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BOOK REVIEWS

Stereoselective Heterocyclic Synthesis III. Topics in Current Chemistry. Vol. 216. Edited by Peter Metz (Technische Universität Dresden). Springer-Verlag: Berlin, Heidelberg, New York. 2001. x + 202 pp. $139.00. ISBN 3-540-41763-X.

In this third installment of the "Stereoselective Heterocyclic Synthesis" series, there are four reviews that provide the scientific community with recent developments in stereoselective synthesis and the use of various heterocyclic compounds. The majority of the chapters deal with nitrogen-containing heterocycles, beginning with a survey of intramolecular 1,3-dipolar cycloaddition of N,O dipoles, with attention paid to the stereochemical issues of the cycloaddition. Chapter 2 provides a summary of the synthesis and utility of 4-substituted-1,3-dioxanes, whereas the next chapter details the synthesis and utility of aziridines and three-membered ring aza-heterocycles. Recent strategies developed for the synthesis of medium-sized lactam ring systems are discussed in the final chapter.

Chapter 1, "Stereoselective Intramolecular 1,3-Dipolar Cycloaddition" by Namboothiri and Hassner, provides an extensive review of intramolecular cycloaddition reactions involving nitrile oxides, silyl nitronates, oximes, azides, and nitrilimines. The authors provide synthetic examples of substrates (e.g., pyrrolidines from intramolecular oxime-olefin cycloadditions) that can be formed by each of the previous reaction types. The utility of these important reactions is detailed in the chapter, although the references in general appear somewhat dated. This chapter gives references for the preparation as well as the reaction of each dipolar species and provides numerous synthetic examples.

Sinz and Rychnovsky wrote the second chapter, entitled "4-Acetoxy- and 4-Cyano-1,3-dioxanes in Synthesis", which discusses the background, preparation, and reactions of the title compounds. In addition, the authors have included examples of a variety of lithio-derived synthons prepared from either the thiophenyl- or tributylstannyl-substituted dioxanes. The authors utilize their extensive experience with substituted dioxanes to discuss the application of these important 1,3-diol synthons to the synthesis of both *syn*- and *anti*-polyol-containing natural products. In each section, the authors provide numerous, documented examples with well-illustrated schemes, reaction conditions, and reagents.

In the third chapter, "The Synthetic Potential of Three-Membered Ring Aza-Heterocycles", Zwanenburg and ten Holte begin with a short introduction about the preparation of aziridine and azirine intermediates and then spend the majority of the review discussing the utility and pertinent reactions applied to three-membered heterocycles. The authors pay particular attention to the utility of aziridine-2-carboxylic esters. Reactions of aziridines and azirines include ring expansion, amino acid and alcohol synthesis, application as chiral ligands, and their use as reactive synthons. The authors supply the reader with up-to-date references that cover much of the recent literature, including a number of synthetic schemes.

In the final chapter, "Synthesis of Medium-Sized Ring Lactams", Nubbemeyer reviews four general methods designed to prepare lactam rings. The review covers ring-closing reactions, cycloaddition reactions, ring expansion through N or C insertions, and finally, fragmentation reactions. Within each general reaction type, the author provides methods to achieve stereoselective syntheses, including reactions such as lactamization, ring-closing metathesis, sigmatropic rearrangements, and Beckmann or other associated reactions. Nubbemeyer presents a number of detailed tables of reaction conditions and results, along with numerous reactions and their mechanistic rationales.

In summary, this latest addition to this series provides an excellent source of reference information for the researcher interested in these specialized topics or the general topic of stereoselective heterocyclic synthesis. It provides excellent coverage for the specialist in the field, providing a good deal of the current state-of-the-art in heterocyclic synthesis. The four chapters are well-written and include clearly illustrated schemes that generally specify reagents and conditions. This book offers a wealth of information for the practicing heterocyclic chemist and will make a worthwhile addition to the collection of an individual or a library.

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Computational Chemistry: Reviews of Current Trends. Volume 6. Edited by Jerzy Leszczynski (Jackson State University). World Scientific: Singapore, New Jersey, London, Hong Kong. 2001. viii + 268 pp. $98.00. ISBN: 981-02-4660-9.

