Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

2,4-Dinitrobenzenesulfonic Acid as an Efficient Brønsted Acid-Catalyzed Controlled/Living Ring-Opening Polymerization of ε-caprolactone

Huiying Wang, Wenzhuo Wu, Zhenjiang Li,* Xu Zhi, Cheng Chen, Chengxu Zhao, Xiaopei LI, Qiguo Zhang, Kai Guo*

State Key Laboratory of Materials-Oriented Chemical Engineering, College of Biotechnology and Pharmaceutical Engineering, Nanjing Tech University, 30 Puzhu Road (S), Nanjing, 211816, China

Fax + 86 25 5813 9935; E-mail: zjli@njtech.edu.cn; guok@njtech.edu.cn

Syntheses of End-Functionalized and *a,ω*-Dihydroxy Telechelic Poly(ε-caprolactone)

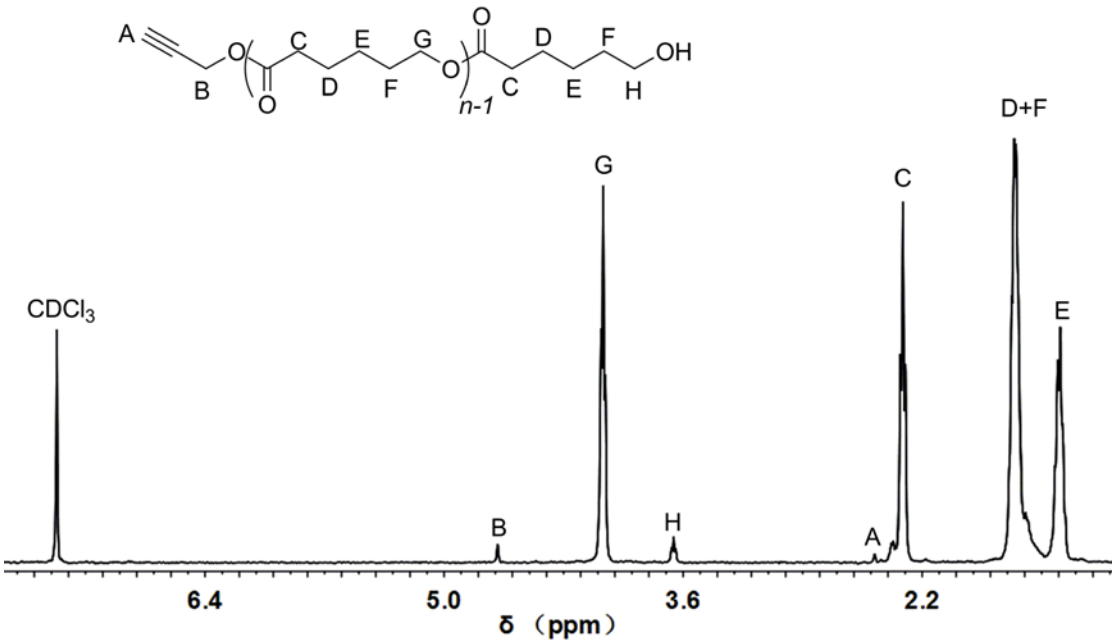

FIGURE S1 ^{1}H NMR spectrum of End-functionalized PCL initiated from propargyl alcohol in $CDCl_3$.

