Book Reviews

Organophosphates. Chemistry, Fate, and Effects. Edited by Janice E. Chambers and Patricia E. Levi. Academic Press, San Diego, CA. 1992. xviii + 443 pp. 15 × 23 cm. ISBN 0-12-167345-6. $69.95.

Organophosphorus compounds (OPs) have been extensively developed for over 30 years, for purposes ranging from the benign (insecticidal) to the malign (CW nerve agents). The global use of these agents in agricultural chemistry has been the impetus for a great deal of research during these decades on the biochemistry and toxicology of OPs. The present volume is an outgrowth of a symposium at the 1990 American Chemical Society National Meeting in Boston and has as its primary focus insecticidal organophosphorus compounds. In addition to acetylcholinesterase inhibition activity, effects such as teratogenicity and immunotoxicity are also covered, providing a timely and up-to-date account of OP toxicology.

Following an introductory section, which includes a discussion of the environmental fate of OP compounds and their analytical detection, the metabolic fate of these substances is extensively covered in the second part of the book. Two sections detailing the toxic effects of OPs follow, the first biochemical in emphasis and the second organismal. A brief summary account rounds out the book.

The book chapters contain extensive references and are, for the most part, accompanied by well-done graphics and tables of data. This volume should prove a useful reference for those concerned with the toxicology of organophosphorus compounds.

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Specialist Periodical Reports. Nuclear Magnetic Resonance. Volume 21. Edited by G. A. Webb. Royal Society of Chemistry, Cambridge, UK. 1992. xxi + 594 pp. 14.5 × 22 cm. ISBN 0-85186-44-2. £145.00.

As has been mentioned in earlier reviews, the *Nuclear Magnetic Resonance* series is one of the most successful in the *Specialist Periodical Reports* which are published by the Royal Society of Chemistry. The NMR series dates since 1972 and reflects the spectacular growth of this spectroscopic method over the past 2 decades spanning a broad spectrum of scientific disciplines from physics to biology and medicine.

This volume consists of the usual mix of annual and biannual reports by an established team of reporters and covers almost all aspects of NMR. The topics being covered include theoretical and physical aspects of nuclear shielding as well as its applications, the theoretical aspects and applications of spin–spin couplings, nuclear spin relaxation in liquids, solid-state NMR, multiple-pulse NMR, natural and synthetic macromolecules, conformational analysis, NMR of living systems, NMR imaging, NMR of oriented molecules, and NMR of heterogeneous systems.

A novelty in this volume is the coverage of NMR imaging in general rather than the more restricted area of living systems covered in earlier volumes. Again, this volume contains a list of all the symbols and abbreviations used in NMR, a chapter listing all the books and reviews published during the 1989–1991 period as well as a complete author index for all of the references cited. Furthermore, each of the 14 chapters averages over 400 references. All of these aspects of the publication are very useful ingredients for a successful reference manual and should be very helpful for everyone, specialist or lay person, who is interested in the method.

As with many multiauthored publications, this volume has the usual shortcomings: The quality of the chapters is not uniform ranging from fair to excellent. Also, in some chapters the style is either somewhat awkward or too terse. The typesetting can be either too small or too dense and the number of figures included in the volume is very small. All of this makes the reading rather difficult. Notwithstanding the above shortcomings, this is a very good and conscientious review of the NMR literature up to the middle of 1991. The high cost of the publication may prevent individuals from purchasing it for private use. However, this and previous volumes should be invaluable for scientists engaged in NMR research and are recommended for every library.

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Chemistry and Biology of *N*-Nitroso Compounds. By William Lijinsky. Cambridge University Press, Cambridge, U.K. 1992. xiv + 464 pp. 15.5 × 23 cm. ISBN 0-521-34629-0. $175.00.

