

In addition radical pair intermediates that are bound together (i.e., biradicals) may have allowable conformations that strongly favor internal combination (cyclization) or disproportionation. Recent reports of the relative combination/disproportionation ratios might be reconsidered in this light.<sup>12,13</sup>

## Book Reviews

**Topics in Current Chemistry, Volume 130.** Springer-Verlag: New York, 1986. 209 pp. \$53.00. ISBN 0-387-15810-3.

This volume contains six diverse and generally readable chapters under the heading of Synthetic Organic Chemistry.

Chapter 1: Steric and Electronic Substituent Effects on the Carbon-Carbon Bond, by C. Rüchardt and H.-D. Beckhaus, reviews the application of experimental and computational techniques toward the elucidation of the factors influencing the bond dissociation energies of C-C bonds.

Chapter 2: Selective Hydroboration and Synthetic Utility of Organoboranes Thus Obtained, by A. Suzuki and R. S. Dhillon, provides a selective account of this large area with a focus on hydroboration of molecules containing several reactive functional groups and options for further manipulations of the so-formed products. Organization is by the nature of the target functional group in the final product.

Chapter 3: Synthesis of Ynamines, by J. Collard-Motte and Z. Janousek, provides a good comprehensive review of available methods for formation of ynamines. The chemistry of ynamines is not discussed, except where relevant to the preparation of other ynamines.

Chapter 4: Electrochemically Reduced Photoreversible Products of Pyrimidine and Purine Analogues, by B. Czochralska, M. Wrona, and D. Shugar, outlines the photoreversible dimerization and related reactions observed when a variety of purine/pyrimidine-related compounds are subjected to reduction at a mercury electrode.

Chapter 5: High Pressure Synthesis of Cryptands and Complexing Behavior of Chiral Cryptands, by J. Jurczak and M. Pietraszkiewicz, provides a brief survey of usual methods for cryptand formation followed by a description of the application of high-pressure techniques to the preparation of these important macrocycles.

Dennis P. Curran, *University of Pittsburgh*

**Ring-chain Tautomerism.** By R. E. Valters and W. Flitsch. Plenum Press: New York and London. 1985. xi + 278 pp. \$45.00. ISBN 0-306-41870-3.

This review of ring-chain tautomerism is an English translation of a book by Valters, "Ring-chain Isomerism in Organic Chemistry", Zinatne, Riga, 1978, which has been revised and updated. The authors state that coverage includes the literature until the end of 1982, and there is some supplementary literature beyond that appended at the end of various chapters. The review is intended to bridge the gap since an earlier review of the topic in 1963. Some of the examples from the earlier review are repeated; on the other hand, these authors have incorporated information from work before 1963 missed by the earlier reviewer. Inevitably, some literature since 1963 has been overlooked. In particular the present treatment covers information based on NMR spectroscopy, a method which was in its infancy for determination of ring-chain structures and equilibria 30 years ago. The development of phosphorus chemistry in the interim is also reflected in the inclusion of several classes of these compounds in Chapter 4.

The book is divided into five chapters: Introduction; Intramolecular Reversible Addition Reactions to the C=O Group; Intramolecular Reversible Addition Reactions to the C=N Group; Intramolecular Reversible Addition Reactions to Other Groups; and Generalizations Concerning the Influence of Structural and External Factors on the Relative Stability of Ring and Chain Isomers. Except for the last chapter, the information is presented rather uncritically according to functional groups undergoing interaction. In the last chapter the authors endeavor to draw generalizations about structure-reactivity relationships from the information presented in earlier chapters. Most of the conclusions are based on equilibrium behavior, not on rates or thermodynamic data, which, as the authors point out, are sparse.

