$[(RAs)_2Mo_6O_{24}(OH_2)]^{4-} \rightharpoonup [(RAs)_2Mo_6O_{24}(OH)]^{5-} + H^+$ must be greater than ~6.[2]

Acknowledgments. We thank Professor J. E. Earley for helpful discussion and S.-B. Chen for assistance with the NMR measurements. This research has been supported by the National Institutes of Health through Grant No. GM23263 and, in part, by the Office of Naval Research.

References and Notes

(1) Good elemental analyses (C, H, N, As, and W) were obtained for the derivatives where R = CH_3, C_6H_5, and p-$C_6H_4NH_2$.
(2) W. Kwak, L. M. Rajković, M. T. Pope, C. O. Quicksall, K. Y. Matsumoto, and Y. Sasaki, *J. Am. Chem. Soc.*, **99**, 6463 (1977).
(3) K. Y. Matsumoto, *Bull. Chem. Soc. Jpn.*, **51**, 492 (1978).
(4) Bond lengths to the other doubly bonding oxygen in the shared face are 1.95, 1.91 (Mo),[3] and 1.93, 1.94 Å (W).
(5) In spite of an equilibrium that strongly favors the hydrated molybdate structure in aqueous solution,[2] salts of the D_{3d} anion, $(RAs)_2Mo_6O_{24}^{4-}$, have been isolated and structurally characterized:[24] W. Kwak, L. M.Rajković, J. K. Stalick, M. T. Pope, and C. O. Quicksall, *Inorg. Chem.*, **15**, 2778 (1976).
(6) At 26 °C the spectrum consists of a pair of narrow lines (~2 Hz) at 2.15 and 2.48 ppm. These broaden and coalesce as the temperature is raised to 90 °C. No shifts indicating exchange with uncomplexed $CH_3AsO_3^{2-}$ (δ 1.7 ppm) were observed at any temperature.

S. H. Wasfi, W. Kwak, M. T. Pope,* K. M. Barkigia
R. J. Butcher, C. O. Quicksall
Department of Chemistry, Georgetown University
Washington, D.C. 20057
Received June 26, 1978

Book Reviews*

Nuclei and Particles: An Introduction to Nuclear and Subnuclear Physics. 2nd Edition. By EMILIO SEGRÈ (University of California, Berkeley). W. A. Benjamin, Inc., Reading, Mass. 1977. xx + 966 pp. $29.50.

The popular text by Nobel laureate Segrè, has been extensively revised and updated. It is suitable for graduate students and advanced undergraduates with introductory knowledge of nuclear physics and quantum mechanics. Some 20 chapters are organized into three parts: I. Tools; II. The Nucleus; III. Particles. Included is a discussion of the more recent developments in elementary particle theory, such as unitary symmetry and quark models.

Tables of Standard Electrode Potentials. By G. MILAZZO and S. CAROLI (Istituto Superiore di Sanita, Rome). Wiley-Interscience, New York. 1978. xvi + 421 pp. $39.95.

This book is the result of a project sponsored by the IUPAC Electrochemistry Commission. It consists of a compilation of electrochemical data referenced in *Chemical Abstracts*, 1945-1973, plus an addendum covering 1973-1975.

Structure and Collisions of Ions and Atoms (Topics in Current Physics. Volume 5). Edited by I. A. SELLIN (Oak Ridge National Laboratory). Springer-Verlag, Heidelberg. 1978. x + 350 pp. DM 72.00 (~$33.20).

Volume 5 in this series is a collection of eight chapters by ten authors. Theoretical and experimental aspects of atomic and molecular physics as investigated by charged particle accelerators are discussed.

Solution of Differential Equation Models by Polynomial Approximation (International Series in the Physical and Chemical Engineering Sciences). By J. VILLADSEN and M. L. MICHELSEN (Instituttet for Kemiteknik, Denmark). Prentice-Hall, Englewood Clifts, N.J. 1978. $24.95.

