

Book review

"Advances in Organometallic Chemistry," Vol. 15, F.G.A. Stone and R. West, editors, Academic Press, New York/San Francisco/London, 1977, vii + 332 pages, \$33.

This latest volume in the series continues the high standards set by the previous volumes. The quality of the binding, paper, and print is high and there are relatively few typographical errors. The subject index (9 pages) is usable, but not complete. Cumulative lists of contributors and titles to date in the series are included. Comments on individual chapters follow.

Recent Developments in Theoretical Organometallic Chemistry (D.M.P. Mingos) (45 pp.). The emphasis of this chapter is on the results of recent theoretical calculations, not on the techniques per se. However, a brief description of the commonly used calculations is given and the results of various methods compared. The bonding, structure, stability, etc. of olefin, polyolefin, sandwich, and polymetal cluster complexes are discussed. The references are generally up to 1975, although a few later ones are included.

Metal Atom Synthesis of Organometallic Compounds. (P.L. Timms and T. W. Turney) (55 pp.). This chapter is rough reading in spots due to a higher than average number of typographical errors and lack of careful editing (for example, p. 64, "...vacuum temperature..." and p. 85, "...halogen abstraction, e.g. polymerization..."). In spite of its flaws, the chapter is well conceived and thorough. Topics covered are experimental methods, reactions of metal atoms with 2-electron donors (CO, R₃P, alkenes, etc.), with many-electron donors (polyenes, arenes, etc.), insertion reactions with organic halides, a comparison of methods, and a Table of reactions. References are to Feb. 1976.

Metal Complexes of π -Ligands Containing Organosilicon Groups

(I. Haiduc and V. Popa) (32 pp.). This chapter reviews the synthesis of metal complexes of π -ligands of the type, $R_nSi-\pi_{4-n}$. The ligands are classified as to the number of electrons donated to the metal and include, 2,3,4,5, and 6-electron donors, large rings, bicyclics, and silylated acetylenes. A note added in proof updates the references through 1975 with some from 1976.

Activation of Alkanes by Transition Metal Compounds (D. E.

Webster) (39 pp.). The bulk of this chapter is devoted to the activation of alkanes, alkyl benzenes, and benzene to H-D exchange by platinum compounds. A valiant attempt is made to correlate a large amount of experimental data with various mechanistic schemes. Also reviewed are reactions involving C-H bonds on coordinated ligands, chlorination of organics by Pt(IV), and oxidation of alkanes of Co(III). Structure XX (p. 157) is incorrect (see Chem. Commun., 1220 (1971)). The latest reference is 1975.

Supported Transition Metal Complexes as Catalysts (F. R. Hartley

and P. N. Vezey) (42 pp.). This chapter contains a good discussion on the preparation of various supported catalysts and a comparison of supported, heterogeneous, and homogeneous catalysts. Catalysis of hydrogenation, hydrosilation, hydroformylation, carbonylation, sequential reactions, etc. by supported catalysts are reviewed. References are to early 1975.

Structures of Main Group Compounds with Electron-Deficient

Bridge Bonds (J.P. Oliver) (33 pp.). This chapter emphasizes recent structural results obtained on the indicated complexes. The various theories of bridge bonds are criticized in light of the structural results. Covered are compounds of the main groups I-III (boron excluded). The latest references are from 1975.

Organometallic Radical Anions (P. R. Jones) (40 pp.). The

bulk of the chapter is devoted to radical anions containing main group IV substituents. A few pages are devoted to electron

transfer processes involving RLi and RMgX compounds. Transition metal derivatives are allotted three pages and there are only two references to boron containing radicals. However, the discussion of Gp. IV radicals is excellent and comprehensive.

In summary, the latest volume of this series is well worth the cost and provides researchers and students access to reasonably up-to-date reviews and references on a variety of timely topics.

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