The English text is a translation by the coauthor of a Russian draft and, perhaps for this reason, contains awkward or archaic passages, which are sometimes unclear. ["...adjustment of the equilibrium affords more

**Acknowledgment.** We gratefully acknowledge discussions with Dr. David Griller, J.J.D. thanks the National Research Council of Canada for his participation in the Distinguished Visiting Scientist Program. This work was supported in part by a PSC-BHE grant.

drastic conditions..."; "...the free energy difference enthalpy and entropy components..."] These interruptions do not, however, detract seriously from the reader's overall comprehension of the subject. In some instances the organization is confusing and does not follow clearly from the table of contents or subheadings. More serious for interested researchers is the lack of literature citations for many of the tables. Some errors were noted in references, particularly the spelling of authors.

The index, organized according to generic functional groups, is sparse and therefore not very useful for searching. Unfortunately, there is no author index.

After one reading the outside cover had already begun to deteriorate, so it can be expected that copies purchased for general library use will soon be in need of rebinding.

Paul R. Jones, *University of New Hampshire*

**Nonsteroidal Antiinflammatory Drugs.** Edited by J. G. Lombardino (Pfizer, Inc.). John Wiley & Sons: New York. 1985. xix + 442 pp. \$99.50. ISBN 0-471-89803-1.

The book presents an overview of different aspects related to nonsteroidal antiinflammatory drugs (NSAID). It is organized into four chapters that cover the different areas now under scientific investigation.

Chapter one describes the physiology of normal synovial joints and the alterations that occur during joint diseases, especially osteoarthritis.

Chapter two reviews recent concepts of biochemical processes involved in initiating and promoting inflammation and the role of different biologically active mediators and possible pharmacological interventions.

In Chapter three laboratory models to characterize antiinflammatory and analgesic effects as well as renal and gastric side effects of NSAIDs in acute and chronic inflammation are introduced and their applications, limitations, and predictive values are discussed. QSAR considerations demonstrate the use of these animal models to predict clinical safety and efficacy of NSAIDs.

Chapter four covers the medicinal chemistry, pharmacology, and metabolism as well as the clinical aspects of the acidic NSAID that have been administered to humans. This chapter includes an excellent literature review for a total of 67 different acidic NSAIDs.

The book is written by experts with hands-on experience; its content is very well organized and presented, and the literature references of each chapter are quite extensive. The book is the ideal reference book for pharmacologists and medicinal chemists involved in NSAID research.

Hartmut Derendorf and Jurgen Venitz, *University of Florida*

**Treatise on Analytical Chemistry, 2nd Edition.** Edited by P. J. Elving (University of Michigan), V. G. Mossotti (U.S. Geological Survey), and I. M. Kolthoff (University of Minnesota). John Wiley & Sons: New York. 1984. xxix + 675 pp. \$75.00. ISBN 0-471-01836-8.

The "Treatise on Analytical Chemistry" has long been THE authoritative source for serious students of the discipline. The present addition to that series, Part 1, "Theory and Practice", Volume 4, Section E, Principles of Instrumentation for Analysis, is therefore a great disappointment.

The sections dealing with hardware, such as analog electronics, operational amplifiers, interfacing principles, and digital electronics, are finely done. But much of the material is available elsewhere, where it is not embedded in such an expensive surrounding.

The sections dealing with transducers and process control equipment are somewhat dated. The sections on computer systems and programming are limited in scope and are not current. These areas are particularly difficult to write about because of the short half-life of the technology. The first manuscripts for this volume were solicited in 1974 and due in 1975. One suspects that many of the authors submitted their material at that time and then periodically attempted to update it as publication of the volume was repeatedly delayed.

Of most concern is the section titled Automation: Instrumentation for

Analysis Systems", with Marvin Margoshes as senior author. This is a review of continuous analysis systems. One page of the fifty pages occupied by this chapter is devoted to flow injection analysis (FIA). This brief discussion of FIA certainly cannot be considered to be unbiased. Margoshes has been highly critical of FIA since its introduction, independently, by Ruzicka and by Stewart. Many observers believe these criticisms often contained more than just scientific evaluation. One reads the page in this volume dealing with FIA with a sense of embarrassment: embarrassment for the author, and for the fine series of volumes in which it appears.

