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Supporting information

A facile and effective strategy to develop the super-hydrophobic / super-oleophilic fiberglass filter membrane for efficient micron-scale water-in-oil emulsions separation

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Table S1. Detailed composition of various MTS@SH-SiO2@FGm

Membrane category	The amount of MTS added(mM)	The amount of SH-SiO2 added(g)
M0	15mM	0
M1	15mM	0.10
M2	15mM	0.15
M3	15mM	0.20
M4	15mM	0.25
M5	15mM	0.30

Table S2. Detailed composition of various emulsions

Emulsion acronym	Emulsion composition				
	Oil		water	Span80	Tween
SE-A	isooctane	99mL	1mL	0.02g	0
SE-B	n-Hexane	99mL	1mL	0.02g	0
SE-C	cyclohexane	99mL	1mL	0.02g	0
SE-D	petroleum ether	99mL	1mL	0.02g	0
SE-E	kerosene	99mL	1mL	0	0.02g

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Table S3. The water content for separated different emulsion.

Emulsion types	The initial concentration of water in the emulsion (mg/L)	Water content used by trace moisture analyzer (WC%)	The concentration of water in the collected oil (mg/L)
SE-A	711910	0.0107%	73.50435
SE-B	663400	0.0212%	141.487
SE-C	793090	0.0181%	133.1698
SE-D	653500	0.0092%	60.89524
SE-E	802000	0.0116%	90.53043

Table S4. The water content of MTS@SH-SiO2@FGm after each water-in-oil emulsion separation cycle for SE-A

Cycle index	C_0 (mg/L)	WC%	C_f (mg/L)
1	711910	0.0107	73.50435
2	711910	0.0148	104.887
3	711910	0.0208	141.9826
4	711910	0.0222	151.5391
5	711910	0.0249	173.2174
6	711910	0.0241	165.0326

Table S5. The water content for SE-A emulsion at different temperature conditions

Temperature	C_0 (mg/L)	WC%	C_f (mg/L)
100	711910	0.0109	74.6413
150	711910	0.0153	103.6227
200	711910	0.0123	84.05
250	711910	0.0188	129.1478
300	711910	0.0155	108.5
350	711910	0.0132	91.25217
400	711910	0.0142	100.0174

Table S6. The water content for SE-A emulsion at different PH conditions

PH	C_0 (mg/L)	WC%	C_f (mg/L)
1	711910	0.0140	95.86957
3	711910	0.0155	107.0909
5	711910	0.0139	96.35227
7	711910	0.0178	120.5545
10	711910	0.0172	117.2727
12	711910	0.0225	155.8125
14	711910	0.0228	155.9727

