Electronic Supplementary Material (ESI) for Polymer Chemistry.

SUPPORTING INFORMATION

Construction and Arm Evolution of Trifunctional Phenolic Initiator-Mediated Polycarbonate Polyols Produced by Using Double Metal Cyanide Catalyst

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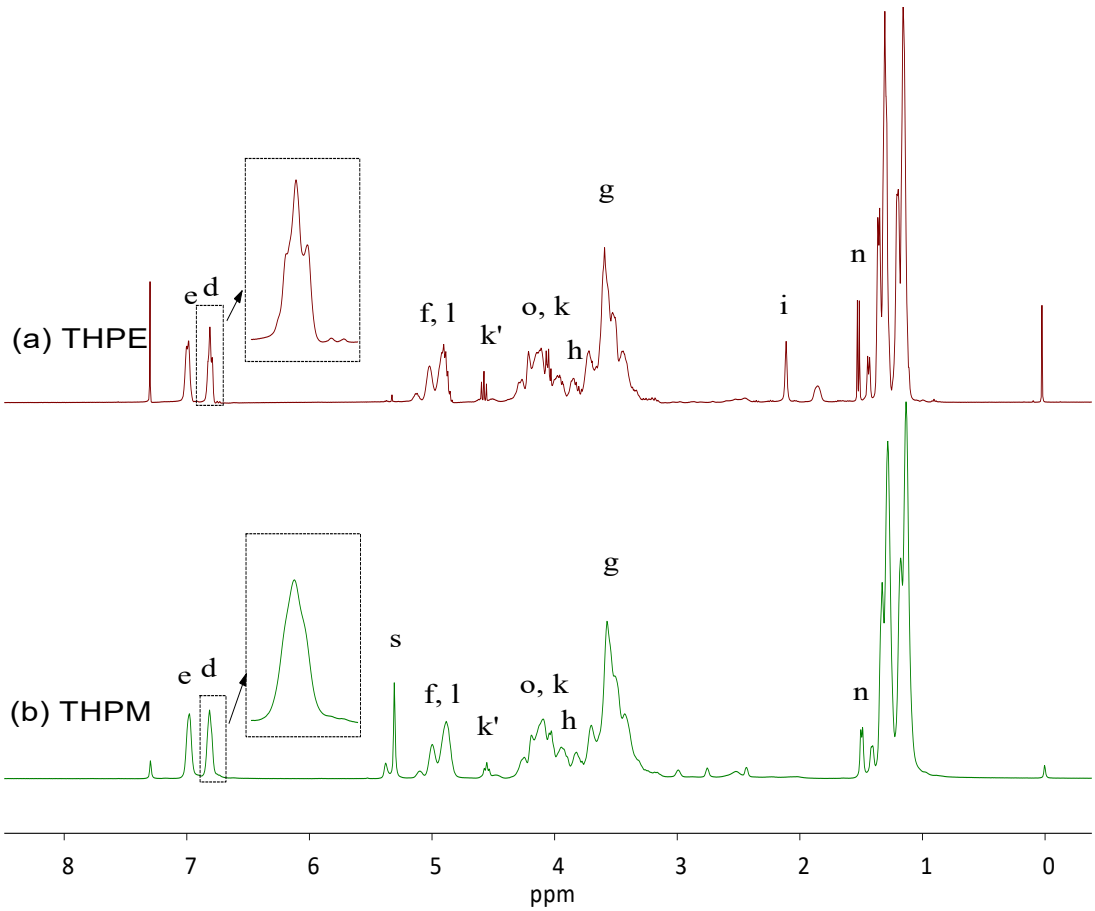

Figure S1. ^{1}H NMR spectra of poly(carbonate-ether) polyols prepared using THPE and THPM as initiators (Entries 1 and 2, Table 1).

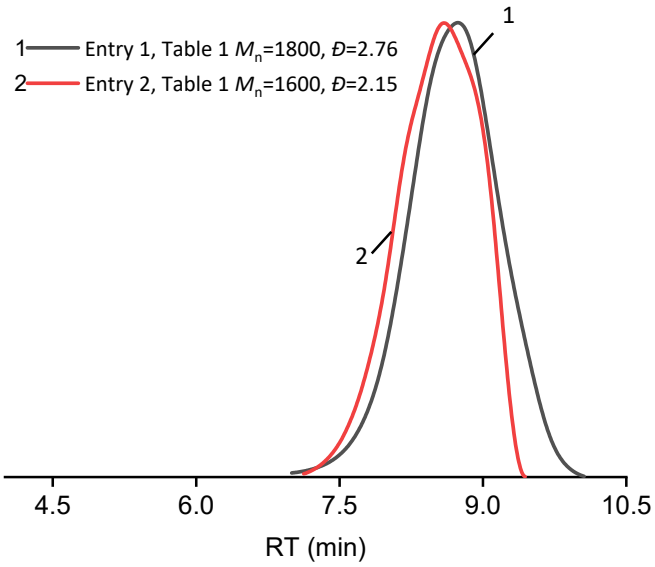

Figure S2. GPC plots of poly(carbonate-ether) polyols prepared using THPE and THPM as starters (Entries 1 and 2, Table 1).

