Supporting Information

Self-Healing UV-Curable Urethane (Meth)acrylates with Various Soft Segment Chemistry

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HODA (Hydroxymethyl)-10-oxatricyclo[5.2.1.02.6]dec-8-ene-3,5-dione-2-aminoethanol)

^{1}H NMR (400 MHz, $CDCl_3$, 298 K) δ (ppm) 6.61 (d, 1H), 6.55 (t, 1H), 5.28 (s, 1H), 4.11 (s, 2H), 3.76 (t, 2H) , 3.69 (t, 2H) , 3.04 (d, 1H), 3.01 (d, 1H), 2.85 (s, 1H), 2.28 (s, 1H); **^{13}C NMR** (400 MHz, $CDCl_3$, 298 K) δ (ppm): 138.31; 136.96; 91.50; 80.96; 60.72; 60.16; 49.99; 48.17; 41.75; **FT-IR (cm^{-1})** 417, 456, 499, 522, 584, 613, 644, 678, 716, 731, 787, 805, 836, 844, 876, 932, 953, 977, 1012, 1036, 1074, 1091, 1111, 1159, 1185, 1248, 1272, 1289, 1303, 1326, 1348, 1363 1402, 1428, 1681, 1766, 2883, 2917, 2929, 2950, 2978, 3016, 3085, 3428.

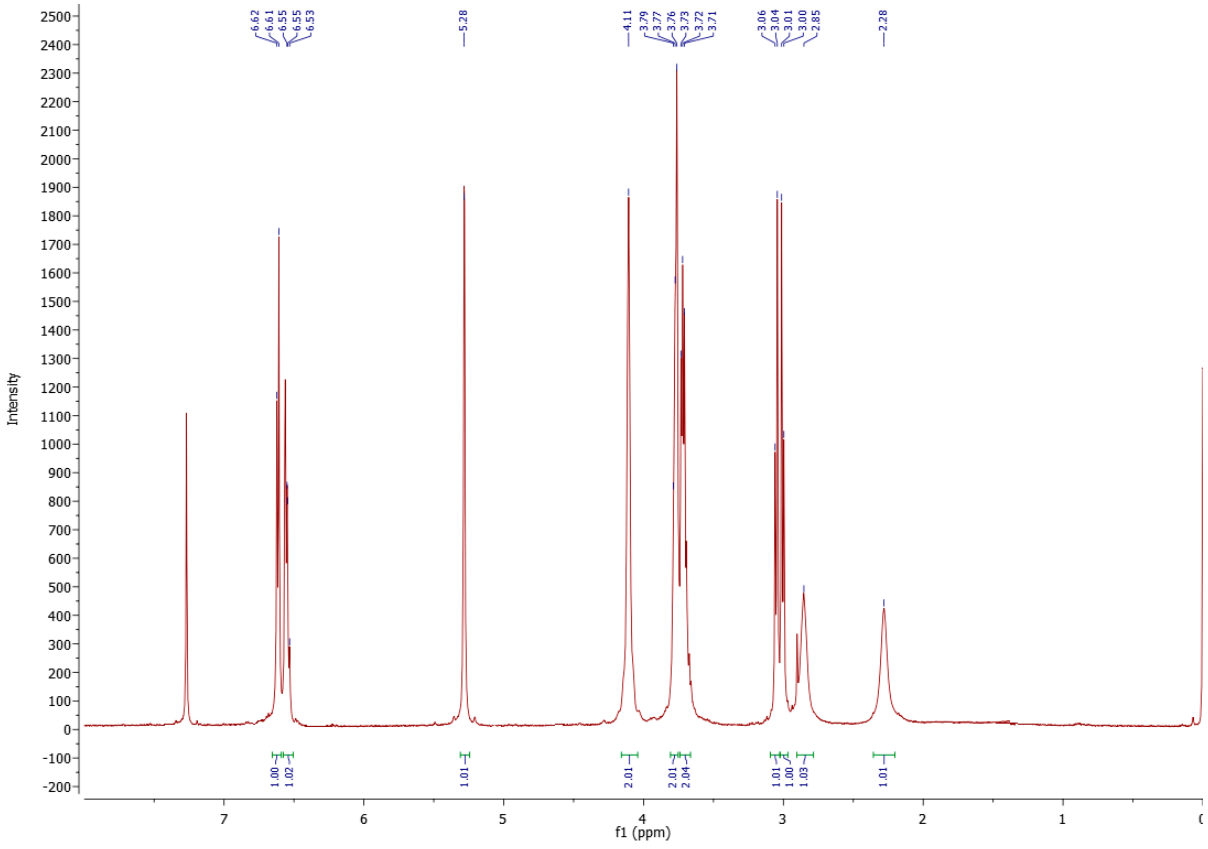

Figure S1. ^{1}H NMR HODA spectrum.

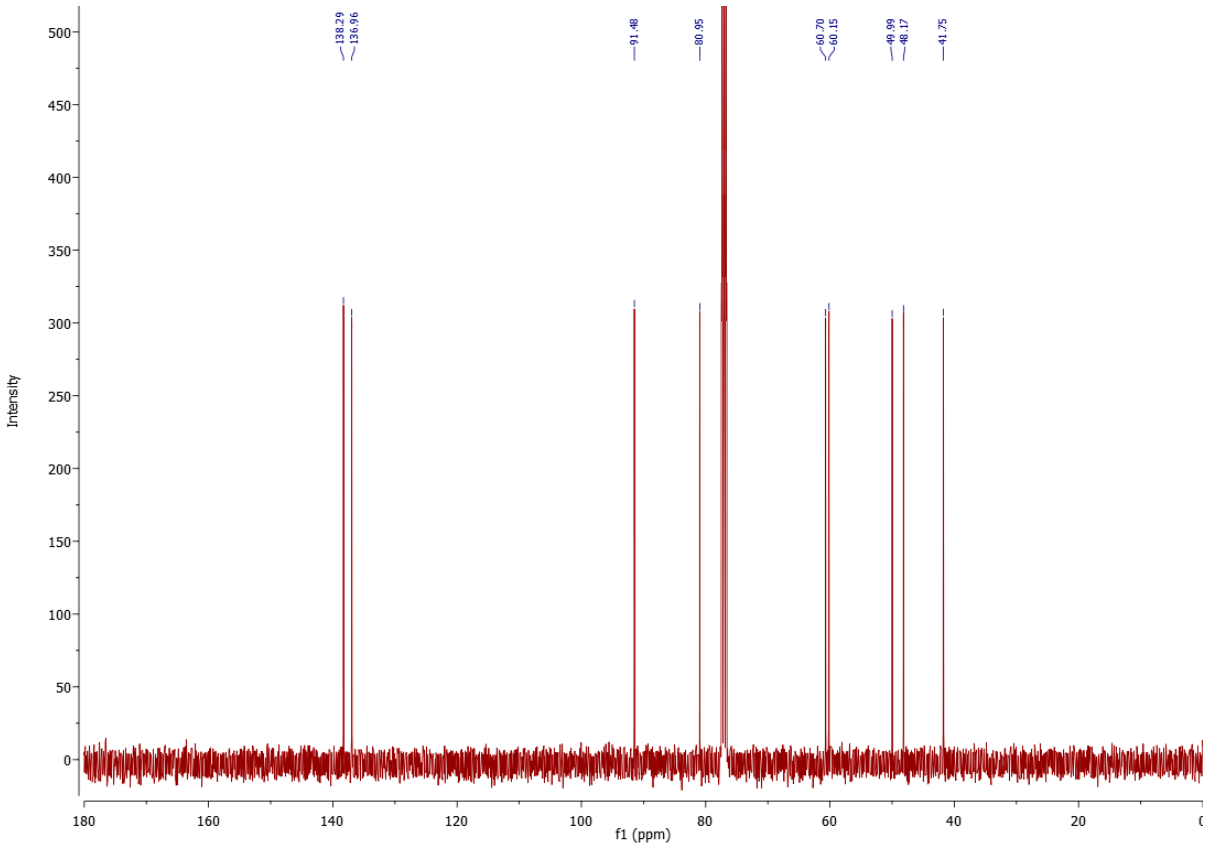

Figure S2. ^{13}C NMR HODA spectrum.

