Book Reviews*

Aldehydes—Photometric Analysis. Volume 4. By EUGENE SAWICKI and CAROLE R. SAWICKI. Academic Press, London and New York. 1977. xiii + 285 pp. $26.25.

This volume is a continuation of the systematic cataloguing of methods of analysis of substances by converting them to aldehydes. It is arranged alphabetically by aldehyde (benzaldehyde to dodecapentaenedial), and under each is considered the sources from which it might be derived. The reactions are given with tables of published applications and representative experimental procedures. Carbohydrate aldehydes are particularly prominent in this volume. A complete author index and a very detailed subject index make this volume independently useful.

The Chemistry of Functional Groups. Supplement A: The Chemistry of Double-bonded Functional Groups. Parts 1 and 2. Edited by SAUL PATAI. Wiley/Interscience, New York, N.Y. 1977. xv + xv + 1343 pp. Part 1, $58.00; Part 2, $60.00.

These two books begin a series of supplementary volumes to the now nearly complete work. Their purpose is to fill in the gaps where originally planned chapters could not be obtained, and "to give a unified and comparative treatment of several related functional groups together."

Part 1 contains seven chapters: Dipole Moments, Configurations and Conformations of Molecules Containing X=Y Groups (O. Exner), Liquid Crystals with X=Y Groups (J. P. Van Meter), Thermochemistry of X=Y Groups (R. Shaw), Mechanisms of Elimination and Addition Reactions Involving the X=Y Group (A. F. Cockerill and R. G. Harrison), The Electrochemistry of X=Y Groups (A. J. Fry and R. G. Reed), 1,3-Dipolar Cycloadditions Involving X=Y Groups (G. Bianchi, C. De Micheli, and R. Gandolfi), and Reactions of Carbenes with X=Y Groups (A. P. Marchand).

Part 2 contains the index to both volumes and six chapters: The Formation of Unsaturated Groups by Heterolytic Fragmentation (K. B. Becker and C. A. Grob), Electrophilic Additions to Carbon–Carbon Double Bonds (G. H. Schmid and D. G. Garratt), The Olefin Metathesis Reaction (N. Calderon), Oxidation of C=C and C=N Groups (P. M. Henry and G. L. Lange), Transition Metal Catalyzed Carbonylation of Olefins (J. K. Stille and D. E. James), and Imidines and Diamidides (J. A. Elvidge and N. R. Barot).

It is obvious that the editor has been successful in recruiting chemists outstanding in research in the fields about which they have written. The chapters are not encyclopedic, although there are many tables; rather, they are unifying, moderately critical reviews. They are well done, and the books are as beautifully produced as earlier volumes in the series. A library that has the original series cannot forego these supplements.

Hydrogenation and Hydrogenolysis in Synthetic Organic Chemistry. By A. P. G. KIEBOOM and F. VAN RANTWIJK. Delft University Press, Delft, Netherlands. 1977 (distributed by Academic Book Services Holland, P.O. Box 66, Groningen, Netherlands). xi + 157 pp. Dfl. 45.00 (ca. $20).

This paperbound book has the stated aim "to provide preparative organic chemists with the insight and know-how necessary to apply catalytic hydrogenation and hydrogenolysis to synthetic problems." It presents the material in a rational way with emphasis on the role of mechanism and organization according to the type of bond being broken. The chapters are succinct and full of helpful information. They have only short bibliographies, sufficient to lead the nonspecialist into the subject. The book provides a quick and useful orientation and should be especially useful to those beginning their research careers in the area of synthesis.

Organic Syntheses. Volume 56. Edited by G. H. BÜCHI. John Wiley & Sons, Inc., New York, N.Y. 1977. xi + 144 + 13 pp. $12.50.

This old friend continues its valuable service to organic chemists and evolves with the times to meeting changing needs. Its emphasis is now on model procedures, and the short discussions following each preparative procedure serve to point out scope and application. Two graceful obituaries record the passing of William W. Hartman and William E. Parham, who contributed so much to the vigor and quality of "Organic Syntheses".

