

Book reviews

Methods for the Oxidation of Organic Compounds, by Alan H. Haines, Academic Press, 1988, xx + 467 pages, £69.50, ISBN 0-12-315502-9.

This volume, in the Best Synthetic Methods Series, is a companion to the earlier one by the same author dealing with oxidation of hydrocarbons. The current volume considers methods for the oxidation of alcohols and their derivatives, alkyl halides, nitroalkanes, alkyl azides, carbonyl compounds, hydroxy arenes and amino arenes. The material is organised by substrate with a chapter for each of the classes of compound discussed. Further subdivisions within the chapters are helpfully arranged. At the end of the book there are tables relating to each chapter, each giving a considerable number of further examples. The author must be congratulated on organising a very large amount of material in an extremely accessible manner. In each chapter there is a section giving experimental details for a variety of typical reactions. At first sight this appears very helpful (the preface stresses the author's intentions to provide a practical guide), but I doubt that one would really want to attempt a reaction in practice without consulting the original literature.

Metal reagents figure widely in the synthetic methods described. If one is interested in reagent rather than substrate this is probably the wrong book to read; *Organic Syntheses by Oxidation with Metal Compounds* by W.J. Mijs and C.R.H.I. de Jonge is probably more suitable. Organometallics as such figure relatively rarely, however. I would have hoped to see some more examples of organometallic catalysts in dehydrogenation reactions of alcohols, and transfer hydrogenations. Oxidations mediated by chromium(VI) and silver reagents are well discussed, but these could not really be considered to be organometallics, or even to involve organometallic intermediates.

There are a number of descriptions of oxidation reactions of organometallic compounds, which do not really involve the organometallic group. For example, the oxidation of groups in the side chains of bis(arene)chromium compounds and ferrocenes are described, but the metal has little or no influence on the course of the reactions.

This book is clearly intended to be useful to the synthetic organic chemist; organometallic reagents and catalysts are therefore viewed as peripheral to this aim, and are given rather modest attention. With its aim in mind the book is clearly of use, and would provide the synthetic chemist with a good starting point for further reading on methods appropriate to achieve a desired transformation. The index is not extensive, but since the contents are given in considerable detail it is probably adequate. The value of volumes such as this one lies in access to the entire series of books, and it is clear that the purchase of such series is likely only to be possible for major libraries. Looking at the volumes in this series which are currently available, I am left with the impression that the editors have not decided whether the series is

“reagent based” (volumes on silicon, boron, lithium and palladium reagents) or “substrate based” (two volumes on oxidation, and one on hydrogenation). The latter is more useful to the synthetic chemist, but is much more difficult to do well, requiring the acquisition of data from a very broad spectrum of the chemical literature. The value of individual volumes may be considerable, but the prices are high. This may eventually emerge to be a substantial and valuable data base for organic synthesis, but as an apparently random and costly collection of specialist monographs it is difficult to recommend that libraries should subscribe to it at present.

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Advances in Boron and the Boranes; edited by J.F. Liebman, A. Greenberg, and R.E. Williams, VCH Publishers, Inc., New York, 1988, xx + 547 pages, £68.00, DM195, ISBN 0-89573-272-6.

This book forms Volume 5 of the series of monographs entitled “Molecular Structure and Energetics”, and is dedicated to A.B. Burg. It comprises a set of essays which review aspects of boron chemistry. The author include some of the most active practitioners in the field; they are: A. Arafat, J. Baer, S.H. Bauer, R.A. Beaudet, A.B. Burg, J.S. Chickos, D.E. Coons, E.W. Corcoran, T.P. Fehlner, L.D. Field, D.F. Gaines, R.N. Grimes, M.F. Hawthorne, J.A. Heppert, Z.S. Herman, S. Heřmánek, N.S. Hosmane, J.C. Huffman, G. Kodama, J.F. Liebman, W.N. Lipscomb, J.A. Maguire, D.S. Matteson, J.A. Morrison, K. Niedenzu, G.A. Olah, T. Onak, L. Pauling, J. Plešek, G.K.S. Prakash, S.G. Shore, A.R. Siedle, J. Simons, L.G. Sneddon, B.F. Spielvogel, B. Štibr, L.J. Todd, J.R. Wermer, and R.E. Williams. The first chapter is by the dedicatee and is entitled “How It All Comes Together: The Mutual Impact of Such Different Fields of Chemistry as Boron Hydrides and Fluorocarbon Phosphines”.

For readers of this Journal, the chapters which will perhaps have the greatest interest, because of their subject matter, are the following: “Syntheses and Reactions of 9- and 10-Atom Carboranes and Heteroboranes”, by B.Š., J.P., and S.H.; “Palladium- and Platinum-Promoted Reactions of Polyhedral Boranes and Carboranes”, by E.W.C. and L.G.S.; “Some Chemistry of the Small Carboranes”, by T.O.; “The Polyborane-Carborane-Carbocation Analogy Extended: New B–H–C Bridge Hydrogen-containing Cations, C–Me–C₂BH₇⁺ (cf. *arachno*-B₃H₈[−]), C,C-(Me)₂CBH₄⁺ (cf. *nido*-B₂H₆), and B–Me–C,C′-(t-Bu)₂C₂B (cf. C₃H₃⁺) Confirmed as Carboranes”, by R.E.W., G.K.S.P., L.D.F., and G.A.O.; “Search for Cluster Catalysis with Metallocarboranes”, by M.F.H.; “Synthetic Strategies in Boron Cage Chemistry”, by R.N.G.; “Recent Advances in the Chemistry of Main Group Heterocarboranes”, by N.S.H. and J.A.M.; “Asymmetric Synthesis with Boronic Esters”, by D.S.M.; “Organometallic Chemistry of Strong Acids: From Boron to Carbon”, by A.R.S.; and “The Molecular Structures of Boranes and Carboranes”, by R.A.B.

The volume is attractively produced and concludes with a subject index.

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