Electronic Supplementary Material (ESI) for Polymer Chemistry.

Supporting Information

Temperature and Salt Responsive Zwitterionic Polysulfamide-based Nanogels with Surface Regeneration Ability and Controlled Drug Release

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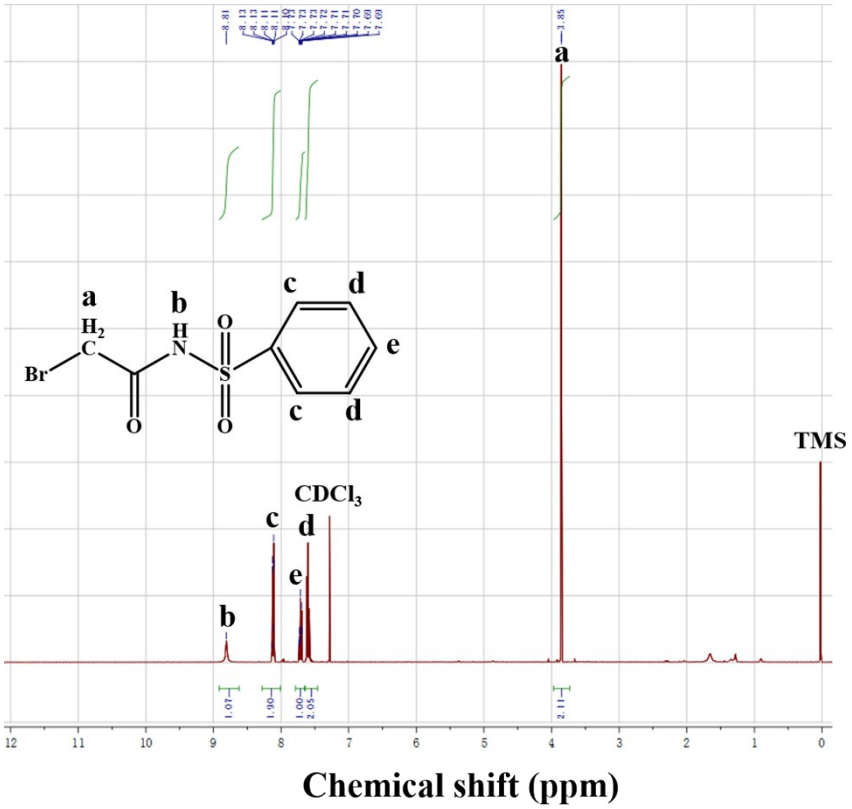

Fig. S1. ^{1}H nuclear magnetic resonance of 2-bromo-N-(phenylsulfonyl)acetamide (BPSA) using deuterium chloroform ($CDCl_3$) as the solvent.

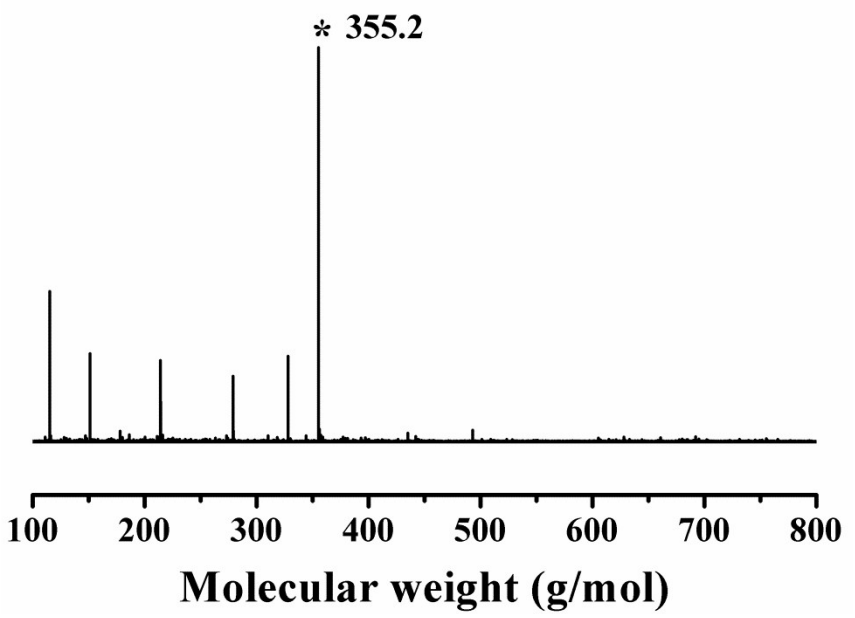

Fig. S2. Matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS) of MEDAPA and the theoretical molecular weight of MEDAPA is 354.4 g/mol.

