

Book Review

***Topics in Organometallic Chemistry, Vol. 2, Lanthanides: Chemistry and Use in Organic Synthesis*, Edited by S. Kobayashi, Springer-Verlag, Berlin, 1999, 307 pp., ISBN 3-540-64526-8; DM179, £69, US\$119.**

This book is the second volume of a new series started this year entitled *Topics in Organometallic Chemistry*. Its aim is an overview of recent advances in the chemistry of lanthanides including the lighter Group 3 elements and their use in organic synthesis. This includes truly organometallic chemistry as well as the use of lanthanides as Lewis acids or reducing agents in organic transformations, which may not involve metal-carbon bonds. The focus is clearly on organic synthesis, which excludes more analytical applications such as shift reagents.

In the first and longest chapter, Anwender summarises today's knowledge of the organometallic chemistry of lanthanides. The emphasis is on the basic aspects relevant to an organic chemist who wants to use and understand lanthanide reagents. After a short discussion of the properties of different lanthanides, a comprehensive description of various methods for the synthesis of the important starting materials and reagents is given, followed by a survey of their reactivity patterns. All of this is supported by a list of more than 300, mostly very recent, references.

The following three chapters give current reviews of the three major areas of application of lanthanides in organic synthesis: Lewis acid-catalysed reactions using lanthanide triflates (Kobayashi); metallocene catalysis

(Molander, Dowdy); and SmI₂-mediated reactions (Kagan, Namy). The topics are covered with many examples in a well-illustrated form that makes it easy to browse through various applications. Again more than 300 mostly recent references are given.

The last four chapters are, to a large extent, reviews of the particular author's own work on more specialised subjects: chiral heterobimetallic lanthanide catalysts (Shibasaki, Gröger); lanthanide ketyl radical anion and dianion complexes (Hou, Wakatsuki); catalysis of olefin polymerisation (Yasuda); and the use of polymer-supported Lewis acid catalysts (Kobayashi). The chapter on polymerisation, had it been included in a book on organic synthesis, could have been more comprehensive and up-to-date.

I can recommend this book for everybody intending to use lanthanide compounds in organic synthesis as it combines the current knowledge of organometallic chemistry of lanthanide complexes with an exposition of the potential for reactions offered by these compounds. Like volume 1 of this series, I feel the book would have benefited from the inclusion of a final index.

R.D. Köhn
Department of Chemistry,
University of Bath,
Claverton Down,
Bath BA2 7AY,
UK