Electronic Supplementary Material (ESI) for New Journal of Chemistry.
This journal is © The Royal Society of Chemistry and the Centre National de la Recherche Scientifique 2019

A tertiary amine group-based organogelator with pH-trigger recyclable property

Dan Liu, [a] Shanshan Dai, *[ab] Li Wang, [a] Ya Liu, [a] Hongsheng Lu *[ab]

[a] College of Chemistry and Chemical Engineering, Southwest Petroleum University, Chengdu, 610500, P. R. China

[b] Oil and Gas Field Applied Chemistry Key Laboratory of Sichuan Province, Chengdu, 610500, P. R. China

*Corresponding author. E-mail: ssdai@swpu.edu.cn; hshlu@swpu.edu.cn

Experimental Section

Synthesis procedures. The synthesis process is straightforward with one-step. HSA (6.00 g, 20 mmol) and excess DMAPA (4.00 g, 40 mmol) were stirred and refluxed at 160 °C for 12 h to obtain a crude product with light yellow. Then, the crude product was dissolved in dilute HCl solution and filtered the insoluble matter off. The resulting acid solution was adjusted to alkaline by using NaOH aqueous solution, and a white solid was floated. Finally, the white solid was washed with deionized water to neutral, filtered, and then dried by vacuum oven to obtain the target product. Yield: 85% (6.53 g); mp: 87-90 °C. ^{1}H NMR (400 MHz, DMSO-d6, TMS, 25 °C): δ 7.73 (t, J = 5.6 Hz, 1H), 4.19 (m, 1H), 3.02 (td, J = 7.0, 5.6 Hz, 2H), 2.20 (t, J = 7.2 Hz, 2H), 2.11 (s, 6H), 2.02 (t, J = 7.4 Hz, 2H), 1.48 (dp, J = 13.9, 7.0 Hz, 4H), 1.40 – 1.32 (m, 2H), 1.23 (m, 24H), 0.89 – 0.82 (t, 3H).

Calculation of product purity. The purity of HSA-N can calculated by using the following equation:

Purity (%) = [∑ I (product) / ∑ I (total)] × 100

where I is the relative area of each signal.[1, 2]

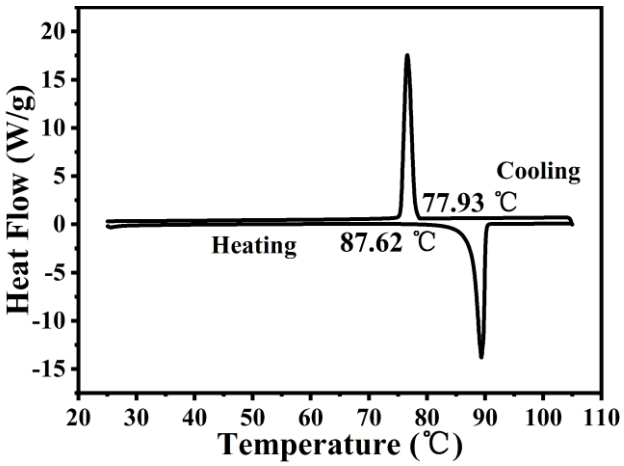

Fig. S1 Heating and cooling cycles in a DSC thermogram of HSA-N.

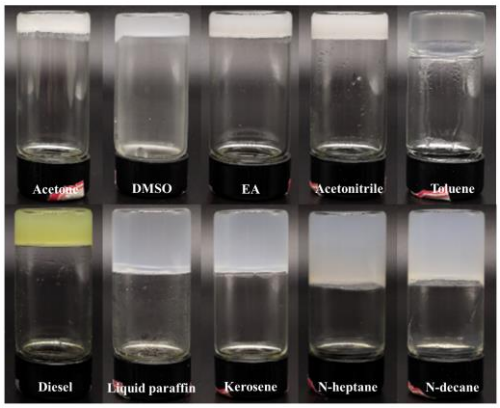

Fig. S2 Pictures of HSA-N gelate various organic liquids at their MGC.

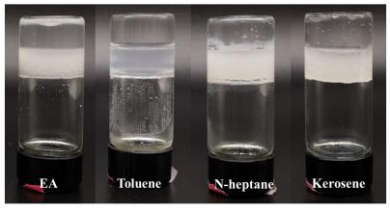

Fig. S3 Pictures of HSA-N phase-selectively gelate organic phase in an oil-water mixture.

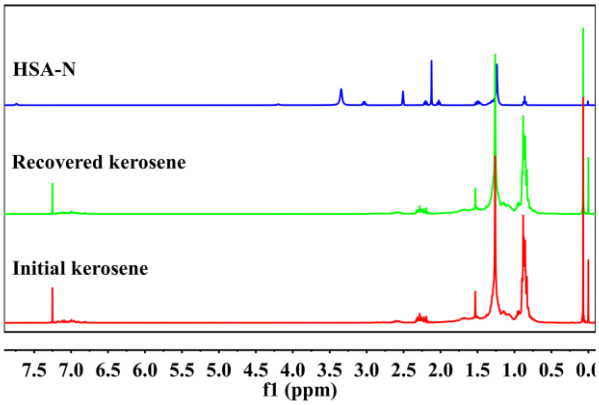

Fig. S4 ^{1}H NMR comparison chart of HSA-N, recovered kerosene and initial kerosene.

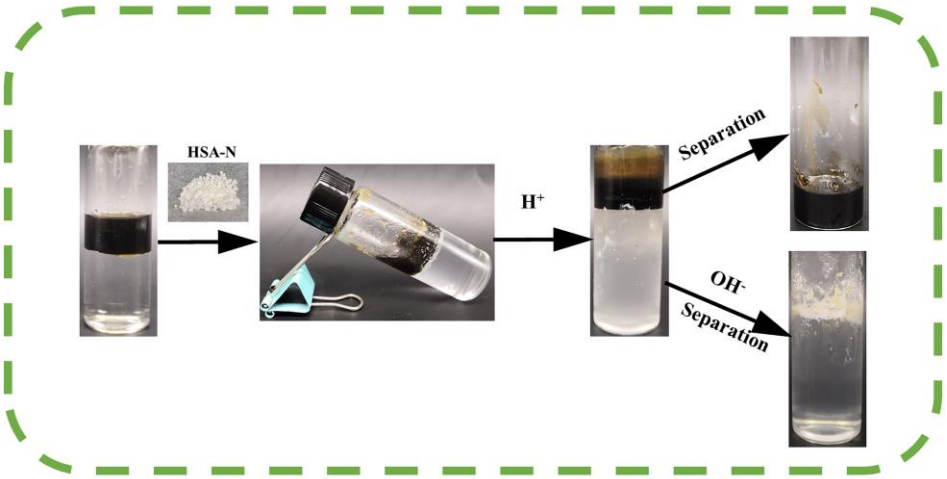

Fig. S5 Process of recovering crude oil and HSA-N from crude oil gel.

Reference

1. Y. Zhang, D. Liu, S. Dai and H. Lu, *J. Phys. Chem. B*, 2019, **123**, 9024-9030.
2. M. K. Ali, R. M. Moshikur, R. Wakabayashi, Y. Tahara, M. Moniruzzaman, N. Kamiya and M. Goto, *J. Colloid Interface Sci.*, 2019, **551**, 72-80.