Book Reviews *

Advances in Photochemistry. Volume 18. By David H. Volman (University of California), George S. Hammond (Bowling Green State University), and Douglas C. Neckers (Bowling Green State University). J. Wiley and Sons: New York. 1993. x + 406 pp. $125.00. ISBN 0-471-1991133-5.

This is perhaps one of the most outstanding volumes in the series of Advances in Photochemistry. The topic selections are such that it more than fulfills the original goal of exploring the recent frontiers of photochemistry. This volume contains four chapters: Time-Resolved FTIR Emission Studies of Photochemical Reactions by Graham Hancock and Dwayne E. Heard; A Model for the Influence of Organized Media on Photochemical Reactions by V. Ramamurthy, Richard G. Weiss, and George S. Hammond; Up-Scaling Photochemical Reactions by André M. Braun, Laurent Jakob, Esther Oliveros, and Claudio A. Oller Do Nascimento; Photochemistry of Xanthine Dyes by Douglas C. Necker and Oscar M. Valdes-Aguilera.

This volume provides opportunities for students and researchers alike to familiarize themselves with selected aspects of photochemistry that can be applied as an introductory exposition or in support of ongoing research. As a graduate textbook on the modern contents of photochemistry, this book does well. In the service of uniformity in course description, one could retitle the chapters as case studies: Experimental Setups; Photochemistry in Supporting Media; Industrial Photochemistry; and Photochemistry of Sensitization. The four chapters are almost self contained and are successful in exposing the state of the art of various topics without requiring extensive prior knowledge in photochemistry.

Almost half (168 out of 400 pages) of this volume is dedicated to the second chapter on the photochemistry in organized media. The chapter summarizes a gigantic effort in exploring several photochemical reactions in a large variety of media (322 references not counting multiples). An attempt is being made to provide some degree of unification and global understanding through a model based on reaction cavity and classification of the walls of such cavities as passive, active, stiff, flexible, etc. The analytical power of such a model in providing a unifying framework for the large volume of data did not come through. It was surprising that the present large effort in attempting to understand dynamic phenomena in restricted media was not even mentioned in this chapter. Perhaps a suitable catalyst for interdisciplinary exposure is still considered to be too precious, but a topic such as photochemistry in organized media remains an unfulfilling aggregate of case studies without such an attempt. The other chapters are much narrower in scope and do not appear to suffer from such a monochromatic vision—in particular the chapter on scale-ups that can be easily trivialized by attempting to simplify engineering concerns manages to expose us to a balanced picture.

I strongly recommend this volume to new and old practitioners of photochemistry, to the browsing visitors, and to graduate students who wish to get a sense about the essence of one of the most exciting branches of physical chemistry.

Micha Tomkiewicz, *Brooklyn College of CUNY*

Adsorption of Molecules at Metal Electrodes. By J. Lipkowski and P. N. Ross. VCH: New York. 1992. xii + 414 pp. $145.00. ISBN 0-89573-786-8. **Structure of Electrified Interfaces.** By J. Lipkowski and P. N. Ross. VCH: New York. 1993. x + 406 pp. $125.00. ISBN 0-89573-789-2.

Although not cohesively advertised as such, these two volumes (hereafter referred to as Volumes I and II) form the initial segments of a new series Frontiers of Electrochemistry. One might question the need for another (highly priced) sequence of volumes in an area already served with more than one well-established review series. However, interfacial electrochemistry is currently evolving rapidly into a discipline with a much stronger atomic-/molecular-level flavor than hitherto, partly as a result of developments in experimental methodology. This series aims to provide coherent sets of reviews on specific topics within the discipline of "electrochemical surface science", with an emphasis on theory and results rather than on the techniques themselves.