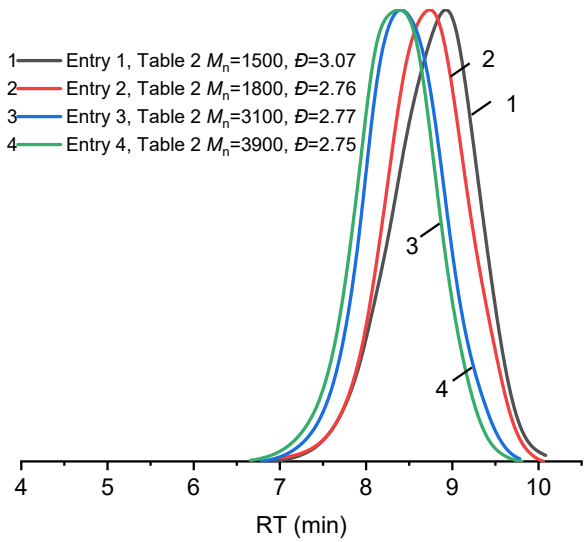

Figure S3. GPC curves of products obtained by using different dosages of THPE (Entries 1–4, Table 2).

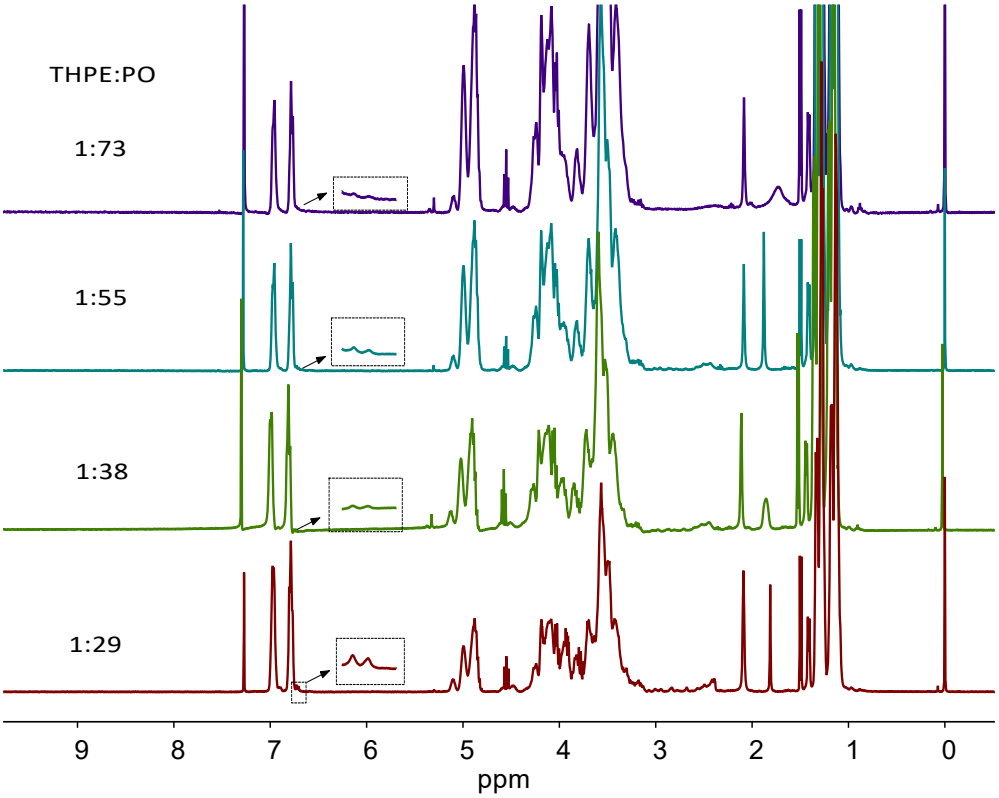

Figure S4. ^{1}H NMR spectra of products obtained by using different dosages of THPE (Entries 1–4, Table 2).

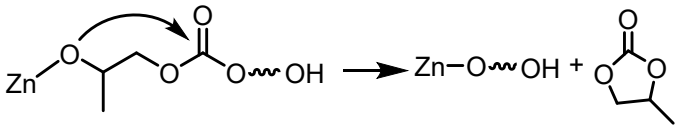

Figure S5. Plausible mechanism of backbite.

