Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Preparation of PMAA: potassium persulfate (0.2872 g), purified MAA (137 mL) and deionized water (DI, 800 mL) were poured into a three-necked flask at 80 °C, and stirred at 200 rpm under nitrogen atmosphere. After polymerization reaction was kept for 8h, thick product was cooled at room temperature and subsequently purified by ethyl ether and DI water repeatedly. Finally, transparent PMAA was obtained after being placed in vacuum drying oven at 50 °C for 24 h. Weight average molecular weight (M_w) of PMAA was about 310, 000 by gel gas chromatography.

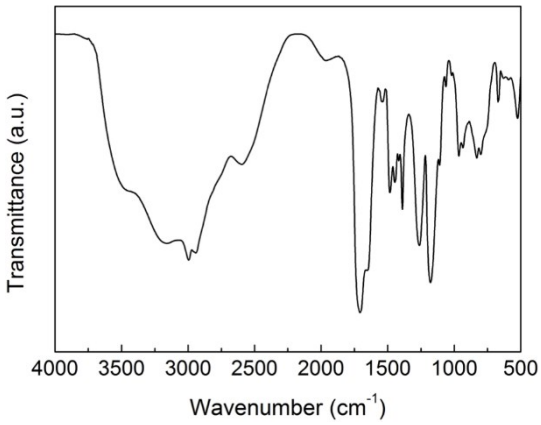

Fig. S1 FT-IR spectrum of the synthesized PMAA.

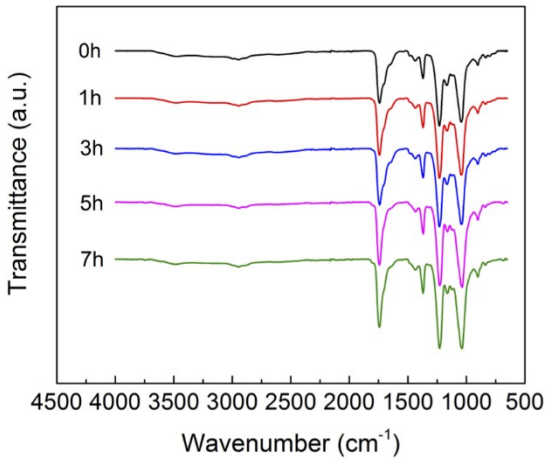

Fig. S2 FTIR spectra of the pristine CA/PMAA NHM and heat-treated NMH under different time.

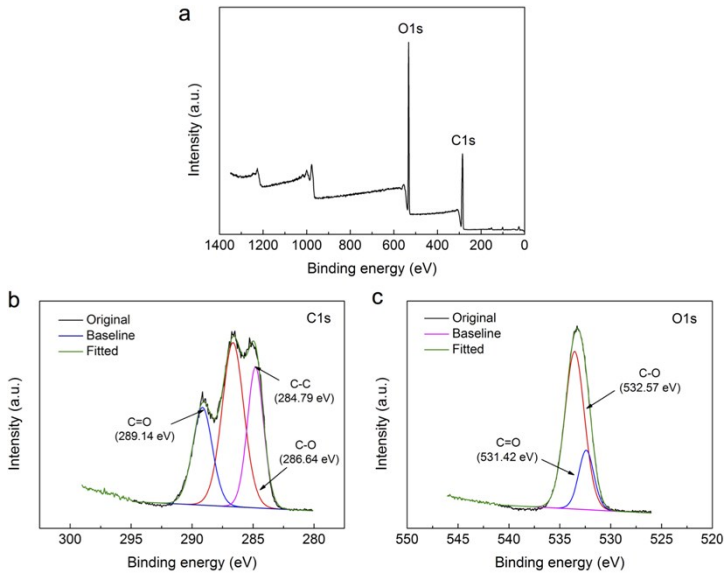

Fig. S3 XPS wide-scan spectrum of the CA/PMAA NHM. (e) and (f) were C1s and O1s spectra of the CA/PMAA NHM, respectively.

