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Book Review

Synthetic Methods of Organometallic and Inorganic Chemistry (Herrmann/Brauer)
Transition Metals, Part 3, Vol. 9; W.A. Herrmann (Ed.); Georg Thieme Verlag, Stuttgart/New York, 2000, ISBN 3-13-115141-2, DM 198.00

This volume is the third devoted to transition metals in this series of 10 monographs "planned to cover the most important standard compounds that appear to be in general use in the laboratories engaged in all branches of synthetic chemistry".

There are seven chapters. The first (52 pages, 173 references) is concerned with alkenyl, allyl, and dienyl complexes of main group elements and of transition metals and is written by R. Beckhaus. The second by N. Kuhn, with contributions from German, French, Polish and US research groups, deals with π-complexes of heterocyclic ligands such as pentamethylpyrrole, η^5-pyrrolyl and η^5-phospholyl (31 pages, 97 references). The third chapter discusses some promising ligands for organometallic catalysis, the *N*-heterocyclic carbenes. They are a recent development in catalysis (they have been used only in the last ten years) as these moieties coordinated to transition metals compare with organophosphanes in terms of their catalytic performances. Specialists in this area, W.A. Herrmann, F.J. Kohl and J. Schwarz, cover this chapter. The synthesis of these carbenes and their complexation with Ni, Pd, Ir and Ru transition metals are presented (27 pages, 30 references). Chapter 4 (28 pages, 28 references) is devoted to oxo- and alkoxy-complexes of rhenium, molybdenum, tungsten, copper, and palladium, and is covered by F.E. Kühn, W.A. Herrmann, J. Fridgen and A.M. Santos. The fifth chapter (12 pages, 32 references) deals with highly reduced tantalum carbonyls derived from the hexacarbonyltantalum anion and is presented by the expert in the field of highly reduced carbonyl anions, J.E. Ellis, and his co-worker G.F. Warnock. Water-soluble metal complexes of sulfonated triphenylphosphane (TPPTS) are presented in Chapter 6 by W.A. Herrmann (25 pages, 9 references). The purification of TPPTS and of its complexes is very well described and this chapter will be very useful for those interested by this family of compounds and the potential of their complexes in catalysis in two phases systems. The last chapter entitled "Miscellaneous Complexes" is a selection of potentially useful complexes and is covered by W.A. Herrmann and F.J. Kohl (25 pages, 46 references). Many of the complexes in this chapter, such as Grubb's ruthenium-alkylidene complexes and bis(imino) systems (Brookhart/Gibson systems) may be useful in the catalysis of the metathesis and polymerisation of olefins. Curiously, this chapter also contains (page 184) a version of the synthesis of allylpalladium complexes which duplicates that given in Chapter 1, page 41. There are small differences between the two procedures and the yield in the second is lower. The duplication does not seem justified.

This book is well presented and easy to read and there are only minor typographical errors: page 160 $(\eta^5\text{-}C_5H_5)Mn(CO)_2$ and not $(CO)_5$, pages 185, 186 N_2CHPh and not N_2CH_2Ph for phenyldiazomethane.

Compared to *Inorganic Syntheses*, this series suffers from the absence of independent checking and may be most useful to workers who are already quite experienced in the field. For instance, in page 66, in the description of the procedure for the synthesis of potassium 2,3,4,5-tetramethylphospholide, no potassium is added to 1-phenyl-2,3,4,5-tetramethylphosphole! Sometimes no references are given for the synthesis of non-commercial starting materials. The advantage may be that this allows more rapid publication of the syntheses of new products that are very useful for applications in organic synthesis, which is the case for many of those described in the present volume.

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