

## Book Reviews \*

**Charge Transfer Photochemistry of Coordination Compounds.** By Ottó Horváth (University of Veszprém) and Kenneth L. Stevenson (Indiana University—Purdue University Fort Wayne). VCH Publishers: New York, 1993. xviii + 380 pp. \$145.00. ISBN 1-56081-564-7.

For many years, the coordination photochemist's bible was Balzani and Carassiti's *Photochemistry of Coordination Compounds*. Regrettably, much of that classic book has been out of date for some time, and a replacement is sorely needed. *Charge Transfer Photochemistry of Coordination Compounds* admirably fills some of the void left by the growing obsolescence of Balzani and Carassiti's book.

As a field, the photochemistry of coordination compounds has developed so much in the 23 years since Balzani and Carassiti's book that it would be virtually impossible to write a new book that encompassed all of coordination compound photochemistry. Horváth and Stevenson wisely decided to focus their new book on charge transfer photochemistry. By limiting their subject in this way, they do not necessarily restrict the reader's view of modern coordination compound photochemistry because much of the research in this field since the time of Balzani and Carassiti's book has been on charge transfer reactions. As the title implies, the subject of this book is coordination complexes; organometallic compounds are not discussed. Most of the reactions discussed are those that occur in homogeneous solution, but some studies on solid state and microheterogeneous systems are mentioned.

The book is divided into two sections. The short first section is a brief introduction and review of "theoretical" topics such as light absorption, quantum yields, photophysical pathways, and the electronic spectra of coordination complexes. Part Two is the heart of the book, which is the discussion of charge transfer photochemistry. The information in this section is designed for easy retrieval: The chapters in Part Two are divided by family in the periodic table. Within a chapter, the discussion is divided by element, and the discussion of each element is in turn divided by oxidation state or ligand. It is noteworthy that not only are the transition metals covered but the main group metals are covered as well. The coverage (including references) is intended to be comprehensive for research done in the last decade.

The book is well-written at a level that is useful for practicing chemists. The authors make extensive use of chemical equations, mechanistic schemes, and lucid figures. Extensive up-to-date references refer the reader to more complete discussions and to the primary literature. An appendix contains additional references that were published or made accessible to the authors at a date too late to be cited in the text. Also making the book useful is the "Material Index", which is a list of compounds mentioned in the book. A supplementary loose-leaf page listing typographical errors (there are not many) is supplied with the book.

In summary, the authors have written a readable and useful book in the tradition of Balzani and Carassiti's classic text. This book belongs on every photochemist's bookshelf.

David R. Tyler, *University of Oregon*

**Polymer Surfaces and Interfaces II.** Edited by W. J. Feast (University of Durham), H. S. Munro (Courtauld's Research), and R. W. Richards (University of Durham). John Wiley and Sons: Chichester, New York, Brisbane, Toronto, and Singapore, 1993. xvi + 297 pp. \$75.00. ISBN 0-471-93456-9.

This book contains eleven independent chapters that summarize various research efforts on current topics in polymer surface science that were presented at the Pure and Applied Macromolecular Chemistry Groups of the Royal Society of Chemistry and the Society of Chemical Industry at Durham, U.K., during July, 1991. The subjects are broadly based with potential appeal to a wide scientific and technical audience. A variety of modern instrumental techniques are described: scanning probe microscopy, static secondary ion mass spectroscopy, scanning electron microscopy, laser light scattering, Raman spectroscopy, and ion beam analysis such as Rutherford backscattering and forward recoil spectrometry. The surface chemistry and surface modification of specific materials are presented, including those of polymers of industrial importance [poly(chlorotrifluoroethylene), poly(ether ether ketone), polyacrylic acid, polyethylene oxide, poly(methacrylate), poly(methylmethacrylate), and poly(vinyl stearate), aramid, polyethylene, and various rigid-rod polymers] and of biological importance.

The individual chapters all appear well organized and well written,

provide good use of graphics, including microphotographs, and cite recent literature references. It is thus recommended that *Polymer Surfaces and Interfaces II* be a part of every technical information center, both academic and industrial. It should provide a useful general reference.

Walter H. Waddell, *PPG Industries, Inc.*

**International Series of Monographs on Chemistry. Volume 27. Transition Metal Oxides: An Introduction to their Electronic Structure and Properties.** By P. A. Cox (University of Oxford). Oxford University Press: Oxford, U.K. 1992. ix + 284 pp. \$75.00. ISBN 0-19-855570-9.

