Supplementary Information

^{1}H NMR Data of the Polymers Synthesized

PMestOx
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 297 H), 3.46 (br, NCH_2CH_2N, 396 H), 3.14 (br, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (br, $COCH_2CH_2CO$, 396 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H)

PC3MestOx
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 267 H), 3.46 (br, NCH_2CH_2N, 356 H), 3.14 (br, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (br, $COCH_2CH_2CH_2CO$, 356 H), 1.90 (br, $COCH_2CH_2CH_2CO$, 178 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H)

PnPropOx
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.46 (br, NCH_2CH_2N, 380 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.27 (b, $COCH_2$, 190 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.63 (b, $COCH_2CH_2$, 190 H), 0.95 (br, CH_2CH_3, 285 H)

P(EtOx-MestOx, 90:10)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 24 H), 3.46 (br, NCH_2CH_2N, 380 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CO$, 32 H), 2.27 (b, $COCH_2$, 174 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.12 (br, CH_2CH_3, 261 H)

P(EtOx-MestOx, 80:20)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 57 H), 3.46 (br, NCH_2CH_2N, 388 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CO$, 76 H), 2.27 (b, $COCH_2$, 156 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.12 (br, CH_2CH_3, 234 H)

P(EtOx-MestOx, 70:30)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 87 H), 3.46 (br, NCH_2CH_2N, 388 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CO$, 116 H), 2.27 (b, $COCH_2$, 136 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.12 (br, CH_2CH_3, 204 H)

P(EtOx-MestOx, 50:50)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 147 H), 3.46 (br, NCH_2CH_2N, 384 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CO$, 196 H), 2.27 (b, $COCH_2$, 96 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.12 (br, CH_2CH_3, 144 H)

P(EtOx-MestOx, 30:70)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 207 H), 3.46 (br, NCH_2CH_2N, 388 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CO$, 276 H), 2.27 (b, $COCH_2$, 56 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.12 (br, CH_2CH_3, 84 H)

P(EtOx-C3MestOx, 90:10)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 30 H), 3.46 (br, NCH_2CH_2N, 392 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CH_2CO$, 40 H), 2.27 (b, $COCH_2$, 174 H), 1.90 (br, $COCH_2CH_2CH_2CO$, 20 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.12 (br, CH_2CH_3, 261 H)

P(EtOx-C3MestOx, 80:20)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 57 H), 3.46 (br, NCH_2CH_2N, 392 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CH_2CO$, 76 H), 2.27 (b, $COCH_2$,

158 H), 1.90 (br, $COCH_2CH_2CH_2CO$, 38 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.12 (br, CH_2CH_3, 237 H)

P(EtOx-C3MestOx, 70:30)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 57 H), 3.46 (br, NCH_2CH_2N, 388 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CH_2CO$, 116 H), 2.27 (b, $COCH_2$, 136 H), 1.90 (br, $COCH_2CH_2CH_2CO$, 58 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.12 (br, CH_2CH_3, 204 H)

P(EtOx-C3MestOx, 50:50)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 147 H), 3.46 (br, NCH_2CH_2N, 388 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CH_2CO$, 196 H), 2.27 (b, $COCH_2$, 96 H), 1.90 (br, $COCH_2CH_2CH_2CO$, 98 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.12 (br, CH_2CH_3, 144 H)

P(EtOx-C3MestOx, 30:70)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 204 H), 3.46 (br, NCH_2CH_2N, 384 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CH_2CO$, 204 H), 2.27 (b, $COCH_2$, 56 H), 1.90 (br, $COCH_2CH_2CH_2CO$, 136 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.12 (br, CH_2CH_3, 84 H)

P(nPropOx-MestOx, 90:10)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 30 H), 3.46 (br, NCH_2CH_2N, 376 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CO$, 40 H), 2.27 (b, $COCH_2$, 168 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.63 (b, $COCH_2CH_2$, 168 H), 0.95 (br, CH_2CH_3, 252 H)

P(nPropOx-MestOx, 80:20)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 57 H), 3.46 (br, NCH_2CH_2N, 396 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CO$, 76 H), 2.27 (b, $COCH_2$, 160 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.63 (b, $COCH_2CH_2$, 160 H), 0.95 (br, CH_2CH_3, 240 H)

P(nPropOx-MestOx, 70:30)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 87 H), 3.46 (br, NCH_2CH_2N, 368 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CO$, 116 H), 2.27 (b, $COCH_2$, 126 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.63 (b, $COCH_2CH_2$, 126 H), 0.95 (br, CH_2CH_3, 189 H)

P(nPropOx-MestOx, 50:50)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 150 H), 3.46 (br, NCH_2CH_2N, 380 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CO$, 200 H), 2.27 (b, $COCH_2$, 90 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.63 (b, $COCH_2CH_2$, 90 H), 0.95 (br, CH_2CH_3, 135 H)

P(nPropOx-MestOx, 30:70)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 231 H), 3.46 (br, NCH_2CH_2N, 420 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CO$, 308 H), 2.27 (b, $COCH_2$, 56 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.63 (b, $COCH_2CH_2$, 56 H), 0.95 (br, CH_2CH_3, 118 H)

P(nPropOx-C3MestOx, 90:10)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 30 H), 3.46 (br, NCH_2CH_2N, 416 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CH_2CO$, 40 H), 2.27 (b, $COCH_2$, 188 H), 1.90 (br, $COCH_2CH_2CH_2CO$, 20 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.63 (b, $COCH_2CH_2$, 188 H), 0.95 (br, CH_2CH_3, 282 H)

P(nPropOx-C3MestOx, 80:20)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 57 H), 3.46 (br, NCH_2CH_2N, 368 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CH_2CO$, 76 H), 2.27 (b, $COCH_2$, 146 H), 1.90 (br, $COCH_2CH_2CH_2CO$, 38 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.63 (b, $COCH_2CH_2$, 146 H), 0.95 (br, CH_2CH_3, 292 H)

P(nPropOx-C3MestOx, 70:30)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 87 H), 3.46 (br, NCH_2CH_2N, 372 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CH_2CO$, 116 H), 2.27 (b, $COCH_2$, 168 H), 1.90 (br, $COCH_2CH_2CH_2CO$, 58 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.63 (b, $COCH_2CH_2$, 168 H), 0.95 (br, CH_2CH_3, 192 H)

