Additions and Corrections

The Diverse Reactivity of Peroxy Ferric Porphyrin Complexes of Electron−Rich and Electron−Poor Porphyrins [*J. Am. Chem. Soc.* **1996**, *118*, 2008]. MATTHIAS SELKE, MARLENE F. SISEMORE, AND JOAN SELVERSTONE VALENTINE*

Page 2010, Figure 1. The figure caption should read: UV/vis spectra of the novel iron(III) porphyrin peroxo complexes in CH_3CN (0.1 mm pathlength): (a) complex **2a** (*ca*. 0.5 mM); (b) complex **2b** (*ca*. 0.5 mM); (c) complex **2c** (*ca*. 1 mM).

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Book Reviews *

Semiconductor Surfaces and Interfaces. By Winfried Mönch (University of Duisburg, Germany). Springer: New York. 1995. xv + 442 pp. $49.95. ISBN 3-540-58625-3.

Following the publication of the first edition of this monograph in 1993, Professor Mönch has moved swiftly to bring out the second, partly to make needed corrections in the earlier one and partly to include some new material. The goal of the work remains to provide a systematic survey and review of the science of semiconductor surfaces and interfaces. The new material includes sections on diamond surfaces and on Ag- and Au-covered silicon surfaces. The chapter on interfaces has been substantially expanded.

Judging the work as a review of the focus topic reveals it to be a huge success. There are over 1000 references cited. Many of these are to work which has been reported since the time the first edition went to press. As a survey of the relevant science, the work fares less well, depending on the background of the reader. The presentation suffers, I believe, from two weaknesses, one minor and one less so. The former derives from the fact that English is not the author's first language, and although his facility with it is remarkable, it is better suited for communicating with other established experts in this field than for instructing those who read only English and are not already well schooled in the discipline. If the intent is to reach the latter audience as well, the book would greatly benefit from a more extensive editorial effort.

Even had such effort been made to improve the readability of the book, its utility to the student reader would be only marginally enhanced, in light of the second problem for nonexperts in the subject matter. The first six chapters review much of the underlying science relevant to explaining surface and interface structure and behavior. An understanding of concepts presented there is essential to the full appreciation of the final 13 chapters, which deal with a multitude of specific interesting examples. The problem is that the background material of the early chapters is often not presented in a way which helps the student acquire the necessary understanding. It is an example of a style of writing, which unfortunately is not uncommon, in which the meaning of the text is well known to those who know it well and largely obscure to those who do not, but readers who have the proper background or take the time to read the introductory chapters carefully enough will find the rest of the book to be a very informative and interesting account of the structures and chemistry of semiconductor surfaces and interfaces. Our understanding of these matters has enjoyed a striking growth in recent years thanks in large part to development and utilization of the scanning tunneling microscope. The implications for surface and interface phenomena in general transcend those for semiconductors alone and should be of interest to a wide audience of chemists.

Sam O. Colgate, *University of Florida*

JA955374K

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Access in Nanoporous Materials. Fundamental Materials Research. Edited by Thomas J. Pinnavaia and M. F. Thorpe (Michigan State University). Plenum: New York. 1995. xi + 441 pp. $125.00. ISBN 0-306-45218-9.

Access in Nanoporous Materials is an excellent compilation of papers from leading researchers in the fields of materials synthesis, catalysis, chemistry and physics of porous materials, and separations. The focus of the volume is synthesis, characterization, and application of materials with pores of size 1−10 nm. While the book contains papers from a symposium, it is not a typical proceedings volume. The depth of the papers is reflected by their average length (∼17 pages) and the abundance of references. Contributions are largely from academia with a few exceptions. The book is divided into five sections: (i) Mesostructures, (ii) Carbon and Layered Materials, (iii) New Materials, (iv) Characterization of Zeolites and Related Materials, and (v) Transport Processes.

