

Additions and Corrections

Preparation and Properties of Dinitrogen Trimethylphosphine Complexes of Molybdenum and Tungsten. 4. Synthesis, Chemical Properties, and X-ray Structure of *cis*-[Mo(N₂)₂(PMe₃)₄]. The Crystal and Molecular Structures of *trans*-[Mo(C₂H₄)₂(PMe₃)₄] and *trans,mer*-[Mo(C₂H₄)₂(CO)(PMe₃)₃] [*J. Am. Chem. Soc.* **1983**, *105*, 3014–3022]. ERNESTO CARMONA,* JOSE M. MARIN, MANUEL L. POVEDA, JERRY L. ATWOOD,* and ROBIN D. ROGERS*

Page 3014, Abstract, line 1: The formula [MoCl₂(PMe₃)₄] should be replaced by [MoCl₃(PMe₃)₃].

Chemistry of Singlet Oxygen. 44. Mechanism of Photooxidation of 2,5-Dimethylhexa-2,4-diene and 2-Methyl-2-pentene [*J. Am. Chem. Soc.* **1983**, *105*, 4710]. LEWIS E. MANRING and CHRISTOPHER S. FOOTE*

Page 4713: This statement "variation of ene product ratios with solvents or temperature has not to our knowledge been previously observed" is an error. Such variation has been observed by Dr. V. Rautenstrauch (personal communication, 1980).

Book Reviews *

IP Standards for Petroleum and Its Products. Part I. Methods for Analysis and Testing. Volume 1. Methods IPI-230. Heyden & Son LTD, London, 1982. \$145.00.

This book contains a collection of 230 methods approved by the Institute of Petroleum (IP) for testing and characterizing petroleum and its products. Seventy-two of these methods have received joint approval of IP and the American Society for Testing and Materials (ASTM). The introduction section includes the following useful listings of methods: alphabetical, numerical, ASTM-IP Joint methods, proposed methods, obsolete methods, and correlations of IP or IP-ASTM methods with British Standards. Changes in the 1982 edition are also summarized. Moreover, criteria for a test method, method designations, formats, and general rules for presentation of numerical results are discussed.

The descriptions of the 230 methods presented range from 1 to 29 pages in length. Each method has appropriate labels as to its IP or ASTM designation number; many contain excellent drawings and pictures of equipment. The figures are clear and well labeled and contain exact information for reproducing a specific apparatus.

Included are methods for quantifying chemical elements and compounds found in petroleum and petroleum products. Moreover, methods for characterizing the purity of certain chemicals derived from petroleum are presented. Many physical properties, from heats of combustion of fuel oils to the load-carrying capacity of lubricating oils, are discussed. A number of methods are concerned with corrosion; both the prevention of corrosion by petroleum products and the causes of corrosion by chemicals in petroleum are considered.

This book would be extremely valuable to any laboratory devoted to general petroleum analyses or to anyone involved in the development of methodology for testing petroleum. It may also prove useful to a general chemical analysis laboratory, where petroleum products are tested occasionally.

Chris W. Brown, *University of Rhode Island*

Chromatography. Fundamentals and Applications of Chromatographic and Electrophoretic Methods. Part A: Fundamentals and Techniques. Part B: Applications. Edited by E. Heftman (Western Regional Research Center, U.S. Department of Agriculture). Elsevier Scientific Publishing Co., Amsterdam and New York, 1983. Part A: XXII + 388 pp. \$83.00. Part B: XVIII + 564 pp. \$138.25.

This most recent edition of "Chromatography" is published as Volumes 22A and 22B of the "Journal of Chromatography Library" series. As in the previous edition, the objective of this volume is to "feature the most recent and most significant techniques and applications" in this

rapidly expanding field. As in the earlier editions each chapter has been written by experts in that particular area.

Volume 22A consists of nine chapters covering the theoretical and practical aspects of separation on the basis of differential migration methods. The introductory chapter is followed by a short but interesting chapter on the history of chromatography and electrophoresis, and a comprehensive chapter on chromatographic theory. These are followed by chapters on column chromatography, planar chromatography, gas chromatography, ion-exchange chromatography, gel chromatography, and electrophoresis.

Considering the number of individuals involved in this volume, the editor has done an admirable job in maintaining the general format through the chapters. Each chapter considers, to a greater or lesser extent, aspects of sample preparation, theory, instrumentation, and methodology. A list of suppliers included in the chapter on planar chromatography should prove useful to anyone wishing to get started in this area.

Volume 22A is a successful attempt to overview a wide range of chromatographic areas. However, a number of shortcomings should be noted. Although the stated purpose of the text is to discuss new techniques, some of the most important new methods are completely omitted. The chapter on gas chromatography describes neither GC-MS nor supercritical fluid techniques. Other topics, such as LC-MS and ion chromatography, are described only briefly.

Volume 22B consists of 16 chapters on applications. As in previous editions, each chapter discusses a specific class of compounds. Topics include amino acids, proteins, lipids, terpenoids, steroids, carbohydrates, pharmaceuticals, antibiotics, nucleic acids, porphyrins, phenolics, pesticides, inorganics, nonhydrocarbon gases, and hydrocarbons. Each chapter is subdivided into specific categories and extensively referenced (4492 total references).

While this edition is not intended for the novice, it should be a useful reference to the practicing scientist. In my opinion this work should be particularly useful to the researcher wishing to employ a method with which he has limited experience.

James E. DiNunzio, *Wright State University*

Structure and Bonding. Volume 52. Springer-Verlag, New York, 1982. 202 pp. \$48.00.

This volume of the series, which is a hybrid between a periodical and a series of books, contains four reviews on rather disparate subjects: Natural Optical Activity and the Molecular Hypothesis, by R. G. Woolley; Spectral-Structural Correlations in High-Spin Cobalt(II) Complexes, by L. Banci, A. Bencini, C. Benelli, D. Gatteschi, and C. Zanchini; Relationships Between Structure and Low-Dimensional Mag-

*Unsigned book reviews are by the Book Review Editor.

netism in Fluorides, by A. Tressand and J.-M. Dance; and Structure and Bonding in Organic Derivatives of Antimony(V), by V. K. Jain, R. Bohra, and R. C. Mehrotra. A cumulative index of authors for Volumes 1 to 52 is included, but a subject index, alas, is not to be found.

Structural Analysis of Organic Compounds by Combined Application of Spectroscopic Methods. By J. T. Clerc, E. Pretsch, and J. Seibl (Swiss Federal Institute of Technology). Elsevier Scientific Publishing Co., Amsterdam and New York. 1981. 288 pp. \$66.00.

