

Gmelin handbook of inorganic chemistry, 8th edition, Fe — Organoiron Compounds, Part A8: Ferrocene 8, Springer-Verlag, Berlin, Heidelberg, New York, Tokyo, 1986, xii + 410 pages, DM 1488. ISBN 3-540-93530-4.

It is six years since Part A7 (which was in German) of this series of volumes dealing with the chemistry of ferrocene and its derivatives appeared. Part A7 initiated a detailed survey of unbridged disubstituted ferrocene derivatives $[\text{FeC}_{10}\text{H}_8\text{R}^1\text{R}^2]$, in which either (or both) R^1 and R^2 are organic functionalities containing oxygen, and described derivatives of alcohols and phenols (their esters, ethers and ketones) and aldehydes. The volume under review, Part A8, continues and concludes this coverage by considering the ketone and carboxylic acid derivatives (including their salts, esters and acid chlorides), as well as heterocyclic derivatives with oxygen as the heteroatom.

In particular, this volume describes $[\text{Fe}\{\eta^5\text{-C}_5\text{H}_4\text{C}(\text{O})\text{Me}\}_2]$ (a total of 52 pages!), $[\text{Fe}\{\eta^5\text{-C}_5\text{H}_4\text{C}(\text{O})\text{Ph}\}_2]$ (10 pages), $[\text{Fe}\{\eta^5\text{-C}_5\text{H}_4\text{C}(\text{O})\text{R}\}_2]$, $[\text{Fe}\{\eta^5\text{-C}_5\text{H}_4\text{-C}(\text{O})\text{R}\}\{\eta^5\text{-C}_5\text{H}_4\text{C}(\text{O})\text{R}'\}]$, $[\text{Fe}\{\eta^5\text{-C}_5\text{H}_4\text{C}(\text{O})\text{R}\}\{\eta^5\text{-C}_5\text{H}_4\text{R}'\}]$, $[\text{Fe}\{\eta^5\text{-C}_5\text{H}_4\text{RC}(\text{O})\text{R}'\}\{\eta^5\text{-C}_5\text{H}_4\text{R}''\}]$, $[\text{Fe}(\eta^5\text{-C}_5\text{H}_5)(\eta^5\text{-C}_5\text{H}_3\{\text{C}(\text{O})\text{R}\}_2)]$ (both the 1,2- and 1,3-isomers) and related complexes, $[\text{Fe}\{\eta^5\text{-C}_5\text{H}_4\text{C}(\text{O})\text{OH}\}_2]$, $[\text{Fe}\{\eta^5\text{-C}_5\text{H}_4\text{C}(\text{O})\text{OH}\}\{\eta^5\text{-C}_5\text{H}_4\text{R}\}]$, $[\text{Fe}\{\eta^5\text{-C}_5\text{H}_4\text{RC}(\text{O})\text{OH}\}\{\eta^5\text{-C}_5\text{H}_4\text{R}'\}]$, $[\text{Fe}(\eta^5\text{-C}_5\text{H}_5)(\eta^5\text{-C}_5\text{H}_3\{\text{C}(\text{O})\text{OH}\}_2)]$, $[\text{Fe}(\eta^5\text{-C}_5\text{H}_5)(\eta^5\text{-C}_5\text{H}_3(\text{R})\{\text{C}(\text{O})\text{OH}\})]$ (both the 1,2- and 1,3-isomers), the ester and acid chloride derivatives of these acids, and finally heterocyclic derivatives with oxygen as the heteroatom {e.g. 2-furyl derivatives such as $[\text{Fe}\{\eta^5\text{-C}_5\text{H}_4\text{C}(\text{O})\text{CH}=\text{CHC}_4\text{H}_3\text{O}\}_2]$). These complexes are described with the care and attention to detail expected from this series, and so extensive details of synthetic procedures, purification, spectroscopic properties, electrochemical response, chemical reactivity and catalytic activity are given (where available). This makes this volume (taken with earlier volumes, Parts A1–A7) an invaluable and encyclopaedic source book to which no worker in the intensely active field(s) of ferrocene chemistry can afford not to have access. Its value is tremendously enhanced by the inclusion of a 33 page formula index (compiled by E. Rudolph) to the combined contents of Parts A7 and A8.

As a note of caution, it must be observed that the volume is not totally comprehensive. There has been a good deal of fascinating research upon the modification of both metallic and semiconducting electrodes with both $[\text{Fe}\{\eta^5\text{-C}_5\text{H}_4\text{C}(\text{O})\text{OH}\}_2]$ and $[\text{Fe}\{\eta^5\text{-C}_5\text{H}_4\text{C}(\text{O})\text{Cl}\}_2]$, but this important area is only mentioned en passant. This criticism aside, however, the author (M. Drössmar-Wolf) has performed a remarkable task of data compilation (references up to and including 1984). Extensive and intelligent use of tables is made, and the type-set text is clearly and helpfully illustrated throughout. It is a must for all chemistry libraries.