

Supporting Information

Facile fabrication of hydrogel coated membrane for controllable and selective oil-in-water emulsion separation

Qingdong Zhang ^a, Na Liu ^b, Yen Wei ^a and Lin Feng ^{a*}

a Department of Chemistry, Tsinghua University, Beijing, 100084, P. R. China

b Institute of Materials for Energy and Environment, School of Materials Science and Engineering, Qingdao University, Qingdao 266071, P. R. China

E-mail: fl@mail.tsinghua.edu.cn

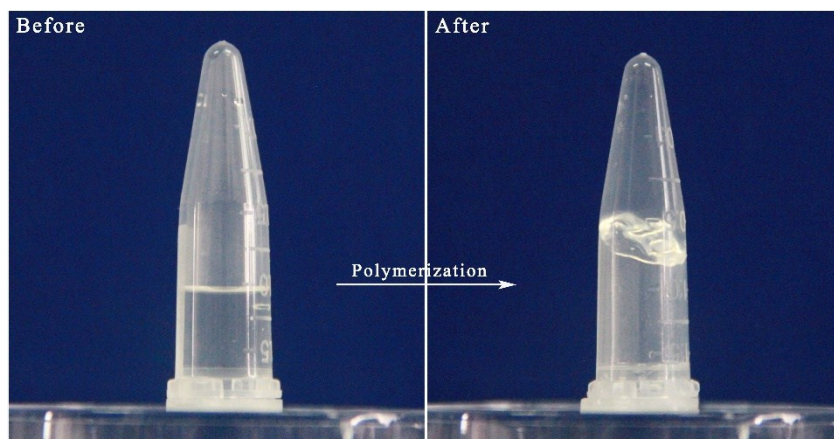


Figure S1 Digital photos of the pregel solution in the bulletlike centrifuge tube and the obtained hydrogel after polymerization.

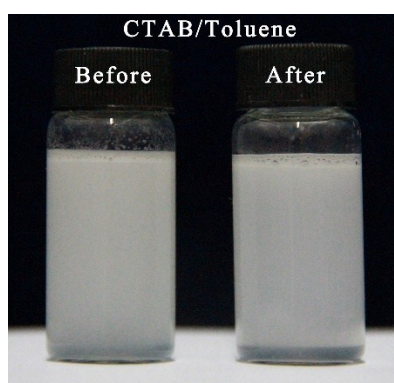


Figure S2 Photographs of the CTAB-stabilized toluene-in-water emulsion before and after filtration.

