

## Book Reviews\*

**Critical Evaluation of Chemical and Physical Structural Information.** Edited by DAVID R. LIDE, JR., and MARTIN A. PAUL. National Academy of Sciences, Washington, D.C., 1974. xii + 628 pp. \$26.25.

This softbound volume contains the papers presented at a conference held at Dartmouth College in June, 1973. The conference was conceived by the Committee on Chemical Crystallography of The National Research Council in consideration of "the difficulty experienced by a practitioner of one experimental technique in comparing his own results with those obtained by other methods." The scope included the geometrical arrangement of atoms in a molecule or crystal, the description of the forces between these atoms, and molecular parameters related to electronic charge distribution. The papers were arranged in eight related groups, with a discussion, the text of which is included, after each group. The papers themselves are of an explanatory review nature and provide valuable orientation for the nonspecialist in understanding the structural data he encounters that do not always seem consistent. The papers are typeset and include figures, tables, and references. The value of the book is increased by the inclusion of a subject index.

**The Chemistry of the Carbon-Halogen Bond. Part 1.** Edited by SAUL PATAI (The Hebrew University). John Wiley & Sons, New York, N.Y. 1974. xii + 607 pp. \$32.50.

The editor discloses sadly that five of the planned twenty-two chapters for this volume of "The Chemistry of Functional Groups" did not materialize, but nevertheless, that part that has now appeared will be welcomed with the enthusiasm that has been accorded previous volumes. In Part 1 of this volume are eight chapters. The first four cover general and theoretical aspects, structural chemistry, analysis, and mass spectrometry. The second four start the general area of reactions, and cover complex formation, directing and activating/deactivating effects, and substitution by homolytic and heterolytic processes. Part 2, which is not available yet, will have the remaining nine chapters and the index.

The editor announces that supplementary volumes are now planned for the series, in order to fill the gaps left in former volumes for which expected chapters were not delivered in time, as well as to treat important new material. Comparative chapters devoted to the similarities and differences of related functional groups are also planned.

**Advances in Carbohydrate Chemistry and Biochemistry. Volume 29.** Academic Press, New York, N.Y. 1974. xi + 475 pp. \$36.50.

Physical methods, especially nmr spectroscopy, are covered in this 29th volume by L. Hall in his chapter entitled "Solutions to the Hidden-Resonance Problem." This includes techniques used by the chemist to extract useful information from complex resonance lines often obtained in nmr studies. Chemical methods include solvent shifts, functional derivatization, specific deuteration, and paramagnetic shift reagents while physical methods include the use of high-field magnets, spin decoupling, internuclear double-resonance, and partially relaxed Fourier-transform spectra. These are discussed with the view in mind of eventually studying biologically complex molecules in aqueous media.

The use of mass spectrometry in structural analysis of natural carbohydrates is the topic of a chapter by J. Lönngren and S. Svensson. This technique in combination with gas chromatography has greatly increased the scope of the methylation linkage-analysis, and this well-written chapter includes the chemical derivatives used most frequently in mono- and oligosaccharide studies.

A chapter on the electrochemistry of carbohydrates (M. Fedorňko) brings into perspective the preparative aspects of electrode oxidation and reduction techniques. Analytical aspects of polarographic redox reactions are adequately covered. The formose reaction, or the self-condensation of formaldehyde in alkaline solution,

is covered by T. Mizuno and A. Weiss. Although far from being understood, it offers a potential application for food synthesis providing, of course, feasible separation methods can be found for this complex reaction.

The  $\beta$ -eliminative degradation of carbohydrates which occurs with uronic acid residues is covered by J. Kiss. This valuable technique is used for structural analysis of the pectins, heteropolysaccharides, and cell wall conjugates. A chapter by J. Kennedy on chemically reactive derivatives of polysaccharides is very complete and of great interest to immunochemists and biochemists involved in affinity chromatography and immobilized enzymes.

An obituary article by L. Goodman describes the career of the late B. R. Baker and his influence on carbohydrate chemistry.

This book meets the usual high standards of technical and literary excellence which characterizes this series.

Theodore H. Haskell, *Parke, Davis and Co.*

**Diatomic Interaction Potential Theory. Volume I: Fundamentals; Volume II: Applications.** By J. GOODISMAN (Syracuse University). Academic Press, New York, N.Y. 1973. Vol. I: xiii + 299 pp. \$24. Vol. II: xiii + 410 pp. \$34.00.

In every area of research, after a critical mass of literature has been generated, the need for compilation becomes evident. So it has been with the calculation of interatomic potential curves. A great deal of activity has occurred since the monumental review work, known to many students as the "Green Monster" (Hirschfelder, Curtiss, and Bird, "Molecular Theory of Gases and Liquids," 1249 pp), was updated in 1964. Dr. Goodisman has done an excellent job of summarizing the more significant achievements in the vast literature on the subject. To accomplish this task he has limited the treatment to ground state diatomic systems, a lamentable restriction, but no doubt necessary to avoid creating a "monster" of his own.

Volume I opens with a section on the separation of nuclear and electronic motions and is followed by a qualitative discussion of the various internuclear distance regimes. A section on the methods of measurement of interatomic potentials is included but is much too brief to serve as more than an introduction to the literature. The remaining two-thirds of this volume consists of a presentation of the principal theoretical techniques available for calculation of the interatomic potential (Variation Methods, Perturbation Theory, Virial Theorem, Hellmann-Feynman Theorem, Local Energy Methods and Statistical Models. In particular, the Thomas-Fermi and Thomas-Fermi-Dirac theories).

Volume II is a presentation of calculations utilizing the methods discussed in Volume I. Numerical results are frequently cited, but locating these results through the subject index can be frustrating. For example, the subject heading virial constants does not appear, yet there are sixteen page numbers cited under the subject virial theorem. Of these, three refer to numerical results in tabular form.

I highly recommend this two volume set to workers active in the calculation of interatomic potentials. Volume I alone should be useful as a text for students in quantum chemistry.

John W. Sheldon, *Florida International University*

**Spectrometric Identification of Organic Compounds. Third Edition.** By R. M. SILVERSTEIN (SUNY), G. C. BASSLER (Hills Bros. Coffee, Inc.), and T. C. MORRILL (Rochester Institute of Technology). John Wiley & Sons, New York, N.Y. 1974. 340 pp. \$13.95.

The latest edition of this well-accepted book is somewhat expanded to encompass recent developments of importance, such as nmr shift reagents, but it continues to be primarily an introduction to the subject and assumes no prior knowledge of spectrometry. It is nevertheless a valuable reference for the practicing chemist, owing to the extensive tables and charts of data commonly needed. This feature of the book has, in fact, been expanded, particularly in the nmr area, and in addition, ir and nmr spectra of many common solvents and impurities are now shown. The large format of the earlier editions is retained; it has the advantage of allowing spectra to be reproduced in a more useful size. A change in the

\* Unsigned book reviews are by the Book Review Editor.

problem sets at the end has been made by moving the problems with unidentified answers to an Instructor's Supplement, which also contains interpretations, and which will be supplied only to instructors. This edition should maintain the popularity of the earlier ones as both a teaching text and a succinct handbook.

