

Table 1.1 Historic Landmarks in Organotransition Metal Chemistry

Year	Event	Reference
1827	Zeise's salt discovered, $K^+[(C_2H_4)PtCl_3]$ .	[29]
1868	Schutzenberger prepared the first carbonyl complex, $[PtCl_2(CO)_2]$ .	[30]
1890	Mond prepares $Ni(CO)_4$ .	[31]
1891	Mond and Berthelot prepare $Fe(CO)_5$ .	[32]
1919	Hein prepares ill characterized $\eta^6$ -arene chromium compounds.	[33]
1925	The Fischer-Tropsch process is developed.	[36]
1930	Reihlen prepares 1,3-butadiene-iron tricarbonyl.	[37]
1938	Roelen discovers the cobalt-catalyzed oxo-process.	[38]
1938	Calvin discovers homogeneous catalytic hydrogenation of quinone by copper acetate.	[21]
1938	Lucas and Winstein study silver-olefin complexes.	[39]
1939	Iguchi describes a rhodium-based homogeneous hydrogenation catalyst.	[41]
1938-1945	Reppe's group develops many homogeneously catalyzed processes.	[42]
1948	Reppe describes the catalytic cyclotrimerization of acetylene to cyclooctatetraene.	[43]
1951	Orgel, Pauling, and Zeiss describe the backbonding in metal carbonyls.	[44]
1951	Ferrocene is discovered by Kealy and Pauson and by Miller.	[45]
1952	Wilkinson, Rosenblum, Whiting, and Woodward propose a sandwich structure for ferrocene.	[46]
1952	E.O. Fischer describes the cobalticinium cation.	[47]

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1955	Cotton and Wilkinson discover fluxional behavior.	[49]
1955	Halpern begins to study the mechanism of homogeneous catalytic hydrogenation.	[50]
1955	Ziegler and Natta discover metal-catalyzed olefin polymerization.	[51]
1956	Longuet-Higgins and Orgel predict stable cyclobutadiene complexes.	[52]
1958	The structure of $[\text{CpMo}(\text{CO})_3]_2$ reveals a covalent metal-metal bond without bridging ligands.	[54]
1958	Criegee and Hubel prepare stable cyclobutadiene complexes.	[53]
1959	Shaw and Chatt describe an oxidative-addition reaction.	[56]
1961	Crowfoot-Hodgkin elucidates the structure of the coenzyme vitamin B <sub>12</sub> .	[58]
1962	Vaska discovers the "Vaska Complex."	[57]
1964	Fischer isolates the first carbene complex.	[59]
1964	Banks reports olefin metathesis.	[60]
1965	Allen and Senoff discover the first dinitrogen complex.	[61]
1965	Wilkinson and Coffey independently discover "the Wilkinson Hydrogenation Complex."	[62a,b]
1969	Whitesides develops a direct NMR method for discovering the stereochemistry at carbon of organometallic reactions.	
1971	Monsanto develops rhodium-catalyzed acetic acid process.	[63]
1973	E.O. Fischer prepares the first complex having a metal-carbon triple bond.	[65]
1974	Commercial synthesis of L-Dopa by asymmetric catalytic hydrogenation.	[1]
1975	DuPont's adiponitrile synthesis by catalytic addition of HCN to butadiene.	[70]
1978	Tebbe discovers "the Tebbe reagent."	[71]
1980	Brown [67] and Halpern [68] independently elucidate the mechanism of asymmetric catalytic olefin hydrogenation.	[67,68]
1981	Schrock discovers a homogeneous catalyst for acetylene metathesis.	[66]
1982	Bergman describes intermolecular oxidative-addition of saturated hydrocarbons.	[72a]
1983	Watson [73] and Graham [74] independently report the activation of methane by oxidative-addition.	[73,74]
1983	The concept of "agostic" structures is formulated by Brookhart and Green.	[74]
1983	Phosphines are reported to degrade during catalytic hydroformylation.	[76]