P(nPropOx-C3MestOx, 50:50)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 147 H), 3.46 (br, NCH_2CH_2N, 376 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CH_2CO$, 196 H), 2.27 (b, $COCH_2$, 90 H), 1.90 (br, $COCH_2CH_2CH_2CO$, 98 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.63 (b, $COCH_2CH_2$, 90 H), 0.95 (br, CH_2CH_3, 175 H)

P(nPropOx-C3MestOx, 30:70)
^{1}H NMR ($CDCl_3$, 300 MHz): δ 3.64 (br, $COOCH_3$, 204 H), 3.46 (br, NCH_2CH_2N, 380 H), 3.14 (b, CH_2NCH_2 piperidine, 4 H), 2.96 (s, NCH_3, 3 H), 2.63 (b, $COCH_2CH_2CH_2CO$, 272 H), 2.27 (b, $COCH_2$, 54 H), 1.90 (br, $COCH_2CH_2CH_2CO$, 136 H), 1.78 (s, $CH_2CH_2CH_2$ piperidine, 6 H), 1.63 (b, $COCH_2CH_2$, 54 H), 0.95 (br, CH_2CH_3, 81 H)

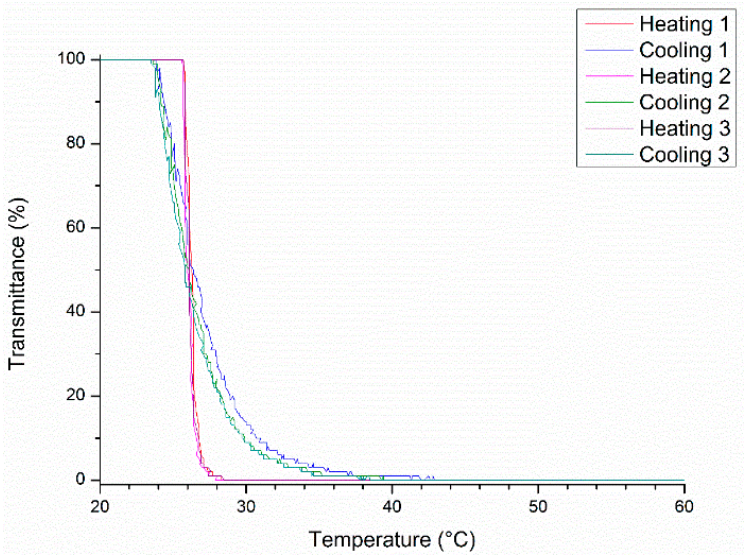

Figure S1. Turbidity curves during heating and cooling of P(nPropOx) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

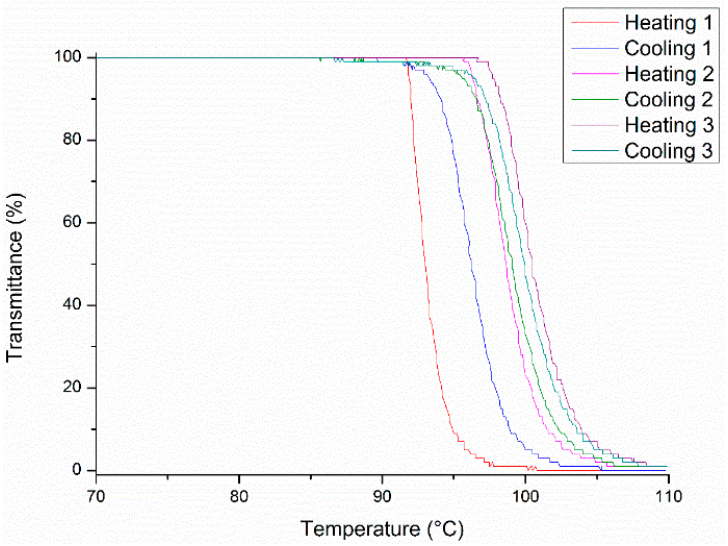

Figure S2. Turbidity curves during heating and cooling of P(EtOx-MestOx, 90:10) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

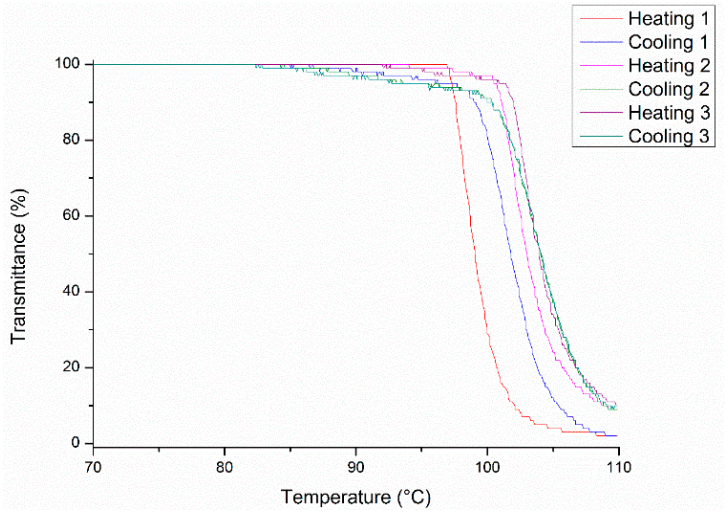

Figure S3. Turbidity curves during heating and cooling of P(EtOx-MestOx, 80:20) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

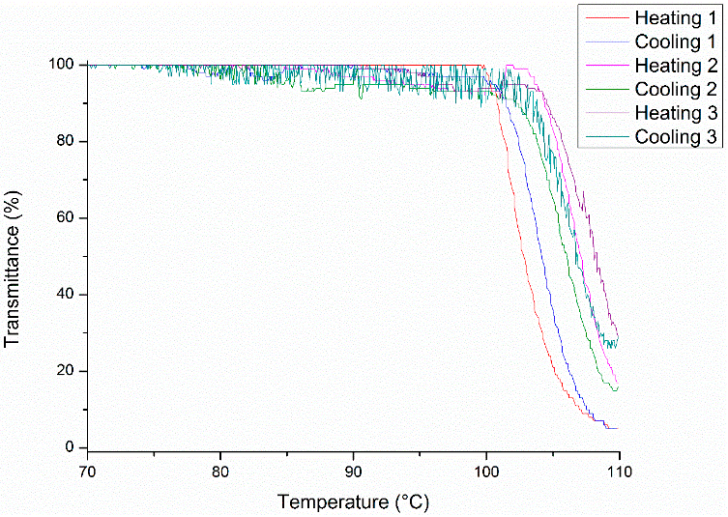

Figure S4. Turbidity curves during heating and cooling of P(EtOx-MestOx, 70:30) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