This book describes how to set up models and obtain numerical solutions for phenomena described by differential equations. Applications in chemical engineering are given.

BOOKS RECEIVED

Anglo-American and German Abbreviations in Science and Technology. Volume 2. By PETER WENNICH. Bowker, New York. 1977. pp 841-1448. $29.95.

Volume 2 of a three-volume dictionary containing some 150,000 abbreviations used in science and technology.

Treatise on Analytical Chemistry. Part. I. Volume 12. Edited by I. M. KOLTHOFF (University of Minnesota) and P. J. ELVING (University of Michigan). John Wiley, New York. 1976. xviii + pp 7235-7428. $22.50.

Cumulative index to Volumes 1-11.

Laboratory Manual of Physical Chemistry. Second Edition. By H. D. CROCKFORD, J. W. NOWELL, H. W. BAIRD, and F. W. GETZEN. John Wiley, New York. 1976. vi + 352 pp. $9.95.

Basic Chemical Thermodynamics. Second Edition. Oxford Chemistry Series. No. 28. By E. BRIAN SMITH (Oxford University). Oxford University Press, New York. 1977. xii + 130 pp. $11.50 cloth; $4.95 paper.

Annual Review of Physical Chemistry. Volume 28. Edited by B. S. RABINOVITCH (University of Washington), J. M. SCHURR (University of Washington), and H. L. STRAUSS (University of California, Berkeley). Annual Reviews Inc., Palo Alto, Calif. 1977. ix + 570 pp. $17.00.

Includes an autobiographical essay for Henry Eyring, who edited this Annual Review for 20 years.

Modern Three-Hadron Physics (Topics in Current Physics. Volume 2). Edited by A. W. THOMAS (University of British Columbia). Springer-Verlag, Berlin. 1977. x + 250 pp. $30.40.

Six chapters, by seven contributors, on aspects of three-body scattering theory.

Organic Chemistry. Second Edition. By N. L. ALLINGER (University of Georgia), M. P. CAVA (University of Pennsylvania), D. C. DEJONGH (University of Montreal), C. R. JOHNSON, N. A. LEBEL, and C. L. STEVENS (Wayne State University. Worth Publishers, Inc., New York. 1976. xxi + 1024 pp. $19.95.

Weak Interactions (Graduate Student Series in Physics). By DAVID BAILIN (University of Sussex). Crane, Russak & Co., New York. 1977. ix + 406 pp. $18.95.

A quite lucid account of the theory of weak interactions intermediate in level between textbooks such as Bjorken and Drell and the current research literature.

Modular Representations of Finite Groups (Pure and Applied Mathematics Series). By B. M. PUTTASWAMAIAH and J. D. DIXON (Carleton University, Ottawa). Academic Press, New York. 1977. xv + 242 pp. $23.50.

INTRODUCTORY TEXTS RECEIVED

Foundations of College Chemistry. Second Edition. By D. B. MURPHY (City University of New York) and V. ROUSSEAU (Iona College). Ronald Press, New York. 1975. xiii + 747 pp. $14.95.

Frantz/Malm's Chemical Principles in the Laboratory. Second Edition. By J. L. ROBERTS, JR., and J. B. IFFT (University of Redlands). W. H. Freeman and Co., San Francisco. 1977. xiii + 483 pp. $8.50.

* Unsigned book reviews are by the Book Review Editor.

Essential Mathematics for General Chemistry. By R. L. OSBURN. John Wiley, New York. 1975. ix + 115 pp. $2.95.

Chemistry. Second Edition. By L. W. FINE (Housatonic College). Williams and Wilkins Co., Baltimore. xviii + 763 pp. $16.50.

A Laboratory Manual for Chemistry. By C. G. VLASSIS (Keystone Junior College). Williams and Wilkins Co., Baltimore. viii + 246 pp. $6.95.

Advances in Quantum Chemistry. Volume 10. Edited by PER-OLOV LÖWDIN. Academic Press, New York. 1977. xii + 338 pp. $34.50.