The twenty-seven carefully checked procedures in this volume draw heavily on recently discovered methods and are thus especially welcome for their timeliness. The Editor's preface should not be overlooked, for it is both informative and very pleasantly written. At the other end, one finds a note of warning about the serious toxic effects of methyl iodide on the central nervous system, an author index, a two-part subject index, and thirteen pages describing, in equation form only, a group of procedures that have been submitted but not yet checked.

Pigment Cell. Volume 2. Melanomas: Basic Properties and Clinical Behavior. Edited by V. RILEY. S. Karger AG, Basel. 1976 (distributed in U.S.A. by Albert J. Phiebig Inc., P. O. Box 352, White Plains, N.Y. 10602). xx + 456 pp. SFr. 153 (ca. $63.75).

This book is the Proceedings of the 9th International Pigment Cell Conference, held at Houston in 1975. Although most of the papers in it are biological or clinical in emphasis, there are several on biochemistry and enzymology, including protein structure and photobiology. There is a substantial subject index.

Rodd's Chemistry of Carbon Compounds. Second Edition. Volume IV. Part B. Edited by S. COFFEY. Elsevier/North Holland, Amsterdam. 1977. xix + 462 pp. $75.50.

This second part of Volume IV is subtitled "Five-membered Monoheterocyclic Compounds: Alkaloids, Dyes, Pigments". The organization departs radically from that of the first edition, for the purpose of "bringing together a large number of important and interesting yet very diverse classes of compounds based on the five-membered heterocyclic pyrrole and closely related ring systems". There are nine contributed chapters, of which the first five are devoted to the various classes of pyrrolidine, pyrrolizidine, pyrrole, and indole alkaloids. The remaining chapters cover pyrrole pigments, azaporphins, phthalocyanines, indigoid compounds, and cyanine dyes.

It is good to see that information on pharmacological and metabolic properties is included, as well as discussions of spectroscopic properties and techniques. The overall treatment of the subject is as detailed and authoritative as one has come to expect of the series. It would be helpful if in the future volumes the date at which literature coverage ceased was explicitly stated. The editor's preface is dated August 1976, and the individual chapters must have been finished well before then, but no earlier than 1973, for the Eschenmoser–Woodward synthesis of cobyric acid is mentioned. The usual excellent index completes the volume.

Trends in Electrochemistry. Edited by J. O'M. BOCKRIS, D. A. J. RAND, and B. J. WELCH. Plenum Publishing Corp., New York, N.Y. 1977. 408 pp. $35.00.

The plenary lectures and invited papers delivered at the Fourth Australian Conference on Electrochemistry (February 1976) constitute the contents of this volume. The theme of the Conference was "electrochemistry for a future society". A substantial part of the program was concerned with energy production, utilization, and storage, but there were also sections on surface and colloid electrochemistry, electrochemical techniques, mineral sulfide electrochemistry, and metallurgy. There is a real author index and a substantial subject index, features not often found in volumes of proceedings.

Organic Chemistry. By DOUGLAS C. NECKERS (Bowling Green State University) and MICHAEL P. DOYLE (Hope College). John Wiley & Sons, Inc., New York, N.Y. 1977. xxxvi + 1147 pp. $21.95.

* Unsigned book reviews are by the Book Review Editor.

This is a well-written comprehensive textbook intended for the student desiring a thorough introduction to organic chemistry. It attempts, quite successfully, to show the integration of major concepts that form the basis of what is known about structures, mechanism, and synthesis.

The book deals first with hydrocarbons and alkyl halides, then in Chapter 4 takes up spectra (mass spectroscopy, IR, and NMR). Electron absorption spectroscopy (or UV to most of us) is taken up in Chapter 6, where dienes are encountered.

Reaction mechanisms and stereochemistry are also introduced in early chapters. However, one has to wait until Chapter 11 (p 281 ff) to encounter compounds containing oxygen. This presents a problem to those anxious to begin laboratory work involving common classes of compounds and yet correlate lecture and laboratory.

The text is slightly unorthodox in that the methods of preparing a class of compound, and the reactions of that class of compound, are not necessarily found close together; e.g., one finds a listing of alkene reactions (pp 117–119), but the preparation of alkenes is not encountered until pp 199–200. The development, however, is logical; e.g., the preparation of alkenes is considered after carbonium ions have been studied in the intervening pages.