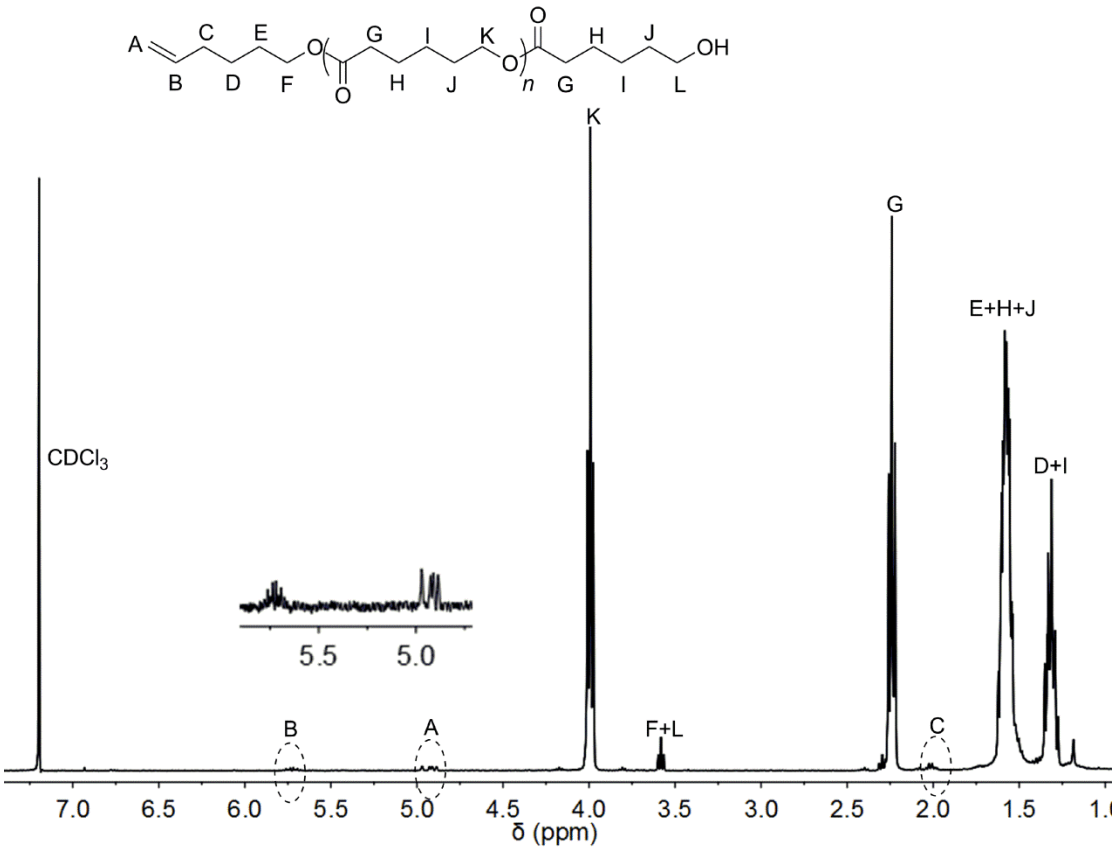

FIGURE S2 ^{1}H NMR spectrum of End-functionalized PCL initiated from 5-hexen-1-ol in $CDCl_3$.

