

chemistry. Commencing with hydrides, it then surveys carbonyls, the metal-carbon bond, alkyl, carbene, and carbyne complexes, π -coordination and the metal-metal bond (discussed almost entirely from a theoretical point of view with little hard chemistry), and finally a section on phosphanes and phosphorus ligands. The emphasis throughout is on generalisation and on analysis of mechanism and orbitals. These two chapters, 2 and 3, constitute the major part of the book. The final two, shorter chapters discuss applications of transition-metal organometallic compounds in organic synthesis and in homogeneous catalysis. There is an appendix on group theory and molecular orbitals, and each chapter has an extensive list of references, but there are no student exercises.

In summary, this book does present a new approach to the subject of transition-metal organometallic chemistry. The emphasis on theory imposes a unity and implies a maturity of the subject which earlier texts sometimes lack. Nevertheless, I have the reservations about detailed accuracy, exemplified below.

So why do I have some reservations? The first brief chapter disturbed me, for pedantic reasons. Nickel tetracarbonyl is presented both as $\text{Ni}(\text{CO})_4$ and $[\text{Ni}(\text{CO})_4]$ on the very first page, and a charge is denoted by +1, which is a number, and not by $1+$, which indicates one unit of positive charge. At the beginning of chapter 2, there is a "Modern Periodic Table" in which the titanium group, for example, is designated IVA, and not 4, which is even more modern. A casual glance shows the use of the formalism μ^n for a bridging indicator and not the IUPAC recommended μ_n . Why are non-SI units tolerated in what is intended to be a text book? I checked the two index references to one of my favourite subjects, nitrogenase. One referred to biological nitrogen fixation by plants, which does not, as far as I know, occur, and the other directed me to a page of chapter references. Why do the authors use the term "coordinated ligand"? To be fair, infelicities of this kind do not occur throughout, but I approach the rest of the book with some apprehension! A text book should be as far as possible without inconsistencies. And finally, why use such a quixotic title? Is not TiCl_4 molecular? Is there not a reasonable chance that $\text{Na}_2[\text{Co}(\text{CO})_4]$ is ionic? Surely a more accurate and descriptive title could have been found? There is much of value in this book, but I recommend that any potential buyers check first that the book meets adequately the demands that their teaching will place upon it.

G.J. Leigh

*School of Chemistry, Physics
and Environmental Science
University of Sussex, Brighton BN1 9QJ
UK*

PII S0022-328X(97)00356-2

Topics in Current Chemistry Volume 179 Organolanthanoid Chemistry: Synthesis, Structure, Catalysis. Springer, Berlin etc., 1996. pages x + 285. DM 215.00. ISBN 3-540-61009-X.

The volume contains the following five articles covering the literature to mid-1995.

Features of Organolanthanide Complexes

R. Anwander and W.A. Herrmann

This first article provides an excellent introduction to the general properties and chemical behaviour of the lanthanide elements. Topics discussed include ionic radii, Lewis acidity, bond disruption enthalpies, the preparation of anhydrous starting materials, ligand design, molecular structure and bonding. Three tables of some fifty review articles are provided along with over two hundred references.

Lanthanide Amides

R. Anwander

Some 300 references are cited in the second article which concentrates on lanthanide-N bonded derivatives. In addition to alkyl, aryl and silyl substituted amide ligands, pyrrole, pyrazoyl, polypyrazolylborate and macrocyclic ligands such as phthalocyanine and porphyrin ligands are also discussed. Both the synthesis and structural properties of these complexes are presented. While the six sections covering these ligands are excellent the seventh which deals with their applications is less well researched.

Rare Earth Complexes with Heteroallylic Ligands

F.T. Edelmann

As a possible alternative to the ubiquitous cyclopentadienyl based ligands the author presents a review of the use of bulky heteroallylic ligands. For the most part the N centered benzamidates are discussed though diiminosulfonates, diiminophosphinates, diphosphinomethanides and alkoxyisilylamides are also presented. This article concentrates on the synthesis and structural aspects of these systems are quite thoroughly researched.

Routes to Monomeric Lanthanide Alkoxides

R. Anwander

This article deals with synthetic routes to and structures associated with "monomeric, mononuclear, monolanthanide alkoxides, enolates, siloxides and aryloxides". The article includes reports on Ln(II), Ln(III) and Ce(IV) systems. Initially attention is given to Ln derivatives of the alkoxides derived from the tritox $\{\text{OC}(\text{CH}_3)_3\}$ and related ligand systems. In the case of the aryloxides, the author also includes Ln complexes of some of their fluorinated derivatives. Ligands containing pendant coordinating groups are also well covered.