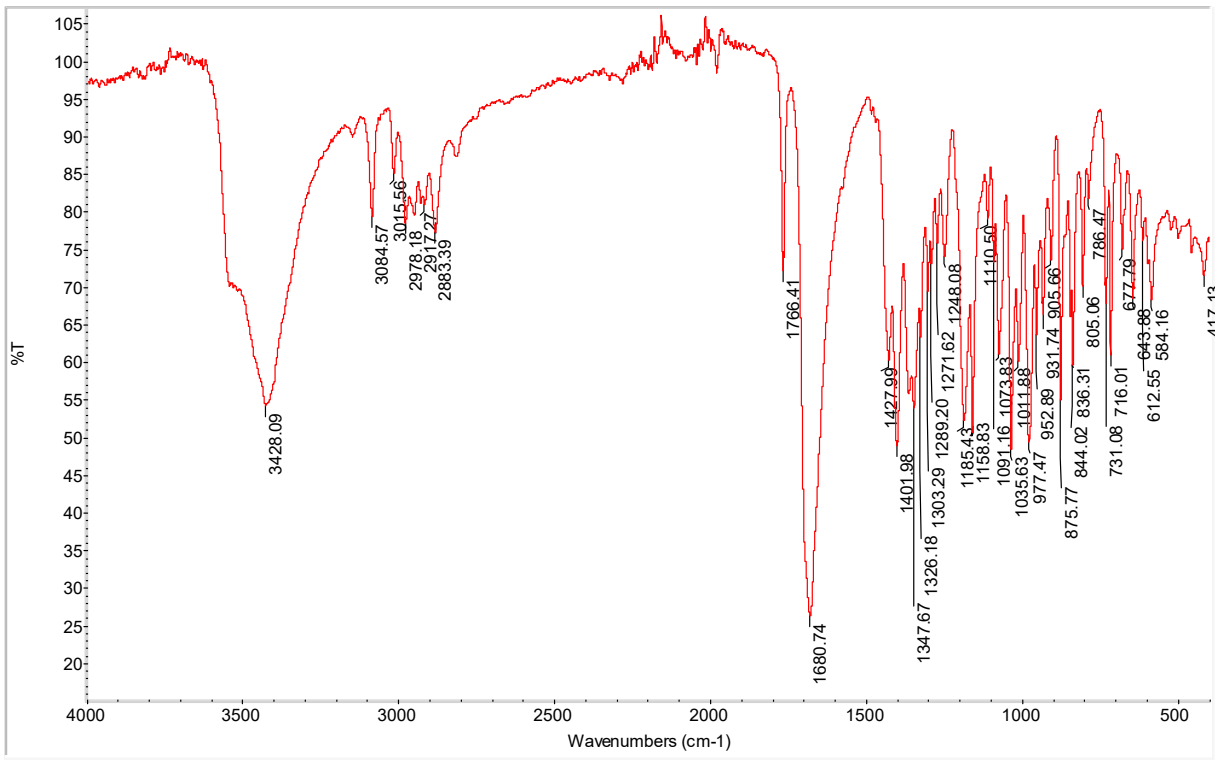

Figure S3. ATR-FTIR HODA spectrum.

The FT-IR spectra during the reaction time for the obtained urethane (meth)acrylates

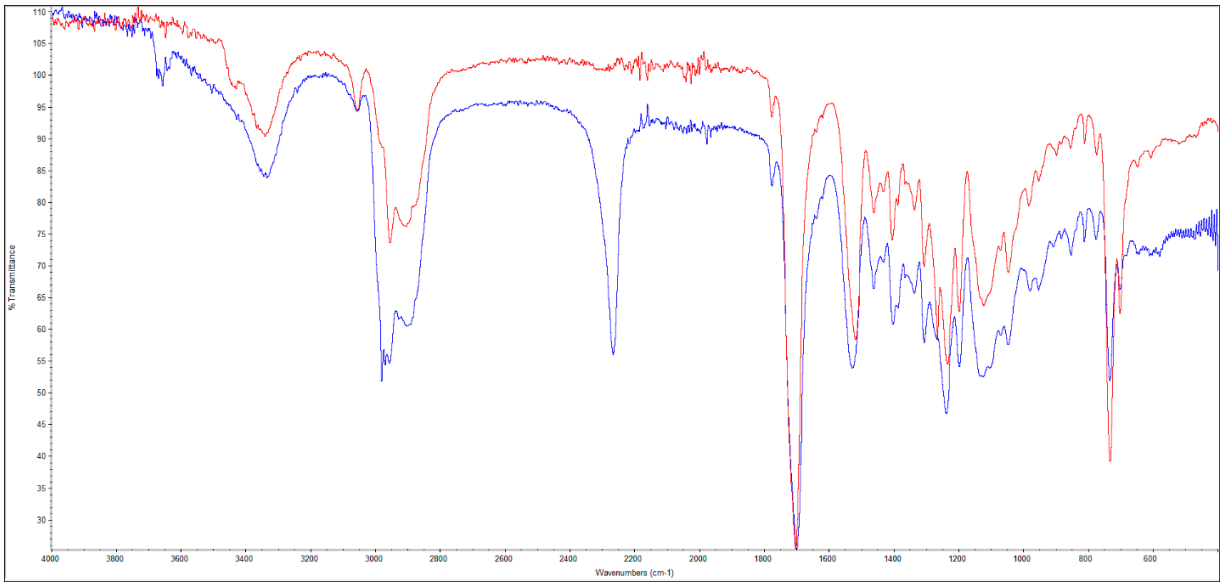

Figure S4. Comparitive of FTIR spectra investigating the reaction of receiving PEG400-HPA after 0 (blue) and 1 h (red) of reaction time. Comparison of FTIR peaks: NCO stretching at 2270 cm^{-1}.

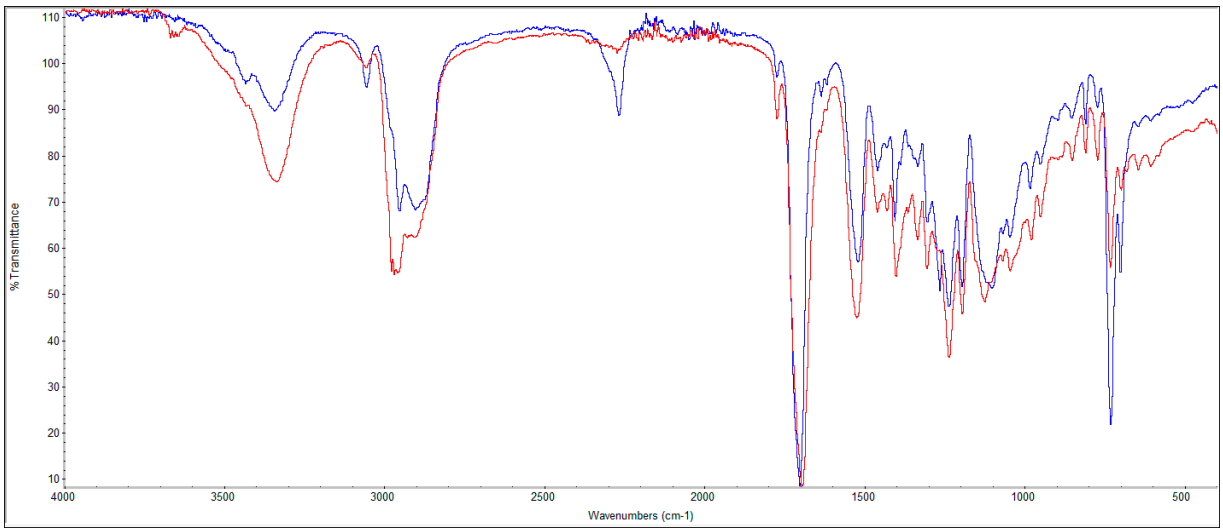

Figure S5. Comparitive of FTIR spectra investigating the reaction of receiving PEG600-HPA after 0 (blue) and 1 h (red) of reaction time. Comparison of FTIR peaks: NCO stretching at 2270 cm^{-1}.

