

Supplementary Information

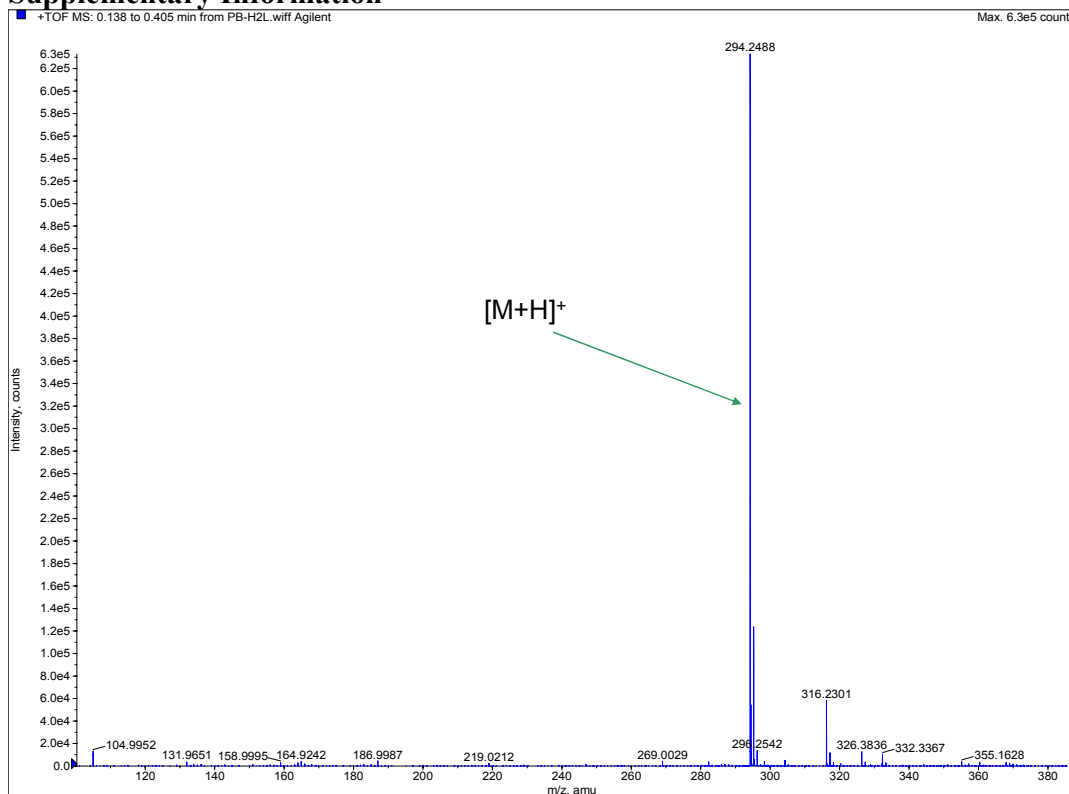


Figure S1: ESI- Mass spectrum of ligand H₂L^I indicating the molecular ion peak ([M+H]⁺)

