U.S. DEPARTMENT OF COMMERCE
National Bureau of Standards

NBS Special Publication 708

Standard Reference Data Publications 1964-1984

Joan C. Sauerwein and Geraldine R. Dalton

National Bureau of Standards

The National Bureau of Standards[1] was established by an act of Congress on March 3, 1901. The Bureau's overall goal is to strengthen and advance the nation's science and technology and facilitate their effective application for public benefit. To this end, the Bureau conducts research and provides: (1) a basis for the nation's physical measurement system, (2) scientific and technological services for industry and government, (3) a technical basis for equity in trade, and (4) technical services to promote public safety. The Bureau's technical work is performed by the National Measurement Laboratory, the National Engineering Laboratory, the Institute for Computer Sciences and Technology, and the Institute for Materials Science and Engineering.

The National Measurement Laboratory

Provides the national system of physical and chemical measurement; coordinates the system with measurement systems of other nations and furnishes essential services leading to accurate and uniform physical and chemical measurement throughout the Nation's scientific community, industry, and commerce; provides advisory and research services to other Government agencies; conducts physical and chemical research; develops, produces, and distributes Standard Reference Materials; and provides calibration services. The Laboratory consists of the following centers:

- Basic Standards[2]
- Radiation Research
- Chemical Physics
- Analytical Chemistry

The National Engineering Laboratory

Provides technology and technical services to the public and private sectors to address national needs and to solve national problems; conducts research in engineering and applied science in support of these efforts; builds and maintains competence in the necessary disciplines required to carry out this research and technical service; develops engineering data and measurement capabilities; provides engineering measurement traceability services; develops test methods and proposes engineering standards and code changes; develops and proposes new engineering practices; and develops and improves mechanisms to transfer results of its research to the ultimate user. The Laboratory consists of the following centers:

- Applied Mathematics
- Electronics and Electrical Engineering[2]
- Manufacturing Engineering
- Building Technology
- Fire Research
- Chemical Engineering[2]

The Institute for Computer Sciences and Technology

Conducts research and provides scientific and technical services to aid Federal agencies in the selection, acquisition, application, and use of computer technology to improve effectiveness and economy in Government operations in accordance with Public Law 89-306 (40 U.S.C. 759), relevant Executive Orders, and other directives; carries out this mission by managing the Federal Information Processing Standards Program, developing Federal ADP standards guidelines, and managing Federal participation in ADP voluntary standardization activities; provides scientific and technological advisory services and assistance to Federal agencies; and provides the technical foundation for computer-related policies of the Federal Government. The Institute consists of the following centers:

- Programming Science and Technology
- Computer Systems Engineering

The Institute for Materials Science and Engineering

Conducts research and provides measurements, data, standards, reference materials, quantitative understanding and other technical information fundamental to the processing, structure, properties and performance of materials; addresses the scientific basis for new advanced materials technologies; plans research around cross-country scientific themes such as nondestructive evaluation and phase diagram development; oversees Bureau-wide technical programs in nuclear reactor radiation research and nondestructive evaluation; and broadly disseminates generic technical information resulting from its programs. The Institute consists of the following Divisions:

- Ceramics
- Fracture and Deformation [3]
- Polymers
- Metallurgy
- Reactor Radiation

---

[1] Headquarters and Laboratories at Gaithersburg, MD, unless otherwise noted; mailing address Gaithersburg, MD 20899.
[2] Some divisions within the center are located at Boulder, CO 80303.
[3] Located at Boulder, CO, with some elements at Gaithersburg, MD.

NBS Special Publication 708

Standard Reference Data Publications 1964-1984

Joan C. Sauerwein
Geraldine R. Dalton

Office of Standard Reference Data
National Bureau of Standards
Gaithersburg, MD 20899

Supersedes NBS SP 612

December 1985

U.S. Department of Commerce
Malcolm Baldrige, Secretary

National Bureau of Standards
Ernest Ambler, Director

Library of Congress
Catalog Card Number: 85-600607
National Bureau of Standards
Special Publication 708
Natl. Bur. Stand. (U.S.),
Spec. Publ. 708
143 pages (Dec. 1985)
CODEN: XNBSAV

U.S. Government Printing Office
Washington: 1985

For sale by the Superintendent
of Documents,
U.S. Government Printing Office,
Washington, DC 20402

Foreword

The National Standard Reference Data System was established in 1963 for the purpose of promoting the critical evaluation and dissemination of numerical data of the physical sciences. The program is coordinated by the Office of Standard Reference Data of the National Bureau of Standards but involves the efforts of many groups in universities, government laboratories, and private industry. The primary aim of the program is to provide compilations of critically evaluated physical and chemical property data. These tables are published in the Journal of Physical and Chemical Reference Data, in the NSRDS-NBS series of the National Bureau of Standards, and through other appropriate channels. Other outputs of the program include bibliographies, computer programs for handling data, and databases in magnetic tape format.

This listing includes all publications which have appeared since establishment of this program in 1964. Indexes to authors, properties, and material classes are given, as well as information on ordering publications.

David R. Lide, Director
Office of Standard Reference Data

Contents

Standard Reference Data Publications 1964 - 1984

Joan C. Sauerwein and Geraldine R. Dalton

Office of Standard Reference Data, National Bureau of Standards, Gaithersburg, MD 20899

The National Bureau of Standards' Office of Standard Reference Data manages a network of data centers that prepare evaluated data bases of physical and chemical properties of substances. Data bases are available in printed form, on magnetic tapes and through on-line computer networks. This document provides a comprehensive list of the products available from the National Standard Reference Data System (NSRDS) for the years 1964-1984, including indexes qualified by author, material, and property terms. Ordering information and current prices can be found at the end of this document.

Key words: bibliographies; chemical properties; evaluated data; indexes; materials properties; physical properties; publication list.

1. Introduction

The National Standard Reference Data System (NSRDS), established in 1963, coordinates on a national scale the compilation and dissemination of reference data in the physical sciences. Under the Standard Reference Data Act (Public Law 90-396) the National Bureau of Standards (NBS) of the U.S. Department of Commerce has the primary responsibility in the Federal Government for providing reliable scientific and technical data. The Office of Standard Reference Data at NBS coordinates a complex of data evaluation centers, located in university, industrial, and other Government laboratories as well as within NBS. These centers compile and critically evaluate numerical physical and chemical property data retrieved from the world's scientific literature.

This publications list includes NSRDS data compilations, critical reviews, and other publications which are available from various sources. Indexes by author, property, and materials class are included. Prices and ordering instructions for publications listed are given in this document and further information may be obtained from:

Office of Standard Reference Data
National Bureau of Standards
Gaithersburg, MD 20899

Reprints

1

Gaseous Diffusion Coefficients — T. R. Marrero and E. A. Mason. J Phys Chem Ref Data **1**, 1(1972).

2

Selected Values of Critical Supersaturation for Nucleation of Liquids from the Vapor — G. M. Pound. J Phys Chem Ref Data **1**, 119(1972).

3

Selected Values of Evaporation and Condensation Coefficients for Simple Substances — G. M. Pound. J Phys Chem Ref Data **1**, 135(1972).

4

Atlas of the Observed Absorption Spectrum of Carbon Monoxide between 1060 and 1900 Å — S. G. Tilford and J. D. Simmons. J Phys Chem Ref Data **1**, 147(1972).

5

Tables of Molecular Vibrational Frequencies, Part 5 — Takehiko Shimanouchi. J Phys Chem Ref Data **1**, 189(1972).

6

Selected Values of Heats of Combustion and Heats of Formation of Organic Compounds Containing the Elements C, H, N, O, P, and S — Eugene S. Domalski. J Phys Chem Ref Data **1**, 221(1972).

7

Thermal Conductivity of the Elements — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. J Phys Chem Ref Data **1**, 279(1972).

8

The Spectrum of Molecular Oxygen — Paul H. Krupenie. J Phys Chem Ref Data **1**, 423(1972).

9

A Critical Review of the Gas-Phase Reaction Kinetics of the Hydroxyl Radical — William E. Wilson, Jr. J Phys Chem Ref Data **1**, 535(1972).

10

Molten Salts: Volume 3, Nitrates, Nitrites, and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Ursula Krebs, H. F. Siegenthaler, and Reginald P. T. Tomkins. J Phys Chem Ref Data **1**, 581(1972).

11

High Temperature Properties and Decomposition of Inorganic Salts, Part 3. Nitrates and Nitrites — Kurt H. Stern. J Phys Chem Ref Data **1**, 747(1972).

12

High-Pressure Calibration: A Critical Review — D. L. Decker, W. A. Bassett, Leo Merrill, H. T. Hall, and J. D. Barnett. J Phys Chem Ref Data **1**, 773(1972).

13

The Surface Tension of Pure Liquid Compounds — Joseph J. Jasper. J Phys Chem Ref Data **1**, 841(1972).

14

Microwave Spectra of Molecules of Astrophysical Interest, I. Formaldehyde, Formamide, and Thioformaldehyde — Donald R. Johnson, Frank J. Lovas, and William H. Kirchhoff. J Phys Chem Ref Data **1**, 1011(1972).

15

Osmotic Coefficients and Mean Activity Coefficients of Uni-Univalent Electrolytes in Water at 25 °C — Walter J. Hamer and Yung-Chi Wu. J Phys Chem Ref Data **1**, 1047(1972).

16

The Viscosity and Thermal Conductivity Coefficients of Gaseous and Liquid Fluorine — Howard J. M. Hanley and R. Prydz. J Phys Chem Ref Data **1**, 1101(1972).

17

Microwave Spectra of Molecules of Astrophysical Interest, II. Methylenimine — William H. Kirchhoff, Donald R. Johnson, and Frank J. Lovas. J Phys Chem Ref Data **2**, 1(1973).

18

Analysis of Specific Heat Data in the Critical Region of Magnetic Solids — F. J. Cook. J Phys Chem Ref Data **2**, 11(1973).

19

Evaluated Chemical Kinetic Rate Constants for Various Gas Phase Reactions — Keith Schofield. J Phys Chem Ref Data **2**, 25(1973).

20

Atomic Transition Probabilities for Forbidden Lines of the Iron Group Elements (A Critical Data Compilation for Selected Lines) — Melvin W. Smith and Wolfgang L. Wiese. J Phys Chem Ref Data **2**, 85(1973).

21

Tables of Molecular Vibrational Frequencies, Part 6 — Takehiko Shimanouchi. J Phys Chem Ref Data **2**, 121(1973).

22

Compilation of Energy Band Gaps in Elemental and Binary Compound Semiconductors and Insulators — W. H. Strehlow and E. L. Cook. J Phys Chem Ref Data **2**, 163(1973).

23

Microwave Spectra of Molecules of Astrophysical Interest, III. Methanol — R. M. Lees, Frank J. Lovas, William H. Kirchhoff, and Donald R. Johnson. J Phys Chem Ref Data **2**, 205(1973).

24

Microwave Spectra of Molecules of Astrophysical Interest, IV. Hydrogen Sulfide — Paul Helminger, Frank C. De Lucia, and William H. Kirchhoff. J Phys Chem Ref Data **2**, 215(1973).

25

Tables of Molecular Vibrational Frequencies, Part 7 — Takehiko Shimanouchi. J Phys Chem Ref Data 2, 225(1973).

26

Energy Levels of Neutral Helium (^{4}He I) — William C. Martin. J Phys Chem Ref Data 2, 257(1973).

27

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data 2, 267(1973).

28

Compilation of the Static Dielectric Constant of Inorganic Solids — K. F. Young and Hans P. R. Frederikse. J Phys Chem Ref Data 2, 313(1973).

29

Soft X-Ray Emission Spectra of Metallic Solids: Critical Review of Selected Systems — Archie J. McAlister, Ronald C. Dobbyn, John R. Cuthill, and M. L. Williams. J Phys Chem Ref Data 2, 411(1973).

30

Ideal Gas Thermodynamic Properties of Ethane and Propane — Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data 2, 427(1973).

31

An Analysis of Coexistence Curve Data for Several Binary Liquid Mixtures Near Their Critical Points — A. Stein and G. F. Allen. J Phys Chem Ref Data 2, 439(1973).

32

Rate Constants for the Reactions of Atomic Oxygen (O ^{3}P) with Organic Compounds in the Gas Phase — John T. Herron and Robert E. Huie. J Phys Chem Ref Data 2, 467(1973).

33

First Spectra of Neon, Argon, and Xenon 136 in the 1.2-4.0 μm Region — Curtis J. Humphreys. J Phys Chem Ref Data 2, 519(1973).

34

Elastic Properties of Metals and Alloys, I. Iron, Nickel, and Iron-Nickel Alloys — Hassell M. Ledbetter and R. P. Reed. J Phys Chem Ref Data 2, 531(1973).

35

The Viscosity and Thermal Conductivity Coefficients of Dilute Argon, Krypton, and Xenon — Howard J. M. Hanley. J Phys Chem Ref Data 2, 619(1973).

36

Diffusion in Copper and Copper Alloys, Part I. Volume and Surface Self-Diffusion in Copper — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data 2, 643(1973).

37

The 1973 Least-Squares Adjustment of the Fundamental Constants — E. Richard Cohen and Barry N. Taylor. J Phys Chem Ref Data 2, 663(1973).

38

The Viscosity and Thermal Conductivity Coefficients of Dilute Nitrogen and Oxygen — Howard J. M. Hanley and James F. Ely. J Phys Chem Ref Data 2, 735(1973).

39

Thermodynamic Properties of Nitrogen Including Liquid and Vapor Phases from 63 K to 2000 K with Pressures to 10,000 Bar — Richard T. Jacobsen and Richard B. Stewart. J Phys Chem Ref Data 2, 757(1973).

40

Thermodynamic Properties of Helium-4 from 2 to 1500 K at Pressures to 10^8 Pa — Robert D. McCarty. J Phys Chem Ref Data 2, 923(1973).

41

Molten Salts: Volume 4, Part 1, Fluorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, G. L. Gardner, Ursula Krebs, and Reginald P. T. Tomkins. J Phys Chem Ref Data 3, 1(1974).

42

Ideal Gas Thermodynamic Properties of Eight Chloro- and Fluoromethanes — A. S. Rodgers, Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data 3, 117(1974).

43

Ideal Gas Thermodynamic Properties of Six Chloroethanes — Jing Chao, A. S. Rodgers, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data 3, 141(1974).

44

Critical Analysis of Heat-Capacity Data and Evaluation of Thermodynamic Properties of Ru, Ph, Pd, Ir, and Pt from 0 to 300 K. A Survey of the Literature Data on Osmium — George T. Furukawa, Martin L. Reilly, and John S. Gallagher. J Phys Chem Ref Data 3, 163(1974).

45

Microwave Spectra of Molecules of Astrophysical Interest, V. Water Vapor — Frank C. De Lucia, Paul Helminger, and William H. Kirchhoff. J Phys Chem Ref Data 3, 211(1974).

46

Microwave Spectra of Molecules of Astrophysical Interest, VI. Carbonyl Sulfide and Hydrogen Cyanide — Arthur G. Maki. J Phys Chem Ref Data 3, 221(1974).

47

Microwave Spectra of Molecules of Astrophysical Interest, VII. Carbon Monoxide, Carbon Monosulfide, and Silicon Monoxide — Frank J. Lovas and Paul H. Krupenie. J Phys Chem Ref Data 3, 245(1974)..

48

Microwave Spectra of Molecules of Astrophysical Interest, VIII. Sulfur Monoxide — Eberhard Tiemann. J Phys Chem Ref Data **3**, 259(1974).

49

Tables of Molecular Vibrational Frequencies, Part 8 — Takehiko Shimanouchi. J Phys Chem Ref Data **3**, 269(1974).

50

JANAF Thermochemical Tables, 1974 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, A. T. Hu, H. Prophet, A. N. Syverud, and L. C. Walker. J Phys Chem Ref Data **3**, 311(1974).

51

High Temperature Properties and Decomposition of Inorganic Salts, Part 4. Oxy-Salts of the Halogens — Kurt H. Stern. J Phys Chem Ref Data **3**, 481(1974).

52

Diffusion in Copper and Copper Alloys, Part II. Copper-Silver and Copper-Gold Systems — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **3**, 527(1974).

53

Microwave Spectral Tables, I. Diatomic Molecules — Frank J. Lovas and Eberhard Tiemann. J Phys Chem Ref Data **3**, 609(1974).

54

Ground Levels and Ionization Potentials for Lanthanide and Actinide Atoms and Ions — William C. Martin, Lucy Hagan, Joseph Reader, and Jack Sugar. J Phys Chem Ref Data **3**, 771(1974).

55

Behavior of the Elements at High Pressures — John Francis Cannon. J Phys Chem Ref Data **3**, 781(1974).

56

Reference Wavelengths from Atomic Spectra in the Range 5Å to 25000Å — Victor Kaufman and Bengt Edlén. J Phys Chem Ref Data **3**, 825(1974).

57

Elastic Properties of Metals and Alloys, II. Copper — Hassell M. Ledbetter and E. R. Naimon. J Phys Chem Ref Data **3**, 897(1974).

58

A Critical Review of H-Atom Transfer in the Liquid Phase: Chlorine Atom, Alkyl, Trichloromethyl, Alkoxy, and Alkylperoxy Radicals — D. G. Hendry, T. Mill, L. Piszkiewicz, J. A. Howard, and H. K. Eigenmann. J Phys Chem Ref Data **3**, 937(1974).

59

The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Argon, Krypton, Xenon, Nitrogen, and Oxygen — Howard J. M. Hanley, Robert D. McCarty, and W. M. Haynes. J Phys Chem Ref Data **3**, 979(1974).

60

JANAF Thermochemical Tables, 1975 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, H. Prophet, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **4**, 1(1975).

61

Diffusion in Copper and Copper Alloys, Part III. Diffusion in Systems Involving Elements of the Groups IA, IIA, IIIB, IVB, VB, and VIIB — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **4**, 177(1975).

62

Ideal Gas Thermodynamic Properties of Ethylene and Propylene — Jing Chao and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 251(1975).

63

Atomic Transition Probabilities for Scandium and Titanium (A Critical Data Compilation of Allowed Lines) — Wolfgang L. Wiese and Jeffrey R. Fuhr. J Phys Chem Ref Data **4**, 263(1975).

64

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

65

Ideal Gas Thermodynamic Properties of Six Fluoroethanes — S. S. Chen, A. S. Rodgers, Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 441(1975).

66

Ideal Gas Thermodynamic Properties of the Eight Bromo- and Iodomethanes — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data **4**, 457(1975).

67

Atomic Form Factors, Incoherent Scattering Functions, and Photon Scattering Cross Sections — John H. Hubbell, W. J. Veigele, E. A. Briggs, R. T. Brown, D. T. Cromer, and R. J. Howerton. J Phys Chem Ref Data **4**, 471(1975).

68

Binding Energies in Atomic Negative Ions — H. Hotop and W. C. Lineberger. J Phys Chem Ref Data **4**, 539(1975).

69

A Survey of Electron Swarm Data — J. Dutton. J Phys Chem Ref Data **4**, 577(1975).

70

Ideal Gas Thermodynamic Properties and Isomerization of n-Butane and Isobutane — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 859(1975).

71

Molten Salts: Volume 4, Part 2, Chlorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., G. L. Gardner, Ursula Krebs, and S. K. Singer. J Phys Chem Ref Data **4**, 871(1975).

73

Scaled Equation of State Parameters for Gases in the Critical Region — J. M. H. Levelt Sengers, W. L. Greer, and Jan V. Sengers. J Phys Chem Ref Data **5**, 1(1976).

74

Microwave Spectra of Molecules of Astrophysical Interest, IX. Acetaldehyde — A. Bauder, Frank J. Lovas, and Donald R. Johnson. J Phys Chem Ref Data **5**, 53(1976).

75

Microwave Spectra of Molecules of Astrophysical Interest, X. Isocyanic Acid — G. Winnewisser, W. H. Hocking, and M. C. L. Gerry. J Phys Chem Ref Data **5**, 79(1976).

76

Diffusion in Copper and Copper Alloys, Part IV. Diffusion in Systems Involving Elements of Group VIII — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **5**, 103(1976).

77

A Critical Review of the Stark Widths and Shifts of Spectral Lines from Non-Hydrogenic Atoms — N. Konjević and J. R. Roberts. J Phys Chem Ref Data **5**, 209(1976).

78

Experimental Stark Widths and Shifts for Non-Hydrogenic Spectral Lines of Ionized Atoms (A Critical Review and Tabulation of Selected Data) — N. Konjević and Wolfgang L. Wiese. J Phys Chem Ref Data **5**, 259(1976).

79

Atlas of the Absorption Spectrum of Nitric Oxide (NO) between 1420 and 1250 Å — E. Miescher and F. Alberti. J Phys Chem Ref Data **5**, 309(1976).

80

Ideal Gas Thermodynamic Properties of Propanone and 2-Butanone — Jing Chao and Bruno J. Zwolinski. J Phys Chem Ref Data **5**, 319(1976).

81

Refractive Index of Alkali Halides and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **5**, 329(1976).

82

Tables of Critically Evaluated Oscillator Strengths for the Lithium Isoelectronic Sequence — Georgia A. Martin and Wolfgang L. Wiese. J Phys Chem Ref Data **5**, 537(1976).

83

Ideal Gas Thermodynamic Properties of Six Chlorofluoromethanes — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **5**, 571(1976).

84

Survey of Superconductive Materials and Critical Evaluation of Selected Properties — Benjamin W. Roberts. J Phys Chem Ref Data **5**, 581(1976).

85

Nuclear Spins and Moments — Gladys H. Fuller. J Phys Chem Ref Data **5**, 835(1976).

86

Nuclear Moments and Moment Ratios as Determined by Mössbauer Spectroscopy — John G. Stevens and B. D. Dunlap. J Phys Chem Ref Data **5**, 1093(1976).

87

Rate Coefficients for Ion-Molecule Reactions, I. Ions Containing C and H — L. Wayne Sieck and Sharon G. Lias. J Phys Chem Ref Data **5**, 1123(1976).

88

Microwave Spectra of Molecules of Astrophysical Interest, XI. Silicon Sulfide — Eberhard Tiemann. J Phys Chem Ref Data **5**, 1147(1976).

90

Diffusion in Copper and Copper Alloys, Part V. Diffusion in Systems Involving Elements of Group VA — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **6**, 1(1977).

91

The Calculated Thermodynamic Properties of Superfluid Helium-4 — James S. Brooks and Russell J. Donnelly. J Phys Chem Ref Data **6**, 51(1977).

92

Thermodynamic Properties of Normal and Deuterated Methanols — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **6**, 105(1977).

93

The Spectrum of Molecular Nitrogen — Alf Lofthus and Paul H. Krupenie. J Phys Chem Ref Data **6**, 113(1977).

94

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

95

The Activity and Osmotic Coefficients of Aqueous Calcium Chloride at 298.15 K — Bert R. Staples and Ralph L. Nuttall. J Phys Chem Ref Data **6**, 385(1977).

96

Molten Salts: Volume 4, Part 3, Bromides and Mixtures, Iodides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., and S. K. Singer. J Phys Chem Ref Data **6**, 409(1977).

97

The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Methane — Howard J. M. Hanley, W. M. Haynes, and Robert D. McCarty. J Phys Chem Ref Data **6**, 597(1977).

98

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Silver Systems — Y. Austin Chang, Daniel Goldberg, and Joachim P. Neumann. J Phys Chem Ref Data **6**, 621(1977)

99

Crystal Data Space-Group Tables — Alan D. Mighell, Helen M. Ondik, and Bettijoyce Breen Molino. J Phys Chem Ref Data 6, 675(1977).

100

Energy Levels of One-Electron Atoms — Glen W. Erickson. J Phys Chem Ref Data 6, 831(1977).

101

Rate Constants for Reactions of ClO_x of Atmospheric Interest — R. T. Watson. J Phys Chem Ref Data 6, 871(1977).

102

NMR Spectral Data: A Compilation of Aromatic Proton Chemical Shifts in Mono- and Di-Substituted Benzene — B. L. Shapiro and L. E. Mohrmann. J Phys Chem Ref Data 6, 919(1977).

103

Tables of Molecular Vibrational Frequencies. Consolidated Volume II — Takehiko Shimanouchi. J Phys Chem Ref Data 6, 993(1977).

104

Effects of Isotopic Composition, Temperature, Pressure, and Dissolved Gases on the Density of Liquid Water — George S. Kell. J Phys Chem Ref Data 6, 1109(1977).

105

Viscosity of Water Substance - New International Formulation and Its Background — A. Nagashima. J Phys Chem Ref Data 6, 1133(1977).

105 Erratum

Erratum: Viscosity of Water Substance - New International Formulation and Its Background — A. Nagashima. J Phys Chem Ref Data 12, 403p. (1983).

106

A Correlation of the Existing Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethane — Howard J. M. Hanley, K. E. Gubbins, and S. Murad. J Phys Chem Ref Data 6, 1167(1977).

107

Elastic Properties of Zinc: A Compilation and a Review — Hassell M. Ledbetter. J Phys Chem Ref Data 6, 1181(1977).

108

Behavior of the AB-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data 6, 1205(1977).

109

Energy Levels of Manganese, Mn I through Mn XXV — Charles H. Corliss and Jack Sugar. J Phys Chem Ref Data 6, 1253(1977).

110

Tables of Atomic Spectral Lines for the 10 000 Å to 40 000 Å Region — Michael Outred. J Phys Chem Ref Data 7, 1(1978).

111

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions The Alkaline Earth Metal Halides — Robert Goldberg and Ralph L. Nuttall. J Phys Chem Ref Data 7, 263(1978).

112

Microwave Spectra of Molecules of Astrophysical Interest, XII. Hydroxyl Radical — Robert A. Beaudet and Robert L. Poynter. J Phys Chem Ref Data 7, 311(1978).

113

Ideal Gas Thermodynamic Properties of Methanoic and Ethanoic Acids — Jing Chao and Bruno J. Zwolinski. J Phys Chem Ref Data 7, 363(1978).

114

Critical Review of Hydrolysis of Organic Compounds in Water Under Environmental Conditions — W. Mabey and T. Mill. J Phys Chem Ref Data 7, 383(1978).

115

Ideal Gas Thermodynamic Properties of Phenol and Cresols — Shanti A. Kudchadker, Arvind P. Kudchadker, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data 7, 417(1978).

116

Densities of Liquid $CH_{4-a}X_a$ (X=Br,I) and $CH_{4-(a+b+c+d)}F_aCl_bBr_cI_d$ Halomethanes — Arvind P. Kudchadker, Shanti A. Kudchadker, P. R. Patnaik, and P. P. Mishra. J Phys Chem Ref Data 7, 425(1978).

117

Microwave Spectra of Molecules of Astrophysical Interest, XIII. Cyanoacetylene — Walter J. Lafferty and Frank J. Lovas. J Phys Chem Ref Data 7, 441(1978).

118

Atomic Transition Probabilities for Vanadium, Chromium, and Manganese (A Critical Data Compilation of Allowed Lines) — S. M. Younger, Jeffrey R. Fuhr, Georgia A. Martin, and Wolfgang L. Wiese. J Phys Chem Ref Data 7, 495(1978).

119

Thermodynamic Properties of Ammonia — Lester Haar and John S. Gallagher. J Phys Chem Ref Data 7, 635(1978).

120

JANAF Thermochemical Tables, 1978 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data 7, 793(1978).

121

Viscosity of Liquid Water in the Range -8°C to 150°C — Joseph Kestin, Mordechai Sokolov, and William A. Wakeham. J Phys Chem Ref Data 7, 941(1978).

122

The Molar Volume (Density) of Solid Oxygen in Equilibrium with Vapor — Hans M. Roder. J Phys Chem Ref Data 7, 949(1978).

123

Thermal Conductivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, S. G. Oh, and T. N. Havill. J Phys Chem Ref Data 7, 959(1978)

124

Semi-Empirical Extrapolation and Estimation of Rate Constants for Abstraction of H from Methane by H, O, HO, and O_2 — Robert Shaw. J Phys Chem Ref Data 7, 1179(1978).

125

Energy Levels of Vanadium, V I through V XXIII — Jack Sugar and Charles H. Corliss. J Phys Chem Ref Data 7, 1191(1978).

126

Recommended Atomic Electron Binding Energies, 1s to $6p_{3/2}$, for the Heavy Elements, Z = 84 to 103 — F. T. Porter and M. S. Freedman. J Phys Chem Ref Data 7, 1267(1978).

127

Ideal Gas Thermodynamic Properties of $CH_{4-(a+b+c+d)}F_aCl_bBr_cI_d$ Halomethanes — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data 7, 1285(1978).

128

Critical Review of Vibrational Data and Force Field Constants for Polyethylene — John Barnes and Bruno Fanconi. J Phys Chem Ref Data 7, 1309(1978).

129

Tables of Molecular Vibrational Frequencies, Part 9 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data 7, 1323(1978).

130

Microwave Spectral Tables II. Triatomic Molecules — Frank J. Lovas. J Phys Chem Ref Data 7, 1445(1978).

131

Energy Levels of Titanium, Ti I through Ti XXII — Charles H. Corliss and Jack Sugar. J Phys Chem Ref Data 8, 1(1979).

132

The Spectrum and Energy Levels of the Neutral Atom of Boron (B I) — G. A. Odintzova and A. R. Striganov. J Phys Chem Ref Data 8, 63(1979).

133

Relativistic Atomic Form Factors and Photon Coherent Scattering Cross Sections — John H. Hubbell and I. Øverbø . J Phys Chem Ref Data 8, 69(1979).

134

Microwave Spectra of Molecules of Astrophysical Interest, XIV. Vinyl Cyanide (Acrylonitrile) — M. C. L. Gerry, K. Yamada, and G. Winnewisser. J Phys Chem Ref Data 8, 107(1979).

135

Molten Salts: Volume 4, Part 4, Mixed Halide Melts. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, and Carolyn B. Allen. J Phys Chem Ref Data 8, 125(1979).

136

Atomic Radiative and Radiationless Yields for K and L Shells — Morris O. Krause. J Phys Chem Ref Data 8, 307(1979).

137

Natural Widths of Atomic K and L Levels, Kα X-Ray Lines and Several KLL Auger Lines — Morris O. Krause and J. H. Oliver. J Phys Chem Ref Data 8, 329(1979).

138

Electrical Resistivity of Alkali Elements — T. C. Chi. J Phys Chem Ref Data 8, 339(1979).

139

Electrical Resistivity of Alkaline Earth Elements — T. C. Chi. J Phys Chem Ref Data 8, 439(1979).

140

Vapor Pressures and Boiling Points of Selected Halomethanes — Arvind P. Kudchadker, Shanti A. Kudchadker, R. P. Shukla, and P. R. Patnaik. J Phys Chem Ref Data 8, 499(1979).

141

Ideal Gas Thermodynamic Properties of Selected Bromoethanes and Iodoethane — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data 8, 519(1979).

142

Thermodynamic Properties of Normal and Deuterated Naphthalenes — S. S. Chen, Shanti A. Kudchadker, and Randolph C. Wilhoit. J Phys Chem Ref Data 8, 527(1979).

143

Microwave Spectra of Molecules of Astrophysical Interest, XV. Propyne — A. Bauer, D. Boucher, J. Burie, J. Demaison, and A. Dubrulle. J Phys Chem Ref Data 8, 537(1979).

144

A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Propane — Paul M. Holland, Howard J. M. Hanley, K. E. Gubbins, and J. M. Haile. J Phys Chem Ref Data 8, 559(1979).

145

Microwave Spectra of Molecules of Astrophysical Interest, XVI. Methyl Formate — A. Bauder. J Phys Chem Ref Data 8, 583(1979).

146

Molecular Structures of Gas-Phase Polyatomic Molecules Determined by Spectroscopic Methods — Marlin D. Harmony, Victor W. Laurie, Robert L. Kuczkowski, Richard H. Schwendeman, D. A. Ramsay, Frank J. Lovas, Walter J. Lafferty, and Arthur G. Maki. J Phys Chem Ref Data 8, 619(1979).

147

Critically Evaluated Rate Constants for Gaseous Reactions of Several Electronically Excited Species — Keith Schofield. J Phys Chem Ref Data 8, 723(1979).

148

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Ethane — M. J. Hiza, R. C. Miller, and Arthur J. Kidnay. J Phys Chem Ref Data 8, 799(1979).

149

Energy levels of Aluminum, Al I through Al XIII — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **8**, 817(1979).

150

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

151

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Iron Chloride and the Bi-Univalent Compounds of Nickel and Cobalt — Robert N. Goldberg, Ralph L. Nuttall, and Bert R. Staples. J Phys Chem Ref Data **8**, 923(1979).

152

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Bi-Univalent Compounds of Lead, Copper, Manganese, and Uranium — Robert N. Goldberg. J Phys Chem Ref Data **8**, 1005(1979).

153

Microwave Spectra of Molecules of Astrophysical Interest, XVII. Dimethyl Ether — Frank J. Lovas, H. Lutz, and H. Dreizler. J Phys Chem Ref Data **8**, 1051(1979).

154

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

155

Electrical Resistivity of Copper, Gold, Palladium, and Silver — R. A. Matula. J Phys Chem Ref Data **8**, 1147(1979).

156

Energy Levels of Magnesium, Mg I through Mg XII — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **9**, 1(1980).

157

Microwave Spectra of Molecules of Astrophysical Interest. XVIII. Formic Acid — Edmond Willemot, Didier Dangoisse, Nicole Monnanteuil, and Jean Bellet. J Phys Chem Ref Data **9**, 59(1980).

158

Refractive Index of Alkaline Earth Halides and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **9**, 161(1980).

159

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **9**, 295(1980).

160

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

161

A Compilation of Kinetic Parameters for the Thermal Degradation of n-Alkane Molecules — D. L. Allara and Robert Shaw. J Phys Chem Ref Data **9**, 523(1980).

162

Refractive Index of Silicon and Germanium and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **9**, 561(1980).

163

Microwave Spectra of Molecules of Astrophysical Interest. XIX. Methyl Cyanide — D. Boucher, J. Burie, A. Bauer, A. Dubrulle, and J. Demaison. J Phys Chem Ref Data **9**, 659(1980).

164

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Propane — R. C. Miller, Arthur J. Kidnay, and M. J. Hiza. J Phys Chem Ref Data **9**, 721(1980).

165

Saturation States of Heavy Water — P. G. Hill and R. D. Chris MacMillan. J Phys Chem Ref Data **9**, 735(1980).

166

The Solubility of Some Sparingly Soluble Lead Salts: An Evaluation of the Solubility in Water and Aqueous Electrolyte Solution — H. Lawrence Clever and Francis J. Johnston. J Phys Chem Ref Data **9**, 751(1980).

167

Molten Salts Data As Reference Standards for Density, Surface Tension, Viscosity and Electrical Conductance: KNO_3 and NaCl — George J. Janz. J Phys Chem Ref Data **9**, 791(1980).

168

Molten Salts: Volume 5, Part 1. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz and Reginald P. T. Tomkins. J Phys Chem Ref Data **9**, 831(1980).

169

Pair, Triplet, and Total Atomic Cross Sections (and Mass Attenuation Coefficients) for 1 MeV-100 GeV Photons in Elements Z=1 to 100 — John H. Hubbell, Heinz A. Gimm, and I. Øverbø . J Phys Chem Ref Data **9**, 1023(1980).

170

Tables of Molecular Vibrational Frequencies, Part 10 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **9**, 1149(1980).

171

An Improved Representative Equation for the Dynamic Viscosity of Water Substance — J. T. R. Watson, R. S. Basu, and Jan V. Sengers. J Phys Chem Ref Data **9**, 1255(1980).

172

Static Dielectric Constant of Water and Steam — M. Uematsu and E. U. Franck. J Phys Chem Ref Data **9**, 1291(1980).

173

Compilation and Evaluation of Solubility Data in the Mercury (I) Chloride-Water System — Y. Marcus. J Phys Chem Ref Data **9**, 1307(1980).

174

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Bi-Univalent Compounds of Zinc, Cadmium, and Ethylene Bis(-Trimethylammonium) Chloride and Iodide — Robert N. Goldberg. J Phys Chem Ref Data **10**, 1(1981).

175

Tables of the Dynamic and Kinematic Viscosity of Aqueous KCl Solutions in the Temperature Range 25-150°C and the Pressure Range 0.1-35 MPa — Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia. J Phys Chem Ref Data **10**, 57(1981).

176

Tables of the Dynamic and Kinematic Viscosity of Aqueous NaCl Solutions in the Temperature Range 20-150°C and the Pressure Range 0.1-35 MPa — Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia. J Phys Chem Ref Data **10**, 71(1981).

177

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. I. Selenium — Umesh Gaur, Hua-Cheng Shu, Aspy Metha, and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 89(1981).

178

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. II. Polyethylene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 119(1981).

179

Energy Levels of Sodium, Na I through Na XI — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **10**, 153(1981).

180

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

181

Ion Product of Water Substance, 0 - 1000°C, 1 - 10,000 Bars. New International Formulation and Its Background — William L. Marshall and E. U. Franck. J Phys Chem Ref Data **10**, 295(1981).

182

Atomic Transition Probabilities for Iron, Cobalt, Nickel: A Critical Data Compilation of Allowed Lines — Jeffrey R. Fuhr, Georgia A. Martin, Wolfgang L. Wiese, and S. M. Younger. J Phys Chem Ref Data **10**, 305(1981).

183

Thermodynamic Tabulations for Selected Phases in the System CaO-Al_2O_3-SiO_2-H_2O at 101.325 kPa (1 atm.) between 273.15 and 1800 K — John L. Haas, Jr., Gilpin R. Robinson, Jr., and Bruce S. Hemingway. J Phys Chem Ref Data **10**, 575(1981).

184

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Thirty-Six Uni-Bivalent Electrolytes — Robert N. Goldberg. J Phys Chem Ref Data **10**, 671(1981).

185

Activity and Osmotic Coefficients of Aqueous Alkali Metal Nitrites — Bert R. Staples. J Phys Chem Ref Data **10**, 765(1981).

186

Activity and Osmotic Coefficients of Aqueous Sulfuric Acid at 298.15 K — Bert R. Staples. J Phys Chem Ref Data **10**, 779(1981).

187

Rate Constants for the Decay and Reactions of the Lowest Electronically Excited Singlet State of Molecular Oxygen in Solution — Francis Wilkinson and James G. Brummer. J Phys Chem Ref Data **10**, 809(1981).

188

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. III. Polyoxides — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 1001(1981).

189

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IV. Polypropylene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 1051(1981).

190

Tables of N_2O Absorption Lines for the Calibration of Tunable Infrared Lasers from 522 cm^{-1} to 657 cm^{-1} and from 1115 cm^{-1} to 1340 cm^{-1} — W. B. Olson, Arthur G. Maki, and Walter J. Lafferty. J Phys Chem Ref Data **10**, 1065(1981).

191

Microwave Spectra of Molecules of Astrophyical Interest. XX. Methane — I. Ozier, M. C. L. Gerry, and A. G. Robiette. J Phys Chem Ref Data **10**, 1085(1981).

192

Energy Levels of Cobalt, Co I through Co XXVII — Jack Sugar and Charles H. Corliss. J Phys Chem Ref Data **10**, 1097(1981).

193

A Critical Review of Henry's Law Constants for Chemicals of Environmental Interest — Donald Mackay and Wan Ying Shiu. J Phys Chem Ref Data **10**, 1175(1981).

194

Journal of Physical and Chemical Reference Data Cummulative Indexes, Volumes 1 to 10 J Phys Chem Ref Data **10**, 1205(1981).

195

A Fundamental Equation of State for Heavy Water — P. G. Hill, R. D. Chris MacMillan, and V. Lee. J Phys Chem Ref Data **11**, 1(1982).

195 Erratum

Erratum: A Fundamental Equation of State for Heavy Water — P. G. Hill, R. D. Chris MacMillan, and V. Lee. J Phys Chem Ref Data **12**, 1065(1983).

196

Volumetric Properties of Aqueous Sodium Chloride Solutions — P. S. Z. Rogers and Kenneth S. Pitzer. J Phys Chem Ref Data **11**, 15(1982).

197

Ideal Gas Thermodynamic Properties of CH_3, CD_3, CD_4, C_2D_2, C_2D_4, C_2D_6, C_2H_6, $CH_3N_2CH_3$, and $CD_3N_2CD_3$ — Krishna M. Pamidimukkala, David Rogers, and Gordon B. Skinner. J Phys Chem Ref Data **11**, 83(1982).

198

Peak Absorption Coefficients of Microwave Absorption Lines of Carbonyl Sulphide — Z. Kisiel and D. J. Millen. J Phys Chem Ref Data **11**, 101(1982).

199

Vibrational Contributions to Molecular Dipole Polarizabilities — David M. Bishop and Lap M. Cheung. J Phys Chem Ref Data **11**, 119(1982).

200

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

201

Microwave Spectra of Molecules of Astrophysical Interest. XXI. Ethanol (C_2H_5OH) and Propionitrile (C_2H_5CN) — Frank J. Lovas J Phys Chem Ref Data **11**, 251(1982).

202

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. V. Polystyrene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **11**, 313(1982).

203

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement I. CODATA Task Group on Chemical Kinetics — D. L. Baulch, R. A. Cox, P. J. Crutzen, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **11**, 327(1982).

204

Molten Salts Data: Diffusion Coefficients in Single and Multi-Component Salt Systems — George J. Janz and Narottam P. Bansal. J Phys Chem Ref Data **11**, 505(1982).

204 Erratum

Erratum: Molten Salts Data: Diffusion Coefficients in Single and Multi-Component Salt Systems — George J. Janz and Narottam P. Bansal. J Phys Chem Ref Data **13**, 305(1984).

205

JANAF Thermochemical Tables, 1982 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, J. R. Downey, Jr., R. A. McDonald, A. N. Syverud, and E. A. Valenzuela. J Phys Chem Ref Data **11**, 695(1982).

206

Critical Evaluation of Vapor-Liquid Equilibrium, Heat of Mixing, and Volume Change of Mixing Data. General Procedures — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 941(1982).

207

Rate Coefficients for Vibrational Energy Transfer Involving the Hydrogen Halides — Stephen R. Leone. J Phys Chem Ref Data **11**, 953(1982).

208

Behavior of the AB_2-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **11**, 1005(1982).

209

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VI. Acrylic Polymers — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **11**, 1065(1982).

210

Molecular Form Factors and Photon Coherent Scattering Cross Sections of Water — L. R. M. Morin. J Phys Chem Ref Data **11**, 1091(1982).

211

Evaluation of Binary $PTxy$ Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1099(1982).

212

Evaluation of Binary Excess Enthalpy Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1127(1982).

213

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1151(1982).

214

Thermodynamic Properties of Steam in the Critical Region — J. M. H. Levelt Sengers, B. Kamgar-Parsi, F. W. Balfour, and Jan V. Sengers. J Phys Chem Ref Data **12**, 1(1983).

215

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VII. Other Carbon Backbone Polymers — Umesh Gaur, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 29(1983).

216

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VIII. Polyesters and Polyamides — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 65(1983).

217

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IX. Final Group of Aromatic and Inorganic Polymers — Umesh Gaur, Suk-fai Lau, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 91(1983).

218

An Annotated Compilation and Appraisal of Electron Swarm Data in Electronegative Gases — Jean W. Gallagher, Earl C. Beaty, J. Dutton, and L. C. Pitchford. J Phys Chem Ref Data **12**, 109(1983).

219

The Solubility of Oxygen and Ozone in Liquids — Rubin Battino, Timothy R. Rettich, and Toshihiro Tominaga. J Phys Chem Ref Data **12**, 163(1983).

220

Recommemded Values for the Thermal Expansivity of Silicon from 0 to 1000 K — C. A. Swenson. J Phys Chem Ref Data **12**, 179(1983).

221

Electrical Resistivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, T. N. Havill, R. H. Bogaard, R. A. Matula, S. G. Oh, and H. M. James. J Phys Chem Ref Data **12**, 183(1983).

222

Energy Levels of Silicon, Si I through Si XIV — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **12**, 323(1983).

223

Evaluation of Binary *PT*xy Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 381(1983).

224

Evaluation of Binary Excess Enthalpy Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 389(1983).

225

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 395(1983).

226

Atlas of the High Temperature Water Vapor Spectrum in the 3000to4000 cm^{-1} Region — A. S. Pine, M. J. Coulombe, C. CamyPeyret,and J-M. Flaud. J Phys Chem Ref Data **12**, 413(1983).

227

Small-Angle Rayleigh Scattering of Photons at High Energies: Tabulations of Relativisitic HFS Modified Atomic Form Factors — D. Schaupp, M. Schumacher, F. Smend, P. Rullhusen, and John H. Hubbell. J Phys Chem Ref Data **12**, 467(1983).

228

Thermodynamic Properties of D_2O in the Critical Region — B. Kamgar-Parsi, J. M. H. Levelt Sengers, and Jan V. Sengers. J Phys Chem Ref Data **12**, 513(1983).

229

Chemical Kinetic Data Sheets for High-Temperature Chemical Reactions — N. Cohen and K. R. Westberg. J Phys Chem Ref Data **12**, 531(1983).

230

Molten Salts: Volume 5, Part 2. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Vicosity and Surface Tension Data — George J. Janz and Reginald P. T. Tomkins. J Phys Chem Ref Data **12**, 591(1983).

231

International Tables of the Surface Tension of Water — N. B. Vargaftik, B. N. Volkov, and L. D. Voljak. J Phys Chem Ref Data **12**, 817(1983).

232

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ions with Atoms. I. Hydrogen Atom-Fully Stripped Ion Systems — R. K. Janev, B. H. Bransden, and Jean W. Gallagher. J Phys Chem Ref Data **12**, 829(1983).

233

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ions with Atoms. II. Hydrogen Atom-Partially Stripped Ions Systems — Jean W. Gallagher, B. H. Bransden, and R. K. Janev. J Phys Chem Ref Data **12**, 873(1983).

234

Recommended Data on the Electron Impact Ionization of Light Atoms and Ions — K. L. Bell, H. B. Gilbody, J. G. Hughes, A. E. Kingston, and Francis J. Smith. J Phys Chem Ref Data **12**, 891(1983).

235

A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethylene — Paul M. Holland, B. E. Eaton, and Howard J. M. Hanley. J Phys Chem Ref Data **12**, 917(1983).

236

Transport Properties of Liquid and Gaseous D_2O over a Wide Range of Temperature and Pressure — N. Matsunaga and A. Nagashima. J Phys Chem Ref Data **12**, 933(1983).

237

Thermochemical Data for Gaseous Monoxides — J. B. Pedley and E. M. Marshall. J Phys Chem Ref Data **12**, 967(1983).

238

Vapor Pressure of Coal Chemicals — Jing Chao, C. T. Lin, and T. H. Chung. J Phys Chem Ref Data **12**, 1033(1983).

239

Thermodynamic Properties of Aqueous Sodium Chloride Solutions — Kenneth S. Pitzer, J. Christopher Peiper, and R. H. Busey. J Phys Chem Ref Data **13**, 1(1984).

240

Refractive Index of ZnS, ZnSe, and ZnTe and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **13**, 103(1984).

241

High Temperature Vaporization Behavior of Oxides. I. Alkali Metal Binary Oxides — R. H. Lamoreaux and D. L. Hildenbrand. J Phys Chem Ref Data **13**, 151(1984).

242

Thermophysical Properties of Fluid H_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 175(1984).

243

Representative Equations for the Viscosity of Water Substance — Jan V. Sengers and B. Kamgar-Parsi. J Phys Chem Ref Data **13**, 185(1984).

244

Atlas of the Schumann-Runge Absorption Bands of O_2 in the Wavelength Region 175-205 nm — K. Yoshino, D. E. Freeman, and W. H. Parkinson. J Phys Chem Ref Data **13**, 207(1984).

245

Equilibrium and Transport Properties of the Noble Gases and Their Mixtures at Low Density — Joseph Kestin, K. Knierim, E. A. Mason, B. Najafi, S. T. Ro, and M. Waldman. J Phys Chem Ref Data **13**, 229(1984).

246

Evaluation of Kinetic and Mechanistic Data for Modeling of Photochemical Smog — Roger Atkinson and Alan C. Lloyd. J Phys Chem Ref Data **13**, 315(1984).

247

Rate Data for Inelastic Collision Processes in the Diatomic Halogen Molecules — J. I. Steinfeld. J Phys Chem Ref Data **13**, 445(1984).

248

Water Solubilities of Polynuclear Aromatic and Heteroaromatic Compounds — Robert S. Pearlman, Samuel H. Yalkowsky, and Sujit Banerjee. J Phys Chem Ref Data **13**, 555(1984).

249

The Solubility of Nitrogen and Air in Liquids — Rubin Battino, Timothy R. Rettich, and Toshihiro Tominaga. J Phys Chem Ref Data **13**, 563(1984).

250

Thermophysical Properties of Fluid D_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 602(1984).

251

Experimental Stark Widths and Shifts for Spectral Lines of Neutral Atoms (A Critical Review of Selected Data for the Period 1976 to 1982) — N. Konjević, M. S. Dimitrijević, and Wolfgang L. Wiese. J Phys Chem Ref Data **13**, 619(1984).

252

Experimental Stark Widths and Shifts for Spectral Lines of Positive Ions (A Critical Review and Tabulation of Selected Data for the Period 1976 to 1982) — N. Konjević, M. S. Dimitrijević, and Wolfgang L. Wiese. J Phys Chem Ref Data **13**, 649(1984).

253

A Review of Deuterium Triple-Point Temperatures — L. A. Schwalbe and E. R. Grilly. J Phys Chem Ref Data **13**, 687(1984).

254

Evaluated Gas Phase Basicities and Proton Affinities of Molecules: Heats of Formation of Protonated Molecules — Sharon G. Lias, Joel F. Liebman, and Rhoda D. Levin. J Phys Chem Ref Data **13**, 695(1984).

255

Isotopic Abundances and Atomic Weights of the Elements — Paul De Bièvre, Marc Gallet, Norman E. Holden, and I. Lynus Barnes. J Phys Chem Ref Data **13**, 809(1984).

256

Representative Equations for the Thermal Conductivity of Water Substance — Jan V. Sengers, J. T. R. Watson, R. S. Basu, B. Kamgar-Parsi, and R. C. Hendricks. J Phys Chem Ref Data **13**, 893(1984).

257

Ground-State Vibrational Energy Levels of Polyatomic Transient Molecules — Marilyn E. Jacox. J Phys Chem Ref Data **13**, 945(1984).

258

Electrical Resistivity of Selected Elements — P. D. Desai, T. K. Chu, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1069(1984).

259

Electrical Resistivity of Vanadium and Zirconium — P. D. Desai, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1097(1984).

260

Electrical Resistivity of Aluminum and Manganese — P. D. Desai, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1131(1984).

261

Standard Chemical Thermodynamic Properties of Alkane Isomer Groups — Robert A. Alberty and Catherine A. Gehrig. J Phys Chem Ref Data **13**, 1173(1984).

262

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ion with Atoms. III. Non-Hydrogenic Target Atoms — R. K. Janev and Jean W. Gallagher. J Phys Chem Ref Data **13**, 1199(1984).

263

Heat Capacity of Reference Materials: Cu and W — G. K. White and S. J. Collocott. J Phys Chem Ref Data **13**, 1251(1984).

264

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement II. CODATA Task Group on Gas Phase Chemical Kinetics — D. L. Baulch, R. A. Cox, Robert F. Hampson , Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **13**, 1259(1984).

Supplements

Physical and Thermodynamic Properties of Aliphatic Alcohols — Randolph C. Wilhoit and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, Suppl. 1(1973).

Thermal Conductivity of the Elements: A Comprehensive Review — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. J Phys Chem Ref Data **3**, Suppl. 1(1974).

Energetics of Gaseous Ions — Henry M. Rosenstock, Keith Draxl, B. W. Steiner, and John T. Herron. J Phys Chem Ref Data **6**, Suppl. 1(1977).

Evaluated Kinetic Data for High Temperature Reactions, Volume 4. Homogeneous Gas Phase Reactions of Halogen- and Cyanide-Containing Species — D. L. Baulch, J. Duxbury, S. J. Grant, and D. C. Montague. J Phys Chem Ref Data **10**, Suppl. 1(1981).

Thermophysical Properties of Fluids. I. Argon, Ethylene, Parahydrogen, Nitrogen, Nitrogen Trifluoride, and Oxygen — Ben A. Younglove. J Phys Chem Ref Data **11**, Suppl. 1(1982).

The NBS Tables of Chemical Thermodynamic Properties. Selected Values for Inorganic and C_1 and C_2 Organic Substances in SI Units — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, Iva Halow, Sylvia M. Bailey, Kenneth L. Churney, and Ralph L. Nuttall. J Phys Chem Ref Data **11**, Suppl. 2(1982).

Heat Capacities and Entropies of Organic Compounds in the Condensed Phase — Eugene S. Domalski, William H. Evans, and Elizabeth D. Hearing. J Phys Chem Ref Data **13**, Suppl. 1(1984).

Reprint Packages

Package	No.	Title and Contents of Package
A1	4	Molecular Vibrational Frequencies Reprint Nos. 103, 129, 170 and NSRDS 39 JANAF Thermochemical Tables, 3rd ed. out in late 1985
A3	19	Atomic Energy Levels Reprint Nos. 26, 54, 64, 68, 94, 100, 109, 125, 126, 131, 132, 149, 150, 154, 156, 160, 179, 180 and 192
A4	6	Atomic Spectra Reprint Nos. 33, 56, 77, 78, 110 and 132
A5	5	Atomic Transition Probabilities Reprint Nos. 20, 63, 82, 118 and 182
A6	20	Molecules in Space Reprint Nos. 14, 17, 23, 24, 45, 46, 47, 48, 74, 75, 88, 112, 117, 134, 143, 145, 153, 157, 163 and 191
A7	9	Chemical Data Relevant to Air Pollution Reprint Nos. 1, 9, 19, 27, 32, 87, 101, 147 and 159
A8	7	Molecular Spectra Reprint Nos. 4, 8, 53, 79, 93, 130 and 146
A9	9	Thermodynamic Properties of Electrolyte Solutions Reprint Nos. 15, 95, 111, 151, 152, 174, 184, 185 and 186
B1	12	Ideal Gas Thermodynamic Properties Reprint Nos. 30, 42, 43, 62, 65, 66, 70, 80, 83, 113, 115, and 141
B2	3	Elastic Properties of Metals and Alloys Reprint Nos. 34, 57, and 107
B3	3	Resistivity Reprint Nos. 138, 139 and 155
B4	7	Molten Salts Reprint Nos. 10, 41, 71, 96, 135, 167, and 168
B5	3	Refractive Index Reprint Nos. 81, 158 and 162
B6	11	Viscosity and Thermal Conductivity of Fluids Reprint Nos. 16, 35, 38, 59, 97, 106, 121, 144, 171, 175 and 176
B7	10	Properties of Water Reprint Nos. 45, 104, 105, 171, 172, 181, 210, 214, 226
B8	4	Properties of Heavy Water Reprint Nos. 165, 195, 228, 236
B9	9	Linear Micromolecules Reprint Nos. 177, 178, 188, 189, 202, 209, 215, 216 and 217

Other NSRDS Data Publications

NSRDS-NBS Series

1

National Standard Reference Data System Plan of Operation — Edward L. Brady and M. Wallenstein. NSRDS-NBS 1, 12p. (1965).

2

Thermal Properties of Aqueous Uni-Univalent Electrolytes — Vivian B. Parker. NSRDS-NBS 2, 68p. (1965).

3 Sec. 1

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; Si II, Si III, Si IV — Charlotte E. Moore. NSRDS-NBS 3, 35p. (1965).

3 Sec. 2

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition: B. Multiplet Tables; Si I — Charlotte E. Moore. NSRDS-NBS 3, 22p. (1967).

3 Sec. 3

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; C I, C II, C III — Charlotte E. Moore. NSRDS-NBS 3, 73p. (1970).

3 Sec. 4

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; N IV, N V, N VI, N VII — Charlotte E. Moore. NSRDS-NBS 3, 46p. (1971).

3 Sec. 5

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; N I, N II, N III — Charlotte E. Moore. NSRDS-NBS 3, 80p. (1975).

3 Sec. 6

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; H I, D, T — Charlotte E. Moore. NSRDS-NBS 3, 32p. (1972).

3 Sec. 7

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; O I — Charlotte E. Moore. NSRDS-NBS 3, 33p. (1976).

3 Sec. 8

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; O VI, O VII , O VIII — Charlotte E. Moore. NSRDS-NBS 3, 31p. (1979).

3 Sec. 9

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; O V — Charlotte E. Moore. NSRDS-NBS 3, 21p. (1980).

3 Sec. 10

Selected Tables of Atomic Spectra: A. Atomic Energy levels - Second Edition; B. Multiplet Tables; O IV — Charlotte E. Moore. NSRDS-NBS 3, 21p. (1983).

3 Sec. 11

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; O III — Charlotte E. Moore. NSRDS-NBS 3, ...p. (1985).

4 Vol. I

Atomic Transition Probabilities. Elements Hydrogen through Neon — Wolfgang L. Wiese, Melvin W. Smith, and Barbara M. Glennon. NSRDS-NBS 4, 153p. (1966).

5

The Band Spectrum of Carbon Monoxide — Paul H. Krupenie. NSRDS-NBS 5, 87p. (1966).

6

Tables of Molecular Vibrational Frequencies, Part 1 — Takehiko Shimanouchi. NSRDS-NBS 6, 56p. (1967).

7

High Temperature Properties and Decomposition of Inorganic Salts, Part 1. Sulfates — Kurt H. Stern and E. L. Weise. NSRDS-NBS 7, 38p. (1966).

8

Thermal Conductivity of Selected Materials — Robert W. Powell, Cho Y. Ho, and Peter E. Liley. NSRDS-NBS 8, 68p. (1966).

9

Tables of Bimolecular Gas Reactions — Aubrey F. Trotman-Dickenson and G. S. Milne. NSRDS-NBS 9, 129p. (1967).

10

Selected Values of Electric Dipole Moments for Molecules in the Gas Phase — Ralph D. Nelson, Jr., David R. Lide, Jr., and Arthur A. Maryott. NSRDS-NBS 10, 49p. (1967).

11

Tables of Molecular Vibrational Frequencies, Part 2 — Takehiko Shimanouchi. NSRDS-NBS 11, 38p. (1967).

12

Tables for the Rigid Asymmetric Rotor: Transformation Coefficients from Symmetric to Asymmetric Bases and Expectation Values of $P^{2<\cdot}{}_z$, $P^{4<\cdot}{}_z$, and $P^{6<\cdot}{}_z$ — Richard H. Schwendeman. NSRDS-NBS 12, 102p. (1968).

13

Hydrogenation of Ethylene on Metallic Catalysts — Juro Horiuti and Koshiro Miyahara. NSRDS-NBS 13, 62p. (1968).

14

X-Ray Wavelengths and X-Ray Atomic Energy Levels — Joyce A. Bearden and A. F. Burr. NSRDS-NBS 14, 66p. (1967).

15

Molten Salts: Volume 1. Electrical Conductance, Density, and Viscosity Data — George J. Janz, F. W. Dampier, G. R. Lakshminarayanan, P. K. Lorenz, and Reginald P. T. Tomkins. NSRDS-NBS 15, 140p. (1968).

16

Thermal Conductivity of Selected Materials, Part 2 — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. NSRDS-NBS **16**, 146p. (1968).

17

Tables of Molecular Vibrational Frequencies, Part 3 — Takehiko Shimanouchi. NSRDS-NBS **17**, 39p. (1968).

18

Critical Analysis of the Heat-Capacity Data of the Literature and Evaluation of Thermodynamic Properties of Copper, Silver, and Gold from 0 to 300 K — George T. Furukawa, W. G. Saba, and Martin L. Reilly. NSRDS-NBS **18**, 49p. (1968).

19

Thermodynamic Properties of Ammonia as an Ideal Gas — Lester Haar. NSRDS-NBS **19**, 10p. (1968).

20

Gas Phase Reaction Kinetics of Neutral Oxygen Species — Harold S. Johnston. NSRDS-NBS **20**, 49p. (1968).

21

Kinetic Data on Gas Phase Unimolecular Reactions — Sidney W. Benson and Harry E. O'Neal. NSRDS-NBS **21**, 645p. (1970).

22

Atomic Transition Probabilities, Volume II. Sodium through Calcium — Wolfgang L. Wiese, Melvin W. Smith, and Barbara M. Miles. NSRDS-NBS **22**, 268p. (1969).

23

Partial Grotrian Diagrams of Astrophysical Interest — Charlotte E. Moore and Paul W. Merrill. NSRDS-NBS **23**, 65p. (1968).

24

Theoretical Mean Activity Coefficients of Strong Electrolytes in Aqueous Solutions from 0 to 100 °C — Walter J. Hamer. NSRDS-NBS **24**, 271p. (1968).

25

Electron Impact Excitation of Atoms — Benjamin L. Moiseiwitsch and Steven J. Smith. NSRDS-NBS **25**, 120p. (1968).

26

Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions — Joseph L. Franklin, J. G. Dillard, Henry M. Rosenstock, John T. Herron, Keith Draxl, and Frank H. Field. NSRDS-NBS **26**, 289p. (1969).

27

Thermodynamic Properties of Argon from the Triple Point to 300 K at Pressures to 1000 Atmospheres — A. L. Gosman, Robert D. McCarty, and Jerome G. Hust. NSRDS-NBS **27**, 153p. (1969).

28

Molten Salts: Volume 2. Section 1. Electrochemistry of Molten Salts. Gibbs Free Energies and Excess Free Energies from Equilibrium-Type Cells, Section 2. Surface Tension Data — George J. Janz, Chr. G. M. Dijkhuis, G. R. Lakshminarayanan, Reginald P. T. Tomkins, and J. Wong. NSRDS-NBS **28**, 116p. (1968).

29

Photon Cross Sections, Attenuation Coefficients, and Energy Absorption Coefficients from 10 keV to 100 GeV — John H. Hubbell. NSRDS-NBS **29**, 85p. (1969).

30

High Temperature Properties and Decomposition of Inorganic Salts, Part 2. Carbonates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **30**, 27p. (1969).

31

Bond Dissociation Energies in Simple Molecules — B. DeB. Darwent. NSRDS-NBS **31**, 48p. (1970).

32

Phase Behavior in Binary and Multicomponent Systems at Elevated Pressures: n-Pentane and Methane-n-Pentane — Virginia M. Berry and Bruce H. Sage. NSRDS-NBS **32**, 79p. (1970).

33

Electrolytic Conductance and the Conductances of the Halogen Acids in Water — Walter J. Hamer and H. J. DeWane. NSRDS-NBS **33**, 37p. (1970).

34

Ionization Potentials and Ionization Limits Derived from the Analyses of Optical Spectra — Charlotte E. Moore. NSRDS-NBS **34**, 22p. (1970).

35 Vol.I

Atomic Energy Levels as Derived from the Analyses of Optical Spectra, Volume I. ^{1}H to ^{23}V — Charlotte E. Moore. NSRDS-NBS **35**, 358p. (1971).

35 Vol.II

Atomic Energy Levels as Derived from the Analyses of Optical Spectra, Volume II. ^{24}Cr to ^{41}Nb — Charlotte E. Moore. NSRDS-NBS **35**, 263p. (1971).

35 Vol.III

Atomic Energy Levels as Derived from the Analysis of Optical Spectra, Volume III. ^{42}Mo to ^{57}La, ^{72}Hf to ^{89}Ac — Charlotte E. Moore. NSRDS-NBS **35**, 289p. (1971).

36

Critical Micelle Concentrations of Aqueous Surfactant Systems — Pasupati Mukerjee and Karol J. Mysels. NSRDS-NBS **36**, 222p. (1971).

37

JANAF Thermochemical Tables, Second Edition — Daniel R. Stull and H. Prophet. NSRDS-NBS **37**, 1141p. (1971).

38

Critical Review of Ultraviolet Photoabsorption Cross Sections for Molecules of Astrophysical and Aeronomic Interest — Robert D. Hudson. NSRDS-NBS **38**, 114p. (1971).

39

Tables of Molecular Vibrational Frequencies, Consolidated Volume I — Takehiko Shimanouchi. NSRDS-NBS **39**, 167p. (1972).

40

A Multiplet Table of Astrophysical Interest, Revised Edition, Part I. Table of Multiplets, Part II. Finding List of All Lines in the Table of Multiplets — Charlotte E. Moore. NSRDS-NBS **40**, 261p. (1972).

41

Crystal Structure Transformations in Binary Halides — C. N. R. Rao and M. Natarajan. NSRDS-NBS **41**, 57p. (1972).

42

Selected Specific Rates of Reactions of the Solvated Electron in Alcohols — Edgar Watson, Jr. and Sathyabhama Roy. NSRDS-NBS **42**, 27p. (1972).

43

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, 1. Hydrated Electron — Michael Anbar, Mark Bambenek, and Alberta B. Ross. NSRDS-NBS **43**, 69p. (1973).

43 Suppl.

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, 1. Hydrated Electron, Supplemental Data — Alberta B. Ross. NSRDS-NBS **43**, Suppl.(1975).

44

The Radiation Chemistry of Gaseous Ammonia — Donald B. Peterson. NSRDS-NBS **44**, 41p. (1974).

45

Radiation Chemistry of Nitrous Oxide Gas, Primary Processes, Elementary Reactions and Yields — George R. A. Johnson. NSRDS-NBS **45**, 29p. (1973).

46

Reactivity of the Hydroxyl Radical in Aqueous Solutions — Leon M. Dorfman and Gerald E. Adams. NSRDS-NBS **46**, 72p. (1973).

47

Tables of Collision Integrals and Second Virial Coefficients for the (m,6,8) Intermolecular Potential Function — Max Klein, Howard J. M. Hanley, Francis J. Smith, and Paul M. Holland. NSRDS-NBS **47**, 161p. (1974).

48

Radiation Chemistry of Ethanol: A Review of Data on Yields, Reaction Rate Parameters, and Spectral Properties of Transients — Gordon R. Freeman. NSRDS-NBS **48**, 44p. (1974).

49

Transition Metal Oxides, Crystal Chemistry, Phase Transition, and Related Aspects — C. N. R. Rao and G. V. Subba Rao. NSRDS-NBS **49**, 140p. (1974).

50

Resonances in Electron Impact on Atoms and Diatomic Molecules — George J. Schulz. NSRDS-NBS **50**, 120p. (1973).

51

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, II. Hydrogen Atom — Michael Anbar, Farhataziz, and Alberta B. Ross. NSRDS-NBS **51**, 66p. (1975).

52

Electronic Absorption and Internal and External Vibrational Data of Atomic and Molecular Ions Doped in Alkali Halide Crystals — Suresh C. Jain, A. V. R. Warrier, and Suresh K. Agarwal. NSRDS-NBS **52**, 55p. (1974).

53

Crystal Structure Transformations in Inorganic Nitrites, Nitrates, and Carbonates — C. N. R. Rao, Brahm Prakash, and M. Natarajan. NSRDS-NBS **53**, 55p. (1975).

54

The Radiolysis of Methanol: Product Yields, Rate Constants, and Spectroscopic Parameters of Intermediates — J. H. Baxendale and Peter Wardman. NSRDS-NBS **54**, 33p. (1975).

55

Property Index to NSRDS Data Compilations, 1964-1972 — David R. Lide, Jr., Gertrude B. Sherwood, Charles H. Douglass, and Herman M. Weisman. NSRDS-NBS **55**, 21p. (1975).

56

Crystal Structure Transformations in Inorganic Sulfates, Phosphates, Perchlorates, and Chromates — C. N. R. Rao and Brahm Prakash. NSRDS-NBS **56**, 37p. (1975).

57

Yields of Free Ions Formed in Liquids by Radiation — Augustine O. Allen. NSRDS-NBS **57**, 38p. (1976).

58

Drift Mobilities and Conduction Band Energies of Excess Electrons in Dielectric Liquids — Augustine O. Allen. NSRDS-NBS **58**, 23p. (1976).

59

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, III. Hydroxyl Radical and Perhydroxyl Radical and Their Radical Ions — Farhataziz and Alberta B. Ross. NSRDS-NBS **59**, 126p. (1977).

60

Atomic Energy Levels - The Rare-Earth Elements, the Spectra of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu — William C. Martin, Romuald Zalubas, and Lucy Hagan. NSRDS-NBS **60**, 422p. (1978).

61 Part I

Physical Properties Data Compilations Relevant to Energy Storage. I. Molten Salts: Eutectic Data — George J. Janz, Carolyn B. Allen, J. R. Downey, Jr., and Reginald P. T. Tomkins. NSRDS-NBS **61**, 244p. (1978).

61 Part II

Physical Properties Data Compilations Relevant to Energy Storage. II. Molten Salts: Data on Single and Multi-Component Systems — George J. Janz, Carolyn B. Allen, Narottam P. Bansal, R. M. Murphy, and Reginald P. T. Tomkins. NSRDS-NBS **61**, 420p. (1979).

61 Part III

Physical Properties Data Compilations Relevant to Energy Storage. III. Engineering Properties of Single and Polycrystalline Sodium Beta and Beta" Alumina — G. R. Miller and D. G. Paquette. NSRDS-NBS **61**, 19p. (1979).

61 Part IV

Physical Properties Data Compilations Relevant to Energy Storage. IV. Molten Salts: Data on Additional Single and Multi-Component Salt Systems — George J. Janz and Reginald P. T. Tomkins. NSRDS-NBS **61**, 870p. (1981).

61 Part V

Physical Properties Data Compilations Relevant to Energy Storage. V. Mechanical Properties Data on Alloys for Use in Flywheels — Hassell M. Ledbetter. NSRDS-NBS **61**, 42p. (1982).

62

Compilation of Rate Constants for the Reactions of Metal Ions in Unusual Valency States — George V. Buxton and Robin M. Sellers. NSRDS-NBS **62**, 68p. (1978).

63 Vols. 1,2,3,4

EPA/NIH Mass Spectral Data Base, Volume 1. Molecular Weights 30-186; Volume 2. Molecular Weights 16-273; Volume 3. Molecular Weights 273-381; Volume 4. Molecular Weights 381-1674 — Stephen R. Heller and G. W. A. Milne. NSRDS-NBS **63**, 1,2,3,4(1978).

63 Suppl. 1

EPA/NIH Mass Spectral Data Base, Supplement 1 — Stephen R. Heller and G. W. A. Milne. NSRDS-NBS **63**, Suppl. 1(1980).

63 Suppl. 2

EPA/NIH Mass Spectral Data Base, Supplement 2 — Stephen R. Heller, G. W. A. Milne, and Lewis H. Gevantman. NSRDS-NBS **63**, Suppl. 2(1983).

64

Rate Coefficients for Ion-Molecule Reactions, Organic Ions Other Than Those Containing Only C and H — L. Wayne Sieck. NSRDS-NBS **64**, 27p. (1980).

65

Rate Constants for Reactions of Inorganic Radicals in Aqueous Solution — Alberta B. Ross and Pedatsur Neta. NSRDS-NBS **65**, 62p. (1979).

66

Ion Energetics Measurements, Supplement I. 1971-1973 — Henry M. Rosenstock, D. Sims, S. S. Schroyer, and W. J. Webb. NSRDS-NBS **66**, 380p. (1980).

67

Table of Recommended Rate Constants for Chemical Reactions Occurring in Combustion — Francis Westley. NSRDS-NBS **67**, 110p. (1980).

68

Tables of Line Spectra of the Elements, Part 1. Wavelengths and Intensities, Part 2. Transition Probabilities — Joseph Reader, Charles H. Corliss, Wolfgang L. Wiese, and Georgia A. Martin. NSRDS-NBS **68**, 415p. (1980).

69

Optical Spectra of Nonmetallic Inorganic Transient Species in Aqueous Solution — Gordon L. Hug. NSRDS-NBS **69**, 167p. (1981).

70

Rate Constants for Reactions of Aliphatic Carbon-Centered Radicals in Aqueous Solution — Alberta B. Ross and Pedatsur Neta. NSRDS-NBS **70**, 96p. (1982).

71

Ionization Potential and Appearance Potential Measurements, 1971-1981 — Rhoda D. Levin and Sharon G. Lias. NSRDS-NBS **71**, 634p. (1982).

72

Tables of Rate Constants for Gas Phase Chemical Reactions of Sulfur Compounds (1971-1980) — Francis Westley. NSRDS-NBS **72**, 42p. 42p. (1982).

NBS Technical Notes

270-3

Selected Values of Chemical Thermodynamic Properties. Tables for the First Thirty-Four Elements in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 264p. (1968).

270-4

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 35 through 53 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 152p. (1969).

270-5

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 54 through 61 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, Richard H. Schumm, and Kenneth L. Churney. NBS Tech. Note **270**, 49p. (1971).

270-6

Selected Values of Chemical Thermodynamic Properties. Tables for the Alkaline Earth Elements (Elements 92 through 97 in the Standard Order of Arrangement) — Vivian B. Parker, Donald D. Wagman, and William H. Evans. NBS Tech. Note **270**, 124p. (1971).

270-7

Selected Values of Chemical Thermodynamic Properties. Tables for the Lanthanide (Rare Earth) Elements (Elements 62 through 76 in the Standard Order of Arrangement) — Richard H. Schumm, Donald D. Wagman, Sylvia M. Bailey, William H. Evans, and Vivian B. Parker. NBS Tech. Note **270**, 84p. (1973).

270- 8

Selected Values of Chemical Thermodynamic Properties: Compounds of Uranium, Protactinium, Thorium, Actinium, and the Alkali Metals — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, and Ralph L. Nuttall. NBS Tech. Note **270**, 149p. (1981).

361

Liquid Densities of Oxygen, Nitrogen, Argon, and Parahydrogen — Hans M. Roder, Robert D. McCarty, and V. J. Johnson. NBS Tech. Note **361**, 1972(1973).

438

Compendium of ab initio Calculations of Molecular Energies and Properties — Morris Krauss. NBS Tech. Note **438**, 139p.

474

Critically Evaluated Transition Probabilities for Ba I and II — Barbara M. Miles and Wolfgang L. Wiese. NBS Tech. Note **474**, 22p. (1969).

484

A Review of Rate Constants of Selected Reactions of Interest in Re-Entry Flow Fields in the Atmosphere — M. H. Bortner. NBS Tech. Note **484**, 62p. (1969).

901

Comparison of Theoretical and Experimental Photoeffect Data, 0.1 keV to 1.5 MeV — John H. Hubbell and W. J. Veigele. NBS Tech. Note **901**, 47p. (1976).

968

Total Photon Absorption Cross Section Measurements, Theoretical Analysis and Evaluations for Energies above 10 MeV — Heinz A. Gimm and John H. Hubbell. NBS Tech. Note **968**, 81p. (1978).

983

Properties of Selected Superconductive Materials, 1978 Supplement — Benjamin W. Roberts. NBS Tech. Note **983**, 103p. (1978).

1045

An Equation of State for Fluid Ethylene — Robert D. McCarty and Richard T. Jacobsen. NBS Tech. Note **1045**, 164p. (1981).

1051

Thermophysical Properties of Isobutane from 114 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Tech. Note **1051**, 199p. (1982).

NBS Monographs

70 Vol. I

Microwave Spectral Tables, Volume I. Diatomic Molecules — Paul F. Wacker, M. Mizushima, J. D. Petersen, and J. R. Ballard. NBS Monograph **70**, 171p. (1964).

70 Vol. II

Microwave Spectral Tables, Volume II. Line Strengths of Asymmetric Rotors — Paul F. Wacker and M. R. Pratto. NBS Monograph **70**, 349p. (1964).

70 Vol. III

Microwave Spectral Tables, Volume III. Polyatomic Molecules with Internal Rotation — Paul F. Wacker, M. S. Cord, D. G. Burkhard, J. D. Petersen, and R. F. Kukol. NBS Monograph **70**, 275p. (1969).

70 Vol. IV

Microwave Spectral Tables, Volume IV. Polyatomic Molecules without Internal Rotation — M. S. Cord, J. D. Petersen, M. S. Lojko, and R. H. Haas. NBS Monograph **70**, 419p. (1968).

70 Vol. V

Microwave Spectral Tables, Volume V. Spectral Line Listing — M. S. Cord, M. S. Lojko, and J. D. Petersen. NBS Monograph **70**, 533p. (1968).

94

Thermodynamic and Related Properties of Parahydrogen from the Triple Point to 100 K at Pressures to 340 Atmospheres — Hans M. Roder, Lloyd A. Weber, and Robert D. Goodwin. NBS Monograph **94**, 116p. (1965).

115

The Calculation of Rotational Energy Levels and Rotational Line Intensities in Diatomic Molecules — Jon T. Hougen. NBS Monograph **115**, 54p. (1970).

134

Space Groups and Lattice Complexes — W. Fisher, Hans Burzlaff, Erwin Hellner, and Joseph D. H. Donnay. NBS Monograph **134**, 177p. (1973).

153

The First Spectrum of Hafnium (Hf I) — William F. Meggers and Charlotte E. Moore. NBS Monograph **153**, 123p. (1976).

167

Physical Properties Data for Rock Salt — Lewis H. Gevantman. NBS Monograph **167**, 288p. (1981).

169

Thermophysical Properties of Normal Butane from 135 to 700 K at Pressures to 70 MPa — W. M. Haynes and Robert D. Goodwin. NBS Monograph **169**, 197p. (1982).

170

Thermophysical Properties of Propane from 85 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Monograph **170**, 249p. (1982).

NBS Special Publication

513

Reaction Rate and Photochemical Data for Atmospheric Chemistry - 1977 — Robert F. Hampson, Jr. and David Garvin. NBS Spec. Publ. **513**, 111p. (1978).

Joint Institute for Laboratory Astrophysics Reports

6

Compilation of Low Energy Electron Collision Cross Section Data Part I. Ionization, Dissociative Processes, Vibrational and Rotational Excitation — Lee J. Kieffer. JILA Report **6**, 95p. (1969).

7

Compilation of Low Energy Electron Collsion Cross Section Data. Part II. Line and Level Excitation — Lee J. Kieffer. JILA Report **7**, 167p. (1969).

13

Compilation of Electron Collision Cross Section Data for Modelling Gas Discharge Lasers — Lee J. Kieffer. JILA Report **13**, 139p. (1973).

NBS Interim Reports

75-770

Equation of State for Ammonia — Lester Haar and John S. Gallagher. NBSIR **75-770**, 27p. (1975).

75-968

Selected Thermochemical Data Compatible with CODATA Recommendations — Vivian B. Parker, Donald D. Wagman, and David Garvin. NBSIR **75-968**, 35p. (1976).

76-1002

Industrial Process Data for Fluids: A Survey of Current Research at the National Bureau of Standards — Howard J. White, Jr. NBSIR **76-1002**, 54p. (1976).

76-1034

Chemical Thermodynamic Properties of Compounds of Sodium, Potassium, and Rubidium: An Interim Tabulation of Selected Material — Donald D. Wagman, William H. Evans, Vivian B. Parker, and Richard H. Schumm. NBSIR **76-1034**, 76p. (1976).

76-1147

A Combined Least Sums and Least Squares Approach to the Evaluation of Thermodynamic Data Networks — David Garvin, Vivian B. Parker, Donald D. Wagman, and William H. Evans. NBSIR **76-1147**, 41p. (1976).

77-860

Provisional Thermodynamic Functions of Propane from 85 to 700 K at Pressures to 700 Bar — Robert D. Goodwin. NBSIR **77-860**, 240p. (1977).

77-865

Thermodynamic and Related Properties of Oxygen from the Triple Point to 300 K at Pressures to 1000 Bar — Lloyd A. Weber. NBSIR **77-865**, 162p. (1977).

77-1300

A Computer Assisted Evaluation of the Thermochemical Data of the Compounds of Thorium — Donald D. Wagman, Richard H. Schumm, and Vivian B. Parker. NBSIR **77-1300**, 94p. (1977).

78-1479

Thermodynamic Properties of Miscellaneous Materials — Eugene S. Domalski, William H. Evans, and Thomas L. Jobe, Jr. NBSIR **78-1479**, 69p. (1981).

79-1777

A Compendium of Gas Phase Basicity and Proton Affinity Measurements — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, Henry M. Rosenstock, S. S. Schroyer, C. Schmidt, D. Martinsen, and G. W. A. Milne. NBSIR **79-1777**, 563p. (1979).

79-1941

Table of Recommended Rate Constants for Chemical Reactions Occurring in Combustion — Francis Westley. NBSIR **79-1941**, 169p. (1979).

80-2029

The Thermochemical Properties of Uranium-Halogen Containing Compounds — Vivian B. Parker. NBSIR **80-2029**, 173p. (1980).

80-2032

Kinetic and Photochemical Data for Atmospheric Chemistry, Reactions of the Nitrogen Oxides — Robert F. Hampson, Jr. NBSIR **80-2032**, 89p. (1980).

81-2217

Feasiblility Study: Compilation and Evaluation of Properties Data for Basalt, Granite, Tuff, and Shale — Lewis H. Gevantman. NBSIR **81-2217**, 259p. (1981).

81-2253

A Thermodynamic Surface for Water: The Formulation and Computer Program — Lester Haar, John S. Gallagher, and George S. Kell. NBSIR **81-2253**, 38p. (1981).

81-2254

Tables of Experimental Rate Constants for Chemical Reactions Occurring in Combustion (1971-1977) — Francis Westley. NBSIR **81-2254**, 302p. (1981).

81-2276

A Compilation of Thermodynamic and Transport Properties of Aqueous Sulfuric Acid — Bert R. Staples and Theresa F. Wobbeking. NBSIR **81-2276**, 26p. (1981).

81-2341

Chemical Thermodynamic Data Banks — David Garvin, Vivian B. Parker, and Donald D. Wagman. NBSIR **81-2341**, 30p. (1981).

81-2343

Thermodynamic Properties of Solid Aluminosilicates at Elevated Temperatures — Richard H. Schumm. NBSIR **81-2343**, 57p. (1981).

81-2345

A Report on Thermodynamic Data for Desulfurization Processes — Vivian B. Parker, Bert R. Staples, Thomas L. Jobe, Jr., and David B. Neumann. NBSIR **81-2345**, 89p. (1981)

NSRDS Data Publications from other Publishers

π+p, π+n, and π+d Interactions - A Compilation: Parts I and II — Denyse M. Chew, Victor P. Henri, Thomas A. Lasinski, Thomas G. Trippe, Fumiyo Uchiyama, Frederick C. Winkelmann and Particle Data Group. UCRL **53**, Springfield, VA: NTIS, 213p. (1973). LBL 53; Part II is on microfiche located in the back cover pocket, A10.

πN Particle-Wave Amplitudes — David J. Herndon, Angela Barbaro-Galtieri, Arthur H. Rosenfeld and Particle Data Group. UCRL **20030πN**, Springfield, VA: NTIS, 85p. (1970). UCRL 20030 πN, A05.

πN Two-Body Scattering Data, 1. A User's Guide to the Lovelace-Almehed Data Tape — Claude Lovelace, Sverkei Almehed, Fumiyo Uchiyama, Robert Kelly, Victor P. Henri and Particle Data Group. UCRL **63**, Springfield, VA: NTIS, 146p. (1973). LBL 63, A07.

A Compilation of YN Reactions — Odette Benary, Naomi Barash-Schmidt, LeRoy R. Price, Arthur H. Rosenfeld, Gideon Alexander and Particle Data Group. UCRL **20000YN**, Springfield, VA: NTIS, 70p. (1970). UCRL-20 000 YN, A04.

Atomic Gas Laser Transition Data, A Critical Evaluation — William Ralph Bennett, Jr., New York: IFI/Plenum, 293p. (1979), ISBN: 0-306-65187-4

Bulletin of Alloy Phase Diagrams — Joanne Murray, editor(s) and American Society for Metals. Bull Alloy Phase Diag **3**, Metals Park, OH: American Society for Metals, 130.p. (1982), ISBN: 01970216.

Chemical Kinetic and Photochemical Data Sheets for Atmospheric Reactions — Robert F. Hampson, Jr. Fed Aviation Admin EE **80-17**, Springfield, VA: NTIS, 490p. (1980). FAA-EE-80-17, A21.

Coblentz Society Evaluated Infrared Reference Spectra, Volumes 6 to 10 and Cumulative Coblentz Indexes — American Society for Testing and Materials; Coblentz Society; Joint Committee on Atomic and Molecular Physical Data. Coblentz Soc Infr Spect **6-10**, Philadelphia, PA: Sadtler Research Laboratories, 5001p. (1975).

Combustion Fundamentals for Waste Incineration — American Society of Mechanical Engineers, Research Committee on Industrial and Municipal Wastes., New York: American Society of Mechanical Engineers, 212p. (1974).

Contributions to the Data on Theoretical Metallurgy, XVI. Thermodynamic Properties of Nickel and Its Inorganic Compounds — Alla D. Mah and Louis B. Pankratz. U.S. Bur Mines Bull **668**, Springfield, VA: NTIS, 125p. (1976). U.S. Bureau of Mines Bulletin 668, A06.

Crystal Data Determinative Tables. Third Edition Volume 1: Organic Compounds — Joseph D. H. Donnay and Helen M. Ondik., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 855p. (1972).

Crystal Data Determinative Tables, Third Edition Volume 2: Inorganic Compounds — Joseph D. H. Donnay and Helen M. Ondik., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1748p. (1973).

Crystal Data Determinative Tables, Third Edition Volume 3. Organic Compounds — Joseph D. H. Donnay, Olga Kennard, David G. Watson, and John R. Rodgers., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 748p. (1978).

Crystal Data Determinative Tables, Third Edition Volume 4. Inorganic Compounds — Joseph D. H. Donnay, Helen M. Ondik, and Alan D. Mighell., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1308p. (1978).

Crystal Data Determinative Tables, Third Edition, Volume 5. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, John R. Rodgers, editor(s). **5**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Crystal Data Determinative Tables, Third Edition, Volume 6. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, editor(s). **6**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Derived Thermodynamic Properties of Ethylene — Roland H. Harrison and Donald R. Douslin. J Chem Eng Data. **22**, Washington, DC: American Chemical Society, 24p. (1977).

Desk Book of Infrared Spectra — Clara D. Craver and Coblentz Society; Joint Committee on Atomic and Molecular Physical Data., Kirkwood, MO: The Coblentz Society, 498p. (1977).

Diffusion Rate Data and Mass Transport Phenomena in Copper Systems — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. INCRA Monograph **V**, New York: International Copper Research Association, Inc., 322p. (1977).

Diffusion Rate Data and Mass Transport Phenomena for Copper Systems, Part II — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. INCRA Monograph **VIII**, New York: International Copper Research Association, Inc., 701p. (1982).

Dissociation in Heavy Particle Collisions — G. W. McClure and James M. Peek. At Mol Collis Proc Ser, New York: Wiley-Interscience, 198p. (1972), ISBN: 0-471-5816-8.

Electron Impact Ionization Cross-Section Data for Atoms, Atomic Ions, and Diatomic Molecules: I. Experimental Data — Lee J. Kieffer and Gordon H. Dunn. Rev Mod Phys. **38**, New York: American Institute of Physics, 35p. (1966).

Excitation in Heavy Particle Collisions — Edward W. Thomas. At Mol Collis Proc Ser, New York: Wiley-Interscience, 436p. (1972), ISBN: 0-471-8589-0.

Infrared Spectra of Halogenated Hydrocarbons — Clara D. Craver and Coblentz Society; Joint Committee on Atomic and Molecular Physical Data., Kirkwood, MO: The Coblentz Society, 125p. (1977).

Infrared Spectra of Plasticizers and Other Additives — Clara D. Craver and Coblentz Society; Joint Committee on Atomic and Molecular Physical Data. , Kirkwood, MO: The Coblentz Society, 152p. (1977).

Ion-Molecule Reactions — Earl W. McDaniel, V. Cermak, A. Dalgarno, E. E. Ferguson, and L. Friedman. At Mol Collis Proc Ser, New York: Wiley-Interscience, 374p. (1970), ISBN: 0-471-5838-3.

$K^0 <_{-1} N$ Interactions - A Compilation — Particle Data Group. UCRL-LBL **55**, Springfield, VA: NTIS, 56p. (1972). LBL 55, A04.

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format — Douglas Mann and U.S. National Bureau of Standards., Boulder, CO: U.S. National Bureau of Standards, Cryogenic Division, 11p. (1977).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, First Supplement — Douglas Mann and U.S. National Bureau of Standards. **Suppl. 1**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1978).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, Second Supplement — Douglas Mann and U.S. National Bureau of Standards. **Suppl. 2**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1980).

Low Energy Electron-Collision Cross Section Data. Part III. Total Scattering; Differential Elastic Scattering — Lee J. Kieffer. At Data. **2**, New York: Academic Press, 293p. (1971).

Metallic Shifts in NMR: A Review of the Theory and Comprehensive Critical Data Compilation of Metallic Materials — Gesina Cynthia Carter, Lawrence H. Bennett, and Daniel J. Kahan. Prog Mater Sci, Oxford, New York: Pergamon Press, 2350p. (1977), ISBN: 0-08-02114-7.

NBS/NRC Steam Tables, Thermodynamic and Transport Properties and Computer Programs for Vapor and Liquid States of Water — Lester Haar, John S. Gallagher, and George S. Kell., New York: Hemisphere Press, 320p. (1984).

NN and ND Interactions - A Compilation — James E. Enstrom, Thomas Ferbel, Paul F. Slattery, Barry L. Werner, Zaven G. T. Guiragossian, Yoshio Sumi, Toshihiro Yoshida and Particle Data Group. UCRL-LBL **58**, Berkeley, CA: Lawrence Berkeley Laboratory, U. of California, 281p. (1972). LBL 58.

Nuclear Wallet Cards — Virginia S. Shirley, C. Michael Lederer and National Nuclear Data Center. **1979**, Upton, NY: National Nuclear Data Center, Brookhaven National Laboratory, 40p. (1979). Title, no charge.

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Metal Systems — Y. Austin Chang, Joachim P. Neumann, A. Mikula, and Daniel Goldberg. INCRA Monograph **VI**, New York: International Copper Research Association, Inc., 702p. (1979).

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Sulfur-Metal Systems — Y. Austin Chang, Joachim P. Neumann, and U. V. Choudary. INCRA Monograph **VII**, New York: International Copper Research Association, Inc., 191p. (1979).

Pressure, Volume, Temperature Relations of Ethylene — Donald R. Douslin and Roland H. Harrison. J Chem Thermody **76**, New York, London:, 301p. (1976).

Problems with the Prandtl Number of Steam — Jan V. Sengers, R. S. Basu, B. Kamgar-Parsi, and Joseph Kestin. Mech Eng **104**, New York, NY, 60p. (1982).

Review of Particle Properties, 25th Anniversary Edition — Particle Data Group. Phys Lett B **111B**, Springfield, VA: NTIS, 316p. (1982).

Selected Thermodynamic Values and Phase Diagrams for Copper and Some of Its Binary Alloys — Ralph Hultgren and Pramond D. Desai. INCRA Monograph **I**, New York: International Copper Research Association, Inc., 204p. (1973).

Selected Values of the Thermodynamic Properties of Binary Alloys — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, and Kenneth K. Kelley., Metals Park, OH: American Society for Metals, 1435p. (1973).

Selected Values of the Thermodynamic Properties of the Elements — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, Kenneth K. Kelley, and Donald D. Wagman., Metals Park, OH: American Society for Metals, 636p. (1973).

Table of Isotopes, Seventh Edition — C. Michael Lederer, Virginia S. Shirley, Edgardo Browne, Janis M. Dairiki, and Raymond E. Doebler., New York: Wiley-Interscience, 1628p. (1978), ISBN: 0-471-0417-3.

The Critical-Region Equation of State of Ethene and the Effect of Small Impurities — J. R. Hastings, J. M. H. Levelt Sengers, and F. W. Balfour. J Chem Thermody **12**, London: Academic Press Inc., 1009p. (1980).

The Thermodynamic Properties of Aqueous Inorganic Copper Systems — Paul Duby. INCRA Monograph **IV**, New York: International Copper Research Association, Inc., 132p. (1977).

Theory of Charge Exchange — R. A. Mapleton., New York: Wiley-Interscience, 284p. (1971), ISBN: 0-471-5678-7.

Theory of the Ionization of Atoms by Electron Impact — M. R. H. Rudge. Rev Mod Phys **40**, .., 564p. (1968).

Thermodynamic Data for Waste Incineration — American Society of Mechanical Engineers, Research Committee on Industrial and Municipal Wastes., New York: American Society of Mechanical Engineers, 160p. (1979).

Thermodynamic Properties of Copper and Its Inorganic Compounds — Edward G. King, Alla D. Mah, and Louis B. Pankratz. INCRA Monograph **II**, New York: International Copper Research Association, Inc., 257p. (1973).

Thermodynamic Properties of Copper-Slag Systems — Carlos Diaz. INCRA Monograph **III**, New York: International Copper Research Association, Inc., 178p. (1976).

Total Electron-Atom Collision Cross Sections at Low Energies — A Critical Review — Benjamin Bederson. Rev Mod Phys **43**, 999, 601p. (1971).

Translations from the Russian

Electric Conductivity of Ferroelectrics — V. M. Gurevich. Russian Transl., Springfield, VA: NTIS, 366p. (1971). TT 70-50180, A16.

Handbook of Hardness Data — G. V. Samsonov and A. A. Ivan'ko. Russian Transl., Springfield, VA: NTIS, 69p. (1970). TT 70-50177, A04.

Handbook of Phase Diagrams of Silicate Systems, Vol. I. Binary Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, V. V. Lapin, N. N. Kurtseva, J. Schmorak, editor(s). Russian Transl., Springfield, VA: NTIS, 730p. (1970). TT 71-50040, A26.

Handbook of Phase Diagrams of Silicate Systems, Vol. II. Metal-Oxygen Compounds in Silicate Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, I. A. Bondar', and Yu. P. Udalov. Russian Transl., Springfield, VA: NTIS, 329p. (1972). TT 71-50041, A15.

Handbook of Thermodynamic Data on Geological Substances — G. B. Naumov, B. N. Ryzhenko, and I. L. Khodakovsky. Russian Transl., Springfield, VA: NTIS, 340p. (1974). TT 73-53051 or PB226 722, A15.

Heavy Water, Thermophysical Properties — V. A. Kirillin, Ya. Z. Kazavchinskii, P. M. Kessel'man, S. L. Rivkin, A. E. Sheindlin, E. E. Shpil'rain, V. V. Sychev, and D. L. Timrot. Russian Transl., Springfield, VA: NTIS, 273p. (1971). TT 70-50094, A12.

Isochoric Heat Capacity of Water and Steam — M. P. Vukalovich, Kh. I. Amirkhanov, G. V. Stepanov, and B. G. Alibekov. Russian Transl., Springfield, VA: NTIS, 215p. (1974). TT 72-52002, A10.

Properties of Liquid and Solid Hydrogen — B. N. Esel'son, Y. P. Blagoi, V.N. Grigor'ev, V. G. Manzhelii, S. A. Mikhailenko, and N. P. Neklyudov. Russian Transl., Springfield, VA: NTIS, 126p. (1971). TT 70-50179, A07.

Rate Constants of Gas Phase Reactions, Reference Book — V. N. Kondratiev, L. J. Holtschlag, R. M. Fristrom, editor(s). Russian Transl., Springfield, VA: NTIS, 434p. (1972). COM 72-10014, A19.

Surface Ionization — E. Ya. Zandberg and N. L. Ionov. Russian Transl., Springfield, VA: NTIS, 364p. (1971). TT 70-50148, A16.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume I. Computation Methods — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, and V. A. Khudyakov. Russian Transl., Springfield, VA: NTIS, 453p. (1974). TT 74-50019, A20.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume II. Oxygen-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 505p. (1975). TT 74-50032, A22.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume III. Oxygen- and Air-Based Propellant — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 648p. (1975). TT 75-50007, A26.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume IV. Nitrogen Tetroxide-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 540p. (1976). TT 76-50007, A23.

Thermodynamic and Thermophysical Properties of Helium — A. F. Alyab'ev, N. V. Tsederberg, V. N. Popov, and N. A. Morozova. Russian Transl., Springfield, VA: NTIS, 260p. (1971). TT 70-50096, A12.

Thermodynamic and Transport Properties of Ethylene and Propylene — I. A. Neduzhii. Russian Transl. Springfield, VA: NTIS, 206p. (1972). COM 75-11276, A10.

Thermophysical Properties of Air and Air Components — A. A. Vasserman, Ya. Z. Kazavchinskii, V. A. Rabinovich, and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 402p. (1971). TT 70-50095, A18.

Thermophysical Properties of Freon-22 — A. V. Kletskii. Russian Transl. Springfield, VA: NTIS, 72p. (1971). TT 70-50178, A04.

Thermophysical Properties of Gases and Liquids, No. 1 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 214p. (1970). TT 69-55091, A10, the translation of volumes 2, 3, and 4 have the title: Thermophysical Properties of Matter and Substances.

Thermophysical Properties of Gaseous and Liquid Methane — V. A. Zagoruchenko and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 251p. (1970). TT 70-50097, A12.

Thermophysical Properties of Liquid Air and Its Components — A. A. Vasserman and V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 255p. (1970). TT 69-55092, A12.

Thermophysical Properties of Matter and Substances, Volume 2 — V. A. Rabinovich. Russian Transl., Springfield, VA: NTIS, 395p. (1974). TT 72-52001, A17, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermophysical Properties of Matter and Substances, Volume 3 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 212p. (1975). TT 73-52009, A10, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermophysical Properties of Matter and Substances, Volume 4 — V. A. Rabinovich. Russian Transl., Springfield, VA: NTIS, 179p. (1975). TT 73-52029, A09, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

NBS Special Publications

281

Bibliography on Flame Spectroscopy. Analytical Applications, 1800-1966 — Radu Mavrodineanu. NBS Spec. Publ. **281**, 155p. (1967).

306 Sect. I

Bibliography on the Analyses of Optical Atomic Spectra. Section 1. ^{1}H-^{23}V — Charlotte E. Moore. NBS Spec. Publ. **306**, 80p. (1968).

306 Sect.II

Bibliography on the Analyses of Optical Atomic Spectra. Section 2. ^{24}Cr-^{41}Nb — Charlotte E. Moore. NBS Spec. Publ. **306**, 57p. (1969).

306 Sect.III

Bibliography on the Analyses of Optical Atomic Spectra. Section 3. ^{42}Mo-^{57}La and ^{72}Hf-^{89}Ac — Charlotte E. Moore. NBS Spec. Publ. **306**, 37p. (1969).

306 Sect.IV

Bibliography on the Analyses of Optical Atomic Spectra. Section 4. ^{57}La-^{71}Lu and ^{89}Ac-^{99}Es — Charlotte E. Moore. NBS Spec. Publ. **306**, 48p. (1969).

324

The NBS Alloy Data Center: Permuted Materials Index — Gesina Cynthia Carter, Daniel J. Kahan, Lawrence H. Bennett, John R. Cuthill, and Ronald C. Dobbyn. NBS Spec. Publ. **324**, 683p. (1971).

349

Heavy-Atom Kinetic Isotope Effects, An Indexed Bibliography — Marvin J. Stern and Max Wolfsberg. NBS Spec. Publ. **349**, 43p. (1972).

362

Chemical Kinetics in the C-O-S and H-N-O-S Systems: A Bibliography - 1899 through June 1971 — Francis Westley. NBS Spec. Publ. **362**, 75p. (1972).

363

Bibliography on Atomic Energy Levels and Spectra, July 1968 through June 1971 — Lucy Hagan and William C. Martin. NBS Spec. Publ. **363**, 109p. (1972).

363 Suppl. 1

Bibliography on Atomic Energy Levels and Spectra, July 1971 through June 1975 — Lucy Hagan. NBS Spec. Publ. **363**, Suppl. 1(1977).

363 Suppl. 2

Bibliography on Atomic Energy Levels and Spectra, July 1975 through June 1979 — Romuald Zalubas and Arlene Albright. NBS Spec. Publ. **363**, Suppl. 2(1980).

366

Bibliography on Atomic Line Shapes and Shifts (1899 through March 1972) — Jeffrey R. Fuhr, Wolfgang L. Wiese, and Larry J. Roszman. NBS Spec. Publication **366**, 165p. (1972).

366 Suppl. 1

Bibliography on Atomic Line Shapes and Shifts (April 1972 through June 1973) — Jeffrey R. Fuhr, Larry J. Roszman, and Wolfgang L. Wiese. NBS Spec. Publ. **366**, Suppl. 1(1974).

366 Suppl. 2

Bibliography on Atomic Line Shapes and Shifts (July 1973 through May 1975) — Jeffrey R. Fuhr, Georgia A. Martin, and Beverly J. Specht. NBS Spec. Publ. **366**, Suppl. 2(1975).

366 Suppl. 3

Bibliography on Atomic Line Shapes and Shifts (June 1975 through June 1978) — Jeffrey R. Fuhr, Beverly J. Miller, and Georgia A. Martin. NBS Spec. Publ. **366**, Suppl. 3(1978).

369

Soft X-Ray Emission Spectra of Metallic Solids: Critical Review of Selected Systems and Annotated Spectral Index — Archie J. McAlister, Ronald C. Dobbyn, John R. Cuthill, and M. L. Williams. NBS Spec. Publ. **369**, 180p. (1974).

371

A Supplementary Bibliography of Kinetic Data on Gas Phase Reactions of Nitrogen, Oxygen, and Nitrogen Oxides — Francis Westley. NBS Spec. Publ. **371**, 93p. (1973).

371 Suppl. 1

Supplementary Bibliography of Kinetic Data on Gas Phase Reactions of Nitrogen, Oxygen, and Nitrogen Oxides (1972 - 1973) — - Francis Westley. NBS Spec. Publ. **371**, Suppl. 1(1975).

380

Photonuclear Reaction Data, 1973 — Everett G. Fuller, Henry M. Gerstenberg, H. J. Vander Molen, and T. C. Dunn. NBS Spec. Publ. **380**, 134p. (1973).

380 Suppl. 1

Photonuclear Data Index, 1973-1977 — Everett G. Fuller and Henry M. Gerstenberg. NBS Spec. Publ. **380**, Suppl. 1(1978).

381

Bibliography of Ion-Molecule Reaction Rate Data (January 1950 - October 1971) — George A. Sinnott. NBS Spec. Publ. **381**, 75p. (1973).

392

Vibrationally Excited Hydrogen Halides: A Bibliography on Chemical Kinetics of Chemiexcitation and Energy Transfer Processes (1958 through 1973) — Francis Westley. NBS Spec. Publ. **392**, 84p. (1974).

396 Sect.1

Critical Surveys of Data Sources: Mechanical Properties of Metals — R. B. Gavert, Robert L. Moore, and John H. Westbrook. NBS Spec. Publ. **396**, 90p. (1974).

