Additions and Corrections

Generation of 1,2-Bisketenes from Cyclobutene-1,2-diones by Flash Photolysis and Ring Closure Kinetics [*J. Am. Chem. Soc.* **1997**, *119*, 12125−12130]. ANNETTE D. ALLEN, JIM D. COLOMVAKOS, FRANÇOIS DIEDERICH, IAN EGLE, XIAOKUAI HAO, RONGHUA LI, JANUSZ LUSZTYK,* JIHAI MA, MICHAEL A. MCALLISTER, YVES RUBIN, KUANGSEN SUNG, THOMAS T. TIDWELL,* AND BRIAN D. WAGNER

The configuration of the anhydride **8** should be *trans*, as reported in ref 13a. We are grateful to Professor Lennart Eberson for pointing out this error.

JA9855141

S0002-7863(98)05514-0
Published on Web 08/15/1998

Book Reviews

Polymer Modification. Edited by Graham Swift, Charles Carraher, Jr., and Christopher N. Bowman. Plenum: New York. 1997. vii + 212 pp. $95.00. ISBN 0-306-45714-8.

This book is a short compilation of 18 papers that are related to the broad topic of Polymer Modification, the subject of a symposium held at the National American Chemical Society Meeting in Orlando, FL, in August 1996. Most of the papers involve synthetic modifications of a variety of polymer systems and property characterizations that include ceramic applications, blend compatibilizers, and separation membranes. Two papers report on theoretical studies. The papers are divided into three sections of five to seven papers each: Surface Modifications, Reactions with Vinyl Polymers, and Inorganic-Containing and Shaped Polymers. The section titles are indicative of the diversity of topics in the book. Thus the reader would have benefited from an overview chapter or a significantly longer preface that provided some linkage of the papers. On the other hand, a very useful feature is the subject index. As is often the case with symposium proceedings, the style, format, and editing of the various chapters are inconsistent. The references in most, but not all, of the papers are from the last decade.

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JA985647M

S0002-7863(98)05647-9

Pulsed Electrochemical Detection in High-Performance Liquid Chromatography. By William R. LaCourse (University of Maryland Baltimore County). Wiley Interscience: New York. 1997. xvii + 324 pp. $59.95. ISBN 0-471-11914-5.

This monograph is in the Wiley Techniques in Analytical Chemistry Series. While the previous titles in this series have covered rather broad topics, this contribution is narrowly focused on a specific family of techniques of electrochemical detection for liquid chromatography. However, the pulsed electrochemical detection (PED) techniques are gaining in application, particularly with respect to carbohydrate analysis in the biotechnology industry. As most scientists using PED are not electrochemists but should understand the basic electrochemistry behind PED, this book fills an important need.

The author has assumed that most readers will have a basic understanding of liquid chromatography and not of electrochemistry. Therefore, the introduction focuses on fundamentals of electrochemistry and omits coverage of liquid chromatography principlels. I believe this was a wise choice, which keeps the book to a manageable length while providing sufficient depth in the discussion of electrochemistry principles for clearly understanding PED. Throughout the book the author has made excellent decisions on the order of material and which material to highlight in order to build the reader's understanding to the point that when the complex topic of waveform optimization is presented in Chapter 6 it seems straightforward.

Most scientists interested in PED will find Chapter 7 (Applications of PED) extremely useful. The author does not give just a historical or categorical summary of all of the analytes which have been detected by PED. Rather, he provides insightful discussions of how the various applications are approached in both their detection and separation aspects. These discussions provide the newcomer to the technique as well as the experienced user helpful information on how to approach a new application in addition to repeating literature methods. Finally, this chapter couples to Appendix B which provides a comprehensive literature survey of applications of PED. While this appendix is somewhat out of date just due to the time taken to publish a book of this nature, it still provides outstanding research for someone using PED.

While the target audience for this book appears to be primarily analytical chemists using or learning to use PED, it would also be very useful for a graduate-level chemistry course. It is written in an extremely accessible style that makes reading enjoyable. In conclusion I highly recommend this book to anyone working with or considering working with PED.

Craig E. Lunte, *University of Kansas*

JA975661J

S0002-7863(97)05661-8

Polycyclic Aromatic Hydrocarbons. By Ronald G. Harvey (The University of Chicago). Wiley/VCH: New York. 1997. $125.00. xiii + 667 pp. ISBN 0-471-18608-2.

Combustion of organic matters, including fossil fuels, generates polycyclic aromatic hydrocarbons (PAHs) as widespread environmental contaminants. A number of PAHs have been found to induce tumors in experimental animals. PAHs are a class of chemicals that has been of interest in the fields of organic chemistry, theoretical chemistry, cancer research, energy science, and environmental science. A set of two books dealing with PAH organic synthesis and chemical properties was published in 1964 by Clar and, apparently, has long been out of print. The book *Polycyclic Aromatic Hydrocarbons* by Ronald G. Harvey fills this gap and provides a comprehensive and up-to-date source of the organic synthesis and chemical properties of PAHs.

The book contains eleven chapters, which can be divided into two sections. The first section consists of the first four chapters, a total of 127 pages. The first chapter introduces the sources, nomenclature, and classification of PAHs. The next chapter deals with structure and aromaticity of PAHs on a molecular orbital theoretical basis. The third chapter provides up-to-date general synthetic methods on the synthesis of parent PAHs, both alternant and nonalternant. The fourth chapter

provides general PAH reactions. Many of the novel and convenient synthetic methods and reactions were developed in the author's laboratory over more than three decades, with timeless dedication. This first section provides knowledge on PAH chemistry that can serve as a useful, valuable, and convenient source for those wanting to learn PAH chemistry.

