

Book Reviews

Synthesis and Applications of Isotopically Labelled Compounds 1994. Proceedings of the Fifth International Symposium, Strasbourg France, 20–24 June, 1994. Edited by J. Allen and R. Voges. John Wiley & Sons, New York. 1995. xxix + 935 pp. 15.5 × 23.5 cm. ISBN 0-471-95143-9. \$199.95.

This elegant volume chronicles the fifth meeting of its kind and the second at a European location. Attended by over 500 scientists from 25 countries covering an increasing range of topics in isotope research, the symposium was outstanding with regard to the caliber of participation. The book contains 101 papers starting with the three excellent plenary lectures by R. Voges, D. W. Young, and T. A. Baillie and the Banquet Address by M. Schwartz and continues through the many sessions that comprised the four day meeting in picturesque Strasbourg. Included in the varied topics are papers for the sessions: Stereoselective Procedures in the Synthesis of Enantiomerically Pure Isotopically Labelled Compounds; Synthesis, Analysis and Applications of Organic Compounds Labelled With Isotopes of Hydrogen; Present Status and New Developments in the Analysis of Labelled Compounds; Application of Isotopes in Pharmacology, Medicine and Clinical Research and Synthesis, Analysis and Applications of Organic Compounds Labelled With Isotopes of Carbon. Of useful historical note, too, is the inclusion of a Preface to the volume along with awards presented at the symposium and biographical information of the awardees. Like preceding volumes, this book also contains a helpful author and subject index.

As I have mentioned in past reviews of this series, with each succeeding volume both the technical presentations and quality of the published proceedings increases. This volume is no exception to that trend and is significantly larger than earlier ones. On a personal note, I had the pleasure of visiting with Dr. Allen in Paris and Dr. Vogel in his Basel laboratory earlier this year as they were just completing the last details of this extensive volume. Clearly their hard and careful work has paid off, and both of them are to be congratulated.

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JM9509049

Oxidative Stress, Lipoproteins and Cardiovascular Dysfunction. Portland Press Research Monograph VII. Edited by C. Rice-Evans and K. R. Bruckdorfer. Portland Press Ltd., London. 1995. xvi + 184 p. 15.5 × 23.5 cm. ISBN 1-85587-045-3. \$96.00.

Awareness of the role of free radicals and antioxidants in disease and health by both the scientific community and the public, in general, has increased dramatically in recent years. This is most apparent in the area of cardiovascular research where great strides have been made in understanding the metabolism of cholesterol,

lipoprotein oxidation, and the role of antioxidants in relation to cardiovascular disease. In this book, leading researchers in free radical biology as applied to cardiovascular disease review developments in this field. The part played by lipoprotein oxidation in atherosclerosis is examined from an experimental viewpoint with appropriate reference to clinical observations. Mechanisms of initiation of atherosclerosis and reperfusion injury are presented and areas for future development in this area of research are considered.

Current understanding of the role of oxidation processes in cardiovascular dysfunction is discussed in terms of their chemistry, biochemistry, and cell biology. The book will therefore be of particular interest to medicinal chemists involved in cardiovascular research. Other scientists and clinicians interested in this exciting area of research will also find this a stimulating and informative up-to-date summary.

Staff

JM9509004

Biochemistry of Redox Reactions. By B. Testa. Academic Press, New York. 1995. xviii + 471 pp. 19.4 × 26.2 cm. ISBN 0-12-685391-6. \$75.00.

This monograph on the biochemistry of redox reactions forms part of a larger series appearing under the title *The Metabolism of Drugs and Other Xenobiotics*, which is edited by Bernard Testa and John Caldwell. Nevertheless, this document stands fully alone in its scope of scientific coverage and represents a truly monumental accomplishment by an individual who already has made so many seminal contributions to the field of medicinal chemistry.

The book starts with a general introduction co-authored with Professor Caldwell and a first chapter (Xenobiotic Metabolism: The Biochemical View) which sets the theme of the pedagogic approach (to offer both *information and knowledge*) and reviews basic concepts of enzyme-catalyzed reactions with an emphasis on xenobiotics. This is followed by a series of chapters, each of which undertakes to provide detailed coverage of redox reactions in terms of molecular functionality and the principal known catalysts. A special feature of Chapter 2 (Dehydrogenation of Alcohols and Aldehydes, Carbonyl Reduction) is the detailed mechanistic information (kinetics, stereochemistry, and enzyme active site structure) available on oxidoreductases that catalyze the redox reaction of carbonyl compounds. Chapter 3 (The Nature and Functioning of Cytochromes P450 and Flavin-Containing Monooxygenases), Chapter 4 (Carbon Oxidations Catalyzed by Cytochromes P450), and Chapter 5 (Monooxygenase-Catalyzed Nitrogen Oxidations) provide excellent and timely reviews of the two most important xenobiotic redox catalysts, the cytochromes P450 and flavin-containing monooxygenases. Protein structures, enzyme multiplicities, substrate selectivities, and the catalytic pathways of the cytochromes P450 are considered in detail in Chapter 3.

