

Supplementary Information

A robust surface with superhydrophobicity and underwater superoleophobicity for on-demand oil/water separation

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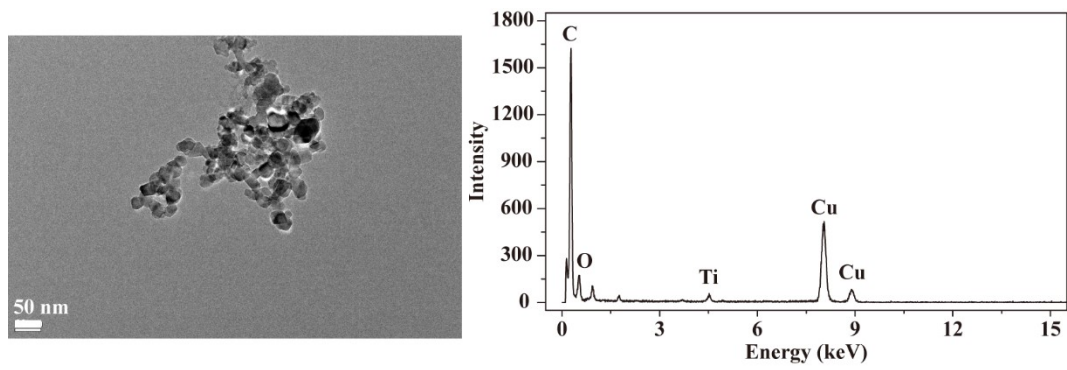


Fig. S1 TEM image and EDS spectrum of TiO_2 nanoparticles.

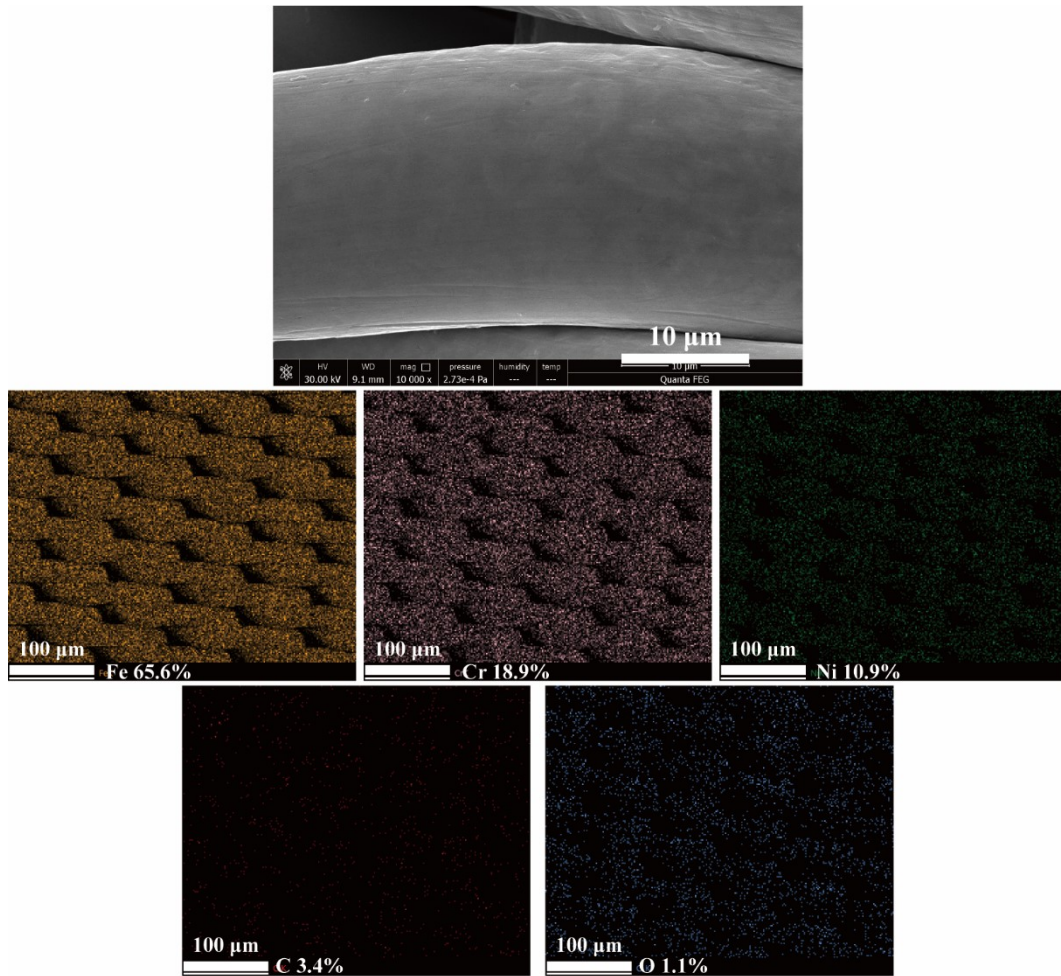


Fig. S2 SEM image and element mapping images of original SSM.

