

Book Review

Application of Organometallic Compounds, I. Omae, John Wiley, Chichester, 1999, pp. 518, hardcover. ISBN 0-471-97604-0; GB£ 85

This book is intended to be an introduction to organometallic chemistry for research chemists in organic, natural product and pharmaceutical synthetic chemistry. It is, in fact, a compilation of reviews of the organometallic chemistry of nine representative Main Group elements and 11 transition metals, published by the author in the Japanese journal *Kagaku Kogyo* (Chemical Industry) from September 1990 to March 1996. Some of these reviews have since been updated.

The book begins with two short chapters: the first defines organometallic compounds and discusses their general properties, and the second is a history of organometallic chemistry, from the discovery of cacodyl by Cadet in 1760 to the discovery of fullerene in 1985 by Kroto. The following nine chapters deal with the selected Main Group elements, lithium, magnesium, zinc, boron, aluminum, silicon, germanium, tin and lead, in that order. All these chapters are organized in the same manner. After a short introduction, they describe successively the element (natural abundance, the ores and the purification procedures), the main synthetic methods for the preparation of its organometallic derivatives, the structures of these compounds and, finally, their reactivity and applications to organic synthesis.

There follow eleven chapters devoted to the same kind of treatment of the transition metals titanium, chromium, manganese, iron, ruthenium, cobalt, rhodium, nickel, palladium, platinum and copper.

This book is written in a purely descriptive style, and some basic principles, such as the 16- and 18-electron rules for transition metal complexes, are not presented. Generally it, suffers badly from poor English, which makes it difficult to read and mars the style of presentation to which the author aspires. There are also too many typographical errors and further mistakes in many of the schemes. These could easily have been avoided.

I was also surprised to read that ferrocene is paramagnetic (p. 16), that BMe_3 is an electron-donating group (p. 36), and the statements that several 16-electron com-

plexes of rhodium (pp. 392, 393) are 17-electron compounds. Such errors promote a feeling of distrust about the whole book.

As most chapters were written before 1996, the bibliography of each chapter is generally complete only to 1995. In several cases the most recent references are to reviews that appeared in Japanese journals and these are not readily accessible to non-Japanese readers. The references to *Comprehensive Organometallic Chemistry* are limited to the first edition.

This book is intended to be an introduction to organometallic chemistry for those interested in the application of organometallic compounds to organic synthesis. It is to be regretted that applications to asymmetric synthesis (either catalytic or not) are only briefly mentioned. There is also no mention in the ruthenium chapter of the highly active metathesis catalyst of Grubbs, discovered seven years ago, for which there has been an explosion of applications in organic synthesis. Among the less recent important applications of organometallic complexes to organic synthesis, there is no mention in the chapter on iron of the Collman reagent, and the possible applications of Fischer carbene complexes to organic synthesis are mentioned without literature citations. The discussion of cross-coupling reactions catalysed by palladium is limited to the Heck reaction, and *inter alia*, there is no mention of the Stille coupling reaction, either in the palladium or the tin chapters.

To conclude, despite the claim on its back cover, this book cannot be considered to be an 'in-depth survey of all recent developments in organometallic chemistry'. It may have some value for non-specialists requiring a rapid general overview of the organometallic chemistry of Main Group elements and of transition metals, but its price is probably excessive for such a restricted purpose.

René Mathieu
Laboratoire de Chimie de Coordination,
205 route de Narbonne,
F-31077 Toulouse Cedex 04,
France
E-mail: mathieu@lcc-toulouse.fr