In keeping with the scope and purpose of the series, the six articles in this volume cover application of quantum-mechanical techniques to diverse areas of chemistry, physics, and biology. Emphasis continues to focus on in-depth surveys of well-developed applications rather than "hot" topics of current interest. Contents: P. Coppens and E. D. Stevens, charge densities by X-ray diffraction; P. Kaijser and V. H. Smith, Jr., momentum distributions and Compton profiles; H. Kleinpopper, electron-atom collisions; J. Katriel and R. Pauncz, theoretical interpretation of Hund's rule; B. H. Brandow, linked-cluster perturbation theory; B. Pullman, conformation of pharmacological molecules.

The Chemistry of Cyanates and Their Thio Derivatives. Parts 1 and 2. Edited by S. PATAI. Wiley-Interscience, New York. 1978. xiv + 1319 pp. $166.00.

The familiar and valuable series "The Chemistry of Functional Groups" nears completion with the appearance of these two volumes, which include isocyanates, isothiocyanates, cyanates, and thiocyanates. There are 22 chapters, contributed by a very international group of experts. Structure, stereochemistry, spectra, and thermochemistry make up about one-fourth of the set; with respect to these subjects, the four functional groups are treated in an integrated manner, as is also done in a chapter on detection and determination. The chapters on chemical reactions, syntheses, and uses make up the bulk of the set. There is also a chapter on selenocyanates, and one on biological formation and reactions of cyanates.

The editor notes in the Foreword that for the first time, all of the planned chapters materialized, unlike the case with the previous volumes. He does not say how he obtained such exemplary performance from the contributors this time—many would like to know his newly discovered secret! It is commendable to see the statement about the date when the coverage of the literature terminated (roughly up to the spring of 1975). Combined indexes for the two parts appear at the end of Part 2.

Neutron Activation Tables. Topical Presentations in Nuclear Chemistry. Volume 6. By GERHARD ERDTMAN. Verlag Chemie, New York. 1976. 146 pp. $34.70.

This book is a critical compilation of reaction cross sections for thermal, epithermal, and fast reactor neutrons, as well as 14.5-MeV neutrons. Nearly all stable and unstable natural elements are included in the tabulation.

Organic Reaction Mechanisms—1976. Edited by A. R. BUTLER and M. J. PERKINS. Wiley/Interscience, New York. 1977. 687 pp. $76.00.

This, the 12th volume, is the combined work of 14 contributors, who have surveyed the literature in journals dated December 1975 to November 1976. The editors announce that they are now retiring from the responsibility which they have discharged so well for four years. New editors have been selected, however, and the series will be carried on.

The familiar pattern of previous volumes is retained in this one, in which are to be found reviews that are selective yet thorough, and which strike a useful balance between comprehensiveness and critical presentation. Such a review as this has become essential to most chemists who wish to be kept abreast of developments in knowledge of reaction mechanisms in their own special fields, and provides excellent insurance against having overlooked important papers. An author index and an extensive subject index make it easy to locate specific contributions, for those who do not have the time to browse (a rewarding activity for nearly any organic chemist).

Organic Syntheses. Volume 57. Edited by C. R. JOHNSON. John Wiley & Sons, New York. 1977. xii + 135 pp. $12.95.

This standard work, which has appeared faithfully since 1921, continues to fulfill its role of providing chemists with carefully checked preparative procedures. Current trends are reflected in the presence of seven procedures for small-ring compounds, procedures using organosulfur reagents, organotellurium reagents, and many other interesting and valuable preparations. It is good to see a replacement for the potentially hazardous blocking reagent, *tert*-butyl azidoformate; di-*tert*-butyl dicarbonate is said to perform the same function.

A note on nomenclature alerts the reader to the use of both common and systematic names for compounds, at the Editor's discretion. Unfortunately, the systematic nomenclature chosen is not IUPAC, but is *Chemical Abstracts* indexing code names; although these are in many cases the same as IUPAC names, in other instances they are not. They are not designed for ordinary communication, written or oral, but are intended to facilitate computer handling of index information.

