

Book Review

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Organometallic chemistry – volume 29

The Royal Society of Chemistry,
Cambridge, 2001 xx +520 pp. Price £219
ISBN 0-85404-328-4

This annual review of the literature in the field of organometallic chemistry covers work published in 1999. It consists of 14 chapters with a total of 21 contributors. The increasing importance of metal complexes in organic synthesis, which flourished during this period, is illustrated by Schrock's chiral molybdenum metathesis catalyst on the front cover.

These specialist periodical reports deserve a place in every university library and organometallic research laboratory. They allow easy access to an overview of the field and will be vital to researchers starting out in a particular sub-area, e.g. group 5 metal complexes, especially as the current edition of *Comprehensive Organometallic Chemistry* (1994) is gradually becoming outdated. The authors' repeatedly state that this review is not meant to be comprehensive; however, it is very thorough and well written.

Chapter 1 on 'Theoretical Organometallic Chemistry' deals with studies on systems containing at least one metal–carbon bond, including structural, spectroscopic and mechanistic studies. The use of computers to gain a better under-

standing of new processes is well illustrated with studies on the Brookhart-Gibson iron polymerization catalyst, which was one of the highlights of transition metal chemistry in the previous year. The alkali and coinage metals are covered in Chapter 2. It is noteworthy that mixed metal systems such as lanthanide 'ate' derivatives are included here and could be overlooked by d- and f-block chemists. It is clear from Chapter 3 that a wide range of interesting chemistry relating to groups 2 and 12 metals was reported in 1999. This includes a range of magnesium- and zinc-mediated organic reactions, in addition to novel zinc cyclophosphazene species, where the highly charged anions are isoelectronic with metasilicates. Results from scandium, yttrium and the lanthanides are discussed in Chapter 4, including some computational studies. This is followed by a short chapter on carboranes and their metal complexes. Many specialized reviews appeared in this area in 1999, which the reporter refers readers to. Organometallic aspects of p-block elements are covered in Chapters 6 and 7. The highlights in this area include the catalytic formation of B–C bonds from unactivated hydrocarbons and boranes, and palladium-catalysed cross-coupling reactions of phospha-alkenes. Further reactions of interest to organic chemists are covered in Chapter 8, 'Organic Aspects of Orga-

nometallic Chemistry'. A significant development here was the functionalization of unactivated aryl chlorides and the expansion of alkene metathesis to include new substrates and new types of catalyst. The long established field of metal carbonyl chemistry provides a particularly well-written Chapter 9. This area continues to yield new results in a variety of sub-disciplines, including metallopharmaceuticals and green chemistry. Chapter 10 covers the early d-block elements and is subdivided into groups 4–7; the development of new non-cyclopentadienyl ligands for the transition metals is an emerging trend in this area of research. Late transition metal derivatives are presented in Chapter 12, including much exciting chemistry from the platinum group metals. New types of organotransition metal cluster are reported in Chapter 11, including heterometallic species and the expanding field of dendrimers. π -Complexes of the transition metals are described in Chapters 13 (non-cyclopentadienyl and arene species) and 14 (cyclopentadienyl derivatives). An author index is a valuable culmination to the book.

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[DOI:10.1002/aoc.373]