Some shortcomings notwithstanding, the two volumes issued so far largely meet this goal. Volume I focuses on molecular adsorption, with an interesting mix of chapters, mostly from an experimental perspective, that discuss results obtained from both traditional electrochemical and in-situ spectroscopic methods. In particular, the last four chapters, by Plieth et al., Pettinger, Nichols, and Corn, provide excellent overviews of the detailed information now obtainable by means of in-situ optical spectroscopies on adsorbate surface bonding at metal electrodes. The earlier chapters, by Buess-Herman, Krauskopf/Wieckowski, and Lipkowski/Stolberg are nicely complementary in that they demonstrate clearly the value of traditional or other nonmolecular level approaches (radiochemistry). An initial chapter in theoretical modeling by Guidelli covers this somewhat disconnected subject credibly well.

Volume II attempts to cover the somewhat broader topic of the structure of electrochemical interfaces. It is here that the weaknesses as well as strengths of the review series so far become apparent. The initial three chapters, by Van Hove, Ross, and Kolb, are concerned with crystallography of metal surfaces, the first being a general overview, with the latter two concerned with electrochemical interfaces. Unfortunately, both the Ross and Kolb chapters fell short of providing a current assessment of our knowledge of spatial atomic structure at metal electrodes. The latter author focuses chiefly on work from his own laboratory on utilizing ex-situ ultrahigh vacuum (uhv) based methods for the assessment of surface crystallographic structure. Since 1990, in-situ methods, primarily scanning tunneling microscopy and X-ray scattering techniques, have yielded much crucially important information for this purpose. While some results from the X-ray techniques are included in Ross' survey, Kolb's presentation is almost bereft of such material. Although some time lag between writing and (mid-1993) publication is inevitable, neither chapter is truly contemporary in its coverage, a serious yet apparently avoidable flaw.

The remaining chapters range from modern double-layer theory (Schmickler), computer modeling of interfacial water (Heinzinger), and related experimental approaches to the elucidation of interfacial molecular structure (Borkowski/Stimming, Soriaga, Pirug/Bonzel). The last two of these emphasize the continuing value of uhv methods. The concluding, and probably the best, chapter by Wagner considers, in a more general (and stylish) vein, the experimental simulation of complete double layers in uhv.

Overall, the two volumes represent important new contributions to the surface science literature. Despite the above unfortunate deficiencies, both should help to disseminate the exciting advances being made in contemporary physical electrochemistry to workers in surface science as a whole.

Michael J. Weaver, *Purdue University*

Biotransformations in Organic Chemistry. By Kurt Faber (Technische Universitat Grayl). Springer-Verlag: New York. 1992. x + 230 pp. $79.50. ISBN 0-387-55762-8.

This book is the most recent publication in the field. It was written for organic chemists interested in synthesis and covers the literature to the end of 1991 with over 1400 references. The book is divided into four chapters. Chapter 1 provides an introduction and background of the field, including the discussion of advantages and disadvantages of biocatalysis, the use of isolated enzymes versus whole cells, the simple kinetic and mechanistic aspects of general enzymatic reactions, the enzyme nomenclature, classification and sources, and the types of coenzymes. The subjects are generally treated well except that some concepts are not fairly or clearly assessed. For example, "enzymes display their highest catalytic activity in water" is treated as a disadvantage as the author believes that water is usually the least desired solvent of choice for most organic reactions. Enzymatic catalysis in water, however, could have clear advantages for certain types of transformations, e.g. synthesis of sugar- and nucleotide-related substances. Though some enzymatic reactions, e.g. lipase and protease reactions, can be conveniently carried out in organic solvents in laboratories, whether they can replace chemical processes is an open question. Cofactor-dependent reactions may not be really disadvantageous, as many of such reactions are novel and regeneration of cofactors is now available to reduce the cost and to avoid inhibition problems. With regard to common cofactors used in enzymatic reactions, sugar nucleotides were disappointingly excluded.

