

## Supporting Information

# A Multimetallic Iron(II)-Lithium Complex as Catalyst for $\epsilon$ -Caprolactone Polymerization

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## Contents

**Fig. S1**  $^1\text{H}$  NMR spectrum of complex **1**.

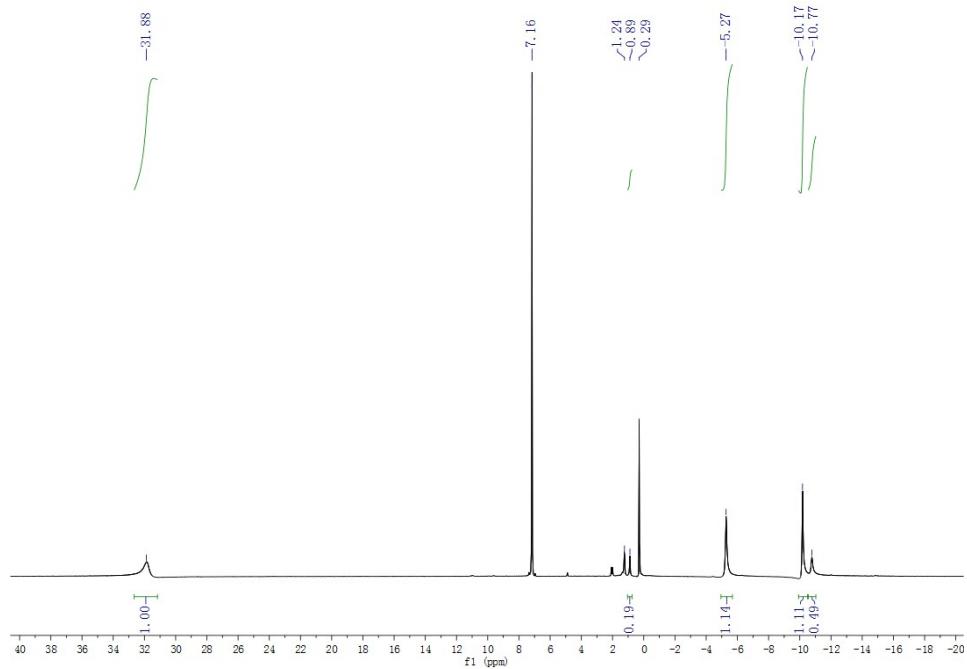
**Fig. S2**  $^1\text{H}$  NMR spectrum for reaction of **1** +  $\epsilon$ -CL after 20 min in  $\text{C}_6\text{D}_6$  at 50 °C.

**Fig. S3**  $^1\text{H}$  NMR spectrum for reaction of **1** + 10  $\epsilon$ -CL after 6 min in  $\text{C}_6\text{D}_6$  at 50 °C.

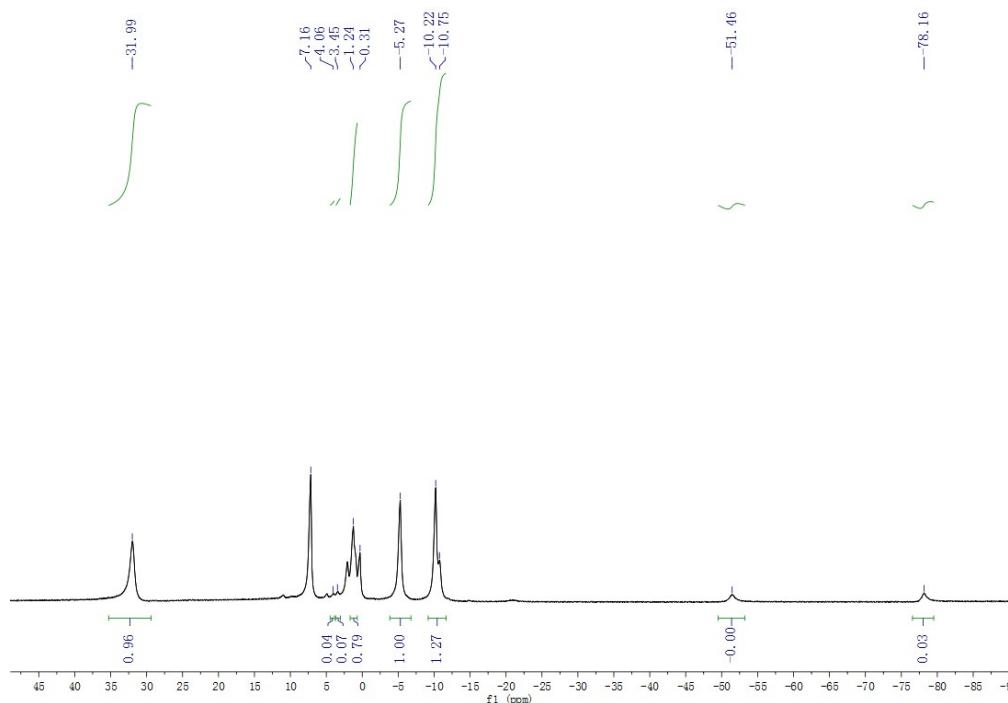
**Fig. S4**  $^1\text{H}$  NMR spectrum of PCL catalyzed by complex **1** in toluene at 50 °C after 30 min, and quenched by 10% HCl/EtOH.

