

Ring-opening Metathesis Polymerization of Tetracyclododecene

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Ring-opening metathesis polymerization (ROMP) has attracted great attention for years because of its unique polymerization mode. Here we achieved ring opening metathesis polymerization of various cyclic olefins (Norbornene, H₂D₂CPD and TCD) using WCl₆, TiCl₄ and Grubb's 1st generation catalysts. Here we chose WCl₆/(i-Bu)₃Al catalytic system for further investigation. The effect of ethanol, 1-hexene and the cocatalyst in polymerization and polymer properties were studied carefully. The prepared polymers structure were analysed by ¹H, ¹³C and two-dimensional NMR spectra. The polymer properties were determined by DSC, TGA and GPC. The polymers showed a higher T_g of >200 °C and a molecular weight of 1.9 x 10⁴ g/mol.