396 Sect.2

Critical Surveys of Data Sources: Ceramics — Dorothea M. Johnson and James F. Lynch. NBS Spec. Publ. **396**, 56p. (1975).

396 Sect.3

Critical Surveys of Data Sources: Corrosion of Metals — Ronald Diegle and Walter K. Boyd. NBS Spec. Publ. **396**, 42p. (1976).

396 Sect. 4

Critical Surveys of Data Sources: Electrical and Magnetic Properties of Metals — M. J. Carr, R. B. Gavert, Robert L. Moore, H. W. Wawrousek, and John H. Westbrook. NBS Spec. Publ. **396**, 96p. (1976).

426

Bibliography of Low Energy Electron and Photon Cross Section Data (through December 1974) — Lee J. Kieffer. NBS Spec. Publ. **426**, 222p. (1976).

426 Suppl. 1

Bibliography of Low Energy Electron and Photon Cross Section Data (January 1975 to December 1977) — Jean W. Gallagher, John R. Rumble, Jr., and Earl C. Beaty. NBS Spec. Publ. **426**, Suppl. 1(1979).

428 Sect. 1,2,3

Bibliography of Infrared Spectroscopy through 1960 — C. N. R. Rao, S. K. Dikshit, Shanti A. Kudchadker, D. S. Gupta, V. A. Narayan, and John J. Comeford. NBS Spec. Publ. **428**, 1,2,3(1976).

449

Chemical Kinetics of the Gas Phase Combustion of Fuels (A Bibliography on the Rates and Mechanisms of Oxidation of Aliphatic C_1 to C_{10} Hydrocarbons and of Their Oxygenated Derivatives) — Francis Westley. NBS Spec. Publ. **449**, 142p. (1976).

454

An Annotated Bibliography of Compiled Thermodynamic Data Sources for Biochemical and Aqueous Systems (1930 to 1975), Equilibrium, Enthalpy, Heat Capacity, and Entropy Data — George T. Armstrong and Robert N. Goldberg. NBS Spec. Publ. **454**, 71p. (1976).

478

Nitrogen Oxychlorides: A Bibliography on Data for Physical and Chemical Properties of ClNO, $ClNO_2$, and $ClNO_3$ — Francis Westley. NBS Spec. Publ. **478**, 54p. (1977).

485

A Bibliography of Sources of Experimental Data Leading to Activity or Osmotic Coefficients for Polyvalent Electrolytes in Aqueous Solution — Robert N. Goldberg, Bert R. Staples, Ralph L. Nuttall, and R. Arbuckle. NBS Spec. Publ. **485**, 57p. (1977).

496 Vols.1,2

Applications of Phase Diagrams, Proceedings of a Workshop Held at the National Bureau of Standards, Gaithersburg, Maryland, January 10-12, 1977, Volumes 1 and 2 — Gesina Cynthia Carter, editor(s). NBS Spec. Publ. **496**, 1622p. (1978).

505

Bibliography on Atomic Transition Probabilities (1914 through October 1977) — Beverly J. Miller, Jeffrey R. Fuhr, and Georgia A. Martin. NBS Spec. Publ. **505**, 283p. (1978).

505 Suppl.

Bibliography on Atomic Transition Probabilities (November 1977 through March 1980) — Beverly J. Miller, Jeffrey R. Fuhr, and Georgia A. Martin. NBS Spec. Publ. **505**, Suppl.(1980).

531

Summary Report on the Workshop on High Temperature Chemical Kinetics: Applications to Combustion Research — David Garvin, R. L. Brown, Robert F. Hampson, Jr., M. J. Kurylo, and W. Tsang. NBS Spec. Publ. **531**, 94p. (1978).

537

A Bibliography of Sources of Experimental Data Leading to Thermal Properties of Binary Aqueous Electrolyte Solutions — David Smith-Magowan and Robert N. Goldberg. NBS Spec. Publ. **537**, 94p. (1979).

578

A Catalog of Data Compilations on Photochemical and Photophysical Processes in Solution — James G. Brummer, W. Phillip Helman, and Alberta B. Ross. NBS Spec. Publ. **578**, 27p. (1980).

593

Data Index for Energy Transfer Collisions of Atoms and Molecules - 1970-1979 — Jean W. Gallagher, Janet Van Blerkom, Earl C. Beaty, and John R. Rumble, Jr. NBS Spec. Publ. **593**, 349p. (1981).

612

Standard Reference Data Publications, 1964-1980 — Gertrude B. Sherwood. NBS Spec. Publ. **612**, 125p. (1981).

NBS Technical Notes

291

A Bibliography on Ion-Molecule Reactions. January 1900 to March 1966 — F. N. Harllee, Henry M. Rosenstock, and John T. Herron. NBS Tech. Note **291**, 40p. (1966).

464

The NBS Alloy Data Center: Function, Bibliographic System, Related Data Centers, and Reference Books — Gesina Cynthia Carter, Lawrence H. Bennett, John R. Cuthill, and Daniel J. Kahan. NBS Tech. Note **464**, 163p. (1968).

554

Annotated Accession List of Data Compilations of the NBS Office of Standard Reference Data — Herman M. Weisman and Gertrude B. Sherwood. NBS Tech. Note **554**, 196p. (1970).

848

A Bibliography of the Russian Reference Data Holdings of the Library of the Office of Standard Reference Data — Gertrude B. Sherwood and Howard J. White, Jr. NBS Tech. Note **848**, 23p. (1974).

947

Critical Evaluation of Data in the Physical Sciences - A Status Report on the National Standard Reference Data System, January 1977 — Stephen A. Rossmassler. NBS Tech. Note **947**, 88p. (1977).

NBS Circulars

488 Sec. 1

An Ultraviolet Multiplet Table, Section I. The Spectra of Hydrogen through Vanadium — Charlotte E. Moore. NBS Circular **488**, 78p. (1950).

488 Sec. 2

An Ultraviolet Multiplet Table, Section 2. The Spectra of Chromium through Niobium — Charlotte E. Moore. NBS Circular **488**, 115p. (1952).

488 Sec. 3

An Ultraviolet Multiplet Table, Section 3. The Spectra of Molybdenum to Lanthanum and Hafnium to Radium — Charlotte E. Moore. NBS Circular **488**, 94p. (1962).

488 Sec. 4

An Ultraviolet Multiplet Table, Section 4. Finding List for Spectra of the Elements Hydrogen to Niobium (Z = 1 to 41) — Charlotte E. Moore. NBS Circular **488**, 65p. (1962).

488 Sec. 5

An Ultraviolet Multiplet Table, Section 5. Finding List for Spectra of the Elements Molybdenum to Lanthanum (Z = 42 to 57), Hafnium to Radium (Z = 72 to 88) — Charlotte E. Moore. NBS Circular **488**,

Office of Standard Reference Data Bibliographies

70-1 Vol. 1

High Pressure Bibliography 1900-1968, Volume I. Section I. Bibliography, Section II. Author Index — Leo Merrill. OSRD Bibl. **70-1**, Vol. 1(1970).

70-1 Vol. 2

High Pressure Bibliography 1900-1968, Volume II. Subject Index — Leo Merrill. OSRD Bibl. **70-1**, Vol. 2(1970).

70-2

The NBS Alloy Data Center: Author Index — Gesina Cynthia Carter, Daniel J. Kahan, Lawrence H. Bennett, John R. Cuthill, and Ronald C. Dobbyn. OSRD Bibl. **70-2**, 413p. (1970).

70-3

Semiempirical and Approximate Methods for Molecular Calculations - Bibliography and KWIC Index — George A. Henderson and Sandra Frattali. OSRD Bibl. **70-3**, 293p. (1970).

70-4

Bibliography of Photoabsorption Cross Section Data — Robert D. Hudson and Lee J. Kieffer. OSRD Bibl. **70-4**, 47p. (1970).

71-1

Bibliography on Properties of Defect Centers in Alkali Halides — Suresh C. Jain, S. A. Khan, H. K. Sehgal, V. K. Garg, and R. K. Jain. OSRD Bibl. **71-1**, 293p. (1971).

71-2

A Bibliography of Kinetic Data on Gas Phase Reactions of Nitrogen, Oxygen, and Nitrous Oxides — Francis Westley. OSRD Bibl. **71-2**, 140p. (1971).

Joint Institute for Laboratory Astrophysics Reports

18

Bibliography of Low Energy Electron and Photon Cross Section Data (1978) — Jean W. Gallagher and Earl C. Beaty. JILA Report **18**, 148p. (1980).

20

A Bibliography of Electron Swarm Data — Earl C. Beaty, J. Dutton, and L. C. Pitchford. JILA Report **20**, 252p. (1979).

21

Bibliography of Low Energy Electron and Photon Cross Section Data (1979) — Jean W. Gallagher and Earl C. Beaty. JILA Report **21**, 127p. (1981).

NBS Interim Reports

76-1061

Annotated Bibliography on Proton Affinities — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, and Henry M. Rosenstock. NBSIR **76-1061**, 52p. (1976).

Critical Bibliographies and Indexes from Other Publishers

A Compilation of Volumes I-IV of Bibliography on High Pressure Research with Author and Subject Indexes — John Francis Cannon and Leo Merrill., Springfield, VA: NTIS, 385p. (1972). in two volumes, Vol. 1. PB 191 174, A17; Vol. 2. PB 191 174.

A Guide to Sources of Information on Materials — Robert S. Marvin, Gertrude B. Sherwood, C. T. Lynch, editor(s)., Cleveland, OH: CRC Press, 603p. (1975). Chapter 10 in Handbook of Materials Science, Volume III. Nonmetallic Materials and Publications, C. T. Lynch, Editor.

An Indexed Compilation of Experimental High Energy Physics Literature — Particle Data Group. UCRL-LBL **90**, Springfield, VA: NTIS, 430p. (1978). LBL 90, A19.

Bibliography of High Pressure Research, Volume XII (1979) — Leo Merrill., Provo, UT: High Pressure Data Center, Brigham Young University,(1979). Bimonthly, order from Data Center.

Binary Fluorides, Free Molecular Structures and Force Fields, A Bibliography (1957-1975) — Donald T. Hawkins, Lawrence S. Bernstein, Warren E. Falconer, and William Klemperer., New York: IFI/Plenum, 253p. (1976), ISBN: 0-306-6601-3.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author indexes, Vol. 11. 1978 — Radiation Chemistry Data Center. Rad Chem **11**, Springfield, VA: NTIS, 768p. (1979). PB 226 368, A99.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author Indexes, Vol. 12. 1979 — Radiation Chemistry Data Center. Rad Chem **12**, Springfield, VA: NTIS, 748p. (1980). PB 81-113 680, A26.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author Indexes, Vol. 13. 1980 — Radiation Chemistry Data Center. Rad Chem **13**, Springfield, VA: NTIS, 704p. (1981). PB 82-122 995, A26.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author Indexes, Vol. 14. 1981 — Radiation Chemistry Data Center. Rad Chem **14**, Springfield, VA: NTIS, 534p. (1982). PB 82-214 487, A22.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumuluation with Keyword and Author Indexes, Vol. 15. 1982 — Radiation Chemistry Data Center. Rad Chem **15**, Springfield, VA: NTIS, 448p. (1983). PB 83-203638, A19.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Vol. 17. 1984 — Radiation Chemistry Data Center. Rad Chem, Notre Dame, IN: Radiation Chem. Data Center, U. of Notre Dame, 44p. (1984). $25.00; the Biweekly List, Vol. 17 (1984) plus the Annual Cumulation, ' '6 (1983), $35.00; foreign and airmail postage rates available upon req.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumuluation with Keyword and Author Indexes, Vol. 16. 1983 — Radiation Chemistry Data Center. Rad Chem **16**, Springfield, VA: NTIS, 444p. (1984).

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 7. 1974 — Radiation Chemistry Data Center. Rad Chem **7**, Springfield, VA: NTIS, 553p. (1975). COM 75-11475, A24.

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 8. 1975 — Radiation Chemistry Data Center. Rad Chem **8**, Springfield, VA: NTIS, 670p. (1976). PB 275 025, A26.

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 9. 1976 — Radiation Chemistry Data Center. Rad Chem **9**, Springfield, VA: NTIS, 707p. (1977). PB 268 699, A26.

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 10. 1977 — Radiation Chemistry Data Center. Rad Chem **10**, Springfield, VA: NTIS, 695p. (1978). PB 291 876, A26.

Bulletin of Chemical Thermodynamics, Volume 24/1981 — Robert D. Freeman, editor(s) and International Union of Pure and Applied Chemistry, Commission 1.2 on Thermodynamics. Bull Chem Thermody **24**, Stillwater, OK: Thermochemistry, Department of Chemistry, Oklahoma State University, 504p. (1982). 0149-2268, bona fide personal subscriptions are less; prices of previous Bulletins available upon request.

Bulletin of Chemical Thermodynamics, Volume 25/1982 — Robert D. Freeman and International Union of Pure and Applied Chemistry. Bull Chem Thermody **25**, Stillwater, OK: Thermochemistry, Department of Chemistry, Oklahoma State University, 544p. (1982). 0149-2268, bona fide personal subscriptions are less; prices of previous Bulletins are available upon request.

Compilation of Volumes V-IX of the Bibliography on High Pressure Research with Author and Subject Indexes — Leo Merrill., Provo, UT: High Pressure Data Center, Brigham Young University, (1979). in microfiche only.

Equilibrium Properties of Fluid Mixtures, 2. A Bibliography of Experimental Data on Selected Fluids — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller., New York: IFI/Plenum, 258p. (1982), ISBN: 0-306-6602-4.

Equilibrium Properties of Fluid Mixtures, A Bibliography on Fluids of Cryogenic Interest — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller., New-York: IFI/Plenum, 166p. (1975), ISBN: 0-306-6601-6.

High Pressure Bibliography, 1968-1971, with Author and Subject Indexes — John Francis Cannon and Leo Merrill., Provo, UT: High Pressure Data Center, Brigham Young University, 189p. (1972). in microfiche only.

Liquid Vapor Equilibria on Systems of Interest in Cryogenics, A Survey — Arthur J. Kidnay, M. J. Hiza, and R. C. Miller. Cryogenics **13**, London: Academic Press, 575p. (1973).

Mossbauer Effect Data Index Covering the 1966-1968 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 522p. (1975), ISBN: 0-306-6516-9.

Mossbauer Effect Data Index Covering the 1969 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 281p. (1970), ISBN: 0-306-6514-8.

Mossbauer Effect Data Index Covering the 1970 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 369p. (1972), ISBN: 0-306-6514-6.

Mossbauer Effect Data Index Covering the 1971 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 430p. (1972), ISBN: 0-306-6514-4.

Mossbauer Effect Data Index Covering the 1972 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 488p. (1973), ISBN: 0-306-6514-2.

Mossbauer Effect Data Index Covering the 1973 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 495p. (1975), ISBN: 0-306-6514-0.

Mossbauer Effect Data Index Covering the 1974 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 397p. (1975), ISBN: 0-306-6514-9.

Mossbauer Effect Data Index Covering the 1975 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 445p. (1977), ISBN: 0-306-6514-7.

Mossbauer Effect Data Index Covering the 1976 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 355p. (1978), ISBN: 0-306-6514-1.

Mossbauer Effect Data Index, 1958-1965 — A. H. Muir, K. J. Ando, and Helen M. Coogan., New York: Interscience Publishers, 351p. (1966).

Mossbauer Effect Reference and Data Journal — John G. Stevens, Virginia E. Stevens, Richard M. White, Janet L. Gibson, editor(s). Moss Eff Ref Data J **6**, Ashville, NC: Mossbauer Effect Data Center, U. of N. C., (1983).

Thesaurus for Radiation Chemistry — Alberta B. Ross and Radiation Chemistry Data Center. Rad Chem. **1**, Springfield, VA: NTIS, 48p. (1977). UND-RCDC-1, A03.

Weekly List of Papers on Radiation Chemistry, Index and Cumulation, Volume IV, Numbers 1-26, January through June 1971 — Radiation Chemistry Data Center. Rad Chem. **IV**, 1-26(1971). COM 71-01103, A13.

Weekly List of Papers on Radiation Chemistry, Index and Cumulation, Volume IV, Numbers 27-52, July through December 1971 — Radiation Chemistry Data Center. Rad Chem. **IV**, 26-52(1972). COM 72-10266, A13.

Weekly List of Papers on Radiation Chemistry, Index and Cumulation, Volume V, Numbers 1-26, January through June 1972 — Radiation Chemistry Data Center. Rad Chem. **V**, 1-26(1972). COM 72-10621, A14.

Weekly List of Papers in Radiation Chemistry, Index and Cumulation, Volume V, Numbers 27-52, July through December 1972 — Radiation Chemistry Data Center. Rad Chem. **V**, 27-52(1973). COM 73-10281, A15.

Weekly List of Papers on Radiation Chemistry, Index and Cumulation, Volume VI, Numbers 1-26, January through June 1973 — Radiation Chemistry Data Center. Rad Chem. **VI**, 1-26(1973). COM 73-11878, A18.

Weekly List of Papers on Radiation Chemistry, Index and Cumulation, Volume VI, Numbers 27-52, July through December 1973 — Radiation Chemistry Data Center. Rad Chem. **VI**, 27-5(1974). COM 74-10899, A16.
istry Data Center. Rad Chem. **V**, 27-52(1973). COM 73-10281, A15.

Computer Programs for Handling Technical Data

NBS Technical Notes

444

Reform: A General-Purpose Program for Manipulating Formatted Data Files — Robert McClenon and Joseph Hilsenrath. NBS Tech. Note **444**, 25p. (1968).

446

PRECISE: A Multiple Precision Version of OMNITAB — Alfred E. Bean and Joseph Hilsenrath. NBS Tech. Note **446**, 84p. (1968).

470

EDPAC: Utility Programs for Computer-Assisted Editing, Copy Production, and Data Retrieval — Carla G. Messina and Joseph Hilsenrath. NBS Tech. Note **470**, 76p. (1969).

500

Edit-Insertion Programs for Automatic Typesetting of Computer Printout — Carla G. Messina and Joseph Hilsenrath. NBS Tech. Note **500**, 47p. (1970).

700

COMBO: A General-Purpose Program for Searching, Annotating, Encoding-Decoding, and Reformatting Data Files — Robert McClenon and Joseph Hilsenrath. NBS Tech. Note **700**, 72p. (1972).

738

Subroutine for the Calculation of CODEN Check Characters — David Garvin. NBS Tech. Note **738**, 16p. (1972).

740

SETAB: An Edit-Insert Program for Automatic Typesetting of Spectroscopic and Other Computerized Tables — Robert C. Thompson and Joseph Hilsenrath. NBS Tech. Note **740**, 32p. (1973).

760

Description of the Magnetic Tape Version of the Bulletin of Thermodynamics and Thermochemistry, No. 14 — Robert McClenon, William H. Evans, David Garvin, and Blanton C. Duncan. NBS Tech. Note **760**, 32p. (1973).

820

Complete Clear Text Representation of Scientific Documents in Machine-Readable Form — Blanton C. Duncan and David Garvin. NBS Tech. Note **820**, 58p. (1974).

903

The NIRA Computer Program Package (Photonuclear Data Center) — H. J. Vander Molen and Henry M. Gerstenberg. NBS Tech. Note **903**, 34p. (1976).

928

Computer Programs for the Evaluation of Activity and Osmotic Coefficients — Bert R. Staples and Ralph L. Nuttall. NBS Tech. Note **928**, 60p. (1976).

1039

A Computer Program for the Prediction of Viscosity and Thermal Conductivity in Hydrocarbon Mixtures — James F. Ely and Howard J. M. Hanley. NBS Tech. Note **1039**, 83p. (1981).

1048

Interactive FORTRAN Program to Calculate Thermophysical Properties of Seven Fluids — Ben A. Younglove. NBS Tech. Note **1048**, 56p. (1982).

1122

Summary of On-Line or Interactive Physico-Chemical Numerical Data Systems — Joseph Hilsenrath. NBS Tech. Note **1122**, 29p. (1980).

1141

NBS* AIDS80: A FORTRAN Program for Crystallographic Data Evaluation — Alan D. Mighell, C. R. Hubbard, and Judy K. Stalick. NBS Tech. Note **1141**, 54p. (1981).

1147

Test Problems and Results for OMNITAB 80 — Sally T. Peavy and Shirley G. Bremer. NBS Tech. Note **1147**, 316p. (1981).

1176

Utility Programs for Generating the Hershey Character Fonts on Microcomputers and Laboratory Plotters — C. E. Dick and Joseph Hilsenrath. NBS Tech. Note **1176**, 49p. (1983).

NBS Handbooks

101

OMNITAB, A Computer Program for Statistical and Numerical Analysis — Joseph Hilsenrath, Guy G. Ziegler, Carla G. Messina, P. J. Walsh, and R. H. Herbold. NBS Handbook **101**, 256p. (1968).

125

OMNIDATA, An Interactive System for Data Retrieval, Statistical and Graphical Analysis, and Data-Base Management, A User's Manual — Joseph Hilsenrath and Bettijoyce Breen. NBS Handbook **125**, 294p. (1978).

NBS Special Publications

424

A Contribution to Computer Typesetting Techniques: Tables of Coordinates for Hershey's Repertory of Occidental Type Fonts and Graphic Symbols — Norman M. Wolcott and Joseph Hilsenrath. NBS Spec. Publ. **424**, 177p. (1976).

NBS Interim Report

78-1432

Automation of the Ion Energetics Data Center — Robert C. Thompson, W. J. Webb, and Henry M. Rosenstock. NBSIR **78-1432**, 84p. (1978).

NBS Magnetic Tape Series

NBS Standard Reference Database 1

EPA/NIH Mass Spectral Data Base Magnetic Tape — Stephen R. Heller and G. W. A. Milne. NBS Standard Reference Database 1 **A1**, Washington, DC: NBS Office of Standard Reference Data,(updated periodically). Call (301) 921-2228 for specific instructions.

NBS Standard Reference Database 2

NBS Chemical Thermodynamics Database NBS Standard Reference Database 2, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

NBS Standard Reference Database 3

NBS Crystal Data Identification File, NBS Standard Reference Database 3, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Lease agreements obtained from JCPDS 1601 Park Ln Swarthmore PA (215)328-9400.

NBS Standard Reference Database 4

Thermophysical Properties of Hydrocarbon Mixtures (TRAPP), NBS Standard Reference Database 4, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

NBS Standard Reference Database 5

Thermophysical Properties of Helium, NBS Standard Reference Database 5, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

NBS Standard Reference Database 6

Interactive Fortran Program to Calculate Thermophysical Properties of 6 Fluids, NBS Standard Reference Database 6, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

NBS Standard Reference Database 9

Activity and Osmotic Coefficients of Aqueous Electrolyte Solutions, NBS Standard Reference Database 9, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

NBS Standard Reference Database 10

Thermophysical Properties of Water, NBS Standard Reference Database 10, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

Anbar, Michael

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, 1. Hydrated Electron — Michael Anbar, Mark Bambenek, and Alberta B. Ross. NSRDS-NBS **43**, 69p. (1973).

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, II. Hydrogen Atom — Michael Anbar, Farhataziz, and Alberta B. Ross. NSRDS-NBS **51**, 66p. (1975).

Ando, K. J.

Mossbauer Effect Data Index, 1958-1965 — A. H. Muir, K. J. Ando, and Helen M. Coogan. New York: Interscience Publishers, 351p. (1966).

Arbuckle, R.

A Bibliography of Sources of Experimental Data Leading to Activity or Osmotic Coefficients for Polyvalent Electrolytes in Aqueous Solution — Robert N. Goldberg, Bert R. Staples, Ralph L. Nuttall, and R. Arbuckle. NBS Spec. Publ. **485**, 57p. (1977).

Armstrong, George T.

An Annotated Bibliography of Compiled Thermodynamic Data Sources for Biochemical and Aqueous Systems (1930 to 1975), Equilibrium, Enthalpy, Heat Capacity, and Entropy Data — George T. Armstrong and Robert N. Goldberg. NBS Spec. Publ. **454**, 71p. (1976).

Heating Values of Natural Gas and Its Components — George T. Armstrong and Thomas L. Jobe, Jr. NBSIR **82-2401**, 164p. (1982).

Atkinson, Roger

Evaluation of Kinetic and Mechanistic Data for Modeling of Photochemical Smog — Roger Atkinson and Alan C. Lloyd. J Phys Chem Ref Data **13**, 315(1984).

Ausloos, P. J.

A Compendium of Gas Phase Basicity and Proton Affinity Measurements — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, Henry M. Rosenstock, S. S. Schroyer, C. Schmidt, D. Martinsen, and G. W. A. Milne. NBSIR **79-1777**, 563p. (1979).

Annotated Bibliography on Proton Affinities — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, and Henry M. Rosenstock. NBSIR **76-1061**, 52p. (1976).

Bailey, Sylvia M.

Selected Values of Chemical Thermodynamic Properties. Tables for the First Thirty-Four Elements in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 264p. (1968).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 35 through 53 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 152p. (1969).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 54 through 61 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, Richard H. Schumm, and Kenneth L. Churney. NBS Tech. Note **270**, 49p. (1971).

Selected Values of Chemical Thermodynamic Properties. Tables for the Lanthanide (Rare Earth) Elements (Elements 62 through 76 in the Standard Order of Arrangement) — Richard H. Schumm, Donald D. Wagman, Sylvia M. Bailey, William H. Evans, and Vivian B. Parker. NBS Tech. Note **270**, 84p. (1973).

The NBS Tables of Chemical Thermodynamic Properties. Selected Values for Inorganic and C_1 and C_2 Organic Substances in SI Units — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, Iva Halow, Sylvia M. Bailey, Kenneth L. Churney, and Ralph L. Nuttall. J Phys Chem Ref Data **11**, Suppl. 2(1982).

Balfour, F. W.

The Critical-Region Equation of State of Ethene and the Effect of Small Impurities — J. R. Hastings, J. M. H. Levelt Sengers, and F. W. Balfour. J Chem Thermody **12**, London: Academic Press Inc., 1009p. (1980).

Thermodynamic Properties of Steam in the Critical Region — J. M. H. Levelt Sengers, B. Kamgar-Parsi, F. W. Balfour, and Jan V. Sengers. J Phys Chem Ref Data **12**, 1(1983).

Ballard, J. R.

Microwave Spectral Tables, Volume I. Diatomic Molecules — Paul F. Wacker, M. Mizushima, J. D. Petersen, and J. R. Ballard. NBS Monograph **70**, 171p. (1964).

Bambenek, Mark

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, 1. Hydrated Electron — Michael Anbar, Mark Bambenek, and Alberta B. Ross. NSRDS-NBS **43**, 69p. (1973).

Banerjee, Sujit

Water Solubilities of Polynuclear Aromatic and Heteroaromatic Compounds — Robert S. Pearlman, Samuel H. Yalkowsky, and Sujit Banerjee. J Phys Chem Ref Data **13**, 555(1984).

Bansal, Narottam P.

Erratum: Molten Salts Data: Diffusion Coefficients in Single and Multi-Component Salt Systems — George J. Janz and Narottam P. Bansal. J Phys Chem Ref Data **13**, 305(1984).

Molten Salts Data: Diffusion Coefficients in Single and Multi-Component Salt Systems — George J. Janz and Narottam P. Bansal. J Phys Chem Ref Data **11**, 505(1982).

Physical Properties Data Compilations Relevant to Energy Storage. II. Molten Salts: Data on Single and Multi-Component Systems — George J. Janz, Carolyn B. Allen, Narottam P. Bansal, R. M. Murphy, and Reginald P. T. Tomkins. NSRDS-NBS **61**, 420p. (1979).

Barash-Schmidt, Naomi

A Compilation of YN Reactions — Odette Benary, Naomi Barash-Schmidt, LeRoy R. Price, Arthur H. Rosenfeld, Gideon Alexander and Particle Data Group. UCRL **20000YN**, Springfield, VA: NTIS, 70p. (1970). UCRL-20 000 YN, A04.

Barbaro-Galtieri, Angela

πN Particle-Wave Amplitudes — David J. Herndon, Angela Barbaro-Galtieri, Arthur H. Rosenfeld and Particle Data Group. UCRL **20030πN**, Springfield, VA: NTIS, 85p. (1970). UCRL 20030 πN, A05.

Barnes, I. Lynus

Isotopic Abundances and Atomic Weights of the Elements — Paul De Bièvre, Marc Gallet, Norman E. Holden, and I. Lynus Barnes. J Phys Chem Ref Data **13**, 809(1984).

Barnes, John

Critical Review of Vibrational Data and Force Field Constants for Polyethylene — John Barnes and Bruno Fanconi. J Phys Chem Ref Data **7**, 1309(1978).

Barnett, J. D.

High-Pressure Calibration: A Critical Review — D. L. Decker, W. A. Bassett, Leo Merrill, H. T. Hall, and J. D. Barnett. J Phys Chem Ref Data **1**, 773(1972).

Barzakovskii, V. P.

Handbook of Phase Diagrams of Silicate Systems, Vol. I. Binary Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, V. V. Lapin, N. N. Kurtseva, J. Schmorak, editor(s). Russian Transl. Springfield, VA: NTIS, 730p. (1970). TT 71-50040, A26.

Handbook of Phase Diagrams of Silicate Systems, Vol. II. Metal-Oxygen Compounds in Silicate Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, I. A. Bondar', and Yu. P. Udalov. Russian Transl. Springfield, VA: NTIS, 329p. (1972). TT 71-50041, A15.

Bassett, W. A.

High-Pressure Calibration: A Critical Review — D. L. Decker, W. A. Bassett, Leo Merrill, H. T. Hall, and J. D. Barnett. J Phys Chem Ref Data **1**, 773(1972).

Basu, R. S.

An Improved Representative Equation for the Dynamic Viscosity of Water Substance — J. T. R. Watson, R. S. Basu, and Jan V. Sengers. J Phys Chem Ref Data **9**, 1255(1980).

Problems with the Prandtl Number of Steam — Jan V. Sengers, R. S. Basu, B. Kamgar-Parsi, and Joseph Kestin. Mech Eng **104**, New York, NY, 60p. (1982).

Representative Equations for the Thermal Conductivity of Water Substance — Jan V. Sengers, J. T. R. Watson, R. S. Basu, B. Kamgar-Parsi, and R. C. Hendricks. J Phys Chem Ref Data **13**, 893(1984).

Battino, Rubin

The Solubility of Nitrogen and Air in Liquids — Rubin Battino, Timothy R. Rettich, and Toshihiro Tominaga. J Phys Chem Ref Data **13**, 563(1984).

The Solubility of Oxygen and Ozone in Liquids — Rubin Battino, Timothy R. Rettich, and Toshihiro Tominaga. J Phys Chem Ref Data **12**, 163(1983).

Bauder, A.

Microwave Spectra of Molecules of Astrophysical Interest, IX. Acetaldehyde — A. Bauder, Frank J. Lovas, and Donald R. Johnson. J Phys Chem Ref Data **5**, 53(1976).

Microwave Spectra of Molecules of Astrophysical Interest, XVI. Methyl Formate — A. Bauder. J Phys Chem Ref Data **8**, 583(1979).

Bauer, A.

Microwave Spectra of Molecules of Astrophysical Interest, XV. Propyne — A. Bauer, D. Boucher, J. Burie, J. Demaison, and A. Dubrulle. J Phys Chem Ref Data **8**, 537(1979).

Microwave Spectra of Molecules of Astrophysical Interest. XIX. Methyl Cyanide — D. Boucher, J. Burie, A. Bauer, A. Dubrulle, and J. Demaison. J Phys Chem Ref Data **9**, 659(1980).

Baulch, D. L.

Evaluated Kinetic Data for High Temperature Reactions, Volume 4. Homogeneous Gas Phase Reactions of Halogen- and Cyanide-Containing Species — D. L. Baulch, J. Duxbury, S. J. Grant, and D. C. Montague. J Phys Chem Ref Data **10**, Suppl. 1(1981).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **9**, 295(1980).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement I. CODATA Task Group on Chemical Kinetics — D. L. Baulch, R. A. Cox, P. J. Crutzen, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **11**, 327(1982).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement II. CODATA Task Group on Gas Phase Chemical Kinetics — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **13**, 1259(1984).

Baxendale, J. H.

The Radiolysis of Methanol: Product Yields, Rate Constants, and Spectroscopic Parameters of Intermediates — J. H. Baxendale and Peter Wardman. NSRDS-NBS **54**, 33p. (1975).

Bean, Alfred E.

PRECISE: A Multiple Precision Version of OMNITAB — Alfred E. Bean and Joseph Hilsenrath. NBS Tech. Note **446**, 84p. (1968).

Bearden, Joyce A.

X-Ray Wavelengths and X-Ray Atomic Energy Levels — Joyce A. Bearden and A. F. Burr. NSRDS-NBS **14**, 66p. (1967).

Beaty, Earl C.

A Bibliography of Electron Swarm Data — Earl C. Beaty, J. Dutton, and L. C. Pitchford. JILA Report **20**, 252p. (1979).

An Annotated Compilation and Appraisal of Electron Swarm Data in Electronegative Gases — Jean W. Gallagher, Earl C. Beaty, J. Dutton, and L. C. Pitchford. J Phys Chem Ref Data **12**, 109(1983).

Bibliography of Low Energy Electron and Photon Cross Section Data (January 1975 to December 1977) — Jean W. Gallagher, John R. Rumble, Jr., and Earl C. Beaty. NBS Spec. Publ. **426**, Suppl. 1(1979).

Bibliography of Low Energy Electron and Photon Cross Section Data (1978) — Jean W. Gallagher and Earl C. Beaty. JILA Report **18**, 148p. (1980).

Bibliography of Low Energy Electron and Photon Cross Section Data (1979) — Jean W. Gallagher and Earl C. Beaty. JILA Report **21**, 127p. (1981).

Data Index for Energy Transfer Collisions of Atoms and Molecules - 1970-1979 — Jean W. Gallagher, Janet Van Blerkom, Earl C. Beaty, and John R. Rumble, Jr. NBS Spec. Publ. **593**, 349p. (1981).

Beaudet, Robert A.

Microwave Spectra of Molecules of Astrophysical Interest, XII. Hydroxyl Radical — Robert A. Beaudet and Robert L. Poynter. J Phys Chem Ref Data **7**, 311(1978).

Bederson, Benjamin

Total Electron-Atom Collision Cross Sections at Low Energies — A Critical Review — Benjamin Bederson. Rev Mod Phys **43**, 999, 601p. (1971).

Bell, K. L.

Recommended Data on the Electron Impact Ionization of Light Atoms and Ions — K. L. Bell, H. B. Gilbody, J. G. Hughes, A. E. Kingston, and Francis J. Smith. J Phys Chem Ref Data **12**, 891(1983).

Bellet, Jean

Microwave Spectra of Molecules of Astrophysical Interest. XVIII. Formic Acid — Edmond Willemot, Didier Dangoisse, Nicole Monnanteuil, and Jean Bellet. J Phys Chem Ref Data **9**, 59(1980).

Benary, Odette

A Compilation of YN Reactions — Odette Benary, Naomi Barash-Schmidt, LeRoy R. Price, Arthur H. Rosenfeld, Gideon Alexander and Particle Data Group. UCRL **20000YN**, Springfield, VA: NTIS, 70p. (1970). UCRL-20 000 YN, A04.

Bennett, Lawrence H.

Metallic Shifts in NMR: A Review of the Theory and Comprehensive Critical Data Compilation of Metallic Materials — Gesina Cynthia Carter, Lawrence H. Bennett, and Daniel J. Kahan. Prog Mater Sci, Oxford, New York: Pergamon Press, 2350p. (1977), ISBN: 0-08-02114-7.

The NBS Alloy Data Center: Author Index — Gesina Cynthia Carter, Daniel J. Kahan, Lawrence H. Bennett, John R. Cuthill, and Ronald C. Dobbyn. OSRD Bibl. **70-2**, 413p. (1970).

The NBS Alloy Data Center: Function, Bibliographic System, Related Data Centers, and Reference Books — Gesina Cynthia Carter, Lawrence H. Bennett, John R. Cuthill, and Daniel J. Kahan. NBS Tech. Note **464**, 163p. (1968).

The NBS Alloy Data Center: Permuted Materials Index — Gesina Cynthia Carter, Daniel J. Kahan, Lawrence H. Bennett, John R. Cuthill, and Ronald C. Dobbyn. NBS Spec. Publ. **324**, 683p. (1971).

Bennett, William Ralph, Jr.

Atomic Gas Laser Transition Data, A Critical Evaluation — William Ralph Bennett, Jr. New York: IFI/Plenum, 293p. (1979), ISBN: 0-306-65187-4.

Benson, Sidney W.

Kinetic Data on Gas Phase Unimolecular Reactions — Sidney W. Benson and Harry E. O'Neal. NSRDS-NBS **21**, 645p. (1970).

Berger, M. J.

Stopping Powers and Ranges of Electrons and Positrons — M. J. Berger and S. M. Seltzer. NBSIR **82-2550**, 164p. (1982).

Bernstein, Lawrence S.

Binary Fluorides, Free Molecular Structures and Force Fields, A Bibliography (1957-1975) — Donald T. Hawkins, Lawrence S. Bernstein, Warren E. Falconer, and William Klemperer. New York: IFI/Plenum, 253p. (1976), ISBN: 0-306-6601-3.

Berry, Virginia M.

Phase Behavior in Binary and Multicomponent Systems at Elevated Pressures: n-Pentane and Methane-n-Pentane — Virginia M. Berry and Bruce H. Sage. NSRDS-NBS **32**, 79p. (1970).

Bishop, David M.

Vibrational Contributions to Molecular Dipole Polarizabilities — David M. Bishop and Lap M. Cheung. J Phys Chem Ref Data **11**, 119(1982).

Blagoi, Y. P.

Properties of Liquid and Solid Hydrogen — B. N. Esel'son, Y. P. Blagoi, V.N. Grigor'ev, V. G. Manzhelii, S. A. Mikhailenko, and N. P. Neklyudov. Russian Transl. Springfield, VA: NTIS, 126p. (1971). **TT** 70-50179, A07.

Bogaard, R. H.

Electrical Resistivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, T. N. Havill, R. H. Bogaard, R. A. Matula, S. G. Oh, and H. M. James. J Phys Chem Ref Data **12**, 183(1983).

Bondar', I. A.

Handbook of Phase Diagrams of Silicate Systems, Vol. II. Metal-Oxygen Compounds in Silicate Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, I. A. Bondar', and Yu. P. Udalov. Russian Transl. Springfield, VA: NTIS, 329p. (1972). **TT** 71-50041, A15.

Bortner, M. H.

A Review of Rate Constants of Selected Reactions of Interest in Re-Entry Flow Fields in the Atmosphere — M. H. Bortner. NBS Tech. Note **484**, 62p. (1969).

Boucher, D.

Microwave Spectra of Molecules of Astrophysical Interest, XV. Propyne — A. Bauer, D. Boucher, J. Burie, J. Demaison, and A. Dubrulle. J Phys Chem Ref Data **8**, 537(1979).

Microwave Spectra of Molecules of Astrophysical Interest. XIX. Methyl Cyanide — D. Boucher, J. Burie, A. Bauer, A. Dubrulle, and J. Demaison. J Phys Chem Ref Data **9**, 659(1980).

Boyd, Walter K.

Critical Surveys of Data Sources: Corrosion of Metals — Ronald Diegle and Walter K. Boyd. NBS Spec. Publ. **396**, 42p. (1976).

Brady, Edward L.

National Standard Reference Data System Plan of Operation — Edward L. Brady and M. Wallenstein. NSRDS-NBS **1**, 12p. (1965).

Bransden, B. H.

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ions with Atoms. I. Hydrogen Atom-Fully Stripped Ion Systems — R. K. Janev, B. H. Bransden, and Jean W. Gallagher. J Phys Chem Ref Data **12**, 829(1983).

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ions with Atoms. II. Hydrogen Atom-Partially Stripped Ions Systems — Jean W. Gallagher, B. H. Bransden, and R. K. Janev. J Phys Chem Ref Data **12**, 873(1983).

Braun, W.

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Breen, Bettijoyce

OMNIDATA, An Interactive System for Data Retrieval, Statistical and Graphical Analysis, and Data-Base Management, A User's Manual — Joseph Hilsenrath and Bettijoyce Breen. NBS Handbook **125**, 294p. (1978).

Bremer, Shirley G.

Test Problems and Results for OMNITAB 80 — Sally T. Peavy and Shirley G. Bremer. NBS Tech. Note **1147**, 316p. (1981).

Brewer, Leo

Simplification of Thermodynamic Calculations Through Dimensionless Entropies (Comments) — Kenneth S. Pitzer and Leo Brewer. J Phys Chem Ref Data **8**, 917(1979).

Briggs, E. A .

Atomic Form Factors, Incoherent Scattering Functions, and Photon Scattering Cross Sections — John H. Hubbell, W. J. Veigele, E. A. Briggs, R. T. Brown, D. T. Cromer, and R. J. Howerton. J Phys Chem Ref Data **4**, 471(1975).

Brooks, James S.

The Calculated Thermodynamic Properties of Superfluid Helium-4 — James S. Brooks and Russell J. Donnelly. J Phys Chem Ref Data **6**, 51(1977).

Brown, R. L.

Summary Report on the Workshop on High Temperature Chemical Kinetics: Applications to Combustion Research — David Garvin, R. L. Brown, Robert F. Hampson, Jr., M. J. Kurylo, and W. Tsang. NBS Spec. Publ. **531**, 94p. (1978).

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Brown, R. T.

Atomic Form Factors, Incoherent Scattering Functions, and Photon Scattering Cross Sections — John H. Hubbell, W. J. Veigele, E. A. Briggs, R. T. Brown, D. T. Cromer, and R. J. Howerton. J Phys Chem Ref Data **4**, 471(1975).

Browne, Edgardo

Table of Isotopes, Seventh Edition — C. Michael Lederer, Virginia S. Shirley, Edgardo Browne, Janis M. Dairiki, and Raymond E. Doebler. New York: Wiley-Interscience, 1628p. (1978), ISBN: 0-471-0417-3.

Brummer, James G.

A Catalog of Data Compilations on Photochemical and Photophysical Processes in Solution — James G. Brummer, W. Phillip Helman, and Alberta B. Ross. NBS Spec. Publ. **578**, 27p. (1980).

Rate Constants for the Decay and Reactions of the Lowest Electronically Excited Singlet State of Molecular Oxygen in Solution — Francis Wilkinson and James G. Brummer. J Phys Chem Ref Data **10**, 809(1981).

Burie, J.

Microwave Spectra of Molecules of Astrophysical Interest, XV. Propyne — A. Bauer, D. Boucher, J. Burie, J. Demaison, and A. Dubrulle. J Phys Chem Ref Data **8**, 537(1979).

Microwave Spectra of Molecules of Astrophysical Interest. XIX. Methyl Cyanide — D. Boucher, J. Burie, A. Bauer, A. Dubrulle, and J. Demaison. J Phys Chem Ref Data **9**, 659(1980).

Burkhard, D. G.

Microwave Spectral Tables, Volume III. Polyatomic Molecules with Internal Rotation — Paul F. Wacker, M. S. Cord, D. G. Burkhard, J. D. Petersen, and R. F. Kukol. NBS Monograph **70**, 275p. (1969).

Burr, A. F.

X-Ray Wavelengths and X-Ray Atomic Energy Levels — Joyce A. Bearden and A. F. Burr. NSRDS-NBS **14**, 66p. (1967).

Burzlaff, Hans

Space Groups and Lattice Complexes — W. Fisher, Hans Burzlaff, Erwin Hellner, and Joseph D. H. Donnay. NBS Monograph **134**, 177p. (1973).

Busey, R. H.

Thermodynamic Properties of Aqueous Sodium Chloride Solutions — Kenneth S. Pitzer, J. Christopher Peiper, and R. H. Busey. J Phys Chem Ref Data **13**, 1(1984).

Butrymowicz, Daniel B.

Diffusion Rate Data and Mass Transport Phenomena in Copper Systems — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. INCRA Monograph V, New York: International Copper Research Association, Inc., 322p. (1977).

Diffusion Rate Data and Mass Transport Phenomena for Copper Systems, Part II — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. INCRA Monograph **VIII**, New York: International Copper Research Association, Inc., 701p. (1982).

Diffusion in Copper and Copper Alloys, Part I. Volume and Surface Self-Diffusion in Copper — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **2**, 643(1973).

Diffusion in Copper and Copper Alloys, Part II. Copper-Silver and Copper-Gold Systems — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **3**, 527(1974).

Diffusion in Copper and Copper Alloys, Part III. Diffusion in Systems Involving Elements of the Groups IA, IIA, IIIB, IVB, VB, and VIIB — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **4**, 177(1975).

Diffusion in Copper and Copper Alloys, Part IV. Diffusion in Systems Involving Elements of Group VIII — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **5**, 103(1976).

Diffusion in Copper and Copper Alloys, Part V. Diffusion in Systems Involving Elements of Group VA — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **6**, 1(1977).

Buxton, George V.

Compilation of Rate Constants for the Reactions of Metal Ions in Unusual Valency States — George V. Buxton and Robin M. Sellers. NSRDS-NBS **62**, 68p. (1978).

Camy-Peyret, C.

Atlas of the High Temperature Water Vapor Spectrum in the 3000 to 4000 cm^{-1} Region — A. S. Pine, M. J. Coulombe, C. Camy-Peyret, and J-M. Flaud. J Phys Chem Ref Data **12**, 413(1983).

Cannon, John Francis

A Compilation of Volumes I-IV of Bibliography on High Pressure Research with Author and Subject Indexes — John Francis Cannon and Leo Merrill. Springfield, VA: NTIS, 385p. (1972). in two volumes, Vol. 1. PB 191 174, A17; Vol. 2. PB 191 174.

Behavior of the Elements at High Pressures — John Francis Cannon. J Phys Chem Ref Data **3**, 781(1974).

High Pressure Bibliography, 1968-1971, with Author and Subject Indexes — John Francis Cannon and Leo Merrill. Provo, UT: High Pressure Data Center, Brigham Young University, 189p. (1972). in microfiche only.

Carr, M. J.

Critical Surveys of Data Sources: Electrical and Magnetic Properties of Metals — M. J. Carr, R. B. Gavert, Robert L. Moore, H. W. Wawrousek, and John H. Westbrook. NBS Spec. Publ. **396**, 96p. (1976).

Carter, Gesina Cynthia

Applications of Phase Diagrams, Proceedings of a Workshop Held at the National Bureau of Standards, Gaithersburg, Maryland, January 10-12, 1977, Volumes 1 and 2 — Gesina Cynthia Carter, editor(s). NBS Spec. Publ. **496**, 1622p. (1978).

Metallic Shifts in NMR: A Review of the Theory and Comprehensive Critical Data Compilation of Metallic Materials — Gesina Cynthia Carter, Lawrence H. Bennett, and Daniel J. Kahan. Prog Mater Sci, Oxford, New York: Pergamon Press, 2350p. (1977), ISBN: 0-08-02114-7.

The NBS Alloy Data Center: Author Index — Gesina Cynthia Carter, Daniel J. Kahan, Lawrence H. Bennett, John R. Cuthill, and Ronald C. Dobbyn. OSRD Bibl. **70-2**, 413p. (1970).

The NBS Alloy Data Center: Function, Bibliographic System, Related Data Centers, and Reference Books — Gesina Cynthia Carter, Lawrence H. Bennett, John R. Cuthill, and Daniel J. Kahan. NBS Tech. Note **464**, 163p. (1968).

The NBS Alloy Data Center: Permuted Materials Index — Gesina Cynthia Carter, Daniel J. Kahan, Lawrence H. Bennett, John R. Cuthill, and Ronald C. Dobbyn. NBS Spec. Publ. **324**, 683p. (1971).

Cermak, V.

Ion-Molecule Reactions — Earl W. McDaniel, V. Cermak, A. Dalgarno, E. E. Ferguson, and L. Friedman. At Mol Collis Proc Ser, New York: Wiley-Interscience, 374p. (1970), ISBN: 0-471-5838-3.

Chang, Y. Austin

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Silver Systems — Y. Austin Chang, Daniel Goldberg, and Joachim P. Neumann. J Phys Chem Ref Data **6**, 621(1977).

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Metal Systems — Y. Austin Chang, Joachim P. Neumann, A. Mikula, and Daniel Goldberg. INCRA Monograph **VI**, New York: International Copper Research Association, Inc., 702p. (1979).

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Sulfur-Metal Systems — Y. Austin Chang, Joachim P. Neumann, and U. V. Choudary. INCRA Monograph **VII**, New York: International Copper Research Association, Inc., 191p. (1979).

Chao, Jing

Ideal Gas Thermodynamic Properties of Ethane and Propane — Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, 427(1973).

Ideal Gas Thermodynamic Properties of Eight Chloro- and Fluoromethanes — A. S. Rodgers, Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **3**, 117(1974).

Ideal Gas Thermodynamic Properties of Six Chloroethanes — Jing Chao, A. S. Rodgers, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **3**, 141(1974).

Ideal Gas Thermodynamic Properties of Ethylene and Propylene — Jing Chao and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 251(1975).

Ideal Gas Thermodynamic Properties of Six Fluoroethanes — S. S. Chen, A. S. Rodgers, Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 441(1975).

Ideal Gas Thermodynamic Properties of Propanone and 2-Butanone — Jing Chao and Bruno J. Zwolinski. J Phys Chem Ref Data **5**, 319(1976).

Ideal Gas Thermodynamic Properties of Methanoic and Ethanoic Acids — Jing Chao and Bruno J. Zwolinski. J Phys Chem Ref Data **7**, 363(1978).

Vapor Pressure of Coal Chemicals — Jing Chao, C. T. Lin, and T. H. Chung. J Phys Chem Ref Data **12**, 1033(1983).

Chase, Malcolm W., Jr.

JANAF Thermochemical Tables, 1974 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, A. T. Hu, H. Prophet, A. N. Syverud, and L. C. Walker. J Phys Chem Ref Data **3**, 311(1974).

JANAF Thermochemical Tables, 1975 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, H. Prophet, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **4**, 1(1975).

JANAF Thermochemical Tables, 1978 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **7**, 793(1978).

JANAF Thermochemical Tables, 1982 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, J. R. Downey, Jr., R. A. McDonald, A. N. Syverud, and E. A. Valenzuela. J Phys Chem Ref Data **11**, 695(1982).

Chen, S. S.

Ideal Gas Thermodynamic Properties of Six Fluoroethanes — S. S. Chen, A. S. Rodgers, Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 441(1975).

Ideal Gas Thermodynamic Properties and Isomerization of n-Butane and Isobutane — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 859(1975).

Ideal Gas Thermodynamic Properties of Six Chlorofluoromethanes — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **5**, 571(1976).

Thermodynamic Properties of Normal and Deuterated Methanols — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **6**, 105(1977).

Thermodynamic Properties of Normal and Deuterated Naphthalenes — S. S. Chen, Shanti A. Kudchadker, and Randolph C. Wilhoit. J Phys Chem Ref Data **8**, 527(1979).

Cheung, Lap M.

Vibrational Contributions to Molecular Dipole Polarizabilities — David M. Bishop and Lap M. Cheung. J Phys Chem Ref Data **11**, 119(1982).

Chew, Denyse M.

π+p, π+n, and π+d Interactions - A Compilation: Parts I and II — Denyse M. Chew, Victor P. Henri, Thomas A. Lasinski, Thomas G. Trippe, Fumiyo Uchiyama, Frederick C. Winkelmann and Particle Data Group. UCRL **53**, Springfield, VA: NTIS, 213p. (1973). LBL 53; Part II is on microfiche located in the back cover pocket, A10.

Chi, T. C.

Electrical Resistivity of Alkali Elements — T. C. Chi. J Phys Chem Ref Data **8**, 339(1979).

Electrical Resistivity of Alkaline Earth Elements — T. C. Chi. J Phys Chem Ref Data **8**, 439(1979).

Choudary, U. V.

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Sulfur-Metal Systems — Y. Austin Chang, Joachim P. Neumann, and U. V. Choudary. INCRA Monograph **VII**, New York: International Copper Research Association, Inc., 191p. (1979).

Chu, T. K.

Electrical Resistivity of Selected Elements — P. D. Desai, T. K. Chu, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1069(1984).

Chung, T. H.

Vapor Pressure of Coal Chemicals — Jing Chao, C. T. Lin, and T. H. Chung. J Phys Chem Ref Data **12**, 1033(1983).

Churney, Kenneth L.

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 54 through 61 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, Richard H. Schumm, and Kenneth L. Churney. NBS Tech. Note **270**, 49p. (1971).

The NBS Tables of Chemical Thermodynamic Properties. Selected Values for Inorganic and C_1 and C_2 Organic Substances in SI Units — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, Iva Halow, Sylvia M. Bailey, Kenneth L. Churney, and Ralph L. Nuttall. J Phys Chem Ref Data **11**, Suppl. 2(1982).

Clever, H. Lawrence

The Solubility of Some Sparingly Soluble Lead Salts: An Evaluation of the Solubility in Water and Aqueous Electrolyte Solution — H. Lawrence Clever and Francis J. Johnston. J Phys Chem Ref Data **9**, 751(1980).

Cohen, E. Richard

The 1973 Least-Squares Adjustment of the Fundamental Constants — E. Richard Cohen and Barry N. Taylor. J Phys Chem Ref Data **2**, 663(1973).

Cohen, N.

Chemical Kinetic Data Sheets for High-Temperature Chemical Reactions — N. Cohen and K. R. Westberg. J Phys Chem Ref Data **12**, 531(1983).

Collocott, S. J.

Heat Capacity of Reference Materials: Cu and W — G. K. White and S. J. Collocott. J Phys Chem Ref Data **13**, 1251(1984).

Comeford, John J.

Bibliography of Infrared Spectroscopy through 1960 — C. N. R. Rao, S. K. Dikshit, Shanti A. Kudchadker, D. S. Gupta, V. A. Narayan, and John J. Comeford. NBS Spec. Publ. **428**, 1,2,3(1976).

Coogan, Helen M.

Mossbauer Effect Data Index, 1958-1965 — A. H. Muir, K. J. Ando, and Helen M. Coogan. New York: Interscience Publishers, 351p. (1966).

Cook, E. L.

Compilation of Energy Band Gaps in Elemental and Binary Compound Semiconductors and Insulators — W. H. Strehlow and E. L. Cook. J Phys Chem Ref Data **2**, 163(1973).

Cook, F. J.

Analysis of Specific Heat Data in the Critical Region of Magnetic Solids — F. J. Cook. J Phys Chem Ref Data **2**, 11(1973).

Cord, M. S.

Microwave Spectral Tables, Volume IV. Polyatomic Molecules without Internal Rotation — M. S. Cord, J. D. Petersen, M. S. Lojko, and R. H. Haas. NBS Monograph **70**, 419p. (1968).

Microwave Spectral Tables, Volume III. Polyatomic Molecules with Internal Rotation — Paul F. Wacker, M. S. Cord, D. G. Burkhard, J. D. Petersen, and R. F. Kukol. NBS Monograph **70**, 275p. (1969).

Microwave Spectral Tables, Volume V. Spectral Line Listing — M. S. Cord, M. S. Lojko, and J. D. Petersen. NBS Monograph **70**, 533p. (1968).

Corliss, Charles H.

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

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

Energy Levels of Cobalt, Co I through Co XXVII — Jack Sugar and Charles H. Corliss. J Phys Chem Ref Data **10**, 1097(1981).

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

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

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

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

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

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

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

Tables of Line Spectra of the Elements, Part 1. Wavelengths and Intensities, Part 2. Transition Probabilities — Joseph Reader, Charles H. Corliss, Wolfgang L. Wiese, and Georgia A. Martin. NSRDS-NBS **68**, 415p. (1980).

Correia, Robert J.

Tables of the Dynamic and Kinematic Viscosity of Aqueous KCl Solutions in the Temperature Range 25-150°C and the Pressure Range 0.1-35 MPa — Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia. J Phys Chem Ref Data **10**, 57(1981).

Tables of the Dynamic and Kinematic Viscosity of Aqueous NaCl Solutions in the Temperature Range 20-150°C and the Pressure Range 0.1-35 MPa — Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia. J Phys Chem Ref Data **10**, 71(1981).

Coulombe, M. J.

Atlas of the High Temperature Water Vapor Spectrum in the 3000 to 4000 cm^{-1} Region — A. S. Pine, M. J. Coulombe, C. Camy-Peyret, and J-M. Flaud. J Phys Chem Ref Data **12**, 413(1983).

Cox, R. A.

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **9**, 295(1980).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement I. CODATA Task Group on Chemical Kinetics — D. L. Baulch, R. A. Cox, P. J. Crutzen, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **11**, 327(1982).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement II. CODATA Task Group on Gas Phase Chemical Kinetics — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **13**, 1259(1984).

Craver, Clara D.

Desk Book of Infrared Spectra — Clara D. Craver and Coblentz Society; Joint Committee on Atomic and Molecular Physical Data. Kirkwood, MO: The Coblentz Society, 458p. (1977).

Infrared Spectra of Halogenated Hydrocarbons — Clara D. Craver and Coblentz Society; Joint Committee on Atomic and Molecular Physical Data. Kirkwood, MO: The Coblentz Society, 125p. (1977).

Infrared Spectra of Plasticizers and Other Additives — Clara D. Craver and Coblentz Society; Joint Committee on Atomic and Molecular Physical Data. , Kirkwood, MO: The Coblentz Society, 152p. (1977).

Cromer, D. T.

Atomic Form Factors, Incoherent Scattering Functions, and Photon Scattering Cross Sections — John H. Hubbell, W. J. Veigele, E. A. Briggs, R. T. Brown, D. T. Cromer, and R. J. Howerton. J Phys Chem VRef Data **4**, 471(1975).

Crutzen, P. J.

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement I. CODATA Task Group on Chemical Kinetics — D. L. Baulch, R. A. Cox, P. J. Crutzen, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **11**, 327(1982).

Curnutt, J. L.

JANAF Thermochemical Tables, 1974 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, A. T. Hu, H. Prophet, A. N. Syverud, and L. C. Walker. J Phys Chem Ref Data **3**, 311(1974).

JANAF Thermochemical Tables, 1975 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, H. Prophet, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **4**, 1(1975).

JANAF Thermochemical Tables, 1978 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **7**, 793(1978).

JANAF Thermochemical Tables, 1982 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, J. R. Downey, Jr., R. A. McDonald, A. N. Syverud, and E. A. Valenzuela. J Phys Chem Ref Data **11**, 695(1982).

Cuthill, John R.

Soft X-Ray Emission Spectra of Metallic Solids: Critical Review of Selected Systems — Archie J. McAlister, Ronald C. Dobbyn, John R. Cuthill, and M. L. Williams. J Phys Chem Ref Data **2**, 411(1973).

Soft X-Ray Emission Spectra of Metallic Solids: Critical Review of Selected Systems and Annotated Spectral Index — Archie J. McAlister, Ronald C. Dobbyn, John R. Cuthill, and M. L. Williams. NBS Spec. Publ. **369**, 180p. (1974).

The NBS Alloy Data Center: Author Index — Gesina Cynthia Carter, Daniel J. Kahan, Lawrence H. Bennett, John R. Cuthill, and Ronald C. Dobbyn. OSRD Bibl. **70-2**, 413p. (1970).

The NBS Alloy Data Center: Function, Bibliographic System, Related Data Centers, and Reference Books — Gesina Cynthia Carter, Lawrence H. Bennett, John R. Cuthill, and Daniel J. Kahan. NBS Tech. Note **464**, 163p. (1968).

The NBS Alloy Data Center: Permuted Materials Index — Gesina Cynthia Carter, Daniel J. Kahan, Lawrence H. Bennett, John R. Cuthill, and Ronald C. Dobbyn. NBS Spec. Publ. **324**, 683p. (1971).

Dairiki, Janis M.

Table of Isotopes, Seventh Edition — C. Michael Lederer, Virginia S. Shirley, Edgardo Browne, Janis M. Dairiki, and Raymond E. Doebler. New York: Wiley-Interscience, 1628p. (1978), ISBN: 0-471-0417-3.

Dalgarno, A.

Ion-Molecule Reactions — Earl W. McDaniel, V. Cermak, A. Dalgarno, E. E. Ferguson, and L. Friedman. At Mol Collis Proc Ser, New York: Wiley-Interscience, 374p. (1970), ISBN: 0-471-5838-3.

Dampier, F. W.

Molten Salts: Volume 1. Electrical Conductance, Density, and Viscosity Data — George J. Janz, F. W. Dampier, G. R. Lakshminarayanan, P. K. Lorenz, and Reginald P. T. Tomkins. NSRDS-NBS **15**, 140p. (1968).

Dangoisse, Didier

Microwave Spectra of Molecules of Astrophysical Interest. XVIII. Formic Acid — Edmond Willemot, Didier Dangoisse, Nicole Monnanteuil, and Jean Bellet. J Phys Chem Ref Data **9**, 59(1980).

Darwent, B. DeB.

Bond Dissociation Energies in Simple Molecules — B. DeB. Darwent. NSRDS-NBS **31**, 48p. (1970).

Davies, John E.

Crystal Data Determinative Tables, Third Edition, Volume 5. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, John R. Rodgers, editor(s). **5**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Crystal Data Determinative Tables, Third Edition, Volume 6. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, editor(s). **6**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

De Bièvre, Paul

Isotopic Abundances and Atomic Weights of the Elements — Paul De Bièvre, Marc Gallet, Norman E. Holden, and I. Lynus Barnes. J Phys Chem Ref Data **13**, 809(1984).

De Lucia, Frank C.

Microwave Spectra of Molecules of Astrophysical Interest, IV. Hydrogen Sulfide — Paul Helminger, Frank C. De Lucia, and William H. Kirchhoff. J Phys Chem Ref Data **2**, 215(1973).

Microwave Spectra of Molecules of Astrophysical Interest, V. Water Vapor — Frank C. De Lucia, Paul Helminger, and William H. Kirchhoff. J Phys Chem Ref Data **3**, 211(1974).

DeWane, H. J.

Electrolytic Conductance and the Conductances of the Halogen Acids in Water — Walter J. Hamer and H. J. DeWane. NSRDS-NBS **33**, 37p. (1970).

Decker, D. L.

High-Pressure Calibration: A Critical Review — D. L. Decker, W. A. Bassett, Leo Merrill, H. T. Hall, and J. D. Barnett. J Phys Chem Ref Data **1**, 773(1972).

Demaison, J.

Microwave Spectra of Molecules of Astrophysical Interest, XV. Propyne — A. Bauer, D. Boucher, J. Burie, J. Demaison, and A. Dubrulle. J Phys Chem Ref Data **8**, 537(1979).

Microwave Spectra of Molecules of Astrophysical Interest. XIX. Methyl Cyanide — D. Boucher, J. Burie, A. Bauer, A. Dubrulle, and J. Demaison. J Phys Chem Ref Data **9**, 659(1980).

Desai, P. D.

Electrical Resistivity of Aluminum and Manganese — P. D. Desai, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1131(1984).

Electrical Resistivity of Selected Elements — P. D. Desai, T. K. Chu, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1069(1984).

Electrical Resistivity of Vanadium and Zirconium — P. D. Desai, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1097(1984).

Desai, Pramond D.

Selected Thermodynamic Values and Phase Diagrams for Copper and Some of Its Binary Alloys — Ralph Hultgren and Pramond D. Desai. INCRA Monograph I, New York: International Copper Research Association, Inc., 204p. (1973).

Selected Values of the Thermodynamic Properties of Binary Alloys — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, and Kenneth K. Kelley. Metals Park, OH: American Society for Metals, 1435p. (1973).

Selected Values of the Thermodynamic Properties of the Elements — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, Kenneth K. Kelley, and Donald D. Wagman. Metals Park, OH: American Society for Metals, 636p. (1973).

Dewan, Ashok

Critical Evaluation of Vapor-Liquid Equilibrium, Heat of Mixing, and Volume Change of Mixing Data. General Procedures — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 941(1982).

Evaluation of Binary Excess Enthalpy Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1127(1982).

Evaluation of Binary Excess Enthalpy Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 389(1983).

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1151(1982).

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 395(1983).

Evaluation of Binary *PT*xy Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1099 (1982).

Evaluation of Binary *PT*xy Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 381(1983).

Diaz, Carlos

Thermodynamic Properties of Copper-Slag Systems — Carlos Diaz. INCRA Monograph III, New York: International Copper Research Association, Inc., 178p. (1976).

Dick, C. E.

Utility Programs for Generating the Hershey Character Fonts on Microcomputers and Laboratory Plotters — C. E. Dick and Joseph Hilsenrath. NBS Tech. Note **1176**, 49p. (1983).

Diegle, Ronald

Critical Surveys of Data Sources: Corrosion of Metals — Ronald Diegle and Walter K. Boyd. NBS Spec. Publ. **396**, 42p. (1976).

Dijkhuis, Chr. G. M.

Molten Salts: Volume 2. Section 1. Electrochemistry of Molten Salts. Gibbs Free Energies and Excess Free Energies from Equilibrium-Type Cells, Section 2. Surface Tension Data — George J. Janz, Chr. G. M. Dijkhuis, G. R. Lakshminarayanan, Reginald P. T. Tomkins, and J. Wong. NSRDS-NBS **28**, 116p. (1968).

Dikshit, S. K.

Bibliography of Infrared Spectroscopy through 1960 — C. N. R. Rao, S. K. Dikshit, Shanti A. Kudchadker, D. S. Gupta, V. A. Narayan, and John J. Comeford. NBS Spec. Publ. **428**, 1,2,3(1976).

Dillard, J. G.

Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions — Joseph L. Franklin, J. G. Dillard, Henry M. Rosenstock, John T. Herron, Keith Draxl, and Frank H. Field. NSRDS-NBS **26**, 289p. (1969).

Dimitrijević, M. S.

Experimental Stark Widths and Shifts for Spectral Lines of Neutral Atoms (A Critical Review of Selected Data for the Period 1976 to 1982) — N. Konjević, M. S. Dimitrijević, and Wolfgang L. Wiese. J Phys Chem Ref Data **13**, 619(1984).

Experimental Stark Widths and Shifts for Spectral Lines of Positive Ions (A Critical Review and Tabulation of Selected Data for the Period 1976 to 1982) — N. Konjević, M. S. Dimitrijević, and Wolfgang L. Wiese. J Phys Chem Ref Data **13**, 649(1984).

Dobbyn, Ronald C.

Soft X-Ray Emission Spectra of Metallic Solids: Critical Review of Selected Systems — Archie J. McAlister, Ronald C. Dobbyn, John R. Cuthill, and M. L. Williams. J Phys Chem Ref Data **2**, 411(1973).

Soft X-Ray Emission Spectra of Metallic Solids: Critical Review of Selected Systems and Annotated Spectral Index — Archie J. McAlister, Ronald C. Dobbyn, John R. Cuthill, and M. L. Williams. NBS Spec. Publ. **369**, 180p. (1974).

The NBS Alloy Data Center: Author Index — Gesina Cynthia Carter, Daniel J. Kahan, Lawrence H. Bennett, John R. Cuthill, and Ronald C. Dobbyn. OSRD Bibl. **70-2**, 413p. (1970).

The NBS Alloy Data Center: Permuted Materials Index — Gesina Cynthia Carter, Daniel J. Kahan, Lawrence H. Bennett, John R. Cuthill, and Ronald C. Dobbyn. NBS Spec. Publ. **324**, 683p. (1971).

Doebler, Raymond E.

Table of Isotopes, Seventh Edition — C. Michael Lederer, Virginia S. Shirley, Edgardo Browne, Janis M. Dairiki, and Raymond E. Doebler. New York: Wiley-Interscience, 1628p. (1978), ISBN: 0-471-0417-3.

Domalski, Eugene S.

Heat Capacities and Entropies of Organic Compounds in the Condensed Phase — Eugene S. Domalski, William H. Evans, and Elizabeth D. Hearing. J Phys Chem Ref Data **13**, Suppl. 1(1984).

Selected Values of Heats of Combustion and Heats of Formation of Organic Compounds Containing the Elements C, H, N, O, P, and S — Eugene S. Domalski. J Phys Chem Ref Data **1**, 221(1972).

Thermodynamic Properties of Miscellaneous Materials — Eugene S. Domalski, William H. Evans, and Thomas L. Jobe, Jr. NBSIR **78-1479**, 69p. (1981).

Donnay, Joseph D. H.

Crystal Data Determinative Tables, Third Edition Volume 1: Organic Compounds — Joseph D. H. Donnay and Helen M. Ondik. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 855p. (1972).

Crystal Data Determinative Tables, Third Edition Volume 2: Inorganic Compounds — Joseph D. H. Donnay and Helen M. Ondik. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1748p. (1973).

Crystal Data Determinative Tables, Third Edition Volume 3. Organic Compounds — Joseph D. H. Donnay, Olga Kennard, David G. Watson, and John R. Rodgers. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 748p. (1978).

Crystal Data Determinative Tables, Third Edition Volume 4. Inorganic Compounds — Joseph D. H. Donnay, Helen M. Ondik, and Alan D. Mighell. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1308p. (1978).

Space Groups and Lattice Complexes — W. Fisher, Hans Burzlaff, Erwin Hellner, and Joseph D. H. Donnay. NBS Monograph **134**, 177p. (1973).

Donnelly, Russell J.

The Calculated Thermodynamic Properties of Superfluid Helium-4 — James S. Brooks and Russell J. Donnelly. J Phys Chem Ref Data **6**, 51(1977).

Dorfman, Leon M.

Reactivity of the Hydroxyl Radical in Aqueous Solutions — Leon M. Dorfman and Gerald E. Adams. NSRDS-NBS **46**, 72p. (1973).

Douglass, Charles H.

Property Index to NSRDS Data Compilations, 1964-1972 — David R. Lide, Jr., Gertrude B. Sherwood, Charles H. Douglass, and Herman M. Weisman. NSRDS-NBS **55**, 21p. (1975).

Douslin, Donald R.

Derived Thermodynamic Properties of Ethylene — Roland H. Harrison and Donald R. Douslin. J Chem Eng Data. **22**, Washington, DC: American Chemical Society, 24p. (1977).

Pressure, Volume, Temperature Relations of Ethylene — Donald R. Douslin and Roland H. Harrison. J Chem Thermody **76**, New York, London:, 301p. (1976).

Downey, J. R., Jr.

JANAF Thermochemical Tables, 1982 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, J. R. Downey, Jr., R. A. McDonald, A. N. Syverud, and E. A. Valenzuela. J Phys Chem Ref Data **11**, 695(1982).

Molten Salts: Volume 4, Part 2, Chlorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., G. L. Gardner, Ursula Krebs, and S. K. Singer. J Phys Chem Ref Data **4**, 871(1975).

Molten Salts: Volume 4, Part 3, Bromides and Mixtures, Iodides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., and S. K. Singer. J Phys Chem Ref Data **6**, 409(1977).

Physical Properties Data Compilations Relevant to Energy Storage. I. Molten Salts: Eutectic Data — George J. Janz, Carolyn B. Allen, J. R. Downey, Jr., and Reginald P. T. Tomkins. NSRDS-NBS **61**, 244p. (1978).

Draxl, Keith

Energetics of Gaseous Ions — Henry M. Rosenstock, Keith Draxl, B. W. Steiner, and John T. Herron. J Phys Chem Ref Data **6**, Suppl. 1(1977).

Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions — Joseph L. Franklin, J. G. Dillard, Henry M. Rosenstock, John T. Herron, Keith Draxl, and Frank H. Field. NSRDS-NBS **26**, 289p. (1969).

Dregalin, A. F.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume I. Computation Methods — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, and V. A. Khudyakov. Russian Transl. Springfield, VA: NTIS, 453p. (1974). TT 74-50019, A20.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume II. Oxygen-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 505p. (1975). TT 74-50032, A22.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume III. Oxygen- and Air-Based Propellant — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 648p. (1975). TT 75-50007, A26.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume IV. Nitrogen Tetroxide-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 540p. (1976). TT 76-50007, A23.

Dreizler, H.

Microwave Spectra of Molecules of Astrophysical Interest, XVII. Dimethyl Ether — Frank J. Lovas, H. Lutz, and H. Dreizler. J Phys Chem Ref Data **8**, 1051(1979).

Dubrulle, A.

Microwave Spectra of Molecules of Astrophysical Interest, XV. Propyne — A. Bauer, D. Boucher, J. Burie, J. Demaison, and A. Dubrulle. J Phys Chem Ref Data **8**, 537(1979).

Microwave Spectra of Molecules of Astrophysical Interest. XIX. Methyl Cyanide — D. Boucher, J. Burie, A. Bauer, A. Dubrulle, and J. Demaison. J Phys Chem Ref Data **9**, 659(1980).

Duby, Paul

The Thermodynamic Properties of Aqueous Inorganic Copper Systems — Paul Duby. INCRA Monograph IV, New York: International Copper Research Association, Inc., 132p. (1977).

Duncan, Blanton C.

Complete Clear Text Representation of Scientific Documents in Machine-Readable Form — Blanton C. Duncan and David Garvin. NBS Tech. Note **820**, 58p. (1974).

Description of the Magnetic Tape Version of the Bulletin of Thermodynamics and Thermochemistry, No. 14 — Robert McClenon, William H. Evans, David Garvin, and Blanton C. Duncan. NBS Tech. Note **760**, 32p. (1973).

Dunlap, B. D.

Nuclear Moments and Moment Ratios as Determined by Mössbauer Spectroscopy — John G. Stevens and B. D. Dunlap. J Phys Chem Ref Data **5**, 1093(1976).

Dunn, Gordon H.

Electron Impact Ionization Cross-Section Data for Atoms, Atomic Ions, and Diatomic Molecules: I. Experimental Data — Lee J. Kieffer and Gordon H. Dunn. Rev Mod Phys. **38**, New York: American Institute of Physics, 35p. (1966).

Dunn, T. C.

Photonuclear Reaction Data, 1973 — Everett G. Fuller, Henry M. Gerstenberg, H. J. Vander Molen, and T. C. Dunn. NBS Spec. Publ. **380**, 134p. (1973).

Dutton, J.

A Bibliography of Electron Swarm Data — Earl C. Beaty, J. Dutton, and L. C. Pitchford. JILA Report **20**, 252p. (1979).

A Survey of Electron Swarm Data — J. Dutton. J Phys Chem Ref Data **4**, 577(1975).

An Annotated Compilation and Appraisal of Electron Swarm Data in Electronegative Gases — Jean W. Gallagher, Earl C. Beaty, J. Dutton, and L. C. Pitchford. J Phys Chem Ref Data **12**, 109(1983).

Duxbury, J.

Evaluated Kinetic Data for High Temperature Reactions, Volume 4. Homogeneous Gas Phase Reactions of Halogen- and Cyanide-Containing Species — D. L. Baulch, J. Duxbury, S. J. Grant, and D. C. Montague. J Phys Chem Ref Data **10**, Suppl. 1(1981).

Eaton, B. E.

A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethylene — Paul M. Holland, B. E. Eaton, and Howard J. M. Hanley. J Phys Chem Ref Data **12**, 917(1983).

Edlén, Bengt

Reference Wavelengths from Atomic Spectra in the Range 5Å to 25000Å — Victor Kaufman and Bengt Edlén. J Phys Chem Ref Data **3**, 825(1974).

Eigenmann, H. K.

A Critical Review of H-Atom Transfer in the Liquid Phase: Chlorine Atom, Alkyl, Trichloromethyl, Alkoxy, and Alkylperoxy Radicals — D. G. Hendry, T. Mill, L. Piszkiewicz, J. A. Howard, and H. K. Eigenmann. J Phys Chem Ref Data **3**, 937(1974).

Ely, James F.

A Computer Program for the Prediction of Viscosity and Thermal Conductivity in Hydrocarbon Mixtures — James F. Ely and Howard J. M. Hanley. NBS Tech. Note **1039**, 83p. (1981).

The Viscosity and Thermal Conductivity Coefficients of Dilute Nitrogen and Oxygen — Howard J. M. Hanley and James F. Ely. J Phys Chem Ref Data **2**, 735(1973).

Enstrom, James E.

NN and ND Interactions - A Compilation — James E. Enstrom, Thomas Ferbel, Paul F. Slattery, Barry L. Werner, Zaven G. T. Guiragossian, Yoshio Sumi, Toshihiro Yoshida and Particle Data Group. UCRL-LBL **58**, Berkeley, CA: Lawrence Berkeley Laboratory, U. of California, 281p. (1972). LBL 58.

Erickson, Glen W.

Energy Levels of One-Electron Atoms — Glen W. Erickson. J Phys Chem Ref Data **6**, 831(1977).

Esel'son, B. N.

Properties of Liquid and Solid Hydrogen — B. N. Esel'son, Y. P. Blagoi, V.N. Grigor'ev, V. G. Manzhelii, S. A. Mikhailenko, and N. P. Neklyudov. Russian Transl. Springfield, VA: NTIS, 126p. (1971). TT 70-50179, A07.

Evans, William H.

A Combined Least Sums and Least Squares Approach to the Evaluation of Thermodynamic Data Networks — David Garvin, Vivian B. Parker, Donald D. Wagman, and William H. Evans. NBSIR **76-1147**, 41p. (1976).

Chemical Thermodynamic Properties of Compounds of Sodium, Potassium, and Rubidium: An Interim Tabulation of Selected Material — Donald D. Wagman, William H. Evans, Vivian B. Parker, and Richard H. Schumm. NBSIR **76-1034**, 76p. (1976).

Description of the Magnetic Tape Version of the Bulletin of Thermodynamics and Thermochemistry, No. 14 — Robert McClenon, William H. Evans, David Garvin, and Blanton C. Duncan. NBS Tech. Note **760**, 32p. (1973).

Heat Capacities and Entropies of Organic Compounds in the Condensed Phase — Eugene S. Domalski, William H. Evans, and Elizabeth D. Hearing. J Phys Chem Ref Data **13**, Suppl. 1(1984).

Selected Values of Chemical Thermodynamic Properties. Tables for the First Thirty-Four Elements in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 264p. (1968).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 35 through 53 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 152p. (1969).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 54 through 61 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, Richard H. Schumm, and Kenneth L. Churney. NBS Tech. Note **270**, 49p. (1971).

Selected Values of Chemical Thermodynamic Properties. Tables for the Alkaline Earth Elements (Elements 92 through 97 in the Standard Order of Arrangement) — Vivian B. Parker, Donald D. Wagman, and William H. Evans. NBS Tech. Note **270**, 124p. (1971).

Selected Values of Chemical Thermodynamic Properties. Tables for the Lanthanide (Rare Earth) Elements (Elements 62 through 76 in the Standard Order of Arrangement) — Richard H. Schumm, Donald D. Wagman, Sylvia M. Bailey, William H. Evans, and Vivian B. Parker. NBS Tech. Note **270**, 84p. (1973).

Selected Values of Chemical Thermodynamic Properties: Compounds of Uranium, Protactinium, Thorium, Actinium, and the Alkali Metals — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, and Ralph L. Nuttall. NBS Tech. Note **270**, 149p. (1981).

The NBS Tables of Chemical Thermodynamic Properties. Selected Values for Inorganic and C_1 and C_2 Organic Substances in SI Units — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, Iva Halow, Sylvia M. Bailey, Kenneth L. Churney, and Ralph L. Nuttall. J Phys Chem Ref Data **11**, Suppl. 2(1982).

Thermodynamic Properties of Miscellaneous Materials — Eugene S. Domalski, William H. Evans, and Thomas L. Jobe, Jr. NBSIR **78-1479**, 69p. (1981).

Falconer, Warren E.

Binary Fluorides, Free Molecular Structures and Force Fields, A Bibliography (1957-1975) — Donald T. Hawkins, Lawrence S. Bernstein, Warren E. Falconer, and William Klemperer. New York: IFI/Plenum, 253p. (1976), ISBN: 0-306-6601-3.

Fanconi, Bruno

Critical Review of Vibrational Data and Force Field Constants for Polyethylene — John Barnes and Bruno Fanconi. J Phys Chem Ref Data **7**, 1309(1978).

Farhataziz

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, II. Hydrogen Atom — Michael Anbar, Farhataziz, and Alberta B. Ross. NSRDS-NBS **51**, 66p. (1975).

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, III. Hydroxyl Radical and Perhydroxyl Radical and Their Radical Ions — Farhataziz and Alberta B. Ross. NSRDS-NBS **59**, 126p. (1977).

Ferbel, Thomas

NN and ND Interactions - A Compilation — James E. Enstrom, Thomas Ferbel, Paul F. Slattery, Barry L. Werner, Zaven G. T. Guiragossian, Yoshio Sumi, Toshihiro Yoshida and Particle Data Group. UCRL-LBL **58**, Berkeley, CA: Lawrence Berkeley Laboratory, U. of California, 281p. (1972). LBL 58.

Ferguson, E. E.

Ion-Molecule Reactions — Earl W. McDaniel, V. Cermak, A. Dalgarno, E. E. Ferguson, and L. Friedman. At Mol Collis Proc Ser, New York: Wiley-Interscience, 374p. (1970), ISBN: 0-471-5838-3.

Field, Frank H.

Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions — Joseph L. Franklin, J. G. Dillard, Henry M. Rosenstock, John T. Herron, Keith Draxl, and Frank H. Field. NSRDS-NBS **26**, 289p. (1969).

Fisher, W.

Space Groups and Lattice Complexes — W. Fisher, Hans Burzlaff, Erwin Hellner, and Joseph D. H. Donnay. NBS Monograph **134**, 177p. (1973).

Fivozinsky, Sherman P.

Medical Physics Data Book — Thomas N. Padikal and Sherman P. Fivozinsky. NBS Handbook **138**, 127p. (1982).

Flaud, J-M.

Atlas of the High Temperature Water Vapor Spectrum in the 3000 to 4000 cm^{-1} Region — A. S. Pine, M. J. Coulombe, C. Camy-Peyret, and J-M. Flaud. J Phys Chem Ref Data **12**, 413(1983).

Franck, E. U.

Ion Product of Water Substance, 0 - 1000°C, 1 - 10,000 Bars. New International Formulation and Its Background — William L. Marshall and E. U. Franck. J Phys Chem Ref Data **10**, 295(1981).

Static Dielectric Constant of Water and Steam — M. Uematsu and E. U. Franck. J Phys Chem Ref Data **9**, 1291(1980).

Franklin, Joseph L.

Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions — Joseph L. Franklin, J. G. Dillard, Henry M. Rosenstock, John T. Herron, Keith Draxl, and Frank H. Field. NSRDS-NBS **26**, 289p. (1969).

Frattali, Sandra

Semiempirical and Approximate Methods for Molecular Calculations - Bibliography and KWIC Index — George A. Henderson and Sandra Frattali. OSRD Bibl. **70-3**, 293p. (1970).

Frederikse, Hans P. R.

Compilation of the Static Dielectric Constant of Inorganic Solids — K. F. Young and Hans P. R. Frederikse. J Phys Chem Ref Data **2**, 313(1973).

Freedman, M. S.

Recommended Atomic Electron Binding Energies, 1s to $6p_{3/2}$, for the Heavy Elements, Z = 84 to 103 — F. T. Porter and M. S. Freedman. J Phys Chem Ref Data **7**, 1267(1978).

Freeman, D. E.

Atlas of the Schumann-Runge Absorption Bands of O_2 in the Wavelength Region 175-205 nm — K. Yoshino, D. E. Freeman, and W. H. Parkinson. J Phys Chem Ref Data **13**, 207(1984).

Freeman, Gordon R.

Radiation Chemistry of Ethanol: A Review of Data on Yields, Reaction Rate Parameters, and Spectral Properties of Transients — Gordon R. Freeman. NSRDS-NBS **48**, 44p. (1974).

Freeman, Robert D.

Bulletin of Chemical Thermodynamics, Volume 24/1981 — Robert D. Freeman, editor(s) and International Union of Pure and Applied Chemistry, Commission 1.2 on Thermodynamics. Bull Chem Thermody **24**, Stillwater, OK: Thermochemistry, Department of Chemistry, Oklahoma State University, 504p. (1982). 0149-2268, bona fide personal subscriptions are less; prices of previous Bulletins available upon request.

Bulletin of Chemical Thermodynamics, Volume 25/1982 — Robert D. Freeman and International Union of Pure and Applied Chemistry. Bull Chem Thermody **25**, Stillwater, OK: Thermochemistry, Department of Chemistry, Oklahoma State University, 544p. (1982). 0149-2268, bona fide personal subscriptions are less; prices of previous Bulletins are available upon request.

Friedman, L.

Ion-Molecule Reactions — Earl W. McDaniel, V. Cermak, A. Dalgarno, E. E. Ferguson, and L. Friedman. At Mol Collis Proc Ser, New York: Wiley-Interscience, 374p. (1970), ISBN: 0-471-5838-3.

Fristrom, R. M.

Rate Constants of Gas Phase Reactions, Reference Book — V. N. Kondratiev, L. J. Holtschlag, R. M. Fristrom, editor(s). Russian Transl. Springfield, VA: NTIS, 434p. (1972). COM 72-10014, A19.

Fuhr, Jeffrey R.

Atomic Transition Probabilities for Scandium and Titanium (A Critical Data Compilation of Allowed Lines) — Wolfgang L. Wiese and Jeffrey R. Fuhr. J Phys Chem Ref Data **4**, 263(1975).

Atomic Transition Probabilities for Vanadium, Chromium, and Manganese (A Critical Data Compilation of Allowed Lines) — S. M. Younger, Jeffrey R. Fuhr, Georgia A. Martin, and Wolfgang L. Wiese. J Phys Chem Ref Data **7**, 495(1978).

Atomic Transition Probabilities for Iron, Cobalt, Nickel: A Critical Data Compilation of Allowed Lines — Jeffrey R. Fuhr, Georgia A. Martin, Wolfgang L. Wiese, and S. M. Younger. J Phys Chem Ref Data **10**, 305(1981).

Bibliography on Atomic Line Shapes and Shifts (1899 through March 1972) — Jeffrey R. Fuhr, Wolfgang L. Wiese, and Larry J. Roszman. NBS Spec. Publication **366**, 165p. (1972).

Bibliography on Atomic Line Shapes and Shifts (April 1972 through June 1973) — Jeffrey R. Fuhr, Larry J. Roszman, and Wolfgang L. Wiese. NBS Spec. Publ. **366**, Suppl. 1(1974).

Bibliography on Atomic Line Shapes and Shifts (July 1973 through May 1975) — Jeffrey R. Fuhr, Georgia A. Martin, and Beverly J. Specht. NBS Spec. Publ. **366**, Suppl. 2(1975).

Bibliography on Atomic Line Shapes and Shifts (June 1975 through June 1978) — Jeffrey R. Fuhr, Beverly J. Miller, and Georgia A. Martin. NBS Spec. Publ. **366**, Suppl. 3(1978).

Bibliography on Atomic Transition Probabilities (1914 through October 1977) — Beverly J. Miller, Jeffrey R. Fuhr, and Georgia A. Martin. NBS Spec. Publ. **505**, 283p. (1978).

Bibliography on Atomic Transition Probabilities (November 1977 through March 1980) — Beverly J. Miller, Jeffrey R. Fuhr, and Georgia A. Martin. NBS Spec. Publ. **505**, Suppl.(1980).

Fuller, Everett G.

Photonuclear Data Index, 1973-1977 — Everett G. Fuller and Henry M. Gerstenberg. NBS Spec. Publ. **380**, Suppl. 1(1978).

Photonuclear Data Index, 1973-1981 (Supplement 2 to NBS Special Publication 380) — Everett G. Fuller and Henry M. Gerstenberg. NBSIR **82-2543**, 139p. (1982).

Photonuclear Reaction Data, 1973 — Everett G. Fuller, Henry M. Gerstenberg, H. J. Vander Molen, and T. C. Dunn. NBS Spec. Publ. **380**, 134p. (1973).

Fuller, Gladys H.

Nuclear Spins and Moments — Gladys H. Fuller. J Phys Chem Ref Data **5**, 835(1976).

Furukawa, George T.

Critical Analysis of Heat-Capacity Data and Evaluation of Thermodynamic Properties of Ru, Ph, Pd, Ir, and Pt from 0 to 300 K. A Survey of the Literature Data on Osmium — George T. Furukawa, Martin L. Reilly, and John S. Gallagher. J Phys Chem Ref Data **3**, 163(1974).

Critical Analysis of the Heat-Capacity Data of the Literature and Evaluation of Thermodynamic Properties of Copper, Silver, and Gold from 0 to 300 K — George T. Furukawa, W. G. Saba, and Martin L. Reilly. NSRDS-NBS **18**, 49p. (1968).

Gallagher, Jean W.

An Annotated Compilation and Appraisal of Electron Swarm Data in Electronegative Gases — Jean W. Gallagher, Earl C. Beaty, J. Dutton, and L. C. Pitchford. J Phys Chem Ref Data **12**, 109(1983).

Bibliography of Low Energy Electron and Photon Cross Section Data (January 1975 to December 1977) — Jean W. Gallagher, John R. Rumble, Jr., and Earl C. Beaty. NBS Spec. Publ. **426**, Suppl. 1(1979).

Bibliography of Low Energy Electron and Photon Cross Section Data (1978) — Jean W. Gallagher and Earl C. Beaty. JILA Report **18**, 148p. (1980).

Bibliography of Low Energy Electron and Photon Cross Section Data (1979) — Jean W. Gallagher and Earl C. Beaty. JILA Report **21**, 127p. (1981).

Data Index for Energy Transfer Collisions of Atoms and Molecules - 1970-1979 — Jean W. Gallagher, Janet Van Blerkom, Earl C. Beaty, and John R. Rumble, Jr. NBS Spec. Publ. **593**, 349p. (1981).

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ions with Atoms. I. Hydrogen Atom-Fully Stripped Ion Systems — R. K. Janev, B. H. Bransden, and Jean W. Gallagher. J Phys Chem Ref Data **12**, 829(1983).

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ions with Atoms. II. Hydrogen Atom-Partially Stripped Ions Systems — Jean W. Gallagher, B. H. Bransden, and R. K. Janev. J Phys Chem Ref Data **12**, 873(1983).

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ion with Atoms. III. Non-Hydrogenic Target Atoms — R. K. Janev and Jean W. Gallagher. J Phys Chem Ref Data **13**, 1199(1984).

Gallagher, John S.

A Thermodynamic Surface for Water: The Formulation and Computer Program — Lester Haar, John S. Gallagher, and George S. Kell. NBSIR **81-2253**, 38p. (1981).

Critical Analysis of Heat-Capacity Data and Evaluation of Thermodynamic Properties of Ru, Ph, Pd, Ir, and Pt from 0 to 300 K. A Survey of the Literature Data on Osmium — George T. Furukawa, Martin L. Reilly, and John S. Gallagher. J Phys Chem Ref Data **3**, 163(1974).

Equation of State for Ammonia — Lester Haar and John S. Gallagher. NBSIR **75-770**, 27p. (1975).

NBS/NRC Steam Tables, Thermodynamic and Transport Properties and Computer Programs for Vapor and Liquid States of Water — Lester Haar, John S. Gallagher, and George S. Kell. New York: Hemisphere Press, 320p. (1984).

Thermodynamic Properties of Ammonia — Lester Haar and John S. Gallagher. J Phys Chem Ref Data **7**, 635(1978).

Gallet, Marc

Isotopic Abundances and Atomic Weights of the Elements — Paul De Bièvre, Marc Gallet, Norman E. Holden, and I. Lynus Barnes. J Phys Chem Ref Data **13**, 809(1984).

Gardner, G. L.

Molten Salts: Volume 4, Part 1, Fluorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, G. L. Gardner, Ursula Krebs, and Reginald P. T. Tomkins. J Phys Chem Ref Data **3**, 1(1974).

Molten Salts: Volume 4, Part 2, Chlorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., G. L. Gardner, Ursula Krebs, and S. K. Singer. J Phys Chem Ref Data **4**, 871(1975).

Garg, V. K.

Bibliography on Properties of Defect Centers in Alkali Halides — Suresh C. Jain, S. A. Khan, H. K. Sehgal, V. K. Garg, and R. K. Jain. OSRD Bibl. **71-1**, 293p. (1971).

Garvin, David

A Combined Least Sums and Least Squares Approach to the Evaluation of Thermodynamic Data Networks — David Garvin, Vivian B. Parker, Donald D. Wagman, and William H. Evans. NBSIR **76-1147**, 41p. (1976).

Chemical Thermodynamic Data Banks — David Garvin, Vivian B. Parker, and Donald D. Wagman. NBSIR **81-2341**, 30p. (1981).

Complete Clear Text Representation of Scientific Documents in Machine-Readable Form — Blanton C. Duncan and David Garvin. NBS Tech. Note **820**, 58p. (1974).

Description of the Magnetic Tape Version of the Bulletin of Thermodynamics and Thermochemistry, No. 14 — Robert McClenon, William H. Evans, David Garvin, and Blanton C. Duncan. NBS Tech. Note **760**, 32p. (1973).

Reaction Rate and Photochemical Data for Atmospheric Chemistry - 1977 — Robert F. Hampson, Jr. and David Garvin. NBS Spec. Publ. **513**, 111p. (1978).

Selected Thermochemical Data Compatible with CODATA Recommendations — Vivian B. Parker, Donald D. Wagman, and David Garvin. NBSIR **75-968**, 35p. (1976).

Subroutine for the Calculation of CODEN Check Characters — David Garvin. NBS Tech. Note **738**, 16p. (1972).

Summary Report on the Workshop on High Temperature Chemical Kinetics: Applications to Combustion Research — David Garvin, R. L. Brown, Robert F. Hampson, Jr., M. J. Kurylo, and W. Tsang. NBS Spec. Publ. **531**, 94p. (1978).

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Gaur, Umesh

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. I. Selenium — Umesh Gaur, Hua-Cheng Shu, Aspy Metha, and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 89(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. II. Polyethylene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 119(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. III. Polyoxides — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 1001(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IV. Polypropylene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 1051(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. V. Polystyrene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **11**, 313(1982).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VI. Acrylic Polymers — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **11**, 1065(1982).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VII. Other Carbon Backbone Polymers — Umesh Gaur, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 29(1983).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VIII. Polyesters and Polyamides — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 65(1983).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IX. Final Group of Aromatic and Inorganic Polymers — Umesh Gaur, Suk-fai Lau, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 91(1983).

Gavert, R. B.

Critical Surveys of Data Sources: Mechanical Properties of Metals — R. B. Gavert, Robert L. Moore, and John H. Westbrook. NBS Spec. Publ. **396**, 90p. (1974).

Critical Surveys of Data Sources: Electrical and Magnetic Properties of Metals — M. J. Carr, R. B. Gavert, Robert L. Moore, H. W. Wawrousek, and John H. Westbrook. NBS Spec. Publ. **396**, 96p. (1976).

Gehrig, Catherine A.

Standard Chemical Thermodynamic Properties of Alkane Isomer Groups — Robert A. Alberty and Catherine A. Gehrig. J Phys Chem Ref Data **13**, 1173(1984).

Gerry, M. C. L.

Microwave Spectra of Molecules of Astrophysical Interest, X. Isocyanic Acid — G. Winnewisser, W. H. Hocking, and M. C. L. Gerry. J Phys Chem Ref Data **5**, 79(1976).

Microwave Spectra of Molecules of Astrophysical Interest, XIV. Vinyl Cyanide (Acrylonitrile) — M. C. L. Gerry, K. Yamada, and G. Winnewisser. J Phys Chem Ref Data **8**, 107(1979).

Microwave Spectra of Molecules of Astrophyical Interest. XX. Methane — I. Ozier, M. C. L. Gerry, and A. G. Robiette. J Phys Chem Ref Data **10**, 1085(1981).

Gerstenberg, Henry M.

Photonuclear Data Index, 1973-1977 — Everett G. Fuller and Henry M. Gerstenberg. NBS Spec. Publ. **380**, Suppl. 1(1978).

Photonuclear Data Index, 1973-1981 (Supplement 2 to NBS Special Publication 380) — Everett G. Fuller and Henry M. Gerstenberg. NBSIR **82-2543**, 139p. (1982).

Photonuclear Reaction Data, 1973 — Everett G. Fuller, Henry M. Gerstenberg, H. J. Vander Molen, and T. C. Dunn. NBS Spec. Publ. **380**, 134p. (1973).

The NIRA Computer Program Package (Photonuclear Data Center) — H. J. Vander Molen and Henry M. Gerstenberg. NBS Tech. Note **903**, 34p. (1976).

Gevantman, Lewis H.

EPA/NIH Mass Spectral Data Base, Supplement 2 — Stephen R. Heller, G. W. A. Milne, and Lewis H. Gevantman. NSRDS-NBS **63**, Suppl. 2(1983).

Feasiblility Study: Compilation and Evaluation of Properties Data for Basalt, Granite, Tuff, and Shale — Lewis H. Gevantman. NBSIR **81-2217**, 259p. (1981).

Physical Properties Data for Basalt — Lewis H. Gevantman. NBSIR **82-2587**, 751p. (1982).

Physical Properties Data for Rock Salt — Lewis H. Gevantman. NBS Monograph **167**, 288p. (1981).

Gibson, Janet L.

Mossbauer Effect Reference and Data Journal — John G. Stevens, Virginia E. Stevens, Richard M. White, Janet L. Gibson, editor(s). Moss Eff Ref Data J **6**, Ashville, NC: Mossbauer Effect Data Center, U. of N. C., (1983).

Gierlach, Matthew

Critical Evaluation of Vapor-Liquid Equilibrium, Heat of Mixing, and Volume Change of Mixing Data. General Procedures — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 941(1982).

Evaluation of Binary Excess Enthalpy Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1127(1982).

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1151(1982).

Evaluation of Binary *PT*xy Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1099(1982).

Gilbody, H. B.

Recommended Data on the Electron Impact Ionization of Light Atoms and Ions — K. L. Bell, H. B. Gilbody, J. G. Hughes, A. E. Kingston, and Francis J. Smith. J Phys Chem Ref Data **12**, 891(1983).

Gimm, Heinz A.

Pair, Triplet, and Total Atomic Cross Sections (and Mass Attenuation Coefficients) for 1 MeV-100 GeV Photons in Elements Z=1 to 100 — John H. Hubbell, Heinz A. Gimm, and I. Ø verbø . J Phys Chem Ref Data **9**, 1023(1980).

Total Photon Absorption Cross Section Measurements, Theoretical Analysis and Evaluations for Energies above 10 MeV — Heinz A. Gimm and John H. Hubbell. NBS Tech. Note **968**, 81p. (1978).

Gleiser, M.

Selected Values of the Thermodynamic Properties of Binary Alloys — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, and Kenneth K. Kelley. Metals Park, OH: American Society for Metals, 1435p. (1973).

Selected Values of the Thermodynamic Properties of the Elements — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, Kenneth K. Kelley, and Donald D. Wagman. Metals Park, OH: American Society for Metals, 636p. (1973).

Glennon, Barbara M.

Atomic Transition Probabilities. Elements Hydrogen through Neon — Wolfgang L. Wiese, Melvin W. Smith, and Barbara M. Glennon. NSRDS-NBS 4, 153p. (1966).

Glushko, V. P.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume I. Computation Methods — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, and V. A. Khudyakov. Russian Transl. Springfield, VA: NTIS, 453p. (1974). TT 74-50019, A20.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume II. Oxygen-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 505p. (1975). TT 74-50032, A22.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume III. Oxygen- and Air-Based Propellant — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 648p. (1975). TT 75-50007, A26.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume IV. Nitrogen Tetroxide-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 540p. (1976). TT 76-50007, A23.

Goldberg, Daniel

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Silver Systems — Y. Austin Chang, Daniel Goldberg, and Joachim P. Neumann. J Phys Chem Ref Data **6**, 621(1977).

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Metal Systems — Y. Austin Chang, Joachim P. Neumann, A. Mikula, and Daniel Goldberg. INCRA Monograph **VI**, New York: International Copper Research Association, Inc., 702p. (1979).

Goldberg, Robert N.

A Bibliography of Sources of Experimental Data Leading to Activity or Osmotic Coefficients for Polyvalent Electrolytes in Aqueous Solution — Robert N. Goldberg, Bert R. Staples, Ralph L. Nuttall, and R. Arbuckle. NBS Spec. Publ. **485**, 57p. (1977).

A Bibliography of Sources of Experimental Data Leading to Thermal Properties of Binary Aqueous Electrolyte Solutions — David Smith-Magowan and Robert N. Goldberg. NBS Spec. Publ. **537**, 94p. (1979).

An Annotated Bibliography of Compiled Thermodynamic Data Sources for Biochemical and Aqueous Systems (1930 to 1975), Equilibrium, Enthalpy, Heat Capacity, and Entropy Data — George T. Armstrong and Robert N. Goldberg. NBS Spec. Publ. **454**, 71p. (1976).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: The Alkaline Earth Metal Halides — Robert N. Goldberg and Ralph L. Nuttall. J Phys Chem Ref Data **7**, 263(1978).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Iron Chloride and the Bi-Univalent Compounds of Nickel and Cobalt — Robert N. Goldberg, Ralph L. Nuttall, and Bert R. Staples. J Phys Chem Ref Data **8**, 923(1979).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Bi-Univalent Compounds of Lead, Copper, Manganese, and Uranium — Robert N. Goldberg. J Phys Chem Ref Data **8**, 1005(1979).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Bi-Univalent Compounds of Zinc, Cadmium, and Ethylene Bis(-Trimethylammonium) Chloride and Iodide — Robert N. Goldberg. J Phys Chem Ref Data **10**, 1(1981).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Thirty-Six Uni-Bivalent Electrolytes — Robert N. Goldberg. J Phys Chem Ref Data **10**, 671(1981).

Goodwin, Robert D.

Provisional Thermodynamic Functions of Propane from 85 to 700 K at Pressures to 700 Bar — Robert D. Goodwin. NBSIR **77-860**, 240p. (1977).

Thermodynamic and Related Properties of Parahydrogen from the Triple Point to 100 K at Pressures to 340 Atmospheres — Hans M. Roder, Lloyd A. Weber, and Robert D. Goodwin. NBS Monograph **94**, 116p. (1965).

Thermophysical Properties of Isobutane from 114 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Tech. Note **1051**, 199p. (1982).

Thermophysical Properties of Normal Butane from 135 to 700 K at Pressures to 70 MPa — W. M. Haynes and Robert D. Goodwin. NBS Monograph **169**, 197p. (1982).

Thermophysical Properties of Propane from 85 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Monograph **170**, 249p. (1982).

Gosman, A. L.

Thermodynamic Properties of Argon from the Triple Point to 300 K at Pressures to 1000 Atmospheres — A. L. Gosman, Robert D. McCarty, and Jerome G. Hust. NSRDS-NBS **27**, 153p. (1969).

Grant, S. J.

