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**Bibliography of Molecular Dissociation
in Heavy Particle Collisions
1950-75**

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Bibliography of Molecular Dissociation in Heavy Particle Collisions
1950-75

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Physics Division, Oak Ridge National Laboratory

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Bibliography of Molecular Dissociation in Heavy Particle Collisions
1950-75

Abstract

This annotated bibliography lists published work on molecular dissociation in heavy particle collisions for the period 1950 to 1975. Sources include scientific journals, abstract compilations, conference proceedings, books, and reports. The bibliography is arranged alphabetically by author. Each entry indicates whether the work was experimental or theoretical, what energy range was covered, and what reactants were investigated. Following the bibliographical listing are indexes of reactants and authors.

Introduction

This bibliography is one of four indexed bibliographies on heavy particle collisions to be published by the Controlled Fusion Atomic Data Center. Other bibliographies in the series include *Bibliography of Atomic and Molecular Excitation in Heavy Particle Collisions, 1950-75*, *Bibliography of Electron Transfer in Heavy Particle Collisions, 1950-75*, and *Bibliography of Ionization and Stripping in Heavy Particle Collisions, 1950-75*. This bibliography consists of an annotated list of published works on dissociation in heavy particles for the period 1950 to 1975. It is divided into two sections, 1950-70 publications and 1971-75 publications. These sections are arranged alphabetically by author and followed by indexes of reactants and authors. Each entry indicates whether the work was experimental (E) or theoretical (T), what energy range was covered, and what reactants were investigated.

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

1. These bibliographies have been edited for obviously misplaced entries, which were deleted from their original categories and added to the end of the correct categories. This editing process accounts for missing entry numbers (due to deletions) and the lack of alphabetical arrangement for some final category entries (added after the bibliography was computer formatted).

2. The addition of a reactant to the subject index is indicated by an asterisk beside the entry's alphabetically correct position; the

reactant is given at the end of the appropriate column. The same method is used to add authors to the author index. When necessary, double or triple asterisks are used to show second or third additions to a column.

3. Since these bibliographies were computer generated using a program developed in 1961-63, the system of making capital or lowercase letters does not conform to conventional practice. All element symbols are set in caps both in the reactants column of the bibliographical listing and in the subject index. In the bibliographical entry itself, capitalization is entirely a function of spacing. Thus, there is no distinction between Co as a symbol of cobalt or of carbon monoxide, and the abbreviation for electron volt is consistently Ev. It is hoped that these idiosyncrasies will be understood in context.

4. Also due to computer manipulation, any differences in symbolic representation or formatting resulted in different entries in the index. For example, a superscript ++ is handled differently from a superscript 2+. The user should keep these differences in mind when performing searches.

5. Sequencing of reactants in the index follows the order

N* (excited state), N, N₂, N⁺, N⁻, N²⁺, NA (etc.), NE (etc.).

An asterisked symbol precedes the symbol alone, which is followed by subscripted symbols, etc. Occasionally, index sequencing is incorrect for various ions of the same element (e.g., I¹⁰⁺ may precede I²⁺).

This occurs only for those elements having ions with charge states of

10+ or greater. Such incorrect sequencing is noted in the appropriate sections of the reactants index.

6. Several papers of interest do not refer to a particular collision or system. The reactants in these cases are listed as undefined, denoted as UNDEF. Review papers are labeled REVIEW rather than list all reactants discussed in the paper. Although every effort was made to locate complete publications, a few entries were indexed from the abstract alone; these are labeled, in both the entry and reactants index, as "Categorized by Abstract Only."

7. The collision energy range is denoted by the numbers 0, 1, 2, 3, 4, and 5, which refer, respectively, to thermal energy, $E < 10$ eV, $E < 100$ eV, $E < 1$ keV, $E < 10$ keV, and $E > 100$ keV.

