

Book Reviews*

Antimetabolites in Biochemistry, Biology and Medicine. Edited by J. Skoda and P. Langen. Pergamon Press, New York. 1979. x + 374 pp. \$40.00.

This book is Volume 57 in the symposia of the Federation of European Biochemical Societies. It contains research papers presented at the Symposium on Antimetabolites in Biochemistry, Biology, and Medicine held in Prague, Czechoslovakia, on July 10–12, 1978. The papers are divided into five areas dealing with the following topics: (i) antimetabolites as tools in enzymology, (ii) consequences of analog incorporation into nucleic acids, (iii) rational approach to the use of antimetabolites in combination cancer chemotherapy and in immunosuppression, (iv) aspects of selective antiviral action, and (v) new types of compounds, their synthesis, and mechanism of action. The book also contains author and subject indexes.

John C. Drach, *University of Michigan*

Nutrition and Cancer. Edited by Jan van Eys, M.D., Ph.D.; Mildred S. Seelig, M.D., M.P.H.; and Buford L. Nichols, Jr., M.D. SP Medical and Scientific Books—Spectrum Publications. New York. 1979. 297 pp. \$25.00.

"Nutrition and Cancer" is the third volume of monographs of the American College of Nutrition. This monograph compiles the Proceedings of the 18th Annual Meeting of the American College of Nutrition held June 9–10, 1977.

The book provides an up-to-date summary of the state of the art of nutrition as it relates to cancer. It gives an excellent review of nutritional assessment techniques and the application of these data in the nutritional management of the cancer patient. The reduced intake or anorexia resulting in cachexia of these patients is discussed with possible physiological and behavioral mechanisms outlined. Correlations between trace minerals/magnesium and occurrence of certain cancers are stated.

"Nutrition and Cancer" stresses the team approach to patient care and is excellent in demonstrating the relevance of nutrition in the treatment plan. The book is geared for the clinician. It states the areas of present knowledge and suggests a variety of areas requiring further investigation both by the basic researcher and the clinical researcher. References are provided after each paper. The book is highly recommended for all health professionals and clinicians.

Dorothy W. Hagan, *Michigan State University*

Global Malnutrition and Cereal Fortification. Edited by James E. Austin (Harvard University). Ballinger Publishing Co., Cambridge, Massachusetts. 1979. xx + 307 pp. \$20.00

Grains are of primary importance as a calorie and protein source for the world's populations. As such, cereal fortification has been selected as a carrier to deliver nutrients to people whose customary diets are deficient. "Global Malnutrition and Cereal Fortification" discusses the issues which should be considered by policy makers, scientists, and the food industry in decision making regarding fortification. The book draws its material from a review of the literature and from case histories of a wheat fortification study undertaken in Tunisia, a rice fortification study carried out in Thailand, and a corn fortification study conducted in Guatemala.

Dorothy W. Hagan, *Michigan State University*

Hydrophobic Fragmental Constant. By Roclaf F. Rekker. Elsevier-North-Holland, New York. 1977. \$56.00.

Researchers interested in basic or applied research on problems dealing with membranes have long known that solute solubility properties relate to membrane permeability. In the last century, Overton demonstrated that the oil-water partition coefficient of solutes is proportionate to the permeability of plant root hair cells. Since then, particularly in the last ten years, great progress has been made on membrane structure and function. Partition coefficients of the general type used by Overton have continued to be useful. The "Hydrophobic Fragmental Constant" is an attempt to make partition coefficients more useful to applied and basic researchers.

For any drug to exert a biological effect, it must cross biological membranes. Therefore, a basic knowledge of how any chemical of interest crosses membranes is of interest for drug delivery and toxicology reasons. The "Hydrophobic Fragmental Constant" attempts to show how various mathematical formulations can be used to calculate partition

coefficient data. The hydrophobic fragmental constant (f) divides molecules into parts and uses the algebraic summation of dipole and other terms that relate to chemical group polarity to assign polarity or partition coefficient values in terms of f values.

This book could be of interest to researchers in pharmacology, toxicology, and basic membrane research. It is not particularly easy to read and requires considerable time for most general readers to figure out what the book is all about. It does contain a great deal of data in tables which may be useful to researchers in the above-mentioned fields.

