Book Reviews

Organometallics, A Concise Introduction, by Ch. Elschenbroich and A. Salzer, VCH, Weinheim, 2nd revised edn., 1992, DM 58.00 (softcover), DM 138.00 (hardcover).

The first edition of this textbook, published in the English edition in 1989, was warmly received and has become one of the more popular organometallic texts. In the second edition, the overall format and many sections of text are unchanged but the preface indicates that over a hundred minor changes have been made to correct errors, provide new examples and include recent discoveries.

This book is not especially original in overall concept, the organization being reminiscent of an earlier text by P. Powell, itself based on the two volume work of Coates, Green and Wade. The material is, however, chosen with care and presented with flair; it should maintain its popularity with the student body. There is an introduction giving selected landmarks, current trends and some general principles of organometallic chemistry, followed by treatment of the main group elements, classified according to groups in the Periodic Table, and transition elements, classified according to ligand type. Final chapters treat metal–metal bonds and clusters, organometallic catalysis and the literature of organometallic chemistry.

At 495 pages, the second edition of this book is 16 pages longer than the first. Although there are several texts which give equal or superior coverage of organotransition metal chemistry, this will continue to be the preferred text for courses covering both main group and transition metal organometallic chemistry. To give such broad coverage in one volume, the book is tightly packed with well-designed, integrated text, tables, diagrams and reaction schemes. In addition, there are "excursions" into less central material, including the use of the spectroscopic methods NMR (separate excursions into ^{1}H and ^{13}C, ^{6}Li and ^{7}Li, ^{11}B, ^{57}Fe and other transition metal nuclei), ESR and Mössbauer, and outlining theoretical concepts such as VSEPR, the isolobal analogy and cluster electron counting rules. The authors' enthusiasm for the subject matter is always evident.

What material do the authors leave out? There is much less emphasis on mechanism than is found in most texts on organotransition metal chemistry (but basic material can be found in the chapter on catalysis), and there is little coverage of the use of organometallics as stoichiometric reagents in organic synthesis. This deficiency is more than compensated for by the fine coverage of

main group organometallics and the introduction to clusters, which competing texts largely ignore. New in the second edition are descriptions of C_{60} complexes and unusual metal–metal bonded organometallics, and there is increased emphasis on catalytic reactions such as C–H bond activation.

A few errors remain from the first edition, such as the assertion (pp. 15 and 140) that MeI and PbI_2 react to give $MePbI_3$, and some terminology is unconventional, such as the description of alkyne complexes, all bound through two carbons, as monodentate to quadridentate. However, these are trivial problems. Overall, the text is a valuable resource to teachers and students of organometallic chemistry and it can be strongly recommended.

R.J. Puddephatt

Bonding and Structure: Structural Principles in Inorganic Chemistry, by N. W. Alcock (Ellis Horwood Series in Inorganic Chemistry, edited by John Burgess), Ellis Horwood, New York, 1990, 314 pp. + Appendix, US $50.95. ISBN 0-13-465253-3.

The author's purpose in writing this little volume is to try to overcome some of the problems which students encounter in studying structure and bonding. The result is a text of the medium level of difficulty, which does not overload the student with an excessive amount of factual material. Emphasis is placed on applying the theoretical principles of chemical bonding to classes of compounds and experimental phenomena which are likely to be of importance to the student in the coming decade, e.g. magnetic oxides, superconductivity, ferroelectricity.

Topics covered include electronegativity, introductory crystallography and diffraction, molecular energies and bond energies, the metallic state, ionic and covalent compounds, alloys, the hydrogen bond, electron-deficient bonding in boranes, semiconductors, intercalation compounds, silicates and clays. The relatively light treatment of crystal field theory and transition metal complexes is in keeping with current trends in research in inorganic chemistry. The absence of significant material on transition metal cluster compounds, carbonyls, and classical organometallic compounds may be somewhat of a disadvantage to the student.

In the reviewer's opinion, this book would be most suitable for a one semester undergraduate course on the properties of inorganic materials, probably at the third or fourth year level.

Ian M. Walker
