Electronic Supplementary Material (ESI) for RSC Advances.

Sensitivity of Coalescence Separation of Oil-Water Emulsions Using Stainless Steel Felt Enabled by LBL Self-Assembly and CVD

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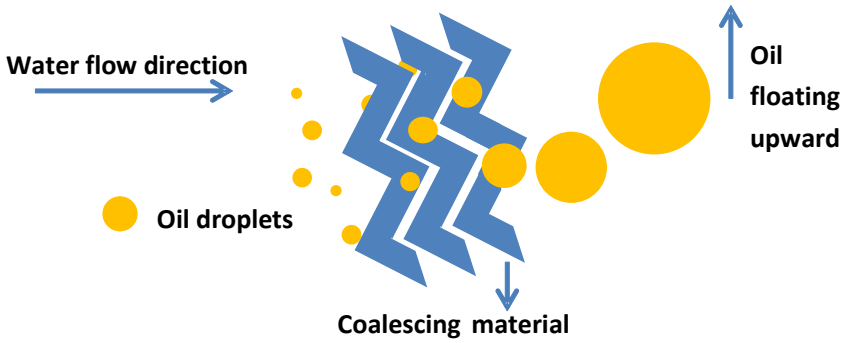


Figure S1. Schematic diagram of coalescence process.

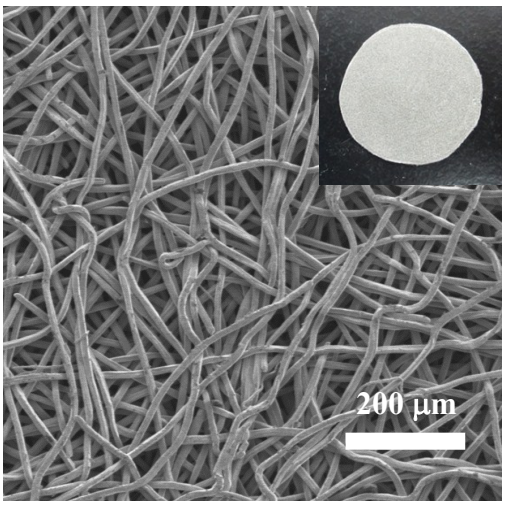


Figure S2. SEM image of the blank stainless steel fiber felt; inset is a digital picture of the felt.

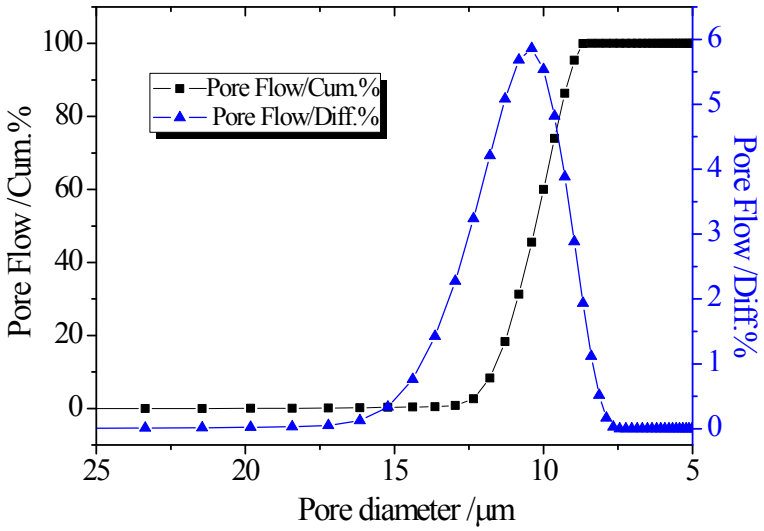


Figure S3. Pore size distribution of the blank felt.