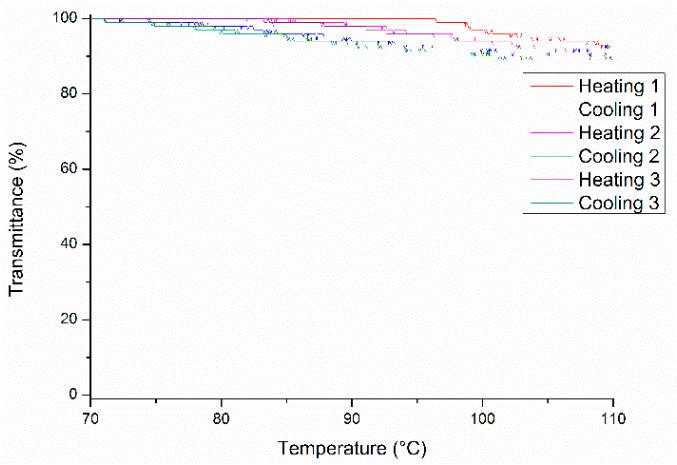

Figure S5. Turbidity curves during heating and cooling of P(EtOx-MestOx, 50:50) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

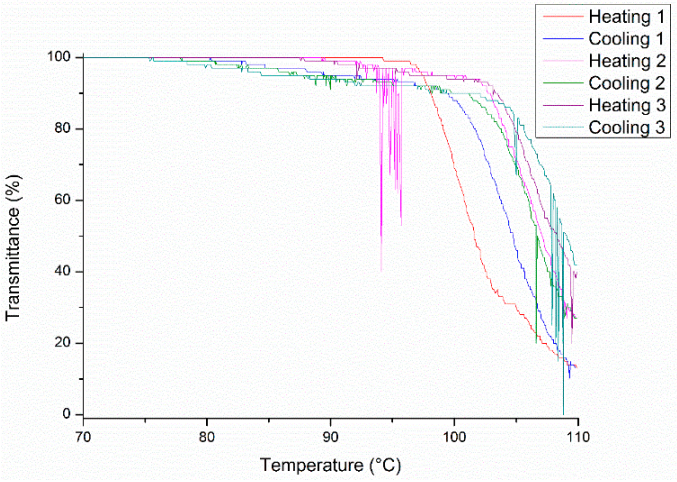

Figure S6. Turbidity curves during heating and cooling of P(EtOx-MestOx, 30:70) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

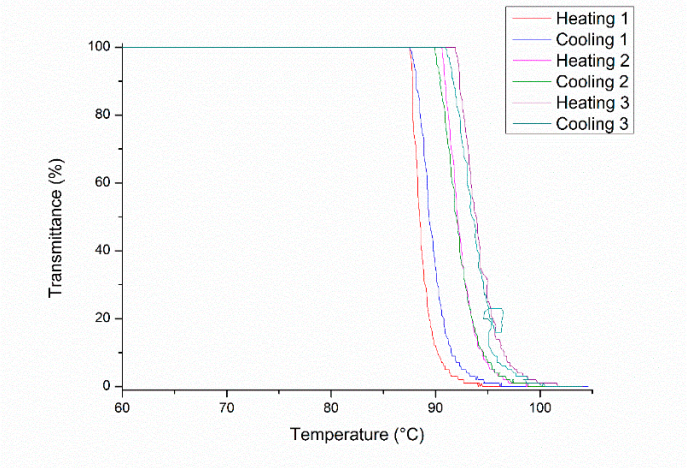

Figure S7. Turbidity curves during heating and cooling of P(EtOx-C3MestOx, 90:10) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

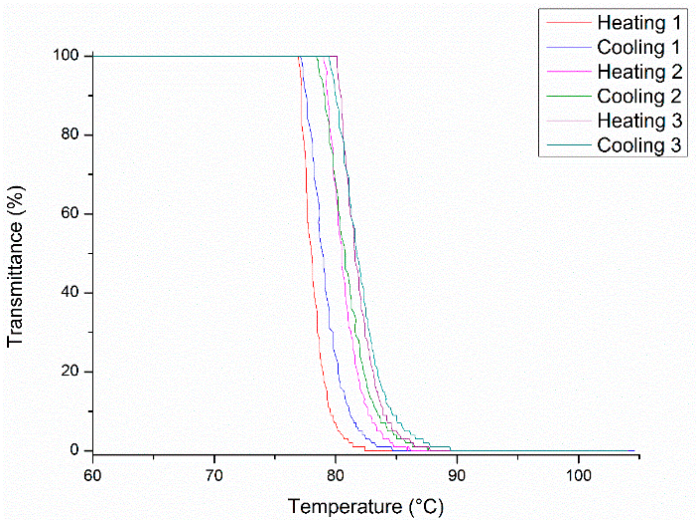

Figure S8. Turbidity curves during heating and cooling of P(EtOx-C3MestOx, 80:20) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

