I	6.5eV, 5.9eV, 5.5eV, 4.7eV	Exp
e + CH_3Br	6.5eV, 5.9eV, 5.5eV, 4.7eV	Exp
e + CH_3Cl	6.5eV, 5.9eV, 5.5eV, 4.7eV	Exp
e + CH_3F	6.5eV, 5.9eV, 5.5eV, 4.7eV	Exp

643. Juan A. Santana, Yasuyuki Ishikawa
Relativistic R-matrix close-coupling method based on the effective many-body Hamiltonian: electron-impact excitation of electric dipole-allowed and spin-forbidden transitions of the S4+ ion
J. Phys. B 43, 074030 (2010)

e + S^{4+}	10−16eV	Th

644. Oleg Zatsarinny, Klaus Bartschat
Benchmark calculations for near-threshold electron-impact excitation of krypton and xenon atoms
J. Phys. B 43, 074031 (2010)

e + Xe	0−12.5eV	Th
e + Kr	0−12.5eV	Th

645. J. Lecointre, J. J. Jureta, P. Defrance
Electron-impact dissociation and ionization of NH+: formation of N+ and N2+
J. Phys. B 43, 105202 (2010)

e + $\mathbf{NH^{+}}$	2.1−2495.1eV	Exp
e + $\mathbf{NH^{+}}$	2.1−2495.1eV	Exp

646. M. S. Pindzola, C. P. Ballance, F. Robicheaux, al. et
Electron-impact double ionization of beryllium
J. Phys. B 43, 105204 (2010)

e + Be	0−500eV	Th

647. A. K. F. Haque, M. R. Talukder, M. Shahjahan, al. et
An extended empirical formula for inner-shell ionization of atoms
J. Phys. B 43, 115201 (2010)

e + Pu	10−1E9eV	Th
e + Np	10−1E9eV	Th
e + U	10−1E9eV	Th
e + Pa	10−1E9eV	Th
e + Th	10−1E9eV	Th
e + Ac	10−1E9eV	Th
e + Ra	10−1E9eV	Th
e + Fr	10−1E9eV	Th
e + Rn	10−1E9eV	Th
e + At	10−1E9eV	Th
e + Po	10−1E9eV	Th
e + Bi	10−1E9eV	Th
e + Pb	10−1E9eV	Th
e + Tl	10−1E9eV	Th
e + Hg	10−1E9eV	Th
e + Au	10−1E9eV	Th
e + Pt	10−1E9eV	Th
e + Ir	10−1E9eV	Th
e + Os	10−1E9eV	Th
e + Re	10−1E9eV	Th
e + W	10−1E9eV	Th
e + Ta	10−1E9eV	Th
e + Hf	10−1E9eV	Th
e + Lu	10−1E9eV	Th
e + Yb	10−1E9eV	Th
e + Tm	10−1E9eV	Th
e + Er	10−1E9eV	Th
e + Ho	10−1E9eV	Th
e + Dy	10−1E9eV	Th
e + Tb	10−1E9eV	Th
e + Gd	10−1E9eV	Th
e + Eu	10−1E9eV	Th
e + Sm	10−1E9eV	Th
e + Pm	10−1E9eV	Th
e + Nd	10−1E9eV	Th
e + Pr	10−1E9eV	Th
e + Ce	10−1E9eV	Th
e + La	10−1E9eV	Th
e + Ba	10−1E9eV	Th
e + Cs	10−1E9eV	Th

e + Xe	10−1E9eV	Th
e + I	10−1E9eV	Th
e + Te	10−1E9eV	Th
e + Sb	10−1E9eV	Th
e + Sn	10−1E9eV	Th
e + In	10−1E9eV	Th
e + Cd	10−1E9eV	Th
e + Ag	10−1E9eV	Th
e + Pd	10−1E9eV	Th
e + Rh	10−1E9eV	Th
e + Ru	10−1E9eV	Th
e + Tc	10−1E9eV	Th
e + Mo	10−1E9eV	Th
e + Nb	10−1E9eV	Th
e + Zr	10−1E9eV	Th
e + Y	10−1E9eV	Th
e + Sr	10−1E9eV	Th
e + Rb	10−1E9eV	Th
e + Kr	10−1E9eV	Th
e + Br	10−1E9eV	Th
e + Se	10−1E9eV	Th
e + As	10−1E9eV	Th
e + Ge	10−1E9eV	Th
e + Ga	10−1E9eV	Th
e + Zn	10−1E9eV	Th
e + Cu	10−1E9eV	Th
e + Ni	10−1E9eV	Th
e + Co	10−1E9eV	Th
e + Fe	10−1E9eV	Th
e + Mn	10−1E9eV	Th
e + Cr	10−1E9eV	Th
e + V	10−1E9eV	Th
e + Ti	10−1E9eV	Th
e + Sc	10−1E9eV	Th
e + Ca	10−1E9eV	Th
e + K	10−1E9eV	Th
e + Ar	10−1E9eV	Th
e + Cl	10−1E9eV	Th
e + S	10−1E9eV	Th
e + P	10−1E9eV	Th
e + Si	10−1E9eV	Th
e + Al	10−1E9eV	Th
e + Mg	10−1E9eV	Th
e + Na	10−1E9eV	Th
e + Ne	10−1E9eV	Th
e + F	10−1E9eV	Th
e + O	10−1E9eV	Th
e + N	10−1E9eV	Th
e + C	10−1E9eV	Th
e + B	10−1E9eV	Th
e + Be	10−1E9eV	Th
e + Li	10−1E9eV	Th
e + He	10−1E9eV	Th
e + H	10−1E9eV	Th

648. Y. Wu, Z. An, Y. M. Duan, al. et
Measurements of L-shell x-ray production cross-sections of Gd and W by low energy electron impact
J. Phys. B 43, 135206 (2010)

e + W	9keV−40keV	Exp
e + Gd	9keV−40keV	Exp

649. K. N. Joshipura, Harshit N. Kothari, Foram A. Shelat, al. et
Electron scattering with metastable H-2*(c(3)Pi(u)) molecules: ionization and other total cross sections
J. Phys. B 43, 135207 (2010)

e + H_2		Th
e + H_2		Th

650. Klaus Bartschat, Anatoli S. Kheifets, Dmitry V. Fursa, al. et
Benchmark calculations for electron impact ionization and ionization-excitation of magnesium
J. Phys. B 43, 165205 (2010)

e + Mg		Th
e + Mg		Th

651. K. Wang, C. Y. Chen, M. Huang, al. et
Electron impact excitation for P-like Ni XIV
J. Phys. B 43, 175202 (2010)

e + Ni^{13+}	0−100eV	Th

652. E. V. Ovcharenko, A. I. Imre, A. N. Gomonai, al. et
Emission cross-sections of the In2+ ion VUV laser transitions at electron-In+ ion collisions
J. Phys. B 43, 175206 (2010)

e + In^{+}	33−120eV	Exp

653. D. S. Belic, J. Lecointre, P. Defrance
Electron impact multiple ionization of argon ions
J. Phys. B 43, 185203 (2010)

e + Ar^{+}	25−2495eV	Exp

654. J. D. Hein, C. Ududec, D. K. Sasaki, al. et
Integral cross sections for electron-impact ionization-excitation of laser-excited barium
J. Phys. B 43, 185206 (2010)

e + Be	10−50eV	Exp
e + Be	10−50eV	Exp

655. L. R. Hargreaves, M. A. Stevenson, B. Lohmann
Absolute triple-differential cross sections for intermediate energy electron impact ionization of neon and argon
J. Phys. B 43, 205202 (2010)

e + Ar	113.5 eV − 600 eV	E/T
e + Ne	113.5 eV − 600 eV	E/T

656. J. -S. Yoon, M. -Y. Song, H. Kato, al. et
Elastic Cross Sections for Electron Collisions with Molecules Relevant to Plasma Processing
J. Phys. Chem. Ref. Data 39, 033106 (2010)

$\mathbf{e + GeH_4}$	20eV− 100eV
$\mathbf{e + Si_2H_6}$	20eV− 100eV
$\mathbf{e + SiH_4}$	20eV− 100eV
$\mathbf{e + SF_6}$	20eV− 100eV
$\mathbf{e + NF_3}$	20eV− 100eV
$\mathbf{e + CF_3I}$	20eV− 100eV
e + F	20eV− 100eV
$\mathbf{e + CH_3}$	20eV− 100eV
$\mathbf{e + CH_2F_2}$	20eV− 100eV
$\mathbf{e + CHF_3}$	20eV− 100eV
$\mathbf{e + C_6F_6}$	20eV− 100eV
$\mathbf{e + C_4F_8}$	20eV− 100eV
$\mathbf{e + C_3F_8}$	20eV− 100eV
$\mathbf{e + C_3F_6}$	20eV− 100eV
$\mathbf{e + F_6}$	20eV− 100eV
$\mathbf{e + C_2}$	20eV− 100eV
$\mathbf{e + C_2F_4}$	20eV− 100eV
$\mathbf{e + CF_4}$	20eV− 100eV
$\mathbf{e + CF_2}$	20eV− 100eV

657. Hemal N. Varambhia, Alexandre Faure, K. Graupner, al. et
Electron-impact rotational excitation of the carbon monosulphide (CS) molecule
Mon. Not. R. Astron. Soc. 403, 1409 (2010)

e + C	5−5000K	Th
e + C	5−5000K	Th

658. Viatcheslav Kokoouline, Alexandre Faure, Jonathan Tennyson, al. et
Calculation of rate constants for vibrational and rotational excitation of the H+(3) ion by electron impact
Mon. Not. R. Astron. Soc. 405, 1195 (2010)

$\mathbf{e + H_3{}^+}$	1−7000K	Th

659. Philip L. Bartlett, Andris T. Stelbovics
Ionization of atoms by electron impact
Nucl. Instrum. Methods Phys. Res. A 619, 1 (2010)

e + Kr	10−3000eV	Th
e + Fe	10−3000eV	Th
e + Ne	10−3000eV	Th
e + H	10−3000eV	Th

660. Y. Wu, Z. An, Y. M. Duan, al. et
Measurements of L-alpha, L-beta X-ray production cross sections of Bi by 17-40 keV electron impact
Nucl. Instrum. Methods Phys. Res. B 268, 2473 (2010)

e + Bi	7−30keV	Exp

661. Y. Wu, Z. An, Y. M. Duan, al. et
Measurements of K-shell ionization cross-sections of S, Ca and Zn by 7-30 keV electron impact
Nucl. Instrum. Methods Phys. Res. B 268, 2820 (2010)

e + Zn	7−30keV	Exp
e + Ca	7−30keV	Exp
e + S	7−30keV	Exp

662. F. Blanco, J. Rosado, A. Illana, al. et
Comparison of two screening corrections to the additivity rule for the calculation of electron scattering from polyatomic molecules
Phys. Lett. A 374, 4420 (2010)

e + $\mathbf{C_6H_6}$	1−1000eV	Th
e + $\mathbf{SF_6}$	1−1000eV	Th
e + $\mathbf{CF_4}$	1−1000eV	Th
e + $\mathbf{CO_2}$	1−1000eV	Th

663. Xiang Gao, Xiao-Ying Han, Lan Voky, al. et
Precision calculation of low-energy electron-impact excitation cross sections of sodium
Phys. Rev. A 81, 022703 (2010)

e + Na	0−5.5eV	Th

664. Philip L. Bartlett, Andris T. Stelbovics
Electron-helium S-wave model benchmark calculations. I. Single ionization and single excitation
Phys. Rev. A 81, 022715 (2010)

e + He	10−500eV	Th
e + He	10−500eV	Th

665. Philip L. Bartlett, Andris T. Stelbovics
Electron-helium S-wave model benchmark calculations. II. Double ionization, single ionization with excitation, and double excitation
Phys. Rev. A 81, 022716 (2010)

e + He	20−500eV	Th
e + He	20−500eV	Th

666. Takeshi Kai
Single-differential and integral cross sections for electron-impact ionization for the damage of carbon clusters irradiated with x-ray free-electron lasers
Phys. Rev. A 81, 023201 (2010)

e + $\mathbf{C^+}$	5−20000eV	Th
e + C	5−20000eV	Th

667. Robin Shakeshaft
Energy partitioning in S-1-wave electron-impact ionization of atomic hydrogen
Phys. Rev. A 81, 032705 (2010)

e + H	10−80eV	Th

668. Song Bin Zhang, Jian Guo Wang, R. K. Janev
Electron-hydrogen-atom elastic and inelastic scattering with screened Coulomb interaction around the n=2 excitation threshold
Phys. Rev. A 81, 032707 (2010)

e + H	0−12eV	Th

669. M. Allan
Electron collisions with CO: Elastic and vibrational excitation cross sections
Phys. Rev. A 81, 042706 (2010)

e + CO	0−5eV	Exp
e + CO	0−5eV	Exp

670. Hsiao-Ling Sun, Jyh-Ching Chang, Ju-Tang Hsiao, al. et
Electron-impact ionization of hydrogenlike ions in QED theory
Phys. Rev. A 81, 042711 (2010)

e + $\mathbf{Mo}^{41+}$	1−15u(scaled unit)	Exp
e + $\mathbf{Dy}^{65+}$	1−15u(scaled unit)	Exp
e + $\mathbf{Fe}^{25+}$	1−15u(scaled unit)	Exp
e + $\mathbf{Ar}^{17+}$	1−15u(scaled unit)	Exp
e + $\mathbf{Ne}^{9+}$	1−15u(scaled unit)	Exp

671. L. Jiao, Y. Zhou, Y. Wang
Negative-ion resonances in total cross sections for slow electron-sodium collisions
Phys. Rev. A 81, 042713 (2010)

e + Na	0−6eV	Th

672. I. Bray, D. V. Fursa, A. S. Kadyrov, al. et
Single ionization of helium by electron impact
Phys. Rev. A 81, 062704 (2010)

e + He		Th

673. O. Zatsarinny, K. Bartschat, V. Suvorov, al. et
Electron-impact excitation of the (3d(10)4s)S-2(1/2) -¿ (3d(9)4s(2))D-2(5/2,3/2) transitions in copper atoms
Phys. Rev. A 81, 062705 (2010)

e + Cu	1−5eV	

674. G. B. Poparie, D. S. Belie
Resonant vibrational excitation of H-2 by electron impact: Full-range differential cross sections
Phys. Rev. A 82, 012706 (2010)

e + $\mathbf{H}_2$	1−5eV	Exp

675. Malkhaz R. Gochitashvili, Roman Ya. Kezerashvili, Ramaz A. Lomsadze
Excitation of Meinel and the first negative band system at the collision of electrons and protons with the nitrogen molecule
Phys. Rev. A 82, 022702 (2010)

e + $\mathbf{N}_2$	400−1500eV	Exp

676. D. A. Konovalov, I. Bray
Calculation of electron-impact ionization using the J-matrix method
Phys. Rev. A 82, 022708 (2010)

e + H	0−150eV	Th

677. Czeslaw Szmytkowski, Pawel Mozejko, Elzbieta Ptasinska-Denga, al. et
Cross sections for electron scattering from furan molecules: Measurements and calculations
Phys. Rev. A 82, 032701 (2010)

e + $\mathbf{C}_4\mathbf{H}_4\mathbf{O}$	0.6−400eV	Exp
e + $\mathbf{C}_4\mathbf{H}_4\mathbf{O}$	0.6−400eV	Exp

678. Jasmeet Singh Rajvanshi, K. L. Baluja
Electron-impact study of the SO radical using the R-matrix method
Phys. Rev. A 82, 032706 (2010)

e + SO	1−10eV	Th
e + SO	1−10eV	Th

679. C. Champion, R. D. Rivarola
Orientation and alignment effects in electron-induced ionization of a single oriented water molecule
Phys. Rev. A 82, 042704 (2010)

e + H_2O	10−10000eV	Th

680. Wei-Qing Xu, Jian-Min Sun, You-Yan Wang, al. et
Generalized oscillator strengths and integral cross sections for the valence-shell excitations of oxygen studied by fast electron impact
Phys. Rev. A 82, 042716 (2010)

e + O_2	5.9−5000eV	Exp

681. M. Fogle, E. M. Bahati, M. E. Bannister, al. et
Electron-impact dissociation of XH2+ (X = B, C, N, O, F): Absolute cross sections for production of XH+ and X+ fragment ions
Phys. Rev. A 82, 042720 (2010)

e + FD_2^+	2−100eV	Exp
e + OD_2^+	2−100eV	Exp
e + ND_2^+	2−100eV	Exp
e + BD_2^+	2−100eV	Exp
e + CH_2^+	2−100eV	Exp
e + FD_2^+	2−100eV	Exp
e + OD_2^+	2−100eV	Exp
e + ND_2^+	2−100eV	Exp
e + BD_2^+	2−100eV	Exp
e + CH_2^+	2−100eV	Exp

682. Teck-Ghee Lee, S. D. Loch, C. P. Ballance, al. et
Electron-impact-ionization cross sections for excited states of Bq+ (q=0-2) and an investigation into n scaling of ionization cross sections
Phys. Rev. A 82, 042721 (2010)

e + B^{2+}	0−40eV	Th
e + B^+	0−40eV	Th
e + B	0−40eV	Th

683. Pragya Bhatt, Raj Singh, Namita Yadav, al. et
Partial-ionization cross sections of a CO2 molecule due to impact of 10-26-keV electrons
Phys. Rev. A 82, 044702 (2010)

e + CO_2	10−26keV	Exp
e + CO_2	10−26keV	Exp

684. Mark C. Zammit, Dmitry V. Fursa, Igor Bray
Convergent-close-coupling calculations for excitation and ionization processes of electron-hydrogen collisions in Debye plasmas
Phys. Rev. A 82, 052705 (2010)

e + H	0−250eV	Th
e + H	0−250eV	Th

685. Jasmeet Singh Rajvanshi, K. L. Baluja
Electron-impact study of the NH radical using the R-matrix method
Phys. Rev. A 82, 062710 (2010)

e + NH	0−10eV	Th
e + NH	0−10eV	Th

686. Song Bin Zhang, Jian Guo Wang, R. K. Janev, al et
Electron collisions with the BH2 radical using the R-matrix method
Phys. Rev. A 82, 062711 (2010)

e + $\mathbf{BH_2}$	0−10eV	Th
e + $\mathbf{BH_2}$	0−10eV	Th

687. S. H. M. Deng, C. R. Vane, M. E. Bannister, al. et
Electron-impact dissociation of ozone cations O-3(+)
Phys. Rev. A 82, 062715 (2010)

e + $\mathbf{O_3}^+$	3−100eV	Exp

688. Song Bin Zhang, Jian Guo Wang, R. K. Janev
Crossover of Feshbach Resonances to Shape-Type Resonances in Electron-Hydrogen Atom Excitation with a Screened Coulomb Interaction
Phys. Rev. Lett. 104, 023203 (2010)

e + H	9.52−10.26eV	Th

689. Jonathan Tennyson
Electron molecule collision calculations using the R-matrix method
Phys. Rep. 491, 29 (2010)

e + $\mathbf{H_2}$	1−10eV	Th

690. M. Hoshino, H. Kato, D. Suzuki, al. et
Benchmark Integral Cross Sections for Electron Impact Excitation of the n=2 States in Helium
Plasma Sci. Technol. 12, 348 (2010)

e + He	10−4000eV	
e + He	10−4000eV	

691. Jung-Sik Yoon, Young-Woo Kim, Deuk-Chul Kwon, al. et
Electron-impact cross sections for deuterated hydrogen and deuterium molecules
Rep. Prog. Phys. 73, 116401 (2010)

e + $\mathbf{D_2}$	0.1−100eV	
e + $\mathbf{H_2}$	0.1−100eV	
e + HD	0.1−100eV	
e + $\mathbf{D_2}$	0.1−100eV	
e + $\mathbf{H_2}$	0.1−100eV	
e + HD	0.1−100eV	

692. D. Nikolic, T. W. Gorczyca, K. T. Korista, N. R. Badnell
Dielectronic recombination of argon-like ions
Astron. Astrophys. 516, A97 (2010)

e + $\mathbf{Zn}^{12+}$	0.1−10000eV	Th
e + $\mathbf{Cu}^{11+}$	0.1−10000eV	Th
e + $\mathbf{Ni}^{10+}$	0.1−10000eV	Th
e + $\mathbf{Co}^{9+}$	0.1−10000eV	Th
e + $\mathbf{Fe}^{8+}$	0.1−10000eV	Th
e + $\mathbf{Mn}^{7+}$	0.1−10000eV	Th
e + $\mathbf{Cr}^{6+}$	0.1−10000eV	Th
e + $\mathbf{V}^{5+}$	0.1−10000eV	Th
e + $\mathbf{Ti}^{4+}$	0.1−10000eV	Th
e + $\mathbf{Sc}^{3+}$	0.1−10000eV	Th
e + $\mathbf{Ca}^{2+}$	0.1−10000eV	Th
e + $\mathbf{K}^{+}$	0.1−10000eV	Th

693. C. V. Pandya, P. M. Patel, K. L. Baluja
Differential Scattering Cross Sections for Elastic Electron Scattering by a Calcium Atom
Chin. J. Phys. 48, 451 (2010)

$\mathbf{e + Ca}$	20−500eV	Th
$\mathbf{e + Ca}$	20−500eV	Th

694. Jian-Hui Yang, Hong Zhang, Xin-Lu Cheng
The KLL dielectronic recombination processes for highly charged krypton, iodine and barium ions
Chin. Phys. B 19, 063201 (2010)

$\mathbf{e + Ba^{48+}}$	8.7−24keV	Th
$\mathbf{e + Ba^{49+}}$	8.7−24keV	Th
$\mathbf{e + Ba^{50+}}$	8.7−24keV	Th
$\mathbf{e + Ba^{51+}}$	8.7−24keV	Th
$\mathbf{e + Ba^{52+}}$	8.7−24keV	Th
$\mathbf{e + Ba^{53+}}$	8.7−24keV	Th
$\mathbf{e + Ba^{54+}}$	8.7−24keV	Th
$\mathbf{e + I^{45+}}$	8.7−24keV	Th
$\mathbf{e + I^{46+}}$	8.7−24keV	Th
$\mathbf{e + I^{47+}}$	8.7−24keV	Th
$\mathbf{e + I^{48+}}$	8.7−24keV	Th
$\mathbf{e + I^{49+}}$	8.7−24keV	Th
$\mathbf{e + I^{50+}}$	8.7−24keV	Th
$\mathbf{e + I^{51+}}$	8.7−24keV	Th
$\mathbf{e + Kr^{28+}}$	8.7−24keV	Th
$\mathbf{e + Kr^{29+}}$	8.7−24keV	Th
$\mathbf{e + Kr^{30+}}$	8.7−24keV	Th
$\mathbf{e + Kr^{31+}}$	8.7−24keV	Th
$\mathbf{e + Kr^{32+}}$	8.7−24keV	Th
$\mathbf{e + Kr^{33+}}$	8.7−24keV	Th
$\mathbf{e + Kr^{34+}}$	8.7−24keV	Th

695. Jun-Bo Liu, Ya-Jun Zhou
Elastic scattering of electrons from water molecule
Chin. Phys. B 19, 093403 (2010)

$\mathbf{e + H_2O}$	6−50eV	Th

696. Y. Zhang, C. Y. Chen, M. Huang, Y. S. Wang, Y. M. Zou
Dielectronic recombination rate coefficients for the NiI isoelectronic sequence
Eur. Phys. J. D 56, 157 (2010)

$\mathbf{e + U^{64+}}$	5−69000eV	Th
$\mathbf{e + At^{57+}}$	5−69000eV	Th
$\mathbf{e + Pb^{54+}}$	5−69000eV	Th
$\mathbf{e + Au^{51+}}$	5−69000eV	Th
$\mathbf{e + W^{46+}}$	5−69000eV	Th
$\mathbf{e + Yb^{42+}}$	5−69000eV	Th
$\mathbf{e + Gd^{36+}}$	5−69000eV	Th
$\mathbf{e + Nd^{32+}}$	5−69000eV	Th
$\mathbf{e + Xe^{26+}}$	5−69000eV	Th
$\mathbf{e + Sn^{22+}}$	5−69000eV	Th
$\mathbf{e + Ag^{19+}}$	5−69000eV	Th
$\mathbf{e + Mo^{14+}}$	5−69000eV	Th
$\mathbf{e + Kr^{8+}}$	5−69000eV	Th

697. E. Yu Remeta, V. I. Kelemen
Potential elastic electron scattering by atoms in the spin-polarized approach
J. Phys. B 43, 045202 (2010)

e + Eu	10eV, 20eV	Th
e + Mn	10eV, 20eV	Th
e + Sb	10eV, 20eV	Th
e + Ag	10eV, 20eV	Th

698. R. K. Gangwar, A. N. Tripathi, L. Sharma, R. Srivastava
Elastic scattering of electrons from Rb, Cs and Fr atoms
J. Phys. B 43, 085205 (2010)

e + Fr	2−300eV	Th
e + Cs	2−300eV	Th
e + Rb	2−300eV	Th

699. H. Cho, M. Y. Song, J. S. Yoon, M. Hoshino, H. Tanaka
Elastic electron scattering from CF3H and CF3I
J. Phys. B 43, 135205 (2010)

e + CF$_3$H	1.5−30eV	Exp
e + CF$_3$I	1.5−30eV	Exp

700. C. P. Ballance, S. D. Loch, M. S. Pindzola, D. C. Griffin
Dielectronic recombination of W35+
J. Phys. B 43, 205201 (2010)

e + W^{35+}	5−3000eV	Th

701. V. I. Kelemen, E. Yu Remeta
Elastic electron scattering from the antimony atom in the spin-polarized optical potential approach
J. Phys. B 43, 235204 (2010)

e + Sb	6−1000eV	Th
e + Sb	6−1000eV	Th

702. Ireneusz Linert, Brygida Mielewska, George C. King, Mariusz Zubek
Elastic electron scattering in krypton in the energy range from 5 to 10 eV
Phys. Rev. A 81, 012706 (2010)

e + Kr	5−10eV	Exp

703. Jessica R. Francis-Staite, Brett A. Schmerl, Michael J. Brunger, H. Kato, Stephen J. Buckman
Elastic electron scattering from CF3I
Phys. Rev. A 81, 022704 (2010)

e + CF$_3$I	10−50eV	Exp

704. Z. Felfli, A. Z. Msezane, D. Sokolovski
Complex angular momentum analysis of low-energy electron elastic scattering from lanthanide atoms
Phys. Rev. A 81, 042707 (2010)

e + Er	0−1eV	Th
e + Ho	0−1eV	Th
e + Sm	0−1eV	Th
e + Dy	0−1eV	Th
e + Hf	0−1eV	Th
e + Tm	0−1eV	Th
e + Pr	0−1eV	Th

705. Magdalena Kaminska, Vitali Zhaunerchyk, Erik Vigren, Mathias Danielsson, Mathias Hamberg, Wolf D. Geppert, Mats Larsson, Stefan Rosen, Richard D. Thomas, Jacek Semaniak
Dissociative recombination of CH5+ and CD5+: Measurement of the product branching fractions and the absolute cross sections, and the breakup dynamics in the CH3 + H + H product channel
Phys. Rev. A 81, 062701 (2010)

$\mathbf{e + CD_5{}^+}$	0.0001− 1eV	Exp
$\mathbf{e + CH_5{}^+}$	0.0001− 1eV	Exp

706. H. Buhr, M. B. Mendes, O. Novotny, D. Schwalm, M. H. Berg, D. Bing, O. Heber, C. Krantz, D. A. Orlov, M. L. Rappaport, T. Sorg, J. Stuetzel, J. Varju, A. Wolf, D. Zajfman
Energy-sensitive imaging detector applied to the dissociative recombination of D2H+
Phys. Rev. A 81, 062702 (2010)

$\mathbf{e + D_2H^+}$	0.0001 − 10eV	Exp

707. Vladimir A. Yerokhin, Andrey Surzhykov
Off-resonant dielectronic recombination in a collision of an electron with a heavy hydrogenlike ion
Phys. Rev. A 81, 062703 (2010)

$\mathbf{e + U^{91+}}$	1−700MeV/nucleon	Th

708. M. A. Khakoo, J. Muse, K. Ralphs, R. F. daCosta, M. H. F. Bettega, M. A. P. Lima
Low-energy elastic electron scattering from furan
Phys. Rev. A 81, 062716 (2010)

$\mathbf{e + C_4H_4O}$	1−50eV	Exp
$\mathbf{e + C_4H_4O}$	1−50eV	Exp

709. O. May, D. Kubala, M. Allan
Absolute cross sections for dissociative electron attachment to HCN and DCN
Phys. Rev. A 82, 010701 (2010)

$\mathbf{e + DCN}$	1.2−3.1eV	Exp
$\mathbf{e + HCN}$	1.2−3.1eV	Exp

710. W. Zhang, K. Yao, Y. Yang, C. Chen, R. Hutton, Y. Zou
Leaky ion extraction method for dielectronic recombination strength measurements at electron-beam ion traps
Phys. Rev. A 82, 020702 (2010)

$\mathbf{e + N_2}$	400−1600eV	Exp

711. Christopher J. Bostock, Dmitry V. Fursa, Igor Bray
Relativistic convergent close-coupling method applied to electron scattering from mercury
Phys. Rev. A 82, 022713 (2010)

$\mathbf{e + Hg}$	0−200eV	Th

712. Holger Kreckel, Oldrich Novotny, Kyle N. Crabtree, Henrik Buhr, Annemieke Petrignani, Brian A. Tom, Richard D. Thomas, Max H. Berg, Dennis Bing, Manfred Grieser, Claude Krantz, Michael Lestinsky, Mario B. Mendes, Christian Nordhorn, Roland Repnow, Julia Stuetzel, Andreas Wolf, Benjamin J. McCall
High-resolution storage-ring measurements of the dissociative recombination of H-3(+) using a supersonic expansion ion source
Phys. Rev. A 82, 042715 (2010)

$\mathbf{e + H_3{}^+}$	0.00001−30eV	Exp

713. Jorge L. S. Lino
Elastic scattering of electrons on Ne atoms at intermediate energies
Phys. Scr. 81, 035301 (2010)

e + Ne	0−200eV	Th

714. A. K. F. Haque, M. Shahjahan, M. A. Uddin, M. A. R. Patoary, A. K. Basak, B. C. Saha, F. B. Malik
Generalized Kolbenstvedt model for electron impact ionization of the K-, L- and M-shell ions
Phys. Scr. 81, 045301 (2010)

e + Ni^{5+}	10−1000000eV	Th
e + Ar^{5+}	10−1000000eV	Th
e + Ti^{2+}	10−1000000eV	Th
e + S^{4+}	10−1000000eV	Th
e + Cr^{8+}	10−1000000eV	Th
e + Si^{3+}	10−1000000eV	Th
e + U^{82+}	10−1000000eV	Th
e + N^{3+}	10−1000000eV	Th
e + Ne^{3+}	10−1000000eV	Th
e + Ne^{8+}	10−1000000eV	Th
e + U^{89+}	10−1000000eV	Th
e + C^{5+}	10−1000000eV	Th

715. M. M. Fujimoto, S. E. Michelin, F. Arretche, K. T. Mazon, M. -T. Lee, I. Iga
Spin-Exchange Effects in Elastic Electron Scattering from Linear Triatomic Radicals
J. Braz. Chem. Soc. 21, 226 (2010)

e + CNN	0−10eV	Th
e + NCN	0−10eV	Th

716. M. Radmilovic-Radjenovic, Z. Lj. Petrovic
Calculations of Cross Sections Data for Scattering of Electrons on HBr
Acta Phys. Pol. A 117, 745 (2010)

e + HBr	0−1000eV	Th
e + HBr	0−1000eV	Th

717. E. A. Y. Castro, G. L. C. Souza, L. M. Brescansin, L. E. Machado, A. S. dosSantos, M-T Lee
Application of the scaled quasi-free scattering model absorption potential to electron scattering by CHx (x=1,2,3,4)
J. Electron Spectrosc. Relat. Phenom. 182, 4 (2010)

e + CH$_4$	5−1000eV	Th
e + CH$_3$	5−1000eV	Th
e + CH$_2$	5−1000eV	Th
e + CH	5−1000eV	Th
e + CH$_4$	5−1000eV	Th
e + CH$_3$	5−1000eV	Th
e + CH$_2$	5−1000eV	Th
e + CH	5−1000eV	Th
e + CH$_4$	5−1000eV	Th
e + CH$_3$	5−1000eV	Th
e + CH$_2$	5−1000eV	Th
e + CH	5−1000eV	Th

718. D. G. M. Silva, T. Tejo, J. Muse, D. Romero, M. A. Khakoo, M. C. A. Lopes
Total electron scattering cross sections for methanol and ethanol at intermediate energies
J. Phys. B 43, 015201 (2010)

e + C_2H_5OH	60−500eV	Exp
e + CH_3OH	60−500eV	Exp

719. A. Zecca, L. Chiari, G. Garcia, F. Blanco, E. Trainotti, M. J. Brunger
Total cross sections for positron and electron scattering from pyrimidine
J. Phys. B 43, 215204 (2010)

e + $C_4H_4N_2$	0.1−1000eV	Th

720. P. Rawat, M. G. P. Homem, R. T. Sugohara, I. P. Sanches, I. Iga, G. L. C. deSouza, A. S. dosSantos, R. R. Lucchese, L. E. Machado, L. M. Brescansin, M-T Lee
Cross sections for electron scattering by ethane in the low- and intermediate-energy ranges
J. Phys. B 43, 225202 (2010)

e + C_2H_6	40−100eV	
e + C_2H_6	40−100eV	

721. Xiao-Ming Tan, Zi-Jiang Liu, Xiao-Hong Tian
A revised additivity rule for electron scattering from ethylene, propene, butene, ethane, propane and butane
Nucl. Instrum. Methods Phys. Res. B 268, 1535 (2010)

e + C_4H_{10}	10−1000eV	Th
e + C_3H_8	10−1000eV	Th
e + C_2H_6	10−1000eV	Th
e + C_4H_8	10−1000eV	Th
e + C_3H_6	10−1000eV	Th
e + C_2H_4	10−1000eV	Th

722. W. M. Ariyasinghe, G. Vilela
An empirical expression for total scattering cross sections of normal hydrocarbons, and experimental total cross sections of C2H2 and C3H4
Nucl. Instrum. Methods Phys. Res. B 268, 2217 (2010)

e + C_3H_4	200−4500eV	Exp
e + C_2H_2	200−4500eV	Exp

723. L. M. Brescansin, I. Iga, L. E. Machado, S. E. Michelin, M. -T. Lee
Cross sections for electron scattering by carbon disulfide in the low- and intermediate-energy range
Phys. Rev. A 81, 012709 (2010)

e + CS_2	1−1000eV	Th
e + CS_2	1−1000eV	Th

724. J. Fedor, C. Winstead, V. McKoy, M. Cizek, K. Houfek, P. Kolorenc, J. Horacek
Electron scattering in HCl: An improved nonlocal resonance model
Phys. Rev. A 81, 042702 (2010)

e + HCl	0−4eV	Th

725. G. L. C. deSouza, M. -T. Lee, I. P. Sanches, P. Rawat, I. Iga, A. S. dosSantos, L. E. Machado, R. T. Sugohara, L. M. Brescansin, M. G. P. Homem, R. R. Lucchese
Cross sections for electron scattering by propane in the low- and intermediate-energy ranges
Phys. Rev. A 82, 012709 (2010)

e + C_3H_8	40−500eV	
e + C_3H_8	40−500eV	

726. M. Kurokawa, M. Kitajima, K. Toyoshima, T. Odagiri, H. Kato, H. Kawahara, M. Hoshino, H. Tanaka, K. Ito
Threshold photoelectron source for the study of low-energy electron scattering: Total cross section for electron scattering from krypton in the energy range from 14 meV to 20 eV
Phys. Rev. A 82, 062707 (2010)

e + Kr	0.014− 20eV	Exp

727. M. H. F. Bettega, C. Winstead, V. McKoy
Low-energy electron scattering from C4H9OH isomers
Phys. Rev. A 82, 062709 (2010)

e + C_4H_9OH	1−50eV	Th
e + C_4H_9OH	1−50eV	Th

728. C. Malespin, C. P. Ballance, M. S. Pindzola, M. C. Witthoeft, T. R. Kallman, S. D. Loch
Electron-impact excitation of H-like Cr, Mn, Fe, Co, and Ni for applications in modeling X-ray astrophysical sources
Astron. Astrophys. 526, A115 (2011)

e + H Z= 24-28	7E5−1E9 K	Th

729. G. Y. Liang, N. R. Badnell
R-matrix electron-impact excitation data for the Li-like iso-electronic sequence including Auger and radiation damping
Astron. Astrophys. 528, A69 (2011)

e + Li Z= 4-36	2E2−2E6 $(Z+1)^2$ K	Th

730. G. Y. Liang, N. R. Badnell, G. Zhao, J. Y. Zhong, F. L. Wang
R-matrix electron-impact excitation data for astrophysically abundant sulphur ions
Astron. Astrophys. 533, A87 (2011)

e + S^{8+}	2E2−2E6 $(Z+1)^2$ K	Th
e + S^{9+}	2E2−2E6 $(Z+1)^2$ K	Th
e + S^{10+}	2E2−2E6 $(Z+1)^2$ K	Th
e + S^{11+}	2E2−2E6 $(Z+1)^2$ K	Th

731. K. M. Aggarwal, F. P. Keenan, K. D. Lawson
Electron impact excitation of Kr XXVIII
At. Data Nucl. Data Tables 97, 225 (2011)

e + Kr^{27+}	1E7−1E9 K	Th

732. K. Wang, C. Y. Chen, M. Huang, Y. S. Wang, Y. M. Zou
Radiative rates and electron impact excitation rate coefficients for Ne-like selenium, Se XXV
At. Data Nucl. Data Tables 97, 426 (2011)

e + Se^{24+}	100−10000 eV	Th

733. C. M. Cassidy, C. A. Ramsbottom, M. P. Scott
ELECTRON-IMPACT EXCITATION OF Ni II: EFFECTIVE COLLISION STRENGTHS FOR OPTICALLY ALLOWED FINE-STRUCTURE TRANSITIONS
Astrophys. J. 738, 5 (2011)

e + Ni^{+}	30 − 1E6 K	Th

734. S. S. Tayal, O. Zatsarinny
EFFECTIVE COLLISION STRENGTHS FOR ELECTRON-IMPACT EXCITATION OF Fe VIII
Astrophys. J. 743, 206 (2011)

e + Fe^{7+}	5E3−5E6 K	Th

735. Tayal, S. S.
ELECTRON EXCITATION COLLISION STRENGTHS FOR SINGLY IONIZED NITROGEN
Astrophys. J., Suppl. Ser. 195, 12 (2011)

e + N^{+}	500 − 1E5 K	Th

736. I. R. Wasson, C. A. Ramsbottom, M. P. Scott
ELECTRON-IMPACT EXCITATION OF Cr II: A THEORETICAL CALCULATION OF EFFECTIVE COLLISION STRENGTHS FOR OPTICALLY ALLOWED TRANSITIONS
Astrophys. J., Suppl. Ser. 196, 24 (2011)

e + Cr^{+}	2E3−1E5 K	Th

737. S. Taj, B. Manaut, L. Oufni
Semirelativistic 1s-2s Excitation of Atomic Hydrogen by Electron Impact
Acta Phys. Pol. A 119, 769 (2011)

e + H	50−300 eV	Th
e + H	50−300 eV	Th

738. Hsiao-Ling Sun, Ju-Tang Hsiao, Sheng-Fang Lin, Keh-Ning Huang
Conspicuous QED Effects in the Positron-Impact Ionization of U91+
Chin. J. Phys. 49, 175 (2011)

$\mathbf{e}^{+}$ **+ U**$^{91+}$	1−10 threshold unit	Th

739. S. Taj, B. Manaut, M. ElIdrissi, L. Oufni
Laser-Assisted Semi-Relativistic Excitation of Atomic Hydrogen by Electronic Impact
Chin. J. Phys. 49, 1164 (2011)

e + H	50−300 eV	Th
e + H	50−300 eV	Th

740. Lin-Mao Ren, You-Yan Wang, Dong-Dong Li, Zhen-Sheng Yuan, Lin-Fan Zhu
Inner-Shell Excitations of 2p Electrons of Argon Investigated by Fast Electron Impact with High Resolution
Chin. Phys. Lett. 28, 053401 (2011)

e + Ar	2500 eV	Exp

741. Yang-Yang Zeng, Hao Feng, Wei-Guo Sun
Integral and Momentum Cross Sections for Electron Elastic and Vibrational Excitation Scattering with Nitrogen in the Energy Range 5-30 eV
Chin. Phys. Lett. 28, 073401 (2011)

e + $\mathbf{N}_2$	5−30 eV	Th
e + $\mathbf{N}_2$	5−30 eV	Th

742. M. Stroe, M. Fifirig
Dissociation and vibrational excitation of cold HD+ by electron impact
Eur. Phys. J. D 61, 63 (2011)

e + HD^+	1−12 eV	Th

743. M. Vinodkumar, C. G. Limbachiya, K. N. Joshipura, N. J. Mason
Electron impact calculations of total elastic cross sections over a wide energy range-0.01 eV to 2 keV for CH4, SiH4 and H2O
Eur. Phys. J. D 61, 579 (2011)

e + CH_4	0.01−2E3 eV	Th
e + SiH_4	0.01−2E3 eV	Th
e + H_2O	0.01−2E3 eV	Th

744. L. Sharma, R. Srivastava, A. D. Stauffer
Excitation of the 5p(5)7p levels of xenon by electron impact
Eur. Phys. J. D 62, 399 (2011)

e + Xe	threshold−200 eV	Th

745. G. F. Du, J. Jiang, C. Z. Dong
Electron impact excitation into the 3p(5)4p levels from the 3p(5)4s metastable levels of argon
Eur. Phys. J. D 63, 103 (2011)

e + Ar	4−12 eV, 50−400 eV	Th

746. J. Lecointre, D. S. Belic, S. Cherkani-Hassani, P. Defrance
Electron impact dissociation of ND+: formation of D+
Eur. Phys. J. D 63, 441 (2011)

e + Nd^+	threshold−2.5 keV	E/T

747. P. Defrance, T. Kereselidze, J. Lecointre, Z. S. Machavariani
Electron-impact ionization of atomic hydrogen: dynamical variational treatment
Eur. Phys. J. D 64, 303 (2011)

e + H	150, 250 eV	Th
e + H	150, 250 eV	Th

748. Hee Seo, Maria Grazia Pia, Paolo Saracco, Chan Hyeong Kim
Ionization Cross Sections for Low Energy Electron Transport
IEEE Trans. Nucl. Sci. 58, 3219 (2011)

e	threshold−1 keV	Th

749. Kumar, Rajeev
Electron impact ionization cross-sections of carbonyl sulfide molecule
Int. J. Mass Spectrom. 303, 69 (2011)

e + e	0−300 eV	Exp

750. Kevin M. Douglas, Stephen D. Price
Electron ionization of hydrogen sulfide
Int. J. Mass Spectrom. 303, 147 (2011)

e + H_2S	20−200 eV	Exp

751. Minaxi Vinodkumar, Kirti Korot, P. C. Vinodkumar
Computation of the electron impact total ionization cross sections of CnH(2n+1)OH molecules from the threshold to 2 keV energy range
Int. J. Mass Spectrom. 305, 26 (2011)

e	threshold−2 keV	Th
e + e	threshold−2 keV	Th

752. Minaxi Vinodkumar, Harshad Bhutadia, Chetan Limbachiya, K. N. Joshipura
Electron impact total ionization cross sections for H2S, PH3, HCHO and HCOOH
Int. J. Mass Spectrom. 308, 35 (2011)

e + e	threshold−2 keV	Th
e + HCOOH	threshold−2 keV	Th
e + PH$_3$	threshold−2 keV	Th
e + H$_2$S	threshold−2 keV	Th

753. Svetlana V. Malinovskaya, Alexander V. Glushkov, Olga Yu. Khetselius, Yury M. Lopatkin, Andrey V. Loboda, Ludmila V. Nikola, Andrey A. Svinarenko, Tat'Yana B. Perelygina
Generalized Energy Approach for Calculating Electron Collision Cross-Sections for Multicharged Ions in a Plasma: Debye Shielding Model
Int. J. Quantum Chem. 111, 288 (2011)

e + Ba^{46+}	5.69, 8.2 keV	Th

754. M. A. R. Patoary, M. Alfaz Uddin, A. K. F. Haque, M. Shahjahan, A. K. Basak, B. C. Saha
Electron Impact Ionization in K-, L-, and M-Shells of Atomic Targets
Int. J. Quantum Chem. 111, 923 (2011)

e + U	threshold−200 MeV, −1GeV	Th
e + Bi	threshold−200 MeV, −1GeV	Th
e + Pb	threshold−200 MeV, −1GeV	Th
e + Au	threshold−200 MeV, −1GeV	Th
e + Ta	threshold−200 MeV, −1GeV	Th
e + Ni^{4+}	threshold−200 MeV, −1GeV	Th
e + Ni^{7+}	threshold−200 MeV, −1GeV	Th
e + Fe^{5+}	threshold−200 MeV, −1GeV	Th
e + Ni^{8+}	threshold−200 MeV, −1GeV	Th
e + Fe^{6+}	threshold−200 MeV, −1GeV	Th
e + Ti^{2+}	threshold−200 MeV, −1GeV	Th
e + e^{+}	threshold−200 MeV, −1GeV	Th
e + Ar^{3+}	threshold−200 MeV, −1GeV	Th
e + Cr^{10+}	threshold−200 MeV, −1GeV	Th
e + Ar^{4+}	threshold−200 MeV, −1GeV	Th
e + Ar^{5+}	threshold−200 MeV, −1GeV	Th
e + Cl^{4+}	threshold−200 MeV, −1GeV	Th
e + Ar^{6+}	threshold−200 MeV, −1GeV	Th
e + Cl^{5+}	threshold−200 MeV, −1GeV	Th
e + S^{4+}	threshold−200 MeV, −1GeV	Th
e + Mg^{2+}	threshold−200 MeV, −1GeV	Th
e + Si^{5+}	threshold−200 MeV, −1GeV	Th
e + Ne^{+}	threshold−200 MeV, −1GeV	Th
e + Si^{6+}	threshold−200 MeV, −1GeV	Th
e + Ne^{2+}	threshold−200 MeV, −1GeV	Th
e + F^{2+}	threshold−200 MeV, −1GeV	Th
e + O^{+}	threshold−200 MeV, −1GeV	Th
e + O^{2+}	threshold−200 MeV, −1GeV	Th
e + N^{+}	threshold−200 MeV, −1GeV	Th
e + O^{3+}	threshold−200 MeV, −1GeV	Th
e + N^{2+}	threshold−200 MeV, −1GeV	Th
e + C^{+}	threshold−200 MeV, −1GeV	Th
e + U^{88+}	threshold−200 MeV, −1GeV	Th
e + Ne^{6+}	threshold−200 MeV, −1GeV	Th
e + C^{2+}	threshold−200 MeV, −1GeV	Th
e + Li^{+}	threshold−200 MeV, −1GeV	Th

e + B^{3+}	threshold−200 MeV, −1GeV	Th
e + C^{4+}	threshold−200 MeV, −1GeV	Th
e + N^{5+}	threshold−200 MeV, −1GeV	Th
e + O^{6+}	threshold−200 MeV, −1GeV	Th
e + U^{90+}	threshold−200 MeV, −1GeV	Th
e + Be^{+}	threshold−200 MeV, −1GeV	Th
e + B^{2+}	threshold−200 MeV, −1GeV	Th
e + N^{4+}	threshold−200 MeV, −1GeV	Th
e + O^{5+}	threshold−200 MeV, −1GeV	Th
e + Ne^{7+}	threshold−200 MeV, −1GeV	Th
e + U^{89+}	threshold−200 MeV, −1GeV	Th

755. R. O. Jung, Garrett A. Piech, M. L. Keeler, John B. Boffard, L. W. Anderson, Chun C. Lin
Electron-impact excitation cross sections into Ne(2p(5)3p) levels for plasma applications
J. Appl. Phys. 109, 123303 (2011)

e + Ne	threshold−200 eV	Th

756. Michael D. Ward, Simon J. King, Stephen D. Price
Electron ionization of methane: The dissociation of the methane monocation and dication
J. Chem. Phys. 134, 024308 (2011)

e + CH_4	30−200 eV	Exp

757. Simon J. King, Stephen D. Price
Electron ionization of SiCl4
J. Chem. Phys. 134, 074311 (2011)

e + $SiCl_4$	30−200 eV	Exp

758. Hidetoshi Kato, Masamitsu Hoshino, Hiroshi Tanaka, Paulo Limao-Vieira, Oddur Ingolfsson, Laurence Campbell, Michael J. Brunger
A study of electron scattering from benzene: Excitation of the B-1(1u), E-3(2g), and E-1(1u) electronic states
J. Chem. Phys. 134, 134308 (2011)

e + C_6H_6	10−200 eV	E/T
e + C_6H_6	10−200 eV	E/T

759. T. P. T. Do, M. Leung, M. Fuss, G. Garcia, F. Blanco, K. Ratnavelu, M. J. Brunger
Excitation of electronic states in tetrahydrofuran by electron impact
J. Chem. Phys. 134, 144302 (2011)

e + C_4H_8O	15−50 eV	Exp
e + C_4H_8O	15−50 eV	Exp

760. S. J. Brotton, J. W. McConkey
Dissociative excitation and fragmentation of S-8 by electron impact
J. Chem. Phys. 134, 204301 (2011)

e + e	threshold−360 eV	Exp

761. Allan, M.
Electron scattering in Pt(PF3)(4): Elastic scattering, vibrational, and electronic excitation
J. Chem. Phys. 134, 204309 (2011)

e + e	0.4−20 eV	Exp
e + e	0.4−20 eV	Exp
e + e	0.4−20 eV	Exp

762. Noboru Watanabe, Daisuke Suzuki, Masahiko Takahashi
Vibronic effects on the 1t(1) -¿ 3s Rydberg excitation in CF4 induced by electron impact
J. Chem. Phys. 134, 234309 (2011)

e + CF_4		Th

763. Mariusz Zubek, Marcin Dampc, Ireneusz Linert, Tomasz Neumann
Electronic states of tetrahydrofuran molecules studied by electron collisions
J. Chem. Phys. 135, 134317 (2011)

e + C_4H_8O	5.5−10 eV	Exp

764. Z Masn, J. D. Gorfinkiel
Elastic and inelastic low-energy electron collisions with pyrazine
J. Chem. Phys. 135, 144308 (2011)

e + $C_4H_4N_2$	0−20 eV	Th

765. P. Limao-Vieira, M. Horie, H. Kato, M. Hoshino, F. Blanco, G. Garcia, S. J. Buckman, H. Tanaka
Differential elastic electron scattering cross sections for CCl4 by 1.5-100 eV energy electron impact
J. Chem. Phys. 135, 234309 (2011)

e + CCl_4	1.5−100 eV	Exp

766. Harshad Bhutadia, Minaxi Vinodkumar, Bobby Antony
Theoretical Investigation of Electron Impact Total Ionization Cross Sections for N(CH3)(3), NH(CH3)(2), NH2CH3, P(CH3)(3), PH(CH3)(2), and PH2CH3 Molecules
J. Korean Phys. Soc. 59, 2873 (2011)

e + e	threshold−2 keV	Th
e + $P(CH_3)_3$	threshold−2 keV	Th

767. M. Z. M. Kamali, Kuru Ratnavelu
Positron Impact Excitation (n=2 states) of Hydrogen at 20 eV
J. Korean Phys. Soc. 59, 2895 (2011)

e^+ + H	20 eV	Th
e^+ + H	20 eV	Th

768. Keh-Ning Huang, Hsiao-Ling Sun, Sheng-Fang Lin, Hao-Tse Shiao, Xin-Zeng Wu
Relativistic Quantum Collision Theory for Many-particle Systems
J. Korean Phys. Soc. 59, 2941 (2011)

H^+ + U^{91+}	1−15 threshold unit, 1−2000 keV	Th
e + U^{91+}	1−15 threshold unit, 1−2000 keV	Th

769. J. D. Hein, S. Kidwai, P. W. Zetner, C. Bostock, D. V. Fursa, I. Bray, L. Sharma, R. Srivastava, A. Stauffer
Differential cross sections for electron-impact excitation of laser-excited Yb-174 (center dot center dot center dot 6s6p (3)P1)
J. Phys. B 44, 015202 (2011)

e + Yb	20 eV	E/T
e + Yb	20 eV	E/T

770. C. DalCappello, A. Haddadou, F. Menas, A. C. Roy
The second Born approximation for the single and double ionization of atoms by electrons and positrons
J. Phys. B 44, 015204 (2011)

$\mathbf{e^+ + H}$	250 eV	Th
e + H	250 eV	Th
$\mathbf{e^+ + H}$	250 eV	Th
e + H	250 eV	Th

771. Rui Zhang, K. L. Baluja, Jan Franz, Jonathan Tennyson
Positron collisions with molecular hydrogen: cross sections and annihilation parameters calculated using the R-matrix with pseudo-states method
J. Phys. B 44, 035203 (2011)

$\mathbf{e^+ + H_2}$	0–10 eV	Th

772. Khakoo, A. Murtadha
Symmetry relations in the relative intensities of the energy loss lines of argon excited by electrons from the ground state to the 3p(5)4s fine-structure states
J. Phys. B 44, 045208 (2011)

e + Ar	threshold–100 eV	Exp
e + Ar	threshold–100 eV	Exp

773. R. Ward, D. Cubric, N. Bowring, G. C. King, F. H. Read, D. V. Fursa, I. Bray, O. Zatsarinny, K. Bartschat
Differential cross sections for electron impact excitation of the n=2 states of helium at intermediate energies (80, 100 and 120 eV) measured across the complete angular scattering range (0-180 degrees)
J. Phys. B 44, 045209 (2011)

e + He	80, 100, 120 eV	E/T
e + He	80, 100, 120 eV	E/T

774. E. M. Staicu Casagrande, C. Li, A. Lahmam-Bennani, C. DalCappello, M. Schulz, M. Ciappina
Experimental and theoretical confirmation of the role of higher order mechanisms in the electron impact double ionization of helium
J. Phys. B 44, 055201 (2011)

e + He	500 eV	E/T
e + He	500 eV	E/T

775. Marcin Dampc, Ewelina Szymanska, Brygida Mielewska, Mariusz Zubek
Ionization and ionic fragmentation of tetrahydrofuran molecules by electron collisions
J. Phys. B 44, 055206 (2011)

$\mathbf{e + C_4H_8O}$	5–150 eV	Exp

776. B. Predojevic, V. Pejcev, D. M. Filipovic, D. Sevic, B. Tomcik, B. P. Marinkovic
Electron impact excitation of the 3s3p P-3 state of magnesium from the ground state
J. Phys. B 44, 055208 (2011)

e + Mg	10, 15, 20, 40, 60 eV	Exp
e + Mg	10, 15, 20, 40, 60 eV	Exp

777. Igor Bray, Dmitry V. Fursa
Benchmark cross sections for electron-impact total single ionization of helium
J. Phys. B 44, 061001 (2011)

e + He	threshold–1 keV	Th

778. M. Allan, O. Zatsarinny, K. Bartschat
Electron impact excitation of the (4p(5) 5s) states in krypton: high-resolution electron scattering experiments and B-spline R-matrix calculations
J. Phys. B 44, 065201 (2011)

e + Kr	10–15 eV	E/T
e + Kr	10–15 eV	E/T

779. Saha, P. Hari
Target correlation and polarization effects on the electron impact ionization of He atoms
J. Phys. B 44, 065202 (2011)

e + He	28.6 eV	Th
e + He	28.6 eV	Th

780. P. Defrance, J. J. Jureta, J. Lecointre, X. Urbain
Isotope effects in electron-impact dissociation of D2H+
J. Phys. B 44, 075202 (2011)

e + D_2H^+	5 eV–2.5 keV	Exp

781. Yaqiu Liang, Zhangjin Chen, D. H. Madison, C. D. Lin
Calibration of distorted wave Born approximation for electron impact excitation of Ne and Ar at incident energies below 100 eV
J. Phys. B 44, 085201 (2011)

e + Ar	20–100 eV	Th
e + Ne	20–100 eV	Th
e + Ar	20–100 eV	Th
e + Ne	20–100 eV	Th

782. M. Fifirig, M. Stroe
Dissociation of H-2(+) ions by collisions with electrons
J. Phys. B 44, 085202 (2011)

e + $H_2{}^+$	1–12 eV	Th

783. M. S. Pindzola, J. A. Ludlow, C. P. Ballance, F. Robicheaux, J. Colgan
Electron-impact double ionization of B+
J. Phys. B 44, 105202 (2011)

e + B^+	63–750 eV	Th

784. Alex Knight-Percival, Sarah Jhumka, Martyn Hussey, Andrew James Murray
Super-elastic electron scattering from the laser-excited 4(1)P(1) state of calcium at low incident energy
J. Phys. B 44, 105203 (2011)

e + Ca	10–12 eV	Exp
e + Ca	10–12 eV	Exp

785. R. Naghma, B. N. Mahato, M. Vinodkumar, B. K. Antony
Electron impact total ionization cross sections for atoms with Z=49-54
J. Phys. B 44, 105204 (2011)

e + Xe	threshold–2000 eV	Th
e + I	threshold–2000 eV	Th
e + Te	threshold–2000 eV	Th
e + Sb	threshold–2000 eV	Th
e + Sn	threshold–2000 eV	Th
e + In	threshold–2000 eV	Th