**Annual Review of Materials Science. Volume 4.** Edited by R. A. HUGGINS, R. H. BUBE, and R. W. ROBERTS. Annual Reviews, Inc., Palo Alto, Calif. 1974. 461 pp. \$12.00.

A hard-bound, typeset reference book such as this, at less than three cents per page, is a rarity today. It is a series of detailed essays with many figures and substantial bibliographies. Among the subjects of particular interest to chemists are "Application of NQR to Solids" (R. W. Vaughan), "Dielectric Properties of Crystals of Order-Disorder Type" (P. da R. Andrade and S. P. S. Porto), "Fire-retardant Polymers" (G. L. Nelson, P. L. Kinson, and C. B. Quinn), etc. Very good author and subject indexes complete the volume.

**Carbon and the Biosphere. Conference 720510.** Edited by G. M. WOODWELL and E. V. PECAN. National Technical Information Service, Springfield, Va. 1974. vii + 392 pp. \$10.60.

This volume is the Proceedings of the 24th Brookhaven Symposium in Biology, (AEC Symposium Series 30), held in 1972. It consists of nineteen papers and a closing summary, plus an appendix summarizing the "World Carbon Cycle and Recommendations for Critical Research," and an index. The subject matter should be of as much concern to chemists as to biologists.

**Mass Spectrometry and NMR Spectroscopy in Pesticide Chemistry.** Edited by R. HAQUE and F. J. BIROS. Plenum Press, New York, N.Y. 1974. xi + 348 pp. \$19.50.

This volume is a compendium of the papers presented at a symposium held at the 165th National Meeting of the American Chemical Society in April 1973, photoreproduced from typescript. Ten of the papers were concerned with mass spectrometry, ten with nmr, one with spin-labeling, and one with infrared emission. The papers are accounts of original research, with some experimental detail, but it is not stated if they will be or have been published in journals as well. There is an unusually good subject index for a book of this type.

**Organic Reaction Mechanisms—1972.** Edited by B. CAPON and C. W. REES. Wiley/Interscience, New York, N.Y. 1974. x + 677 pp. \$47.50.

This eighth volume of the continuing series covers the literature dated December, 1971, through November, 1972. Over 5000 references are reported, and the ones judged the more-significant are concisely discussed. The organization is that familiar from previous volumes, with subdivisions for significant classes of intermediates (e.g., carbonium ions, carbenes, etc.), types of reaction (e.g., elimination, oxidation, etc.), reactions of certain functional groups (aldehydes and ketones; acids), and photochemistry. The expertise of the contributors, who have treated their subjects from a restrained critical viewpoint, is evident. An author index for 1970–1972 helps to make this book a most valuable tool for the chemist interested in mechanisms.

The editors, who have done great service to organic chemists with this series, to which they have contributed chapters as well as editorial functions, announce that this volume is their last, and that the editing of the next volume has been turned over to a new team, M. J. Perkins and A. R. Butler.

**The Particle Atlas. Edition Two.** By WALTER C. MCCRONE and JOHN G. DELLY. Ann Arbor Science Publishers Inc., Ann Arbor, Mich. 1973. In four volumes, 1138 pp. \$240.00.

This is a work for the scientist engaged in the applied investigation of pollution as well as forensics, and it surely would have been appreciated by Sir Arthur Conan Doyle. It is a treatise and guide for the identification of small particles in minute amounts, organic or inorganic, pure substances, or complex mixtures. It is designed to answer the two questions: "What is the identity of an unknown particle?" and "Does the sample contain particles of a specific composition?" It deals with "the theory, instrumentation, and applications for the most effective ultramicroanalytical tools," and purports to tell the chemical analyst "when and if he should use

one," as well as to help the research manager to decide if he should buy one. The subject of the Atlas is chemical microscopy, refined and brought up to date, and integrated with myriad modern instrumental aids. Both light and electron microscopy are treated. Volume I is devoted to instrumentation, Volumes II and III are devoted respectively to optical and electron-scanning microscopy and consist largely of photographic illustrations, and Volume IV is all tables and charts. The volumes are beautifully produced, and the illustrations of particles exactly as they appear under the microscope are impressive. A large number are in color.

**Progress in Molecular and Subcellular Biology. Volume 3.** Edited by F. F. HAHN. Springer-Verlag, New York, N.Y. 1973. vii + 251 pp. \$25.50.

The six review chapters in this volume contain much that is of interest to biochemists. The subjects are: Reverse Transcription and Central Dogma (Hahn); The Isolation of Genes (Fournier, Brenner, and Doctor); Mechanism of Protein Synthesis (Kaji); Structural Features of Immunoglobulin Light Chains (Edmundson, Schiffer, Ely, and Wood); The Thalassemia Syndromes: Genetically Determined Disorders of the Regulation of Protein Synthesis in Eukaryotic Cells (Braverman); and the Mitochondrial DNA of Malignant Cells (Paoletti and Riou).

**Synthetic Methods. Volume 28.** Edited by W. THEILHEIMER. S. Karger AG, Basel, 1974. U. S. distributor: Albert J. Phiebig Inc., P.O. Box 352, White Plains, N.Y. 10602. xx + 652 pp. \$178.75.

Synthetic organic chemists show no signs of tiring, nor does W. Theilheimer, and the regular arrival of this important literature resource is a testimony to the industry of both. Its price, at 27¢ per page, is a testimony to the pervasiveness of inflation, and reflects in part the exceptional rise in the cost of paper and of printing in the last year.

This volume covers the literature "published between 1971 and 1973," and summarizes the principal contributions in the highly organized manner familiar from the earlier volumes. If one does not wish to take the rather small amount of trouble to become acquainted with the system, there is a magnificently complete index, which is cumulative for Volumes 26, 27, and 28. The information in the "Theilheimer" is thus eminently retrievable. It also constitutes a tool by which to maintain current awareness, and the abundance of equations with clear structural formulas encourages browsing.

**Thin Liquid Films and Boundary Layers.** Edited by F. C. TOMPKINS. Academic Press, London and New York. 1971. 269 pp. \$16.00.

This book is No. 1 of the Faraday Society Special Discussions, and contains the papers presented at the University of Cambridge in 1970, together with the general discussions following related groups of papers. The papers are presented in standard journal format, and in general are accounts of original research. There is a list of contributors, but no index.

**Gas Chromatographic Detectors.** By D. J. DAVID (Monsanto Research Corp.). Wiley-Interscience, New York, N.Y. 1974. xii + 295 pp. \$17.95.

This is the first book in English which aims to summarize the information on the various detectors used in gas chromatography. The subject is very important; after all, since gas chromatography is the most widely used analytical technique, a thorough discussion on the theory and the optimum practical use of the wide variety of detectors is of great help to the chromatographers.

After a short introduction dealing with historical background, detector classification, and the definition of terms, separate chapters deal with the thermal conductivity, flame ionization, electron capture, thermionic, ultrasonic, and helium ionization detectors. This is followed by a chapter combining the electrolytic detectors and another one dealing with the detectors of minor importance. Fold-out sheets giving a fault diagnosis chart for the flame ionization detector and GC nomenclature complement the book.

