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MARTIN MARIETTA

**1982
Bibliography of Atomic and
Molecular Processes**

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1982
BIBLIOGRAPHY OF ATOMIC AND MOLECULAR PROCESSES

Compiled by

C. F. Barnett	F. W. Meyer
D. H. Crandall	T. J. Morgan
H. B. Gilbody	(Wesleyan Univ.)
(Queen's U., Belfast)	R. A. Phaneuf
D. C. Gregory	M. S. Pindzola
M. I. Kirkpatrick	(Auburn Univ.)
E. W. McDaniel	E. W. Thomas
(Georgia Tech)	(Georgia Tech)
R. H. McKnight	
(Nat. Bur. Stds.)	

As a part of the work of:
The Controlled Fusion Atomic Data Center
Physics Division
Oak Ridge National Laboratory
Oak Ridge, Tennessee 37831
for the Office of Fusion Energy
of the U.S. Department of Energy

Date Published - May 1984

Prepared by the
OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37831
operated by
MARTIN MARIETTA ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
Under contract No. DE-AC05-84OR21400

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ABSTRACT

This annotated bibliography includes papers on atomic and molecular processes published during 1982. Sources include scientific journals, conference proceedings, and books. Each entry is designated by one or more of the 114 categories of atomic and molecular processes used by the Controlled Fusion Atomic Data Center, Oak Ridge National Laboratory to classify data. Also indicated is whether the work was experimental or theoretical, what energy range was covered, what reactants were investigated, and the country of origin of the first author. Following the bibliographical listing, the entries are indexed according to the categories and according to reactants within each subcategory.

INTRODUCTION

This annotated bibliography on atomic and molecular processes reported in publications during 1982 has been compiled as a part of the activities of the Controlled Fusion Atomic Data Center. Each entry is labeled by one or more of the 10 major categories and 114 subcategories of atomic and molecular processes given on page 2. Grouping according to specific categories is found in the reactants index. Each entry indicates whether the work was experimental (E) or theoretical (T), what energy range was covered, and what reactants were investigated. The classification scheme relates principally to atomic collisions and in particular does not specifically contain atomic structure information (energy levels or wavelength). Structure data are compiled by the National Bureau of Standards and information on atomic structure may be solicited from W. L. Wiese, NBS, Rm. A267, Bldg. 221, Washington, DC 20234.

The following remarks are offered to facilitate the use of the bibliography:

1. Sequencing of reactants in the index follows the order N, N^{*} (excited state), N⁺, N₂, N⁻, NO, Na, Ne, etc.
2. Many papers do not refer to a particular collision system. Reactants in these cases are listed as undefined, denoted as Undef. Review papers are labeled Review rather than listing all reactants discussed in the paper. The abbreviation Seq., preceded by an atom, indicates all members of the isoelectronic sequence for that particular atom. PERT symbolizes "periodic table"; this notation is used when reactions involving a large number of the elements are covered by a publication. All of these codes are used in a general sense to avoid handling thousands of additional reactants at every stage in the production of these bibliographies.
3. The country listed at the end of each bibliographic entry is derived from the address of the first author given in the original publication.

Beginning in 1982 the Data Center adopted a revised categorization scheme in which some categories have been dropped and molecular reactants have been severely limited. This reduced categorization scheme reflects more precisely magnetic fusion interests but is still quite broad. Molecular species covered include H₂, H₃, HeH, N₂, O₂, CO, CO₂, OH, H₂O, CH₂, CH₃, CH₄, their ions and dissociated fragments.

ATOMIC COLLISIONS BIBLIOGRAPHY CATEGORIZATIONS LIST

Controlled Fusion Atomic Data Center, ORNL

A. HEAVY PARTICLE - HEAVY PARTICLE INTERACTIONS

1. General
2. Elastic Scattering Collisions
3. Excitation
4. Dissociation
5. Fluorescence
6. Electron Capture
7. Ionization
8. Stripping
9. Recombination or Mutual Neutralization Leading to Neutral Products (ion-ion)
11. Collisional De-Excitation
12. Collisional Line Broadening
14. Heavy Particle Interchange (must involve some form of hydrogen or helium)
16. Electron Detachment from Negative Ions into Continuum
17. Interaction Potentials
18. Angular Scattering
20. Attenuation (unspecified process)

B. INTERACTIONS OF ATOMIC PARTICLES WITH FIELDS

1. Interaction of Individual Atoms or Molecules with External Fields
7. Collisions in Presence of Static or time Varying Fields

C. PARTICLE PENETRATION IN MACROSCOPIC MATTER (IONS, NEUTRALS, AND ELECTRONS)

1. General
2. Energy Loss and Stopping Power
4. Particle Range
5. Multiple Scattering
6. Charge State Population
7. Excited State Population

D. PARTICLE INTERACTIONS WITH SOLID SURFACES

1. General
2. Sputtering by Electrons, Neutrons, and Heavy Particles (only total removal coefficients)
3. Sputtered Particle Charge and Quantum (Excited) State Distribution
4. Secondary Electron Ejection by Heavy Particle and Electrons
5. Photoelectric Ejection of Electrons (coefficients only)
6. Reflection of Electrons from Surfaces (coefficients only)
7. Reflection of Heavy Particles from Surfaces (total reflection coefficients only)
8. Charge and Quantum State Distributions of Reflected Heavy Particles
9. De-Excitation, Neutralization, Ionization, or Dissociation of Particles Interacting with Surfaces

11. Sticking Coefficients, Thermal Energies and Adsorption
12. Electromagnetic Radiation Induced by Electron or Heavy Particle Impact on Surfaces
13. Desorption of Gases from Surfaces
17. Electron-, Ion-, and Photon-Induced Chemical Changes to Surfaces
18. Trapping and Reemission of Hydrogen (all forms) and Helium

E. ELECTRON-PARTICLE INTERACTION

1. General
2. Elastic Collisions
3. Excitation
4. Dissociation
5. Ionization
6. Recombination (electron-ion)
7. Collisional De-Excitation
8. Collisional Line Broadening
9. Negative Ion Formation
11. Free-Free Transitions (Bremsstrahlung)
13. Electron Detachment from Negative Ions
16. Fluorescence
17. Angular Scattering
19. Momentum Transfer

H. PHOTON COLLISIONS WITH HEAVY PARTICLES AND ELECTRONS (hv < 100 keV)

1. General
2. Total Absorption
3. Elastic Scattering
4. Excitation
5. Dissociation
6. Ionization
7. Photodetachment
8. Fluorescence
11. Free-Free Absorption ~ Inverse Bremsstrahlung

J. DATA COMPILATION

1. Heavy Particle
2. Electrons
3. Photons
4. Particles on Surfaces and Solids
5. Transport
6. Structure

K. REVIEWS AND BOOKS

1. Heavy Particle
2. Electrons
3. Photons
4. Particles on Surfaces and Solids
5. Transport
6. Structure
7. General
8. Use of Atomic Data for Plasma Studies

L. BIBLIOGRAPHIES

1. Heavy Particle
2. Electrons
3. Photons
4. Particles on Surfaces and Solids
5. Transport
6. Structure

ABBREVIATIONS:

L1 Seq - sequence (L1)

PERT - periodic table

Undef - undefined

No molecules except H₂, H₃, HeH, H₂, O₂, CO, CO₂, OH, H₂O, CH₂, CH₃, CH₄, and their ions

H or "hydrogen" also includes D and T

COUNTRY CODE:

1. United States	26. Brazil
2. United Kingdom	26. Australia
3. Soviet Union	27. East Germany
4. Japan	28. Sweden
5. West Germany	29. Greece
6. France	30. South Africa
7. Canada	31. Taiwan
8. Mexico	32. Argentina
9. The Netherlands	33. People's Republic of China
10. Denmark	34. Saudi Arabia
11. Finland	35. Algeria
12. Norway	36. People's Republic of Singapore
13. Switzerland	37. Malaysia
14. India	38. Nigeria
15. Israel	39. Egypt
16. Italy	40. Jordan
17. Czechoslovakia	41. New Zealand
18. Yugoslavia	42. Chile
19. Romania	43. Turkey
20. Poland	44. Bulgaria
21. Austria	45. Pakistan
22. Hungary	46. Portugal
23. Belgium	
24. Spain	

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REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1	H ¹⁸ hv + Na	E	590 nm	Russo, R. E.; Niefert, G. M. Determination of atomic and molecular excited-state lifetimes using an optoelectronic cross-correlation method. Appl. Spectrosc. 36, 52 (1982) United States
2	A ¹³ H ¹⁸ + Fe ²²⁺ E ¹³ e + Fe ²²⁺ H ¹⁴ hv + Fe ²²⁺	T	85-170 Ry	Bhatia, A. K.; Masch, L. E. Atomic calculation for Fe XXIII, UV, and x-ray lines. Astron. Astrophys. 103, 324 (1981) United States
3	H ¹² hv + H ¹⁰⁺ H ¹⁴ hv + H ¹⁰⁺	T	100-500 eV	Reilman, R. F.; Tasson, S. T. *Erratum: Photoabsorption cross sections for positive ions with Z less than or equal to 20. Astrophys. J. Suppl. Ser. 46, 115 (1981) United States
4	H ¹⁴ Undef	E	Undef	Gurtovenko, E. A.; Kostik, R. I. On the establishment of internally consistent solar scales of oscillator strengths and abundances of chemical elements: I. Oscillator strengths for 865 Fe I lines from abundance. Astron. Astrophys. Suppl. Ser. 46, 235 (1981) Soviet Union
5	E ¹⁶ e + Fe ¹⁺ ; e + Fe ²⁺ ; e + Fe ³⁺ ; e + Fe ⁴⁺ ; e + Fe ⁵⁺ ; e + Fe ⁶⁺ ; e + Fe ⁷⁺ ; e + Fe ⁸⁺ ; e + Fe ⁹⁺ ; e + Fe ¹⁰⁺ ; e + Fe ¹¹⁺ ; e + Fe ¹²⁺ ; e + Fe ¹³⁺ ; e + Fe ¹⁴⁺ ; e + Fe ¹⁵⁺ ; e + Fe ¹⁶⁺ ; e + Fe ¹⁷⁺ ; e + Fe ¹⁸⁺ ; e + Fe ¹⁹⁺ ; e + Fe ²⁰⁺ ; e + Fe ²¹⁺ ; e + Fe ²²⁺ ; e + Fe ²³⁺ ; e + Fe ²⁴⁺	T	Undef	Woods, B. T.; Shull, J. M.; Sarazin, C. L. Recombination coefficients for iron ions. Astrophys. J., Part 1 245, 355 (1981) United States
6	A ¹³ H ¹⁸ + S ¹⁰⁺ E ¹³ e + S ¹⁰⁺ H ¹⁴ hv + S ¹⁰⁺	T	3.4-9.9 Ry	Feldman, U.; Doschek, G. A.; Bhatia, A. K. Solar observations and atomic data for the 3s ² 3s-3p ² transition in S V. Astrophys. J., Part 1 250, 799 (1981) United States
7	E ¹³ e + N ₂	E	20-300 eV	Muschitt, J. C.; Dassen, H. W.; McConkey, J. W. Vacuum ultraviolet excitation of N ₂ by low energy electrons: polarization and excitation-function measurements. Can. J. Phys. 55, 1293 (1981) Canada
8	A ¹³ Cs ⁰ + N ₂ ; Cs ⁰ + N ₂ ; Cs ⁰ + CH ₄ ; Cs ⁰ + CD ₄ A ¹¹ Cs ⁰ + N ₂ ; Cs ⁰ + N ₂ ; Cs ⁰ + CH ₄ ; Cs ⁰ + CD ₄	E	470-651 K	Siara, I. M.; Lubis, R. U.; Krause, L. Temperature dependence of cross sections for 7 ² P _{3/2} going to or coming from 7 ² P _{3/2} excitation transfer and for quenching in cesium, induced in collisions with N ₂ , N ₂ , CH ₄ , and CD ₄ . Can. J. Phys. 60, 239 (1982) Canada
9	A ¹⁷ H ₂ O	T	Undef	Reimers, J. R.; Watts, R. C.; Klein, M. L. Intermolecular potential functions and the properties of water. Chem. Phys. 64, 95 (1982) Australia
10	A ¹¹ CO ⁰ + He	T	0-4 eV	Gianturco, F. A.; Lavagna, U. T.; Petralia, G. The CO-He system revisited: V-T collisional relaxation from ab initio potentials. Chem. Phys. 64, 259 (1982) Italy
11	A ¹¹ CO ₂ ⁰ + He; CO ₂ ⁰ + Ne	T	50-470 K	Clary, D. C. Ab initio computation of vibrational relaxation rate coefficients for the collisions of CO ₂ with helium and neon atoms. Chem. Phys. 65, 247 (1982) United Kingdom
12	A ⁰⁷ He ⁰ + Ar	E	13-1500 eV	Pradel, P.; Loucagne, J. J. Energy dependence of the total ionization cross section of Ar atoms by metastable He atoms. Chem. Phys. Lett. 86, 48 (1982) France
13	A ¹⁷ HeBe; HeHg; BeHg	T	Undef	Chiles, R. A.; Dykstra, C. E. The potential energy curves of HeBe, HeHg, and BeHg. Chem. Phys. Lett. 86, 447 (1982) United States

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
14	A17 $\text{He} + \text{H}_2$	T	Under	Habitz, P.; Tong, K. T.; Toennies, J. P. The anisotropic Van der Waals potential for He-H_2 . Chem. Phys. Lett. 88, 461 (1982) West Germany
15	A11 $\text{CO}^+ + \text{He}$	T	100-1060 K	Billing, G. B.; Cocciatore, M. Semiclassical calculation of vibrational relaxation of CO colliding with ^3He and ^4He . Chem. Phys. Lett. 86, 29 (1982) Denmark
16	A14 $\text{H} + \text{N}_2$ A18 $\text{H} + \text{N}_2$	T	0.1-0.4 eV	Mayne, M. R. A simple technique for obtaining reactive differential cross sections from highly-averaged trajectory data. Chem. Phys. Lett. 86, 33 (1982) Canada
17	A17 H_2	T	Under	Tennyson, J. The ground-state H_2 molecule. Chem. Phys. Lett. 86, 161 (1982) The Netherlands
18	A14 $\text{F} + \text{H}_2$ A18 $\text{F} + \text{H}_2$	T	1.9-2.9 kcal/mol	Bowman, J. N.; Lee, K. T.; Ju, G. Z. Approximate quantum differential cross sections for the $\text{F} + \text{H}_2$ reaction. Chem. Phys. Lett. 86, 384 (1982) United States
19	A06 $\text{He}^{++} + \text{H}; \text{H}^{++} + \text{H}; \text{C}^{++} + \text{H}; \text{C}^{++} + \text{H}; \text{C}^{++} + \text{H}$	T	1-1000 eV	Butcher, C.; Hall, I. G. Low-energy charge exchange from hydrogen atoms by He^{++} -electron ions. Chem. Phys. Lett. 86, 686 (1982) United States
20	A17 $\text{Na} + \text{Na}$	T	Under	Peach, G. Model potentials or pseudopotentials; what's the difference. Comments At. Mol. Phys. 11, 101 (1982) United Kingdom
21	A05 $\text{H}^+ + \text{Xe}; \text{H}^+ + \text{La}$ E11 $\text{e} + \text{Xe}; \text{e} + \text{La}$	T	E11 10-600 eV A05 1-20 MeV	Amusia, M. Atomic bremsstrahlung spectrum. Comments At. Mol. Phys. 11, 123 (1982) Soviet Union
22	A17 $\text{I} + \text{Br}$	E T	Under	de Vries, A. E. Half-collisions. Comments At. Mol. Phys. 11, 157 (1982) The Netherlands
23	E02 $\text{e} + \text{H}$ E03 $\text{e} + \text{C}^{++}; \text{e} + \text{H}$ E17 $\text{e} + \text{H}$	E T	E03 1-12 Ry; E02; E17 30-54.4 eV	Kingston, A. E.; Walters, W.R.J. Electron-atom scattering at intermediate energies. Comments At. Mol. Phys. 11, 177 (1982) United Kingdom
24	E05 $\text{e} + \text{He}^+; \text{e} + \text{Li}^+; \text{e} + \text{H}^+$	E T	1-100 Threshold	Younger, S. R. Current theoretical problems in the electron impact ionization of positive ions. Comments At. Mol. Phys. 11, 192 (1982) United States
25	A07 $\text{Ca}^+ + \text{Ca}^+$ A09 $\text{H}^+ + \text{H}^-; \text{Na}^+ + \text{O}^-$	E T	A07 20-300 keV A09 1-4000 keV; 1-20x10 ⁹ cm/s	Dolder, K. Ion-ion collisions. Comments At. Mol. Phys. 11, 211 (1982) United Kingdom
26	A06 $\text{H}^+ + \text{H}; \text{Na}^+ + \text{H}^+$ A10 $\text{H}^+ + \text{H}; \text{Na}^+ + \text{H}^+$	T	2-25 keV; 0.20-0.64 a.u.	Lin, C. D. Some new approaches to atomic expansion method in ion-atom collisions. Comments At. Mol. Phys. 11, 241 (1982) United States
27	E03 Review	E	Under	Gibson, A. F. Lasers for compression and fusion. Contemp. Phys. 23, 285 (1982) United Kingdom
28	A02 $\text{He}^{++} + \text{O}$ A10 $\text{He}^{++} + \text{O}$	E	3.5-4.9 MeV	Bauer, M. V. Elastic scattering of α particles from ^{16}O near the Coulomb barrier. Helv. Phys. Acta 54, 439 (1981) Switzerland
29	A11 Under	T	Under	Goroshkov, A. A.; Golov, A. I. Vibrational-rotational relaxation of diatomic molecules in an inert gas. High Temp. 19, 586 (1981) Soviet Union
30	A14 $\text{O}_2^+ + \text{N}_2; \text{H}_2\text{O}^+ + \text{N}_2; \text{C}_2\text{H}_4^+ + \text{D}_2$	E	2-16 eV	Karachevskiy, G. V.; Morozhin, A. Z.; Savkin, V. V. Study of slow ion-molecule exchange reactions: II. The reactions $\text{H}_2\text{O}^+ + \text{N}_2; \text{O}_2^+ + \text{N}_2$, and $\text{C}_2\text{H}_4^+ + \text{D}_2$. High Energy Chem. 16, 288 (1981) Soviet Union

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32	A92 $\text{He}^+ + \text{He}$	E	400-1000 eV	Rei Bastide, T. K.; Rei Bastide, K. Scattering of He^+ in He . Int. J. Mass Spectrom. Ion Phys. 42, 191 (1982) India
33	A14 $\text{O} + \text{H}_2$; $\text{O} + \text{D}_2$	E	1919-2781 K	Pandiyakhal, K. N.; Shinaer, C. B. Resonance absorption measurements of atom concentrations in reacting gas mixtures: VIII. Rate constants for $\text{O} + \text{H}_2 + \text{OH} + \text{H}$ and $\text{O} + \text{D}_2 + \text{OD} + \text{D}$ from measurements of O atoms in oxidation of H_2 and D_2 by H_2O . J. Chem. Phys. 76, 311 (1982) United States
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36	A17 $\text{H}_2 + \text{H}_2$	T	Under	Van Nieuert, H. C.; Berns, E. W. Comparison of electron gas and ab initio potentials for the $\text{H}_2\text{-H}_2$ interactions. Application in the second virial coefficient. J. Chem. Phys. 76, 364 (1982) The Netherlands
37	H95 $\text{h}\nu + \text{O}_2$ H96 $\text{h}\nu + \text{O}_2$	E	700-120 Å	Saeson, J.A.F.; Raybren, G. H.; Parook, P. H. Dissociative photoionization cross sections of O_2 from threshold to 120 Å. J. Chem. Phys. 76, 393 (1982) United States
38	H06 $\text{h}\nu + \text{H}_2\text{O}$	E	10-31 eV	Tremblay, C. M.; Southworth, S.; Kobrin, P. H.; Lindle, D. W.; Thornton, G.; Shirley, E. A. Photoelectron angular distributions of H_2C . J. Chem. Phys. 76, 869 (1982) United States
39	A02 $\text{He} + \text{H}_2$	T	0.1-4.2 eV	Cross, R. J. An energy-adjusted sudden approximation for inelastic scattering. J. Chem. Phys. 76, 931 (1982) United States
40	H94 $\text{h}\nu + \text{H}_2\text{O}$ H96 $\text{h}\nu + \text{H}_2\text{O}$	T	16-500 eV	Dierksen, G.H.F.; Kraemer, W. P.; Rascigno, T. N.; Bender, C. F.; McKoy, B. V.; Langhoff, S. H.; Langhoff, P. W. Theoretical studies of photoexcitation and ionization in H_2O . J. Chem. Phys. 76, 1043 (1982) West Germany
41	A11 $(\text{CO}^+)^+ + \text{CC}$; $(\text{CO}^+)^+ + \text{Ar}$ H08 $\text{h}\nu + \text{CO}$; $\text{h}\nu + \text{CC} + \text{Ar}$	E	A11 300 K H08 4560 Å	Danon, J.; Maccisire, G.; Govers, T. R.; Marx, R. Laser induced fluorescence of ions trapped in an ion cyclotron resonance cell: excitation of $\text{CO}^+ X^2\Sigma$, $V(\text{double prime}) = 6$ and relaxation of $\text{CC}^+ A^2\Sigma$, $V(\text{prime}) = 1$. J. Chem. Phys. 76, 1252 (1982) France
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44	E02 $e + \text{H}_2$ E17 $e + \text{H}_2$	T	5-1000 eV	Ganes, P. S.; Green, A.E.S. Semiempirical e- H_2 elastic scattering cross sections from 5 eV to 1 keV. J. Chem. Phys. 76, 161P (1982) United States
45	A11 $\text{OH}^+ + \text{H}_2$; $\text{OH}^+ + \text{O}_2$; $\text{OH}^+ + \text{H}_2$; $\text{OH}^+ + \text{H}_2\text{O}$	E	300 K	McDermid, I. S.; Landenberger, J. B. Radiative lifetimes and quenching rate coefficients for directly excited rotational levels of $\text{OH}(A^2\Sigma, v(\text{prime}) = 0)$. J. Chem. Phys. 76, 1024 (1982) United States

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
46	E03 $\text{Cs} + \text{Cs}$	T	10-10000 eV	Genes, F. S. Excitation of cesium atoms by electron impact. J. Chem. Phys. 76, 2103 (1982) United States
47	A17 $\text{Br} + \text{He}; \text{Br} + \text{Ar}; \text{Br} + \text{Kr}; \text{Br} + \text{Xe}$	E T	Undef	Hollman, F. B.; Fege, W. M.; Eisels, F. L.; Twist, J. R.; Hensley, G. W.; Thackston, M. G.; Chelf, R. D.; McDaniel, E. L. Longitudinal diffusion coefficients and test of the generalized Einstein relation for $\text{Br}-\text{He}$, $\text{Br}-\text{Ar}$, $\text{Br}-\text{Kr}$, and $\text{Br}-\text{Xe}$. J. Chem. Phys. 76, 2106 (1982) United States
48	A11 $\text{Pb} + \text{Pb}; \text{Pb} + \text{Ar}$	E	1200 K	Reimer, C.; Ejes, S.; Burnham, R. Collisional quenching of $\text{Pb } 6p^2 \text{ } ^3\text{P}_1$ and $6p^2 \text{ } ^3\text{P}_2$ metastables by ground state Pb atoms. J. Chem. Phys. 76, 2332 (1982) United States
49	A02 $\text{He} + \text{He}$ A17 $\text{He} + \text{He}$ A18 $\text{He} + \text{He}$	E T	100-5000 m/s	Feltgen, R.; Kirst, H.; Kohler, K. A.; Fauly, H.; Torallo, F. Unique determination of the He_2 ground state potential from experiment by use of a reliable potential model. J. Chem. Phys. 76, 2360 (1982) West Germany
50	A14 $\text{H}_2 + \text{D}_2$	E	0.002-11.0 eV	Douglas, C. E.; Singer, G.; Contry, W. R. The dynamics of the reaction $\text{H}_2 + \text{D}_2 \rightarrow \text{HD}_2 + \text{H}_2$, and the effects of reactant vibrational excitation on the product energy and angle distributions. J. Chem. Phys. 76, 2423 (1982) United States
51	A11 $\text{Ar} + \text{O}_2; \text{Ar} + \text{CO}_2; \text{Ar} + \text{CO}; \text{Kr} + \text{O}_2; \text{Kr} + \text{CO}_2; \text{Kr} + \text{CO}; \text{Xe} + \text{O}_2; \text{Xe} + \text{CO}_2; \text{Xe} + \text{CO}$	E	300 K	Balanis, J.; Gaida, M. F. Quenching of metastable Ar, Kr, and Xe atoms by oxygen-containing compounds: a resonance fluorescence study of reaction products. J. Chem. Phys. 76, 2430 (1982) United States
52	A17 $\text{He} + \text{H}_2; \text{He} + \text{H}_2$	T	Undef	Teng, K. I.; Toennies, J. P. A simple theoretical model for the van der Waals potential at intermediate distances: IV. The bond distance dependence of the potential hypersurfaces for $\text{He}-\text{H}_2$ and $\text{He}-\text{H}_2$ also for the repulsive region. J. Chem. Phys. 76, 2524 (1982) West Germany
53	A11 $\text{CO} + \text{CO}^+$	E	300 K	Paske, W. C.; Garrett, A. W.; Shadfar, E.; Golden, D. E.; Twist, J. R. Radiative decay lifetimes and optical excitation functions for the $\text{ } ^2\Sigma^-(v=2,3,4)$ states of CO . J. Chem. Phys. 76, 3002 (1982) United States
54	A17 $\text{H} + \text{H}_2$	T	Undef	Lewchenko, V.; Hancock, G. C.; Certain, P. R. Near Hartree-Fock calculation of the $\text{H} + \text{H}_2$ potential energy surface. J. Chem. Phys. 76, 3119 (1982) United States
55	A14 $\text{O} + \text{H}_2$ A17 $\text{O} + \text{H}_2$	T	Undef	Lee, K. T.; Eucken, J. P.; Wagner, A. F.; Schatz, G. C. A comparative study of the reaction dynamics of several potential energy surfaces for $\text{O}(^3\text{P}) + \text{H}_2 \rightarrow \text{OH} + \text{H}$: II. Collinear exact quantum and quasiclassical reaction probabilities. J. Chem. Phys. 76, 3562 (1982) United States
56	A14 $\text{O} + \text{H}_2$	T	200-2000 K	Lee, K. T.; Eucken, J. P.; Wagner, A. F.; Schatz, G. C. A comparative study of the reaction dynamics of the $\text{O}(^3\text{P}) + \text{H}_2 \rightarrow \text{OH} + \text{H}$ reaction on several potential energy surfaces: III. Collinear exact quantum transition coefficient correction to transition state theory. J. Chem. Phys. 76, 3583 (1982) United States
57	E03 $\text{O} + \text{N}_2$ E04 $\text{O} + \text{N}_2$	E	20-340 eV	Filippelli, A. R.; Sharpton, F. A.; Li, C. C.; Murphy, R. E. Production of atomic nitrogen emission by electron-impact dissociative excitation of nitrogen molecules. J. Chem. Phys. 76, 3597 (1982) United States
58	A14 $\text{Li} + \text{O}_2 + \text{He}; \text{Li} + \text{O}_2 + \text{Ar}$	E	150 °C	Kramer, S. L.; Lehmann, B. E.; Hurst, G. S.; Payne, M. G.; Young, J. P. The reaction of Li with O_2 in the presence of He or Ar. J. Chem. Phys. 76, 3614 (1982) United States
59	A11 $\text{He} + \text{He}^+$ E07 $\text{e} + \text{He}^+$	E	300 K	Stevafelt, J.; Pouville, J. M.; Bouchouie, A. Reaction kinetics of a high pressure helium fast discharge afterglow. J. Chem. Phys. 76, 4006 (1982) France

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60	A14 $O + H_2$	T	0.25-6.0 kcal/mol	Whittlech, P. A.; Reckmann, J. T.; Fisher, E. R. Quasiclassical trajectory investigation of the reaction $O(1D) + H_2$. J. Chem. Phys. 76, 4468 (1982) United States
61	A14 $F + H_2$ A10 $F + H_2$	T	0.23 eV	Blais, M. C.; Trehlar, E. G. Quasiclassical trajectory calculation of the state-specified differential cross sections and opacity functions for $F + H_2 \rightarrow HF(v \text{ prime}) + H$. J. Chem. Phys. 76, 4490 (1982) United States
62	A96 $F^- + H_2$; $F^- + D_2$; $Cl^- + H_2$; $Cl^- + D_2$ A14 $F^- + H_2$; $F^- + D_2$; $Cl^- + H_2$; $Cl^- + D_2$ A16 $F^- + H_2$; $F^- + D_2$; $Cl^- + H_2$; $Cl^- + D_2$	E	1.0-3000 eV	Hug, M. S.; Friedrich, B. S.; Doverspike, L. S.; Champion, R. L.; Esselcy, V. A. Reactive scattering and electron detachment in collisions of halogen negative ions with isotopic hydrogen molecules. J. Chem. Phys. 76, 4552 (1982) United States
63	A14 $Ar^+ + H_2$; $Ar^+ + H_2$; $Ar^+ + CO$; $Ar^+ + O_2$; $Ar^+ + CO_2$	E	0.04-2.5 eV	Dotan, I.; Lindinger, W. Energy dependences of the reactions of Ar^+ with H_2 , H_2 , CO , O_2 , CO_2 , H_2O , and CCl_4 . J. Chem. Phys. 76, 4572 (1982) Austria
64	H06 $h\nu + O_2$	E	10-56 eV	Dittman, P. R.; Bill, B.; Bohmer, J. L. Shape-resonance-induced non-Franck-Condon effects in the valence-shell photoionization of O_2 . J. Chem. Phys. 76, 5703 (1982) United States
65	A03 $H_2 + CO_2$; $C_2 + CC_2$; $Ar + CO_2$	E	2-5 keV	Ryall, S. S.; Fenn, J. B.; Kolb, C. E.; Silver, J. A. Collisional excitation of CO_2 by H_2 , O_2 , and Ar . J. Chem. Phys. 76, 5878 (1982) United States
66	A03 $O_2^+ + O_2$ A06 $O_2^+ + O_2$	E	1-36 eV	Becker, C. H. Quantum mechanical calculations of symmetrical molecular charge exchange and vibrational excitations in $O_2^+ + O_2$ collisions. J. Chem. Phys. 76, 5820 (1982) United States
67	H06 $h\nu + CO_2$	T	840-660 eV	Densch, W. R.; Davidson, E. R.; Hazi, A. U. Oxygen K hole photoionization cross section of CO_2 . J. Chem. Phys. 76, 6031 (1982) United States
68	A17 $H_2 + H_2$	T	Under	Burton, P. G.; Senff, U. E. The $(H_2)_2$ potential surface and the interaction between hydrogen molecules at low temperatures. J. Chem. Phys. 76, 6073 (1982) Australia
69	D17 $N_2^+ + Al$; $N_2^+ + Cu$; $N_2^+ + Mo$; $N_2^+ + Ni$	E	0-60 eV	Shenir, M.; Baldwin, B. A.; Darke, T.; Nebelais, J. W.; Hochmann, P. Reactions of homonuclear diatomic ions with metal surfaces: II. Nitridation of Al, Cu, Mo, and Ni by N_2^+ beams in the low kinetic energy-near threshold region. J. Chem. Phys. 76, 6417 (1982) United States
70	H06 $h\nu + Xe^0$	E	3740-4744 Å	King, B. F.; Latimer, C. J. Autoionizing resonances in the photoionization of long-lived excited xenon atoms. J. Opt. Soc. Am. 72, 306 (1982) United Kingdom
71	A06 $H^+ + H$ A10 $H^+ + H$	T	25-60 keV	Eichenauer, E.; Gryn, B.; Scheid, W. Classical-trajectory calculations of the differential cross section for charge transfer in $H^+ - H$ collisions. J. Phys. B 15, L17 (1982) West Germany
72	E05 $e + H$; $e + He$ E17 $e + H$; $e + He$	T	200-3600 eV	Pathak, A.; Srivastava, M. K. Comments on the semiclassical approach to the electron-electron correlation in the electron impact ionization of atoms. J. Phys. B 15, L21 (1982) India
73	A03 $He^{2+} + H$ A06 $He^{2+} + H$	T	1-100 keV	Errea, L. F.; Mendez, L.; Sierra, A. On the choice of translation factors for approximate molecular wavefunctions. J. Phys. B 15, 101 (1982) Spain
74	A06 $He^+ + Li$; $He^{2+} + Li$	E	6.7-800 keV	McCullough, R. W.; Goffe, T. V.; Shah, R. B.; Lennan, M.; Gilbody, M. B. Electron capture by He^+ and He^{2+} ions in lithium vapour. J. Phys. B 15, 111 (1982) United Kingdom

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75	E02 $e + Kr; e + Xe; e + \text{Xe}$	T	0.05-30 eV	Sin Fai Lam, L. T. Relativistic effects in electron scattering by atoms: III. Elastic scattering by krypton, xenon, and radon. <i>J. Phys. B</i> 15, 119 (1982) Australia
76	E05 Undef	T	Undef	Casati, E.; Tortori, A.; Baraldi, C. An empirical approach to K-shell ionisation cross section by electrons. <i>J. Phys. B</i> 15, 155 (1982) Italy
77	E07 Undef	T		Bivona, S.; Ferrante, G.; Nuzzo, S.; Zaccaro, M. Particle scattering in a plasma in the presence of a laser field. <i>J. Phys. B</i> 15, 169 (1982) Italy
78	H06 $h\nu + O_2$	T	10-41 eV	Delaney, J. J.; Millicr, I. H.; Saunders, V. R. Separated-channel static-exchange calculations of the photoionisation of the $1(\text{small pi sub g})$ orbital of O_2 . <i>J. Phys. B</i> 15, 137 (1982) United Kingdom
79	E07 $Ne + Be^+ + h\nu$	E		Polak-Diegels, P.; Benenne, G.; Keller, J.; Weiner, J. Direct observation of a two-photon radiation ionisation collision in crossed Ne-Be atomic beams. <i>J. Phys. B</i> 15, L41 (1982) United States
80	A06 $Ti^+ + Ti^+$ A07 $Ti^+ + Ti^+$	E	33-92 keV	Forrest, R. A.; Peart, B.; Dolder, K. Measurements of inelastic collisions between Ti^+ ions. <i>J. Phys. B</i> 15, L45 (1982) United Kingdom
81	H06 $h\nu + Ne; h\nu + Ar; h\nu + Kr; h\nu + Xe$	T	0-42 eV	Dyall, K. G.; Larkins, F. P. Satellite structure in atomic spectra: II. The outer-shell photoelectron spectra of the rare gases. <i>J. Phys. F</i> 15, 219 (1982) Australia
82	H05 $h\nu + NeH^+$	T	1000-1100 Å	Basu, D.; Bhattacharyya, S. S.; Dutta, K. K. Photodissociation of NeH^+ molecular ions. <i>J. Phys. B</i> 15, 233 (1982) India
83	A17 $Hg + Hg$	T	Undef	Stefanov, B.; Iordanov, O.; Zarkova, I. Interaction potential in $^2I(\text{rot g})^+ Hg_2$: fit to the experimental data. <i>J. Phys. B</i> 15, 239 (1982) Bulgaria
84	A03 $H^+ + CO_2; D^+ + CO_2$	E	15-100 eV	Eischof, G.; Hermann, V.; Krutsk, J.; Linder, F. Vibrational excitation in $H^+(D^+)-CO_2$ collisions: mode selectivity and time effects. <i>J. Phys. B</i> 15, 249 (1982) West Germany
85	A06 $Ar^{2+} + Ne$ A18 $Ar^{2+} + Ne$	E	540 eV	Kamber, E. Y.; Nathur, D.; Hasted, J. E. Energy-loss spectra of $Ar^{2+}-Ne$ collisions. <i>J. Phys. B</i> 15, 263 (1982) Soviet Union
86	E03 $e + In$ E06 $e + In$	E	15-450 eV	James, G. K.; Rossi, D.; Ross, K. J.; Wilson, M. The ejected-electron spectrum of In I and In II autoionising transitions resulting from 15-450 eV electron impact excitation. <i>J. Phys. B</i> 15, 275 (1982) United Kingdom
87	E05 $e + Ba$	E	5-500 eV	Dettmann, J.-H.; Karstensen, F. Absolute ionisation functions for electron impact with barium. <i>J. Phys. B</i> 15, 287 (1982) West Germany
88	E03 $e + H_2$ E17 $e + H_2$	T	0.02-0.4 Ry	Feldt, A. M.; Morrison, M. A. Breakdown of the adiabatic-nuclear-rotation approximation for near-threshold e- H_2 collisions. <i>J. Phys. B</i> 15, 301 (1982) United States
89	E02 $e + CO_2$	E	3.2-14.4 eV	Chentrell, S. J.; Field, D.; Williams, P. I. A new set of resonances in the electron scattering spectrum of CO_2 . <i>J. Phys. B</i> 15, 289 (1982) United Kingdom
90	A09 $Kr^+ + F^- + Ar; Na^+ + Cl^- + H_2; Na^+ + Cl^- + N_2; K^+ + Cl^- + O_2; K^+ + Cl^- + N_2; K^+ + Cl^- + N_2; K^+ + Cl^- + O_2$	T	1000-2400 K	Whitten, B. L.; Morgan, W. L.; Bardsley, J. N. Monte-Carlo calculations of two- and three-body ionic recombination. <i>J. Phys. B</i> 15, 319 (1982) United States

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91	A06 $h\nu + \text{Na}^+$	T	4200-1000 Å	Chang, T. H. Effect of many-body interaction to the photoionization from the excited state of Na. J. Phys. B 15, L61 (1982) United States
92	A06 $\text{H}^- + \text{H}_2; \text{H}^- + \text{CO}; \text{H}^- + \text{D}_2; \text{F}^- + \text{H}_2; \text{F}^- + \text{CO}; \text{F}^- + \text{D}_2; \text{Cl}^- + \text{H}_2; \text{Cl}^- + \text{CO}; \text{Cl}^- + \text{D}_2$ A16 $\text{H}^- + \text{H}_2; \text{H}^- + \text{CO}; \text{H}^- + \text{D}_2; \text{F}^- + \text{H}_2; \text{F}^- + \text{CO}; \text{F}^- + \text{D}_2; \text{Cl}^- + \text{H}_2; \text{Cl}^- + \text{CO}; \text{Cl}^- + \text{D}_2$	E	100-900 eV	Tsao, V. B.; Esaulov, V. A. Electron detachment via direct coupling and charge exchange to shape resonances in negative-ion-molecule collisions. J. Phys. B 15, L58 (1982) France
93	E07 $e + \text{Na}^+$	E	20 eV	Hanne, G. F.; Smythowski, C.; Van der Ziel, R. J. Spin polarization of electrons scattered superelastically by laser-excited Na atoms. J. Phys. B 15, L15 (1982) The Netherlands
94	E03 $e + \text{Hg}$	E	10-27 eV	Franz, K.; Hanne, G. F.; Hiddemann, K. H.; Kessler, J. Electron spin polarization by inelastic scattering from mercury atoms. J. Phys. B 15, L15 (1982) West Germany
95	E06 $e + \text{Ar}^{10+}$	E	Undef	Lunny, J. G.; Seely, J. F. Inner-shell excitation of argon dielectronic satellite spectral lines in imploded microballoon plasmas. J. Phys. B 15, L121 (1982) United Kingdom
96	E03 $e + \text{Hg}$	E	Undef	Okazaki, R.; Fukuda, K. Doubly excited levels of alkaline-earth elements near the first ionization limit: I. Magnesium. J. Phys. B 15, 347 (1982) Japan
97	E03 $e + \text{Ca}$	E	Undef	Okazaki, R.; Fukuda, K. Doubly excited levels of alkaline-earth elements near the first ionization limit: II. Calcium. J. Phys. B 15, 367 (1982) Japan
98	A12 $\text{K}^+ + \text{Ar}$	E	443-760 K	Kraus, W. C. Temperature dependence of the shift, width and asymmetry of the potassium (4p coming from 7s) 5002 Å line perturbed by argon. J. Phys. B 15, 371 (1982) United States
99	H08 Undef	T	Undef	Stebie, P. Time dependence of multiphoton scattering processes. J. Phys. B 15, 387 (1982) United States
100	A07 $\text{H}^+ + \text{H}; \text{H} + \text{H}; \text{H} + \text{C}; \text{H}^+ + \text{H}; \text{H}^+ + \text{C}$	E	0.25-10 MeV/amu	Keminsky, A. R.; Popova, M. I. Angular and energy distributions of electrons ejected in ion-atom collisions: II. J. Phys. B 15, 403 (1982) Soviet Union
101	A07 $\text{Li}^+ + \text{H}; \text{Li}^{2+} + \text{H}; \text{Li}^{3+} + \text{H}$	E	214-2713 keV	Shah, N. B.; Gilbody, M. B. Experimental study of the ionization of atomic hydrogen by fast lithium ions. J. Phys. B 15, 413 (1982) United Kingdom
102	A03 $\text{Ar}^+ + \text{He}; \text{Ar}^+ + \text{Ne}; \text{Ar}^{2+} + \text{He}; \text{Ar}^{2+} + \text{Ne}; \text{Ar}^{3+} + \text{He}; \text{Ar}^{3+} + \text{Ne}$	E	15-400 keV	El-Sherbini, T. M.; de Meer, F. J. Projectile excitation in the collision of $\text{Ar}(\text{sup } q^+)$ ($q = 1, 2$ and 3) with He and Ne. J. Phys. B 15, 423 (1982) The Netherlands
103	A03 $\text{K} + \text{He}; \text{K} + \text{Ar}; \text{K} + \text{H}_2; \text{K} + \text{N}_2$	E	0.1-0.4 eV	Meetdagh, J. P.; Berlande, J.; Cuvelier, J.; de Fajó, P.; Binet, A. Fine-structure transitions in $\text{K}(4s)$ induced by rare gases and diatomic molecules. J. Phys. B 15, 439 (1982) France
104	A06 $\text{Li}^{2+} + \text{H}$	T	1.4-200 keV/amu	Bronsdon, B. M.; Noble, C. J. Charge transfer in $\text{Li}^{2+} + \text{H}$ collisions. J. Phys. B 15, 461 (1982) United Kingdom
105	A06 $\text{Ca}^+ + \text{Ca}^+; \text{Li}^+ + \text{Li}^+; \text{H}^+ + \text{He}^+; \text{H}^+ + \text{Li}^+$	T	300-5000 keV	Zrnolac, A. P.; Noble, C. J.; Bronsdon, B. M. Charge exchange between Ca^+ ions and related studies. J. Phys. B 15, 487 (1982) United Kingdom
106	E02 $e + \text{K}^+$ E03 $e + \text{K}^+$ E07 $e + \text{K}^+$	T	E03 1-3 Threshold E02; E07 2.5-5.0 eV	Moore, B. L.; Sheehey, V. B. Electron scattering from excited states of neutral potassium. J. Phys. B 15, 471 (1982) United Kingdom

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107	B07 Under	T		Cavaliere, P.; Ferrante, G.; Leone, C. Electron-atom ionization in a resonant electromagnetic field. J. Phys. B 15, 475 (1982) Italy
108	A07 $H^+ + He; Li^+ + Au$	T	1-4 MeV	Avaldi, L.; Locorne, G.; Milazzo, M. Relativistic corrections to the binary encounter approximation for ionization of atoms by collisions with ions. J. Phys. B 15, L129 (1982) Italy
109	A17 $Li + H$	T	Under	Lazzarotti, F.; Escal, E.; Zenevi, R. Bond length dependence of the electric properties of lithium hydride. J. Phys. B 15, 521 (1982) Italy
110	E03 $e + U; e + W$	E	Under	Obberius, M. U.; Kech, R. Oscillator strengths of neutral and singly ionized tungsten. J. Phys. B 15, 527 (1982) West Germany
111	A05 Under	T	Under	Nienhuis, G. Fluorescence spectra and the rate of optical collisions. J. Phys. B 15, 535 (1982) The Netherlands
112	H03 $He + Au; He + Pb$	E	84-145 keV	Sen Gupta, S. K.; Paul, M. C.; Bose, J.; Goswami, G. C.; Das, S. C.; Choudhuri, M. Atomic Rayleigh scattering of photons in the vicinity of K-absorption edges. J. Phys. B 15, 555 (1982) India
113	A11 $He^+ + He; He^+ + He; He^+ + Ar$	T	420 K	Mabe, Y. Thermal collisions of high-Rydberg atoms with neutral particles: II. Higher-order corrections to the impulse approximation. J. Phys. B 15, 613 (1982) United States
114	A03 $H^+ + He^+; He^{2+} + H$ A06 $H^+ + He^+; He^{2+} + H$ A07 $H^+ + He^+; He^{2+} + H$	T	30-500 keV	Reading, J. F.; Ford, A. L.; Becker, B. L. One and a half centred calculations of ionization and charge transfer in $H^+ + He^+$ and $He^{2+} + H$ collisions. J. Phys. B 15, 625 (1982) United States
115	A07 $S^{2+} + Ar; S^{1+} + Ar$	E	32 MeV	Cocks, C. L.; Schmidt-Rocking, W.; Schuch, R. Impact parameter dependence of electron production in S-Ar collisions. J. Phys. E 15, 661 (1982) West Germany
116	A03 $Rb^+ + H_2; Rb^+ + H_2; Rb^+ + He$	E	1.05-0.5 eV	Hastings, J. P.; de Pije, P.; Cavallier, J.; Binet, A.; Fournier, P. R.; Barlande, J. Fine-structure transitions in $Rb(EF)$ induced by H_2 and He molecules. J. Phys. B 15, 663 (1982) France
117	A17 $H^+ + H^+$	T	Under	Lesch, C.; Aubert-Frecon, M. Correlated proton-spheroidal wavefunction containing no adjustable parameters for some doubly-excited states of H_2 . J. Phys. B 15, L125 (1982) France
118	A06 $H^+ + Li; He^{2+} + Li$	T	50-400 keV/cm	Olson, E. E. Electron capture and ionization in H^+ , $He^{2+} + Li$ collisions. J. Phys. B 15, L163 (1982) United States
119	H06 $2h\nu + Ca$	T	20500-21300 cm^{-1}	Aymar, R.; Crance, F. Two-photon ionization of calcium ground state: theoretical calculation of the interference minimum near the 7p resonance. J. Phys. B 15, 715 (1982) France
120	A02 $He^+ + Ar$ A11 $He^+ + Ar$ A16 $He^+ + Ar$	E	21-100 meV	Bratschk, B.; Huberland, W.; Verner, F. On the structure of the $He(2^1S) + Ar$ potential energy curve. J. Phys. B 15, 731 (1982) West Germany
121	A06 $H^+ + CH_4; H^+ + He$ A07 $H^+ + CH_4; H^+ + He$ A10 $H^+ + CH_4; H^+ + He$	E	200-1500 keV	Moradell-Pedersen, E.; Folkmann, F.; Pedersen, M. H. Differential cross sections for K-shell ionization and capture by H^+ in $C(CH_4)$ and He . J. Phys. B 15, 739 (1982) Denmark

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122	A07 $H^+ + Dy; H^+ + Au$	E	0.15-10 MeV	Jitschke, W.; Knochke, A.; Nippner, K.; Lutz, H. G. Relative L subshell ionization cross sections for 0.15 to 10 MeV proton bombardment of Dy and Au. J. Phys. B 15, 743 (1982) West Germany
123	B00 $Na^+ + Pb; Na^+ + Sn; Na^+ + Al$	E	0.0-2.3 MeV	Naruyama, Y.; Kawasumi, Y.; Kido, T.; Fukusawa, F. Equilibrium charge state distributions of MeV Na ions backscattered from continuously evaporated targets. J. Phys. B 15, 775 (1982) Japan
124	A16 $Li^+ + H_2; Li^+ + H_2; Li^+ + Ar; Li^+ + CD_4$	E	100-2400 keV	McCullough, B. W.; Shah, M. B.; Lennon, M.; Glibody, M. B. Electron loss by fast Li^+ ions. J. Phys. B 15, 791 (1982) United Kingdom
125	A06 $Na^+ + Na; Ar^+ + Ar$	E	100-1000 Td	Hegerberg, B.; Elford, N. T.; Skallerud, M. R. The cross section for symmetric charge exchange of Na^+ in He and Ar^+ in Ar at low energies. J. Phys. B 15, 797 (1982) Australia
126	A06 $Na^{2+} + Na; Na^{2+} + Ar; Na^{2+} + Kr; Na^{2+} + Xe$	E	4-32 keV	Groh, W.; Schlechter, A. S.; Muller, A.; Salzborn, E. Transfer ionization in slow collisions of Na^{2+} ions in rare gases. J. Phys. B 15, L207 (1982) West Germany
127	E02 $e + He$ E09 $e + He$	T	1.24-1.27 Ry	Clark, C. W.; Taylor, K. T. Eigenchannel analysis of neon-negative-ion resonances. J. Phys. B 15, L213 (1982) United Kingdom
128	E03 $e + S^{2+}$	T	5000-20,000 K	Mendonça, C. Electron impact excitation of the forbidden transitions of S III and calculated term structure of S II. J. Phys. B 15, 867 (1982) United Kingdom
129	E04 $e + H_2$	T	Undef	Borondo, F.; Egulezgray, L. R.; Riera, A. Predissociation of the $5^1\sigma(\text{sub } u)$ state of H_2 near threshold. J. Phys. B 15, 899 (1982) Spain
130	A16 $H^- + He; D^- + He; F^- + He; F^- + Na; F^- + Ar; F^- + CD_4; F^- + H_2; F^- + O_2; F^- + CO$	E	1-300 eV	Hsu, M. S.; Eversgike, L. D.; Champion, S. L.; Esselov, V. A. Total electron detachment cross sections for collisions of H^- with He and F^- with atomic and molecular targets. J. Phys. B 15, 961 (1982) United States
131	H11 $h\nu + He^-$	T	151878-4550 Å	Bell, K. L.; Harrington, K. A.; Craskey, J. P. The free-free absorption coefficient of the negative helium ion. J. Phys. B 15, 977 (1982) United Kingdom
132	A17 $O^+ + H_2$	T	Undef	Ellison, P. C.; McCandlish, M. L. Diatomic-in-molecule calculation of the potential energy surface of H_2C^+ : linear approach. J. Phys. B 15, L225 (1982) United States
133	A03 $Na^+ + Na^+$	E	1000 eV	MacAdam, K. E.; Rolfe, P. G. Rydberg-to-Rydberg charge transfer in sodium. J. Phys. B 15, L243 (1982) United States
134	E03 $e + He$ E17 $e + He$	E	61.2 eV	MacAdam, K.; Williams, J. F. Electron-photon coincidence measurements on He(3^1P) excitation at large scattering angles. J. Phys. B 15, L247 (1982) Australia
135	H08 $Shv + Na$	E	5.14 eV	Lauche, G.; Smith, S. J. Five-photon non-resonant photoionization of atomic sodium—the angular distribution of photoelectrons. J. Phys. B 15, 1061 (1982) United States
136	A17 $Ar + Mg; Ar + Ca; Ar + Sr; Ar + Ba$	T	Undef	Schwardtferger, F.; Stoll, H.; Preuss, M. A study of potential curves arising in X-Ar complexes (X = Mg, Ca, Sr, Ba). J. Phys. B 15, 1061 (1982) West Germany
137	A06 $Ne^{2+} + He; Ne^{2+} + Na; Ne^{2+} + Ar; Ne^{2+} + CH_4; Ne^{2+} + Xe$	E	8×10^8 cm s ⁻¹	Bayer, W. F.; Mann, R.; Folkmann, F. Electron capture by slow Ne^{2+} recoil ions. J. Phys. B 15, 1083 (1982) West Germany

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
138	E93 $e + Si^{10+}$	T	6-70 Ry	Saha, N. P.; Trefftz, E. Electron impact excitation of Si X. J. Phys. B 15, 1089 (1982) West Germany
139	E95 $e + Kr$	L	23-26 eV	Baxter, J. A.; Mitchell, P.; Comer, J. Autoionising states of krypton in the 23-26 eV range. J. Phys. B 15, 1105 (1982) United Kingdom
140	A17 $O + CO$	T	Undef	Cabus, S.; Schisch, H. Density matrix treatment of BO_2 and CO_2 . J. Phys. B 15, L265 (1982) West Germany
141	A97 Undef	T	Undef	Montenegro, E. C.; de Finho, A. G. A general expression for the PMBA low-energy limit of ionisation cross sections by heavy ions. J. Phys. B 15, L275 (1982) Brazil
142	A96 $Li^{10+} + H$	T	1.4-140 keV	Fritsch, W.; Lip, C. E. Electron transfer in $Li^{10+} + H$ collisions at low and intermediate energies. J. Phys. B 15, L281 (1982) West Germany
143	E96 $e + H; e + He$ E17 $e + H; e + He$	T	500 eV	Byron, F. W., Jr.; Jacobs, C. J.; Pirman, B. On the second Born approximation for the ionisation of atomic hydrogen and helium by fast electrons. J. Phys. B 15, L283 (1982) United States
144	E93 $e + Fe^{10+}$ E95 $e + Fe^{10+}$	T	100-500 eV	Zhdanov, V. P. Electron impact excitation of multiply charged ions via autoionisation states with inner-shell vacancy. J. Phys. B 15, L297 (1982) Soviet Union
145	H96 $h\nu + Ne; h\nu + Ne^+$	T	0.05-1.3 Ry	Luke, T. R. Photoionisation states in neon: photoionisation from ground and excited states. J. Phys. B 15, L217 (1982) Canada
146	A92 Undef A17 Undef	T	Undef	Martins, M.; Pilkuhn, H. The long-range contribution to quasi-elastic collisions of atoms. J. Phys. B 15, L243 (1982) West Germany
147	A96 $H^+ + H; H^+ + He^+$	T	1.5-1000 keV	Fritsch, W.; Lip, C. D. Close-coupling calculations for inelastic processes in intermediate energy ion-atom collisions. J. Phys. B 15, L255 (1982) West Germany
148	E95 $e + He^+$ E17 $e + He^+$	T	200-2000 eV	Roy, A.; Roy, K.; Sil, N. C. Triple differential cross sections for electron impact ionisation of He^+ . J. Phys. B 15, L265 (1982) India
149	H96 $h\nu + He$	T	80-230 eV	Timary, S. M. Double photoionisation of $He 1s^2 1S(sup e)$. J. Phys. B 15, L323 (1982) Greece
150	A96 $Br^{10+} + C$	E	70-130 MeV	May, M. J.; Pender, L. F.; Tracy, P. E. L-shell vacancies and radiative electron capture in 70 and 130 MeV Br projectiles. J. Phys. B 15, L331 (1982) Australia
151	E92 $e + H_2$	E	0.1-10 eV	Schneider, B. I.; Collins, L. A. Application of ab-initio optical potentials to low-energy electron- H_2 scattering. J. Phys. B 15, L335 (1982) United States
152	A12 $K^+ + Cs$	E	610-930 K	Beuc, R.; Mavre, R.; Vadia, C. Blue asymmetry of potassium resonance lines broadened by caesium atoms. J. Phys. B 15, L333 (1982) Yugoslavia
153	H92 $h\nu + Ne Seq$ H96 $h\nu + Ne Seq$	T	0-6 Ry	Lamoureux, M.; Radcjevich, V. Photoabsorption in the beginning of the neon isoelectronic sequence. J. Phys. B 15, L341 (1982) United States
154	H96 $h\nu + Xe$	E	1.06-0.53 μm	Fabre, F.; Petite, G.; Agostini, P.; Clement, M. Multiphoton above-threshold ionisation of xenon at 0.53 and 1.06 μm . J. Phys. B 15, L353 (1982) France

REF. NO.	REACTANTS	EXP. ON THEOR.	ENERGY RANGE	REFERENCE
155	A03 H + N ₂ ; H ⁺ + N ₂ ; H ₂ ⁺ + N ₂ ; H ₂ ⁺ + N ₂ A04 H + N ₂ ; H ⁺ + N ₂ ; H ₂ ⁺ + N ₂ ; H ₂ ⁺ + N ₂ A06 H + N ₂ ; H ⁺ + N ₂ ; H ₂ ⁺ + N ₂ ; H ₂ ⁺ + N ₂	E	1.5-100 keV	Williams, I. E.; Geddes, J.; Gilbody, M. B. Helium α emission in collisions of H, H ⁺ , N ₂ ⁺ , and H ₂ ⁺ with N ₂ . J. Phys. B 15, 1377 (1982) United Kingdom
156	A03 He ⁺ + He; He ⁺ + He; He ⁺ + Ar; He ²⁺ + He; He ²⁺ + He; He ²⁺ + Ar; He ²⁺ + He; He ²⁺ + He; He ²⁺ + Ar; He ²⁺ + He; He ²⁺ + He; He ²⁺ + Ar A06 He ⁺ + He; He ⁺ + He; He ⁺ + Ar; He ²⁺ + He; He ²⁺ + He; He ²⁺ + Ar; He ²⁺ + He; He ²⁺ + He; He ²⁺ + Ar; He ²⁺ + He; He ²⁺ + Ar	E	25-800 keV	Bloemen, E.W.F.; Dijkman, B.; de Meer, F. J. Production of excited projectile states in collisions of 25-800 keV He(sup α) ⁺ (α = 1, 2, 3, 4) with He, Ne, and Ar. J. Phys. E 15, 1591 (1982) The Netherlands
157	E05 e + Hg	T	30-200 eV	Chatterjee, S. K.; Kumar, A.; Ray, D. K. Electron impact double ionisation of Hg. J. Phys. B 15, 1415 (1982) India
158	F05 e + Ga E17 e + Ga	E	13-500 eV	James, G. K.; Pajcek, V.; Moss, K. J.; Wilson, M. The ejected electron spectrum of Ga I and Ga II autoionising transitions resulting from 12-500 eV electron impact excitation. J. Phys. B 15, 1421 (1982) United Kingdom
159	A03 He + He	E	1250 eV	de Vlieger, G.J.H.E.; Heideman, M.G.M.; Van Eck, J.; Nienhuis, G. Cross sections for simultaneous 2P excitation of two colliding He atoms to various substate combinations. J. Phys. B 15, L346 (1982) The Netherlands
160	A06 He ⁺ + He; He ⁺ + N ₂ ; He ⁺ + He; He ⁺ + Ar; He ²⁺ + He; He ²⁺ + N ₂ ; He ²⁺ + He; He ²⁺ + Ar C06 He ⁺ + He; He ⁺ + N ₂ ; He ⁺ + He; He ⁺ + Ar; He ²⁺ + He; He ²⁺ + N ₂ ; He ²⁺ + He; He ²⁺ + Ar	E, T	0-20x10 ⁶ cm s ⁻¹	Dutrieux, I. S.; Vorobiev, M. F.; Zaitsev, V. P.; Kononova, Z. A.; Blizniou, V. S.; Topova, Y. A.; Fainberg, Y. S. Collisions of the charge exchange cross sections and the average equilibrium charge of helium ions. J. Phys. B 15, L351 (1982) Soviet Union
161	E05 e + Ar E17 e + Ar	E	1000 eV	Swell, E. C.; Cross, A. Measurements of angular correlations in electron impact inner-shell ionisation. J. Phys. B 15, L357 (1982) United Kingdom
162	H06 hv + Zn; hv + Cd; hv + Hg	E	27-37 eV	Holland, B.W.F.; Codling, K.; West, J. B. Near threshold double photoionisation in Zn, Cd, and Hg. J. Phys. B 15, 1473 (1982) United Kingdom
163	A07 H ⁺ + Cu; H ⁺ + Ag; H ⁺ + Au; O ⁺ + Cu; O ⁺ + Ag; O ⁺ + Au; S ⁺ + Cu; S ⁺ + Ag; S ⁺ + Au A18 H ⁺ + Cu; H ⁺ + Ag; H ⁺ + Au; O ⁺ + Cu; O ⁺ + Ag; O ⁺ + Au; S ⁺ + Cu; S ⁺ + Ag; S ⁺ + Au	E	1.0-10 MeV/amu	Bell, F.; Trillmann, G.; Bockl, M.; Betz, H.-D. Emission of (small delta) electrons from inner-shell excitation in heavy-ion-atom collisions. J. Phys. B 15, 1487 (1982) West Germany
164	A03 H ⁺ + N ₂ ; H ⁺ + CO; H ⁺ + CO ₂ A18 H ⁺ + N ₂ ; H ⁺ + CO; H ⁺ + CO ₂	T	15-77 eV	Richards, D. Small-angle ion-molecule vibrational excitation. J. Phys. E 15, 1499 (1982) United Kingdom
165	E02 e + N ₂ ; e + CO E17 e + N ₂ ; e + CO E19 e + N ₂ ; e + CO	T	40-800 eV	Jain, A. Elastic scattering of intermediate- and high-energy electrons by N ₂ and CO in the two-potential coherent approach. J. Phys. B 15, 1533 (1982) United Kingdom
166	E03 e + H E17 e + H	T	54-200 eV	Unnikrishnan, K.; Fraser, M. A. Second-order ohmic cross sections for the excitation of atomic hydrogen. J. Phys. B 15, 1649 (1982) India

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
167	2D5 $e + Fe$ E18 $e + Ne$	T	200-2000 eV	Nay, A.; Nay, K.; Zil, N. C. Studies of differential cross sections for electron impact ionization of helium. <i>J. Phys. B</i> 15, 1559 (1982) India
168	A66 $C^{2+} + H$	T	0.1-1.0 keV/amu	Fritsch, B. Atomic orbital expansion description for slow ion-atom collisions: a curved-line trajectory study. <i>J. Phys. B</i> 15, 1369 (1982) West Germany
169	A93 $Cu + Fe$	T	28 MeV	Noor, B. The effect of direct excitation on K-shell vacancy production in Cu-Fe collisions. <i>J. Phys. B</i> 15, L395 (1982) Israel
170	E92 $e + H$	T	50-200 eV	McCarthy, I. E.; Saha, R. C.; Stelbovics, A. T. Electron-hydrogen elastic scattering at intermediate energies. <i>J. Phys. B</i> 15, L401 (1982) Australia
171	H92 $2He + He$	E	5790-5794 Å	Allen, L.; Eagles, K. A.; Stroud, C. R., Jr. The time development of adiabatic two-photon absorption: I. Low intensity regime. <i>J. Phys. B</i> 15, 1443 (1982) United Kingdom
172	H94 $nHe + Sr$	E	577-585 nm	Feldmann, D.; Volge, K. H. Two- and three-photon resonant ionization of strontium: energy and angular distribution of the electrons. <i>J. Phys. E</i> 15, 1651 (1982) France
173	H95 $nHe + Sr$	E	5321 Å	Feldmann, D.; Krawtsov, J.; Chin, S. L.; Von Hellfeld, A.; Volge, K. H. Multiphoton ionization of strontium creating Sr^+ and Sr^{2+} . <i>J. Phys. B</i> 15, 1663 (1982) France
174	P93 $He + H_2$	T	0.01-1.5 eV	Flower, B. R.; Kirchpatrick, D. J. Rovibrational excitation of molecular hydrogen in collisions with helium atoms. <i>J. Phys. B</i> 15, 1791 (1982) United Kingdom
175	A93 $He^+ + H_2$ A18 $He^+ + H_2$	E	100-3000 eV	Lebehot, A.; Compagne, R. Differential cross sections for vibrational excitation in the collisions of He^+ with H_2 at moderate energies. <i>J. Phys. B</i> 15, 1711 (1982) France
176	A93 $H^+ + H$ A97 $H^+ + H$ E95 $e + I$	T	A93; A97 20-200 keV/amu E95 10-200 eV	Martir, M. H.; Ford, A. L.; Reading, J. F.; Becker, R. L. Excitation and ionization in collisions of negatively charged projectiles with atoms. <i>J. Phys. B</i> 15, 1725 (1982) United States
177	A97 $B^+ + Co$; $B^+ + Se$; $B^+ + Ti$; $B^+ + V$; $B^+ + Cr$; $B^+ + Mn$; $B^+ + Fe$; $B^+ +$ Co ; $I^+ + Ni$; $B^+ + Cu$; $Ne^{2+} + Cu$; $Ne^{2+} + Se$; $Ne^{2+} + Ti$; $Ne^{2+} + V$; $Ne^{2+} + Cr$; $Ne^{2+} + Mn$; $Ne^{2+} + Fe$; $Ne^{2+} + Co$; $Ne^{2+} + Ni$; $Ne^{2+} + Cu$	E	0.2-0.45 MeV/amu	Lopes, J. S.; Jesus, A. P.; de Silva, M. F. The binding effect in deuteron- and alpha-induced K-shell ionization. <i>J. Phys. E</i> 15, 1749 (1982) Portugal
178	A96 $H^+ + H_2^+$; $H^+ + Ca^+$; $H^+ + Sr^+$; $H^+ +$ Ba^+	T	10-1000 MeV	Sinha, C.; Guha, S.; Sill, M. C. Electron capture by protons in collision with some alkali-like ions using a model potential approach. <i>J. Phys. B</i> 15, 1759 (1982) India
179	A96 $H_2^+ + Ar$; $O_2^+ + Xe$	E	20-1000 eV	Latimer, C. J.; Campbell, F. M. The effect of vibrational and electronic energy on near-resonant charge-transfer processes involving the rare gases and simple molecules. <i>J. Phys. B</i> 15, 1765 (1982) United Kingdom
180	E93 $e + Ne$	T	20-120 eV	Machado, L. E.; Leal, E. P.; Connah, G. The calculation of electron-photon angular correlation parameters for the electron impact excitation of neon. <i>J. Phys. B</i> 15, 1772 (1982) Brazil
181	E93 $e + N_2$; $e + Ar$	E	200-2000 eV	Shaw, D. A.; King, G. C.; Read, F. M.; Cvijanovic, D. The observation of electric-dipole-forbidden inner-shell transitions in N_2 and Ar by the electron energy-loss technique. <i>J. Phys. B</i> 15, 1785 (1982) United Kingdom

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
182	A02 $H^+ + He$ A18 $H^+ + He$	E	0.1-1.5 eV	Konrad, H.; Linder, F. Measurement of orbiting structures in differential H^+-He scattering at E_{lab} less than or equal to 0.5 eV. J. Phys. B 15, L406 (1982) West Germany
183	E03 $e + Kr; e + Xe$ E17 $e + Kr; e + Xe$	E	30-60 eV	McGregor, I.; Ellis, D.; Niggler, R.; Nelli, N. A.; Williams, J. F.; Zeidl, A. A.; Kleinpoppen, H. Electron-photon angular correlations from electron impact excitation of heavy rare-gas atoms. J. Phys. B 16, L411 (1982) United Kingdom
184	A12 $He^+ + He^+$	T	3.6 eV	Greene, R. L. Ion-radiator dynamic effects in Stark broadening of He II lines. J. Phys. B 16, 1631 (1982) United States
185	A17 $Hg + He$	T	Undef	Demetropoulos, I. D.; Lawley, K. P. An initial potential energy curves for the lower states of the $Hg-He$ system. J. Phys. B 16, 1665 (1982) Greece
186	A03 $H^+ + H; H^{2+} + H$	T	0.85-1 MeV	Ray, K.; Saha, B. C. The $p(\alpha)-H$ excitation cross sections for moderate and high α values. J. Phys. B 16, 1663 (1982) India
187	A06 $Ar^{2+} + He$	E	1.5 keV	Natsuoto, A.; Ohtani, S.; Imai, T. Experimental study of one-electron capture by ground and metastable Ar^{2+} ions from He at 1.5 keV. J. Phys. B 16, 1671 (1982) Japan
188	E03 $e + Hg$	E	7.5-14.0 eV	McLennan, C. B.; Weber, H. J. E.; MacGillivray, W. R.; Standage, N. C. Isotope specific analysis of the electron impact excited $6^3P_2-6^1P_1$ transition of mercury using stepwise electron and laser excitation. J. Phys. B 16, 1673 (1982) Australia
189	E03 $e + Li; e + Na; e + K$	T	30-600 eV	Srivastava, R.; Singh, C. S.; Rai, D. K. Excitation of the lowest autoionizing states in alkalis. J. Phys. B 16, 1699 (1982) India
190	E05 $e + Ni; e + Ag; e + Sn$	T	0-1 MeV	Sud, K. K.; Sharma, S. K. K-shell ionization cross section of atoms calculated by PDA. J. Phys. B 16, 1906 (1982) India
191	A07 Undef E05 Undef	T	Undef	Grafic, P. The classical theory of near-threshold ionization. J. Phys. B 16, 1913 (1982) Yugoslavia
192	E03 $e + CO$	E	6-10.9 eV	Davies, S.; Bailhach, B.; Comer, J.; Nicks, P. J. Electron energy-loss spectroscopy of carbon monoxide using a new position-sensitive multidetector spectrometer: I. The energy region 6-10.9 eV. J. Phys. B 16, 1925 (1982) United Kingdom
193	A09 Undef	T	Undef	Bates, B. R.; Mendes, I. Thermodynamic ionic recombination at low ambient gas density for the case of a polarization interaction. J. Phys. B 16, 1949 (1982) United Kingdom
194	A07 $H^+ + Ni; D^+ + Ni; He^{2+} + Ni$	T	50-300 keV	Grane, A.; Hovsteen, J. N.; Gundersen, B.; Kochbach, L. K-shell ionization by protons, deuterons and alpha particles at low projectile energies. J. Phys. B 16, L445 (1982) Norway
195	A07 $C^+ + Au; H^+ + Au$	T	2.4 MeV	Palinko, J.; Sarkadi, L.; Schlenk, B.; Terek, I.; Kalman, G. L ₂ -subshell alignment of gold by C^+ and H^+ impact ionization. J. Phys. B 16, L451 (1982) Hungary
196	A14 $F + H_2$	T	0-2.6 eV	Looney, J. N.; Le Bourneuf, M. Hyperspherical description of collinear reactive scattering. J. Phys. B 16, L456 (1982) France

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
197	E95 $e + H$ E17 $e + H$	T	13.6-27 eV	Bottcher, C. Numerical studies on the electron impact ionization of hydrogen near threshold. J. Phys. B 15, L463 (1982) United States
198	H07 $e + H + h\nu$	T		Pondir, B. S.; Pathur, K. C. Scattering of electrons by hydrogen atoms in a laser field. J. Phys. B 15, L471 (1982) India
199	H07 $e + H + h\nu$	T		Ferrante, G.; Leone, C.; Trosbetta, F. Laser modification of the exchange scattering in electron-atom collisions. J. Phys. B 15, L475 (1982) Italy
200	H02 $h\nu + Li; h\nu + Be^+$	T	0.3-2 Ry	Serron, J.H.F. Absorption spectrum of lithium and singly-ionized beryllium. J. Phys. B 15, 2009 (1982) France
201	A03 $Xe^{2+} + Xe$	E	1.05 MeV	Shankar, R.; Hippler, R.; Villo, U.; Lutz, M. G. Coincidence measurements of M-shell excitation in slow Xe-Xe collisions. J. Phys. B 15, 2041 (1982) West Germany
202	A03 $Ar^{2+} + Ar; Ar^{2+} + Kr; Ar^{2+} + Xe$ A06 $Ar^{2+} + Ar; Ar^{2+} + Kr; Ar^{2+} + Xe$ A10 $Ar^{2+} + Ar; Ar^{2+} + Kr; Ar^{2+} + Xe$	E	540 eV	Kashor, E. V.; Mathur, D.; Husted, J. E. Energy-loss spectra of single electron capture products from Ar^{2+} collisions with Ar, Kr, and Xe. J. Phys. B 15, 2051 (1982) United Kingdom
203	A06 $H^+ + H$	T	Under	Crathorn, B.S.F. Refined orthogonal variational treatment of continuum distorted waves. J. Phys. B 15, 2061 (1982) United Kingdom
204	E95 $e + Hg; e + Ar$ E17 $e + Hg; e + Ar$	T	1-2 Ry	Borzhuk, E. G.; Katschuk, M. M. Application of distorted-wave approximation to the study of inner-shell alignment by electron impact. J. Phys. B 15, 2075 (1982) Soviet Union
205	E95 $e + Na Seq$	T	100-1500 eV	Saegren, B. H. Ionization of Na-like ions including excitation-autoionization. J. Phys. B 15, 2087 (1982) United States
206	E95 $e + Mg^+$	T	0.32-0.33 Ry	LaGattuta, K. J.; John, V. Dielectronic recombination cross sections for Pg^+ . J. Phys. B 15, 2101 (1982) United States
207	H06 $h\nu + He$	E	642 nm	Ganz, J.; Leandowski, B.; Siegel, A.; Buehert, W.; Walzel, H.; Ruf, R.-H.; Motop, M. Photoionization of $He(2p^2 3p^2 B_2)$ atoms and the production of state-selected, polarized $He^+(2p^1 2P_{3/2})$ ions. J. Phys. B 15, L465 (1982) West Germany
208	A03 $Kr + Kr; Kr + Xe$ A10 $Kr + Kr; Kr + Xe$	E	1.4 MeV	Shankar, R.; Hippler, R.; Villo, U.; Bille, R.; Lutz, M. G. Evidence for rotationally induced 4f (small sigma) excitation in slow Kr-Xe and Kr-Kr collisions. J. Phys. B 15, L456 (1982) West Germany
209	E93 $e + He$ E17 $e + He$	E	26.5 eV	Crowe, A.; McGuire, J. C. Low-energy electron impact excitation of the 2^1P state of helium. J. Phys. B 15, L501 (1982) United Kingdom
210	E92 $e + Ar$ E93 $e + Ar$	T	10.8-13.4 eV	Ojha, P. C.; Burke, P. G.; Taylor, K. T. Near-threshold electron impact excitation of argon atoms. J. Phys. B 15, L507 (1982) United Kingdom
211	H01 He^+	E		McMillan, G. B.; Jays, T. H.; Smith, K. P.; Dunning, F. B.; Stobbing, A. F. High-resolution field ionization of $He(ns,nd)$ Rydberg atoms. J. Phys. B 15, 2131 (1982) United States
212	H06 $h\nu + He$	T	Under	Strakhova, E. I.; Shakhov, V. A. The resonance photoionization of neon in the vicinity of the $2p^2 3s 3p^1 P$ resonance in the close-coupling approximation. J. Phys. B 15, 2149 (1982) Soviet Union

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
213	A06 H ⁺ + Ar; H ⁺ + Ne; He ²⁺ + Ar; He ²⁺ + Ne; Li ²⁺ + Ar; Li ²⁺ + Ne A07 H ⁺ + Ar; H ⁺ + Ne; He ²⁺ + Ar; He ²⁺ + Ne; Li ²⁺ + Ar; Li ²⁺ + Ne A18 H ⁺ + Ar; H ⁺ + Ne; He ²⁺ + Ar; He ²⁺ + Ne; Li ²⁺ + Ar; Li ²⁺ + Ne	E	0.0-12.0 MeV	Moradai-Pedersen, E.; Pedersen, H. H. Differential cross sections for K-shell ionization and capture in asymmetric collisions: scaling properties. <i>J. Phys. B</i> 15, 2205 (1982) Denmark
214	A06 H ⁺ + H	T	0-50 MeV	Riverola, B. E.; Miraglia, J. E. Comparison between the continuum distorted-wave and the second Brinkman-Kramers approximations at high energies electron capture. <i>J. Phys. B</i> 15, 2221 (1982) France
215	A03 He ²⁺ + Xe A06 He ²⁺ + Xe A07 He ²⁺ + Xe	E	40 keV	Brazuk, A.; Winter, R. Excitation by electron capture in collisions of ground state and metastable He ²⁺ with Xe at 40 keV. <i>J. Phys. B</i> 15, 2233 (1982) Austria
216	E02 e + H E03 e + H E17 e + H	T	13.6-60 eV	Van de Ben, J. Electron-hydrogen scattering calculations at energies between 13.6 and 60 eV including $n = 3$ levels. <i>J. Phys. B</i> 15, 2245 (1982) The Netherlands
217	E05 e + He E17 e + He	E T	100 eV	Pechat, A.; Tucc, D. J.; Boritch, M.; Perera, J. Double and triple differential cross sections for autoionization of helium by electron impact. <i>J. Phys. B</i> 15, 2265 (1982) France
218	E03 e + Kr	E	12-13 eV	Van de Water, W.; Heideman, H.G.M. Correlation effects in the electron impact excitation of krypton atoms near the ionization threshold. <i>J. Phys. B</i> 15, 2285 (1982) The Netherlands
219	E03 e + Li ²⁺ ; e + Be ²⁺ ; e + B ²⁺ ; e + C ²⁺ ; e + N ²⁺ ; e + O ²⁺ ; e + F ²⁺ ; e + Ne ²⁺ ; e + Si ²⁺ ; e + Ca ²⁺ ; e + Fe ²⁺	T	4-2000 Ry	Nakazaki, S.; Hashino, T. Electron impact excitation of positive ions in the Coulomb-Born-Sely approximation: calculation for helium-like ions. <i>J. Phys. B</i> 15, 2295 (1982) Japan
220	A03 He ⁺ + Cd A07 He ⁺ + Cd	E	30-130 eV	Inaba, S.; Goto, T.; Hattori, S. Determination of the Penning excitation cross-sections of individual Cd(II) states for He metastable atoms using Penning electron spectroscopy. <i>J. Phys. B</i> 15, 35 (1982) Japan
221	A03 H + H ₂	E	9-50 keV	Bonnai, J. F.; Bracco, G.; Braton, C.; de Nichelle, C.; Drouot, J.; Rattelli, M.; Gerson, R.; Smetta, J. Doppler spectroscopy on high power neutral beams. <i>J. Phys. B</i> 15, 2385 (1982) France
222	A12 Hg ⁰ + He; Hg ⁰ + Ne	E	420-920 K	Perrin, B.; Ben Lohder, Z.; Jeannot, J. C.; Lemaire, R. Experimental shape of the 252.7 nm mercury line perturbed by the light noble gases (He, Ne). <i>J. Phys. (Paris)</i> 43, 45 (1982) France
223	H04 Under	T	Under	Ducloy, M.; Bloch, B. Theory of degenerate four-wave mixing in resonant Doppler-broadened media: II. Doppler-free heterodyne spectroscopy via collinear four-wave mixing in two- and three-level systems. <i>J. Phys. (Paris)</i> 43, 57 (1982) France
224	A12 Ca ⁰ + Kr	E	800 K	Ueda, K.; Haseguchi, Y.; Fukuda, K. Collision broadening of principal series lines of calcium in the presence of krypton. <i>J. Phys. Soc. Jpn.</i> 51, 13 (1982) Japan
225	A12 Ca ⁰ + He	E	800-1040 K	Ueda, K.; Haseguchi, Y.; Fukuda, K. Collision broadening of principal series lines of calcium in the presence of helium. <i>J. Phys. Soc. Jpn.</i> 51, 612 (1982) Japan

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
226	A05 $\text{He}^+ + \text{Zn}$	E	300-400 °C	Inaba, S.; Goto, T.; Hattori, S. Penning excitation cross sections for the individual Zn(II) states by He 2 ¹ S and He 2 ³ S metastable atoms. J. Phys. Soc. Jpn. 51, 627 (1982) Japan
227	A06 $\text{O}^{++} + \text{H}$ A17 $\text{O}^{++} + \text{H}$	T	Undef	Toshida, J.; K-shato, S. Ab initio calculation of t^2 potential curves for the reaction $\text{O}^{++} + \text{H} \rightarrow \text{O}^{++} + \text{H}^+$ and the related diabatic coupling matrix elements. J. Phys. Soc. Jpn. 51, 1274 (1982) Japan
228	A12 Undef	T	Undef	Helmsel, P.; Hutony, I. Non-coherent scattering in subordinate lines: II. Collisional redistribution. J. Quant. Spectrosc. Radiat. Transfer 27, 1 (1982) Czechoslovakia
229	K03 Review	T	Undef	Haffernan, B. N.; Liboff, R. L. Review of fundamental processes for scatter-radiation interaction. J. Quant. Spectrosc. Radiat. Transfer 27, 55 (1982) United States
230	A12 $\text{CO}^+ + \text{H}_2$	E	300 K	Bennich, J.-F. Bondshapes and dipole correlation functions for the first overtones of CO compressed by H_2 . J. Quant. Spectrosc. Radiat. Transfer 27, 131 (1982) France
231	A14 $\text{O}^+ + \text{H}_2$	T	Undef	Huss, N.; Gerliche, K.-H.; Comes, F. J. Energy partitioning in the reaction $^{16}\text{O}(^1\text{D}) + \text{H}_2(^1\text{D}) \rightarrow ^{16}\text{OH} + ^{16}\text{OH}$: VI. The u.v.-spectrum of ^{16}OH and ^{16}OH . J. Quant. Spectrosc. Radiat. Transfer 27, 161 (1982) West Germany
232	E06 $e + \text{S}^{++}; e + \text{Cl}^{++}; e + \text{S}^{++}$	T	24200-24500 K	Dimitrijevic, M. E.; Kanjovic, W. Semi-classical calculations of electron impact Stark widths of S(III), Cl(III), and S(IV) isolated lines. J. Quant. Spectrosc. Radiat. Transfer 27, 293 (1982) Yugoslavia
233	A12 $\text{Rb}^+ + \text{Rb}$	E	Thermal	Rabin, Y.; Rehestrat, F. On the self-shift and broadening of Doppler-free Rydberg S-2 spectral lines in alkali atoms. Opt. Commun. 40, 257 (1982) West Germany
234	A12 $\text{Rb}^+ + \text{Rb}; \text{Rb}^+ + \text{Ar}$	E	600 K	Bruce, E. N.; Pirza, M. Y.; Daley, W. L. Collision broadening and shift of the S and D Rydberg levels of rubidium by He and Ar. Opt. Commun. 40, 347 (1982) Canada
235	B07 $\text{Rb} + \text{K} + h\nu$	E		Cheron, B.; Lemaire, H. Observation of laser induced collisional energy transfer in a rubidium-potassium mixture. Opt. Commun. 42, 109 (1982) France
236	B07 $\text{H}_2 + \text{He} + h\nu$	T		Downes, L. J.; Norcum, S. D.; Tilton, E. A.; Wells, W. E. Radiative-collision laser amplifier in helium-nitrogen. Opt. Lett. 7, 22 (1982) United States
237	A03 $\text{I}^+ + \text{Xe}$	E	300 K	Gersh, E.; Füll, E. $\text{XeI}(^2\text{P}_{3/2} \rightarrow ^2\text{P}_{1/2})$ excimer emission at 1.3 μm . Opt. Lett. 7, 25 (1982) West Germany
238	H06 $h\nu + \text{Ba}$	E	564-420 nm	Cooke, W. E.; Bhatti, A. S.; Cromer, C. L. Spectroscopic decay-rate measurements below the laser linewidth. Opt. Lett. 7, 69 (1982) United States
239	E03 $e + \text{Cr}$ E08 $e + \text{Cr}$	E	0-250 eV	Mainikov, V. V.; Solinov, Y. N. Excitation cross sections of Cr II spectral lines from the ground state of the chromium atom. Opt. Spectrosc. 50, 325 (1981) Soviet Union
240	E03 $e + \text{Mn}$	E	3-200 eV	Mainikov, V. V.; Solinov, Y. N.; Sharov, Y. Measurement of cross sections for electron impact excitation of a manganese atom. Opt. Spectrosc. 50, 357 (1981) Soviet Union
241	E03 $e + \text{Bi}$ E08 $e + \text{Bi}$	E	4-40 eV	Shafrench, I. I.; Stordub, V. P.; Shishchev, T. A.; Alekshin, I. S. Electron-impact excitation of bismuth. Opt. Spectrosc. 50, 360 (1981) Soviet Union

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
242	A03 Ca + Na; Cu + Na; Cu + Ar; Ca + Kr; Ca + Xe; Rb + Na; Rb + Na; Rb + Ar; Rb + Kr; Rb + Xe; K + Na; K + Na; K + Ar; K + Kr; K + Xe; Na + Na; Na + Na; Na + Ar; Na + Kr; Na + Xe	T	Thermal	Batygin, V. V.; Gurevich, B. M. Impact relaxation of polarization of the ground state of alkali metal atoms in inert gases. Opt. Spectrosc. 50, 363 (1981) Soviet Union
243	E03 e + C ²⁺ ; e + N ²⁺ ; e + Ne ⁷⁺ ; e + Ar ¹⁸⁺ ; e + O ⁷⁺ ; e + Na ²⁺	T	10-100 eV	Bazylev, V. A.; Chitsov, N. I. Electron-impact excitation of dipole transitions with low excitation energies in multiply charged ions. Opt. Spectrosc. 50, 487 (1981) Soviet Union
244	A11 Na ⁰ + Na; Na ⁰ + Na A12 Na ⁰ + Na; Na ⁰ + Na	T	Thermal	Bakarev, B. S.; Udevin, Y. A. Determination of the relaxation characteristics of the optically forbidden 3p-3s transition in neon. Opt. Spectrosc. 50, 462 (1981) Soviet Union
245	B12 e + Ag	E	300 eV	Artamonov, B. M.; Sinabava, E. B.; Kuznetsov, A. E.; Samarin, S. S.; Yeklov, I. I. Temperature dependence of photon emission under irradiation of a thin silver film by slow electrons. Opt. Spectrosc. 50, 581 (1981) Soviet Union
246	E03 e + Ta	T	0-600 eV	Peterhop, H. E. Oscillator strengths and cross sections for thulium-ion excitation. Opt. Spectrosc. 50, 542 (1981) Soviet Union
247	H07 hv + N ⁻ ; hv + Li ⁻ ; hv + Na ⁻ ; hv + K ⁻ ; hv + Rb ⁻ ; hv + Cs ⁻	T	0.5-1.5 eV	Gelovinski, F. A.; Zuo, B. A. Effect of polarization of atoms on photoexcitation of their negative ions. Opt. Spectrosc. 50, 565 (1981) Soviet Union
248	E03 e + Yb E05 e + Yb	E	0-300 eV	Shimon, L. L.; Gelovinski, N. V.; Garga, I. I.; Kurta, I. V. Electron-impact excitation of atomic-ytterbium spectral lines: an experimental study. Opt. Spectrosc. 50, 571 (1981) Soviet Union
249	E03 e + Mn E05 e + Mn	E	0-150 eV	Shafrenokh, I. I.; Shishova, T. A.; Ronnyuk, V. I.; Alekshin, I. S. Excitation of spectral transitions in Mn and Mn II by low-energy electrons. Opt. Spectrosc. 50, 652 (1981) Soviet Union
250	H02 hv + Al	E	19.4-1760 Å	Exler, N. G. Photoabsorption cross section of aluminum vapor near the first ionization limit. Opt. Spectrosc. 51, 16 (1981) Soviet Union
251	E03 e + Sm	E	0-300 eV	Shimon, L. L.; Gelovinski, N. V.; Garga, I. I. Effective cross sections for electron-impact excitation of spectral lines of atomic samarium. Opt. Spectrosc. 51, 19 (1981) Soviet Union
252	A12 Rb ⁰ + Xe; Rb ⁰ + N ₂ ; Rb ⁰ + CH ₄	E	Thermal	Belov, V. M. Application of the magnetic-scanning method to the measurement of the broadening and shift constants of the red diode D ₂ line (780.6 nm) by foreign gases. Opt. Spectrosc. 51, 22 (1981) Soviet Union
253	A06 Ca ⁰ + Sr + hv B07 Ca ⁰ + Sr + hv	T	A06 Thermal	Vitlina, N. Z.; Chaplik, A. V. Nonresonant radiative charge transfer. Opt. Spectrosc. 51, 161 (1981) Soviet Union
254	E03 e + B E05 e + B	E	0-200 eV	Kuchanov, A. B.; Hairanov, Y. M. Cross sections for electron-impact excitation of boron. Opt. Spectrosc. 51, 116 (1981) Soviet Union
255	A12 Rb ⁰ + Na; Rb ⁰ + Na; Rb ⁰ + Ar; Rb ⁰ + Kr; Rb ⁰ + Xe	E	Thermal	Belov, V. M. Measurement of the constants for the broadening and shift of the D ₂ line of rubidium (780.6 nm) by inert gases. Opt. Spectrosc. 51, 209 (1981) Soviet Union
256	H08 hv + Ni; hv + Cu; hv + Au; hv + Zn; hv + Se; hv + Br; hv + Zr; hv + Nb; hv + Mo; hv + Ag; hv + In; hv + Sn; hv + I	E	59.5 keV	Arora, S. K.; Alibekhi, K. L.; Seed, S. S. Measurement of K-shell fluorescence yields in elements 28 less than or equal to 2 less than or equal to 53. Physica B+C 111, 71 (1981) India

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
257	D95 hv + C; hv + Al; hv + Sn; hv + Ni; hv + Y; hv + Ag; hv + Cd; hv + Dy	E	5-45 keV	Vijayavara Rao, V.; Shob-suar; Venkateswara Rao, D. Photoelectric cross sections for x-ray photons in low- and medium-Z elements. <i>Physica B+C</i> 111, 107 (1981) India
258	H84 hv + P; hv + S ²⁺ ; hv + Cl ²⁺ ; hv + Ar ²⁺ ; hv + Kr ²⁺	T	Undef	Genoa, P. S. Optical oscillator strengths for isoelectronic ions of silicon. <i>Physica B+C</i> 111, 365 (1981) United States
259	E93 e + N ₂ ; e + N ₂ ⁺ E97 e + N ₂ ; e + N ₂ ⁺	T	1-150 eV	Becrl, J.; Madani, A. Electron diatomic molecule weighted total cross section calculations. <i>Physica B+C</i> 112, 101 (1982) France
260	A17 Na ⁺ + Xe A18 Na ⁺ + Xe	E	700 K	Van Deventer, J.M.R.; Van der Valk, F. Determination of the Na(2P _{3/2})-Xe(1S ₀) interaction potentials from differential scattering cross sections. <i>Physica B+C</i> 112, 115 (1982) The Netherlands
261	A17 Na + Xe A18 Na + Xe	E	700 K	Van Deventer, J.M.R.; Van der Valk, F. Determination of the Na-Xe interaction potential from differential scattering cross-section measurements. <i>Physica B+C</i> 113, 217 (1982) The Netherlands
262	E92 e + Ar; e + Kr E17 e + Ar; e + Kr	E T	10-50 eV	Zhou Qing; Beerlage, H.J.R.; Van der Wiel, H. J. Angular distributions of electrons elastically scattered from argon and krypton at energies between 10 and 50 eV. <i>Physica B+C</i> 113, 225 (1982) The Netherlands
263	A17 Ba + F; Mg + F; Ca + F; Sr + F; Ba + F	T	Undef	Varma, N. P.; Ichner, A. B.; Jha, B. L. Potential energy curves and dissociation energy of group II A diatomic fluorides. <i>Physica B+C</i> 113, 244 (1982) India
264	A17 Ca + N; Sr + N; Ba + N	T	Undef	Romansch, N. V.; Lohmann, E.V.J. True potential energy curves <i>vs.</i> Franck-Condon factors of a few alkaline earth hydrides. <i>Physica B+C</i> 112, 263 (1982) India
265	C92 Pb ⁺ + PERT; Xe ⁺ + PERT; Kr ⁺ + PERT; U ⁺ + PERT	E	1-10 MeV/amu	Gelsoel, N.; Leichter, Y.; Schneider, b.F.h.; Armbruster, V. Observation of a gas-solid difference in the stopping powers of (1-10) MeV/u heavy ions. <i>Phys. Lett.</i> 88A, 26 (1982) West Germany
266	A96 N ⁺ + H A97 N ⁺ + H A16 N ⁺ + H	T	25-200 keV	Torlocki, G.; Grun, M.; Scheid, U. Solution of the time-dependent Schrodinger equation with a trajectory method and application to N ⁺ -H scattering. <i>Phys. Lett.</i> 88A, 33 (1982) West Germany
267	A97 PERT + PERT	E	10-150 keV	Bell, F.; Trellmann, G.; Betz, M.-D. Semi-empirical scaling law for (small delta)-electron production in heavy ion-atomic collisions. <i>Phys. Lett.</i> 88A, 37 (1982) West Germany
268	A96 N ⁺ + N; Na ²⁺ + Na ⁺ ; Li ²⁺ + Li ⁺ ; Ca ²⁺ + Ca ⁺ ; Na ²⁺ + Na ⁺ A16 N ⁺ + N; Na ²⁺ + Na ⁺ ; Li ²⁺ + Li ⁺ ; Ca ²⁺ + Ca ⁺ ; Na ²⁺ + Na ⁺	T	25 keV	Maidagan, J. P.; Fiacentini, R. D.; Rivercia, R. D. Differential cross sections for one electron two center symmetric systems. <i>Phys. Lett.</i> 88A, 128 (1982) Argentina
269	A95 Au + Au	E	0-60 MeV	Moranzoni, E.; Bonani, G.; Burgi, P.; Itoller, C.; Wolfl, U. Threshold behaviour of the PD x-ray anisotropy spectra observed in heavy ion collisions. <i>Phys. Lett.</i> 88A, 121 (1982) Switzerland
270	A93 Na ²⁺ + Li A95 Na ²⁺ + Li	E	10-150 keV	Kodota, K.; Eijhauf, L.; Van der Woude, R.; Pan, G. Y.; de Heer, F. J. Absolute cross sections for one electron capture into excited projectile states in collisions between Na ²⁺ (10-150 keV) and Li atoms. <i>Phys. Lett.</i> 88A, 135 (1982) The Netherlands
271	E92 e + Xe E17 e + Xe	T	5.5-200 eV	Berg, N. P. The elastic scattering of ion energy electrons <i>free xenon</i> . <i>Phys. Lett.</i> 88, 292 (1982) West Germany