The author deviates somewhat from the title by including heterobimetallic derivatives such as the "ate" complexes derived, for the most part, from the alkali-metal ligand precursors. Brief commentaries on Schiff base ligands and on mixed ligand systems (i.e. cyclopentadienyls) are included. Finally the article ends with an excellently reviewed section dealing with the applications of the "LnOR" systems previously described.

Lanthanide Metallocenes in Homogeneous Catalysis

F.T. Edelmann

The final article is a review of recent developments in the use of lanthanide metallocenes in homogeneous catalysis and reports on olefin transformations such as hydrogenation, polymerisation, hydroamination, and hydroboration; diene and alkyne transformations such as cyclization, hydrosilylation and polymerisation; and finally polyester formation and some miscellaneous hydrogenation and isomerisation catalysts.

In conclusion this book is highly recommended for any serious researcher in the area of lanthanide chemistry.

G.A. Lawless

*The Chemistry Laboratory
School of Chemistry, Physics
and Environmental Science
University of Sussex
Brighton BN1 9Q5
UK.*

PII S0022-328X(97)00301-X

Handbook of Palladium-Catalysed Organic Reactions, Jean-Luc Malleron, Jean-Claude Fiaud and Jean-Yves Legros. Academic Press, 1997, 304 pages. £50, ISBN 0-12-466615-9.

Palladium has a long and distinguished history in homogeneous catalysis. The complexes used are simple, largely air- and water-stable and readily available. The mechanisms are often well-understood and organic chemists have a good "feel" for what can be done. The problem is that there is so much literature that finding the right references quickly can be quite difficult.

This handbook organises reaction types into 84 classes (e.g. "Cross-coupling of terminal alkynes with RX derivatives", and "Substitution, addition and elimination of on π -allyl substrates"). Each of these 84 classes has a graphical abstract which aids enormously in finding the type of reaction one needs. The main body of the Handbook is taken up with an organisation of over 3000 reactions into the 84 classes. Of course, the population of each class varies enormously; "Cross-coupling of organometallics with RX deriva-

tives" has over 400 entries while, "Allylation of pronucleophiles with allylstannanes" has but one.

The Handbook is clearly laid out and is easy to use. Choose the reaction type, check out the mechanism, browse the entries and look up the references. There is also a CD-ROM, "Database of Palladium Chemistry: Reactions, Catalytic Cycles and Chemical Parameters on CD-Rom", (£545 + VAT) with which one can search for reagents, products, mechanism, author name, periodic structure, substructure, solvent, catalyst ligand and other parameters. See <http://www.hbuk.co.uk/ap/books/palladium> for details. I cannot tell you how the (PC-format only) CD performs because only a demonstration copy was provided.

At £50 the Handbook is a bargain. It is a shame that it is bound in spiral with a fragile cover since I imagine the Handbook being used in the lab environment. It is, after all, not the sort of book that one might take to bed of an evening. Then again, neither is the Yellow Pages.

Peter Scott

*School of Chemistry, Physics
and Environmental Science
University of Sussex,
Brighton, BN1 9QJ
UK*

PII S0022-328X(97)00235-0

Synthetic Methods of Organometallic and Inorganic Chemistry (Herrmann/Brauer) Vol 6, F.T. Edelmann (ed.), Thieme, Stuttgart, 1997, x + 226 pages, DM124. ISBN 3 13-103071-2.

This is the sixth in a new series of eight volumes on *Synthetic Methods of Organometallic and Inorganic Chemistry* edited by W. Herrmann and intended as a successor to the *Handbuch der Präparativen Anorganischen Chemie* which inorganic chemists know simply as *Brauer*. The scope has been expanded to take account of the considerable growth of organometallic chemistry since the earlier volumes of Brauer were published. As organometallic, alkoxy, amido and coordination compounds are almost always synthesised from simple inorganic precursors such as halides or oxides it is appropriate that the syntheses of all these classes of compounds of a particular group of elements are brought together in a single volume.

The book has been edited by F.T. Edelmann and P. Poremba. Besides the sections they have written themselves there are extensive contributions from a wide range of experts who have been responsible for the development of the inorganic and organometallic chemistry of the *f*-block elements. The four chapters cover