

BOOK REVIEW

Transition-Metal Organometallic Chemistry—An Introduction; by R. Bruce King, Academic Press, New York and London, 1969, ix + 204 pages, \$11.50.

This book is an expansion of a short course on transition-metal organometallic chemistry sponsored by the American Chemical Society and directed at the beginning graduate student. The opening chapter is devoted to general principles, such as “coordination number”, “electronic configuration” (which turns out to be the number of electrons in the valence shell) and “retroductive bonding”. It also lists preparative methods for various classes of compounds, with schematic pictures of the orbitals involved in their metal–ligand bonds, although with no indication of how and why these orbitals schemes arise. The discussion here is rather too superficial. The compound $[\{\pi\text{-}(\text{C}_5\text{H}_5)\text{Fe}(\text{CO})\}_4]$ is taken as an example of metal coordination number 9, but no structure for the complex is shown. It is not explained how the concept of “electronic configuration” applies to the central carbon atom of $[\text{Fe}_5(\text{CO})_{15}\text{C}]$. “Back-bonding” and “reverse-bonding” appear synonymous with “retroductive bonding”.

The second chapter is a quick guide to organometallic compounds of Groups III, IV and V, and of the actinides and lanthanides. Chapter III performs the same function for the chromium group elements, and so on through the manganese, iron, cobalt, nickel and copper groups. Each chapter contains a list of references, some supplementary reading recommendations and some questions.

This introduction consists principally of a list of preparative reactions. One looks in vain for discussions of mechanism, kinetics or structure. Even the “crucial concepts” of coordination number and electronic configuration are hardly mentioned after the first chapter. As a reference book or as an introduction this leaves much to be desired, and there are better texts available for the new student.

G. J. Leigh