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
272	E03 $e + Si^{1+}; e + Si^{2+}$ E06 $e + Si^{1+}; e + Si^{2+}$	T	100-140 Ry	McLaughlin, E. J.; Hahn, Y. Dielectronic recombination cross sections (or Si^{1+} and Si^{2+} . Phys. Lett. 80A, 394 (1982) United States
273	A07 $Br + Pb$ A18 $Br + Pb$	E	246 MeV	Soff, G.; de Haas, Y.; Fuller, B.; Greiner, W. Delta-electron production rates in the superheavy system $Br + Pb$. Phys. Lett. 88A, 398 (1982) West Germany
274	A07 $H^+ + Ar; H_2^+ + Ar; He^+ + Ar$ A18 $H^+ + Ar; H_2^+ + Ar; He^+ + Ar$	E	0.8-2 MeV/amu	Kever, A.; Szabo, G.; Berenyi, D.; Varga, B.; Kadar, I.; Ricz, S.; Vagh, J. Z^2 scaling and effective Z of the projectile in H_2^+ , He^+ -Ar collisions. Phys. Lett. 85A, 71 (1982) Hungary
275	E03 $e + D_2$ E04 $e + D_2$ E17 $e + D_2$	E	20-60 eV	Landau, M.; Hall, E. I.; Pichou, F.; Schermann, C. Deuteron production via autoionizing states of D_2 excited by electron impact. Phys. Lett. 89A, 75 (1982) France
276	A06 $Li^+ + Li^{2+}; Be^{2+} + Be^{3+}; B^{3+} + B^{4+}; C^{4+} + C^{5+}; N^{5+} + N^{6+}; O^{6+} + O^{7+}; F^{7+} + F^{8+}; Ne^{8+} + Ne^{9+}; B^+ + B^{2+}; C^+ + C^{2+}; N^{2+} + N^{3+}; O^{2+} + O^{3+}$	T	0.06-800 keV	Janov, R. K.; Belic, D. S. Double resonant charge exchange in ion-ion collisions. Phys. Lett. 89A, 190 (1982) United States
277	C07 $O^{2+} + C$	E	56 MeV	Dehmelt, G.; Georgiadis, A.; Von Gardtall, L.; Strater, D.; Von Brantano, P.; Ahmad-Ditar, R. Z. The optical decay of high l Rydberg states in beam foil excited O^{2+} . Phys. Lett. 89A, 193 (1982) West Germany
278	A17 $He^{2+} + He$	T	Undef	Nikulin, V. E.; Samoylov, A. V. Quasimolecular states for $He^{2+} + He$ collisions. Phys. Lett. 89A, 225 (1982) Soviet Union
279	E03 $e + O$ Seq	T	0.01-5.0 keV	Ganan, P. S. Excitation of the oxygen isoelectronic sequence by electron impact. Phys. Lett. 84A, 115 (1981) United States
280	A03 $U^+ + Ti; Pb^+ + Ni; U^+ + Co$	E	1.4 MeV	Worczak, A.; Linsen, D.; Mohler, P. H.; Schonfeldt, W. A. Impact-parameter dependence of 3d (small sigma) excitation in very asymmetric U, Pb, U 1.4 MeV/u ion-atom collisions. Phys. Lett. 84A, 239 (1981) West Germany
281	A06 $H + PERT$	T	0.5-1.0 keV/amu	Presnyakov, L. P.; Ishev, D. B.; Janov, R. K. New analytic approach to the theory of charge exchange in atom-multiply charged ion collisions. Phys. Lett. 84A, 243 (1981) Soviet Union
282	A03 $He^{2+} + Li$ A06 $He^{2+} + Li$	T	1-65 keV	Bransden, B. H.; Erskine, A. W. Charge exchange in He^{2+} -Li collisions. Phys. Lett. 84A, 316 (1981) United Kingdom
283	A07 $D^+ + Cu$ A18 $D^+ + Cu$	T	1 MeV	Anholt, B. Cancellation of the dipole ionization amplitudes in slow heavy-ion-atom collisions. Phys. Lett. 84A, 321 (1981) United States
284	H06 $2h\nu + H^+$	T	50-1800 Å	Berson, I. Multiphoton ionization of high Rydberg states. Phys. Lett. 84A, 364 (1981) Soviet Union
285	E06 $e + Mo^{3+}; e + Fe^{16+}; e + Ar^{7+}$	T	26-220 Ry	LaGattuta, K. J.; Hahn, Y. Dielectronic recombination involving high Rydberg states. Phys. Lett. 84A, 468 (1981) United States

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
286	A06 Xe ²⁺ + Xe; Xe ³⁺ + Xe; Xe ⁴⁺ + Xe; Xe ⁵⁺ + Xe; Xe ⁶⁺ + Xe; Xe ⁷⁺ + Xe; Xe ⁸⁺ + Xe; Xe ⁹⁺ + Xe; Xe ¹⁰⁺ + Xe; Xe ¹¹⁺ + Xe; Xe ¹²⁺ + Xe A07 Xe ²⁺ + Xe; Xe ³⁺ + Xe; Xe ⁴⁺ + Xe; Xe ⁵⁺ + Xe; Xe ⁶⁺ + Xe; Xe ⁷⁺ + Xe; Xe ⁸⁺ + Xe; Xe ⁹⁺ + Xe; Xe ¹⁰⁺ + Xe; Xe ¹¹⁺ + Xe; Xe ¹²⁺ + Xe	E	152-912 eV/amu	Groh, W.; Muller, A.; Achenbach, C.; Schlachter, A. S.; Salabero, E. Correlated capture ionization in slow collisions of multiply charged Xe ions with Xe atoms. Phys. Lett. 85A, 77 (1981) West Germany
287	M04 hv + Mo	E	311-390 nm	Kuizikovskii, P.; Nicoll, G.; Varner, K.; Zimmermann, P. Radiative lifetimes and oscillator strengths in Mo I. Phys. Lett. 85A, 272 (1981) West Germany
288	M01 H ⁺	T		Nguyen, H.; D'Etat, R.; Coulaud, G. Electric field ionization rate of the hydrogen atom. Phys. Lett. 85A, 327 (1981) France
289	A06 O ²⁺ + O ₂ ; O ³⁺ + O ₂	E	8000-12000 K	Holzscheiter, H. F.; Church, D. A. Charge transfer reaction of multi-charged oxygen ions with O ₂ . Phys. Lett. 86A, 2E (1981) United States
290	C02 H ⁺ + Kr; H ⁺ + Ar	T	0-400 keV	Kuhrt, E.; Wadell, S. Classical calculation of the electronic stopping power of charged particles near its maximum. Phys. Lett. 86A, 54 (1981) West Germany
291	E05 e + H E19 e + H	E	400-1200 eV	Lohmann, B.; Weigold, E. Direct measurement of the electron momentum probability distribution in atomic hydrogen. Phys. Lett. 86A, 139 (1981) Australia
292	A07 Cl ⁺ + Pb A10 Cl ⁺ + Pb	E	87-135 MeV	Stiehing, K. E.; Tseruya, I.; Bethge, K.; Scholdt-Bocking, H. Role of relativistic and binding-energy effects in the Pb K-shell ionization by Cl projectiles. Phys. Lett. 87A, 24 (1981) West Germany
293	A12 He ⁺ + He	E	88 K	Damaschini, E.; Verges, J. Non-linear broadening observed in He at moderate densities. Phys. Lett. 87A, 27 (1981) France
294	E05 e + Kr	E	219-3000 eV	Yagishita, A. Ionization cross sections of krypton M subshells by electron impact. Phys. Lett. 87A, 30 (1981) Japan
295	C07 H ⁺ + C	E	6-30 keV	Letimer, C. J.; Robinson, R. G.; Murtagh, L. P. Formation of highly excited hydrogen atoms in a beam-foil interaction. Phys. Lett. 87A, 232 (1981) United Kingdom
296	D08 H ⁺ + H; D ⁺ + H	E	100-2000 eV	Van Veenik, J. H. M.; Fesser, R.; Los, J. H ⁺ and D ⁺ formation by scattering H ⁺ and D ⁺ from a cesiated W(110) surface. Phys. Lett. 87A, 288 (1981) The Netherlands
297	E03 e + He	E	80-230 eV	Gelabert, F.; Leguendron, H.; Perasse, J. Electron-photon coincidence measurements for the excitation of helium 3 ¹ P by intermediate energy electrons. Phys. Lett. 87A, 345 (1981) France
298	M04 hv + Ar ²⁺	T	Undef	Genes, P. S. Optical oscillator strengths for the sulphur L ₂ electronic sequence. Phys. Lett. 87A, 394 (1982) United States
299	A03 H ⁺ + D A11 H ⁺ + D	E	5330 m/s	Slupek, J.; Folmer, R.; Bergstedt, R. Measurement of the excitation transfer rate between the n = 4 levels of hydrogen and deuterium. Phys. Lett. 87A, 412 (1981) West Germany
300	A00 Review M01 Electron Capture	T	Undef	Greenland, F. T. Electron capture by highly stripped ions. Phys. Rep. 81, 131 (1982) United Kingdom

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
301	E05 $e + \text{Mg}^+; e + \text{Al}^{2+}; e + \text{Si}^{2+}$	E	15-1500 eV	Crandall, D. H.; Phaneuf, R. A.; Falk, B. A.; Aulic, D. S.; Dunn, G. E. Absolute cross-section measurements for electron-impact ionization of Mg-like ions Mg^+ , Al^{2+} , and Si^{2+} . <i>Phys. Rev. A</i> 25, 143 (1982) United States
302	E05 $e + \text{Mg}^+; e + \text{Al}^{2+}; e + \text{Si}^{2+}$	T	25-160 eV	Griffin, B. C.; Botcher, C.; Pindzola, W. S. Contributions of excitation autoionization to the electron-impact ionization of Mg^+ , Al^{2+} , and Si^{2+} ion the distorted-wave approximation with exchange. <i>Phys. Rev. A</i> 25, 184 (1982) United States
303	A17 $\text{H} + \text{K}^+$ C07 $\text{H}_2^+ + \text{C}; \text{H}_2^+ + \text{C}$	E	0.2-5.25 MeV	Brooks, R. L.; LeFevre, R. G. Measurements and a model for the enhancement of Lyman- α radiation following foil-induced dissociation of molecular ions. <i>Phys. Rev. A</i> 25, 161 (1982) United States
304	A03 $\text{F} + \text{H}_2$ A14 $\text{F} + \text{H}_2$	T	0.1-0.2 eV	Emmons, R. V.; Fuch, S. H. Distorted-wave-Born-approximation study of angular distributions for state-to-state rearrangement collisions: role of orbital angular momentum. <i>Phys. Rev. A</i> 25, 178 (1982) United States
305	E03 $e + \text{Ne}^+$	E	25 eV	Foltz, G. B.; Heiting, E. J.; Jays, T. M.; Smith, K. A.; Dunning, F. B.; Stebbings, R. F. State changing in $\text{Ne}(\text{nd})$ -electron collisions. <i>Phys. Rev. A</i> 25, 107 (1982) United States
306	E03 $e + \text{C}^+; e + \text{C}^{2+}; e + \text{C}^{3+}; e + \text{C}^{4+};$ $e + \text{N}^+; e + \text{N}^{2+}; e + \text{N}^{3+}; e + \text{O}^+;$ $e + \text{O}^{2+}; e + \text{O}^{3+}; e + \text{O}^{4+}; e + \text{F}^+;$ $e + \text{F}^{2+}; e + \text{F}^{3+}; e + \text{F}^{4+}; e +$ $\text{Fe}^+; e + \text{Ne}; e + \text{Mg}; e + \text{Ar}; e +$ $\text{Si}; e + \text{S}; e + \text{Al}$ E05 $e + \text{C}^+; e + \text{C}^{2+}; e + \text{C}^{3+}; e + \text{C}^{4+};$ $e + \text{N}^+; e + \text{N}^{2+}; e + \text{N}^{3+}; e + \text{O}^+;$ $e + \text{O}^{2+}; e + \text{O}^{3+}; e + \text{O}^{4+}; e + \text{F}^+;$ $e + \text{F}^{2+}; e + \text{F}^{3+}; e + \text{F}^{4+}; e +$ $\text{Fe}^+; e + \text{Ne}; e + \text{Mg}; e + \text{Ar}; e +$ $\text{Si}; e + \text{S}; e + \text{Al}$	T	20-10 ⁴ eV	McGuire, E. J. Electron ionization of some low-Z ions in the plane-wave Born approximation. <i>Phys. Rev. A</i> 25, 182 (1982) United States
307	A07 Undef	T	Undef	Micha, B. A.; Piacentini, R. D. Ionization in heavy-particle collisions: multichannel treatment with discretization of the electronic continuum. <i>Phys. Rev. A</i> 25, 204 (1982) United States
308	E05 $e + \text{Ga}^+$	T	15-40 eV	Pindzola, W. S.; Griffin, B. C.; Botcher, C. Electron-impact excitation autoionization of Ga II. <i>Phys. Rev. A</i> 25, 211 (1982) United States
309	E02 $e + \text{Ar}$ E17 $e + \text{Ar}$	T	1 Ry	Anusiev, M. Y.; Chetuphev, M. A.; Chernysheva, L. V.; Davidovic, D. M.; Vodojevic, V. Slow-electron elastic scattering on argon. <i>Phys. Rev. A</i> 25, 219 (1982) Soviet Union
310	H03 $\text{He} + \text{He}$	T	17461 eV	Sharma, S. S.; Trigathi, A. M.; Singh, G. S. Incoherent-scattering factors for atomic helium using a density-matrix approach. <i>Phys. Rev. A</i> 25, 239 (1982) India
311	A03 $\text{He}^+ + \text{He}$ A07 $\text{He}^+ + \text{He}$ A17 $\text{He}^+ + \text{He}$	E	3-140 keV	Bordenave-Montesquieu, A.; Gleizes, A.; Benoit-Cattin, P. Excitation of the helium autoionizing states in He^+-He collisions, between 3 and 140 keV. <i>Phys. Rev. A</i> 25, 245 (1982) France
312	E01 Undef	T	Undef	McCarthy, I. E.; Saha, B. C.; Stelbovics, A. T. Polarization potential for intermediate-energy electron-atom scattering. <i>Phys. Rev. A</i> 25, 268 (1982) Australia
313	H06 Undef	T	Undef	Farrar, J. P. C. Multichannel scattering theory of the resonant Auger effect in photoelectron spectroscopy. <i>Phys. Rev. A</i> 25, 247 (1982) France

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
314	H06 hv + CH ⁺	E	17500-18700 cm ⁻¹	Helm, R.; Comby, P. C.; Graff, M. H.; Paselky, J. T. Photofragment spectroscopy of CH ⁺ : laser excitation of shape resonances in the A ¹ Σ state. Phys. Rev. A 25, 304 (1982) United States
315	H02 hv + Na H03 hv + Na H04 hv + Na	E	800 nm	Fujimoto, T.; Phelps, A. V. Transport of resonance excitation in Na vapor excited by white light. Phys. Rev. A 26, 222 (1982) United States
316	H06 hv + Zn; hv + Cd; hv + Hg	T	1-10 a.u.	Johnson, B. F.; Radejevic, V.; Beshkikh, F.; Cheng, K. T. Photoionization of group-II B elements. Phys. Rev. A 25, 337 (1982) United States
317	A07 Na ⁺ + Na	E	Undef	Kushawaha, V. S.; Leventhal, J. J. Associative ionization in laser-excited sodium vapor. Phys. Rev. A 25, 346 (1982) United States
318	A04 Undef A05 Undef	T	Undef	Lau, A.M.F. Resonant photon-catalyzed predissociation and autoionization: fragment yield, rate constant, and rotational line strengths. Phys. Rev. A 25, 363 (1982) United States
319	H04 hv + Na ⁺	E	15-60 cm ⁻¹	Spencer, B. P.; Vaidyanathan, A. G.; Kleppner, D.; Deane, T. W. Temperature dependence of blackbody-radiation-induced transfer among highly excited states of sodium. Phys. Rev. A 25, 380 (1982) United States
320	D05 Na ⁺	E		Van Wijngaarden, A.; Brahe, G.W.F. Measurements of an E1-M1 interference effect in the electric-field quenching of spin-polarized Na ⁺ 2s _{1/2} ions. Phys. Rev. A 25, 488 (1982) Canada
321	H06 hv + Li Seq	T	Undef	LaGottuta, A. J.; Kahn, Y. Photo-Auger ionization of lithiumlike ions. Phys. Rev. A 25, 411 (1982) United States
322	C07 Ar ⁷⁺ + C; Kr ⁷⁺ + C	E	2 MeV	Bashkin, E.; Cora, M.; Vaja, E. Experimental study of relative level populations in beam-foil-excited Ar VIII and Kr VIII. Phys. Rev. A 25, 417 (1982) United States
323	E03 e + N ₂	E	0.3-5.0 eV	Pitchford, L. C.; Phelps, A. V. Comparative calculations of electron-swarm properties in N ₂ at moderate E/N values. Phys. Rev. A 25, 548 (1982) United States
324	A03 Na ⁺ + Na ⁺	E	465-510 K	Kushawaha, V. S.; Leventhal, J. J. Formation of Na 5s and Na 4d in Na 3p-ha3p energy-pooling collisions. Phys. Rev. A 25, 276 (1982) United States
325	E03 e + Na	T	Undef	Parker, G. A.; Miller, T. M.; Golden, E. E. Inclusion of fine and hyperfine effects in electron-sodium excitation. Phys. Rev. A 25, 586 (1982) United States
326	H06 hv + C ²⁺ ; hv + N ²⁺ ; hv + O ²⁺	T	0-60 Ry	Pradhan, A. K. Ground-state photoionization cross sections for lithiumlike carbon, nitrogen, and oxygen. Phys. Rev. A 25, 252 (1982) Canada
327	A12 Undef	T	Undef	Walkup, R. E. Exponentially decreasing collision-broadened line shapes. Phys. Rev. A 25, 596 (1982) United States
328	E06 e + Xe ₂ ⁺	E	0-5 eV	Takahashi, T.; Huer(Gan), J.; Kubota, I.; Shimizu, F. Time delay of recombination luminescence: electron thermalization in xenon gas and xenon-nitrogen gas mixtures excited by ²⁵² Cf fission fragments. Phys. Rev. A 25, 680 (1982) Japan

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329	C84 $H^+ + Al$	T	100 MeV	Cowern, R.F.E. Comment on range distributions of energetic ions in matter. Phys. Rev. A 25, 694 (1982) United Kingdom
330	E03 $e + Zn^+$	E	6.25-790 eV	Rogers, W. T.; Dunn, G. H.; Olson, J. C.; Harding, M.; Stefani, G. Absolute emission cross sections for electron-impact excitation of $Zn^+(4p^2P)$ and $(5s^2S)$ terms: I. Phys. Rev. A 25, 681 (1982) United States
331	E03 $e + Zn^+$	T	15-400 eV	Mazzone, A. Z.; Henry, R.J.W. Electron-impact excitation of Zn II: II. Phys. Rev. A 25, 692 (1982) United States
332	A06 $H^+ + He^+; He^{2+} + H$	T	4-120 keV	Winter, T. G. Electron transfer in $p-He^+$ and $He^{2+}-H$ collisions using a Sturmian basis. Phys. Rev. A 25, 697 (1982) United States
333	D04 $H^+ + C$	E	1 MeV	Toburen, L. H.; Wilson, W. E.; Paratzke, R. G. K-Auger emission from carbon foils for 1-MeV-proton impact. Phys. Rev. A 25, 713 (1982) United States
334	A03 $H^+ + H; Li^{2+} + H; B^{3+} + H; C^{4+} + H; Si^{4+} + H$ A06 $H^+ + H; Li^{2+} + H; B^{3+} + H; C^{4+} + H; Si^{4+} + H$ A07 $H^+ + H; Li^{2+} + H; B^{3+} + H; C^{4+} + H; Si^{4+} + H$	T	0.01-5000 keV/amu	Ryufuku, H. Ionization, excitation, and charge transfer for impacts of H^+ , Li^{2+} , B^{3+} , C^{4+} , and Si^{4+} ions on atomic hydrogen. Phys. Rev. A 25, 728 (1982) Japan
335	E05 $e + Zn^+; e + Ga^+$	E T	0.015-2 keV	Rogers, W. T.; Stefani, G.; Camillon, S.; Dunn, G. H.; Mazzone, A. Z.; Henry, R.J.W. Electron-impact ionization of Zn^+ and Ga^+ . Phys. Rev. A 25, 737 (1982) United States
336	E03 $e + F$ Seq; $e + Na$ Seq; $e + Li$ Seq; $e + Be$ Seq	T	Under	Peck, J. R.; Rapp, J. E. Cross sections for inelastic electron-ion scattering in weak-coupling approximations. Phys. Rev. A 25, 749 (1982) United States
337	C02 Under	T	Under	Moravcsik, D. W. Application of the adiabatic-nuclei approximation to energy-loss cross sections for collisions with molecules. Phys. Rev. A 25, 764 (1982) United States
338	D07 $Cu + Au$	T	Under	Nervin, A. M.; Tolgo, F. Van der Waals interaction between a point particle and a metallic surface: II. Applications. Phys. Rev. A 25, 803 (1982) Italy
339	A03 $Ar^+ + Ar$ A06 $Ar^+ + Ar$ A07 $Ar^+ + Ar$	E	50-575 keV	Thomsen, G. H. Trajectory and charge dependence of L x-ray fluorescence following $Ar^+ + Ar$ collisions. Phys. Rev. A 25, 816 (1982) United States
340	C01 $H^+ + C; H_2^+ + C; H_3^+ + C; D^+ + C; D_2^+ + C; D_3^+ + C; HD_2^+ + C; HeH^+ + C$ C07 $H^+ + C; H_2^+ + C; H_3^+ + C; D^+ + C; D_2^+ + C; D_3^+ + C; HD_2^+ + C; HeH^+ + C$	E	50-400 keV	Astner, G.; Mennervik, S.; Vaja, E. Molecular effects in optical beam-foil spectroscopy using H^+ , H_2^+ , H_3^+ , D^+ , D_2^+ , D_3^+ , HeH^+ , and HeH^+ projectiles. Phys. Rev. A 25, 828 (1982) Denmark
341	A03 $Rb^+ + Rb$ A11 $Ru^+ + Rb$	E	75-200 eV	Hill, R. N., Jr.; Schwesler, M. A.; Zellars, B. G. Inelastic collisions between selectively excited rubidium atoms and ground-state rubidium atoms. Phys. Rev. A 25, 824 (1982) United States
342	H08 Under	T	Under	Storace, A. F. Polarization of fluorescence radiation subsequent to inner-shell photoionization: LS-coupling formulae. Phys. Rev. A 25, 842 (1982) West Germany

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343	H04 $h\nu + He$ H06 $h\nu + He$	E	60-130 eV	Woodruff, P. R.; Sasser, J.A.R. Measurements of partial cross sections and autoionization in the photoionization of helium to $He^+(N=2)$. Phys. Rev. A 25, 848 (1982) United States
344	H06 $h\nu + Zn$	T	10^{-2} -10 ¹ keV	Vang, N. S.; Kim, Y. S.; Pratt, R. M.; Kox, A. Observation of zeros and amplification of quadrupole-matrix-element contributions to photoelectron angular distributions. Phys. Rev. A 25, 857 (1982) United States
345	H01 He^{2+}	T		Van Wijngaarden, A.; Helbing, R.; Patel, J.; Bruke, G.M.F. El-El damping interference in the electric field quenching of spin-polarized $He^+ 2p_{1/2}$ ions. Phys. Rev. A 26, 662 (1982) Canada
346	A06 $Ar + O^-$; $Ar + N^-$; $Ar + B^-$	T	1-5 keV	Nacik, J.; Edwards, A. K. Spin dependence of $P_{3/2}$ and $P_{1/2}$ autodetaching levels of Ar^- populated by electron capture. Phys. Rev. A 25, 881 (1982) United States
347	A07 $He^+ + C$	T	300-650 keV	Slair, J. S.; Anhalt, E. Theory of K-shell ionization during nuclear resonance scattering. Phys. Rev. A 25, 987 (1982) United States
348	C06 $P^+ + C$ C07 $P^+ + C$	E	100-500 keV	Riddar, B.; Schneider, B. Auger spectra excited in collisions of fast phosphorus ions with thin carbon foils. Phys. Rev. A 25, 521 (1982) West Germany
349	H03 $h\nu + H_2$	T	590 nm	Mee, T. A.; Roberts, J. R. Investigation of laser temporal pulse duration on Rayleigh scattering. Phys. Rev. A 25, 1460 (1982) United States
350	E03 $e + H$ E17 $e + H$	T	1-4 Ry	Van de Ree, J. Calculation of elastic and inelastic scattering matrix elements in e-H collisions between 1 and 4 Ry. Phys. Rev. A 25, 1101 (1982) The Netherlands
351	E03 $e + He$	E	20-300 eV	Miers, R. E.; Gostineau, J. E.; Phillips, M. H.; Anderson, L. b.; Lin, C. C. Electron excitation cross sections for the 1s, and 1s, levels in He. Phys. Rev. A 25, 1165 (1982) United States
352	A03 $C^+ + C$ C07 $C^+ + C$	E	1-2 MeV	Huddle, J. E.; Fonet, J. R. Delayed K x rays from four- and five-electron carbon ions. Phys. Rev. A 25, 1192 (1982) United States
353	J06 Review	T	Undef	Cole, L. A.; Fardeu, J. P. Calculated electron affinities of the elements. Phys. Rev. A 25, 1265 (1982) United States
354	A07 $He^+ + Ge$	E	2 GeV/c	Bak, J. F.; Reichert, G.; Uggerhoj, E.; Fcrster, J. S.; Jansen, P. R.; Nadeball, M.; Moller, S. P.; Petersen, G.; Schiott, M. E.; Regall, R.; Siffert, F. Contribution from close and distant collisions to K-shell excitation in Ge measured using the channeling technique for relativistic protons, pi^+ , and pi^- . Phys. Rev. A 26, 1234 (1982) Denmark
355	A03 $He^+ + H$ A17 $He^+ + H$	T	60-100 keV	France, V. Small-angle scattering of ions or atoms by atomic hydrogen. Phys. Rev. A 26, 1322 (1982) United States
356	A03 $C^{3+} + H$ A06 $C^{3+} + H$	T	0.013-27 keV	Green, T. A.; Shipsey, E. J.; Browne, J. C. Modified method of perturbed stationary states; IV. Electron-capture cross sections for the reaction $C^{3+} + H(1s) \rightarrow C^{2+}(n,l) + H^+$. Phys. Rev. A 26, 1364 (1982) United States
357	E06 $e + Ti^{2+}$; $e + Zr^{2+}$; $e + Fe^{2+}$; $e + Fe^{3+}$; $e + Ni^{2+}$	T	50-60 eV	Griffin, D. C.; Bettecher, C.; Pindzola, M. S. Theoret' : calculations of the contributions of excitat' : autoionization to electron-impact ionization in ions of the transition series of elements. Phys. Rev. A 26, 1274 (1982) United States

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358	E17 $e + H_2; e + H_2; e + CO_2$	E	0.5-500 eV	Moffatt, E. F.; Bakstsch, N. S.; Matsch, Y.-F.; Kauppila, W. E.; Pel, V.; Smart, J. M.; Stein, T. S. Total-cross-section measurements for positrons and electrons colliding with H_2 , H_2 , and CO_2 . Phys. Rev. A 26, 1393 (1982) United States
359	A12 $K^+ + Ar$	E	110 °C	Mahler, J. P.; Gee, J. Collision broadening and shift of the potassium 4p-ns and 4p-md lines by argon. Phys. Rev. A 25, 1404 (1982) United States
360	A07 $H^+ + Au$	T	0-1.7 MeV	Mukeyama, T.; Serachi, L. Electronic relativistic effects on L-shell ionization of atoms by light-ion impact. Phys. Rev. A 25, 1411 (1982) Japan
361	A07 $He^{2+} + H; H^+ + H$ A10 $He^{2+} + H; H^+ + H$	T	5-200 keV	Garibetti, C. R.; Bireglio, J. E. Single differential and total scattering cross sections for electrons ejected in collisions of fast bare ions with atomic hydrogen. Phys. Rev. A 25, 1440 (1982) Argentina
362	E03 $e + CO_2$	T	2×10^{-2} - 2.5×10^{-2} Ry	Morrison, N. A. Interpretation of the near-threshold behavior of cross sections for e- CO_2 scattering. Phys. Rev. A 26, 1446 (1982) United States
363	C02 Undef	T	Undef	Sigmund, P.; Fu, E.-J. Energy loss straggling of a point charge penetrating a free-electron gas. Phys. Rev. A 25, 1466 (1982) Denmark
364	A08 $H^+ + H$ A10 $H^+ + H$	E	25-125 keV	Mo, Y. S.; Eichler, J.; Lieber, M.; Chen, F. T. Calculation of the differential cross section for electron capture in fast ion-atom collisions. Phys. Rev. A 25, 1466 (1982) West Germany
365	A07 Undef	T	Undef	McVey, E. W.; Woldenmiller, M. A. Analysis of K-shell ionization accompanying nuclear scattering. Phys. Rev. A 25, 1462 (1982) West Germany
366	H06 $h\nu + N_2$	E	10600 Å	Baravian, G.; Godart, J.; Saiton, G. Multiphoton ionization of molecular nitrogen by a neodymium-glass laser. Phys. Rev. A 25, 1483 (1982) France
367	A12 $Li^+ + He; Li^+ + He; Li^+ + Ar; Li^+ + Kr$	E	525 K	Kachru, R.; Chen, T. J.; Mossberg, T. S.; Hertzmann, S. R. Relative noble-gas-induced broadening of the D lines of atomic lithium. Phys. Rev. A 26, 1546 (1982) United States
368	H04 Undef	T	Undef	Wilson-Gordon, A. E.; Klimovsky-Barid, B.; Friedmann, M. Saturation effects in coherent anti-Stokes Raman scattering. Phys. Rev. A 25, 1500 (1982) Israel
369	E92 $e + CO_2$	T	0.1-10 eV	Collins, L. A.; Morrison, N. A. Exchange in low-energy e- CO_2 collisions. Phys. Rev. A 25, 1764 (1982) United States
370	E05 $e + He$	T	5-500 eV	Del Cappello, C.; Tovar, C. Ejected-electron cross sections in electron Compton scattering: an impulse profile for the helium atom. Phys. Rev. A 26, 1766 (1982) France
371	E02 $e + Li_2$	E	0.5-10 eV	Miller, T. R.; Keadan, A.; Boderson, B. Measurements of total cross sections for electron scattering by Li_2 (0.5-10 eV). Phys. Rev. A 25, 1777 (1982) United States
372	A02 $He^+ + D_2; He + D_2; K^+ + H_2$	T	0.1-3.5 keV	Jahan, N. N. Energy loss for electronically elastic atom-molecule collisions in the keV energy range. Phys. Rev. A 26, 1782 (1982) Argentina
373	A07 $He^+ + H_2$	E	Undef	Downes, L. W.; Marcus, S. B.; Tilton, S. A.; Wells, M. E. Observation of intermediate Rydberg states in Penning ionization of nitrogen by helium (2°S). Phys. Rev. A 26, 1790 (1982) United States

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374	A06 He ²⁺ + Li	E	4.8-29 keV	Murray, C. A.; Itess, J.; Rayo, M.; Morgan, T. J. Single and double electron transfer in He ²⁺ + Li collisions. Phys. Rev. A 25, 1885 (1982) United States
375	C02 He ⁺ + PERT; Ar ⁺ + PERT; Fe ⁺ + PERT	T	100-1000 MeV/amu	Ahlen, S. P. Calculation of the relativistic Bloch correction to stopping power. Phys. Rev. A 25, 1886 (1982) United States
376	C02 C ⁺ + C; C ⁺ + Al; C ⁺ + Cu; C ⁺ + Ag; C ⁺ + Au; Si ⁺ + C; Si ⁺ + Al; Si ⁺ + Cu; Si ⁺ + Ag; Si ⁺ + Au; Cl ⁺ + C; Cl ⁺ + Al; Cl ⁺ + Cu; Cl ⁺ + Ag; Cl ⁺ + Au; Ti ⁺ + C; Ti ⁺ + Al; Ti ⁺ + Cu; Ti ⁺ + Ag; Ti ⁺ + Au; Fe ⁺ + C; Fe ⁺ + Al; Fe ⁺ + Cu; Fe ⁺ + Ag; Fe ⁺ + Au; Ni ⁺ + C; Ni ⁺ + Al; Ni ⁺ + Cu; Ni ⁺ + Ag; Ni ⁺ + Au; Ga ⁺ + C; Ga ⁺ + Al; Ga ⁺ + Cu; Ga ⁺ + Ag; Ga ⁺ + Au; Br ⁺ + C; Br ⁺ + Al; Br ⁺ + Cu; Br ⁺ + Ag; Br ⁺ + Au; Hb ⁺ + C; Hb ⁺ + Al; Hb ⁺ + Cu; Hb ⁺ + Ag; Hb ⁺ + Au; I ⁺ + C; I ⁺ + Al; I ⁺ + Cu; I ⁺ + Ag; I ⁺ + Au	E	0.4-3.6 MeV/amu	Anthony, J. N.; Louford, W. A. Stopping power and effective charge of heavy ions in solids. Phys. Rev. A 25, 1888 (1982) United States
377	A03 H ⁺ + Pb	E	0.4-3.0 MeV	Barros Leite, C. V.; de Castro Faria, A. V.; Moravicz, R. J.; Montenegro, E. C.; de Pinho, A. G. Anisotropy of Pb L _{2,3} -subshell x rays excited by ion-velocity-proton impact. Phys. Rev. A 25, 1889 (1982) Brazil
378	A03 K ⁺ + He; K ⁺ + Ne; K ⁺ + Kr	E	300 K	Boggy, B.; From, F. A. Cross sections for J, α(sub j) + J prime, α(sub j) prime transitions within the 4F ⁵ states of potassium induced by collisions with He, Ne, and Kr. Phys. Rev. A 25, 1887 (1982) United States
379	E02 e + H E17 e + H	T	30-600 eV	France, V.; Iulinski, Z. First-order correction to Glauber approximation for electron-hydrogen and positron-hydrogen scattering. Phys. Rev. A 25, 1900 (1982) United States
380	A03 Na ⁺ + Na ⁺	T	500 °C	Gallagher, T. F.; Zafra, K. A.; Gonnard, F.; Delpech, J. F.; Sandner, W.; Kachra, R. Resonant Rydberg-atom-Rydberg-atom collisions. Phys. Rev. A 25, 1888 (1982) United States
381	A03 Fe ⁺ + He; Fe ⁺ + Ne A06 Fe ⁺ + He; Fe ⁺ + Ne	E	4.4-10 MeV	Hagmann, J.; Cocke, C. L.; MacDonald, J. F.; Richard, P.; Schmidt-Ecking, M.; Schuch, R. Quasiresonant charge transfer in inner-shell excitation: impact-parameter dependence of K-vacancy creation in F(sub sup 4p) + He collisions. Phys. Rev. A 25, 1918 (1982) United States
382	A06 C ⁺ + He; C ⁺ + Ne; N ⁺ + He; N ⁺ + Ne; O ⁺ + He; O ⁺ + Ne	E	3-100 keV	Hoffman, J. R.; Miller, G. H.; Lockwood, G. J. Charge transfer of ground-state C ⁺ , N ⁺ , and O ⁺ in He and Ne. Phys. Rev. A 25, 1920 (1982) United States
383	A03 Fe ⁺ + He A06 Fe ⁺ + He	E	10-40 MeV	Richard, P.; Pepmiller, P. L.; Kautsura, K. Electron excitation and capture in Fe ⁺ plus He collisions. Phys. Rev. A 25, 1927 (1982) United States
384	A01 Undef C01 Undef	T	Undef	Seabee, G.; Ritchie, M. H. Vicinage effects in ion-cluster collisions with condensed matter and with single atoms. Phys. Rev. A 26, 1943 (1982) United States
385	E02 e + CO ₂ E17 e + CO ₂	T	0-15 eV	Lucchese, R. R.; McCoy, V. Study of electron scattering by CO ₂ at the static-exchange level. Phys. Rev. A 25, 1963 (1982) United States
386	D04 Na ⁺ + Al; Na ⁺ + Al; Ar ⁺ + Al; Kr ⁺ + Al; Xe ⁺ + Al	E	0.4-15 keV	Beragiele, R. A.; Alonso, E. V.; Raiti, M.-J.L. Ion-induced Auger-electron emission from aluminum. Phys. Rev. A 25, 1969 (1982) Argentina

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387	B07 Undef M11 Undef	T	Undef	Shenkeft, B.; Robinson, E. J. Free-free electron scattering from a neutral atom: comparison of one- versus two-photon absorption and test of the soft-photon approximation. Phys. Rev. A 25, 1977 (1982) United States
388	M02 hv + La; hv + Ce; hv + Pr; hv + Nd; hv + Sm; hv + Gd; hv + Dy; hv + Ho; hv + Er; hv + Ta; hv + Pb; hv + Bi	E	279-1115 keV	Unruh, T. K.; Gonda, R.; Sanjivani, R. Incoherent-scattering cross sections in some lanthanum-group rare-earth elements and Ta, Pb, and Bi derived from the measured total attenuation cross sections in compounds. Phys. Rev. A 25, 1986 (1982) India
389	E02 e + H; e + He	T	50-1000 eV	Jhanwar, B. L.; Khare, S. P.; Sharma, R. K. Forward elastic scattering of electrons and positrons by hydrogen and helium atoms. Phys. Rev. A 25, 1993 (1982) Canada
390	A06 He ⁺ + H ₂	T	10 ⁻⁴ -10 ⁴ cm/s	Gleason, E. J.; Goldfield, E. M. Theoretical analysis of the vibrational population in the H ₂ ⁺ [2 ² I(sub u) ⁺] state produced in charge-transfer collisions of He ⁺ + H ₂ [2 ² I(sub g) ⁺]. Phys. Rev. A 25, 2062 (1982) United States
391	M06 hv + Kr; hv + Xe	E	21-25 eV	Ederer, B. L.; Parr, A. C.; West, J. B.; Holland, D. R. P.; Bohner, J. L. Measurement of the spin-orbit branching ratios and the angular asymmetry parameter in the region of the 4s4p ² resonances in krypton and the 5s5p ² resonances in xenon. Phys. Rev. A 25, 2006 (1982) United States
392	B07 H + H + hv	T		Federman, S. E.; Frombrid, L. Recombination of hydrogen atoms via free-to-bound Raman transitions. Phys. Rev. A 25, 2012 (1982) United States
393	M06 hv + Cd	T	21.2 eV	Greene, C. H.; Zare, R. N. Photoionization-produced alignment of Cd. Phys. Rev. A 25, 2031 (1982) United States
394	M03 Undef	T	Undef	Jacon, R. Continuum Rayleigh scattering in an intense laser beam. Phys. Rev. A 25, 2036 (1982) France
395	M06 hv + Ba; hv + Ba ²⁺	T	99-178 eV	Kelly, H. P.; Carter, S. L.; Norum, B. E. Calculations of photoionization of the 4d subshell of Ba and Ba ²⁺ . Phys. Rev. A 25, 2052 (1982) United States
396	M06 nhv + Xe; nhv + Kr; nhv + Ar M09 nhv + Xe; nhv + Kr; nhv + Ar	E	147-107 nm	Miller, J. C.; Cooglen, R. W. Third-harmonic generation and multiphoton ionization in rare gases. Phys. Rev. A 25, 2054 (1982) United States
397	E08 a + Xe ⁺	E	10 ⁻⁴ -1.2x10 ⁴ K	Miller, R. N.; Lesage, A.; Abadie, D. Experimental Stark widths of Xe II and trends in the broadening of homologous rare-gas ions. Phys. Rev. A 25, 2064 (1982) France
398	M06 hv + Pr; hv + Sm	E	12-15.5 keV	Salm, S. I.; Kumer, A.; Lee, P. L. Double-vacancy excitations in the L atomic levels of Pr and Sm. Phys. Rev. A 25, 2069 (1982) United States
399	M04 hv + Na ₂	T	Undef	Haugen, R. P.; Kowaleki, F. V. Spectroscopy of atoms and molecules in gases: corrections to the Doppler-recall shift. Phys. Rev. A 25, 2102 (1982) United States
400	M02 hv + Li M04 hv + Li M06 hv + Li	E	175-110 Å	Robinson, G.; Cooper, J. V.; Salomon, E. R. Absolute photoabsorption cross section of the K shell of atomic lithium. Phys. Rev. A 25, 2113 (1982) United States
401	B01 Undef	T		Saxena, R.; Agarwal, G. S. Modulated Raman signals in partially coherent fields. Phys. Rev. A 25, 2123 (1982) India

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402	A06 $H^+ + H$ A10 $H^+ + H$	T	2-25 keV	Lin, C. B.; Winter, T. G.; Fritsch, W. Three-center atomic expansion method for ion-atom collisions. Phys. Rev. A 25, 2258 (1982) United States
403	B05 $e + Mg; e + Au$	T	100-165 keV	Dedera, J. T.; Malik, F. E. Relativistic effects in the K-shell ionization of Au and Mg by electron impact. Phys. Rev. A 25, 2407 (1982) United States
404	E03 $e + H_2$	E	11-400 eV	Ajello, J. N.; Sribastava, S. K.; Yang, Y. L. Laboratory studies of uv emissions of H_2 by electron impact. The Lyman- and Lyman-band systems. Phys. Rev. A 25, 2405 (1982) United States
405	C02 $H^+ + H_2; H^+ + He; H^+ + H_2; H^+ + O_2; H^+ + CH_4; He^{2+} + H_2; He^{2+} + He; He^{2+} + H_2; He^{2+} + O_2; He^{2+} + CH_4; H^+ + Air; He^{2+} + Air$	T	0.1-20 MeV	Michael, B.; Porter, L. E. Stopping power of protons and alpha particles in H_2 , He, H_2O , CH_4 , and air. Phys. Rev. A 25, 2499 (1982) United States
406	A07 $H^+ + Al; H^+ + Y; He^+ + Al; He^+ + Y$	E	7-21 MeV/mm	Ishii, K.; Sato, K.; Yamadera, A.; Sebata, M.; Araki, M.; Morita, S. Projectile-charge dependence of inner-shell-ionization cross sections in a high-velocity region. Phys. Rev. A 25, 2511 (1982) Japan
407	E02 $e + H_2$ E17 $e + H_2$	T	0.3-10 eV	Sar, S.; Ghosh, A. Z. Model-potential approach to electron-hydrogen-molecule scattering at low energies. Phys. Rev. A 25, 2519 (1982) India
408	C02 $H^+ + Be; H^+ + Al; H^+ + Ag$ C05 $H^+ + Be; H^+ + Al; H^+ + Ag$	E	7 MeV	Ishiwari, S.; Ebisu, H.; Sakamoto, M. Geometrical effect on the measurement of stopping power: angle-dependent energy loss of 7-MeV protons in metallic and organic thin foils. Phys. Rev. A 25, 2524 (1982) Japan
409	B07 $Li^+ + Li + He$	E		Polak-Wiegand, F.; Scussano, R.; Keller, J.; Weiner, J.; Gauthier, J.-C. Direct observation of two-photon optical ionizing collisions in crossed lithium atomic beams. Phys. Rev. A 25, 2539 (1982) United States
410	C07 $He^+ + C$	E	50-900 keV	Brooks, R. L.; Berry, R. G.; Pinnington, E. H. Alignment and orientation of the $3p^2P$ He I term after tilted-foil excitation. Phys. Rev. A 25, 2545 (1982) United States
411	A01 Undef	T	Undef	Berman, P. R.; Mosberg, T. W.; Hartmann, S. R. Collision kernels and laser spectroscopy. Phys. Rev. A 25, 2550 (1982) United States
412	B06 $He + H_2$	T	15-40 eV	Lucchese, R. E.; Nasenev, G.; McKoy, V. Studies of differential and total photoionization cross sections of molecular nitrogen. Phys. Rev. A 25, 2572 (1982) United States
413	E03 $e + Ar^{17+}; e + He^+; e + O^{7+}; e + Fe^{26+}$	T	243-4860 Ry	Ose, B. H.; Collopy, J.; Abu-Salbi, N. Electron-impact excitation of hydrogenlike argon ions. Phys. Rev. A 25, 2512 (1982) United States
414	E02 $e + H_2$ E17 $e + H_2$	T	50-2000 eV	Narasimhan, V. L.; Ramachandran, A. S.; Verhe, C. J. Polarization effects in the elastic scattering of electrons by molecular hydrogen. Phys. Rev. A 25, 2534 (1982) India
415	A06 $C^{3+} + H$	T	10-5000 eV	Bienstock, S.; Hall, T. G.; Bottcher, C.; Felgarno, A. Charge transfer of C^{3+} ions in atomic hydrogen. Phys. Rev. A 25, 2558 (1982) United States
416	B06 $He + He$	E	414-409 nm	Feneuille, S.; Liberman, S.; Luc-Koenig, E.; Pinard, J.; Teich, A. Photoionization Stark spectra of $n(\text{sub } j) = 1$ excited sodium atoms. Phys. Rev. A 25, 2553 (1982) France

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417	E11 Undef	T	Undef	Olsen, R. A.; Kolbenstvedt, M. Čerenkov radiation and transition radiation from small systems: radiation generated in a sphere. Phys. Rev. A 25, 2682 (1982) Norway
418	A07 $H^+ + Ti$; $H^+ + Cr$; $H^+ + Co$; $H^+ + Ni$; $H^+ + Cu$; $H^+ + Zn$	E	300-2400 keV	Brown, R. D.; Simons, B. G.; Lead, B. J.; Brennan, J. G. K-shell ionization cross sections for Ti, Cr, Co, Ni, Cu, and Zn targets induced by protons in the energy range 300-2400 keV. Phys. Rev. A 25, 2935 (1982) United States
419	E02 $e + He$ E05 $e + He$ E17 $e + He$ E19 $e + He$	T	30-400 eV	Thirumalai, B.; Trubler, D. G.; Brandt, M. A.; Eades, R. A.; Blizon, D. A. Polarization and absorption effects in electron-helium scattering at 30-400 eV. Phys. Rev. A 25, 2546 (1982) United States
420	A02 $He^{2+} + He$ A06 $He^{2+} + He$	T	10-70 keV	Kulander, K. C.; Devl, K.R.S.; Koonin, S. E. Time-dependent Hartree-Fock theory of charge exchange: application to $He^{2+} + He$. Phys. Rev. A 25, 2946 (1982) United States
421	A06 $H^+ + H$; $H^+ + D$	E	0.1-150 eV	Neuman, J. H.; Cohen, J. B.; Ziegler, E. L.; Hitz, D. E.; Rundel, H. L.; Smith, K. A.; Stobbing, R. F. Charge transfer in H^+-H and H^+-D collisions within the energy range 0.1-150 eV. Phys. Rev. A 25, 2976 (1982) United States
422	A03 $Rb^+ + H_2$	E	305 K	Sieradzka, A.; Franz, F. A. Quenching, depolarization, and transfer of spin polarization in $Rb-H_2$ collisions. Phys. Rev. A 25, 2665 (1982) United States
423	E03 $e + Ga^+$	E	0.0-400 eV	Stefani, G.; Cappelletti, B.; Dunn, G. N.; Rogers, M. T. Absolute emission cross section for electron-impact excitation of Ga^+ to the 4^1P level. Phys. Rev. A 25, 2956 (1982) United States
424	E02 Undef	T	Undef	Valone, S. M.; Trubler, D. G.; Thirumalai, B. Localized second-order optical potential for electron scattering in terms of imaginary-frequency susceptibilities. Phys. Rev. A 25, 3643 (1982) United States

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
434	E05 $e + Ar^+; e + Kr^+; e + Sc^{++}; e + Fe^{++}$	T	7.3-26200 eV	Younger, S. N. Electron-impact-ionization cross sections for highly ionized chlorinelike ions. <i>Phys. Rev. A</i> 26, 3396 (1982) United States
435	B07 Undef	T		Julienne, P. Z.; Nies, F. M. Role of angular momentum for atomic scattering in intense laser fields. <i>Phys. Rev. A</i> 26, 3399 (1982) United States
436	A09 Undef	T	Undef	Flannery, M. E. Analytical solution of the Bohm-Zwischenberg equation for geminate and homogeneous recombination and for fluorescence quenching. <i>Phys. Rev. A</i> 26, 3463 (1982) United States
437	C02 $He^{++} + H_2O$	T	2-5.5 MeV	Porter, L. E.; Theillet, D. I. Physical state effects on the mean excitation energy of water as determined from a particle stopping-power measurement. <i>Phys. Rev. A</i> 26, 3467 (1982) United States
438	E08 $e + He^+$	T	$18 \times 10^3 - 49 \times 10^3$ K	Cattani, R.; Valder, V. S. Quasistatic, adiabatic, and impact calculations for the ion broadening and shift of neutral-helium lines in a hot plasma. <i>Phys. Rev. A</i> 26, 3411 (1982) Brazil
439	A03 $H^+ + He$ A10 $H^+ + He$	T	20-1000 keV	Batta, Z.; Sur, S. K.; Fakhjee, S. C. Giant cross sections for excitation of atomic helium by proton impact. <i>Phys. Rev. A</i> 25, 3422 (1982) India
440	A01 Undef	T	Undef	Le Gouet, J.-L.; Herman, P. R. *Erratum: Semiclassical picture of depolarizing collisions: application to collisional studies using laser spectroscopy [<i>Phys. Rev. A</i> 24, 1021 (1981)]. <i>Phys. Rev. A</i> 25, 3429 (1982) France
441	B07 $e + H$	T		Brandi, M. S.; Kallier, D.; Miranda, L.C.R.; Castro, J.J. *Erratum: Theory of electron-hydrogen-atom collisions in the presence of a laser field [<i>Phys. Rev. A</i> 17, 1998 (1978)]. <i>Phys. Rev. A</i> 25, 3429 (1982) Brazil
442	A12 $Ca^+ + Ar$	E	300 K	Wlab, W.; Millard, G. B.; Hayfey, M. M. Observation of collisional narrowing in a two-photon transition in a three-level system. <i>Phys. Rev. A</i> 25, 3431 (1982) United States
443	H08 Undef	T	Undef	Huang, K.-M. Coherent fluorescence radiation following photoexcitation and photoionization. <i>Phys. Rev. A</i> 25, 3436 (1982) United States
444	A17 $Ne + Ne; Ar + Ar; Kr + Kr; Xe + Xe$	T	Undef	Wu, M.-S. Modified variational solution of the Thomas-Fermi equation for atoms. <i>Phys. Rev. A</i> 26, 67 (1982) Taiwan
445	C05 PERT ⁺ + C	T	$10^4 - 10^6$ keV/amu	Baudinet-Robinet, Y. Equilibrium charge-state distributions for heavy ions exiting carbon foils. <i>Phys. Rev. A</i> 26, 62 (1982) Belgium
446	A03 $Ni^+ + Ni$ A07 $Ni^+ + Ni$	E	65 MeV	Bell, F.; Trullinger, G.; Betz, M.-D.; Spindler, Z. Delta electrons and continuous x rays in heavy-ion-atom collisions. <i>Phys. Rev. A</i> 26, 72 (1982) West Germany
447	A06 $H^+ + Mg$ A18 $H^+ + Mg$	E	0.5-5.0 keV	Alvarez, I.; Cisneros, C.; Russek, A. Angular distributions for H^+ scattering in single collisions of H^+ on Mg. <i>Phys. Rev. A</i> 26, 77 (1982) Mexico
448	A03 $He^+ + Xe; He^+ + Ar$ A06 $He^+ + Xe; He^+ + Ar$	E	0.02-2000 eV	Noworha, F.; Ruen, I.; Villinger, M.; Lindinger, W.; Fritelli, J. H. Combined drift-tube and beam fluorescence study of the charge-transfer reaction of He^+ with Xe in the energy range from thermal (300 and 300 K) up to 2000 eV. <i>Phys. Rev. A</i> 26, 53 (1982) Austria

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464	B07 Under	T		Bergou, J.; Eblitzky, F.; Varro, S. Charged-particle scattering in a magnetic and a laser field and nonlinear bremsstrahlung. <i>Phys. Rev. A</i> 26, 470 (1982) Austria
465	H03 $h\nu + Ag; h\nu + Pb$	T	5.4-1332 keV	Roy, S. C.; Pratt, R. R. Validity of nonrelativistic dipole approximation for forward Rayleigh scattering. <i>Phys. Rev. A</i> 26, 661 (1982) United States
466	C02 $\alpha + PERT^+$ C05 $\alpha + PERT^+$	T	0.2-106 MeV/amu	Maynard, G.; Deutsch, C. Energy loss and straggling of ions with any velocity in dense plasmas at any temperature. <i>Phys. Rev. A</i> 26, 665 (1982) France
467	H07 Under	T	Under	Engelking, P. C. Strong electron-dipole coupling in photodetachment of molecular negative ions: anomalous rotational thresholds. <i>Phys. Rev. A</i> 26, 740 (1982) United States
468	A03 $He + H_2; He + D_2; He^+ + H_2; He^+ + D_2$ A06 $He + H_2; He + D_2; He^+ + H_2; He^+ + D_2$ A18 $He + H_2; He + D_2; He^+ + H_2; He^+ + D_2$	E	0.2-3.0 keV	Douek, B.; Shulc, B.; Sidis, V.; Barst, N. Collision spectroscopy of the $He, He^+-H_2(D_2)$ systems. A triatomic extension of the molecular-orbital-projection model. <i>Phys. Rev. A</i> 26, 746 (1982) France
469	A03 $H^+ + H$ A06 $H^+ + H$	T	1-20 keV	Fritsch, L.; Lin, C. E. Excitation and charge transfer to 2s and 2p states in 1-20-keV H^+-H collisions. <i>Phys. Rev. A</i> 26, 762 (1982) West Germany
470	A06 $D^+ + Mg; D^+ + Ca; D^+ + Sr; D^+ + Ba$ A16 $D^- + Ca; D^- + Mg; D^- + Sr; D^- + Ba$ A17 $CaH; CaH^+; CaH^-$ C06 $D^+ + Mg; D^+ + Ca; D^+ + Sr; D^+ + Ba$	E T	0.3-3.0 keV	McFarland, R. H.; Schlechter, A. S.; Stearns, J. W.; Liu, B.; Clack, R. E. D^- production by charge transfer of (0.3-3)-keV D^+ in thick alkaline-earth vapor targets: interaction energies for CaH^+, CaH , and CaH^- . <i>Phys. Rev. A</i> 26, 778 (1982) United States
471	A03 $F^{2+} + Ne; F^{3+} + Ne; F^{4+} + Ne; F^{5+} + Ne; F^{6+} + Ne; F^{7+} + Ne; F^{8+} + Ne; F^{9+} + Ne$ A08 $F^{2+} + Ne; F^{3+} + Ne; F^{4+} + Ne; F^{5+} + Ne; F^{6+} + Ne; F^{7+} + Ne; F^{8+} + Ne; F^{9+} + Ne$	E	15 MeV	Pepinier, P. L.; Eichard, P. Charge-state dependence of fluorine K x rays in F-Ne collisions. <i>Phys. Rev. A</i> 26, 786 (1982) United States
472	E02 $\alpha + Ne$ E17 $\alpha + Ne$ E19 $\alpha + Ne$	T	10-100 eV	Thirumal, B.; Truhlar, D. G. Energy-dependent polarization potential, dispersion-relaxation absorption potential, and matrix effective potential for electron-neon scattering at 10-100 eV. <i>Phys. Rev. A</i> 26, 763 (1982) United States
473	A03 Under	T	Under	Besence, S. Origin of the left-right asymmetry in rotationally inelastic differential cross sections. <i>Phys. Rev. A</i> 26, 816 (1982) Yugoslavia
474	A12 $Na^+ + Ar; Na^+ + Kr; Na^+ + Ne; Na^+ + He; Na^+ + Xe; Rb^+ + He; Rb^+ + Xe$	T	300 K	Gounand, F.; Izady, J.; Hugon, M.; Sayer, B.; Fournier, P. R. Influence of inelastic collisions on the width of optical lines involving Rydberg states. <i>Phys. Rev. A</i> 26, 831 (1982) France
475	H06 $h\nu + Cd$	E	19-27 eV	Kobrin, P. N.; Becker, U.; Southworth, S.; Truesdale, C. N.; Lisdle, R. W.; Shirley, D. A. Autoionizing resonance profiles in the photoelectron spectra of atomic cadmium. <i>Phys. Rev. A</i> 26, 842 (1982) United States
476	H04 $h\nu + I$	T	Under	Druhl, K. Cross section and hyperfine structure of the atomic iodine ($^2P_{1/2} - ^2P_{3/2}$) resonant transition. <i>Phys. Rev. A</i> 26, 643 (1982) West Germany

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477	C82 e + Al; e + Al ⁺ ; e + Al ²⁺ ; e + Al ³⁺ ; e + Al ⁴⁺ ; e + Al ⁵⁺ ; e + Al ⁶⁺ ; e + Al ⁷⁺ ; e + Al ⁸⁺ ; e + Al ⁹⁺ ; e + Al ¹⁰⁺ ; e + Al ¹¹⁺ ; e + Al ¹²⁺	T	Undef	Peck, J. N. Free-electron-gas approximation for the stopping power of ionic targets. Phys. Rev. A 26, 1630 (1982) United States
478	A86 H ⁺ + H A18 H ⁺ + H	T	1-50 MeV	McGuire, J. H.; Simony, P. R.; Weaver, J. L.; Macch, J. Interpretation of second Born amplitudes in electron capture. Phys. Rev. A 26, 1109 (1982) United States
479	D03 e + Li E17 e + Li	T	60-200 eV	Sherma, R. K.; Gupta, G. P.; Mathur, K. C. Differential cross sections for the 2s-2p excitation of the lithium atom by electron and positron impact. Phys. Rev. A 26, 1122 (1982) India
480	E06 e + Cl ¹⁹⁺	T	10-20 Ry	LeGottate, E.; Naha, Y. Dielectronic recombination cross section for Cl ¹⁹⁺ . Phys. Rev. A 26, 1125 (1982) United States
481	A06 Pb ²⁺ + H ₂ ; Pb ³⁺ + H ₂ ; Pb ⁴⁺ + H ₂ ; Pb ⁵⁺ + H ₂ ; Pb ⁶⁺ + H ₂ ; Pb ⁷⁺ + H ₂ ; Pb ⁸⁺ + H ₂ ; Pb ⁹⁺ + H ₂ ; Pb ¹⁰⁺ + H ₂ ; Pb ¹¹⁺ + H ₂ ; Pb ¹²⁺ + H ₂ ; Pb ¹³⁺ + H ₂ ; Pb ¹⁴⁺ + H ₂ ; Pb ¹⁵⁺ + H ₂ ; Pb ¹⁶⁺ + H ₂ ; Pb ¹⁷⁺ + H ₂ ; Pb ¹⁸⁺ + H ₂ ; Pb ¹⁹⁺ + H ₂ ; Pb ²⁰⁺ + H ₂ ; Pb ²¹⁺ + H ₂ ; Pb ²²⁺ + H ₂ ; Pb ²³⁺ + H ₂ ; Pb ²⁴⁺ + H ₂ ; Pb ²⁵⁺ + H ₂ ; Pb ²⁶⁺ + H ₂ ; Pb ²⁷⁺ + H ₂ ; Pb ²⁸⁺ + H ₂ ; Pb ²⁹⁺ + H ₂ ; Pb ³⁰⁺ + H ₂ ; Pb ³¹⁺ + H ₂ ; Pb ³²⁺ + H ₂ ; Pb ³³⁺ + H ₂ ; Pb ³⁴⁺ + H ₂ ; Pb ³⁵⁺ + H ₂ ; Pb ³⁶⁺ + H ₂ ; Pb ³⁷⁺ + H ₂ ; Pb ³⁸⁺ + H ₂ ; Pb ³⁹⁺ + H ₂ ; Pb ⁴⁰⁺ + H ₂ ; Pb ⁴¹⁺ + H ₂ ; Pb ⁴²⁺ + H ₂ ; Pb ⁴³⁺ + H ₂ ; Pb ⁴⁴⁺ + H ₂ ; Pb ⁴⁵⁺ + H ₂ ; Pb ⁴⁶⁺ + H ₂ ; Pb ⁴⁷⁺ + H ₂ ; Pb ⁴⁸⁺ + H ₂ ; Pb ⁴⁹⁺ + H ₂ ; Pb ⁵⁰⁺ + H ₂ ; Pb ⁵¹⁺ + H ₂ ; Pb ⁵²⁺ + H ₂ ; Pb ⁵³⁺ + H ₂ ; Pb ⁵⁴⁺ + H ₂ ; Pb ⁵⁵⁺ + H ₂ ; Pb ⁵⁶⁺ + H ₂ ; Pb ⁵⁷⁺ + H ₂ ; Pb ⁵⁸⁺ + H ₂ ; Pb ⁵⁹⁺ + H ₂ ; Pb ⁶⁰⁺ + H ₂ ; Pb ⁶¹⁺ + H ₂ ; Pb ⁶²⁺ + H ₂ ; Pb ⁶³⁺ + H ₂ ; Pb ⁶⁴⁺ + H ₂ ; Pb ⁶⁵⁺ + H ₂ ; Pb ⁶⁶⁺ + H ₂ ; Pb ⁶⁷⁺ + H ₂ ; Pb ⁶⁸⁺ + H ₂ ; 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Pb ¹³⁴⁺ + H ₂ ; Pb ¹³⁵⁺ + H ₂ ; Pb ¹³⁶⁺ + H ₂ ; Pb ¹³⁷⁺ + H ₂ ; Pb ¹³⁸⁺ + H ₂ ; Pb ¹³⁹⁺ + H ₂ ; Pb ¹⁴⁰⁺ + H ₂ ; Pb ¹⁴¹⁺ + H ₂ ; Pb ¹⁴²⁺ + H ₂ ; Pb ¹⁴³⁺ + H ₂ ; Pb ¹⁴⁴⁺ + H ₂ ; Pb ¹⁴⁵⁺ + H ₂ ; Pb ¹⁴⁶⁺ + H ₂ ; Pb ¹⁴⁷⁺ + H ₂ ; Pb ¹⁴⁸⁺ + H ₂ ; Pb ¹⁴⁹⁺ + H ₂ ; Pb ¹⁵⁰⁺ + H ₂ ; Pb ¹⁵¹⁺ + H ₂ ; Pb ¹⁵²⁺ + H ₂ ; Pb ¹⁵³⁺ + H ₂ ; Pb ¹⁵⁴⁺ + H ₂ ; Pb ¹⁵⁵⁺ + H ₂ ; Pb ¹⁵⁶⁺ + H ₂ ; Pb ¹⁵⁷⁺ + H ₂ ; Pb ¹⁵⁸⁺ + H ₂ ; Pb ¹⁵⁹⁺ + H ₂ ; Pb ¹⁶⁰⁺ + H ₂ ; Pb ¹⁶¹⁺ + H ₂ ; Pb ¹⁶²⁺ + H ₂ ; Pb ¹⁶³⁺ + H ₂ ; Pb ¹⁶⁴⁺ + H ₂ ; Pb ¹⁶⁵⁺ + H ₂ ; Pb ¹⁶⁶⁺ + H ₂ ; Pb ¹⁶⁷⁺ + H ₂ ; Pb ¹⁶⁸⁺ + H ₂ ; Pb ¹⁶⁹⁺ + H ₂ ; Pb ¹⁷⁰⁺ + H ₂ ; Pb ¹⁷¹⁺ + H ₂ ; Pb ¹⁷²⁺ + H ₂ ; Pb ¹⁷³⁺ + H ₂ ; Pb ¹⁷⁴⁺ + H ₂ ; Pb ¹⁷⁵⁺ + H ₂ ; Pb ¹⁷⁶⁺ + H ₂ ; Pb ¹⁷⁷⁺ + H ₂ ; Pb ¹⁷⁸⁺ + H ₂ ; Pb ¹⁷⁹⁺ + H ₂ ; Pb ¹⁸⁰⁺ + H ₂ ; Pb ¹⁸¹⁺ + H ₂ ; Pb ¹⁸²⁺ + H ₂ ; Pb ¹⁸³⁺ + H ₂ ; Pb ¹⁸⁴⁺ + H ₂ ; Pb ¹⁸⁵⁺ + H ₂ ; Pb ¹⁸⁶⁺ + H ₂ ; Pb ¹⁸⁷⁺ + H ₂ ; Pb ¹⁸⁸⁺ + H ₂ ; Pb ¹⁸⁹⁺ + H ₂ ; Pb ¹⁹⁰⁺ + H ₂ ; Pb ¹⁹¹⁺ + H ₂ ; Pb ¹⁹²⁺ + H ₂ ; Pb ¹⁹³⁺ + H ₂ ; Pb ¹⁹⁴⁺ + H ₂ ; Pb ¹⁹⁵⁺ + H ₂ ; Pb ¹⁹⁶⁺ + H ₂ ; 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Pb ³²³⁺ + H ₂ ; Pb ³²⁴⁺ + H ₂ ; Pb ³²⁵⁺ + H ₂ ; Pb ³²⁶⁺ + H ₂ ; Pb ³²⁷⁺ + H ₂ ; Pb ³²⁸⁺ + H ₂ ; Pb ³²⁹⁺ + H ₂ ; Pb ³³⁰⁺ + H ₂ ; Pb ³³¹⁺ + H ₂ ; Pb ³³²⁺ + H ₂ ; Pb ³³³⁺ + H ₂ ; Pb ³³⁴⁺ + H ₂ ; Pb ³³⁵⁺ + H ₂ ; Pb ³³⁶⁺ + H ₂ ; Pb ³³⁷⁺ + H ₂ ; Pb ³³⁸⁺ + H ₂ ; Pb ³³⁹⁺ + H ₂ ; Pb ³⁴⁰⁺ + H ₂ ; Pb ³⁴¹⁺ + H ₂ ; Pb ³⁴²⁺ + H ₂ ; Pb ³⁴³⁺ + H ₂ ; Pb ³⁴⁴⁺ + H ₂ ; Pb ³⁴⁵⁺ + H ₂ ; Pb ³⁴⁶⁺ + H ₂ ; Pb ³⁴⁷⁺ + H ₂ ; Pb ³⁴⁸⁺ + H ₂ ; Pb ³⁴⁹⁺ + H ₂ ; Pb ³⁵⁰⁺ + H ₂ ; Pb ³⁵¹⁺ + H ₂ ; Pb ³⁵²⁺ + H ₂ ; Pb ³⁵³⁺ + H ₂ ; Pb ³⁵⁴⁺ + H ₂ ; Pb ³⁵⁵⁺ + H ₂ ; Pb ³⁵⁶⁺ + H ₂ ; Pb ³⁵⁷⁺ + H ₂ ; Pb ³⁵⁸⁺ + H ₂ ; Pb ³⁵⁹⁺ + H ₂ ; Pb ³⁶⁰⁺ + H ₂ ; Pb ³⁶¹⁺ + H ₂ ; Pb ³⁶²⁺ + H ₂ ; Pb ³⁶³⁺ + H ₂ ; Pb ³⁶⁴⁺ + H ₂ ; Pb ³⁶⁵⁺ + H ₂ ; Pb ³⁶⁶⁺ + H ₂ ; Pb ³⁶⁷⁺ + H ₂ ; Pb ³⁶⁸⁺ + H ₂ ; Pb ³⁶⁹⁺ + H ₂ ; Pb ³⁷⁰⁺ + H ₂ ; Pb ³⁷¹⁺ + H ₂ ; Pb ³⁷²⁺ + H ₂ ; Pb ³⁷³⁺ + H ₂ ; Pb ³⁷⁴⁺ + H ₂ ; Pb ³⁷⁵⁺ + H ₂ ; Pb ³⁷⁶⁺ + H ₂ ; Pb ³⁷⁷⁺ + H ₂ ; Pb ³⁷⁸⁺ + H ₂ ; Pb ³⁷⁹⁺ + H ₂ ; Pb ³⁸⁰⁺ + H ₂ ; Pb ³⁸¹⁺ + H ₂ ; Pb ³⁸²⁺ + H ₂ ; Pb ³⁸³⁺ + H ₂ ; Pb ³⁸⁴⁺ + H ₂ ; Pb ³⁸⁵⁺ + H ₂ ; 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REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
485	E02 $e + Kr; e + Xe$	E	20-800 eV	Babushuk, N. Z.; Neich, Y.-F.; Kauppila, b. E.; Pol, V.; Stein, T. Z. Total-scattering cross-section measurements for intermediate-energy positrons and electrons colliding with Kr and Xe. <i>Phys. Rev. A</i> 26, 1262 (1982) United States
486	A16 $H^- + He$	T	500 keV	Day, M. H. Externally differential cross section for electron detachment from H^- in high-velocity collisions with He. <i>Phys. Rev. A</i> 26, 1260 (1982) United States
487	A06 $C^{4+} + H$	E	10^4-10^7 cm/s	Green, T. A.; Peck, J. P.; Riley, M. E.; Shipsey, E. J.; Browne, J. C. Electron-capture cross section for $C^{4+}-H(1s)$ collisions at electron-volt energies. A test of the Landau-Zener formula. <i>Phys. Rev. A</i> 26, 1278 (1982) United States
488	A03 $Na_2 + He$ A10 $Na_2 + He$	E T	190 meV	Jones, P. L.; Hafter, U.; Matthews, A.; Witt, J.; Bergmann, K.; Muller, b.; Mayer, U.; Schieke, R. Angularly resolved rotationally inelastic scattering of Na_2 -He: comparison between experiment and theory. <i>Phys. Rev. A</i> 26, 1283 (1982) West Germany
489	A11 $H^+ + SF_6$ E03 $e + N_2$ E04 $e + N_2$	E	A11 5-20 e/s E03; E04 0-190 eV	Klopf, M. U.; Berst, M.; Fricke, J. In-flight radiative decay and collision-induced ionization of H^{10} . <i>Phys. Rev. A</i> 26, 1302 (1982) West Germany
490	A07 $H^+ + H^+; H^{2+} + H^+; H^{3+} + H^+; H^{4+} + H^+; H^{5+} + H^+; O^+ + H^+; O^{2+} + H^+; O^{3+} + H^+; C^{4+} + H^+; C^{5+} + H^+; Ar^{18+} + H^+; Ar^{19+} + H^+; Ar^{20+} + H^+; Ar^{21+} + H^+; Ar^{22+} + H^+$	E	$2.2 \times 10^3-4.4 \times 10^4$ cm/s	Kim, M. J.; Meyer, F. b. Electron removal from $H^+(n)$ in fast collisions with multiply charged ions. <i>Phys. Rev. A</i> 26, 1318 (1982) United States
491	C02 $H^+ + Al; H^+ + Al^+; H^+ + Al^{2+}; H^+ + Al^{3+}; H^+ + Al^{4+}; H^+ + Al^{5+}; H^+ + Al^{6+}; H^+ + Al^{7+}; H^+ + Al^{8+}; H^+ + Al^{9+}; H^+ + Al^{10+}; H^+ + Al^{11+}$	T	0.1-100 MeV	McGuire, E. J.; Peck, J. N.; Pitchford, L. C. Proton stopping power of aluminum ions. <i>Phys. Rev. A</i> 26, 1318 (1982) United States
492	A06 $H^+ + He$ A10 $H^+ + He$	T	5-200 MeV	Simony, P. K.; McGuire, J. H.; Eichler, J. Exact second Born electron capture for $p + He$. <i>Phys. Rev. A</i> 26, 1337 (1982) United States
493	E03 $e + H$ E17 $e + H$	E	35 eV	Sievir, J.; Enslin, M.; Woolsey, J. M.; Vannieu, G.; Porter, M. Q.; Beck, C. G.; Watkins, S. Electron-photon angular correlation measurements for the 2P state of hydrogen at 25 eV. <i>Phys. Rev. A</i> 26, 1344 (1982) United Kingdom
494	B07 $Xe^+ + Xe$	E		Slusher, M. F.; Higgs, C.; Smith, K. A.; Bunning, F. B.; Stebbings, F. F. Influence of an applied electric field on state changing in xenon-Rydberg-atom-xenon collisions. <i>Phys. Rev. A</i> 26, 1360 (1982) United States
495	E0J $e + Li^{2+}; e + C^{3+}; e + W^{71+}$	T	Undef	Sch, S. S.; Cho, E. N.; Kim, Y.-K. Relativistic Born cross sections for Li-like C and W ions. <i>Phys. Rev. A</i> 26, 1357 (1982) Korea
496	E52 $e + O_2$ E17 $e + O_2$ E19 $e + O_2$	E	2-200 eV	Shyn, T. W.; Sherr, W. E. Angular distribution of electrons elastically scattered from O_2 : 2.0-200-eV impact energy. <i>Phys. Rev. A</i> 26, 1368 (1982) United States
497	A07 $U^{92+} + He; U^{93+} + He; U^{94+} + Ar; U^{94+} + Kr; U^{94+} + Xe$	E T	1.4 MeV/amu	Schlaechter, A. E.; Grob, U.; Muller, A.; Sayer, M. F.; Mann, R.; Olsson, E. E. Production of highly charged rare-gas recoil ions by 1.4-MeV/amu U^{94+} . <i>Phys. Rev. A</i> 26, 1372 (1982) West Germany
498	E01 Undef	T	Undef	Hahn, Y.; LaGattuta, K.; McLaughlin, D. Electron-ion collisions at medium energies: II. Effect of radiative coupling. <i>Phys. Rev. A</i> 26, 1385 (1982) United States

REF. NO.	REACTANTS	EXP OR THEORY	ENERGY RANGE	REFERENCE
499	E02 $e + H_2$ E17 $e + H_2$	T	50-1000 eV	Jhaveri, B. L.; Khare, S. F.; Sharma, N. K. Elastic scattering of electrons by hydrogen molecules in the modified Glauber approximation. <i>Phys. Rev. A</i> 26, 1392 (1982) India
500	E02 $e + He^+$; $e + Li^{2+}$; $e + Be^{3+}$; $e + B^{4+}$	T	0.7-64 eV	Khan, P.; Baskhan, R.; Ghosh, A. S.; Falcun, C. Electron-hydrogenlike-ion scattering. <i>Phys. Rev. A</i> 26, 1401 (1982) India
501	H06 $h\nu + CO_2$	T	20-50 eV	Lucchese, R. E.; McRoy, V. Studies of differential and total photoionization cross sections of carbon dioxide. <i>Phys. Rev. A</i> 26, 1406 (1982) United States
502	E07 Undef	T		DeVries, P. L.; George, T. F. Atomic collisions in the presence of laser radiation: time dependence and the asymptotic wave function. <i>Phys. Rev. A</i> 26, 1419 (1982) United States
503	A12 $Li + He$; $Li + He$ A17 $Li + He$; $Li + He$	E	130-375 K	Belling, L. C.; Bright, J. J.; Harvey, P. E. Experimental β α potentials for Li-He and Li-Ne molecules. <i>Phys. Rev. A</i> 26, 1426 (1982) United States
504	A03 $Li^+ + Li$; $Li^+ + He$; $Li^+ + He$ A11 $Li^+ + Li$; $Li^+ + He$; $Li^+ + He$	E	300 K	Choleard, C.; Dubreuil, B.; Cathérinet, A. Quenching and excitation transfers in $n = 3$ lithium sublevels. <i>Phys. Rev. A</i> 26, 1431 (1982) France
505	E01 He	E		Cooper, J. V.; Salzman, E. B. Stark effect on the oscillator-strength distribution of helium near the ionization limit. <i>Phys. Rev. A</i> 26, 1482 (1982) United States
506	A12 $Na^+ + He$; $Na^+ + Ar$; $Na^+ + Kr$	E	300 K	Krebs, D. J.; Scheerer, L. D. Rare-gas, collision-induced shifts of the nD states of sodium. <i>Phys. Rev. A</i> 26, 1473 (1982) United States
507	H06 $h\nu + He$	E	90-300 K	Spencer, W. F.; Vaidyanathan, A. G.; Kleppner, D.; Lucas, T. W. Photoionization by blackbody radiation. <i>Phys. Rev. A</i> 26, 1456 (1982) United States
508	H06 $h\nu + Co$	T	Undef	Dixit, S. N. Ac-Stark-shift-induced photoelectron spin polarization in resonant multiphoton ionization. <i>Phys. Rev. A</i> 26, 1686 (1982) United States
509	A09 $Kr^+ + F^- + Ar$; $Kr^+ + F^- + He$	T	Undef	Morgan, W. L.; Sardaui, J. M.; Lin, J.; Whitten, B. L. Theory of ion-ion recombination in plasmas. <i>Phys. Rev. A</i> 26, 1656 (1982) United States
510	A02 $H^+ + H$ A18 $H^+ + H$	T	15-200 keV	Wadehra, J. P.; Shukla, R. Elastic scattering of protons from hydrogen atoms at energies 15-200 keV. <i>Phys. Rev. A</i> 26, 1771 (1982) United States
511	E01 H	T		Gallus, J.A.C.; Melther, H.; Werner, E. WKB solution of the Stark effect in hydrogen. <i>Phys. Rev. A</i> 26, 1775 (1982) West Germany
512	A06 $H^+ + H$; $C^{4+} + H$ A07 $H^+ + H$; $C^{4+} + H$	T	0-84 keV/amu	Bottcher, C. Accurate quantum studies of ion-atom collisions using finite-element techniques. <i>Phys. Rev. Lett.</i> 48, 88 (1982) United States
513	H06 $h\nu + Co^0$	T	0-4 eV	Lahiri, J.; Pansu, Z. I. Multiple minima in photoionization cross sections of excited atoms. <i>Phys. Rev. Lett.</i> 48, 614 (1982) United States
514	A06 $H^+ + He$	E T	40-60 keV	Havener, C. C.; Westerveld, W. B.; Risley, J. S.; Toth, M. R.; Tully, J. C. Observation of a large electric dipole moment produced in electron-transfer collisions of H^+ on He. <i>Phys. Rev. Lett.</i> 48, 924 (1982) United States

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515	E03 $e + He^{2+}; e + H^{2+}$ E05 $e + He^{2+}; e + H^{2+}$	T	3×10^7 K	Fujimoto, T.; Kato, T. New excitation and ionization mechanism of ions in dense plasmas: the role of autoionization states. Phys. Rev. Lett. 46, 1622 (1982) Japan
516	E02 $e + H$	E	4-30 eV	Fletcher, G. D.; Alguard, R. J.; Gay, T. J.; Hughes, V. W.; Tu, C. W.; Vainswright, P. F.; Lubell, M. S.; Raith, W.; Tang, F. C. Measurement of spin-exchange effects in electron-hydrogen collisions: 90° elastic scattering from 4 to 30 eV. Phys. Rev. Lett. 46, 1671 (1982) United States
517	E06 $e + He$	E	500 eV	Ehrhardt, H.; Fischer, R.; Jung, K.; Syrov, F. W., Jr.; Joachain, C. J.; Pirau, B. Triply differential cross sections for the ionization of helium by fast electrons. Phys. Rev. Lett. 46, 1007 (1982) West Germany
518	E02 $e + H$	T	0.75 Ry	Callaway, J. The 4P shape resonance in electron-hydrogen scattering. Phys. Lett. 81A, 496 (1982) United States
519	A16 Underf	T	Underf	Taylor, R. B.; Balas, J. B. Theory of electron detachment in collisions of negative ions with atoms: I. Close-coupling formalism and solution to a model. Proc. R. Soc. London Ser. A 379, 179 (1982) United States
520	A02 $H^- + H; D^- + H$ A16 $H^- + H; D^- + H$ A18 $H^- + H; D^- + H$	T	1-20 eV	Taylor, R. B.; Balas, J. B. Theory of electron detachment in collisions of negative ions with atoms: II. Survival probability, differential elastic cross sections, and total detachment cross sections for the H^-H system. Proc. R. Soc. London Ser. A 379, 209 (1982) United States
521	E04 $e + N_2$	E	Thermal	Baranov, V. Y.; Bely, S. I.; Lopatova, G. B.; Starostin, A. N.; Strel'tsov, A. P.; Khramenko, S. V. Measurement of the dissociative-recombination coefficient in vibrationally excited nitrogen. Sov. J. Plasma Phys. 7, 643 (1981) Soviet Union
522	C02 $Al^+ + Al; Al^+ + Al$ ions; $Al^{2+} + Al$ $Al; Al^{2+} + Al$ ions; $Al^{3+} + Al$ $Al^{3+} + Al$ ions	T	0.01-200 keV	Anan'ia, G. I.; Stupitskii, E. L. Energy loss of ions passing through a plasma. Sov. J. Plasma Phys. 7, 763 (1981) Soviet Union
523	H04 Underf	T	Underf	Zon, B. A.; Katsnel'son, B. G. Two-photon excitation of a quantum system. Sov. Phys.-JETP 53, 241 (1981) Soviet Union
524	H06 $h\nu + He$	E	Underf	Borchen, S. W.; Hughes, J. L. Measurement of ionization threshold intensities in helium using ponderomotive force accelerated electrons. Sov. Phys.-JETP 53, 282 (1981) Australia
525	A01 Underf A18 Underf	T	Underf	Drukarev, G. F. Effective-range approximation for scattering of a particle with nonzero orbital angular momentum. Sov. Phys.-JETP 53, 271 (1981) Soviet Union
526	H01 Underf H04 Underf	T	Underf	Kazantsev, A. N.; Sordetovich, G. I.; Yakovlev, V. P. Motion of atoms and molecules in a resonant light field. Sov. Phys.-JETP 53, 272 (1981) Soviet Union
527	H04 $h\nu + Cd$	E	3261 Å	Bench-Strauch, A. P.; Przhibelskii, I. G.; Chigir', N. A. Two-photon resonance excitation of two-level systems by stochastic fields. Sov. Phys.-JETP 53, 206 (1981) Soviet Union
528	A12 Underf	T	Underf	Alekseev, V. P.; Polyugin, A. V. General features of collision narrowing of spectral lines in gases. Sov. Phys.-JETP 53, 486 (1981) Soviet Union

REF. NO.	REACTANTS	EXP OR THEORY	ENERGY RANGE	REFERENCE
539	H01 hv + Na H03 hv + Na	E	Under	Belykin, V. I.; Letchkov, V. S.; Minogin, V. G. Radiative redistribution of the velocities of free sodium atoms by resonance laser radiation. Sov. Phys.-JETP 52, 915 (1981) Soviet Union
540	E03 e + K; e + Rb; e + Cs; e + Ca; e + Sr; e + Ba	E	10-300 eV	Alekashin, I. S.; Bogachev, G. G.; Zagorodnyi, I. P.; Ugrin, S. Y. Experimental investigations of radiative decay of autoionizing states of alkali and alkaline earth elements. Sov. Phys.-JETP 53, 1140 (1981) Soviet Union
541	E02 e + He; e + Ne; e + Ar; e + Kr; e + Xe	E	Under	Golovenichuk, K. S.; Kabilan, A. P. Investigation of collisions of electrons with noble gas atoms at thermal and subthermal energies by electron cyclotron resonance spectroscopy. Sov. Phys.-JETP 53, 1162 (1981) Soviet Union
542	H03 Under	T	Under	Minogin, V. G. Elastic theory of the scattering of atoms by a resonant standing light wave. Sov. Phys.-JETP 53, 1164 (1981) Soviet Union
543	E03 e + He; e + Ne; e + Ar; e + Kr E17 e + He; e + Ne; e + Ar; e + Kr	E	12-50 eV	Zavilets, A. M.; Saagurshil, A. V.; Shpenik, O. B.; Kutsipa, M. K. Excitation of metastable states of inert-gas atoms by electron impact in the near-threshold energy region. Sov. Phys.-JETP 54, 440 (1981) Soviet Union
544	H07 Under	T		Silin, V. P.; Uryuzin, S. A. Absorption of intense electromagnetic radiation in collisions of charged particles. Sov. Phys.-JETP 54, 486 (1981) Soviet Union
545	A06 C ⁶⁺ + He; C ⁶⁺ + H ₂ ; H ⁷⁺ + He; H ⁷⁺ + H ₂ ; O ⁸⁺ + He; O ⁸⁺ + H ₂ ; Ne ¹⁰⁺ + He; Ne ¹⁰⁺ + H ₂ ; Ar ¹⁸⁺ + He; Ar ¹⁸⁺ + H ₂	E	0.5-8 keV/amu	Afrosimov, V. V.; Issaiev, A. A.; Donets, E. D.; Loshkin, K. I.; Pavov, M. N. Processes involving the capture of an electron by the nuclei of atoms near lithium atoms and hydrogen molecules at low energies. Sov. Phys.-JETP Lett. 34, 171 (1981) Soviet Union
546	H01 H	T		Selov'ev, E. A. Approximate action integral for a hydrogen atom in a magnetic field. Sov. Phys.-JETP Lett. 34, 266 (1981) Soviet Union
547	A06 C ⁶⁺ + H ₂ ; C ⁶⁺ + H ₂	E	0.5-8 keV/amu	Afrosimov, V. V.; Issaiev, A. A.; Gordonov, Y. S.; Donets, E. D.; Zinov'ev, A. M.; Ouchinskikov, S. Y.; Pavov, M. N. X radiation accompanying electron capture by oxygen and carbon nuclei in molecular hydrogen. Sov. Phys.-JETP Lett. 34, 316 (1981) Soviet Union
548	H01 hv + Na	E		Grinchev, V. A.; Kazantsev, A. P.; Kuzin, E. F.; Nagayeva, M. L.; Rybenko, G. A.; Sardutovich, G. I.; Yakovlev, V. F. Scattering of atoms by a short, standing-light-wave pulse. Sov. Phys.-JETP Lett. 34, 375 (1981) Soviet Union
549	H07 Under H06 Under	T	H06 Under	Dashkov, Y. A.; Kondratovich, V. D.; Ostrovskii, V. M. Interference of electrons resulting from the photoionization of an atom in an electric field. Sov. Phys.-JETP Lett. 34, 483 (1981) Soviet Union
550	H01 hv + Na H01 hv + Na	E	H01 Under	Andraev, S. V.; Belykin, V. I.; Letokhev, V. S.; Minogin, V. G. Radiative slowing and reduction of the energy spread of a beam of sodium atoms to 1.8 K in an oppositely directed laser beam. Sov. Phys.-JETP Lett. 34, 442 (1981) Soviet Union
551	E03 e + H-like; e + He-like; e + Li-like; e + Be-like; Review E06 e + H-like; e + He-like; e + Li-like; e + Be-like; Review A02 Excitation; Ionization	T	1-10 threshold	Bazylev, V. A.; Chibinov, M. I. Excitation and ionization of multicharged ions by electron collisions. Sov. Phys.-Usp. 24, 276 (1981) Soviet Union

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562	H04 Review H06 Review H03 Dev' a	T	Under	Letchkov, V. S.; Raharov, A. A. Polyatomic molecules in a strong infrared field. Sov. Phys.-Usp. 24, 366 (1981) Soviet Union
563	A07 $H + D$	E	5 keV	Tarashin, V. I.; Chebotarev, V. V.; Shewchuk, B. A.; Yakubovich, V. G.; Fantropin, A. B. Local anisotropies of the ion temperature in a plasma stream by the elastic scattering of hydrogen atoms. Sov. Tech. Phys. Lett. 7, 5 (1981) Soviet Union
564	A07 $Ar^+ + Ar$; $Ne^+ + Ar$; $PERT^+ + PERT$	T	Under	Zinov'ev, A. B.; Cuchbashev, S. Y.; Gerdeev, Y. S. Dynamic inner-shell ionization in collisions of heavy ions and atoms. Sov. Tech. Phys. Lett. 7, 55 (1981) Soviet Union
565	H06 $e + Si$	E	2-50 keV	Abroyan, I. A.; Padavitsay, O. A. Anisotropy formation depth in electron back scattering from a silicon crystal. Sov. Tech. Phys. Lett. 7, 78 (1981) Soviet Union
566	A07 $Ne^+ + Ne$	E T	50 keV	Nashki, G. G.; Tseret, A. B.; Shargin, A. F. Emission of electrons with a continuous energy distribution in Ne^+-Ne collisions. Sov. Tech. Phys. Lett. 7, 89 (1981) Soviet Union
567	H06 $He + He$	E	9470-9390 cm^{-1}	Bondar', I. I.; Zepesochnyi, I. P.; Dolina, N. B.; Suran, V. V. Frequency dependence of two-electron many-photon ionization of atoms. Sov. Tech. Phys. Lett. 7, 104 (1981) Soviet Union
568	H08 $He + H$	T	126.1 nm	Gledushchak, V. I.; Moskalev, S. A.; Skreider, E. Y. Excitation of fluorescence of atomic hydrogen by excimer lasers. Sov. Tech. Phys. Lett. 7, 112 (1981) Soviet Union
569	A17 PERT	T	Under	Bedkov, G. V. Effect of the incident-particle energy on the interaction potential. Sov. Tech. Phys. Lett. 7, 120 (1981) Soviet Union
560	H12 $e + Ag$	E	600 eV	Kritskii, V. A.; Kiyap, M. P.; Guchanikov, V. L.; Pop, S. S. Polarization of the optical emission from the surface of polycrystalline silver during bombardment by low-energy electrons. Sov. Tech. Phys. Lett. 7, 125 (1981) Soviet Union
561	A12 $Tl + H_2$	E	733 K	Lisichi, E.; Bielaki, A.; Szudy, J. Broadening and shift of the 826.6 nm thallium line by nitrogen. Z. Naturforsch. A 36, 53 (1981) Poland
562	A17 $Ne^+ + He$	E	20-370 meV	Kaberland, M.; Gesterlin, P. Interaction potentials and energy transfer cross sections for collisions of metastable helium and neon: $1. He(2^3S) + He$. Z. Phys. A 304, 11 (1982) West Germany
563	A07 $He^+ + O_2$	E	400 K	Lelain, O.; Rergner, W.; Muller, V. Ionization of O_2 by metastable $He(2^3S, 2^1S)$ at thermal collision energy. Z. Phys. A 304, 22 (1982) West Germany
564	A03 $Ne^+ + He$; $Ne^+ + He$ A18 $Ne^+ + He$; $Ne^+ + He$	E	30-300 eV	Grosser, J.; Metzke, M.-P. Photon-ion angular correlations for $Ne^+ + He$ and $Ne^+ + Ne$ collisions. Z. Phys. A 304, 45 (1982) West Germany
565	A06 $H^+ + Ar$	E	1.8 keV	Hippler, E.; Melubet, G.; Faust, M.; Kleinpoppen, H.; Lutz, H. O. Determination of alignment tensor components for the $M(2p)$ charge exchange excitation in proton-argon collisions. Z. Phys. A 304, 63 (1982) West Germany
566	A07 $H^+ + Xe$; $H^+ + Dy$; $H^+ + Au$; $H^+ + U$	E	0.150-10 MeV	Jitushin, V.; Keschuts, A.; Kleinpoppen, H.; Lutz, H. O. Proton-induced alignment of the $L_{2,3}$ -subshell in heavy atoms. Z. Phys. A 304, 69 (1982) West Germany