Some problems are scattered throughout the chapters, and a goodly number are found at the end of most chapters. (There are said to be over 1100 problems altogether.)

Special sections (e.g., Industrial Organic Chemistry, and the Chemistry of Coal), which stand by themselves, enhance the work and make it current.

The book deals with up-to-date techniques, such as the Merrifield synthesis of polypeptides, and concepts, such as orbital symmetry; it provides a seven-page bibliography, and its drawings are well-done. The print is easy to read and the format is pleasing.

Chapter 28 (Organic Chemistry and the Periodic Table) is an unusual and valuable feature. While we often mentally place compounds of carbon with elements such as Li, Mg, B, and Fe in separate categories, this chapter points out not only the utility of these compounds, but also emphasizes that carbon can logically be expected to bond with many elements of the periodic table.

Also available are a "Solutions Manual", a programmed "Study Guide", and a "Personalized System of Instruction Study Guide".

This carefully sequenced text can be recommended as one which instructors will enjoy, because of a wide range of topics and problems, and students will like, because it is easy to read and because basic concepts are carefully and clearly developed.

Andrew C. Watson, *Schoolcraft College*

Biological Macromolecules and Polyelectrolytes in Solution. By H. EISENBERG (The Weizmann Institute of Science, Israel). Oxford University Press, London. 1976. xviii + 272 pp. $33.75.

The title is more general than the contents. This book deals with selected topics, mainly in the areas of thermodynamics and transport properties of solutions (with emphasis on macromolecular solutes). The topics covered are theory of multicomponent systems, partial volumes and density, light (and small angle x-ray) scattering, sedimentation equilibrium, transport methods, and viscosity. The coverage of each topic is brief. For readers interested in more detailed presentations, the author provides an excellent bibliography. This brief book should be a useful complement to the earlier (and more comprehensive) one by C. Tanford, "Physical Chemistry of Macromolecules".

Adam Allerhand, *Indiana University*

Introduction to the Spectroscopy of Biological Polymers. Edited by D. W. JONES (University of Bradford, England). Academic Press, London and New York. 1976. xii + 328 pp. $25.50.

This text on the applications of spectroscopic techniques in biochemistry and biophysics is an assemblage of chapters written by several contributors at the senior undergraduate to first-year graduate level. The first chapter, by the Editor, is an introduction. The remaining chapters, given by number, title (author) and content, follow. Chapter 2, Infrared Spectroscopy (J. H. Keighley), provides a sound description of basic theory, and of polarization and derivative spectra. Results on proteins and polysaccharides are given. Chapter 3, Raman Spectroscopy (J. L. Koenig), includes a rudimentary description of the physical basis and extensive results on polypeptides and polynucleotides. Resonance raman scattering is not treated. Chapter 4, Far-infrared Spectroscopy (T. R. Manley), while well written, could have been combined beneficially with Chapter 2. Chapter 5, Electronic Absorption and Emission Spectroscopy (S. Ainsworth), provides a concise description of the photophysics of electronic transitions, and of energy transfer. There are few examples and exciton phenomena are not presented. Chapter 6, Optical Rotatory Dispersion and Circular Dichroism (D. G. Dalgleish), presents a cursory treatment of optical activity and describes applications to proteins, nucleic acids, and certain probe molecules. Chapter 7, Nuclear Magnetic Resonance Spectroscopy (J. S. Leigh), provides an excellent summary of all significant facets of this topic. Chapter 8, Electron-Spin Resonance (J. H. Keighley), describes theory adequately but draws examples largely from free radicals induced in polypeptides and proteins. Paramagnetic metalloproteins and ESR spin labels are neglected. Chapter 9, Mössbauer Spectroscopy (C. E. Johnson), is a fine description of the method, with several examples of iron-containing proteins included. Chapter 10, Combined Applications and Other Techniques (the Editor), outlines strategies for the concerted application of several of the above techniques and hints at certain other methods.

Most chapters (but not 5 and 6) describe instrumentation. Chapters 3, 5, and 6 have assiduously avoided mathematical formulas, and the consequent verbal descriptions sometimes lead to loss of clarity. Continuity has in places not been adequately achieved. For example an exposition of group theory in Chapter 2 has been ignored in Chapters 3 and 5, where symmetry-based selection rules could have been described.