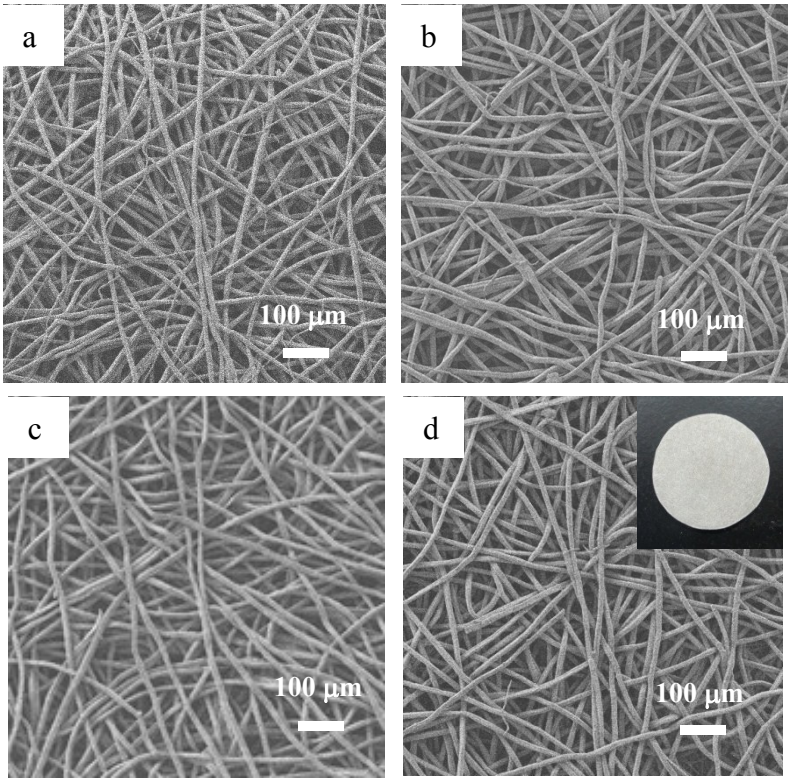


Figure S4. SEM images of the felts with (a) 0+1, (b) 1+1, (c) 2+1 and (d) 4+1 particle depositions before hydrophobic modification using CVD; inset is a digital picture of the felt with 4+1 particle deposition.

