Supporting Materials for:

Phase Transition in Amphiphilic Poly(*N*-isopropylacrylamide): Controlled Gelation

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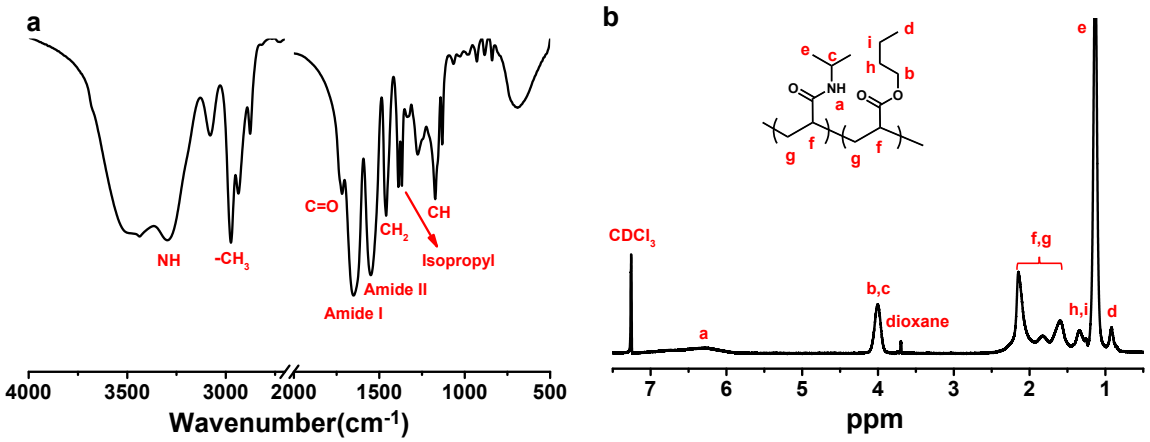

Figure S1. (a) FT-IR characterization of p(NIPAM-co-BA). (b) ^{1}H NMR spectrum (400M, $CDCl_3$) of p(NIPAM-co-BA).