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Section I

Bibliography of Molecular Dissociation in Heavy Particle Collisions

1950-70

FACTANTS	EXP OR THEOR.	I RANGE	REFERENCE
1 (H^+ , H_2^+ , H_3^+ , Ar^+ , Ne^+ , He^+) $\bullet(C_2H_6, C_2H_4)$	E	3	Abbe, J. G., Adloff, J. P., In The Reactions Of Positive Ions With Ethylene And Ethane, COMPT. REND. 280B 3003 (1974).
2 (He^+ , Ne^+ , Ar^+ , CH_4^+ , $C_2H_4^+$, $C_2H_6^+$, HCN^+ , N_2^+ , CO^+ , H_2O^+ , NO^+ , OH^+ , HF^+ , Cl^+ , Br^+) $\bullet(H_2)$	E	2	Adams, N. G., Bohme, D. H., Ferguson, L. E., Reactions Of Mg^+ , Ky^+ , Rz^+ , And Form-Gas Hydride Ions With Hydrogen At 20 Degrees K, J. CHEM. PHYS. 52 5101 (1970).
3 (He^+ , Ne^+) $\bullet(C_2F_4)$	E	2	Adams, N. G., Bohme, D. H., Duncan, B. S., Fenssenfeld, F. C., Ferguson, L. E., Flowing Afterglow Studies Of Formation And Reactions Of Cluster Ions Of O_2^+ , O_3^+ , And C_2^+ , J. CHEM. PHYS. 52 2133 (1970).
4 (H^+) $\bullet(H_2)$	E	4	Afrosimov, V. V., Leino, G. A., Mamayev, Yu. A., Panov, M. B., Fedorenko, N. V., Elementary Processes Of Charge State Change In The Interaction Of Protons With Hydrogen And Nitrogen Molecules, VI ICPEAC, P.114, THE MIT PRESS, CAMBRIDGE, MASS. (1972).
5 (H^+) $\bullet(H_2)$	F	4	Afrosimov, V. V., Leino, G. A., Mamayev, Yu. A., Panov, M. B., Elementary Processes Of Change Of Charge States In The Interaction Between Protons And Hydrogen Molecules, SOVIET PHYS.-JETP 25 649 (1969).
6 (He^+) $\bullet(H_2)$	E	2	Albritton, D. L., Schmittpeter, A. L., Ferguson, L. E., The Mechanism For The Reaction Of He^+ With H_2 , VI ICPEAC, P.331, THE MIT PRESS, CAMBRIDGE, MASS. (1972).
7 (He^+ , Ne^+) $\bullet(C_2F_4)$	E	4	Andreev, E. P., Anudinov, V. A., Bobashev, S. V., Effective Cross Sections For The Excitation Of Helium Series Hydragen Lines In Collisions Of Singly Ionized Helium And Neon Ions With Hydrogen Molecules, IPT. ... AIS. 15 163 (1964).
8 (H_2^+ , He^+) $\bullet(H_2)$	E	4	Andreev, E. P., Anudinov, V. A., Bobashev, S. V., Excitation Of Hydrogen Lyman Alpha And Beta Lines By H^+ , H_2^+ , And He^+ Ions Passing Through Hydrogen, P. 309, SIX INT. CONF. ON COLLISIONS, LENINGRAD (1967).
9 (He^+) $\bullet(H_2)$	F	4	Anudinov, V. A., Bobashev, S. V., Andreev, E. P., Excitation Of 3s, 3p, And 3d States Of The Hydrogen Atom Upon Dissociation Of The H_2 Molecule By Fast He Ions, SOVIET PHYS.-JETP 25 236 (1967).
