Electronic Supplementary Material (ESI) for Soft Matter.

Supplementary Materials for

Fractographic Mirror Law for Brittle Fracture of Nonlinear Elastic Soft Materials

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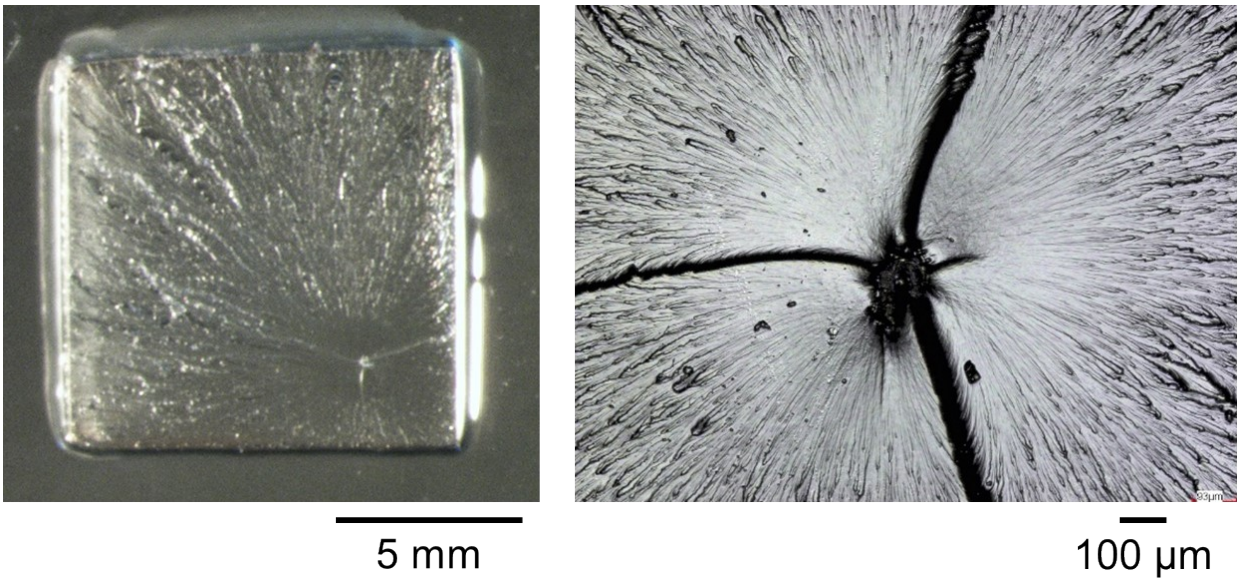

Fig. S1.
Example of the gel broken from internal defect (contaminant probably introduced during gel preparation). Left: overview. Right: high magnification image around the defect.

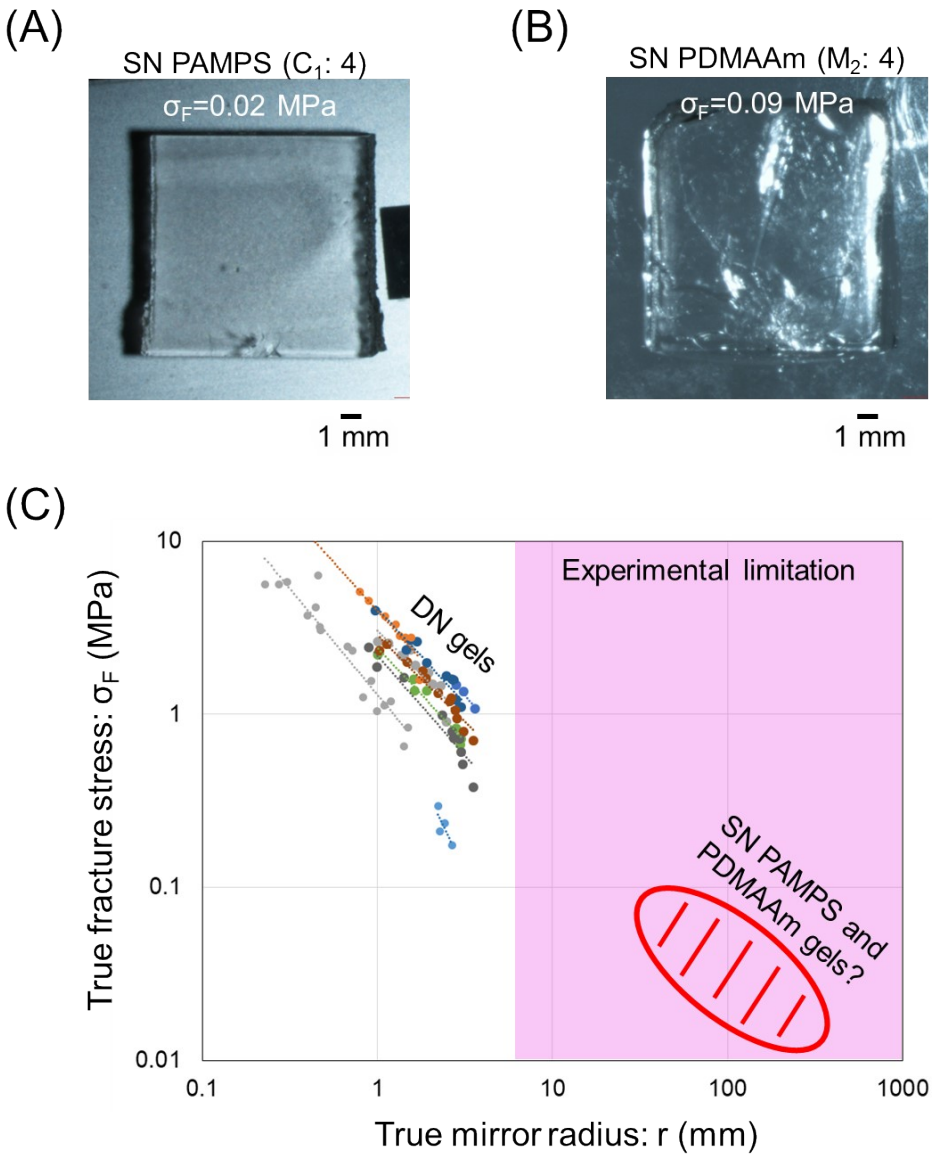

Fig. S2.