This volume closes, as usual, with a selection of procedures recently submitted but not yet checked.

Quinolines. Part I. Edited by GURNOS JONES. Wiley/Interscience, New York. 1977. ix + 898 pp. $100.00.

This addition to the series "The Chemistry of Heterocyclic Compounds" consists of three chapters: The Physical and Chemical Properties of Quinoline, Synthesis of the Quinoline Ring System, and Haloquinolines. They deal with their subjects comprehensively, up to early 1976. The task of the two contributors (one is the editor) was truly enormous, and the wealth of information, tabular and otherwise, is staggering. An author index and a gratifyingly detailed subject index make use of this important work reasonably easy.

Rodd's Chemistry of Carbon Compounds. Second Edition. Volume III: Aromatic Compounds. Part G. Edited by S. COFFEY. Elsevier Scientific Publishing Co., Amsterdam and New York. 1977. xviii + 342 pp. $69.75.

Most of this volume is concerned with condensed and fused-ring aromatic compounds, but one chapter (by M. Sainsbury) covers monocarboxylic acids of arenes, including arylakanoic acids and those substituted with other functional groups. It is good to see that this volume is abreast of the times by presenting tables of both proton and ^{13}C NMR shifts.

The chapter on aromatic compounds with two fused carbocyclic ring systems (by H. G. Heller) is devoted principally to benzocyclopropene, benzocyclobutene, and indene compounds and includes their various functional derivatives. The largest chapter (by N. Campbell) covers not only naphthalene and its many derivatives, but also phenalenes, azulenes, benzocycloheptatrienes, and benzocyclooctatetraenes. There is a very substantial index for this individual volume.

STRUCTURE REPORTS

Structure Reports for 1974. Volume 40B. Parts 1 and 2. Organic Compounds. General Editor, J. TROTTER; Section Editor, G. FERGUSON. Published for International Union of Crystallography by Bohn, Scheltema and Holkema, Utrecht. Part 1, 1976; Part 2, 1977. viii + 1227 pp. $113.50 (standing order).

Structure Reports for 1975. Volume 41A. Metals and Inorganic Compounds. Section Editors L. D. CALVERT and J. TROTTER. 1977. viii + 477 pp. $53.00.

Strukturbericht. Cumulative Index for Volumes 1–7 (1913–1939). 1976. vi + 91 pp. $17.00.

Structure Reports, 60-Year Structure Index (1913–1973). A. Metals and Inorganic Compounds. 1976. ix + 229 pp. $26.35.

Structure Reports, 60-Year Index, Supplement for 1974–1975. A. Metals and Inorganic Compounds. 1976. 47 pp.

Structure Reports, 60-Year Structure Index (1913–1973). B. Organic and Organometallic Compounds. 1976. x + 437 pp. $62.00.

Photochemistry of Heterocyclic Compounds. Edited by OLE BUCHARDT (University of Copenhagen). John Wiley & Sons, New York. 1976. viii + 622 pp. $49.50.

This book is one of a new series entitled, "General Heterocyclic Chemistry", which deals with those aspects of heterocyclic chemistry which cut across the specific classes of heterocyclic compounds treated

in the earlier series, "The Chemistry of Heterocyclic Compounds", published by Wiley.

The photochemistry of heterocyclic compounds is presented in nine chapters: Ultraviolet Spectroscopy and Excited States of Heterocyclic Molecules, by I. G. Ross; Photochemistry of Three- and Four-Membered Heterocyclic Rings, by G. W. Griffin and A. Padwa; Photoisomerization of Five-Membered Heterocyclic Compounds and Photoisomerization of Six-Membered Heterocyclic Compounds, by Alain Lablache-Combier; Photochemistry of Seven-Membered and Higher Heterocyclic Systems, by V. Snieckus and D. J. Harris; Photochemically Induced Fragmentation Reactions of Heterocyclic Compounds, by Richard M. Kellogg; Photooxidation of Heterocyclic Compounds, by Teruo Matsuura and Isao Saito; Photoreduction and Photoaddition Reactions of Heterocyclic Compounds, by D. G. Whitten; and Industrial Aspects of Heterocyclic Photochemistry, by David R. Julian.

