SUPPORTING INFORMATION

"Oxidative esterification of aliphatic α,ω-diols, an alternative route to polyester precursors for the synthesis of polyurethanes."

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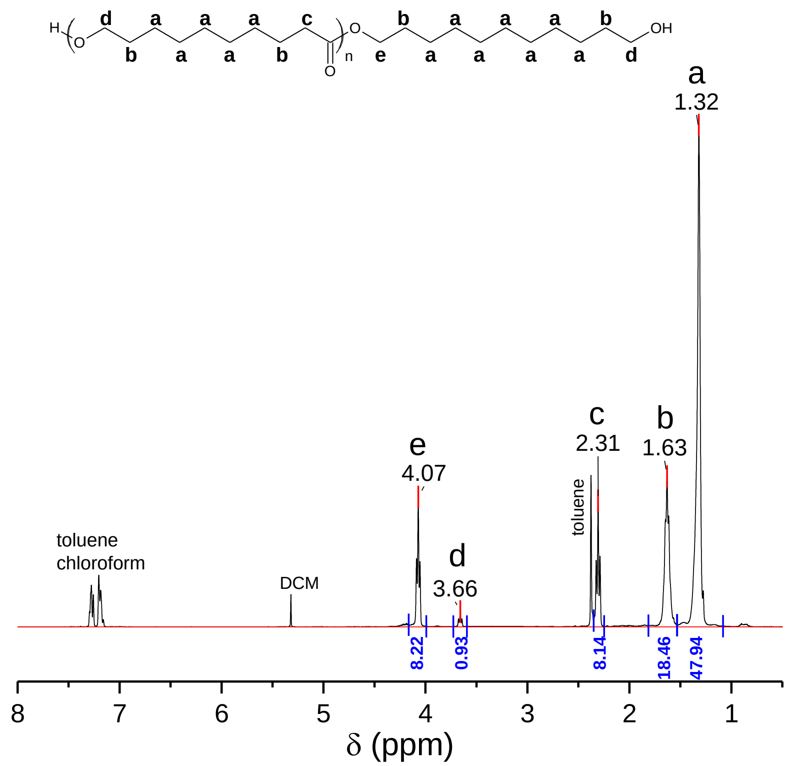

Figure S1. [1]H NMR spectrum of poly(decane sebacate) ($CDCl_3$, 400 MHz).

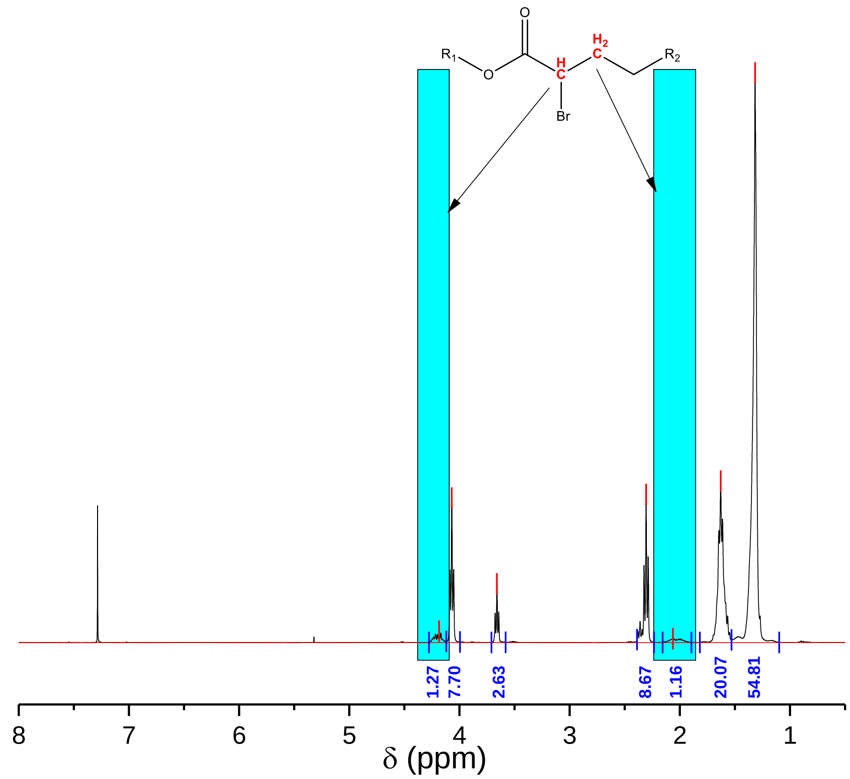

Figure S2. [1]H NMR spectrum of poly(decane sebacate) synthesized at 80°C ($CDCl_3$, 400 MHz).

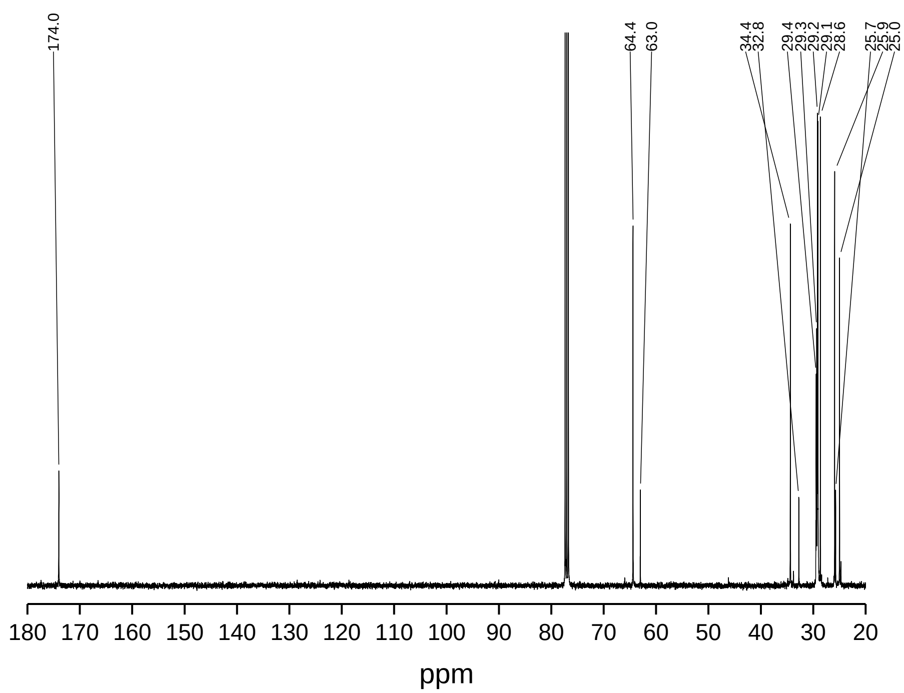

Figure S3. [13]C NMR spectrum of poly(decane sebacate) $CDCl_3$. ($CDCl_3$, 100 MHz).