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
567	A07 $H^+ + Au; H^+ + Ag; He^{2+} + Au$	T	0.1-10 MeV	Rees, F.; Treutmann, T.; Saur, G. Semi-classical treatment of light-ion induced alignment of the $L_{2,3}$ -subshell in heavy atoms. <i>Z. Phys. A</i> 304, 75 (1982) West Germany
568	E05 $e + S; e + Ca; e + Mn; e + Ni; e + Ge; e + Cu; e + Ag; e + Au; e + Co + Ru$	E	0.9-2.0 GeV	Geis, H.; Brendel, C.; Eschweg, P.; Kuhn, U.; Low, W.; Richter, A.; Sauerbrey, F.; Sauerwein, R. Search for the density effect in inner-shell ionization by ultra relativistic electron impact. <i>Z. Phys. A</i> 306, 9 (1982) West Germany
569	E03 $e + Rb$	T	$1-10^4$ eV	Gemas, P. S. Excitation of rubidium atoms by electron impact. <i>Z. Phys. A</i> 306, 21 (1982) United States
570	A07 $H^+ + Ar$ A10 $H^+ + Ar$	E	6 MeV	Walter, T.; Schuch, P. Energy distribution of electrons ejected from the argon K shell by 6 MeV protons. <i>Z. Phys. A</i> 306, 91 (1982) West Germany
571	E11 $e + Au$	E	120 keV	Schofer, H. S.; Von Brachenfels, U.; Paul, W. Measurement of the asymmetry in the emission of Röntgenbremsstrahlung produced by transversely polarized electrons. <i>Z. Phys. A</i> 306, 212 (1982) West Germany
572	A06 $Si^{2+} + H; Si^+ + H^+$	T	$10-10^4$ K	Gergaud, R.; McCortell, R.; Velliron, P. Charge transfer ionization of Si^+ by H^+ at thermal energies. <i>Astron. Astrophys.</i> 104, 197 (1981) France
573	E03 $e + O^{2+}$ E04 $h\nu + O^{2+}$	T	$0.1-1.6 \times 10^4$ K	Kastner, G. O. The solar spectrum of C IV, including photoexcitation by Fe II 171.67 Å. <i>Astron. Astrophys.</i> 104, 341 (1982) United States
574	E04 $h\nu + Fe$	E	7000-4200 Å	Gurtevskaya, E. A.; Kostik, R. I. On the establishment of internally consistent solar scales of oscillator strengths and abundances of chemical elements: III. Oscillator strengths obtained from equivalent widths of 366 Fe I lines. <i>Astron. Astrophys. Suppl. Ser.</i> 47, 193 (1982) Soviet Union
575	E03 $e + H$ Seq; $e + He$ Seq; $e + Li$ Seq; $e + Be$ Seq; $e + B$ Seq; $e + Na$ Seq; $e + Mg$ Seq	T	Undef	Clerk, R.E.M.; Nagge, R. M., Jr.; Mann, J. B.; Merts, A. L. Collisional excitation rates of complex atomic ions by electron impact. <i>Astrophys. J., Part 1</i> 254, 412 (1982) United States
576	E03 $e + O^{++}$	T	$2.0-2.5 \times 10^4$ K	Viding, K. G.; Boyle, J. G.; Dufton, P. L.; Kingston, A. E. Electron density diagnostic line ratios from the $n = 3$ lines of C V. <i>Astrophys. J., Part 1</i> 257, 913 (1982) United Kingdom
577	E05 $e + C; e + N; e + O; e + Ne; e + Mg; e + Si; e + S; e + Ar; e + Ca; e + Fe; e + Ni$ E06 $e + C; e + N; e + O; e + Ne; e + Mg; e + Si; e + S; e + Ar; e + Ca; e + Fe; e + Ni$ E08 $e + C; e + N; e + O; e + Ne; e + Mg; e + Si; e + S; e + Ar; e + Ca; e + Fe; e + Ni$	T	Undef	Shull, M. J.; Van Steenberg, M. The ionization equilibrium of astrophysically abundant elements. <i>Astrophys. J. Suppl. Ser.</i> 48, 95 (1982) United States
578	A06 $O^{2+} + H$	T	10^4 K	Dalgarno, A.; Neill, T. G.; Butler, S. E. Charge transfer of C IV with hydrogen. <i>Astrophys. J., Part 1</i> 248, 753 (1981) United States
579	A14 $C^+ + H_2$	E	$10-100$ K	Herbst, E. A reinvestigation of the rate of the $C^+ + H_2$ radiative association reaction. <i>Astrophys. J., Part 1</i> 252, 810 (1981) United States

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500	C04 $\text{He}^+ + \text{He}$	E T	20 keV	Fenske, G.; Bee, S. K.; Kaminsky, M.; Biley, G.; Terroult, B.; Abel, G.; Lubrie, J. P. Experimental and calculated depth distributions of damage and projected ranges of 20-keV ^4He ions in nickel. <i>J. Appl. Phys.</i> 52, 3618 (1981) United States
501	E03 $\text{e} + \text{N}_2^+$ E04 $\text{e} + \text{N}_2^+$ E05 $\text{e} + \text{N}_2^+$	T	5-45 eV	Cocattara, P.; Capitelli, M.; Gorse, C. Non-equilibrium dissociation and ionization of nitrogen in electrical discharges: the role of electronic collisions from vibrationally excited molecules. <i>Chem. Phys.</i> 66, 141 (1982) Italy
502	A11 $\text{CO}_2^+ + \text{N}_2$; $\text{N}_2^+ + \text{CO}_2$	T	200-2000 K	Billing, G. B. Semiclassical calculation of energy transfer in polyatomic molecules: VII. Intra- and inter-molecular energy transfer on $\text{N}_2 + \text{CO}_2$. <i>Chem. Phys.</i> 67, 35 (1982) Denmark
503	A06 $\text{He}^+ + \text{He}^+$	E	0.01-1200 eV	Maymader, S. B.; (srg, S. Y. Charge transfer between helium ions and metastable helium. <i>Chem. Phys.</i> 69, 213 (1982) United States
504	A14 $\text{H} + \text{H}_2$	T	0.15-0.8 eV	Varandas, A.J.C. Quasiclassical trajectory calculations for $\text{H} + \text{H}_2(v=0,1)$ on a potential energy surface from force field data. <i>Chem. Phys.</i> 65, 295 (1982) Portugal
505	A17 H_2O	T	Undef	Kroemer, W. F.; Foss, S. G.; Siegbahn, P.E.M. MCSCF and multi-reference CI calculations of the potential energy surface for ground state H_2O . <i>Chem. Phys.</i> 69, 365 (1982) West Germany
506	A03 $\text{CO} + \text{D}_2$ A10 $\text{CO} + \text{D}_2$	T	0.007 eV	Billing, G. B.; Paulsen, L. L. Classical path calculation of differential cross sections for rotational excitation of CO colliding with D_2 at 87.2 meV. <i>Chem. Phys.</i> 70, 119 (1982) Denmark
507	A17 H_2	T	Undef	Heger, C.; Jørgen, M. Potential surfaces for the Rydberg states of H_2 . <i>Chem. Phys.</i> 70, 185 (1982) Switzerland
508	A17 $\text{H}_2 + \text{Ar}$; $\text{O}_2 + \text{Ar}$; $\text{H}_2 + \text{Kr}$; $\text{O}_2 + \text{Kr}$	E T	Undef	Reitzel, G. Anisotropic well depth parameters for $\text{H}_2\text{-Ar}$, $\text{O}_2\text{-Ar}$, $\text{H}_2\text{-Kr}$, and $\text{O}_2\text{-Kr}$ from total differential cross sections. <i>Chem. Phys. Lett.</i> 88, 175 (1982) West Germany
509	A07 $\text{Rb}^+ + \text{Rb}$; $\text{Rb}^+ + \text{Rb}^+$	E	300 K	Cheret, M.; Lindinger, W.; Barbier, L.; Deloche, R. Ion formation in collisions of $\text{Rb}(6s)$ with $\text{Rb}(6p)$ and $\text{Rb}(5s)$. <i>Chem. Phys. Lett.</i> 88, 229 (1982) France
510	A02 $\text{K}^+ + \text{Hg}$ A10 $\text{K}^+ + \text{Hg}$	E	0.5-4.0 eV	Lechechevitz, U.; Paier, J.; Pami, H. Rainbow scattering of $\text{K}(4^2F_{5/2})$ from Hg at hyperthermal energies. <i>Chem. Phys. Lett.</i> 88, 233 (1982) West Germany
511	A11 $\text{Li}^+ + \text{Ar}$; $\text{Li}^+ + \text{Xe}$	E	300 K	Ennen, G.; Cöttinger, C. Product-state specific observation of $\text{Li}(2^2E)$ quenching collisions with inert-gas atoms. <i>Chem. Phys. Lett.</i> 86, 467 (1982) West Germany
512	A14 $\text{CO}_2^+ + \text{H}_2$	E	298 K	Copp, N. W.; Hooper, M.; Jones, J.D.C.; Birkinshaw, K.; Twiddy, M. D. A selected ion flow tube study of the reactions of the gaseous ion CO_2^+ at 254 K. <i>Chem. Phys. Lett.</i> 88, 502 (1982) United Kingdom
513	A11 $\text{CO}_2^+ + \text{Ne}$; $\text{CO}_2^+ + \text{Ne}$	T	0-0.4 eV	Billing, G. B.; Clery, D. C. Comparison of semiclassical and quantum-mechanical cross sections and rate constants for $\text{CCl}_3(01^0) + \text{M} + \text{CO}_2(00^0) + \text{M}$ ($\text{M} = \text{He}, \text{Ne}$). <i>Chem. Phys. Lett.</i> 90, 27 (1982) Denmark
514	A17 $\text{Ne} + \text{Ar}$	E T	Undef	Candori, R.; Pirani, F.; Vecchiocattivi, F. An accurate Ne-Ar interatomic potential. <i>Chem. Phys. Lett.</i> 90, 262 (1982) Italy

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595	D08 $\text{ND} + \text{C}$	E	125-750 K	Frankel, F.; Neger, J.; Krieger, W.; Walther, M.; Ertl, G.; Segner, J.; Vielhaber, V. Rotational state populations and angular distributions of surface-scattered molecules: ND on graphite. <i>Chem. Phys. Lett.</i> 50, 221 (1982) West Germany
596	D13 $\text{N}_2 + \text{Pt} + \text{TiO}_2$; $\text{CO} + \text{Pt} + \text{TiO}_2$	E	Underf	Schreffels, J. A.; Belton, D. M.; White, J. M.; Hensle, R. L. Thermal desorption of N_2 and CO on Pt/TiO ₂ . <i>Chem. Phys. Lett.</i> 50, 261 (1982) United States
597	H03 $\text{hv} + \alpha$	T	Underf	Buland, A.K.S.; Vachaspati Polarization of light scattered into second harmonic by free electrons. <i>Indian J. Phys. B</i> 14, 343 (1980) India
598	E17 Underf	T	100 GeV	Mehra, S.; Sharma, L. K. Scattering amplitude in high energy potential scattering for the general even power potential. <i>Indian J. Pure Appl. Phys.</i> 19, 1183 (1981) India
599	A06 $\text{H}^+ + \text{He}^+$; $\text{H}^+ + \text{Li}^{2+}$; $\text{H}^+ + \text{C}^{3+}$; $\text{H}^+ + \text{N}^{4+}$	T	0-1000 keV	Sinha, C.; Sil, W. C. A modified Coulomb-Born approximation and charge transfer in proton-positive ion collision. <i>Indian J. Pure Appl. Phys.</i> 20, 26 (1982) India
600	H06 $\text{hv} + \text{N}_2$; $\text{hv} + \text{ND}$; $\text{hv} + \text{D}_2$	E	584 Å	Pellard, J. E.; Trever, D. J.; Rautt, J. E.; Lee, Y. T.; Shirley, D. A. Rotationally resolved photoelectron spectroscopy of $n\text{-N}_2$, $p\text{-N}_2$, ND, and D ₂ . <i>J. Chem. Phys.</i> 77, 34 (1982) United States
601	H04 $\text{hv} + \text{N}_2$	E	17-30 eV	Tabche-Fouhelle, A.; Ito, K.; Meener, I.; Fröhlich, M.; Guyon, P. M. $\text{N}_2^+(A + X)$ and $\text{N}_2^+(B + X)$ fluorescence excitation spectra by photon impact. <i>J. Chem. Phys.</i> 77, 182 (1982) France
602	A06 $\text{Ar}^+ + \text{N}_2$; $\text{Ar}^+ + \text{CO}$	E	0.2-5.6 eV	Kato, T.; Tanaka, K.; Koyano, I. State selected ion-molecule reactions by a TESICO technique: IV. Relative importance of the two spin-orbit states of Ar^+ in the charge transfer reactions with N_2 and CO. <i>J. Chem. Phys.</i> 77, 327 (1982) Japan
603	A06 $\text{N}_2^+ + \text{Ar}$; $\text{E}_2^+ + \text{Ar}$ A14 $\text{H}_2^+ + \text{Ar}$; $\text{D}_2^+ + \text{Ar}$	E	0.2-9 eV	Moule, F. A.; Anderson, S. L.; Gerlich, D.; Turner, T.; Lee, Y. T. Nonadiabaticity in ion-molecule reactions: coupling of proton and charge transfer in the N_2^+ and D_2^+ -Ar system. <i>J. Chem. Phys.</i> 77, 741 (1982) United States
604	A11 $\text{Na}^+ + \text{N}_2$	E	0.4-1.7 eV	Truhlar, D. G.; Buff, J. W.; Blain, W. C.; Tully, J. C.; Garrett, B. C. The quenching of $\text{Na}(3^2P)$ by N_2 : interactions and dynamics. <i>J. Chem. Phys.</i> 77, 764 (1982) United States
605	A06 $(\text{N}_2^+)^+ + \text{Ar}$	E	0.3-11.8 eV	Kato, T.; Tanaka, K.; Koyano, I. State selected ion-molecule reactions by a TESICO technique: V. $\text{N}_2^+(v) + \text{Ar} + \text{N}_2 + \text{Ar}^+$. <i>J. Chem. Phys.</i> 77, 634 (1982) Japan
606	H06 $3\text{hv} + \text{N}_2$	T	6.6 eV	Ritchie, B.; McGuire, E. J.; Peek, J. R.; Hand, C. W. Three-photon resonance ionization of N_2 . <i>J. Chem. Phys.</i> 77, 877 (1982) United States
607	H06 $\text{hv} + \text{O}_3^+$	E	1.7-2.2 eV	Miller, J. F.; Vestal, M. L. Laser photodissociation of O_3^+ and the energetics of ozone and its ions. <i>J. Chem. Phys.</i> 77, 1248 (1982) United States
608	E03 $\alpha + \text{H}_2$	T	300 eV	Kalos, V.; Mankhorat, M. J.; Szalwicz, K. Inelastic high-energy electron scattering from a hydrogen molecule: I. X-E and X-E transitions. <i>J. Chem. Phys.</i> 77, 1325 (1982) United States

REF. No.	REACTANTS	EXP OR THEORY	ENERGY RANGE	REFERENCE
609	A06 $H_2^+ + Ca; H_2^+ + K; H_2^+ + Mg; H_2^+ + Zn$	E	$3-7 \times 10^7$ cm/s	Gellene, G. I.; Cleary, B. A.; Porter, R. F.; Burkhardt, C. E.; Leventhal, J. J. Electronic energy transfer in near-resonant electron capture collisions of H_2^+ with metal atoms: radiative and nonradiative transitions. J. Chem. Phys. 77, 1354 (1982) United States
610	A11 $Na^+ + H_2; Na^+ + CO$	E	340-370 K	Tanarro, I.; Arqueros, F.; Campos, J. Quenching of $Na(3p^2P)$ atoms by H_2 and CO molecules at low temperatures. J. Chem. Phys. 77, 1626 (1982) Spain
611	A06 $H_2^+ + H_2; H_2^+ + CO; H_2^+ + O_2$ A14 $H_2^+ + H_2; H_2^+ + CO; H_2^+ + O_2$	E	0.5-9.0 eV	Andersson, S. L.; Turner, T.; Mahan, B. R.; Lee, Y. T. The effects of collision energy and ion vibrational excitation on proton and charge transfer in $H_2^+ + H_2$, CO , O_2 . J. Chem. Phys. 77, 1642 (1982) United States
612	A11 $Na^+ + CO$	E	0.2-2.4 eV	Reiland, H.; Tittes, H.-U.; Hertel, I. V.; Benacic-Koutecky, V.; Fersico, M. Stereochemical effects in the quenching of $Na(3P)$ by CO: crossed beam experiment and ab initio CI potential energy surfaces. J. Chem. Phys. 77, 1908 (1982) West Germany
613	B11 $NO + Pt$	E	500-900 K	Serri, J. A.; Cordillo, R. J.; Becker, G. E. A molecular beam study of the NO interaction with Pt(111). J. Chem. Phys. 77, 2175 (1982) United States
614	A03 $O + H_2^+$	E	300 K	Piper, L. G. The excitation of $O(^1S)$ in the reaction between $H_2(A^1\Sigma^+g)$ and $O(^1P)$. J. Chem. Phys. 77, 2373 (1982) United States
615	A11 $Ar + H_2^+$	T	4000 K	Trehlar, E. G.; Biale, h. C. Test of the linear sum rule for vibrational energy transfer by trajectory calculations. J. Chem. Phys. 77, 2438 (1982) United States
616	A14 $D + H_2$	E	297 K	Glass, G. P.; Chaturvedi, B. K. The rate of the reaction $D + H_2(v=1) \rightarrow DH + H$. J. Chem. Phys. 77, 3478 (1982) United States
617	A14 $OH + H_2$	T	200-2400 K	Trehlar, D. G.; Isaacson, A. D. Statistical-dissociation model for state-selected reaction rates. Theory and application of vibrational-mode correlation analysis to $OH(n_{\text{vib}} OH) + H_2(n_{\text{vib}} HH) \rightarrow H_2O + H$. J. Chem. Phys. 77, 3516 (1982) United States
618	B02 $H^+ + C$	E	0.1-6 keV	Yanada, H.; Ishiguro, K.; Stone, K.; Seidch, M. Measurement of chemical sputtering yields of various types of carbon. J. Nucl. Mater. 95, 278 (1980) Japan
619	D16 $H_2 + Ti$	E	400-800 °C	Hirooka, Y.; Miyake, M.; Sano, T. A study of hydrogen absorption and desorption by titanium. J. Nucl. Mater. 96, 227 (1981) Japan
620	D16 $H_2 + Zr$	E	400-750 °C	Liauger, J. F.; Walton, C. N. Absorption and desorption of hydrogen from zirconium foil. J. Nucl. Mater. 97, 165 (1981) United Kingdom
621	D08 $H^+ + TiH; H^+ + TiC; H^+ + TiH_2; H_2^+ + TiH; H_2^+ + TiC; H_2^+ + TiH_2$	E	2.5-10 keV	Schneider, P. J.; Verbeek, M. Hydrogen backscattering from TiH, TiC, and TiH ₂ . J. Nucl. Mater. 97, 319 (1981) West Germany
622	E02 $e + H_2$	T	0.6-0.5 eV	Gibson, T. L.; Morrison, N. A. A parameter-free non-adiabatic polarization potential for low-energy $e + H_2$ collisions. J. Phys. B 15, L221 (1982) United States
623	E05 $e + He^+$	T	200-2000 eV	Ray, A.; Ray, K.; Sii, N. C. Triple differential cross sections for electron impact ionization of He^+ . J. Phys. B 15, 1289 (1982) India
624	K06 $e + Si$ plasma	T	100 eV	Stavrakas, T. A.; Lee, R. W. Model dependence of the calculated line intensity ratios for a highly ionized silicon plasma. J. Phys. B 15, 1939 (1982) United Kingdom

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625	H04 hv + He ⁺ H06 hv + He ⁺	E	60-140 eV	Schmidt, V.; Eerenbach, H.; Malutzhii, B. Angle-resolved photoionization study of the photoionization of helium to He ⁺ (n = 2). J. Phys. B 15, L523 (1982) West Germany
626	H06 hv + S ⁻	E	563-559 nm	Feldmann, D.; Kraussold, W. J.; Welge, K. M. Resonant double ionization of strontium atoms by tunable laser radiation. J. Phys. B 15, L529 (1982) West Germany
627	A06 C ³⁺ + He; O ³⁺ + He	E	0.45 keV/amu	Ohtani, S.; Kaneke, Y.; Kimura, H.; Kobayashi, H.; Imai, I.; Matsunaga, A.; Ohno, K.; Takagi, S.; Tawara, H.; Tsurubuchi, S. Observation of electron capture into selective state by fully stripped ions from He atom. J. Phys. B 15, L533 (1982) Japan
628	E06 e + Fe ²⁴⁺	T	100-500 eV	Zhdanov, V. F. Dielectronic recombination of multiply charged ions via autoionization states with an inner-shell vacancy. J. Phys. B 15, L537 (1982) Soviet Union
629	E06 e + Fe ²³⁺	T	1.4 keV	Zhdanov, V. F. Dielectronic recombination of the multiply charged Li-like ion Fe ²³⁺ via the 2s-3d transition. J. Phys. B 15, L541 (1982) Soviet Union
630	H06 hv + C ²⁺ ; hv + C ³⁺	T	0-3 Ry	Brew, J. E.; Storey, P. J. Photoionization of C ²⁺ and C ³⁺ . J. Phys. B 15, 2367 (1982) United Kingdom
631	A11 Rb ⁺ + He; Rb ⁺ + He; Rb ⁺ + Ar; Rb ⁺ + Kr; Rb ⁺ + Xe	E	296 K	Hugon, N.; Sayer, P.; Fournier, P. R.; Goumand, F. Collisional depopulation of rubidium Rydberg levels by rare gases. J. Phys. B 15, 2391 (1982) France
632	A07 H ⁺ + Ar; He ²⁺ + Ar	T	100-650 keV/amu	Martir, M. M.; Ford, A. L.; Reading, J. F.; Becker, R. L. Coupled-state calculations of argon L-shell impact ionization. J. Phys. B 15, 2405 (1982) United States
633	A06 H ⁺ + He; H ⁺ + He; H ⁺ + Ar A18 H ⁺ + He; H ⁺ + He; H ⁺ + Ar	E	200-2500 keV	Morad-el-Pederson, E.; Loftager, P.; Rasmussen, J. L. Angular-dependent electron capture probabilities for H ⁺ ion helium, neon, and argon. J. Phys. B 15, 2461 (1982) Denmark
634	E02 e + Xe E17 e + Xe	E	50-300 eV	Berger, O.; Hubner, H.; Hollenkaamp, R.; Kessler, J. The polarization of electrons elastically scattered from xenon at low energies. J. Phys. B 15, 2473 (1982) West Germany
635	E05 e + He	E	25-30 eV	Keenan, G. A.; Walker, I. C.; Dance, D. F. Near-threshold electron impact ionization of helium. J. Phys. B 15, 2569 (1982) United Kingdom
636	E03 e + Li E17 e + Li	E	10-200 eV	Vaskovic, L.; Trajner, S.; Register, D. F. Electron impact cross sections for the 2 ² P state excitation of lithium. J. Phys. B 15, 2617 (1982) United States
637	E05 e + Na; e + K	E T	800-1200 eV	Frout, L.; Weigold, E. Electron coincidence spectroscopy of sodium and potassium. J. Phys. B 15, 2631 (1982) Australia
638	E02 e + Ar E03 e + Ar E05 e + Ar	E	0.5-3.0 keV	Nogueira, J. C.; Iga, I.; Nu-Tao, L. Total cross sections for electrons scattered from gases: 0.5-3.0 keV range on Ar. J. Phys. B 15, 2639 (1982) Brazil
639	B01 He ⁺	E		Neirovsky, I.B.L.; Freschi, M. F. Polarization of electric field quench radiation from He ^{+(2S)} ions. J. Phys. B 15, 2679 (1982) Argentina
640	A12 Xe ⁺ + Xe	E	290 K	Lebastic, P.; Giacchino, E.; Biraben, F. Collision effects in Rydberg states of xenon. J. Phys. B 15, 2686 (1982) France

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641	A12 $\text{Na}^+ + \text{Na}$	T	300 K	Reauff, E.; Spielfeld, A. Broadening of hyperfine components of Na D lines perturbed by He. J. Phys. B 15, 261 (1982) France
642	A03 $\text{H}^+ + \text{H}$ A06 $\text{H}^+ + \text{H}$	T	1-50 keV	Ludde, H. J.; Breizler, B. M. Direct and capture processes in proton-hydrogen scattering: II. Total cross sections for scattering energies of 1 to 50 keV. J. Phys. B 15, 2762 (1982) West Germany
643	A06 $\text{He}^{2+} + \text{H}; \text{Li}^{2+} + \text{H}; \text{Be}^{2+} + \text{H}; \text{B}^{2+} + \text{H}$	T	0.3-1.4 a.u.	Ludde, H. J.; Breizler, B. M. Electron capture with He^{2+} , Li^{2+} , Be^{2+} , and B^{2+} projectiles from atomic hydrogen. J. Phys. B 15, 2713 (1982) West Germany
644	A16 $\text{Cl}^- + \text{H}; \text{F}^- + \text{H}$	T	25 meV	Gouyacq, J. F. Associative detachment in collisions between negative halogen ions and hydrogen atoms. J. Phys. B 15, 2721 (1982) United States
645	E03 $e + \text{H}$ E17 $e + \text{H}$	T	30-790 eV	Kingston, A. E.; Liew, Y. C.; Burke, P. G. Scattering amplitudes and orientation and alignment for $1s-2p$ excitation of hydrogen. J. Phys. B 15, 2755 (1982) United Kingdom
646	E03 $e + \text{C}^{2+}; e + \text{N}^{2+}; e + \text{O}^{2+}; e + \text{Ne}^{2+}$	T	10-2000 eV	Nakazaki, S.; Hashino, T. Electron collisional excitation of beryllium-like ions: C^{2+} , N^{2+} , O^{2+} , and Ne^{2+} . J. Phys. E 15, 2767 (1982) Japan
647	H06 $\text{He} + \text{He}$	T	1-5 Ry	Barrington, K. A.; Burke, P. G.; Fon, B. C.; Taylor, K. T. Photoionisation of helium. J. Phys. E 15, L603 (1982) United Kingdom
648	A03 $\text{Na}^+ + \text{Ca}$ A11 $\text{Na}^+ + \text{Ca}$	E	424-550 K	Harris, M.; Lewis, E. L. Cross sections for sodium fine-structure transitions induced by collision with caesium atoms. J. Phys. B 15, L613 (1982) United Kingdom
649	A07 $\text{H}^+ + \text{Au}$	T	0.02-1 MeV	Mukoyama, T.; Furhaci, L. Approximate relativistic correction factors in L-shell ionisation. J. Phys. B 15, L617 (1982) Japan
650	E02 $e + \text{Ar}$	T	0.01-0.03 Ry	Scott, N. S.; Bell, K. L.; Burke, P. G.; Taylor, K. T. An investigation of the $[(3P^2)_{3/2,1/2}(4f)^2]$ resonances in the elastic scattering of electrons by argon atoms. J. Phys. B 15, L627 (1982) United Kingdom
651	E07 $e + \text{N}_2\text{O}; e + \text{CH}_4$ E17 $e + \text{N}_2\text{O}; e + \text{CH}_4$	T	1-10 eV	Jain, A.; Thompson, L. G. Elastic scattering of slow electrons by CH_4 and N_2O using a local exchange potential and new polarization potential. J. Phys. B 15, L631 (1982) United Kingdom
652	H02 $\text{He} + \text{Cr}$	E	30-70 eV	Bruhn, B.; Schmidt, E.; Jochroder, H.; Sonntag, B. VUV photoabsorption and photoemission of atomic Cr. J. Phys. B 15, 2807 (1982) West Germany
653	A12 $\text{Mg} + \text{Na}; \text{Mg} + \text{Ar}; \text{Ca} + \text{Na}; \text{Ca} + \text{Ar}; \text{Sr} + \text{Na}; \text{Sr} + \text{Ar}$	E	550-857 K	Giles, R. G.; Lewis, E. L. Collision broadening and shifts in the spectra of neutral and singly ionised magnesium, calcium, and strontium. J. Phys. B 15, 2871 (1982) United Kingdom
654	A03 $\text{He}^+ + \text{He}$ A11 $\text{He}^+ + \text{He}$	E	25-225 meV	Haberland, H.; Kopp, W.; Osterlin, P. Interaction potentials and energy transfer cross sections for collisions of metastable helium and neon: II. $\text{He}(2^1S) + \text{He}$. J. Phys. B 15, 2869 (1982) West Germany
655	A03 $\text{Na}^+ + \text{Na}; \text{Na}^+ + \text{Na}; \text{Na}^+ + \text{Ar}$ A11 $\text{Na}^+ + \text{Na}; \text{Na}^+ + \text{Na}; \text{Na}^+ + \text{Ar}$	E T	500 K	Masnou-Seeuws, F.; Euliser, J.; Maurin, T.; Roche, A. L.; Valiron, P. Theoretical prediction and experimental observation of $(n+1)p \rightarrow n(l \text{ greater than or equal to } 2)$ transitions in excited sodium-rare-gas collisions. J. Phys. E 15, 2909 (1982) France

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
656	A03 $K^+ + H_2; K^+ + H_2; Rb^+ + H_2; Rb^+ + H_2$ A11 $K^+ + H_2; K^+ + H_2; Rb^+ + H_2; Rb^+ + H_2$	T	0.1-0.5 eV	Nichman, A. P. Model for fine-structure transitions in collisions of $K(4^2F)$ and $Rb(5^2P)$ with H_2 and H_2 . J. Phys. B 15, 3885 (1982) France
657	A07 $He^+ + Cu; He^+ + Ga; He^+ + Mo; He^+ + Ag$	E	0.8-1.8 MeV	Bhattacharya, B.; Sanyal, A.; Bhattacharjee, S. K.; Mitra, S. K. K-shell ionization cross sections of Cu, Ga, Mo and Ag by helium ions of energy 0.8 to 1.8 MeV. J. Phys. B 15, 3047 (1982) India
658	A06 $H + H_2; H + Cu$ A08 $H + H_2; H + Cu$	E	0.1-5 keV	Niethe, K.; Dreiseldler, T.; Salzbach, E. Charge transfer of hydrogen atoms in H_2 and in cesium vapour. J. Phys. B 15, 3045 (1982) West Germany
659	A06 $H^+ + H; Li^{2+} + He^{2+}$ A18 $H^+ + H; Li^{2+} + He^{2+}$	T	10-150 MeV	Briggs, J. S.; Greenland, P. T.; Kuebach, L. Differential cross sections for high-energy electron capture in the impulse approximation. J. Phys. B 15, 3685 (1982) West Germany
660	A06 $Li^+ + Li^+; H^+ + Li^+$ A07 $Li^+ + Li^+; H^+ + Li^+$	T	6-1000 keV/amu	Ermolaev, A. R.; Miraglia, J. E.; Bransden, B. H. Ionization and charge exchange in collisions between Li^+ ions at intermediate energies. J. Phys. B 15, L677 (1982) United Kingdom
661	B01 He^+	E		Tepchen, G. G.; Rejz, H.-J.; Kleinpoppen, H. Low-field Stark effect measurements in He. J. Phys. B 15, 3189 (1982) United Kingdom
662	A03 $He^+ + He$	E	10-40 keV	Müller, R.; Von Cygan, G.; Perschmann, E. B.; Schilling, W. Level-crossing measurements on the excitation of low 3D levels of He I in He^+-He collisions. J. Phys. B 15, 3179 (1982) West Germany
663	A06 $H^+ + Li^+; H^+ + Li^{2+}; Li^{2+} + H;$ $Li^{2+} + H$ A07 $H^+ + Li^+; H^+ + Li^{2+}; Li^{2+} + H;$ $Li^{2+} + H$	T	50-400 keV/amu	Ford, A. L.; Reading, J. F.; Becker, R. L. Coupled-channel calculations of ionization and charge transfer in $e + Li^+, Li^{2+}$ and transfer in $Li^{2+} + M(1s)$ collisions. J. Phys. B 15, 3257 (1982) United States
664	A03 $He^{2+} + Li$ A06 $He^{2+} + Li$	E	15-150 keV	Kadota, K.; Eijhkan, L.; Van der Vonde, R. L.; de Boer, A.; Van, P. G.; de Haer, F. J. One-electron capture into excited states for $He^{2+}-Li$ collisions in the energy range of 15-150 keV. J. Phys. B 15, 3275 (1982) The Netherlands
665	A03 $He^{2+} + Li$	E	15-600 keV	Kadota, K.; Eijhkan, L.; Van der Vonde, R. L.; Van, P. G.; de Haer, F. J. Excitation of Li by He^{2+} ion impact between 15 and 600 keV. J. Phys. B 15, 3297 (1982) The Netherlands
666	E02 $e + CH_4$ E17 $e + CH_4$	E	3-20 eV	Tanaka, H.; Chada, T.; Eeston, L.; Suzuki, T.; Yamamoto, T.; Kudo, N. Differential cross sections for elastic scattering of electrons by CH_4 in the energy range of 3 to 20 eV. J. Phys. B 15, 3285 (1982) Japan
667	E05 $e + He^+$	T	3.5-4.2 Ry	Chidichimo, M. C. Electron impact ionization of He^+ including autoionization. J. Phys. B 15, 3333 (1982) United Kingdom
668	E05 $e + Na$	E	5.6-37 eV	Hile, B.; Jitschin, W.; Kleinpoppen, H. The spin-dependent ionization asymmetry in sodium. J. Phys. B 15, 2347 (1982) United Kingdom
669	B01 He^+	E		Higgs, C.; Fineman, M. A.; Dunning, F. B.; Stebbings, R. F. Electric field ionization of $He(n^1P)$ Rydberg atoms. J. Phys. B 15, L657 (1982) United States
670	H06 $He + Ca$	T	6.1-7.7 eV	Altun, Z.; Carter, S. L.; Kelly, M. P. Near-threshold resonance structure in the photoionization cross section of Ca I. J. Phys. B 15, L709 (1982) United States

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671	A03 $H^+ + H; H^+ + He^+$ E03 $e + H$	T	Under	Gallitis, N. The influence of finite masses on the threshold behaviour of scattering in a three charged particle system. J. Phys. B 15, 3423 (1982) Soviet Union
672	A04 $H^+ + H_2; He^{2+} + H_2; Li^+ + H_2; Li^{2+} + H_2; Li^{3+} + H_2; C^{2+} + H_2; C^{3+} + H_2; C^{4+} + H_2; N^{2+} + H_2; N^{3+} + H_2; N^{4+} + H_2; O^{2+} + H_2; O^{3+} + H_2; O^{4+} + H_2; O^{5+} + H_2$ A07 $H^+ + H_2; He^{2+} + H_2; Li^+ + H_2; Li^{2+} + H_2; Li^{3+} + H_2; C^{2+} + H_2; C^{3+} + H_2; C^{4+} + H_2; N^{2+} + H_2; N^{3+} + H_2; N^{4+} + H_2; O^{2+} + H_2; O^{3+} + H_2; O^{4+} + H_2$	E	12-1500 keV/amu	Shah, M. B.; Gilbody, R. B. Ionization of H_2 by fast protons and multiply charged ions of He, Li, C, N, and O. J. Phys. E 15, 2441 (1982) United Kingdom
673	A03 $Na^+ + Ar; Na^+ + Kr; Na^+ + Xe$ A11 $Na^+ + Ar; Na^+ + Kr; Na^+ + Xe$	E	Under	Chapelet, M.; Boulmer, J.; Gauthier, J.-C.; Delpech, J.-F. Collisional angular momentum mixing of very high (20 less than or equal to n less than or equal to 46) Rydberg d states of He by Ar, Kr, and Xe. J. Phys. B 15, 3455 (1982) France
674	A07 $Rb^+ + Rb$ A11 $Rb^+ + Rb$	E	450 K	Cheret, M.; Erbier, L.; Lindinger, W.; Deloche, R. Penning and associative ionization of highly excited rubidium atoms. J. Phys. E 15, 3463 (1982) France
675	A06 $B^+ + C^{2+}; O^{2+} + He^{2+}; C^{2+} + N^{3+}; N^{3+} + O^{2+}; O^{2+} + Fe^{2+}; Fe^{2+} + Na^{4+}$	T	0.1-200 keV	Janev, R. K.; Belic, D. S. Quasi-resonant charge exchange collisions between multiply charged ions. J. Phys. E 15, 2479 (1982) United States
676	A03 $Na^+ + Li; Na^{2+} + Li$ A06 $Na^+ + Li; Na^{2+} + Li$	E	5-60 keV	Rille, E.; Winter, H. State-selective and total one-electron capture in $Na(sup q)^+-Li$ collisions ($q = 1, 2$, E less than or equal to 30 keV). J. Phys. B 15, 3469 (1982) Austria
677	E13 $e + H^+$	E	17.0-1000 eV	Defrance, P.; Claess, b.; Brouillard, F. The formation of H^+ from H^- ions by electron impact. J. Phys. B 15, 3509 (1982) Belgium
678	E03 $e + He$ E17 $e + He$	E	26-40 eV	Van Linden van den Heuvell, M. B.; Van Eck, J.; Haldeman, H.G.H. Measurement of alignment and orientation parameters for low-energy electron impact excitation of the 2^1F state of helium. J. Phys. B 15, 3517 (1982) The Netherlands
679	E03 $e + H_2; e + CD_2; e + H_2O$ E17 $e + H_2; e + CD_2; e + H_2O$	E	0.5-6 eV	Jung, K.; Antoni, I.; Fuller, R.; Koches, K.-H.; Ehrhardt, H. Rotational excitation of H_2 , CD_2 , and H_2O by low-energy electron collisions. J. Phys. B 15, 3535 (1982) West Germany
680	K03 Review	E T	Under	Weightman, P. X-ray-excited Auger and photoelectron spectroscopy. Rep. Prog. Phys. 45, 753 (1982) United Kingdom
681	K03 Review	T	Under	Manson, S. T.; Starsce, A. F. Photoelectron angular distributions: energy dependence for a subshell. Rev. Mod. Phys. 54, 385 (1982) United States
682	K08 Under	E T	Under	Dalgarno, A. Applications of atomic collisions physics to astrophysics. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 1, North-Holland (1981) United States
683	E02 $e + H; e + He$ E03 $e + H; e + He$	T	30-200 eV	McDowell, M.R.C. Theory of electron-atom scattering at intermediate energies. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 19, North-Holland (1981) United Kingdom
684	E02 $e + H; e + He$ E03 $e + H; e + He$	T	10-30 eV	Wesbet, R. E. Theory of low-energy electron-atom scattering. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 32, North-Holland (1981) United States

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685	E02 e + O E03 e + O E05 e + O	T	10-1000 eV	Howell, W. B. Electron scattering from atomic oxygen. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 49, North-Holland (1981) United Kingdom
686	E02 e + LiH E03 e + LiH	T	0.1-10 eV	Garrett, W. B. Electron interactions with polar molecules. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 66, North-Holland (1981) United States
687	A03 He ⁺ + He; H ⁺ + He	E	0.5-6.5 keV	Jaacks, B. J.; Goldberger, A.; Natarajan, R.; Montgomery, E.; Mueller, B. Alignment and orientation in low-atom/molecule collisions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 97, North-Holland (1981) United States
688	A03 H ⁺ + H A07 H ⁺ + H	E	25-125 keV	Park, J. T. Fast hydrogen collisions energy-loss spectroscopy. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 165, North-Holland (1981) United States
689	A06 H ⁺ + Ar; C ⁺⁺ + H	T	2-20 MeV	Shakeshaft, S. Atomic rearrangement collisions at asymptotically high impact velocities. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 123, North-Holland (1981) United States
690	A06 H ⁺ + Ne; H ⁺ + Ar; H ⁺ + Ne; H ⁺ + C; He ⁺⁺ + Ne; He ⁺⁺ + Ar; Li ⁺⁺ + Ar	E	0.3-12 MeV	Horndal-Pedersen, E. Electron capture from K shells by light ions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 139, North-Holland (1981) Denmark
691	A07 Review	E	2 MeV/amu	Schock, R. Characteristic x-ray production in high-energy heavy-ion collisions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 161, North-Holland (1981) West Germany
692	A07 Ne ⁺ + Ne; Ar ⁺ + Ar; Kr ⁺ + Kr; O ⁺ + O ₂	E	1-200 keV	Gordeev, Y. S.; Zisaviev, A. M. Production of continuous electron spectra in heavy ion-atom collisions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 169, North-Holland (1981) Soviet Union
693	A07 S ⁺ + Pb; Pb ⁺ + Pb; Pb ⁺ + Zn; I ⁺ + Pb	E	5 MeV/amu	Kozubarov, C. Spectroscopy of high energy (small delta)-rays emitted in collisions of very heavy ions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 179, North-Holland (1981) West Germany
694	A07 Review	E	0.01-5 MeV/amu	Seilin, I. A. Electron capture and loss to continuum. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 195, North-Holland (1981) United States
695	A06 H ⁺ + He ⁺ ; H ⁺ + Ne ⁺ ; H ⁺ + Ti ⁺ ; H ⁺ + Li ⁺ ; H ⁺ + C ⁺ ; H ⁺ + N ⁺ ; Ca ⁺ + Ca ⁺ ; Xe ⁺ + Xe ⁺ ; Li ⁺ + Li ⁺ ; Na ⁺ + Na ⁺	E	1-400 keV	Gilbody, M. S. Collisions between positive ions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 223, North-Holland (1981) United Kingdom
696	A07 Na ⁺ + Ar; Na ⁺ + Ar; Na ⁺ + Kr; Na ⁺ + Xe	E	1 eV	Niehaus, A. Fanning ionization. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 227, North-Holland (1981) The Netherlands
697	A11 K ⁺ + Xe; Ar ⁺ + Xe; Na ⁺ + Na ⁺	E	1-1000 eV	Gounand, F. Collisions of Rydberg atoms. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 255, North-Holland (1981) France
698	A16 Review	T	1-250 eV	Devdariani, A. Z. Theory of collisional electron detachment. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 269, North-Holland (1981) Soviet Union
699	A16 Cl ⁻ + He; Cl ⁻ + D ₂ ; Cl ⁻ + O ₂ ; Cl ⁻ + CO; Cl ⁻ + N ₂ ; Cl ⁻ + Ar	E	5-200 eV	Annis, B. K.; Setz, S. Collisional electron detachment of Cl ⁻ on diatomic molecules. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 283, North-Holland (1981) United States

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700	A14 Review	T	0.1 eV	Takayanagi, S. Low energy ion molecule collisions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 343, North-Holland (1981) Japan
701	A83 $\text{Li}^+ + \text{N}_2$; $\text{Li}^+ + \text{CO}$; $\text{Li}^+ + \text{H}_2$; $\text{Kr}^{2+} + \text{He}$	E	50-500 eV; 3 keV	Kobayashi, M. Ultrahigh-resolution ion energy-loss spectroscopy. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 355, North-Holland (1981) Japan
702	E84 $e + \text{H}_2^+$ E86 $e + \text{H}_2^+$	T	0.02-0.5 eV	Giusti-Suzor, A. Application of quantum defect theory to preionization predissociation and dissociative recombination. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 351, North-Holland (1981) France
703	B07 Review	E		Berry, R. S. What's really happening in laser-induced processes in collisions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 412, North-Holland (1981) United States
704	H06 $h\nu + \text{Ar}$; $h\nu + \text{He}$ H07 $h\nu + \text{H}^-$	T	H06 35 eV; H07 12 eV	Starace, A. F. New perspectives on electron correlations. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 421, North-Holland (1981) United States
705	H06 $h\nu + \text{Xe}$; $h\nu + \text{Ar}$	E T	30-102 nm	Kessler, J. The Fano effect and its consequences. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 467, North-Holland (1981) West Germany
706	A11 $\text{Na}^+ + \text{He}$; $\text{Na}^+ + \text{Hg}$	E	47 eV	Hertel, I. V. State selection with lasers in atomic and molecular collision physics. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 513, North-Holland (1981) West Germany
707	A83 $\text{He} + \text{He}$	E	1 keV	Feytson, J. A.; Brossat, J. C.; Houver, J. C. Multicoincidence techniques in atomic physics. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 525, North-Holland (1981) France
708	A06 $\text{N}^{2+} + \text{N}_2$; $\text{Ar}^{2+} + \text{N}_2$; $\text{O}^{2+} + \text{O}_2$; $\text{O}^{2+} + \text{O}_2$	E	1 eV	Church, E. A. Charge transfer to multi-charged ions in Penning traps. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 532, North-Holland (1981) United States
709	E83 Undef	T	7 eV	Domcke, W.; Cederhaus, L. S. Theoretical methods for low-energy electron-molecule scattering. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 555, North-Holland (1981) United States
710	E83 Review E86 Review K02 Review	E	1-50 threshold	Crandall, D. E. Experiments on collisions of electrons and multicharged ions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 595, North-Holland (1981) United States
711	E83 Review	T	1-50 threshold	Henry, R.J.W. Excitation processes in collisions of electrons with multicharged ions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 605, North-Holland (1981) United States
712	E86 Review	T	1-5 threshold	Moore, D. L. Ionization processes in collisions of electrons with multicharged ions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 623, North-Holland (1981) United Kingdom
713	E86 Review	T	Undef	Rozsman, L. J. Dielectronic recombination in collision of electrons with multicharged ions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 641, North-Holland (1981) United States
714	A86 Review A87 Review	E	1-1000 keV/amu	Knudsen, H. Electron capture and target ionization by medium- and high-velocity multiply charged ions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 657, North-Holland (1981) Denmark

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715	A06 Ar ²⁰⁺ + He; Ar ²⁰⁺ + He; Ar ²⁰⁺ + He; Ar ²⁰⁺ + He; Ar ²⁰⁺ + He; Ar ²⁰⁺ + He; Ar ²⁰⁺ + He; Ar ²⁰⁺ + He; Ar ²⁰⁺ + He; Ar ²⁰⁺ + He; Ar ²⁰⁺ + He; Ar ²⁰⁺ + He; Ar ²⁰⁺ + He; Ar ²⁰⁺ + He; Ar ²⁰⁺ + Ar; Ar ²⁰⁺ + Ar; Ar ²⁰⁺ + Ar; Ar ²⁰⁺ + Ar; Ar ²⁰⁺ + Ar; Ar ²⁰⁺ + Ar; Ar ²⁰⁺ + Ar; Ar ²⁰⁺ + Xe; Ar ²⁰⁺ + Xe; Ar ²⁰⁺ + Xe; Ar ²⁰⁺ + Xe; Ar ²⁰⁺ + Xe; Ar ²⁰⁺ + Xe; Ar ²⁰⁺ + Xe	E	100-1000 eV/q	Cochs, C. L.; Dubois, R.; Justiniano, E.; Gray, T. J.; Can, C. Electron capture by highly charged low-velocity ions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 671, North-Holland (1981) United States
716	A03 Review A06 Review	E	10 eV	Mann, E.; Beyer, K. F.; Felhmann, F. Excited states formed by electron capture in highly charged recoil ions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 683, North-Holland (1981) West Germany
717	A06 C ³⁺ + He; C ³⁺ + He; C ³⁺ + He; C ³⁺ + He; C ³⁺ + He; C ³⁺ + He; C ³⁺ + He; C ³⁺ + He; He; N ⁷⁺ + He; O ⁸⁺ + He; O ⁸⁺ + He; O ⁷⁺ + He; O ⁸⁺ + He; F ⁹⁺ + He; F ⁹⁺ + He; He; F ⁹⁺ + He; He ⁷⁺ + He; He ⁸⁺ + He; He; He ⁸⁺ + He; He ¹⁰⁺ + He; Si ¹³⁺ + He	E	0.5-4.0 keV/q	Kawabe, Y.; Imai, T.; Ohtani, S.; Okuno, K.; Kobayashi, M.; Tsurubuchi, S.; Kikura, M.; Tawara, H.; Takagi, S. Cross sections for one-electron capture from He by highly stripped ions of C, N, O, F, Ne, and S below 1 keV/amu. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 657, North-Holland (1981) Japan
718	A06 C ³⁺ + H	T	1-500 eV/amu	Gargaud, M.; Bannas, J.; McCarroll, R.; Vailion, P. Electron capture in slow C ³⁺ /H collisions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 787, North-Holland (1981) France
719	K08 Review	E T	Under	Pest, D. E. Atomic physics issues in fusion. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 786, North-Holland (1981) United States
720	A06 C ³⁺ + H; C ³⁺ + H; C ⁵⁺ + H; C ⁶⁺ + H K08 C ³⁺ + H; C ³⁺ + H; C ⁵⁺ + H; C ⁶⁺ + H	T	10-350 eV (Temp)	Hogan, J. T. The effects of low energy electron capture collisions [He + C(sup a)] on the particle and energy balance of tokamak plasmas. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 765, North-Holland (1981) United States
721	K08 Review	E	Under	Suchauer, S.; Hinnov, E. Atomic processes for diagnostics of magnetically confined plasmas. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 783, North-Holland (1981) United States
722	K08 Review	E T	Under	Hauer, A.; Berns, E.J.T. Survey of atomic physics issues in experimental inertial confinement fusion research. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 757, North-Holland (1981) United States
723	E03 e + He ²⁰⁺ ; e + Ar ¹⁷⁺ K08 Review	T	E03 1-20 keV K08 Under	Davis, J.; Blake, P. Atomic properties and processes in dense plasmas. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 811, North-Holland (1981) United States
724	A07 O ⁸⁺ + H K08 O ⁸⁺ + H	E	30 keV	Isler, R. C.; Murray, L. E.; Kanai, S. Optical excitation by charge exchange of H ⁰ with O ⁸⁺ . XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 823, North-Holland (1981) United States
725	D08 He ⁴⁺ + Si; H ⁰ + Ni	E	530 keV; 9 keV	Tolk, M. W.; Tully, J. C.; Niv, Y. Coherence, orientation, and alignment in excited hydrogenic states formed at surfaces. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 832, North-Holland (1981) United States
726	C06 HeH ⁺ + C; H ₂ ⁺ + C; He ₂ ⁺ + C; CO ⁺ + C; HCO ⁺ + C	E	1-5 MeV	Gosnell, D. I. Molecular-ion structures determined from Coulomb explosions of penetrating ions. XII ICPEAC, Gatlinburg, TN., Invited Papers, p. 841, North-Holland (1981) United States

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727	A16 $H^- + He; H^- + O_2; H^- + N_2; H^- + Ar;$ $H^- + Ne; D^- + O_2; D^- + N_2; D^- + Ar;$ $Cl^- + He; Cl^- + O_2; Cl^- + N_2; Cl^- + Ar;$ $Br^- + He; Br^- + O_2; Br^- + N_2; Br^- + Ar;$ $F^- + H_2; F^- + O_2$	E	1-200 eV	Deverapike, L. E.; Champion, R. L. Collisional processes for negative ion-atom (molecule) systems for low collisional energies. <i>Notas de Fisica</i> 5, 1 (1982) United States
728	A16 $H^- + He; H^- + K; H^- + Rb; H^- + Cs;$ $H^- + Ca; Li^- + K; Li^- + Ca; Li^- + Na$	T	20-300 eV	Gislen, S. E. Molecular negative ions. <i>Notas de Fisica</i> 5, 50 (1982) United States
729	A16 $Na^- + He; Na^- + Ne; Na^- + Ar; Na^- + N_2;$ $Na^- + O_2; Na^- + ND$ M07 $h\nu + Na^-$	E	A16 500-4000 eV M07 10741-308 nm	Coggiola, M. J. Photodetachment and collisional destruction of Na^- . <i>Notas de Fisica</i> 5, 78 (1982) United States
730	A16 $H^- + He; H^- + Ne; H^- + Ar$	E	0.1-10 keV	Riechy, J. S.; Elson, S. E. The effect of scattering on attenuation cross section measurements of H^- on He and Ar. <i>Notas de Fisica</i> 5, 108 (1982) United States
731	A16 $H^- + He; H^- + Ne$	T	1-100 eV	Gauyacq, J. F. Theoretical study of electron detachment in low energy negative ion-atom collisions. <i>Notas de Fisica</i> 5, 126 (1982) United States
732	A06 $H^+ + Ar; H^+ + N$ A16 $Na^- + He; Na^- + N_2; Na^- + Ne; Na^- + Ar;$ $Na^- + O_2; Na^- + H; H^- + He; H^- + N_2; H^- + Ar;$ M01 Electron Capture; Electron Detachment	E	1-100 keV	Gilbody, M. E. Collisional formation and destruction of H^- and He^- ions in gases. <i>Notas de Fisica</i> 5, 146 (1982) United Kingdom
733	A06 $O^- + N_2; O^- + He$ A16 $O^- + N_2; O^- + Ne; O^- + Ar$	E	A06 20-200 keV A16 20-400 keV	Graham, W. G. Production and detachment of heavy negative ions in fast collisions in gases. <i>Notas de Fisica</i> 5, 174 (1982) United Kingdom
734	A16 $H^- + He; H^- + Ne; H^- + Ar; O^- + He;$ $O^- + Ne; O^- + Ar; Br^- + He;$ $Br^- + Ne; Br^- + Ar$	E	0.1-2 keV	Esaulov, V. A. Studies of negative ion-atom collisions. <i>Notas de Fisica</i> 5, 196 (1982) France
735	E09 $e + HCl; e + DCl$	E T	0-1.5 eV	Horzenberg, A. Bound states, barriers, and resonances. <i>Notas de Fisica</i> 5, 227 (1982) United States
736	B07 $H^+ + Na + \text{field}; H + Na + \text{field};$ $Na^+ + Na + \text{field}; H + Na + \text{field}$	E		Anderson, L. V. Feasible uses of optical pumping for the production of polarized negative ions. <i>Notas de Fisica</i> 5, 246 (1982) United States
737	M07 $h\nu + H^-$	E	2-15 eV	Bryant, M. C.; Butterfield, L. B.; Clay, E. A.; Frost, C. A.; Donahue, J. E.; Gram, P. A. M.; Hamm, R. W.; Smith, W. W. Photodetachment spectroscopy of the H^- ion. <i>Notas de Fisica</i> 5, 265 (1982) United States
738	D09 $H_2^+ + Fe$	T	500 K	Kero, A. P. Molecular potentials and relaxation dynamics. <i>Notas de Fisica</i> 5, 305 (1982) United States
739	D08 $H_2^+ [Cs + u]$	T	1-10 eV	Nishe, J. R. Formation of negative hydrogen ions in surface and volume processes. <i>Notas de Fisica</i> 5, 348 (1982) United States
740	D08 $H_2^+ + Cs; H_2^+ + Rb; H_2^+ + K; H_2^+ + Na;$ $H_2^+ + Li; D_2^+ + Cs; D_2^+ + Rb; D_2^+ + K;$ $D_2^+ + Na; D_2^+ + Li; H_2^+ + Cs; H_2^+ + Rb;$ $H_2^+ + K; H_2^+ + Na; H_2^+ + Li; D_2^+ + Cs;$ $D_2^+ + Rb; D_2^+ + K; D_2^+ + Na; D_2^+ + Li; D + He; H + He;$ $D + [Cs + He]; H + [Cs + He]$	E	0.15-4 keV/nucleus ; 2000-3000 K	Berkner, K. H.; Ehlers, K. W.; Graham, W. G.; Leung, K. M.; Pyle, R. V.; Schneider, P. J.; Stearns, J. W. H^- and D^- production by backscattering from surfaces. <i>Notas de Fisica</i> 5, 360 (1982) United States
741	D03 $Ca^+ + [CaH + He]$ D08 $H + [CaH + He]$	E	D03 1-20 keV D08 1000-2600 K	Seldel, M.; Pergellia, A. N.; Greer, J. Experiments on surface production of negative hydrogen ions. <i>Notas de Fisica</i> 5, 392 (1982) United States

REF. NO.	REACTANTS	EXP OR THEORY	ENERGY RANGE	REFERENCE
742	D08 $N_2^+ + Co; N_2^+ + Ti; N_2^+ + Si; N_2^+ + Mo; N_2^+ + Ni; N_2^+ + Au; N_2^+ + U;$ $N_2^+ + Si_3N_4; N_2^+ + TiN_2; N_2^+ + Co;$ $N_2^+ + Ti; N_2^+ + Si; N_2^+ + Mo; N_2^+ + Ni; N_2^+ + Au; N_2^+ + U; N_2^+ + Si_3N_4;$ $N_2^+ + TiN_2; N_2^+ + Co; N_2^+ + Ti;$ $N_2^+ + Si; N_2^+ + Mo; N_2^+ + Ni; N_2^+ + Au; N_2^+ + U; N_2^+ + Si_3N_4; N_2^+ + TiN_2$	T	1-16 keV	Eckstein, W.; Verbeek, M.; Schneider, F. J. Negative ion production by scattering from surfaces. <i>Notas de Fisica</i> 5, 426 (1982) West Germany
743	A04 $HD_2^+ + H_2; H_2^+ + H_2; H_2^+ + H_2; D_2^+ + H_2$ A06 $HD_2^+ + H_2; H_2^+ + H_2; H_2^+ + H_2; D_2^+ + H_2$	E	20-60 keV	Bennett, C. F. Dissociation and electron capture collisions of diatomic and triatomic hydrogen ions in L_2 and M_2 . <i>Notas de Fisica</i> 5, 487 (1982) United States
744	A06 $H + H_2; H + Co$	E	0.2-5 keV	Miethe, K.; Einsiedler, T.; Salzbach, E. Charge exchange of hydrogen atoms in nitrogen and in cesium vapor. <i>Notas de Fisica</i> 5, 474 (1982) West Germany
745	A06 $D^+ + Co; D^+ + Mo; D^+ + Sr; D^+ + Ca; D^+ + Ba; D^+ + Rb$	E	0.3-20 keV	Schlachter, A. Z. Production and destruction of D^+ by charge transfer in metal vapors. <i>Notas de Fisica</i> 5, 461 (1982) United States
746	A06 $H + Mg; H^+ + Mg$ A10 $H + Mg; H^+ + Mg$	E	0.5-5 keV	Alvarez, I.; Cisneros, C. Angular distributions of H^- and H^+ produced by H^+ and H^- impact on Mg. <i>Notas de Fisica</i> 7, 617 (1982) Mexico
747	A10 $H + \text{general target}$	T	0.5-3 keV	Russek, A. Glory scattering in negative ion formation. <i>Notas de Fisica</i> 2, 238 (1982) United States
748	A04 $H + H_2$	T	7.0-30.0 eV	Bisio, M. C.; Irehler, D. G. High-energy collision-induced dissociation of H_2 by H . <i>Astrophys. J., Part 2</i> 266, L79 (1982) United States
749	E03 $e + H \text{ Seq}$	T	Undef	Clark, R.E.H.; Ferguson, D. M.; Goett, S. J. Scaled collision strengths for He greater than or equal to 1 transitions involving a less than or equal to 5 in hydrogenic ions. <i>Astrophys. J. Suppl. Ser.</i> 49, 545 (1982) United States
750	A14 $OH + NO_2$	E	296 K	Temps, F.; Wagner, M. G. Investigations of the reaction $OH + NO_2 + H_2C + O_2$ with the aid of a laser magnetic spectrometer. <i>Ber. Bunsenges. Phys. Chem.</i> 86, 115 (1982) West Germany
751	A14 $F + H_2; Li + HF$	E	0.25-0.65 eV	Lee, Y. T. Molecular beam studies of bimolecular reactions: $F + H_2$ and $Li + HF$. <i>Ber. Bunsenges. Phys. Chem.</i> 86, 376 (1982) United States
752	E03 Review	E T	Undef	Smith, I.B.M. Lasers in the study of elementary processes. <i>Ber. Bunsenges. Phys. Chem.</i> 86, 396 (1982) United Kingdom
753	A17 $H_2; H_2^+$	E T	Undef	Porter, R. H. H_2 and H_2^+ : correlations of theory and experiment. <i>Ber. Bunsenges. Phys. Chem.</i> 86, 407 (1982) United States
754	A14 $F + H_2$	T	0.3-0.4 eV	Wyatt, R. E.; McHutt, J. F.; Redmon, M. J. Analysis of the resonance in the three dimensional $F + H_2$ reaction. <i>Ber. Bunsenges. Phys. Chem.</i> 86, 437 (1982) United States
755	A14 $H^+ + H_2; H_2^+ + H; Ar^+ + H_2; F + H_2$	T	0-0.6 eV	Beer, R. Quantum mechanical treatment of electronic transitions in atom-diatom exchange collisions. <i>Ber. Bunsenges. Phys. Chem.</i> 86, 448 (1982) Israel
756	D11 $CO + Co$	E	100-420 K	Papp, M. The chemisorption of carbon monoxide on a $Co(10\bar{1}0)$ single crystal surface. Studied by LEIS, UPS, AES, and work function measurements. <i>Ber. Bunsenges. Phys. Chem.</i> 86, 565 (1982) West Germany

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767	A14 $O + C_2H; C + CH_2; CH + CH_2$	E	298 K	Grebe, J.; Hossann, K. H. Blue-green chemiluminescence in the system $C_2H_2/O/H$. Formation of the emitter $CH(A^2\Delta)$, $C_2[d^2(4s\sigma g)]$ and C_2H . Ber. Bunsenges. Phys. Chem. 86, 627 (1982) West Germany
768	A14 $OH + NO_2$	E	298 K	Braun, M.; Hofmann, A.; Stuhl, F. WUV flash photolysis study of the reaction of OH with NO_2 at 1 atm and 298 K. Ber. Bunsenges. Phys. Chem. 86, 597 (1982) West Germany
769	A17 $Li^+ + Li^+; Na^+ + Na^+; K^+ + K^+; Rb^+ + Rb^+; F^- + F^-; Cl^- + Cl^-; Br^- + Br^-; I^- + I^-; LiF; LiCl; LiBr; NaF; NaCl; NaBr; NaI; KF; KCl; KBr; KI; RbF; RbCl; RbBr; RbI; Li^+ + O; Li^+ + N; Na^+ + O; Na^+ + N; K^+ + O; K^+ + N; F^- + O; F^- + N; Cl^- + O; Cl^- + N$	T	Undef	Fischer, W.; Erichmann, J. Lennard-Jones (12,6) parameters for the non-ionic contributions to interionic pair-potentials of alkali cations and halide anions from crystal data. Ber. Bunsenges. Phys. Chem. 86, 680 (1982) West Germany
769	B09 $H_2 + W; H_2 + Cu; H_2 + Pt; H_2 + Ni; D_2 + W; D_2 + Cu; D_2 + Pt; D_2 + Ni$ D11 $H_2 + W; H_2 + Cu; H_2 + Pt; H_2 + Ni; D_2 + W; D_2 + Cu; D_2 + Pt; D_2 + Ni$	E	300-1200 K	Gentsch, H.; Adamitski, M.; Ave, M.; Rother, F.-W.; Fischer, H.; Rogge, B. Thermal excitation of H_2 and D_2 at clean metal surfaces. Noteworthy differences between d- and s-metals. Ber. Bunsenges. Phys. Chem. 86, 848 (1982) West Germany
761	B01 $H_2; He; Ne; Ar; Kr; Xe$	E		Bloch, J. H. Molecular ions formed by field ionization. Ber. Bunsenges. Phys. Chem. 86, 852 (1982) West Germany
762	H06 $hw + Sr^+; hw + K^+; hw + Ba^+$	E	Undef	Delone, B. B.; Zagacchay, I. P.; Zon, B. A.; Suran, V. V. Two-electron multiphoton ionization of atoms. Bull. Acad. Sci. USSR Phys. Ser. 45, 167 (1981) Soviet Union
763	K01 Electron Capture	T	Undef	Briggs, J.; Pavek, J.; Taulbjerg, K. Theory of asymmetric electron capture collisions. Comments At. Mol. Phys. 12, 1 (1982) West Germany
764	K06 Review	E	Undef	Martinson, I. Studies of atomic structure using ion accelerators. Comments At. Mol. Phys. 12, 19 (1982) Sweden
765	K01 Review	T	Undef	Riera, A. Quantum chemistry in atomic collisions. Comments At. Mol. Phys. 12, 95 (1982) Spain
766	H04 $hw + H_2; hw + O_2; hw + D_2; hw + H_2; hw + CO; hw + H_2O; hw + CO_2$	E	614-337 nm	Danichkin, Z. A.; Eliseev, A. A.; Popova, T. M.; Ruvodina, O. V.; Etenire, V. V. Raman scattering parameters for gas molecules (survey). J. Appl. Spectrosc. 28, 1627 (1981) Soviet Union
767	D03 $e + Nb$	E	3-200 eV	Kuchenev, A. M.; Salncev, Y. M. Excitation cross section of the niobium atom. J. Appl. Spectrosc. 36, 136 (1982) Soviet Union
768	C04 $e + C$	T	10^1-10^6 eV	Ballard, R. E. Empirical mean free path curves for electron scattering in solids. J. Electron. Spectrosc. Relat. Phenom. 28, 75 (1982) United Kingdom
769	D11 $H_2 + Dy$	E	115-300 K	Schraifels, J. A.; Jeffayes, J. E.; Neff, L. E.; White, J. R. An x-ray photoelectron spectroscopic study of the adsorption of H_2 , NH_3 , NO , and H_2O on dysprosium. J. Electron. Spectrosc. Relat. Phenom. 28, 191 (1982) United States
770	L02 Excitation L03 Excitation	E T	Undef	Hitchcock, A. P. Bibliography of atomic and molecular inner-shell excitation studies. J. Electron. Spectrosc. Relat. Phenom. 28, 245 (1982) Canada
771	H06 $hw + H_2; hw + D_2$	E	19-27 eV	Southworth, S.; Brumer, V. D.; Truesdale, C. M.; Kohn, P. M.; Linsley, D. W.; Shirley, E. A. Photoelectron angular distributions from H_2 and D_2 . J. Electron. Spectrosc. Relat. Phenom. 26, 43 (1982) United States

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772	D13 $e + Cl + [Ti + Al]; e + S + [Ti + Al]; e + Ar + [Ti + Al]$	E	1.5 keV	Bouquet, S.; Bergner, J.; le Mericy, J.; Langeron, J. P. Chlorine migration under electron bombardment observed by AES. <i>J. Electron. Spectrosc. Relat. Phenom.</i> 26, 247 (1982) France
773	H86 $h\nu + CO_2$	E	164-848 eV	Petterson, L.; Nordgren, J.; Selander, L.; Nordling, C.; Siegbahn, K.; Agren, N. Core-electron binding energies in the soft x-ray range obtained in x-ray emission. <i>J. Electron. Spectrosc. Relat. Phenom.</i> 27, 29 (1982) Sweden
774	J86 $F^{2+}; F^{3+}; F^{4+}; F^{5+}; F^{6+}$	T	Undef	Can, C.; Tunnell, T. U.; Bshell, C. P. K-shell Auger rates for multiply-ionized atoms: II. Fluorine. <i>J. Electron. Spectrosc. Relat. Phenom.</i> 27, 75 (1982) United States
775	C84 $e + SiO_2 + Si; e + C + Au$ C85 $e + SiO_2 + Si; e + C + Au$	T	Undef	Beschke, G. A.; Bufadov, V. I. Relative intensities in x-ray photoelectron spectra: IX. Estimates for photoelectron mean free paths taking into account elastic collisions in a solid. <i>J. Electron. Spectrosc. Relat. Phenom.</i> 27, 185 (1982) Soviet Union
776	H86 $h\nu + O_2^+$	E	15.8-18.5 eV	Van Lenthuyzen, N.; de Lange, C. A. Modulation techniques in UV photoelectron spectroscopy of transient species; the $C_2^+ [^2\sigma(\text{sub } g)]$ cation from $O_2 [^1\Delta(\text{sub } g)]$ transition. <i>J. Electron. Spectrosc. Relat. Phenom.</i> 27, 255 (1982) The Netherlands
777	J86 $CO; H_2O; CH_4; N_2$	T	Undef	Van Hiseon, b.; Cederbaum, L. S.; Schirmer, J.; Diercksen, G.K.F.; Krauss, U. P. Ionization energies of some molecules found in interstellar clouds calculated by a Green's function method. <i>J. Electron. Spectrosc. Relat. Phenom.</i> 28, 45 (1982) West Germany
778	E83 $e + N_2$	E	Undef	Leroux, B.; Coeyne, J. Band intensities of the second positive system of N_2 . <i>J. Mol. Spectrosc.</i> 92, 65 (1982) Spain
779	A12 $CO_2^+ + N_2$ H82 $h\nu + CO_2$	T	A12 300 K H82 641-673 cm^{-1}	Braun, C. Calculation of the absorption coefficient of the $15\text{-}\mu\text{m}$ ν_2 band of CO_2 using the theory of overlapping spectral lines. <i>J. Mol. Spectrosc.</i> 93, 1 (1982) United States
780	A17 CO^+	E T	Undef	Conan, J. A.; Foster, S. C. Deperturbation analysis for the $A^2\Pi(\text{sub } 1)$ state of CO^+ : A, ν prime - 1, ν double prime perturbation matrix elements for ν prime = 0, 5, 10 and improved BSR potential for the $X^2\Sigma$ state. <i>J. Mol. Spectrosc.</i> 93, 117 (1982) Canada
781	H84 $h\nu + CO; h\nu + CH_4$	T	Undef	Chackerian, C., Jr.; Tipping, B. M. Synthesis of vibrational intensities for diatomic molecules: approximate formulae. <i>J. Mol. Spectrosc.</i> 93, 237 (1982) United States
782	A12 $CO^+ + CO; CO^+ + He$	E	295 K	Belbruno, J. J.; Gelfand, J.; Radigan, N.; Verges, K. Helium and self-broadening in the first and second overtone bands of $^{12}C^{16}O$. <i>J. Mol. Spectrosc.</i> 94, 336 (1982) United States
783	H82 $h\nu + CH_4$	E	1170-1317 cm^{-1}	Jennings, D. E.; Robiette, A. G. Determination of the ν_2 band strength of $^{12}CH_4$ from diode laser line strength measurements. <i>J. Mol. Spectrosc.</i> 94, 389 (1982) United States
784	H82 $h\nu + OD$	E	310-37 μm	Brown, J. M.; Schubert, J. E. The EPR spectrum of the OD radical: a determination of molecular parameters for the ground state. <i>J. Mol. Spectrosc.</i> 95, 194 (1982) United Kingdom
785	H82 $h\nu + HD$	E	3360-4210 cm^{-1}	Rich, B. N.; Johns, J.W.C.; McKellar, A.R.W. Frequency and intensity measurements in the fundamental infrared band of HD. <i>J. Mol. Spectrosc.</i> 95, 432 (1982) Canada

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786	H ₂ hv + CH ₄	E	2.4 μ	Brann, L. R. Line strengths of the v ₁ + v ₂ band of ¹² CH ₄ . J. Mol. Spectrosc. 96, 94 (1982) United States
787	H ₂ hv + H ₂	T	Undef	Volakovich, L.; Eressler, K. Electronic transition moments between excited singlet states of the H ₂ molecule. J. Mol. Spectrosc. 96, 195 (1982) Switzerland
788	CO ₂ He ⁺ + Er; He ⁺ + Er	E	0.2-3 MeV	Oberlin, J. C.; Aochraue, A.; Beaunivellie, H.; Stoquert, J. F.; Ferrier de la Bathie, S. Stopping power and straggling of 0.2-2.0 MeV protons and 0.3-3.1 MeV He ions in erbium. J. Phys. (Paris) 43, 485 (1982) France
789	Al ₂ Ca ⁺ + Xe	T	300-600 K	Allard, H. F.; Birsud, Y. G. Effect of the velocities of the perturbers on alkali-rare gas line profiles. J. Phys. (Paris) 43, 661 (1982) France
790	Al ₂ Ne ₂ ⁺	T	Undef	Colomb de Bausant, I.; Vassiliev, G.; Bauden, J.; Stern, B. An adjustment of the Ne ₂ ⁺ (² P _{1/2} - ¹ S ₀) potentials to thermal-energy scattering data. J. Phys. (Paris) 43, 591 (1982) France
791	D ₁₂ Undef	T	Undef	De Andres, P.; Mouren, H.; Flores, F.; Garcia-Molina, F. Surface photoeffect with non specular surface scattering of electrons. J. Phys. (Paris) 43, 685 (1982) Spain
792	He ₁ nhv + He ⁺	E		Dubreuil, B.; Pignolet, P.; Catherinot, A.; Davy, P. A.C. Stark effect on the 4713 Å ⁰ line emitted by a helium glow discharge in the field of a multimode T.E.A. CO ₂ laser. J. Phys. (Paris) 43, 275 (1982) France
793	Al ₂ Undef	T	Undef	Reynaud, S.; Cahuz-Yannoudji, C. Dressed atom approach to collisional redistribution. J. Phys. (Paris) 43, 1821 (1982) France
794	Ar ₂ Undef	T	Undef	Avrilier, S.; Borce, C. J.; Picart, J.; Tran Minh, N. Comparison of quantum mechanical and semi-classical scattering amplitudes for the calculation of elastic collision kernels with Lennard-Jones intermolecular potentials. J. Phys. (Paris) 43, 1213 (1982) France
795	Li ₂ e + He	E	28 keV	Lahman-Bennett, A.; Euguet, A. The Compton profile of neon: comparison between experiment and the impulse approximation. J. Phys. (Paris) 43, 1233 (1982) France
796	Al ₂ Ar ⁺ + Ar	E	35-250 neV	Robert, J.; Vassiliev, G.; Colomb de Bausant, I.; Bouden, J.; Becvarski, V. Differential measurements of metastable Ar(2P ⁰ 4s, ² F _{5/2}) on Ar(3p ⁰ , ¹ S ₀) collisions at thermal energies. J. Phys. (Paris) Lett. 43, L299 (1982) France
797	Ar ₃ Undef	T	Undef	Lattanzi, F. The Zeeman effect in molecular doublet-doublet transitions in the - high field-low field - limit. J. Phys. (Paris) Lett. 43, L383 (1982) Italy
798	Li ₁ e + Cu ⁺	T	1 keV	Lamoureux, H.; Fung, I. J.; Prett, R. W.; Tseng, H. K. Calculation of free-free Gaunt factors for 1 keV electrons in a 1 keV normal density Cu plasma. J. Quant. Spectrosc. Radiat. Transfer 27, 227 (1982) United States
799	ES ₂ Review	T	Undef	Volts, L. A.; Iglesias, C. A.; Hooper, C. F., Jr. Stark broadening in hot, dense, laser-produced plasmas: a review. J. Quant. Spectrosc. Radiat. Transfer 27, 233 (1982) United States
800	ES ₂ Undef	T	Undef	Lee, W. W. Comments on the calculation of spectral line shifts induced by plasma perturbations. J. Quant. Spectrosc. Radiat. Transfer 27, 249 (1982) United Kingdom

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801	H08 $h\nu + \text{He Seq}$	T	Undef	Alley, S. E.; Chapline, G.; Kunnaz, P.; Weinbelt, J. C. Calculation of gain at x-ray wavelengths resulting from optical pumping of helium-like ions. J. Quant. Spectrosc. Radiat. Transfer 27, 257 (1982) United States
802	E06 $e + \text{C}^{4+}; e + \text{Si}^{14+}; e + \text{Ar}^{17+}$	E	50-700 eV	Sooly, J. F.; Bizan, R. M.; Elton, R. C.; Lunnay, J. G. Dielectronic satellite spectra from dense laser-produced plasmas. J. Quant. Spectrosc. Radiat. Transfer 27, 257 (1982) United States
803	E03 $e + \text{Ne}^{9+}$ E08 $e + \text{Ne}^{9+}$	T	200-500 keV	Davis, J.; Bisha, P. Level shifts and inelastic electron scattering in dense plasmas. J. Quant. Spectrosc. Radiat. Transfer 27, 307 (1982) United States
804	E08 $e + \text{Fe}$	T	0.01-1 (kT) keV	Fong, I. J.; Pratt, S. M. Binding energies and bound-free transition matrix elements for an impurity atom in a hydrogen plasma. J. Quant. Spectrosc. Radiat. Transfer 27, 341 (1982) United States
805	E08 $e + \text{Fe}; e + \text{Al}$	T	0.01-1 (kT) keV	Mora, S. M. Electronic energy-levels in dense plasmas. J. Quant. Spectrosc. Radiat. Transfer 27, 345 (1982) United States
806	A12 $\text{H}_2^+ + \text{He}; \text{H}_2^+ + \text{H}_2$	T	50-300 K	Goorvitch, D.; Tipping, R. H. Pressure-induced H_2 opacity in the 5- μm region. J. Quant. Spectrosc. Radiat. Transfer 27, 357 (1982) United States
807	A12 $\text{H}_2\text{O}^+ + \text{H}_2; \text{H}_2\text{O}^+ + \text{H}_2\text{O}; \text{H}_2\text{O}^+ + \text{Al}^+$ H02 $h\nu + \text{H}_2\text{O}$	E	A12 393 K H02 932-961 nm	Giver, L. F.; Gentry, E.; Schwanmer, G.; Wilkerson, T. D. Water absorption lines, 931-961 nm: selected intensities, H_2 -collision-broadening coefficients, self-broadening coefficients, and pressure shifts in air. J. Quant. Spectrosc. Radiat. Transfer 27, 423 (1982) United States
808	H04 $h\nu + \text{Cl}$	E	120 nm	Schwab, J. J.; Anderson, J. G. Oscillator strengths of Cl(I) in the vacuum ultraviolet: the $^2P-^2P$ transitions. J. Quant. Spectrosc. Radiat. Transfer 27, 445 (1982) United States
809	H02 $h\nu + \text{OH}^+$	T	Undef	Singh, P. D.; de Almeida, A. A. Rotational dependence of Franck-Condon factors for OH^+ , NH^+ , SiH^+ , MgH^+ , SiH^+ , and HO^+ . J. Quant. Spectrosc. Radiat. Transfer 27, 471 (1982) Brazil
810	A12 $\text{Ar}^+ + \text{H}^+$	E	12200 K	Seldel, J.; Stamm, R. Effects of radiator motion on plasma-broadened hydrogen Lyman- β . J. Quant. Spectrosc. Radiat. Transfer 27, 499 (1982) West Germany
811	E05 $e + \text{Fe}^{17+}; e + \text{Fe}^{17+}; e + \text{Fe}^{18+}; e + \text{Fe}^{18+}; e + \text{Fe}^{19+}; e + \text{Fe}^{19+}; e + \text{Fe}^{20+}; e + \text{Fe}^{20+}; e + \text{Fe}^{21+}; e + \text{Fe}^{21+}$	T	1-5 threshold	Younger, S. M. Electron impact ionization rate coefficients and cross sections for highly ionized iron. J. Quant. Spectrosc. Radiat. Transfer 27, 541 (1982) United States
812	A12 $\text{CO}^+ + \text{H}_2$	T	Undef	Hummer, D. G. High order asymptotic expansions of the four kernel functions for line formation with the Voigt profile. J. Quant. Spectrosc. Radiat. Transfer 27, 565 (1982) United States
813	A12 $\text{CO}_2^+ + \text{CO}_2; \text{CO}_2^+ + \text{H}_2; \text{CO}_2^+ + \text{He}; \text{CO}_2^+ + \text{O}_2; \text{CO}_2^+ + \text{N}_2; \text{CO}_2^+ + \text{Ar}; \text{CO}_2^+ + \text{Xe}$ H02 $h\nu + \text{CO}_2$	E	A12 295 K H02 1.6-10.4 μ	McLaughlin, E. F.; Mattick, A. T. Absorption and line-broadening of $^{12}\text{C}^{18}\text{O}_2$ at 2.7 μm . J. Quant. Spectrosc. Radiat. Transfer 27, 611 (1982) United States
814	A12 $\text{O}_2^+ + \text{O}_2; \text{C}_2^+ + \text{N}_2$ H02 $h\nu + \text{O}_2; h\nu + \text{N}_2$	E	A12 296 K H02 762-828 nm	Makazawa, T.; Yamasuchi, T.; Tanaka, M. Line parameters of the oxygen A band and calculation of the atmospheric transmission functions for the A, B, and gamma bands. J. Quant. Spectrosc. Radiat. Transfer 27, 615 (1982) Japan
815	A12 $\text{H}^+ + \text{Ar}^+$	T	10000 K	Greene, R. L. A relaxation theory of Stark broadening by ions. J. Quant. Spectrosc. Radiat. Transfer 27, 639 (1982) United States

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816	E08 $e + C^+$	E	12000 K	Gely, A.; Veniger, S. Experimental Stark widths and shifts of the ultraviolet C(II) lines. J. Quant. Spectrosc. Radiat. Transfer 27, 657 (1982) France
817	A12 Undef E08 Undef	T	Undef	Cooper, J.; Smith, E. H. Comment on the use of an exponential approximation for the Stark broadening of hydrogen lines. J. Quant. Spectrosc. Radiat. Transfer 27, 645 (1982) United States
818	D01 $h\nu + He^0$	E		Van Calcar, F. A.; Bouts, H.J.G.; Van Ultert, B. K.; Meijer, H.A.J.; Hellander, T. J.; Alkemade, C.T.J. Power broadening of the He-B lines in a flame: II. The fluorescence line width as a function of the spectral irradiance of the pulsed dye laser. J. Quant. Spectrosc. Radiat. Transfer 28, 1 (1982) The Netherlands
819	A11 $Cd^0 + H_2$; $Cd^0 + H_2$; $Cd^0 + CO$; $Cd^0 + CO_2$	E	480-540 K	Czajkowski, M.; Wolentzowicz, E.; Krause, L. Deexcitation of Cd 5^2P_1 atoms in collisions with ground state atoms and molecules. J. Quant. Spectrosc. Radiat. Transfer 28, 12 (1982) Canada
820	E08 $e + He^0$	T	5000-40000 K	Beensalc, J. P.; Cattani, M.; Walder, V. S. Convergent calculations for electron impact broadening and shift of neutral helium lines. J. Quant. Spectrosc. Radiat. Transfer 28, 78 (1982) Brazil
821	A12 $H_2O^0 + H_2$; $H_2O^0 + O_2$ H02 $h\nu + H_2O$	T	Undef	Thomas, M. E.; Morestres, R. J. The H_2 -broadened water vapor absorption line shape and infrared continuum absorption: I. Theoretical development. J. Quant. Spectrosc. Radiat. Transfer 28, 81 (1982) United States
822	A12 $H_2O^0 + H_2$; $H_2O^0 + H_2O$ H02 $h\nu + H_2O$	T	A12 296 K H02 0-14 μ	Thomas, M. E.; Morestres, R. J. The H_2 -broadened water vapor absorption line shape and infrared continuum absorption: II. Implementation of the line shape. J. Quant. Spectrosc. Radiat. Transfer 28, 183 (1982) United States
823	H04 $h\nu + Hn^+$	T	380-237 nm	Wajer, T.; Veniger, S. Transition probabilities of He(II) lines lying between 237 and 357 nm from arc emission measurements. J. Quant. Spectrosc. Radiat. Transfer 28, 113 (1982) France
824	H04 $h\nu + C$	T	Undef	Hofmann, B. Theoretical term energies and oscillator strengths for carbon. J. Quant. Spectrosc. Radiat. Transfer 28, 127 (1982) West Germany
825	E08 $e + Cu$; $e + Ni$; $e + O^+$; $e + Cl^+$; $e + Cl^{2+}$; $e + C$; $e + Ar^+$; $e + S^{2+}$; $e + N$; $e + Si$; $e + P$; $e + S^+$	E	11000-26000 K	Wiese, W. L.; Konjevic, M. Regularities and similarities in plasma broadened spectral line widths (Stark widths). J. Quant. Spectrosc. Radiat. Transfer 28, 185 (1982) Yugoslavia
826	A12 $OH^0 + H_2$; $OH^0 + H_2$; $OH^0 + Ar$ A17 $OH + Ar$; $OH + H_2$; $OH + N_2$	T	Undef	Khayer, A.; Benany, J. Calculation of spin collision cross sections of free radical OH with foreign gases. J. Quant. Spectrosc. Radiat. Transfer 28, 199 (1982) France
827	H04 $h\nu + Hg$	E	284 nm	Halstead, J. A.; Reeves, R. R. Determination of the lifetime of the mercury 6^3P_1 state. J. Quant. Spectrosc. Radiat. Transfer 28, 289 (1982) United States
828	E06 $e + Fe^{2+}$	T	1-6 (kV) keV	McLaughlin, E. J.; Kahn, Y. Dielectronic recombination rate coefficients for Fe^{2+} ion. J. Quant. Spectrosc. Radiat. Transfer 28, 243 (1982) United States
829	H04 $h\nu + Cu$	E	328-244 nm	Kono, A.; Mottori, S. Some lifetimes and transition probabilities in Cu(I). J. Quant. Spectrosc. Radiat. Transfer 28, 382 (1982) Japan
830	E08 $e + C^+$	E	12000 K	Gely, A.; Veniger, S. Stark widths and transition probabilities of some multiplets of singly ionized carbon. J. Quant. Spectrosc. Radiat. Transfer 28, 389 (1982) France

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831	A12 $\text{CO}^+ + \text{CO}; \text{CO}^+ + \text{N}_2; \text{CO}^+ + \text{O}_2$ $\text{CO}^+ + \text{CO}_2$	E	300 K	Makazawa, T.; Tanaka, R. Measurements of intensities and self- and foreign-gas-broadened half-widths of spectral lines in the CO fundamental band. J. Quant. Spectrosc. Radiat. Transfer 28, 409 (1982) Japan
832	H84 $h\nu + \text{Lu}^{2+}$	T	Under	Nigdelich, J. One-electron spectrum of Lu^{2+} : relativistic energies, transition probabilities and dipole polarizability. J. Quant. Spectrosc. Radiat. Transfer 28, 417 (1982) Poland
833	E05 $e + \text{Li}$	T	1.4-540 eV	Younger, S. R. Electron impact ionization of lithium. J. Res. Nat. Bur. Stand. Sec. A 87, 45 (1982) United States
834	H84 $h\nu + \text{N Seq}$	T	Under	Zeippen, C. J. Transition probabilities for forbidden lines in the $2p^2$ configuration. Mon. Not. R. Astron. Soc. 158, 111 (1982) France
835	H84 $h\nu + \text{P Seq}$	T	Under	Mendoza, C.; Zeippen, C. J. Transition probabilities for forbidden lines in the $3p^2$ configuration. Mon. Not. R. Astron. Soc. 158, 127 (1982) United Kingdom
836	E03 $e + \text{Fe}^{23+}; e + \text{Fe}^{24+}$ E06 $e + \text{Fe}^{24+}$	T	500 Ry	Bely-Dubau, F.; Dubau, J.; Faucher, P.; Gehriol, A. H. Dielectronic satellite spectra for highly charged helium-like ions: VI. Iron spectra with improved inner-shell and helium-like excitation rates. Mon. Not. R. Astron. Soc. 158, 239 (1982) France
837	H84 $h\nu + \text{Fe}^{23+}; h\nu + \text{V}^{21+}$	T	Under	Hate, J.; Grant, I. P. MCDF calculation of wavelengths and intensities of satellite lines in lithium-like ions. Mon. Not. R. Astron. Soc. 194, 1081 (1982) United Kingdom
838	H84 $h\nu + \text{Si}; h\nu + \text{P}^+; h\nu + \text{S}^{2+}; h\nu + \text{Cl}^{3+}; h\nu + \text{Ar}^{19+}; h\nu + \text{K}^{18+}; h\nu + \text{Ca}^{18+}; h\nu + \text{Sc}^{17+}; h\nu + \text{Ti}^{16+}; h\nu + \text{V}^{15+}; h\nu + \text{Cr}^{14+}; h\nu + \text{Mn}^{13+}; h\nu + \text{Fe}^{12+}; h\nu + \text{Co}^{11+}; h\nu + \text{Ni}^{10+}$	T	Under	Mendoza, C.; Zeippen, C. J. Transition probabilities for forbidden lines in the $3p^2$ configuration: II. Mon. Not. R. Astron. Soc. 159, 1025 (1982) United Kingdom
839	E03 $e + \text{O}^{3+}$	T	$1.0-4.0 \times 10^6$ K	Hayes, R. A. The C IV 1401 Å multiplet-calculation of the electron impact excitation rate coefficients. Mon. Not. R. Astron. Soc. 159, 49p (1982) United Kingdom
840	H84 $2h\nu + 2n$	E	359-320 nm	Jamroz, W.; LaBecque, F. E.; Steinhoff, B. P. Resonantly enhanced second-harmonic generation in zinc vapor. Opt. Lett. 7, 148 (1982) Canada
841	H84 $h\nu + \text{Hg}^0$	E	546 nm	Kroll, R. Saturation spectroscopy and resonant degenerate four-wave mixing in Hg at 546.1 nm. Opt. Lett. 7, 181 (1982) United States
842	H08 $h\nu + \text{Pb}$	E	308 nm	Brooman, S. J.; Kocina, N.; Stapperts, E. A.; Plummer, M. J.; West, J. E. High-efficiency joule-level Raman generation in Pb vapor. Opt. Lett. 7, 184 (1982) United States
843	H08 $h\nu + \text{H}_2$	E	308 nm	Kocina, N.; Stapperts, E. A. Higher-Stokes-order Raman conversion of HeCl laser in hydrogen. Opt. Lett. 7, 157 (1982) United States
844	H08 $2h\nu + \text{Xe}$	E	1064-224 nm	Yiu, Y.-M.; Kucin, E. E.; McIlrath, T. J. Two-photon resonant upconversion in xenon. Opt. Lett. 7, 288 (1982) United States
845	H08 $2h\nu + \text{Hg}$	E	Under	Tomkins, F. S.; Cohen, E. Generation of continuously tunable narrow-band radiation from 1226 to 1174 Å in Hg vapor. Opt. Lett. 7, 864 (1982) United States
846	H08 $2h\nu + \text{Hg}$	E	460-254 nm	Rodgers, M. C.; Bradshaw, J. D.; Liu, K.; Davis, D. D. Sequential two-photon laser-induced fluorescence detection of mercury. Opt. Lett. 7, 360 (1982) United States

