

Additions and Corrections

Efficient Synthesis of Benzene and Planar Cyclooctatetraene Fully Annulated with Bicyclo[2.1.1]hex-2-ene [J. Am. Chem. Soc. 2001, 123, 1768–1769]. AKIRA MATSUURA AND KOICHI KOMATSU*

Page 1769, left column, line 1: Among the ^1H NMR data, δ 1.13 (dd, $^3J_{\text{CC}'} = 3.6$ Hz, $^3J_{\text{BC}} = 1.5$ Hz, 8H, H_C) should be corrected to δ 1.13 (AA' part of AA'XX' spectrum, $^4J_{\text{CC}'} = 9.8$ Hz, $^2J_{\text{BC}} = 6.0$ Hz, $^4J_{\text{BC}'} = -0.8$ Hz, 8H, H_C).

We thank Professor Manfred Christl of the University of Würzburg for pointing out this error.

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Book Reviews*

Stimulating Concepts in Chemistry. Edited by Fritz Vöglé (Universität Bonn), J. Fraser Stoddart (University of California, Los Angeles), and Masakatsu Shibasaki (University of Tokyo). Wiley-VCH: Weinheim. 2000. xvii + 396 pp. \$50.00. ISBN 3-527-299785.

Stimulating indeed, this book is an invaluable resource for the chemistry community as well as for scientists in a wide range of disciplines and across different levels of education. Well-renowned chemists, all pioneers in their corresponding fields, have contributed a total of 24 chapters, written in essay format, with each addressing a different “concept”. The text of this book flows remarkably smoothly. Even the most complicated concepts are easy to comprehend because of the way the essays are written and organized. Each essay begins with a clear and concise definition of the concept, including a pictorial description, followed by an abstract. There is a prologue introducing each essay and an epilogue concluding it. These features provide a nice perspective to the more detailed contents and offer a vision of future developments. Hence, each essay is not only informative, but thought-provoking as well. The cited literature is extensive, covering both the fundamental and the most current references in each topic. The book is thus a wonderful resource for those wishing to pursue further knowledge in any of the specific fields covered.

The concepts are grouped into four separate sections. Section I addresses new concepts in design and synthesis, where the word “green chemistry” recurs throughout the 10 essays that cover topics ranging from Lewis acid catalysis in aqueous media, organic synthesis in supercritical fluids, and combinatorial chemistry to asymmetric two-center catalysis, to name a few. Interfacing structure and function, section II comprises five fabulous essays discussing concepts in molecular architecture, organization, and assembly. Topics include new frontiers in the chemistry of fullerenes and novel carbon allotropes, functional dendrimers, chemical encapsulation via self-assembly, constrictive noncovalent bonding, and molecular host-frameworks for crystal engineering. The exciting progression continues in section III, where the connection between chemistry and new materials science is explored via a half-dozen essays. Concepts developed in the previous section are applied in section III to concepts in nanotechnology. After reading this section, one has the conviction that concepts that sounded like science fiction a decade ago, such as the advent of molecular computers, could become a reality in the not-too-distant future. Outstanding discussions on the most recent development of molecular wires, molecular devices, and molecular machines are complemented by the latest research in electron/energy transfer, luminescent logic and sensing, nanoarchitecture, and the supramolecular synthon. The last three essays of the book, in section IV, are dedicated to the intellectually challenging bridge between biology and chemistry. The link is brilliantly explored through the concepts of enzyme mimics and enzyme inhibition

and through the interplay between organic synthesis and biophysics in the investigation of biological phenomena at the cellular level.

In summary, this book is recommended to graduating college seniors seeking graduate training in a frontier area of chemistry. It will also be an invaluable resource for graduate students wishing to broaden their knowledge of certain areas, searching for new avenues of research or for proposal ideas, or looking for postdoctoral advisors. Finally, for the mature scientist, this book, with its challenging concepts in current chemistry, should be thought-provoking and very, very informative.

Luis Echegoyen, University of Miami, Florida

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Biomedical Chemistry. Applying Chemical Principles to the Understanding and Treatment of Disease. Edited by Paul F. Torrence (Northern Arizona University). Wiley-Interscience: New York. 2000. xvi + 416 pp. \$79.95. ISBN 0-471-32633-X.

