

Ferrocenes: Ligands, Materials and Biomolecules

Editor

PETR ŠTĚPNIČKA

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John Wiley & Sons, Ltd

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Preface

Ferrocene, the first known and archetypal metallocene, stirred up a great deal of attention immediately after its discovery in the early 1950s.^{1,2} However, after the vigorous era of pioneering research aimed predominantly at understanding its basic properties and reactivity had subsided, research activity did not cease in the slightest. Instead, it spread further into many fields of chemistry and also to related neighbouring disciplines, where it continues with still increasing publication activity (Figure 1).

Nowadays, ferrocene is no longer considered a chemical curiosity, but serves as a widely applicable organometallic scaffold for the preparation of functional derivatives that are finding use in very many areas. These range from mostly academic research aimed at exploring its use in the preparation of various organometallic compounds, to practically directed applications in catalysis, material science and, more recently, also in biomedicinal chemistry.

About twelve years have already passed since the legendary book *Ferrocenes* edited by A. Togni and T. Hayashi was published.³ This, together with the recent developments, certainly justifies publication of a new guide to ferrocene chemistry. Although the areas originally highlighted in the subtitle of the book (Homogeneous Catalysis, Organic Synthesis, Materials Science) still represent the major research fields in ferrocene chemistry, there have emerged some additional, rapidly developing areas with a strong practical relevance, such as organometallic crystal engineering and, above all, bioorganometallic chemistry, which are also included in this book. Consequently, the book is formally divided into parts, dealing with ferrocene ligands, material aspects of ferrocene chemistry and, finally, with bioorganometallic chemistry involving ferrocene compounds. However, in view of the amount of literature concerning ferrocene and its derivatives, particularly in the popular areas, this book can no longer provide any kind of an exhaustive literature survey. Therefore, it is conceived for the most part as a combination of the necessary introductory information and a summary of important recent results published up to about the end of the year 2006. For readers seeking

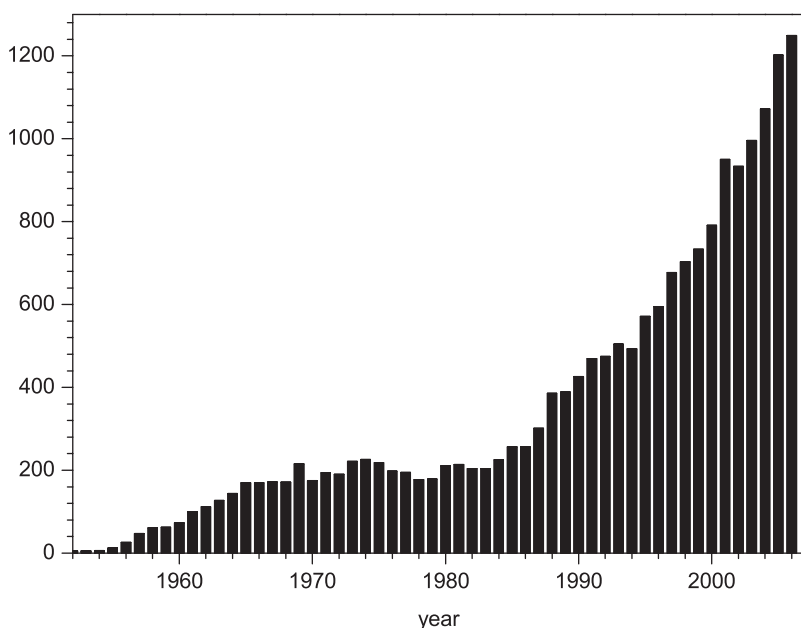


Figure 1 The number of research articles published per year on 'ferrocene' according to CAS

more exhaustive literatures sources, references to literature reviews focusing on particular research areas have been included where appropriate. The book should not only provide a timely summary of important findings in each particular field covered but should also be of help for newcomers (or even random visitors) to ferrocene chemistry who simply make use of some property of a ferrocene derivative. I believe that this book may also serve as a starting point for those who want to become really 'involved' with ferrocene.

Finally, I wish to thank all the authors for the preparation of their individual contributions that really *make* this book. Their work, which often nearly turned to a Herculean task because of the enormous amount of recent literature, was always reliable and accurate. My sincere thanks go also to Paul Deards, a commissioning editor at Wiley in Chichester, and his whole editorial team for their encouragement in the initial stages, continuing support during the manuscript preparation and smooth guidance through the entire production process. I hope that the readers will enjoy reading this book and find it useful in their own work.

Petr Štěpnička
Prague, summer 2007

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- 2 For historical essays, see: G. Wilkinson, *J. Organomet. Chem.*, 1975, **100**, 273–278; and historical notes published in the special issue of *J. Organomet. Chem.* dedicated to the 50th anniversary of the discovery of ferrocene, *J. Organomet. Chem.*, 2001, **637–639**.
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Note

Since the use of abbreviated symbols for ferrocene and ferrocenyl groups is somewhat confusing in the literature, in this book the ferrocenyl group $[\text{Fe}(\eta^5\text{-C}_5\text{H}_4)(\eta^5\text{-C}_5\text{H}_5)]$ is denoted as Fc and the ferrocene-1,1'-diyl group $[\text{Fe}(\eta^5\text{-C}_5\text{H}_4)_2]$ as fc. By using these abbreviations, ferrocene $[\text{Fe}(\eta^5\text{-C}_5\text{H}_5)_2]$ can be formulated either as FcH or fcH₂. Definitions of the frequently or chapter-specific abbreviations are provided in the individual parts.

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PART I

Ferrocene Ligands