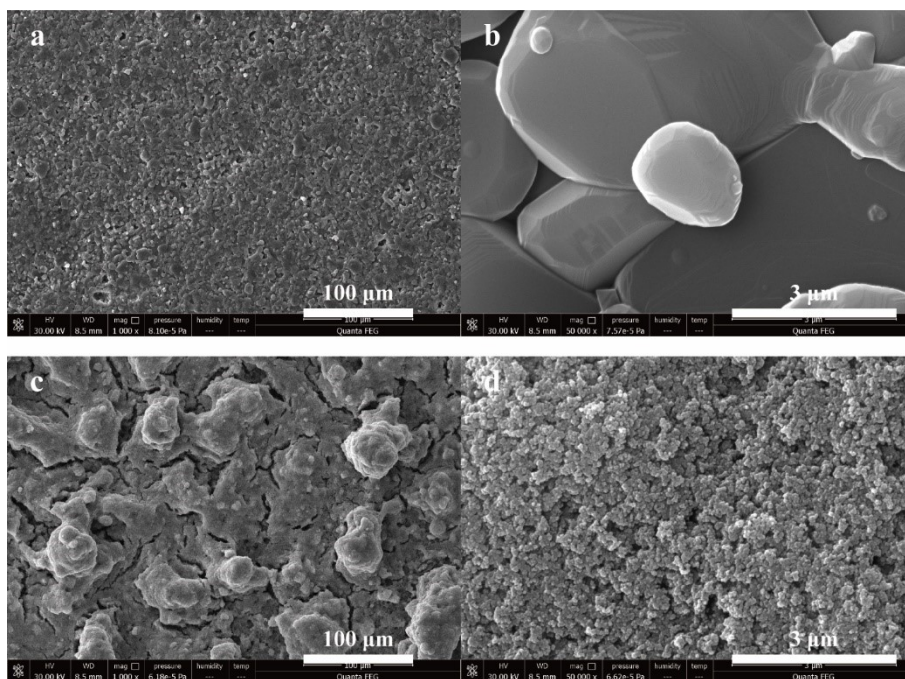


Fig. S3 SEM images of the original (a, b) and TiO₂@FOTS-AP-coated (c, d) ceramic.

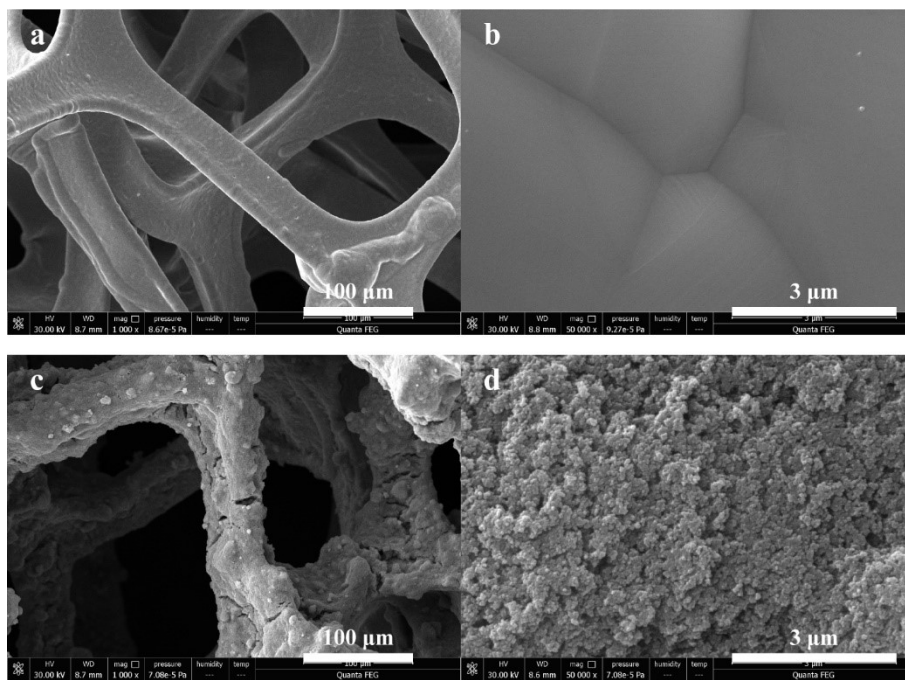


Fig. S4 SEM images of the original (a, b) and TiO₂@FOTS-AP-coated (c, d) NF.