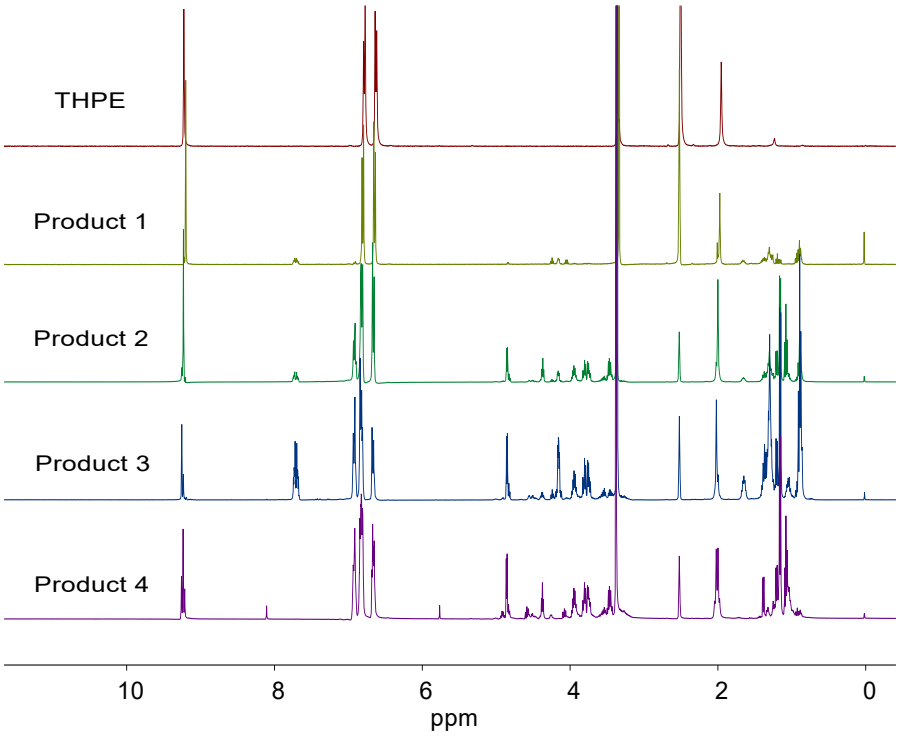

Figure S6. ^{1}H NMR (DMSO) spectra of the three different species (Products 1–3) separated from the CH_2Cl_2 insoluble sample and ^{1}H NMR spectrum of the CH_2Cl_2 soluble sample (Product 4). Copolymerizations were carried out at 95 °C, 4 MPa with PO (50 mL, 41.5 g, 0.72 mol), 13 mg DMC, n_{THPE}:n_{PO}=1:38 (5.8 g THPE).

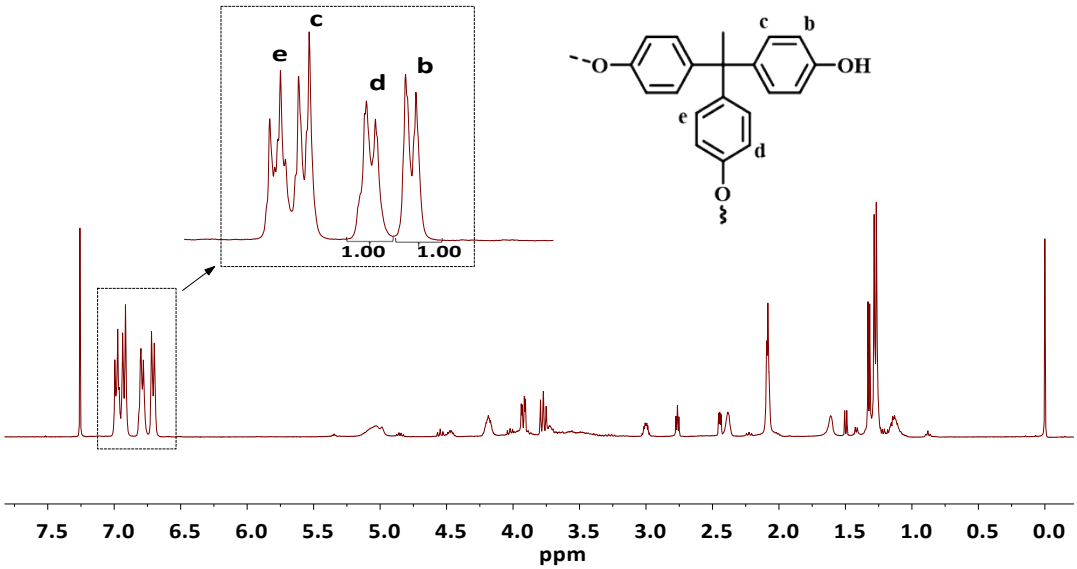

Figure S7. ^{1}H NMR($CDCl_3$) spectrum of the product taken at 50 min of reaction.