Raymond E. Dessy, *Virginia Polytechnic Institute and State University*

**Topics in Organic Electrochemistry.** Edited by Albert J. Fry (Wesleyan University) and Wayne E. Britton (University of Texas at Dallas). Plenum Press: New York. 1986. xiv + 296 pp. \$49.50. ISBN 0-306-42058-9.

This is a book whose subject material encompasses a broader spectrum than the title suggests. It provides a detailed review of recent advances in the following: organic electrochemistry, transition-metal organometallic electrochemistry, organic photoelectrochemistry, and chemically modified electrodes. There is also a chapter devoted to the application of electroanalytical techniques in organic chemistry.

This text is an excellent reference, especially for those interested in organic and organometallic electrochemistry, photoelectrochemical reactions, and chemically modified electrodes. The entire text is attractively written and organized. Numerous tables, figures, and illustrated electron-transfer mechanisms aid in the explanation and clarification of many salient topics. For example, an entire section centers on electrochemically induced reactions. The author describes processes from electron-transfer-induced substitution reactions to induced isomerization reactions. The material is written for the reader with a good electrochemistry background, so very little is lost in the discussion of nonspecifics.

There is no similar source of recent information on the modern electrochemical topics covered here. Therefore, this book is highly recommended for any laboratory that conducts electroanalytical investigations in organic or organometallic chemistry.

Thomas Gennett, *Mount Holyoke College*

**Radioactive Waste Management and the Nuclear Fuel Cycle. Volume 4. No. 3. Waste Management Organizations.** Edited by John R. Grover (NIREX, Harwell Didcot), Harwood Academic Publishers: New York. 1984. ii + 106 pp. \$28.00. ISBN 3-718-60202-4.

This special issue of the Journal: "Radioactive Waste Management and the Nuclear Fuel Cycle", is a collection of papers describing the management organizations and nuclear waste programs in six European countries, the United States, and the IAEA. European countries included are Switzerland, Sweden, France, Belgium, Italy, and the United Kingdom. Collectively, the papers present a comprehensive background, with history of the need for management of low-, intermediate-, and high-level radioactive wastes, discussion of various potential host rocks, waste packaging processes, disposal facility concepts, and assessment of performance and safety. Individual papers discuss pertinent laws, identify and describe existing and newly created agencies, and outline programs in the respective countries. Potential geologic formations for repositories are described, but specific candidate sites are not identified. The IAEA program is to provide guidelines and share information among the member countries; a list of IAEA documents on underground disposal of radioactive waste is provided. Conspicuously absent is a paper describing the extensive program in the Federal Republic of Germany. Also missing is discussion of programs at OECD/NEA and the CEC. The publication provides an excellent background on radioactive waste management in the several countries presented, with descriptions of the organizations set up to plan and administer waste management programs.

Stanley E. Logan, *S. E. Logan and Associates, Inc.*

**Thermodynamic and Transport Properties of Coal Liquids. An Exxon Monograph.** By C. Tsonopoulos and J. L. Heidman (Exxon Research and Engineering Company) and S. Hwang (BOC Group, Inc.). John Wiley and Sons: New York. 1986. xvii + 214 pp. \$49.95. ISBN 0-471-83282-0.

Coal liquefaction technology has progressed to the stage where coal is expected to provide a viable source of liquid fuel in the near future. Several liquefaction processes are presently under investigation with the aim of developing large-scale production facilities.