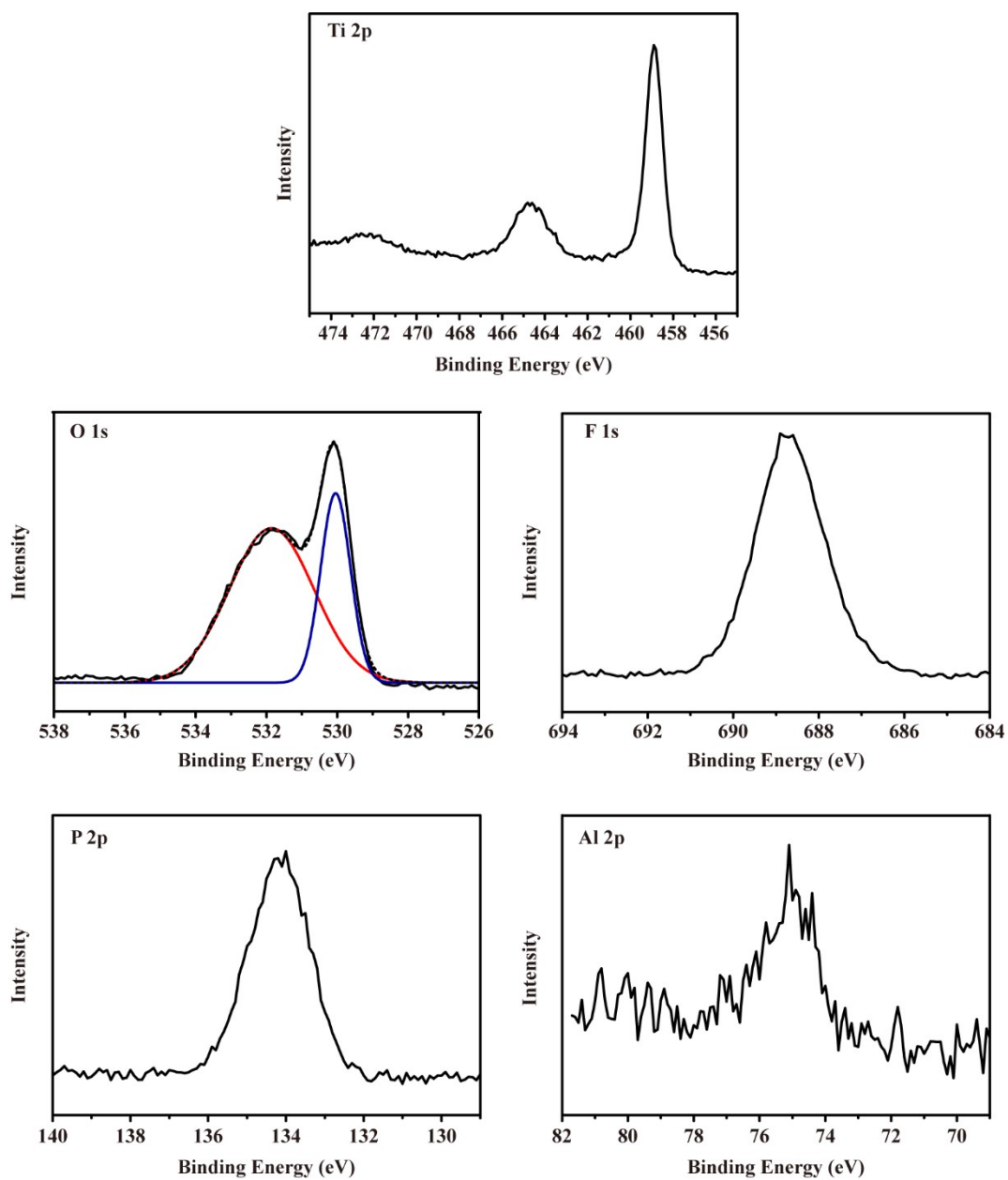


Fig. S5 XPS spectra of the TiO₂@FOTS-AP-coated SSM.

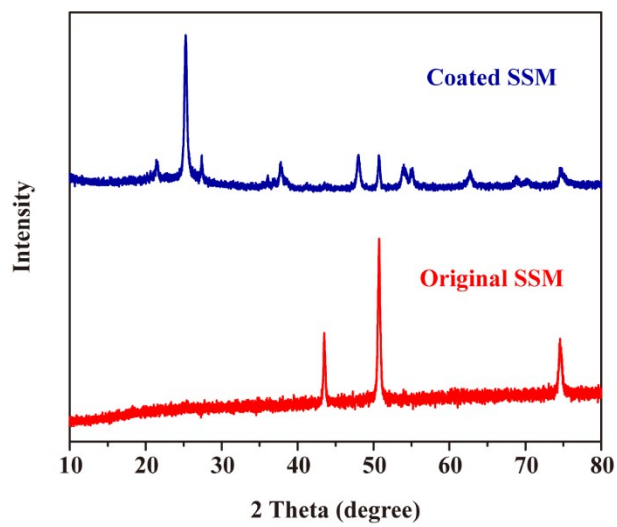


Fig. S6 XRD patterns of original and AP-TiO₂-FOTS-coated SSM.

