

New Heterogenous α -Diimine Nickel (II)/ MWCNT Catalysts for Ethylene Polymerization

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Abstract : Homogeneous α -diimine nickel (II) catalyst complexes, with and without amino para-aryl position functionality, were synthesized. These complexes were immobilized on carboxyl, hydroxyl, and acyl chloride functionalized multi-walled carbon nanotubes to form five novel heterogeneous α -diiminonickel catalysts. Immobilization was performed by covalent or electrostatic bonding via methylaluminoxane (MAO) linker or amide linkage. Both the nature of α -diimine ligands and the kind of interaction between anchored catalyst complexes and multi-walled carbon nanotube surface influenced the catalytic performance, microstructure, and morphology of obtained polyethylenes. The catalyst prepared by amide bonding showed lowest relative weight loss in thermogravimetry analysis and highest activities up to 5863 gr PE mmol-1Ni.hr-1. This catalyst produced polyethylene with dense botryoidal morphology.

Keywords : α -diimine nickel (II) complexes, immobilization, multi-walled carbon nanotubes, ethylene polymerization

Conference Title : ICNMN 2015 : International Conference on Nanostructured Materials and Nanotechnology

Conference Location : Miami, United States

Conference Dates : March 09-10, 2015