As mentioned, this text is the first book in English dealing only with detectors; however, it is not the first compilation on this subject: in 1967, an almost 100-page-long chapter by Gudzinowicz [B. J. Gudzinowicz, "Detectors," in "The Practice of Gas Chromatography," L. S. Ettre and A. Zlatkis, Ed., Interscience Publishers,

New York, N.Y., 1967, pp 239–332] was included in a monograph on the practice of gas chromatography, and in 1972, a book in German was published on gas chromatographic detectors (D. Jentsch and E. Otte, "Detektoren in der Gas-Chromatographie," Akademische Verlagsgesellschaft, Frankfurt am Main, 1970, xvi + 454 pp). It is difficult to comprehend the complete omission of any reference to these texts. Similarly, the author states that "ancillary devices" used as detectors—*e.g.*, IR, MS—will not be discussed, but then he fails to give any reference to available texts dealing with this subject. This omission is even more difficult to understand since 18 general references to gas chromatography are given including books in German, a Ph.D. thesis on steroid analysis, and a reprint on amino acid analysis by gas chromatography.

Another problem with the usefulness of the text is the peculiar nature of certain references. For example, in the introduction, the first four volumes of the *Advances in Chromatography* series (edited by J. C. Giddings and R. A. Keller) are given within the general literature, although by the end of 1972—the preface is dated January 1973—nine volumes of this series had been published. Another example of the peculiar way of citation is the reference to three papers presented at the 1960 Edinburgh meeting dealing with the flame-ionization detector: two (those of Condon, *et al.*, and Desty, *et al.*) are properly cited from the final proceedings, but Ongkiehong's paper is from the *preprint*, although it is also included in the final proceedings. There are other similar cases (*e.g.*, references to papers presented at the 1961 Lansing meeting on pp 74–75) and this laxity makes it very difficult for the reader to check some of the important original references. It seems that the manuscript of the book was written in "piecemeal" over a considerable time period and paragraphs or pages already written were never rechecked. This assumption is corroborated, *e.g.*, by the fact that the classification of detectors as proposed by Halasz is repeated almost verbatim twice, even including the two figures: first in the introduction (p 3 and 6)—where it belongs—and then, in the discussion of the thermal conductivity detector (pp 35–37).

While the discussion of some detectors is very detailed, others, much more important, are handled only briefly. For example, we have 36 pages on the electrochemical detectors but only 33 pages on the flame ionization detector which certainly is much more important. There is no adequate discussion in the FID chapter on the optimization of the flame gases, and the very important question of molar *vs.* equal weight response is barely touched although there is extensive literature on this subject. In the thermionic detector chapter there is no mention on the nitrogen-specific thermionic detector although, *e.g.*, this was used during the 1972 Olympic Games in Munich to test the athletes for illicit drugs; the singular title of this chapter indicates the author's disregard of the fact that there are a number of thermionic detector types.

In summary, the book contains a lot of information but many important questions are missing. It is useful in many respects but it certainly cannot be considered as a critical treatment of the subject.

Finally, a few words about the presentation of the text and the figures. The book is produced directly from the typed manuscript pages and the author's drawings. The typing is very clear; however, somebody should have instructed the author or his secretary to use different type face for the figure captions and the tables. It is often difficult to realize where a caption or footnote to a table end and the text continues. The worst example is page 24, where the figure caption is not even indented. Also, I wish somebody would finally realize that lower case and capital letters in symbols have different meaning and the fact that lettering is done using a Leroy set is not an excuse to mix up these. For example, the symbol for millivolt is mV and not MV; the first symbol represents  $10^{-3}$  V while the latter  $10^6$  V, *i.e.*, a  $10^9$  order of magnitude difference. Similarly, millimeter is mm and not MM and milligram is mg and not MG; also, the unit of flow rate is ml/min and not CC/MIN. Such errors can be found on almost every figure in the book.

L. S. Ettre, *The Perkin-Elmer Corporation*

**Processes for Major Addition-Type Plastics and Their Monomers.** By L. F. ALBRIGHT (Purdue University). McGraw-Hill Book Co., New York, N.Y. 1974. viii + 385 pp. \$17.50.

This book is an interesting review of the high-volume addition-type polymer industry. The main topics of discussion are the methods for the synthesis of monomers and polymerization of polyethyl-

ene, polypropylene, poly(vinyl chloride), polystyrene, and related copolymers. Considerable attention is given to detail of the formation and purification of the monomers from various feedstock sources and discussion of alternate commercial methods to obtain these monomers. Similarly, in the polymerization chapters, various commercial methods for the polymerization of each of the plastics is discussed at length, covering such items as the chemistry of polymerization, methods of polymerization, and details of processing.

An effort has been made to cover most of the available methods of polymerization (slurry, emulsion, suspension, bulk, and vapor phase) for each of the appropriate monomers. In the discussion of the processing details, equipment operation and design, economics of competing methods, and advantages and liabilities of each process are given.

This book is a useful introduction into commercial processes of major plastics for the student as well as a useful reference text for workers in the plastics industry.

George Zakrzewski, *TRW Systems Group*

**Nucleic Acid Biosynthesis (Methods in Molecular Biology, Volume 4).** Edited by ALLEN I. LASKIN (Esso Research and Engineering Co.) and JEROLD A. LAST (Harvard University). Marcel Dekker, Inc., New York, N.Y. 1973. x + 276 pp. \$16.50.

With this volume, "Methods in Molecular Biology" begins to look more complete as a series and more valuable as a laboratory reference. The series endeavors to provide a collection of experimental procedures of particular value to the uninitiated in specific areas of molecular biology and biochemistry. The chapters in this volume appear to fulfill this goal, being lucidly written by prominent workers in each subject area. In some cases, however, authors have fallen short of another goal, that of discussing the rationale, the "whys," of a particular procedure. Rather than giving a critical discussion, some authors were content with providing a procedure that "works." It is characteristic of methodology that one is never told quite enough, however, and one should not criticize too strongly in this vein. All chapters still provide much useful information and some are exceptionally complete.

The editors have emphasized RNA rather than DNA biosynthesis in this volume; a later volume is planned for DNA. The number of currently interesting enzymatic activities whose purification is described in this volume is impressive. Chapters on RNA- and DNA-dependent RNA polymerases, RNA-dependent DNA polymerase, ribonuclease H, and DNA polymerase II are included. Procedures for the isolation of specific RNAs (the series now covers six major types) are also presented along with chapters dealing with methods for *in vitro* protein synthesis, synchronization of mammalian cells in culture, and dissociation of protein and RNA synthesis *in vivo*.

Although initial volumes, by themselves, may have appeared specialized and limited, the series as a whole now appears to be realizing its potential. Such a collection can become instrumental in standardizing and improving methodology in molecular biology in much the same way as "Methods in Enzymology" has done for protein chemistry. Although volumes of "Methods in Molecular Biology" are shorter (and less expensive), they should attract an increasing audience if the editors continue to select topics of current interest. Proposed volumes on subcellular fractionation and immune responses at the cellular level appear to satisfy this requirement nicely.