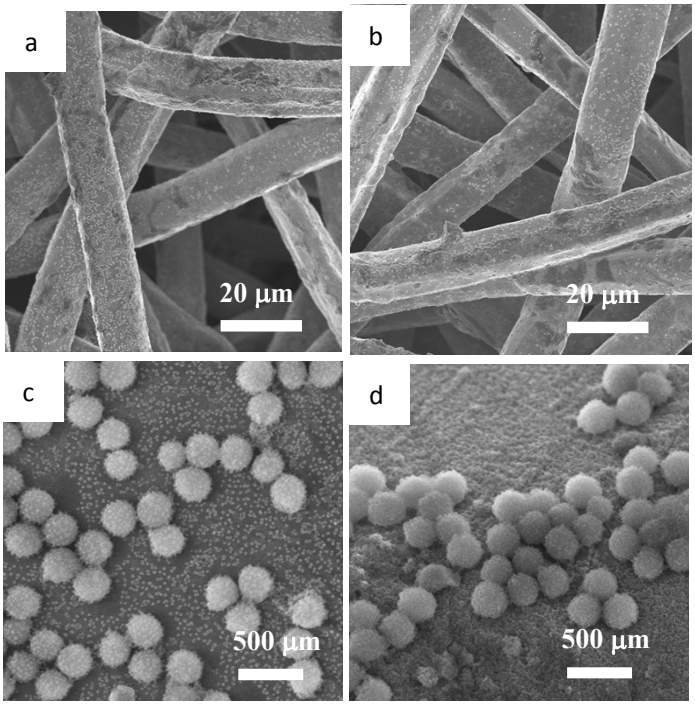
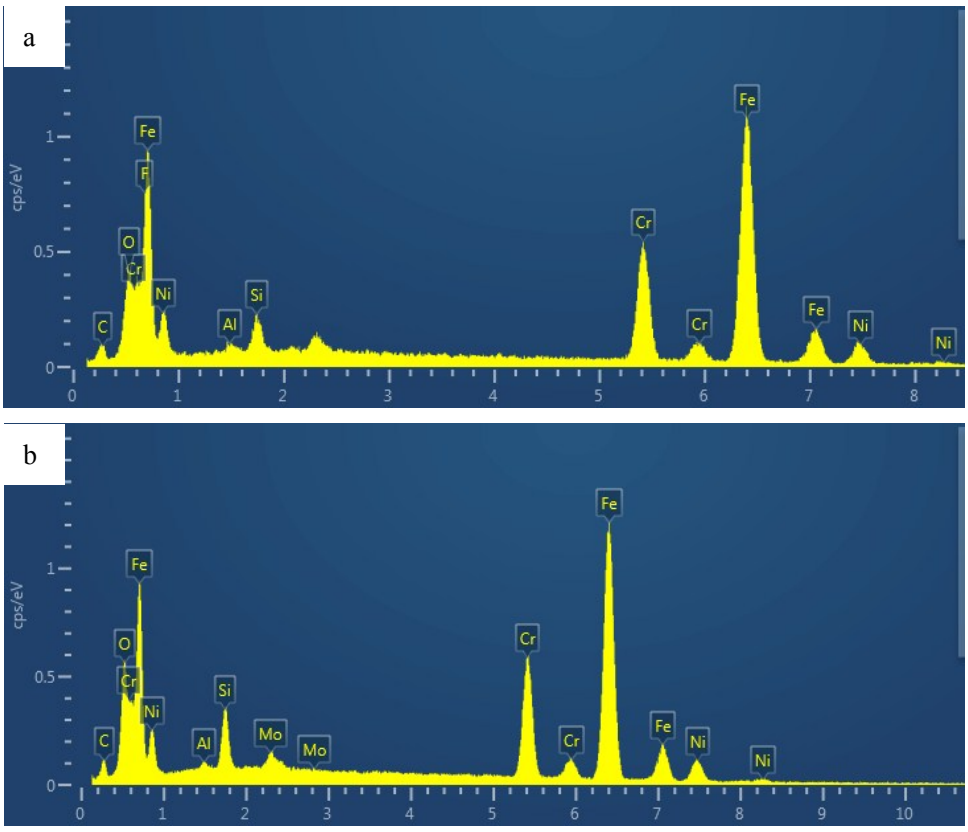


Figure S5. SEM images of the felts with 1+1 particle deposition and low level CVD treatment with POTS (a and c) and high level CVD treatment with POTS (b and d).



element	wt%
C	3.89
O	2.65
F	2.39
Al	0.34
Si	1.49
S	0.61
Cr	17.02
Fe	62.62
Ni	9.00

element	wt%
C	4.09
O	4.70
Al	0.29
Si	2.52
Cr	16.86
Fe	61.15
Ni	8.78
Mo	1.61

Figure S6. EDXS spectra for 1+1 particle deposition and (a) high level CVD treatment with POTS and (b) low level CVD treatment with POTS.

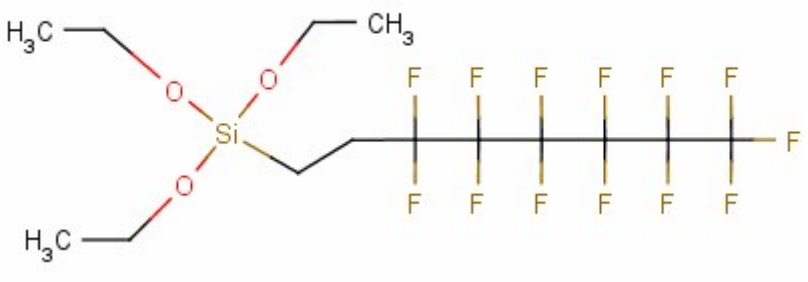


Figure S7. Molecular formula of POTS.