The various chapters are somewhat unevenly written and proofread. They range from ones in which some attempt is made to bring critical order into the mass of facts collected, such as the chapters by Griffin and Padwa, Kellogg, and Whitten, to the two chapters by Lablache-Combier, which seem to be simple compilations of the large number of reactions which fall within the subject headings. These two chapters are especially disappointing because the late literature (1974, 1975) is tacked on to the end as a totally unintegrated Addendum. Names of compounds are used uncritically as they appear in the original literature so that very similar reactions appear to be different when a search of the index is made, and in some cases the name of the compound does not evoke the structure at all. There are also errors in referencing, and the figures are hard to follow because all compounds are not numbered in a systematic way and too many different reactions are lumped together in a single scheme.

The index is very brief for a volume of this kind, but detailed outlines for each chapter are some help in locating material. In general, the literature covered extends to 1974 with a few references in 1975. Overall the book constitutes a review that would enable someone not familiar with the tremendous variety of photochemical reactions to find his way into this fertile and interesting field of research.

Seyhan N. Eğe, *University of Michigan*

Magnetic Properties of Transition Metal Compounds. By RICHARD L. CARLIN (University of Illinois, Chicago Circle) and A. J. VAN DUYNEVELDT (University of Leiden). Springer-Verlag, New York. 1977. xv + 264 pp. $18.80.

This is a book on magnetochemistry. However, except in the first chapter, its coverage is beyond the customary topics such as the relationship between the stereochemistry and the magnetic susceptibility of a metal ion in a complex. Indeed, it may be more appropriate to say that this is a book on magnetophysics, as much of the work described is currently done by physicists.

The chapter titles give a general idea of this book's coverage—paramagnetism: the Curie law; thermodynamics and relaxation; paramagnetism: zero-field splittings; dimers and clusters; long-range order; short-range order; special topics: spin-flop, metamagnetism, ferrimagnetism, and canting; selected examples.

The emphasis of the book is on the magnetic measurements on single crystals carried out at low temperatures, i.e., between the temperatures of liquid nitrogen and liquid helium. Practically all the systems described are the complexes of the first transition series ions; the description on lanthanides covers less than two pages.

The book was produced by photocopying the typed manuscript. It cites some 370 references, including a few published in 1977.

There are rather abbreviated subject index and a useful formula index. However, an author index, which is often convenient for a monograph of this type, is lacking.

Wai-Kee Li, *The Chinese University of Hong Kong*

Statistical Mechanics. Part A: Equilibrium Techniques (Modern Theoretical Chemistry. Volume 5). Edited by BRUCE J. BERNE (Columbia University). Plenum Press, New York. 1977. xv + 242 pp. $39.50.

This book comprehensively describes the statistical mechanical techniques currently being used in theoretical studies of the equilibrium properties of fluids. The various topics are clearly treated, with some illustrative applications and enough discussion of details to permit the reader to consult and utilize the original literature in the area.

The chapters and authors are "Cluster Methods in Equilibrium Statistical Mechanics" (Hans C. Andersen), "Fluids with Long-Range Forces: Toward a Simple Analytical Theory" (G. Stell), "Electrolyte Solutions at Equilibrium" (Harold L. Friedman and William D. T. Dale), "A Guide to Monte Carlo for Statistical Mechanics: 1. Highways" (J. P. Valleau and S. G. Whittington), "A Guide to Monte Carlo for Statistical Mechanics: 2. Byways" (J. P. Valleau and G. M. Torrie), and "Nucleation Theory" (J. J. Burton).

This is a rather specialized book, but one which will be indispensable to any theoretical chemist or physicist interested in the equilibrium properties of fluids.

