

## Additions and Corrections

**Electron-Transfer Mechanism for Aromatic Nitration via the Photoactivation of EDA Complexes. Direct Relationship to Electrophilic Aromatic Substitution [J. Am. Chem. Soc. 1993, 115, 3091-3104].** E. K. KIM, T. M. BOCKMAN, AND J. K. KOCHI\*

Page 3093, Table III: Heading to column 8 should be conv,<sup>d</sup> %. Footnote *d* should read as follows: Total conversion to CH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>NO<sub>2</sub>....

Page 3103, Figure 6: The second line of the caption should read as follows: nucleophilic (*k*<sub>2</sub>') annihilation....

## Book Reviews \*

**Theilheimer's Synthetic Methods of Organic Chemistry. Volume 46.** Edited by A. F. Finch. Karger: Basel and New York. 1992. xxii + 504 pp. \$638.50. ISBN 3-8055-5509-1.

Theilheimer's *Synthetic Methods* enters its tenth series with this volume. This annual publication continues its tradition of providing abstracts and supplementary data for the year, this one extending from 1990 to the early months of 1991. Its unique classification system allows easy access to organic chemical transformations organized according to the bond formed, the reaction type, and the bond broken or the "element" eliminated. Thus, for example, cyclopropane formation through reactions with diazo compounds is classified by CC↑↓N, and hydration of an alkene is OC||CC. A further subdivision according to reagents used, not included in the reaction symbols, generally follows the placement of the reagent's principal element in the periodic table. With its juxtaposition of different chemical reactions of the same general type, this classification system affords advantages in literature review for molecular design, especially for the synthetic organic chemist, that are not available in other series or compendia.

A subject index lists names of methods as well as types of compounds and reagents, but not specific compounds. Volume 46 also contains the abbreviated formulas of complex functional groups (e.g., OSi<sub>2</sub> = disiloxanes and OP = phosphine oxides or phosphinous acids and esters) for the 46 volume series, but this index is of marginal utility. Of greater importance is the collation of the reviews in Volumes 45 and 46, which has been organized to aid access via a supplementary reference index.

Overall, this volume provides a well-organized, comprehensive review of the recent organic chemistry literature with sufficient detail to understand the major thrust or achievement in the abstracted publication. Formulas and equations encourage browsing, and the systematic organization of this volume expands the reader's knowledge and understanding of organic chemistry. As has been true of previous volumes, this one should be added to library collections as a valued reference book.

Michael P. Doyle, *Trinity University*

**Optical Engineering Series. Volume 29. Electron and Ion Microscopy and Microanalysis: Principles and Applications.** By Lawrence E. Murr (University of Texas at El Paso). Marcel Dekker, Inc.: New York, Basel, and Hong Kong. 1991. xiv + 837 pp. \$195.00. ISBN 0-8247-8556-8.

With the necessity of understanding phenomena of scientific and technological importance on a submicron to atomic scale, nearly every researcher is faced with learning about microanalytical techniques. There are a large number of such techniques, the equipment required is generally complex and costly, and sophisticated sample preparation techniques are often required. In order to solve a particular problem, a researcher must gain a general knowledge of the various applicable methods. This book by L. E. Murr performs an important function in providing a source of information regarding the principles, equipment, and methods relating to obtaining microanalytical information using a wide range of techniques. Some of the techniques emphasized include thermionic electron emission microscopy, field emission microscopy, scanning tunneling microscopy, electron probe microanalysis, ion microprobe, scanning electron microscopy, electron diffraction, transmission electron microscopy, and high voltage electron microscopy. Numerous other techniques are discussed

more briefly. The type of information which can be obtained with each technique is described along with its limitations. Micrographs and spectra obtained in application studies with each technique are provided. In addition to describing the techniques, fundamental quantum mechanical and solid state principles are provided; electron, ion, and light optics are described; and specimen preparation techniques are emphasized for a large number of microanalytical techniques. Tremendous gains have been made during the last decade with regard to improvement of resolution and in the development of new techniques with atomic resolution. These developments are described, and adequate references are given. This book is well written and is appropriate for use as a text in a senior or graduate-level course or self study by physical scientists or engineers who wish to learn about microcharacterization techniques for materials.

Gar B. Hoflund, *University of Florida*

**Advances in Medicinal Chemistry. Volume 1.** Edited by Bruce E. Maryanoff and Cynthia A. Maryanoff. JAI Press Inc.: Greenwich, Connecticut, and London. 1992. xiv + 274 pp. \$78.50. ISBN 1-55938-170-1.