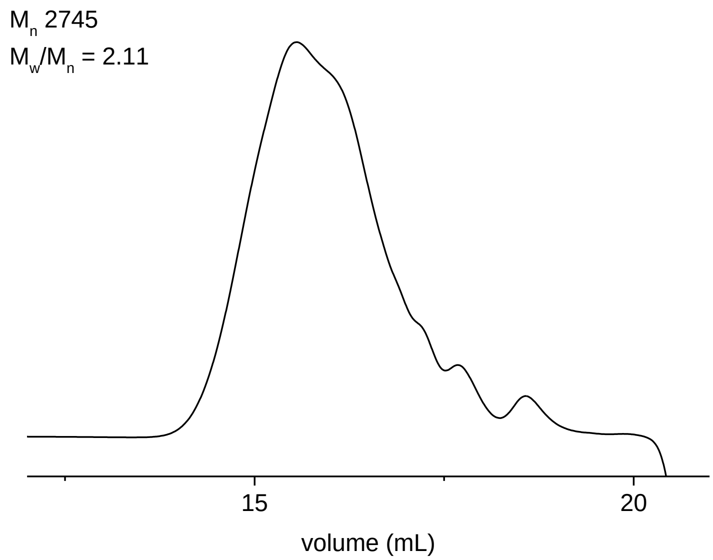

Figure S4. GPC chromatogram of poly(decane sebacate).

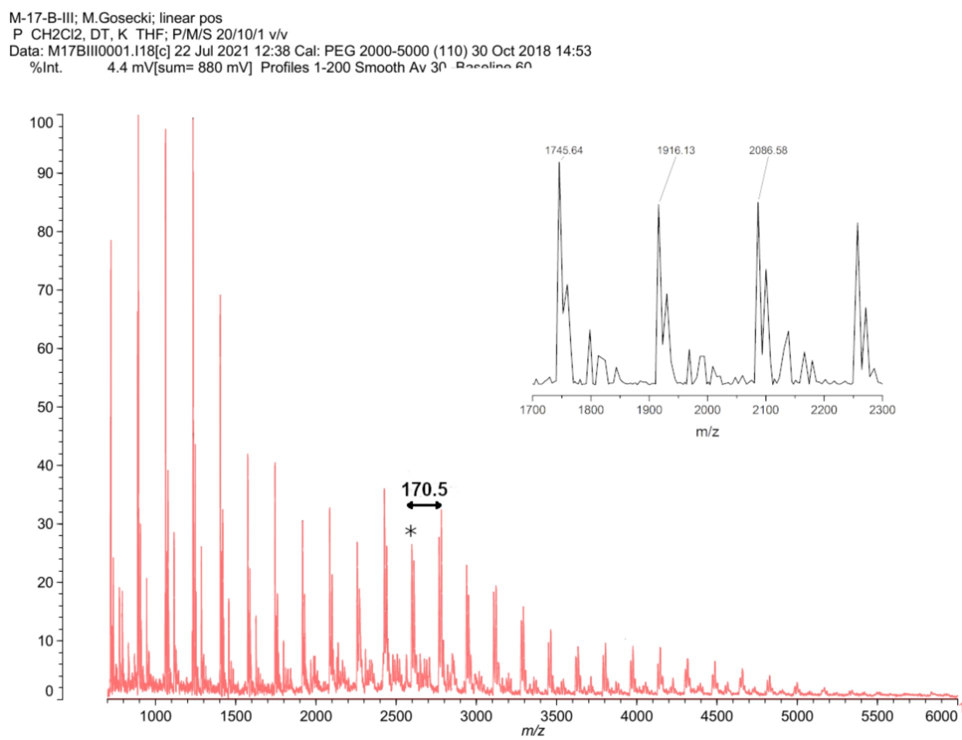

Figure S5 MALDI TOF mass spectrum of poly(decane sebacate); *denotes population of signals ascribed to $HO(CH_2)_{10}O[(O)C(CH_2)_9O]_n$-H + K^+.

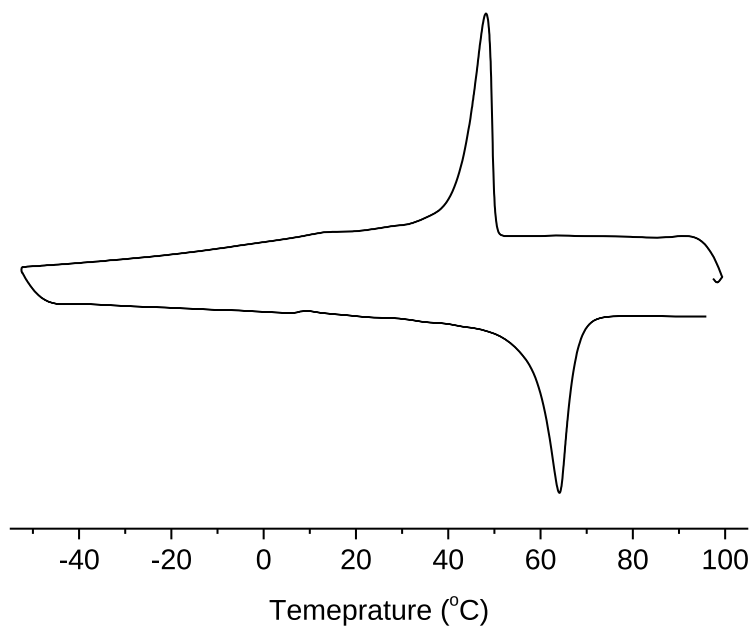

Figure S6. DSC of poly(decane sebacate).

