

Book Reviews

Free Radicals and Oxidative Stress: Environment, Drugs and Food Additives. Biochemical Society Symposium No. 61. Organized and edited by C. Rice-Evans, B. Halliwell, and G. G. Lunt. Portland Press Ltd., London, on behalf of the Biochemical Society. 1995. x + 276 pp. 16 × 25.5 cm. ISBN 1-85578-069-0. \$96.00.

This volume presents the proceedings of Biochemical Society Symposium No. 61 that was held at The University of Sussex, Brighton, U.K., in December 1994. It derives from the only recently recognized "paradox of aerobic life", i.e., that oxygen is essential to human life yet is poisonous to all aerobic organisms. Accordingly, as a result of being metabolized to oxygen-derived free radicals and other free radical species, e.g., nitric oxide, oxygen is both useful and harmful. Antioxidants, both endogenous and diet-derived, oppose the harmful effects of the derived reactive oxygen species. This volume consists of 19 articles, each 10–15 pages in length, that cover the basics of the chemistry of free radicals (including nitric oxide), the way in which side effects of certain drugs and air pollutants can be mediated by free radicals, the mechanisms of action of antioxidants in foods, and the utility of antioxidants in the treatment of human disease. Each article is clearly written by an expert in the field. References are up-to-date, and an adequate subject index is provided.

This book provides a timely survey of a rapidly expanding area of investigation; it will be of particular interest to advanced students and researchers active in this field.

Staff

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Chemistry of Organic Fluorine Compounds II: A Critical Review. Edited by M. Hudlicky and A. E. Pavlath. American Chemical Society Monograph 187. American Chemical Society, Washington, D.C. 1995. xxi + 1296 pp. 16.0 × 23.5 cm. ISBN 0-8412-2515-X. \$169.95.

This is an excellent and comprehensive review of organic fluorine compounds. It is an update of the 1976 edition and therefore focuses on developments since the writing of that volume. The literature coverage is from 1972 to 1991. The book consists of eight chapters, namely: (1) Survey of the Literature of Organic Fluorine Chemistry, (2) Survey of Fluorinating Agents, (3) Methods of Introducing Fluorine into Organic Molecules, (4) Reactions of Organic Fluorine Compounds, (5) Fluorinated Compounds as Reagents, (6) Properties of Fluorinated Compounds, (7) Analysis of Organic Fluorine Compounds, and (8) Applications of Fluorinated Compounds. Several of the chapters are further subdivided. For example, Chapter 3 on Methods of Introducing Fluorine into Organic Molecules is further subdivided

into 11 parts focusing on different types of reactions including Addition of Fluorine, Addition of Hydrogen Fluoride, Replacement of Hydrogen by Fluorine, and Replacement of Oxygen by Fluorine. There are also excellent author and subject indices. General safety rules for working with fluorine and fluorinated compounds are discussed. Procedures, for example, on how to conduct a halogen–fluorine exchange are also discussed.

Clearly, one of the greatest assets of this book is the comprehensive survey of the literature during the period covered. Other monographs and journal reviews are well referenced. People working in fluorine chemistry will find this as a very handy reference book. On the other hand, chemists thinking of incorporating fluorine in their works will find this as a very good starting point. Such questions like what are the physical properties of fluorine as compared to other halides and how to incorporate fluorine into a desired compound are addressed. In addition, analysis of fluorinated compounds and examples of fluorinated compounds with commercial applications in refrigerant, agricultural, and pharmaceutical industries are given. It is easy to read and has a lot of examples and references for each aspect examined. The only disadvantage of the book is that, like most books, the references are several years old at the time of publication. The 47 authors that put this monograph together have indeed done a great job.

Adeboye Adejare

*School of Pharmacy
University of Missouri-Kansas City
Kansas City, Missouri 64110*

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Enantioselective Reactions in Organic Chemistry. By Otakar Cervinka. Ellis Horwood, New York. 1995. xii + 194 pp. 17 × 24 cm. ISBN 0-13-276239-0. \$119.95.