786. C. Li, A. Lahmam-Bennani, E. M. Staicu Casagrande, C. DalCappello
Electron impact double ionization of neon, argon and molecular nitrogen: role of the two-step mechanism
J. Phys. B 44, 115201 (2011)

e + N_2	600−700 eV	Exp
e + Ar	600−700 eV	Exp
e + Ne	600−700 eV	Exp
e + N_2	600−700 eV	Exp
e + Ar	600−700 eV	Exp
e + Ne	600−700 eV	Exp

787. L. Vainshtein, I. Beigman, Ph Mertens, S. Brezinsek, A. Pospieszczyk, D. Borodin
Ionization of W atoms and W+ ions by electrons
J. Phys. B 44, 125201 (2011)

e + W^+	threshold−500 eV	Th
e + W	threshold−500 eV	Th

788. Harshit N. Kothari, Siddharth H. Pandya, K. N. Joshipura
Electron impact ionization of plasma important SiClX (X=1-4) molecules: theoretical cross sections
J. Phys. B 44, 125202 (2011)

e	threshold−2000 eV	Th

789. A. Borovik, A. Kupliauskiene, O. Zatsarinny
Excitation cross sections and spectroscopic classification of autoionizing levels in a caesium atom
J. Phys. B 44, 145203 (2011)

e + Cs	10−600 eV	Exp

790. Y. K. Hahn, E. Zerrad
Optimized scattering functions and amplitudes for electron impact ionization and the post-prior symmetry
J. Phys. B 44, 165201 (2011)

e + H	$E_a/E = 0.1, 0.3$ (ratio of outgoing electron energy	Th

791. J. Rausch, A. Becker, K. Spruck, J. Hellhund, A., Jr. Borovik, K. Huber, S. Schippers, A. Mueller
Electron-impact single and double ionization of W17+
J. Phys. B 44, 165202 (2011)

e + W^{17+}	threshold−1000 eV	E/T

792. M. A. Khakoo, O. Zatsarinny, K. Bartschat
Near-threshold electron impact excitation of the argon 3p(5)4s configuration-new and revised normalized differential cross sections using recent time-of-flight measurements for normalization (vol 44, 015201, 2011)
J. Phys. B 44, 169801 (2011)

e + Ar	13 eV	Exp
e + Ar	13 eV	Exp

793. J. Ma, Y. Cheng, Y. Cwang, Y. Zhou
2s-3s excitation for positron-metastable hydrogen collisions
J. Phys. B 44, 175203 (2011)

e^+ + H	10−200 eV	Th

794. B. M. McLaughlin, Teck-Ghee Lee, J. A. Ludlow, E. Landi, S. D. Loch, M. S. Pindzola, C. P. Ballance
A large-scale R-matrix calculation for electron-impact excitation of the Ne2+, O-like ion
J. Phys. B 44, 175206 (2011)

e + Ne^{2+}	1E3−1E6 K	Th

795. Toshinori Tsuchida, Takeshi Odagiri, Lisa Ishikawa, Kazufumi Yachi, Keisuke Shigemura, Naruhito Ohno, Kouichi Hosaka, Masashi Kitajima, Noriyuki Kouchi
Doubly excited states of water as studied by electron energy loss spectroscopy in coincidence with detecting Lyman-alpha photons
J. Phys. B 44, 175207 (2011)

e + H$_2$O	100 eV	Exp

796. C. Q. Jiao, S. F. Adams
Electron ionization of selected cyclohexanes
J. Phys. B 44, 175209 (2011)

e + C$_8$H$_{16}$	10−200 eV	Exp
e + C$_6$H$_{12}$	10−200 eV	Exp

797. Rui Zhang, Pavlos G. Galiatsatos, Jonathan Tennyson
Positron collisions with acetylene calculated using the R-matrix with pseudo-states method
J. Phys. B 44, 195203 (2011)

e$^+$ + C$_2$H$_2$	0−5 eV	Th

798. M. S. Sulc, R. Curik, J. P. Ziesel, N. C. Jones, D. Field
A new type of interference phenomenon in cold collisions of electrons with N-2
J. Phys. B 44, 195204 (2011)

e + N$_2$	0−250 meV	E/T

799. I. Toth, L. Nagy
Ionization of molecular nitrogen by electron impact in (e, 2e) processes
J. Phys. B 44, 195205 (2011)

e + N$_2$	500−600 eV	Th
e + N$_2$	500−600 eV	Th

800. H. Kato, M. Ohkawa, H. Tanaka, I. Shimamura, M. J. Brunger
Vibrational excitation functions for inelastic and superelastic electron scattering from the ground electronic state in hot N2O
J. Phys. B 44, 195208 (2011)

e + N$_2$O	0.65−4.55 eV	Exp
e + N$_2$O	0.65−4.55 eV	Exp

801. Czeslaw Szmytkowski, Pawel Mozejko, Elzbieta Ptasinska-Denga
Electron scattering from hexafluoroacetone molecules: cross section measurements and calculations
J. Phys. B 44, 205202 (2011)

e + e	1−400 eV	E/T
e + e	1−400 eV	E/T

802. A., Jr. Borovik, C. Brandau, J. Jacobi, S. Schippers, A. Mueller
Electron-impact single ionization of Xe10+ ions
J. Phys. B 44, 205205 (2011)

e + Xe^{10+}	threshold−1000 eV	E/T

803. S. J. Brotton, J. W. McConkey
Electron-impact dissociative excitation of S-2
J. Phys. B 44, 215202 (2011)

e + S_2	threshold−370 eV	E/T

804. F. Kossoski, T. C. Freitas, M. H. F. Bettega
Resonances in electron collisions with C2H2Cl2 isomers
J. Phys. B 44, 245201 (2011)

e + $C_2H_2CL_2$	0−20 eV	Th

805. Ken-ichi Akita, Shinobu Nakazaki, Akinori Igarashi
Study of Angular Momentum Transfer in Electron-Impact 2s -¿ 2p Excitation for Lithium Isoelectronic Sequence
J. Phys. Soc. Japan 80, 034302 (2011)

e + Li Z= 3-6	1−1.5 threshold unit	Th
e + Li Z= 3-6	1−1.5 threshold unit	Th

806. Yuko Tohyama, Tetsuo Nagata
Absolute and Relative Measurements of Optical Emission Cross Sections for the N-2(+) 1Nd(v ',v ") Bands by Electron Impact
J. Phys. Soc. Japan 80, 034304 (2011)

e + N_2	18.8−300 eV	Exp

807. Ken-ichi Akita, Shinobu Nakazaki, Akinori Igarashi, Akihiko Ohsaki
Elastic Scattering and 3p Excitation from Ground State of Sodium Isoelectronic Sequence by Electron Impact
J. Phys. Soc. Japan 80, 114301 (2011)

e + Na Z= 12-14	threshold−20 eV	Th

808. Marius Stroe, Magda Fifirig
Dissociation of vibrationally excited D-2(+) by electrons
Mol. Phys. 109, 1617 (2011)

e + D_2	1−12 eV	Th

809. Y. Wu, Z. An, Y. M. Duan, M. T. Liu, J. Wu
K-shell ionization cross sections of Cl and L-alpha, L-beta X-ray production cross sections of Ba by 6-30 keV electron impact
Nucl. Instrum. Methods Phys. Res. B 269, 117 (2011)

e + Ba	6−30 keV	Exp
e + Cl	6−30 keV	Exp

810. R. Dey, A. C. Roy
The role of projectile interactions in triply differential cross sections for excitation-ionization of helium
Nucl. Instrum. Methods Phys. Res. B 269, 364 (2011)

e + He	500, 1240−4260 eV	Th
e + He	500, 1240−4260 eV	Th

811. Z. Felfli, A. Z. Msezane, D. Sokolovski
Low-energy electron elastic collision cross sections for ground and excited Tm, Lu and Hf atoms
Nucl. Instrum. Methods Phys. Res. B 269, 1046 (2011)

e + Hf	0−1.0 eV	Th
e + Lu	0−1.0 eV	Th
e + Tm	0−1.0 eV	Th

812. Z. Rezkallah, S. Houamer, C. DalCappello, I. Charpentier, A. C. Roy
Ionization of molecules by electron impact: Differential and total cross sections
Nucl. Instrum. Methods Phys. Res. B 269, 2750 (2011)

e + CH_4	threshold−1000 eV	Th
e + NH_3	threshold−1000 eV	Th
e + H_2O	threshold−1000 eV	Th
e + Hf	threshold−1000 eV	Th

813. Saidou Diallo, I. G. Faye, I. A. Diedhiou, M. S. Tall, L. Gomis, C. S. Diatta
Triple differential cross section for the ionization of helium by electronic impact
Nucl. Instrum. Methods Phys. Res. B 269, 2807 (2011)

e + He	1000 eV	Th
e + He	1000 eV	Th

814. Tapasi Das, Rajesh Srivastava, A. D. Stauffer
Electron impact excitation of the resonance transition 5p(2)P(1/2)-6s(2)S(1/2) in indium atoms at small scattering angles
Phys. Lett. A 375, 568 (2011)

e + In	10−100 eV	Th
e + In	10−100 eV	Th

815. Chuji Wang, Peeyush Sahay, Susan T. Scherrer
A new optical method of measuring electron impact excitation cross section of atoms: Cross section of the metastable 6s6p P-3(0) level of Hg
Phys. Lett. A 375, 2366 (2011)

e + Hg	4−10 eV	Exp

816. Zhongjun Li, Xu Shan, Jing Zhang, Damin Meng, Rui Wang
Triple differential cross section in (e, 2e) collisions for sodium in a coplanar symmetric geometry
Phys. Lett. A 375, 2563 (2011)

e + Na	10−65 eV	Th
e + Na	10−65 eV	Th

817. S. J. Brotton, J. W. McConkey
VUV fluorescence following electron-impact dissociative excitation of CS2
Phys. Rev. A 83, 012702 (2011)

e + Cs_2	100 eV	E/T

818. D. B. Jones, M. Yamazaki, N. Watanabe, M. Takahashi
Electron-impact ionization of the water molecule at large momentum transfer above the double-ionization threshold
Phys. Rev. A 83, 012704 (2011)

e + H_2O	2055 eV	E/T
e + H_2O	2055 eV	E/T

819. D. Oubaziz, H. Aouchiche, C. Champion
Double ionization of the water molecule: Influence of the target orientation on the secondary-electron angular distributions
Phys. Rev. A 83, 012708 (2011)

e + H_2O	1 keV	Th
e + H_2O	1 keV	Th

820. Jose M. Fernandez-Varea, Silvina Segui, Michael Dingfelder
L alpha, L beta, and L gamma x-ray production cross sections of Hf, Ta, W, Re, Os, Au, Pb, and Bi by electron impact: Comparison of distorted-wave calculations with experiment
Phys. Rev. A 83, 022702 (2011)

e + Bi	threshold−50 keV	Th
e + Pb	threshold−50 keV	Th
e + Au	threshold−50 keV	Th
e + Os	threshold−50 keV	Th
e + Re	threshold−50 keV	Th
e + W	threshold−50 keV	Th
e + Ta	threshold−50 keV	Th
e + Hf	threshold−50 keV	Th

821. W. Cao, J. -Cl. Dousse, J. Hoszowska, M. Kavcic, Y. Kayser, J. -L. Schenker, M. Zitnik
Double L3M ionization of Pd induced by impact with medium-energy electrons
Phys. Rev. A 83, 022708 (2011)

e + Pd	threshold−18 keV	Exp

822. O. Zatsarinny, K. Bartschat, M. Allan
High-resolution experiments and B-spline R-matrix calculations for elastic electron scattering from krypton
Phys. Rev. A 83, 032713 (2011)

e + Kr	0.3−9.8 eV	Th

823. Xiangfu Jia, Shiyan Sun
Effects of dynamical screening on single ionization of sodium by electron impact in doubly symmetric geometry
Phys. Rev. A 83, 032715 (2011)

e + Na	6−60 eV	Th
e + Na	6−60 eV	Th

824. Song Bin Zhang, Jian Guo Wang, R. K. Janev, Xiang Jun Chen
Electron-hydrogen atom-impact 1s -¿ 2s and 1s -¿ 2p excitation with screened Coulomb interaction between the n=2 and n=3 excitation thresholds
Phys. Rev. A 83, 032724 (2011)

e + H	11.2−12.1 eV	Th

825. L. Pravica, J. F. Williams, D. Cvejanovi, S. Samarin, K. Bartschat, O. Zatsarinny, A. D. Stauffer, R. Srivastava
Unexpected effects in spin-polarized electron-impact excitation of the (3d(10)4s5s)S-3(1) state in zinc
Phys. Rev. A 83, 040701 (2011)

e + Zn	6.5−8.5 eV	Exp

826. O. Zatsarinny, K. Bartschat, G. Garcia, F. Blanco, L. R. Hargreaves, D. B. Jones, R. Murrie, J. R. Brunton, M. J. Brunger, M. Hoshino, S. J. Buckman
Electron-collision cross sections for iodine
Phys. Rev. A 83, 042702 (2011)

e + I	1−50 eV	E/T

827. Chetan Limbachiya, Minaxi Vinodkumar, Nigel Mason
Calculation of electron-impact rotationally elastic total cross sections for NH3, H2S, and PH3 over the energy range from 0.01 eV to 2 keV
Phys. Rev. A 83, 042708 (2011)

e + PH_3	0.01−2000 eV	Th
e + H_2S	0.01−2000 eV	Th
e + NH_3	0.01−2000 eV	Th

828. Brent R. Yates, Murtadha A. Khakoo
Near-threshold electron-impact doubly differential cross sections for the ionization of argon and krypton
Phys. Rev. A 83, 042712 (2011)

e + Kr	15−30 eV	Exp
e + Ar	15−30 eV	Exp
e + Kr	15−30 eV	Exp
e + Ar	15−30 eV	Exp

829. M. M. Ristic, G. B. Poparic, D. S. Belic
Excitation of the a (3)Pi state of CO by electron impact
Phys. Rev. A 83, 042714 (2011)

e + Co	threshold−10 eV	Exp
e + Co	threshold−10 eV	Exp

830. M. Allan, O. May, J. Fedor, B. C. Ibanescu, L. Andric
Absolute angle-differential vibrational excitation cross sections for electron collisions with diacetylene
Phys. Rev. A 83, 052701 (2011)

e + C_4H_2	1−10 eV	Exp
e + C_4H_2	1−10 eV	Exp

831. S. Xu, X. Ma, X. Ren, A. Senftleben, T. Pflueger, A. Dorn, J. Ullrich
Formation of protons from dissociative ionization of methane induced by 54 eV electrons
Phys. Rev. A 83, 052702 (2011)

e + CH_4	54 eV	Exp

832. M. Silenou Mengoue, M. G. Kwato Njock, B. Piraux, Yu. V. Popov, S. A. Zaytsev
Electron-impact double ionization of He by applying the Jacobi matrix approach to the Faddeev-Merkuriev equations
Phys. Rev. A 83, 052708 (2011)

e + He	5500−5600 eV	Th
e + He	5500−5600 eV	Th

833. Christopher J. Bostock, Dmitry V. Fursa, Igor Bray
Calculation of electron scattering from the ground state of ytterbium
Phys. Rev. A 83, 052710 (2011)

e + Yb	threshold−200 eV	Th
e + Yb	threshold−200 eV	Th

834. X. Ren, I. Bray, D. V. Fursa, J. Colgan, M. S. Pindzola, T. Pflueger, A. Senftleben, S. Xu, A. Dorn, J. Ullrich
Electron-impact ionization of helium: A comprehensive experiment benchmarks theory
Phys. Rev. A 83, 052711 (2011)

e + He	70.6 eV	E/T
e + He	70.6 eV	E/T

835. Xueguang Ren, Arne Senftleben, Thomas Pflueger, Alexander Dorn, Klaus Bartschat, Joachim Ullrich
Benchmark experiment for electron-impact ionization of argon: Absolute triple-differential cross sections via three-dimensional electron emission images
Phys. Rev. A 83, 052714 (2011)

e + Ar	195 eV	E/T
e + Ar	195 eV	E/T

836. L. Sharma, A. Surzhykov, R. Srivastava, S. Fritzsche
Electron-impact excitation of singly charged metal ions
Phys. Rev. A 83, 062701 (2011)

e + $\mathbf{Ba^+}$	threshold−300 eV	Th
e + $\mathbf{Cd^+}$	threshold−300 eV	Th
e + $\mathbf{Zn^+}$	threshold−300 eV	Th
e + $\mathbf{Ca^+}$	threshold−300 eV	Th
e + $\mathbf{Mg^+}$	threshold−300 eV	Th

837. M. Allan, C. Winstead, V. McKoy
Absolute angle-differential elastic cross sections for electron collisions with diacetylene
Phys. Rev. A 83, 062703 (2011)

e + $\mathbf{C_4H_2}$	1−15 eV	E/T

838. M. S. Pindzola, C. P. Ballance, S. D. Loch
Electron-impact ionization of moderately charged atomic ions in excited states
Phys. Rev. A 83, 062705 (2011)

e + $\mathbf{C^{3+}}$	threshold−50 eV	Th

839. Savinder Kaur, Anand Bharadvaja, K. L. Baluja
Electron-impact study of S-3 using the R-matrix method
Phys. Rev. A 83, 062707 (2011)

e + e	500−30000 K	Th
e + e	500−30000 K	Th
e + e	500−30000 K	Th

840. C. DalCappello, C. Champion, I. Kada, A. Mansouri
Double ionization of single oriented water molecules by electron impact: Second-order Born description
Phys. Rev. A 83, 062716 (2011)

e + $\mathbf{H_2O}$	310−340 eV	Th
e + $\mathbf{H_2O}$	310−340 eV	Th

841. Chen, G. X.
Breit-Pauli R-matrix method for electron-impact excitation to magnetic sublevels and x-ray-line polarization of ions
Phys. Rev. A 84, 012705 (2011)

e + $\mathbf{Fe^{16+}}$	820−1150 eV	Th

842. R. Celiberto, R. K. Janev, J. M. Wadehra, A. Laricchiuta
Cross sections for 14-eV e-H-2 resonant collisions: Isotope effect in dissociative electron attachment
Phys. Rev. A 84, 012707 (2011)

e + $\mathbf{H_2}$	1−1000 eV	Th

843. J. A. Ludlow, T. G. Lee, C. P. Ballance, S. D. Loch, M. S. Pindzola
Level-resolved R-matrix calculations for the electron-impact excitation of Ne3+ and Ne6+
Phys. Rev. A 84, 022701 (2011)

e + Ne^{3+}	1E4−1E6, 1E7 K	Th
e + Ne^{6+}	1E4−1E6, 1E7 K	Th

844. Omer Sise, Mevlut Dogan, Ibrahim Okur, Albert Crowe
Electron-impact excitation of the (2p(2)) D-1 and (2s2p) P-1(o) autoionizing states of helium
Phys. Rev. A 84, 022705 (2011)

e + He	250 eV	E/T
e + He	250 eV	E/T

845. Yong-Feng Wang, Shan Xi Tian
Low-energy electron collisions with thioformaldehyde
Phys. Rev. A 84, 022709 (2011)

e + e	0−10 eV	Th
e + e	0−10 eV	Th

846. Zhangjin Chen, Yaqiu Liang, D. H. Madison, C. D. Lin
Strong-field nonsequential double ionization of Ar and Ne
Phys. Rev. A 84, 023414 (2011)

e + Ne	threshold−100 eV	Th
e + Ar	threshold−100 eV	Th
e + Ne	threshold−100 eV	Th
e + Ar	threshold−100 eV	Th

847. Hao Xu, Robin Shakeshaft
Near-threshold behavior of electron-impact excitation of He+(2s) and He+(2p)
Phys. Rev. A 84, 024701 (2011)

e + He	40.84−45.60 eV	Th

848. L. E. Machado, R. T. Sugohara, A. S. dosSantos, M. -T. Lee, I. Iga, G. L. C. deSouza, M. G. P. Homem, S. E. Michelin, L. M. Brescansin
Absorption effects in electron-sulfur-dioxide collisions
Phys. Rev. A 84, 032709 (2011)

e + SO$_2$	100−1000 eV	E/T

849. C. DalCappello, Z. Rezkallah, S. Houamer, I. Charpentier, P. A. Hervieux, M. F. Ruiz-Lopez, R. Dey, A. C. Roy
Second-order Born approximation for the ionization of molecules by electron and positron impact
Phys. Rev. A 84, 032711 (2011)

e$^+$ + H$_2$O	250 eV	Th
e + H$_2$O	250 eV	Th
e$^+$ + H$_2$O	250 eV	Th
e + H$_2$O	250 eV	Th

850. Zhong-Wen Wu, Jun Jiang, Chen-Zhong Dong
Influence of Breit interaction on the polarization of radiation following inner-shell electron-impact excitation of highly charged berylliumlike ions
Phys. Rev. A 84, 032713 (2011)

$\mathbf{e + Nd^{56+}}$	(1−5)?threshold	Th
$\mathbf{e + Mo^{38+}}$	(1−5)?threshold	Th
$\mathbf{e + Bi^{79+}}$	(1−5)?threshold	Th

851. M. Fogle, E. M. Bahati, M. E. Bannister, S. H. M. Deng, C. R. Vane, R. D. Thomas, V. Zhaunerchyk
Electron-impact dissociative excitation and ionization of N2D+
Phys. Rev. A 84, 032714 (2011)

$\mathbf{e + N_2D^+}$	5−100 eV	Exp

852. O. A. Fojon, C. R. Stia, R. D. Rivarola
Erasing the traces of classical mechanics in ionization of H-2 by quantum interferences
Phys. Rev. A 84, 032715 (2011)

$\mathbf{e + H_2}$	4087 eV	Th

853. Pragya Bhatt, Raj Singh, Namita Yadav, R. Shanker
Dissociative-ionization cross sections for 12-keV-electron impact on CO2
Phys. Rev. A 84, 042701 (2011)

$\mathbf{e + CO_2}$	12 keV	Exp

854. M. H. F. Bettega, C. Winstead, V. McKoy, A. Jo, A. Gauf, J. Tanner, L. R. Hargreaves, M. A. Khakoo
Collisions of low-energy electrons with isopropanol
Phys. Rev. A 84, 042702 (2011)

$\mathbf{e + C_3H_7OH}$	1.5−30 eV	E/T

855. Jasmeet Singh Rajvanshi, K. L. Baluja
Electron-impact study of the S-2 molecule using the R-matrix method
Phys. Rev. A 84, 042711 (2011)

$\mathbf{e + S_2}$	0−10 eV	Th
$\mathbf{e + S_2}$	0−10 eV	Th
$\mathbf{e + S_2}$	0−10 eV	Th

856. Minaxi Vinodkumar, Harshad Bhutadia, Bobby Antony, Nigel Mason
Electron-impact rotationally elastic total cross sections for H2CO and HCOOH over a wide range of incident energy (0.01-2000 eV)
Phys. Rev. A 84, 052701 (2011)

$\mathbf{e + H_2CO}$	1−1000 eV	Th
$\mathbf{e + HCOOH}$	1−1000 eV	Th

857. Michal Tarana, Karel Houfek, Jiri Horacek, Ilya I. Fabrikant
Dissociative electron attachment and vibrational excitation of CF3Cl: Effect of two vibrational modes revisited
Phys. Rev. A 84, 052717 (2011)

$\mathbf{e + CF_3Cl}$	0.4−2.4 eV	Th

858. A. L. Harris, B. Milum, D. H. Madison
Indistinguishability in electron-impact excitation-ionization of helium
Phys. Rev. A 84, 052718 (2011)

$\mathbf{e + He}$	112−319 eV	Th
$\mathbf{e + He}$	112−319 eV	Th
$\mathbf{e + He}$	112−319 eV	Th

859. Bettega, M. H. F.
Elastic collisions of low-energy electrons with SiY4 (Y = Cl, Br, I) molecules
Phys. Rev. A 84, 052725 (2011)

e + $\mathbf{SiBR_4}$	1–10 eV	Th
e + $\mathbf{SiI_4}$	1–10 eV	Th
e + $\mathbf{SiCl_4}$	1–10 eV	Th

860. L. R. Hargreaves, R. Albaridy, G. Serna, M. C. A. Lopes, M. A. Khakoo
Electron-impact vibrational excitation of furan
Phys. Rev. A 84, 062705 (2011)

e + $\mathbf{C_4H_4O}$	5–15 eV	Exp

861. C. P. Ballance, S. D. Loch, J. A. Ludlow, Sh. A. Abdel-Naby, M. S. Pindzola
Electron-impact ionization of C+ excited states
Phys. Rev. A 84, 062713 (2011)

e + $\mathbf{C^+}$	threshold–25 eV	Th
e + $\mathbf{C^+}$	threshold–25 eV	Th

862. T. C. Freitas, S. d'A. Sanchez, M. T. do N. Varella, M. H. F. Bettega
Electron collisions with hydrogen-bonded complexes
Phys. Rev. A 84, 06714 (2011)

e	1–6 eV	Th
e + e	1–6 eV	Th

863. Kate L. Nixon, Andrew James Murray
Differential Cross Sections for Ionization of Laser-Aligned Atoms by Electron Impact
Phys. Rev. Lett. 106, 123201 (2011)

e + Mg	47.65 eV	Exp
e + Mg	47.65 eV	Exp

864. Oleg Zatsarinny, Klaus Bartschat
Nonperturbative Treatment of Ionization with Excitation of Helium by Electron Impact
Phys. Rev. Lett. 107, 023203 (2011)

e + He	70 – 150 eV	Th
e + He	70 – 150 eV	Th
e + He	70 – 150 eV	Th

865. K. M. Aggarwal, T. Kato, F. P. Keenan, I. Murakami
Energy levels, radiative rates and electron impact excitation rates for transitions in He-like Li II, Be III, B IV and C V
Phys. Scr. 83, 015302 (2011)

e + $\mathbf{Li^+}$	1E4–1E6 K	Th
e + $\mathbf{Be^{2+}}$	1E4–1E6 K	Th
e + $\mathbf{B^{3+}}$	1E4–1E6 K	Th
e + $\mathbf{C^{4+}}$	1E4–1E6 K	Th

866. Stancalie, V.
Forbidden transitions in excitation by electron impact in Co3+: an R-matrix approach
Phys. Scr. 83, 025301 (2011)

e + $\mathbf{Co^{3+}}$	40–70 eV	Th

867. Satyendra Pal, Anshu, C. Singh
Electron impact ionization cross sections for C-60 fullerene
Phys. Scr. T144, 014036 (2011)

e + C_{60}	threshold−1000 eV	Th

868. D. -H. Kwon, D. W. Savin
EFFECTS OF CONFIGURATION INTERACTION FOR DIELECTRONIC RECOMBINATION OF Na-LIKE IONS FORMING Mg-LIKE IONS
Astrophys. J. 734, 2 (2011)

e + Ca^{9+}	1−5000 eV	Th
e + Ti^{11+}	1−5000 eV	Th
e + Cr^{13+}	1−5000 eV	Th
e + Fe^{15+}	1−5000 eV	Th
e + Ni^{17+}	1−5000 eV	Th
e + Zn^{19+}	1−5000 eV	Th

869. M. Hahn, M. Grieser, C. Krantz, M. Lestinsky, A. Mueller, O. Novotny, R. Repnow, S. Schippers, A. Wolf, D. W. Savin
STORAGE RING CROSS SECTION MEASUREMENTS FOR ELECTRON IMPACT IONIZATION OF Fe12+ FORMING Fe13+ AND Fe14+
Astrophys. J. 735, 105 (2011)

e + Fe^{12+}	1E5−1E8 K	Exp

870. A. Urbanowicz, A. Bielski, D. Lisak, R. Ciurylo, R. S. Trawinski
Temperature Effects on Dissociative Recombination in Neon
Acta Phys. Pol. A 119, 336 (2011)

e + Ne^{2+}	100−700 K	Exp
e + Ne^{2+}	100−700 K	Exp

871. Viatcheslav Kokoouline, Nicolas Douguet, Chris H. Greene
Breaking bonds with electrons: Dissociative recombination of molecular ions
Chem. Phys. Lett. 507, 1 (2011)

e + $H_3{}^+$	10−2000 K	Th

872. N. Bhargava Ram, E. Krishnakumar
Dissociative electron attachment to methane probed using velocity slice imaging
Chem. Phys. Lett. 511, 22 (2011)

e + CH_4	8−12 eV	Exp

873. P. Lukac, O. Mikus, I. Morva, Z. Zabudla, J. Trnovec, M. Morvova
Electron Temperature Dependence of the Dissociative Recombination Coefficient of Molecular Argon Ions Ar-2(+) with Electrons
Contrib. Plasma Phys. 51, 672 (2011)

e + Ar^{2+}	3E3−1E4 K	Exp

874. S. E. Huber, J. Seebacher, A. Kendl, D. Reiter
Assessment of Hydrocarbon Electron-Impact Ionization Cross Section Measurements for Magnetic Fusion
Contrib. Plasma Phys. 51, 931 (2011)

e + C_2H_2	threshold−1000 eV	Th
e + C_2H_4	threshold−1000 eV	Th
e + C_3H_6	threshold−1000 eV	Th

875. H. Elabidi, S. Sahal-Brechot
Checking the dependence on the upper level ionization potential of electron impact widths using quantum calculations
Eur. Phys. J. D 61, 285 (2011)

$\mathbf{e + Mg^{6+}}$	1E5 K	Th
$\mathbf{e + Na^{6+}}$	1E5 K	Th
$\mathbf{e + Al^{7+}}$	1E5 K	Th
$\mathbf{e + Na^{7+}}$	1E5 K	Th
$\mathbf{e + Mg^{8+}}$	1E5 K	Th
$\mathbf{e + Al^{9+}}$	1E5 K	Th
$\mathbf{e + Mg^{9+}}$	1E5 K	Th
$\mathbf{e + Al^{10+}}$	1E5 K	Th
$\mathbf{e + Si^{10+}}$	1E5 K	Th
$\mathbf{e + Ti^{10+}}$	1E5 K	Th
$\mathbf{e + Cr^{12+}}$	1E5 K	Th
$\mathbf{e + Cr^{13+}}$	1E5 K	Th
$\mathbf{e + Fe^{14+}}$	1E5 K	Th
$\mathbf{e + Fe^{15+}}$	1E5 K	Th
$\mathbf{e + Ni^{17+}}$	1E5 K	Th
$\mathbf{e + Fe^{22+}}$	1E5 K	Th

876. M. Hoshino, P. Limao-Vieira, M. Probst, Y. Nunes, H. Tanaka
Dissociative electron attachment to carbonyl fluoride, F2CO
Int. J. Mass Spectrom. 303, 125 (2011)

$\mathbf{e + e}$	0–30 eV	Exp

877. Patrick A. Lawson, David, Jr. Osborne, Nigel G. Adams
Effect of isotopic content on the rate constants for the dissociative electron-ion recombination of N2H+
Int. J. Mass Spectrom. 304, 41 (2011)

$\mathbf{e + N_2H}$	300–500 K	Exp

878. David, Jr. Osborne, Patrick A. Lawson, Nigel G. Adams
Flowing afterglow studies of dissociative electron-ion recombination for a series of single ring compounds at room temperature
Int. J. Mass Spectrom. 305, 35 (2011)

$\mathbf{e + e^{+}}$	300 K	Exp

879. M. Hoshino, S. Matejcik, Y. Nunes, F. FerreiradaSilva, P. Limao-Vieira, H. Tanaka
Negative ion formation through dissociative electron attachment to GeH4: Comparative studies with CH4 and SiH4
Int. J. Mass Spectrom. 306, 51 (2011)

$\mathbf{e + GeH_4}$	6–11 eV	Exp
$\mathbf{e + CH_4}$	6–11 eV	Exp
$\mathbf{e + SiH_4}$	6–11 eV	Exp

880. David S., Jr. Osborne, Patrick A. Lawson, Nigel G. Adams
The effect of N-heteroatoms and CH3 substituents on dissociative electron-ion recombination of protonated single six membered ring compounds at room temperature
Int. J. Mass Spectrom. 308, 114 (2011)

$\mathbf{e + e}$	300 K	Exp

881. Nicholas S. Shuman, Thomas M. Miller, Jeffrey F. Friedman, Albert A. Viggiano, Anatol I. Maergoiz, Juergen Troe
Pressure and temperature dependence of dissociative and non-dissociative electron attachment to CF3: Experiments and kinetic modeling
J. Chem. Phys. 135, 054306 (2011)

e + CF_3	300–600 K	E/T

882. Gordon A. Gallup, Ilya I. Fabrikant
Dissociative electron attachment to CH2Cl2, CHCH3Cl2, and C(CH3)(2)Cl-2
J. Chem. Phys. 135, 134316 (2011)

e + CH_2Cl_2	0–2.0 eV	Th
e + $C_2H_4Cl_2$	0–2.0 eV	Th
e + e	0–2.0 eV	Th

883. U. I. Safronova, A. S. Safronova, P. Beiersdorfer, W. R. Johnson
Excitation energies, radiative and autoionization rates, dielectronic satellite lines and dielectronic recombination rates for excited states of Ag-like W from Pd-like W
J. Phys. B 44, 035005 (2011)

e + W^{28+}	0.1–10000 eV	Th

884. L. R. Hargreaves, J. R. Brunton, A. Prajapati, M. Hoshino, F. Blanco, G. Garcia, S. J. Buckman, M. J. Brunger
Elastic cross sections for electron scattering from iodomethane
J. Phys. B 44, 045207 (2011)

e + CH_3I	5–50 eV	Exp

885. S. Yan, X. Ma, P. Zhang, S. Xu, S. F. Zhang, X. L. Zhu, W. T. Feng, H. P. Liu
Signatures of the projectile electron-target core elastic scattering in Ar (e, 2e) reactions at low and intermediate impact energies
J. Phys. B 44, 055202 (2011)

e + Ar	80–220 eV	Exp

886. Bostock, James Christopher
The fully relativistic implementation of the convergent close-coupling method
J. Phys. B 44, 083001 (2011)

e + Ar^{17+}	(2–28)*threshold, threshold–100 eV	Th
e + Ti^{21+}	(2–28)*threshold, threshold–100 eV	Th
e + Fe^{25+}	(2–28)*threshold, threshold–100 eV	Th
e + Hg	(2–28)*threshold, threshold–100 eV	Th

887. N. R. Badnell, A. Foster, D. C. Griffin, D. Kilbane, M. O'Mullane, H. P. Summers
Dielectronic recombination of heavy species: the tin 4p64dq ? 4p64d(q?1)4f + 4p54d(q+1) transition arrays for q = 1?10
J. Phys. B 44, 135201 (2011)

e + Sn^{4+}	1–1000 eV	Th
e + Sn^{5+}	1–1000 eV	Th
e + Sn^{6+}	1–1000 eV	Th
e + Sn^{7+}	1–1000 eV	Th
e + Sn^{8+}	1–1000 eV	Th
e + Sn^{9+}	1–1000 eV	Th
e + Sn^{10+}	1–1000 eV	Th
e + Sn^{11+}	1–1000 eV	Th
e + Sn^{12+}	1–1000 eV	Th
e + Sn^{13+}	1–1000 eV	Th

888. Z. Felfli, A. Z. Msezane, D. Sokolovski
Elastic scattering of slow electrons from Y, Ru, Pd, Ag and Pt atoms: search for
J. Phys. B 44, 135204 (2011)

e + Y	0−7 eV	Th
e + Ru	0−7 eV	Th
e + Pd	0−7 eV	Th
e + Ag	0−7 eV	Th
e + Pt	0−7 eV	Th

889. D. S. Slaughter, H. Adaniya, T. N. Rescigno, D. J. Haxton, A. E. Orel, C. W. McCurdy, A. Belkacem
Dissociative electron attachment to carbon dioxide via the 8.2 eV Feshbach resonance
J. Phys. B 44, 205203 (2011)

$\mathbf{e + CO_2}$	8.2 eV	E/T

890. U. I. Safronova, P. G. Wilcox, A. S. Safronova
Relativistic calculations of dielectronic recombination and satellite lines of an Ar-like Ni ion
J. Phys. B 44, 225002 (2011)

$\mathbf{e + Ni^{10+}}$	0.1−5000 eV	Th

891. Fabrikant, I. Ilya
Dissociative electron attachment to CH3I on surfaces and in bulk media: vibrational Feshbach resonance suppression
J. Phys. B 44, 225202 (2011)

$\mathbf{e + S_2}$	threshold−100 eV	E/T

892. G. Purohit, Vinod Patidar, K. K. Sud
Differential cross section calculations of positron and electron impact ionization of Ar (3p)
Nucl. Instrum. Methods Phys. Res. B 269, 745 (2011)

e + Ar	100−500 eV	Th
$\mathbf{e^+ + Ar}$	100−500 eV	Th
e + Ar	100−500 eV	Th
$\mathbf{e^+ + Ar}$	100−500 eV	Th

893. Duck-Hee Kwon, Daniel Wolf Savin
Fe15+ dielectronic recombination and the effects of configuration interaction between resonances with different captured electron principal quantum numbers
Phys. Rev. A 83, 012701 (2011)

$\mathbf{e + Fe^{15+}}$	300−900 eV	Th

894. Gordon A. Gallup, Ilya I. Fabrikant
Vibrational Feshbach resonances in dissociative electron attachment to uracil
Phys. Rev. A 83, 012706 (2011)

$\mathbf{e + C_4H_4N_2O_2}$	0.7−2.3 eV	Th
e + e	0.7−2.3 eV	Th

895. S. Schippers, D. Bernhardt, A. Mueller, C. Krantz, M. Grieser, R. Repnow, A. Wolf, M. Lestinsky, M. Hahn, O. Novotny, D. W. Savin
Dielectronic recombination of xenonlike tungsten ions
Phys. Rev. A 83, 012711 (2011)

$\mathbf{e + W^{20+}}$	0−140 eV	Exp

896. D. Bernhardt, C. Brandau, Z. Harman, C. Kozhuharov, A. Mueller, W. Scheid, S. Schippers, E. W. Schmidt, D. Yu, A. N. Artemyev, I. I. Tupitsyn, S. Boehm, F. Bosch, F. J. Currell, B. Franzke, A. Gumberidze, J. Jacobi, P. H. Mokler, F. Nolden, U. Spillman, Z. Stachura, M. Steck, Th. Stoehlker
Breit interaction in dielectronic recombination of hydrogenlike uranium
Phys. Rev. A 83, 020701 (2011)

$\mathbf{e + U^{91+}}$	63−90 keV	E/T

897. S. T. Chourou, A. E. Orel
Isotope effect in dissociative electron attachment to HCN
Phys. Rev. A 83, 032709 (2011)

e + HCN	0−4 eV	Th
e + DCN	0−4 eV	Th

898. Annemieke Petrignani, Simon Altevogt, Max H. Berg, Dennis Bing, Manfred Grieser, Jens Hoffmann, Brandon Jordon-Thaden, Claude Krantz, Mario B. Mendes, Oldrich Novotny, Steffen Novotny, Dmitry A. Orlov, Roland Repnow, Tobias Sorg, Julia Stuetzel, Andreas Wolf, Henrik Buhr, Holger Kreckel, Viatcheslav Kokoouline, Chris H. Greene
Resonant structure of low-energy H-3(+) dissociative recombination
Phys. Rev. A 83, 032711 (2011)

$\mathbf{e + H^{3+}}$	1E−5−1E0 eV	E/T

899. M. S. Pindzola, S. D. Loch, F. Robicheaux
Dielectronic recombination in C3+ above and below the ionization threshold
Phys. Rev. A 83, 042705 (2011)

$\mathbf{e + C^{3+}}$	threshold	Th

900. Z. Felfli, A. Z. Msezane, D. Sokolovski
Low-energy electron elastic scattering from Mn, Cu, Zn, Ni, Ag, and Cd atoms
Phys. Rev. A 83, 052705 (2011)

e + Mn	0−1 eV	Th
e + Ni	0−1 eV	Th
e + Cu	0−1 eV	Th
e + Zn	0−1 eV	Th
e + Ag	0−1 eV	Th
e + Cd	0−1 eV	Th

901. Y. B. Fu, C. Z. Dong, M. G. Su, F. Koike, G. O'Sullivan, J. G. Wang
Theoretical investigation of dielectronic recombination of Sn12+ ions
Phys. Rev. A 83, 062708 (2011)

$\mathbf{e + Sn^{12+}}$	1−1000 eV	Th

902. Jeremy S. Savage, Dmitry V. Fursa, Igor Bray
Convergent close-coupling calculations of positron-magnesium scattering
Phys. Rev. A 83, 062709 (2011)

$\mathbf{e^{+} + Mg}$	0.01−100 eV	Th

903. A. R. Lopes, S. d'A. Sanchez, M. H. F. Bettega
Elastic scattering of low-energy electrons by nitromethane
Phys. Rev. A 83, 062713 (2011)

e + e	0−10 eV	Th

904. F. O. Waffeu Tamo, H. Buhr, O. Motapon, S. Altevogt, V. M. Andrianarijaona, M. Grieser, L. Lammich, M. Lestinsky, M. Motsch, I. Nevo, S. Novotny, D. A. Orlov, H. B. Pedersen, D. Schwalm, F. Sprenger, X. Urbain, U. Weigel, A. Wolf, I. F. Schneider

Assignment of resonances in dissociative recombination of HD+ ions: High-resolution measurements compared with accurate computations

Phys. Rev. A 84, 022710 (2011)

e + HD^+	1E−4−20 eV	E/T

905. D. J. Haxton, H. Adaniya, D. S. Slaughter, B. Rudek, T. Osipov, T. Weber, T. N. Rescigno, C. W. McCurdy, A. Belkacem

Observation of the dynamics leading to a conical intersection in dissociative electron attachment to water

Phys. Rev. A 84, 030701 (2011)

e + H_2O	11.3 eV	E/T

906. Daniel J. Haxton, Chris H. Greene

Ab initio frame-transformation calculations of direct and indirect dissociative recombination rates of HeH+ + e(-) (vol 79, 022701, 2009)

Phys. Rev. A 84, 039903 (2011)

e + HeH^+	0.01−1 eV	Th

907. C. J. Colyer, S. M. Bellm, F. Blanco, G. Garcia, B. Lohmann

Elastic electron scattering from the DNA bases cytosine and thymine

Phys. Rev. A 84, 042707 (2011)

e + $C_4H_5N_3O$	60−500 eV	E/T
e + e	60−500 eV	E/T

908. Mingwu Zhang, Xiaohong Cai, Asa Larson, Ann E. Orel

Theoretical study of dissociative recombination of Cl-2(+)

Phys. Rev. A 84, 052707 (2011)

e + $Cl_2{}^+$	1E1−1E5 K	Th

909. Serov, V. Vladislav

Calculation of intermediate-energy electron-impact ionization of molecular hydrogen and nitrogen using the paraxial approximation

Phys. Rev. A 84, 062701 (2011)

e + H_2	200−600 eV	Th
e + N_2	200−600 eV	Th

910. R. T. Sugohara, M. -T. Lee, G. L. C. deSouza, M. G. P. Homem, I. Iga

Cross sections for elastic electron scattering by tetramethylsilane in the intermediate-energy range

Phys. Rev. A 84, 062709 (2011)

e + e	100−1000 eV	E/T

911. N. Bhargava Ram, Vaibhav S. Prabhudesai, E. Krishnakumar

Comment on Imaging the Molecular Dynamics of Dissociative Electron Attachment to Water

Phys. Rev. Lett. 106, 049301 (2011)

e + H_2O	8.5,9.5 eV	Th
e + H_2O	8.5,9.5 eV	Th

912. E. Krishnakumar, S. Denifl, I. Cadez, S. Markelj, N. J. Mason
Dissociative Electron Attachment Cross Sections for H-2 and D-2
Phys. Rev. Lett. 106, 243201 (2011)

$\mathbf{e + H_2}$	0–20 eV	Exp
$\mathbf{e + D_2}$	0–20 eV	Exp

913. D. Androic, D. S. Armstrong, J. Arvieux, S. L. Bailey, D. H. Beck, E. J. Beise, J. Benesch, F. Benmokhtar, L. Bimbot, J. Birchall, P. Bosted, H. Breuer, C. L. Capuano, Y. -C. Chao, A. Coppens, C. A. Davis, C. Ellis, G. Flores, G. Franklin, C. Furget, D. Gaskell, M. T. W. Gericke, J. Grames, G. Guillard, J. Hansknecht, T. Horn, M. K. Jones, P. M. King, W. Korsch, S. Kox, L. Lee, J. Liu, A. Lung, J. Mammei, J. W. Martin, R. D. McKeown, A. Micherdzinska, M. Mihovilovic, H. Mkrtchyan, M. Muether, S. A. Page, V. Papavassiliou, S. F. Pate, S. K. Phillips, P. Pillot, M. L. Pitt, M. Poelker, B. Quinn, W. D. Ramsay, J. -S. Real, J. Roche, P. Roos, J. Schaub, T. Seva, N. Simicevic, G. R. Smith, D. T. Spayde, M. Stutzman, R. Suleiman, V. Tadevosyan, W. T. H. vanOers, M. Versteegen, E. Voutier, W. Vulcan, S. P. Wells, S. E. Williamson, S. A. Wood, B. Pasquini, M. Vanderhaeghen
Transverse Beam Spin Asymmetries at Backward Angles in Elastic Electron-Proton and Quasielastic Electron-Deuteron Scattering
Phys. Rev. Lett. 107, 022501 (2011)

$\mathbf{e + H^{+}}$	362,687 eV	Exp
$\mathbf{e + D^{+}}$	362,687 eV	Exp

914. Christopher J. Bostock, Michael J. Berrington, Dmitry V. Fursa, Igor Bray
Relativistic and Close-Coupling Effects in the Spin Polarization of Low-Energy Electrons Scattered Elastically from Cadmium
Phys. Rev. Lett. 107, 093202 (2011)

$\mathbf{e + Cd}$	0.3–9.0 eV	Th

915. Oleg Y. Andreev, Leonti N. Labzowsky, Alexander V. Prigorovsky
Dielectronic recombination with one-electron highly charged ions
Phys. Scr. T144, 014008 (2011)

$\mathbf{e + U^{91+}}$	63–73.5, 0–31.3 keV	Th
$\mathbf{e + Gd^{63+}}$	63–73.5, 0–31.3 keV	Th

916. Zhi-min Hu, Yue-ming Li, Akira Yamazaki, Nobuyuki Nakamura
Two-photon observations of dielectronic recombination processes
Phys. Scr. T144, 014047 (2011)

$\mathbf{e + Kr^{35+}}$	9.22, 9.24 keV	E/T

917. C. E. Hudson, P. H. Norrington, C. A. Ramsbottom, M. P. Scott
Dirac R-matrix collision strengths and effective collision strengths for transitions of Ni XVII
Astron. Astrophys. 537, A12 (2012)

$\mathbf{e + Ni^{16+}}$	1E4.5–1E8 K	Th

918. S. S. Tayal
Breit-Pauli oscillator strengths and electron excitation collision strengths for Si VIII
Astron. Astrophys. 541, A61 (2012)

$\mathbf{e + Si^{7+}}$	1E4–1E6.5 K	Th

919. G. Y. Liang, N. R. Badnell, G. Zhao
R-matrix electron-impact excitation data for the B-like iso-electronic sequence
Astron. Astrophys. 547, A87 (2012)

e + $\mathbf{Kr}^{31+}$	0−−400 Ryd	Th
e + $\mathbf{Fe}^{21+}$	0−−400 Ryd	Th
e + $\mathbf{Ar}^{13+}$	0−−400 Ryd	Th
e + $\mathbf{Ne}^{5+}$	0−−400 Ryd	Th

920. S. S. Tayal
Oscillator strengths and effective collision strengths for electron excitation of Mg VI
Astron. Astrophys. 548, A27 (2012)

e + $\mathbf{Mg}^{5+}$	10000−200000 K	Th

921. L. Di, J. R. Shi, G. Zhao
Electron impact collision strengths in Ne VII
At. Data Nucl. Data Tables 98, 437 (2012)

e + $\mathbf{Ne}^{6+}$	1E5.8−1E7 K	Th

922. K. Wang, J. Yan, M. Huang, C. Y. Li, J. L. Zeng, C. Y. Chen, Y. S. Wang, Y. M. Zou
Electron impact excitation rate coefficients for P-like Ni XIV
At. Data Nucl. Data Tables 98, 779 (2012)

e + $\mathbf{Ni}^{13+}$	1E5 1E8 K	Th

923. C. E. Hudson, C. A. Ramsbottom, M. P. Scott
COLLISION STRENGTHS AND EFFECTIVE COLLISION STRENGTHS FOR TRANSITIONS WITHIN THE GROUND-STATE CONFIGURATION OF S III
Astrophys. J. 750, 65 (2012)

e + $\mathbf{S}^{2+}$	0−2 RYD	Th

924. S. Mahmood, S. Ali, I. Orban, S. Tashenov, E. Lindroth, R. Schuch
RECOMBINATION AND ELECTRON IMPACT EXCITATION RATE COEFFICIENTS FOR S XV AND S XVI
Astrophys. J. 754, 86 (2012)

e + $\mathbf{S}^{15+}$	1.4−3.0 keV	Exp
e + $\mathbf{S}^{14+}$	1.4−3.0 keV	Exp
e + $\mathbf{S}^{15+}$	1.4−3.0 keV	Exp
e + $\mathbf{S}^{14+}$	1.4−3.0 keV	Exp

925. M. Hahn, A. Becker, M. Grieser, C. Krantz, M. Lestinsky, A. Mueller, O. Novotny, R. Repnow, S. Schippers, K. Spruck, A. Wolf, D. W. Savin
STORAGE RING CROSS-SECTION MEASUREMENTS FOR ELECTRON IMPACT SINGLE AND DOUBLE IONIZATION OF Fe9+ AND SINGLE IONIZATION OF Fe10+
Astrophys. J. 760, 80 (2012)

e + $\mathbf{Fe}^{10+}$	250−1200 eV	Exp
e + $\mathbf{Fe}^{9+}$	250−1200 eV	Exp

926. A. M. Sossah, S. S. Tayal
TRANSITION PROBABILITIES AND COLLISION STRENGTHS FOR ELECTRON-IMPACT EXCITATION OF Cl III
Astrophys. J., Suppl. Ser. 202, 12 (2012)

e + $\mathbf{Cl}^{2+}$	5E3−1E6 K	Th

927. S. Y. Sun, X. Y. Ma, X. Li, X. Y. Miao, X. F. Jia
Effect of initial-state target polarization on the single ionization of helium by 1-keV electron impact
Chin. Phys. B 21, 73402 (2012)

e + He 1keV Th

928. S. S. Zang, Z. M. Ge
Post-collision interactions and the polarization effect in (e, 2e) collisions of helium
Chin. Phys. B 21, 73403 (2012)

e + He 50, 102eV Th

929. Y. Wang, Y. J. Zhou, L. G. Jiao
Second-Order Born Effect in Single Ionization of Argon by Electron Impact
Chin. Phys. Lett. 29, 13401 (2012)

e + Ar 37,74,205eV Th

930. R. Celiberto, R. K. Janev, J. M. Wadehra, J. Tennyson
Dissociative electron attachment to vibrationally excited H-2 molecules involving the (2)Sigma(+)(g) resonant Rydberg electronic state
Chem. Phys. 398, 206 (2012)

e + H_2 8−18eV Th

931. M. M. Ristic, M. Vojnovic, G. B. Poparic, D. S. Belic
Rate coefficients for electron impact excitation of the a(3)Pi state of CO
Chem. Phys. 405, 16 (2012)

e + Co 0−17eV Th

932. Y. Y. Zeng, H. Feng, W. G. Sun
Studies on the vibrational excitation differential cross sections of non-resonant e-N-2 scattering using augmented polarization potentials
Eur. Phys. J. D 66, 3 (2012)

e + N_2 4−15eV Th

933. I. Linert, M. Dampc, B. Mielewska, M. Zubek
Cross sections for ionization and ionic fragmentation of pyrimidine molecules by electron collisions
Eur. Phys. J. D 66, 20 (2012)

e + $C_4H_4N_2$ 10−150eV Exp

934. I. Toth, R. I. Campeanu, L. Nagy
Triple differential cross sections for the ionization of water by electron and positron impact
Eur. Phys. J. D 66, 21 (2012)

e + H_2O 250eV Th
e + H_2O 250eV Th

935. K. Chakrabarti, J. Tennyson
Electron collisions with the BeH+ molecular ion in the R-matrix approach
Eur. Phys. J. D 66, 31 (2012)

e + BeH^+ 0−24eV Th

936. K. Anzai, H. Kato, M. Hoshino, H. Tanaka, Y. Itikawa, L. Campbell, M. J. Brunger, S. J. Buckman, H. Cho, F. Blanco, G. Garcia, P. Limao-Vieira, O. Ingolfsson
Cross section data sets for electron collisions with H-2, O-2, CO, CO2, N2O and H2O
Eur. Phys. J. D 66, 36 (2012)

$\mathbf{e + H_2}$	0.01−1000eV	Exp
$\mathbf{e + H_2O}$	0.01−1000eV	Exp
$\mathbf{e + N_2O}$	0.01−1000eV	Exp
$\mathbf{e + CO_2}$	0.01−1000eV	Exp
$\mathbf{e + Co}$	0.01−1000eV	Exp
$\mathbf{e + O_2}$	0.01−1000eV	Exp
$\mathbf{e + H_2}$	0.01−1000eV	Exp
$\mathbf{e + H_2O}$	0.01−1000eV	Exp
$\mathbf{e + N_2O}$	0.01−1000eV	Exp
$\mathbf{e + CO_2}$	0.01−1000eV	Exp
$\mathbf{e + Co}$	0.01−1000eV	Exp
$\mathbf{e + O_2}$	0.01−1000eV	Exp
$\mathbf{e + H_2}$	0.01−1000eV	Exp
$\mathbf{e + H_2O}$	0.01−1000eV	Exp
$\mathbf{e + N_2O}$	0.01−1000eV	Exp
$\mathbf{e + CO_2}$	0.01−1000eV	Exp
$\mathbf{e + Co}$	0.01−1000eV	Exp
$\mathbf{e + O_2}$	0.01−1000eV	Exp

937. P. Mozejko, E. Ptasinska-Denga, C. Szmytkowski
Cross sections for electron collision with five-membered ring heterocycles
Eur. Phys. J. D 66, 44 (2012)

$\mathbf{e + C_3H_3NO}$	8−3000eV	Exp
$\mathbf{e + C_3H_3NO}$	8−3000eV	Exp

938. I. Cadez, S. Markelj, Z. Rupnik
Low energy H- production by electron collision with small hydrocarbons
Eur. Phys. J. D 66, 73 (2012)