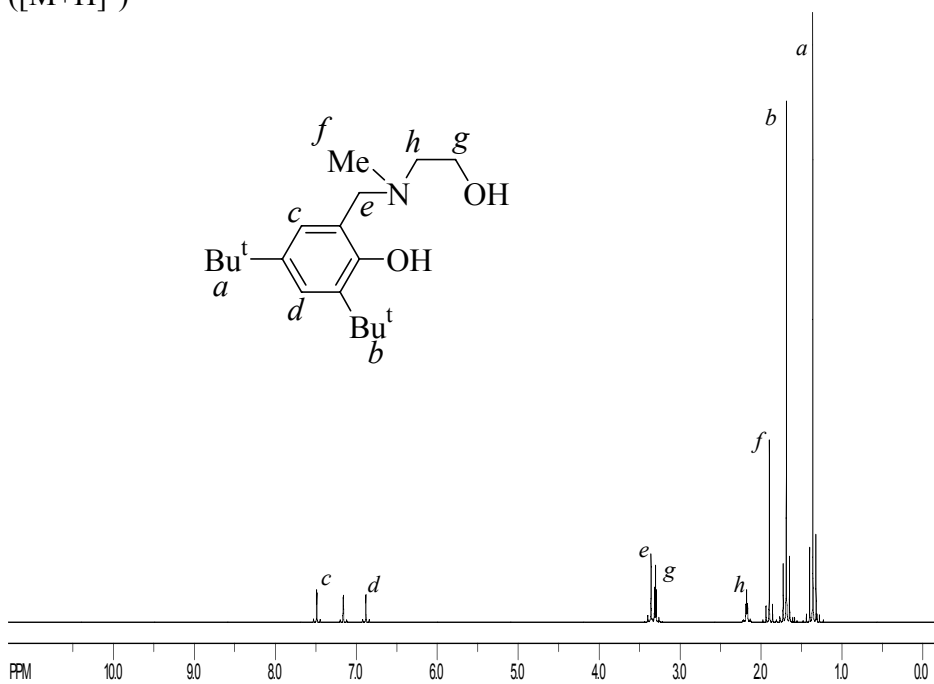


Figure S2: ¹H NMR spectrum of ligand H₂L^I in C₆D₆ at 25 °C

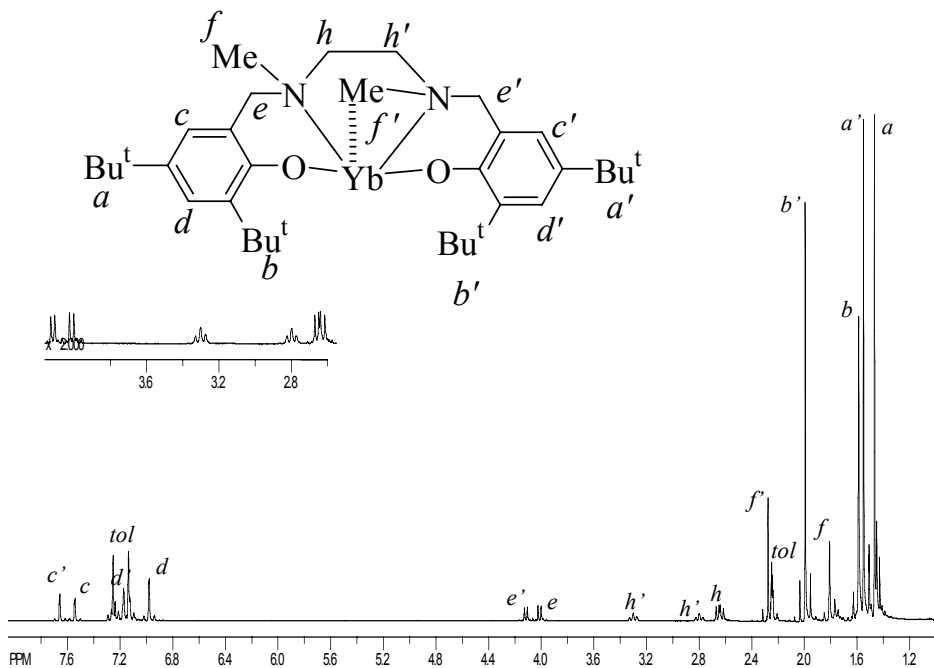


Figure S3: ^1H NMR spectrum of $[\text{Yb}(\text{L}^{\text{II}})]_2$ (**2**) in C_7D_8 at 25°C