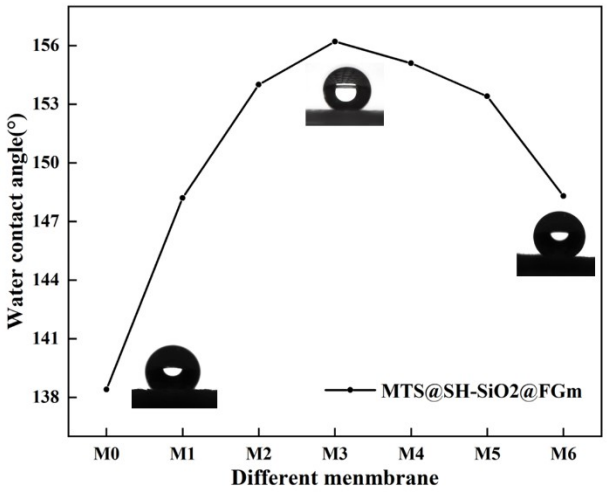

Fig. S1. Water content angle of different MTS@SH-SiO2@FGm

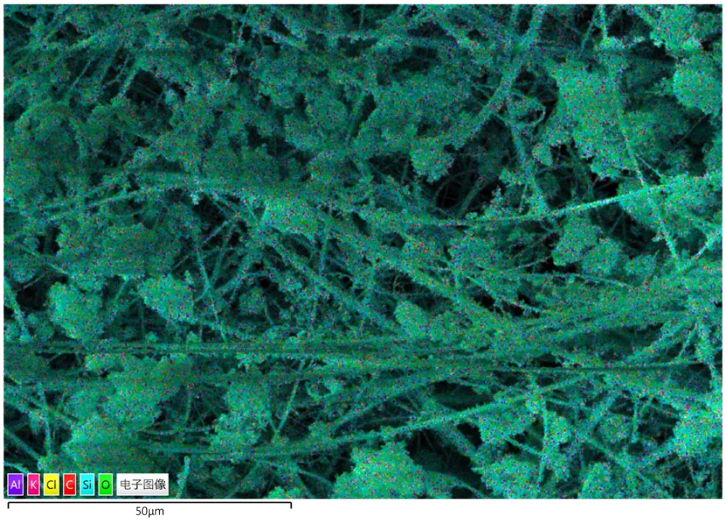

Fig. S2. The corresponding EDS mapping for MTS@SH-SiO_2@FGm.

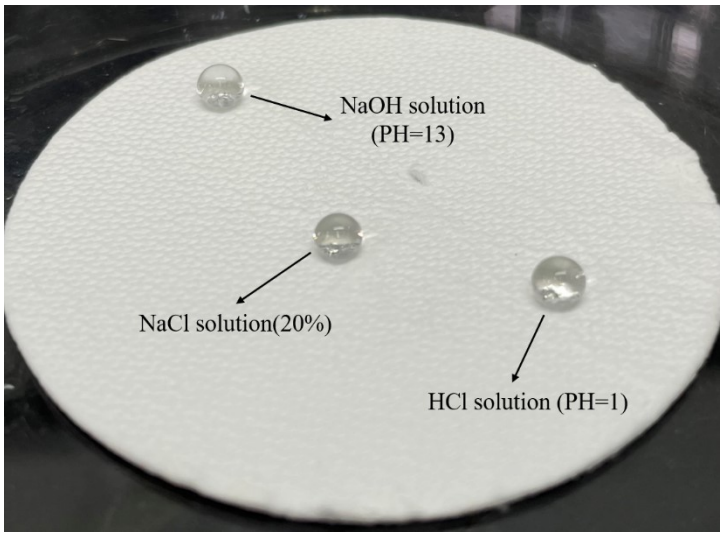

Fig. S3. Photograph of various water droplets (pure water, HCl solution, and NaOH solution) on the surface of MTS@SH-SiO_2@FGm

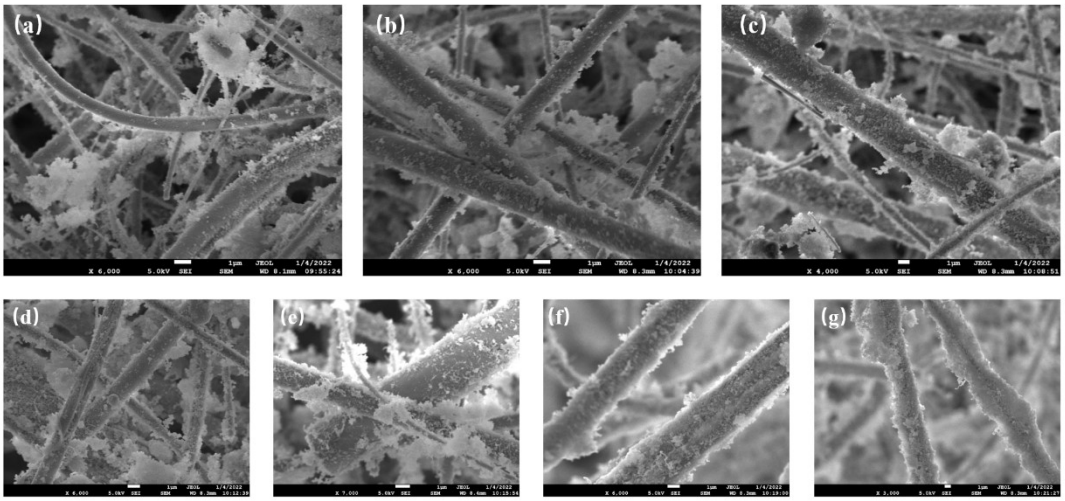

Fig. S4. The SEM images showing the morphology of modified membrane which was placed in into muffle furnace at different temperature ranging from (a) 100 ℃, (b) 150℃, (c) 200℃, (d) 250℃, (e) 300℃, (f) 350 ℃ and (g) 400℃.