

Journal of Organometallic Chemistry, 426 (1992) C49–C51
Elsevier Sequoia S.A., Lausanne

Book reviews

Organic Synthesis via Organometallics, K.H. Dotz and R.W. Hoffmann (Eds.), Vieweg, Braunschweig, 1991, pp. 323. DM 92. ISBN 3-528-08947-4

A wide variety of novel synthetic carbon–carbon bond forming reactions using organometallic reagents have been developed over the past twenty-five years. The ‘Volkswagen-Stiftung’ has been active in supporting research in this area and this has resulted in symposia which were held in Hamburg (1986), Würzburg (1988) and Marburg (1990). This book is the proceedings of the symposium held in Marburg, and it contains seventeen chapters that present recent developments in transition metal mediated synthesis. The topics include polymer synthesis through organometallic intermediates, enantioselective telomerization of 1,3-dienes, the synthesis and application of chiral ansa-metallocene derivatives, and the use of pentacarbonyl(benzylidene) complexes of chromium and tungsten as convenient C₁ carbene sources for cyclopropanation. There are chapters on the use of organo-iron complexes in aromatic synthesis particularly by activation of the aromatic ring in an ‘umpolung’ sense, and on the activation of CO₂, and the use of metallacyclic carboxylates for introducing this fragment into organic molecules, as, for example, in pyrone synthesis. The role of charge-transfer activation for organometallic reactions is discussed in a further chapter. Natural products, particularly those with useful pharmacological properties, make suitable targets for the application of new synthetic strategies and this is explored in a chapter on the application of iron-diene complexes to alkaloid synthesis. The application of iron complexes in carbonylation reactions involving ring expansion is described. Some new reactions of rhenium heterobimetallic complexes and the preparation of cobalt complexes from substituted cyclopentadienes are also reported.

Enantioselective synthesis using metal complexes is a very important area of study and this is reflected by the remaining chapters of the book. These describe the use of optically-active bipyridine complexes of nickel as chiral catalysts, the use of chiral molybdenum(VI)(oxo-diperoxo)dialkylactamides in the synthesis of chiral epoxides and of configurationally stable enantiomerically enriched α -lithio-carbamates in synthesis. Chiral titanium complexes continue to play a role in chiral synthesis and some applications of a novel class of cyclopentadienyldialkoxy-chlorotitanates based on carbohydrates, are described. The final chapter describes the use of chiral auxiliaries based on β -dialkylaminoalcohols, to create optically-active alcohols through the addition of organometallic reagents to carbonyl compounds.

This is a useful series of chapters which present an overview of recent developments and applications of a range of organometallic reagents in organic synthesis. It is well-presented and each chapter is accompanied by a set of references to the original literature.

School of Chemistry and Molecular Sciences
University of Sussex, Brighton BN1 9QJ (UK)

J.R. Hanson