This is a book of worked problems. The first chapter contains introductory remarks, including explanations of terms of a description of working philosophy. Thereafter come 30 problems, each of which includes a mass spectrum, proton and usually also ^{13}C NMR spectra, an infrared spectrum, and, in some instances, UV data. These are then analyzed in an integrated, carefully reasoned manner, using several pages of text for each problem, and including amplifying comments that lead to a deeper and broader understanding of the phenomena encountered. The problems are thus meant to be followed rather than worked; they are used as a device to teach methods, principles, and facts.

The book closes with a group of Short Supplementary Essays, which treat didactically such topics as determining elemental composition from mass spectra, infrared overtones, higher order NMR spectra, use of shift reagents, etc. Some useful supplementary data, such as tables of values for use in estimating NMR shifts, are included in an appendix.

This is a highly instructive book, designed for the chemist who has at least an introductory acquaintance with spectroscopy. The wide variety of structural features represented makes the book generally useful for anyone wanting to sharpen or refresh his skills of interpretation. It is a pity that the book is effectively priced out of the student market; perhaps the publishers will consider a paperback edition?

Diosgenin and Other Steroid Drug Precursors. By L. V. Asolkar, Y. R. Chadha, and P. S. Rawat. Publications and Information Directorate, CSIR, New Delhi-110012. 1979. xii + 170 pp.

This book is intended to provide a concise, yet comprehensive, account of the search for naturally occurring starting materials for industrial synthesis of steroids. Four chapters are devoted to diosgenin, and one to the competing precursors, solasodine, hecogenin, stigmaterol, cholesterol, etc. A final chapter is headed Production, Requirements, and Trade. There are appendices on Plant Species Reported to Contain Diosgenin, Glossary of Botanical and Agricultural Terms, and Diosgenin Extraction Centers in India. There is also a good subject index.

Molecular Interactions. Volume 3. Edited by H. Ratajczak and W. Orville-Thomas. John Wiley & Sons, New York. 1982. xxi + 561 pp.

This is the third volume in a series, the first having emphasized the general theory of molecular interactions and vibrational effects on molecular interactions and the second emphasizing strong molecular interactions and charge-transfer, excited-state, and solid-state complexes. Volume 3 focuses on three problems of molecular interactions: (1) the development and application of perturbation methods for studying molecular interactions; (2) the influence of solvent effects on the properties of molecular interactions; and (3) molecular interactions and dynamics of liquids.

There are 10 chapters which fall into the above three categories. In category (1), there are chapters by Jeziorski and Kolos and by Tomasi. These two chapters are nicely complementary. Jeziorski and Kalos describe in detail the developments of perturbation theory approaches to studying intermolecular interactions in the last twenty years as well as current and future perspectives on these approaches. Tomasi focuses on the electrostatic potential model and its applications to studying molecular interactions. This chapter is not limited to the analysis of "weak" interactions and the author gives a very general perspective and many examples of the theoretical study of molecular interactions. This chapter was closest to the reviewer's expertise and it is very well written, scholarly, and filled with useful insights.

There are five chapters which deal with solvent effects on molecular properties: O. Tapia, Quantum theories of solvent-effect representation: an overview of methods and results; J. Malecki, Solvent effects on molecular complexes; C. Reichardt, Empirical Parameters of solvent polarity and chemical reactivity; O. Sinanoglu, Molecular Interactions within Liquids, the Solvophobic Force and Molecular Surface Areas; and Y. M. Kimel'fel'd, Low-temperature Studies of Molecular Complexes in Solution. Tapia nicely summarizes the various ways in which solvent effects can be incorporated into quantum mechanical calculations on the solute or complex and gives a brief review of applications to enzyme-substrate complexes; Malecki summarizes experimental methods of studying complex formation in various solvents and the ability of simple reaction field models to rationalize free energies of association; Reichardt describes how linear force energy approaches to understanding solvent polarity can be

used to understand the influence of solvent on chemical reactivity; Sinanoglu review his solvophobic theory and how it can be used to analyze the thermodynamics of molecular interactions; and Kimel'fel'd describes low-temperature liquid-phase experiments on the IR properties of complexes.

In the final three chapters, Rosato and Williams describe how dielectric relaxation and Kerr effect relaxation in liquids can be used to analyze molecular interactions; Reid and Evans review how far-IR spectroscopic studies can be used to understand condensed phase molecular interactions; and Pethrick describes how molecular acoustics can be used to analyze molecular properties in liquids.

All in all, this is a very well-written collection of chapters on important topics. The subject matter may cover too broad a range to encourage purchase by many individual scientists, but every library should have a copy.

Peter Kollman, *University of California, San Francisco*

Methods in Enzymology, Carbohydrate Metabolism. Volume 90. Part E. Edited by W. A. Wood (Michigan State University). Academic Press, Inc., New York, NY. 1982. xxix + 602 pp. \$58.00.

Volume 90 and its twin Volume 89 are updates of Volumes 41 and 42, which were published in 1975. Significant improvements in the techniques of enzyme isolation have taken place during this period, e.g., affinity chromatography, and these are ably covered in the updated volumes.

Volume 90 is in the tradition and style of the series, and brings together some 160 experts in the general area of carbohydrate enzymology. It includes 10 sections and covers most enzymes involved in the conversion of monosaccharides to pyruvate with the exception of the isomerases and the oxido-reductases, which are covered in Volume 89. The section on the kinases is, by far, the most extensive. Preparation of an enzyme from several sources is included for the sake of stimulating comparative and phylogenetic relationships, an area given impetus by the recent developments in genetic techniques. Thus, procedures for the preparation of fructose 1,6-bisphosphatase from 12 and phosphofructokinase from 8 different sources are described. However, due to space constraints, description of the characteristics of each enzyme is brief and the original literature has to be referred to for more thorough accounts. Section VII is of particular application since it deals with procedures that yield simultaneously several enzymes from the same tissue extract. It is hoped that this approach will be expanded in future editions for its obvious usefulness. The bibliographies are comprehensive and research workers in this field will find this volume a convenient and inclusive source of isolation techniques and information of many enzymes of carbohydrate metabolism.

Like other volumes in this encyclopedic series, flaws in this volume are hard to detect. However, it is the opinion of this reviewer that a section on the newly discovered enzyme, fructose 6-phosphate 2-kinase, and one in the applications of NMR spectroscopy to the elucidation of anomeric composition of sugars and sugar phosphates and the determination of conformational specificity of the enzymes acting thereon would have rendered this volume more valuable. Probably, these areas will be covered in future volumes.

Carbohydrate metabolism is one of the oldest areas of biochemical research. Recently, however, interest in it seems to be waning somewhat. It is hoped that publications like this volume will identify the many promising research points in that field and will rekindle interest therein.

Ezzat S. Younathan, *Louisiana State University*

Topics in Current Physics. No. 29. Aerosol Microphysics II, Chemical Physics of Microparticles. Edited by W. H. Marlow (Brookhaven National Laboratory). Springer-Verlag, Berlin, West Germany. 1982. x + 189 pp. \$29.00.