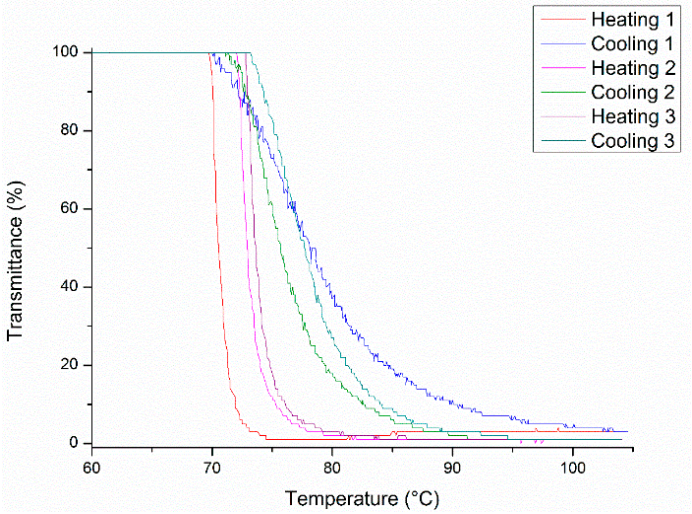

Figure S9. Turbidity curves during heating and cooling of P(EtOx-C3MestOx, 70:30) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

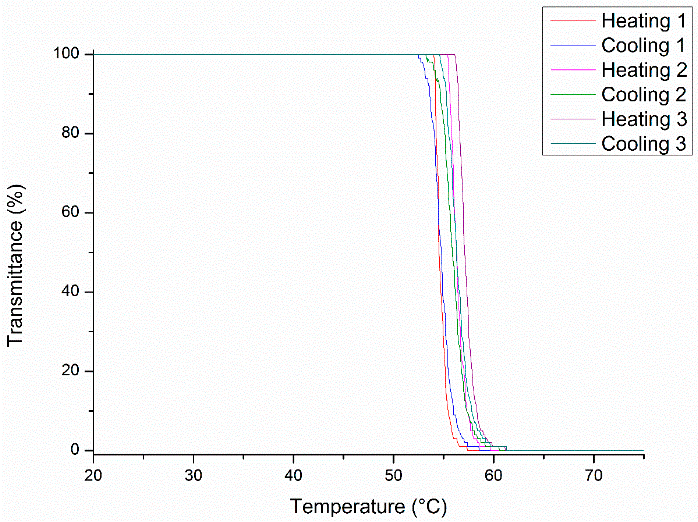

Figure S10. Turbidity curves during heating and cooling of P(EtOx-C3MestOx, 50:50) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

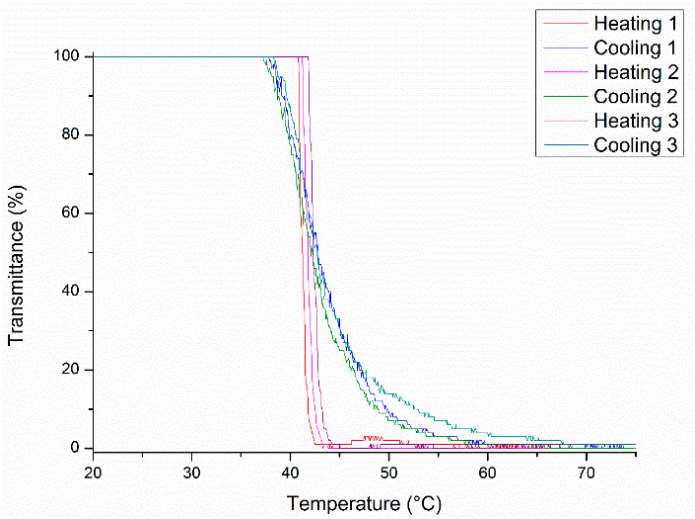

Figure S11. Turbidity curves during heating and cooling of P(EtOx-C3MestOx, 30:70) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

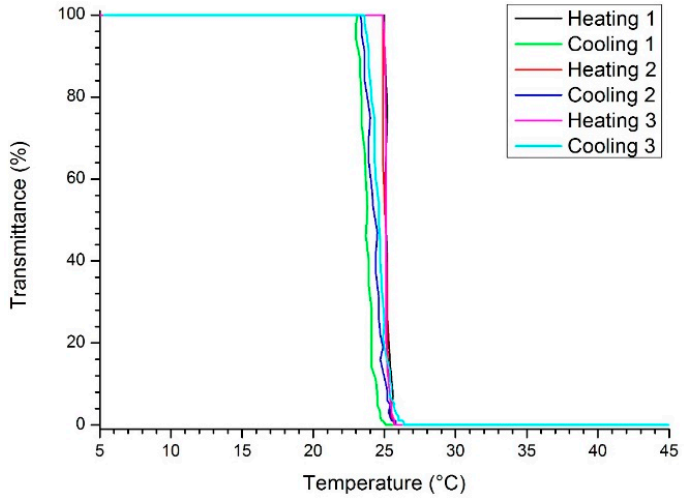

Figure S12. Turbidity curves during heating and cooling of P(nPropOx-MestOx, 90:10) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

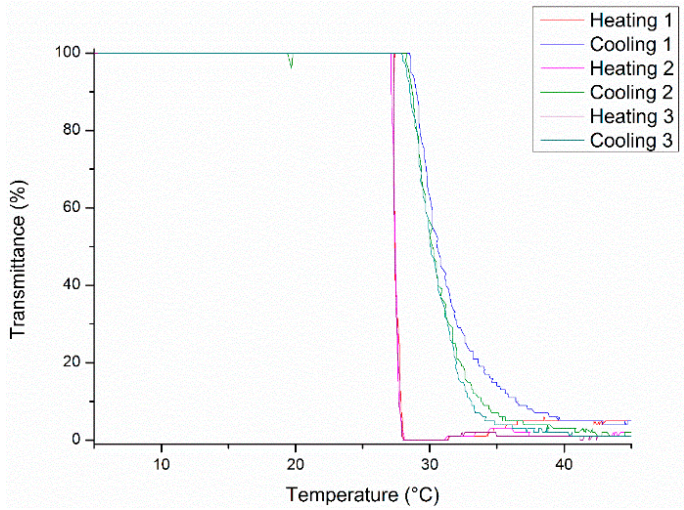

Figure S13. Turbidity curves during heating and cooling of P(nPropOx-MestOx, 80:20) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