This volume of the *Cambridge Monographs on Cancer Research* series provides an in-depth examination of the carcinogenic properties of *N*-nitroso compounds. These compounds are found in smoked foods and in meat and fish cured with nitrites. They occur, sometimes in high concentrations, in the environment and they are also formed in some industrial processes. In addition, they are present in tobacco, tobacco smoke, and certain cosmetics. The *N*-nitroso compounds are unique among carcinogenic substances as they are active in all species and are capable of producing cancer in a broad spectrum of target cells and organs. Some of these compounds are the most potent carcinogens presently known. The wide occurrence and potent carcinogenicity of the *N*-nitroso compounds has resulted in an enormous volume of publications. In this volume, the author, who is a foremost researcher in this field, presents a comprehensive survey of the chemistry and biological actions of these substances, thus explaining how they exert their carcinogenic potential and how apparently harmless precursors such as nitrites and amines are metabolized to form carcinogens. Following an introductory chapter is one describing the occurrence, formation, and detection of *N*-nitroso compounds. Subsequent chapters detail the chemistry of this class of compounds, their metabolism, toxicity, mutagenic

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properties, and structure–activity relationships. The concluding section deals with the importance of *N*-nitroso compounds as environmental carcinogens and as experimental models for investigating cancer. The book is thoroughly referenced and contains an excellent subject index.

N-Nitrosoamines, particularly those that can be formed upon ingestion of drug products, have become of major concern to those involved with development of new therapeutic agents. This excellent, comprehensive review will therefore be of interest to scientists involved in research and development of new drugs as well as to those concerned with the environment and all aspects of cancer research. The volume is recommended for all libraries in the health sciences.

Staff

Progress in Basic and Clinical Pharmacology. Volume 8. α-Adrenoceptors: Molecular Biology, Biochemistry and Pharmacology. Edited by Robert R. Ruffolo, Jr. Karger A. G., Basel. 1991. xiii + 225 pp. 17 × 24.5 cm. ISBN 3-8055-5390-0. $189.00.

Major advances in our understanding of the molecular structure and function of α-adrenoceptors have recently been achieved. At least seven subtypes of α-adrenergic receptors are currently recognized and more will probably be identified in the future. These subpopulations are discussed in the first chapter. At the same time, molecular biology has contributed a great deal to our understanding of these receptors. The cloning of α_1 and α_2 adrenoceptor DNAs and their expression, as well as the structure and conformation of the α-receptors, are described in the second chapter. Important advances in our understanding of the biochemical events involved in the signal transduction processes that are activated by the α-adrenoceptors, and which ultimately result in the end-organ response, are the subject of the next chapter. This is followed by a description of structure–activity relationships for various classes of α-adrenoceptor agonists and antagonists which will be of particular interest to medicinal chemists. The final two chapters deal with the functions mediated both centrally and peripherally by this class of receptors and therapeutic utilities that might be anticipated of agents that interact with them.

This book is notable because of the broadness of its scope. The most recent and important advances concerning the α-adrenoceptors, from the intracellular level of the nucleus, including the messenger RNA that encodes for them, through the biochemical processes they activate or inhibit, up to and including the functional effects they mediate in intact organs, animals, and in humans in both normal and disease states, are comprehensively reviewed. The consequence of integration of the knowledge of α-adrenoceptors from the fields of molecular biology, biochemistry, and pharmacology is a wealth of information which enhances a rational approach to their modulation which, in turn, offers the potential for development of new and useful therapeutic agents. The book will be of importance to all who study α-adrenoceptors, especially medicinal chemists, molecular and cellular biologists, biochemists, physiologists, and pharmacologists.

Staff

The Chemistry of Heterocyclic Compounds. Volume 24. Part 4. Fused Pyrimidines. Miscellaneous Fused Pyrimidines. By Thomas J. Delia. John Wiley, Inc., New York. 1992. xviii + 317 pp. 16 × 24 cm. ISBN 0-471-80462-2 (pt. 4). $175.00.