Asymmetric synthesis has steadily grown in importance over the past 20 years or so. Enantioselective reactions provide optically active compounds from optically inactive compounds and, due to the advances in this area of synthesis, provide a strategy to synthesize a myriad of homochiral compounds. The purpose of this monograph is not to comprehensively review this important topic in organic synthesis but rather to build upon the already excellent reviews and monographs available.

This monograph contains 15 chapters, along with a preface and references. The earlier chapters introduce the resolution of racemates and the behavior of enantiomers under chiral conditions (determining optical purity, chiral solvents, and shift reagents) with later chapters dealing with enantioselective solid state reactions, enzyme-catalyzed reactions, and the importance of enantioselective synthesis. The middle chapters

comprise the major portion of this monograph. Chapter 7, entitled Noncatalyzed Asymmetric Reactions, deals with asymmetric reductions involving organoboranes, Grignard reagents and the use of chiral analogs of lithium aluminum hydride. Only a brief mention to asymmetric reactions at sulfur is included. Chapter 10, entitled Asymmetric Reactions Catalyzed with Transition Metal Complexes, deals with, after some discussion of chiral phosphorus ligands, asymmetric hydrogenations, hydrosilylations, and hydroformylations. Chapter 11, entitled Asymmetric Reactions Which Use a Chiral Auxiliary Reagent, discusses asymmetric epoxidations, hydroborations, and Diels–Alder reactions. Use of lithium enolates in asymmetric alkylations and Aldol reactions are included, as is a brief mention of conjugate addition reactions and the synthesis of chiral amino acids.

References are compiled in two sections as opposed to listing them at the end of each chapter. References are numerous (621); however, they only provide literature citations through 1991. A general index is available.

This monograph is recommended to anyone involved in organic synthesis and is a requisite addition to all chemistry libraries. Unfortunately, the high cost may prohibit many from personal purchase.

Ciro J. Spagnuolo

*Bristol-Myers Squibb
Chemical Process Development
One Squibb Drive
New Brunswick, New Jersey 08903-0191*

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Organic Chemistry. Sixth Edition. By T. W. Graham Solomons. John Wiley & Sons, New York. 1995. xxvii + 1290 pp. 18.5 × 26 cm. ISBN 0-471-01342-0. \$90.95.

This new edition provides an increased emphasis on detailed explanations of mechanisms, structure, and theory. Chapter 3 has been extensively revised. An

introduction to the four categories of organic reactions and the mechanisms of organic reactions have been included. The use of curved arrows in explaining reactions has also been added early in Chapter 3. Chapter 5 contains new sections on enantioselective syntheses and chiral drugs. The mechanisms starting in Chapter 6 and continuing throughout the book, have a new, more detailed format. Radical reactions have been moved back to Chapter 9 so that students can consolidate their understanding of ionic reactions before encountering radical reactions. The use of magnesium monoperoxyphthalate as a safer means of carrying out epoxidations is added in Chapter 10. Chapter 13 on spectroscopy has been extensively revised and moved earlier in the book. For greater clarity, all of the ¹H NMR spectra are taken on a 300 MHz instrument. A new special topic on 2-dimensional NMR techniques has been added. It is now possible to cover spectroscopy in the first semester using this edition of the book. Responding to suggestions from reviewers, the chapters on carbonyl chemistry (16–19) have been rearranged to make them consecutive. The 6th edition has several hundred new problems in it, especially in the early chapters. A welcome addition to this edition is a glossary of more than 350 important terms found in the appendix.

Other improvements include consistently sized type and shapes in the reaction diagrams. The introductory pictures at the start of each chapter are an improvement over the dark, computer-generated pictures of the previous edition. This is a very comprehensive and well-written text for the standard undergraduate organic chemistry course. Its price, size, and length are in line with several other texts competing for the same market. In my opinion the book would benefit from summaries at the end of all of the chapters.

John R. Williams

*Department of Chemistry
Temple University
Philadelphia, Pennsylvania 19122-2585*

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