

Neodymium-based Catalysts $\text{NdCl}_3 \cdot 3\text{L}$ (L = triethyl phosphate (TEP) or tris(2-ethylhexyl) phosphate (TEHP) for ring opening polymerization of ϵ -Caprolactone

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Neodymium-based catalysts bearing phosphate ligands $\text{NdCl}_3 \cdot 3\text{L}$ (L = triethyl phosphate (TEP) or tris(2-ethylhexyl) phosphate (TEHP) were successfully synthesized. The ring opening polymerization (ROP) of ϵ -caprolactone (ϵ -CL) initiated with these catalysts in the presence of a series of alcohols were performed yielding polymers with the narrow polydispersity index (PDI = 1.22 to 1.55) and controllable molecular weight. An important result from the kinetic studies revealed that the sterically bulkier ligand TEHP, as compared to TEP ligand significantly increased the rate for ROP of ϵ -CL. Di-block copolymers poly(ϵ -CL)-block-poly(D,L-lactide) via sequential monomer addition were successfully synthesized demonstrating the living nature of the catalytic system.

Biography

Yixin Ren is a McNair scholar. He received his BS degree in Chemistry & Medicinal Chemistry from the University at Buffalo in 2012. He subsequently completed his M.S. degree in chemistry from the Illinois State University in 2014 under the supervision of Lisa F. Szczepura. He is currently working on his PhD in chemistry at the University of Texas at Dallas under supervision of Mihaela C. Stefan. His current research endeavors are focused on neodymium-based catalysts for polymerization of dienes and vinyl monomers and ring opening polymerization of cyclic esters.

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