The book kicks off with the hot topic of mesostructures. Three papers are devoted to surfactant templating approaches to creating ordered porous media. While synthesis considerations dominate, a historical perspective to this recent development is given and there are discussions of applications. The section on carbon and layered materials (four papers) includes papers on polymer-derived molecular sieves, pillared clay technology, layer rigidity in intercalation materials, and the use of electrochemistry to study transport phenomena. The new materials section (four papers) includes papers on synthesis by molecular building block approaches, processing of bulk and thin film porous materials by sol−gel methods, application of porous sol−gel-derived materials as hosts for chemical and electrochemical reactions, and hydroxy double salts. A host of experimental and computational approaches are applied to the characterization of zeolites, carbon molecular sieves, and the new mesoporous materials in the next section (seven papers). The techniques of pulsed field gradient NMR and chromatographic and zero length column methods are the subjects of reviews focused on diffusivity. In other papers, electron microscopy, nitrogen and oxygen sorption, and X-ray diffraction are used to unravel the pore structure and sorption behaviors of nanoporous materials. The final section (six papers) encompasses experimental and modeling work broadly dealing with transport processes. Topics include electrokinetic and interfacial effects on transport in porous media, molecular simula-

*Unsigned book reviews are by the Book Review Editor.

tions of surface barrier effects, dynamics of liquid crystals in porous matrices, electronic and ionic transport in nanocomposites, and others.

This book serves as a good overview of nanoporous materials with an emphasis on their application in catalysis and separations. References are abundant and recent. The papers are well written and usually include ample background sections. The book would be a good addition to the libraries of those old and new to the field.

Lorraine F. Francis, *University of Minnesota*

JA965674H

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Theilheimer's Synthetic Methods of Organic Chemistry, Volume 50: Yearbook 1996, with Cumulative Reaction Titles of Volumes 46−50. Edited by A. F. Finch (Cambridge). Karger: Basel. 1996. xxviii + 512 pp. $848.25. ISBN 3-8055-6231-4.

The pioneering editor of *Synthetic Methods of Organic Chemistry* from 1946 to 1981, William Theilheimer, laid the foundations of this series is Basel, Switzerland, during the early 1940s. This series has become an archival source and powerful retrieval tool in the sphere of synthetic organic chemistry. Its unique, systematic classification of reactions and their encapsulation in the form of succinct, stylized abstracts have remained essentially unchanged during the last 50 years. The development of consistent nomenclature and cross-referencing has been the cornerstone of the most sophisticated subject index in this field. Completing 50 years of Theilheimer, this yearbook is the last in the Tenth Series, and contains abstracts and supplementary data from papers published in the field of synthetic organic chemistry in the latter half of 1994 and the first half of 1995. Being the fifth volume of the series, it also contains a cumulation of the reaction titles (including key supplementary references) published in Volumes 46−49.

JA9657014

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Biofunctional Membranes. Edited by D. Allan Butterfield (University of Kentucky). Plenum: New York. 1996. xi + 294 pp. $89.50. ISBN 0-306-45281-2.

The International Conference on Biofunctional Membranes, organized and hosted by the University of Kentucky Center of Membrane Sciences, was held in Lexington, Kentucky, April 9−12, 1995. Approximately 80 scientists and engineers from six countries attended the conference to present or hear the most current insights into the structure, function, and applications of biofunctional membranes. Biofunctional membranes are entities in which a biomolecule, a collection of biomolecules, or cells are incorporated into a polymeric matrix cast in the form of porous membranes. The conference covered the following topics: catalysis (membrane-based enzyme bioreactors), bioseparations (affinity membranes), recognition and bioanalysis (biosensors and membrane-based imprinting), and medical applications (artificial organs, etc.).

JA965678M

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Advances in Atomic Spectroscopy, Volume 2. Edited by Joseph Sneddon (McNeese State University). JAI Press: Greenwich, CT. 1995. x + 297 pp. $97.50. ISBN 1-555938-701-7.

The use of atomic spectroscopic techniques for trace and ultratrace metal determination in complex matrices has led to the continuous development of this method. This book is a continuation and extension of Volume 1 in this series about atomic spectroscopy. Topics covered include laser-excited atomic and molecular fluorescence in a graphite furnace, electrothermal vaporization sample introduction into plasma sources for analytical emission spectrometry, hydride generation techniques in atomic spectroscopy, use of an excimer laser in atomic spectroscopy, hydride generation techniques in atomic spectroscopy, and recent developments in analytical microwave-induced plasmas.