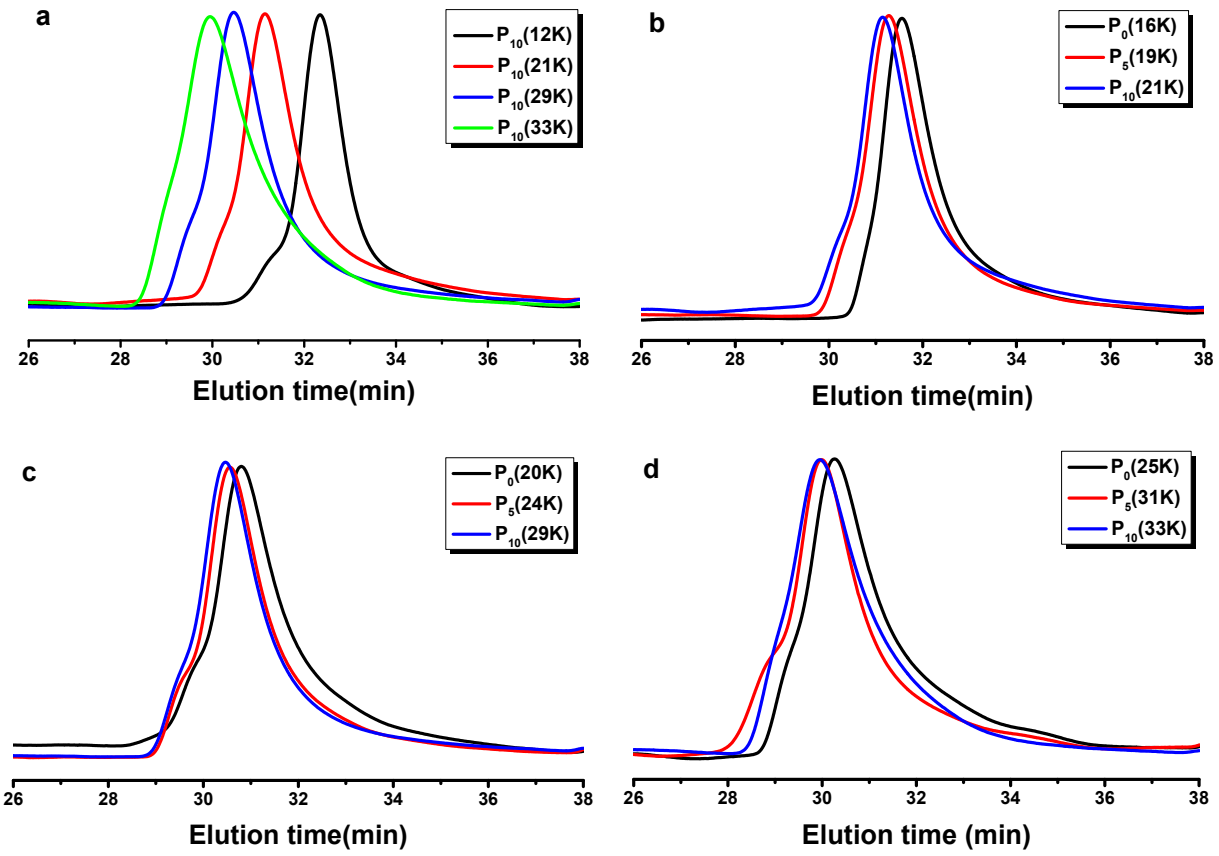

Figure S2. GPC traces of p(NIPAM-co-BA) synthesized with varying the feeding ratio of comonomers and chain transfer agent (CTA). (a) Different CTA feeding ratios to monomers at a fixed BA/NIPAM ratio of 0.1. (b-d) Different BA feeding ratios at a fixed CTA/NIPAM ratio.

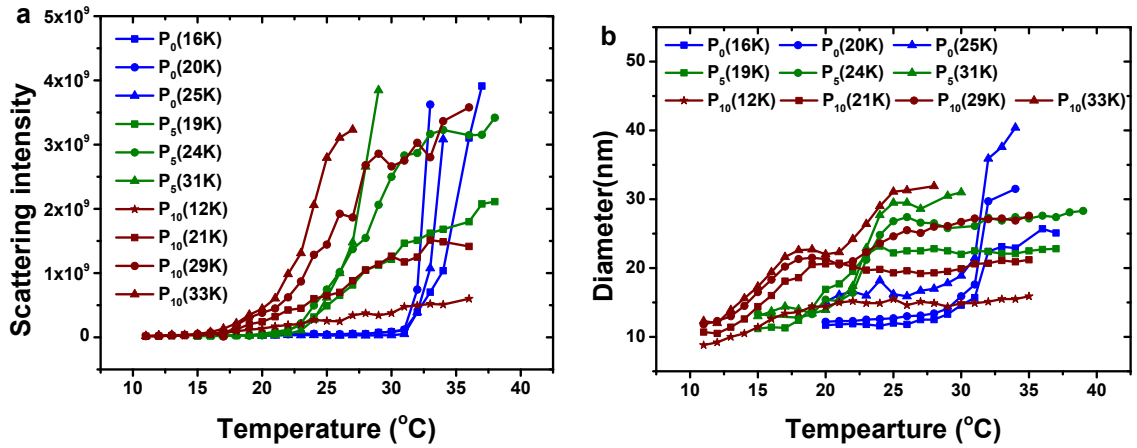

Figure S3. Temperature dependence of the light scattering intensity (a) and hydrodynamic diameters (b) for p(NIPAM-co-BA) solutions with different molecular weights and BA feeding ratios. Measurements were conducted with 5 mg mL^{-1} polymer solutions and a temperature increment of 1 °C.