This book contains 17 chapters grouped into four sections that are centered around the theme of the application of fundamental chemical principles to drug design. The first section covers the development of drugs based either on the inhibition of specific enzymes or on the use of specific enzymes to activate a prodrug. An example of the first is the use of irreversible inhibitors of *S*-adenosylmethionine decarboxylase as antitrypanosomal agents, while the second approach is exemplified by chapters on two different prodrug approaches to the treatment of AIDS.

The second section contains six chapters covering the application of fundamental chemical principles to drug design. The topics covered in this section vary from the use of superacid media to prepare new vinca alkaloid analogues to the use of magnetic drug delivery, with additional chapters on fluorine substitution in neurotransmitters and the design of inhibitors of HIV-1 reverse transcriptase, among others.

The third section contains three chapters with the theme of understanding the chemical basis of drug action and disease and includes chapters on thioureylenes compounds as antimelanoma agents, new antimalarial peroxide drugs, and the chemistry of Parkinson's disease. The fourth and final section provides a nice overview of three relatively new approaches to drug discovery and contains chapters on DNA chips, peptide nucleic acids, and ribozyme mimics.

Overall, the book fulfills the goal of providing a sound chemical understanding of the fundamental processes of drug discovery. Many of the chapters are particularly illuminating in this respect; I especially enjoyed Susan Ludeman's lucid explanation of the development of cyclophosphamide as an anticancer agent, the discussion by Christian Perigaud et al. on the design of biolabile phosphate protecting groups, and the chapter by Gary Posner et al. on the rational design of new antimalarial peroxide drugs. Some of the chapters, such as that by

*Unsigned book reviews are by the Book Review Editor.

Ludeman and the three final chapters, provide complete overviews of particular areas, while others focus primarily or exclusively on work from the authors' laboratories. This can lead to uneven coverage and accounts for the lack of references to Castagnoli's work in the chapter on Parkinson's disease, for example.

The book is generally well produced, with relatively few typographical errors, although some of them are amusing: d'Ischia and Prota no doubt think that their approach is ingenious rather than ingenuous (p 267), and Dr. Borchardt's name is regrettably misspelled in his chapter title (p 41). At what must be considered a modest price, this book is warmly recommended as a good overall survey of the field to chemists and biochemists working in biomedical or related areas. It will also appeal to teachers of organic chemistry as a source book of medically relevant examples of fundamental chemical principles. I plan to use some of the examples in my next nonmajors undergraduate organic chemistry course.

David G. I. Kingston, *Virginia Polytechnic Institute and State University*

JA004852A

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Nuclear and Radiation Chemical Approaches to Fullerene Science. Developments in Fullerene Science. Edited by Tibor Braun (L. Eotvos University). Kluwer Academic Publishers: Dordrecht, Boston, London. 2000. xvi + 204 pp. \$95.00. ISBN 0-7923-6524-0.

This volume, edited by Braun, is the first of a series on fullerenes. It contains 10 chapters reviewing work arising from techniques in the fields of nuclear and radiation chemistry, such as positron annihilation, Mössbauer spectroscopy, radiation chemistry, and hot-atom chemistry.

Gadd's chapter reviews his work on hot-atom chemistry, where he uses a nuclear reaction to produce an energetic, radioactive, noble-gas atom that penetrates into a fullerene. Since the present reviewers have made these compounds with stable noble-gas isotopes for years, we expected that there should be a large overlap with our work. There is no discussion of our work and only three references to it. Since the noble gas atoms considered here are radioactive with short half-lives, they can be made and detected in extremely small amounts. Their existence can be established, but measurements of other properties have not been made.

The chapter on radiation chemistry by Asmus and Guldi gives a good description of radiation chemistry and ties in with the large body of redox properties of fullerenes and their derivatives. Ehrhardt and Wilson's chapter on fullerene radiopharmaceuticals describes an important emerging field, but the chapter is too short to be very useful.

With the exception of the chapter by Asmus and Guldi, the work is strangely disconnected from the mainstream of fullerene research. These techniques are seldom mentioned in fullerene conferences, and the references in the chapters are not well connected to the literature as a whole. For example, Sundar's chapter on positron annihilation gives a nice description of positron lifetimes and how they are affected by fullerenes. The data are explained by modeling calculations, but in the end, we learn very little about fullerenes that was not already known through other techniques. Similar comments apply to the chapter on Mössbauer spectroscopy by Klencsár and Vértes. They obtain information on metals in groups, usually porphyrins, bound to fullerenes. We learn about the metal atoms but little about the fullerenes.