Overall, this is a useful text, for it treats reasonably well an area of study which has not received adequate attention in the past. It is optimally suited as an adjunct to a formal lecture course; it is less valuable as a reference or for self-instruction.

Henry E. Auer
University of Rochester, School of Medicine & Dentistry

Inorganic Aspects of Biological and Organic Chemistry. By ROBERT P. HANZLIK (University of Kansas). Academic Press, New York, N.Y. 1976. xvii + 402 pp. $37.00.

Professor Hanzlik's book is designed to introduce research workers in organic and biological chemistry to the applications of the hitherto somewhat arcane art of inorganic chemistry to their fields of study. It will also be read with profit by hard-core inorganic chemists interested in familiarizing themselves with the organic and biological implications of their work. The book focusses on the types of reactions which can occur at a metal center, including catalysis by metal ions, shifting of equilibria by chelation, and reactions of coordinated ligands. This offers a refreshing change from the "metallocentric" point of view of most inorganic texts, which emphasize the effect of the environment upon the electronic properties of the metal ion. That is, the emphasis here is on what a metal ion can *do*, and not on the nature of the metal complex itself. Through the use of numerous examples of well-studied reactions, the author nicely illustrates the basic principles involved in metal-mediated reactions.

The organization of the book is such as to proceed from ionic interactions of metals with no valence electrons through the coordination chemistry of the transition metals, showing the effect of partially occupied d orbitals, to organometallic compounds with highly covalent metal–ligand bonding. The discussion of the alkali metals and the alkaline earths demonstrates that these cations can be regarded as "protons" of varying charge and radius, with their chemistry largely dictated by the ratio of these two parameters. This is followed by a brief discussion of atomic structure and bonding theory, which introduces the reader to transition metal chemistry. The analogies presented in Chapter VI between ligand exchange reactions of six-coordinate complexes and classical organic S_N1 substitution reactions serve to illustrate the fact that organic and inorganic chemistry do indeed obey the same basic principles, contrary to the belief of many students. A point which is particularly emphasized is the apparent paradox of how an enzyme molecule is able to coordinate a metal ion cofactor, rendering it kinetically inert to exchange, yet allowing rapid exchange of ligands (substrates and products) at one or more coordination sites. Since a major role of metal ions in biology is catalysis of oxidation–reduction reactions, the nature of electron-transfer reactions and the factors affecting oxidation–reduction potentials are considered in some detail in Chapter VII. Unfortunately, the electrochemical data are not presented using the same convention throughout, and the shift from reduction potentials to oxidation potentials may trip the unwary reader. In addition to reactions involving

organic molecules, a discussion of the reactivity of two important inorganic molecules, O_2 and N_2, is included. The final chapters on organometallic chemistry consist of a brief survey of metal–carbon bonding and basic types of reactions (ligand dissociation–association, oxidative addition–reductive elimination, insertion and coupling), followed by a longer survey of specific examples of each of these and a discussion of the factors affecting them.

Since the book is intended to be read by people with diverse backgrounds, the level of the material presented varies a great deal. For example, the sections on atomic structure and bonding will be redundant to those with graduate-level inorganic training, but probably necessary for many other readers, while the organometallic chemistry chapters may be rather heavy going for some biochemists. The title of the book is also somewhat misleading, in that the inorganic chemistry of the nonmetals is not considered; a more descriptive title would have been "Metal Ions in Organic and Biological Chemistry". The major criticism of the book, however, must be that the emphasis is primarily on organic applications of inorganic chemistry, with the biological aspects being somewhat shortchanged. Thus, the reduction of oxygen in biological respiration is mentioned briefly, but not the converse, the photosynthetic evolution of oxygen from water, nor the activation of molecular oxygen by mono- and dioxygenases. Other examples of metalloenzymes involved in biological oxidation–reduction reactions and not included in the book could be cited, demonstrating the lack of emphasis on some of the most exciting new applications of inorganic chemistry to biology. The point is simply that these omissions prevent a very good book from being even better.

Bruce A. Averill, *Michigan State University*

Advances in Biochemical Engineering. Volume IV. Edited by T. K. GHOSE, A. FIECHTER, and N. BLAKEBROUGH. Springer-Verlag, New York, N.Y. 1976. 172 pp. $24.60.