The present volume continues the annual series of reviews edited by Lesczynski. It contains six unrelated reviews dealing with quite diverse aspects of quantum mechanics. Many of them heavily emphasize the work of the authors rather than attempting to give a complete survey of the field. The chapters vary considerably in the amount of mathematical and physical background they assume in their readers.

Chapter 1 by Ishikawa and Vilkas is an extension of the paper by the senior author that appeared in the first volume of this series. It briefly reviews the background of the relativistic multireference Møller−Plesset perturbation method and follows this with new work on monatomic aluminum-like ions with Z = 26−79 (Fe^{13+}−Au^{66+}).

The second chapter, by Rothlisberger, is indeed a true review with 348 references of Car-Parrinello simulations in physics, chemistry, and biology. It packs a great deal of library research into only 23 well-written pages.

In Chapter 3 by Bersuker, the author reviews methods that have been used for combining quantum mechanical and classical modeling for large organometallic systems. After surveying a variety of approaches, he addresses the special problems introduced by transition metal atoms in enzymes and other metallobiochemical systems, such as vitamin B-12.

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Next, Allavena and White present an extensive survey, including 223 references, of ab initio calculations on proton transfer in zeolites. The review is more balanced than some of the others in this volume, with no special emphasis on the authors' own work.

In a very brief article, Roszak and the series editor Leszczynski consider ionic clusters with weakly interacting components and present their evidence for the utility of a shell model in the description of such systems.

In the final chapter, by Handy, the author addresses turning-point quantization and scalet-wavelet analysis. Readers of this chapter are required to have a more sophisticated mathematical ability than for the other chapters. Applications are only made to simple model systems, such as a double-well anharmonic oscillator. Most of the recent work cited is that of the authors.

The book has been produced from camera-ready copy so the type font is different in each chapter, and in only one of them is the font a little small for comfortable reading. Thanks to modern spell checkers, only a very few typographical errors, such as "hexagonl" on page 159, mar the presentation.

Few people will have the breadth of interest to enjoy reading this volume cover to cover. Its value lies in its applicability as a reference, and as such, it certainly deserves a spot in chemistry libraries. Overall, the reviews are well-done, and if one of them matches a field of work that a researcher plans to enter, it will save a great deal of library exploration.

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Inorganic Biochemistry of Iron Metabolism: From Molecular Mechanisms to Clinical Consequences. Second Edition. By Robert Crichton (Université Catholique De Louvain, Belgium). J. Wiley & Sons: Chichester. 2001. xxi + 326 pp. $165.00. ISBN:0-471-49223-X.

The arduous task of synthesizing the latest scientific concepts in inorganic biochemistry of iron metabolism is handled adroitly in the second edition of this classic text. The prodigious body of traditional knowledge in the iron metabolism field has been updated with the most recent discoveries in molecular and cellular biology as well as the clinical consequences. The new edition incorporates a compendious review of recent literature to revisit the role of iron in infection, oxidative stress, deficiency and overload, and homeostasis. An exciting new chapter details the interactions between iron and other metals, with particular emphasis on copper and zinc.

The enormous breadth of the book is its greatest strength. The chapters form a smooth transition from the macrocosm to the minutiae of the respective iron topics. The writing avoids the abstruse style typical of many academics by providing intelligible background information as well as didactic tables and figures to facilitate comprehension. The treatment of the material is encyclopedic, as evidenced by the 110 figures and tables. A particularly salient feature is the 16-page color layout that provides three-dimensional structural images, binding sites, and receptor domains of critical iron proteins as well as cartoons of iron transport, death receptor pathway, and copper chaperone function.

The reorganization of the references and the subdivision of the chapters are pragmatic features of this edition that streamline access and contribute to the overall usability of the book. The clarity of the writing coupled with the numerous, well-illustrated figures and comprehensive tables will greatly increase the understanding of the material for biochemical and biomedical students and researchers.

In summary, this text exceeds its promise as a solid foundation and valuable reference for the field of iron biochemistry. From beginning scientist to field expert, and from molecular biologist to clinical practitioner, this text serves the needs of those interested in iron metabolism.

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