This book under review was aimed at describing the magnetic, optical, spectroscopic, and electrical properties of transition metal oxides and also at critically discussing the various models proposed to interpret these properties. The intention of the book was to introduce chemists and physicists who wish to get some idea of what the field is all about at a level suitable for graduate students and other researchers with a background in solid-state chemistry, solid-state physics, or materials science. The author attempted to accomplish this challenging task in a very limited space (in a monograph of less than 300 pages, in five chapters with each chapter being four sections long) by presenting the physical properties of about 160 different compounds and discussing the various concepts necessary to explain them. Consequently, the author did not attempt a comprehensive discussion on any of the topics given in the book but rather provided a "guidebook" for the physical properties and concepts of transition metal oxides. Because such a wide range of topics was covered in a very limited space, no topics were mastered. In addition, this book cannot be considered a useful and well-thought-out guidebook. As Honig and Spalek pointed out in their review of this book (*J. Solid State Chem.* 1993, 103, 539), it did not properly describe the seminal contributions by Goodenough and discussed the NiO problem on the basis of data published in 1971 instead of providing an up-to-date description. In the description of the metallic oxides, the book missed the essence of the exciting new developments in molybdenum and tungsten oxide bronzes for the past 10 years (contributed largely by Fleming, Greenblatt, Pouget, Sato, Schlenker, and Schneemeyer) and gave a discussion of the metal-insulator transition in the blue bronze  $K_{0.3}MoO_3$  on the basis of data published in 1972. The author states that a course of lectures given in Fall 1988 at Cornell University forms the basis of this book. It seems that, even as a lecture note for 1988, this work was not up to date in many areas.

M.-H. Whangbo, *North Carolina State University*

**Second Supplements to the 2nd Edition of Rodd's Chemistry of Carbon Compounds. Volume I: Aliphatic Compounds. Part C: Monocarbonyl Derivatives of Aliphatic Hydrocarbons, Their Analogues, and Derivatives.** Edited by M. Sainsbury. Elsevier: New York, 1992. xiv + 388 pp. \$208.75. ISBN 0-444-89758-5.

Chapter 8a. Aliphatic Carbonyl Compounds: Aliphatic Aldehydes, by A. Furstner and H. Weidmann.

Chapter 8b. Aliphatic Ketones, by D. J. Simmonds.

Chapter 9a. Monobasic Aliphatic Saturated Acids, by J. Bergman.

Chapter 9b. Unsaturated Monobasic Acids, by R. B. Millar.

Chapter 10. Carbon Monoxide and Its Derivatives, Carbonic Acid and Its Derivatives, by I. G. C. Coutts.

Chapter 11. Carbamates and Their Allies, by D. W. Anderson.

**Second Supplements to the 2nd Edition of Rodd's Chemistry of Carbon Compounds. Volume I: Aliphatic Compounds. Part D: Dihydric Alcohols, Their Oxidation Products and Derivatives.** Edited by M. Sainsbury. Elsevier: New York, 1993. xvi + 384 pp. \$220.00. ISBN 0-444-81517-1.

Chapter 12. Dihydric Alcohols, by J. Charalambous and K. W. P. White.

Chapter 13. Hydroxy-Aldehydes and -Ketones and Related Compounds: Dicarboxylic Compounds, by J. Grimshaw.

Chapter 14. Aliphatic Monohydroxy-Monocarboxylic Acids and

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Related Compounds, by G. Singh.

Chapter 15a. Aliphatic Amino Acids and Their Derivatives: Synthesis, Stereochemistry and Resolution of  $\alpha$ -Amino Acids, by G. C. Barrett.

Chapter 15b. Peptide Synthesis, by D. T. Elmore.

Chapter 16. Aldehydic and Ketonic Monocarboxylic Acids, by T. H. Black.

Chapter 17. Aliphatic Dicarboxylic Acids, by J. J. R. Kamal.

Chapter [6]. Nitrogen Derivatives of the Acyclic Hydrocarbons, by J. G. Woolley.

**Second Supplements to the 2nd Edition of Rodd's Chemistry of Carbon Compounds. Volume 1: Aliphatic Compounds. Part E: Trihydric Alcohols, Their Oxidation Products and Derivatives. Part F: Penta- and Higher Polyhydric Alcohols, Their Oxidation Products and Derivatives: Saccharides. Part G: Tetrahydric Alcohols, Their Oxidation Products and Derivatives.** Edited by M. Sainsbury. Elsevier: New York. 1993. xvi + 550 pp. \$311.50. ISBN 0-444-89873-5.

Chapter 18. Trihydric Alcohols: Their Analogues and Derivatives and Their Oxidation Products: Trihydric Alcohols to Triketones, by B. J. Coffin.

Chapter 19. Trihydric Alcohols and Their Oxidation Products (continued), by B. J. Coffin.

Chapter 20. Trihydric Alcohols and Their Oxidation Products (continued), by B. J. Coffin.

Chapter 21. Phospholipids, by S. A. Bowles.

Chapter 22. Polyhydric Alcohols and Their Oxidation Products, by P. D. Jenkins.

Chapter 23a. Monosaccharides: Synthesis, Chemistry, Structure and Physical Properties, by D. K. Weerasinghe.

Chapter 23b. Monosaccharides; Use in Synthesis as Chiral Templates, by K. J. Hale.

Chapter 23c. Monosaccharides; Use in Asymmetric Synthesis of Natural Products, by K. J. Hale.

