Synthesis and thermal decarbonylation of W(CO)5 complexes supported by nitrile, pyridine or phosphine ligands to poly-spirophosphazene random copolymers carrying O-C6H5-CO2Pr groups

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The phosphazene copolymers {[NP(O2C12H 8)]0.5[NP(O-C6H4-CO 2Prn)(O-C6H4-L)]0.5} n [L = CN (1), PPh2 (2)] and {[NP(O2C 12H8)]0.6[NP(O-C6H 4-CO2Prn)(O-C5H4N)] 0.4}n (3) have been synthesized by sequential substitution from [NPCl2]n. Their reactions with [W(MeOH)(CO) 5] gives the corresponding tungsten carbonyl complexes {[NP(O 2C12H8)]0.5[NP(O-C6H 4-CO2Prn)(O-C6H4-CN) (W(CO)5)0.4]0.5}n (4), {[NP(O 2C12H8)]0.5[NP(O-C6H 4-CO2Prn)(O-C6H4-PPh 2)(W(CO)5)0.7]0.5}n (5), {[NP(O2C12H8)]0.6[NP(O-C 6H4-CO2Prn)(O-C5H 4N-W(CO)5)]0.4}n (6a), and {[NP(O2C12H8)]0.6[NP(O-C 6H4-CO2Prn)(O-C5H 4N)(W(CO)5)0.4]0.4}n (6b), that have been fully characterized by IR and NMR spectroscopies. The thermal properties (TGA and DSC) of the polymeric complexes showed that they are high glass transition materials that undergo a complete decarbonylation below 300°C forming metal containing species that have a stabilizing effect on the polymeric matrices. The final residues up to 800°C are of the order of30-50%. © 2005 Else