Glenn M. Nagel, *California State University—Fullerton*

**Combustion Aerodynamics.** By J. M. BEER and N. A. CHIGIER (University of Sheffield, England). Halsted Press (John Wiley and Sons), New York, N.Y. 1972. x + 264 pp. \$24.50.

The flyleaf of this book states "The book will be of help to graduates and undergraduates studying combustion or propulsion. . . ." This reviewer disagrees. The presentations throughout, although appearing very mathematical in nature, are only cursory and empirical. There is much, perhaps useful and practical, information in the book, but there is little explanation of the fundamentals underlying the analyses in jets, flame stabilization, droplet, and spray burning. The best and longest chapter is on "Swirling Flows," one of the major research interests of the authors. Many will find bits of useful information in this book, but it certainly is not a text from which to teach combustion.

Irvin Glassman, *Princeton University*

**Metastable Ions.** By R. G. COOKS, J. H. BEYNON, R. M. CAPRIOLI, and G. R. LESTER (Purdue University). American Elsevier, New York, N.Y. 1973. ix + 296 pp. \$29.50.

"Metastable Ions" is an excellent book which must be read by any scientist with a serious interest in the properties of gaseous ions.

The subjects covered encompass an extremely wide viewpoint, covering details of the measurement of metastable ions and their physical, analytical, and organic chemical properties.

Following two acceptable chapters outlining basic mass spectral instrumentation and ion type, the authors proceed to extensively and clearly show how metastable ions may be brought to focus. Here one finds the detail of the Ion Kinetic Energy Spectroscopy (IKES) and Mass Analyzed IKES (MIKES) techniques. These new methodologies allow the determination of the fragmentation pattern of a single ion to be isolated from all other ions and as well yield energies released on metastable decomposition. The latter data are shown to give extremely detailed structural and mechanistic information on these inaccessible short-lived ions. The authors amply demonstrate this capability with numerous examples including an exemplary analysis of the loss of formaldehyde from substituted anisoles wherein composite metastable ions of the same elemental composition but differing energy release reveal competing pathways. Many organic chemical examples in the text demonstrate the utility of metastable ion analysis for the understanding of isotope effects, for refinement of thermochemical data, and for the determination of energy partitioning on fragmentation.

With this foundation the authors then show the application of these techniques (IKES, MIKES, HV) in various areas of analytical chemistry, including analysis of mixtures and isotope composition. The last chapter, "Approaches to the Structure of Gaseous Ions," is a good general account of this area and places metastable characteristics in context with the manifold other approaches taken. The book has an appendix with a critical discussion of the theory of unimolecular fragmentation and a table on the statistics of scrambling atoms.

This is a well-referenced specialist text which necessitates slow and thoughtful reading. In addition there is a good deal of information which is simply burdensome if one does not plan to work with these ions. Although the cost is outrageous, any researcher in the general area would find it useful to own a copy which perhaps could be rented to interested colleagues seeking some insight on the new acronymical mass spectral procedures.

Mark M. Green, *Michigan State University*  
David Burdick, *University of Michigan*

**Progress in Polymer Science, Japan. Volume 6.** Edited by S. ONOGI (Kyoto University) and K. UNO (University of Tokyo). Halsted Press, John Wiley & Sons, New York, N.Y. (also published in Japan by Kodansha Ltd., Tokyo). 1973. x + 302 pp. \$19.50.

General comments in the review of the first five volumes of this series (*J. Amer. Chem. Soc.*, **97**, in press) apply as well to the present one. Volume 6 has three reviews on polymer synthesis and three on structures and properties of polymers. In each the emphasis is on the research contributions of the author(s) and other Japanese polymer scientists: Synthesis of Condensation Polymers (N. Ogata); Preparation of Polypeptides and Oligopeptides from *N*-Carboxy- $\alpha$ -amino Acid Anhydrides in Acetonitrile (M. Oya, K. Uno, and Y. Iwakura); Cationic Ring-Opening Polymerization of Cyclic Ethers (T. Saegusa and S. Kobayashi); Deformation of Polyethylene Single Crystal Mats and Properties of Drawn Mats (K. Miyasaka and K. Ishikawa); Fluorescence Methods in Polymer Research (Y. Nishijima); Actin in the Organized System of Muscle Proteins (K. Mihashi and Oosawa).

There are cumulative author and subject indexes for the first five volumes.

Daniel T. Longone, *The University of Michigan*

**Understanding Chemistry: From Atoms to Attitudes.** By T. R. DICKSON (Aptos, Calif.). John Wiley & Sons, Inc., New York, N.Y. 1974. xv + 361 pp. \$9.95.

This textbook is written for a beginning or survey course for nonscience or parascience majors. The author acquaints the student with chemistry by offering a chemical view of the environ-

ment in which the student finds himself. The basic concepts of atoms, molecules, bonding, and structure are discussed. These concepts and chemical processes, and the use of chemistry and chemical technology are shown to affect the environment.

The topics chosen to relate the practical significance of these principles are very current and fashionable. These discussions on air pollution, water pollution, nuclear energy, thermal pollution, energy sources, population, and food supplies based on chemical principles provide the student with a good basis for development of values and attitudes concerning these environmental situations. The author clearly challenges the students to become knowledgeable and involved in these issues by including at the end of the appropriate chapters questions designed for students to express their feelings on the topics. These questions are thought provoking, and the solutions depend on the attitudes of the students coupled with the scientific knowledge learned by the students.

There is effective use of photographs, figures, diagrams, graphs, and tables throughout the text. A bibliography at the end of each chapter includes books, articles, and pamphlets.

The author has written a text which is very readable on the part of the student and also allows the instructor a degree of freedom in breadth as well as depth in discussing most of the topics included.

Also available is "Study and Action Guide to Accompany Understanding Chemistry: From Atoms to Attitudes," by T. R. Dickson, John Wiley & Sons, Inc., New York, 1974, vii + 142 pp. \$3.25.

This guide can be used by students to review and reinforce the topics in the textbook. It can also be used by the instructor to make assignments or for group or class discussions. The guide includes a bibliography more extensive than the ones listed in the textbook.

More help for the students is the glossary and innovative methods for student review such as crossword puzzles.

Mamie W. Moy, *University of Houston*

**Introductory Organic Chemistry.** By J. T. GERIG (University of California at Santa Barbara). Academic Press, New York, N.Y. 1974. xvi + 404 pp. \$9.95.

This text is intended for a one-semester or two-quarter introductory organic chemistry course for nonmajors and is designed primarily for students in the health and life sciences and hence has a biological flavor and emphasis.