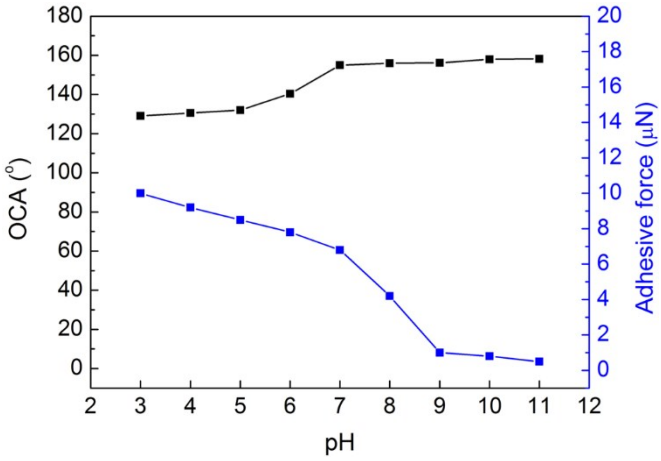

Fig. S4 pH stability of the NHM: underwater OCAs and adhesive forces after being kept in water with pH from 3 to 11.

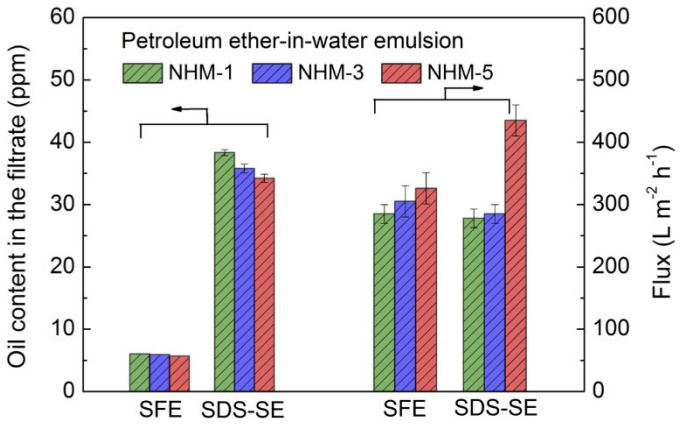

Fig. S5 Oil concentration in the corresponding filtrates and fluxes for a series of surfactant-free and surfactant-stabilized petroleum-in-water emulsions permeating the NHM-1, NHM-3 and NHM-5.

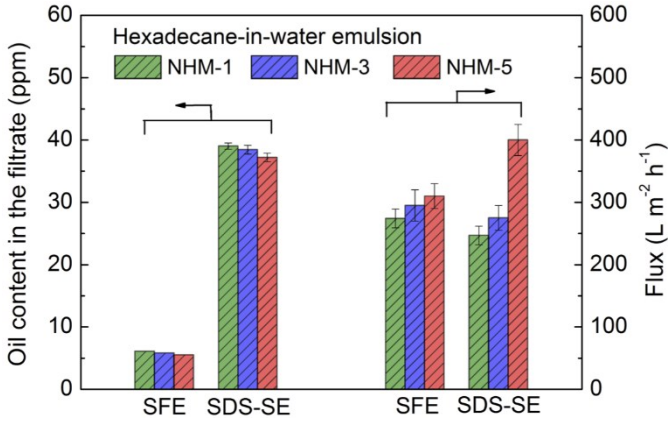

Fig. S6 Oil concentration in the corresponding filtrates and fluxes for a series of surfactant-free and surfactant-stabilized hexadecane-in-water emulsions permeating the NHM-1, NHM-3 and NHM-5.

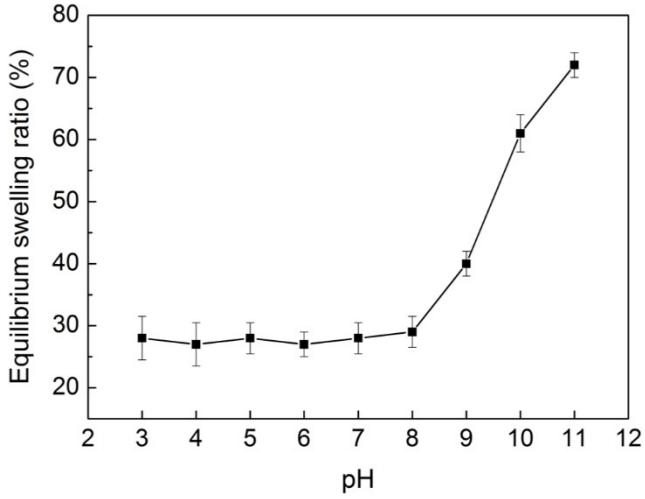

Fig. S7 Equilibrium swelling ratios of NHMs-7 after being immersed in acid or alkali solution (pH=3~11).