

Bioactive Marine Natural Products. By D. S. Bhakuni (Central Drug Research Institute, Lucknow, India) and D. S. Rawat (University of Delhi, Delhi, India). Springer: New York and Anamaya Publishers: New Delhi. 2005. xv + 382 pp. \$159.00. ISBN 1-4020-3472-5.

The world's oceans are a rich source of biologically active natural products. Having reached maturity about a decade ago, the field of marine natural products is vast and has combined the fields of chemistry (namely, natural products) and biology (marine biology and ecology) since its inception. Consequently, familiarization with a body of literature that includes over 15 000 marine natural products obtained from diverse marine organisms can be a daunting task. Authors Bhakuni and Rawat have taken a large step toward bringing together findings from key papers and reviews that describe most of the major classes of natural product structures, their biological sources, and reported biological activities while paying special attention to those with ecological as well as biomedical relevance.

The book begins with two general chapters giving a broad overview of the types of bioactive secondary metabolites one can expect to find from marine plants and microorganisms and marine invertebrates. Two methodological chapters that introduce the reader to standard purification techniques employed to isolate natural products and to assays used for biological and clinical evaluations of marine natural products follow. Because the fourth chapter is extensive in the number of biological assays discussed, much of it reads like a manual of clinical protocols. However, many readers will appreciate the attention given in this chapter to explaining approaches used in cancer screens and the role of the National Cancer Institute. The fifth chapter is a description of bioactivities too numerous to mention that are associated with crude extracts and pure compounds. References are not provided for many of the findings included in this chapter. Before transitioning to chapters covering specific structural families, a lone chapter on biosynthesis considers feeding studies published predominantly in the 1980s. This chapter may serve as a primer to metabolic labeling, but to learn more about this rapidly expanding area of natural products research, readers would benefit by reading the current literature and reviews rather than relying on this chapter.

In the final five chapters, the authors summarize in detail illustrative and important examples of marine toxins, nucleosides, alkaloids, peptides, and prostaglandins originating from marine phyla that the nonspecialist will know as algae, bacteria, blue-green algae, fungi, mollusks, snails, sponges, and worms, to name a few. Although somewhat dated, the authors highlight a number of examples of marine natural products that entered clinical trials and their fates, information that most readers should find interesting. Given the large number of important biologically active terpenes and polyketides isolated from marine organisms, the absence of chapters covering these structural classes is surprising.

On the whole, the authors have successfully undertaken an enormous task by bringing together these broad topics into one book that is richly illustrated with hundreds of chemical structures, makes reference to over 2000 papers, and provides ample evidence that the oceans are a rich source of new drugs. *Bioactive Marine Natural Products* would be welcome as a text for upper-level undergraduate or graduate courses on marine natural products and should be a valuable reference to specialists and nonspecialists alike.

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Overviews of Recent Research on Energetic Materials, Advanced Series in Physical Chemistry, Volume 16. Edited by Robert W. Shaw (Army Research Office), Thomas B. Brill (University of Delaware), and Donald L. Thompson (University of Missouri). World Scientific Publishing Co. Pte. Ltd: Singapore. 2005. xx + 510 pp. \$92.00. ISBN 98-256-171-4.

The book is composed of contributions from leading practitioners in the field of energetic materials, including the editors themselves. It comprises an extended preface and 14 chapters on the various physicochemical aspects of the combustion of energetic materials, with the exception of the last chapter, which deals with their synthetic and structural aspects. In the preface, Shaw expounds on both the need and timeliness of this book as well as the breadth of the coverage of the field.

Chapter 1 by Brill covers connecting molecular properties of energetic compounds to trends in decomposition, combustion, and explosion. He rightly cautions that observation of correlations among molecular and crystal properties may require greater care in interpretation since they may not have any sound chemical or physical basis. He also warns of the pitfalls of molecular correlations with macro events.