Chapter 2 covers the application of biocatalysis in organic synthesis and contains hydrolytic reactions, oxidoreductions, formation of C–C bonds, additions and eliminations, glycosyl-transfer reactions, and halogenation/dehalogenation reactions. The part on hydrolytic reactions is the most comprehensive and many useful approaches based on hydrolases, e.g. ligases, proteases, and nitrile hydrolases, in enantio- and regioselective reactions are described. Techniques required to predict and to improve enantioselectivity in reactions with chiral, prochiral, and meso compounds are described. Active-site models of several hydrolytic

*Unsigned book reviews are by the Book Review Editor.

reactions are illustrated for use to explain known and predict new reactions. Oxidoreductions cover reactions based on both isolated enzymes and whole cells, and both nicotinamide cofactor-dependent and metal-dependent oxidoreductases are included. Some oxygenase reactions are quite interesting. Several new and useful dehydrogenases are not included because the enzymes are not commercially available. On the contrary, some reactions with enzymes not readily available are covered in much detail. The C–C bond forming reactions (especially aldolase reactions), glycosyl-transfer reactions (e.g. glycosidase and glycosyltransferase reactions), and ATP-dependent phosphorylation are only briefly discussed. Very limited information is provided for addition/elimination and halogenation/dehalogenation reactions.

Chapter 3 covers some special techniques used in enzymatic processes, such as reactions in organic solvents in esterase- and protease-catalyzed reactions, enzyme immobilization, modified and artificial enzymes, and catalytic antibodies. A good discussion and coverage is seen in the organic solvent section. The problems of the reversible nature of reactions (e.g. transesterification) in organic solvents are mentioned, and solutions to the problems with the use of irreversible transfer reactions are described. Chapter 4 covers the state of the art and the outlook of the field. In general, the book contains useful information and is a good reference for those who are interested in the use of enzymes in organic synthesis.

Chi-Huey Wong, *Scripps Research Institute*

Organic Photochemistry: A Comprehensive Treatment. By William Horspool (University of Dundee) and Diego Armesto (Universidad Complutense, Madrid). Ellis Horwood and Prentice Hall: New York. 1992. xiv + 521 pp. $75.00. ISBN 0-13-639477-9.

This text is addressed primarily to synthetic organic chemists and their students. It catalogs a wide variety of synthetic transformations which are organized in chapters according to heteroatom. Thus, Chapter 2 describes hydrocarbon photochemistry, Chapter 3 covers oxygen-containing compounds, Chapter 4 covers sulfur compounds, Chapter 5 is devoted to nitrogen, and Chapter 6 covers halogen-containing compounds. There is either incidental or no coverage of other main group elements such as phosphorus and silicon. Chapter 1 briefly considers photophysics and some basic mechanistic concepts. Chapter 7 discusses practical issues such as lamps, color filters, actinometry, and safety.

The strong point of this book is that it fills a clear need. By emphasizing reaction chemistry rather than photophysics and theory, it should prove accessible and useful to those chemists whose main interest is in synthesis. Indeed, the coverage of photochemical reactions is by far more extensive than that of any recent texts in the field. Serious students of photochemistry would probably want to have an additional text with more extensive discussion of molecular photophysics, orbital symmetry, and experimental methods. One example is Gilbert and Baggot's *Essentials of Molecular Photochemistry*, and there are several other first-rate books with a similar emphasis.

The authors present each reaction and provide concise comments on the mechanism and its utility. There are references to the primary literature for those who wish to explore a given subject further. By and large this has been done very well. One might quibble with the statement concerning cycloaddition of alkenes to arenes "there has not been widespread success in applying these reaction(s) ... to synthetic procedures" (page 82)—especially considering Wender's syntheses of (±)-silphene, (±)-luarenene, α-cedrene, and (–)-reterigeranic acid. But this is a matter of opinion.

It was disappointing to find a large number of typographical and editorial errors. These range from the merely annoying (the running title References appears in the middle of various chapters well before the reference section begins) to more consequential (on page 411 nitro compounds are said to have high wavelength $n-\pi^*$ transitions with molar absorptivity of "... *c.* 10,000 mol^{-1} cm^{-1}"—when in fact such transitions have typical molar absorptivities 3 orders of magnitude lower than this).

