

L-Lactide and  $\epsilon$ -caprolactone ring opening polymerization by binary catalysts systems that include *bis*-ligated magnesium complexes

Reile M. Slattery, Arnold L. Rheingold, Joseph M. Fritsch

A series of *bis*-ligated magnesium complexes supported by tridentate ketoiminates containing electron-donating and electron-withdrawing groups were prepared. The complexes were characterized with  $^1\text{H}$ ,  $^{13}\text{C}$ , and  $^{19}\text{F}$  NMR, absorbance spectroscopy, and x-ray crystallography. The complexes were assessed for their ring opening polymerization activity with L-lactide (L-lac) and  $\epsilon$ -caprolactone (eCL) in binary catalyst systems with 4-fluorophenol at 100 °C. The magnesium complexes supported by ketoiminates bearing electron-donating groups yielded greater percentage conversions from monomers to polymers than those containing electron-withdrawing groups for both L-lac and eCL. The magnesium complexes were more efficient at polymerizing L-lac than eCL, and di-block copolymers of PCL-PLA were produced by the sequential polymerization of eCL followed by L-lac.

**Key Words:** magnesium complexes, L-lactide,  $\epsilon$ -caprolactone, ring opening polymerization