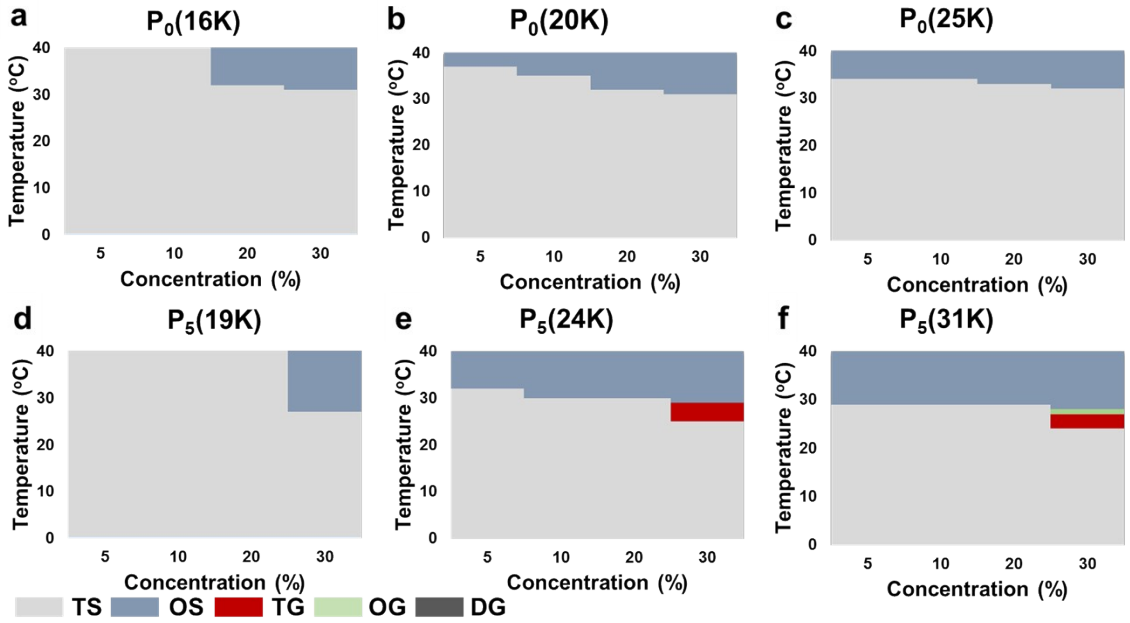

Figure S4. Phase diagram of aqueous p(NIPAM-co-BA) solutions with different molecular weights and BA feeding ratios. TS: transparent solution phase; OS: opaque solution phase; TG: transparent gel phase; OG: opaque gel phase; DG: dehydrated gel phase.

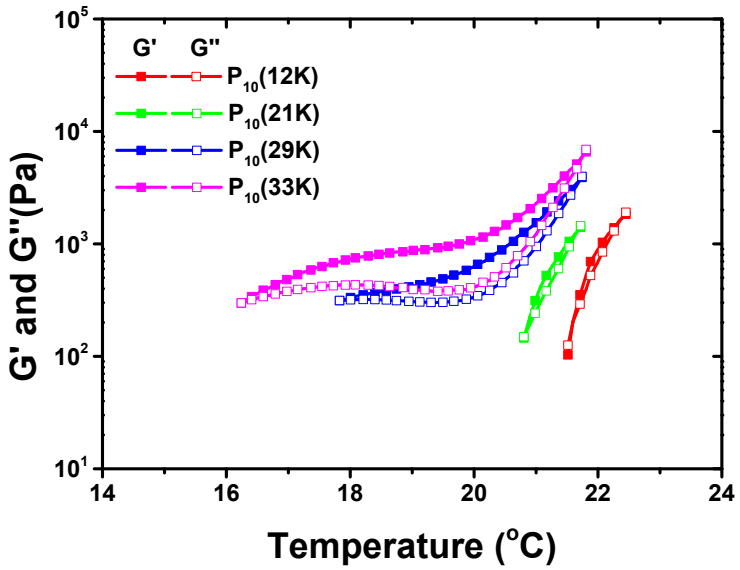

Figure S5. Summary of the temperature ramp curves of 20 w/w% aqueous p(NIPAM-co-BA) solutions at the regions with G' ≥ G''. Measurements were performed at a constant strain of 1% and frequency of 6.3 rad s^{-1}.