Despite these drawbacks, the book is a competent contribution to the field. Because of its emphasis on the synthetic aspects of organic photochemistry, it is among the books that I would recommend to students or practitioners of organic synthesis who wish to find out what photochemistry can do for them.

Daniel E. Falvey, *University of Maryland*

Harmful Chemical Substances. Volume 1: Elements in Group I–IV of the Periodic Table and their Inorganic Compounds. Edited by V. A. Filov (Institute of Oncology), B. A. Ivin (Chemical Pharmaceutical Institute), and A. L. Bandman (Library of the USSR Academy of Science). Ellis Horwood: London. English Edition 1993. xxv + 722 pp. $85.00. ISBN 0-13-383373-9.

The volume published in 1993 is the English edition of the Russian 1988 edition, revised and updated, and makes use of USA standards for means of control of exposure and threshold limits.

The volume is the first of 12–15 volumes on Harmful Chemical Substances and covers the elements and their inorganic compounds of groups I–IV. In terms of the new periodic table notation, the book covers the elements of groups 1–4 and 11–14 as well as the rare earths Th and U.

The information provided is factual material on the toxicity of chemicals. In most cases each chapter is devoted to a single element with a standard format of presentation. The chapters generally include properties, occurrence, and environmental levels; production, uses, and human made sources; toxicity to micro-organisms, plants, animals, and human beings, both chronic and acute; absorption into, distribution in, and elimination from the human body; hygienic standards; methods of analysis; and measures for control and emergency treatment.

The book is concerned just with inorganic compounds (presumably organo-compounds of the elements will appear in a later volume) and is adequately referenced with a reasonable number of references from the late 1980s. A large proportion of the references are from the Russian literature, and this book opens this material to the rest of the world. The editors refer to the references as sources for further information if required.

Such a book as this one needs to be up to date and accurate. The editors have achieved in a reasonable space a useful compendium of information on the toxicity of the chemical elements covered. It will be a useful addition to libraries and could well become a "working" book for both research and applied laboratories, as well as health authorities. It is good that such a book has become available to English-speaking people, as it has a long history, the first edition appearing in Russia in the mid-1930s.

The three chapters devoted to silicon and its compounds are a useful source of the toxic effects of silicates which are so widely used throughout the world and encountered in some form or other by most people, such as the extensive use of talc in our homes. It is easy to find your way about in the book with the many headings and subheadings in each chapter. An extensive appendix lists some useful properties of the compounds mentioned in the text.

The volume is generally free of typographical errors. However, the environmental concentrations of cadmium that are listed are not complete.

Jack Fergusson, *University of Canterbury*

Continuous Flow Methods in Organic Synthesis. By Pietro Tundo. Ellis Horwood: 1991. Sussex, U.K. 378 pp. $80.00. ISBN 0-13-170788-4.

The traditional training of organic chemists considers most chemical reactions and processes to take place in batch mode. This leaves a gap between training and experience, since the greater preponderance of chemical processing, i.e., industrial synthesis, is done in a continuous flow mode. This book seeks to bridge this gap by providing a basic introduction to open system, or continuous flow, synthesis. To meet this challenge, the text covers heterogeneous catalysts (Chapter 1), characterization of supported catalysts (Chapter 2), and membranes, monoliths, and chemical reactors (Appendices 1–3). These topics account for 174 of 371 pages of text. The material in these chapters and appendices was meant to be introductory, and it is; the coverage is not deep but it is informative. This is not problematic, since advanced coverage of any of these topics can be readily found in more specialized texts on heterogeneous catalysis and chemical reactors.

