

Book review

Principles and Applications of Organotransition Metal Chemistry by J.P. Collman, L.S. Hegeudus, J.R. Norton, and R.G. Finke. University Science Books, Mill Valley (California), 1987. ISBN 0-935702-51-2, x + 989 pages. £12.75

This is the second and substantially revised edition of a book which was first published in 1980. Drs. R.J. Norton and R.G. Finke have become co-authors of the present work, which is regarded as a graduate text. There are four entirely new chapters (4, 8, 11, and 16) and Chapters 1–3 have been very substantially re-written. There are many references, both to reviews and the primary literature, which are intended to be illustrative rather than comprehensive.

The book is divided into three parts: Part I deals with basic principles, and the chapter headings, numbers of pages, and numbers of references are as follows: Ch. 2, 'Structure and Bonding', 36, 34; Ch. 3, 'Survey of Organotransition-Metal Complexes According to Ligand', 177, 622; Ch. 4, 'Ligand Substitution Processes', 44, 134; Ch. 5, 'Oxidative Addition and Reductive Elimination', 75, 148; Ch. 6, 'Intramolecular Insertion Reaction', 45, 117; Ch. 7, 'Nucleophilic Attack on Ligands Coordinated to Transition Metals', 31, 73; Ch. 8, 'Electrophilic Attack on Coordinated Ligands', 26, 58; Ch. 9, 'Metallacycles', 62, 122. Part II deals with catalytic processes and comprises: Ch. 10, 'Homogeneous Catalytic Hydrogenation, Hydrosilylation, and Hydrocyanation', 53, 77; Ch. 11, 'Catalytic Polymerization of Olefins and Acetylenes', 41, 56; Ch. 12, 'Catalytic Reactions Involving Carbon Monoxide', 48, 131. Part III is entitled "Applications to Organic Synthesis" and contains: Ch. 13, 'Synthetic Applications of Transition-Metal Hydrides', 12, 33; Ch. 14, 'Synthetic Applications of Complexes Containing Metal-Carbon σ Bonds', 58, 145; Ch. 15, 'Synthetic Applications of Transition-Metal Carbonyl Compounds', 43, 82; Ch. 16, 'Synthetic Applications of Transition-Metal Carbenes and Metallacycles', 41, 91; Ch. 17, 'Synthetic Applications of Transition-Metal Alkene, Diene, and Dienyl Complexes', 33, 63; Ch. 18, 'Synthetic Applications of Transition-Metal Alkyne Complexes', 21, 38; Ch. 19, 'Synthetic Applications of η^3 -Allyl Transition-Metal Complexes', 439, 93; Ch. 20, 'Synthetic Applications of Arene Transition-Metal Complexes', 20, 35. There is a substantial Subject Index, 46 pp. which, however, also contains the names of those authors named in the text (rather than those listed in the references); not all the latter entries are particularly useful. For example, under Collman, J.P., we find an entry on p. 9 which simply tells us that it is 25 years since J.P.C. began independent research.

The book is attractively produced using a laser printer. There are very few errors, although, oddly enough, on the first "Contents" page "phosphorus" is misspelt; there is a clerical error in ref. 18 on p. 272.

Unquestionably, this is an extremely valuable textbook. It will be clear from the chapter headings that the authors do not treat individual metals, rather the

chemistry is defined by the ligand or by the nature of the reaction which is being considered. As is evident from the title of the book, main group elements are not considered. Other aspects which are excluded concern the *f*-block elements (because, allegedly, they “lack the variable oxidation states, . . . which are crucial to the reactivity of *d*-block transition metals”; researchers working, for example, on uranium would, undoubtedly, challenge this assertion) and transition metal clusters.

Chapter 1 is entitled ‘A Perspective’, and informs the reader about the structure of the book, but also has a useful brief historical section. Organometallic chemists will not necessarily agree with the chosen landmarks. For example, I find it strange that there is no mention of the work of Hieber. Additionally, it seems somewhat arbitrary to have selected 6 out of the 41 “historic landmarks” to deal with homogeneous hydrogenation, and yet have no entry on, say, hydroformylation; the first phosphine-stabilised transition metal hydrides, alkyls or alkenes or homoleptic alkyls.

With regard to balance, again there will be differences of opinion. For example, in the very long Chapter 3 which deals with organotransition-metal compounds according to ligand types, we find that phosphides (i.e., having $\overline{\text{PR}}_2$ as ligand) are dealt with in 6 pages, with 15 references, whereas amides (i.e., with $\overline{\text{NR}}_2$ as ligand) are dismissed in half a page with only a single reference, and that to the primary literature. Even alkyls are dealt with in only 6 pages.

There is no doubt that this book will be a major source book of organometallic chemistry for new practitioners of the subject. It is an authoritative work.

*School of Chemistry and Molecular Sciences,
University of Sussex, Brighton BN1 9QJ (Great Britain)*

Michael F. Lappert

Announcement

Sixth International Conference on the Organometallic and Coordination Chemistry of Germanium, Tin and Lead

The above Conference will be held at the Free University of Brussels on July 23–28 1989. Details may be obtained from

Professor Dr. M. Gielen,
Free University of Brussels, V.U.B.,
AOSC Unit, 8G512, Pleinlaan 2,
B-1050, Brussels, Belgium.