The second section comprises the remaining seven chapters. A total of 125 alternant PAHs with five, six, and seven rings is described in Chapters 5, 6, and 7, and 233 nonalternant PAHs with four, five, six, and seven fused rings are given in Chapters 8, 9, 10, and 11. These chapters provide essential information on each compound as to its sources from organic synthesis, methods of synthesis, physical, structural, and spectral properties, organic reactions, and references of information. Emphasis is placed on the provision of newest synthetic methods. In this section, a total of 511 pages is used to describe 358 PAHs. With less than $1^1/_2$ pages per compound, the information is presented in a highly condensed manner, and consequently, little in-depth discussion is presented. Furthermore, even though an extensive range of PAHs is covered, some useful information has been omitted, such as the PAH chemistry associated with fullerenes, which represent a new field linking theoretical interest and the application to superconductivity.

The author has previously published a book entitled *Polycyclic Aromatic Hydrocarbons: Chemistry and Carcinogenicity* in 1991, in which the chemistry and carcinogenesis of 49 PAHs are described. To avoid repetition and keep the book size manageable, the chemistry of most of these 49 PAHs is not included in the book under review. Thus, for those who want to obtain the whole scope of PAH chemistry, purchase of both books is recommended.

This book is the most complete account of the chemistry of PAHs currently available, written by a person who has made outstanding contributions to the field during the last several decades. The information described should make this book a valuable addition for research libraries and those interested in PAHs and related fields. I highly recommend this book as an important resource on the chemistry of PAHs, chemical carcinogenesis, environmental pollution, and coal and petroleum science.

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JA9756937

S0002-7863(97)05693-X

Catalysis by Di- and Polynuclear Metal Cluster Complexes. Edited by Richard D. Adams (University of South Carolina) and F. Albert Cotton (Texas A&M University). Wiley-VCH: New York. 1998. x + 555 pp. $125.00. ISBN 0-471-23930-5.

In some ways this book is a successor to an earlier volume in the series, *The Chemistry of Metal Cluster Complexes* (1990). Important new developments in cluster chemistry since that time are discussed here; a large fraction of the references cited are from 1991 or later. However, the chapters also add a great deal of new information concerning applications to catalysis.

Chapter 1 (E. Rosenberg and R. M. Laine) introduces the subject, and outlines criteria for distinguishing homogeneous from heterogeneous catalysis and for establishing cluster catalysis. This chapter also ties in well with a number of the other chapters in the book. Chapter 2 (G. Lavigne and B. de Bonneval) deals with activation of Ru clusters for catalysis, including photochemical methods, use of labile metal−metal and metal−ligand bonds, promoters, and synergism with other metals. Chapter 3 (L. H. Pignolet) emphasizes the reactivity of Au and Au−Pt phosphine clusters toward H_2 for the purposes of H/D exchange and hydrogenation, and heterogeneous catalysts prepared by adsorbing the clusters on solid supports. In Chapter 4 (M. Rakowski DuBois), catalytic reactions of sulfido-bridged molybdenum dimers are discussed: hydrogenation, hydrogenolysis, and olefin oligomerization, with analogies to known heterogeneous metal sulfide catalysts and to sulfur-containing metalloenzymes. Systems with multiple metal−metal bonds can also be catalysts or catalyst precursors, as illustrated in Chapter 5 (M. McCann). The applications include homogeneous reactions and reactions of the complexes after adsorption onto solid supports. Chapter 6 (G. Süss-Fink and M. Jahnke) is an extensive survey of organic syntheses using metal clusters as catalysts, a sort of "minicourse" in organic chemistry with an inorganic perspective. Chapter 7 (M. P. Doyle) deals with binuclear Rh(II)-based catalysts, covering carbene and heteroatom reactions as well as enantioselective processes. Chapter 8 (R. D. Adams) focuses on the activation of strained cyclic sulfur compounds by metal clusters, including the unusual macrocyclization of thietane to generate crown thioethers. In Chapter 9 (I. Ojima and Z. Li) the emphasis is on reactions catalyzed by multinuclear group 9 (Co, Rh, Ir) complexes, mainly addition of Si compounds to C≡C bonds. Chapter 10 (G. G. Stanley), on hydroformylation using a dirhodium−tetraphosphine catalyst, includes mechanistic information deduced from chemical and spectroscopic evidence, and the use of the catalyst for asymmetric hydroformylation. Chapter 11 (L. N. Lewis) examines catalytic applications of colloids, ranging from photoinduced reactions on semiconductors to hydrogenation to oxidation. Chapter 12 (I. I. Moiseev and M. N. Vargaftik) surveys the catalytic properties of Pd clusters, including the "giant clusters" with ca. 570 Pd atoms as well as several mixed-metal catalysts. Chapter 13 (P. Braunstein and J. Rosé) emphasizes the preparation of heterogeneous catalysts from mixed-metal precursors; an extensive table of catalyst composition and reactivity is included. Chapter 14 (B. C. Gates) also treats supported cluster catalysts, with insights from spectroscopy and electronic structure into chemical properties and catalytic activity.

This book presents a wide variety of perspectives on what is a highly interdisciplinary field, catalysis by metal cluster compounds. It is a must for libraries, and students and practitioners interested in any aspect of catalysis, from organic synthesis through inorganic/organometallic mechanisms to surface chemistry, will also find it valuable.

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JA985643H

S0002-7863(98)05643-1