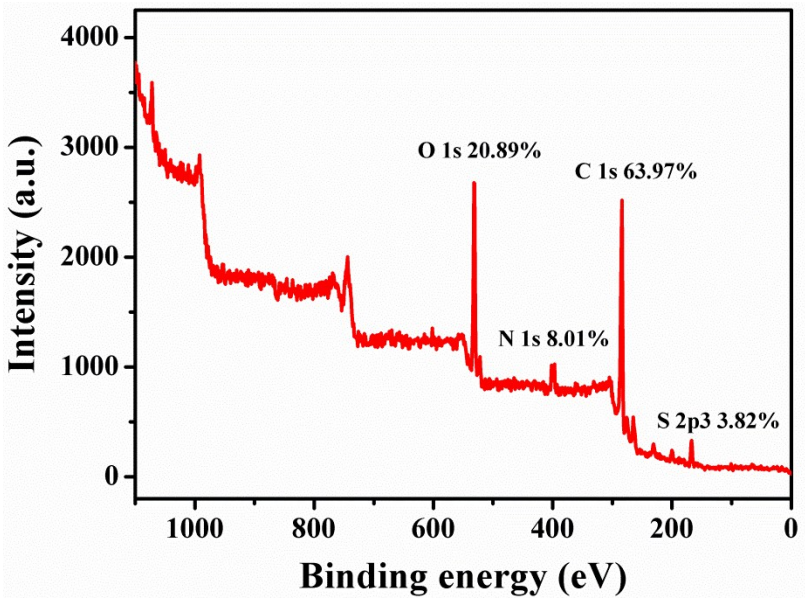

Fig. S3. X-ray photoelectron spectroscopy (XPS) of MEDAPA and the molar ratio of C, O, N and S were calculated.