Chapter 2 pertains to the thermal decomposition processes of energetic materials in the condensed phase at low and medium temperatures. Here, Behrens covers 20 years of research, wherein he has developed remarkable models to correlate physical changes in a sample to a detailed model of thermal decomposition. He also discusses an apparatus of his own design for measuring time-dependent evolution of gas-phase products from the thermal decomposition of energetic propellant formulations. Such studies at low and medium temperatures have paved the way to understanding decomposition, combustion, and detonation at higher temperatures. The chapter is a valuable contribution to the investigation of decomposition processes far removed from equilibrium.

In Chapter 3, Korobeinichev probes energetic flames. The temperature profiles coupled with mass spectrometric analyses provide valuable data on the nature of species formed. Detailed

analyses of RDX, HMX, ADN, and ADN-based propellants are discussed. Parr and Hanson-Parr describe the use of laser spectroscopy to delineate concentrations of reactive species and exact temperatures in flames in Chapter 4. Such studies should aid in understanding the complex kinetics of solid-state combustion. Dagdigian discusses the nature of species formed during the early and late stages of combustion processes in Chapter 5, research that may eventually help in the characterization and detection of energetic residues. In the next chapter, Bernstein tries to understand fundamentally the role of the electronic states of energetic molecules in their decomposition. Such studies are complex, however.

Chapter 7 by Anderson and Fontijn is a discussion of the chemistry that takes place at various flame zones by using elementary kinetics. In Chapter 8, Thompson describes the current state of knowledge of the decomposition of nitromethane, methyl nitrate, DMNA, TNAZ, and RDX, and in Chapter 9, Fried et al. use chemical equilibrium methods and atomistic modeling to study condensed phase reactions. They also discuss the efficacy of using various force fields. The transfer of mechanical energy into molecular energy and the close relationship of energetic molecular properties to explosion sensitivity are discussed in Chapter 10 by Dlott. In the next two chapters, Rice covers the applications of theory to assess the performance and sensitivity of energetic materials as a function of the structure, and Kim and Yang elaborately describe their transient and combustion models for nitramine-type explosives. Chapter 13 by Miller is a description of some successful models for predicting burning rates of solid propellants from compositions of their basic ingredients. Finally, the last, stand-alone chapter of the book by Bottaro ably covers the design and synthesis of high nitrogen compounds with an eye on potential new structures and frameworks.

Surprisingly, the book does not have a discussion of recent work in the area of energetic ionic liquids and difluoramine compounds. Perhaps, such studies are still in their infancy. Although the subject matter overlaps in several chapters, the book nicely covers the application of many experimental and theoretical tools to study the difficult problem of ignition and combustion of many traditional energetic materials. It could be a valuable resource to the researchers in the field.

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Catalysis of Organic Reactions. Edited by John R. Sowa, Jr. (Seton Hall University). CRC Press (an imprint of Taylor & Francis Group): Boca Raton, FL. 2005. xvi + 574 pp. \$199.95. ISBN 0-8247-2729-0.

This book is a collection of 63 papers that were presented at the 20th Conference on Catalysis of Organic Reactions held in South Carolina in March, 2004. They are organized into the following sections: (I) Symposium on Catalytic Hydrogenation; (II) Symposium on Novel Concepts and Approaches to Catalysis of Organic Reactions; (III) Symposium on Acid–Base Catalysis; (IV) Symposium on Catalytic Oxidation; and (V) Symposium

on Catalysis in Organic Synthesis. An author and a keyword index complete the book.

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Chemistry of Peptide Synthesis. By N. Leo Benoiton (University of Ottawa). CRC Press (an imprint of Taylor & Francis Group): Boca Raton, FL. 2006. xiv + 290 pp. \$139.95. ISBN 1-57444-454-9.

The focus of this book, according to the author, is “on understanding how and why reactions and phenomena occur” in the synthesis of peptides with an effort “to convey to the reader a notion of how the field of peptide chemistry has developed.” Concepts are presented progressively in the following eight chapters: (1) Fundamentals of Peptide Synthesis; (2) Methods for the Formation of Peptide Bonds; (3) Protectors and Methods of Deprotection; (4) Chirality in Peptide Synthesis; (5) Solid-Phase Synthesis; (6) Reactivity, Protection, and Side Reactions; (7) Ventilation of Activated Forms and Coupling Methods; and (8) Miscellaneous. The book concludes with a subject index and three appendices: (1) Useful Reviews; (2) Year, Location, and Chairmen of the Major Symposia; and (3) On the “Primary Sequence” of Peptides and Proteins.