Alec D. Keith, *The Pennsylvania State University*

Recent Advances in Environmental Analysis (Current Topics in Environmental and Toxicological Chemistry. Volume 2). Edited by R. W. Frei Gordon and Breach Science Publishers, London. 1979. 354 pp. \$49.50.

The main source for the presentations in this book are papers presented at the Eighth Annual Symposium on the Analytical Chemistry of Pollutants (Geneva, April 1978) which have previously appeared in two environmental chemistry journals. There are 11 papers concerned with air pollution and 13 papers discussing aspects of water pollution. The book's greatest strength is the diversity of topics presented. These include a plethora of sampling and analytical techniques applied to problems of interest to a broad spectrum of those involved in environmental studies, ranging from biochemists to landfill engineers. This is also the book's major weakness since it lacks depth in any one area.

Several papers treat sampling techniques by providing details on the statistical analysis of the reproducibility of replicate sample data as well as exploring the problems inherent in locating sampling equipment for the maximum usefulness of the data obtained.

The analytical techniques described include a number of methods which are not routinely applied to environmental analysis presently, and which should be considered more often. Neutron activation analysis, inductively coupled plasma emission spectroscopy, and X-ray fluorescence methods are treated in several papers.

The quality of the presentations is uneven—some being very detailed and others rather sketchy. The English translations are, in some instances, not of particularly high quality. Additionally, a paper on water treatment seems out of place in a book primarily concerned with sampling and analysis techniques.

Although this book is more suited to an institutional rather than an individual library, it does provide a useful review of some nontraditional analytical techniques for the environmental scientist or engineer.

Arthur Greenberg, Barbara Kezbekus
New Jersey Institute of Technology

Advances in Inorganic Biochemistry. Volume 1. Edited by Gunther L. Eichhorn and Luigi G. Marzilli. Elsevier-North Holland, Inc., New York. 1979. xiv + 261 pp. \$24.50.

This book is the first in a series of volumes to be published which are designed to update and supplement the original two-volume treatise, "Inorganic Biochemistry" (G. L. Eichhorn, Ed.), which was published in 1973. The field of metal ions in biological systems has undergone explosive growth in the last decade. Although other publications treating the subject matter exist, this series is a welcome addition since it will assemble and organize rapidly advancing material from the broad range of topics in the area.

Volume I of the series contains nine chapters, covering a variety of topics, some of which were not discussed at all in "Inorganic Biochemistry" (superoxide dismutase, ATPase ($\text{Na}^+ + \text{K}^+$), nucleotide probes) and others in which substantial progress has occurred or new work is being reported (cytochrome P-450, hemerythrin, alkaline phosphatase, vitamin B_{12} , Cu oxidases). All of the contributors to this volume are recognized experts in their respective areas, and only one, J. E. Coleman, also contributed to the original "Inorganic Biochemistry".

In Chapter 1, J. E. Coleman and J. F. Chlebowski review the physicochemical and enzymatic properties of *E. coli* alkaline phosphatase emphasizing recent findings. Chapter 2, by I. Fridovich, is a brief, but in-depth and thoroughly referenced review of "Superoxide and Superoxide Dismutases" discussing both inorganic and biological aspects of superoxide ion and the dismutases. Recent advances in our understanding of the catalytic sites in "The Copper-Containing Oxidases" are discussed in Chapter 3 by B. Reinhammar. Emphasis is placed on the "blue" oxidases, where substantial progress has occurred as a result of a recent protein X-ray structural determination, and on the catalytic mechanism of the multicopper oxidase, laccase. Chapter 4, by J. T.

*Unsigned book reviews are by the Book Review Editor.