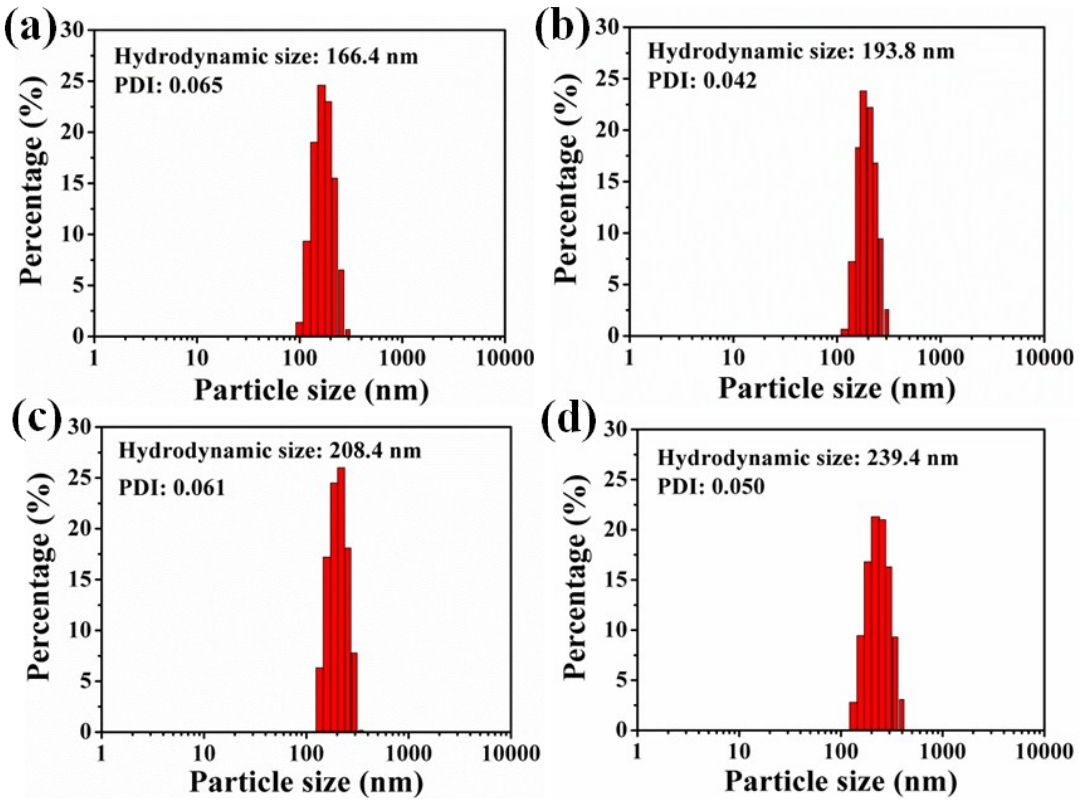

Fig. S4. Hydrodynamic size and polydispersity (PDI) of PMEDAPA-5 (a), PMEDAPA-10 (b), PMEDAPA-15 (c) and PMEDAPA-20 (d) in deionized water at 25 ^{o}C.

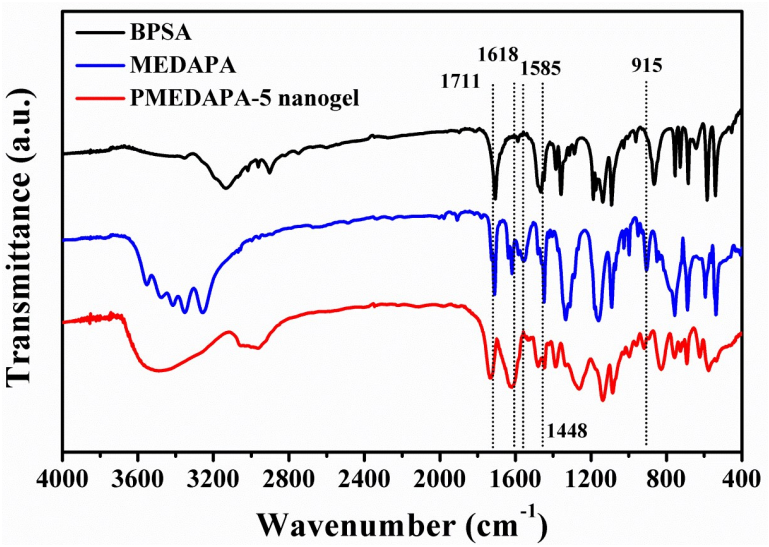

Fig. S5. FT-IR spectra of BPSA, MEDAPA and PMEDAPA-5 nanogels.

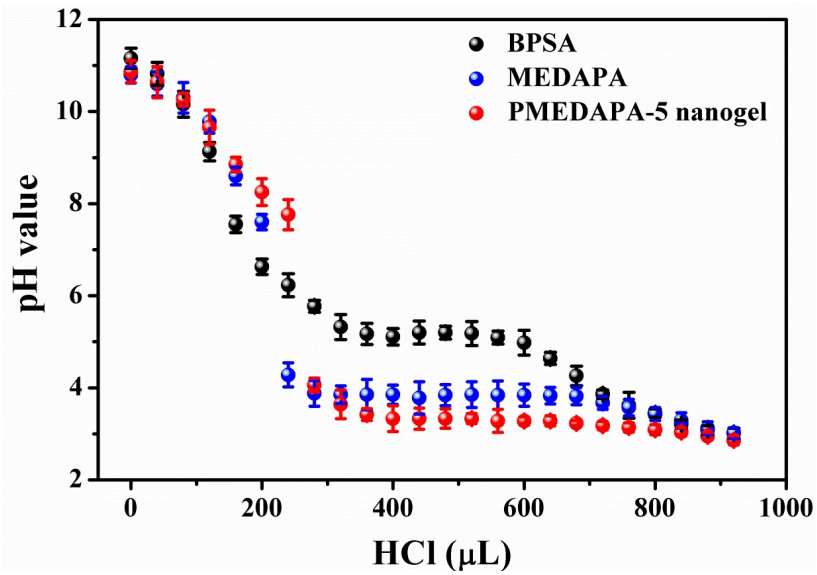

Fig. S6. Buffering capacity of BPSA, MEDAPA and PMEDAPA-5 nanogels by titrating the dispersions (0.5 mg mL^{-1}) in deionized water (pH 11, adjusted with NaOH) with 0.1 M HCl.