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Oxidation and Antioxidants in Organic Chemistry and Biology. By Evgeny T. Denisov (Russian Academy of Sciences, Chernogolovka, Russia) and Igor B. Afanas'ev (Vitamin Research Institute, Moscow, Russia). CRC Press (an imprint of Taylor & Francis Group): Boca Raton, FL. 2005. xxxviii + 982 pp. \$199.95. ISBN 0-8247-5356-9.

This book is a comprehensive treatise on the phenomena of oxidation processes as they pertain to organic compounds and biological systems. The voluminous amount of information found in its almost 1000 pages has been divided in three main parts: Part I is a description of the chemistry and kinetics of the oxidation of organic compounds by dioxygen (13 chapters); Part II is a discussion of the chemistry of antioxidants (7 chapters); and Part III is an analysis of biological oxidations, broadly defined (12 chapters). The topics in Parts I and III are clearly the most numerous, with each topic mirroring the authors' own areas of expertise. More specifically, Part I covers the theory of chain oxidation in the liquid-phase oxidation of hydrocarbons, with an explanation of the semiempirical model of bimolecular homolytic reactions using the parabolic model developed by Denisov. This analysis is applied to reactions of peroxy radicals with the C–H bond of various functional groups, namely alcohols, ethers, amines, and carbonyl compounds, such as aldehydes, ketones, amides, and esters. A CD (PC-readable only) entitled “Database of Oxidation and Antioxidants in Organic Chemistry” accompanies this book as Supporting Information offering kinetic data, and it includes the electronic program for the application of the semiempirical bimolecular homolysis model formulated by the author. Part I

ends with an overview of catalysis in the liquid-phase oxidation of hydrocarbons, the sulfoxidation of hydrocarbons, and the oxidation of polymers. Overall, Part I can be appreciated more fully from a physical chemistry standpoint. There are many tables and schemes in it and approximately 1450 literature references from a variety of sources, the most recent from the year 2002. Although quite a few entries date back to the 1960s and 70s, the information contained therein is derived from hard-to-find Russian journals, which makes it useful to practitioners in this field.

Part II, which is comparatively short, is a description of the inhibition of chain oxidation in organic compounds from a mechanistic perspective and an analysis of the action of antioxidants on peroxy radicals and the synergism of antioxidant action. It concludes with an overview of hydroperoxide-decomposing antioxidants. There are close to 500 references, the most recent from 2002.

Part III is entirely devoted to a consideration of the physiological and pathophysiological oxidative processes mediated by free radicals in enzyme-catalyzed reactions. Information about this topic is distributed according to the nature and action of major initiators of oxidative processes. A discussion of prooxidant enzymes gives way to an analysis of the role of mitochondria and microsomes in the production of free radicals. This is followed by lipid oxidation and destructive oxidation of proteins and DNA. The role of antioxidants (scavengers,

chelators, and antioxidant enzymes) is also discussed, with a final focus on pathologies and therapies as well as analytical methods of free radical determination. This part is by far the most comprehensive of the three in terms of the number of literature references (2243).

This book is more like a one-volume encyclopedia than a regular text. It is dense insofar as the material goes, thus requiring intense concentration, and it seems tailored to be read and appreciated by an expert in the field. Although individual sections in each chapter are clearly delimited, the index is relatively brief in terms of number of entries compared to the enormous amount of information provided in the 32 chapters. The book has a helpful list of abbreviations—chemical, physico-chemical and biological symbols—at the beginning of the book and a profusion of tables and equations throughout. In addition, the authors have conveniently reproduced many figures and schemes directly from their original sources, all of which contribute to a clear visualization of the material covered, although the writing style and sentence flow can be confusing at times. Overall, the substantial amount of information contained under one cover is definitely the most important asset of this book.

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