

Supporting information for

Design and molecular dynamics of multifunctional sulfonated poly(dimethylaminoethyl methacrylate)/mica hybrid cryogels through freezing-induced gelation

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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, ΔL , 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} 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.

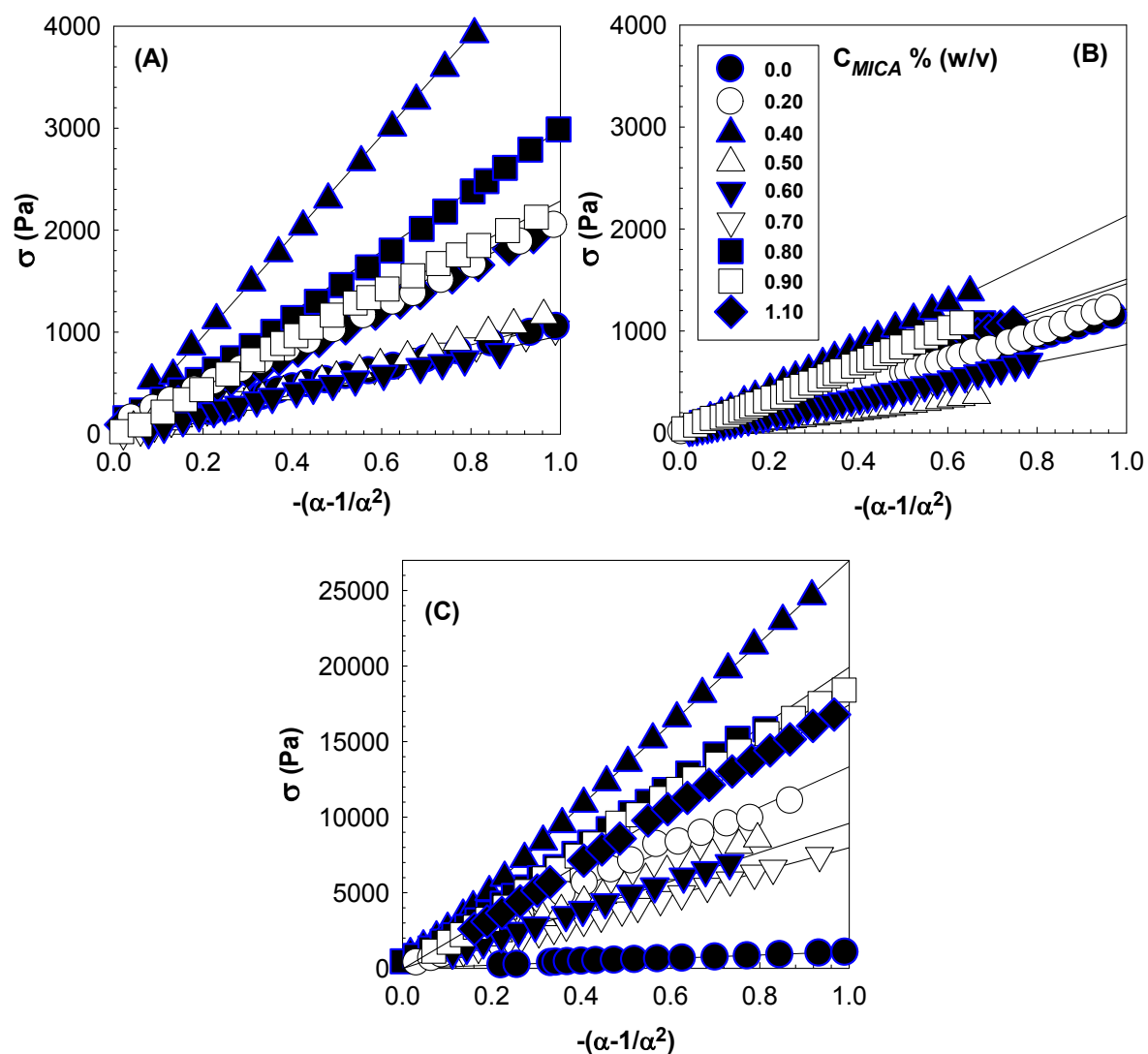


Figure S1. Typical stress - strain isotherms of hybrid MICAm/PDA-HGel as-prepared state (A), after their equilibrium swelling in water (B) and that of hybrid MICAm/PDA-CGel after equilibrium swelling in water (C). Mica contents (in % w/v) are indicated in the figure.

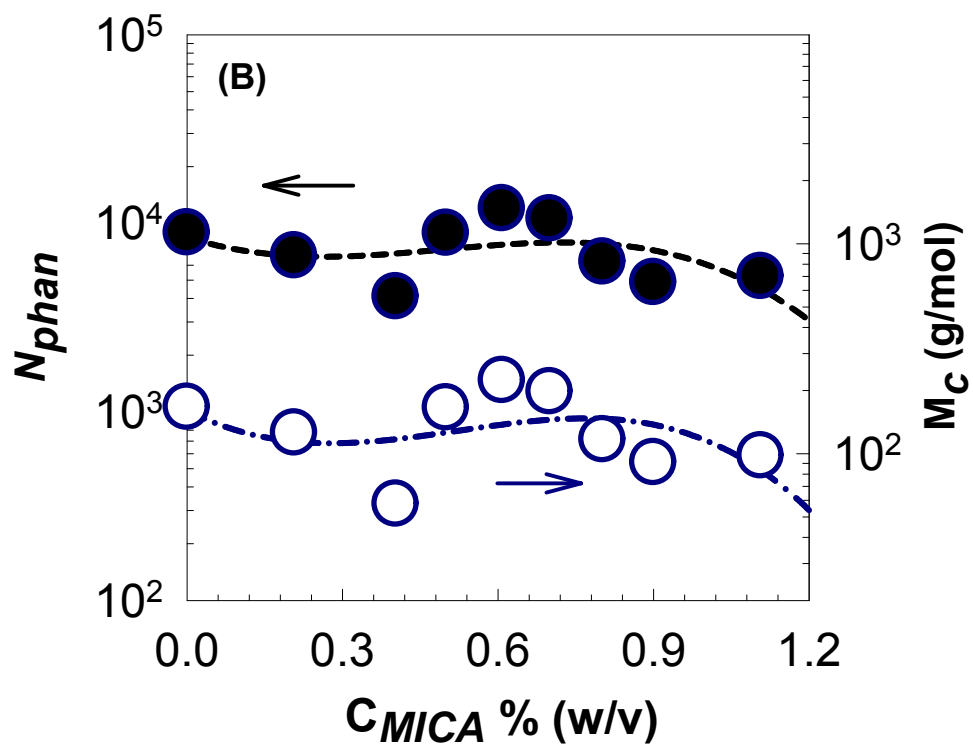


Figure S2. Variation of the average network chain length N (solid symbols) and M_c (open symbols) in the hybrid hydrogel network of MICAm/PDA-HGel as a function of mica content.