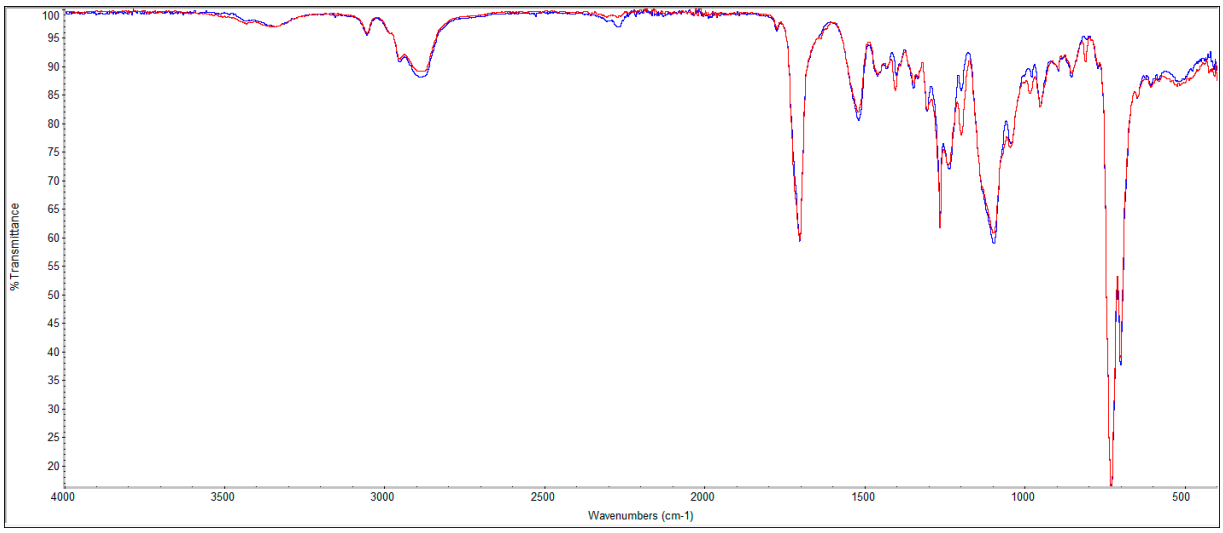

Figure S6. Comparitive of FTIR spectra investigating the reaction of receiving PEG1000-HPA after 0 (blue) and 1 h (red) of reaction time. Comparison of FTIR peaks: NCO stretching at 2270 cm^{-1}.

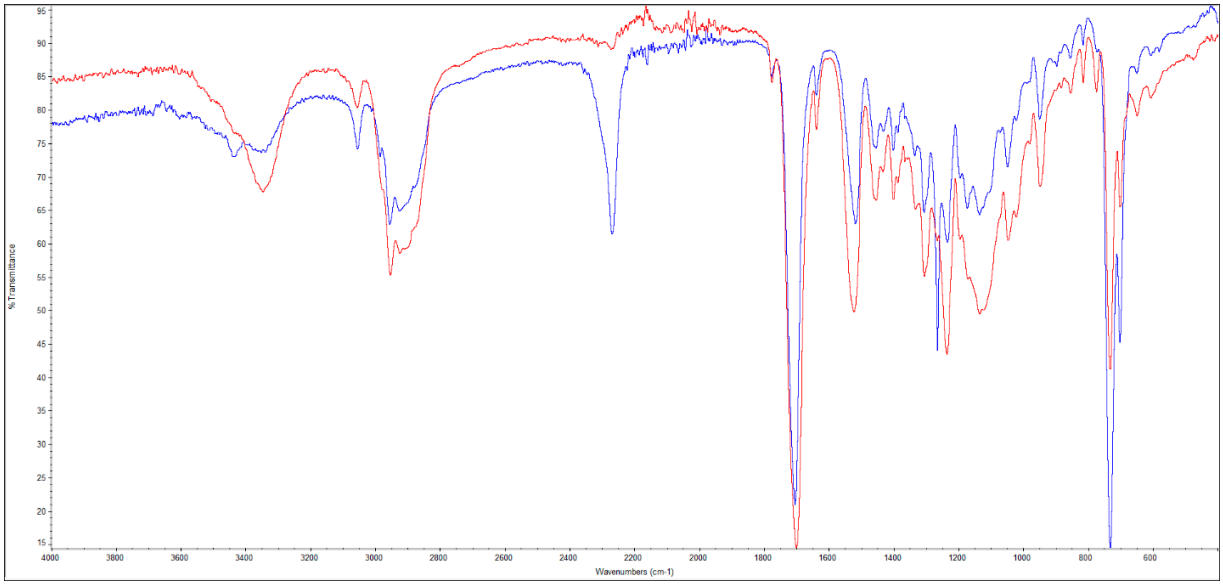

Figure S7. Comparison of FTIR spectra investigating the reaction of receiving PEG400-HPMA after 0 (blue) and 3 h (red) reaction time. Comparison of FTIR peaks: NCO stretching at 2270 cm^{-1}.

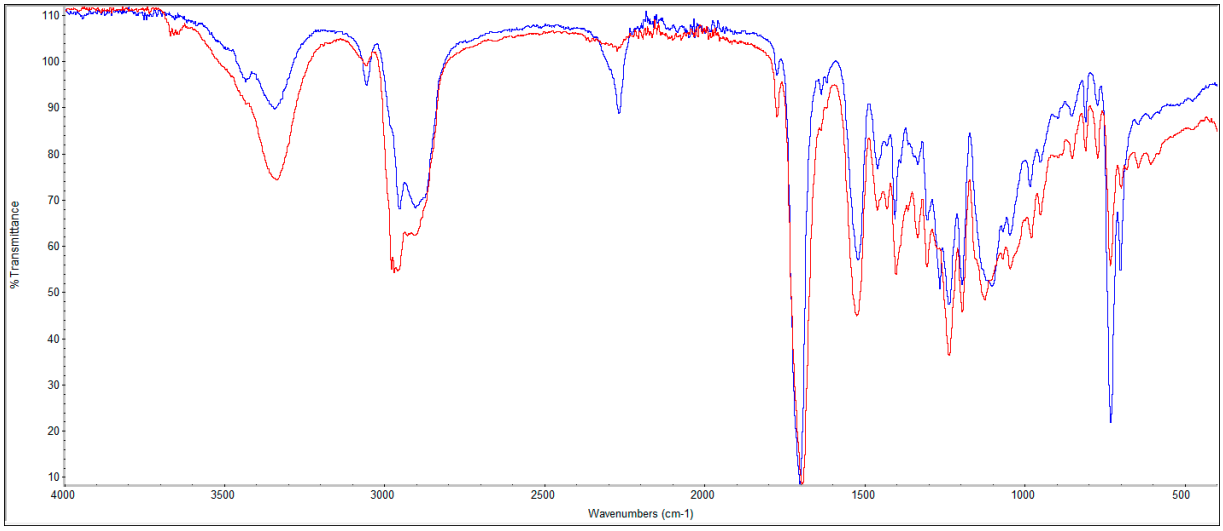

Figure S8. Comparitive of FTIR spectra investigating the reaction of receiving PEG600-HPMA after 0 (blue) and 4 h (red) of reaction time. Comparison of FTIR peaks: NCO stretching at 2270 cm^{-1}.