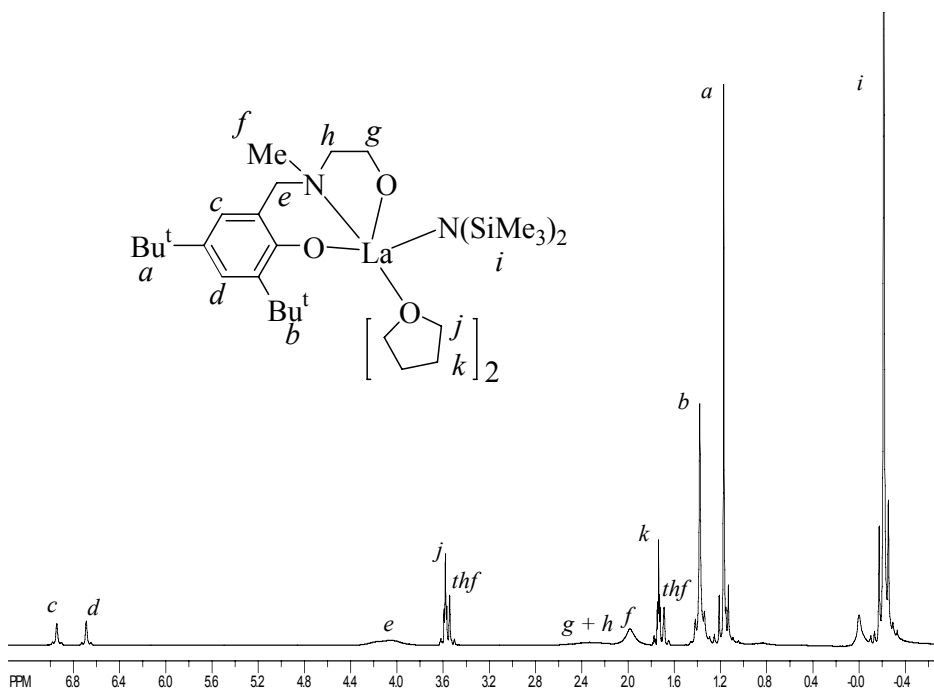


Figure S4: ^1H NMR spectrum of $[\text{La}(\text{L}^{\text{I}})(\text{N}(\text{SiMe}_3)_2)(\text{THF})_2]$ (**6**) in $\text{C}_4\text{D}_8\text{O}$ at 25°C