Martin Saunders and R. J. Cross, *Yale University*

JA004836D

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Dendrimers III: Design, Dimension, Function. 212 Topics in Current Chemistry. Edited by Fritz Vögtle (Universität Bonn). Springer Verlag: Berlin, Heidelberg, New York. 2001. x + 198 pp. \$119.00. ISBN 3-540-67828-X.

This book continues the series edited by Prof. Vögtle in which the first two volumes considered dendrimer synthesis, architecture, nanostructure, and supramolecular chemistry. The rational design of dendrimers to accomplish specific tasks, such as encapsulating metals or semiconductors, creating an inflexible polymer or even a flexible one, and making unique coatings, is covered in this volume. Each

chapter considers one aspect of the above tasks, with the final chapter covering small-angle neutron scattering results to obtain molecule structure/dimension in solution.

The conclusion one can draw after reading this volume is that dendrimers present a unique way to include other molecules or atoms in a molecular architecture that can either sequester them from or present them to the outside environment. This can influence chemical reactivity or physical properties. For example, hyperbranched polymers (imperfect dendrimers) may be enhanced cross-linkers in specialty coating applications, and dendrimers, through their molecular architectures, can assemble into interesting surface morphologies. Dendrimers are also shown to have the ability to locate metal ions within their interiors. Since the highly branched architecture can act as a molecular "gate", interesting semiconductors can be generated. Choice of monomers is also critical for defining dendrimer properties. As discussed throughout the book, different monomers can make the molecule rigid or flexible, which influences the properties of dendrimers.

The references are up-to-date, and a comprehensive literature survey is provided. This is a worthy addition to any library.

Michael E. Mackay, *Stevens Institute of Technology*

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Chemistry for the 21st Century. Edited by E. Keinan (Technion-Israel Institute of Technology and Scripps) and I. Schechter (Technion, Israel). Wiley-VCH: Weinheim, New York, Chichester, Brisbane, Singapore, Toronto. 2001. xiv + 294 pp. \$35.00. ISBN 3-527-30235-2

This book brings together top leaders in field of chemistry—including both Wolf and Nobel prize winners—to discuss some future developments in chemical research. Many of the 15 chapters were originally presented at the symposia celebrating the 20th anniversary of the Wolf Prize and the 50th anniversary of the State of Israel held in May 1998. A sampling of the variety of subjects discussed includes "Heterogeneous Catalysis: from 'Black Art' to Atomic Understanding" by G. Ertl, "Spherical Molecular Assemblies: A Class of Hosts for the Next Millennium" by L.R. MacGillivray and J. L. Atwood, and "Quantum Theory Project" by R. J. Bartlett. This book is the first of a three-volume set: Volume 2 will focus on the life sciences, and Volume 3 will concentrate on physics and the mathematical sciences.

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Imaging in Chemical Dynamics. Edited by Arthur G. Suits (Berkeley Laboratory) and Robert E. Continetti (University of California). American Chemical Society: Washington, DC (Distributed by Oxford University Press). 2001. xii + 412 pp. \$150.00. ISBN 0-8412-3690-9

This book emerged from the Imaging in Chemical Dynamics symposium held at the 212th National American Chemical Society Meeting in New Orleans, LA. The book contains 21 chapters derived from presentations at the symposium by an international group of scientists who use a variety of imaging techniques for studying chemical dynamics.

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Glycosyl Hydrolases for Biomass Conversion. Edited by Michael E. Himmel, John O. Baker (both at National Renewable Energy Lab), and John N. Saddler (University of British Columbia). American Chemical Society: Washington, DC (Distributed by Oxford University Press). 2001. x + 292 pp. \$120.00. ISBN 0-8412-3681-X

This book arose from an ACS symposium of the same name held in Anaheim, CA, in March 1999. Some of the topics covered include glycosyl hydrolase structure-function relationships and "large bench-scale" studies directed toward understanding how these enzymes may best be utilized in industrial applications. There is also a section on cellulase action and synergism.

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