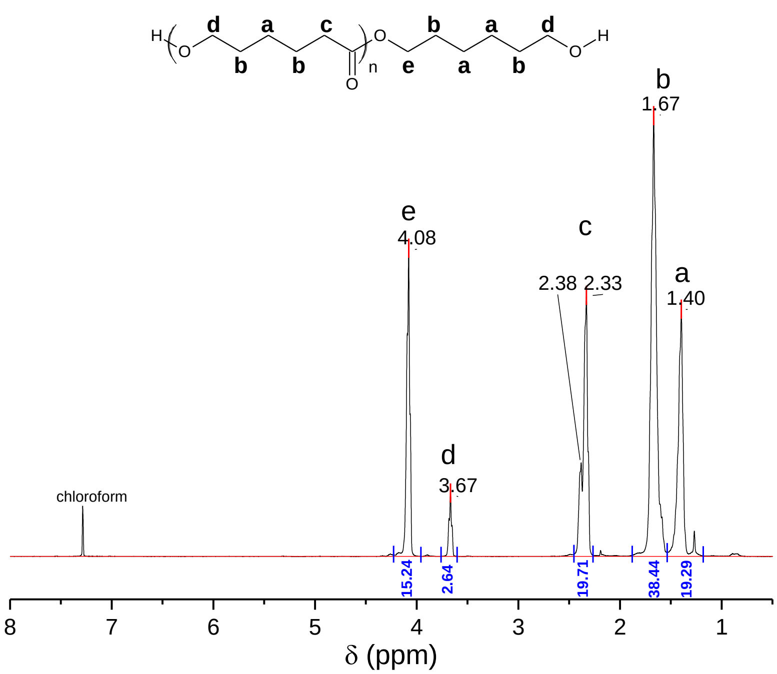

Figure S7. ^{1}H NMR spectrum of poly(hexane adipate) ($CDCl_3$, 400 MHz).

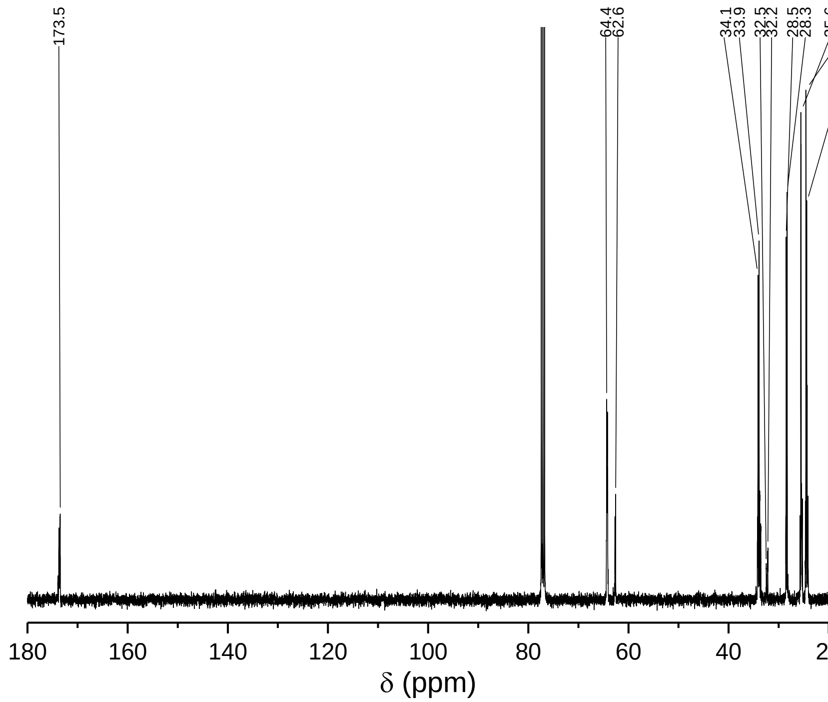

Figure S8. ^{13}C NMR spectrum of poly(hexane adipate) ($CDCl_3$, 100 MHz).

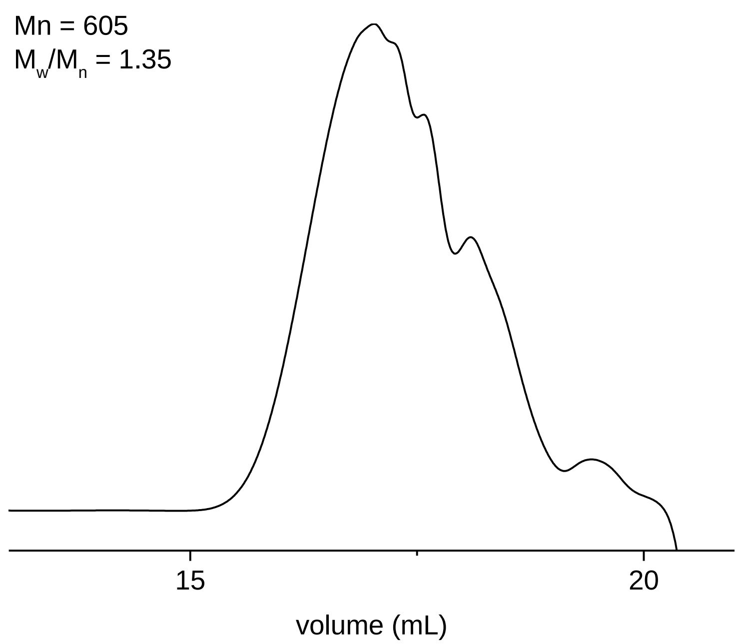

Figure S9. GPC chromatogram of poly(hexane adipate).

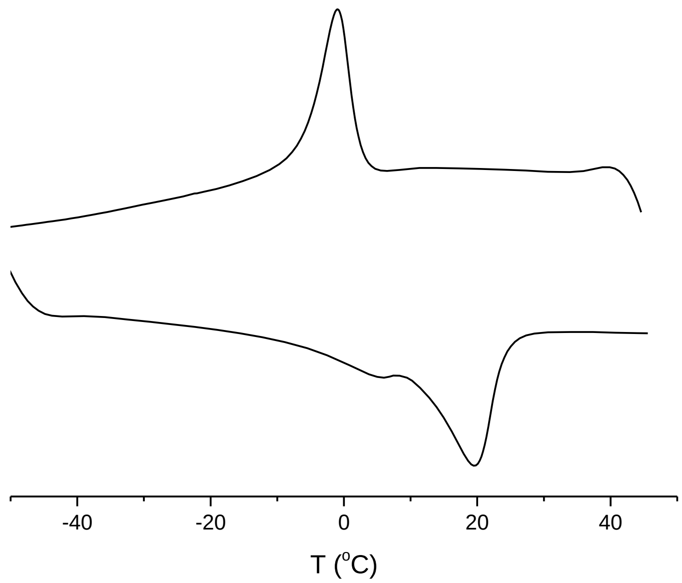

Figure S10. DSC of poly(hexane adipate).