Volume 24 of *The Chemistry of Heterocyclic Compounds* series is devoted to the subject of fused pyrimidines. The first three parts review quinazolines, purines, and pteridines. In the present volume, part 4, fused pyrimidines in which the second ring is six-membered and contains one or more of the elements nitrogen, oxygen, or sulfur are reviewed in the traditional format of the series. Fused pyrimidine classes reviewed are pyridopyrimidines, pyrano- and thiopyranopyrimidines, pyrimidopyrimidines, pyrimidopyridazines, pyrimidooxazines and pyrimidothiazines, and pyrimidotriazines. Each chapter consists of an introductory section, followed by ones outlining the methods of synthesis of the ring system, its reactions, a review of the patent literature, tables in which every member of the class described during the period being reviewed (either complete, or, in the case of the pyridopyrimidines, from the time of the last comprehensive review in *Advances in Heterocyclic Chemistry* in 1967) is tabulated by name, melting point, other data, and references.

The style, format, and overall excellence of this volume are consistent with those of its predecessors. The complete series is a must for all institutional chemistry libraries. This volume will be a particularly valuable addition to the personal libraries of organic and medicinal chemists specializing in heterocycles, particularly pyrimidines.

Staff

Biotransformations. A Survey of the Biotransformations of Drugs and Chemicals in Animals. Volume 4. Edited by D. R. Hawkins. The Royal Society of Chemistry, Cambridge, U.K. 1992. xxix + 491 pp. 19 × 25 cm. ISBN 0-85186-187-3. £99.50.

This is the fourth volume in a series dedicated to providing a timely and comprehensive summary of the scientific literature reporting biotransformation reactions of xenobiotics that are catalyzed by vertebrate enzyme systems. The coverage is broad and includes pharmaceuticals, agrochemicals, food additives, and environmental and industrial chemicals. As in the previous volumes, a single year (in the present instance 1990) is covered. A comprehensive index to all volumes is included at the end of the book. A quick count indicated almost 400 entries. In view of the expanding nature of this field, the intention of the editor to develop a computerized database to supplement the book series is most welcome.

The book starts with a brief overview of some of the more interesting biotransformation studies reported during 1990 and is followed by 13 sections into which the material has been organized. Examples of the headings of these sections are polycyclic aromatic hydrocarbons, substituted aromatic compounds, heterocyclics, and steroids. Each chapter contains "abstracts" which summarize the literature reports. The compound, functional group, and reaction type indices are detailed and insure complete access to the contents of the book. This reviewer was surprised that an author index was not included.

An attractive feature of this series is the detailed structural information which accompanies each of the abstracts. For the most part, the structures are accurate, although the occasional structural error (p 275) and repeated errors in bond angles are minor distractions. The highlights of the studies are well-chosen and insightful and are presented in a clear and thorough fashion. As one examines the various abstracts, the only disappointment is the decision of Dr. Hawkins to not include key literature citations that are quoted in the original paper.

All in all this is a scholarly endeavor that provides a rich and readily available source of information that will be of general value to chemists and biologists alike who are interested in the metabolic fate of xenobiotics.

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Peptide Drug Delivery to the Brain. By William M. Pardridge. Raven Press, Ltd., New York. 1991. x + 357 pp. 16 × 24 cm. ISBN 0-88167-793-0. $125.00.

This book is a welcome addition to the scientific literature on CNS drug delivery. It provides the reader with a thorough overview of concepts used to describe the events involved in blood–brain barrier (BBB) transport of nutrients and drugs. Some outdated and misconceived notions are critically examined, currently accepted views are supported with additional documentation, and new theses are presented. While the title of the book implies that only the delivery of peptide drugs to the brain will be discussed, the author presents a lucid exposition on blood–CNS transcytosis in general, using peptide delivery as a specific example where appropriate. It covers a range of BBB-related topics including the physiology and anatomy of brain compartments and structures, and the molecular biology and biochemistry of membranes which constitute the compartmental interfaces. Discussions are detailed enough to enlighten but should not be overly esoteric to the lay reader. Topics are properly introduced at the beginning of most chapters and objectives are clearly explained. Over 850 pertinent references are cited, a number of which were published in 1990.