10 (He^+) $\bullet(H_2)$	E	4	Anudinov, V. A., Andreev, E. P., Bobashev, S. V., Dissociation Of H_2 Molecules By He^+ Impact With Excitation Of Hydrogen Atoms Into 3s-, 3p-, And 3d-States, P. 304, SIX INT. CONF. ON COLLISIONS, LENINGRAD (1967).
11 (H_2) $\bullet(Ar, Ne, N)$	E	2	Appleton, J. P., Steinberg, M., Liqueur, B. J., Shock-Tube Study Of Nitrogen Dissociation Using Vacuum-Ultraviolet Light Absorption, J. CHEM. PHYS. 40 559 (1964).
12 (CS_2, CO_2, C_2F_4) $\bullet(Ar, Ne, N)$	F	2	Appleton, John P., Steinberg, Martin, Liqueur, David J., Shock-Tube Study Of Carbon Monoxide Dissociation Using Vacuum-Ultraviolet Absorption, J. CHEM. PHYS. 52 2285 (1970).
13 (CS_2) $\bullet(CS_2)$, (CO_2) $\bullet(Ar)$	F	2	Arnold, S. J., Rowland, W. G., Ribbell, G. H., Sections Of Shock-Heated Carbon Disulfide-Argon Mixtures. II. Kinetics Of The Dissociation Of Carbon Disulfide, J. PHYS. CHEM. 74 1170 (1970).
14 Under	T	0	Bab, Thor A., Amverson, Knut, Dissociation Of Diatomic Molecules Considered As Diffusion In Phase Space, ADGEL. DAN. VIDENSK. SELSK., MAT.-FYS. MED. VOL. 33, PAPER NO. 7 (1961).
15 Under	T	1	Bab, Thor A., Lebovitz, Joel L., Dissociation Of Diatomic Molecules, DISC. FARADAY SOC. 33 189 (1962).
16 (Ar, Ne) $\bullet(C_2F_4)$	T	1	Bab, T. A., Lebovitz, J. L., Impulsive Collision Model For The Dissociation Of diatomic Molecules, PHYS. REV. 131 1139 (1963).
17 Review	T	0	Bab, Thor A., Fisher, Edward H., The Relaxation And Dissociation Of Small Molecules, RECENT ADVANCES IN AEROTHERMOCHEMISTRY, AGARD-CP-12, Vol. 1, P.45 (1967).
18 (He) $\bullet(I_2)$, (Ar) $\bullet(O_2)$, (He) $\bullet(H_2)$	T	1	Bab, T. A., Nielsen, S. E., Anderson R., Dynlands, C., Theory Of Chemical Kinetics, ANL-63-211, AD-622 731 (1964).
19 (H^+ , OH^+) $\bullet(C_2F_4)$	E	3	Bohrer, C. E., McGuire, J. H., Roschitz, E. E., Jr., Low-Energy Collision Cross Sections Of H^+ And OH^+ Ions In Gases, J. CHEM. PHYS. 37 2571 (1962).
20 (H^+) $\bullet(H_2)$	E	3	Borai, T., Rudon, J., Study Of The Discrete Energy Losses Of A Fast Proton Beam Passing Through A Gaseous Target, SIX INT. CONF. ON PHENOMENA GASES, 1 127, SERNA, PARIS (1963).
21 Review	E	6	Bornett, C. F., Gilboda, R., Measurements Of Atomic Cross Sections In Static Gases, METHODS IN EXPERIMENTAL PHYSICS, VOL. 7A, P.190, ACADEMIC PRESS, NEW YORK (1964).
22 (H_2^+) $\bullet(H_2)$	E	4	Bornett, C. F., Roy, J. A., The Dissociation Cross section Of H_2^+ In Hydrogen Gas, ATOMIC COLLISION PROCESSES, P.703, NORTH-HOLLAND PUBL. CO., AMSTERDAM (1964).