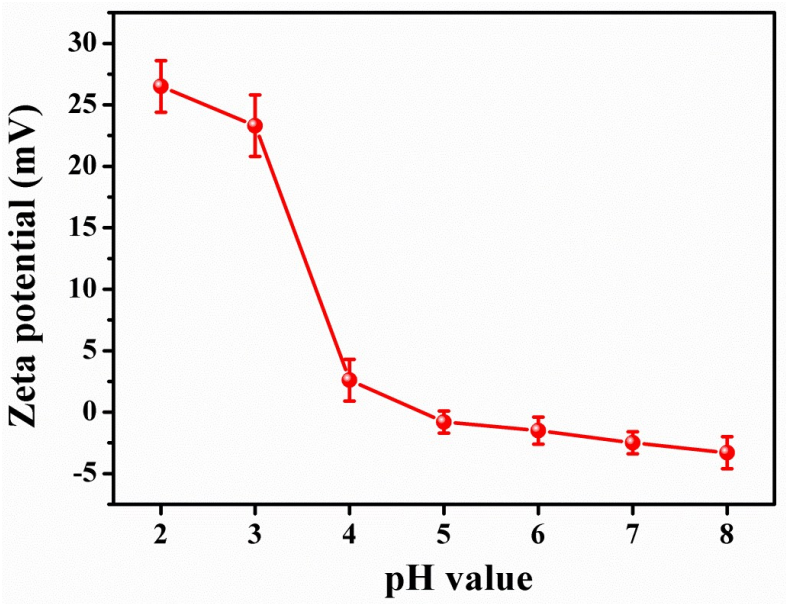

Fig. S7. Zeta potential variation of PMEDAPA-5 nanogels (0.5 mg/mL) versus the change of pH in deionized water.

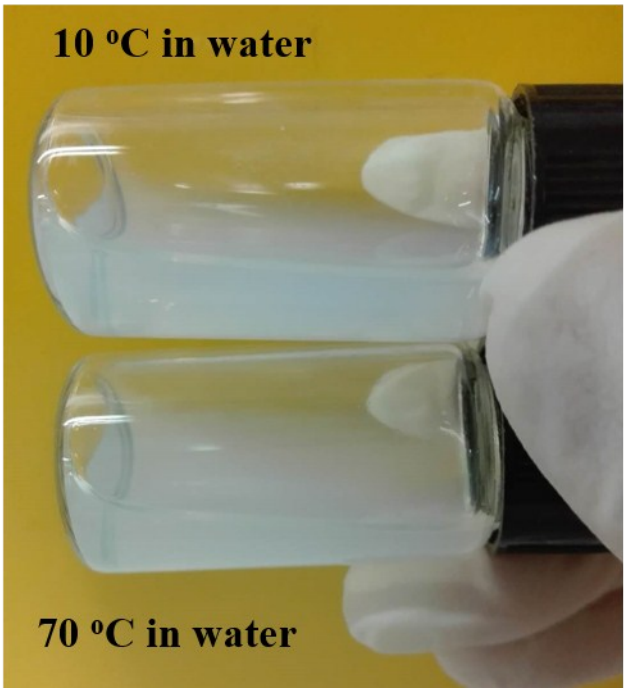

Fig. S8. Optical photograph of PMEDAPA-5 nanogels (0.5 mg/mL) at 10 °C in water (upper layer) and at 70 °C in water (under layer).