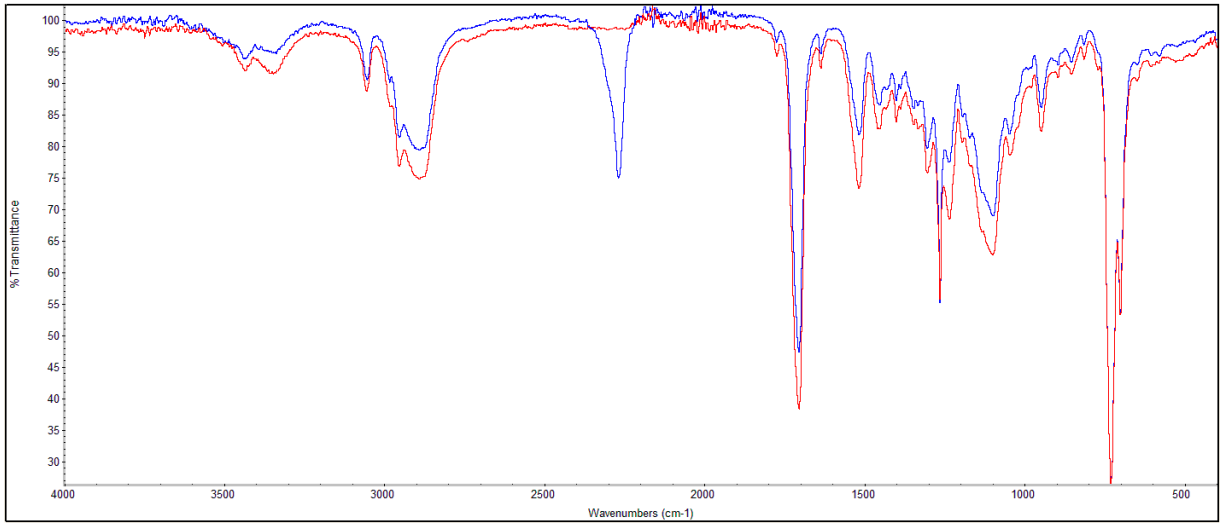

Figure S9. Comparitive of FTIR spectra investigating the reaction of receiving PEG1000-HPMA after 0 (blue) and 3 h (red) of reaction time. Comparison of FTIR peaks: NCO stretching at 2270 cm^{-1}.

Selected NMR spectra of the obtained urethane (meth)acrylates

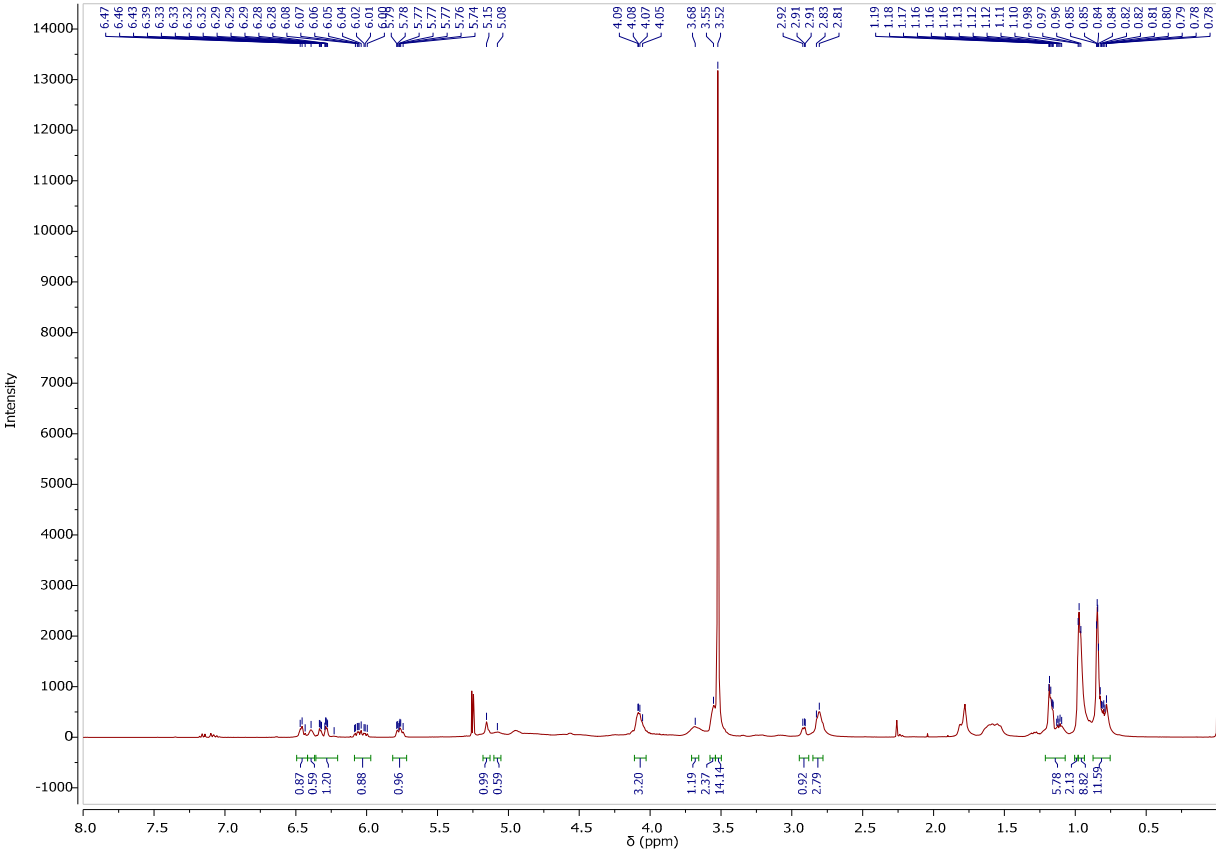

Figure S10. ^{1}H NMR spectra of PEG400-HPA.