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REACTANTS	EXP OR THEOR.	E RANGE	REFERENCE
23 $(H_2^+)(H_2^+, H_2^+, H_2^+)$ $(H_2^+)(H_2, H_2, H_2)$	E	5	Barnett, C. F., Ray, J. A., Thompson, J. C., Cross - section Measurements, OML-3652 74 (1964).
24 $(H_2^+)(H_2, H_2)$	T	5	Barnett, C. F., Griffin, D. A., Aronow, M. J., Ray, J. A., Atomic And Molecular Cross Sections, OML-3900 50 (1965).
25 $(H_2^+, H_2^+)(H_2, H_2O)$	T	5	Barnett, C. F., Rankin, R., Ray, J. A., Formation Of Neutral Atomic Hydrogen Beams, 6TH INT. CONF. ION. PHENOMENA CASES, 1 53, SEPRA, PARIS (1963).
26 Under	T	0	Bates, D. R., I. Collision Processes Not Involving Chemical Reactions - Resonance Effects In Atom-Atom Collisions, DISC. FARADAY SOC. 33 7 (1962).
27 $(H^+)(H_2^+)$	E	5	Bates, D. R., Mott, A. R., Dissociation Of Hydrogen Molecular Ions By Fast Protons, PAUC. PHYS. SOC. (LONDON) 45 631 (1965).
28 $(He^+)(H_2)$	T	1	Bauer, S. J., Chemical Processes Involving Helium Ions And The Behavior Of Atomic Nitrogen Ions In The Upper Atmosphere, J. GEOPHYS. RES. 71 1500 (1966).
29 Under	T	1	Bauer, S., Dissociation Of Hydrogen Molecules By Vibrational Excitation And Three-Body Recombination Coefficient. II, PHYS. REV. 125 277 (1962).
30 $(He^+)(H_2, O_2)$	T	1	Bauer, S. J., Loss Process For Helium Ions In The Upper Atmosphere, 864-1404, NASA-TN-X-5055 (1964).
31 $(H^+)(H_2)$	T	3	Bauer, S., Dissociation Of Hydrogen Molecules By Vibrational Excitation And Three-Body Recombination Coefficient, PHYS. REV. 125 315 (1961).
32 $(H_2^+)(Li, H^+, H)$	E	5	Bell, P. A., Lithium-Arc Experiments, OML-3434 15 (1965).
33 $(He^+)(O_2)$	E	1	Bennett, W. R., Jr., Faust, G. L., McFarlane, R. A., Patel, C. R. M., Dissociative Excitation Transfer And Optical Raster Oscillation In He-O2 And Ar-O2 RF Discharges, PHYS. REV. LETTERS 4 470 (1962).
34 $(He, Ar^+)(O_2)$	E	1	Bennett, W. R., Jr., Relaxation Mechanisms, Dissociative Excitation Transfer And Raster Pulling Effects In Gas Lasers, QUANTUM ELECTRONICS III 461, COLUMBIA PRESS, (1964).
35 $(He, H_2^+)(He, He)$ $(I_2^+)(H_2)$	T	0	Benson, S. W., Barand, G. C., Vibrational Energy Exchange Of Highly Excited Anharmonic Oscillators, J. CHEM. PHYS. 40 1205 (1964).
36 $(H_2^+)(D_2, C_2, H_2)$	E	1	Berisford, R., Le Roy, D. J., Reaction Of Deuterium Atoms With Ethane - Mechanism Of Methane Exchange, CAN. J. CHEM. 35 543 (1954).
37 $(H_2^+)(H_2)$	E	5	Bernner, R. M., Mises, J. R., Kaplan, S. M., Paulinas, G. A., Pyle, R. V., The Excitation And Lorentz Ionization Of 10-Mev Hydrogen Atoms, ATOMIC COLLISION PROCESSES, P.720, NORTH-HOLLAND PUBL. CO., AMSTERDAM (1964).