JA9552252

S0002-7863(95)05225-5

Progress in the Chemistry of Organic Natural Products, #63. Edited by W. Herz (Florida State University), G. W. Kirby (University of Glasgow), R. E. Moore (University of Hawaii), W. Steglich (University of Munich), and Ch. Tamm (University of Basel). Springer: Wein. 1994. vi + 216 pp. DM198.00. ISBN 3-211-82443-X.

The volumes of this series, now referred to as "Zechmeister" after its founder, L. Zechmister, have appeared under the Springer Imprint ever since the series inauguration in 1938. The volumes contain contributions on various topics related to the origin, distribution, chemistry, synthesis, biochemistry, function, or use of various classes of naturally occurring substances ranging from small molecules to biopolymers. Each contribution is written by a recognized authority in his field and provides a comprehensive and up-to-date review of the topic in question. Addressed to biologists, technologists, and chemists alike, the series can be used by the expert as a source of information and literature citations and by the nonexpert as a means of orientation in a rapidly developing discipline.

JA955213G

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Aroma Biotechnology. By Ralf G. Berger (University of Hanover, Germany). Springer: New York. 1995. x + 240 pp. $145.00. ISBN 3-540-58606-7.

The focus of this book is primarily on the development of volatile flavor components in foods through the application of biotechnology with particular emphasis on the microbiological generation of flavor compounds. Enzymatic technology for the generation of volatile flavors is also covered to a lessor extent and actually relies on the microbiological framework established early on. Bioprocess technology is only covered on an introductory basis. The text presents a reasonable review of this field including many post-1990 references on the subject. The reader can access past references by utilizing the numerous review articles cited in the text. Such articles have been highlighted by the author.

The first chapter presents a general summary of volatile flavor chemicals and includes a brief definition of natural and artificial components. The author has pointed out differences in the current definitions and standards between Europe and the United States. A brief discussion of the bioactivity associated with such chemicals was presented and represents some newer information.

Volatile flavor components derived from a variety of food fermentations and traditional food bioprocesses are briefly described in the second chapter. This chapter serves to summarize the broad base of bioprocessing traditionally found in the food industry. These topics have been discussed by many authors, and this text only offers several newer literature citations.

The third chapter attempts to present the advantages of novel biotechnological processes for the production of volatile flavor components. This discussion centers around the high degree of stereospecificity associated with biosynthesis and the development of certain organoleptic characteristics through bioprocessing. Again, an abundance of references and literature reviews are offered.

Laboratory procedures for flavor chemical research are briefly covered in the fourth chapter. The chapter is strictly introductory and serves only as a general background for this rapidly growing and complex segment of analytical chemistry. This does set the stage for the discussion of the synthesis of flavor components described in Chapters 5−9. These chapters focus on different technologies for the production of volatile flavors such as direct microbial conversions, biotransformations, bioconversions, and enzyme technologies. Special chapters discussing genetically altered catalysis and plant catalysis highlight this discussion. Again, each of these chapters is handled on an introductory basis with a variety of relatively recent references. Greater discussion on the end-use of some aroma chemicals derived from these technologies would have strengthened these chapters.

Bioprocess technology and industrial applications are briefly covered in the final two chapters. The author attempts to cover all aspects of industrial production from reactor design to final product purification. This is too broad a subject to adequately cover in an introductory text such as this. The highlight of this section is the discussion of extraction procedures, where some valuable detail and recent references are presented. The author concludes with a brief summary of the outlook

for biotechnology in the production of aroma chemicals. This section serves to tie the book together and focus the readers attention on the long-range potential of the biogeneration of volatile flavor chemicals.

To summarize, this book serves as an introductory text on the role of biotechnology in the development of volatile flavor chemicals. The references are all recent and represent a good cross-section of current research activities.

Thomas Skatrud and Fenjin He, *International Flavors and Fragrances, Inc.*

JA9553720

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Organic Syntheses, Volume 73. Edited by Robert K. Boeckman (University of Rochester). Wiley: New York. 1996. xxxiv + 353 pp. $39.95. ISBN 0-471-14701-X.

