Compressive elasticity of hybrid gels

Samples were loaded using a vertically fitted circular probe, having 40 mm diameter, and moving at a constant speed. After each active deformation period, the compressive force $f$ acting on the gel samples was calculated by reading the mass change of the sample from the balance $m$, as $f = mg$, where $g$ is the gravitational acceleration ($g = 9.803 \text{ m/s}^2$). By displacement control, the change in the length of the sample, $\Delta L$, was recorded by readings data from a digital comparator (IDC type Digimatic Indicator 543-262, Mitutoyo) which was sensitive to the displacements of $10^{-3} \text{ mm}$ and was calculated as $\Delta L = L_0 - L$, where $L_0$ and $L$ are the initial undeformed and deformed lengths, respectively. Three experimental variations during the elasticity measurement are: (1) each compressive loading was conducted up to about 20% compression of the initial length, (2) after each loading, the sample was held under compression for 10 s of relaxation and (3) each testing was carried out in $\leq 3 \text{ min}$ to avoid the loss of water during the measurement. Throughout each compressive loading, stress and strain were continuously recorded and stress-strain graphs were plotted according to the following linear dependence.
Figure S1. Typical stress-strain isotherms of hybrid MICA\textsubscript{m}/PDA-HGel as-prepared state (A), after their equilibrium swelling in water (B) and that of hybrid MICA\textsubscript{m}/PDA-CGel after equilibrium swelling in water (C). Mica contents (in % w/v) are indicated in the figure.
Figure S2. Variation of the average network chain length $\bar{N}$ (solid symbols) and $M_c$ (open symbols) in the hybrid hydrogel network of MICA/PDA-HGel as a function of mica content.