38 $(H_2^+)(H_2, He, H_2, Ar)$	T	5	Bernner, R. M., Kaplan, S. M., Pyle, R. V., Stearns, J. W., Collisional Breakup Of High-Energy H_2^+ Ions, PHYS. REV. 146 3 (1964).
39 $(H_2^+)(H_2)$ (Col. by Abstract Only)	E	5	Bernner, R. M., Collisional Excitation And Lorentz Ionization Of 10-Mev Hydrogen Atoms, TMSIS, CALIF., UNIV., BERKELEY, UCL-11249 (1964).
40 Review	E	0	Beynon, J. M., Saunders, P. A., Williams, A. L., Metastable Ions In Double-Focusing Mass Spectrometers, NATURE 204 67 (1964).
41 $(H_2^+, H_2^+)(He, He)$	E	4	Bobashev, S. V., Andreev, E. P., Annudinov, V. A., Excitation Of Raman Hydrogen Lines Upon Passage Of H^+ , H_2^+ , And H_3^+ Through Helium And Neon, SOVIET PHYS.-JETP 14 1205 (1964).
42 $(H_2^+)(He)$	E	4	Bobashev, S. V., Pop, J. S., Excitation Of The α Beta Line Of Hydrogen And Of Some Mercury Lines By Collision Of Protons And H_2^+ Ions With Mercury Atoms, JPE. SPECTRY. 14 421 (1965).
43 $(H_2^+, H_2^+)(He, He)$	T	4	Bobashev, S. V., Annudinov, V. A., Andreev, E. P., Charge Exchange Of Protons And The Dissociation Of H_2^+ And H_3^+ Ions In Helium And Neon Accompanied By The Formation Of Fast Hydrogen Atoms In Excited States, SOVIET PHYS. - JETP 21 554 (1965).
44 $(He, H_2^+, He, Ar, AB^+)(He, Ar, Kr, Xe, O_2, C_2, H_2, CO_2)$ $(HeHe^+)(He)$ $(ArAr^+)(Ar)$ $(ArCO^+)(CO)$	E	2	Baker, D. R., Adams, R. W., Moseeson, M., Dunham, D. B., Ferguson, E. L., Flowing Afterglow Studies Of The Reactions Of The Rare-Gas Molecular Ions He_2^+ , Ne_2^+ , And Ar_2^+ With Molecules And Rare-Gas Atoms, J. CHEM. PHYS. 52 3694 (1970).
45 $(He^+)(H_2, CH_4, O_2, CO_2, NH_3)$	E	0	Balden, R. C., Monmouth, R. S., Shaw, M. J., Taidy, M. D., The Measurement Of Penning Ionization Cross-Sections For Helium 2 ³ S Metastables, 12 INT. CONF. ON PHENOMENA IN IONIZED GASES, P.27, EDITURA ACADEMIEI REPUBLICII SOCIALISTE ROMANIA, BUCHAREST (1967).
46 $(O_2)(O_2, O)$	E	1	Bertner, R. M., Golden, J. A., A Critique On Reaction Rate Constants Involved In The Chemical System Of High Temperature Air, DA M 034, OND 3107, AD-680 425 (1964).
47 $(SF_6)(Ar)$	E	1	Bell, J. F., Jacobs, T. A., Shock-Tube Studies Of Sulfur Hexafluoride, J. CHEM. PHYS. 30 3890 (1959).
48 $(H_2^+, H_2^+)(Li)$	E	0	Bottigioni, F., Contini, J., Gode, L., Dissociation Des Ions H_2^+ Et H_3^+ Dans Un Plasma De Lithium, EUR-CEA-FC-343 (1964).
49 $(H_2^+)(Li)$ (Col. by Abstract Only)	E	4	Bottigioni, F., Contini, J., Gode, L., Dissociation Rate Of Energetic H_2^+ Passing Through A Lithium Plasma, CONF-681124-31, AEC-CONF-68-25J-664 (1965).
50 $(H_2^+, H_2^+)(Li^+)$	E	0	Bottigioni, F., Contini, J., Gode, L., Dissociation Of The Ions H_2^+ And H_3^+ In A Lithium Plasma, J. PHYS. 27 549 (1964).