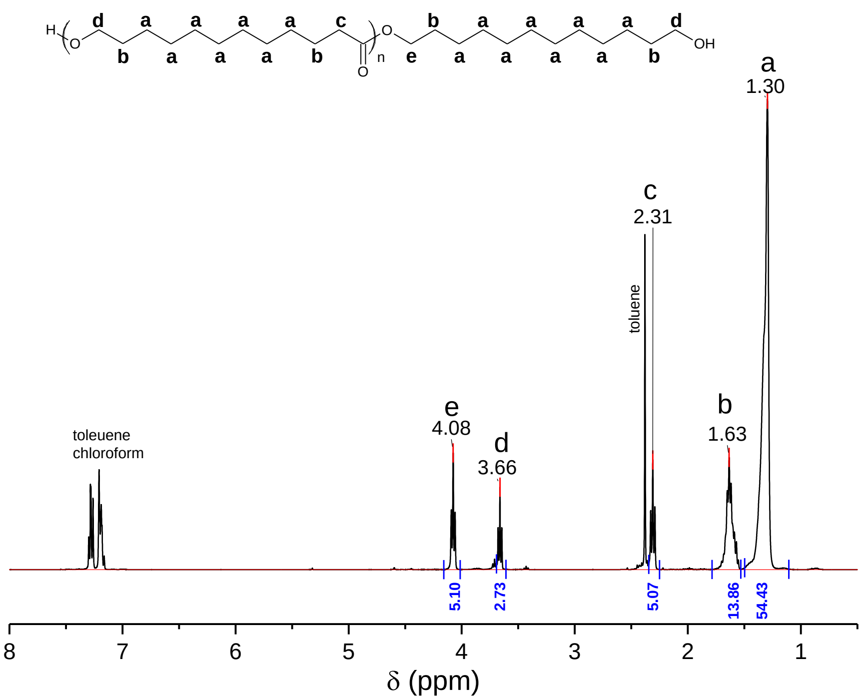

Figure S11. ^{1}H NMR spectrum of poly(dodecane dodecanedioate) ($CDCl_3$, 400 MHz).

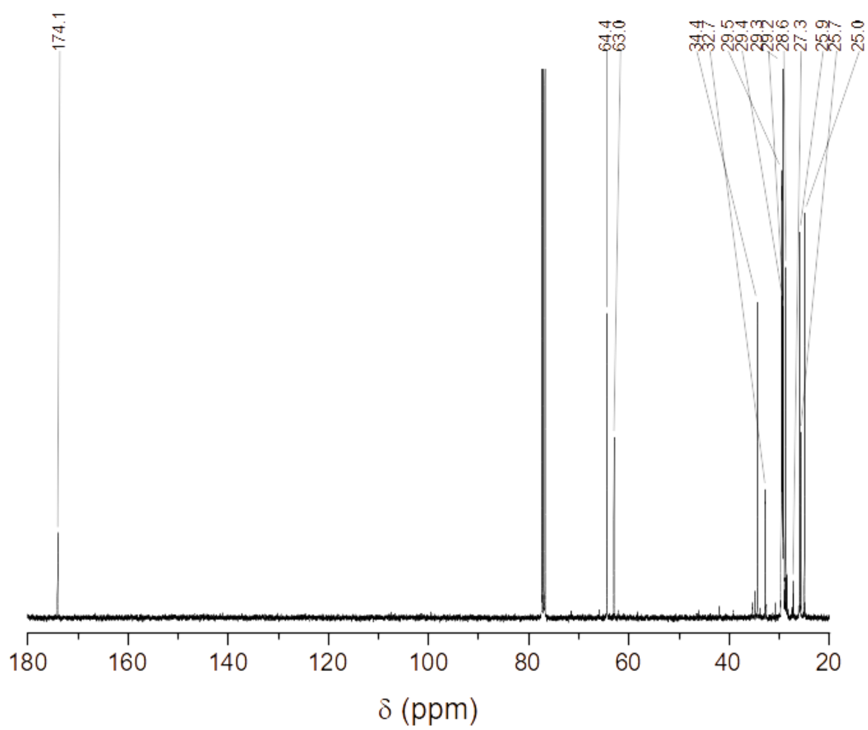

Figure S12. ^{13}C NMR spectrum of poly(dodecane dodecanedioate) ($CDCl_3$, 100 MHz).

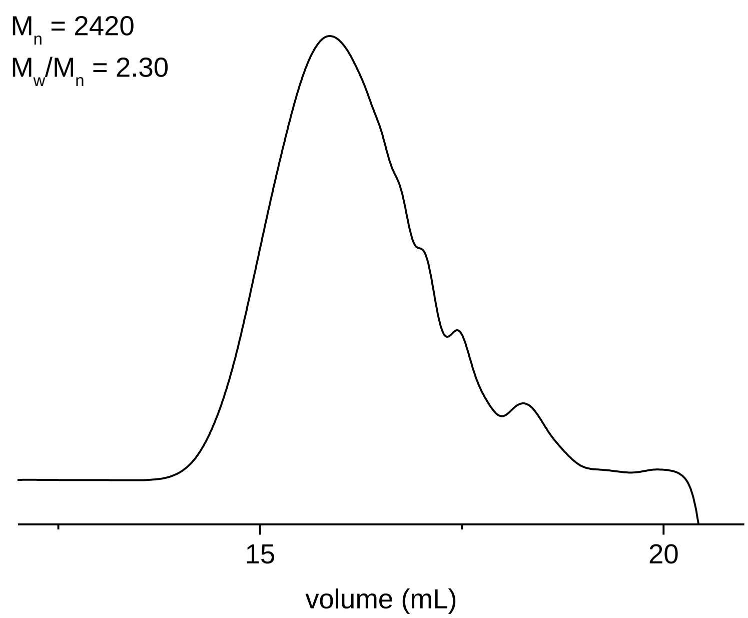

Figure S13. GPC chromatogram of poly(dodecane dodecanedioate).