Evaluated Kinetic Data for High Temperature Reactions, Volume 4. Homogeneous Gas Phase Reactions of Halogen- and Cyanide-Containing Species — D. L. Baulch, J. Duxbury, S. J. Grant, and D. C. Montague. J Phys Chem Ref Data **10**, Suppl. 1(1981).

Greer, W. L.

Scaled Equation of State Parameters for Gases in the Critical Region — J. M. H. Levelt Sengers, W. L. Greer, and Jan V. Sengers. J Phys Chem Ref Data **5**, 1(1976).

Grigor'ev, V.N.

Properties of Liquid and Solid Hydrogen — B. N. Esel'son, Y. P. Blagoi, V.N. Grigor'ev, V. G. Manzhelii, S. A. Mikhailenko, and N. P. Neklyudov. Russian Transl. Springfield, VA: NTIS, 126p. (1971). TT 70-50179, A07.

Grilly, E. R.

A Review of Deuterium Triple-Point Temperatures — L. A. Schwalbe and E. R. Grilly. J Phys Chem Ref Data **13**, 687(1984).

Gubbins, K. E.

A Correlation of the Existing Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethane — Howard J. M. Hanley, K. E. Gubbins, and S. Murad. J Phys Chem Ref Data **6**, 1167(1977).

A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Propane — Paul M. Holland, Howard J. M. Hanley, K. E. Gubbins, and J. M. Haile. J Phys Chem Ref Data **8**, 559(1979).

Erratum: A Correlation of the Existing Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethane — Howard J. M. Hanley, K. E. Gubbins, and S. Murad. J Phys Chem Ref Data **10**, 799(1981).

Guiragossian, Zaven G. T.

NN and ND Interactions - A Compilation — James E. Enstrom, Thomas Ferbel, Paul F. Slattery, Barry L. Werner, Zaven G. T. Guiragossian, Yoshio Sumi, Toshihiro Yoshida and Particle Data Group. UCRL-LBL **58**, Berkeley, CA: Lawrence Berkeley Laboratory, U. of California, 281p. (1972). LBL 58.

Gupta, D. S.

Bibliography of Infrared Spectroscopy through 1960 — C. N. R. Rao, S. K. Dikshit, Shanti A. Kudchadker, D. S. Gupta, V. A. Narayan, and John J. Comeford. NBS Spec. Publ. **428**, 1,2,3(1976).

Gurevich, V. M.

Electric Conductivity of Ferroelectrics — V. M. Gurevich. Russian Transl. Springfield, VA: NTIS, 366p. (1971). TT 70-50180, A16.

Haar, Lester

A Thermodynamic Surface for Water: The Formulation and Computer Program — Lester Haar, John S. Gallagher, and George S. Kell. NBSIR **81-2253**, 38p. (1981).

Equation of State for Ammonia — Lester Haar and John S. Gallagher. NBSIR **75-770**, 27p. (1975).

NBS/NRC Steam Tables, Thermodynamic and Transport Properties and Computer Programs for Vapor and Liquid States of Water — Lester Haar, John S. Gallagher, and George S. Kell. New York: Hemisphere Press, 320p. (1984).

Thermodynamic Properties of Ammonia as an Ideal Gas — Lester Haar. NSRDS-NBS **19**, 10p. (1968).

Thermodynamic Properties of Ammonia — Lester Haar and John S. Gallagher. J Phys Chem Ref Data 7, 635(1978).

Haas, John L., Jr.

Thermodynamic Tabulations for Selected Phases in the System CaO-Al_2O_3-SiO_2-H_2O at 101.325 kPa (1 atm.) between 273.15 and 1800 K — John L. Haas, Jr., Gilpin R. Robinson, Jr., and Bruce S. Hemingway. J Phys Chem Ref Data **10**, 575(1981).

Haas, R. H.

Microwave Spectral Tables, Volume IV. Polyatomic Molecules without Internal Rotation — M. S. Cord, J. D. Petersen, M. S. Lojko, and R. H. Haas. NBS Monograph 70, 419p. (1968).

Hagan, Lucy

Atomic Energy Levels - The Rare-Earth Elements, the Spectra of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu — William C. Martin, Romuald Zalubas, and Lucy Hagan. NSRDS-NBS **60**, 422p. (1978).

Bibliography on Atomic Energy Levels and Spectra, July 1968 through June 1971 — Lucy Hagan and William C. Martin. NBS Spec. Publ. **363**, 109p. (1972).

Bibliography on Atomic Energy Levels and Spectra, July 1971 through June 1975 — Lucy Hagan. NBS Spec. Publ. **363**, Suppl. 1(1977).

Ground Levels and Ionization Potentials for Lanthanide and Actinide Atoms and Ions — William C. Martin, Lucy Hagan, Joseph Reader, and Jack Sugar. J Phys Chem Ref Data **3**, 771(1974).

Haile, J. M.

A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Propane — Paul M. Holland, Howard J. M. Hanley, K. E. Gubbins, and J. M. Haile. J Phys Chem Ref Data **8**, 559(1979).

Hall, H. T.

High-Pressure Calibration: A Critical Review — D. L. Decker, W. A. Bassett, Leo Merrill, H. T. Hall, and J. D. Barnett. J Phys Chem Ref Data **1**, 773(1972).

Halow, Iva

Selected Values of Chemical Thermodynamic Properties. Tables for the First Thirty-Four Elements in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 264p. (1968).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 35 through 53 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 152p. (1969).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 54 through 61 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, Richard H. Schumm, and Kenneth L. Churney. NBS Tech. Note **270**, 49p. (1971).

The NBS Tables of Chemical Thermodynamic Properties. Selected Values for Inorganic and C_1 and C_2 Organic Substances in SI Units — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, Iva Halow, Sylvia M. Bailey, Kenneth L. Churney, and Ralph L. Nuttall. J Phys Chem Ref Data **11**, Suppl. 2(1982).

Hamer, Walter J.

Electrolytic Conductance and the Conductances of the Halogen Acids in Water — Walter J. Hamer and H. J. DeWane. NSRDS-NBS **33**, 37p. (1970).

Osmotic Coefficients and Mean Activity Coefficients of Uni-Univalent Electrolytes in Water at 25 °C — Walter J. Hamer and Yung-Chi Wu. J Phys Chem Ref Data **1**, 1047(1972).

Revised Values of the Osmotic Coefficients and Mean Activity Coefficients of Sodium Nitrate in Water at 25°C (Comments) — Yung-Chi Wu and Walter J. Hamer. J Phys Chem Ref Data **9**, 513(1980).

Theoretical Mean Activity Coefficients of Strong Electrolytes in Aqueous Solutions from 0 to 100 °C — Walter J. Hamer. NSRDS-NBS **24**, 271p. (1968).

Hampson, Robert F., Jr.

Chemical Kinetic and Photochemical Data Sheets for Atmospheric Reactions — Robert F. Hampson, Jr. Fed Aviation Admin EE **80-17**, Springfield, VA: NTIS, 490p. (1980). FAA-EE-80-17, A21.

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **9**, 295(1980).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement I. CODATA Task Group on Chemical Kinetics — D. L. Baulch, R. A. Cox, P. J. Crutzen, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **11**, 327(1982).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement II. CODATA Task Group on Gas Phase Chemical Kinetics — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **13**, 1259(1984).

Kinetic and Photochemical Data for Atmospheric Chemistry, Reactions of the Nitrogen Oxides — Robert F. Hampson, Jr. NBSIR **80-2032**, 89p. (1980).

Reaction Rate and Photochemical Data for Atmospheric Chemistry - 1977 — Robert F. Hampson, Jr. and David Garvin. NBS Spec. Publ. **513**, 111p. (1978).

Summary Report on the Workshop on High Temperature Chemical Kinetics: Applications to Combustion Research — David Garvin, R. L. Brown, Robert F. Hampson, Jr., M. J. Kurylo, and W. Tsang. NBS Spec. Publ. **531**, 94p. (1978).

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Hanley, Howard J. M.

A Computer Program for the Prediction of Viscosity and Thermal Conductivity in Hydrocarbon Mixtures — James F. Ely and Howard J. M. Hanley. NBS Tech. Note **1039**, 83p. (1981).

A Correlation of the Existing Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethane — Howard J. M. Hanley, K. E. Gubbins, and S. Murad. J Phys Chem Ref Data **6**, 1167(1977).

A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Propane — Paul M. Holland, Howard J. M. Hanley, K. E. Gubbins, and J. M. Haile. J Phys Chem Ref Data **8**, 559(1979).

A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethylene — Paul M. Holland, B. E. Eaton, and Howard J. M. Hanley. J Phys Chem Ref Data **12**, 917(1983).

Erratum: A Correlation of the Existing Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethane — Howard J. M. Hanley, K. E. Gubbins, and S. Murad. J Phys Chem Ref Data **10**, 799(1981).

Tables of Collision Integrals and Second Virial Coefficients for the (m,6,8) Intermolecular Potential Function — Max Klein, Howard J. M. Hanley, Francis J. Smith, and Paul M. Holland. NSRDS-NBS **47**, 161p. (1974).

The Viscosity and Thermal Conductivity Coefficients of Gaseous and Liquid Fluorine — Howard J. M. Hanley and R. Prydz. J Phys Chem Ref Data **1**, 1101(1972).

The Viscosity and Thermal Conductivity Coefficients of Dilute Argon, Krypton, and Xenon — Howard J. M. Hanley. J Phys Chem Ref Data **2**, 619(1973).

The Viscosity and Thermal Conductivity Coefficients of Dilute Nitrogen and Oxygen — Howard J. M. Hanley and James F. Ely. J Phys Chem Ref Data **2**, 735(1973).

The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Argon, Krypton, Xenon, Nitrogen, and Oxygen — Howard J. M. Hanley, Robert D. McCarty, and W. M. Haynes. J Phys Chem Ref Data **3**, 979(1974).

The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Methane — Howard J. M. Hanley, W. M. Haynes, and Robert D. McCarty. J Phys Chem Ref Data **6**, 597(1977).

Harada, Issei

Tables of Molecular Vibrational Frequencies, Part 9 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data 7, 1323(1978).

Tables of Molecular Vibrational Frequencies, Part 10 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **9**, 1149(1980).

Harllee, F. N.

A Bibliography on Ion-Molecule Reactions. January 1900 to March 1966 — F. N. Harllee, Henry M. Rosenstock, and John T. Herron. NBS Tech. Note **291**, 40p. (1966).

Harmony, Marlin D.

Molecular Structures of Gas-Phase Polyatomic Molecules Determined by Spectroscopic Methods — Marlin D. Harmony, Victor W. Laurie, Robert L. Kuczkowski, Richard H. Schwendeman, D. A. Ramsay, Frank J. Lovas, Walter J. Lafferty, and Arthur G. Maki. J Phys Chem Ref Data **8**, 619(1979).

Harrison, Roland H.

Derived Thermodynamic Properties of Ethylene — Roland H. Harrison and Donald R. Douslin. J Chem Eng Data. **22**, Washington, DC: American Chemical Society, 24p. (1977).

Pressure, Volume, Temperature Relations of Ethylene — Donald R. Douslin and Roland H. Harrison. J Chem Thermody **76**, New York, London:, 301p. (1976).

Hartman, K. N.

A Compendium of Gas Phase Basicity and Proton Affinity Measurements — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, Henry M. Rosenstock, S. S. Schroyer, C. Schmidt, D. Martinsen, and G. W. A. Milne. NBSIR **79-1777**, 563p. (1979).

Annotated Bibliography on Proton Affinities — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, and Henry M. Rosenstock.NBSIR**76-1061**, 52p. (1976).

Hastings, J. R.

The Critical-Region Equation of State of Ethene and the Effect of Small Impurities — J. R. Hastings, J. M. H. Levelt Sengers, and F. W. Balfour. J Chem Thermody **12**, London: Academic Press Inc., 1009p. (1980).

Havill, T. N.

Electrical Resistivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, T. N. Havill, R. H. Bogaard, R. A. Matula, S. G. Oh, and H. M. James. J Phys Chem Ref Data **12**, 183(1983).

Thermal Conductivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, S. G. Oh, and T. N. Havill. J Phys Chem Ref Data 7, 959(1978).

Hawkins, Donald T.

Binary Fluorides, Free Molecular Structures and Force Fields, A Bibliography (1957-1975) — Donald T. Hawkins, Lawrence S. Bernstein, Warren E. Falconer, and William Klemperer. New York: IFI/Plenum, 253p. (1976), ISBN: 0-306-6601-3.

Selected Values of the Thermodynamic Properties of Binary Alloys — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, and Kenneth K. Kelley. Metals Park, OH: American Society for Metals, 1435p. (1973).

Selected Values of the Thermodynamic Properties of the Elements — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, Kenneth K. Kelley, and Donald D. Wagman. Metals Park, OH: American Society for Metals, 636p. (1973).

Haynes, W. M.

The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Argon, Krypton, Xenon, Nitrogen, and Oxygen — Howard J. M. Hanley, Robert D. McCarty, and W. M. Haynes. J Phys Chem Ref Data **3**, 979(1974).

The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Methane — Howard J. M. Hanley, W. M. Haynes, and Robert D. McCarty. J Phys Chem Ref Data **6**, 597(1977).

Thermophysical Properties of Isobutane from 114 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Tech. Note **1051**, 199p. (1982).

Thermophysical Properties of Normal Butane from 135 to 700 K at Pressures to 70 MPa — W. M. Haynes and Robert D. Goodwin. NBS Monograph **169**, 197p. (1982).

Thermophysical Properties of Propane from 85 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Monograph **170**, 249p. (1982).

Hearing, Elizabeth D.

Heat Capacities and Entropies of Organic Compounds in the Condensed Phase — Eugene S. Domalski, William H. Evans, and Elizabeth D. Hearing. J Phys Chem Ref Data **13**, Suppl. 1(1984).

Heller, Stephen R.

EPA/NIH Mass Spectral Data Base Magnetic Tape — Stephen R. Heller and G. W. A. Milne. NBS Standard Reference Database 1 **A1**, Washington, DC: NBS Office of Standard Reference Data,(updated periodically). Call (301) 921-2228 for specific instructions.

EPA/NIH Mass Spectral Data Base, Supplement 1 — Stephen R. Heller and G. W. A. Milne. NSRDS-NBS **63**, Suppl. 1(1980).

EPA/NIH Mass Spectral Data Base, Supplement 2 — Stephen R. Heller, G. W. A. Milne, and Lewis H. Gevantman. NSRDS-NBS **63**, Suppl. 2(1983).

EPA/NIH Mass Spectral Data Base, Volume 1. Molecular Weights 30-186; Volume 2. Molecular Weights 16-273; Volume 3. Molecular Weights 273-381; Volume 4. Molecular Weights 381-1674 — Stephen R. Heller and G. W. A. Milne. NSRDS-NBS **63**, 1,2,3,4(1978).

Hellner, Erwin

Space Groups and Lattice Complexes — W. Fisher, Hans Burzlaff, Erwin Hellner, and Joseph D. H. Donnay. NBS Monograph **134**, 177p. (1973).

Helman, W. Phillip

A Catalog of Data Compilations on Photochemical and Photophysical Processes in Solution — James G. Brummer, W. Phillip Helman, and Alberta B. Ross. NBS Spec. Publ. **578**, 27p. (1980).

Helminger, Paul

Microwave Spectra of Molecules of Astrophysical Interest, IV. Hydrogen Sulfide — Paul Helminger, Frank C. De Lucia, and William H. Kirchhoff. J Phys Chem Ref Data **2**, 215(1973).

Microwave Spectra of Molecules of Astrophysical Interest, V. Water Vapor — Frank C. De Lucia, Paul Helminger, and William H. Kirchhoff. J Phys Chem Ref Data **3**, 211(1974).

Hemingway, Bruce S.

Thermodynamic Tabulations for Selected Phases in the System CaO-Al_2O_3-SiO_2-H_2O at 101.325 kPa (1 atm.) between 273.15 and 1800 K — John L. Haas, Jr., Gilpin R. Robinson, Jr., and Bruce S. Hemingway. J Phys Chem Ref Data **10**, 575(1981).

Henderson, George A.

Semiempirical and Approximate Methods for Molecular Calculations - Bibliography and KWIC Index — George A. Henderson and Sandra Frattali. OSRD Bibl. **70-3**, 293p. (1970).

Hendricks, R. C.

Representative Equations for the Thermal Conductivity of Water Substance — Jan V. Sengers, J. T. R. Watson, R. S. Basu, B. Kamgar-Parsi, and R. C. Hendricks. J Phys Chem Ref Data **13**, 893(1984).

Hendry, D. G.

A Critical Review of H-Atom Transfer in the Liquid Phase: Chlorine Atom, Alkyl, Trichloromethyl, Alkoxy, and Alkylperoxy Radicals — D. G. Hendry, T. Mill, L. Piszkiewicz, J. A. Howard, and H. K. Eigenmann. J Phys Chem Ref Data **3**, 937(1974).

Henri, Victor P.

π+p, π+n, and π+d Interactions - A Compilation: Parts I and II — Denyse M. Chew, Victor P. Henri, Thomas A. Lasinski, Thomas G. Trippe, Fumiyo Uchiyama, Frederick C. Winkelmann and Particle Data Group. UCRL **53**, Springfield, VA: NTIS, 213p. (1973). LBL 53; Part II is on microfiche located in the back cover pocket, A10.

πN Two-Body Scattering Data, I. A User's Guide to the Lovelace-Almehed Data Tape — Claude Lovelace, Sverkei Almehed, Fumiyo Uchiyama, Robert Kelly, Victor P. Henri and Particle Data Group. UCRL **63**, Springfield, VA: NTIS, 146p. (1973). LBL 63, A07.

Herbold, R. H.

OMNITAB, A Computer Program for Statistical and Numerical Analysis — Joseph Hilsenrath, Guy G. Ziegler, Carla G. Messina, P. J. Walsh, and R. H. Herbold. NBS Handbook **101**, 256p. (1968).

Herndon, David J.

πN Particle-Wave Amplitudes — David J. Herndon, Angela Barbaro-Galtieri, Arthur H. Rosenfeld and Particle Data Group. UCRL **20030**πN, Springfield, VA: NTIS, 85p. (1970). UCRL 20030 πN, A05.

Herron, John T.

A Bibliography on Ion-Molecule Reactions. January 1900 to March 1966 — F. N. Harllee, Henry M. Rosenstock, and John T. Herron. NBS Tech. Note **291**, 40p. (1966).

Energetics of Gaseous Ions — Henry M. Rosenstock, Keith Draxl, B. W. Steiner, and John T. Herron. J Phys Chem Ref Data **6**, Suppl. 1(1977).

Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions — Joseph L. Franklin, J. G. Dillard, Henry M. Rosenstock, John T. Herron, Keith Draxl, and Frank H. Field. NSRDS-NBS **26**, 289p. (1969).

Rate Constants for the Reactions of Atomic Oxygen ($O\ ^3P$) with Organic Compounds in the Gas Phase — John T. Herron and Robert E. Huie. J Phys Chem Ref Data **2**, 467(1973).

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Hildenbrand, D. L.

High Temperature Vaporization Behavior of Oxides. I. Alkali Metal Binary Oxides — R. H. Lamoreaux and D. L. Hildenbrand. J Phys Chem Ref Data **13**, 151(1984).

Hill, P. G.

A Fundamental Equation of State for Heavy Water — P. G. Hill, R. D. Chris MacMillan, and V. Lee. J Phys Chem Ref Data **11**, 1(1982).

Erratum: A Fundamental Equation of State for Heavy Water — P. G. Hill, R. D. Chris MacMillan, and V. Lee. J Phys Chem Ref Data **12**, 1065(1983).

Saturation States of Heavy Water — P. G. Hill and R. D. Chris MacMillan. J Phys Chem Ref Data **9**, 735(1980).

Hilsenrath, Joseph

A Contribution to Computer Typesetting Techniques: Tables of Coordinates for Hershey's Repertory of Occidental Type Fonts and Graphic Symbols — Norman M. Wolcott and Joseph Hilsenrath. NBS Spec. Publ. **424**, 177p. (1976).

COMBO: A General-Purpose Program for Searching, Annotating, Encoding-Decoding, and Reformatting Data Files — Robert McClenon and Joseph Hilsenrath. NBS Tech. Note **700**, 72p. (1972).

EDPAC: Utility Programs for Computer-Assisted Editing, Copy Production, and Data Retrieval — Carla G. Messina and Joseph Hilsenrath. NBS Tech. Note **470**, 76p. (1969).

Edit-Insertion Programs for Automatic Typesetting of Computer Printout — Carla G. Messina and Joseph Hilsenrath. NBS Tech. Note **500**, 47p. (1970).

Fortran Programs for Text Editing, File Manipulation and Automatic Typsetting — Carla G. Messina, Robert McClenon, and Joseph Hilsenrath. OSRD Mag. Tape **A2**, Washington, DC: Office of Standard Reference Data,(1973). COM 71-003 885 or PB 183 142, T05.

OMNIDATA, An Interactive System for Data Retrieval, Statistical and Graphical Analysis, and Data-Base Management, A User's Manual — Joseph Hilsenrath and Bettijoyce Breen. NBS Handbook **125**, 294p. (1978).

OMNITAB, A Computer Program for Statistical and Numerical Analysis — Joseph Hilsenrath, Guy G. Ziegler, Carla G. Messina, P. J. Walsh, and R. H. Herbold. NBS Handbook **101**, 256p. (1968).

PRECISE: A Multiple Precision Version of OMNITAB — Alfred E. Bean and Joseph Hilsenrath. NBS Tech. Note **446**, 84p. (1968).

Reform: A General-Purpose Program for Manipulating Formatted Data Files — Robert McClenon and Joseph Hilsenrath. NBS Tech. Note **444**, 25p. (1968).

SETAB: An Edit-Insert Program for Automatic Typesetting of Spectroscopic and Other Computerized Tables — Robert C. Thompson and Joseph Hilsenrath. NBS Tech. Note **740**, 32p. (1973).

Summary of On-Line or Interactive Physico-Chemical Numerical Data Systems — Joseph Hilsenrath. NBS Tech. Note **1122**, 29p. (1980).

Tables of Coordinates for Hershey's Repertory of Type Fonts and Graphic Symbols — Norman M. Wolcott and Joseph Hilsenrath. OSRD Mag. Tape **A12**, Washington, DC: Office of Standard Reference Data,(1977). Hershey tape.

Utility Programs for Generating the Hershey Character Fonts on Microcomputers and Laboratory Plotters — C. E. Dick and Joseph Hilsenrath. NBS Tech. Note **1176**, 49p. (1983).

Hiza, M. J.

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Ethane — M. J. Hiza, R. C. Miller, and Arthur J. Kidnay. J Phys Chem Ref Data **8**, 799(1979).

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Propane — R. C. Miller, Arthur J. Kidnay, and M. J. Hiza. J Phys Chem Ref Data **9**, 721(1980).

Equilibrium Properties of Fluid Mixtures, A Bibliography on Fluids of Cryogenic Interest — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller. New York: IFI/Plenum, 166p. (1975), ISBN: 0-306-6601-6.

Equilibrium Properties of Fluid Mixtures, 2. A Bibliography of Experimental Data on Selected Fluids — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller. New York: IFI/Plenum, 258p. (1982), ISBN: 0-306-6602-4.

Liquid Vapor Equilibria on Systems of Interest in Cryogenics, A Survey — Arthur J. Kidnay, M. J. Hiza, and R. C. Miller. Cryogenics **13**, London: Academic Press, 575p. (1973).

Ho, Cho Y.

Electrical Resistivity of Aluminum and Manganese — P. D. Desai, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1131(1984).

Electrical Resistivity of Selected Elements — P. D. Desai, T. K. Chu, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1069(1984).

Electrical Resistivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, T. N. Havill, R. H. Bogaard, R. A. Matula, S. G. Oh, and H. M. James. J Phys Chem Ref Data **12**, 183(1983).

Electrical Resistivity of Vanadium and Zirconium — P. D. Desai, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1097(1984).

Thermal Conductivity of Selected Materials — Robert W. Powell, Cho Y. Ho, and Peter E. Liley. NSRDS-NBS **8**, 68p. (1966).

Thermal Conductivity of Selected Materials, Part 2 — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. NSRDS-NBS **16**, 146p. (1968).

Thermal Conductivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, S. G. Oh, and T. N. Havill. J Phys Chem Ref Data **7**, 959(1978).

Thermal Conductivity of the Elements — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. J Phys Chem Ref Data **1**, 279(1972).

Thermal Conductivity of the Elements: A Comprehensive Review — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. J Phys Chem Ref Data **3**, Suppl. 1(1974).

Hocking, W. H.

Microwave Spectra of Molecules of Astrophysical Interest, X. Isocyanic Acid — G. Winnewisser, W. H. Hocking, and M. C. L. Gerry. J Phys Chem Ref Data **5**, 79(1976).

Holden, Norman E.

Isotopic Abundances and Atomic Weights of the Elements — Paul De Bièvre, Marc Gallet, Norman E. Holden, and I. Lynus Barnes. J Phys Chem Ref Data **13**, 809(1984).

Holland, Paul M.

A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Propane — Paul M. Holland, Howard J. M. Hanley, K. E. Gubbins, and J. M. Haile. J Phys Chem Ref Data **8**, 559(1979).

A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethylene — Paul M. Holland, B. E. Eaton, and Howard J. M. Hanley. J Phys Chem Ref Data **12**, 917(1983).

Tables of Collision Integrals and Second Virial Coefficients for the (m,6,8) Intermolecular Potential Function — Max Klein, Howard J. M. Hanley, Francis J. Smith, and Paul M. Holland. NSRDS-NBS **47**, 161p. (1974).

Holtschlag, L. J.

Rate Constants of Gas Phase Reactions, Reference Book — V. N. Kondratiev, L. J. Holtschlag, R. M. Fristrom, editor(s). Russian Transl. Springfield, VA: NTIS, 434p. (1972). COM 72-10014, A19.

Horiuti, Juro

Hydrogenation of Ethylene on Metallic Catalysts — Juro Horiuti and Koshiro Miyahara. NSRDS-NBS **13**, 62p. (1968).

Hotop, H.

Binding Energies in Atomic Negative Ions — H. Hotop and W. C. Lineberger. J Phys Chem Ref Data **4**, 539(1975).

Hougen, Jon T.

The Calculation of Rotational Energy Levels and Rotational Line Intensities in Diatomic Molecules — Jon T. Hougen. NBS Monograph **115**, 54p. (1970).

Howard, J. A.

A Critical Review of H-Atom Transfer in the Liquid Phase: Chlorine Atom, Alkyl, Trichloromethyl, Alkoxy, and Alkylperoxy Radicals — D. G. Hendry, T. Mill, L. Piszkiewicz, J. A. Howard, and H. K. Eigenmann. J Phys Chem Ref Data **3**, 937(1974).

Howerton, R. J.

Atomic Form Factors, Incoherent Scattering Functions, and Photon Scattering Cross Sections — John H. Hubbell, W. J. Veigele, E. A Briggs, R. T. Brown, D. T. Cromer, and R. J. Howerton. J Phys Chem Ref Data **4**, 471(1975).

Hu, A. T.

JANAF Thermochemical Tables, 1974 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, A. T. Hu, H. Prophet, A. N. Syverud, and L. C. Walker. J Phys Chem Ref Data **3**, 311(1974).

Hubbard, C. R.

NBS* AIDS80: A FORTRAN Program for Crystallographic Data Evaluation — Alan D. Mighell, C. R. Hubbard, and Judy K. Stalick. NBS Tech. Note **1141**, 54p. (1981).

Hubbell, John H.

Atomic Form Factors, Incoherent Scattering Functions, and Photon Scattering Cross Sections — John H. Hubbell, W. J. Veigele, E. A. Briggs, R. T. Brown, D. T. Cromer and R. J. Howerton. J Phys Chem Ref Data **4**,471(1975].

Comparison of Theoretical and Experimental Photoeffect Data, 0.1 keV to 1.5 MeV — John H. Hubbell and W. J. Veigele. NBS Tech. Note **901**, 47p. (1976).

Pair, Triplet, and Total Atomic Cross Sections (and Mass Attenuation Coefficients) for 1 MeV-100 GeV Photons in Elements Z=1 to 100 — John H. Hubbell, Heinz A. Gimm, and I. Øverbø . J Phys Chem Ref Data **9**, 1023(1980).

Photon Cross Sections, Attenuation Coefficients, and Energy Absorption Coefficients from 10 keV to 100 GeV — John H. Hubbell. NSRDS-NBS **29**, 85p. (1969).

Relativistic Atomic Form Factors and Photon Coherent Scattering Cross Sections — John H. Hubbell and I. Ø verbø . J Phys Chem Ref Data **8**, 69(1979).

Small-Angle Rayleigh Scattering of Photons at High Energies: Tabulations of Relativisitic HFS Modified Atomic Form Factors — D. Schaupp, M. Schumacher, F. Smend, P. Rullhusen, and John H. Hubbell. J Phys Chem Ref Data **12**, 467(1983).

Total Photon Absorption Cross Section Measurements, Theoretical Analysis and Evaluations for Energies above 10 MeV — Heinz A. Gimm and John H. Hubbell. NBS Tech. Note **968**, 81p. (1978).

Hudson, Robert D.

Bibliography of Photoabsorption Cross Section Data — Robert D. Hudson and Lee J. Kieffer. OSRD Bibl. **70-4**, 47p. (1970).

Critical Review of Ultraviolet Photoabsorption Cross Sections for Molecules of Astrophysical and Aeronomic Interest — Robert D. Hudson. NSRDS-NBS **38**, 114p. (1971).

Hug, Gordon L.

Optical Spectra of Nonmetallic Inorganic Transient Species in Aqueous Solution — Gordon L. Hug. NSRDS-NBS **69**, 167p. (1981).

Hughes, J. G.

Recommended Data on the Electron Impact Ionization of Light Atoms and Ions — K. L. Bell, H. B. Gilbody, J. G. Hughes, A. E. Kingston, and Francis J. Smith. J Phys Chem Ref Data **12**, 891(1983).

Huie, Robert E.

Rate Constants for the Reactions of Atomic Oxygen ($O\ ^3P$) with Organic Compounds in the Gas Phase — John T. Herron and Robert E. Huie. J Phys Chem Ref Data **2**, 467(1973).

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Hultgren, Ralph

Selected Thermodynamic Values and Phase Diagrams for Copper and Some of Its Binary Alloys — Ralph Hultgren and Pramond D. Desai. INCRA Monograph I, New York: International Copper Research Association, Inc., 204p. (1973).

Selected Values of the Thermodynamic Properties of Binary Alloys — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, and Kenneth K. Kelley. Metals Park, OH: American Society for Metals, 1435p. (1973).

Selected Values of the Thermodynamic Properties of the Elements — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, Kenneth K. Kelley, and Donald D. Wagman. Metals Park, OH: American Society for Metals, 636p. (1973).

Humphreys, Curtis J.

First Spectra of Neon, Argon, and Xenon 136 in the 1.2-4.0 μm Region — Curtis J. Humphreys. J Phys Chem Ref Data **2**, 519(1973).

Hust, Jerome G.

Thermodynamic Properties of Argon from the Triple Point to 300 K at Pressures to 1000 Atmospheres — A. L. Gosman, Robert D. McCarty, and Jerome G. Hust. NSRDS-NBS **27**, 153p. (1969).

Ionov, N. L.

Surface Ionization — E. Ya. Zandberg and N. L. Ionov. Russian Transl. Springfield, VA: NTIS, 364p. (1971). TT 70-50148, A16.

Ivan'ko, A. A.

Handbook of Hardness Data — G. V. Samsonov and A. A. Ivan'ko. Russian Transl. Springfield, VA: NTIS, 69p. (1970). TT 70-50177, A04.

Jacobsen, Richard T.

An Equation of State for Fluid Ethylene — Robert D. McCarty and Richard T. Jacobsen. NBS Tech. Note **1045**, 164p. (1981).

Thermodynamic Properties of Nitrogen Including Liquid and Vapor Phases from 63 K to 2000 K with Pressures to 10,000 Bar — Richard T. Jacobsen and Richard B. Stewart. J Phys Chem Ref Data **2**, 757(1973).

Jacox, Marilyn E.

Ground-State Vibrational Energy Levels of Polyatomic Transient Molecules — Marilyn E. Jacox. J Phys Chem Ref Data **13**, 945(1984).

Jain, R. K.

Bibliography on Properties of Defect Centers in Alkali Halides — Suresh C. Jain, S. A. Khan, H. K. Sehgal, V. K. Garg, and R. K. Jain. OSRD Bibl. **71-1**, 293p. (1971).

Jain, Suresh C.

Bibliography on Properties of Defect Centers in Alkali Halides — Suresh C. Jain, S. A. Khan, H. K. Sehgal, V. K. Garg, and R. K. Jain. OSRD Bibl. **71-1**, 293p. (1971).

Electronic Absorption and Internal and External Vibrational Data of Atomic and Molecular Ions Doped in Alkali Halide Crystals — Suresh C. Jain, A. V. R. Warrier, and Suresh K. Agarwal. NSRDS-NBS **52**, 55p. (1974).

James, H. M.

Electrical Resistivity of Aluminum and Manganese — P. D. Desai, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1131(1984).

Electrical Resistivity of Selected Elements — P. D. Desai, T. K. Chu, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1069(1984).

Electrical Resistivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, T. N. Havill, R. H. Bogaard, R. A. Matula, S. G. Oh, and H. M. James. J Phys Chem Ref Data **12**, 183(1983).

Electrical Resistivity of Vanadium and Zirconium — P. D. Desai, H. Hudson. NSRDS-NBS **38**, 114p. (1971).

Janev, R. K.

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ions with Atoms. I. Hydrogen Atom-Fully Stripped Ion Systems — R. K. Janev, B. H. Bransden, and Jean W. Gallagher. J Phys Chem Ref Data **12**, 829(1983).

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ions with Atoms. II. Hydrogen Atom-Partially Stripped Ions Systems — Jean W. Gallagher, B. H. Bransden, and R. K. Janev. J Phys Chem Ref Data **12**, 873(1983).

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ion with Atoms. III. Non-Hydrogenic Target Atoms — R. K. Janev and Jean W. Gallagher. J Phys Chem Ref Data **13**, 1199(1984).

Janz, George J.

Erratum: Molten Salts Data: Diffusion Coefficients in Single and Multi-Component Salt Systems — George J. Janz and Narottam P. Bansal. J Phys Chem Ref Data **13**, 305(1984).

Molten Salts Data As Reference Standards for Density, Surface Tension, Viscosity and Electrical Conductance: KNO_3 and NaCl — George J. Janz. J Phys Chem Ref Data **9**, 791(1980).

Molten Salts Data: Diffusion Coefficients in Single and Multi-Component Salt Systems — George J. Janz and Narottam P. Bansal. J Phys Chem Ref Data **11**, 505(1982).

Molten Salts: Volume 1. Electrical Conductance, Density, and Viscosity Data — George J. Janz, F. W. Dampier, G. R. Lakshminarayanan, P. K. Lorenz, and Reginald P. T. Tomkins. NSRDS-NBS **15**, 140p. (1968).

Molten Salts: Volume 2. Section 1. Electrochemistry of Molten Salts. Gibbs Free Energies and Excess Free Energies from Equilibrium-Type Cells, Section 2. Surface Tension Data — George J. Janz, Chr. G. M. Dijkhuis, G. R. Lakshminarayanan, Reginald P. T. Tomkins, and J. Wong. NSRDS-NBS **28**, 116p. (1968).

Molten Salts: Volume 3, Nitrates, Nitrites, and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Ursula Krebs, H. F. Siegenthaler, and Reginald P. T. Tomkins. J Phys Chem Ref Data **1**, 581(1972).

Molten Salts: Volume 4, Part 1, Fluorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, G. L. Gardner, Ursula Krebs, and Reginald P. T. Tomkins. J Phys Chem Ref Data **3**, 1(1974).

Molten Salts: Volume 4, Part 2, Chlorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., G. L. Gardner, Ursula Krebs, and S. K. Singer. J Phys Chem Ref Data **4**, 871(1975).

Molten Salts: Volume 4, Part 3, Bromides and Mixtures, Iodides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., and S. K. Singer. J Phys Chem Ref Data **6**, 409(1977).

Molten Salts: Volume 4, Part 4, Mixed Halide Melts. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, and Carolyn B. Allen. J Phys Chem Ref Data **8**, 125(1979).

Molten Salts: Volume 5, Part 1. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz and Reginald P. T. Tomkins. J Phys Chem Ref Data **9**, 831(1980).

Molten Salts: Volume 5, Part 2. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Vicosity and Surface Tension Data — George J. Janz and Reginald P. T. Tomkins. J Phys Chem Ref Data **12**, 591(1983).

Physical Properties Data Compilations Relevant to Energy Storage. I. Molten Salts: Eutectic Data — George J. Janz, Carolyn B. Allen, J. R. Downey, Jr., and Reginald P. T. Tomkins. NSRDS-NBS **61**, 244p. (1978).

Physical Properties Data Compilations Relevant to Energy Storage. II. Molten Salts: Data on Single and Multi-Component Systems — George J. Janz, Carolyn B. Allen, Narottam P. Bansal, R. M. Murphy, and Reginald P. T. Tomkins. NSRDS-NBS **61**, 420p. (1979).

Physical Properties Data Compilations Relevant to Energy Storage. IV. Molten Salts: Data on Additional Single and Multi-Component Salt Systems — George J. Janz and Reginald P. T. Tomkins. NSRDS-NBS **61**, 870p. (1981).

Jasper, Joseph J.

The Surface Tension of Pure Liquid Compounds — Joseph J. Jasper. J Phys Chem Ref Data **1**, 841(1972).

Jobe, Thomas L., Jr.

A Report on Thermodynamic Data for Desulfurization Processes — Vivian B. Parker, Bert R. Staples, Thomas L. Jobe, Jr., and David B. Neumann. NBSIR **81-2345**, 89p. (1981).

Heating Values of Natural Gas and Its Components — George T. Armstrong and Thomas L. Jobe, Jr. NBSIR **82-2401**, 164p. (1982).

Thermodynamic Properties of Miscellaneous Materials — Eugene S. Domalski, William H. Evans, and Thomas L. Jobe, Jr. NBSIR **78-1479**, 69p. (1981).

Johnson, Donald R.

Microwave Spectra of Molecules of Astrophysical Interest, I. Formaldehyde, Formamide, and Thioformaldehyde — Donald R. Johnson, Frank J. Lovas, and William H. Kirchhoff. J Phys Chem Ref Data **1**, 1011(1972).

Microwave Spectra of Molecules of Astrophysical Interest, II. Methylenimine — William H. Kirchhoff, Donald R. Johnson, and Frank J. Lovas. J Phys Chem Ref Data **2**, 1(1973).

Microwave Spectra of Molecules of Astrophysical Interest, III. Methanol — R. M. Lees, Frank J. Lovas, William H. Kirchhoff, and Donald R. Johnson. J Phys Chem Ref Data **2**, 205(1973).

Microwave Spectra of Molecules of Astrophysical Interest, IX. Acetaldehyde — A. Bauder, Frank J. Lovas, and Donald R. Johnson. Phys Chem Ref Data **5**, 53(1976).

Johnson, Dorothea M.

Critical Surveys of Data Sources: Ceramics — Dorothea M. Johnson and James F. Lynch. NBS Spec. Publ. **396**, 56p. (1975).

Johnson, George R. A.

Radiation Chemistry of Nitrous Oxide Gas, Primary Processes, Elementary Reactions and Yields — George R. A. Johnson. NSRDS-NBS **45**, 29p. (1973).

Johnson, V. J.

Liquid Densities of Oxygen, Nitrogen, Argon, and Parahydrogen — Hans M. Roder, Robert D. McCarty, and V. J. Johnson. NBS Tech. Note **361**, 1972(1973).

Johnston, Francis J.

The Solubility of Some Sparingly Soluble Lead Salts: An Evaluation of the Solubility in Water and Aqueous Electrolyte Solution — H. Lawrence Clever and Francis J. Johnston. J Phys Chem Ref Data **9**, 751(1980).

Johnston, Harold S.

Gas Phase Reaction Kinetics of Neutral Oxygen Species — Harold S. Johnston. NSRDS-NBS **20**, 49p. (1968).

Joseph, R. E.

A Compilation of Thermodynamic and Transport Properties of Aqueous Potassium Hydroxide — R. E. Joseph and Bert R. Staples. NBSIR **81-2356**, 17p. (1982).

Kahan, Daniel J.

Metallic Shifts in NMR: A Review of the Theory and Comprehensive Critical Data Compilation of Metallic Materials — Gesina Cynthia Carter, Lawrence H. Bennett, and Daniel J. Kahan. Prog Mater Sci, Oxford, New York: Pergamon Press, 2350p. (1977), ISBN: 0-08-02114-7.

The NBS Alloy Data Center: Author Index — Gesina Cynthia Carter, Daniel J. Kahan, Lawrence H. Bennett, John R. Cuthill, and Ronald C. Dobbyn. OSRD Bibl. **70-2**, 413p. (1970).

The NBS Alloy Data Center: Function, Bibliographic System, Related Data Centers, and Reference Books — Gesina Cynthia Carter, Lawrence H. Bennett, John R. Cuthill, and Daniel J. Kahan. NBS Tech. Note **464**, 163p. (1968).

The NBS Alloy Data Center: Permuted Materials Index — Gesina Cynthia Carter, Daniel J. Kahan, Lawrence H. Bennett, John R. Cuthill, and Ronald C. Dobbyn. NBS Spec. Publ. **324**, 683p. (1971).

Kamgar-Parsi, B.

Problems with the Prandtl Number of Steam — Jan V. Sengers, R. S. Basu, B. Kamgar-Parsi, and Joseph Kestin. Mech Eng **104**, New York, NY, 60p. (1982).

Representative Equations for the Thermal Conductivity of Water Substance — Jan V. Sengers, J. T. R. Watson, R. S. Basu, B. Kamgar-Parsi, and R. C. Hendricks. J Phys Chem Ref Data **13**, 893(1984).

Representative Equations for the Viscosity of Water Substance — Jan V. Sengers and B. Kamgar-Parsi. J Phys Chem Ref Data **13**, 185(1984).

Thermodynamic Properties of D_2O in the Critical Region — B. Kamgar-Parsi, J. M. H. Levelt Sengers, and Jan V. Sengers. J Phys Chem Ref Data **12**, 513(1983).

Thermodynamic Properties of Steam in the Critical Region — J. M. H. Levelt Sengers, B. Kamgar-Parsi, F. W. Balfour, and Jan V. Sengers. J Phys Chem Ref Data **12**, 1(1983).

Thermophysical Properties of Fluid H_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 175(1984).

Thermophysical Properties of Fluid D_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 602(1984).

Kaufman, Victor

Reference Wavelengths from Atomic Spectra in the Range 5Å to 25000Å — Victor Kaufman and Bengt Edlén. J Phys Chem Ref Data **3**, 825(1974).

Kazavchinskii, Ya. Z.

Heavy Water, Thermophysical Properties — V. A. Kirillin, Ya. Z. Kazavchinskii, P. M. Kessel'man, S. L. Rivkin, A. E. Sheindlin, E. E. Shpil'rain, V. V. Sychev, and D. L. Timrot. Russian Transl. Springfield, VA: NTIS, 273p. (1971). TT 70-50094, A12.

Thermophysical Properties of Air and Air Components — A. A. Vasserman, Ya. Z. Kazavchinskii, V. A. Rabinovich, and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 402p. (1971). TT 70-50095, A18.

Kell, George S.

A Thermodynamic Surface for Water: The Formulation and Computer Program — Lester Haar, John S. Gallagher, and George S. Kell. NBSIR **81-2253**, 38p. (1981).

Effects of Isotopic Composition, Temperature, Pressure, and Dissolved Gases on the Density of Liquid Water — George S. Kell. J Phys Chem Ref Data **6**, 1109(1977).

NBS/NRC Steam Tables, Thermodynamic and Transport Properties and Computer Programs for Vapor and Liquid States of Water — Lester Haar, John S. Gallagher, and George S. Kell. New York: Hemisphere Press, 320p. (1984).

Kelley, Kenneth K.

Selected Values of the Thermodynamic Properties of Binary Alloys — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, and Kenneth K. Kelley. Metals Park, OH: American Society for Metals, 1435p. (1973).

Selected Values of the Thermodynamic Properties of the Elements — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, Kenneth K. Kelley, and Donald D. Wagman. Metals Park, OH: American Society for Metals, 636p. (1973).

Kelly, Robert

πN Two-Body Scattering Data, I. A User's Guide to the Lovelace-Almehed Data Tape — Claude Lovelace, Sverkei Almehed, Fumiyo Uchiyama, Robert Kelly, Victor P. Henri and Particle Data Group. UCRL **63**, Springfield, VA: NTIS, 146p. (1973). LBL 63, A07.

Kennard, Olga

Crystal Data Determinative Tables, Third Edition, Volume 5. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, John R. Rodgers, editor(s). **5**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Crystal Data Determinative Tables, Third Edition, Volume 6. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, editor(s). **6**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Crystal Data Determinative Tables, Third Edition Volume 3. Organic Compounds — Joseph D. H. Donnay, Olga Kennard, David G. Watson, and John R. Rodgers. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 748p. (1978).

Kerr, J. A.

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **9**, 295(1980).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement I. CODATA Task Group on Chemical Kinetics — D. L. Baulch, R. A. Cox, P. J. Crutzen, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **11**, 327(1982).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement II. CODATA Task Group on Gas Phase Chemical Kinetics — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **13**, 1259(1984).

Kessel'man, P. M.

Heavy Water, Thermophysical Properties — V. A. Kirillin, Ya. Z. Kazavchinskii, P. M. Kessel'man, S. L. Rivkin, A. E. Sheindlin, E. E. Shpil'rain, V. V. Sychev, and D. L. Timrot. Russian Transl. Springfield, VA: NTIS, 273p. (1971). TT 70-50094, A12.

Kestin, Joseph

Equilibrium and Transport Properties of the Noble Gases and Their Mixtures at Low Density — Joseph Kestin, K. Knierim, E. A. Mason, B. Najafi, S. T. Ro, and M. Waldman. J Phys Chem Ref Data **13**, 229(1984).

Problems with the Prandtl Number of Steam — Jan V. Sengers, R. S. Basu, B. Kamgar-Parsi, and Joseph Kestin. Mech Eng **104**, New York, NY, 60p. (1982).

Tables of the Dynamic and Kinematic Viscosity of Aqueous KCl Solutions in the Temperature Range 25-150°C and the Pressure Range 0.1-35 MPa — Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia. J Phys Chem Ref Data **10**, 57(1981).

Tables of the Dynamic and Kinematic Viscosity of Aqueous NaCl Solutions in the Temperature Range 20-150°C and the Pressure Range 0.1-35 MPa — Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia. J Phys Chem Ref Data **10**, 71(1981).

Thermophysical Properties of Fluid H_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 175(1984).

Thermophysical Properties of Fluid D_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 602(1984).

Viscosity of Liquid Water in the Range -8°C to 150°C — Joseph Kestin, Mordechai Sokolov, and William A. Wakeham. J Phys Chem Ref Data **7**, 941(1978).

Khalifa, H. Ezzat

Tables of the Dynamic and Kinematic Viscosity of Aqueous KCl Solutions in the Temperature Range 25-150°C and the Pressure Range 0.1-35 MPa — Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia. J Phys Chem Ref Data **10**, 57(1981).

Tables of the Dynamic and Kinematic Viscosity of Aqueous NaCl Solutions in the Temperature Range 20-150°C and the Pressure Range 0.1-35 MPa — Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia. J Phys Chem Ref Data **10**, 71(1981).

Khan, S. A.

Bibliography on Properties of Defect Centers in Alkali Halides — Suresh C. Jain, S. A. Khan, H. K. Sehgal, V. K. Garg, and R. K. Jain. OSRD Bibl. **71-1**, 293p. (1971).

Khodakovsky, I. L.

Handbook of Thermodynamic Data on Geological Substances — G. B. Naumov, B. N. Ryzhenko, and I. L. Khodakovsky. Russian Transl. Springfield, VA: NTIS, 340p. (1974). TT 73-53051 or PB226 722, A15.

Khudyakov, V. A.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume I. Computation Methods — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, and V. A. Khudyakov. Russian Transl. Springfield, VA: NTIS, 453p. (1974). TT 74-50019, A20.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume II. Oxygen-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 505p. (1975). TT 74-50032, A22.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume III. Oxygen- and Air-Based Propellant — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 648p. (1975). TT 75-50007, A26.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume IV. Nitrogen Tetroxide-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 540p. (1976). TT 76-50007, A23.

Kidnay, Arthur J.

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Ethane — M. J. Hiza, R. C. Miller, and Arthur J. Kidnay. J Phys Chem Ref Data **8**, 799(1979).

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Propane — R. C. Miller, Arthur J. Kidnay, and M. J. Hiza. J Phys Chem Ref Data **9**, 721(1980).

Equilibrium Properties of Fluid Mixtures, A Bibliography on Fluids of Cryogenic Interest — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller. New York: IFI/Plenum, 166p. (1975), ISBN: 0-306-6601-6.

Equilibrium Properties of Fluid Mixtures, 2. A Bibliography of Experimental Data on Selected Fluids — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller. New York: IFI/Plenum, 258p. (1982), ISBN: 0-306-6602-4.

Liquid Vapor Equilibria on Systems of Interest in Cryogenics, A Survey — Arthur J. Kidnay, M. J. Hiza, and R. C. Miller. Cryogenics **13**, London: Academic Press, 575p. (1973).

Kieffer, Lee J.

Bibliography of Low Energy Electron and Photon Cross Section Data (through December 1974) — Lee J. Kieffer. NBS Spec. Publ. **426**, 222p. (1976).

Bibliography of Photoabsorption Cross Section Data — Robert D. Hudson and Lee J. Kieffer. OSRD Bibl. **70-4**, 47p. (1970).

Compilation of Electron Collision Cross Section Data for Modelling Gas Discharge Lasers — Lee J. Kieffer. JILA Report **13**, 139p. (1973).

Compilation of Low Energy Electron Collision Cross Section Data Part I. Ionization, Dissociative Processes, Vibrational and Rotational Excitation — Lee J. Kieffer. JILA Report **6**, 95p. (1969).

Compilation of Low Energy Electron Collsion Cross Section Data. Part II. Line and Level Excitation — Lee J. Kieffer. JILA Report **7**, 167p. (1969).

Electron Impact Ionization Cross-Section Data for Atoms, Atomic Ions, and Diatomic Molecules: I. Experimental Data — Lee J. Kieffer and Gordon H. Dunn. Rev Mod Phys. **38**, New York: American Institute of Physics, 35p. (1966).

Low Energy Electron-Collision Cross Section Data. Part III. Total Scattering; Differential Elastic Scattering — Lee J. Kieffer. At Data. **2**, New York: Academic Press, 293p. (1971).

King, Edward G.

Thermodynamic Properties of Copper and Its Inorganic Compounds — Edward G. King, Alla D. Mah, and Louis B. Pankratz. INCRA Monograph **II**, New York: International Copper Research Association, Inc., 257p. (1973).

Kingston, A. E.

Recommended Data on the Electron Impact Ionization of Light Atoms and Ions — K. L. Bell, H. B. Gilbody, J. G. Hughes, A. E. Kingston, and Francis J. Smith. J Phys Chem Ref Data **12**, 891(1983).

Kirchhoff, William H.

Microwave Spectra of Molecules of Astrophysical Interest, I. Formaldehyde, Formamide, and Thioformaldehyde — Donald R. Johnson, Frank J. Lovas, and William H. Kirchhoff. J Phys Chem Ref Data **1**, 1011(1972).

Microwave Spectra of Molecules of Astrophysical Interest, II. Methylenimine — William H. Kirchhoff, Donald R. Johnson, and Frank J. Lovas. J Phys Chem Ref Data **2**, 1(1973).

Microwave Spectra of Molecules of Astrophysical Interest, III. Methanol — R. M. Lees, Frank J. Lovas, William H. Kirchhoff, and Donald R. Johnson. J Phys Chem Ref Data **2**, 205(1973).

Microwave Spectra of Molecules of Astrophysical Interest, IV. Hydrogen Sulfide — Paul Helminger, Frank C. De Lucia, and William H. Kirchhoff. J Phys Chem Ref Data **2**, 215(1973).

Microwave Spectra of Molecules of Astrophysical Interest, V. Water Vapor — Frank C. De Lucia, Paul Helminger, and William H. Kirchhoff. J Phys Chem Ref Data **3**, 211(1974). .

Kirillin, V. A.

Heavy Water, Thermophysical Properties — V. A. Kirillin, Ya. Z. Kazavchinskii, P. M. Kessel'man, S. L. Rivkin, A. E. Sheindlin, E. E. Shpil'rain, V. V. Sychev, and D. L. Timrot. Russian Transl. Springfield, VA: NTIS, 273p. (1971). TT 70-50094, A12.

Kisiel, Z.

Peak Absorption Coefficients of Microwave Absorption Lines of Carbonyl Sulphide — Z. Kisiel and D. J. Millen. J Phys Chem Ref Data **11**, 101(1982).

Klein, Max

Tables of Collision Integrals and Second Virial Coefficients for the (m,6,8) Intermolecular Potential Function — Max Klein, Howard J. M. Hanley, Francis J. Smith, and Paul M. Holland. NSRDS-NBS **47**, 161p. (1974).

Klemperer, William

Binary Fluorides, Free Molecular Structures and Force Fields, A Bibliography (1957-1975) — Donald T. Hawkins, Lawrence S. Bernstein, Warren E. Falconer, and William Klemperer. New York: IFI/Plenum, 253p. (1976), ISBN: 0-306-6601-3.

Kletskii, A. V.

Thermophysical Properties of Freon-22 — A. V. Kletskii. Russian Transl. Springfield, VA: NTIS, 72p. (1971). TT 70-50178, A04.

Knierim, K.

Equilibrium and Transport Properties of the Noble Gases and Their Mixtures at Low Density — Joseph Kestin, K. Knierim, E. A. Mason, B. Najafi, S. T. Ro, and M. Waldman. J Phys Chem Ref Data **13**, 229(1984).

Kondratiev, V. N.

Rate Constants of Gas Phase Reactions, Reference Book — V. N. Kondratiev, L. J. Holtschlag, R. M. Fristrom, editor(s). Russian Transl. Springfield, VA: NTIS, 434p. (1972). COM 72-10014, A19.

Konjević, N.

A Critical Review of the Stark Widths and Shifts of Spectral Lines from Non-Hydrogenic Atoms — N. Konjević and J. R. Roberts. J Phys Chem Ref Data **5**, 209(1976).

Experimental Stark Widths and Shifts for Non-Hydrogenic Spectral Lines of Ionized Atoms (A Critical Review and Tabulation of Selected Data) — N. Konjević and Wolfgang L. Wiese. J Phys Chem Ref Data **5**, 259(1976).

Experimental Stark Widths and Shifts for Spectral Lines of Neutral Atoms (A Critical Review of Selected Data for the Period 1976 to 1982) — N. Konjević, M. S. Dimitrijević, and Wolfgang L. Wiese. J Phys Chem Ref Data **13**, 619(1984).

Experimental Stark Widths and Shifts for Spectral Lines of Positive Ions (A Critical Review and Tabulation of Selected Data for the Period 1976 to 1982) — N. Konjević, M. S. Dimitrijević, and Wolfgang L. Wiese. J Phys Chem Ref Data **13**, 649(1984).

Kostin, V. N.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume II. Oxygen-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 505p. (1975). TT 74-50032, A22.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume III. Oxygen- and Air-Based Propellant — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 648p. (1975). TT 75-50007, A26.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume IV. Nitrogen Tetroxide-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 540p. (1976). TT 76-50007, A23.

Krause, Morris O.

Atomic Radiative and Radiationless Yields for K and L Shells — Morris O. Krause. J Phys Chem Ref Data **8**, 307(1979).

Natural Widths of Atomic K and L Levels, Kα X-Ray Lines and Several KLL Auger Lines — Morris O. Krause and J. H. Oliver. J Phys Chem Ref Data **8**, 329(1979).

Krauss, Morris

Compendium of ab Initio Calculations of Molecular Energies and Properties — Morris Krauss. NBS Tech. Note **438**, 139p. (1967).

Krebs, Ursula

Molten Salts: Volume 3, Nitrates, Nitrites, and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Ursula Krebs, H. F. Siegenthaler, and Reginald P. T. Tomkins. J Phys Chem Ref Data **1**, 581(1972).

Molten Salts: Volume 4, Part 1, Fluorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, G. L. Gardner, Ursula Krebs, and Reginald P. T. Tomkins. J Phys Chem Ref Data **3**, 1(1974).

Molten Salts: Volume 4, Part 2, Chlorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., G. L. Gardner, Ursula Krebs, and S. K. Singer. J Phys Chem Ref Data **4**, 871(1975).

Krupenie, Paul H.

Microwave Spectra of Molecules of Astrophysical Interest, VII. Carbon Monoxide, Carbon Monosulfide, and Silicon Monoxide — Frank J. Lovas and Paul H. Krupenie. J Phys Chem Ref Data **3**, 245(1974).

The Band Spectrum of Carbon Monoxide — Paul H. Krupenie. NSRDS-NBS **5**, 87p. (1966).

The Spectrum of Molecular Nitrogen — Alf Lofthus and Paul H. Krupenie. J Phys Chem Ref Data **6**, 113(1977).

The Spectrum of Molecular Oxygen — Paul H. Krupenie. J Phys Chem Ref Data **1**, 423(1972).

Kuczkowski, Robert L.

Molecular Structures of Gas-Phase Polyatomic Molecules Determined by Spectroscopic Methods — Marlin D. Harmony, Victor W. Laurie, Robert L. Kuczkowski, Richard H. Schwendeman, D. A. Ramsay, Frank J. Lovas, Walter J. Lafferty, and Arthur G. Maki. J Phys Chem Ref Data **8**, 619(1979).

Kudchadker, Arvind P.

Densities of Liquid $CH_{4-a}X_a$ (X=Br,I) and $CH_{4-(a+b+c+d)}F_aCl_bBr_cI_d$ Halomethanes — Arvind P. Kudchadker, Shanti A. Kudchadker, P. R. Patnaik, and P. P. Mishra. J Phys Chem Ref Data **7**, 425(1978).

Ideal Gas Thermodynamic Properties of the Eight Bromo- an Iodomethanes — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data **4**, 457(1975).

Ideal Gas Thermodynamic Properties of Phenol and Cresols — Shanti A. Kudchadker, Arvind P. Kudchadker, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **7**, 417(1978).

Ideal Gas Thermodynamic Properties of $CH_{4-(a+b+c+d)}F_aCl_bBr_cI_d$ Halomethanes — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data **7**, 1285(1978).

Ideal Gas Thermodynamic Properties of Selected Bromoethanes and Iodoethane — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data **8**, 519(1979).

Vapor Pressures and Boiling Points of Selected Halomethanes — Arvind P. Kudchadker, Shanti A. Kudchadker, R. P. Shukla, and P. R. Patnaik. J Phys Chem Ref Data **8**, 499(1979).

Kudchadker, Shanti A.

Bibliography of Infrared Spectroscopy through 1960 — C. N. R. Rao, S. K. Dikshit, Shanti A. Kudchadker, D. S. Gupta, V. A. Narayan, and John J. Comeford. NBS Spec. Publ. **428**, 1,2,3(1976).

Densities of Liquid $CH_{4-a}X_a$ (X=Br,I) and $CH_{4-(a+b+c+d)}F_aCl_bBr_cI_d$ Halomethanes — Arvind P. Kudchadker, Shanti A. Kudchadker, P. R. Patnaik, and P. P. Mishra. J Phys Chem Ref Data **7**, 425(1978).

Ideal Gas Thermodynamic Properties of the Eight Bromo- an Iodomethanes — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data **4**, 457(1975).

Ideal Gas Thermodynamic Properties of Phenol and Cresols — Shanti A. Kudchadker, Arvind P. Kudchadker, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **7**, 417(1978).

Ideal Gas Thermodynamic Properties of $CH_{4-(a+b+c+d)}F_aCl_bBr_cI_d$ Halomethanes — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data **7**, 1285(1978).

Ideal Gas Thermodynamic Properties of Selected Bromoethanes and Iodoethane — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data **8**, 519(1979).

Thermodynamic Properties of Normal and Deuterated Naphthalenes — S. S. Chen, Shanti A. Kudchadker, and Randolph C. Wilhoit. J Phys Chem Ref Data **8**, 527(1979).

Vapor Pressures and Boiling Points of Selected Halomethanes — Arvind P. Kudchadker, Shanti A. Kudchadker, R. P. Shukla, and P. R. Patnaik. J Phys Chem Ref Data **8**, 499(1979).

Kukol, R. F.

Microwave Spectral Tables, Volume III. Polyatomic Molecules with Internal Rotation — Paul F. Wacker, M. S. Cord, D. G. Burkhard, J. D. Petersen, and R. F. Kukol. NBS Monograph **70**, 275p. (1969).

Kurtseva, N. N.

Handbook of Phase Diagrams of Silicate Systems, Vol. I. Binary Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, V. V. Lapin, N. N. Kurtseva, J. Schmorak, editor(s). Russian Transl. Springfield, VA: NTIS, 730p. (1970). TT 71-50040, A26.

Kurylo, M. J.

Summary Report on the Workshop on High Temperature Chemical Kinetics: Applications to Combustion Research — David Garvin, R. L. Brown, Robert F. Hampson, Jr., M. J. Kurylo, and W. Tsang. NBS Spec. Publ. **531**, 94p. (1978).

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Lafferty, Walter J.

Microwave Spectra of Molecules of Astrophysical Interest, XIII. Cyanoacetylene — Walter J. Lafferty and Frank J. Lovas. J Phys Chem Ref Data **7**, 441(1978).

Molecular Structures of Gas-Phase Polyatomic Molecules Determined by Spectroscopic Methods — Marlin D. Harmony, Victor W. Laurie, Robert L. Kuczkowski, Richard H. Schwendeman, D. A. Ramsay, Frank J. Lovas, Walter J. Lafferty, and Arthur G. Maki. J Phys Chem Ref Data **8**, 619(1979).

Tables of N_2O Absorption Lines for the Calibration of Tunable Infrared Lasers from 522 cm^{-1} to 657 cm^{-1} and from 1115 cm^{-1} to 1340 cm^{-1} — W. B. Olson, Arthur G. Maki, and Walter J. Lafferty. J Phys Chem Ref Data **10**, 1065(1981).

Lakshminarayanan, G. R.

Molten Salts: Volume 1. Electrical Conductance, Density, and Viscosity Data — George J. Janz, F. W. Dampier, G. R. Lakshminarayanan, P. K. Lorenz, and Reginald P. T. Tomkins. NSRDS-NBS **15**, 140p. (1968).

Molten Salts: Volume 2. Section 1. Electrochemistry of Molten Salts. Gibbs Free Energies and Excess Free Energies from Equilibrium-Type Cells, Section 2. Surface Tension Data — George J. Janz, Chr. G. M. Dijkhuis, G. R. Lakshminarayanan, Reginald P. T. Tomkins, and J. Wong. NSRDS-NBS **28**, 116p. (1968).

Lamoreaux, R. H.

High Temperature Vaporization Behavior of Oxides. I. Alkali Metal Binary Oxides — R. H. Lamoreaux and D. L. Hildenbrand. J Phys Chem Ref Data **13**, 151(1984).

Lapin, V. V.

Handbook of Phase Diagrams of Silicate Systems, Vol. I. Binary Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, V. V. Lapin, N. N. Kurtseva, J. Schmorak, editor(s). Russian Transl. Springfield, VA: NTIS, 730p. (1970). TT 71-50040, A26.

Lasinski, Thomas A.

π+p, π+n, and π+d Interactions - A Compilation: Parts I and II — Denyse M. Chew, Victor P. Henri, Thomas A. Lasinski, Thomas G. Trippe, Fumiyo Uchiyama, Frederick C. Winkelmann and Particle Data Group. UCRL **53**, Springfield, VA: NTIS, 213p. (1973). LBL 53; Part II is on microfiche located in the back cover pocket, A10.

Lau, Suk-fai

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VI. Acrylic Polymers — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **11**, 1065(1982).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VIII. Polyesters and Polyamides — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 65(1983).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IX. Final Group of Aromatic and Inorganic Polymers — Umesh Gaur, Suk-fai Lau, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 91(1983).

Laufer, A. H.

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Laurie, Victor W.

Molecular Structures of Gas-Phase Polyatomic Molecules Determined by Spectroscopic Methods — Marlin D. Harmony, Victor W. Laurie, Robert L. Kuczkowski, Richard H. Schwendeman, D. A. Ramsay, Frank J. Lovas, Walter J. Lafferty, and Arthur G. Maki. J Phys Chem Ref Data **8**, 619(1979).

Ledbetter, Hassell M.

Elastic Properties of Metals and Alloys, I. Iron, Nickel, and Iron-Nickel Alloys — Hassell M. Ledbetter and R. P. Reed. J Phys Chem Ref Data **2**, 531(1973).

Elastic Properties of Metals and Alloys, II. Copper — Hassell M. Ledbetter and E. R. Naimon. J Phys Chem Ref Data **3**, 897(1974).

Elastic Properties of Zinc: A Compilation and a Review — Hassell M. Ledbetter. J Phys Chem Ref Data **6**, 1181(1977).

Physical Properties Data Compilations Relevant to Energy Storage. V. Mechanical Properties Data on Alloys for Use in Flywheels — Hassell M. Ledbetter. NSRDS-NBS **61**, 42p. (1982).

Lederer, C. Michael

Nuclear Wallet Cards — Virginia S. Shirley, C. Michael Lederer and National Nuclear Data Center. **1979**, Upton, NY: National Nuclear Data Center, Brookhaven National Laboratory, 40p. (1979). Title, no charge.

Table of Isotopes, Seventh Edition — C. Michael Lederer, Virginia S. Shirley, Edgardo Browne, Janis M. Dairiki, and Raymond E. Doebler. New York: Wiley-Interscience, 1628p. (1978), ISBN: 0-471-0417-3.

Lee, V.

A Fundamental Equation of State for Heavy Water — P. G. Hill, R. D. Chris MacMillan, and V. Lee. J Phys Chem Ref Data **11**, 1(1982).

Erratum: A Fundamental Equation of State for Heavy Water — P. G. Hill, R. D. Chris MacMillan, and V. Lee. J Phys Chem Ref Data **12**, 1065(1983).

Lees, R. M.

Microwave Spectra of Molecules of Astrophysical Interest, III. Methanol — R. M. Lees, Frank J. Lovas, William H. Kirchhoff, and Donald R. Johnson. J Phys Chem Ref Data 2, 205(1973).

Leone, Stephen R.

Rate Coefficients for Vibrational Energy Transfer Involving the Hydrogen Halides — Stephen R. Leone. J Phys Chem Ref Data **11**, 953(1982).

Levin, Ernest M.

Phase Diagrams for Ceramists — Ernest M. Levin, Carl R. Robbins, Howard F. McMurdie, editor(s). American Ceramic Society; Columbus, Ohio, 601p. (1964), ISBN: 0-916094-04-9.

Phase Diagrams for Ceramists 1969 Supplement — Ernest M. Levin, Carl R. Robbins, Howard F. McMurdie, editor(s). American Ceramic Society; Columbus, Ohio, 625p. (1969), ISBN: 0-916094-05-7.

Phase Diagrams for Ceramists 1975 Supplement — Ernest M. Levin, Howard F. McMurdie, editor(s). American Ceramic Society; Columbus, Ohio, 513p. (1975).

Levin, Rhoda D.

Evaluated Gas Phase Basicities and Proton Affinities of Molecules: Heats of Formation of Protonated Molecules — Sharon G. Lias, Joel F. Liebman, and Rhoda D. Levin. J Phys Chem Ref Data **13**, 695(1984).

Ionization Potential and Appearance Potential Measurements, 1971-1981 — Rhoda D. Levin and Sharon G. Lias. NSRDS-NBS **71**, 634p. (1982).

Li, H. H.

Refractive Index of Alkali Halides and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **5**, 329(1976).

Refractive Index of Alkaline Earth Halides and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **9**, 161(1980).

Refractive Index of Silicon and Germanium and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **9**, 561(1980).

Refractive Index of ZnS, ZnSe, and ZnTe and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **13**, 103(1984).

Lias, Sharon G.

A Compendium of Gas Phase Basicity and Proton Affinity Measurements — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, Henry M. Rosenstock, S. S. Schroyer, C. Schmidt, D. Martinsen, and G. W. A. Milne. NBSIR **79-1777**, 563p. (1979).

Annotated Bibliography on Proton Affinities — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, and Henry M. Rosenstock. NBSIR **76-1061**, 52p. (1976).

Evaluated Gas Phase Basicities and Proton Affinities of Molecules: Heats of Formation of Protonated Molecules — Sharon G. Lias, Joel F. Liebman, and Rhoda D. Levin. J Phys Chem Ref Data **13**, 695(1984).

Ionization Potential and Appearance Potential Measurements, 1971-1981 — Rhoda D. Levin and Sharon G. Lias. NSRDS-NBS **71**, 634p. (1982).

Rate Coefficients for Ion-Molecule Reactions, I. Ions Containing C and H — L. Wayne Sieck and Sharon G. Lias. J Phys Chem Ref Data **5**, 1123(1976).

Lide, David R., Jr.

Property Index to NSRDS Data Compilations, 1964-1972 — David R. Lide, Jr., Gertrude B. Sherwood, Charles H. Douglass, and Herman M. Weisman. NSRDS-NBS **55**, 21p. (1975).

Selected Values of Electric Dipole Moments for Molecules in the Gas Phase — Ralph D. Nelson, Jr., David R. Lide, Jr., and Arthur A. Maryott. NSRDS-NBS **10**, 49p. (1967).

The Effect of Computers on the Generation and Use of Technical Data — David R. Lide, Jr., editor(s). NBSIR **84-2907**, 1p. (1984).

Liebman, Joel F.

Evaluated Gas Phase Basicities and Proton Affinities of Molecules: Heats of Formation of Protonated Molecules — Sharon G. Lias, Joel F. Liebman, and Rhoda D. Levin. J Phys Chem Ref Data **13**, 695(1984).

Liley, Peter E.

Thermal Conductivity of Selected Materials — Robert W. Powell, Cho Y. Ho, and Peter E. Liley. NSRDS-NBS **8**, 68p. (1966).

Thermal Conductivity of Selected Materials, Part 2 — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. NSRDS-NBS **16**, 146p. (1968).

Thermal Conductivity of the Elements — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. J Phys Chem Ref Data **1**, 279(1972).

Thermal Conductivity of the Elements: A Comprehensive Review — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. J Phys Chem Ref Data **3**, Suppl. 1(1974).

Lin, C. T.

Vapor Pressure of Coal Chemicals — Jing Chao, C. T. Lin, and T. H. Chung. J Phys Chem Ref Data **12**, 1033(1983).

Lineberger, W. C.

Binding Energies in Atomic Negative Ions — H. Hotop and W. C. Lineberger. J Phys Chem Ref Data **4**, 539(1975).

Lloyd, Alan C.

Evaluation of Kinetic and Mechanistic Data for Modeling of Photochemical Smog — Roger Atkinson and Alan C. Lloyd. J Phys Chem Ref Data **13**, 315(1984).

Lofthus, Alf

The Spectrum of Molecular Nitrogen — Alf Lofthus and Paul H. Krupenie. J Phys Chem Ref Data **6**, 113(1977).

Lojko, M. S.

Microwave Spectral Tables, Volume IV. Polyatomic Molecules without Internal Rotation — M. S. Cord, J. D. Petersen, M. S. Lojko, and R. H. Haas. NBS Monograph **70**, 419p. (1968).

Microwave Spectral Tables, Volume V. Spectral Line Listing — M. S. Cord, M. S. Lojko, and J. D. Petersen. NBS Monograph **70**, 533p. (1968).

Lorenz, P. K.

Molten Salts: Volume 1. Electrical Conductance, Density, and Viscosity Data — George J. Janz, F. W. Dampier, G. R. Lakshminarayanan, P. K. Lorenz, and Reginald P. T. Tomkins. NSRDS-NBS **15**, 140p. (1968).

Lovas, Frank J.

Microwave Spectra of Molecules of Astrophysical Interest, I. Formaldehyde, Formamide, and Thioformaldehyde — Donald R. Johnson, Frank J. Lovas, and William H. Kirchhoff. J Phys Chem Ref Data **1**, 1011(1972).

Microwave Spectra of Molecules of Astrophysical Interest, II. Methylenimine — William H. Kirchhoff, Donald R. Johnson, and Frank J. Lovas. J Phys Chem Ref Data **2**, 1(1973).

Microwave Spectra of Molecules of Astrophysical Interest, III. Methanol — R. M. Lees, Frank J. Lovas, William H. Kirchhoff, and Donald R. Johnson. J Phys Chem Ref Data **2**, 205(1973).

Microwave Spectra of Molecules of Astrophysical Interest, VII. Carbon Monoxide, Carbon Monosulfide, and Silicon Monoxide — Frank J. Lovas and Paul H. Krupenie. J Phys Chem Ref Data **3**, 245(1974).

Microwave Spectra of Molecules of Astrophysical Interest, IX. Acetaldehyde — A. Bauder, Frank J. Lovas, and Donald R. Johnson. J Phys Chem Ref Data **5**, 53(1976).

Microwave Spectra of Molecules of Astrophysical Interest, XIII. Cyanoacetylene — Walter J. Lafferty and Frank J. Lovas. J Phys Chem Ref Data **7**, 441(1978).

Microwave Spectra of Molecules of Astrophysical Interest, XVII. Dimethyl Ether — Frank J. Lovas, H. Lutz, and H. Dreizler. J Phys Chem Ref Data **8**, 1051(1979).

Microwave Spectra of Molecules of Astrophysical Interest. XXI. Ethanol (C_2H_5OH) and Propionitrile (C_2H_5CN) — Frank J. Lovas. J Phys Chem Ref Data **11**, 251(1982).

Microwave Spectral Tables II. Triatomic Molecules — Frank J. Lovas. J Phys Chem Ref Data **7**, 1445(1978).

Microwave Spectral Tables, I. Diatomic Molecules — Frank J. Lovas and Eberhard Tiemann. J Phys Chem Ref Data **3**, 609(1974).

Molecular Structures of Gas-Phase Polyatomic Molecules Determined by Spectroscopic Methods — Marlin D. Harmony, Victor W. Laurie, Robert L. Kuczkowski, Richard H. Schwendeman, D. A. Ramsay, Frank J. Lovas, Walter J. Lafferty, and Arthur G. Maki. J Phys Chem Ref Data **8**, 619(1979).

Lovelace, Claude

πN Two-Body Scattering Data, I. A User's Guide to the Lovelace-Almehed Data Tape — Claude Lovelace, Sverkei Almehed, Fumiyo Uchiyama, Robert Kelly, Victor P. Henri and Particle Data Group. UCRL **63**, Springfield, VA: NTIS, 146p. (1973). LBL 63, A07.

Lutz, H.

Microwave Spectra of Molecules of Astrophysical Interest, XVII. Dimethyl Ether — Frank J. Lovas, H. Lutz, and H. Dreizler. J Phys Chem Ref Data **8**, 1051(1979).

Lynch, C. T.

A Guide to Sources of Information on Materials — Robert S. Marvin, Gertrude B. Sherwood, C. T. Lynch, editor(s). Cleveland, OH: CRC Press, 603p. (1975). Chapter 10 in Handbook of Materials Science, Volume III. Nonmetallic Materials and Publications, C. T. Lynch, Editor.

Lynch, James F.

Critical Surveys of Data Sources: Ceramics — Dorothea M. Johnson and James F. Lynch. NBS Spec. Publ. **396**, 56p. (1975).

Mabey, W.

Critical Review of Hydrolysis of Organic Compounds in Water Under Environmental Conditions — W. Mabey and T. Mill. J Phys Chem Ref Data **7**, 383(1978).

MacMillan, R. D. Chris

A Fundamental Equation of State for Heavy Water — P. G. Hill, R. D. Chris MacMillan, and V. Lee. J Phys Chem Ref Data **11**, 1(1982).

Erratum: A Fundamental Equation of State for Heavy Water — P. G. Hill, R. D. Chris MacMillan, and V. Lee. J Phys Chem Ref Data **12**, 1065(1983).

Saturation States of Heavy Water — P. G. Hill and R. D. Chris MacMillan. J Phys Chem Ref Data **9**, 735(1980).

Mackay, Donald

A Critical Review of Henry's Law Constants for Chemicals of Environmental Interest — Donald Mackay and Wan Ying Shiu. J Phys Chem Ref Data **10**, 1175(1981).

Mah, Alla D.

Contributions to the Data on Theoretical Metallurgy, XVI. Thermodynamic Properties of Nickel and Its Inorganic Compounds — Alla D. Mah and Louis B. Pankratz. U.S. Bur Mines Bull **668**, Springfield, VA: NTIS, 125p. (1976). U.S. Bureau of Mines Bulletin 668, A06.

Thermodynamic Properties of Copper and Its Inorganic Compounds — Edward G. King, Alla D. Mah, and Louis B. Pankratz. INCRA Monograph **II**, New York: International Copper Research Association, Inc., 257p. (1973).

Maki, Arthur G.

Microwave Spectra of Molecules of Astrophysical Interest, VI. Carbonyl Sulfide and Hydrogen Cyanide — Arthur G. Maki. J Phys Chem Ref Data **3**, 221(1974).

Molecular Structures of Gas-Phase Polyatomic Molecules Determined by Spectroscopic Methods — Marlin D. Harmony, Victor W. Laurie, Robert L. Kuczkowski, Richard H. Schwendeman, D. A. Ramsay, Frank J. Lovas, Walter J. Lafferty, and Arthur G. Maki. J Phys Chem Ref Data **8**, 619(1979).

Tables of N_2O Absorption Lines for the Calibration of Tunable Infrared Lasers from 522 cm^{-1} to 657 cm^{-1} and from 1115 cm^{-1} to 1340 cm^{-1} — W. B. Olson, Arthur G. Maki, and Walter J. Lafferty. J Phys Chem Ref Data **10**, 1065(1981).

Mann, Douglas

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format — Douglas Mann and U.S. National Bureau of Standards. Boulder, CO: U.S. National Bureau of Standards, Cryogenic Division, 11p. (1977).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, First Supplement — Douglas Mann and U.S. National Bureau of Standards. **Suppl. 1**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1978)

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, Second Supplement — Douglas Mann and U.S. National Bureau of Standards. **Suppl. 2**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1980).

Manning, John R.

Diffusion Rate Data and Mass Transport Phenomena in Copper Systems — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. INCRA Monograph V, New York: International Copper Research Association, Inc., 322p. (1977).

Diffusion Rate Data and Mass Transport Phenomena for Copper Systems, Part II — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. INCRA Monograph **VIII**, New York: International Copper Research Association, Inc., 701p. (1982).

Diffusion in Copper and Copper Alloys, Part I. Volume and Surface Self-Diffusion in Copper — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **2**, 643(1973).

Diffusion in Copper and Copper Alloys, Part II. Copper-Silver and Copper-Gold Systems — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **3**, 527(1974).

Diffusion in Copper and Copper Alloys, Part III. Diffusion in Systems Involving Elements of the Groups IA, IIA, IIIB, IVB, VB, and VIIB — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **4**, 177(1975).

Diffusion in Copper and Copper Alloys, Part IV. Diffusion in Systems Involving Elements of Group VIII — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **5**, 103(1976).

Diffusion in Copper and Copper Alloys, Part V. Diffusion in Systems Involving Elements of Group VA — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **6**, 1(1977).

Manzhelii, V. G.

Properties of Liquid and Solid Hydrogen — B. N. Esel'son, Y. P. Blagoi, V.N. Grigor'ev, V. G. Manzhelii, S. A. Mikhailenko, and N. P. Neklyudov. Russian Transl. Springfield, VA: NTIS, 126p. (1971). **TT** 70-50179, A07.

Mapleton, R. A.

Theory of Charge Exchange — R. A. Mapleton., New York: Wiley-Interscience, 284p. (1971), ISBN: 0-471-5678-7.

Marcus, Y.

Compilation and Evaluation of Solubility Data in the Mercury (I) Chloride-Water System — Y. Marcus. J Phys Chem Ref Data **9**, 1307(1980).

Marrero, T. R.

Gaseous Diffusion Coefficients — T. R. Marrero and E. A. Mason. J Phys Chem Ref Data **1**, 1(1972).

Marshall, E. M.

Thermochemical Data for Gaseous Monoxides — J. B. Pedley and E. M. Marshall. J Phys Chem Ref Data **12**, 967(1983).

Marshall, William L.

Ion Product of Water Substance, 0 - 1000°C, 1 - 10,000 Bars. New International Formulation and Its Background — William L. Marshall and E. U. Franck. J Phys Chem Ref Data **10**, 295(1981).

Martin, Georgia A.

Atomic Transition Probabilities for Vanadium, Chromium, and Manganese (A Critical Data Compilation of Allowed Lines) — S. M. Younger, Jeffrey R. Fuhr, Georgia A. Martin, and Wolfgang L. Wiese. J Phys Chem Ref Data **7**, 495(1978).

Atomic Transition Probabilities for Iron, Cobalt, Nickel: A Critical Data Compilation of Allowed Lines — Jeffrey R. Fuhr, Georgia A. Martin, Wolfgang L. Wiese, and S. M. Younger. J Phys Chem Ref Data **10**, 305(1981).

Bibliography on Atomic Line Shapes and Shifts (July 1973 through May 1975) — Jeffrey R. Fuhr, Georgia A. Martin, and Beverly J. Specht. NBS Spec. Publ. **366**, Suppl. 2(1975).

Bibliography on Atomic Line Shapes and Shifts (June 1975 through June 1978) — Jeffrey R. Fuhr, Beverly J. Miller, and Georgia A. Martin. NBS Spec. Publ. **366**, Suppl. 3(1978).

Bibliography on Atomic Transition Probabilities (1914 through October 1977) — Beverly J. Miller, Jeffrey R. Fuhr, and Georgia A. Martin. NBS Spec. Publ. **505**, 283p. (1978).

Bibliography on Atomic Transition Probabilities (November 1977 through March 1980) — Beverly J. Miller, Jeffrey R. Fuhr, and Georgia A. Martin. NBS Spec. Publ. **505**, Suppl.(1980).

Tables of Critically Evaluated Oscillator Strengths for the Lithium Isoelectronic Sequence — Georgia A. Martin and Wolfgang L. Wiese. J Phys Chem Ref Data **5**, 537(1976).

Tables of Line Spectra of the Elements, Part 1. Wavelengths and Intensities, Part 2. Transition Probabilities — Joseph Reader, Charles H. Corliss, Wolfgang L. Wiese, and Georgia A. Martin. NSRDS-NBS **68**, 415p. (1980).

Martin, William C.

Atomic Energy Levels - The Rare-Earth Elements, the Spectra of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu — William C. Martin, Romuald Zalubas, and Lucy Hagan. NSRDS-NBS **60**, 422p. (1978).

Bibliography on Atomic Energy Levels and Spectra, July 1968 through June 1971 — Lucy Hagan and William C. Martin. NBS Spec. Publ. **363**, 109p. (1972).

Energy Levels of Magnesium, Mg I through Mg XII — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **9**, 1(1980).

Energy Levels of Neutral Helium (^{4}He I) — William C. Martin. J Phys Chem Ref Data **2**, 257(1973).

Energy Levels of Silicon, Si I through Si XIV — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **12**, 323(1983).

Energy Levels of Sodium, Na I through Na XI — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **10**, 153(1981).

Energy levels of Aluminum, Al I through Al XIII — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **8**, 817(1979).

Ground Levels and Ionization Potentials for Lanthanide and Actinide Atoms and Ions — William C. Martin, Lucy Hagan, Joseph Reader, and Jack Sugar. J Phys Chem Ref Data **3**, 771(1974).

Martinsen, D.

A Compendium of Gas Phase Basicity and Proton Affinity Measurements — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, Henry M. Rosenstock, S. S. Schroyer, C. Schmidt, D. Martinsen, and G. W. A. Milne. NBSIR **79-1777**, 563p. (1979).

Marvin, Robert S.

A Guide to Sources of Information on Materials — Robert S. Marvin, Gertrude B. Sherwood, C. T. Lynch, editor(s). Cleveland, OH: CRC Press, 603p. (1975). Chapter 10 in Handbook of Materials Science, Volume III. Nonmetallic Materials and Publications, C. T. Lynch, Editor.

Maryott, Arthur A.

Selected Values of Electric Dipole Moments for Molecules in the Gas Phase — Ralph D. Nelson, Jr., David R. Lide, Jr., and Arthur A. Maryott. NSRDS-NBS **10**, 49p. (1967).

Mason, E. A.

Equilibrium and Transport Properties of the Noble Gases and Their Mixtures at Low Density — Joseph Kestin, K. Knierim, E. A. Mason, B. Najafi, S. T. Ro, and M. Waldman. J Phys Chem Ref Data **13**, 229(1984).

Gaseous Diffusion Coefficients — T. R. Marrero and E. A. Mason. J Phys Chem Ref Data **1**, 1(1972).

Matsunaga, N.

Transport Properties of Liquid and Gaseous D_2O over a Wide Range of Temperature and Pressure — N. Matsunaga and A. Nagashima. J Phys Chem Ref Data **12**, 933(1983).

Matsuura, Hiroatsu

Tables of Molecular Vibrational Frequencies, Part 9 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **7**, 1323(1978).

Tables of Molecular Vibrational Frequencies, Part 10 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **9**, 1149(1980).

Matula, R. A.

Electrical Resistivity of Copper, Gold, Palladium, and Silver — R. A. Matula. J Phys Chem Ref Data **8**, 1147(1979).

Electrical Resistivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, T. N. Havill, R. H. Bogaard, R. A. Matula, S. G. Oh, and H. M. James. J Phys Chem Ref Data **12**, 183(1983).

Mavrodineanu, Radu

Bibliography on Flame Spectroscopy. Analytical Applications, 1800-1966 — Radu Mavrodineanu. NBS Spec. Publ. **281**, 155p. (1967).

McAlister, Archie J.

Soft X-Ray Emission Spectra of Metallic Solids: Critical Review of Selected Systems — Archie J. McAlister, Ronald C. Dobbyn, John R. Cuthill, and M. L. Williams. J Phys Chem Ref Data **2**, 411(1973).

Soft X-Ray Emission Spectra of Metallic Solids: Critical Review of Selected Systems and Annotated Spectral Index — Archie J. McAlister, Ronald C. Dobbyn, John R. Cuthill, and M. L. Williams. NBS Spec. Publ. **369**, 180p. (1974).

McCarty, Robert D.

An Equation of State for Fluid Ethylene — Robert D. McCarty and Richard T. Jacobsen. NBS Tech. Note **1045**, 164p. (1981).

Liquid Densities of Oxygen, Nitrogen, Argon, and Parahydrogen — Hans M. Roder, Robert D. McCarty, and V. J. Johnson. NBS Tech. Note **361**, 1972(1973).

The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Argon, Krypton, Xenon, Nitrogen, and Oxygen — Howard J. M. Hanley, Robert D. McCarty, and W. M. Haynes. J Phys Chem Ref Data **3**, 979(1974).

The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Methane — Howard J. M. Hanley, W. M. Haynes, and Robert D. McCarty. J Phys Chem Ref Data **6**, 597(1977).

Thermodynamic Properties of Argon from the Triple Point to 300 K at Pressures to 1000 Atmospheres — A. L. Gosman, Robert D. McCarty, and Jerome G. Hust. NSRDS-NBS **27**, 153p. (1969).

Thermodynamic Properties of Helium-4 from 2 to 1500 K at Pressures to 10^8 Pa — Robert D. McCarty. J Phys Chem Ref Data **2**, 923(1973).

McClenon, Robert

COMBO: A General-Purpose Program for Searching, Annotating, Encoding-Decoding, and Reformatting Data Files — Robert McClenon and Joseph Hilsenrath. NBS Tech. Note **700**, 72p. (1972).

Description of the Magnetic Tape Version of the Bulletin of Thermodynamics and Thermochemistry, No. 14 — Robert McClenon, William H. Evans, David Garvin, and Blanton C. Duncan. NBS Tech. Note **760**, 32p. (1973).

Fortran Programs for Text Editing, File Manipulation and Automatic Typsetting — Carla G. Messina, Robert McClenon, and Joseph Hilsenrath. OSRD Mag. Tape **A2**, Washington, DC: Office of Standard Reference Data,(1973). COM 71-003 885 or PB 183 142, T05.

Reform: A General-Purpose Program for Manipulating Formatted Data Files — Robert McClenon and Joseph Hilsenrath. NBS Tech. Note **444**, 25p. (1968).

McClure, G. W.

Dissociation in Heavy Particle Collisions — G. W. McClure and James M. Peek. At Mol Collis Proc Ser, New York: Wiley-Interscience, 198p. (1972), ISBN: 0-471-5816-8.

McDaniel, Earl W.

Ion-Molecule Reactions — Earl W. McDaniel, V. Cermak, A. Dalgarno, E. E. Ferguson, and L. Friedman. At Mol Collis Proc Ser, New York: Wiley-Interscience, 374p. (1970), ISBN: 0-471-5838-3.

McDonald, R. A.

JANAF Thermochemical Tables, 1975 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, H. Prophet, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **4**, 1(1975).

JANAF Thermochemical Tables, 1978 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **7**, 793(1978).

JANAF Thermochemical Tables, 1982 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, J. R. Downey, Jr., R. A. McDonald, A. N. Syverud, and E. A. Valenzuela. J Phys Chem Ref Data **11**, 695(1982).

McKinley, J. D.

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

McMurdie, Howard F.

Phase Diagrams for Ceramists — Ernest M. Levin, Carl R. Robbins, Howard F. McMurdie, editor(s). American Ceramic Society; Columbus, Ohio, 601p. (1964), ISBN: 0-916094-04-9.

Phase Diagrams for Ceramists 1969 Supplement — Ernest M. Levin, Carl R. Robbins, Howard F. McMurdie, editor(s). American Ceramic Society; Columbus, Ohio, 625p. (1969), ISBN: 0-916094-05-7.

Phase Diagrams for Ceramists 1975 Supplement — Ernest M. Levin, Howard F. McMurdie, editor(s). American Ceramic Society; Columbus, Ohio, 513p. (1975).

Meggers, William F.

The First Spectrum of Hafnium (Hf I) — William F. Meggers and Charlotte E. Moore. NBS Monograph **153**, 123p. (1976).

Merrill, Leo

A Compilation of Volumes I-IV of Bibliography on High Pressure Research with Author and Subject Indexes — John Francis Cannon and Leo Merrill. Springfield, VA: NTIS, 385p. (1972). in two volumes, vol. 1 PB 191 174, A17; vol. 2 PB 191 174.

Behavior of the AB-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **6**, 1205(1977).

Behavior of the AB_2-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **11**, 1005(1982).

Bibliography of High Pressure Research, Volume XII (1979) — Leo Merrill. Provo, UT: High Pressure Data Center, Brigham Young University, ..p. (1979). Bimonthly, order from Data Center.

Compilation of Volumes V-IX of the Bibliography on High Pressure Research with Author and Subject Indexes — Leo Merrill. Provo, UT: High Pressure Data Center, Brigham Young University, (1979). in microfiche only.

High Pressure Bibliography 1900-1968, Volume I. Section I. Bibliography, Section II. Author Index — Leo Merrill. OSRD Bibl. **70-1**, Vol. 1(1970).

High Pressure Bibliography 1900-1968, Volume II. Subject Index — Leo Merrill. OSRD Bibl. **70-1**, Vol. 2(1970).

High Pressure Bibliography, 1968-1971, with Author and Subject Indexes — John Francis Cannon and Leo Merrill. Provo, UT: High Pressure Data Center, Brigham Young University, 189p. (1972). in microfiche only.

High-Pressure Calibration: A Critical Review — D. L. Decker, W. A. Bassett, Leo Merrill, H. T. Hall, and J. D. Barnett. J Phys Chem Ref Data **1**, 773(1972).

Merrill, Paul W.

Partial Grotrian Diagrams of Astrophysical Interest — Charlotte E. Moore and Paul W. Merrill. NSRDS-NBS **23**, 65p. (1968).

Messina, Carla G.

EDPAC: Utility Programs for Computer-Assisted Editing, Copy Production, and Data Retrieval — Carla G. Messina and Joseph Hilsenrath. NBS Tech. Note **470**, 76p. (1969).

Edit-Insertion Programs for Automatic Typesetting of Computer Printout — Carla G. Messina and Joseph Hilsenrath. NBS Tech. Note **500**, 47p. (1970).

Fortran Programs for Text Editing, File Manipulation and Automatic Typsetting — Carla G. Messina, Robert McClenon, and Joseph Hilsenrath. OSRD Mag. Tape **A2**, Washington, DC: Office of Standard Reference Data,(1973). COM 71-003 885 or PB 183 142, T05.

OMNITAB, A Computer Program for Statistical and Numerical Analysis — Joseph Hilsenrath, Guy G. Ziegler, Carla G. Messina, P. J. Walsh, and R. H. Herbold. NBS Handbook **101**, 256p. (1968).

Metha, Aspy

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. I. Selenium — Umesh Gaur, Hua-Cheng Shu, Aspy Metha, and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 89(1981).

Miescher, E.

Atlas of the Absorption Spectrum of Nitric Oxide (NO) between 1420 and 1250 Å — E. Miescher and F. Alberti. J Phys Chem Ref Data **5**, 309(1976).

Mighell, Alan D.

Crystal Data Space-Group Tables — Alan D. Mighell, Helen M. Ondik, and Bettijoyce Breen Molino. J Phys Chem Ref Data **6**, 675(1977).

Crystal Data Determinative Tables, Third Edition Volume 4. Inorganic Compounds — Joseph D. H. Donnay, Helen M. Ondik, and Alan D. Mighell. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1308p. (1978).

NBS* AIDS80: A FORTRAN Program for Crystallographic Data Evaluation — Alan D. Mighell, C. R. Hubbard, and Judy K. Stalick. NBS Tech. Note **1141**, 54p. (1981).

Mikhailenko, S. A.

Properties of Liquid and Solid Hydrogen — B. N. Esel'son, Y. P. Blagoi, V.N. Grigor'ev, V. G. Manzhelii, S. A. Mikhailenko, and N. P. Neklyudov. Russian Transl. Springfield, VA: NTIS, 126p. (1971). TT 70-50179, A07.

Mikula, A.

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Metal Systems — Y. Austin Chang, Joachim P. Neumann, A. Mikula, and Daniel Goldberg. INCRA Monograph **VI**, New York: International Copper Research Association, Inc., 702p. (1979).

Miles, Barbara M.

Atomic Transition Probabilities, Volume II. Sodium through Calcium — Wolfgang L. Wiese, Melvin W. Smith, and Barbara M. Miles. NSRDS-NBS **22**, 268p. (1969).

Critically Evaluated Transition Probabilities for Ba I and II — Barbara M. Miles and Wolfgang L. Wiese. NBS Tech. Note **474**, 22p. (1969).

Mill, T.

A Critical Review of H-Atom Transfer in the Liquid Phase: Chlorine Atom, Alkyl, Trichloromethyl, Alkoxy, and Alkylperoxy Radicals — D. G. Hendry, T. Mill, L. Piszkiewicz, J. A. Howard, and H. K. Eigenmann. J Phys Chem Ref Data **3**, 937(1974).

Critical Review of Hydrolysis of Organic Compounds in Water Under Environmental Conditions — W. Mabey and T. Mill. J Phys Chem Ref Data 7, 383(1978).

Millen, D. J.

Peak Absorption Coefficients of Microwave Absorption Lines of Carbonyl Sulphide — Z. Kisiel and D. J. Millen. J Phys Chem Ref Data **11**, 101(1982).

Miller, Beverly J.

Bibliography on Atomic Line Shapes and Shifts (June 1975 through June 1978) — Jeffrey R. Fuhr, Beverly J. Miller, and Georgia A. Martin. NBS Spec. Publ. **366**, Suppl. 3(1978).

Bibliography on Atomic Transition Probabilities (1914 through October 1977) — Beverly J. Miller, Jeffrey R. Fuhr, and Georgia A. Martin. NBS Spec. Publ. **505**, 283p. (1978).

Bibliography on Atomic Transition Probabilities (November 1977 through March 1980) — Beverly J. Miller, Jeffrey R. Fuhr, and Georgia A. Martin. NBS Spec. Publ. **505**, Suppl.(1980).

Miller, G. R.

Physical Properties Data Compilations Relevant to Energy Storage. III. Engineering Properties of Single and Polycrystalline Sodium Beta and Beta" Alumina — G. R. Miller and D. G. Paquette. NSRDS-NBS **61**, 19p. (1979).

Miller, R. C.

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Ethane — M. J. Hiza, R. C. Miller, and Arthur J. Kidnay. J Phys Chem Ref Data **8**, 799(1979).

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Propane — R. C. Miller, Arthur J. Kidnay, and M. J. Hiza. J Phys Chem Ref Data **9**, 721(1980).

Equilibrium Properties of Fluid Mixtures, A Bibliography on Fluids of Cryogenic Interest — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller. New York: IFI/Plenum, 166p. (1975), ISBN: 0-306-6601-6

Equilibrium Properties of Fluid Mixtures, 2. A Bibliography of Experimental Data on Selected Fluids — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller. New York: IFI/Plenum, 258p. (1982), ISBN: 0-306-6602-4.

Liquid Vapor Equilibria on Systems of Interest in Cryogenics, A Survey — Arthur J. Kidnay, M. J. Hiza, and R. C. Miller. Cryogenics **13**, London: Academic Press, 575p. (1973).

Milne, G. S.

Tables of Bimolecular Gas Reactions — Aubrey F. Trotman-Dickenson and G. S. Milne. NSRDS-NBS **9**, 129p. (1967).

Milne, G. W. A.

A Compendium of Gas Phase Basicity and Proton Affinity Measurements — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, Henry M. Rosenstock, S. S. Schroyer, C. Schmidt, D. Martinsen, and G. W. A. Milne. NBSIR **79-1777**, 563p. (1979).

EPA/NIH Mass Spectral Data Base Magnetic Tape — Stephen R. Heller and G. W. A. Milne. NBS Standard Reference Database 1 **A1**, Washington, DC: NBS Office of Standard Reference Data,(updated periodically). Call (301) 921-2228 for specific instructions.

EPA/NIH Mass Spectral Data Base, Supplement 1 — Stephen R. Heller and G. W. A. Milne. NSRDS-NBS **63**, Suppl. 1(1980).

EPA/NIH Mass Spectral Data Base, Supplement 2 — Stephen R. Heller, G. W. A. Milne, and Lewis H. Gevantman. NSRDS-NBS **63**, Suppl. 2(1983).

EPA/NIH Mass Spectral Data Base, Volume 1. Molecular Weights 30-186; Volume 2. Molecular Weights 16-273; Volume 3. Molecular Weights 273-381; Volume 4. Molecular Weights 381-1674 — Stephen R. Heller and G. W. A. Milne. NSRDS-NBS **63**, 1,2,3,4(1978).

Mishra, P. P.

Densities of Liquid $CH_{4-a}X_a$ (X=Br,I) and $CH_{4-(a+b+c+d)}F_aCl_bBr_cI_d$ Halomethanes -- Arvind P. Kudchadker, Shanti A. Kudchadker, P. R. Patnaik, and P. P. Mishra. J Phys Chem Ref Data **7**, 425(1978).

Miyahara, Koshiro

Hydrogenation of Ethylene on Metallic Catalysts — Juro Horiuti and Koshiro Miyahara. NSRDS-NBS **13**, 62p. (1968).

Mizushima, M.

Microwave Spectral Tables, Volume I. Diatomic Molecules — Paul F. Wacker, M. Mizushima, J. D. Petersen, and J. R. Ballard. NBS Monograph **70**, 171p. (1964).

Mohrmann, L. E.

NMR Spectral Data: A Compilation of Aromatic Proton Chemical Shifts in Mono- and Di-Substituted Benzene — B. L. Shapiro and L. E. Mohrmann. J Phys Chem Ref Data **6**, 919(1977).

Moiseiwitsch, Benjamin L.

Electron Impact Excitation of Atoms — Benjamin L. Moiseiwitsch and Steven J. Smith. NSRDS-NBS **25**, 120p. (1968).

Molino, Bettijoyce Breen

Crystal Data Space-Group Tables — Alan D. Mighell, Helen M. Ondik, and Bettijoyce Breen Molino. J Phys Chem Ref Data **6**, 675(1977).

Monnanteuil, Nicole

Microwave Spectra of Molecules of Astrophysical Interest. XVIII. Formic Acid — Edmond Willemot, Didier Dangoisse, Nicole Monnanteuil, and Jean Bellet. J Phys Chem Ref Data **9**, 59(1980).

Montague, D. C.

Evaluated Kinetic Data for High Temperature Reactions, Volume 4. Homogeneous Gas Phase Reactions of Halogen- and Cyanide-Containing Species — D. L. Baulch, J. Duxbury, S. J. Grant, and D. C. Montague. J Phys Chem Ref Data **10**, Suppl. 1(1981).

Moore, Charlotte E.

A Multiplet Table of Astrophysical Interest, Revised Edition, Part I. Table of Multiplets, Part II. Finding List of All Lines in the Table of Multiplets — Charlotte E. Moore. NSRDS-NBS **40**, 261p. (1972).

An Ultraviolet Multiplet Table, Section 1. The Spectra of Hydrogen through Vanadium — Charlotte E. Moore. NBS Circular **488**, 78p. (1950).

An Ultraviolet Multiplet Table, Section 2. The Spectra of Chromium through Niobium — Charlotte E. Moore. NBS Circular **488**, 115p. (1952).

An Ultraviolet Multiplet Table, Section 3. The Spectra of Molybdenum to Lanthanum and Hafnium to Radium — Charlotte E. Moore. NBS Circular **488**, 94p. (1962).

An Ultraviolet Multiplet Table, Section 4. Finding List for Spectra of the Elements Hydrogen to Niobium (Z = 1 to 41) — Charlotte E. Moore. NBS Circular **488**, 65p. (1962).

An Ultraviolet Multiplet Table, Section 5. Finding List for Spectra of the Elements Molybdenum to Lanthanum (Z = 42 to 57), Hafnium to Radium (Z = 72 to 88) — Charlotte E. Moore. NBS Circular **488**, 30p. (1962).

Atomic Energy Levels as Derived from the Analyses of Optical Spectra, Volume I. ^{1}H to ^{23}V — Charlotte E. Moore. NSRDS-NBS **35**, 358p. (1971).

Atomic Energy Levels as Derived from the Analyses of Optical Spectra, Volume II. ^{24}Cr to ^{41}Nb — Charlotte E. Moore. NSRDS-NBS **35**, 263p. (1971).