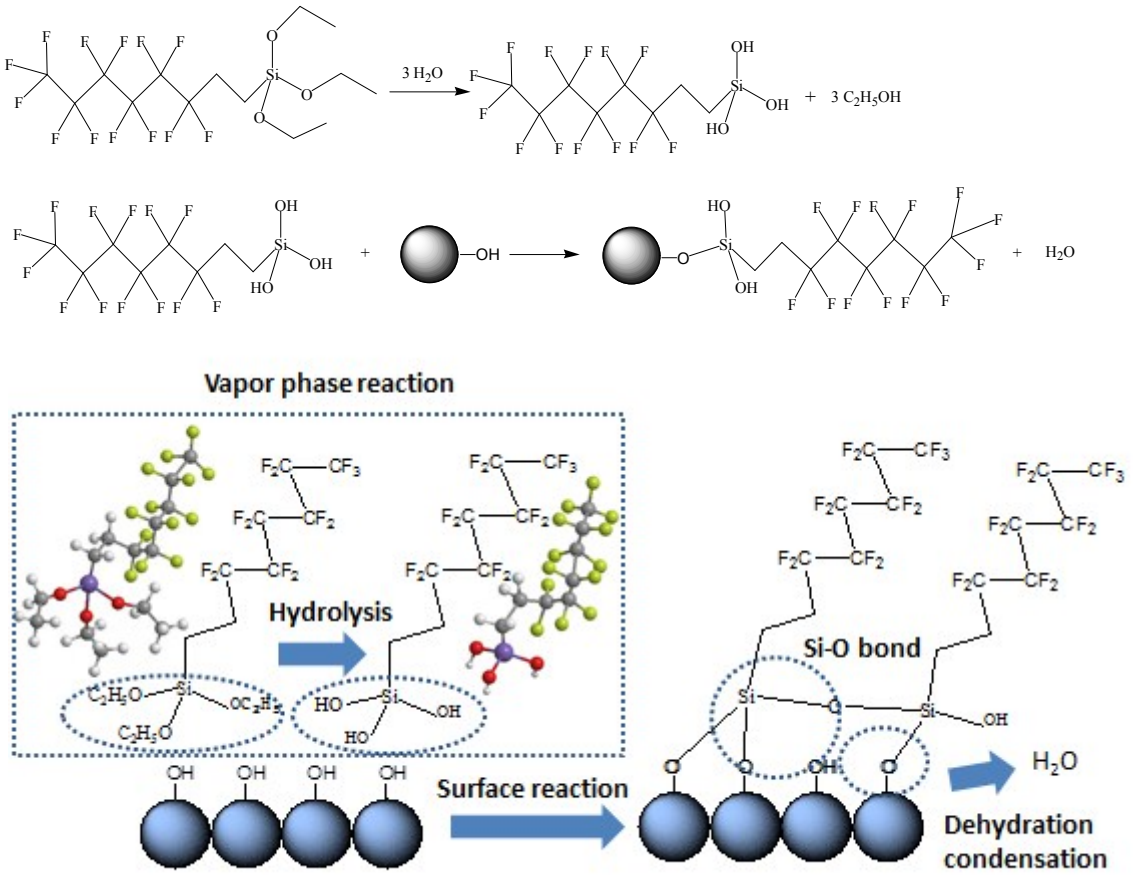


Figure S8. Reaction mechanism between POTS and SiO_2.