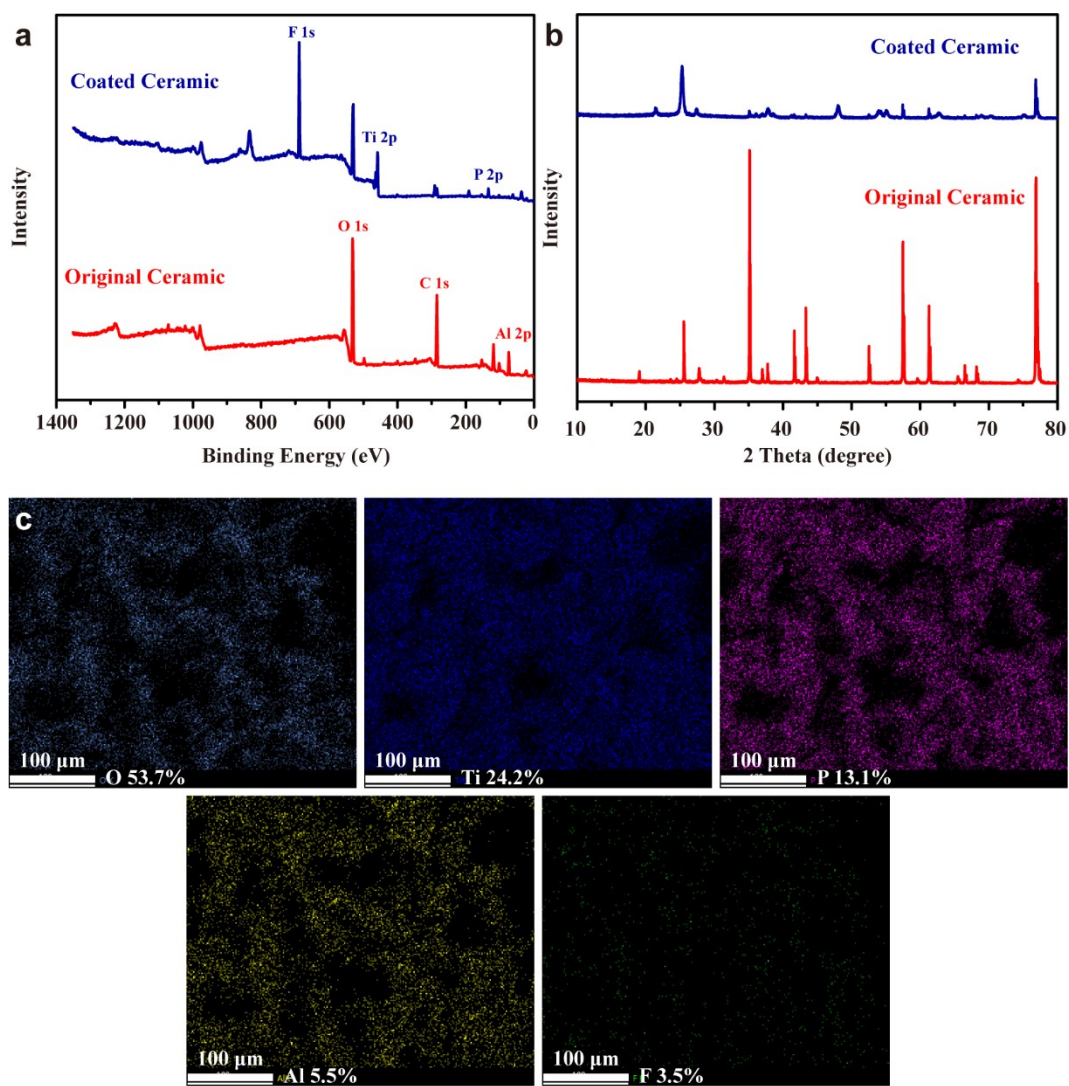


Fig. S7 (a) XPS spectra of original and TiO_2 @FOTS-AP-coated ceramic. (b) XRD patterns of original and TiO_2 @FOTS-AP-coated ceramic. (c) Element mapping images of TiO_2 @FOTS-AP-coated ceramic.