After an introductory chapter that serves as a review of some elementary chemistry, the next four chapters deal with hydrocarbons including alkanes, cycloalkanes, alkenes, alkynes, and aromatic compounds. Chapter 5 deals with spectroscopy and in particular mass spectrometry and nmr. Chapter 6 treats "compounds derived from water and hydrogen sulfide" and specifically alcohols, phenols, ethers, thiols, and sulfides, whereas Chapter 7 handles "compounds derived from ammonia and heterocyclic molecules," in particular, amines, azo compounds and hydrazines, and various classes of heterocycles. Chapter 8 is a special chapter on reaction mechanisms although aspects of mechanisms, such as electrophilic substitution in Chapter 4 and others, are interspersed in other sections of the text as well. Chapter 9 covers aldehydes and ketones and Chapter 10 carbohydrates with an introductory discussion of optical isomerism. Chapter 11 treats carboxylic acids, esters, amides, acid halides, acid anhydrides, and lipids. Chapter 12 is a continuation of molecular spectroscopy with brief coverage of ir, Raman, uv-visible, ORD and X-ray. Chapters 13 and 14 treat biomolecules and, in particular, amino acids, peptides, proteins, and nucleic acids. The final chapter (15) treats chemical evolution in some detail.

At the end of each chapter (except 15) there are problems of various levels of difficulty. Each chapter also has some suggested readings, unfortunately most of which, in this reviewer's opinion, are too difficult and specialized for beginning organic students. The text is also liberally interspersed with short asides and tidbits on a variety of topics such as octane ratings, chemistry of vision, tobacco smoke, crown ethers, antifertility drugs, coniferin, cholesterol, amino acids and meteorites, hormones, composition of hair, etc.

On the whole the text is well written, with a good balance between a descriptive and mechanistic approach as well as between fundamental and more traditional organic chemistry and biological application. Perhaps the treatment of spectroscopy could have been better; in particular, having two separate chapters far apart

seems awkward and unnecessary, as is the inclusion of such areas as Raman spectroscopy, ORD, and X-Ray crystallography in an introductory text. A single, simple but clear chapter on mass spectrometry, nmr, and ir would, in this reviewer's opinion, have been more in tune with the intended audience of the text. It can, nevertheless, certainly be recommended for use in the intended course and should find wide application in a growing area.

Peter J. Stang, *The University of Utah*

**Nonaqueous Electrolytes Handbook. Volume II.** Edited by G. J. JANZ and R. P. T. TOMPKINS (Rensselaer Polytechnic Institute). Academic Press, New York, N.Y. 1973. xiii + 933 pp. \$60.00.

As in the case of Volume I (*J. Amer. Chem. Soc.*, **95**, 4105 (1973)), this book also contains a large number of potentially valuable tables in seven major sections: Solubilities of Electrolytes, EMF Data, Vapor Pressure, Cryoscopy, Heats of Solution Calorimetry, Polarography, and Ligand Exchange Rates and Electrode Reactions. Three shorter sections (of 10 to 28 pages) contain data on Electrical Double Layer Properties, Nonaqueous Spectroscopy and Structure of Electrolytes, and Organic Electrolyte Battery Systems.

The main part of the first section, on solubilities of electrolytes, appears to contradict the dustcover statement of literature coverage "to 1973." Only one reference is even as late as 1958, and nearly half are 1925 or before; an additional listing of solubility studies without numerical data is as old. (Certainly, one 1864 reference is obsolete!) Other tables are not from old data as is the first, but dustcover statements are redeemed primarily through an addendum of "Additional References and Data Sources" which include some especially useful tables from NASA and contract literature. However, the majority of this addendum is lists of articles rather than tables of data, except for polarography. Polarography is equally featured in the rest of the volume: 200 pages out of 780, a rather lavish use of space, especially since all of these data are readily traceable from the biennial review articles in *Analytical Chemistry*. The sections on polarography contain a large number of nomenclature barbarisms but only occasionally are these crucial. Such obvious errors could have been decreased—and the costs of this good-looking, hand typeset volume cut markedly—if the publisher had used a photographic process for the authors' own, personally proof-read, typewritten tables.

This volume is useful; there are many helpful tables. But it isn't as good as the dustcover or the price led me to believe that it would be. (One hundred references were missing in the section on non-aqueous spectroscopy in the review copy, and perhaps others; they will undoubtedly be supplied by the publisher in all copies sold in the future.)

Frank L. Lambert, *Occidental College*

**Recycling and Disposal of Solid Wastes—Industrial, Agricultural, Domestic.** By T. F. YEN, Editor (University of Southern California, Los Angeles). Ann Arbor Science Publishers, Inc., Ann Arbor, Mich. 1974. viii + 372 pp. \$20.00.

In new and expanding fields, pertinent information is often scattered and difficult to collect. Books which serve to collect and organize the important information into a complete and coherent review of the field are invaluable to the researcher and practitioner alike.

"Recycling and Disposal of Solid Wastes," edited by T. F. Yen, although a useful book, falls short of the unified collection of solid waste management concepts which the title seems to promise. The book consists of a series of papers which had their genesis at the Symposium on Polymers and Ecology, 10th SAS Pacific Meeting and 7th ACS Regional Meeting at Anaheim, Calif. in October 1971. It includes basic articles on biodeterioration and biodisintegration and mechanism of leachate formation in sanitary landfills. Articles on polymer-gas reaction and flocculation of waste particles by ionene polymers appear somewhat out of place. Sections on applied technology cover recycling and disposal of farm, field, animal, and plastic waste, production of liquid and gaseous fuels from organic solid wastes, use of polymers for stabilizing mineral wastes, and protein production from cellulosic wastes. Although the authors have made an attempt to review their field of specialty, often the emphasis has been on their own work. The first chapter on biodeterioration and biodisintegration by the editor sets a high

standard of reporting not consistently followed throughout. On the whole, the articles are timely and offer an interesting and thought-provoking glimpse of some aspects of the state of recycle and disposal today. As such, it will be a worthwhile addition to the reader's library.

Philip A. Palmer, *E. I. du Pont de Nemours & Co., Inc.*

**Alchemy: Ancient and Modern. Second Edition.** By H. STANLEY REDGROVE. Barnes and Noble, New York, N.Y. 1974. xx + 141 pp. \$9.00.

This book, a reprint of one first published in 1911, provides an excellent overview of the aims, theories, and methods of the alchemists. Historical sketches of the alchemists from Hermes Trismegistos to George Starkey are included as well as reproductions of many early engravings. The achievements of alchemy are compared to those of modern chemistry, particularly in the light of the knowledge of radioactivity at that time.

M. C. W. Smith, *Ann Arbor, Michigan*

**Introduction to Modern Organic Chemistry.** By CARL H. SNYDER (University of Miami). Harper and Row, Publishers, New York, N.Y. 1973. xiv + 530 pp. \$11.95.

This text is written as a survey of modern organic chemistry for a nonmajor course of one semester or one quarter in length. The author attempts to get away from some of the drudgery of memorization of facts found in many short organic texts, and to present the subject material in a way which corresponds to the practice of organic chemistry outside of the classroom.

The text is divided into seven major parts, varying in length from two to six chapters. The first part is concerned with structure, spectroscopy, and stereochemistry; and the remaining parts deal with reactions of common functional groups. The chemistry of hydrocarbons is somewhat de-emphasized in comparison to many organic texts since combustion and halogenation reactions are not considered as important in practice.

A central concept which could be used more in many texts is that every preparation of an organic compound is not an isolated incident, but involves the reaction of at least one other organic compound. Most reactions of functional groups are presented in the context of analysis, preparation of other functional groups, or study of mechanisms. Reactions are presented as being carried out for some defined reason with some desired product as a goal.