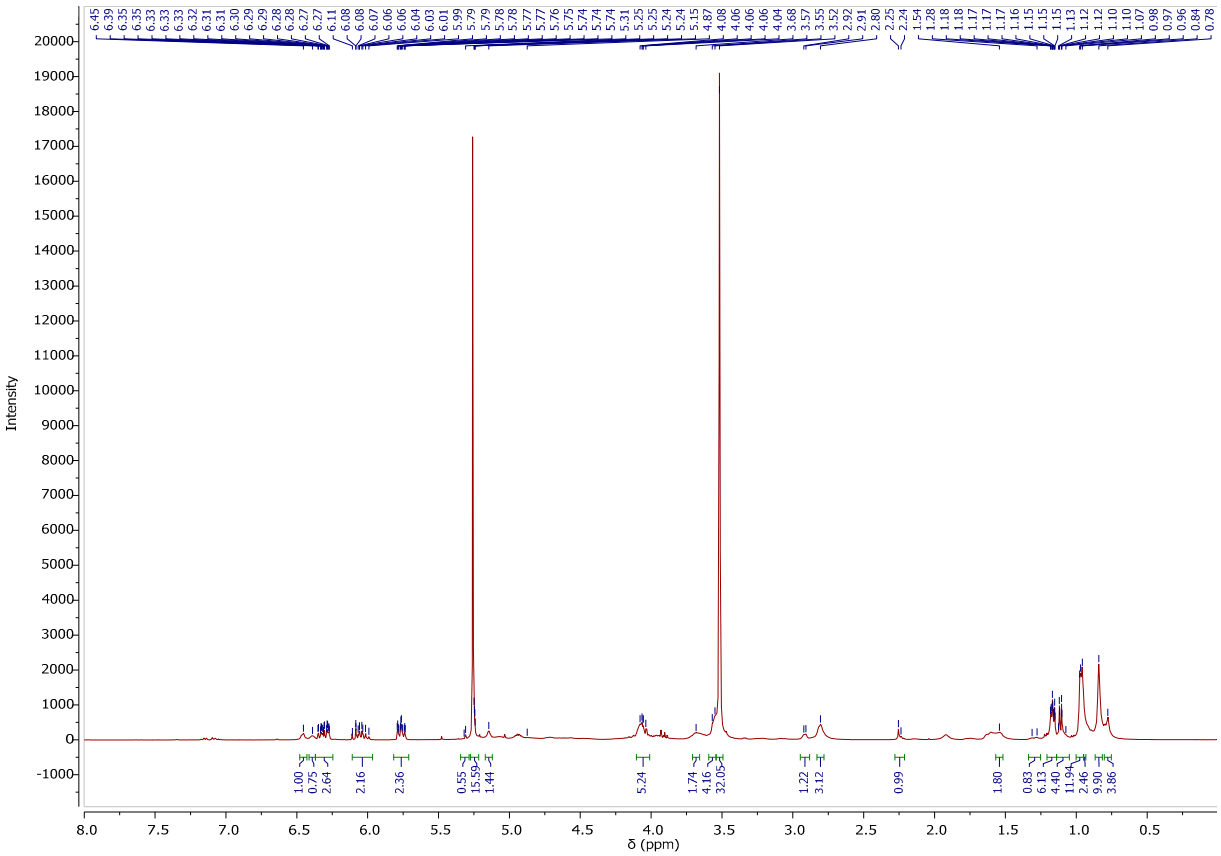

Figure S11. ^{1}H NMR spectra of PEG600-HPA.

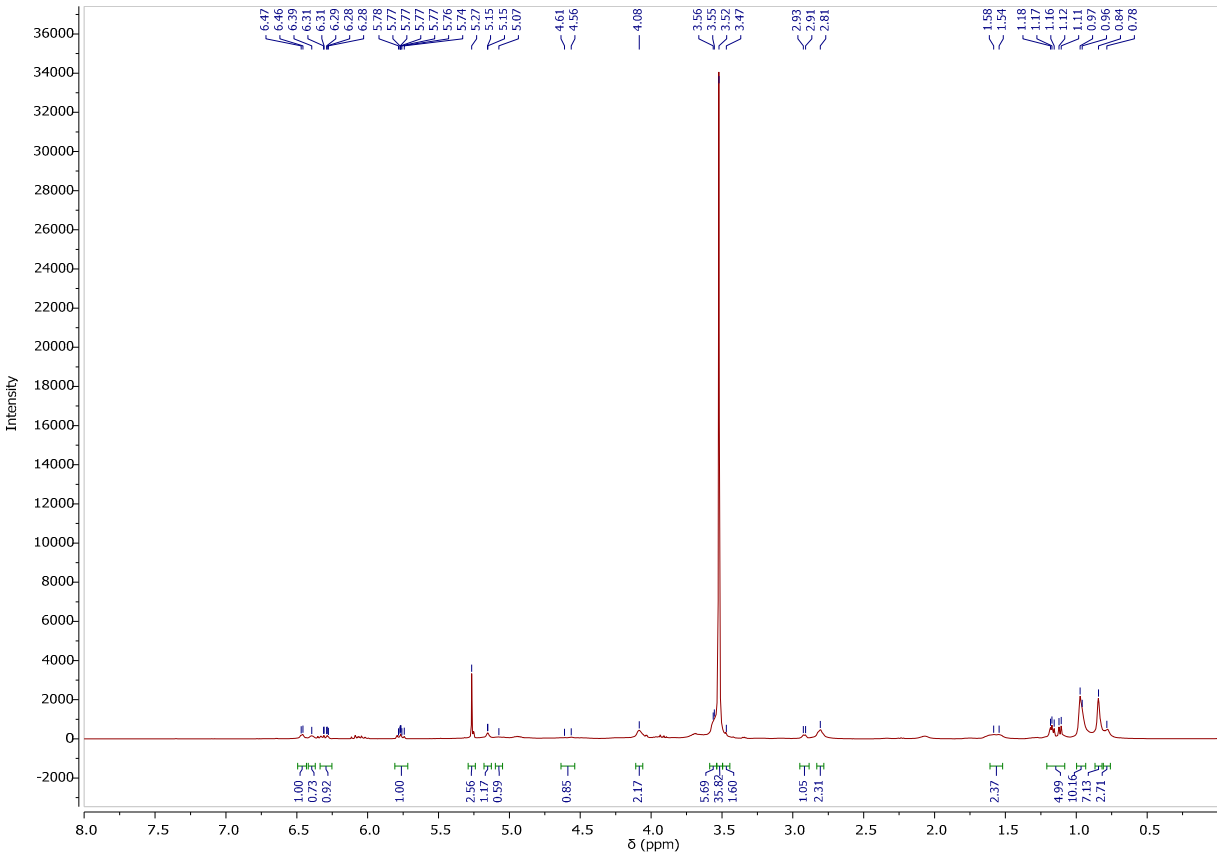

Figure S12. ^{1}H NMR spectra of PEG1000-HPA.

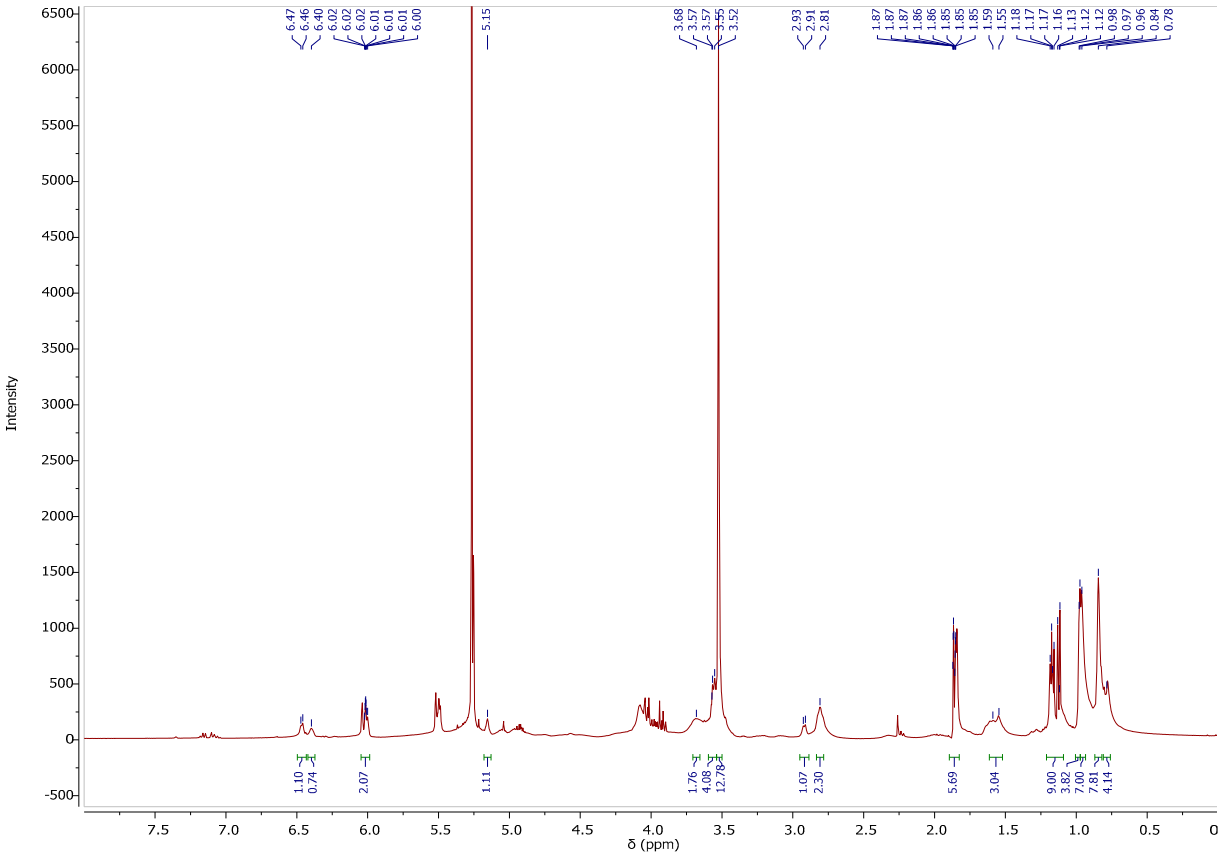

Figure S13. ^{1}H NMR spectra of PEG400-HPMA.