$\mathbf{e + C_3H_8}$	0−20eV	Exp
$\mathbf{e + C_2H_6}$	0−20eV	Exp
$\mathbf{e + C_2H_4}$	0−20eV	Exp
$\mathbf{e + C_2H_2}$	0−20eV	Exp
$\mathbf{e + CH_4}$	0−20eV	Exp
$\mathbf{e + C_3H_8}$	0−20eV	Exp
$\mathbf{e + C_2H_6}$	0−20eV	Exp
$\mathbf{e + C_2H_4}$	0−20eV	Exp
$\mathbf{e + C_2H_2}$	0−20eV	Exp
$\mathbf{e + CH_4}$	0−20eV	Exp

939. M. Vinodkumar, C. G. Limbachiya, M. Y. Barot, N. J. Mason
Computation of the total scattering cross sections for electron impact on HCl and HBr between 0.1 eV and 2000 eV
Eur. Phys. J. D 66, 74 (2012)

$\mathbf{e + HBr}$	0.1−2000 eV	Th
$\mathbf{e + HCl}$	0.1−2000 eV	Th

940. S. Kumari, L. K. Jha
Electron impact double ionization of Mg+ ions
Eur. Phys. J. D 66, 87 (2012)

$\mathbf{e + Mg^+}$	100−1000 eV	Th

941. L. K. Jha, M. P. Singh, S. Kumar
Double ionization of Ne5+ and Ne6+ ions by electron impact
Eur. Phys. J. D 66, 116 (2012)

$\mathbf{e + Ne^{6+}}$	450−5000 eV	Th
$\mathbf{e + Ne^{5+}}$	450−5000 eV	Th

942. M. M. Fujimoto, W. J. Brigg, J. Tennyson
R-matrix calculations of differential and integral cross sections for low-energy electron collisions with ethanol
Eur. Phys. J. D 66, 204 (2012)

e + C_2H_5OH	0–10 eV	Th
e + C_2H_5OH	0–10 eV	Th

943. D. S. Belic, J. J. Jureta, J. Lecointre, H. Cherkani-Hassani, S. Cherkani-Hassani, P. Defrance
Electron-impact dissociation and ionization of OH+ and OD+ ions
Eur. Phys. J. D 66, 218 (2012)

e + OD^+	20−2500 eV	Th
e + OH^+	20−2500 eV	Th
e + OD^+	20−2500 eV	Th
e + OH^+	20−2500 eV	Th

944. M. Guerra, F. Parente, P. Indelicato, J. P. Santos
Modified binary encounter Bethe model for electron-impact ionization
Int. J. Mass Spectrom. 313, 1 (2012)

e + Zn	0.1−1E6 keV	Th
e + Fe	0.1−1E6 keV	Th
e + Cr	0.1−1E6 keV	Th
e + V	0.1−1E6 keV	Th
e + Ti	0.1−1E6 keV	Th
e + Sc	0.1−1E6 keV	Th
e + Si	0.1−1E6 keV	Th
e + Ne	0.1−1E6 keV	Th
e + C	0.1−1E6 keV	Th
e + Bi	0.1−1E6 keV	Th
e + Pb	0.1−1E6 keV	Th
e + Ba	0.1−1E6 keV	Th
e + Xe	0.1−1E6 keV	Th
e + Sb	0.1−1E6 keV	Th
e + Ag	0.1−1E6 keV	Th
e + Kr	0.1−1E6 keV	Th
e + Se	0.1−1E6 keV	Th
e + Sr	0.1−1E6 keV	Th
e + Co	0.1−1E6 keV	Th

945. K. Wnorowski, M. Stano, W. Barszczewska, A. Jowko, S. Matejcik
Electron ionization of W(CO)(6): Appearance energies
Int. J. Mass Spectrom. 314, 42 (2012)

e + $W(CO)_6$	0−150eV	Exp

946. M. A. Rahman, S. Gangopadhyay, C. Limbachiya, K. N. Joshipura, E. Krishnakumar
Electron ionization of NF3
Int. J. Mass Spectrom. 319, 48 (2012)

e + NF_3	20−500eV	E/T

947. S. H. Pandya, F. A. Shelat, K. N. Joshipura, B. G. Vaishnav
Electron ionization of exotic molecular targets CN, C2N2, HCN, HNC and BF-Theoretical cross sections
Int. J. Mass Spectrom. 323, 28 (2012)

e + BF	10−2000eV	Th
e + HNC	10−2000eV	Th
e + HCN	10−2000eV	Th
e + C_2N_2	10−2000eV	Th
e + CN	10−2000eV	Th

948. H. Kato, A. Suga, M. Hoshino, F. Blanco, G. Garcia, P. Limao-Vieira, M. J. Brunger, H. Tanaka
Elastic cross sections for electron scattering from GeF4: Predominance of atomic-F in the high-energy collision dynamics
J. Chem. Phys. 136, 134313 (2012)

e + GeF_4	3−200eV	Exp

949. M. Vinodkumar, A. Barot, B. Antony
Electron impact total cross section for acetylene over an extensive range of impact energies (1 eV-5000 eV)
J. Chem. Phys. 136, 184308 (2012)

e + C_2H_2	1−5000eV	Th

950. T. P. T. Do, K. L. Nixon, M. Fuss, G. Garcia, F. Blanco, M. J. Brunger
Electron impact excitation of the (a)over-tilde B-3(1u) electronic state in C2H4: An experimentally benchmarked system?
J. Chem. Phys. 136, 184313 (2012)

e + C_2H_4	5−50eV	Exp

951. M. Ziolkowski, A. Vikar, M. L. Mayes, A. Bencsura, G. Lendvay, G. C. Schatz
Modeling the electron-impact dissociation of methane
J. Chem. Phys. 137, 22 (2012)

e + CH_4	10−30eV	Th
e + CH_4	10−30eV	Th

952. M. Vinodkumar, M. Barot
Scattering of N2O on electron impact over an extensive energy range (0.1 eV-2000 eV)
J. Chem. Phys. 137, 74311 (2012)

e + N_2O	0.1−2000eV	Th

953. A. Senftleben, T. Pflueger, X. Ren, B. Najjari, A. Dorn, J. Ullrich
Tuning the internuclear distance in ionization of H-2
J. Phys. B 45, 21001 (2012)

e + H_2	0−360 Deg.	Th

954. S. Harrison, J. Tennyson
Electron collisions with the CN radical: bound states and resonances
J. Phys. B 45, 35204 (2012)

e + CN	0−10eV	Th
e + CN	0−10eV	Th

955. M. L. deSanctis, M. F. Politis, R. Vuilleumier, C. R. Stia, O. A. Fojon
Liquid water ionization by fast electron impact: a multiple differential study for the 1B(1) orbital
J. Phys. B 45, 45206 (2012)

e + H_2O	0−360 Deg.	Th
e + H_2O	0−360 Deg.	Th

956. S. D. Loch, C. P. Ballance, D. Wu, S. A. Abdel-Naby, M. S. Pindzola
Electron-impact ionization of Al
J. Phys. B 45, 65201 (2012)

e + Al	0−30eV	Th

957. M. Sahlaoui, M. Bouamoud
Electron impact single ionization of the water molecule in the second Born approximation
J. Phys. B 45, 85201 (2012)

e + H_2O	0−360 Deg.	Th
e + H_2O	0−360 Deg.	Th

958. X. Liu, D. E. Shemansky
Nondissociative electron and photon ionization cross sections of molecular hydrogen and deuterium
J. Phys. B 45, 95203 (2012)

P + H_2	16−3000eV	Th
e + D_2	16−3000eV	Th
e + H_2	16−3000eV	Th
P + D_2	16−3000eV	Th

959. H. Kato, K. Anzai, T. Ishihara, M. Hoshino, F. Blanco, G. Garcia, P. Limao-Vieira, M. J. Brunger, S. J. Buckman, H. Tanaka
A study of electron interactions with silicon tetrafluoride: elastic scattering and vibrational excitation cross sections
J. Phys. B 45, 95204 (2012)

e + SiF_4	1.5−200eV	Th
e + SiF_4	1.5−200eV	Th

960. C. C. Montanari, J. E. Miraglia
Antiproton, proton and electron impact multiple ionization of rare gases
J. Phys. B 45, 105201 (2012)

e + Xe	20−1E4 keV	Th
e + Kr	20−1E4 keV	Th
e + Ar	20−1E4 keV	Th
e + Ne	20−1E4 keV	Th

961. C. Li, S. Casagrande, A. Lahmam-Bennani, A. Naja
Identification of first order and non-first order contributions in the (e,3-1e) and (e,3e) double ionization of molecular nitrogen
J. Phys. B 45, 135201 (2012)

e + N_2	0−360 Deg.	Th
e + N_2	0−360 Deg.	Th

962. S. Harrison, J. Tennyson, A. Faure
Calculated electron impact spin-coupled rotational cross-sections for (2S+1)Sigma(+) linear molecules: CN as an example
J. Phys. B 45, 175202 (2012)

e + CN	0.1−4eV	Th

963. L. Hargreaves, K. Ralphs, G. Serna, M. A. Khakoo, C. Winstead, V. McKoy
Excitation of the (a)over-tilde B-3(1) and (A)over-tilde B-1(1) states of H2O by low-energy electron impact
J. Phys. B 45, 201001 (2012)

e + H_2O	9−20eV	Th

964. M. S. Pindzola, S. A. Abdel-Naby, J. Colgan, A. Dorn
Pentuple energy and angle differential cross sections for the electron-impact double ionization of helium
J. Phys. B 45, 225201 (2012)

e + He	9eV	Th
e + He	9eV	Th

965. A. A. Illarionov, A. D. Stauffer
Calculation of non-coplanar electron-impact ionization of xenon
J. Phys. B 45, 225202 (2012)

e + Xe	1−35eV	Th

966. J. N. Bull, P. W. Harland, C. Valiance
Absolute Total Electron Impact Ionization Cross-Sections for Many-Atom Organic and Halocarbon Species
J. Phys. Chem. A 116, 767 (2012)

e + C_2H_4O	0−300eV	E/T

967. T. L. Phan, B. H. Jeon
Determination of Electron Collision of Cross-Sections for the H-2 Molecule for Plasma Discharge Simulation
J. Phys. Soc. Japan 81, 104501 (2012)

e + H_2	0.01−1000eV	Th

968. H. Elabidi, N. BenNessib, S. Sahal-Brechot
Electron impact broadening of Si IV spectral lines: Comparison with recent experiments
J. Quant. Spectrosc. Radiat. Transfer 113, 1606 (2012)

e + Si^{3+}	0−20E4 K	Th

969. M. F. R. Grieve, C. A. Ramsbottom
Electron-impact excitation of Sc ii: collision strengths and effective collision strengths for fine-structure transitions
Mon. Not. R. Astron. Soc. 424, 2461 (2012)

e + Sc^+	1E1−1E5 K	Th

970. P. Wang
ELECTRON IMPACT DISSOCIATIVE IONIZATION OF NITROSYL CHLORIDE
Mod. Phys. Lett. B 26, 1250065 (2012)

e + NOCl	200 eV	Th

971. R. Dey, A. C. Roy, C. DalCappello
Fivefold differential cross sections for the ionization of aligned hydrogen molecule by electron and positron impact
Nucl. Instrum. Methods Phys. Res. B 271, 82 (2012)

e + H_2	200 eV	Th
e + H_2	200 eV	Th

972. P. V. Grujic
Classical theory of atomic collisions - The first hundred years
Nucl. Instrum. Methods Phys. Res. B 279, 44 (2012)

e + H	0−20eV	Th

973. S. D. Tosic, V. Pejcev, D. Sevic, R. P. McEachran, A. D. Stauffer, B. P. Marinkovic
Absolute differential cross sections for electron excitation of silver at small scattering angles
Nucl. Instrum. Methods Phys. Res. B 279, 53 (2012)

e + Ag	10−100eV	Th
e + Ag	10−100eV	Th

974. K. Houfek
Resonant inelastic collisions of electrons with diatomic molecules
Nucl. Instrum. Methods Phys. Res. B 279, 71 (2012)

e + HBr	0.2−1eV	Th
e + HCl	0.2−1eV	Th

975. S. J. Ward, J. Shertzer
Hyperspherical hidden crossing method applied to Ps(1s)-formation in low energy e(+)-H, e(+)-Li and e(+)-Na collisions
New J. Phys. 14, 25003 (2012)

e + Li	6−10eV,0−2eV	Th
e + H	6−10eV,0−2eV	Th

976. R. D. DuBois
Doubly and triply differential ionization measurements using femtoamp beams of positrons and electrons
New J. Phys. 14, 25004 (2012)

e + N_2	250eV	Exp

977. J. Annaloro, V. Morel, A. Bultel, P. Omaly
Global rate coefficients for ionization and recombination of carbon, nitrogen, oxygen, and argon
Phys. Plasmas 19, 73515 (2012)

e + N	3000−20000 K	Th
e + C	3000−20000 K	Th
e + Ar	3000−20000 K	Th
e + O	3000−20000 K	Th
e + N	3000−20000 K	Th
e + C	3000−20000 K	Th
e + Ar	3000−20000 K	Th
e + O	3000−20000 K	Th

978. Y. Wang, L. Jiao, Y. Zhou
Second-order Born effect in coplanar doubly symmetric (e, 2e) collisions for sodium
Phys. Lett. A 376, 2122 (2012)

e + Na	6−60eV	Th

979. R. Celiberto, R. K. Janev, D. Reiter
State-to-state electron impact cross sections for BeH+ molecular ions in ITER-like fusion edge plasmas with Be walls
Plasma Phys. and Controlled Fusion 54, 35012 (2012)

e + BeH^+	1−1E4 eV	Th

980. M. S. Pindzola, S. A. Abdel-Naby, J. A. Ludlow, F. Robicheaux, J. Colgan
Electron-impact ionization of Li-2 using a time-dependent close-coupling method
Phys. Rev. A 85, 12704 (2012)

e + Li_2	5−25eV	Th

981. Y. F. Wang, S. X. Tian
Low-energy electron collisions with formamide using the R-matrix method
Phys. Rev. A 85, 12706 (2012)

e + NH_2CHO	5−10eV,0−180eV,0−10eV,0−10eV	Th
e + NH_2CHO	5−10eV,0−180eV,0−10eV,0−10eV	Th
e + NH_2CHO	5−10eV,0−180eV,0−10eV,0−10eV	Th
e + NH_2CHO	5−10eV,0−180eV,0−10eV,0−10eV	Th

982. D. Wu, S. D. Loch, M. S. Pindzola, C. P. Ballance
Electron-impact ionization of Al2+
Phys. Rev. A 85, 12711 (2012)

e + Al^{2+}	20−200eV	Th

983. G. Purohit, P. Singh, V. Patidar, Y. Azuma, K. K. Sud
Effects of target polarization and postcollision interaction on the electron-impact single ionization of Ne(2p), Ar(3p), and Na(3s) atoms
Phys. Rev. A 85, 22714 (2012)

e + Na	5−50eV	Th
e + Ar	5−50eV	Th
e + Ne	5−50eV	Th
e + Na	5−50eV	Th
e + Ar	5−50eV	Th
e + Ne	5−50eV	Th

984. X. Ren, T. Pflueger, J. Ullrich, O. Zatsarinny, K. Bartschat, D. H. Madison, A. Dorn
Low-energy electron-impact ionization of argon: Three-dimensional cross section
Phys. Rev. A 85, 32702 (2012)

e + Ar	3−15eV	Th
e + Ar	3−15eV	Th

985. O. Zatsarinny, K. Bartschat
Nonperturbative treatment of electron-impact ionization of Ar(3p)
Phys. Rev. A 85, 32708 (2012)

e + Ar	195eV	Th
e + Ar	195eV	Th

986. P. Bhatt, R. Singh, N. Yadav, R. Shanker
Relative partial ionization cross sections of N2O under 10-25-keV electron impact
Phys. Rev. A 85, 34702 (2012)

e + N_2O	10−25keV	Exp

987. K. M. Dunseath, M. Terao-Dunseath
Comment on Near-threshold behavior of electron-impact excitation of He+(2s) and He+ (2p)
Phys. Rev. A 85, 36701 (2012)

e + He^{+}	40−46eV	Th

988. M. J. Berrington, C. J. Bostock, D. V. Fursa, I Bray, R. P. McEachran, A. D. Stauffer
Calculations of electron scattering from cadmium
Phys. Rev. A 85, 42708 (2012)

e + Cd	3−85eV	Th

989. L. R. Hargreaves, C. Campbell, M. A. Khakoo, O. Zatsarinny, K. Bartschat
Unusual angular momentum transfer in electron-impact excitation of neon
Phys. Rev. A 85, 50701 (2012)

e + Ne	25eV	E/T

990. S. Kaur, K. L. Baluja
Electron-impact study of an NCO molecule using the R-matrix method
Phys. Rev. A 85, 52701 (2012)

e + NCO	0−10eV,10−5000eV,0−10eV	Th
e + NCO	0−10eV,10−5000eV,0−10eV	Th
e + NCO	0−10eV,10−5000eV,0−10eV	Th

991. H. R. J. Walters, C. T. Whelan
Ionization of He by C6+, C-6-, e(-), and e(+)
Phys. Rev. A 85, 62701 (2012)

$h\nu$ + He	1keV,100MeV	Th
e + He	1keV,100MeV	Th
$h\nu$ + He	1keV,100MeV	Th
e + He	1keV,100MeV	Th

992. Z. Zhang, X. Shan, E. Wang, X. Chen
Ejected-electron spectroscopy of autoionizing resonances of helium excited by fast-electron impact
Phys. Rev. A 85, 62702 (2012)

e + He	250−2000eV	Exp

993. C. P. Malone, P. V. Johnson, X. Liu, B. Ajdari, I. Kanik, M. A. Khakoo
Integral cross sections for the electron-impact excitation of the b (1)Pi(u), c(3) (1)Pi(u), o(3) (1)Pi(u), b ' (1)Sigma(+)(u), c '(4) (1)Sigma(+)(u), G (3)Pi(u), and F (3)Pi(u) states of N-2
Phys. Rev. A 85, 62704 (2012)

e + N_2	17.5−100eV	Th

994. R. F. daCosta, M. H. F. Bettega, M. A. P. Lima, M. C. A. Lopes, L. R. Hargreaves, G. Serna, M. A. Khakoo
Electronic excitation of gas-phase furan molecules by electron impact
Phys. Rev. A 85, 62706 (2012)

e + C_4H_4O	0−30eV	E/T
e + C_4H_4O	0−30eV	E/T
e + C_4H_4O	0−30eV	E/T

995. O. Zatsarinny, K. Bartschat
Nonperturbative B-spline R-matrix-with-pseudostates calculations for electron-impact ionization of helium
Phys. Rev. A 85, 62709 (2012)

e + He	20−500eV	Th
e + He	20−500eV	Th

996. O. Zatsarinny, K. Bartschat
Large-scale pseudostate calculations for electron scattering from neon atoms
Phys. Rev. A 85, 62710 (2012)

e + Ne	0.1−200eV	Th
e + Ne	0.1−200eV	Th
e + Ne	0.1−200eV	Th
e + Ne	0.1−200eV	Th

997. A. Laricchiuta, G. Capitta, R. Celiberto, M. Capitelli
Electron-impact-induced allowed transitions in Cs-2
Phys. Rev. A 85, 62713 (2012)

e + Cs_2	0−20eV	Th

998. D. H. Kwon, D. W. Savin
Theoretical electron-impact-ionization cross section for Fe11+ forming Fe12+
Phys. Rev. A 86, 22701 (2012)

e + Fe^{11+}	300−2500eV	Th

999. I. Linert, M. Zubek
Elastic electron scattering and vibrational excitation of isoxazole molecules in the energy range from 2 to 20 eV
Phys. Rev. A 86, 22708 (2012)

e + C_3H_3NO	2−20eV	Exp
e + C_3H_3NO	2−20eV	Exp
e + C_3H_3NO	2−20eV	Exp

1000. T. Das, L. Sharma, R. Srivastava, A. D. Stauffer
Electron-impact excitation of zinc and ytterbium atoms
Phys. Rev. A 86, 22710 (2012)

e + Yb	10−100eV	Th
e + Zn	10−100eV	Th
e + Yb	10−100eV	Th
e + Zn	10−100eV	Th

1001. Z. W. Wu, C. Z. Dong, J. Jiang
Degrees of polarization of the two strongest 5 f -¿ 3d lines following electron-impact excitation and dielectronic recombination processes of Cu-like to Se-like gold ions
Phys. Rev. A 86, 22712 (2012)

e + Au^{49+}	100−10000eV	Th
e + Au^{48+}	100−10000eV	Th
e + Au^{47+}	100−10000eV	Th
e + Au^{46+}	100−10000eV	Th
e + Au^{45+}	100−10000eV	Th
e + Au^{50+}	100−10000eV	Th

1002. O. Zatsarinny, K. Bartschat
Electron-impact excitation of neon at intermediate energies
Phys. Rev. A 86, 22717 (2012)

e + Ne	10−300eV	Th
e + Ne	10−300eV	Th

1003. J. S. Rajvanshi, K. L. Baluja
Electron-impact study of the B-2 molecule using the R-matrix method
Phys. Rev. A 86, 32704 (2012)

e + B_2	300−30000K	Th
e + B_2	300−30000K	Th
e + B_2	300−30000K	Th

1004. S. P. Limandri, M. A. Z. Vasconcellos, R. Hinrichs, J. C. Trincavelli
Experimental determination of cross sections for K-shell ionization by electron impact for C, O, Al, Si, and Ti
Phys. Rev. A 86, 42701 (2012)

e + Ti	2.5−25keV	Exp
e + Si	2.5−25keV	Exp
e + Al	2.5−25keV	Exp
e + O	2.5−25keV	Exp
e + C	2.5−25keV	Exp

1005. D. A. Konovalov, D. V. Fursa, I. Bray
J-matrix calculation of electron-helium S-wave scattering. II. Single ionization and single excitation
Phys. Rev. A 86, 52704 (2012)

e + He	19−24eV,25−60eV	Th
e + He	19−24eV,25−60eV	Th

1006. R. Curik, P. Carsky, M. Allan
Vibrational excitation of cyclopropane by electron impact: An experimental test of the discrete-momentum-representation theory with density-functional-theory approximation of polarization and correlation
Phys. Rev. A 86, 62709 (2012)

e + $\mathbf{C_3H_6}$	5.5eV	Exp
e + $\mathbf{C_3H_6}$	5.5eV	Exp

1007. X. Ren, T. Pflueger, S. Xu, J. Colgan, M. S. Pindzola, A. Senftleben, J. Ullrich, A. Dorn
Strong Molecular Alignment Dependence of H-2 Electron Impact Ionization Dynamics
Phys. Rev. Lett. 109, 123202 (2012)

e + $\mathbf{H_2}$	18eV	Th
e + $\mathbf{H_2}$	18eV	Th

1008. I. Bray, D. V. Fursa, A. S. Kadyrov, A. T. Stelbovics, A. S. Kheifets, A. M. Mukhamedzhanov
Electron- and photon-impact atomic ionisation
Phys. Rep. 520, 135 (2012)

e + He	1−1000eV	Th
e + H	1−1000eV	Th
e + He	1−1000eV	Th
e + H	1−1000eV	Th

1009. M. R. Talukder, M. Shahjahan, M. A. Uddin
Electron impact double ionization cross-sections of heavy elements
Phys. Scr. 85, 15301 (2012)

e + U	10−1E6eV	Th
e + $\mathbf{Ba^{2+}}$	10−1E6eV	Th
e + $\mathbf{Cs^{+}}$	10−1E6eV	Th
e + $\mathbf{Xe^{4+}}$	10−1E6eV	Th
e + In	10−1E6eV	Th
e + $\mathbf{Sb^{+}}$	10−1E6eV	Th
e + $\mathbf{Bi^{+}}$	10−1E6eV	Th
e + Ag	10−1E6eV	Th
e + $\mathbf{Mo^{3+}}$	10−1E6eV	Th
e + $\mathbf{Rb^{+}}$	10−1E6eV	Th
e + $\mathbf{Kr^{4+}}$	10−1E6eV	Th
e + Ga	10−1E6eV	Th
e + Pb	10−1E6eV	Th
e + $\mathbf{Ni^{3+}}$	10−1E6eV	Th
e + $\mathbf{Fe^{6+}}$	10−1E6eV	Th
e + $\mathbf{Ti^{5+}}$	10−1E6eV	Th
e + $\mathbf{Sc^{+}}$	10−1E6eV	Th
e + Hg	10−1E6eV	Th
e + $\mathbf{W^{6+}}$	10−1E6eV	Th
e + $\mathbf{Sm^{6+}}$	10−1E6eV	Th
e + $\mathbf{Pr^{3+}}$	10−1E6eV	Th

1010. K. M. Aggarwal, F. P. Keenan
Energy levels, radiative rates and electron impact excitation rates for transitions in He-like Mg XI, Al XII, P XIV and S XV
Phys. Scr. 85, 25305 (2012)

e + S^{14+}	130−550 RYD	Th
e + P^{13+}	130−550 RYD	Th
e + Al^{11+}	130−550 RYD	Th
e + Mg^{10+}	130−550 RYD	Th

1011. K. M. Aggarwal, F. P. Keenan
Energy levels, radiative rates and electron impact excitation rates for transitions in He-like Cl XVI, K XVIII, Ca XIX and Sc XX
Phys. Scr. 85, 25306 (2012)

e + Ca^{18+}	359−900 RYD	Th
e + K^{17+}	359−900 RYD	Th
e + Cl^{15+}	359−900 RYD	Th
e + Sc^{19+}	359−900 RYD	Th

1012. K. M. Aggarwal, F. P. Keenan
Energy levels, radiative rates and electron impact excitation rates for transitions in He-like Ti XXI, V XXII, Cr XXIII and Mn XXIV
Phys. Scr. 85, 65301 (2012)

e + Mn^{23+}	500−1200 RYD	Th
e + Cr^{22+}	500−1200 RYD	Th
e + V^{21+}	500−1200 RYD	Th
e + Ti^{20+}	500−1200 RYD	Th

1013. H. Elabidi, S. Sahal-Brechot, N. BenNessib
Fine structure collision strengths for S VII lines
Phys. Scr. 85, 65302 (2012)

e + S^{6+}	20−120 RYD	Th

1014. T. Das, L. Sharma, R. Srivastava
Electron impact excitation of the M-shell electrons from Zn-like through Co-like tungsten ions
Phys. Scr. 85, 35301 (2012)

e + W^{44+}	0−50keV	Th
e + W^{47+}	0−50keV	Th
e + W^{46+}	0−50keV	Th
e + W^{45+}	0−50keV	Th

1015. K. M. Aggarwal, F. P. Keenan
Energy levels, radiative rates and electron impact excitation rates for transitions in He-like Kr XXXV
Phys. Scr. 85, 35302 (2012)

e + Kr^{34+}	1E5.4−1E8.1 K	Th

1016. K. M. Aggarwal, F. P. Keenan
Energy levels, radiative rates and electron impact excitation rates for transitions in Be-like Ti XIX
Phys. Scr. 85, 55301 (2012)

e + Ti^{18+}	100−1100 RYD	Th

1017. V. Laporta, C. M. Cassidy, J. Tennyson, R. Celiberto
Electron-impact resonant vibration excitation cross sections and rate coefficients for carbon monoxide
Plasma Sources Sci. Technol. 21, 45005 (2012)

e + Co	1−10eV	Th

1018. V. Laporta, R. Celiberto, J. M. Wadehra
Theoretical vibrational-excitation cross sections and rate coefficients for electron-impact resonant collisions involving rovibrationally excited N-2 and NO molecules
Plasma Sources Sci. Technol. 21, 55018 (2012)

e + NO	0.1−100eV	Th
e + N_2	0.1−100eV	Th

1019. S. Abdel-Naby, D. Nikolic, T. W. Gorczyca, K. T. Korista, N. R. Badnell
Dielectronic recombination data for dynamic finite-density plasmas XIV. The aluminum isoelectronic sequence
Astron. Astrophys. 537, A40 (2012)

e + S^{3+}	0.1−1000eV	Th
e + Zn^{17+}	0.1−1000eV	Th
e + Cu^{16+}	0.1−1000eV	Th
e + Ni^{15+}	0.1−1000eV	Th
e + Co^{14+}	0.1−1000eV	Th
e + Mn^{12+}	0.1−1000eV	Th
e + Cr^{11+}	0.1−1000eV	Th
e + V^{10+}	0.1−1000eV	Th
e + Ti^{9+}	0.1−1000eV	Th
e + Sc^{8+}	0.1−1000eV	Th
e + Ca^{7+}	0.1−1000eV	Th
e + K^{6+}	0.1−1000eV	Th
e + Ar^{5+}	0.1−1000eV	Th
e + Cl^{4+}	0.1−1000eV	Th
e + P^{2+}	0.1−1000eV	Th
e + Si^{+}	0.1−1000eV	Th

1020. E. Vigren, V. Zhaunerchyk, M. Hamberg, M. Kaminska, J. Semaniak, M. afUgglas, M. Larsson, R. D. Thomas, W. D. Geppert
REASSESSMENT OF THE DISSOCIATIVE RECOMBINATION OF N2H+ AT CRYRING
Astrophys. J. 757, 34 (2012)

e + N_2H^+	10−1000 K	Exp

1021. R. D. Thomas, I. Kashperka, E. Vigren, W. D. Geppert, M. Hamberg, M. Larsson, M. afUgglas, V. Zhaunerchyk, N. Indriolo, K. Yagi, S. Hirata, B. J. McCall
DISSOCIATIVE RECOMBINATION OF VIBRATIONALLY COLD CH3+ AND INTERSTELLAR IMPLICATIONS
Astrophys. J. 758, 55 (2012)

e + $CH_3{}^+$	1E−1−10eV	Exp

1022. M. Hahn, D. Bernhardt, M. Lestinsky, A. Mueller, S. Schippers, A. Wolf, D. W. Savin
STORAGE RING MEASUREMENT OF ELECTRON IMPACT IONIZATION FOR Mg7+ FORMING Mg8+ (vol 712, pg 1166, 2010)
Astrophys. J. 761, 77 (2012)

e + Mg^{7+}	250−1500eV	Exp

1023. M. Hahn, D. Bernhardt, M. Grieser, C. Krantz, M. Lestinsky, A. Mueller, O. Novotny, R. Repnow, S. Schippers, A. Wolf, D. W. Savin
STORAGE RING CROSS SECTION MEASUREMENTS FOR ELECTRON IMPACT IONIZATION OF Fe11+ FORMING Fe12+ AND Fe13+ (vol 729, pg 76, 2011)
Astrophys. J. 761, 78 (2012)

e + Fe^{11+}	300−2000eV	Exp

1024. M. Hahn, M. Grieser, C. Krantz, M. Lestinsky, A. Mueller, O. Novotny, R. Repnow, S. Schippers, A. Wolf, D. W. Savin
STORAGE RING CROSS-SECTION MEASUREMENTS FOR ELECTRON IMPACT IONIZATION OF Fe12+ FORMING Fe13+ AND Fe14+ (vol 735, pg 105, 2011)
Astrophys. J. 761, 79 (2012)

e + Fe^{12+}	350−1910eV	Exp

1025. D.-H. Zhang, Y.-L. Shi, J. Jiang, C.-Z. Dong, F. Koike
KLL dielectronic recombination process of He-like to O-like xenon ions
Chin. Phys. B 21, 13402 (2012)

e + Xe^{52+}	20−22.4keV	Th
e + Xe^{51+}	20−22.4keV	Th
e + Xe^{50+}	20−22.4keV	Th
e + Xe^{49+}	20−22.4keV	Th
e + Xe^{48+}	20−22.4keV	Th
e + Xe^{47+}	20−22.4keV	Th
e + Xe^{46+}	20−22.4keV	Th

1026. Y. Wang, Y.-J. Zhou, L.-G. Jiao
Study of (e, 2e) process on potassium at 6 eV-60 eV above threshold in a second-order Born approximation
Chin. Phys. B 21, 83401 (2012)

e + K	6−60eV	Th

1027. L.-X. Zhou, Y.-G. Yan
(e, 2e) triple-differential cross sections for Ag+(4p, 4s) in coplanar symmetric geometry
Chin. Phys. B 21, 93401 (2012)

e + Ag^{+}	50−1000eV	Th

1028. X.-L. Hu, Y.-Z. Qu, S.-B. Zhang, Y. Zhang
Dielectronic recombination and resonant transfer excitation processes for helium-like krypton
Chin. Phys. B 21, 103401 (2012)

e + Kr^{34+}	8−13keV	Th

1029. O. Sasic, S. Dujko, T. Makabe, Z. L. Petrovic
A set of cross sections and transport coefficients for electrons in HBr
Chem. Phys. 398, 154 (2012)

e + HBr	0.001−1E4eV	Th
e + HBr	0.001−1E4eV	Th
e + HBr	0.001−1E4eV	Th

1030. Y. Sugioka, T. Takayanagi
A practical approach to temperature effects in dissociative electron attachment cross sections using local complex potential theory
Chem. Phys. 405, 189 (2012)

e + CF_3Cl	300−800K	Th
e + H_2O	300−800K	Th

1031. J. Troe, T. M. Miller, A. A. Viggiano
Communication: Revised electron affinity of SF6 from kinetic data
J. Chem. Phys. 136, 121102 (2012)

e + SF_6	1−2eV	Th

1032. N. B. Ram, E. Krishnakumar
Dissociative electron attachment resonances in ammonia: A velocity slice imaging based study
J. Chem. Phys. 136, 164308 (2012)

e + NH_3	0−20eV	Exp

1033. S. A. Haughey, T. A. Field, J. Langer, N. S. Shuman, T. M. Miller, J. F. Friedman, A. A. Viggiano
Dissociative electron attachment to C2F5 radicals
J. Chem. Phys. 137, 54310 (2012)

e + C_2F_5	300−600K	Exp

1034. S. L. Guberman
Spectroscopy above the ionization threshold: Dissociative recombination of the ground vibrational level of N-2(+)
J. Chem. Phys. 137, 74309 (2012)

e + $N_2{}^+$	0.001−0.1eV	Th

1035. S. T. Pratt, C. Jungen
The isotope dependence of dissociative recombination via the indirect mechanism
J. Chem. Phys. 137, 174306 (2012)

e + D_3O	0.0001−1eV	Exp
e + H_3O	0.0001−1eV	Exp
e + $ND_4{}^+$	0.0001−1eV	Exp
e + $NH_4{}^+$	0.0001−1eV	Exp
e + N_2D^+	0.0001−1eV	Exp
e + N_2H^+	0.0001−1eV	Exp

1036. P. Palihawadana, J. P. Sullivan, S. J. Buckman, M. J. Brunger
Electron scattering from pyrazine: Elastic differential and integral cross sections
J. Chem. Phys. 137, 204307 (2012)

e + $C_4H_4N_2$	3−50eV	Exp

1037. O. Chuluunbaatar, A. A. Gusev, B. B. Joulakian
The correlated two-centre double continuum and the double ionization of H-2 and N-2 by fast electron impact
J. Phys. B 45, 15205 (2012)

e + N_2	500−600eV	Th
e + H_2	500−600eV	Th

1038. C. P. Ballance, D. C. Griffin, S. D. Loch, N. R. Badnell
Dielectronic recombination of Au20+: a theoretical description of the resonances at low electron energies
J. Phys. B 45, 45001 (2012)

e + Au^{20+}	1−1000eV	Th

1039. Z. Felfli, A. Z. Msezane, D. Sokolovski
Slow electron elastic scattering cross sections for In, Tl, Ga and At atoms
J. Phys. B 45, 189501 (2012)

e + At	0.01−10eV	Th
e + Ga	0.01−10eV	Th
e + Tl	0.01−10eV	Th
e + In	0.01−10eV	Th

1040. A. L. Harris, M. Foster, C. Ryan-Anderson, J. L. Peacher, D. H. Madison
Projectile interactions in theoretical triple differential cross sections for simultaneous excitation-ionization of helium (vol 41, 135203, 2008)
J. Phys. B 45, 59501 (2012)

e + He	110−270eV	Th
e + He	110−270eV	Th
e + He	110−270eV	Th

1041. U. I. Safronova, A. S. Safronova, P. Beiersdorfer
Excitation energies, radiative and autoionization rates, dielectronic satellite lines, and dielectronic recombination rates for excited states of Yb-like W
J. Phys. B 45, 85001 (2012)

$\mathbf{e + W^{4+}}$	0.1−5000eV	Th

1042. V. I. Kelemen, Y. Remeta
Critical minima and spin polarization in the elastic electron scattering by the mercury atoms
J. Phys. B 45, 185202 (2012)

e + Hg	0.1−2000eV	Th
e + Hg	0.1−2000eV	Th
e + Hg	0.1−2000eV	Th

1043. D. H. Jakubassa-Amundsen, R. Barday
The Sherman function in highly relativistic elastic electron-atom scattering
Journal Of Physics G Nuclear And Particle Physics 39, 25102 (2012)

e + U	20−200MeV	Th
e + Pb	20−200MeV	Th
e + Zn	20−200MeV	Th

1044. C. Champion, S. Incerti, H. N. Tran, Z. ElBitar
Electron and proton elastic scattering in water vapour
Nucl. Instrum. Methods Phys. Res. B 273, 98 (2012)

$\mathbf{e + H_2O}$	0.01−1E4eV	Th

1045. V. Stancalie
Contribution of near threshold states to dielectronic recombination in recombining plasma with Li-like Al ions
Nucl. Instrum. Methods Phys. Res. B 279, 147 (2012)

$\mathbf{e + Al^{10+}}$	0−0.1 RYD	Th

1046. B. W. Li, G. O'Sullivan, Y. B. Fu, C. Z. Dong
Dielectronic recombination of Pd-like gadolinium
Phys. Rev. A 85, 012712 (2012)

$\mathbf{e + Gd^{18+}}$	1−50000eV	Th

1047. M. Vandevraye, C. Drag, C. Blondel
Electron affinity of selenium measured by photodetachment microscopy
Phys. Rev. A 85, 015401 (2012)

e + Se	0.4-0.8 cm$^-$1	Exp

1048. U. I. Safronova, A. S. Safronova
Dielectronic recombination of Er-like tungsten
Phys. Rev. A 85, 032507 (2012)

e + W^{6+}	0.1−575eV	Th

1049. A. Larson, M. Stenrup, A. E. Orel
Role of the direct mechanism in dissociative recombination of HCO+ and HOC+
Phys. Rev. A 85, 042702 (2012)

e + HOC^{+}	0−10eV	Th
e + HCO^{+}	0−10eV	Th

1050. M. Hahn, D. Bernhardt, M. Grieser, C. Krantz, M. Lestinsky, A. Mueller, O. Novotny, R. Repnow, S. Schippers, A. Wolf, D. W. Savin
Electron-impact-ionization measurements using hyperfine-assisted state preparation of ground-state berylliumlike sulfur
Phys. Rev. A 85, 042713 (2012)

e + S^{12+}	500−3000eV	Exp

1051. B. W. Li, G. O'Sullivan, Y. B. Fu, C. Z. Dong
Dielectronic recombination of Rh-like Gd and W
Phys. Rev. A 85, 052706 (2012)

e + Gd^{19+}	1−5000eV	Th
e + W^{29+}	1−5000eV	Th

1052. N. R. Badnell, C. P. Ballance, D. C. Griffin, M. O'Mullane
Dielectronic recombination of W20+ (4d(10)4 f(8)): Addressing the half-open f shell
Phys. Rev. A 85, 052716 (2012)

e + W^{20+}	1−1000eV	E/T

1053. C. J. Bostock, D. V. Fursa, I. Bray
Relativistic convergent close-coupling method calculation of the spin polarization of electrons scattered elastically from zinc and mercury
Phys. Rev. A 85, 062707 (2012)

e + Hg	1−14eV	Th
e + Zn	1−14eV	Th

1054. R. Janeckova, O. May, J. Fedor
Dissociative electron attachment to methylacetylene and dimethylacetylene: Symmetry versus proximity
Phys. Rev. A 86, 052702 (2012)

e + C	1−6eV	Exp

1055. C. J. Bostock, D. V. Fursa, I. Bray
Relativistic convergent close-coupling calculation of spin asymmetries for electron-thallium scattering
Phys. Rev. A 86, 062701 (2012)

e + Ta	4−180eV	Th

1056. D. J. Haxton, C. H. Greene
Estimates of rates for dissociative recombination of NO2+ + e(-) via various mechanisms
Phys. Rev. A 86, 062712 (2012)

e + $\mathbf{NO_2}^+$	0−10eV	Th

1057. N. Douguet, A. E. Orel, C. H. Greene, V. Kokoouline
Dissociative Recombination of Highly Symmetric Polyatomic Ions
Phys. Rev. Lett. 108, 023202 (2012)

e + $\mathbf{CH_3}^+$	0.0001−1eV	Th
e + $\mathbf{H_3O}^+$	0.0001−1eV	Th

1058. Z. Hu, X. Han, Y. Li, D. Kato, X. Tong, N. Nakamura
Experimental Demonstration of the Breit Interaction which Dominates the Angular Distribution of X-ray Emission in Dielectronic Recombination
Phys. Rev. Lett. 108, 073002 (2012)

e + $\mathbf{Au}^{76+}$	45eV	Exp

1059. P. Lukac, O. Mikus, I. Morva, Z. Zabudla, J. Trnovec, M. Morvova, K. Hensel
Dependence of the dissociative recombination coefficient of molecular ions Kr-2(+) with electrons on the electron and gas temperatures
Plasma Sources Sci. Technol. 21, 065002 (2012)

e + $\mathbf{Kr_2}^+$	300−19000K	Exp

1060. M. Honigmann, R. J. Buenker, H. P. Liebermann
Complex configuration interaction calculations of the cross section for the dissociative electron attachment process e(-)+F-2 -¿ F-2(-) -¿ F+F- using the complex basis function method
J. Comput. Phys. 33, 355 (2012)

e + $\mathbf{F_2}^-$	0.01−1.4eV	Th
e + $\mathbf{F_2}$	0.01−1.4eV	Th
e + $\mathbf{F_2}^-$	0.01−1.4eV	Th
e + $\mathbf{F_2}$	0.01−1.4eV	Th

1061. H. Kreckel, A. Petrignani, O. Novotny, K. Crabtree, H. Buhr, B. J. McCall, A. Wolf
Storage ring measurements of the dissociative recombination of H-3(+)
Phil. Trans. R. Soc. A 370, 5088 (2012)

e + $\mathbf{H_3}^+$	0.00001−1000eV	Exp

1062. M. Larsson
Dissociative recombination of H-3(+): 10 years in retrospect
Phil. Trans. R. Soc. A 370, 5118 (2012)

e + $\mathbf{H_3}^+$	0.00001−10eV	Exp

1063. B. Zhou, M. Y. Zheng, D. Y. Wen
The second Born approximation of electron argon elastic scattering in a bichromatic laser field
Pramana 78, 399 (2012)

e + Ar	9.5−19.5eV	Th

1064. B. O'Dwyer, G. DelZanna, N. R. Badnell, H. E. Mason, P. J. Storey
Atomic data for the X-ray lines of Fe VIII and Fe IX
Astron. Astrophys. 537, A22 (2012)

$\mathbf{e + Fe^{8+}}$	0−80 RYD	Th
$\mathbf{e + Fe^{7+}}$	0−80 RYD	Th

1065. G. DelZanna, P. J. Storey, N. R. Badnell, H. E. Mason
Atomic data for astrophysics: Fe x soft X-ray lines
Astron. Astrophys. 541, A90 (2012)

$\mathbf{e + Fe^{9+}}$	10−60 RYD	Th

1066. G. DelZanna, P. J. Storey, N. R. Badnell, H. E. Mason
Atomic data for astrophysics: Fe XII soft X-ray lines
Astron. Astrophys. 543, A139 (2012)

$\mathbf{e + Fe^{11+}}$	10−60 RYD	Th

1067. G. DelZanna, P. J. Storey
Atomic data for astrophysics: Fe XIII soft X-ray lines
Astron. Astrophys. 543, A144 (2012)

$\mathbf{e + Fe^{12+}}$	10−50 RYD	Th

1068. X. M. Tan, X. M. Liu
Total Electron Scattering Cross Sections of SiH4 and PH3 Molecules in the Energy Range from 10 eV to 5000 eV
Chin. J. Phys. 50, 573 (2012)

$\mathbf{e + PH_3}$	10−5000eV	Th
$\mathbf{e + SiH_4}$	10−5000eV	Th

1069. X. M. Tan, G. Zhao
Total cross sections for electron scattering from fluoromethanes: A revised additivity rule method
Chin. Phys. B 21, 063402 (2012)

$\mathbf{e + CH_3F}$	1E2−2E3 eV	Th
$\mathbf{e + CH_2F_2}$	1E2−2E3 eV	Th
$\mathbf{e + CF_3H}$	1E2−2E3 eV	Th
$\mathbf{e + CF_4}$	1E2−2E3 eV	Th

1070. G. L. C. deSouza, A. S. dosSantos, R. R. Lucchese, L. E. Machado, L. M. Brescansin, H. V. Manini, I. Iga, M. -T. Lee
Theoretical investigation on electron scattering by benzene in the intermediate-energy range
Chem. Phys. 393, 19 (2012)

$\mathbf{e + C_6H_6}$	20−500eV	Th

1071. S. Pancheshnyi, S. Biagi, M. C. Bordage, G. J. M. Hagelaar, W. L. Morgan, A. V. Phelps, L. C. Pitchford
The LXCat project: Electron scattering cross sections and swarm parameters for low temperature plasma modeling
Chem. Phys. 398, 148 (2012)

$\mathbf{e + Ar}$	40−1000Td	Th

1072. M. C. Zammit, D. V. Fursa, I. Bray
Electron scattering in a helium Debye plasma
Chem. Phys. 398, 214 (2012)

e + He	20−1000eV	Th
e + He	20−1000eV	Th
e + He	20−1000eV	Th
e + He	20−1000eV	Th

1073. D. B. Jones, S. M. Bellm, P. Limao-Vieira, M. J. Brunger
Low-energy electron scattering from pyrimidine: Similarities and differences with benzene
Chem. Phys. 535, 30 (2012)

e + $C_4H_4N_2$	15−30eV	Exp
e + $C_4H_4N_2$	15−30eV	Exp
e + $C_4H_4N_2$	15−30eV	Exp

1074. M. Kitajima, M. Kurokawa, T. Kishino, K. Toyoshima, T. Odagiri, H. Kato, K. Anzai, M. Hoshino, H. Tanaka, K. Ito
Ultra-low-energy electron scattering cross section measurements of Ar, Kr and Xe employing the threshold photoelectron source
Eur. Phys. J. D 66, 130 (2012)

e + Xe	0.005−20eV	Exp
e + Kr	0.005−20eV	Exp
e + Ar	0.005−20eV	Exp
e + Xe	0.005−20eV	Exp
e + Kr	0.005−20eV	Exp
e + Ar	0.005−20eV	Exp

1075. M. -T. Lee, G. L. C. deSouza, L. E. Machado, L. M. Brescansin, A. S. dosSantos, R. R. Lucchese, R. T. Sugohara, M. G. P. Homem, I. P. Sanches, I. Iga
Electron scattering by methanol and ethanol: A joint theoretical-experimental investigation
J. Chem. Phys. 136, 114311 (2012)

e + C_2H_5OH	1−1000eV	E/T
e + CH_3OH	1−1000eV	E/T

1076. A. G. Sanz, M. C. Fuss, F. Blanco, F. Sebastianelli, F. A. Gianturco, G. Garcia
Electron scattering cross sections from HCN over a broad energy range (0.1-10 000 eV): Influence of the permanent dipole moment on the scattering process
J. Chem. Phys. 137, 124103 (2012)

e + HCN	0.1−10000eV	Th
e + HCN	0.1−10000eV	Th

1077. A. V. Khrabrov, I. D. Kaganovich
Electron scattering in helium for Monte Carlo simulations
Phys. Plasmas 19, 093511 (2012)

e + He	0.1−1000eV	Th

1078. H. Miyagi, T. Morishita, S. Watanabe
Electron scattering and photoionization of one-electron diatomic molecules
Phys. Rev. A 85, 022708 (2012)

e + HeH^{2+}	10−150eV	Th
e + $H_2{}^+$	10−150eV	Th

1079. V. Gedeon, S. Gedeon, V. Lazur, E. Nagy, O. Zatsarinny, K. Bartschat
Electron scattering from silicon
Phys. Rev. A 85, 022711 (2012)

e + Si	0−60eV	Th
e + Si	0−60eV	Th
e + Si	0−60eV	Th

1080. R. P. McEachran, M. Vos
Large-angle scattering of energetic electrons from Xe: A combined theoretical and experimental approach
Phys. Rev. A 85, 032703 (2012)

e + Xe	500,750eV	E/T

1081. A. R. Lopes, M. H. F. Bettega, S. d'A. Sanchez
Resonances in low-energy-electron scattering by nitro compounds
Phys. Rev. A 85, 044701 (2012)

e + $C_3H_7NO_2$	0−8eV	Th
e + $C_2H_5NO_2$	0−8eV	Th
e + $C_2H_3NO_2$	0−8eV	Th

1082. M. Vinodkumar, C. Limbachiya, A. Barot, N. Mason
Theoretical total cross sections for e-SO2 scattering over a wide energy range (0.1-2000 eV) revealing a 3.4-eV shape resonance
Phys. Rev. A 86, 012706 (2012)

e + SO_2	0.1−2000eV	Th

1083. C. J. Bostock, D. V. Fursa, I. Bray
Nonperturbative electron-ion-scattering theory incorporating the Moller interaction
Phys. Rev. A 86, 042709 (2012)

e + U^{91+}	100−120eV	Th

1084. N. Morrison, C. H. Greene
Laser-assisted electron-argon scattering at small angles
Phys. Rev. A 86, 053422 (2012)

e + Ar		Th

1085. K. S. Jassim
The electron scattering form factor of B-10, S-32 and Ca-48 nuclei
Phys. Scr. 86, 035202 (2012)

e + Kr^{34+}	1000−3500eV	Th

1086. K. L. Nixon, A. J. Murray, H. Chaluvadi, S. Amami, D. H. Madison, C. Ning
Low energy (e,2e) measurements of CH4 and neon in the perpendicular plane
J. Chem. Phys. 136, 94302 (2012)

e + Ne	0.5−50eV	E/T
e + CH_4	0.5−50eV	E/T

1087. I. I. Fabrikant, S. Caprasecca, G. A. Gallup, J. D. Gorfinkiel
Electron attachment to molecules in a cluster environment
J. Chem. Phys. 136, 184301 (2012)

e + CF_3Cl	0−2.5 eV	Th
e + CF_2Cl_2	0−2.5 eV	Th

1088. S. Xu, H. Chaluvadi, X. Ren, T. Pflueger, A. Senftleben, C. G. Ning, S. Yan, P. Zhang, J. Yang, X. Ma, J. Ullrich, D. H. Madison, A. Dorn
Low energy (e, 2e) study from the 1t(2) orbital of CH4
J. Chem. Phys. 137, 24301 (2012)

e + $\mathbf{CH_4}$	10−20eV	E/T
e + $\mathbf{CH_4}$	10−20eV	E/T

1089. J. Troe, T. M. Miller, N. S. Shuman, A. A. Viggiano
Analysis by kinetic modeling of the temperature dependence of thermal electron attachment to CF3Br
J. Chem. Phys. 137, 24303 (2012)

e + $\mathbf{CF_3Br}$	100−20000K	Th

1090. N. S. Shuman, T. M. Miller, A. A. Viggiano
Electron attachment to fluorocarbon radicals
J. Chem. Phys. 137, 214318 (2012)

e + $\mathbf{C_3F_5}$	300−550K	Exp
e + $\mathbf{C_2F_3}$	300−550K	Exp
e + $\mathbf{CF_2}$	300−550K	Exp

1091. K. L. Nixon, A. J. Murray
Mapping the xenon (e,2e) differential cross section from coplanar to perpendicular geometries
Phys. Rev. A 85, 22716 (2012)

e + Xe	5−40eV	Exp
e + Xe	5−40eV	Exp

1092. J. N. Bull, M. Bart, C. Vallance, P. W. Harland
Electron-impact-ionization dynamics of five C-2 to C-4 perfluorocarbons
Phys. Rev. A 88, 62710 (2013)

e + $\mathbf{C_4}$	0−220 eV	E/T
e + $\mathbf{C_2}$	0−220 eV	E/T

1093. E. Ghanbari-Adivi, R. Abdollahi-Tadi
A four-body approach to electron-impact single ionization of helium atoms
Eur. Phys. J. D 67, 266 (2013)

e + He	100−600eV	Th

1094. D. H. Kwon, Y. S. Cho, Y. O. Lee
Electron-impact ionization of W+ forming W2+
Int. J. Mass Spectrom. 356, 7 (2013)

e + $\mathbf{W^{2+}}$	10−1000 eV	Th
e + $\mathbf{W^{+}}$	10−1000 eV	Th

1095. M. C. Zammit, D. V. Fursa, I. Bray
Calculations of electron scattering from H-2(+)
Phys. Rev. A 88, 62709 (2013)

e + $\mathbf{H_2{}^{+}}$	0−1000eV	Th

1096. Q. Fan, G. Jiang, L. Cao, W. Wang, S. Du
Collision strengths for transitions of Ni XXI
Eur. Phys. J. D 67, 255 (2013)

e + $\mathbf{Ni^{10+}}$	0−450eV	Th

1097. J. C. Lower, E. Ali, S. Bellm, E. Weigold, A. Harris, C. G. Ning, D. Madison
Experimental and theoretical cross sections for molecular-frame electron-impact excitation-ionization of D-2
Phys. Rev. A 88, 62705 (2013)

e + D_2	178 eV	E/T
e + D_2	178 eV	E/T

1098. R. Celiberto, R. K. Janev, V. Laporta, J. Tennyson, J. M. Wadehra
Electron-impact vibrational excitation of vibrationally excited H-2 molecules involving the resonant (2)Sigma(+)(g) Rydberg-excited electronic state
Phys. Rev. A 88, 62701 (2013)

e + H_2	0–100eV	Th

1099. B. Goswami, U. Saikia, R. Naghma, B. Antony
Electron Impact Total Ionization Cross Sections for Plasma Wall Coating Elements
Chin. J. Phys. 51, 1172 (2013)

e + Fe	5–2000eV	Th
e + Ti	5–2000eV	Th
e + B	5–2000eV	Th
e + Be	5–2000eV	Th
e + Li	5–2000eV	Th

1100. H. Elabidi, S. Sahal-Brechot
Excitation cross-sections by electron impact for O v and O vi levels
Mon. Not. R. Astron. Soc. 436, 1452 (2013)

e + O^{5+}	1–140 RYD	Th
e + O^{4+}	1–140 RYD	Th

1101. Y. Y. Qi, L. N. Ning, J. G. Wang, Y. Z. Qu
Plasma effect on fast-electron-impact-ionization from 2p state of hydrogen-like ions
Phys. Plasmas 20, 123301 (2013)

e + H	1E–6–10 A.U.	Th

1102. D. P. Kilcrease, S. Brookes
Correction of the near threshold behavior of electron collisional excitation cross-sections in the plane-wave Born approximation
High En. Dens. Phys. 9, 722 (2013)

e + He^{+}	40–1000eV	Th
e + C^{5+}	40–1000eV	Th
e + C^{3+}	40–1000eV	Th

1103. Y. Smirnov
Excitation of Even Configurations of a Nickel Atom Containing Nine 3d Electrons
Opt. Spectrosc. 115, 787 (2013)

e + Ni	50 eV	Exp

1104. A. Kupliauskiene, G. Kerevicius
Theoretical study of the 4p(5)nln ' l ' autoionizing states of Rb excited by electron impact
Phys. Scr. 88, 65305 (2013)

e + Rb	0–400eV	Th

1105. S. I. Lopatin, S. M. Shugurov, K. A. Emelyanova
High-temperature mass spectrometric determinations of relative ionization cross-sections of gaseous TiO, TiO2, VO, VO2, YO, HfO and GeO molecules
Rap. Comm. Mass. Spect. 27, 2338 (2013)

e + GeO	45−55eV	Exp
e + HfO	45−55eV	Exp
e + YO	45−55eV	Exp
$\mathbf{e + VO}_2$	45−55eV	Exp
e + VO	45−55eV	Exp
$\mathbf{e + TiO}_2$	45−55eV	Exp
e + TiO	45−55eV	Exp