The rapid growth in experimental techniques for the study of condensed phase systems at the microscopic level and the subsequent wealth of detailed data has created a renewed interest in such systems. Springer-Verlag has once again published a timely review of one type of condensed phase system, namely, aerosols or microparticles. The editor has brought together reviews from distinguished scientists in the field whose viewpoints span the spectrum from macroscopic or thermodynamic perspectives to microscopic or atomic and molecular perspectives. This variation is to be commended as it will help to bridge several previously disparate points of view.

The primary thrust of the review articles is to establish the current state of affairs in microparticle physics from a theoretical perspective and thus they are not a compilation of experimental data. It should be emphasized that the chemistry of microparticles is also not addressed in these reviews.

This book will be a valuable addition to those who want to initiate research in aerosol microphysics, to experimentalists who would like a

compact broadly based theoretical treatment, and to those desiring an extensive bibliography of the field with references to other related areas.

Keith McDowell, *Los Alamos National Laboratory*

Electron Transfer Reactions. By R. D. Cannon. Butterworths, London. 1980. 314 pp. \$84.95.

This book provides a rather fundamental coverage of the subject, which is divided into three parts: electron transfer in the gas phase and in solution, and energetics of electron transfer. Redox reactions of nonmetals, electrochemical mechanisms, and electron-transfer in biochemical systems are largely omitted. The coverage of topics dealing with the condensed phase (including solids) largely concerns inorganics but is very detailed, with many mathematical derivations and with numerous footnotes by way of commentary. References (1131 total) are all placed at the end with an 8-page subject index and useful index of oxidants, reductants, and electron-transfer intermediates. The only serious deficiencies with the text are that the literature is covered only through 1976, and that the subject areas omitted have shown a great deal of recent advances.

G. David Mendenhall, *Michigan Technological University*

Progress in Physical Organic Chemistry. Volume 13. Edited by R. W. Taft. John Wiley & Sons, New York. 1981. ix + 638 pp. \$80.00.

This volume contains a collection of timely and extensively chronicled chapters that demonstrate the complementary roles of theory and experiment in modern organic chemistry.

The first chapter (61 pages), A theoretical Approach to Substituent Interactions in Substituted Benzenes, by A. Pross and L. Radom, combines quantitative (STO-3G) *ab initio* and qualitative molecular orbital theory to discuss the energetics of numerous well-defined classes of mono- and polysubstituted benzenes. Many interesting problems of general interest are discussed, e.g., inversion and rotation barriers, acidity and basicity for which there is little or no experimental data—these theoretical results provide the sole source of information.

The second chapter (54 pages), The Systematic Prediction of the Most Stable Neutral Hydrocarbon Isomer, by S. Godleski, P. v. R. Schleyer, E. Osawa, and W. T. Wipke, skillfully interweaves synthetic and mechanistic organic chemistry, experimental thermochemistry, and molecular mechanics. The authors present a systematic approach to generate all of the possible isomers corresponding to a given C_nH_m empirical formula and then to find the most stable isomer or stabilomer. Comparison with experiment or Benson-derived energies is also usually made. (The Benson parameters for $>C<$, $>CH<$, $-CH_2<$, and CH_3 , accidentally omitted from one of their tables, are 0.50, -1.90, -4.95, and -10.08 kcal/mol.)

The next chapter (132 pages), Electrical Effect Substituent Constants for Correlation Analysis, by M. Charton, contains 52 often multipage tables of compiled data and calculated constants. After summarizing many of the previous approaches toward obtaining localized electronic effects, the author defines best values for σ_1 , σ_R , σ_R^+ , and σ_R^- . He defines a reference set of substituent constants, arguing for the use of this classic Hammett approach rather than evaluation of an ever changing, all-inclusive set of substituent constants determined by statistical analyses. Table 7 lists almost 300 σ_1 constants and extends their validity from protic media to various aprotic solvents. Charton defines a best set of σ_m and σ_p and presents a similarly large and extended tabulation of σ_R , σ_R^+ , and σ_R^- . The author then briefly discusses estimation of substituent constants, separation of electrical effects, and the reliability of highly variable substituent "constants" (e.g., ionic groups).

The fourth chapter (82 pages), The Trifluoromethyl Group in Chemistry and Spectroscopy. Carbon-Fluorine Hyperconjugation, by L. Stock and M. Wasieleski, chronicles the effect of the $-CF_3$ group on a wide variety of species discussing properties ranging from acidity to EPR coupling constants. It is to be noted that the authors' scope is both broader and narrower than the title of the chapter suggests, since numerous aspects of general organofluorine chemistry are also discussed.

The fifth chapter (169 pages), Substituent Effects of Allenes and Cumulenes, by W. Runge, recalls Charton's 1973 comment "there are absolutely no data sets for substituted allenenes or cumulenes...a situation which should be remedied at the earliest opportunity". This admirable essay, the cure, begins with mathematical formalism and then uses it for understanding dipole moments, electron densities, chemical shifts, coupling constants, and ionization and excitation energies. The chapter nicely interweaves experimental and calculational data and relates these to substituent constants. (Interestingly, Runge's Figure 6 involves a correlation with σ_1 in which the discrepancies found with CF_3 and CH_3S substituents would largely disappear had Charton's Table 7 from Chapter 3 been available to Runge.)

The last chapter (145 pages), An Examination of Linear Solvation Energy Relationships, by M. Kamlet, J. Abboud, and R. Taft, begins with a somewhat imposing discussion of solution structure and the ap-

plication of theoretical relationships to the understanding of solvent effects on reaction rates and equilibria. The authors then summarize the empirical linear free energy relationships, "chemical" approaches such as the exo/endo ratios of Diels-Alder reactions, and the Y and other scales derived from reactivity and spectroscopy. The authors define a generalized π -scale of polarity for "select solvents"—polar, monofunctional, aprotic aliphatic compounds—and then correlate π with a number of solvent properties. In order to obtain the most general linear solvation energy relationships, α - and β -scales of solvent basicity for hydrogen bond acceptors and donors are defined. The chapter concludes with a comprehensive table of solvent constants.

In summary, this volume is a wonderful book and is suggested reading for anyone interested in the interplay of theory and experiment in organic chemistry. The price is regrettably prohibitive for most individuals, although we can rest assured that most libraries will acquire a copy, as it is part of a venerable series in organic chemistry.

Joel F. Liebman, *University of Maryland Baltimore County*
Arthur Greenberg, *New Jersey Institute of Technology*

Practice of Thin Layer Chromatography. Second Edition. By J. C. Touchstone and M. F. Dobbins. John Wiley & Sons, Inc., New York. 1983. XXIII + 405 pp. \$40.00.