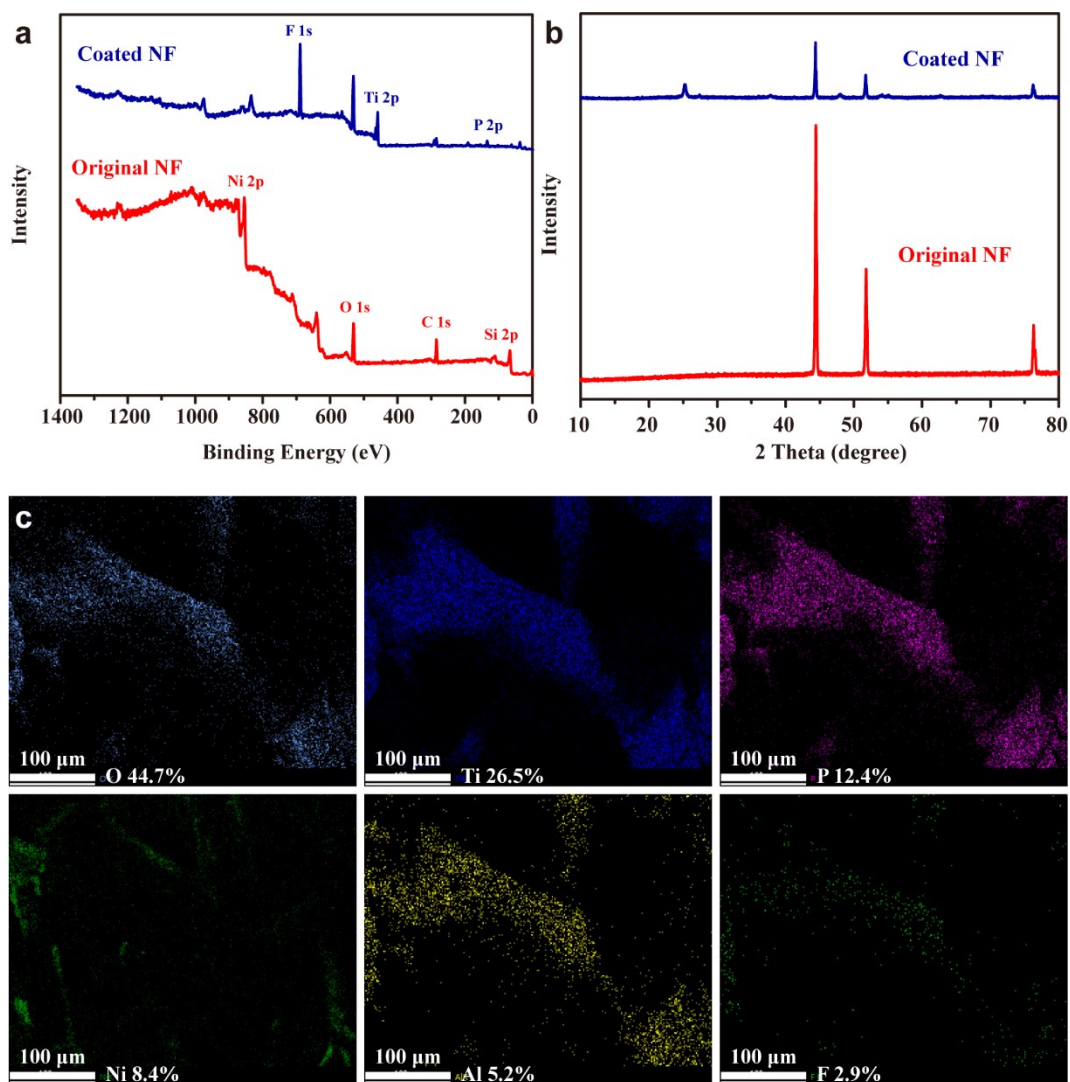


Fig. S8 (a) XPS spectra of original and TiO₂@FOTS-AP-coated NF. (b) XRD patterns of original and TiO₂@FOTS-AP-coated NF. (c) Element mapping images of TiO₂@FOTS-AP-coated NF.

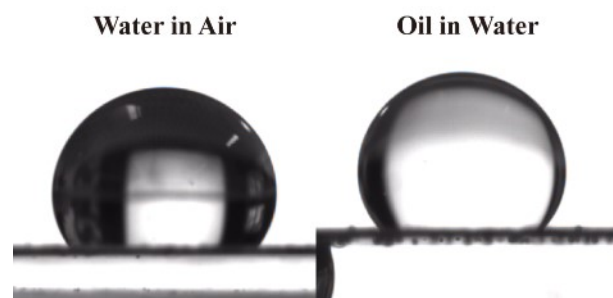


Fig. S9 Photographs of water droplets in air and oil droplets in water on the surfaces of original SSMS.

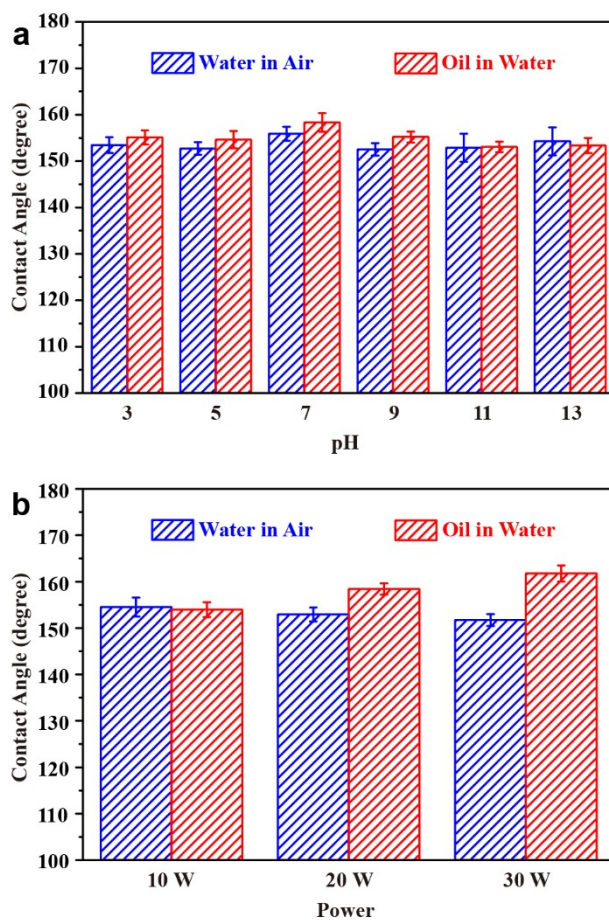


Fig. S10 (a) Water contact angles in air and oil contact angles in water of the $\text{TiO}_2\text{@FOTS-AP}$ -coated SSMs with aqueous solutions of different pH. (b) Contact angles of water in air and oil in water after O_2 -plasma etching with different power. 1, 2-dichloroethane was selected as oil.