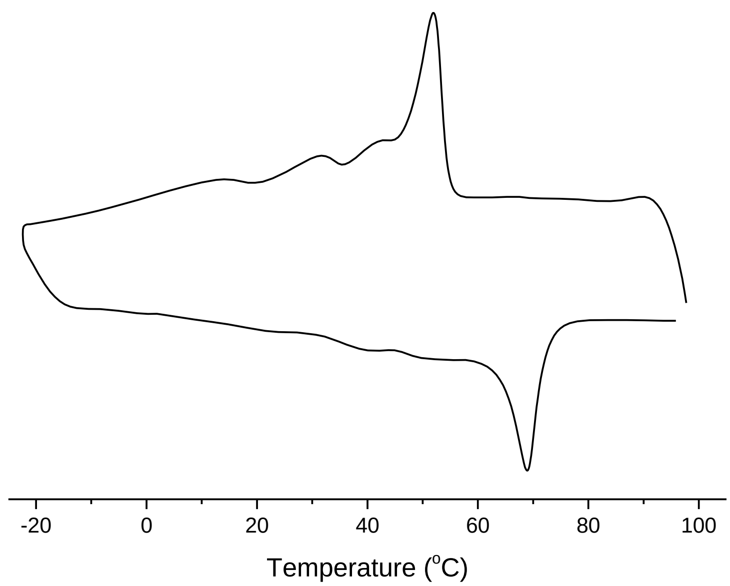

Figure S14. DSC of poly(dodecane dodecanediote).

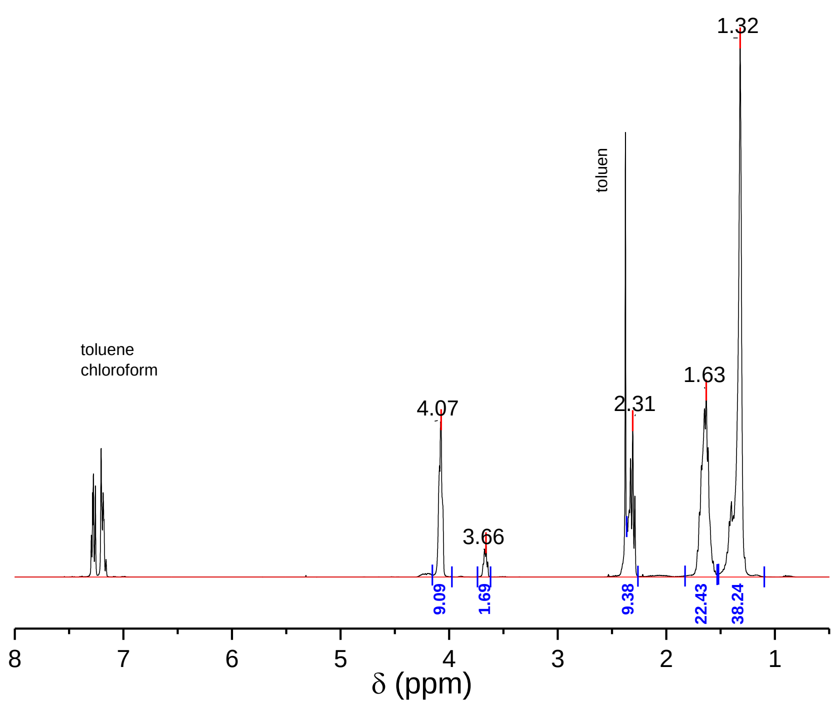

Figure S15. ^{1}H NMR spectrum of 1,6 hexanediol and 1,10-decanediol copolymer ($CDCl_3$, 400 MHz).

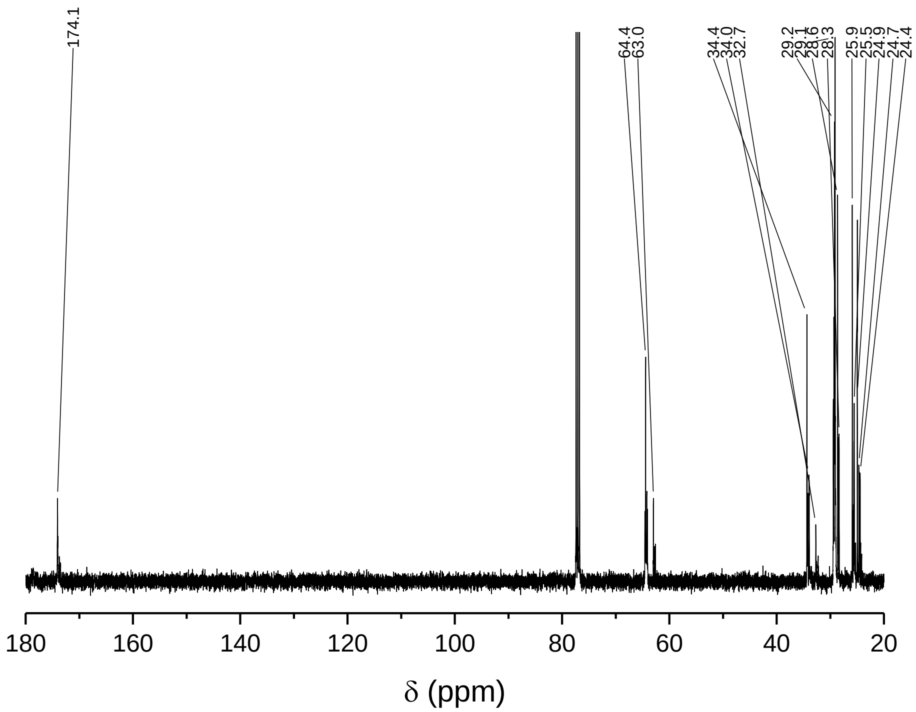

Figure S16. ^{13}C NMR spectrum of 1,6 hexanediol and 1,10-decanediol copolymer ($CDCl_3$, 100 MHz).

