

Synthesis, spectroscopic and electrochemical study of cationic cyclopentadienyliron(Diphosphine) complexes supported on a high molecular weight phosphazene polymer through nitrile ligands

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The high molecular weight phosphazene random copolymer $\{[NP(OC_6H_5)_2]_{0.94} [NP(OC_6H_5)(OC_6H_4CNFe(dppe)Cp)]_{0.06}[PF_6]_{0.06}\}_n$ (1), that carries $[Fe(dppe)Cp]$ cationic fragments coordinated to nitrile side groups, has been synthesized from the copolymer $\{[NP(OC_6H_5)_2]_{0.94}[NP(OC_6H_5)(OC_6H_4CN)]_{0.06}\}_n$ and the complex $[Fe(CH_3CN)(dppe)Cp][PF_6]$ by the complete elimination of the acetonitrile from the equilibrium mixture that they form in dichloromethane solution. The new polymer has been fully characterized by a detailed discussion of the IR and NMR data that may be also useful for the study of other polymeric complexes with similar metal fragments. The cyclic voltammogram of (1) showed an oxidation process that is chemically irreversible but, rather unexpectedly, electrochemically reversible. All the results were interpreted by comparison with the data obtained for the new cyclic model complexes $\{N_3P_3(OC_6H_4-R)_5[OC_6H_4CNFe(dppe)Cp]\}[PF_6]$ R=H (2a), But (2b), (see chart 1) that were synthesized by