**Fig. S5** MALDI-TOF mass spectrum of PCL catalyzed by complex **1** with 10 : 1  $[\epsilon\text{-CL}] / [\text{Fe}]$  ratio after 20 min in toluene at 25 °C.

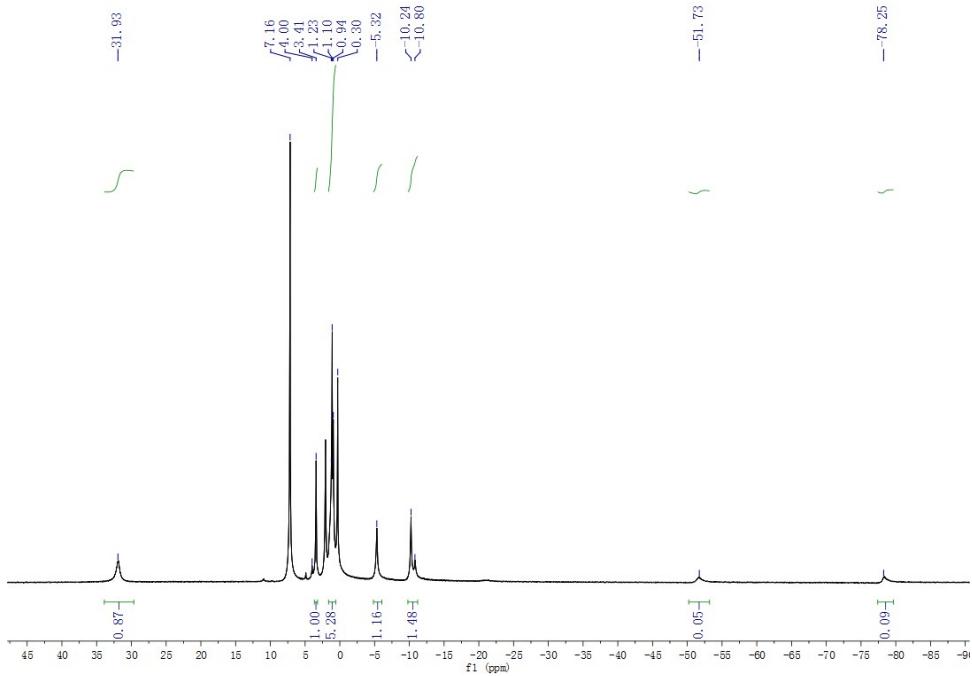
**Fig. S6** MALDI-TOF mass spectrum of PCL catalyzed by complex **1** with 10 : 1  $[\epsilon\text{-CL}] / [\text{Fe}]$  ratio after 30 min in toluene at 50 °C, and quenched by 10% HCl/EtOH.



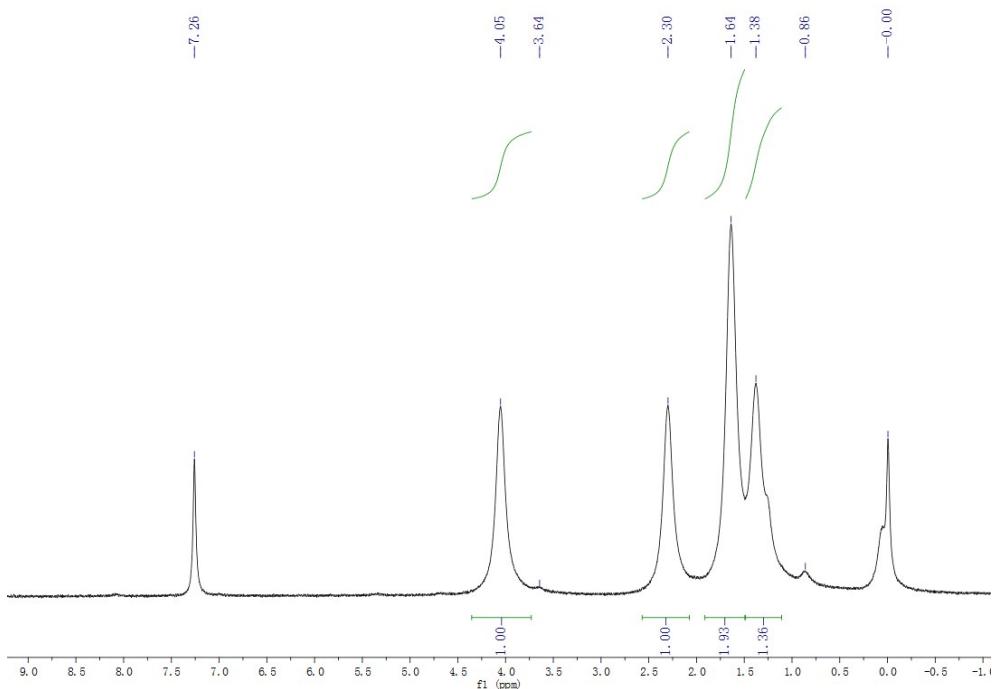
**Fig. S1**  $^1\text{H}$  NMR spectrum of complex **1**. The signals at 1.24, 0.89 ppm attribute to the protons of co-crystallized hexane molecule.