This book is a "How to" system enabling anyone, including beginners, to use thin layer chromatography (TLC). It begins with a glossary of terms describing many of the parts and functions of chromatography. It goes on to describe the basics of TLC, its advantages, history, and procedural details. It provides a thorough description of the preparation of normal and reversed phase TLC plates including a list of suppliers of the bulk materials. It contains descriptions of both manual and motorized systems for preparation of plates. In addition, extensive tables list commercial plates by suppliers and include details of sorbents on glass, alumina, and plastic including sorbent type, layer thickness, presence of UV indicator, and plate size.

It discusses in considerable detail the preparation and application of the sample. Important information on the solvent needed to dissolve the sample and the whys, the preparation of the sample, application, and the available applicators is provided. The mobile phase is aptly discussed, including eluotropic series for a variety of compounds and solvent selectivity containing mobile phase selection parameters for different sorbents. A clear set of detailed instructions for development techniques follows showing available chambers for a variety of purposes. The entire process is detailed enough to allow even beginners to choose the development most suitable to their purposes be it ascending, descending multiple, stepwise, or continuous development.

Visualization procedures of several types are described including a variety of location reagent recipes useful for a large representative list of different compounds and a number of *in situ* chemical reactions needed for the visualization processes for different analytes. The characteristics are detailed for documenting a chromatogram and reporting how the chromatography is performed along with a suggested key for identification or description of the separated spots according to position, intensity, and/or color. This serves an important purpose in enabling other workers to reproduce the technique. Thus, chamber, stationary phase, mobile phase, application, means of location, and other pertinent details including photographic documentation are included.

The important area of quantification should prove of particular interest to chromatographers because of optical problems when using spectroscopy in opaque media. One chapter details the necessary requirements for useful evaluation and includes the characteristics needed to accurately determine the constituents of a chromatogram. It succinctly covers elution after location and measurement after elution. It devotes considerable space to *in situ* scanning because of the current use of densitometry and shows several schematics for fluorescence, reflectance, or transmission, including single and double-beam systems along with the desirable measurement characteristics. An introduction to Kubelka-Munk mathematics and its use in densitometry is provided. Procedures for the use of radioisotopes in TLC are well described. Included in this section are autoradiography, fluorography, liquid scintillation counting, and zonal profile scans.

Reproducibility in TLC, how to achieve it, and the reasons for poor reproducibility are described in terms of the required information needed for practical TLC. Preparative TLC is also described in a brief chapter.

The last chapters include one on a brief description of reversed phase TLC, including plates, manufacturers, theories of separation, and the "How to" process itself. This is followed by details of high-performance TLC, including equipment required, and a separate chapter on special techniques for TLC, including vapor programming, radial TLC, programmed multiple development, pyrolysis product measurement, bioautography, and enzyme inhibition methods. The book ends with a description of combining TLC with other techniques such as liquid chro-

matography, gas chromatography, and mass spectrometry.

This book is indeed a practical one for carrying out TLC in a variety of analytical circumstances. It appears to present its information in such a logical manner that it should remove the difficulty of having reproducible separatory systems for the process of TLC. Certainly, it can be recommended as an indispensable book for practical and research laboratory workers.

Bennie Zak, *Wayne State University, Detroit*

Studies in Physical and Theoretical Chemistry. Volume 12. Ionic Hydration in Chemistry and Biophysics. By B. E. Conway (University of Ottawa). Elsevier Scientific Publishing Company, Amsterdam and New York. 1981. xxvi + 768 pp. \$131.75.

This volume, in 34 chapters, attempts to cover comprehensively the ways in which ionic hydration is involved in physicochemical processes in chemistry and biophysics. The monograph is concerned primarily with the behavior of ions in aqueous media but treats solvation in nonaqueous solvents in a separate chapter. Several chapters at the end deal with aspects of ionic hydration that are important to understanding ion selectivity of membranes, action potentials, and the hydration of natural and synthetic macromolecular polyions. For those readers who may not be physical chemists, the author has included introductory discussions of electrostatics and the dielectric behavior, thermodynamics, and vibrational and magnetic resonance spectroscopy of ionic solutions. Preliminary material like the properties of the water molecule, ionic radii, and gas-phase ionic solvation are covered in the first five chapters. Methods used to study ionic solvation are included in Chapters 6–9. Ample coverage is given of the results obtained from the spectroscopic techniques mentioned above, but little is written concerning X-ray and neutron diffraction methods. The energetics and thermodynamics of ionic processes are discussed in six chapters. Other chapters are devoted to explaining solvation effects in electrode processes, proton hydration, ion pairing, salting-out, stereochemical effects, hydrophobic interactions, electrostriction, and D₂O solvent isotope effects. Two chapters treat the dynamical aspects of ionic solvation. A thorough treatment is given of hydration numbers in a single chapter and a discussion of ionic solvation in terms of Lewis acid–base interactions given in a companion chapter.

Although the book is not intended as a literature survey, it does contain a fairly extensive list of references to the leading literature published up to 1974. The literature cited after that date is relatively sparse. Little, if any, mention is made in the book of the newer methods used for the investigation of ionic solutions published in the latter 1970's. The results from computer simulation studies of water and solutions and neutron and X-ray diffraction studies of ionic solutions are absent.

The discussion in Chapter 29 of the determination of hydration numbers by the direct NMR method would lead the nonspecialist to believe that it is not possible to observe separated proton NMR signals in pure aqueous salt solution, restricted as this possibility is. Several papers showing separate signals in the absence of any organic component were published in the early 1970's and, furthermore, showed that acetone functioned solely as a diluent with no effect on the hydration number. Also no mention is made of the successful use of this method for competitive solvation studies for several different cations.

Overall, the book has relatively few misprints, a minor one being the use of Chapter 21 on successive headings for the pages of Chapter 31. Many of the chapters contain references to articles that are not cited in the text and appear to have been added only for completeness.

The beginnings of obsolescence noted in some of the chapters of this book, and its high cost, make its purchase by individual researchers currently active in the field questionable. However, the volume remains quite useful for workers outside the field who need a comprehensive introduction to the subject, and it is recommended for library purchase.

George A. Vidulich, *College of the Holy Cross*

Topics in Bioelectrochemistry and Bioenergetics. Volume 4. Edited by G. Milazzo (Università di Roma). John Wiley and Sons, New York. 1981. xiv + 342 pp. \$96.00.

This series was developed with the admirable intent of allowing "both biologists and electrochemists to become better acquainted ... with the kinds of problems that can be solved by means of a bioelectrochemical approach". Volume 4 contains the following monographs: Physicochemical aspects of homeostasis (V. S. Vaidyanathan), Electrochemical Interactions and Energy Balance in Red Blood Cell Aggregation (S. Chien), Principles of Electric Field Effects in Chemical and Biological Systems (E. Neumann), Structural and Energetic Aspects of Charge Transport in Lipid Layers and in Biological Membranes (I. R. Miller), Electron Transferring Proteins: Electrochemical Approaches and Kinetic–Ionic Strength Effects (B. A. Feinberg and M. D. Ryan), and Electro-Mechanical Equilibrium in Membranes (G. Dickel).