The Advances in Biochemical Engineering Series represents the first major source of review articles that are specifically oriented to the biochemical engineer. What is especially unique about this series is the method of presentation. The first half of each article represents a basic review of the topic. Each subject is introduced and developed in a very readable and understandable fashion. The secord half of each article represents a comprehensive set of recent results that have been obtained by the particular author. As a result, the articles present information which is useful to both the casual and highly specialized reader.

Volume IV in this series presents four topic areas. The first two are: "Transfer of Oxygen and Scale-Up in Submerged Aerobic Fermentation", and "Microbial Flocs and Flocculation in Fermentation Process Engineering". It is fortuitous that these are presented under the same cover as they are considerably interrelated. The second two articles are: "Analog/Hybrid Computation in Biochemical Engineering", and a short article on "Preparation and Properties of Gel Entrapped Enzymes". These two articles basically stand alone.

Although this book is not a class textbook, it could be readily used for outside reading assignments for senior or graduate level courses. The subject matter that is presented should be of interest to engineers, microbiologists, and biochemists, who are interested in industrial applications. The extensive literature survey should be of special interest to students or researchers who are moving into a new area of research.

Fredric G. Bader, *The University of Michigan*

Poly(ethylene oxide). By F. E. BAILEY, JR., and J. V. KOLESKE. Academic Press, Inc., New York, N.Y. 1976. ix + 173 pp. $13.00.

Poly(ethylene oxide) is an interesting hybrid of an easily read textbook and the typical reference book. It is very readable, allowing those uninitiated to gain a reasonable understanding with a minimum of "fuss"—a quite positive feature.

Several chapters are only short summaries. Chapter 2, "Preparation of Ethylene Oxide", is only five content pages in length, with little discussion of experimental particularities, etc. This is understandable, since the book is about poly(ethylene oxide)—not ethylene oxide. Of a more serious nature is the brevity of the chapter dealing with applications. Some nice applications (such as the use of 30-ppm poly(ethylene oxide) to reduce by 80% the frictional resistance in fire hoses, allowing over a doubling of "water throw" distance) are described, but much more should be included since poly(ethylene oxide) is a "second magnitude" polymer (i.e., of secondary industrial importance; polyethylene is a "first magnitude" polymer, and polyphosphonate ester a "third magnitude" industrial polymer). For instance, little is said about such typical applications as sizing for synthetic and cotton fibers. Also, little or nothing is said about the biodegradation of poly(ethylene oxide) or about the toxicity of ethylene oxide or poly(ethylene oxide).

Unfortunately no new commercial secrets—such as the details for commercial preparation of high molecular weight poly(ethylene oxide)—are revealed.

The book is fairly current with coverage including at least some of 1975. It includes a number of helpful hints that would probably be overlooked by the novice, such as utilization of the inverse solubility–temperature relationship to effect rapid aqueous solution. A good summary of solution properties is included as are chapters on "Association Complexes of Poly(ethylene oxide)" and "Copolymers of Ethylene Oxide".

By no means is this a complete, exhaustive treatise on poly(ethylene oxide), but it is a good overview with supporting literature data. The authors do more than simply quote literature; often they speculate, integrate, and evaluate literature reports, a positive feature.

I advise its purchase by both academic and industrial libraries and by those who have some interest in poly(ethylene oxide), poly(methylene oxide), polyethers, or polyglycols. Its readability also allows its use by chemists involved with pharmaceutical and cosmetic formulations and pharmaceutical coatings.

Charles E. Carraher, *Wright State University*

Spectroscopy. Edited by B. P. STRAUGHAN (University of Newcastle upon Tyne, England) and S. WALKER (Lakehead University, Canada). Wiley/Halsted, New York, N.Y. 1976. Vol. 1, x + 304 pp; Vol. 2, x + 362 pp; Vol. 3, x + 324 pp. $22.50 each.

