New Pathways for Organic Synthesis

Practical Applications of Transition Metals

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Foreword

The continually growing contribution of transition metal chemistry to synthetic organic chemistry is, of course, widely recognized. Equally well-known is the difficulty in keeping up-to-date with the multifarious reactions and procedures that seem to be spawned at an ever-increasing rate. These can certainly be summarized on the basis of reviews under the headings of the individual transition metals. More useful to the bench organic chemist, however, would be the opposite type of concordance based on the structural type of the desired synthetic product. This is the approach taken in the present monograph, which presents for each structural entity a conspectus of the transition metal-mediated processes that can be employed in its production. The resulting comparative survey should be a great help in devising the optimum synthetic approach for a particular goal. It is presented from an essentially practical viewpoint, with detailed directions interspersed in the Houben–Weyl style. The wide scope of the volume should certainly encourage synthetic organic chemists to utilize fully the range and versatility of these transition metal-mediated processes. This will certainly be a well-thumbed reference book!

Cambridge University

R. A. RAPHAEL

Preface

In recent years an enormous amount of work has been done on the catalysis of organic reactions by various transition metal species and on the organic reactivity of organo-transition-metal compounds. Many new, facile, and potentially useful pathways to organic products have been discovered and it is unfortunate that, because the majority of this work has been carried out in “inorganic” laboratories, many practicing organic chemists are probably unaware of these developments.

The objective of the present book is to help remedy this situation by providing those engaged in the preparation of pharmaceuticals, natural products, herbicides, dyestuffs, and other organic chemicals, with a practical guide to the application of transition metals in organic synthesis. Here we have collected a considerable number of transition-metal-based procedures that have genuine applications in synthesis, arranged according to the nature of the organic product or synthetic transformation being carried out. Many illustrative examples of actual practical procedures are given, though extensive reference to the original literature is also provided if more detailed information is required.

The procedures described are often straightforward and generally require only commercially available or readily prepared inorganic materials. However details for the preparation of catalysts are not always easily accessible, being widely scattered in the primary literature, and a short chapter is therefore devoted to the preparation and handling of transition metal catalysts.

The reaction pathways offered by transition metal reagents and catalysts have much to offer in organic synthesis and it is the hope of the present authors that this book will help to encourage their wider routine application.

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