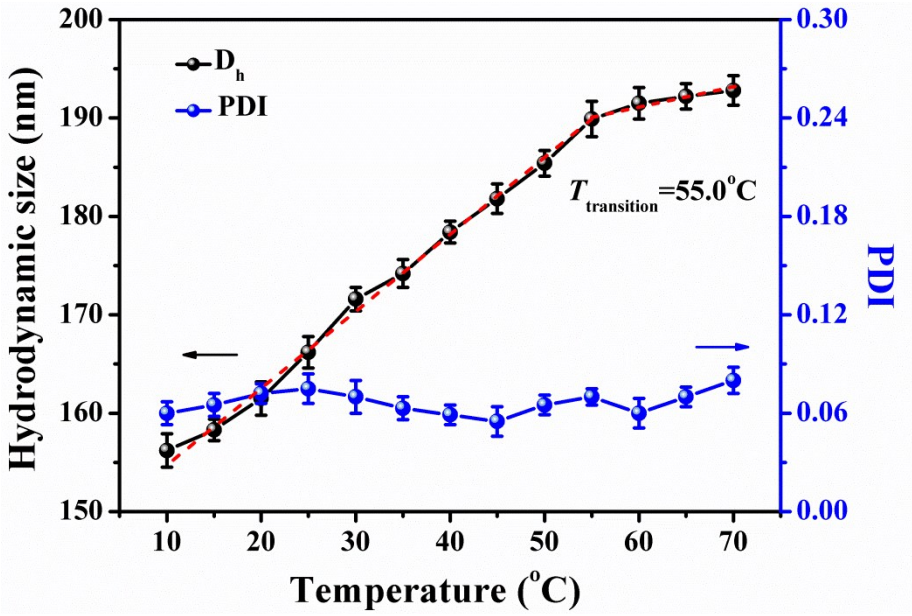

Fig. S9. Plots of hydrodynamic size (D_h) and polydispersity (PDI) of PMEDAPA-5 nanogels in water at a concentration of 0.5 mg/mL versus temperature upon cooling in the temperature range from 70 to 10 °C.

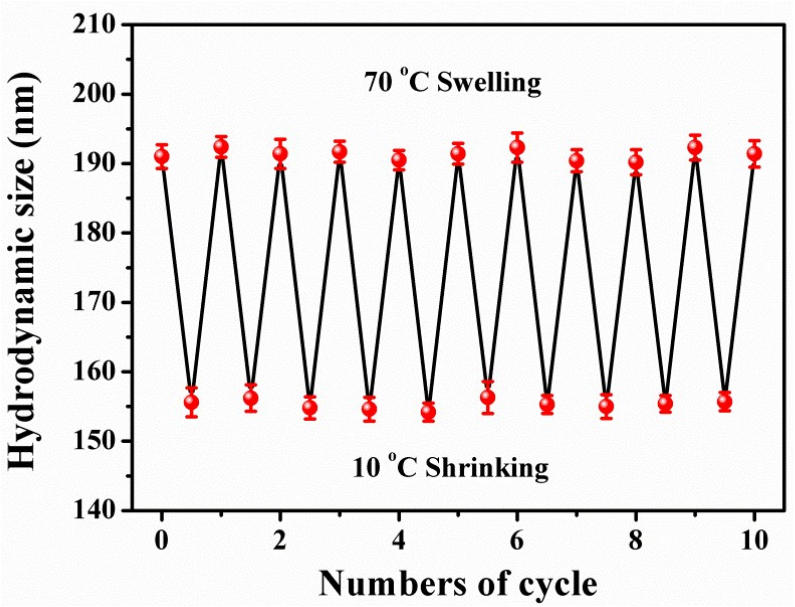

Fig. S10. The D_h values of PMEDAPA-5 at 70 and 10 °C in water at a concentration of 0.5 mg/mL from repeated cooling and heating experiments.

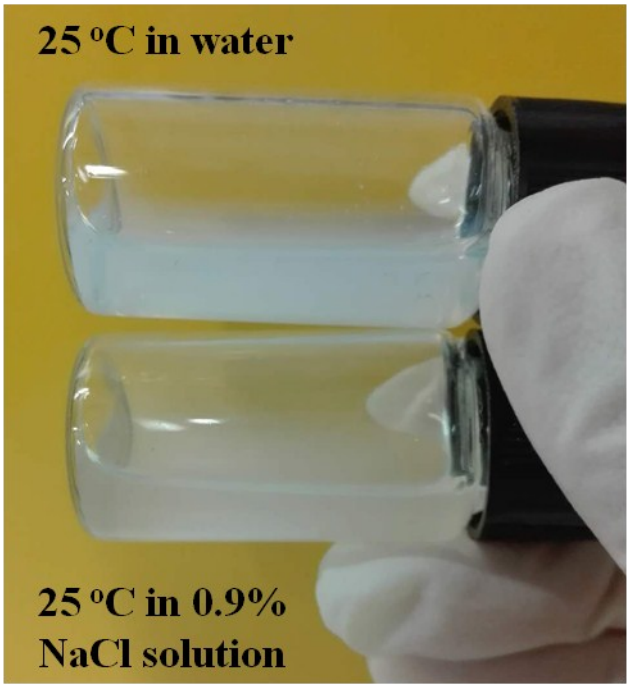

Fig. S11. Optical photograph of PMEDAPA-5 nanogel (0.5 mg/mL) at 25 °C in water (upper layer) and at 25 °C in 0.9 % NaCl solution (under layer).