The core of the text is in Chapters 3–5. In the context of reactions in the gas phase (Chapter 3), basic industrial processes are examined including, for example, ethylene oxide and styrene, but ample coverage also is given to catalysis by Nafion, zeolites, and supported bases. In Chapter 4, the author leads off with current industrial processes when discussing catalysis over liquid films by considering mounted phosphoric acid, the Deacon catalyst, and vandia melts, but this is followed by discussions of supported noble metal complexes and phase transfer catalysts. Chapter 5, entitled Continuous-Flow Syntheses in the Liquid Phase, covers a range of processes from linear α-olefins to copolymerization. Added to this are sections devoted to solid-phase peptide synthesis, acid resins, and immobilized enzymes, among others. Each of these chapters is laden with literature references and patent citations that are very up-to-date. The topical coverage of these chapters will appeal to a wider audience than the nominal target of organic chemists, including inorganic and catalysis chemists, as well as chemical reaction engineers.

In summary, this book will find its way to the bookshelves of a diverse group of chemical professionals, since it will be quite useful in their research pursuits.

Henry C. Foley, *University of Delaware*

Organic Reactions. Volume 44. Edited by Leo A. Paquette. John Wiley & Sons: New York and Chichester. 1993. vii + 613 pp. $95.00. ISBN 0-471-30302-X.

Two comprehensive reviews make up this latest volume in the series. Preparation of α,β-Unsaturated Carbonyl Compounds and Nitriles by Selenoxide Elimination, by Hans J. Reich and Susan Wollowitz, and Enone Olefin [2+2] Photochemical Cycloadditions, by Michael T. Crimmins and Tracy L. Reinhold, continue the series's tradition of thorough reviews covering synthetically useful reactions.

The first of these, on the selenoxide eliminations, is particularly well organized; the topic lends itself to a presentation based on the different structural features of the reaction products. The review would have benefited from a brief discussion of nomenclature for selenium compounds, but novices to the field will find the presentation so lucid that there is rarely any confusion. There is substantial comparison of the methodology with alternatives, as well as a thorough discussion of limitations. Fifteen pages of representative experimental procedures are supplemented by more than 200 pages of tables summarizing examples from the literature; organization of each parallels that of the text. The preface to the experimental procedures also notes the hazards inherent to working with selenium compounds.

The second review splits photochemical [2+2] cycloadditions into two general classes, inter- and intramolecular. The authors emphasize the difficulty in predicting the regio- and stereochemical outcome for the former; they have included enough examples that the reader appreciates both the source of those generalizations which can be made and the degree to which exceptions are possible. The latter half of the review is satisfying in its exposition of the improved selectivity available from intramolecular cycloadditions. Experimental procedures are preceded by a particularly useful discussion of reaction conditions and variables therein. Tables summarizing examples from the literature are thorough (238 pages) and well organized.

Kevin P. Gable, *Oregon State University*

Practical Organic Mass Spectrometry: A Guide for Chemical and Biochemical Analysis. Second Edition. By J. R. Chapman. John Wiley & Sons: Chichester and New York. 1993. xiii + 330 pp. $54.95. ISBN 0-471-92753-8.

This book is designed to be a "practical guide" to modern organic mass spectrometry, and as such it succeeds quite admirably. The book will be useful to newcomers in the field and also to current practitioners who desire an overview of newer methods. The coverage of pertinent basic principles and techniques is fairly complete, and numerous references are listed.