Variation in quality is a common problem in books combining the

work of multiple authors. The problem is accentuated in this volume, in which the authors are charged with fusing biological and physicochemical approaches in an intellectually productive fashion. The contributions by Chien, Neumann, and Feinberg and Ryan are particularly successful. Each addresses a well-defined topic. In each, the biological problem is presented clearly with the aid of diagrams and electron micrographs as appropriate. This is followed by a discussion of relevant methodology, both experimental and analytical, with emphasis on the latter. Miller's treatment of charge transport in lipid bilayers offers insights of obvious biological interest integrated with concise mathematical descriptions. The article would have benefitted, however, from an introductory section outlining the areas to be discussed and the author's intended approach and/or bias. The remaining two monographs have fallen short of the series' goal for two very different reasons: Vaidyanathan has supplied a compendium of equations common to physical chemistry courses with little apparent effort either to apply them to a particular biological issue or to develop them in any conceptual depth. In contrast, Dickel has launched directly into the mathematics surrounding a controversial topic, namely osmosis, with little regard for the reader for whom this is not a primary research interest.

Patricia M. Sokolove, *University of Maryland Medical School*

Fluorimetric. By M. Zander (Rütgerswerke AG). Springer-Verlag, Berlin, Heidelberg, and New York. 1981. VIII + 127 pp. \$32.40.

This book is an introduction to analytical fluorescence techniques and is intended for those just entering the field who require a brief overview of the basic principles. It is written in German and would require a translation for wider acceptance.

The first chapter of substance (Chapter 2) deals with the theoretical principles of luminescence of organic molecules. It starts with potential energy diagrams and the Franck–Condon Principle and then moves into deactivation, solvent effects, and Franck–Condon States. Kinetics of photophysical processes is covered next and a brief survey of the various types of unimolecular and bimolecular processes is outlined. The chapter finished with term diagrams, quenching studies, and energy transfer.

Chapter 3 covers instrumentation and analytical fundamentals. The instrumentation is presented as a brief overview of each of the principal components in fluorescence spectrometers. Following this is a nice section on low-temperature solvents with useful tables. The remainder of the chapter covers quantum yields, qualitative analyses, and foundations of quantitative analysis.

The final two chapters briefly cover special fluorimetric techniques such as Shpol'skii spectra, matrix isolation, laser induced fluorescence, etc. and applications of fluorescence to organic molecules such as polycyclics, proteins, heterocyclics, etc. These chapters are very short and are mainly used to introduce each area and provide a reference or two.

This book provides a very concise introduction to many areas of fluorescence. The principles are outlined briefly, but if a new practitioner is to learn the field, this person will certainly have to supplement this short introductory book. My principal criticism is the brevity of topic coverage, but this may be useful for a certain type of analyst.

Herbert H. Richtol, *Rensselaer Polytechnic Institute*

Stereospecific Polymerization of Isoprene. By Elena Ceausescu. Pergamon Press, Oxford, New York, Toronto, Sydney, and Paris. 1983. x + 280 pp. \$60.00.

The coverage of this book is not as extensive or current as its title and publication date imply. The original Romanian version appeared in 1979 and it, in turn, was essentially a reprinting of the 1967 doctoral dissertation of Dr. Ceausescu plus a summary of studies done subsequently in her Institute that concern the preparation of *cis*-1,4-polyisoprene using isoprene fractions obtained by dehydrogenating isopentane. Catalysts derived from TiCl₄ and triethylaluminum or triisobutylaluminum were employed in these studies. The book provides detailed information about catalyst preparation and modification, solvent and monomer purification, polymerization conditions, polymer isolation and stabilization, and a brief coverage of polymer properties.

The book has two parts. Part I is a reprinting of Dr. Ceausescu's doctoral dissertation. It contains a 54-page survey of stereospecific polymerization that cites 378 references, the most recent of which appeared in 1966. The coverage is very broad and necessarily superficial. It will be useful as a bibliography. The remainder of this part (100 pages) covers experimental studies concerning *cis*-1,4-polyisoprene synthesis. Part II (104 pages) elaborates on these studies, providing a wealth of experimental data plus citations to publications as recent as 1979. Unfortunately, of the 50 references published after 1972 that were cited, only four originated outside the Soviet Union and Eastern Europe.

This book can be recommended as a "how to" book for individuals about to embark on Ziegler-Natta catalyzed polymerizations and as a

source of useful industrial data. However, anyone acquiring this book with the expectation of obtaining up-to-date information about stereoregular polymerization will surely be disappointed.

H. James Harwood, *The University of Akron*

Guide-Lines to Planning Atomic Spectrometric Analysis. SAC 4. By B. Magyar (Swiss Federal Institute of Technology). Elsevier Science Publishing Company, Inc., Amsterdam and New York. 1982. x + 283 pp. \$76.75.

This text is unusual in that it provides a picture of the basic theoretical principles underlying atomic absorption spectrometry (AAS) and atomic emission spectrometry (AES) without the impedimenta of any discussion or presentation of associated analytical procedures.

The explanations of these principles, their application with respect to the spectrometric fields covered, and their associated influences on analytical sensitivities are simple and concise.

The first chapter gives very good coverage of the capacities of the primary physical methods of elemental analysis, as well as the various criteria permitting, for given circumstances, a choice of the most suitable method of approach.

Where students of analytical chemistry are concerned, there has often been a very considerable gap between their understanding of the methodology and practice of AAS and AES and the underlying theoretical principles. This gap continues relative to those actually applying these techniques in industry.

As the author comments in his preface, the purpose of this text is to fill this gap between theory and practice. This he accomplishes admirably.

James G. Dick, *Concordia University*

Atomic Absorption Spectrometry. TIAC 5. By J. E. Cantle (VG Isotopes Ltd). Elsevier Science Publishing Company, Inc., Amsterdam and New York. 1982. xvi + 448 pp. \$97.75.

This text is basically a compendium of the practical methodologies of atomic absorption spectrometry (AAS). The usual lack of specificity of texts of this nature is avoided by the use of multiauthor (23) contributions.

The sections on the theoretical principles underlying AAS are presented with only sufficient detail to permit a basic understanding, although a more comprehensive approach is provided for those chapters and sections covering instrumental requirements and practical technology.

The strength of the text lies in Chapter 4 and its associated sub-chapters. In these sections, very detailed outlines of the AAS techniques applicable to the analysis of water, effluents, seawater, marine organisms and sediments, ambient atmospheres and airborne particles, foodstuffs, ferrous and non-ferrous alloys, glass and ceramics, clinical and biological samples, forensic samples, and fine and industrial chemicals. These detailed outlines comprise an exacting "cookbook" approach, invaluable in that it eliminates any doubts as to the exact requirements and approaches for each method involved.

