

Journal of Organometallic Chemistry, 405 (1991) C11–C12
Elsevier Sequoia S.A., Lausanne

Book reviews

Photocatalysis: Fundamentals and Applications; edited by N. Serpone and E. Pelizzetti, Wiley-Interscience, Chichester, 1989, x + 650 pages, £59.00. ISBN 0-471-62603-1.

This volume represents an attempt by the editors to present the first textbook on photocatalysis: a field of burgeoning importance to the coordination and organometallic chemist. To quote directly from their preface. "This book is, in a sense, unique. All chapters have been written by experts in their fields of expertise. Also, each chapter is written to cover two to four lecture periods". The editors have been supremely successful in achieving their aims: this is a book which could be recommended to final year undergraduates, research students, postdoctoral fellows, faculty and industrialists. Uniquely, for a multi-author work, the text shows a uniformity of presentation, and the chapters follow with an ineffable logic which speaks volumes for the planning and forethought of the editors.

The opening chapter (H. Kisch) addresses the crucial question—what is photocatalysis? This chapter is a linchpin of the book, and is both erudite and thought-provoking. This is followed by a brilliantly written chapter (V. Balzani and F. Scandola) describing the interaction between light and matter, a chapter essential to the understanding of the rest of the volume. With chapters three and four (N.S. Lewis and M.L. Rosenbluth), we enter the solid-state world of the theory of semiconductors, and their preparation and characterization. Chapter five (M. Grätzel), a key chapter to all chemists, describes the field of colloidal semiconductors. A brief chapter (M. Schiavello and A. Sclafani) describing thermodynamic and kinetic aspects of photocatalysis is followed by an important overview (H. Van Damme) of photocatalytic supports.

Chapter eight (P. Pichat and J.-M. Herrmann) signals a change of direction, with a detailed discussion of adsorption–desorption phenomena, and this is followed by (perhaps the editors' greatest coup) a chapter on the the surface science of catalysis and photocatalysis by G.A. Somorjai, a superb example of clarity of thought coupled with deep insight.

Chapter ten (T. Sakata) describes heterogeneous photocatalysis at the liquid–solid interface, and is followed by chapters on photoelectrocatalysis (H. Tributsch), photocatalysis in organized assemblies (D. Meisel and M.S. Matheson), photocatalysis in organic synthesis (M.A. Fox), and the mechanistic implications in surface photochemistry (H. Al-Ekabi and N. Serpone).

One of the most fascinating chapters in this volume, and certainly the chapter of most practical interest to readers of this journal, is that on transition metal complexes in photocatalysis (F. Chanon and M. Chanon), which selects many organometallic examples (particularly metal carbonyls) for discussion. This is followed by a predictably outstanding treatise of the selective activation of small

molecules (P.C. Ford and A.F. Friedman), including excellent sections on CO₂ and on C–H activation. The book concludes with two very applied chapters, one on energy production (V.N. Parmon and K.I. Zamaraev) and one on environmental aspects (D.F. Ollis, E. Pelizzetti and N. Serpone). The index is adequate, but not remarkable.

I believe this to be an outstanding volume, at a remarkably cheap price. It is a definitive statement about a fascinating field of growing importance. My only regrets are the absence of a short concluding chapter on the future of the field, and the rather poor quality of the paper upon which the book has been printed. The book can be unreservedly recommended, and my congratulations go to the editors for their careful planning and their brilliant selection of authors. If there were a prize for multi-author works, this volume would be a strong contender.

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Gmelin Handbook of Inorganic Chemistry, 8th Edition, Pb. Organolead Compounds, Part 2, Springer-Verlag, Berlin, 1990, xi + 273 pages, DM1203.00. ISBN 3-540-93606-8 and 0-387-93608-8.

This volume (by F. Huber) is concerned entirely with tetraethyllead, mainly the methods for its preparation and analysis, spectra, physical properties, chemical reactions, physiological properties, uses, and environmental presence. Much information is concisely and clearly presented in good English, and those interested in tetraethyllead will find here either all of the available information they seek or references to it. I found especially interesting and informative the section on reactions with electrophiles.

The literature has been comprehensively surveyed up to the end of 1988 but there are some later references.

This is another worthy addition to the highly respected Handbook.

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