Electronic Supplementary Information

Notch Insensitive and Self-Healing PNIPAm-PAM-Clay

Nanocomposite Hydrogels

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Fig. S1 Copolymerized NC gel samples for tensile test with the initial $a_0 = 30$ mm, $L_0 = 20$ mm, and thickness $b_0 = 2$ mm. A: without notch; B: central notch N1; C: edge notch N2.



Fig. S2 Temperature dependence of the transmittance of AmC4 gels with different AM concentrations.

Transparence of the NC gels as a function of temperature was monitored with a UV/Vis spectrophotometer (U-3010, Hitachi) at wavelength $\lambda = 600$ nm. The gel sample was put into a quartz cell (5 mm × 10 mm × 40 mm) with a cap. The NC gel was equilibrated at test temperature for 10 min before data collection.



Fig. S3 Stretching stress-strain curves for AmC4 (A), A0Cn (B) and A4Cn(B) gels.



Fig. S4 Equilibrium swelling ratio (d_s/d_0) of the AmC4 and A4Cn gels.

For swelling equilibrium in water, the cylindrical NC gels of 15 mm length were soaked in a large amount of deionized water at 20 °C with daily replacement for at least 10 days until the gel diameter ceased to increase. The equilibrium swelling ratio was defined as d_s/d_0 , where d_s and d_0 are the gel diameter at swelling equilibrium and as-prepared, respectively.



Fig. S5 Notch stretching curves for AmC4 gels with different N1 (center) notch lengths (mm).

Due to growth of the notch, the area of the sample cross-section was always changed. Thus, the force-length curve was used instead of stress-strain curve, where *L* was obtained from the distance between two clamps (initially L = 20 mm).



Fig. S6 Notch stretching curves for AmC4 gels with different N2 (edge) notch lengths (mm).



Fig. S7 Photos during notch stretching process for the A4C4 (A, notch length c = 25 mm) and A0C4 (B, notch length c = 13 mm) samples with the edge notch C2, the red arrow in B indicates the crack tip.



Fig. S8 Notch stretching curves for A0Cn gels with N1 (left) and N2(right) notches (mm).



Fig. S9 Notch stretching curves for A4Cn gels with N1 (left) and N2(right) notches.



Fig. S10 Stress-strain curves of NC gels after self-healing under indicated conditions compared with the as-prepared ones, A: A2C4, B: A4C4.