There is a copious reference section for each subchapter, permitting the user ample opportunity for further indepth study of the details for each technique outlined.

This is an excellent text for those applying AAS in the general industrial and commercial fields.

James G. Dick, *Concordia University*

Diffusion in Gases and Porous Media. By R. E. Cunningham (Atanor S. A. M., and University of La Plata) and R. J. J. Williams (University of Mar del Plata). Plenum Press, New York. 1980. xxiii + 275 pp. \$37.50.

The subject treated in this book has a long and unusually complex history which begins with the researches by Thomas Graham in 1826. The complexity arises not only from the actual difficulty of some of the topics but also from the various confusions, misunderstandings, and actual errors in the literature which have made it a confusing subject to enter without a guide. As would be expected in a book designed to be suitable for graduate courses, the emphasis in the text under review is on the conceptual aspects of the subject rather than on a detailed mathematical development. The book begins with a phenomenological description of gas diffusion experiments with special emphasis on the role of the walls in the various cases. The constitutive equations for diffusion are then introduced and an elementary mean-free-path theory of the transport coefficients is presented. As the authors note, this introductory material, which comprises about one quarter of the text, could be used at an undergraduate level.

The more advanced material begins with the introduction of the Boltzmann equation by physical arguments and an outline of the results

obtained by the Chapman-Enskog, Grad-Zhdanov (13-moment), and BGK methods of solution. The wall effects are then "added" following the well-known dusty gas model introduced by Evans, Watson, and Mason in 1961. The constitutive equations of the total diffusive and viscous fluxes are applied first to flow in a capillary and then to flow in a porous medium. The results obtained are used to discuss realistic models of isothermal systems, including closed systems, semiopen systems with and without chemical reactions, and open systems. This survey covers very many of the situations of practical interest to physical chemists.

The final chapter of the book gives a survey of the history of diffusion in gases from the time of Thomas Graham. The reasoned account given here of the various errors and confusions which have arisen in the development of this field will be a valuable aid to the student embarking upon his own study of the literature. The whole book can be recommended as a unified general introduction to the fundamental aspects of a subject with many important practical applications.

A. R. Allnatt, *University of Western Ontario*

Books on Applied Chemistry

Los Alamos Explosive Performance Data. Edited by Charles L. Mader, James N. Johnson, and Sharon L. Crane. University of California Press, Berkeley. 1982. ix + 811 pp. \$45.00.

This hefty volume "is designed to provide a source of reliable performance data on some of the high explosives that have been studied at the Los Alamos National Laboratory". It complements the 1980 books "LASL Explosive Property Data". The table of contents is almost laconic: Plate Acceleration Data; Aquarium Data; Detonation Velocity Data. The content is equally laconic and consists of innumerable tables, mercifully set in real type, rather than the ersatz product of a computer print-out.

User Guide on Process Integration for the Efficient Use of Energy. By B. Linnhoff, D. W. Townsend, D. Boland, G. F. Hewitt, B. E. A. Thomas, A. R. Guy, and R. H. Marsland. The Institution of Chemical Engineers, Pergamon Press, New York. 1982. v + 247 pp. \$25.00.

This softbound volume describes a simple and effective approach to saving energy in chemical process design by improvements derived from network analysis. The savings result not from advanced (and often expensive) technology applied to unit processes, but from better design of the total system.

Electricity Generation and the Ecology of Natural Waters. By T. E. Langford. Liverpool University Press, Liverpool, England. 1983. xxiv + 342 pp. £14.50.

The author's objective is to provide objective reference, putting "the ecological truths into perspective without reference to politics or public relations". Noting that ecologists and industrialists are often opposed, he hopes "that each side believes that I have favoured the other". It would be a valuable book for its bibliography alone—1173 references, each given with its full title. Since it treats chemical as well as thermal discharges, it should be of interest to chemists as well as engineers.

Analytical Sciences Monographs. No. 8. The Sampling of Bulk Materials. By R. Smith and G. V. James. The Royal Society of Chemistry, London. 1981. viii + 191 pp. £16.50.

The highly accurate determinations of the most skillful analytical chemists are of little use if applied to a sample that is not representative. Unfortunately, the subject is not always given the emphasis that it deserves, a shortcoming that this book aims to alleviate. After an introduction and a glossary of terms come chapters on Establishing a Sampling Scheme, Sampling Theories, Apparatus for Sampling, and Sampling Methods. There are also appendices of useful data.

Patents for Chemists. By Philip W. Grubb. Clarendon Press, Oxford University Press, Oxford and New York. 1982. xi + 273 pp. \$39.95.

This book is offered "as a guide to patent matters for laymen, particularly, but not exclusively, for chemists". Its three parts are the following: The General Principle of Patents; Patenting for the Chemical Inventor; and The Politics of Patents. The subject is treated from a world-wide standpoint, and is set in perspective by an historical introduction. A small but useful feature is a list of arcane abbreviations, such as CPA (Chartered Patent Agent).

Industrial Engineering Series. Volume 7. Practical Quality Management in the Chemical Process Industry. By Morton E. Bader. Marcel Dekker Press, New York. 1983. x + 160 pp. \$27.50.

This book, drawn partly from material previously published in *Chemical Engineering*, is offered as a "how to" work and as a reference of primary recourse. It deals with managing the quality control laboratory,

sampling, packaging, statistical procedure, costs and audits, government regulations, and product liability.

Gas Treating With Chemical Solvents. By Gianni Astarita, David W. Savage, and Attilio Bisio. John Wiley & Sons, New York. 1983. xxi + 493 pp. \$49.95.

The central concern of this book is the removal of acidic impurities from industrial gases. It is divided into four sections: Industrial Gas Treating; Theory; Applications; and Industrial Problems. It includes a 19-page annotated bibliography and a 19-page appendix of gas-treating patents.

The Production and Application of Fluorescent Brightening Agents. By Miloš Zahradník. John Wiley & Sons, New York. 1983. 147 pp. \$29.95.

Fluorescent brightening agents for making laundry "whiter than white" are drawn from a variety of organic structural types, such as stilbenes, coumarin derivatives, acrylamides, and methinecyanines. This book reviews their production, compounding, use, toxicology, and industrial effluent problems.

Advances in Drying. Volume 2. Edited by Arun S. Mujumdar. Hemisphere Publishing Corporation, New York. 1983. xi + 301 pp. \$55.00.

This is a volume of eight contributed reviews of primary interest to chemical engineers, especially those concerned with food processing. The chapters deal with dryer design, microwave drying, dehydration of foods, fluidized beds, pastes, drying-induced stress, and mechanism of drying of porous material.

Critical Reports on Applied Chemistry. Volume 3. Chemical Engineering and the Environment. Edited by A. S. Teja. Halsted Press, John Wiley & Sons, New York. 1981. ix + 100 pp. \$27.95.