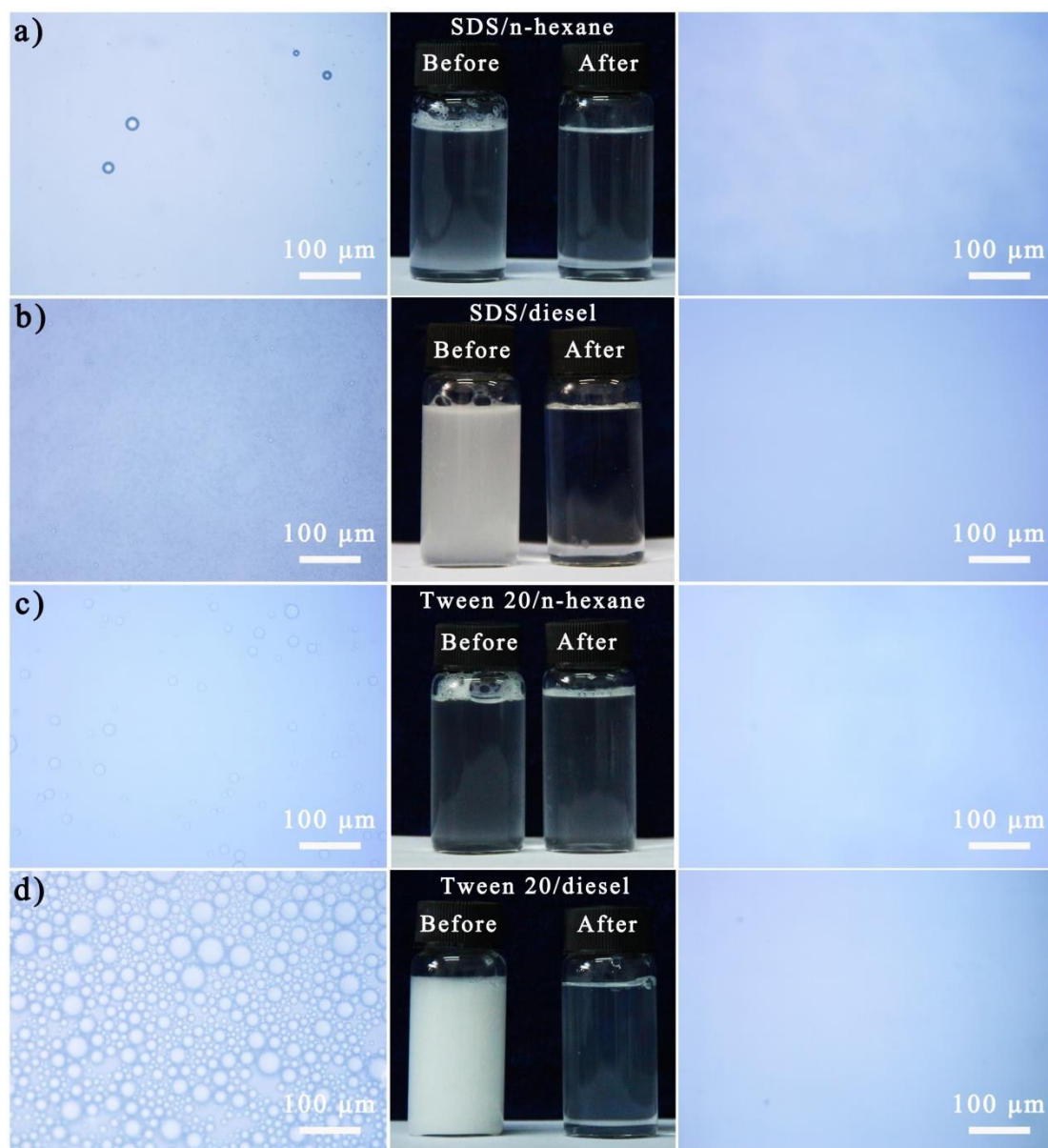


Figure S3 Photographs of n-hexane/diesel-in-water emulsions stabilized with SDS and Tween 20 before and after filtration.

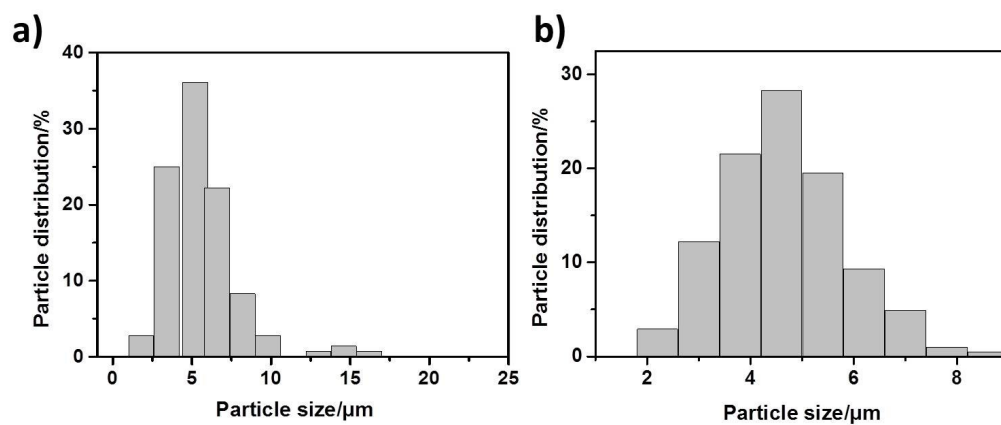


Figure S4 The particle size distribution of a) SDS-stabilized toluene-in-water emulsions; b) Tween20-stabilized toluene-in-water emulsions.