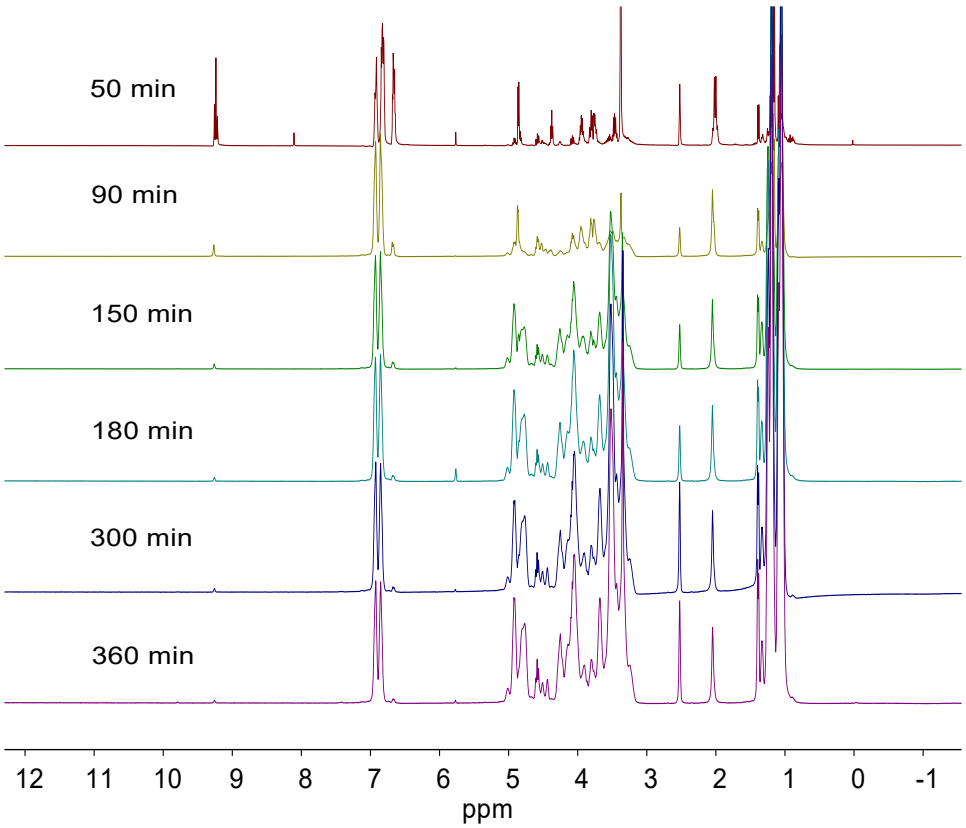

Figure S8. ^{1}H NMR (DMSO) spectra of the products collected at different reaction periods. Copolymerizations were carried out at 95 °C, 4 MPa with PO (50 mL, 41.5 g, 0.72 mol), 13 mg DMC, n_{THPE}:n_{PO}=1:38 (5.8 g THPE).

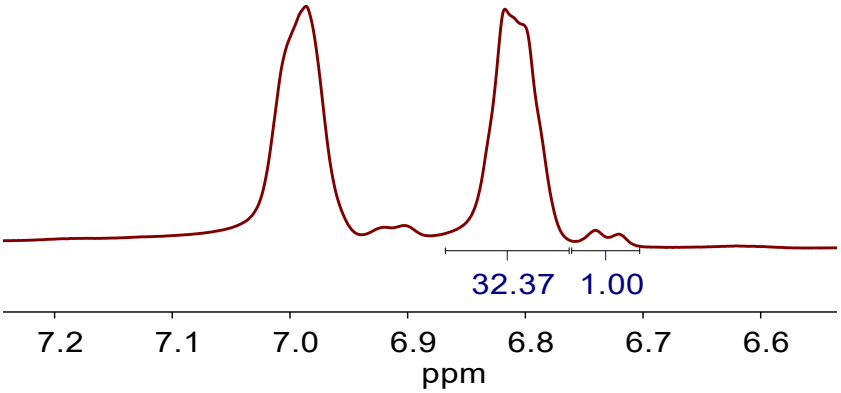

Figure S9. The ^{1}H NMR spectrum ($CDCl_3$) of the product collected at 70 min of polymerization. Copolymerizations were carried out at 95 °C, 4 MPa with 18 mg DMC, PO (50 mL, 41.5 g, 0.72 mol), n_{THPE}:n_{PO}=1:38 (5.8 g THPE).