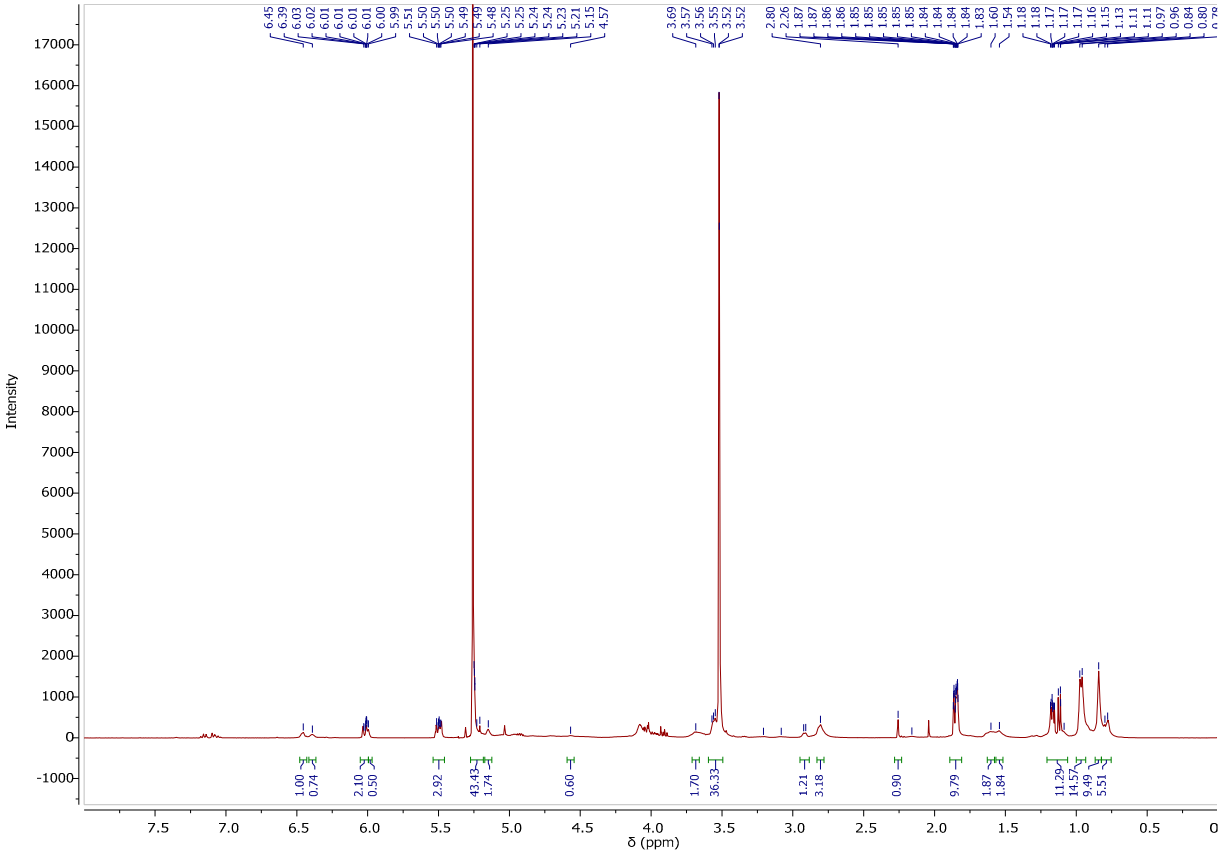

Figure S14. ^{1}H NMR spectra of PEG600-HPMA.

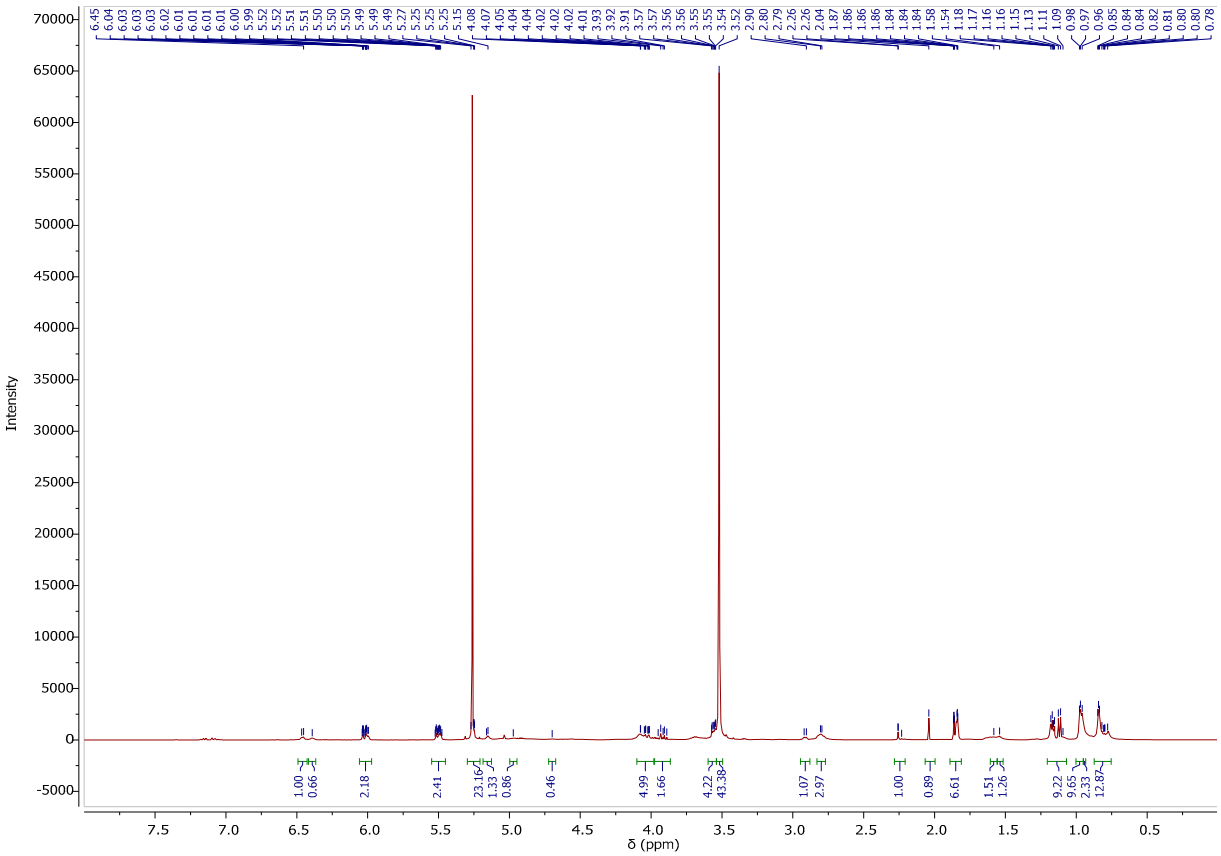

Figure S15. [1]H NMR spectra of PEG1000-HPMA.

The TG and DTG curves of the obtained urethane (meth)acrylates.

