

Electronic Supplementary Information for

**Sorbitol-Based supramolecular organogelators with effective phase-selective gelation
and Significant Self-healing Property**

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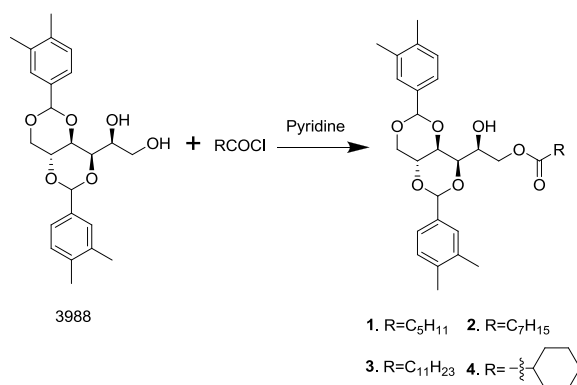
1. Experimental section

1) SEM Observations. To understand the network morphology of the gel, small portions of the gels, produced at 25 °C, were placed on a glass cover slip. They were dried in air at room temperature and finally in a vacuum for three days, and then they were observed through a field emission scanning electron micrograph taken with a Hitachi-4800 (Hitachi, Japan) microscope.

2) Spectroscopy. FTIR measurements were performed on a Bruker Equinox 55 spectrometer. The absorption spectra of the xerogels were obtained at room temperature in the range of 500-4000 cm^{-1} and a resolution of 2 cm^{-1} . The measured samples were dispersed in KBr pellets. NMR spectra of gels were recorded with a Bruker DPX 400 instrument at 400 MHz.

3) Rheological measurements. Rheological measurements were obtained on stress-controlled rheometer (Stress Tech) using steel-coated parallel-plate geometry (25 mm diameter). A solvent-trapping device was placed above the plate to avoid evaporation. All measurements were made at 20 °C. Constant frequency (1Hz) oscillatory stress sweeps from 0.1 to 100 Pa were performed to obtain the storage modulus G' and the loss modulus G'' as functions of the stress amplitude. To study the thixotropic behavior, a simple step strain experiment was performed for all gels in several steps. At first gels were subjected to a constant strain of 0.1% (step 1). Then a constant strain (100%) was applied to destroy the sample (step 2). Then a small constant strain was applied (0.1%) again and the storage modulus G' and the loss modulus G'' of the sample were monitored as functions of time (step 3).

2. Synthetic procedures and characterization



Scheme S1 Structures of gelators **1-4** Synthesized.

1,3:2,4-bis-O-(*p*-methoxybenzylidene)-6-hexanoate-D-sorbitol (compound 1). A mixture of 3988 (8.28 g, 0.02mol), hexanoyl chloride (2.69 g, 0.02 mol), and dry pyridine (50 mL) was heated at 50 °C for 6 h. The reaction was monitored by TLC. When TLC showed complete disappearance of the starting material, the reaction mixture was cooled to room temperature. Then the reaction mixture was filtered, and the filtrate was washed with water and alcohol, and then reprecipitated by pyridine to give a white solid of 7.48 g, yield: 73%. Mp 170.0-171.8 °C.

¹H-NMR (400MHz, DMSO-d₆): δ 7.19-7.04 (m, 6H, Ar-H), 5.66 (s, 1H, OCHO), 5.54 (s, 1H, OCHO), 5.27-5.23 (m, 1H, OH), 4.46-4.00 (m, 8H, CH, CH₂), 2.27-2.25 (m, 12H, Ar-CH₃), 1.91-1.07 (m, 11H, CH₂-CH₃). Anal. Calcd for C₃₀H₄₀O₇: C, 70.29; H, 7.86; found: C, 69.78; H, 7.81. R_f (4:1 hexanes / ethyl acetate) = 0.37.

1,3:2,4-bis-O-(*p*-methoxybenzylidene)-6-caprylate-D-sorbitol (compound 2). The procedures used for the preparation of **2** are similar to those for **1**. Compound **2** was isolated as a white solid in 77% yield. Mp 166.4-167.9 °C.

¹H-NMR (500MHz, DMSO-d₆): δ 7.19-7.04 (m, 6H, Ar-H), 5.66 (s, 1H, OCHO), 5.54 (s, 1H, OCHO), 5.27-5.23 (m, 1H, OH), 4.46-4.06 (m, 8H, CH, CH₂), 2.29-2.25 (m, 12H, Ar-CH₃), 1.49-0.80 (m, 15H, CH₂-CH₃). Anal. Calcd for C₃₃H₄₄O₇: C, 71.08; H, 8.20; found: C, 70.88; H, 8.11. R_f (4:1 hexanes / ethyl acetate) = 0.41.

1,3:2,4-bis-O-(*p*-methoxybenzylidene)-6-laurate-D-sorbitol (compound 3) : The procedures used for the preparation of **3** are similar to those for **1**. Compound **3** was isolated as a white solid in 77% yield. Mp 161.0-163.9 °C.

$^1\text{H-NMR}$ (500MHz, CDCl_3): δ 7.19-7.04 (m, 6H, Ar-H), 5.66 (s, 1H, OCHO), 5.54 (s, 1H, OCHO), 5.27-5.23 (m, 1H, OH), 4.48-4.02 (m, 8H, CH, CH_2), 2.28-2.25 (m, 12H, Ar- CH_3), 1.62-0.87 (m, 23H, CH_2 - CH_3). Anal. Calcd for $\text{C}_{36}\text{H}_{52}\text{O}_7$: C, 72.45; H, 8.78; found: C, 71.79; H, 8.70. R_f (4:1 hexanes / ethyl acetate) = 0.47.