Atomic Energy Levels as Derived from the Analysis of Optical Spectra, Volume III. ^{42}Mo to ^{57}La, ^{72}Hf to ^{89}Ac — Charlotte E. Moore. NSRDS-NBS **35**, 289p. (1971).

Bibliography on the Analyses of Optical Atomic Spectra. Section 1. ^{1}H-^{23}V — Charlotte E. Moore. NBS Spec. Publ. **306**, 80p. (1968).

Bibliography on the Analyses of Optical Atomic Spectra. Section 2. ^{24}Cr-^{41}Nb — Charlotte E. Moore. NBS Spec. Publ. **306**, 57p. (1969).

Bibliography on the Analyses of Optical Atomic Spectra. Section 3. ^{42}Mo-^{57}La and ^{72}Hf-^{89}Ac — Charlotte E. Moore. NBS Spec. Publ. **306**, 37p. (1969).

Bibliography on the Analyses of Optical Atomic Spectra. Section 4. ^{57}La-^{71}Lu and ^{89}Ac-^{99}Es — Charlotte E. Moore. NBS Spec. Publ. **306**, 48p. (1969).

Ionization Potentials and Ionization Limits Derived from the Analyses of Optical Spectra — Charlotte E. Moore. NSRDS-NBS **34**, 22p. (1970).

Partial Grotrian Diagrams of Astrophysical Interest — Charlotte E. Moore and Paul W. Merrill. NSRDS-NBS **23**, 65p. (1968).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; Si II, Si III, Si IV — Charlotte E. Moore. NSRDS-NBS **3**, 35p. (1965).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition: B. Multiplet Tables; SiI — Charlotte E. Moore. NSRDS-NBS **3**, 22p. (1967).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; C I, C II, C III — Charlotte E. Moore. NSRDS-NBS **3**, 73p. (1970).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; N IV, N V, N VI, N VII — Charlotte E. Moore. NSRDS-NBS **3**, 46p. (1971).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; H I, D, T — Charlotte E. Moore. NSRDS-NBS **3**, 32p. (1972).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Sec ond Edition; B. Multiplet Tables; N I, N II, N III, — Charlotte E. Moore. NSRDS-NBS **3**, 80p.(1975).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; O I — Charlotte E. Moore. NSRDS-NBS **3**, 33p. (1976).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; O VI, O VII , O VIII — Charlotte E. Moore. NSRDS-NBS **3**, 31p. (1979).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; O V — Charlotte E. Moore. NSRDS-NBS **3**, 21p. (1980).

Selected Tables of Atomic Spectra: A. Atomic Energy levels - Second Edition; B. Multiplet Tables; O IV — Charlotte E. Moore. NSRDS-NBS **3**, 21p. (1983).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; O III — Charlotte E. Moore. NSRDS-NBS **3**, ...p. (1985).

The First Spectrum of Hafnium (Hf I) — William F. Meggers and Charlotte E. Moore. NBS Monograph **153**, 123p. (1976).

Moore, Robert L.

Critical Surveys of Data Sources: Mechanical Properties of Metals — R. B. Gavert, Robert L. Moore, and John H. Westbrook. NBS Spec. Publ. **396**, 90p. (1974).

Critical Surveys of Data Sources: Electrical and Magnetic Properties of Metals — M. J. Carr, R. B. Gavert, Robert L. Moore, H. W. Wawrousek, and John H. Westbrook. NBS Spec. Publ. **396**, 96p. (1976).

Morin, L. R. M.

Molecular Form Factors and Photon Coherent Scattering Cross Sections of Water — L. R. M. Morin. J Phys Chem Ref Data **11**, 1091(1982).

Morozova, N. A.

Thermodynamic and Thermophysical Properties of Helium — A. F. Alyab'ev, N. V. Tsederberg, V. N. Popov, and N. A. Morozova. Russian Transl. Springfield, VA: NTIS, 260p. (1971). TT 70-50096, A12.

Muir, A. H.

Mossbauer Effect Data Index, 1958-1965 — A. H. Muir, K. J. Ando, and Helen M. Coogan. New York: Interscience Publishers, 351p. (1966).

Mukerjee, Pasupati

Critical Micelle Concentrations of Aqueous Surfactant Systems — Pasupati Mukerjee and Karol J. Mysels. NSRDS-NBS **36**, 222p. (1971).

Murad, S.

A Correlation of the Existing Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethane — Howard J. M. Hanley, K. E. Gubbins, and S. Murad. J Phys Chem Ref Data **6**, 1167(1977).

Erratum: A Correlation of the Existing Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethane — Howard J. M. Hanley, K. E. Gubbins, and S. Murad. J Phys Chem Ref Data **10**, 799(1981).

Murphy, R. M.

Physical Properties Data Compilations Relevant to Energy Storage. II. Molten Salts: Data on Single and Multi-Component Systems — George J. Janz, Carolyn B. Allen, Narottam P. Bansal, R. M. Murphy, and Reginald P. T. Tomkins. NSRDS-NBS **61**, 420p. (1979).

Murray, Joanne

Bulletin of Alloy Phase Diagrams — Joanne Murray, editor(s) and American Society for Metals. Bull Alloy Phase Diag **3**, Metals Park, OH: American Society for Metals, 130p. (1982), ISBN: 01970216.

Muthu, Ol

Critical Evaluation of Vapor-Liquid Equilibrium, Heat of Mixing, and Volume Change of Mixing Data. General Procedures — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 941(1982).

Definition of Recommended Values of Certain Thermodynamic Properties for the Ketones — Buford D. Smith and Ol Muthu. NBSIR **84-2811**, 162p. (1983).

Evaluation of Binary Excess Enthalpy Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1127(1982).

Evaluation of Binary Excess Enthalpy Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 389(1983).

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1151(1982).

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 395(1983).

Evaluation of Binary *PT*xy Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1099(1982).

Evaluation of Binary *PT*xy Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 381(1983).

Mysels, Karol J.

Critical Micelle Concentrations of Aqueous Surfactant Systems — Pasupati Mukerjee and Karol J. Mysels. NSRDS-NBS **36**, 222p. (1971).

Nagashima, A.

Erratum: Viscosity of Water Substance - New International Formulation and Its Background — A. Nagashima. J Phys Chem Ref Data **12**, 403p. (1983).

Transport Properties of Liquid and Gaseous D_2O over a Wide Range of Temperature and Pressure — N. Matsunaga and A. Nagashima. J Phys Chem Ref Data **12**, 933(1983).

Viscosity of Water Substance - New International Formulation and Its Background — A. Nagashima. J Phys Chem Ref Data **6**, 1133(1977).

Naimon, E. R.

Elastic Properties of Metals and Alloys, II. Copper — Hassell M. Ledbetter and E. R. Naimon. J Phys Chem Ref Data **3**, 897(1974).

Najafi, B.

Equilibrium and Transport Properties of the Noble Gases and Their Mixtures at Low Density — Joseph Kestin, K. Knierim, E. A. Mason, B. Najafi, S. T. Ro, and M. Waldman. J Phys Chem Ref Data **13**, 229(1984).

Narayan, V. A.

Bibliography of Infrared Spectroscopy through 1960 — C. N. R. Rao, S. K. Dikshit, Shanti A. Kudchadker, D. S. Gupta, V. A. Narayan, and John J. Comeford. NBS Spec. Publ. **428**, 1,2,3(1976)

Natarajan, M.

Crystal Structure Transformations in Binary Halides — C. N. R. Rao and M. Natarajan. NSRDS-NBS **41**, 57p. (1972).

Crystal Structure Transformations in Inorganic Nitrites, Nitrates, and Carbonates — C. N. R. Rao, Brahm Prakash, and M. Natarajan. NSRDS-NBS **53**, 55p. (1975).

Naumov, G. B.

Handbook of Thermodynamic Data on Geological Substances — G. B. Naumov, B. N. Ryzhenko, and I. L. Khodakovsky. Russian Transl. Springfield, VA: NTIS, 340p. (1974). TT 73-53051 or PB226 722, A15.

Neduzhii, I. A.

Thermodynamic and Transport Properties of Ethylene and Propylene — I. A. Neduzhii. Russian Transl. Springfield, VA: NTIS, 206p. (1972). COM 75-11276, A10.

Neklyudov, N. P.

Properties of Liquid and Solid Hydrogen — B. N. Esel'son, Y. P. Blagoi, V.N. Grigor'ev, V. G. Manzhelii, S. A. Mikhailenko, and N. P. Neklyudov. Russian Transl. Springfield, VA: NTIS, 126p. (1971). TT 70-50179, A07.

Nelson, Ralph D., Jr.

Selected Values of Electric Dipole Moments for Molecules in the Gas Phase — Ralph D. Nelson, Jr., David R. Lide, Jr., and Arthur A. Maryott. NSRDS-NBS **10**, 49p. (1967).

Neta, Pedatsur

Rate Constants for Reactions of Aliphatic Carbon-Centered Radicals in Aqueous Solution — Alberta B. Ross and Pedatsur Neta. NSRDS-NBS **70**, 96p. (1982).

Rate Constants for Reactions of Inorganic Radicals in Aqueous Solution — Alberta B. Ross and Pedatsur Neta. NSRDS-NBS **65**, 62p. (1979).

Neumann, David B.

A Report on Thermodynamic Data for Desulfurization Processes — Vivian B. Parker, Bert R. Staples, Thomas L. Jobe, Jr., and David B. Neumann. NBSIR **81-2345**, 89p. (1981).

Neumann, Joachim P.

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Silver Systems — Y. Austin Chang, Daniel Goldberg, and Joachim P. Neumann. J Phys Chem Ref Data **6**, 621(1977).

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Metal Systems — Y. Austin Chang, Joachim P. Neumann, A. Mikula, and Daniel Goldberg. INCRA Monograph **VI**, New York: International Copper Research Association, Inc., 702p. (1979).

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Sulfur-Metal Systems — Y. Austin Chang, Joachim P. Neumann, and U. V. Choudary. INCRA Monograph **VII**, New York: International Copper Research Association, Inc. 191 p. (1979).

Nuttall, Ralph L.

A Bibliography of Sources of Experimental Data Leading to Activity or Osmotic Coefficients for Polyvalent Electrolytes in Aqueous Solution — Robert N. Goldberg, Bert R. Staples, Ralph L. Nuttall, and R. Arbuckle. NBS Spec. Publ. **485**, 57p. (1977).

Computer Programs for the Evaluation of Activity and Osmotic Coefficients — Bert R. Staples and Ralph L. Nuttall. NBS Tech. Note **928**, 60p. (1976).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: The Alkaline Earth Metal Halides — Robert N. Goldberg and Ralph L. Nuttall. J Phys Chem Ref Data **7**, 263(1978).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Iron Chloride and the Bi-Univalent Compounds of Nickel and Cobalt — Robert N. Goldberg, Ralph L. Nuttall, and Bert R. Staples. J Phys Chem Ref Data **8**, 923(1979).

Selected Values of Chemical Thermodynamic Properties: Compounds of Uranium, Protactinium, Thorium, Actinium, and the Alkali Metals — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, and Ralph L. Nuttall. NBS Tech. Note **270**, 149p. (1981).

The Activity and Osmotic Coefficients of Aqueous Calcium Chloride at 298.15 K — Bert R. Staples and Ralph L. Nuttall. J Phys Chem Ref Data **6**, 385(1977).

The NBS Tables of Chemical Thermodynamic Properties. Selected Values for Inorganic and C_1 and C_2 Organic Substances in SI Units — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, Iva Halow, Sylvia M. Bailey, Kenneth L. Churney, and Ralph L. Nuttall. J Phys Chem Ref Data **11**, Suppl. 2(1982).

O'Neal, Harry E.

Kinetic Data on Gas Phase Unimolecular Reactions — Sidney W. Benson and Harry E. O'Neal. NSRDS-NBS **21**, 645p. (1970).

Øverbø , I.

Pair, Triplet, and Total Atomic Cross Sections (and Mass Attenuation Coefficients) for 1 MeV-100 GeV Photons in Elements Z=1 to 100 — John H. Hubbell, Heinz A. Gimm, and I. Øverbø . J Phys Chem Ref Data **9**, 1023(1980).

Relativistic Atomic Form Factors and Photon Coherent Scattering Cross Sections — John H. Hubbell and I. Øverbø . J Phys Chem Ref Data **8**, 69(1979).

Odintzova, G. A.

The Spectrum and Energy Levels of the Neutral Atom of Boron (B I) — G. A. Odintzova and A. R. Striganov. J Phys Chem Ref Data **8**, 63(1979).

Ogawa, Yoshiki

Tables of Molecular Vibrational Frequencies, Part 9 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **7**, 1323(1978).

Tables of Molecular Vibrational Frequencies, Part 10 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **9**, 1149(1980).

Oh, S. G.

Electrical Resistivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, T. N. Havill, R. H. Bogaard, R. A. Matula, S. G. Oh, and H. M. James. J Phys Chem Ref Data **12**, 183(1983).

Thermal Conductivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, S. G. Oh, and T. N. Havill. J Phys Chem Ref Data **7**, 959(1978).

Okabe, H.

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr.,W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Oliver, J. H.

Natural Widths of Atomic K and L Levels, Kα X-Ray Lines and Several KLL Auger Lines — Morris O. Krause and J. H. Oliver. J Phys Chem Ref Data **8**, 329(1979).

Olson, W. B.

Tables of N_2O Absorption Lines for the Calibration of Tunable Infrared Lasers from 522 cm^{-1} to 657 cm^{-1} and from 1115 cm^{-1} to 1340 cm^{-1} — W. B. Olson, Arthur G. Maki, and Walter J. Lafferty. J Phys Chem Ref Data **10**, 1065(1981).

Ondik, Helen M.

Crystal Data Space-Group Tables — Alan D. Mighell, Helen M. Ondik, and Bettijoyce Breen Molino. J Phys Chem Ref Data **6**, 675(1977).

Crystal Data Determinative Tables, Third Edition Volume 1: Organic Compounds — Joseph D. H. Donnay and Helen M. Ondik. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 855p. (1972).

Crystal Data Determinative Tables, Third Edition Volume 2: Inorganic Compounds — Joseph D. H. Donnay and Helen M. Ondik. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1748p. (1973).

Crystal Data Determinative Tables, Third Edition Volume 4. Inorganic Compounds — Joseph D. H. Donnay, Helen M. Ondik, and Alan D. Mighell. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1308p. (1978).

Outred, Michael

Tables of Atomic Spectral Lines for the 10 000 Å to 40 000 Å Region — Michael Outred. J Phys Chem Ref Data **7**, 1(1978).

Ozier, I.

Microwave Spectra of Molecules of Astrophyical Interest. XX. Methane — I. Ozier, M. C. L. Gerry, and A. G. Robiette. J Phys Chem Ref Data **10**, 1085(1981).

Padikal, Thomas N.

Medical Physics Data Book — Thomas N. Padikal and Sherman P. Fivozinsky. NBS Handbook **138**, 127p. (1982).

Pamidimukkala, Krishna M.

Ideal Gas Thermodynamic Properties of CH_3, CD_3, CD_4, C_2D_2, C_2D_4, C_2D_6, C_2H_6, $CH_3N_2CH_3$, and $CD_3N_2CD_3$ — Krishna M. Pamidimukkala, David Rogers, and Gordon B. Skinner. J Phys Chem Ref Data **11**, 83(1982).

Pankratz, Louis B.

Contributions to the Data on Theoretical Metallurgy, XVI. Thermodynamic Properties of Nickel and Its Inorganic Compounds — Alla D. Mah and Louis B. Pankratz. U.S. Bur Mines Bull **668**, Springfield, VA: NTIS, 125p. (1976). U.S. Bureau of Mines Bulletin 668, A06.

Thermodynamic Properties of Copper and Its Inorganic Compounds — Edward G. King, Alla D. Mah, and Louis B. Pankratz. INCRA Monograph II, New York: International Copper Research Association, Inc., 257p. (1973).

Paquette, D. G.

Physical Properties Data Compilations Relevant to Energy Storage. III. Engineering Properties of Single and Polycrystalline Sodium Beta and Beta″ Alumina — G. R. Miller and D. G. Paquette. NSRDS-NBS **61**, 19p. (1979).

Parker, Vivian B.

A Combined Least Sums and Least Squares Approach to the Evaluation of Thermodynamic Data Networks — David Garvin, Vivian B. Parker, Donald D. Wagman, and William H. Evans. NBSIR **76-1147**, 41p. (1976).

A Computer Assisted Evaluation of the Thermochemical Data of the Compounds of Thorium — Donald D. Wagman, Richard H. Schumm, and Vivian B. Parker. NBSIR **77-1300**, 94p. (1977).

A Report on Thermodynamic Data for Desulfurization Processes — Vivian B. Parker, Bert R. Staples, Thomas L. Jobe, Jr., and David B. Neumann. NBSIR **81-2345**, 89p. (1981).

Chemical Thermodynamic Data Banks — David Garvin, Vivian B. Parker, and Donald D. Wagman. NBSIR **81-2341**, 30p. (1981).

Chemical Thermodynamic Properties of Compounds of Sodium, Potassium, and Rubidium: An Interim Tabulation of Selected Material — Donald D. Wagman, William H. Evans, Vivian B. Parker, and Richard H. Schumm. NBSIR **76-1034**, 76p. (1976).

Selected Thermochemical Data Compatible with CODATA Recommendations — Vivian B. Parker, Donald D. Wagman, and David Garvin. NBSIR **75-968**, 35p. (1976).

Selected Values of Chemical Thermodynamic Properties. Tables for the First Thirty-Four Elements in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 264p. (1968).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 35 through 53 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 152p. (1969).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 54 through 61 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, Richard H. Schumm, and Kenneth L. Churney. NBS Tech. Note **270**, 49p. (1971).

Selected Values of Chemical Thermodynamic Properties. Tables for the Alkaline Earth Elements (Elements 92 through 97 in the Standard Order of Arrangement) — Vivian B. Parker, Donald D. Wagman, and William H. Evans. NBS Tech. Note **270**, 124p. (1971).

Selected Values of Chemical Thermodynamic Properties. Tables for the Lanthanide (Rare Earth) Elements (Elements 62 through 76 in the Standard Order of Arrangement) — Richard H. Schumm, Donald D. Wagman, Sylvia M. Bailey, William H. Evans, and Vivian B. Parker. NBS Tech. Note **270**, 84p. (1973).

Selected Values of Chemical Thermodynamic Properties: Compounds of Uranium, Protactinium, Thorium, Actinium, and the Alkali Metals — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, and Ralph L. Nuttall. NBS Tech. Note **270**, 149p. (1981).

The NBS Tables of Chemical Thermodynamic Properties. Selected Values for Inorganic and C_1 and C_2 Organic Substances in SI Units — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, Iva Halow, Sylvia M. Bailey, Kenneth L. Churney, and Ralph L. Nuttall. J Phys Chem Ref Data **11**, Suppl. 2(1982).

The Thermochemical Properties of Uranium-Halogen Containing Compounds — Vivian B. Parker. NBSIR **80-2029**, 173p. (1980).

Thermal Properties of Aqueous Uni-Univalent Electrolytes — Vivian B. Parker. NSRDS-NBS **2**, 68p. (1965).

Parkinson, W. H.

Atlas of the Schumann-Runge Absorption Bands of O_2 in the Wavelength Region 175-205 nm — K. Yoshino, D. E. Freeman, and W. H. Parkinson. J Phys Chem Ref Data **13**, 207(1984).

Patnaik, P. R.

Densities of Liquid $CH_{4-a}X_a$ (X=Br,I) and $CH_{4-(a+b+c+d)}F_aCl_bBr_cI_d$ Halomethanes — Arvind P. Kudchadker, Shanti A. Kudchadker, P. R. Patnaik, and P. P. Mishra. J Phys Chem Ref Data **7**, 425(1978).

Vapor Pressures and Boiling Points of Selected Halomethanes — Arvind P. Kudchadker, Shanti A. Kudchadker, R. P. Shukla, and P. R. Patnaik. J Phys Chem Ref Data **8**, 499(1979).

Pearlman, Robert S.

Water Solubilities of Polynuclear Aromatic and Heteroaromatic. Compounds — Robert S. Pearlman, Samuel H. Yalkowsky, and Sujit Banerjee. J Phys Chem Ref Data **13**, 555(1984).

Peavy, Sally T.

OMNITAB 80 Magnetic Tape — Sally T. Peavy. OSRD Mag. Tape , Washington, DC: NBS Office of Standard Reference Data,(1980). U.S. and foreign prices, for further information write, or call (301) 921-3651.

Test Problems and Results for OMNITAB 80 — Sally T. Peavy and Shirley G. Bremer. NBS Tech. Note **1147**, 316p. (1981).

Pedley, J. B.

Thermochemical Data for Gaseous Monoxides — J. B. Pedley and E. M. Marshall. J Phys Chem Ref Data **12**, 967(1983).

Peek, James M.

Dissociation in Heavy Particle Collisions — G. W. McClure and James M. Peek. At Mol Collis Proc Ser, New York: Wiley-Interscience, 198p. (1972), ISBN: 0-471-5816-8.

Peiper, J. Christopher

Thermodynamic Properties of Aqueous Sodium Chloride Solutions — Kenneth S. Pitzer, J. Christopher Peiper, and R. H. Busey. J Phys Chem Ref Data **13**, 1(1984).

Petersen, J. D.

Microwave Spectral Tables, Volume I. Diatomic Molecules — Paul F. Wacker, M. Mizushima, J. D. Petersen, and J. R. Ballard. NBS Monograph **70**, 171p. (1964).

Microwave Spectral Tables, Volume IV. Polyatomic Molecules without Internal Rotation — M. S. Cord, J. D. Petersen, M. S. Lojko, and R. H. Haas. NBS Monograph **70**, 419p. (1968).

Microwave Spectral Tables, Volume III. Polyatomic Molecules with Internal Rotation — Paul F. Wacker, M. S. Cord, D. G. Burkhard, J. D. Petersen, and R. F. Kukol. NBS Monograph **70**, 275p. (1969).

Microwave Spectral Tables, Volume V. Spectral Line Listing — M. S. Cord, M. S. Lojko, and J. D. Petersen. NBS Monograph **70**, 533p. (1968).

Peterson, Donald B.

The Radiation Chemistry of Gaseous Ammonia — Donald B. Peterson. NSRDS-NBS **44**, 41p. (1974).

Pine, A. S.

Atlas of the High Temperature Water Vapor Spectrum in the 3000 to 4000 cm^{-1} Region — A. S. Pine, M. J. Coulombe, C. Camy-Peyret, and J-M. Flaud. J Phys Chem Ref Data **12**, 413(1983).

Piszkiewicz, L.

A Critical Review of H-Atom Transfer in the Liquid Phase: Chlorine Atom, Alkyl, Trichloromethyl, Alkoxy, and Alkylperoxy Radicals — D. G. Hendry, T. Mill, L. Piszkiewicz, J. A. Howard, and H. K. Eigenmann. J Phys Chem Ref Data **3**, 937(1974).

Pitchford, L. C.

A Bibliography of Electron Swarm Data — Earl C. Beaty, J. Dutton, and L. C. Pitchford. JILA Report **20**, 252p. (1979).

An Annotated Compilation and Appraisal of Electron Swarm Data in Electronegative Gases — Jean W. Gallagher, Earl C. Beaty, J. Dutton, and L. C. Pitchford. J Phys Chem Ref Data **12**, 109(1983).

Pitzer, Kenneth S.

Simplification of Thermodynamic Calculations Through Dimensionless Entropies (Comments) — Kenneth S. Pitzer and Leo Brewer. J Phys Chem Ref Data **8**, 917(1979).

Thermodynamic Properties of Aqueous Sodium Chloride Solutions — Kenneth S. Pitzer, J. Christopher Peiper, and R. H. Busey. J Phys Chem Ref Data **13**, 1(1984).

Volumetric Properties of Aqueous Sodium Chloride Solutions — P. S. Z. Rogers and Kenneth S. Pitzer. J Phys Chem Ref Data **11**, 15(1982).

Popov, V. N.

Thermodynamic and Thermophysical Properties of Helium — A. F. Alyab'ev, N. V. Tsederberg, V. N. Popov, and N. A. Morozova. Russian Transl. Springfield, VA: NTIS, 260p. (1971). TT 70-50096, A12.

Porter, F. T.

Recommended Atomic Electron Binding Energies, 1s to $6p_{3/2}$, for the Heavy Elements, Z = 84 to 103 — F. T. Porter and M. S. Freedman. J Phys Chem Ref Data **7**, 1267(1978).

Pound, G. M.

Selected Values of Critical Supersaturation for Nucleation of Liquids from the Vapor — G. M. Pound. J Phys Chem Ref Data **1**, 119(1972).

Selected Values of Evaporation and Condensation Coefficients for Simple Substances — G. M. Pound. J Phys Chem Ref Data **1**, 135(1972).

Powell, Robert W.

Thermal Conductivity of Selected Materials — Robert W. Powell, Cho Y. Ho, and Peter E. Liley. NSRDS-NBS **8**, 68p. (1966).

Thermal Conductivity of Selected Materials, Part 2 — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. NSRDS-NBS **16**, 146p. (1968).

Thermal Conductivity of the Elements — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. J Phys Chem Ref Data **1**, 279(1972).

Thermal Conductivity of the Elements: A Comprehensive Review — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. J Phys Chem Ref Data **3**, Suppl. 1(1974).

Poynter, Robert L.

Microwave Spectra of Molecules of Astrophysical Interest, XII. Hydroxyl Radical — Robert A. Beaudet and Robert L. Poynter. J Phys Chem Ref Data **7**, 311(1978).

Prakash, Brahm

Crystal Structure Transformations in Inorganic Nitrites, Nitrates, and Carbonates — C. N. R. Rao, Brahm Prakash, and M. Natarajan. NSRDS-NBS **53**, 55p. (1975).

Crystal Structure Transformations in Inorganic Sulfates, Phosphates, Perchlorates, and Chromates — C. N. R. Rao and Brahm Prakash. NSRDS-NBS **56**, 37p. (1975).

Pratto, M. R.

Microwave Spectral Tables, Volume II. Line Strengths of Asymmetric Rotors — Paul F. Wacker and M. R. Pratto. NBS Monograph 70, 349p. (1964).

Price, LeRoy R.

A Compilation of YN Reactions — Odette Benary, Naomi Barash-Schmidt, LeRoy R. Price, Arthur H. Rosenfeld, Gideon Alexander and Particle Data Group. UCRL **20000YN**, Springfield, VA: NTIS, **70**p. (1970). UCRL-20 000 YN, A04.

Prophet, H.

JANAF Thermochemical Tables, 1974 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, A. T. Hu, H. Prophet, A. N. Syverud, and L. C. Walker. J Phys Chem Ref Data **3**, 311(1974).

JANAF Thermochemical Tables, 1975 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, H. Prophet, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **4**, 1(1975).

JANAF Thermochemical Tables, Second Edition — Daniel R. Stull and H. Prophet. NSRDS-NBS **37**, 1141p. (1971).

Prydz, R.

The Viscosity and Thermal Conductivity Coefficients of Gaseous and Liquid Fluorine — Howard J. M. Hanley and R. Prydz. J Phys Chem Ref Data **1**, 1101(1972).

Rabinovich, V. A.

Thermophysical Properties of Air and Air Components — A. A. Vasserman, Ya. Z. Kazavchinskii, V. A. Rabinovich, and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 402p. (1971). TT 70-50095, A18.

Thermophysical Properties of Gases and Liquids, No. 1 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 214p. (1970). TT 69-55091, A10, the translation of volumes 2, 3, and 4 have the title: Thermophysical Properties of Matter and Substances.

Thermophysical Properties of Liquid Air and Its Components — A. A. Vasserman and V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 255p. (1970). TT 69-55092, A12.

Thermophysical Properties of Matter and Substances, Volume 2 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 395p. (1974). TT 72-52001, A17, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermophysical Properties of Matter and Substances, Volume 3 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 212p. (1975). TT 73-52009, A10, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermophysical Properties of Matter and Substances, Volume 4 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 179p. (1975). TT 73-52029, A09, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Ramsay, D. A.

Molecular Structures of Gas-Phase Polyatomic Molecules Determined by Spectroscopic Methods — Marlin D. Harmony, Victor W. Laurie, Robert L. Kuczkowski, Richard H. Schwendeman, D. A. Ramsay, Frank J. Lovas, Walter J. Lafferty, and Arthur G. Maki. J Phys Chem Ref Data **8**, 619(1979).

Rao, C. N. R.

Bibliography of Infrared Spectroscopy through 1960 — C. N. R. Rao, S. K. Dikshit, Shanti A. Kudchadker, D. S. Gupta, V. A. Narayan, and John J. Comeford. NBS Spec. Publ. **428**, 1,2,3(1976).

Crystal Structure Transformations in Binary Halides — C. N. R. Rao and M. Natarajan. NSRDS-NBS **41**, 57p. (1972).

Crystal Structure Transformations in Inorganic Nitrites, Nitrates, and Carbonates — C. N. R. Rao, Brahm Prakash, and M. Natarajan. NSRDS-NBS **53**, 55p. (1975).

Crystal Structure Transformations in Inorganic Sulfates, Phosphates, Perchlorates, and Chromates — C. N. R. Rao and Brahm Prakash. NSRDS-NBS **56**, 37p. (1975).

Transition Metal Oxides, Crystal Chemistry, Phase Transition, and Related Aspects — C. N. R. Rao and G. V. Subba Rao. NSRDS-NBS **49**, 140p. (1974).

Rao, G. V. Subba

Transition Metal Oxides, Crystal Chemistry, Phase Transition, and Related Aspects — C. N. R. Rao and G. V. Subba Rao. NSRDS-NBS **49**, 140p. (1974).

Read, Michael E.

Diffusion Rate Data and Mass Transport Phenomena in Copper Systems — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. INCRA Monograph **V**, New York: International Copper Research Association, Inc., 322p. (1977).

Diffusion Rate Data and Mass Transport Phenomena for Copper Systems, Part II — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. INCRA Monograph **VIII**, New York: International Copper Research Association, Inc., 701p. (1982).

Diffusion in Copper and Copper Alloys, Part I. Volume and Surface Self-Diffusion in Copper — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **2**, 643(1973).

Diffusion in Copper and Copper Alloys, Part II. Copper-Silver and Copper-Gold Systems — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **3**, 527(1974).

Diffusion in Copper and Copper Alloys, Part III. Diffusion in Systems Involving Elements of the Groups IA, IIA, IIIB, IVB, VB, and VIIB — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **4**, 177(1975).

Diffusion in Copper and Copper Alloys, Part IV. Diffusion in Systems Involving Elements of Group VIII — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **5**, 103(1976).

Diffusion in Copper and Copper Alloys, Part V. Diffusion in Systems Involving Elements of Group VA — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **6**, 1(1977).

Reader, Joseph

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

Ground Levels and Ionization Potentials for Lanthanide and Actinide Atoms and Ions — William C. Martin, Lucy Hagan, Joseph Reader, and Jack Sugar. J Phys Chem Ref Data **3**, 771(1974).

Tables of Line Spectra of the Elements, Part 1. Wavelengths and Intensities, Part 2. Transition Probabilities — Joseph Reader, Charles H. Corliss, Wolfgang L. Wiese, and Georgia A. Martin. NSRDS-NBS **68**, 415p. (1980).

Reed, R. P.

Elastic Properties of Metals and Alloys, I. Iron, Nickel, and Iron-Nickel Alloys — Hassell M. Ledbetter and R. P. Reed. J Phys Chem Ref Data **2**, 531(1973).

Reilly, Martin L.

Critical Analysis of Heat-Capacity Data and Evaluation of Thermodynamic Properties of Ru, Ph, Pd, Ir, and Pt from 0 to 300 K. A Survey of the Literature Data on Osmium — George T. Furukawa, Martin L. Reilly, and John S. Gallagher. J Phys Chem Ref Data **3**, 163(1974).

Critical Analysis of the Heat-Capacity Data of the Literature and Evaluation of Thermodynamic Properties of Copper, Silver, and Gold from 0 to 300 K — George T. Furukawa, W. G. Saba, and Martin L. Reilly. NSRDS-NBS **18**, 49p. (1968).

Rettich, Timothy R.

The Solubility of Nitrogen and Air in Liquids — Rubin Battino, Timothy R. Rettich, and Toshihiro Tominaga. J Phys Chem Ref Data **13**, 563(1984).

The Solubility of Oxygen and Ozone in Liquids — Rubin Battino, Timothy R. Rettich, and Toshihiro Tominaga. J Phys Chem Ref Data **12**, 163(1983).

Rivkin, S. L.

Heavy Water, Thermophysical Properties — V. A. Kirillin, Ya. Z. Kazavchinskii, P. M. Kessel'man, S. L. Rivkin, A. E. Sheindlin, E. E. Shpil'rain, V. V. Sychev, and D. L. Timrot. Russian Transl. Springfield, VA: NTIS, 273p. (1971). TT 70-50094, A12.

Ro, S. T.

Equilibrium and Transport Properties of the Noble Gases and Their Mixtures at Low Density — Joseph Kestin, K. Knierim, E. A. Mason, B. Najafi, S. T. Ro, and M. Waldman. J Phys Chem Ref Data **13**, 229(1984).

Robbins, Carl R.

Phase Diagrams for Ceramists — Ernest M. Levin, Carl R. Robbins, Howard F. McMurdie, editor(s). American Ceramic Society; Columbus, Ohio, 601p. (1964), ISBN: 0-916094-04-9.

Phase Diagrams for Ceramists 1969 Supplement — Ernest M. Levin, Carl R. Robbins, Howard F. McMurdie, editor(s). American Ceramic Society; Columbus, Ohio, 625p. (1969), ISBN: 0-916094-05-7.

Roberts, Benjamin W.

Properties of Selected Superconductive Materials, 1978 Supplement — Benjamin W. Roberts. NBS Tech. Note **983**, 103p. (1978).

Survey of Superconductive Materials and Critical Evaluation of Selected Properties — Benjamin W. Roberts. J Phys Chem Ref Data **5**, 581(1976).

Roberts, J. R.

A Critical Review of the Stark Widths and Shifts of Spectral Lines from Non-Hydrogenic Atoms — N. Konjević and J. R. Roberts. J Phys Chem Ref Data **5**, 209(1976).

Robiette, A. G.

Microwave Spectra of Molecules of Astrophyical Interest. XX. Methane — I. Ozier, M. C. L. Gerry, and A. G. Robiette. J Phys Chem Ref Data **10**, 1085(1981).

Robinson, Gilpin R., Jr.

Thermodynamic Tabulations for Selected Phases in the System CaO-Al_2O_3-SiO_2-H_2O at 101.325 kPa (1 atm.) between 273.15 and 1800 K — John L. Haas, Jr., Gilpin R. Robinson, Jr., and Bruce S. Hemingway. J Phys Chem Ref Data **10**, 575(1981).

Roder, Hans M.

Liquid Densities of Oxygen, Nitrogen, Argon, and Parahydrogen — Hans M. Roder, Robert D. McCarty, and V. J. Johnson. NBS Tech. Note **361**, 1972(1973).

The Molar Volume (Density) of Solid Oxygen in Equilibrium with Vapor — Hans M. Roder. J Phys Chem Ref Data **7**, 949(1978).

Thermodynamic and Related Properties of Parahydrogen from the Triple Point to 100 K at Pressures to 340 Atmospheres — Hans M. Roder, Lloyd A. Weber, and Robert D. Goodwin. NBS Monograph **94**, 116p. (1965).

Rodgers, A. S.

Ideal Gas Thermodynamic Properties of Eight Chloro- and Fluoromethanes — A. S. Rodgers, Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **3**, 117(1974).

Ideal Gas Thermodynamic Properties of Six Chloroethanes — Jing Chao, A. S. Rodgers, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **3**, 141(1974).

Ideal Gas Thermodynamic Properties of Six Fluoroethanes — S. S. Chen, A. S. Rodgers, Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 441(1975).

Rodgers, John R.

Crystal Data Determinative Tables, Third Edition, Volume 3. Organic Compounds — Joseph D. H. Donnay, Olga Kennard, David G. Watson, and John R. Rodgers. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 748p. (1978).

Crystal Data Determinative Tables, Third Edition, Volume 5. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, John R. Rodgers, editor(s). **5**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Rogers, David

Ideal Gas Thermodynamic Properties of CH_3, CD_3, CD_4, C_2D_2, C_2D_4, C_2D_6, C_2H_6, $CH_3N_2CH_3$, and $CD_3N_2CD_3$ — Krishna M. Pamidimukkala, David Rogers, and Gordon B. Skinner. J Phys Chem Ref Data **11**, 83(1982).

Rogers, P. S. Z.

Volumetric Properties of Aqueous Sodium Chloride Solutions — P. S. Z. Rogers and Kenneth S. Pitzer. J Phys Chem Ref Data **11**, 15(1982).

Rosenfeld, Arthur H.

πN Particle-Wave Amplitudes — David J. Herndon, Angela Barbaro-Galtieri, Arthur H. Rosenfeld and Particle Data Group. UCRL **20030**πN, Springfield, VA: NTIS, 85p. (1970). UCRL 20030 πN, A05.

A Compilation of YN Reactions — Odette Benary, Naomi Barash-Schmidt, LeRoy R. Price, Arthur H. Rosenfeld, Gideon Alexander and Particle Data Group. UCRL **20000YN**, Springfield, VA: NTIS, 70p. (1970). UCRL-20 000 YN, A04.

Rosenstock, Henry M.

A Bibliography on Ion-Molecule Reactions. January 1900 to March 1966 — F. N. Harllee, Henry M. Rosenstock, and John T. Herron. NBS Tech. Note **291**, 40p. (1966).

A Compendium of Gas Phase Basicity and Proton Affinity Measurements — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, Henry M. Rosenstock, S. S. Schroyer, C. Schmidt, D. Martinsen, and G. W. A. Milne. NBSIR **79-1777**, 563p. (1979).

Annotated Bibliography on Proton Affinities — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, and Henry M. Rosenstock. NBSIR **76-1061**, 52p. (1976).

Automation of the Ion Energetics Data Center — Robert C. Thompson, W. J. Webb, and Henry M. Rosenstock. NBSIR **78-1432**, 84p. (1978).

Energetics of Gaseous Ions — Henry M. Rosenstock, Keith Draxl, B. W. Steiner, and John T. Herron. J Phys Chem Ref Data **6**, Suppl. 1(1977).

Ion Energetics Measurements, Supplement I. 1971-1973 — Henry M. Rosenstock, D. Sims, S. S. Schroyer, and W. J. Webb. NSRDS-NBS **66**, 380p. (1980).

Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions — Joseph L. Franklin, J. G. Dillard, Henry M. Rosenstock, John T. Herron, Keith Draxl, and Frank H. Field. NSRDS-NBS **26**, 289p. (1969).

Ross, Alberta B.

A Catalog of Data Compilations on Photochemical and Photophysical Processes in Solution — James G. Brummer, W. Phillip Helman, and Alberta B. Ross. NBS Spec. Publ. **578**, 27p. (1980).

Rate Constants for Reactions of Aliphatic Carbon-Centered Radicals in Aqueous Solution — Alberta B. Ross and Pedatsur Neta. NSRDS-NBS **70**, 96p. (1982).

Rate Constants for Reactions of Inorganic Radicals in Aqueous Solution — Alberta B. Ross and Pedatsur Neta. NSRDS-NBS **65**, 62p. (1979).

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, 1. Hydrated Electron — Michael Anbar, Mark Bambenek, and Alberta B. Ross. NSRDS-NBS **43**, 69p. (1973).

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, 1. Hydrated Electron, Supplemental Data — Alberta B. Ross. NSRDS-NBS **43**, Suppl.(1975).

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, II. Hydrogen Atom — Michael Anbar, Farhataziz, and Alberta B. Ross. NSRDS-NBS **51**, 66p. (1975).

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, III. Hydroxyl Radical and Perhydroxyl Radical and Their Radical Ions — Farhataziz and Alberta B. Ross. NSRDS-NBS **59**, 126p. (1977).

Thesaurus for Radiation Chemistry — Alberta B. Ross and Radiation Chemistry Data Center. Rad Chem. **1**, Springfield, VA: NTIS, 48p. (1977). UND-RCDC-1, A03.

Rossmassler, Stephen A.

Critical Evaluation of Data in the Physical Sciences - A Status Report on the National Standard Reference Data System, January 1977 — Stephen A. Rossmassler. NBS Tech. Note **947**, 88p. (1977).

Roszman, Larry J.

Bibliography on Atomic Line Shapes and Shifts (1899 through March 1972) — Jeffrey R. Fuhr, Wolfgang L. Wiese, and Larry J. Roszman. NBS Spec. Publication **366**, 165p. (1972).

Bibliography on Atomic Line Shapes and Shifts (April 1972 through June 1973) — Jeffrey R. Fuhr, Larry J. Roszman, and Wolfgang L. Wiese. NBS Spec. Publ. **366**, Suppl. 1(1974).

Roy, Sathyabhama

Selected Specific Rates of Reactions of the Solvated Electron in Alcohols — Edgar Watson, Jr. and Sathyabhama Roy. NSRDS-NBS **42**, 27p. (1972).

Rudge, M. R. H.

Theory of the Ionization of Atoms by Electron Impact — M. R. H. Rudge. Rev Mod Phys **40**, .., 564p. (1968).

Rullhusen, P.

Small-Angle Rayleigh Scattering of Photons at High Energies: Tabulations of Relativisitic HFS Modified Atomic Form Factors — D. Schaupp, M. Schumacher, F. Smend, P. Rullhusen, and John H. Hubbell. J Phys Chem Ref Data **12**, 467(1983).

Rumble, John R., Jr.

Bibliography of Low Energy Electron and Photon Cross Section Data (January 1975 to December 1977) — Jean W. Gallagher, John R. Rumble, Jr., and Earl C. Beaty. NBS Spec. Publ. **426**, Suppl. 1(1979).

Data Index for Energy Transfer Collisions of Atoms and Molecules - 1970-1979 — Jean W. Gallagher, Janet Van Blerkom, Earl C. Beaty, and John R. Rumble, Jr. NBS Spec. Publ. **593**, 349p. (1981).

Ryzhenko, B. N.

Handbook of Thermodynamic Data on Geological Substances — G. B. Naumov, B. N. Ryzhenko, and I. L. Khodakovsky. Russian Transl. Springfield, VA: NTIS, 340p. (1974). TT 73-53051 or PB226 722, A15.

Saba, W. G.

Critical Analysis of the Heat-Capacity Data of the Literature and Evaluation of Thermodynamic Properties of Copper, Silver, and Gold from 0 to 300 K — George T. Furukawa, W. G. Saba, and Martin L. Reilly. NSRDS-NBS **18**, 49p. (1968).

Sage, Bruce H.

Phase Behavior in Binary and Multicomponent Systems at Elevated Pressures: n-Pentane and Methane-n-Pentane — Virginia M. Berry and Bruce H. Sage. NSRDS-NBS **32**, 79p. (1970).

Samsonov, G. V.

Handbook of Hardness Data — G. V. Samsonov and A. A. Ivan'ko. Russian Transl. Springfield, VA: NTIS, 69p. (1970). TT 70-50177, A04.

Schaupp, D.

Small-Angle Rayleigh Scattering of Photons at High Energies: Tabulations of Relativisitic HFS Modified Atomic Form Factors — D. Schaupp, M. Schumacher, F. Smend, P. Rullhusen, and John H. Hubbell. J Phys Chem Ref Data **12**, 467(1983).

Scheer, M. D.

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Schmidt, C.

A Compendium of Gas Phase Basicity and Proton Affinity Measurements — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, Henry M. Rosenstock, S. S. Schroyer, C. Schmidt, D. Martinsen, and G. W. A. Milne. NBSIR **79-1777**, 563p. (1979).

Schmorak, J.

Handbook of Phase Diagrams of Silicate Systems, Vol. I. Binary Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, V. V. Lapin, N. N. Kurtseva, J. Schmorak, editor(s). Russian Transl. Springfield, VA: NTIS, 730p. (1970). TT 71-50040, A26.

Schofield, Keith

Critically Evaluated Rate Constants for Gaseous Reactions of Several Electronically Excited Species — Keith Schofield. J Phys Chem Ref Data **8**, 723(1979).

Evaluated Chemical Kinetic Rate Constants for Various Gas Phase Reactions — Keith Schofield. J Phys Chem Ref Data **2**, 25(1973).

Schroyer, S. S.

A Compendium of Gas Phase Basicity and Proton Affinity Measurements — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, Henry M. Rosenstock, S. S. Schroyer, C. Schmidt, D. Martinsen, and G. W. A. Milne. NBSIR **79-1777**, 563p. (1979).

Ion Energetics Measurements, Supplement I. 1971-1973 — Henry M. Rosenstock, D. Sims, S. S. Schroyer, and W. J. Webb. NSRDS-NBS **66**, 380p. (1980).

Schulz, George J.

Resonances in Electron Impact on Atoms and Diatomic Molecules — George J. Schulz. NSRDS-NBS **50**, 120p. (1973).

Schumacher, M.

Small-Angle Rayleigh Scattering of Photons at High Energies: Tabulations of Relativisitic HFS Modified Atomic Form Factors — D. Schaupp, M. Schumacher, F. Smend, P. Rullhusen, and John H. Hubbell. J Phys Chem Ref Data **12**, 467(1983).

Schumm, Richard H.

A Computer Assisted Evaluation of the Thermochemical Data of the Compounds of Thorium — Donald D. Wagman, Richard H. Schumm, and Vivian B. Parker. NBSIR **77-1300**, 94p. (1977).

Chemical Thermodynamic Properties of Compounds of Sodium, Potassium, and Rubidium: An Interim Tabulation of Selected Material — Donald D. Wagman, William H. Evans, Vivian B. Parker, and Richard H. Schumm. NBSIR **76-1034**, 76p. (1976).

Selected Values of Chemical Thermodynamic Properties. Tables for the First Thirty-Four Elements in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 264p. (1968).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 35 through 53 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 152p. (1969).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 54 through 61 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, Richard H. Schumm, and Kenneth L. Churney. NBS Tech. Note **270**, 49p. (1971).

Selected Values of Chemical Thermodynamic Properties. Tables for the Lanthanide (Rare Earth) Elements (Elements 62 through 76 in the Standard Order of Arrangement) — Richard H. Schumm, Donald D. Wagman, Sylvia M. Bailey, William H. Evans, and Vivian B. Parker. NBS Tech. Note **270**, 84p. (1973).

Selected Values of Chemical Thermodynamic Properties: Compounds of Uranium, Protactinium, Thorium, Actinium, and the Alkali Metals — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, and Ralph L. Nuttall. NBS Tech. Note **270**, 149p. (1981).

The NBS Tables of Chemical Thermodynamic Properties. Selected Values for Inorganic and C_1 and C_2 Organic Substances in SI Units — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, Iva Halow, Sylvia M. Bailey, Kenneth L. Churney, and Ralph L. Nuttall. J Phys Chem Ref Data **11**, Suppl. 2(1982).

Thermodynamic Properties of Solid Aluminosilicates at Elevated Temperatures — Richard H. Schumm. NBSIR **81-2343**, 57p. (1981).

Schwalbe, L. A.

A Review of Deuterium Triple-Point Temperatures — L. A. Schwalbe and E. R. Grilly. J Phys Chem Ref Data **13**, 687(1984).

Schwendeman, Richard H.

Molecular Structures of Gas-Phase Polyatomic Molecules Determined by Spectroscopic Methods — Marlin D. Harmony, Victor W. Laurie, Robert L. Kuczkowski, Richard H. Schwendeman, D. A. Ramsay, Frank J. Lovas, Walter J. Lafferty, and Arthur G. Maki. J Phys Chem Ref Data **8**, 619(1979).

Tables for the Rigid Asymmetric Rotor: Transformation Coefficients from Symmetric to Asymmetric Bases and Expectation Values of $P^{2<-}{}_z$, $P^{4<-}{}_z$, and $P^{6<-}{}_z$ — Richard H. Schwendeman. NSRDS-NBS **12**, 102p. (1968).

Sehgal, H. K.

Bibliography on Properties of Defect Centers in Alkali Halides — Suresh C. Jain, S. A. Khan, H. K. Sehgal, V. K. Garg, and R. K. Jain. OSRD Bibl. **71-1**, 293p. (1971).

Sellers, Robin M.

Compilation of Rate Constants for the Reactions of Metal Ions in Unusual Valency States — George V. Buxton and Robin M. Sellers. NSRDS-NBS **62**, 68p. (1978).

Seltzer, S. M.

Stopping Powers and Ranges of Electrons and Positrons — M. J. Berger and S. M. Seltzer. NBSIR **82-2550**, 164p. (1982).

Sengers, J. M. H. Levelt

Scaled Equation of State Parameters for Gases in the Critical Region — J. M. H. Levelt Sengers, W. L. Greer, and Jan V. Sengers. J Phys Chem Ref Data **5**, 1(1976).

The Critical-Region Equation of State of Ethene and the Effect of Small Impurities — J. R. Hastings, J. M. H. Levelt Sengers, and F. W. Balfour. J Chem Thermody **12**, London: Academic Press Inc., 1009p. (1980).

Thermodynamic Properties of D_2O in the Critical Region — B. Kamgar-Parsi, J. M. H. Levelt Sengers, and Jan V. Sengers. J Phys Chem Ref Data **12**, 513(1983).

Thermodynamic Properties of Steam in the Critical Region — J. M. H. Levelt Sengers, B. Kamgar-Parsi, F. W. Balfour, and Jan V. Sengers. J Phys Chem Ref Data **12**, 1(1983).

Thermophysical Properties of Fluid H_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 175(1984).

Thermophysical Properties of Fluid D_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 602(1984).

Sengers, Jan V.

An Improved Representative Equation for the Dynamic Viscosity of Water Substance — J. T. R. Watson, R. S. Basu, and Jan V. Sengers. J Phys Chem Ref Data **9**, 1255(1980).

Problems with the Prandtl Number of Steam — Jan V. Sengers, R. S. Basu, B. Kamgar-Parsi, and Joseph Kestin. Mech Eng **104**, New York, NY, 60p. (1982).

Representative Equations for the Thermal Conductivity of Water Substance — Jan V. Sengers, J. T. R. Watson, R. S. Basu, B. Kamgar-Parsi, and R. C. Hendricks. J Phys Chem Ref Data **13**, 893(1984).

Representative Equations for the Viscosity of Water Substance — Jan V. Sengers and B. Kamgar-Parsi. J Phys Chem Ref Data **13**, 185(1984).

Scaled Equation of State Parameters for Gases in the Critical Region — J. M. H. Levelt Sengers, W. L. Greer, and Jan V. Sengers. J Phys Chem Ref Data **5**, 1(1976).

Thermodynamic Properties of D_2O in the Critical Region — B. Kamgar-Parsi, J. M. H. Levelt Sengers, and Jan V. Sengers. J Phys Chem Ref Data **12**, 513(1983).

Thermodynamic Properties of Steam in the Critical Region — J. M. H. Levelt Sengers, B. Kamgar-Parsi, F. W. Balfour, and Jan V. Sengers. J Phys Chem Ref Data **12**, 1(1983).

Thermophysical Properties of Fluid H_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 175(1984).

Thermophysical Properties of Fluid D_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 602(1984).

Shapiro, B. L.

NMR Spectral Data: A Compilation of Aromatic Proton Chemical Shifts in Mono- and Di-Substituted Benzene — B. L. Shapiro and L. E. Mohrmann. J Phys Chem Ref Data **6**, 919(1977).

Shaw, Robert

A Compilation of Kinetic Parameters for the Thermal Degradation of n-Alkane Molecules — D. L. Allara and Robert Shaw. J Phys Chem Ref Data **9**, 523(1980).

Semi-Empirical Extrapolation and Estimation of Rate Constants for Abstraction of H from Methane by H, O, HO, and O_2 — Robert Shaw. J Phys Chem Ref Data **7**, 1179(1978).

Sheindlin, A. E.

Heavy Water, Thermophysical Properties — V. A. Kirillin, Ya. Z. Kazavchinskii, P. M. Kessel'man, S. L. Rivkin, A. E. Sheindlin, E. E. Shpil'rain, V. V. Sychev, and D. L. Timrot. Russian Transl. Springfield, VA: NTIS, 273p. (1971). TT 70-50094, A12.

Sherwood, Gertrude B.

A Bibliography of the Russian Reference Data Holdings of the Library of the Office of Standard Reference Data — Gertrude B. Sherwood and Howard J. White, Jr. NBS Tech. Note **848**, 23p. (1974).

A Guide to Sources of Information on Materials — Robert S. Marvin, Gertrude B. Sherwood, C. T. Lynch, editor(s). Cleveland, OH: CRC Press, 603p. (1975). Chapter 10 in Handbook of Materials Science, Volume III. Nonmetallic Materials and Publications, C. T. Lynch, Editor.

Annotated Accession List of Data Compilations of the NBS Office of Standard Reference Data — Herman M. Weisman and Gertrude B. Sherwood. NBS Tech. Note **554**, 196p. (1970).

Property Index to NSRDS Data Compilations, 1964-1972 — David R. Lide, Jr., Gertrude B. Sherwood, Charles H. Douglass, and Herman M. Weisman. NSRDS-NBS **55**, 21p. (1975).

Standard Reference Data Publications, 1964-1980 — Gertrude B. Sherwood. NBS Spec. Publ. **612**, 125p. (1981).

Shimanouchi, Takehiko

Tables of Molecular Vibrational Frequencies, Part 1 — Takehiko Shimanouchi. NSRDS-NBS **6**, 56p. (1967).

Tables of Molecular Vibrational Frequencies, Part 2 — Takehiko Shimanouchi. NSRDS-NBS **11**, 38p. (1967).

Tables of Molecular Vibrational Frequencies, Part 3 — Takehiko Shimanouchi. NSRDS-NBS **17**, 39p. (1968).

Tables of Molecular Vibrational Frequencies, Consolidated Volume I — Takehiko Shimanouchi. NSRDS-NBS **39**, 167p. (1972).

Tables of Molecular Vibrational Frequencies, Part 5 — Takehiko Shimanouchi. J Phys Chem Ref Data **1**, 189(1972).

Tables of Molecular Vibrational Frequencies, Part 6 — Takehiko Shimanouchi. J Phys Chem Ref Data **2**, 121(1973).

Tables of Molecular Vibrational Frequencies, Part 7 — Takehiko Shimanouchi. J Phys Chem Ref Data **2**, 225(1973).

Tables of Molecular Vibrational Frequencies, Part 8 — Takehiko Shimanouchi. J Phys Chem Ref Data **3**, 269(1974).

Tables of Molecular Vibrational Frequencies. Consolidated Volume II — Takehiko Shimanouchi. J Phys Chem Ref Data **6**, 993(1977).

Tables of Molecular Vibrational Frequencies, Part 9 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **7**, 1323(1978).

Tables of Molecular Vibrational Frequencies, Part 10 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **9**, 1149(1980).

Shirley, Virginia S.

Nuclear Wallet Cards — Virginia S. Shirley, C. Michael Lederer and National Nuclear Data Center. **1979**, Upton, NY: National Nuclear Data Center, Brookhaven National Laboratory, 40p. (1979). Title, no charge.

Table of Isotopes, Seventh Edition — C. Michael Lederer, Virginia S. Shirley, Edgardo Browne, Janis M. Dairiki, and Raymond E. Doebler. New York: Wiley-Interscience, 1628p. (1978), ISBN: 0-471-0417-3.

Shiu, Wan Ying

A Critical Review of Henry's Law Constants for Chemicals of Environmental Interest — Donald Mackay and Wan Ying Shiu. J Phys Chem Ref Data **10**, 1175(1981).

Shpil'rain, E. E.

Heavy Water, Thermophysical Properties — V. A. Kirillin, Ya. Z. Kazavchinskii, P. M. Kessel'man, S. L. Rivkin, A. E. Sheindlin, E. E. Shpil'rain, V. V. Sychev, and D. L. Timrot. Russian Transl. Springfield, VA: NTIS, 273p. (1971). TT 70-50094, A12.

Shu, Hua-Cheng

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. I. Selenium — Umesh Gaur, Hua-Cheng Shu, Aspy Metha, and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 89(1981).

Shukla, R. P.

Vapor Pressures and Boiling Points of Selected Halomethanes — Arvind P. Kudchadker, Shanti A. Kudchadker, R. P. Shukla, and P. R. Patnaik. J Phys Chem Ref Data **8**, 499(1979).

Sieck, L. Wayne

Rate Coefficients for Ion-Molecule Reactions, I. Ions Containing C and H — L. Wayne Sieck and Sharon G. Lias. J Phys Chem Ref Data **5**, 1123(1976).

Rate Coefficients for Ion-Molecule Reactions, Organic Ions Other Than Those Containing Only C and H — L. Wayne Sieck. NSRDS-NBS **64**, 27p. (1980).

Siegenthaler, H. F.

Molten Salts: Volume 3, Nitrates, Nitrites, and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Ursula Krebs, H. F. Siegenthaler, and Reginald P. T. Tomkins. J Phys Chem Ref Data **1**, 581(1972).

Simmons, J. D.

Atlas of the Observed Absorption Spectrum of Carbon Monoxide between 1060 and 1900 Å — S. G. Tilford and J. D. Simmons. J Phys Chem Ref Data **1**, 147(1972).

Sims, D.

Ion Energetics Measurements, Supplement I. 1971-1973 — Henry M. Rosenstock, D. Sims, S. S. Schroyer, and W. J. Webb. NSRDS-NBS **66**, 380p. (1980).

Singer, S. K.

Molten Salts: Volume 4, Part 2, Chlorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., G. L. Gardner, Ursula Krebs, and S. K. Singer. J Phys Chem Ref Data **4**, 871(1975).

Molten Salts: Volume 4, Part 3, Bromides and Mixtures, Iodides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., and S. K. Singer. J Phys Chem Ref Data **6**, 409(1977).

Sinnott, George A.

Bibliography of Ion-Molecule Reaction Rate Data (January 1950 - October 1971) — George A. Sinnott. NBS Spec. Publ. **381**, 75p. (1973).

Skinner, Gordon B.

Ideal Gas Thermodynamic Properties of CH_3, CD_3, CD_4, C_2D_2, C_2D_4, C_2D_6, C_2H_6, $CH_3N_2CH_3$, and $CD_3N_2CD_3$ — Krishna M. Pamidimukkala, David Rogers, and Gordon B. Skinner. J Phys Chem Ref Data **11**, 83(1982).

Slattery, Paul F.

NN and ND Interactions - A Compilation — James E. Enstrom, Thomas Ferbel, Paul F. Slattery, Barry L. Werner, Zaven G. T. Guiragossian, Yoshio Sumi, Toshihiro Yoshida and Particle Data Group. UCRL-LBL **58**, Berkeley, CA: Lawrence Berkeley Laboratory, U. of California, 281p. (1972). LBL 58.

Smend, F.

Small-Angle Rayleigh Scattering of Photons at High Energies: Tabulations of Relativisitic HFS Modified Atomic Form Factors — D. Schaupp, M. Schumacher, F. Smend, P. Rullhusen, and John H. Hubbell. J Phys Chem Ref Data **12**, 467(1983).

Smith, Buford D.

Critical Evaluation of Vapor-Liquid Equilibrium, Heat of Mixing, and Volume Change of Mixing Data. General Procedures — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 941(1982).

Definition of Recommended Values of Certain Thermodynamic Properties for the Ketones — Buford D. Smith and Ol Muthu. NBSIR **84-2811**, 162p. (1983).

Evaluation of Binary Excess Enthalpy Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1127(1982).

Evaluation of Binary Excess Enthalpy Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 389(1983).

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1151(1982).

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 395(1983).

Evaluation of Binary *PT*xy Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1099(1982).

Evaluation of Binary *PT*xy Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 381(1983).

Smith, Francis J.

Recommended Data on the Electron Impact Ionization of Light Atoms and Ions — K. L. Bell, H. B. Gilbody, J. G. Hughes, A. E. Kingston, and Francis J. Smith. J Phys Chem Ref Data **12**, 891(1983).

Tables of Collision Integrals and Second Virial Coefficients for the (m,6,8) Intermolecular Potential Function — Max Klein, Howard J. M. Hanley, Francis J. Smith, and Paul M. Holland. NSRDS-NBS **47**, 161p. (1974).

Smith, Melvin W.

Atomic Transition Probabilities for Forbidden Lines of the Iron Group Elements (A Critical Data Compilation for Selected Lines) — Melvin W. Smith and Wolfgang L. Wiese. J Phys Chem Ref Data **2**, 85(1973).

Atomic Transition Probabilities, Volume II. Sodium through Calcium — Wolfgang L. Wiese, Melvin W. Smith, and Barbara M. Miles. NSRDS-NBS **22**, 268p. (1969).

Atomic Transition Probabilities. Elements Hydrogen through Neon — Wolfgang L. Wiese, Melvin W. Smith, and Barbara M. Glennon. NSRDS-NBS **4**, 153p. (1966).

Smith, Steven J.

Electron Impact Excitation of Atoms — Benjamin L. Moiseiwitsch and Steven J. Smith. NSRDS-NBS **25**, 120p. (1968).

Smith-Magowan, David

A Bibliography of Sources of Experimental Data Leading to Thermal Properties of Binary Aqueous Electrolyte Solutions — David Smith-Magowan and Robert N. Goldberg. NBS Spec. Publ. **537**, 94p. (1979).

Sokolov, Mordechai

Viscosity of Liquid Water in the Range -8°C to 150°C — Joseph Kestin, Mordechai Sokolov, and William A. Wakeham. J Phys Chem Ref Data **7**, 941(1978).

Specht, Beverly J.

Bibliography on Atomic Line Shapes and Shifts (July 1973 through May 1975) — Jeffrey R. Fuhr, Georgia A. Martin, and Beverly J. Specht. NBS Spec. Publ. **366**, Suppl. 2(1975).

Stalick, Judy K.

NBS* AIDS80: A FORTRAN Program for Crystallographic Data Evaluation — Alan D. Mighell, C. R. Hubbard, and Judy K. Stalick. NBS Tech. Note **1141**, 54p. (1981).

Staples, Bert R.

A Bibliography of Sources of Experimental Data Leading to Activity or Osmotic Coefficients for Polyvalent Electrolytes in Aqueous Solution — Robert N. Goldberg, Bert R. Staples, Ralph L. Nuttall, and R. Arbuckle. NBS Spec. Publ. **485**, 57p. (1977).

A Compilation of Thermodynamic and Transport Properties of Aqueous Sulfuric Acid — Bert R. Staples and Theresa F. Wobbeking. NBSIR **81-2276**, 26p. (1981).

A Compilation of Thermodynamic and Transport Properties of Aqueous Potassium Hydroxide — R. E. Joseph and Bert R. Staples. NBSIR **81-2356**, 17p. (1982).

A Report on Thermodynamic Data for Desulfurization Processes — Vivian B. Parker, Bert R. Staples, Thomas L. Jobe, Jr., and David B. Neumann. NBSIR **81-2345**, 89p. (1981).

Activity and Osmotic Coefficients of Aqueous Alkali Metal Nitrites — Bert R. Staples. J Phys Chem Ref Data **10**, 765(1981).

Activity and Osmotic Coefficients of Aqueous Sulfuric Acid at 298.15 K — Bert R. Staples. J Phys Chem Ref Data **10**, 779(1981).

Computer Programs for the Evaluation of Activity and Osmotic Coefficients — Bert R. Staples and Ralph L. Nuttall. NBS Tech. Note **928**, 60p. (1976).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Iron Chloride and the Bi-Univalent Compounds of Nickel and Cobalt — Robert N. Goldberg, Ralph L. Nuttall, and Bert R. Staples. J Phys Chem Ref Data **8**, 923(1979).

The Activity and Osmotic Coefficients of Aqueous Calcium Chloride at 298.15 K — Bert R. Staples and Ralph L. Nuttall. J Phys Chem Ref Data **6**, 385(1977).

Stedman, D. H.

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Stein, A.

An Analysis of Coexistence Curve Data for Several Binary Liquid Mixtures Near Their Critical Points — A. Stein and G. F. Allen. J Phys Chem Ref Data **2**, 439(1973).

Steiner, B. W.

Energetics of Gaseous Ions — Henry M. Rosenstock, Keith Draxl, B. W. Steiner, and John T. Herron. J Phys Chem Ref Data **6**, Suppl. 1(1977).

Steinfeld, J. I.

Rate Data for Inelastic Collision Processes in the Diatomic Halogen Molecules — J. I. Steinfeld. J Phys Chem Ref Data **13**, 445(1984).

Stepanov, G. V.

Isochoric Heat Capacity of Water and Steam — M. P. Vukalovich, Kh. I. Amirkhanov, G. V. Stepanov, and B. G. Alibekov. Russian Transl. Springfield, VA: NTIS, 215p. (1974). TT 72-52002, A10.

Stern, Kurt H.

High Temperature Properties and Decomposition of Inorganic Salts, Part 1. Sulfates — Kurt H. Stern and E. L. Weise. NSRDS-NBS 7, 38p. (1966).

High Temperature Properties and Decomposition of Inorganic Salts, Part 2. Carbonates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **30**, 27p. (1969).

High Temperature Properties and Decomposition of Inorganic Salts, Part 3. Nitrates and Nitrites — Kurt H. Stern. J Phys Chem Ref Data **1**, 747(1972).

High Temperature Properties and Decomposition of Inorganic Salts, Part 4. Oxy-Salts of the Halogens — Kurt H. Stern. J Phys Chem Ref Data **3**, 481(1974).

Stern, Marvin J.

Heavy-Atom Kinetic Isotope Effects, An Indexed Bibliography — Marvin J. Stern and Max Wolfsberg. NBS Spec. Publ. **349**, 43p. (1972).

Stevens, John G.

Mossbauer Effect Data Index Covering the 1969 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 281p. (1970), ISBN: 0-306-6514-8.

Mossbauer Effect Data Index Covering the 1970 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 369p. (1972), ISBN: 0-306-6514-6.

Mossbauer Effect Data Index Covering the 1971 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 430p. (1972), ISBN: 0-306-6514-4.

Mossbauer Effect Data Index Covering the 1972 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 488p. (1973), ISBN: 0-306-6514-2.

Mossbauer Effect Data Index Covering the 1966-1968 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 522p. (1975), ISBN: 0-306-6516-9.

Mossbauer Effect Data Index Covering the 1973 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 495p. (1975), ISBN: 0-306-6514-0.

Mossbauer Effect Data Index Covering the 1974 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 397p. (1975), ISBN: 0-306-6514-9.

Mossbauer Effect Data Index Covering the 1975 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 445p. (1977), ISBN: 0-306-6514-7.

Mossbauer Effect Data Index Covering the 1976 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 355p. (1978), ISBN: 0-306-6514-1.

Mossbauer Effect Reference and Data Journal — John G. Stevens, Virginia E. Stevens, Richard M. White, Janet L. Gibson, editor(s). Moss Eff Ref Data J 6, Ashville, NC: Mossbauer Effect Data Center, U. of N. C., (1983).

Nuclear Moments and Moment Ratios as Determined by Mössbauer Spectroscopy — John G. Stevens and B. D. Dunlap. J Phys Chem Ref Data **5**, 1093(1976).

Stevens, Virginia E.

Mossbauer Effect Data Index Covering the 1969 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 281p. (1970), ISBN: 0-306-6514-8.

Mossbauer Effect Data Index Covering the 1970 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 369p. (1972), ISBN: 0-306-6514-6.

Mossbauer Effect Data Index Covering the 1971 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 430p. (1972), ISBN: 0-306-6514-4.

Mossbauer Effect Data Index Covering the 1972 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 488p. (1973), ISBN: 0-306-6514-2.

Mossbauer Effect Data Index Covering the 1966-1968 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 522p. (1975), ISBN: 0-306-6516-9.

Mossbauer Effect Data Index Covering the 1973 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 495p. (1975), ISBN: 0-306-6514-0.

Mossbauer Effect Data Index Covering the 1974 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 397p. (1975), ISBN: 0-306-6514-9.

Mossbauer Effect Data Index Covering the 1975 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 445p. (1977), ISBN: 0-306-6514-7.

Mossbauer Effect Data Index Covering the 1976 Literature — John G. Stevens and Virginia E. Stevens. New York: IFI/Plenum, 355p. (1978), ISBN: 0-306-6514-1.

Mossbauer Effect Reference and Data Journal — John G. Stevens, Virginia E. Stevens, Richard M. White, Janet L. Gibson, editor(s). Moss Eff Ref Data J 6, Ashville, NC: Mossbauer Effect Data Center, U. of N. C., (1983).

Stewart, Richard B.

Thermodynamic Properties of Nitrogen Including Liquid and Vapor Phases from 63 K to 2000 K with Pressures to 10,000 Bar — Richard T. Jacobsen and Richard B. Stewart. J Phys Chem Ref Data **2**, 757(1973).

Strehlow, W. H.

Compilation of Energy Band Gaps in Elemental and Binary Compound Semiconductors and Insulators — W. H. Strehlow and E. L. Cook. J Phys Chem Ref Data **2**, 163(1973).

Striganov, A. R.

The Spectrum and Energy Levels of the Neutral Atom of Boron (B I) — G. A. Odintzova and A. R. Striganov. J Phys Chem Ref Data **8**, 63(1979).

Stull, Daniel R.

JANAF Thermochemical Tables, Second Edition — Daniel R. Stull and H. Prophet. NSRDS-NBS **37**, 1141p. (1971).

Sugar, Jack

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

Energy Levels of Chromium, Cr I through Cr XXIV — Jack Sugar and Charles H. Corliss. J Phys Chem Ref Data 6, 317(1977).

Energy Levels of Cobalt, Co I through Co XXVII — Jack Sugar and Charles H. Corliss. J Phys Chem Ref Data **10**, 1097(1981).

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

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

Energy Levels of Manganese, Mn I through Mn XXV — Charles H. Corliss and Jack Sugar. J Phys Chem Ref Data 6, 1253(1977).

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

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

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

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

Energy Levels of Vanadium, V I through V XXIII — Jack Sugar and Charles H. Corliss. J Phys Chem Ref Data 7, 1191(1978).

Ground Levels and Ionization Potentials for Lanthanide and Actinide Atoms and Ions — William C. Martin, Lucy Hagan, Joseph Reader, and Jack Sugar. J Phys Chem Ref Data **3**, 771(1974).

Sumi, Yoshio

NN and ND Interactions - A Compilation — James E. Enstrom, Thomas Ferbel, Paul F. Slattery, Barry L. Werner, Zaven G. T. Guiragossian, Yoshio Sumi, Toshihiro Yoshida and Particle Data Group. UCRL-LBL **58**, Berkeley, CA: Lawrence Berkeley Laboratory, U. of California, 281p. (1972). LBL 58.

Swenson, C. A.

Recommemded Values for the Thermal Expansivity of Silicon from 0 to 1000 K — C. A. Swenson. J Phys Chem Ref Data **12**, 179(1983).

Sychev, V. V.

Heavy Water, Thermophysical Properties — V. A. Kirillin, Ya. Z. Kazavchinskii, P. M. Kessel'man, S. L. Rivkin, A. E. Sheindlin, E. E. Shpil'rain, V. V. Sychev, and D. L. Timrot. Russian Transl. Springfield, VA: NTIS, 273p. (1971). TT 70-50094, A12.

Syverud, A. N.

JANAF Thermochemical Tables, 1974 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, A. T. Hu, H. Prophet, A. N. Syverud, and L. C. Walker. J Phys Chem Ref Data **3**, 311(1974).

JANAF Thermochemical Tables, 1975 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, H. Prophet, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data 4, 1(1975).

JANAF Thermochemical Tables, 1978 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data 7, 793(1978).

JANAF Thermochemical Tables, 1982 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, J. R. Downey, Jr., R. A. McDonald, A. N. Syverud, and E. A. Valenzuela. J Phys Chem Ref Data **11**, 695(1982).

Taylor, Barry N.

Numerical Comparisons of Several Algorithms for Treating Inconsistent Data in a Least-Squares Adjustment of the Fundamental Constants — Barry N. Taylor. NBSIR **81-2426**, 87p. (1982).

The 1973 Least-Squares Adjustment of the Fundamental Constants — E. Richard Cohen and Barry N. Taylor. J Phys Chem Ref Data **2**, 663(1973).

Thomas, Edward W.

Excitation in Heavy Particle Collisions — Edward W. Thomas. At Mol Collis Proc Ser, New York: Wiley-Interscience, 436p. (1972), ISBN: 0-471-8589-0.

Thompson, Robert C.

Automation of the Ion Energetics Data Center — Robert C. Thompson, W. J. Webb, and Henry M. Rosenstock. NBSIR **78-1432**, 84p. (1978).

SETAB: An Edit-Insert Program for Automatic Typesetting of Spectroscopic and Other Computerized Tables — Robert C. Thompson and Joseph Hilsenrath. NBS Tech. Note **740**, 32p. (1973).

Tiemann, Eberhard

Microwave Spectra of Molecules of Astrophysical Interest, VIII. Sulfur Monoxide — Eberhard Tiemann. J Phys Chem Ref Data **3**, 259(1974).

Microwave Spectra of Molecules of Astrophysical Interest, XI. Silicon Sulfide — Eberhard Tiemann. J Phys Chem Ref Data **5**, 1147(1976).

Microwave Spectral Tables, I. Diatomic Molecules — Frank J. Lovas and Eberhard Tiemann. J Phys Chem Ref Data **3**, 609(1974).

Tilford, S. G.

Atlas of the Observed Absorption Spectrum of Carbon Monoxide between 1060 and 1900 Å — S. G. Tilford and J. D. Simmons. J Phys Chem Ref Data **1**, 147(1972).

Timrot, D. L.

Heavy Water, Thermophysical Properties — V. A. Kirillin, Ya. Z. Kazavchinskii, P. M. Kessel'man, S. L. Rivkin, A. E. Sheindlin, E. E. Shpil'rain, V. V. Sychev, and D. L. Timrot. Russian Transl. Springfield, VA: NTIS, 273p. (1971). TT 70-50094, A12.

Tishin, A. P.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume I. Computation Methods — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, and V. A. Khudyakov. Russian Transl. Springfield, VA: NTIS, 453p. (1974). TT 74-50019, A20.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume II. Oxygen-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 505p. (1975). TT 74-50032, A22.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume III. Oxygen- and Air-Based Propellant — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 648p. (1975). TT 75-50007, A26.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume IV. Nitrogen Tetroxide-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 540p. (1976). TT 76-50007, A23.

Tominaga, Toshihiro

The Solubility of Nitrogen and Air in Liquids — Rubin Battino, Timothy R. Rettich, and Toshihiro Tominaga. J Phys Chem Ref Data **13**, 563(1984).

The Solubility of Oxygen and Ozone in Liquids — Rubin Battino, Timothy R. Rettich, and Toshihiro Tominaga. J Phys Chem Ref Data **12**, 163(1983).

Tomkins, Reginald P. T.

Molten Salts: Volume 1. Electrical Conductance, Density, and Viscosity Data — George J. Janz, F. W. Dampier, G. R. Lakshminarayanan, P. K. Lorenz, and Reginald P. T. Tomkins. NSRDS-NBS **15**, 140p. (1968).

Molten Salts: Volume 2. Section 1. Electrochemistry of Molten Salts. Gibbs Free Energies and Excess Free Energies from Equilibrium-Type Cells, Section 2. Surface Tension Data — George J. Janz, Chr. G. M. Dijkhuis, G. R. Lakshminarayanan, Reginald P. T. Tomkins, and J. Wong. NSRDS-NBS **28**, 116p. (1968).

Molten Salts: Volume 5, Part 1. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz and Reginald P. T. Tomkins. J Phys Chem Ref Data **9**, 831(1980).

Molten Salts: Volume 5, Part 2. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Vicosity and Surface Tension Data — George J. Janz and Reginald P. T. Tomkins. J Phys Chem Ref Data **12**, 591(1983).

Molten Salts: Volume 3, Nitrates, Nitrites, and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Ursula Krebs, H. F. Siegenthaler, and Reginald P. T. Tomkins. J Phys Chem Ref Data **1**, 581(1972).

Molten Salts: Volume 4, Part 1, Fluorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, G. L. Gardner, Ursula Krebs, and Reginald P. T. Tomkins. J Phys Chem Ref Data **3**, 1(1974).

Molten Salts: Volume 4, Part 2, Chlorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., G. L. Gardner, Ursula Krebs, and S. K. Singer. J Phys Chem Ref Data **4**, 871(1975).

Molten Salts: Volume 4, Part 3, Bromides and Mixtures, Iodides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., and S. K. Singer. J Phys Chem Ref Data **6**, 409(1977).

Molten Salts: Volume 4, Part 4, Mixed Halide Melts. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, and Carolyn B. Allen. J Phys Chem Ref Data **8**, 125(1979).

Physical Properties Data Compilations Relevant to Energy Storage. I. Molten Salts: Eutectic Data — George J. Janz, Carolyn B. Allen, J. R. Downey, Jr., and Reginald P. T. Tomkins. NSRDS-NBS **61**, 244p. (1978).

Physical Properties Data Compilations Relevant to Energy Storage. II. Molten Salts: Data on Single and Multi-Component Systems — George J. Janz, Carolyn B. Allen, Narottam P. Bansal, R. M. Murphy, and Reginald P. T. Tomkins. NSRDS-NBS **61**, 420p. (1979).

Physical Properties Data Compilations Relevant to Energy Storage. IV. Molten Salts: Data on Additional Single and Multi-Component Salt Systems — George J. Janz and Reginald P. T. Tomkins. NSRDS-NBS **61**, 870p. (1981).

Toropov, N. A.

Handbook of Phase Diagrams of Silicate Systems, Vol. I. Binary Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, V. V. Lapin, N. N. Kurtseva, J. Schmorak, editor(s). Russian Transl. Springfield, VA: NTIS, 730p. (1970). TT 71-50040, A26.

Handbook of Phase Diagrams of Silicate Systems, Vol. II. Metal-Oxygen Compounds in Silicate Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, I. A. Bondar', and Yu. P. Udalov. Russian Transl. Springfield, VA: NTIS, 329p. (1972). TT 71-50041, A15.

Trippe, Thomas G.

π+p, π+n, and π+d Interactions - A Compilation: Parts I and II — Denyse M. Chew, Victor P. Henri, Thomas A. Lasinski, Thomas G. Trippe, Fumiyo Uchiyama, Frederick C. Winkelmann and Particle Data Group. UCRL **53**, Springfield, VA: NTIS, 213p. (1973). LBL 53; Part II is on microfiche located in the back cover pocket, A10.

Troe, J.

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **9**, 295(1980).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement I. CODATA Task Group on Chemical Kinetics — D. L. Baulch, R. A. Cox, P. J. Crutzen, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **11**, 327(1982).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement II. CODATA Task Group on Gas Phase Chemical Kinetics — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **13**, 1259(1984).

Trotman-Dickenson, Aubrey

Tables of Bimolecular Gas Reactions — Aubrey F. Trotman-Dickenson and G. S. Milne. NSRDS-NBS **9**, 129p. (1967).

Tsang, W.

Summary Report on the Workshop on High Temperature Chemical Kinetics: Applications to Combustion Research — David Garvin, R. L. Brown, Robert F. Hampson, Jr., M. J. Kurylo, and W. Tsang. NBS Spec. Publ. **531**, 94p. (1978).

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Tsederberg, N. V.

Thermodynamic and Thermophysical Properties of Helium — A. F. Alyab'ev, N. V. Tsederberg, V. N. Popov, and N. A. Morozova. Russian Transl. Springfield, VA: NTIS, 260p. (1971). TT 70-50096, A12.

Uchiyama, Fumiyo

π+p, π+n, and π+d Interactions - A Compilation: Parts I and II — Denyse M. Chew, Victor P. Henri, Thomas A. Lasinski, Thomas G. Trippe, Fumiyo Uchiyama, Frederick C. Winkelmann and Particle Data Group. UCRL **53**, Springfield, VA: NTIS, 213p. (1973). LBL 53; Part II is on microfiche located in the back cover pocket, A10.

πN Two-Body Scattering Data, I. A User's Guide to the Lovelace-Almehed Data Tape — Claude Lovelace, Sverkei Almehed, Fumiyo Uchiyama, Robert Kelly, Victor P. Henri and Particle Data Group. UCRL **63**, Springfield, VA: NTIS, 146p. (1973). LBL 63, A07.

Udalov, Yu. P.

Handbook of Phase Diagrams of Silicate Systems, Vol. II. Metal-Oxygen Compounds in Silicate Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, L. A. Bondar and Yu. P. Udalov. Russian Transl. Springfield, VA: NTIS, 325p. (1972). TT 71-5004-1, A15.

Uematsu, M.

Static Dielectric Constant of Water and Steam — M. Uematsu and E. U. Franck. J Phys Chem Ref Data **9**, 1291(1980).

Valenzuela, E. A.

JANAF Thermochemical Tables, 1982 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, J. R. Downey, Jr., R. A. McDonald, A. N. Syverud, and E. A. Valenzuela. J Phys Chem Ref Data **11**, 695(1982).

Van Blerkom, Janet

Data Index for Energy Transfer Collisions of Atoms and Molecules - 1970-1979 — Jean W. Gallagher, Janet Van Blerkom, Earl C. Beaty, and John R. Rumble, Jr. NBS Spec. Publ. **593**, 349p. (1981).

Vander Molen, H. J.

Photonuclear Reaction Data, 1973 — Everett G. Fuller, Henry M. Gerstenberg, H. J. Vander Molen, and T. C. Dunn. NBS Spec. Publ. **380**, 134p. (1973).

The NIRA Computer Program Package (Photonuclear Data Center) — H. J. Vander Molen and Henry M. Gerstenberg. NBS Tech. Note **903**, 34p. (1976).

Vargaftik, N. B.

International Tables of the Surface Tension of Water — N. B. Vargaftik, B. N. Volkov, and L. D. Voljak. J Phys Chem Ref Data **12**, 817(1983).

Vasserman, A. A.

Thermophysical Properties of Air and Air Components — A. A. Vasserman, Ya. Z. Kazavchinskii, V. A. Rabinovich, and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 402p. (1971). TT 70-50095, A18.

Thermophysical Properties of Liquid Air and Its Components — A. A. Vasserman and V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 255p. (1970). TT 69-55092, A12.

Veigele, W. J.

Atomic Form Factors, Incoherent Scattering Functions, and Photon Scattering Cross Sections — John H. Hubbell, W. J. Veigele, E. A Briggs, R. T. Brown, D. T. Cromer, and R. J. Howerton. J Phys Chem Ref Data **4**, 471(1975).

Comparison of Theoretical and Experimental Photoeffect Data, 0.1 keV to 1.5 MeV — John H. Hubbell and W. J. Veigele. NBS Tech. Note **901**, 47p. (1976).

Voljak, L. D.

International Tables of the Surface Tension of Water — N. B. Vargaftik, B. N. Volkov, and L. D. Voljak. J Phys Chem Ref Data **12**, 817(1983).

Volkov, B. N.

International Tables of the Surface Tension of Water — N. B. Vargaftik, B. N. Volkov, and L. D. Voljak. J Phys Chem Ref Data **12**, 817(1983).

Vukalovich, M. P.

Isochoric Heat Capacity of Water and Steam — M. P. Vukalovich, Kh. I. Amirkhanov, G. V. Stepanov, and B. G. Alibekov. Russian Transl. Springfield, VA: NTIS, 215p. (1974). TT 72-52002, A10.

Wacker, Paul F.

Microwave Spectral Tables, Volume I. Diatomic Molecules — Paul F. Wacker, M. Mizushima, J. D. Petersen, and J. R. Ballard. NBS Monograph **70**, 171p. (1964).

Microwave Spectral Tables, Volume II. Line Strengths of Asymmetric Rotors — Paul F. Wacker and M. R. Pratto. NBS Monograph **70**, 349p. (1964).

Microwave Spectral Tables, Volume III. Polyatomic Molecules with Internal Rotation — Paul F. Wacker, M. S. Cord, D. G. Burkhard, J. D. Petersen, and R. F. Kukol. NBS Monograph **70**, 275p. (1969).

Wagman, Donald D.

A Combined Least Sums and Least Squares Approach to the Evaluation of Thermodynamic Data Networks — David Garvin, Vivian B. Parker, Donald D. Wagman, and William H. Evans. NBSIR **76-1147**, 41p. (1976).

A Computer Assisted Evaluation of the Thermochemical Data of the Compounds of Thorium — Donald D. Wagman, Richard H. Schumm, and Vivian B. Parker. NBSIR **77-1300**, 94p. (1977).

Chemical Thermodynamic Data Banks — David Garvin, Vivian B. Parker, and Donald D. Wagman. NBSIR **81-2341**, 30p. (1981).

Chemical Thermodynamic Properties of Compounds of Sodium, Potassium, and Rubidium: An Interim Tabulation of Selected Material — Donald D. Wagman, William H. Evans, Vivian B. Parker, and Richard H. Schumm. NBSIR **76-1034**, 76p. (1976).

Selected Thermochemical Data Compatible with CODATA Recommendations — Vivian B. Parker, Donald D. Wagman, and David Garvin. NBSIR **75-968**, 35p. (1976).

Selected Values of Chemical Thermodynamic Properties. Tables for the First Thirty-Four Elements in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 264p. (1968).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 35 through 53 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 152p. (1969).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 54 through 61 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, Richard H. Schumm, and Kenneth L. Churney. NBS Tech. Note **270**, 49p. (1971).

Selected Values of Chemical Thermodynamic Properties. Tables for the Alkaline Earth Elements (Elements 92 through 97 in the Standard Order of Arrangement) — Vivian B. Parker, Donald D. Wagman, and William H. Evans. NBS Tech. Note **270**, 124p. (1971).

Selected Values of Chemical Thermodynamic Properties. Tables for the Lanthanide (Rare Earth) Elements (Elements 62 through 76 in the Standard Order of Arrangement) — Richard H. Schumm, Donald D. Wagman, Sylvia M. Bailey, William H. Evans, and Vivian B. Parker. NBS Tech. Note **270**, 84p. (1973).

Selected Values of Chemical Thermodynamic Properties: Compounds of Uranium, Protactinium, Thorium, Actinium, and the Alkali Metals — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, and Ralph L. Nuttall. NBS Tech. Note **270**, 149p. (1981).

Selected Values of the Thermodynamic Properties of the Elements — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, Kenneth K. Kelley, and Donald D. Wagman. Metals Park, OH: American Society for Metals, 636p. (1973).

The NBS Tables of Chemical Thermodynamic Properties. Selected Values for Inorganic and C_1 and C_2 Organic Substances in SI Units — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, Iva Halow, Sylvia M. Bailey, Kenneth L. Churney, and Ralph L. Nuttall. J Phys Chem Ref Data **11**, Suppl. 2(1982).

Wakeham, William A.

Viscosity of Liquid Water in the Range -8°C to 150°C — Joseph Kestin, Mordechai Sokolov, and William A. Wakeham. J Phys Chem Ref Data **7**, 941(1978).

Waldman, M.

Equilibrium and Transport Properties of the Noble Gases and Their Mixtures at Low Density — Joseph Kestin, K. Knierim, E. A. Mason, B. Najafi, S. T. Ro, and M. Waldman. J Phys Chem Ref Data **13**, 229(1984).

Walker, L. C.

JANAF Thermochemical Tables, 1974 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, A. T. Hu, H. Prophet, A. N. Syverud, and L. C. Walker. J Phys Chem Ref Data **3**, 311(1974).

Wallenstein, M.

National Standard Reference Data System Plan of Operation — Edward L. Brady and M. Wallenstein. NSRDS-NBS **1**, 12p. (1965).

Walsh, P. J.

OMNITAB, A Computer Program for Statistical and Numerical Analysis — Joseph Hilsenrath, Guy G. Ziegler, Carla G. Messina, P. J. Walsh, and R. H. Herbold. NBS Handbook **101**, 256p. (1968).

Wardman, Peter

The Radiolysis of Methanol: Product Yields, Rate Constants, and Spectroscopic Parameters of Intermediates — J. H. Baxendale and Peter Wardman. NSRDS-NBS **54**, 33p. (1975).

Warrier, A. V. R.

Electronic Absorption and Internal and External Vibrational Data of Atomic and Molecular Ions Doped in Alkali Halide Crystals — Suresh C. Jain, A. V. R. Warrier, and Suresh K. Agarwal. NSRDS-NBS **5**, 55p. (1974).

Watson, David G.

Crystal Data Determinative Tables, Third Edition, Volume 5. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, John R. Rodgers, editor(s). **5**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Crystal Data Determinative Tables, Third Edition, Volume 6. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, editor(s). **6**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Crystal Data Determinative Tables, Third Edition Volume 3. Organic Compounds — Joseph D. H. Donnay, Olga Kennard, David G. Watson, and John R. Rodgers., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 748p. (1978).

Watson, Edgar, Jr.

Selected Specific Rates of Reactions of the Solvated Electron in Alcohols — Edgar Watson, Jr. and Sathyabhama Roy. NSRDS-NBS **42**, 27p. (1972).

Watson, J. T. R.

An Improved Representative Equation for the Dynamic Viscosity of Water Substance — J. T. R. Watson, R. S. Basu, and Jan V. Sengers. J Phys Chem Ref Data **9**, 1255(1980).

Representative Equations for the Thermal Conductivity of Water Substance — Jan V. Sengers, J. T. R. Watson, R. S. Basu, B. Kamgar-Parsi, and R. C. Hendricks. J Phys Chem Ref Data **13**, 893(1984).

Watson, R. T.

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **9**, 295(1980).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement I. CODATA Task Group on Chemical Kinetics — D. L. Baulch, R. A. Cox, P. J. Crutzen, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **11**, 327(1982).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement II. CODATA Task Group on Gas Phase Chemical Kinetics — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A.Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **13**, 1259(1984).

Rate Constants for Reactions of ClO_x of Atmospheric Interest — R. T. Watson. J Phys Chem Ref Data **6**, 871(1977).

Wawrousek, H. W.

Critical Surveys of Data Sources: Electrical and Magnetic Properties of Metals — M. J. Carr, R. B. Gavert, Robert L. Moore, H. W. Wawrousek, and John H. Westbrook. NBS Spec. Publ. **396**, 96p. (1976).

Webb, W. J.

Automation of the Ion Energetics Data Center — Robert C. Thompson, W. J. Webb, and Henry M. Rosenstock. NBSIR **78-1432**, 84p. (1978).

Ion Energetics Measurements, Supplement I. 1971-1973 — Henry M. Rosenstock, D. Sims, S. S. Schroyer, and W. J. Webb. NSRDS-NBS **66**, 380p. (1980).

Weber, Lloyd A.

Thermodynamic and Related Properties of Parahydrogen from the Triple Point to 100 K at Pressures to 340 Atmospheres — Hans M. Roder, Lloyd A. Weber, and Robert D. Goodwin. NBS Monograph **94**, 116p. (1965).

Thermodynamic and Related Properties of Oxygen from the Triple Point to 300 K at Pressures to 1000 Bar — Lloyd A. Weber. NBSIR **77-865**, 162p. (1977).

Weise, E. L.

High Temperature Properties and Decomposition of Inorganic Salts, Part 1. Sulfates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **7**, 38p. (1966).

High Temperature Properties and Decomposition of Inorganic Salts, Part 2. Carbonates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **30**, 27p. (1969).

Weisman, Herman M.

Annotated Accession List of Data Compilations of the NBS Office of Standard Reference Data — Herman M. Weisman and Gertrude B. Sherwood. NBS Tech. Note **554**, 196p. (1970).

Property Index to NSRDS Data Compilations, 1964-1972 — David R. Lide, Jr., Gertrude B. Sherwood, Charles H. Douglass, and Herman M. Weisman. NSRDS-NBS **55**, 21p. (1975).

Werner, Barry L.

NN and ND Interactions - A Compilation — James E. Enstrom, Thomas Ferbel, Paul F. Slattery, Barry L. Werner, Zaven G. T. Guiragossian, Yoshio Sumi, Toshihiro Yoshida and Particle Data Group. UCRL-LBL **58**, Berkeley, CA: Lawrence Berkeley Laboratory, U. of California, 281p. (1972). LBL 58.

Westberg, K. R.

Chemical Kinetic Data Sheets for High-Temperature Chemical Reactions — N. Cohen and K. R. Westberg. J Phys Chem Ref Data **12**, 531(1983).

Westbrook, John H.

Critical Surveys of Data Sources: Mechanical Properties of Metals — R. B. Gavert, Robert L. Moore, and John H. Westbrook. NBS Spec. Publ. **396**, 90p. (1974).

Critical Surveys of Data Sources: Electrical and Magnetic Properties of Metals — M. J. Carr, R. B. Gavert, Robert L. Moore, H. W. Wawrousek, and John H. Westbrook. NBS Spec. Publ. **396**, 96p. (1976).

Westley, Francis

A Bibliography of Kinetic Data on Gas Phase Reactions of Nitrogen, Oxygen, and Nitrous Oxides — Francis Westley. OSRD Bibl. **71-2**, 140p. (1971).

A Supplementary Bibliography of Kinetic Data on Gas Phase Reactions of Nitrogen, Oxygen, and Nitrogen Oxides — Francis Westley. NBS Spec. Publ. **371**, 93p. (1973).

Chemical Kinetics in the C-O-S and H-N-O-S Systems: A Bibliography - 1899 through June 1971 — Francis Westley. NBS Spec. Publ. **362**, 75p. (1972).

Chemical Kinetics of the Gas Phase Combustion of Fuels (A Bibliography on the Rates and Mechanisms of Oxidation of Aliphatic C_1 to C_{10} Hydrocarbons and of Their Oxygenated Derivatives) — Francis Westley. NBS Spec. Publ. **449**, 142p. (1976).

Nitrogen Oxychlorides: A Bibliography on Data for Physical and Chemical Properties of ClNO, $ClNO_2$, and $ClNO_3$ — Francis Westley. NBS Spec. Publ. **478**, 54p. (1977).

Supplementary Bibliography of Kinetic Data on Gas Phase Reactions of Nitrogen, Oxygen, and Nitrogen Oxides (1972 - 1973) — Francis Westley. NBS Spec. Publ. **371**, Suppl. 1(1975).

Table of Recommended Rate Constants for Chemical Reactions Occurring in Combustion — Francis Westley. NBSIR **79-1941**, 169p. (1979).

Table of Recommended Rate Constants for Chemical Reactions Occurring in Combustion — Francis Westley. NSRDS-NBS **67**, 110p. (1980).

Tables of Experimental Rate Constants for Chemical Reactions Occurring in Combustion (1971-1977) — Francis Westley. NBSIR **81-2254**, 302p. (1981).

Tables of Rate Constants for Gas Phase Chemical Reactions of Sulfur Compounds (1971-1980) — Francis Westley. NSRDS-NBS **72**, 42p. (1982).

Vibrationally Excited Hydrogen Halides: A Bibliography on Chemical Kinetics of Chemiexcitation and Energy Transfer Processes (1958 through 1973) — Francis Westley. NBS Spec. Publ. **392**, 84p. (1974).

White, G. K.

Heat Capacity of Reference Materials: Cu and W — G. K. White and S. J. Collocott. J Phys Chem Ref Data **13**, 1251(1984).

White, Howard J., Jr.

A Bibliography of the Russian Reference Data Holdings of the Library of the Office of Standard Reference Data — Gertrude B. Sherwood and Howard J. White, Jr. NBS Tech. Note **848**, 23p. (1974).

Industrial Process Data for Fluids: A Survey of Current Research at the National Bureau of Standards — Howard J. White, Jr. NBSIR **76-1002**, 54p. (1976).

White, Richard M.

Mossbauer Effect Reference and Data Journal — John G. Stevens, Virginia E. Stevens, Richard M. White, Janet L. Gibson, editor(s). Moss Eff Ref Data J **6**, Ashville, NC: Mossbauer Effect Data Center, U. of N. C., (1983).

Wiese, Wolfgang L.

Atomic Transition Probabilities for Forbidden Lines of the Iron Group Elements (A Critical Data Compilation for Selected Lines) — Melvin W. Smith and Wolfgang L. Wiese. J Phys Chem Ref Data **2**, 85(1973).

Atomic Transition Probabilities for Scandium and Titanium (A Critical Data Compilation of Allowed Lines) — Wolfgang L. Wiese and Jeffrey R. Fuhr. J Phys Chem Ref Data **4**, 263(1975).

Atomic Transition Probabilities for Vanadium, Chromium, and Manganese (A Critical Data Compilation of Allowed Lines) — S. M. Younger, Jeffrey R. Fuhr, Georgia A. Martin, and Wolfgang L. Wiese. J Phys Chem Ref Data **7**, 495(1978).

Atomic Transition Probabilities for Iron, Cobalt, Nickel: A Critical Data Compilation of Allowed Lines — Jeffrey R. Fuhr, Georgia A. Martin, Wolfgang L. Wiese, and S. M. Younger. J Phys Chem Ref Data **10**, 305(1981).

Atomic Transition Probabilities, Volume II. Sodium through Calcium — Wolfgang L. Wiese, Melvin W. Smith, and Barbara M. Miles. NSRDS-NBS **22**, 268p. (1969).

Atomic Transition Probabilities. Elements Hydrogen through Neon — Wolfgang L. Wiese, Melvin W. Smith, and Barbara M. Glennon. NSRDS-NBS **4**, 153p. (1966).

Bibliography on Atomic Line Shapes and Shifts (1899 through March 1972) — Jeffrey R. Fuhr, Wolfgang L. Wiese, and Larry J. Roszman. NBS Spec. Publication **366**, 165p. (1972).

Bibliography on Atomic Line Shapes and Shifts (April 1972 through June 1973) — Jeffrey R. Fuhr, Larry J. Roszman, and Wolfgang L. Wiese. NBS Spec. Publ. **366**, Suppl. 1(1974).

Critically Evaluated Transition Probabilities for Ba I and II — Barbara M. Miles and Wolfgang L. Wiese. NBS Tech. Note **474**, 22p. (1969).

Experimental Stark Widths and Shifts for Non-Hydrogenic Spectral Lines of Ionized Atoms (A Critical Review and Tabulation of Selected Data) — N. Konjević and Wolfgang L. Wiese. J Phys Chem Ref Data **5**, 259(1976).

Experimental Stark Widths and Shifts for Spectral Lines of Neutral Atoms (A Critical Review of Selected Data for the Period 1976 to 1982) — N. Konjević, M. S. Dimitrijević, and Wolfgang L. Wiese. J Phys Chem Ref Data **13**, 619(1984).

Experimental Stark Widths and Shifts for Spectral Lines of Positive Ions (A Critical Review and Tabulation of Selected Data for the Period 1976 to 1982) — N. Konjević, M. S. Dimitrijević, and Wolfgang L. Wiese. J Phys Chem Ref Data **13**, 649(1984).

Tables of Critically Evaluated Oscillator Strengths for the Lithium Isoelectronic Sequence — Georgia A. Martin and Wolfgang L. Wiese. J Phys Chem Ref Data **5**, 537(1976).

Tables of Line Spectra of the Elements, Part 1. Wavelengths and Intensities, Part 2. Transition Probabilities — Joseph Reader, Charles H. Corliss, Wolfgang L. Wiese, and Georgia A. Martin. NSRDS-NBS **68**, 415p. (1980).

Wilhoit, Randolph C.

Ideal Gas Thermodynamic Properties of Ethane and Propane — Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, 427(1973).

Ideal Gas Thermodynamic Properties of Eight Chloro- and Fluoromethanes — A. S. Rodgers, Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **3**, 117(1974).

Ideal Gas Thermodynamic Properties of Six Chloroethanes — Jing Chao, A. S. Rodgers, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **3**, 141(1974).

Ideal Gas Thermodynamic Properties of Six Fluoroethanes — S. S. Chen, A. S. Rodgers, Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 441(1975).

Ideal Gas Thermodynamic Properties and Isomerization of n-Butane and Isobutane — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 859(1975).

Ideal Gas Thermodynamic Properties of Six Chlorofluoromethanes — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **5**, 571(1976).

Ideal Gas Thermodynamic Properties of Phenol and Cresols — Shanti A. Kudchadker, Arvind P. Kudchadker, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **7**, 417(1978).

Physical and Thermodynamic Properties of Aliphatic Alcohols — Randolph C. Wilhoit and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, Suppl. 1(1973).

Thermodynamic Properties of Normal and Deuterated Methanols — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **6**, 105(1977).

Thermodynamic Properties of Normal and Deuterated Naphthalenes — S. S. Chen, Shanti A. Kudchadker, and Randolph C. Wilhoit. J Phys Chem Ref Data **8**, 527(1979).

Wilkinson, Francis

Rate Constants for the Decay and Reactions of the Lowest Electronically Excited Singlet State of Molecular Oxygen in Solution — Francis Wilkinson and James G. Brummer. J Phys Chem Ref Data **10**, 809(1981).

Willemot, Edmond

Microwave Spectra of Molecules of Astrophysical Interest. XVIII. Formic Acid — Edmond Willemot, Didier Dangoisse, Nicole Monnanteuil, and Jean Bellet. J Phys Chem Ref Data **9**, 59(1980).

Williams, M. L

Soft X-Ray Emission Spectra of Metallic Solids: Critical Review of Selected Systems — Archie J. McAlister, Ronald C. Dobbyn, John R. Cuthill, and M. L. Williams. J Phys Chem Ref Data **2**, 411(1973).

Soft X-Ray Emission Spectra of Metallic Solids: Critical Review of Selected Systems and Annotated Spectral Index — Archie J. McAlister, Ronald C. Dobbyn, John R. Cuthill, and M. L. Williams. NBS Spec. Publ. **369**, 180p. (1974).

Wilson, William E., Jr.

A Critical Review of the Gas-Phase Reaction Kinetics of the Hydroxyl Radical — William E. Wilson, Jr. J Phys Chem Ref Data **1**, 535(1972).

Winkelmann, Frederick C.

π+p, π+n, and π+d Interactions - A Compilation: Parts I and II — Denyse M. Chew, Victor P. Henri, Thomas A. Lasinski, Thomas G. Trippe, Fumiyo Uchiyama, Frederick C. Winkelmann and Particle Data Group. UCRL **53**, Springfield, VA: NTIS, 213p. (1973). LBL 53; Part II is on microfiche located in the back cover pocket, A10.

Winnewisser, G.

Microwave Spectra of Molecules of Astrophysical Interest, X. Isocyanic Acid — G. Winnewisser, W. H. Hocking, and M. C. L. Gerry. J Phys Chem Ref Data **5**, 79(1976).

Microwave Spectra of Molecules of Astrophysical Interest, XIV. Vinyl Cyanide (Acrylonitrile) — M. C. L. Gerry, K. Yamada, and G. Winnewisser. J Phys Chem Ref Data **8**, 107(1979).