1106. M. Hoshino, H. Murai, H. Kato, M. J. Brunger, Y. Itikawa, H. Tanaka
Electron impact excitation of the low-lying 3s[3/2](1) and 3s '[1/2](1) levels in neon for incident energies between 20 and 300 eV
J. Chem. Phys. 139, 184301 (2013)

e + Ne	20−300eV	Exp

1107. A. Borovik, A. Kupliauskiene, O. Zatsarinny
Excitation-autoionization cross section of alkali atoms by electron impact
J. Phys. B 46, 215201 (2013)

e + Li	10−600eV	Exp
e + Cs	10−600eV	Exp
e + Rb	10−600eV	Exp
e + K	10−600eV	Exp
e + Na	10−600eV	Exp
e + Li	10−600eV	Exp
e + Cs	10−600eV	Exp
e + Rb	10−600eV	Exp
e + K	10−600eV	Exp
e + Na	10−600eV	Exp

1108. M. S. Pindzola, S. D. Loch, A. BorovikJr, M. F. Gharaibeh, J. K. Rudolph, S. Schippers, A. Mueller
Electron-impact ionization of moderately charged xenon ions
J. Phys. B 46, 215202 (2013)

$\mathbf{e + Xe}^{12+}$	100−1000eV	Th
$\mathbf{e + Xe}^{11+}$	100−1000eV	Th
$\mathbf{e + Xe}^{17+}$	100−1000eV	Th
$\mathbf{e + Xe}^{10+}$	100−1000eV	Th
$\mathbf{e + Xe}^{16+}$	100−1000eV	Th
$\mathbf{e + Xe}^{15+}$	100−1000eV	Th
$\mathbf{e + Xe}^{14+}$	100−1000eV	Th
$\mathbf{e + Xe}^{13+}$	100−1000eV	Th

1109. S. Harrison, A. Faure, J. Tennyson
CN excitation and electron densities in diffuse molecular clouds
Mon. Not. R. Astron. Soc. 435, 3541 (2013)

e + CN	0−1000 K	Th

1110. B. Goswami, R. Naghma, B. Antony
Calculations of electron collision and ionisation of rare gas dimers
Mol. Phys. 111, 3047 (2013)

$\mathbf{e + Kr}_2$	0−2000eV	Th
$\mathbf{e + He}_2$	0−2000eV	Th
$\mathbf{e + Ar}_2$	0−2000eV	Th
$\mathbf{e + Ne}_2$	0−2000eV	Th
$\mathbf{e + He}_2$	0−2000eV	Th
$\mathbf{e + Kr}_2$	0−2000eV	Th
$\mathbf{e + Ar}_2$	0−2000eV	Th
$\mathbf{e + Ne}_2$	0−2000eV	Th

1111. M. U. Bug, E. Gargioni, H. Nettelbeck, W. Y. Baek, G. Hilgers, A. B. Rosenfeld, H. Rabus
Ionization cross section data of nitrogen, methane, and propane for light ions and electrons and their suitability for use in track structure simulations
Phys. Rev. E 88, 43308 (2013)

e + C_3H_8	10−10000eV	Th
e + N_2	10−10000eV	Th

1112. J. Lecointre, K. A. Kouzakov, D. S. Belic, P. Defrance, Y. V. Popov, V. P. Shevelko
Multiple ionization of C+, N+ and O+ ions by fast electron impact
J. Phys. B 46, 205201 (2013)

e + N^+	10−10000eV	E/T
e + C^+	10−10000eV	E/T
e + O^+	10−10000eV	E/T

1113. D. Oubaziz, C. Champion, H. Aouchiche
Electron-induced double ionization of isolated water molecules
Phys. Rev. A 88, 42709 (2013)

e + H_2O	50−500eV	Th

1114. M. Hoshino, H. Mura, H. Kato, Y. Itikawa, M. J. Brunger, H. Tanaka
Resolution of a significant discrepancy in the electron impact excitation of the 3s[3/2](1) and 3s '[1/2](1) low-lying electronic states in neon
Chem. Phys. Lett. 585, 33 (2013)

e + Ne	20−300eV	Exp

1115. S. y. Sun, X. f. Jia
(e, 2e) Investigations of the Simultaneous Ionization and Excitation Helium to He+ (n=2)
Chin. J. Chem. Phys. 26, 576 (2013)

e + He	5.5−570eV	Th
e + He	5.5−570eV	Th

1116. L. J. Liu, C. C. Jia, L. M. Zhang, J. J. Chen, Z. J. Chen
The effect of wave function orthogonality on the simultaneous ionization and excitation of helium
Chin. Phys. B 22, 103401 (2013)

e + He	645−676eV	Th
e + He	645−676eV	Th

1117. M. Dance, E. Palay, S. N. Nahar, A. K. Pradhan
Fine-structure collision strengths and line ratios for [Ne v] in infrared and optical sources
Mon. Not. R. Astron. Soc. 435, 1576 (2013)

e + Ne^{4+}	0−2.5 RYD	Th

1118. A. K. F. Haque, I. Hossain, T. I. Talukder, M. Hasan, A. Uddin, A. K. Basak, B. C. Saha, F. B. Malik
Electron impact ionization cross-section of K-shell and H- to Be-isoelectronic series: An empirical model
Radiat. Phys. Chem. 91, 50 (2013)

e + Au	0–1E8 keV	Th
e + Ne^{8+}	0–1E8 keV	Th
e + Ne^{7+}	0–1E8 keV	Th
e + Be^{+}	0–1E8 keV	Th
e + Li^{+}	0–1E8 keV	Th
e + Ag	0–1E8 keV	Th
e + Ne^{6+}	0–1E8 keV	Th
e + O^{6+}	0–1E8 keV	Th
e + Li	0–1E8 keV	Th
e + He^{+}	0–1E8 keV	Th
e + Cu	0–1E8 keV	Th
e + O^{4+}	0–1E8 keV	Th
e + N^{6+}	0–1E8 keV	Th
e + He	0–1E8 keV	Th
e + H	0–1E8 keV	Th
e + Ar	0–1E8 keV	Th
e + N^{4+}	0–1E8 keV	Th
e + N^{3+}	0–1E8 keV	Th
e + U^{90+}	0–1E8 keV	Th
e + U^{91+}	0–1E8 keV	Th
e + C^{4+}	0–1E8 keV	Th
e + C^{2+}	0–1E8 keV	Th
e + U^{89+}	0–1E8 keV	Th
e + U^{88+}	0–1E8 keV	Th
e + C	0–1E8 keV	Th
e + B^{4+}	0–1E8 keV	Th
e + U	0–1E8 keV	Th
e + Mo^{41+}	0–1E8 keV	Th
e + B^{2+}	0–1E8 keV	Th
e + B^{+}	0–1E8 keV	Th

1119. R. Choubisa, M. Jain
On the spin interplay of the ejected electrons in the relativistic electron impact K-shell double ionization of atoms
J. Phys. B 46, 185202 (2013)

e + Xe	540eV	Th
e + Mo	540eV	Th
e + Ca	540eV	Th

1120. B. Goswami, R. Naghma, B. Antony
Cross sections for electron collisions with NF3
Phys. Rev. A 88, 32707 (2013)

e + NF$_{3}$	1–5keV	Th
e + NF$_{3}$	1–5keV	Th

1121. M. Vojnovic, M. Popovic, M. M. Ristic, M. D. Vicic, G. B. Poparic
Rate coefficients for electron impact excitation of CO
Chem. Phys. 423, 1 (2013)

e + Co	0–1000 Td	Th

1122. A. N. Gomonai, Y. I. Hutych, A. I. Gomonai
Emission cross sections for spectral lines transiting from the In2+ lower laser 4d(10)5p P-2(1/2,3/2) states excited by electron impact on the In+ ion
Nucl. Instrum. Methods Phys. Res. B 311, 37 (2013)

e + In^{+}	0–120eV	Exp

1123. A. BorovikJr, M. F. Gharaibeh, P. M. Hillenbrand, S. Schippers, A. Mueller
Detailed investigation of electron-impact single-ionization cross sections and plasma rate coefficients of N-shell tin ions
J. Phys. B 46, 175201 (2013)

e + Sn^{7+}	0−1000eV	E/T
e + Sn^{13+}	0−1000eV	E/T
e + Sn^{6+}	0−1000eV	E/T
e + Sn^{12+}	0−1000eV	E/T
e + Sn^{5+}	0−1000eV	E/T
e + Sn^{11+}	0−1000eV	E/T
e + Sn^{4+}	0−1000eV	E/T
e + Sn^{10+}	0−1000eV	E/T
e + Sn^{9+}	0−1000eV	E/T
e + Sn^{8+}	0−1000eV	E/T

1124. K. Bartschat
Computational methods for electron-atom collisions in plasma applications
J. Phys. D 46, 334004 (2013)

e + I	0−10eV	Th
e + Ar	0−10eV	Th
e + Ne	0−10eV	Th
e + He	0−10eV	Th
e + He	0−10eV	Th
e + Hg	0−10eV	Th
e + Kr	0−10eV	Th
e + I	0−10eV	Th
e + Ar	0−10eV	Th
e + Ne	0−10eV	Th
e + He	0−10eV	Th
e + Hg	0−10eV	Th
e + Kr	0−10eV	Th
e + I	0−10eV	Th
e + Ar	0−10eV	Th
e + Ne	0−10eV	Th
e + Hg	0−10eV	Th
e + He	0−10eV	Th
e + Hg	0−10eV	Th
e + Kr	0−10eV	Th
e + Kr	0−10eV	Th
e + I	0−10eV	Th
e + Ar	0−10eV	Th
e + Ne	0−10eV	Th

1125. M. Guerra, F. Parente, J. P. Santos
Electron impact ionization cross sections of several ionization stages of Kr, Ar and Fe
Int. J. Mass Spectrom. 348, 1 (2013)

e + Ar^{6+}	0−1000keV	Th
e + Ar^{5+}	0−1000keV	Th
e + Ar^{4+}	0−1000keV	Th
e + Ar^{3+}	0−1000keV	Th
e + Ar^{2+}	0−1000keV	Th
e + Ar^{7+}	0−1000keV	Th

1126. R. Naghma, B. Antony
Total and elastic cross sections for methyl halides by electron impact
J. Electron Spectrosc. Relat. Phenom. 189, 17 (2013)

e + CH_3I	20−5000 eV	Th
e + CH_3Br	20−5000 eV	Th
e + CH_3Cl	20−5000 eV	Th
e + CH_3F	20−5000 eV	Th

1127. M. F. R. Grieve, C. A. Ramsbottom, F. P. Keenan
Electron impact excitation of Mg VIII Collision strengths, transition probabilities and theoretical EUV and soft X-ray line intensities for Mg VIII
Astron. Astrophys. 556, A24 (2013)

e + Mg^{8+}	1E4−1E7 K	Th

1128. F. Li, G. Y. Liang, M. A. Bari, G. Zhao
Dirac R-matrix calculation for electron-impact excitation of S XIII
Astron. Astrophys. 556, A32 (2013)

e + S^{12+}	1E4−1E8 K	Th

1129. H. S. Uhm, Y. H. Na, E. H. Choi, G. Cho
Dissociation and excitation coefficients of nitrogen molecules and nitrogen monoxide generation
Phys. Plasmas 20, 83502 (2013)

e + N_2	0−40 eV	Th
e + N_2	0−40 eV	Th

1130. C. DalCappello, B. Hmouda, A. Naja, G. Gasaneo
Ionization of atomic hydrogen by electrons: the role of the contributions of the pseudo-states in the second Born approximation
J. Phys. B 46, 145203 (2013)

e + H	250eV	Th

1131. A. L. Harris, K. Morrison
Comprehensive study of 3-body and 4-body models of single ionization of helium
J. Phys. B 46, 145202 (2013)

e + He	64−600eV	Th

1132. C. J. Bostock, C. J. Fontes, D. V. Fursa, H. L. Zhang, I. Bray
Calculation of the relativistic rise in electron-impact-excitation cross sections for highly charged ions
Phys. Rev. A 88, 12711 (2013)

e + U^{91+}	0−160eV	Th
e + Xe^{53+}	0−160eV	Th
e + Ni^{27+}	0−160eV	Th

1133. L. Sigaud, N. Ferreira, E. C. Montenegro
Absolute cross sections for O-2 dication production by electron impact
J. Chem. Phys. 139, 24302 (2013)

e + O_2	30−400eV	Exp

1134. T. N. Rescigno, A. E. Orel
Theoretical study of excitation of the low-lying electronic states of water by electron impact
Phys. Rev. A 88, 12703 (2013)

e + H_2O	0−30eV	Th

1135. Y. Z. Zhang, Y. J. Zhou
Ionization cross sections for electron scattering from metastable rare-gas atoms (Ne* and Ar*)
Chin. Phys. B 22, 73402 (2013)

e + Ar	4−200eV	Th
e + Ne	4−200eV	Th

1136. V. V. Serov, V. L. Derbov, T. A. Sergeeva, S. I. Vinitskii
Modern methods for calculating photoionization and electron-impact ionization of two-electron atoms and molecules
Physics Of Particles And Nuclei 44, 757 (2013)

e + N_2	550−600eV	Th
e + He	550−600eV	Th
e + H_2	550−600eV	Th

1137. Y. C. Wang, J. Ma, Y. J. Zhou
Electronic Excitation of H-2 by Electron Impact Using Multichannel Static-Exchange-Optical Method
Chin. Phys. Lett. 30, 73401 (2013)

e + H_2	20−30eV	Th
e + H_2	20−30eV	Th

1138. Q. Fan, G. Jiang, L. Cao, B. Deng
Collision strength calculations of Ni XXIII
Phys. Scr. 88, 15302 (2013)

e + Ni^{22+}	100−500 RYD	Th

1139. H. L. Zhang, C. J. Fontes
Relativistic distorted-wave collision strengths for the 16 Delta n=0 optically allowed transitions with n=2 in the 67 Be-like ions with 26 ¡= Z ¡= 92
At. Data Nucl. Data Tables 99, 416 (2013)

e + U^{89+}	0−150 keV	Th
e + Xe^{51+}	0−150 keV	Th

1140. K. Ralphs, G. Serna, L. R. Hargreaves, M. A. Khakoo, C. Winstead, V. McKoy
Excitation of the six lowest electronic transitions in water by 9-20 eV electrons
J. Phys. B 46, 125201 (2013)

e + H_2O	9−20eV	E/T

1141. A. Moy, C. Merlet, X. Llovet, O. Dugne
Measurements of absolute L- and M-subshell x-ray production cross sections of Pb by electron impact
J. Phys. B 46, 115202 (2013)

e + Pb	3−38keV	E/T

1142. M. Sahlaoui, M. Bouamoud, B. Lasri, M. Dogan
Ionization of a water molecule by electron impact in coplanar symmetric and asymmetric geometries
J. Phys. B 46, 115206 (2013)

e + H_2O	52−107eV	Th

1143. P. Singh, G. Purohit, V. Patidar
Second-order Born effects in the coplanar to perpendicular plane single ionization of Xe (5p)
J. Phys. B 46, 115207 (2013)

e + Xe	20−40eV	Th

1144. M. Ulu, Z. N. Ozer, M. Yavuz, O. Zatsarinny, K. Bartschat, M. Dogan, A. Crowe
Experimental and theoretical investigation of (e, 2e) ionization of Ar(3p) in asymmetric kinematics at 200 eV
J. Phys. B 46, 115204 (2013)

e + Ar	200eV	E/T

1145. O. Zatsarinny, K. Bartschat
The B-spline R-matrix method for atomic processes: application to atomic structure, electron collisions and photoionization
J. Phys. B 46, 112001 (2013)

e + Xe	2−500eV	Th
e + Kr	2−500eV	Th
e + Ar	2−500eV	Th
e + Ne	2−500eV	Th
e + He	2−500eV	Th
e + Xe	2−500eV	Th
e + Kr	2−500eV	Th
e + Ar	2−500eV	Th
e + Ne	2−500eV	Th
e + He	2−500eV	Th
e + Xe	2−500eV	Th
e + Kr	2−500eV	Th
e + Ar	2−500eV	Th
e + Ne	2−500eV	Th
e + He	2−500eV	Th

1146. A. Bharadvaja, S. Kaur, K. L. Baluja
Electron-impact study of PO2 using the R-matrix method
Phys. Rev. A 87, 62703 (2013)

$\mathbf{e + PO_2}$	0−10eV	Th
$\mathbf{e + PO_2}$	0−10eV	Th
$\mathbf{e + PO_2}$	0−10eV	Th
$\mathbf{e + PO_2}$	0−10eV	Th

1147. A. Barot, D. Gupta, M. Vinodkumar, B. Antony
Computation of electron-impact total and differential cross sections for allene (C3H4) in the energy range 0.1-2000 eV
Phys. Rev. A 87, 62701 (2013)

$\mathbf{e + C_3H_4}$	0.1−2000eV	Th

1148. Y. L. Shi, C. Z. Dong, X. Y. Ma, Z. W. Wu, L. Y. Xie, S. Fritzsche
Polarization of M2 Line Emitted Following Electron-Impact Excitation of Beryllium-Like Ions
Chin. Phys. Lett. 30, 63401 (2013)

$\mathbf{e + Ho^{63+}}$	0−5 TH	Th
$\mathbf{e + Mo^{38+}}$	0−5 TH	Th
$\mathbf{e + U^{88+}}$	0−5 TH	Th

1149. J. D. Fletcher, M. A. Parkes, S. D. Price
Electron ionisation of sulfur dioxide
J. Chem. Phys. 138, 184309 (2013)

e + SO_2	0−200eV	Exp

1150. K. M. Aggarwal, F. P. Keenan
Energy levels, radiative rates and electron impact excitation rates for transitions in He-like Fe XXV, Co XXVI, Ni XXVII, Cu XXVIII and Zn XXIX
Phys. Scr. 87, 55302 (2013)

e + Zn^{18+}	700−1300 RYD	Th
e + Cu^{17+}	700−1300 RYD	Th
e + Ni^{16+}	700−1300 RYD	Th
e + Co^{15+}	700−1300 RYD	Th
e + Fe^{14+}	700−1300 RYD	Th

1151. G. Gasaneo, D. M. Mitnik, J. M. Randazzo, L. U. Ancarani, F. D. Colavecchia
S-model calculations for high-energy-electron-impact double ionization of helium
Phys. Rev. A 87, 42707 (2013)

e + He	500−5600eV	Th

1152. M. Hahn, A. Becker, D. Bernhardt, M. Grieser, C. Krantz, M. Lestinsky, A. Mueller, O. Novotny, R. Repnow, S. Schippers, K. Spruck, A. Wolf, D. W. Savin
STORAGE RING CROSS SECTION MEASUREMENTS FOR ELECTRON IMPACT SINGLE AND DOUBLE IONIZATION OF Fe13+ AND SINGLE IONIZATION OF Fe16+ AND Fe17+
Astrophys. J. 767, 47 (2013)

e + Fe^{17+}	0−3000eV	Th
e + Fe^{16+}	0−3000eV	Th
e + Fe^{13+}	0−3000eV	Th

1153. T. Pflueger, O. Zatsarinny, K. Bartschat, A. Senftleben, X. Ren, J. Ullrich, A. Dorn
Electron-Impact Ionization of Neon at Low Projectile Energy: An Internormalized Experiment and Theory for a Complex Target
Phys. Rev. Lett. 110, 153202 (2013)

e + Ne	100eV	E/T

1154. Y. M. Smirnov
Excitation of undecuplet levels of the gadolinium atom belonging to the 4f (7)5d (2)6p configuration
Opt. Spectrosc. 114, 492 (2013)

e + Gd	0−200eV	E/T

1155. V. Laporta, R. Celiberto, J. Tennyson
Resonant vibrational-excitation cross sections and rate constants for low-energy electron scattering by molecular oxygen
Plasma Sources Sci. Technol. 22, 25001 (2013)

e + O_2	0−18eV	Th

1156. K. M. Aggarwal, F. P. Keenan
Energy levels, radiative rates and electron impact excitation rates for transitions in He-like Ga XXX, Ge XXXI, As XXXII, Se XXXIII and Br XXXIV
Phys. Scr. 87, 45304 (2013)

e + As^{31+}	1E5.2−1E7.7 K	Th
e + Ge^{30+}	1E5.2−1E7.7 K	Th
e + Ga^{29+}	1E5.2−1E7.7 K	Th
e + Br^{33+}	1E5.2−1E7.7 K	Th
e + Se^{32+}	1E5.2−1E7.7 K	Th

1157. C. P. Ballance, S. D. Loch, M. S. Pindzola, D. C. Griffin
Electron-impact excitation and ionization of W3+ for the determination of tungsten influx in a fusion plasma
J. Phys. B 46, 55202 (2013)

e + W^{3+}	0−100eV	Th
e + W^{3+}	0−100eV	Th

1158. B. Najjari, A. B. Voitkiv
Excitation of highly charged hydrogenlike ions by the impact of equivelocity electrons and protons: A comparative study
Phys. Rev. A 87, 34701 (2013)

e + U^{91+}	0−500keV	Th
e + Bi^{80+}	0−500keV	Th
e + Xe^{53+}	0−500keV	Th
e + Er^{67+}	0−500keV	Th
e + Ni^{27+}	0−500keV	Th

1159. K. M. Aggarwal, F. P. Keenan
Energy levels, radiative rates, and electron impact excitation rates for transitions in Li-like ions with 12 ¡= Z ¡= 20
At. Data Nucl. Data Tables 99, 156 (2013)

e + Ca^{17+}	1E4.5−1E7.5 K	Th
e + K^{16+}	1E4.5−1E7.5 K	Th
e + Ar^{15+}	1E4.5−1E7.5 K	Th
e + Cl^{14+}	1E4.5−1E7.5 K	Th
e + S^{13+}	1E4.5−1E7.5 K	Th
e + P^{12+}	1E4.5−1E7.5 K	Th
e + Al^{10+}	1E4.5−1E7.5 K	Th
e + Mg^{9+}	1E4.5−1E7.5 K	Th

1160. P. X. Hien, B. H. Jeon, A. T. Do
Electron Collision Cross Sections for the BF3 Molecule and Electron Transport Coefficients in BF3-Ar and BF3-SiH4 Mixtures
J. Phys. Soc. Japan 82, 34301 (2013)

e + BF_3	0.1−200eV	Th
e + BF_3	0.1−200eV	Th

1161. S. Niyonzima, F. Lique, K. Chakrabarti, A. Larson, A. E. Orel, I. F. Schneider
Multichannel-quantum-defect-theory treatment of reactive collisions between electrons and BeH+
Phys. Rev. A 87, 22713 (2013)

e + BeH^{+}	0.001−3eV	Th

1162. K. L. Nixon, A. J. Murray
(e,2e) ionization studies of the stable noble gases in a coplanar symmetric geometry
Phys. Rev. A 87, 22712 (2013)

e + He	1.2−200eV	Th
e + Xe	1.2−200eV	Th
e + Kr	1.2−200eV	Th
e + Ne	1.2−200eV	Th

1163. S. Abdel-Naby, C. P. Ballance, T. G. Lee, S. D. Loch, M. S. Pindzola
Electron-impact ionization of the C atom
Phys. Rev. A 87, 22708 (2013)

e + C	0−60eV	Th

1164. K. D. Lawson, I. H. Coffey, K. M. Aggarwal, F. P. Keenan
The effect of ionization on the populations of excited levels of C IV and C V in tokamak edge plasmas
J. Phys. B 46, 35701 (2013)

$\mathbf{e + C^{4+}}$	20−130eV	Th
$\mathbf{e + C^{3+}}$	20−130eV	Th
$\mathbf{e + C^{4+}}$	20−130eV	Th
$\mathbf{e + C^{3+}}$	20−130eV	Th

1165. O. Zatsarinny, Y. Wang, K. Bartschat
Relativistic B-spline R-matrix calculations for electron collisions with lead atoms: differential cross sections and spin asymmetries
J. Phys. B 46, 35202 (2013)

e + Pb	9−10eV	Th

1166. Y. Wang, O. Zatsarinny, K. Bartschat, J. P. Booth
Fine-structure-resolved electron collisions from chlorine atoms in the (3p(5))(2) P-3/2(0) and (3p(5))(2) P-1/2(0) states
Phys. Rev. A 87, 22703 (2013)

e + Cl	0.01−100eV	Th
e + Cl	0.01−100eV	Th

1167. Y. C. Wang, J. Ma, Y. J. Zhou
Momentum-space calculation of electron-CO elastic collision
Chin. Phys. B 22, 23402 (2013)

e + Co	2−10eV	Th

1168. R. Singh, P. Bhatt, N. Yadav, R. Shanker
Partial ionization cross-sections of H2O molecule by 10-25 keV electron ionization
J. Electron Spectrosc. Relat. Phenom. 186, 58 (2013)

$\mathbf{e + H_2O}$	10−25keV	Exp

1169. Z. N. Ozer, F. Olgac, M. Ulu, M. Dogan
Double Differential Cross-Section Measurements for Electron Impact Ionization of Helium
Astron. Astrophys. 123, 361 (2013)

e + He	100−300eV	Exp

1170. D. H. Ki, Y. D. Jung
ELECTRON IMPACT DISSOCIATION X (1)Sigma(+)(g) -¿ b (3)Sigma(+)(u) AND EXCITATIONS X (1)Sigma(+)(g) -¿ a (3)Sigma(+)(g) AND X (1)Sigma(+)(g) -¿ B (1)Sigma(+)(u) OF MOLECULAR HYDROGEN IN NONTHERMAL ASTROPHYSICAL PLASMAS
Astrophys. J., Suppl. Ser. 204, 18 (2013)

$\mathbf{e + H_2}$	9.2−3000eV	Th
$\mathbf{e + H_2}$	9.2−3000eV	Th

1171. R. Celiberto, K. L. Baluja, R. K. Janev
Electron-impact state-to-state resolved cross sections and rate coefficients for the X(v) -¿ A(v ') excitation in BeH molecules
Plasma Sources Sci. Technol. 22, 15008 (2013)

e + BeH	1−1000eV	Th

1172. R. Kumar, S. Pal
Evaluation of electron ionization cross-sections of methyl halides
Rap. Comm. Mass. Spect. 27, 223 (2013)

e + CH_3Br	13−1000eV	Th
e + CH_3Cl	13−1000eV	Th
e + CH_3F	13−1000eV	Th

1173. A. Borovik, V. Roman, O. Zatsarinny, K. Bartschat
Electron impact excitation of the lowest doublet and quartet core-excited autoionizing states in Rb atoms
J. Phys. B 46, 15203 (2013)

e + Rb	15−50eV	E/T

1174. Y. Wang, O. Zatsarinny, K. Bartschat
B-spline R-matrix-with-pseudostates calculations for electron-impact excitation and ionization of carbon
Phys. Rev. A 87, 12704 (2013)

e + C	0−100eV	Th
e + C	0−100eV	Th
e + C	0−100eV	Th

1175. M. Vinodkumar, C. Limbachiya, A. Barot, N. Mason
Computation of electron-impact rotationally elastic total cross sections for methanol over an extensive range of impact energy (0.1-2000 eV)
Phys. Rev. A 87, 12702 (2013)

e + CH_3OH	0.1−2000eV	Th
e + CH_3OH	0.1−2000eV	Th
e + CH_3OH	0.1−2000eV	Th
e + CH_3OH	0.1−2000eV	Th

1176. M. Dogan, M. Ulu, Z. N. Ozer, M. Yavuz, G. Bozkurt
Double Differential Cross-Sections for Electron Impact Ionization of Atoms and Molecules
J. Spectroc. 2013, 192917 (2013)

e + CH_4	200−250 eV	Exp
e + H_2	200−250 eV	Exp
e + Ar	200−250 eV	Exp
e + He	200−250 eV	Exp

1177. V. Stancalie
ELECTRON COLLISIONS WITH Fe-PEAK ELEMENT Co IV: A COMPUTATIONAL GRAND CHALLENGE
Romanian Reports In Physics 65, 745 (2013)

e + Co^{3+}	3−5 RYD	Th

1178. B. M. Smirnov
Excitation of helium atoms in collisions with plasma electrons in an electric field
Journal Of Experimental And Theoretical Physics 116, 48 (2013)

e + He	1−8eV	Th

1179. T. Maihom, I. Sukuba, R. Janev, K. Becker, T. Maerk, A. Kaiser, J. Limtrakul, J. Urban, P. Mach, M. Probst
Electron impact ionization cross sections of beryllium and beryllium hydrides
Eur. Phys. J. D 67, 2 (2013)

e + Be_2H_4	0−1000eV	Th
e + Be_2H_2	0−1000eV	Th
e + BeH_2	0−1000eV	Th
e + BeH	0−1000eV	Th
e + Be	0−1000eV	Th

1180. R. Naghma, B. Antony
Electron impact ionization cross-section of C2, C3, Si2, Si3, SiC, SiC2 and Si2C
Mol. Phys. 111, 269 (2013)

e + Si_2C	10−2000eV	Th
e + SiC_2	10−2000eV	Th
e + SiC	10−2000eV	Th
e + Si_3	10−2000eV	Th
e + Si_2	10−2000eV	Th
e + C_3	10−2000eV	Th
e + C_2	10−2000eV	Th

1181. N. A. Borovoy, R. N. Ishchenko
Ionization of M subshells of Pb atoms by electron impact in an energy range of 5-30 keV
Opt. Spectrosc. 114, 1 (2013)

e + Pb	5−30keV	Exp

1182. HM Boechat-Roberty, EO Uhl, FN Rodrigues, MCA Lopes, MLM Rocco, CA Lucas, AB Rocha, CE Bielschowsky, GGB deSouza
Electron scattering from trans 1,3-butadiene molecule: cross-sections, oscillator strength and VUV photoabsorption cross-sections
Eur. Phys. J. D 67, 26 (2013)

e + C_4H_6	1000 eV	E/T

1183. H Murai, Y Ishijima, T Mitsumura, Y Sakamoto, H Kato, M Hoshino, F Blanco, G Garcia, P Limao-Vieira, MJ Brunger, SJ Buckman, H Tanaka
A comprehensive and comparative study of elastic electron scattering from OCS and CS2 in the energy region from 1.2 to 200 eV
J. Chem. Phys. 138, 54302 (2013)

e + OCS	1.2−200eV	E/T
e + Cs_2	1.2−200eV	E/T

1184. L Chiari, A Zecca, G Garcia, F Blanco, MJ Brunger
Low-energy positron and electron scattering from nitrogen dioxide
J. Phys. B 46, 235202 (2013)

e + NO_2	1−1000eV	Exp

1185. A Gauf, C Navarro, G Balch, LR Hargreaves, MA Khakoo, C Winstead, V McKoy
Low-energy elastic electron scattering by acetylene
Phys. Rev. A 87, 12710 (2013)

e + C_2H_2	1−1000eV	E/T
e + C_2H_2	1−1000eV	E/T

1186. JR Brunton, LR Hargreaves, TM Maddern, SJ Buckman, G Garcia, F Blanco, O Zatsarinny, K Bartschat, DB Jones, GB daSilva, MJ Brunger
Differential cross sections for low-energy elastic electron scattering from the CF3 radical
J. Phys. B 46, 245203 (2013)

e + CF_3	7–50eV	E/T

1187. RP McEachran, M Vos, LF Zhu
Fast-electron scattering from Ne: A comparison of distorted-wave theory with experiment
Phys. Rev. A 87, 52703 (2013)

e + Ne	300–2500eV	E/T

1188. R Ward, D Cubric, N Bowring, GC King, FH Read, DV Fursa, I Bray
Negative ion resonance measurements in the autoionizing region of helium measured across the complete angular scattering range (0 degrees-180 degrees)
J. Phys. B 46, 35001 (2013)

e + He	56–60eV	E/T
e + He	56–60eV	E/T

1189. G DelZanna, PJ Storey
Atomic data for astrophysics: Fe xi soft X-ray lines
Astron. Astrophys. 549, A42 (2013)

e + Fe^{10+}	1E5–1E7 K	Th

1190. VK Dolmatov, MY Amusia, LV Chernysheva
Electron elastic scattering off a semifilled-shell atom: The Mn atom
Phys. Rev. A 88, 42706 (2013)

e + Mn	0–25eV	Th
e + Mn	0–25eV	Th

1191. NS Shuman, TM Miller, AA Viggiano, J Troe
Electron attachment to CF3 and CF3Br at temperatures up to 890 K: Experimental test of the kinetic modeling approach
J. Chem. Phys. 138, 204316 (2013)

e + CF_3Br	300–890K	Exp
e + CF_3	300–890K	Exp

1192. R Janeckova, D Kubala, O May, J Fedor, M Allan
Experimental Evidence on the Mechanism of Dissociative Electron Attachment to Formic Acid
Phys. Rev. Lett. 111, 213201 (2013)

e + HCOOH	1–3.5eV	Exp

1193. KL Nixon, AJ Murray, H Chaluvadi, CG Ning, J Colgan, DH Madison
Low energy (e,2e) coincidence studies of NH3: Results from experiment and theory
J. Chem. Phys. 138, 174304 (2013)

e + CH_4	11–28eV	E/T
e + NH_3	11–28eV	E/T
e + CH_4	11–28eV	E/T
e + NH_3	11–28eV	E/T

1194. O Novotny, A Becker, H Buhr, C Domesle, W Geppert, M Grieser, C Krantz, H Kreckel, R Repnow, D Schwalm, K Spruck, J Stuuetzel, B Yang, A Wolf, DW Savin
DISSOCIATIVE RECOMBINATION MEASUREMENTS OF HCl+ USING AN ION STORAGE RING
Astrophys. J. 777, 54 (2013)

$\mathbf{e + HCl^{+}}$	1E−5−5eV	Exp

1195. T Sochi, PJ Storey
Dielectronic recombination lines of C+
At. Data Nucl. Data Tables 99, 633 (2013)

$\mathbf{e + C^{+}}$	1E3−1E4.8 K	Th

1196. GSJ Armstrong, J Colgan, MS Pindzola
Angular distributions for the electron-impact single ionization of sodium and magnesium
Phys. Rev. A 88, 42713 (2013)

$\mathbf{e + Mg}$	10−60eV	Th
$\mathbf{e + Na}$	10−60eV	Th

1197. M Braun, II Fabrikant, MW Ruf, H Hotop
High-resolution studies of (SF6)(q)(-) (q=1-3) cluster anion formation in low-energy electron collisions with (SF6)N clusters (N ¿= 2)
J. Phys. B 46, 195202 (2013)

$\mathbf{e + SF_6}$	0.−3000eV	Exp

1198. C Cornaggia
Electron elastic back-scattering from aligned CO2+ molecular ions in the 15-30 eV energy range
J. Phys. B 46, 191001 (2013)

$\mathbf{e + CO_2}$	10−30eV	Th

1199. SL Guberman
The vibrational dependence of dissociative recombination: Cross sections for N-2(+)
J. Chem. Phys. 139, 124318 (2013)

$\mathbf{e + N_2{}^{+}}$	0.001−1eV	Th

1200. A Sasaki, I Murakami
Algorithm-based modelling of fractional ion abundance and rates of ionization and recombination for tungsten plasmas
J. Phys. B 46, 175701 (2013)

$\mathbf{e + W^{42+}}$	100−10000eV	Th
$\mathbf{e + W^{41+}}$	100−10000eV	Th
$\mathbf{e + W^{46+}}$	100−10000eV	Th
$\mathbf{e + W^{45+}}$	100−10000eV	Th
$\mathbf{e + W^{44+}}$	100−10000eV	Th
$\mathbf{e + W^{436+}}$	100−10000eV	Th
$\mathbf{e + W^{42+}}$	100−10000eV	Th
$\mathbf{e + W^{41+}}$	100−10000eV	Th
$\mathbf{e + W^{46+}}$	100−10000eV	Th
$\mathbf{e + W^{45+}}$	100−10000eV	Th
$\mathbf{e + W^{44+}}$	100−10000eV	Th
$\mathbf{e + W^{436+}}$	100−10000eV	Th

1201. ZM Hu, YM Li, N Nakamura
Resonance strength for KLL dielectronic recombination of hydrogenlike krypton
Phys. Rev. A 87, 52706 (2013)

e + K^{35+}		E/T

1202. D Nikolic, TW Gorczyca, KT Korista, GJ Ferland, NR Badnell
SUPPRESSION OF DIELECTRONIC RECOMBINATION DUE TO FINITE DENSITY EFFECTS
Astrophys. J. 768, 82 (2013)

e + C^{3+}	0.01−30eV	Th

1203. MA Khakoo, H Silva, J Muse, MCA Lopes, C Winstead, V McKoy
Electron scattering from H2O: Elastic scattering (vol 78, 052710, 2008)
Phys. Rev. A 87, 49902 (2013)

e + H$_2$O	1−100eV	Exp

1204. K Chakrabarti, DR Backodissa-Kiminou, N Pop, JZ Mezei, O Motapon, F Lique, O Dulieu, A Wolf, IF Schneider
Dissociative recombination of electrons with diatomic molecular cations above dissociation threshold: Application to H-2(+) and HD+
Phys. Rev. A 87, 22702 (2013)

e + HD$^+$	0−14eV	Th
e + H$_2$$^+$	0−14eV	Th

1205. R Curik, FA Gianturco
Indirect dissociative recombination of LiHe+ ions driven by vibrational Feshbach resonances
Phys. Rev. A 87, 12705 (2013)

e + LiHe$^+$	0.02−500eV	Th

1206. O. Novotn
DISSOCIATIVE RECOMBINATION MEASUREMENTS OF HCl+ USING AN ION STORAGE RING
Astrophys. J. 777, 54 (2014)

e + HCl$^+$	1E−5−4.06eV	Exp

1207. D.H. Ki, Y.D. Jung
ELECTRON IMPACT DISSOCIATION X (1)Sigma(+)(g) -¿ b (3)Sigma(+)(u) AND EXCITATIONS X (1)Sigma(+)(g) -¿ a (3)Sigma(+)(g) AND X (1)Sigma(+)(g) -¿ B (1)Sigma(+)(u) OF MOLECULAR HYDROGEN IN NONTHERMAL ASTROPHYSICAL PLASMAS
Astrophys. J., Suppl. Ser. 204, 18 (2014)

e + H$_2$	9.2−3000eV	Th

1208. Z.N. Ozera, F. Olgaca, M. Ulua, B. Aktasb, M. Dogana
Measurements of Double Differential Cross-Sections for He at Intermediate Energy
Acta Phys. Pol. A 125, 341 (2014)

e + He	200eV	Exp

1209. M. Yavuz, N. Isik, Z. N. Ozer
Double Differential Cross-Section Measurements for Methane Molecule at 350 eV
Acta Phys. Pol. A 125, 442 (2014)

e + $\mathbf{CH_4}$	25−300eV	Exp

1210. G. DelZanna, P. J. Storey, N. R. Badnell, H. E. Mason
Atomic data for astrophysics: Fe IX
Astron. Astrophys. 565, A77 (2014)

e + Fe^{8+}	1E5−1E6.4 K	Th

1211. G. DelZanna, N. R. Badnell
Atomic data for astrophysics: improved collision strengths for Fe VIII
Astron. Astrophys. 570, A56 (2014)

e + Fe^{7+}	1E5−1E6.4 K	Th

1212. G. DelZanna, P. J. Storey, H. E. Mason
Atomic data for astrophysics: Ni xv
Astron. Astrophys. 567, A18 (2014)

e + Ni^{14+}	1E5.6−1E6.7 K	Th

1213. G. DelZanna, P. J. Storey, N. R. Badnell
Atomic data for astrophysics: Ni XI
Astron. Astrophys. 566, A123 (2014)

e + Ni^{10+}	1E5−1E7 K	Th

1214. M. F. R. Grieve, C. A. Ramsbottom, F. P. Keenan
Electron impact excitation of Mg VIII Collision strengths, transition probabilities and theoretical EUV and soft X-ray line intensities for Mg VIII
Astron. Astrophys. 556, A24 (2014)

e + Mg^{7+}	1E4−1E7 K	Th

1215. L. Fernandez-Menchero, G. DelZanna, N. R. Badnell
R-matrix electron-impact excitation data for the Be-like iso-electronic sequence
Astron. Astrophys. 566, A104 (2014)

e + Ne^{6+}	1−1E9 K	Th
e + C^{2+}	1−1E9 K	Th
e + Fe^{22+}	1−1E9 K	Th
e + Mg^{8+}	1−1E9 K	Th

1216. F. Li, G. Y. Liang, M. A Bari
Dirac R-matrix calculation for electron-impact excitation of S XIII
Astron. Astrophys. 556, A32 (2014)

e + S^{12+}	0−150 RYD	Th

1217. A. N. Zavilopulo, P. P. Markush, O. B. Shpenik, M. I. Mykyta
Electron-impact ionization of sulfur in the gas phase
Atomic And Molecular Physics 59, 951 (2014)

e + Sn^{-}	0−10eV	Exp

1218. H. L. Zhang, C. J. Fontes
Relativistic distorted-wave collision strengths for the 16 Delta n=0 optically allowed transitions with n=2 in the 67 Be-like ions with 26 ¡= Z ¡= 92
At. Data Nucl. Data Tables 99, 416 (2014)

e + U^{88+}	0−1E5 eV	Th
e + Xe^{50+}	0−1E5 eV	Th

1219. E. Landi, A. K Bhatia
Atomic data and spectral line intensities for Ca IX
At. Data Nucl. Data Tables 100, 1519 (2014)

e + Ca^{8+}	0–60 RYD	Th

1220. M. Yavuz
Comprehensive experimental and theoretical study of double-differential cross sections for CH4 at 300 and 350 eV incident electron energies
Can. J. Phys. 92, 1676 (2014)

e + CH$_4$	300–350eV	E/T

1221. M. Vojnovi, M. Popovi
Rate coefficients for electron impact excitation of CO
Chem. Phys. 423, 1 (2014)

e + Co	0–1000 Td	Th

1222. R. Kumar
Electron ionization cross sections for the PH3 molecule
Chem. Phys. Lett. 609, 108 (2014)

e + PH$_3$	14–1000eV	Th

1223. M. Hoshino, H. Mura, H. Kato
Resolution of a significant discrepancy in the electron impact excitation of the 3s[3/2](1) and 3s '[1/2](1) low-lying electronic states in neon
Chem. Phys. Lett. 585, 33 (2014)

e + Ne	20–300eV	Th

1224. J. R. Brunton, L. R. Hargreaves, S. J. Buckman
Anomalously large low-energy elastic cross sections for electron scattering from the CF3 radical
Chem. Phys. Lett. 568, 55 (2014)

e + CF$_3$	7–50eV	E/T

1225. N. X. Yang, J. J. Zhang, C. Z. Dong
Absolute Cross Sections for Near-Threshold Electron-Impact Excitation of the 2s S-2 -¿ 2p P-2 Transition of Li-Like C3+, N4+, and O5+ Ions
Chin. Phys. Lett. 31, 083401 (2014)

e + O^{5+}	8–17eV	Th
e + N^{4+}	8–17eV	Th
e + C^{3+}	8–17eV	Th

1226. Z. B. Chen, C. Z. Dong, L. Y. Xie, J. Jiang
Electron Impact Excitation of Xenon from the Ground State and the Metastable State to the 5p(5)7p Levels
Chin. Phys. Lett. 31, 033401 (2014)

e + Xe	0–200eV	Th

1227. J. Jiang, C. Z. Dong, L. Y. Xie
Electron Impact Excitations and Linear Polarization for 1s(2) S-1(0)-1s2P P-3,1(1) Lines of Fe24+ Ions under Screened Coulomb Interactions
Chin. Phys. Lett. 31, 023401 (2014)

e + Fe^{24+}	0–100 eV	Th

1228. Y. Z. Zhang, Y. J. Zhou
Ionization cross sections for electron scattering from metastable rare-gas atoms (Ne* and Ar*)
Chin. Phys. B 22, 073402 (2014)

e + Ar	50−200eV	Th
e + Ne	50−200eV	Th

1229. X. M. Tan, Y. W. Wang
Total cross sections for electron scattering from sulfur compounds
Chin. Phys. B 22, 023403 (2014)

e + SO_2	0−3000eV	Th
e + SO	0−3000eV	Th

1230. Y. Wu, G. Y. Wang, Q. Mu, Q. Zhao
M-alpha beta X-ray production cross sections of Pb and Bi by 9-40 keV electron impact
Chin. Phys. B 23, 013401 (2014)

e + Bi	9−40 keV	Exp
e + Pb	9−40 keV	Exp

1231. Y. B. Tang, C. B. Li, H. X. Qiao
Calculations on polarization properties of alkali metal atoms using Dirac-Fock plus core polarization method
Chin. Phys. B 23, 063101 (2014)

e + Fr		Th
e + Cs		Th
e + Rb		Th
e + K		Th
e + Na		Th
e + Li		Th

1232. L. X. Zhou
Polarization effect in (e, 2e) reaction process for Ar (3s) in coplanar asymmetric geometry
Chin. Phys. B 23, 113402 (2014)

e + Ar	2−10eV	Th

1233. Y. Z. Zhang, W. Yangb, Y. J. Zhou
Second-order Born calculation of coplanar symmetric (e, 2e) process on Mg
Chin. Phys. B 23, 063402 (2014)

e + Mg	3−10eV	Th

1234. Y. C. Wang
Electronic Excitation of H-2 by Electron Impact Using Multichannel Static-Exchange-Optical Method
Chin. Phys. Lett. 30, 073401 (2014)

e + H_2	20−30eV	Th
e + H_2	20−30eV	Th

1235. Y. L. Shi, C. Z. Dong, X. Y. Ma
Polarization of M2 Line Emitted Following Electron-Impact Excitation of Beryllium-Like Ions
Chin. Phys. Lett. 30, 063401 (2014)

e + $\mathbf{U}^{88+}$	0−5eV	Th
e + $\mathbf{Ho}^{63+}$	0−5eV	Th
e + $\mathbf{Mo}^{38+}$	0−5eV	Th

1236. E. S. Chen
Hyperfine electron affinities of molecular oxygen
Comput. Theo. Chem 1050, 89 (2014)

e + $\mathbf{O}_2$		E/T

1237. Q. Fan, G. Jiang, L. Cao
Collision strengths for transitions of Ni XXI
Eur. Phys. J. D 67, 255 (2014)

e + $\mathbf{Ni}^{20+}$	1E6.4−1E7.4	Th

1238. J. Li, Z. Zhao, X. Zhang
MCDHF calculation of electron affinities of Group I and Group IB atomic anions
Europhys. Lett. 107, 33001 (2014)

e + $\mathbf{Au}^-$		Th
e + $\mathbf{Ag}^-$		Th
e + $\mathbf{Cu}^-$		Th
e + $\mathbf{Fr}^-$		Th
e + $\mathbf{Cs}^-$		Th
e + $\mathbf{Rb}^-$		Th
e + $\mathbf{K}^-$		Th
e + $\mathbf{Na}^-$		Th
e + $\mathbf{Li}^-$		Th
e + $\mathbf{H}^-$		Th

1239. H. Cho, J. S. Yoon, M. Y. Song
EVALUATION OF TOTAL ELECTRON SCATTERING CROSS SECTIONS OF PLASMA-RELEVANT MOLECULES
Fusion Sci. Technol. 63, 349 (2014)

e + $\mathbf{C_2H_6}$	0.01−100eV	Th
e + $\mathbf{C_2H_4}$	0.01−100eV	Th
e + $\mathbf{CH_4}$	0.01−100eV	Th
e + $\mathbf{C\text{-}C_4F_8}$	0.01−100eV	Th
e + $\mathbf{C_3F_8}$	0.01−100eV	Th
e + $\mathbf{CF_3I}$	0.01−100eV	Th
e + $\mathbf{CF_3Cl}$	0.01−100eV	Th
e + $\mathbf{C_2F_6}$	0.01−100eV	Th

1240. G. Karwasz, K. Fedus
SOME SYSTEMATICS IN ELECTRON SCATTERING CROSS SECTIONS
Fusion Sci. Technol. 63, 338 (2014)

e + $\mathbf{Si_2H_6}$	0.1−100eV	E/T
e + $\mathbf{CF_4}$	0.1−100eV	E/T
e + $\mathbf{CCl_4}$	0.1−100eV	E/T
e + $\mathbf{H_2O}$	0.1−100eV	E/T
e + $\mathbf{HCl}$	0.1−100eV	E/T
e + $\mathbf{BCl_3}$	0.1−100eV	E/T
e + $\mathbf{BF_3}$	0.1−100eV	E/T
e + $\mathbf{CO_2}$	0.1−100eV	E/T
e + $\mathbf{NO}$	0.1−100eV	E/T
e + $\mathbf{CF_3Br}$	0.1−100eV	E/T
e + $\mathbf{CH_4}$	0.1−100eV	E/T

e + $\mathbf{WF_6}$	0.1−100eV	E/T
e + $\mathbf{H_2O}$	0.1−100eV	E/T
e + $\mathbf{CH_3Br}$	0.1−100eV	E/T
e + $\mathbf{CCl_2F_2}$	0.1−100eV	E/T
e + $\mathbf{SF_6}$	0.1−100eV	E/T
e + $\mathbf{C_2F_6}$	0.1−100eV	E/T
e + $\mathbf{HCl}$	0.1−100eV	E/T
e + $\mathbf{BCl_3}$	0.1−100eV	E/T
e + $\mathbf{BF_3}$	0.1−100eV	E/T
e + $\mathbf{Si_2H_6}$	0.1−100eV	E/T
e + $\mathbf{CF_4}$	0.1−100eV	E/T
e + $\mathbf{CCl_4}$	0.1−100eV	E/T
e + $\mathbf{CH_4}$	0.1−100eV	E/T
e + $\mathbf{CO_2}$	0.1−100eV	E/T
e + $\mathbf{NO}$	0.1−100eV	E/T
e + $\mathbf{CF_3Br}$	0.1−100eV	E/T
e + $\mathbf{WF_6}$	0.1−100eV	E/T
e + $\mathbf{H_2O}$	0.1−100eV	E/T
e + $\mathbf{HCl}$	0.1−100eV	E/T
e + $\mathbf{BCl_3}$	0.1−100eV	E/T
e + $\mathbf{CH_3Br}$	0.1−100eV	E/T
e + $\mathbf{CCl_2F_2}$	0.1−100eV	E/T
e + $\mathbf{SF_6}$	0.1−100eV	E/T
e + $\mathbf{BF_3}$	0.1−100eV	E/T
e + $\mathbf{CO_2}$	0.1−100eV	E/T
e + $\mathbf{NO}$	0.1−100eV	E/T
e + $\mathbf{CF_3Br}$	0.1−100eV	E/T
e + $\mathbf{C_2F_6}$	0.1−100eV	E/T
e + $\mathbf{Si_2H_6}$	0.1−100eV	E/T
e + $\mathbf{CF_4}$	0.1−100eV	E/T
e + $\mathbf{CH_3Br}$	0.1−100eV	E/T
e + $\mathbf{CCl_2F_2}$	0.1−100eV	E/T
e + $\mathbf{SF_6}$	0.1−100eV	E/T
e + $\mathbf{C_2F_6}$	0.1−100eV	E/T
e + $\mathbf{CCl_4}$	0.1−100eV	E/T
e + $\mathbf{CH_4}$	0.1−100eV	E/T
e + $\mathbf{WF_6}$	0.1−100eV	E/T

1241. G. Y. Liang, N. R. Badnell, G. Zhao
EVALUATION OF ELECTRON IMPACT EXCITATION DATA ALONG ISOELECTRONIC SEQUENCES
Fusion Sci. Technol. 63, 372 (2014)

e + $\mathbf{Ar^{15+}}$	800−1200eV	Th
e + $\mathbf{Fe^{16+}}$	800−1200eV	Th

1242. M. Guerra, F. Parente, J.P. Santos
Electron impact ionization cross sections of several ionization stages of Kr, Ar and Fe
Int. J. Mass Spectrom. 348, 1 (2014)

e + $\mathbf{Ar^{4+}}$	10eV−5E3keV	Th
e + $\mathbf{Kr^{5+}}$	10eV−5E3keV	Th
e + $\mathbf{Kr^{+}}$	10eV−5E3keV	Th
e + $\mathbf{Fe}$	10eV−5E3keV	Th
e + $\mathbf{Ar}$	10eV−5E3keV	Th
e + $\mathbf{Ar^{3+}}$	10eV−5E3keV	Th
e + $\mathbf{Kr}$	10eV−5E3keV	Th
e + $\mathbf{Ar^{2+}}$	10eV−5E3keV	Th
e + $\mathbf{Kr^{17+}}$	10eV−5E3keV	Th
e + $\mathbf{Kr^{15+}}$	10eV−5E3keV	Th

e + Fe^{13+}	10eV−5E3keV	Th
e + Fe^{11+}	10eV−5E3keV	Th
e + Fe^{9+}	10eV−5E3keV	Th
e + Fe^{6+}	10eV−5E3keV	Th
e + Kr^{10+}	10eV−5E3keV	Th
e + Fe^{5+}	10eV−5E3keV	Th
e + Fe^{2+}	10eV−5E3keV	Th
e + Ar^{7+}	10eV−5E3keV	Th
e + Ar^{6+}	10eV−5E3keV	Th
e + Ar^{5+}	10eV−5E3keV	Th
e + Kr^{6+}	10eV−5E3keV	Th

1243. G. P. Karwasz, P. Mozejko, M. Y. Song
Electron-impact ionization of fluoromethanes - Review of experiments and binary-encounter models
Int. J. Mass Spectrom. 365, 232 (2014)

e + CF_4	10−1000 eV	Exp
e + CHF_3	10−1000 eV	Exp
e + CH_2F_2	10−1000 eV	Exp
e + CH_3F	10−1000 eV	Exp

1244. J. Kopyra
Electron attachment to molecules studied by electron beam and electron swarm experiments
Int. J. Mass Spectrom. 365, 98 (2014)

e + CF_2Cl_2	0−4E19 mole/cm^3	Exp

1245. T. M. Miller, N. S. Shuman, A. A. Viggiano
Arrhenius behavior of electron attachment to CH3Br from 303 to 1100K
Int. J. Mass Spectrom. 365, 75 (2014)

e + CH_3Br	330−1100 K	Exp

1246. J. Wang, C. Z. Gao, F. Calvayrac, F. S. Zhang
Collision dynamics of proton with formaldehyde: Fragmentation and ionization
J. Chem. Phys. 140, 124306 (2014)

e + CH_2O	85eV	Th

1247. D. L. Huang, P. D. Dau, H. T. Liu, L. S. Wang
High-resolution photoelectron imaging of cold C-60(-) anions and accurate determination of the electron affinity of C-60
J. Chem. Phys. 140, 224315 (2014)

e + C_{60}		Exp

1248. S. L. Guberman
The vibrational dependence of dissociative recombination: Rate constants for N-2(+)
J. Chem. Phys. 141, 204307 (2014)

e + $N_2{}^+$	100−3000 K	Th

1249. X. Llovet, C. J. Powell, F. Salvat, A. Jablonski
Cross Sections for Inner-Shell Ionization by Electron Impact
J. Phys. Chem. Ref. Data 43, 013102 (2014)

e + Pt	5−1E6 keV	Th
e + Os	5−1E6 keV	Th
e + Re	5−1E6 keV	Th
e + Hf	5−1E6 keV	Th
e + Dy	5−1E6 keV	Th
e + I	5−1E6 keV	Th
e + U	5−1E6 keV	Th
e + Pb	5−1E6 keV	Th
e + Au	5−1E6 keV	Th
e + W	5−1E6 keV	Th
e + Ta	5−1E6 keV	Th
e + Y	5−1E6 keV	Th
e + Tm	5−1E6 keV	Th
e + Er	5−1E6 keV	Th
e + Ho	5−1E6 keV	Th
e + Gd	5−1E6 keV	Th
e + Eu	5−1E6 keV	Th
e + Sm	5−1E6 keV	Th
e + Nd	5−1E6 keV	Th
e + Pr	5−1E6 keV	Th
e + Ce	5−1E6 keV	Th
e + La	5−1E6 keV	Th
e + Te	5−1E6 keV	Th
e + Xe	5−1E6 keV	Th
e + Sb	5−1E6 keV	Th
e + Sn	5−1E6 keV	Th
e + In	5−1E6 keV	Th
e + Cd	5−1E6 keV	Th
e + Pd	5−1E6 keV	Th
e + Mo	5−1E6 keV	Th
e + Nb	5−1E6 keV	Th
e + Zr	5−1E6 keV	Th
e + Sr	5−1E6 keV	Th
e + Rb	5−1E6 keV	Th
e + Kr	5−1E6 keV	Th
e + Br	5−1E6 keV	Th
e + Se	5−1E6 keV	Th
e + As	5−1E6 keV	Th
e + Ge	5−1E6 keV	Th
e + Ga	5−1E6 keV	Th
e + Zn	5−1E6 keV	Th
e + Cu	5−1E6 keV	Th
e + Ni	5−1E6 keV	Th
e + Co	5−1E6 keV	Th
e + Mn	5−1E6 keV	Th
e + Cr	5−1E6 keV	Th
e + V	5−1E6 keV	Th
e + Ti	5−1E6 keV	Th
e + Sc	5−1E6 keV	Th
e + Ca	5−1E6 keV	Th
e + K	5−1E6 keV	Th
e + Ar	5−1E6 keV	Th
e + Cl	5−1E6 keV	Th
e + S	5−1E6 keV	Th
e + Al	5−1E6 keV	Th
e + Mg	5−1E6 keV	Th
e + Na	5−1E6 keV	Th
e + O	5−1E6 keV	Th
e + H	5−1E6 keV	Th

e + C	5−1E6 keV	Th
e + Bi	5−1E6 keV	Th
e + Ag	5−1E6 keV	Th
e + Fe	5−1E6 keV	Th
e + Si	5−1E6 keV	Th
e + N	5−1E6 keV	Th