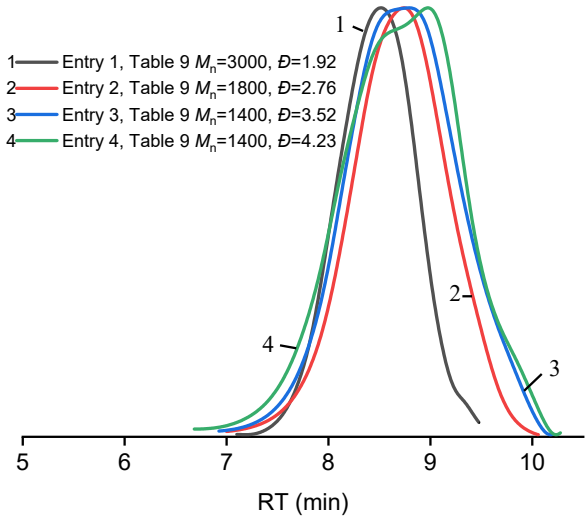

Figure S10. GPC curves of products obtained by using different dosages of DMC catalyst (Entries 1–4, Table 9).

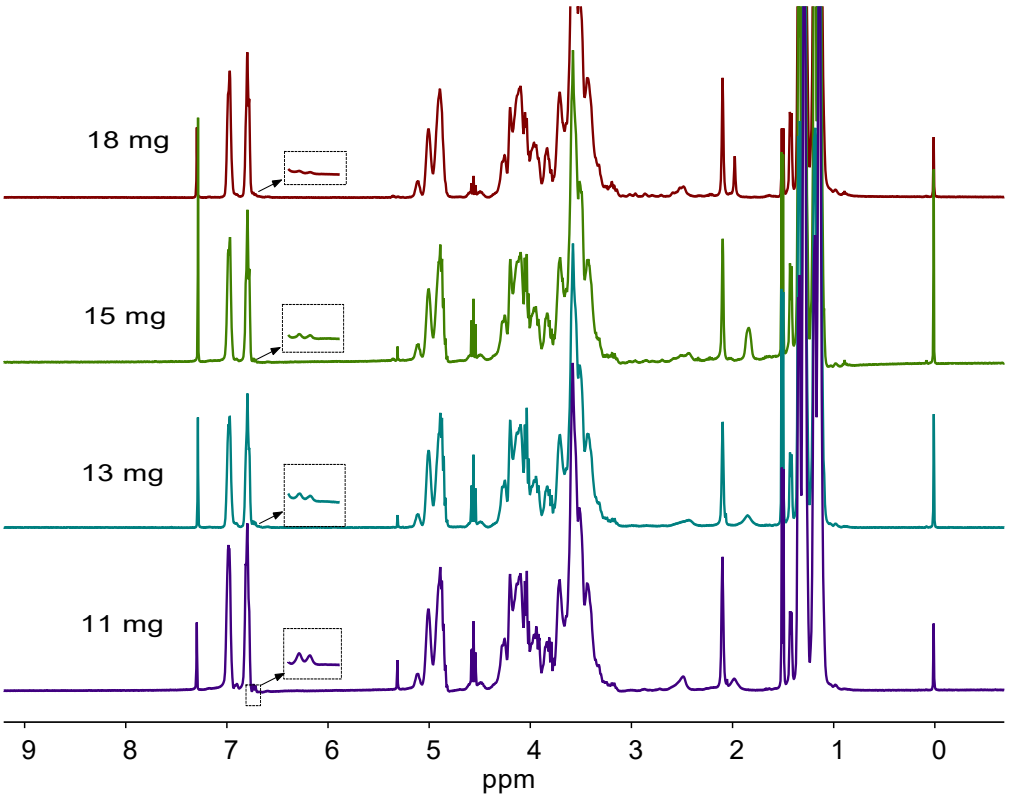

Figure S11. ^{1}H NMR spectra of products obtained by using different dosages of DMC catalyst (Entries 1–4, Table 9).

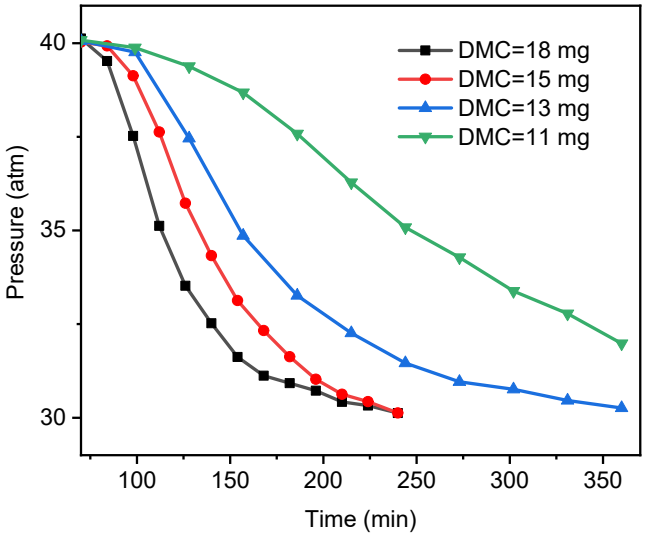

Figure S12. The variation of CO2 pressure during the copolymerization under different dosages of DMC catalyst (Entries 1–4, Table 9).