The first (of eight) chapter is a nice introduction to the various parts of a mass spectrometer, presented without a lot of detail. Perhaps there is more discussion than is needed (for an introductory book) on topics of more concern to a service engineer than to an analyst; examples of this would be the descriptions of tests for sensitivity, multiplier gain, and stability. Chapter 2 is a reasonable overview of sample introduction methods, plus some vaporization/ionization methods as well (thermospray, atmospheric pressure ionization, fast atom bombardment). Chapters 3 and 4 give a very nice overview of the important topic of chemical ionization, with helpful hints on reagent gas selection and optimization. Many references are given, unfortunately only up to 1982. Chapters 5 and 6 discuss the ionization of labile compounds. The techniques described are basically "desorption/ionization" methods, although this widely used term is not emphasized. The coverage of current methods is quite complete, including the recently introduced matrix-assisted laser desorption and electrospray techniques. It is pleasing to find a good discussion of field desorption in Chapter 6; this is a useful method that has never had widespread appeal. One feature of these chapters that is somewhat inconvenient is the arrangement of various methods under three subheadings: introduction, instrumentation, and applications. That is, you have to look in three different sections to find all the information on any particular method. Chapter 7 covers "tandem mass spectrometry" (MS/MS); the concentration is more on instrumental aspects than on applications. The author might distinguish better between configurations that are "tandem in space" (beam instruments) and those that are "tandem in time" (trapping instruments). Both metastable and collision-induced dissociations are considered. The discussion of applications focuses on structure elucidation and target compound analysis. An important omission is the use of MS/MS for general chemical mixture analysis, which is probably the most important application of MS/MS in industry. Interestingly, only the term "fragment ion"—and not "product ion"—is used in this chapter, despite the fact that both terms are common in the MS/MS literature. Chapter 8 covers "quantitative analysis", which in general is difficult to perform by mass spectrometry. The author gives a good discussion of the procedures and cautions that one must use in setting up and carrying out quantitative procedures.

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Laboratory Waste Management. A Guidebook. By ACS Task Force on Laboratory Waste Management. American Chemical Society: Washington, DC. 1994. xii + 212 pp. $16.95. ISBN 0-8412-2849-3.

The purpose of this book is to provide laboratories with the information necessary to develop effective strategies for managing laboratory wastes. After a list of the task force, acknowledgments, and a disclaimer, there are nine chapters with the following headings: Introduction; Laws and Regulations; Responsibilities of the Organization; Training of Laboratory Workers; Identification and Characterization of Wastes; Reducing Wastes; On-Site Waste Handling and Disposal; Off-Site; Monitoring and Control; and Working with Regulators. There are also an epilogue, a glossary, appendices (Examples of Potentially Incompatible Wastes; RCRA Listed Wastes; Segregation of Wastes for DOT Shipping; Sample Generator Hazardous Waste Inspection Report; and Sources and Resources), and an index.

Plant Polymeric Carbohydrates. Edited by F. Meuser (Technical University of Berlin), David J. Manners (Heriot-Watt University, Edinburgh), and Wilfried Seibel (Federal Research Centre for Cereal, Potato, and Lipid Research, Münster). Royal Society of Chemistry: Cambridge, UK. 1993. xii + 296 pp. £52.20. ISBN 0-85186-645-x.

This book was developed from the proceedings of an International Symposium on Plant Polymeric Carbohydrates held on 1–3 July 1992 in Berlin. After a preface by the editors, there are 22 chapters that are organized under the following headings: Biosynthesis and Chemical Structure; Rheology; Nutrition; Industrial Uses; and Chemical and Enzymic Conversion. There is a subject index.

New Advances in Polyolefins. Edited by T. C. Chung (Pennsylvania State University). Plenum Press: New York. 1993. viii + 248 pp. $79.50. ISBN 0-306-44588-3.

This book was developed from the proceedings of the ACS symposium on New Advances in Polyolfein Polymers held on 23–28 August 1992 in Washington, DC. After a preface by the editor, there are 18 chapters organized under the following headings: Catalyst/Polymerization; Functionalization; Characterization; and Polyolefin Blends and Composites. There is a subject index.

Dynamics of Excited Molecules. 82. Studies in Physical and Theoretical Chemistry. Edited By Kozo Kuchitsu (Josai University, Japan). Elsevier: Amsterdam, The Netherlands. 1994. xvi + 614 pp. $282.75. ISBN 0-444-81796-4.

This book was developed from the joint research project titled Dynamics of Excited Molecules undertaken by molecular scientists in Japan. After a preface by the editor and a list of contributors, there are 14 chapters reporting on new chemical species in vibronically excited states and on dynamical processes like intramolecular and intermolecular energy transfer, dissociation, ionization, and chemical reactions. There is a subject index.