Wobbeking, Theresa F.

A Compilation of Thermodynamic and Transport Properties of Aqueous Sulfuric Acid — Bert R. Staples and Theresa F. Wobbeking. NBSIR **81-2276**, 26p. (1981).

Wolcott, Norman M.

A Contribution to Computer Typesetting Techniques: Tables of Coordinates for Hershey's Repertory of Occidental Type Fonts and Graphic Symbols — Norman M. Wolcott and Joseph Hilsenrath. NBS Spec. Publ. **424**, 177p. (1976).

Computer Science & Technology: FORTRAN IV Enhanced Character Graphics — Norman M. Wolcott. OSRD Mag. Tape, Washington, DC: NBS Office of Standard Reference Data,(1978). For specific instructions, call (301) 921-2468.

Tables of Coordinates for Hershey's Repertory of Type Fonts and Graphic Symbols — Norman M. Wolcott and Joseph Hilsenrath. OSRD Mag. Tape **A12**, Washington, DC: Office of Standard Reference Data,(1977). Hershey tape.

Wolfsberg, Max

Heavy-Atom Kinetic Isotope Effects, An Indexed Bibliography — Marvin J. Stern and Max Wolfsberg. NBS Spec. Publ. **349**, 43p. (1972).

Wong, J.

Molten Salts: Volume 2. Section 1. Electrochemistry of Molten Salts. Gibbs Free Energies and Excess Free Energies from Equilibrium-Type Cells, Section 2. Surface Tension Data — George J. Janz, Chr. G. M. Dijkhuis, G. R. Lakshminarayanan, Reginald P. T. Tomkins, and J. Wong. NSRDS-NBS **28**, 116p. (1968).

Wu, K. Y.

Electrical Resistivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, T. N. Havill, R. H. Bogaard, R. A. Matula, S. G. Oh, and H. M. James. J Phys Chem Ref Data **12**, 183(1983).

Thermal Conductivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, S. G. Oh, and T. N. Havill. J Phys Chem Ref Data **7**, 959(1978).

Wu, Yung-Chi

Osmotic Coefficients and Mean Activity Coefficients of Uni-Univalent Electrolytes in Water at 25 °C — Walter J. Hamer and Yung-Chi Wu. J Phys Chem Ref Data **1**, 1047(1972).

Revised Values of the Osmotic Coefficients and Mean Activity Coefficients of Sodium Nitrate in Water at 25°C (Comments) — Yung-Chi Wu and Walter J. Hamer. J Phys Chem Ref Data **9**, 513(1980).

Wunderlich, Bernhard

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. I. Selenium — Umesh Gaur, Hua-Cheng Shu, Aspy Metha, and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 89(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. II. Polyethylene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 119(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. III. Polyoxides — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 1001(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IV. Polypropylene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 1051(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. V. Polystyrene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **11**, 313(1982).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VI. Acrylic Polymers — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **11**, 1065(1982).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VII. Other Carbon Backbone Polymers — Umesh Gaur, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 29(1983).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VIII. Polyesters and Polyamides — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 65(1983).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IX. Final Group of Aromatic and Inorganic Polymers — Umesh Gaur, Suk-fai Lau, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 91(1983).

Wunderlich, Brent B.

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VI. Acrylic Polymers — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **11**, 1065(1982).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VII. Other Carbon Backbone Polymers — Umesh Gaur, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 29(1983).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VIII. Polyesters and Polyamides — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 65(1983).

Yalkowsky, Samuel H.

Water Solubilities of Polynuclear Aromatic and Heteroaromatic Compounds — Robert S. Pearlman, Samuel H. Yalkowsky, and Sujit Banerjee. J Phys Chem Ref Data **13**, 555(1984).

Yamada, K.

Microwave Spectra of Molecules of Astrophysical Interest, XIV. Vinyl Cyanide (Acrylonitrile) — M. C. L. Gerry, K. Yamada, and G. Winnewisser. J Phys Chem Ref Data **8**, 107(1979).

Yoshida, Toshihiro

NN and ND Interactions - A Compilation — James E. Enstrom, Thomas Ferbel, Paul F. Slattery, Barry L. Werner, Zaven G. T. Guiragossian, Yoshio Sumi, Toshihiro Yoshida and Particle Data Group. UCRL-LBL **58**, Berkeley, CA: Lawrence Berkeley Laboratory, U. of California, 281p. (1972). LBL 58.

Yoshino, K.

Atlas of the Schumann-Runge Absorption Bands of O_2 in the Wavelength Region 175-205 nm — K. Yoshino, D. E. Freeman, and W. H. Parkinson. J Phys Chem Ref Data **13**, 207(1984).

Young, K. F.

Compilation of the Static Dielectric Constant of Inorganic Solids — K. F. Young and Hans P. R. Frederikse. J Phys Chem Ref Data **2**, 313(1973).

Younger, S. M.

Atomic Transition Probabilities for Vanadium, Chromium, and Manganese (A Critical Data Compilation of Allowed Lines) — S. M. Younger, Jeffrey R. Fuhr, Georgia A. Martin, and Wolfgang L. Wiese. J Phys Chem Ref Data **7**, 495(1978).

Atomic Transition Probabilities for Iron, Cobalt, Nickel: A Critical Data Compilation of Allowed Lines — Jeffrey R. Fuhr, Georgia A. Martin, Wolfgang L. Wiese, and S. M. Younger. J Phys Chem Ref Data **10**, 305(1981).

Younglove, Ben A.

Interactive FORTRAN Program to Calculate Thermophysical Properties of Seven Fluids — Ben A. Younglove. NBS Tech. Note **1048**, 56p. (1982).

Thermophysical Properties of Fluids. I. Argon, Ethylene, Parahydrogen, Nitrogen, Nitrogen Trifluoride, and Oxygen — Ben A. Younglove. J Phys Chem Ref Data **11**, Suppl. 1(1982).

Zagoruchenko, V. A.

Thermophysical Properties of Gaseous and Liquid Methane — V. A. Zagoruchenko and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 251p. (1970). TT 70-50097, A12.

Zalubas, Romuald

Atomic Energy Levels - The Rare-Earth Elements, the Spectra of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu — William C. Martin, Romuald Zalubas, and Lucy Hagan. NSRDS-NBS **60**, 422p. (1978).

Bibliography on Atomic Energy Levels and Spectra, July 1975 through June 1979 — Romuald Zalubas and Arlene Albright. NBS Spec. Publ. **363**, Suppl. 2(1980).

Energy Levels of Magnesium, Mg I through Mg XII — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **9**, 1(1980).

Energy Levels of Silicon, Si I through Si XIV — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **12**, 323(1983).

Energy Levels of Sodium, Na I through Na XI — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **10**, 153(1981).

Energy levels of Aluminum, Al I through Al XIII — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **8**, 817(1979).

Actinide elements

Ground Levels and Ionization Potentials for Lanthanide and Actinide Atoms and Ions — William C. Martin, Lucy Hagan, Joseph Reader, and Jack Sugar. J Phys Chem Ref Data **3**, 771(1974).

Recommended Atomic Electron Binding Energies, 1s to $6p_{3/2}$, for the Heavy Elements, Z = 84 to 103 — F. T. Porter and M. S. Freedman. J Phys Chem Ref Data 7, 1267(1978).

Selected Values of Chemical Thermodynamic Properties: Compounds of Uranium, Protactinium, Thorium, Actinium, and the Alkali Metals — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, and Ralph L. Nuttall. NBS Tech. Note **270**, 149p. (1981).

The Thermochemical Properties of Uranium-Halogen Containing Compounds — Vivian B. Parker. NBSIR **80-2029**, 173p. (1980).

Alcohols

Physical and Thermodynamic Properties of Aliphatic Alcohols — Randolph C. Wilhoit and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, Suppl. 1(1973).

Radiation Chemistry of Ethanol: A Review of Data on Yields, Reaction Rate Parameters, and Spectral Properties of Transients — Gordon R. Freeman. NSRDS-NBS **48**, 44p. (1974).

Selected Specific Rates of Reactions of the Solvated Electron in Alcohols — Edgar Watson, Jr. and Sathyabhama Roy. NSRDS-NBS **42**, 27p. (1972).

The Radiolysis of Methanol: Product Yields, Rate Constants, and Spectroscopic Parameters of Intermediates — J. H. Baxendale and Peter Wardman. NSRDS-NBS **54**, 33p. (1975).

Thermodynamic Properties of Normal and Deuterated Methanols — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **6**, 105(1977).

Alkali halides

Bibliography on Properties of Defect Centers in Alkali Halides — Suresh C. Jain, S. A. Khan, H. K. Sehgal, V. K. Garg, and R. K. Jain. OSRD Bibl. **71-1**, 293p. (1971).

Electronic Absorption and Internal and External Vibrational Data of Atomic and Molecular Ions Doped in Alkali Halide Crystals — Suresh C. Jain, A. V. R. Warrier, and Suresh K. Agarwal. NSRDS-NBS **52**, 55p. (1974).

Physical Properties Data for Rock Salt — Lewis H. Gevantman. NBS Monograph **167**, 288p. (1981).

Refractive Index of Alkali Halides and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **5**, 329(1976).

Tables of the Dynamic and Kinematic Viscosity of Aqueous KCl Solutions in the Temperature Range 25-150°C and the Pressure Range 0.1-35 MPa — Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia. J Phys Chem Ref Data **10**, 57(1981).

Tables of the Dynamic and Kinematic Viscosity of Aqueous NaCl Solutions in the Temperature Range 20-150°C and the Pressure Range 0.1-35 MPa — Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia. J Phys Chem Ref Data **10**, 71(1981).

Thermodynamic Properties of Aqueous Sodium Chloride Solutions — Kenneth S. Pitzer, J. Christopher Peiper, and R. H. Busey. J Phys Chem Ref Data **13**, 1(1984).

Volumetric Properties of Aqueous Sodium Chloride Solutions — P. S. Z. Rogers and Kenneth S. Pitzer. J Phys Chem Ref Data **11**, 15(1982).

Alkali metals

Activity and Osmotic Coefficients of Aqueous Alkali Metal Nitrites — Bert R. Staples. J Phys Chem Ref Data **10**, 765(1981).

Chemical Thermodynamic Properties of Compounds of Sodium, Potassium, and Rubidium: An Interim Tabulation of Selected Material — Donald D. Wagman, William H. Evans, Vivian B. Parker, and Richard H. Schumm. NBSIR **76-1034**, 76p. (1976).

Electrical Resistivity of Alkali Elements — T. C. Chi. J Phys Chem Ref Data **8**, 339(1979).

Electron Impact Excitation of Atoms — Benjamin L. Moiseiwitsch and Steven J. Smith. NSRDS-NBS **25**, 120p. (1968).

Energy Levels of Sodium, Na I through Na XI — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **10**, 153(1981).

Selected Values of Chemical Thermodynamic Properties: Compounds of Uranium, Protactinium, Thorium, Actinium, and the Alkali Metals — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, and Ralph L. Nuttall. NBS Tech. Note **270**, 149p. (1981).

Alkaline earth halides

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: The Alkaline Earth Metal Halides — Robert N. Goldberg and Ralph L. Nuttall. J Phys Chem Ref Data **7**, 263(1978).

Refractive Index of Alkaline Earth Halides and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **9**, 161(1980).

Alkaline earth metals

Electrical Resistivity of Alkaline Earth Elements — T. C. Chi. J Phys Chem Ref Data **8**, 439(1979).

Selected Values of Chemical Thermodynamic Properties. Tables for the Alkaline Earth Elements (Elements 92 through 97 in the Standard Order of Arrangement) — Vivian B. Parker, Donald D. Wagman, and William H. Evans. NBS Tech. Note **270**, 124p. (1971).

Aqueous solutions

A Bibliography of Sources of Experimental Data Leading to Activity or Osmotic Coefficients for Polyvalent Electrolytes in Aqueous Solution — Robert N. Goldberg, Bert R. Staples, Ralph L. Nuttall, and R. Arbuckle. NBS Spec. Publ. **485**, 57p. (1977).

A Bibliography of Sources of Experimental Data Leading to Thermal Properties of Binary Aqueous Electrolyte Solutions — David Smith-Magowan and Robert N. Goldberg. NBS Spec. Publ. **537**, 94p. (1979).

A Report on Thermodynamic Data for Desulfurization Processes — Vivian B. Parker, Bert R. Staples, Thomas L. Jobe, Jr., and David B. Neumann. NBSIR **81-2345**, 89p. (1981).

Activity and Osmotic Coefficients of Aqueous Alkali Metal Nitrites — Bert R. Staples. J Phys Chem Ref Data **10**, 765(1981).

Activity and Osmotic Coefficients of Aqueous Sulfuric Acid at 298.15 K — Bert R. Staples. J Phys Chem Ref Data **10**, 779(1981).

An Annotated Bibliography of Compiled Thermodynamic Data Sources for Biochemical and Aqueous Systems (1930 to 1975), Equilibrium, Enthalpy, Heat Capacity, and Entropy Data — George T. Armstrong and Robert N. Goldberg. NBS Spec. Publ. **454**, 71p. (1976).

Compilation of Rate Constants for the Reactions of Metal Ions in Unusual Valency States — George V. Buxton and Robin M. Sellers. NSRDS-NBS **62**, 68p. (1978).

Computer Programs for the Evaluation of Activity and Osmotic Coefficients — Bert R. Staples and Ralph L. Nuttall. NBS Tech. Note **28**, 60p. (1976).

Electrolytic Conductance and the Conductances of the Halogen Acids in Water — Walter J. Hamer and H. J. DeWane. NSRDS-NBS **3**, 37p. (1970).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: The Alkaline Earth Metal Halides — Robert N. Goldberg and Ralph L. Nuttall. J Phys Chem Ref Data **7**, 263(1978).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Iron Chloride and the Bi-Univalent Compounds of Nickel and Cobalt — Robert N. Goldberg, Ralph L. Nuttall, and Bert R. Staples. J Phys Chem Ref Data **8**, 923(1979).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Bi-Univalent Compounds of Lead, Copper, Manganese, and Uranium — Robert N. Goldberg. J Phys Chem Ref Data **8**, 1005(1979).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Bi-Univalent Compounds of Zinc, Cadmium, and Ethylene Bis(-Trimethylammonium) Chloride and Iodide — Robert N. Goldberg. J Phys Chem Ref Data **10**, 1(1981).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Thirty-Six Uni-Bivalent Electrolytes — Robert N. Goldberg. J Phys Chem Ref Data **10**, 671(1981).

High Temperature Properties and Decomposition of Inorganic Salts, Part 3. Nitrates and Nitrites — Kurt H. Stern. J Phys Chem Ref Data **1**, 747(1972).

Optical Spectra of Nonmetallic Inorganic Transient Species in Aqueous Solution — Gordon L. Hug. NSRDS-NBS **69**, 167p. (1981).

Rate Constants for Reactions of Aliphatic Carbon-Centered Radicals in Aqueous Solution — Alberta B. Ross and Pedatsur Neta. NSRDS-NBS **70**, 96p. (1982).

Rate Constants for Reactions of Inorganic Radicals in Aqueous Solution — Alberta B. Ross and Pedatsur Neta. NSRDS-NBS **65**, 62p. (1979).

Tables of the Dynamic and Kinematic Viscosity of Aqueous KCl Solutions in the Temperature Range 25-150°C and the Pressure Range 0.1-35 MPa — Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia. J Phys Chem Ref Data **10**, 57(1981).

Tables of the Dynamic and Kinematic Viscosity of Aqueous NaCl Solutions in the Temperature Range 20-150°C and the Pressure Range 0.1-35 MPa — Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia. J Phys Chem Ref Data **10**, 71(1981).

The Activity and Osmotic Coefficients of Aqueous Calcium Chloride at 298.15 K — Bert R. Staples and Ralph L. Nuttall. J Phys Chem Ref Data **6**, 385(1977).

The Thermodynamic Properties of Aqueous Inorganic Copper Systems — Paul Duby. INCRA Monograph **IV**, New York: International Copper Research Association, Inc., 132p. (1977).

Theoretical Mean Activity Coefficients of Strong Electrolytes in Aqueous Solutions from 0 to 100 °C — Walter J. Hamer. NSRDS-NBS **24**, 271p. (1968).

Thermal Properties of Aqueous Uni-Univalent Electrolytes — Vivian B. Parker. NSRDS-NBS **2**, 68p. (1965).

Thermodynamic Properties of Aqueous Sodium Chloride Solutions — Kenneth S. Pitzer, J. Christopher Peiper, and R. H. Busey. J Phys Chem Ref Data **13**, 1(1984).

Volumetric Properties of Aqueous Sodium Chloride Solutions — P. S. Z. Rogers and Kenneth S. Pitzer. J Phys Chem Ref Data **11**, 15(1982)

Atmospheric gases

A Bibliography of Kinetic Data on Gas Phase Reactions of Nitrogen, Oxygen, and Nitrous Oxides — Francis Westley. OSRD Bibl. **71-2**, 140p. (1971).

A Review of Rate Constants of Selected Reactions of Interest in Re-Entry Flow Fields in the Atmosphere — M. H. Bortner. NBS Tech. Note **484**, 62p. (1969).

A Supplementary Bibliography of Kinetic Data on Gas Phase Reactions of Nitrogen, Oxygen, and Nitrogen Oxides — Francis Westley. NBS Spec. Publ. **371**, 93p. (1973).

A Survey of Electron Swarm Data — J. Dutton. J Phys Chem Ref Data **4**, 577(1975).

An Annotated Compilation and Appraisal of Electron Swarm Data in Electronegative Gases — Jean W. Gallagher, Earl C. Beaty, J. Dutton, and L. C. Pitchford. J Phys Chem Ref Data **12**, 109(1983).

Atlas of the Observed Absorption Spectrum of Carbon Monoxide between 1060 and 1900 Å — S. G. Tilford and J. D. Simmons. J Phys Chem Ref Data **1**, 147(1972).

Atlas of the Schumann-Runge Absorption Bands of O_2 in the Wavelength Region 175-205 nm — K. Yoshino, D. E. Freeman, and W. H. Parkinson. J Phys Chem Ref Data **13**, 207(1984).

Chemical Kinetic and Photochemical Data Sheets for Atmospheric Reactions — Robert F. Hampson, Jr. Fed Aviation Admin EE **80-17**, Springfield, VA: NTIS, 490p. (1980). FAA-EE-80-17, A21.

Critical Review of Ultraviolet Photoabsorption Cross Sections for Molecules of Astrophysical and Aeronomic Interest — Robert D. Hudson. NSRDS-NBS **38**, 114p. (1971).

Equilibrium Properties of Fluid Mixtures, A Bibliography on Fluids of Cryogenic Interest — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller. New York: IFI/Plenum, 166p. (1975), ISBN: 0-306-6601-6.

Equilibrium Properties of Fluid Mixtures, 2. A Bibliography of Experimental Data on Selected Fluids — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller. New York: IFI/Plenum, 258p. (1982), ISBN: 0-306-6602-4.

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **9**, 295(1980).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement I. CODATA Task Group on Chemical Kinetics — D. L. Baulch, R. A. Cox, P. J. Crutzen, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **11**, 327(1982).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement II. CODATA Task Group on Gas Phase Chemical Kinetics — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **13**, 1259(1984).

Evaluation of Kinetic and Mechanistic Data for Modeling of Photochemical Smog — Roger Atkinson and Alan C. Lloyd. J Phys Chem Ref Data **13**, 315(1984).

Gaseous Diffusion Coefficients — T. R. Marrero and E. A. Mason. J Phys Chem Ref Data **1**, 1(1972).

Interactive FORTRAN Program to Calculate Thermophysical Properties of Seven Fluids — Ben A. Younglove. NBS Tech. Note **1048**, 56p. (1982).

Interactive Fortran Program to Calculate Thermophysical Properties of 6 Fluids NBS Standard Reference Database 6, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

Kinetic and Photochemical Data for Atmospheric Chemistry, Reactions of the Nitrogen Oxides — Robert F. Hampson, Jr. NBSIR **80-2032**, 89p. (1980).

Liquid Densities of Oxygen, Nitrogen, Argon, and Parahydrogen — Hans M. Roder, Robert D. McCarty, and V. J. Johnson. NBS Tech. Note **361**, 1972(1973).

Rate Constants for Reactions of ClO_x of Atmospheric Interest — R. T. Watson. J Phys Chem Ref Data **6**, 871(1977).

Reaction Rate and Photochemical Data for Atmospheric Chemistry - 1977 — Robert F. Hampson, Jr. and David Garvin. NBS Spec. Publ. **513**, 111p. (1978).

Scaled Equation of State Parameters for Gases in the Critical Region — J. M. H. Levelt Sengers, W. L. Greer, and Jan V. Sengers. J Phys Chem Ref Data **5**, 1(1976).

Supplementary Bibliography of Kinetic Data on Gas Phase Reactions of Nitrogen, Oxygen, and Nitrogen Oxides (1972 - 1973) —

Supplementary Bibliography of Kinetic Data on Gas Phase Reactions of Nitrogen, Oxygen, and Nitrogen Oxides (1972 - 1973) — Francis Westley. NBS Spec. Publ. **371**, Suppl. 1(1975).

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

The Molar Volume (Density) of Solid Oxygen in Equilibrium with Vapor — Hans M. Roder. J Phys Chem Ref Data 7, 949(1978).

The Solubility of Nitrogen and Air in Liquids — Rubin Battino, Timothy R. Rettich, and Toshihiro Tominaga. J Phys Chem Ref Data **13**, 563(1984).

The Solubility of Oxygen and Ozone in Liquids — Rubin Battino, Timothy R. Rettich, and Toshihiro Tominaga. J Phys Chem Ref Data **12**, 163(1983).

The Spectrum of Molecular Nitrogen — Alf Lofthus and Paul H. Krupenie. J Phys Chem Ref Data **6**, 113(1977).

The Spectrum of Molecular Oxygen — Paul H. Krupenie. J Phys Chem Ref Data **1**, 423(1972).

The Viscosity and Thermal Conductivity Coefficients of Dilute Nitrogen and Oxygen — Howard J. M. Hanley and James F. Ely. J Phys Chem Ref Data **2**, 735(1973).

The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Argon, Krypton, Xenon, Nitrogen, and Oxygen — Howard J. M. Hanley, Robert D. McCarty, and W. M. Haynes. J Phys Chem Ref Data **3**, 979(1974).

Thermodynamic Properties of Argon from the Triple Point to 300 K at Pressures to 1000 Atmospheres — A. L. Gosman, Robert D. McCarty, and Jerome G. Hust. NSRDS-NBS **27**, 153p. (1969).

Thermodynamic Properties of Nitrogen Including Liquid and Vapor Phases from 63 K to 2000 K with Pressures to 10,000 Bar — Richard T. Jacobsen and Richard B. Stewart. J Phys Chem Ref Data **2**, 757(1973). Thermodynamic and Related Properties of Oxygen from the Triple Point to 300 K at Pressures to 1000 Bar — Lloyd A. Weber. NBSIR **77-865**, 162p. (1977).

Thermodynamic and Thermophysical Properties of Combustion Products, Volume III. Oxygen- and Air-Based Propellant — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 648p. (1975). TT 75-50007, A26.

Thermophysical Properties of Air and Air Components — A. A. Vasserman, Ya. Z. Kazavchinskii, V. A. Rabinovich, and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 402p. (1971). TT 70-50095, A18.

Thermophysical Properties of Fluids. I. Argon, Ethylene, Parahydrogen, Nitrogen, Nitrogen Trifluoride, and Oxygen — Ben A. Younglove. J Phys Chem Ref Data **11**, Suppl. 1(1982).

Thermophysical Properties of Liquid Air and Its Components — A. A. Vasserman and V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 255p. (1970). TT 69-55092, A12.

Ceramics

Applications of Phase Diagrams, Proceedings of a Workshop Held at the National Bureau of Standards, Gaithersburg, Maryland, January 10-12, 1977, Volumes 1 and 2 — Gesina Cynthia Carter, editor(s). NBS Spec. Publ. **496**, 1622p. (1978).

Critical Surveys of Data Sources: Ceramics — Dorothea M. Johnson and James F. Lynch. NBS Spec. Publ. **396**, 56p. (1975).

Electric Conductivity of Ferroelectrics — V. M. Gurevich. Russian Transl. Springfield, VA: NTIS, 366p. (1971). TT 70-50180, A16.

Phase Diagrams for Ceramists — Ernest M. Levin, Carl R. Robbins, Howard F. McMurdie, editor(s). American Ceramic Society; Columbus, Ohio, 601p. (1964), ISBN: 0-916094-04-9.

Phase Diagrams for Ceramists 1969 Supplement — Ernest M. Levin, Carl R. Robbins, Howard F. McMurdie, editor(s). American Ceramic Society; Columbus, Ohio, 625p. (1969), ISBN: 0-916094-05-7.

Phase Diagrams for Ceramists 1975 Supplement — Ernest M. Levin, Howard F. McMurdie, editor(s). American Ceramic Society; Columbus, Ohio, 513p. (1975).

Physical Properties Data Compilations Relevant to Energy Storage. III. Engineering Properties of Single and Polycrystalline Sodium Beta and Beta″ Alumina — G. R. Miller and D. G. Paquette. NSRDS-NBS **61**, 19p. (1979).

Colloids

Critical Micelle Concentrations of Aqueous Surfactant Systems — Pasupati Mukerjee and Karol J. Mysels. NSRDS-NBS **36**, 222p. (1971).

Crystals

Bibliography on Properties of Defect Centers in Alkali Halides — Suresh C. Jain, S. A. Khan, H. K. Sehgal, V. K. Garg, and R. K. Jain. OSRD Bibl. **71-1**, 293p. (1971).

Crystal Data Determinative Tables, Third Edition, Volume 5. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, John R. Rodgers, editor(s). **5**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Crystal Data Determinative Tables, Third Edition, Volume 6. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, editor(s). **6**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Crystal Data Space-Group Tables — Alan D. Mighell, Helen M. Ondik, and Bettijoyce Breen Molino. J Phys Chem Ref Data **6**, 675(1977).

Crystal Data Determinative Tables, Third Edition Volume 1: Organic Compounds — Joseph D. H. Donnay and Helen M. Ondik. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 855p. (1972).

Crystal Data Determinative Tables, Third Edition Volume 2: Inorganic Compounds — Joseph D. H. Donnay and Helen M. Ondik. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1748p. (1973).

Crystal Data Determinative Tables, Third Edition Volume 3. Organic Compounds — Joseph D. H. Donnay, Olga Kennard, David G. Watson, and John R. Rodgers. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 748p. (1978).

Crystal Data Determinative Tables, Third Edition Volume 4. Inorganic Compounds — Joseph D. H. Donnay, Helen M. Ondik, and Alan D. Mighell. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1308p. (1978).

Crystal Structure Transformations in Binary Halides — C. N. R. Rao and M. Natarajan. NSRDS-NBS **41**, 57p. (1972).

Crystal Structure Transformations in Inorganic Nitrites, Nitrates, and Carbonates — C. N. R. Rao, Brahm Prakash, and M. Natarajan. NSRDS-NBS **53**, 55p. (1975).

Crystal Structure Transformations in Inorganic Sulfates, Phosphates, Perchlorates, and Chromates — C. N. R. Rao and Brahm Prakash. NSRDS-NBS **56**, 37p. (1975).

Electronic Absorption and Internal and External Vibrational Data of Atomic and Molecular Ions Doped in Alkali Halide Crystals — Suresh C. Jain, A. V. R. Warrier, and Suresh K. Agarwal. NSRDS-NBS **52**, 55p. (1974).

NBS* AIDS80: A FORTRAN Program for Crystallographic Data Evaluation — Alan D. Mighell, C. R. Hubbard, and Judy K. Stalick. NBS Tech. Note **1141**, 54p. (1981).

Space Groups and Lattice Complexes — W. Fisher, Hans Burzlaff, Erwin Hellner, and Joseph D. H. Donnay. NBS Monograph **134**, 177p. (1973)

Transition Metal Oxides, Crystal Chemistry, Phase Transition, and Related Aspects — C. N. R. Rao and G. V. Subba Rao. NSRDS-NBS **49**, 140p. (197.

Diatomic molecules

Atlas of the Absorption Spectrum of Nitric Oxide (NO) between 1420 and 1250 Å — E. Miescher and F. Alberti. J Phys Chem Ref Data **5**, 309(1976).

Atlas of the Observed Absorption Spectrum of Carbon Monoxide between 1060 and 1900 Å — S. G. Tilford and J. D. Simmons. J Phys Chem Ref Data **1**, 147(1972).

Electron Impact Ionization Cross-Section Data for Atoms, Atomic Ions, and Diatomic Molecules: I. Experimental Data — Lee J. Kieffer and Gordon H. Dunn. Rev Mod Phys. **38**, New York: American Institute of Physics, 35p. (1966).

Microwave Spectral Tables, I. Diatomic Molecules — Frank J. Lovas and Eberhard Tiemann. J Phys Chem Ref Data **3**, 609(1974).

Microwave Spectral Tables, Volume I. Diatomic Molecules — Paul F. Wacker, M. Mizushima, J. D. Petersen, and J. R. Ballard. NBS Monograph **70**, 171p. (1964).

Resonances in Electron Impact on Atoms and Diatomic Molecules — George J. Schulz. NSRDS-NBS **50**, 120p. (1973).

The Band Spectrum of Carbon Monoxide — Paul H. Krupenie. NSRDS-NBS **5**, 87p. (1966).

The Calculation of Rotational Energy Levels and Rotational Line Intensities in Diatomic Molecules — Jon T. Hougen. NBS Monograph **115**, 54p. (1970).

The Spectrum of Molecular Nitrogen — Alf Lofthus and Paul H. Krupenie. J Phys Chem Ref Data **6**, 113(1977).

The Spectrum of Molecular Oxygen — Paul H. Krupenie. J Phys Chem Ref Data **1**, 423(1972).

Elements

A Multiplet Table of Astrophysical Interest, Revised Edition, Part I. Table of Multiplets, Part II. Finding List of All Lines in the Table of Multiplets — Charlotte E. Moore. NSRDS-NBS **40**, 261p. (1972).

An Ultraviolet Multiplet Table, Section 1. The Spectra of Hydrogen through Vanadium — Charlotte E. Moore. NBS Circular **488**, 78p. (1950).

An Ultraviolet Multiplet Table, Section 2. The Spectra of Chromium through Niobium — Charlotte E. Moore. NBS Circular **488**, 115p. (1952).

An Ultraviolet Multiplet Table, Section 3. The Spectra of Molybdenum to Lanthanum and Hafnium to Radium — Charlotte E. Moore. NBS Circular **488**, 94p. (1962).

An Ultraviolet Multiplet Table, Section 4. Finding List for Spectra of the Elements Hydrogen to Niobium (Z = 1 to 41) — Charlotte E. Moore. NBS Circular **488**, 65p. (1962).

An Ultraviolet Multiplet Table, Section 5. Finding List for Spectra of the Elements Molybdenum to Lanthanum (Z = 42 to 57), Hafnium to Radium (Z = 72 to 88) — Charlotte E. Moore. NBS Circular **488**, 30p. (1962).

Atomic Energy Levels - The Rare-Earth Elements, the Spectra of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu — William C. Martin, Romuald Zalubas, and Lucy Hagan. NSRDS-NBS **60**, 422p. (1978).

Atomic Energy Levels as Derived from the Anasyses of Optical Spectra, Volume I. ^{1}H to ^{23}V — Charlotte E. Moore. NSRDS-NBS **35**, 358p. (1971).

Atomic Energy Levels as Derived from the Analyses of Optical Spectra, Volume II. ^{24}Cr to ^{41}Nb — Charlotte E. Moore. NSRDS-NBS **35**, 263p. (1971).

Atomic Energy Levels as Derived from the Analysis of Optical Spectra, Volume III. ^{42}Mo to ^{57}La, ^{72}Hf to ^{89}Ac — Charlotte E. Moore. NSRDS-NBS **35**, 289p. (1971).

Atomic Form Factors, Incoherent Scattering Functions, and Photon Scattering Cross Sections — John H. Hubbell, W. J. Veigele, E. A Briggs, R. T. Brown, D. T. Cromer, and R. J. Howerton. J Phys Chem Ref Data **4**, 471(1975).

Atomic Gas Laser Transition Data, A Critical Evaluation — William Ralph Bennett, Jr., New York: IFI/Plenum, 293p. (1979), ISBN: 0-306-65187-4.

Atomic Radiative and Radiationless Yields for K and L Shells — Morris O. Krause. J Phys Chem Ref Data **8**, 307(1979).

Atomic Transition Probabilities, Volume II. Sodium through Calcium — Wolfgang L. Wiese, Melvin W. Smith, and Barbara M. Miles. NSRDS-NBS **22**, 268p. (1969).

Atomic Transition Probabilities. Elements Hydrogen through Neon — Wolfgang L. Wiese, Melvin W. Smith, and Barbara M. Glennon. NSRDS-NBS 4, 153p. (1966).

Behavior of the Elements at High Pressures — John Francis Cannon. J Phys Chem Ref Data **3**, 781(1974).

Bibliography on Atomic Energy Levels and Spectra, July 1968 through June 1971 — Lucy Hagan and William C. Martin. NBS Spec. Publ. **363**, 109p. (1972).

Bibliography on Atomic Energy Levels and Spectra, July 1971 through June 1975 — Lucy Hagan. NBS Spec. Publ. **363**, Suppl. 1(1977).

Bibliography on Atomic Energy Levels and Spectra, July 1975 through June 1979 — Romuald Zalubas and Arlene Albright. NBS Spec. Publ. **363**, Suppl. 2(1980).

Bibliography on Atomic Line Shapes and Shifts (1899 through March 1972) — Jeffrey R. Fuhr, Wolfgang L. Wiese, and Larry J. Roszman. NBS Spec. Publication **366**, 165p. (1972).

Bibliography on Atomic Line Shapes and Shifts (April 1972 through June 1973) — Jeffrey R. Fuhr, Larry J. Roszman, and Wolfgang L. Wiese. NBS Spec. Publ. **366**, Suppl. 1(1974).

Bibliography on Atomic Line Shapes and Shifts (July 1973 through May 1975) — Jeffrey R. Fuhr, Georgia A. Martin, and Beverly J. Specht. NBS Spec. Publ. **366**, Suppl. 2(1975).

Bibliography on Atomic Line Shapes and Shifts (June 1975 through June 1978) — Jeffrey R. Fuhr, Beverly J. Miller, and Georgia A. Martin. NBS Spec. Publ. **366**, Suppl. 3(1978).

Bibliography on Flame Spectroscopy. Analytical Applications, 1800-1966 — Radu Mavrodineanu. NBS Spec. Publ. **281**, 155p. (1967).

Bibliography on the Analyses of Optical Atomic Spectra. Section 1. ^{1}H-^{23}V — Charlotte E. Moore. NBS Spec. Publ. **306**, 80p. (1968).

Bibliography on the Analyses of Optical Atomic Spectra. Section 2. ^{24}Cr-^{41}Nb — Charlotte E. Moore. NBS Spec. Publ. **306**, 57p. (1969).

Bibliography on the Analyses of Optical Atomic Spectra. Section 3. ^{42}Mo-^{57}La and ^{72}Hf-^{89}Ac — Charlotte E. Moore. NBS Spec. Publ. **306**, 37p. (1969).

Bibliography on the Analyses of Optical Atomic Spectra. Section 4. ^{57}La-^{71}Lu and ^{89}Ac-^{99}Es — Charlotte E. Moore. NBS Spec. Publ. **306**, 48p. (1969).

Binding Energies in Atomic Negative Ions — H. Hotop and W. C. Lineberger. J Phys Chem Ref Data **4**, 539(1975).

Comparison of Theoretical and Experimental Photoeffect Data, 0.1 keV to 1.5 MeV — John H. Hubbell and W. J. Veigele. NBS Tech. Note **901**, 47p. (1976).

Energy Levels of One-Electron Atoms — Glen W. Erickson. J Phys Chem Ref Data **6**, 831(1977).

Experimental Stark Widths and Shifts for Spectral Lines of Neutral Atoms (A Critical Review of Selected Data for the Period 1976 to 1982) — N. Konjević, M. S. Dimitrijević, and Wolfgang L. Wiese. J Phys Chem Ref Data **13**, 619(1984).

Ionization Potentials and Ionization Limits Derived from the Analyses of Optical Spectra — Charlotte E. Moore. NSRDS-NBS **34**, 22p. (1970).

Isotopic Abundances and Atomic Weights of the Elements — Paul De Bièvre, Marc Gallet, Norman E. Holden, and I. Lynus Barnes. J Phys Chem Ref Data **13**, 809(1984).

Natural Widths of Atomic K and L Levels, Kα X-Ray Lines and Several KLL Auger Lines — Morris O. Krause and J. H. Oliver. J Phys Chem Ref Data **8**, 329(1979).

Nuclear Moments and Moment Ratios as Determined by Mössbauer Spectroscopy — John G. Stevens and B. D. Dunlap. J Phys Chem Ref Data **5**, 1093(1976)..

Nuclear Spins and Moments — Gladys H. Fuller. J Phys Chem Ref Data **5**, 835(1976).

Pair, Triplet, and Total Atomic Cross Sections (and Mass Attenuation Coefficients) for 1 MeV-100 GeV Photons in Elements Z=1 to 100 — John H. Hubbell, Heinz A. Gimm, and I. Ø verbø . J Phys Chem Ref Data **9**, 1023(1980).

Partial Grotrian Diagrams of Astrophysical Interest — Charlotte E. Moore and Paul W. Merrill. NSRDS-NBS **23**, 65p. (1968).

Photon Cross Sections, Attenuation Coefficients, and Energy Absorption Coefficients from 10 keV to 100 GeV — John H. Hubbell. NSRDS-NBS **29**, 85p. (1969).

Photonuclear Data Index, 1973-1977 — Everett G. Fuller and Henry M. Gerstenberg. NBS Spec. Publ. **380**, Suppl. 1(1978).

Photonuclear Reaction Data, 1973 — Everett G. Fuller, Henry M. Gerstenberg, H. J. Vander Molen, and T. C. Dunn. NBS Spec. Publ. **380**, 134p. (1973).

Recommended Atomic Electron Binding Energies, 1s to $6p_{3/2}$, for the Heavy Elements, Z = 84 to 103 — F. T. Porter and M. S. Freedman. J Phys Chem Ref Data **7**, 1267(1978).

Reference Wavelengths from Atomic Spectra in the Range 5Å to 25000Å — Victor Kaufman and Bengt Edlén. J Phys Chem Ref Data **3**, 825(1974).

Relativistic Atomic Form Factors and Photon Coherent Scattering Cross Sections — John H. Hubbell and I. Øverbø . J Phys Chem Ref Data **8**, 69(1979).

Selected Values of the Thermodynamic Properties of the Elements — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, Kenneth K. Kelley, and Donald D. Wagman. Metals Park, OH: American Society for Metals, 636p. (1973).

Small-Angle Rayleigh Scattering of Photons at High Energies: Tabulations of Relativisitic HFS Modified Atomic Form Factors — D. Schaupp, M. Schumacher, F. Smend, P. Rullhusen, and John H. Hubbell. J Phys Chem Ref Data **12**, 467(1983).

Table of Isotopes, Seventh Edition — C. Michael Lederer, Virginia S. Shirley, Edgardo Browne, Janis M. Dairiki, and Raymond E. Doebler. New York: Wiley-Interscience, 1628p. (1978), ISBN: 0-471-0417-3.

Tables of Atomic Spectral Lines for the 10 000 Å to 40 000 Å Region — Michael Outred. J Phys Chem Ref Data **7**, 1(1978).

Tables of Line Spectra of the Elements, Part 1. Wavelengths and Intensities, Part 2. Transition Probabilities — Joseph Reader, Charles H. Corliss, Wolfgang L. Wiese, and Georgia A. Martin. NSRDS-NBS **68**, 415p. (1980).

Thermal Conductivity of the Elements — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. J Phys Chem Ref Data **1**, 279(1972).

Thermal Conductivity of the Elements: A Comprehensive Review — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. J Phys Chem Ref Data **3**, Suppl. 1(1974).

Total Photon Absorption Cross Section Measurements, Theoretical Analysis and Evaluations for Energies above 10 MeV — Heinz A. Gimm and John H. Hubbell. NBS Tech. Note **968**, 81p. (1978).

X-Ray Wavelengths and X-Ray Atomic Energy Levels — Joyce A. Bearden and A. F. Burr. NSRDS-NBS **14**, 66p. (1967).

Ferroelectrics

Electric Conductivity of Ferroelectrics — V. M. Gurevich. Russian Transl. Springfield, VA: NTIS, 366p. (1971). TT 70-50180, A16.

Free radicals

A Critical Review of H-Atom Transfer in the Liquid Phase: Chlorine Atom, Alkyl, Trichloromethyl, Alkoxy, and Alkylperoxy Radicals — D. G. Hendry, T. Mill, L. Piszkiewicz, J. A. Howard, and H. K. Eigenmann. J Phys Chem Ref Data **3**, 937(1974).

A Critical Review of the Gas-Phase Reaction Kinetics of the Hydroxyl Radical — William E. Wilson, Jr. J Phys Chem Ref Data **1**, 535(1972).

Atlas of the Absorption Spectrum of Nitric Oxide (NO) between 1420 and 1250 Å — E. Miescher and F. Alberti. J Phys Chem Ref Data **5**, 309(1976).

Chemical Kinetic Data Sheets for High-Temperature Chemical Reactions — N. Cohen and K. R. Westberg. J Phys Chem Ref Data **12**, 531(1983).

Chemical Kinetics of the Gas Phase Combustion of Fuels (A Bibliography on the Rates and Mechanisms of Oxidation of Aliphatic C_1 to C_{10} Hydrocarbons and of Their Oxygenated Derivatives) — Francis Westley. NBS Spec. Publ. **449**, 142p. (1976).

Critically Evaluated Rate Constants for Gaseous Reactions of Several Electronically Excited Species — Keith Schofield. J Phys Chem Ref Data **8**, 723(1979).

Drift Mobilities and Conduction Band Energies of Excess Electrons in Dielectric Liquids — Augustine O. Allen. NSRDS-NBS **58**, 23p. (1976).

Evaluated Chemical Kinetic Rate Constants for Various Gas Phase Reactions — Keith Schofield. J Phys Chem Ref Data **2**, 25(1973).

Evaluated Kinetic Data for High Temperature Reactions, Volume 4. Homogeneous Gas Phase Reactions of Halogen- and Cyanide-Containing Species — D. L. Baulch, J. Duxbury, S. J. Grant, and D. C. Montague. J Phys Chem Ref Data **10**, Suppl. 1(1981).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **9**, 295(1980).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement I. CODATA Task Group on Chemical Kinetics — D. L. Baulch, R. A. Cox, P. J. Crutzen, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **11**, 327(1982).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement II. CODATA Task Group on Gas Phase Chemical Kinetics — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **13**, 1259(1984).

Gas Phase Reaction Kinetics of Neutral Oxygen Species — Harold S. Johnston. NSRDS-NBS **20**, 49p. (1968).

Ground-State Vibrational Energy Levels of Polyatomic Transient Molecules — Marilyn E. Jacox. J Phys Chem Ref Data **13**, 945(1984).

Kinetic Data on Gas Phase Unimolecular Reactions — Sidney W. Benson and Harry E. O'Neal. NSRDS-NBS **21**, 645p. (1970).

Microwave Spectra of Molecules of Astrophysical Interest, XII. Hydroxyl Radical — Robert A. Beaudet and Robert L. Poynter. J Phys Chem Ref Data **7**, 311(1978).

Optical Spectra of Nonmetallic Inorganic Transient Species in Aqueous Solution — Gordon L. Hug. NSRDS-NBS **69**, 167p. (1981).

Radiation Chemistry of Nitrous Oxide Gas, Primary Processes, Elementary Reactions and Yields — George R. A. Johnson. NSRDS-NBS **45**, 29p. (1973).

Radiation Chemistry of Ethanol: A Review of Data on Yields, Reaction Rate Parameters, and Spectral Properties of Transients — Gordon R. Freeman. NSRDS-NBS **48**, 44p. (1974).

Rate Constants for Reactions of Aliphatic Carbon-Centered Radicals in Aqueous Solution — Alberta B. Ross and Pedatsur Neta. NSRDS-NBS **70**, 96p. (1982).

Rate Constants for Reactions of ClO_x of Atmospheric Interest — R. T. Watson. J Phys Chem Ref Data **6**, 871(1977).

Rate Constants for Reactions of Inorganic Radicals in Aqueous Solution — Alberta B. Ross and Pedatsur Neta. NSRDS-NBS **65**, 62p. (1979).

Rate Constants for the Decay and Reactions of the Lowest Electronically Excited Singlet State of Molecular Oxygen in Solution — Francis Wilkinson and James G. Brummer. J Phys Chem Ref Data **10**, 809(1981).

Rate Constants for the Reactions of Atomic Oxygen ($O\ ^3P$) with Organic Compounds in the Gas Phase — John T. Herron and Robert E. Huie. J Phys Chem Ref Data **2**, 467(1973).

Reactivity of the Hydroxyl Radical in Aqueous Solutions — Leon M. Dorfman and Gerald E. Adams. NSRDS-NBS **46**, 72p. (1973).

Selected Specific Rates of Reactions of the Solvated Electron in Alcohols — Edgar Watson, Jr. and Sathyabhama Roy. NSRDS-NBS **42**, 27p. (1972).

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, 1. Hydrated Electron — Michael Anbar, Mark Bambenek, and Alberta B. Ross. NSRDS-NBS **43**, 69p. (1973).

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, 1. Hydrated Electron, Supplemental Data — Alberta B. Ross. NSRDS-NBS **43**, Suppl.(1975).

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, II. Hydrogen Atom — Michael Anbar, Farhataziz, and Alberta B. Ross. NSRDS-NBS **51**, 66p. (1975).

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, III. Hydroxyl Radical and Perhydroxyl Radical and Their Radical Ions — Farhataziz and Alberta B. Ross. NSRDS-NBS **59**, 126p. (1977).

Semi-Empirical Extrapolation and Estimation of Rate Constants for Abstraction of H from Methane by H, O, HO, and O_2 — Robert Shaw. J Phys Chem Ref Data **7**, 1179(1978).

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Table of Recommended Rate Constants for Chemical Reactions Occurring in Combustion — Francis Westley. NSRDS-NBS **67**, 110p. (1980).

Tables of Bimolecular Gas Reactions — Aubrey F. Trotman-Dickenson and G. S. Milne. NSRDS-NBS **9**, 129p. (1967).

Tables of Experimental Rate Constants for Chemical Reactions Occurring in Combustion (1971-1977) — Francis Westley. NBSIR **81-2254**, 302p. (1981).

Tables of Rate Constants for Gas Phase Chemical Reactions of Sulfur Compounds (1971-1980) — Francis Westley. NSRDS-NBS **72**, 42p. (1982).

The Radiation Chemistry of Gaseous Ammonia — Donald B. Peterson. NSRDS-NBS **44**, 41p. (1974).

The Radiolysis of Methanol: Product Yields, Rate Constants, and Spectroscopic Parameters of Intermediates — J. H. Baxendale and Peter Wardman. NSRDS-NBS **54**, 33p. (1975).

Yields of Free Ions Formed in Liquids by Radiation — Augustine O. Allen. NSRDS-NBS **57**, 38p. (1976).

Geologic substances

Handbook of Thermodynamic Data on Geological Substances — G. B. Naumov, B. N. Ryzhenko, and I. L. Khodakovsky. Russian Transl. Springfield, VA: NTIS, 340p. (1974). TT 73-53051 or PB226 722, A15.

Glasses

Critical Surveys of Data Sources: Ceramics — Dorothea M. Johnson and James F. Lynch. NBS Spec. Publ. **396**, 56p. (1975).

Halogenated hydrocarbons

A Critical Review of Henry's Law Constants for Chemicals of Environmental Interest — Donald Mackay and Wan Ying Shiu. J Phys Chem Ref Data **10**, 1175(1981).

An Annotated Compilation and Appraisal of Electron Swarm Data in Electronegative Gases — Jean W. Gallagher, Earl C. Beaty, J. Dutton, and L. C. Pitchford. J Phys Chem Ref Data **12**, 109(1983).

Densities of Liquid $CH_{4-a}X_a$ (X=Br,I) and $CH_{4-(a+b+c+d)}F_aCl_bBr_cI_d$ Halomethanes — Arvind P. Kudchadker, Shanti A. Kudchadker, P. R. Patnaik, and P. P. Mishra. J Phys Chem Ref Data **7**, 425(1978).

Ideal Gas Thermodynamic Properties of Eight Chloro- and Fluoromethanes — A. S. Rodgers, Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **3**, 117(1974).

Ideal Gas Thermodynamic Properties of Six Chloroethanes — Jing Chao, A. S. Rodgers, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **3**, 141(1974).

Ideal Gas Thermodynamic Properties of Six Fluoroethanes — S. S. Chen, A. S. Rodgers, Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 441(1975).

Ideal Gas Thermodynamic Properties of the Eight Bromo- and Iodomethanes — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data **4**, 457(1975).

Ideal Gas Thermodynamic Properties of Six Chlorofluoromethanes — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **5**, 571(1976).

Ideal Gas Thermodynamic Properties of $CH_{4-(a+b+c+d)}F_aCl_bBr_cI_d$ Halomethanes — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data **7**, 1285(1978).

Ideal Gas Thermodynamic Properties of Selected Bromoethanes and Iodoethane — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data **8**, 519(1979).

Infrared Spectra of Halogenated Hydrocarbons — Clara D. Craver and Coblentz Society; Joint Committee on Atomic and Molecular Physical Data. Kirkwood, MO: The Coblentz Society, 125p. (1977).

Tables of Molecular Vibrational Frequencies, Part 1 — Takehiko Shimanouchi. NSRDS-NBS **6**, 56p. (1967).

Tables of Molecular Vibrational Frequencies, Part 6 — Takehiko Shimanouchi. J Phys Chem Ref Data **2**, 121(1973).

Tables of Molecular Vibrational Frequencies, Part 7 — Takehiko Shimanouchi. J Phys Chem Ref Data **2**, 225(1973).

Tables of Molecular Vibrational Frequencies, Part 8 — Takehiko Shimanouchi. J Phys Chem Ref Data **3**, 269(1974).

Tables of Molecular Vibrational Frequencies. Consolidated Volume II — Takehiko Shimanouchi. J Phys Chem Ref Data **6**, 993(1977).

Thermophysical Properties of Freon-22 — A. V. Kletskii. Russian Transl. Springfield, VA: NTIS, 72p. (1971). TT 70-50178, A04.

Vapor Pressures and Boiling Points of Selected Halomethanes — Arvind P. Kudchadker, Shanti A. Kudchadker, R. P. Shukla, and P. R. Patnaik. J Phys Chem Ref Data **8**, 499(1979).

Helium

Thermophysical Properties of Helium NBS Standard Reference Database **5**, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

Hydrocarbons

A Compilation of Kinetic Parameters for the Thermal Degradation of n-Alkane Molecules — D. L. Allara and Robert Shaw. J Phys Chem Ref Data **9**, 523(1980).

A Computer Program for the Prediction of Viscosity and Thermal Conductivity in Hydrocarbon Mixtures — James F. Ely and Howard J. M. Hanley. NBS Tech. Note **1039**, 83p. (1981).

A Correlation of the Existing Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethane — Howard J. M. Hanley, K. E. Gubbins, and S. Murad. J Phys Chem Ref Data **6**, 1167(1977).

A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Propane — Paul M. Holland, Howard J. M. Hanley, K. E. Gubbins, and J. M. Haile. J Phys Chem Ref Data **8**, 559(1979).

A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethylene — Paul M. Holland, B. E. Eaton, and Howard J. M. Hanley. J Phys Chem Ref Data **12**, 917(1983).

A Critical Review of Henry's Law Constants for Chemicals of Environmental Interest — Donald Mackay and Wan Ying Shiu. J Phys Chem Ref Data **10**, 1175(1981).

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Ethane — M. J. Hiza, R. C. Miller, and Arthur J. Kidnay. J Phys Chem Ref Data **8**, 799(1979).

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Propane — R. C. Miller, Arthur J. Kidnay, and M. J. Hiza. J Phys Chem Ref Data **9**, 721(1980).

An Equation of State for Fluid Ethylene — Robert D. McCarty and Richard T. Jacobsen. NBS Tech. Note **1045**, 164p. (1981).

Chemical Kinetics of the Gas Phase Combustion of Fuels (A Bibliography on the Rates and Mechanisms of Oxidation of Aliphatic C_1 to C_{10} Hydrocarbons and of Their Oxygenated Derivatives) — Francis Westley. NBS Spec. Publ. **449**, 142p. (1976).

Critical Evaluation of Vapor-Liquid Equilibrium, Heat of Mixing, and Volume Change of Mixing Data. General Procedures — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 941(1982).

Critical Review of Vibrational Data and Force Field Constants for Polyethylene — John Barnes and Bruno Fanconi. J Phys Chem Ref Data **7**, 1309(1978).

Derived Thermodynamic Properties of Ethylene — Roland H. Harrison and Donald R. Douslin. J Chem Eng Data. **22**, Washington, DC: American Chemical Society, 24p. (1977).

Drift Mobilities and Conduction Band Energies of Excess Electrons in Dielectric Liquids — Augustine O. Allen. NSRDS-NBS **58**, 23p. (1976).

Equilibrium Properties of Fluid Mixtures, A Bibliography on Fluids of Cryogenic Interest — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller. New York: IFI/Plenum, 166p. (1975), ISBN: 0-306-6601-6.

Equilibrium Properties of Fluid Mixtures, 2. A Bibliography of Experimental Data on Selected Fluids — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller. New York: IFI/Plenum, 258p. (1982), ISBN: 0-306-6602-4.

Erratum: A Correlation of the Existing Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethane — Howard J. M. Hanley, K. E. Gubbins, and S. Murad. J Phys Chem Ref Data **10**, 799(1981).

Evaluation of Binary Excess Enthalpy Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1127(1982).

Evaluation of Binary Excess Enthalpy Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 389(1983).

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1151(1982).

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 395(1983).

Evaluation of Binary *PT*xy Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1099(1982).

Evaluation of Binary *PT*xy Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 381(1983).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. II. Polyethylene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 119(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IV. Polypropylene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 1051(1981).

Hydrogenation of Ethylene on Metallic Catalysts — Juro Horiuti and Koshiro Miyahara. NSRDS-NBS **13**, 62p. (1968).

Ideal Gas Thermodynamic Properties of Ethane and Propane — Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, 427(1973).

Ideal Gas Thermodynamic Properties of Ethylene and Propylene — Jing Chao and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 251(1975).

Ideal Gas Thermodynamic Properties and Isomerization of n-Butane and Isobutane — S. S. Chen, Randolph C. Wilhoit, and Bruno J. - Zwolinski. J Phys Chem Ref Data **4**, 859(1975).

Ideal Gas Thermodynamic Properties of CH_3, CD_3, CD_4, C_2D_2, C_2D_4, C_2D_6, C_2H_6, $CH_3N_2CH_3$, and $CD_3N_2CD_3$ — Krishna M. Pamidimukkala, David Rogers, and Gordon B. Skinner. J Phys Chem Ref Data **11**, 83(1982).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format — Douglas Mann and U.S. National Bureau of Standards. Boulder, CO: U.S. National Bureau of Standards, Cryogenic Division, 11p. (1977).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, First Supplement — Douglas Mann and U.S. National Bureau of Standards. Suppl. **1**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1978).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, Second Supplement — Douglas Mann and U.S. National Bureau of Standards. Suppl. **2**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1980).

Microwave Spectra of Molecules of Astrophyical Interest. XX. Methane — I. Ozier, M. C. L. Gerry, and A. G. Robiette. J Phys Chem Ref Data **10**, 1085(1981).

Phase Behavior in Binary and Multicomponent Systems at Elevated Pressures: n-Pentane and Methane-n-Pentane — Virginia M. Berry and Bruce H. Sage. NSRDS-NBS **32**, 79p. (1970).

Pressure, Volume, Temperature Relations of Ethylene — Donald R. Douslin and Roland H. Harrison. J Chem Thermody **76**, New York, London:, 301p. (1976).

Provisional Thermodynamic Functions of Propane from 85 to 700 K at Pressures to 700 Bar — Robert D. Goodwin. NBSIR **77-860**, 240p. (1977).

Rate Coefficients for Ion-Molecule Reactions, I. Ions Containing C and H — L. Wayne Sieck and Sharon G. Lias. J Phys Chem Ref Data **5**, 1123(1976).

Semi-Empirical Extrapolation and Estimation of Rate Constants for Abstraction of H from Methane by H, O, HO, and O_2 — Robert Shaw. J Phys Chem Ref Data **7**, 1179(1978).

Standard Chemical Thermodynamic Properties of Alkane Isomer Groups — Robert A. Alberty and Catherine A. Gehrig. J Phys Chem Ref Data **13**, 1173(1984).

Table of Recommended Rate Constants for Chemical Reactions Occurring in Combustion — Francis Westley. NBSIR **79-1941**, 169p. (1979).

Table of Recommended Rate Constants for Chemical Reactions Occurring in Combustion — Francis Westley. NSRDS-NBS **67**, 110p. (1980).

Tables of Experimental Rate Constants for Chemical Reactions Occurring in Combustion (1971-1977) — Francis Westley. NBSIR **81-2254**, 302p. (1981).

The Critical-Region Equation of State of Ethene and the Effect of Small Impurities — J. R. Hastings, J. M. H. Levelt Sengers, and F. W. Balfour. J Chem Thermody **12**, London: Academic Press Inc., 1009p. (1980).

The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Methane — Howard J. M. Hanley, W. M. Haynes, and Robert D. McCarty. J Phys Chem Ref Data **6**, 597(1977).

Thermodynamic Properties of Normal and Deuterated Naphthalenes — S. S. Chen, Shanti A. Kudchadker, and Randolph C. Wilhoit. J Phys Chem Ref Data **8**, 527(1979).

Thermodynamic and Transport Properties of Ethylene and Propylene — I. A. Neduzhii. Russian Transl. Springfield, VA: NTIS, 206p. (1972). COM 75-11276, A10.

Thermophysical Properties of Gaseous and Liquid Methane — V. A. Zagoruchenko and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 251p. (1970). TT 70-50097, A12.

Thermophysical Properties of Hydrocarbon Mixtures (TRAPP) NBS Standard Reference Database 4, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

Thermophysical Properties of Isobutane from 114 to 700 K at Pres4sures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Tech Note **1051**, 199p. (1982).

Thermophysical Properties of Normal Butane from 135 to 700 K at Pressures to 70 MPa — W. M. Haynes and Robert D. Goodwin. NBS Monograph **169**, 197p. (1982).

Thermophysical Properties of Propane from 85 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Monograph **170**, 249p. (1982).

Water Solubilities of Polynuclear Aromatic and Heteroaromatic Compounds — Robert S. Pearlman, Samuel H. Yalkowsky, and Sujit Banerjee. J Phys Chem Ref Data **13**, 555(1984).

Hydrogen

Equilibrium Properties of Fluid Mixtures, A Bibliography on Fluids of Cryogenic Interest — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller. New York: IFI/Plenum, 166p. (1975), ISBN: 0-306-6601-6.

Equilibrium Properties of Fluid Mixtures, 2. A Bibliography of Experimental Data on Selected Fluids — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller. New York: IFI/Plenum, 258p. (1982), ISBN: 0-306-6602-4.

Properties of Liquid and Solid Hydrogen — B. N. Esel'son, Y. P. Blagoi, V.N. Grigor'ev, V. G. Manzhelii, S. A. Mikhailenko, and N. P. Neklyudov. Russian Transl. Springfield, VA: NTIS, 126p. (1971). TT 70-50179, A07.

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, II. Hydrogen Atom — Michael Anbar, Farhataziz, and Alberta B. Ross. NSRDS-NBS **51**, 66p. (1975).

Table of Recommended Rate Constants for Chemical Reactions Occurring in Combustion — Francis Westley. NSRDS-NBS **67**, 110p. (1980).

Thermodynamic and Related Properties of Parahydrogen from the Triple Point to 100 K at Pressures to 340 Atmospheres — Hans M. Roder, Lloyd A. Weber, and Robert D. Goodwin. NBS Monograph **94**,, 116p. (1965).

Inorganic materials

Analysis of Specific Heat Data in the Critical Region of Magnetic Solids — F. J. Cook. J Phys Chem Ref Data **2**, 11(1973).

Behavior of the AB-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **6**, 1205(1977).

Behavior of the AB_2-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **11**, 1005(1982).

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 7. 1974 — Radiation Chemistry Data Center. Rad Chem 7, Springfield, VA: NTIS, 553p. (1975). COM 75-11475, A24.

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 8. 1975 — Radiation Chemistry Data Center. Rad Chem **8**, Springfield, VA: NTIS, 670p. (1976). PB 275 025, A26.

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 9. 1976 — Radiation Chemistry Data Center. Rad Chem **9**, Springfield, VA: NTIS, 707p. (1977). PB 268 699, A26.

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 10. 1977 — Radiation Chemistry Data Center. Rad Chem **10**, Springfield, VA: NTIS, 695p. (1978). PB 291 876, A26.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author indexes, Vol. 11. 1978 — Radiation Chemistry Data Center. Rad Chem **11**, Springfield, VA: NTIS, 768p. (1979). PB 226 368, A99.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author Indexes, Vol. 12. 1979 — Radiation Chemistry Data Center. Rad Chem **12**, Springfield, VA: NTIS, 748p. (1980). PB 81-113 680, A26.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author Indexes, Vol. 13. 1980 — Radiation Chemistry Data Center. Rad Chem **13**, Springfield, VA: NTIS, 704p. (1981). PB 82-122 995, A26.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author Indexes, Vol. 14. 1981 — Radiation Chemistry Data Center. Rad Chem **14**, Springfield, VA: NTIS, 534p. (1982). PB 82-214 487, A22.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumuluation with Keyword and Author Indexes, Vol. 15. 1982 — Radiation Chemistry Data Center. Rad Chem **15**, Springfield, VA: NTIS, 448p. (1983). PB 83-20363, A19.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Vol. 17. 1984 — Radiation Chemistry Data Center. Rad Chem, Notre Dame, IN: Radiation Chem. Data Center, U. of Notre Dame, 449 p. (1984). $25.00; the Biweekly List, Vol. 17 (1984) plus the Annual Cumulation, Vol. 16 (1983), $35.00; foreign and airmail postage rates available upon request.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumuluation with Keyword and Author Indexes, Vol. 16. 1983 — Radiation Chemistry Data Center. Rad Chem **16**, Springfield, VA: NTIS, 444p. (1984).

Bond Dissociation Energies in Simple Molecules — B. DeB. Darwent. NSRDS-NBS **31**, 48p. (1970).

Bulletin of Chemical Thermodynamics, Volume 24/1981 — Robert D. Freeman, editor(s) and International Union of Pure and Applied Chemistry, Commission 1.2 on Thermodynamics. Bull Chem Thermody **24**, Stillwater, OK: Thermochemistry, Department of Chemistry, Oklahoma State University, 504p. (1982). 0149-2268, bona fide personal subscriptions are less; prices of previous Bulletins available upon request.

Bulletin of Chemical Thermodynamics, Volume 25/1982 — Robert D. Freeman and International Union of Pure and Applied Chemistry. Bull Chem Thermody **25**, Stillwater, OK: Thermochemistry, Department of Chemistry, Oklahoma State University, 544p. (1982). 0149-2268, bona fide personal subscriptions are less; prices of previous Bulletins are available upon request.

Compilation and Evaluation of Solubility Data in the Mercury (I) Chloride-Water System — Y. Marcus. J Phys Chem Ref Data **9**, 1307(1980).

Compilation of Volumes V-IX of the Bibliography on High Pressure Research with Author and Subject Indexes — Leo Merrill. Provo, UT: High Pressure Data Center, Brigham Young University, (1979).

Compilation of the Static Dielectric Constant of Inorganic Solids — K. F. Young and Hans P. R. Frederikse. J Phys Chem Ref Data **2**, 313(1973).

Crystal Data Space-Group Tables — Alan D. Mighell, Helen M. Ondik, and Bettijoyce Breen Molino. J Phys Chem Ref Data **6**, 675(1977).

Crystal Data Determinative Tables, Third Edition Volume 2: Inorganic Compounds — Joseph D. H. Donnay and Helen M. Ondik. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1748p. (1973).

Crystal Data Determinative Tables, Third Edition Volume 4. Inorganic Compounds — Joseph D. H. Donnay, Helen M. Ondik, and Alan D. Mighell. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1308p. (1978).

Crystal Structure Transformations in Binary Halides — C. N. R. Rao and M. Natarajan. NSRDS-NBS **41**, 57p. (1972).

EPA/NIH Mass Spectral Data Base, Supplement 1 — Stephen R. Heller and G. W. A. Milne. NSRDS-NBS **63**, Suppl. 1(1980).

EPA/NIH Mass Spectral Data Base, Supplement 2 — Stephen R. Heller, G. W. A. Milne, and Lewis H. Gevantman. NSRDS-NBS **63**, Suppl. 2(1983).

EPA/NIH Mass Spectral Data Base, Volume 1. Molecular Weights 30-186; Volume 2. Molecular Weights 16-273; Volume 3. Molecular Weights 273-381; Volume 4. Molecular Weights 381-1674 — Stephen R. Heller and G. W. A. Milne. NSRDS-NBS **63**, 1,2,3,4(1978).

Energetics of Gaseous Ions — Henry M. Rosenstock, Keith Draxl, B. W. Steiner, and John T. Herron. J Phys Chem Ref Data **6**, Suppl. 1(1977).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: The Alkaline Earth Metal Halides — Robert N. Goldberg and Ralph L. Nuttall. J Phys Chem Ref Data **7**, 263(1978).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Iron Chloride and the Bi-Univalent Compounds of Nickel and Cobalt — Robert N. Goldberg, Ralph L. Nuttall, and Bert R. Staples. J Phys Chem Ref Data **8**, 923(1979).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Bi-Univalent Compounds of Lead, Copper, Manganese, and Uranium — Robert N. Goldberg. J Phys Chem Ref Data **8**, 1005(1979).

JANAF Thermochemical Tables, 1974 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, A. T. Hu, H. Prophet, A. N. Syverud, and L. C. Walker. J Phys Chem Ref Data **3**, 311(1974).

JANAF Thermochemical Tables, 1975 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, H. Prophet, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **4**, 1(1975).

JANAF Thermochemical Tables, 1978 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **7**, 793(1978).

JANAF Thermochemical Tables, 1982 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, J. R. Downey, Jr., R. A. McDonald, A. N. Syverud, and E. A. Valenzuela. J Phys Chem Ref Data **11**, 695(1982).

JANAF Thermochemical Tables, Second Edition — Daniel R. Stull and H. Prophet. NSRDS-NBS **37**, 1141p. (1971).

Kinetic Data on Gas Phase Unimolecular Reactions — Sidney W. Benson and Harry E. O'Neal. NSRDS-NBS **21**, 645p. (1970).

Molten Salts: Volume 2. Section 1. Electrochemistry of Molten Salts. Gibbs Free Energies and Excess Free Energies from Equilibrium-Type Cells, Section 2. Surface Tension Data — George J. Janz, Chr. G. M. Dijkhuis, G. R. Lakshminarayanan, Reginald P. T. Tomkins, and J. Wong. NSRDS-NBS **28**, 116p. (1968).

NBS Crystal Data Identification File NBS Standard Reference Database 3, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Lease agreements obtained from JCPDS 1601 Park Ln Swarthmore PA (215)328-9400.

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Sulfur-Metal Systems — Y. Austin Chang, Joachim P. Neumann, and U. V. Choudary. INCRA Monograph **VII**, New York: International Copper Research Association, Inc., 191p. (1979).

Phase Diagrams for Ceramists — Ernest M. Levin, Carl R. Robbins, Howard F. McMurdie, editor(s). American Ceramic Society; Columbus, Ohio, 601p. (1964), ISBN: 0-916094-04-9.

Phase Diagrams for Ceramists 1969 Supplement — Ernest M. Levin, Carl R. Robbins, Howard F. McMurdie, editor(s). American Ceramic Society; Columbus, Ohio, 625p. (1969), ISBN: 0-916094-05-7.

Phase Diagrams for Ceramists 1975 Supplement — Ernest M. Levin, Howard F. McMurdie, editor(s). American Ceramic Society; Columbus, Ohio, 513p. (1975).

Physical Properties Data Compilations Relevant to Energy Storage. I. Molten Salts: Eutectic Data — George J. Janz, Carolyn B. Allen, J. R. Downey, Jr., and Reginald P. T. Tomkins. NSRDS-NBS **61**, 244p. (1978).

Physical Properties Data Compilations Relevant to Energy Storage. II. Molten Salts: Data on Single and Multi-Component Systems — George J. Janz, Carolyn B. Allen, Narottam P. Bansal, R. M. Murphy, and Reginald P. T. Tomkins. NSRDS-NBS **61**, 420p. (1979).

Physical Properties Data Compilations Relevant to Energy Storage. III. Engineering Properties of Single and Polycrystalline Sodium Beta and Beta″ Alumina — G. R. Miller and D. G. Paquette. NSRDS-NBS **61**, 19p. (1979).

Rate Coefficients for Vibrational Energy Transfer Involving the Hydrogen Halides — Stephen R. Leone. J Phys Chem Ref Data **11**, 953(1982).

Rate Constants for Reactions of Inorganic Radicals in Aqueous Solution — Alberta B. Ross and Pedatsur Neta. NSRDS-NBS **65**, 62p. (1979).

Refractive Index of Alkali Halides and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **5**, 329(1976).

Selected Values of Chemical Thermodynamic Properties. Tables for the First Thirty-Four Elements in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 264p. (1968).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 35 through 53 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 152p. (1969).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 54 through 61 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, Richard H. Schumm, and Kenneth L. Churney. NBS Tech. Note **270**, 49p. (1971).

Selected Values of Chemical Thermodynamic Properties. Tables for the Alkaline Earth Elements (Elements 92 through 97 in the Standard Order of Arrangement) — Vivian B. Parker, Donald D. Wagman, and William H. Evans. NBS Tech. Note **270**, 124p. (1971).

Selected Values of Electric Dipole Moments for Molecules in the Gas Phase — Ralph D. Nelson, Jr., David R. Lide, Jr., and Arthur A. Maryott. NSRDS-NBS **10**, 49p. (1967).

Tables of Bimolecular Gas Reactions — Aubrey F. Trotman-Dickenson and G. S. Milne. NSRDS-NBS **9**, 129p. (1967).

Tables of Molecular Vibrational Frequencies, Part 2 — Takehiko Shimanouchi. NSRDS-NBS **11**, 38p. (1967).

Tables of Molecular Vibrational Frequencies, Part 3 — Takehiko Shimanouchi. NSRDS-NBS **17**, 39p. (1968).

Tables of Molecular Vibrational Frequencies, Consolidated Volume I — Takehiko Shimanouchi. NSRDS-NBS **39**, 167p. (1972).

Tables of Molecular Vibrational Frequencies, Part 5 — Takehiko Shimanouchi. J Phys Chem Ref Data **1**, 189(1972).

Tables of Molecular Vibrational Frequencies, Part 6 — Takehiko Shimanouchi. J Phys Chem Ref Data **2**, 121(1973).

Tables of Molecular Vibrational Frequencies, Part 7 — Takehiko Shimanouchi. J Phys Chem Ref Data **2**, 225(1973).

Tables of Molecular Vibrational Frequencies, Part 8 — Takehiko Shimanouchi. J Phys Chem Ref Data **3**, 269(1974).

Tables of Molecular Vibrational Frequencies. Consolidated Volume II — Takehiko Shimanouchi. J Phys Chem Ref Data **6**, 993(1977).

The NBS Tables of Chemical Thermodynamic Properties. Selected Values for Inorganic and C_1 and C_2 Organic Substances in SI Units — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, Iva Halow, Sylvia M. Bailey, Kenneth L. Churney, and Ralph L. Nuttall. J Phys Chem Ref Data **11**, Suppl. 2(1982).

The Surface Tension of Pure Liquid Compounds — Joseph J. Jasper. J Phys Chem Ref Data **1**, 841(1972).

The Viscosity and Thermal Conductivity Coefficients of Gaseous and Liquid Fluorine — Howard J. M. Hanley and R. Prydz. J Phys Chem Ref Data **1**, 1101(1972).

Thermal Conductivity of Selected Materials, Part 2 — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. NSRDS-NBS **16**, 146p. (1968).

Thermodynamic Properties of Ammonia — Lester Haar and John S. Gallagher. J Phys Chem Ref Data **7**, 635(1978).

Thermodynamic Properties of Copper and Its Inorganic Compounds — Edward G. King, Alla D. Mah, and Louis B. Pankratz. INCRA Monograph **II**, New York: International Copper Research Association, Inc., 257p. (1973).

Thermodynamic Properties of Copper-Slag Systems — Carlos Diaz. INCRA Monograph **III**, New York: International Copper Research Association, Inc., 178p. (1976).

Thermodynamic Tabulations for Selected Phases in the System CaO-Al_2O_3-SiO_2-H_2O at 101.325 kPa (1 atm.) between 273.15 and 1800 K — John L. Haas, Jr., Gilpin R. Robinson, Jr., and Bruce S. Hemingway. J Phys Chem Ref Data **10**, 575(1981).

Interstellar molecules

Microwave Spectra of Molecules of Astrophysical Interest, I. Formaldehyde, Formamide, and Thioformaldehyde — Donald R. Johnson, Frank J. Lovas, and William H. Kirchhoff. J Phys Chem Ref Data **1**, 1011(1972).

Microwave Spectra of Molecules of Astrophysical Interest, II. Methylenimine — William H. Kirchhoff, Donald R. Johnson, and Frank J. Lovas. J Phys Chem Ref Data **2**, 1(1973).

Microwave Spectra of Molecules of Astrophysical Interest, III. Methanol — R. M. Lees, Frank J. Lovas, William H. Kirchhoff, and Donald R. Johnson. J Phys Chem Ref Data **2**, 205(1973).

Microwave Spectra of Molecules of Astrophysical Interest, IV. Hydrogen Sulfide — Paul Helminger, Frank C. De Lucia, and William H. Kirchhoff. J Phys Chem Ref Data **2**, 215(1973).

Microwave Spectra of Molecules of Astrophysical Interest, V. Water Vapor — Frank C. De Lucia, Paul Helminger, and William H. Kirchhoff. J Phys Chem Ref Data **3**, 211(1974).

Microwave Spectra of Molecules of Astrophysical Interest, VI. Carbonyl Sulfide and Hydrogen Cyanide — Arthur G. Maki. J Phys Chem Ref Data **3**, 221(1974).

Microwave Spectra of Molecules of Astrophysical Interest, VII. Carbon Monoxide, Carbon Monosulfide, and Silicon Monoxide — Frank J. Lovas and Paul H. Krupenie. J Phys Chem Ref Data **3**, 245(1974).

Microwave Spectra of Molecules of Astrophysical Interest, VIII. Sulfur Monoxide — Eberhard Tiemann. J Phys Chem Ref Data **3**, 259(1974).

Microwave Spectra of Molecules of Astrophysical Interest, IX. Acetaldehyde — A. Bauder, Frank J. Lovas, and Donald R. Johnson. J Phys Chem Ref Data **5**, 53(1976).

Microwave Spectra of Molecules of Astrophysical Interest, X. Isocyanic Acid — G. Winnewisser, W. H. Hocking, and M. C. L. Gerry. J Phys Chem Ref Data **5**, 79(1976).

Microwave Spectra of Molecules of Astrophysical Interest, XI. Silicon Sulfide — Eberhard Tiemann. J Phys Chem Ref Data **5**, 1147(1976).

Microwave Spectra of Molecules of Astrophysical Interest, XII. Hydroxyl Radical — Robert A. Beaudet and Robert L. Poynter. J Phys Chem Ref Data **7**, 311(1978).

Microwave Spectra of Molecules of Astrophysical Interest, XIII. Cyanoacetylene — Walter J. Lafferty and Frank J. Lovas. J Phys Chem Ref Data **7**, 441(1978).

Microwave Spectra of Molecules of Astrophysical Interest, XIV. Vinyl Cyanide (Acrylonitrile) — M. C. L. Gerry, K. Yamada, and G. Winnewisser. J Phys Chem Ref Data **8**, 107(1979).

Microwave Spectra of Molecules of Astrophysical Interest, XV. Propyne — A. Bauer, D. Boucher, J. Burie, J. Demaison, and A. Dubrulle. J Phys Chem Ref Data **8**, 537(1979).

Microwave Spectra of Molecules of Astrophysical Interest, XVI. Methyl Formate — A. Bauder. J Phys Chem Ref Data **8**, 583(1979).

Microwave Spectra of Molecules of Astrophysical Interest, XVII. Dimethyl Ether — Frank J. Lovas, H. Lutz, and H. Dreizler. J Phys Chem Ref Data **8**, 1051(1979).

Microwave Spectra of Molecules of Astrophysical Interest. XVIII. Formic Acid — Edmond Willemot, Didier Dangoisse, Nicole Monnanteuil, and Jean Bellet. J Phys Chem Ref Data **9**, 59(1980).

Microwave Spectra of Molecules of Astrophysical Interest. XIX. Methyl Cyanide — D. Boucher, J. Burie, A. Bauer, A. Dubrulle, and J. Demaison. J Phys Chem Ref Data **9**, 659(1980).

Microwave Spectra of Molecules of Astrophyical Interest. XX. Methane — I. Ozier, M. C. L. Gerry, and A. G. Robiette. J Phys Chem Ref Data **10**, 1085(1981).

Microwave Spectra of Molecules of Astrophysical Interest. XXI. Ethanol (C_2H_5OH) and Propionitrile (C_2H_5CN) — Frank J. Lovas. J Phys Chem Ref Data **11**, 251(1982).

Ions

A Bibliography on Ion-Molecule Reactions. January 1900 to March 1966 — F. N. Harllee, Henry M. Rosenstock, and John T. Herron. NBS Tech. Note **291**, 40p. (1966).

A Compendium of Gas Phase Basicity and Proton Affinity Measurements — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, Henry M. Rosenstock, S. S. Schroyer, C. Schmidt, D. Martinsen, and G. W. A. Milne. NBSIR **79-1777**, 563p. (1979).

A Report on Thermodynamic Data for Desulfurization Processes — Vivian B. Parker, Bert R. Staples, Thomas L. Jobe, Jr., and David B. Neumann. NBSIR **81-2345**, 89p. (1981).

A Survey of Electron Swarm Data — J. Dutton. J Phys Chem Ref Data **4**, 577(1975).

Annotated Bibliography on Proton Affinities — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, and Henry M. Rosenstock. NBSIR **76-1061**, 52p. (1976).

Bibliography of Ion-Molecule Reaction Rate Data (January 1950 - October 1971) — George A. Sinnott. NBS Spec. Publ. **381**, 75p. (1973).

Binding Energies in Atomic Negative Ions — H. Hotop and W. C. Lineberger. J Phys Chem Ref Data **4**, 539(1975).

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 7. 1974 — Radiation Chemistry Data Center. Rad Chem **7**, Springfield, VA: NTIS, 553p. (1975). COM 75-11475, A24.

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 8. 1975 — Radiation Chemistry Data Center. Rad Chem **8**, Springfield, VA: NTIS, 670p. (1976). PB 275 025, A26.

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 9. 1976 — Radiation Chemistry Data Center. Rad Chem **9**, Springfield, VA: NTIS, 707p. (1977). PB 268 699, A26.

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 10. 1977 — Radiation Chemistry Data Center. Rad Chem **10**, Springfield, VA: NTIS, 695p. (1978). PB 291 876, A26.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author indexes, Vol. 11. 1978 — Radiation Chemistry Data Center. Rad Chem **11**, Springfield, VA: NTIS, 768p. (1979). PB 226 368, A99.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author Indexes, Vol. 12. 1979 — Radiation Chemistry Data Center. Rad Chem **12**, Springfield, VA: NTIS, 748p. (1980). PB 81-113 680, A26.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author Indexes, Vol. 13. 1980 — Radiation Chemistry Data Center. Rad Chem **13**, Springfield, VA: NTIS, 704p. (1981). PB 82-122 995, A26.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author Indexes, Vol. 14. 1981 — Radiation Chemistry Data Center. Rad Chem **14**, Springfield, VA: NTIS, 534p. (1982). PB 82-214 487, A22.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumuluation with Keyword and Author Indexes, Vol. 15. 1982 — Radiation Chemistry Data Center. Rad Chem **15**, Springfield, VA: NTIS, 448p. (1983). PB 83-203638, A19.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Vol. 17. 1984 — Radiation Chemistry Data Center. Rad Chem, Notre Dame, IN: Radiation Chem. Data Center, U. of Notre Dame, 449p. (1984). $25.00; the Biweekly List, Vol. 17 (1984) plus the Annual Cumulation, Vol. 16 (1983), $35.00; foreign and airmail postage rates available upon request.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumuluation with Keyword and Author Indexes, Vol. 16. 1983 — Radiation Chemistry Data Center. Rad Chem **16**, Springfield, VA: NTIS, 444p. (1984).

Compilation of Rate Constants for the Reactions of Metal Ions in Unusual Valency States — George V. Buxton and Robin M. Sellers. NSRDS-NBS **62**, 68p. (1978).

Drift Mobilities and Conduction Band Energies of Excess Electrons in Dielectric Liquids — Augustine O. Allen. NSRDS-NBS **58**, 23p. (1976).

Electron Impact Ionization Cross-Section Data for Atoms, Atomic Ions, and Diatomic Molecules: I. Experimental Data — Lee J. Kieffer and Gordon H. Dunn. Rev Mod Phys. **38**. New York: American Institute of Physics, 35p. (1966).

Energetics of Gaseous Ions — Henry M. Rosenstock, Keith Draxl, B. W. Steiner, and John T. Herron. J Phys Chem Ref Data **6**, Suppl. 1(1977).

Evaluated Gas Phase Basicities and Proton Affinities of Molecules: Heats of Formation of Protonated Molecules — Sharon G. Lias, Joel F. Liebman, and Rhoda D. Levin. J Phys Chem Ref Data **13**, 695(1984).

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ions with Atoms. I. Hydrogen Atom-Fully Stripped Ion Systems — R. K. Janev, B. H. Bransden, and Jean W. Gallagher. J Phys Chem Ref Data **12**, 829(1983).

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ions with Atoms. II. Hydrogen Atom-Partially Stripped Ions Systems — Jean W. Gallagher, B. H. Bransden, and R. K. Janev. J Phys Chem Ref Data **12**, 873(1983).

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ion with Atoms. III. Non-Hydrogenic Target Atoms — R. K. Janev and Jean W. Gallagher. J Phys Chem Ref Data **13**, 1199(1984).

Experimental Stark Widths and Shifts for Non-Hydrogenic Spectral Lines of Ionized Atoms (A Critical Review and Tabulation of Selected Data) — N. Konjević and Wolfgang L. Wiese. J Phys Chem Ref Data **5**, 259(1976).

Experimental Stark Widths and Shifts for Spectral Lines of Positive Ions (A Critical Review and Tabulation of Selected Data for the Period 1976 to 1982) — N. Konjević, M. S. Dimitrijević, and Wolfgang L. Wiese. J Phys Chem Ref Data **13**, 649(1984).

Ground Levels and Ionization Potentials for Lanthanide and Actinide Atoms and Ions — William C. Martin, Lucy Hagan, Joseph Reader, and Jack Sugar. J Phys Chem Ref Data **3**, 771(1974).

Ion Energetics Measurements, Supplement I. 1971-1973 — Henry M. Rosenstock, D. Sims, S. S. Schroyer, and W. J. Webb. NSRDS-NBS **66**, 380p. (1980).

Ion-Molecule Reactions — Earl W. McDaniel, V. Cermak, A. Dalgarno, E. E. Ferguson, and L. Friedman. At Mol Collis Proc Ser, New York: Wiley-Interscience, 374p. (1970), ISBN: 0-471-5838-3.

Ionization Potential and Appearance Potential Measurements, 1971-1981 — Rhoda D. Levin and Sharon G. Lias. NSRDS-NBS **71**, 634p. (1982).

Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions — Joseph L. Franklin, J. G. Dillard, Henry M. Rosenstock, John T. Herron, Keith Draxl, and Frank H. Field. NSRDS-NBS **26**, 289p. (1969).

Rate Coefficients for Ion-Molecule Reactions, I. Ions Containing C and H — L. Wayne Sieck and Sharon G. Lias. J Phys Chem Ref Data **5**, 1123(1976).

Rate Coefficients for Ion-Molecule Reactions, Organic Ions Other Than Those Containing Only C and H — L. Wayne Sieck. NSRDS-NBS **64**, 27p. (1980).

Recommended Data on the Electron Impact Ionization of Light Atoms and Ions — K. L. Bell, H. B. Gilbody, J. G. Hughes, A. E. Kingston, and Francis J. Smith. J Phys Chem Ref Data **12**, 891(1983).

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, III. Hydroxyl Radical and Perhydroxyl Radical and Their Radical Ions — Farhataziz and Alberta B. Ross. NSRDS-NBS **59**, 126p. (1977).

Surface Ionization — E. Ya. Zandberg and N. L. Ionov. Russian Transl. Springfield, VA: NTIS, 364p. (1971). TT 70-50148, A16.

Theory of Charge Exchange — R. A. Mapleton. New York: Wiley-Interscience, 284p. (1971), ISBN: 0-471-5678-7.

Theory of the Ionization of Atoms by Electron Impact — M. R. H. Rudge. Rev Mod Phys **40**, .., 564p. (1968).

Yields of Free Ions Formed in Liquids by Radiation — Augustine O. Allen. NSRDS-NBS **57**, 38p. (1976).

Lanthanide elements

Atomic Energy Levels - The Rare-Earth Elements, the Spectra of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu — William C. Martin, Romuald Zalubas, and Lucy Hagan. NSRDS-NBS **60**, 422p. (1978).

Ground Levels and Ionization Potentials for Lanthanide and Actinide Atoms and Ions — William C. Martin, Lucy Hagan, Joseph Reader, and Jack Sugar. J Phys Chem Ref Data **3**, 771(1974).

Selected Values of Chemical Thermodynamic Properties. Tables for the Lanthanide (Rare Earth) Elements (Elements 62 through 76 in the Standard Order of Arrangement) — Richard H. Schumm, Donald D. Wagman, Sylvia M. Bailey, William H. Evans, and Vivian B. Parker. NBS Tech. Note **270**, 84p. (1973).

Magnetic solids

Analysis of Specific Heat Data in the Critical Region of Magnetic Solids — F. J. Cook. J Phys Chem Ref Data **2**, 11(1973).

Metal oxides

Handbook of Phase Diagrams of Silicate Systems, Vol. II. Metal-Oxygen Compounds in Silicate Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, I. A. Bondar', and Yu. P. Udalov. Russian Transl. Springfield, VA: NTIS, 329p. (1972). TT 71-50041, A15.

High Temperature Vaporization Behavior of Oxides. I. Alkali Metal Binary Oxides — R. H. Lamoreaux and D. L. Hildenbrand. J Phys Chem Ref Data **13**, 151(1984).

Thermochemical Data for Gaseous Monoxides — J. B. Pedley and E. M. Marshall. J Phys Chem Ref Data **12**, 967(1983).

Transition Metal Oxides, Crystal Chemistry, Phase Transition, and Related Aspects — C. N. R. Rao and G. V. Subba Rao. NSRDS-NBS **49**, 140p. (1974).

Metals

Computerizing Materials Data-A Workshop for the Nuclear Power Industry — John Jr. Rumble and Jack H. Westbrook. NBS Spec. Publ. **689**, 37p. (1985).

Metals and alloys

Applications of Phase Diagrams, Proceedings of a Workshop Held at the National Bureau of Standards, Gaithersburg, Maryland, January 10-12, 1977, Volumes 1 and 2 — Gesina Cynthia Carter, editor(s). NBS Spec. Publ. **496**, 1622p. (1978).

Bulletin of Alloy Phase Diagrams — Joanne Murray, editor(s) and American Society for Metals. Bull Alloy Phase Diag **3**, Metals Park, OH: American Society for Metals, 130p. (1982), ISBN: 01970216.

Contributions to the Data on Theoretical Metallurgy, XVI. Thermodynamic Properties of Nickel and Its Inorganic Compounds — Alla D. Mah and Louis B. Pankratz. U.S. Bur Mines Bull **668**, Springfield, VA: NTIS, 125p. (1976). U.S. Bureau of Mines Bulletin 668, A06.

Critical Analysis of Heat-Capacity Data and Evaluation of Thermodynamic Properties of Ru, Ph, Pd, Ir, and Pt from 0 to 300 K. A Survey of the Literature Data on Osmium — George T. Furukawa, Martin L. Reilly, and John S. Gallagher. J Phys Chem Ref Data **3**, 163(1974).

Critical Analysis of the Heat-Capacity Data of the Literature and Evaluation of Thermodynamic Properties of Copper, Silver, and Gold from 0 to 300 K — George T. Furukawa, W. G. Saba, and Martin L. Reilly. NSRDS-NBS **18**, 49p. (1968).

Critical Surveys of Data Sources: Mechanical Properties of Metals — R. B. Gavert, Robert L. Moore, and John H. Westbrook. NBS Spec. Publ. **396**, 90p. (1974).

Critical Surveys of Data Sources: Corrosion of Metals — Ronald Diegle and Walter K. Boyd. NBS Spec. Publ. **396**, 42p. (1976).

Critical Surveys of Data Sources: Electrical and Magnetic Properties of Metals — M. J. Carr, R. B. Gavert, Robert L. Moore, H. W. Wawrousek, and John H. Westbrook. NBS Spec. Publ. **396**, 96p. (1976).

Diffusion Rate Data and Mass Transport Phenomena in Copper Systems — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. INCRA Monograph V, New York: International Copper Research Association, Inc., 322p. (1977).

Diffusion Rate Data and Mass Transport Phenomena for Copper Systems, Part II — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. INCRA Monograph **VIII**, New York: International Copper Research Association, Inc., 701p. (1982).

Diffusion in Copper and Copper Alloys, Part I. Volume and Surface Self-Diffusion in Copper — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **2**, 643(1973).

Diffusion in Copper and Copper Alloys, Part II. Copper-Silver and Copper-Gold Systems — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **3**, 527(1974).

Diffusion in Copper and Copper Alloys, Part III. Diffusion in Systems Involving Elements of the Groups IA, IIA, IIIB, IVB, VB, and VIIB — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **4**, 177(1975).

Diffusion in Copper and Copper Alloys, Part IV. Diffusion in Systems Involving Elements of Group VIII — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **5**, 103(1976).

Diffusion in Copper and Copper Alloys, Part V. Diffusion in Systems Involving Elements of Group VA — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **6**, 1(1977).

Elastic Properties of Metals and Alloys, I. Iron, Nickel, and Iron-Nickel Alloys — Hassell M. Ledbetter and R. P. Reed. J Phys Chem Ref Data **2**, 531(1973).

Elastic Properties of Metals and Alloys, II. Copper — Hassell M. Ledbetter and E. R. Naimon. J Phys Chem Ref Data **3**, 897(1974).

Elastic Properties of Zinc: A Compilation and a Review — Hassell M. Ledbetter. J Phys Chem Ref Data **6**, 1181(1977).

Electrical Resistivity of Aluminum and Manganese — P. D. Desai, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1131(1984).

Electrical Resistivity of Selected Elements — P. D. Desai, T. K. Chu, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1069(1984).

Electrical Resistivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, T. N. Havill, R. H. Bogaard, R. A. Matula, S. G. Oh, and H. M. James. J Phys Chem Ref Data **12**, 183(1983).

Electrical Resistivity of Vanadium and Zirconium — P. D. Desai, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1097(1984).

Handbook of Hardness Data — G. V. Samsonov and A. A. Ivan'ko. Russian Transl. Springfield, VA: NTIS, 69p. (1970). TT 70-50177, A04.

Heat Capacity of Reference Materials: Cu and W — G. K. White and S. J. Collocott. J Phys Chem Ref Data **13**, 1251(1984).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format — Douglas Mann and U.S. National Bureau of Standards. Boulder, CO: U.S. National Bureau of Standards, Cryogenic Division, 11p. (1977).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, First Supplement — Douglas Mann and U.S. National Bureau of Standards. **Suppl. 1**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1978).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, Second Supplement — Douglas Mann and U.S. National Bureau of Standards. **Suppl. 2**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1980).

Metallic Shifts in NMR: A Review of the Theory and Comprehensive Critical Data Compilation of Metallic Materials — Gesina Cynthia Carter, Lawrence H. Bennett, and Daniel J. Kahan. Prog Mater Sci, Oxford, New York: Pergamon Press, 2350p. (1977), ISBN: 0-08-02114-7.

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Silver Systems — Y. Austin Chang, Daniel Goldberg, and Joachim P. Neumann. J Phys Chem Ref Data **6**, 621(1977).

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Metal Systems — Y. Austin Chang, Joachim P. Neumann, A. Mikula, and Daniel Goldberg. INCRA Monograph **VI**, New York: International Copper Research Association, Inc., 702p. (1979).

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Sulfur-Metal Systems — Y. Austin Chang, Joachim P. Neumann, and U. V. Choudary. INCRA Monograph **VII**, New York: International Copper Research Association, Inc., 191p. (1979).

Physical Properties Data Compilations Relevant to Energy Storage. V. Mechanical Properties Data on Alloys for Use in Flywheels — Hassell M. Ledbetter. NSRDS-NBS **61**, 42p. (1982).

Selected Thermodynamic Values and Phase Diagrams for Copper and Some of Its Binary Alloys — Ralph Hultgren and Pramond D. Desai. INCRA Monograph I, New York: International Copper Research Association, Inc., 204p. (1973).

Selected Values of the Thermodynamic Properties of Binary Alloys — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, and Kenneth K. Kelley. Metals Park, OH: American Society for Metals, 1435p. (1973).

Soft X-Ray Emission Spectra of Metallic Solids: Critical Review of Selected Systems — Archie J. McAlister, Ronald C. Dobbyn, John R. Cuthill, and M. L. Williams. J Phys Chem Ref Data **2**, 411(1973).

Soft X-Ray Emission Spectra of Metallic Solids: Critical Review of Selected Systems and Annotated Spectral Index — Archie J. McAlister, Ronald C. Dobbyn, John R. Cuthill, and M. L. Williams. NBS Spec. Publ. **369**, 180p. (1974).

Surface Ionization — E. Ya. Zandberg and N. L. Ionov. Russian Transl. Springfield, VA: NTIS, 364p. (1971). TT 70-50148, A16.

The NBS Alloy Data Center: Author Index — Gesina Cynthia Carter, Daniel J. Kahan, Lawrence H. Bennett, John R. Cuthill, and Ronald C. Dobbyn. OSRD Bibl. **70-2**, 413p. (1970).

The NBS Alloy Data Center: Function, Bibliographic System, Related Data Centers, and Reference Books — Gesina Cynthia Carter, Lawrence H. Bennett, John R. Cuthill, and Daniel J. Kahan. NBS Tech. Note **464**, 163p. (1968).

The NBS Alloy Data Center: Permuted Materials Index — Gesina Cynthia Carter, Daniel J. Kahan, Lawrence H. Bennett, John R. Cuthill, and Ronald C. Dobbyn. NBS Spec. Publ. **324**, 683p. (1971).

Thermal Conductivity of Selected Materials — Robert W. Powell, Cho Y. Ho, and Peter E. Liley. NSRDS-NBS **8**, 68p. (1966).

Thermal Conductivity of Selected Materials, Part 2 — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. NSRDS-NBS **16**, 146p. (1968).

Thermal Conductivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, S. G. Oh, and T. N. Havill. J Phys Chem Ref Data **7**, 959(1978).

Thermal Conductivity of the Elements — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. J Phys Chem Ref Data **1**, 279(1972).

Thermal Conductivity of the Elements: A Comprehensive Review — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. J Phys Chem Ref Data **3**, Suppl. 1(1974).

Thermodynamic Properties of Copper-Slag Systems — Carlos Diaz. INCRA Monograph **III**, New York: International Copper Research Association, Inc., 178p. (1976).

Minerals

Crystal Data Determinative Tables, Third Edition Volume 2: Inorganic Compounds — Joseph D. H. Donnay and Helen M. Ondik. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1748p. (1973).

Crystal Data Determinative Tables, Third Edition Volume 4. Inoganic Compounds — Joseph D. H. Donnay, Helen M. Ondik, and Alan D. Mighell. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1308p. (1978).

Feasiblility Study: Compilation and Evaluation of Properties Data for Basalt, Granite, Tuff, and Shale — Lewis H. Gevantman. NBSIR **81-2217**, 259p. (1981).

Handbook of Thermodynamic Data on Geological Substances — G. B. Naumov, B. N. Ryzhenko, and I. L. Khodakovsky. Russian Transl. Springfield, VA: NTIS, 340p. (1974). TT 73-53051 or PB226 722, A15.

Physical Properties Data for Basalt — Lewis H. Gevantman. NBSIR **82-2587**, 751p. (1982).

Noble gases

A Survey of Electron Swarm Data — J. Dutton. J Phys Chem Ref Data **4**, 577(1975).

Energy Levels of Neutral Helium (^{4}He I) — William C. Martin. J Phys Chem Ref Data **2**, 257(1973).

Equilibrium and Transport Properties of the Noble Gases and Their Mixtures at Low Density — Joseph Kestin, K. Knierim, E. A. Mason, B. Najafi, S. T. Ro, and M. Waldman. J Phys Chem Ref Data **13**, 229(1984).

First Spectra of Neon, Argon, and Xenon 136 in the 1.2-4.0 μm Region — Curtis J. Humphreys. J Phys Chem Ref Data **2**, 519(1973).

Gaseous Diffusion Coefficients — T. R. Marrero and E. A. Mason. J Phys Chem Ref Data **1**, 1(1972).

Interactive Fortran Program to Calculate Thermophysical Properties of 6 Fluids NBS Standard Reference Database 6, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

NBS Chemical Thermodynamics Database NBS Standard Reference Database 2, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

Scaled Equation of State Parameters for Gases in the Critical Region — J. M. H. Levelt Sengers, W. L. Greer, and Jan V. Sengers. J Phys Chem Ref Data **5**, 1(1976).

The Calculated Thermodynamic Properties of Superfluid Helium-4 — James S. Brooks and Russell J. Donnelly. J Phys Chem Ref Data **6**, 51(1977).

The Viscosity and Thermal Conductivity Coefficients of Dilute Argon, Krypton, and Xenon — Howard J. M. Hanley. J Phys Chem Ref Data **2**, 619(1973).

The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Argon, Krypton, Xenon, Nitrogen, and Oxygen — Howard J. M. Hanley, Robert D. McCarty, and W. M. Haynes. J Phys Chem Ref Data **3**, 979(1974).

Thermodynamic Properties of Argon from the Triple Point to 300 K at Pressures to 1000 Atmospheres — A. L. Gosman, Robert D. McCarty, and Jerome G. Hust. NSRDS-NBS **27**, 153p. (1969).

Thermodynamic Properties of Helium-4 from 2 to 1500 K at Pressures to 10^8 Pa — Robert D. McCarty. J Phys Chem Ref Data **2**, 923(1973).

Thermodynamic and Thermophysical Properties of Helium — A. F. Alyab'ev, N. V. Tsederberg, V. N. Popov, and N. A. Morozova. Russian Transl. Springfield, VA: NTIS, 260p. (1971). TT 70-50096, A12.

Thermophysical Properties of Fluids. I. Argon, Ethylene, Parahydrogen, Nitrogen, Nitrogen Trifluoride, and Oxygen — Ben A. Younglove. J Phys Chem Ref Data **11**, Suppl. 1(1982).

Organic compounds

A Correlation of the Existing Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethane — Howard J. M. Hanley, K. E. Gubbins, and S. Murad. J Phys Chem Ref Data **6**, 1167(1977).

A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Propane — Paul M. Holland, Howard J. M. Hanley, K. E. Gubbins, and J. M. Haile. J Phys Chem Ref Data **8**, 559(1979).

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Ethane — M. J. Hiza, R. C. Miller, and Arthur J. Kidnay. J Phys Chem Ref Data **8**, 799(1979).

An Analysis of Coexistence Curve Data for Several Binary Liquid Mixtures Near Their Critical Points — A. Stein and G. F. Allen. J Phys Chem Ref Data **2**, 439(1973).

Critical Review of Hydrolysis of Organic Compounds in Water Under Environmental Conditions — W. Mabey and T. Mill. J Phys Chem Ref Data **7**, 383(1978).

Crystal Data Determinative Tables, Third Edition, Volume 6. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, editor(s). **6**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Crystal Data Space-Group Tables — Alan D. Mighell, Helen M. Ondik, and Bettijoyce Breen Molino. J Phys Chem Ref Data **6**, 675(1977).

Crystal Data Determinative Tables, Third Edition Volume 1: Organic Compounds — Joseph D. H. Donnay and Helen M. Ondik. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 855p. (1972).

Crystal Data Determinative Tables, Third Edition Volume 3. Organic Compounds — Joseph D. H. Donnay, Olga Kennard, David G. Watson, and John R. Rodgers. Swarthmore, PA: JCPDS-International Center for Diffraction Data, 748p. (1978).

Definition of Recommended Values of Certain Thermodynamic Properties for the Ketones — Buford D. Smith and Ol Muthu. **NBSIR 84-2811**, 162p. (1983).

Densities of Liquid $CH_{4-a}X_a$ (X=Br,I) and $CH_{4-(a+b+c+d)}F_aCl_bBr_cI_d$ Halomethanes — Arvind P. Kudchadker, Shanti A. Kudchadker, P. R. Patnaik, and P. P. Mishra. J Phys Chem Ref Data **7**, 425(1978).

EPA/NIH Mass Spectral Data Base, Supplement 1 — Stephen R. Heller and G. W. A. Milne. NSRDS-NBS **63**, Suppl. 1(1980).

EPA/NIH Mass Spectral Data Base, Supplement 2 — Stephen R. Heller, G. W. A. Milne, and Lewis H. Gevantman. NSRDS-NBS **63**, Suppl. 2(1983).

EPA/NIH Mass Spectral Data Base, Volume 1. Molecular Weights 30-186; Volume 2. Molecular Weights 16-273; Volume 3. Molecular Weights 273-381; Volume 4. Molecular Weights 381-1674 — Stephen R. Heller and G. W. A. Milne. NSRDS-NBS **63**, 1,2,3,4(1978).

Energetics of Gaseous Ions — Henry M. Rosenstock, Keith Draxl, B. W. Steiner, and John T. Herron. J Phys Chem Ref Data **6**, Suppl. 1(1977).