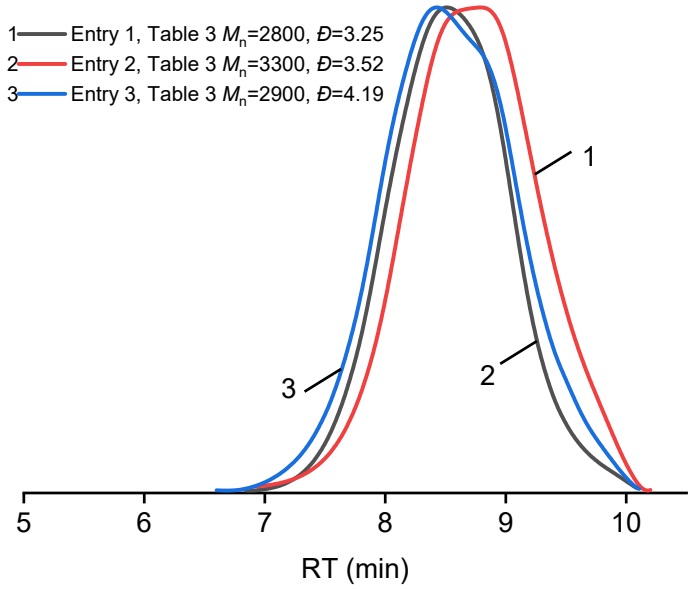

Figure S13. GPC curves of products obtained by using different temperatures (Entries 1–3, Table 10).

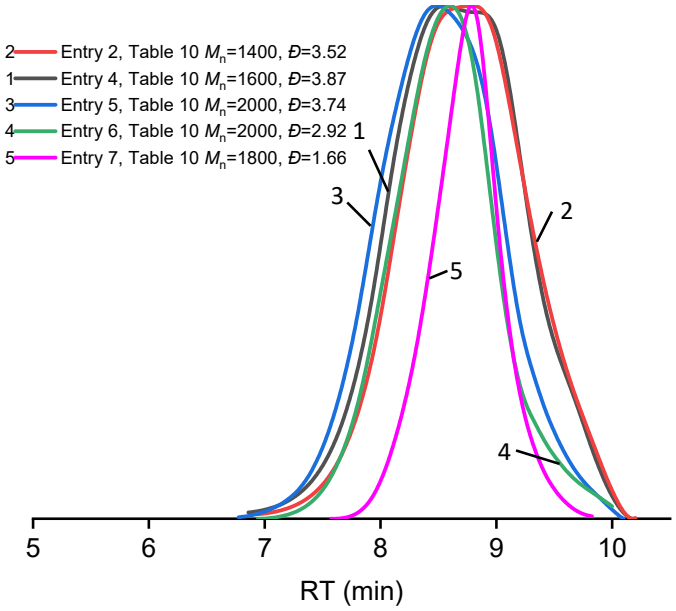

Figure S14. GPC curves of products obtained by using different pressures of CO_2 (Entries 2, 4–7, Table 10).