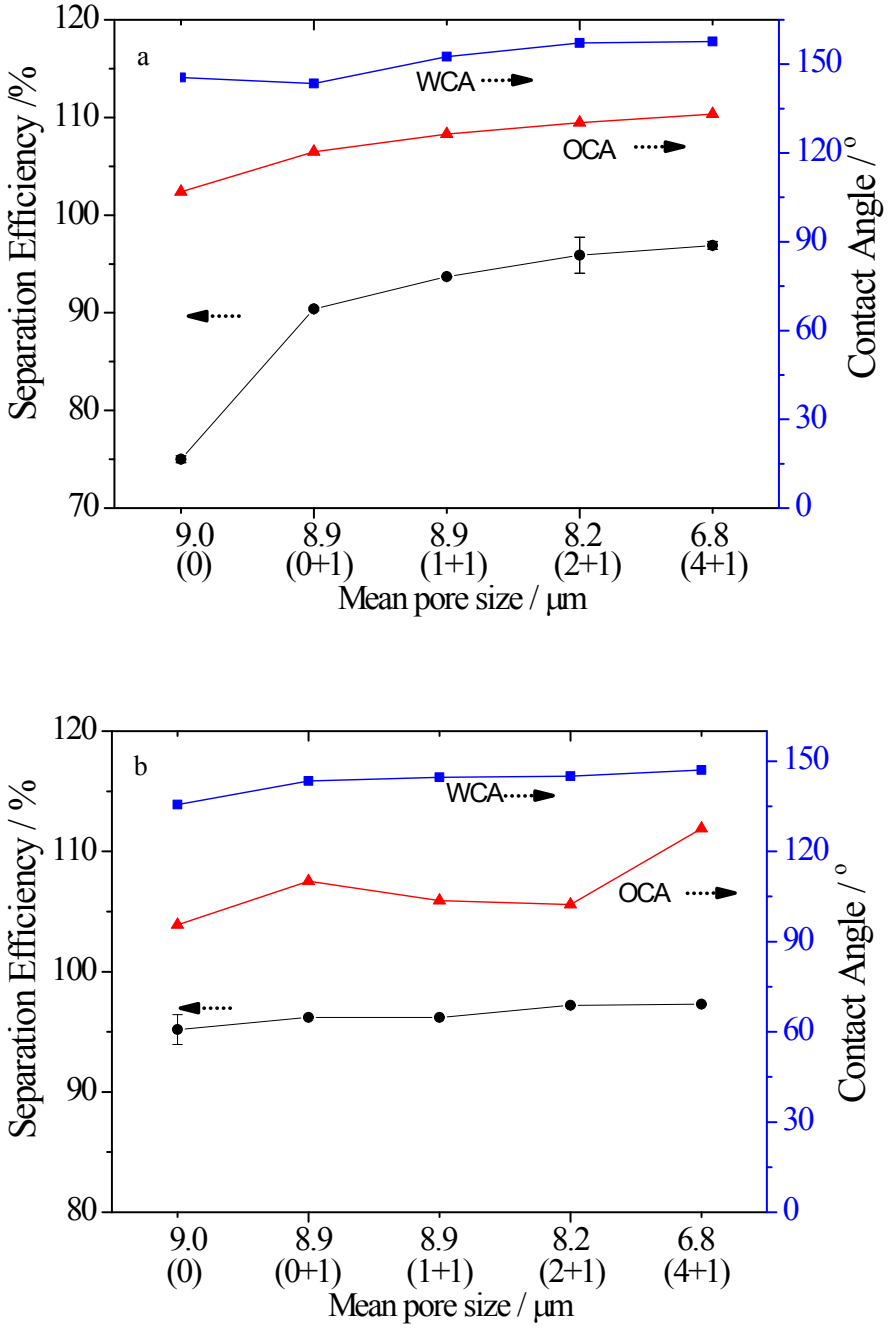


Figure S9. Separation efficiency vs. wetting properties of various felts endowed with (a) high level CVD treatment and (b) low level CVD treatment.

