Supporting information

Tunable Molecular Sieving in Gel Electrophoresis Using a Poly(ethylene glycol)-Based Hydrogel

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Preparation of an agarose gel

An agarose powder was dispersed in 1 × TBE buffer at 1.0 wt% against the solvent. The solution was stirred and heated (90 ºC) until agarose was completely dissolved. Then, after cooling down less than 70 ºC, the solution was poured to a gel-tray, 130 mm × 59.5 mm × 13 mm (height) and left at room temperature for 20 min.

YOYO-1 labeling

The defrosted each DNA was mixed with 1.0 mM YOYO-1 and stirred with Vortex stirrer. Then, the mixture was diluted with 0.5 × TBE buffer and left at room temperature for 1 h.

APTS derivatization

5 % APTS in water of 3.0 μL was mixed with 100 mM each glucan in water of 3.0 μL, acetic acid of 2.25 μL, and water of 6.75μL. Then, 1M $NaBH_3CN$/ in tetrahydrofuran of 5.0 μL was added to the solution, the mixture left at 55 ºC for 2 h. After the reaction, the mixture was diluted with water of 30 μL.

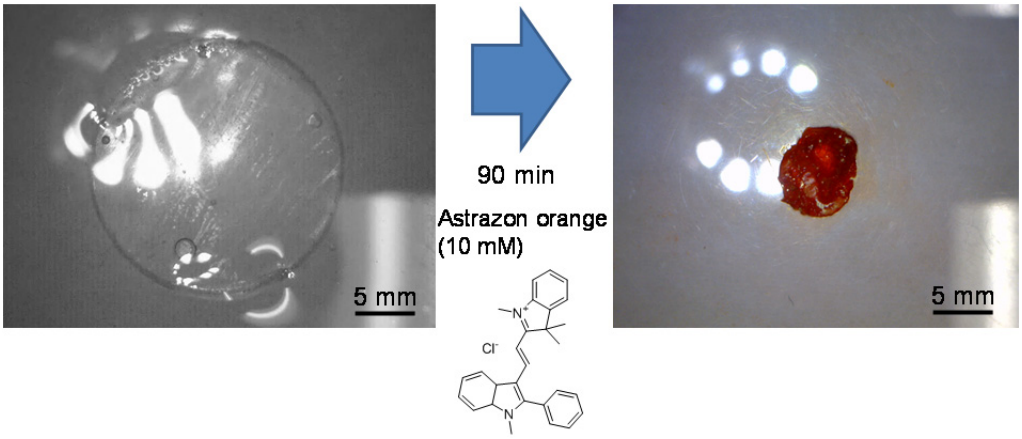

Fig. S1. Irreversible shrinking of the gel in astrazon orange R. Gel: 0.9 mmol PEG-DMA, 14 mL MeOH/water = 9/5 (v/v), 1.0 wt% AIZP toward monomers, and 2.1 mmol sodium *p*-styrenesulfonate (SS).

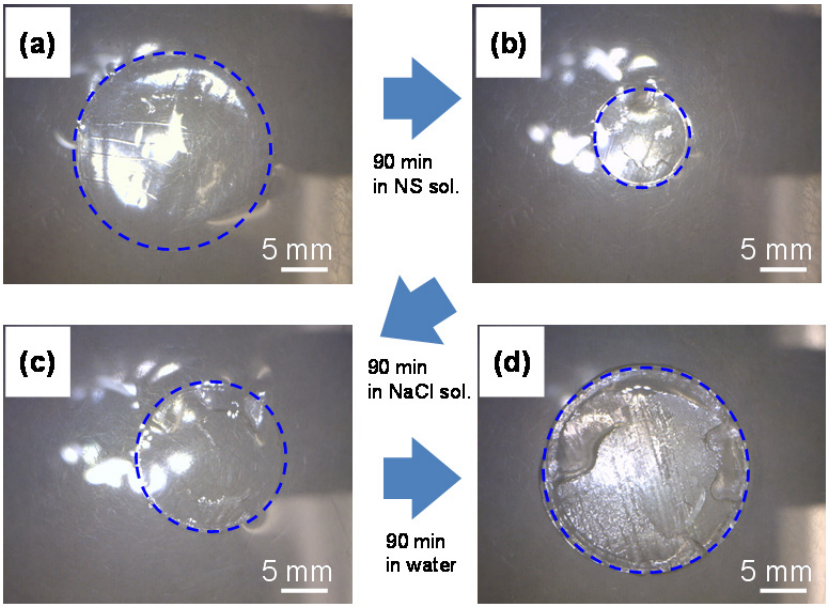

Fig. S2. Photo images of swelling and shrinking of the gel. Gel: 0.9 mmol PEG-DMA, 14 mL MeOH/water = 9/5 (v/v), 1.0 wt% AIZP toward monomers, and 2.1 mmol vinylbenzyl trimethylammonium chloride (VBTMAC). Immersed solution: (a) water, (b) 10 mM sodium 2-naphthalenesulfate aq., (c) 50 mM NaCl aq., (d) water.

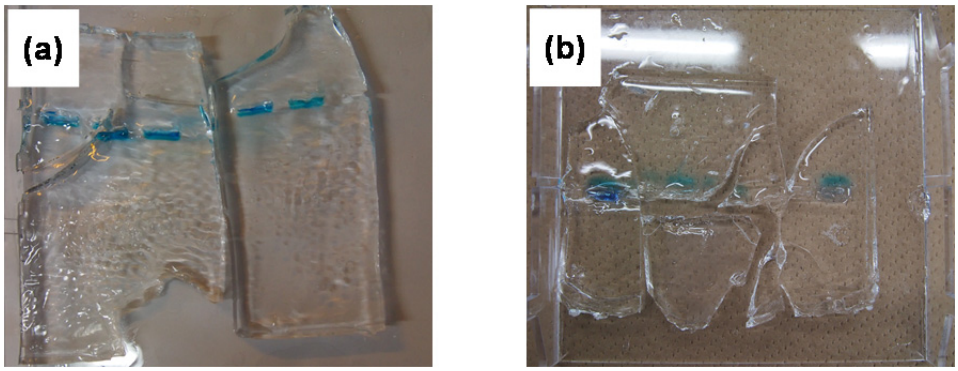

Fig. S3. Breaking of the gel under voltage applying in electrophoresis. Gel: 0.9 mmol PEG-DMA, 14 mL MeOH/water = 9/5 (v/v), 1.0 wt% AIZP toward monomers, and 2.1 mmol (a) SS or (b) VBTMAC. Electrophoresis: migration solution, 1 × TBE buffer; applied voltage and time, 100 V for 30 min.