REACTANTS	EXP OR THEOR.	F RANGE	REFERENCE
51 $(Br_2)(Ar)(Br)(Br_2)$	E	2	Boyd, A. K., Burns, George, Laurence, T. B., Lippitt, J. H., Dissociation And Two-Body Collision In Shock-Heated Bromine. I. Br_2 In Argon, J. CHEM. PHYS. 49 3604 (1968).
52 $(Br_2,Br)(Br_2)$	E	2	Boyd, A. K., Brown, J. B., Burns, George, Lippitt, J. H., Dissociation And Two-Body Collision In Shock-Heated Bromine. II. Pure Br_2 , J. CHEM. PHYS. 49 3622 (1968).
53 $(CO_2)(Ar,Cl_2)(Cl)(Cl_2)$	E	2	Brooks, T. A., Belles, E., Zlatarich, S. A., Shock-Tube Study Of Carbon Dioxide Dissociation Rate, J. CHEM. PHYS. 40 1939 (1963).
54 $(I)(C_2H_2, C_2D_2, C_2F_2, C_2H_4, C_2H_6)$	E	2	Bradley, J. R., Yee, R. S., Splitting Of Electron Cyclotron Resonance Signals Produced During Chem-Ionization, J. CHEM. PHYS. 43 1968 (1964).
55 $(H_2)(Ar)$	T	2	Brau, Charles A., Koch, James C., Carrier, George F., Transient Phenomena In Dissociative Reactions, PHYS. FLUIDS 9 1440 (1966).
56 $(H_2)(H_2)$	T	4	Brown, R. G., Jr., Inelastic Dissociation And Charge Exchange Scattering Of Protons By Nitrogen, AFRL-66-330, AD-660 440 (1966).
57 $(H_2)(I_2)$	E	1	Britten, Doyle, Davidson, Norman, Schell, Garry, Shock Waves In Chemical Kinetics The Rate Of Dissociation Of Molecular Iodine, DISC. FARRAR SYM. 17 56 (1954).
58 $(I_2)(Ar, He, N_2, O_2, Cl_2)(I)(I_2)(Ar, He, N_2, O_2, Cl_2)$	E	1	Britten, Doyle, Davidson, Norman, Cohen, William, Schell, Garry, Shock waves In Chemical Kinetics Further Studies On The Rate Of Dissociation Of Molecular Iodine, J. CHEM. PHYS. 25 404 (1956).
59 $(Ar)(H_2)$	E	4	Brackenhurst, R., On The Excitation Of Argon By High-Energy Radiation, J. CHEM. PHYS. 42 1852 (1965).
60 $(H_2)(H_2, N_2, O_2, Cl_2, CH_4)$	E	4	Browning, R., Gilbody, M. B., Fragmentation Of Molecular Gases By 5-65 KeV Protons, J. PHYS. B 1 1149 (1969).
61 $(H_2)(H_2, N_2, O_2, Cl_2, CH_4)$	E	4	Browning, R., Latimer, C. J., Gilbody, M. B., Fragmentation Of Molecular Gases By 5-65 KeV He ⁺ Ions, J. PHYS. B 2 534 (1969).
62 $(H_2)(H_2, N_2, O_2)$	E	4	Browning, R., Latimer, C. J., Gilbody, M. B., Fragmentation Of H ₂ , N ₂ And O ₂ By 5-65 KeV He ⁺ Ions, VI ICPLAC, P.792, THE PIT PRESS, CAMBRIDGE, MASS. (1969).
63 $(H_2)(H_2, N_2, O_2, CO, CH_4)$	E	4	Browning, R., Latimer, C. J., Gilbody, M. B., Ionization And Dissociation Of Molecular Gases By 5-65 KeV Helium Atoms, J. PHYS. B 1 667 (1970).
64 $(F, O_2, Cl_2)(Cl_2)$	E	2	Buhterov, A. M., Bydin, Ye. F., Danel Shli, V. M., Electron Capture By O ₂ And Cl ₂ Molecules Bombarded With Fast Alkali-Metal Atoms, SOVIET PHYS. - TECH. PHYS. 6 496 (1961).