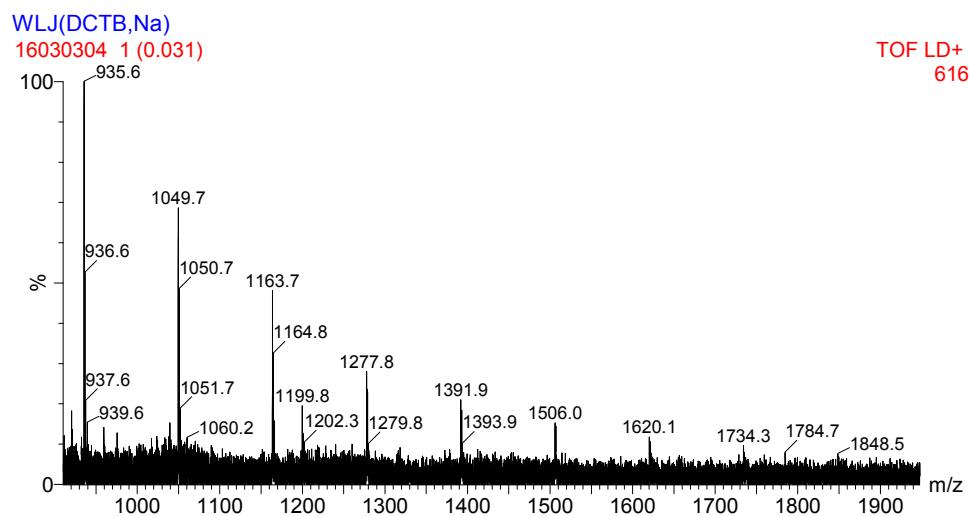
**Fig. S2**  $^1\text{H}$  NMR spectrum for reaction of **1** +  $\epsilon$ -CL after 20 min in  $\text{C}_6\text{D}_6$  at  $50\text{ }^\circ\text{C}$ . The signals at 4.06, 3.45 ppm attribute to the protons of PCL and  $\epsilon$ -CL respectively.



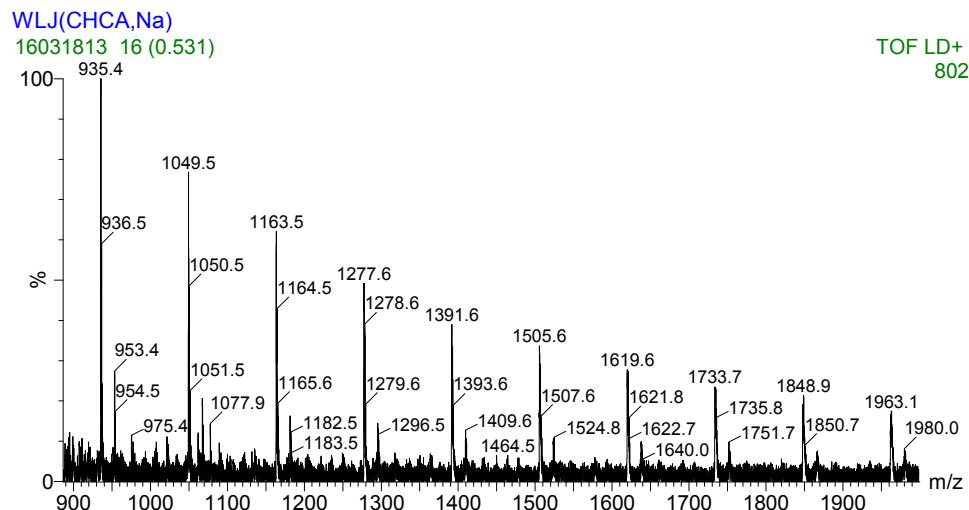
**Fig. S3**  $^1\text{H}$  NMR spectrum for reaction of **1** + 10  $\epsilon$ -CL after 6 min in  $\text{C}_6\text{D}_6$  at 50°C. The signals at 4.00, 3.41, 1.10 ppm attribute to the protons of PCL and  $\epsilon$ -CL respectively, and the signals at 1.23, 0.94 ppm attribute to the protons of co-crystallized hexane molecule.



**Fig. S4**  $^1\text{H}$  NMR spectrum of PCL catalyzed by complex **1** in toluene at 50 °C after 30 min, and quenched by 10% HCl/EtOH.



**Fig. S5** MALDI-TOF mass spectrum of PCL catalyzed by complex **1** with 10 : 1  $[\epsilon\text{-CL}] / [\text{Fe}]$  ratio after 20 min in toluene at 25 °C.



**Fig. S6** MALDI-TOF mass spectrum of PCL catalyzed by complex **1** with 10 : 1  $[\epsilon\text{-CL}] / [\text{Fe}]$  ratio after 30 min in toluene at 50 °C, and quenched by 10% HCl/EtOH.