

---

## Book review

---

### The organometallic chemistry of the transition metals

R H Crabtree

John Wiley and Sons (Wiley Interscience), New York, Chichester, Brisbane, Toronto, Singapore, 1988.

£36.45. ISBN 0 471853062.

This book is intended for 'senior undergraduate and graduate courses in organometallic chemistry'. It succeeds in this aim giving a well-rounded summary of the subject, starting from such basic concepts in the area as *d*-orbital splitting and the theory of carbon monoxide bonding to transition metals.

The first chapter covers some basic ideas in complex and transition metal chemistry. Chapter 2 continues with more general properties including topics such as the 18-Electron Rule and its limitations. Chapter 3 is more specifically organometallic and covers the stability of the transition metal-alkyl carbon bond, metal hydride species and metal alkyl properties. Chapters 4-8 deal in detail with organometallic properties and reactions including ligand substitution,  $\pi$ -bonded ligands, oxidative addition and reductive elimination, insertion and elimination and finally addition and abstraction. Chapter 9 seems incongruously placed in that it deals with some of the catalytic uses of transition metal organometallics before other chapters dealing with basic properties and characterizations (e.g. Chapter 10). However, this chapter is particularly useful for those wishing to cover the industrial utility of organometallics and it might indeed

have usefully been widened and extended (2½ pages on hydroformylation is not an over-generous coverage for such an important topic).

Other chapters concerned with the utilization of organometallics include Chapter 12 (activation of small molecules), Chapter 14 (application to organic synthesis) and Chapter 11 (carbenes, metathesis and polymerization). This work, like a number of other recent works in the organometallic area, covers the role of organometallics in biochemical areas (e.g. coenzyme B12, nitrogen fixation, hydrogenases and methanogens). Other chapters cover clusters, metal-metal bonds and high-oxidation-state complexes.

As can be deduced from the summary above, the book covers the whole spectrum of organometallic chemistry of transition metals. It does so concisely and economically in 422 pages. It is fully typeset. It is well indexed; each chapter also includes problems or discussion questions and a set of brief answers are supplied at the end of the book. These latter are useful resources to both lecturers and students. Depending on one's perspective or interests, one can always disagree with the selectivity or the extent of coverage of topics. In this case it would be churlish to make a great issue out of this. The book is comprehensive, very well balanced and not over-long. At £34.50 it appears to this reviewer, if not to be exactly a bargain, at the least to be very well worth the price.

P J CRAIG  
*Leicester Polytechnic*