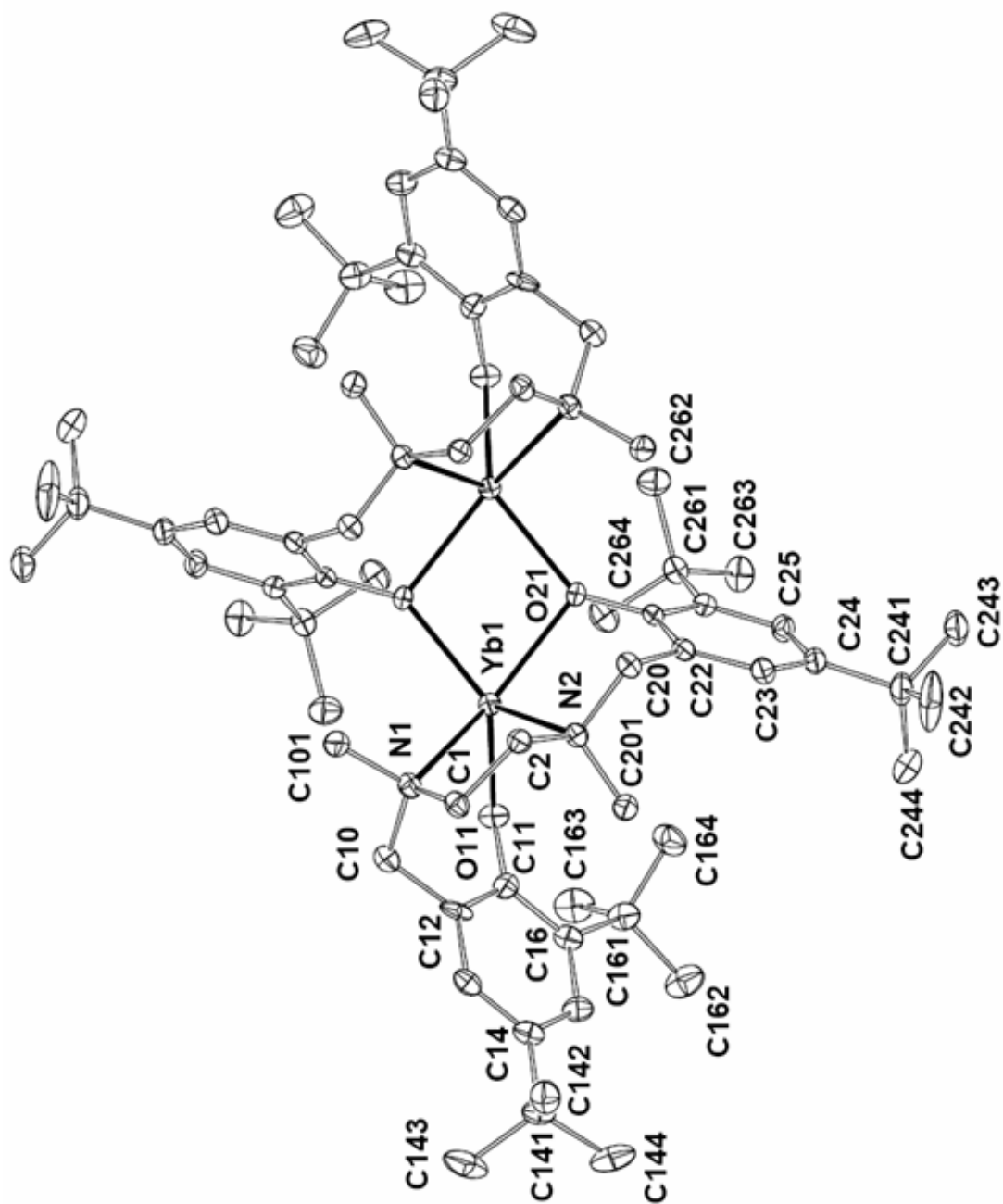


Figure S5: ORTEP diagram of compound 2 with hydrogen atoms omitted for clarity. Thermal ellipsoids are drawn at the 50% probability level.