J. E. Mark, *University of Cincinnati*

Statistical Mechanics. Part B: Time-Dependent Processes (Modern Theoretical Chemistry. Volume 6). Edited by BRUCE J. BERNE (Columbia University). Plenum Press, New York. 1977. xv + 362 pp. $39.50.

This second part of a two-volume series on statistical mechanics deals with time-dependent processes and contains seven chapters written by people who are truly active and major contributors to the area. The first two chapters, by Erpenbeck and Wood and by Kushick and Berne, deal with molecular dynamics techniques and constitute a very thorough and readable discussion of these techniques applied to both hard-sphere and continuous systems. The third chapter, by Dorfman and van Beijeren, is one of the highlights of the volume. It is a 115-page chapter on the kinetic theory of gases, dealing with the Boltzmann equation on up through its density corrections and generalizations. It not only discusses the theoretical background and subtleties involved in this subject but, in addition, has a number of reductions and comparisons to the experimental data. This chapter may well become what one may call a classic review article. Chapter 4, by Mazenko and Yip, discusses the renormalization kinetic theory of dense fluids. This technique, developed by Mazenko himself, offers a powerful and even practical approach to the kinetic theory of dense fluids. To this reviewer's knowledge, there is no other review of this nature discussing this material and is another major contribution of this volume. Chapter 5 is a brief introduction to the projection operator techniques and is included since there are other chapters in this volume requiring a certain background in the use of this technique. The next chapter, "Principles of Mode-Mode Coupling Theory" by Keyes, is a very thorough and detailed discussion of this method. This is a fairly advanced treatment, and the level of this chapter is considerably above the others in the volume. Lastly, Chapter 7, by Glass, discusses the global analysis of nonlinear chemical kinetics.

Donald A. McQuarrie, *Indiana University*

Molecular Energy Transfer. Edited by R. D. LEVINE (Hebrew University of Jersusalem) and J. JORTNER (Tel-Aviv University). John Wiley & Sons, New York. 1976. viii + 310 pp. $35.00.

This book is a compilation of 13 papers presented at a conference held in December 1973 in Ein Bokek, Israel, with a brief introduction by the editors. The papers were updated in 1974. The editors aptly describe the papers as concerned with the "acquisition, transfer, and disposal of energy from a microscopic point of view". The style and length of the papers vary. Among the longer (29–40 pp) presentations are a discussion by J. P. Toennies of rotationally and vibrationally inelastic atom–diatom collisions, especially $Li^+ + H_2$, an excellent review by I. W. M. Smith of vibrational energy transfer processes important in molecular lasers, especially vibration–vibration energy transfer in diatom–diatom collisions, and M. J. Berry's detailed survey of chemical laser techniques and their use in determining product energy distributions. These reports are well suited for someone with a background in gas-phase physical chemistry. The authors carefully define their terminology and provide examples to illustrate their discussions of experimental and theoretical work. Of comparable length are a review by B. Raz, O. Chesnovsky, and J. Jortner of decay processes in condensed rare gases and a discussion by J. Jortner and S. Mukamel of the theory of molecular radiationless processes. The remaining articles are shorter (9–22 pp) and consequently more restricted in focus. Most of these latter papers are directed toward an audience familiar with the literature. One interesting exception is the clear account by R. Bersohn of the reactions of excited alkali atoms and electronically excited CN radicals. Also included among the special topics are the use of transport processes to study collisions of rotating molecules, fluorescence and double resonance techniques to

probe electronic, vibrational, and rotational energy transfer, theoretical models of the time evolution of polyatomic systems coupled to the electromagnetic field, radiationless relaxation of diatomic and triatomic systems, picosecond relaxation processes, and energy transfer in organic crystals. The articles are well illustrated and supplied with ample and useful sets of references. The volume is cheaply bound and likely to fall apart easily.