This little book contains three chapters: Energy utilization in chemical processes (by A. S. Teja and J. R. Roach); Pollution control (by J. I. T. Stenhouse), and Chemical engineering and health and safety (by V. C. Marshall). They are reviews of subjects that have become of major concern to chemical engineers in recent years. Although much of the material is universal in application, the reviews have been written from the standpoint of the United Kingdom.

Automated Stream Analysis for Process Control. Volume 1. Edited by Dan P. Manka. Academic Press, New York. 1982. xii + 317 pp. \$39.50.

This volume contains twelve contributed chapters on various key aspects of the subject, such as process ion chromatography, flow-injection analysis, on-line atomic absorption spectroscopy, on-line gas chromatography, and process liquid chromatography. The editor rightly points out that continuous analysis has high potential for optimizing processes.

Gas-Solid Transport. By George E. Klinzing. McGraw-Hill Book Company, New York. 1981. xvi + 175 pp. \$28.50.

Two-phase flow systems—the moving of a solid in stream of gas or liquid—is no longer a novelty, but is widely used for long-distance transport as well as for handling solid feeds in the chemical process industries, such as synthetic fuel production. This book deals with particle size, adhesion and agglomeration, particle dynamics, electrostatics, measurement, etc. A gratifying feature is a glossary of symbols no less than 6 pages long.

Chemical and Process Plant: A Guide to the Selection of Engineering Materials. Second Edition. By L. S. Evans. Halsted Press, John Wiley & Sons, New York. 1980. 190 pp. \$34.95.

This book deals with all types of materials used for handling chemicals industrially, from cast iron to precious metals, ceramics, plastics, and coatings. Their strengths and corrosion resistance are treated along with information on fabrication and costs. Appendices contain lists of trade names for resins, and addresses of plastics manufacturers.

Rubber Technology and Manufacture. Second Edition. Edited by C. M. Blow and C. Hepburn. Butterworths Scientific, London and Boston. 1982. xxvi + 607 pp. \$59.95.

This is completely revised from the first edition, with some new contributors. It gives a comprehensive review of rubber technology, from history to manufacturing and testing methods. Although polymerization is not treated, the many varieties of synthetic polymers used as rubber-like materials are described, and a chapter is devoted to the chemistry and technology of vulcanization.

Handbook on Atmospheric Diffusion. By Steven R. Hanna, Gary A. Briggs, and Rayford P. Hosker, Jr. Technical Information Center, U.S. Department of Energy, Springfield, Virginia. 1982. vi + 102 pp. \$10.75.

This soft-bound book grew out of the need to calculate the effects of atmospheric diffusion as a result of the United States Clean Air Acts and

increased environmental consciousness. It aims to give "the best current formulas—and a simple physical description of the principles of analysis", and is intended both for reference purposes and as a text for a short course of instruction.

Equilibrium-Stage Separation Operations in Chemical Engineering. By Ernest J. Henley and J. D. Seader. John Wiley & Sons, New York. 1981. xxvi + 741 pp. \$37.95.

This is a book about computer programs for simulating the performance of fractionators, absorbers, extractive distillation columns, etc., in solving the problems of industrial design. It describes a variety of specific problems, and uses them as a means to enhance the reader's understanding of modern calculation procedures.

Chemistry and Chemical Engineering in the People's Republic of China. Edited by John D. Baldeschwieler. American Chemical Society, Washington, DC. 1979. xix + 266 pp. \$15.00 (hardbound); \$9.50 (paperback).

This is a report by a 12-member delegation from the USA who visited China in 1978. It is concerned with the status of research in chemistry and chemical engineering, including organization and infrastructure. It is a useful guide to universities, institutes, and chemical industries in China.

False Profits: The Decline of Industrial Creativity. By Thomas Carney. University of Notre Dame Press, Notre Dame, Indiana. 1981. viii + 184 pp. \$17.95.

The author presents his contention that over-regulation and the desire for a risk-free society have made it difficult for creativity to flourish, and suggests solutions.

Molybdenum Catalyst Bibliography (1977–1978). Supplement No. 6. Compiled by George A. Tsiginos. Climax Molybdenum Company, P.O. Box 54, Canal St. Station, New York, NY. 1981. 149 pp. Gratis.

The bibliography is arranged according to reaction or process. For each entry, the process is identified, the catalyst is given in formula form, and the reference is given. Patents appear prominently.

Energy and Feedstocks in the Chemical Industry. Edited by Andrew Stratton. Ellis Horwood Publishers, John Wiley & Sons, New York. 1983. 403 pp. \$89.95.

This book consists of 21 chapters contributed by persons in high political or technological positions who examine the world energy situation in the present and near future. Special attention is paid to chemical feedstocks and the production of fuel and feedstocks from coal. The intended primary audience comprises governmental and industrial people concerned with long-range planning, research, and development.

Thermodynamic Derivatives for Water and Steam. By S. L. Rivkin, A. A. Aleksandrov, and E. A. Kremenevskaya (Union Institute of Thermal Engineering); translated by J. Keston. John Wiley & Sons, New York. 1978. 264 pp. \$25.00.

Except for eight pages of introductory material, this is a book of tables only. Their content is developed from the skeleton tables published earlier, by computer-assisted calculation of derivatives to provide a means to define the thermodynamic derivatives at every point in the p - T plane and to allow accurate interpolation.

Matchmaking: Science, Technology and Manufacture. By C. A. Finch and S. Ramachandran. Ellis Horwood Publishers, John Wiley & Sons, New York. 1983. 236 pp. \$65.00.

This fascinating book begins with a short history, treats theory of ignition and principles of formulation, and then takes the reader all the way from peeling the bark off trees to analyzing matchheads. On the route are discussions of production and control, fire protection and safety, chemicals, thickeners and binders, pyrotechnic devices, and recent developments. Six appendices give special data.

Volumes of Proceedings

Structure of Complexes between Biopolymers and Low Molecular Weight Molecules. Edited by W. Bartmann and G. Snatzke. John Wiley and Sons, Inc., New York. 1982. x + 213 pp. \$42.95.

Proceedings of the Eleventh Workshop Conference in Schloss Reisenburg in 1981, consisting of 13 review papers reproduced from the authors' typescripts. Hardbound and provided with a subject index.

Conformation in Biology. Edited by R. Srinivasan and Ramaswamy H. Sarma. Adenine Press, Guilderland, NY. 1983. xviii + 483 pp.

Proceedings of the International Symposium on Molecular Biophysics and Biocrystallography, held in Madras in December 1982, in honor of Professor G. N. Ramachandran. It consists of papers on Peptides and Proteins, Nucleic Acids, and X-Ray Crystallography, plus a biography

and bibliography of Professor Ramachandran. The book is typeset on paper of high quality, and is hardbound and provided with a short subject index. The promptness of its publication is exemplary.

