Organic Synthesis using Transition Metals, Postgraduate Chemistry Series, Volume 4. Edited by R. Bates. Publisher Sheffield Academic Press: Sheffield, **2001**, 190 pp, £ 39.00, hardback. ISBN 1-84127-107-1.

The aim of the Postgraduate Chemistry Series published by Sheffield Academic Press is to provide a broad understanding of selected growth areas of chemistry at the postgraduate student and research level. One such growth area is the use of transition metal reagents and catalysts in organic synthesis. A tremendous range of new methodologies using transition metals has been developed over the last two decades and these methodologies have become increasingly important in the synthesis of complex molecules. Rod Bates, in his book *Organic Synthesis using Transition Metals*, provides an overview of this exciting area. As he notes in his introduction the size of the book (190 pages) prohibits any attempt at being comprehensive and the focus throughout the book is on the bond-forming reactions that set transition metal chemistry apart from 'classical' organic chemistry.

The book consists of ten chapters, with the references to the original literature and important reviews placed at the end of each chapter. The introduction is brief, informing the reader of the aim and scope of the book, and highlighting some of the major texts available for further reading. The remaining part of the introduction provides a short summary of the basic topics of organometallic chemistry. The second chapter, entitled 'Coupling Reactions', provides an excellent overview of the reactions of organometallic reagents with organic halides, in the presence of either a palladium or nickel catalyst. The bulk of this chapter deals with the different main group organometallic reagents that can be used in cross-coupling reactions, with the advantages and disadvantages of each type of reagent being examined. The author must be commended for his inclusion of a section on choosing the right coupling reaction, as this is often a major stumbling block when planning a synthesis. In the chapters 'Carbonylation' and 'Alkene and Alkyne Insertion Reactions', a broad range of transition metal chemistry is covered, with both catalytic and stoichiometric methods being examined.

In the chapters entitled 'Electrophilic Alkene Complexes' and 'Reactions of Alkyne Complexes' the emphasis is on the effect that complexation of a transition metal to a functional group has on the chemistry of that functional group. Thus, Chapter 5 details how coordination of an alkene to a metal in a high oxidation state results in the formation of electrophilic alkene complexes, whose further chemistry can be exploited, while in Chapter 6, the fascinating chemistry of alkyne cobalt complexes is examined. The next three chapters deal with 'Carbene Complex Chemistry', '(-Allyl Complexes' and 'Diene, Dienyl and Arene Complexes' – the range of chemistry in each of these fields is impressive and Bates does an excellent job of providing an overview of the important chemistry in each of these chapters. The final chapter focuses on the cycloisomerization and formal cycloaddition reactions that can be carried out using transition metals, effectively illustrating how transition metals can be used to develop new C-C bond forming reactions that allow for the ready generation of complex carbocycles.

As with all of the books in this series, the presentation of the text and structural diagrams is excellent. There are relatively few errors, although the following diagrams do contain structural errors (Scheme 4.5, middle figure on p 87, Scheme 6.6, Scheme 7.43, Scheme 8.2, Scheme 9.13).

Overall, *Organic Synthesis using Transition Metals* is a well-written book, that does an excellent job of providing a broad introduction to the field. The breadth of topics, and the examples used to illustrate them, help to show the importance of transition metals in organic synthesis.

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