Erratum: A Correlation of the Existing Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethane — Howard J. M. Hanley, K. E. Gubbins, and S. Murad. J Phys Chem Ref Data **10**, 799(1981).

Heat Capacities and Entropies of Organic Compounds in the Condensed Phase — Eugene S. Domalski, William H. Evans, and Elizabeth D. Hearing. J Phys Chem Ref Data **13**, Suppl. 1(1984).

Ideal Gas Thermodynamic Properties of Ethane and Propane — Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, 427(1973).

Ideal Gas Thermodynamic Properties of Eight Chloro- and Fluoromethanes — A. S. Rodgers, Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **3**, 117(1974).

Ideal Gas Thermodynamic Properties of Six Chloroethanes — Jing Chao, A. S. Rodgers, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **3**, 141(1974).

Ideal Gas Thermodynamic Properties of Ethylene and Propylene — Jing Chao and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 251(1975).

Ideal Gas Thermodynamic Properties of Six Fluoroethanes — S. S. Chen, A. S. Rodgers, Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 441(1975).

Ideal Gas Thermodynamic Properties of the Eight Bromo- an Iodomethanes — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data **4**, 457(1975).

Ideal Gas Thermodynamic Properties and Isomerization of n-Butane and Isobutane — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 859(1975).

Ideal Gas Thermodynamic Properties of Propanone and 2-Butanone — Jing Chao and Bruno J. Zwolinski. J Phys Chem Ref Data **5**, 319(1976).

Ideal Gas Thermodynamic Properties of Six Chlorofluoromethanes — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **5**, 571(1976).

Ideal Gas Thermodynamic Properties of Methanoic and Ethanoic Acids — Jing Chao and Bruno J. Zwolinski. J Phys Chem Ref Data **7**, 363(1978).

Ideal Gas Thermodynamic Properties of Phenol and Cresols — Shanti A. Kudchadker, Arvind P. Kudchadker, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **7**, 417(1978).

Ideal Gas Thermodynamic Properties of $CH_{4-(a+b+c+d)}F_aCl_bBr_cI_d$ Halomethanes — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data **7**, 1285(1978).

Ideal Gas Thermodynamic Properties of Selected Bromoethanes and Iodoethane — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data **8**, 519(1979).

Ideal Gas Thermodynamic Properties of CH_3, CD_3, CD_4, C_2D_2, C_2D_4, C_2D_6, C_2H_6, $CH_3N_2CH_3$, and $CD_3N_2CD_3$ — Krishna M. Pamidimukkala, David Rogers, and Gordon B. Skinner. J Phys Chem Ref Data **11**, 83(1982).

Kinetic Data on Gas Phase Unimolecular Reactions — Sidney W. Benson and Harry E. O'Neal. NSRDS-NBS **21**, 645p. (1970).

NBS Crystal Data Identification File NBS Standard Reference Database 3, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Lease agreements obtained from JCPDS 1601 Park Ln Swarthmore PA (215)328-9400.

NMR Spectral Data: A Compilation of Aromatic Proton Chemical Shifts in Mono- and Di-Substituted Benzene — B. L. Shapiro and L. E. Mohrmann. J Phys Chem Ref Data **6**, 919(1977).

Physical and Thermodynamic Properties of Aliphatic Alcohols — Randolph C. Wilhoit and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, Suppl. 1(1973).

Provisional Thermodynamic Functions of Propane from 85 to 700 K at Pressures to 700 Bar — Robert D. Goodwin. NBSIR **77-860**, 240p. (1977).

Rate Constants for the Reactions of Atomic Oxygen ($O\ ^3P$) with Organic Compounds in the Gas Phase — John T. Herron and Robert E. Huie. J Phys Chem Ref Data **2**, 467(1973).

Selected Values of Electric Dipole Moments for Molecules in the Gas Phase — Ralph D. Nelson, Jr., David R. Lide, Jr., and Arthur A. Maryott. NSRDS-NBS **10**, 49p. (1967).

Selected Values of Heats of Combustion and Heats of Formation of Organic Compounds Containing the Elements C, H, N, O, P, and S — Eugene S. Domalski. J Phys Chem Ref Data **1**, 221(1972).

Table of Recommended Rate Constants for Chemical Reactions Occurring in Combustion — Francis Westley. NBSIR **79-1941**, 169p. (1979).

Tables of Bimolecular Gas Reactions — Aubrey F. Trotman-Dickenson and G. S. Milne. NSRDS-NBS **9**, 129p. (1967).

Tables of Molecular Vibrational Frequencies, Part 1 — Takehiko Shimanouchi. NSRDS-NBS **6**, 56p. (1967).

Tables of Molecular Vibrational Frequencies, Part 2 — Takehiko Shimanouchi. NSRDS-NBS **11**, 38p. (1967).

Tables of Molecular Vibrational Frequencies, Part 3 — Takehiko Shimanouchi. NSRDS-NBS **17**, 39p. (1968).

Tables of Molecular Vibrational Frequencies, Consolidated Volume I — Takehiko Shimanouchi. NSRDS-NBS **39**, 167p. (1972).

Tables of Molecular Vibrational Frequencies, Part 9 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **7**, 1323(1978).

Tables of Molecular Vibrational Frequencies, Part 10 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **9**, 1149(1980).

The Surface Tension of Pure Liquid Compounds — Joseph J. Jasper. J Phys Chem Ref Data **1**, 841(1972).

The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Methane — Howard J. M. Hanley, W. M. Haynes, and Robert D. McCarty. J Phys Chem Ref Data **6**, 597(1977).

Thermal Conductivity of Selected Materials — Robert W. Powell, Cho Y. Ho, and Peter E. Liley. NSRDS-NBS **8**, 68p. (1966).

Thermal Conductivity of Selected Materials, Part 2 — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. NSRDS-NBS **16**, 146p. (1968).

Thermodynamic Properties of Normal and Deuterated Methanols — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **6**, 105(1977).

Thermodynamic Properties of Normal and Deuterated Naphthalenes — S. S. Chen, Shanti A. Kudchadker, and Randolph C. Wilhoit. J Phys Chem Ref Data **8**, 527(1979).

Thermodynamic and Thermophysical Properties of Combustion Products, Volume II. Oxygen-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl. Springfield, VA: NTIS, 505p. (1975). TT 74-50032, A22.

Vapor Pressure of Coal Chemicals — Jing Chao, C. T. Lin, and T. H. Chung. J Phys Chem Ref Data **12**, 1033(1983).

Vapor Pressures and Boiling Points of Selected Halomethanes — Arvind P. Kudchadker, Shanti A. Kudchadker, R. P. Shukla, and P. R. Patnaik. J Phys Chem Ref Data **8**, 499(1979).

Polymers

Computerizing Materials Data-A Workshop for the Nuclear Power Industry — John Jr. Rumble and Jack H. Westbrook. NBS Spec. Publ. **689**, 37p. (1985).

Critical Review of Vibrational Data and Force Field Constants for Polyethylene — John Barnes and Bruno Fanconi. J Phys Chem Ref Data **7**, 1309(1978).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. I. Selenium — Umesh Gaur, Hua-Cheng Shu, Aspy Metha, and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 89(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. II. Polyethylene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 119(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. III. Polyoxides — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 1001(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IV. Polypropylene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 1051(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. V. Polystyrene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **11**, 313(1982).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VI. Acrylic Polymers — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **11**, 1065(1982).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VII. Other Carbon Backbone Polymers — Umesh Gaur, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 29(1983).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VIII. Polyesters and Polyamides — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 65(1983).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IX. Final Group of Aromatic and Inorganic Polymers — Umesh Gaur, Suk-fai Lau, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 91(1983).

Infrared Spectra of Plasticizers and Other Additives — Clara D. Craver and Coblentz Society; Joint Committee on Atomic and Molecular Physical Data., Kirkwood, MO: The Coblentz Society, 152p. (1977).

Salts

Activity and Osmotic Coefficients of Aqueous Alkali Metal Nitrites — Bert R. Staples. J Phys Chem Ref Data **10**, 765(1981).

Erratum: Molten Salts Data: Diffusion Coefficients in Single and Multi-Component Salt Systems — George J. Janz and Narottam P. Bansal. J Phys Chem Ref Data **13**, 305(1984).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: The Alkaline Earth Metal Halides — Robert N. Goldberg and Ralph L. Nuttall. J Phys Chem Ref Data **7**, 263(1978).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Iron Chloride and the Bi-Univalent Compounds of Nickel and Cobalt — Robert N. Goldberg, Ralph L. Nuttall, and Bert R. Staples. J Phys Chem Ref Data **8**, 923(1979).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Bi-Univalent Compounds of Lead, Copper, Manganese, and Uranium — Robert N. Goldberg. J Phys Chem Ref Data **8**, 1005(1979).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Thirty-Six Uni-Bivalent Electrolytes — Robert N. Goldberg. J Phys Chem Ref Data **10**, 671(1981).

High Temperature Properties and Decomposition of Inorganic Salts, Part 1. Sulfates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **7**, 38p. (1966).

High Temperature Properties and Decomposition of Inorganic Salts, Part 2. Carbonates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **30**, 27p. (1969).

High Temperature Properties and Decomposition of Inorganic Salts, Part 3. Nitrates and Nitrites — Kurt H. Stern. J Phys Chem Ref Data **1**, 747(1972).

High Temperature Properties and Decomposition of Inorganic Salts, Part 4. Oxy-Salts of the Halogens — Kurt H. Stern. J Phys Chem Ref Data **3**, 481(1974).

Molten Salts Data As Reference Standards for Density, Surface Tension, Viscosity and Electrical Conductance: KNO_3 and NaCl — George J. Janz. J Phys Chem Ref Data **9**, 791(1980).

Molten Salts Data: Diffusion Coefficients in Single and Multi-Component Salt Systems — George J. Janz and Narottam P. Bansal. J Phys Chem Ref Data **11**, 505(1982).

Molten Salts: Volume 1. Electrical Conductance, Density, and Viscosity Data — George J. Janz, F. W. Dampier, G. R. Lakshminarayanan, P. K. Lorenz, and Reginald P. T. Tomkins. NSRDS-NBS **15**, 140p. (1968).

Molten Salts: Volume 2. Section 1. Electrochemistry of Molten Salts. Gibbs Free Energies and Excess Free Energies from Equilibrium-Type Cells, Section 2. Surface Tension Data — George J. Janz, Chr. G. M. Dijkhuis, G. R. Lakshminarayanan, Reginald P. T. Tomkins, and J. Wong. NSRDS-NBS **28**, 116p. (1968).

Molten Salts: Volume 5, Part 1. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz and Reginald P. T. Tomkins. J Phys Chem Ref Data **9**, 831(1980).

Molten Salts: Volume 5, Part 2. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Vicosity and Surface Tension Data — George J. Janz and Reginald P. T. Tomkins. J Phys Chem Ref Data **12**, 591(1983).

Molten Salts: Volume 3, Nitrates, Nitrites, and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Ursula Krebs, H. F. Siegenthaler, and Reginald P. T. Tomkins. J Phys Chem Ref Data **1**, 581(1972).

Molten Salts: Volume 4, Part 1, Fluorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, G. L. Gardner, Ursula Krebs, and Reginald P. T. Tomkins. J Phys Chem Ref Data **3**, 1(1974).

Molten Salts: Volume 4, Part 2, Chlorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., G. L. Gardner, Ursula Krebs, and S. K. Singer. J Phys Chem Ref Data **4**, 871(1975).

Molten Salts: Volume 4, Part 3, Bromides and Mixtures, Iodides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., and S. K. Singer. J Phys Chem Ref Data **6**, 409(1977).

Molten Salts: Volume 4, Part 4, Mixed Halide Melts. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, and Carolyn B. Allen. J Phys Chem Ref Data **8**, 125(1979).

Osmotic Coefficients and Mean Activity Coefficients of Uni-Univalent Electrolytes in Water at 25 °C — Walter J. Hamer and Yung-Chi Wu. J Phys Chem Ref Data **1**, 1047(1972).

Physical Properties Data Compilations Relevant to Energy Storage. I. Molten Salts: Eutectic Data — George J. Janz, Carolyn B. Allen, J. R. Downey, Jr., and Reginald P. T. Tomkins. NSRDS-NBS **61**, 244p. (1978).

Physical Properties Data Compilations Relevant to Energy Storage. II. Molten Salts: Data on Single and Multi-Component Systems — George J. Janz, Carolyn B. Allen, Narottam P. Bansal, R. M. Murphy, and Reginald P. T. Tomkins. NSRDS-NBS **61**, 420p. (1979).

Physical Properties Data Compilations Relevant to Energy Storage. IV. Molten Salts: Data on Additional Single and Multi-Component Salt Systems — George J. Janz and Reginald P. T. Tomkins. NSRDS-NBS **61**, 870p. (1981).

Refractive Index of Alkali Halides and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **5**, 329(1976).

Revised Values of the Osmotic Coefficients and Mean Activity Coefficients of Sodium Nitrate in Water at 25°C (Comments) — Yung-Chi Wu and Walter J. Hamer. J Phys Chem Ref Data **9**, 513(1980).

Tables of the Dynamic and Kinematic Viscosity of Aqueous KCl Solutions in the Temperature Range 25-150°C and the Pressure Range 0.1-35 MPa — Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia. J Phys Chem Ref Data **10**, 57(1981).

Tables of the Dynamic and Kinematic Viscosity of Aqueous NaCl Solutions in the Temperature Range 20-150°C and the Pressure Range 0.1-35 MPa — Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia. J Phys Chem Ref Data **10**, 71(1981).

The Activity and Osmotic Coefficients of Aqueous Calcium Chloride at 298.15 K — Bert R. Staples and Ralph L. Nuttall. J Phys Chem Ref Data **6**, 385(1977).

The Solubility of Some Sparingly Soluble Lead Salts: An Evaluation of the Solubility in Water and Aqueous Electrolyte Solution — H. Lawrence Clever and Francis J. Johnston. J Phys Chem Ref Data **9**, 751(1980).

Volumetric Properties of Aqueous Sodium Chloride Solutions — P. S. Z. Rogers and Kenneth S. Pitzer. J Phys Chem Ref Data **11**, 15(1982).

Semiconductors

Compilation of Energy Band Gaps in Elemental and Binary Compound Semiconductors and Insulators — W. H. Strehlow and E. L. Cook. J Phys Chem Ref Data **2**, 163(1973).

Handbook of Hardness Data — G. V. Samsonov and A. A. Ivan'ko. Russian Transl. Springfield, VA: NTIS, 69p. (1970). TT 70-50177, A04.

Recommemded Values for the Thermal Expansivity of Silicon from 0 to 1000 K — C. A. Swenson. J Phys Chem Ref Data **12**, 179(1983).

Survey of Superconductive Materials and Critical Evaluation of Selected Properties — Benjamin W. Roberts. J Phys Chem Ref Data **5**, 581(1976).

Superconductors

Properties of Selected Superconductive Materials, 1978 Supplement — Benjamin W. Roberts. NBS Tech. Note **983**, 103p. (1978).

Survey of Superconductive Materials and Critical Evaluation of Selected Properties — Benjamin W. Roberts. J Phys Chem Ref Data **5**, 581(1976).

Surfactants

Critical Micelle Concentrations of Aqueous Surfactant Systems — Pasupati Mukerjee and Karol J. Mysels. NSRDS-NBS **36**, 222p. (1971).

Transition elements

Atomic Transition Probabilities for Forbidden Lines of the Iron Group Elements (A Critical Data Compilation for Selected Lines) — Melvin W. Smith and Wolfgang L. Wiese. J Phys Chem Ref Data **2**, 85(1973).

Atomic Transition Probabilities for Scandium and Titanium (A Critical Data Compilation of Allowed Lines) — Wolfgang L. Wiese and Jeffrey R. Fuhr. J Phys Chem Ref Data **4**, 263(1975).

Atomic Transition Probabilities for Vanadium, Chromium, and Manganese (A Critical Data Compilation of Allowed Lines) — S. M. Younger, Jeffrey R. Fuhr, Georgia A. Martin, and Wolfgang L. Wiese. J Phys Chem Ref Data **7**, 495(1978).

Atomic Transition Probabilities for Iron, Cobalt, Nickel: A Critical Data Compilation of Allowed Lines — Jeffrey R. Fuhr, Georgia A. Martin, Wolfgang L. Wiese, and S. M. Younger. J Phys Chem Ref Data **10**, 305(1981).

Electrical Resistivity of Copper, Gold, Palladium, and Silver — R. A. Matula. J Phys Chem Ref Data **8**, 1147(1979).

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

Energy Levels of Cobalt, Co I through Co XXVII — Jack Sugar and Charles H. Corliss. J Phys Chem Ref Data **10**, 1097(1981).

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

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

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

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

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

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

Refractive Index of ZnS, ZnSe, and ZnTe and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **13**, 103(1984).

Transition Metal Oxides, Crystal Chemistry, Phase Transition, and Related Aspects — C. N. R. Rao and G. V. Subba Rao. NSRDS-NBS **49**, 140p. (1974).

Water

A Fundamental Equation of State for Heavy Water — P. G. Hill, R. D. Chris MacMillan, and V. Lee. J Phys Chem Ref Data **11**, 1(1982).

A Thermodynamic Surface for Water: The Formulation and Computer Program — Lester Haar, John S. Gallagher, and George S. Kell. NBSIR **81-2253**, 38p. (1981).

An Annotated Compilation and Appraisal of Electron Swarm Data in Electronegative Gases — Jean W. Gallagher, Earl C. Beaty, J. Dutton, and L. C. Pitchford. J Phys Chem Ref Data **12**, 109(1983).

An Improved Representative Equation for the Dynamic Viscosity of Water Substance — J. T. R. Watson, R. S. Basu, and Jan V. Sengers. J Phys Chem Ref Data **9**, 1255(1980).

Atlas of the High Temperature Water Vapor Spectrum in the 3000 to 4000 cm^{-1} Region — A. S. Pine, M. J. Coulombe, C. Camy-Peyret, and J-M. Flaud. J Phys Chem Ref Data **12**, 413(1983).

Effects of Isotopic Composition, Temperature, Pressure, and Dissolved Gases on the Density of Liquid Water — George S. Kell. J Phys Chem Ref Data **6**, 1109(1977).

Equilibrium Properties of Fluid Mixtures, 2. A Bibliography of Experimental Data on Selected Fluids — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller. New York: IFI/Plenum, 258p. (1982), ISBN: 0-306-6602-4.

Erratum: A Fundamental Equation of State for Heavy Water — P. G. Hill, R. D. Chris MacMillan, and V. Lee. J Phys Chem Ref Data **12**, 1065(1983).

Erratum: Viscosity of Water Substance - New International Formulation and Its Background — A. Nagashima. J Phys Chem Ref Data **12**, 403p. (1983).

Heavy Water, Thermophysical Properties — V. A. Kirillin, Ya. Z. Kazavchinskii, P. M. Kessel'man, S. L. Rivkin, A. E. Sheindlin, E. E. Shpil'rain, V. V. Sychev, and D. L. Timrot. Russian Transl. Springfield, VA: NTIS, 273p. (1971). TT 70-50094, A12.

International Tables of the Surface Tension of Water — N. B. Vargaftik, B. N. Volkov, and L. D. Voljak. J Phys Chem Ref Data **12**, 817(1983).

Ion Product of Water Substance, 0 - 1000°C, 1 - 10,000 Bars. New International Formulation and Its Background — William L. Marshall and E. U. Franck. J Phys Chem Ref Data **10**, 295(1981).

Isochoric Heat Capacity of Water and Steam — M. P. Vukalovich, Kh. I. Amirkhanov, G. V. Stepanov, and B. G. Alibekov. Russian Transl. Springfield, VA: NTIS, 215p. (1974). TT 72-52002, A10.

Microwave Spectra of Molecules of Astrophysical Interest, V. Water Vapor — Frank C. De Lucia, Paul Helminger, and William H. Kirchhoff. J Phys Chem Ref Data **3**, 211(1974).

Molecular Form Factors and Photon Coherent Scattering Cross Sections of Water — L. R. M. Morin. J Phys Chem Ref Data **11**, 1091(1982).

NBS/NRC Steam Tables, Thermodynamic and Transport Properties and Computer Programs for Vapor and Liquid States of Water — Lester Haar, John S. Gallagher, and George S. Kell. New York: Hemisphere Press, 320p. (1984).

Problems with the Prandtl Number of Steam — Jan V. Sengers, R. S. Basu, B. Kamgar-Parsi, and Joseph Kestin. Mech Eng **104**, New York, NY, 60p. (1982).

Representative Equations for the Thermal Conductivity of Water Substance — Jan V. Sengers, J. T. R. Watson, R. S. Basu, B. Kamgar-Parsi, and R. C. Hendricks. J Phys Chem Ref Data **13**, 893(1984).

Representative Equations for the Viscosity of Water Substance — Jan V. Sengers and B. Kamgar-Parsi. J Phys Chem Ref Data **13**, 185(1984).

Saturation States of Heavy Water — P. G. Hill and R. D. Chris MacMillan. J Phys Chem Ref Data **9**, 735(1980).

Static Dielectric Constant of Water and Steam — M. Uematsu and E. U. Franck. J Phys Chem Ref Data **9**, 1291(1980).

Thermodynamic Properties of D_2O in the Critical Region — B. Kamgar-Parsi, J. M. H. Levelt Sengers, and Jan V. Sengers. J Phys Chem Ref Data **12**, 513(1983).

Thermodynamic Properties of Steam in the Critical Region — J. M. H. Levelt Sengers, B. Kamgar-Parsi, F. W. Balfour, and Jan V. Sengers. J Phys Chem Ref Data **12**, 1(1983).

Thermophysical Properties of Fluid H_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 175(1984).

Thermophysical Properties of Fluid D_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 602(1984).

Transport Properties of Liquid and Gaseous D_2O over a Wide Range of Temperature and Pressure — N. Matsunaga and A. Nagashima. J Phys Chem Ref Data **12**, 933(1983).

Viscosity of Liquid Water in the Range -8°C to 150°C — Joseph Kestin, Mordechai Sokolov, and William A. Wakeham. J Phys Chem Ref Data **7**, 941(1978).

Viscosity of Water Substance - New International Formulation and Its Background — A. Nagashima. J Phys Chem Ref Data **6**, 1133(1977).

Absorption coefficient, spectral

See: Transition probabilities for atoms and molecules
Photon cross section

Activation energies of chemical reactions

See: Rate constants of chemical reactions

Activity coefficients

A Bibliography of Sources of Experimental Data Leading to Activity or Osmotic Coefficients for Polyvalent Electrolytes in Aqueous Solution — Robert N. Goldberg, Bert R. Staples, Ralph L. Nuttall, and R. Arbuckle. NBS Spec. Publ. **485**, 57p. (1977).

A Report on Thermodynamic Data for Desulfurization Processes — Vivian B. Parker, Bert R. Staples, Thomas L. Jobe, Jr., and David B. Neumann. NBSIR **81-2345**, 89p. (1981).

Activity and Osmotic Coefficients of Aqueous Alkali Metal Nitrites — Bert R. Staples. J Phys Chem Ref Data **10**, 765(1981).

Activity and Osmotic Coefficients of Aqueous Sulfuric Acid at 298.15 K — Bert R. Staples. J Phys Chem Ref Data **10**, 779(1981).

Computer Programs for the Evaluation of Activity and Osmotic Coefficients — Bert R. Staples and Ralph L. Nuttall. NBS Tech. Note **928**, 60p. (1976).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: The Alkaline Earth Metal Halides — Robert N. Goldberg and Ralph L. Nuttall. J Phys Chem Ref Data **7**, 263(1978).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Iron Chloride and the Bi-Univalent Compounds of Nickel and Cobalt — Robert N. Goldberg, Ralph L. Nuttall, and Bert R. Staples. J Phys Chem Ref Data **8**, 923(1979).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Bi-Univalent Compounds of Lead, Copper, Manganese, and Uranium — Robert N. Goldberg. J Phys Chem Ref Data **8**, 1005(1979).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Bi-Univalent Compounds of Zinc, Cadmium, and Ethylene Bis(-Trimethylammonium) Chloride and Iodide — Robert N. Goldberg. J Phys Chem Ref Data **10**, 1(1981).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Thirty-Six Uni-Bivalent Electrolytes — Robert N. Goldberg. J Phys Chem Ref Data **10**, 671(1981).

Osmotic Coefficients and Mean Activity Coefficients of Uni-Univalent Electrolytes in Water at 25 °C — Walter J. Hamer and Yung-Chi Wu. J Phys Chem Ref Data **1**, 1047(1972).

Revised Values of the Osmotic Coefficients and Mean Activity Coefficients of Sodium Nitrate in Water at 25°C (Comments) — Yung-Chi Wu and Walter J. Hamer. J Phys Chem Ref Data **9**, 513(1980).

The Activity and Osmotic Coefficients of Aqueous Calcium Chloride at 298.15 K — Bert R. Staples and Ralph L. Nuttall. J Phys Chem Ref Data **6**, 385(1977).

Theoretical Mean Activity Coefficients of Strong Electrolytes in Aqueous Solutions from 0 to 100 °C — Walter J. Hamer. NSRDS-NBS **24**, 271p. (1968).

Thermodynamic Properties of Aqueous Sodium Chloride Solutions — Kenneth S. Pitzer, J. Christopher Peiper, and R. H. Busey. J Phys Chem Ref Data **13**, 1(1984).

Appearance potentials

A Bibliography on Ion-Molecule Reactions. January 1900 to March 1966 — F. N. Harllee, Henry M. Rosenstock, and John T. Herron. NBS Tech. Note **291**, 40p. (1966).

Energetics of Gaseous Ions — Henry M. Rosenstock, Keith Draxl, B. W. Steiner, and John T. Herron. J Phys Chem Ref Data **6**, Suppl. 1(1977).

Ion Energetics Measurements, Supplement I. 1971-1973 — Henry M. Rosenstock, D. Sims, S. S. Schroyer, and W. J. Webb. NSRDS-NBS **66**, 380p. (1980).

Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions — Joseph L. Franklin, J. G. Dillard, Henry M. Rosenstock, John T. Herron, Keith Draxl, and Frank H. Field. NSRDS-NBS **26**, 289p. (1969).

Ionization Potential and Appearance Potential Measurements, 1971-1981 — Rhoda D. Levin and Sharon G. Lias. NSRDS-NBS **71**, 634p. (1982).

Atomic energy levels and spectra

A Critical Review of the Stark Widths and Shifts of Spectral Lines from Non-Hydrogenic Atoms — N. Konjević and J. R. Roberts. J Phys Chem Ref Data **5**, 209(1976).

A Multiplet Table of Astrophysical Interest, Revised Edition, Part I. Table of Multiplets, Part II. Finding List of All Lines in the Table of Multiplets — Charlotte E. Moore. NSRDS-NBS **40**, 261p. (1972).

An Ultraviolet Multiplet Table, Section 1. The Spectra of Hydrogen through Vanadium — Charlotte E. Moore. NBS Circular **488**, 78p. (1950).

An Ultraviolet Multiplet Table, Section 2. The Spectra of Chromium through Niobium — Charlotte E. Moore. NBS Circular **488**, 115p. (1952).

An Ultraviolet Multiplet Table, Section 3. The Spectra of Molybdenum to Lanthanum and Hafnium to Radium — Charlotte E. Moore. NBS Circular **488**, 94p. (1962).

An Ultraviolet Multiplet Table, Section 4. Finding List for Spectra of the Elements Hydrogen to Niobium (Z = 1 to 41) — Charlotte E. Moore. NBS Circular **488**, 65p. (1962).

An Ultraviolet Multiplet Table, Section 5. Finding List for Spectra of the Elements Molybdenum to Lanthanum (Z = 42 to 57), Hafnium to Radium (Z = 72 to 88) — Charlotte E. Moore. NBS Circular **488**, 30p. (1962).

Atomic Energy Levels as Derived from the Analyses of Optical Spectra, Volume I. ^{1}H to ^{23}V — Charlotte E. Moore. NSRDS-NBS **35**, 358p. (1971).

Atomic Energy Levels as Derived from the Analyses of Optical Spectra, Volume II. ^{24}Cr to ^{41}Nb — Charlotte E. Moore. NSRDS-NBS **35**, 263p. (1971).

Atomic Energy Levels as Derived from the Analysis of Optical Spectra, Volume III. ^{42}Mo to ^{57}La, ^{72}Hf to ^{89}Ac — Charlotte E. Moore. NSRDS-NBS **35**, 289p. (1971).

Atomic Energy Levels - The Rare-Earth Elements, the Spectra of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu — William C. Martin, Romuald Zalubas, and Lucy Hagan. NSRDS-NBS **60**, 422p. (1978).

Bibliography on the Analyses of Optical Atomic Spectra. Section 1. ^{1}H-^{23}V — Charlotte E. Moore. NBS Spec. Publ. **306**, 80p. (1968).

Bibliography on the Analyses of Optical Atomic Spectra. Section 2. ^{24}Cr-^{41}Nb — Charlotte E. Moore. NBS Spec. Publ. **306**, 57p. (1969).

Bibliography on the Analyses of Optical Atomic Spectra. Section 3. ^{42}Mo-^{57}La and ^{72}Hf-^{89}Ac — Charlotte E. Moore. NBS Spec. Publ. **306**, 37p. (1969).

Bibliography on the Analyses of Optical Atomic Spectra. Section 4. ^{57}La-^{71}Lu and ^{89}Ac-^{99}Es — Charlotte E. Moore. NBS Spec. Publ. **306**, 48p. (1969).

Bibliography on Atomic Energy Levels and Spectra, July 1968 through June 1971 — Lucy Hagan and William C. Martin. NBS Spec. Publ. **363**, 109p. (1972).

Bibliography on Atomic Energy Levels and Spectra, July 1971 through June 1975 — Lucy Hagan. NBS Spec. Publ. **363**, Suppl. 1(1977).

Bibliography on Atomic Energy Levels and Spectra, July 1975 through June 1979 — Romuald Zalubas and Arlene Albright. NBS Spec. Publ. **363**, Suppl. 2(1980).

Bibliography on Atomic Line Shapes and Shifts (1899 through March 1972) — Jeffrey R. Fuhr, Wolfgang L. Wiese, and Larry J. Roszman. NBS Spec. Publ. **366**, 165 p. (1974).

Bibliography on Atomic Line Shapes and Shifts (April 1972 through June 1973) — Jeffrey R. Fuhr, Larry J. Roszman, and Wolfgang L. Wiese. NBS Spec. Publ. **366**, Suppl. 1(1974).

Bibliography on Atomic Line Shapes and Shifts (July 1973 through May 1975) — Jeffrey R. Fuhr, Georgia A. Martin, and Beverly J. Specht. NBS Spec. Publ. **366**, Suppl. 2(1975).

Bibliography on Atomic Line Shapes and Shifts (June 1975 through June 1978) — Jeffrey R. Fuhr, Beverly J. Miller, and Georgia A. Martin. NBS Spec. Publ. **366**, Suppl. 3(1978).

Binding Energies in Atomic Negative Ions — H. Hotop and W. C. Lineberger. J Phys Chem Ref Data **4**, 539(1975).

Energy Levels of Neutral Helium (^{4}He I) — William C. Martin. J Phys Chem Ref Data **2**, 257(1973).

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

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

Energy Levels of One-Electron Atoms — Glen W. Erickson. J Phys Chem Ref Data **6**, 831(1977).

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

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

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

Energy levels of Aluminum, Al I through Al XIII — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **8**, 817(1979).

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

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

Energy Levels of Magnesium, Mg I through Mg XII — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **9**, 1(1980).

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

Energy Levels of Sodium, Na I through Na XI — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **10**, 153(1981).

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

Energy Levels of Cobalt, Co I through Co XXVII — Jack Sugar and Charles H. Corliss. J Phys Chem Ref Data **10**, 1097(1981).

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

Energy Levels of Silicon, Si I through Si XIV — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **12**, 323(1983).

Experimental Stark Widths and Shifts for Non-Hydrogenic Spectral Lines of Ionized Atoms (A Critical Review and Tabulation of Selected Data) — N. Konjević and Wolfgang L. Wiese. J Phys Chem Ref Data **5**, 259(1976).

Experimental Stark Widths and Shifts for Spectral Lines of Neutral Atoms (A Critical Review of Selected Data for the Period 1976 to 1982) — N. Konjević, M. S. Dimitrijević, and Wolfgang L. Wiese. J Phys Chem Ref Data **13**, 619(1984).

Experimental Stark Widths and Shifts for Spectral Lines of Positive Ions (A Critical Review and Tabulation of Selected Data for the Period 1976 to 1982) — N. Konjević, M. S. Dimitrijević, and Wolfgang L. Wiese. J Phys Chem Ref Data **13**, 649(1984).

First Spectra of Neon, Argon, and Xenon 136 in the 1.2-4.0 μm Region — Curtis J. Humphreys. J Phys Chem Ref Data **2**, 519(1973).

Ground Levels and Ionization Potentials for Lanthanide and Actinide Atoms and Ions — William C. Martin, Lucy Hagan, Joseph Reader, and Jack Sugar. J Phys Chem Ref Data **3**, 771(1974).

Ionization Potentials and Ionization Limits Derived from the Analyses of Optical Spectra — Charlotte E. Moore. NSRDS-NBS **34**, 22p. (1970).

Partial Grotrian Diagrams of Astrophysical Interest — Charlotte E. Moore and Paul W. Merrill. NSRDS-NBS **23**, 65p. (1968).

Recommended Atomic Electron Binding Energies, 1s to $6p_{3/2}$, for the Heavy Elements, Z = 84 to 103 — F. T. Porter and M. S. Freedman. J Phys Chem Ref Data **7**, 1267(1978).

Reference Wavelengths from Atomic Spectra in the Range 5Å to 25000Å — Victor Kaufman and Bengt Edlén. J Phys Chem Ref Data **3**, 825(1974).

Resonances in Electron Impact on Atoms and Diatomic Molecules — George J. Schulz. NSRDS-NBS **50**, 120p. (1973).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; Si II, Si III, Si IV — Charlotte E. Moore. NSRDS-NBS **3**, 35p. (1965).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition: B. Multiplet Tables; Si I — Charlotte E. Moore. NSRDS-NBS **3**, 22p. (1967).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; C I, C II, C III — Charlotte E. Moore. NSRDS-NBS **3**, 73p. (1970).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; N IV, N V, N VI, N VII — Charlotte E. Moore. NSRDS-NBS **3**, 46p. (1971).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; N I, N II, N III — Charlotte E. Moore. NSRDS-NBS **3**, 80p. (1975).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; H I, D, T — Charlotte E. Moore. NSRDS-NBS **3**, 32p. (1972).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; O I — Charlotte E. Moore. NSRDS-NBS **3**, 33p. (1976).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; O VI, O VII , O VIII — Charlotte E. Moore. NSRDS-NBS **3**, 31p. (1979).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels - Second Edition; B. Multiplet Tables; O V — Charlotte E. Moore. NSRDS-NBS **3**, 21p. (1980).

Selected Tables of Atomic Spectra: A. Atomic Energy levels - Second Edition; B. Multiplet Tables; O IV — Charlotte E. Moore. NSRDS-NBS **3**, 21p. (1983).

Selected Tables of Atomic Spectra: A. Atomic Energy Levels -f Second Edition; B. Multiplet Tables; O III — Charlotte E. Moore. NSRDS-NBS **3**, ...p. (1985).

Soft X-Ray Emission Spectra of Metallic Solids: Critical Review of Selected Systems and Annotated Spectral Index — Archie J. McAlister, Ronald C. Dobbyn, John R. Cuthill, and M. L. Williams. NBS Spec. Publ. **369**, 180p. (1974).

Tables of Line Spectra of the Elements, Part 1. Wavelengths and Intensities, Part 2. Transition Probabilities — Joseph Reader, Charles H. Corliss, Wolfgang L. Wiese, and Georgia A. Martin. NSRDS-NBS **68**, 415p. (1980).

Tables of Atomic Spectral Lines for the 10 000 Å to 40 000 Å Region — Michael Outred. J Phys Chem Ref Data **7**, 1(1978).

The First Spectrum of Hafnium (Hf I) — William F. Meggers and Charlotte E. Moore. NBS Monograph **153**, 123p. (1976).

The Spectrum and Energy Levels of the Neutral Atom of Boron (B I) — G. A. Odintzova and A. R. Striganov. J Phys Chem Ref Data **8**, 63(1979).

X-Ray Wavelengths and X-Ray Atomic Energy Levels — Joyce A.. Bearden and A. F. Burr. NSRDS-NBS **14**, 66p. (1967).

Atomic form factor

Atomic Form Factors, Incoherent Scattering Functions, and Photon Scattering Cross Sections — John H. Hubbell, W. J. Veigele, E. A. Briggs, R. T. Brown, D. T. Cromer, and R. J. Howerton. J Phys Chem Ref Data **4**, 471(1975).

Molecular Form Factors and Photon Coherent Scattering Cross Sections of Water — L. R. M. Morin. J Phys Chem Ref Data **11**, 1091(1982).

Small-Angle Rayleigh Scattering of Photons at High Energies: Tabulations of Relativisitic HFS Modified Atomic Form Factors — D

Schaupp, M. Schumacher, F. Smend, P. Rullhusen, and John H. Hubbell. J Phys Chem Ref Data **12**, 467(1983).

Atomic weight

Isotopic Abundances and Atomic Weights of the Elements — Paul De Bièvre, Marc Gallet, Norman E. Holden, and I. Lynus Barnes. J Phys Chem Ref Data **13**, 809(1984).

Attenuation coefficients for x-rays and gamma rays

Comparison of Theoretical and Experimental Photoeffect Data, 0.1 keV to 1.5 MeV — John H. Hubbell and W. J. Veigele. NBS Tech. Note **901**, 47p. (1976).

Molecular Form Factors and Photon Coherent Scattering Cross Sections of Water — L. R. M. Morin. J Phys Chem Ref Data **11**, 1091(1982).

Photon Cross Sections, Attenuation Coefficients, and Energy Absorption Coefficients from 10 keV to 100 GeV — John H. Hubbell. NSRDS-NBS **29**, 85p. (1969).

Band gap

See: Energy bands of solids

Band spectra

See: Electronic molecular spectra

Binding energy

See: Atomic energy levels and spectra
Bond dissociation energy

Boiling point

A Critical Review of Henry's Law Constants for Chemicals of Environmental Interest — Donald Mackay and Wan Ying Shiu. J Phys Chem Ref Data **10**, 1175(1981).

Definition of Recommended Values of Certain Thermodynamic Properties for the Ketones — Buford D. Smith and Ol Muthu. NBSIR **84-2811**, 162p. (1983).

High Temperature Properties and Decomposition of Inorganic Salts, Part 1. Sulfates — Kurt H. Stern and E. L. Weise. NSRDS-NBS 7, 38p. (1966).

JANAF Thermochemical Tables, Second Edition — Daniel R. Stull and H. Prophet. NSRDS-NBS **37**, 1141p. (1971).

JANAF Thermochemical Tables, 1974 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, A. T. Hu, H. Prophet, A. N. Syverud, and L. C. Walker. J Phys Chem Ref Data **3**, 311(1974).

JANAF Thermochemical Tables, 1975 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, H. Prophet, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **4**, 1(1975).

JANAF Thermochemical Tables, 1978 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data 7, 793(1978).

JANAF Thermochemical Tables, 1982 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, J. R. Downey, Jr., R. A. McDonald, A. N. Syverud, and E. A. Valenzuela. J Phys Chem Ref Data **11**, 695(1982).

Physical and Thermodynamic Properties of Aliphatic Alcohols — Randolph C. Wilhoit and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, Suppl. 1(1973).

Thermodynamic and Thermophysical Properties of Combustion Products, Volume III. Oxygen- and Air-Based Propellant — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 648p. (1975). TT 75-50007, A26.

Vapor Pressures and Boiling Points of Selected Halomethanes — Arvind P. Kudchadker, Shanti A. Kudchadker, R. P. Shukla, and P. R. Patnaik. J Phys Chem Ref Data **8**, 499(1979).

Bond dissociation energy (see also Thermodynamic properties)

Bond Dissociation Energies in Simple Molecules — B. DeB. Darwent. NSRDS-NBS **31**, 48p. (1970).

Compendium of ab initio Calculations of Molecular Energies and Properties — Morris Krauss. NBS Tech. Note **438**, 139p. (1967).

The Band Spectrum of Carbon Monoxide — Paul H. Krupenie. NSRDS-NBS **5**, 87p. (1966).

The Spectrum of Molecular Oxygen — Paul H. Krupenie. J Phys Chem Ref Data **1**, 423(1972).

The Spectrum of Molecular Nitrogen — Alf Lofthus and Paul H. Krupenie. J Phys Chem Ref Data **6**, 113(1977).

Thermochemical Data for Gaseous Monoxides — J. B. Pedley and E. M. Marshall. J Phys Chem Ref Data **12**, 967(1983).

Bulk modulus

See: Elastic constants

Cell constants

See: Lattice constants

Charge exchange cross section

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ions with Atoms. I. Hydrogen Atom-Fully Stripped Ion Systems — R. K. Janev, B. H. Bransden, and Jean W. Gallagher. J Phys Chem Ref Data **12**, 829(1983).

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ions with Atoms. II. Hydrogen Atom-Partially Stripped Ions Systems — Jean W. Gallagher, B. H. Bransden, and R. K. Janev. J Phys Chem Ref Data **12**, 873(1983).

Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ion with Atoms. III. Non-Hydrogenic Target Atoms — R. K. Janev and Jean W. Gallagher. J Phys Chem Ref Data **13**, 1199(1984).

Combustion, heat of

See: Thermodynamic properties
Heat of combustion

Compressibility factor

See: Equation of state

Compton scattering cross section

Atomic Form Factors, Incoherent Scattering Functions, and Photon Scattering Cross Sections — John H. Hubbell, W. J. Veigele, E. A Briggs, R. T. Brown, D. T. Cromer, and R. J. Howerton. J Phys Chem Ref Data **4**, 471(1975).

Comparison of Theoretical and Experimental Photoeffect Data, 0.1 keV to 1.5 MeV — John H. Hubbell and W. J. Veigele. NBS Tech. Note **901**, 47p. (1976).

Photon Cross Sections, Attenuation Coefficients, and Energy Absorption Coefficients from 10 keV to 100 GeV — John H. Hubbell. NSRDS-NBS **29**, 85p. (1969).

Conductance

See: Electrical conductance

Conductivity, electrical

See: Electrical resistivity

Conductivity, thermal

See: Thermal conductivity

Consolute point

An Analysis of Coexistence Curve Data for Several Binary Liquid Mixtures Near Their Critical Points — A. Stein and G. F. Allen. J Phys Chem Ref Data **2**, 439(1973).

Corrosion rate

Critical Surveys of Data Sources: Corrosion of Metals — Ronald Diegle and Walter K. Boyd. NBS Spec. Publ. **396**, 42p. (1976).

Critical micelle concentration

Critical Micelle Concentrations of Aqueous Surfactant Systems — Pasupati Mukerjee and Karol J. Mysels. NSRDS-NBS **36**, 222p. (1971).

Critical supersaturation ratio

Selected Values of Critical Supersaturation for Nucleation of Liquids from the Vapor — G. M. Pound. J Phys Chem Ref Data **1**, 119(1972).

Critical temperature, pressure (see also Equation of state)

An Analysis of Coexistence Curve Data for Several Binary Liquid Mixtures Near Their Critical Points — A. Stein and G. F. Allen. J Phys Chem Ref Data **2**, 439(1973).

Analysis of Specific Heat Data in the Critical Region of Magnetic Solids — F. J. Cook. J Phys Chem Ref Data **2**, 11(1973).

Definition of Recommended Values of Certain Thermodynamic Properties for the Ketones — Buford D. Smith and Ol Muthu. NBSIR **84-2811**, 162p. (1983).

Heavy Water, Thermophysical Properties — V. A. Kirillin, Ya. Z. Kazavchinskii, P. M. Kessel'man, S. L. Rivkin, A. E. Sheindlin, E. E. Shpil'rain, V. V. Sychev, and D. L. Timrot. Russian Transl., Springfield, VA: NTIS, 273p. (1971). TT 70-50094, A12.

Properties of Selected Superconductive Materials, 1978 Supplement — Benjamin W. Roberts. NBS Tech. Note **983**, 103p. (1978).

Scaled Equation of State Parameters for Gases in the Critical Region — J. M. H. Levelt Sengers, W. L. Greer, and Jan V. Sengers. J Phys Chem Ref Data **5**, 1(1976).

Thermophysical Properties of Gaseous and Liquid Methane — V. A. Zagoruchenko and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 251p. (1970). TT 70-50097, A12.

Thermodynamic Properties of Steam in the Critical Region — J. M. H. Levelt Sengers, B. Kamgar-Parsi, F. W. Balfour, and Jan V. Sengers. J Phys Chem Ref Data **12**, 1(1983).

Thermodynamic Properties of D_2O in the Critical Region — B. Kamgar-Parsi, J. M. H. Levelt Sengers, and Jan V. Sengers. J Phys Chem Ref Data **12**, 513(1983).

Cross section

See: **Charge exchange cross section**
Electron collision cross section
Photon cross section
Rayleigh scattering cross section

Crystal structure

Behavior of the Elements at High Pressures — John Francis Cannon. J Phys Chem Ref Data **3**, 781(1974).

Behavior of the AB-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **6**, 1205(1977).

Behavior of the AB_2-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **11**, 1005(1982).

Crystal Structure Transformations in Binary Halides — C. N. R. Rao and M. Natarajan. NSRDS-NBS **41**, 57p. (1972).

Crystal Structure Transformations in Inorganic Nitrites, Nitrates, and Carbonates — C. N. R. Rao, Brahm Prakash, and M. Natarajan. NSRDS-NBS **53**, 55p. (1975).

Crystal Structure Transformations in Inorganic Sulfates, Phosphates, Perchlorates, and Chromates — C. N. R. Rao and Brahm Prakash. NSRDS-NBS **56**, 37p. (1975).

Crystal Data Determinative Tables, Third Edition Volume 1: Organic Compounds — Joseph D. H. Donnay and Helen M. Ondik., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 855p. (1972).

Crystal Data Determinative Tables, Third Edition Volume 2: Inorganic Compounds — Joseph D. H. Donnay and Helen M. Ondik., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1748p. (1973).

Crystal Data Determinative Tables, Third Edition Volume 3. Organic Compounds — Joseph D. H. Donnay, Olga Kennard, David G. Watson, and John R. Rodgers., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 748p. (1978).

Crystal Data Determinative Tables, Third Edition Volume 4. Inorganic Compounds — Joseph D. H. Donnay, Helen M. Ondik, and Alan D. Mighell., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1308p. (1978).

Crystal Data Determinative Tables, Third Edition, Volume 5. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, John R. Rodgers, editor(s). **5**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Crystal Data Determinative Tables, Third Edition, Volume 6. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, editor(s). **6**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Crystal Data Space-Group Tables — Alan D. Mighell, Helen M. Ondik, and Bettijoyce Breen Molino. J Phys Chem Ref Data **6**, 675(1977).

Electronic Absorption and Internal and External Vibrational Data of Atomic and Molecular Ions Doped in Alkali Halide Crystals — Suresh C. Jain, A. V. R. Warrier, and Suresh K. Agarwal. NSRDS-NBS **52**, 55p. (1974).

Handbook of Phase Diagrams of Silicate Systems, Vol. I. Binary Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, V. V. Lapin, N. N. Kurtseva, J. Schmorak, editor(s). Russian Transl., Springfield, VA: NTIS, 730p. (1970). TT 71-50040, A26.

Handbook of Phase Diagrams of Silicate Systems, Vol. II. Metal-Oxygen Compounds in Silicate Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, I. A. Bondar', and Yu. P. Udalov. Russian Transl., Springfield, VA: NTIS, 329p. (1972). TT 71-50041, A15.

NBS Crystal Data Identification File NBS Standard Reference Database 3, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Lease agreements obtained from JCPDS 1601 Park Ln Swarthmore PA (215)328-9400.

NBS* AIDS80: A FORTRAN Program for Crystallographic Data Evaluation — Alan D. Mighell, C. R. Hubbard, and Judy K. Stalick. NBS Tech. Note **1141**, 54p. (1981).

Properties of Selected Superconductive Materials, 1978 Supplement — Benjamin W. Roberts. NBS Tech. Note **983**, 103p. (1978).

Space Groups and Lattice Complexes — W. Fisher, Hans Burzlaff, Erwin Hellner, and Joseph D. H. Donnay. NBS Monograph **134**, 177p. (1973).

Transition Metal Oxides, Crystal Chemistry, Phase Transition, and Related Aspects — C. N. R. Rao and G. V. Subba Rao. NSRDS-NBS **49**, 140p. (1974).

Debye characteristic temperature

Critical Analysis of the Heat-Capacity Data of the Literature and Evaluation of Thermodynamic Properties of Copper, Silver, and Gold from 0 to 300 K — George T. Furukawa, W. G. Saba, and Martin L. Reilly. NSRDS-NBS **18**, 49p. (1968).

Critical Analysis of Heat-Capacity Data and Evaluation of Thermodynamic Properties of Ru, Ph, Pd, Ir, and Pt from 0 to 300 K. A Survey of the Literature Data on Osmium — George T. Furukawa, Martin L. Reilly, and John S. Gallagher. J Phys Chem Ref Data **3**, 163(1974).

Elastic Properties of Metals and Alloys, I. Iron, Nickel, and Iron-Nickel Alloys — Hassell M. Ledbetter and R. P. Reed. J Phys Chem Ref Data **2**, 531(1973).

Survey of Superconductive Materials and Critical Evaluation of Selected Properties — Benjamin W. Roberts. J Phys Chem Ref Data **5**, 581(1976).

Density

A Computer Program for the Prediction of Viscosity and Thermal Conductivity in Hydrocarbon Mixtures — James F. Ely and Howard J. M. Hanley. NBS Tech. Note **1039**, 83p. (1981).

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Ethane — M. J. Hiza, R. C. Miller, and Arthur J. Kidnay. J Phys Chem Ref Data **8**, 799(1979).

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Propane — R. C. Miller, Arthur J. Kidnay, and M. J. Hiza. J Phys Chem Ref Data **9**, 721(1980).

Critical Evaluation of Vapor-Liquid Equilibrium, Heat of Mixing, and Volume Change of Mixing Data. General Procedures — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 941(1982).

Crystal Data Determinative Tables, Third Edition Volume 1: Organic Compounds — Joseph D. H. Donnay and Helen M. Ondik., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 855p. (1972).

Crystal Data Determinative Tables, Third Edition Volume 2: Inorganic Compounds — Joseph D. H. Donnay and Helen M. Ondik., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1748p. (1973).

Crystal Data Determinative Tables, Third Edition Volume 3. Organic Compounds — Joseph D. H. Donnay, Olga Kennard, David G. Watson, and John R. Rodgers., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 748p. (1978).

Crystal Data Determinative Tables, Third Edition Volume 4. Inorganic Compounds — Joseph D. H. Donnay, Helen M. Ondik, and Alan D. Mighell., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1308p. (1978).

Crystal Data Determinative Tables, Third Edition, Volume 5. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, John R. Rodgers, editor(s). **5**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Crystal Data Determinative Tables, Third Edition, Volume 6. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, editor(s). **6**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Definition of Recommended Values of Certain Thermodynamic Properties for the Ketones — Buford D. Smith and Ol Muthu. NBSIR **84-2811**, 162p. (1983).

Densities of Liquid $CH_{4-a}X_a$ (X=Br,I) and $CH_{4-(a+b+c+d)}F_aCl_bBr_cI_d$ Halomethanes — Arvind P. Kudchadker, Shanti A. Kudchadker, P. R. Patnaik, and P. P. Mishra. J Phys Chem Ref Data **7**, 425(1978).

Effects of Isotopic Composition, Temperature, Pressure, and Dissolved Gases on the Density of Liquid Water — George S. Kell. J Phys Chem Ref Data **6**, 1109(1977).

Electrolytic Conductance and the Conductances of the Halogen Acids in Water — Walter J. Hamer and H. J. DeWane. NSRDS-NBS **33**, 37p. (1970).

Equilibrium Properties of Fluid Mixtures, A Bibliography on Fluids of Cryogenic Interest — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller., New York: IFI/Plenum, 166p. (1975), ISBN: 0-306-6601-6.

Equilibrium Properties of Fluid Mixtures, 2. A Bibliography of Experimental Data on Selected Fluids — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller., New York: IFI/Plenum, 258p. (1982), ISBN: 0-306-6602-4.

Erratum: Viscosity of Water Substance - New International Formulation and Its Background — A. Nagashima. J Phys Chem Ref Data **12**, 403p. (1983).

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1151(1982).

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 395(1983).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. III. Polyoxides — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 1001(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IV. Polypropylene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 1051(1981).

Heavy Water, Thermophysical Properties — V. A. Kirillin, Ya. Z. Kazavchinskii, P. M. Kessel'man, S. L. Rivkin, A. E. Sheindlin, E. E. Shpil'rain, V. V. Sychev, and D. L. Timrot. Russian Transl., Springfield, VA: NTIS, 273p. (1971). TT 70-50094, A12.

High Temperature Properties and Decomposition of Inorganic Salts, Part 1. Sulfates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **7**, 38p. (1966).

High Temperature Properties and Decomposition of Inorganic Salts, Part 2. Carbonates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **30**, 27p. (1969).

High Temperature Properties and Decomposition of Inorganic Salts, Part 3. Nitrates and Nitrites — Kurt H. Stern. J Phys Chem Ref Data **1**, 747(1972).

High Temperature Properties and Decomposition of Inorganic Salts, Part 4. Oxy-Salts of the Halogens — Kurt H. Stern. J Phys Chem Ref Data **3**, 481(1974).

Interactive FORTRAN Program to Calculate Thermophysical Properties of Seven Fluids — Ben A. Younglove. NBS Tech. Note **1048**, 56p. (1982).

Interactive Fortran Program to Calculate Thermophysical Properties of 6 Fluids NBS Standard Reference Database 6, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format — Douglas Mann and U.S. National Bureau of Standards., Boulder, CO: U.S. National Bureau of Standards, Cryogenic Division, 11p. (1977).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, First Supplement — Douglas Mann and U.S. National Bureau of Standards. **Suppl. 1**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1978).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, Second Supplement — Douglas Mann and U.S. National Bureau of Standards. **Suppl. 2**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1980).

Liquid Densities of Oxygen, Nitrogen, Argon, and Parahydrogen — Hans M. Roder, Robert D. McCarty, and V. J. Johnson. NBS Tech. Note **361**, 1972(1973).

Molten Salts: Volume 1. Electrical Conductance, Density, and Viscosity Data — George J. Janz, F. W. Dampier, G. R. Lakshminarayanan, P. K. Lorenz, and Reginald P. T. Tomkins. NSRDS-NBS **15**, 140p. (1968).

Molten Salts: Volume 2. Section 1. Electrochemistry of Molten Salts. Gibbs Free Energies and Excess Free Energies from Equilibrium-Type Cells, Section 2. Surface Tension Data — George J. Janz, Chr. G. M. Dijkhuis, G. R. Lakshminarayanan, Reginald P. T. Tomkins, and J. Wong. NSRDS-NBS **28**, 116p. (1968).

Molten Salts: Volume 3, Nitrates, Nitrites, and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Ursula Krebs, H. F. Siegenthaler, and Reginald P. T. Tomkins. J Phys Chem Ref Data **1**, 581(1972).

Molten Salts: Volume 4, Part 1, Fluorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, G. L. Gardner, Ursula Krebs, and Reginald P. T. Tomkins. J Phys Chem Ref Data **3**, 1(1974).

Molten Salts: Volume 4, Part 2, Chlorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., G. L. Gardner, Ursula Krebs, and S. K. Singer. J Phys Chem Ref Data **4**, 871(1975).

Molten Salts: Volume 4, Part 3, Bromides and Mixtures, Iodides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., and S. K. Singer. J Phys Chem Ref Data **6**, 409(1977).

Molten Salts: Volume 4, Part 4, Mixed Halide Melts. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, and Carolyn B. Allen. J Phys Chem Ref Data **8**, 125(1979).

Molten Salts Data As Reference Standards for Density, Surface Tension, Viscosity and Electrical Conductance: KNO_3 and NaCl — George J. Janz. J Phys Chem Ref Data **9**, 791(1980).

Molten Salts: Volume 5, Part 1. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz and Reginald P. T. Tomkins. J Phys Chem Ref Data **9**, 831(1980).

Molten Salts: Volume 5, Part 2. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Vicosity and Surface Tension Data — George J. Janz and Reginald P. T. Tomkins. J Phys Chem Ref Data **12**, 591(1983).

NBS Chemical Thermodynamics Database NBS Standard Reference Database 2, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

NBS Crystal Data Identification File NBS Standard Reference Database 3, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Lease agreements obtained from JCPDS 1601 Park Ln Swarthmore PA (215)328-9400.

Phase Behavior in Binary and Multicomponent Systems at Elevated Pressures: n-Pentane and Methane-n-Pentane — Virginia M. Berry and Bruce H. Sage. NSRDS-NBS **32**, 79p. (1970).

Physical Properties Data Compilations Relevant to Energy Storage. V. Mechanical Properties Data on Alloys for Use in Flywheels — Hassell M. Ledbetter. NSRDS-NBS **61**, 42p. (1982).

Physical and Thermodynamic Properties of Aliphatic Alcohols — Randolph C. Wilhoit and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, Suppl. 1(1973).

Pressure, Volume, Temperature Relations of Ethylene — Donald R. Douslin and Roland H. Harrison. J Chem Thermody **76**, New York, London:, 301p. (1976).

Properties of Liquid and Solid Hydrogen — B. N. Esel'son, Y. P. Blagoi, V.N. Grigor'ev, V. G. Manzhelii, S. A. Mikhailenko, and N. P. Neklyudov. Russian Transl., Springfield, VA: NTIS, 126p. (1971). TT 70-50179, A07.

The Critical-Region Equation of State of Ethene and the Effect of Small Impurities — J. R. Hastings, J. M. H. Levelt Sengers, and F. W. Balfour. J Chem Thermody **12**, London: Academic Press Inc., 1009p. (1980).

The Calculated Thermodynamic Properties of Superfluid Helium-4 — James S. Brooks and Russell J. Donnelly. J Phys Chem Ref Data **6**, 51(1977).

The Molar Volume (Density) of Solid Oxygen in Equilibrium with Vapor — Hans M. Roder. J Phys Chem Ref Data 7, 949(1978).

Theoretical Mean Activity Coefficients of Strong Electrolytes in Aqueous Solutions from 0 to 100 °C — Walter J. Hamer. NSRDS-NBS **24**, 271p. (1968).

Thermodynamic Properties of Argon from the Triple Point to 300 K at Pressures to 1000 Atmospheres — A. L. Gosman, Robert D. McCarty, and Jerome G. Hust. NSRDS-NBS **27**, 153p. (1969).

Thermophysical Properties of Isobutane from 114 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Tech. Note **1051**, 199p. (1982).

Thermodynamic and Related Properties of Parahydrogen from the Triple Point to 100 K at Pressures to 340 Atmospheres — Hans M. Roder, Lloyd A. Weber, and Robert D. Goodwin. NBS Monograph **94**, 116p. (1965).

Thermophysical Properties of Normal Butane from 135 to 700 K at Pressures to 70 MPa — W. M. Haynes and Robert D. Goodwin. NBS Monograph **169**, 197p. (1982).

Thermodynamic and Thermophysical Properties of Combustion Products, Volume II. Oxygen-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 505p. (1975). TT 74-50032, A22.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume III. Oxygen- and Air-Based Propellant — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 648p. (1975). TT 75-50007, A26.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume IV. Nitrogen Tetroxide-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 540p. (1976). TT 76-50007, A23.

Thermodynamic and Transport Properties of Ethylene and Propylene — I. A. Neduzhii. Russian Transl. Springfield, VA: NTIS, 206p. (1972). COM 75-11276, A10.

Thermophysical Properties of Gases and Liquids, No. 1 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 214p. (1970). TT 69-55091, A10, the translation of volumes 2, 3, and 4 have the title: Thermophysical Properties of Matter and Substances.

Thermophysical Properties of Gaseous and Liquid Methane — V. A. Zagoruchenko and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 251p. (1970). TT 70-50097, A12.

Thermophysical Properties of Matter and Substances, Volume 2 — V. A. Rabinovich. Russian Transl., Springfield, VA: NTIS, 395p. (1974). TT 72-52001, A17, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermophysical Properties of Matter and Substances, Volume 3 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 212p. (1975). TT 73-52009, A10, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermophysical Properties of Matter and Substances, Volume 4 — V. A. Rabinovich. Russian Transl., Springfield, VA: NTIS, 179p. (1975). TT 73-52029, A09, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermodynamic Properties of Nitrogen Including Liquid and Vapor Phases from 63 K to 2000 K with Pressures to 10,000 Bar — Richard T. Jacobsen and Richard B. Stewart. J Phys Chem Ref Data **2**, 757(1973).

Thermodynamic Properties of Helium-4 from 2 to 1500 K at Pressures to 10^8 Pa — Robert D. McCarty. J Phys Chem Ref Data **2**, 923(1973).

Thermodynamic Properties of Ammonia — Lester Haar and John S. Gallagher. J Phys Chem Ref Data 7, 635(1978).

Thermophysical Properties of Fluids. I. Argon, Ethylene, Parahydrogen, Nitrogen, Nitrogen Trifluoride, and Oxygen — Ben A. Younglove. J Phys Chem Ref Data **11**, Suppl. 1(1982).

Viscosity of Water Substance - New International Formulation and Its Background — A. Nagashima. J Phys Chem Ref Data 6, 1133(1977).

Volumetric Properties of Aqueous Sodium Chloride Solutions — P. S. Z. Rogers and Kenneth S. Pitzer. J Phys Chem Ref Data **11**, 15(1982).

Dielectric constant (see also Electric dipole moment of molecules)

Compendium of ab initio Calculations of Molecular Energies and Properties — Morris Krauss. NBS Tech. Note **438**, 139p. (1967).

Compilation of the Static Dielectric Constant of Inorganic Solids — K. F. Young and Hans P. R. Frederikse. J Phys Chem Ref Data **2**, 313(1973).

Crystal Structure Transformations in Inorganic Sulfates, Phosphates, Perchlorates, and Chromates — C. N. R. Rao and Brahm Prakash. NSRDS-NBS **56**, 37p. (1975).

Electrolytic Conductance and the Conductances of the Halogen Acids in Water — Walter J. Hamer and H. J. DeWane. NSRDS-NBS **33**, 37p. (1970).

Electric Conductivity of Ferroelectrics — V. M. Gurevich. Russian Transl., Springfield, VA: NTIS, 366p. (1971). TT 70-50180, A16.

Interactive Fortran Program to Calculate Thermophysical Properties of 6 Fluids NBS Standard Reference Database 6, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

NBS/NRC Steam Tables, Thermodynamic and Transport Properties and Computer Programs for Vapor and Liquid States of Water — Lester Haar, John S. Gallagher, and George S. Kell., New York: Hemisphere Press, 320p. (1984).

Static Dielectric Constant of Water and Steam — M. Uematsu and E. U. Franck. J Phys Chem Ref Data **9**, 1291(1980).

Theoretical Mean Activity Coefficients of Strong Electrolytes in Aqueous Solutions from 0 to 100 °C — Walter J. Hamer. NSRDS-NBS **24**, 271p. (1968).

Thermophysical Properties of Isobutane from 114 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Tech. Note **1051**, 199p. (1982).

Thermophysical Properties of Normal Butane from 135 to 700 K at Pressures to 70 MPa — W. M. Haynes and Robert D. Goodwin. NBS Monograph **169**, 197p. (1982).

Thermophysical Properties of Fluids. I. Argon, Ethylene, Para hydrogen, Nitrogen, Nitrogen Trifluoride, and Oxygen — Ben A. Younglove. J Phys Chem Ref Data **11**, Suppl. 1(1982).

Diffusion coefficient

A Survey of Electron Swarm Data — J. Dutton. J Phys Chem Ref Data 4, 577(1975).

An Annotated Compilation and Appraisal of Electron Swarm Data in Electronegative Gases — Jean W. Gallagher, Earl C. Beaty, J. Dutton, and L. C. Pitchford. J Phys Chem Ref Data **12**, 109(1983).

Bibliography on Properties of Defect Centers in Alkali Halides — Suresh C. Jain, S. A. Khan, H. K. Sehgal, V. K. Garg, and R. K. Jain. OSRD Bibl. **71-1**, 293p. (1971).

Diffusion Rate Data and Mass Transport Phenomena in Copper Systems — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. INCRA Monograph V, New York: International Copper Research Association, Inc., 322p. (1977).

Diffusion Rate Data and Mass Transport Phenomena for Copper Systems, Part II — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. INCRA Monograph VIII, New York: International Copper Research Association, Inc., 701p. (1982).

Diffusion in Copper and Copper Alloys, Part I. Volume and Surface Self-Diffusion in Copper — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **2**, 643(1973).

Diffusion in Copper and Copper Alloys, Part II. Copper-Silver and Copper-Gold Systems — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **3**, 527(1974).

Diffusion in Copper and Copper Alloys, Part III. Diffusion in Systems Involving Elements of the Groups IA, IIA, IIIB, IVB, VB, and VIIB — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **4**, 177(1975).

Diffusion in Copper and Copper Alloys, Part IV. Diffusion in Systems Involving Elements of Group VIII — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **5**, 103(1976).

Diffusion in Copper and Copper Alloys, Part V. Diffusion in Systems Involving Elements of Group VA — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. J Phys Chem Ref Data **6**, 1(1977).

Equilibrium and Transport Properties of the Noble Gases and Their Mixtures at Low Density — Joseph Kestin, K. Knierim, E. A. Mason, B. Najafi, S. T. Ro, and M. Waldman. J Phys Chem Ref Data **13**, 229(1984).

Erratum: Molten Salts Data: Diffusion Coefficients in Single and Multi-Component Salt Systems — George J. Janz and Narottam P. Bansal. J Phys Chem Ref Data **13**, 305(1984).

Gaseous Diffusion Coefficients — T. R. Marrero and E. A. Mason. J Phys Chem Ref Data **1**, 1(1972).

Molten Salts Data: Diffusion Coefficients in Single and Multi-Component Salt Systems — George J. Janz and Narottam P. Bansal. J Phys Chem Ref Data **11**, 505(1982).

Tables of Collision Integrals and Second Virial Coefficients for the (m,6,8) Intermolecular Potential Function — Max Klein, Howard J. M. Hanley, Francis J. Smith, and Paul M. Holland. NSRDS-NBS **47**, 161p. (1974).

Transport Properties of Liquid and Gaseous D_2O over a Wide Range of Temperature and Pressure — N. Matsunaga and A. Nagashima. J Phys Chem Ref Data **12**, 933(1983).

Diffusivity

See: **Thermal conductivity**

Dipole moment

See: **Electric dipole moment of molecules**

Dissociation energy

See: **Bond dissociation energy**

Effective mass

See: **Semiconductor properties**

Elastic constants

Elastic Properties of Metals and Alloys, I. Iron, Nickel, and Iron-Nickel Alloys — Hassell M. Ledbetter and R. P. Reed. J Phys Chem Ref Data **2**, 531(1973).

Elastic Properties of Metals and Alloys, II. Copper — Hassell M. Ledbetter and E. R. Naimon. J Phys Chem Ref Data **3**, 897(1974).

Elastic Properties of Zinc: A Compilation and a Review — Hassell M. Ledbetter. J Phys Chem Ref Data **6**, 1181(1977).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format — Douglas Mann and U.S. National Bureau of Standards., Boulder, CO: U.S. National Bureau of Standards, Cryogenic Division, 11p. (1977).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, First Supplement — Douglas Mann and U.S. National Bureau of Standards. **Suppl. 1**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1978).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, Second Supplement — Douglas Mann and U.S. National Bureau of Standards. **Suppl. 2**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1980).

Physical Properties Data Compilations Relevant to Energy Storage. V. Mechanical Properties Data on Alloys for Use in Flywheels — Hassell M. Ledbetter. NSRDS-NBS **61**, 42p. (1982).

Electric dipole moment of molecules

Compendium of ab initio Calculations of Molecular Energies and Properties — Morris Krauss. NBS Tech. Note **438**, 139p. (1967).

Microwave Spectral Tables, Volume I. Diatomic Molecules — Paul F. Wacker, M. Mizushima, J. D. Petersen, and J. R. Ballard. NBS Monograph **70**, 171p. (1964).

Microwave Spectral Tables, Volume III. Polyatomic Molecules with Internal Rotation — Paul F. Wacker, M. S. Cord, D. G. Burkhard, J. D. Petersen, and R. F. Kukol. NBS Monograph **70**, 275p. (1969).

Microwave Spectral Tables, Volume IV. Polyatomic Molecules without Internal Rotation — M. S. Cord, J. D. Petersen, M. S. Lojko, and R. H. Haas. NBS Monograph **70**, 419p. (1968).

Microwave Spectra of Molecules of Astrophysical Interest, I. Formaldehyde, Formamide, and Thioformaldehyde — Donald R. Johnson, Frank J. Lovas, and William H. Kirchhoff. J Phys Chem Ref Data **1**, 1011(1972).

Microwave Spectra of Molecules of Astrophysical Interest, II. Methylenimine — William H. Kirchhoff, Donald R. Johnson, and Frank J. Lovas. J Phys Chem Ref Data **2**, 1(1973).

Microwave Spectra of Molecules of Astrophysical Interest, III. Methanol — R. M. Lees, Frank J. Lovas, William H. Kirchhoff, and Donald R. Johnson. J Phys Chem Ref Data **2**, 205(1973).

Microwave Spectra of Molecules of Astrophysical Interest, IV. Hydrogen Sulfide — Paul Helminger, Frank C. De Lucia, and William H. Kirchhoff. J Phys Chem Ref Data **2**, 215(1973).

Microwave Spectra of Molecules of Astrophysical Interest, V. Water Vapor — Frank C. De Lucia, Paul Helminger, and William H. Kirchhoff. J Phys Chem Ref Data **3**, 211(1974).

Microwave Spectra of Molecules of Astrophysical Interest, VI. Carbonyl Sulfide and Hydrogen Cyanide — Arthur G. Maki. J Phys Chem Ref Data **3**, 221(1974).

Microwave Spectra of Molecules of Astrophysical Interest, VII. Carbon Monoxide, Carbon Monosulfide, and Silicon Monoxide — Frank J. Lovas and Paul H. Krupenie. J Phys Chem Ref Data **3**, 245(1974).

Microwave Spectra of Molecules of Astrophysical Interest, VIII. Sulfur Monoxide — Eberhard Tiemann. J Phys Chem Ref Data **3**, 259(1974).

Microwave Spectral Tables, I. Diatomic Molecules — Frank J. Lovas and Eberhard Tiemann. J Phys Chem Ref Data **3**, 609(1974).

Microwave Spectra of Molecules of Astrophysical Interest, IX. Acetaldehyde — A. Bauder, Frank J. Lovas, and Donald R. Johnson. J Phys Chem Ref Data **5**, 53(1976).

Microwave Spectra of Molecules of Astrophysical Interest, X. Isocyanic Acid — G. Winnewisser, W. H. Hocking, and M. C. L. Gerry. J Phys Chem Ref Data **5**, 79(1976).

Microwave Spectra of Molecules of Astrophysical Interest, XI. Silicon Sulfide — Eberhard Tiemann. J Phys Chem Ref Data **5**, 1147(1976).

Microwave Spectra of Molecules of Astrophysical Interest, XII. Hydroxyl Radical — Robert A. Beaudet and Robert L. Poynter. J Phys Chem Ref Data **7**, 311(1978).

Microwave Spectra of Molecules of Astrophysical Interest, XIII. Cyanoacetylene — Walter J. Lafferty and Frank J. Lovas. J Phys Chem Ref Data **7**, 441(1978).

Microwave Spectral Tables II. Triatomic Molecules — Frank J. Lovas. J Phys Chem Ref Data **7**, 1445(1978).

Microwave Spectra of Molecules of Astrophysical Interest, XIV. Vinyl Cyanide (Acrylonitrile) — M. C. L. Gerry, K. Yamada, and G. Winnewisser. J Phys Chem Ref Data **8**, 107(1979).

Microwave Spectra of Molecules of Astrophysical Interest, XV. Propyne — A. Bauer, D. Boucher, J. Burie, J. Demaison, and A. Dubrulle. J Phys Chem Ref Data **8**, 537(1979).

Microwave Spectra of Molecules of Astrophysical Interest, XVI. Methyl Formate — A. Bauder. J Phys Chem Ref Data **8**, 583(1979).

Microwave Spectra of Molecules of Astrophysical Interest, XVII. Dimethyl Ether — Frank J. Lovas, H. Lutz, and H. Dreizler. J Phys Chem Ref Data **8**, 1051(1979).

Microwave Spectra of Molecules of Astrophysical Interest. XVIII. Formic Acid — Edmond Willemot, Didier Dangoisse, Nicole Monnanteuil, and Jean Bellet. J Phys Chem Ref Data **9**, 59(1980).

Microwave Spectra of Molecules of Astrophysical Interest. XIX. Methyl Cyanide — D. Boucher, J. Burie, A. Bauer, A. Dubrulle, and J. Demaison. J Phys Chem Ref Data **9**, 659(1980).

Microwave Spectra of Molecules of Astrophysical Interest. XXI. Ethanol (C_2H_5OH) and Propionitrile (C_2H_5CN) — Frank J. Lovas. J Phys Chem Ref Data **11**, 251(1982).

Selected Values of Electric Dipole Moments for Molecules in the Gas Phase — Ralph D. Nelson, Jr., David R. Lide, Jr., and Arthur A. Maryott. NSRDS-NBS **10**, 49p. (1967).

The Band Spectrum of Carbon Monoxide — Paul H. Krupenie. NSRDS-NBS **5**, 87p. (1966).

Electrical conductance

A Bibliography of Sources of Experimental Data Leading to Thermal Properties of Binary Aqueous Electrolyte Solutions — David Smith-Magowan and Robert N. Goldberg. NBS Spec. Publ. **537**, 94p. (1979).

Drift Mobilities and Conduction Band Energies of Excess Electrons in Dielectric Liquids — Augustine O. Allen. NSRDS-NBS **58**, 23p. (1976).

Electrolytic Conductance and the Conductances of the Halogen Acids in Water — Walter J. Hamer and H. J. DeWane. NSRDS-NBS **33**, 37p. (1970).

Electric Conductivity of Ferroelectrics — V. M. Gurevich. Russian Transl., Springfield, VA: NTIS, 366p. (1971). TT 70-50180, A16.

Molten Salts: Volume 1. Electrical Conductance, Density, and Viscosity Data — George J. Janz, F. W. Dampier, G. R. Lakshminarayanan, P. K. Lorenz, and Reginald P. T. Tomkins. NSRDS-NBS **15**, 140p. (1968).

Molten Salts: Volume 3, Nitrates, Nitrites, and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Ursula Krebs, H. F. Siegenthaler, and Reginald P. T. Tomkins. J Phys Chem Ref Data **1**, 581(1972).

Molten Salts: Volume 4, Part 1, Fluorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, G. L. Gardner, Ursula Krebs, and Reginald P. T. Tomkins. J Phys Chem Ref Data **3**, 1(1974).

Molten Salts: Volume 4, Part 2, Chlorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., G. L. Gardner, Ursula Krebs, and S. K. Singer. J Phys Chem Ref Data **4**, 871(1975).

Molten Salts: Volume 4, Part 3, Bromides and Mixtures, Iodides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., and S. K. Singer. J Phys Chem Ref Data **6**, 409(1977).

Molten Salts: Volume 4, Part 4, Mixed Halide Melts. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, and Carolyn B. Allen. J Phys Chem Ref Data **8**, 125(1979).

Molten Salts Data As Reference Standards for Density, Surface Tension, Viscosity and Electrical Conductance: KNO_3 and NaCl — George J. Janz. J Phys Chem Ref Data **9**, 791(1980).

Molten Salts: Volume 5, Part 1. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz and Reginald P. T. Tomkins. J Phys Chem Ref Data **9**, 831(1980).

Molten Salts: Volume 5, Part 2. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Vicosity and Surface Tension Data — George J. Janz and Reginald P. T. Tomkins. J Phys Chem Ref Data **12**, 591(1983).

Physical Properties Data Compilations Relevant to Energy Storage. III. Engineering Properties of Single and Polycrystalline Sodium Beta and Beta" Alumina — G. R. Miller and D. G. Paquette. NSRDS-NBS **61**, 19p. (1979).

Electrical resistivity

Critical Surveys of Data Sources: Electrical and Magnetic Properties of Metals — M. J. Carr, R. B. Gavert, Robert L. Moore, H. W. Wawrousek, and John H. Westbrook. NBS Spec. Publ. **396**, 96p. (1976).

Electrical Resistivity of Alkali Elements — T. C. Chi. J Phys Chem Ref Data **8**, 339(1979).

Electrical Resistivity of Alkaline Earth Elements — T. C. Chi. J Phys Chem Ref Data **8**, 439(1979).

Electrical Resistivity of Copper, Gold, Palladium, and Silver — R. A. Matula. J Phys Chem Ref Data **8**, 1147(1979).

Electrical Resistivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, T. N. Havill, R. H. Bogaard, R. A. Matula, S. G. Oh, and H. M. James. J Phys Chem Ref Data **12**, 183(1983).

Electrical Resistivity of Selected Elements — P. D. Desai, T. K. Chu, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1069(1984).

Electrical Resistivity of Vanadium and Zirconium — P. D. Desai, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1097(1984).

Electrical Resistivity of Aluminum and Manganese — P. D. Desai, H. M. James, and Cho Y. Ho. J Phys Chem Ref Data **13**, 1131(1984).

Feasiblility Study: Compilation and Evaluation of Properties Data for Basalt, Granite, Tuff, and Shale — Lewis H. Gevantman. NBSIR **81-2217**, 259p. (1981).

Physical Properties Data Compilations Relevant to Energy Storage. III. Engineering Properties of Single and Polycrystalline Sodium Beta and Beta" Alumina — G. R. Miller and D. G. Paquette. NSRDS-NBS **61**, 19p. (1979).

Physical Properties Data Compilations Relevant to Energy Storage. IV. Molten Salts: Data on Additional Single and Multi-Component Salt Systems — George J. Janz and Reginald P. T. Tomkins. NSRDS-NBS **61**, 870p. (1981).

Physical Properties Data for Rock Salt — Lewis H. Gevantman. NBS Monograph **167**, 288p. (1981).

Physical Properties Data for Basalt — Lewis H. Gevantman. NBSIR **82-2587**, 751p. (1982).

Electron affinity

Binding Energies in Atomic Negative Ions — H. Hotop and W. C. Lineberger. J Phys Chem Ref Data **4**, 539(1975).

Energetics of Gaseous Ions — Henry M. Rosenstock, Keith Draxl, B. W. Steiner, and John T. Herron. J Phys Chem Ref Data **6**, Suppl. 1(1977).

Ion Energetics Measurements, Supplement I. 1971-1973 — Henry M. Rosenstock, D. Sims, S. S. Schroyer, and W. J. Webb. NSRDS-NBS **66**, 380p. (1980).

Electron collision cross section

Bibliography of Low Energy Electron and Photon Cross Section Data (1978) — Jean W. Gallagher and Earl C. Beaty. JILA Report **18**, 148p. (1980).

Bibliography of Low Energy Electron and Photon Cross Section Data (1979) — Jean W. Gallagher and Earl C. Beaty. JILA Report **21**, 127p. (1981).

Compilation of Low Energy Electron Collision Cross Section Data Part I. Ionization, Dissociative Processes, Vibrational and Rotational Excitation — Lee J. Kieffer. JILA Report **6**, 95p. (1969).

Compilation of Low Energy Electron Collsion Cross Section Data. Part II. Line and Level Excitation — Lee J. Kieffer. JILA Report **7**, 167p. (1969).

Compilation of Electron Collision Cross Section Data for Modelling Gas Discharge Lasers — Lee J. Kieffer. JILA Report **13**, 139p. (1973).

Electron Impact Excitation of Atoms — Benjamin L. Moiseiwitsch and Steven J. Smith. NSRDS-NBS **25**, 120p. (1968).

Electron Impact Ionization Cross-Section Data for Atoms, Atomic Ions, and Diatomic Molecules: I. Experimental Data — Lee J. Kieffer and Gordon H. Dunn. Rev Mod Phys. **38**, New York: American Institute of Physics, 35p. (1966).

Low Energy Electron-Collision Cross Section Data. Part III. Total Scattering; Differential Elastic Scattering — Lee J. Kieffer. At Data. **2**, New York: Academic Press, 293p. (1971).

Recommended Data on the Electron Impact Ionization of Light Atoms and Ions — K. L. Bell, H. B. Gilbody, J. G. Hughes, A. E. Kingston, and Francis J. Smith. J Phys Chem Ref Data **12**, 891(1983).

Theory of the Ionization of Atoms by Electron Impact — M. R. H. Rudge. Rev Mod Phys **40**, .., 564p. (1968).

Total Electron-Atom Collision Cross Sections at Low Energies — A Critical Review — Benjamin Bederson. Rev Mod Phys **43**, 999, 601p. (1971).

Electron swarm parameters

A Bibliography of Electron Swarm Data — Earl C. Beaty, J. Dutton, and L. C. Pitchford. JILA Report **20**, 252p. (1979).

A Survey of Electron Swarm Data — J. Dutton. J Phys Chem Ref Data **4**, 577(1975).

An Annotated Compilation and Appraisal of Electron Swarm Data in Electronegative Gases — Jean W. Gallagher, Earl C. Beaty, J. Dutton, and L. C. Pitchford. J Phys Chem Ref Data **12**, 109(1983).

Electronic molecular spectra

Atlas of the Observed Absorption Spectrum of Carbon Monoxide between 1060 and 1900 Å — S. G. Tilford and J. D. Simmons. J Phys Chem Ref Data **1**, 147(1972).

Atlas of the Absorption Spectrum of Nitric Oxide (NO) between 1420 and 1250 Å — E. Miescher and F. Alberti. J Phys Chem Ref Data **5**, 309(1976).

Atlas of the Schumann-Runge Absorption Bands of O_2 in the Wavelength Region 175-205 nm — K. Yoshino, D. E. Freeman, and W. H. Parkinson. J Phys Chem Ref Data **13**, 207(1984).

Bibliography on Flame Spectroscopy. Analytical Applications, 1800-1966 — Radu Mavrodineanu. NBS Spec. Publ. **281**, 155p. (1967).

Biweekly List of Papers on Radiation Chemistry and Photochemistry Vol. 17. 1984 — Radiation Chemistry Data Center. Rad Chem, Notre Dame, IN: Radiation Chem. Data Center, U. of Notre Dame,... p. (1984). $25.00; the Biweekly List, Vol. 17 (1984) plus the Annual Cumulation, Vol. 16 (1983), $35.00; foreign and airmail postage rates available upon request.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumuluation with Keyword and Author Indexes, Vol. 16. 1983 — Radiation Chemistry Data Center. Rad Chem **16**, Springfield, VA: NTIS, 444p. (1984).

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumuluation with Keyword and Author Indexes, Vol. 15. 1982 — Radiation Chemistry Data Center. Rad Chem **15**, Springfield, VA: NTIS, 448p. (1983). PB 83-203638, A19.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author Indexes, Vol. 14. 1981— Radiation Chemistry Data Center. Rad Chem **14**, Springfield, VA: NTIS, 534p. (1982). PB 82-214 487, A22.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author Indexes, Vol. 13. 1980 — Radiation Chemistry Data Center. Rad Chem **13**, Springfield, VA: NTIS, 704p. (1981). PB 82-122 995, A26.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author Indexes, Vol. 12. 1979 — Radiation Chemistry Data Center. Rad Chem **12**, Springfield, VA: NTIS, 748p. (1980). PB 81-113 680, A26.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author indexes, Vol. 11. 1978 — Radiation Chemistry Data Center. Rad Chem **11**, Springfield, VA: NTIS, 768p. (1979). PB 226 368, A99.

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 10. 1977 — Radiation Chemistry Data Center. Rad Chem **10**, Springfield, VA: NTIS, 695p. (1978). PB 291 876, A26. .

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 9. 1976 — Radiation Chemistry Data Center. Rad Chem **9**, Springfield, VA: NTIS, 707p. (1977). PB 268 699, A26.

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 8. 1975 — Radiation Chemistry Data Center. Rad Chem **8**, Springfield, VA: NTIS, 670p. (1976). PB 275 025, A26.

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 7. 1974 — Radiation Chemistry Data Center. Rad Chem **7**, Springfield, VA: NTIS, 553p. (1975). COM 75-11475, A24.,

Electronic Absorption and Internal and External Vibrational Data of Atomic and Molecular Ions Doped in Alkali Halide Crystals — Suresh C. Jain, A. V. R. Warrier, and Suresh K. Agarwal. NSRDS-NBS **52**, 55p. (1974).

Optical Spectra of Nonmetallic Inorganic Transient Species in Aqueous Solution — Gordon L. Hug. NSRDS-NBS **69**, 167p. (1981).

Radiation Chemistry of Ethanol: A Review of Data on Yields, Reaction Rate Parameters, and Spectral Properties of Transients — Gordon R. Freeman. NSRDS-NBS **48**, 44p. (1974).

The Band Spectrum of Carbon Monoxide — Paul H. Krupenie. NSRDS-NBS **5**, 87p. (1966).

The Radiolysis of Methanol: Product Yields, Rate Constants, and Spectroscopic Parameters of Intermediates — J. H. Baxendale and Peter Wardman. NSRDS-NBS **54**, 33p. (1975).

The Spectrum of Molecular Nitrogen — Alf Lofthus and Paul H. Krupenie. J Phys Chem Ref Data **6**, 113(1977).

Energy bands of solids

Compilation of Energy Band Gaps in Elemental and Binary Compound Semiconductors and Insulators — W. H. Strehlow and E. L. Cook. J Phys Chem Ref Data **2**, 163(1973).

Soft X-Ray Emission Spectra of Metallic Solids: Critical Review of Selected Systems — Archie J. McAlister, Ronald C. Dobbyn, John R. Cuthill, and M. L. Williams. J Phys Chem Ref Data **2**, 411(1973).

Energy gap

See: Energy bands of solids
Semiconductor properties

Energy levels

See: Atomic energy levels and spectra
Molecular energy levels and constants

Energy transfer coefficients

Data Index for Energy Transfer Collisions of Atoms and Molecules - 1970-1979 — Jean W. Gallagher, Janet Van Blerkom, Earl C. Beaty, and John R. Rumble, Jr. NBS Spec. Publ. **593**, 349p. (1981).

Rate Coefficients for Vibrational Energy Transfer Involving the Hydrogen Halides — Stephen R. Leone. J Phys Chem Ref Data **11**, 953(1982).

Rate Data for Inelastic Collision Processes in the Diatomic Halogen Molecules — J. I. Steinfeld. J Phys Chem Ref Data **13**, 445(1984).

Energy, binding

See: Bond Dissociation energy
Bond dissociation energy
Electron affinity

Energy, dissociation

See: Bond dissociation energy
Thermodynamic properties

Enthalpy

See: Thermodynamic properties

Enthalpy of formation

See: Heat of formation
Thermodynamic properties

Entropy

See: Thermodynamic properties

Equation of state

A Fundamental Equation of State for Heavy Water — P. G. Hill, R. D. Chris MacMillan, and V. Lee. J Phys Chem Ref Data **11**, 1(1982).

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Ethane — M. J. Hiza, R. C. Miller, and Arthur J. Kidnay. J Phys Chem Ref Data **8**, 799(1979).

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Propane — R. C. Miller, Arthur J. Kidnay, and M. J. Hiza. J Phys Chem Ref Data **9**, 721(1980).

A Review of Deuterium Triple-Point Temperatures — L. A. Schwalbe and E. R. Grilly. J Phys Chem Ref Data **13**, 687(1984).

A Thermodynamic Surface for Water: The Formulation and Computer Program — Lester Haar, John S. Gallagher, and George S. Kell. NBSIR **81-2253**, 38p. (1981).

An Analysis of Coexistence Curve Data for Several Binary Liquid Mixtures Near Their Critical Points — A. Stein and G. F. Allen. J Phys Chem Ref Data **2**, 439(1973).

An Equation of State for Fluid Ethylene — Robert D. McCarty and Richard T. Jacobsen. NBS Tech. Note **1045**, 164p. (1981).

Critical Evaluation of Vapor-Liquid Equilibrium, Heat of Mixing, and Volume Change of Mixing Data. General Procedures — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 941(1982).

Definition of Recommended Values of Certain Thermodynamic Properties for the Ketones — Buford D. Smith and Ol Muthu. NBSIR **84-2811**, 162p. (1983).

Effects of Isotopic Composition, Temperature, Pressure, and Dissolved Gases on the Density of Liquid Water — George S. Kell. J Phys Chem Ref Data **6**, 1109(1977).

Equation of State for Ammonia — Lester Haar and John S. Gallagher. NBSIR **75-770**, 27p. (1975).

Equilibrium and Transport Properties of the Noble Gases and Their Mixtures at Low Density — Joseph Kestin, K. Knierim, E. A. Mason, B. Najafi, S. T. Ro, and M. Waldman. J Phys Chem Ref Data **13**, 229(1984).

Erratum: A Fundamental Equation of State for Heavy Water — P. G. Hill, R. D. Chris MacMillan, and V. Lee. J Phys Chem Ref Data **12**, 1065(1983).

Evaluation of Binary *PT*xy Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1099(1982).

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1151(1982).

Evaluation of Binary *PT*xy Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 381(1983).

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 395(1983).

Heavy Water, Thermophysical Properties — V. A. Kirillin, Ya. Z. Kazavchinskii, P. M. Kessel'man, S. L. Rivkin, A. E. Sheindlin, E. E. Shpil'rain, V. V. Sychev, and D. L. Timrot. Russian Transl., Springfield, VA: NTIS, 273p. (1971). TT 70-50094, A12.

High Pressure Bibliography 1900-1968, Volume I. Section I. Bibliography, Section II. Author Index — Leo Merrill. OSRD Bibl. **70-1**, Vol. 1(1970).

High Pressure Bibliography 1900-1968, Volume II. Subject Index — Leo Merrill. OSRD Bibl. **70-1**, Vol. 2(1970).

High-Pressure Calibration: A Critical Review — D. L. Decker, W. A. Bassett, Leo Merrill, H. T. Hall, and J. D. Barnett. J Phys Chem Ref Data **1**, 773(1972).

Interactive FORTRAN Program to Calculate Thermophysical Properties of Seven Fluids — Ben A. Younglove. NBS Tech. Note **1048**, 56p. (1982)

Phase Behavior in Binary and Multicomponent Systems at Elevated Pressures: n-Pentane and Methane-n-Pentane — Virginia M. Berry and Bruce H. Sage. NSRDS-NBS **32**, 79p. (1970).

Physical and Thermodynamic Properties of Aliphatic Alcohols — Randolph C. Wilhoit and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, Suppl. 1(1973).

Saturation States of Heavy Water — P. G. Hill and R. D. Chris MacMillan. J Phys Chem Ref Data **9**, 735(1980).

Scaled Equation of State Parameters for Gases in the Critical Region — J. M. H. Levelt Sengers, W. L. Greer, and Jan V. Sengers. J Phys Chem Ref Data **5**, 1(1976).

The Critical-Region Equation of State of Ethene and the Effect of Small Impurities — J. R. Hastings, J. M. H. Levelt Sengers, and F. W. Balfour. J Chem Thermody **12**, London: Academic Press Inc., 1009p. (1980).

The Calculated Thermodynamic Properties of Superfluid Helium-4 — James S. Brooks and Russell J. Donnelly. J Phys Chem Ref Data **6**, 51(1977).

The Molar Volume (Density) of Solid Oxygen in Equilibrium with Vapor — Hans M. Roder. J Phys Chem Ref Data **7**, 949(1978).

Thermodynamic Properties of Argon from the Triple Point to 300 K at Pressures to 1000 Atmospheres — A. L. Gosman, Robert D. McCarty, and Jerome G. Hust. NSRDS-NBS **27**, 153p. (1969).

Thermophysical Properties of Isobutane from 114 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Tech. Note **1051**, 199p. (1982).

Thermodynamic and Related Properties of Parahydrogen from the Triple Point to 100 K at Pressures to 340 Atmospheres — Hans M. Roder, Lloyd A. Weber, and Robert D. Goodwin. NBS Monograph **94**, 116p. (1965).

Thermophysical Properties of Normal Butane from 135 to 700 K at Pressures to 70 MPa — W. M. Haynes and Robert D. Goodwin. NBS Monograph **169**, 197p. (1982).

Thermodynamic and Thermophysical Properties of Helium — A. F. Alyab'ev, N. V. Tsederberg, V. N. Popov, and N. A. Morozova. Russian Transl., Springfield, VA: NTIS, 260p. (1971). TT 70-50096, A12.

Thermodynamic and Transport Properties of Ethylene and Propylene — I. A. Neduzhii. Russian Transl. Springfield, VA: NTIS, 206p. (1972). COM 75-11276, A10.

Thermophysical Properties of Air and Air Components — A. A. Vasserman, Ya. Z. Kazavchinskii, V. A. Rabinovich, and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 402p. (1971). TT 70-50095, A18.

Thermophysical Properties of Gases and Liquids, No. 1 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 214p. (1970). TT 69-55091, A10, the translation of volumes 2, 3, and 4 have the title: Thermophysical Properties of Matter and Substances.

Thermophysical Properties of Gaseous and Liquid Methane — V. A. Zagoruchenko and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 251p. (1970). TT 70-50097, A12.

Thermophysical Properties of Liquid Air and Its Components — A. A. Vasserman and V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 255p. (1970). TT 69-55092, A12.

Thermophysical Properties of Matter and Substances, Volume 2 — V. A. Rabinovich. Russian Transl., Springfield, VA: NTIS, 395p. (1974). TT 72-52001, A17, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermophysical Properties of Matter and Substances, Volume 3 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 212p. (1975). TT 73-52009, A10, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermophysical Properties of Hydrocarbon Mixtures (TRAPP) NBS Standard Reference Database 4, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

Thermophysical Properties of Helium NBS Standard Reference Database 5, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

Thermodynamic Properties of Nitrogen Including Liquid and Vapor Phases from 63 K to 2000 K with Pressures to 10,000 Bar — Richard T. Jacobsen and Richard B. Stewart. J Phys Chem Ref Data **2**, 757(1973).

Thermodynamic Properties of Helium-4 from 2 to 1500 K at Pressures to 10^8 Pa — Robert D. McCarty. J Phys Chem Ref Data **2**, 923(1973).

Thermodynamic Properties of Ammonia — Lester Haar and John S. Gallagher. J Phys Chem Ref Data **7**, 635(1978).

Thermodynamic Properties of Steam in the Critical Region — J. M. H. Levelt Sengers, B. Kamgar-Parsi, F. W. Balfour, and Jan V. Sengers. J Phys Chem Ref Data **12**, 1(1983).

Thermodynamic Properties of D_2O in the Critical Region — B. Kamgar-Parsi, J. M. H. Levelt Sengers, and Jan V. Sengers. J Phys Chem Ref Data **12**, 513(1983).

Thermodynamic Properties of Aqueous Sodium Chloride Solutions — Kenneth S. Pitzer, J. Christopher Peiper, and R. H. Busey. J Phys Chem Ref Data **13**, 1(1984).

Thermophysical Properties of Fluid H_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 175(1984).

Thermophysical Properties of Fluid D_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 602(1984).

Volumetric Properties of Aqueous Sodium Chloride Solutions — P. S. Z. Rogers and Kenneth S. Pitzer. J Phys Chem Ref Data **11**, 15(1982).

Equilibrium constant

A Critical Review of the Gas-Phase Reaction Kinetics of the Hydroxyl Radical — William E. Wilson, Jr. J Phys Chem Ref Data **1**, 535(1972).

An Annotated Bibliography of Compiled Thermodynamic Data Sources for Biochemical and Aqueous Systems (1930 to 1975), Equilibrium, Enthalpy, Heat Capacity, and Entropy Data — George T. Armstrong and Robert N. Goldberg. NBS Spec. Publ. **454**, 71p. (1976).

Bulletin of Chemical Thermodynamics, Volume 24/1981 — Robert D. Freeman, editor(s) and International Union of Pure and Applied Chemistry, Commission 1.2 on Thermodynamics. Bull Chem Thermody **24**, Stillwater, OK: Thermochemistry, Department of Chemistry, Oklahoma State University, 504p. (1982). 0149-2268, bona fide personal subscriptions are less; prices of previous Bulletins available upon request.

Bulletin of Chemical Thermodynamics, Volume 25/1982 — Robert D. Freeman and International Union of Pure and Applied Chemistry. Bull Chem Thermody **25**, Stillwater, OK: Thermochemistry, Department of Chemistry, Oklahoma State University, 544p. (1982). 0149-2268, bona fide personal subscriptions are less; prices of previous Bulletins are available upon request.

Compilation and Evaluation of Solubility Data in the Mercury (I) Chloride-Water System — Y. Marcus. J Phys Chem Ref Data **9**, 1307(1980).

Evaluated Chemical Kinetic Rate Constants for Various Gas Phase Reactions — Keith Schofield. J Phys Chem Ref Data **2**, 25(1973).

Gas Phase Reaction Kinetics of Neutral Oxygen Species — Harold S. Johnston. NSRDS-NBS **20**, 49p. (1968).

High Temperature Properties and Decomposition of Inorganic Salts, Part 1. Sulfates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **7**, 38p. (1966).

High Temperature Properties and Decomposition of Inorganic Salts, Part 2. Carbonates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **30**, 27p. (1969).

High Temperature Properties and Decomposition of Inorganic Salts, Part 3. Nitrates and Nitrites — Kurt H. Stern. J Phys Chem Ref Data **1**, 747(1972).

Ion Product of Water Substance, 0 - 1000°C, 1 - 10,000 Bars. New International Formulation and Its Background — William L. Marshall and E. U. Franck. J Phys Chem Ref Data **10**, 295(1981)

Rate Constants of Gas Phase Reactions, Reference Book — V. N. Kondratiev, L. J. Holtschlag, R. M. Fristrom, editor(s). Russian Transl., Springfield, VA: NTIS, 434p. (1972). COM 72-10014, A19.

The Solubility of Some Sparingly Soluble Lead Salts: An Evaluation of the Solubility in Water and Aqueous Electrolyte Solution — H. Lawrence Clever and Francis J. Johnston. J Phys Chem Ref Data **9**, 751(1980).

Equivalent conductance

See: Electrical conductance

Eutectic data

Physical Properties Data Compilations Relevant to Energy Storage. I. Molten Salts: Eutectic Data — George J. Janz, Carolyn B. Allen, J. R. Downey, Jr., and Reginald P. T. Tomkins. NSRDS-NBS **61**, 244p. (1978).

Evaporation and condensation coefficients

Selected Values of Evaporation and Condensation Coefficients for Simple Substances — G. M. Pound. J Phys Chem Ref Data **1**, 135(1972).

Excitation potential

See: Atomic energy levels and spectra

F-values

See: Transition probabilities for atoms and molecules

Force constants

Binary Fluorides, Free Molecular Structures and Force Fields, A Bibliography (1957-1975) — Donald T. Hawkins, Lawrence S. Bernstein, Warren E. Falconer, and William Klemperer., New York: IFI/Plenum, 253p. (1976), ISBN: 0-306-6601-3.

Critical Review of Vibrational Data and Force Field Constants for Polyethylene — John Barnes and Bruno Fanconi. J Phys Chem Ref Data **7**, 1309(1978).

Tables of Molecular Vibrational Frequencies, Part 9 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **7**, 1323(1978).

Tables of Molecular Vibrational Frequencies, Part 10 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **9**, 1149(1980).

Formation, heat of

See: Heat of formation
Thermodynamic properties

Franck-Condon factor

See: Transition probabilities for atoms and molecules

Free energy

See: Thermodynamic properties

Frequencies, vibrational

See: Vibrational frequencies of molecules

Fundamental physical constants

Energy Levels of One-Electron Atoms — Glen W. Erickson. J Phys Chem Ref Data **6**, 831(1977).

Numerical Comparisons of Several Algorithms for Treating Inconsistent Data in a Least-Squares Adjustment of the Fundamental Constants — Barry N. Taylor. NBSIR **81-2426**, 87p. (1982).

The 1973 Least-Squares Adjustment of the Fundamental Constants — E. Richard Cohen and Barry N. Taylor. J Phys Chem Ref Data **2**, 663(1973).

G-Factor

See: Magnetic moments of molecules

Gaseous diffusion coefficient

See: Diffusion coefficient

Gibbs energy

See: Thermodynamic properties

Hardness data

Handbook of Hardness Data — G. V. Samsonov and A. A. Ivan'ko. Russian Transl., Springfield, VA: NTIS, 69p. (1970). TT 70-50177, A04.

Heat capacity (see also Thermodynamic properties)

A Bibliography of Sources of Experimental Data Leading to Thermal Properties of Binary Aqueous Electrolyte Solutions — David Smith-Magowan and Robert N. Goldberg. NBS Spec. Publ. **537**, 94p. (1979).

A Thermodynamic Surface for Water: The Formulation and Computer Program — Lester Haar, John S. Gallagher, and George S. Kell. NBSIR **81-2253**, 38p. (1981).

An Annotated Bibliography of Compiled Thermodynamic Data Sources for Biochemical and Aqueous Systems (1930 to 1975), Equilibrium, Enthalpy, Heat Capacity, and Entropy Data — George T. Armstrong and Robert N. Goldberg. NBS Spec. Publ. **454**, 71p. (1976).

Analysis of Specific Heat Data in the Critical Region of Magnetic Solids — F. J. Cook. J Phys Chem Ref Data **2**, 11(1973).

Bulletin of Chemical Thermodynamics, Volume 24/1981 — Robert D. Freeman, editor(s) and International Union of Pure and Applied Chemistry, Commission 1.2 on Thermodynamics. Bull Chem Thermody **24**, Stillwater, OK: Thermochemistry, Department of Chemistry, Oklahoma State University, 504p. (1982). 0149-2268, bona fide personal subscriptions are less; prices of previous Bulletins available upon request.

Bulletin of Chemical Thermodynamics, Volume 25/1982 — Robert D. Freeman and International Union of Pure and Applied Chemistry. Bull Chem Thermody **25**, Stillwater, OK: Thermochemistry, Department of Chemistry, Oklahoma State University, 544p. (1982). 0149-2268, bona fide personal subscriptions are less; prices of previous Bulletins are available upon request.

Chemical Thermodynamic Properties of Compounds of Sodium, Potassium, and Rubidium: An Interim Tabulation of Selected Material — Donald D. Wagman, William H. Evans, Vivian B. Parker, and Richard H. Schumm. NBSIR **76-1034**, 76p. (1976).