1250. M. Hoshino, H. Murai, H. Kato, M. J. Brunger, Y. Itikawa, H. Tanaka
Electron impact excitation of the low-lying 3s[3/2](1) and 3s ’[1/2](1) levels in neon for incident energies between 20 and 300 eV
J. Chem. Phys. 139, 184301 (2014)

e + Ne	20−300eV	Exp

1251. L. Sigaud, N. Ferreira, E. C. Montenegro
Absolute cross sections for O-2 dication production by electron impact
J. Chem. Phys. 139, 024302 (2014)

e + $\mathbf{O_2}$	30−400eV	Exp

1252. M. Hoshino, M. Horie, H Kato
Cross sections for elastic scattering of electrons by CF3Cl, CF2Cl2, and CFCl3
J. Chem. Phys. 138, 214305 (2014)

e + $\mathbf{CFCl_3}$	1.5−100eV	E/T
e + $\mathbf{CF_2Cl_2}$	1.5−100eV	E/T
e + $\mathbf{CF_3Cl}$	1.5−100eV	E/T

1253. R. Naghma, B. Antony
Total and elastic cross sections for methyl halides by electron impact
J. Electron Spectrosc. Relat. Phenom. 189, 17 (2014)

e + $\mathbf{CH_3I}$	20−5000eV	Th
e + $\mathbf{CH_3Br}$	20−5000eV	Th
e + $\mathbf{CH_3Cl}$	20−5000eV	Th
e + $\mathbf{CH_3F}$	20−5000eV	Th

1254. J. R. Ferraz, A. S. dosSantos, G. L. C. deSouza
Cross sections for electron scattering by methylfluoride (CH3F) in the low- and intermediate-energy ranges
J. Electron Spectrosc. Relat. Phenom. 193, 16 (2014)

e + $\mathbf{CH_3F}$	15−500eV	Th

1255. R. Naghma, D. Gupta, B. Antony
Total cross sections for electron scattering with halocarbon molecules
J. Electron Spectrosc. Relat. Phenom. 193, 48 (2014)

e + $\mathbf{CHCl_3}$	20−5000eV	Th
e + $\mathbf{CH_2Cl_2}$	20−5000eV	Th

1256. B. Goswami, D. Gupta, B. Antony
0.1-2000 eV electron impact cross sections for dichlorine monoxide
J. Electron Spectrosc. Relat. Phenom. 193, 86 (2014)

e + $\mathbf{Cl_2O}$	0.1−2000eV	Th

1257. M. O. A. ElGhazaly, J. B. A. Mitchell, J. J Jureta
Electron Impact Induced Fragmentation of N2H+ and N2D+
J. Phys. Chem. A 118, 10020 (2014)

$\mathbf{e + N_2D^+}$	5−3000eV	Exp
$\mathbf{e + N_2H^+}$	5−3000eV	Exp

1258. A Moy, C Merlet
Measurements of absolute L- and M-subshell x-ray production cross sections of Pb by electron impact
J. Phys. B 46, 115202 (2014)

$\mathbf{e + Pb}$	3−38keV	E/T

1259. A Borovik
Electron impact excitation of the lowest doublet and quartet core-excited autoionizing states in Rb atoms
J. Phys. B 46, 015203 (2014)

$\mathbf{e + Rb}$	15−50eV	E/T

1260. C. P. Ballance, S. D. Loch, M. S. Pindzola, D. C. Griffin
Electron-impact excitation and ionization of W3+ for the determination of tungsten influx in a fusion plasma
J. Phys. B 46, 055202 (2014)

$\mathbf{e + W^{3+}}$	0.2−100eV	Th
$\mathbf{e + W^{3+}}$	0.2−100eV	Th

1261. J. R. Brunton, L. R. Hargreaves, T. M Maddern
Differential cross sections for low-energy elastic electron scattering from the CF3 radical
J. Phys. B 46, 245203 (2014)

$\mathbf{e + CF_3}$	7−50eV	Exp

1262. A Borovik, A Kupliauskiene, O Zatsarinny
Excitation-autoionization cross section of alkali atoms by electron impact
J. Phys. B 46, 215201 (2014)

$\mathbf{e + Na}$	30−400eV	Exp

1263. B. Jr, M. F. Gharaibeh, P. M. Hillenbrand
Detailed investigation of electron-impact single-ionization cross sections and plasma rate coefficients of N-shell tin ions
J. Phys. B 46, 175201 (2014)

$\mathbf{e + Sn^{13+}}$	40−1000eV	Exp
$\mathbf{e + Sn^{12+}}$	40−1000eV	Exp
$\mathbf{e + Sn^{11+}}$	40−1000eV	Exp
$\mathbf{e + Sn^{10+}}$	40−1000eV	Exp
$\mathbf{e + Sn^{9+}}$	40−1000eV	Exp
$\mathbf{e + Sn^{8+}}$	40−1000eV	Exp
$\mathbf{e + Sn^{7+}}$	40−1000eV	Exp
$\mathbf{e + Sn^{6+}}$	40−1000eV	Exp
$\mathbf{e + Sn^{5+}}$	40−1000eV	Exp
$\mathbf{e + Sn^{4+}}$	40−1000eV	Exp

1264. J Lecointre, J. J. Jureta, X Urbain, P Defrance
Electron-impact dissociation of HeH+: absolute cross sections for the production of Heq+ (q=1-2) fragments
J. Phys. B 47, 015203 (2014)

$\mathbf{e + HeH^+}$	10−3000eV	Exp

1265. Y. M. Smirnov
Excitation of GeII in collisions of slow electrons with germanium atoms
J. Phys. B 47, 225204 (2014)

e + Ge^{+}	0−200eV	Exp

1266. A Moy, C Merlet, X Llovet, O Dugne
M-subshell ionization cross sections of U by electron impact
J. Phys. B 47, 055202 (2014)

e + U	4−40keV	Exp

1267. J. M. Fernandez-Varea, V Jahnke, N. L. Maidana, A. A. Malafronte, V. R. Vanin
Cross sections of K-shell ionization by electron impact, measured from threshold to 100 keV, for Au and Bi
J. Phys. B 47, 155201 (2014)

e + Bi	80−100keV	Exp
e + Au	80−100keV	Exp

1268. G. A. Alna'washi, K. K. Baral, N. B. Aryal, C. M. Thomas, R. A. Phaneuf
Electron-impact ionization of Se3+
J. Phys. B 47, 105201 (2014)

e + Se^{3+}	30−1000eV	Exp

1269. G. A. Alna'washi, N. B. Aryal, K. K. Baral, C. M. Thomas, R. A. Phaneuf
Electron-impact ionization of Se2+
J. Phys. B 47, 135203 (2014)

e + Se^{2+}	30−500eV	Exp

1270. C. C. Montanari, J. E. Miraglia
Electron-impact multiple ionization of Ne, Ar, Kr and Xe
J. Phys. B 47, 105203 (2014)

e + Ar	0.1−10keV	Th
e + Ne	0.1−10keV	Th
e + Xe	0.1−10keV	Th
e + Kr	0.1−10keV	Th

1271. M. S. Casagrande
Comparison of the electron impact experimental and theoretical fourfold differential cross sections for Ne and CH4
J. Phys. B 47, 115203 (2014)

e + CH$_4$	500eV	E/T
e + Ne	500eV	E/T

1272. M. C. Bordage
Comparisons of sets of electron-neutral scattering cross sections and swarm parameters in noble gases: III. Krypton and xenon
J. Phys. D 46, 334003 (2014)

e + Xe	0.01−400eV	E/T
e + Kr	0.01−400eV	E/T
e + Xe	0.01−400eV	E/T
e + Kr	0.01−400eV	E/T
e + Xe	0.01−400eV	E/T
e + Kr	0.01−400eV	E/T
e + Xe	0.01−400eV	E/T
e + Kr	0.01−400eV	E/T

1273. L. L. Alves, K Bartschat, S. F. Biagi, M. C. Bordage
Comparisons of sets of electron-neutral scattering cross sections and swarm parameters in noble gases: II. Helium and neon
J. Phys. D 46, 334002 (2014)

e + He	20−1000eV	E/T
e + Ne	20−1000eV	E/T
e + He	20−1000eV	E/T
e + Ne	20−1000eV	E/T
e + He	20−1000eV	E/T
e + Ne	20−1000eV	E/T
e + He	20−1000eV	E/T
e + Ne	20−1000eV	E/T

1274. L. C. Pitchford, L. L. Alves, K Bartschat
Comparisons of sets of electron-neutral scattering cross sections and swarm parameters in noble gases: I. Argon
J. Phys. D 46, 334001 (2014)

e + Ar	0.01−200eV	E/T
e + Ar	0.01−200eV	E/T
e + Ar	0.01−200eV	E/T

1275. L.Y. Xie, X.Y. Maa, C.Z. Donga, Z.W. Wua, Y.L. Shia, J. Jiang
Polarization of the nf -¿ 3d (n=4, 5, 6) x-rays from tungsten ions following electron-impact excitation and dielectronic recombination processes
J. Quant. Spectrosc. Radiat. Transfer 141, 31 (2014)

e + W^{46+}	0−12 keV	Th
e + W^{45+}	0−12 keV	Th
e + W^{44+}	0−12 keV	Th
e + W^{43+}	0−12 keV	Th
e + W^{42+}	0−12 keV	Th

1276. K. Shigemura, M. Kitajima, M. Kurokawa, K. Toyoshima, T. Odagiri, A. Suga, H. Kato, M. Hoshino, H. Tanaka, K. Ito
Total cross sections for electron scattering from He and Ne at very low energies
Phys. Rev. A 89, 022709 (2014)

e + Ne	0.06−20eV	Exp
e + He	0.06−20eV	Exp

1277. C. J. Bostock, D. V. Fursa, I. Bray, K. Bartschat
Calculation of the polarization fraction and electron-impact excitation cross section for the Cd+ 5(p) P-2(3/2) state
Phys. Rev. A 90, 012707 (2014)

e + Cd^{+}	20−200eV	Th

1278. A. Muller, A. Borovik, K. Huber, S. Schippers, D. V. Fursa, I. Bray
Double- K- vacancy states in electron-impact single ionization of metastable two-electron N5+(1s2s S-3(1)) ions
Phys. Rev. A 90, 010701 (2014)

e + N^{5+}	100−1000eV	Exp

1279. D. Bernhardt, A. Becker, M. Grieser, M. Hahn, C. Krantz, M. Lestinsky, O. Novotny, R. Repnow, D. W. Savin
Absolute rate coefficients for photorecombination and electron-impact ionization of magnesiumlike iron ions from measurements at a heavy-ion storage ring
Phys. Rev. A 90, 012702 (2014)

e + Fe^{14+}	0.5−1000eV	Exp
e + Fe^{14+}	0.5−1000eV	Exp

1280. R. D. Thomas, A. Ehlerding, W. D. Geppert
Dissociative recombination of LiH2+
Phys. Rev. A 89, 050701 (2014)

e + LiH$_2$$^+$	0.001−20eV	E/T

1281. V. Jonauskas, A. Prancikevicius, S. Masys, A. Kyniene
Electron-impact direct double ionization as a sequence of processes
Phys. Rev. A 89, 052714 (2014)

e + W^{5+}	50−10000eV	Th
e + Ar^{2+}	50−10000eV	Th
e + C^{+}	50−10000eV	Th
e + O^{3+}	50−10000eV	Th
e + O^{2+}	50−10000eV	Th
e + O^{+}	50−10000eV	Th

1282. S. Amami, M. Ulu
Theoretical and experimental investigation of (e,2e) ionization of argon 3p in asymmetric kinematics at intermediate energy
Phys. Rev. A 90, 012704 (2014)

e + Ar	200 eV	E/T

1283. C. Y. Lin, C. W. McCurdy, T. N. Rescigno
Complex Kohn approach to molecular ionization by high-energy electrons: Application to H2O
Phys. Rev. A 89, 012703 (2014)

e + H$_2$**O**	0−50eV	Th

1284. C. Y. Lin, C. W. McCurdy, T. N. Rescigno
Theoretical study of (e, 2e) from outer- and inner-valence orbitals of CH4: A complex Kohn treatment
Phys. Rev. A 89, 052718 (2014)

e + CH$_4$	500 eV	Th

1285. S. Amami, A. Murray
Theoretical and experimental (e,2e) study of electron-impact ionization of laser-aligned Mg atoms
Phys. Rev. A 90, 062707 (2014)

e + Mg	10−25eV	Th

1286. A. Makhoute, I. Ajana, D. Khalil
Low- energy electron- impact laser- assisted ionization of atomic hydrogen
Phys. Rev. A 90, 053415 (2014)

e + H	25−250eV	Th

1287. C. J. Bostock
Relativistic convergent close-coupling calculation of inelastic scattering of electrons from cesium
Phys. Rev. A 89, 032712 (2014)

e + Cs	7−12eV	Th

1288. X. Ren
Benchmark experiment for electron-impact ionization of argon: Absolute triple-differential cross sections via three-dimensional electron emission images (vol 83, 052714, 2011)
Phys. Rev. A 89, 029904 (2014)

$\mathbf{e + Ar}$	195eV	E/T

1289. A. Gauf
Low-energy elastic electron scattering by acetaldehyde
Phys. Rev. A 89, 022708 (2014)

$\mathbf{e + CH_3CHO}$	1−50eV	E/T

1290. I. Bray, C. J. Guilfoile, A. S. Kadyrov, D. V. Fursa, A. T. Stelbovics
Ionization amplitudes in electron-hydrogen collisions
Phys. Rev. A 90, 022710 (2014)

$\mathbf{e + Kr^+}$	0−5eV	Th

1291. P. Singh, G. Purohit, C. Champion, V. Patidar
Electron- and positron-induced ionization of water molecules: Theory versus experiment at the triply differential scale
Phys. Rev. A 89, 032714 (2014)

$\mathbf{e + H_2O}$	4−40eV	Th

1292. G. Jalbert
Electron-detachment cross section for CN(-)and O-2(-) incident on N-2 at intermediate velocities
Phys. Rev. A 89, 012712 (2014)

$\mathbf{e + N_2}$	0.088−10 A.U.	Th
$\mathbf{e + O^-}$	0.088−10 A.U.	Th
$\mathbf{e + CN^-}$	0.088−10 A.U.	Th

1293. M. C. Zammit, D. V. Fursa, I. Bray
Electron scattering from the molecular hydrogen ion and its isotopologues
Phys. Rev. A 90, 022711 (2014)

$\mathbf{e + HD^+}$	0−1000eV	Th
$\mathbf{e + T_2{}^+}$	0−1000eV	Th
$\mathbf{e + D_2{}^+}$	0−1000eV	Th
$\mathbf{e + H_2{}^+}$	0−1000eV	Th
$\mathbf{e + T_2{}^+}$	0−1000eV	Th
$\mathbf{e + D_2{}^+}$	0−1000eV	Th
$\mathbf{e + H_2{}^+}$	0−1000eV	Th
$\mathbf{e + He^+}$	0−1000eV	Th
$\mathbf{e + D_2{}^+}$	0−1000eV	Th
$\mathbf{e + H_2{}^+}$	0−1000eV	Th
$\mathbf{e + He^+}$	0−1000eV	Th
$\mathbf{e + H_2{}^+}$	0−1000eV	Th
$\mathbf{e + He^+}$	0−1000eV	Th
$\mathbf{e + HT^+}$	0−1000eV	Th
$\mathbf{e + He^+}$	0−1000eV	Th
$\mathbf{e + HT^+}$	0−1000eV	Th
$\mathbf{e + HD^+}$	0−1000eV	Th
$\mathbf{e + HT^+}$	0−1000eV	Th
$\mathbf{e + HD^+}$	0−1000eV	Th
$\mathbf{e + T_2{}^+}$	0−1000eV	Th

$\mathbf{e + HT^{+}}$	0−1000eV	Th
$\mathbf{e + HD^{+}}$	0−1000eV	Th
$\mathbf{e + T_2{}^{+}}$	0−1000eV	Th
$\mathbf{e + D_2{}^{+}}$	0−1000eV	Th

1294. K. M. Aggarwal, F. P. Keenan
Energy levels, radiative rates and electron impact excitation rates for transitions in He-like Ga XXX, Ge XXXI, As XXXII, Se XXXIII and Br XXXIV
Phys. Scr. 87, 045304 (2014)

$\mathbf{e + Br^{33+}}$	900−2100 RYD	Th
$\mathbf{e + Se^{32+}}$	900−2100 RYD	Th
$\mathbf{e + As^{31+}}$	900−2100 RYD	Th
$\mathbf{e + Ge^{30+}}$	900−2100 RYD	Th
$\mathbf{e + Ga^{29+}}$	900−2100 RYD	Th

1295. A. Barot, D. Gupta
Computation of electron-impact total and differential cross sections for allene (C3H4) in the energy range 0.1-2000 eV
Phys. Rev. A 87, 062701 (2014)

$\mathbf{e + C_3H_4}$	0.1−2000eV	Th

1296. Y. Wang, O. Zatsarinny, K. Bartschat
B-spline R-matrix-with-pseudostates calculations for electron-impact excitation and ionization of carbon
Phys. Rev. A 87, 012704 (2014)

$\mathbf{e + C}$	0−100eV	Th
$\mathbf{e + C}$	0−100eV	Th
$\mathbf{e + C}$	0−100eV	Th
$\mathbf{e + C}$	0−100eV	Th

1297. M. Vinodkumar, C. Limbachiya, A. Barot
Computation of electron-impact rotationally elastic total cross sections for methanol over an extensive range of impact energy (0.1-2000 eV)
Phys. Rev. A 87, 012702 (2014)

$\mathbf{e + CH_3OH}$	0.1−2000eV	Th
$\mathbf{e + CH_3OH}$	0.1−2000eV	Th
$\mathbf{e + CH_3OH}$	0.1−2000eV	Th

1298. A. I. Mikhailov, A. V. Nefiodov, G Plunien
Electron correlations in cross sections for ionization of heliumlike ions by high-energy particle impact
Phys. Rev. A 87, 032705 (2014)

$\mathbf{e + Ar^{16+}}$	1−1000eV	Th
$\mathbf{e + Ne^{8+}}$	1−1000eV	Th
$\mathbf{e + O^{6+}}$	1−1000eV	Th
$\mathbf{e + N^{5+}}$	1−1000eV	Th
$\mathbf{e + C^{4+}}$	1−1000eV	Th
$\mathbf{e + B^{3+}}$	1−1000eV	Th
$\mathbf{e + Li^{+}}$	1−1000eV	Th
$\mathbf{e + He}$	1−1000eV	Th

1299. M. C. Zammit, D. V. Fursa, I. Bray
Calculations of electron scattering from H-2(+)
Phys. Rev. A 88, 062709 (2014)

$\mathbf{e + H_2{}^{+}}$	0−1000eV	Th

1300. J. C. Lower, E. Ali, S. Bellm
Experimental and theoretical cross sections for molecular-frame electron-impact excitation-ionization of D-2
Phys. Rev. A 88, 062705 (2014)

e + D_2	178eV	E/T
e + D_2	178eV	E/T

1301. R. Celiberto, R. K. Janev, V. Laporta, J. Tennyson, J. M. Wadehra
Electron-impact vibrational excitation of vibrationally excited H-2 molecules involving the resonant (2)Sigma(+)(g) Rydberg-excited electronic state
Phys. Rev. A 88, 062701 (2014)

e + H_2	0−100eV	Th

1302. C. J. Bostock, C. J. Fontes, D. V. Fursa, H. L. Zhang, I. Bray
Calculation of the relativistic rise in electron-impact-excitation cross sections for highly charged ions
Phys. Rev. A 88, 012711 (2014)

e + U	0−160 keV	Th
e + Xe	0−160 keV	Th
e + Ni	0−160 keV	Th

1303. T. N. Rescigno, A. E. Orel
Theoretical study of excitation of the low-lying electronic states of water by electron impact
Phys. Rev. A 88, 012703 (2014)

e + H_2O	9−20eV	Th

1304. M. Belkhiri, M. Poirier
Analysis of density effects in plasmas and their influence on electron-impact cross sections
Phys. Rev. A 90, 062712 (2014)

e + Al^{12+}	100 eV	Th

1305. O. Zatsarinny, Y. Wang, K. Bartschat
Electron-impact excitation of argon at intermediate energies
Phys. Rev. A 89, 022706 (2014)

e + Ar	0.01−300eV	Th
e + Ar	0.01−300eV	Th
e + Ar	0.01−300eV	Th

1306. M. S. Pindzola
Electron-impact ionization of the inner subshells of uranium
Phys. Rev. A 90, 022708 (2014)

e + U	0−1000eV	Th

1307. Y. Wang, O. Zatsarinny, K. Bartschat
B-spline R-matrix-with-pseudostates calculations for electron-impact excitation and ionization of nitrogen
Phys. Rev. A 89, 062714 (2014)

e + N	0.01−140eV	Th
e + N	0.01−140eV	Th
e + N	0.01−140eV	Th

1308. V. Gedeon, S. Gedeon, V. Lazur, E. Nagy, O. Zatsarinny, K. Bartschat
B-spline R-matrix-with-pseudostates calculations for electron-impact excitation and ionization of fluorine
Phys. Rev. A 89, 052713 (2014)

$\mathbf{e + F}$	0.01−120eV	Th
$\mathbf{e + F}$	0.01−120eV	Th
$\mathbf{e + F}$	0.01−120eV	Th

1309. P. F. Liu, Y. P. Liu, J. L. Zeng, J. M. Yuan
Electron-impact excitation and single- and multiple-ionization cross sections of heavy ions: Sn13+ as an example
Phys. Rev. A 89, 042704 (2014)

$\mathbf{e + Sn^{13+}}$	0−4000eV	Th
$\mathbf{e + Sn^{13+}}$	0−4000eV	Th

1310. D. A. Little, K. Chakrabarti, Z. Mezei, I. F. Schneider, J. Tennyson
Dissociative recombination of N-2(+) : An ab initio study
Phys. Rev. A 90, 052705 (2014)

$\mathbf{e + N_2{}^+}$	0.1−1eV	Th

1311. T. M. Baumann, Z. Harman, J. Stark, C. Beilmann, G. Liang, P. H. Mokler, J. Ullrich, C. L. Jose
Contributions of dielectronic, trielectronic, and metastable channels to the resonant intershell recombination of highly charged silicon ions
Phys. Rev. A 90, 052704 (2014)

$\mathbf{e + Si^{9+}}$	1330−1550eV	E/T
$\mathbf{e + Si^{8+}}$	1330−1550eV	E/T
$\mathbf{e + Si^{7+}}$	1330−1550eV	E/T
$\mathbf{e + Si^{6+}}$	1330−1550eV	E/T
$\mathbf{e + Si^{12+}}$	1330−1550eV	E/T
$\mathbf{e + Si^{11+}}$	1330−1550eV	E/T
$\mathbf{e + Si^{10+}}$	1330−1550eV	E/T

1312. P. Defrance, J. Jureta, J. Lecointre, E. Giglio, B. Gervais, D. Cappello, I. Charpentier, P. A. Hervieux
Electron-impact dissociative ionization of the molecular ion HDO+: A global view
Phys. Rev. A 90, 042704 (2014)

$\mathbf{e + HDO^+}$	10−2500eV	Exp

1313. Z. B. Chen, C. Z. Dong, J. Jiang
Dominance of the Breit interaction in the cross section and circular polarization of x-ray radiation following longitudinally-polarized-electron-impact excitation of highly charged ions
Phys. Rev. A 90, 022715 (2014)

$\mathbf{e + Bi^{79+}}$		Th
$\mathbf{e + Ho^{53+}}$		Th
$\mathbf{e + Ag^{43+}}$		Th

1314. LI Maijuan, FU Yanbiao, SU Maogen, C. DONG, FUMIHIRO Koike
Dielectronic Recombination of Br-Like Tungsten Ions
Plasma Sci. Technol. 16, 182 (2014)

$\mathbf{e + W^{39+}}$	1−50000eV	Th

1315. X. Yu, D. Hongbin
Ab initio Calculations of Electron-Impact Excitation Cross Sections for N-2 Molecule
Plasma Sci. Technol. 16, 104 (2014)

e + N_2	0−22eV	Th

1316. V. Laporta, R. Celiberto, J. Tennyson
Resonant vibrational-excitation cross sections and rate constants for low-energy electron scattering by molecular oxygen
Plasma Sources Sci. Technol. 22, 025001 (2014)

e + O_2	0−100eV	Th

1317. R Celiberto, K. L. Baluja, R. K. Janev
Electron-impact state-to-state resolved cross sections and rate coefficients for the X(v) -¿ A(v ’) excitation in BeH molecules
Plasma Sources Sci. Technol. 22, 015008 (2014)

e + BeH	0−1000eV	Th

1318. V Laporta, D. A. Little, R Celiberto, J Tennyson
Electron-impact resonant vibrational excitation and dissociation processes involving vibrationally excited N-2 molecules
Plasma Sources Sci. Technol. 23, 065002 (2014)

e + N_2	0−100eV	Th
e + N_2	0−100eV	Th

1319. B. Goswami
Electron impact scattering by SF6 molecule over an extensive energy range
Rsc Advances 4, 30953 (2014)

e + SF_6	0.1−5000eV	Th
e + SF_6	0.1−5000eV	Th

1320. A. N. Zavilopulo, P. P. Markush, O. B. Shpenik, M. I. Mykyta
Electron-impact ionization and dissociative ionization of sulfur in the gas phase
Technical Physics 59, 951 (2014)

e + S	0−10eV	Exp

1321. O. Novotn
DISSOCIATIVE RECOMBINATION MEASUREMENTS OF NH+ USING AN ION STORAGE RING
Astrophys. J. 792, 132 (2014)

e + NH^+	1.71E−5−2EeV	Exp

1322. S. S. Tayal, O. Zatsarinny
ELECTRON IMPACT EXCITATION COLLISION STRENGTHS FOR EXTREME ULTRAVIOLET LINES OF Fe VII
Astrophys. J. 788, 24 (2014)

e + Fe^{6+}	0.01−40eV	Th

1323. N. R. Badnell, C. P. Ballance
ELECTRON-IMPACT EXCITATION OF Fe2+: A COMPARISON OF INTERMEDIATE COUPLING FRAME TRANSFORMATION, BREIT-PAULI AND DIRAC R-MATRIX CALCULATIONS
Astrophys. J. 785, 99 (2014)

e + Fe^{2+}	1E3−1E5 K	Th

1324. D. H. Kwon, D. W. Savin
ELECTRON-IMPACT IONIZATION OF P-LIKE IONS FORMING Si-LIKE IONS
Astrophys. J. 784, 13 (2014)

$\mathbf{e + Zn^{15+}}$	1E4−1E7 K	Th
$\mathbf{e + Cu^{14+}}$	1E4−1E7 K	Th
$\mathbf{e + Ni^{13+}}$	1E4−1E7 K	Th
$\mathbf{e + Co^{12+}}$	1E4−1E7 K	Th
$\mathbf{e + Fe^{11+}}$	1E4−1E7 K	Th
$\mathbf{e + Mn^{10+}}$	1E4−1E7 K	Th
$\mathbf{e + Cr^{9+}}$	1E4−1E7 K	Th
$\mathbf{e + V^{8+}}$	1E4−1E7 K	Th
$\mathbf{e + Ti^{7+}}$	1E4−1E7 K	Th
$\mathbf{e + Sc^{6+}}$	1E4−1E7 K	Th
$\mathbf{e + Ca^{5+}}$	1E4−1E7 K	Th
$\mathbf{e + K^{4+}}$	1E4−1E7 K	Th
$\mathbf{e + Ar^{3+}}$	1E4−1E7 K	Th
$\mathbf{e + Cl^{2+}}$	1E4−1E7 K	Th
$\mathbf{e + P^{+}}$	1E4−1E7 K	Th
$\mathbf{e + S^{+}}$	1E4−1E7 K	Th

1325. R.P. McEachran, A.D. Stauffer
Momentum transfer cross sections for the heavy noble gases
Eur. Phys. J. D 68, 153 (2014)

e + Ar	0.01−1000eV	Th
e + Xe	0.01−1000eV	Th
e + Xe	0.01−1000eV	Th
e + Kr	0.01−1000eV	Th
e + Kr	0.01−1000eV	Th
e + Ar	0.01−1000eV	Th
e + Ar	0.01−1000eV	Th
e + Xe	0.01−1000eV	Th
e + Xe	0.01−1000eV	Th
e + Kr	0.01−1000eV	Th
e + Kr	0.01−1000eV	Th
e + Ar	0.01−1000eV	Th

1326. D. F. Pastega, R. F. Costa, M. A. Lima, M. H. Bettega
Elastic scattering of low-energy electrons by BF3
Eur. Phys. J. D 68, 20 (2014)

$\mathbf{e + BF_3}$	0−10eV	Th

1327. T
Triple differential cross sections for the ionization of water by electron impact
Eur. Phys. J. D 68, 369 (2014)

$\mathbf{e + H_2O}$	2−20eV	Th

1328. T. Das, A. D. Stauffer, R. Srivastava
A method to obtain static potentials for electron-molecule scattering
Eur. Phys. J. D 68, 102 (2014)

$\mathbf{e + H_2O}$	30−100eV	Th

1329. K. M. Aggarwal
Energy levels, radiative rates and electron impact excitation rates for transitions in He-like Fe XXV, Co XXVI, Ni XXVII, Cu XXVIII and Zn XXIX
Phys. Scr. 87, 1 (2014)

$\mathbf{e + Zn^{28+}}$	450−1300 RYD	Th
$\mathbf{e + Cu^{27+}}$	450−1300 RYD	Th
$\mathbf{e + Ni^{26+}}$	450−1300 RYD	Th
$\mathbf{e + Co^{25+}}$	450−1300 RYD	Th
$\mathbf{e + Fe^{24+}}$	450−1300 RYD	Th

1330. K. M. Aggarwal, F. P. Keenan
Energy levels, radiative rates and electron impact excitation rates for transitions in Al X
Mon. Not. R. Astron. Soc. 438, 1223 (2014)

$\mathbf{e + Al^{9+}}$	0−350 RYD	Th

1331. K. M. Aggarwal, F. P. Keenan
Energy levels, radiative rates and electron impact excitation rates for transitions in Si II
Mon. Not. R. Astron. Soc. 442, 388 (2014)

$\mathbf{e + Si^{+}}$	1E3.7−1E5.5 K	Th

1332. D. D. Reid, J. M. Wadehra
Scattering of low-energy electrons and positrons by atomic beryllium: Ramsauer-Townsend effect
J. Phys. B 47, 225211 (2014)

$\mathbf{e + Be}$	1E−7−1E1 eV	Th

1333. K. Scherer, H. Fichtner, H. J. Fahr, M. Bzowski, S. E. S. Ferreira
Ionization rates in the heliosheath and in astrosheaths Spatial dependence and dynamical relevance
Astron. Astrophys. 563, A69 (2014)

$\mathbf{e + He}$	10−10000eV	Th
$\mathbf{e + H}$	10−10000eV	Th

1334. D. C. Nicholls, M. A. Dopita, R. S. Sutherland, L. J. Kewley, E. Palay
MEASURING NEBULAR TEMPERATURES: THE EFFECT OF NEW COLLISION STRENGTHS WITH EQUILIBRIUM AND kappa-DISTRIBUTED ELECTRON ENERGIES
Astrophys. J., Suppl. Ser. 207, 21 (2014)

$\mathbf{e + O^{2+}}$	0−40eV	Th

1335. C. Mendoza, M. A. Bautista
TESTING THE EXISTENCE OF NON-MAXWELLIAN ELECTRON DISTRIBUTIONS IN HII REGIONS AFTER ASSESSING ATOMIC DATA ACCURACY
Astrophys. J. 785, 91 (2014)

$\mathbf{e + S^{+}}$	0−20000K	Th
$\mathbf{e + N^{+}}$	0−20000K	Th

1336. E. Yarevsky, S. L. Yakovlev, N Elander
On the Scattering of the Electron off the Hydrogen Atom and the Helium Ion Below and Above the Ionization Threshold: Temkin-Poet Model
FEW-BODY SYSTEMS 55, 1057 (2014)

$\mathbf{e + He^{+}}$	40−70eV	Th

1337. D.P. Kilcreasea, S. Brookesa
Correction of the near threshold behavior of electron collisional excitation cross-sections in the plane-wave Born approximation
High En. Dens. Phys. 9, 722 (2014)

$\mathbf{e + He^{+}}$	0−1000eV	Th

1338. S. J. Ward, J. H. Macek
Effect of a vortex in the triply differential cross section for electron-impact K-shell ionization of carbon
Phys. Rev. A 90, 062709 (2014)

$\mathbf{e + C}$	1801eV	Th

1339. X. Gao, J. M. Li
Precision spectroscopy and electron-ion scattering
Phys. Rev. A 89, 022710 (2014)

$\mathbf{e + Kr^{+}}$	3.3eV	Th

1340. Z. Hu, Y. Li, X. Han, D. Kato, X. Tong, H. Watanabe, N. Nakamura
Atomic-number dependence of the magnetic-sublevel population in the autoionization state formed in dielectronic recombination
Phys. Rev. A 90, 062702 (2014)

$\mathbf{e + Ho^{64+}}$	20−40keV	Th
$\mathbf{e + Ho^{65+}}$	20−40keV	Th
$\mathbf{e + Pr^{56+}}$	20−40keV	Th
$\mathbf{e + Pr^{57+}}$	20−40keV	Th

1341. J. L. Zeng, L. P. Liu, P. F. Liu, J. M. Yuan
Role of ionization-excitation processes in the cross section for direct ionization of heavy atomic ions by electron impact
Phys. Rev. A 90, 044701 (2014)

$\mathbf{e + W^{28+}}$	0−4000eV	Th
$\mathbf{e + Yb^{24+}}$	0−4000eV	Th
$\mathbf{e + Tb^{19+}}$	0−4000eV	Th
$\mathbf{e + Nd^{14+}}$	0−4000eV	Th
$\mathbf{e + Ba^{10+}}$	0−4000eV	Th
$\mathbf{e + Sn^{4+}}$	0−4000eV	Th
$\mathbf{e + Gd^{18+}}$	0−4000eV	Th

1342. C. Merlet
Measurements of absolute Ma x-ray production cross sections of heavy elements Au, Pb, Bi, and U by electron impact
Surface And Interface Analysis 46, 12 (2014)

$\mathbf{e + U}$	0−40keV	Exp
$\mathbf{e + Bi}$	0−40keV	Exp
$\mathbf{e + Pb}$	0−40keV	Exp
$\mathbf{e + Au}$	0−40keV	Exp

1343. P. Lukac, O. Mikus, I. Morva, Z. Zabudla, J. Trnovec, M. Morvova
Electron and gas temperature dependences of the dissociative recombination coefficient of molecular ions Ar-2(+) with electrons
Plasma Sources Sci. Technol. 20, 055012 (2011)

$\mathbf{e + Ar_2{}^{+}}$	300−10400 K	E/T

1344. Sterling, N. C.
Atomic data for neutron-capture elements II. Photoionization and recombination properties of low-charge krypton ions
Astron. Astrophys. 533, A62 (2011)

e + Kr^{2+}	1E1−1E8 K	Th
e + Kr^{+}	1E1−1E8 K	Th
e + Kr	1E1−1E8 K	Th
e + Kr^{4+}	1E1−1E8 K	Th
e + Kr^{3+}	1E1−1E8 K	Th
e + Kr^{5+}	1E1−1E8 K	Th
e + Kr^{6+}	1E1−1E8 K	Th
P + Kr	1E1−1E8 K	Th
P + Kr^{+}	1E1−1E8 K	Th
P + Kr^{2+}	1E1−1E8 K	Th
P + Kr^{3+}	1E1−1E8 K	Th
P + Kr^{4+}	1E1−1E8 K	Th
P + Kr^{5+}	1E1−1E8 K	Th
P + Kr^{6+}	1E1−1E8 K	Th

1345. A. K. Bhatia, E. Landi
Atomic data and spectral line intensities for Ni XI
At. Data Nucl. Data Tables 97, 50 (2011)

e + Ni^{10+}	threshold−1000 eV	Th

1346. A. K. Bhatia, E. Landi
Atomic data and spectral line intensities for Ni XVII
At. Data Nucl. Data Tables 97, 189 (2011)

e + Ni^{16+}	threshold−1700 eV	Th

1347. Landi, E.
Atomic data and spectral line intensities for Fe XV
At. Data Nucl. Data Tables 97, 587 (2011)

e + Fe^{14+}	threshold−1670 eV	Th

1348. K. Ratnavelu, W. E. Ong
Electron and positron scattering from atomic potassium
Eur. Phys. J. D 64, 269 (2011)

e + K	4−100 eV	Th
e^{+} + K	4−100 eV	Th
e + K	4−100 eV	Th
e^{+} + K	4−100 eV	Th

1349. Cho, H.
Low-energy Electron Scattering with CH3Cl: Comparison with the High-energy Counterpart
J. Korean Phys. Soc. 59, 30 (2011)

e + CH$_3$Cl	5, 10, 20 eV	Exp
e + CH$_3$Cl	5, 10, 20 eV	Exp

1350. J. H. Chin, Kuru Ratnavelu, Y. Zhou
Optical Potential Study of Electron Scattering by Rubidium
J. Korean Phys. Soc. 59, 2877 (2011)

e + Rb	10−100 eV	Th

1351. J. P. Sullivan, C. Makochekanwa, A. Jones, P. Caradonna, D. S. Slaughter, J. Machacek, R. P. McEachran, D. W. Mueller, S. J. Buckman
Forward angle scattering effects in the measurement of total cross sections for positron scattering
J. Phys. B 44, 035201 (2011)

e + Ar	0−9 eV	E/T
e + Xe	0−9 eV	E/T
e^+ + Ar	0−9 eV	E/T
e^+ + Xe	0−9 eV	E/T
e + Ar	0−9 eV	E/T
e + Xe	0−9 eV	E/T
e^+ + Ar	0−9 eV	E/T
e^+ + Xe	0−9 eV	E/T

1352. A. Zecca, E. Trainotti, L. Chiari, G. Garcia, F. Blanco, M. H. F. Bettega, M. T. do N. Varella, M. A. P. Lima, M. J. Brunger
An experimental and theoretical investigation into positron and electron scattering from formaldehyde
J. Phys. B 44, 195202 (2011)

e + CH_2O	0.26−50.3 eV	E/T
e^+ + CH_2O	0.26−50.3 eV	E/T

1353. Tan Xiao-Ming, Wang De-Hua
Total cross sections for electron scattering from CH3OH and CH3CH2OH molecules in the energy range from 10 to 1000 eV
Nucl. Instrum. Methods Phys. Res. B 269, 1094 (2011)

e + CH_3OH	10−1000 eV	Th
e + e	10−1000 eV	Th

1354. A. Zecca, L. Chiari, G. Garcia, F. Blanco, E. Trainotti, M. J. Brunger
Total cross-sections for positron and electron scattering from alpha-tetrahydrofurfuryl alcohol
New J. Phys. 13, 063019 (2011)

e + e	0.15−50.15 eV	E/T
e^+ + e	0.15−50.15 eV	E/T

1355. A. Zecca, L. Chiari, A. Sarkar, M. J. Brunger
Positron scattering from the isoelectronic molecules N-2, CO and C2H2
New J. Phys. 13, 115001 (2011)

e^+ + N_2	0.2−40 eV	Exp
e^+ + Co	0.2−40 eV	Exp
e^+ + C_2H_2	0.2−40 eV	Exp

1356. A. C. L. Jones, C. Makochekanwa, P. Caradonna, D. S. Slaughter, J. R. Machacek, R. P. McEachran, J. P. Sullivan, S. J. Buckman, A. D. Stauffer, I. Bray, D. V. Fursa
Positron scattering from neon and argon
Phys. Rev. A 83, 032701 (2011)

e^+ + Ne	0.3−60 eV	E/T
e^+ + Ar	0.3−60 eV	E/T

1357. R. T. Sugohara, M. G. P. Homem, I. P. Sanches, A. F. deMoura, M. -T. Lee, I. Iga
Cross sections for electron scattering by methanol in the intermediate-energy range
Phys. Rev. A 83, 032708 (2011)

e + CH_3OH	100−1000 eV	E/T
e + CH_3OH	100−1000 eV	E/T

1358. Denise Assafrao, H. R. J. Walters, Felipe Arretche, Adriano Dutra, J. R. Mohallem
Semiempirical potentials for positron scattering by atoms
Phys. Rev. A 84, 022713 (2011)

e^+ + Ne	0−200 eV	Th
e^+ + Ar	0−200 eV	Th
e^+ + Be	0−200 eV	Th
e^+ + Mg	0−200 eV	Th
e^+ + Ne	0−200 eV	Th
e^+ + Ar	0−200 eV	Th
e^+ + Be	0−200 eV	Th
e^+ + Mg	0−200 eV	Th

1359. D. A. Konovalov, D. V. Fursa, I. Bray
J-matrix calculation of electron-helium S-wave scattering
Phys. Rev. A 84, 032707 (2011)

e + He	0.1−1000 eV	Th
e + He	0.1−1000 eV	Th
e + He	0.1−1000 eV	Th

1360. Mark C. Zammit, Dmitry V. Fursa, Igor Bray, R. K. Janev
Electron-helium scattering in Debye plasmas
Phys. Rev. A 84, 052705 (2011)

e + He	threshold−1000 eV	Th
e + He	threshold−1000 eV	Th

1361. M. Kurokawa, M. Kitajima, K. Toyoshima, T. Kishino, T. Odagiri, H. Kato, M. Hoshino, H. Tanaka, K. Ito
High-resolution total-cross-section measurements for electron scattering from Ar, Kr, and Xe employing a threshold-photoelectron source
Phys. Rev. A 84, 062717 (2011)

e + Ar	7 meV− 20 eV	Exp
e + Kr	7 meV− 20 eV	Exp
e + Xe	7 meV− 20 eV	Exp

1362. Thomas Pflueger, Arne Senftleben, Xueguang Ren, Alexander Dorn, Joachim Ullrich
Observation of Multiple Scattering in (e, 2e) Experiments on Small Argon Clusters
Phys. Rev. Lett. 107, 223201 (2011)

e + Ar	100 eV	Exp
e + Ar	100 eV	Exp

1363. Arijit Ghoshal, Y. K. Ho
Elastic scattering of positrons from hydrogen atoms with exponential cosine-screened Coulomb potentials
Phys. Scr. 83, 065301 (2011)

e^+ + H	20−300 eV	Th
e^+ + H	20−300 eV	Th

1364. Klaus Bartschat, Oleg Zatsarinny
Benchmark calculations of atomic data for plasma and lighting applications
Plasma Sources Sci. Technol. 20, 024012 (2011)

e + Ne	threshold−20 eV	Th
e + Ar	threshold−20 eV	Th
e + Kr	threshold−20 eV	Th
e + Xe	threshold−20 eV	Th
e + Ne	threshold−20 eV	Th
e + Ar	threshold−20 eV	Th
e + Kr	threshold−20 eV	Th
e + Xe	threshold−20 eV	Th

1365. Ghanbari-Adivi, E.
Inner-shell electron capture by impact of positron on the multi-electron atomic targets
Eur. Phys. J. D 62, 389 (2011)

e^+ + He	100–500, 600–1500, 1500–4000, 3000–5500, 8000–	Th
e^+ + C	100–500, 600–1500, 1500–4000, 3000–5500, 8000–	Th
e^+ + Ne	100–500, 600–1500, 1500–4000, 3000–5500, 8000–	Th
e^+ + Na	100–500, 600–1500, 1500–4000, 3000–5500, 8000–	Th
e^+ + Ar	100–500, 600–1500, 1500–4000, 3000–5500, 8000–	Th
e^+ + He	100–500, 600–1500, 1500–4000, 3000–5500, 8000–	Th
e^+ + C	100–500, 600–1500, 1500–4000, 3000–5500, 8000–	Th
e^+ + Ne	100–500, 600–1500, 1500–4000, 3000–5500, 8000–	Th
e^+ + Na	100–500, 600–1500, 1500–4000, 3000–5500, 8000–	Th
e^+ + Ar	100–500, 600–1500, 1500–4000, 3000–5500, 8000–	Th

1366. C. Mitterdorfer, A. Edtbauer, S. Karolczak, J. Postler, D. Gschliesser, S. Denifl, E. Illenberger, P. Scheier
Strong fragmentation processes driven by low energy electron attachment to various small perfluoroether molecules
Int. J. Mass Spectrom. 306, 63 (2011)

e + e	0–15 eV	Exp

3.2.2 Heavy Particles Collisions

1367. Hui-Ping Liu, Xiao-Ping Ouyang, Hua-Si Hu, al. et
Single electron loss in the collisions of C3+ and atomic hydrogen
Chin. Phys. B 19, 093401 (2010)

C^{3+} + H	0–700keV/u	Th

1368. Xue-Rong Wang, Ling Liu, Jian-Guo Wang
Electron Capture Process in Collisions of Proton with Excited State of Helium
Chin. Phys. Lett. 27, 123401 (2010)

H^+ + He	1–100keV/u	Th

1369. L. F. Errea, Clara Illescas, A. Macias, al. et
Influence of nuclear exchange on nonadiabatic electron processes in H++H-2 collisions
J. Chem. Phys. 133, 244307 (2010)

H^+ + H_2	5–600eV	Th

1370. F. Guzman, L. F. Errea, Clara Illescas, al. et
Calculation of total cross sections and effective emission coefficients for B5+ collisions with ground-state and excited hydrogen
J. Phys. B 43, 144007 (2010)

B^{5+} + H	0.1– 200keV/amu	Th

1371. C. C. Montanari, E. C. Montenegro, J. E. Miraglia
CDW-EIS calculations for multiple ionization of Ne, Ar, Kr and Xe by the impact of H+ and He+, including post-collisional electron emission
J. Phys. B 43, 165201 (2010)

He^+ + Kr	10 – 1000keV/amu	Th
He^+ + Xe	10 – 1000keV/amu	Th
He^+ + Ar	10 – 1000keV/amu	Th
He^+ + Ne	10 – 1000keV/amu	Th
H^+ + Kr	10 – 1000keV/amu	Th
H^+ + Xe	10 – 1000keV/amu	Th
H^+ + Ar	10 – 1000keV/amu	Th
H^+ + Ne	10 – 1000keV/amu	Th

1372. Keh-Ning Huang, Hsiao-Ling Sun, Sheng-Fang Lin, Hao-Tse Shiao, Xin-Zeng Wu
Relativistic Quantum Collision Theory for Many-particle Systems
J. Korean Phys. Soc. 59, 2941 (2011)

$\mathbf{H^+ + U^{91+}}$	1–15 threshold unit, 1–2000 keVTh	
$\mathbf{e + U^{91+}}$	1–15 threshold unit, 1–2000 keVTh	

1373. J. Colgan, M. S. Pindzola, F. Robicheaux, M. F. Ciappina
Fully differential cross sections for the single ionization of He by C6+ ions
J. Phys. B 44, 175205 (2011)

$\mathbf{C^{6+} + He}$	100 MeV	Th
$\mathbf{C^{6+} + He}$	100 MeV	Th

1374. M. S. Pindzola, T. G. Lee, J. Colgan
Antiproton-impact ionization of H, He and Li
J. Phys. B 44, 205204 (2011)

$\mathbf{H^- + Li}$	0–100 keV	Th
$\mathbf{H^- + He}$	0–100 keV	Th
$\mathbf{H^- + H}$	0–100 keV	Th

1375. S. Otranto, R. E. Olson
X-ray emission cross sections following Ar18+ charge-exchange collisions on neutral argon: The role of the multiple electron capture
Phys. Rev. A 83, 032710 (2011)

$\mathbf{Ar^{18+} + Ar}$	5–4000 eV	Th

1376. U. Chowdhury, M. Schulz, D. H. Madison
Differential cross sections for single ionization of H-2 by 75-keV proton impact
Phys. Rev. A 83, 032712 (2011)

$\mathbf{H^+ + H_2}$	75 keV	Th
$\mathbf{H^+ + H_2}$	75 keV	Th

1377. S. D. Lopez, M. Fiori, C. R. Garibotti
Analysis of the approximations applied in the continuum-distorted-wave-eikonal-initial-state theory for the evaluation of ionization cross sections: Post-prior discrepancy, axial symmetry, and ion-ion interaction
Phys. Rev. A 83, 032716 (2011)

$\mathbf{H^+ + He}$	100–1000 eV	Th

1378. S. D. Lopez, C. R. Garibotti, S. Otranto
Double ionization of helium by bare ions: Theoretical study of the fully differential cross sections
Phys. Rev. A 83, 062702 (2011)

$\mathbf{Li^{3+} + He}$	700–1000 keV	Th
$\mathbf{He^{2+} + He}$	700–1000 keV	Th
$\mathbf{C^{6+} + He}$	700–1000 keV	Th
$\mathbf{H^- + He}$	700–1000 keV	Th
$\mathbf{H^+ + He}$	700–1000 keV	Th
$\mathbf{Li^{3+} + He}$	700–1000 keV	Th
$\mathbf{He^{2+} + He}$	700–1000 keV	Th
$\mathbf{C^{6+} + He}$	700–1000 keV	Th
$\mathbf{H^- + He}$	700–1000 keV	Th
$\mathbf{H^+ + He}$	700–1000 keV	Th

1379. P. Botheron, B. Pons
Classical interpretation of probability oscillations in low-energy atomic collisions
Phys. Rev. A 83, 062704 (2011)

$\mathbf{H^+ + H}$	1–100 keV	Th
$\mathbf{H^{2+} + H}$	1–100 keV	Th

1380. A. Dubois, S. Carniato, P. D. Fainstein, J. P. Hansen
Ionization of water molecules by fast charged projectiles
Phys. Rev. A 84, 012708 (2011)

$\mathbf{H^+ + H_2O}$	100–1000 keV	Th

1381. Y. Iriki, Y. Kikuchi, M. Imai, A. Itoh
Absolute doubly differential cross sections for ionization of adenine by 1.0-MeV protons
Phys. Rev. A 84, 032704 (2011)

$\mathbf{H^+ + H}$	1.0 MeV	Exp
$\mathbf{H^+ + H}$	1.0 MeV	Exp

1382. A. N. Artemyev, S. R. McConnell, A. Surzhykov, B. Najjari, A. B. Voitkiv
Coulomb excitation of highly charged projectile ions in relativistic collisions with diatomic molecules
Phys. Rev. A 84, 042709 (2011)

$\mathbf{N_2 + U^{91+}}$	300–1000 MeV	Th
$\mathbf{N_2 + Fe^{25+}}$	300–1000 MeV	Th
$\mathbf{N_2 + Xe^{53+}}$	300–1000 MeV	Th

1383. R. J. Mawhorter, J. B. Greenwood, A. Chutjian, T. Haley, C. D. Mitescu, J. Simcic
Measurement of absolute charge-exchange cross sections for He2+ collisions with He and H-2
Phys. Rev. A 84, 052714 (2011)

$\mathbf{He^{2+} + H_2}$	0.3–4.6 keV	E/T
$\mathbf{He^{2+} + He}$	0.3–4.6 keV	E/T

1384. Y. Iriki, Y. Kikuchi, M. Imai, A. Itoh
Proton-impact ionization cross sections of adenine measured at 0.5 and 2.0 MeV by electron spectroscopy
Phys. Rev. A 84, 052719 (2011)

P + P	0.5–2 MeV	E/T

1385. Nicolas Sisourat, Ingjald Pilskog, Alain Dubois
Nonperturbative treatment of multielectron processes in ion-molecule scattering: Application to He2+-H-2 collisions
Phys. Rev. A 84, 052722 (2011)

$\mathbf{He^{2+} + H_2}$	0.01–25 keV	Th

1386. I. B. Abdurakhmanov, A. S. Kadyrov, D. V. Fursa, I. Bray, A. T. Stelbovics
Convergent close-coupling calculations of helium single ionization by antiproton impact
Phys. Rev. A 84, 062708 (2011)

$\mathbf{H^- + He}$	1–1000 keV	Th

1387. O. Abu-Haija, A. Hasan, A. Kayani, E. Y. Kamber
State-selective single- and double-electron capture in slow collisions of Ne4+ ions with CO2
Phys. Scr. T144, 014017 (2011)

$\mathbf{Ne^{4+} + CO_2}$	60−1200 eV	E/T

1388. O. Abu-Haija, A. Hasan, A. Kayani, E. Y. Kamber
Electron capture processes in slow collisions of Ne6+ ions with CO2 and H2O
Europhys. Lett. 93, 13003 (2011)

$\mathbf{Ne^{6+} + CO_2}$	450−2400 eV	E/T
$\mathbf{Ne^{6+} + H_2O}$	450−2400 eV	E/T

1389. M. N. Guimaraes, F. V. Prudente
A variational adiabatic hyperspherical finite element R matrix methodology: general formalism and application to H+H-2 reaction
Eur. Phys. J. D 64, 287 (2011)

$\mathbf{H + H_2}$	0.5−1.4 eV	Th

1390. J. Perez-Rios, G. Tejeda, J. M. Fernandez, M. I. Hernandez, S. Montero
Inelastic collisions in molecular oxygen at low temperature (4 ¡= T ¡= 34 K). Close-coupling calculations versus experiment
J. Chem. Phys. 134, 174307 (2011)

$\mathbf{O_2 + O_2}$	4−34 K	E/T

1391. I. B. Abdurakhmanov, A. S. Kadyrov, I. Bray, A. T. Stelbovics
Differential ionization in antiproton-hydrogen collisions within the convergent-close-coupling approach
J. Phys. B 44, 165203 (2011)

$\mathbf{H^{-} + H}$	30−500, 30−200 keV	Th
$\mathbf{H^{-} + H}$	30−500, 30−200 keV	Th

1392. Teck-Ghee Lee, M. S. Pindzola
Proton-impact excitation of lithium using a time-dependent close-coupling method
Phys. Rev. A 84, 052712 (2011)

$\mathbf{H^{+} + Li}$	0−50 keV	Th

3.3 Surface Interactions

1393. P. Wang, W. Jacob, M. Balden, A. Manhard, T. Schwarz-Selinger
Erosion of tungsten-doped amorphous carbon films in oxygen plasma
J. Nucl. Mater. 420, 101 (2012)

$\mathbf{D^{+} + W}$	30−100 eV, T: 350K	Exp
$\mathbf{D_2{}^{+} + W}$	30−100 eV, T: 350K	Exp
$\mathbf{D_3{}^{+} + W}$	30−100 eV, T: 350K	Exp
$\mathbf{D^{+} + C}$	30−100 eV, T: 350K	Exp
$\mathbf{D_2{}^{+} + C}$	30−100 eV, T: 350K	Exp
$\mathbf{D_3{}^{+} + C}$	30−100 eV, T: 350K	Exp