Thermally Generated Flavors. Maillard, Microwave, and Extrusion Processes. ACS Symposium Series 543. Edited By Thomas H. Parliment (Kraft General Foods), Michael J. Morello (The Quaker Oats Company), and Robert J. McGorrin (Kraft General Foods). American Chemical Society: Washington, DC. 1994. x + 492 pp. $109.95. ISBN 0-8412-2742-x.

This book was developed from the symposium sponsored by the Division of Agricultural and Food Chemistry at the 204th national meeting of the American Chemical Society held on 23–28 August in Washington, DC. After a preface by the author, there are 40 chapters organized under the

following headings: Perspectives, Analytical Methodology; Aromas Generated via Maillard Reactions; Aromas Generated via Extrusion Processing; and Microwave Aromas. There are author, affiliation, and subject indexes.

Environmental Geochemistry of Sulfide Oxidation. ACS Symposium Series 550. Edited by Charles N. Alpers (U.S. Geological Survey) and David W. Blowes (University of Waterloo). American Chemical Society: Washington, DC. 1994. xiv + 682 pp. $139.95. ISBN 0-8412-2772-1.

This book was developed from the symposium sponsored by the Division of Geochemistry, Inc., at the 204th National Meeting of the American Chemical Society held on 23–28 August 1992 in Washington, DC. After a preface by the editors, there are 39 chapters organized under the following headings: Laboratory Studies of Sulfide-Oxidation Kinetics; Microbial Processes Affecting Sulfide Oxidation; Numerical Modeling of Sulfide Oxidation in Tailing, Waste Rock, and In Situ Deposits; Solubility and Sorption Control in Formation of Sulfide-Oxidation Products; Transport of Sulfide-Oxidation Products in Surface Waters; Transport and Storage of Sulfides and Oxidation Products in Sediments; Effects of Sulfide-Oxidation Processes on Ground-Water Geochemistry; Sulfide-Oxidation Processes in Wetlands and the Oceans; Recent Advances in Analytical Methods; Stable Isotope Fractionation and Equilibration in Oxidizing Sulfide Systems; Supergene Oxidation and Enrichment of Sulfide Ore Deposits; and Remediation and Prevention of the Environmental Effects of Sulfide Oxidation. There are also author, affiliation, and subject indexes.

The Anomeric Effect and Associated Stereoelectronic Effects. ACS Symposium Series 539. Edited by Gregory R. J. Thatcher (Queen's University). American Chemical Society: Washington, DC. 1993. xii + 306 pp. $74.95. ISBN 0-8412-2729-2.

This book was developed from the symposium sponsored by the Division of Carbohydrate Chemistry at the 204th National Meeting of the American Chemical Society held on 23–28 August 1992 in Washington, DC. After a preface by the editor and an introduction by Walter Szarek, there are 15 chapters covering the recent anomeric developments in carbohydrate chemistry and the associated stereoelectronic effects in organometallic chemistry and for the derivatives of sulfur and phosphorus oxyacids. There are author, affiliation, and subject indexes.

Physical Methods of Chemistry, 2nd Edition. Volume X: Supplement and Cumulative Index. Edited by Bryant W. Rossiter and Roger C. Baetzold. John Wiley & Sons, Inc.: New York. 1993. xiii + 391 pp. $195.00. ISBN 0-471-57086-9.

This tenth and final volume in the Physical Methods of Chemistry Series is semicryptically titled *Supplement and Cumulative Index*. The supplement actually consists of two chapters. The first chapter covers supercritical fluid chromatography (SFC) and extraction while the second deals with liquid chromatography. Chapter one was written by Jerry W. King, Herbert Hill, Jr., and Milton L. Lee. After a brief introduction, sections dealing with types of columns, types of mobile phases, and instrumentation in SFC are presented. The chapter concludes with a section on supercritical fluid extractions followed by a section of applications of the technique. In general this chapter is well written and the material is clearly presented. The applications section is particularly useful with a number of recent examples being presented.