65 $(Cl_2)(Cl_2)(Cl)(Cl_2)(Cl_2)$	E	1	Burns, George, Browne, R. J., Comparison Of High-And Low-Temperature Data For The Cl ₂ Going To Or Coming From 2 Cl Reaction, J. CHEM. PHYS. 53 3318 (1970).
66 $(H_2)(H_2)$	E	6	Butler, J. C., Parcell, L., Total Cross Section For Proton Excitation Of H Atoms, PHYS. LETTERS 14 110 (1965).
67 $(I_2)(Ar, Ar, Ar, Ar)$	E	7	Byron, Stanley R., Measurement Of The Rate Of Dissociation Of Iodine, J. CHEM. PHYS. 30 1388 (1959).
68 $(H_2, N_2, Ar)(N_2)$	E	1	Byron, Stanley, Shock-Tube Measurement Of The Rate Of Dissociation Of Nitrogen, J. CHEM. PHYS. 44 1378 (1966).
69 $(I_2)(Ar)$	E	0	Camer, Morton, O ₂ Vibration Relaxation In Gaseous-Argon Mixtures, J. CHEM. PHYS. 34 444 (1961).
70 $(NH_3)(Ar)$	E	1	Cann, W. G. P., Roth, S. W., Formation Of Nh From Shock-Heated Ammonia, J. CHEM. PHYS. 41 3055 (1964).
71 $(N_2)(H_2)$	E	1	Cory, R., Shock-Tube Study Of The Thermal Dissociation Of Nitrogen, PHYS. OF FLUIDS A 26 (1965).
72 $(I_2)(H_2, Ar, Ar)$	E	3	Coudane, R., Delfosse, J. M., Energy Spectrum Of Protons Produced In Collisional Dissociation Of Fast H ₂ ⁺ Ions, J. PHYS. B 1 813 (1969).
73 $(H_2, O_2)(H_2, Ar)$ (Calc. By Abstract Only)	E	4	Coudane, R., Delfosse, J. M., Steepert, J., Study Of The Dissociation Of H ₂ ⁺ And O ₂ ⁺ Ions By Passage Through Gas, ANN. SOC. SCI. BRUX., SER. 1, 76 127 (1962).
74 $(H_2)(H_2, Ar)$	E	4	Coudane, R., Delfosse, J. M., Energy Distribution Of Protons Produced By H ₂ ⁺ Dissociation In Gas Targets, P. 599, 5TH INT. CONF. ON COLLISIONS, Leningrad (1967).
75 $(H_2)(H_2)$	E	4	Coudane, R., Delfosse, J. M., Energy Spectrum Of Protons Produced In Collisional Dissociation Of Fast H ₂ ⁺ Ions, PROC. PHYS. SOC., LONDON 10 813 (1968).
76 $(H_2, O_2, Ar)(H_2, O_2, Ar)$	E	1	Cernak, V., Herman, Z., Ionizing Reactions Of Noble Gas Atoms In Metastable States With Polyatomic Molecules, COLLECTION CHEM. CHIM. COMMUN. 30 169 (1965).
77 $(H_2, O_2, Ar)(H_2, O_2, Ar)$	E	1	Cernak, V., Herman, Z., Ionization Of Polyatomic Molecules In Collisions With Excited Metastable Noble Gas Atoms, CONF-66-25 1966, 12TH ANN. CONF. MASS SPECTRY, AND APPL. TECH., MINTNEAL, JUN (1966).
78 Under Test. By Abstract Only	E	2	Cernak, V., Herman, Z., Molecular Dissociation In Charge-Transfer Reactions, NUCLEONICS 19 100 (1961).
79 $(H_2, O_2, Ar)(H_2, O_2, Ar)$ $(H_2, O_2, Ar)(H_2)$	E	7	Chabbers, F. S., Ions And Dissociation Products Obtained From A Hydrogen Of Ion Source, JCL-14271 (1965).
80 $(H_2, O_2)(H_2)$	E	4	Chabbers, F. S., Radio-Frequency Ion Source Producing Vibrationally Excited H ₂ ⁺ , REV. SCI. INSTRUM. 35 41 (1964).
81 $(H_2, O_2)(H_2)$	E	4	Chabbers, F. S., Dissociation Of Vibrationally Excited Molecular Hydrogen Ions In Hydrogen Gas, JCL-7966 (1964).