1394. K. Tokunaga, M. J. Baldwin, R. P. Doerner, D. Nishijima, H. Kurishita, T. Fujiwara, K. Araki, Y. Miyamoto, N. Ohno, Y. Ueda
Nanoscale surface morphology of tungsten materials induced by Be-seeded D-He plasma exposure
J. Nucl. Mater. 417, 528 (2011)

$\mathbf{He + W}$	60eV, T: 1123K	Exp
$\mathbf{D + W}$	60eV, T: 1123K	Exp
$\mathbf{Be + W}$	60eV, T: 1123K	Exp

1395. A. Lasa, C. Bjorkas, K. Vortler, K. Nordlund
MD simulations of low energy deuterium irradiation on W, WC and W2C surfaces
J. Nucl. Mater. 429, 284 (2012)

D + WC	10−1000eV, T: 300−600K	Th
D + W	10−1000eV, T: 300−600K	Th
$\mathbf{D + W_2C}$	10−1000eV, T: 300−600K	Th
$\mathbf{D + W_2C}$	10−1000eV, T: 300−600K	Th
D + WC	10−1000eV, T: 300−600K	Th
D + W	10−1000eV, T: 300−600K	Th
$\mathbf{D + W_2C}$	10−1000eV, T: 300−600K	Th
D + WC	10−1000eV, T: 300−600K	Th
D + W	10−1000eV, T: 300−600K	Th
$\mathbf{D + W_2C}$	10−1000eV, T: 300−600K	Th
D + WC	10−1000eV, T: 300−600K	Th
D + W	10−1000eV, T: 300−600K	Th
$\mathbf{D + W_2C}$	10−1000eV, T: 300−600K	Th
D + WC	10−1000eV, T: 300−600K	Th
D + W	10−1000eV, T: 300−600K	Th

1396. Martin Nieto-Perez, G. Ramos, Jean Paul Allain
Modeling of Surface Composition Dynamics in the ITER Divertor Region
IEEE Trans. Plasma Sci. 38, 414 (2010)

D + C	10−250eV, T: undef	Th
Be + C	10−250eV, T: undef	Th
D + C	10−250eV, T: undef	Th
C + Be	10−250eV, T: undef	Th
Be + Be	10−250eV, T: undef	Th
D + Be	10−250eV, T: undef	Th
C + C	10−250eV, T: undef	Th
Be + C	10−250eV, T: undef	Th
Be + Be	10−250eV, T: undef	Th
D + Be	10−250eV, T: undef	Th
C + C	10−250eV, T: undef	Th
C + Be	10−250eV, T: undef	Th
Be + Be	10−250eV, T: undef	Th
D + Be	10−250eV, T: undef	Th
C + C	10−250eV, T: undef	Th
Be + C	10−250eV, T: undef	Th
D + C	10−250eV, T: undef	Th
C + Be	10−250eV, T: undef	Th
D + C	10−250eV, T: undef	Th
Be + C	10−250eV, T: undef	Th
D + C	10−250eV, T: undef	Th
C + Be	10−250eV, T: undef	Th
Be + Be	10−250eV, T: undef	Th
D + Be	10−250eV, T: undef	Th
C + C	10−250eV, T: undef	Th
Be + C	10−250eV, T: undef	Th
C + Be	10−250eV, T: undef	Th
Be + Be	10−250eV, T: undef	Th
D + Be	10−250eV, T: undef	Th
C + C	10−250eV, T: undef	Th
Be + C	10−250eV, T: undef	Th
D + C	10−250eV, T: undef	Th
C + Be	10−250eV, T: undef	Th
Be + Be	10−250eV, T: undef	Th
D + Be	10−250eV, T: undef	Th
C + C	10−250eV, T: undef	Th

1397. Ch. Linsmeier, M. Reinelt, K. Schmid
Surface chemistry of first wall materials - From fundamental data to modeling
J. Nucl. Mater. 415, S212 (2011)

Be + W	undef, T: 670−1470K	E/T
C + W	undef, T: 670−1470K	E/T
Be + W	undef, T: 670−1470K	E/T
C + W	undef, T: 670−1470K	E/T

1398. J. N. Brooks, J. P. Allain
'Mixed-material evolution analysis of the ITER divertor'
J. Nucl. Mater. 390-91, 123 (2009)

D + W	10−1000eV, T: undef	Th
D + Be	10−1000eV, T: undef	Th

1399. Shin Kajita, Daisuke Nishijima, Russ Doerner, Karl Umstadter, Jonathan Yu, Noriyasu Ohno, Yoshio Ueda
Beryllium erosion induced by transient heat loads and subsequent reactions in a deuterium plasma
J. Nucl. Mater. 420, 252 (2012)

D + Be	¡80eV, T: 800−2000K	Exp

1400. M. F. Stamp, K. Krieger, S. Brezinsek
Measurements of beryllium sputtering yields at JET
J. Nucl. Mater. 415, S173 (2011)

Be + Be	10−1000eV, T: undef	E/T
D + Be	10−1000eV, T: undef	E/T

1401. M. Mehine, C. Bjorkas, K. Vortler, K. Nordlund, M. I. Airila
Modelling the erosion of beryllium carbide surfaces
J. Nucl. Mater. 414, 1 (2011)

Be + Be	10−100eV, T: 300K	Th
D + Be	10−100eV, T: 300K	Th
D + $\mathbf{Be_2C}$	10−100eV, T: 300K	Th

1402. Liudvikas Pranevicius, Liudas Pranevicius, Andrius Martinavicius, Arvydas Kanapickas, Claude Templier
Studies of carbon behavior in tungsten under carbon and hydrogen mixed irradiation
Vacuum 83, S45 (2009)

$\mathbf{H_2}$ + C	300eV, T: 400K	Exp
$\mathbf{H_2}$ + W	300eV, T: 400K	Exp
Ar + C	300eV, T: 400K	Exp
Ar + W	300eV, T: 400K	Exp
Ar + W	300eV, T: 400K	Exp
$\mathbf{H_2}$ + C	300eV, T: 400K	Exp
$\mathbf{H_2}$ + W	300eV, T: 400K	Exp
Ar + C	300eV, T: 400K	Exp

1403. E. Vassallo, M. Canetti, A. Cremona, F. Ghezzi, G. Grosso, L. Laguardia
Evaluation of a method to reduce the redeposition of hydrogenated coatings containing carbon and tungsten in fusion reactors
Vacuum 86, 1528 (2012)

Ar + W	undef, T: undef	Exp
Ar + W	undef, T: undef	Exp
CH_4 + W	undef, T: undef	Exp
H_2 + W	undef, T: undef	Exp
Ar + C	undef, T: undef	Exp
CH_4 + C	undef, T: undef	Exp
H_2 + C	undef, T: undef	Exp
Ar + H	undef, T: undef	Exp
CH_4 + H	undef, T: undef	Exp
H_2 + H	undef, T: undef	Exp
H_2 + H	undef, T: undef	Exp
CH_4 + H	undef, T: undef	Exp
Ar + H	undef, T: undef	Exp
H_2 + C	undef, T: undef	Exp
CH_4 + C	undef, T: undef	Exp
Ar + C	undef, T: undef	Exp
H_2 + W	undef, T: undef	Exp
CH_4 + W	undef, T: undef	Exp

1404. P. Wang, W. Jacob, M. Balden, T. Hoeschen, A. Manhard
Erosion of tungsten-doped amorphous carbon films exposed to deuterium plasmas
J. Nucl. Mater. 426, 277 (2012)

D^+ + W	30−300eV, T: 300K	Exp
$D_2{}^+$ + W	30−300eV, T: 300K	Exp
$D_3{}^+$ + W	30−300eV, T: 300K	Exp
D^+ + C	30−300eV, T: 300K	Exp
$D_2{}^+$ + C	30−300eV, T: 300K	Exp
$D_3{}^+$ + C	30−300eV, T: 300K	Exp

1405. A. Kallenbach, M. Balden, R. Dux, T. Eich, C. Giroud, A. Huber, G. P. Maddison, M. Mayer, K. McCormick, R. Neu, T. W. Petrie, T. Puetterich, J. Rapp, M. L. Reinke, K. Schmid, J. Schweinzer, S. Wolfe
Plasma surface interactions in impurity seeded plasmas
J. Nucl. Mater. 415, S19 (2011)

D + W	2−2000eV, T: undef	Th
He + W	2−2000eV, T: undef	Th
C + W	2−2000eV, T: undef	Th
N + W	2−2000eV, T: undef	Th
Ne + W	2−2000eV, T: undef	Th
Ar + W	2−2000eV, T: undef	Th
Kr + W	2−2000eV, T: undef	Th

1406. T. Dittmar, M. J. Baldwin, R. P. Doerner, D. Nishijima, M. Oberkofler, T. Schwarz-Selinger, F. Tabares
Interaction of high flux deuterium/nitrogen plasmas with beryllium
Phys. Scr. T145, 14009 (2011)

N_2 + Be	30−95eV, T: 310−420K	Exp
D_2 + Be	30−95eV, T: 310−420K	Exp
N_2 + Be	30−95eV, T: 310−420K	Exp
D_2 + Be	30−95eV, T: 310−420K	Exp
N_2 + Be	30−95eV, T: 310−420K	Exp
D_2 + Be	30−95eV, T: 310−420K	Exp
N_2 + Be	30−95eV, T: 310−420K	Exp
D_2 + Be	30−95eV, T: 310−420K	Exp
N_2 + Be	30−95eV, T: 310−420K	Exp
D_2 + Be	30−95eV, T: 310−420K	Exp

1407. Y. Ueda, K. Miyata, Y. Ohtsuka, H. T. Lee, M. Fukumoto, S. Brezinsek, J. W. Coenen, A. Kreter, A. Litnovsky, V. Philipps, B. Schweer, G. Sergienko, T. Hirai, A. Taguchi, Y. Torikai, K. Sugiyama, T. Tanabe, S. Kajita, N. Ohno
Exposure of tungsten nano-structure to TEXTOR edge plasma
J. Nucl. Mater. 415, S92 (2011)

D + W	160−320eV, T: 570−1070K	Exp
He + W	160−320eV, T: 570−1070K	Exp
D + W	160−320eV, T: 570−1070K	Exp
He + W	160−320eV, T: 570−1070K	Exp
D + W	160−320eV, T: 570−1070K	Exp
He + W	160−320eV, T: 570−1070K	Exp
D + W	160−320eV, T: 570−1070K	Exp
He + W	160−320eV, T: 570−1070K	Exp
D + W	160−320eV, T: 570−1070K	Exp
He + W	160−320eV, T: 570−1070K	Exp

1408. S. Brezinsek, D. Borodin, J. W. Coenen, D. Kondratjew, M. Laengner, A. Pospieszczyk, U. Samm
Quantification of tungsten sputtering at W/C twin limiters in TEXTOR with the aid of local WF6 injection
Phys. Scr. T145, 14016 (2011)

H + W	30−85eV(Te), T: 420K	Exp
D + W	30−85eV(Te), T: 420K	Exp
H + C	30−85eV(Te), T: 420K	Exp
D + C	30−85eV(Te), T: 420K	Exp

1409. A. Widdowson, M. J. Baldwin, J. P. Coad, R. P. Doerner, J. Hanna, D. E. Hole, G. F. Matthews, M. Rubel, R. Seraydarian, H. Xu
Testing of beryllium marker coatings in PISCES-B for the JET ITER-like wall
J. Nucl. Mater. 390-91, 988 (2009)

D + Be	30eV, T: 700−900K	Exp

1410. K. Vortler, C. Bjorkas, K. Nordlund
The effect of plasma impurities on the sputtering of tungsten carbide
J. Phys. Condens. Matter 23, 85002 (2011)

D + WC	100−300eV, T: 600K	Th
C + WC	100−300eV, T: 600K	Th
W + WC	100−300eV, T: 600K	Th
He + WC	100−300eV, T: 600K	Th
Ne + WC	100−300eV, T: 600K	Th
Ar + WC	100−300eV, T: 600K	Th

1411. P. Sundelin, C. Schulz, V. Philipps, M. Rubel, G. Sergienko, L. Marot
Nitrogen-assisted removal of deuterated carbon layers
J. Nucl. Mater. 390-91, 647 (2009)

H_2 + C	undef, T: 300−600K	Exp
H_2 + D	undef, T: 300−600K	Exp
N_2 + C	undef, T: 300−600K	Exp
N_2 + D	undef, T: 300−600K	Exp
H_2 + B	undef, T: 300−600K	Exp
N_2 + B	undef, T: 300−600K	Exp

1412. K. Nordlund, C. Bjorkas, K. Vortler, A. Meinander, A. Lasa, M. Mehine, A. V. Krasheninnikov
Mechanism of swift chemical sputtering: Comparison of Be/C/W dimer bond breaking
Nucl. Instrum. Methods Phys. Res. B 269, 1257 (2011)

D + Be	2−200eV, T: 300K	Th
D + $\mathbf{Be_2C}$	2−200eV, T: 300K	Th
D + WC	2−200eV, T: 300K	Th
D + C	2−200eV, T: 300K	Th

1413. M. Tokitani, N. Yoshida, S. Masuzaki, N. Noda, A. Sagara, H. Yamada, A. Komori, S. Nagata, B. Tsuchiya
Plasma surface interaction on the surface of tungsten divertor tiles in LHD
J. Nucl. Mater. 415, S87 (2011)

H + W	¡100eV, T: undef	Exp
H + W	¡100eV, T: undef	Exp
H + W	¡100eV, T: undef	Exp
H + W	¡100eV, T: undef	Exp
H + W	¡100eV, T: undef	Exp

1414. K. Ohya
Modeling of Erosion and Deposition on Plasma Facing Walls
AIP Conf. Proc. 1237, 47 (2010)

$\mathbf{CH_4}$ **+ C**	3−100eV, T: undef	Th
$\mathbf{CH_4}$ **+ W**	3−100eV, T: undef	Th
$\mathbf{CH_4}$ **+ H**	3−100eV, T: undef	Th
$\mathbf{C_2H_6}$ **+ C**	3−100eV, T: undef	Th
$\mathbf{C_2H_6}$ **+ H**	3−100eV, T: undef	Th
$\mathbf{CH_4}$ **+ C**	3−100eV, T: undef	Th
$\mathbf{CH_4}$ **+ W**	3−100eV, T: undef	Th
$\mathbf{CH_4}$ **+ H**	3−100eV, T: undef	Th
$\mathbf{C_2H_6}$ **+ C**	3−100eV, T: undef	Th
$\mathbf{C_2H_6}$ **+ H**	3−100eV, T: undef	Th

1415. C. Bjorkas, K. Vortler, K. Nordlund, D. Nishijima, R. Doerner
Chemical sputtering of Be due to D bombardment
New J. Phys. 11, 123017 (2009)

D + Be	7−3000eV, T: 373K	E/T

1416. A. Kreter, D. Nishijima, M. J. Baldwin, R. P. Doerner, A. Pospieszczyk
Mitigation of carbon erosion in beryllium seeded deuterium plasma under bombardment by argon and helium ions in PISCES-B
J. Nucl. Mater. 417, 651 (2011)

D + C	30−126eV, T: 700K	Exp
Be + C	30−126eV, T: 700K	Exp
He + C	30−126eV, T: 700K	Exp
Ar + C	30−126eV, T: 700K	Exp

1417. Predrag S. Krstic, Carlos O. Reinhold
Burning Plasma - Wall Interactions
AIP Conf. Proc. 1161, 75 (2009)

$\mathbf{D_2}$ **+ C**	2−60eV, T: undef	E/T
$\mathbf{D_2}$ **+ C**	2−60eV, T: undef	E/T
$\mathbf{D_2}$ **+ C**	2−60eV, T: undef	E/T
$\mathbf{D_2}$ **+ C**	2−60eV, T: undef	E/T
$\mathbf{D_2}$ **+ C**	2−60eV, T: undef	E/T

1418. S. Khakshouri, D. M. Duffy
Influence of electronic effects on the surface erosion of tungsten
Phys. Rev. B 80, 35415 (2009)

W + W	5000eV, T: 300K	Th

1419. Shengguang Liu, Jizhong Sun, Shuyu Dai, Thomas Stirner, Dezhen Wang
A general model for chemical erosion of carbon materials due to low-energy H+ impact
J. Appl. Phys. 108, 73302 (2010)

H^+ + C	25−200eV, T: 300−1000K	Th

1420. Q Xu, K Ohya, ZS Yang, K Inai, GN Luo
Monte Carlo simulation of erosion and deposition behavior on SiC-coated graphite tiles in EAST
J. Nucl. Mater. 415, S153 (2011)

H + SiC	20eV(Te), T: undef	Th
H + C	20eV(Te), T: undef	Th
H + SiC	20eV(Te), T: undef	Th
H + C	20eV(Te), T: undef	Th

1421. K. R. Umstadter, R. Doerner, G. Tynan
Enhanced erosion of tungsten plasma-facing components subject to simultaneous heat pulses and deuterium plasma
J. Nucl. Mater. 386-88, 751 (2009)

H^+ + W	50−250eV, T: 320−370K	Exp
D^+ + W	50−250eV, T: 320−370K	Exp

1422. GR. Tynan, M. Baldwin, R. Doerner, E. Hollmann, D. Nishijima, K. Umstadter, J Yu
Mixed Material Plasma-Surface Interactions in ITER: Recent Results from the PISCES Group
AIP Conf. Proc. 1237, 78 (2010)

D + W	15−70eV, T: 293−1100K	Exp
D + Be	15−70eV, T: 293−1100K	Exp
He + W	15−70eV, T: 293−1100K	Exp
D + W	15−70eV, T: 293−1100K	Exp
He + W	15−70eV, T: 293−1100K	Exp
D + Be	15−70eV, T: 293−1100K	Exp
D + W	15−70eV, T: 293−1100K	Exp
He + W	15−70eV, T: 293−1100K	Exp
D + Be	15−70eV, T: 293−1100K	Exp
D + W	15−70eV, T: 293−1100K	Exp
D + Be	15−70eV, T: 293−1100K	Exp
Be + W	15−70eV, T: 293−1100K	Exp
D + Be	15−70eV, T: 293−1100K	Exp
He + W	15−70eV, T: 293−1100K	Exp

1423. A. Kirschner, D. Borodin, V. Philipps, U. Samm, R. Ding, K. Schmid, J. Roth, A. Kukushkin, G. Federici, A Loarte
Estimations of erosion fluxes, material deposition and tritium retention in the divertor of ITER
J. Nucl. Mater. 390-91, 152 (2009)

T + C	undef, T: undef	Th
T + Be	undef, T: undef	Th
T + C	undef, T: undef	Th
T + Be	undef, T: undef	Th
T + C	undef, T: undef	Th
T + Be	undef, T: undef	Th
T + C	undef, T: undef	Th
T + Be	undef, T: undef	Th

1424. K Ohya

Progress in modeling erosion and redeposition on plasma facing materials

J. Nucl. Mater. 415, S10 (2011)

C + W	1−100eV, T: undef	Th
D + W	1−100eV, T: undef	Th
CH_4 + C	1−100eV, T: undef	Th
C + C	1−100eV, T: undef	Th
D + C	1−100eV, T: undef	Th
CH_4 + C	1−100eV, T: undef	Th
C + C	1−100eV, T: undef	Th
D + C	1−100eV, T: undef	Th
C + W	1−100eV, T: undef	Th
D + W	1−100eV, T: undef	Th
H + H	1−100eV, T: undef	Th
H + C	1−100eV, T: undef	Th
Be + H	1−100eV, T: undef	Th
Be + C	1−100eV, T: undef	Th
CH_4 + W	1−100eV, T: undef	Th
CH_4 + H	1−100eV, T: undef	Th
D + W	1−100eV, T: undef	Th
H + H	1−100eV, T: undef	Th
H + C	1−100eV, T: undef	Th
Be + H	1−100eV, T: undef	Th
Be + C	1−100eV, T: undef	Th
CH_4 + W	1−100eV, T: undef	Th
CH_4 + H	1−100eV, T: undef	Th
C + C	1−100eV, T: undef	Th
D + C	1−100eV, T: undef	Th
C + W	1−100eV, T: undef	Th
CH_4 + W	1−100eV, T: undef	Th
CH_4 + H	1−100eV, T: undef	Th
CH_4 + C	1−100eV, T: undef	Th
D + C	1−100eV, T: undef	Th
C + W	1−100eV, T: undef	Th
D + W	1−100eV, T: undef	Th
H + H	1−100eV, T: undef	Th
H + C	1−100eV, T: undef	Th
Be + H	1−100eV, T: undef	Th
Be + C	1−100eV, T: undef	Th
CH_4 + H	1−100eV, T: undef	Th
CH_4 + C	1−100eV, T: undef	Th
C + C	1−100eV, T: undef	Th
Be + H	1−100eV, T: undef	Th
Be + C	1−100eV, T: undef	Th
CH_4 + W	1−100eV, T: undef	Th
C + W	1−100eV, T: undef	Th
D + W	1−100eV, T: undef	Th
H + H	1−100eV, T: undef	Th
H + C	1−100eV, T: undef	Th
CH_4 + C	1−100eV, T: undef	Th
C + C	1−100eV, T: undef	Th
D + C	1−100eV, T: undef	Th
H + H	1−100eV, T: undef	Th
H + C	1−100eV, T: undef	Th
Be + H	1−100eV, T: undef	Th
Be + C	1−100eV, T: undef	Th
CH_4 + W	1−100eV, T: undef	Th
CH_4 + H	1−100eV, T: undef	Th

1425. D. Borodin, R. Doerner, D. Nishijima, A. Kirschner, A. Kreter, D. Matveev, A. Galonska, V Philipps
Simulation of Be-C interaction dynamics in mixed Be/C layers formed in experiments at PISCES-B
J. Nucl. Mater. 415, S219 (2011)

D + C	7eV(Te), T: undef	Th
Be + C	7eV(Te), T: undef	Th
D + C	7eV(Te), T: undef	Th
Be + C	7eV(Te), T: undef	Th

1426. AY. Pigarov, P. Krstic, SI. Krasheninnikov, R. Doerner, TD Rognlien
Dynamic Models for Plasma-Wall Interactions
Contrib. Plasma Phys. 52, 465 (2012)

D + C	1−100eV, T: 300−900K	Th
D + Be	1−100eV, T: 300−900K	Th
D + C	1−100eV, T: 300−900K	Th
D + Be	1−100eV, T: 300−900K	Th
D + C	1−100eV, T: 300−900K	Th
D + Be	1−100eV, T: 300−900K	Th
D + C	1−100eV, T: 300−900K	Th
D + Be	1−100eV, T: 300−900K	Th
D + C	1−100eV, T: 300−900K	Th
D + Be	1−100eV, T: 300−900K	Th
D + C	1−100eV, T: 300−900K	Th
D + Be	1−100eV, T: 300−900K	Th

1427. D. Nishijima, MJ. Baldwin, RP. Doerner, JH Yu
Sputtering properties of tungsten 'fuzzy' surfaces
J. Nucl. Mater. 415, S96 (2011)

Ar + W	30−120eV, T: undef	Exp

1428. A. Vesel, M. Mozetic, P. Panjan, N. Hauptman, M. Klanjsek-Gunde, M Balat-Pichelin
Etching of carbon-tungsten composite with oxygen plasma
Surf. Coat. Tech. 204, 1503 (2010)

O + WC	undef, T: 800K	Exp
O + C	undef, T: 800K	Exp

1429. J. Roth, E. Tsitrone, A. Loarte, T. Loarer, G. Counsell, R. Neu, V. Philipps, S. Brezinsek, M. Lehnen, P. Coad, C. Grisolia, K. Schmid, K. Krieger, A. Kallenbach, B. Lipschultz, R. Doerner, R. Causey, V. Alimov, W. Shu, O. Ogorodnikova, A. Kirschner, G. Federici, A Kukushkin
Recent analysis of key plasma wall interactions issues for ITER
J. Nucl. Mater. 390-91, 1 (2009)

D + Be	1−1000eV, T: 300−900K	E/T
D + W	1−1000eV, T: 300−900K	E/T
Ar + W	1−1000eV, T: 300−900K	E/T
D + C	1−1000eV, T: 300−900K	E/T
D + W	1−1000eV, T: 300−900K	E/T
D + Be	1−1000eV, T: 300−900K	E/T
D + C	1−1000eV, T: 300−900K	E/T
D + BeC	1−1000eV, T: 300−900K	E/T
D + W	1−1000eV, T: 300−900K	E/T
D + Be	1−1000eV, T: 300−900K	E/T
D + C	1−1000eV, T: 300−900K	E/T
D + WC	1−1000eV, T: 300−900K	E/T
D + BeO	1−1000eV, T: 300−900K	E/T
D + BeC	1−1000eV, T: 300−900K	E/T

D + BeO	1−1000eV, T: 300−900K	E/T
D + BeC	1−1000eV, T: 300−900K	E/T
D + W	1−1000eV, T: 300−900K	E/T
D + Be	1−1000eV, T: 300−900K	E/T
D + C	1−1000eV, T: 300−900K	E/T
D + WC	1−1000eV, T: 300−900K	E/T
D + BeO	1−1000eV, T: 300−900K	E/T
D + Be	1−1000eV, T: 300−900K	E/T
D + C	1−1000eV, T: 300−900K	E/T
D + WC	1−1000eV, T: 300−900K	E/T
D + BeO	1−1000eV, T: 300−900K	E/T
D + BeC	1−1000eV, T: 300−900K	E/T
D + W	1−1000eV, T: 300−900K	E/T
D + WC	1−1000eV, T: 300−900K	E/T

1430. Y. Igitkhanov, B Bazylev
Evaluation of energy and particle impact on the plasma facing components in DEMO
Fusion Eng. Des. 87, 520 (2012)

D + W	10−1000eV, T: undef	Th
He + W	10−1000eV, T: undef	Th
T + W	10−1000eV, T: undef	Th

1431. K. Dobes, P. Naderer, C. Hopf, T. Schwarz-Selinger, F Aumayr
Transient effects during sputtering of a-C:H surfaces by nitrogen ions
Nucl. Instrum. Methods Phys. Res. B 286, 20 (2012)

N_2 + H	500−1000eV, T: 460K	Exp
N_2 + C	500−1000eV, T: 460K	Exp

1432. BI. Khripunov, A. Brukhanov, OK. Chugunov, VM. Gureev, VS. Koidan, SN. Kornienko, BV. Kuteev, ST. Latushkin, AM. Muksunov, VB. Petrov, AI. Ryazanov, EV. Semenov, VP. Smirnov, VG. Stolyarova, VN Unezhev
Evidence of radiation damage impact on material erosion in plasma environment
J. Nucl. Mater. 390-91, 921 (2009)

D + W	100−250eV, T: 300K	Exp
D + C	100−250eV, T: 300K	Exp

1433. C. Bjorkas, N. Juslin, H. Timko, K. Vortler, K. Nordlund, K. Henriksson, P Erhart
Interatomic potentials for the Be-C-H system
J. Phys. Condens. Matter 21, 445002 (2009)

Be + Be	20−500eV, T: 320−670K	E/T
Be + Be	20−500eV, T: 320−670K	E/T

1434. MA El Fqih
Angular distribution of sputtered alloy. Experimental and simulated study
Eur. Phys. J. D 56, 167 (2010)

Kr + CuBe	2000−10000eV, T: undef	E/T

1435. K. Bystrov, J. Westerhout, M. Matveeva, A. Litnovsky, L. Marot, E. Zoethout, G De Temmerman
Erosion yields of carbon under various plasma conditions in Pilot-PSI
J. Nucl. Mater. 415, S149 (2011)

H + B	1−75eV, T: 900−2000K	Exp
H + C	1−75eV, T: 900−2000K	Exp

1436. AG. McLean, PC. Stangeby, BD. Bray, S. Brezinsek, NH. Brooks, JW. Davis, RC. Isler, A. Kirschner, R. Laengner, CJ. Lasnier, Y. Mu, J. Munoz, DL. Rudakov, O. Schmitz, EA. Unterberg, JG. Watkins, DG. Whyte, CPC Wong
Quantification of chemical erosion in the DIII-D divertor and implications for ITER
J. Nucl. Mater. 415, S141 (2011)

D + C	15−200eV, T: 300−1000K	Exp

1437. V. Liechtenstein, V. Jaggi, E. Olshanski, JA. Scheer, P. Wurz, SK Zeisler
Investigation of sputtering of thin diamond-like carbon (DLC) target foils by low energy light ions
Nucl. Instrum. Methods Phys. Res. A 613, 429 (2010)

T + C	1000−4000eV, T: undef	Exp
He + C	1000−4000eV, T: undef	Exp
H + C	1000−4000eV, T: undef	Exp
D + C	1000−4000eV, T: undef	Exp

1438. BI. Khripunov, AN. Brukhanov, VM. Gureev, VS. Koidan, SN. Kornienko, ST. Latushkin, VB. Petrov, AI. Ryazanov, EV. Semenov, VG. Stolyarova, VN. Unezhev, LS. Danelyan, VS. Kulikauskas, VV. Zatekin, VG. Vostrikov, EA Romanovsky
Plasma effect on tungsten damaged by high-energy alpha particles: Erosion and deuterium trapping
J. Nucl. Mater. 415, S649 (2011)

D + W	250eV, T: 400K	Exp
D + W	250eV, T: 400K	Exp
D + W	250eV, T: 400K	Exp
D + W	250eV, T: 400K	Exp
D + W	250eV, T: 400K	Exp

1439. T. Sizyuk, A Hassanein
Dynamic analysis and evolution of mixed materials bombarded with multiple ions beams
J. Nucl. Mater. 404, 60 (2010)

H + W	333−1000eV, T: 1000−1050K	E/T
C + W	333−1000eV, T: 1000−1050K	E/T
H + W	333−1000eV, T: 1000−1050K	E/T
C + W	333−1000eV, T: 1000−1050K	E/T

1440. J. Westerhout, D. Borodin, RS. Al, S. Brezinsek, MHJ. 't Hoen, A. Kirschner, S. Lisgo, HJ. van der Meiden, V. Philipps, MJ. van de Pol, AE. Shumack, G. De Temmerman, WAJ. Vijvers, GM. Wright, NJL. Cardozo, J. Rapp, GJ van Rooij
Chemical erosion of different carbon composites under ITER-relevant plasma conditions
Phys. Scr. T138, 014017 (2009)

H_2 + C	0.1−2.4eV(Te), T: ¡1000K	Exp

1441. JZ. Sun, SY. Li, T. Stirner, JL. Chen, DZ Wang
Molecular dynamics simulation of energy exchanges during hydrogen collision with graphite sheets
J. Appl. Phys. 107, 113533 (2010)

H + C	0.35−200eV, T: undef	Th
H + C	0.35−200eV, T: undef	Th
H + C	0.35−200eV, T: undef	Th

1442. C. Pardanaud, E. Areou, C. Martin, R. Ruffe, T. Angot, P. Roubin, C. Hopf, T. Schwarz-Selinger, W Jacob
Raman micro-spectroscopy as a tool to measure the absorption coefficient and the erosion rate of hydrogenated amorphous carbon films heat-treated under hydrogen bombardment
DIAMOND AND RELATED MATERIALS 22, 92 (2012)

H + H	undef, T: 300−830K	Exp
H + C	undef, T: 300−830K	Exp

1443. M. Balden, P. Starke, C. Garcia-Rosales, C. Adelhelm, PA. Sauter, I. Lopez-Galilea, N. Ordas, JMR. Fernandez, MM Escandell
Compilation of erosion yields of metal-doped carbon materials by deuterium impact from ion beam and low temperature plasma
J. Nucl. Mater. 417, 612 (2011)

D + Zr	30−200eV	Exp
D + Ti	30−200eV	Exp
D + C	30−200eV	Exp

1444. GJ. van Rooij, J. Westerhout, S. Brezinsek, J Rapp
Chemical erosion of carbon at ITER relevant plasma fluxes: Results from the linear plasma generator Pilot-PSI
J. Nucl. Mater. 415, S137 (2011)

H + C	0.2−2eV(Te), T: 400−1200K	Exp

1445. I. Tanarro, JA. Ferreira, VJ. Herrero, FL. Tabares, C Gomez-Aleixandre
Removal of carbon films by oxidation in narrow gaps: Thermo-oxidation and plasma-assisted studies
J. Nucl. Mater. 390-91, 696 (2009)

He + H	3eV(Te), T: undef	Exp
He + C	3eV(Te), T: undef	Exp
O_2 + H	3eV(Te), T: undef	Exp
O_2 + C	3eV(Te), T: undef	Exp

1446. K. Yada, N. Matsui, N. Ohno, S. Kajita, S. Takamura, M Takagi
Investigation of detached recombining deuterium plasma and carbon chemical erosion in the toroidal divertor simulator NAGDIS-T
J. Nucl. Mater. 390-91, 290 (2009)

D + C	0.1−0.4eV(Te), T: 600−1000K	Exp

1447. A. Kreter, S. Brezinsek, JP. Coad, HG. Esser, W. Fundamenski, V. Philipps, RA. Pitts, V. Rohde, T. Tanabe, A Widdowson
Dynamics of erosion and deposition in tokamaks
J. Nucl. Mater. 390-91, 38 (2009)

D + C	undef, T: undef	Exp
D + C	undef, T: undef	Exp

1448. T. Tanabe, K. Masaki, K. Sugiyama, M Yoshida
An overview of recent erosion/deposition and hydrogen retention studies in JT-60U
Phys. Scr. T138, 014006 (2009)

H + C	undef, T: 300−1200K	Exp
D + C	undef, T: 300−1200K	Exp
H + C	undef, T: 300−1200K	Exp
D + C	undef, T: 300−1200K	Exp

H + C	undef, T: 300−1200K	Exp
D + C	undef, T: 300−1200K	Exp
H + C	undef, T: 300−1200K	Exp
D + C	undef, T: 300−1200K	Exp
H + C	undef, T: 300−1200K	Exp
D + C	undef, T: 300−1200K	Exp
H + C	undef, T: 300−1200K	Exp
D + C	undef, T: 300−1200K	Exp

1449. VS. Koidan, AN. Brukhanov, OK. Chugunov, VM. Gureev, BI. Khripunov, SN. Kornienko, BV. Kuteev, ST. Latushkin, AM. Muksunov, VB. Petrov, AI. Ryazanov, VP. Smirnov, VG. Stolyarova, VN Unezhev
Influence of radiation damage on plasma facing material erosion
J. Nucl. Mater. 386-88, 261 (2009)

D + C	100eV, T: ¡340K	Exp
D + C	100eV, T: ¡340K	Exp

1450. S. Porro, G. De Temmerman, S. Lisgo, DL. Rudakov, A. Litnovsky, P. Petersson, P. John, JIB Wilson
Diamond coatings exposure to fusion-relevant plasma conditions
J. Nucl. Mater. 415, S161 (2011)

D + B	44eV(Te), T: 1050−1250K	Exp
D + C	44eV(Te), T: 1050−1250K	Exp
D + B	44eV(Te), T: 1050−1250K	Exp
D + C	44eV(Te), T: 1050−1250K	Exp
D + B	44eV(Te), T: 1050−1250K	Exp
D + C	44eV(Te), T: 1050−1250K	Exp
D + B	44eV(Te), T: 1050−1250K	Exp
D + C	44eV(Te), T: 1050−1250K	Exp

1451. P. Petersson, A. Kreter, G. Possnert, M Rubel
Nuclear micro-beam analysis of deuterium distribution in carbon fibre composites for controlled fusion devices
Nucl. Instrum. Methods Phys. Res. B 268, 1833 (2010)

D + C	undef, T: 470K	Exp
D + C	undef, T: 470K	Exp
D + C	undef, T: 470K	Exp
D + C	undef, T: 470K	Exp
D + C	undef, T: 470K	Exp

1452. JP. Allain, DL. Rokusek, SS. Harilal, M. Nieto-Perez, CH. Skinner, HW. Kugel, B. Heim, R. Kaita, R Majeski
Experimental studies of lithium-based surface chemistry for fusion plasma-facing materials applications
J. Nucl. Mater. 390-91,942 (2009)

He + Li	10−5000eV, T: undef	Exp
He + C	10−5000eV, T: undef	Exp

1453. R Majeski
Liquid Metal Walls, Lithium, And Low Recycling Boundary Conditions In Tokamaks
AIP Conf. Proc. 1237, 122 (2010)

D + Li	undef, T: 523−673K	Exp
D + Li	undef, T: 523−673K	Exp
D + Li	undef, T: 523−673K	Exp
D + Li	undef, T: 523−673K	Exp

1454. V. Tiron, S. Dobrea, C. Costin, G Popa
On the carbon and tungsten sputtering rate in a magnetron discharge
Nucl. Instrum. Methods Phys. Res. B 267, 434 (2009)

Ar + C	undef, T: undef	Exp
Ar + W	undef, T: undef	Exp

1455. C. Porosnicu, A. Anghel, K. Sugiyama, K. Krieger, J. Roth, CP Lungu
Influence of beryllium carbide formation on deuterium retention and release
J. Nucl. Mater. 415, S713 (2011)

D + C	200eV, T: 300K	Exp
D + Be	200eV, T: 300K	Exp
D + O	200eV, T: 300K	Exp
D + C	200eV, T: 300K	Exp
D + Be	200eV, T: 300K	Exp
D + O	200eV, T: 300K	Exp
D + C	200eV, T: 300K	Exp
D + Be	200eV, T: 300K	Exp
D + O	200eV, T: 300K	Exp
D + C	200eV, T: 300K	Exp
D + Be	200eV, T: 300K	Exp
D + O	200eV, T: 300K	Exp

1456. S. Ishikawa, K. Katayama, Y. Ohnishi, S. Fukada, M Nishikawa
Sorption and desorption behavior of hydrogen isotopes from tungsten deposits caused by deuterium gas or deuterium plasma exposure
Fusion Eng. Des. 87, 1390 (2012)

H + W	2.8−10eV(Te), T: 350−600K	Exp
D + W	2.8−10eV(Te), T: 350−600K	Exp
H + W	2.8−10eV(Te), T: 350−600K	Exp
D + W	2.8−10eV(Te), T: 350−600K	Exp

1457. BI. Khripunov, LS. Danelyan, VG. Vostrikov, VV. Zatekin, VS. Koidan, VS. Kulikauskas, ST. Latushkin, VB. Petrov, EA. Romanovsky, AI. Ryazanov, VN Unezhev
Accumulation of deuterium in radiation-damaged tungsten
JOURNAL OF SURFACE INVESTIGATION-X-RAY SYNCHROTRON AND NEUTRON TECHNIQUES 5, 272 (2011)

D + W	250eV, T: undef	Exp
D + W	250eV, T: undef	Exp
D + W	250eV, T: undef	Exp
D + W	250eV, T: undef	Exp

1458. B. Khripunov, V. Gureev, VS. Koidan, S. Latushkin, V. Petrov, A. Ryazanov, E. Semenov, V. Stolyarova, V. Unezhev, L. Danelyan, V. Kulikauskas, V Zatekin
Plasma impact on materials damaged by high-energy ions
Phys. Scr. T145, 14052 (2011)

D + C	100−250eV, T: ¡400K	Exp
D + W	100−250eV, T: ¡400K	Exp
D + C	100−250eV, T: ¡400K	Exp
D + W	100−250eV, T: ¡400K	Exp
D + C	100−250eV, T: ¡400K	Exp
D + W	100−250eV, T: ¡400K	Exp
D + C	100−250eV, T: ¡400K	Exp
D + W	100−250eV, T: ¡400K	Exp
D + C	100−250eV, T: ¡400K	Exp
D + W	100−250eV, T: ¡400K	Exp

1459. K. Katayama, S. Kasahara, S. Ishikawa, S. Fukada, M Nishikawa
Hydrogen incorporation in tungsten deposits growing by deuterium plasma sputtering
Fusion Eng. Des. 86, 1702 (2011)

D + W	undef, T: 330−470K	Exp
H + W	undef, T: 330−470K	Exp
O + W	undef, T: 330−470K	Exp
D + W	undef, T: 330−470K	Exp
H + W	undef, T: 330−470K	Exp
O + W	undef, T: 330−470K	Exp
D + W	undef, T: 330−470K	Exp
H + W	undef, T: 330−470K	Exp
O + W	undef, T: 330−470K	Exp
D + W	undef, T: 330−470K	Exp
H + W	undef, T: 330−470K	Exp
O + W	undef, T: 330−470K	Exp

1460. GM. Wright, J. Westerhout, RS. Al, E. Alves, LC. Alves, NP. Barradas, MA. van den Berg, D. Borodin, S. Brezinsek, S. Brons, HJN. van Eck, B. de Groot, AW. Kleyn, WR. Koppers, OG. Kruijt, J. Linke, NJL. Cardozo, M. Mayer, HJ. van der Meiden, PR. Prins, GJ. van Rooij, J. Scholten, AE. Shumack, PHM. Smeets, G. De Temmerman, WAJ. Vijvers, J Rapp
Materials research under ITER-like divertor conditions at FOM Rijnhuizen
J. Nucl. Mater. 417, 457 (2011)

$\mathbf{D^+ + Mo}$	0.1−3eV(Te), T: 500−1700K	Exp
$\mathbf{D^+ + W}$	0.1−3eV(Te), T: 500−1700K	Exp
$\mathbf{D^+ + Mo}$	0.1−3eV(Te), T: 500−1700K	Exp
$\mathbf{D^+ + W}$	0.1−3eV(Te), T: 500−1700K	Exp
$\mathbf{D^+ + Mo}$	0.1−3eV(Te), T: 500−1700K	Exp
$\mathbf{D^+ + W}$	0.1−3eV(Te), T: 500−1700K	Exp
$\mathbf{D^+ + Mo}$	0.1−3eV(Te), T: 500−1700K	Exp
$\mathbf{D^+ + W}$	0.1−3eV(Te), T: 500−1700K	Exp
H + Si	0.1−3eV(Te), T: 500−1700K	Exp
H + C	0.1−3eV(Te), T: 500−1700K	Exp

1461. DV. Kovalenko, NS. Klimov, VL. Podkovyrov, AD. Muzichenko, AM. Zhitlukhin, LN. Khimchenko, IB. Kupriyanov, RN Giniyatulin
First experiments at the QSPA-Be plasma gun facility
Phys. Scr. T145, 14065 (2011)

H + Be	undef, T: 300K	Exp

1462. YR. Niu, S. Suzuki, XB. Zheng, CX. Ding, JL. Chen, WJ. Wang, Y. Oya, K Okuno
Chemical states and deuterium retention behavior of vacuum plasma sprayed tungsten coatings
J. Nucl. Mater. 417, 551 (2011)

D + W	1000eV, T: 300K	Exp
D + W	1000eV, T: 300K	Exp
D + W	1000eV, T: 300K	Exp
D + W	1000eV, T: 300K	Exp

1463. Z. Somogyvari, GA. Langer, G. Erdelyi, L Balazs
Sputtering yields for low-energy Ar+- and Ne+-ion bombardment
Vacuum 86, 1979 (2012)

Ne + Fe	30−300eV, T: ¡373K	Exp
Ar + Fe	30−300eV, T: ¡373K	Exp
Ar + W	30−300eV, T: ¡373K	Exp
Ar + Mo	30−300eV, T: ¡373K	Exp

1464. JP. Roszell, AJ. Labelle, P. Brodersen, JW. Davis, AA Haasz
D retention in C- and O-contaminated tungsten during D+ irradiation
J. Nucl. Mater. 427, 193 (2012)

He + W	10−500eV, T: 300−500K	Exp
D + O	10−500eV, T: 300−500K	Exp
D + C	10−500eV, T: 300−500K	Exp
D + W	10−500eV, T: 300−500K	Exp
D + O	10−500eV, T: 300−500K	Exp
D + C	10−500eV, T: 300−500K	Exp
D + W	10−500eV, T: 300−500K	Exp
He + O	10−500eV, T: 300−500K	Exp
He + C	10−500eV, T: 300−500K	Exp
He + W	10−500eV, T: 300−500K	Exp
D + O	10−500eV, T: 300−500K	Exp
D + C	10−500eV, T: 300−500K	Exp
D + W	10−500eV, T: 300−500K	Exp
He + O	10−500eV, T: 300−500K	Exp
He + C	10−500eV, T: 300−500K	Exp
He + O	10−500eV, T: 300−500K	Exp
He + C	10−500eV, T: 300−500K	Exp
He + W	10−500eV, T: 300−500K	Exp
D + W	10−500eV, T: 300−500K	Exp
D + C	10−500eV, T: 300−500K	Exp
D + O	10−500eV, T: 300−500K	Exp
He + W	10−500eV, T: 300−500K	Exp
He + C	10−500eV, T: 300−500K	Exp
He + O	10−500eV, T: 300−500K	Exp

1465. C. Garcia-Rosales, I. Lopez-Galilea, N. Ordas, C. Adelhelm, M. Balden, G. Pintsuk, M. Grattarola, C Gualco
Ti-doped isotropic graphite: A promising armour material for plasma-facing components
J. Nucl. Mater. 386-88, 801 (2009)

D + Ti	30−200eV, T: 630−820K	Exp
D + C	30−200eV, T: 630−820K	Exp

1466. A. Ito, K. Ohya, K. Inai, H Nakamura
Dependency of Tritium Retention in Graphite on Temperature Control of Molecular Dynamics
Contrib. Plasma Phys. 50, 464 (2010)

H + C	30eV, T: 300−1500K	Th

1467. J Marian
Generation of an amorphous graphite substrate by cumulative deuterium bombardment using molecular dynamics with full nonbonded interactions
J. Appl. Phys. 109, 63501 (2011)

D + D	25eV, T: 1000K	Th
D + C	25eV, T: 1000K	Th
D + D	25eV, T: 1000K	Th
D + C	25eV, T: 1000K	Th
D + D	25eV, T: 1000K	Th
D + C	25eV, T: 1000K	Th
D + D	25eV, T: 1000K	Th
D + C	25eV, T: 1000K	Th

1468. R Neu
Benefits and Challenges of the Use of High-Z Plasma Facing Materials in Fusion Devices
AIP Conf. Proc. 1237, 62 (2010)

D + W	1−200eV, T: 300K	E/T
D + Mo	1−200eV, T: 300K	E/T
D + W	1−200eV, T: 300K	E/T
Ne + W	1−200eV, T: 300K	E/T
C + W	1−200eV, T: 300K	E/T
D + Mo	1−200eV, T: 300K	E/T
D + W	1−200eV, T: 300K	E/T
D + Mo	1−200eV, T: 300K	E/T
D + W	1−200eV, T: 300K	E/T
D + Mo	1−200eV, T: 300K	E/T
D + W	1−200eV, T: 300K	E/T
Kr + W	1−200eV, T: 300K	E/T
Ar + W	1−200eV, T: 300K	E/T

1469. N. Klimov, V. Podkovyrov, A. Zhitlukhin, D. Kovalenko, B. Bazylev, G. Janeschitz, I. Landman, S. Pestchanyi, G. Federici, A. Loarte, M. Merola, J. Linke, T. Hirai, J Compan
Experimental study of PFCs erosion under ITER-like transient loads at plasma gun facility QSPA
J. Nucl. Mater. 390-91, 721 (2009)

H + W	undef, T: undef	Exp

1470. T. Sizyuk, A Hassanein
Dynamic analysis of mixed ion beams/materials effects on the performance of ITER-like devices
J. Nucl. Mater. 415, S293 (2011)

H + W	333−1000eV, T: 453−1050K	Th
C + W	333−1000eV, T: 453−1050K	Th
H + W	333−1000eV, T: 453−1050K	Th
C + W	333−1000eV, T: 453−1050K	Th
C + W	333−1000eV, T: 453−1050K	Th
H + W	333−1000eV, T: 453−1050K	Th
C + W	333−1000eV, T: 453−1050K	Th
H + W	333−1000eV, T: 453−1050K	Th
C + W	333−1000eV, T: 453−1050K	Th
H + W	333−1000eV, T: 453−1050K	Th

1471. A.. Allouche, A.. Wiltner, Ch Linsmeier
Quantum modeling (DFT) and experimental investigation of beryllium-tungsten alloy formation
J. Phys. Condens. Matter 21, 355011 (2009)

Be + W	undef, T: undef	Th

1472. A. Allouche
Electronic aspects of beryllium-tungsten surface alloying, a density functional approach
Chem. Phys. Lett. 470, 119 (2009)

W + Be	undef, T: undef	Th
Be + W	undef, T: undef	Th

1473. P. E.. Lhuillier, T.. Belhabib, P.. Desgardin, B.. Courtois, T.. Sauvage, M. F.. Barthe, A. L.. Thomann, P.. Brault, Y. Tessier
Trapping and release of helium in tungsten
J. Nucl. Mater. 416, 13 (2011)

He + W	320−6000eV, T: 1873K	Exp

1474. Xiang-Shan. Kong, Yu-Wei. You, C. S.. Liu, Q. F.. Fang, Jun-Ling. Chen, G. -N. Luo
First principles study of hydrogen behaviors in hexagonal tungsten carbide
J. Nucl. Mater. 418, 233 (2011)

H + WC	undef, T: undef	Th

1475. Y. G.. Li, W. H.. Zhou, L. F.. Huang, Z.. Zeng, X. Ju
Cluster dynamics modeling of accumulation and diffusion of helium in neutron irradiated tungsten
J. Nucl. Mater. 431, 26 (2012)

He + W	30−1500eV, T: 300−873K	Th

1476. Bojan. Zajec, Vincenc. Nemanic, Cristian Ruset
Hydrogen diffusive transport parameters in W coating for fusion applications
J. Nucl. Mater. 412, 116 (2011)

H + EUROFER$_{97}$	undef, T: 673K	E/T
H + W	undef, T: 673K	E/T

1477. Xiang-Shan. Kong, Yu-Wei. You, J. H.. Xia, C. S.. Liu, Q. F.. Fang, G. -N.. Luo, Qun-Ying Huang
First principles study of intrinsic defects in hexagonal tungsten carbide
J. Nucl. Mater. 406, 323 (2010)

W + WC	undef, T: undef	Th
C + WC	undef, T: undef	Th

1478. Pengbo. Zhang, Jijun. Zhao, Bin Wen
Retention and diffusion of H, He, O, C impurities in Be
J. Nucl. Mater. 423, 164 (2012)

C + Be	undef, T: undef	Th
O + Be	undef, T: undef	Th
He + Be	undef, T: undef	Th
H + Be	undef, T: undef	Th

1479. Shuo. Jin, Yue-Lin. Liu, Hong-Bo. Zhou, Ying. Zhang, Guang-Hong Lu
First-principles investigation on the effect of carbon on hydrogen trapping in tungsten
J. Nucl. Mater. 415, S709 (2011)

H + W	undef, T: undef	Th
H + C	undef, T: undef	Th

1480. Yue-Lin. Liu, Hong-Bo. Zhou, Ying. Zhang, Chen Duan
Point defect concentrations of impurity carbon in tungsten
Comp. Mater. Sci. 62, 282 (2012)

C + W	undef, T: 300−1000K	Th

1481. M.. Reinelt, A.. Allouche, M.. Oberkofler, Ch Linsmeier
Retention mechanisms and binding states of deuterium implanted into beryllium
New J. Phys. 11, 43023 (2009)

D + O	1000eV, T: 300−1000K	Exp
D + Be	1000eV, T: 300−1000K	Exp
D + O	1000eV, T: 300−1000K	Exp
D + Be	1000eV, T: 300−1000K	Exp
D + O	1000eV, T: 300−1000K	Exp

D + Be	1000eV, T: 300−1000K	Exp
D + O	1000eV, T: 300−1000K	Exp
D + Be	1000eV, T: 300−1000K	Exp
D + O	1000eV, T: 300−1000K	Exp
D + Be	1000eV, T: 300−1000K	Exp

1482. T. Ikeda, T. Otsuka, T Tanabe
Determination of hydrogen diffusivity and permeability in W near room temperature applying a tritium tracer technique
J. Nucl. Mater. 415, S684 (2011)

T + Ni	undef, T: 285−1000K	Exp
T + W	undef, T: 285−1000K	Exp
H + Ni	undef, T: 285−1000K	Exp
H + W	undef, T: 285−1000K	Exp

1483. I. Takagi, R. Imade, Y. Ikegami, M. Akiyoshi, K. Moritani, T. Sasaki, H Moriyama
Deuterium recombination coefficients on tungsten exposed to RF plasma
J. Nucl. Mater. 417, 564 (2011)

D + W	undef, T: 426−654K	Exp

1484. YF. Hua, ZX. Li, X. Zhang, JH. Du, CL. Huang, MH Du
Inter-diffusion analysis of joint interface of tungsten-rhenium couple
J. Nucl. Mater. 416, 270 (2011)

W + Re	undef, T: 1373−1673K	Exp
W + W	undef, T: 1373−1673K	Exp
Re + Re	undef, T: 1373−1673K	Exp
Re + W	undef, T: 1373−1673K	Exp

1485. XS. Kong, YW. You, C. Song, QF. Fang, JL. Chen, GN. Luo, CS Liu
First principles study of foreign interstitial atom (carbon, nitrogen) interactions with intrinsic defects in tungsten
J. Nucl. Mater. 430, 270 (2012)

N + W	undef, T: undef	Th
C + W	undef, T: undef	Th

1486. Y. Zayachuk, MHJ. 't Hoen, I. Uytdenhouwen, G Van Oost
Thermal desorption spectroscopy of W-Ta alloys, exposed to high-flux deuterium plasma
Phys. Scr. T145, 14041 (2011)

D + Ta	50eV, T: undef	Exp
D + W	50eV, T: undef	Exp

1487. K. Ohsawa, K. Eguchi, H. Watanabe, M. Yamaguchi, M Yagi
Configuration and binding energy of multiple hydrogen atoms trapped in monovacancy in bcc transition metals
Phys. Rev. B 85, 94102 (2012)

H + Fe	undef, T: undef	Th
H + W	undef, T: undef	Th
H + Mo	undef, T: undef	Th
H + Cr	undef, T: undef	Th
H + Ta	undef, T: undef	Th
H + Nb	undef, T: undef	Th
H + V	undef, T: undef	Th

1488. Q. Xu, K. Sato, T Yoshiie
Interaction of tritium plasma and defects in tungsten irradiated with neutrons
J. Nucl. Mater. 390-91, 663 (2009)

T + W	1000eV, T: 473−873K	Th

1489. U. von Toussaint, S. Gori, A. Manhard, T. Hoschen, C Hoschen
Molecular dynamics study of grain boundary diffusion of hydrogen in tungsten
Phys. Scr. T145, 14036 (2011)

H + W	undef, T: 300−1000K	Th

1490. T. Hoshihira, T. Otsuka, R. Wakabayashi, T Tanabe
Hydrogen behavior near surface regions in Mo and W studied by tritium tracer technique
J. Nucl. Mater. 417, 559 (2011)

T + Mo	undef, T: 273−323K	Exp
H + Mo	undef, T: 273−323K	Exp
T + W	undef, T: 273−323K	Exp
H + W	undef, T: 273−323K	Exp

1491. YL. Liu, HB. Zhou, S. Jin, Y. Zhang, GH Lu
Dissolution and diffusion properties of carbon in tungsten
J. Phys. Condens. Matter 22, 445504 (2010)

C + W	undef, T: 100−1200K	Th

1492. W. Xiao, WT Geng
Role of grain boundary and dislocation loop in H blistering in W: A density functional theory assessment
J. Nucl. Mater. 430, 132 (2012)

H + W	undef, T: undef	Th

1493. CJ. Ortiz, MJ. Caturla, CC. Fu, F Willaime
Influence of carbon on the kinetics of He migration and clustering in alpha-Fe from first principles
Phys. Rev. B 80, 134109 (2009)

C + He	undef, T: 300−573K	Th
C + Fe	undef, T: 300−573K	Th

1494. CS. Becquart, C Domain
An object Kinetic Monte Carlo Simulation of the dynamics of helium and point defects in tungsten
J. Nucl. Mater. 385, 223 (2009)

He + W	undef, T: 1−1000K	Th

1495. WW. Basuki, J Aktaa
Investigation on the diffusion bonding of tungsten and EUROFER97
J. Nucl. Mater. 417, 524 (2011)