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847	H06 hv + He	E	305 nm	Glab, W.; Rayfeh, P. M. Excitation and ionization of hydrogen Rydberg states in a plasma. Opt. Lett. 7, 300 (1982) United States
848	H04 2hv + H H06 hv + H	E	H04 224-266 nm H06 560-565 nm	Goldsmith, J.E.R. Resonant multiphoton optogalvanic detection of atomic hydrogen in flames. Opt. Lett. 7, 437 (1982) United States
849	H06 hv + H ₂	E	440 nm	Brink, B. J.; Proch, B. Efficient tunable ultraviolet source based on stimulated Raman scattering of an excimer-pumped dye laser. Opt. Lett. 7, 494 (1982) South Africa
850	H02 Undef	T	Undef	Adam, J. C.; Serviere, A. G.; Laval, G. Efficiency of resonant absorption of electromagnetic waves in an inhomogeneous plasma. Phys. Fluids 25, 276 (1982) France
851	H11 Undef	T	Undef	Speziale, T. Stimulated Brillouin scattering from an absorbing plasma. Phys. Fluids 25, 385 (1982) United States
852	H11 Undef	T	Undef	Mara, P. Theoretical model of absorption of laser light by a plasma. Phys. Fluids 25, 1051 (1982) France
853	H02 Undef	T	Undef	Dragile, R.; Mara, M. Dynamic collisionless absorption of a laser pulse in a homogeneous plasma by nonlinear forces. Phys. Fluids 25, 1057 (1982) Australia
854	E11 Undef	T	Undef	Nambu, N. Consequence of induced bremsstrahlung radiation. Phys. Fluids 25, 1196 (1982) Japan
855	H11 hv + e	E	10.6 μ	Phillips, D. B.; Banner, D. L.; Campbell, E. M.; Turner, R. E.; Estabrook, K. G. Stimulated Raman scattering in large plasmas. Phys. Fluids 25, 1434 (1982) United States
856	A07 H + Ti; F + Ti; Mg + Ti; Al + Ti; Si + Ti; Cl + Ti	E	2.0-6.5 MeV/aom	Hall, J.; Richard, P.; Gray, T. J.; Jores, K.; Johnson, B.; Gregory, E. Ratios of double to single K-vacancy production in heavy ion-atom collisions. Phys. Lett. 90A, 129 (1982) United States
857	D02 e + D _n + Au D04 e + D _n + Au D06 e + D _n + Au	E	0.5-3.0 keV	Borgesen, P.; Sorensen, H. Erosion of solid D ₂ by 2 keV electrons. Phys. Lett. 90A, 319 (1982) Denmark
858	E05 e + He E17 e + He	E	80.5-100 eV	Pochat, A.; Ecrich, M.; Peresse, J. Triple differential cross sections for low energy electron impact ionization of helium. Phys. Lett. 90A, 354 (1982) France
859	C02 e + Kr	E	0.015-4.0 keV	Dayashankar; Prasad, M. A.; Unnikrishnan, K. Energy degradation of electrons in krypton. Phys. Lett. 90A, 402 (1982) India
860	C06 O + C C07 O + C	E	40-60 MeV	Betz, M.-B.; Ecker, J.; Reschenthaler, D.; Bell, F.; Schuch, R.; Wolke, G. Foil-excited Rydberg states of fast oxygen ions. Phys. Lett. 91A, 12 (1982) West Germany
861	E02 e + H ⁺ E17 e + H ⁺	T	200-400 eV	Pundir, R. S.; Enayes, S. K.; Mathur, R. C. Elastic scattering of electrons by the metastable 2s state of atomic hydrogen. Phys. Lett. 91A, 15 (1982) India
862	A06 Li ²⁺ + H	T	1-50 keV	Selin, A. Charge exchange in Li ²⁺ -H collisions. Phys. Lett. 91A, 61 (1982) France
863	D07 Ar ⁺ + Cu	T	12 keV	Evdakinov, I. N. Elastic scattering of ions by atomic strings at solid surfaces. Phys. Lett. 91A, 30 (1982) Soviet Union

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864	A02 I + I A17 I + I A18 I + I	T	25-400 keV	Hartung, H.; Fricke, H.; Lenz, H.; Sepp, W.-D. Influence of the electronic shell structure on the elastic scattering of heavy ions. Phys. Lett. 91A, 166 (1982) West Germany
865	E04 e + Sbm E05 e + Sbm	E	20-135 eV	Pfau, P.; Settler, K.; Nuhlbauch, J.; Recknagel, E. Fragmentation of antimony-microclusters from electron bombardment. Phys. Lett. A 91, 316 (1982) West Germany
866	A06 Mg ⁺ + Ca	E	75-1000 eV	Panov, G. S. Charge-transfer in collisions of Mg ⁺ ions with Ca atoms. Phys. Lett. 91A, 349 (1982) Bulgaria
867	H06 hv + Hg	T	80-400 eV	Johnson, W. F.; Radojevic, V. Photoionization calculations for 4d, 5p, and 4f subshells of mercury. Phys. Lett. 92A, 76 (1982) United States
868	E05 e + Ag; e + Cu E17 e + Ag; e + Cu	T	140-500 keV	Das, J. M.; Chakraborty, S. An improved calculation for the inner-shell ionization problems. Phys. Lett. 92A, 127 (1982) India
869	A06 C ⁶⁺ + H	T	2-40x10 ⁴ cm/sec	Crothers, D. S. F.; McCann, J. F. Continuum-distorted-wave capture into the n-th shell: 1, a distribution. Phys. Lett. 92A, 176 (1982) United Kingdom
870	A07 H ⁺ + He; He ²⁺ + He; Li ²⁺ + He; Be ³⁺ + He; B ⁴⁺ + He; C ⁵⁺ + He; N ⁶⁺ + He; O ⁷⁺ + He; F ⁸⁺ + He; Ne ⁹⁺ + He	T	1-5 MeV/amu	Pfeiffer, S. J.; Gluck, R. E. Electron removal from helium by fast, multiply charged ions. Phys. Lett. 92A, 175 (1982) United States
871	C02 H ⁺ + C; H ⁺ + Ag; He ⁺ + Al; Li ⁺ + Al; O ⁺ + Al	T	1x10 ⁶ keV/amu	Montenegro, E. C.; Cruz, S. A.; Verges-Aberto, C. A universal equation for the electronic stopping of ions in solids. Phys. Lett. 92A, 196 (1982) Mexico
872	A06 Ba ²⁺ + H	T	10 ⁻¹ -10 ² keV/amu	Errea, L. F.; Randoz, L.; Riera, A. Charge transfer in Ba ²⁺ + H collisions: a molecular approach including translation factors. Phys. Lett. 92A, 231 (1982) Spain
873	B01 Pb	E T		Bermond, J. M. The trajectories of neutral polarizable particles in an homogeneous electric field. Rev. Phys. Appl. (Paris) 17, 451 (1982) France
874	H04 Under	T	Under	Grishanin, B. A.; Schaidt, F. Fluorescence spectrum of a multilevel atom under two-photon resonance conditions. Sov. J. Quantum Electron. 11, 1275 (1982) Soviet Union
875	H04 2hv + Li; 2hv + Na; 2hv + K; 2hv + Rb; 2hv + Cs	T	1079-550 nm	Iskenderov, M. A.; Kudryashov, V. A.; Matveev, I. N.; Tsvetov, M. E. Four-photon resonance parametric up-conversion of a weak infrared signal in a nanosecond pump field. Sov. J. Quantum Electron. 11, 1362 (1982) Soviet Union
876	H04 Under	T	Under	Iskenderov, M. A.; Kudryashov, V. A.; Matveev, I. N.; Chernyshev, A. M. Six-photon resonance parametric up-conversion in a nanosecond pump field. Sov. J. Quantum Electron. 11, 1365 (1982) Soviet Union
877	H04 hv + K	T	Under	Bekhtadze, A. G.; Bel'shev, L. A.; Vetsko, V. M.; Starostin, A. M. Analysis of the efficiency of isotopically selective laser excitation of potassium atoms. Sov. J. Quantum Electron. 11, 1527 (1982) Soviet Union
878	H04 hv + H ₂ ; hv + D ₂	T	0.43-0.68 μ	Andreev, M. S.; Gortunov, V. A.; Gulidov, S. S.; Popovyi, S. B.; Serebryakov, V. A. Role of parametric effects in generation of higher components of stimulated Raman scattering in gases. Sov. J. Quantum Electron. 12, 28 (1982) Soviet Union

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879	D07 $e + H^+ + h\nu$	?		Zaretskii, B. F.; Kozlinskii, A. V.; Lomovskov, V. V. Stimulated recombination of atoms in beams. <i>Sov. J. Quantum Electron.</i> 12, 283 (1982) Soviet Union
880	H04 $3He + Na$	E	516-602 nm	Dinov, E. S.; Netchkov, D. I.; Pavlov, T. I.; Stamenov, K. V. Laser-induced resonances in the continuum observed in optical frequency mixing in sodium vapor. <i>Sov. J. Quantum Electron.</i> 12, 672 (1982) Soviet Union
881	D01 Undef	T		Danilov, V. N.; Brezhev, G. F. Loosely bound particle with nonzero orbital angular momentum in an electric or magnetic field. <i>Sov. Phys.-JETP</i> 54, 658 (1981) Soviet Union
882	D07 $e + H$ E02 $e + H$ E03 $e + H$ E05 $e + H$	T	Undef	Peral', V. I.; Polyakov, D. G. Collisions of electrons with hydrogen atoms in a strong magnetic field. <i>Sov. Phys.-JETP</i> 54, 657 (1981) Soviet Union
883	H05 Undef	T	Undef	Valutinskii, O. E. Contribution to the theory of the effect of orientation of atoms produced in photodissociation of molecules. <i>Sov. Phys.-JETP</i> 54, 656 (1981) Soviet Union
884	E06 $e + H_2$	E	Undef	Otarbaev, D. Z.; Cehlis, V. N.; Preobrazhenskii, M. G.; Savinov, Z. Y.; Sevel'shkov, A. I.; Sobolev, M. N. Broadening of spectral lines and distribution of the velocities of electron-excited molecules in a nonequilibrium plasma. <i>Sov. Phys.-JETP</i> 54, 665 (1981) Soviet Union
885	A07 Undef	T	Undef	Solov'ev, E. A. Ionization of a hydrogen-like atom by slow ions. <i>Sov. Phys.-JETP</i> 54, 693 (1981) Soviet Union
886	D07 Undef E11 Undef	T	Undef	Fedorov, M. V.; Yudin, G. L. Stimulated bremsstrahlung in inelastic electron-atom collisions. <i>Sov. Phys.-JETP</i> 54, 1061 (1981) Soviet Union
887	D01 Undef	T		Matveev, V. I.; Perilla, E. S. Decay of autoionizing states in an external field. <i>Sov. Phys. Tech. Phys.</i> 26, 1025 (1981) Soviet Union
888	A04 Undef	T	100-500 K	Eletshtil, A. V.; Zaretskii, M. P. Dissociation in collisions of vibrationally excited diatomic molecules. <i>Sov. Phys. Tech. Phys.</i> 26, 1174 (1981) Soviet Union
889	C04 $He^+ + Ni$	E	0.5-1.8 MeV	Bondarenko, V. A.; Zvyagintseva, L. N.; Kisel, V. Y.; Storizhko, V. E.; Sukhovatova, V. I.; Tolstolutskaia, G. D. Measurement of projected ranges and their spread for helium ions with energy 0.5-1.8 MeV in nickel. <i>Sov. Phys. Tech. Phys.</i> 26, 1230 (1981) Soviet Union
890	A17 CO_2 ; O_2 ; CO; CH_4	T	Undef	Nadestup, V. I.; Mashurov, A. V. Direct determination of repulsion energy of simple molecules using viscosity data for a rarefied gas. <i>Sov. Phys. Tech. Phys.</i> 26, 1240 (1981) Soviet Union
891	D02 Undef	T	Undef	Bitenski, I. S.; Perilla, E. S. Ejection of high-energy dimers from the surface of a monocrystal by ion bombardment at grazing angles. <i>Sov. Phys. Tech. Phys.</i> 26, 1247 (1981) Soviet Union
892	D07 $H^+ + C$; $H^- + C$; $He^+ + C$	E	5-30 keV	Zhabrev, G. I.; Kurnosov, V. A.; Nikiforova, E. S.; Tel'kovskii, V. G. Energy distributions of reflected particles produced by bombarding a graphite target with light ions. <i>Sov. Phys. Tech. Phys.</i> 26, 1257 (1981) Soviet Union

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893	D17 Kr + Fe	E	1 keV	Aleksandrov, V. P.; Gertsenko, B. S.; Kertan, V. I.; Tyshkevich, V. A.; Fal'chenko, V. M. Mobility of atoms under ion bombardment. <i>Sov. Phys. Tech. Phys.</i> 26, 1382 (1981) Soviet Union
894	A17 Li ⁺ + Ar; Li ⁺ + Kr; Li ⁺ + Xe; K ⁺ + Ar; K ⁺ + Kr; K ⁺ + Xe	T	10-1000 eV	Paliukh, B. A.; Ryhalyuk, R. E.; Chigin, V. I. Interaction potentials of lithium and potassium ions with argon, krypton, and xenon atoms. <i>Sov. Phys. Tech. Phys.</i> 26, 1252 (1981) Soviet Union
895	D11 Ti + H	E	Undef	Erinovich, E. E.; Pung, G. A.; Burnistrova, O. P.; Vladimirov, G. G. Adsorption of titanium on the tungsten (011) surface. <i>Sov. Phys. Tech. Phys.</i> 26, 1406 (1981) Soviet Union
896	D86 e + Ga	T	1-15 MeV	Khlebnin, V. G.; Fivovarov, V. L. Resonances in reflection of relativistic particles from the atomic planes of single crystals. <i>Sov. Phys. Tech. Phys.</i> 26, 1410 (1981) Soviet Union
897	D18 He ⁺ + Mo	E	Undef	Rentov, V. F. Effects of helium on radiation damage to molybdenum in a high-voltage electron microscope. <i>Sov. Phys. Tech. Phys.</i> 26, 1412 (1981) Soviet Union
898	D03 Ar ⁺ + Cu	E	6-15 keV	Polyakova, G. N.; Kopylov, A. I.; Gerasimenko, V. I.; Opelev, D. A. Kinetic energy distribution of emitted atoms created by sputtering copper with argon ions with energies of 6-15 keV. <i>Sov. Phys. Tech. Phys.</i> 27, 32 (1982) Soviet Union
899	D18 H ⁺ + Mo; H ⁺ + Ni; He ⁺ + Mo; He ⁺ + Ni	E	4-9 keV	Alimov, V. K.; Gorodetskiy, A. E.; Zakharenko, A. P. Successive and simultaneous bombardment of molybdenum and nickel by ions of hydrogen and helium isotopes. <i>Sov. Phys. Tech. Phys.</i> 27, 51 (1982) Soviet Union
900	D18 He ⁺ + Ti; He ⁺ + TiO ₂	E	100 eV	Gorchikov, N. Y.; Kochkarev, A. P.; Panov, A. M. Trapping of low-energy inert-gas ions by polycrystalline titanium and titanium dioxide surfaces. <i>Sov. Phys. Tech. Phys.</i> 27, 91 (1982) Soviet Union
901	E02 Undef	T	Undef	Bakaleinikov, L. A. Eigenvalues of the collision integral for elastic scattering of fast electrons by a screened Coulomb potential. <i>Sov. Phys. Tech. Phys.</i> 27, 106 (1982) Soviet Union
902	A07 H ⁺ + H; He ²⁺ + H; Li ³⁺ + H; C ⁴⁺ + H; N ⁵⁺ + H; O ⁶⁺ + H; O ⁶⁺ + H	T	0.025-1.5 MeV	Gillespie, G. H. A scaling cross section for the ionization of atomic hydrogen by fast, highly stripped ions. <i>J. Phys. B</i> 15, 1729 (1982) United States
903	A06 N ⁷⁺ + He; O ⁸⁺ + He A07 N ⁷⁺ + He; C ⁶⁺ + He	E	7 keV	Tsurubuchi, S.; Iwai, T.; Koneko, Y.; Kimura, M.; Kobayashi, M.; Matsumoto, A.; Ohtani, S.; Okuno, K.; Takagi, S.; Tawara, M. Two-electron capture into autoionizing states of N ⁶⁺ (3131 ⁺) and C ⁵⁺ (1s3131 ⁺) in collisions of N ⁷⁺ and O ⁸⁺ with He. <i>J. Phys. B</i> 15, 1733 (1982) Japan
904	E02 e + Na; e + K; e + Rb; e + Cs; e + Mg	E	0-1.6 eV	Johnston, A. S.; Burrow, P. D. Shape resonances in electron scattering from metal atoms. <i>J. Phys. B</i> 15, 1745 (1982) United States
905	A09 Kr ⁺ + F ⁻ + Kr ⁺ ; Kr ⁺ + F ⁻ + F ⁻ ; He ⁺ + F ⁻ + Na ⁺ ; Na ⁺ + F ⁻ + F ⁻ ; H ₂ ⁺ + F ⁻ + H ⁺ ; H ₂ ⁺ + F ⁻ + F ⁻	T	800 K	Bates, D. R. Ion-ion recombination in an ambient ion gas. <i>J. Phys. B</i> 15, 1755 (1982) United States
906	A12 Na + He; Na + He; Na + Ar A17 Na + He; Na + He; Na + Ar	E	700-750 K	Ewart, P.; C'Leary, S. V. Comparisons of sodium: rare-gas potentials by measurements of excited-state degenerate four-wave mixing. <i>J. Phys. B</i> 15, 3669 (1982) United Kingdom

REF. NO.	REACTANTS	EXP OR THEORY	ENERGY RANGE	REFERENCE
907	A17 Ba + Xe; Ba + Kr; Ba + Ar	E	1050-1150 K	Marina, H.; Tachibana, K.; Urano, Y. Empirical interatomic potentials for Ba-rare-gas systems deduced from an absorption measurement. J. Phys. B 15, 3679 (1982) Japan
908	A02 Li ⁺ + He A18 Li ⁺ + He	E	25-134 eV	Von Busch, Hermes, J.; Liesen, D. A study of low-energy differential ion-atom scattering: I. Experimental: Li ⁺ -He. J. Phys. B 15, 3655 (1982) West Germany
909	A07 He ⁺ + He A18 He ⁺ + He	E	20 keV	Tokoro, M.; Takasuechi, J.; Urahara, J.; Cda, M. Angular distribution of ejected electrons from 20 keV He ⁺ impact on He. J. Phys. B 15, 3737 (1982) Japan
910	A07 He ⁺ + He A18 He ⁺ + He	E	2 keV	Boshamp, E.; Erlebling, C.; Morgenstern, E.; Nienhuis, G. Angular correlation between autoionisation electrons from He(2p ² 3s ²) ³ D and scattered ions in He ⁺ + He collisions. J. Phys. B 15, 3745 (1982) The Netherlands
911	A06 He ⁺ + H ₂ ; He ⁺ + He; He ⁺ + CH ₄ ; He ⁺ + H ₂ ; He ⁺ + O ₂ ; He ⁺ + He	E	111 MeV	Kashara, T.; Aoyagi, Y.; Hitechi, A.; Kase, M.; Kohno, I.; Tomura, I. X rays from radiative electron capture induced by 100 MeV He ions. J. Phys. E 15, 3759 (1982) Japan
912	E02 e + He E17 e + He	T	10-200 eV	Berg, L. P. The X(sub alpha) potential in electron-atom scattering. J. Phys. B 15, 3769 (1982) West Germany
913	E02 e + H ₂ ; e + N ₂	T	0.01-1.30 Ry	Noble, C. J.; Burke, P. G.; Salvini, S. Low-energy scattering of electrons by diatomic molecules. J. Phys. B 15, 3779 (1982) United Kingdom
914	A01 Undef	T	Undef	Hyman, M. A. Inelastic collisions: the second-order Magnus approximations for a two-level model. J. Phys. B 15, L773 (1982) United States
915	A03 He ⁺ + He; He ⁺ + He; He ⁺ + Ar A11 He ⁺ + He; He ⁺ + He; He ⁺ + Ar	E	1-2.5x10 ⁴ cm s ⁻¹	Fierling, K. B.; Ryan, E. R.; Wing, W. h. A crossed-beam time-of-flight study of metastable helium in collisions with helium, neon, and argon. J. Phys. B 15, 3841 (1982) United States
916	A03 Kr ⁺ + Ar; Xe ⁺ + Ar; Pb ⁺ + Ar; U ⁺ + Ar A07 Kr ⁺ + Ar; Xe ⁺ + Ar; Pb ⁺ + Ar; U ⁺ + Ar	E	2.5-5.0 MeV/amu	Beyer, M. F.; Penn, F.; Folkmann, F.; Achler, P. X-ray and Auger transitions in highly ionised argon recoils. (in German) J. Phys. B 15, 3853 (1982) Denmark
917	A06 Li ²⁺ + H	T	0.05-0.5 a.u.	Grozdanov, T. P.; Ichlov'ev, E. A. Rotationally induced transitions in close encounters of one-electron collisional systems: the three-state problem. J. Phys. B 15, 3871 (1982) Yugoslavia
918	E02 e + H E17 e + H	T	100-400 eV	Byron, F. W., Jr.; Joachain, C. J.; Potvliege, R. M. Unitarisation of the partial-wave series method for electron-atom and positron-atom collisions. J. Phys. B 15, 3915 (1982) United States
919	E03 e + Li E17 e + Li	T	10-60 eV	Winters, K. H.; Vanderspoorten, R. The excitation of Li(3s) by electron impact. J. Phys. B 15, 3945 (1982) United Kingdom
920	E05 e + Cd E17 e + Cd	E	150 eV	Martin, N.L.f.; Ross, B. J. Large angle electron scattering (e-2e) studies of the cadmium (4d ⁹ 5s ² 5p) 12.81 eV autoionising level. J. Phys. E 15, 3959 (1982) United Kingdom
921	E03 e + CO	T	20-50 eV	Wu-Yao, L.; McKoy, V. Electron impact excitation cross sections for carbon monoxide. J. Phys. B 15, 3971 (1982) United States

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922	E06 $e + Ar$	E T	200-3000 eV	Hedman, S.; Holenelund, K.; Asplund, L.; Gelius, U.; Siegbahn, K. Line sharpening effect due to PCI in Ar LAM Auger spectra: experimental and theoretical results. <i>J. Phys. B</i> 15, L799 (1982) Sweden
923	A03 $He + H_2$	T	0-26 eV	Kirkpatrick, D. J. Vibrational excitation of ortho- H_2 by He. <i>J. Phys. B</i> 15, L813 (1982) United Kingdom
924	H06 $h\nu + Na; h\nu + K; h\nu + Rb; h\nu + Cs$	T	0-160 eV	Theodossiou, C. E.; Fielder, W., Jr. Photoionization of the outermost closed shell of the alkali metal atoms. <i>J. Phys. B</i> 15, 4115 (1982) West Germany
925	A03 $I + I; Xe + Xe; Pb + Pb; Pb + Cu; Yb + Yb$	E T	0.5-6 MeV/amu	Mann, N.; Mehler, F. M.; Fricke, B.; Sepp, W.-B.; Schonfeldt, H. A.; Hartung, H. Evidence for an additional coupling of the innermost shells in very heavy quasi-molecular ion-atom collisions. <i>J. Phys. B</i> 15, 4195 (1982) West Germany
926	A03 Under A06 Under	T	Under	Miraglia, J. E. Generalized impulse approximation. <i>J. Phys. B</i> 15, 4255 (1982) United Kingdom
927	A06 $Cu^+ + Cu^+$ A07 $Cu^+ + Cu^+$	E	42-271 keV	Neill, P. A.; Angel, G. C.; Dunn, K. F.; Gilbody, H. B. Collisions between Cu^+ ions - a further experimental study. <i>J. Phys. B</i> 15, 4219 (1982) United Kingdom
928	A06 $C^{++} + H$ A18 $C^{++} + H$	E	40-430 eV	Olsen, B. E.; Kimura, M. Angular scattering in slow multiply-charged ion-atom collisions. <i>J. Phys. B</i> 15, 4231 (1982) United States
929	E02 $e + H_2$	T	100-1000 eV	Jhanwar, B. L.; Khare, S. P.; Singh, M. P. $e-H_2$ elastic scattering over 100-1000 eV. <i>J. Phys. B</i> 15, 4239 (1982) India
930	E03 $e + H$ E17 $e + H$	T	35-84 eV	Morgan, L. A. Angular distributions for the electron impact excitation of the $n = 2$ levels of atomic hydrogen. <i>J. Phys. B</i> 15, 4247 (1982) United Kingdom
931	E03 $e + Kr$ E17 $e + Kr$	E	28 eV	Phillips, J. P. Near-threshold electron impact excitation of Kr. <i>J. Phys. B</i> 15, 4255 (1982) United States
932	E07 $e + [He^+]^+$	E	4.3 eV	Kelbe, G.; Huang, Y. W.; Burgess, D. D. A laser based measurement of electron collision rates for excited states of ionized helium in a plasma. <i>J. Phys. B</i> 15, 4283 (1982) United Kingdom
933	A07 $Cu^{++} + Cu; Cu^{++} + Ge; Cu^{++} + Ag$ A18 $Cu^{++} + Cu; Cu^{++} + Ge; Cu^{++} + Ag$	E	63 MeV	Frank, W.; Jarnaz, P.; Kaun, K.-H.; Rudiger, J.; Stachura, Z. Impact parameter dependence of K-shell vacancy production in collisions of 1 MeV/amu Cu ions. <i>Ann. Phys. (Germany)</i> 39, 161 (1982) Soviet Union
934	A07 $Cu + Au; Nb + Au$ A18 $Cu + Au; Nb + Au$	E	1 MeV/amu	Frank, W.; Jarnaz, P.; Kaun, K.-H.; Rudiger, J.; Stachura, Z.; Warych, A. K- and L-vacancy production in asymmetric 1 MeV/b collisions of Cu and Nb projectiles with Au and Pb targets. <i>Ann. Phys. (Germany)</i> 35, 256 (1982) Soviet Union
935	D03 $Ar^+ + Fe$	E	10 keV	Schwarz, E.; Ley, H. L. On the velocity distribution of excited Fe-atoms by sputtering of iron. <i>Appl. Phys. (Germany)</i> 25A, 83 (1982) West Germany
936	D02 $Ar^+ + Si$	E	0.5-5.0 keV	Kirchner, J.; Eitzern, H. W. On the fluence dependence of the sputtering yield for low-energy noble gas ions. <i>Appl. Phys. (Germany)</i> 29A, 133 (1982) West Germany
937	A06 $Ar^+ + H_2; Ar^{++} + H_2$	E	30-80 eV	Matsuo, T.; Kobayashi, N.; Kaneko, Y. Time-of-flight study of low energy charge transfer reactions of Ar ions and metastable Ar ions with H_2 molecules. <i>J. Phys. Soc. Jpn.</i> 51, 1558 (1982) Japan

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
938	A12 $\text{Ca}^0 + \text{Ar}; \text{Ca}^0 + \text{Kr}$	E	000-900 K	Ueda, K.; Namaguchi, Y.; Fukuda, K. Zero-gas-induced broadening of Ca principal series lines. J. Phys. Soc. Jpn. 51, 1948 (1982) Japan
939	E02 $e + \text{O}_2$ E17 $e + \text{O}_2$	E	200-500 eV	Daimon, H.; Miyoshi, S.; Kadow, T.; Kuchitsu, K. Measurements of differential cross sections of low-energy electrons elastically scattered by gas molecules: II. Scattering of 200-500 eV electrons by molecular oxygen. J. Phys. Soc. Jpn. 51, 2641 (1982) Japan
940	A06 $\text{Kr}^+ + \text{Kr}; \text{Kr}^{2+} + \text{Kr}; \text{Xe}^+ + \text{Xe}; \text{Xe}^{2+} + \text{Xe}$	E	0.01-10 eV	Kokumi, T.; Chono, K.; Kobayashi, H.; Kureha, Y. Drift tube study of symmetric resonance single- and double-charge transfer in $\text{Kr}^+ + \text{Kr}$, $\text{Xe}^+ + \text{Xe}$, $\text{Kr}^{2+} + \text{Kr}$, and $\text{Xe}^{2+} + \text{Xe}$ systems. J. Phys. Soc. Jpn. 51, 2688 (1982) Japan
941	C07 $\text{H}^+ + \text{C}; \text{H}_2^+ + \text{C}; \text{H}_3^+ + \text{C}$	E	0.5-0.8 MeV/amu	Kobayashi, H.; Cao, H. Balmer emission yields for excited hydrogen atoms produced by H^+ , H_2^+ , and H_3^+ ions passing through thin carbon foils. J. Phys. Soc. Jpn. 51, 2718 (1982) Japan
942	A03 $\text{Li}^+ + \text{CO}_2$	E	203 eV	Itoh, Y.; Kobayashi, H.; Kaneko, Y. High resolution ion energy-loss spectroscopy of $\text{Li}^+ + \text{CO}_2$ collisions. J. Phys. Soc. Jpn. 51, 2577 (1982) Japan
943	A06 $\text{Li}^{2+} + \text{H}; \text{Be}^{2+} + \text{H}$	T	0.1-25 MeV/amu	Yamaguchi, T. C.; Itikawa, Y. Charge transfer in collisions of Li^{2+} and Be^{2+} ions with atomic hydrogen at low impact energy. J. Phys. Soc. Jpn. 51, 2982 (1982) Japan
944	A03 $\text{Na}^0 + \text{Ar}; \text{Na}^0 + \text{N}_2; \text{Ar}^0 + \text{N}_2$ f07 $\text{Na}^0 + \text{Ar}; \text{Na}^0 + \text{N}_2; \text{Ar}^0 + \text{N}_2$	E	400 K	Hitachi, A.; King, T. A. Penning ionization of Ar and N_2 by $\text{Na}(2^3S)$ and excitation transfer from $\text{Ar}(1^3P)$ to N_2 . J. Phys. Soc. Jpn. 51, 3325 (1982) Japan
945	H06 $nh\nu + \text{Na}^0; nh\nu + \text{Hg}^0$	E T	Undef	Ohno, T.; Sazama, K.; Ohno, T. Multi-photon ionization of excited atoms in gaseous discharge by ruby laser light. J. Phys. Soc. Jpn. 51, 3668 (1982) Japan
946	D01 $\text{Na}^0; \text{Li}^0$	T		Kawachi, K.; Usui, T.; Oda, T. Forbidden transitions in sodium and lithium due to fluctuating electric fields for plasma diagnostics. J. Phys. Soc. Jpn. 51, 3666 (1982) Japan
947	D18 $\text{H}^+ + \text{PERT}; \text{Na}^+ + \text{PERT}$ E04 $\text{H}^+ + \text{PERT}; \text{Na}^+ + \text{PERT}$	E T	1-80 keV	Guseva, M. I.; Paryshev, V. V. Radiative blistering. Sov. Phys.-Usp. 24, 956 (1981) Soviet Union
948	E04 Review E06 Review	E T	0.01-10 eV	Vietek, A. V.; Seitz, B. M. Dissociative recombination of electrons and molecular ions. Sov. Phys.-Usp. 25, 12 (1982) Soviet Union
949	A12 Review	E T	Undef	Yakovlenko, I. I. Absorption of powerful resonance radiation accompanying collisional line broadening. Sov. Phys.-Usp. 25, 216 (1982) Soviet Union
950	E03 $e + \text{Si}^{4+}$	T	7-70 Ry	Sahn, H. P.; Trafftz, E. Electron collisional excitation of Si III. Z. Naturforsch. A 37, 744 (1982) West Germany
951	E03 $e + \text{Hg}$	E	4-14 eV	Berteckat, K.; Paspe, C. F.; Wolcke, A. Observation of integrated state multipoles in collisional excitation of Hg atoms by polarized electrons. Z. Phys. A 304, 69 (1982) West Germany
952	A03 $\text{Mg}^+ + \text{Ar}$ A18 $\text{Mg}^+ + \text{Ar}$	T	0.5-8 keV	Zehle, L.; Hall, T.; Schinke, R.; Kempter, V. $\text{Mg}^+(3p)$ excitation in slow $\text{Mg}^+ - \text{Ar}$ collisions; some remarks concerning the mechanism for $\text{Mg}^+(3p)$ excitation. Z. Phys. A 304, 51 (1982) West Germany

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953	FJ4 $\gamma + \text{Ba}$	E	5000 Å	Fischer, A.; Hertel, I. V. Alignment and orientation of the hyperfine levels of a laser excited Ba-atom beam: I. The $3^2F_{5/2}$ F(Ba) - 2 going to or coming from $3^2F_{3/2}$ F = 3 transition. Z. Phys. A 304, 183 (1982) West Germany
954	E05 $e + \text{He}$ E17 $e + \text{He}$	E	500 eV	Ehrhardt, H.; Fischer, H.; Jung, K. Triple differential cross section measurements for the electron impact ionization of helium: comparison with a second Born approximation. Z. Phys. A 304, 119 (1982) West Germany
955	A17 $\text{H} + \text{F}$	T	Under	Bettendorff, R.; Ruesch, R. J.; Peyerimhoff, S. D.; Roselt, J. Ab initio CI calculation of the effects of Rydberg-valence mixing in the electronic spectrum of the HF molecule. Z. Phys. A 304, 125 (1982) West Germany
956	H05 $\text{h}\nu + \text{HI}$	E	266 nm	Schmidl, P.; Bogen, H.; Meier, W.; Welge, K. R. Laser Doppler spectroscopy of atomic hydrogen in the photodissociation of HI. Z. Phys. A 304, 137 (1982) West Germany
957	E03 $e + \text{Cl}_2$	E	2-14 eV	Jureta, J.; Cvejanovic, S.; Kurepa, M.; Cvejanovic, B. Threshold electron impact excitation of Cl_2 . Z. Phys. A 304, 143 (1982) Yugoslavia
958	H07 $\text{h}\nu + \text{Rb}^+$	E, T	16380-16820 cm^{-1}	Frey, P.; Lawen, H.; Brayer, F.; Klar, H.; Metap, R. Partial cross sections for Rb^+ photodetachment in the region of the $5d(5g^2F_{5/2,3/2})$ thresholds and their analysis by multichannel quantum defect theory. Z. Phys. A 304, 166 (1982) West Germany
959	A03 $\text{Ar} + \text{Ar}$	E	4.5-20 MeV	Schmidt-Bocking, H.; Baumann, H.; Bethge, K.; Grappe, A.; Schadt, G.; Zebach, R.; Stiebing, R. E. Impact parameter dependence of K-shell excitation probabilities in Ar-Ar collisions. Z. Phys. A 304, 177 (1982) West Germany
960	A07 $\gamma + \text{PERT}$	E	6 MeV/amu	Endo, H.; Uda, N. Atomic number dependence of L-shell vacancy rearrangement probabilities on $K(\alpha)$ x-ray satellites induced by 6 MeV/amu M^{10+} impacts. Z. Phys. A 304, 187 (1982) Japan
961	C02 $\text{As} + \text{He}; \text{As} + \text{Ne}; \text{As} + \text{H}_2$	E	10 eV	Ahlert, J.; Saund, F.; Schumacher, H.; Hülthausen, P.; Ziegeler, L. The stopping of slow ^{76}As recoil atoms in He, Ne, and H_2 . Z. Phys. A 306, 301 (1982) West Germany
962	A03 $\text{He} + \text{Ar}; \text{Ne} + \text{Ar}; \text{K} + \text{Ar}; \text{K}^+ + \text{Ar}$ A18 $\text{Na} + \text{Ar}; \text{Ne} + \text{Ar}; \text{K} + \text{Ar}; \text{K}^+ + \text{Ar}$	T	thermal	Duren, E.; Nesselbrink, E.; Moritz, G. On the interaction of excited alkali atoms with rare gas targets in scattering processes. Z. Phys. A 307, 1 (1982) West Germany
963	A12 $\text{Rb}^+ + \text{He}; \text{Rb}^+ + \text{Ar}; \text{Rb}^+ + \text{Xe}$	E	150 °C	Weber, K. H.; Niemann, E. Impact broadening and shift of Rb nS and nD levels by noble gases. Z. Phys. A 307, 13 (1982) West Germany
964	H04 $\text{h}\nu + \text{O}_2^+$ H08 $\text{h}\nu + \text{O}_2^+$	E	Under	Frey, R.; Koleschke, R.; Müller-Dethlefs, K.; Schleg, E. V. Spectroscopy of molecular ions: laser induced predissociation of C_2^+ . Z. Phys. A 307, 25 (1982) West Germany
965	E05 $e + \text{Ar}$ E11 $e + \text{Ar}$	E	2.5-12 keV	Hippler, R.; Isen, K.; McGregor, I.; Kleinpoppen, H. Energy dependence of characteristic and bremsstrahlung cross sections of argon induced by electron bombardment at low energies. Z. Phys. A 307, 83 (1982) United Kingdom
966	E07 $e + \text{Ne}^+$	E	5-22.1 eV	Martmann, H. W.; Hertel, I. V. Complete density matrix measured for $\text{Ne}(3^2F)$ excited by electron impact. Z. Phys. A 307, 85 (1982) West Germany
967	H02 $\text{h}\nu + \text{Na}; \text{h}\nu + \text{Ar}; \text{h}\nu + \text{Kr}; \text{h}\nu + \text{Xe}$	T	20-1000 eV	Heizacher, P.; Dreizler, R. H. Charge oscillations and photoabsorption of the Thomas-Fermi-Dirac-Weizsäcker atom. Z. Phys. A 307, 211 (1982) West Germany

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968	E85 e + PERT	T	10-300 keV	Hippler, R.; Jitschin, W. Plane wave Born cross sections including exchange for K-shell ionization of light atoms. Z. Phys. A 307, 287 (1982) West Germany
969	A93 Ne + Ne; Ar + Ar	T	125-720 keV	Wille, U. Non-perturbative study of rotationally induced inner-shell excitation. Z. Phys. A 308, 3 (1982) West Germany
970	A97 Xe + Pb A16 Xe + Pb	E	5.9-8.5 MeV/amu	Arbitt, R.; Meyerhof, W. E.; Molitorie, J. D.; Jun-Shan, L. Pb K-shell ionization probability in high energy Xe + Pt collisions. Z. Phys. A 308, 189 (1982) United States
971	E85 e + PERT	T	0.1-1000 MeV	Eichwey, F.; Assaker, F. Structure functions and ionization of isolated atoms by charged projectiles. Z. Phys. A 306, 155 (1982) West Germany
972	D01 He + W; He + U	T	15-150 K	Stetzki, J.; Franig, W. Theory of inelastic atom-surface scattering: a three-dimensional treatment. Z. Phys. B 40, 45 (1982) West Germany
973	C82 He ⁺ + Ga; Ar + Ga C84 He ⁺ + Ga; Ar + Ga B17 He ⁺ + Ga; Ar + Ga	E T	200-275 keV	Gorlach, U.; Hitzfeld, R.; Ziemann, P.; Buckel, W. Low temperature ion beam irradiation of Gallium films. Z. Phys. B 47, 227 (1982) West Germany
974	D07 He + W B11 He + W	T	0-400 K	Boheim, J.; Bräunig, W.; Stetzki, J. On the low energy limit of reflection and sticking coefficients in atom surface scattering: II. Long range forces. Z. Phys. B 48, 43 (1982) West Germany
975	E93 e + C ²⁺ ; e + O ⁶⁺ ; e + Ne ⁷⁺ ; e + Ar ¹⁶⁺	T	Under	Bhadra, K.; Henry, E.J.W. Effect of resonances on 2s-2p and 2l-2l (prime) excitation of Li-like ions by electron impact. Phys. Rev. A 26, 1842 (1982) United States
976	E83 e + N ₂	T	15-30 eV	Molloy, T. K.; Chung, S.; Lin, C. C.; Lee, E.T.P. Excitation cross sections of the H ₂ [K ² I(sub g) ⁺ + b ² I(sub u) ⁺] by the combined close-coupling-R-matrix method. Phys. Rev. A 26, 1852 (1982) United States
977	C82 H ⁺ + PERT	T	0.1-10 MeV	McGuire, E. J. Subshell stopping power of the elements for protons in the Born approximation. Phys. Rev. A 26, 1858 (1982) United States
978	C82 H ⁺ + Au; H ⁺ + Au ⁺ ; H ⁺ + Au ²⁺ ; H ⁺ + Au ³⁺ ; H ⁺ + Au ⁴⁺ ; H ⁺ + Au ⁵⁺ ; H ⁺ + Au ⁶⁺ ; H ⁺ + Au ⁷⁺ ; H ⁺ + Au ⁸⁺ ; H ⁺ + Au ⁹⁺ ; H ⁺ + Au ¹⁰⁺ ; H ⁺ + Au ¹¹⁺ ; H ⁺ + Au ¹²⁺ ; H ⁺ + Au ¹³⁺	T	0.1-10 MeV	McGuire, E. J. Stopping power of some lightly ionized gold ions for protons. Phys. Rev. A 26, 1871 (1982) United States
979	A93 H ⁺ + Au; H ⁺ + Pb; H ⁺ + Bi; H ⁺ + V; He ⁺ + Au; He ⁺ + Pb; He ⁺ + Bi; He ⁺ + V A97 H ⁺ + Au; H ⁺ + Pb; H ⁺ + Bi; H ⁺ + V; He ⁺ + Au; He ⁺ + Pb; He ⁺ + Bi; He ⁺ + V	E	0.3-2.6 MeV	Mehta, R.; Duggan, J. L.; Price, J. L.; McDaniel, F. D.; Lepich, G. M-shell x-ray-production cross sections in thin targets of ¹⁹⁷ Au, ²⁰⁸ Pb, ²⁰⁹ Bi, and ⁵¹ V by 0.3-2.6-MeV 1 over 1 H ⁺ and 4 over 2 He ⁺ ions. Phys. Rev. A 26, 1883 (1982) United States
980	A96 C ²⁺ + N; C ²⁺ + N ₂ ; C ²⁺ + N; C ²⁺ + N ₂ ; C ³⁺ + N; C ³⁺ + N ₂ ; C ³⁺ + N; C ³⁺ + N ₂ ; O ²⁺ + N; O ²⁺ + N ₂ ; O ²⁺ + N; O ²⁺ + N ₂ ; O ³⁺ + N; O ³⁺ + N ₂ ; O ³⁺ + N; O ³⁺ + N ₂ ; O ⁴⁺ + N; O ⁴⁺ + N ₂ ; O ⁴⁺ + N; O ⁴⁺ + N ₂	E	0.13-160 keV	Phaneuf, R. A.; Alvarez, L.; Mayer, F. W.; Crennell, D. H. Electron capture in low-energy collisions of C(sup q) ⁺ and O(sup q) ⁺ with H and H ₂ . Phys. Rev. A 26, 1892 (1982) United States
981	E85 Under	T	1.5-10 keV	White, R. G. Photoelectron angular distributions from electron-atom collisions. Phys. Rev. A 26, 1907 (1982) United States

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982	C84 $U^+ + C; U^+ + Al; U^+ + Ti; U^+ + Ni;$ $U^+ + Nb; U^+ + Pb; U^+ + Sn$ C85 $U^+ + C; U^+ + Al; U^+ + Ti; U^+ + Ni;$ $U^+ + Nb; U^+ + Pb; U^+ + Sn$	E	333 MeV	Leichter, Y.; Geisel, H.; Schadel, H.; Ambruster, P. Range profiles for (0.12-10)-MeV/u uranium ions in solids. Phys. Rev. A 26, 1915 (1982) West Germany
983	A17 $He + H_2$	T	Undef	Russek, A.; Garcia, G. S. Analytic fit of the He- H_2 energy surface in the repulsive region. Phys. Rev. A 26, 1524 (1982) United States
984	A82 $He + H_2; He + H_2; He^+ + H_2$	T	0.5-3.5 keV	Snyder, R.; Sussak, P. Energy-loss calculations for medium-energy rare gas + H_2 collisions. Phys. Rev. A 26, 1521 (1982) United States
985	A83 $Kr^+ + Xe$ A86 $Kr^+ + Xe$	E	0-70 eV	Jones, E. G. Excitation in asymmetric ion-atom collisions: $Kr^+ + Xe$. Phys. Rev. A 26, 1530 (1982) United States
986	A86 $H^+ + H$	T	Undef	Devangan, E. P. The high-energy behavior of the charge-transfer cross section in the eikonal approximation. Phys. Rev. A 26, 1946 (1982) United Kingdom
987	A87 $H^+ + He; He^+ + He; Li^+ + He; He^{2+} + He; Li^{2+} + He; Be^{2+} + He; C^{3+} + He; C^{4+} + He; C^{5+} + He; C^{6+} + He; B^{3+} + He; B^{4+} + He; B^{5+} + He; O^{3+} + He; O^{4+} + He; C^{2+} + He; O^{2+} + He$	E	0.64-2.31 MeV/amu	Haugen, H. K.; Andersen, L. N.; Hvelplund, P.; Knudsen, M. Ionization of helium by fast, multiply charged ions. Deviations from a q^2 scaling. Phys. Rev. A 26, 1580 (1982) Denmark
988	A87 $H^+ + He; H^+ + Ne; H^+ + Ar; H^+ + Kr; H^+ + Xe; He^{2+} + He; He^{2+} + Ne; He^{2+} + Ar; He^{2+} + Kr; He^{2+} + Xe; Li^{2+} + He; Li^{2+} + Ne; Li^{2+} + Ar; Li^{2+} + Kr; Li^{2+} + Xe; B^{3+} + He; B^{3+} + Ne; B^{3+} + Ar; B^{3+} + Kr; B^{3+} + Xe; C^{4+} + He; C^{4+} + Ne; C^{4+} + Ar; C^{4+} + Kr; C^{4+} + Xe; O^{4+} + He; O^{4+} + Ne; O^{4+} + Ar; O^{4+} + Kr; O^{4+} + Xe$	E	1.44-2.3 MeV/amu	Haugen, H. K.; Andersen, L. N.; Hvelplund, P.; Knudsen, M. Multiple ionization of noble gases by fully stripped ions. Phys. Rev. A 26, 1962 (1982) Denmark
989	B81 Undef	T		Hayfeh, N. N.; King, K.; Millard, G. B.; Shubin, I. S.; Hayfeh, A. N. Intensity-induced quenching of absorption of diatomic molecules in the near-resonance laser fields. Phys. Rev. A 26, 1986 (1982) United States
990	H86 $h\nu + CO_2$	T	20-50 eV	Lucchese, R. E.; McFey, V. Vibrational effects in the photoionization shape resonance leading to the $C^+II(sub g)^+$ state of CO_2^+ . Phys. Rev. A 26, 1592 (1982) United States
991	E88 $e + Fe^{18+}; e + Fe^{17+}; e + Fe^{16+}; e + Fe^{15+}; e + Fe^{14+}$ E86 $e + Fe^{18+}; e + Fe^{17+}; e + Fe^{16+}; e + Fe^{15+}; e + Fe^{14+}$	E	400-600 eV	Islar, R. C.; Crane, E. C.; Armbrus, E. E. Ionization and recombination coefficients for Fe IV-Fe XII. Phys. Rev. A 26, 2185 (1982) United States
992	A87 $H^+ + He$ E85 $e + He; e + H_2$	T	A87 1 MeV E85 Undef	Del Cappello, C.; Teyard, C.; Lahman-Bemmel, A. Ejected-electron cross sections and Compton profiles: an unitary formalism. Phys. Rev. A 26, 2249 (1982) France
993	E82 $e + H_2$	T	Undef	Narasimhan, V. L.; Somaschandran, A. S.; Marko, C. S. *Erratum: Exchange correction to electron-hydrogen-molecule scattering cross section in the Glauber approximation [Phys. Rev. A 23, 641 (1981)]. Phys. Rev. A 26, 2270 (1982) India
994	A86 $H^+ + He^+; He^{2+} + H$	T	Undef	Winter, T. G. *Erratum: Electron transfer in $p-He^+$ and $He^{2+}-H$ collisions using a Sturmian basis [Phys. Rev. A 25, 657 (1982)]. Phys. Rev. A 26, 2270 (1982) United States
995	E83 $e + Zn^+$ E17 $e + Zn^+$	E	30-100 eV	Chetjian, A.; Beuall, W. B. Experimental electron energy-loss spectra and cross sections for the $4d^9$ $4p$ transition in Zn II. Phys. Rev. A 26, 2271 (1982) United States

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996	H01 Undef H06 Undef	T	H06 Undef	Agarwal, G. S.; Haas, E. L.; Burnett, R.; Cooper, J. Photoemission spectra in intense laser field induced autoionization. Phys. Rev. A 26, 2277 (1982) United States
997	H06 Sh _u + Xe	E	12 eV	McCown, A. W.; Ediger, M. N.; Eden, J. G. Resonantly enhanced, three-photon ionization of Xe: optically pumped rare-gas laser. Phys. Rev. A 26, 2281 (1982) United States
998	A07 H ⁺ + In	E	120-400 keV	Fast, E.; Filmer, J. L.; Glick, A.; Isaac, F. W.; Oelmen, L.; Pearson, C.; Michelgren, D. L. x-ray-production cross sections for (120-400)-keV proton bombardment of indium. Phys. Rev. A 26, 2417 (1982) United States
999	A03 Li + He; Li + H ₂ ; Li + H; Li + Li; Li + N; Li + Ne; Li + B; Li + C; Li + O; Li + F; Li + Na; Li + Na; Li ⁺ + He; Li ⁺ + H ₂ ; Li ⁺ + H; Li ⁺ + Li; Li ⁺ + N; Li ⁺ + Ne; Li ⁺ + B; Li ⁺ + C; Li ⁺ + O; Li ⁺ + F; Li ⁺ + Na; Li ⁺ + Na; Li ²⁺ + He; Li ²⁺ + H ₂ ; Li ²⁺ + H; Li ²⁺ + Li; Li ²⁺ + N; Li ²⁺ + Ne; Li ²⁺ + B; Li ²⁺ + C; Li ²⁺ + O; Li ²⁺ + F; Li ²⁺ + Na; Li ²⁺ + Na A07 Li + He; Li + H ₂ ; Li + H; Li + Li; Li + N; Li + Ne; Li + B; Li + C; Li + O; Li + F; Li + Na; Li + Na; Li ⁺ + He; Li ⁺ + H ₂ ; Li ⁺ + H; Li ⁺ + Li; Li ⁺ + N; Li ⁺ + Ne; Li ⁺ + B; Li ⁺ + C; Li ⁺ + O; Li ⁺ + F; Li ⁺ + Na; Li ⁺ + Na; Li ²⁺ + He; Li ²⁺ + H ₂ ; Li ²⁺ + H; Li ²⁺ + Li; Li ²⁺ + N; Li ²⁺ + Ne; Li ²⁺ + B; Li ²⁺ + C; Li ²⁺ + O; Li ²⁺ + F; Li ²⁺ + Na; Li ²⁺ + Na	T	10-10 ⁶ keV/atom	Gillespie, G. M. Excitation and ionization cross sections for fast lithium atoms and ions colliding with atoms. Phys. Rev. A 26, 2421 (1982) United States
1000	C02 e + Al; e + Cu	E	11-127 keV	Hubbard, M. H., Jr.; Birkhoff, R. D. Calorimetric measurement of electron stopping power of aluminum and copper between 11 and 127 keV. Phys. Rev. A 26, 2460 (1982) United States
1001	C07 Cl ⁺ + C	E	2-10 MeV	Jørgen, C.; Benne, F.; Ekberg, J. O.; Engström, L.; Litzén, U.; Persson, L.; Tai-Heng, W.; Trigueros, A.; Vajda, E. Study of the beam-foil excitation mechanism with the use of chlorine projectiles, 2-10 MeV. Phys. Rev. A 26, 2468 (1982) Sweden
1002	A02 H ⁺ + He A10 H ⁺ + He	E	25-100 keV	Pencher, J. L.; Kvile, T. J.; Redd, E.; Martin, P. J.; Blankenship, L. M.; Hille, E.; Sutcliffe, V. C.; Park, J. T. Elastic differential cross sections for small-angle scattering of 25-, 50-, and 100-keV protons by helium atoms. Phys. Rev. A 26, 2476 (1982) United States
1003	E02 e + H E17 e + H	T	4x10 ² -10 ³ eV	France, V.; Halpern, A. M. First-order orbital exchange amplitudes. Phys. Rev. A 26, 2482 (1982) United States
1004	C02 Undef C08 Undef	T	Undef	Sigmund, P. Kinetic theory of particle stopping in a medium with internal action. Phys. Rev. A 26, 2497 (1982) Denmark
1005	C04 H ⁺ + Si; C ⁺ + C; Al ⁺ + Be	T	10 ² -10 ³ eV	Coburn, M.E.P. Range distribution function for energetic ions in matter. Phys. Rev. A 26, 2518 (1982) United Kingdom
1006	E05 e + Al ²⁺ ; e + Si ²⁺ ; e + Mg ⁺	T	10-150 eV	Henry, B.J.B.; Mazzone, A. Z. Cross sections for inner-shell excitation of Na-like ions. Phys. Rev. A 26, 2542 (1982) United States

REF. NO.	REACTANTS	EXP OR THEORY	ENERGY RANGE	REFERENCE
1007	A06 $Li^{2+} + H$	T	100-1500 keV	Datta, S.; Mendel, C. S.; Mukherjee, S. C.; Sil, N. C. Calculation of cross sections for electron capture by fast Li^{2+} ions from atomic hydrogen in the continuum distorted-wave approximation. <i>Phys. Rev. A</i> 26, 2551 (1982) India
1008	A02 Under A27 U_1, Au_1	T	Under	Rosendorff, I.; Birken, A. Total cross sections for elastic and inelastic scattering of charged particles by hydrogen atoms. <i>Phys. Rev. A</i> 26, 2567 (1982) Israel
1009	A06 $H^+ + Li^+; H^+ + Be^{2+}; H^+ + B^{3+}; H^+ + C^{4+}; H^+ + O^{6+}$	T	20-1000 keV	Sinha, C.; Guha, S.; Ray, P. K.; Sil, N. C. Electron capture by protons passing through helium-like ions. <i>Phys. Rev. A</i> 26, 2586 (1982) India
1010	E03 $e + N_2$ E17 $e + N_2$	T	20-200 eV	Bhattacharyya, F. K.; Goswami, K. K. Elastic and rotational excitation of the nitrogen molecule by intermediate-energy electrons. <i>Phys. Rev. A</i> 26, 2592 (1982) India
1011	A07 $H^+ + Ni; H^+ + U$	T	1-1500 GeV	Leung, P. T.; Rustgi, P. L. Structural effects on K-vacancy production by protons of extreme relativistic energies. <i>Phys. Rev. A</i> 26, 2606 (1982) United States
1012	B01 $h\nu + H; h\nu + Na$	T		Herman, D. A. Theory of the Stark effect. <i>Phys. Rev. A</i> 26, 2656 (1982) United States
1013	H06 $h\nu + Ne^+; h\nu + Ar^+; h\nu + Kr^+; h\nu + Xe^+$	T	0.1-100 eV	Chang, T. H.; Kim, Y. I. Photoionization from the excited p states of the rare-gas atoms. <i>Phys. Rev. A</i> 26, 2728 (1982) United States
1014	E02 $e + He^+$	T	Under	Davis, E. F.; Chung, K. T. $1P^o$ resonances of helium below the $n = 4$ threshold of He^+ . <i>Phys. Rev. A</i> 26, 2743 (1982) United States
1015	E05 $e + NeKr$	E	37-49 eV	Stephen, K.; Mark, T. E.; Helm, H. Double ionization of rare-gas dimers: $NeKr + e \rightarrow NeKr^{2+}$. <i>Phys. Rev. A</i> 26, 2561 (1982) Austria
1016	C02 Under	T	Under	Khandelwal, G. S. Stopping power of K and L electrons. <i>Phys. Rev. A</i> 26, 2583 (1982) United States
1017	A06 $Li^+ + H; C^+ + H; Li^{2+} + H; C^{2+} + H; H^+ + H; He^{2+} + H$	T	50-500 keV/amu	Ishihara, T.; Tsuji, A. Eikonal approximation for electron capture into partially stripped projectile ions. <i>Phys. Rev. A</i> 26, 2967 (1982) Japan
1018	E03 $e + H^+$ E17 $e + H^+$	T	13.9-19.6 eV	Basu, N.; Mazumder, P. S.; Ghosh, A. S. Electron-impact excitation of the $n = 2$ level of atomic hydrogen at low incident energies. <i>Phys. Rev. A</i> 26, 3000 (1982) India
1019	A07 $H^+ + H$	T	25-600 keV	Cohen, J. S. Comment on the classical-trajectory Monte Carlo method for ion-atom collisions. <i>Phys. Rev. A</i> 26, 3088 (1982) United States
1020	C07 $S^{2+} + C$	E	2 MeV/amu	Church, D. A.; Benfick, R. A.; Wang, E.-b.; Watson, R. L. Alignment of the 2F state of 2-MeV/amu helium-like sulfur. <i>Phys. Rev. A</i> 26, 3093 (1982) United States
1021	A16 $F^- + Ne; F^- + Ne; F^- + Ar; F^- + Kr; F^- + Xe$	E	25-120 keV	Hird, B.; Schuman, F. Charge neutralization of F^- ions in thin rare-gas targets. <i>Phys. Rev. A</i> 26, 3168 (1982) Canada
1022	A06 $H^+ + Na; H^+ + K; H^+ + Rb; H^+ + Cs$ A17 $H^+ + Li; H^+ + Na; H^+ + K; H^+ + Rb; H^+ + Cs$	T	10^{-10} eV	Kimura, M.; Clion, F. E.; Pascale, J. Molecular treatment of electron capture by protons from the ground and excited states of alkali-metal atoms. <i>Phys. Rev. A</i> 26, 3113 (1982) United States

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1023	A01 Undef	T	Undef	Makamuro, H. Dynamical-state representation and <i>adiabatic</i> electronic transitions in atomic collisions. <i>Phys. Rev. A</i> 26, 3125 (1982) Japan
1024	A07 Undef	T	Undef	Nienhuis, G. Description of polarization-dependent associative ionization of radiatively excited atoms. <i>Phys. Rev. A</i> 26, 2137 (1982) The Netherlands
1025	E03 $e + Ar$; $e + Kr$; $e + Xe$ E05 $e + Ar$; $e + Kr$; $e + Xe$	E	4-10 keV	Quarles, C.; Emsen, W. Characteristic x-ray production by electron bombardment of argon, krypton, and xenon from 4 to 10 keV. <i>Phys. Rev. A</i> 26, 3147 (1982) United States
1026	E11 $e + Ne$; $e + Ar$; $e + Kr$; $e + Xe$	T	6 keV	Sensen, M.; Quarles, C. 2 dependence of atomic-field bremsstrahlung. <i>Phys. Rev. A</i> 26, 3152 (1982) United States
1027	A01 Undef	T	Undef	Turner, R. E. Distorted eikonal cross sections: a time-dependent view. <i>Phys. Rev. A</i> 26, 3155 (1982) Canada
1028	A03 $Ne^{2+} + H$ A06 $Ne^{2+} + H$	T	0.1-1000 eV	West, B. W.; Lane, B. F.; Cohen, J. S. Radiative charge transfer in collisions of Ne^{2+} ions and ground-state H atoms. <i>Phys. Rev. A</i> 26, 3164 (1982) United States
1029	E03 $e + CO_2$	T	0.00-1.0 eV	Whitten, R. L.; Lane, B. F. Near-threshold vibrational excitation in electron- CO_2 collisions: a simple model. <i>Phys. Rev. A</i> 26, 2170 (1982) United States
1030	E05 $e + Ar$; $e + K^+$; $e + Ca^{2+}$; $e + Sr^{2+}$; $e + Yb^{2+}$; $e + Fe^{2+}$; $e + Kr^{1+}$	T	16-3946 eV	Younger, S. P. Distorted-wave electron-impact ionization cross sections for the argon isoelectronic sequence. <i>Phys. Rev. A</i> 26, 3177 (1982) United States
1031	B07 $e + h\nu + h\nu$	T		Bertolotti, P.; Sibilia, C. Coherent gamma radiation production by interaction between a relativistic electron beam and two interfering laser fields. <i>Phys. Rev. A</i> 26, 3187 (1982) Italy
1032	A16 $H^- + He$	T	0.5 MeV	Malicki, M.; Meek, J. Doubly differential cross section for electron detachment from 0.5-MeV H^- in collision with He. <i>Phys. Rev. A</i> 26, 3196 (1982) United States
1033	C02 $H^+ + Al$; $H^+ + Ar$	T	0.9-40 MeV	Sabin, J. R.; Ederhede, J. Shell corrections to electronic stopping powers from orbital mean excitation energies. <i>Phys. Rev. A</i> 26, 3209 (1982) United States
1034	E03 $e + He$; $e + Mg$; $e + Ca$	T	10-2000 eV	Williamson, V., Jr.; Ellis, D. G.; Ramenujan, P. S. Double electron excitation and the Glauber theory. <i>Phys. Rev. A</i> 26, 3220 (1982) United States
1035	E05 $e + Mn$	E	11 keV	Li-Scholz, A.; Leiterich, A.; Scholz, B. X-ray emission following K-L double ionization by electron impact and K capture: vacancy-production probabilities and structure of the K α satellite spectra. <i>Phys. Rev. A</i> 26, 3232 (1982) United States
1036	E03 $e + H_2$ E04 $e + H_2$ E17 $e + H_2$	T	16-200 eV	Mu-Yac, L.; Lucchesi, E. P.; McKay, V. Electron-impact excitation and dissociation processes in H_2 . <i>Phys. Rev. A</i> 26, 3240 (1982) United States
1037	H06 $h\nu + SF_6$	E	16-30 eV	Dehaer, J. L.; Ferr, A. C.; Wallace, S.; Bill, D. Photoelectron branching ratios and angular distributions for the valence levels of SF_6 in the range 16 less than or equal to $h\nu$ less than or equal to 30 eV. <i>Phys. Rev. A</i> 26, 3263 (1982) United States
1038	A03 $H^+ + O^{2+}$	T	Undef	Heil, T. G.; Green, S.; Delgarno, A. Proton-induced fine-structure transitions in O IV. <i>Phys. Rev. A</i> 26, 3283 (1982) United States

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1039	A12 $O^+ + Ar$	T	Undef	Julienne, P. S. Nonadiabatic theory of collision-broadened atomic line profiles. <i>Phys. Rev. A</i> 26, 3299 (1982) United States
1040	H06 $2h\nu + Xe$	E	193 nm	McCown, A. W.; Ediger, R. W.; Eden, J. G. Two-photon ionization of xenon at 193 nm. <i>Phys. Rev. A</i> 26, 3316 (1982) United States
1041	H01 $h\nu + Al$; $h\nu + Fe$; $h\nu + Pb$	T	17.5-1115 keV	Ribberfors, R.; Berggren, K.-F. Incoherent-x-ray-scattering functions and cross sections ($d\sigma/d\Omega$) [sub incoh] by means of a pocket calculator. <i>Phys. Rev. A</i> 26, 3326 (1982) Sweden
1042	H02 $h\nu + Nd$	T	6140-6260 eV	Salon, S. I.; Kumar, A.; Schiessel, K. G.; Lee, P. L. Double-vacancy excitations in the L atomic levels of neodymium. <i>Phys. Rev. A</i> 26, 3334 (1982) United States
1043	A03 $K^+ + K$; $K^+ + Ar$	E	344-397 K	Skalinshi, P.; Braune, L. Collisional (sub j) mixing and multipole relaxation in 4^2P potassium atoms. <i>Phys. Rev. A</i> 26, 3338 (1982) Canada
1044	A12 Undef	T	Undef	Davies, R. W.; Tipping, R. M.; Clough, S. A. Dipole autocorrelation function for molecular pressure broadening: a quantum theory which satisfies the fluctuation-dissipation theorem. <i>Phys. Rev. A</i> 26, 3378 (1982) United States
1045	E05 $e + H$	T	14.1-30.3 eV	Gay, T. J.; Fletcher, G. D.; Alguard, R. J.; Hughes, V. W.; Mainwright, P. F.; Lubell, M. S. Measurement of spin-exchange effects in electron-hydrogen collisions: further studies of impact ionization. <i>Phys. Rev. A</i> 26, 3604 (1982) United States
1046	A06 $C^{++} + H$	T	3-1300 eV	Green, T. A.; Riley, M. E.; Shipsey, E. J.; Browne, J. C. Semiclassical trajectory effects on $C^{++}-H$ charge-exchange cross sections at low energy. <i>Phys. Rev. A</i> 26, 2666 (1982) United States
1047	E02 $e + H_2$; $e + N_2$	T	0-45 meV	Crompton, R. W.; Harrison, M. A. Comment of the possibility of Rasser-Townsend mixing in $e-H_2$ and $e-N_2$ scattering. <i>Phys. Rev. A</i> 26, 3658 (1982) Australia
1048	C06 $N^+ + C$	E	0.4-2.7 MeV	Schneider, D.; Kopter, E. P.; Zabransky, B. J. Target-thickness dependence of K-shell vacancy fractions in foil-excited ion beams. <i>Phys. Rev. A</i> 26, 3700 (1982) United States
1049	A17 $Na + Na$; $Cs + He$	T	Undef	Paicale, J. Pseudopotential molecular-structure calculations for NaHe and CsHe. <i>Phys. Rev. A</i> 26, 3709 (1982) France
1050	E03 $e + He$	T	$10^3-3 \times 10^4$ K	Berrington, K. A.; Fox, W. C.; Kingston, A. E. Electron excitation rates for helium. <i>Mon. Not. R. Astron. Soc.</i> 200, 347 (1982) United Kingdom
1051	E03 $e + O^{2+}$	T	$0.25-2.00 \times 10^4$ K	Aggarwal, K. M.; Bejuja, K. L.; Tully, J. A. Electron collision strengths for the far-infrared lines of O III. <i>Mon. Not. R. Astron. Soc.</i> 201, 623 (1982) United Kingdom
1052	E03 $e + Ca^{17+}$ E06 $e + Ca^{17+}$	T	10^7 K	Bely-Dubau, F.; Dutoit, J.; Faucher, P.; Gahriel, A. M.; Lefebvre, M.; Steensma-Clark, L.; Volante, S.; Antonucci, E.; Hapley, C. G. Dielectric satellite spectra for highly-charged helium-like ions: VII. Calcium spectra - theory and comparison with SW observations. <i>Mon. Not. R. Astron. Soc.</i> 201, 1155 (1982) France
1053	E03 $e + N^{2+}$	T	$0.4-6.0 \times 10^4$ K	Muebchner, H.; Storey, P. J. The collision strength for the N III (λ) 1750 transition. <i>Astron. Astrophys.</i> 105, 271 (1982) Switzerland

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1054	E03 $e + \text{Ni}^+$	T	4 eV	Hussbaumer, M.; Storey, P. J. [Ni II] emission under nebular conditions. <i>Astron. Astrophys.</i> 110, 295 (1982) Switzerland
1055	E03 $e + \text{Ne}^{2+}$	T	76 Ry	Petrini, B. The theoretical KLL + KLM Auger spectra of the free Ne atom. <i>Astron. Astrophys.</i> 111, 279 (1982) France
1056	E03 $e + \text{Fe}^{2+}$	T	0.7-2.5 Ry	Hussbaumer, M.; Storey, P. J. Forbidden emission lines of Fe VII. <i>Astron. Astrophys.</i> 113, 21 (1982) Switzerland
1057	A12 $\text{Li} + \text{Ne}; \text{Li} + \text{Ne}; \text{Li} + \text{Ar}; \text{Li} + \text{Kr}; \text{Li} + \text{Xe}$	E	500-660 K	Harris, M.; Lwin, H.; McCartan, D. G. The shift of the atomic resonance lines of lithium by noble gases. <i>J. Phys. B</i> 15, L221 (1982) United Kingdom
1058	H06 $h\nu + \text{Na}$	T	0-25 eV	Chang, T. N.; Kim, Y. S. Photoionization of the 2p subshell of the sodium atom under varying outer-shell environments. <i>J. Phys. B</i> 15, L835 (1982) United States
1059	A06 $\text{C}^{2+} + \text{He}; \text{N}^{2+} + \text{He}; \text{O}^{2+} + \text{He}$	E	3-5 keV	Kizure, M.; Imai, T.; Kaneko, Y.; Kobayashi, H.; Natsunoto, A.; Ohtani, S.; Okuno, K.; Takagi, S.; Tawara, H.; Tsurubuchi, S. The (n,l) distributions in electron capture reactions for C^{2+} , N^{2+} and O^{2+} ions colliding with He. <i>J. Phys. B</i> 15, L851 (1982) Japan
1060	A06 $\text{C}^{2+} + \text{H}_2; \text{C}^{2+} + \text{He}$	E	2-5 MeV	Bruch, M.; Dute, L. J.; Trabert, E.; Heckmann, P. H.; Reith, S.; Brand, S. Electron capture to Rydberg states: C^{2+} in collisions with H_2 . <i>J. Phys. B</i> 15, L857 (1982) West Germany
1061	E02 $e + \text{H}$	T	0.5-1.0 K	Moiseiwitsch, B. L. Variational linear algebraic equations method. <i>J. Phys. D</i> 15, L863 (1982) United Kingdom
1062	E02 $e + \text{CO}_2$	E	50-500 eV	Jain, A.; Tayal, S. S. Modified-independent-atom-model (MIAM) calculations for e- CO_2 elastic scattering at 50-500 eV. <i>J. Phys. B</i> 15, L867 (1982) United Kingdom
1063	H06 $h\nu + \text{Li}; h\nu + \text{Na}$	E	40-160 eV	Kronmacker, S.; Schmidt, V.; Bizau, J. M.; Ederer, D. L.; Bhez, P.; Baillet-Latour, F. Inner-shell photoemission studies of lithium and sodium vapour. <i>J. Phys. B</i> 15, 4363 (1982) West Germany
1064	A06 $\text{H}^+ + \text{CH}_4$ A18 $\text{H}^+ + \text{CH}_4$	E	200-2000 keV	Horndal-Pedersen, E.; Ioffe, P.; Rasmussen, J. L. Electron capture in close collisions between protons and carbon (CH_4). <i>J. Phys. B</i> 15, 4421 (1982) Denmark
1065	A06 $\text{N}_2^+ + \text{N}_2; \text{N}_2^+ + \text{N}_2; \text{O}_2^+ + \text{O}_2; \text{CO}^+ + \text{CO}$	T	0.1-30000 eV	Yasunoyev, A. V.; Radtsig, A. A.; Smirnov, B. M. The asymptotic theory of resonance charge exchange between diatomic molecules. <i>J. Phys. B</i> 15, 4437 (1982) Soviet Union
1066	E02 $e + \text{Na}^+ \text{Seq}$	T	10-250000 eV	Vasiliashvili, A. V.; Gurchumeliya, A. S. S-matrix approach to the problem of electron scattering on atoms and ions. <i>J. Phys. B</i> 15, 4453 (1982) Soviet Union
1067	E02 $e + \text{CO}$	T	0.005-10 eV	Chandra, H. Low-energy electron scattering from CO: III. Analytic method for outer region in frame-transformation theory. <i>J. Phys. E</i> 15, 4465 (1982) India
1068	A11 $\text{O}^+ + \text{Xe}$	E	0.5-10 eV	Kiefl, M. U.; Hahn, K.; Fricke, J. Energy-dependent cross sections for the reaction $\text{O}^+ + \text{Xe} \rightarrow \text{O} + \text{Xe}^+(\text{P}_1)$. <i>J. Phys. E</i> 15, L909 (1982) West Germany
1069	A06 $\text{Ne}^{2+} + \text{Ne}$	E	Under	Klein, M. A.; Bashkin, S.; Duval, B. P.; Moscatelli, F.; Silver, J. D.; Beyer, M. F.; Folkman, F. Observations of the $1s2s^2S - 1s2p^2P_{1,2}$ transitions in helium-like Ne^{2+} recoil ions produced in a gas target. <i>J. Phys. B</i> 15, 4567 (1982) United Kingdom

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1070	H06 hv + Fe; hv + Co; hv + Ni	E	58.4 nm	Dyke, J. R.; Graveser, H.W.J.; Lewis, F. A.; Morris, A. Gas-phase high-temperature photoelectron spectroscopy: an investigation of the transition metals iron, cobalt and nickel. <i>J. Phys. B</i> 15, 4523 (1982) United Kingdom
1071	A07 He ⁺ + He A18 He ⁺ + He	E	2000 eV	Besharp, E.; Porgensstern, B.; Niehaus, J. Interference of autoionising transitions in separate atoms: a theoretical analysis applied to electron distributions from He ⁺ + He collisions. <i>J. Phys. B</i> 15, 4577 (1982) The Netherlands
1072	A06 Na ⁺ + Na ⁺	E	550-2000 eV	Rolfes, R. G.; Macdon, K. B. Final-state distributions in charge transfer from sodium Rydberg atoms near the matching velocity. <i>J. Phys. B</i> 15, 4591 (1982) United States
1073	E02 e + H E03 e + H	T	64-200 eV	Brennden, B. H.; Seett, Y.; Schingel, B.; Roychowdhury, B. K. Elastic and inelastic scattering of electrons by atomic hydrogen at intermediate energies in a coupled-channel second-order potential model. <i>J. Phys. B</i> 15, 4605 (1982) United States
1074	E03 e + O ₂	E	14.0-20.3 eV	York, T. A.; Cumer, J. Electron energy-loss studies of molecular oxygen in the region 14.0-20.2 eV using a multidetector electron spectrometer. <i>J. Phys. B</i> 15, 4629 (1982) United Kingdom
1075	E17 e + Zn; e + Cd; e + Hg E19 e + Zn; e + Cd; e + Hg	E	7 eV	Kazakov, S. P. Resonances in the cross sections for electron scattering by zinc, cadmium, and mercury atoms. <i>Sov. Tech. Phys. Lett.</i> 7, 386 (1981) Soviet Union
1076	D06 e + Be; e + C; e + Al; e + Cu; e + Sn; e + Au; e + U	T	2-6000 keV	Tilinin, I. E. Total reflection coefficient for fast electrons incident normally on a surface. <i>Sov. Tech. Phys. Lett.</i> 8, 35 (1982) Soviet Union
1077	B07 Undef	T		Karlov, M. V.; Griev, A. M.; Petrov, Y. M.; Prokhorov, A. M. Interaction between molecules in a resonant electromagnetic field. <i>Sov. Tech. Phys. Lett.</i> 8, 186 (1982) Soviet Union
1078	E03 e + Ne; e + Ar; e + Kr; e + Xe	E	0-50 eV	Kupriyanov, I. E.; Staganov, A. M.; Percv, A. A.; Kabanov, S. F. Mass-spectrometric study of the excitation function of long-lived highly excited states of noble gas atoms. <i>High Energy Chem.</i> 16, 7 (1982) Soviet Union
1079	A14 CO ₂ ⁺ + D ₂ ; CO ₂ ⁺ + CD ₄ ; N ₂ ⁺ + CO ₂	E	30-70 eV	Ladanov, A. I.; Prokof'ev, A. A.; Karachavtsev, G. V.; Potapov, V. K. Mass-spectrometric investigation of slow ion-molecular exchange reactions. <i>High Energy Chem.</i> 16, 71 (1982) Soviet Union
1080	A06 Ar ⁺ + CD ₄ ; Kr ⁺ + CD ₄	E	60 eV	Aparina, E. V.; Balshai, A. A.; Markin, M. I.; Tal'roze, V. L. Measurement of the translational energy of Ar and Kr atoms formed. <i>High Energy Chem.</i> 16, 121 (1982) Soviet Union
1081	E05 e + He; e + Ne; e + Ar; e + Kr; e + Xe	T	0.05-1.0 keV	Dymshits, Y. I.; Neverov, V. G.; Khoroshev, V. G. Calculation of the yields of the primary products of irradiation of inert gases with fast electrons. <i>High Energy Chem.</i> 16, 156 (1982) Soviet Union
1082	E17 e + Ar	T	100 eV	Khare, S. P.; Kumar, A.; Late, K. Elastic scattering of positrons and electrons by argon atoms. <i>Indian J. Pure Appl. Phys.</i> 20, 379 (1982) India
1083	E02 e + C; e + O; e + Ne E17 e + C; e + O; e + Ne	T	45-750 eV	Kaushik, Y. D.; Khare, S. P.; Raj, D. Elastic scattering of electrons by complex atoms at intermediate energies. <i>Indian J. Pure Appl. Phys.</i> 20, 466 (1982) India
1084	E02 e + O ₂ ; e + CO ₂ E17 e + O ₂ ; e + CO ₂	T	45-500 eV	Khare, S. P.; Raj, D. Elastic scattering of electrons by O ₂ and CO ₂ molecules at intermediate energies. <i>Indian J. Pure Appl. Phys.</i> 20, 538 (1982) India

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1085	D10 $H_2 + SS$	E	0-100 kPa	Borisovskii, A. F.; Fosebilo, T. S. Influence of pressure on the penetration of hydrogen through oxidized steel and alloys at 685°C. <i>Sov. At. Energy</i> 52, 135 (1982) Soviet Union
1086	C04 $e + Al; e + Pb$	E	0.01-1 MeV	Gel'din, N. I.; Tkuchenko, V. D. Approximation of the range of electrons as a function of their energy and atomic number. <i>Sov. At. Energy</i> 52, 144 (1982) Soviet Union
1087	C02 $e + H_2O$	T	0.01-39 keV	Pitkevich, V. A.; Videnskii, V. G.; Duba, V. V. Statistical modeling of the slowing down of electrons with energies below 39 keV in a tissue-equivalent material. <i>Sov. At. Energy</i> 52, 195 (1982) Soviet Union
1088	D10 $He + Ti-V-Al$	E	30 keV	Guseva, M. I.; Martynenko, Y. V.; Chalochov, O. I.; Chernov, I. F.; Shadrin, V. N.; Cherdantsev, Y. P.; Sulama, V. M. Effect of temperature on the behavior of implanted helium in a Ti-V-Al alloy. <i>Sov. At. Energy</i> 52, 202 (1982) Soviet Union
1089	D02 $H^+ + Al$ D12 $H^+ + Al$	T	0.1-1 MeV	Dobkin, A. V.; Semchincov, I. V. Properties and electromagnetic emission of a plasma produced at an aluminum target by a proton pulse in vacuum. <i>Sov. J. Plasma Phys.</i> 8, 54 (1982) Soviet Union
1090	D05 $e + O$	E	45-400 eV	Ziegler, B. L.; Newman, J. M.; Smith, R. A.; Stebbings, R. F. Double ionization of atomic oxygen by electron impact. <i>Planet. Space Sci.</i> 30, 451 (1982) United States
1091	A17 $HeM^+; HeH^+; HeH^{2+}$	T	Undef	Paiderova, I.; Vojtik, J.; Polak, R. Atom-in-molecule calculation on diatomic fragments of polyatomic systems: HeH , HeH^+ and HeH^{2+} for a DIM model of Penning ionization of H_2 by He^+ . <i>Chem. Phys.</i> 72, 119 (1982) Czechoslovakia
1092	D03 $e + H_2; e + D_2$ D04 $e + H_2; e + D_2$	E	10-100 eV	Higo, M.; Kasato, F.; Gsawa, T. Electron impact dissociation of molecular hydrogen and deuterium: Isotope effect on the emission cross section of H^+ and D^+ ($n = 3, 4, 5$). <i>Chem. Phys.</i> 73, 99 (1983) Japan
1093	A11 $CO^+ + H_2$	T	80-1500 K	Poulsen, L. L.; Billing, G. D. Vibrational deactivation of CO ($v = 1$) by $p-H_2$ and $c-H_2$. <i>Chem. Phys.</i> 73, 313 (1982) Denmark
1094	H02 $h\nu + PERT$ H03 $h\nu + PERT$	E	100-2000 eV	Henke, B. L.; Lee, P.; Tanske, T. J.; Shisabukuro, R. L.; Fujikawa, B. K. Low-energy x-ray interaction coefficients: photoabsorption, scattering, and reflection. <i>At. Data Nucl. Data Tables</i> 27, 1 (1982) United States
1095	J04 Range-Energy	E	$1.0-10^7$ keV	Janni, J. F. Proton range-energy tables, 1 keV-10 GeV energy loss, range, path length, time-of-flight, straggling, multiple scattering, and nuclear interaction probability: Part 1. For 62 compounds. <i>At. Data Nucl. Data Tables</i> 27, 147 (1982) United States
1096	J04 Range-Energy	E	$1.0-10^7$ keV	Janni, J. F. Proton range-energy tables, 1 keV-10 GeV energy loss, range, path length, time-of-flight, straggling, multiple scattering, and nuclear interaction probability: Part 2. For elements 1 less than or equal to 2 less than or equal to 52. <i>At. Data Nucl. Data Tables</i> 27, 341 (1982) United States
1097	K01 Undef	T	Undef	Kopystynski, A.; Mol, L. Energy transfer in collisions between excited atoms. <i>Phys. Rep.</i> 92, 135 (1982) Poland
1098	H10 $h\nu + Kr; h\nu + Kr + Ar; h\nu + Kr + Ne$	E	10 eV	Young, R. A. Chemistry in mixtures of Kr with Ar and Ne illuminated with Kr resonance radiation. <i>Int. J. Chem. Kinet.</i> 14, 52 (1982) United States

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1099	A14 $O + O_2 + N_2; O + O_2 + O_2; O + O_2 + Ar; O + O_2 + He$	E	210-366 K	Lin, C. L.; Liu, M. T. Temperature and third-body dependence of the rate constant for the reaction $O + O_2 + M + O_2 + M$. Int. J. Chem. Kinet. 14, 417 (1982) United States
1100	A14 $H + O_2$	E	300-431 K	Cupitt, L. T.; Tshets, G. A.; Glaze, G. P. Reaction of hydrogen atoms and $C_2[{}^4\Delta(\text{sub } g)]$. Int. J. Chem. Kinet. 14, 407 (1982) United States
1101	C02 $Ne + Cu; Xe + Cu; Ar + Cu$ C04 $Ne + Cu; Xe + Cu; Ar + Cu$	T	5-60 keV	Balashova, L. L.; Iedonov, A. I.; Mambhova, E. S.; Melchenov, V. A. Spatial and energy distributions of incident particles and recoil atoms at finite distances behind a scattering center. Bull. Acad. Sci. USSR Phys. Ser. 46, 165 (1982) Soviet Union
1102	D12 $K^+ + Al$	E	1-15 keV	Pop, E. S.; Drobach, V. G.; Evdokimov, S. A.; Zapevalov, I. P. Excitation of secondary-emission particles in the ion bombardment of aluminum. Sov. Phys. Tech. Phys. 27, 291 (1982) Soviet Union
1103	D04 $e + Cr; e + Ni; e + Ni; e + Cu$	E	0.7-2.2 keV	Zapozhahanko, V. I.; Kantsel, V. V.; Kashin, G. N. Measurement of Auger electron emission coefficients of Cr, Ni, and Cu. Sov. Phys. Tech. Phys. 27, 283 (1982) Soviet Union
1104	A17 $Ar^+ + Cu$ D01 $Ar^+ + Cu$	E	35 keV	Mambhova, E. S.; Melchenov, V. A.; Shul'ga, V. I. Determination of ion-channel focusing energy from surface scattering data. Sov. Phys. Tech. Phys. 27, 342 (1982) Soviet Union
1105	D18 $H^+ + Al; H^+ + V$	E	30 keV	Katrich, N. F.; Budnikov, A. T. Density distribution profile of implanted hydrogen and blistering in Al and V films. Sov. Phys. Tech. Phys. 27, 763 (1982) Soviet Union
1106	K04 Review	E T	Under	Veksel, V. I. Emission of protons with a continuous spectrum by products of metal sputtering. Sov. Phys. Tech. Phys. 27, 775 (1982) Soviet Union
1107	D04 $He + LiF; He + NaCl; He + KBr; He + LiF; He + NaCl; He + KBr; Ar + LiF; Ar + NaCl; Ar + KBr; Kr + LiF; Kr + NaCl; Kr + KBr$	T	0.5-12 keV	Kishinevskii, L. M.; Pavlis, E. S. Theory of ion-electron emission from alkali-halide crystals. Sov. Phys. Tech. Phys. 27, 764 (1982) Soviet Union
1108	C02 $H^+ + Nb; H^+ + Al; H^+ + C; D^+ + Nb; D^+ + Al; D^+ + C; He^+ + Nb; He^+ + Al; He^+ + C$ C04 $H^+ + Nb; H^+ + Al; H^+ + C; D^+ + Nb; D^+ + Al; D^+ + C; He^+ + Nb; He^+ + Al; He^+ + C$ D18 $H^+ + Nb; H^+ + Al; H^+ + C; D^+ + Nb; D^+ + Al; D^+ + C; He^+ + Nb; He^+ + Al; He^+ + C$	T	10-20 keV	Mel'ker, A. I.; Romanov, E. M. Computer simulation of radiation damage and imbedded atom profiles in solids irradiated with light ions. Sov. Phys. Tech. Phys. 27, 828 (1982) Soviet Union
1109	D12 $e + La$	T	0.5 keV	Anus'ys, M. Y.; Zinkina, T. M.; Fuchiev, M. Y. Broad emission bands in the radiation of atoms bombarded with fast electrons. Sov. Phys. Tech. Phys. 27, 866 (1982) Soviet Union
1110	A14 $OH + H_2S$	E	22-518 K	Lau, M. T.; Smith, S. H. Rate constants for the gas-phase reaction between hydroxyl and hydrogen sulfide over the temperature range 220-518 K. J. Phys. Chem. 86, 73 (1982) United States
1111	A14 $OH + H_2S$	E	223-437 K	Michael, J. V.; Nava, E. F.; Brown, W. D.; Borkowski, R. P.; Stier, L. J. Temperature dependence of the absolute rate constant for the reaction of hydroxyl radical with hydrogen sulfide. J. Phys. Chem. 86, 81 (1982) United States

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1112	A14 $\text{OH} + \text{NO}_2$	E	296 K	DePere, W. B. Rate constant and possible pressure dependence of the reaction $\text{OH} + \text{NO}_2$. <i>J. Phys. Chem.</i> 86, 121 (1982) United States
1113	A14 $\text{H}_2 + \text{O}; \text{O}_2 + \text{O}_2$	E	300 K	Ogren, P. J.; Smorsh, T. J.; Hochanadel, C. J.; Caswell, J. R. Flash photolysis of O_2 in C_2 and $\text{O}_2 + \text{H}_2$ mixtures. Kinetics of $\text{C}_2[{}^1\Sigma(\text{sub } g)]$ and $\text{O}({}^1\text{D}) + \text{H}_2$ reactions. <i>J. Phys. Chem.</i> 86, 238 (1982) United States
1114	A14 $\text{Br} + \text{H}_2\text{O}$	E	300 K	DiGiuseppe, T. G.; Estes, R.; Davidovits, P. Boron atom reactions: 3. Rate constants with H_2O , H_2O_2 , alcohols, and ethers. <i>J. Phys. Chem.</i> 86, 260 (1982) United States
1115	A14 $\text{B}^+ + \text{D}_2$	E	10-50 eV	Sondergaard, N. A.; Sauer, I.; Kaufman, J. J.; Koshi, W. S. Reaction of $\text{B}^+({}^1\Sigma(\text{sub } g))$ with molecular deuterium. <i>J. Phys. Chem.</i> 86, 533 (1982) United States
1116	A11 $\text{MCl}^+ + \text{Ar}$	T	0.3-0.8 eV	Thompson, D. L. Vibrational and rotational relaxation of MCl in collisions with Ar. Quasiclassical trajectories on model potential-energy surfaces. <i>J. Phys. Chem.</i> 86, 626 (1982) United States
1117	A03 $\text{Ar} + \text{H}_2^+$	T	1 eV	Blais, M. C.; Truhlar, D. G. Monte Carlo trajectory calculation of state-to-state cross sections for vibrational-rotational-translational energy transfer in Ar- H_2 collisions. <i>J. Phys. Chem.</i> 86, 638 (1982) United States
1118	A02 $\text{hv} + \text{O}_2$	E	320-210 nm	Astholz, B. C.; Croce, A. E.; Tree, J. Temperature dependence of the ozone absorption coefficient in the Hartley continuum. <i>J. Phys. Chem.</i> 86, 656 (1982) West Germany
1119	A11 $\text{O}_2^+ + \text{O}_2; \text{O}_2^+ + \text{N}_2$	E	300-1850 K	Borrelli, F. M.; Borrelli, P.; Grant, K. R.; Padley, M. D. Rate constants for the energy-pooling and quenching reactions of singlet molecular oxygen at high temperatures. <i>J. Phys. Chem.</i> 86, 700 (1982) United Kingdom
1120	A14 $\text{OH} + \text{NO}_2 + \text{Ar}$	E	300 K	Robertshaw, J. E.; Smith, I. M. Kinetics of the $\text{OH} + \text{NO}_2 + \text{N}$ reaction at high total pressures. <i>J. Phys. Chem.</i> 86, 785 (1982) United Kingdom
1121	A17 $\text{Li} + \text{F}; \text{Li} + \text{Cl}; \text{Li} + \text{Br}; \text{Li} + \text{I};$ $\text{Na} + \text{F}; \text{Na} + \text{Cl}; \text{Na} + \text{Br}; \text{Na} + \text{I};$ $\text{K} + \text{F}; \text{K} + \text{Cl}; \text{K} + \text{Br}; \text{K} + \text{I}; \text{Rb} +$ $\text{F}; \text{Rb} + \text{Cl}; \text{Rb} + \text{Br}; \text{Rb} + \text{I}; \text{Cs} +$ $\text{F}; \text{Cs} + \text{Cl}; \text{Cs} + \text{Br}; \text{Cs} + \text{I}$	T	Under	Goude, B. T.; Bannock, E. W. Empirical potential parameters for alkali halide molecules and crystals, hydrogen halide molecules, alkali metal dimers, and hydrogen and halogen molecules. <i>J. Phys. Chem.</i> 86, 847 (1982) United States
1122	B11 $\text{H}_2 + \text{Pd}; \text{D}_2 + \text{Pd}$	T	300-5000 K	Bowers, F. B.; Tang, X. Y. Quantum effects of vibrational excitation in an idealized three-body reactive collision. <i>J. Phys. Chem.</i> 86, 1107 (1982) United States
1123	A17 H_2	T	Under	Evmler, V. C.; Pelesko, A. D.; Mulliken, R. S. Ab initio study of valence state potential energy curves of H_2 . <i>J. Phys. Chem.</i> 86, 1305 (1982) United States
1124	A14 $\text{H}_2 + \text{O}_2$	E	1200-3200 K	Nishike, Y.; Takahashi, S.; Kawano, H.; Suga, M.; Gardiner, W. C., Jr. Shock-tube measurement of the rate constant for excited $\text{OH}({}^2\Pi^+)$ formation in the hydrogen-oxygen reaction. <i>J. Phys. Chem.</i> 86, 1429 (1982) Japan
1125	A11 $\text{Ar}^+ + \text{OH}$	T	0.2-1.0 eV	Thompson, D. L. Vibrational-rotational-translational energy transfer in $\text{Ar} + \text{OH}$. Quasiclassical trajectory state-to-state cross sections. <i>J. Phys. Chem.</i> 86, 2638 (1982) United States
1126	A14 $\text{HO}_2 + \text{O}; \text{HO}_2 + \text{H}$	E	296 K	Sridharan, U. C.; Giv, L. X.; Kaufman, F. Kinetics and product channels of the reactions of HO_2 with O and H atoms at 296 K. <i>J. Phys. Chem.</i> 86, 4869 (1982) United States