The integration of biological and commercially important compounds into the text is intended to keep the interest of some of those students who never seem to understand why organic chemistry is required in their curriculum. The text offers a slightly different approach to nonmajor organic chemistry, but maintains the necessary emphasis on important fundamentals. Students whose background in the general chemical principles is somewhat lacking may have difficulty with this text, but, overall, it appears to be very useable for a short course in organic chemistry.

Roy D. Pointer, *Bloomsburg State College*

**Laboratory Experiments in Organic Chemistry. Second Edition.** By JERRY R. MOHRIG (Carleton College) and DOUGLAS C. NECKERS (University of New Mexico). D. Van Nostrand Co., New York, N.Y. 1973. xv + 281 pp. \$8.95. Instructors Manual, \$2.00.

The objective of the original edition of this text was to provide a format for involving students in the process of chemical research as it actually takes place. This second edition pursues that same objective as much as any undergraduate text can and still meet the publishers expectation for wide adoption.

The early experiments demonstrate specific techniques in the context of a typical use of that technique for isolation, purification, or analysis of some specific material. The authors have attempted to select experiments which (1) maintain student interest, (2) have some teaching value, and (3) can be carried out at modest cost. Although there is an emphasis on self-discovery, classical methods and syntheses are still presented and considered as essential to experimental organic chemistry. Spectroscopic and chromatographic techniques are introduced early and then applied throughout the text. There are many optional and open-ended experiments and experiments which introduce more sophisticated research areas. Some experiments found in the first edition have been deleted and

eleven new ones have been added after they were class tested. There are eight experiments which are biologically oriented.

The instructors manual complements the lab text and should be quite useful for teaching assistants or faculty. This manual gives helpful comments on individual experiments and answers to the questions found at the end of each experiment. Along with a listing of chemicals for each experiment, the instructors manual also gives a breakdown of approximate cost per student for each experiment, suggested suppliers for the more exotic chemicals, and some suggestions for experiment modifications.

This text and accompanying instructors manual seem to be written with larger schools in mind, but could also be used effectively in smaller colleges. It should be particularly useful in those classes where students are already motivated toward the study of chemistry.

Roy D. Pointer, *Bloomsburg State College*

**Laboratory Techniques in Chemistry and Biochemistry. Second Edition.** By PAUL S. DIAMOND (Institute of Basic Medical Sciences, Royal College of Surgeons of England) and RON F. DENMAN (Imperial College of Science and Technology, U.K.). Halsted Press/John Wiley & Sons, Inc., New York, N.Y. 1973. 523 pp. \$21.50.

This text was written to meet the needs of a course for persons starting, or intending to start, careers as laboratory technicians, or for anyone starting laboratory work in chemistry or biochemistry. Although designed for training laboratory technicians, this book would be a good reference for any working laboratory.

The twelve chapters cover a wide range of topics including (1) basic materials and methods, (2) inorganic and organic analysis, (3) common instruments, (4) laboratory automation, and (5) biochemical apparatus and methods. There is an appendix introducing the literature of chemistry which includes hints on how to use a technical library. The major changes from the first edition are the introduction of SI units, the addition of the chapter on automation, a decrease in introductory, theoretical material, and the omission of details for suggested class experiments. A minor drawback, perhaps, is the use of trade names common in Britain for laboratory materials, but in most cases this presents no problem.

Although there are probably few if any schools in this country which offer a course where this book could serve as the text and be used as intended by the authors, the book could be valuable as a reference work for any laboratory. The intent is to answer practical questions which are sometimes overlooked in academic training.

Roy D. Pointer, *Bloomsburg State College*

**MTP International Review of Science, Organic Chemistry, Series One. Volumes 1, 2, 5, 6, and 9.** Consultant Editor, D. H. HEY (University of London). University Park Press, Baltimore, Md. Volume 1: Edited by W. D. OLLIS. 1973. xii + 306 pp. \$24.50. Volume 2: Edited by N. B. CHAPMAN. 1973. xii + 373 pp. \$24.50. Volume 5: Edited by W. PARKER. 1973. xii + 317 pp. \$24.50. Volume 6: Edited by D. H. HEY and D. I. JOHN. 1973. xii + 282 pp. \$24.50. Volume 9: Edited by K. F. WIESNER. 1973. xii + 346 pp. \$24.50.

This series in organic chemistry and the two companion series for physical and inorganic chemistry aim to provide periodic authoritative reviews of the entire discipline of chemistry (analytical chemistry appears within the physical chemistry volumes). The organic chemistry set will consist of ten volumes, eight divided along classical structural lines and separate volumes on structure determination and free radical reactions. In addition, an index for all ten volumes will appear separately (individual volumes do not have an index). Series One, emphasizing the literature which appeared in 1970 and 1971, is the first set of what will be biennial reviews. Series Two, planned for publication in 1974, will cover the interval to 1973. Each review is intended to be critical rather than comprehensive. Based on random examination, the reviews are generally well written such that they are not only informative but also interesting to read.

**Volume 1. Structure Determination in Organic Chemistry:** Stereochemistry (J. F. Stoddart); Mass Spectrometry (J. M. Wilson); Ultraviolet and Visible Spectroscopy (C. J. Timmons); Chiroptical Properties (D. N. Jones); Nuclear Magnetic Resonance Spectroscopy (I. O. Sutherland); X-Ray Crystallography (A. F. Cameron);

Structure of Reaction Intermediates (J. McKenna); Natural Products-Structure Determination (E. Haslam); From Meso- to Macro-Structure: Nucleic Acids (G. M. Blackburn); Biosynthetic Studies and Structure Elucidation (R. Ramage).

**Volume 2. Aliphatic Compounds:** Hydrocarbons (D. E. Webster); Halogeno Compounds (G. M. Brooke); Alcohols, Ethers and Related Compounds (S. G. Wilkinson); Nitrogen Compounds (P. Wilder, Jr. and J. M. Shepherd); Phosphorus Compounds (L. D. Quin); Sulfur Compounds (D. R. Hogg); Carbonyl Compounds (R. Brettle); Carboxylic Acids (N. Polgar); Boron Compounds (K. J. Toyne).

**Volume 5. Alicyclic Compounds:** Structure of Alicyclic Compounds (N. M. D. Brown and D. J. Cowley); Conformational Analysis of Alicyclic Compounds (B. T. Golding); Alicyclic Photochemistry (R. Bishop); Metal-Catalyzed Reactions in Strained Ring Systems (L. A. Paquette); Thermolysis of Alicyclic Compounds (J. M. Brown); Aspects of the Chemistry of Seven- to Eleven-Membered Rings (M. S. Baird); Adamantane and Its Relatives (E. M. Engler and P. v. R. Schleyer).

**Volume 6. Amino Acids, Peptides and Related Compounds:** Amino Acids of Natural Origin (E. A. Bell); Synthesis, Structural Properties and Reactions of Amino Acids (A. Thomson); The Structural Elucidation of Peptides (P. M. Hardy); Spectroscopic, Solution and Theoretical Studies Relating to the Conformations of Peptides (G. C. Barrett); Biological Activity of Structural Variants of Insulin (D. G. Smyth); Procedures for Peptide Synthesis (C. H. Stammer); New Syntheses of Naturally Occurring Peptides and Analogues (R. Wade); Depsipeptides (H. A. James); Penicillins and Cephalosporins (R. D. G. Cooper).