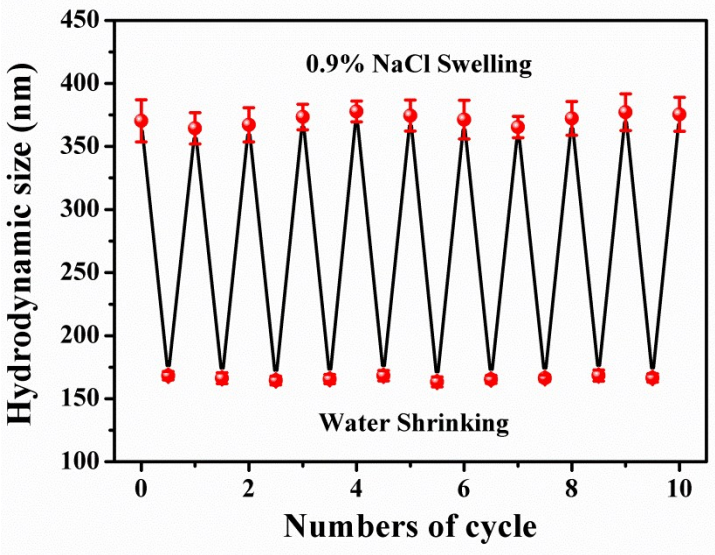

Fig. S12. The D_h values of PMEDAPA-5 nanogels dispersed in water or 0.9 % NaCl solutions at a concentration of 0.5 mg/mL repeatedly.

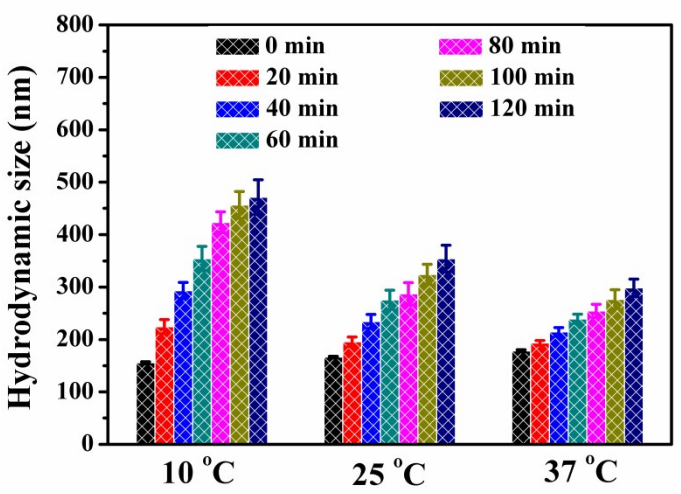

Fig. S13. The D_h change of PMEDAPA-5 nanogels (2 mg/mL) versus time after incubation with human serum albumin (HSA, 40 mg/mL) in deionized water at different temperature.

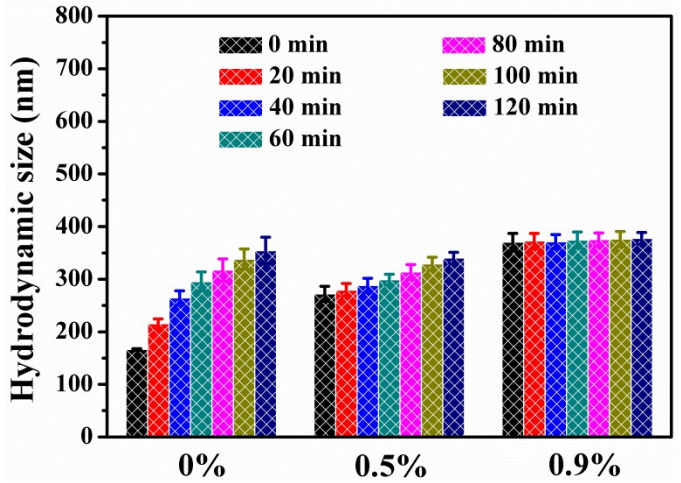

Fig. S14. The D_h change of PMEDAPA-5 nanogels (2 mg/mL) versus time after incubation with human serum albumin (HSA, 40 mg/mL) in NaCl solutions with different concentration at 25 °C.