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1127	D00 NO + Pt	E	400-1200 K	Aronow, M.; Guthrie, B. L.; Lin, T.-W.; Somorjai, G. A. Vibrational and rotational energy distribution of NO scattered from the Pt(111) surface: detection by two-photon ionization. Phys. Rev. Lett. 49, 76 (1982) United States
1128	B07 Na + hv H06 hv + Na	T	H06 24400-24500 cm ⁻¹	Harmin, B. A. Theory of the nonhydrogenic Stark effect. Phys. Rev. Lett. 49, 128 (1982) United States
1129	A03 H ⁺ + H ₂ A06 H ⁺ + H ₂	E	49 keV	Knize, R. J.; Lundsen, S. R.; Phipps, F. R. Measurement of excited-state charge-exchange cross sections. Phys. Rev. Lett. 49, 315 (1982) United States
1130	D07 He + CO + Pt; H ₂ + CO + Pt	E	500-3000 m/sec	Peelsma, B.; de Zwart, S. T.; Conesa, G. Scattering cross section of low-coverage CO on Pt(111) for thermal He and H ₂ beams. Phys. Rev. Lett. 49, 578 (1982) West Germany
1131	A06 O ²⁺ + H; O ²⁺ + H	E	0.8-6.0x10 ⁴ K	Church, D. A.; Holzschetter, M. R. Charge transfer from atomic hydrogen to O ²⁺ and O ³⁺ ions with electronvolt energy. Phys. Rev. Lett. 46, 643 (1982) United States
1132	D13 hv + NaCl; hv + LiF	E	40-200 eV	Tolb, M. H.; Traub, J. R.; Kraus, J. S.; Fian, T. R.; Collins, M. E.; Stiffel, H. G.; Margaritondo, G. Optical radiation from photon-stimulated desorption of excited atoms. Phys. Rev. Lett. 49, 812 (1982) United States
1133	H02 hv + Ba; hv + Ba ⁺ ; hv + Ba ²⁺	T	80-160 eV	Mureh, K.; Stett, R. J.; Zaremba, E. Calculation of the 4d subshell photoabsorption spectra of Ba, Ba ⁺ , and Ba ²⁺ . Phys. Rev. Lett. 46, 862 (1982) Canada
1134	D01 e + H	T		Gallas, J.-A.C.; Walther, H.; Werner, E. Simple formula for the ionization rate of Rydberg states in static electric fields. Phys. Rev. Lett. 49, 867 (1982) West Germany
1135	A05 Si ³⁺ + Ar A06 Si ³⁺ + Ar	E	70-160 MeV	Tanin, J. A.; Bernstein, E. M.; Graham, W. G.; Clark, M.; Shafroth, S. M.; Johnson, B. M.; Jeros, K. W.; Meram, M. Resonant behavior in the projectile x-ray yield associated with electron capture in Si + Ar collisions. Phys. Rev. Lett. 49, 1328 (1982) United States
1136	A06 H ⁺ + H; H ⁺ + D; D ⁺ + H; D ⁺ + D A18 H ⁺ + H; H ⁺ + D; D ⁺ + H; D ⁺ + D	E T	40 keV	Rille, E.; Olsen, R. E.; Pascher, J. L.; Blankenship, D. M.; Kvale, T. J.; Redd, E.; Park, J. T. Isotope effect in electron-capture differential cross sections at intermediate energies. Phys. Rev. Lett. 49, 1819 (1982) United States
1137	D05 hv + Ni; hv + Pt	T	56-78 eV	Dietz, R. E.; Yafet, Y.; Williams, G. F.; Lapeyre, G. J.; Anderson, J. Sum-rule test for coherent and incoherent contributions to the photoelectron cross sections near core-electron resonances in metallic Ni and Pt. Phys. Rev. B 24, 6820 (1981) United States
1138	D11 Under	T	Under	Schonhammer, K.; Gunnarsson, O. Sticking probability on metal surfaces: temperature dependence of the electron-hole pair mechanism. Phys. Rev. B 24, 7084 (1981) West Germany
1139	D13 e + CO + Ni; e + NO + Ni; e + N ₂ + Ru	E	0-1200 eV	Faulner, P.; Traichler, R.; Menzel, D. Thresholds and mechanisms in electron-stimulated desorption of ions and neutrals from covalent adsorbates on metals. Phys. Rev. B 24, 7427 (1981) West Germany
1140	H06 hv + Th; hv + U	E	1253 eV	McLean, W.; Colmenares, C. A.; Smith, R. L.; Somorjai, G. A. Electron-spectroscopy studies of clean thorium and uranium surfaces. Chemisorption and initial stages of reaction with C ₂ , CC, and CO ₂ . Phys. Rev. B 26, 8 (1982) United States

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1141	C92 $\text{H}^+ + \text{Al}$	T	Undef	Inokuti, M.; Smith, E. Y. Fermi density effect on the stopping power of metallic aluminum. <i>Phys. Rev. B</i> 25, 61 (1982) United States
1142	D93 $\text{Kr}^+ + \text{Al}$; $\text{Xe}^+ + \text{Li}$; $\text{Xe}^+ + \text{Ga}$; $\text{Xe}^+ + \text{Tl}$; $\text{Ar}^+ + \text{Ba}$	E T	12-80 keV	Kelly, K. Statistical model for the formation of excited atoms in the sputtering process. <i>Phys. Rev. B</i> 25, 700 (1982) United States
1143	D97 $\text{Na} + \text{Cu}$	T	0-65 meV	Gunnarsson, C.; Ichekshamer, K. Inelastic scattering of rare-gas atoms from metal surfaces. Excitation of electron-hole pairs. <i>Phys. Rev. B</i> 25, 2614 (1982) West Germany
1144	D94 $\text{H}^+ + \text{Al}$; $\text{H}^+ + \text{Cu}$; $\text{H}_2^+ + \text{Al}$; $\text{H}_2^+ + \text{Cu}$; $\text{N}_2^+ + \text{Al}$; $\text{N}_2^+ + \text{Cu}$	E	0-400 keV	Svensson, B.; Nilsson, G. Electron emission from aluminum and copper under molecular-hydrogen-ion bombardment. <i>Phys. Rev. B</i> 25, 3856 (1982) Sweden
1145	C92 Undef	T	Undef	Mann, A.; Brandt, W. *Erratum: Material dependence of low-velocity stopping powers [<i>Phys. Rev. E</i> 24, 4999 (1981)]. <i>Phys. Rev. B</i> 25, 3399 (1982) United States
1146	D12 $\text{H} + \text{Ag}$	T	Undef	Adams, A.; Morelone, J.; Hanawa, P. K.; Schlesinger, Z. Light emission from surface-plasmon and waveguide modes excited by H atoms near a silver grating. <i>Phys. Rev. B</i> 25, 3457 (1982) United States
1147	D95 $\text{HD} + \text{Ag}$	E	0.75 eV	Luntz, A. C.; Kleyn, A. M.; Auerbach, E. J. Observation of rotational polarization produced in molecule-surface collisions. <i>Phys. Rev. B</i> 25, 4273 (1982) United States
1148	D93 $\text{H} + \text{Cs}$	E	1000-2500 K	Pergellia, A.; Seidl, P. Formation of H^- ions by backscattering thermal hydrogen atoms from a cesium surface. <i>Phys. Rev. B</i> 25, 4356 (1982) United States
1149	C92 $\text{Xe}^+ + \text{Al}$; $\text{Xe}^+ + \text{Ag}$; $\text{Xe}^+ + \text{Au}$; $\text{U}^+ + \text{Al}$; $\text{U}^+ + \text{Ag}$; $\text{U}^+ + \text{Au}$	T	0-14 MeV/amu	Brueckner, K. A.; Fesbetu, L.; Metzler, M. Stopping power for energetic ions in solids and plasmas. <i>Phys. Rev. E</i> 25, 4277 (1982) United States
1150	D97 Undef	T	Undef	Garcia, M. Normalized distorted-wave Born approximation for soft potentials in atom-surface scattering. <i>Phys. Rev. B</i> 25, 4994 (1982) Switzerland
1151	C92 $\text{He}^+ + \text{C}$; $\text{H}^+ + \text{C}$	E	300 keV	Mertens, F.; Krist, T. Energy loss of 300-keV He^+ and H^+ in 180- to 800-Å carbon foils. <i>Phys. Rev. B</i> 25, 5591 (1982) West Germany
1152	C92 $\text{H}^+ + \text{C}$; $\text{H}^+ + \text{Al}$; $\text{H}^+ + \text{Au}$	T	Undef	Brandt, W.; Kluge, M. Effective stopping-power charges of swift ions in condensed matter. <i>Phys. Rev. B</i> 25, 2631 (1982) United States
1153	D93 Undef D93 $\text{Cs} + \text{Cu}$	T	4-80 eV	Sroubek, Z. Ionization of low-energy atoms ejected from ion-bombarded solid surfaces. <i>Phys. Rev. B</i> 25, 6046 (1982) Czechoslovakia
1154	C95 Undef	T	Undef	Gutierrez, F.; Flores, F.; Echenique, P. M. Charge states for H and He moving in an electron gas. <i>Phys. Rev. B</i> 25, 6105 (1982) Spain
1155	D97 $\text{H}_2 + \text{Cu}$; $\text{He} + \text{LiF}$	T	Undef	Arnaud, G.; Manson, J. R. Scattering of neutral particles by an exponential corrugated potential: a solution for high corrugation amplitude. <i>Phys. Rev. B</i> 25, 6195 (1982) France
1156	D93 $\text{Cs}^+ + \text{H}_2 + \text{Cs}$ D13 $\text{Cs}^+ + \text{H}_2 + \text{Cs}$	E	700 eV	Seidl, M.; Pergellia, A. Production of negative hydrogen ions by scattering absorbed hydrogen from a cesiated molybdenum surface. <i>Phys. Rev. E</i> 26, 1 (1982) United States

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1157	D01 $e + H_2 + Ag$	E	2-5 eV	Berlinsky, A. J. Rotational excitation of physisorbed H_2 by low-energy electron scattering. <i>Phys. Rev. B</i> 26, 443 (1982) United States
1158	C06 $D^+ + Al; D^+ + Au; D^+ + C; D^+ + Co;$ $H^+ + Al; H^+ + Au; H^+ + C; H^+ + Co$	E	50-230 keV	Kraussler, S.; Sizmann, R. Neutralization of 50-230-keV hydrogen ions which have penetrated Al, Au, C, and Co films. <i>Phys. Rev. B</i> 26, 526 (1982) West Germany
1159	D13 $e + CO + W$	E	200-1000 eV	Houston, J. E.; Maday, T. E. Core-level processes in the electron-stimulated desorption of CO from the W(110) surface. <i>Phys. Rev. B</i> 26, 564 (1982) United States
1160	D13 $e + H + Si$	E	0-100 eV	Madden, H. M.; Jennison, D. R.; Tramm, R. N.; Margaritondo, G.; Staffei, M. G. Correlation of stimulated H^+ -desorption threshold with localized state observed in Auger line shape-Si(100): h. <i>Phys. Rev. B</i> 26, 656 (1982) United States
1161	D04 $Ar^+ + V; Ar^+ + Cr$	E	1 keV	Yin, L. I.; Tseng, T.; Coyle, G. J.; Yin, H.; Adler, I. Relative intensity changes of L _{2,3} M Auger transitions in maximal-valent V and Cr compounds under ion bombardment. <i>Phys. Rev. B</i> 26, 1093 (1982) United States
1162	C02 Undef	T	Undef	Brandt, W.; Kitagawa, M. *Erratum: Effective stopping-power charges of swift ions in condensed matter [<i>Phys. Rev. E</i> 26, 5631 (1982)]. <i>Phys. Rev. B</i> 26, 3568 (1982) United States
1163	C02 $He^+ + C; He^+ + Al; He^+ + Au; He^+ +$ $C; He^+ + Al; He^+ + Au; He^+ + C; He^+$ $+ Al; He^+ + Au; Ar^+ + C; Ar^+ + Al;$ $Ar^+ + Au$ C06 $He^+ + C; He^+ + Al; He^+ + Au; He^+ +$ $C; He^+ + Al; He^+ + Au; He^+ + C; He^+$ $+ Al; He^+ + Au; Ar^+ + C; Ar^+ + Al;$ $Ar^+ + Au$	E	70-810 keV	Schulz, F.; Brandt, W. Effective charge of low-velocity ions in matter: a comparison of theoretical predictions with data derived from energy-loss measurements. <i>Phys. Rev. B</i> 26, 4064 (1982) United States
1164	D13 $Ar^+ + CO + Ru$	E	5 keV	Lauderback, L. L.; Elgers, W. M. Intact emission of CO in secondary-ion mass spectrometry of CO-covered Ru(001). <i>Phys. Rev. B</i> 26, 5258 (1982) United States
1165	D01 Undef	T	Undef	Rosenfeld, H. E.; Littmark, U.; Sanders, J. B. Spatial distribution of recoiling atoms with a specific momentum generated in a collision cascade. <i>Phys. Rev. B</i> 26, 5261 (1982) West Germany
1166	C02 $D^+ + C; D^+ + Al; D^+ + Au; D^+ + Cu;$ $He^+ + C; He^+ + Al; He^+ + Au; He^+ +$ Co	E	50-230 keV	Kraussler, S.; Varelas, C.; Sizmann, R. Electronic stopping power and effective charge of 50- to 230-keV D^+ and He^+ in carbon, aluminum, gold, and cesium. <i>Phys. Rev. B</i> 26, 6659 (1982) West Germany
1167	C07 $C^+ + C; N^+ + C$	E	300-400 keV	Lu, F. Q.; Tang, J. Y.; Dautch, B. I. Atomic and nuclear polarization of ^{12}C , ^{13}C , and ^{14}N by beam-foil interaction at 300-400 keV. <i>Phys. Rev. C</i> 26, 1476 (1982) Denmark
1168	E06 $e + C^+$	T	50-100 K	Wainsley, C. M.; Watson, V. D. The influence of dielectronic-like recombination at low temperatures on the interpretation of interstellar, radio recombination lines of carbon. <i>Astrophys. J., Part 1</i> 260, 317 (1982) United States
1169	H04 $h\nu + Co$	E	9356-2276 Å	Cardon, B. L.; Smith, P. L.; Scalo, J. M.; Testerman, L.; Whaling, W. Absolute oscillator strengths for lines of neutral cobalt between 2276 Å and 9357 Å and a redetermination of the solar cobalt abundance. <i>Astrophys. J., Part 1</i> 260, 395 (1982) United States
1170	E16 $e + HCl + Ar$	E	100 keV	Center, R. E.; Jachet, J. M.; Rohai, M.; Rosenborg, Z. Vibrational excitation of HCl in electron beam excited Ar/HCl mixtures. <i>Appl. Phys. Lett.</i> 41, 116 (1982) Israel

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1171	D03 Ar ⁺ + ZnO D04 Ar ⁺ + ZnO	E	0.3-2.0 keV	Tominaga, K.; Ueshita, M.; Shintani, Y.; Toda, O. High-energy neutral atoms in the sputtering of ZnO. Jpn. J. Appl. Phys. 20, 519 (1982) Japan
1172	D07 N ₂ + Ag; O ₂ + Ag; NO + Ag; CO + Ag; CO ₂ + Ag; CH ₄ + Ag	E	300-600 K	Asada, M. Scattering of diatomic and polyatomic molecules from the (111) plane of silver. Jpn. J. Appl. Phys. 20, 227 (1982) Japan
1173	A12 Ca ⁺ + Ar	E	765-7700 K	Uramo, Y.; Nishijima, P.; Maries, M.; Tachibana, K. Measurement of collision broadening of resonance lines of calcium ion by a low-resolution spectrometer. Jpn. J. Appl. Phys. 21, 1021 (1982) Japan
1174	D02 Ne ⁺ + Si; F ⁺ + Si	E	0.1-3.0 keV	Tachi, S.; Miyake, K.; Yokuyama, T. Chemical and physical sputtering in F ⁺ ion beam etching of Si. Jpn. J. Appl. Phys. 20, 1411 (1982) Japan
1175	E09 + + O ₂	E	0.03-1.0 eV	Sugiyama, T. Attachment of low-energy electrons to O ₂ -molecules in Ar-N ₂ -O ₂ gaseous mixtures. Jpn. J. Appl. Phys. 20, 1361 (1982) Japan
1176	D03 Ar ⁺ + Al; Ar ⁺ + Mg; Ar ⁺ + Ni + W; Ar ⁺ + Cu + Ni	E	10 keV	Ohutani, Y.; Shimizu, F. Measurement of the energy distributions of secondary ions from pure metals and alloys. Jpn. J. Appl. Phys. 21, 1435 (1982) Japan
1177	D07 N + PERT; D + PERT; Ne + PERT	E T	0.1-10 keV	Tabata, T.; Ito, R.; Morita, K.; Itikawa, Y. Empirical formulae for the backscattering of light ions from solids. Jpn. J. Appl. Phys. 20, 1925 (1982) Japan
1178	D02 O ₂ ⁺ + Ag; O ₂ ⁺ + Cu; O ₂ ⁺ + Ni; O ₂ ⁺ + Al	E	10 keV	Chajine, V. Measurement of sputtering rate for 10 keV O ₂ ⁺ ions with ion microanalyzer. Jpn. J. Appl. Phys. 20, 2313 (1982) Japan
1179	D02 Ar ⁺ + Ni; Ar ⁺ + Si; Ar ⁺ + Ni + Si	E	5 keV	Kin, S. C.; Yamaguchi, S.; Kataoka, Y.; Iwami, M.; Hiraki, A.; Ietou, M.; Fujimoto, F. Sputtering yields of Si and Ni from the Ni _{1-x} Si _x system studied by Rutherford backscattering spectrometry. Jpn. J. Appl. Phys. 21, 39 (1982) Japan
1180	D07 Ne + Ag; Ar + Ag; N ₂ + Ag; O ₂ + Ag; NO + Ag; CO + Ag; CO ₂ + Ag; CH ₄ + Ag	E	70-85 meV	Asada, M.; Patsui, T. Speed distribution of monatomic, diatomic and polyatomic molecular beams scattered by the (111) plane of silver. Jpn. J. Appl. Phys. 21, 259 (1982) Japan
1181	C02 As ⁺ + Mo; As ⁺ + Mo ₂ ; As ⁺ + N	E	50-150 keV	Fujinaga, K.; Morada, M. Stopping properties of molybdenum films against arsenic ion implantation. Jpn. J. Appl. Phys. 21, 373 (1982) Japan
1182	D02 Sb ⁺ + Ag; Sb ⁺ + Au; Sb ⁺ + Pt; Se ⁺ + Ag; Se ⁺ + Au; Se ⁺ + Pt; Te ⁺ + Ag; Te ⁺ + Au; Te ⁺ + Pt; Sb ₂ ⁺ + Ag; Sb ₂ ⁺ + Au; Sb ₂ ⁺ + Pt; Se ₂ ⁺ + Ag; Se ₂ ⁺ + Au; Se ₂ ⁺ + Pt; Te ₂ ⁺ + Ag; Te ₂ ⁺ + Au; Te ₂ ⁺ + Pt	T	10-2000 keV	Karashima, S. Non-linear effects of molecular ion bombardment on sputtering yield. Jpn. J. Appl. Phys. 21, 424 (1982) Japan
1183	D02 H ⁺ + TaC; H ⁺ + Ni	T	1-4 keV	Ohutani, Y.; Shimizu, F. A hybrid Monte Carlo calculation estimate of angular distribution of sputtered atoms for keV proton bombardment. Jpn. J. Appl. Phys. 21, 270 (1982) Japan
1184	D04 He ²⁺ + Al; He ²⁺ + Cu; He ²⁺ + Ag; He ²⁺ + Au; C ⁶⁺ + Al; C ⁶⁺ + Cu; C ⁶⁺ + Ag; C ⁶⁺ + Au; C ⁶⁺ + Al; C ⁶⁺ + Cu; C ⁶⁺ + Ag; C ⁶⁺ + Au; N ⁸⁺ + Al; N ⁸⁺ + Cu; N ⁸⁺ + Ag; N ⁸⁺ + Au; N ⁸⁺ + Al; N ⁸⁺ + Cu; N ⁸⁺ + Ag; N ⁸⁺ + Au; O ⁸⁺ + Al; O ⁸⁺ + Cu; O ⁸⁺ + Ag; O ⁸⁺ + Au	E	4.5-6.0 MeV/amu	Koyama, A.; Ebikato, T.; Sakurai, M.; Yagi, E. Secondary electron emission from metal targets under heavy ion bombardment. Jpn. J. Appl. Phys. 21, 586 (1982) Japan

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1185	D07 $O^+ + Pd$	E	0.2-2.4 keV	Saiki, K.; Tanaka, S. Scattering of low energy oxygen ions from a polycrystalline palladium surface. Jpn. J. Appl. Phys. 21, L225 (1982) Japan
1186	D02 $H_2^+ + C$	E	3 keV	Yanada, R.; Nakamura, K.; Saitoh, M. Chemical sputtering yield of pyrolytic graphite bombarded with 3 keV H_2^+ under atomic hydrogen atmosphere. J. Nucl. Mater. 98, 167 (1981) Japan
1187	D02 $H_2^+ + SiC$	E	3 keV	Sone, K.; Saitoh, M.; Nakamura, K.; Yanada, R.; Murakami, Y.; Shikama, T.; Fukutomi, M.; Kitojima, M.; Ohada, P. Sputtering of silicon carbide coatings by low-energy hydrogen ions. J. Nucl. Mater. 90, 270 (1981) Japan
1188	D18 $H^+ + SS$	E	100 eV	Baehs, M. I. Hydrogen recycling from stainless steel. J. Nucl. Mater. 55, 327 (1981) United States
1189	D18 $H^+ + Mo; D^+ + Mo$	E	0.5-6.0 keV	Yanada, R.; Nakamura, K.; Sone, K.; Saitoh, M. Dose and energy dependence of low-induced release of deuterium from molybdenum by low energy hydrogen ions. J. Nucl. Mater. 101, 100 (1981) Japan
1190	D17 $H^+ + TiC; D^+ + TiC$	E	1-3 keV	Ferre, C.; Francini, E.; Nori, A.; Bressa, F. Behaviour of TiC coatings under hydrogen and deuterium ion bombardment. J. Nucl. Mater. 101, 224 (1981) Italy
1191	D02 $He^+ + C$	E	200 keV	Saitoh, M.; Yanada, R.; Nakamura, K. Surface erosion and re-emission behaviour of various types of carbon under helium-ion bombardment. J. Nucl. Mater. 102, 97 (1981) Japan
1192	D13 $Ar^+ + Cl + Mo; Ar^+ + C + Mo$	E	0.2-1.0 keV	Pena, J. L.; Sieball, J. W.; Lichtman, E. Argon ion impact desorption cross sections of chlorine and carbon from silybdenum. J. Nucl. Mater. 102, 267 (1981) United States
1193	D18 $D^+ + C$	E	0.53-3.0 keV	Wenpler, W. R.; Brice, D. K.; Magee, C. W. Saturation of deuterium retention in carbon, a new calibration for plasma edge probes. J. Nucl. Mater. 102, 304 (1981) United States
1194	D02 $O^+ + TiC; O^+ + SiC; D^+ + C; O^+ + W; D^+ + SS; C^+ + TiC; C^+ + SiC; C^+ + C; C^+ + W; C^+ + SS$	E	0.1-10 keV	Mechtl, E.; Bohdansky, J.; Roth, J. The sputtering yield of typical impurity ions for different fusion reactor materials. J. Nucl. Mater. 103-104, 333 (1982) West Germany
1195	D02 $H^+ + Ni; H^+ + NbB_2; D^+ + Ni; D^+ + NbB_2$	E	0.45-8.0 keV	Bohdansky, J.; Chen, G. L.; Eckstein, H.; Roth, J. Light ion sputtering of fusion reactor materials in dependence of angle of incidence. J. Nucl. Mater. 103-104, 329 (1982) West Germany
1196	D02 $D^+ + Fe; D^+ + Mo; D^+ + W$	T	50-200 keV	Haggenrich, L. G.; Biersack, J. P. Sputtering yield calculations of neutral beam particle energies. J. Nucl. Mater. 103-104, 248 (1982) United States
1197	D02 $D^+ + SiC$	E	10 keV	Kato, S.; Sato, Y.; Pohri, M.; Yamashina, T. Energy analysis of secondary ion species sputtered from silicon carbide surface during deuterium ion irradiation. J. Nucl. Mater. 103-104, 321 (1982) Japan
1198	D13 $He^+ + H_2 + Mo; He^+ + CO + Mo; He^+ + O_2 + Mo; He^+ + P + Mo; He^+ + H_2 + Mo; He^+ + CO + Mo; He^+ + O_2 + Mo; He^+ + I + Mo; Ar^+ + H_2 + Mo; Ar^+ + CO + Mo; Ar^+ + O_2 + Mo; Ar^+ + P + Mo$	E	0.3-2.8 keV	Sogero, A.; Phelishi, K.; Kamada, K.; Nishihara, A. ISS studies on sputtering of chemisorbed gases by low-energy ions. J. Nucl. Mater. 103-104, 367 (1982) Japan
1199	D52 $D^+ + TiC$	E	0.4-10 keV	Bardera, J. A.; Nelson, G. C. Sputtering and surface modification of TiC coatings by low energy deuterium bombardment. J. Nucl. Mater. 103-104, 345 (1982) United States

REF. NO.	REACTANTS	EXP OR THEORY	ENERGY RANGE	REFERENCE
1200	D07 H + SS; D + SS D10 H + SS; D + SS K04 H + SS; D + SS	E T	0.1-10 keV	Wilson, K. L. Hydrogen recycling properties of stainless steels. J. Nucl. Mater. 103-104, 453 (1982) United States
1201	D10 D ⁺ + SS	E	Under	Waelbroeck, F.; Winter, J.; Wienhold, F. Influence of the wall temperature on hydrogen recycling phenomena in an SS simulation apparatus. J. Nucl. Mater. 103-104, 471 (1982) West Germany
1202	D10 D ⁺ + Ni; D ⁺ + Ni	E	20 keV	Tanabe, T.; Ito, M.; Etoh, Y.; Imoto, S. Permeation and reemission of deuterium implanted in first wall materials. J. Nucl. Mater. 103-104, 463 (1982) Japan
1203	D17 H + TiC; H + TiB ₂	E	315-510 K	Ashby, C. I. H.; Hye, S. R. Electron enhanced hydrogen attack on first wall materials. J. Nucl. Mater. 103-104, 485 (1982) United States
1204	D10 D ₂ ⁺ + SS	E	6 keV	Wilson, K. L.; Fonten, A. E.; Haggmark, L. G.; Baskes, M. I.; Bohdansky, J.; Roth, J. Trapping of deuterium in helium-damaged steels: He ⁺ fluence dependence. J. Nucl. Mater. 103-104, 493 (1982) United States
1205	D13 H + D + SS	E	0.5-1.5 keV	Baetz, E.; Haggmark, L. G. Ion impact desorption and hydrogen release. J. Nucl. Mater. 103-104, 499 (1982) United States
1206	D10 H ⁺ + Si	T	1.5-20 keV	Brice, D. K.; Doyle, B. L. A trap activation model for hydrogen retention and isotope exchange in some refractory materials. J. Nucl. Mater. 103-104, 503 (1982) United States
1207	D10 H ⁺ + C; D ⁺ + C	E	0.5-1.5 keV	Wampler, W. F.; Magee, C. W. Depth resolved measurements of hydrogen isotope exchange in carbon. J. Nucl. Mater. 103-104, 509 (1982) United States
1208	D10 H ⁺ + TiC; D ⁺ + TiC	E	1.5 keV	Doyle, B. L.; Wampler, W. R.; Brice, D. K. Temperature dependence of H saturation and isotope exchange. J. Nucl. Mater. 103-104, 513 (1982) United States
1209	D07 H ⁺ + Ni; H ⁺ + SS; H ⁺ + C	E	0.15-2.2 keV	Kono, A.; Sakai, K.; Tanaka, H.; Tanaka, S. Energy and angular dependences of low energy hydrogen ions backscattered from sputter-coated, stainless steel and graphite. J. Nucl. Mater. 103-104, 515 (1982) Japan
1210	D07 He ⁺ + W	T	0.008-1.5 keV	Robinson, M. T. The reflection of low energy helium atoms from tungsten surfaces. J. Nucl. Mater. 103-104, 525 (1982) United States
1211	D02 He ⁺ + Ar	E	0.1-3.0 MeV	Beebecker, F.; Ertiger, J.; Greversen, O.; Hansen, J. L.; Sorensen, M. The erosion of frozen argon by swift helium ions. Nucl. Instrum. Methods Phys. Res. 191, 221 (1981) Denmark
1212	D02 Ar ⁺ + [Ag + Au]; Ar ⁺ + [Cu + Pt]	E	20-80 keV	Andersen, M. K.; Chevallier, J.; Chernysh, V. The angular distribution of material sputtered from AgAu and CuPt by 20-80 keV argon. Nucl. Instrum. Methods Phys. Res. 191, 241 (1981) Denmark
1213	D02 Ar ⁺ + Co	E	80 keV	Chernysh, V. I.; Jøhansen, A.; Serholt-Kristensen, L. Sputtering yield measurements on single crystal cobalt. Nucl. Instrum. Methods Phys. Res. 191, 253 (1981) Denmark
1214	D02 Ar ⁺ + KCl; Ar ⁺ + NaCl; Ar ⁺ + LiF	E	45 keV	Kerstus, Z. L.; Kelly, J. C.; Delglish, R. L.; MacDonald, R. J.; Bayly, A. R.; Martin, P. J. Sputtering of ionic clusters from KCl, NaCl and LiF. Nucl. Instrum. Methods Phys. Res. 191, 255 (1981) Australia

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1215	D03 Ar ⁺ + Nb; Ar ⁺ + [Nb + V]	E	1-55 keV	Leston, C. P.; Partin, F. J.; MacDonald, S. J. Contamination induced changes in photoemission from Nb and Nb/V alloys. Nucl. Instrum. Methods Phys. Res. 191, 269 (1981) Australia
1216	D02 Ar ⁺ + [Cu + Pd] D17 Ar ⁺ + [Cu + Pd]	E	0.5-5.0 keV	Sundaraman, M.; Eherse, S. K.; Kumar, L.; Krishnan, R. Sputtering induced surface composition changes in copper-palladium alloys. Nucl. Instrum. Methods Phys. Res. 191, 285 (1981) India
1217	D03 Ar ⁺ + Nb; Ar ⁺ + V; Ar ⁺ + [Nb + V]	E	53 keV	Gerrett, R. F.; MacDonald, R. J. Cluster ion emission from ion bombarded niobium-vanadium alloys. Nucl. Instrum. Methods Phys. Res. 191, 308 (1981) Australia
1218	D03 Ar ⁺ + [Al + Zn]	E	~ keV	Van Creen, R.; Van Esen, P.; Adams, F. Study of the matrix effect in the secondary ion emission of aluminium-silicic. Nucl. Instrum. Methods Phys. Res. 191, 313 (1981) Belgium
1219	D08 D ⁺ + Cr; D ⁺ + Ni	E	150 keV	Rau, C.; Eichner, S. Electron capture spectroscopy ECS at Cr(100) and Ni(110) surfaces. Nucl. Instrum. Methods Phys. Res. 191, 433 (1981) West Germany
1220	C02 H ⁺ + PERT C06 N ⁺ + Cu; N ⁺ + Al; N ⁺ + C; N ⁺ + Au; H ⁺ + PERT	T	Under	Brandt, W. Modern problems of low-velocity stopping powers. Nucl. Instrum. Methods Phys. Res. 191, 483 (1981) United States
1221	C02 O ⁺ + Al; He ²⁺ + Al; C ⁺ + Al	E	4-50 MeV	Soffield, C. J.; Cseern, M.E.B.; Freeman, J. W. The role of charge-exchange in energy-loss straggling. Nucl. Instrum. Methods Phys. Res. 191, 462 (1981) United Kingdom
1222	C02 H ⁺ + Ni; H ⁺ + Ag; H ⁺ + Au; He ⁺ + Ni; He ⁺ + Ag; He ⁺ + Au	E	20-140 keV	Thompson, D. A.; Pechman, M.F.S.; Presnka, P.; Davies, J. A. Stopping powers for 20-140 keV H ⁺ and He ⁺ on Ni, Ag and Au. Nucl. Instrum. Methods Phys. Res. 191, 465 (1981) Canada
1223	C02 H ⁺ + Au	E	0.8-3.8 MeV	Andersen, H. E.; Beilman, S. R. The stopping power of gold in the Bethe region. Nucl. Instrum. Methods Phys. Res. 191, 472 (1981) Denmark
1224	C02 H ⁺ + Cu; D ⁺ + Cu; He ²⁺ + Cu	E	0.2-3.0 MeV/amu	Friedland, E.; Kotze, C. P. Energy-loss straggling of protons, deuterons and α -particles in copper. Nucl. Instrum. Methods Phys. Res. 191, 490 (1981) South Africa
1225	A02 H ⁺ + Au; D ⁺ + Au; He ⁺ + Au; Li ⁺ + Au; Au; Be ⁺ + Au; C ⁺ + Au; N ⁺ + Au; Ne ⁺ + Au A18 H ⁺ + Au; D ⁺ + Au; He ⁺ + Au; Li ⁺ + Au; Au; Be ⁺ + Au; C ⁺ + Au; N ⁺ + Au; Ne ⁺ + Au D07 H ⁺ + Au; D ⁺ + Au; He ⁺ + Au; Li ⁺ + Au; Au; Be ⁺ + Au; C ⁺ + Au; N ⁺ + Au; Ne ⁺ + Au	E	65-135 keV	Pechman, M.F.S.; Thompson, D. A.; Davies, J. A. Large angle differential scattering cross-sections for various ions (2 less than or equal to Z, less than or equal to 10) in the 65-135 keV energy range. Nucl. Instrum. Methods Phys. Res. 191, 495 (1981) Canada
1226	C05 Under	T	Under	Smith, A. E. Small angle multiple scattering of ions for the McIlwain potential. Nucl. Instrum. Methods Phys. Res. 191, 500 (1981) Australia
1227	D07 He ⁺ + Au; He ⁺ + Pt; He ⁺ + Ge	E	0.5-2.5 MeV	Appleton, B. R.; Holland, G. W.; Barrett, J. M. Reversibility effects in disordered and ordered solids leading to scattered-ion yield enhancements near 180°. Nucl. Instrum. Methods Phys. Res. 191, 507 (1981) United States
1228	D07 He ⁺ + Au	T	2 MeV	Butler, J. W. On the shapes of high-resolution Rutherford backscattering spectra. Nucl. Instrum. Methods Phys. Res. 191, 516 (1981) United States

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1229	D07 He ⁺ + Bi	E	0.5-2.0 MeV	Jackson, T. E.; Davies, J. N.; Eckstein, G.; Moore, J. A. An experimental study of the 106° backscattering yield enhancement. <i>Nucl. Instrum. Methods Phys. Res.</i> 191, 527 (1981) Canada
1230	A07 He ⁺ + Dy; He ⁺ + V; He ⁺ + Au; He ⁺ + Pb; He ⁺ + U	E	1-3.0 MeV	Cohen, B. D. NIEL - a comparison of experimental ionization subshell cross sections with PHBA, PWBA and CPSSR theories. <i>Nucl. Instrum. Methods Phys. Res.</i> 191, 551 (1981) Australia
1231	A07 Ar ⁺ + Al; Ar ⁺ + Si; Ar ⁺ + P; Ar ⁺ + S; Ar ⁺ + Cl; Ar ⁺ + Ar	E	0.5-6.0 MeV	Holtz, C.; Caillaret, J.; Iturbe, J.; Legarde, G.; Siffert, P. On the possibility of immediate analysis of chlorine and sulfur in air by argon ion induced x-ray emission. <i>Nucl. Instrum. Methods Phys. Res.</i> 191, 554 (1981) France
1232	D04 e + Sn + Cu; e + Pb + Cu	E	2134 eV	Argile, C.; Fhead, G. E. Secondary electron emission enhancement by metal monolayer adsorption. <i>J. Phys. C</i> 15, L152 (1982) France
1233	D07 Undef	T	Undef	Harris, J.; Liebsch, A. Interaction of helium with a metal surface. <i>J. Phys. C</i> 15, 2275 (1982) United States
1234	D02 e + KCl; e + NaCl	E	0.3 keV	Friedenberg, A.; Shagrir, Y. Electron-induced sputtering of KCl and NaCl. <i>J. Phys. C</i> 15, 4763 (1982) Israel
1235	D13 e + CO + U	E	5-25 eV	Rutio, J.; Lopez-Sanche, J. M.; Lopez-Sanche, M. P. Resonant contributions to the cross section for electron stimulated desorption of neutral particles from absorbates. <i>J. Vac. Sci. Technol.</i> 20A, 217 (1982) Spain
1236	D03 Ar ⁺ + Cu; Ar ⁺ + Cu ₂ S; Ar ⁺ + Cu ₂ O	E	3.5 keV	Hammer, G. E. Matrix effects in SIMS: ion yield enhancement in copper sulfide films on copper and copper alloys. <i>J. Vac. Sci. Technol.</i> 20A, 403 (1982) United States
1237	D03 Ne ⁺ + O + V; Ne ⁺ + O + Nb D13 Ne ⁺ + O + V; Ne ⁺ + O + Nb	E	500 eV	Yu, M. L. Summary abstract: Escape velocity dependence of secondary ion emission during sputtering. <i>J. Vac. Sci. Technol.</i> 20A, 417 (1982) United States
1238	D03 Xe ⁺ + CsI	E	4.7 keV	Colton, R. J.; Barish, T. M.; Wyatt, J. R.; DeCorpo, J. J.; Campana, J. E. Summary abstract: On the formation and emission of polyatomic secondary ions from metal salts. <i>J. Vac. Sci. Technol.</i> 20A, 421 (1982) United States
1239	D03 Ar ⁺ + PtSi; Ar ⁺ + NiSi ₂ ; Ar ⁺ + AgAu; Xe ⁺ + PtSi; Xe ⁺ + NiSi ₂ ; Xe ⁺ + AgAu D17 Ar ⁺ + PtSi; Ar ⁺ + NiSi ₂ ; Ar ⁺ + AgAu; Xe ⁺ + PtSi; Xe ⁺ + NiSi ₂ ; Xe ⁺ + AgAu	E	0.5-2.0 keV	Holloway, P. M.; Bhattacharya, R. S. Preferential sputtering of PtSi, NiSi ₂ , and AgAu. <i>J. Vac. Sci. Technol.</i> 20A, 444 (1982) United States
1240	D13 Kr ⁺ + Zr	E	3 keV	Wright, R. B.; Yurg, C. E.; Pellin, M. J.; Gruen, D. M. High resolution continuous wave laser induced fluorescence spectroscopy of sputtered Zr atoms. <i>J. Vac. Sci. Technol.</i> 20A, 510 (1982) United States
1241	D02 Ar ⁺ + Sn + Pb; Ar ⁺ + Sn + In; Ar ⁺ + In + Pb D17 Ar ⁺ + Sn + Pb; Ar ⁺ + Sn + In; Ar ⁺ + In + Pb	E	2 keV	Frankenthal, F. F.; Siconolfi, D. J. Summary abstract: Effect of ion sputtering on the surface composition of binary alloys of tin, lead, and indium. <i>J. Vac. Sci. Technol.</i> 20A, 516 (1982) United States
1242	D13 e + CO + V; e + O + V; hv + O + Mo; e + CO + Ru	E	5-3600 eV	Menzel, D. Recent developments in electron and photon stimulated desorption. <i>J. Vac. Sci. Technol.</i> 20A, 538 (1982) West Germany

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1243	D03 e + NaCl; e + KCl D13 e + NaCl; e + KCl	E	20-1000 eV	Pian, T. R.; Teik, B.; Kraus, J.; Traus, M. M.; Tully, J.; Collins, W. E. Electron-stimulated desorption of excited alkali atoms from alkali halide surfaces. J. Vac. Sci. Technol. 20A, 556 (1982), United States
1244	D13 e + H + Ni; e + H + Pd	E	Undef	Melius, C. F.; Mcell, J. O.; Stulen, R. H. A theoretical study of stimulated desorption of protons from transition metal surfaces. J. Vac. Sci. Technol. 20A, 659 (1982), United States
1245	D06 Undef	T	Undef	Hall, B. W.; Tong, S. Y. The image potential barrier for large angle inelastic electron scattering from surfaces. J. Vac. Sci. Technol. 20A, 676 (1982), United States
1246	D13 e + H + Pd	E	10-80 eV	Stulen, R. H. Electron-stimulated desorption from hydrogen exposed palladium (100). J. Vac. Sci. Technol. 20A, 646 (1982), United States
1247	D02 D* + TiC; E* + TiB ₂ ; He* + TiC; He* + TiB ₂	E	1.5-60 keV	Kosinsky, M.; Nielson, R.; Zachack, P. Preferential sputtering of TiC and TiB ₂ coatings under B ⁺ and He ⁺ bombardment: partial yields. J. Vac. Sci. Technol. 20A, 1584 (1982), United States
1248	D04 e + Si; e + Ti; e + Cu; e + Mo	E	100-1500 eV	Ruzic, B.; Moore, F.; Manos, D.; Cohen, S. Secondary electron yields of carbon-coated and polished stainless steel. J. Vac. Sci. Technol. 20A, 1313 (1982), United States
1249	D17 Review	E T	Undef	Kelly, R. Factors determining the compound phases formed by oxygen or nitrogen implantation in metals. J. Vac. Sci. Technol. 21A, 778 (1982), United States
1250	E02 e + Ar E19 e + Ar	E T	0.01-5.0 eV	Haddad, G. R.; C'Malley, T. F. Scattering cross sections in argon from electron transport parameters. Aust. J. Phys. 35, 25 (1982), Australia
1251	E02 e + H	T	30-400 eV	Das, J. N.; Elavaz, A. K.; Saha, M. Electron-hydrogen elastic scattering at intermediate and high energies. Aust. J. Phys. 35, 392 (1982), India
1252	E02 e + H E03 e + H E17 e + H	T	54-100 eV	McCarthy, I. E.; Steibevics, A. T. Intermediate-energy electron scattering by atomic hydrogen. Aust. J. Phys. 35, 543 (1982), Australia
1253	E01 e + He	E	0.0-50 eV	Jones, B. K.; Echen, F. A. The pulsed electron beam time-of-flight method for measuring absolute total cross sections: atomic helium. Aust. J. Phys. 35, 569 (1982), United States
1254	E05 e + H; e + He; e + Kr	T	400-1200 eV	Weigold, E. Electron coincidence spectroscopy: an introduction to aerosol space chemistry. Aust. J. Phys. 35, 571 (1982), Australia
1255	A03 He + N ₂ A18 He + N ₂	E	27 meV	Tommies, J. P. Rotational and vibrational transitions in molecular collisions. Aust. J. Phys. 35, 593 (1982), West Germany
1256	A03 K + N ₂	E	0-2 eV	Ross, U.; Schepper, W.; Beck, D. Activation threshold for vibrational excitation in K-N ₂ collisions. Chem. Phys. 61, 95 (1981), West Germany
1257	E03 e + CH ₄ E04 e + CH ₄	E	20-300 eV	Ogawa, T.; Kurawaki, J.; Nigo, M. Translational energy distribution and production mechanism of excited hydrogen atoms produced in electron-CH ₄ collisions. Chem. Phys. 61, 161 (1981), Japan
1258	H05 hv + O ₂	E	21 eV	Boesch, R.; Schuelzer, A.; Stedermann, J. P. The predissociation of molecular oxygen cations O ₂ ⁺ [B ² I(sub g)-]. Chem. Phys. 61, 214 (1981), Switzerland

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1259	A11 $H_2^+ + He$	T	0.5-1.5 eV	Orlikowski, T. Close-coupling calculations of the cross sections and relaxation rates for ro-vibrational transitions in H_2 colliding with He. Chem. Phys. 61, 405 (1981) Poland
1260	A17 $He + He$	T	Under	Molinaowski, P.; Tanner, A. C.; Lee, K. F.; Linder, B. Van der Waals forces, scattering functions and charge density susceptibility: II. Application to the He-He interaction potential. Chem. Phys. 62, 423 (1981) United States
1261	A17 $H_2 + CO$	T	Under	Poulsen, L. L. An analytical representation of the $H_2 + CO$ potential. Chem. Phys. 68, 29 (1982) Denmark
1262	A06 $Ar^+ + CO; CO^+ + CO$	E	300 K	Danon, J.; Marx, R. Laser induced fluorescence study of thermal energy charge transfer reactions from $Ar^+(^2P_{3/2}, ^2F_{3/2})$ and $CO^+(X^2\Sigma, v \text{ double prime})$ to CO. Chem. Phys. 66, 255 (1982) France
1263	A16 $Cl^- + He; Cl^- + Ne; Cl^- + Ar; Cl^- + Kr; Cl^- + Xe$	E	1.5-3 keV	De Vreugd, C.; Wijngaerts van Rosend, R. W.; Delos, J. B.; Lee, J. Energy distributions of electrons detached in Cl^- + noble gas atom collisions. Chem. Phys. 68, 275 (1982) The Netherlands
1264	A17 $He + He; He + Ar; He + Kr; He + Ar; He + Kr$	T	Under	Watanabe, K.; Allnatt, A. R.; Meath, W. J. On the interatomic potentials for noble gas mixtures. Chem. Phys. 68, 423 (1982) Canada
1265	A14 $C^+ + H_2$ A17 $C^+ + H_2$	T	Under	Jaquet, R.; Stenmier, V. CEPA calculations of potential energy surfaces for open-shell systems: II. The reaction of C^+ ions with molecular hydrogen. Chem. Phys. 68, 475 (1982) West Germany
1266	A03 $D^+ + CH_4; H^+ + CH_4; Li^+ + CH_4$	T	2.78-15.9 eV	Ellenbroek, T.; Tennyson, J. P. A semiclassical model for the vibrational excitation of spherical-top molecules in collisions with ions. Chem. Phys. 71, 365 (1982) West Germany
1267	A07 $Ce + NO; Ce + O_2; K + NO; K + O_2; Na + NO; Na + O_2$	E	30-300 eV	Kicop, U. C.; Lee, J. State-to-state total cross sections for ion-pair formation. Chem. Phys. 71, 443 (1982) The Netherlands
1268	H02 $h\nu + He + Ar$	E	25-500 cm^{-1}	Raczynski, A. Collision-induced absorption in a He-Ar mixture. Chem. Phys. 72, 321 (1982) Poland
1269	A02 $Ar + Ar; Ar + Xe; Ar + Kr; Kr + Ar; Kr + Kr$	E	$2 \times 10^3 - 2 \times 10^6$ K	Beljersinch, h.C.W.; Van der Kam, P.H.A.; Verster, N. F. Glory undulations in the total cross section for Ar-Ar, Kr, Xe and Kr-Ar, Kr. Chem. Phys. 72, 351 (1982) The Netherlands
1270	D03 $e + Ag$ D05 $e + Ag$	E	17-250 eV	Krasavin, A. Y.; Kucharev, A. N.; Salracy, Y. M. Measurement of excitation cross sections of the silver ion by electron impact. J. Appl. Spectrosc. 36, 373 (1982) Soviet Union
1271	A12 $H_2O^+ + H_2O$ H02 $h\nu + H_2O$	E	A12 300 K H02 694 nm	Tikhomirov, S. A.; Fonosov, Y. N.; Delgikh, V. A. Measurement of the parameters of the 654.215, 694.237, and 694.38 nm absorption lines of atmospheric water vapor. J. Appl. Spectrosc. 36, 466 (1982) Soviet Union
1272	D03 $e + V$	E	3-200 eV	Krasavin, A. Y.; Kucharev, A. N.; Salracy, Y. M. Excitation cross sections of the vanadium atom. J. Appl. Spectrosc. 36, 275 (1983) Soviet Union
1273	D03 $e + Cu$	E	5-200 eV	Krasavin, A. Y.; Kucharev, A. N.; Salracy, Y. M. Measurement of the cross section of excitation of copper atoms by electron impact. J. Appl. Spectrosc. 36, 631 (1982) Soviet Union

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1274	H02 $h\nu + CO; h\nu + CO_2$	T	2.7-4.7 μ	Kudryavtsev, M. N.; Evikov, S. S. Integral emission and absorption characteristics of CO_2 and CO bands in conditions of vitreous disequilibrium. J. Appl. Spectrosc. 37, 83. (1982) Soviet Union
1275	E03 $e + Mo$	E	3-200 eV	Bopdanov, S. B.; Budylov, A. Y.; Kuchenev, A. M.; Sairacov, Y. M. Cross sections for the excitation of molybdenum atoms from the ground state by electron impact. J. Appl. Spectrosc. 37, 989 (1982) Soviet Union
1276	D13 $h\nu + H_2 + SS; h\nu + CO + SS$	E	Undef	Pospieszczyk, A.; Tegle, J. A. Absorption behaviour of H_2 and CO on Inconel 600 surfaces under laser-induced thermal desorption. J. Nucl. Mater. 105, 14 (1982) West Germany
1277	D02 $n + Nb; n + Au$	E	14.6 MeV	Behrisch, R. Sputtering with neutrons. J. Nucl. Mater. 108, 73 (1982) West Germany
1278	D18 $D^+ + SS$	E	15 keV	Myers, S. M.; Wampler, W. R. Trapping and surface permeation of deuterium in helium-implanted stainless steel. J. Nucl. Mater. 111-112, 579 (1982) United States
1279	D03 $H_2^+ + C; D_2^+ + C$	E	12 keV	Underwood, N. C. Surface processes occurring under hydrogen isotope bombardment studied by secondary-ion emission. J. Nucl. Mater. 111-112, 584 (1982) United Kingdom
1280	D18 $D_2^+ + TiO_2; D_2^+ + TiC; D_2^+ + Si; D_2^+ + Al_2O_3$	E	0.1-2 keV	Erents, S. K. Deuterium trapping in low-Z coatings. J. Nucl. Mater. 111-112, 590 (1982) United Kingdom
1281	D18 $D^+ + C; D^+ + TiC; H^+ + C; H^+ + TiC$	T	1.5 keV	Brice, D. K.; Boyle, B. L.; Wampler, W. R. Extended local mixing model for hydrogen retention and isotope exchange. J. Nucl. Mater. 111-112, 558 (1982) United States
1282	D18 $D^+ + C$	E	0.1-1.0 keV	Sone, K.; McCracker, G. M. The effect of radiation damage on deuterium re-emission and trapping in carbon. J. Nucl. Mater. 111-112, 606 (1982) United Kingdom
1283	D18 $D^+ + C$	E	0.15-0.6 keV	Wampler, W. R.; Myers, S. M. Ion-induced release of deuterium from carbon. J. Nucl. Mater. 111-112, 616 (1982) United States
1284	D18 $D^+ + SS; D_2^+ + SS$	E	10 keV	Wilson, K. L.; Bashas, P. I. Deuterium re-emission from 304W stainless steel. J. Nucl. Mater. 111-112, 622 (1982) United States
1285	D18 $D^+ + SS$	E	2.5-20 keV	Young, R.; Thomas, E. W.; Emmoth, B. Re-emission of implanted deuterium from the back side of a stainless steel membrane. J. Nucl. Mater. 111-112, 642 (1982) United States
1286	D18 $D_2^+ + SS$	E	6.0 keV	Pontau, A. E.; Bashas, P. I.; Wilson, K. L.; Haggmark, L. G.; Bohdansky, J.; Scherzer, S.M.U.; Roth, J. Deuterium retention in helium-damaged stainless steel: d-trapping energy. J. Nucl. Mater. 111-112, 661 (1982) United States
1287	D18 $D^+ + C; D^+ + SS$	E	5 keV	Thomas, E. W.; Seun, H. Dynamic measurements of implanted deuterium retention and release in stainless steel and carbon. J. Nucl. Mater. 111-112, 654 (1982) Sweden
1288	D18 $He^+ + C$	E	8 keV	McIlroy, W.; Scherzer, S.M.U.; Ehrenberg, J. Retention, re-emission and thermal desorption of He implanted into pyrolytic graphite. J. Nucl. Mater. 111-112, 669 (1982) West Germany
1289	D18 $He^+ + A; He^+ + Ni$	E	0.6-8.0 keV	Jager, W.; Mense, R.; Trinius, H.; Crocellus, G.; Zeller, R.; Fink, J.; Bay, H. L. Density and pressure of helium in small bubbles in metals. J. Nucl. Mater. 111-112, 674 (1982) West Germany

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1290	D18 $\text{He}^+ + \text{Cu}; \text{D}^+ + \text{Cu}$	E	30 keV	Johnson, P. E.; Rezey, D. J. The depth distribution of bubbles and fracture in He^+ and D^+ irradiated copper. <i>J. Nucl. Mater.</i> 111-112, 681 (1982) New Zealand
1291	D02 $\text{H}^+ + \text{Ni}; \text{H}^+ + \text{Cu}; \text{H}^+ + \text{Au}; \text{H}^+ + \text{Mo}; \text{H}^+ + \text{W}; \text{D}^+ + \text{Ni}; \text{D}^+ + \text{Cu}; \text{D}^+ + \text{Au}; \text{D}^+ + \text{Mo}; \text{D}^+ + \text{W}; \text{He}^+ + \text{Ni}; \text{He}^+ + \text{Cu}; \text{He}^+ + \text{Au}; \text{He}^+ + \text{Mo}; \text{He}^+ + \text{W}$	E	26-100 keV	Bohdansky, J.; Cher, G. L.; Eckstein, W.; Roth, J.; Scherzer, B.F.U.; Sebrisch, R. Light ion sputtering for H, D and He in the energy range of 25 eV to 100 keV. <i>J. Nucl. Mater.</i> 111-112, 717 (1982) West Germany
1292	D02 $\text{H}^+ + \text{C}; \text{H}^+ + \text{Ti}; \text{H}^+ + \text{Ta}; \text{H}^+ + \text{TaC}; \text{H}^+ + \text{TiC}; \text{H}^+ + \text{TiB}_2; \text{He}^+ + \text{C}; \text{He}^+ + \text{Ti}; \text{He}^+ + \text{Ta}; \text{He}^+ + \text{TaC}; \text{He}^+ + \text{TiC}; \text{He}^+ + \text{TiB}_2$ D17 $\text{H}^+ + \text{C}; \text{H}^+ + \text{Ti}; \text{H}^+ + \text{Ta}; \text{H}^+ + \text{TaC}; \text{H}^+ + \text{TiC}; \text{H}^+ + \text{TiB}_2; \text{He}^+ + \text{C}; \text{He}^+ + \text{Ti}; \text{He}^+ + \text{Ta}; \text{He}^+ + \text{TaC}; \text{He}^+ + \text{TiC}; \text{He}^+ + \text{TiB}_2$	E	0.3-4.0 keV	Varga, P.; Tagliavini, E. Preferential sputtering of compounds due to light ion bombardment. <i>J. Nucl. Mater.</i> 111-112, 726 (1982) West Germany
1293	D02 $\text{H}^+ + \text{Ti}; \text{D}^+ + \text{Ti}; \text{He}^+ + \text{Ti}$	E	0.04-12 keV	Bay, H. L.; Scherer, B.; Bogen, P.; Hitz, E. Investigation of light-ion sputtering of titanium using laser-induced fluorescence. <i>J. Nucl. Mater.</i> 111-122, 732 (1982) West Germany
1294	D02 $\text{Ar}^+ + \text{Ti}; \text{Ar}^+ + [\text{O}_2 + \text{Ti}]$ D03 $\text{Ar}^+ + \text{Ti}; \text{Ar}^+ + [\text{O}_2 + \text{Ti}]$ D17 $\text{Ar}^+ + \text{Ti}; \text{Ar}^+ + [\text{O}_2 + \text{Ti}]$	E	3 keV	Pellin, W. J.; Young, C. E.; Mendelsohn, H. M.; Green, D. M.; Wright, R. E.; DeWald, A. S. Oxygen and titanium sputtering yields as determined by laser fluorescence and Auger electron spectroscopy for monolayer oxygen coverage of polycrystalline Ti. <i>J. Nucl. Mater.</i> 111-112, 738 (1982) United States
1295	D02 $\text{H}^+ + \text{TiC}$	E	0.1-6.0 keV	Yamada, K.; Ishimura, K.; Saidoh, M. Chemical sputtering yields of titanium carbides. <i>J. Nucl. Mater.</i> 111-112, 744 (1982) Japan
1296	D02 $\text{H} + \text{C}$ D17 $\text{H} + \text{C}; \alpha + \text{C}$	E	0.1-210 eV	Ashby, C.I.W. Temperature dependence of electron bombardment enhanced reactivity of different types of graphite. <i>J. Nucl. Mater.</i> 111-112, 756 (1982) United States
1297	D02 $\text{H} + \text{C}$ D17 $\text{H} + \text{C}; \alpha + \text{C}$	E	2000 K; 200-1000 eV	Haez, A. A.; Stangeby, P. C.; Auciello, O. Methane production from graphite and TiC under electron and atomic hydrogen impact. <i>J. Nucl. Mater.</i> 111-112, 757 (1982) Canada
1298	D02 $\text{H} + \text{C}$ D17 $\text{H} + \text{C}; \alpha + \text{C}$	E	2000 K; 600 eV	Vietzke, E.; Flasekamp, K.; Philipps, V. Hydrocarbon formation in the reaction of atomic hydrogen with pyrolytic graphite and the synergistic effect of argon ion bombardment. <i>J. Nucl. Mater.</i> 111-112, 763 (1982) West Germany
1299	D02 $\text{D}^+ + \text{C}$ D17 $\text{D}^+ + \text{C}$	E	5 keV	Ashida, K.; Ichikawa, K.; Matsuyama, M.; Miyaoka, M.; Uemura, K. Trapped states of deuterium implanted into graphite and the thermal desorption. <i>J. Nucl. Mater.</i> 111-112, 769 (1982) Japan
1300	D02 $\text{H}^+ + \text{C}; \text{D}^+ + \text{C}; \text{He}^+ + \text{C}; \text{He}^+ + \text{C}$	E	0.4-7.0 keV	Roth, J.; Bohdanský, J.; Wilson, K. L. Erosion of carbon due to bombardment with energetic ions at temperatures up to 2000 K. <i>J. Nucl. Mater.</i> 111-112, 775 (1982) West Germany
1301	D02 $\text{Ar}^+ + \text{C}$	E	2-5 keV	Philipps, V.; Flasekamp, K.; Vietzke, E. Enhancement of the sputtering yield of pyrolytic graphite at elevated temperatures. <i>J. Nucl. Mater.</i> 111-112, 781 (1982) West Germany
1302	D02 $\text{H}^+ + \text{Mo}$	E	10-20 MeV	Bergmann, E.; Belzer, E.; Riccato, A.; Becker, M. New aspects in sputtering experiments with high-energy protons. <i>J. Nucl. Mater.</i> 111-112, 785 (1982) West Germany
1303	D07 $\text{H} + \text{Al}; \text{H} + \text{W}; \text{He} + \text{Al}; \text{He} + \text{W}$	T	0.1-0.1 keV	Oen, O. E.; Robinson, P. T. Energy and angle correlations of low energy backscattered light ions. <i>J. Nucl. Mater.</i> 111-112, 789 (1982) United States

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1304	D07 $D^+ + Na; D_2^+ + Na; D_3^+ + Na$ D08 $D^+ + Na; D_2^+ + Na; D_3^+ + Na$	E	0.5-9.0 keV	Schneider, P. J.; Eckstein, U.; Verbeek, H. Energy distributions and charge-state fractions of deuterium reflected from a sodium target bombarded by D^+ , D_2^+ , D_3^+ and D^0 . J. Nucl. Mater. 111-112, 795 (1982) West Germany
1305	D13 $H^+ + H + Ni; H^+ + b + Ni; He^+ + O + Ni; He^+ + N + Mo; Ar^+ + N + Mo; Xe^+ + N + Mo; He^+ + N + V; Ar^+ + N + V; Xe^+ + N + V$	T	0.3 keV	Taglauer, E.; Beitler, U. Ion impact desorption mechanisms and energy distributions. J. Nucl. Mater. 111-112, 806 (1982) West Germany
1306	D13 $H_2^+ + D + SS; H_3^+ + D + SS$	E	0.3-1.5 keV	Bastaux, R.; Heggmark, L. G. Hydrogen ion impact desorption of adsorbed deuterium from stainless steel. J. Nucl. Mater. 111-112, 805 (1982) United States
1307	J04 Review	E T	Under	Thomas, E. W.; Itch, N.; Langley, R. P. Surface data for fusion devices-progress report on data compilation and assessment by the US, Japanese, and IAEA data centres. J. Nucl. Mater. 111-112, 805 (1982) United States
1308	D13 Review	E T	0.1-200 keV	Sagara, A.; Kanada, K. Compilation and evaluation of ion impact desorption cross-section. J. Nucl. Mater. 111-112, 812 (1982) Japan
1309	D02 $D^+ + Al; D^+ + Li + Al$ D03 $D^+ + Al; D^+ + Li + Al$ D17 $Ar^+ + Li + Al$	T	0.1-2.0 keV	Green, D. W.; Krause, A. R.; Mondeloe, R. H.; Susman, S. Surface segregation in binary alloy first wall candidate materials. J. Nucl. Mater. 111-112, 831 (1983) United States
1310	E17 $Ar^+ + B_4C; Ar^+ + TiC; Ar^+ + SiC$	E	3 keV	Fukuda, S.; Kato, S.; Mohri, M.; Yamashina, T. Changes in surface composition of low-Z compound materials with ion bombardment and heat treatment. J. Nucl. Mater. 111-112, 836 (1982) Japan
1311	D02 $H_2^+ + TiC; He^+ + TiC$ D17 $H_2^+ + TiC; He^+ + TiC$	E	200 keV	Saidoh, M.; Yamada, R.; Nakamura, K. Surface erosion and re-emission behaviour of TiC coatings under hydrogen and helium ion bombardments. J. Nucl. Mater. 111-112, 848 (1982) Japan
1312	A07 $He^+ + Ar; He^+ + Kr; He^+ + Xe; He^+ + Ar; He^+ + Kr; He^+ + Xe$	E	400-500 K	Le Maden, A.; Le Cos, G.; Tuffin, F.; Perreau, J. Energy and angular distribution of electrons ejected from Ar, Kr, Xe by helium and neon metastables. J. Phys. (Paris) 43, 1607 (1982) France
1313	H01 Under	T	Under	Dallbard, J.; Dugent-Roc, J.; Cohen-Tannoudji, C. Vacuum fluctuations and radiation reaction: identification of their respective contributions. J. Phys. (Paris) 43, 1617 (1982) France
1314	A07 $He^{2+} + Ca; He^{2+} + Sc; He^{2+} + Ti; He^{2+} + V; He^{2+} + Cr; N^{7+} + Ca; N^{7+} + Sc; N^{7+} + Ti; N^{7+} + V; N^{7+} + Cr$	E	5-7 MeV/amu	Sabets, M.; Kaniya, M.; Kuwako, A.; Morita, S.; Ishii, K.; Aoyama, Y.; Yonuma, T. K-shell vacancy production in light-element atoms with α particles and N^{7+} ions of 5, 6 and 7 MeV/amu. J. Phys. Soc. Jpn. 51, 4021 (1982) Japan
1315	A03 $K^+ + He; K^+ + Ne; K^+ + Ar; K^+ + Kr; K^+ + Xe$	E	342 K	Clergyio, J.; Brause, L. $4^2P_{3/2}$ going to cr coming from $4^2P_{3/2}$ mixing in potassium induced in collisions with noble gas atoms. J. Quant. Spectrosc. Radiat. Transfer 28, 467 (1982) Canada
1316	A12 $H_2O^+ + H_2O; H_2O^+ + N_2$ H02 $h\nu + H_2O$	E	A12 334 K H02 9000-14500 cm^{-1}	Yanaka, M.; Nakazawa, T.; Fukubori, M. Absorptions of the rho sigma tau, 8.0 μm and alpha bands of the water vapor. J. Quant. Spectrosc. Radiat. Transfer 28, 463 (1982) Japan
1317	A12 $CO^+ + CO; CO^+ + N_2; CO^+ + O_2; CO^+ + CO_2$ H02 $h\nu + CO$	E	A12 81-200 K H02 2160 cm^{-1}	Nakazawa, T.; Yanaka, M. Intensities, half-widths and shapes of spectral lines in the fundamental band of CO at low temperatures. J. Quant. Spectrosc. Radiat. Transfer 28, 471 (1982) Japan

REF. NO.	REACTANTS	EXP OR THEORY	ENERGY RANGE	REFERENCE
1318	A03 Zn ⁺ + Ar; Zn ⁺ + H ₂ ; Zn ⁺ + H ₂ ; Zn ⁺ + CO; Zn ⁺ + CO ₂ A11 Zn ⁺ + Ar; Zn ⁺ + H ₂ ; Zn ⁺ + H ₂ ; Zn ⁺ + CO; Zn ⁺ + CO ₂	E	613-613 K	Czajkowski, P.; Wołostyrowicz, L.; Krause, L. Excitation transfer and quenching induced in inelastic collisions of Zn 4 ¹ F, and 4 ³ P ₂ atoms. J. Quant. Spectrosc. Radiat. Transfer 28, 493 (1982) Canada
1319	B04 Na ²⁺ + Al; Na ²⁺ + Au; Na ²⁺ + Ag; C ³⁺ + Al; C ³⁺ + Au; C ³⁺ + Ag; N ⁷⁺ + Al; N ⁷⁺ + Au; N ⁷⁺ + Ag; O ⁸⁺ + Al; O ⁸⁺ + Au; O ⁸⁺ + Ag	E	6.2 MeV/amu	Koyama, A.; Shikata, T.; Sakurai, M.; Inagi, E. Dependence of secondary electron emission coefficients on Z ₁ in metal targets under bombardment with bare projectiles. Jpn. J. Appl. Phys. Pt. 1 21, 1216 (1982) Japan
1320	A11 Ne ⁺ + Ne	E	300 K	Tachibana, K.; Harino, M.; Ureno, Y. A set of de-excitation rate coefficients for the 3s ³ P ₂ and ³ P ₁ levels of neon. Jpn. J. Appl. Phys. Pt. 1 21, 1529 (1982) Japan
1321	B08 hv + ND ₂	E	463 nm	Sugimoto, M.; Takezawa, C.; Takeuchi, H. Time-resolved, dispersed laser-induced fluorescence of ND ₂ : observation of collision-induced energy transfer effect. Jpn. J. Appl. Phys. Pt. 1 21, 1536 (1982) Japan
1322	B08 O ⁺ + Pd	E	0.2-2.0 keV	Saiki, K.; Tanaka, S. Scattering of low energy oxygen ions from a polycrystalline palladium surface. Jpn. J. Appl. Phys. Pt. 2 21, 1325 (1982) Japan
1323	A03 H ⁺ + Ne; H ⁺ + C; H ⁺ + Cu; H ⁺ + Na ⁺ ; H ⁺ + N; Na ²⁺ + Ne; Li ²⁺ + Ne; Na ²⁺ + N A06 H ⁺ + Ne; H ⁺ + C; H ⁺ + Cu; H ⁺ + Na ⁺ ; H ⁺ + N; Na ²⁺ + Ne; Li ²⁺ + Ne; Na ²⁺ + N A07 H ⁺ + Ne; H ⁺ + C; H ⁺ + Cu; H ⁺ + Na ⁺ ; H ⁺ + N; Na ²⁺ + Ne; Li ²⁺ + Ne; Na ²⁺ + N E03 e + N	T	10-1000 keV; 20-300 eV	Reading, J. F.; Ford, J. L.; Martin, M.; Becker, R. L. Learning from numerical calculations of ion-atom collisions. Nucl. Instrum. Methods Phys. Res. 192, 1 (1982) United States
1324	A07 H ⁺ + PERT E01 Ionization	T	25-2000 keV	Paul, M. K-shell ionization by protons: a quantitative comparison between published cross sections and theories. Nucl. Instrum. Methods Phys. Res. 192, 11 (1982) Austria
1325	F07 D ⁺ + In; D ⁺ + Sb; D ⁺ + Co; H ⁺ + In; H ⁺ + Sb; H ⁺ + Co	T	0.3-1.0 MeV/amu	Jesus, A. P.; Lopes, J. S. Nuclear Coulomb, energy-loss and relativistic effects in proton-and deuteron-induced K-shell ionization. Nucl. Instrum. Methods Phys. Res. 192, 25 (1982) Portugal
1326	A03 H ⁺ + Cu A07 H ⁺ + Cu	T	0.6-100 MeV	Unterwiesing, K.; Kleber, P. Dynamics of inner-shell electrons in ion-atom collisions. Nucl. Instrum. Methods Phys. Res. 192, 35 (1982) West Germany
1327	A07 H ⁺ + Ni; H ⁺ + Ti; D ⁺ + Ni; D ⁺ + Ti; C ³⁺ + Sn	T	0.6-4.5 MeV	Rosel, F.; Trautmann, D.; Baur, G. Recoil effects in atomic inner shell ionization. Nucl. Instrum. Methods Phys. Res. 192, 42 (1982) Switzerland
1328	A07 H ⁺ + Ti; H ⁺ + Cr; H ⁺ + Co; H ⁺ + Ni; H ⁺ + Cu; H ⁺ + Zn; Na ²⁺ + Cu A10 H ⁺ + Ti; H ⁺ + Cr; H ⁺ + Co; H ⁺ + Ni; H ⁺ + Cu; H ⁺ + Zn; Na ²⁺ + Cu	E	0.3-2.4 MeV	Lend, D. J.; Brown, M. E.; Simons, D. G.; Brennan, J. G. Total and differential cross sections for proton-induced K-shell ionization - comparisons of experimental measurements with recent data and with theory. Nucl. Instrum. Methods Phys. Res. 192, 53 (1982) United States
1329	A07 D ⁺ + Ni; D ⁺ + Cu; H ⁺ + Ni; H ⁺ + Cu	T	60-300 keV	Gundersen, R.; Hønsen, J. M.; Kocbach, L. Coulomb deflection factors for K-shell ionization by protons and deuterons: the role of the dipole amplitudes. Nucl. Instrum. Methods Phys. Res. 192, 53 (1982) Norway

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1330	A07 H ⁺ + H ⁺ ; H ⁺ + Ag; D ⁺ + Ni; D ⁺ + Ag; He ⁺ + Ni; Cl ⁺ + Pb	E	0.9-136 MeV	Schmidt-Böcking, W.; Stiebing, K. E.; Schadt, W.; Lechter, H.; Gruber, G.; Kolb, S.; Bethge, K.; Schuch, R.; Törring, I. Trajectory, binding and relativistic effects in the K-shell ionization process investigated by particle-proton coincidences. Nucl. Instrum. Methods Phys. Res. 192, 71 (1982) West Germany
1331	A07 H ⁺ + Cu; H ⁺ + Ag; H ⁺ + Au A18 H ⁺ + Cu; H ⁺ + Ag; H ⁺ + Au	E T	0.5-2.5 MeV	Andersen, J. L.; Lønggaard, E.; Lund, P. Impact-parameter dependence of K-shell ionization. Nucl. Instrum. Methods Phys. Res. 192, 79 (1982) Denmark
1332	A07 H ⁺ + PERT K01 Ionization	T	Undef	Bell, F. A single description of universal cross sections for K-shell ionization by heavy charged particles. Nucl. Instrum. Methods Phys. Res. 192, 103 (1982) West Germany
1333	A03 H ⁺ + Dy; H ⁺ + Pb A07 H ⁺ + Dy; H ⁺ + Pb	E	0.5-3.0 MeV	Schulz, B. S.; Crangston, B. Measurement of proton-induced L-shell x-ray production cross-sections and their comparison with theory. Nucl. Instrum. Methods Phys. Res. 192, 121 (1982) United Kingdom
1334	C02 H ⁺ + Ge; D ⁺ + Ge; He ⁺ + Ge C05 H ⁺ + Ge; D ⁺ + Ge; He ⁺ + Ge	E	0.2-2.4 MeV	Melherbe, J. B.; Alberts, M. W. Energy-loss straggling in C and Ge of p, d and α-particles in the energy region 0.2 to 2.4 MeV. Nucl. Instrum. Methods Phys. Res. 192, 505 (1982) South Africa
1335	A05 He ²⁺ + Ar; He ²⁺ + Kr; He ²⁺ + Xe	E	Undef	Suzuki, H.; Esen, J.; Kubota, S. Time dependence of the recombination luminescence from high-pressure argon, krypton and xenon excited by alpha particles. Nucl. Instrum. Methods Phys. Res. 192, 543 (1982) Japan
1336	M06 hv + Pb; hv + Th; hv + U	E	13-18 keV	Sood, P. L.; Pillayadhi, K. L.; Arora, S. K. Inner-shell subshell photoionization cross section measurement using a gamma-excited variable energy x-ray source. Nucl. Instrum. Methods Phys. Res. 193, 391 (1982) India
1337	M03 hv + PERT	E	0.00-2.0 MeV	Gupta, S.K.L.; Paul, M. C.; Bose, J.; Das, S. C.; Chaudhuri, B. New measurements of coherent and incoherent atomic scattering factors using radioactive gamma-ray sources. Nucl. Instrum. Methods Phys. Res. 193, 398 (1982) India
1338	C02 Undef C05 Undef K04 Undef	T	Undef	Ansel, G. Peculiar effects induced by statistical processes related to fast particle - matter interactions in diluted and dense media. Nucl. Instrum. Methods Phys. Res. 194, 1 (1982) France
1339	K04 Charge state Population; Stopping power	T	Undef	Brandt, W. Effective charges of ions and the stopping power of dense media. Nucl. Instrum. Methods Phys. Res. 194, 13 (1982) United States
1340	K04 Energy loss	E	0.5-10.0 MeV/amu	Gelens, H.; Leichter, Y.; Schneider, G.F.W.; Armbruster, F. Energy loss and energy loss straggling of fast heavy ions in matter. Nucl. Instrum. Methods Phys. Res. 194, 21 (1982) West Germany
1341	C02 PERT + PERT	T	Undef	Pathak, A. P. Z-excitations in channeling stopping power. Nucl. Instrum. Methods Phys. Res. 194, 31 (1982) Australia
1342	C01 Undef	T	Undef	Ohtsuki, T. M.; Ghori, T.; Kawai, R. Surface wave correlations of the ion and of ions. Nucl. Instrum. Methods Phys. Res. 194, 35 (1982) Japan
1343	D12 H ⁺ + NaCl; H ⁺ + KBr; H ⁺ + KI; He ⁺ + NaCl; He ⁺ + KBr; He ⁺ + KI	E	0.5-2.0 MeV	Natsuemoni, H.; Chushi, T.; Itoh, M.; Marino, Y. Ion-induced high density excitation in ionic crystals. Nucl. Instrum. Methods Phys. Res. 194, 39 (1982) Japan

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1344	C82 $\text{He}^{2+} + \text{Cu}; \text{He}^{2+} + \text{Au}$	E	0.6-2.7 MeV	Stoquert, J. F.; Abdessalam, A.; Beauneville, M.; Boudanna, Y.; Oterlin, J. C. Alpha-particle stopping cross sections of Cu and Au at energies below 3 MeV. Nucl. Instrum. Methods Phys. Res. 194, 51 (1982) Algeria
1345	C82 $\text{H}^+ + \text{C}; \text{H}^+ + \text{Al}; \text{H}^+ + \text{Si}; \text{H}^+ + \text{V};$ $\text{H}^+ + \text{Cr}; \text{H}^+ + \text{Fe}; \text{H}^+ + \text{Co}; \text{H}^+ +$ $\text{Ni}; \text{H}^+ + \text{Cu}; \text{H}^+ + \text{Zn}; \text{H}^+ + \text{Ga}; \text{H}^+$ $+ \text{Ag}; \text{H}^+ + \text{Au}$	E	30-300 keV	Hertens, F.; Krist, T. Electronic stopping cross sections for 30-300 keV protons in materials with 23 less-than-or-equal-to 22 less-than-or-equal-to 30. Nucl. Instrum. Methods Phys. Res. 194, 57 (1982) West Germany
1346	C82 $\text{H}^+ + \text{Be}; \text{H}^+ + \text{Al}; \text{H}^+ + \text{Ti}; \text{H}^+ + \text{V};$ $\text{H}^+ + \text{Fe}; \text{H}^+ + \text{Co}; \text{H}^+ + \text{Ni}; \text{H}^+ +$ $\text{Cu}; \text{H}^+ + \text{Zn}; \text{H}^+ + \text{Mo}; \text{H}^+ + \text{Rh}; \text{H}^+$ $+ \text{Ag}; \text{H}^+ + \text{Sn}; \text{H}^+ + \text{Ta}; \text{H}^+ + \text{Pt};$ $\text{H}^+ + \text{Au}$	E	6.75 MeV	Ishiwari, K.; Chikui, N.; Sakamoto, N. Stopping powers of metallic elements for 6.75 MeV protons. Nucl. Instrum. Methods Phys. Res. 194, 61 (1982) Japan
1347	C82 $\text{H}^+ + \text{Au}; \text{D}^+ + \text{Au}; \text{He}^+ + \text{Au}$	E	0.6-15 keV	Blume, R.; Eckstein, W.; Verbeek, H.; Reichelt, K. Electronic energy loss of H, D and He in single crystal gold films in the energy range below 15 keV. Nucl. Instrum. Methods Phys. Res. 194, 67 (1982) West Germany
1348	C82 $\text{H}^+ + \text{H}_2; \text{H}_2^+ + \text{H}_2; \text{H}_2^+ + \text{H}_2$	E	1-2 keV, amu	Borgesen, P.; Chen, N. H.; Sorensen, M. Stopping of 1-2 keV amu hydrogen ions in solid H_2 . Nucl. Instrum. Methods Phys. Res. 194, 71 (1982) Denmark
1349	C85 $\text{He}^+ + \text{Al}_2\text{O}_3$	E	1.0 MeV	Schmaus, B.; Lohr, A. Multiple scattering of HeV light ions transmitted through thin Al_2O_3 films - detailed analysis of angular distributions. Nucl. Instrum. Methods Phys. Res. 194, 75 (1982) France
1350	C85 $\text{He}^+ + \text{Al}_2\text{O}_3$	T	1.0 MeV	Schmaus, B.; Lohr, A.; Cohen, C. Ion multiple scattering - a tool for studying the thickness topography of self-supporting targets. Nucl. Instrum. Methods Phys. Res. 194, 81 (1982) France
1351	D87 $\text{He}^+ + \text{Pt}$	T	1.0 MeV	Den, D. S. The 2-atom model in enhanced ion backscattering near 180-degree scattering angles. Nucl. Instrum. Methods Phys. Res. 194, 87 (1982) United States
1352	C84 $\text{H}^+ + \text{C}; \text{C}^+ + \text{C}$	T	3-100 MeV	Cowern, M.E.B. Range distributions of energetic ions. Nucl. Instrum. Methods Phys. Res. 194, 161 (1982) United Kingdom
1353	C84 $\text{He}^+ + \text{Fe}; \text{He}^+ + \text{Cu}; \text{He}^+ + \text{Zn}; \text{He}^+$ $+ \text{W}; \text{He}^+ + \text{Bi}; \text{He}^+ + \text{Co}; \text{Li}^+ + \text{Fe};$ $\text{Li}^+ + \text{Cu}; \text{Li}^+ + \text{Zn}; \text{Li}^+ + \text{W}; \text{Li}^+ +$ $\text{Bi}; \text{Li}^+ + \text{Co}$	E	0.08-1.5 MeV	Fink, D.; Bierusch, J. P.; Tjan, K.; Cheng, V. K. Ranges of He and Li in various solids. Nucl. Instrum. Methods Phys. Res. 194, 185 (1982) West Germany
1354	C84 $\text{B}^+ + \text{Si}$	E	1-10 keV	Wach, W.; Wittneach, K. Low energy range distributions of B-10 and B-11 in amorphous and crystalline silicon. Nucl. Instrum. Methods Phys. Res. 194, 113 (1982) West Germany
1355	C84 $\text{Xe}^+ + \text{Ni}$	E	40 keV	Ingram, D. C.; Fraser, E. G. High dose implantation of xenon into nickel. Nucl. Instrum. Methods Phys. Res. 194, 117 (1982) United Kingdom
1356	C84 $\text{D}^+ + \text{Ni}$	T	10-30 keV	Moller, W.; Eckstein, W. Effects of target crystallinity on the range distribution of hydrogen ions in metals. Nucl. Instrum. Methods Phys. Res. 194, 121 (1982) West Germany
1357	C86 $\text{He}^{2+} + \text{C}; \text{H}_2^+ + \text{C}; \text{He}_2^+ + \text{C}; \text{D}_2^+ +$ $\text{C}; \text{H}_2^+ + \text{Al}_2\text{O}_3; \text{H}_2^+ + \text{C}$	E	1.0-3.6 MeV	Gemmell, D. S. Collisional effects in the passage of fast molecular ions through thin foils. Nucl. Instrum. Methods Phys. Res. 194, 265 (1982) United States
1358	C86 $\text{He}^{2+} + \text{C}$	E	2 MeV	Piessens, I. The interpretation of molecular-ion dissociation experiments. Nucl. Instrum. Methods Phys. Res. 194, 265 (1982) Israel

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1359	C02 $H_2^+ + C; H^+ + C; O_2^+ + C; C^+ + C;$ $He_2^+ + C; He^+ + C; H_2^+ + C; H^+ + C$	E	0.4-1.0 MeV	Steuer, H. F.; Connell, D. S.; Koster, E. P.; Johnson, E. A.; Zehrmann, B. J. Diminished stopping power for fast nitrogen and oxygen dications in carbon. Nucl. Instrum. Methods Phys. Res. 194, 277 (1982) United States
1360	C02 $H^+ + C; H_2^+ + C$	E	12.5-25 keV/amu	Levisetti, R.; Lee, K.; Fox, T. R. H_2^+ traversing ultra-thin carbon foils - cluster effects in the energy loss at 12.5 and 25 keV/amu. Nucl. Instrum. Methods Phys. Res. 154, 281 (1982) United States
1361	C02 $H_2^+ + C$	E	12.5-25 keV/amu	Fox, T. R.; Lee, K.; Levisetti, R. H_2^+ traversing ultra-thin carbon foils - exciting molecular states at 12.5 and 25 keV/amu. Nucl. Instrum. Methods Phys. Res. 194, 285 (1982) United States
1362	C01 $H_2^+ + C; H_2^+ + Al$ C06 $H_2^+ + C; H_2^+ + Al$	E	28 MeV	Kumbartzki, G. J.; Neuburger, H.; Kohl, H. P.; Polster, W. Measurements of the wavelength of the polarization wave in carbon and aluminium. Nucl. Instrum. Methods Phys. Res. 154, 261 (1982) West Germany
1363	C06 $H_2^+ + C$	T	0.1-0.2 MeV/amu	Schecterson, R. H.; Ruden, W. D. Monte-Carlo calculation of the distributions of interatomic separation and relative velocity resulting from the dissociation of fast molecular ions by thin foils. Nucl. Instrum. Methods Phys. Res. 194, 285 (1982) United States
1364	C06 $OH^+ + C$	E	11.2 MeV	Falbis, A.; Goldring, G.; Haas, H.; Kain, R.; Plesner, I.; Vager, Z. The study of the neutral hydrogen component in the break-up of OH. Nucl. Instrum. Methods Phys. Res. 194, 299 (1982) Israel
1365	C07 $CO^+ + C$	T	2-33 MeV	Frischkorn, H. J.; Roscher, P.; Latz, S.; Pfennig, J.; Schader, J.; Szabo, G.; Groeneveld, K. G. Auger electron spectroscopy of beam-foil excited molecular heavy ions. Nucl. Instrum. Methods Phys. Res. 194, 311 (1982) West Germany
1366	C01 $H^+ + C; He^+ + C; Ti^{10+} + C; V^{10+} + C;$ $H_2^+ + C; H_2^+ + C$ D04 $H^+ + C; He^+ + C; Ti^{10+} + C; V^{10+} + C;$ $H_2^+ + C; H_2^+ + C$	E	1.4-1.7 MeV/amu	Latz, S.; Ascher, G.; Frischkorn, H. J.; Roscher, P.; Pfennig, J.; Schader, J.; Groeneveld, K. G. Strong molecular effects in zero degree electron emission from molecular ions after solid foil interaction. Nucl. Instrum. Methods Phys. Res. 194, 315 (1982) West Germany
1367	C07 $H^+ + C; H_2^+ + C; H_2^+ + C; D^+ + C;$ $D_2^+ + C; D_2^+ + C; HD_2^+ + C; HeH^+ + C$	E	117-250 keV	Asner, G.; Hennervik, S.; Vajo, E. Study of molecular effects in atom solid interactions. Nucl. Instrum. Methods Phys. Res. 194, 319 (1982) Sweden
1368	D04 $H^+ + Al; H^+ + C; H_2^+ + Al; H_2^+ + C$	E	1.2 MeV/amu	Yamazaki, Y.; Oda, H. Inner shell ionization by molecular ion bombardment on solid foils. Nucl. Instrum. Methods Phys. Res. 194, 323 (1982) Japan
1369	C07 $B^{10+} + Au; C^{10+} + Au; He^{10+} + Au; O^{10+} + Au;$ $F^{10+} + Au; N^{10+} + Au; O^{10+} + Au; F^{10+} + Au$	E	13-36 MeV	Neuh, C. B.; Biggs-staff, J. A.; Crawford, G. V.; Bittner, P. J.; Batz, S.; Delcamp, J. G.; Huelmann, P.; Knudsen, H.; Krause, H. F.; Miller, P. F.; Overbury, S. W. Resonant coherent excitation of fast heavy ions in crystals. Nucl. Instrum. Methods Phys. Res. 194, 327 (1982) United States
1370	D06 $He^+ + Ni$	T	Undef	Burgdorfer, J.; Gebriel, M.; Kupfer, E. Angular dependence of resonant coherent excitation in ion surface scattering at grazing incidence. Nucl. Instrum. Methods Phys. Res. 194, 337 (1982) West Germany
1371	C07 $O^{10+} + C; Si^{10+} + C$	E	60-127 MeV	Rothermel, J.; Batz, H. D.; Bell, F.; Zech, V. Foil-excited Rydberg states of fast oxygen and sulfur ions. Nucl. Instrum. Methods Phys. Res. 194, 341 (1982) West Germany

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1372	C87 Al ⁺ + C; Si ⁺ + C; P ⁺ + C; S ⁺ + C; Cl ⁺ + C D84 Al ⁺ + C; Si ⁺ + C; P ⁺ + C; S ⁺ + C; Cl ⁺ + C	E	50-500 keV	Schneider, D.; Berner, H. C.; Holte, G. Absolute Auger yield measurements of Al ⁺ , Si ⁺ , P ⁺ , S ⁺ , and Cl ⁺ projectiles following foil excitation. Nucl. Instrum. Methods Phys. Res. 194, 345 (1982) West Germany
1373	C87 Br ¹¹⁺ + C; Br ²¹⁺ + C; Br ²²⁺ + C; Br ²³⁺ + C; Br ²⁴⁺ + C; Br ²⁵⁺ + C; Br ²⁶⁺ + C; Br ²⁷⁺ + C; Br ²⁸⁺ + C	E	70-130 MeV	May, N. J.; Fender, L. F.; Treacy, P. B. Perturbation of L x rays emitted by swift heavy-ion projectiles. Nucl. Instrum. Methods Phys. Res. 194, 349 (1982) Australia
1374	C87 Cl ¹⁰⁺ + C; Cl ¹²⁺ + C; Cl ¹³⁺ + C; Cl ¹⁵⁺ + C; Cl ¹⁶⁺ + C; Cl ¹⁷⁺ + C; Fe ¹⁰⁺ + C; Cu ¹¹⁺ + C; Cu ¹²⁺ + C; Br ¹²⁺ + C	E	40-160 MeV	Shima, K.; Uetani, K.; Mihano, T. Target thickness dependence of projectile K x-ray emission in fast heavy ion bombardments of carbon foils. Nucl. Instrum. Methods Phys. Res. 194, 353 (1982) Japan
1375	C87 Ne ⁺ + C D88 Ne ⁺ + C	E	30-310 keV	Winter, H. The dependence of ion current density of the alignment of HeI 3d _{5/2} after beam-foil interaction. Nucl. Instrum. Methods Phys. Res. 194, 357 (1982) West Germany
1376	C87 Ne ⁺ + C	E	0.7-2.2 MeV	Beno, A.; Benesqueles, J.; Druetta, N.; Pegg, D. J. Quantal beam study of the Ne ⁺ beam-carbon foil interaction. Nucl. Instrum. Methods Phys. Res. 194, 363 (1982) France
1377	C87 Ar ²⁰⁺ + C; Kr ²⁰⁺ + C	E	2 MeV	Bashkin, S.; Csan, M.; Vojte, E. Experimental study of relative level populations in beam-foil excited Ar ²⁰⁺ and Kr ²⁰⁺ . Nucl. Instrum. Methods Phys. Res. 194, 369 (1982) United States
1378	C87 Ga + C; Ga ⁺ + C; Ga ²⁺ + C; Tl + C; Tl ⁺ + C; Tl ²⁺ + C	E	1-12 keV/cm	Lingard, A.; Vojte, E.; Jelenkovic, B.; Hennrich, S. Study of beam-foil excitations of gallium and thallium. Nucl. Instrum. Methods Phys. Res. 194, 373 (1982) Denmark
1379	C86 U ⁹⁰⁺ + C; U ⁹⁰⁺ + Sn	E	6.7-7.5 MeV/cm	Noor, B.; Mahler, P. M.; Schull, D.; Stachurs, Z. Projectile charge state distributions in close, fast heavy ion atom collisions - dependence on target thickness and inner shell vacancy production. Nucl. Instrum. Methods Phys. Res. 194, 377 (1982) West Germany
1380	D86 H ⁺ + Ni	T	Under	Schroder, H. K-vector selection for electron capture at metal surfaces. Nucl. Instrum. Methods Phys. Res. 194, 381 (1982) West Germany
1381	D88 D ⁺ + Cu; D ⁺ + Ni; D ₂ ⁺ + Cu; D ₂ ⁺ + Ni; D + Cu; D + Ni	E	1-9 keV	Schneider, P. J.; Eckstein, W.; Verbeek, H. Charge states of reflected particles for grazing incidence of D ⁺ , D ₂ ⁺ and D ₂ ⁺ on Ni and Cu targets. Nucl. Instrum. Methods Phys. Res. 194, 387 (1982) West Germany
1382	A86 O ²⁺ + Ar; C ²⁺ + Al; O ²⁺ + Au; O ²⁺ + Au; O ²⁺ + Au D84 O ²⁺ + Ar; C ²⁺ + Al; O ²⁺ + Au; O ²⁺ + Au; O ²⁺ + Au	E	12-100 MeV	Sellin, I. A.; Ertisig, M.; Brandt, W.; Lambert, R. Convey electron production in heavy ion-foil collisions. Nucl. Instrum. Methods Phys. Res. 194, 388 (1982) United States
1383	D84 Ar ⁺ + Mo; Ar ⁺ + Zr; Ar ²⁺ + Mo; Ar ²⁺ + Zr; Ar ²⁺ + Mo; Ar ²⁺ + Zr; Ar ⁺ + Cu; Ne ⁺ + Cu; Kr ⁺ + Cu; Xe ⁺ + Cu; Ar ⁺ + Ag; Ar ⁺ + Si; H ⁺ + Al; Ne ⁺ + Al; Ne ⁺ + Al; Ar ⁺ + Al; Kr ⁺ + Al; Xe ⁺ + Al; Ne ⁺ + Mg	E	2-100 keV	Bonazeth, R. Review on kinetic ion-electron emission from solid metallic targets. Nucl. Instrum. Methods Phys. Res. 194, 405 (1982) France
1384	A86 H ⁺ + C; Ne ²⁺ + C	T	0.01-100 MeV/cm	Yamazaki, Y.; Oda, H. Electron capture process into the wake potential. Nucl. Instrum. Methods Phys. Res. 194, 415 (1982) Japan
1385	A86 H ⁺ + N ₂ ; H ₂ ⁺ + N ₂	E T	100-900 keV/cm	Crane, R. W.; Stockmeier, U.; Lucas, R. W. The importance of projectile ionisation in studies of forward electron ejection from solid targets. Nucl. Instrum. Methods Phys. Res. 194, 419 (1982) United Kingdom