Chapter 4 reviews in a systematic fashion the types of cytochrome P450-catalyzed carbon oxidations (sp^3 , sp^2 , and sp), while Chapter 5 treats flavin-containing monooxygenase-catalyzed oxidations of aliphatic and aromatic amines as well as related nitrogen-containing systems such as azaheterocycles, hydrazines, and azo derivatives. The material covered in Chapter 6 (Monooxygenase-Catalyzed N–C Cleavage) and Chapter 7 (Oxidation of Oxygen- and Sulfur-Containing Compounds) builds on the fundamentals introduced earlier and provides, through specific examples, a sound appreciation of the scope and diversity of the N-, O-, and S-dealkylation reactions as well as those direct heteroatom oxidations that lead to various oxides and related systems. Chapter 9 (Oxidations Catalyzed by Various Oxidases and Monooxygenases) and Chapter 10 (Reactions Catalyzed by Peroxidases) treat these complex topics in depth and with special attention to the fundamentals of redox biochemistry and how these fundamentals can be nicely illustrated by specific examples taken from both endogenous and xenobiotic substrates. Chapter 12 (Reductions Catalyzed by Cytochrome P450 and Other Oxidoreductases) reviews the enzyme-catalyzed reductions of carbon-, nitrogen-, and sulfur-containing systems as well as less commonly encountered inorganic and organometallic systems. Finally, Chapter 8 (Oxidative Dehalogenation and Dealkylation of Organometallics), Chapter 11 (Oxidation of Mercury, Silicon, Phosphorus, Arsenic, Selenium and Halogens), Chapter 13 (Various Enzymatic and Non-Enzymatic reactions), and Chapter 14 (Conclusion and Outlook) are special topic chapters to complete the coverage of the various classes of xenobiotic oxidation reactions and to set the stage for the future.

This book is beautifully structured, with the reader always in mind. The chapters are outlined in detail, and the index is thorough. The literature citations (which are extensive!) cover publications through 1993. Both the novice and sophisticated student of xenobiotic metabolism will benefit by careful study of this monograph. Those of us who work in the area of drug metabolism owe Professor Testa a vote of thanks for having brought together in a unified volume the diverse elements that constitute the bioorganic chemistry of metabolic redox reactions.

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JM950846R

The Logic of Chemical Synthesis. By E. J. Corey and Xue-Min Cheng. John Wiley & Sons, Inc., New York. 1995. 436 pp. 18 × 25 cm. ISBN 0-471-11594-0. \$24.95 (pbk).

This is the paperback edition of the now standard and widely read book on organic synthesis by Corey and Cheng originally published in 1989. The usefulness of this book has been in no way diminished with time, and the syntheses presented provide clear examples of the manner in which organic chemists approach the construction of complex molecules. As the original publica-

tion date was several years ago, the references are necessarily not up-to-date.

The approach that is taken in this book is the rational analysis of synthetic problems. The book is divided into three parts: (1) an outline of the concepts of retrosynthetic analysis, (2) a representative collection of total syntheses from the Corey group, and (3) a structural guide to the literature on natural products. Part 1 is a discussion of the now familiar concept of retrosynthesis, and the authors present the basis for this manner of thinking about complex syntheses, including the concepts of transforms and retrons. Part 2 is a detailed, thorough presentation (principally graphical) of many of the significant natural products that have been synthesized by Corey and co-workers over the past 35 years. These are divided into structural classes, including macrocycles, heterocycles, sesquiterpenoids, polycyclic isoprenoids, prostanoids, and leukotrienes. Part 3 is a compilation of significant total syntheses by many other workers over the last 40 years. Particularly useful is that, for a given natural product, literature citations are given for each investigator's work.

This book will be of widespread interest by those interested in the synthesis of complex natural and unnatural products. It can serve as both a reference work and a textbook. At such a bargain price, it should become a dog-eared item on the bookshelves of anyone interested in organic synthesis.

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JM950845Z

Fundamentals of Enzyme Kinetics. Revised Edition. By Athel Cornish-Bowden. Portland Press, London. 1995. xiii + 343 pp. 17.5 cm × 24.5 cm. ISBN 1-85578-072-0. \$29.00.

This is a first revision of the volume originally published in 1979. Biochemistry, aided by molecular biology, has changed considerably during this time; however, the essentials remain the same. The material presented begins on a fundamental level with a discussion of reaction orders and rate constants (Chapter 1) and proceeds through to the complexities of multi-enzyme kinetics (Chapter 10) and estimations of rate constants (Chapter 12). Enzyme inhibition, multisubstrate reactions, and isotope effects are covered in a comprehensive and understandable fashion along the way. By necessity, most of the material builds upon itself, although single chapters can be read for review or reference once the concepts have been mastered.

The text is well organized and presents the early material in a historical context. This is valuable as it reminds the reader that no scientific insights occur in a vacuum. The many necessary derivations and equations are explained thoroughly and set off from the text leaving ample room for marginal notes. As would be expected from a thorough revision, the literature references have also been extensively updated.

Although this volume focuses on the underlying principles of enzyme kinetics, it is not constrained solely