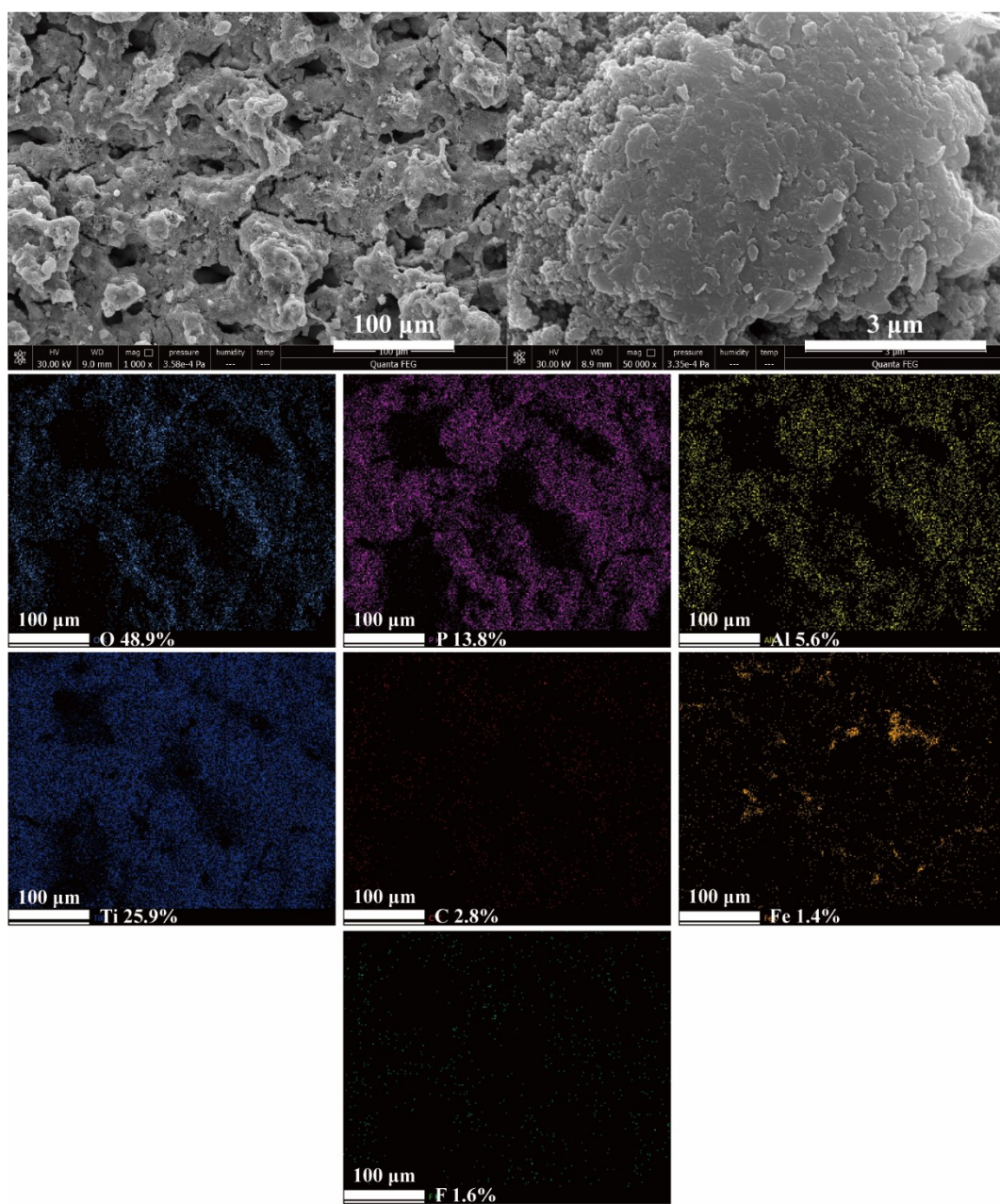


Fig. S11 SEM images and element mapping images of TiO₂@FOTS-AP-coated SSM after 100 impingement cycles.