**Volume 9. Alkaloids:** The Lycopodium Alkaloids Including Synthesis and Biosynthesis (W. A. Ayer); The Total Synthesis of Indole Alkaloids (J. P. Kutney); Biosynthesis of Indole Alkaloids (A. I. Scott); Tuberosmonine and Related Compounds: The Chemistry of the *Stemona* Alkaloids (M. Gotz and G. M. Strunz); Spirobenzylisoquinoline Alkaloids (S. McLean and J. Whelan); Benzylisoquinoline and Homobenzylisoquinoline Alkaloids (T. Kametani and K. Fukumoto); Steroid Alkaloids (G. G. Habermehl); The *Amaryllidaceae* Alkaloids (P. W. Jeffs); The Structure and Synthesis of C<sub>19</sub>-Diterpene Alkaloids (S. W. Pelletier and S. W. Page).

Daniel Longone, *The University of Michigan*

**Thermophysical Properties Research Literature Retrieval Guide. Supplement I. 1964-1970.** Edited by Y. S. TOULOUKIAN, J. KOOLHAAS GERRITSEN, and W. H. SHAFER. IFI/Plenum Data Corp., New York, N.Y., 1973. Volume 1: Elements and Inorganic Compounds, ~730 pp. \$90. Volume 2: Organic Compounds and Polymeric Materials, ~258 pp. \$45. Volume 3: Alloys, Intermetallic Compounds, and Cermet, ~382 pp. \$50. Volume 4: Oxide Mixtures and Minerals, ~235 pp. \$45. Volume 5: mixtures and Solutions ~292 pp. \$45. Volume 6: Coatings, Systems, and Composites, ~264 pp. \$45. Set price: \$290.

Retrieval of scientific and technological data from the burgeoning scientific literature is increasingly difficult because most abstracting is *concept* rather than *data* accessing. Items of data are frequently literally lost save for the endeavors of a few data centers which to a greater or lesser extent retrieve particular types of data, tabulate it in accord with some format, and evaluate it to some extent—often short of truly critical evaluation. Because such work is time consuming and because the level of funding is rather modest, the task lags far behind the need. Much by way of adjuvant help (e.g., tagging and flagging) of the secondary (abstract) literature is needed. Finally, the tabulations and compilations are of such a diverse nature, widely scattered, and often produced in varied (and essentially incompatible) format and units, and are referred to different reference states, that even the *existence* or source of an appropriate table is unknown to the user, be he scientist or engineer.

As a complement to its "*Data Tables Series*," the Thermophysical Properties Research Center (TPRC) at Purdue University published a work entitled "*Thermophysical Properties Research Retrieval Guide*" in 1967 covering 33,700 references on seven thermophysical property groups on about 45,000 substances found in the literature between 1920 and mid-1964. The present work, the first supplement to the basic edition, covers an increment of 26,000 references on about 20,000 materials between mid-1964

and 1971. In addition, 9000 entries involve synonyms and trade names.

The supplement follows the general scheme of the Basic Edition, but has been restructured in six volumes on the basis of various classes of materials so that user groups with interest only in particular areas need not purchase the entire six-volume set.

The volumes are geared to permit bibliographic search strategy based on an alphabetic materials directory (and intermediary assignment of a substance number and property codes) or by author. The search parameters include thermal conductivity, diffusivity contact resistance, linear and volume expansion coefficients; accommodation coefficients, specific heat, viscosity, emittance, reflectance, absorbance, transmittance, and the ratio of absorbance to admittance; the Prandtl number, diffusion coefficient, and surface tension.

Until better schemes for the organization of the scientific literature are devised, the unique methodology of machine storage of data with publication in book format provides a convenient accessing of data in the thermophysical area and lightens the laborious retrospective search in the fields covered by this endeavor. Although the printed volumes must always lag somewhat behind the literature and even the abstract journals, mechanized retrieval is available at TPRC on the more recent unpublished portion. That tremendous saving of the user's time results and that significant amounts of data not cited in abstracting journals are included is evident. Although individuals might have preferred alternate approaches in some respects, there is no question that this is a valuable and unique interim tool of utility in excess of its cost to engineers, research scientists, technical librarians, and even compilers themselves. Our urgent need is for more such endeavors in many other areas.

Edgar F. Westrum, Jr., *University of Michigan*

**Progress in Surface and Membrane Science. Volume 8.** Edited by D. A. CADENHEAD (State University of New York), J. F. DANIELLI (State University of New York), and M. D. ROSENBERG (University of Minnesota). Academic Press, New York and London. 1974. xv + 327 pp. \$28.50.

Like its predecessors in this series, this volume offers a collection of review articles covering a broad range of physical, chemical, and biological issues whose common bond is their concern for surface phenomena. It would be a rare reader who is expert in all fields covered here, so that cross-fertilization and a lowering of communications barriers between divergent disciplines is an implicit goal of this book.

The eight chapters address these topics: the application of statistical mechanics to physical adsorption (J. R. Sams); electron spectroscopy and cognate techniques in solid surface studies (J. M. Thomas); physical adsorption on molecular solids (A. W. Adamson and M. W. Orem); ellipsometric studies of thin films (A. Rothén); photochemistry of lipid bilayer membranes (H. T. Tien and V. K.-H. Chen); the inner mitochondrial membrane (D. L. Schneider); intercellular junctions (J. Overton); and the role of the cell surface in contact inhibition of cell division (K. D. Noonan and M. M. Burger). At least in the five reviews I felt competent to judge critically, the topics were all of importance and interest to the life sciences and were uniformly of high quality. Apparently anticipating their breadth of readership, the authors all provided a measure of introductory material and historical review.

This volume, and the series to which it belongs, is well conceived and edited. Its unusual blend of contents makes it a valuable sourcebook for libraries in the life sciences and physical sciences. However, few individuals, I suspect, will find it a necessity for their private collection.

Theodore L. Steck, *The University of Chicago*

**Surface Carbohydrates of the Eukaryotic Cell.** By G. M. W. COOK and R. W. STODDART (Strangeways Research Laboratory, Cambridge, England). Academic Press, London and New York. 1973. xi + 289 pp. \$19.50.

"Surface Carbohydrates of the Eukaryotic Cell" is a well-written and well-organized, although somewhat diffuse, review of recent advances in surface carbohydrate chemistry. The text is well referenced and can serve both the active researcher and the student.

The book is divided into six sections beginning with a description of the plasma membrane itself, followed by a discussion of membrane carbohydrates with emphasis on methodology. The third section deals with structural features of mucopolysaccharides, glycoproteins, and glycolipids of animal cells with some reference to fungal cells. Section four discusses carbohydrates of plant cells, while section five concentrates on both animal and plant cell heterosaccharide biosynthesis. Finally, the last chapter deals with the functional significance of these carbohydrates.