The second chapter, covering liquid chromatography, is written by C. H. Lochmüller and Thomas J. Wenzel. The organization for this chapter is similar to that of the one before it. A brief introduction is followed by a theoretical section with subsequent experimental sections dealing with stationary phases, mobile phases, and instrumentation. Examples of applications are dispersed throughout the chapter so that there is (perhaps wisely considering the maturity of the technique) no separate section devoted to applications. This chapter does, however, have a number of minor faults which tend to detract from its overall effectiveness. First of all the references used are all pre-1990. Indeed this chapter could have been written almost unchanged six years ago. This is probably not a fatal error, however, considering the maturity of liquid chromatographic techniques. More serious weaknesses include a number of examples of awkward wording, several figures that are almost completely mysterious as to what they are supposed to show, and the annoying practice that the authors have adopted of splitting up sentences to insert equations into the text. For its intended audience, this chapter should still provide a passable introduction to liquid chromatography.

Over half of this volume (220 pages) is devoted to a cumulative index for all twelve of the volumes in the series (Volumes III and IX have A and B parts). An inspection of the index was performed by randomly picking numerous topics from this and two other volumes on hand to see if they were included in the index and checking, if so, whether the references were accurate. From this type of cursory inspection we find that the index seems to be complete, accurate, and easy to use. For those who own the other volumes in this series, the cumulative index makes this tenth volume well worth owning.

Thomas A. Shaler and Christopher H. Becker,
SRI International

Siloxane Polymers. Edited by Stephen J. Clarson (University of Cincinnati) and J. Anthony Semylen (University of York). Ellis Horwood and PTR Prentice Hall: New Jersey. 1993. xxii + 673 pp. $75.00. ISBN 0-13-816315-4.

This book is part of the Polymer Technology Series edited by J. Mark at teh University of Cincinnati. As stated in the foreword, the purpose of the series is to provide authoritative, well written, and easily accessible books on polymer science and technology for professionals in research, academia, and industry as well as for those with only limited knowledge of these areas. *Siloxane Polymers* is composed of monographs covering important aspects of silicone polymer chemistry with contributions from academic and industrial laboratories in Europe and North America. The book begins with a preface by Eugene Rochow (inventor of the direct process for the production of methylchlorosilanes from methyl chloride and silicon which is the basis of the present-day silicone industry) that provides a historical perspective on siloxane polymers. This is followed by biographies of the sixteen contributing authors.

The book consists of 14 chapters written by noted experts in their respective fields. The discussions are limited to polymers containing silicon oxygen bonds. The topics include descriptions of polymerization reactions, siloxane copolymers, cyclic siloxane polymers, organofunctional siloxanes, cross-linking reactions of siloxanes, liquid crystal siloxanes, and siloxane IPNs. There are also several chapters which describe the physical and mechanical properties of siloxanes such as their thermal properties, dielectric properties, viscoelastic and ultrasonic properties, conformation dependent properties, network properties, and surface chemistry.

The chapters fall into two categories, those which are more general overviews of a field and those in which the author has concentrated on contributions from his or her one laboratory. Examples of the former include the chapters on surface chemistry and cross-linking mechanisms, and examples of the latter include chapters on NMR spectroscopy and siloxane IPNs. The more general chapters are easily understood by those relatively uninitiated in the topics whereas those on siloxane properties in many cases require a rudimentary knowledge of the property or technique discussed.

The book fills the void for a comprehensive, up-to-date treatise on the subject of siloxane polymers. The chapters are generally concise, well written, and highly readable. References are given through 1990 in all chapters and in some through 1992. The book contains high-quality graphics. The book also has a very good index. On a critical note, the book suffers from nonuniform use of abbreviations, and identical information can be found in more than one chapter, as might be expected from a collection of monographs.

This book is highly recommended for inclusion in institutional and industrial laboratories as well as in the personal library of all practicing silicone chemists.

Judith Stein,
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