

Book reviews

The Organometallic Chemistry of the Transition Metals, by R.H. Crabtree, John Wiley & Sons, New York, 1988, xv + 422 pages, £34.50, ISBN 0-471-8530602.

During the last four or five years there has been a spate of books broadly similar to the text under review, intended for senior undergraduates or graduate students in organometallic chemistry. Nevertheless, the present work has much to recommend it. The problems at the end of each chapter are particularly useful. The chosen references are inevitably highly selective, but are adequately illustrative.

The book is divided into sixteen chapters, with the following titles (number of pages in parentheses): Introduction (16 pages); General Properties of Organometallic Complexes (16 pages); The Metal–Carbon and Metal–Hydrogen Bonds (23 pages); Ligand Substitution Reactions (26 pages); Complexes of π -Bound Ligands (30 pages); Oxidative Addition and Reductive Elimination (19 pages); Insertion and Elimination (18 pages); Nucleophilic and Electrophilic Addition and Abstraction (20 pages); Homogeneous Catalysis (24 pages); Characterization of Organometallic Compounds (30 pages); Carbenes, Metathesis, and Polymerization (33 pages); The Activation of Small Molecules (20 pages); Clusters and the Metal–Metal Bond (30 pages); Applications to Organic Synthesis (33 pages); Oxidation and High-Oxidation-State Complexes (13 pages); and Bioorganometallic Chemistry (23 pages). Finally, there is a Subject Index (5 pages).

The book is clearly intended to be self-contained, and to this end the introduction deals with some basic concepts of transition metal coordination chemistry. Additionally, in Chapter 10 we have a useful section dealing with such problems as compound isolation (very much an outline) and aspects of NMR spectroscopy and, more briefly, IR spectroscopy and crystallography; finally, there is a short section (2 pages) mentioning other methods such as UV, EPR, PES, and ESCA (mass spectrometry is also mentioned, although, curiously enough, it is referred to as “mass spectroscopy”).

The writing is clear and concise. Some minor quibbles are (i) Cl^- is a ligand, rather than Cl, e.g., p. 18; (ii) the word “descriptor” features prominently, but it is not in the Oxford Dictionary (surely the term “symbol” would be equally appropriate); (iii) square brackets for Werner complexes are more often than not omitted, although in the introduction their use is recommended.

The final chapter is something of a mystery in the context of its title, in that the only organometallic biomolecule is coenzyme B_{12} , the chemistry of which occupies only about one quarter of the chapter; other topics are concerned with such matters as nitrogen fixation, the iron sulfur proteins, and hydrogenases and methanogens.

Few errors have been detected. This text is a useful introductory account to the subject.