S. Walker and H. Straw wrote the first, two-volume edition of "Spectroscopy" in 1962 as a medium-level introduction to the main branches of spectroscopy and to present an integrated view of spectroscopy. There have been many advances in the meantime that have tended to outdate this work; therefore, B. Straughan and S. Walker, assisted by several of their English colleagues, have produced a second edition comprising three volumes and containing much new material in reflection of modern research developments and progress in instrumentation. As before, the volumes are intended to be self-contained and they are primarily designed to serve as a comprehensive reference for all the spectroscopy that an undergraduate chemistry student will normally encounter; the books will also be useful and informative to graduate students, senior researchers just entering a field, and to students and workers in applied physics. There are no problems to be worked at the end of the chapters, and, therefore, these books do not fit the classical textbook mold. Nonetheless, the readability and good, progressive depth of coverage in each chapter make these books useful in teaching as primary references for students taking laboratory-oriented courses in analytical chemistry, independent study courses, or research participation courses. The complexities of each area of spectroscopy are clearly and effectively explained, and effective use is made of diagrams and research data. Mathematical development is kept to a minumum without sacrificing completeness. SI units are used throughout, and the notation is consistent throughout the chapters.

Volume 1 is devoted to atomic spectroscopy, while Volumes 2 and 3 cover molecular spectroscopy. Most chapters have been revised and restructured since the first edition; all chapters have been updated. The physics of quantum wave mechanics is employed more frequently in the chapters, in contrast to its almost complete confinement to an appendix in the first edition. Areas of spectroscopy that have experienced increased activity and development since the first edition are now discussed in separate expanded chapters. These include nuclear quadrupole resonance spectroscopy, far-infrared spectroscopy, and the electronic spectra of polyatomic molecules. Relatively new areas of research, such as Mössbauer spectroscopy and photoelectron spectroscopy, are also included in separate chapters. A new chapter on symmetry and group theory has been added, and its inclusion should assist in the understanding of fundamental processes in molecular spectra. The appendices have been expanded to include quantum mechanical calculations and derivations on absorption and emission of radiation, the harmonic oscillator, and diatomic molecular vibrations. Other topics that are treated in separate chapters are nuclear magnetic resonance, electron spin resonance, microwave, infrared, luminescence, and Raman spectroscopy; an introduction to

atomic and molecular theory; dissociation energies, force constants, and thermodynamic functions; and astrochemistry.

Each volume begins with an introductory chapter, or two, that develops the theoretical background necessary to understand the material that follows. Each succeeding chapter generally gives a thorough coverage of its topic, including general principles, experimental methods, instrumentation, methods of data interpretation, and applications. Extensive, up-to-date references are found at the end of each chapter.

The readers of these books will be rewarded with an insight into and a fundamental understanding of spectroscopy. Even a scientist already working in a field of spectroscopy will come away with a clearer understanding of his science, and he will also appreciate better the interrelation between different branches of spectroscopy. The authors of the chapters have succeeded in their efforts to make the material understandable from first principles; Straughan and Walker have also nicely succeeded in maintaining a consistent clarity and cohesiveness throughout all three volumes. Better treatments of individual fields of spectroscopy exist as separate books devoted to one field, and more detailed and pedagogically oriented texts can be found on basic atomic and molecular theory; but this up-to-date and highly readable set of books puts it all together, and the volumes stand out in accomplishing the intended purpose of introducing modern spectroscopy, especially to undergraduates, and of showing how the various branches of spectroscopy intertwine and complement each other.

Sam J. Cipolla, *Creighton University*

Thermal Analysis. Volume 1: Theory. Inorganic Chemistry. Volume 2: Organic and Macromolecular Chemistry. Earth Sciences. Volume 3: Applied Sciences. Methodics and Instrumentation. Edited by I. BUZÁS (Institute for General and Analytical Chemistry, Technical University, Budapest, Hungary). Heyden and Son Ltd. Publishers, London. 1975. xx + 1046 pp (Vol 1); xviii + 767 pp (Vol 2); xx + 1119 pp (Vol 3). $77.68 (set).

This three-volume set of hardback books constitutes the Proceedings of the Fourth International Conference on Thermal Analysis held at Budapest, Hungary, from July 8 to 13, 1974. The copyright is actually held by Akadémiai Kiadó, Budapest, and the books are printed in Hungary. Presumably Heyden and Son Ltd. is the agent for publication and distribution in the west.