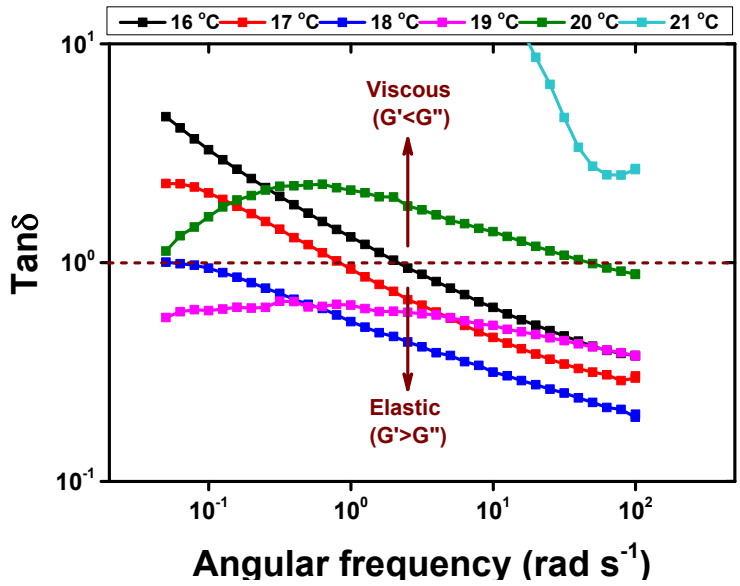

Figure S6. Frequency sweep of 20 w/w% aqueous P_{10}(33K) solution at the gel region determined by the oscillatory temperature ramp. Tan δ=1 was used as the boundary to distinguish different rheological behaviors, the gel was predominantly elastic at tan δ <1 regime, and predominantly viscous at tan δ >1 regime. Measurements were performed at a constant strain of 0.5%.

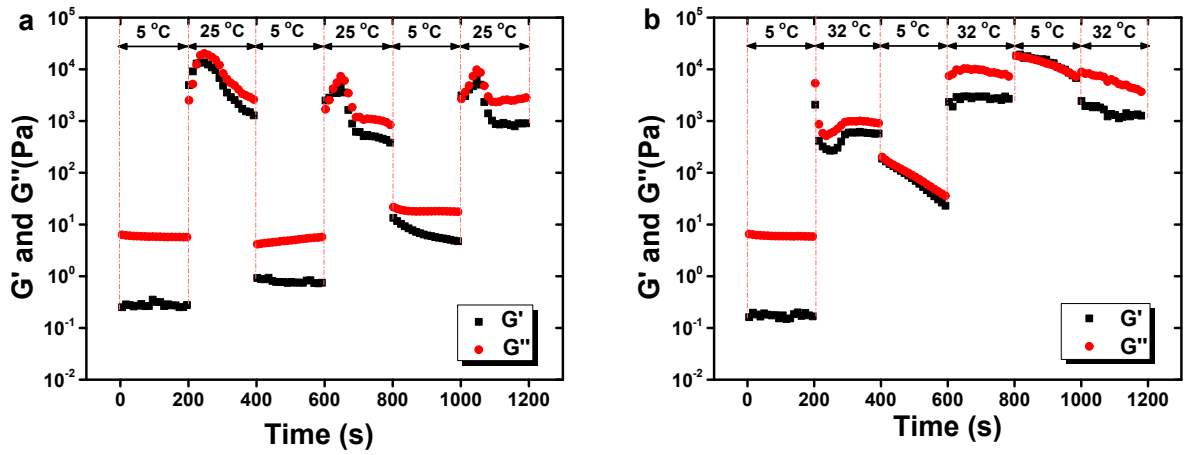

Figure S7. Rheological reversibility of p(NIPAM-BA) between different phase states. (a) 5 °C (transparent solution) and 25 °C (opaque gel). (b) 5 °C (transparent solution) and 32 °C (dehydrated gel). The aqueous polymer solution was made of P_{10}(33K) at the concentration of 20 w/w%.