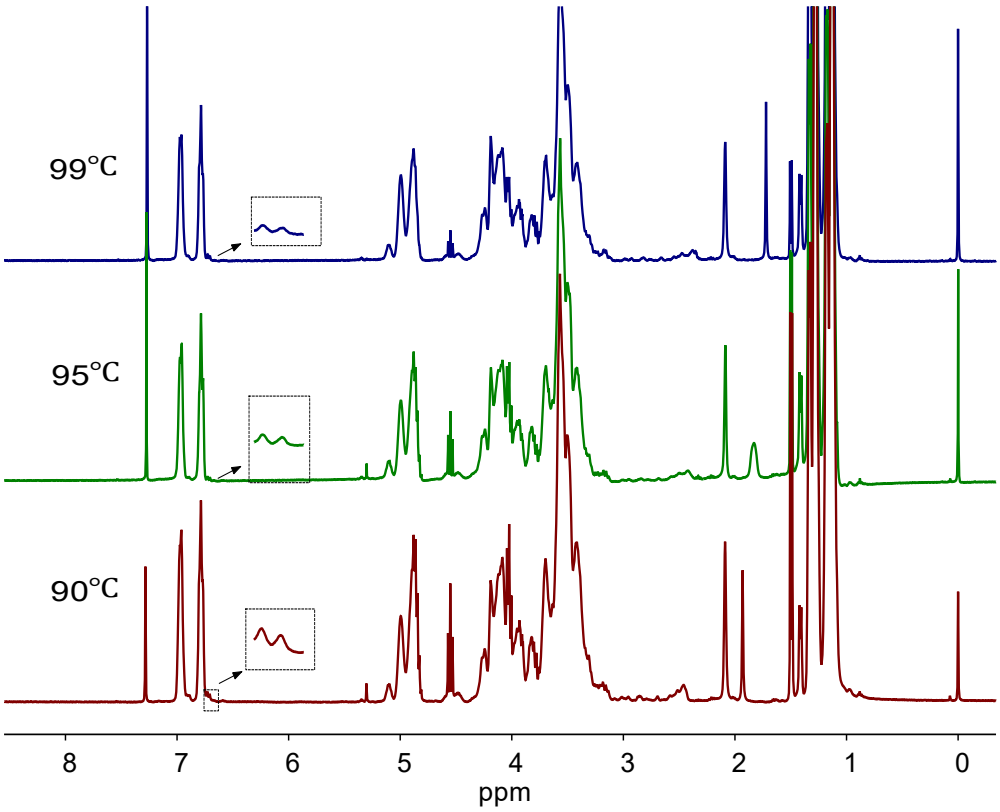

Figure S15. ^{1}H NMR spectra of products obtained by using different temperatures (Entries 1–3, Table 10).

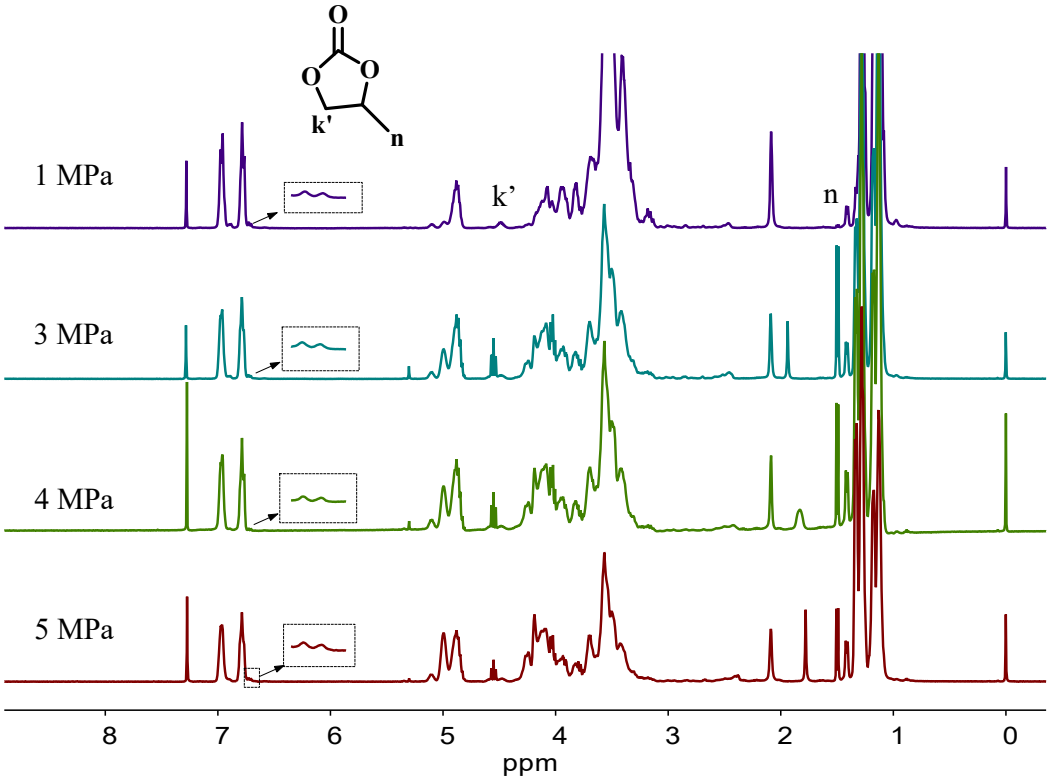

Figure S16. ^{1}H NMR spectra of products obtained by using different pressures of CO_2 (Entries 2, 4–6, Table 10).

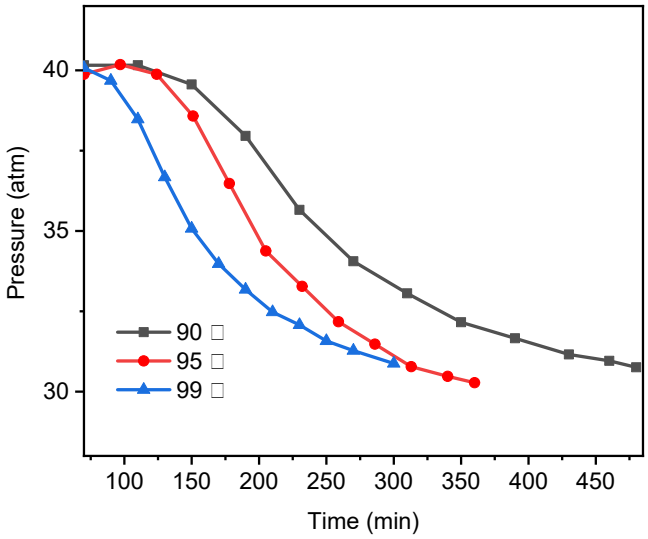

Figure S17. The variation of CO2 pressure during the copolymerizations under different temperatures (Entries 1–3, Table 10).