The Conference Proceedings consist of a total of 277 papers broken down as follows: 32 papers on Theory, 68 papers on Inorganic Chemistry; 49 papers on Organic and Macromolecular Chemistry, 23 papers on Earth Sciences; 64 papers on Applied Sciences, and 41 papers on Methodics and Instrumentation. As would be expected authorship of papers is predominantly east European, although the names of some well-known western researchers such as Levy, Bergren, Nesbitt, and Wendlandt, do occur. All papers are in English, the quality of which ranges from excellent to quite awkward in grammar, spelling, and word usage, as anticipated. Since reproduction is (photographically?) from original typewritten manuscripts and, occasionally, rough draft figures, there is a wide variance in quality here as well. Significance and scientific contents of the reports vary from truly interesting, new, and worthwhile to (in this reviewer's opinion) trivial and obscure. (Perhaps some obscurity is a result of this reviewer's inability to comprehend the intended meanings in some of the papers exhibiting awkward English translation and word usage.)

It is doubtful that any but the most active workers in thermal analytical research would be interested in purchasing these books for personal use, but certainly they represent a very worthwhile addition to the technical library of any institution in which such research is performed. It is probable that every researcher in the overall area will find one or more topics of specific interest in this almost encyclopedic coverage of the state of the art.

James L. Copeland, *Kansas State University*

Topics in Current Chemistry (Fortschritte der Chemischen Forschung). Volume 63. Bonding and Structure. Springer-Verlag, Berlin—Heidelberg—New York. 1976. 202 pp. $27.90.

The title of this volume is rather ambitious for a relatively short book of review articles, and I was disappointed to find the topics limited to "Discriminating Interactions Between Chiral Molecules", by D. P. Craig and D. P. Mellor, "No-Bond-Resonance Compounds, Structure, Bonding, and Properties", by R. Gleiter and R. Gygax, and "The Molecular Zeeman Effect", by D. H. Sutter and W. H. Flygare.

The first article is written at a fairly high level and includes discussions of experimental background, electrostatic discrimination, discrimination in the dispersion interaction, resonance discrimination, and discrimination by short-range forces in chiral molecules. The article is 48 pages long, including a relatively short bibliography which includes only 16 literature references since 1970.

The second article concerns the trithiapentalenes and includes rather abbreviated discussions of their molecular structure, bonding models, spectroscopic investigations, and chemical properties. It is 40 pages in length.

The third article comprises more than half the book and is an excellent review at the graduate level of the Zeeman effect, including some basic principles of the rigid rotor model, determination of the molecular electric quadrupole moments, tabulated values of some magnetic susceptibilities, instrumentation, and analysis of rotational Zeeman effect spectra in asymmetric top, symmetric top, and linear molecules and in molecules containing quadrupole nuclei. There is also a derivation of the effective rotational Hamiltonian and a tabulation of the molecular Zeeman effect data (50 molecules) collected since a review in 1971.

Although there is useful information in this review volume, the cost of the book seems unreasonable. I'm sure that even many libraries will be unable to purchase this series of books, and this limits their usefulness.

Gene A. Crowder, *West Texas State University*

Enzyme Kinetics. By D. V. ROBERTS (Australian National University). Cambridge University Press, London. 1977. x + 326 pp. $31.50 (hardcover), $9.95 (paperback).

This volume in the Cambridge Chemistry Texts series is at least the fifth major treatise on enzyme kinetics to appear in the past three years. After a brief introduction to chemical kinetics, successive chapters are devoted to one-substrate reactions, reversible inhibition, pH and temperature dependence, multisubstrate reactions, flow and relaxation studies, regulatory enzymes, coupled enzyme systems, computer simulation of biochemical systems, and statistical treatment of enzyme kinetic data. Overall, the treatment is quite a readable introduction to the subject, although the language and terminology are rather loose in places and Textbook Error 130[1] is committed on several occasions. The aspiring professional enzyme kineticist will prefer the more comprehensive texts of Laidler and Bunting (no relation to the reviewer), Fromm, or Segal. However, there is one feature of this new publication that will make it the choice of a large number of students—its availability in a paperback edition for less than $10.

(1) F. R. Cruickshank, A. J. Hyde, and D. Pugh, *J. Chem. Educ.*, **54**, 288 (1977).

John W. Bunting *University of Toronto*