Book Review

Synthetic Methods of Organometallic and Inorganic Chemistry, Volumes 7 and 8. Edited by W. A. Herrmann. Thieme: Stuttgart, 1997, Volume 7, 308 pp, hardback. DM 185. ISBN 3 13 103081 X. Volume 8, 280 pp, hardback. DM 185. ISBN 1 13 103091 7.

These two Volumes are part of a new series that is a modernized, English language version of a classic German language compendium, Georg Brauer's "Handbuch der Präparativen Anorganischen Chemie". Volumes 1-3 and 6 were reviewed earlier [p. 1402, **1996**; p. 372, 736, and 981, **1997**], together with general features of the series. These newest installments cover inorganic and organometallic compounds of the transition metals, and are divided into complexes of acyclic ligands such as carbonyls, carbenes, or simple alkenes (Volume 7), and sandwich or half-sandwich complexes (Volume 8). Some transition metal compounds also appear in earlier volumes, in connection with subjects such as binary metal carbides or silylene complexes.

Transition metal compounds pervade all phases of modern synthetic chemistry, and these volumes are edited with the objective of serving all constituencies. They nicely capture both the traditional and most up-to-date aspects of the field, and showcase the many important contributions made by Munich-based research groups [including the one headed by the Editor] through most of this century. Volume 7 begins with a chapter on metal carbonyls that spans time-honored compounds such as $Fe_2(CO)_9$ or $Fe_3(CO)_{12}$, modern super-reduced species such as $Na_4M(CO)_4$ (M = Cr, Mo, W), and a number of nitrosyl, phosphine, cyano-containing, halide, and hydride derivatives.

The next chapter covers complexes with metal-carbon σ bonds, with examples ranging from $MnCH_3(CO)_5$ to $W(CH_3)_6$ to CH_3ReO_3-derived species. Two chapters are devoted to syntheses of carbene, carbyne, and ketenyl complexes. These include many $(CO)_5M{=}C(OR)R'$ compounds that see use in organic synthesis, several Dötz-type and related reactions, Schrock metathesis catalysts and other alkylidene adducts, and pyrazolylborato and manganese systems. The remaining chapters are subdivided into sections involving alkene, allyl, alkyne, and alkynyl complexes, the last of which highlights recent advances in transition metal polymers with polyyne-containing backbones.

Volume 8 begins with a chapter on complexes that contain at least two cyclic ligands of formula C_nH_n. Separate sections cover bis, tris, and mixed ligand adducts. A final section features metallocenes with additional ligands, such as Grubbs' titanacyclobutanes. A long second chapter focuses mainly on half-sandwich compounds, and is grouped into sections on carbonyl, nitrosyl, hydride, halide, and other types of derivatives. The last includes ansa species, and fulvalene based systems. A third chapter collects miscellaneous compounds. This contains a major section on complexes with weakly bonded anions, as well as non-sandwich compounds not easily accommodated or classified elsewhere, and metal vapor reactor procedures.

Volume 8 concludes with an index of transition metal complexes in Volumes 1-6, most of which are also cross listed in the text. However, Volumes 7 and 8 contain separate indices. In view of the unavoidably arbitrary demarcations (which for example place a few half-sandwich compounds in Volume 7), a combined index would have been more useful. Content-wise, the only conspicuous omission would be non-racemic complexes, which are playing an ever increasing role in enantioselective organic synthesis.

In summary, Volumes 7 and 8 succinctly capture the essence of nearly all aspects of modern preparative transition metal chemistry. They also supersede a number of older treatments, such as the early volumes of *Organometallic Syntheses*. Although they are not edited from the standpoint of the synthetic organic readership of *Synthesis*, this makes them all the more valuable as desk references, and less likely to become obsolete as new applications are developed. All researchers who frequently prepare transition metal compounds will find it useful to purchase their own copies, or even the entire series.

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