Combustion Fundamentals for Waste Incineration — American Society of Mechanical Engineers, Research Committee on Industrial and Municipal Wastes., New York: American Society of Mechanical Engineers, 212p. (1974).

Critical Analysis of the Heat-Capacity Data of the Literature and Evaluation of Thermodynamic Properties of Copper, Silver, and Gold from 0 to 300 K — George T. Furukawa, W. G. Saba, and Martin L. Reilly. NSRDS-NBS **18**, 49p. (1968).

Critical Analysis of Heat-Capacity Data and Evaluation of Thermodynamic Properties of Ru, Ph, Pd, Ir, and Pt from 0 to 300 K. A Survey of the Literature Data on Osmium — George T. Furukawa, Martin L. Reilly, and John S. Gallagher. J Phys Chem Ref Data **3**, 163(1974).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. I. Selenium — Umesh Gaur, Hua-Cheng Shu, Aspy Metha, and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 89(1981)

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. II. Polyethylene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 119(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. III. Polyoxides — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 1001(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IV. Polypropylene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 1051(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. V. Polystyrene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **11**, 313(1982).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VI. Acrylic Polymers — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **11**, 1065(1982).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VII. Other Carbon Backbone Polymers — Umesh Gaur, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 29(1983).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VIII. Polyesters and Polyamides — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 65(1983).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IX. Final Group of Aromatic and Inorganic Polymers — Umesh Gaur, Suk-fai Lau, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 91(1983).

Heat Capacity of Reference Materials: Cu and W — G. K. White and S. J. Collocott. J Phys Chem Ref Data **13**, 1251(1984).

Heat Capacities and Entropies of Organic Compounds in the Condensed Phase — Eugene S. Domalski, William H. Evans, and Elizabeth D. Hearing. J Phys Chem Ref Data **13**, Suppl. 1(1984).

Heavy Water, Thermophysical Properties — V. A. Kirillin, Ya. Z. Kazavchinskii, P. M. Kessel'man, S. L. Rivkin, A. E. Sheindlin, E. E. Shpil'rain, V. V. Sychev, and D. L. Timrot. Russian Transl., Springfield, VA: NTIS, 273p. (1971). TT 70-50094, A12.

Interactive Fortran Program to Calculate Thermophysical Properties of 6 Fluids NBS Standard Reference Database 6, Washington, DC; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

Isochoric Heat Capacity of Water and Steam — M. P. Vukalovich, Kh. I. Amirkhanov, G. V. Stepanov, and B. G. Alibekov. Russian Transl., Springfield, VA: NTIS, 215p. (1974). TT 72-52002, A10.

NBS Chemical Thermodynamics Database NBS Standard Reference Database 2, Washington, DC; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

Properties of Liquid and Solid Hydrogen — B. N. Esel'son, Y. P. Blagoi, V.N. Grigor'ev, V. G. Manzhelii, S. A. Mikhailenko, and N. P. Neklyudov. Russian Transl., Springfield, VA: NTIS, 126p. (1971). TT 70-50179, A07.

Selected Values of Chemical Thermodynamic Properties. Tables for the First Thirty-Four Elements in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 264p. (1968).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 35 through 53 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 152p. (1969).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 54 through 61 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, Richard H. Schumm, and Kenneth L. Churney. NBS Tech. Note **270**, 49p. (1971).

Selected Values of Chemical Thermodynamic Properties. Tables for the Alkaline Earth Elements (Elements 92 through 97 in the Standard Order of Arrangement) — Vivian B. Parker, Donald D. Wagman, and William H. Evans. NBS Tech. Note **270**, 124p. (1971).

Selected Values of Chemical Thermodynamic Properties. Tables for the Lanthanide (Rare Earth) Elements (Elements 62 through 76 in the Standard Order of Arrangement) — Richard H. Schumm, Donald D. Wagman, Sylvia M. Bailey, William H. Evans, and Vivian B. Parker. NBS Tech. Note **270**, 84p. (1973).

Selected Values of Chemical Thermodynamic Properties: Compounds of Uranium, Protactinium, Thorium, Actinium, and the Alkali Metals — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, and Ralph L. Nuttall. NBS Tech. Note **270**, 149p. (1981).

Selected Thermochemical Data Compatible with CODATA Recommendations — Vivian B. Parker, Donald D. Wagman, and David Garvin. NBSIR **75-968**, 35p. (1976).

The Thermochemical Properties of Uranium-Halogen Containing Compounds — Vivian B. Parker. NBSIR **80-2029**, 173p. (1980).

The NBS Tables of Chemical Thermodynamic Properties. Selected Values for Inorganic and C_1 and C_2 Organic Substances in SI Units — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, Iva Halow, Sylvia M. Bailey, Kenneth L. Churney, and Ralph L. Nuttall. J Phys Chem Ref Data **11**, Suppl. 2(1982).

Thermal Properties of Aqueous Uni-Univalent Electrolytes — Vivian B. Parker. NSRDS-NBS **2**, 68p. (1965).

Thermophysical Properties of Isobutane from 114 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Tech. Note **1051**, 199p. (1982).

Thermodynamic and Related Properties of Parahydrogen from the Triple Point to 100 K at Pressures to 340 Atmospheres — Hans M. Roder, Lloyd A. Weber, and Robert D. Goodwin. NBS Monograph **94**, 116p. (1965).

Thermophysical Properties of Normal Butane from 135 to 700 K at Pressures to 70 MPa — W. M. Haynes and Robert D. Goodwin. NBS Monograph **169**, 197p. (1982).

Thermodynamic Properties of Solid Aluminosilicates at Elevated Temperatures — Richard H. Schumm. NBSIR **81-2343**, 57p. (1981).

Thermodynamic and Thermophysical Properties of Combustion Products, Volume II. Oxygen-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 505p. (1975). TT 74-50032, A22.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume III. Oxygen- and Air-Based Propellant — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. - Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 648p. (1975). TT 75-50007, A26.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume IV. Nitrogen Tetroxide-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 540p. (1976). TT 76-50007, A23.

Thermodynamic and Thermophysical Properties of Helium — A. F. Alyab'ev, N. V. Tsederberg, V. N. Popov, and N. A. Morozova. Russian Transl., Springfield, VA: NTIS, 260p. (1971). TT 70-50096, A12.

Thermodynamic and Transport Properties of Ethylene and Propylene — I. A. Neduzhii. Russian Transl. Springfield, VA: NTIS, 206p. (1972). COM 75-11276, A10.

Thermophysical Properties of Freon-22 — A. V. Kletskii. Russian Transl. Springfield, VA: NTIS, 72p. (1971). TT 70-50178, A04.

Thermophysical Properties of Gaseous and Liquid Methane — V. A. Zagoruchenko and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 251p. (1970). TT 70-50097, A12.

Thermophysical Properties of Matter and Substances, Volume 2 — V. A. Rabinovich. Russian Transl., Springfield, VA: NTIS, 395p. (1974). TT 72-52001, A17, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermophysical Properties of Matter and Substances, Volume 4 — V. A. Rabinovich. Russian Transl., Springfield, VA: NTIS, 179p.

(1975). TT 73-52029, A09, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermodynamic Tabulations for Selected Phases in the System CaO-Al_2O_3-SiO_2-H_2O at 101.325 kPa (1 atm.) between 273.15 and 1800 K — John L. Haas, Jr., Gilpin R. Robinson, Jr., and Bruce S. Hemingway. J Phys Chem Ref Data **10**, 575(1981).

Thermophysical Properties of Fluids. I. Argon, Ethylene, Parahydrogen, Nitrogen, Nitrogen Trifluoride, and Oxygen — Ben A. Younglove. J Phys Chem Ref Data **11**, Suppl. 1(1982).

Thermodynamic Properties of Aqueous Sodium Chloride Solutions — Kenneth S. Pitzer, J. Christopher Peiper, and R. H. Busey. J Phys Chem Ref Data **13**, 1(1984).

Heat of combustion

Chemical Kinetics of the Gas Phase Combustion of Fuels (A Bibliography on the Rates and Mechanisms of Oxidation of Aliphatic C_1 to C_{10} Hydrocarbons and of Their Oxygenated Derivatives) — Francis Westley. NBS Spec. Publ. **449**, 142p. (1976).

Combustion Fundamentals for Waste Incineration — American Society of Mechanical Engineers, Research Committee on Industrial and Municipal Wastes., New York: American Society of Mechanical Engineers, 212p. (1974).

Selected Values of Heats of Combustion and Heats of Formation of Organic Compounds Containing the Elements C, H, N, O, P, and S — Eugene S. Domalski. J Phys Chem Ref Data **1**, 221(1972).

Table of Recommended Rate Constants for Chemical Reactions Occurring in Combustion — Francis Westley. NBSIR **79-1941**, 169p. (1979).

Tables of Experimental Rate Constants for Chemical Reactions Occurring in Combustion (1971-1977) — Francis Westley. NBSIR **81-2254**, 302p. (1981).

Thermodynamic and Thermophysical Properties of Combustion Products, Volume I. Computation Methods — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, and V. A. Khudyakov. Russian Transl., Springfield, VA: NTIS, 453p. (1974). TT 74-50019, A20.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume III. Oxygen- and Air-Based Propellant — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 648p. (1975). TT 75-50007, A26.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume IV. Nitrogen Tetroxide-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS,

Heat of formation (see also Thermodynamic properties)

Annotated Bibliography on Proton Affinities — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, and Henry M. Rosenstock. NBSIR **76-1061**, 52p. (1976).

Energetics of Gaseous Ions — Henry M. Rosenstock, Keith Draxl, B. W. Steiner, and John T. Herron. J Phys Chem Ref Data **6**, Suppl. 1(1977).

Evaluated Gas Phase Basicities and Proton Affinities of Molecules: Heats of Formation of Protonated Molecules — Sharon G. Lias, Joel F. Liebman, and Rhoda D. Levin. J Phys Chem Ref Data **13**, 695(1984).

High Temperature Properties and Decomposition of Inorganic Salts, Part 1. Sulfates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **7**, 38p. (1966).

High Temperature Properties and Decomposition of Inorganic Salts, Part 2. Carbonates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **30**, 27p. (1969).

High Temperature Properties and Decomposition of Inorganic Salts, Part 3. Nitrates and Nitrites — Kurt H. Stern. J Phys Chem Ref Data **1**, 747(1972).

High Temperature Properties and Decomposition of Inorganic Salts, Part 4. Oxy-Salts of the Halogens — Kurt H. Stern. J Phys Chem Ref Data **3**, 481(1974).

High Temperature Vaporization Behavior of Oxides. I. Alkali Metal Binary Oxides — R. H. Lamoreaux and D. L. Hildenbrand. J Phys Chem Ref Data **13**, 151(1984).

Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions — Joseph L. Franklin, J. G. Dillard, Henry M. Rosenstock, John T. Herron, Keith Draxl, and Frank H. Field. NSRDS-NBS **26**, 289p. (1969).

Kinetic Data on Gas Phase Unimolecular Reactions — Sidney W. Benson and Harry E. O'Neal. NSRDS-NBS **21**, 645p. (1970).

Selected Values of Chemical Thermodynamic Properties. Tables for the First Thirty-Four Elements in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 264p. (1968).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 35 through 53 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 152p. (1969).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 54 through 61 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, Richard H. Schumm, and Kenneth L. Churney. NBS Tech. Note **270**, 49p. (1971).

Selected Values of Chemical Thermodynamic Properties. Tables for the Alkaline Earth Elements (Elements 92 through 97 in the Standard Order of Arrangement) — Vivian B. Parker, Donald D. Wagman, and William H. Evans. NBS Tech. Note **270**, 124p. (1971).

Selected Values of Chemical Thermodynamic Properties. Tables for the Lanthanide (Rare Earth) Elements (Elements 62 through 76 in the Standard Order of Arrangement) — Richard H. Schumm, Donald D. Wagman, Sylvia M. Bailey, William H. Evans, and Vivian B. Parker. NBS Tech. Note **270**, 84p. (1973).

Selected Values of Chemical Thermodynamic Properties: Compounds of Uranium, Protactinium, Thorium, Actinium, and the Alkali Metals — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, and Ralph L. Nuttall. NBS Tech. Note **270**, 149p. (1981).

Selected Thermochemical Data Compatible with CODATA Recommendations — Vivian B. Parker, Donald D. Wagman, and David Garvin. NBSIR **75-968**, 35p. (1976).

Selected Values of Heats of Combustion and Heats of Formation of Organic Compounds Containing the Elements C, H, N, O, P, and S — Eugene S. Domalski. J Phys Chem Ref Data **1**, 221(1972).

The NBS Tables of Chemical Thermodynamic Properties. Selected Values for Inorganic and C_1 and C_2 Organic Substances in SI Units — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, Iva Halow, Sylvia M. Bailey, Kenneth L. Churney, and Ralph L. Nuttall. J Phys Chem Ref Data **11**, Suppl. 2(1982).

Thermodynamic and Thermophysical Properties of Combustion Products, Volume III. Oxygen- and Air-Based Propellant — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 648p. (1975). TT 75-50007, A26.

Thermochemical Data for Gaseous Monoxides — J. B. Pedley and E. M. Marshall. J Phys Chem Ref Data **12**, 967(1983).

Heat of mixing

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Ethane — M. J. Hiza, R. C. Miller, and Arthur J. Kidnay. J Phys Chem Ref Data **8**, 799(1979).

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Propane — R. C. Miller, Arthur J. Kidnay, and M. J. Hiza. J Phys Chem Ref Data **9**, 721(1980).

Critical Evaluation of Vapor-Liquid Equilibrium, Heat of Mixing, and Volume Change of Mixing Data. General Procedures — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 941(1982).

Evaluation of Binary Excess Enthalpy Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1127(1982).

Evaluation of Binary Excess Enthalpy Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 389(1983).

Thermal Properties of Aqueous Uni-Univalent Electrolytes — Vivian B. Parker. NSRDS-NBS **2**, 68p. (1965).

Thermodynamic and Thermophysical Properties of Combustion Products, Volume III. Oxygen- and Air-Based Propellant — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 648p. (1975). TT 75-50007, A26.

Heat of vaporization

Properties of Liquid and Solid Hydrogen — B. N. Esel'son, Y. P. Blagoi, V.N. Grigor'ev, V. G. Manzhelii, S. A. Mikhailenko, and N. P. Neklyudov. Russian Transl., Springfield, VA: NTIS, 126p. (1971). TT 70-50179, A07.

Thermodynamic and Transport Properties of Ethylene and Propylene — I. A. Neduzhii. Russian Transl. Springfield, VA: NTIS, 206p. (1972). COM 75-11276, A10.

Thermophysical Properties of Air and Air Components — A. A. Vasserman, Ya. Z. Kazavchinskii, V. A. Rabinovich, and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 402p. (1971). TT 70-50095, A18.

Henry's law constant

See: Solubility

High pressure properties

A Compilation of Volumes I-IV of Bibliography on High Pressure Research with Author and Subject Indexes — John Francis Cannon and Leo Merrill., Springfield, VA: NTIS, 385p. (1972). in two volumes, Vol. 1. PB 191 174, A17; Vol. 2. PB 191 174.

Behavior of the Elements at High Pressures — John Francis Cannon. J Phys Chem Ref Data **3**, 781(1974).

Behavior of the AB-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **6**, 1205(1977).

Behavior of the AB_2-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **11**, 1005(1982).

Bibliography of High Pressure Research, Volume XII (1979) — Leo Merrill., Provo, UT: High Pressure Data Center, Brigham Young University,(1979). Bimonthly, order from Data Center.

Compilation of Volumes V-IX of the Bibliography on High Pressure Research with Author and Subject Indexes — Leo Merrill., Provo, UT: High Pressure Data Center, Brigham Young University, (1979). in microfiche only.

High Pressure Bibliography 1900-1968, Volume I. Section I. Bibliography, Section II. Author Index — Leo Merrill. OSRD Bibl. **70-1**, Vol. 1(1970).

High Pressure Bibliography 1900-1968, Volume II. Subject Index — Leo Merrill. OSRD Bibl. **70-1**, Vol. 2(1970).

High Pressure Bibliography, 1968-1971, with Author and Subject Indexes — John Francis Cannon and Leo Merrill., Provo, UT: High Pressure Data Center, Brigham Young University, 189p. (1972). in microfiche only.

High-Pressure Calibration: A Critical Review — D. L. Decker, W. A. Bassett, Leo Merrill, H. T. Hall, and J. D. Barnett. J Phys Chem Ref Data **1**, 773(1972).

Index of refraction

See: Refractive index

Infrared spectra

See: Vibrational spectra (infrared, Raman)

Intensities, spectral

See: Transition probabilities for atoms and molecules

Interatomic distances

See: Molecular structure

Ionization potentials (see also Atomic energy levels and spectra)

A Bibliography on Ion-Molecule Reactions. January 1900 to March 1966 — F. N. Harllee, Henry M. Rosenstock, and John T. Herron. NBS Tech. Note **291**, 40p. (1966).

Electron Impact Excitation of Atoms — Benjamin L. Moiseiwitsch and Steven J. Smith. NSRDS-NBS **25**, 120p. (1968).

Electron Impact Ionization Cross-Section Data for Atoms, Atomic Ions, and Diatomic Molecules: I. Experimental Data — Lee J. Kieffer and Gordon H. Dunn. Rev Mod Phys. **38**, New York: American Institute of Physics, 35p. (1966).

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

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

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

Energetics of Gaseous Ions — Henry M. Rosenstock, Keith Draxl, B. W. Steiner, and John T. Herron. J Phys Chem Ref Data **6**, Suppl. 1(1977).

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

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

Energy levels of Aluminum, Al I through Al XIII — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **8**, 817(1979).

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

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

Energy Levels of Magnesium, Mg I through Mg XII — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **9**, 1(1980).

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

Energy Levels of Sodium, Na I through Na XI — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **10**, 153(1981).

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

Energy Levels of Cobalt, Co I through Co XXVII — Jack Sugar and Charles H. Corliss. J Phys Chem Ref Data **10**, 1097(1981).

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

Energy Levels of Silicon, Si I through Si XIV — William C. Martin and Romuald Zalubas. J Phys Chem Ref Data **12**, 323(1983).

Ground Levels and Ionization Potentials for Lanthanide and Actinide Atoms and Ions — William C. Martin, Lucy Hagan, Joseph Reader, and Jack Sugar. J Phys Chem Ref Data **3**, 771(1974).

Ion Energetics Measurements, Supplement I. 1971-1973 — Henry M. Rosenstock, D. Sims, S. S. Schroyer, and W. J. Webb. NSRDS-NBS **66**, 380p. (1980).

Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions — Joseph L. Franklin, J. G. Dillard, Henry M. Rosenstock, John T. Herron, Keith Draxl, and Frank H. Field. NSRDS-NBS **26**, 289p. (1969).

Ionization Potentials and Ionization Limits Derived from the Analyses of Optical Spectra — Charlotte E. Moore. NSRDS-NBS **34**, 22p. (1970).

Ionization Potential and Appearance Potential Measurements, 1971-1981 — Rhoda D. Levin and Sharon G. Lias. NSRDS-NBS **71**, 634p. (1982).

Surface Ionization — E. Ya. Zandberg and N. L. Ionov. Russian Transl., Springfield, VA: NTIS, 364p. (1971). TT 70-50148, A16.

Tables of Atomic Spectral Lines for the 10 000 Å to 40 000 Å Region — Michael Outred. J Phys Chem Ref Data 7, 1(1978).

The Band Spectrum of Carbon Monoxide — Paul H. Krupenie. NSRDS-NBS **5**, 87p. (1966).

The Spectrum of Molecular Nitrogen — Alf Lofthus and Paul H. Krupenie. J Phys Chem Ref Data **6**, 113(1977).

The Spectrum and Energy Levels of the Neutral Atom of Boron (B I) — G. A. Odintzova and A. R. Striganov. J Phys Chem Ref Data **8**, 63(1979).

Theory of the Ionization of Atoms by Electron Impact — M. R. H. Rudge. Rev Mod Phys **40**, .., 564p. (1968).

Isotopic abundance

Isotopic Abundances and Atomic Weights of the Elements — Paul De Bièvre, Marc Gallet, Norman E. Holden, and I. Lynus Barnes. J Phys Chem Ref Data **13**, 809(1984).

Kinetic rate constants

See: **Rate constants of chemical reactions**

Lattice constants

Behavior of the Elements at High Pressures — John Francis Cannon. J Phys Chem Ref Data **3**, 781(1974).

Behavior of the AB-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **6**, 1205(1977).

Behavior of the AB_2-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **11**, 1005(1982).

Crystal Structure Transformations in Binary Halides — C. N. R. Rao and M. Natarajan. NSRDS-NBS **41**, 57p. (1972).

Crystal Structure Transformations in Inorganic Nitrites, Nitrates, and Carbonates — C. N. R. Rao, Brahm Prakash, and M. Natarajan. NSRDS-NBS **53**, 55p. (1975).

Crystal Structure Transformations in Inorganic Sulfates, Phosphates, Perchlorates, and Chromates — C. N. R. Rao and Brahm Prakash. NSRDS-NBS **56**, 37p. (1975).

Crystal Data Determinative Tables, Third Edition Volume 1: Organic Compounds — Joseph D. H. Donnay and Helen M. Ondik., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 855p. (1972).

Crystal Data Determinative Tables, Third Edition Volume 2: Inorganic Compounds — Joseph D. H. Donnay and Helen M. Ondik., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1748p. (1973).

Crystal Data Determinative Tables, Third Edition Volume 3. Organic Compounds — Joseph D. H. Donnay, Olga Kennard, David G. Watson, and John R. Rodgers., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 748p. (1978).

Crystal Data Determinative Tables, Third Edition Volume 4. Inorganic Compounds — Joseph D. H. Donnay, Helen M. Ondik, and Alan D. Mighell., Swarthmore, PA: JCPDS-International Center for Diffraction Data, 1308p. (1978).

Crystal Data Determinative Tables, Third Edition, Volume 5. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, John R. Rodgers, editor(s). **5**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Crystal Data Determinative Tables, Third Edition, Volume 6. Organic Compounds — Olga Kennard, David G. Watson, John E. Davies, editor(s). **6**, Swarthmore, PA, JCPDS-International Center for Diffraction Data,(1983).

Crystal Data Space-Group Tables — Alan D. Mighell, Helen M. Ondik, and Bettijoyce Breen Molino. J Phys Chem Ref Data **6**, 675(1977).

Electronic Absorption and Internal and External Vibrational Data of Atomic and Molecular Ions Doped in Alkali Halide Crystals — Suresh C. Jain, A. V. R. Warrier, and Suresh K. Agarwal. NSRDS-NBS **52**, 55p. (1974).

NBS Crystal Data Identification File NBS Standard Reference Database 3, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Lease agreements obtained from JCPDS 1601 Park Ln Swarthmore PA (215)328-9400.

Space Groups and Lattice Complexes — W. Fisher, Hans Burzlaff, Erwin Hellner, and Joseph D. H. Donnay. NBS Monograph **134**, 177p. (1973).

Transition Metal Oxides, Crystal Chemistry, Phase Transition, and Related Aspects — C. N. R. Rao and G. V. Subba Rao. NSRDS-NBS **49**, 140p. (1974).

Lifetimes

See: **Transition probablities for atoms and molecules**

Line strengths

See: **Transition probabilities for atoms and molecules**

Line widths

See: **Spectral line widths**

Loss tangent

See: **Dielectric constant**

Magnetic moments of molecules

Bibliography on Properties of Defect Centers in Alkali Halides — Suresh C. Jain, S. A. Khan, H. K. Sehgal, V. K. Garg, and R. K. Jain. OSRD Bibl. **71-1**, 293p. (1971).

Compendium of ab initio Calculations of Molecular Energies and Properties — Morris Krauss. NBS Tech. Note **438**, 139p. (1967).

The Band Spectrum of Carbon Monoxide — Paul H. Krupenie. NSRDS-NBS **5**, 87p. (1966).

Magnetic properties

Critical Surveys of Data Sources: Electrical and Magnetic Properties of Metals — M. J. Carr, R. B. Gavert, Robert L. Moore, H. W. Wawrousek, and John H. Westbrook. NBS Spec. Publ. **396**, 96p. (1976).

Physical Properties Data for Rock Salt — Lewis H. Gevantman. NBS Monograph **167**, 288p. (1981).

Physical Properties Data for Basalt — Lewis H. Gevantman. NBSIR **82-2587**, 751p. (1982).

Mass spectra

EPA/NIH Mass Spectral Data Base, Volume 1. Molecular Weights 30-186; Volume 2. Molecular Weights 16-273; Volume 3. Molecular Weights 273-381; Volume 4. Molecular Weights 381-1674 — Stephen R. Heller and G. W. A. Milne. NSRDS-NBS **63**, 1,2,3,4(1978).

EPA/NIH Mass Spectral Data Base, Supplement 1 — Stephen R. Heller and G. W. A. Milne. NSRDS-NBS **63**, Suppl. 1(1980).

EPA/NIH Mass Spectral Data Base, Supplement 2 — Stephen R. Heller, G. W. A. Milne, and Lewis H. Gevantman. NSRDS-NBS **63**, Suppl. 2(1983).

EPA/NIH Mass Spectral Data Base Magnetic Tape — Stephen R. Heller and G. W. A. Milne. NBS Standard Reference Database 1 **A1**, Washington, DC: NBS Office of Standard Reference Data,(updated periodically). Call (301) 921-2228 for specific instructions.

Mechanical properties

Computerizing Materials Data-A Workshop for the Nuclear Power Industry — John Jr. Rumble and Jack H. Westbrook. NBS Spec. Publ. **689**, 37p. (1985).

Critical Surveys of Data Sources: Mechanical Properties of Metals — R. B. Gavert, Robert L. Moore, and John H. Westbrook. NBS Spec. Publ. **396**, 90p. (1974).

Feasiblility Study: Compilation and Evaluation of Properties Data for Basalt, Granite, Tuff, and Shale — Lewis H. Gevantman. NBSIR **81-2217**, 259p. (1981).

Handbook of Hardness Data — G. V. Samsonov and A. A. Ivan'ko. Russian Transl., Springfield, VA: NTIS, 69p. (1970). TT 70-50177, A04. LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format — Douglas Mann and U.S. National Bureau of Standards., Boulder, CO: U.S. National Bureau of Standards, Cryogenic Division, 11p. (1977).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, First Supplement — Douglas Mann and U.S. National Bureau of Standards. **Suppl. 1**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1978).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, Second Supplement — Douglas Mann and U.S. National Bureau of Standards. **Suppl. 2**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1980).

Physical Properties Data Compilations Relevant to Energy Storage. III. Engineering Properties of Single and Polycrystalline Sodium Beta and Beta″ Alumina — G. R. Miller and D. G. Paquette. NSRDS-NBS **61**, 19p. (1979).

Physical Properties Data Compilations Relevant to Energy Storage. V. Mechanical Properties Data on Alloys for Use in Flywheels — Hassell M. Ledbetter. NSRDS-NBS **61**, 42p. (1982).

Physical Properties Data for Rock Salt — Lewis H. Gevantman. NBS Monograph **167**, 288p. (1981).

Physical Properties Data for Basalt — Lewis H. Gevantman. NBSIR **82-2587**, 751p. (1982).

Melting point

A Critical Review of Henry's Law Constants for Chemicals of Environmental Interest — Donald Mackay and Wan Ying Shiu. J Phys Chem Ref Data **10**, 1175(1981).

A Review of Deuterium Triple-Point Temperatures — L. A. Schwalbe and E. R. Grilly. J Phys Chem Ref Data **13**, 687(1984).

Behavior of the AB-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **6**, 1205(1977).

Behavior of the AB_2-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **11**, 1005(1982).

Definition of Recommended Values of Certain Thermodynamic Properties for the Ketones — Buford D. Smith and Ol Muthu. NBSIR **84-2811**, 162p. (1983).

Heat Capacities and Entropies of Organic Compounds in the Condensed Phase — Eugene S. Domalski, William H. Evans, and Elizabeth D. Hearing. J Phys Chem Ref Data **13**, Suppl. 1(1984).

High Temperature Properties and Decomposition of Inorganic Salts, Part 1. Sulfates — Kurt H. Stern and E. L. Weise. NSRDS-NBS 7, 38p. (1966).

High Temperature Properties and Decomposition of Inorganic Salts, Part 2. Carbonates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **30**, 27p. (1969).

High Temperature Properties and Decomposition of Inorganic Salts, Part 3. Nitrates and Nitrites — Kurt H. Stern. J Phys Chem Ref Data **1**, 747(1972).

High Temperature Properties and Decomposition of Inorganic Salts, Part 4. Oxy-Salts of the Halogens — Kurt H. Stern. J Phys Chem Ref Data **3**, 481(1974).

JANAF Thermochemical Tables, Second Edition — Daniel R. Stull and H. Prophet. NSRDS-NBS **37**, 1141p. (1971).

JANAF Thermochemical Tables, 1974 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, A. T. Hu, H. Prophet, A. N. Syverud, and L. C. Walker. J Phys Chem Ref Data **3**, 311(1974).

JANAF Thermochemical Tables, 1975 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, H. Prophet, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **4**, 1(1975).

JANAF Thermochemical Tables, 1978 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data 7, 793(1978).

JANAF Thermochemical Tables, 1982 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, J. R. Downey, Jr., R. A. McDonald, A. N. Syverud, and E. A. Valenzuela. J Phys Chem Ref Data **11**, 695(1982).

Molten Salts: Volume 1. Electrical Conductance, Density, and Viscosity Data — George J. Janz, F. W. Dampier, G. R. Lakshminarayanan, P. K. Lorenz, and Reginald P. T. Tomkins. NSRDS-NBS **15**, 140p. (1968).

Molten Salts: Volume 2. Section 1. Electrochemistry of Molten Salts. Gibbs Free Energies and Excess Free Energies from Equilibrium-Type Cells, Section 2. Surface Tension Data — George J. Janz, Chr. G. M. Dijkhuis, G. R. Lakshminarayanan, Reginald P. T. Tomkins, and J. Wong. NSRDS-NBS **28**, 116p. (1968).

Phase Diagrams for Ceramists — Ernest M. Levin, Carl R. Robbins, Howard F. McMurdie, editor(s)., American Ceramic Society; Columbus, Ohio, 601p. (1964), ISBN: 0-916094-04-9.

Phase Diagrams for Ceramists 1969 Supplement — Ernest M. Levin, Carl R. Robbins, Howard F. McMurdie, editor(s)., American Ceramic Society; Columbus, Ohio, 625p. (1969), ISBN: 0-916094-05-7.

Phase Diagrams for Ceramists 1975 Supplement — Ernest M. Levin, Howard F. McMurdie, editor(s)., American Ceramic Society; Columbus, Ohio, 513p. (1975).

Physical Properties Data Compilations Relevant to Energy Storage. I. Molten Salts: Eutectic Data — George J. Janz, Carolyn B. Allen, J. R. Downey, Jr., and Reginald P. T. Tomkins. NSRDS-NBS **61**, 244p. (1978).

Physical and Thermodynamic Properties of Aliphatic Alcohols — Randolph C. Wilhoit and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, Suppl. 1(1973).

Thermophysical Properties of Isobutane from 114 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Tech. Note **1051**, 199p. (1982).

Thermophysical Properties of Normal Butane from 135 to 700 K at Pressures to 70 MPa — W. M. Haynes and Robert D. Goodwin. NBS Monograph **169**, 197p. (1982).

Microwave spectra

See: Rotational spectra

Mobility of electrons and holes

See: Electron swarm parameters

Molecular energy levels and constants

Atlas of the Observed Absorption Spectrum of Carbon Monoxide between 1060 and 1900 Å — S. G. Tilford and J. D. Simmons. J Phys Chem Ref Data **1**, 147(1972).

Atlas of the High Temperature Water Vapor Spectrum in the 3000 to 4000 cm^{-1} Region — A. S. Pine, M. J. Coulombe, C. Camy-Peyret, and J-M. Flaud. J Phys Chem Ref Data **12**, 413(1983).

Atlas of the Schumann-Runge Absorption Bands of O_2 in the Wavelength Region 175-205 nm — K. Yoshino, D. E. Freeman, and W. H. Parkinson. J Phys Chem Ref Data **13**, 207(1984).

Compendium of ab initio Calculations of Molecular Energies and Properties — Morris Krauss. NBS Tech. Note **438**, 139p. (1967).

Critical Review of Vibrational Data and Force Field Constants for Polyethylene — John Barnes and Bruno Fanconi. J Phys Chem Ref Data 7, 1309(1978).

Drift Mobilities and Conduction Band Energies of Excess Electrons in Dielectric Liquids — Augustine O. Allen. NSRDS-NBS **58**, 23p. (1976).

Ground-State Vibrational Energy Levels of Polyatomic Transient Molecules — Marilyn E. Jacox. J Phys Chem Ref Data **13**, 945(1984).

JANAF Thermochemical Tables, Second Edition — Daniel R. Stull and H. Prophet. NSRDS-NBS **37**, 1141p. (1971).

JANAF Thermochemical Tables, 1974 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, A. T. Hu, H. Prophet, A. N. Syverud, and L. C. Walker. J Phys Chem Ref Data **3**, 311(1974).

JANAF Thermochemical Tables, 1975 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, H. Prophet, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **4**, 1(1975).

JANAF Thermochemical Tables, 1978 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **7**, 793(1978).

JANAF Thermochemical Tables, 1982 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, J. R. Downey, Jr., R. A. McDonald, A. N. Syverud, and E. A. Valenzuela. J Phys Chem Ref Data **11**, 695(1982).

Microwave Spectral Tables, Volume I. Diatomic Molecules — Paul F. Wacker, M. Mizushima, J. D. Petersen, and J. R. Ballard. NBS Monograph **70**, 171p. (1964).

Microwave Spectral Tables, Volume II. Line Strengths of Asymmetric Rotors — Paul F. Wacker and M. R. Pratto. NBS Monograph **70**, 349p. (1964).

Microwave Spectral Tables, Volume III. Polyatomic Molecules with Internal Rotation — Paul F. Wacker, M. S. Cord, D. G. Burkhard, J. D. Petersen, and R. F. Kukol. NBS Monograph **70**, 275p. (1969).

Microwave Spectral Tables, Volume IV. Polyatomic Molecules without Internal Rotation — M. S. Cord, J. D. Petersen, M. S. Lojko, and R. H. Haas. NBS Monograph **70**, 419p. (1968).

Microwave Spectral Tables, Volume V. Spectral Line Listing — M. S. Cord, M. S. Lojko, and J. D. Petersen. NBS Monograph **70**, 533p. (1968).

Microwave Spectra of Molecules of Astrophysical Interest, I. Formaldehyde, Formamide, and Thioformaldehyde — Donald R. Johnson, Frank J. Lovas, and William H. Kirchhoff. J Phys Chem Ref Data **1**, 1011(1972).

Microwave Spectra of Molecules of Astrophysical Interest, II. Methylenimine — William H. Kirchhoff, Donald R. Johnson, and Frank J. Lovas. J Phys Chem Ref Data **2**, 1(1973).

Microwave Spectra of Molecules of Astrophysical Interest, III. Methanol — R. M. Lees, Frank J. Lovas, William H. Kirchhoff, and Donald R. Johnson. J Phys Chem Ref Data **2**, 205(1973).

Microwave Spectra of Molecules of Astrophysical Interest, IV. Hydrogen Sulfide — Paul Helminger, Frank C. De Lucia, and William H. Kirchhoff. J Phys Chem Ref Data **2**, 215(1973).

Microwave Spectra of Molecules of Astrophysical Interest, V. Water Vapor — Frank C. De Lucia, Paul Helminger, and William H. Kirchhoff. J Phys Chem Ref Data **3**, 211(1974).

Microwave Spectra of Molecules of Astrophysical Interest, VI. Carbonyl Sulfide and Hydrogen Cyanide — Arthur G. Maki. J Phys Chem Ref Data **3**, 221(1974).

Microwave Spectra of Molecules of Astrophysical Interest, VII. Carbon Monoxide, Carbon Monosulfide, and Silicon Monoxide — Frank J. Lovas and Paul H. Krupenie. J Phys Chem Ref Data **3**, 245(1974).

Microwave Spectra of Molecules of Astrophysical Interest, VIII. Sulfur Monoxide — Eberhard Tiemann. J Phys Chem Ref Data **3**, 259(1974).

Microwave Spectral Tables, I. Diatomic Molecules — Frank J. Lovas and Eberhard Tiemann. J Phys Chem Ref Data **3**, 609(1974).

Microwave Spectra of Molecules of Astrophysical Interest, IX. Acetaldehyde — A. Bauder, Frank J. Lovas, and Donald R. Johnson. J Phys Chem Ref Data **5**, 53(1976).

Microwave Spectra of Molecules of Astrophysical Interest, X. Isocyanic Acid — G. Winnewisser, W. H. Hocking, and M. C. L. Gerry. J Phys Chem Ref Data **5**, 79(1976).

Microwave Spectra of Molecules of Astrophysical Interest, XI. Silicon Sulfide — Eberhard Tiemann. J Phys Chem Ref Data **5**, 1147(1976).

Microwave Spectra of Molecules of Astrophysical Interest, XII. Hydroxyl Radical — Robert A. Beaudet and Robert L. Poynter. J Phys Chem Ref Data **7**, 311(1978).

Microwave Spectra of Molecules of Astrophysical Interest, XIII. Cyanoacetylene — Walter J. Lafferty and Frank J. Lovas. J Phys Chem Ref Data **7**, 441(1978).

Microwave Spectral Tables II. Triatomic Molecules — Frank J. Lovas. J Phys Chem Ref Data **7**, 1445(1978).

Microwave Spectra of Molecules of Astrophysical Interest, XIV. Vinyl Cyanide (Acrylonitrile) — M. C. L. Gerry, K. Yamada, and G. Winnewisser. J Phys Chem Ref Data **8**, 107(1979).

Microwave Spectra of Molecules of Astrophysical Interest, XV. Propyne — A. Bauer, D. Boucher, J. Burie, J. Demaison, and A. Dubrulle. J Phys Chem Ref Data **8**, 537(1979).

Microwave Spectra of Molecules of Astrophysical Interest, XVI. Methyl Formate — A. Bauder. J Phys Chem Ref Data **8**, 583(1979).

Microwave Spectra of Molecules of Astrophysical Interest, XVII. Dimethyl Ether — Frank J. Lovas, H. Lutz, and H. Dreizler. J Phys Chem Ref Data **8**, 1051(1979).

Microwave Spectra of Molecules of Astrophysical Interest. XVIII. Formic Acid — Edmond Willemot, Didier Dangoisse, Nicole Monnanteuil, and Jean Bellet. J Phys Chem Ref Data **9**, 59(1980).

Microwave Spectra of Molecules of Astrophysical Interest. XIX. Methyl Cyanide — D. Boucher, J. Burie, A. Bauer, A. Dubrulle, and J. Demaison. J Phys Chem Ref Data **9**, 659(1980).

Microwave Spectra of Molecules of Astrophyical Interest. XX. Methane — I. Ozier, M. C. L. Gerry, and A. G. Robiette. J Phys Chem Ref Data **10**, 1085(1981).

Microwave Spectra of Molecules of Astrophysical Interest. XXI. Ethanol (C_2H_5OH) and Propionitrile (C_2H_5CN) — Frank J. Lovas. J Phys Chem Ref Data **11**, 251(1982).

Resonances in Electron Impact on Atoms and Diatomic Molecules — George J. Schulz. NSRDS-NBS **50**, 120p. (1973).

Tables of Molecular Vibrational Frequencies, Part 1 — Takehiko Shimanouchi. NSRDS-NBS **6**, 56p. (1967).

Tables of Molecular Vibrational Frequencies, Part 2 — Takehiko Shimanouchi. NSRDS-NBS **11**, 38p. (1967).

Tables of Molecular Vibrational Frequencies, Part 3 — Takehiko Shimanouchi. NSRDS-NBS **17**, 39p. (1968).

Tables of Molecular Vibrational Frequencies, Consolidated Volume I — Takehiko Shimanouchi. NSRDS-NBS **39**, 167p. (1972).

Tables of Molecular Vibrational Frequencies, Part 5 — Takehiko Shimanouchi. J Phys Chem Ref Data **1**, 189(1972).

Tables of Molecular Vibrational Frequencies, Part 6 — Takehiko Shimanouchi. J Phys Chem Ref Data **2**, 121(1973).

Tables of Molecular Vibrational Frequencies, Part 7 — Takehiko Shimanouchi. J Phys Chem Ref Data **2**, 225(1973).

Tables of Molecular Vibrational Frequencies, Part 8 — Takehiko Shimanouchi. J Phys Chem Ref Data **3**, 269(1974).

Tables of Molecular Vibrational Frequencies. Consolidated Volume II — Takehiko Shimanouchi. J Phys Chem Ref Data **6**, 993(1977).

Tables of Molecular Vibrational Frequencies, Part 9 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **7**, 1323(1978).

Tables of Molecular Vibrational Frequencies, Part 10 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **9**, 1149(1980).

Tables of N_2O Absorption Lines for the Calibration of Tunable Infrared Lasers from 522 cm^{-1} to 657 cm^{-1} and from 1115 cm^{-1} to 1340 cm^{-1} — W. B. Olson, Arthur G. Maki, and Walter J. Lafferty. J Phys Chem Ref Data **10**, 1065(1981).

The Band Spectrum of Carbon Monoxide — Paul H. Krupenie. NSRDS-NBS **5**, 87p. (1966).

The Calculation of Rotational Energy Levels and Rotational Line Intensities in Diatomic Molecules — Jon T. Hougen. NBS Monograph **115**, 54p. (1970).

The Spectrum of Molecular Nitrogen — Alf Lofthus and Paul H. Krupenie. J Phys Chem Ref Data **6**, 113(1977).

Thermodynamic Properties of Ammonia as an Ideal Gas — Lester Haar. NSRDS-NBS **19**, 10p. (1968).

Molecular spectra

See: Rotational spectra
Vibrational spectra (infrared, Raman)

Molecular structure

Binary Fluorides, Free Molecular Structures and Force Fields, A Bibliography (1957-1975) — Donald T. Hawkins, Lawrence S. Bernstein, Warren E. Falconer, and William Klemperer., New York: IFI/Plenum, 253p. (1976), ISBN: 0-306-6601-3.

JANAF Thermochemical Tables, 1974 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, A. T. Hu, H. Prophet, A. N. Syverud, and L. C. Walker. J Phys Chem Ref Data **3**, 311(1974).

JANAF Thermochemical Tables, 1975 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, H. Prophet, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **4**, 1(1975).

JANAF Thermochemical Tables, 1978 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **7**, 793(1978).

Microwave Spectra of Molecules of Astrophysical Interest, I. Formaldehyde, Formamide, and Thioformaldehyde — Donald R. Johnson, Frank J. Lovas, and William H. Kirchhoff. J Phys Chem Ref Data **1**, 1011(1972).

Microwave Spectra of Molecules of Astrophysical Interest, II. Methylenimine — William H. Kirchhoff, Donald R. Johnson, and Frank J. Lovas. J Phys Chem Ref Data **2**, 1(1973).

Microwave Spectra of Molecules of Astrophysical Interest, III. Methanol — R. M. Lees, Frank J. Lovas, William H. Kirchhoff, and Donald R. Johnson. J Phys Chem Ref Data **2**, 205(1973).

Microwave Spectra of Molecules of Astrophysical Interest, IV. Hydrogen Sulfide — Paul Helminger, Frank C. De Lucia, and William H. Kirchhoff. J Phys Chem Ref Data **2**, 215(1973).

Microwave Spectra of Molecules of Astrophysical Interest, VI. Carbonyl Sulfide and Hydrogen Cyanide — Arthur G. Maki. J Phys Chem Ref Data **3**, 221(1974).

Microwave Spectra of Molecules of Astrophysical Interest, VII. Carbon Monoxide, Carbon Monosulfide, and Silicon Monoxide — Frank J. Lovas and Paul H. Krupenie. J Phys Chem Ref Data **3**, 245(1974).

Microwave Spectral Tables, I. Diatomic Molecules — Frank J. Lovas and Eberhard Tiemann. J Phys Chem Ref Data **3**, 609(1974).

Microwave Spectra of Molecules of Astrophysical Interest, IX. Acetaldehyde — A. Bauder, Frank J. Lovas, and Donald R. Johnson. J Phys Chem Ref Data **5**, 53(1976).

Microwave Spectra of Molecules of Astrophysical Interest, X. Isocyanic Acid — G. Winnewisser, W. H. Hocking, and M. C. L. Gerry. J Phys Chem Ref Data **5**, 79(1976).

Microwave Spectra of Molecules of Astrophysical Interest, XII. Hydroxyl Radical — Robert A. Beaudet and Robert L. Poynter. J Phys Chem Ref Data **7**, 311(1978).

Microwave Spectra of Molecules of Astrophysical Interest, XIII. Cyanoacetylene — Walter J. Lafferty and Frank J. Lovas. J Phys Chem Ref Data **7**, 441(1978).

Microwave Spectral Tables II. Triatomic Molecules — Frank J. Lovas. J Phys Chem Ref Data **7**, 1445(1978).

Microwave Spectra of Molecules of Astrophysical Interest, XIV. Vinyl Cyanide (Acrylonitrile) — M. C. L. Gerry, K. Yamada, and G. Winnewisser. J Phys Chem Ref Data **8**, 107(1979).

Microwave Spectra of Molecules of Astrophysical Interest, XV. Propyne — A. Bauer, D. Boucher, J. Burie, J. Demaison, and A. Dubrulle. J Phys Chem Ref Data **8**, 537(1979).

Microwave Spectra of Molecules of Astrophysical Interest, XVI. Methyl Formate — A. Bauder. J Phys Chem Ref Data **8**, 583(1979).

Microwave Spectra of Molecules of Astrophysical Interest, XVII. Dimethyl Ether — Frank J. Lovas, H. Lutz, and H. Dreizler. J Phys Chem Ref Data **8**, 1051(1979).

Microwave Spectra of Molecules of Astrophysical Interest. XVIII. Formic Acid — Edmond Willemot, Didier Dangoisse, Nicole Monnanteuil, and Jean Bellet. J Phys Chem Ref Data **9**, 59(1980).

Microwave Spectra of Molecules of Astrophysical Interest. XIX. Methyl Cyanide — D. Boucher, J. Burie, A. Bauer, A. Dubrulle, and J. Demaison. J Phys Chem Ref Data **9**, 659(1980).

Molecular Structures of Gas-Phase Polyatomic Molecules Determined by Spectroscopic Methods — Marlin D. Harmony, Victor W. Laurie, Robert L. Kuczkowski, Richard H. Schwendeman, D. A. Ramsay, Frank J. Lovas, Walter J. Lafferty, and Arthur G. Maki. J Phys Chem Ref Data **8**, 619(1979).

Mossbauer effect

Mossbauer Effect Data Index, 1958-1965 — A. H. Muir, K. J. Ando, and Helen M. Coogan., New York: Interscience Publishers, 351p. (1966).

Mossbauer Effect Data Index Covering the 1966-1968 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 522p. (1975), ISBN: 0-306-6516-9.

Mossbauer Effect Data Index Covering the 1969 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 281p. (1970), ISBN: 0-306-6514-8.

Mossbauer Effect Data Index Covering the 1970 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 369p. (1972), ISBN: 0-306-6514-6.

Mossbauer Effect Data Index Covering the 1971 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 430p. (1972), ISBN: 0-306-6514-4.

Mossbauer Effect Data Index Covering the 1972 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 488p. (1973), ISBN: 0-306-6514-2.

Mossbauer Effect Data Index Covering the 1973 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 495p. (1975), ISBN: 0-306-6514-0.

Mossbauer Effect Data Index Covering the 1974 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 397p. (1975), ISBN: 0-306-6514-9.

Mossbauer Effect Data Index Covering the 1975 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 445p. (1977), ISBN: 0-306-6514-7.

Mossbauer Effect Data Index Covering the 1976 Literature — John G. Stevens and Virginia E. Stevens., New York: IFI/Plenum, 355p. (1978), ISBN: 0-306-6514-1.

Mossbauer Effect Reference and Data Journal — John G. Stevens, Virginia E. Stevens, Richard M. White, Janet L. Gibson, editor(s). Moss Eff Ref Data J **6**, Ashville, NC: Mossbauer Effect Data Center, U. of N. C., ...p. (1983).

Nuclear and particle properties

π+p, π+n, and π+d Interactions - A Compilation: Parts I and II — Denyse M. Chew, Victor P. Henri, Thomas A. Lasinski, Thomas G. Trippe, Fumiyo Uchiyama, Frederick C. Winkelmann and Particle Data Group. UCRL **53**, Springfield, VA: NTIS, 213p. (1973). LBL **53**; Part II is on microfiche located in the back cover pocket, A10.

πN Particle-Wave Amplitudes — David J. Herndon, Angela Barbaro-Galtieri, Arthur H. Rosenfeld and Particle Data Group. UCRL 20030πN, Springfield, VA: NTIS, 85p. (1970). UCRL 20030 πN, A05.

πN Two-Body Scattering Data, I. A User's Guide to the Lovelace-Almehed Data Tape — Claude Lovelace, Sverkei Almehed, Fumiyo Uchiyama, Robert Kelly, Victor P. Henri and Particle Data Group. UCRL **63**, Springfield, VA: NTIS, 146p. (1973). LBL 63, A07.

A Compilation of YN Reactions — Odette Benary, Naomi Barash-Schmidt, LeRoy R. Price, Arthur H. Rosenfeld, Gideon Alexander and Particle Data Group. UCRL **20000YN**, Springfield, VA: NTIS, 70p. (1970). UCRL-20 000 YN, A04.

An Indexed Compilation of Experimental High Energy Physics Literature — Particle Data Group. UCRL-LBL **90**, Springfield, VA: NTIS, 430p. (1978). LBL 90, A19.

Dissociation in Heavy Particle Collisions — G. W. McClure and James M. Peek. At Mol Collis Proc Ser, New York: Wiley-Interscience, 198p. (1972), ISBN: 0-471-5816-8.

Excitation in Heavy Particle Collisions — Edward W. Thomas. At Mol Collis Proc Ser, New York: Wiley-Interscience, 436p. (1972), ISBN: 0-471-8589-0.

$K^0 <-_1 N$ Interactions - A Compilation — Particle Data Group. UCRL-LBL **55**, Springfield, VA: NTIS, 56p. (1972). LBL 55, A04.

Microwave Spectral Tables, Volume III. Polyatomic Molecules with Internal Rotation — Paul F. Wacker, M. S. Cord, D. G. Burkhard, J. D. Petersen, and R. F. Kukol. NBS Monograph **70**, 275p. (1969).

Microwave Spectral Tables, Volume V. Spectral Line Listing — M. S. Cord, M. S. Lojko, and J. D. Petersen. NBS Monograph **70**, 533p. (1968).

NN and ND Interactions - A Compilation — James E. Enstrom, Thomas Ferbel, Paul F. Slattery, Barry L. Werner, Zaven G. T. Guiragossian, Yoshio Sumi, Toshihiro Yoshida and Particle Data Group. UCRL-LBL **58**, Berkeley, CA: Lawrence Berkeley Laboratory, U. of California, 281p. (1972). LBL 58.

Nuclear Wallet Cards — Virginia S. Shirley, C. Michael Lederer and National Nuclear Data Center. **1979**, Upton, NY: National Nuclear Data Center, Brookhaven National Laboratory, 40p. (1979). Title, no charge.

Nuclear Spins and Moments — Gladys H. Fuller. J Phys Chem Ref Data **5**, 835(1976).

Nuclear Moments and Moment Ratios as Determined by Mössbauer Spectroscopy — John G. Stevens and B. D. Dunlap. J Phys Chem Ref Data **5**, 1093(1976).

Photonuclear Reaction Data, 1973 — Everett G. Fuller, Henry M. Gerstenberg, H. J. Vander Molen, and T. C. Dunn. NBS Spec. Publ. **380**, 134p. (1973).

Photonuclear Data Index, 1973-1977 — Everett G. Fuller and Henry M. Gerstenberg. NBS Spec. Publ. **380**, Suppl. 1(1978).

Review of Particle Properties, 25th Anniversary Edition — Particle Data Group. Phys Lett B **111B**, Springfield, VA: NTIS, 316p. (1982).

Table of Isotopes, Seventh Edition — C. Michael Lederer, Virginia S. Shirley, Edgardo Browne, Janis M. Dairiki, and Raymond E. Doebler., New York: Wiley-Interscience, 1628p. (1978), ISBN: 0-471-0417-3.

Nuclear magnetic resonance

Metallic Shifts in NMR: A Review of the Theory and Comprehensive Critical Data Compilation of Metallic Materials — Gesina Cynthia Carter, Lawrence H. Bennett, and Daniel J. Kahan. Prog Mater Sci, Oxford, New York: Pergamon Press, 2350p. (1977), ISBN: 0-08-02114-7.

NMR Spectral Data: A Compilation of Aromatic Proton Chemical Shifts in Mono- and Di-Substituted Benzene — B. L. Shapiro and L. E. Mohrmann. J Phys Chem Ref Data **6**, 919(1977).

The NBS Alloy Data Center: Function, Bibliographic System, Related Data Centers, and Reference Books — Gesina Cynthia Carter, Lawrence H. Bennett, John R. Cuthill, and Daniel J. Kahan. NBS Tech. Note **464**, 163p. (1968).

The NBS Alloy Data Center: Author Index — Gesina Cynthia Carter, Daniel J. Kahan, Lawrence H. Bennett, John R. Cuthill, and Ronald C. Dobbyn. OSRD Bibl. **70-2**, 413p. (1970).

Nuclear moments

Microwave Spectral Tables, Volume III. Polyatomic Molecules with Internal Rotation — Paul F. Wacker, M. S. Cord, D. G. Burkhard, J. D. Petersen, and R. F. Kukol. NBS Monograph **70**, 275p. (1969).

Microwave Spectral Tables, Volume V. Spectral Line Listing — M. S. Cord, M. S. Lojko, and J. D. Petersen. NBS Monograph **70**, 533p. (1968).

Nuclear Spins and Moments — Gladys H. Fuller. J Phys Chem Ref Data **5**, 835(1976).

Nuclear Moments and Moment Ratios as Determined by Mössbauer Spectroscopy — John G. Stevens and B. D. Dunlap. J Phys Chem Ref Data **5**, 1093(1976).

Optical spectra

See: **Electronic molecular spectra**

Oscillator strengths

See: **Transition probabilities for atoms and molecules**

Osmotic coefficients

A Bibliography of Sources of Experimental Data Leading to Activity or Osmotic Coefficients for Polyvalent Electrolytes in Aqueous Solution — Robert N. Goldberg, Bert R. Staples, Ralph L. Nuttall, and R. Arbuckle. NBS Spec. Publ. **485**, 57p. (1977).

A Report on Thermodynamic Data for Desulfurization Processes — Vivian B. Parker, Bert R. Staples, Thomas L. Jobe, Jr., and David B. Neumann. NBSIR **81-2345**, 89p. (1981).

Activity and Osmotic Coefficients of Aqueous Alkali Metal Nitrites — Bert R. Staples. J Phys Chem Ref Data **10**, 765(1981).

Activity and Osmotic Coefficients of Aqueous Sulfuric Acid at 298.15 K — Bert R. Staples. J Phys Chem Ref Data **10**, 779(1981).

Computer Programs for the Evaluation of Activity and Osmotic Coefficients — Bert R. Staples and Ralph L. Nuttall. NBS Tech. Note **928**, 60p. (1976).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: The Alkaline Earth Metal Halides — Robert N. Goldberg and Ralph L. Nuttall. J Phys Chem Ref Data **7**, 263(1978).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Iron Chloride and the Bi-Univalent Compounds of Nickel and Cobalt — Robert N. Goldberg, Ralph L. Nuttall, and Bert R. Staples. J Phys Chem Ref Data **8**, 923(1979).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Bi-Univalent Compounds of Lead, Copper, Manganese, and Uranium — Robert N. Goldberg. J Phys Chem Ref Data **8**, 1005(1979).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Bi-Univalent Compounds of Zinc, Cadmium, and Ethylene Bis(-Trimethylammonium) Chloride and Iodide — Robert N. Goldberg. J Phys Chem Ref Data **10**, 1(1981).

Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Thirty-Six Uni-Bivalent Electrolytes — Robert N. Goldberg. J Phys Chem Ref Data **10**, 671(1981).

Osmotic Coefficients and Mean Activity Coefficients of Uni-Univalent Electrolytes in Water at 25 °C — Walter J. Hamer and Yung-Chi Wu. J Phys Chem Ref Data **1**, 1047(1972).

Revised Values of the Osmotic Coefficients and Mean Activity Coefficients of Sodium Nitrate in Water at 25°C (Comments) — Yung-Chi Wu and Walter J. Hamer. J Phys Chem Ref Data **9**, 513(1980).

The Activity and Osmotic Coefficients of Aqueous Calcium Chloride ride at 298.15 K — Bert R. Staples and Ralph L. Nuttall. J Phys Chem Ref Data **6**, 385(1977).

Thermodynamic Properties of Aqueous Sodium Chloride Solutions — Kenneth S. Pitzer, J. Christopher Peiper, and R. H. Busey. J Phys Chem Ref Data **13**, 1(1984).

PVT surface

See: **Equation of state**

Pair production cross section

Comparison of Theoretical and Experimental Photoeffect Data, 0.1 keV to 1.5 MeV — John H. Hubbell and W. J. Veigele. NBS Tech. Note **901**, 47p. (1976).

Pair, Triplet, and Total Atomic Cross Sections (and Mass Attenuation Coefficients) for 1 MeV-100 GeV Photons in Elements Z=1 to 100 — John H. Hubbell, Heinz A. Gimm, and I. Ø verbø . J Phys Chem Ref Data **9**, 1023(1980).

Photon Cross Sections, Attenuation Coefficients, and Energy Absorption Coefficients from 10 keV to 100 GeV — John H. Hubbell. NSRDS-NBS **29**, 85p. (1969).

Phase diagrams

Applications of Phase Diagrams, Proceedings of a Workshop Held at the National Bureau of Standards, Gaithersburg, Maryland, January 10-12, 1977, Volumes 1 and 2 — Gesina Cynthia Carter, editor(s). NBS Spec. Publ. **496**, 1622p. (1978).

Behavior of the Elements at High Pressures — John Francis Cannon. J Phys Chem Ref Data **3**, 781(1974).

Behavior of the AB-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **6**, 1205(1977).

Behavior of the AB_2-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **11**, 1005(1982).

Bulletin of Alloy Phase Diagrams — Joanne Murray, editor(s) and American Society for Metals. Bull Alloy Phase Diag **3**, Metals Park, OH: American Society for Metals, 130p. (1982), ISBN: 01970216.

Handbook of Phase Diagrams of Silicate Systems, Vol. I. Binary Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, V. V. Lapin, N. N. Kurtseva, J. Schmorak, editor(s). Russian Transl., Springfield, VA: NTIS, 730p. (1970). TT 71-50040, A26.

Handbook of Phase Diagrams of Silicate Systems, Vol. II. Metal-Oxygen Compounds in Silicate Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, I. A. Bondar', and Yu. P. Udalov. Russian Transl., Springfield, VA: NTIS, 329p. (1972). TT 71-50041, A15.

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Metal Systems — Y. Austin Chang, Joachim P. Neumann, A. Mikula, and Daniel Goldberg. INCRA Monograph **VI**, New York: International Copper Research Association, Inc., 702p. (1979).

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Sulfur-Metal Systems — Y. Austin Chang, Joachim P. Neumann, and U. V. Choudary. INCRA Monograph **VII**, New York: International Copper Research Association, Inc., 191p. (1979).

Phase Diagrams for Ceramists — Ernest M. Levin, Carl R. Robbins, Howard F. McMurdie, editor(s)., American Ceramic Society; Columbus, Ohio, 601p. (1964), ISBN: 0-916094-04-9.

Phase Diagrams for Ceramists 1969 Supplement — Ernest M. Levin, Carl R. Robbins, Howard F. McMurdie, editor(s)., American Ceramic Society; Columbus, Ohio, 625p. (1969), ISBN: 0-916094-05-7.

Phase Diagrams for Ceramists 1975 Supplement — Ernest M. Levin, Howard F. McMurdie, editor(s)., American Ceramic Society; Columbus, Ohio, 513p. (1975).

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Silver Systems — Y. Austin Chang, Daniel Goldberg, and Joachim P. Neumann. J Phys Chem Ref Data **6**, 621(1977).

Physical Properties Data Compilations Relevant to Energy Storage. I. Molten Salts: Eutectic Data — George J. Janz, Carolyn B. Allen, J. R. Downey, Jr., and Reginald P. T. Tomkins. NSRDS-NBS **61**, 244p. (1978).

Selected Thermodynamic Values and Phase Diagrams for Copper and Some of Its Binary Alloys — Ralph Hultgren and Pramond D. Desai. INCRA Monograph **I**, New York: International Copper Research Association, Inc., 204p. (1973).

Selected Values of the Thermodynamic Properties of Binary Alloys — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, and Kenneth K. Kelley., Metals Park, OH: American Society for Met als, 1435p. (1973).

Phase transition data

Behavior of the AB-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **6**, 1205(1977).

Behavior of the AB_2-Type Compounds at High Pressures and High Temperatures — Leo Merrill. J Phys Chem Ref Data **11**, 1005(1982).

Crystal Structure Transformations in Binary Halides — C. N. R. Rao and M. Natarajan. NSRDS-NBS **41**, 57p. (1972).

Crystal Structure Transformations in Inorganic Nitrites, Nitrates, and Carbonates — C. N. R. Rao, Brahm Prakash, and M. Natarajan. NSRDS-NBS **53**, 55p. (1975).

Crystal Structure Transformations in Inorganic Sulfates, Phosphates, Perchlorates, and Chromates — C. N. R. Rao and Brahm Prakash. NSRDS-NBS **56**, 37p. (1975).

Equilibrium Properties of Fluid Mixtures, A Bibliography on Fluids of Cryogenic Interest — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller., New York: IFI/Plenum, 166p. (1975), ISBN: 0-306-6601-6.

Equilibrium Properties of Fluid Mixtures, 2. A Bibliography of Experimental Data on Selected Fluids — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller., New York: IFI/Plenum, 258p. (1982), ISBN: 0-306-6602-4.

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VI. Acrylic Polymers — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **11**, 1065(1982).

Heat Capacities and Entropies of Organic Compounds in the Condensed Phase — Eugene S. Domalski, William H. Evans, and Elizabeth D. Hearing. J Phys Chem Ref Data **13**, Suppl. 1(1984).

High Temperature Properties and Decomposition of Inorganic Salts, Part 1. Sulfates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **7**, 38p. (1966).

High Temperature Properties and Decomposition of Inorganic Salts, Part 2. Carbonates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **30**, 27p. (1969).

High Pressure Bibliography 1900-1968, Volume I. Section I. Bibliography, Section II. Author Index — Leo Merrill. OSRD Bibl. **70-1**, Vol. 1(1970).

High Pressure Bibliography 1900-1968, Volume II. Subject Index — Leo Merrill. OSRD Bibl. **70-1**, Vol. 2(1970).

High Temperature Properties and Decomposition of Inorganic Salts, Part 3. Nitrates and Nitrites — Kurt H. Stern. J Phys Chem Ref Data **1**, 747(1972).

High-Pressure Calibration: A Critical Review — D. L. Decker, W. A. Bassett, Leo Merrill, H. T. Hall, and J. D. Barnett. J Phys Chem Ref Data **1**, 773(1972).

High Temperature Properties and Decomposition of Inorganic Salts, Part 4. Oxy-Salts of the Halogens — Kurt H. Stern. J Phys Chem Ref Data **3**, 481(1974).

JANAF Thermochemical Tables, Second Edition — Daniel R. Stull and H. Prophet. NSRDS-NBS **37**, 1141p. (1971).

JANAF Thermochemical Tables, 1974 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, A. T. Hu, H. Prophet, A. N. Syverud, and L. C. Walker. J Phys Chem Ref Data **3**, 311(1974).

JANAF Thermochemical Tables, 1975 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, H. Prophet, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **4**, 1(1975).

JANAF Thermochemical Tables, 1978 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **7**, 793(1978).

JANAF Thermochemical Tables, 1982 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, J. R. Downey, Jr., R. A. McDonald, A. N. Syverud, and E. A. Valenzuela. J Phys Chem Ref Data **11**, 695(1982).

Liquid Vapor Equilibria on Systems of Interest in Cryogenics, A Survey — Arthur J. Kidnay, M. J. Hiza, and R. C. Miller. Cryogenics **13**, London: Academic Press, 575p. (1973).

Physical and Thermodynamic Properties of Aliphatic Alcohols — Randolph C. Wilhoit and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, Suppl. 1(1973).

Properties of Liquid and Solid Hydrogen — B. N. Esel'son, Y. P. Blagoi, V.N. Grigor'ev, V. G. Manzhelii, S. A. Mikhailenko, and N. P. Neklyudov. Russian Transl., Springfield, VA: NTIS, 126p. (1971). TT 70-50179, A07.

The Molar Volume (Density) of Solid Oxygen in Equilibrium with Vapor — Hans M. Roder. J Phys Chem Ref Data **7**, 949(1978).

Thermophysical Properties of Isobutane from 114 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Tech. Note **1051**, 199p. (1982).

Thermophysical Properties of Normal Butane from 135 to 700 K at Pressures to 70 MPa — W. M. Haynes and Robert D. Goodwin. NBS Monograph **169**, 197p. (1982).

Thermophysical Properties of Propane from 85 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Monograph **170**, 249p. (1982).

Transition Metal Oxides, Crystal Chemistry, Phase Transition, and Related Aspects — C. N. R. Rao and G. V. Subba Rao. NSRDS-NBS **49**, 140p. (1974).

Photon cross section

A Catalog of Data Compilations on Photochemical and Photophysical Processes in Solution — James G. Brummer, W. Phillip Helman, and Alberta B. Ross. NBS Spec. Publ. **578**, 27p. (1980).

Atomic Form Factors, Incoherent Scattering Functions, and Photon Scattering Cross Sections — John H. Hubbell, W. J. Veigele, E. A Briggs, R. T. Brown, D. T. Cromer, and R. J. Howerton. J Phys Chem Ref Data **4**, 471(1975).

Bibliography of Low Energy Electron and Photon Cross Section Data (through December 1974) — Lee J. Kieffer. NBS Spec. Publ. **426**, 222p. (1976).

Bibliography of Low Energy Electron and Photon Cross Section Data (January 1975 to December 1977) — Jean W. Gallagher, John R. Rumble, Jr., and Earl C. Beaty. NBS Spec. Publ. **426**, Suppl. 1(1979).

Bibliography of Photoabsorption Cross Section Data — Robert D.Hudson and Lee J. Kieffer. OSRD Bibl. 70-4, 47p. (1970).

Bibliography of Low Energy Electron and Photon Cross Section Data (1978) — Jean W. Gallagher and Earl C. Beaty. JILA Report **18**, 148p. (1980).

Bibliography of Low Energy Electron and Photon Cross Section Data (1979) — Jean W. Gallagher and Earl C. Beaty. JILA Report **21**, 127p. (1981).

Comparison of Theoretical and Experimental Photoeffect Data, 0.1 keV to 1.5 MeV — John H. Hubbell and W. J. Veigele. NBS Tech. Note **901**, 47p. (1976).

Critical Review of Ultraviolet Photoabsorption Cross Sections for Molecules of Astrophysical and Aeronomic Interest — Robert D. Hudson. NSRDS-NBS **38**, 114p. (1971).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **9**, 295(1980).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement I. CODATA Task Group on Chemical Kinetics — D. L. Baulch, R. A. Cox, P. J. Crutzen, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **11**, 327(1982).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement II. CODATA Task Group on Gas Phase Chemical Kinetics — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **13**, 1259(1984).

Molecular Form Factors and Photon Coherent Scattering Cross Sections of Water — L. R. M. Morin. J Phys Chem Ref Data **11**, 1091(1982).

Pair, Triplet, and Total Atomic Cross Sections (and Mass Attenuation Coefficients) for 1 MeV-100 GeV Photons in Elements Z=1 to 100 — John H. Hubbell, Heinz A. Gimm, and I. Øverbø . J Phys Chem Ref Data **9**, 1023(1980).

Photon Cross Sections, Attenuation Coefficients, and Energy Absorption Coefficients from 10 keV to 100 GeV — John H. Hubbell. NSRDS-NBS **29**, 85p. (1969).

Rate Constants for Reactions of ClO_x of Atmospheric Interest — R. T. Watson. J Phys Chem Ref Data **6**, 871(1977).

Relativistic Atomic Form Factors and Photon Coherent Scattering Cross Sections — John H. Hubbell and I. Ø verbø . J Phys Chem Ref Data **8**, 69(1979).

Small-Angle Rayleigh Scattering of Photons at High Energies: Tabulations of Relativisitic HFS Modified Atomic Form Factors — D. Schaupp, M. Schumacher, F. Smend, P. Rullhusen, and John H. Hubbell. J Phys Chem Ref Data **12**, 467(1983).

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Total Photon Absorption Cross Section Measurements, Theoretical Analysis and Evaluations for Energies above 10 MeV — Heinz A. Gimm and John H. Hubbell. NBS Tech. Note **968**, 81p. (1978).

Polarizability

Vibrational Contributions to Molecular Dipole Polarizabilities — David M. Bishop and Lap M. Cheung. J Phys Chem Ref Data **11**, 119(1982).

Potential energy curves for atoms and molecules

Atlas of the Observed Absorption Spectrum of Carbon Monoxide between 1060 and 1900 Å — S. G. Tilford and J. D. Simmons. J Phys Chem Ref Data **1**, 147(1972).

Gaseous Diffusion Coefficients — T. R. Marrero and E. A. Mason. J Phys Chem Ref Data **1**, 1(1972).

The Spectrum of Molecular Oxygen — Paul H. Krupenie. J Phys Chem Ref Data **1**, 423(1972).

The Spectrum of Molecular Nitrogen — Alf Lofthus and Paul H. Krupenie. J Phys Chem Ref Data **6**, 113(1977).

Proton affinity

A Compendium of Gas Phase Basicity and Proton Affinity Measurements — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, Henry M. Rosenstock, S. S. Schroyer, C. Schmidt, D. Martinsen, and G. W. A. Milne. NBSIR **79-1777**, 563p. (1979).

Annotated Bibliography on Proton Affinities — K. N. Hartman, Sharon G. Lias, P. J. Ausloos, and Henry M. Rosenstock. NBSIR **76-1061**, 52p. (1976).

Evaluated Gas Phase Basicities and Proton Affinities of Molecules: Heats of Formation of Protonated Molecules — Sharon G. Lias, Joel F. Liebman, and Rhoda D. Levin. J Phys Chem Ref Data **13**, 695(1984).

Quadrupole moments

See: **Nuclear moments**

Quantum yield

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Raman spectra

See: **Vibrational spectra (infrared, Raman)**

Rate constants of chemical reactions

A Bibliography on Ion-Molecule Reactions. January 1900 to March 1966 — F. N. Harllee, Henry M. Rosenstock, and John T. Herron. NBS Tech. Note **291**, 40p. (1966).

A Bibliography of Kinetic Data on Gas Phase Reactions of Nitrogen, Oxygen, and Nitrous Oxides — Francis Westley. OSRD Bibl. **71-2**, 140p. (1971)

A Compilation of Kinetic Parameters for the Thermal Degradation of n-Alkane Molecules — D. L. Allara and Robert Shaw. J Phys Chem Ref Data **9**, 523(1980).

A Critical Review of the Gas-Phase Reaction Kinetics of the Hydroxyl Radical — William E. Wilson, Jr. J Phys Chem Ref Data **1**, 535(1972).

A Critical Review of H-Atom Transfer in the Liquid Phase: Chlorine Atom, Alkyl, Trichloromethyl, Alkoxy, and Alkylperoxy Radicals — D. G. Hendry, T. Mill, L. Piszkiewicz, J. A. Howard, and H. K. Eigenmann. J Phys Chem Ref Data **3**, 937(1974).

A Review of Rate Constants of Selected Reactions of Interest in Re-Entry Flow Fields in the Atmosphere — M. H. Bortner. NBS Tech. Note **484**, 62p. (1969).

A Supplementary Bibliography of Kinetic Data on Gas Phase Reactions of Nitrogen, Oxygen, and Nitrogen Oxides — Francis Westley. NBS Spec. Publ. **371**, 93p. (1973).

Bibliography of Ion-Molecule Reaction Rate Data (January 1950 - October 1971) — George A. Sinnott. NBS Spec. Publ. **381**, 75p. (1973).

Biweekly List of Papers on Radiation Chemistry and Photochemistry Vol. 17. 1984 — Radiation Chemistry Data Center. Rad Chem, Notre Dame, IN: Radiation Chem. Data Center, U. of Notre Dame, ..p. (1984). $25.00; the Biweekly List, Vol. 17 (1984) plus the Annual Cumulation, Vol. 16 (1983), $35.00; foreign and airmail postage rates available upon request.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumuluation with Keyword and Author Indexes, Vol. 16. 1983 — Radiation Chemistry Data Center. Rad Chem **16**, Springfield, VA: NTIS, 444p. (1984).

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumuluation with Keyword and Author Indexes, Vol. 15. 1982 — Radiation Chemistry Data Center. Rad Chem **15**, Springfield, VA: NTIS, 448p. (1983). PB 83-203638, A19.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author Indexes, Vol. 14. 1981 — Radiation Chemistry Data Center. Rad Chem **14**, Springfield, VA: NTIS, 534p. (1982). PB 82-214 487, A22.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author Indexes, Vol. 13. 1980 — Radiation Chemistry Data Center. Rad Chem **13**, Springfield, VA: NTIS, 704p. (1981). PB 82-122 995, A26.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author Indexes, Vol. 12. 1979 — Radiation Chemistry Data Center. Rad Chem **12**, Springfield, VA: NTIS, 748p. (1980). PB 81-113 680, A26.

Biweekly List of Papers on Radiation Chemistry and Photochemistry Annual Cumulation with Keyword and Author indexes, Vol. 11. 1978 — Radiation Chemistry Data Center. Rad Chem **11**, Springfield, VA: NTIS, 768p. (1979). PB 226 368, A99.

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 10. 1977 — Radiation Chemistry Data Center. Rad Chem **10**, Springfield, VA: NTIS, 695p. (1978). PB 291 876, A26.

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 9. 1976 — Radiation Chemistry Data Center. Rad Chem **9**, Springfield, VA: NTIS, 707p. (1977). PB 268 699, A26.

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 8. 1975 — Radiation Chemistry Data Center. Rad Chem **8**, Springfield, VA: NTIS, 670p. (1976). PB 275 025, A26.

Biweekly List of Papers on Radiation Chemistry, Annual Cumulation with Keyword and Author Indexes, Vol. 7. 1974 — Radiation Chemistry Data Center. Rad Chem 7, Springfield, VA: NTIS, 553p. (1975). COM 75-11475, A24.

Chemical Kinetics in the C-O-S and H-N-O-S Systems: A Bibliography - 1899 through June 1971 — Francis Westley. NBS Spec. Publ. **362**, 75p. (1972).

Chemical Kinetics of the Gas Phase Combustion of Fuels (A Bibliography on the Rates and Mechanisms of Oxidation of Aliphatic C_1 to C_{10} Hydrocarbons and of Their Oxygenated Derivatives) — Francis Westley. NBS Spec. Publ. **449**, 142p. (1976).

Chemical Kinetic and Photochemical Data Sheets for Atmospheric Reactions — Robert F. Hampson, Jr. Fed Aviation Admin **EE 80-17**, Springfield, VA: NTIS, 490p. (1980). FAA-EE-80-17, A21.

Chemical Kinetic Data Sheets for High-Temperature Chemical Reactions — N. Cohen and K. R. Westberg. J Phys Chem Ref Data **12**, 531(1983).

Compilation of Rate Constants for the Reactions of Metal Ions in Unusual Valency States — George V. Buxton and Robin M. Sellers. NSRDS-NBS **62**, 68p. (1978).

Compendium of ab initio Calculations of Molecular Energies and Properties — Morris Krauss. NBS Tech. Note **438**, 139p. (1967).

Critical Review of Hydrolysis of Organic Compounds in Water Under Environmental Conditions — W. Mabey and T. Mill. J Phys Chem Ref Data **7**, 383(1978).

Critically Evaluated Rate Constants for Gaseous Reactions of Several Electronically Excited Species — Keith Schofield. J Phys Chem Ref Data **8**, 723(1979).

Data Index for Energy Transfer Collisions of Atoms and Molecules - 1970-1979 — Jean W. Gallagher, Janet Van Blerkom, Earl C. Beaty, and John R. Rumble, Jr. NBS Spec. Publ. **593**, 349p. (1981).

Evaluated Chemical Kinetic Rate Constants for Various Gas Phase Reactions — Keith Schofield. J Phys Chem Ref Data **2**, 25(1973).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **9**, 295(1980).

Evaluated Kinetic Data for High Temperature Reactions, Volume 4. Homogeneous Gas Phase Reactions of Halogen- and Cyanide-Containing Species — D. L. Baulch, J. Duxbury, S. J. Grant, and D. C. Montague. J Phys Chem Ref Data **10**, Suppl. 1(1981).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement I. CODATA Task Group on Chemical Kinetics — D. L. Baulch, R. A. Cox, P. J. Crutzen, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **11**, 327(1982).

Evaluation of Kinetic and Mechanistic Data for Modeling of Photochemical Smog — Roger Atkinson and Alan C. Lloyd. J Phys Chem Ref Data **13**, 315(1984).

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement II. CODATA Task Group on Gas Phase Chemical Kinetics — D. L. Baulch, R. A. Cox, Robert F. Hampson, Jr., J. A. Kerr, J. Troe, and R. T. Watson. J Phys Chem Ref Data **13**, 1259(1984).

Gas Phase Reaction Kinetics of Neutral Oxygen Species — Harold S. Johnston. NSRDS-NBS **20**, 49p. (1968).

Heavy-Atom Kinetic Isotope Effects, An Indexed Bibliography — Marvin J. Stern and Max Wolfsberg. NBS Spec. Publ. **349**, 43p. (1972).

High Temperature Properties and Decomposition of Inorganic Salts, Part 1. Sulfates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **7**, 38p. (1966).

High Temperature Properties and Decomposition of Inorganic Salts, Part 2. Carbonates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **30**, 27p. (1969).

High Temperature Properties and Decomposition of Inorganic Salts, Part 4. Oxy-Salts of the Halogens — Kurt H. Stern. J Phys Chem Ref Data **3**, 481(1974).

Hydrogenation of Ethylene on Metallic Catalysts — Juro Horiuti and Koshiro Miyahara. NSRDS-NBS **13**, 62p. (1968).

Ion-Molecule Reactions — Earl W. McDaniel, V. Cermak, A. Dalgarno, E. E. Ferguson, and L. Friedman. At Mol Collis Proc Ser, New York: Wiley-Interscience, 374p. (1970), ISBN: 0-471-5838-3.

Kinetic Data on Gas Phase Unimolecular Reactions — Sidney W. Benson and Harry E. O'Neal. NSRDS-NBS **21**, 645p. (1970).

Kinetic and Photochemical Data for Atmospheric Chemistry, Reactions of the Nitrogen Oxides — Robert F. Hampson, Jr. NBSIR **80-2032**, 89p. (1980).

Nitrogen Oxychlorides: A Bibliography on Data for Physical and Chemical Properties of ClNO, $ClNO_2$, and $ClNO_3$ — Francis Westley. NBS Spec. Publ. **478**, 54p. (1977).

Radiation Chemistry of Nitrous Oxide Gas, Primary Processes, Elementary Reactions and Yields — George R. A. Johnson. NSRDS-NBS **45**, 29p. (1973).

Radiation Chemistry of Ethanol: A Review of Data on Yields, Reaction Rate Parameters, and Spectral Properties of Transients — Gordon R. Freeman. NSRDS-NBS **48**, 44p. (1974).

Rate Coefficients for Ion-Molecule Reactions, Organic Ions Other Than Those Containing Only C and H — L. Wayne Sieck. NSRDS-NBS **64**, 27p. (1980).

Rate Constants for Reactions of Inorganic Radicals in Aqueous Solution — Alberta B. Ross and Pedatsur Neta. NSRDS-NBS **65**, 62p. (1979).

Rate Constants for Reactions of Aliphatic Carbon-Centered Radicals in Aqueous Solution — Alberta B. Ross and Pedatsur Neta. NSRDS-NBS **70**, 96p. (1982).

Rate Constants of Gas Phase Reactions, Reference Book — V. N. Kondratiev, L. J. Holtschlag, R. M. Fristrom, editor(s). Russian Transl., Springfield, VA: NTIS, 434p. (1972). COM 72-10014, A19.

Rate Constants for the Reactions of Atomic Oxygen ($O\ ^3P$) with Organic Compounds in the Gas Phase — John T. Herron and Robert E. Huie. J Phys Chem Ref Data **2**, 467(1973).

Rate Coefficients for Ion-Molecule Reactions, I. Ions Containing C and H — L. Wayne Sieck and Sharon G. Lias. J Phys Chem Ref Data **5**, 1123(1976).

Rate Constants for Reactions of ClO_x of Atmospheric Interest — R. T. Watson. J Phys Chem Ref Data **6**, 871(1977).

Rate Constants for the Decay and Reactions of the Lowest Electronically Excited Singlet State of Molecular Oxygen in Solution — Francis Wilkinson and James G. Brummer. J Phys Chem Ref Data **10**, 809(1981).

Rate Coefficients for Vibrational Energy Transfer Involving the Hydrogen Halides — Stephen R. Leone. J Phys Chem Ref Data **11**, 953(1982).

Reactivity of the Hydroxyl Radical in Aqueous Solutions — Leon M. Dorfman and Gerald E. Adams. NSRDS-NBS **46**, 72p. (1973).

Reaction Rate and Photochemical Data for Atmospheric Chemistry - 1977 — Robert F. Hampson, Jr. and David Garvin. NBS Spec. Publ. **513**, 111p. (1978).

Selected Specific Rates of Reactions of the Solvated Electron in Alcohols — Edgar Watson, Jr. and Sathyabhama Roy. NSRDS-NBS **42**, 27p. (1972).

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, 1. Hydrated Electron — Michael Anbar, Mark Bambenek, and Alberta B. Ross. NSRDS-NBS **43**, 69p. (1973).

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, 1. Hydrated Electron, Supplemental Data — Alberta B. Ross. NSRDS-NBS **43**, Suppl.(1975).

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, II. Hydrogen Atom — Michael Anbar, Farhataziz, and Alberta B. Ross. NSRDS-NBS **51**, 66p. (1975).

Selected Specific Rates of Reactions of Transients from Water in Aqueous Solution, III. Hydroxyl Radical and Perhydroxyl Radical and Their Radical Ions — Farhataziz and Alberta B. Ross. NSRDS-NBS **59**, 126p. (1977).

Semi-Empirical Extrapolation and Estimation of Rate Constants for Abstraction of H from Methane by H, O, HO, and O_2 — Robert Shaw. J Phys Chem Ref Data **7**, 1179(1978).

Summary Report on the Workshop on High Temperature Chemical Kinetics: Applications to Combustion Research — David Garvin, R. L. Brown, Robert F. Hampson, Jr., M. J. Kurylo, and W. Tsang. NBS Spec. Publ. **531**, 94p. (1978).

Supplementary Bibliography of Kinetic Data on Gas Phase Reactions of Nitrogen, Oxygen, and Nitrogen Oxides (1972 - 1973) — Francis Westley. NBS Spec. Publ. **371**, Suppl. 1(1975).

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Tables of Bimolecular Gas Reactions — Aubrey F. Trotman-Dickenson and G. S. Milne. NSRDS-NBS **9**, 129p. (1967).

Table of Recommended Rate Constants for Chemical Reactions Occurring in Combustion — Francis Westley. NSRDS-NBS **67**, 110p. (1980).

Table of Recommended Rate Constants for Chemical Reactions Occurring in Combustion — Francis Westley. NBSIR **79-1941**, 169p. (1979).

Tables of Experimental Rate Constants for Chemical Reactions Occurring in Combustion (1971-1977) — Francis Westley. NBSIR **81-2254**, 302p. (1981).

The Radiation Chemistry of Gaseous Ammonia — Donald B. Peterson. NSRDS-NBS **44**, 41p. (1974).

The Radiolysis of Methanol: Product Yields, Rate Constants, and Spectroscopic Parameters of Intermediates — J. H. Baxendale and Peter Wardman. NSRDS-NBS **54**, 33p. (1975).

Theory of Charge Exchange — R. A. Mapleton., New York: Wiley-Interscience, 284p. (1971), ISBN: 0-471-5678-7.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume II. Oxygen-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 505p. (1975). TT 74-50032, A22.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume IV. Nitrogen Tetroxide-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 540p. (1976). TT 76-50007, A23.

Vibrationally Excited Hydrogen Halides: A Bibliography on Chemical Kinetics of Chemiexcitation and Energy Transfer Processes (1958 through 1973) — Francis Westley. NBS Spec. Publ. **392**, 84p. (1974).

Yields of Free Ions Formed in Liquids by Radiation — Augustine O. Allen. NSRDS-NBS **57**, 38p. (1976).

Rayleigh scattering cross section

Atomic Form Factors, Incoherent Scattering Functions, and Photon Scattering Cross Sections — John H. Hubbell, W. J. Veigele, E. A Briggs, R. T. Brown, D. T. Cromer, and R. J. Howerton. J Phys Chem Ref Data **4**, 471(1975).

Molecular Form Factors and Photon Coherent Scattering Cross Sections of Water — L. R. M. Morin. J Phys Chem Ref Data **11**, 1091(1982).

Relativistic Atomic Form Factors and Photon Coherent Scattering Cross Sections — John H. Hubbell and I. Ø verbø . J Phys Chem Ref Data **8**, 69(1979).

Small-Angle Rayleigh Scattering of Photons at High Energies: Tabulations of Relativisitic HFS Modified Atomic Form Factors — D. Schaupp, M. Schumacher, F. Smend, P. Rullhusen, and John H. - Hubbell. J Phys Chem Ref Data **12**, 467(1983).

Refractive index

Physical and Thermodynamic Properties of Aliphatic Alcohols — Randolph C. Wilhoit and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, Suppl. 1(1973).

Refractive Index of Alkali Halides and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **5**, 329(1976).

Refractive Index of Alkaline Earth Halides and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **9**, 161(1980).

Refractive Index of Silicon and Germanium and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **9**, 561(1980).

Refractive Index of ZnS, ZnSe, and ZnTe and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **13**, 103(1984).

Refractive Index of ZnS, ZnSe, and ZnTe and Its Wavelength and Temperature Derivatives — H. H. Li. J Phys Chem Ref Data **13**, 103(1984).

Thermophysical Properties of Gases and Liquids, No. 1 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 214p. (1970). TT 69-55091, A10, the translation of volumes 2, 3, and 4 have the title: Thermophysical Properties of Matter and Substances.

Resistivity

See: Electrical resistivity

Rotational constants

See: Molecular energy levels and constants

Rotational spectra

The Band Spectrum of Carbon Monoxide — Paul H. Krupenie. NSRDS-NBS **5**, 87p. (1966).

Microwave Spectral Tables, Volume I. Diatomic Molecules — Paul F. Wacker, M. Mizushima, J. D. Petersen, and J. R. Ballard. NBS Monograph **70**, 171p. (1964).

Microwave Spectral Tables, Volume II. Line Strengths of Asymmetric Rotors — Paul F. Wacker and M. R. Pratto. NBS Monograph **70**, 349p. (1964).

Microwave Spectral Tables, Volume III. Polyatomic Molecules with Internal Rotation — Paul F. Wacker, M. S. Cord, D. G. Burkhard, J. D. Petersen, and R. F. Kukol. NBS Monograph **70**, 275p. (1969).

Microwave Spectral Tables, Volume IV. Polyatomic Molecules without Internal Rotation — M. S. Cord, J. D. Petersen, M. S. Lojko, and R. H. Haas. NBS Monograph **70**, 419p. (1968).

Microwave Spectral Tables, Volume V. Spectral Line Listing — M. S. Cord, M. S. Lojko, and J. D. Petersen. NBS Monograph **70**, 533p. (1968).

Microwave Spectra of Molecules of Astrophysical Interest, I. Formaldehyde, Formamide, and Thioformaldehyde — Donald R. Johnson, Frank J. Lovas, and William H. Kirchhoff. J Phys Chem Ref Data **1**, 1011(1972).

Microwave Spectra of Molecules of Astrophysical Interest, II. Methylenimine — William H. Kirchhoff, Donald R. Johnson, and Frank J. Lovas. J Phys Chem Ref Data **2**, 1(1973).

Microwave Spectra of Molecules of Astrophysical Interest, III. Methanol — R. M. Lees, Frank J. Lovas, William H. Kirchhoff, and Donald R. Johnson. J Phys Chem Ref Data **2**, 205(1973).

Microwave Spectra of Molecules of Astrophysical Interest, IV. Hydrogen Sulfide — Paul Helminger, Frank C. De Lucia, and William H. Kirchhoff. J Phys Chem Ref Data **2**, 215(1973).

Microwave Spectra of Molecules of Astrophysical Interest, V. Water Vapor — Frank C. De Lucia, Paul Helminger, and William H. Kirchhoff. J Phys Chem Ref Data **3**, 211(1974).

Microwave Spectra of Molecules of Astrophysical Interest, VI. Carbonyl Sulfide and Hydrogen Cyanide — Arthur G. Maki. J Phys Chem Ref Data **3**, 221(1974).

Microwave Spectra of Molecules of Astrophysical Interest, VII. Carbon Monoxide, Carbon Monosulfide, and Silicon Monoxide — Frank J. Lovas and Paul H. Krupenie. J Phys Chem Ref Data **3**, 245(1974).

Microwave Spectra of Molecules of Astrophysical Interest, VIII. Sulfur Monoxide — Eberhard Tiemann. J Phys Chem Ref Data **3**, 259(1974).

Microwave Spectral Tables, I. Diatomic Molecules — Frank J. Lovas and Eberhard Tiemann. J Phys Chem Ref Data **3**, 609(1974).

Microwave Spectra of Molecules of Astrophysical Interest, IX. Acetaldehyde — A. Bauder, Frank J. Lovas, and Donald R. Johnson. J Phys Chem Ref Data **5**, 53(1976).

Microwave Spectra of Molecules of Astrophysical Interest, X. Isocyanic Acid — G. Winnewisser, W. H. Hocking, and M. C. L. Gerry. J Phys Chem Ref Data **5**, 79(1976).

Microwave Spectra of Molecules of Astrophysical Interest, XI. Silicon Sulfide — Eberhard Tiemann. J Phys Chem Ref Data **5**, 1147(1976).

Microwave Spectra of Molecules of Astrophysical Interest, XII. Hydroxyl Radical — Robert A. Beaudet and Robert L. Poynter. J Phys Chem Ref Data **7**, 311(1978).

Microwave Spectra of Molecules of Astrophysical Interest, XIII. Cyanoacetylene — Walter J. Lafferty and Frank J. Lovas. J Phys Chem Ref Data **7**, 441(1978).

Microwave Spectral Tables II. Triatomic Molecules — Frank J. Lovas. J Phys Chem Ref Data **7**, 1445(1978).

Microwave Spectra of Molecules of Astrophysical Interest, XIV. Vinyl Cyanide (Acrylonitrile) — M. C. L. Gerry, K. Yamada, and G. Winnewisser. J Phys Chem Ref Data **8**, 107(1979).

Microwave Spectra of Molecules of Astrophysical Interest, XV. Propyne — A. Bauer, D. Boucher, J. Burie, J. Demaison, and A. Dubrulle. J Phys Chem Ref Data **8**, 537(1979).

Microwave Spectra of Molecules of Astrophysical Interest, XVI. Methyl Formate — A. Bauder. J Phys Chem Ref Data **8**, 583(1979).

Microwave Spectra of Molecules of Astrophysical Interest, XVII. Dimethyl Ether — Frank J. Lovas, H. Lutz, and H. Dreizler. J Phys Chem Ref Data **8**, 1051(1979).

Microwave Spectra of Molecules of Astrophysical Interest. XVIII. Formic Acid — Edmond Willemot, Didier Dangoisse, Nicole Monnanteuil, and Jean Bellet. J Phys Chem Ref Data **9**, 59(1980).

Microwave Spectra of Molecules of Astrophysical Interest. XIX. Methyl Cyanide — D. Boucher, J. Burie, A. Bauer, A. Dubrulle, and J. Demaison. J Phys Chem Ref Data **9**, 659(1980).

Microwave Spectra of Molecules of Astrophyical Interest. XX. Methane — I. Ozier, M. C. L. Gerry, and A. G. Robiette. J Phys Chem Ref Data **10**, 1085(1981).

Microwave Spectra of Molecules of Astrophysical Interest. XXI. Ethanol (C_2H_5OH) and Propionitrile (C_2H_5CN) — Frank J. Lovas. J Phys Chem Ref Data **11**, 251(1982).

Peak Absorption Coefficients of Microwave Absorption Lines of Carbonyl Sulphide — Z. Kisiel and D. J. Millen. J Phys Chem Ref Data **11**, 101(1982).

Resonances in Electron Impact on Atoms and Diatomic Molecules — George J. Schulz. NSRDS-NBS **50**, 120p. (1973).

Tables for the Rigid Asymmetric Rotor: Transformation Coefficients from Symmetric to Asymmetric Bases and Expectation Values of $P^{2<}{}_z$, $P^{4<}{}_z$, and $P^{6<}{}_z$ — Richard H. Schwendeman. NSRDS-NBS **12**, 102p. (1968).

The Calculation of Rotational Energy Levels and Rotational Line Intensities in Diatomic Molecules — Jon T. Hougen. NBS Monograph **115**, 54p. (1970).

The Spectrum of Molecular Oxygen — Paul H. Krupenie. J Phys Chem Ref Data **1**, 423(1972).

Semiconductor properties: mobility, effective mass, energy gap

Compilation of Energy Band Gaps in Elemental and Binary Compound Semiconductors and Insulators — W. H. Strehlow and E. L. Cook. J Phys Chem Ref Data **2**, 163(1973).

Solubility

A Critical Review of Henry's Law Constants for Chemicals of Environmental Interest — Donald Mackay and Wan Ying Shiu. J Phys Chem Ref Data **10**, 1175(1981).

Compilation and Evaluation of Solubility Data in the Mercury (I) Chloride-Water System — Y. Marcus. J Phys Chem Ref Data **9**, 1307(1980).

The Solubility of Some Sparingly Soluble Lead Salts: An Evaluation Lawrence Clever and Francis J. Johnston. J Phys Chem Ref Data **9**, 751(1980).

The Solubility of Oxygen and Ozone in Liquids — Rubin Battino, Timothy R. Rettich, and Toshihiro Tominaga. J Phys Chem Ref Data **12**, 163(1983)

The Solubility of Nitrogen and Air in Liquids — Rubin Battino, Timothy R. Rettich, and Toshihiro Tominaga. J Phys Chem Ref Data 3, 563(1984).

Water Solubilities of Polynuclear Aromatic and Heteroaromatic Compounds — Robert S. Pearlman, Samuel H. Yalkowsky, and Sujit Banerjee. J Phys Chem Ref Data **13**, 555(1984).

Specific conductance

See: Electrical conductance

Specific gravity

See: Density

Specific heat

See: Heat capacity
Thermodynamic properties

Spectra

See: Atomic energy levels and spectra
Rotational spectra
Vibrational spectra (infrared, Raman)

Spectral line widths

A Critical Review of the Stark Widths and Shifts of Spectral Lines from Non-Hydrogenic Atoms — N. Konjević and J. R. Roberts. J Phys Chem Ref Data **5**, 209(1976).

Atomic Radiative and Radiationless Yields for K and L Shells — Morris O. Krause. J Phys Chem Ref Data **8**, 307(1979).

Bibliography on Atomic Line Shapes and Shifts (1899 through March 1972) — Jeffrey R. Fuhr, Wolfgang L. Wiese, and Larry J. Roszman. NBS Spec. Publication **366**, 165p. (1972).

Bibliography on Atomic Line Shapes and Shifts (April 1972 through June 1973) — Jeffrey R. Fuhr, Larry J. Roszman, and Wolfgang L. Wiese. NBS Spec. Publ. **366**, Suppl. 1(1974).

Bibliography on Atomic Line Shapes and Shifts (July 1973 through May 1975) — Jeffrey R. Fuhr, Georgia A. Martin, and Beverly J. Specht. NBS Spec. Publ. **366**, Suppl. 2(1975).

Bibliography on Atomic Line Shapes and Shifts (June 1975 through June 1978) — Jeffrey R. Fuhr, Beverly J. Miller, and Georgia A. Martin. NBS Spec. Publ. **366**, Suppl. 3(1978).

Experimental Stark Widths and Shifts for Non-Hydrogenic Spectral Lines of Ionized Atoms (A Critical Review and Tabulation of Selected Data) — N. Konjević and Wolfgang L. Wiese. J Phys Chem Ref Data **5**, 259(1976).

Experimental Stark Widths and Shifts for Spectral Lines of Neutral Atoms (A Critical Review of Selected Data for the Period 1976 to 1982) — N. Konjević, M. S. Dimitrijević, and Wolfgang L. Wiese. J Phys Chem Ref Data **13**, 619(1984).

Experimental Stark Widths and Shifts for Spectral Lines of Positive Ions (A Critical Review and Tabulation of Selected Data for the Period 1976 to 1982) — N. Konjević, M. S. Dimitrijević, and Wolfgang L. Wiese. J Phys Chem Ref Data **13**, 649(1984).

Natural Widths of Atomic K and L Levels, Kα X-Ray Lines and Several KLL Auger Lines — Morris O. Krause and J. H. Oliver. J Phys Chem Ref Data **8**, 329(1979).

Peak Absorption Coefficients of Microwave Absorption Lines of Carbonyl Sulphide — Z. Kisiel and D. J. Millen. J Phys Chem Ref Data **11**, 101(1982).

The Spectrum of Molecular Oxygen — Paul H. Krupenie. J Phys Chem Ref Data **1**, 423(1972).

Structure, crystal

See: Crystal structure

Structure, molecular

See: Molecular structure

Superconductivity

Properties of Selected Superconductive Materials, 1978 Supplement — Benjamin W. Roberts. NBS Tech. Note **983**, 103p. (1978).

Survey of Superconductive Materials and Critical Evaluation of Selected Properties — Benjamin W. Roberts. J Phys Chem Ref Data **5**, 581(1976).

Surface tension

Critical Micelle Concentrations of Aqueous Surfactant Systems — Pasupati Mukerjee and Karol J. Mysels. NSRDS-NBS **36**, 222p. (1971).

International Tables of the Surface Tension of Water — N. B. —Vargaftik, B. N. Volkov, and L. D. Voljak. J Phys Chem Ref Data **12**, 817(1983).

Molten Salts: Volume 2. Section 1. Electrochemistry of Molten Salts. Gibbs Free Energies and Excess Free Energies from Equilibrium-Type Cells, Section 2. Surface Tension Data — George J. Janz, Chr. G. M. Dijkhuis, G. R. Lakshminarayanan, Reginald P. T. Tomkins, and J. Wong. NSRDS-NBS **28**, 116p. (1968).

Molten Salts: Volume 3, Nitrates, Nitrites, and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Ursula Krebs, H. F. Siegenthaler, and Reginald P. T. Tomkins. J Phys Chem Ref Data **1**, 581(1972).

Molten Salts: Volume 4, Part 1, Fluorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, G. L. Gardner, Ursula Krebs, and Reginald P. T. Tomkins. J Phys Chem Ref Data **3**, 1(1974).

Molten Salts: Volume 4, Part 2, Chlorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., G. L. Gardner, Ursula Krebs, and S. K. Singer. J Phys Chem Ref Data **4**, 871(1975).

Molten Salts: Volume 4, Part 3, Bromides and Mixtures, Iodides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., and S. K. Singer. J Phys Chem Ref Data **6**, 409(1977).

Molten Salts: Volume 4, Part 4, Mixed Halide Melts. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, and Carolyn B. Allen. J Phys Chem Ref Data **8**, 125(1979).

Molten Salts Data As Reference Standards for Density, Surface Tension, Viscosity and Electrical Conductance: KNO_3 and NaCl — George J. Janz. J Phys Chem Ref Data **9**, 791(1980).

Molten Salts: Volume 5, Part 1. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz and Reginald P. T. Tomkins. J Phys Chem Ref Data **9**, 831(1980).

Molten Salts: Volume 5, Part 2. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Vicosity and Surface Tension Data — George J. Janz and Reginald P. T. Tomkins. J Phys Chem Ref Data **12**, 591(1983).

NBS/NRC Steam Tables, Thermodynamic and Transport Properties and Computer Programs for Vapor and Liquid States of Water — Lester Haar, John S. Gallagher, and George S. Kell., New York: Hemisphere Press, 320p. (1984).

Properties of Liquid and Solid Hydrogen — B. N. Esel'son, Y. P. Blagoi, V.N. Grigor'ev, V. G. Manzhelii, S. A. Mikhailenko, and N. P. Neklyudov. Russian Transl., Springfield, VA: NTIS, 126p. (1971). TT 70-50179, A07.

The Surface Tension of Pure Liquid Compounds — Joseph J. Jasper. J Phys Chem Ref Data **1**, 841(1972).

Thermophysical Properties of Fluid H_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 175(1984).

Thermal conductivity

A Computer Program for the Prediction of Viscosity and Thermal Conductivity in Hydrocarbon Mixtures — James F. Ely and Howard J. M. Hanley. NBS Tech. Note **1039**, 83p. (1981).

A Correlation of the Existing Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethane — Howard J. M. Hanley, K. E. Gubbins, and S. Murad. J Phys Chem Ref Data **6**, 1167(1977).

A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Propane — Paul M. Holland, Howard J. M. Hanley, K. E. Gubbins, and J. M. Haile. J Phys Chem Ref Data **8**, 559(1979).

A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethylene — Paul M. Holland, B. E. Eaton, and Howard J. M. Hanley. J Phys Chem Ref Data **12**, 917(1983).

Diffusion Rate Data and Mass Transport Phenomena in Copper Systems — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. INCRA Monograph **V**, New York: International Copper Research Association, Inc., 322p. (1977).

Diffusion Rate Data and Mass Transport Phenomena for Copper Systems, Part II — Daniel B. Butrymowicz, John R. Manning, and Michael E. Read. INCRA Monograph **VIII**, New York: International Copper Research Association, Inc., 701p. (1982).