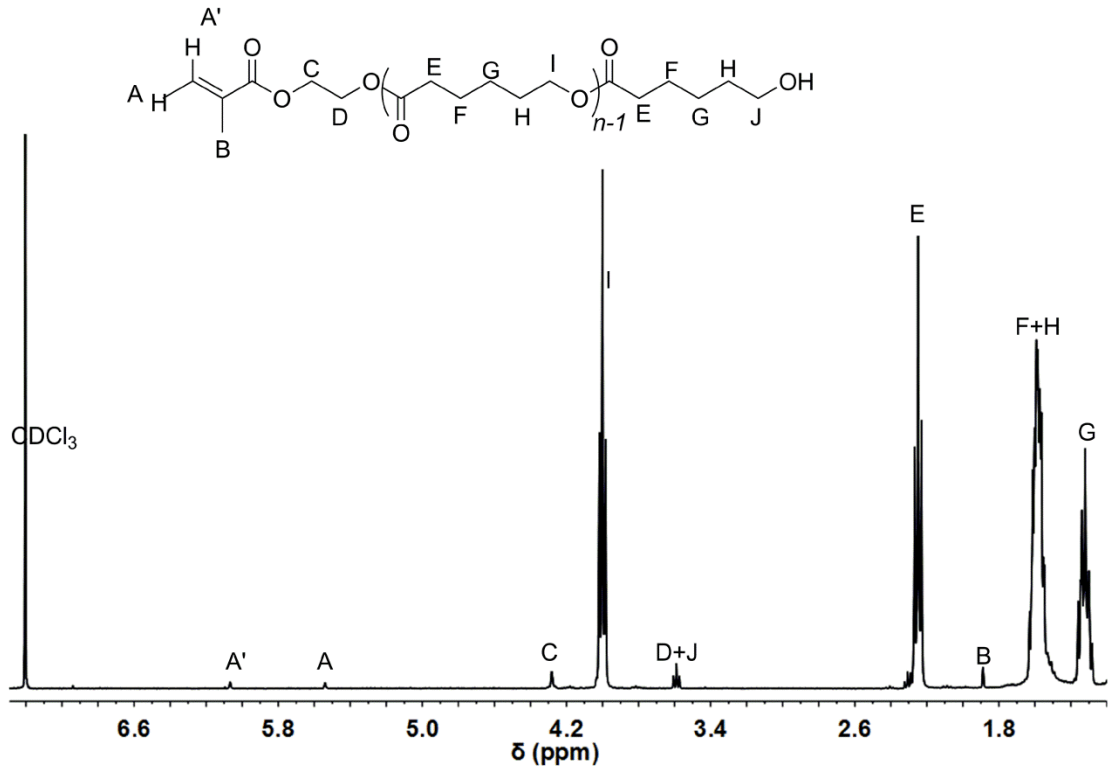

FIGURE S3 ^{1}H NMR spectrum of End-functionalized PCL initiated from 2-hydroxyethyl methacrylate in $CDCl_3$.

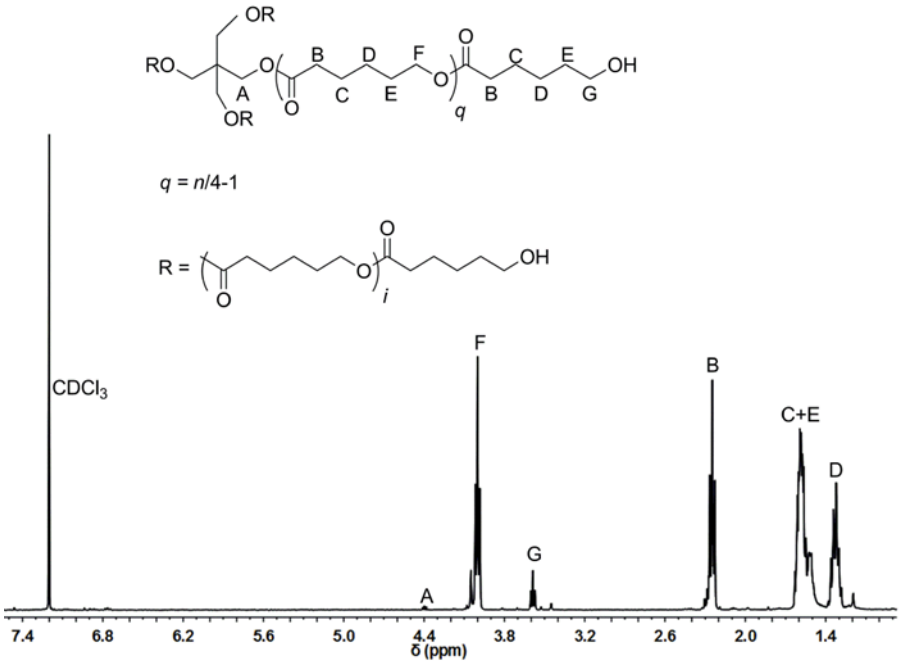

FIGURE S4 [1]H NMR spectrum of PCL initiated from Pentaerythritol in CDCl3.