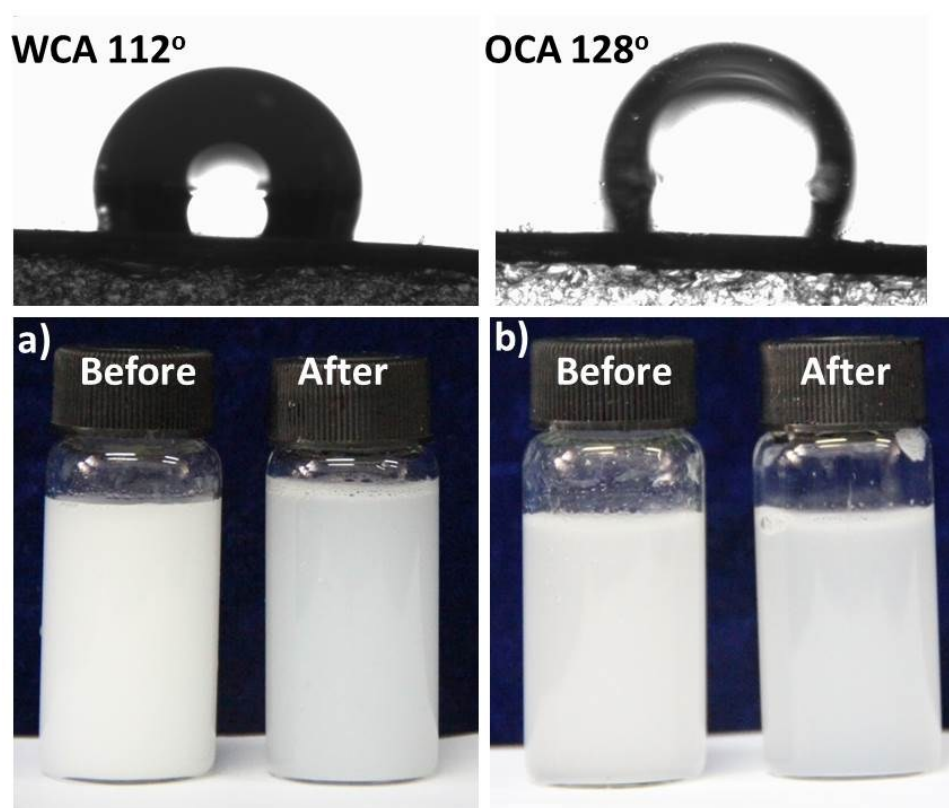


Figure S5 The water and oil contact angle of the initial MCE membrane and the separation results by the initial MCE membrane. a) photographs of Tween 20-stabilized toluene-in-water emulsions before and after filtration by the initial MCE membrane; b) photographs of SDS-stabilized toluene-in-water emulsions before and after filtration by the initial MCE membrane.

a)	1 (ppm)	2 (ppm)	3 (ppm)
SDS/Toluene	50.841	49.89	48.895
Tween 20/Toluene	46.408	50.72	50.261
SDS/n-Hexane	52.424	50.854	50.284
Tween 20/n-Hexane	51.539	52.3	51.54
SDS /Diesel	11.26	11.248	11.236
Tween 20/Diesel	12.523	12.028	11.032

b)	1 (ppm)	10 (ppm)	20 (ppm)	30 (ppm)
----	---------	----------	----------	----------

SDS/Toluene	50.903	52.623	50.12	48.239
--------------------	--------	--------	-------	--------

Figure S6 The oil content in collected filtrates measured by the infrared spectrometer oil content analyzer. a) The oil content in the collected filtrates in the emulsion separation experiments for toluene-in-water, n-hexane-in-water and diesel-in-water emulsions stabilized with different surfactants. a) The oil content in the collected filtrates in recyclability tests of the PAMPS hydrogel coated membrane for repeated SDS-stabilized toluene-in-water emulsion separation.

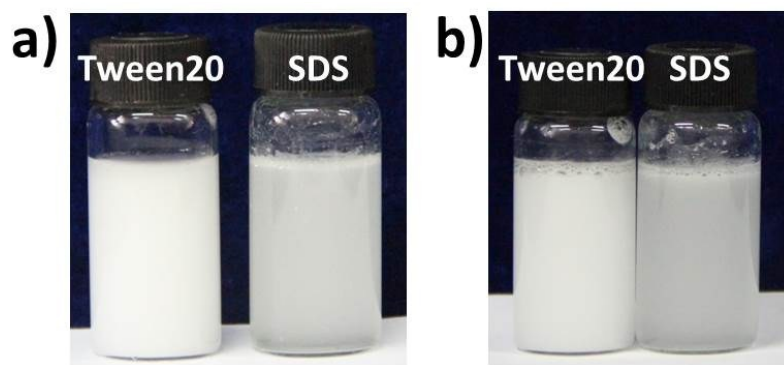


Figure S7 The stability test of Tween 20/SDS-stabilized toluene-in-water emulsions. a) the prepared fresh Tween 20/SDS-stabilized toluene-in-water emulsions; b) the emulsions after placement for 48 h.

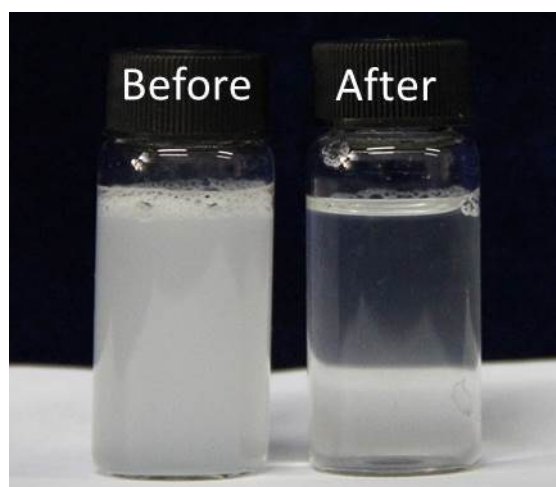


Figure S8 Photographs of the SDS-stabilized toluene-in-water emulsion before and after filtration.