REACTANTS	EXP (IN TEMP.	T RANGE	REFERENCE
82 $(H_2^+)(H_2, CO, CH_4, H_2O)(H_2^+)(H_2, CO, CH_4, H_2O)$	E	4	Chambers, E. J., Neutralization of Fast Hydrogen Ions Colliding with H_2 , CO , CH_4 , and H_2O Molecules, UCM-14216 (1965).
83 $(H_2^+, H_2^+)(H_2)$	E	4	Chambers, E. J., Dissociation of Molecular Hydrogen Ions Enhanced by Ion-Source Operation, PHYS. REV. 139 A1944 (1965).
84 $(D_2^+)(Ar, N_2)$	E	2	Chapman, Roy Lunsford, Jr., Collision-Induced Dissociation of D_2^+ Ions by Argon and Nitrogen, THESIS, THE UNIVERSITY OF FLORIDA (1964).
85 $(D_2^+)(Ar, N_2)$	E	3	Chapman, R. L., Deverspike, L. D., Bailey, T. L., Collision-Induced Dissociation of D_2^+ Ions by Argon and Nitrogen, J. CHEM. PHYS. 45 4377 (1966).
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396	(C ₂ H ₂) ⁺ (HE)	(C ⁺) ⁺ (CH ₂)	227
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(NO ⁺) ⁺)-(NE)	399				
(NO ⁺) ⁺)-(NO)	290				
(J) ⁺)-(C ₂ D ₂)	54				
(J) ⁺)-(C ₂ H ₂)	54				
(J) ⁺)-(C ₂ H ₄)	54				
(J) ⁺)-(C ₂ H ₆)	54				
(J) ⁺)-(C ₂ H ₈)	54				
(J) ⁺)-(C ₂ H ₁₀)	54				
(J) ⁺)-(C ₂ H ₁₂)	54				
(J) ⁺)-(C ₂ H ₁₄)	54				
(J) ⁺)-(C ₂ H ₁₆)	54				
(J) ⁺)-(C ₂ H ₁₈)	54				
(J) ⁺)-(C ₂ H ₂₀)	54				
(J) ⁺)-(C ₂ H ₂₂)	54				
(J) ⁺)-(C ₂ H ₂₄)	54				
(J) ⁺)-(C ₂ H ₂₆)	54				
(J) ⁺)-(C ₂ H ₂₈)	54				
(J) ⁺)-(C ₂ H ₃₀)	54				
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(J) ⁺)-(C ₂ H ₃₄)	54				
(J) ⁺)-(C ₂ H ₃₆)	54				
(J) ⁺)-(C ₂ H ₃₈)	54				
(J) ⁺)-(C ₂ H ₄₀)	54				
(J) ⁺)-(C ₂ H ₄₂)	54				
(J) ⁺)-(C ₂ H ₄₄)	54				
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(J) ⁺)-(C ₂ H ₁₀₆)	54				
(J) ⁺)-(C ₂ H ₁₀₈)	54				

(U ⁺) ₀ (C ₂ H ₆)	(Cat. by Abstract Only)			
262				
(C ⁺) ₀ (CH ₃ OH)	(Cat. by Abstract Only)			
262				
(U ⁺) ₀ (C ₂ H ₆)	(Cat. by Abstract Only)			
262				
(U ⁺) ₀ (CC ₂)	(Cat. by Abstract Only)			
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(G ⁺) ₀ (H ₂ O)	(Cat. by Abstract Only)			
262				
(O ⁺) ₀ (H ₂ S)				
261				
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402	425	430		
(O ⁺) ₀ (SO)				
493	430			
(G ⁺) ₀ (J ₂)				
240	373	374	403	420
(G ⁺) ₀ (AP)				
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132				
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Section II

Bibliography of Molecular Dissociation in Heavy Particle Collisions 1971-75

[illegible]

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- 392.- Given distribution as shown in TID-4500-R66, Magnetic Fusion Energy,
- 590. Experimental Plasma Physics (Distribution Category UC-20f)