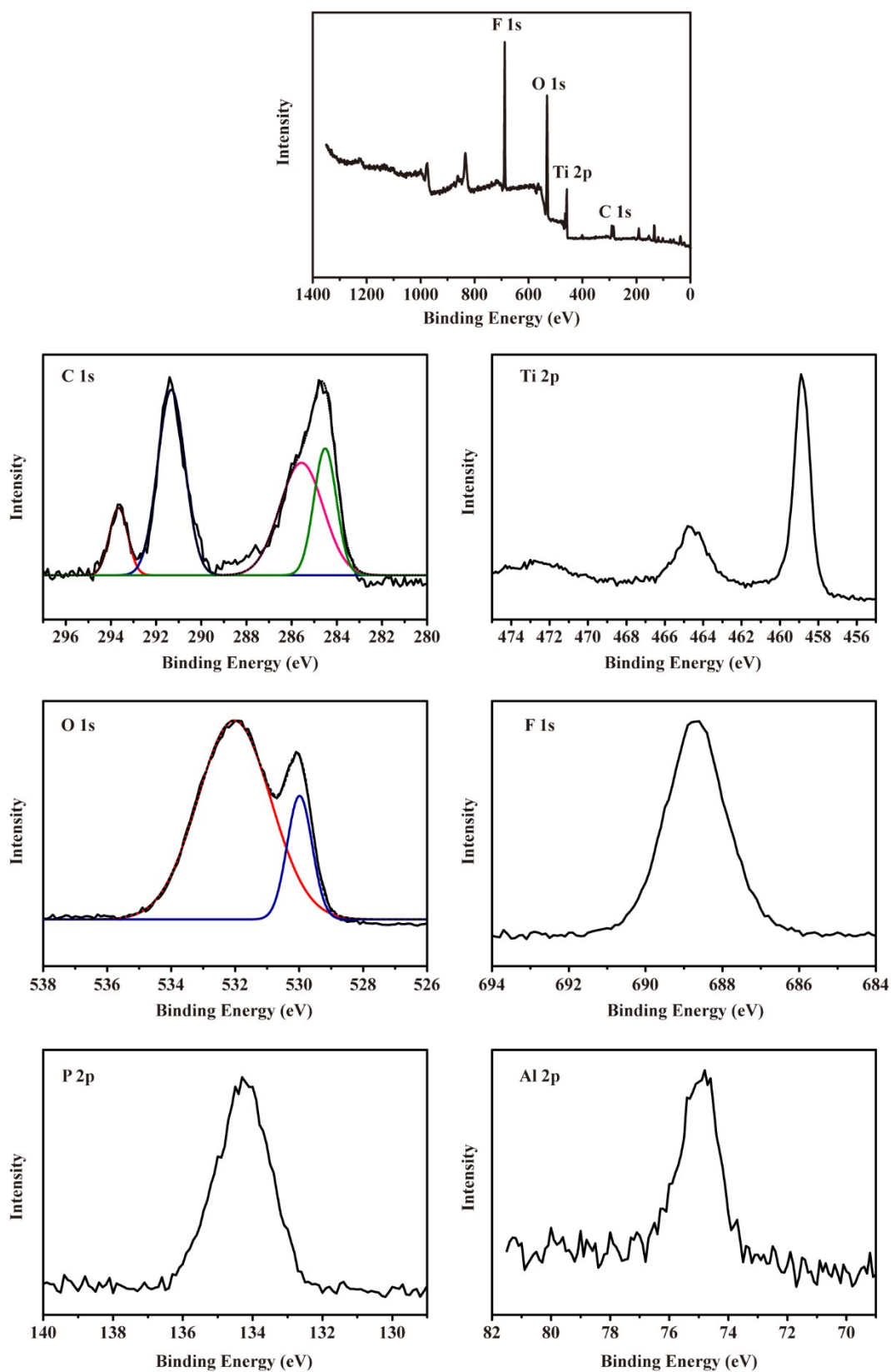


Fig. S12 XPS spectra of TiO₂@FOTS-AP-coated SSM after 100 impingement cycles.