Fracture surfaces of single network (SN) gels, which are constituent materials of DN gels. (A) Equilibrium swollen SN PAMPS gels (C_1:4). (B) Non-swollen SN PDMAAm gels (M_2:4). (C) Relationship between fracture stress and mirror radius. These SN gels break with a smaller fracture stress (10–100 kPa) than DN gels (0.2–10 MPa). Therefore, the expected mirror radius (red-hatched region) greatly exceeds the sample size (1 cm × 1 cm) used in this study.

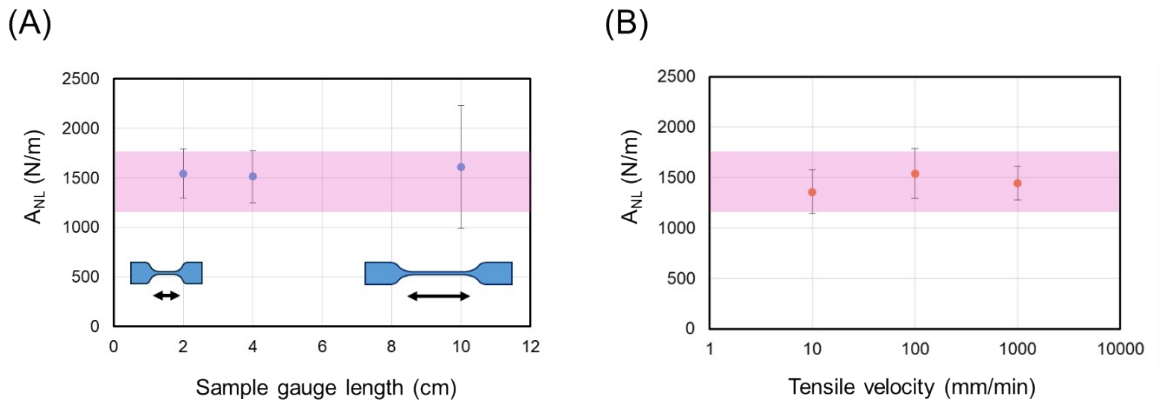

Fig. S3.

Material constant A_{NL} under different experimental conditions. (A) Different sample gauge lengths. (B) Different tensile velocities. The sample composition is DN gel (8/2).

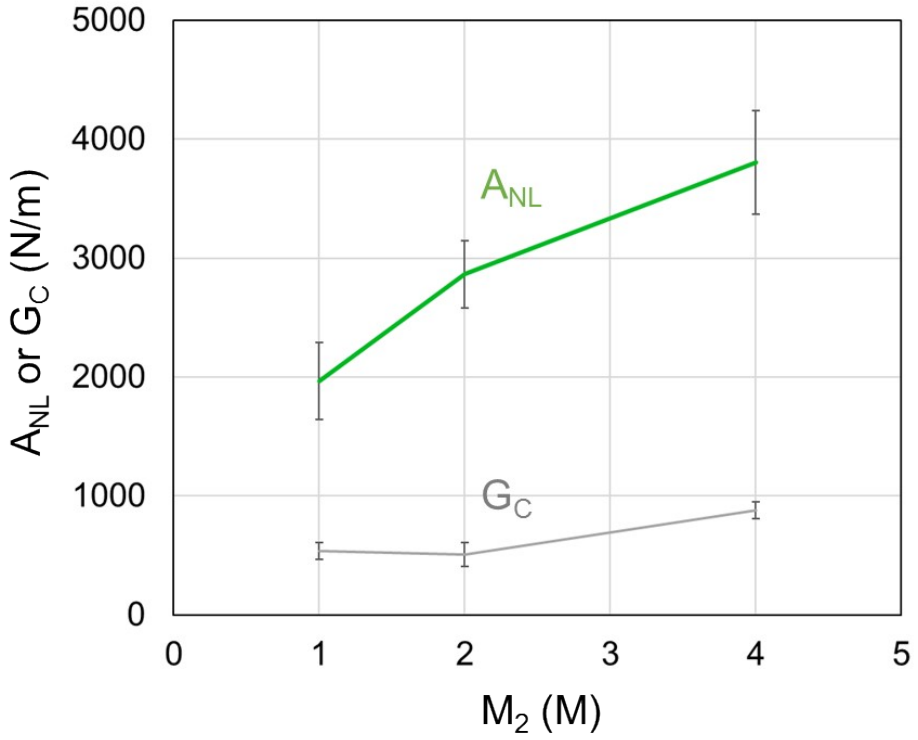

Fig. S4.

Relationship between mirror constant A_{NL} and critical energy release rate G_c of DN hydrogels with varied second-network monomer concentrations M_2. The G_c was measured using a pure shear test [27]. The sample composition is DN gel (4/ M_2).

Movie S1.
Tensile test movie of DN (8/2).