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1386	A07 $H^+ + Ag; O^+ + Au; Ni^+ + C$	E	22-180 MeV	Bell, F.; Trolman, G.; Bochl, M.; Setz, H. D. Double-differential cross section for delta-electrons from heavy ion atom collisions. Nucl. Instrum. Methods Phys. Res. 194, 423 (1982) West Germany
1387	D04 $Se^+ + Ag; Te^+ + Ag; Se_2^+ + Ag; Te_2^+ + Ag$	E	10-320 keV	Svensson, B.; Helmer, G.; Linnar, J. Electron emission from silver under heavy atomic and molecular ion bombardment. Nucl. Instrum. Methods Phys. Res. 194, 429 (1982) Sweden
1388	D04 $K^+ + Au; H_2^+ + Au; H_3^+ + Au; He^+ + Au; HeH^+ + Au$	E	70-110 keV	Važe, Z. Secondary electron emission from gold bombarded with H^+ , H_2^+ , H_3^+ , He^+ , and HeH^+ . Nucl. Instrum. Methods Phys. Res. 194, 433 (1982) Denmark
1389	A07 $He^{2+} + Ar; He^{2+} + CH_4; H^+ + He$	T	4-12 MeV	Senger, R.; Wittenbergprobenmann, E.; Beckmann, R. V. Ionization cross-sections in the case of sodium and low energy heavy charged particles crossing complex media. Nucl. Instrum. Methods Phys. Res. 194, 437 (1982) France
1390	D17 $Na^+ + [Ni + Si]; Kr^+ + [Ni + Si]; Na^+ + [Ni + Cu]; Kr^+ + [Ni + Cu]; Na^+ + [Ni + Ge]; Kr^+ + [Ni + Ge]$	E	2-3.25 MeV	Averback, R. E.; Rehn, L. E.; Wagner, G.; Chao, P. R.; Wiedersich, M. In situ Rutherford backscattering analysis of radiation-induced segregation. Nucl. Instrum. Methods Phys. Res. 194, 457 (1982) United States
1391	D17 $Li^+ + LiF$	E	100 keV	Fritsch, L.; Kereš, G.; Peres, A. Oriented indium metallic aggregates in implanted LiF single crystals. Nucl. Instrum. Methods Phys. Res. 194, 461 (1982) France
1392	D17 $Fe^+ + C; Fe^+ + Si; Fe^+ + Ge$	E	70-100 keV	Sawicki, J. A.; Sawicki, B. D. Implantation induced diamond to amorphous-carbon transition studied by conversion electron Mossbauer spectroscopy. Nucl. Instrum. Methods Phys. Res. 194, 465 (1982) Poland
1393	D18 $H^+ + SiO_2; D^+ + SiO_2$	E	20 keV	Arnold, G. W.; Boye, B. L. Trapping and release of implanted D/H ion in fused silica. Nucl. Instrum. Methods Phys. Res. 194, 451 (1982) United States
1394	D18 $D^+ + C$	E	1.5-9.0 keV	Scherzer, B.R.U.; Langley, R. A.; Moller, W.; Roth, J.; Schatz, R. Influence of damage on the thermal release of deuterium implants in graphite. Nucl. Instrum. Methods Phys. Res. 194, 497 (1982) West Germany
1395	D18 $Na^+ + Ni$	E	40 keV	Ehrenberg, J.; Zehrisch, R.; Scherzer, B.R.U. Gas re-emission and surface structure due to implantation of helium in nickel. Nucl. Instrum. Methods Phys. Res. 194, 501 (1982) West Germany
1396	D17 $C^+ + KCl; N^+ + KCl$	E	20-200 keV	Metz, W. A.; Thoms, E. V. Formation of C α radicals by ion implantation. Nucl. Instrum. Methods Phys. Res. 194, 505 (1982) United States
1397	D02 PERT $^+$ + PERT	T	Under	Yamazaki, Y. Theory of sputtering and comparison to experimental data. Nucl. Instrum. Methods Phys. Res. 194, 515 (1982) Japan
1398	D02 $Xe^+ + W; Xe^+ + AgAu; Xe^+ + Ag; Ar^+ + RbI; Kr^+ + LiI$	E T	6 keV	Szymanski, M. Sputtering mechanisms of compound solids. Nucl. Instrum. Methods Phys. Res. 194, 523 (1982) Poland
1399	D03 $Ar^+ + GaAu; Ar^+ + O + Ta; Ar^+ + Cu + V; Ar^+ + Pd + V; Ar^+ + Y + V$	T	Under	Srowah, Z. Theory of charge states in sputtering. Nucl. Instrum. Methods Phys. Res. 194, 523 (1982) West Germany
1400	D02 Under D17 Under	T	Under	Signand, P.; Olive, A.; Falcione, G. Sputtering of multicomponent materials - elements of a theory. Nucl. Instrum. Methods Phys. Res. 194, 541 (1982) Denmark
1401	D03 $Kr^+ + LiF; Kr^+ + MgF_2; Kr^+ + CaF_2$	E	3-20 keV	Auciello, O. Determination of excited sputtered atom kinetic energy as a contribution to the understanding of the excitation phenomenon in the sputtering. Nucl. Instrum. Methods Phys. Res. 194, 549 (1982) Canada

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1403	D03 $\text{D}^+ + \text{Zr}; \text{Ne}^+ + \text{Zr}; \text{Ar}^+ + \text{Zr}$	E	2.5-8 keV	Bay, H. L.; Herres, W.; Hintz, E. Surface normal velocity distribution of sputtered Zr-atoms for light-ion irradiation. Nucl. Instrum. Methods Phys. Res. 194, 555 (1982) West Germany
1404	D02 $\text{Ne}^+ + \text{Au}; \text{Xe}^+ + \text{Au}$ D03 $\text{Ne}^+ + \text{Au}; \text{Xe}^+ + \text{Au}$	E	0.2-30 keV	Szymczek, W.; Wittmann, K. Impact-energy dependence of the angular distribution of gold sputtered from a (111) crystal at 100 and 300-K. Nucl. Instrum. Methods Phys. Res. 194, 541 (1982) West Germany
1404	D02 Undef	T	Undef	Clausen, C. Sputtering from elastic-collision spikes: spherical geometry. Nucl. Instrum. Methods Phys. Res. 194, 547 (1982) Denmark
1405	D02 $\text{Te}^+ + \text{Au}$ D03 $\text{Te}^+ + \text{Au}$	T	45 keV	Keller, R. A.; Waller, H. R. A nonlinear Boltzmann equation calculation of sputtering from spikes. Nucl. Instrum. Methods Phys. Res. 194, 573 (1982) United States
1406	D02 $\text{Xe}^+ + \text{Kr}$ D03 $\text{Xe}^+ + \text{Kr}$	T	3 keV	Rosenbaum, H. E.; Maring, R. A.; Sanders, J. B. Surface distribution as an observable factor in the energy distribution of sputtered particles. Nucl. Instrum. Methods Phys. Res. 194, 579 (1982) West Germany
1407	D03 Undef	T	Undef	Kelly, R. On the origin of sputtered excited atoms. Nucl. Instrum. Methods Phys. Res. 194, 583 (1982) United States
1408	D03 $\text{Ar}^+ + \text{H}_2 + \text{Si}; \text{Ar}^+ + \text{C}_2 + \text{B}; \text{H}_2^+ + \text{H}_2 + \text{Si}$ D13 $\text{Ar}^+ + \text{H}_2 + \text{Si}; \text{Ar}^+ + \text{O}_2 + \text{B}; \text{H}_2^+ + \text{H}_2 + \text{Si}$	E	100 keV	Efstathiou, L.; Thomas, E. M. Excited states of sputtered molecules. Nucl. Instrum. Methods Phys. Res. 194, 589 (1982) United States
1409	D03 $\text{Ar}^+ + \text{Ba}; \text{Ar}^+ + \text{Hg}; \text{Ar}^+ + \text{Zn}; \text{Ar}^+ + \text{Cd}$	E	50 keV	Vejte, E. Atomic excitations in sputtering studied with group 2 element targets. Nucl. Instrum. Methods Phys. Res. 194, 552 (1982) Denmark
1410	D03 $\text{Xe}^+ + \text{PERT}$	T	15 keV	Jurek, Z. Periodicity of the degree of positive ionization of sputtered atoms in the conception of thermal spikes. Nucl. Instrum. Methods Phys. Res. 194, 557 (1982) Yugoslavia
1412	D02 $\text{Cu}^+ + \text{Cu}; \text{Ni}^+ + \text{Ni}; \text{Al}^+ + \text{Al}$	E	60-120 keV	Alías, R. G.; Knudson, A. R.; Lambert, J. H.; Treado, P. A.; Reynolds, G. W. Self-ion sputtering yields for copper, nickel, and aluminum. Nucl. Instrum. Methods Phys. Res. 194, 615 (1982) United States
1413	D02 $\text{Ne}^+ + \text{SS}; \text{Ar}^+ + \text{SS}$	E	10 keV	Navinsek, B.; Panjan, V.; Peternel, M.; Zebbar, A. Comparative erosion yields, topographical changes and depth profile analysis of ion eroded nickel-based alloys. Nucl. Instrum. Methods Phys. Res. 194, 621 (1982) Yugoslavia
1414	D07 $\text{Ne}^+ + \text{Pb}; \text{Ne}^+ + \text{Ag}; \text{Ne}^+ + \text{Cd}; \text{Ne}^+ + \text{In}; \text{Ne}^+ + \text{Sn}; \text{Ne}^+ + \text{Sb}; \text{Ne}^+ + \text{Te}; \text{Ne}^+ + \text{Bi}; \text{Li}^+ + \text{Pb}; \text{Li}^+ + \text{Ag}; \text{Li}^+ + \text{Cd}; \text{Li}^+ + \text{In}; \text{Li}^+ + \text{Sn}; \text{Li}^+ + \text{Sb}; \text{Li}^+ + \text{Te}; \text{Li}^+ + \text{Bi}$	E	0.3-2.0 keV	Woodruff, D. F. Neutralization effects in low energy ion scattering. Nucl. Instrum. Methods Phys. Res. 194, 639 (1982) United Kingdom
1415	D08 $\text{H}^+ + \text{Au}; \text{He}^+ + \text{Au}; \text{Ne}^+ + \text{Au}; \text{H}_2^+ + \text{Au}; \text{Ar}^+ + \text{Au}$	E	5 keV	Buch, T. P.; Wheatley, G. M.; Jackson, D. P.; Boers, A. L.; Luitjens, E.; VanLoenen, E. Round Robin comparison of low energy ion scattering by ESA, time-of-flight, stripping technique and computer simulation. Nucl. Instrum. Methods Phys. Res. 194, 649 (1982) United States
1416	D03 $\text{Ne}^+ + \text{Ni}$ D08 $\text{Ne}^+ + \text{Ni}$	E	4 keV	Tsang, I.-T.; Toth, M. H.; Buch, T. M.; Kraus, J. S.; Pian, T. B.; Kelly, R. Outer-shell electronic processes in He^+ collisions with a Ni(110) surface. Nucl. Instrum. Methods Phys. Res. 194, 655 (1982) United States

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1417	D08 $\text{Ar}^+ + \text{Hg}$	E	4 keV	Cross, S. A.; Alenac, E. V.; Walker, R. V.; Martin, D. J.; Armour, E. G. Interscopic potential considerations in low energy ion scattering. Nucl. Instrum. Methods Phys. Res. 194, 655 (1982) United Kingdom
1418	D08 $\text{Li}^+ + \text{Ni}; \text{Na}^+ + \text{Ni}$	E	0.5 keV	Englert, W.; Taglauer, E.; Heiland, W. Scattering of low-energy Li^+ and Na^+ ions from clean and oxygen covered $\text{Ni}(110)$ surfaces. Nucl. Instrum. Methods Phys. Res. 194, 662 (1982) West Germany
1419	D08 $\text{N}_2^+ + \text{Ni}$ D09 $\text{N}_2^+ + \text{Ni}$	E	0.4 keV	Heiland, W.; Taglauer, E. The dissociation of nitrogen molecular ions at clean and adsorbate covered surfaces. Nucl. Instrum. Methods Phys. Res. 194, 667 (1982) West Germany
1420	D07 $\text{H}^+ + \text{U}; \text{H}^+ + \text{WO}_3; \text{He}^+ + \text{U}; \text{He}^+ + \text{WO}_3$	T	0.1-15 keV	Eckstein, W. The scattering of keV H and He ions from tungsten and tungsten oxide. Nucl. Instrum. Methods Phys. Res. 194, 671 (1982) Canada
1421	D08 $\text{K}^+ + \text{Ni}$	T	Under	Meshevic, N.; Ciric, B.; Perovic, B. Survival probability in small angle scattering of low energy alkali ions from alkali covered metal surfaces. Nucl. Instrum. Methods Phys. Res. 194, 677 (1982) Yugoslavia
1422	D98 $\text{He}^+ + \text{Al}$	E	100 keV	Scheetsan, E. R.; Hall, T. A pulsed beam time of flight technique for studying ion atom scattering. Nucl. Instrum. Methods Phys. Res. 194, 681 (1982) United States
1423	D06 $e + \text{Be}; e + \text{C}; e + \text{LiF}; e + \text{Al}; e + \text{Si}; e + \text{Cu}$	T	1-1000 keV	Kalefexra, J.; Marcults, Y. S.; Mack, J. N. Electron backscattering from low-Z thick absorbers. Nucl. Instrum. Methods Phys. Res. 195, 587 (1982) United States
1424	C02 $\text{H}^+ + \text{Pb}; \text{D}^+ + \text{Pb}; \text{He}^{2+} + \text{Pb}$ C05 $\text{H}^+ + \text{Pb}; \text{D}^+ + \text{Pb}; \text{He}^{2+} + \text{Pb}$	E	0.2-2.5 MeV	Walterbe, J. E.; Alberts, M. W. Energy-loss straggling in lead of P, D and alpha-particles in the energy region 0.2-2.5 MeV. Nucl. Instrum. Methods Phys. Res. 196, 499 (1982) South Africa
1425	A07 $\text{H}^+ + \text{Au}; \text{H}^+ + \text{Pb}; \text{H}^+ + \text{Bi}; \text{H}^+ + \text{Sn}; \text{H}^+ + \text{V}$	E T	0.3-0.6 MeV	Mukoyama, T.; Serkadi, L. Relative intensity ratios for L-shell x rays by low-energy proton impact. Nucl. Instrum. Methods Phys. Res. 197, 503 (1982) Japan
1426	D02 $\text{H}^+ + \text{H}_2\text{O}; \text{H}_2^+ + \text{H}_2\text{O}; \text{H}_3^+ + \text{H}_2\text{O}; \text{He}^+ + \text{H}_2\text{O}; \text{He}^+ + \text{CO}_2; \text{He}^+ + \text{SO}_2$	E	10-10 ³ keV/amu	Brown, W. L.; Augustyniak, W. R.; Siemenc, E.; Marcantonio, E. J.; Lazzarotti, L. J.; Johnson, R. E.; Boring, J. W.; Reimann, C. T.; Foti, G.; Pirronello, V. Erosion and molecule formation in condensed gas films by electronic energy loss of fast ions. Nucl. Instrum. Methods Phys. Res. 198, 1 (1982) United States
1427	D02 Review	T	Under	Townsend, P. S. Electron and photon sputtering of alkali halides. Nucl. Instrum. Methods Phys. Res. 198, 9 (1982) United Kingdom
1428	D02 $\text{S}^+ + \text{CuI}; \text{F}^{2+} + \text{UF}_6; \text{F}^{2+} + \text{H}_2\text{O}; \text{F}^{2+} + \text{UF}_6; \text{F}^{2+} + \text{H}_2\text{O}; \text{F}^{2+} + \text{UF}_6; \text{F}^{2+} + \text{H}_2\text{O}; \text{F}^{2+} + \text{UF}_6; \text{Cl}^+ + \text{UF}_6$	E	1-30 MeV	Seiberling, L. E.; Meins, C. K.; Cooper, B. H.; Griffith, J. E.; Mandeshall, M. M.; Tombrillo, T. A. The sputtering of insulating materials by fast heavy ions. Nucl. Instrum. Methods Phys. Res. 198, 17 (1982) United Kingdom
1429	D02 $\text{He}^+ + \text{Ar}$	E	0.1-3 MeV	Besenbacher, F.; Bettiger, J.; Groverman, O.; Hanson, J. L.; Sorensen, M. The erosion of frozen argon by swift helium ions. Nucl. Instrum. Methods Phys. Res. 198, 27 (1982) Denmark
1430	D02 $\text{H}^+ + \text{KCl}; \text{He}^+ + \text{KCl}; \text{Ar}^+ + \text{KCl}; \text{He}^+ + \text{KBr}; \text{He}^+ + \text{KI}$	E	70-300 keV	Biersack, J. P.; Santner, E. Sputtering of alkali halides under ion bombardment. Nucl. Instrum. Methods Phys. Res. 198, 29 (1982) West Germany
1431	C02 $e + \text{Al}; \text{H}^+ + \text{Al}$	T	1-1000 keV	Ritchie, R. H. Energy losses by swift charged particles in the bulk and at the surface of condensed matter. Nucl. Instrum. Methods Phys. Res. 198, 81 (1982) United Kingdom

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1432	D02 $\text{H}^+ + \text{H}_2\text{O}; \text{He}^+ + \text{H}_2\text{O}; \text{He}^+ + \text{CO}_2$	E T	1-5 MeV	Jehncen, E. E.; Brown, W. L. Electronic mechanisms for sputtering of condensed-gas solids by energetic ions. Nucl. Instrum. Methods Phys. Res. 198, 163 (1982) United States
1433	D13 Underf	T	Underf	Karlsson, B. B. Polarization field induced by fast, heavy charges, and the desorption of surface ions. Nucl. Instrum. Methods Phys. Res. 198, 121 (1982) Sweden
1434	A06 $\text{He}^{2+} + \text{He}; \text{He}^{2+} + \text{He}; \text{He}^{2+} + \text{H}_2$ C06 $\text{He}^{2+} + \text{He}; \text{He}^{2+} + \text{He}; \text{He}^{2+} + \text{H}_2$	E	0.7-3.0 keV	Kusakabe, T.; Masaki, M.; Nagai, M.; Kuroda, K.; Maeda, M.; Sakisaka, M. Ion-impact ion source applied to low energy charge-transfer collisions. Nucl. Instrum. Methods Phys. Res. 198, 577 (1982) Japan
1435	C04 $\text{As}^+ + \text{Si}; \text{In}^+ + \text{Si}$	E	9-25 keV	Whitlow, R. J.; Biced, P.; Farnery, B. W.; O'Connor, D. J. Range distributions and thermal-annealing properties of low-energy arsenic and indium implants in silicon. Nucl. Instrum. Methods Phys. Res. 200, 491 (1982) United Kingdom
1436	C02 $\text{H}^+ + \text{H}_2; \text{H}^+ + \text{D}_2; \text{D}^+ + \text{H}_2; \text{D}^+ + \text{D}_2$ C04 $\text{H}^+ + \text{H}_2; \text{H}^+ + \text{D}_2; \text{D}^+ + \text{H}_2; \text{D}^+ + \text{D}_2; \text{H}^+ + \text{H}_2; \text{H}^+ + \text{D}_2; \text{D}^+ + \text{H}_2; \text{D}^+ + \text{D}_2$	E	1-10 keV	Bergesen, P.; Sorensen, H. Stopping of keV light ions in solid hydrogen. Nucl. Instrum. Methods Phys. Res. 200, 571 (1982) Denmark
1437	C06 PERT ⁺ + PERT	T	0-6 MeV/amu	Shima, K.; Ishihara, Y.; Mikuwa, T. Empirical formula for the average equilibrium charge-state of heavy ions behind various foils. Nucl. Instrum. Methods Phys. Res. 200, 605 (1982) Japan
1438	A06 $\text{He}^{2+} + \text{He}; \text{He}^{2+} + \text{He}; \text{He}^{2+} + \text{He}; \text{He}^{2+} + \text{He}; \text{He}^{2+} + \text{He}; \text{He}^{2+} + \text{He}; \text{He}^{2+} + \text{He}; \text{He}^{2+} + \text{He}$	E	$5 \times 10^4 - 2.5 \times 10^5$ cm/s	Marrus, B.; Prior, R.; Vane, C. R. Electron capture by trapped, low-energy, multicharged neon ions. Nucl. Instrum. Methods Phys. Res. 202, 171 (1982) United States
1439	D04 $\text{Ar}^+ + \text{C}; \text{Ne}^+ + \text{C}; \text{H}^+ + \text{C}; \text{Cl}^+ + \text{C}$	E	0.5-1.0 MeV	Garnir, M. F.; Dumont, P. D.; Baudinet-Robinet, Y. Secondary electron emission from thin foils under fast ion bombardment. Nucl. Instrum. Methods Phys. Res. 202, 187 (1982) Belgium
1440	D12 $\text{Ne}^+ + \text{C}; \text{Ne}^+ + \text{C}; \text{S}^+ + \text{C}$	E	2 MeV/amu	Maurer, R. J.; Watson, R. L.; Benke, D.; Sanders, J. M.; Oldham, E. N. Dynamic screening energy shifts and collision broadening of $2p \rightarrow 1s$ transitions in 2 MeV/amu H- and He-like Ne, Mg and S ions. Nucl. Instrum. Methods Phys. Res. 202, 193 (1982) United States
1441	C07 $\text{H}^+ + \text{C}; \text{C}^+ + \text{C}$	E	200 keV	Tang, J. Y.; Lu, F. G.; Deutch, B. I. Polarization measurements following the beam-foil interaction. Nucl. Instrum. Methods Phys. Res. 202, 215 (1982) Republic of China
1442	A03 $\text{Ne}^+ + \text{Ne}$ A06 $\text{Ne}^+ + \text{Ne}$	E	2-3 keV	Michaels, R. W.; Lee, C. S.; Church, D. A. Polarized photon emission following $\text{Ne}^+ - \text{Ne}$ charge capture collisions. Nucl. Instrum. Methods Phys. Res. 202, 223 (1982) United States
1443	A03 $\text{H}^+ + \text{H}$ A06 $\text{H}^+ + \text{H}$	T	$10^2 - 10^3$ keV	Singer, W.; Lehmann, J. C. Coherent excitation in electron capture collisions. Nucl. Instrum. Methods Phys. Res. 202, 227 (1982) Belgium
1444	C07 $\text{Ne}^+ + \text{C}$	T	100 keV	Dehaes, J. C.; Schenkel, M.; Dovey, J. Theoretical calculation of the foil tilt angle dependence of the Stokes parameters. Nucl. Instrum. Methods Phys. Res. 202, 235 (1982) Belgium
1445	C07 $\text{Ne}^+ + \text{C}$	E	100 keV	Winter, M. Contribution of surface and bulk to the orientation of beam-foil excited Ne I $3p^2$. Nucl. Instrum. Methods Phys. Res. 202, 241 (1982) West Germany
1446	C07 $\text{Ne}^+ + \text{Si}; \text{Ne}^+ + \text{C}$ D03 $\text{Ne}^+ + \text{Si}; \text{Ne}^+ + \text{C}$	E	9-500 keV	Talib, M. M.; Tully, J. C.; Feldman, L. C.; Kraus, J. S.; Riv, Y.; Tazewer, G. M.; Hess, M. The creation of excited hydrogenic states near surfaces. Nucl. Instrum. Methods Phys. Res. 202, 247 (1982) United States

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1447	D05 Undef	T	Undef	Burgdorfer, J. Electron capture into Stark states in ion-surface collisions. Nucl. Instrum. Methods Phys. Res. 202, 262 (1982) West Germany
1448	C07 $H^+ + C$; $H_2^+ + C$; $H_3^+ + C$; $B^+ + C$; $B_2^+ + C$; $B_3^+ + C$; $MD_2^+ + C$; $HMH^+ + C$	E	50 keV/cm	Astner, G.; Pannervik, S.; Vaje, E. Study of molecular effects in optical beam-foil spectroscopy. Nucl. Instrum. Methods Phys. Res. 202, 288 (1982) Sweden
1449	C06 $H_2^+ + C$	T	Undef	Schooten, R. N.; Teden, W. R. Use of realistic single scattering cross sections in computing interproton separations in the dissociation of fast H_2^+ ions traversing thin carbon foils. Nucl. Instrum. Methods Phys. Res. 202, 268 (1982) United States
1450	C07 $Cl^+ + C$	E	2-10 MeV	Jupen, C.; Besse, E.; Ekberg, J. O.; Engstrom, L.; Litzen, U.; Martinson, I.; Tai-Nong, U.; Triguero, A.; Vaje, E. Study of the beam-foil excitation mechanism using Cl ⁺ projectiles. 2-10 MeV. Nucl. Instrum. Methods Phys. Res. 202, 269 (1982) Sweden
1451	C06 $He^+ + C$; $He^+ + Al$; $He^+ + Ni$; $He^+ + Cu$	E	1-8 MeV	Kido, Y.; Kusumoto, J. Influence of contaminating layers on charge state distributions of fast ions emerging from solids. Nucl. Instrum. Methods Phys. Res. 202, 452 (1982) Japan
1452	C06 $Si^+ + C$; $Si^+ + Au$; $Cl^+ + C$; $Cl^+ + Au$	E	30-110 MeV	Ishihara, T.; Shino, K.; Kimura, T.; Ishii, S.; Nomai, T.; Yamaguchi, N.; Uetani, K.; Moriyama, M.; Yamamoto, M.; Nishino, T. Equilibrium charge state distributions of fast Si and Cl ions in carbon and gold foils. Nucl. Instrum. Methods Phys. Res. 204, 235 (1982) Japan
1453	C02 $H^+ + H_2$; $H^+ + He$; $H^+ + N_2$; $H^+ + O_2$; $H^+ + Ne$; $H^+ + Ar$; $H^+ + Kr$; $H^+ + Xe$	E	60-800 keV	Baumgart, M.; Arnold, U.; Berg, H.; Muttel, E.; Clausenitzer, G. Proton stopping powers in various gases. Nucl. Instrum. Methods Phys. Res. 204, 597 (1982) West Germany
1454	C02 $H^+ + Ne$; $H^+ + Ar$; $H^+ + Kr$; $He^{2+} + Ne$; $He^{2+} + Ar$; $He^{2+} + Kr$	T	0.5-10.0 MeV	Porter, L. E.; Jeppesen, B. G. Mean excitation energies and Barkas-effect parameters for Ne, Ar, Kr, and Xe extracted from proton and alpha particle stopping power measurements. Nucl. Instrum. Methods Phys. Res. 204, 668 (1982) United States
1455	C02 $e + Al$	T	0.5-1.5 keV	Kwai, C. N. Energy-loss and range distributions of low-energy electrons in aluminum. Nucl. Instrum. Methods Phys. Res. 204, 615 (1982) Taiwan
1456	C02 $H^+ + Si$; $He^{2+} + Si$	T	5-2000 keV	Akhmanov, A. F.; Akhmanov, S. A. Range distribution characteristics of H^+ and He^{2+} ions with energies (5 to 2) $\times 10^3$ keV implanted into silicon. Phys. Status Solidi A 62, 65 (1981) Soviet Union
1457	C02 $H^+ + Al$; $H^+ + C$; $He^+ + Al$; $He^+ + C$	E	70-1200 keV	Bednyashov, A. A.; Bulgakov, Y. V.; Nishchay, V. S.; Chernov, V. I. Energy straggling of hydrogen and helium ions in Al, C, and polystyrene at energies of tens and hundreds keV per nucleon. Phys. Status Solidi A 66, 167 (1981) Soviet Union
1458	C04 $D^+ + Si$; $B^+ + Si$	E	50-65 MeV	Fahrner, H. R.; Heidemann, K.; Schottke, F. Results of ion implantation into silicon in the 100 MeV range (I). Phys. Status Solidi A 78, 443 (1982) West Germany
1459	D08 $h\nu + In$; $h\nu + Pb$	T	1.6-2.6 eV	Brodehli, A. R.; Deihhin, L. I.; Urbakh, N. I. On the polarization dependence of photoemission from metals. Phys. Status Solidi B 100, 653 (1981) Soviet Union
1460	C04 PERT + Si	T	Undef	Gartner, K.; Nohl, K. 2,-dependence of low energy ranges in Si. Phys. Status Solidi B 100, K169 (1981) East Germany

REF. NO.	REACTANTS	EXP OR THEORY	ENERGY RANGE	REFERENCE
1461	D05 hv + C; hv + Al; hv + Ti; hv + Cu; hv + Mo; hv + Cd; hv + Gd; hv + Ta; hv + Bi; hv + U	T	0.1-3.0 MeV	Alberman, A. F.; Botvin, V. A.; Grudekii, N. Y.; Solonov, V. V.; Chernov, G. Y.; Shilenkova, M. V. Secondary electron radiation from different targets exposed to photons with energy 0.1 to 3 MeV. <i>Phys. Status Solidi B</i> 110, 285 (1982) Argentina
1462	C02 H ⁺ + Au	T	100-400 keV	Yferov, G. A.; Zhukova, Y. M. The impact-parameter dependence of energy losses in proton, scattering by gold atoms. <i>Phys. Status Solidi B</i> 110, 653 (1982); Soviet Union
1463	A06 He ²⁺ + PERT A08 He ²⁺ + PERT C06 He ²⁺ + PERT	T	1 MeV	Kaneko, T.; Ohtsuki, Y. M. Calculation of the equilibrium mean charge of helium ions. <i>Phys. Status Solidi B</i> 111, 491 (1982) Japan
1464	D05 hv + NaCl; hv + KCl; hv + RbCl; hv + CsCl	E	100-250 eV	Elango, M.; Kikas, A.; Houshe, E.; Paulmann, J.; Sear, A. The quantum yield spectra of electron emission of solids in UV region. Alkali chlorides at 100 to 250 eV. <i>Phys. Status Solidi B</i> 114, 467 (1982) Soviet Union
1465	D08 Ca ⁺ + Ta	E	4 keV	Belykh, S. F.; Vekeler, V. I. On the nature of continuum emission production of photons, emitted by the products of refractory metal sputtering. <i>Radiat. Eff. Lett.</i> 67, 87 (1981) Soviet Union
1466	C04 H ⁺ + PERT C05 H ⁺ + PERT	T	1-1000 keV	Laukkanen, A.; Hentala, M. Calculation of H ⁺ -ranges and H ⁺ -range stragglings in the energy region 1-1000 keV. <i>Radiat. Eff.</i> 59, 113 (1982) Finland
1467	C02 He ⁺ + Cu C05 He ⁺ + Cu	T	100 keV	Eller, K.; Wedell, E. Modification of the theory of energy-angle distributions of low energy heavy particles after penetration through matter by Meyer, Klein, and Wedell. <i>Radiat. Eff.</i> 59, 109 (1982) East Germany
1468	C04 H ⁺ + Si; H ⁺ + Ge; H ₂ ⁺ + Si; H ₂ ⁺ + Ge	T	0.3-2.0 MeV	Blister, M.; Hirvonen, J.; Räsänen, J.; Anttila, A. Ranges of the 0.3-2 MeV H ⁺ and 0.7-2 MeV H ₂ ⁺ ions in Si and Ge. <i>Radiat. Eff.</i> 59, 199 (1982) Finland
1469	C02 Ar ⁺ + C	T	30 keV	Balashova, L. L.; Polchanov, V. A. Energy redistribution of the ion flux as the result of its interaction with the scattering center. <i>Radiat. Eff.</i> 60, 45 (1982) Soviet Union
1470	C04 He ²⁺ + Ni	T	50-200 keV	Lisakov, Y. L.; Rysanov, A. I. Stopping of implanted charged particles in solid targets and calculation of radiation damage induced by them. <i>Radiat. Eff.</i> 60, 95 (1982) Soviet Union
1471	C02 He ⁺ + Al; He ⁺ + Cu; He ⁺ + Ag C05 He ⁺ + Al; He ⁺ + Cu; He ⁺ + Ag	E	0.25-0.75 MeV/amu	Stoquert, J. F.; Amokrane, A.; Beaumeville, M.; Oberlin, J. C. Energy straggling of He ions in Al, Cu and Ag from 0.25 to 0.75 MeV/amu. <i>Radiat. Eff.</i> 60, 111 (1982) Algeria
1472	D03 Xe ⁺ + Mg; Xe ⁺ + Cu; Xe ⁺ + Zn; Xe ⁺ + Ge; Xe ⁺ + Au; Xe ⁺ + Ti	E	10-120 keV	Andersen, M.; Andersen, B.; Vejse, E. Atomic excitations in sputtering processes. <i>Radiat. Eff.</i> 60, 112 (1982) Denmark
1473	C04 H ⁺ + GaAs	E	100-300 keV	Snyman, H. C.; Heethling, J. M. Damage distribution and measure of projected range in proton bombarded GaAs. <i>Radiat. Eff.</i> 60, 147 (1982) South Africa
1474	D00 Li ⁺ + Cu; He ⁺ + Cu; K ⁺ + Cu	E	3-22 keV	Algra, A. J.; Loenen, E. V.; Saurmeijer, E.P.T.M.; Boers, A. L. The ion fractions of 2-10 keV lithium, sodium and potassium scattered from a copper (100) surface. <i>Radiat. Eff.</i> 60, 173 (1982) The Netherlands
1475	D01 Under	T	Under	Winterbon, K. B. The spatial structure of collision cascades. <i>Radiat. Eff.</i> 60, 199 (1982) Canada

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1476	D02 Undef	T	Undef	Voller, R. A.; Voller, M. R. Energy sharing and sputtering in low-energy collision cascades. Radiat. Eff. 40, 205 (1982) United States
1477	C01 Review D01 Review	E T	Undef	Pathak, A. P. The effects of defects on charged particle propagation in crystalline solids. Radiat. Eff. 61, 1 (1982) India
1478	D04 Review	E	Undef	Barragiano, R. A. Principles and applications of ion-induced Auger electron emission from solids. Radiat. Eff. 61, 47 (1982) Argentina
1479	C04 $H^+ + Si$; $B^+ + Si$; $Sb^+ + Si$ C06 $H^+ + Si$; $B^+ + Si$; $Sb^+ + Si$	T	0.5-200 keV	Aderido, I.; Karagiannis, L. Monte Carlo simulation of ion beam penetration in solids. Radiat. Eff. 61, 223 (1982) United States
1480	D07 $K^+ + Cu$; $Ne^+ + Cu$; $Ar^+ + Cu$	E	5-10 keV	Algra, A. J.; Leltjens, S. B.; Borggreve, M.; Smeets, E.-P.T.M.; Ectors, A. L. The ratio of the single and double scattering intensities in ion scattering spectroscopy as a quantitative measure of surface structures. Radiat. Eff. 62, 7 (1982) The Netherlands
1481	C01 Undef	T	Undef	Tulupov, A. V. Quantum theory of the Rutherford radiation from several MeV particles. Radiat. Eff. 62, 77 (1982) Soviet Union
1482	D08 $Ne^+ + Ni$	T	5 keV	Nishiyama, S. L.; Parilis, E. S.; Verlinger, V. K. Anisotropy of ionization degree at scattering on surface semichannels. Radiat. Eff. 62, 173 (1982) Soviet Union
1483	C02 Undef	T	Undef	Biersack, J. P.; Stadel, R. Repulsive potentials and nuclear stopping in ionic insulators. Radiat. Eff. 64, 51 (1982) West Germany
1484	D02 $He^+ + S$	E	30-300 keV	Fink, D.; Biersack, J. P. Catastrophic sputtering of sulfur by helium. Radiat. Eff. 62, 85 (1982) West Germany
1485	D02 $Cl^+ + Al_2O_3$; $Cl^+ + LiNbO_3$	E	3-25 MeV	Qiu, Y.; Griffith, J. E.; Tombrello, T. A. Sputtering of Al_2O_3 and $LiNbO_3$ in the electronic stopping region. Radiat. Eff. 64, 111 (1982) United States
1486	D17 $O^+ + Ge$; $O^+ + Si$; $O^+ + Ag$; $O^+ + Cr$; $O^+ + Cu$; $O^+ + Fe$; $O^+ + Hf$; $O^+ + Mo$; $O^+ + Nb$; $O^+ + Ni$; $O^+ + Ta$; $O^+ + Ti$; $O^+ + V$; $O^+ + W$; $O^+ + Yb$; $O^+ + Zr$; $N^+ + Ge$; $N^+ + Si$; $N^+ + Ag$; $N^+ + Cr$; $N^+ + Cu$; $N^+ + Fe$; $N^+ + Hf$; $N^+ + Mo$; $N^+ + Nb$; $N^+ + Ni$; $N^+ + Ta$; $N^+ + Ti$; $N^+ + V$; $N^+ + W$; $N^+ + Yb$; $N^+ + Zr$	T	40 keV	Kelly, R. On the nature of the phases formed when metals are implanted with oxygen or nitrogen. Radiat. Eff. 64, 205 (1982) United States
1487	D17 Review	E	Undef	Volf, G. K. Chemical and catalytic effects of ion implantation. Radiat. Eff. 65, 167 (1982) West Germany
1488	D17 Review	E	Undef	Bibring, J.-P.; Record, F. Ion implantation phenomena in space. Radiat. Eff. 65, 159 (1982) France
1489	D02 $He^+ + H_2O$; $Ar^+ + H_2O$	E	20-100 keV	Cicciolo, G.; Foti, G.; Torrini, L.; Pirronello, V.; Strazzulla, G. Molecular erosion of ice by keV ion bombardment. Radiat. Eff. 65, 167 (1982) Italy
1490	D01 Undef	T	Undef	Protasov, V. I.; Chudinov, V. G. Evolution of cascade region during the thermal spike. Radiat. Eff. 66, 1 (1982) Soviet Union
1491	D02 $Ar^+ + Ag$; $Xe^+ + Ag$	E	5 keV	Baercke, K.; Jerges, S.; Moser, W. O.; Littmark, U. A search for a thermal spike effect in sputtering: I. Temperature dependence of the yield at low-keV, heavy-ion bombardment. Radiat. Eff. 66, 35 (1982) West Germany

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1492	D18 $\text{He}^+ + \text{U}; \text{Kr}^+ + \text{Al}$	E	30 keV	Katrich, M. P.; Budnikov, A. T. Interaction of He^+ ions with polycrystalline and single-crystal metals. Sov. At. Energy E3, 752 (1982) Soviet Union
1493	A11 $\text{Na}_2^+ + \text{Na}; \text{K}_2^+ + \text{K}$ M05 $h\nu + \text{Na}_2^+$	E	A11 473-723 K M05 600-440 nm	Yanson, M. L. Collisional and dissociative processes in the excitation of atoms and their role in lasing of alkali metal vapors. Sov. J. Quantum Electron. 12, 1641 (1982) Soviet Union
1494	A14 Undef	T	Undef	Aristov, V. F.; Tolmachev, V. V. Quasiclassical theory of the reaction scattering $\text{AB} + \text{CD} \rightarrow \text{AC} + \text{BD}$. Sov. Phys. J. 25, 132 (1982) Soviet Union
1495	D18 $\text{H}_2 + \text{Ti}$	E	300 K	Malyshov, L. G.; Lebedev, S. A.; Ryabov, B. A.; Gel'd, P. V.; Kuznetsov, S. A. Hydrogen diffusion in titanium at room temperature. Sov. Phys. J. 25, 232 (1982) Soviet Union
1496	A12 $\text{CO}_2^+ + \text{CO}_2; \text{CO}_2^+ + \text{H}_2$ M02 $h\nu + \text{CO}_2$	T	A12 240-296 K M02 700-910 cm^{-1}	Nosmlova, L. I.; Radisova, O. B.; Ivorogov, S. D.; Voltskhovskaya, C. K.; Sulakhina, O. N. Absorption coefficient in the wings of carbon dioxide bands in the 700-910- cm^{-1} spectrum range. Sov. Phys. J. 25, 475 (1982) Soviet Union
1497	E23 $e + \text{Y}$	E	25-210 eV	Kuchanov, A. B.; Zairnov, Y. M. Excitation cross sections of the spectral lines of the doubly charged yttrium ion. Sov. Phys. J. 25, 759 (1982) Soviet Union
1498	D06 $e + \text{Au}$	T	10 keV	Korayushkin, Y. B. Backscattering of electrons at oblique incidence from the surface of a free or semi-infinite layer. Sov. Phys.-Solid State 23, 1666 (1981) Soviet Union
1499	D06 $e + \text{Si}$	E	20-300 eV	Bozhanova, M. P.; Kechetov, M. I.; Abusov, V. M. Yield of electrons with fixed energy losses from Si(111) bombarded with $E(\text{sub } p) = 20\text{-}300$ eV electrons. Sov. Phys.-Solid State 23, 2145 (1981) Soviet Union
1500	D13 $e + \text{Cs} + \text{WO}$	E	0-250 eV	Ageev, V. A.; Kuznetsov, Y. A.; Yakshinskii, B. V. Electron stimulated desorption of cesium atoms from oxidized tungsten. Sov. Phys.-Solid State 24, 199 (1982) Soviet Union
1501	D06 $e + \text{Be}$	E	1-1000 eV	Ershova, T. F.; Korshlev, V. V.; Morozov, Y. A. Determination of the depth of emission of coherently and elastically reflected electrons of energies 1-1000 eV. Sov. Phys.-Solid State 24, 715 (1982) Soviet Union
1502	K01 Electron detachment	E T	0-3000 eV	Bydin, Y. F.; Boshov, Y. M. Electron energy spectrum in low-energy collisions of negative ions and atoms. Sov. Phys.-Usp. 25, 453 (1982) Soviet Union
1503	E02 $e + \text{H}_2\text{S}; e + \text{SO}_2; e + \text{H}_2\text{O}$	E	0-10 eV	Sokolov, V. F.; Sokolova, Y. A. Total cross sections for electron scattering by H_2S , SO_2 , and H_2O molecules at electron energies in the range 0-10 eV. Sov. Tech. Phys. Lett. 7, 262 (1981) Soviet Union
1504	M06 Undef	T	Undef	Geller, Y. I.; Popov, A. K. Narrowing of autoionization resonances in multiphoton ionization spectra. Sov. Tech. Phys. Lett. 7, 387 (1981) Soviet Union
1505	E23 $e + \text{O}_2; e + \text{CO}; e + \text{H}_2; e + \text{NO}; e + \text{H}_2\text{O}; e + \text{CO}_2$	E	8-36 eV	Kupriyanov, S. E.; Percov, A. A.; Zayats, A. Y.; Stepanov, A. A. Electron-impact excitation of molecules to long-lived Rydberg states. Sov. Tech. Phys. Lett. 7, 365 (1981) Soviet Union
1506	D07 $h\nu + e$ M03 $h\nu + e$	E	M03 10.2 cm	Didenko, A. B.; Borisov, A. R.; Zherbitsky, A. G.; Mol'nikov, G. V.; Fomchenko, G. P.; Shtein, Y. G. Scattering of an electromagnetic wave by an intense electron beam. Sov. Tech. Phys. Lett. 7, 439 (1981) Soviet Union

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1507	A02 $Li^+ + Na; Li^+ + Ne; Li^+ + Ar; Li^+ + Kr; Li^+ + Xe; K^+ + Na; K^+ + Ne; K^+ + Ar; K^+ + Kr; K^+ + Xe$	T	Undef	Kolomolets, A. R. Empirical expression for the elastic cross section of atoms. <i>Sov. Tech. Phys. Lett.</i> 7, 543 (1981) Soviet Union
1508	A05 $Kr^+ + Kr; Kr^{2+} + Kr; Kr^{3+} + Kr; Kr^{4+} + Kr$	E	0-800 keV	Boyer, M. F.; Mann, R.; Mushki, G. G.; Shergin, A. P. X-ray emission in keV-range Kr-Kr collisions. <i>Sov. Tech. Phys. Lett.</i> 8, 317 (1982) France
1509	D04 $He^+ + Al$	E	0.5-3.0 keV	Zampieri, G. E.; Baragiale, R. A. Anticlonation of He projectiles in collisions with surfaces. <i>Surf. Sci.</i> 114, L15 (1982) Argentina
1510	D02 Review	T	Undef	Garrison, B. J. Preferential sputtering of binary compounds: a model study. <i>Surf. Sci.</i> 114, 23 (1982) United States
1511	D07 Undef	T	Undef	Kawai, R.; Itoh, M.; Ohtsuki, Y. M. Inelastic scattering of ions at the surface. <i>Surf. Sci.</i> 114, 137 (1982) Japan
1512	D07 $He^+ + Ni$	T	0.6-3.2 keV	Heibig, M. F.; Linder, M. W.; Morris, G. A.; Steward, S. A. Computer simulations of low-energy neon-ion scattering from nickel crystals. <i>Surf. Sci.</i> 114, 261 (1982) United States
1513	D09 $He^+ + W$	T	2-1000 eV	Mayer, C. A.; Orzech, K. Neutralization in ion-surface collisions. <i>Surf. Sci.</i> 114, 295 (1982) United States
1514	D08 $H^+ + Ni; H^+ + Cu$	E	1.7-6.7 keV/amu	Von Gombingen, U.; Sizmann, R. Charge states of slow hydrogen ions reflected at single crystal surfaces. <i>Surf. Sci.</i> 114, 445 (1982) West Germany
1515	D02 $Ar^+ + Au; Ar^{2+} + Au$	E	3-14 keV	Fitch, R. K.; Hammond, E. A. Measurement of the sputtering yield for Ar^+ and Ar^{2+} ions on gold films. <i>Thin Solid Films</i> 87, 379 (1982) United Kingdom
1516	D11 $Au + MgO$	E	20-800 °C	Gotoh, T.; Hirasawa, S.; Kinoshita, K. Measurement of sticking coefficient of gold atoms on $MgO(001)$ with a torsion microbalance. <i>Thin Solid Films</i> 87, 385 (1982) Japan
1517	D09 $ArH^+ + Cu; ArH^+ + Au; ArH^+ + Pt; ArH^+ + Ag$	E	20 keV	Vlasov, V. P.; Evstigneev, S. A.; Zvonkov, S. M.; Lehtyshev, S. V.; Chicherov, V. M. Scattering of nonhomonuclear hydrogenous molecular ions by a metal surface. <i>Sov. Phys.-JETP Lett.</i> 35, 628 (1982) Soviet Union
1518	A17 Undef	T	Undef	Dedkov, G. V. New approximation for the interatomic potential: dependence on the relative-motion energy of the atoms. <i>Sov. Phys. Tech. Phys.</i> 27, 911 (1982) Soviet Union
1519	A06 $C^{4+} + H; O^{8+} + H$	T	0.1-0.4 a.u.	Kozanskii, A. K.; Kernerov, I. V. Charge exchange of C^{4+} and O^{8+} ions with hydrogen atoms: strong coupling calculation. <i>Sov. Phys. Tech. Phys.</i> 27, 1064 (1982) Soviet Union
1520	A02 $C^{4+} + H_2; C^{4+} + H^+; O^{8+} + H_2; O^{8+} + H^+$	T	Undef	Kozanskii, A. K.; Kernerov, I. V. Elastic scattering with high momentum transfer of slow hydrogen atoms by ions. <i>Sov. Phys. Tech. Phys.</i> 27, 1504 (1982) Soviet Union
1521	K06 Bound states	T	Undef	Perelov, I. C. Semiclassical theory of bound states. <i>Adv. Chem. Phys.</i> 36, 1 (1977) United Kingdom
1522	K01 Review	T	Undef	Clark, A. P.; Dickinson, A. S.; Richards, D. The correspondence principle in heavy particle collisions. <i>Adv. Chem. Phys.</i> 36, 62 (1977) United Kingdom
1523	K01 Scattering	T	Undef	Leubner, B. G.; Myatt, S. E. Potential-energy surfaces and elastic and inelastic scattering. <i>Adv. Chem. Phys.</i> 36, 141 (1977) United States

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1524	A14 $F + H_2$	E T	100-500 K	Anderson, J. E. The reaction $F + H_2 \rightarrow HF + H$. Adv. Chem. Phys. 41, 229 (1980) United States
1525	K01 Excited states	E T	Undef	Tiernan, T. O.; Litshitz, C. Role of excited states. Adv. Chem. Phys. 45, 82 (1981) United States
1526	K06 Structure	T	Undef	Nichols, R. N.; Electronic structure of excited states of selected atmospheric systems. Adv. Chem. Phys. 45, 225 (1981) United States
1527	K01 Energy transfer	E	Undef	Hertel, I. V. Collisional energy-transfer spectroscopy with laser-excited atoms in crossed atomic beams. Adv. Chem. Phys. 45, 341 (1981) West Germany
1528	K01 Ionization	E	Undef	Krishner, A. Spontaneous ionization in slow collisions. Adv. Chem. Phys. 45, 299 (1981) The Netherlands
1529	K01 Scattering	E	Undef	Haberland, H.; Lee, Y. T.; Siska, P. E. Scattering of noble gas metastable atoms in molecular beams. Adv. Chem. Phys. 45, 487 (1981) West Germany
1530	K03 Photoionization	E	Undef	Ng, C. Y. Molecular beam photoionization studies of molecules and clusters. Adv. Chem. Phys. 52, 263 (1983) United States
1531	A11 $Mg^+ + H_2; Mg^+ + D_2$	E	543-882 K	Breckenridge, W. N.; Stewart, J. The temperature dependence of the quenching of $Mg(^3P_{sub{ext}} j)$ by H_2 and D_2 : endoergic chemical reaction as rate limiting. J. Chem. Phys. 77, 4465 (1982) United States
1532	A11 $OH^+ + H_2; OH^+ + D_2; OH^+ + H_2O$	E	300 K	Glass, G. F.; Endo, K.; Chattervedi, B. K. Vibrational energy transfer from OH^+ to other gaseous hydrides. J. Chem. Phys. 77, 5456 (1982) United States
1533	A02 $Kr^+ + He; Xe^+ + He$	E	0.5-3.0 keV	Inouye, H.; Ienji-hoda, K. Integral elastic-scattering of Kr^+ and Xe^+ ions in collision with He atoms. J. Chem. Phys. 77, 5550 (1982) Japan
1534	A17 He_2^{2+}	T	Undef	Castro, M.; Keller, J.; Ventura, O. M. Ground state of the He_2^{2+} molecular ion computed with density functional techniques. J. Chem. Phys. 77, 6348 (1982) Mexico
1535	E03 $e + Si$	E	0-250 eV	Kolosev, P. A.; Kresavin, A. Y.; Smirnov, Y. M. Collisional excitation cross sections for atomic silicon. Sov. Astron.-AJ 25, 690 (1981) Soviet Union
1536	E07 $e + H_2^+$	T	500-3500 K	Walte, J. H., Jr.; Cravens, T. E. Vibrational and rotational cooling of electrons by molecular hydrogen. Planet. Space Sci. 25, 1333 (1981) United States
1537	K02 Scattering; Excitation K03 Photoionization	T		Joachain, C. J. Electron and photon collisions with atoms and ions. p. 1 in Atomic and Molecular Collision Theory, F. A. Gianturco, ed. Plenum Press, New York, (1982) Belgium
1538	K02 Scattering; Excitation K03 Photoionization	T		Burke, F. G. Electron and photon collisions with molecules. p. 69 in Atomic and Molecular Collision Theory, F. A. Gianturco, ed. Plenum Press, New York, (1982) United Kingdom
1539	K01 Mutual neutralization K02 Radiative recombination; Dissociative recombination	T		Berdale, J. A. Recombination processes in atomic and molecular physics. p. 123 in Atomic and Molecular Collision Theory, F. A. Gianturco, ed. Plenum Press, New York, (1982) United States

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1540	K01 Charge exchange; Ionization; Interaction potential	T		McCorrell, B. Charge exchange and ionization in ion-atom collisions. p. 155 in Atomic and Molecular Collision Theory, F. A. Gianturco, ed. Plenum Press, New York, (1982) France
1541	K00 Astrophysics	T		Van Hogenorter, H. Atoms in astrophysical plasmas. p. 232 in Atomic and Molecular Collision Theory, F. A. Gianturco, ed. Plenum Press, New York, (1982) France
1542	K01 Scattering; Excitation	T		Child, B. S. Low energy atom-atom collisions. p. 279 in Atomic and Molecular Collision Theory, F. A. Gianturco, ed. Plenum Press, New York, (1982) United Kingdom
1543	K01 Interaction potentials; Excitation	T		Gianturco, F. A. Internal energy transfers in molecular collisions. p. 315 in Atomic and Molecular Collision Theory, F. A. Gianturco, ed. Plenum Press, New York, (1982) Italy
1544	K01 Interchange K03 Excitation; Dissociation	T		Lavine, R. D. Chemical photophysics. p. 383 in Atomic and Molecular Collision Theory, F. A. Gianturco, ed. Plenum Press, New York, (1982) Israel
1545	K07 Excited state collisions	T		Perceival, I. C. Collisions of charged particles with highly excited atoms. p. 431 in Atomic and Molecular Collision Theory, F. A. Gianturco, ed. Plenum Press, New York, (1982) United Kingdom
1546	K02 Scattering	T		Mittleman, M. N. Electron-atom scattering in the field of a laser. p. 461 in Atomic and Molecular Collision Theory, F. A. Gianturco, ed. Plenum Press, New York, (1982) United States
1547	A14 $C_2H_2 + H_2$	E	1111-1200 K	Cao, J. R.; Beck, M. M. Kinetics of the reaction $C_2H_2 + H_2 \rightarrow C_2H_4 + H$ from 1111-1200 K. Can. J. Chem. 60, 3839 (1982) Canada
1548	A06 $Ar^+ + He$; $Ar^+ + Ne$; $Ar^+ + Ar$; $Ar^+ + Kr$; $Ar^+ + Xe$	E	30-120 keV	Hird, B.; Ali, S. F. Electron loss cross sections from rare gas atoms to Ar^+ . Can. J. Phys. 60, 977 (1982) Canada
1549	A06 $Kr^+ + He$; $Kr^+ + Ne$; $Kr^+ + Ar$; $Kr^+ + Kr$; $Kr^+ + Xe$	E	30-120 keV	Hird, B.; Ali, S. F. Charge transfer from rare gas atoms to Kr^+ . Can. J. Phys. 60, 981 (1982) Canada
1550	A93 $Ne^{2+} + Li$ A94 $Ne^{2+} + Li$ K08 $Ne^{2+} + Li$	E	20-60 keV	Winter, M. Excitation of multiply charged ions by electron capture from lithium and applications for plasma impurity ion transport studies. Comments At. Mol. Phys. 12, 165 (1982) Austria
1551	C04 $e + PERT$	T	0.05-100 MeV	Gupta, S. K.; Gupta, D. K. Continuous slowing-down approximation range of 50-keV-100-MeV electrons. J. Appl. Phys. 52, 1175 (1981) India
1552	D03 $O_2^+ + [Cr + Ni]$; $O_2^+ + [Fe + Ni]$; $O_2^+ + [Cu + Ni]$; $O_2^+ + [Pd + Ni]$; $O_2^+ + [Ag + Pd]$	E	15 keV	Yu, M. L.; Rester, W. Secondary ion emission from binary alloy systems. Part I: O_2^+ bombardment. J. Appl. Phys. 52, 1472 (1981) United States
1553	D03 $Ar^+ + [Cu + Ni]$; $Ar^+ + [Pd + Ni]$; $Ar^+ + [Ag + Pd]$; $Ar^+ + [Pd + Ni]$; $Ar^+ + [Ag + Pd]$; $Ar^+ + [Pd + Ni]$	E	15 keV	Yu, M. L.; Rester, W. Secondary ion emission from binary alloy systems. Part II: Ar^+ bombardment with O_2 absorption. J. Appl. Phys. 52, 1489 (1981) United States
1554	D02 $Ar^+ + Cu$	T	6 keV	Harrison, D. E., Jr. A molecular dynamics simulation study of the influence of the ion-atom. J. Appl. Phys. 52, 1495 (1981) United States
1555	D05 $h\nu + Al$; $h\nu + Au$; $h\nu + CuI$; $h\nu + CuI$	E	0.1-10 keV	Henke, B. L.; Kruer, J. P.; Premaratne, K. The characterization of x-ray photoanodes in the 0.1-10-keV photon energy region. J. Appl. Phys. 52, 1509 (1981) United States

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1555	D02 $\text{Xe}^+ + [\text{Si} + \text{Xe}] + \text{O}_2; \text{Xe}^+ + [\text{SiO}_2 + \text{Xe}]$	E	20 keV	Wach, V.; Wittmann, K. Ion implantation and sputtering in the presence of reactive gases: bombardment-induced incorporation of oxygen and related phenomena. J. Appl. Phys. 52, 3341 (1981) West Germany
1557	C02 $\text{He}^+ + \text{Ni}$ C04 $\text{He}^+ + \text{Ni}$	E	20 keV	Fenske, G.; Das, S. K.; Kaminsky, M.; Piley, G.; Terreselt, B.; Atzl, G.; Labrie, J. P. Experimental and calculated depth distributions of damage and projected ranges of 20-keV ^4He ions in nickel. J. Appl. Phys. 52, 3618 (1981) United States
1558	C02 $\text{H}^+ + \text{LiF}; \text{D}^+ + \text{LiF}; \text{He}^{2+} + \text{LiF}$	T	0.5-3 MeV	Wilman, J. W.; Chung, C. K.; Xu, Y. J.; Kamaratos, E. Ionic bond effects on the mean excitation energy for stopping power. J. Appl. Phys. 53, 828 (1982) United States
1559	E05 $e + \text{Ce}^+$	E	25-2000 eV	Hartling, D. S.; Feeney, B. K.; Hughes, D. W.; Sayle, W. E., II. Absolute experimental cross sections for the electron impact single, double, triple, and quadruple ionization of Ce^+ ions. J. Appl. Phys. 53, 5427 (1982) United States
1560	D02 $\text{Ar}^+ + \text{In}$	E	17-100 eV	Murat, H. I.; Cooper, C. B.; Matosian, J.; Seidl, M. Low energy Ar^+ ion sputtering of liquid and solid indium. J. Appl. Phys. 53, 6372 (1982) United States
1561	D07 $\text{D}^+ + \text{C}$	E	32-2000 eV	Brown, M.; Thomsen, E. W. Reflection of 32-2000 eV deuterium from carbon. J. Appl. Phys. 53, 6446 (1982) United States
1562	C02 $\text{H}^+ + \text{C}; \text{H}^+ + \text{V}; \text{H}^+ + \text{Cr}; \text{H}^+ + \text{Fe};$ $\text{H}^+ + \text{Ni}; \text{He}^+ + \text{C}; \text{He}^+ + \text{V}; \text{He}^+ +$ $\text{Cr}; \text{He}^+ + \text{Fe}; \text{He}^+ + \text{Ni}; \text{Li}^+ + \text{C};$ $\text{Li}^+ + \text{V}; \text{Li}^+ + \text{Cr}; \text{Li}^+ + \text{Fe}; \text{Li}^+ +$ $\text{Ni}; \text{Be}^+ + \text{C}; \text{Be}^+ + \text{V}; \text{Be}^+ + \text{Cr};$ $\text{Be}^+ + \text{Fe}; \text{Be}^+ + \text{Ni}; \text{B}^+ + \text{C}; \text{B}^+ +$ $\text{V}; \text{B}^+ + \text{Cr}; \text{B}^+ + \text{Fe}; \text{B}^+ + \text{Ni}$	E	30-330 keV	Mortens, P.; Krist, T. Stopping ratios for 30-330 keV ions with 1 less than or equal to Z, less than or equal to 5. J. Appl. Phys. 53, 7343 (1982) West Germany
1563	D04 $\text{Ar}^+ + \text{Si}; \text{Kr}^+ + \text{Si}$	E	2-10 keV	Sakhi, A.; Tanaka, S. Ion-induced Auger electron emission from Si surface. Jpn. J. Appl. Phys. Pt. 2 21, L629 (1982) Japan
1564	H06 $h\nu + \text{Sn}; h\nu + \text{Pd}$	E T	5-6 keV	Scrovel, M. A.; Zhsudskii, A. Z.; Musatenko, L. A.; Shiyenovich, V. I. Determination of photoionization cross sections of L subshells of tin and palladium. Opt. Spectrosc. 51, 226 (1981) Soviet Union
1565	E03 $e + \text{K}^{2+}$	E	62-125 eV	Smirnov, Y. P.; Shapochkin, M. B. Electron-impact excitation of the doubly charged potassium ion from the ground atomic state. Opt. Spectrosc. 51, 242 (1981) Soviet Union
1566	E07 $e + \text{Ar}^0$	E	500-3000 K	Barnov, I. Y.; Denisov, V. I.; Klekolev, M. B. Temperature dependence of rate constants for metastable atomic-argon deactivation by slow electrons. Opt. Spectrosc. 51, 316 (1981) Soviet Union
1567	A17 $\text{Ar}^{20+} + \text{Ar}^{20+}$	T		Plindov, G. I.; Pogrebnya, S. K. Electron energy and interaction potential of two identical ions. Opt. Spectrosc. 51, 337 (1981) Soviet Union
1568	A17 $\text{Hg}^0 + \text{Hg}; \text{Hg}^0 + \text{Ne}; \text{Hg}^0 + \text{Ar}; \text{Hg}^0 +$ $\text{Kr}; \text{Hg}^0 + \text{Xe}$	E T		Kryukov, M. A.; Peskin, M. P.; Radko, I. P. Interaction of metastable mercury atoms with ground-state inert-gas atoms. Opt. Spectrosc. 51, 420 (1981) Soviet Union
1569	E03 $e + \text{Hg}$	E	4-20 eV	Melnikov, V. V.; Smirnov, Y. M.; Sharov, Y. D. Excitation of the manganese-atom octet states by electron collisions. Opt. Spectrosc. 51, 423 (1981) Soviet Union

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1570	E03 $e + Na^+$	E	55-65 eV	Shapochkin, N. V.; Shirmov, Y. N. Cross sections for level excitations and probabilities of singly charged sodium-ion transitions. Opt. Spectrosc. 61, 532 (1981) Soviet Union
1571	A02 $Ar + Ar$ A17 $Ar + Ar$	T	A02 0.8-6.4 keV	Van den Bielen, J.J.H.; Van den Heijdenberg, C.J.H. Calculation of approximation total cross sections in the glory region from noble gas potentials. Physica A 115, 383 (1982) The Netherlands
1572	A17 $Ar + Ar; Kr + Kr; Xe + Xe$	T		Van den Bielen, J.J.H.; Van den Heijdenberg, C.J.H. Relation between total cross section and the interaction potential; a comparison with closely connected data. Physica A 116, 376 (1982) The Netherlands
1573	A02 $He + Ar; He + Kr; He + Xe; Ar + Ar; Ar + Kr; Ar + Xe; Kr + Kr; Kr + Xe; Xe + Xe$	E	Thermal	Van den Bielen, J.J.H.; Hermans, R. M.; Van den Heijdenberg, C.J.H. Experimental total collision cross sections in the glory region for noble gas systems. Physica A 116, 394 (1982) The Netherlands
1574	A02 $O_2 + Ar; O_2 + Kr; F_2 + Ar; NO + Ar$ A17 $O_2 + Ar; O_2 + Kr; F_2 + Ar; NO + Ar$	E	A02 3.8-140 K	Van den Bielen, J.J.H.; Treffers, N. A.; Van den Heijdenberg, C.J.H. Experimental total collision cross sections in the glory region for atom-molecule systems. Physica A 116, 101 (1982) The Netherlands
1575	A02 $Ar + Ar$	T	Thermal	Neuman, E. A.; Nyeland, C.; Van den Bielen, J.J.H.; Van den Heijdenberg, C.J.H. Improved calculation of total scattering cross sections in the glory region. Physica A 116, 133 (1982) The Netherlands
1576	M08 $h\nu + Pb$	E	3.62-4.95 keV	Hribar, M.; Kedra, A.; Faber, J. A study of the M-shell fluorescence yields of lead. Physica Scripta 116, 132 (1982) Yugoslavia
1577	A03 $H^+ + He; H_2^+ + He; H_2^+ + He$	E	1-25 keV	Moskold, A. R.; Niern, E. E.; Allen, J. S.; Anderson, L. W.; Lin, C. C. Excitation of the He(3p) level by H^+ , H_2^+ , or H_2^+ ions. Phys. Lett. 92A, 328 (1982) United States
1578	A06 $He^+ + C$ A07 $He^+ + C$	E	68-130 MeV	Katayama, I.; Berg, G.F.A.; Harlmann, U.; Martin, S. A.; Meisburger, J.; Oelert, W.; Rogge, M.; Romer, J.G.M.; Tels, J.; Teyssie, B.; Gaul, G. Charge transfer reactions of 4He in carbon at 68, 99 and 130 MeV. Phys. Lett. 62A, 385 (1982) West Germany
1579	A02 $D^+ + Sn$	E	19-20.5 MeV	Clemm, M.; Frick, B.; Graw, G.; Herz, F.; Schiemenz, P.; Seichert, B. Phase relations and the determination of static mass quadrupole moments in the scattering of polarized deuterons. Phys. Lett. 116B, 109 (1982) West Germany
1580	A08 $He^+ + He; He^+ + N_2; He^+ + Ar; Li^{2+} + He; Li^{2+} + N_2; Li^{2+} + Ar; C^{3+} + He; C^{3+} + N_2; C^{3+} + Ar; O^{7+} + He; O^{7+} + N_2; O^{7+} + Ar$	E	1-4.3 MeV/nm	Knudsen, H.; Andersen, L. B.; Høgen, M. Z.; Hvelplund, P. Electron loss from fast one-electron ions colliding with He, N_2 , and Ar. Phys. Scr. 26, 122 (1982) Denmark
1581	A06 $H^+ + Ar; H^+ + He$ A10 $H^+ + Ar; H^+ + He$	T	0.4-1.0 MeV	Amundsen, P. A.; Jakobsen-Amundsen, B. N. Charge transfer at large scattering angles in asymmetric ion-atom collisions. Phys. Scr. 26, 155 (1982) Denmark
1582	A08 $He^+ + H; He^+ + N_2; H + H; H + N_2; He + H; He + N_2$ A16 $H^+ + H; H^+ + N_2; He^+ + H; He^+ + N_2$	E	0.3-3.5 MeV	Hvelplund, P.; Andersen, A. Electron loss by fast He^+ , H , He , H^+ and He^+ projectiles in collisions with atomic and molecular hydrogen. Phys. Scr. 26, 370 (1982) Denmark
1583	A06 $H^+ + H; H^+ + N_2; He^+ + H; He^+ + N_2; He^{2+} + H; He^{2+} + N_2$	E	0.3-2.0 MeV	Hvelplund, P.; Andersen, A. Electron capture by fast H^+ , He^+ , and He^{2+} ions in collisions with atomic and molecular hydrogen. Phys. Scr. 26, 375 (1982) Denmark
1584	E05 $e + Al^{10+}; e + Al^{10+}; e + Al^{10+}; e + Al^{10+}; e + Al^{10+}; e + Si^{11+}; e + Si^{11+}; e + Si^{11+}; e + Si^{11+}; e + Si^{11+}$	E	100-235 eV	Grove, P. Experimental ionization rate coefficients of aluminium and silicon ions. Phys. Scr. 26, 461 (1982) West Germany

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1505	D10 $\text{He}^+ + \text{Nb}; \text{He}^+ + \text{U}; \text{He}^+ + \text{SS}$	E	0.1-15 keV	Carter, G.; Froun, E. G.; Donnelly, S. E.; Ingram, D. C.; Webb, M. F. The injection of inert gas ions into solids: their trapping and escape. Radiat. Eff. 53, 143 (1980) United Kingdom
1506	K06 Review	E T	Under	Doe, S. K. The role of inert gases in first wall phenomena in fusion devices. Radiat. Eff. 53, 257 (1980) United States
1507	D02 $\text{He}^+ + \text{LiI}; \text{Ar}^+ + \text{LiI}; \text{D}^{++} + \text{LiI};$ $\text{Xe}^+ + \text{LiI}$ D03 $\text{He}^+ + \text{LiI}; \text{Ar}^+ + \text{LiI}; \text{Kr}^+ + \text{LiI};$ $\text{Xe}^+ + \text{LiI}$	E	6 keV	Szymanski, W.; de Vries, A. E. Beam induced decomposition and sputtering of LiI. Radiat. Eff. 54, 135 (1981) Poland
1508	D07 $\text{H} + \text{Nb}; \text{H} + \text{Ta}; \text{H} + \text{Mo}; \text{H} + \text{Si}$	E T	0-100 keV	Schleichauf, P. W.; Manikopoulos, C. W. Comparison of backscattering computer simulations to experimental measurements. Radiat. Eff. 54, 149 (1981) United States
1509	D07 $\text{He}^+ + \text{He} + \text{Ag}$	E	0.8-3.2 keV	Terzic, I.; Ciric, B.; Neshovic, M. Inelastic effects in low energy He^+ scattering from an He contaminated polycrystalline Ag surface. Radiat. Eff. 54, 177 (1981) Yugoslavia
1510	C04 $\text{H}^+ + \text{H}$	E	0.8-2.6 MeV	Kaneko, T.; Ghtschi, Y. M.; Kitagawa, P. Neutral fraction of an energetic ion under channeling conditions. Radiat. Eff. 54, 183 (1981) Japan
1511	C04 $\text{Rb}^+ + \text{Ar}; \text{Rb}^+ + \text{N}_2; \text{Ca}^+ + \text{Ar}; \text{Ca}^+ + \text{N}_2; \text{Fr}^+ + \text{Ar}; \text{Fr}^+ + \text{N}_2$	T	20-100 keV	Mantala, M.; Bister, M. Comparison of theoretical and experimental ranges of low energy heavy ions in Ar and N_2 . Radiat. Eff. 54, 191 (1981) Finland
1512	D17 Under	T	Under	Collins, R.; Carter, G. A first order diffusion approximation to atomic redistribution during ion bombardment of solids: I. Infinite range approximation. Radiat. Eff. 54, 225 (1981) United Kingdom
1513	D02 $\text{Hg}^+ + \text{Ni}; \text{Hg}^+ + \text{Mo}$	T	0.25-2.0 keV	Yamamura, Y. Contribution of anisotropic velocity distribution of recoil atoms to sputtering yields and angular distributions of sputtered atoms. Radiat. Eff. 55, 45 (1981) Japan
1514	D03 $\text{O}^+ + \text{Gd}; \text{O}^+ + \text{Dy}_2\text{O}_3; \text{O}^+ + \text{Gd}_2\text{O}_3;$ $\text{O}^+ + \text{Ta}_2\text{O}_5; \text{Ar}^+ + \text{Gd}; \text{Ar}^+ + \text{Dy}_2\text{O}_3;$ $\text{Ar}^+ + \text{Gd}_2\text{O}_3; \text{Ar}^+ + \text{Ta}_2\text{O}_5$	E	6.5 keV	Nadal, D. T.; Harris, L. C.; Morrison, G. H. A study of secondary molecular ion formation in rare earth and rare earth oxides. Radiat. Eff. 55, 57 (1981) United States
1515	D02 $\text{P}^+ + \text{Ag}; \text{P}^+ + \text{Au}; \text{P}_2^+ + \text{Ag}; \text{P}_2^+ + \text{Au};$ $\text{As}^+ + \text{Ag}; \text{Sb}^+ + \text{Ag}; \text{Sb}^+ + \text{Au}; \text{Sb}_2^+ + \text{Ag};$ $\text{Sb}_2^+ + \text{Au}; \text{Sb}_3^+ + \text{Ag}; \text{Sb}_3^+ + \text{Au};$ $\text{Bi}^+ + \text{Ag}; \text{Bi}^+ + \text{Au}; \text{Bi}_2^+ + \text{Ag};$ $\text{Bi}_2^+ + \text{Au}$	E T	30-135 keV	Thompson, D. A.; Jaher, S. S. Influence of the bombarding angle on the sputtering yield of heavy atomic and molecular ion bombardment of Ag and Au. Radiat. Eff. 55, 91 (1981) Canada
1516	D17 Under	T	Under	Carter, G.; Collins, R.; Thompson, D. A. A first order diffusion approximation to atomic redistribution during ion bombardment of solids: II. Finite range approximation. Radiat. Eff. 55, 99 (1981) United Kingdom
1517	D17 Under	T	Under	Rough, M. L.; Andreadis, T. D.; Goktepe, C. F. Evolve, a time-dependent Monte Carlo code to simulate the effects of ion-beam-induced atomic mixing. Radiat. Eff. 55, 119 (1981) United States
1518	D01 Review	E T	Under	Thompson, D. A. High density cascade effects. Radiat. Eff. 56, 165 (1981) Canada
1519	D01 Under	T	Under	Orlov, A. M.; Trushin, Y. V. Theory of the spatial distribution of defects in radiation cascades in crystals: I. The cascade of moving atoms. Radiat. Eff. 56, 193 (1981) Soviet Union

REF. NO.	REACTANTS	EXP OR THEORY	ENERGY RANGE	REFERENCE
1600	D01 Undef	T	Undef	Orlov, A. N.; Frushin, V. V. Theory of the spatial distribution of defects in radiation cascades in crystals: II. The structure of the cascade region. Radiat. Eff. 16, 165 (1981) Soviet Union
1601	D02 $O^+ + Al$; $O^+ + C$; $O^+ + Ni$; $O^+ + Ag$; $Cl^+ + Ar$; $Cl^+ + Al$; $Cl^+ + C$; $Ne^+ + Ne$	T	0.3-5.0 MeV/cm	Sugiyama, N. Electronic stopping power formula for intermediate energies. Radiat. Eff. 56, 295 (1981) Japan
1602	D13 $Ne^+ + H_2 + Ne$; $Ne^+ + H_2 + Ne$; $Ne^+ + H_2 + Cu$	E	0 keV	Katrick, N. F.; Konischev, V. N. Gas desorption during irradiation of metals with molybdenum ions. Sov. At. Energy 42, 622 (1982) Soviet Union
1603	A04 $H_2^+ + H_2^+$	E	15 eV	Belyaev, V. A.; Lyubov, N. M.; Khlopin, A. M. Collisions of hydrogen ions in a focused hollow beam. Sov. Tech. Phys. Lett. 8, 601 (1982) Soviet Union
1604	D03 $Ar^+ + Al$; $Ar^+ + AlO$	E	4 keV	Farren, J. Pressure independence of secondary ion emission enhancement of Al during oxidation at low pressure. Surf. Sci. 116, 171 (1982) Argentina
1605	D07 $He + Cu$; $He + Cu$; $Ar + Cu$	T	0-665 eV	Steinbrunzel, C. Gas-surface scattering distributions according to the hard-spheroid model. Surf. Sci. 115, 247 (1982) Switzerland
1606	D07 $He + LiF$	E	200 K	Sewer, E.; Mori, E. R. Inelastic scattering of He atoms from a LiF(001) surface. Surf. Sci. 115, 346 (1982) Austria
1607	D03 $Ar^+ + Cu$	E	2 keV	Vasile, M. J. Evidence for the Auger neutralization mechanism in secondary ion emission. Surf. Sci. 115, 1141 (1982) United States
1608	D09 $He^+ + Ni$	E	1 keV	Woodruff, D. F. Trajectory and collision related neutralization in low energy He^+ ion scattering. Surf. Sci. 116, 1215 (1982) United Kingdom
1609	D07 $He + LiF$; $He + NaF$; $He + KCl$	E	300 K	Dock, R. E.; Teetsles, J. P. Inelastic molecular beam scattering from solid surfaces. Surf. Sci. 117, 1 (1982) West Germany
1610	D07 $NO + Ag$	E	0.44-1.6	Kleyn, A. M.; Lantz, A. C.; Auerbach, B. J. Laser-induced fluorescence studies of NO scattering from Ag(111). Surf. Sci. 117, 33 (1982) United States
1611	D07 $Ar + Ag$; $Kr + Ag$; $Xe + Ag$	T	300 K	Brake, B.; Munn, D. N. Energy and angular distribution of atoms scattered from surfaces. Surf. Sci. 117, 42 (1982) United Kingdom
1612	D07 Undef D11 Undef	T	Undef	Schönhammer, K.; Gunnerson, O. Sticking and inelastic scattering at metal surfaces: the electron-hole pair mechanism. Surf. Sci. 117, 53 (1982) West Germany
1613	D07 $He + Pt$	E	10-165 meV	Poole, D.; Palmer, R. L.; Mechtershäuser, G.; Conen, G. Helium scattering as a probe of the clean and adsorbate covered Pt(111) surface. Surf. Sci. 117, 60 (1982) West Germany
1614	D07 Undef D09 Undef	T	Undef	Doyon, G. Quantum theory for the reflection of metastable atoms at surfaces. Surf. Sci. 117, 85 (1982) West Germany
1615	D07 $He^+ + LiF$; $He^+ + NaCl$; $He^+ + LiF$; $He^+ + NaCl$; $Ar^+ + LiF$; $Ar^+ + NaCl$; D09 $He^+ + LiF$; $He^+ + NaCl$; $He^+ + LiF$; $He^+ + NaCl$; $Ar^+ + LiF$; $Ar^+ + NaCl$	E	60-71 meV	Conrad, H.; Ertl, G.; Koppers, J.; Sesselmann, W.; Vorotnick, B.; Heberland, H. Scattering of metastable rare gas atoms from solid surfaces. Surf. Sci. 117, 98 (1982) West Germany

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1616	D07 He ⁺ + Ni; Li ⁺ + Ni; Na ⁺ + O ₂ + Ni; Li ⁺ + O ₂ + Ni	E T	600 eV	Englert, W.; Tagliavini, E.; Mollard, W. Li ⁺ and He ⁺ ion scattering from clean and oxygen covered Ni(110) surfaces. <i>Surf. Sci.</i> 117, 124 (1982) West Germany
1617	D09 He ⁺ + U; He ²⁺ + U; Ar ⁺ + U; Ar ²⁺ + U; Ar ³⁺ + U; Kr ⁺ + U; Kr ²⁺ + U; Xe ⁺ + U; Xe ²⁺ + U	E	10-100 eV	Varga, P.; Meier, W.; Bister, H. Auger neutralization of multiply charged noble gas ions at a tungsten surface. <i>Surf. Sci.</i> 117, 142 (1982) Austria
1618	D13 He + CO + Ni; He + NO + Ni	E	200-1300 eV	Jaeger, R.; Treichler, H.; Stehr, J. Evidence for multi-electron excitation in photon stimulated ion desorption: CO and NO on Ni(100). <i>Surf. Sci.</i> 117, 533 (1982) United States
1619	D07 Undef	T	Undef	Goodman, F. O. Zero-energy reflection coefficients for the UVA atom-surface interaction potential. <i>Surf. Sci.</i> 118, L246 (1982) Canada
1620	D09 Undef	T	Undef	Geduzak, J. W. A dissipative trajectory theory for reactive scattering at surfaces. <i>Surf. Sci.</i> 118, 100 (1982) United States
1621	D04 He ⁺ + Al; Ar ⁺ + Al; Kr ⁺ + Al; Xe ⁺ + Al	E	40 keV	Mischler, J.; Negro, R.; Baumzath, H. Energy-resolved angular distributions of secondary electrons emitted from (111) Al target bombarded by different inert gas ions. <i>Surf. Sci.</i> 118, 163 (1982) France
1622	D02 H ⁺ + Si; H ⁺ + B; H ⁺ + C; H ⁺ + TiB ₂ ; Xe ⁺ + Si; Xe ⁺ + B; Xe ⁺ + C; D17 Xe ⁺ + TiB ₂ D17 H ⁺ + Si; H ⁺ + B; H ⁺ + C; H ⁺ + TiB ₂	E	50-1000 eV	Sharp, D. J.; Paultz, J.K.G. Surface modification by ion chemical and physical erosion. <i>Surf. Sci.</i> 118, 429 (1982) United States
1623	D09 H ⁺ + Cs; H ⁺ + W	T	Undef	Rasser, B.; Von Munich, J.W.H.; Lee, J. Theoretical models of the negative ionization of hydrogen on clean tungsten, coated tungsten and cesium surfaces at low energies. <i>Surf. Sci.</i> 118, 697 (1982) The Netherlands
1624	D07 He + Cu	T	6-4 meV	Armand, G.; Renssen, J. H. An exact iterative solution of the atom-surface scattering problem for realistic potentials. <i>Surf. Sci.</i> 119, L299 (1982) France
1625	D02 O ₂ ⁺ + Al; O ₂ ⁺ + Cr; O ₂ ⁺ + Ti; O ₂ ⁺ + Ni; O ₂ ⁺ + Cu; O ₂ ⁺ + Au D03 O ₂ ⁺ + Al; O ₂ ⁺ + Cr; O ₂ ⁺ + Ti; O ₂ ⁺ + Ni; O ₂ ⁺ + Cu; O ₂ ⁺ + Au	E	Undef	Taga, Y.; Inoue, K.; Sette, K. Sputtering and secondary ion yields of metals subjected to oxygen ion bombardment. <i>Surf. Sci.</i> 119, L363 (1982) Japan
1626	D07 Br ₂ + C	E	300 K	Mollard, L.; Eigerdsson, A.; Nyman, G. Molecular scattering of heavy molecules from low mass surfaces layers; Br ₂ from a graphite covered surface. <i>Surf. Sci.</i> 119, 107 (1982) Sweden
1627	D07 H ₂ ⁺ + Cu	E	30 keV	Balancheva, L. L.; Gorin, S. N.; Dodonov, A. I.; Mashkova, E. S.; Melchikov, V. A. Directional effects of the molecular ion reflection from a crystal surface. <i>Surf. Sci.</i> 119, L278 (1982) Soviet Union
1628	D04 H ⁺ + Al; He ⁺ + Al; Ar ⁺ + Al	E	500 keV	Hasselkamp, B.; Schermann, A. The ion-induced low energy electron spectrum from aluminium. <i>Surf. Sci.</i> 119, L388 (1982) West Germany
1629	D09 K + Si; Na + Si; Li + Si; Ti + Si	E	500 K	Greene, E. F.; Keeley, J. T.; Pickering, H. A. Interaction of K, Na, Li, and Ti with silicon (111) and (100) surfaces; surface ionization and kinetics of desorption. <i>Surf. Sci.</i> 120, 103 (1982) United States
1630	D04 H ⁺ + Ni; H ₂ ⁺ + Ni; H ₂ ⁺ + Ni	E	5 keV	Von Goplingen, U. Ion induced secondary electron emission from single crystal surfaces. <i>Surf. Sci.</i> 120, 334 (1982) United States

REF. NO.	REACTANTS	EAP OR THEOR	ENERGY RANGE	REFERENCE
1631	D04 $\text{Ar}^+ + \text{Al}; \text{Ar}^+ + \text{Ne}$	E	4-60 keV	Ferreira, J.; Alonso, E. V.; Boragiolini, R. A.; Olivero-Florio, A. Ion-electron emission: the effect of oxidation. <i>Surf. Sci.</i> 120, 427 (1982) Argentina
1632	D07 Undef	T	Undef	Levi, A. C.; Bocca, N.; Salvo, C.; Terroni, S.; Tommasini, F. Atom-surface elastic scattering with addition potential. <i>Surf. Sci.</i> 121, 1007 (1982) Italy
1633	D09 $\text{He}^+ + \text{W}$	T	200 eV	Meyer, C. A.; Grack, K. Neutralization in ion-surface collisions: II. Nonperturbative results. <i>Surf. Sci.</i> 121, 138 (1982) United States
1634	D03 $\text{Xe}^+ + \text{CaI}$	E T	4.7 keV	Bunlay, B. I. On the bond breaking model of polycyclic ion emission in secondary ion mass spectrometry. <i>Surf. Sci.</i> 121, 260 (1982) United States
1635	D17 $\text{Ar}^+ + [\text{Au} + \text{Cu}]$	E	2 keV	Li, B.; Keshava, Y. Changes in gold concentration at the surface of a Au-Cu alloy sputtered at low temperature. <i>Surf. Sci.</i> 121, 1851 (1982) Japan
1636	D07 Undef	T	Undef	Levi, A. C.; Spadocini, R.; Tomasi, G. E. Quantum theory of atom-surface scattering: incommensurate and field adsorbates. <i>Surf. Sci.</i> 121, 604 (1982) Italy
1637	D13 Undef	T	Undef	Freed, E. F. Quantum theory of the dynamics of electron stimulated desorption. <i>Surf. Sci.</i> 122, 317 (1982) United States
1638	D11 Undef	T	Undef	Booby, J. L.; Agrawal, B. K. Theory of the sticking coefficient for atom-surface scattering. <i>Surf. Sci.</i> 122, 447 (1982) United Kingdom
1639	D05 $\text{Ar}^+ + \text{CO} + \text{Ni}$	E	0.3-1.2 keV	Foley, K. E.; Vinograd, N. Primary ion beam energy effects on secondary ion emission from $\text{Ni}(001)(2 \times 2)\text{-CO}$: classical dynamic calculations and sim. <i>Surf. Sci.</i> 122, 341 (1982) United States
1640	D09 $\text{e} + \text{O} + \text{W}; \text{e} + \text{O} + \text{Mo}; \text{e} + \text{O} + \text{Cr}$ D13 $\text{e} + \text{O} + \text{W}; \text{e} + \text{O} + \text{Mo}; \text{e} + \text{O} + \text{Cr}$	E	20-100 eV	Bouman, P. M.; Bontecr, M. L. Electron-induced desorption of O^+ ions from W, Mo, and Cr. <i>Surf. Sci.</i> 122, 588 (1982) Canada
1641	D13 $h\nu + \text{GaP}$	E	600-400 nm	Nakayama, T.; Ichikawa, H.; Itoh, N. Non-linear photo-induced desorption of GaP. <i>Surf. Sci.</i> 123, 1693 (1982) Japan
1642	D03 PERT ⁺ + PERT	E	10-150 keV	Kato, I.; Mohri, N.; Yamashina, Y. Analysis of energy distributions for molecular and cluster secondary ions. <i>Surf. Sci.</i> 123, 1717 (1982) Japan
1643	D02 $\text{Ar}^+ + \text{CoPt}$	E	1.25-320 keV	Andersen, H. N.; Chiriyach, V.; Stenon, B.; Sorensen, T.; Whitlow, M. J. Measurements of angular distributions of sputtered material as a new tool for surface-segregation studies: segregation in CoPt alloys. <i>Surf. Sci.</i> 123, 39 (1982) Denmark
1644	D02 $\text{O}^+ + \text{Si}; \text{Ar}^+ + \text{Si}$ D03 $\text{O}^+ + \text{Si}; \text{Ar}^+ + \text{Si}$	E	1-14 keV	Morgen, A. E.; de Grefte, H.A.M.; Verocitz, N.; Verner, M. W.; Telle, M. J. The influence of bombardment conditions upon the sputtering and secondary ion yields of silicon. <i>Appl. Surf. Sci.</i> 7, 372 (1981) The Netherlands
1645	D02 $\text{O}^+ + \text{Si}; \text{O}_2^+ + \text{Si}; \text{O}_3^+ + \text{Si}; \text{O}^+ + [\text{Ni} + \text{Cr}]; \text{O}_2^+ + [\text{Ni} + \text{Cr}]; \text{O}_3^+ + [\text{Ni} + \text{Cr}]$ D03 $\text{O}^+ + \text{Si}; \text{O}_2^+ + \text{Si}; \text{O}_3^+ + \text{Si}; \text{O}^+ + [\text{Ni} + \text{Cr}]; \text{O}_2^+ + [\text{Ni} + \text{Cr}]; \text{O}_3^+ + [\text{Ni} + \text{Cr}]$	E	1-20 keV	Vittmann, K. Implications in the use of reactive ion bombardment for secondary ion yield enhancement. <i>Appl. Surf. Sci.</i> 5, 318 (1981) West Germany

REF. NO.	REACTANTS	EXP OR THEOR	ENERGY RANGE	REFERENCE
1646	D04 $\text{He}^+ + [\text{Ag} + \text{Hg}]; \text{Ar}^+ + [\text{Ag} + \text{Hg}]$	E	1-6 keV	Dev, B. Detection of low energy ion-induced secondary electron emission; dependence on the angle of incidence. <i>Appl. Surf. Sci.</i> 13, 240 (1982) The Netherlands
1647	D02 $\text{T}^+ + \text{Hf}$	T	0.5-10 keV	Tingwei, X.; Jieqiong, F.; Gichao, M. Li, X. Sputtering yield calculations for light ions incident on the wall in a tokamak. <i>Appl. Surf. Sci.</i> 10, 473 (1982) Republic of China
1648	D03 $\text{He}^+ + \text{V}_2\text{O}_5$	E	0.5 keV	Yu, N. L. The sputtering of molecular ions from surfaces in secondary ion mass spectrometry. <i>Appl. Surf. Sci.</i> 11-12, 156 (1982) United States
1649	D02 $\text{Ar}^+ + \text{Si}$	T	3 keV	Koush, M. L.; Andreadis, T. D.; Davarys, F.; Gektopo, O. F. Dynamic simulation of changes in near-surface composition during ion bombardment. <i>Appl. Surf. Sci.</i> 11-12, 235 (1982) United States
1650	D03 Review D08 Review	E	55 keV	MacDonald, R. J. Outer shell excitation during ion bombardment and its application to surface analysis. <i>Appl. Surf. Sci.</i> 12, 62 (1982) Australia
1651	D03 Review	E T	Under	Williams, P. On mechanisms of sputtered ion emission. <i>Appl. Surf. Sci.</i> 12, 241 (1982) United States
1652	K03 Ionization	E	Under	Baynon, J. N.; Erenton, A. G.; Harris, F. N. Metastable ions and photon-induced reactions. <i>Int. J. Mass Spectrom. Ion Phys.</i> 45, 5 (1982) United Kingdom
1653	K02 Ionization	E T	Under	Mark, T. B. Fundamental aspects of electron impact ionization. <i>Int. J. Mass Spectrom. Ion Phys.</i> 45, 125 (1982) Austria
1654	K01 Interchange	E T	Under	Herman, Z. Ion-molecule reactions: collision dynamics and energy partitioning. <i>Int. J. Mass Spectrom. Ion Phys.</i> 45, 253 (1982) Czechoslovakia
1655	K01 Interchange	E T	Under	Jennings, K. R.; Headley, J. V.; Mason, R. S. The temperature dependence of ion-molecule association reactions. <i>Int. J. Mass Spectrom. Ion Phys.</i> 45, 315 (1982) United Kingdom
1656	K01 Review	T		Baer, W. A review of quantum mechanical approximate treatments of three-body reactive systems. <i>Adv. Chem. Phys.</i> 49, 161 (1982) United States
1657	K07 Review	T		Eno, L.; Rabitz, H. Sensitivity analysis and its role in quantum scattering theory. <i>Adv. Chem. Phys.</i> 51, 177 (1982) United States