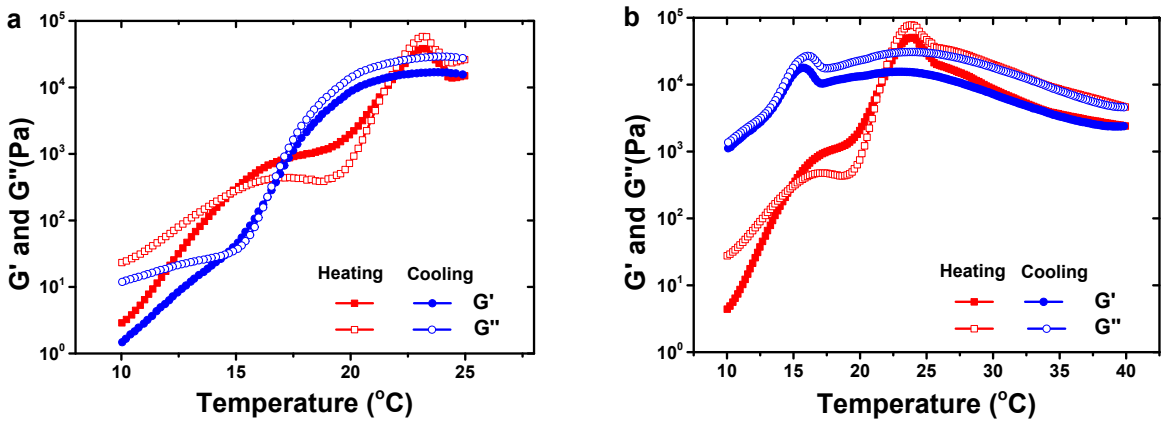

Figure S8. Rheological hysteresis curves of 20 w/w% aqueous P_{10}(33K) solution in a heating and cooling cycle between different phase states. (a) 10 °C (transparent solution) and 25 °C (opaque gel). (b) 10 °C (transparent solution) and 40 °C (dehydrated gel).

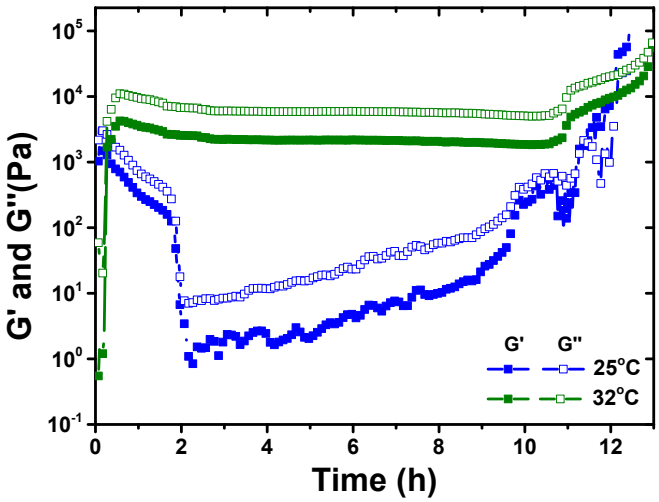

Figure S9. Long-term rheological stability of p(NIPAM-co-BA) in an oscillatory time sweep at different phase states. Blue square: 25 °C (opaque gel); olive square: 32 °C (dehydrated gel). The polymer solution was made of P_{10}(33K) at the concentration of 20 w/w%, and the measurements were performed at a constant strain of 1% and frequency of 6.3 rad s^{-1}.

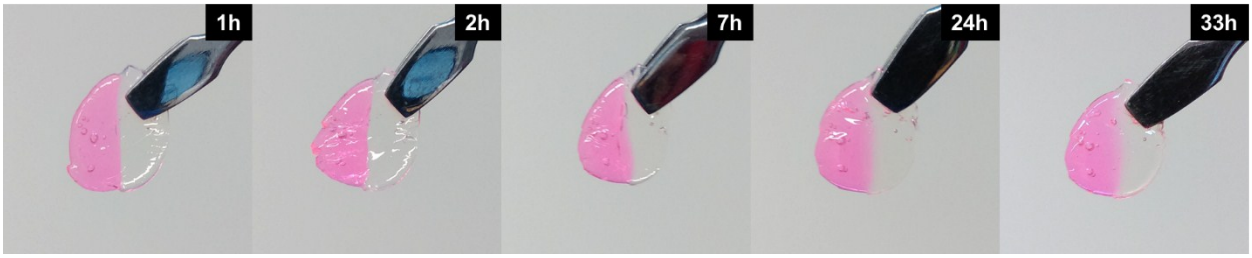

Figure S10. Photographs showing the self-healing process of P(NIPAM-co-BA) hydrogels with two different Mw at constant temperature (18 °C). The colorless gel was made of 30 w/w% aqueous P_{10}(33K) solution, and the red gel was made of 30 w/w% aqueous P_{10}(29K) solution stained with rhodamine B to facilitate visualization.