

*Metal-Ligand Multiple Bonds*, by William A. Nugent and James M. Mayer, Wiley-Interscience, 1988, xi + 334 pages, £35.15, ISBN 0-471-85440-9.

This book is concerned with the chemistry of complexes in which a first row element, oxygen, nitrogen or carbon is multiply bonded to a transition metal. This area of research has seen an explosive growth over the last few years, and will clearly attract continued attention for many years to come. The chemistry of the Fischer carbenes is specifically excluded (a recent monograph by Dötz et al. and a number of good reviews have been published recently in this area) and bridging systems are not extensively treated. The authors also regretted that they were not able to include a discussion of metal sulphur multiply bonded species in comparison with the oxygen analogues.

After a brief introduction, Chapter 2 considers the electronic structures of the complexes and Chapter 3 their syntheses. Some of the style seemed to me unfortunate. On page 61 section 3.2.2 is entitled "Cleavage of Silicon and Other Electropositive Leaving Groups"; this is poor usage since you may cleave a bond, but scarcely, in this context, an element. This should have been cleavage of silicon-oxygen bonds etc., or cleavage "off" or "from" silicon. Chapter 4 discusses IR and NMR spectra of the complexes, whilst Chapter 5 reviews the immense range of structural studies in this area. This is a particularly valuable collection, with over 800 reference running into 1987. The final two chapters deal respectively with reactions of the complexes and with their role in catalytic reactions. Within each chapter the material has been arranged in the order oxygen, nitrogen, carbon. The comparisons which are drawn are among the most valuable features of the book, and should stimulate the reader to much further thought on the subject.

The quality of the text is generally good, with few obvious typographic errors. The references and many of the tables are, however, printed from camera ready manuscript, and some of the presentation here is less pleasing. I particularly disliked the use of "<" for angle and "∞" as a subscript to indicate a polymer. The use (or non-use) of square brackets is frequently not in accord with IUPAC rules. I noted a number of problems with the diagrams; the use of a computer drawing program has generally ensured clarity, but has introduced a number of odd deficiencies in symmetry, and some strange molecular geometries, as well as gaps in bonds and improper perspectives. The index is generally adequate.

Most recent works on organometallic or inorganic chemistry have included some discussion of metal-ligand multiply-bonded species, and there have been various reviews of aspects of the subject, but this book does fill a useful gap in providing an overview. In a fast moving field it will inevitably have a relatively short useful life, and the commendable speed of production has had some deleterious effects on presentation. The data compilation on structural studies will remain a useful starting point for many years. Although some readers will find that the coverage is not entirely to their taste, by modern standards the cost is modest, and this book should be purchased by major libraries and many interested individuals.