The book is organized into 10 well-written chapters. It begins with an illuminating discussion of peptides found in the human body. Topics include the synthesis and actions of peptides, peptide inactivation by peptidases, a rationalization for the development of peptides as neuropharmaceuticals, and a discussion of obstacles associated with the delivery of these agents to the CNS with possible solutions to overcome such problems. In-depth discussions of current methods employed to circumvent the BBB follow in chapters 3 and 4. These are presented in a chronological historical account of the study of the BBB which provides insight into its ontogenesis as well as its anatomy. Transnasal and intraventricular strategies for delivery of peptides to the brain are critically reviewed from a physiological as well as a functional perspective. In chapter 5, special attention is given to lipidization of drugs, an approach that is currently popular in drug-delivery efforts to enhance tissue penetration of polar compounds. The basic principles of lipid-mediated transport through the BBB are reviewed and specific examples of peptide lipidization are presented. The status of liposome technology for BBB drug delivery is also discussed, with respect to the problems associated with the technology of liposome formation and physiological obstacles associated with this strategy. Chapters 6–10 emphasize drug delivery to the brain employing specific vectors that undergo receptor-mediated or absorptive-mediated transcytosis through the BBB. Pinocytosis and receptor-mediated transcytosis are reviewed in chapter 6 as well as data supporting the presence of receptor-mediated transcytosis mechanisms within the BBB. In chapter 7 evidence for absorptive-mediated transcytosis at the BBB is presented with examples of two classes of proteins: polycation proteins and glycoproteins. Antibody complexation as a strategy for the delivery of drugs through the BBB is discussed in chapter 8. Proposed models of monoclonal antibodies as potential neurodiagnostics and neuropharmaceuticals, cationized antibodies as drug delivery agents, and IgG chimeric peptide delivery systems are described. The chimeric peptide pharmaceutical delivery system paradigm is explained in detail in chapter 9. Brain-specific transport vectors, i.e., brain capillary-enriched proteins and brain capillary-specific proteins as possible models for CNS drug-delivery systems are outlined in chapter 10 from a molecular biology perspective.

As a whole, this work is an excellent treatise on BBB transport and may be useful as a springboard for the development of novel strategies to enhance the delivery of pharmaceuticals to the CNS. However, carrier-mediated peptide transport at the BBB, which has been reported to occur for endogenous neuropeptides by several investigators, is not discussed in this work and sparse indexing may limit its usefulness as a reference text. These minor criticisms aside, the broad scope of subject matter encompassed in this book renders it a valuable text for scientists in almost every aspect of BBB transport, and of particular interest to those working in various areas related to CNS drug delivery such as neuropharmacology and medicinal chemistry.

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Books of Interest

Parkinson's Disease. From Clinical Aspects to Molecular Basis. Edited by T. Nagatsu, H. Narabayashi, and M. Yoshida. Springer-Verlag, New York, Secaucus, NJ. 1991. viii + 220 pp. 15 × 22.5 cm. ISBN 0-387-82272-0. $69.00.

Aging and Alzheimer's Disease. Sensory Systems, Neuronal Growth and Neuronal Metabolism. Volume 640. Edited by J. Growdon, S. Corkin, E. Ritter-Walker, and R. Wurtman. The New York Academy of Sciences, New York. 1991. xiii + 303 pp. 15 × 22.5 cm. ISBN 0-89766-726-3. $75.00.

Textbook of Biochemistry. With Clinical Correlations. Edited by Thomas M. Devlin. John Wiley & Sons, Inc., New York. xxiii + 1185 pp. 22 × 28 cm. ISBN 0-471-51348-2. $55.95.