Chapter 24. Disaccharides and Oligosaccharides, by R. Darcy and K. McCarthy.

Chapter 25. Tetrahydric Alcohols, Their Analogues, Derivatives, and Oxidation Products, by R. A. Hill.

**Second Supplements to the 2nd Edition of Rodd's Chemistry of Carbon Compounds. Volume II: Alicyclic Compounds. Part A: Monocarbocyclic Compounds To and Including Five Ring Atoms. Part B: Six- and Higher-membered Monocarbocyclic Compounds.** Edited by M. Sainsbury. Elsevier: New York. 1992. xviii + 522 pp. \$294.50. ISBN 0-444-89844-1.

Chapter 1. Alicyclic Hydrocarbon, Conformation, and Stereochemistry, by T. A. Crabb and A. V. Patel.

Chapter 2. The Cyclopropanes, by H. N. C. Wong.

Chapter 3. The Cyclobutanes, by D. T. Hurst.

Chapter 4a. The Cyclopentanes, by D. T. Hurst.

Chapter 4b. Natural Products Containing the Cyclopentane Subunit: Prostaglandins, by R. J. K. Taylor, S. G. Pyke, and S. M. Pyke.

Chapter 4c. Cyclopentadiene, by D. F. Ewing.

Chapter 5a. Cyclohexane and Its Derivatives, by R. Bolton.

Chapter 5b. Natural Products Containing a Cyclohexane, Cyclohexene, or Cyclohexadiene Subunit, by G. W. Gribble.

Chapter 5c. Cyclohexadienes, by A. J. Pearson.

The continued updating of "Rodd" is a major service to organic chemistry. While many other encyclopedic works that claim to be comprehensive are available, in reality they are not. The closest series

that can make this claim is "Rodd". This is, of course, in part because of the large number of volumes. The chapters are uniformly well written and remarkably free from errors. It is very pleasing to see that the text discusses structures that are usually on the same page and does so with admirable clarity. As a result the books are surprisingly readable. Another excellent feature is the references are in the text directly following the discussion. This makes access to the primary literature all the more easy. It is clear that a great deal of common sense has gone into producing this series, which serves as a model for other lesser works. While the price of the books makes individual ownership virtually impossible, they should be a standard component of any good organic chemical library.

Philip Magnus, *The University of Texas, Austin*

**Polycyclic Aromatic Compounds. Synthesis, Properties, Analytical Measurements, Occurrence and Biological Effects.** Edited by Philippe Garrigues and Michel Lamotte (Universite de Bordeaux I). Gordon and Breach Scientific Publications: Amsterdam, The Netherlands. 1993. xiv + 1264 pp. \$190.00. ISBN 2-88124-545-5.

This book is the proceedings of the Thirteenth International Symposium on Polynuclear Aromatic Hydrocarbons (PAH) held in Bordeaux, France, on October 1-4, 1991. After a preface by the editors, a list of committee members, acknowledgements, and two introductory chapters by G. Grimmer, there are 146 chapters organized under the following headings: Standard Reference Materials and Methods; PAH Transformation and Degradation; Molecular Modeling and Theory; PAH-Analysis, Methodology; PAH Analysis in Aquatic Systems and Geological Samples; PAH Analysis in Emission Sources and in Ambient Air; PAH's in Coal and Petroleum; Metabolic Activity, Mutagenicity; DNA-Adducts-Mechanisms, Characterization; DNA-Binding, Metabolic Activation; PAH Exposure, Biomonitoring; Comparative Metabolism of B[a]P; and Bioactivation, Metabolites. There are also a list of participants, a subject index, and an author index.

**Biotechnology from A to Z.** By William Bains. Oxford Press: New York. 1993. x + 358 pp. \$19.95. ISBN 0-19-963334-7.

This book is a glossary of biotechnological terms designed for the nonexpert; however, a basic familiarity with terms such as "DNA" and "bacterium" is assumed. There are 280 entries arranged alphabetically and a list of further readings at the end of the book. There is also a subject index.

**Cyclitols and Their Derivatives. A Handbook of Physical, Spectral, and Synthetic Data.** By Tomas Hudlicky and Mary Cebulak (Virginia Polytechnic Institute and State University). VCH: New York. 1993. viii + 316 pp. \$85.00. ISBN 1-56081-633-3.

This book is a compilation of known cyclitol derivatives and their derivatives containing alkyl, amino, or halogen substituents (phosphate derivatives are excluded). Each entry contains available spectral and physical data and references to isolation, structure elucidation, and synthesis of the compound. After an introduction by Hudlicky, the entries are organized under the following headings depending on the number of hydroxyls and the degree of unsaturation: Aminocyclitols and Derivatives; Cyclohexanetetrols and Derivatives; Cyclohexanetetrols and Derivatives; Cyclohexanepentols and Derivatives; Anhydrocyclohexanes and Derivatives; and Cyclohexanehexols and Derivatives. There are also author and subject indexes.