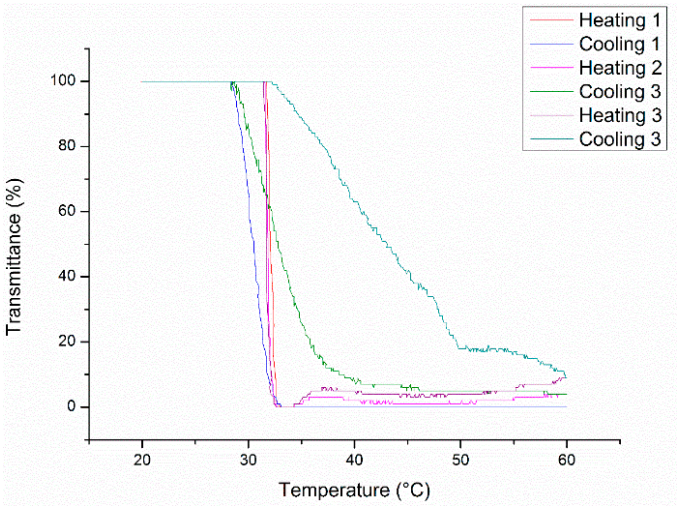

Figure S14. Turbidity curves during heating and cooling of P(nPropOx-MestOx, 70:30) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

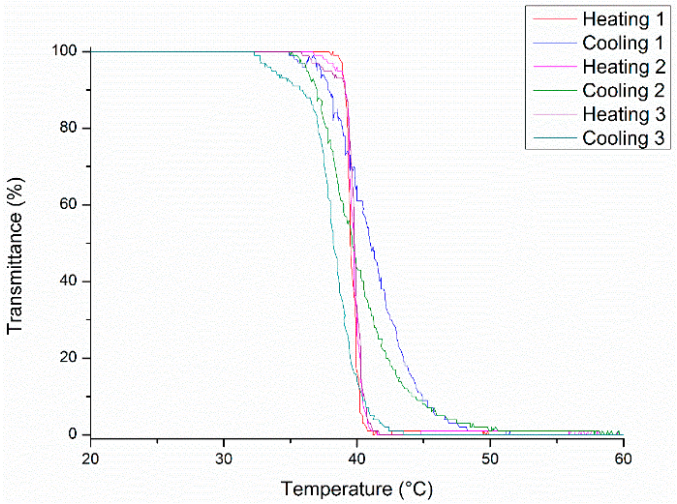

Figure S15. Turbidity curves during heating and cooling of P(nPropOx-MestOx, 50:50) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

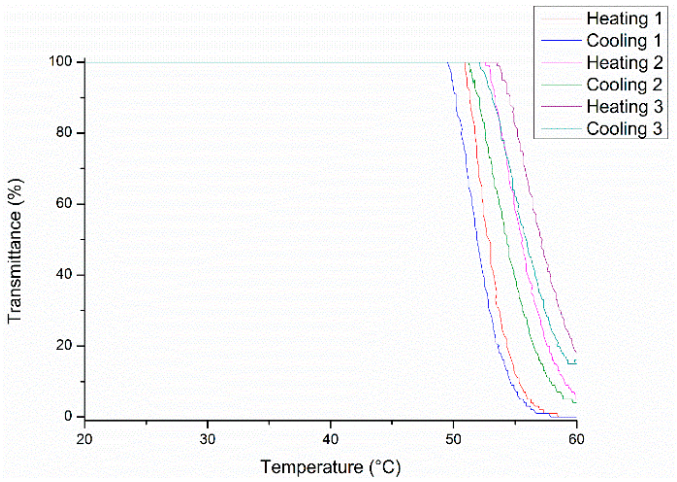

Figure S16. Turbidity curves during heating and cooling of P(nPropOx-MestOx, 30:70) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

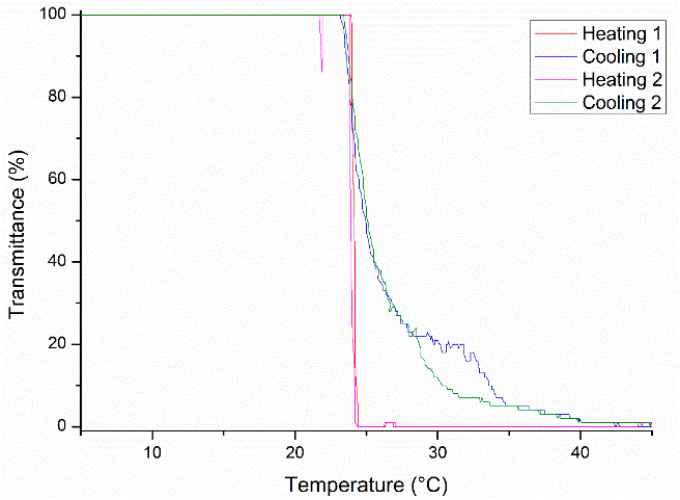

Figure S17. Turbidity curves during heating and cooling of P(nPropOx-C3MestOx, 90:10) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

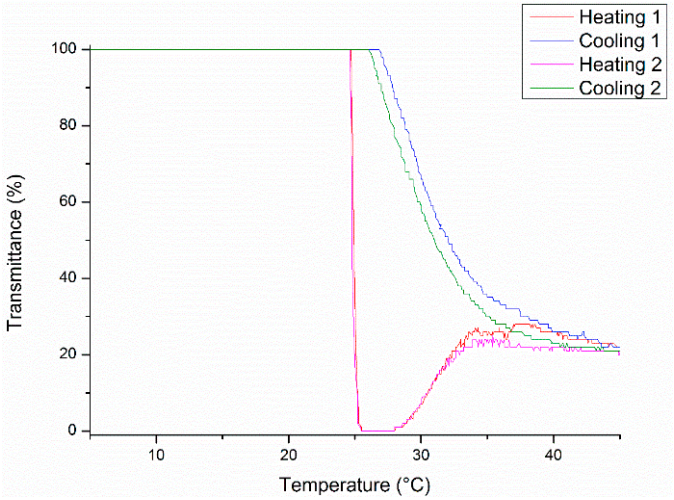

Figure S18. Turbidity curves during heating and cooling of P(nPropOx-C3MestOx, 80:20) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

