Supporting information

Multiblock thermoplastic elastomers via one-pot thiol-ene reaction

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Figure S1. ¹H NMR spectra of multiblock thermoplastic elastomers with different molar ratios of MBAm.



Figure S2. ¹H NMR spectra of prepolymer of P4-0 at different reaction times in the first step. The samples for ¹H NMR measurements were quenched in CDCl₃ and ¹N NMR spectra were recorded without further purification.



Figure S3. ¹H NMR spectra of multiblock thermoplastic elastomer of P4 at different reaction times in the chain extension reaction. The samples for ¹H NMR measurements were quenched in CDCl₃ and ¹N NMR spectra were recorded without further purification. With increasing the reaction time, the integral values of the peak at 5.5-5.6 ppm (-CH=CH₂ of MBAm) decreased quickly, and the integral values of the peaks at 4.5-4.6 ppm (-CH₂ of MBAm with one C=C bond) and 4.4-4.5 ppm (-CH₂ of MBAm without C=C bond) increased, as shown in the Figure 2.



Figure S4. GPC elution curves of multiblock thermoplastic elastomers with different molar ratios of MBAm.



Figure S5. FT-IR spectra of multiblock thermoplastic elastomers with different molar ratios of MBAm. With the content of MBAm units increasing, the intensity of the peaks at 1645 cm⁻¹ and 1539 cm⁻¹ increased obviously, assigned to stretching vibration of C=O (the amide I band) and the bending vibration of N-H (the amide II band), respectively.



Figure S6. Fitted curves of variable-temperature FT-IR spectra of multiblock thermoplastic elastomer of P4 in the range of (a) 1480-1580 cm⁻¹ and (b) 3200-3500 cm⁻¹ by software PeakFit v4.12. The increase rate of temperature is 5 °C per min from 25 °C to 120 °C. With temperature increasing, the intensity of the peaks at 1539 cm⁻¹ decreased, assigned to stretching vibration of the bending vibration of N-H (the amide II band), and that of the peak at 1512 cm⁻¹ increased obviously. The peak at 3307 cm⁻¹ shifted to a higher wavenumber at 3380 cm⁻¹, attributed to the free N-H stretching absorbance.



Figure S7. DSC cooling curves of multiblock thermoplastic elastomers with different molar ratios of MBAm. The corresponding transition temperatures were relatively lower than these in DSC heating curves.