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## Book reviews

*$^{13}C$ NMR Data for Organometallic Compounds.* By B.E. Mann and B.F. Taylor, Academic Press, London, 1981, viii + 326 pages, £15.90/U.S. $32.50.

Organometallic chemists are making increasing use of $^{13}C$ NMR spectroscopy in characterizing organometallic compounds, and they will find this volume helpful and timely. Apart from the first 36 pages, which are devoted to a useful introduction, the book consists of tables of data; with one exception each table presents chemical shifts and coupling constants for a particular type of organic group (e.g. an acetylene group or a phenyl group) attached to the range of metals and metalloids. The exception is the brief table concerned with data for some paramagnetic organometallic compounds.

The only elements not regarded as metals for the purposes of this volume are H, C, N, O, S, the halogens, and the noble gases. However, because of the very large body of data on silicon and phosphorus derivatives, these are treated superficially; this makes the book of limited use to organosilicon and organophosphorus chemists, but they can still turn to it first for some illustrative material and leading references.

Most organometallic chemists will want to have this monograph available to them, and they will be pleased by the price, which is remarkably low on present day standards.

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*Topics in Current Chemistry, Vol. 97,* (Managing editor F.L. Boschke), Springer-Verlag, Berlin-Heidelberg-New York, 1981, DM 92.00.

There is considerable current interest in the chemistry of organophosphorus compounds having novel structural and bonding features (see for example recent reviews by E. Fluck on compounds of phosphorus with coordination number 2 (Topics in P.chem. Vol 10) and R. Appel on Phospha-alkenes and Phospha-alkynes, Angew. Chem. Int. Edn., 20, 731 (1981). The article by Regitz and Maas entitled "Short Lived Phosphorus(V) Compounds having Coordination number 3" complements these and surveys the chemistry of short lived compounds of pentavalent phosphorus of three general types: (a) $RP(X)(CR_2)$, (X = O, S); (b) RP(O)X, (X = O, NR) and (c) ZP(X)(Y), (Z = O, OR, $NR_2$, X, Y = O, S, $NR_2$).

The authors give a comprehensive account of synthetic routes, trapping reactions and wide variety of physical and spectroscopic techniques employed in the characteristic of these systems and the article is of considerable general interest to those working in all branches of phosphorus chemistry. Some recent references to work done in 1981 appear in an appendix.

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*Advances in Inorganic Chemistry and Radiochemistry, Vol. 24*: edited by H.J. Emeléus and A.G. Sharpe. Academic Press, New York/London, 1981, 384 pages, US $52.50/£30.40.

The final article in Vol. 24 of this well known series which is bv B.F.G. Johnson and J. Lewis reviews Transition-Metal Molecular Clusters and is of considerable interest to Organometallic chemists. The introduction gives an excellent summary of structural and bonding aspects of transition metal clusters containing 3 to 6 metal atoms. The application of the effective atomic number rule, skeletal electron counting procedures and extended Hückel calculations are discussed with particular emphasis on metal carbonyl complexes. There is also a useful summary of metal–metal bond distances and bond orders and a consideration of ligand–ligand interactions. Mechanistic aspects of cluster expansion reactions and the activation of carbonyl clusters forms the natural preamble to the second section of the article which is concerned exclusively with structural and chemical aspects of Ru and Os carbonyl clusters. The authors are authorities in this rapidly expanding field and the coverage emphasises the important role of X-ray crystallography in the elucidation of novel structures and the understanding of reaction patterns. The importance of IR and NMR spectroscopy and neutron diffraction studies of hydrides is also underlined.

The in-depth coverage of the chemistry of tri-, tetra-, penta- and hexa-nuclear cluster carbonyl complexes of Ru and Os is especially valuable but is marred slightly by some trivial errors (e.g. p.290 wrong formula for $HOs_3(CO)_8(PhC_2Ph)$-$(PhC_2C_6H_4)$, wrong caption to Scheme 4 which leads to confusion elsewhere in the text, p.293 confusion of E and e in formula, p.287 Fig. 22 the structure of $Os_3(CO)_7(Ph_2C_2)_3$ is referred to as containing an osmacyclopentadiene ring but is wrongly drawn, and Fig. 24 (p.289) refers to the structure of the same complex this time reformulated as $Os_3(CO)_7(Ph_2C_2)(Ph_4C_4)$. However, the review is strongly recommended for its timely and informed assessment of current views in this active area of organometallic chemistry.

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