

Book Reviews

Synthesis and Applications of Isotopically Labelled Compounds 1994. Edited by J. Allen (Synthelabo Recherche), and R. Voges (Sandoz Pharma). John Wiley and Sons, Inc., New York, NY. 1995. xxix + 935 pp. 15 × 22.5 cm. \$199.00. ISBN 0-471-95143-9.

This book is a compilation of the proceedings of the Fifth International Symposium on the Synthesis and Applications of Isotopes and Isotopically Labelled Compounds held in Strasbourg, France, 20–24 June, 1994. The editors have organized the volume into 14 different sections dealing with various synthetic aspects as well as applications of isotopically labelled compounds. The chemistry described in most of the papers represents modern research in the field of isotopically labelled compounds. The first three papers provide an overview of synthetic methods for selected compounds, including stereoselective and stereospecific methods, and applications of stable isotope labelling techniques used in mechanistic studies. The remainder of the book provides a good survey of the synthesis, analysis, and applications of labelled organic compounds bearing different isotopes. Almost all sections cover very recent developments in the field of isotopic labelling, including applications, synthesis of isotopically labelled compounds used in research, safe handling of radioisotopes, waste disposal, and government regulations for radioactive compounds, etc. Each paper provides references to more specialized reviews as well as to representative research papers.

The sections in this book cover major topics in the field of labelled compounds. Since the book is a collection of research papers, the sections are largely independent of each other and can be read in any order. The sections are as follows: Synthesis, analysis and applications of organic compounds labelled with isotopes of hydrogen, Production of stable and radioactive isotopes: current status and future projections, Use of isotopes in agriculture, nutrition and environment studies, Synthesis and applications of organic compounds labelled with short lived isotopes, applications of isotopically labelled compounds in pharmaceutical research & development, applications of isotopes in macromolecules: proteins, nucleic acid and monoclonal antibody research, Present status and new developments in the analysis of isotopically labelled compounds, Application of isotopes in pharmacology, medicine and clinical research, Synthesis, analysis and applications of organic compounds labelled with isotopes of carbon, Uses of isotopes in investigations in organic, exchange and bioorganic mechanisms, Synthesis and applications of organic compounds labelled with isotopes of elements other than carbon and hydrogen, Applications of labelled compounds in drug metabolism & toxicology, The use of labelled compounds in investigating biological pathways, Handling radioisotopes safely, laboratory design waste disposal and government regulations throughout the world.

This book is recommended for the chemist who wishes to survey modern synthetic methods and new tech-

niques in the field of isotopically labelled compounds. Every laboratory dealing with isotopically labelled compounds should have a copy of this book.

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Anti-AIDS Drug Development: Challenges, Strategies and Prospects. Edited by Prem Mohan (University of Illinois at Chicago) and Masanori Baba (Kagoshima University, Japan). Harwood Academic Publishers, Langhorne, PA. 1995. x + 298 pp. 17 × 24.5 cm. \$85.00. ISBN 3-7186-5698-1.

This book is comprised of twelve chapters that review various areas related to anti-AIDS drug development. It is a reference text that provides something for everyone. For those already involved actively in research in this area, it provides specific, well-referenced, and topical information, and for those relatively new to the area or contemplating entry into the area, it provides very good background and entry into the primary literature. It suffers, as do all books on AIDS-related topics, from the unavoidable disadvantage that information becomes somewhat dated rather quickly, since progress in this area is rapid and new results are constantly updated in the primary literature. Nevertheless, this book provides a very good foundation upon which to keep up with the developments reported in the primary literature.

The introductory chapter by Erik De Clercq provides an excellent overview of the HIV replicative cycle and potential targets for drug development. There are, of course, other reviews and references that cover this same information; however, Dr. De Clercq lives up to the title of his chapter by providing a *critical appraisal* of the status of each of these target areas and makes important points regarding the constantly changing landscape of AIDS-related drug discovery. He appropriately cautions the reader regarding making simple assumptions based on specific observed effects, when there may be multiple, complicated reasons for such effects. The introduction by Dr. De Clercq lays the groundwork for the chapters that follow by providing an overview of the HIV inhibitors identified to date. The remainder of the book is organized around the various drug targets, i.e., nucleosides, α -glucosidase inhibitors, regulatory proteins, protease inhibitors, etc. There is also a well-written chapter on plant-derived anti-HIV agents (by A. Douglas Kinghorn) which covers some novel agents for which targets have not yet been fully characterized.