This volume focuses on the methods of predicting physical properties of coal liquids at the high temperatures and pressures of the liquefaction process. The book begins with a general discussion of coal liquids, an

introduction to the model compounds used in predicting their properties, and a discussion of the important differences between coal liquids and petroleum. Next, the data necessary in the design of processing plants are outlined. These include vapor-liquid equilibria, enthalpy, density, viscosity, thermal conductivity, and transport properties. The following section describes how methods used in the petroleum industry can, with modification, be used to predict physical properties of coal liquids. Two types of predictive methods are presented: one based on normal boiling point and specific gravity and the second based on critical constants and the acentric factor.

For the remainder of the book, the methods used in industry for predicting each property are presented in detail. These discussions are supported by experimental data, correlation equations, and numerous figures.

The book deals entirely with physical properties of liquids produced by the coal liquefaction processes, and no information (except for pressure and temperature) is given about the specific processes.

S. Michael Sterner, *Virginia Polytechnic Institute and State University*

**Handbook of Fiber Science and Technology. Volume III. High Technology Fibers. Part A.** Edited by Menachem Lewin and Jack Preston. Marcel Dekker: New York. 1985. XIX + 397 pp. \$99.75. ISBN 0-8247-7279-2.

This volume in the "Fiber Science and Technology" series is a timely addition to the library of polymer chemists and material scientists. If the table of contents of the forthcoming part B were included, the rationale for the selection of specific topics would be more clearly apparent. Nevertheless, the subjects covered in this volume are important and represent current interests in the field. The contributors are, in most instances, well-known in the field of fiber science and several among them have made significant contributions in research on high technology fibers.

The approach to the overviews is generally technology oriented, focusing on the fiber manufacturing process and material properties rather than on the chemistry of polymer synthesis or on the relationships of molecular structure to polymer properties. There are significant differences in the authors' presentation of fundamental concepts, perhaps in part because of historical factors pertaining to the development of particular classes of fibers. The chapters on Carbon and Graphite Fibers and on High Performance Aramid Fibers perhaps represent an optimum balance in this respect.

With some exceptions, the authors have provided ample and well-chosen references, and the reader can thus readily acquire additional information.

In conclusion, the book will be of value to scientists who have some knowledge of fibers and are interested in the specialized applications of the fibrous materials covered. This reviewer would welcome chapters of comparable scope on glass fibers, optical fibers, hollow fibers, whiskers, and other materials which represent the advanced fiber technology of today.

Giuliana C. Tesoro, *Polytechnic University*

**Organometallic Chemistry Reviews; Annual Survey: Si, Sb, Bi, Mn, Tc, Re, Heteronuclear Complexes.** Edited by R. B. King and J. P. Oliver. Elsevier Science Publishers: Amsterdam and New York. 1985. 577 pp. \$166.75. ISBN 0-444-42515-2.

This book contains six articles reviewing the literature for the listed topics that appeared during 1983. The majority of the text is devoted to two reviews of the silicon literature. The first article was written by G. L. Larson and is entitled Organosilicon survey 1953—The silicon-carbon bond (162 pp, 447 references). The second chapter is on Silafunctional Compounds: Synthesis and Reactivity and was authored by J. C. Corey (146 pp, 599 references). Two relatively small chapters covering the chemistry of Antimony, Annual Survey Covering the Year 1983 (41 pp, 136 references) and Bismuth, Annual Survey Covering the Year 1983 (11 pp, 38 references) were both coauthored by L. D. Freedman and G. O. Doak. P. M. Treichel's chapter on Manganese, Technetium, and Rhenium, Annual Survey Covering the Year 1983 (32 pp, 218 references) is followed by a lengthy chapter written by M. I. Bruce entitled Complexes Containing Heteronuclear Metal-Metal Bonds. Some Recent Advances 1982-83 B, Heterometallic Cluster Complexes and Related Compounds (149 pp, 234 references). A helpful index of the authors whose work is cited is available. These surveys are generally useful for keeping up on the abundant literature in organometallic chemistry. This particular volume would be a worthwhile purchase for any library that does not already subscribe to the *Journal of Organometallic Chemistry*.

Wayne L. Gladfelter, *University of Minnesota*