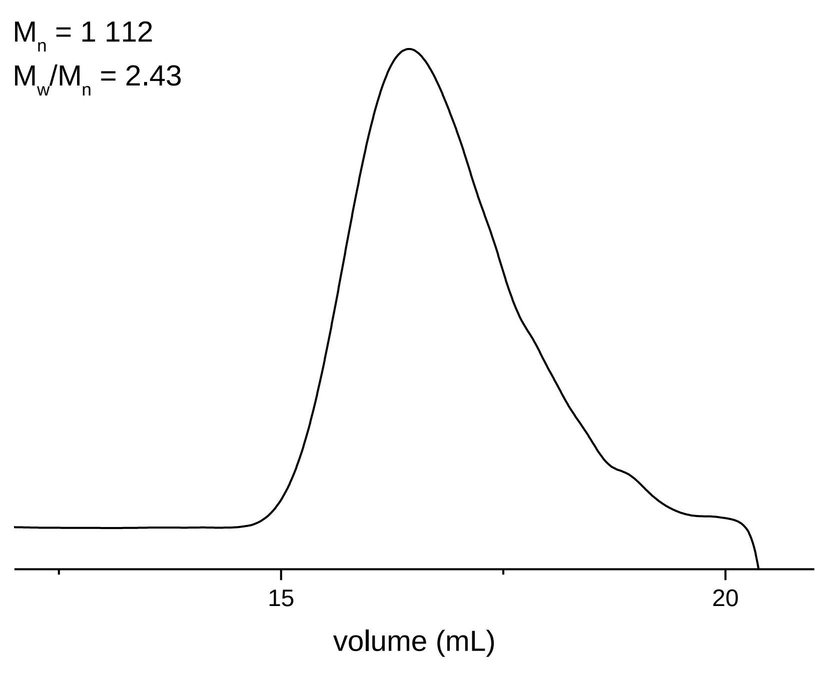

Figure S17. GPC chromatogram of 1,6 hexanediol and 1,10-decanediol copolymer.

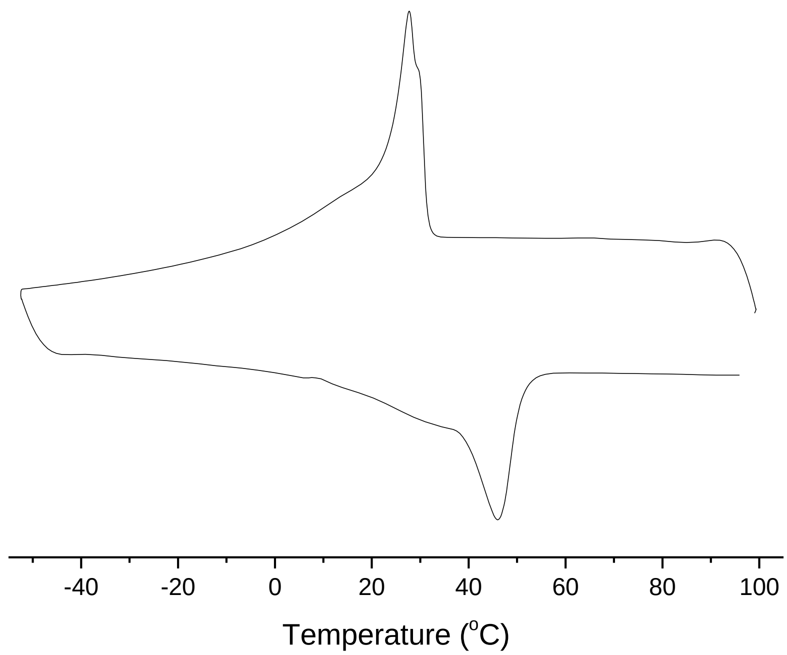

Figure S18. DSC of 1,6 hexanediol and 1,10-decanediol copolymer.

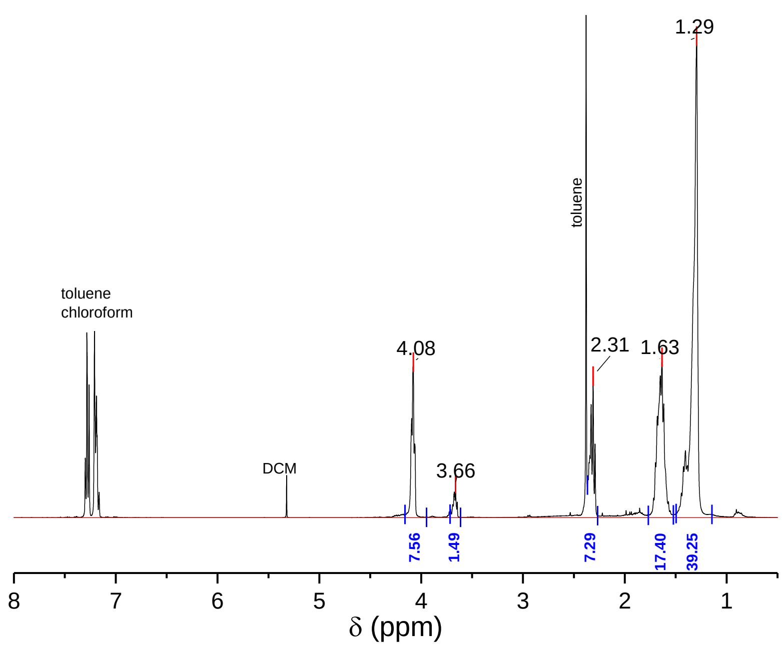

Figure S19. [1]H NMR spectrum of 1,6-hexanediol and 1,12-dodecanediol copolymer ($CDCl_3$, 400 MHz).