Most of the chapters provide an introduction that provides good historical background for the topic, a comprehensive discussion of specific research conducted in the area, and concluding remarks. Most of the

chapters are relatively free of typographical and stylistic errors, and references provided are as up-to-date as can be expected for topics as dynamic as these. Chapters 8 and 9, dealing with resistance to anti-HIV agents and anti-HIV drug test systems, are both practical and excellent. Overall, the strengths of most of the chapters are the background, discussion of past and current research activity, and useful references. There were no obvious errors in the index. It was somewhat disappointing that there were some inconsistencies in the style of the chapters; i.e., not all authors provided "Conclusions" and only one included a distinct section on "Future Directions." Given the rapidly changing environment for anti-HIV drug discovery, the perspectives of each of these recognized authorities on directions that the field may take in the future would have been very useful and informative. Nevertheless, this is considered a relatively minor weakness of an otherwise excellent compendium. It is well-organized, timely, and relatively easy to read and appeals to a broad audience. It could be useful as a textbook in advance course work, but would also be most useful as a reference book for those involved in AIDS drug development.

For those actively involved in AIDS drug development research the material may soon appear to be dated. Nevertheless, this book provides a good overview of a field of research that encompasses many different areas and, in that regard, will be a good addition to anyone's library. The price of \$85.00 seems a little on the high end but the volume is worth purchasing.

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Symmetry: A Basis for Synthesis Design. By Tse-Lok Ho (National Chiao Tung University). John Wiley & Sons, New York, NY. 1995. xv + 561 pp. 15.5 cm × 23.5 cm. \$69.95. ISBN 0-471-57376-0.

This book treats complex molecule synthesis strategy from the perspective of symmetry, as its title makes clear. The "symmetry" referred to is that which characterizes (or is absent or hidden in) synthesis intermediates and targets due to their functionality, stereochemistry, and other structural features. The author includes a very brief preface that offers some insight into his philosophical take on this subject, an introductory chapter that summarizes the essential elements of symmetry operations and point groups, symmetry-related strategic concepts such as desymmetrization of symmetrical intermediates, enantiodivergence, and convergence, pseudosymmetry and local symmetry, and a short discussion of how the exploitation of these symmetry principles affects synthetic efficiency. There follow a chapter devoted to the construction of symmetrical molecules, largely but not exclusively unnatural, and a series of seven chapters making up the remainder of the book that focuses on the use of various synthons of increasing complexity that have important symmetry characteristics, either in and of themselves

or relative to the target structures to which they lead. These latter seven chapters (and the respective part of the table of contents) are organized according to the operations done with or on the various synthons. However, the context for this treatment is the involvement of the synthons in a broad range of natural product syntheses. This allows the book to provide convenient access to information on the transformations of the synthons addressed, which, however, is documented in terms of the solution of genuine problems in the construction of complex molecules. Ho's writing style is both sophisticated and quite readable. The production values are high, including that of the structural art, and the error rate appears to be low. The index is composed mainly of target structures and reactions and methodological procedures, and thus complements the table of contents. There is no author index; the references are accumulated alphabetically by first author at the end, thus constituting a kind of ersatz author index. However, the inability to retrieve easily the contributions of those principal scientists who do not list their names first is a shortcoming.

The proliferation of total syntheses of complex natural products has led to an attendant proliferation of reviews and monographs in which they are republished as concise collections. While frequently usefully organized around some theme, these secondary sources are often merely summative rather than evaluative and critical. Thus, this volume was received with the expectation that "symmetry" had been chosen as yet another excuse for the republication of some recent total syntheses. However, this reviewer must concede that Ho has taken a genuinely thoughtful and scholarly approach to his subject. An impressive number of syntheses are analyzed painstakingly according to the organizational scheme outlined above and, of course, with a view toward the way symmetry considerations have played key roles in their accomplishment. It is particularly welcome that some earlier total syntheses are reconsidered from this perspective. Ho's insights are capable of stimulating one to see synthetic problems in a new light. Moreover, this book certainly could be used to advantage in a graduate course in complex molecule synthesis. There is, however, one flaw that is likely to dissuade many potential purchasers, which is the absence of detail (reagents and important reaction conditions, some intermediate structures) from the schemes that summarize the syntheses Ho treats. Although this is done clearly to engage the audience at the level of strategic design, it is an unfortunate omission since it is the rare reader who will be indifferent to the chemistry that causes the lofty strategic planning to be realized. Notwithstanding this significant shortcoming, Ho's book can be recommended based on its unusually thorough and thoughtful evaluation of the contributions symmetry considerations have made to complex molecule synthesis.

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