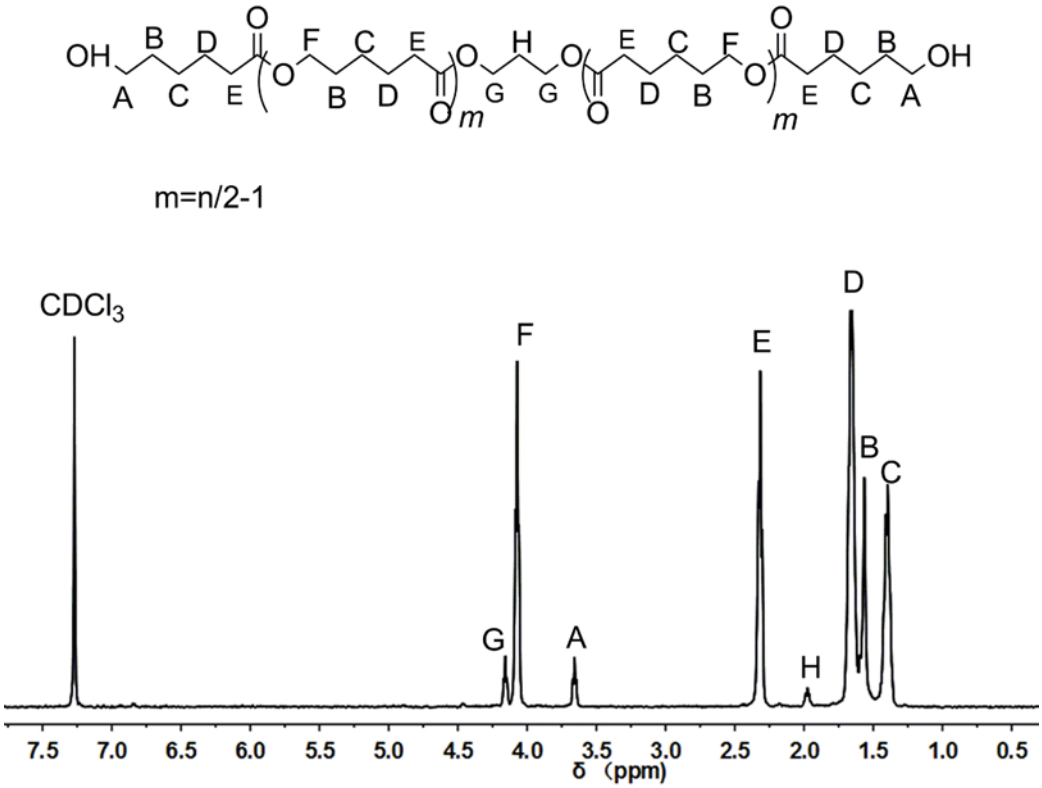

FIGURE S5 [1]H NMR spectrum of a,ω-Dihydroxy Telechelic PCL initiated from 1,3-Propanediol in $CDCl_3$.

Diblock Copolymers of ε-Caprolactone and δ-Valerolactone, Trimethylene Carbonate.

