Edited by Paul Knochel

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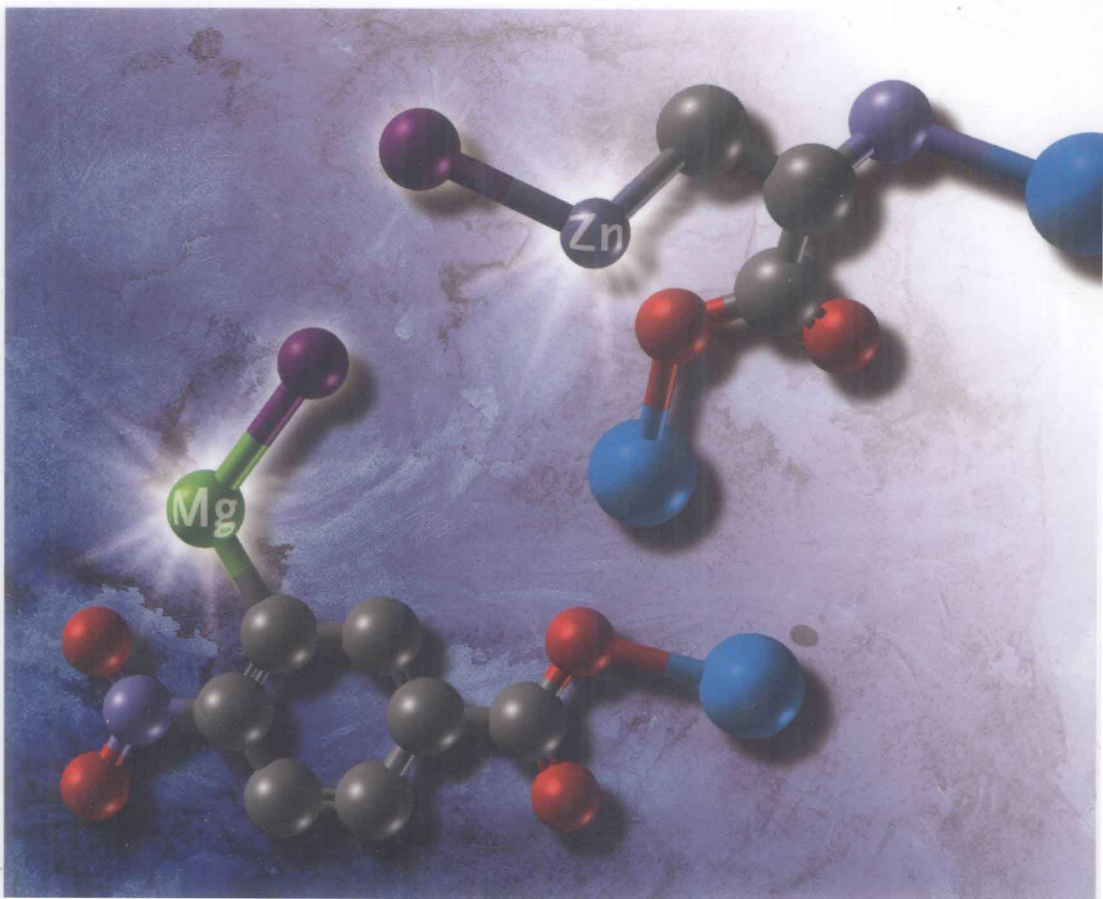
Handbook of Functionalized Organometallics

Applications in Synthesis

Volume 1



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Preface

Since the pioneering work of Frankland and Wurtz, organometallic intermediates have occupied a central position in organic synthesis. The chemical behavior of organometallic reagents depends greatly on the nature of the metal and on the carbon hybridization. Each metal has intrinsic chemical properties, which confer a specific reactivity for forming new carbon-carbon bonds to the organic moiety attached to it. The nature of the metal substituents (ligands) enables a modulation and adjustment to this reactivity of the organometallic to the organic substrate. Choosing the correct metal and ligand sphere to achieve any given transformation represents a major task for the synthetic chemist. During the course of the last thirty years, chemists have realized that this fine-tuning of the reactivity of organometallics has a number of synthetic advantages (selectivity, yields, reaction conditions, etc.). However, they have also noticed that a broad range of functionalities can be present in the organometallic intermediate itself and therefore these reagents allow for the preparation of polyfunctional molecules without the need for multiple protection and deprotection steps.

This book summarizes the synthetic knowledge available as of 2005 for preparing functionalized organometallics and the optimum conditions for their reacting with electrophilic species. It also covers main group and transition organometallics while outlining in detail the functional group compatibility for each class of organometallics in the various book chapters.

Organometallic chemistry is a field of chemistry that is constantly experiencing discoveries and is one of the motors of chemistry. Thus it can be expected that numerous new synthetic methods based on the use of functionalized organometallics will be added to the chemistry presented in this book within the next few years. An effort has been made to present the material in an attractive layout with many equations and numerous practical details, allowing for rapidly entry in the field. Therefore, this book is well suited for master and PhD students, for advanced undergraduate students, as well as industrial process and research chemists.

Munich, August 2005 *Paul Knochel*

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