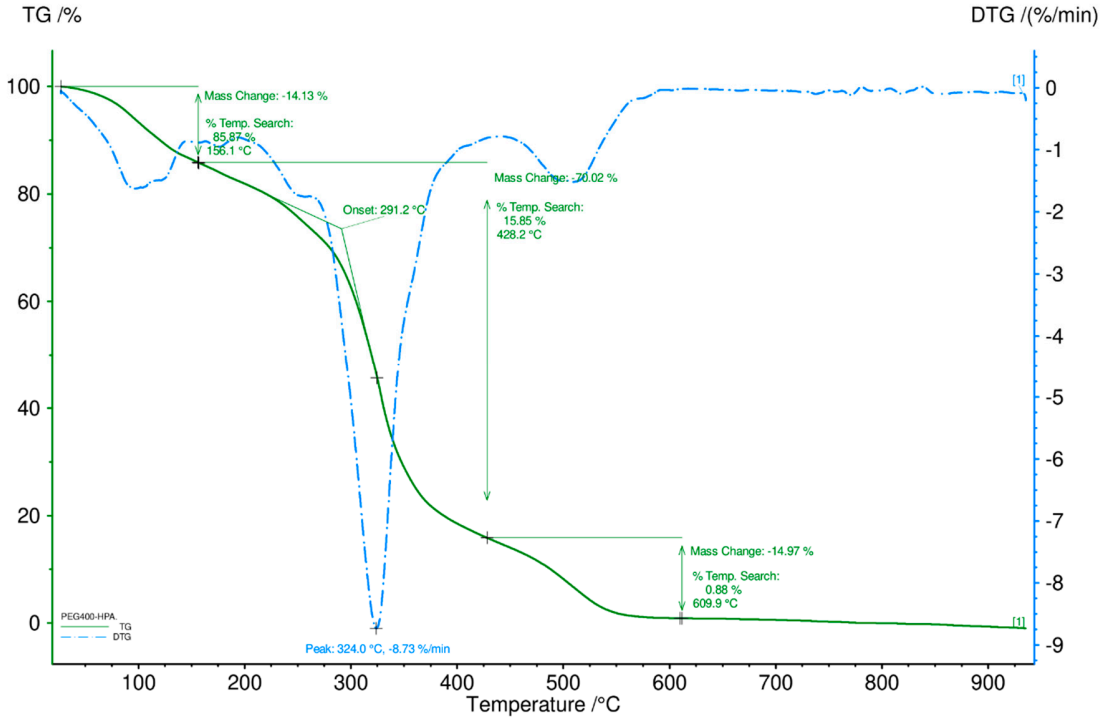

Figure S16. TG and DTG curves of PEG400-HPA.

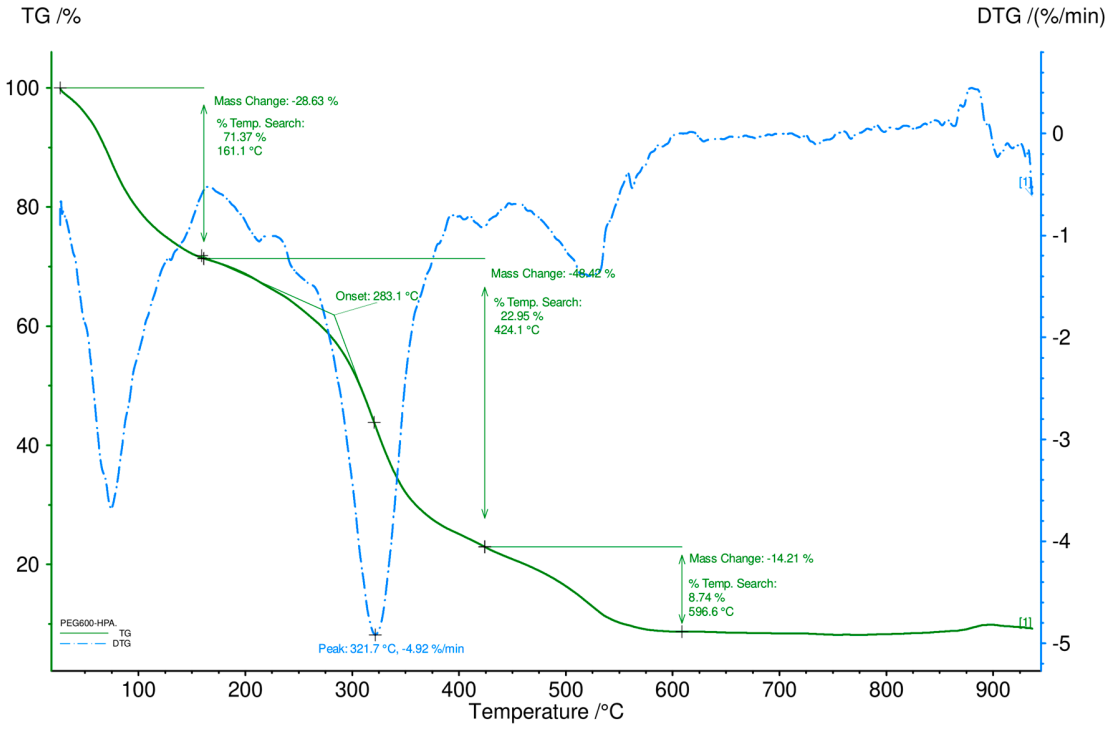

Figure S17. TG and DTG curves of PEG600-HPA.

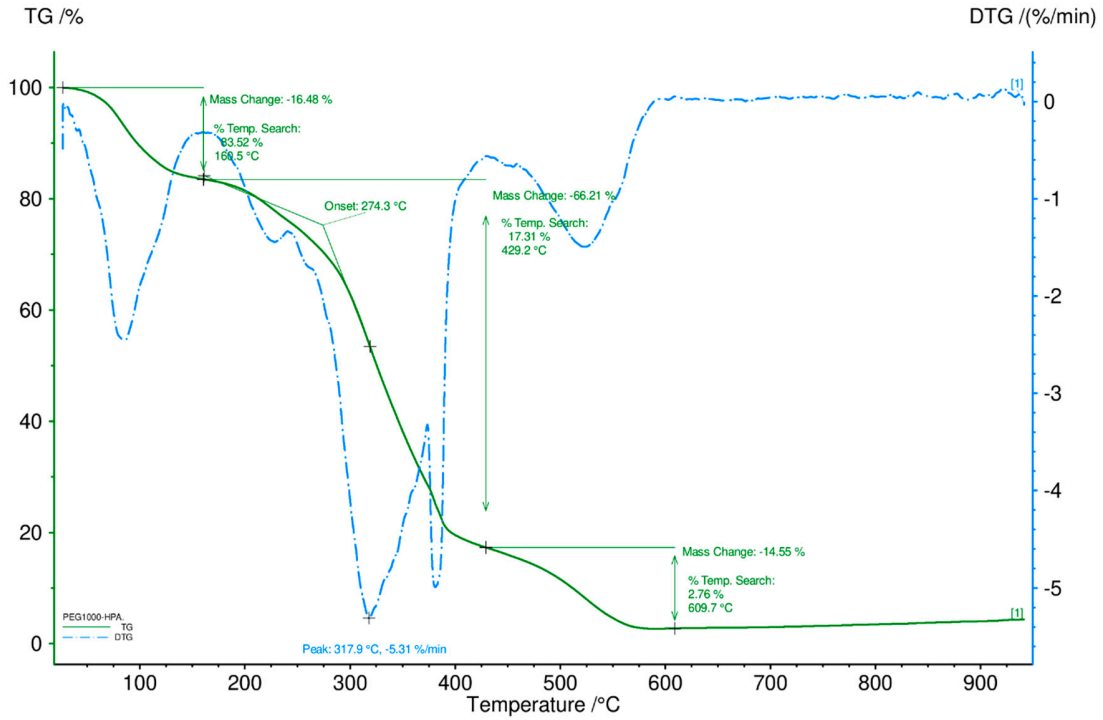

Figure S17. TG and DTG curves of PEG1000-HPA.