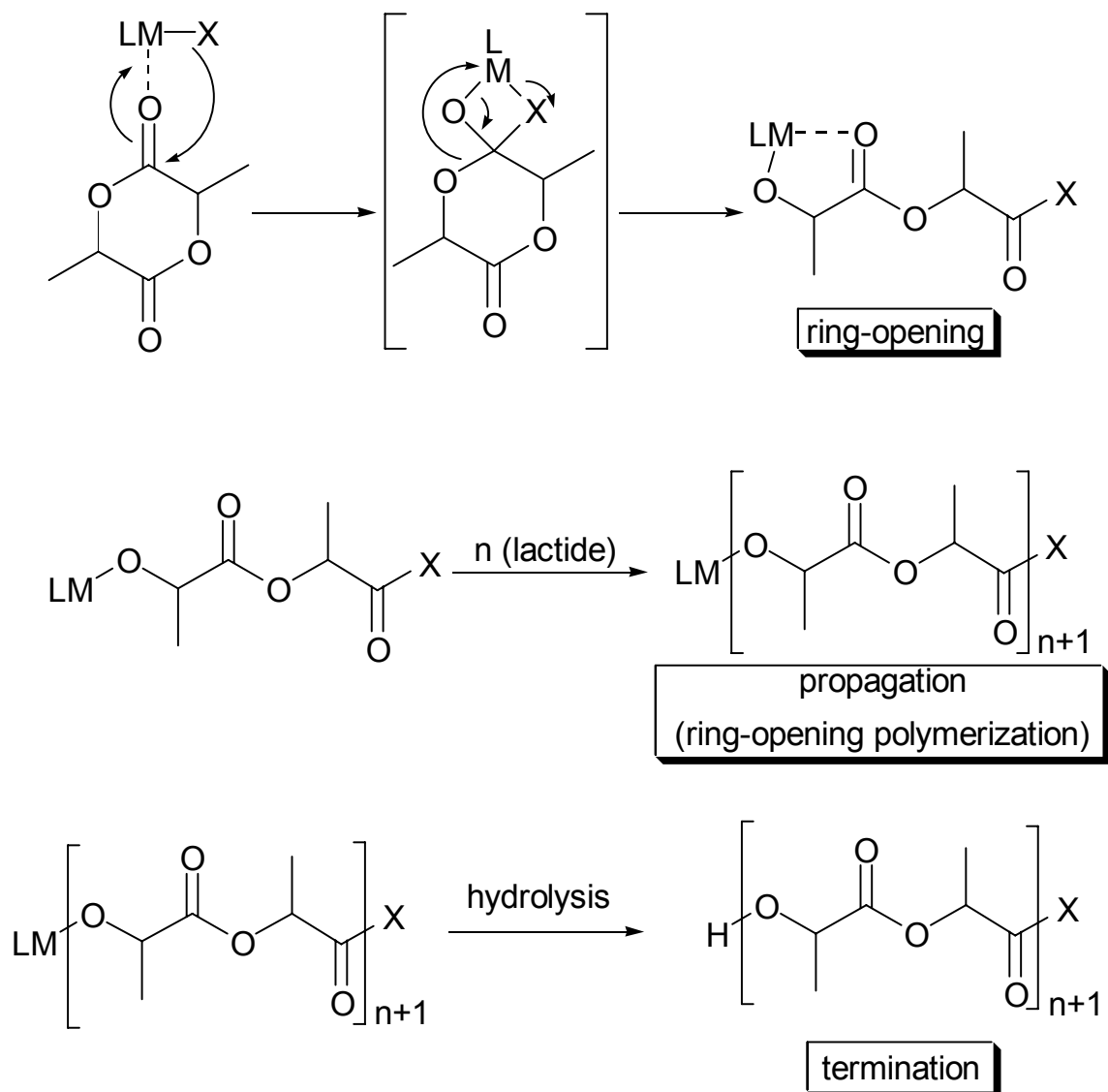


Figure S6: Commonly accepted coordination–Insertion Mechanism for ring-opening polymerization of lactide catalyzed by LMX. A similar mechanism is invoked for ϵ -caprolactone.

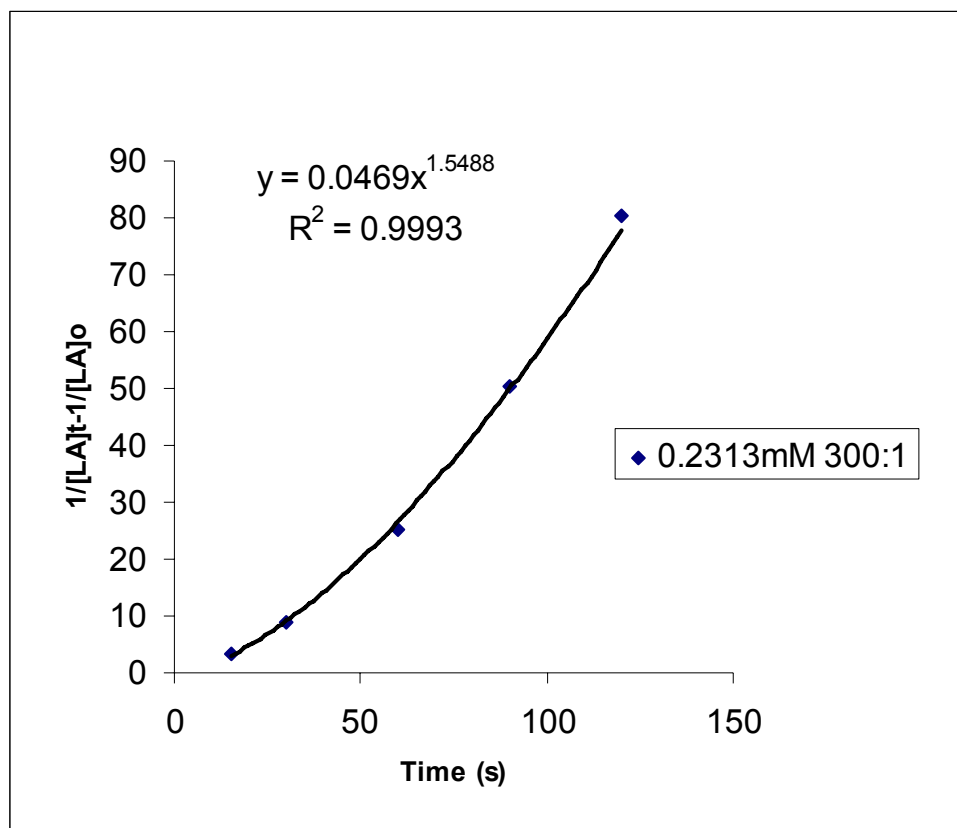


Figure S7: Second-order kinetic plots for *L*-lactide vs. time using compound **6** as an initiator at 0.2313 mM (300:1)