CATEGORIZATION INDEX

A01

HEAVY PARTICLE - HEAVY PARTICLE
INTERACTIONS

General

Undef		
384T	411T	440T
525T	914T	1023T
1027T		

A02

HEAVY PARTICLE - HEAVY PARTICLE
INTERACTIONS

Elastic Scattering Collisions

Ar + Ar		
1269E	1571T	1573E
1575T		
Ar + Kr		
1269E	1573E	
Ar + Xe		
1269E	1573E	
Be+ + Au		
1225E		
C+ + Au		
1225E		
C++ + H+		
1520T		
C++ + H ₂		
1520T		
D+ + Au		
1225E		
D+ + Sm		
1579E		
D- + H		
520T		
H + D		
553E		
H+ + Au		
1225E		
H+ + H		
510T		
H+ + He		
102E	1002E	
H- + H		
520T		
He + H ₂		
35T	244T	
He + He		
45E-T		
He+ + Ar		
120E		

He+ + Au
1225E

He+ + He
32E

He2+ + He
420T

He2+ + O
28E

I + I
864T

K+ + Hg
590E

K+ + Ar
1507T

K+ + Ia
1507T

K+ + Kr
1507T

K+ + N ₂
3/2T

K+ + Na
1507T

K+ + Xe
1507T

Kr + Ar
126JE

Kr + Kr	1573E
1269E	

Kr + Xe
1573E

Kr+ + He
1533E

Li+ + Ar
1507T

Li+ + Au
1225E

Li+ + He
1507T

Li+ + Kr
1507T

Li+ + Na
908E

Li+ + Ne
1507T

Li+ + Xe
1507T

N+ + Au
1225E

N ₂ + Ar
1574E

Ne + Ar
1573E

Ne + D ₂
372T

ne + H ₂
984T

ne + Kr
1573E

ne + Xe
1573E

Ne+ + Au
1225E

ne+ + D ₂
372T

Ne+ + H ₂
984T

NO + Ar
1574E

C++ + H+
1520T

C++ + H ₂
1520T

C ₂ + Ar
1574E

C ₂ + Kr
1574E

Xe + Xe
1573E

Xe+ + He
1533E

Undef		
146T	536T	794T
1008T		

A03

HEAVY PARTICLE - HEAVY PARTICLE
INTERACTIONS

Excitation

Ar + Ar
959E 969TAr + CO₂
65EAr + H₂⁺
1117TAr⁺ + H₂
944EAr⁺ + Ar
339EAr⁺ + He
102EAr⁺ + Ne
102EAr²⁺ + Ar
202EAr²⁺ + He
102EAr²⁺ + Kr
202EAr²⁺ + Ne
102EAr²⁺ + Xe
202EAr²⁺ + He
102EAr³⁺ + Ne
102EBr⁺ + H
334TC⁺ + C
352ECa⁺ + H
334T 356TCO + D₂
585TCo + Ar
242TCo + He
242TCo + Kr
242TCs + Ne
242TCs + He
242TCs⁺ + CD₄
8ECs⁺ + CH₄
8ECs⁺ + H₂
8ECs⁺ + N₂
8ECu + Fe
169TD⁺ + CH₄
1266TD⁺ + CO₂
84ED₂ + CO
43EF + H₂
304TF²⁺ + He
471EF³⁺ + Ne
471EF⁴⁺ + Ne
471EF⁵⁺ + Ne
471EF⁶⁺ + Ne
381E 471EF⁷⁺ + Ne
471EF⁸⁺ + He
454EF⁹⁺ + Ne
381E 383E 471EF¹⁰⁺ + He
454EF¹¹⁺ + Ne
471EH + H₂
155E 221EH⁺ + D
299EH⁺ + Au
979EH⁺ + Bi
979EH⁺ + C
1323TH⁺ + CH₄
1266TH⁺ + CO
164TH⁺ + CO₂
84E 164TH⁺ +
1323T 1326TH⁺ + Dy
1333EH⁺ + Fe²²⁺
2TH⁺ + H
176T 186T 334T
469T 642T 671T
688E 1323T 1443TH⁺ + H₂
155EH⁺ + He
459T 607EH⁺ + He⁺
114T 1323TH⁺ + He⁺
671TH⁺ + N₂
164T 1129EH⁺ + Na
1577EH⁺ + Ne
1323TH⁺ + O²⁺
1038TH⁺ + Pb
377E 979E 1333EH⁺ + S⁴⁺
6TH⁺ + V
379EH₂⁺ + H₂
155EH₂⁺ + Na
1577EH₃⁺ + H₂
155EH₃⁺ + Na
1577EHe + D₂
468EHe + H₂
174T 468E 923THe + He
159E 707EHe + N₂
1255EHe⁺ + Ar
915E 944EHe⁺ + Cd
220EHe⁺ + He
915EHe⁺ + N₂
944EHe⁺ + Ne
533E 654E 915EHe⁺ + Zn
226EHe⁺ + Ar
156E 448EHe⁺ + Au
979EHe⁺ + Bi
579EHe⁺ + D₂
468EHe⁺ + H
355THe⁺ + H₂
175E 468EHe⁺ + He
311E 564E 662E
607E 1442EHe⁺ + N₂
433EHe⁺ + Ne
564EHe⁺ + Pb
979EHe⁺ + V
979E

$\text{He}^+ + \text{Xe}$
 448E
 $\text{He}^{2+} + \text{H}$
 73T 114T 186T
 1028T 1323T
 $\text{He}^{2+} + \text{Li}$
 270E 664E
 665E
 $\text{He}^{2+} + \text{Ne}$
 1323T
 $\text{I} + \text{I}$
 925E-T
 $\text{I}^+ + \text{Xe}$
 237E
 $\text{K} + \text{Ar}$
 103E 242T 962T
 $\text{K} + \text{H}_2$
 103E
 $\text{K} + \text{He}$
 103E 242T
 $\text{K} + \text{Kr}$
 242T
 $\text{K} + \text{N}_2$
 103E 1256E
 $\text{K} + \text{Ne}$
 242T
 $\text{K} + \text{Xe}$
 242T
 $\text{K}^+ + \text{Ar}$
 962T 1043E 1315E
 $\text{K}^+ + \text{H}_2$
 656T
 $\text{K}^+ + \text{He}$
 378E 1315E
 $\text{K}^+ + \text{K}$
 1043E
 $\text{K}^+ + \text{Kr}$
 378E 1315E
 $\text{K}^+ + \text{N}_2$
 656T
 $\text{K}^+ + \text{Ne}$
 378E 1315E
 $\text{K}^+ + \text{Xe}$
 1315E
 $\text{Kr} + \text{Kr}$
 208E
 $\text{Kr} + \text{Xe}$
 208E
 $\text{Kr}^+ + \text{Ar}$
 315E
 $\text{Kr}^+ + \text{Xe}$
 225E
 $\text{Kr}^{2+} + \text{Ne}$
 701E
 $\text{Li} + \text{B}$
 999T
 $\text{Li} + \text{Be}$
 999T
 $\text{Li} + \text{C}$
 999T
 $\text{Li} + \text{F}$
 999T
 $\text{Li} + \text{H}$
 999T

$\text{Li} + \text{H}_2$
 999T
 $\text{Li} + \text{He}$
 999T
 $\text{Li} + \text{Li}$
 999T
 $\text{Li} + \text{N}$
 999T
 $\text{Li} + \text{Ne}$
 999T
 $\text{Li} + \text{Na}$
 999T
 $\text{Li} + \text{O}$
 999T
 $\text{Li} + \text{O}$
 999T
 $\text{Li}^+ + \text{He}$
 504E
 $\text{Li}^+ + \text{Li}$
 504E
 $\text{Li}^+ + \text{Ne}$
 504E
 $\text{Li}^+ + \text{B}$
 999T
 $\text{Li}^+ + \text{Be}$
 999T
 $\text{Li}^+ + \text{C}$
 999T
 $\text{Li}^+ + \text{CH}_4$
 1266T
 $\text{Li}^+ + \text{CO}$
 701E
 $\text{Li}^+ + \text{CO}_2$
 942E
 $\text{Li}^+ + \text{F}$
 999T
 $\text{Li}^+ + \text{H}$
 999T
 $\text{Li}^+ + \text{H}_2$
 701E 999T
 $\text{Li}^+ + \text{He}$
 999T
 $\text{Li}^+ + \text{Li}$
 999T
 $\text{Li}^+ + \text{N}$
 999T
 $\text{Li}^+ + \text{N}_2$
 701E
 $\text{Li}^+ + \text{Na}$
 999T
 $\text{Li}^+ + \text{Ne}$
 999T
 $\text{Li}^+ + \text{O}$
 999T
 $\text{Li}^{2+} + \text{B}$
 999T
 $\text{Li}^{2+} + \text{Be}$
 999T
 $\text{Li}^{2+} + \text{C}$
 999T
 $\text{Li}^{2+} + \text{F}$
 999T
 $\text{Li}^{2+} + \text{H}$
 999T
 $\text{Li}^{2+} + \text{H}_2$
 999T

$\text{Li}^{2+} + \text{He}$
 999T
 $\text{Li}^{2+} + \text{Li}$
 999T
 $\text{Li}^{2+} + \text{N}$
 999T
 $\text{Li}^{2+} + \text{Ne}$
 999T
 $\text{Li}^{2+} + \text{Na}$
 999T
 $\text{Li}^{2+} + \text{O}$
 999T
 $\text{Li}^{2+} + \text{H}$
 334T
 $\text{Li}^{2+} + \text{Ne}$
 1323T
 $\text{Mg}^+ + \text{Ar}$
 952T
 $\text{N}_2 + \text{CO}_2$
 65E
 $\text{Na} + \text{Ar}$
 242T 962T
 $\text{Na} + \text{He}$
 242T
 $\text{Na} + \text{Kr}$
 242T
 $\text{Na} + \text{Ne}$
 242T
 $\text{Na} + \text{Xe}$
 242T
 $\text{Ni}^+ + \text{Ar}$
 655E-T 673E 962T
 $\text{Na}^+ + \text{Ca}$
 648E
 $\text{Na}^+ + \text{He}$
 655E-T
 $\text{Na}^+ + \text{Kr}$
 673E
 $\text{Na}^+ + \text{Na}^+$
 324E 380T
 $\text{Na}^+ + \text{Ne}$
 655E-T
 $\text{Na}^+ + \text{Xe}$
 673E
 $\text{Na}^+ + \text{Na}^+$
 133E
 $\text{Na}_2 + \text{Ne}$
 488E-T
 $\text{Na} + \text{He}$
 969T
 $\text{Na}^+ + \text{He}$
 156E
 $\text{Na}^+ + \text{Li}$
 676E
 $\text{Na}^+ + \text{Ne}$
 156E
 $\text{Na}^{2+} + \text{Ar}$
 166E
 $\text{Na}^{2+} + \text{He}$
 156E
 $\text{Na}^{2+} + \text{Li}$
 676E 1550E
 $\text{Na}^{2+} + \text{Ne}$
 156E

Ne ²⁺ + Xe 218E	Pb ⁺ + Ni 280E	W ⁺ + Ti 280E
Ne ²⁺ + Ar 156E	Ne ⁺ + Ar 242T	Xe ⁺ + Xe 925E-T
Ne ²⁺ + He 156E	Rb ⁺ + He 242T	Xe ⁺ + Ar 916E
Ne ²⁺ + He 156E	Rb ⁺ + Kr 242T	Xe ²⁺ + Xe 201E
Ne ²⁺ + Ar 156E	Rb ⁺ + Ne 242T	Yb ⁺ + Yb 925E-T
Ne ²⁺ + He 156E	Wb ⁺ + Xe 242T	Zn ⁺ + Ar 1318E
Ne ²⁺ + He 156E	Rb ⁺ + H ₂ 116E 656T	Zn ⁺ + CO 1318E
Ni ⁺ + Ni 446E	Rb ⁺ + He 116E	Zn ⁺ + CO ₂ 1318E
O ⁺ + N ₂ ⁺ 614E	Rb ⁺ + H ₂ 116E 422E 656T	Zn ⁺ + H ₂ 1318E
O ₂ + CO ₂ 65E	Rb ⁺ + Rb 341E	Zn ⁺ + N ₂ 1318E
O ₂ ⁺ + O ₂ 66E	Si ¹⁰⁺ + H 334T	Review 716E
Pb ⁺ + Cu 925E-T	U ⁺ + Ar 916E	Undef 460T 4731 797T 926T
Pb ⁺ + Fe 925E-T	U ⁺ + Ge 280E	
Pb ⁺ + Ar 916E		
A94	H ₂ ⁺ + H ₂ 155E 743E	N ³⁺ + H ₂ 672E
HEAVY PARTICLE - HEAVY PARTICLE INTERACTIONS	H ₂ ⁺ + H ₂ ⁺ 1603E	N ⁴⁺ + H ₂ 672E
Dissociation	H ₂ ⁺ + H ₂ 155E 743E	N ⁵⁺ + H ₂ 672E
	HD ₂ ⁺ + H ₂ 743E	C ²⁺ + H ₂ 672E
	He ²⁺ + H ₂ 672E	C ³⁺ + H ₂ 672E
	Li ⁺ + H ₂ 672E	C ⁴⁺ + H ₂ 672E
	Li ²⁺ + H ₂ 672E	C ⁵⁺ + H ₂ 672E
	Li ³⁺ + H ₂ 672E	Undef 318T 8881
	N ²⁺ + H ₂ 672E	
A95	H ⁺ + Xe 21T	Kr ³⁺ + Kr 1508E
HEAVY PARTICLE - HEAVY PARTICLE INTERACTIONS	He ²⁺ + Ar 1335E	Kr ⁴⁺ + Kr 1508E
Fluorescence	He ²⁺ + Kr 1335E	Ne ²⁺ + Ne 1069E
	He ²⁺ + Xe 1335E	Si ³⁺ + Ar 1135E
	Kr ⁺ + Kr 1508E	Undef 111T 318T
	Kr ²⁺ + Kr 1508E	
Ar ⁺ + Ar 339E		
Au ⁺ + Au 269E		
H ⁺ + Li 21T		

A96

HEAVY PARTICLE - HEAVY PARTICLE
INTERACTIONS

Electron Capture

$\text{Ar}^+ + \text{D}^-$
346T
 $\text{Ar}^+ + \text{H}^-$
346T
 $\text{Ar}^+ + \text{D}^-$
346T
 $\text{Ar}^+ + \text{Ar}$
125E 1548E
 $\text{Ar}^+ + \text{CD}_2$
1680E
 $\text{Ar}^+ + \text{CO}$
602E 1262E
 $\text{Ar}^+ + \text{H}_2$
937E
 $\text{Ar}^+ + \text{He}$
1548E
 $\text{Ar}^+ + \text{Kr}$
1548E
 $\text{Ar}^+ + \text{N}_2$
602E
 $\text{Ar}^+ + \text{Ne}$
1548E
 $\text{Ar}^+ + \text{Xe}$
1548E
 $\text{Ar}^{2+} + \text{H}_2$
937E
 $\text{Ar}^{2+} + \text{Ar}$
202E 715E
 $\text{Ar}^{2+} + \text{He}$
715E
 $\text{Ar}^{2+} + \text{Kr}$
202E
 $\text{Ar}^{2+} + \text{N}_2$
708E
 $\text{Ar}^{2+} + \text{Ne}$
187E
 $\text{Ar}^{2+} + \text{Ne}$
85E 715E
 $\text{Ar}^{2+} + \text{Xe}$
202E 715E
 $\text{Ar}^{3+} + \text{Ar}$
715E
 $\text{Ar}^{3+} + \text{He}$
715E
 $\text{Ar}^{3+} + \text{Ne}$
715E
 $\text{Ar}^{3+} + \text{Xe}$
715E
 $\text{Ar}^{4+} + \text{Ar}$
715E
 $\text{Ar}^{4+} + \text{He}$
715E
 $\text{Ar}^{4+} + \text{Ne}$
715E
 $\text{Ar}^{4+} + \text{Xe}$
715E

$\text{Ar}^{5+} + \text{Ar}$
715E
 $\text{Ar}^{5+} + \text{He}$
715E
 $\text{Ar}^{5+} + \text{Ne}$
715E
 $\text{Ar}^{5+} + \text{Xe}$
715E
 $\text{Ar}^{6+} + \text{Ar}$
715E
 $\text{Ar}^{6+} + \text{He}$
715E
 $\text{Ar}^{6+} + \text{Ne}$
715E
 $\text{Ar}^{6+} + \text{Xe}$
715E
 $\text{Ar}^{7+} + \text{Ar}$
715E
 $\text{Ar}^{7+} + \text{He}$
715E
 $\text{Ar}^{7+} + \text{Ne}$
715E
 $\text{Ar}^{7+} + \text{Xe}$
715E
 $\text{Ar}^{8+} + \text{Ar}$
715E
 $\text{Ar}^{8+} + \text{He}$
715E
 $\text{Ar}^{8+} + \text{Ne}$
715E
 $\text{Ar}^{8+} + \text{Xe}$
715E
 $\text{Ar}^{10+} + \text{H}_2$
545E
 $\text{Ar}^{10+} + \text{He}$
545E
 $\text{B}^+ + \text{B}^{3+}$
276T
 $\text{B}^+ + \text{C}^{2+}$
675T
 $\text{B}^{2+} + \text{B}^{3+}$
276T
 $\text{B}^{2+} + \text{He}$
449E
 $\text{B}^{2+} + \text{He}$
449E
 $\text{B}^{3+} + \text{H}$
19T 334T 643T
 $\text{B}^{3+} + \text{He}$
449E
 $\text{Be}^{2+} + \text{Be}^{3+}$
276T
 $\text{Be}^{3+} + \text{H}$
19T 643T 872T
 $\text{Be}^{3+} + \text{C}$
150E
 $\text{C}^+ + \text{H}$
1017T
 $\text{C}^+ + \text{H}_2$
382E
 $\text{C}^+ + \text{H}_2$
342E

$\text{C}^{2+} + \text{Al}$
1342E
 $\text{C}^{2+} + \text{Ar}$
425E
 $\text{C}^{2+} + \text{C}^{3+}$
276T
 $\text{C}^{2+} + \text{H}$
1017T
 $\text{C}^{2+} + \text{He}$
425E
 $\text{C}^{2+} + \text{M}^{3+}$
675T
 $\text{C}^{2+} + \text{Ne}$
425E
 $\text{C}^{2+} + \text{H}$
415T 720T 980E
 $\text{C}^{2+} + \text{H}_2$
980E
 $\text{C}^{2+} + \text{He}$
449E 717E 1059E
 $\text{C}^{3+} + \text{C}^{3+}$
276T
 $\text{C}^{3+} + \text{H}$
19T 718T 720T
 $\text{C}^{3+} + \text{H}_2$
980E 1060E
 $\text{C}^{3+} + \text{He}$
449E 717E 1060E
 $\text{C}^{3+} + \text{H}$
19T 720T 980E
 $\text{C}^{3+} + \text{H}_2$
980E
 $\text{C}^{3+} + \text{He}$
449E 717E
 $\text{C}^{3+} + \text{Ar}$
425E
 $\text{C}^{3+} + \text{C}^{3+}$
268T
 $\text{C}^{3+} + \text{H}$
19T 168T 334T
 $\text{C}^{3+} + \text{H}_2$
356T 487E 512T
 $\text{C}^{3+} + \text{H}_2$
689T 720T 869T
 $\text{C}^{3+} + \text{H}_2$
928E 980E 1046T
 $\text{C}^{3+} + \text{H}_2$
1519T
 $\text{C}^{3+} + \text{H}_2$
545E 547E 980E
 $\text{C}^{3+} + \text{He}$
425E 449E 545E
 $\text{C}^{3+} + \text{He}$
425E 717E
 $\text{C}^{3+} + \text{Ne}$
425E
 $\text{Ca}^+ + \text{Sr} + \text{hv}$
253T
 $\text{Cl}^- + \text{CO}$
92E
 $\text{Cl}^- + \text{D}_2$
62E 92E
 $\text{Cl}^- + \text{H}_2$
62E
 $\text{Cl}^- + \text{N}_2$
92E
 $\text{CO}^+ + \text{CO}$
1066T 1262E
 $\text{Cs}^+ + \text{Cs}^+$
195T 695E 927E

$D^+ + Ar$
425E
 $D^+ + Ba$
470E-T 745E
 $D^+ + Ca$
470E-T 745E
 $D^+ + Co$
745E
 $D^+ + D$
1136E-T
 $D^+ + H$
1136E-T
 $D^+ + He$
425E
 $D^+ + Mg$
470E-T
 $D^+ + Na$
745E
 $D^+ + Ne$
425E
 $D^+ + Pb$
745E
 $D^+ + Sr$
470E-T 745E
 $D_2^+ + Ar$
603E
 $D_2^+ + H_2$
743E
 $F^{++} + Na^{++}$
675T
 $F^{++} + He$
449E 717E
 $F^{++} + Ne$
381E
 $F^{++} + F^{++}$
276T
 $F^{++} + He$
449E 717E
 $F^{++} + He$
449E 454E 717E
 $F^{++} + He$
381E 383E
 $F^{++} + He$
454E
 $F^- + CO$
92E
 $F^- + D_2$
62E 92E
 $F^- + H_2$
62E
 $F^- + N_2$
92E
 $H + Cu$
658E 744E
 $H + H$
732E
 $H + H_2$
186E
 $H + Mg$
745E
 $H + N_2$
682E 744E
 $H + PERT$
261T

$H^+ + Ar$
215E 425E 565E
433E 690T 698E
732E 1581T
 $H^+ + B^{++}$
1009T
 $H^+ + Be^+$
178T
 $H^+ + Be^{++}$
1009T
 $H^+ + C$
690E 1323T 1384T
 $H^+ + C^+$
695E
 $H^+ + C^{++}$
1009T
 $H^+ + C^{++}$
599T
 $H^+ + Ca^+$
178T
 $i^+ + CH_4$
121E 1064E
 $H^+ + Co$
1022T
 $H^+ + Cu$
1323T
 $H^+ + D$
421E 1136E-T
 $H^+ + H$
26T 71T 147T
203T 214T 266T
268T 334T 364E
402T 421E 469T
478T 512T 642T
659T 986T 1017T
1136E-T 1323T 1443T
1583E
 $H^+ + H_2$
155E 1385E-T 1583E
 $H^+ + He$
425E 492T 514E-T
633E 690E
 $H^+ + He^+$
105T 114T 147T
332T 599T 695E
994T 1323T
 $H^+ + K$
1022T
 $H^+ + Li$
118T
 $H^+ + Li^+$
105T 660T 663T
695E 1009T
 $H^+ + Li^{++}$
599T 663T
 $H^+ + Mg$
447E 746E
 $H^+ + Mg^+$
178T 695E
 $H^+ + N^+$
695E
 $H^+ + Na^+$
599T
 $H^+ + N_2$
1129E
 $H^+ + Ne$
482T 1022T

$H^+ + Na^+$
482T
 $H^+ + Ne$
121E 213E 425E
633E 690E 1323T
1581T
 $H^+ + O^{++}$
1009T
 $H^+ + Rb$
1022T
 $H^+ + Sr^+$
178T
 $H^+ + Ti^+$
695E
 $H^+ Seq + H Seq$
459T
 $H_2^+ + Ar$
179E 693E
 $H_2^+ + CO$
611E
 $H_2^+ + Co$
609E
 $H_2^+ + H_2$
155E 743E 1065T
1385E-T
 $H_2^+ + K$
609E
 $H_2^+ + Mg$
609E
 $H_2^+ + N_2$
611E
 $H_2^+ + O_2$
611E
 $H_2^+ + Zn$
609E
 $H_2^+ + H_2$
155E 743E
 $H^- + CO$
92E
 $H^- + D_2$
92E
 $H^- + N_2$
92E
 $HD_2^+ + H_2$
743E
 $He + D_2$
468E
 $He + H_2$
468E
 $He^+ + Ar$
160E-T 448E
 $He^+ + C$
1578E
 $He^+ + D_2$
468E
 $He^+ + H$
1583E
 $He^+ + H^+$
26T
 $He^+ + H_2$
468E 1583E
 $He^+ + He$
160E-T 1442E
 $He^+ + He^+$
583E

$\text{He}^+ + \text{Li}$
 74E
 $\text{He}^+ + \text{N}_2$
 169E-T 390T
 $\text{He}^+ + \text{Ne}$
 160E-T
 $\text{He}^+ + \text{Xe}$
 448E
 $\text{He}^{2+} + \text{Ar}$
 126E 169E-T 213E
 590E
 $\text{He}^{2+} + \text{Ba}^{2+}$
 461T
 $\text{He}^{2+} + \text{C}$
 1384T
 $\text{He}^{2+} + \text{C}^{3+}$
 461T
 $\text{He}^{2+} + \text{Fe}^{2+}$
 461T
 $\text{He}^{2+} + \text{H}$
 73T 114T 332T
 461T 643T 994T
 1017T 1020T 1323T
 1583E
 $\text{He}^{2+} + \text{H}_2$
 1583E
 $\text{He}^{2+} + \text{He}$
 160E-T 420T 1434E
 $\text{He}^{2+} + \text{He}^+$
 260T 461T
 $\text{He}^{2+} + \text{Kr}$
 126E
 $\text{He}^{2+} + \text{Li}$
 74E 114T 279E
 282T 374E 664E
 $\text{He}^{2+} + \text{Li}^{2+}$
 461T
 $\text{He}^{2+} + \text{N}_2$
 169E-T 1434E
 $\text{He}^{2+} + \text{Ne}$
 126E 169E-T 213E
 650E 1323T 1434E
 $\text{He}^{2+} + \text{O}^{2+}$
 461T
 $\text{He}^{2+} + \text{PERT}$
 1463T
 $\text{He}^{2+} + \text{Xe}$
 126E
 $\text{Kr}^+ + \text{Ar}$
 1549E
 $\text{Kr}^+ + \text{CD}_4$
 1680E
 $\text{Kr}^+ + \text{He}$
 1549E
 $\text{Kr}^+ + \text{Kr}$
 949E 1549E
 $\text{Kr}^+ + \text{Ne}$
 1549E
 $\text{Kr}^+ + \text{Xe}$
 986E 1549E
 $\text{Kr}^{2+} + \text{Kr}$
 940E
 $\text{Li}^+ + \text{H}$
 1017T
 $\text{Li}^+ + \text{Li}^+$
 195T 660T 595E

$\text{Li}^+ + \text{Li}^{2+}$
 276T
 $\text{Li}^{2+} + \text{H}$
 663T 1017T
 $\text{Li}^{2+} + \text{Ar}$
 213E 690E
 $\text{Li}^{2+} + \text{H}$
 104T 142T 334T
 643T 663T 662T
 917T 943T 1007T
 $\text{Li}^{2+} + \text{Li}^{2+}$
 268T
 $\text{Li}^{2+} + \text{Ne}$
 213E 1323T
 $\text{Li}^{2+} + \text{Ne}^{3+}$
 659T
 $\text{Mg}^+ + \text{Ca}$
 866E
 $\text{N}^+ + \text{H}_2$
 382E
 $\text{N}^+ + \text{N}_2$
 382E
 $\text{N}^{2+} + \text{N}_2$
 708E
 $\text{N}^{3+} + \text{N}^{3+}$
 276T
 $\text{N}^{2+} + \text{O}^{2+}$
 675T
 $\text{N}^{3+} + \text{He}$
 449E 717E 1059E
 $\text{N}^{3+} + \text{He}$
 449E 717E
 $\text{N}^{3+} + \text{N}^{2+}$
 276T
 $\text{N}^{3+} + \text{He}$
 449E 717E
 $\text{N}^{3+} + \text{H}_2$
 545E
 $\text{N}^{3+} + \text{He}$
 449E 545E 717E
 903E
 $\text{N}_2^+ + \text{N}_2$
 1065T
 $(\text{N}_2^+)^+ + \text{Ar}$
 605E
 $\text{Ne}^+ + \text{Ne}^+$
 1072E
 $\text{Ne}^+ + \text{Ne}^{2+}$
 695E
 $\text{Ne}^+ + \text{Ar}$
 156E
 $\text{Ne}^+ + \text{CH}_4$
 911E
 $\text{Ne}^+ + \text{H}_2$
 911E
 $\text{Ne}^+ + \text{He}$
 156E 911E
 $\text{Ne}^+ + \text{Li}$
 676E
 $\text{Ne}^+ + \text{N}_2$
 911E
 $\text{Ne}^+ + \text{Ne}$
 125E 156E 911E
 $\text{Ne}^+ + \text{O}_2$
 911E

$\text{Ne}^{2+} + \text{Ar}$
 156E
 $\text{Ne}^{2+} + \text{He}$
 156E
 $\text{Ne}^{2+} + \text{Li}$
 676E 1550E
 $\text{Ne}^{2+} + \text{Ne}$
 156E
 $\text{Ne}^{2+} + \text{Xe}$
 215E
 $\text{Ne}^{3+} + \text{Ar}$
 156E
 $\text{Ne}^{3+} + \text{He}$
 156E
 $\text{Ne}^{3+} + \text{Ne}$
 156E 1438E
 $\text{Ne}^{3+} + \text{Ar}$
 156E
 $\text{Ne}^{3+} + \text{He}$
 156E
 $\text{Ne}^{3+} + \text{Ne}$
 156E 1438E
 $\text{Ne}^{3+} + \text{He}$
 1438E
 $\text{Ne}^{3+} + \text{Ne}$
 1438E
 $\text{Ne}^{3+} + \text{He}$
 449E 717E
 $\text{Ne}^{3+} + \text{Ne}$
 1438E
 $\text{Ne}^{3+} + \text{Ar}$
 137E
 $\text{Ne}^{3+} + \text{CH}_4$
 137E
 $\text{Ne}^{3+} + \text{He}$
 137E 449E 717E
 $\text{Ne}^{3+} + \text{Ne}$
 137E 1438E
 $\text{Ne}^{3+} + \text{Ne}^{10+}$
 276T
 $\text{Ne}^{3+} + \text{Xe}$
 137E
 $\text{Ne}^{3+} + \text{He}$
 449E 717E
 $\text{Ne}^{3+} + \text{Ne}$
 1438E
 $\text{Ne}^{10+} + \text{H}_2$
 645E
 $\text{Ne}^{10+} + \text{He}$
 545E 717E
 $\text{Ne}^{10+} + \text{Ne}$
 1438E
 $\text{Ne}^{10+} + \text{Ne}^{3+}$
 268T
 $\text{C} + \text{H}_2$
 733E
 $\text{C}^+ + \text{H}_2$
 382E 733E
 $\text{C}^+ + \text{N}_2$
 382E
 $\text{C}^{2+} + \text{H}$
 980E 1131E
 $\text{C}^{2+} + \text{H}_2$
 980E

$O^{2+} + He^{2+}$ 675T			
$O^{2+} + O_2$ 299E	70.0E		
$O^{2+} + Ar$ 1302E			
$O^{2+} + H$ 227T 1131E	57.8T		99.0E
$O^{2+} + H_2$ 900E			
$O^{2+} + O_2$ 299E	70.0E		
$O^{2+} + Ar$ 425E			
$O^{2+} + F^{2+}$ 675T			
$O^{2+} + H$ 900E			
$O^{2+} + H_2$ 900E			
$O^{2+} + He$ 425E			
$O^{2+} + He$ 425E			
$O^{2+} + O^{2+}$ 276T			
$O^{2+} + Ar$ 425E			
$O^{2+} + H$ 900E			
$O^{2+} + H_2$ 900E			
$O^{2+} + He$ 425E 903E	44.9E 17.59E		71.7E
$O^{2+} + He$ 425E			
$O^{2+} + Au$ 1302E			
$O^{2+} + H$ 900E			
$O^{2+} + H_2$ 900E			
$O^{2+} + He$ 449E	71.7E		
$O^{2+} + O^{2+}$ 276T			
$O^{2+} + Ar$ 425E			
$O^{2+} + Au$ 1302E			
$O^{2+} + He$ 425E	44.9E		71.7E
$O^{2+} + He$ 425E			
$O^{2+} + Au$ 1302E			
$O^{2+} + H$ 1519T			
$O^{2+} + H_2$ 546E	54.7E		
$O^{2+} + He$ 449E 717E	54.6E		62.7E

$O_2^- + O_2$	66E	1065T
$O_2^+ + Xe$	179E	
$Pb^{30+} + N_2$	481E	
$Pb^{33+} + N_2$	481E	
$Pb^{36+} + N_2$	481E	
$Pb^{37+} + N_2$	481E	
$Pb^{38+} + N_2$	481E	
$Pb^{39+} + N_2$	481E	
$Pb^{40+} + N_2$	481E	
$Pb^{41+} + N_2$	481E	
$Pb^{42+} + N_2$	481E	
$Pb^{43+} + N_2$	481E	
$Pb^{44+} + N_2$	481E	
$Pb^{45+} + N_2$	481E	
$Pb^{46+} + N_2$	481E	
$Pb^{47+} + N_2$	481E	
$Pb^{48+} + N_2$	481E	
$Pb^{49+} + N_2$	481E	
$Pb^{50+} + N_2$	481E	
$Pb^{51+} + N_2$	481E	
$Pb^{52+} + N_2$	481E	
$Pb^{53+} + N_2$	481E	
$Pb^{54+} + N_2$	481E	
$Pb^{55+} + N_2$	481E	
$Pb^{56+} + N_2$	481E	
$Pb^{57+} + N_2$	481E	
$Pb^{58+} + N_2$	481E	
$Pb^{59+} + N_2$	481E	
$Pb^{60+} + N_2$	481E	
$Pb^{61+} + N_2$	481E	
$Pb^{62+} + N_2$	481E	
$Pb^{63+} + N_2$	481E	

Pb ⁸⁰⁰⁰ + H ₂	461E	
Si ¹¹⁰ + He	449E	717E
Si ¹²⁰ + Ar	1135E	
Si ¹²⁰ + He	449E	
Si ¹⁰ + H ⁺	572T	
Si ¹²⁰ + H	572T	
Si ¹⁰⁰ + Ar	425E	
Si ¹⁰⁰ + He	425E	
Si ¹⁰⁰ + He	425E	
Si ¹⁷⁰ + Ar	425E	
Si ¹⁷⁰ + He	425E	
Si ¹⁷⁰ + He	425E	
Si ¹⁰⁰ + Ar	425E	
Si ¹⁰⁰ + He	425E	
Si ¹⁰⁰ + He	425E	
Si ¹⁹⁰ + Ar	425E	
Si ¹⁹⁰ + He	425E	
Si ¹⁹⁰ + He	425E	
Si ¹⁸⁰ + Ar	425E	
Si ¹⁸⁰ + He	425E	
Si ¹⁸⁰ + He	425E	
Si ¹¹⁰ + Ar	425E	
Si ¹¹⁰ + He	425E	
Si ¹¹⁰ + He	425E	
Si ¹²⁰ + Ar	425E	
Si ¹²⁰ + He	425E	
Si ¹²⁰ + He	425E	
Si ¹²⁰ + Ar	425E	
Si ¹²⁰ + He	425E	
Si ¹²⁰ + He	425E	
Si ¹⁹⁰ + Ar	425E	
Si ¹⁹⁰ + H	334T	

Si¹¹⁰ + He
425E

Si¹¹⁰ + He
425E

Tl¹ + Tl¹
98E

Xe¹ + Xe
340E

Xe¹ + Xe¹
695E

Xe²⁰ + Xe
285E 947E

Xe²⁰ + Xe
285E

Xe²⁰ + Xe
285E

Xe²⁰ + Xe
285E

Xe²⁰ + Xe
285E

Xe²⁰ + Xe
285E

Xe²⁰ + Xe
285E

Xe²⁰ + Xe
285E

Xe¹⁰⁰ + Xe
285E

Xe¹¹⁰ + Xe
285E

Xe¹²⁰ + Xe
286E

Xe²¹⁰ + N₂
481E

Xe²²⁰ + N₂
481E

Xe²³⁰ + N₂
481E

Xe²⁴⁰ + N₂
481E

Xe²⁵⁰ + N₂
481E

Xe²⁶⁰ + N₂
481E

Xe²⁷⁰ + N₂
481E

Xe²⁸⁰ + N₂
481E

Xe²⁹⁰ + N₂
481E

Xe³⁰⁰ + N₂
481E

Xe³¹⁰ + N₂
481E

Xe³²⁰ + N₂
481E

Xe³³⁰ + N₂
481E

Xe³⁴⁰ + N₂
481E

Xe³⁵⁰ + N₂
481E

Xe³⁶⁰ + N₂
481E

Xe³⁷⁰ + N₂
481E

Xe³⁸⁰ + N₂
481E

Xe³⁹⁰ + N₂
481E

Xe⁴⁰⁰ + N₂
481E

Xe⁴¹⁰ + N₂
481E

Xe⁴²⁰ + N₂
481E

Xe⁴³⁰ + N₂
481E

Xe⁴⁴⁰ + N₂
481E

Xe⁴⁵⁰ + N₂
481E

Review 300T 714E 716E

Undef 926T

A07

HEAVY PARTICLE - HEAVY PARTICLE
INTERACTIONS

Ionization

Al + Ti	856E		
Ar+ + N ₂	944E		
Ar+ + Al	1231E		
Ar+ + Ar	339E 1231E	554T	692E
Ar+ + Cl	1231E		
Ar+ + H ₂	490E		
Ar+ + P	1231E		
Ar+ + S	1231E		
Ar+ + Si	1231E		
Ar ²⁺ + H ₂	490E		
Ar ²⁺ + H ₂	490E		
Ar ²⁺ + H ₂	490E		
Ar ²⁺ + H ₂	490E		
Ar ²⁺ + He	431E		
B ²⁺ + He	187E		
B ²⁺ + He	987E		
B ²⁺ + Ar	988E		
B ²⁺ + H	334T	452T	
B ²⁺ + He	870T	987E	988E
B ²⁺ + Kr	988E		
B ²⁺ + Ne	988E		
B ²⁺ + Xe	988E		
Be ²⁺ + He	987E		
Be ²⁺ + H	482T		
Be ²⁺ + He	870T		
Br + Pb	273E		
C + Au	195T		

C ²⁺ + H ₂	672E		
C ²⁺ + H ₂	672E		
C ²⁺ + He	987E		
C ²⁺ + H	902T		
C ²⁺ + H ₂	672E		
C ²⁺ + He	987E		
C ²⁺ + He	987E		
C ²⁺ + Ar	988E		
C ²⁺ + H	334T	452T	512T
C ²⁺ + He	870T	987E	988E
C ²⁺ + Kr	988E		
C ²⁺ + Ne	988E		
C ²⁺ + Xe	988E		
Cl + Ti	856E		
Cl ²⁺ + Pb	292E	1330E	
Cl ²⁺ + Sn	1327T		
Cs + Nd	1267E		
Cs + O ₂	1267E		
Cs ²⁺ + Cs ²⁺	25E-T	927E	
Cu + Au	934E		
Cu ²⁺ + Ag	933E		
Cu ²⁺ + Cu	933E		
Cu ²⁺ + Ge	933E		
D ²⁺ + Ag	1330E		
D ²⁺ + Ca	177E		
D ²⁺ + Co	1325T		
D ²⁺ + Co	177E		
D ²⁺ + Cr	177E		
D ²⁺ + Cu	177E	263T	1329T
D ²⁺ + Fe	177E		
D ²⁺ + In	1325T		
D ²⁺ + Mn	177E		

E ²⁺ + Ni	177E 1329T	1941 1330E	1327T
E ²⁺ + Sb	1325T		
E ²⁺ + Se	177E		
E ²⁺ + Ti	177E	1327T	
E ²⁺ + V	177E		
F + Ti	856E		
F ²⁺ + He	870T		
F + C	100E		
H + H	100E		
H ²⁺ + C	100E		
H ²⁺ + H	100E		
H ²⁺ + Ag	163E 1331E-T	5671 1386E	1330E
H ²⁺ + Al	406E		
H ²⁺ + Ar	213E 632T	274E 988E	570E
H ²⁺ + Au	108T 360T 567T 1331E-T	122E 4841 6491 1425E-T	163E 566E 979E
H ²⁺ + Bi	979E	1425E-T	
H ²⁺ + C	347T	1322T	
H ²⁺ + Ce	1325T		
H ²⁺ + CH ₄	177E		
H ²⁺ + Co	418E	1322E	
H ²⁺ + Cr	418E	1322E	
H ²⁺ + Cu	163E 1326T 1331E-T	418E 1322E	1323T 1329T
H ²⁺ + Dy	122E	566E	1333E
H ²⁺ + Ge	354E		
H ²⁺ + H	109E 334T 512T 1019T	1761 3611 688E	266T 482T 902T
H ²⁺ + H ₂	672E		
H ²⁺ + He	870T 992T	987E 1386T	988E
H ²⁺ + He ²⁺	114T	1322T	

$H^+ + Mo$ 168T			$He^+ + Bi$ 979E		$He^{2+} + Xe$ 988E
$H^+ + In$ 958E	1325T		$He^+ + C$ 1578E		$Li^+ + Pb$ 693E
$H^+ + Kr$ 988E			$He^+ + Cu$ 657E		$K + Mo$ 1267E
$H^+ + Li^+$ 660T	663T		$He^+ + Dy$ 1230E		$K + O_2$ 1267E
$H^+ + Li^{2+}$ 663T			$He^+ + Ge$ 357E		$Kr^+ + Ar$ 916E
$H^+ + Ne$ 121E 1323T	213E	988E	$He^+ + He$ 311E 1071E	909E 987E	$Kr^+ + Kr$ 692E
$H^+ + Ni$ 194T 1327T 1330E	418E 1328E	1011T 1329T	$He^+ + Mo$ 657E		$Li^+ + B$ 999T
$H^+ + Pb$ 979E	1333E	1425E-T	$He^+ + Ne$ 910E		$Li^+ + Be$ 999T
$H^+ + PERT$ 1324T	1332T		$He^+ + Pb$ 979E	1239E	$Li^+ + C$ 999T
$H^+ + Rb$ 428E-T			$He^+ + U$ 1230E		$Li^+ + F$ 999T
$H^+ + Sb$ 1325T			$He^+ + V$ 979E		$Li^+ + H$ 999T
$H^+ + Sn$ 1425E-T			$He^+ + W$ 1230E		$Li^+ + H_2$ 999T
$H^+ + Sr$ 453E			$He^+ + Y$ 436E		$Li^+ + He$ 999T
$H^+ + Ti$ 418E	1327T	1328E	$He^{2+} + Ar$ 213E 1389T	632T 588E	$Li^+ + Li$ 999T
$H^+ + U$ 484T	566E	1011T	$He^{2+} + Au$ 567T		$Li^+ + N$ 999T
$H^+ + V$ 979E	1425E-T		$He^{2+} + Ca$ 177E	1314E	$Li^+ + Na$ 999T
$H^+ + Xe$ 566E	938E		$He^{2+} + CH_4$ 1389T		$Li^+ + Ne$ 999T
$H^+ + Y$ 406E			$He^{2+} + Co$ 177E		$Li^+ + O$ 999T
$H^+ + Zn$ 416E	1328E		$He^{2+} + Cr$ 177E	1314E	$Li^+ + B$ 999T
$H_2^+ + Ar$ 274E			$He^{2+} + Cu$ 177E	1328E	$Li^+ + Be$ 999T
$He^+ + Ar$ 12E 744E	34E 1312E	696E	$He^{2+} + Fe$ 177E		$Li^+ + C$ 999T
$He^+ + Cd$ 229E			$He^{2+} + H$ 114T 902T	361T 1323T	452T
$He^+ + CO$ 34E			$He^{2+} + H_2$ 672E		$Li^+ + H$ 101E
$He^+ + Kr$ 34E	1312E		$He^{2+} + He$ 670T	987E	988E
$He^+ + N_2$ 34E	373E	944E	$He^{2+} + Kr$ 988E		$Li^+ + Li$ 999T
$He^+ + O_2$ 34E	563E		$He^{2+} + Mn$ 177E		$Li^+ + Li^+$ 660T
$He^+ + Xe$ 1312E			$He^{2+} + Ne$ 213E	988E	1323T
$He^+ + Ag$ 657E			$He^{2+} + Ni$ 177E	194T	
$He^+ + Al$ 406E			$He^{2+} + Sc$ 177E	1314E	
$He^+ + Ar$ 274E			$He^{2+} + Ti$ 177E	1314E	
$He^+ + Au$ 979E	1230E		$He^{2+} + V$ 177E	1314E	
					$Li^{2+} + B$ 959T

$\text{Li}^{2+} + \text{Be}$
 999T
 $\text{Li}^{2+} + \text{C}$
 999T
 $\text{Li}^{2+} + \text{F}$
 999T
 $\text{Li}^{2+} + \text{H}$
 101E 663T 999T
 $\text{Li}^{2+} + \text{H}_2$
 672E 999T
 $\text{Li}^{2+} + \text{He}$
 987E 999T
 $\text{Li}^{2+} + \text{Li}$
 999T
 $\text{Li}^{2+} + \text{N}$
 999T
 $\text{Li}^{2+} + \text{Na}$
 999T
 $\text{Li}^{2+} + \text{Ne}$
 999T
 $\text{Li}^{2+} + \text{O}$
 999T
 $\text{Li}^{2+} + \text{Ar}$
 215E 988E
 $\text{Li}^{2+} + \text{H}$
 101E 334T 452T
 663T 902T
 $\text{Li}^{2+} + \text{H}_2$
 672E
 $\text{Li}^{2+} + \text{He}$
 870T 988E
 $\text{Li}^{2+} + \text{Kr}$
 988E
 $\text{Li}^{2+} + \text{Ne}$
 213E 988E 1323T
 $\text{Li}^{2+} + \text{Xe}$
 988E
 $\text{Mg} + \text{Ti}$
 856E
 $\text{H} + \text{Ti}$
 856E
 $\text{H}^+ + \text{Au}$
 155T
 $\text{H}^+ + \text{H}^+$
 490E
 $\text{H}^{2+} + \text{H}^+$
 490E
 $\text{H}^{2+} + \text{H}_2$
 672E
 $\text{H}^{2+} + \text{H}^+$
 490E
 $\text{H}^{2+} + \text{H}_2$
 672E
 $\text{H}^{2+} + \text{H}$
 902T
 $\text{H}^{2+} + \text{H}^+$
 490E
 $\text{H}^{2+} + \text{H}_2$
 672E
 $\text{H}^{2+} + \text{PERT}$
 980E
 $\text{H}^{2+} + \text{H}$
 902T
 $\text{H}^{2+} + \text{H}^+$
 490E

$\text{H}^{2+} + \text{N}_2$
 672E
 $\text{H}^{2+} + \text{Ca}$
 1314E
 $\text{H}^{2+} + \text{Cr}$
 1314E
 $\text{H}^{2+} + \text{He}$
 870T 903E
 $\text{H}^{2+} + \text{Sc}$
 1314E
 $\text{H}^{2+} + \text{Ti}$
 1314E
 $\text{H}^{2+} + \text{V}$
 1314E
 $\text{Na} + \text{MO}$
 1267E
 $\text{Na} + \text{O}_2$
 1267E
 $\text{Na}^+ + \text{Na}$
 317E
 $\text{Nb} + \text{Au}$
 934E
 $\text{Ne}^+ + \text{Ar}$
 690E 1312E
 $\text{Ne}^+ + \text{Kr}$
 690E 1312E
 $\text{Ne}^+ + \text{Xe}$
 690E 1312E
 $\text{Ne}^+ + \text{Ar}$
 554T
 $\text{Ne}^+ + \text{He}$
 556E-T 692E
 $\text{Ne}^+ + \text{Ni}$
 1330E
 $\text{Ne}^{2+} + \text{Xe}$
 215E
 $\text{Ne}^{2+} + \text{He}$
 431E
 $\text{Ne}^{10+} + \text{He}$
 870T
 $\text{Ni}^+ + \text{C}$
 1386E
 $\text{Ni}^+ + \text{Ni}$
 446E
 $\text{O}^+ + \text{Ag}$
 163E
 $\text{O}^+ + \text{Au}$
 153E 1305E
 $\text{O}^+ + \text{Cu}$
 163E
 $\text{O}^+ + \text{H}^+$
 490E
 $\text{O}^+ + \text{O}_2$
 692E
 $\text{O}^{2+} + \text{H}^+$
 490E
 $\text{O}^{2+} + \text{H}_2$
 672E
 $\text{O}^{2+} + \text{H}^+$
 490E
 $\text{O}^{2+} + \text{H}_2$
 672E
 $\text{O}^{2+} + \text{He}$
 907E

$\text{O}^{2+} + \text{H}^+$
 490E
 $\text{O}^{2+} + \text{H}_2$
 672E
 $\text{O}^{2+} + \text{He}$
 987E
 $\text{O}^{2+} + \text{H}$
 902T
 $\text{O}^{2+} + \text{H}^+$
 490E
 $\text{O}^{2+} + \text{H}_2$
 672E
 $\text{O}^{2+} + \text{He}$
 903E 987E
 $\text{O}^{2+} + \text{He}$
 987E
 $\text{O}^{2+} + \text{Ar}$
 988E
 $\text{O}^{2+} + \text{H}$
 724E
 $\text{O}^{2+} + \text{He}$
 870T 988E
 $\text{O}^{2+} + \text{Kr}$
 988E
 $\text{O}^{2+} + \text{Ne}$
 988E
 $\text{O}^{2+} + \text{Xe}$
 984E
 $\text{Pb}^+ + \text{Ar}$
 916E
 $\text{Pb}^+ + \text{Pb}$
 693E
 $\text{Pb}^+ + \text{Zn}$
 693E
 $\text{PERT} + \text{PERT}$
 267E
 $\text{PERT}^+ + \text{PERT}$
 554T
 $\text{Rb}^+ + \text{Rb}$
 589E 674E
 $\text{Rb}^+ + \text{Rb}^+$
 589E
 $\text{S}^+ + \text{Ag}$
 163E
 $\text{S}^+ + \text{Au}$
 163E
 $\text{S}^+ + \text{Cu}$
 163E
 $\text{S}^+ + \text{Pb}$
 693E
 $\text{S}^{2+} + \text{Ar}$
 115E
 $\text{Si}^{10+} + \text{Ar}$
 115E
 $\text{Si} + \text{Ti}$
 656E
 $\text{Si}^{10+} + \text{H}$
 334T
 $\text{Ti}^+ + \text{Ti}^+$
 80E
 $\text{U}^+ + \text{Ar}$
 916E
 $\text{U}^{2+} + \text{Ar}$
 497E-T

U²³⁵ + He
497E-T

U²³⁵ + Kr
497E-T

U²³⁵ + Ne
497E-T

U²³⁵ + Xe
497E-T

Xe + Pb
970E

Xe + Ar
916E

Xe²⁺ + Xe
286E

Xe²⁺ + Xe
286E

Xe³⁺ + Xe
286E

Xe⁴⁺ + Xe
286E

Xe⁵⁺ + Xe
286E

Xe⁶⁺ + Xe
286E

Xe⁷⁺ + Xe
286E

Xe⁸⁺ + Xe
286E

Xe¹⁰⁺ + Xe
286E

Xe¹¹⁺ + Xe
286E

Xe¹²⁺ + Xe
286E

Review
691E 694E 714E

Under
141T 1911 307T
365T 534T 885T
1008T 1024T

HEAVY PARTICLE - HEAVY PARTICLE INTERACTIONS

Stripping

$C^{2+} + Ar$	425E	
$C^{2+} + Ne$	425E	
$C^{2+} + He$	425E	
$C^{3+} + Ar$	425E	1509E
$C^{3+} + He$	425E	1509E
$C^{3+} + N_2$	1509E	
$C^{3+} + Ne$	425E	
$F^{2+} + Ne$	471E	
$F^{2+} + He$	471E	
$F^{4+} + Ne$	471E	
$F^{3+} + Ne$	471E	
$F^{3+} + He$	471E	
$F^{3+} + N_2$	471E	
$F^{3+} + Ne$	471E	
$F^{3+} + He$	471E	
$F^{3+} + N_2$	471E	
$F^{3+} + Ne$	471E	
$Ar + Cs$	650E	
$H + H$	1532E	
$H + N_2$	1502E	
$H + N_2$	650E	
$He + H$	1502E	
$He + H_2$	1502E	
$He^+ + Ar$	1500E	
$He^+ + H$	1502E	
$He^+ + H_2$	1502E	
$He^+ + He$	1500E	
$He^+ + N_2$	1500E	
$He^{2+} + PERT$	1463T	
$Li^{2+} + Ar$	1500E	

$\text{Li}^{12+} + \text{He}$	1500E	
$\text{Li}^{12+} + \text{N}_2$	1500E	
$\text{O}^{8+} + \text{Ar}$	425E	
$\text{O}^{8+} + \text{He}$	425E	
$\text{O}^{8+} + \text{Ne}$	425E	
$\text{O}^{8+} + \text{Ar}$	425E	
$\text{O}^{8+} + \text{He}$	425E	
$\text{O}^{8+} + \text{Ne}$	425E	
$\text{O}^{7+} + \text{Ar}$	425E	1500E
$\text{O}^{7+} + \text{He}$	425E	1500E
$\text{O}^{7+} + \text{N}_2$	1500E	
$\text{O}^{7+} + \text{Ne}$	425E	
$\text{Pb}^{34+} + \text{N}_2$	401E	
$\text{Pb}^{35+} + \text{N}_2$	401E	
$\text{Pb}^{36+} + \text{N}_2$	401E	
$\text{Pb}^{37+} + \text{N}_2$	401E	
$\text{Pb}^{38+} + \text{N}_2$	401E	
$\text{Pb}^{39+} + \text{N}_2$	401E	
$\text{Pb}^{40+} + \text{N}_2$	401E	
$\text{Pb}^{41+} + \text{N}_2$	401E	
$\text{Pb}^{42+} + \text{N}_2$	401E	
$\text{Pb}^{43+} + \text{N}_2$	401E	
$\text{Pb}^{44+} + \text{N}_2$	401E	
$\text{Pb}^{45+} + \text{N}_2$	401E	
$\text{Pb}^{46+} + \text{N}_2$	401E	
$\text{Pb}^{47+} + \text{N}_2$	401E	
$\text{Pb}^{48+} + \text{N}_2$	401E	
$\text{Pb}^{49+} + \text{N}_2$	401E	
$\text{Pb}^{50+} + \text{N}_2$	401E	
$\text{Pb}^{51+} + \text{N}_2$	401E	
$\text{Pb}^{52+} + \text{N}_2$	401E	
$\text{Pb}^{53+} + \text{N}_2$	401E	

$\text{Pb}^{80+} + \text{N}_2$
481E
 $\text{Pb}^{85+} + \text{N}_2$
481E
 $\text{Pb}^{90+} + \text{N}_2$
481E
 $\text{Pb}^{97+} + \text{N}_2$
481E
 $\text{Fb}^{90+} + \text{N}_2$
481E
 $\text{Pb}^{90+} + \text{N}_2$
481E
 $\text{Fb}^{90+} + \text{N}_2$
481E
 $\text{Fb}^{92+} + \text{N}_2$
481E
 $\text{Fb}^{93+} + \text{N}_2$
481E
 $\text{Pb}^{97+} + \text{N}_2$
481E
 $\text{Si}^{90+} + \text{Ar}$
425E
 $\text{Si}^{95+} + \text{Ar}$
425E
 $\text{Si}^{90+} + \text{He}$
425E
 $\text{Si}^{90+} + \text{Ne}$
425E
 $\text{Si}^{97+} + \text{Ar}$
425E
 $\text{Si}^{97+} + \text{He}$
425E
 $\text{Si}^{97+} + \text{Ne}$
425E
 $\text{Si}^{90+} + \text{Ar}$
425E
 $\text{Si}^{90+} + \text{He}$
425E
 $\text{Si}^{90+} + \text{Ne}$
425E
 $\text{Si}^{97+} + \text{He}$
425E
 $\text{Si}^{97+} + \text{Ne}$
425E
 $\text{Si}^{100+} + \text{Ar}$
425E
 $\text{Si}^{100+} + \text{He}$
425E
 $\text{Si}^{100+} + \text{Ne}$
425E
 $\text{Si}^{110+} + \text{He}$
425E
 $\text{Si}^{110+} + \text{Ar}$
425E
 $\text{Si}^{110+} + \text{Ne}$
425E
 $\text{Si}^{120+} + \text{Ar}$
425E
 $\text{Si}^{120+} + \text{He}$
425E
 $\text{Si}^{120+} + \text{Ne}$
425E

$\text{Si}^{13+} + \text{Ar}$
425E

$\text{Si}^{13+} + \text{He}$
425E

$\text{Si}^{13+} + \text{Ne}$
425E

$\text{Xe}^{21+} + \text{N}_2$
481E

$\text{Xe}^{22+} + \text{N}_2$
481E

$\text{Xe}^{23+} + \text{N}_2$
481E

$\text{Xe}^{24+} + \text{N}_2$
481E

$\text{Xe}^{25+} + \text{N}_2$
481E

$\text{Xe}^{26+} + \text{N}_2$
481E

$\text{Xe}^{27+} + \text{N}_2$
481E

$\text{Xe}^{28+} + \text{N}_2$
481E

$\text{Xe}^{29+} + \text{N}_2$
481E

$\text{Xe}^{30+} + \text{N}_2$
481E

$\text{Xe}^{31+} + \text{N}_2$
481E

$\text{Xe}^{32+} + \text{N}_2$
481E

$\text{Xe}^{33+} + \text{N}_2$
481E

$\text{Xe}^{34+} + \text{N}_2$
481E

$\text{Xe}^{35+} + \text{N}_2$
481E

$\text{Xe}^{36+} + \text{N}_2$
481E

$\text{Xe}^{37+} + \text{N}_2$
481E

$\text{Xe}^{38+} + \text{N}_2$
481E

$\text{Xe}^{39+} + \text{N}_2$
481E

$\text{Xe}^{40+} + \text{N}_2$
481E

$\text{Xe}^{41+} + \text{N}_2$
481E

$\text{Xe}^{42+} + \text{N}_2$
481E

$\text{Xe}^{43+} + \text{N}_2$
481E

$\text{Xe}^{44+} + \text{N}_2$
481E

$\text{Xe}^{45+} + \text{N}_2$
481E

A09

HEAVY PARTICLE - HEAVY PARTICLE INTERACTIONS

Recombination or Mutual Neutralization Leading to Neutral Products (ion-ion)

$\text{H}^+ + \text{H}^-$
25E-T

$\text{H}_3^+ + \text{F}^-$
905T

$\text{H}_3^+ + \text{F}^- + \text{H}^+$
905T

$\text{K}^+ + \text{Cl}^- + \text{H}_2$
90T

$\text{K}^+ + \text{Cl}^- + \text{N}_2$
90T

$\text{K}^+ + \text{Cl}^- + \text{O}_2$
90T

$\text{Kr}^+ + \text{F}^- + \text{Ar}$
90T 509T

$\text{Kr}^+ + \text{F}^- + \text{F}^-$
905T

$\text{Kr}^+ + \text{F}^- + \text{He}$
509T

$\text{Kr}^+ + \text{F}^- + \text{Kr}^+$
935T

$\text{Na}^+ + \text{Cl}^- + \text{H}_2$
90T

$\text{Na}^+ + \text{Cl}^- + \text{N}_2$
90T

$\text{Na}^+ + \text{Cl}^- + \text{O}_2$
90T

$\text{Na}^+ + \text{O}^-$
25E-T

$\text{Na}^+ + \text{F}^- + \text{F}^-$
905T

$\text{Na}^+ + \text{F}^- + \text{Na}^+$
905T

Undef
193T 436T

All

HEAVY PARTICLE - HEAVY PARTICLE
INTERACTIONS

Collisional De-Excitation

$\text{Ar} + \text{H}_2^+ 615\text{T}$
 $\text{Ar}^+ + \text{CO} 51\text{E}$
 $\text{Ar}^+ + \text{CO}_2 51\text{E}$
 $\text{Ar}^+ + \text{O}_2 51\text{E}$
 $\text{Ar}^+ + \text{OH} 1125\text{T}$
 $\text{Ar}^+ + \text{Na}^+ 657\text{E}$
 $\text{Cd}^+ + \text{CO} 819\text{E}$
 $\text{Cd}^+ + \text{CO}_2 819\text{E}$
 $\text{Cd}^+ + \text{H}_2 819\text{E}$
 $\text{Cd}^+ + \text{N}_2 819\text{E}$
 $\text{CO}^+ + \text{H}_2 1\text{T}$
 $\text{CO}^+ + \text{He} 10\text{T} 15\text{T}$
 $\text{CO}^+ + \text{CO}^+ 53\text{E}$
 $(\text{CO}^+)^+ + \text{Ar} 41\text{E}$
 $(\text{CO}^+)^+ + \text{CO} 41\text{E}$
 $\text{CO}_2^+ + \text{He} 11\text{T} 593\text{T}$
 $\text{CO}_2^+ + \text{N}_2 582\text{T}$
 $\text{CO}_2^+ + \text{Ne} 11\text{T} 593\text{T}$
 $\text{Cs}^+ + \text{CD}_3 8\text{E}$
 $\text{Cs}^+ + \text{CH}_3 8\text{E}$
 $\text{Cs}^+ + \text{H}_2 8\text{E}$
 $\text{Cs}^+ + \text{N}_2 8\text{E}$
 $\text{H}^+ + \text{D} 249\text{E}$
 $\text{H}_2^+ + \text{He} 1259\text{T}$
 $\text{HCl}^+ + \text{Ar} 1116\text{T}$
 $\text{He}^+ + \text{Ar} 120\text{E} 915\text{E}$
 $\text{He}^+ + \text{He} 915\text{E}$
 $\text{He}^+ + \text{He}^+ 55\text{E}$

$\text{He}^+ + \text{He} 654\text{E} 915\text{E}$
 $\text{K}^+ + \text{H}_2 656\text{T}$
 $\text{K}^+ + \text{H}_2 656\text{T}$
 $\text{K}_2^+ + \text{K} 1493\text{E}$
 $\text{Kr}^+ + \text{CO} 51\text{E}$
 $\text{Kr}^+ + \text{CO}_2 51\text{E}$
 $\text{Kr}^+ + \text{O}_2 51\text{E}$
 $\text{Li}^+ + \text{Ar} 591\text{E}$
 $\text{Li}^+ + \text{He} 504\text{E}$
 $\text{Li}^+ + \text{Li} 504\text{E}$
 $\text{Li}^+ + \text{Ne} 504\text{E}$
 $\text{Li}^+ + \text{Xe} 591\text{E}$
 $\text{Hg}^+ + \text{D}_2 1531\text{E}$
 $\text{Hg}^+ + \text{H}_2 1531\text{E}$
 $\text{Mo} + \text{SF}_6 489\text{E}$
 $\text{N}_2^+ + \text{CO}_2 582\text{T}$
 $\text{Na}^+ + \text{Ar} 113\text{T} 655\text{E}-\text{T} 673\text{E}$
 $\text{Na}^+ + \text{CO} 610\text{E} 612\text{E}$
 $\text{Na}^+ + \text{Cs} 648\text{E}$
 $\text{Na}^+ + \text{H}_2 604\text{E}$
 $\text{Na}^+ + \text{He} 113\text{T} 655\text{E}-\text{T}$
 $\text{Na}^+ + \text{Hg} 796\text{E}$
 $\text{Na}^+ + \text{Kr} 673\text{E}$
 $\text{Na}^+ + \text{N}_2 610\text{E}$
 $\text{Na}^+ + \text{Na} 796\text{E}$
 $\text{Na}^+ + \text{Ne} 113\text{T} 655\text{E}-\text{T}$
 $\text{Na}^+ + \text{Xe} 673\text{E}$
 $\text{Na}_2^+ + \text{Na} 1493\text{E}$
 $\text{Ne}^+ + \text{He} 244\text{T}$
 $\text{Ne}^+ + \text{Ne} 244\text{T} 1320\text{E}$
 $\text{Ne}^+ + \text{O}_2 35\text{E}$

$\text{Ne}^+ + \text{Na}^+ 697\text{E}$
 $\text{C}^+ + \text{He} 35\text{E}$
 $\text{C}^+ + \text{Xe} 1068\text{E}$
 $\text{C}_2^+ + \text{N}_2 1119\text{E}$
 $\text{C}_2^+ + \text{O}_2 1119\text{E}$
 $\text{GH}^+ + \text{D}_2 1532\text{E}$
 $\text{GH}^+ + \text{H}_2 45\text{E} 1532\text{E}$
 $\text{GH}^+ + \text{H}_2\text{O} 45\text{E} 1532\text{E}$
 $\text{GH}^+ + \text{N}_2 45\text{E}$
 $\text{LH}^+ + \text{O}_2 45\text{E}$
 $\text{Pb}^+ + \text{Ar} 48\text{E}$
 $\text{Pb}^+ + \text{Pb} 48\text{E}$
 $\text{Rb}^+ + \text{Ar} 631\text{E}$
 $\text{Rb}^+ + \text{H}_2 656\text{T}$
 $\text{Rb}^+ + \text{He} 631\text{E}$
 $\text{Rb}^+ + \text{Kr} 631\text{E}$
 $\text{Rb}^+ + \text{N}_2 656\text{T}$
 $\text{Rb}^+ + \text{Ne} 631\text{E}$
 $\text{Rb}^+ + \text{Rb} 341\text{E} 674\text{E}$
 $\text{Rb}^+ + \text{Xe} 631\text{E}$
 $\text{Xe}^+ + \text{CO} 51\text{E}$
 $\text{Xe}^+ + \text{CO}_2 51\text{E}$
 $\text{Xe}^+ + \text{O}_2 51\text{E}$
 $\text{Xe}^+ + \text{Xe} 697\text{E}$
 $\text{Zn}^+ + \text{Ar} 1318\text{E}$
 $\text{Zn}^+ + \text{CO} 1318\text{E}$
 $\text{Zn}^+ + \text{CO}_2 1318\text{E}$
 $\text{Zn}^+ + \text{H}_2 1318\text{E}$
 $\text{Zn}^+ + \text{N}_2 1318\text{E}$
 $\text{Under} 29\text{T}$

A12

HEAVY PARTICLE - HEAVY PARTICLE
INTERACTIONS

Collisional Line Broadening

Ar ⁺ + He	910E		
Ca + Ar	653E		
Ca + He	653E		
Ca ⁺ + Ar	938E	1173E	
Ca ⁺ + He	225E		
Ca ⁺ + Kr	224E	938E	
CO ⁺ + CO	782E	831E	1317E
CO ⁺ + CO ₂	1317E		
CO ⁺ + He	782E		
CO ⁺ + N ₂	230E 1317E	812T	831E
CO ⁺ + O ₂	1317E		
CO ⁺ + CO ₂	931E		
CO ₂ ⁺ + Ar	913E		
CO ₂ ⁺ + CO ₂	913E	1496T	
CO ₂ ⁺ + H ₂	913E		
CO ₂ ⁺ + He	913E		
CO ₂ ⁺ + N ₂	779T	813E	1496T
CO ₂ ⁺ + O ₂	813E		
CO ₂ ⁺ + Xe	913E		
Cs ⁺ + Ar	442E		
Cs ⁺ + Xe	789T		
H ⁺ + Ar ⁺	915T		
H ₂ ⁺ + H ₂	906T		
H ₂ ⁺ + He	906T		
H ₂ O ⁺ + Air	907E		

H ₂ O ⁺ + H ₂ O	807E 1316E	922T	1271E
H ₂ O ⁺ + N ₂	807E 1316E	821T	822T
H ₂ O ⁺ + O ₂	821T		
He ⁺ + He	293E		
He ⁺ + He ⁺	184T		
Hg ⁺ + He	222E		
Hg ⁺ + Ne	222E		
K ⁺ + Ar	98E	389E	
K ⁺ + Cs	152E		
Li + Ar	1057E		
Li + He	503E	1057E	
Li + Kr	1057E		
Li + Ne	503E	1057E	
Li + Xe	1057E		
Li ⁺ + Ar	367E		
Li ⁺ + He	367E		
Li ⁺ + Kr	367E		
Li ⁺ + Ne	367E		
Mg + Ar	653E		
Mg + He	653E		
Na + Ar	906E		
Na + He	906E		
Na + Ne	906E		
Na ⁺ + Ar	474T	506E	
Na ⁺ + He	474T	506E	641T
Na ⁺ + Kr	474T	506E	
Na ⁺ + Ne	474T		
Na ⁺ + Xe	474T		

Ne ⁺ + He	244T		
Ne ⁺ + Ne	244T		
Ge ⁺ + Ar	1039T		
C ₂ ⁺ + H ₂	814E		
C ₂ ⁺ + O ₂	814E		
CH ⁺ + Ar	826T		
CH ⁺ + H ₂	826T		
CH ⁺ + N ₂	826T		
Fb ⁺ + Ar	234E	255E	963E
Rb ⁺ + CH ₄	252E		
Rb ⁺ + He	234E 963E	255E	474T
Rb ⁺ + Kr	255E		
Rb ⁺ + N ₂	252E		
Fb ⁺ + Na	255E		
Rb ⁺ + Rb	233E		
Fb ⁺ + Xe	262E 963E	255E	474T
Sr + Ar	653E		
Sr + He	653E		
Tl + N ₂	561E		
Tl ⁺ + Ar	430E		
Tl ⁺ + He	430E		
Tl ⁺ + Kr	430E		
Tl ⁺ + Ne	430E		
Tl ⁺ + Xe	430E		
Xe ⁺ + Xe	640E		
Review	949E-7		
Undef	228T 793T	327T 817T	528T 1044T

A14

HEAVY PARTICLE - HEAVY PARTICLE INTERCHANGE

Heavy Particle Interchange (most involve some form of hydrogen or helium)

A16

HEAVY PARTICLE - HEAVY PARTICLE
INTERACTIONSElectron Detachment from Negative Ions
into Continuum

Br ⁻ + Ar	727E	734E	
Br ⁻ + He	727E	734E	
Br ⁻ + N ₂	727E		
Br ⁻ + Ne	734E		
Br ⁻ + O ₂	727E		
Cl ⁻ + Ar	659E	727E	1263E
Cl ⁻ + CO	92E	699E	
Cl ⁻ + D ₂	62E	92E	699E
Cl ⁻ + H	644T		
Cl ⁻ + H ₂	62E		
Cl ⁻ + He	659E	727E	1263E
Cl ⁻ + Kr	1263E		
Cl ⁻ + N ₂	92E	699E	727E
Cl ⁻ + Ne	1263E		
Cl ⁻ + O ₂	659E	727E	
Cl ⁻ + Xe	1263E		
D ⁻ + Ar	727E		
D ⁻ + Ba	470E-T		
D ⁻ + Ca	470E-T		
D ⁻ + H	520T		
D ⁻ + He	134E	727E	
D ⁻ + Mg	470E-T		

D ⁻ + N ₂	727E		
D ⁻ + O ₂	727E		
D ⁻ + Sr	470E-T		
F ⁻ + Ar	130E	1021E	
F ⁻ + CO	92E	130E	
F ⁻ + CO ₂	130E		
F ⁻ + D ₂	62E	92E	727E
F ⁻ + H	644T		
F ⁻ + H ₂	62E	727E	
F ⁻ + He	130E	1021E	
F ⁻ + Kr	1021E		
F ⁻ + N ₂	92E	130E	
F ⁻ + Ne	130E	1021E	
F ⁻ + O ₂	130E		
F ⁻ + Xe	1021E		
H ⁻ + Ar	727E	730E	732E
H ⁻ + Ca	728T		
H ⁻ + CO	92E		
H ⁻ + Cs	728T		
H ⁻ + D ₂	92E		
H ⁻ + H	520T	732E	1502E
H ⁻ + H ₂	732E	1502E	
H ⁻ + He	130E	486T	727E
	730E	731T	732E
	734E	1632T	
H ⁻ + K	728T		

H ⁻ + N ₂	92E	727E	
H ⁻ + Ne	728T		
H ⁻ + Ne	730E	731T	732E
	734E		
H ⁻ + O ₂	727E		
H ⁻ + Rb	728T		
he ⁻ + Ar	729E	732E	
he ⁻ + H	732E	1502E	
he ⁻ + H ₂	729E	732E	1502E
he ⁻ + He	729E	732E	
he ⁻ + Ne	729E	732E	
He ⁻ + ND	729E		
he ⁻ + O ₂	729E		
Li ⁻ + Ar	124E		
Li ⁻ + Ca	728T		
Li ⁻ + CO ₂	124E		
Li ⁻ + H ₂	124E		
Li ⁻ + K	728T		
Li ⁻ + N ₂	124E		
Li ⁻ + Na	728T		
C ⁻ + Ar	733E	734E	
C ⁻ + H ₂	733E		
C ⁻ + He	733E	734E	
C ⁻ + Ne	734E		
Review	698T		
Undef	519T		

A17

HEAVY PARTICLE - HEAVY PARTICLE
INTERACTIONS

Interaction Potentials

Ar + Ar
444T 1571T 1572TAr + Ba
136TAr + Ca
136TAr + Hg
136TAr + Sr
136TAr⁺ + Cu
1104EAr³⁺ + Ar³⁺
1567TLa + Ar
907EBa + F
263TBa + H
264TBa + Kr
907EBa + Xe
907EBa + F
263TBaHg
13TBr⁻ + Ar
47E-TBr⁻ + Br⁻
759TBr⁻ + Kr
47E-TBr⁻ + Ne
47E-TBr⁻ + Xe
47E-TC⁺ + H₂
1265TCa + F
263TCa + H
264TCaH
470E-TCaH⁺
470E-TCaH⁻
470E-TCH₄
890TCl⁻ + Cl⁻
759TCl⁻ + H
759TCl⁻ + O
759TCG
0y0iCO⁺
740E-TCO₂
890TCs + Br
1121TCs + Cl
1121TCs + F
1121TCs + He
1049TCs + I
1121TF⁻ + F⁻
759TF⁻ + H
759TF⁻ + O
759TH + F
955TH + H⁺
303EH + H₂
54TH⁺ + H⁺
117TH⁺ + Cs
1022TH⁺ + K
1022TH⁺ + Li
1022TH⁺ + Na
1022TH⁺ + Rb
1022TH₂ + CO
1261TH₂ + H₂
68TH₂⁺
535TH₂O
9T 595TH₃
17T 587T 753E-TH₃⁺
753E-THe + Ar
1264THe + H₂
52T 983THe + He
49E-T 1260THe + Kr
1264THe + N₂
14THe + Ne
1264THe⁺ + Ne
362EHe⁺ + H
355THe⁺ + He
311EHe²⁺ + He
278THe₂²⁺
1534THeBe
13THeH
1091THeH⁺
1091THeH⁻
1091THeHg
13THg + Hg
83THg⁺ + Ar
1568E-THg⁺ + Ne
1568E-THg⁺ + Kr
1568E-THg⁺ + Xe
1568E-THg⁺ + Xe
1568E-TI + Br
225-TI + I
864TI⁻ + I⁻
759TK + Br
1121TK + Cl
1121TK + F
1121TK + I
1121TK⁺ + Ar
894TK⁺ + H
759TK⁺ + K⁺
759TK⁺ + Kr
894TK⁺ + O
759TK⁺ + Xe
894TKBr
759TKCl
759T

KF	759T	$H_2 + H_2$	36T	$C + H_2$	55T
Ki	759T	$Na + Ar$	906E	$C + H_2$	132T
Kr + Kr	444T 1572T	$Na + Br$	1121T	$C^{2+} + H$	227T
Li + Br	1121T	$Na + Cl$	1121T	C_2	890T
Li + Cl	1121T	$Na + F$	1121T	$C_2 + Ar$	588E-T 1574E
Li + F	1121T	$Na + He$	906E 1049T	$C_2 + Kr$	588E-T 1574E
Li + H	109T	$Na + I$	1121T	$CH + Ar$	826T
Li + He	503E	$Na + Ne$	20T 906E	$CH + H_2$	826T
Li + I	1121T	$Na + Xe$	261E	$CH + H_2$	826T
Li + Ne	503E	$Na^{+} + Xe$	260E	FERT	559T
Li ⁺ + Ar	894T	$Na^{+} + H$	759T	Fb + Br	1121T
Li ⁺ + H	759T	$Na^{+} + Na^{+}$	759T	Rb + Cl	1121T
Li ⁺ + Kr	894T	$Na^{+} + O$	759T	Fb + F	1121T
Li ⁺ + Li ⁺	759T	NaBr	759T	Fb + I	1121T
Li ⁺ + O	759T	NaCl	759T	Fb ⁺ + Rb ⁺	759T
Li ⁺ + Xe	894T	NaF	759T	FbBr	759T
LiBr	759T	NaI	759T	RbCl	759T
LiCl	759T	$Na + Ar$	594E-T 1264T	FbF	759T
LIF	759T	$Ne + H_2$	52T	FbI	759T
Mg + F	263T	$Ne + Kr$	1264T	Sr + F	263T
Mg + He	105T	$Ne + Ne$	444T	Sr + H	264T
N ₂	1123T	Ne_2^{+}	790T	Xe + Xe	144T 1572T
$N_2 + Ar$	588E-T 1574E	NO + Ar	1574E	Undef	146T 1518T
$N_2 + Kr$	588E-T	O + CO	140T		

A18

HEAVY PARTICLE - HEAVY PARTICLE
INTERACTIONS

Angular Scattering

$\text{Ar}^0 + \text{Ar}$
796E
 $\text{Ar}^{2+} + \text{Ar}$
202E
 $\text{Ar}^{2+} + \text{Kr}$
202E
 $\text{Ar}^{2+} + \text{Ne}$
85E
 $\text{Ar}^{2+} + \text{Xe}$
202E
 $\text{Ba}^+ + \text{Au}$
1225E
 $\text{Br} + \text{Pb}$
273E
 $\text{C}^+ + \text{Au}$
1225E
 $\text{Ca}^+ + \text{C}^{3+}$
268T
 $\text{Ca}^+ + \text{H}$
928E
 $\text{Cl}^+ + \text{Pb}$
292E
 $\text{CO} + \text{D}_2$
586T
 $\text{Cu} + \text{Au}$
934E
 $\text{Cu}^{3+} + \text{Ag}$
933E
 $\text{Cu}^{3+} + \text{Cu}$
933E
 $\text{Cu}^{3+} + \text{Ge}$
933E
 $\text{D}^+ + \text{Au}$
1225E
 $\text{D}^+ + \text{Cu}$
283T
 $\text{D}^+ + \text{D}$
1136E-T
 $\text{D}^+ + \text{H}$
1136E-T
 $\text{D}^- + \text{H}$
528T
 $\text{F} + \text{H}_2$
18T 61T
 $\text{H} + \text{general target}$
747T
 $\text{H} + \text{H}_2$
18T
 $\text{H} + \text{Hg}$
748E
 $\text{H}^+ + \text{Ag}$
163E 1331E-T
 $\text{H}^+ + \text{Ar}$
213E 274E 570E
638E 1581T

$\text{H}^+ + \text{Au}$
163E 1225E 1331E-T
 $\text{H}^+ + \text{CH}_4$
121E 1064E
 $\text{H}^+ + \text{Cl}$
164T
 $\text{H}^+ + \text{Co}$
1328E
 $\text{H}^+ + \text{CO}_2$
164T
 $\text{H}^+ + \text{Cr}$
1328E
 $\text{H}^+ + \text{Cu}$
163E 1329E 1331E-T
 $\text{H}^+ + \text{D}$
1136E-T
 $\text{H}^+ + \text{H}$
26T 71T 256T
268T 361T 364E
402T 478T 510T
659T 1136E-T
 $\text{H}^+ + \text{He}$
182E 439T 492T
633E 1082E
 $\text{H}^+ + \text{Hg}$
447E 746E
 $\text{H}^+ + \text{H}_2$
164T
 $\text{H}^+ + \text{Ne}$
121E 213E 633E
1581T
 $\text{H}^+ + \text{NI}$
1328E
 $\text{H}^+ + \text{Ti}$
1328E
 $\text{H}^+ + \text{Zn}$
1328E
 $\text{H}_2^+ + \text{Ar}$
274E
 $\text{H}^- + \text{H}$
520T
 $\text{He} + \text{D}_2$
468E
 $\text{He} + \text{H}_2$
468E
 $\text{He} + \text{He}$
49E-T
 $\text{He} + \text{H}_2$
1255E
 $\text{He}^+ + \text{Ar}$
120E
 $\text{He}^+ + \text{Ar}$
274E
 $\text{He}^+ + \text{Au}$
1225E
 $\text{He}^+ + \text{D}_2$
468E
 $\text{He}^+ + \text{H}^+$
26T
 $\text{He}^+ + \text{H}_2$
175E 468E
 $\text{He}^+ + \text{He}$
564E 909E 1071E
 $\text{He}^+ + \text{Ne}$
564E 910E

$\text{He}^{2+} + \text{Ar}$
213E
 $\text{He}^{2+} + \text{Cu}$
1225E
 $\text{He}^{2+} + \text{H}$
361T
 $\text{He}^{2+} + \text{He}^+$
268T
 $\text{He}^{2+} + \text{Ne}$
213E
 $\text{He}^{2+} + \text{O}$
28E
 $\text{I} + \text{I}$
864T
 $\text{K} + \text{Ar}$
962T
 $\text{K}^+ + \text{Ar}$
962T
 $\text{K}^+ + \text{Hg}$
598E
 $\text{Kr} + \text{Kr}$
208E
 $\text{Kr} + \text{Xe}$
208E
 $\text{Li}^+ + \text{Au}$
1225E
 $\text{Li}^+ + \text{Ne}$
908E
 $\text{Li}^{3+} + \text{Ar}$
213E
 $\text{Li}^{3+} + \text{Li}^{2+}$
268T
 $\text{Li}^{3+} + \text{Ne}$
213E
 $\text{Li}^{3+} + \text{Ne}^{2+}$
659T
 $\text{Mg}^+ + \text{Ar}$
952T
 $\text{h}^+ + \text{Au}$
1225E
 $\text{ha} + \text{Ar}$
962T
 $\text{Na} + \text{Xe}$
261E
 $\text{ha}^+ + \text{Ar}$
962T
 $\text{Na}^+ + \text{Xe}$
260E
 $\text{ha}_2 + \text{Ne}$
488E-T
 $\text{hb} + \text{Au}$
934E
 $\text{K}^+ + \text{Au}$
1225E
 $\text{He}^{10+} + \text{Ne}^{9+}$
268T
 $\text{O}^+ + \text{Ag}$
163E
 $\text{C}^+ + \text{Au}$
163E
 $\text{O}^+ + \text{Cu}$
163E
 $\text{S}^+ + \text{Ag}$
163E

S* + Au
163E

S* + Cu
163E

Xa + Pb
970E

Underf
525T

B01

INTERACTIONS OF ATOMIC PARTICLES WITH FIELDS

Interaction of Individual Atoms or Molecules with External Fields

Ar
761E

e + H
1134T

H
511T 545T

H⁺
288T

H₂
761E

hv + H
1012T

hv + Na
540E 559E 1712T

hv + Na⁺
818E

He
505E 761E

He⁺
669E 946T

He⁺
639E 661E

He⁺⁺
345T

Kr
761E

Li⁺
946T

Na⁺
211E 462E

Na
761E

phv + Na⁺
792E

Fb
873E-T

Ie
761E

Underf
401T 538T 881T
887T 969T 996T

B05

INTERACTIONS OF ATOMIC PARTICLES WITH FIELDS

Quenching

He⁺⁺
320E

B07

INTERACTIONS OF ATOMIC PARTICLES WITH FIELDS

Collisions in Presence of Static or Time-Varying Fields

Ca⁺ + Sr + hv
253T

e + H
441T 882T

e + H⁺ + hv
879T

e + H + hv
154T 199T

e + hv + hv
1031T

: + H + hv
392T

H + Na + field
736E

H⁺ + Na + field
736E

hv + e
1506E

He + Na + field
736E

He⁺ + Na + field
736E

Li⁺ + Li + hv
409E

N₂ + Na + hv
235T

Na + Ba⁺ + hv
79E

Na + hv
1128T

Rb + K + hv
235E

Ie⁺ + Xe
494E

Review
703E

Underf
31T 77T 107T
387T 435T 481T
464T 502T 544T
549T 886T 1077T

C91

PARTICLE PENETRATION IN MACROSCOPIC
MATTER (IONS, NEUTRALS, AND ELECTRONS)

General

C²⁺ + Al
425E

C²⁺ + Au
425E

D⁺ + C
340E

D₂⁺ + C
340E

D₃⁺ + C
340E

H⁺ + Ag
425E

H⁺ + Al
425E

H⁺ + Au
425E

H⁺ + C
340E 425E 1366E

H₂⁺ + Al
1362E

H₂⁺ + C
340E 1362E 1366E

H₃⁺ + C
340E 1366E

HD₂⁺ + C
340E

He⁺ + C
1366E

HeH⁺ + C
340E

NI⁺ + Ag
425E

NI⁺ + Al
425E

NI⁺ + Au
425E

NI⁺ + C
425E

O⁺ + Ag
425E

O⁺ + Al
425E

O⁺ + Au
425E

O⁺ + C
425E

O²⁺ + Al
425E

O²⁺ + Au
425E

C⁷⁺ + Al
425E

C⁷⁺ + Au
425E

C⁸⁺ + Al
425E

Q²⁺ + Au
425E

SI⁺ + Ag
425E

SI⁺ + Al
425E

SI⁺ + Au
425E

SI⁺ + C
425E

Ti¹⁰⁺ + C
1366E

V¹⁰⁺ + C
1366E

Review
1477E-T

Under
384T 1342T 1481T

CH2

PARTICLE PENETRATION IN MACROSCOPIC
MATTER (IONS, NEUTRALS, AND ELECTRONS)

Energy Loss and Stopping Power

Al⁺ + Air
522TAl⁺ + Air ions
522TAl³⁺ + Air
522TAl³⁺ + Air ions
522TAl³⁺ + Air
522TAl³⁺ + Air ions
522TAr + Cu
1191TAr + Ga
973E-TAr⁺ + Al
1163EAr⁺ + Au
1163EAr⁺ + C
1163E 1469TAr⁺ + PERT
375TAs + H₂
961EAs + He
96EAs + Ne
961EAs + Mo
1191EAs⁺ + Mo₂
1191EAs⁺ + N
1181EB⁺ + C
1562EB⁺ + Cr
1562EB⁺ + Fe
1562EB⁺ + Ni
1562EB⁺ + V
1562EBe⁺ + C
1562EBe⁺ + Cr
1562EBe⁺ + Fe
1562EBe⁺ + Ni
1562EBe⁺ + V
1562EBr⁺ + Ag
376EBr⁺ + Al
376EBr⁺ + Au
376EBr⁺ + C
376EBr⁺ + Cu
376EC⁺ + Ag
376EC⁺ + Al
376E 1221EC⁺ + Au
376EC⁺ + C
376EC⁺ + Cu
376ECl⁺ + Ag
376ECl⁺ + Al
376E 1601TCl⁺ + Ar
1601TCl⁺ + Au
376ECl⁺ + C
376E 1601TCl⁺ + Cu
376ED⁺ + Al
1108T 1165ED⁺ + Au
1165E 1347ED⁺ + C
1108T 1165ED⁺ + Ca
1166ED⁺ + Cu
1224ED⁺ + D₂
1436ED⁺ + Ge
1334ED⁺ + H₂
1436ED⁺ + LiF
1558TD⁺ + Nb
1108TD⁺ + Pb
1424Ee⁻ + Al
477T 1000E 1431Te⁻ + Al⁺
477Te⁻ + Al²⁺
477Te⁻ + Al³⁺
477Te⁻ + Al⁺⁺
477Te⁻ + Al¹⁺
477Te⁻ + Al⁰⁺
477Te⁻ + Al¹⁺
477Te⁻ + Al⁰⁺
477Te⁻ + Al⁰⁺
477Te⁻ + Al¹⁰⁺
477Te⁻ + Al¹¹⁺
477Te⁻ + Al¹²⁺
477Te⁻ + Cu
1000Ee⁻ + H₂O
1087Te⁻ + Kr
859Ee⁻ + PERT⁺
466TFe⁺ + Ag
376EFe⁺ + Al
376EFe⁺ + Au
376EFe⁺ + C
376EFe⁺ + Cu
376EFe⁺ + PERT
375TGe⁺ + Ag
376EGe⁺ + Al
376EGe⁺ + Au
376EGe⁺ + C
376EGe⁺ + Cu
376EH⁺ + Ag
408E 871T 1222E
1345E 1346EH⁺ + Al⁺
405TH⁺ + Al
408E 491T 1033T
1108T 1141T 1346E
1346E 1431T 1487EH⁺ + Al⁺
491TH⁺ + Al²⁺
491TH⁺ + Al³⁺
491TH⁺ + Al⁰⁺
491T

H ⁺ + Al ⁹⁺ 4 91T			H ⁺ + H ₂ 405T	1436E	1453E	He ⁺ + Cu 1471E		
H ⁺ + Al ¹⁰⁺ 4 91T			H ⁺ + He 405T	1453E		He ⁺ + Er 788E		
H ⁺ + Al ¹¹⁺ 4 91T			H ⁺ + Kr 290T	1453E	1454T	He ⁺ + Fe 1562E		
H ⁺ + Al ¹²⁺ 4 51T			H ⁺ + LiF 1558T			He ⁺ + Ga 973E-T		
H ⁺ + Al ¹³⁺ 4 91T			H ⁺ + Mo 1346E			He ⁺ + Nb 1168T		
H ⁺ + Al ¹⁴⁺ 4 91T			H ⁺ + N ₂ 405T	1348E	1453E	He ⁺ + Ne 1601T		
H ⁺ + Al ¹⁵⁺ 4 91T			H ⁺ + Nb 1188T			He ⁺ + Ni 1222E	1557E	1562E
H ⁺ + Ar 2 99T 1464T	1033T	1453E	H ⁺ + Ne 1453E	1454T		He ⁺ + V 1562E		
H ⁺ + Au 9 78T 1346E 1462T	1222E 1346E	1223E 1347E	H ⁺ + Ni 1222E 1562E	1345E	1346E	He ²⁺ + Alr 435T		
H ⁺ + Au ⁺ 9 78T			H ⁺ + O ₂ 405T	1453E		He ²⁺ + Al 1221E		
H ⁺ + Au ²⁺ 9 78T			H ⁺ + Pb 1424E			He ²⁺ + Ar 1454T		
H ⁺ + Au ³⁺ 9 78T			H ⁺ + PERT 977T	1220T		He ²⁺ + Au 1344E		
H ⁺ + Au ⁴⁺ 9 78T			H ⁺ + Pt 1346E			He ²⁺ + CH ₄ 405T		
H ⁺ + Au ⁵⁺ 9 78T			H ⁺ + Rh 1346E			He ²⁺ + Cu 1224E	1344E	
H ⁺ + Au ⁶⁺ 9 78T			H ⁺ + Si 1345E	1456T		He ²⁺ + Ge 1334E		
H ⁺ + Au ⁷⁺ 9 78T			H ⁺ + Sn 1346E			He ²⁺ + H ₂ 405T		
H ⁺ + Au ⁸⁺ 9 78T			H ⁺ + Ta 1346E			He ²⁺ + H ₂ O 437T		
H ⁺ + Au ⁹⁺ 9 78T			H ⁺ + Ti 1346E			He ²⁺ + He 405T		
H ⁺ + Au ¹⁰⁺ 9 78T			H ⁺ + V 1345E	1346E	1562E	He ²⁺ + Kr 1454T		
H ⁺ + Au ¹¹⁺ 9 78T			H ⁺ + Xe 1453E			He ²⁺ + LiF 1558T		
H ⁺ + Au ¹²⁺ 9 78T			H ⁺ + Zn 1345E	1346E		He ²⁺ + N ₂ 405T		
H ⁺ + Ba 4 88E	1346E		H ₂ ⁺ + C 1359E	1360E	1361E	He ²⁺ + Ne 1454T		
H ⁺ + C 8 71T 1369E 1862E	1108T 1360E	1345E 1457E	H ₂ ⁺ + H ₂ 1348E			He ²⁺ + O ₂ 405T		
H ⁺ + CH ₄ 4 06T			H ₂ ⁺ + H ₂ 1348E			He ²⁺ + Pb 1424E		
H ⁺ + Co 1346E	1346E		He ⁺ + Ag 1222E	1471E		He ²⁺ + Si 1456T		
H ⁺ + Cr 1345E	1562E		He ⁺ + Al 8 71T 1166E	1108T 1457E	1163E 1471E	He ₂ ⁺ + C 1359E		
H ⁺ + Cu 1224E	1346E	1346E	He ⁺ + Au 1163E 1347E	1166E	1222E	I ⁺ + Ag 376E		
H ⁺ + D ₂ 1436E			He ⁺ + C 1108T 1166E 1562E	1151E 1369E	1163E 1457E	I ⁺ + Al 376E		
H ⁺ + Er 7 08E			He ⁺ + Cr 1562E			I ⁺ + Au 376E		
H ⁺ + Fe 1345E	1346E	1562E	He ⁺ + Cs 1166E			I ⁺ + C 376E		
H ⁺ + Ga 1334E	1346E					I ⁺ + Cu 376E		
						Kr ⁺ + PERT 260E		

