Polymerization of Norbornene over Novel Bis(acetylacetonate)palladium/Boron Trifluoride Etherate Catalyst System

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The norbornene addition polymer displays a characteristic rigid random coil conformation, shows restricted rotation about the main chain, and exhibits strong thermal stability, excellent dielectric properties, optical transparency and unusual transport properties. Therefore, norbornene addition polymer and its derivatives are attractive materials for the manufacture of microelectronic and optical devices. While some of the nickel and palladium complexes are themselves active polymerization catalysts towards norbornene and its derivatives, most of them have to be activated with methylalumoxane (MAO) cocatalysts. Another possibility to activate late-transition metal complexes is the organo-Lewis acid tris(pentafluorophenyl)borane, B(C6F5)3, with or without triethylaluminum (TEA).

In this work a simple inorganic Lewis acid-boron trifluoride etherate, BF3OEt2, was used as an activator towards bis(acetylacetonate)palladium precursor, Pd(Acac)2, in the polymerization of norbornene. The catalyst system Pd(Acac)2/BF3OEt2 was highly active in the polymerization of norbornene.