Somatic Cell Genetics. Edited by C. Thomas Caskey and D. Christopher Robbins. Plenum Press, New York. 1982. viii + 218 pp. \$35.00.

Proceedings of a NATO Advanced Study Institute held in Portugal in 1981, consisting of 12 papers with substantial bibliographies, reproduced from the authors' typescripts. Hardbound and provided with a short subject index.

Regulation of Phosphate and Mineral Metabolism. Edited by Shaul G. Massry, Joseph M. Letteri, and Eberhard Ritz. Plenum Press, New York. 1982. xv + 702 pp. \$85.00.

Proceedings of the Fifth International Workshop on Phosphate in Other Minerals, held in New York in 1981, consisting of 59 papers, reproduced from the authors' typescripts. Hardbound and provided with a subject index.

Chemistry of Natural Products: The Proceedings of Sino-American Symposium on Chemistry of Natural Products. Edited by Wang Yu. Copublished by Science Press, Beijing, The Peoples Republic of China, and Gordon and Breach, Science Publishers, Inc., New York. 1982. v + 321 pp.

Proceedings of the Sino-American Symposium on the title subject, held in the Peoples Republic of China in 1980, consisting of a large number of short (3 to 7 pages) papers, reproduced from the authors' typescripts, a photograph, a poem in Chinese, a list of participants, but, alas, not an index.

Frontiers in Physicochemical Biology. Edited by Bernard Pullman. Academic Press, Inc., New York. 1979. xiii + 503 pp. \$45.00.

Proceedings of an International Symposium celebrating the 50th anniversary of the Institute de Biologie Physico-Chimique, held in Paris in 1977, consisting of 21 papers, set in type, hardbound, and provided with a subject index.

Cell Regulation by Intracellular Signals. Edited by Stephane Swillens and Jacques E. Dumont. Plenum Press, New York. 1982. ix + 334 pp. \$42.50.

Proceedings of a NATO Advanced Study Institute held in Brussels in 1980, consisting of 25 papers, reproduced from typescripts. Hardbound and with a short subject index.

Ions in Macromolecular and Biological Systems. Edited by D. H. Everett and B. Vincent. University Park Press, Baltimore, Md. 1978. xiii + 348 pp. \$39.50.

Proceedings of the Twenty-ninth Symposium of the Colstron Research Society, held at the University of Bristol in 1977, consisting of 26 papers, set in type, hardbound, and provided with a subject index.

Chemistry of Peptides and Proteins. Edited by Wolfgang Voelter, Erich Wunsch, Yuri Ovchennikov, and Vadim Ivanov. Walter de Gruyter and Co., Berlin and New York. 1982. xiii + 554 pp. \$89.15.

Proceedings of the Third USSR-FRG Symposium, held in Mak-hachkala, USSR, in 1980, consisting of a large number of generally short papers, all in English, reproduced from typescripts. Hardbound and with author and subject indexes.

Structure and Activity of Natural Peptides. Edited by W. Voelter and G. Weitzel. Walter de Gruyter and Co., Berlin and New York. 1981. xii + 634 pp. \$68.20.

Proceedings of the Fall Meeting of the Gesellschaft für Biologische Chemie, held in Tübingen in 1979, consisting of 38 papers, all in English, reproduced from the authors' typescripts. Hardbound and with author

and subject indexes.

Structural Molecular Biology: Methods and Applications. Edited by David B. Davis, Wolfram Saenger, and Steven S. Danyluk. Plenum Press, New York. 1982. x + 530 pp. \$65.00.

Proceedings of a NATO Advanced Study Institute held in Italy in 1981, consisting of 17 review papers with extensive bibliographies, notes on research seminars, and poster presentations, reproduced from the authors' typescripts. Hardbound and with subject index.

Terminal Transferase in Immunobiology and Leukemia. Edited by Umberto Bertazzoni and F. J. Bollum. Plenum Press, New York. 1982. xii + 393 pp. \$49.50.

Proceedings of an EMBO Workshop held in Italy in 1981, consisting of 31 papers reproduced from typescripts. Hardbound and with subject index.

Enzyme Engineering. Edited by Ichiro Chibata, Saburo Fukui, and Lemuel B. Wingard, Jr. Plenum Press, New York. 1982. xxii + 538 pp. \$59.50.

Proceedings of the 2nd Engineering Foundation Conference on the title subject, held in Japan in 1981, consisting of a large number of short (2 to 10 pages) papers in uniform typescript plus a history of the Conference and a major keynote address, Recent Studies on Antibiotics and Low Molecular Weight Enzyme Inhibitors, by H. Umezawa. Hardbound with subject index.

Behavioral Models and the Analysis of Drug Action. Edited by Michael Y. Spiegelstein and Aharon Levy. Elsevier Scientific Publishing Co., Amsterdam and New York. 1982. xvi + 498 pp. \$139.50.

Proceedings of the 27th OHOLO Conference, held in Israel in 1982, consisting of 31 papers in seemingly nearly as many typefaces, hardbound, but not indexed.

Advanced Interpretation of Clinical Laboratory Data. Edited by Camille Heusghem, Adelin Albert, and Ellis S. Benson. Marcel Dekker, Inc., New York. 1982. xxiv + 420 pp. \$55.00.

Proceedings of a conference held in Graz in 1981, consisting of 29 papers together with discussions and abstracts of a poster session. Reproduced from the authors' typescripts, hardbound, but not indexed.

Cyclodextrins. Edited by J. Szejtli. D. Reidel Publishing Co., Dordrecht, Boston, and London. 1982. xiii + 544 pp. \$84.50.

Proceedings of a symposium held in Budapest in 1981, organized by the Congress Bureau of the Association of Hungarian Medical Societies, containing 63 papers, reproduced from a wide mixture of typefaces, hardbound, and with both author and subject indexes.

Microsomes, Drug Oxidations, and Drug Toxicity. Edited by Ryo Sato and Ryuichi Kato. Copublished by Japan Scientific Societies Press, Tokyo, and Wiley-Interscience, New York. 1982. xvii + 636 pp. \$59.95.

Proceedings of the Fifth International Symposium on the title subject, held in Tokyo in 1981, consisting of a large number of mostly very short (2 pages) papers, some of which appear to be typeset, whereas others, curiously, are reproduced from miscellaneous typescripts. No index of any sort.

Thermal Analysis. Volumes 1 and 2. Edited by Bernard Miller. John Wiley and Sons, New York. 1982. xxxii + 1530 pp. \$90.00.

Proceedings of the Seventh International Conference, held in Ontario in 1982, consisting of over 200 papers, ranging from award addresses and plenary lectures to reports of original research, reproduced from a rich variety of typescripts. The lack of a subject index in a work of this size detracts substantially from its usefulness.