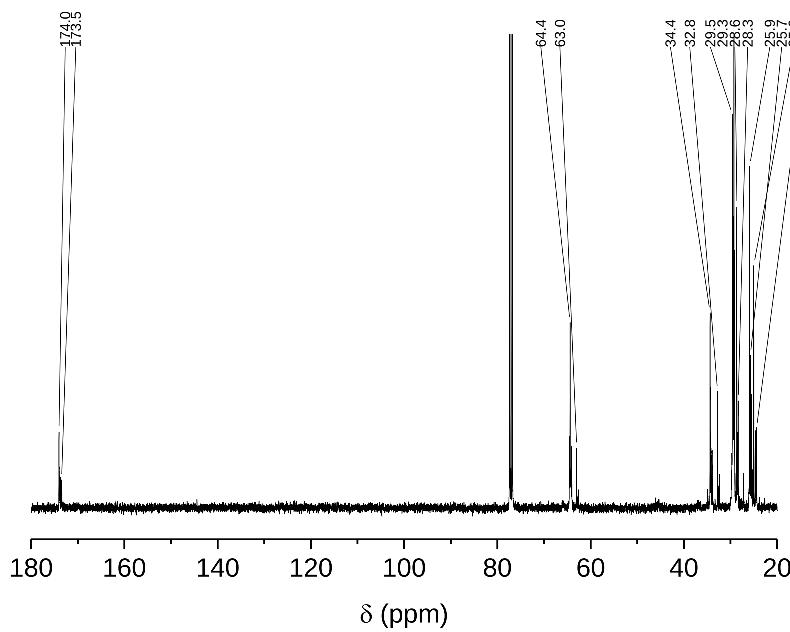

Figure S20. [13]C NMR spectrum of 1,6-hexanediol and 1,12-dodecanediol copolymer ($CDCl_3$, 100 MHz).

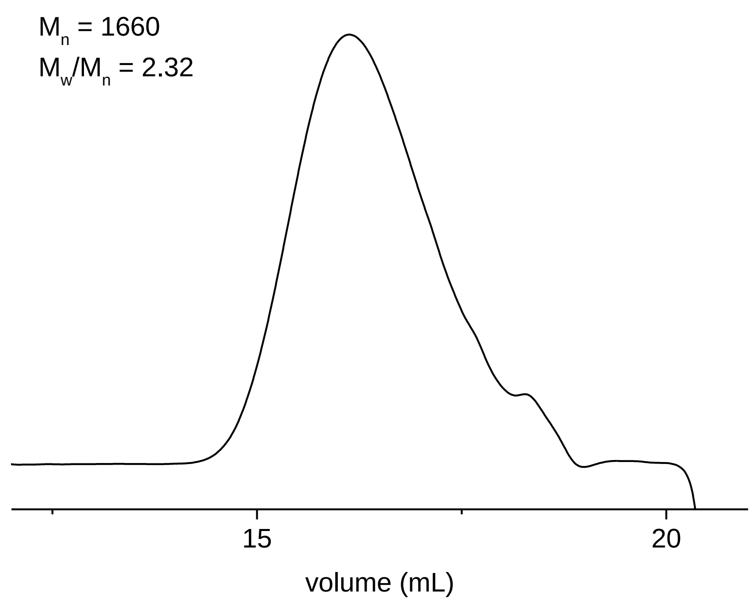

Figure S21. GPC chromatogram of 1,6-hexanediol and 1,12-dodecanediol copolymer.

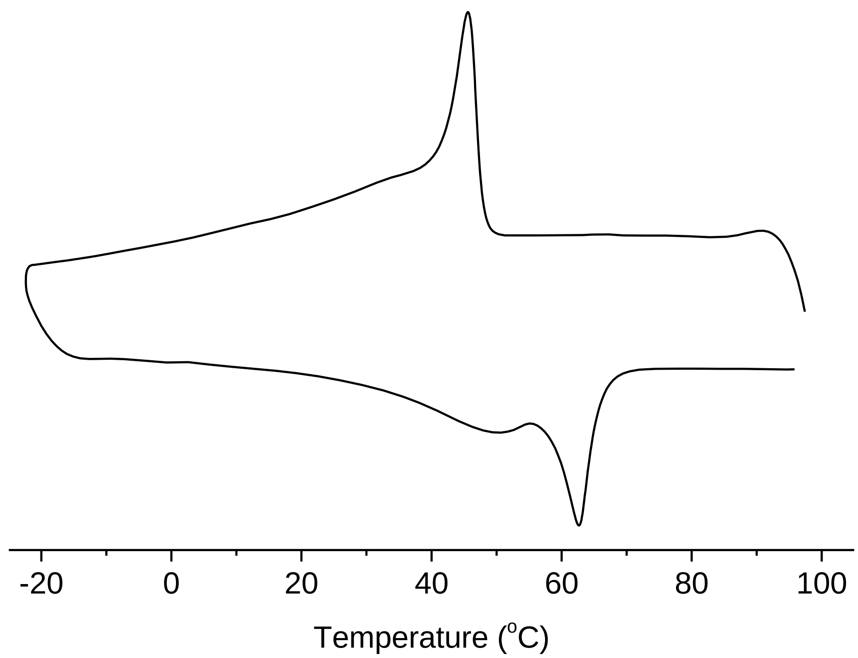

Figure S22. DSC of 1,6-hexanediol and 1,12-dodecanediol copolymer.

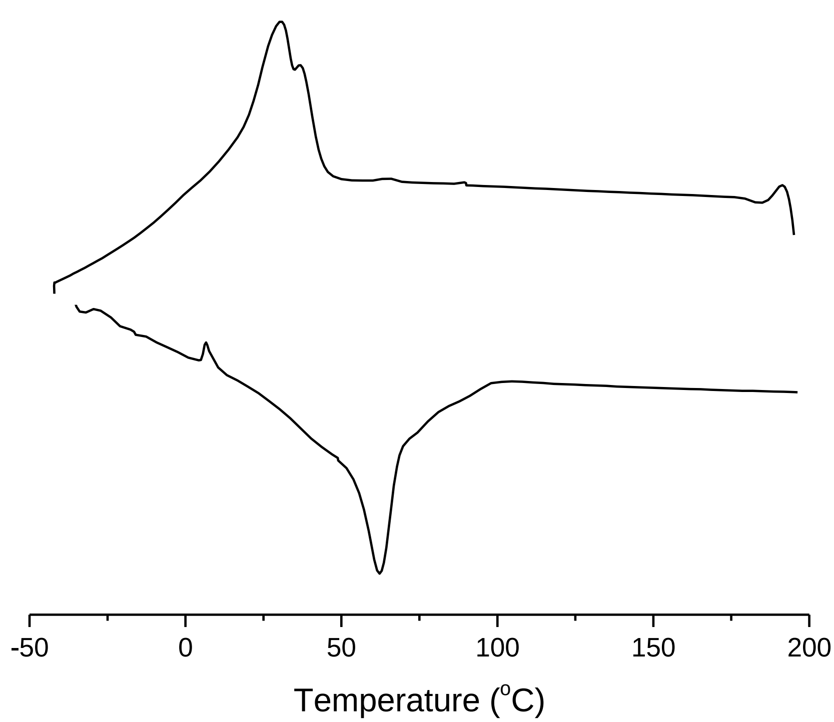

Figure S23. DSC of a polyurethane prepared from poly(decane sebacate) and hexamethylene diisocyanate.