Groves, outlines the current state of our knowledge for "Cytochrome P-450 and other Heme-Containing Oxygenases". The author concentrates on the binding and activation of molecular oxygen by the heme-iron, and there is also a section on chemical models for the P-450 action, including findings from the author's laboratories. In Chapter 5, Y.-T. Fanchiang, W. P. Ridley, and J. M. Wood examine the different mechanisms for "B₁₂-Dependent Methyl-Transfer Reactions", primarily reporting results of studies on the methylation by methylcobalamin of platinum salts. Recent investigations by W. W. Cleland and A. S. Mildvan on Chromium(III) and Cobalt(III) Nucleotide Complexes are discussed in Chapter 6. The magnetic and spectroscopic properties of these metals when complexed to adenosine phosphates allow them to be used as biological probes, and studies reported include those related to the mechanism of certain kinases. In Chapter 7, by C. M. Grisham, entitled "The Structure of the (Na⁺ + K⁺)-ATPase. Implications for the Mechanism of Sodium and Potassium Transport", the current state of knowledge of this important but relatively poorly understood enzyme is summarized. Chapters 8 and 9 are devoted to the subject of hemerythrin and derivatives. In "Hemerythrin and Myohemerythrin. A Review of Models Based on X-ray Crystallographic Data", R. E. Stenkamp and L. H. Jensen review their own and other X-ray investigations discussing the nature of the active site in light of seemingly conflicting crystallographic results. Chapter 9 entitled "Hemerythrin. A Review of Structural and Spectroscopic Properties", by J. S. Loehr and T. M. Loehr, complements Chapter 8 by summarizing those features of hemerythrin which are now well established on the basis of physico-chemical studies.

"Advances in Inorganic Biochemistry", Volume I, presents a limited, but useful and interesting variety of subjects, updating areas previously reviewed in "Inorganic Biochemistry" and stimulating interest in other fields. The articles are of reasonable length, well written and well referenced, thus valuable to both newcomers and current research investigators. The book also contains a thorough index.

The extensive scope of subjects related to metal ions in biological systems, along with the growth and progress in these fields, requires continued discussions of specific topics. Volume I responds to this need successfully and offers an excellent beginning to a series which will hopefully continue to inform and stimulate research interest. Three additional volumes in the series are already in progress.

Kenneth D. Karlin, *State University of New York at Albany*

Advances in Polymer Science. Springer-Verlag, Berlin-Heidelberg-New York. **Volume 30, Physical Chemistry.** 1979. iii + 231 pp. \$47.30. **Volume 31, Chemistry.** 1979. iii + 179 pp. \$46.20.

Each of these volumes of this useful series contains four chapters on very diverse topics. The unifying theme for each volume is only very broadly defined, and may be a little misleading. For example, there is no apparent reason why a chapter on kinetics and statistics of reactions should appear in Vol. 31, "Chemistry", rather than Vol. 30, "Physical Chemistry". The length and format of the chapters makes these volumes resemble issues of a review journal, with the useful feature that each issue comes prebound in hard covers. A would-be contributor apparently submits a manuscript to one of the editors (of whom 14 are listed), but there is no indication within these volumes as to the editorial policy governing the types of articles sought or the mechanism by which they may be submitted. Nor is there any introductory statement explaining the scope or objective of the publication.

Because of the very diverse subjects treated, probably only libraries or private collectors would care to own the complete series. However, for those who find chapters within their own specific fields, personal ownership of individual volumes could be very useful.

Volume 30 contains chapters entitled: Polymer Analysis by Thermofractography, by E. Stahl and V. Brüderle (University of the Saarland); Star-branched Polymers, by S. Bywater (National Research Council of Canada); Dilute Solution Properties of Aliphatic Polyamides, by Z. Tuzar, P. Kratochvíl, and M. Bohdanecký (Czechoslovak Academy of Sciences); A General Theory for the Evaluation of X-ray Diagrams of Biomembranes and Other Lamellar Systems, by W. Welt and W. Kreutz (University of Freiburg).

Volume 31 contains chapters entitled: Stereospecific Polymerization of Alpha-Substituted Acrylic Acid Esters, by H. Yuki and K. Hatada (Osaka University); Molecular Sieves as Polymerization Catalysts, by M. Biswas and N.C. Maity (Indian Institute of Technology); Modified Polyethylene Terephthalate Fibers, by L. Szegő; Kinetics and Statistics of Reactions of Functional Groups of Macromolecules, by N.S. Platé and O.V. Noah (M.V. Lomonosov State University of Moscow).