Equilibrium and Transport Properties of the Noble Gases and Their Mixtures at Low Density — Joseph Kestin, K. Knierim, E. A. Mason, B. Najafi, S. T. Ro, and M. Waldman. J Phys Chem Ref Data **13**, 229(1984).

Erratum: A Correlation of the Existing Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethane — Howard J. M. Hanley, K. E. Gubbins, and S. Murad. J Phys Chem Ref Data **10**, 799(1981).

Heavy Water, Thermophysical Properties — V. A. Kirillin, Ya. Z. Kazavchinskii, P. M. Kessel'man, S. L. Rivkin, A. E. Sheindlin, E. E. Shpil'rain, V. V. Sychev, and D. L. Timrot. Russian Transl., Springfield, VA: NTIS, 273p. (1971). TT 70-50094, A12.

Interactive Fortran Program to Calculate Thermophysical Properties of 6 Fluids NBS Standard Reference Database 6, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format — Douglas Mann and U.S. National Bureau of Standards., Boulder, CO: U.S. National Bureau of Standards, Cryogenic Division, 11p. (1977).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, First Supplement — Douglas Mann and U.S. National Bureau of Standards. **Suppl. 1**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1978).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, Second Supplement — Douglas Mann and U.S. National Bureau of Standards. **Suppl. 2**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1980).

NBS Chemical Thermodynamics Database NBS Standard Reference Database 2, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

Physical Properties Data for Rock Salt — Lewis H. Gevantman. NBS Monograph **167**, 288p. (1981).

Physical Properties Data for Basalt — Lewis H. Gevantman. NBSIR **82-2587**, 751p. (1982).

Properties of Liquid and Solid Hydrogen — B. N. Esel'son, Y. P. Blagoi, V.N. Grigor'ev, V. G. Manzhelii, S. A. Mikhailenko, and N. P. Neklyudov. Russian Transl., Springfield, VA: NTIS, 126p. (1971). TT 70-50179, A07.

Representative Equations for the Thermal Conductivity of Water Substance — Jan V. Sengers, J. T. R. Watson, R. S. Basu, B. Kamgar-Parsi, and R. C. Hendricks. J Phys Chem Ref Data **13**, 893(1984).

Tables of Collision Integrals and Second Virial Coefficients for the (m,6,8) Intermolecular Potential Function — Max Klein, Howard J. M. Hanley, Francis J. Smith, and Paul M. Holland. NSRDS-NBS **47**, 161p. (1974).

The Viscosity and Thermal Conductivity Coefficients of Gaseous and Liquid Fluorine — Howard J. M. Hanley and R. Prydz. J Phys Chem Ref Data **1**, 1101(1972).

The Viscosity and Thermal Conductivity Coefficients of Dilute Argon, Krypton, and Xenon — Howard J. M. Hanley. J Phys Chem Ref Data **2**, 619(1973).

The Viscosity and Thermal Conductivity Coefficients of Dilute Nitrogen and Oxygen — Howard J. M. Hanley and James F. Ely. J Phys Chem Ref Data **2**, 735(1973).

The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Argon, Krypton, Xenon, Nitrogen, and Oxygen — Howard J. M. Hanley, Robert D. McCarty, and W. M. Haynes. J Phys Chem Ref Data **3**, 979(1974).

The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Methane — Howard J. M. Hanley, W. M. Haynes, and Robert D. McCarty. J Phys Chem Ref Data **6**, 597(1977).

Thermal Conductivity of Selected Materials — Robert W. Powell, Cho Y. Ho, and Peter E. Liley. NSRDS-NBS **8**, 68p. (1966).

Thermal Conductivity of Selected Materials, Part 2 — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. NSRDS-NBS **16**, 146p. (1968)

Thermodynamic and Thermophysical Properties of Combustion Products, Volume II. Oxygen-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 505p. (1975). TT 74-50032, A22.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume III. Oxygen- and Air-Based Propellant — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 648p. (1975). TT 75-50007, A26.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume IV. Nitrogen Tetroxide-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 540p. (1976). TT 76-50007, A23.

Thermophysical Properties of Air and Air Components — A. A. Vasserman, Ya. Z. Kazavchinskii, V. A. Rabinovich, and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 402p. (1971). TT 70-50095, A18.

Thermophysical Properties of Gases and Liquids, No. 1 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 214p. (1970). TT 69-55091, A10, the translation of volumes 2, 3, and 4 have the title: Thermophysical Properties of Matter and Substances.

Thermophysical Properties of Gaseous and Liquid Methane — V. A. Zagoruchenko and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 251p. (1970). TT 70-50097, A12.

Thermophysical Properties of Liquid Air and Its Components — A. A. Vasserman and V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 255p. (1970). TT 69-55092, A12.

Thermophysical Properties of Matter and Substances, Volume 2 — V. A. Rabinovich. Russian Transl., Springfield, VA: NTIS, 395p. (1974). TT 72-52001, A17, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermophysical Properties of Matter and Substances, Volume 3 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 212p. (1975). TT 73-52009, A10, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermal Conductivity of the Elements — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. J Phys Chem Ref Data **1**, 279(1972).

Thermal Conductivity of the Elements: A Comprehensive Review — Cho Y. Ho, Robert W. Powell, and Peter E. Liley. J Phys Chem Ref Data **3**, Suppl. 1(1974).

Thermal Conductivity of Ten Selected Binary Alloy Systems — Cho Y. Ho, M. W. Ackerman, K. Y. Wu, S. G. Oh, and T. N. Havill. J Phys Chem Ref Data **7**, 959(1978).

Thermophysical Properties of Fluids. I. Argon, Ethylene, Parahydrogen, Nitrogen, Nitrogen Trifluoride, and Oxygen — Ben A. Younglove. J Phys Chem Ref Data **11**, Suppl. 1(1982).

Thermophysical Properties of Fluid H_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem-Ref Data **13**, 175(1984).

Thermophysical Properties of Fluid D_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 602(1984).

Transport Properties of Liquid and Gaseous D_2O over a Wide Range of Temperature and Pressure — N. Matsunaga and A. Nagashima. J Phys Chem Ref Data **12**, 933(1983).

Thermal diffusivity

See: Thermal conductivity

Thermal expansion coefficient

High Temperature Properties and Decomposition of Inorganic Salts, Part 2. Carbonates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **30**, 27p. (1969).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format — Douglas Mann and U.S. National Bureau of Standards., Boulder, CO: U.S. National Bureau of Standards, Cryogenic Division, 11p. (1977).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, First Supplement — Douglas Mann and U.S. National Bureau of Standards. **Suppl. 1**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1978).

LNG Materials & Fluids, A User's Manual of Property Data in Graphic Format, Second Supplement — Douglas Mann and U.S. National Bureau of Standards. **Suppl. 2**, Boulder, CO: U.S. National Bureau of Standards, 11p. (1980).

Physical Properties Data Compilations Relevant to Energy Storage. III. Engineering Properties of Single and Polycrystalline Sodium Beta and Beta" Alumina — G. R. Miller and D. G. Paquette. NSRDS-NBS **61**, 19p. (1979).

Recommemded Values for the Thermal Expansivity of Silicon from 0 to 1000 K — C. A. Swenson. J Phys Chem Ref Data **12**, 179(1983).

The Calculated Thermodynamic Properties of Superfluid Helium-4 — James S. Brooks and Russell J. Donnelly. J Phys Chem Ref Data **6**, 51(1977).

Thermophysical Properties of Matter and Substances, Volume 2 — V. A. Rabinovich. Russian Transl., Springfield, VA: NTIS, 395p. (1974). TT 72-52001, A17, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Volumetric Properties of Aqueous Sodium Chloride Solutions — P. S. Z. Rogers and Kenneth S. Pitzer. J Phys Chem Ref Data **11**, 15(1982).

Thermodynamic properties

See: enthalpy, entropy, Gibbs energy, heat capacity (see also Heat of formation, Heat capacity, and other individual properties)

A Bibliography of Sources of Experimental Data Leading to Thermal Properties of Binary Aqueous Electrolyte Solutions — David Smith-Magowan and Robert N. Goldberg. NBS Spec. Publ. **537**, 94p. (1979).

A Combined Least Sums and Least Squares Approach to the Evaluation of Thermodynamic Data Networks — David Garvin, Vivian B. Parker, Donald D. Wagman, and William H. Evans. NBSIR **76-1147**, 41p. (1976).

A Computer Assisted Evaluation of the Thermochemical Data of the Compounds of Thorium — Donald D. Wagman, Richard H. Schumm, and Vivian B. Parker. NBSIR **77-1300**, 94p. (1977).

A Compilation of Kinetic Parameters for the Thermal Degradation of n-Alkane Molecules — D. L. Allara and Robert Shaw. J Phys Chem Ref Data **9**, 523(1980).

A Fundamental Equation of State for Heavy Water — P. G. Hill, R. D. Chris MacMillan, and V. Lee. J Phys Chem Ref Data **11**, 1(1982).

A Report on Thermodynamic Data for Desulfurization Processes — Vivian B. Parker, Bert R. Staples, Thomas L. Jobe, Jr., and David B. Neumann. NBSIR **81-2345**, 89p. (1981).

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Ethane — M. J. Hiza, R. C. Miller, and Arthur J. Kidnay. J Phys Chem Ref Data **8**, 799(1979).

A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Propane — R. C. Miller, Arthur J. Kidnay, and M. J. Hiza. J Phys Chem Ref Data **9**, 721(1980).

A Thermodynamic Surface for Water: The Formulation and Computer Program — Lester Haar, John S. Gallagher, and George S. Kell. NBSIR **81-2253**, 38p. (1981).

An Annotated Bibliography of Compiled Thermodynamic Data Sources for Biochemical and Aqueous Systems (1930 to 1975), Equilibrium, Enthalpy, Heat Capacity, and Entropy Data — George T. Armstrong and Robert N. Goldberg. NBS Spec. Publ. **454**, 71p. (1976).

An Equation of State for Fluid Ethylene — Robert D. McCarty and Richard T. Jacobsen. NBS Tech. Note **1045**, 164p. (1981).

Applications of Phase Diagrams, Proceedings of a Workshop Held at the National Bureau of Standards, Gaithersburg, Maryland, January 10-12, 1977, Volumes 1 and 2 — Gesina Cynthia Carter, editor(s). NBS Spec. Publ. **496**, 1622p. (1978).

Bulletin of Chemical Thermodynamics, Volume 24/1981 — Robert D. Freeman, editor(s) and International Union of Pure and Applied Chemistry, Commission 1.2 on Thermodynamics. Bull Chem Thermody **24**, Stillwater, OK: Thermochemistry, Department of Chemistry, Oklahoma State University, 504p. (1982). 0149-2268, bona fide personal subscriptions are less; prices of previous Bulletins available upon request.

Bulletin of Chemical Thermodynamics, Volume 25/1982 — Robert D. Freeman and International Union of Pure and Applied Chemistry. Bull Chem Thermody **25**, Stillwater, OK: Thermochemistry, Department of Chemistry, Oklahoma State University, 544p. (1982). 0149-2268, bona fide personal subscriptions are less; prices of previous Bulletins are available upon request.

Chemical Thermodynamic Properties of Compounds of Sodium, Potassium, and Rubidium: An Interim Tabulation of Selected Material — Donald D. Wagman, William H. Evans, Vivian B. Parker, and Richard H. Schumm. NBSIR **76-1034**, 76p. (1976).

Combustion Fundamentals for Waste Incineration — American Society of Mechanical Engineers, Research Committee on Industrial and Municipal Wastes., New York: American Society of Mechanical Engineers, 212p. (1974).

Computer Programs for the Evaluation of Activity and Osmotic Coefficients — Bert R. Staples and Ralph L. Nuttall. NBS Tech. Note **928**, 60p. (1976).

Contributions to the Data on Theoretical Metallurgy, XVI. Thermodynamic Properties of Nickel and Its Inorganic Compounds — Alla D. Mah and Louis B. Pankratz. U.S. Bur Mines Bull **668**, Springfield, VA: NTIS, 125p. (1976). U.S. Bureau of Mines Bulletin 668, A06.

Critical Analysis of the Heat-Capacity Data of the Literature and Evaluation of Thermodynamic Properties of Copper, Silver, and Gold from 0 to 300 K — George T. Furukawa, W. G. Saba, and Martin L. Reilly. NSRDS-NBS **18**, 49p. (1968).

Critical Analysis of Heat-Capacity Data and Evaluation of Thermodynamic Properties of Ru, Ph, Pd, Ir, and Pt from 0 to 300 K. A Survey of the Literature Data on Osmium — George T. Furukawa, Martin L. Reilly, and John S. Gallagher. J Phys Chem Ref Data **3**, 163(1974).

Critical Evaluation of Vapor-Liquid Equilibrium, Heat of Mixing, and Volume Change of Mixing Data. General Procedures — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 941(1982).

Crystal Structure Transformations in Inorganic Sulfates, Phosphates, Perchlorates, and Chromates — C. N. R. Rao and Brahm Prakash. NSRDS-NBS **56**, 37p. (1975).

Derived Thermodynamic Properties of Ethylene — Roland H. Harrison and Donald R. Douslin. J Chem Eng Data. **22**, Washington, DC: American Chemical Society, 24p. (1977).

Energetics of Gaseous Ions — Henry M. Rosenstock, Keith Draxl, B. W. Steiner, and John T. Herron. J Phys Chem Ref Data **6**, Suppl. 1(1977).

Equation of State for Ammonia — Lester Haar and John S. Gallagher. NBSIR **75-770**, 27p. (1975).

Equilibrium Properties of Fluid Mixtures, A Bibliography on Fluids of Cryogenic Interest — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller., New York: IFI/Plenum, 166p. (1975), ISBN: 0-306-6601-6.

Equilibrium Properties of Fluid Mixtures, 2. A Bibliography of Experimental Data on Selected Fluids — M. J. Hiza, Arthur J. Kidnay, and R. C. Miller., New York: IFI/Plenum, 258p. (1982), ISBN: 0-306-6602-4.

Equilibrium and Transport Properties of the Noble Gases and Their Mixtures at Low Density — Joseph Kestin, K. Knierim, E. A. Mason, B. Najafi, S. T. Ro, and M. Waldman. J Phys Chem Ref Data **13**, 229(1984).

Erratum: A Fundamental Equation of State for Heavy Water — P. G. Hill, R. D. Chris MacMillan, and V. Lee. J Phys Chem Ref Data **12**, 1065(1983).

Evaluated Chemical Kinetic Rate Constants for Various Gas Phase Reactions — Keith Schofield. J Phys Chem Ref Data **2**, 25(1973).

Evaluated Kinetic Data for High Temperature Reactions, Volume 4. Homogeneous Gas Phase Reactions of Halogen- and Cyanide-Containing Species — D. L. Baulch, J. Duxbury, S. J. Grant, and D. C. Montague. J Phys Chem Ref Data **10**, Suppl. 1(1981).

Evaluation of Binary *PT*xy Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1099(1982).

Evaluation of Binary Excess Enthalpy Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1127(1982).

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1151(1982).

Evaluation of Binary *PT*xy Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 381(1983).

Evaluation of Binary Excess Enthalpy Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 389(1983).

Evaluation of Binary Excess Volume Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 395(1983).

Feasiblility Study: Compilation and Evaluation of Properties Data for Basalt, Granite, Tuff, and Shale — Lewis H. Gevantman. NBSIR **81-2217**, 259p. (1981).

Handbook of Phase Diagrams of Silicate Systems, Vol. I. Binary Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, V. V. Lapin, N. N. Kurtseva, J. Schmorak, editor(s). Russian Transl., Springfield, VA: NTIS, 730p. (1970). TT 71-50040, A26.

Handbook of Phase Diagrams of Silicate Systems, Vol. II. Metal-Oxygen Compounds in Silicate Systems, Second Revised Edition — N. A. Toropov, V. P. Barzakovskii, I. A. Bondar', and Yu. P. Udalov. Russian Transl., Springfield, VA: NTIS, 329p. (1972). TT 71-50041, A15.

Handbook of Thermodynamic Data on Geological Substances — G. B. Naumov, B. N. Ryzhenko, and I. L. Khodakovsky. Russian Transl., Springfield, VA: NTIS, 340p. (1974). TT 73-53051 or PB226 722, A15.

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. I. Selenium — Umesh Gaur, Hua-Cheng Shu, Aspy Metha, and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 89(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. II. Polyethylene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 119(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. III. Polyoxides — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 1001(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IV. Polypropylene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **10**, 1051(1981).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. V. Polystyrene — Umesh Gaur and Bernhard Wunderlich. J Phys Chem Ref Data **11**, 313(1982).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VI. Acrylic Polymers — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **11**, 1065(1982).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VII. Other Carbon Backbone Polymers — Umesh Gaur, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 29(1983).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VIII. Polyesters and Polyamides — Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 65(1983).

Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IX. Final Group of Aromatic and Inorganic Polymers — Umesh Gaur, Suk-fai Lau, and Bernhard Wunderlich. J Phys Chem Ref Data **12**, 91(1983).

Heat Capacities and Entropies of Organic Compounds in the Condensed Phase — Eugene S. Domalski, William H. Evans, and Elizabeth D. Hearing. J Phys Chem Ref Data **13**, Suppl. 1(1984).

Heavy Water, Thermophysical Properties — V. A. Kirillin, Ya. Z. Kazavchinskii, P. M. Kessel'man, S. L. Rivkin, A. E. Sheindlin, E. E. Shpil'rain, V. V. Sychev, and D. L. Timrot. Russian Transl., Springfield, VA: NTIS, 273p. (1971). TT 70-50094, A12.

High Temperature Properties and Decomposition of Inorganic Salts, Part 1. Sulfates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **7**, 38p. (1966).

High Temperature Properties and Decomposition of Inorganic Salts, Part 2. Carbonates — Kurt H. Stern and E. L. Weise. NSRDS-NBS **30**, 27p. (1969).

High Temperature Properties and Decomposition of Inorganic Salts, Part 3. Nitrates and Nitrites — Kurt H. Stern. J Phys Chem Ref Data **1**, 747(1972).

High Temperature Properties and Decomposition of Inorganic Salts, Part 4. Oxy-Salts of the Halogens — Kurt H. Stern. J Phys Chem Ref Data **3**, 481(1974).

High Temperature Vaporization Behavior of Oxides. I. Alkali Metal Binary Oxides — R. H. Lamoreaux and D. L. Hildenbrand. J Phys Chem Ref Data **13**, 151(1984).

Ideal Gas Thermodynamic Properties of Ethane and Propane — Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, 427(1973).

Ideal Gas Thermodynamic Properties of Eight Chloro- and Fluoromethanes — A. S. Rodgers, Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **3**, 117(1974).

Ideal Gas Thermodynamic Properties of Six Chloroethanes — Jing Chao, A. S. Rodgers, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **3**, 141(1974).

Ideal Gas Thermodynamic Properties of Ethylene and Propylene — Jing Chao and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 251(1975).

Ideal Gas Thermodynamic Properties of Six Fluoroethanes — S. S. Chen, A. S. Rodgers, Jing Chao, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 441(1975).

Ideal Gas Thermodynamic Properties of the Eight Bromo- an Iodomethanes — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data **4**, 457(1975).

Ideal Gas Thermodynamic Properties and Isomerization of n-Butane and Isobutane — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **4**, 859(1975).

Ideal Gas Thermodynamic Properties of Propanone and 2-Butanone — Jing Chao and Bruno J. Zwolinski. J Phys Chem Ref Data **5**, 319(1976).

Ideal Gas Thermodynamic Properties of Six Chlorofluoromethanes — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **5**, 571(1976).

Ideal Gas Thermodynamic Properties of Methanoic and Ethanoic Acids — Jing Chao and Bruno J. Zwolinski. J Phys Chem Ref Data **7**, 363(1978).

Ideal Gas Thermodynamic Properties of Phenol and Cresols — Shanti A. Kudchadker, Arvind P. Kudchadker, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **7**, 417(1978).

Ideal Gas Thermodynamic Properties of $CH_{4-(a+b+c+d)}F_aCl_bBr_cI_d$ Halomethanes — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data **7**, 1285(1978).

Ideal Gas Thermodynamic Properties of Selected Bromoethanes and Iodoethane — Shanti A. Kudchadker and Arvind P. Kudchadker. J Phys Chem Ref Data **8**, 519(1979).

Ideal Gas Thermodynamic Properties of CH_3, CD_3, CD_4, C_2D_2, C_2D_4, C_2D_6, C_2H_6, $CH_3N_2CH_3$, and $CD_3N_2CD_3$ — Krishna M. Pamidimukkala, David Rogers, and Gordon B. Skinner. J Phys Chem Ref Data **11**, 83(1982).

Interactive Fortran Program to Calculate Thermophysical Properties of 6 Fluids NBS Standard Reference Database 6, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

Isochoric Heat Capacity of Water and Steam — M. P. Vukalovich, Kh. I. Amirkhanov, G. V. Stepanov, and B. G. Alibekov. Russian Transl., Springfield, VA: NTIS, 215p. (1974). TT 72-52002, A10.

JANAF Thermochemical Tables, Second Edition — Daniel R. Stull and H. Prophet. NSRDS-NBS **37**, 1141p. (1971).

JANAF Thermochemical Tables, 1974 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, A. T. Hu, H. Prophet, A. N. Syverud, and L. C. Walker. J Phys Chem Ref Data **3**, 311(1974).

JANAF Thermochemical Tables, 1975 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, H. Prophet, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **4**, 1(1975).

JANAF Thermochemical Tables, 1978 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **7**, 793(1978).

JANAF Thermochemical Tables, 1982 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, J. R. Downey, Jr., R. A. McDonald, A. N. Syverud, and E. A. Valenzuela. J Phys Chem Ref Data **11**, 695(1982).

Kinetic Data on Gas Phase Unimolecular Reactions — Sidney W. Benson and Harry E. O'Neal. NSRDS-NBS **21**, 645p. (1970).

Molten Salts: Volume 2. Section 1. Electrochemistry of Molten Salts. Gibbs Free Energies and Excess Free Energies from Equilibrium-Type Cells, Section 2. Surface Tension Data — George J. Janz, Chr. G. M. Dijkhuis, G. R. Lakshminarayanan, Reginald P. T. Tomkins, and J. Wong. NSRDS-NBS **28**, 116p. (1968).

NBS Chemical Thermodynamics Database NBS Standard Reference Database 2, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

NBS/NRC Steam Tables, Thermodynamic and Transport Properties and Computer Programs for Vapor and Liquid States of Water — Lester Haar, John S. Gallagher, and George S. Kell., New York: Hemisphere Press, 320p. (1984).

Nitrogen Oxychlorides: A Bibliography on Data for Physical and Chemical Properties of ClNO, $ClNO_2$, and $ClNO_3$ — Francis Westley. NBS Spec. Publ. **478**, 54p. (1977).

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Metal Systems — Y. Austin Chang, Joachim P. Neumann, A. Mikula, and Daniel Goldberg. INCRA Monograph **VI**, New York: International Copper Research Association, Inc., 702p. (1979).

Phase Diagrams and Thermodynamic Properties of Ternary Copper-Sulfur-Metal Systems — Y. Austin Chang, Joachim P. Neumann, and U. V. Choudary. INCRA Monograph **VII**, New York: International Copper Research Association, Inc., 191p. (1979).

Physical Properties Data Compilations Relevant to Energy Storage. II. Molten Salts: Data on Single and Multi-Component Systems — George J. Janz, Carolyn B. Allen, Narottam P. Bansal, R. M. Murphy, and Reginald P. T. Tomkins. NSRDS-NBS **61**, 420p. (1979).

Physical Properties Data Compilations Relevant to Energy Storage. IV. Molten Salts: Data on Additional Single and Multi-Component Salt Systems — George J. Janz and Reginald P. T. Tomkins. NSRDS-NBS **61**, 870p. (1981).

Physical Properties Data for Rock Salt — Lewis H. Gevantman. NBS Monograph **167**, 288p. (1981).

Physical Properties Data for Basalt — Lewis H. Gevantman. NBSIR **82-2587**, 751p. (1982).

Physical and Thermodynamic Properties of Aliphatic Alcohols — Randolph C. Wilhoit and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, Suppl. 1(1973).

Pressure, Volume, Temperature Relations of Ethylene — Donald R. Douslin and Roland H. Harrison. J Chem Thermody **76**, New York, London:, 301p. (1976).

Problems with the Prandtl Number of Steam — Jan V. Sengers, R. S. Basu, B. Kamgar-Parsi, and Joseph Kestin. Mech Eng **104**, New York, NY, 60p. (1982).

Provisional Thermodynamic Functions of Propane from 85 to 700 K at Pressures to 700 Bar — Robert D. Goodwin. NBSIR **77-860**, 240p. (1977).

Saturation States of Heavy Water — P. G. Hill and R. D. Chris MacMillan. J Phys Chem Ref Data **9**, 735(1980).

Selected Values of Chemical Thermodynamic Properties. Tables for the First Thirty-Four Elements in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 264p. (1968).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 35 through 53 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, and Richard H. Schumm. NBS Tech. Note **270**, 152p. (1969).

Selected Values of Chemical Thermodynamic Properties. Tables for Elements 54 through 61 in the Standard Order of Arrangement — Donald D. Wagman, William H. Evans, Vivian B. Parker, Iva Halow, Sylvia M. Bailey, Richard H. Schumm, and Kenneth L. Churney. NBS Tech. Note **270**, 49p. (1971).

Selected Values of Chemical Thermodynamic Properties. Tables for the Alkaline Earth Elements (Elements 92 through 97 in the Standard Order of Arrangement) — Vivian B. Parker, Donald D. Wagman, and William H. Evans. NBS Tech. Note **270**, 124p. (1971).

Selected Values of Chemical Thermodynamic Properties. Tables for the Lanthanide (Rare Earth) Elements (Elements 62 through 76 in the Standard Order of Arrangement) — Richard H. Schumm, Donald D. Wagman, Sylvia M. Bailey, William H. Evans, and Vivian B. Parker. NBS Tech. Note **270**, 84p. (1973).

Selected Values of Chemical Thermodynamic Properties: Compounds of Uranium, Protactinium, Thorium, Actinium, and the Alkali Metals — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, and Ralph L. Nuttall. NBS Tech. Note **270**, 149p. (1981).

Selected Thermochemical Data Compatible with CODATA Recommendations — Vivian B. Parker, Donald D. Wagman, and David Garvin. NBSIR **75-968**, 35p. (1976).

Selected Thermodynamic Values and Phase Diagrams for Copper and Some of Its Binary Alloys — Ralph Hultgren and Pramond D. Desai. INCRA Monograph **I**, New York: International Copper Research Association, Inc., 204p. (1973).

Selected Values of the Thermodynamic Properties of Binary Alloys — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, and Kenneth K. Kelley., Metals Park, OH: American Society for Metals, 1435p. (1973).

Selected Values of the Thermodynamic Properties of the Elements — Ralph Hultgren, Pramond D. Desai, Donald T. Hawkins, M. Gleiser, Kenneth K. Kelley, and Donald D. Wagman., Metals Park, OH: American Society for Metals, 636p. (1973).

Simplification of Thermodynamic Calculations Through Dimensionless Entropies (Comments) — Kenneth S. Pitzer and Leo Brewer. J Phys Chem Ref Data **8**, 917(1979).

Standard Chemical Thermodynamic Properties of Alkane Isomer Groups — Robert A. Alberty and Catherine A. Gehrig. J Phys Chem Ref Data **13**, 1173(1984).

Surface Ionization — E. Ya. Zandberg and N. L. Ionov. Russian Transl., Springfield, VA: NTIS, 364p. (1971). TT 70-50148, A16.

The Thermochemical Properties of Uranium-Halogen Containing Compounds — Vivian B. Parker. NBSIR **80-2029**, 173p. (1980).

The Thermodynamic Properties of Aqueous Inorganic Copper Systems — Paul Duby. INCRA Monograph **IV**, New York: International Copper Research Association, Inc., 132p. (1977).

The Calculated Thermodynamic Properties of Superfluid Helium-4 — James S. Brooks and Russell J. Donnelly. J Phys Chem Ref Data **6**, 51(1977).

The NBS Tables of Chemical Thermodynamic Properties. Selected Values for Inorganic and C_1 and C_2 Organic Substances in SI Units — Donald D. Wagman, William H. Evans, Vivian B. Parker, Richard H. Schumm, Iva Halow, Sylvia M. Bailey, Kenneth L. Churney, and Ralph L. Nuttall. J Phys Chem Ref Data **11**, Suppl. 2(1982).

Thermodynamic Properties of Ammonia as an Ideal Gas — Lester Haar. NSRDS-NBS **19**, 10p. (1968).

Thermodynamic Properties of Argon from the Triple Point to 300 K at Pressures to 1000 Atmospheres — A. L. Gosman, Robert D. McCarty, and Jerome G. Hust. NSRDS-NBS **27**, 153p. (1969).

Thermophysical Properties of Isobutane from 114 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Tech. Note **1051**, 199p. (1982).

Thermodynamic and Related Properties of Parahydrogen from the Triple Point to 100 K at Pressures to 340 Atmospheres — Hans M. Roder, Lloyd A. Weber, and Robert D. Goodwin. NBS Monograph **94**, 116p. (1965).

Thermophysical Properties of Normal Butane from 135 to 700 K at Pressures to 70 MPa — W. M. Haynes and Robert D. Goodwin. NBS Monograph **169**, 197p. (1982).

Thermophysical Properties of Propane from 85 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Monograph **170**, 249p. (1982).

Thermodynamic and Related Properties of Oxygen from the Triple Point to 300 K at Pressures to 1000 Bar — Lloyd A. Weber. NBSIR **77-865**, 162p. (1977).

Thermodynamic Properties of Miscellaneous Materials — Eugene S. Domalski, William H. Evans, and Thomas L. Jobe, Jr. NBSIR **78-1479**, 69p. (1981).

Thermodynamic Properties of Solid Aluminosilicates at Elevated Temperatures — Richard H. Schumm. NBSIR **81-2343**, 57p. (1981).

Thermodynamic and Thermophysical Properties of Combustion Products, Volume I. Computation Methods — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, and V. A. Khudyakov. Russian Transl., Springfield, VA: NTIS, 453p. (1974). TT 74-50019, A20.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume II. Oxygen-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 505p. (1975). TT 74-50032, A22.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume III. Oxygen- and Air-Based Propellant — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 648p. (1975). TT 75-50007, A26.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume IV. Nitrogen Tetroxide-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 540p. (1976). TT 76-50007, A23.

Thermodynamic and Thermophysical Properties of Helium — A. F. Alyab'ev, N. V. Tsederberg, V. N. Popov, and N. A. Morozova. Russian Transl., Springfield, VA: NTIS, 260p. (1971). TT 70-50096, A12.

Thermophysical Properties of Air and Air Components — A. A. Vasserman, Ya. Z. Kazavchinskii, V. A. Rabinovich, and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 402p. (1971). TT 70-50095, A18.

Thermophysical Properties of Freon-22 — A. V. Kletskii. Russian Transl. Springfield, VA: NTIS, 72p. (1971). TT 70-50178, A04.

Thermophysical Properties of Gases and Liquids, No. 1 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 214p. (1970). TT 69-55091, A10, the translation of volumes 2, 3, and 4 have the title: Thermophysical Properties of Matter and Substances.

Thermophysical Properties of Gaseous and Liquid Methane — V. A. Zagoruchenko and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 251p. (1970). TT 70-50097, A12.

Thermophysical Properties of Liquid Air and Its Components — A. A. Vasserman and V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 255p. (1970). TT 69-55092, A12.

Thermophysical Properties of Matter and Substances, Volume 2 — V. A. Rabinovich. Russian Transl., Springfield, VA: NTIS, 395p. (1974). TT 72-52001, A17, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermophysical Properties of Matter and Substances, Volume 3 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 212p. (1975). TT 73-52009, A10, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermophysical Properties of Matter and Substances, Volume 4 — V. A. Rabinovich. Russian Transl., Springfield, VA: NTIS, 179p. (1975). TT 73-52029, A09, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermodynamic Data for Waste Incineration — American Society of Mechanical Engineers, Research Committee on Industrial and Municipal Wastes., New York: American Society of Mechanical Engineers, 160p. (1979).

Thermodynamic Properties of Copper and Its Inorganic Compounds — Edward G. King, Alla D. Mah, and Louis B. Pankratz. INCRA Monograph **II**, New York: International Copper Research Association, Inc., 257p. (1973).

Thermodynamic Properties of Copper-Slag Systems — Carlos Diaz. INCRA Monograph **III**, New York: International Copper Research Association, Inc., 178p. (1976).

Thermodynamic Properties of Nitrogen Including Liquid and Vapor Phases from 63 K to 2000 K with Pressures to 10,000 Bar — Richard T. Jacobsen and Richard B. Stewart. J Phys Chem Ref Data **2**, 757(1973).

Thermodynamic Properties of Helium-4 from 2 to 1500 K at Pressures to 10^8 Pa — Robert D. McCarty. J Phys Chem Ref Data **2**, 923(1973).

Thermodynamic Properties of Normal and Deuterated Methanols — S. S. Chen, Randolph C. Wilhoit, and Bruno J. Zwolinski. J Phys Chem Ref Data **6**, 105(1977).

Thermodynamic Properties of Ammonia — Lester Haar and John S. Gallagher. J Phys Chem Ref Data **7**, 635(1978).

Thermodynamic Properties of Normal and Deuterated Naphthalenes — S. S. Chen, Shanti A. Kudchadker, and Randolph C. Wilhoit. J Phys Chem Ref Data **8**, 527(1979).

Thermodynamic Tabulations for Selected Phases in the System CaO-Al_2O_3-SiO_2-H_2O at 101.325 kPa (1 atm.) between 273.15 and 1800 K — John L. Haas, Jr., Gilpin R. Robinson, Jr., and Bruce S. Hemingway. J Phys Chem Ref Data **10**, 575(1981).

Thermophysical Properties of Fluids. I. Argon, Ethylene, Parahydrogen, Nitrogen, Nitrogen Trifluoride, and Oxygen — Ben A. Younglove. J Phys Chem Ref Data **11**, Suppl. 1(1982).

Thermodynamic Properties of Steam in the Critical Region — J. M. H. Levelt Sengers, B. Kamgar-Parsi, F. W. Balfour, and Jan V. Sengers. J Phys Chem Ref Data **12**, 1(1983).

Thermodynamic Properties of D_2O in the Critical Region — B. Kamgar-Parsi, J. M. H. Levelt Sengers, and Jan V. Sengers. J Phys Chem Ref Data **12**, 513(1983).

Thermochemical Data for Gaseous Monoxides — J. B. Pedley and E. M. Marshall. J Phys Chem Ref Data **12**, 967(1983).

Thermodynamic Properties of Aqueous Sodium Chloride Solutions — Kenneth S. Pitzer, J. Christopher Peiper, and R. H. Busey. J Phys Chem Ref Data **13**, 1(1984).

Thermophysical Properties of Fluid H_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 175(1984).

Thermophysical Properties of Fluid D_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 602(1984).

Volumetric Properties of Aqueous Sodium Chloride Solutions — P. S. Z. Rogers and Kenneth S. Pitzer. J Phys Chem Ref Data **11**, 15(1982).

Transition probabilities for atoms and molecules

Atomic Transition Probabilities. Elements Hydrogen through Neon — Wolfgang L. Wiese, Melvin W. Smith, and Barbara M. Glennon. NSRDS-NBS **4**, 153p. (1966).

Atomic Transition Probabilities, Volume II. Sodium through Calcium — Wolfgang L. Wiese, Melvin W. Smith, and Barbara M. Miles. NSRDS-NBS **22**, 268p. (1969).

Atomic Gas Laser Transition Data, A Critical Evaluation — William Ralph Bennett, Jr., New York: IFI/Plenum, 293p. (1979), ISBN: 0-306-65187-4.

Atomic Transition Probabilities for Forbidden Lines of the Iron Group Elements (A Critical Data Compilation for Selected Lines) — Melvin W. Smith and Wolfgang L. Wiese. J Phys Chem Ref Data **2**, 85(1973).

Atomic Transition Probabilities for Scandium and Titanium (A Critical Data Compilation of Allowed Lines) — Wolfgang L. Wiese and Jeffrey R. Fuhr. J Phys Chem Ref Data **4**, 263(1975).

Atomic Transition Probabilities for Vanadium, Chromium, and Manganese (A Critical Data Compilation of Allowed Lines) — S. M. Younger, Jeffrey R. Fuhr, Georgia A. Martin, and Wolfgang L. Wiese. J Phys Chem Ref Data **7**, 495(1978).

Atomic Radiative and Radiationless Yields for K and L Shells — Morris O. Krause. J Phys Chem Ref Data **8**, 307(1979).

Atomic Transition Probabilities for Iron, Cobalt, Nickel: A Critical Data Compilation of Allowed Lines — Jeffrey R. Fuhr, Georgia A. Martin, Wolfgang L. Wiese, and S. M. Younger. J Phys Chem Ref Data **10**, 305(1981).

Bibliography on Flame Spectroscopy. Analytical Applications, 1800-1966 — Radu Mavrodineanu. NBS Spec. Publ. **281**, 155p. (1967).

Bibliography on Atomic Transition Probabilities (1914 through October 1977) — Beverly J. Miller, Jeffrey R. Fuhr, and Georgia A. Martin. NBS Spec. Publ. **505**, 283p. (1978).

Bibliography on Atomic Transition Probabilities (November 1977 through March 1980) — Beverly J. Miller, Jeffrey R. Fuhr, and Georgia A. Martin. NBS Spec. Publ. **505**, Suppl.(1980).

Critical Review of Ultraviolet Photoabsorption Cross Sections for Molecules of Astrophysical and Aeronomic Interest — Robert D. Hudson. NSRDS-NBS **38**, 114p. (1971).

Critically Evaluated Transition Probabilities for Ba I and II — Barbara M. Miles and Wolfgang L. Wiese. NBS Tech. Note **474**, 22p. (1969).

Critically Evaluated Rate Constants for Gaseous Reactions of Several Electronically Excited Species — Keith Schofield. J Phys Chem Ref Data **8**, 723(1979).

Natural Widths of Atomic K and L Levels, Kα X-Ray Lines and Several KLL Auger Lines — Morris O. Krause and J. H. Oliver. J Phys Chem Ref Data **8**, 329(1979).

Peak Absorption Coefficients of Microwave Absorption Lines of Carbonyl Sulphide — Z. Kisiel and D. J. Millen. J Phys Chem Ref Data **11**, 101(1982).

Resonances in Electron Impact on Atoms and Diatomic Molecules — George J. Schulz. NSRDS-NBS **50**, 120p. (1973).

Semiempirical and Approximate Methods for Molecular Calculations - Bibliography and KWIC Index — George A. Henderson and Sandra Frattali. OSRD Bibl. **70-3**, 293p. (1970).

Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry — Robert F. Hampson, Jr., W. Braun, R. L. Brown, David Garvin, John T. Herron, Robert E. Huie, M. J. Kurylo, A. H. Laufer, J. D. McKinley, H. Okabe, M. D. Scheer, W. Tsang, D. H. Stedman, editor(s). J Phys Chem Ref Data **2**, 267(1973).

Tables of Line Spectra of the Elements, Part 1. Wavelengths and Intensities, Part 2. Transition Probabilities — Joseph Reader, Charles H. Corliss, Wolfgang L. Wiese, and Georgia A. Martin. NSRDS-NBS **68**, 415p. (1980).

Tables of Critically Evaluated Oscillator Strengths for the Lithium Isoelectronic Sequence — Georgia A. Martin and Wolfgang L. Wiese. J Phys Chem Ref Data **5**, 537(1976).

The Band Spectrum of Carbon Monoxide — Paul H. Krupenie. NSRDS-NBS **5**, 87p. (1966).

The Spectrum of Molecular Nitrogen — Alf Lofthus and Paul H. Krupenie. J Phys Chem Ref Data **6**, 113(1977).

Vibrational Contributions to Molecular Dipole Polarizabilities — David M. Bishop and Lap M. Cheung. J Phys Chem Ref Data **11**, 119(1982).

Transport properties

See: **Diffusion coefficient**
Thermal conductivity
Viscosity

Vapor pressure (see also Equation of state)

A Bibliography of Sources of Experimental Data Leading to Thermal Properties of Binary Aqueous Electrolyte Solutions — David Smith-Magowan and Robert N. Goldberg. NBS Spec. Publ. **537**, 94p. (1979).

A Critical Review of Henry's Law Constants for Chemicals of Environmental Interest — Donald Mackay and Wan Ying Shiu. J Phys Chem Ref Data **10**, 1175(1981).

A Fundamental Equation of State for Heavy Water — P. G. Hill, R. D. Chris MacMillan, and V. Lee. J Phys Chem Ref Data **11**, 1(1982).

Computer Programs for the Evaluation of Activity and Osmotic Coefficients — Bert R. Staples and Ralph L. Nuttall. NBS Tech. Note **928**, 60p. (1976).

Critical Evaluation of Vapor-Liquid Equilibrium, Heat of Mixing, and Volume Change of Mixing Data. General Procedures — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 941(1982).

Definition of Recommended Values of Certain Thermodynamic Properties for the Ketones — Buford D. Smith and Ol Muthu. NBSIR **84-2811**, 162p. (1983).

Erratum: A Fundamental Equation of State for Heavy Water — P. G. Hill, R. D. Chris MacMillan, and V. Lee. J Phys Chem Ref Data **12**, 1065(1983).

Evaluation of Binary *PT*xy Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Cyclohexane — Buford D. Smith, Ol Muthu, Ashok Dewan, and Matthew Gierlach. J Phys Chem Ref Data **11**, 1099(1982).

Evaluation of Binary *PT*xy Vapor-Liquid Equilibrium Data for C_6 Hydrocarbons. Benzene + Hexane — Buford D. Smith, Ol Muthu, and Ashok Dewan. J Phys Chem Ref Data **12**, 381(1983).

High Temperature Vaporization Behavior of Oxides. I. Alkali Metal Binary Oxides — R. H. Lamoreaux and D. L. Hildenbrand. J Phys Chem Ref Data **13**, 151(1984).

Interactive Fortran Program to Calculate Thermophysical Properties of 6 Fluids NBS Standard Reference Database 6, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

Phase Behavior in Binary and Multicomponent Systems at Elevated Pressures: n-Pentane and Methane-n-Pentane — Virginia M. Berry and Bruce H. Sage. NSRDS-NBS **32**, 79p. (1970).

Physical and Thermodynamic Properties of Aliphatic Alcohols — Randolph C. Wilhoit and Bruno J. Zwolinski. J Phys Chem Ref Data **2**, Suppl. 1(1973).

Saturation States of Heavy Water — P. G. Hill and R. D. Chris MacMillan. J Phys Chem Ref Data **9**, 735(1980).

Thermodynamic Properties of Argon from the Triple Point to 300 K at Pressures to 1000 Atmospheres — A. L. Gosman, Robert D. McCarty, and Jerome G. Hust. NSRDS-NBS **27**, 153p. (1969).

Thermophysical Properties of Isobutane from 114 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Tech. Note **1051**, 199p. (1982).

Thermodynamic and Related Properties of Parahydrogen from the Triple Point to 100 K at Pressures to 340 Atmospheres — Hans M. Roder, Lloyd A. Weber, and Robert D. Goodwin. NBS Monograph **94**, 116p. (1965).

Thermophysical Properties of Normal Butane from 135 to 700 K at Pressures to 70 MPa — W. M. Haynes and Robert D. Goodwin. NBS Monograph **169**, 197p. (1982).

Thermophysical Properties of Propane from 85 to 700 K at Pressures to 70 MPa — Robert D. Goodwin and W. M. Haynes. NBS Monograph **170**, 249p. (1982)

Thermophysical Properties of Gaseous and Liquid Methane — V. A. Zagoruchenko and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 251p. (1970). TT 70-50097, A12.

Thermophysical Properties of Matter and Substances, Volume 3 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 212p. (1975). TT 73-52009, A10, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermophysical Properties of Fluids. I. Argon, Ethylene, Parahydrogen, Nitrogen, Nitrogen Trifluoride, and Oxygen — Ben A. Younglove. J Phys Chem Ref Data **11**, Suppl. 1(1982).

Vapor Pressures and Boiling Points of Selected Halomethanes — Arvind P. Kudchadker, Shanti A. Kudchadker, R. P. Shukla, and P. R. Patnaik. J Phys Chem Ref Data **8**, 499(1979).

Vapor Pressure of Coal Chemicals — Jing Chao, C. T. Lin, and T. H. Chung. J Phys Chem Ref Data **12**, 1033(1983).

Vibrational frequencies of molecules

(see also Molecular energy levels and constants)

Critical Review of Vibrational Data and Force Field Constants for Polyethylene — John Barnes and Bruno Fanconi. J Phys Chem Ref Data **7**, 1309(1978).

Ground-State Vibrational Energy Levels of Polyatomic Transient Molecules — Marilyn E. Jacox. J Phys Chem Ref Data **13**, 945(1984).

JANAF Thermochemical Tables, Second Edition — Daniel R. Stull and H. Prophet. NSRDS-NBS **37**, 1141p. (1971).

JANAF Thermochemical Tables, 1974 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, A. T. Hu, H. Prophet, A. N. Syverud, and L. C. Walker. J Phys Chem Ref Data **3**, 311(1974).

JANAF Thermochemical Tables, 1975 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, H. Prophet, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data **4**, 1(1975).

JANAF Thermochemical Tables, 1978 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, R. A. McDonald, and A. N. Syverud. J Phys Chem Ref Data 7, 793(1978).

JANAF Thermochemical Tables, 1982 Supplement — Malcolm W. Chase, Jr., J. L. Curnutt, J. R. Downey, Jr., R. A. McDonald, A. N. Syverud, and E. A. Valenzuela. J Phys Chem Ref Data **11**, 695(1982).

Tables of Molecular Vibrational Frequencies, Part 1 — Takehiko Shimanouchi. NSRDS-NBS **6**, 56p. (1967).

Tables of Molecular Vibrational Frequencies, Part 2 — Takehiko Shimanouchi. NSRDS-NBS **11**, 38p. (1967).

Tables of Molecular Vibrational Frequencies, Part 3 — Takehiko Shimanouchi. NSRDS-NBS **17**, 39p. (1968).

Tables of Molecular Vibrational Frequencies, Consolidated Volume I — Takehiko Shimanouchi. NSRDS-NBS **39**, 167p. (1972).

Tables of Molecular Vibrational Frequencies, Part 5 — Takehiko Shimanouchi. J Phys Chem Ref Data **1**, 189(1972).

Tables of Molecular Vibrational Frequencies, Part 6 — Takehiko Shimanouchi. J Phys Chem Ref Data **2**, 121(1973).

Tables of Molecular Vibrational Frequencies, Part 7 — Takehiko Shimanouchi. J Phys Chem Ref Data **2**, 225(1973).

Tables of Molecular Vibrational Frequencies, Part 8 — Takehiko Shimanouchi. J Phys Chem Ref Data **3**, 269(1974).

Tables of Molecular Vibrational Frequencies. Consolidated Volume II — Takehiko Shimanouchi. J Phys Chem Ref Data **6**, 993(1977).

Tables of Molecular Vibrational Frequencies, Part 9 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **7**, 1323(1978).

Tables of Molecular Vibrational Frequencies, Part 10 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **9**, 1149(1980).

Vibrational spectra

(infrared, Raman)

Atlas of the High Temperature Water Vapor Spectrum in the 3000 to 4000 cm^{-1} Region — A. S. Pine, M. J. Coulombe, C. Camy-Peyret, and J-M. Flaud. J Phys Chem Ref Data **12**, 413(1983).

Bibliography of Infrared Spectroscopy through 1960 — C. N. R. Rao, S. K. Dikshit, Shanti A. Kudchadker, D. S. Gupta, V. A. Narayan, and John J. Comeford. NBS Spec. Publ. **428**, 1,2,3(1976).

Coblentz Society Evaluated Infrared Reference Spectra, Volumes 6 to 10 and Cumulative Coblentz Indexes — American Society for Testing and Materials; Coblentz Society; Joint Committee on Atomic and Molecular Physical Data. Coblentz Soc Infr Spect **6-10**, Philadelphia, PA: Sadtler Research Laboratories, 5001p. (1975).

Critical Review of Vibrational Data and Force Field Constants for Polyethylene — John Barnes and Bruno Fanconi. J Phys Chem Ref Data 7, 1309(1978).

Desk Book of Infrared Spectra — Clara D. Craver and Coblentz Society; Joint Committee on Atomic and Molecular Physical Data., Kirkwood, MO: The Coblentz Society, 498p. (1977).

Electronic Absorption and Internal and External Vibrational Data of Atomic and Molecular Ions Doped in Alkali Halide Crystals — Suresh C. Jain, A. V. R. Warrier, and Suresh K. Agarwal. NSRDS-NBS **52**, 55p. (1974).

Ground-State Vibrational Energy Levels of Polyatomic Transient Molecules — Marilyn E. Jacox. J Phys Chem Ref Data **13**, 945(1984).

Infrared Spectra of Halogenated Hydrocarbons — Clara D. Craver and Coblentz Society; Joint Committee on Atomic and Molecular Physical Data., Kirkwood, MO: The Coblentz Society, 125p. (1977).

Infrared Spectra of Plasticizers and Other Additives — Clara D. Craver and Coblentz Society; Joint Committee on Atomic and Molecular Physical Data. , Kirkwood, MO: The Coblentz Society, 152p. (1977).

Resonances in Electron Impact on Atoms and Diatomic Molecules — George J. Schulz. NSRDS-NBS **50**, 120p. (1973).

Semiempirical and Approximate Methods for Molecular Calculations - Bibliography and KWIC Index — George A. Henderson and Sandra Frattali. OSRD Bibl. **70-3**, 293p. (1970).

Tables of Molecular Vibrational Frequencies, Part 1 — Takehiko Shimanouchi. NSRDS-NBS **6**, 56p. (1967).

Tables of Molecular Vibrational Frequencies, Part 2 — Takehiko Shimanouchi. NSRDS-NBS **11**, 38p. (1967).

Tables of Molecular Vibrational Frequencies, Part 3 — Takehiko Shimanouchi. NSRDS-NBS **17**, 39p. (1968).

Tables of Molecular Vibrational Frequencies, Consolidated Volume I — Takehiko Shimanouchi. NSRDS-NBS **39**, 167p. (1972).

Tables of Molecular Vibrational Frequencies, Part 5 — Takehiko Shimanouchi. J Phys Chem Ref Data **1**, 189(1972).

Tables of Molecular Vibrational Frequencies, Part 6 — Takehiko Shimanouchi. J Phys Chem Ref Data **2**, 121(1973).

Tables of Molecular Vibrational Frequencies, Part 7 — Takehiko Shimanouchi. J Phys Chem Ref Data **2**, 225(1973).

Tables of Molecular Vibrational Frequencies, Part 8 — Takehiko Shimanouchi. J Phys Chem Ref Data **3**, 269(1974).

Tables of Molecular Vibrational Frequencies. Consolidated Volume II — Takehiko Shimanouchi. J Phys Chem Ref Data **6**, 993(1977).

Tables of Molecular Vibrational Frequencies, Part 9 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **7**, 1323(1978).

Tables of Molecular Vibrational Frequencies, Part 10 — Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada. J Phys Chem Ref Data **9**, 1149(1980).

Tables of N_2O Absorption Lines for the Calibration of Tunable Infrared Lasers from 522 cm^{-1} to 657 cm^{-1} and from 1115 cm^{-1} to 1340 cm^{-1} — W. B. Olson, Arthur G. Maki, and Walter J. Lafferty. J Phys Chem Ref Data **10**, 1065(1981).

Vibrational Contributions to Molecular Dipole Polarizabilities — David M. Bishop and Lap M. Cheung. J Phys Chem Ref Data **11**, 119(1982).

Vibrational spectra potential energy curves for atoms and molecules

The Band Spectrum of Carbon Monoxide — Paul H. Krupenie. NSRDS-NBS **5**, 87p. (1966).

Viscosity

A Computer Program for the Prediction of Viscosity and Thermal Conductivity in Hydrocarbon Mixtures — James F. Ely and Howard J. M. Hanley. NBS Tech. Note **1039**, 83p. (1981).

A Correlation of the Existing Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethane — Howard J. M. Hanley, K. E. Gubbins, and S. Murad. J Phys Chem Ref Data **6**, 1167(1977).

A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Propane — Paul M. Holland, Howard J. M. Hanley, K. E. Gubbins, and J. M. Haile. J Phys Chem Ref Data **8**, 559(1979).

A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethylene — Paul M. Holland, B. E. Eaton, and Howard J. M. Hanley. J Phys Chem Ref Data **12**, 917(1983).

An Improved Representative Equation for the Dynamic Viscosity of Water Substance — J. T. R. Watson, R. S. Basu, and Jan V. Sengers. J Phys Chem Ref Data **9**, 1255(1980).

Electrolytic Conductance and the Conductances of the Halogen Acids in Water — Walter J. Hamer and H. J. DeWane. NSRDS-NBS **33**, 37p. (1970).

Equilibrium and Transport Properties of the Noble Gases and Their Mixtures at Low Density — Joseph Kestin, K. Knierim, E. A. Mason, B. Najafi, S. T. Ro, and M. Waldman. J Phys Chem Ref Data **13**, 229(1984).

Erratum: A Correlation of the Existing Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethane — Howard J. M. Hanley, K. E. Gubbins, and S. Murad. J Phys Chem Ref Data **10**, 799(1981).

Erratum: Viscosity of Water Substance - New International Formulation and Its Background — A. Nagashima. J Phys Chem Ref Data **12**, 403p. (1983).

Interactive Fortran Program to Calculate Thermophysical Properties of 6 Fluids NBS Standard Reference Database 6, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

Molten Salts: Volume 1. Electrical Conductance, Density, and Viscosity Data — George J. Janz, F. W. Dampier, G. R. Lakshminarayanan, P. K. Lorenz, and Reginald P. T. Tomkins. NSRDS-NBS **15**, 140p. (1968).

Molten Salts: Volume 3, Nitrates, Nitrites, and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Ursula Krebs, H. F. Siegenthaler, and Reginald P. T. Tomkins. J Phys Chem Ref Data **1**, 581(1972).

Molten Salts: Volume 4, Part 1, Fluorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, G. L. Gardner, Ursula Krebs, and Reginald P. T. Tomkins. J Phys Chem Ref Data **3**, 1(1974).

Molten Salts: Volume 4, Part 2, Chlorides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., G. L. Gardner, Ursula Krebs, and S. K. Singer. J Phys Chem Ref Data **4**, 871(1975).

Molten Salts: Volume 4, Part 3, Bromides and Mixtures, Iodides and Mixtures. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, Carolyn B. Allen, J. R. Downey, Jr., and S. K. Singer. J Phys Chem Ref Data **6**, 409(1977).

Molten Salts: Volume 4, Part 4, Mixed Halide Melts. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz, Reginald P. T. Tomkins, and Carolyn B. Allen. J Phys Chem Ref Data **8**, 125(1979).

Molten Salts Data As Reference Standards for Density, Surface Tension, Viscosity and Electrical Conductance: KNO_3 and NaCl — George J. Janz. J Phys Chem Ref Data **9**, 791(1980).

Molten Salts: Volume 5, Part 1. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Viscosity, and Surface Tension Data — George J. Janz and Reginald P. T. Tomkins. J Phys Chem Ref Data **9**, 831(1980).

Molten Salts: Volume 5, Part 2. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Vicosity and Surface Tension Data — George J. Janz and Reginald P. T. Tomkins. J Phys Chem Ref Data **12**, 591(1983).

NBS Chemical Thermodynamics Database NBS Standard Reference Database 2, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

Problems with the Prandtl Number of Steam — Jan V. Sengers, R. S. Basu, B. Kamgar-Parsi, and Joseph Kestin. Mech Eng **104**, New York, NY, 60p. (1982).

Properties of Liquid and Solid Hydrogen — B. N. Esel'son, Y. P. Blagoi, V.N. Grigor'ev, V. G. Manzhelii, S. A. Mikhailenko, and N. P. Neklyudov. Russian Transl., Springfield, VA: NTIS, 126p. (1971). TT 70-50179, A07.

Representative Equations for the Viscosity of Water Substance — Jan V. Sengers and B. Kamgar-Parsi. J Phys Chem Ref Data **13**, 185(1984).

Tables of Collision Integrals and Second Virial Coefficients for the (m,6,8) Intermolecular Potential Function — Max Klein, Howard J. M. Hanley, Francis J. Smith, and Paul M. Holland. NSRDS-NBS **47**, 161p. (1974).

Tables of the Dynamic and Kinematic Viscosity of Aqueous KCl Solutions in the Temperature Range 25-150°C and the Pressure Range 0.1-35 MPa — Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia. J Phys Chem Ref Data **10**, 57(1981).

Tables of the Dynamic and Kinematic Viscosity of Aqueous NaCl Solutions in the Temperature Range 20-150°C and the Pressure Range 0.1-35 MPa — Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia. J Phys Chem Ref Data **10**, 71(1981).

The Viscosity and Thermal Conductivity Coefficients of Gaseous and Liquid Fluorine — Howard J. M. Hanley and R. Prydz. J Phys Chem Ref Data **1**, 1101(1972).

The Viscosity and Thermal Conductivity Coefficients of Dilute Argon, Krypton, and Xenon — Howard J. M. Hanley. J Phys Chem Ref Data **2**, 619(1973).

The Viscosity and Thermal Conductivity Coefficients of Dilute Nitrogen and Oxygen — Howard J. M. Hanley and James F. Ely. J Phys Chem Ref Data **2**, 735(1973).

The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Argon, Krypton, Xenon, Nitrogen, and Oxygen — Howard J. M. Hanley, Robert D. McCarty, and W. M. Haynes. J Phys Chem Ref Data **3**, 979(1974).

The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Methane — Howard J. M. Hanley, W. M. Haynes, and Robert D. McCarty. J Phys Chem Ref Data **6**, 597(1977).

Thermodynamic and Thermophysical Properties of Combustion Products, Volume II. Oxygen-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 505p. (1975). TT 74-50032, A22.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume III. Oxygen- and Air-Based Propellant — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 648p. (1975). TT 75-50007, A26.

Thermodynamic and Thermophysical Properties of Combustion Products, Volume IV. Nitrogen Tetroxide-Based Propellants — V. P. Glushko, V. E. Alemasov, A. F. Dregalin, A. P. Tishin, V. A. Khudyakov, and V. N. Kostin. Russian Transl., Springfield, VA: NTIS, 540p. (1976). TT 76-50007, A23.

Thermodynamic and Thermophysical Properties of Helium — A. F. Alyab'ev, N. V. Tsederberg, V. N. Popov, and N. A. Morozova. Russian Transl., Springfield, VA: NTIS, 260p. (1971). TT 70-50096, A12.

Thermophysical Properties of Air and Air Components — A. A. Vasserman, Ya. Z. Kazavchinskii, V. A. Rabinovich, and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 402p. (1971). TT 70-50095, A18.

Thermophysical Properties of Freon-22 — A. V. Kletskii. Russian Transl. Springfield, VA: NTIS, 72p. (1971). TT 70-50178, A04.

Thermophysical Properties of Gases and Liquids, No. 1 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 214p. (1970). TT 69-55091, A10, the translation of volumes 2, 3, and 4 have the title: Thermophysical Properties of Matter and Substances.

Thermophysical Properties of Gaseous and Liquid Methane — V. A. Zagoruchenko and A. M. Zhuravlev. Russian Transl. Springfield, VA: NTIS, 251p. (1970). TT 70-50097, A12.

Thermophysical Properties of Liquid Air and Its Components — A. A. Vasserman and V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 255p. (1970). TT 69-55092, A12.

Thermophysical Properties of Matter and Substances, Volume 2 — V. A. Rabinovich. Russian Transl., Springfield, VA: NTIS, 395p. (1974). TT 72-52001, A17, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermophysical Properties of Matter and Substances, Volume 3 — V. A. Rabinovich. Russian Transl. Springfield, VA: NTIS, 212p. (1975). TT 73-52009, A10, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermophysical Properties of Matter and Substances, Volume 4 — V. A. Rabinovich. Russian Transl., Springfield, VA: NTIS, 179p. (1975). TT 73-52029, A09, the translation of volume 1 has the title: Thermophysical Properties of Gases and Liquids.

Thermophysical Properties of Hydrocarbon Mixtures (TRAPP) NBS Standard Reference Database 4, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

Thermophysical Properties of Helium NBS Standard Reference Database 5, Washington, D.C.; NBS, Office of Standard Reference Data,(updated periodically). Call (301)921-2228 for specific instructions.

Thermophysical Properties of Fluids. I. Argon, Ethylene, Parahydrogen, Nitrogen, Nitrogen Trifluoride, and Oxygen — Ben A. Younglove. J Phys Chem Ref Data **11**, Suppl. 1(1982).

Thermophysical Properties of Fluid H_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 175(1984).

Thermophysical Properties of Fluid D_2O — Joseph Kestin, Jan V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers. J Phys Chem Ref Data **13**, 602(1984).

Transport Properties of Liquid and Gaseous D_2O over a Wide Range of Temperature and Pressure — N. Matsunaga and A. Nagashima. J Phys Chem Ref Data **12**, 933(1983).

Viscosity of Water Substance - New International Formulation and Its Background — A. Nagashima. J Phys Chem Ref Data **6**, 1133(1977).

Viscosity of Liquid Water in the Range -8°C to 150°C — Joseph Kestin, Mordechai Sokolov, and William A. Wakeham. J Phys Chem Ref Data 7, 941(1978).

Wavelengths of spectral lines

See: Atomic energy levels and spectra
Rotational spectra
Vibrational spectra (infrared, Raman)
Electronic molecular spectra

Young's modulus

See: Elastic constants

Ordering Information

The National Standard Reference Data System publications are available from a variety of sources, including the American Chemical Society (ACS); the American Institute of Physics (AIP); the Superintendent of Documents, U.S. Government Printing Office (GPO); the National Technical Information Service (NTIS); and the Office of Standard Reference Data (OSRD), as well as private publishers and other societies. Ordering information for all publications is included in the Price List chapter. It provides the following information for each publication: the publication number; number of pages; date of publication; hard copy price and order number; and microfiche copy order number as appropriate. Microfiche copies of many U.S. Government documents are available from NTIS for $4.50. The source codes used in the price list are explained below.

SOURCE ORDERING INSTRUCTIONS
CODE

ACS American Chemical Society
Distribution Office
Room 210
1155 Sixteenth Street, N.W.
Washington, D.C 20036

Telephone: (202)872-4539 Mr. Leon Viloria

Payment must accompany the order. Charge accounts acceptable include MasterCard, VISA, BarclayCard, and Access. Include the full account number, the Interbank number (MasterCard and Access only), card expiration date, and signature. Checks must be made payable to the American Chemical Society. Bulk rates: subtract 20 percent from the listed price for orders of 50 or more copies of any one item of the same title. No book dealer discount other than the bulk rate.

AIP American Institute of Physics
Department S/F
500 Sunnyside Blvd.
Woodbury, N. Y. 11797

Telephone: (212)661-9409

Write for price quotes and further information on the availability of the journal in microfilm.

GPO Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Telephone: (202)783-3238

Payment must accompany the order. Make money order or check payable to the Superintendent of Documents. Foreign remittances should be made either by international money order, draft on an American bank, or UNESCO coupons. Postage stamps will not be accepted. No charge is made for postage on documents sent to points in the United States and its possessions. In computing foreign postage, the charge for surface mail is approximately one-fourth of the current selling price of the publication.

JILA Joint Institute for Laboratory Astrophysics
Information Center
University of Colorado
Box 440
Boulder, CO 80309

Most items are free from the Information Center.

NTIS National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road
Springfield, VA 22161

Telex: 89-9405
Telephone:
Order Desk: (703)487-4650
Rush Handling: (703)487-4700
Customer Service:(703)487-4660

Orders may be placed with NTIS by one of the following methods:
1. Rush handling - guarantees the order is filled within 24 hours
- must be placed by telephone or telex
- adds $10.00 for each mailed document
- adds $6.00 for each document picked up locally
- must be charged to an NTIS deposit account or your American Express, Visa, or MasterCard account

2. Regular service - orders completed in 9 to 30 working days
- optional priority mail service available, $3.00 extra in North America, $4.00 extra elsewhere
- ship and bill service available - $7.50 used only by businesses (an individual cannot order this way). A purchase order, accounting office telephone number,and 9 digit federal tax ID number is necessary.

3. Online Ordering - under development by commercial vendors of the NTIS Bibliographic Data Base. Contact individual vendors.

4. Telex 89-9405

5. Orders for foreign destinations - NTIS has arranged that dealers be the exclusive agents in many countries. Only those orders originating in countries not served by an agent should be placed directly with NTIS. Please write to NTIS for further details.

NTIS price codes are used for items in this list. As an aid to users of the publications list, the price code schedule is given below.

Standard Price Schedule
NTIS Code Schedule A
Price List

Price Code	Page Range	U.S. Domestic	Foreign Price
A01	Microfiche	$ 4.50	$ 9.00
A02	001-025	7.00	14.00
A03	026-050	8.50	17.00
A04	051-075	10.00	20.00
A05	076-100	11.50	23.00
A06	101-125	13.00	26.00
A07	126-150	14.50	29.00
A08	151-175	16.00	32.00
A09	176-200	17.50	35.00
A10	201-225	19.00	38.00
A11	226-250	20.50	41.00
A12	251-275	22.00	44.00
A13	276-300	23.50	47.00
A14	301-325	25.00	50.00
A15	326-350	26.50	53.00
A16	351-375	28.00	56.00
A17	376-400	29.50	59.00
A18	401-425	31.00	62.00
A19	426-450	32.50	65.00
A20	451-475	34.00	68.00
A21	476-500	35.50	71.00
A22	501-525	37.00	74.00
A23	526-550	38.50	77.00
A24	551-575	40.00	80.00
A25	576-600	41.50	83.00
A26	601-up	*	**
A99	Please write for a price quote		

*For documents over 600 pages, add $1.50 for each additional 25 page increment or portion thereof.

**For documents over 600 pages, add $3.00 for each additional 25 page increment or portion thereof.

OSRD Office of Standard Reference Data
National Bureau of Standards
Gaithersburg, MD 20899
Payment must accompany order. Checks should be drawn on an American bank and made payable to the National Bureau of Standards.

RCDC Radiation Chemistry Data Center
Radiation Laboratory
University of Notre Dame
Notre Dame, IN 46556

Write to the Center for price quotes and availability.

Journal of Physical and Chemical Reference Data

Reprints

Vol(No)	Page	(year)	Reprint No.	Price
1	1-118	1972	1	$7.00
1	119-134	1972	2	3.00
1	135-146	1972	3	3.00
1	147-188	1972	4	4.50
1	189-216	1972	5	4.00
1	221-278	1972	6	5.00
1	279-422	1972	7	7.50
1	423-534	1972	8	6.50
1	535-574	1972	9	4.50
1	581-746	1972	10	8.50
1	747-772	1972	11	4.00
1	773-836	1972	12	5.00
1	841-1009	1972	13	8.50
1	1011-1045	1972	14	4.50
1	1047-1099	1972	15	5.00
1	1101-1113	1972	16	3.00
2	1-10	1973	17	3.00
2	11-24	1973	18	3.00
2	25-84	1973	19	5.00
2	85-120	1973	20	4.50
2	121-162	1973	21	4.50
2	163-200	1973	22	4.50
2	205-214	1973	23	3.00
2	215-224	1973	24	3.00
2	225-256	1973	25	4.00
2	257-266	1973	26	3.00
2	267-312	1973	27	4.50
2	313-410	1973	28	6.50
2	411-426	1973	29	3.00
2	427-438	1973	30	3.00
2	439-466	1973	31	4.00
2	467-518	1973	32	5.00
2	519-530	1973	33	3.00
2	531-618	1973	34	6.00
2	619-642	1973	35	4.00
2	643-656	1973	36	3.00
2	663-734	1973	37	5.50
2	735-756	1973	38	4.00
2	757-922	1973	39	8.50
2	923-1042	1973	40	7.00
3	1-115	1974	41	7.00
3	117-140	1974	42	4.00
3	141-162	1974	43	4.00
3	163-209	1974	44	4.50
3	211-219	1974	45	3.00
3	221-244	1974	46	4.00
3	245-257	1974	47	3.00
3	259-268	1974	48	3.00
3	269-308	1974	49	4.50
3	311-480	1974	50	8.50
3	481-526	1974	51	4.50
3	527-602	1974	52	5.50
3	609-770	1974	53	8.50
3	771-780	1974	54	3.00
3	781-824	1974	55	4.50
3	825-895	1974	56	5.50
3	897-935	1974	57	4.50
3	937-978	1974	58	4.50
3	979-1017	1974	59	4.50
4	1-175	1975	60	8.50
4	177-249	1975	61	6.00

Journal of Physical and Chemical Reference Data

Reprints

Vol(No)	Page	(Year)	Reprint No.	Price
4	251-261	1975	62	3.00
4	263-352	1975	63	6.00
4	353-440	1975	64	6.00
4	441-456	1975	65	3.00
4	457-470	1975	66	3.00
4	471-538	1975	67	5.50
4	539-576	1975	68	4.50
4	577-856	1975	69	12.00
4	859-870	1975	70	3.00
4	871-1178	1975	71	13.00
5	1-51	1976	73	5.00
5	53-77	1976	74	4.00
5	79-101	1976	75	4.00
5	103-200	1976	76	6.50
5	209-257	1976	77	5.00
5	259-308	1976	78	5.00
5	309-317	1976	79	3.00
5	319-328	1976	80	3.00
5	329-528	1976	81	9.50
5	537-570	1976	82	4.50
5	571-580	1976	83	3.00
5	581-821	1976	84	12.50
5	835-1092	1976	85	11.50
5	1093-1121	1976	86	4.00
5	1123-1146	1976	87	4.00
5	1147-1156	1976	88	3.00
6	1-50	1977	90	5.00
6	51-104	1977	91	5.00
6	105-112	1977	92	3.00
6	113-307	1977	93	9.50
6	317-383	1977	94	5.50
6	385-407	1977	95	4.00
6	409-596	1977	96	9.00
6	597-609	1977	97	3.00
6	621-673	1977	98	5.00
6	675-829	1977	99	8.00
6	831-869	1977	100	4.50
6	871-917	1977	101	4.50
6	919-991	1977	102	5.50
6	993-1102	1977	103	6.50
6	1109-1132	1977	104	4.00
6	1133-1166	1977	105	4.50
6	1167-1180	1977	106	3.00
6	1181-1204	1977	107	4.00
6	1205-1252	1977	108	4.50
6	1253-1330	1977	109	5.50
7	1-262	1978	110	11.50
7	263-310	1978	111	4.50
7	311-362	1978	112	5.00
7	363-377	1978	113	3.00
7	383-415	1978	114	4.50
7	417-423	1978	115	3.00
7	425-439	1978	116	3.00
7	441-493	1978	117	5.00
7	495-629	1978	118	7.50
7	635-792	1978	119	8.00
7	793-940	1978	120	8.00
7	941-948	1978	121	3.00
7	949-957	1978	122	3.00
7	959-1177	1978	123	10.00
7	1179-1190	1978	124	3.00

Reprints

Vol(No)	Page	(year)	Reprint No.	Price
7	1191-1262	1978	125	5.50
7	1267-1284	1978	126	4.00
7	1285-1307	1978	127	4.00
7	1309-1321	1978	128	3.00
7	1323-1443	1978	129	7.00
7	1445-1750	1978	130	13.00
8	1-62	1979	131	5.00
8	63-68	1979	132	3.00
8	69-105	1979	133	4.50
8	107-123	1979	134	4.00
8	125-302	1979	135	9.00
8	307-327	1979	136	4.00
8	329-338	1979	137	3.00
8	339-438	1979	138	6.50
8	439-497	1979	139	5.00
8	499-517	1979	140	4.00
8	519-526	1979	141	3.00
8	527-535	1979	142	3.00
8	537-558	1979	143	4.00
8	559-575	1979	144	4.00
8	583-618	1979	145	4.50
8	619-722	1979	146	6.50
8	723-798	1979	147	5.50
8	799-816	1979	148	4.00
8	817-864	1979	149	4.50
8	865-916	1979	150	5.00
8	923-1004	1979	151	6.00
8	1005-1050	1979	152	4.50
8	1051-1108	1979	153	5.00
8	1109-1146	1979	154	4.50
8	1147-1298	1979	155	8.00
9	1-58	1980	156	6.00
9	59-160	1980	157	7.50
9	161-289	1980	158	8.50
9	295-471	1980	159	10.00
9	473-511	1980	160	5.50
9	523-560	1980	161	5.50
9	561-658	1980	162	7.50
9	659-720	1980	163	6.00
9	721-734	1980	164	4.00
9	735-750	1980	165	4.00
9	751-790	1980	166	5.50
9	791-830	1980	167	5.50
9	831-1022	1980	168	10.50
9	1023-1148	1980	169	8.00
9	1149-1254	1980	170	7.50
9	1255-1290	1980	171	5.50
9	1291-1306	1980	172	4.00
9	1307-1328	1980	173	5.00
10	1-55	1981	174	6.00
10	57-70	1981	175	4.00
10	71-87	1981	176	5.00
10	89-117	1981	177	5.00
10	119-152	1981	178	5.50
10	153-196	1981	179	5.50
10	197-289	1981	180	7.00
10	295-304	1981	181	4.00
10	305-565	1981	182	12.50
10	575-669	1981	183	7.00
10	671-764	1981	184	7.00
10	765-778	1981	185	4.00
10	779-798	1981	186	5.00

Journal of Physical and Chemical Reference Data — Continued

Reprints

Vol(No)	Page	(year)	Reprint No.	Price
10	809-999	1981	187	10.00
10	1001-1049	1981	188	5.50
10	1051-1064	1981	189	4.00
10	1065-1084	1981	190	5.00
10	1085-1095	1981	191	4.00
10	1097-1174	1981	192	6.50
10	1175-1199	1981	193	5.00
10	1205-1240	1981	194	5.00
11	1-14	1982	195	5.00
11	15-81	1982	196	9.00
11	83-99	1982	197	6.00
11	101-117	1982	198	6.00
11	119-133	1982	199	5.00
11	135-241	1982	200	11.00
11	251-312	1982	201	8.00
11	313-325	1982	202	5.00
11	327-496	1982	203	15.00
11	505-693	1982	204	16.00
11	695-940	1982	205	20.00
11	941-951	1982	206	5.00
11	953-996	1982	207	7.00
11	1005-1064	1982	208	8.00
11	1065-1089	1982	209	6.00
11	1091-1098	1982	210	5.00
11	1099-1127	1982	211	6.00
11	1127-1151	1982	212	6.00
11	1151-1171	1982	213	6.00
12	1-28	1983	214	6.00
12	29-63	1983	215	7.00
12	65-89	1983	216	6.00
12	91-108	1983	217	6.00
12	109-152	1983	218	7.00
12	163-178	1983	219	5.00
12	179-182	1983	220	5.00
12	183-322	1983	221	13.00
12	323-380	1983	222	8.00
12	381-387	1983	223	5.00
12	389-393	1983	224	5.00
12	395-401	1983	225	5.00
12	413-465	1983	226	8.00
12	467-512	1983	227	7.00
12	513-529	1983	228	6.00
12	531-590	1983	229	8.00
12	591-815	1983	230	19.00
12	817-820	1983	231	5.00
12	829-872	1983	232	7.00
12	873-890	1983	233	6.00
12	891-916	1983	234	6.00
12	917-932	1983	235	5.00
12	933-966	1983	236	7.00
12	967-1031	1983	237	9.00
12	1033-1063	1983	238	6.00
13	1-102	1984	239	11.00
13	103-150	1984	240	7.00
13	151-173	1984	241	6.00
13	175-183	1984	242	5.00
13	185-205	1984	243	6.00
13	207-227	1984	244	6.00
13	229-303	1984	245	9.00
13	315-444	1984	246	13.00
13	445-553	1984	247	11.00
13	555-562	1984	248	5.00

Reprints

13	563-600	1984	249	7.00
13	602-609	1984	250	5.00
13	619-648	1984	251	6.00
13	649-686	1984	252	7.00
13	687-694	1984	253	5.00
13	695-808	1984	254	12.00
13	809-892	1984	255	10.00
13	893-934	1984	256	7.00
13	945-1068	1984	257	12.00
13	1069-1096	1984	258	6.00
13	1097-1130	1984	259	7.00
13	1131-1172	1984	260	7.00
13	1173-1197	1984	261	6.00
13	1199-1250	1984	262	8.00
13	1251-1257	1984	263	5.00
13	1259-1380	1984	264	12.00

Special Reprint Packages

Package	No.	Title	Price
A1	4	Molecular Vibrational Frequencies	$22.00
		JANAF Thermochemical Tables	due 85
A3	19	Atomic Energy Levels	66.00
A4	6	Atomic Spectra	27.00
A5	5	Atomic Transition Probabilities	28.00
A6	20	Molecules in Space	58.00
A7	9	Chemical Data Relevant to Air Pollution	40.00
A8	7	Molecular Spectra	41.00

A9	9	Thermodynamic Properties of Electrolyte Solutions	37.00
B1	12	Ideal Gas Thermodynamic Properties	31.00
B2	3	Elastic Properties of Metals and Alloys	12.00
B3	3	Resistivity	16.00
B4	7	Molten Salts	44.00
B5	3	Refractive Index	21.00
B6	11	Viscosity and Thermal Conductivity of Fluids	35.00
B7	10	Properties of Water	37.00
B8	4	Properties of Heavy Water	16.00
B9	9	Linear Micromolecules	38.00

Supplements to the Journal

Vol. 2, Supplement 1, 420 p. (1973)
hard cover $33.00
soft cover $30.00
Vol. 3 Supplement 1, 796 p. (1974)
hard cover $60.00
soft cover $55.00
Vol. 6, Supplement 1, 783 p. (1977)
hard cover $70.00
soft cover $65.00
Vol. 10. Supplement 1, 720 p. (1981)
hard cover $80.00
Vol. 11, Supplement 1, 354 p. (1982)
hard cover $40.00
Volume 11, Supplement 2, 394 p. (1982)
hard cover $40.00
Volume 12, Supplement 1 (1983)
hard cover $40.00

National Standard Reference Data System-National Bureau of Standards (NSRDS-NBS)

Series No.	Pages	Year	Source	Ordering Information
1	12	1965	GPO	SN 003-003-00627-1, microfiche not available
2	68	1965	NTIS	NSRDS-NBS 2, A04
3(1)	35	1965	NTIS	NSRDS-NBS 3, A03
3(2)	22	1967	NTIS	NSRDS-NBS 3-2, A02
3(3)	73	1970	NTIS	COM 72-50056, A04
3(4)	46	1971	NTIS	COM 71-50346, A03
3(5)	80	1975	NTIS	COM 75-10953/AS, A05
3(6)	32	1972	NTIS	COM 72-50994, A03
3(7)	33	1976	NTIS	SN 003-003-01558-0, PB 253231, A03
3(8)	31	1979	NTIS	SN 003-003-01964, PB 291914, A03
3(9)	21	1980	NTIS	SN 003-003-02134-2, PB 80197460, A02
3(10)	21	1983	NTIS	SN 003-003-02469-4, PB 83208942, A02
3(11)	...	1985	NTIS	IN PRESS
4(I)	153	1966	NTIS	AD 634145, A08
5	87	1966	NTIS	NSRDS-NBS 5, A05
6	56	1967	NTIS	Out of print, superseded by NSRDS-NBS 39
7	38	1966	NTIS	NSRDS-NBS 7, microfiche not available
8	68	1966	NTIS	PB 189698, A04
9	129	1967	NTIS	NSRDS-NBS 9, A07
10	49	1967	NTIS	NSRDS-NBS 10, A03
11	38	1967	NTIS	Out of print, superseded by NSRDS-NBS 39
12	102	1968	NTIS	NSRDS-NBS 12, A05
13	62	1968	NTIS	NSRDS-NBS 13, A04
14	66	1967	NTIS	NSRDS-NBS 14, A04
15	140	1968	NTIS	NSRDS-NBS 15, A07
16	146	1968	NTIS	NSRDS-NBS 16, A07
17	39	1968	NTIS	Out of print, superseded by NSRDS-NBS 39
18	49	1968	GPO	SN 003-003-00628-9, microfiche not available
19	10	1968	NTIS	NSRDS-NBS 19, A02
20	49	1968	NTIS	NSRDS-NBS 20, A03
21	645	1970	NTIS	PB 191956, A26
22	268	1969	NTIS	AD 696884, A12
23	65	1968	NTIS	NSRDS-NBS 23, A04
24	271	1968	NTIS	NSRDS-NBS 24, A12
25	120	1968	NTIS	NSRDS-NBS 25, A06
26	289	1969	NTIS	Out of print, superseded by J. Phys. Chem. Ref. Data Vol. 6, Supplement1(1977)
27	153	1969	NTIS	NSRDS-NBS 27, A08
28	116	1968	NTIS	NSRDS-NBS 28, A06
29	85	1969	NTIS	NSRDS-NBS 29, A05, superseded by 2 papers: J. Phys. Chem. Ref. Data 9, 1023(1980)(Reprint
30	27	1969	NTIS	NSRDS-NBS 30, A03
31	48	1970	NTIS	PB 189028, A03
32	79	1970	NTIS	PB 192873, A05
33	37	1970	NTIS	PB 192183, A03
34	22	1970	NTIS	NSRDS-NBS 34, A02
35(I)	358	1971	NTIS	SN 003-003-00949-1, COM 72-50282, A16; Reprints and updates parts of NBS Circular 467, VolumeI
35(II)	263	1971	NTIS	SN 003-003-00935-1, COM 72-50216, A12; Reprint of NBS Circular467, VolumeII
35(III)	289	1971	NTIS	SN 003-003-00950-4, COM 72-50283, A13; Reprint of NBS Circular467, VolumeIII
36	222	1971	NTIS	COM 71-50203, A10
37	1141	1971	NTIS	AD 732043, A26
38	114	1971	NTIS	COM 71-50351, A06; reprinted from Rev. Geophys. Space Phys. 9(2) May 1971
39	167	1972	NTIS	COM 72-50747, A08; supersedes NSRDS-NBS 6, 11, and 17; available as part of JPCRD
40	261	1972	NTIS	COM 72-50439, A12; reprint of NBS Technical Note 36
41	57	1972	NTIS	COM 72-50849, A04
42	27	1972	NTIS	COM 72-50886, A03
43	69	1973	NTIS	COM 73-50537, A04
43(Suppl.)	53	1975	NTIS	COM 75-10737/AS
44	41	1974	NTIS	COM 74-50175, A03
45	29	1973	NTIS	COM 74-50060, A03
46	72	1973	NTIS	COM 73-50623, A04
47	161	1974	NTIS	COM 74-50641, A08
48	44	1974	NTIS	COM 74-50310, A03
49	140	1974	NTIS	COM 74-50715, A07
50	120	1973	NTIS	AD 771200, A06; reprinted from Rev. Mod. Phys. 45(3) 378-486 (July 1973)
51	66	1975	NTIS	COM 75-10617, A04
52	55	1974	NTIS	COM 74-50696, A04
53	55	1975	NTIS	COM 75-11437, A04

National Standard Reference Data Systems-National Bureau of Standards (NSRDS-NBS)—Continued

Series No.	Pages	Year	Ordering Information	
54	33	1975	NTIS	COM 75-10625, A03
55	21	1975	NTIS	COM 75-10917/AS, A02
56	37	1975	NTIS	PB 248991, A03
57	38	1976	NTIS	PB 255 004, A03
58	23	1976	NTIS	PB 254 470, A02
59	126	1976	NTIS	PB 263 198, A07
60	422	1978	NTIS	PB 282 067, A18
61(I)	244	1978	NTIS	PB 281 463, A11
61(II)	420	1979	NTIS	PB 295 406, A18
61(III)	19	1979	NTIS	PB 297847, A02
61(IV)	870	1981	NTIS	PB 81-244 121, A26
61(V)	42	1982	NTIS	PB 82-232 919, A03
62	68	1978	NTIS	PB 283487, A04
63(1,2,3,4)	3975	1978	NTIS	PB 290 661 A26
63(Suppl. 1)	2040	1980	NTIS	PB 81-189 367, A26
63(Suppl. 2)	1110	1983	NTIS	PB 84-156 496, A26
64	27	1980	NTIS	PB 294304, A03
65	62	1979	NTIS	PB 296 734, A04
66	380	1980	NTIS	out of print, superseded by NSRDS-NBS 71
67	110	1980	NTIS	PB 208 887, A06
68	415	1980	NTIS	PB 81-206 120, A18
69	167	1981	NTIS	SN003-003-02322-1, PB 82-10941, A08
70	96	1982	NTIS	SN003-003-02431-7, microfiche from NTIS as PB 82-109 141, A05
71	634	1982	NTIS	SN003-003-02424-4, supersedes NSRDS-NBS 66
72	42	1982	NTIS	PB 82-215 401, A03
NBS Circulars				
488(1)	78	1950	NTIS	PB 252 093, A09, bound together with section 2
488(2)	115	1952	NTIS	PB 252 093, A09, bound together with section 1
488(3)	94	1962	NTIS	PB 252 094, A09, bound together with sections 4 and 5
488(4)	65	1962	NTIS	PB 252 094, A09, bound together with sections 3 and 5
488(5)	30	1962	NTIS	PB 252 094, A09, bound together with sections 3 and 4
NBS Handbooks				
101	256	1968	NTIS	NBS-H101, A12, reprinting with corrections of the 1966 edition
125	294	1978	NTIS	SN003-003-01972-1, microfiche from NTIS as NBS-H-125
138	127	1982	NTIS	SN003-003-02391-4, PB 82-217175
NBS Monographs				
70(I)	171	1964	NTIS	PB 168 072, A08
70(II)	349	1964	NTIS	PB 189 714, A15
70(III)	275	1969	NTIS	COM 74-10794, A12
70(IV)	419	1968	NTIS	COM 74-10795, A18
70(V)	533	1968	NTIS	COM 74-10796, A23
94	116	1965	NTIS	N65-32001, A06
115	54	1970	NTIS	PB 192 874, A04
134	177	1973	NTIS	COM 73-50582, A09
153	123	1976	NTIS	PB 256 586, A06
167	288	1981	GPO	SN003-003-02166-1
169	197	1982	NTIS	SN003-003-02406-6, microfiche from NTIS as PB 82-249 632
170	249	1982	NTIS	SN003-003-02409-1, microfiche from NTIS as PB 82-252 040100
NBS Office of Standard Reference Data Bibliographies (OSRDB)				
70-1(Vol. 1)	692	1970	NTIS	PB 191 174, A26
70-1(Vol. 2)	748	1970	NTIS	PB 191 175, A26
70-2	413	1970	NTIS	COM 71-00722, A18
70-3	293	1970	NTIS	AD 705 110, A13
70-4	47	1970	NTIS	COM 71-00025, A03
71-1	293	1971	NTIS	COM 71-00248, A13
71-2	140	1971	NTIS	COM 71-00841, A07; supplemented by NBS Spec. Publ. 371 and 371 Suppl.

Joint Institute for Laboratory Astrophysics (JILA Reports)

6	95	1969	NTIS	PB 189 127, A06
7	167	1969	NTIS	AD 696 467, A08
13	139	1973	NTIS	COM 74-11661, A07
18	148	1980		no charge, University of Colorado, Box 440, Boulder, CO 80309
20	252	1979		no charge, University of Colorado, Box 440, Boulder, CO 80309
21	127	1981		no charge, University of Colorado, Box 440, Boulder, CO 80309

NBS Special Publications

Series No.	Pages	Year	Ordering Information	
281	155	1967	NTIS	NBS SP-281, A08
306(I)	80	1968	NTIS	NBS SP 306, A05
306(II)	57	1969	NTIS	NBS SP-306-2, A04
306(III)	37	1969	NTIS	PB 264 245, A03
306(IV)	48	1969	NTIS	COM 73-10870, A02
324	683	1971	NTIS	COM 71-50070, A26
349	43	1972	NTIS	COM 72-50807, A03
362	75	1972	NTIS	COM 72-50466, A04
363	109	1972	NTIS	COM 72-50676, A06
363(Suppl. 1)	190	1977	NTIS	PB 263 199, A05
363(Suppl. 2)	119	1980	NTIS	SN003-003-02267-5, PB 81 125833, A06
366	165	1972	NTIS	COM 72-50943, A08
366(Suppl. 1)	76	1974	NTIS	COM 74-50063, A05
366(Suppl. 2)	75	1975	NTIS	PB 245 714, A04
366(Suppl. 3)	87	1978	NTIS	PB 289 815, A05
369	180	1974	NTIS	COM 74-50302, A09
371	93	1973	NTIS	COM 73-50245, A05; supplements NBS-OSRDB 71-2 (1971)
371(Suppl. 1)	91	1975	NTIS	COM 75-10687, A05; supplements NBS-OSRDB 71-2 (1972) and NBS Special Publication 371
380	134	1973	NTIS	COM 73-50244, A07
380(Suppl. 1)	106	1978	NTIS	PB 284 499, A06
381	75	1973	NTIS	COM 73-50932, A04
392	84	1974	NTIS	COM 74-50348, A05
396(1)	90	1974	NTIS	COM 74-51060, A05
396(2)	56	1975	NTIS	PB 248 989, A04
396(3)	42	1976	NTIS	PB 250 844, A03
396(4)	96	1976	NTIS	SN003-003-01572-5, PB 258 557, A05
424	177	1976	NTIS	PB 251 845, A09
426	222	1976	NTIS	SN003-003-01465-6, PB 252 687, A10
426(Suppl. 1)	115	1979	NTIS	PB 296 736, A06
428(1,2,3)	2414	1976	NTIS	SN003-003-01541-5, sold as a three volume set PB 249160, 161, 162
449	142	1976	NTIS	PB 263 122, A07
454	71	1976	NTIS	PB 257 765, A04
478	54	1977	NTIS	SN003-003-01824-4, PB 270 972, A04
485	57	1977	NTIS	PB 270 367, A04
496(1,2)	1622	1978	NTIS	Vol. 1: PB 280 244, Vol. 2: PB 280 245
505	283	1978	NTIS	PB 280736, A13
505(Suppl.)	126	1980	NTIS	PB 80-213 739, A07
513	111	1978	NTIS	PB 280549, A06
531	94	1978	NTIS	PB 289 918, A05
537	94	1979	NTIS	PB 292 163, A05
578	27	1980	NTIS	PB 81 167025, A03
593	349	1981	NTIS	PB 81-204 760, A15
612	125	1981	NTIS	NBS Special Publication 612, no charge; microfiche from NTIS as PB 82-134 362
689	37	1985	GPO	SP 689

NBS Technical Notes

270(3)	264	1968	NTIS	NBS TN 270(3), A12. Superseded by J. Phys. Chem. Ref. Data 11, Supplement 2 (1982)
270(4)	152	1969	GPO	SN003-003-00407-3, microfiche not available. Superseded by J. Phys. Chem. Ref. Data 11, Suppl
270(5)	49	1971	NTIS	COM 71-50171 A03. Superseded by J. Phys. Chem. Ref. Data 11, Supplement 2 (1982)
270(6)	124	1971	NTIS	COM 71-50608, A06. Superseded by J. Phys. Chem. Ref. Data, 11, Supplement 2 (1982)
270(7)	84	1973	NTIS	COM 73-50435, A05. Superseded by J. Phys. Chem. Ref. Data 11, Supplement 2 (1982)
270(8)	149	1981	GPO	SN003-003-02318-3, superseded by J. Phys. Chem. Ref. Data 11, Supplement 2 (1982)

NBS Technical Notes—Continued

Series No.	Pages	Year	Ordering Information	
291	40	1966	NTIS	NBS-TN-291, A03
361	118	1973	NTIS	COM 74-50760, A06
438	139	1967	NTIS	AD 665 245, A07
444	25	1968	NTIS	NBS-TN-444, A02
446	84	1968	NTIS	NBS-TN-446, A04
464	163	1968	NTIS	NBS-TN-464, A08
470	76	1969	NTIS	NBS-TN-470, A05
474	22	1969	NTIS	AD 681 351, A02
484	62	1969	NTIS	AD 692 231, A04
500	47	1970	NTIS	PB 191 352, A03
554	196	1970	NTIS	PB 194 750, A09
700	72	1972	NTIS	COM 73-50015, A04
738	16	1972	NTIS	COM 72-50810, A02
740	32	1973	NTIS	COM 73-50986, A03
760	32	1973	NTIS	SN003-003-0112-6, COM 73-50242, A03
820	58	1974	NTIS	COM 74-50140, A04
848	23	1974	NTIS	COM 74-50943, A02
901	47	1976	NTIS	PB 251 269, A03
903	34	1976	NTIS	PB 249 541, A04
928	60	1976	NTIS	PB 262 600, A04
947	88	1977	NTIS	PB 268 513, A05
968	81	1978	NTIS	PB 84-148 717, A05
983	103	1978	NTIS	PB 287 013, A06; supplements J. Phys. Chem. Reference Data 5(3)581-821(1976), Reprint No. 84
1039	83	1981	NTIS	PB 81-214 165, A05
1045	164	1981	NTIS	SN003-003-02351-5, PB 82-107673, A08
1048	56	1982	NTIS	PB 83117523, A04
1051	199	1982	NTIS	PB 82-225 988, A09
1122	29	1980	NTIS	PB 81-11511, A03
1141	54	1981	NTIS	SN003-003-02309-4, PB 81 205437, A04
1147	316	1981	NTIS	SN003-003-02379-5; supersedes NBS Technical Note 551; PB 82 136474, A14
1176	49	1983	NTIS	SN003-003-02490-2, PB 83 220467, A03

Translations from the Russian

Russian Tran.	366	1971	NTIS	TT 70-50180, A16
Russian Tran.	69	1970	NTIS	TT 70-50177, A04
Russian Tran.	730	1970	NTIS	TT 71-50040, A26
Russian Tran.	329	1972	NTIS	TT 71-50041, A15
Russian Tran.	340	1974	NTIS	TT 73-53051 or PB226 722, A15
Russian Tran.	273	1971	NTIS	TT 70-50094, A12
Russian Tran.	215	1974	NTIS	TT 72-52002, A10
Russian Tran.	126	1971	NTIS	TT 70-50179, A07
Russian Tran.	434	1972	NTIS	COM 72-10014, A19
Russian Tran.	364	1971	NTIS	TT 70-50148, A16
Russian Tran.	453	1974	NTIS	TT 74-50019, A20
Russian Tran.	505	1975	NTIS	TT 74-50032, A22
Russian Tran.	648	1975	NTIS	TT 75-50007, A26
Russian Tran.	540	1976	NTIS	TT 76-50007, A23
Russian Tran.	260	1971	NTIS	TT 70-50096, A12
Russian Tran.	206	1972	NTIS	COM 75-11276, A10
Russian Tran.	402	1971	NTIS	TT 70-50095, A18
Russian Tran.	72	1971	NTIS	TT 70-50178, A04
Russian Tran.	214	1970	NTIS	TT 69-55091, A10
Russian Tran.	251	1970	NTIS	TT 70-50097, A12
Russian Tran.	255	1970	NTIS	TT 69-55092, A12
Russian Tran.	395	1974	NTIS	TT 72-52001, A17
Russian Tran.	212	1975	NTIS	TT 73-52009, A10
Russian Tran.	179	1975	NTIS	TT 73-52029, A09,

NBS Interim Reports (NBSIR)

75-770	27	1975	NTIS	COM 75-11370, A03
75-968	35	1976	NTIS	PB 250 845, A03
76-1002	54	1976	NTIS	PB 257 469, A04
76-1034	76	1976	NTIS	PB 254 460, A05

76-1061	52	1976	NTIS	PB 256 328, A04
76-1147	41	1976	NTIS	PB 259 637, A03
77-860	240	1977	NTIS	PB 272 355, A11
77-865	162	1977	NTIS	N-78-16119, A08
77-1300	94	1977	NTIS	PB 273 171, A05
78-1432	84	1978	NTIS	PB 293 918, A05
78-1479	69	1981	NTIS	PB 80-284 659, A08
79-1777	563	1979	NTIS	PB 299 289, A24
79-1941	169	1979	NTIS	PB 80-128 531, A08
80-2029	173	1980	NTIS	PB 80-204 605, A08
80-2032	89	1980	NTIS	PB 80-198 799, A05
81-2217	259	1981	NTIS	For Official distribution only
81-2253	38	1981	NTIS	PB 83-249 789, A03
81-2254	302	1981	NTIS	PB 81-205 429, A15
81-2276	26	1981	NTIS	PB 81-229 171, A03
81-2343	57	1981	NTIS	PB 82-131 525, A04
81-2345	89	1981	NTIS	PB 82-184 904, A05
81-2356	17	1982	NTIS	PB 82-171 091, A02
82-2401	164	1982	NTIS	PB 82-259373, A08
81-2426	87	1982	NTIS	PB 83-216358, A05
82-2543	139	1982	NTIS	PB 83-25 363, A07; supplements NBS Spec. Publ. 380 and 380-1
82-2550	164	1982	NTIS	PB 82-2550, A08
82-2587	751	1982	NTIS	PB 83-115 311, A26
75-763	206	1972	NTIS	COM 75-11276, A10
84-2811	162	1983	NTIS	Order from NTIS NBSIR 84-2811
84-2907	55	1984	NTIS	Order from NTIS NBSIR 84-2907

NBS-114A (REV. 2-80)

U.S. DEPT. OF COMM. BIBLIOGRAPHIC DATA SHEET (See Instructions)	1. PUBLICATION OR REPORT NO. NBS/SP-708	2. Performing Organ. Report No.	3. Publication Date December 1985

4. TITLE AND SUBTITLE

Standard Reference Data Publications 1964-1984

5. AUTHOR(S)

Joan C. Sauerwein and Geraldine R. Dalton

6. PERFORMING ORGANIZATION (If joint or other than NBS, see Instructions)

National Bureau of Standards
Department of Commerce
Gaithersburg, MD 20899

7. Contract/Grant No.

8. Type of Report & Period Covered
1964-1984

9. SPONSORING ORGANIZATION NAME AND COMPLETE ADDRESS (Street, City, State, ZIP)

Same as item 6.

10. SUPPLEMENTARY NOTES

Supersedes NBS SP 612
Library of Congress Catalog Card Number: 85-600607

☐ Document describes a computer program; SF-185, FIPS Software Summary, is attached.

11. ABSTRACT (A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here)

The National Bureau of Standards' Office of Standard Reference Data manages a network of data centers that prepare evaluated data bases of physical and chemical properties of substances. Data bases are available in printed form, on magnetic tapes and through on-line computer networks. This document provides a comprehensive list of the products available from the National Standard Reference Data System (NSRDS) for the years 1964-1984, including indexes qualified by author, material, and property terms. Ordering information and current prices can be found at the end of this document.

12. KEY WORDS (Six to twelve entries; alphabetical order; capitalize only proper names; and separate key words by semicolons)

bibliographies; chemical properties; evaluated data; indexes; materials properties; physical properties; publication list

13. AVAILABILITY

☒ Unlimited
☐ For Official Distribution. Do Not Release to NTIS
☒ Order From Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.
☐ Order From National Technical Information Service (NTIS), Springfield, VA. 22161

14. NO. OF PRINTED PAGES
143

15. Price

NBS Technical Publications

Periodical

Journal of Research—The Journal of Research of the National Bureau of Standards reports NBS research and development in those disciplines of the physical and engineering sciences in which the Bureau is active. These include physics, chemistry, engineering, mathematics, and computer sciences. Papers cover a broad range of subjects, with major emphasis on measurement methodology and the basic technology underlying standardization. Also included from time to time are survey articles on topics closely related to the Bureau's technical and scientific programs. Issued six times a year.

Nonperiodicals

Monographs—Major contributions to the technical literature on various subjects related to the Bureau's scientific and technical activities.

Handbooks—Recommended codes of engineering and industrial practice (including safety codes) developed in cooperation with interested industries, professional organizations, and regulatory bodies.

Special Publications—Include proceedings of conferences sponsored by NBS, NBS annual reports, and other special publications appropriate to this grouping such as wall charts, pocket cards, and bibliographies.

Applied Mathematics Series—Mathematical tables, manuals, and studies of special interest to physicists, engineers, chemists, biologists, mathematicians, computer programmers, and others engaged in scientific and technical work.

National Standard Reference Data Series—Provides quantitative data on the physical and chemical properties of materials, compiled from the world's literature and critically evaluated. Developed under a worldwide program coordinated by NBS under the authority of the National Standard Data Act (Public Law 90-396). NOTE: The Journal of Physical and Chemical Reference Data (JPCRD) is published quarterly for NBS by the American Chemical Society (ACS) and the American Institute of Physics (AIP). Subscriptions, reprints, and supplements are available from ACS, 1155 Sixteenth St., NW, Washington, DC 20056.

Building Science Series—Disseminates technical information developed at the Bureau on building materials, components, systems, and whole structures. The series presents research results, test methods, and performance criteria related to the structural and environmental functions and the durability and safety characteristics of building elements and systems.

Technical Notes—Studies or reports which are complete in themselves but restrictive in their treatment of a subject. Analogous to monographs but not so comprehensive in scope or definitive in treatment of the subject area. Often serve as a vehicle for final reports of work performed at NBS under the sponsorship of other government agencies.

Voluntary Product Standards—Developed under procedures published by the Department of Commerce in Part 10, Title 15, of the Code of Federal Regulations. The standards establish nationally recognized requirements for products, and provide all concerned interests with a basis for common understanding of the characteristics of the products. NBS administers this program as a supplement to the activities of the private sector standardizing organizations.

Consumer Information Series—Practical information, based on NBS research and experience, covering areas of interest to the consumer. Easily understandable language and illustrations provide useful background knowledge for shopping in today's technological marketplace.

Order the **above** *NBS publications from: Superintendent of Documents, Government Printing Office, Washington, DC 20402.*

Order the **following** *NBS publications—FIPS and NBSIR's—from the National Technical Information Service, Springfield, VA 22161.*

Federal Information Processing Standards Publications (FIPS PUB)—Publications in this series collectively constitute the Federal Information Processing Standards Register. The Register serves as the official source of information in the Federal Government regarding standards issued by NBS pursuant to the Federal Property and Administrative Services Act of 1949 as amended, Public Law 89-306 (79 Stat. 1127), and as implemented by Executive Order 11717 (38 FR 12315, dated May 11, 1973) and Part 6 of Title 15 CFR (Code of Federal Regulations).

NBS Interagency Reports (NBSIR)—A special series of interim or final reports on work performed by NBS for outside sponsors (both government and non-government). In general, initial distribution is handled by the sponsor; public distribution is by the National Technical Information Service, Springfield, VA 22161, in paper copy or microfiche form.

U.S. Department of Commerce
National Bureau of Standards
Gaithersburg, MD 20899