This most recent volume of *Organic Synthesis* continues the series' tradition of presenting independently checked and edited procedures which are of general use to organic chemists. The procedures reflect topics which are important in modern organic synthesis. Thus, about 1/2 of the procedures relate to some aspect of asymmetric synthesis. Highlights include the Sharpless asymmetric dihydroxylation, asymmetric cyclopropanation using a chiral rhodium catalyst, enzymatic desymmetrizations, stereocontrolled intramolecular hydrosilylation, and the use of chiral auxiliaries or temporary chirality transfer to control developing stereochemistry. There are also procedures describing the stereocontrolled synthesis of trisubstituted alkenes via stereocontrolled synthesis/decomposition of β-hydroxysilanes and β-lactones as well as the alkylidenation of esters. The remaining potpourri include heteroatom-directed metalation, a simple and convenient method for oxidizing organoboranes, a method for effecting hindered Mitsunobu inversions, detrifluoroacetylative diazo group transfer, and optimized preparations for a variety of useful compounds. The level of experimental detail provided in the procedures and accompanying notes should allow even novices to perform the organic transformations with confidence while the discussion sections provide a good background to the chemistry along with literature references. Of particular value to students are the introductory sections on Handling Hazardous Chemicals and Disposal of Chemical Waste, which address commonly encountered safety concerns and/or questions. This well-written (and indexed) series continues to be an essential part of any organic chemistry reference collection.

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Progress in the Chemistry of Organic Natural Products, #64. Edited by W. Herz (Florida State University), G. W. Kirby (University of Glasgow), R. E. Moore (University of Hawaii), W. Steglich (University of Munich), and Ch. Tamm (University of Basel). Springer: Wein. 1995. vi + 216 pp. DM225.00. ISBN 3-211-82533-9.

The volumes of this series, now referred to as "Zechmeister" after its founder, L. Zechmeister, have appeared under the Springer Imprint ever since the series inauguration in 1938. The volumes contain contributions on various topics related to the origin, distribution, chemistry, synthesis, biochemistry, function, or use of various classes of naturally occurring substances ranging from small molecules to biopolymers. Each contribution is written by a recognized authority in his field and provides a comprehensive and up-to-date review of the topic in question. Addressed to biologists, technologists, and chemists alike, the series can be used by the expert as a source of information and literature citations and by the nonexpert as a means of orientation in a rapidly developing discipline.

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Advances in Strain in Organic Chemistry, Volume 5. Edited by Brian Halton (Victoria University—Wellington). JAI Press: Greenwich, CT. 1996. xi + 287 pp. $97.50. ISBN 0-7623-0075-2.

The latest offering in this continuing series provides four rather diverse chapters that fit under the general topic of strained organic molecules. Warkentin and Woollard describe the cyclopropene—vinylcarbene rearrangement and the subsequent reactions of the ring-cleaved products. Theoretical considerations, substituent effects, and alternate processes are all nicely detailed in this fine review. A concluding section covers the emerging importance of transition metal-derived vinylcarbenes. Sydnes and Bakstad delve into the chemistry of halo- and alkoxyhalocyclopropanes. Although this contribution does overlap some of the material presented in the first volume of the series, the present authors do a considerably more thorough job of discussing the various routes of cyclopropane formation by carbene addition. Unfortunately, the reaction chemistry is limited only to reactions with alkoxide solutions (in order to avoid additional overlap). Vollhardt and Mohler contribute a very detailed account of the phenylenes. Clearly the leaders in this field, their review describes the Vollhardt group's use of the cobalt-mediated cyclotrimerization reaction to create numerous phenylenes of varying topologies. The reactivity and physical properties of the phenylenes are outlined for each structural subtype, thus providing some insight into the different forces at work within these fascinating molecules. Regitz and co-workers provide a thorough review on the formation of benzene valence bond isomers by reaction of kinetically stabilized cyclobutadienes and azacyclobutadienes with alkynes, nitriles, and phosphaalkynes. Many varieties of heterobenzenes, hetero-Dewar benzenes, and heteroprismanes are discussed in detail, including pertinent spectral and crystallographic data of several derivatives. Rounding out Volume 5 is a supplement by Woollard that tabulates the stability data of cyclopropenes. Though not fully comprehensive, this long-overdue compilation includes examples of a vast majority of the known simple cyclopropenes along with the stability of each as reported by the original authors including the leading reference. The supplement alone will justify the purchase price of the book for some groups.

With the minor exceptions noted above, Volume 5 is a worthy addition to this outstanding series. It should readily find its place on the bookshelves of researchers involved with the chemistry of strained-ring molecules.

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