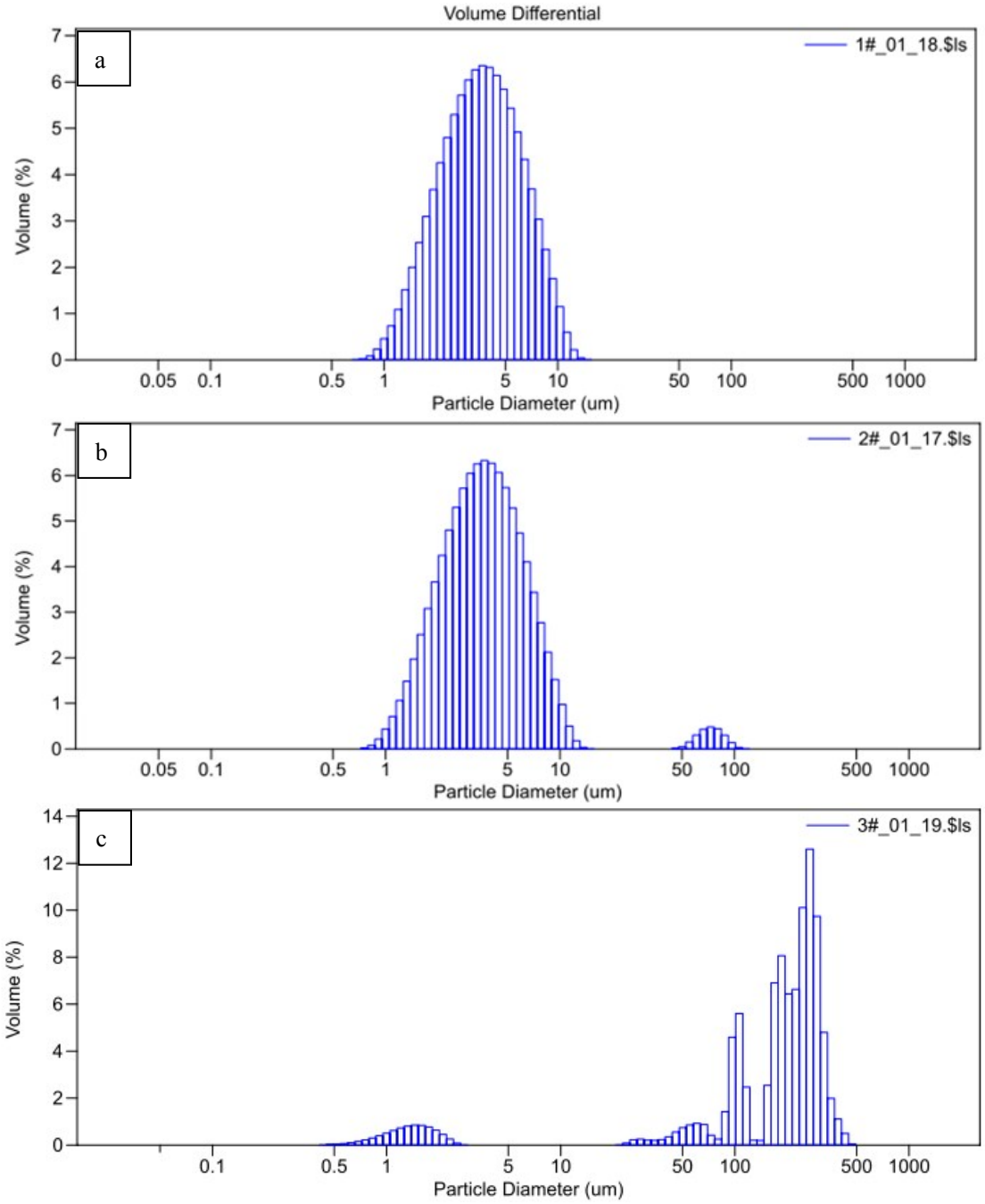


Figure S10. The drop size distributions of (a) oil-water emulsion, (b) after passing through the syringe and (c) after passing through the coated filter felt. (n-hexadecane is the oil).

Table S1. Si content in deionized water, the ultrasonicated water containing the coated felt and ultrasonicated 2M NaOH solution containing the coated felt. Sonication power 270 W, time 1h.

Sampled liquid	Si content/ppm
deionized water	0.00137*
Ultra-sonicated water with the felt	0.00851*
Ultra-sonicated NaOH solution with the felt	2.31828

*out of detection limit