

Synthesis of dimeric zinc complexes for use as ring opening polymerization catalysts

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In this project, new zinc complexes were synthesized to be used in the polymerization of ϵ -caprolactone (ϵ -CL) and L-lactide (LA). The complexes that were prepared contained electron-donating and electron-withdrawing substituents. The complexes were analyzed with ^1H NMR and broad peaks were observed which suggested a dynamic equilibrium for the complex. Variable temperature ^1H NMR spectra were collected and demonstrated that as the temperature decreased, the resonances became sharp and well resolved indicating decreasing fluxional character of the complexes. Single crystal x-ray crystallography elucidated the dimeric solid-state structures of the complexes through bridging ligands between zinc centers. A preliminary study of the zinc complexes showed that they are active ring-opening polymerization initiators for LA and ϵ -CL achieving percent conversions of 92% conversion to poly-lactic acid (PLA) and 42% for polycaprolactone (PCL). The isolated polymers were analyzed with gel permeation chromatography and found to have moderate molecular masses with low poly-dispersity index values.