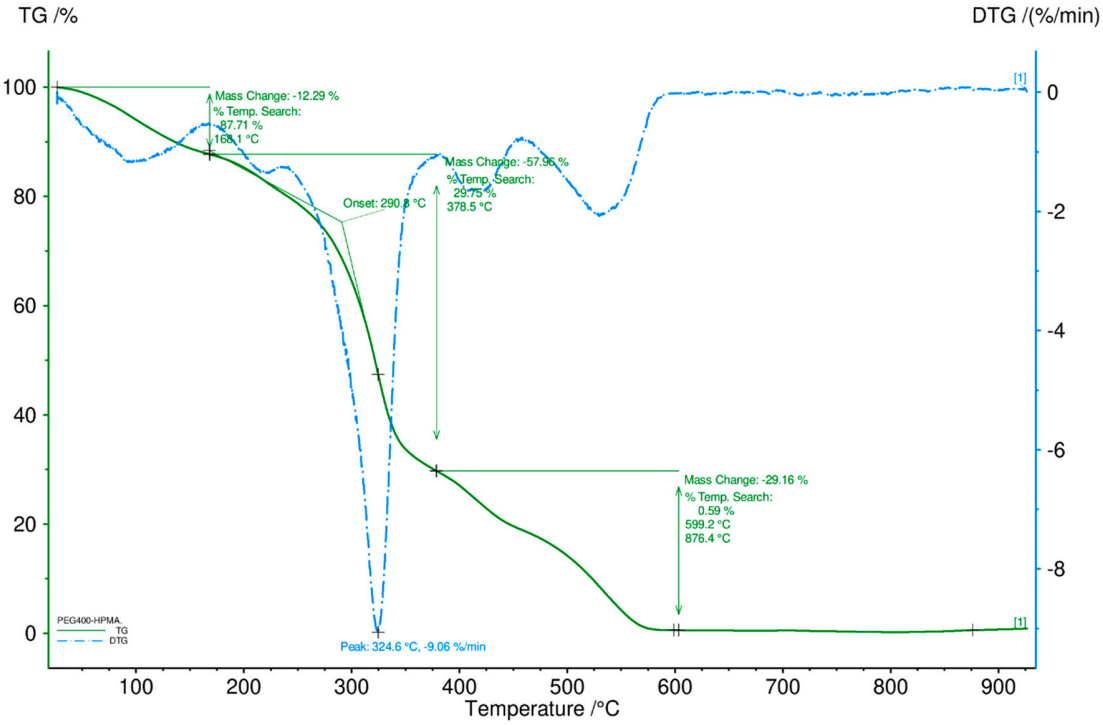

Figure S19. TG and DTG curves of PEG400-HPMA.

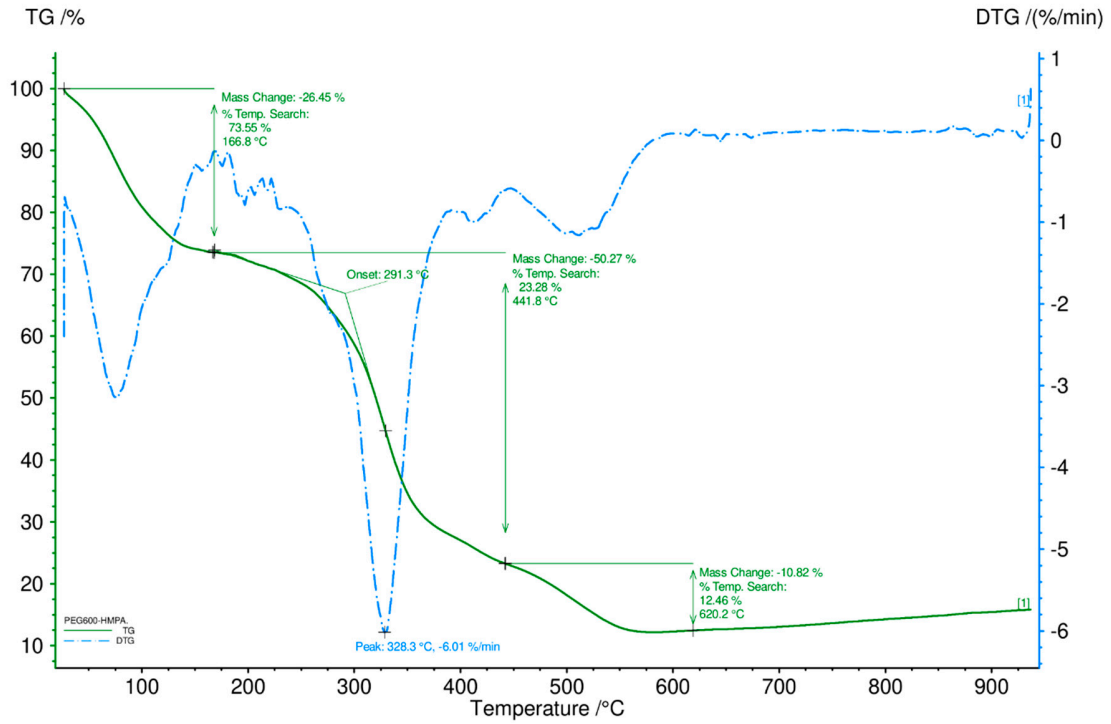

Figure S18. TG and DTG curves of PEG600-HPMA.

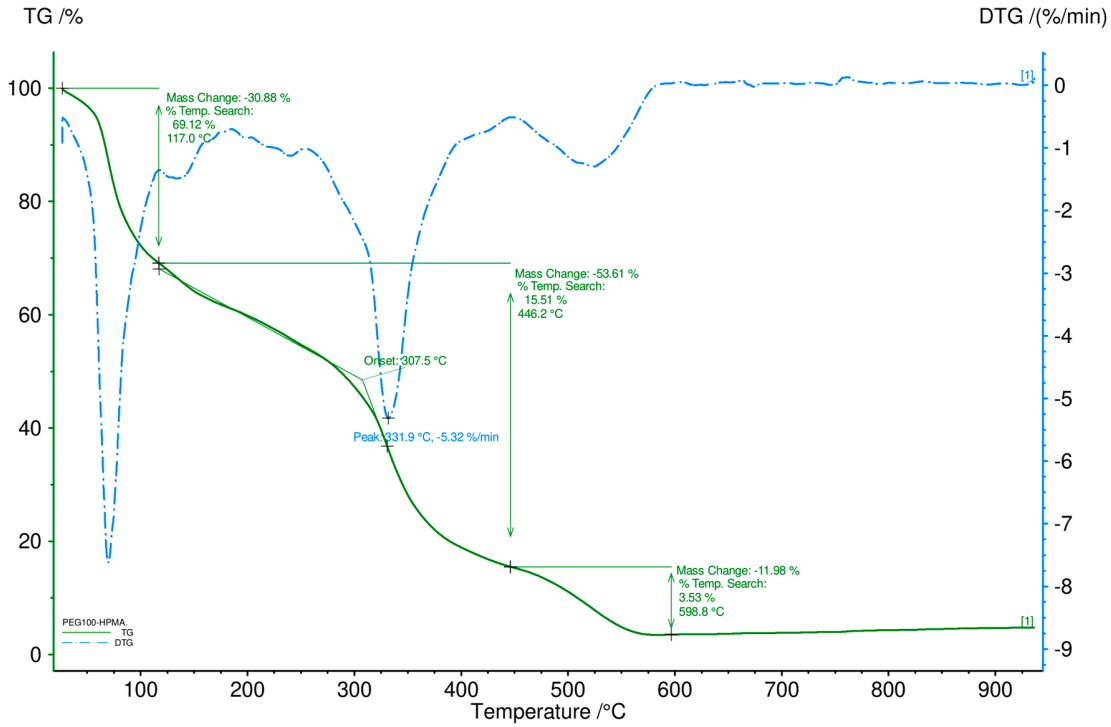

Figure S19. TG and DTG curves of PEG1000-HPMA.