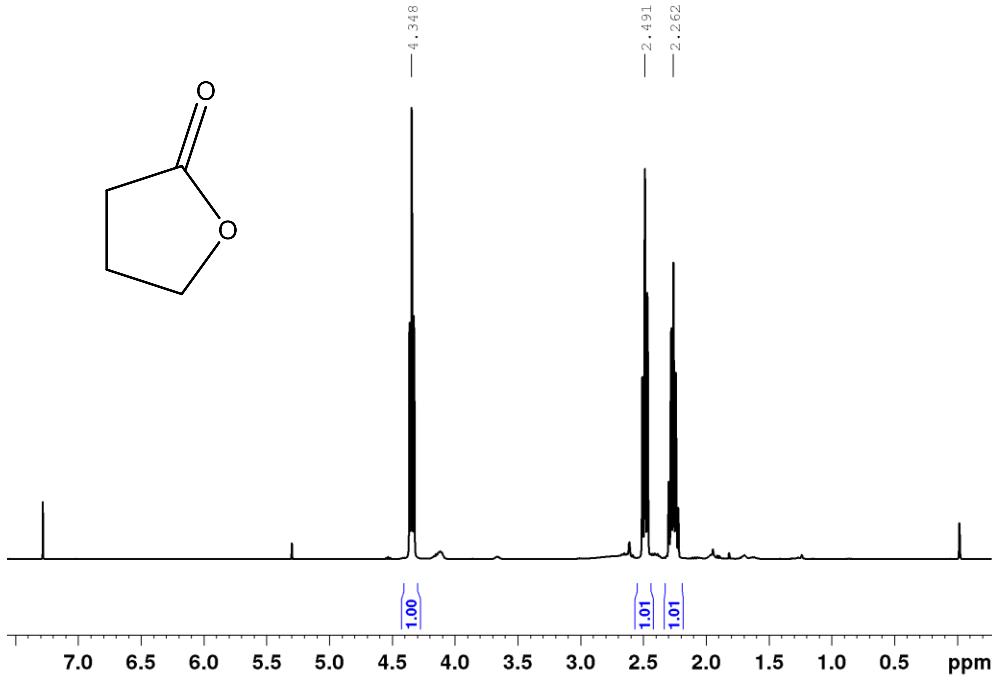

Figure S24. ^{1}H NMR spectrum of the product of oxidative self-esterification of 1,4-butanediol ($CDCl_3$, 400 MHz). δ_H: 4.35 (2H t, (**CH_2**O)); 2.49 (2H, t, **CH_2**C(O))); 2.26 (2H, m, (CH_2**CH_2**CH_2)). The product has been identified as γ-butyrolactone.

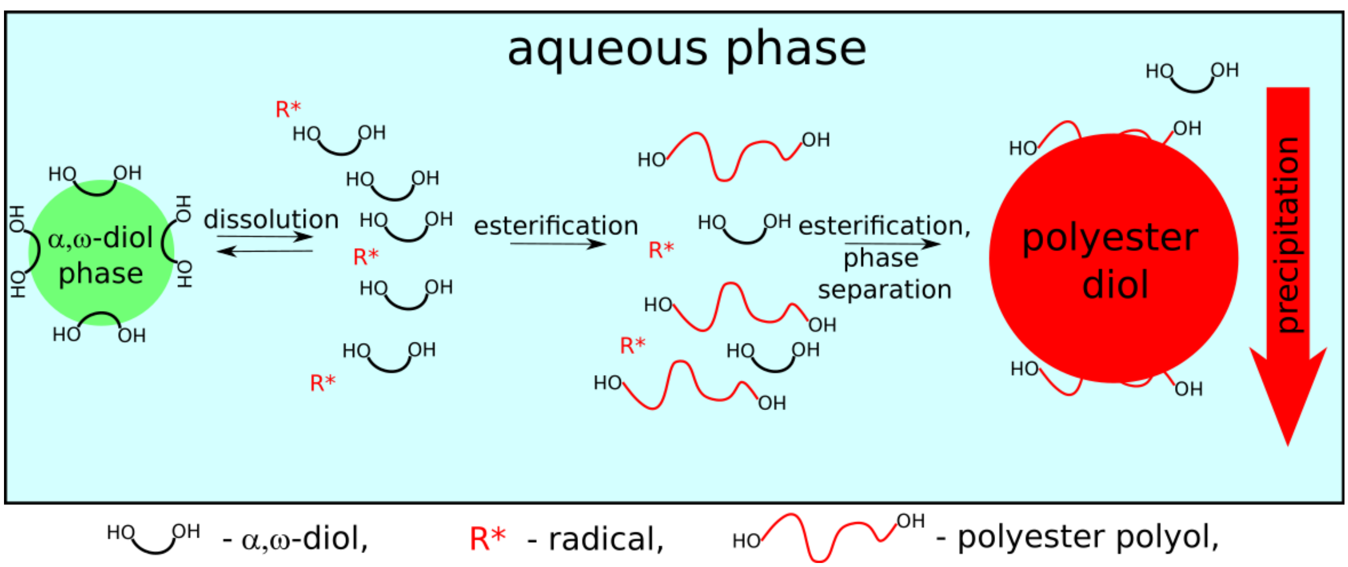

Figure S25. The cartoon shows a proposed sequence of processes that lead from a α,ω-aliphatic diol to a polyester polyol via radical oxidative self-esterification carried out in an aqueous solution. A diol, which is fully or partially dissolved in water, reacts with generated in the solution radicals and forms oligomers. With the increase of the molecular weight, molecules reach a critical size at which they collapse and phase out from the solution, which prevents them from growing further.