Volume 1 of this series covers a range of important topics of current interest in the field of medicinal chemistry. As the editors point out, practitioners of this area of science are rather diverse, as are the contributors to this issue. The first chapter by Wender and Cribbs describes their work on tumor promoters and their interaction with protein kinase C. Included is an extensive biochemical background of this important enzyme, followed by a discussion of the various synthetic approaches to phorbol and the development of a pharmacophore model using computer modeling.

The contribution by Shinkai and Sigal discusses the chemistry and biology of FK-506. After a detailed description of most of the synthetic efforts directed toward FK-506 and its various fragments, the authors elaborate on the biochemical mechanism of action of FK-506 including a summary of significant clinical findings.

A more traditional medicinal chemistry effort is recounted by Muchowski on the development of the antiinflammatory agent ketorolac. This account is a valuable example of how a drug is brought from conception all the way to the marketplace. A discussion of the various pyrrole syntheses required to generate analogs is followed by structure-activity studies and the selection of a clinical candidate. The process chemistry required for large-scale preparations is also discussed as well as recent results from various clinical trials.

An historical perspective on the partial syntheses of corticosteroids at Upjohn is presented by Livingston which includes the various methods of introduction of the 17-position side chains of progesterone and cortisone. Of particular interest is the use of silicon containing "tethers" to deliver reagents from the desired face of the steroid nucleus.

The pyridinone based alkaloid huperzine A is the subject of a chapter by Kozikowski and co-workers. A description of the total synthesis is accompanied by the syntheses of a number of interesting analogs. A thorough treatment of both the *in vitro* and *in vivo* pharmacology of huperzine A as an inhibitor of the acetyl cholinesterase (AChE) enzyme is covered in the latter half of the chapter.

Albrecht and Christenson describe the development of dual-acting cephalosporins as novel antibiotics. Included is an explanation of the concept and results of incorporating a cephalosporin and a quinolone antibiotic in a single molecule to create a broader spectrum agent. The

\*Unsigned book reviews are by the Book Review Editor.

mechanism of enzymatic cleavage of the two entities, as well as some pharmacokinetic data, is also presented.

The final chapter by Krantz is devoted to the design and characterization of enzyme inhibitors. Emphasis is placed on the rationale and activity of affinity labels for the inhibition of cysteine proteases such as cathepsin B, including detailed enzymology and structure-activity studies of peptidyl acyloxymethyl ketones.

In summary, the first volume of *Advances in Medicinal Chemistry* provides a broad sampling of several topics of current medical interest. The authors have contributed generally well written and clear accounts with both sufficient background and current references to appeal to a broad audience.

Terry A. Lyle, *Merck Research Laboratories*

**Studies in Physical and Theoretical Chemistry. Volume 79. Structure and Dynamics of Solutions.** Edited by Hitoshi Ohtaki (Institute for Molecular Science, Okazaki) and Hideo Yamatera (Daido Institute of Technology, Nagoya). Elsevier: Amsterdam, London, and New York. 1992. xvi + 344 pp. \$177.00. ISBN 0-444-89651-1.

This heavily edited volume on solution chemistry is apparently the outgrowth of a project (*Microscopic and Dynamical Aspects of Solute-Solvent Interactions*) sponsored by the Japanese Government (1985-1987) and a symposium (*Molecular and Dynamic Approaches to Electrolyte Solutions*) held in Tokyo (1988). The work of Japanese scientists who participated in these events is displayed in this volume. The six main chapters cover Structure of Solutions by Diffraction, EXAFS, and XANES Methods, Molecular Dynamics Simulations of Liquids and Solutions, Dynamic Properties of Liquids and Solutions, Effect of Pressure and Temperature, Ion-Ion and Ion-Solvent Interactions and Complex Formation in Solution, and Energetic Aspects of Solute-Solvent Interactions. These chapter headings are quite broad in scope, and each chapter is actually subdivided into three to six subsections authored by different individuals or groups almost exclusively from the Japanese scientific community. The reference lists to the chapters, which cover the international literature well, are extensive and are largely complete through 1989. Figures and tables are uniformly well done and integrated into the text. The volume is also well indexed. Anyone interested in the experimental/theoretical literature of solution chemistry in the 1980s will find this volume useful.

L. Pedersen, *University of North Carolina, Chapel Hill*

**Conjugate Addition Reactions in Organic Synthesis. Tetrahedron Organic Chemistry Series, Volume 9.** By P. Perlmutter (Monash University). Pergamon Press: New York. 1992. 373 pp. \$57.00 (soft-cover). ISBN 008-0370675.