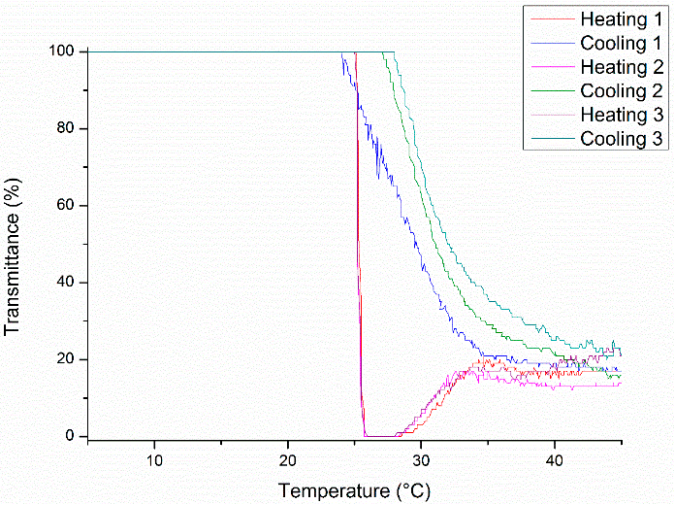

Figure S19. Turbidity curves during heating and cooling of P(nPropOx-C3MestOx, 70:30) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

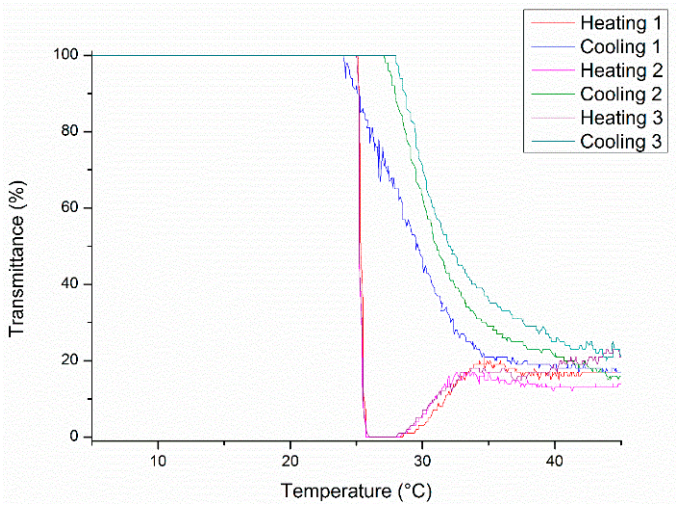

Figure S20. Turbidity curves during heating and cooling of P(nPropOx-C3MestOx, 50:50) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

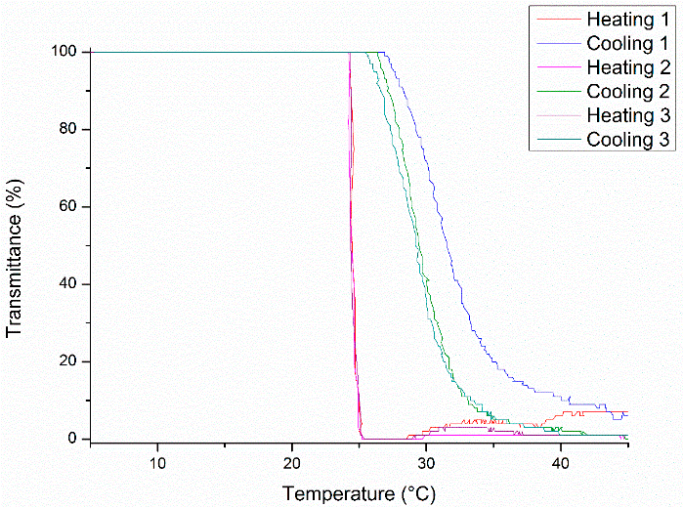

Figure S21. Turbidity curves during heating and cooling of P(nPropOx-C3MestOx, 30:70) aqueous solutions (5 mg/mL) with a heating/cooling rate of 1 °C min^{-1}.

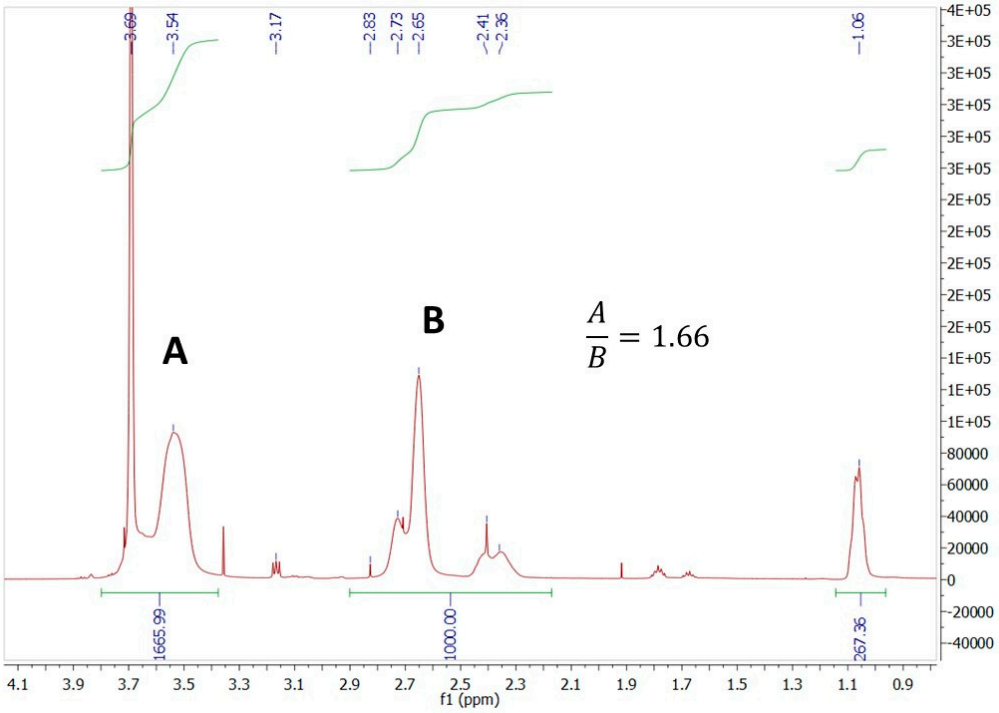

Figure S22. 1H NMR spectrum of P(EtOx-MestOx, 30:70) before TCP measurements in CDCl3.