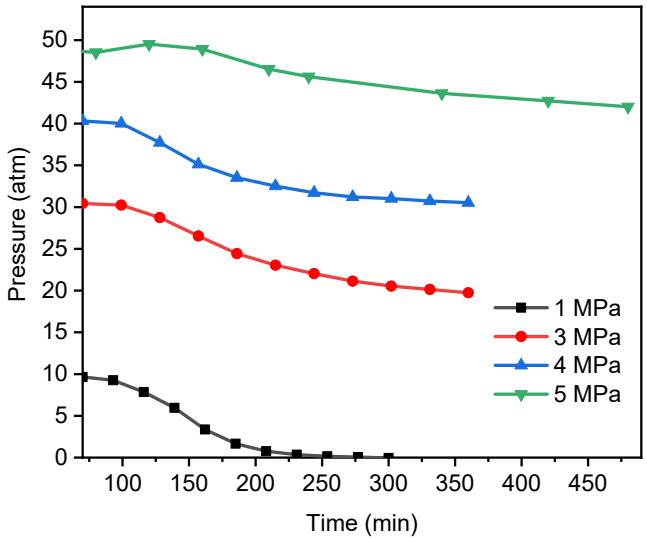

Figure S18. The variation of CO_2 pressure during the copolymerizations under different CO_2 pressures (Entries 2, 4-6, Table 10).

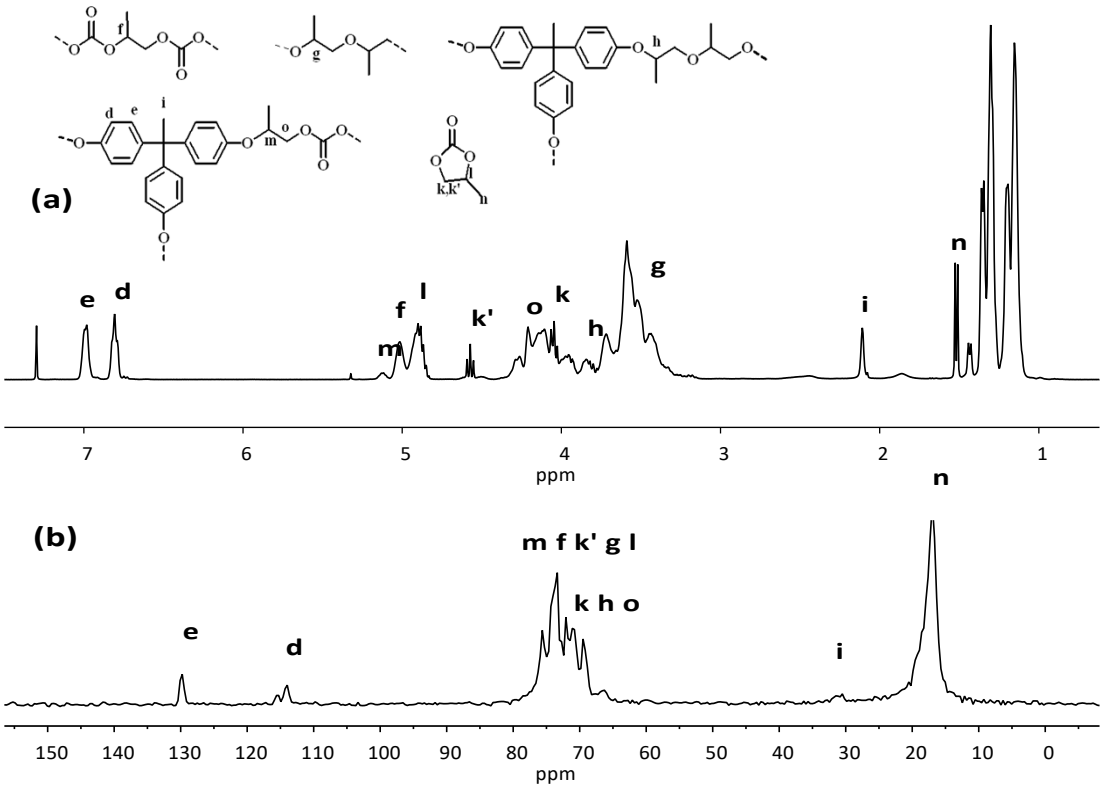

Figure S19. ^{1}H and ^{13}C NMR ($CDCl_3$) spectra of the product (Entry 3, Table 9). Copolymerizations were carried out at 95 °C, 4 MPa with 13 mg DMC PO (50 mL, 41.5 g, 0.72 mol), n_{THPE}:n_{PO}=1:38 (5.8 g THPE).