This book is divided into seven chapters. The first 50-page chapter describes how the book is organized, with emphasis on mechanism and types of nucleophiles. Acyclic (Chapter 2) and cyclic (Chapter 3)  $\alpha,\beta$ -ethylenic ketones as well as acyclic  $\alpha,\beta$ -unsaturated carboxylic acids and derivatives (Chapter 4) are described first in terms of *intermolecular* and then *intramolecular* conjugate additions. Chapter 5 deals with  $\alpha,\beta$ -ethylenic lactones and lactams, and Chapter 6 discusses other Michael acceptors like nitroalkenes, alkenyl sulfoxides, alkenyl phosphonates, and quinones. Chapter 7 deals with  $\alpha,\beta$ -acetylenic ketones and carboxylic acid derivatives.

Each chapter has a very large number of remarkably accurate, visually pleasing, and easily comprehended equations and tables illustrating the discussions in the text. Syntheses of a large variety of natural products are presented, further exemplifying the points in the text. Extensive referencing to the original literature and to review articles provides appropriate leads for in-depth study of material covered briefly in the text. Conjugate addition reactions of free radicals, a topic of recent excitement, is included in this ambitious and comprehensive book.

Due to the book's organization based on the type of Michael acceptor, some topics and examples unavoidably appear in several places. For example, types of heteroatom-stabilized carbanions are shown on pages 92, 143, and 150; it would have been helpful to the reader to provide cross-references in the text each time such systems were mentioned. Likewise, cross-referencing would have helped for bislactim ethers (pp. 18 and 212) and tandem reactions (pp. 52 and 153). Also, a major service to the reader would have been inclusion of an alphabetical author index.

Overall, this is an outstanding and high-quality review of a very large

field. The moderate price of the soft-cover edition makes it an excellent investment for an organic chemist's personal library.

Gary H. Posner, *The Johns Hopkins University*

**Accurate Molecular Structures. Their Determination and Importance.** Edited by Aldo Domenicano (University of L'Aquila) and Istvan Hargittai (Hungarian Academy of Sciences). Oxford University Press: New York. 1992. xii + 590 pp. \$125.00. ISBN 0-19-855556-3.

This book is the first of the IUCr Monographs on Crystallography developed from the course *Static and Dynamic Implications of Precise Structural Information* held in Erice, Italy, in the spring of 1985. After a preface by the editors, the book contains 21 chapters and author, formula, and subject indexes.

**Industrial and Technological Applications of Neutrons.** Edited by M. Fontana, F. Rustichelli, and R. Coppola. Elsevier: Amsterdam, The Netherlands. 1992. xvi + 528 pp. \$219.00. ISBN 0-444-89837-9.

This book is based on a collaboration between the Societa Italiana di Fisica and the Ente per le Nuove Tecnologie, to provide results obtained by means of neutron techniques in applied research. After an introduction by the editors, there are 21 chapters authored by various experts in the field.

**Physical Chemistry of Foods.** Edited by Henry G. Schwartzberg (University of Massachusetts) and Richard W. Hartel (University of Wisconsin). Marcel Dekker: New York. 1992. xiv + 748 pp. \$69.75. ISBN 0-8247-8693-9.

This book was developed from the symposium sponsored by the Institute of Food Technologists and the International Union of Food Science and Technology held in Dallas on May 31 and June 1, 1991. After a preface by the editors, this book contains 16 chapters and a subject index. A list of the contributors, with their affiliations, follows the preface.

**Hazards in the Chemical Laboratory. 5th Edition.** Edited by S. G. Luxon. Royal Society of Chemistry: Cambridge, England. 1992. xx + 676 pp. £45.00. ISBN 0-85186-229-2.

This book is an overview of recent developments in the design and operation of chemical laboratories, recent legislative requirements (including the new regulations for COSHH, OSHA, and electrical hazards and radiation hazards), and current safety procedures and contains a listing of approximately 1400 hazardous substances along with their safety data.

**Organic Synthesis. Collective Volume VIII. A Revised Edition of Annual Volumes 65-69.** Edited by Jeremiah P. Freeman (University of Notre Dame). J. Wiley and Sons: New York. 1993. xx + 696 pp. \$59.95. ISBN 0-471-58565-3.

This book is a collective volume of procedures previously published in volumes 65-69 (1987-1990) with revisions and updates as needed. This is the first volume in which the collective volumes are compiled every 5 years rather than the usual 10 years, which is largely due to the increased pace of research in organic chemistry. Unlike previous volumes, Chemical Abstracts registry numbers and names have been omitted in the procedures in order to save space. However, continuing the tradition of *Collective Volumes VI and VII*, the table of contents lists the title compound alphabetically and contains multiple indexes, in which the names of the title compounds, isolated intermediates, and uncommon reagents appear with their Chemical Abstracts registry numbers and the Chemical Abstracts names in brackets. This book contains the following indexes: Type of Reaction Index; Type of Compound Index; Formula Index; Author Index; General Index; Hazard and Waste Disposal Index; and Concordance Index.