1,3:2,4-bis-O-(*p*-methoxybenzylidene)-6-cyclohexanecarbonate-D-sorbitol (compound 4). The procedures used for the preparation of **4** are similar to those for **1**. Compound **4** was isolated as a white solid in 77% yield. Mp 189.7-191.6 $^\circ\text{C}$.

$^1\text{H-NMR}$ (500MHz, CDCl_3): δ 7.19-7.04 (m, 6H, Ar-H), 5.66 (s, 1H, OCHO), 5.54 (s, 1H, OCHO), 5.27-5.23 (m, 1H, OH), 4.44-4.02 (m, 8H, CH, CH_2), 2.28-2.25 (m, 12H, Ar- CH_3), 1.32-0.87 (m, 12H, CH_2). Anal. Calcd for $\text{C}_{31}\text{H}_{40}\text{O}_7$: C, 70.97; H, 7.68; found: C, 69.13; H, 7.03. R_f (4:1 hexanes / ethyl acetate) = 0.35.

3 Figure S1

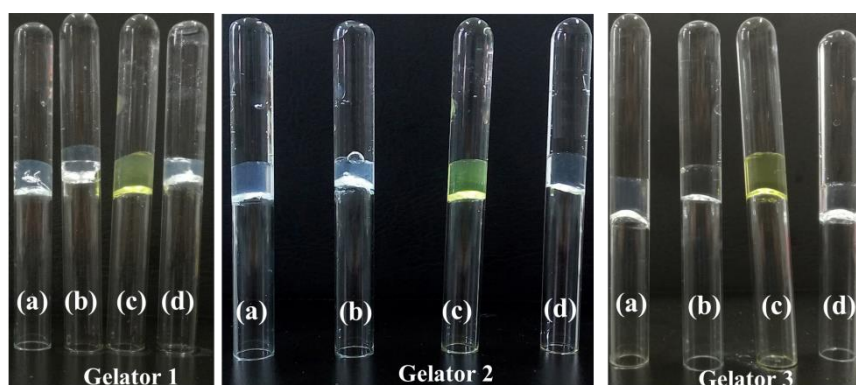


Figure S1 Photographs of gels of **1**, **2** and **3** in (a) gasoline, (b) Silicon oil, (c) kerosene and (d) cyclohexane in presence of water are stable to inversion in 2 wt%.

4 Figure S2

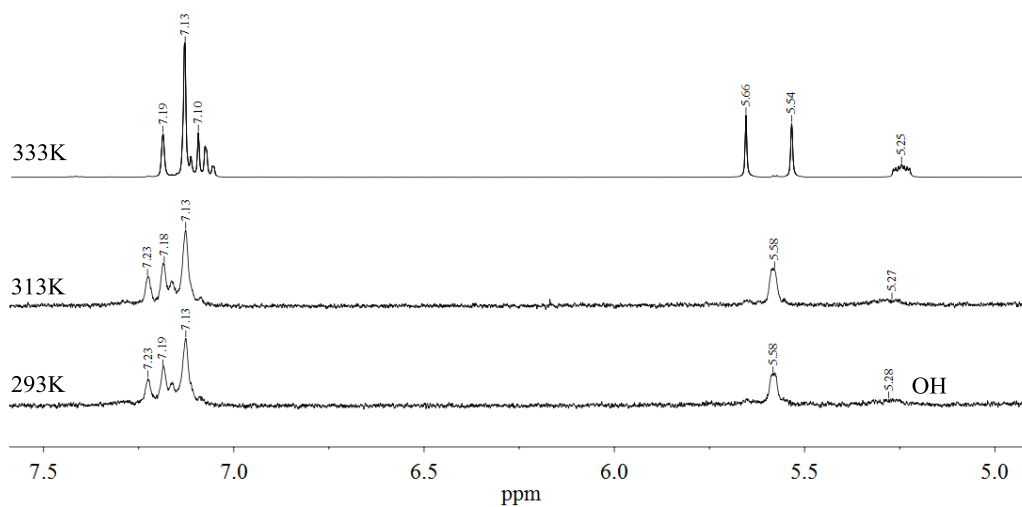


Figure S2 ^1H NMR spectra of **3** in acetonitrile- d_3 at different temperatures (1 wt%).

5 Figure S3

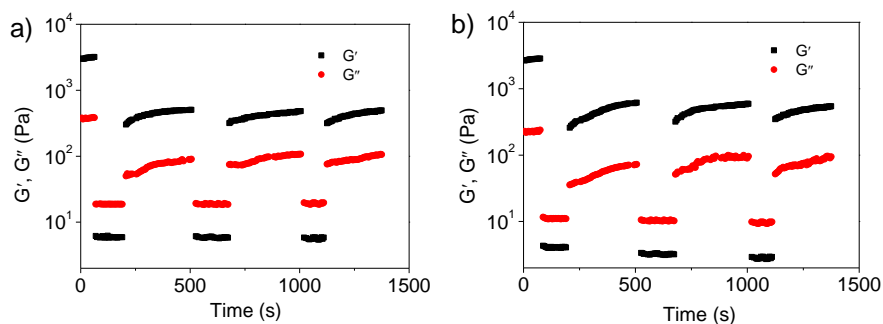


Figure S3 Time scan tests under alternating strain of 0.1% and 100% of gasoline gel derived from a) **1** and b) **2** with a fixed frequency at 1 Hz.

6 Table S1 The values of BCGC for the gels of gelator 1-4 in various organic solvents in presence of water.

Solvent	BCGC in wt%			
	1	2	3	4
cyclohexane	0.33	0.26	0.21	0.48
n-octane	0.48	0.41	0.35	PG
gasoline	0.88	0.75	0.52	0.89
Kerosene	0.93	0.79	0.61	PG
Silicon oil	0.43	0.35	0.26	P
soybean oil	0.46	0.39	0.19	P