H + EUROFER$_{97}$	undef, T: 1323K	Exp
C + EUROFER$_{97}$	undef, T: 1323K	Exp
S + EUROFER$_{97}$	undef, T: 1323K	Exp
Ca + EUROFER$_{97}$	undef, T: 1323K	Exp
P + EUROFER$_{97}$	undef, T: 1323K	Exp
Fe + EUROFER$_{97}$	undef, T: 1323K	Exp
Cr + EUROFER$_{97}$	undef, T: 1323K	Exp
W + EUROFER$_{97}$	undef, T: 1323K	Exp

1496. SI. Kim, CW Lee
Impurity behaviors of nitrogen in W-C-N thin diffusion barriers for Cu metallization schemes
J. Electroceram. 23, 488 (2009)

N + W	undef, T: 300−1000K	Exp
N + C	undef, T: 300−1000K	Exp
N + N	undef, T: 300−1000K	Exp
Cu + W	undef, T: 300−1000K	Exp
Cu + C	undef, T: 300−1000K	Exp
Cu + N	undef, T: 300−1000K	Exp

1497. VB. Vykhodets, TE. Kurennykh, AG. Kesarev, MV. Kuznetsov, VV. Kondrat'ev, C. Hulsen, U Koester
Diffusion of insoluble carbon in zirconium oxides
JETP Letters 93, 5 (2011)

C + $\mathbf{ZrO_2}$	undef, T: 1173−1273K	Exp

1498. W. Xiao, GN. Luo, WT Geng
Threshold concentration for H blistering in defect free W
J. Nucl. Mater. 421, 176 (2012)

H + W	undef, T: undef	Th

1499. A. Alkhamees, YL. Liu, HB. Zhou, S. Jin, Y. Zhang, GH Lu
First-principles investigation on dissolution and diffusion of oxygen in tungsten
J. Nucl. Mater. 393, 508 (2009)

O + W	undef, T: 300−1000K	Th

1500. A. Moitra, K Solanki
Adsorption and penetration of hydrogen in W: A first principles study
Comp. Mater. Sci. 50, 2291 (2011)

H + W	undef, T: ¿300K	Th

1501. MJ. Baldwin, RP. Doerner, D. Nishijima, K. Tokunaga, Y Ueda
The effects of high fluence mixed-species (deuterium, helium, beryllium) plasma interactions with tungsten
J. Nucl. Mater. 390-91, 886 (2009)

$\mathbf{D_2}$ + W	¡75eV, T: 1070−1320K	Exp
Be + W	¡75eV, T: 1070−1320K	Exp
He + W	¡75eV, T: 1070−1320K	Exp

1502. M. Nieto-Perez, G. Ramos, JP Allain
Modeling of Beryllium-Carbon Dynamics in the ITER Divertor Region
2009 23RD IEEE/NPSS SYMPOSIUM ON FUSION ENGINEERING ,424 (2009)

$\mathbf{D_3^+}$ + C	13.3−48.5eV, T: undef	Th
$\mathbf{D_2^+}$ + C	13.3−48.5eV, T: undef	Th
$\mathbf{D^+}$ + C	13.3−48.5eV, T: undef	Th
Be + C	13.3−48.5eV, T: undef	Th
C + C	13.3−48.5eV, T: undef	Th
T + C	13.3−48.5eV, T: undef	Th

1503. V. Nemanic, B. Zajec, M. Zumer, C. Porosnicu, CP Lungu
Hydrogen permeability of beryllium films prepared by the thermionic vacuum arc method
Fusion Eng. Des. 86, 2421 (2011)

H + Be	undef, T: 673K	Exp

1504. M. Oberkofler, M. Reinelt, C Linsmeier
Retention and release mechanisms of deuterium implanted into beryllium
Nucl. Instrum. Methods Phys. Res. B 269, 1266 (2011)

D_3^+ + Be	400−3000eV, T: 300K	Exp
D_2^+ + Be	400−3000eV, T: 300K	Exp
D_3^+ + Be	400−3000eV, T: 300K	Exp
D_2^+ + Be	400−3000eV, T: 300K	Exp
D_3^+ + Be	400−3000eV, T: 300K	Exp
D_2^+ + Be	400−3000eV, T: 300K	Exp
D_3^+ + Be	400−3000eV, T: 300K	Exp
D_2^+ + Be	400−3000eV, T: 300K	Exp

1505. HY. Peng, HT. Lee, Y. Ohtsuka, Y Ueda
Ion-driven permeation of deuterium in tungsten by deuterium and carbon-mixed ion irradiation
Phys. Scr. T145, 14046 (2011)

D^+ + W	1000eV, T: 550−1050K	Exp
D_2^+ + W	1000eV, T: 550−1050K	Exp
D_3^+ + W	1000eV, T: 550−1050K	Exp
C + W	1000eV, T: 550−1050K	Exp

1506. A. Anghel, C. Porosnicu, CP. Lungu, K. Sugiyama, C. Krieger, J Roth
Influence of thermal treatment on beryllium/carbon formation and fuel retention
J. Nucl. Mater. 416, 9 (2011)

Be + Be	200eV, T: 300−1023K	Exp
Be + O	200eV, T: 300−1023K	Exp
Be + C	200eV, T: 300−1023K	Exp
O + Be	200eV, T: 300−1023K	Exp
O + O	200eV, T: 300−1023K	Exp
O + C	200eV, T: 300−1023K	Exp
C + Be	200eV, T: 300−1023K	Exp
C + O	200eV, T: 300−1023K	Exp
C + C	200eV, T: 300−1023K	Exp
D + Be	200eV, T: 300−1023K	Exp
D + O	200eV, T: 300−1023K	Exp
D + C	200eV, T: 300−1023K	Exp
D + Be	200eV, T: 300−1023K	Exp
D + O	200eV, T: 300−1023K	Exp
D + C	200eV, T: 300−1023K	Exp
D + Be	200eV, T: 300−1023K	Exp
D + O	200eV, T: 300−1023K	Exp
D + C	200eV, T: 300−1023K	Exp
D + Be	200eV, T: 300−1023K	Exp
D + O	200eV, T: 300−1023K	Exp
D + C	200eV, T: 300−1023K	Exp

1507. K. Vortler, K Nordlund
Molecular Dynamics Simulations of Deuterium Trapping and Re-emission in Tungsten Carbide
J. Phys. Chem. C 114, 5382 (2010)

D + WC	100−300eV, T: 600K	Th
Ar + WC	100−300eV, T: 600K	Th
W + WC	100−300eV, T: 600K	Th
C + WC	100−300eV, T: 600K	Th

He + WC	100−300eV, T: 600K	Th
He + WC	100−300eV, T: 600K	Th
Ar + WC	100−300eV, T: 600K	Th
Ne + WC	100−300eV, T: 600K	Th
D + WC	100−300eV, T: 600K	Th

1508. OV. Ogorodnikova, K. Sugiyama, A. Markin, Y. Gasparyan, V. Efimov, A. Manhard, M Balden
Effect of nitrogen seeding into deuterium plasma on deuterium retention in tungsten
Phys. Scr. T145, 14034 (2011)

$\mathbf{D^{+} + W}$	20−60eV, T: 320−593K	Exp
$\mathbf{D_2^{+} + W}$	20−60eV, T: 320−593K	Exp
$\mathbf{D_3^{+} + W}$	20−60eV, T: 320−593K	Exp
He + W	20−60eV, T: 320−593K	Exp
$\mathbf{D^{+} + W}$	20−60eV, T: 320−593K	Exp
$\mathbf{D_2^{+} + W}$	20−60eV, T: 320−593K	Exp
$\mathbf{D_3^{+} + W}$	20−60eV, T: 320−593K	Exp
He + W	20−60eV, T: 320−593K	Exp
$\mathbf{D^{+} + W}$	20−60eV, T: 320−593K	Exp
$\mathbf{D_2^{+} + W}$	20−60eV, T: 320−593K	Exp
$\mathbf{D_3^{+} + W}$	20−60eV, T: 320−593K	Exp
He + W	20−60eV, T: 320−593K	Exp
$\mathbf{D^{+} + W}$	20−60eV, T: 320−593K	Exp
$\mathbf{D_2^{+} + W}$	20−60eV, T: 320−593K	Exp
$\mathbf{D_3^{+} + W}$	20−60eV, T: 320−593K	Exp
He + W	20−60eV, T: 320−593K	Exp

1509. M. Shimada, G. Cao, Y. Hatano, T. Oda, Y. Oya, M. Hara, P Calderoni
The deuterium depth profile in neutron-irradiated tungsten exposed to plasma
Phys. Scr. T145, 14051 (2011)

D + W	100eV, T: 300−1000K	E/T
D + W	100eV, T: 300−1000K	E/T
D + W	100eV, T: 300−1000K	E/T
D + W	100eV, T: 300−1000K	E/T

1510. K. Bystrov, J. Westerhout, M. Matveeva, A. Litnovsky, L. Marot, E. Zoethout, G De Temmerman
Erosion yields of carbon under various plasma conditions in Pilot-PSI
J. Nucl. Mater. 415, S149 (2011)

H + C	1−75eV, T: undef	Exp

1511. K. Schmid, J Roth
Erosion processes due to energetic particle-surface interaction
AIP Conf. Proc. 1237, 18 (2010)

Ar + W	10−10000eV, T: 300−1300K	Th
D + Be	10−10000eV, T: 300−1300K	Th
D + W	10−10000eV, T: 300−1300K	Th
Ar + Be	10−10000eV, T: 300−1300K	Th
H + H	10−10000eV, T: 300−1300K	Th
H + C	10−10000eV, T: 300−1300K	Th
He + Be	10−10000eV, T: 300−1300K	Th
T + C	10−10000eV, T: 300−1300K	Th
$\mathbf{D^{+} + C}$	10−10000eV, T: 300−1300K	Th
$\mathbf{H^{+} + C}$	10−10000eV, T: 300−1300K	Th

1512. K. Sugiyama, K. Krieger, M. Mayer, S. Lindig, M. Balden, T Durbeck
Deuterium retention in bulk tungsten exposed to the outer divertor plasma of ASDEX Upgrade
Phys. Scr. T145, 14033 (2011)

D + W	38−500eV, T: 473−673K	Exp
D + W	38−500eV, T: 473−673K	Exp
D + W	38−500eV, T: 473−673K	Exp
D + W	38−500eV, T: 473−673K	Exp

1513. I. Bizyukov, K. Krieger, H. Lee, K. Schmid, AA. Haasz, JW Davis
An overview of sputtering-related processes occurring at mixed surfaces formed by simultaneous C+ and D+ irradiation of W
J. Nucl. Mater. 427, 401 (2012)

He^{+} + W	100−6000eV, T: 300−2000K	E/T
C^{+} + W	100−6000eV, T: 300−2000K	E/T
C + WC	100−6000eV, T: 300−2000K	E/T
C + C	100−6000eV, T: 300−2000K	E/T
C + W	100−6000eV, T: 300−2000K	E/T

1514. RD. Kolasinski, KR. Umstadter, JP. Sharpe, RA. Causey, RJ. Pawelko, JA. Whaley, DA. Buchenauer, M Shimada
The impact of specific surface area on the retention of deuterium in carbon fiber composite materials
Fusion Eng. Des. 84, 1068 (2009)

D^{+} + C	130−150eV, T: 473K	Exp
D^{+} + C	130−150eV, T: 473K	Exp
D^{+} + C	130−150eV, T: 473K	Exp
D^{+} + C	130−150eV, T: 473K	Exp

1515. CS. Becquart, MF. Barthe, A De Backer
Modelling radiation damage and He production in tungsten
Phys. Scr. T145, 14048 (2011)

He + W	undef, T: undef	Th

1516. A. Rai, A. Mutzke, R Schneider
Modeling of chemical erosion of graphite due to hydrogen by inclusion of chemical reactions in SDTrimSP
Nucl. Instrum. Methods Phys. Res. B 268, 2639 (2010)

H^{+} + C	10−1000eV, T: 200−1000K	Th
Ar^{+} + H	10−1000eV, T: 200−1000K	Th
Ar^{+} + C	10−1000eV, T: 200−1000K	Th
H^{+} + C	10−1000eV, T: 200−1000K	Th
Ar^{+} + H	10−1000eV, T: 200−1000K	Th
Ar^{+} + C	10−1000eV, T: 200−1000K	Th

1517. RD. Kolasinski, M. Shimada, DA. Buchenauer, RA. Causey, T. Otsuka, WM. Clift, JM. Shea, TR. Allen, P. Calderoni, JP Sharpe
Characterization of surface morphology and retention in tungsten materials exposed to high fluxes of deuterium ions in the tritium plasma experiment
Phys. Scr. T138, 14042 (2009)

D + W	70eV, T: 420−927K	Exp
D + W	70eV, T: 420−927K	Exp
D + W	70eV, T: 420−927K	Exp
D + W	70eV, T: 420−927K	Exp

1518. T. Ogawa, A. Hasegawa, H. Kurishita, S Nogami
Improvement of Surface Exfoliation Behavior by Helium-ion Bombardment of a Tungsten Alloy Fabricated by Mechanical Alloying
J. Nucl. Sci. Technol. 46, 717 (2009)

He^{+} + W	undef, T: 298−823K	Exp

1519. RP. Doerner, MJ. Baldwin, D. Nishijima, J. Roth, K Schmid
Impact of beryllium surface layers on deuterium retention in tungsten
J. Nucl. Mater. 415, S717 (2011)

Be + Be	50−60eV, T: 573K	Exp
Be + W	50−60eV, T: 573K	Exp
D + Be	50−60eV, T: 573K	Exp
D + W	50−60eV, T: 573K	Exp
D + W	50−60eV, T: 573K	Exp
Be + Be	50−60eV, T: 573K	Exp
Be + W	50−60eV, T: 573K	Exp
D + Be	50−60eV, T: 573K	Exp
D + W	50−60eV, T: 573K	Exp
Be + Be	50−60eV, T: 573K	Exp
Be + W	50−60eV, T: 573K	Exp
D + Be	50−60eV, T: 573K	Exp
D + W	50−60eV, T: 573K	Exp
Be + Be	50−60eV, T: 573K	Exp
Be + W	50−60eV, T: 573K	Exp
D + Be	50−60eV, T: 573K	Exp

1520. CH Skinner
Tritium Retention and Removal in Tokamaks
2ND ITER INTERNATIONAL SUMMER SCHOOL: CONFINEMENT 1095, 127 (2009)

T + C	undef, T: undef	Th
T + C	undef, T: undef	Th
T + C	undef, T: undef	Th
T + C	undef, T: undef	Th

1521. K. Sugiyama, J. Roth, A. Anghel, C. Porosnicu, M. Baldwin, R. Doerner, K. Krieger, CP Lungu
Consequences of deuterium retention and release from Be-containing mixed materials for ITER Tritium Inventory Control
J. Nucl. Mater. 415, S731 (2011)

D_3^{+} + Be	600eV, T: 623K	Exp
D_3^{+} + C	600eV, T: 623K	Exp
D_3^{+} + W	600eV, T: 623K	Exp
D_3^{+} + Be	600eV, T: 623K	Exp
D_3^{+} + C	600eV, T: 623K	Exp
D_3^{+} + W	600eV, T: 623K	Exp
D_3^{+} + Be	600eV, T: 623K	Exp
D_3^{+} + C	600eV, T: 623K	Exp
D_3^{+} + W	600eV, T: 623K	Exp
D_3^{+} + Be	600eV, T: 623K	Exp
D_3^{+} + W	600eV, T: 623K	Exp
D_3^{+} + C	600eV, T: 623K	Exp

1522. VK. Alimov, J. Roth, WM. Shu, DA. Komarov, K. Isobe, T Yamanishi
Deuterium trapping in tungsten deposition layers formed by deuterium plasma sputtering
J. Nucl. Mater. 399, 225 (2010)

He + W	170−340eV, T: 300−700K	Exp
D + W	170−340eV, T: 300−700K	Exp
Ar + W	170−340eV, T: 300−700K	Exp
D + W	170−340eV, T: 300−700K	Exp
Ar + W	170−340eV, T: 300−700K	Exp

He + W	170−340eV, T: 300−700K	Exp
D + W	170−340eV, T: 300−700K	Exp
Ar + W	170−340eV, T: 300−700K	Exp
He + W	170−340eV, T: 300−700K	Exp
D + W	170−340eV, T: 300−700K	Exp
Ar + W	170−340eV, T: 300−700K	Exp
He + W	170−340eV, T: 300−700K	Exp

1523. M. Fukumoto, T. Nakano, K. Itami, T. Wada, Y. Ueda, T Tanabe
Effects of carbon impurity on deuterium retention in VPS-tungsten coatings exposed to JT-60U divertor plasmas
J. Nucl. Mater. 415, S705 (2011)

C + C	undef, T: 1073K	Exp
C + W	undef, T: 1073K	Exp

1524. V. Rohde, M. Mayer, V. Mertens, R. Neu, K Sugiyama
Dynamic and static deuterium inventory in ASDEX Upgrade with tungsten first wall
Nucl. Fusion 49, 85031 (2009)

C + C	undef, T: undef	Exp
D + W	undef, T: undef	Exp
D + C	undef, T: undef	Exp
C + W	undef, T: undef	Exp
C + C	undef, T: undef	Exp
D + W	undef, T: undef	Exp
D + C	undef, T: undef	Exp
C + W	undef, T: undef	Exp
C + C	undef, T: undef	Exp
D + W	undef, T: undef	Exp
D + C	undef, T: undef	Exp
C + W	undef, T: undef	Exp
C + C	undef, T: undef	Exp
C + W	undef, T: undef	Exp
D + C	undef, T: undef	Exp
D + W	undef, T: undef	Exp

1525. OV. Ogorodnikova, T. Schwarz-Selinger, K. Sugiyama, VK Alimov
Deuterium retention in tungsten exposed to low-energy pure and helium-seeded deuterium plasmas
J. Appl. Phys. 109, 13309 (2011)

D_3^+ + W	30−60eV, T: 300−700K	Exp
D_2^+ + W	30−60eV, T: 300−700K	Exp
D^+ + W	30−60eV, T: 300−700K	Exp
He^+ + W	30−60eV, T: 300−700K	Exp
D_3^+ + W	30−60eV, T: 300−700K	Exp
D_2^+ + W	30−60eV, T: 300−700K	Exp
D^+ + W	30−60eV, T: 300−700K	Exp
He^+ + W	30−60eV, T: 300−700K	Exp
D_3^+ + W	30−60eV, T: 300−700K	Exp
D_2^+ + W	30−60eV, T: 300−700K	Exp
D^+ + W	30−60eV, T: 300−700K	Exp
He^+ + W	30−60eV, T: 300−700K	Exp
D_3^+ + W	30−60eV, T: 300−700K	Exp
D_2^+ + W	30−60eV, T: 300−700K	Exp
D^+ + W	30−60eV, T: 300−700K	Exp
He^+ + W	30−60eV, T: 300−700K	Exp

1526. J. Roth, K Schmid
Hydrogen in tungsten as plasma-facing material
Phys. Scr. T145, 14031 (2011)

D + W	38eV, T: 285−1000K	E/T
He + W	38eV, T: 285−1000K	E/T
D + W	38eV, T: 285−1000K	E/T
He + W	38eV, T: 285−1000K	E/T
D + W	38eV, T: 285−1000K	E/T
He + W	38eV, T: 285−1000K	E/T
D + W	38eV, T: 285−1000K	E/T
He + W	38eV, T: 285−1000K	E/T
H + W	38eV, T: 285−1000K	E/T

1527. S. Ishikawa, K. Katayama, Y. Ohnishi, S. Fukada, M Nishikawa
Sorption and desorption behavior of hydrogen isotopes from tungsten deposits caused by deuterium gas or deuterium plasma exposure
Fusion Eng. Des. 87, 1390 (2012)

D + W	2.8−10eV(Te), T: 573K	Exp
H + W	2.8−10eV(Te), T: 573K	Exp
D + W	2.8−10eV(Te), T: 573K	Exp
H + W	2.8−10eV(Te), T: 573K	Exp
D + W	2.8−10eV(Te), T: 573K	Exp
H + W	2.8−10eV(Te), T: 573K	Exp
D + W	2.8−10eV(Te), T: 573K	Exp
H + W	2.8−10eV(Te), T: 573K	Exp

1528. T. Fujiki, K. Katayama, S. Kasahara, S. Fukada, M Nishikawa
Effect of oxygen on hydrogen retention in W deposition layers formed by hydrogen RF plasma
Fusion Eng. Des. 85, 1094 (2010)

H + W	undef, T: 373−1073K	Exp
H + O	undef, T: 373−1073K	Exp
D + W	undef, T: 373−1073K	Exp
D + O	undef, T: 373−1073K	Exp
H + W	undef, T: 373−1073K	Exp
H + O	undef, T: 373−1073K	Exp
D + W	undef, T: 373−1073K	Exp
D + W	undef, T: 373−1073K	Exp
H + O	undef, T: 373−1073K	Exp
H + W	undef, T: 373−1073K	Exp
D + O	undef, T: 373−1073K	Exp
D + W	undef, T: 373−1073K	Exp
H + O	undef, T: 373−1073K	Exp
H + W	undef, T: 373−1073K	Exp
D + O	undef, T: 373−1073K	Exp
D + O	undef, T: 373−1073K	Exp

1529. A. Debelle, PE. Lhuillier, MF. Barthe, T. Sauvage, P Desgardin
Helium desorption in He-3 implanted tungsten at low fluence and low energy
Nucl. Instrum. Methods Phys. Res. B 268, 223 (2010)

He + W	undef, T: 200−2000K	Exp
He + He	undef, T: 200−2000K	Exp
He + W	undef, T: 200−2000K	Exp
He + He	undef, T: 200−2000K	Exp

1530. K. Ohya, A Kirschner
Simulation of hydrogen retention and re-emission from tungsten exposed to divertor plasmas
Phys. Scr. T145, 14047 (2011)

$\mathbf{D_3^+ + W}$	100eV, T: ¿298K	Th
$\mathbf{D_3^+ + W}$	100eV, T: ¿298K	Th
$\mathbf{D_3^+ + W}$	100eV, T: ¿298K	Th
$\mathbf{D_3^+ + W}$	100eV, T: ¿298K	Th

1531. M. Mayer, V. Rohde, K. Sugiyama, JL. Chen, X. Gong, C. Hopf, J. Likonen, S. Lindig, R. Neu, G. Ramos, E. Vainonen-Ahlgren, A Wiltner
Carbon balance and deuterium inventory from a carbon dominated to a full tungsten ASDEX Upgrade
J. Nucl. Mater. 390-91, 538 (2009)

B + W	undef, T: undef	Exp
C + W	undef, T: undef	Exp
D + W	undef, T: undef	Exp
B + W	undef, T: undef	Exp
C + W	undef, T: undef	Exp
D + W	undef, T: undef	Exp
B + W	undef, T: undef	Exp
C + W	undef, T: undef	Exp
D + W	undef, T: undef	Exp
B + W	undef, T: undef	Exp
C + W	undef, T: undef	Exp
D + W	undef, T: undef	Exp

1532. GM. Wright, M. Mayer, K. Ertl, G. de Saint-Aubinc, J Rapp
TMAP7 simulations of deuterium trapping in pre-irradiated tungsten exposed to high-flux plasma
J. Nucl. Mater. 415, S636 (2011)

D + W	undef, T: 360−950K	Th
D + W	undef, T: 360−950K	Th

1533. GN. Luo, K. Umstadter, WM. Shu, W. Wampler, GH Lu
Behavior of tungsten with exposure to deuterium plasmas
Nucl. Instrum. Methods Phys. Res. B 267, 3041 (2009)

D + W	¡100eV, T: 300−900K	Exp
D + W	¡100eV, T: 300−900K	Exp
D + W	¡100eV, T: 300−900K	Exp
D + W	¡100eV, T: 300−900K	Exp

1534. E. Alves, LC. Alves, NP. Barradas, R. Mateus, PA. Carvalho, GM Wright
Influence of temperature and plasma composition on deuterium retention in refractory metals
Nucl. Instrum. Methods Phys. Res. B 268, 2124 (2010)

$\mathbf{D^+ + Mo}$	3eV(Te), T: undef	Exp
$\mathbf{D^+ + W}$	3eV(Te), T: undef	Exp
$\mathbf{D^+ + Mo}$	3eV(Te), T: undef	Exp
$\mathbf{D^+ + W}$	3eV(Te), T: undef	Exp
$\mathbf{D^+ + Mo}$	3eV(Te), T: undef	Exp
$\mathbf{D^+ + W}$	3eV(Te), T: undef	Exp
$\mathbf{D^+ + Mo}$	3eV(Te), T: undef	Exp
$\mathbf{D^+ + W}$	3eV(Te), T: undef	Exp

1535. K. Okamoto, H. Zushi, Y. Hirooka, R. Bhattacharyay, M. Sakamoto, M Sato
Surface temperature effects on the retention and pressure variation in continuous and cyclic plasma exposures on the tungsten
J. Nucl. Mater. 390-91, 671 (2009)

He + WC	¡25eV, T: 400−1000K	Exp
H + WC	¡25eV, T: 400−1000K	Exp
He + WC	¡25eV, T: 400−1000K	Exp
H + WC	¡25eV, T: 400−1000K	Exp
He + WC	¡25eV, T: 400−1000K	Exp
H + WC	¡25eV, T: 400−1000K	Exp
He + WC	¡25eV, T: 400−1000K	Exp
H + WC	¡25eV, T: 400−1000K	Exp

1536. OV. Ogorodnikova, B. Tyburska, VK. Alimov, K Ertl
The influence of radiation damage on the plasma-induced deuterium retention in self-implanted tungsten
J. Nucl. Mater. 415, S661 (2011)

D^+ + W	38−60eV, T: 300−800K	E/T
D^+ + W	38−60eV, T: 300−800K	E/T
D^+ + W	38−60eV, T: 300−800K	E/T
D^+ + W	38−60eV, T: 300−800K	E/T
D^+ + W	38−60eV, T: 300−800K	E/T

1537. C. Porosnicu, A. Anghel, K. Sugiyama, K. Krieger, J. Roth, CP Lungu
Influence of beryllium carbide formation on deuterium retention and release
J. Nucl. Mater. 415, S713 (2011)

D + C	200eV, T: 300K	Exp
D + Be	200eV, T: 300K	Exp
D + C	200eV, T: 300K	Exp
D + Be	200eV, T: 300K	Exp
D + C	200eV, T: 300K	Exp
D + Be	200eV, T: 300K	Exp
D + C	200eV, T: 300K	Exp
D + Be	200eV, T: 300K	Exp

1538. VK. Alimov, B. Tyburska-Puschel, Y. Hatano, J. Roth, K. Isobe, M. Matsuyama, T Yamanishi
The effect of displacement damage on deuterium retention in ITER-grade tungsten exposed to low-energy, high-flux pure and helium-seeded deuterium plasmas
J. Nucl. Mater. 420, 370 (2012)

He^+ + W	76eV, T: 400−750K	Exp
$D_2{}^+$ + W	76eV, T: 400−750K	Exp
He^+ + W	76eV, T: 400−750K	Exp
$D_2{}^+$ + W	76eV, T: 400−750K	Exp
He^+ + W	76eV, T: 400−750K	Exp
$D_2{}^+$ + W	76eV, T: 400−750K	Exp
He^+ + W	76eV, T: 400−750K	Exp
$D_2{}^+$ + W	76eV, T: 400−750K	Exp

1539. PE. Lhuillier, A. Debelle, T. Belhabib, AL. Thomann, P. Desgardin, T. Sauvage, MF. Barthe, P. Brault, Y Tessier
Helium desorption in He-3 implanted tungsten at low energy
J. Nucl. Mater. 417, 504 (2011)

He + W	undef, T: 300−1873K	Exp
He + W	undef, T: 300−1873K	Exp
He + W	undef, T: 300−1873K	Exp
He + W	undef, T: 300−1873K	Exp

1540. JP. Sharpe, RD. Kolasinski, M. Shimada, P. Calderoni, RA Causey
Retention behavior in tungsten and molybdenum exposed to high fluences of deuterium ions in TPE
J. Nucl. Mater. 390-91, 709 (2009)

$\mathbf{D^+ + Mo}$	70eV, T: 300−900K	Exp
$\mathbf{D^+ + W}$	70eV, T: 300−900K	Exp
$\mathbf{D^+ + Mo}$	70eV, T: 300−900K	Exp
$\mathbf{D^+ + W}$	70eV, T: 300−900K	Exp
$\mathbf{D^+ + Mo}$	70eV, T: 300−900K	Exp
$\mathbf{D^+ + W}$	70eV, T: 300−900K	Exp
$\mathbf{D^+ + Mo}$	70eV, T: 300−900K	Exp
$\mathbf{D^+ + W}$	70eV, T: 300−900K	Exp

1541. B. Schweer, F. Irrek, M. Zlobinski, A. Huber, G. Sergienko, S. Brezinsek, V. Philipps, U Samm
In situ detection of hydrogen retention in TEXTOR by laser induced desorption
J. Nucl. Mater. 390-91, 576 (2009)

$\mathbf{H^+ + H}$	undef, T: undef	Exp
$\mathbf{H^+ + C}$	undef, T: undef	Exp
$\mathbf{H^+ + H}$	undef, T: undef	Exp
$\mathbf{H^+ + C}$	undef, T: undef	Exp
$\mathbf{H^+ + H}$	undef, T: undef	Exp
$\mathbf{H^+ + C}$	undef, T: undef	Exp
$\mathbf{H^+ + H}$	undef, T: undef	Exp
$\mathbf{H^+ + C}$	undef, T: undef	Exp

1542. Y. Oya, S. Suzuki, WJ. Wang, R. Kurata, M. Kobayashi, N. Ashikawa, A. Sagara, N. Yoshida, K Okuno
Correlation between deuterium retention and microstructure change for tungsten under triple ion implantation
Phys. Scr. T138, 14051 (2009)

$\mathbf{CH_4 + W}$	1−100eV, T: 1−50eV	Th
$\mathbf{CH_4 + H}$	1−100eV, T: 1−50eV	Th
$\mathbf{CH_4 + C}$	1−100eV, T: 1−50eV	Th

1543. GM. Wright, AW. Kleyn, E. Alves, LC. Alves, NP. Barradas, GJ. van Rooij, AJ. van Lange, AE. Shumack, J. Westerhout, RS. Al, WAJ. Vijvers, B. de Groot, MJV. de Pol, HJ. van der Meiden, J. Rapp, NJL Cardozo
Hydrogenic retention in tungsten exposed to ITER divertor relevant plasma flux densities
J. Nucl. Mater. 390-91, 610 (2009)

D + W	2eV(Te), T: ¡1600K	Exp
D + W	2eV(Te), T: ¡1600K	Exp
D + W	2eV(Te), T: ¡1600K	Exp
D + W	2eV(Te), T: ¡1600K	Exp

1544. VK. Alimov, H. Nakamura, B. Tyburska-Puschel, OV. Ogorodnikova, J. Roth, K. Isobe, T Yamanishi
Deuterium retention in plasma spray tungsten coatings exposed to low-energy, high flux D plasma
J. Nucl. Mater. 414, 479 (2011)

$\mathbf{D_2{}^+ + W}$	38eV, T: 340−1300K	Exp
$\mathbf{D_2{}^+ + W}$	38eV, T: 340−1300K	Exp
$\mathbf{D_2{}^+ + W}$	38eV, T: 340−1300K	Exp
$\mathbf{D_2{}^+ + W}$	38eV, T: 340−1300K	Exp

1545. VK. Alimov, B. Tyburska, V. Ogorodnikova, J. Roth, K. Isobe, T Yamanishi
Deuterium retention in porous vacuum plasma-sprayed tungsten coating exposed to low-energy, high-flux pure and helium-seeded D plasmas
J. Nucl. Mater. 415, S628 (2011)

D_2^+ + W	76eV, T: 300−800K	Exp
He^+ + W	76eV, T: 300−800K	Exp
D_2^+ + W	76eV, T: 300−800K	Exp
He^+ + W	76eV, T: 300−800K	Exp
D_2^+ + W	76eV, T: 300−800K	Exp
He^+ + W	76eV, T: 300−800K	Exp
D_2^+ + W	76eV, T: 300−800K	Exp
He^+ + W	76eV, T: 300−800K	Exp

1546. N. Matsunami, N. Ohno, M Tokitani
Deuterium retention in tungsten oxide under low energy D-2(+) plasma exposure
J. Nucl. Mater. 390-91, 693 (2009)

D + WO_3	20−250eV, T: 300K	Exp
D + W	20−250eV, T: 300K	Exp
D + WO_3	20−250eV, T: 300K	Exp
D + W	20−250eV, T: 300K	Exp
D + WO_3	20−250eV, T: 300K	Exp
D + W	20−250eV, T: 300K	Exp
D + W	20−250eV, T: 300K	Exp
D + WO_3	20−250eV, T: 300K	Exp

1547. OV. Ogorodnikova, K. Sugiyama, T. Schwarz-Selinger, T. Durbeck, M Balden
Ion-induced deuterium retention in tungsten coatings on carbon substrate
J. Nucl. Mater. 419, 194 (2011)

D_3^+ + W	20−200eV, T: 320−593K	Exp
D_3^+ + W	20−200eV, T: 320−593K	Exp
D_3^+ + W	20−200eV, T: 320−593K	Exp
D_3^+ + W	20−200eV, T: 320−593K	Exp

1548. T. Ahlgren, K. Heinola, K. Vortler, J Keinonen
Simulation of irradiation induced deuterium trapping in tungsten
J. Nucl. Mater. 427, 152 (2012)

D + W	30000eV,T: 298K	Th
D + W	30000eV,T: 298K	Th
D + W	30000eV,T: 298K	Th
D + W	30000eV,T: 298K	Th

1549. A. Kirschner, K. Ohya, D. Borodin, R. Ding, D. Matveev, V. Philipps, U Samm
Prediction of long-term tritium retention in the divertor of ITER: influence of modelling assumptions on retention rates
Phys. Scr. T138, 14011 (2009)

D + Be	undef, T: undef	Exp
T + Be	undef, T: undef	Exp
D + Be	undef, T: undef	Exp
T + Be	undef, T: undef	Exp
T + W	undef, T: undef	Exp
D + C	undef, T: undef	Exp
T + C	undef, T: undef	Exp
D + C	undef, T: undef	Exp
T + W	undef, T: undef	Exp
T + Be	undef, T: undef	Exp
D + Be	undef, T: undef	Exp
T + C	undef, T: undef	Exp
D + C	undef, T: undef	Exp
T + C	undef, T: undef	Exp
D + Be	undef, T: undef	Exp

T + Be	undef, T: undef	Exp
T + W	undef, T: undef	Exp
D + C	undef, T: undef	Exp
T + C	undef, T: undef	Exp
T + W	undef, T: undef	Exp

1550. M. Yamagiwa, Y. Nakamura, N. Matsunami, N. Ohno, S. Kajita, M. Takagi, M. Tokitani, S. Masuzaki, A. Sagara, K Nishimura
In situ measurement of hydrogen isotope retention using a high heat flux plasma generator with ion beam analysis
Phys. Scr. T145, 14032 (2011)

D + W	17−28eV, T: 497−1000K	Exp
D + C	17−28eV, T: 497−1000K	Exp
D + W	17−28eV, T: 497−1000K	Exp
D + C	17−28eV, T: 497−1000K	Exp
D + W	17−28eV, T: 497−1000K	Exp
D + C	17−28eV, T: 497−1000K	Exp
D + W	17−28eV, T: 497−1000K	Exp
D + C	17−28eV, T: 497−1000K	Exp

1551. KR. Umstadter, R. Doerner, G Tynan
Effect of bulk temperature on erosion of tungsten plasma-facing components subject to simultaneous deuterium plasma and heat pulses
Phys. Scr. T138, 14047 (2009)

D + W	40−140eV, T: 323−903K	Exp
D + W	40−140eV, T: 323−903K	Exp
D + W	40−140eV, T: 323−903K	Exp
D + W	40−140eV, T: 323−903K	Exp

1552. DG Whyte
On the consequences of neutron induced damage for volumetric fuel retention in plasma facing materials
J. Nucl. Mater. 390-91, 911 (2009)

T + W	undef, T: 300−750K	Th
T + W	undef, T: 300−750K	Th
T + W	undef, T: 300−750K	Th
T + W	undef, T: 300−750K	Th
T + W	undef, T: 300−750K	Th

1553. WR. Wampler, RP Doerner
Deuterium retention in tungsten from exposure to plasma
Phys. Scr. T138, 14037 (2009)

D + W	undef, T: 473−773K	Exp
D + W	undef, T: 473−773K	Exp
D + W	undef, T: 473−773K	Exp
D + W	undef, T: 473−773K	Exp

1554. B. Tyburska, VK. Alimov, OV. Ogorodnikova, K. Schmid, K Ertl
Deuterium retention in self-damaged tungsten
J. Nucl. Mater. 395, 150 (2009)

D_3^+ + W	38−800eV, T: 320−470K	Exp
D_3^+ + W	38−800eV, T: 320−470K	Exp
D_3^+ + W	38−800eV, T: 320−470K	Exp
D_3^+ + W	38−800eV, T: 320−470K	Exp

1555. LB. Begrambekov, AS. Kuznetsov, PA Shigin
Hydrogen trapping in depositing carbon films
J. Nucl. Mater. 391-91, 685 (2009)

$\mathbf{D} + \mathbf{C}$	50−1000eV, T: 300K	Exp
$\mathbf{H} + \mathbf{C}$	50−1000eV, T: 300K	Exp
$\mathbf{D} + \mathbf{C}$	50−1000eV, T: 300K	Exp
$\mathbf{H} + \mathbf{C}$	50−1000eV, T: 300K	Exp
$\mathbf{D} + \mathbf{C}$	50−1000eV, T: 300K	Exp
$\mathbf{H} + \mathbf{C}$	50−1000eV, T: 300K	Exp
$\mathbf{D} + \mathbf{C}$	50−1000eV, T: 300K	Exp
$\mathbf{H} + \mathbf{C}$	50−1000eV, T: 300K	Exp

1556. RH. Ning, YG. Li, WH. Zhou, Z. Zeng, X Ju
Modeling D retention in W under D ions and neutrons irradiation
J. Nucl. Mater. 430, 20 (2012)

$\mathbf{D}^+ + \mathbf{W}$	200−3000eV, T: 300−600K	Th
$\mathbf{D}^+ + \mathbf{W}$	200−3000eV, T: 300−600K	Th
$\mathbf{D}^+ + \mathbf{W}$	200−3000eV, T: 300−600K	Th
$\mathbf{D}^+ + \mathbf{W}$	200−3000eV, T: 300−600K	Th

1557. Z. Tian, JW. Davis, AA Haasz
Deuterium retention in tungsten at fluences of up to 10(26) D+/m(2) using D+ ion beams
J. Nucl. Mater. 399, 101 (2010)

$\mathbf{D}^+ + \mathbf{W}$	38−500eV, T: 300−643K	Exp
$\mathbf{D}^+ + \mathbf{W}$	38−500eV, T: 300−643K	Exp
$\mathbf{D}^+ + \mathbf{W}$	38−500eV, T: 300−643K	Exp
$\mathbf{D}^+ + \mathbf{W}$	38−500eV, T: 300−643K	Exp

1558. B. Tyburska, VK. Alimov, OV. Ogorodnikova, K. Ertl, K. Schmid, J Roth
Trapping of permeating deuterium in defect induced at the rear side of tungsten samples
J. Nucl. Mater. 415, S680 (2011)

$\mathbf{D_2}^+ + \mathbf{W}$	38−68eV, T: 300−800K	Exp
$\mathbf{D}^+ + \mathbf{W}$	38−68eV, T: 300−800K	Exp
$\mathbf{D_2}^+ + \mathbf{W}$	38−68eV, T: 300−800K	Exp
$\mathbf{D_2}^+ + \mathbf{W}$	38−68eV, T: 300−800K	Exp
$\mathbf{D}^+ + \mathbf{W}$	38−68eV, T: 300−800K	Exp
$\mathbf{D}^+ + \mathbf{W}$	38−68eV, T: 300−800K	Exp
$\mathbf{D_2}^+ + \mathbf{W}$	38−68eV, T: 300−800K	Exp
$\mathbf{D}^+ + \mathbf{W}$	38−68eV, T: 300−800K	Exp

1559. OV. Ogorodnikova, T. Schwarz-Selinger, K. Sugiyama, T. Durbeck, W Jacob
Deuterium retention in different tungsten grades
Phys. Scr. T138, 14053 (2009)

$\mathbf{D_3}^+ + \mathbf{W}$	3−200eV, T: 320−500K	Exp
$\mathbf{D_2}^+ + \mathbf{W}$	3−200eV, T: 320−500K	Exp
$\mathbf{D}^+ + \mathbf{W}$	3−200eV, T: 320−500K	Exp
$\mathbf{D_3}^+ + \mathbf{W}$	3−200eV, T: 320−500K	Exp
$\mathbf{D_2}^+ + \mathbf{W}$	3−200eV, T: 320−500K	Exp
$\mathbf{D}^+ + \mathbf{W}$	3−200eV, T: 320−500K	Exp
$\mathbf{D}^+ + \mathbf{W}$	3−200eV, T: 320−500K	Exp
$\mathbf{D_2}^+ + \mathbf{W}$	3−200eV, T: 320−500K	Exp
$\mathbf{D_3}^+ + \mathbf{W}$	3−200eV, T: 320−500K	Exp
$\mathbf{D}^+ + \mathbf{W}$	3−200eV, T: 320−500K	Exp
$\mathbf{D_2}^+ + \mathbf{W}$	3−200eV, T: 320−500K	Exp
$\mathbf{D_3}^+ + \mathbf{W}$	3−200eV, T: 320−500K	Exp

1560. A. Manhard, K. Schmid, M. Balden, W Jacob
Influence of the microstructure on the deuterium retention in tungsten
J. Nucl. Mater. 415, S632 (2011)

D_3^+ + W	38eV, T: 300K	Exp
D_3^+ + W	38eV, T: 300K	Exp
D_3^+ + W	38eV, T: 300K	Exp
D_3^+ + W	38eV, T: 300K	Exp

1561. T Loarer
Fuel retention in tokamaks
J. Nucl. Mater. 391-91, 20 (2009)

T + Be	undef, T: undef	E/T
T + W	undef, T: undef	E/T
T + C	undef, T: undef	E/T
D + W	undef, T: undef	E/T
D + Mo	undef, T: undef	E/T
T + Be	undef, T: undef	E/T
T + W	undef, T: undef	E/T
T + C	undef, T: undef	E/T
D + W	undef, T: undef	E/T
D + Mo	undef, T: undef	E/T
T + Be	undef, T: undef	E/T
T + W	undef, T: undef	E/T
T + C	undef, T: undef	E/T
D + W	undef, T: undef	E/T
D + Mo	undef, T: undef	E/T
T + Be	undef, T: undef	E/T
T + W	undef, T: undef	E/T
T + C	undef, T: undef	E/T
D + W	undef, T: undef	E/T
D + Mo	undef, T: undef	E/T

1562. K.. Ohya, N.. Mohara, K.. Inai, A.. Ito, H.. Nakamura, A.. Kirschner, D. Borodin
Molecular dynamics and dynamic Monte Carlo studies of mixed materials and their impact on plasma wall interactions
Fusion Eng. Des. 85, 1167 (2010)

C + C	1−200eV, T: undef	Th
CH_3 + Be	1−200eV, T: undef	Th
CH_3 + H	1−200eV, T: undef	Th
CH_3 + C	1−200eV, T: undef	Th
CH_2 + Be	1−200eV, T: undef	Th
CH_2 + H	1−200eV, T: undef	Th
CH_2 + C	1−200eV, T: undef	Th
CH + Be	1−200eV, T: undef	Th
CH + H	1−200eV, T: undef	Th
CH + C	1−200eV, T: undef	Th
C + Be	1−200eV, T: undef	Th
C + H	1−200eV, T: undef	Th

1563. Chen. Duan, Yue-Lin. Liu, Hong-Bo. Zhou, Ying. Zhang, Shuo. Jin, Guang-Hong. Lu, G. -N. Luo
First-principles study on dissolution and diffusion properties of hydrogen in molybdenum
J. Nucl. Mater. 404, 109 (2010)

T + Mo	undef, T: 600−2000K	Th
D + Mo	undef, T: 600−2000K	Th
H + Mo	undef, T: 600−2000K	Th

1564. Rudolf Ludwig Neu
Experience With High-Z Plasma-Facing Materials and Extrapolation to Future Devices
IEEE Trans. Plasma Sci. 38, 453 (2010)

D + W	100−200eV, T: 298K	Exp
D + Mo	100−200eV, T: 298K	Exp
D + W	100−200eV, T: 298K	Exp
D + W	100−200eV, T: 298K	Exp
D + Mo	100−200eV, T: 298K	Exp
D + Mo	100−200eV, T: 298K	Exp
D + W	100−200eV, T: 298K	Exp
D + Mo	100−200eV, T: 298K	Exp

1565. V.. Chakin, R.. Rolli, A.. Moeslang, P.. Kurinskiy, P.. Vladimirov, C.. Ferrero, R.. Pieritz, W. Van Renterghem
Study of helium bubble evolution in highly neutron-irradiated beryllium by using x-ray micro-tomography and metallography methods
Phys. Scr. T145, 14012 (2011)

Be + Be	undef, T: 1123−1273K	Exp
He + Be	undef, T: 1123−1273K	Exp

1566. A.. Allouche, M.. Oberkofler, M.. Reinelt, Ch. Linsmeier
Quantum Modeling of Hydrogen Retention in Beryllium Bulk and Vacancies
J. Phys. Chem. C 114, 3588 (2010)

Be + H	undef, T: undef	Th
H + H	undef, T: undef	Th
Be + Be	undef, T: undef	Th
H + Be	undef, T: undef	Th

1567. V. Kh. Alimov, B.. Tyburska-Pueschel, M. H. J.. 't Hoen, J.. Roth, Y.. Hatano, K.. Isobe, M.. Matsuyama, T. Yamanishi
Hydrogen isotope exchange in tungsten irradiated sequentially with low-energy deuterium and protium ions
Phys. Scr. T145, 14037 (2011)

H + W	38−200eV, T: 300−750K	Exp
D + W	38−200eV, T: 300−750K	Exp
H + W	38−200eV, T: 300−750K	Exp
D + W	38−200eV, T: 300−750K	Exp
H + W	38−200eV, T: 300−750K	Exp
D + W	38−200eV, T: 300−750K	Exp
H + W	38−200eV, T: 300−750K	Exp
D + W	38−200eV, T: 300−750K	Exp

1568. V.. Nemanic, B.. Zajec, D.. Dellasega, M. Passoni
Hydrogen permeation through disordered nanostructured tungsten films
J. Nucl. Mater. 429, 92 (2012)

Re + W	undef, T: 673−873K	Exp
H + W	undef, T: 673−873K	Exp

1569. S. J.. Zenobia, G. L. Kulcinski
Formation and retention of surface pores in helium-implanted nano-grain tungsten for fusion reactor first-wall materials and divertor plates
Phys. Scr. T138, 14049 (2009)

He$^+$ + W	30000eV, T: 1273−1423K	Exp
He$^+$ + W	30000eV, T: 1273−1423K	Exp
He$^+$ + W	30000eV, T: 1273−1423K	Exp
He$^+$ + W	30000eV, T: 1273−1423K	Exp

1570. M.. Wada, T.. Kenmotsu, Y.. Matsumoto, M.. Nishiura, M.. Sasao, K.. Tsumori, H. Yamaoka
Low-energy particle interaction with plasma-irradiated metal surfaces
Plasma Devices Oper. 17, 132 (2009)

O + W	700−2000eV, T: undef	Th
H_2^+ + W	700−2000eV, T: undef	Th
H^+ + W	700−2000eV, T: undef	Th
H^+ + H	700−2000eV, T: undef	Th
H^+ + C	700−2000eV, T: undef	Th

1571. Zhongshi. Yang, Qian. Xu, Rongjie. Hong, Qiang. Li, Guang-Nan Luo
Molecular dynamics simulation of low-energy atomic hydrogen on tungsten surface
Fusion Eng. Des. 85, 1517 (2010)

D + W	0.5−50eV, T: 298K	Th
H + W	0.5−50eV, T: 298K	Th
D + W	0.5−50eV, T: 298K	Th
H + W	0.5−50eV, T: 298K	Th

1572. Yue-Lin. Liu, Hong-Bo. Zhou, Ying. Zhang, Guang-Hong. Lu, Guang-Nan Luo
Interaction of C with vacancy in W: A first-principles study
Comp. Mater. Sci. 50, 3213 (2011)

C + W	undef, T: undef	Th

1573. Pengbo. Zhang, Jijun. Zhao, Bin Wen
Vacancy trapping mechanism for multiple hydrogen and helium in beryllium: a first-principles study
J. Phys. Condens. Matter 24, 95004 (2012)

H + H	undef, T: undef	Th
He + He	undef, T: undef	Th
He + Be	undef, T: undef	Th
H + Be	undef, T: undef	Th

1574. Y. G.. Li, W. H.. Zhou, L. F.. Huang, Z.. Zeng, X. Ju
Cluster dynamics modeling of accumulation and diffusion of helium in neutron irradiated tungsten
J. Nucl. Mater. 431, 26 (2012)

He + W	30−1000eV, T: 837−873K	Th

1575. Jingcheng. Xu, Jijun Zhao
First-principles study of hydrogen in perfect tungsten crystal
Nucl. Instrum. Methods Phys. Res. B 267, 3170 (2009)

H + W	undef, T: undef	Th

1576. B.. Jiang, F. R.. Wan, W. T. Geng
Strong hydrogen trapping at helium in tungsten: Density functional theory calculations
Phys. Rev. B 81, 134112 (2010)

He + W	undef, T: undef	Th
H + W	undef, T: undef	Th

1577. Samuel J.. Zenobia, Lauren M.. Garrison, Gerald L. Kulcinski
The response of polycrystalline tungsten to 30 keV helium ion implantation at normal incidence and high temperatures
J. Nucl. Mater. 425, 83 (2012)

He^+ + W	undef, T: 773−1173K	Exp
He^+ + W	undef, T: 773−1173K	Exp
He^+ + W	undef, T: 773−1173K	Exp

1578. Yue-Lin. Liu, Ying. Zhang, Hong-Bo. Zhou, Guang-Hong. Lu, Feng. Liu, G. -N. Luo
Vacancy trapping mechanism for hydrogen bubble formation in metal
Phys. Rev. B 79, 172103 (2009)

H + W	undef, T: undef	Th

1579. R. H.. Ning, Y. G.. Li, W. H.. Zhou, Z.. Zeng, X. Ju
AN IMPROVED CLUSTER DYNAMICS MODEL FOR HYDROGEN RETENTION IN TUNGSTEN
Int. J. Mod. Phys. C 23, 1250042 (2012)

D^+ + W	200eV, T: 300−573K	E/T
D^+ + W	200eV, T: 300−573K	E/T
D^+ + W	200eV, T: 300−573K	E/T
D^+ + W	200eV, T: 300−573K	E/T

1580. Yue-Lin. Liu, Hong-Bo. Zhou, Shuo. Jin, Ying. Zhang, Guang-Hong Lu
Dissolution and diffusion properties of carbon in tungsten
J. Phys. Condens. Matter 22, 445504 (2010)

C + W	undef, T: 300−1000K	Th

1581. Kazuhito. Ohsawa, Junya. Goto, Masahiro. Yamakami, Masatake. Yamaguchi, Masatoshi Yagi
Trapping of multiple hydrogen atoms in a tungsten monovacancy from first principles
Phys. Rev. B 82, 184117 (2010)

H + Fe	undef, T: undef	Th
H + W	undef, T: undef	Th

1582. W.. Xiao, W. T. Geng
Role of grain boundary and dislocation loop in H blistering in W: A density functional theory assessment
J. Nucl. Mater. 430, 132 (2012)

H + W	undef, T: undef	Exp

1583. JP. Allain, JN Brooks
Lithium surface-response modelling for the NSTX liquid lithium divertor
Nucl. Fusion 51, 23002 (2011)

D^+ + Li	20−10000eV, T: 473−693K	Th

1584. R. Ding, A. Kirschner, D. Borodin, S. Brezinsek, A. Kreter, MZ. Tokar, J. Chen, O. Schmitz, V. Philipps, U. Samm, J Li
Modelling of local carbon deposition from methane and ethene injection through graphite and tungsten test limiters in TEXTOR
Plasma Phys. and Controlled Fusion 52, 45005 (2010)

C_2H_4 + W	undef, T: undef	E/T
CH_4 + W	undef, T: undef	E/T
C_2H_4 + C	undef, T: undef	E/T
CH_4 + C	undef, T: undef	E/T

1585. RP. Doerner, MJ. Baldwin, PC Stangeby
An equilibrium model for tungsten fuzz in an eroding plasma environment
Nucl. Fusion 51, 43001 (2011)

He^+ + W	60−250eV, T: 1120−1320K	Exp

1586. RP. Doerner, D. Nishijima, T Schwarz-Selinger
Measuring the difference between gross and net erosion
Nucl. Fusion 52, 103003 (2012)

He^+ + Be	20−160eV, T: undef	E/T
Be + Be	20−160eV, T: undef	E/T
$D_3{}^+$ + Be	20−160eV, T: undef	E/T
$D_2{}^+$ + Be	20−160eV, T: undef	E/T
D^+ + Be	20−160eV, T: undef	E/T

1587. A Kirschner
EROSION AND DEPOSITION MECHANISMS IN FUSION PLASMAS
Fusion Sci. Technol. 57, 277 (2010)

CH_4 + C	0.1−1000eV, T: 400−1400K	E/T
C + C	0.1−1000eV, T: 400−1400K	E/T
C + W	0.1−1000eV, T: 400−1400K	E/T
D^+ + Be	0.1−1000eV, T: 400−1400K	E/T
CH_4 + C	0.1−1000eV, T: 400−1400K	E/T
C + C	0.1−1000eV, T: 400−1400K	E/T
C + W	0.1−1000eV, T: 400−1400K	E/T
D^+ + Be	0.1−1000eV, T: 400−1400K	E/T

1588. R Neu
Preparing the scientific basis for an all metal ITER
Plasma Phys. and Controlled Fusion 53, 124040 (2011)

D + WC	undef, T: 273−873K	Exp
D + BeO	undef, T: 273−873K	Exp
D + BeC	undef, T: 273−873K	Exp
D + W	undef, T: 273−873K	Exp
D + Be	undef, T: 273−873K	Exp
D + C	undef, T: 273−873K	Exp

1589. M. Oberkofler, C Linsmeier
Properties of nitrogen-implanted beryllium and its interaction with energetic deuterium
Nucl. Fusion 50, 125001 (2010)

D + N	2000eV, T: undef	Exp
D + Be	2000eV, T: undef	Exp

1590. AI. Ryazanov, VS. Koidan, BI. Khripunov, ST. Latushkin, VB. Petrov, LS. Danelyan, EV. Semenov, VN Unezhev
INVESTIGATIONS OF RADIATION DAMAGE EFFECTS ON ITER STRUCTURAL AND PLASMA-FACING MATERIALS
Fusion Sci. Technol. 61, 107 (2012)

D + C	100eV, T: ¡313K	Exp

1591. K. Schmid, A. Manhard, C. Linsmeier, A. Wiltner, T. Schwarz-Selinger, W. Jacob, S Mandl
Interaction of nitrogen plasmas with tungsten
Nucl. Fusion 50, 25006 (2010)

N + W	20−500V, T: 350K	E/T
N + W	20−500V, T: 350K	E/T
N + W	20−500V, T: 350K	E/T
N + W	20−500V, T: 350K	E/T

1592. BD. Wirth, K. Nordlund, DG. Whyte, D Xu
Fusion materials modeling: Challenges and opportunities
MRS BULLETIN 36, 216 (2011)

D + Be	10−100eV, T: undef	E/T

1593. RP. Doerner, MJ. Baldwin, G. De Temmerman, J. Hanna, D. Nishijima, J. Roth, K. Schmid, GR. Tynan, K Umstadter
Codeposition of deuterium with ITER materials
Nucl. Fusion 49, 35002 (2009)

