

Effect of TiCl_4 hybridization with modified Ni(II)-diimine catalyst complex for the ethylene polymerization

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The researches of olefin polymerization catalysts have actively been in progress since the Ziegler-Natta catalyst was invented. Recently, late-transition-metal catalysts are used as the various copolymerization catalysts due to their low oxygen affinity. In general, Ni(II)-diimine catalysts can be easily modified with bulky ligands. Therefore, by modifying the ligand structure of the catalyst, the polymer with high molecular weight and various structures can be synthesized. In this work, we examined the effect of TiCl_4 hybridization with Ni(II)-diimine catalyst complex in the ethylene polymerization. The polymerization activity of the Ni(II)-diimine/ TiCl_4 hybrid catalyst was lower than that of the homogeneous the Ni(II)-diimine catalyst. In the DSC analysis, it was found that the melting point of the produced polyethylene with Ni(II)-diimine/ TiCl_4 hybrid catalyst was shifted to the higher temperature. And the molecular weight, PDIs were remarkably increased with hybrid catalysts. The bimodal distribution was clearly observed when Ti/Ni molar ratio was 5 and 10.