

Book reviews

Mechanisms of Oxidation by Metal Ions; by D. Benson (Halton College of Further Education, Widnes, Cheshire, Great Britain), Elsevier Scientific Publishing Co., Amsterdam, 1976, viii + 225 pages, 20 figs., US \$33.95, Dfl. 85.00.

As part 10 of the series, "Reaction Mechanisms in Organic Chemistry," this book focuses primarily on the mechanistic aspects of the oxidation of organic compounds with metal ions. In keeping with the introductory nature of this series of monographs, the treatment is designed more as a summary to whet the appetite of the reader rather than overwhelming him with details (already largely covered in Volume 7 of "Comprehensive Chemical Kinetics"). After a cursory introductory chapter, metal ions are divided into three classes: one-equivalent oxidants such as Co(III), V(V), Ce(IV), Mn(III), and Cu(II), two-equivalent oxidants [Pb(IV), Tl(III), Hg(II) and Pd(II)] and multi-equivalent oxidants [Cr(VI) and Mn(VI)] in their reactions with various hydrocarbons, alcohols, and carbonyl compounds. The role of reactive intermediates such as free radicals and carbonium ions as well as the interplay with wholly inorganic reaction mechanisms are nicely interwoven. The contents of the subject index, which includes only specific reactions between metal ions and organic compounds, fairly well summarizes the emphasis of the book. For a short and pocketbook sized, introductory book the price is outrageous. It is not clear which market the publishers intended this book to serve since it is too dear for the casual but informed reader and not sufficiently comprehensive, critical nor up-to-date for the specialist.

Department of Chemistry,
Indiana University,
Bloomington, Indiana 47401 (U.S.A.)

JAY K. KOCHI

International Review of Science. Physical Chemistry, Series Two, Volume 11: Chemical Crystallography. J.M. Robertson, volume editor. Butterworths, London, 1975, 228 pages, £13.45.

The format for this second volume is the same as for the first (1972/1973): authoritative, specialized articles by recognized experts under the editorship of J.M. Robertson. Although the volume should appeal to the chemical crystallographer there are several features that make it less than attractive to the organometallic chemist. First, there is the explicit grouping of articles from diverse areas of chemistry under the umbrella of chemical crystallography. This reviewer prefers series in which the grouping is by chemical area (e.g.,

actinides, carbenes, heterocumulenes), with the result that a large percentage of the articles, whether they be primarily synthetic, structural, spectroscopic, or kinetics and mechanisms, will be read by the chemist interested in that particular field of chemistry. Second, the present volume suffers from two production problems: the literature has been covered only up to mid-1973 and there is no author index.

Of the six articles, three are probably only of minimal interest to the organometallic chemist: (1) "Aspects of Hydrogen Bonding" by Speakman; (2) "Structures of Natural Products: Alkaloids" by Mathieson; and (3) "Chemistry and Crystallography of Caryophyllene" by Robertson. This last article at least serves to remind the organometallic chemist that some intriguing rearrangements occur in organic systems in the absence of metals! Of somewhat more interest to the physically oriented organometallic chemist are the articles on "Measurement of Electron Densities in Solids by X-ray Diffraction" by Coppens and "Non-bonded Interactions in Organic Molecules" by Dunitz and Burgi. The Coppens' article provides a very good summary of the current state of the art in the determination of electron densities in solids by diffraction methods. By judicious choice of compound and meticulous attention to experimental details it is now possible to determine approximate electron densities that serve to test theory and intuition. Unfortunately, the article does not include the more recent applications by Coppens, Saito, Maslen, and others to organometallic and coordination compounds. The Dunitz-Burgi article provides an excellent summary of force-field calculations, with emphasis on applications to medium-ring cycloalkanes. This article will prove valuable to those considering applications to organometallic or coordination compounds. Of genuine interest to the organometallic chemist is the article "Structural Organotransition Metal Chemistry" by Mason and Mingos. Covered in this article are the structural aspects of mononuclear organometallic complexes containing simple, unsaturated ligands; dinuclear organometallic complexes; and cluster compounds. It is doubtful, however, if the organometallic chemist could justify the price of the volume on the basis of this excellent article of 56 pages.

*Department of Chemistry,
Northwestern University,
Evanston, Illinois 60201 (U.S.A.)*

JAMES A. IBERS

Organic Phosphorus Compounds, Volume 7; edited by G.M. Kosolapoff and L. Maier, John Wiley and Sons, New York/London/Sydney/Toronto, 1976, viii + 871 pages, \$42.75, £21.50.

This book completes the "Beilstein" of organophosphorus chemistry which has been so ably organized and edited by Kosolapoff and Maier*. We regret that Dr. Kosolapoff did not live to see the publication of this last volume. Organophosphorus chemists owe both editors a vote of thanks for undertaking and bringing to completion this monumental task (over 4300 pages covering the results of over 18 000 references).

*For reviews of the previous volumes see *J. Organometal. Chem.*, 57 (1973) C27 and 67 (1974) C35.