In some respects the authors would have done well to restrict the scope of the text, devoting more time to a more critical analysis of less material. However, in spite of this, the book is still to be well recommended.

Ray Bergeron, *University of Maryland*

**Basic Physical Chemistry for the Life Sciences. Second Edition.** By VIRGINIA R. WILLIAMS and HULEN B. WILLIAMS (Louisiana State University). W. H. Freeman and Co., San Francisco, Calif. 1973. xviii + 524 pp. \$14.95.

The chapters in the present book treat the same topics and, in fact, have the same major headings as the previous edition. However, the chapters have been expanded and a new chapter on some aspects of spectroscopy has been added.

The major strong point of the book is the fact that it treats some classical aspects of physical chemistry using examples with which the biologist and life-science student should be familiar. The authors do a creditable job of relating thermodynamics to systems of interest to the life-scientist and in bringing in applications not usually treated in standard undergraduate physical chemistry texts. The chapter on kinetics, which does deal with classical enzyme kinetic studies, does not include any of the recent work on relaxation methods, which have great impact on molecular biology. The main function served by the new chapter entitled "Electromagnetic Radiation and Matter" is the listing of some interesting biological systems that have been studied spectroscopically.

Liberty Casali, *Madison College*

**Lipid Analysis.** By WILLIAM W. CHRISTE (Hannah Research Institute). Pergamon Press, New York, N.Y. 1973. xiv + 338 pp. \$18.00.

This book is an extensive collection of techniques for lipid analysis from classical extraction procedures to modern instrumental methods. It should be useful to both experienced researchers and students interested in the study of lipids. The book is well written, adequately indexed, and extensively referenced. It contains numerous detailed procedures, several of which have been successfully repeated in our laboratory. For certain techniques that are not discussed in detail, e.g., spectroscopic methods, the reader is referred to several recent reviews.

The author begins with a discussion of the structure, chemistry, and occurrence of lipids, which includes some easily understandable explanations of the sometimes confusing lipid nomenclature. A brief chapter concerning the isolation of lipids from tissues is then followed by detailed descriptions of the methods commonly used to characterize lipid species. Although the organization is at times confusing, the book contains a wealth of information about useful procedures. Among the topics most extensively covered are chromatographic methods and analytical techniques. The author concludes with a summary chapter which, if read first, helps to clarify the organization of the work, and provides one with a logical approach to problems in lipid analysis.

This book is a valuable introduction to lipid techniques for students with ample sophistication to satisfy the needs of established researchers. It is a definite contribution to the lipid literature.

William R. Snyder, *Harvard University*

**Chemical and Process Technology Encyclopedia.** Edited by DOUGLAS M. CONSIDINE. McGraw-Hill, New York, N.Y. 1974. xxix + 1261 pp. \$35.00.

The editor states that his intention is to combine "the detailed coverage of a handbook with the convenience and scope of an alphabetized encyclopedia." The subject entries are in the areas of materials (ranging from individual elements to broad categories such as "abrasives"), processes (from fairly specific, such as "diazotization," to broad, such as "absorption"), and theory (found in-

terspersed under other headings as well as under headings such as "pH"). The treatment is in general succinct, but clear, and much information is given in tables.

Shortcomings appear in many forms, many of which can be summarized by the characterization "obsolete." Nomenclature that has been abandoned for fifty years appears frequently (*e.g.*,  $\alpha$  and  $\beta$ -methylhydroxylamine); structures that were last seriously used in the nineteenth century can be found (*e.g.*, a quaternary ammonium iodide is represented on p 90 with five covalent bonds to nitrogen!). On p 202, cyclopropene is stated not to exist, whereas it has been known since 1923. Representation of organic structures is of very variable quality, and benzene rings can be found as plain hexagons, as hexagons with three double bonds, and as a ring of six carbons without attached hydrogens. There are some statements that make one doubt that the contributor understood his subject, such as, on p 251, "Because of its very high electropositivity, Cs readily combines with the very electronegative oxyhalions giving compounds such as  $\text{CsClO}_3$ ,  $\text{CsClO}_4$  (for example,  $\text{Cs}_2\text{CO}_3 + 2\text{HClO}_4 \rightarrow 2\text{CsClO}_4 + \text{H}_2\text{CO}_3$ ).". The treatment of similar subjects is sometimes uneven, as in the case of silver, which is given half the space given to copper, and in spite of its importance is given no more space than tellurium. A serious gap is the lack of any mention of toxicity in connection with such subjects as "vinyl chloride," "benzene," "aromatic amines," etc., although in other instances, such as "beryllium," appropriate warnings are given. It is a lot of book for the money, and it could be very useful, even though there are too many traps for the unforwarned.

**Encyclopedia of Industrial Chemical Analysis. Volume 19: Thorium to Zinc.** Edited by F. D. SNELL and L. S. ETTRE. Wiley/Interscience, New York, N.Y. 1974, xiv + 619 pp. \$45.00 (\$35.00 by subscription).

The end of the alphabet is reached with this volume, to which is appended a substantial section on Pesticides and Insecticides. Besides the elements falling between thorium and zinc, there are a number of very important subjects treated in this volume: water, wine, tobacco, yeast, urethane polymers, triphenylmethane dyes, vanillin. Although whiskey might logically be expected here, it has already been treated under Alcoholic Beverages, Distilled, in an

earlier volume. The emphasis, as in earlier volumes, is on the practical, and many detailed procedures are given, along with useful tables, graphs, and references.

**Organophosphorus Chemistry. Volumes 4 and 5.** Edited by S. TRIPPETT. The Chemical Society, London. 1973 and 1974. Vol. 4: xi + 305 pp £7.50. Vol. 5: xi + 302 pp. £10.00.

Volume 4 of this section of The Specialist Periodical Reports covers the literature between July, 1971, and June, 1972. The senior reporter states that this period "has in most areas of organophosphorus chemistry been one of consolidation with few new exciting advances," with notable exceptions "in the study of stable quinquivalent phosphoranes . . . and in the application of molecular orbital calculations to studies of bonding in phosphorus compounds." The eleven chapters cover, in addition to the various structural types, phosphorus ylides, radical, photochemical, and deoxygenation reactions, and physical methods (largely spectroscopy). Volume 5, which covers the literature from June, 1972, to June, 1973, continues the pattern.

**Electrons in Fluids. The Nature of Metal-Ammonia Solutions.** Edited by J. JORTNER and N. R. KESTNER. Springer-Verlag, New York, N.Y. 1973. xii + 493 pp. \$44.10.

This volume records the lectures, communications, and discussions at the Third Weyl Colloquium, held in 1972. The principal concern was the nature and properties of the blue solutions of metals in liquid ammonia, which are remarkable in many ways, not the least of which are their unusual reducing powers and their manifestation of superconductivity under some circumstances. The Colloquium extended its scope to related systems, such as metallic vapors, excess electrons in nonpolar hydrocarbons, and solvated electrons in other solvents, such as amides and ethers. The lectures, which have the character of critical reviews, are presented in full, with all graphs, tables, and references. The other communications, which are also presented *in extenso*, are reports of original research, and contain experimental details. There are a three-page subject index and a pair of color plates.