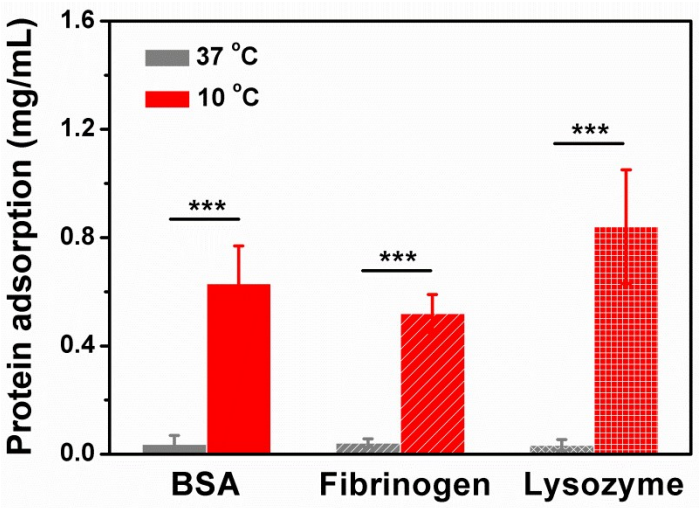

Fig. S15. Quantitative measurement of protein amounts adsorbed by PMEDAPA-5 nanogels in 0.9 wt% NaCl solution with varied proteins (bovine serum albumin (BSA), fibrinogen and lysozyme) at 10 °C or 37 °C.

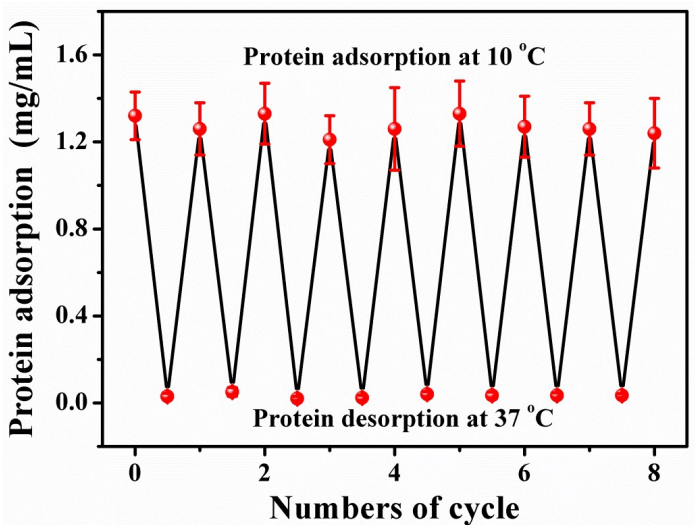

Fig. S16. The protein adsorption and desorption behavior of PMEDAPA-5 nanogel (2 mg/mL) in water or 0.9 wt% NaCl solution at 25 °C with HSA (40 mg/mL) for 8 cycles.

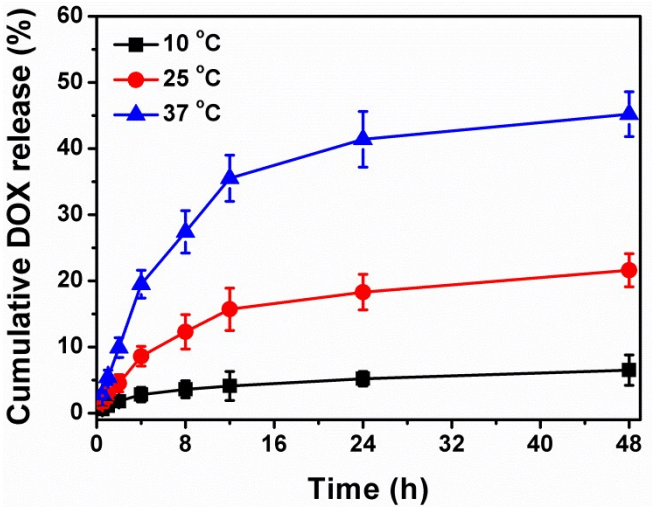

Fig. S17. Doxorubicin release profiles of DOX-loaded PMEDAPA-20 nanogels at 10 °C, 25 °C or 37 °C in 0.9 wt% NaCl solutions. The experiments were repeated for three times.