The decrease of the methyl ester is determined by the integration of all side CH_2 protons of the sidechains (peaks of CH_2 next to methyl ester and carboxylic acid are overlapping, δ 2.17–2.90 ppm) and compared those with the overlapping peaks of the backbone and the methyl ester (δ 3.37–3.80 ppm).

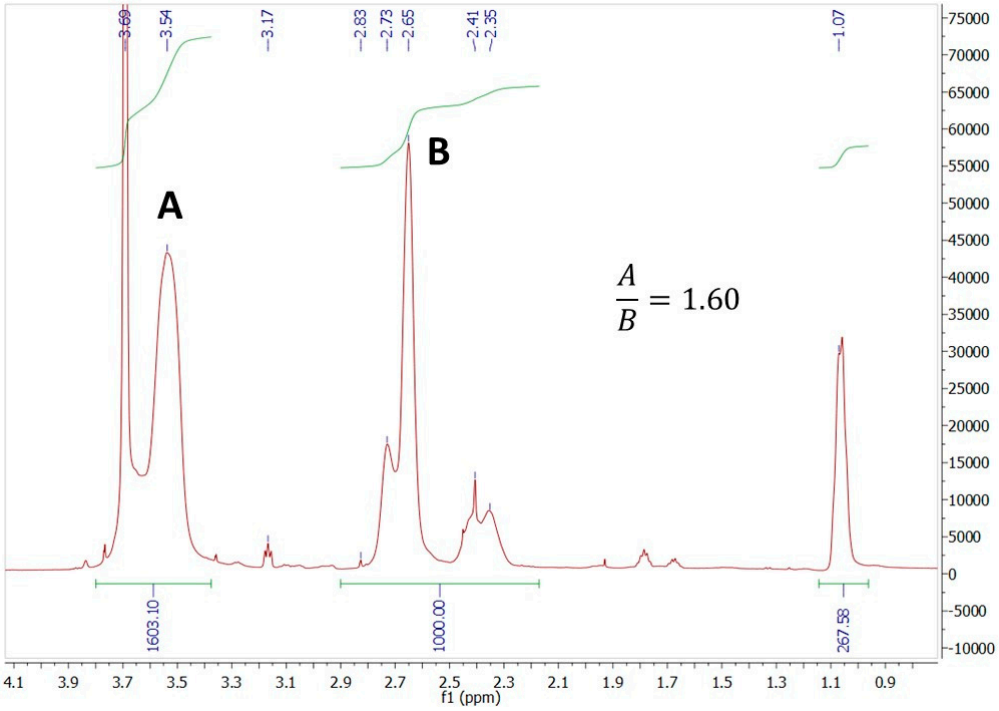

Figure S23. 1H NMR spectrum of P(EtOx-MestOx, 30:70) after TCP measurements.

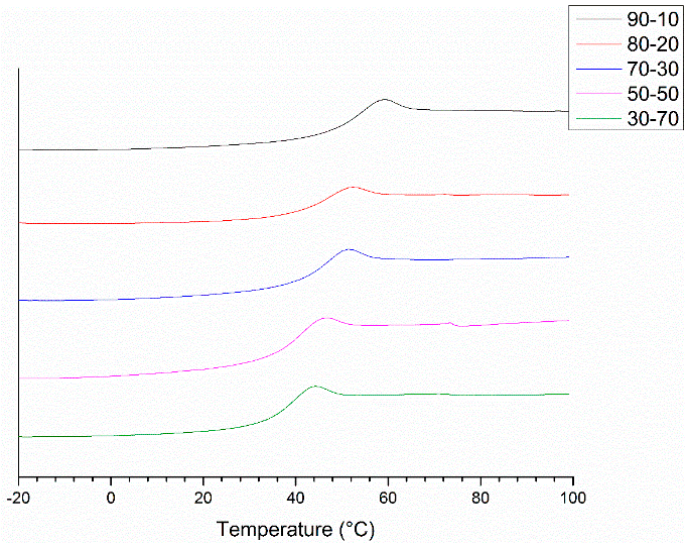

Figure S24. DSC traces of second heating run (10 K min-1) of P(EtOx-MestOx).

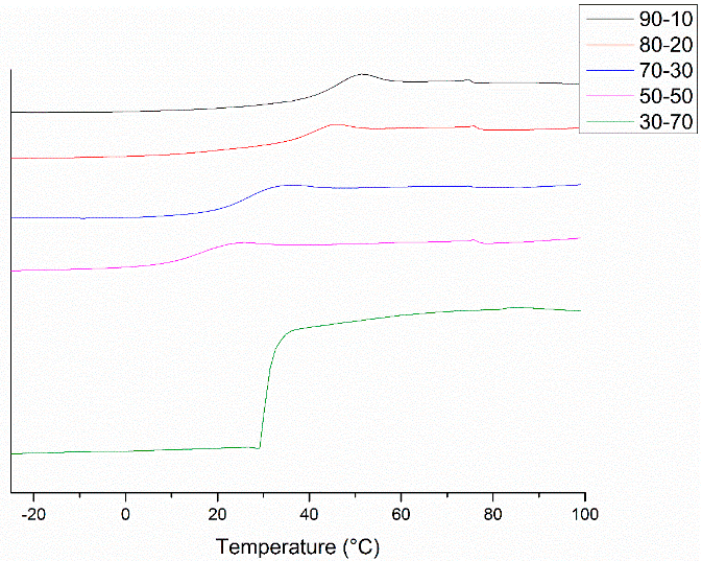

Figure S25. DSC traces of second heating run (10 K min-1) of P(EtOx-C3MestOx).

