

Gmelin handbook of inorganic chemistry, 8th edition, *Fe – Organoiron Compounds, Part B10: Mononuclear Compounds 10*, Springer-Verlag, Berlin, Heidelberg, New York, Tokyo, 1986, ix + 361 pages, DM 1354, ISBN 3-540-93523-1

This volume (Part B10) continues the treatment of mononuclear organoiron complexes of general type $[(\eta^4\text{-L})\text{Fe}(\text{CO})_3]$ which was developed in Part B9 (see preceding review). Thus, the first 42 pages describe complexes of trimethylene-methane and its derivatives, the following 133 pages detail σ -bonded ligands also bonded to the iron via an η^3 -linkage, and the section is concluded by a short account of ligands bonded to the iron by two discrete σ -bonds and a discrete η^2 -linkage.

The complexes which form the basis of the final 53 pages are less simply summarized. The penultimate section (8 pages) describes complexes with an $\{\text{Fe}(\eta^4\text{-L})(\eta^2\text{-L}')\}$, $\{\text{Fe}(\eta^4\text{-L})(\eta^3\text{-L}')\}$ or $\{\text{Fe}(\eta^4\text{-L})(\eta^2\text{-L}')_2\}$ nucleus, and includes complexes such as $[\text{Fe}(\eta^4\text{-L})(\eta^2\text{-L}')\{\text{P}(\text{OR})_3\}_2]$, $[\text{Fe}(\eta^4\text{-L})(\eta^2\text{-L}')(\text{CO})_2]$, $[\text{Fe}(\eta^4\text{-L})(\eta^3\text{-L}')(\text{CO})\text{Cl}]$ and $[\text{Fe}(\eta^4\text{-L})(\eta^2\text{-L}')_2(\text{CO})]$. The final section (45 pages) is devoted to complexes containing two " $\eta^4\text{L}$ " ligands (i.e. in Gmelin terms, two ligands each making four FeC bonds). This starts with a fascinating section on François Mathey's diphosphaferrocenes and their derivatives, and continues with a description of $[\text{Fe}(\text{butadiene})_2\text{L}]$ (L = two-electron donor, typically a phosphine ligand or CO) and its derivatives and related complexes (more generally, $[\text{Fe}(\eta^4\text{-L})(\eta^4\text{-L}')(\text{CO})]$). The section finishes with a brief description of $[\text{Fe}(\text{butadiene})_3]$, formulated as $[\text{Fe}(\eta^4\text{-C}_4\text{H}_6)_2(\eta^2\text{-C}_4\text{H}_6)]$. As in Part 9, the text (again by Adolf Slawisch), tables and illustrations are clear, well-conceived and eminently accessible, and details of synthesis, structure, reactivity, spectroscopic studies and other physical measurements are given.

In addition to the text described above, this volume contains two indices (compiled by E. Rudolph) to the compounds (ca. 2100) detailed in Parts B8, B9 and B10. The first is an empirical formula index (43 pages), the second (and probably more generally useful) is a ligand formula index (86 pages), subdivided according to the other ligands present. For example, $[\text{Fe}(\text{C}_4\text{Ph}_4)(\text{P}(\text{OMe})_3)\{(\text{NC})_2\text{C}=\text{C}(\text{CN})_2\}(\text{CO})]$ has an entry in the first index under $\text{C}_{38}\text{H}_{29}\text{FeN}_4\text{O}_4\text{P}$, as well as three entries in the ligand formula index, viz:

$\text{C}_3\text{H}_9\text{O}_3\text{P}$	C_6N_4	$\text{C}_{28}\text{H}_{20}$	CO
C_6N_4	$\text{C}_3\text{H}_9\text{O}_3\text{P}$	$\text{C}_{28}\text{H}_{20}$	CO
$\text{C}_{28}\text{H}_{20}$	$\text{C}_3\text{H}_9\text{O}_3\text{P}$	C_6N_4	CO

Thus, the Gmelin Institute have made accessing information upon even the most complex structures as easy as possible. It is this careful attention to the needs of the chemist which characterizes the Gmelin handbook and the presence of such detailed indexing adds enormously to the value of these volumes. As with the preceding volume, one can wholeheartedly recommend it to all scientific libraries, and encourage research groups in the area to buy their own copy.