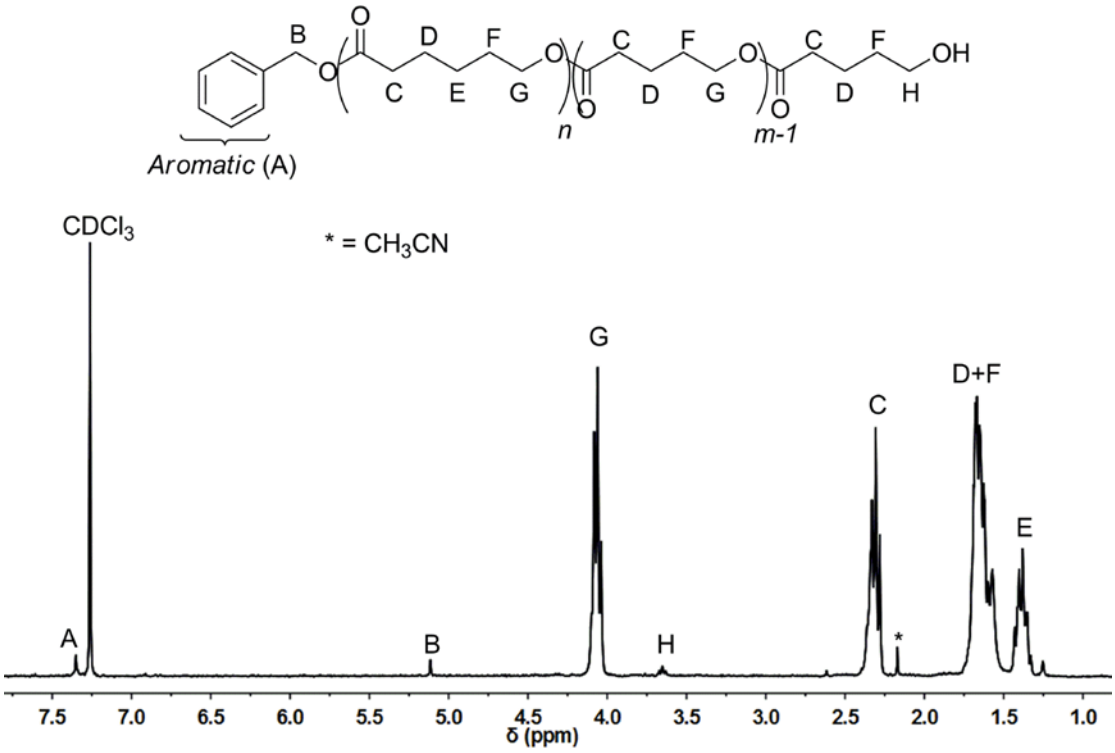

FIGURE S6 ^{1}H NMR spectrum of PCL-*b*-PVL initiated from BnOH in CDCl3

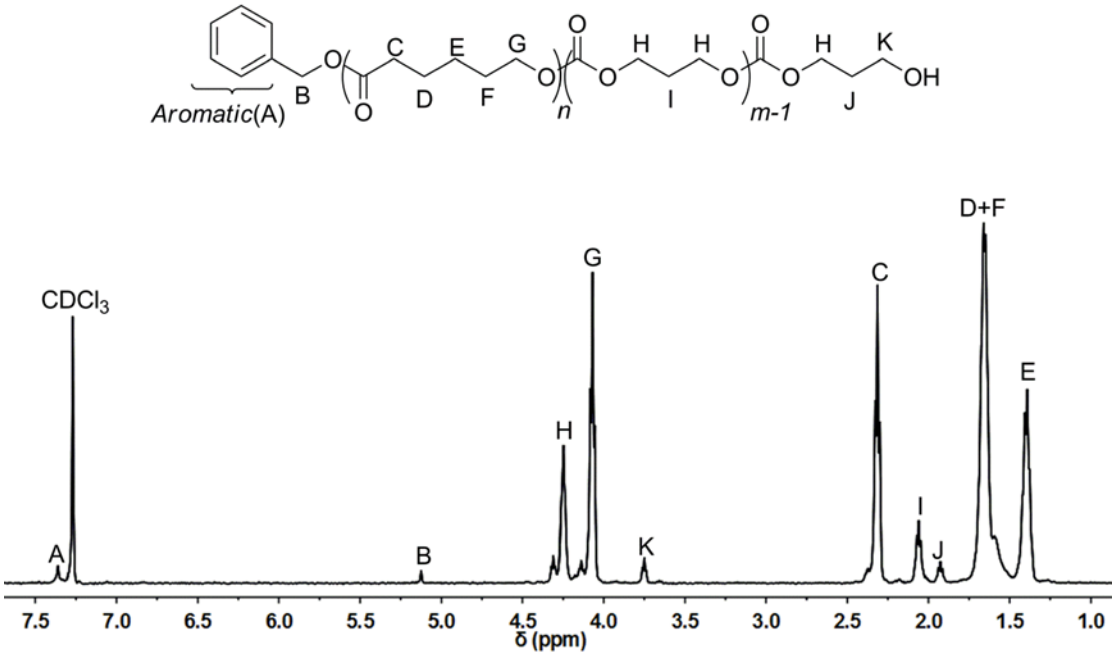

FIGURE S7 ^{1}H NMR spectrum of PCL-*b*-PTMC initiated from BnOH in $CDCl_3$.

The calculation details of *ε*-CL conversion

The calculated conversions of *ε*-CL were obtained from ^{1}H NMR spectra of reaction mixtures, and the details were as follows: the integral area of the signal of methylene protons at 4.25 ppm of *ε*-CL monomer was appointed to 1, and then the integral area of the signal at 4.06 ppm $(–CH_2CH_2O–)_n$ was appointed to *n*. based on the formula, conv. = $n/(n+1)$ * 100%.