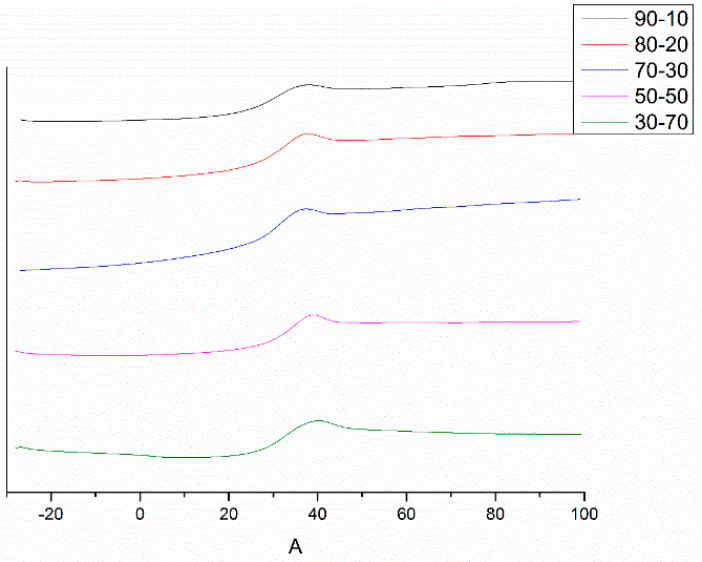

Figure S26. DSC traces of second heating run (10 K min-1) of P(nPropOx-MestOx).

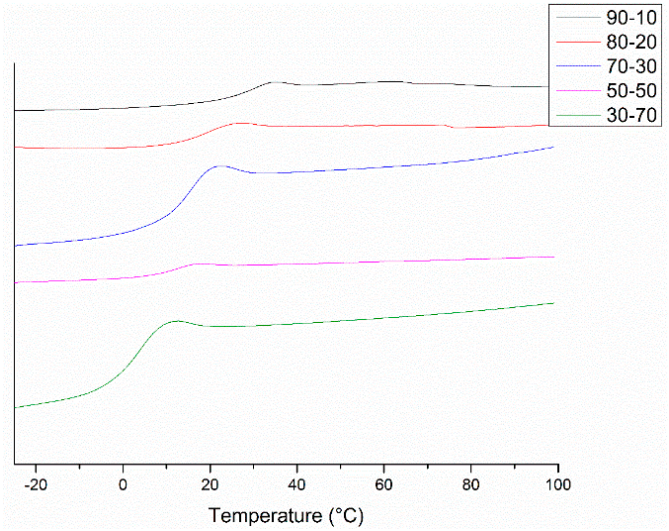

Figure S27. DSC traces of second heating run (10 K min-1) of P(nPropOx-C3MestOx).

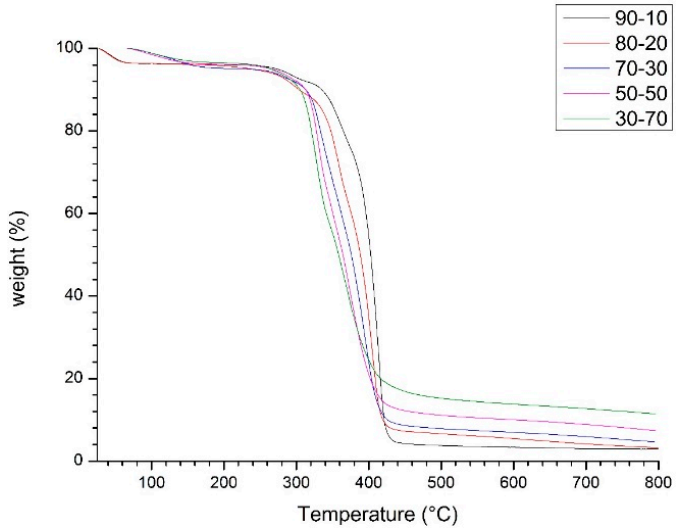

Figure S28. Thermogravimetric analysis of P(EtOx-MestOx) copolymers under nitrogen atmosphere at a heating rate of 10 ° C min^{-1}.

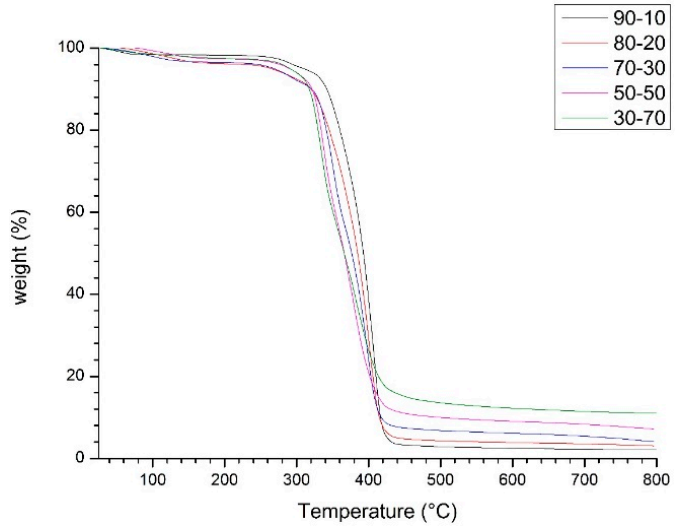

Figure S29. Thermogravimetric analysis of P(nPropOx-MestOx) copolymers under nitrogen atmosphere at a heating rate of 10 ° C min^{-1}.

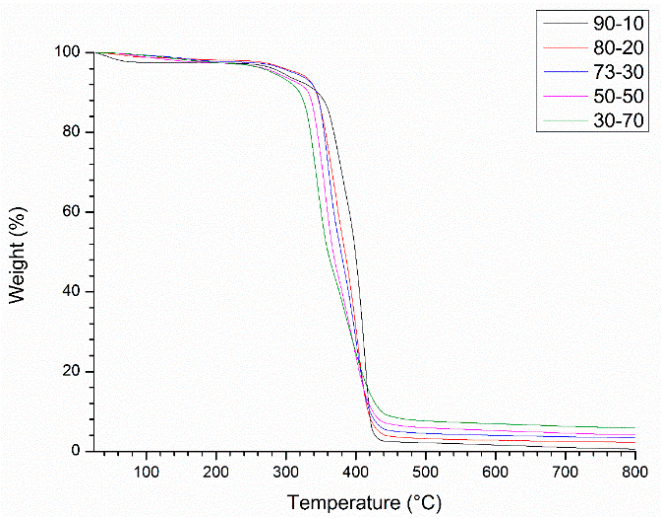

Figure S30. Thermogravimetric analysis of P(nPropOx-C3MestOx) copolymers under nitrogen atmosphere at a heating rate of 10 ° C min^{-1}.