Nancy Ann Mullaney, Donald G. Truhlar, *University of Minnesota*

Encyclopedia of Electrochemistry of the Elements. Edited by ALLEN J. BARD (University of Texas). **Volume X: Fused Salt Systems.** By JAMES A. PLAMBECK (University of Alberta). Marcel Dekker, Inc. New York. 1976. xxi + 440 pp. $75.00.

This volume is a special edition of the Encyclopedia series. It consists of an introductory chapter on the solvent nature of fused salts with the rest of the volume devoted to a description of the physicochemical behavior of groups of elements in 15 binary and ternary systems. The physical characteristics of these fused salts are presented in tabular form in the introductory chapter. They are described in terms of their chemical composition, mean molecular weight, temperature of standardization, melting point and density, electrical conductivity, and surface tension at the standard temperature. The definitions of standard states and acid-base concepts for fused salts also are discussed in chapter one.

Each fused salt is reviewed in a separate chapter, except for two closely related systems which are covered in a single chapter. The elements are divided into groups which consist of oxygen, hydrogen, the inert gases through to scandium, yttrium, and the lanthanides, then the actinides, the alkaline earths, and the alkali metals. A general description of the fused salt is presented before the behavior of the individual element groups is discussed. The general description includes melt preparation, prevention of melt contamination, melt properties, and appropriate reference electrodes. A table of standard electrode potentials and an extensive bibliography are given at the end of each chapter.

The 15 fused salt systems covered in this text are as follows: lithium chloride-potassium chloride, sodium chloride-potassium chloride, magnesium chloride-potassium chloride, magnesium chloride-sodium chloride-potassium chloride, lithium sulfate-potassium sulfate, lithium nitrate-potassium nitrate, sodium nitrate-potassium nitrate, aluminum chloride-sodium chloride, aluminum chloride-sodium chloride-potassium chloride, sodium hydroxide-potassium hydroxide, sodium thiocyanate-potassium thiocyanate, lithium acetate-sodium acetate-potassium acetate, lithium fluoride-sodium fluoride-potassium fluoride, sodium metaphosphate-potassium metaphosphate, and lithium carbonate-sodium carbonate.

The author has succeeded in compiling a comprehensive collection of facts and figures on the electrochemical behavior of the elements in 15 fused salt systems. This information along with the extensive bibliographies will make this volume a valuable reference source for those engaged in fused salt research, especially in the areas of high-temperature battery research and thermal energy storage.

R. A. Rizzo, *Globe-Union, Inc.*

Atomic Absorption Spectroscopy. By BERNARD WELZ. Verlag Chemie, New York. 1976. vii + 267 pp. $30.30.

With the ever increasing use of atomic absorption spectroscopy in a wide variety of disciplines and various sample types, it has become increasingly important to understand the fundamental principles and techniques upon which current methodology is based. The concise yet comprehensive manner in which this book is written provides not only an understanding of current methodology, but also gives the reader perspective into its evolution.

The book was originally published in German in 1972 and translated to English with the writing of the second edition (1975). This allowed addition of many recent advances in instrumentation, including flameless atomization. Other pertinent instrumentation sections include atomization in flames, light sources, optics, and electronics and readout. These sections also give the reader perspective in the development of these techniques.

On the practical side, the more important topics of discussion are interferences and analytical procedure. The interference section includes a discussion of background absorption and considers in-depth nonresonant line and deuterium source background methods. No discussion of the Zeeman effect for background correction is given. Many workers will be interested in the section devoted to the analysis of 59 individual elements.

The final section in the text deals with the analysis of specific samples and should serve as a useful guide to the analyst.

One of the strongest features of this book is the section containing 1388 references spanning the entire development of atomic absorption spectrometry from its early beginnings to the present state-of-the-art instrumentation and techniques.

Some brief comparisons with other atomic spectroscopic techniques would have been useful. However, this is a minor concern and the book can be recommended without reservation to all interested in atomic absorption spectrometry, regardless of their background. Indeed it could readily be utilized as a text in this area.

Wayne B. Robbins, Joseph A. Caruso, *University of Cincinnati*