As review articles, each of the chapters is well organized, thorough, and with numerous cited references. They provide excellent means for

the reader to keep updated in the areas treated. This reviewer found of particular interest the article on thermofractography, which is the identification and analysis of polymers by thermal degradation followed by thin layer chromatography of the fragments. While not as elegant as the use of mass spectrometry combined with GC or IR, this method nonetheless is applicable to a very broad spectrum of polymer compositions, and with apparatus much less costly than that required by the more elegant methods.

C. E. Brockway, *Becton, Dickinson and Company*

Metal Vapor Synthesis in Organometallic Chemistry. By J. R. Blackborow and D. Young. Volume 9 of the series "Reactivity and Structure Concepts in Organic Chemistry". Springer-Verlag, Berlin-Heidelberg-New York. 1979. xiii + 202 pp. \$53.90.

Synthetic chemists working in organometallic chemistry (and to some extent organic chemists as well) will be interested in this book. It is a nonencyclopedia volume describing the chemistry of metal atoms as synthetic reagents, and is laid out in the order: description of experimental techniques, behavior of metal atoms in matrices, results of preparative experiments, and latest developments in metal vapor syntheses. This last chapter picks up the most recent significant work in 1978 published after completion of the major portion of the writing.

Chapter 1 (The Basic Principles) describes some history of the metal vapor synthesis method (MVS), its scope, and uses (synthesis of new compounds, improved synthesis of known compounds, and a quick convenient tool to explore certain combinations of reactants). Chapter 2 (Practical Aspects of Metal Vapor Synthesis) is probably the most valuable since some detail is brought out concerning the host of methods available for vaporizing metals and manipulating them such that the vapors can be combined with organic molecules in a continually forming matrix or in solution. Chapter 3 (Properties of Metal Atoms and Interactions with Atoms and Molecules in Condensed Phases) considers the more theoretical aspects of metal atom chemistry, particularly matrix isolation spectroscopic investigations of atoms and small metal clusters (formed by atom aggregation). Chapter 4 (The Reactions of Metal Atoms) is the largest chapter and deals with both spectroscopic studies of reactions in matrices as well as (and mainly) synthetic aspects. This chapter is arranged by ligand, treating first a series of two-electron ligands followed by polyelectron ligands, organic and inorganic halides, and finally oxygen- and sulfur-containing organic compounds. This organization is the best that can be achieved without complete segregation of metal families, which is not done.

The material in this book has been covered piecemeal by certain review articles on this topic, but the authors have done a good job in bringing things together and therefore this is a worthwhile volume. They have done particularly well at covering the most significant aspects while showing admirable insight and appreciation for the work of others. Overall, the book is well done and has relatively few errors.

It should also be mentioned that the coverage for this book is relatively broad in terms of "metal vapor chemistry," but narrow in terms of "vapor synthesis chemistry" or "atom and particle chemistry". Thus, the principles described by the authors can and have been applied to the study of many reactive species in addition to metal atoms, and these extensions are not covered in this volume. This constitutes a loss in material covered, and in a proper sense of history regarding the early development and exploitation of the fascinating laboratory techniques employed.

Kenneth J. Klabunde, *Kansas State University*

Organic Reactions. Volume 26. Edited by W. G. Dauben. John Wiley & Sons, Inc., New York. 1979. viii + 488 pp. \$32.00.

It is interesting to look back over the years to see how the character of Organic Reactions has evolved. Volume I (1942) contained no less than twelve chapters, although it had only four-fifths as many pages as this newest volume, which contains only two chapters. They are "Heteroatom-Facilitated Lithiations", by Gschwend and Rodriguez, and "Intermolecular Reactions of Diazocarbonyl Compounds", by Burke and Grieco. These topics were essentially nonexistent when Organic Reactions began, although scattered examples of the former topic were known.

The lithiation chapter is far the larger (360 pp). In each chapter, the tables are nearly three times as long as the discursive text (the authors have been thorough!). The treatment of the subjects follows the traditional style, with short sections on history and mechanism leading to detailed discussions of the scope and limitations of the reactions, followed by shorter sections on the place of the reactions in the context of synthesis, and a description of experimental procedures with examples of complete laboratory directions. The Chapter and Topic Cumulative index for all 26 volumes now requires six pages, whereas the subject index for this volume requires only two.