Li⁺ + Al
 971T
 Li⁺ + C
 1562E
 Li⁺ + Cr
 1562E
 Li⁺ + Fe
 1562E
 Li⁺ + Ni
 1562E
 Li⁺ + V
 1562E
 Na⁺ + Al
 1152T 1163E
 Na⁺ + Au
 1152T 1163E
 Na⁺ + C
 1151E 1152T 1163E
 1359E
 Na₂⁺ + C
 1359E
 Nb⁺ + Ag
 376E
 Nb⁺ + Al
 376E
 Nb⁺ + Au
 376E
 Nb⁺ + C
 376E
 Nb⁺ + Cu
 376E
 Ne⁺ + Cu
 1191T
 Ne⁺ + Al
 1163E
 Ne⁺ + Au
 1163E
 Ne⁺ + C
 1163F

Ne⁺ + Cu
 1467T
 Ne⁺ + PERT
 375T
 Ni⁺ + Ag
 376E
 Ni⁺ + Al
 376E
 Ni⁺ + Au
 376E
 Ni⁺ + C
 376E
 Ni⁺ + Cu
 376E
 O⁺ + Ag
 1601T
 O⁺ + Al
 871T 1221E 1601T
 O⁺ + C
 1359E 1601T
 O⁺ + Ni
 1601T
 O₂⁺ + C
 1359E
 Pb⁺ + PERT
 265E
 PERT + PERT
 1341T
 Si⁺ + Ag
 376E
 Si⁺ + Al
 376E
 Si⁺ + Au
 376E
 Si⁺ + C
 376E

Si⁺ + Cu
 376E
 Ti⁺ + Ag
 376E
 Ti⁺ + Al
 376E
 Ti⁺ + Au
 376E
 Ti⁺ + C
 376E
 Ti⁺ + Cu
 376E
 U⁺ + Ag
 1149T
 U⁺ + Al
 1149T
 U⁺ + Au
 1149T
 U⁺ + PERT
 265E
 Xe⁺ + Cu
 1101T
 Xe⁺ + Ag
 1149T
 Xe⁺ + Al
 1149T
 Xe⁺ + Au
 1149T
 Xe⁺ + PERT
 265E
 Undef
 337T 3631 457T
 1004T 1016T 1145T
 1162T 1330T 1463T

C04

PARTICLE PENETRATION IN MACROSCOPIC
MATTER (IONS, NEUTRALS, AND ELECTRONS)

Particle Range

Al⁺ + Be
1005T

Ar⁺ + Cu
1171T

Ar⁺ + Ge
973E-T

As⁺ + Si
1435E

B⁺ + Si
1354E 1450E 1479T

C⁺ + C
1005T 1352T

Cs⁺ + Ar
1591T

Cs⁺ + N₂
1591T

D⁺ + Al
1108T

D⁺ + C
1108T

D⁺ + D₂
1436E

D⁺ + H₂
1436E

D⁺ + Nb
1108T

D⁺ + Ni
1356T

e⁺ + Al
1006E

e⁺ + C
768T

e⁺ + C + Au
775T

e⁺ + Pb
1006E

e⁺ + PERT
1561T

e⁺ + SiO₂ + Si
775T

Fr⁺ + Ar
1591T

Fr⁺ + N₂
1591T

H⁺ + Al
329T 1108T

H⁺ + C
1108T 1352T

H⁺ + D₂
1436E

H⁺ + GaAs
1473E

H⁺ + Ge
1468T

H⁺ + H₂
1436E

H⁺ + Nb
1108T

H⁺ + PERT
1466T

H⁺ + Si
10⁺5T 1468T 1479T

H₂⁺ + Ge
1468T

H₂⁺ + Si
1468T

He⁺ + Al
1108T

He⁺ + Bi
1353E

He⁺ + C
1108T

He⁺ + Co
1353E

He⁺ + Cu
1353E

He⁺ + Fe
1353E

He⁺ + Ga
973E-T

He⁺ + Nb
1108T

He⁺ + Ni
500E-T 809E 1557E

He⁺ + W
1353E

He⁺ + Zn
1353E

He⁺ + Ni
1470T

In⁺ + Si
1435E

Li⁺ + Bi
1353E

Li⁺ + Co
1353E

Li⁺ + Cu
1353E

Li⁺ + Fe
1353E

Li⁺ + W
1353E

Li⁺ + Zn
1353E

Ne + Cu
1101T

Q⁺ + Si
1450E

PERT + Si
1460T

Rb⁺ + Ar
1591T

Rb⁺ + N₂
1591T

Sb⁺ + Si
1479T

U⁺ + Al
982E

U⁺ + C
982E

U⁺ + Nb
982E

U⁺ + Ni
982E

U⁺ + Pb
982E

U⁺ + Sn
982E

U⁺ + Ti
982E

Xe + Cu
1101T

Xe⁺ + Ni
1355E

COS

PARTICLE PENETRATION IN MACROSCOPIC
MATTER (IONS, NEUTRALS, AND ELECTRONS)

Multiple Scattering

B⁺ + Si
1479T

D⁺ + Ge
1334E

D⁺ + Pb
1424E

e⁺ + C + Au
775T

e⁺ + PERT⁺
466T

e⁺ + SiO₂ + Si
775T

H⁺ + Ag
408E

H⁺ + Al
408E

H⁺ + Be
408E

H⁺ + Ge
1334E

H⁺ + Pb
1424E

H⁺ + PERT
1466T

H⁺ + Si
1479T

He⁺ + Ag
1471E

He⁺ + Al
1471E

He⁺ + Al₂O₃
1349E 1350T

He⁺ + Cu
1471E

He²⁺ + Ge
1334E

He²⁺ + Pb
1424E

He⁺ + Cu
1467T

Sb⁺ + Si
1479T

U⁺ + Al
982E

U⁺ + C
982E

U⁺ + Nb
982E

U⁺ + Ni
982E

U⁺ + Pb
982E

U⁺ + Sn
982E

U⁺ + Ti
982E

Undef
1004T 1226T 1330T

C06

PARTICLE PENETRATION IN MACROSCOPIC
MATTER (IONS, NEUTRALS, AND ELECTRONS)

Charge State Populations

Ar⁺ + Al
1163E

Ar⁺ + Au
1163E

Ar⁺ + C
1163E

Cl⁺ + Au
1452E

Cl⁺ + C
1452E

CO⁺ + C
726E

D⁺ + Al
1158E

D⁺ + Au
1158E

D⁺ + Ba
470E-T

D⁺ + C
1158E

D⁺ + Co
470E-T

D⁺ + Cu
1158E

D⁺ + Hg
470E-T

D⁺ + Sr
470E-T

D₂⁺ + C
1367E

H⁺ + Al
1158E

H⁺ + Au
1158E

H⁺ + C
1158E

H⁺ + Cu
1158E

H⁺ + Ni
1329E

H⁺ + PERT
1220T

H₂⁺ + Al
1362E

H₂⁺ + Al₂O₃
1357E

H₂⁺ + C
726E 1357E 1362E
1363T 1449T

HCO⁺ + C
726E

He⁺ + Al
1163E 1451E

He⁺ + Ar
160E-T

He⁺ + Au
1163E

He⁺ + C
1163E 1451E

He⁺ + Cu
1451E

He⁺ + He
160E-T

He⁺ + N₂
160E-T

He⁺ + Ne
160E-T

He⁺ + Ni
1451E

He⁺ + Ar
160E-T

He⁺ + He
160E-T 1434E

He⁺ + N₂
160E-T 1434E

He⁺ + Ne
160E-T 1434E

He⁺ + PERT
1463T

He₂⁺ + C
726E 1357E

HeH⁺ + C
726E 1357E 1358E

H⁺ + Al
1163E 1226T

H⁺ + Au
1163E 1226T

H⁺ + C
1048E 1162E 1220T

H⁺ + Co
1220T

H₂⁺ + C
1357E

He⁺ + Al
1163E

He⁺ + Au
1163E

He⁺ + C
1163E

C + C
660E

OH⁺ + C
1364E

P⁺ + C
348E

PERT⁺ + C
445T

PERT⁺ + PERT
1437T

Si⁺ + Au
1452E

Si⁺ + C
1452E

U⁺ + C
1379E

U⁺ + Sn
1379E

Undef
1154T

C07

PARTICLE PENETRATION IN MACROSCOPIC
MATTER (IONS, NEUTRALS, AND ELECTRONS)

Excited State Populations

Al⁺ + C
1372E

Ar⁷⁺ + C
322E 1377E

B⁺ + Au
1369E

Br¹¹⁺ + C
1373E

Br¹²⁺ + C
1374E

Br²¹⁺ + C
1373E

Br²²⁺ + C
1373E

Br²³⁺ + C
1373E

Br²⁴⁺ + C
1373E

Br²⁵⁺ + C
1373E

Br²⁶⁺ + C
1373E

Br²⁷⁺ + C
1373E

Br²⁸⁺ + C
1373E

C⁺ + C
352E 1167E 1441E

C⁹⁺ + Au
1369E

Cl⁺ + C
1011E 1372E 1450E

Cl¹⁰⁺ + C
1374E

Cl¹²⁺ + C
1374E

Cl¹³⁺ + C
1374E

Cl¹⁵⁺ + C
1374E

Cl¹⁶⁺ + C
1374E

Cl¹⁷⁺ + C
1374E

CO⁺ + C
1365E

Cu¹¹⁺ + C
1374E

Cu¹²⁺ + C
1374E

D⁺ + C
340E 1367E 1448E

D₂⁺ + C
340E 1367E 1448E

D₃⁺ + C
340E 1367E 1448E

F⁷⁺ + Au
1369E

F⁸⁺ + Au
1369E

Fe¹⁰⁺ + C
1374E

Ga + C
1378E

Ga⁺ + C
1378E

Ga²⁺ + C
1378E

H⁺ + C
295E 340E 941E
1367E 1448E

H₂⁺ + C
303E 340E 941E
1367E 1448E

H₃⁺ + C
303E 340E 941E
1367E 1448E

HD₂⁺ + C
340E 1367E 1448E

He⁺ + C
418E 1378E 1378E
1444E 1448E 1448E

He⁺ + Si
1448E

HeH⁺ + C
340E 1367E 1448E

Kr⁷⁺ + C
322E 1377E

N⁺ + C
1167E 1441E

N⁹⁺ + Au
1369E

N¹⁰⁺ + Au
1369E

C + C
860E

O⁸⁺ + Au
1369E

C¹⁰⁺ + C
277E

O⁷⁺ + Au
1369E

O⁷⁺ + C
1371E

P⁺ + C
348E 1372E

S⁺ + C
1372E

S⁹⁺ + C
1020E

Si¹⁰⁺ + C
1371E

Si⁺ + C
1372E

Tl + C
1378E

Tl⁺ + C
1378E

Tl²⁺ + C
1378E

D*1

PARTICLE INTERACTIONS WITH SOLID
SURFACES

General

Ar⁺ + Cu
1104E

e + H₂ + Ag
1157E

H₂ + d
972E

He + d
972E

Review
1477E-T 1598E-T

Under
1165E 1478E 1490E
1599E 1606E

B02

PARTICLE INTERACTIONS WITH SOLID SURFACES

Sputtering by Electrons, Neutrons, and Heavy Particles (only total removal coefficients)

$\text{Al}^+ + \text{Al}$
1412E
 $\text{Ar}^+ + \text{Ag}$
1491E
 $\text{Ar}^+ + [\text{Ag} + \text{Au}]$
1212E
 $\text{Ar}^+ + \text{Au}$
1515E
 $\text{Ar}^+ + \text{C}$
1391E
 $\text{Ar}^+ + \text{Co}$
1213E
 $\text{Ar}^+ + \text{Cu}$
1554T
 $\text{Ar}^+ + [\text{Cu} + \text{Pd}]$
1216E
 $\text{Ar}^+ + [\text{Cu} + \text{Pt}]$
1212E
 $\text{Ar}^+ + \text{CuPt}$
1643E
 $\text{Ar}^+ + \text{H}_2\text{O}$
1489E
 $\text{Ar}^+ + \text{In}$
1560E
 $\text{Ar}^+ + \text{In} + \text{Pb}$
1241E
 $\text{Ar}^+ + \text{RCl}$
1214E 1430E
 $\text{Ar}^+ + \text{LiF}$
1214E
 $\text{Ar}^+ + \text{LiI}$
1587F
 $\text{Ar}^+ + \text{NaCl}$
1214E
 $\text{Ar}^+ + \text{Ni}$
1179E
 $\text{Ar}^+ + \text{Ni} + \text{Si}$
1179E
 $\text{Ar}^+ + [\text{O}_2 + \text{Ti}]$
1294E
 $\text{Ar}^+ + \text{RbI}$
1398E-T
 $\text{Ar}^+ + \text{Si}$
936E 1179E 1644E
1649T
 $\text{Ar}^+ + \text{Sn} + \text{In}$
1241E
 $\text{Ar}^+ + \text{Sn} + \text{Pb}$
1241E
 $\text{Ar}^+ + \text{SS}$
1413E
 $\text{Ar}^+ + \text{Ti}$
1294E
 $\text{Ar}^+ + \text{ZnO}$
1171E

$\text{Ar}^{2+} + \text{Au}$
1515E
 $\text{Bi}^+ + \text{Ag}$
1595E-T
 $\text{Bi}^+ + \text{Au}$
1595E-T
 $\text{Bi}_2^+ + \text{Ag}$
1595E-T
 $\text{Bi}_2^+ + \text{Au}$
1595E-T
 $\text{C}^+ + \text{C}$
1194E
 $\text{C}^+ + \text{SiC}$
1194E
 $\text{C}^+ + \text{SS}$
1194E
 $\text{C}^+ + \text{TIC}$
1194E
 $\text{C}^+ + \text{W}$
1194E
 $\text{Cl}^+ + \text{Al}_2\text{O}_3$
1485E
 $\text{Cl}^+ + \text{LiNbO}_3$
1485E
 $\text{Cl}^+ + \text{UF}_6$
1428E
 $\text{Cu}^+ + \text{Cu}$
1412E
 $\text{D}^+ + \text{Al}$
1309T
 $\text{D}^+ + \text{Au}$
1291E
 $\text{D}^+ + \text{C}$
1299E 1309E
 $\text{D}^+ + \text{Cu}$
1291E
 $\text{D}^+ + \text{Fe}$
1196T
 $\text{D}^+ + \text{Li} + \text{Al}$
1309T
 $\text{D}^+ + \text{Mo}$
1196T 1291E
 $\text{D}^+ + \text{NbB}_2$
1195E
 $\text{D}^+ + \text{Ni}$
1195E 1291E
 $\text{D}^+ + \text{SiC}$
1197E
 $\text{D}^+ + \text{Ti}$
1293E
 $\text{D}^+ + \text{TiB}_2$
1247E
 $\text{D}^+ + \text{TIC}$
1199E 1247E
 $\text{D}^+ + \text{W}$
1196T 1291E
 $e + \text{O}_2 + \text{Au}$
857E
 $e + \text{KCl}$
1234E
 $e + \text{NaCl}$
1234E
 $\text{F}^+ + \text{Si}$
1174E

$\text{F}^{++} + \text{H}_2\text{O}$
1428E
 $\text{F}^{++} + \text{UF}_6$
1428E
 $\text{F}^{++} + \text{H}_2\text{O}$
1428E
 $\text{F}^{++} + \text{UF}_6$
1429E
 $\text{F}^{7+} + \text{H}_2\text{O}$
1428E
 $\text{F}^{7+} + \text{UF}_6$
1428E
 $\text{F}^{8+} + \text{H}_2\text{O}$
1428E
 $\text{F}^{8+} + \text{UF}_6$
1428E
 $\text{h} + \text{C}$
1296E 1297E 1298E
 $\text{H}^+ + \text{Al}$
1789T
 $\text{H}^+ + \text{Au}$
1291E
 $\text{H}^+ + \text{B}$
1622E
 $\text{H}^+ + \text{C}$
618E 1292E 1300E
1622E
 $\text{H}^+ + \text{Cu}$
1291E
 $\text{H}^+ + \text{H}_2\text{O}$
1426E 1432E-T
 $\text{H}^+ + \text{KCl}$
1430E
 $\text{H}^+ + \text{Mo}$
1291E
 $\text{H}^+ + \text{Nb}$
1302E
 $\text{H}^+ + \text{NbB}_2$
1195E
 $\text{H}^+ + \text{Ni}$
1183T 1195E 1291E
 $\text{H}^+ + \text{Si}$
1622E
 $\text{H}^+ + \text{Ta}$
1292E
 $\text{H}^+ + \text{TaC}$
1183T 1292E
 $\text{H}^+ + \text{Ti}$
1292E 1292E
 $\text{H}^+ + \text{TiB}_2$
1292E 1622E
 $\text{H}^+ + \text{TIC}$
1292E 1292E
 $\text{H}^+ + \text{W}$
1291E
 $\text{F}_2^+ + \text{H}_2\text{O}$
1426E
 $\text{H}_2^+ + \text{TIC}$
1311E
 $\text{H}_3^+ + \text{C}$
1186E 1306E
 $\text{H}_3^+ + \text{H}_2\text{O}$
1426E

$H_2^+ + SiC$ 1187E	$O^+ + C$ 1194E	$Sb_2^+ + Ag$ 1595E-T
$He^+ + Ar$ 1211E 1429E	$O^+ + [Ni + Cr]$ 1645E	$Sb_2^+ + Au$ 1595E-T
$He^+ + Au$ 1291E	$O^+ + Si$ 1644E 1645E	$Se^+ + Ag$ 1182T
$He^+ + C$ 1191E 1292E 1303E	$O^+ + SiC$ 1194E	$Se^+ + Au$ 1182T
$He^+ + CO_2$ 1426E 1432E-T	$O^+ + SS$ 1194E	$Se^+ + Pt$ 1182T
$He^+ + Cu$ 1291E	$O^+ + TiC$ 1194E	$Se_2^+ + Ag$ 1182T
$He^+ + H_2O$ 1426E 1432E-T 1489E	$O^+ + W$ 1194E	$Se_2^+ + Au$ 1182T
$He^+ + KBr$ 1430E	$O_2^+ + Ag$ 1178E	$Se_2^+ + Pt$ 1182T
$He^+ + KCl$ 1439E	$O_2^+ + Al$ 1178E 1625E	$T^+ + Ni$ 1647T
$He^+ + KI$ 1430E	$O_2^+ + Au$ 1625E	$Te^+ + Ag$ 1182T
$He^+ + Mo$ 1291E	$O_2^+ + Cr$ 1625E	$Te^+ + Au$ 1182T 1405T
$He^+ + Ni$ 1291E	$O_2^+ + Cu$ 1178E 1625E	$Te^+ + Pt$ 1182T
$He^+ + S$ 1484E	$O_2^+ + Ni$ 1178E 1625E	$Te_2^+ + Ag$ 1182T
$He^+ + SO_2$ 1426E	$O_2^+ + [Ni + Cr]$ 1645E	$Te_2^+ + Au$ 1182T
$He^+ + SS$ 1413E	$O_2^+ + Si$ 1645E	$Te_2^+ + Pt$ 1182T
$He^+ + Ta$ 1292E	$O_2^+ + Ti$ 1625E	$Xe^+ + Ag$ 1398E-T 1451E
$He^+ + TaC$ 1292E	$O_2^+ + [Ni + Cr]$ 1645E	$Xe^+ + AgAu$ 1398E-T
$He^+ + Ti$ 1292E 1293E	$O_2^+ + Si$ 1645E	$Xe^+ + Au$ 1403E
$He^+ + TiB_2$ 1247E 1292E	$P^+ + Ag$ 1595E-T	$Xe^+ + B$ 1622E
$He^+ + TiC$ 1247E 1292E 1311E	$P^+ + Au$ 1595E-T	$Xe^+ + C$ 1622E
$He^+ + W$ 1291E	$P_2^+ + Ag$ 1595E-T	$Xe^+ + HFC$ 1398E-T
$Hg^+ + Mo$ 1593T	$P_2^+ + Au$ 1595E-T	$Xe^+ + Kr$ 1406T
$Hg^+ + Ni$ 1593T	$PERT^+ + PERT$ 1397T	$Xe^+ + LII$ 1687E
$Kr^+ + LII$ 1398E-T 1587E	$S^+ + CsI$ 1428E	$Xe^+ + Si$ 1622E
$n + Au$ 1277E	$Sb^+ + Ag$ 1182T 1595E-T	$Xe^+ + [Si + Xe] + O_2$ 1556E
$n + Nb$ 1277E	$Sb^+ + Au$ 1182T 1595E-T	$Xe^+ + [SiO_2 + Xe]$ 1556E
$Ne^+ + Au$ 1403E	$Sb^+ + Pt$ 1182T	$Xe^+ + TiB_2$ 1622E
$Ne^+ + LII$ 1587E	$Sb_2^+ + Ag$ 1182T 1595E-T	Review 1427T 1518T
$Ne^+ + Si$ 1174E	$Sb_2^+ + Au$ 1182T 1595E-T	Under 891T 1400T 1404T
$Ni^+ + Ni$ 1412E	$Sb_2^+ + Pt$ 1182T	

D03

PARTICLE INTERACTIONS WITH SOLID SURFACES

Sputtered Particle Charge and Quantum (Excited) State Distribution

$\text{Ar}^+ + [\text{Ag} + \text{Pd}] + \text{O}_2$ 1553E	$\text{Ar}^+ + \text{O} + \text{Ta}$ 1399T	$\text{Ne}^+ + \text{LiI}$ 1587E
$\text{Ar}^+ + \text{AgAu}$ 1239E	$\text{Ar}^+ + \text{O}_2 + \text{B}$ 1408E	$\text{Ne}^+ + \text{Ni}$ 1416E
$\text{Ar}^+ + \text{Al}$ 1176E 1604E	$\text{Ar}^+ + [\text{O}_2 + \text{Ti}]$ 1294E	$\text{Ne}^+ + \text{O} + \text{Nb}$ 1237E
$\text{Ar}^+ + [\text{Al} + \text{Zn}]$ 1218E	$\text{Ar}^+ + [\text{Pd} + \text{Ni}] + \text{C}_2$ 1553E	$\text{Ne}^+ + \text{O} + \text{V}$ 1237E
$\text{Ar}^+ + \text{AlO}$ 1604E	$\text{Ar}^+ + \text{Pd} + \text{V}$ 1399T	$\text{Ne}^+ + \text{V}_2\text{O}_3$ 1648E
$\text{Ar}^+ + \text{Ba}$ 1142E-T	$\text{Ar}^+ + \text{PtSi}$ 1239E	$\text{O}^+ + \text{Dy}_2\text{O}_3$ 1594E
$\text{Ar}^+ + \text{Ba}$ 1409E	$\text{Ar}^+ + \text{Si}$ 1644E	$\text{O}^+ + \text{Gd}$ 1594E
$\text{Ar}^+ + \text{Cd}$ 1409E	$\text{Ar}^+ + \text{Ti}$ 1294E	$\text{O}^+ + \text{Gd}_2\text{O}_3$ 1594E
$\text{Ar}^+ + \text{CO} + \text{Ni}$ 1639E	$\text{Ar}^+ + \text{TiO}_2$ 1594E	$\text{C}^+ + [\text{Ni} + \text{Cr}]$ 1645E
$\text{Ar}^+ + \text{Cu}$ 858E 1236E 1607E	$\text{Ar}^+ + \text{V}$ 1217E	$\text{C}^+ + \text{Si}$ 1644E 1645E
$\text{Ar}^+ + \text{Cu} + \text{Ni}$ 1176E	$\text{Ar}^+ + \text{Y} + \text{W}$ 1399T	$\text{C}^+ + \text{TiO}_2$ 1594E
$\text{Ar}^+ + [\text{Cu} + \text{Ni}] + \text{O}_2$ 1563E	$\text{Ar}^+ + \text{Zn}$ 1409E	$\text{C}_2^+ + [\text{Ag} + \text{Pd}]$ 1552E
$\text{Ar}^+ + \text{Cu} + \text{V}$ 1399T	$\text{Ar}^+ + \text{Zr}$ 1402E	$\text{O}_2^+ + \text{Al}$ 1625E
$\text{Ar}^+ + \text{Cu}_2\text{O}$ 1236E	$\text{Ca}^+ + [\text{CuH} + \text{Mo}]$ 741E	$\text{O}_2^+ + \text{Au}$ 1625E
$\text{Ar}^+ + \text{Cr}_2\text{S}$ 1236E	$\text{Ca}^+ + \text{H}_2 + \text{Co}$ 1156E	$\text{O}_2^+ + \text{Cr}$ 1625E
$\text{Ar}^+ + \text{Dy}_2\text{O}_3$ 1594E	$\text{D}^+ + \text{Al}$ 1309T	$\text{O}_2^+ + [\text{Cr} + \text{Ni}]$ 1552E
$\text{Ar}^+ + \text{Fe}$ 936E	$\text{D}^+ + \text{Li} + \text{Al}$ 1309T	$\text{C}_2^+ + \text{Cu}$ 1625E
$\text{Ar}^+ + \text{GaAs}$ 1399T	$\text{D}^+ + \text{Zr}$ 1402E	$\text{C}_2^+ + [\text{Cu} + \text{Ni}]$ 1552E
$\text{Ar}^+ + \text{Gd}$ 1594E	$\text{D}_2^+ + \text{C}$ 1279E	$\text{C}_2^+ + [\text{Fe} + \text{Ni}]$ 1552E
$\text{Ar}^+ + \text{Gd}_2\text{O}_3$ 1594E	$\bullet + \text{KCl}$ 1243E	$\text{G}_2^+ + \text{Ni}$ 1625E
$\text{Ar}^+ + \text{LiI}$ 1587E	$\bullet + \text{NaCl}$ 1243E	$\text{O}_2^+ + [\text{Ni} + \text{Cr}]$ 1645E
$\text{Ar}^+ + \text{Hg}$ 1176E 1409E	$\text{H} + \text{Ca}$ 1140E	$\text{O}_2^+ + [\text{Pd} + \text{Ni}]$ 1552E
$\text{Ar}^+ + \text{H}_2 + \text{Si}$ 1408E	$\text{H}_2^+ + \text{C}$ 1279E	$\text{C}_2^+ + \text{Si}$ 1645E
$\text{Ar}^+ + \text{Nb}$ 1215E 1217E	$\text{He}^+ + \text{Zr}$ 1402E	$\text{O}_2^+ + \text{Ti}$ 1625E
$\text{Ar}^+ + [\text{Nb} + \text{V}]$ 1216E 1217E	$\text{Kr}^+ + \text{Al}$ 1142E-T	$\text{C}_3^+ + [\text{Ni} + \text{Cr}]$ 1645E
$\text{Ar}^+ + \text{Ni} + \text{V}$ 1176E	$\text{Kr}^+ + \text{CaF}_2$ 1401E	$\text{O}_2^+ + \text{Si}$ 1645E
$\text{Ar}^+ + \text{NiSi}_2$ 1239E	$\text{Kr}^+ + \text{LiF}$ 1401E	$\text{PERT}^+ + \text{PERT}$ 1642E
	$\text{Kr}^+ + \text{LiI}$ 1587E	$\text{Te}^+ + \text{Au}$ 1405T
	$\text{Kr}^+ + \text{MgF}_2$ 1401E	$\text{Xe}^+ + \text{AgAu}$ 1239E
	$\text{Kr}^+ + \text{Zr}$ 1240E	$\text{Xe}^+ + \text{Au}$ 1403E 1472E
	$\text{N}_2^+ + \text{N}_2 + \text{Si}$ 1408E	$\text{Xe}^+ + \text{CsI}$ 1238E 1634E-T
	$\text{Ne}^+ + \text{Au}$ 1403E	$\text{Xe}^+ + \text{Cu}$ 1472E

Xe* + Ga
1142E-T 1472E

Xe* + Kr
1470T

Xe* + Li
1142E-T

Xe* + LiI
1547E

Xe* + Mg
1472E

Xe* + NiSi₂
1239E

Xe* + PERT
1410T

Xe* + PtSi
1239E

Xe* + Ti
1142E-T 1472E

Xe* + Zn
1472E

Fevlow
1650F 1651E-T

Undef
1153T 1407T

D⁴

PARTICLE INTERACTIONS WITH SOLID SURFACES

Secondary Electron Ejection by Heavy Particles and Electrons

Al ⁺ + C	1372E		
Ar + KBr	1107T		
Ar + LiF	1107T		
Ar + NaCl	1107T		
Ar ⁺ + Ag	1383E		
Ar ⁺ + [Ag + Mg]	1645E		
Ar ⁺ + Al	1385E	1383E	1621E
	1428E	1631E	
Ar ⁺ + C	1439E		
Ar ⁺ + Cr	1161E		
Ar ⁺ + Cu	1383E		
Ar ⁺ + Mo	1383E	1631E	
Ar ⁺ + Si	1383E	1563E	
Ar ⁺ + V	1161E		
Ar ⁺ + ZnO	1171E		
Ar ⁺ + Zr	1383E		
Ar ²⁺ + Mo	1383E		
Ar ²⁺ + Zr	1383E		
Ar ²⁺ + Mo	1383E		
Ar ²⁺ + Zr	1383E		
C ²⁺ + Al	1382E		
C ³⁺ + Ag	1184E		
C ³⁺ + Al	1184E		
C ³⁺ + Au	1184E		
C ³⁺ + Cu	1184E		
C ³⁺ + Ag	1184E	1319E	
C ³⁺ + Al	1184E	1319E	
C ³⁺ + Au	1184E	1319E	

C ³⁺ + Cu	1184E		
Cl ⁺ + C	1572E	1439E	
e + Cr	1103E		
e + Cu	1103E	1248E	
e + D ₂ + Au	857E		
e + Mo	1103E		
e + Mo	1248E		
e + Ni	1103E		
e + Pb + Cu	1232E		
e + Sn + C-	1232E		
e + Si	1248E		
e + Ti	1248E		
H ⁺ + Al	1144E	1368E	1383E
	1628E		
H ⁺ + Au	1388E		
H ⁺ + C	333E	1365E	1368E
H ⁺ + Cu	1144E		
H ⁺ + Ni	1630E		
H ₂ ⁺ + Al	1144E	1368E	
H ₂ ⁺ + Au	1388E		
H ₂ ⁺ + C	1366E	1363E	
H ₂ ⁺ + Cu	1144E		
H ₂ ⁺ + Ni	1630E		
H ₂ ⁺ + Al	1144E		
H ₂ ⁺ + Au	1388E		
H ₂ ⁺ + C	1366E		
H ₂ ⁺ + Cu	1144E		
H ₂ ⁺ + Ni	1630E		
He + KBr	1107T		
He + LiF	1107T		
He + NaCl	1107T		
He ⁺ + [Ag + Mg]	1646E		

He ⁺ + Al	386E	1382E	1628E
He ⁺ + Au	1388E		
He ⁺ + C	1366E	1435E	
He ²⁺ + Ag	1184E	1315E	
He ²⁺ + Al	1184E	1315E	
He ²⁺ + Au	1184E	1315E	
He ²⁺ + Cu	1194E		
HeH ⁺ + Au	1388E		
Kr + KBr	1107T		
Kr + LiF	1107T		
Kr + NaCl	1107T		
Kr ⁺ + Al	386E	1382E	1621E
Kr ⁺ + Cu	1383E		
Kr ⁺ + Si	1563E		
N ⁺ + C	1439E		
N ⁺ + Ag	1184E		
N ⁺ + Al	1184E		
N ⁺ + Au	1184E		
N ⁺ + Cu	1184E		
N ²⁺ + Ag	1184E		
N ²⁺ + Al	1184E		
N ²⁺ + Au	1184E		
N ²⁺ + Cu	1184E		
N ²⁺ + Ag	1184E	1315E	
N ²⁺ + Al	1184E	1315E	
N ²⁺ + Au	1184E	1315E	
N ²⁺ + Cu	1184E		
Ne + KBr	1107T		
Ne + LiF	1107T		
Ne + NaCl	1107T		
Ne ⁺ + Al	386E	1382E	1621E

He⁺ + Cu
1387E

He⁺ + Mg
1383E

O²⁺ + Ar
1392E

He⁺ + Ag
1194E

O²⁺ + Al
1184E

O²⁺ + Au
1184E

O²⁺ + Cu
1184E

O²⁺ + Au
1382E

O²⁺ + Au
1382E

O²⁺ + Ag
1319E

O²⁺ + Al
1319E

O²⁺ + Au
1319E 1382E

P⁺ + C
1372E

S⁺ + C
1372E

Se⁺ + Ag
1387E

Se⁺ + Ag
1387E

Si⁺ + C
1372E

Te⁺ + Ag
1387E

Te⁺ + Ag
1387E

Ti¹⁺ + C
1366E

V¹⁺ + C
1366E

Xe⁺ + Al
386E 1382E 1621E

Xe⁺ + Cu
1383E

Review
1478E

D55

PARTICLE INTERACTIONS WITH SOLID SURFACES

Photoelectric Ejection of Electrons (coefficients only)

hv + Ag
257E

hv + Al
257E 1461T 1555E

hv + Au
1555E

hv + Bi
1461T

hv + C
257E 1461T

hv + Cd
1461T

hv + CuCl
1464E

hv + CuI
1555E

hv + Cu
1461T

hv + CuI
1555E

hv + Dy
257E

hv + Gd
257E 1461T

hv + In
1459T

hv + KCl
1464E

hv + NaCl
1464E

hv + Nb
1461T

hv + Ni
257E 1137T

hv + Pb
1459T

hv + Pt
1137T

hv + RbCl
1464E

hv + Sc
257E

hv + Ta
1461T

hv + Ti
1461T

hv + U
1461T

hv + Y
257E

D56

PARTICLE INTERACTIONS WITH SOLID SURFACES

Reflection of Electrons from Surfaces (coefficients only)

e + Al
1775T 1423T

e + Au
1775T 1499T

e + Be
1376T 1423T 1501E

e + C
1376T 1423T

e + Cu
1376T 1423T

e + Dy + Au
857E

e + Ge
896T

e + LiF
1423T

e + Si
556E 1423T 1499E

e + Sn
1076T

e + U
1076T

Under
1246T

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DDB

PARTICLE INTERACTIONS WITH SOLID SURFACES

Charge and Quantum State Distributions of Reflected Heavy Particles

Ar ⁺ + Au 1415E	H ⁺ + Cs 742T	H ₃ ⁺ + Li 740E
Ar ⁺ + Mg 1417E	H ⁺ + Cu 1514E	h ₂ ⁺ + Na 740E
Cs ⁺ + Ta 1465E	H ⁺ + Mo 742T	H ₃ ⁺ + Rb 740E
D + Cs 1331E	H ⁺ + Ni 725E 742T 1380T 1514E	He ⁺ + Al 123E 1422E
D + [Cs + Mo] 740E	H ⁺ + Si 742T	He ⁺ + Au 742T 1415E
D + Mo 740E	H ⁺ + Si ₃ N ₄ 742T	He ⁺ + C 1375E 1446E
D + Ni 1381E	H ⁺ + Ti 742T	He ⁺ + Co 742T
D ⁺ + Cr 1219E	H ⁺ + TiB ₂ 621E	He ⁺ + Mo 742T
D ⁺ + Ca 1381E	H ⁺ + TiC 621E	He ⁺ + Ni 742T 1376T 1418E
D ⁺ + Co 1374E	H ⁺ + TiH ₂ 742T	He ⁺ + Pb 123E
D ⁺ + Ni 1219E 1381E	H ⁺ + TiN 621E	He ⁺ + Si 725E 742T 1446E
D ⁺ + W 256E	H ⁺ + W 296E 742T	He ⁺ + Si ₃ N ₄ 742T
D ₂ ⁺ + Cs 740E 1381E	H ₂ ⁺ [Cs + W] 739T	He ⁺ + Sn 123E
D ₂ ⁺ + K 740E	H ₂ ⁺ + Au 742T	He ⁺ + Ti 742T
D ₂ ⁺ + Li 740E	H ₂ ⁺ + Ca 740E 742T	He ⁺ + TiH ₂ 742T
D ₂ ⁺ + Na 740E 1374E	H ₂ ⁺ + K 740E	He ⁺ + W 742T
D ₂ ⁺ + Ni 1381E	H ₂ ⁺ + Li 740E	K ⁺ + Cu 1474E
D ₂ ⁺ + Rb 740E	H ₂ ⁺ + Mo 742T	K ⁺ + Ni 1421T
D ₂ ⁺ + Cs 740E	H ₂ ⁺ + Na 740E	Li ⁺ + Cu 1474E
D ₂ ⁺ + K 740E	H ₂ ⁺ + Ni 742T	Li ⁺ + Ni 1418E
D ₂ ⁺ + Li 740E	H ₂ ⁺ + Rb 740E	h ₂ ⁺ + Au 1415E
D ₂ ⁺ + Na 740E 1374E	H ₂ ⁺ + Si 742T	H ₂ ⁺ + Ni 1419E
D ₂ ⁺ + Ni 1381E	H ₂ ⁺ + Si ₃ N ₄ 742T	Na ⁺ + Cu 1474E
D ₂ ⁺ + Rb 740E	H ₂ ⁺ + Ti 742T	Na ⁺ + Au 1415E
D ₂ ⁺ + Cs 740E	H ₂ ⁺ + TiB ₂ 621E	Na ⁺ + Ni 1416E 1482T
D ₂ ⁺ + K 740E	H ₂ ⁺ + TiC 621E	NO + Ag 1147E
D ₂ ⁺ + Li 740E	H ₂ ⁺ + TiH ₂ 742T	NO + C 595E
D ₂ ⁺ + Na 740E 1374E	H ₂ ⁺ + TiN 621E	NO + Pt 1127E
D ₂ ⁺ + Rb 740E	H ₂ ⁺ + W 742T	G ⁺ + Pd 1322E
H + [Cs + Mo] 740E	H ₂ ⁺ + Cs 740E	Review 1650E
H + [CsH + Mo] 741E	H ₃ ⁺ + K 740E	Under 1447T
H + Mo 740E		
H ⁺ + Au 742T 1415E		

D09

PARTICLE INTERACTIONS WITH SOLID SURFACES

De-ionization, Neutralization, Ionization, or Dissociation of Particles Interacting with Surfaces

Ar⁺ + LiF
1615EAr⁺ + NaCl
1615EAr⁺ + W
1617EAr²⁺ + W
1617EAr³⁺ + W
1617EArH⁺ + Ag
1517EArH⁺ + Au
1517EArH⁺ + Cu
1517EArH⁺ + Pt
1517ECu + Cu
1153TD₂ + Cu
760ED₂ + Ni
768ED₂ + Pt
750ED₂ + W
760Ee + O + Li
1640Ee + O + Mo
1640Ee + O + W
1640EH⁺ + Co
1623TH⁺ + W
1623TH₂ + Cu
760EH₂ + Ni
760EH₂ + Pt
760EH₂ + W
760EH₂⁺ + Fe
738THe⁺ + LiF
1615EHe⁺ + NaCl
1615EHe⁺ + Ni
1608EHe⁺ + W
1513T 1632TK + Si
1629EKr⁺ + W
1617EKr²⁺ + W
1617ELi + Si
1629EN₂⁺ + Ni
1419ENa + Si
1529ENe⁺ + LiF
1615ENe⁺ + NaCl
1615ENe⁺ + W
1617ENe²⁺ + W
1617ETi + Si
1629EXe⁺ + W
1617EXe²⁺ + W
1617EUnder
1614T 1626T

D11

PARTICLE INTERACTIONS WITH SOLID SURFACES

Sticking Coefficients, Thermal Energies and Adsorption

Au + MgO
1516ECo + Co
756ED₂ + Cu
760ED₂ + Ni
760ED₂ + Pd
1122TD₂ + Pt
750ED₂ + W
750EH₂ + Cu
750EH₂ + Ni
750EH₂ + Pd
1122TH₂ + Pt
750EN₂ + W
760EHe + W
574TH₂ + Dy
760EAC + Pt
613FTi + W
895EUnder
1138T 1612T 1638T

D12

PARTICLE INTERACTIONS WITH SOLID SURFACES

Electromagnetic Radiation Induced by Electron or Heavy Particle Impact on Surfaces

$e + Ag$
245E 557E

$e + La$
1179T

$e + Mo$
537E

$H^+ + Al$
1089T

$H^+ + KBr$
1343E

$H^+ + KI$
1343E

$H^+ + NaCl$
1343E

$He^+ + KBr$
1343E

$He^+ + KI$
1343E

$He^+ + NaCl$
1343E

$K^+ + Al$
1102E

$Mg^+ + C$
1440E

$N + Ag$
1146T

$Ne^+ + C$
1440E

$S^+ + C$
1440E

Undef
791T

D13

PARTICLE INTERACTIONS WITH SOLID SURFACES

Desorption of Gases from Surfaces

$Ar^+ + C + Mo$
1192E

$Ar^+ + Cl + Mo$
1192E

$Ar^+ + CO + Mo$
1198E

$Ar^+ + CO + Ru$
1164E

$Ar^+ + N_2 + Mo$
1198E

$Ar^+ + N + Mo$
1315T

$Ar^+ + N + W$
1315T

$Ar^+ + N_2 + Si$
1418E

$Ar^+ + O_2 + B$
1418E

$Ar^+ + O_2 + Mo$
1198E

$Ar^+ + P + Mo$
1198E

$CO + Pt + TiO_2$
596E

$Cs^+ + H_2 + Cs$
1154E

$e + Ar + [Ti + Al]$
772E

$e + Cl + [Ti + Al]$
772E

$e + CO + Ni$
1139E

$e + CO + Ru$
1242E

$e + CO + W$
1150E 1235E 1242E

$e + Cu + WO$
1511E

$e + H + Ni$
1244E

$e + H + Pd$
1244E 1246E

$e + H + Si$
1160E

$e + KCl$
1243E

$e + N_2 + Ru$
1139E

$e + NaCl$
1243E

$e + NJ + Ni$
1139E

$e + O + Cr$
1643E

$e + O + Mo$
1643E

$e + O + W$
1242E 1640E

$e + S + [Ti + Al]$
772E

$H + D + SS$
1205E

$H^+ + D + Ni$
1305T

$H^+ + I + Ni$
1305T

$H_2 + Pt + TiO_2$
596E

$H_2^+ + D + SS$
1306E

$H_2^+ + O + SS$
1306E

$hv + CO + Ni$
1618E

$hv + CO + SS$
1276E

$hv + GaP$
1641E

$hv + H_2 + SS$
1276E

$hv + LiF$
1132E

$hv + NaCl$
1132E

$hv + NO + Ni$
1618E

$hv + O + Mo$
1242E

$He^+ + CO + Mo$
1195E

$He^+ + H_2 + Mo$
1198E

$He^+ + N + Mo$
1305T

$He^+ + N + W$
1305T

$He^+ + O + Ni$
1305T

$He^+ + O_2 + Mo$
1198E

$He^+ + P + Mo$
1198E

$Mo^+ + H_2 + Cu$
1602E

$Mo^+ + H_2 + Nb$
1602E

$Mo^+ + N_2 + Nb$
1602E

$N_2^+ + N_2 + Si$
1408E

$Ne^+ + CO + Mo$
1198E

$Ne^+ + H_2 + Mo$
1198E

$Ne^+ + O + Nb$
1237E

$Ne^+ + O + V$
1237E

$Ne^+ + O_2 + Mo$
1198E

$Ne^+ + P + Mo$
1198E

$Xe^+ + N + Mo$
1305T

$Xe^+ + N + W$
1305T

Review
1308E-T

Undef
1433T 1637T

B17

PARTICLE INTERACTIONS WITH SOLID SURFACES

Electron-, Ion-, and Photon-Induced Chemical Changes to Surfaces

Ar + Ga 973E-T	H ⁺ + Nb 1486T	N ⁺ + Si 1486T
Ar ⁺ + AgAu 1239E	H ⁺ + Ni 1486T	N ⁺ + Ti 1486T
Ar ⁺ + [Au + Cu] 1635E	H ⁺ + Si 1622E	N ⁺ + V 1486T
Ar ⁺ + B ₂ C 1319E	H ⁺ + Ta 1292E	N ⁺ + W 1486T
Ar ⁺ + [Cu + Pd] 1216E	H ⁺ + TaC 1292E	N ⁺ + Yb 1486T
Ar ⁺ + In + Pb 1241E	H ⁺ + Ti 1292E	N ⁺ + Zr 1486T
Ar ⁺ + Li + Al 1309T	H ⁺ + TiB ₂ 1292E 1622E	N ⁺ + Ta 1486T
Ar ⁺ + NiSi ₂ 1239E	H ⁺ + TiC 1199E 1292E	N ₂ ⁺ + Al 69E
Ar ⁺ + [O ₂ + Ti] 1294E	H ₂ ⁺ + TiC 1311E	N ₂ ⁺ + Cu 69E
Ar ⁺ + PtSi 1239E	He ⁺ + C 1292E	N ₂ ⁺ + Mo 69E
Ar ⁺ + SiC 1310E	He ⁺ + Ga 973E-T	N ₂ ⁺ + Ni 69F
Ar ⁺ + Sn + In 1241E	He ⁺ + [Ni + Cu] 1390E	O ⁺ + Ag 1486T
Ar ⁺ + Sn + Pb 1241E	He ⁺ + [Ni + Ge] 1390E	O ⁺ + Cr 1486T
Ar ⁺ + Ti 1294E	He ⁺ + [Ni + Si] 1390E	C ⁺ + Cu 1486T
Ar ⁺ + TiC 1319E	He ⁺ + Ta 1292E	C ⁺ + Fe 1486T
C ⁺ + KCl 1395E	He ⁺ + TaC 1292E	C ⁺ + Ge 1486T
D ⁺ + C 1299E	He ⁺ + Ti 1292E	O ⁺ + Hf 1486T
D ⁺ + TiC 1190E	He ⁺ + TiB ₂ 1292E	O ⁺ + Mo 1486T
e ⁺ + C 1296E 1297E 1298E	He ⁺ + TiC 1292E 1311E	O ⁺ + Nb 1486T
Fe ⁺ + C 1392E	In ⁺ + LiF 1391E	O ⁺ + Ni 1486T
Fe ⁺ + Ge 1392E	Kr + Fe 893E	O ⁺ + Si 1486T
Fe ⁺ + Si 1392E	Kr ⁺ + [Ni + Cu] 1390E	C ⁺ + Ta 1486T
H + C 1296E 1297E 1298E	Kr ⁺ + [Ni + Ge] 1390E	O ⁺ + Ti 1486T
H + TiB ₂ 1203E	Kr ⁺ + [Ni + Si] 1390E	O ⁺ + V 1486T
H + TiC 1203E	N ⁺ + Ag 1486T	O ⁺ + W 1486T
H ⁺ + B 1622E	N ⁺ + Cr 1486T	C ⁺ + Yb 1486T
H ⁺ + C 1292E 1622E	N ⁺ + Cu 1486T	O ⁺ + Zr 1486T
	N ⁺ + Fe 1486T	Xe ⁺ + AgAu 1239E
	N ⁺ + Ge 1486T	Xe ⁺ + NiSi ₂ 1239E
	N ⁺ + Hf 1486T	Xe ⁺ + PtSi 1239E
	N ⁺ + KCl 1396E	Review 1249E-T 1487E 1488E
	N ⁺ + Mo 1486T	Undef 1417T 1592T 1594T 1597T

D10

PARTICLE INTERACTIONS WITH SOLID
SURFACES

Trapping and Reemission of Hydrogen
(all forms) and Helium

D ⁺ + SS 1201E-T	D ₂ ⁺ + Si 1280E	H ₂ + SS 1085E
D ⁺ + Al 1158T	D ₂ ⁺ + TiC 1280E	H ₂ + Ti 1100E 1490E
D ⁺ + C 1198T 1193E 1207E 1281T 1282E 1283E 1287E 1394E	D ₂ ⁺ + TiO ₂ 1282E	H ₂ + Zr 820E
D ⁺ + Cu 1290E	D ₂ ⁺ + SS 1204E 1284E 1286E	He ⁺ + Al 1108T 1285E 1492E
D ⁺ + Mo 1189E 1202E	H + SS 1200E-T	He ⁺ + C 1108T 1286E
D ⁺ + Nb 1178T	H ⁺ + Al 1105E 1103T	He ⁺ + Cu 1290E
D ⁺ + Ni 1212E	H ⁺ + C 1108T 1207E 1281T	He ⁺ + Mo 897E 899E
D ⁺ + SiO ₂ 1394E	H ⁺ + Mo 893E 1183E	He ⁺ + Nb 1108T 1585E
D ⁺ + SS 1201E 1278E 1294E 1285E 1287E	H ⁺ + Nb 1108T	He ⁺ + Ni 899E 1285E 1395E
D ⁺ + TiC 1278E 1281T	H ⁺ + Ni 899E	He ⁺ + PERT 947E-T
D ₂ ⁺ + Al ₂ O ₃ 1290E	H ⁺ + PERT 947E-T	He ⁺ + SS 1585E
	H ⁺ + Si 1206T	He ⁺ + Ti 900E
	H ⁺ + SiO ₂ 1393E	He ⁺ + Ti-V-Al 1088E
	H ⁺ + SS 1188E	He ⁺ + TiO ₂ 900E
	H ⁺ + TiC 1203E 1281T	He ⁺ + W 1492E 1585E
	H ⁺ + W 1105E	

E91

Under
312T 498T

ELECTRON-PARTICLE INTERACTIONS

General

e + He
1253E

E92

ELECTRON-PARTICLE INTERACTIONS

Elastic Collisions

e + Ar
211T 252E-T 399T
541E 538E 654T
1257E-T

e + Ba⁺⁺
504T

e + Ba⁺⁺
500T

e + C
1083T

e + CH₄
651T 666E

e + CO
165T 1067T

e + CO₂
99E 359T 385T
1762E 1084T

e + Cs
904E

e + H
23E-T 170T 216T
379T 399T 454T
516E 518T 643T
584T 882T 918T
1073T 1461T 1473T
1251T 1252T

e + H⁺
861T

e + H₂
151E 407T 414T
439T 622T 513T
929T 993T 1047T

e + H₂O
651T 1503E

e + H₂S
1503E

e + He
389T 419T 455E-T
541E 683T 684T

e + He⁺
506T 1014T

e + He⁺ Seq
1766T

e + Hg
904E

e + K
904E

e + K⁺
106T

e + Kr
75T 242E-T 485E
541E

e + Li⁺⁺
570T

e + Li₂
371E

e + LiH
686T

e + N₂
44T 165T 913T
1947T

e + Na
904E

e + Ne
127T 427T 472T
541E 912T 1083T

e + O
685T 1082T

e + O₂
496E 939E 1084T

e + Rb
904E

e + Rn
75T

e + Si₂
1503E

e + Xe
75T 271T 485E
541E 534E

Under
424T 457T 961T

E³

ELECTRON-PARTICLE INTERACTIONS

Excitation

e + Ag	1270E		
e + Al	306T		
e + Ar	161E 543E 1078E	210T 638E	396T 1925E
e + Ar ¹⁵⁺	243T	975T	
e + Ar ¹⁷⁺	413T	723T	
e + B	254E		
e + B Seq	575T		
e + B ²⁺	219T		
e + Ba	540E		
e + Ba Seq	336T	575T	
e + Be ²⁺	219T		
e + Be-like	551T		
e + Bi	241E		
e + C ⁺	375T		
e + C ²⁺	23E-T	316T	646T
e + C ³⁺	243T 975T	316T	495T
e + C ⁴⁺	219T	316T	
e + Ca	97E	540E	1934T
e + Ca ¹²⁺	1952T		
e + Ca ¹⁸⁺	219T		
e + CH ₄	1257E		
e + Cl ₂	157E		
e + CO	162E 1505E	479E	921T
e + CO ₂	362T	1123T	1505E
e + Cr	239E		
e + Cs ⁺	46T	540E	
e + Cu	1270E		

e + D ₂	275E	1092E	
e + F ⁺	306T		
e + F ²⁺	306T		
e + F ³⁺	306T		
e + F ⁴⁺	306T		
e + F ⁵⁺	306T		
e + F ⁷⁺	219T		
e + Fe ²⁺	1056T		
e + Fe ¹³⁺	144T		
e + Fe ²²⁺	2T		
e + Fe ²³⁺	836T		
e + Fe ²⁴⁺	219T	836T	
e + Fe ²⁵⁺	413T		
e + Ga ⁺	423E		
e + H	23E-T 350T 645T 644T 1973T	166T 456T 671T 682T 1252T	216T 493E 683T 930T 1323T
e + H ⁺	1315T		
e + H Seq	336T 749T	515T	575T
e + H-like	551T		
e + H ₂	89T 976T	404E 1036T	608T 1092E
e + H ₂ O	679E		
e + He	134E 453E 663T 1050	209E 543E 684T	297E 678E 1034T
e + He ⁺	413T		
e + He Seq	336T	575T	
e + He-like	551T		
e + Hg	94E	188E	961E
e + In	89E		
e + K	139T	540E	
e + Kr	106T		
e + Kr ⁺	1565E		

e + Kr	183E 931E	218E 1022E	543E 1078E
e + Li	1A9T 919T	479T	636E
e + Li ⁺	219T		
e + Li Seq	336T	495T	575T
e + Li-like	551T		
e + LiH	68CT		
e + Mg	96E 1569E	306T	1034T
e + Mg Seq	575T		
e + Mn	240E	249E	
e + Mo	1275E		
e + N ⁺	306T		
e + N ²⁺	306T	1053T	
e + N ³⁺	306T	646T	
e + N ⁴⁺	243T		
e + N ⁵⁺	219T		
e + N ₂	7E 259T 532T 1010T	57E 323E 679E 1505E	181E 489E 778E
e + N ₂ ⁺	581T		
e + N ₂ ⁺	259T		
e + N ₂ O	1505E		
e + Na	189T	306T	325T
e + Na ⁺	305E		
e + Na ⁺	1570E		
e + Na Seq	575T		
e + Na ²⁺	1055T		
e + Nb	767E		
e + Ne	180T 1078E	351E	543E
e + Ne ²⁺	243T	646T	
e + Ne ³⁺	243T	975T	
e + Ne ⁴⁺	219T		

e + Me⁺⁺
 515T 723T 803T
 e + Ni⁺
 1064T
 e + Ni
 1505E
 e + O
 685T
 e + O⁺
 306T
 e + O Seq
 279T
 e + O⁺⁺
 306T 1051T
 e + O⁺⁺
 306T 573T 839T
 e + O⁺⁺
 243T 396T 576T
 646T
 e + O⁺⁺
 975T
 e + O⁺⁺
 219T
 e + O⁺⁺
 413T
 e + O₂
 1074E 1605E

e + Rb
 540E 569T
 e + S
 306T
 e + S⁺⁺
 120T
 e + S⁺⁺
 6T
 e + Si⁺
 272T 950T
 e + Si⁺⁺
 272T
 e + Sb
 426E
 e + Si
 306T 1535E
 e + Si⁺⁺
 138T
 e + Si⁺⁺
 215T
 e + Sm
 251E
 e + Sr
 540E

e + Te
 426E
 e + Tm
 240T
 e + V
 1272E
 e + W
 110E
 e + W⁺
 110E
 e + W⁺⁺
 495T
 e + Xe
 183E 1025E 1078E
 e + Y
 1497E
 e + Yb
 248E
 e + Zn⁺
 330E 331T 995E
 Review
 551T 710E 711T
 Undefined
 799T

594

ELECTRON-PARTICLE INTERACTIONS

Dissociation

e + CH₄
 1257E

e + D₂
 275E 1092E
 e + H₂
 129T 1036T 1092E
 e + H₂⁺
 702T
 e + N₂
 57E 489E 521E

e + N₂⁺
 501T
 e + Sbn
 865E
 Review
 948E-T

E⁺S

ELECTRON-PARTICLE INTERACTIONS

Ionization

• • Ag
150T 568E 864T
1271E

• • Al
306T 450T

• • Al⁺
450T

• • Al²⁺
301E 312T 450T
1005T

• • Al³⁺
450T

• • Al⁴⁺
450T

• • Al⁵⁺
450T

• • Al⁶⁺
450T 1584E

• • Al⁷⁺
450T 1584E

• • Al⁸⁺
450T 1584E

• • Al⁹⁺
450T 1584E

• • Al¹⁰⁺
450T 1584E

• • Al¹¹⁺
450T

• • Ar
161E 214T 306T
577T 638E 922E-T
365E 1325E 1030T
1691T

• • Ar⁺
434T

• • Ar²⁺
529E

• • Ar³⁺
529E

• • Ar⁴⁺
529E

• • Ar⁵⁺
529E

• • Ar⁶⁺
529E

• • Ar⁷⁺
529E

• • Ar⁸⁺
529E

• • Ar⁹⁺
529E

• • Ar¹⁰⁺
529E

• • Ar¹¹⁺
529E

• • Ar¹²⁺
529E

• • Ar¹³⁺
529E

• • Ar¹⁴⁺
529E

• • Ar¹⁵⁺
529E

• • Ar¹⁶⁺
529E

• • Ar¹⁷⁺
529E

• • Au
433T 568E

• • B
254E

• • Ba
47E

• • Be-like
551T

• • Bi
241T

• • C
577T

• • C⁺
336T 529E

• • C²⁺
336T 529E

• • C³⁺
336T 529E

• • C⁴⁺
336T 529E

• • C⁵⁺
529E

• • Ca
568E 577T

• • Ca + Mn
568E

• • Ca²⁺
1030T

• • Cd
920E

• • Cf
239E

• • Cs⁺
1559E

• • Cu
568E 868T

• • F⁺
336T

• • F²⁺
306T

• • F³⁺
306T

• • F⁴⁺
336T

• • F⁵⁺
306T

• • Fe
577T

• • Fe²⁺
357T

• • Fe³⁺
357T

• • Fe⁴⁺
1130T

• • Fe⁵⁺
434T

• • Fe⁶⁺
991E

• • Fe⁷⁺
144T 991E

• • Fe⁸⁺
811T 991E

• • Fe⁹⁺
811T 991E

• • Fe¹⁰⁺
811T 991E

• • Fe¹¹⁺
811T

• • Fe¹²⁺
811T

• • Fe¹³⁺
811T

• • Fe¹⁴⁺
811T

• • Fe¹⁵⁺
811T

• • Fe¹⁶⁺
811T

• • Fe¹⁷⁺
811T

• • Ga
158E

• • Ga⁺
308T 335E-T

• • Ga
568E

• • H
72T 143T 176T
197T 291E 862T
1045T 1254T

• • H Seq
515T

• • H-like
551T

• • H₂
992T

• • He
72T 143T 167T
217E-T 370T 419T
517E 635E 858E
954E 992T 1081T
1254T

• • He⁺
24E-T 148T 623T

• • He-like
551T

• • Hf³⁺
357T

• • Hg
403T

• • In
86E

• • K
637E-T

• • K⁺
1030T

• • K²⁺
434T

• • Kr
139E 294E 1028E
1081T 1254T

e + Xe²¹⁺
529E

e + Xe²²⁺
529E

e + Xe²³⁺
529E

e + Xe²⁴⁺
529E

e + Xe²⁵⁺
529E

e + Xe²⁶⁺
529E

e + Xe²⁷⁺
529E

e + Xe²⁸⁺
529E

e + Xe²⁹⁺
529E

e + Xe³⁰⁺
529E

e + Xe³¹⁺
529E

e + Xe³²⁺
529E

e + Xe³³⁺
529E

e + Xe³⁴⁺
529E

e + Xe³⁵⁺
529E

e + Xe³⁶⁺
529E

e + Xe³⁷⁺
529E

e + Yb
248E

e + Zn⁺
335E-T

e + Zn¹⁹⁺
450T

e + Zr²⁺
357T

Review
551T 710E 712T

Undef
76T 191T 981T

E16

ELECTRON-PARTICLE INTERACTIONS

Recombination (electron-ion)

e + Ar
577T

e + Ar⁷⁺
265T

e + Ar¹⁰⁺
95E

e + Ar¹⁷⁺
402E

e + Cl
577T

e + Cl⁺
1169T

e + Cl⁹⁺
402E

e + Ca
577T

e + Ca¹⁷⁺
1752T

e + Cl⁷⁺
421T

e + Fe
577T

e + Fe⁺
5T

e + Fe²⁺
5T

e + Fe³⁺
5T

e + Fe⁴⁺
5T

e + Fe⁵⁺
5T

e + Fe⁶⁺
5T

e + Fe⁷⁺
5T

e + Fe⁸⁺
5T

e + Fe⁹⁺
5T

e + Fe¹⁰⁺
5T

e + Fe¹¹⁺
5T

e + Fe¹²⁺
5T

e + Fe¹³⁺
5T

e + Fe¹⁴⁺
5T 991E

e + Fe¹⁵⁺
5T 285T 628T

e + Fe¹⁶⁺
5T 991E

e + Fe¹⁷⁺
5T 991E

e + Fe¹⁸⁺
5T 991E

e + Fe¹⁹⁺
5T

e + Fe²⁰⁺
5T 530T

e + Fe²¹⁺
5T 530T

e + Fe²²⁺
5T 530T

e + Fe²³⁺
5T

e + Fe²⁴⁺
5T 530T 629T 828T

e + Fe²⁵⁺
5T 530T 836T

e + Fe²⁶⁺
5T 530T

e + Fe²⁷⁺
5T 530T

e + H₂⁺
702T

e + H₂
577T

e + Mg⁺
296T

e + Mo²¹⁺
385T

e + N
577T

e + Ne
577T

e + Ni
577T

e + O
577T

e + O⁺
530T

e + O²⁺
530T

e + O³⁺
530T

e + O⁴⁺
530T

e + O⁵⁺
530T

e + O⁶⁺
530T

e + O⁷⁺
530T

e + O⁸⁺
530T

e + S
577T

e + Si¹⁺
272T

e + Si²⁺
272T

e + Si
577T

e + Si¹⁰⁺
802E

e + Xe₂⁺
328E

Review
713T 948E-T

E87

ELECTRON-PARTICLE INTERACTIONS

Collisional De-Excitation

e + Ar⁰
1566E

e + H₂⁰
1536T

e + He⁰
59E

e + [He⁺]⁰
932E

e + K⁰
106T

e + Ne⁰
97E 966E

E88

ELECTRON-PARTICLE INTERACTIONS

Collisional Line Broadening

e + Al
805T

e + Ar
577T

e + Ar⁰
825E

e + C
577T 825E

e + C⁰
816E 839E

e + Ca
577T

e + Cl⁰
825E

e + Cl²⁺
232T 825E

e + Cs
825E

e + Fe
577T 804T 805T

e + He
825E

e + He⁰
438T 826T

e + Hg
577T

e + H
577T 825E

e + H₂
844E

e + He
577T

e + He⁺⁺
803T

e + MI
577T

e + O
577T

e + O⁰
825E

e + P
825E

e + S
577T

e + S⁰
825E

e + S²⁺
232T 825E

e + S³⁺
232T

e + Si
577T 825E

e + Xe⁰
397E

Review
799T

Uncert
809T 8171

E89

ELECTRON-PARTICLE INTERACTIONS

Negative Ion Formation

e + DCI
736E-T

e + DCI
735E-T

e + He
127T

e + O₂
1175E

E11

ELECTRON-PARTICLE INTERACTIONS

Free-Free Transitions (bremsstrahlung)

e + Ar
965E 1026T

e + Au
571E

e + Ce⁺
796E

e + Kr
1026T

e + La
21T

e + Mo
1026T

e + Xe
21T 1026T

Undef
417T 854T 886T

E13

ELECTRON-PARTICLE INTERACTIONS

Electron Detachment from Negative Ions

e + H⁻
677E

E16

ELECTRON-PARTICLE INTERACTIONS

Fluorescence

e + HCl + Ar
1177E

E17

ELECTRON-PARTICLE INTERACTIONS

Angular Scattering

e + Ag
866T

e + Ar
161E 384T 262E-T
385T 543E 1082T

e + C
1083T

e + Cd
920E 1975E

e + CH₄
661T 666E

e + CO
105T 679E

e + CC₂
358E 388T 1084T

e + Cu
868T

e + D₂
275E

e + Ga
158E

e + H
23E-T 72T 143T
166T 197T 216T
358T 379T 493E
645T 918T 930T
1083T 1252T

e + H⁺
861T 1019T

e + H₂
88T 358E 407T
414T 499T 1036T

e + H₂O
651T 679E

e + He
72T 134E 143T
209E 217E-T 419T
453E 543E 678E
858E 954E

e + He⁺
148T

e + Hg
1075E

e + Kr
183E 262E-T 543E
931E

e + Li
479T 636E 919T

e + Mg
204T

e + N₂
44T 165T 358E
679E 1010T

e + Ne
427T 472T 543E
795E 912T 1083T

e + O
1083T

e + O₂
496E 939E 1084T

e + Xe
183E 271T 634E

e + Zn
1075E

e + Zn⁺
995E

Undef
598T

E18

ELECTRON-PARTICLE INTERACTIONS

Attenuation (unspecified process)

e + He
167T

E19

ELECTRON-PARTICLE INTERACTIONS

Momentum Transfer

e + Ar
1259E-T

e + Cd
1075E

e + CO
165T

e + H
291E

e + He
619T

e + Hg
1075E

e + N₂
165T

e + Ne
427T 472T

e + O₂
496E

e + Sb
426E

e + Te
426E

e + Z.
1075E

M01

PHOTON COLLISIONS WITH HEAVY PARTICLES
AND ELECTRONS ($h\nu < 100$ keV)

General

 $h\nu + \text{Al}$
1041T $h\nu + \text{Fe}$
1041T $h\nu + \text{Na}$
539E 560E $h\nu + \text{Pb}$
1041TUndef
626T 631T 1313T

M02

PHOTON COLLISIONS WITH HEAVY PARTICLES
AND ELECTRONS ($h\nu < 100$ keV)

Total Absorption

 $h\nu + \text{Al}$
250E $h\nu + \text{Ar}$
367T $h\nu + \text{Ba}$
1133T $h\nu + \text{Ba}^+$
1133T $h\nu + \text{Ba}^{2+}$
1133T $h\nu + \text{Be}^+$
200T $h\nu + \text{Bi}$
388E $h\nu + \text{Ce}$
388E $h\nu + \text{CH}_4$
783E 786E $h\nu + \text{CO}$
1274T 1317E $h\nu + \text{CO}_2$
779T 1496T 813E 1274T $h\nu + \text{Cr}$
652E $h\nu + \text{Dy}$
388E $h\nu + \text{Er}$
388E $h\nu + \text{Gd}$
388E $h\nu + \text{H}_2\text{O}$
807E 821T 822T
1271E 1316E $h\nu + \text{HD}$
785E $h\nu + \text{He} + \text{Ar}$
1268E $h\nu + \text{Ho}$
388E $h\nu + \text{Kr}$
967T $h\nu + \text{La}$
388E $h\nu + \text{Li}$
200T 400E $h\nu + \text{N}^+$
3T $h\nu + \text{N}_2$
814E $h\nu + \text{Na}$
315E $h\nu + \text{Nd}$
388E 1042T $h\nu + \text{Ne}$
967T $h\nu + \text{Ne Seq}$
153T $h\nu + \text{O}_2$
814E $h\nu + \text{O}_3$
1118E $h\nu + \text{OD}$
784E $h\nu + \text{OH}^+$
809T $h\nu + \text{Pb}$
388E $h\nu + \text{PERT}$
1094E $h\nu + \text{Pr}$
388E $h\nu + \text{Sm}$
388E $h\nu + \text{Ta}$
388E $h\nu + \text{Xe}$
967T $2h\nu + \text{Ne}$
171EUndef
850T 853T

M03

PHOTON COLLISIONS WITH HEAVY PARTICLES
AND ELECTRONS ($h\nu < 100$ keV)

Elastic Scattering

 $h\nu + \text{Ag}$
465T $h\nu + \text{Au}$
112E $h\nu + \text{e}$
637T 1606E $h\nu + \text{He}$
310T $h\nu + \text{N}_2$
349T $h\nu + \text{Na}$
315E 432E 639E $h\nu + \text{Pb}$
112E 465T $h\nu + \text{PERT}$
1094E 1337EUndef
394T 831T 842T

H84

PHOTON COLLISIONS WITH HEAVY PARTICLES
AND ELECTRONS ($h\nu < 100$ keV)

Excitation

$h\nu + \text{Ar}^{2+}$	258T	
$h\nu + \text{Ar}^{3+}$	258T	838T
$h\nu + \text{C}$	834T	
$h\nu + \text{Ca}^{2+}$	838T	
$h\nu + \text{Cd}$	827E	
$h\nu + \text{CH}_4$	781T	
$h\nu + \text{Cl}$	886E	
$h\nu + \text{Cl}^{2+}$	258T	838T
$h\nu + \text{Cl}$	786E	781T
$h\nu + \text{Co}$	1169E	
$h\nu + \text{Co}^{12+}$	838T	
$h\nu + \text{CO}_2$	766E	
$h\nu + \text{Cr}^{18+}$	838T	
$h\nu + \text{Cu}$	829E	
$h\nu + \text{D}_2$	766E	878T
$h\nu + \text{Fe}$	874E	
$h\nu + \text{Fe}^{12+}$	838T	
$h\nu + \text{Fe}^{22+}$	2T	
$h\nu + \text{Fe}^{23+}$	837T	

$h\nu + \text{H}_2$	766E	787T	878T
$h\nu + \text{H}_2\text{O}$	48T	766E	
$h\nu + \text{He}$	343E		
$h\nu + \text{He}^+$	325E		
$h\nu + \text{Hg}$	827E		
$h\nu + \text{Hg}^+$	841E		
$h\nu + \text{I}$	476T		
$h\nu + \text{K}$	877T		
$h\nu + \text{K}^{2+}$	838T		
$h\nu + \text{Kr}^{2+}$	258T		
$h\nu + \text{Li}$	488E		
$h\nu + \text{Lu}^{2+}$	832T		
$h\nu + \text{Na}^+$	823T		
$h\nu + \text{Mn}^{11+}$	838T		
$h\nu + \text{Mo}$	287E		
$h\nu + \text{N Seq}$	834T		
$h\nu + \text{N}^{2+}$	3T		
$h\nu + \text{N}_2$	601E	766E	
$h\nu + \text{Na}$	318E	463E	553E
$h\nu + \text{Na}^+$	319E		
$h\nu + \text{Ne}_2$	399T		
$h\nu + \text{Ni}^{12+}$	838T		
$h\nu + \text{O}^{2+}$	873T		

$h\nu + \text{O}_2$	766E		
$h\nu + \text{O}_2^+$	964E		
$h\nu + \text{P}^+$	258T	838T	
$h\nu + \text{P Seq}$	835T		
$h\nu + \text{Se}^{2+}$	258T	838T	
$h\nu + \text{S}^{2+}$	6T		
$h\nu + \text{Sc}^{7+}$	838T		
$h\nu + \text{Si}$	838T		
$h\nu + \text{Ti}^{18+}$	838T		
$h\nu + \text{V}^{2+}$	838T		
$h\nu + \text{V}^{21+}$	837T		
$2h\nu + \text{Ca}$	875T		
$2h\nu + \text{H}$	429T	848E	
$2h\nu + \text{K}$	875T		
$2h\nu + \text{Li}$	875T		
$2h\nu + \text{Na}$	875T		
$2h\nu + \text{Rb}$	875T		
$2h\nu + \text{Zn}$	840E		
$3h\nu + \text{Na}$	880E		
Review	552T		
Under	4E	223T	368T
	823T	526T	874T
	876T		

H85

PHOTON COLLISIONS WITH HEAVY PARTICLES
AND ELECTRONS ($h\nu < 100$ keV)

Dissociation

$h\nu + \text{CH}^+$	314E
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$h\nu + \text{HeH}^{2+}$	82T
$h\nu + \text{HI}$	964E
$h\nu + \text{Na}_2^+$	1493E
$h\nu + \text{O}_2$	37E

$h\nu + \text{O}_2^+$	1258E
$h\nu + \text{O}_2^+$	607E
Review	552T
Under	883T

PHOTON COLLISIONS WITH HEAVY PARTICLES
AND ELECTRONS ($h\nu < 100 \text{ keV}$)

Ionization

$h\nu + \text{Ar}$	31T	704T	705E-T
$h\nu + \text{Ar}^*$	1013T		
$h\nu + \text{Ba}$	238E	395T	557E
$h\nu + \text{Ba}^*$	762E		
$h\nu + \text{Ba}^{2+}$	395T		
$h\nu + \text{C}^{2+}$	639T		
$h\nu + \text{C}^{3+}$	326T	630T	
$h\nu + \text{Ca}$	579T		
$h\nu + \text{Cd}$	162E 475E	316T	393T
$h\nu + \text{Co}$	1073E		
$h\nu + \text{CO}_2$	67T 950T	501T	773E
$h\nu + \text{Cs}$	568T	924T	
$h\nu + \text{Cs}^*$	513T		
$h\nu + \text{D}_2$	607E	771E	
$h\nu + \text{Fe}$	1079E		
$h\nu + \text{H}$	848E		
$h\nu + \text{H}^*$	347E		
$h\nu + \text{H Seq}$	458T		
$h\nu + \text{H}_2$	509E	771E	
$h\nu + \text{H}_2\text{O}$	38E	49T	
$h\nu + \text{HD}$	509E		

$h\nu + \text{He}$	149T 647T	343E 704T	524E
$h\nu + \text{He}^*$	625E		
$h\nu + \text{Hg}$	162E	316T	867T
$h\nu + \text{K}$	324T		
$h\nu + \text{K}^*$	752E		
$h\nu + \text{Kr}$	81T	391E	
$h\nu + \text{Kr}^*$	1013T		
$h\nu + \text{Li}$	430E	1063E	
$h\nu + \text{Li Seq}$	321T		
$h\nu + \text{N}^{2+}$	326T		
$h\nu + \text{N}_2$	366E	412T	
$h\nu + \text{Na}$	416E 924T 1126T	463E 1050T 1063E	507E 1063E
$h\nu + \text{Ne}$	81T 212T	145T	207E
$h\nu + \text{Ne}^*$	91T	145T	1013T
$h\nu + \text{Ne Seq}$	153T		
$h\nu + \text{Ni}$	1070E		
$h\nu + \text{O}^{2+}$	326T		
$h\nu + \text{O}_2$	37E	64E	78T
$h\nu + \text{O}_3^*$	776E		
$h\nu + \text{Pb}$	1336E		
$h\nu + \text{Pd}$	1564E-T		
$h\nu + \text{Pr}$	398E		
$h\nu + \text{Rb}$	924T		

$h\nu + \text{SF}_6$	1037E		
$h\nu + \text{Sn}$	398E		
$h\nu + \text{Sn}$	344T	1564E-T	
$h\nu + \text{Sr}$	626E		
$h\nu + \text{Sr}^*$	762E		
$h\nu + \text{Th}$	1140E	1336E	
$h\nu + \text{U}$	1140E	1336E	
$h\nu + \text{Xe}$	81T 705E-T	154E	391E
$h\nu + \text{Xe}^*$	70E	1013T	
$h\nu + \text{Zn}$	162E	316T	
$nh\nu + \text{Ar}$	396E		
$nh\nu + \text{He}^*$	945E-T		
$nh\nu + \text{Hg}^*$	945E-T		
$nh\nu + \text{Kr}$	396E		
$nh\nu + \text{Sr}$	172E	173E	
$nh\nu + \text{Xe}$	396E		
$2h\nu + \text{Cs}$	119T		
$2h\nu + \text{H}^*$	264T		
$2h\nu + \text{Xe}$	1040E		
$3h\nu + \text{H}_2$	606T		
$3h\nu + \text{Xe}$	997E		
$5h\nu + \text{Na}$	135E		
Under	313T 1504T	549T	996T

H07

PHOTON COLLISIONS WITH HEAVY PARTICLES
AND ELECTRONS ($h\nu < 100$ keV)

Photodetachment

 $h\nu + \text{Cs}^-$
247T $h\nu + \text{H}^-$
247T 704T 737C $h\nu + \text{He}^-$
729E $h\nu + \text{K}^-$
247T $h\nu + \text{Li}^-$
247T $h\nu + \text{Na}^-$
247T $h\nu + \text{Rb}^-$
247T 958E-TUndef
467T

H06

PHOTON COLLISIONS WITH HEAVY PARTICLES
AND ELECTRONS ($h\nu < 100$ keV)

Fluorescence

 $h\nu + \text{Ag}$
256E $h\nu + \text{As}$
256E $h\nu + \text{Br}$
256E $h\nu + \text{Cl}$
41E $h\nu + \text{Cl} + \text{Ar}$
41E $h\nu + \text{Cu}$
256E $h\nu + \text{H}$
558T $h\nu + \text{H}_2$
843E 849E $h\nu + \text{He Seq}$
801T $h\nu + \text{I}$
256E $h\nu + \text{In}$
256E $h\nu + \text{Mo}$
256E $h\nu + \text{Na}$
1E $h\nu + \text{Nb}$
256E $h\nu + \text{Ni}$
256E $h\nu + \text{NO}_2$
1321E $h\nu + \text{O}_2$
964E $h\nu + \text{Pb}$
842E 1576E $h\nu + \text{Se}$
256E $h\nu + \text{Sn}$
256E $h\nu + \text{Zn}$
256E $h\nu + \text{Zr}$
256E $nh\nu + \text{Ar}$
396E $nh\nu + \text{Kr}$
396E $nh\nu + \text{Xe}$
396E $2h\nu + \text{Hg}$
845E 846E $2h\nu + \text{Xe}$
844EUndef
99T 342T 443T

H10

PHOTON COLLISIONS WITH HEAVY PARTICLES
AND ELECTRONS ($h\nu < 100$ keV)

Photochemistry

 $h\nu + \text{Kr}$
1098E $h\nu + \text{Kr} + \text{Ar}$
1098E $h\nu + \text{Kr} + \text{He}$
1098E

H11

PHOTON COLLISIONS WITH HEAVY PARTICLES
AND ELECTRONS ($h\nu < 100$ keV)Free-Free Absorption or Inverse
Bremsstrahlung $h\nu + e$
855E $h\nu + \text{He}^-$
131TUndef
387T 851T 852T

J04

Review
1307E-T

DATA COMPILATION

Particles on Surfaces and Solids

Range-Energy
1095E 1195E

J05

DATA COMPILATION

Structure

CH₄
777T

CO

777T

F²⁺

774T

F³⁺

774T

F⁴⁺

774T

F⁵⁺

774T

F⁶⁺

774T

H₂D

777T

H₂

777T

Review

353T

K01

REVIEWS AND BOOKS

Heavy Particle

Charge exchange
1540TElectron Capture
700T 732E 763TElectron Detachment
732EElectron detachment
1502E-TEnergy transfer
1527EExcitation
1543T 1543TExcited states
1525E-TInteraction potential
1540TInteraction potentials
1543TInterchange
1544T 1654E-T 1655E-TIonization
1324T 1332T 1528E
1540TMutual neutralization
1539TScattering
1523T 1525E 1542TReview
765T 1522T 1656TUnder
1092T

K02

REVIEWS AND BOOKS

Electrons

Dissociative recombination
1539TExcitation
501T 1537T 1538TIonization
551T 1653E-TRadiative recombination
1539TScattering
1537T 1538T 1546TReview
719E

K03

REVIEWS AND BOOKS

Photons

Dissociation
1544TExcitation
1544TIonization
1652EPhotoionization
1533E 1537T 1538TReview
27E 229T 552T
640E-T 641T 752E-T

K04

REVIEWS AND BOOKS

Particles on Surfaces and Solids

Charge state Population
1339TD + SS
1200E-TEnergy loss
1340EH + SS
1200E-TH+ + PERT
947E-THe+ + PERT
947E-TStopping power
1339TReview
1106E-TUnder
1338T

K06

REVIEWS AND BOOKS

Structure

Bound states
1521TStructure
1525TReview
764E

K07

REVIEWS AND BOOKS

General

Excited state collisions
1545TReview
1557T

K08

REVIEWS AND BOOKS

Use of Atomic Data for Plasma Studies

Astrophysics
1541TC³⁺ + H
720TC²⁺ + H
720TC²⁺ + H
720TC²⁺ + H
720Te + Si plasma
624THe²⁺ + Li
1550EC²⁺ + H
724EReview
719E-T 721E 722E-T
723T 1596E-TUnder
643E-T

L02

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Electrons

Excitation
779E-T

L03

BIBLIOGRAPHIES

Photons

Excitation
779E-T

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Group, Abingdon Oxfordshire OX 14 3DB, England
133. S. C. Haydon, University of New England, Armidale, Australia
134. R. J. Henry, Louisiana State University, Baton Rouge, LA 70803
135. A. Hershcovitch, Brookhaven National Lab., Upton, NY 11973
136. K. W. Hill, Princeton Plasma Physics Laboratory, Princeton, NJ 08544
137. E. Hinnov, Plasma Physics Laboratory, Princeton University,
Princeton, NJ 08544
138. J. R. Hiskes, L-439, Lawrence Livermore National Lab., P.O. Box 808,
Livermore, CA 94550
139. E. B. Hooper, Jr., L-433, Neutral Beam Group, Lawrence Livermore
National Lab., P.O. Box 808, Livermore, CA 94550
140. P. Hvelplund, University of Aarhus, Aarhus, Denmark
141. Y. Itikawa, Research Information Center, Institute of Plasma Physics,
Nagoya University, Nagoya, Japan
142. V. L. Jacobs, Plasma Physics Division, Code 6707, Naval Research
Laboratory, Washington, DC 20375
143. F. Jahoda, MS 639, Los Alamos National Laboratory, Los Alamos, NM
87544
144. R. K. Janev, Institute of Physics, P.O. Box 57, Studentski TRG 12/V,
11001 Beograd, Yugoslavia
145. C. Joachain, Universite de Louvain, Louvain-la-Neuve, Belgium
146. K. W. Jones, Brookhaven National Laboratory, Upton, NY 11973
147. E. Kaelble, Center for Astrophysics, 60 Garden Street, Cambridge,
MA 02138
148. T. Kato, Nagoya University, Nagoya, Japan
149. K. Katsonis, International Atomic Energy Agency, Wagramerstrasse 5,
P.O. Box 100, A-1400 Vienna, Austria
150. R. L. Kelly, Naval Postgraduate School, Monterey, CA 93940
151. Y-K. Kim, National Bureau of Standards, Washington, DC 20234
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Arbor, MI 48106
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154. L. I. Krupnik, The Ukrainian Academy of Sciences, Kharkov, U.S.S.R.
155. Lawrence Livermore National Lab., Attn: Magnetic Fusion Energy
Library, L-440, P.O. Box 808, Livermore, CA 94550

156. N. H. Lazar, Bldg. R1, Defense and Space Systems Group of TRW Inc., One Space Park, Redondo Beach, CA 90278
157. K-N. Leung, Bldg. 16, Lawrence Livermore Laboratory, Berkeley, CA 94720
158. Kwong Leung, Fusion Research Center, Physics Dept., RLM 11-222, University of Texas, Austin, TX 78712
159. A. Lorenz, Nuclear Data Section, International Atomic Energy Agency, Wagramerstrasse 5, P.O. Box 100, A-1400 Vienna, Austria
160. Los Alamos National Laboratory, Attn: Librarian, MS-362, P.O. Box 1663, Los Alamos, NM 87545
161. E. S. Marmar, Massachusetts Institute of Technology, Cambridge, MA 02139
162. J. V. Martinez, Division of Chemical Sciences, Office of Basic Energy Sciences, J-309, U.S. Department of Energy, Washington, DC 20545
163. I. Martinson, Fysiska Institutionen, Lunds Universitet, Lund, Sweden
164. Yu. Martynenko, Institute Atommoi Energii, I. V. Kurchatova, Moscow, U.S.S.R.
165. M. Mattioli, Association Euratom-CEA sur la Fusion, Fontenay-aux-Roses, France
166. J. W. McConkey, University of Windsor, Windsor, Ontario, Canada
167. G. M. McCracken, Culham Laboratory, Abingdon Oxfordshire OX14 3DB, England
168. E. W. McDaniel, School of Physics, Georgia Institute of Technology, Atlanta, GA 30332
169. R. H. McFarland, ER-542 GTN, Office of Fusion Energy, U.S. Department of Energy, Washington, DC 20545
170. J. H. McGuire, Dept. of Physics, Kansas State University, Manhattan, KS 66506
171. R. H. McKnight, National Bureau of Standards, Washington, DC 20234
172. R.W.P. McWhirter, Rm. 1.61, Bldg. R25, Space and Astrophysics Div., Rutherford and Appleton Laboratories, Chilton, Didcot, Oxfordshire, OX11 0QX England
173. W. Meckbach, Centro Atomico Bariloche, Argentina
174. A. L. Merts, Los Alamos National Laboratory, MS-212, Los Alamos, NM 87544
175. H. W. Moos, Physics Dept., Johns Hopkins University, Baltimore, MD 21218
176. T. J. Morgan, Dept. of Physics, Wesleyan University, Middletown, CT 06457
177. K. Moses, JAYCOR, Suite 690, 2811 Wilshire Blvd., Santa Monica, CA 90406
178. Y. Nakai, Division of Physics, Japan Atomic Energy Research Institute, Tokai Research Establishment, Tokai, Mura, Naka-Gun, Ibaraki-Ken, Japan
179. H. Narumi, University of Library and Information Science, Ibaraki-Ken, Japan
180. D. W. Norcross, JILA, University of Colorado, Boulder, CO 80309
181. S. Ohtani, Institute of Plasma Physics, Nagoya University, Nagoya 464, Japan
182. R. E. Olson, University of Missouri-Rolla, Rolla, MO 65401

183. J. E. Osher, L-437, Lawrence Livermore National Lab., University of California, P.O. Box 808, Livermore, CA 94550
184. E. S. Parilis, Institute of Electronics, Tashkent, U.S.S.R.
185. J. T. Park, University of Missouri-Rolla, Rolla, MO 65401
186. R. Patten, TRW, Energy Systems, Bldg. R4/2120, One Space Park, Redondo Beach, CA 90278
187. J. R. Peterson, SRI International, Menlo Park, CA 94025
188. M. P. Petrov, A. F. Ioffe Physical Technical Institute, Leningrad, U.S.S.R.
189. M. S. Pindzola, Dept. of Physics, Auburn University, Auburn, AL 36830
190. Plasma Fusion Center, Massachusetts Institute of Technology, Cambridge, MA 02139
191. D. E. Post, Plasma Physics Laboratory, P.O. Box 451, Princeton, NJ 08544
192. D. H. Priester, ER-542 GTN, Office of Fusion Energy, U.S. Department of Energy, Washington, DC 20545
193. Princeton University, Attn: Library, Plasma Physics Laboratory, P.O. Box 451, Princeton, NJ 08544
194. R. V. Pyle, Lawrence Berkeley Laboratory, Berkeley, CA 94720
195. J. Reader, National Bureau of Standards, Washington, DC 20234
196. J. S. Risley, Dept. of Physics, North Carolina State University, Raleigh, NC 27650
197. J. R. Roberts, National Bureau of Standards, Washington, DC 20234
198. W. L. Rowan, University of Texas, Austin, TX 78712
199. M. E. Rudd, University of Nebraska, Lincoln, NE 68588
200. J. R. Rumble, Physics Building A323, National Bureau of Standards, Washington, DC 20234
201. A. Russek, University of Connecticut, Storrs, CT 06268
202. E. Salzborn, Strahlenzentrum, der Justus Liebig-Universitaet, Leihgesterner Weg 217, D-6300 Giessen, West Germany
203. A. S. Schlachter, Lawrence Berkeley Laboratory, University of California, Berkeley, CA 94720
204. R. Shakeshaft, University of Southern California, Los Angeles, CA 90007
205. M. Shimada, JAERI Team, General Atomic Co., P.O. Box 81608, San Diego, CA 92138
206. E. J. Shipsey, University of Texas-Austin, Austin, TX 78712
207. C. H. Skinner, Princeton University, Princeton, NJ 08544
208. B. M. Smirnov, Institute of Thermophysics, Novosibirsk-90, U.S.S.R.
209. R. F. Stebbings, Dept. of Space Physics and Astronomy, Rice University, Houston, TX 77001
210. P. M. Stone, ER 542 GTN, Office of Fusion Energy, U.S. Department of Energy, Washington, DC 20545
211. H. Suzuki, Dept. of Physics, Faculty of Science and Technology, Sophia University, Chiyoda-Ku, Tokyo 102, Japan
212. K. Takayanagi, Institute of Space and Astronautical Science, Tokyo, Japan
213. C. B. Tartar, L-71, Theoretical Physics Division, Lawrence Livermore National Lab., P.O. Box 5503, Livermore, CA 95363
214. H. Tawara, Nuclear Engineering Dept., Kyushu University, Fukuoka 812, Japan

- 215. R. J. Taylor, Tokamak Fusion Laboratory, Boelter Hall, Room 2567, University of California, Los Angeles, CA 90024
- 216. A. Temkin, Goddard Space Flight Center, Greenbelt, MD 20771
- 217. V. I. Tereshin, The Ukrainian Academy of Sciences, Kharkov, U.S.S.R.
- 218. E. W. Thomas, Dept. of Physics, Georgia Institute of Technology, Atlanta, GA 30332
- 219. D. B. Thomson, Los Alamos National Laboratory, Los Alamos, NM 87545
- 220. L. H. Toburen, Battelle Pacific Northwest Labs, 300 Area 3745-B, P.O. Box 999, Richland, WA 99352
- 221. H. Verbeek, Max Planck Inst. für Plasma Physik, 8046 Garching bei München, West Germany
- 222. H. Vernickel, Max-Planck-Institut für Plasmaphysik, München, West Germany
- 223. A. W. Weiss, National Bureau of Standards, Washington, DC 20234
- 224. W. L. Wiese, National Bureau of Standards, Washington, DC 20234
- 225. H. Winter, Institut Für Allgemeine Physik, Technische Universitaet Wien, Karlsplatz 13, Wien A1040 Vienna, Austria
- 226- Technical Information Center, Department of Energy, Oak Ridge, TN 252. 37831