D + Be	10−100eV, T: 273−1073K	E/T
D + W	10−100eV, T: 273−1073K	E/T
D + C	10−100eV, T: 273−1073K	E/T
D + Be	10−100eV, T: 273−1073K	E/T
D + W	10−100eV, T: 273−1073K	E/T
D + C	10−100eV, T: 273−1073K	E/T
D + Be	10−100eV, T: 273−1073K	E/T
D + W	10−100eV, T: 273−1073K	E/T
D + C	10−100eV, T: 273−1073K	E/T
D + Be	10−100eV, T: 273−1073K	E/T
D + W	10−100eV, T: 273−1073K	E/T
D + C	10−100eV, T: 273−1073K	E/T

1594. CF. Sang, X. Bonnin, M. Warrier, A. Rai, R. Schneider, JZ. Sun, DZ Wang
Modelling of hydrogen isotope inventory in mixed materials including porous deposited layers in fusion devices
Nucl. Fusion 52, 43003 (2012)

D + C	200−1500eV, T: 300−1000K	E/T
H + C	200−1500eV, T: 300−1000K	E/T
T + W	200−1500eV, T: 300−1000K	E/T
D + W	200−1500eV, T: 300−1000K	E/T
H + W	200−1500eV, T: 300−1000K	E/T
T + C	200−1500eV, T: 300−1000K	E/T
D + C	200−1500eV, T: 300−1000K	E/T
H + C	200−1500eV, T: 300−1000K	E/T
T + W	200−1500eV, T: 300−1000K	E/T
D + W	200−1500eV, T: 300−1000K	E/T
H + W	200−1500eV, T: 300−1000K	E/T
T + C	200−1500eV, T: 300−1000K	E/T
H + W	200−1500eV, T: 300−1000K	E/T
D + W	200−1500eV, T: 300−1000K	E/T
T + W	200−1500eV, T: 300−1000K	E/T
H + C	200−1500eV, T: 300−1000K	E/T
D + C	200−1500eV, T: 300−1000K	E/T
T + C	200−1500eV, T: 300−1000K	E/T
H + W	200−1500eV, T: 300−1000K	E/T
D + W	200−1500eV, T: 300−1000K	E/T
T + W	200−1500eV, T: 300−1000K	E/T
H + C	200−1500eV, T: 300−1000K	E/T
D + C	200−1500eV, T: 300−1000K	E/T
T + C	200−1500eV, T: 300−1000K	E/T

1595. S. Takamura, T. Miyamoto, N Ohno
Effects of fibre-form nanostructures on particle emissions from a tungsten surface in plasmas
Nucl. Fusion 52, 123001 (2012)

Ar + W	20−180eV, T: undef	Exp

1596. A. Yamawaki, M. Fukumoto, Y. Soga, Y. Ohtsuka, Y. Ueda, K Ohya
Temperature dependence of carbon deposition on Tungsten
Fusion Sci. Technol. 56, 1038 (2009)

D + C	50eV, T: 473−973K	Th

1597. T. Ikeda, T. Otsuka, T Tanabe
APPLICATION OF TRITIUM TRACER TECHNIQUE TO DETERMINATION OF HYDROGEN DIFFUSION COEFFICIENTS AND PERMEATION RATE NEAR ROOM TEMPERATURE FOR TUNGSTEN
Fusion Sci. Technol. 60, 1463 (2011)

H + W	undef, T: 273−2000K	Exp

1598. DF. Johnson, EA Carter
Hydrogen in tungsten: Absorption, diffusion, vacancy trapping, and decohesion
J. Mater. Res. 25, 315 (2010)

H + W	undef, T: 500−1450K	Th
D + W	undef, T: 500−1450K	Th
T + W	undef, T: 500−1450K	Th

1599. YG. Li, WH. Zhou, RH. Ning, LF. Huang, Z. Zeng, X Ju
A Cluster Dynamics Model for Accumulation of Helium in Tungsten under Helium Ions and Neutron Irradiation
Commun. Comput. Phys. 11, 1547 (2012)

He + W	1000−5000eV, T: 300−873K	E/T
He + W	1000−5000eV, T: 300−873K	E/T
He + W	1000−5000eV, T: 300−873K	E/T
He + W	1000−5000eV, T: 300−873K	E/T

1600. HB. Zhou, YL. Liu, S. Jin, Y. Zhang, GN. Luo, GH Lu
Towards suppressing H blistering by investigating the physical origin of the H-He interaction in W
Nucl. Fusion 50, 115010 (2010)

H + W	undef, T: undef	Th
He + W	undef, T: undef	Th

1601. MJ. Baldwin, RP. Doerner, WR. Wampler, D. Nishijima, T. Lynch, M Miyamoto
Effect of He on D retention in W exposed to low-energy, high-fluence (D, He, Ar) mixture plasmas (vol 51, 103021, 2011)
Nucl. Fusion 51, 119501 (2011)

D_2 + W	30−200eV, T: 420−1100K	Exp
He + W	30−200eV, T: 420−1100K	Exp
Ar + W	30−200eV, T: 420−1100K	Exp
D_2 + W	30−200eV, T: 420−1100K	Exp
He + W	30−200eV, T: 420−1100K	Exp
Ar + W	30−200eV, T: 420−1100K	Exp
D_2 + W	30−200eV, T: 420−1100K	Exp
He + W	30−200eV, T: 420−1100K	Exp
Ar + W	30−200eV, T: 420−1100K	Exp
D_2 + W	30−200eV, T: 420−1100K	Exp
He + W	30−200eV, T: 420−1100K	Exp
Ar + W	30−200eV, T: 420−1100K	Exp

1602. B. Lipschultz, DG. Whyte, J. Irby, B. LaBombard, GM Wright
Hydrogenic retention with high-Z plasma facing surfaces in Alcator C-Mod
Nucl. Fusion 49, 45009 (2009)

D$^+$ + Mo	undef, T: undef	Exp
D$^+$ + W	undef, T: undef	Exp
He$^+$ + Mo	undef, T: undef	Exp
He$^+$ + W	undef, T: undef	Exp
D$^+$ + Mo	undef, T: undef	Exp
D$^+$ + W	undef, T: undef	Exp
He$^+$ + Mo	undef, T: undef	Exp
He$^+$ + W	undef, T: undef	Exp
D$^+$ + Mo	undef, T: undef	Exp
D$^+$ + W	undef, T: undef	Exp
He$^+$ + Mo	undef, T: undef	Exp
He$^+$ + W	undef, T: undef	Exp
D$^+$ + Mo	undef, T: undef	Exp
D$^+$ + W	undef, T: undef	Exp
He$^+$ + Mo	undef, T: undef	Exp
He$^+$ + W	undef, T: undef	Exp

1603. M. Miyamoto, D. Nishijima, Y. Ueda, RP. Doerner, H. Kurishita, MJ. Baldwin, S. Morito, K. Ono, J Hanna
Observations of suppressed retention and blistering for tungsten exposed to deuterium-helium mixture plasmas
Nucl. Fusion 49, 65035 (2009)

D + W	40−70eV, T: ¡573K	Exp
He + W	40−70eV, T: ¡573K	Exp
D + W	40−70eV, T: ¡573K	Exp
He + W	40−70eV, T: ¡573K	Exp
D + W	40−70eV, T: ¡573K	Exp
He + W	40−70eV, T: ¡573K	Exp
D + W	40−70eV, T: ¡573K	Exp
He + W	40−70eV, T: ¡573K	Exp

1604. Y. Song, QY. Huang, MY Ni
Analysis of Plasma-Driven Tritium Permeation Through the First Wall of DFLL-TBM in ITER
Plasma Sci. Technol. 11, 730 (2009)

T + F$_{82}$H	undef, T: undef	Th
T + Be	undef, T: undef	Th

1605. Y. Zayachuk, MHJ. ’t Hoen, PAZ. van Emmichoven, I. Uytdenhouwen, G van Oost
Deuterium retention in tungsten and tungsten-tantalum alloys exposed to high-flux deuterium plasmas
Nucl. Fusion 52, 103021 (2012)

D + W	¡50eV, T: ¡480K	Exp
D + Ta	¡50eV, T: ¡480K	Exp
D + W	¡50eV, T: ¡480K	Exp
D + Ta	¡50eV, T: ¡480K	Exp
D + W	¡50eV, T: ¡480K	Exp
D + Ta	¡50eV, T: ¡480K	Exp
D + W	¡50eV, T: ¡480K	Exp
D + Ta	¡50eV, T: ¡480K	Exp

1606. MHJ. ’t Hoen, B. Tyburska-Puschel, K. Ertl, M. Mayer, J. Rapp, AW. Kleyn, PAZ van Emmichoven
Saturation of deuterium retention in self-damaged tungsten exposed to high-flux plasmas
Nucl. Fusion 52, 23008 (2012)

D + W	0.5−5eV(Te), T: ¡525K	Exp
D + W	0.5−5eV(Te), T: ¡525K	Exp
D + W	0.5−5eV(Te), T: ¡525K	Exp
D + W	0.5−5eV(Te), T: ¡525K	Exp

1607. WR. Wampler, RP Doerner
The influence of displacement damage on deuterium retention in tungsten exposed to plasma
Nucl. Fusion 49, 115023 (2009)

D + W	undef, T: 314−773K	Exp
He + W	undef, T: 314−773K	Exp
D + W	undef, T: 314−773K	Exp
He + W	undef, T: 314−773K	Exp
D + W	undef, T: 314−773K	Exp
He + W	undef, T: 314−773K	Exp
D + W	undef, T: 314−773K	Exp
He + W	undef, T: 314−773K	Exp

1608. GM. Wright, E. Alves, LC. Alves, NP. Barradas, PA. Carvalho, R. Mateus, J Rapp
Hydrogenic retention of high-Z refractory metals exposed to ITER divertor-relevant plasma conditions
Nucl. Fusion 50, 75006 (2010)

D + Mo	¡5eV(Te), T: 600−1600K	Exp
D + W	¡5eV(Te), T: 600−1600K	Exp
D + Mo	¡5eV(Te), T: 600−1600K	Exp
D + W	¡5eV(Te), T: 600−1600K	Exp
D + Mo	¡5eV(Te), T: 600−1600K	Exp
D + W	¡5eV(Te), T: 600−1600K	Exp
D + Mo	¡5eV(Te), T: 600−1600K	Exp
D + W	¡5eV(Te), T: 600−1600K	Exp

1609. GM. Wright, E. Alves, LC. Alves, NP. Barradas, PA. Carvalho, R. Mateus, J Rapp
Hydrogenic retention of high-Z refractory metals exposed to ITER divertor-relevant plasma conditions
Nucl. Fusion 50, 55004 (2010)

D + Mo	¡5eV(Te), T: 600−1600K	Exp
D + W	¡5eV(Te), T: 600−1600K	Exp
D + Mo	¡5eV(Te), T: 600−1600K	Exp
D + W	¡5eV(Te), T: 600−1600K	Exp
D + Mo	¡5eV(Te), T: 600−1600K	Exp
D + W	¡5eV(Te), T: 600−1600K	Exp
D + Mo	¡5eV(Te), T: 600−1600K	Exp
D + W	¡5eV(Te), T: 600−1600K	Exp

1610. I. Takagi, K. Yamamichi, R. Imade, T. Sasaki, H. Tsuchida, K. Moritani, H Moriyama
THERMAL GROWTH OF HYDROGEN TRAP IN ION-IRRADIATED W
Fusion Sci. Technol. 60, 1451 (2011)

D + W	undef, T: undef	Exp
D + W	undef, T: undef	Exp
D + W	undef, T: undef	Exp
D + W	undef, T: undef	Exp

1611. SJ. Zenobia, GL Kulcinski
RETENTION AND SURFACE PORE FORMATION IN HELIUM IMPLANTED TUNGSTEN AS A FUSION FIRST WALL MATERIAL
Fusion Sci. Technol. 56, 352 (2009)

$\mathbf{He^+ + W}$	undef, T: 1123−1273K	Exp
$\mathbf{He^+ + W}$	undef, T: 1123−1273K	Exp
$\mathbf{He^+ + W}$	undef, T: 1123−1273K	Exp
$\mathbf{He^+ + W}$	undef, T: 1123−1273K	Exp

1612. H. Zush, Y. Hirooka, K. Okamoto, R. Bhattacharyay, M. Sakamoto, M. Sato
DYNAMIC RESPONSE OF HYDROGEN REEMISSION AND RETENTION FROM AND IN INERT GAS SPRAYED TUNGSTEN EXPOSED TO ECR PLASMAS
Fusion Sci. Technol. 55, 9 (2009)

$\mathbf{H^+ + W}$	15−25eV, T: 450−900K	Exp
$\mathbf{He^+ + W}$	15−25eV, T: 450−900K	Exp
$\mathbf{H^+ + W}$	15−25eV, T: 450−900K	Exp
$\mathbf{He^+ + W}$	15−25eV, T: 450−900K	Exp
$\mathbf{H^+ + W}$	15−25eV, T: 450−900K	Exp
$\mathbf{He^+ + W}$	15−25eV, T: 450−900K	Exp
$\mathbf{H^+ + W}$	15−25eV, T: 450−900K	Exp
$\mathbf{He^+ + W}$	15−25eV, T: 450−900K	Exp

1613. ZZ Chen, N Ghoniem
Biaxial strain effects on adatom surface diffusion on tungsten from first principles
Phys. Rev. B 88, 35415 (2013)

W + W	undefined

1614. XG Yu, FJ Gou
Molecular Dynamics Study on the Diffusion Properties of Hydrogen Atoms in Bulk Tungsten
Plasma Sci. Technol. 15, 710 (2013)

H + W	undefined

1615. Y Ferro, A Allouche, C Linsmeier
Absorption and diffusion of beryllium in graphite, beryllium carbide formation investigated by density functional theory
J. Appl. Phys. 113, 213514 (2013)

Be + C	undefined
Be + BeC	undefined
Be + C	undefined
Be + BeC	undefined
Be + C	undefined
Be + BeC	undefined
Be + C	undefined
Be + BeC	undefined
Be + C	undefined
Be + BeC	undefined

1616. XL Shu, P Tao, XC Li, Y Yu
Helium diffusion in tungsten: A molecular dynamics study
Nucl. Instrum. Methods Phys. Res. B 303, 84 (2013)

He + W	T: 50−3000K

1617. A Drenik, L Salamon, R Zaplotnik, A Vesel, M Mozetic
Erosion of amorphous carbon layers in the afterglow of oxygen microwave plasma
VACUUM 98, 45 (2013)

O + CH	undef, T: 473−623K

1618. V Yakushin, V Polsky, B Kalin, P Dzhumaev, A Polyansky, O Sevryukov, A Suchkov, V Fedotov
Erosion of tungsten and its brazed joints with bronze irradiated by pulsed deuterium plasma flows
J. Nucl. Mater. 442, S237 (2013)

D + W	¡2000eV, T: 1173−1223K

1619. X Yang, A Hassanein
Molecular dynamics simulation of erosion and surface evolution of tungsten due to bombardment with deuterium and carbon in Tokamak fusion environments
Nucl. Instrum. Methods Phys. Res. B 308, 80 (2013)

D + W	1−250eV, T: 300−1500K
C + W	1−250eV, T: 300−1500K
D + WC	1−250eV, T: 300−1500K
C + WC	1−250eV, T: 300−1500K

1620. RP Doerner, C Bjorkas, D Nishijima, T Schwarz-Selinger
Erosion of beryllium under high-flux plasma impact
J. Nucl. Mater. 438, S272 (2013)

D^{+} + Be	10−140eV, T: ¡330K
D_2^{+} + Be	10−140eV, T: ¡330K
D_3^{+} + Be	10−140eV, T: ¡330K
D^{+} + BeD	10−140eV, T: ¡330K
D_2^{+} + BeD	10−140eV, T: ¡330K
D_3^{+} + BeD	10−140eV, T: ¡330K

1621. K Katayama, Y Ohnishi, T Honda, K Uehara, S Fukada, M Nishikawa, N Ashikawa, T Uda
Hydrogen incorporation into metal deposits forming from tungsten or stainless steel by sputtering under mixed hydrogen and argon plasma at elevated temperature
J. Nucl. Mater. 438, S1010 (2013)

H + W	200−300eV, T: 373−773K
Ar + W	200−300eV, T: 373−773K
H + SS	200−300eV, T: 373−773K
Ar + SS	200−300eV, T: 373−773K
H + W	200−300eV, T: 373−773K
Ar + W	200−300eV, T: 373−773K
H + SS	200−300eV, T: 373−773K
Ar + SS	200−300eV, T: 373−773K
H + W	200−300eV, T: 373−773K
Ar + W	200−300eV, T: 373−773K
H + SS	200−300eV, T: 373−773K
Ar + SS	200−300eV, T: 373−773K
H + W	200−300eV, T: 373−773K
Ar + W	200−300eV, T: 373−773K
H + SS	200−300eV, T: 373−773K
Ar + SS	200−300eV, T: 373−773K
H + W	200−300eV, T: 373−773K
Ar + W	200−300eV, T: 373−773K
H + SS	200−300eV, T: 373−773K
Ar + SS	200−300eV, T: 373−773K

1622. M Laengner, S Brezinsek, JW Coenen, A Pospieszczyk, D Kondratyev, D Borodin, H Stoschus, O Schmitz, V Philipps, U Samm
Penetration depths of injected/sputtered tungsten in the plasma edge layer of TEXTOR
J. Nucl. Mater. 438, S865 (2013)

D + W	1−100eV(Te), T: undef

1623. F Sefta, N Juslin, KD Hammond, BD Wirth
Molecular dynamics simulations on the effect of sub-surface helium bubbles on the sputtering yield of tungsten
J. Nucl. Mater. 438, S493 (2013)

He + W	300−1000eV, T: 298K

1624. GJ van Rooij, JW Coenen, L Aho-Mantila, S Brezinsek, M Clever, R Dux, M Groth, K Krieger, S Marsen, GF Matthews, A Meigs, R Neu, S Potzel, T Putterich, J Rapp, MF Stamp
Tungsten divertor erosion in all metal devices: Lessons from the ITER like wall of JET
J. Nucl. Mater. 438, S42 (2013)

D + W	1−50eV(Te), T: undef

1625. Y Yuan, H Greuner, B Boswirth, GN Luo, BQ Fu, HY Xu, W Liu
Melt layer erosion of pure and lanthanum doped tungsten under VDE-like high heat flux loads
J. Nucl. Mater. 438, S229 (2013)

H + W	20000eV, T: undef

1626. C Bjorkas, D Borodin, A Kirschner, RK Janev, D Nishijima, R Doerner, K Nordlund
Molecules can be sputtered also from pure metals: sputtering of beryllium hydride by fusion plasma-wall interactions
Plasma Phys. and Controlled Fusion 55, 74004 (2013)

D^+ + BeD	5−100eV, T: 300−725K
D^+ + BeW	5−100eV, T: 300−725K
D_2^+ + BeD	5−100eV, T: 300−725K
D_2^+ + BeW	5−100eV, T: 300−725K
D_3^+ + BeD	5−100eV, T: 300−725K
D_3^+ + BeW	5−100eV, T: 300−725K

1627. XH Tang, LQ Shi, Q Qi, B Zhang, WY Zhang, JS Hu, DJ O'Connor, B King
Deuterium retention in the carbon co-deposition layers deposited by magnetron sputtering in D-2/He atmosphere
J. Nucl. Mater. 436, 93 (2013)

D_2 + Cd	210eV, T: 300−773K
He + Cd	210eV, T: 300−773K
D_2 + Cd	210eV, T: 300−773K
He + Cd	210eV, T: 300−773K
D_2 + Cd	210eV, T: 300−773K
He + Cd	210eV, T: 300−773K
D_2 + Cd	210eV, T: 300−773K
He + Cd	210eV, T: 300−773K

1628. Y Furuta, I Takagi, S Kawamura, K Yamamichi, M Akiyoshi, T Sasaki, T Kobayashi
In situ deuterium observation in deuterium-implanted tungsten
Nucl. Instrum. Methods Phys. Res. B 315, 121 (2013)

D + W	3000eV, T: 384−673K
D + W	3000eV, T: 384−673K
D + W	3000eV, T: 384−673K
D + W	3000eV, T: 384−673K

1629. H Atsumi, Y Takemura, T Miyabe, T Konishi, T Tanabe, T Shikama
Desorption of hydrogen trapped in carbon and graphite
J. Nucl. Mater. 442, S746 (2013)

H + C	undef, T: undef
H + C	undef, T: undef
H + C	undef, T: undef
H + C	undef, T: undef

1630. I Takagi, K Yamamichi, Y Furuta, M Akiyoshi, T Sasaki, H Tsuchida, Y Hatano
In situ observation of deuterium trapping in self-ion irradiated tungsten
J. Nucl. Mater. 442, S246 (2013)

D + W	1eV, T: 300−850K
D + W	1eV, T: 300−850K
D + W	1eV, T: 300−850K
D + W	1eV, T: 300−850K

1631. HB Zhou, X Ou, Y Zhang, XL Shu, YL Liu, GH Lu
Effect of carbon on helium trapping in tungsten: A first-principles investigation
J. Nucl. Mater. 440, 338 (2013)

He + WC	undef, T: undef
He + WC	undef, T: undef
He + WC	undef, T: undef
He + WC	undef, T: undef
He + WC	undef, T: undef

1632. L Begrambekov, V Barsuk, M Dubrov, A Kaplevsky, N Klimov, D Kovalenko, A Kuzmin, A Mischenko, V Podkovyrov, P Shigin, A Zhitlukhin, A Zakharov
Deuterium trapping in carbon films formed in different deposition conditions
J. Nucl. Mater. 438, S971 (2013)

H_2 + C	5−8eV
HD + C	5−8eV
D_2 + C	5−8eV
H_2 + C	5−8eV
HD + C	5−8eV
D_2 + C	5−8eV
H_2 + C	5−8eV
HD + C	5−8eV
D_2 + C	5−8eV
H_2 + C	5−8eV
HD + C	5−8eV
D_2 + C	5−8eV

1633. Y Hatano, M Shimada, VK Alimov, J Shi, M Hara, T Nozaki, Y Oya, M Kobayashi, K Okuno, T Oda, G Cao, N Yoshida, N Futagami, K Sugiyama, J Roth, B Tyburska-Puschel, J Dorner, I Takagi, M Hatakeyama, H Kurishita, MA Sokolov
Trapping of hydrogen isotopes in radiation defects formed in tungsten by neutron and ion irradiations
J. Nucl. Mater. 438, S114 (2013)

D + W	undef, T: 673−973K
D + W	undef, T: 673−973K
D + W	undef, T: 673−973K
D + W	undef, T: 673−973K

1634. Y Hatano, M Shimada, T Otsuka, Y Oya, VK Alimov, M Hara, J Shi, M Kobayashi, T Oda, G Cao, K Okuno, T Tanaka, K Sugiyama, J Roth, B Tyburska-Puschel, J Dorner, N Yoshida, N Futagami, H Watanabe, M Hatakeyama, H Kurishita, M Sokolov, Y Katoh
Deuterium trapping at defects created with neutron and ion irradiations in tungsten
Nucl. Fusion 53, 73006 (2013)

D + W	1−400eV, T: 473−773K
D + W	1−400eV, T: 473−773K
D + W	1−400eV, T: 473−773K
D + W	1−400eV, T: 473−773K

1635. A Alkhamees, HB Zhou, YL Liu, S Jin, Y Zhang, GH Lu
Vacancy trapping behaviors of oxygen in tungsten: A first-principles study
J. Nucl. Mater. 437, 6 (2013)

O + W	undef, T: undef
O + W	undef, T: undef
O + W	undef, T: undef
O + W	undef, T: undef
O + W	undef, T: undef

1636. X Yang, A Hassanein
Molecular dynamics simulation of deuterium trapping and bubble formation in tungsten
J. Nucl. Mater. 434, 1 (2013)

D + W	5−100eV, T: 600−2000K

1637. L Sun, S Jin, XC Li, Y Zhang, GH Lu
Hydrogen behaviors in molybdenum and tungsten and a generic vacancy trapping mechanism for H bubble formation
J. Nucl. Mater. 434, 395 (2013)

H + Mo	undef, T: 50−1500K
H + W	undef, T: 50−1500K
H + Mo	undef, T: 50−1500K
H + W	undef, T: 50−1500K
H + Mo	undef, T: 50−1500K
H + W	undef, T: 50−1500K
H + Mo	undef, T: 50−1500K
H + W	undef, T: 50−1500K
H + Mo	undef, T: 50−1500K
H + W	undef, T: 50−1500K

1638. PE Lhuillier, T Belhabib, P Desgardin, B Courtois, T Sauvage, MF Barthe, AL Thomann, P Brault, Y Tessier
Helium retention and early stages of helium-vacancy complexes formation in low energy helium-implanted tungsten
J. Nucl. Mater. 433, 305 (2013)

He + W	320eV, T: undef
He + W	320eV, T: undef
He + W	320eV, T: undef
He + W	320eV, T: undef

1639. A Ying, HB Liu, M Abdou
ANALYSIS OF TRITIUM/DEUTERIUM RETENTION AND PERMEATION IN FW/DIVERTOR INCLUDING GEOMETRIC AND TEMPERATURE OPERATING FEATURES
Fusion Sci. Technol. 64, 303 (2013)

T + W	200eV, T: 300−623K
D + W	200eV, T: 300−623K
T + W	200eV, T: 300−623K
D + W	200eV, T: 300−623K
T + W	200eV, T: 300−623K

D + W	200eV, T: 300−623K
T + W	200eV, T: 300−623K
D + W	200eV, T: 300−623K
T + W	200eV, T: 300−623K
D + W	200eV, T: 300−623K

1640. L Begrambekov, A Ayrapetov, V Ermakov, A Kaplevsky, Y Sadovsky, P Shigin
Hydrogen and oxygen trapping and retention in stainless steel and graphite materials irradiated in plasma
Nucl. Instrum. Methods Phys. Res. B 315, 110 (2013)

H + SS	10−1000eV, T: undef
O + SS	10−1000eV, T: undef
H + C	10−1000eV, T: undef
O + C	10−1000eV, T: undef
H + SS	10−1000eV, T: undef
O + SS	10−1000eV, T: undef
H + C	10−1000eV, T: undef
O + C	10−1000eV, T: undef
H + SS	10−1000eV, T: undef
O + SS	10−1000eV, T: undef
H + C	10−1000eV, T: undef
O + C	10−1000eV, T: undef
H + SS	10−1000eV, T: undef
O + SS	10−1000eV, T: undef
H + C	10−1000eV, T: undef
O + C	10−1000eV, T: undef

1641. MHJ t Hoen, M Mayer, AW Kleyn, H Schut, PAZ van Emmichoven
Reduced deuterium retention in self-damaged tungsten exposed to high-flux plasmas at high surface temperatures
Nucl. Fusion 53, 43003 (2013)

D + W	¡1.6eV, T: ¡1250K
D + W	¡1.6eV, T: ¡1250K
D + W	¡1.6eV, T: ¡1250K
D + W	¡1.6eV, T: ¡1250K

1642. B Zajec, V Nemanic, M Zumer, C Porosnicu, CP Lungu
Hydrogen permeability through beryllium films and the impact of surface oxides
J. Nucl. Mater. 443, 185 (2013)

H + Be	undef, T: 673K
H + BeO	undef, T: 673K
H + Be	undef, T: 673K
H + BeO	undef, T: 673K
H + Be	undef, T: 673K
H + BeO	undef, T: 673K
H + Be	undef, T: 673K
H + BeO	undef, T: 673K
H + Be	undef, T: 673K
H + BeO	undef, T: 673K

1643. A Rivera, G Valles, MJ Caturla, I Martin-Bragado
Effect of ion flux on helium retention in helium-irradiated tungsten
Nucl. Instrum. Methods Phys. Res. B 303, 81 (2013)

He + W	undef, T: 700−1600K
He + He	undef, T: 700−1600K
He + W	undef, T: 700−1600K

He + He	undef, T: 700−1600K
He + W	undef, T: 700−1600K
He + He	undef, T: 700−1600K
He + W	undef, T: 700−1600K
He + He	undef, T: 700−1600K

1644. PV Vladimirov, A Moeslang
Ab initio static and molecular dynamics studies of helium behavior in beryllium
J. Nucl. Mater. 442, S694 (2013)

He + Be	undef, T: undef

1645. Y Torikai, A Taguchi, M Saito, RD Penzhorn, Y Ueda, H Kurishita, K Sugiyama, V Philipps, A Kreter, M Zlobinski
Tritium loading study of tungsten pre-exposed to TEXTOR plasmas
J. Nucl. Mater. 438, S1121 (2013)

T + W	140eV, T: 573K
T + W	140eV, T: 573K
T + W	140eV, T: 573K
T + W	140eV, T: 573K

1646. Y Oya, S Masuzaki, T Fujishima, M Tokitani, N Yoshida, H Watanabe, Y Yamauchi, T Hino, M Miyamoto, Y Hatano, K Okuno
Enhancement of hydrogen isotope retention in tungsten exposed to LHD plasmas
J. Nucl. Mater. 438, S1055 (2013)

D_2^+ + W	1000eV, T: ¡373K
H + W	1000eV, T: ¡373K
D_2^+ + W	1000eV, T: ¡373K
H + W	1000eV, T: ¡373K
D_2^+ + W	1000eV, T: ¡373K
H + W	1000eV, T: ¡373K
D_2^+ + W	1000eV, T: ¡373K
H + W	1000eV, T: ¡373K

1647. J Roth, T Schwarz-Selinger, VK Alimov, E Markina
Hydrogen isotope exchange in tungsten: Discussion as removal method for tritium
J. Nucl. Mater. 432, 341 (2013)

H + W	200eV, T: 320−450K
H + W	200eV, T: 320−450K
H + W	200eV, T: 320−450K
H + W	200eV, T: 320−450K
H + W	200eV, T: 320−450K
D + W	200eV, T: 320−450K
D + W	200eV, T: 320−450K
D + W	200eV, T: 320−450K
D + W	200eV, T: 320−450K
D + W	200eV, T: 320−450K

1648. CF Sang, JZ Sun, X Bonnin, SG Liu, DZ Wang
Numerical simulation of the bubble growth due to hydrogen isotopes inventory processes in plasma-irradiated tungsten
J. Nucl. Mater. 443, 403 (2013)

D + W	20eV, T: 300−1200K

1649. TV Kulsartov, YN Gordienko, IL Tazhibayeva, EA Kenzhin, NI Barsukov, AO Sadvakasova, AV Kulsartova, ZA Zaurbekova
Tritium migration in the materials proposed for fusion reactors: Li2TiO3 and beryllium
J. Nucl. Mater. 442, S740 (2013)

D + Be	undef, T: 570−1333K
T + Be	undef, T: 570−1333K
He + Be	undef, T: 570−1333K

1650. Q Xu, K Sato, XZ Cao, P Zhang, BY Wang, T Yoshiie, H Watanabe, N Yoshida
Interaction of deuterium with vacancies induced by ion irradiation in W
Nucl. Instrum. Methods Phys. Res. B 315, 146 (2013)

D_2^+ + W	500eV, T: 298K
D_2^+ + W	500eV, T: 298K
D_2^+ + W	500eV, T: 298K
D_2^+ + W	500eV, T: 298K
D_2^+ + W	500eV, T: 298K

1651. V Chakin, R Rolli, A Moeslang, M Klimenkov, M Kolb, P Vladimirov, P Kurinskiy, HC Schneider, S van Til, AJ Magielsen, M Zmitko
Tritium release and retention properties of highly neutron-irradiated beryllium pebbles from HIDOBE-01 experiment
J. Nucl. Mater. 442, S483 (2013)

T + Be	undef, T: 298−1373K
T + He	undef, T: 298−1373K
T + Be	undef, T: 298−1373K
T + He	undef, T: 298−1373K
T + Be	undef, T: 298−1373K
T + He	undef, T: 298−1373K
T + Be	undef, T: 298−1373K
T + He	undef, T: 298−1373K

1652. P Wang, W Jacob, L Gao, T Durbeck, T Schwarz-Selinger
Comparing deuterium retention in tungsten films measured by temperature programmed desorption and nuclear reaction analysis
Nucl. Instrum. Methods Phys. Res. B 300, 54 (2013)

D_3^+ + W	38eV, T: 370−600K
D_3^+ + W	38eV, T: 370−600K
D_3^+ + W	38eV, T: 370−600K
D_3^+ + W	38eV, T: 370−600K

1653. VK Alimov, Y Hatano, B Tyburska-Puschel, K Sugiyama, I Takagi, Y Furuta, J Dorner, M Fusseder, K Isobe, T Yamanishi, M Matsuyama
Deuterium retention in tungsten damaged with W ions to various damage levels
J. Nucl. Mater. 441, 280 (2013)

D + W	1−150eV, T: 403−550K
D + W	1−150eV, T: 403−550K
D + W	1−150eV, T: 403−550K
D + W	1−150eV, T: 403−550K

1654. AV Arzhannikov, VA Bataev, IA Bataev, AV Burdakov, IA Ivanov, MV Ivantsivsky, KN Kuklin, KI Mekler, AF Rovenskikh, SV Polosatkin, VV Postupaev, SL Sinitsky, AA Shoshin
Surface modification and droplet formation of tungsten under hot plasma irradiation at the GOL-3
J. Nucl. Mater. 438, S677 (2013)

undef + W	undef, T: undef

1655. A Rusinov, M Sakamoto, K Honda, R Ohyama, N Yoshida, H Zushi, T Tanabe, I Takagi
DEUTERIUM RETENTION IN TUNGSTEN WITH DIFFERENT GRAIN ELONGATION DIRECTION IRRADIATED BY PLASMA IN APSEDAS
Fusion Sci. Technol. 63, 229 (2013)

D + W	30eV, T: 500K
D + W	30eV, T: 500K
D + W	30eV, T: 500K
D + W	30eV, T: 500K

1656. J Roth, R Doerner, M Baldwin, T Dittmar, H Xu, K Sugiyama, M Reinelt, C Linsmeier, M Oberkofler
Oxidation of beryllium and exposure of beryllium oxide to deuterium plasmas in PISCES B
J. Nucl. Mater. 438, S1044 (2013)

D^+ + Be	1−300eV, T: 273−523K
D_2^+ + Be	1−300eV, T: 273−523K
D_3^+ + Be	1−300eV, T: 273−523K
D^+ + Be	1−300eV, T: 273−523K
D_2^+ + Be	1−300eV, T: 273−523K
D_3^+ + Be	1−300eV, T: 273−523K
D^+ + Be	1−300eV, T: 273−523K
D_2^+ + Be	1−300eV, T: 273−523K
D_3^+ + Be	1−300eV, T: 273−523K
D^+ + Be	1−300eV, T: 273−523K
D_2^+ + Be	1−300eV, T: 273−523K
D_3^+ + Be	1−300eV, T: 273−523K

1657. JL Barton, YQ Wang, T Schwarz-Selinger, RP Doerner, GR Tynan
Isotope exchange experiments in tungsten with sequential deuterium and protium plasmas in PISCES
J. Nucl. Mater. 438, S1183 (2013)

D_2^+ + W	110eV, T: ¡373K
H_2^+ + W	110eV, T: ¡373K
D_2^+ + W	110eV, T: ¡373K
H_2^+ + W	110eV, T: ¡373K
D_2^+ + W	110eV, T: ¡373K
H_2^+ + W	110eV, T: ¡373K
D_2^+ + W	110eV, T: ¡373K
H_2^+ + W	110eV, T: ¡373K

1658. F Sefta, KD Hammond, N Juslin, BD Wirth
Tungsten surface evolution by helium bubble nucleation, growth and rupture
Nucl. Fusion 53, 73015 (2013)

He + W	60eV, T: 500−2000K

1659. T Otsuka, T Tanabe, K Tokunaga
Retention and release mechanisms of tritium loaded in plasma-sprayed tungsten coatings by plasma exposure
J. Nucl. Mater. 438, S1048 (2013)

T + W	400eV, T: 453−573K
T + W	400eV, T: 453−573K
T + W	400eV, T: 453−573K
T + W	400eV, T: 453−573K

1660. M Zlobinski, V Philipps, B Schweer, A Huber, M Reinhart, S Moller, G Sergienko, U Samm, MHJ t Hoen, A Manhard, K Schmid
Hydrogen retention in tungsten materials studied by Laser Induced Desorption
J. Nucl. Mater. 438, S1155 (2013)

D + W	38−350eV, T: 370−700K
D + W	38−350eV, T: 370−700K
D + W	38−350eV, T: 370−700K
D + W	38−350eV, T: 370−700K

1661. VK Alimov, Y Hatano, K Sugiyama, J Roth, B Tyburska-Puschel, J Dorner, J Shi, M Matsuyama, K Isobe, T Yamanishi
The effect of displacement damage on deuterium retention in tungsten exposed to D neutrals and D-2 gas
J. Nucl. Mater. 438, S959 (2013)

D + W	1−150eV, T: 423−1073K
D_2 + W	1−150eV, T: 423−1073K
D + W	1−150eV, T: 423−1073K
D_2 + W	1−150eV, T: 423−1073K
D + W	1−150eV, T: 423−1073K
D_2 + W	1−150eV, T: 423−1073K
D + W	1−150eV, T: 423−1073K
D_2 + W	1−150eV, T: 423−1073K

1662. K Schmid
Implementation of a diffusion convection surface evolution model in WallDYN
J. Nucl. Mater. 438, S484 (2013)

Be + Be	300−500eV, T: undef
D + Be	300−500eV, T: undef
Ar + Be	300−500eV, T: undef
Be + Be	300−500eV, T: undef
D + Be	300−500eV, T: undef
Ar + Be	300−500eV, T: undef
Be + Be	300−500eV, T: undef
D + Be	300−500eV, T: undef
Ar + Be	300−500eV, T: undef
Be + Be	300−500eV, T: undef
D + Be	300−500eV, T: undef
Ar + Be	300−500eV, T: undef
Be + Be	300−500eV, T: undef
D + Be	300−500eV, T: undef
Ar + Be	300−500eV, T: undef

1663. B Tyburska-Puschel, VK Alimov
On the reduction of deuterium retention in damaged Re-doped W
Nucl. Fusion 53, 123021 (2013)

D_2^+ + ReW	76eV, T: 350−750K
D^+ + ReW	76eV, T: 350−750K
D_2^+ + ReW	76eV, T: 350−750K
D^+ + ReW	76eV, T: 350−750K
D_2^+ + ReW	76eV, T: 350−750K
D^+ + ReW	76eV, T: 350−750K
D_2^+ + ReW	76eV, T: 350−750K
D^+ + ReW	76eV, T: 350−750K

1664. M Oya, K Uekita, HT Lee, Y Ohtsuka, Y Ueda, H Kurishita, A Kreter, JW Coenen, V Philipps, S Brezinsek, A Litnovsky, K Sugiyama, Y Torikai
Deuterium retention in Toughened, Fine-Grained Recrystallized Tungsten
J. Nucl. Mater. 438, S1052 (2013)

D + W	1000eV, T: 473−873K
D + W	1000eV, T: 473−873K
D + W	1000eV, T: 473−873K
D + W	1000eV, T: 473−873K

1665. A Sagara, R Nygren, M Miyamoto, D Nishijima, R Doerner, S Fukada, Y Oya, T Oda, Y Watanabe, K Morishita, F Gao, T Norimatsu
Integrated Material System Modeling of Fusion Blanket
Mat. Trans. 54, 477 (2013)

He^{+} + W	10−10000eV, T: 298−1600K
D^{+} + W	10−10000eV, T: 298−1600K
He^{+} + W	10−10000eV, T: 298−1600K
D^{+} + W	10−10000eV, T: 298−1600K
He^{+} + W	10−10000eV, T: 298−1600K
D^{+} + W	10−10000eV, T: 298−1600K
He^{+} + W	10−10000eV, T: 298−1600K
D^{+} + W	10−10000eV, T: 298−1600K

1666. MHJ t Hoen, M Mayer, AW Kleyn, PAZ van Emmichoven
Strongly Reduced Penetration of Atomic Deuterium in Radiation-Damaged Tungsten
Phys. Rev. Lett. 111, 22 (2013)

D + W	5eV, T: 470−560K

1667. Y Oya, M Shimada, T Tokunaga, H Watanabe, N Yoshida, Y Hatano, R Kasada, T Nagasaka, A Kimura, K Okuno
Behavior of deuterium retention and surface morphology for VPS-W/F82H
J. Nucl. Mater. 442, S242 (2013)

D + W	100−1500eV, T: 300−473K
D$_2{}^{+}$ + W	100−1500eV, T: 300−473K
D + W	100−1500eV, T: 300−473K
D$_2{}^{+}$ + W	100−1500eV, T: 300−473K
D + W	100−1500eV, T: 300−473K
D$_2{}^{+}$ + W	100−1500eV, T: 300−473K
D + W	100−1500eV, T: 300−473K
D$_2{}^{+}$ + W	100−1500eV, T: 300−473K

1668. O El-Atwani, M Efe, B Heim, JP Allain
Surface damage in ultrafine and multimodal grained tungsten materials induced by low energy helium irradiation
J. Nucl. Mater. 434, 170 (2013)

He + W	200eV, T: 1223K

1669. V Borovikov, XZ Tang, D Perez, XM Bai, BP Uberuaga, AF Voter
Coupled motion of grain boundaries in bcc tungsten as a possible radiation-damage healing mechanism under fusion reactor conditions
Nucl. Fusion 53, 63001 (2013)

W + W	undef, T: undef

1670. A Keim, M Harnisch, P Scheier, Z Herman
Collisions of low-energy ions Ar + and N-2(+) with room-temperature and heated surfaces of tungsten, beryllium, and a mixed beryllium-tungsten thin film
Int. J. Mass Spectrom. 354, 78 (2013)

Ar^{+} + Be	15−70eV, T: 298−573K
Ar^{+} + W	15−70eV, T: 298−573K
Ar^{+} + BeW	15−70eV, T: 298−573K
N$_2{}^{+}$ + Be	15−70eV, T: 298−573K
N$_2{}^{+}$ + W	15−70eV, T: 298−573K
N$_2{}^{+}$ + BeW	15−70eV, T: 298−573K

1671. C Bjorkas, K Nordlund
Variables affecting simulated Be sputtering yields
J. Nucl. Mater. 439, 174 (2013)

D + Be	5−100eV, T: 300K
Be + Be	5−100eV, T: 300K

1672. M Miyamoto, D Nishijima, MJ Baldwin, RP Doerner, Y Ueda, A Sagara, H Kurishita
Microstructures and Deuterium-Retention Behavior of Tungsten Exposed to D + (He and/or Be) Mixture Plasmas
Mat. Trans. 54, 420 (2013)

D^+ + W	60eV, T: 573K
He + W	60eV, T: 573K
Be + W	60eV, T: 573K
D^+ + W	60eV, T: 573K
He + W	60eV, T: 573K
Be + W	60eV, T: 573K
D^+ + W	60eV, T: 573K
He + W	60eV, T: 573K
Be + W	60eV, T: 573K
D^+ + W	60eV, T: 573K
He + W	60eV, T: 573K
Be + W	60eV, T: 573K

1673. A Lasa, KOE Henriksson, K Nordlund
MD simulations of onset of tungsten fuzz formation under helium irradiation
Nucl. Instrum. Methods Phys. Res. B 303, 156 (2013)

He + W	60eV, T: 573−1603K
C + W	60eV, T: 573−1603K

1674. BI Khripunov, VM Gureev, VS Koidan, SN Kornienko, ST Latushkin, VB Petrov, AI Ryazanov, EV Semenov, VG Stolyarova, LS Danelyan, VS Kulikauskas, VV Zatekin, VN Unezhev
Study of ion-irradiated tungsten in deuterium plasma
J. Nucl. Mater. 438, S1014 (2013)

D + W	250eV, T: ¡373K

1675. P Wang, W Jacob, L Gao, T Durbeck
Deuterium retention in tungsten-doped amorphous carbon films exposed to deuterium plasma
J. Nucl. Mater. 438, S1134 (2013)

D + WC	30−100eV, T: undef
D + WC	30−100eV, T: undef
D + WC	30−100eV, T: undef
D + WC	30−100eV, T: undef

1676. Y Hatano, M Shimada, Y Oya, GP Cao, M Kobayashi, M Hara, BJ Merrill, K Okuno, MA Sokolov, Y Katoh
Retention of Hydrogen Isotopes in Neutron Irradiated Tungsten
Mat. Trans. 54, 437 (2013)

D + W	100eV, T: 373−773K
D + W	100eV, T: 373−773K
D + W	100eV, T: 373−773K
D + W	100eV, T: 373−773K
D + W	100eV, T: 373−773K

1677. JT Zhao, Q Wang, TS Wang, XX Xu, S Zhang, YS Zhou, XC Guan, KH Fang, J Kasagi
Dynamical saturated concentration of deuterium in a beryllium foil studied by low energy D(d,p)T reaction
Nucl. Instrum. Methods Phys. Res. B 316, 13 (2013)

D_3^+ + Be	20000−75000eV, T: ¡340K
D_3^+ + Be	20000−75000eV, T: ¡340K
D_3^+ + Be	20000−75000eV, T: ¡340K
D_3^+ + Be	20000−75000eV, T: ¡340K

1678. K Sugiyama, C Porosnicu, W Jacob, J Roth, T Durbeck, I Jepu, CP Lungu
Study of deuterium retention in/release from ITER-relevant Be-containing mixed material layers implanted at elevated temperatures
J. Nucl. Mater. 438, S1113 (2013)

D + Be	200eV, T: 398−623K
D + BeW	200eV, T: 398−623K
D + BeC	200eV, T: 398−623K
D + Be	200eV, T: 398−623K
D + BeW	200eV, T: 398−623K
D + BeC	200eV, T: 398−623K
D + Be	200eV, T: 398−623K
D + BeW	200eV, T: 398−623K
D + BeC	200eV, T: 398−623K
D + Be	200eV, T: 398−623K
D + BeW	200eV, T: 398−623K
D + BeC	200eV, T: 398−623K

1679. XB Wu, XS Kong, YW You, CS Liu, QF Fang, JL Chen, GN Luo, ZG Wang
Effects of alloying and transmutation impurities on stability and mobility of helium in tungsten under a fusion environment
Nucl. Fusion 53, 73049 (2013)

He + W	undef, T: undef
He + Be	undef, T: undef
He + C	undef, T: undef
He + N	undef, T: undef
He + O	undef, T: undef
He + Re	undef, T: undef
He + Ta	undef, T: undef
He + Nb	undef, T: undef
He + V	undef, T: undef
He + Ti	undef, T: undef
He + Si	undef, T: undef
He + Zr	undef, T: undef
He + Y	undef, T: undef
He + Sc	undef, T: undef
He + W	undef, T: undef
He + Be	undef, T: undef
He + C	undef, T: undef
He + N	undef, T: undef
He + O	undef, T: undef
He + Re	undef, T: undef
He + Ta	undef, T: undef
He + Nb	undef, T: undef
He + V	undef, T: undef
He + Os	undef, T: undef
He + Ti	undef, T: undef
He + Si	undef, T: undef
He + Zr	undef, T: undef

He + Y	undef, T: undef
He + Sc	undef, T: undef
He + W	undef, T: undef
He + Be	undef, T: undef
He + C	undef, T: undef
He + N	undef, T: undef
He + O	undef, T: undef
He + Re	undef, T: undef
He + Ta	undef, T: undef
He + Nb	undef, T: undef
He + V	undef, T: undef
He + Os	undef, T: undef
He + Ti	undef, T: undef
He + Si	undef, T: undef
He + Zr	undef, T: undef
He + Y	undef, T: undef
He + Sc	undef, T: undef
He + W	undef, T: undef
He + Be	undef, T: undef
He + C	undef, T: undef
He + N	undef, T: undef
He + O	undef, T: undef
He + Re	undef, T: undef
He + Ta	undef, T: undef
He + Nb	undef, T: undef
He + V	undef, T: undef
He + Os	undef, T: undef
He + Ti	undef, T: undef
He + Si	undef, T: undef
He + Zr	undef, T: undef
He + Y	undef, T: undef
He + Sc	undef, T: undef
He + W	undef, T: undef
He + Be	undef, T: undef
He + C	undef, T: undef
He + N	undef, T: undef
He + O	undef, T: undef
He + Re	undef, T: undef
He + Ta	undef, T: undef
He + Nb	undef, T: undef
He + V	undef, T: undef
He + Ti	undef, T: undef
He + Si	undef, T: undef
He + Zr	undef, T: undef
He + Y	undef, T: undef
He + Sc	undef, T: undef

1680. Y Zayachuk, MHJ t Hoen, PAZ van Emmichoven, D Terentyev, I Uytdenhouwen, G van Oost
Surface modification of tungsten and tungsten-tantalum alloys exposed to high-flux deuterium plasma and its impact on deuterium retention
Nucl. Fusion 53, 13013 (2013)

D + W	50eV, T: 460−510K
D + Ta	50eV, T: 460−510K
D + W	50eV, T: 460−510K
D + Ta	50eV, T: 460−510K
D + W	50eV, T: 460−510K
D + Ta	50eV, T: 460−510K
D + W	50eV, T: 460−510K
D + Ta	50eV, T: 460−510K

1681. A Adachi, M Yoshida, T Takeishi, T Tanabe, T Hayashi, T Nakano, M Fukumoto, J Yagyuu, Y Miyo, K Masaki, K Itami
Tritium retention to the first wall of JT-60U
Fusion Eng. Des. 88, 295 (2013)

T + C	undef, T: 1273K
T + C	undef, T: 1273K
T + C	undef, T: 1273K
T + C	undef, T: 1273K

3.4 Data Collection, Bibliographic and Progress Report

1682. Ch Jungen, S. T. Pratt
Low-energy dissociative recombination in small polyatomic molecules
J. Chem. Phys. 133, 214303 (2010)

e + ND_4^+	0.001−1eV
e + NH_4^+	0.001−1eV
e + CH_5^+	0.001−1eV
e + NO^+	0.001−1eV
e + H_3O^+	0.001−1eV

1683. Do Anh Tuan, Byung-Hoon Jeon
Determination of the Momentum Transfer Cross-section for the Cl-2 Molecule in a Plasma Discharge Simulation
J. Korean Phys. Soc. 57, 1224 (2010)

e + Cl_2	0.01 − 100 eV	Exp

1684. J. Gregorio, L. C. Pitchford
Updated compilation of electron-Cl-2 scattering cross sections
Plasma Sources Sci. Technol. 21, 032002 (2012)

e + Cl_2	0.01−100eV	E/T

1685. X. Llovet, C. J. Powell, F. Salvat, A. Jablonski
Cross Sections for Inner-Shell Ionization by Electron Impact
J. Phys. Chem. Ref. Data 43, 013102 (2014)

e + Cl	5−1E6 keV	Th
e + S	5−1E6 keV	Th
e + Al	5−1E6 keV	Th
e + Mg	5−1E6 keV	Th
e + Na	5−1E6 keV	Th
e + O	5−1E6 keV	Th
e + H	5−1E6 keV	Th
e + C	5−1E6 keV	Th
e + Bi	5−1E6 keV	Th
e + Ta	5−1E6 keV	Th
e + Xe	5−1E6 keV	Th
e + Au	5−1E6 keV	Th
e + Ag	5−1E6 keV	Th
e + Y	5−1E6 keV	Th
e + Fe	5−1E6 keV	Th
e + Si	5−1E6 keV	Th
e + N	5−1E6 keV	Th
e + Pt	5−1E6 keV	Th
e + Os	5−1E6 keV	Th
e + Re	5−1E6 keV	Th

e + Hf	5−1E6 keV	Th
e + Dy	5−1E6 keV	Th
e + I	5−1E6 keV	Th
e + U	5−1E6 keV	Th
e + Pb	5−1E6 keV	Th
e + W	5−1E6 keV	Th
e + Tm	5−1E6 keV	Th
e + Er	5−1E6 keV	Th
e + Ho	5−1E6 keV	Th
e + Gd	5−1E6 keV	Th
e + Eu	5−1E6 keV	Th
e + Sm	5−1E6 keV	Th
e + Nd	5−1E6 keV	Th
e + Pr	5−1E6 keV	Th
e + Ce	5−1E6 keV	Th
e + La	5−1E6 keV	Th
e + Te	5−1E6 keV	Th
e + Sb	5−1E6 keV	Th
e + Sn	5−1E6 keV	Th
e + In	5−1E6 keV	Th
e + Cd	5−1E6 keV	Th
e + Pd	5−1E6 keV	Th
e + Mo	5−1E6 keV	Th
e + Nb	5−1E6 keV	Th
e + Zr	5−1E6 keV	Th
e + Sr	5−1E6 keV	Th
e + Rb	5−1E6 keV	Th
e + Kr	5−1E6 keV	Th
e + Br	5−1E6 keV	Th
e + Se	5−1E6 keV	Th
e + As	5−1E6 keV	Th
e + Ge	5−1E6 keV	Th
e + Ga	5−1E6 keV	Th
e + Zn	5−1E6 keV	Th
e + Cu	5−1E6 keV	Th
e + Ni	5−1E6 keV	Th
e + Co	5−1E6 keV	Th
e + Mn	5−1E6 keV	Th
e + Cr	5−1E6 keV	Th
e + V	5−1E6 keV	Th
e + Ti	5−1E6 keV	Th
e + Sc	5−1E6 keV	Th
e + Ca	5−1E6 keV	Th
e + K	5−1E6 keV	Th
e + Ar	5−1E6 keV	Th

1686. M. C. Bordage
Comparisons of sets of electron-neutral scattering cross sections and swarm parameters in noble gases: III. Krypton and xenon
J. Phys. D 46, 334003 (2014)

e + Xe	0.01−400eV	E/T
e + Kr	0.01−400eV	E/T

1687. L. L. Alves, K Bartschat, S. F. Biagi, M. C. Bordage
Comparisons of sets of electron-neutral scattering cross sections and swarm parameters in noble gases: II. Helium and neon
J. Phys. D 46, 334002 (2014)

e + Ne	20−1000eV	E/T
e + He	20−1000eV	E/T

1688. L. C. Pitchford, L. L. Alves, K Bartschat
Comparisons of sets of electron-neutral scattering cross sections and swarm parameters in noble gases: I. Argon
J. Phys. D 46, 334001 (2014)

e + Ar	0.01−200eV	E/T

3.5 Interactions of Atomic Particles with Fields

1689. Ph V. Demekhin, I. D. Petrov, V. L. Sukhorukov, al. et
Strong interference effects in the angularly resolved Auger decay and fluorescence emission spectra of the core-excited NO molecule
J. Phys. B 43, 165103 (2010)

B^{5+} + NO	399 −401eV	

1690. Hao Xu, Robin Shakeshaft
R-matrix approach with proper boundary conditions for dissipative and nondissipative collision processes
Phys. Rev. A 83, 012714 (2011)

P + He	80−240 eV	Th

1691. Hao Xu, Robin Shakeshaft
R-matrix approach to collision processes: Study of the threshold behavior of gamma plus He -¿ He+(2s) plus e(-) or He+(2p) plus e(-)
Phys. Rev. A 83, 012716 (2011)

P + He	65−71 eV	Th

1692. Sterling, N. C.
Atomic data for neutron-capture elements II. Photoionization and recombination properties of low-charge krypton ions
Astron. Astrophys. 533, A62 (2011)

e + Kr	1E1−1E8 K	Th
e + Kr^{+}	1E1−1E8 K	Th
e + Kr^{2+}	1E1−1E8 K	Th
e + Kr^{3+}	1E1−1E8 K	Th
e + Kr^{4+}	1E1−1E8 K	Th
e + Kr^{5+}	1E1−1E8 K	Th
e + Kr^{6+}	1E1−1E8 K	Th
P + Kr	1E1−1E8 K	Th
P + Kr^{+}	1E1−1E8 K	Th
P + Kr^{2+}	1E1−1E8 K	Th
P + Kr^{3+}	1E1−1E8 K	Th
P + Kr^{4+}	1E1−1E8 K	Th
P + Kr^{5+}	1E1−1E8 K	Th
P + Kr^{6+}	1E1−1E8 K	Th

CHAPTER 3
AUTHOR INDEX