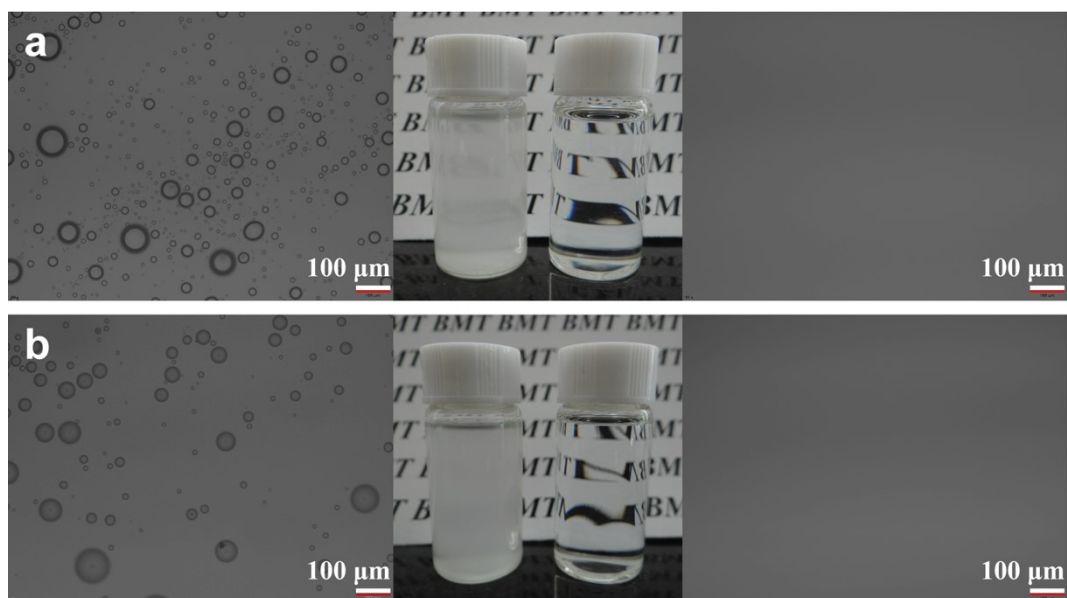


Fig. S13 Optical photographs of (a) water-in-xylene and (b) water-in-chloroform before (left) and after (right) separation by TiO_2 @FOTS-AP-coated SSMs.

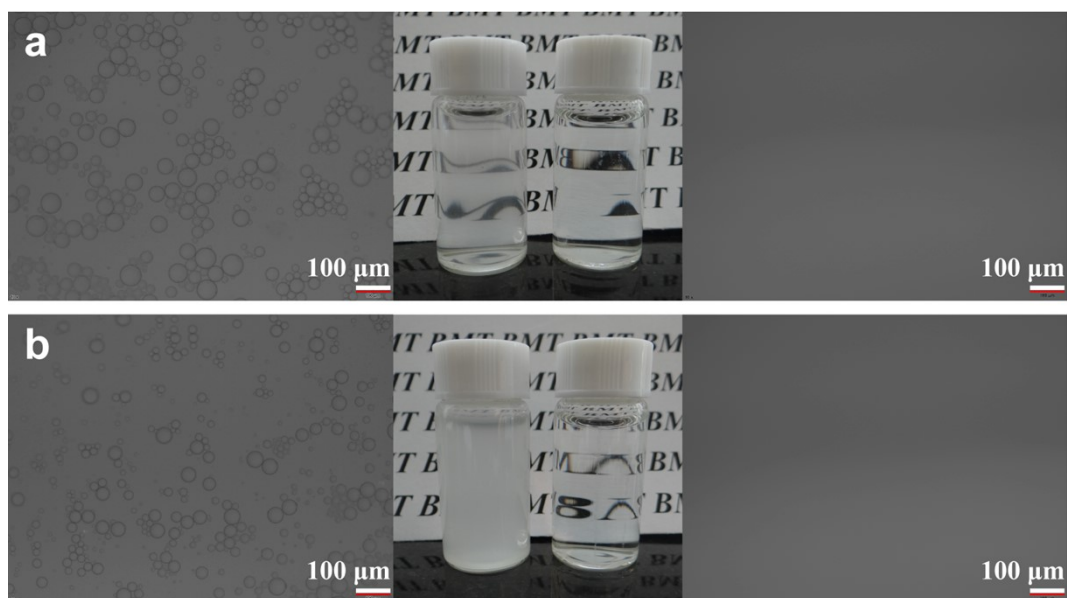


Fig. S14 Optical photographs of (a) hexane-in-water and (b) petroleum ether-in-water before (left) and after (right) separation by $\text{TiO}_2@\text{FOTS-AP}$ -coated SSMs.

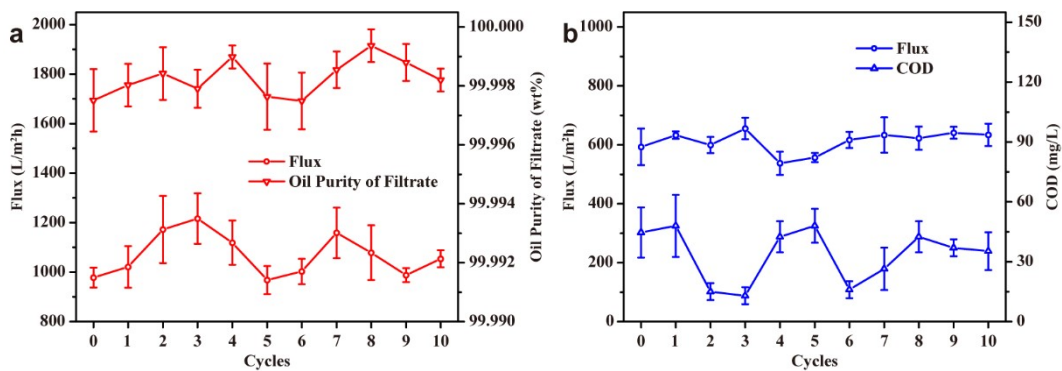


Fig. S15 (a) Plots of water-in-oil emulsion separation cycles with fluxes and oil purities of filtrates. (b) Plots of oil-in-water emulsion separation cycles with fluxes and COD values of filtrates. All the feed emulsions were separated by TiO₂@FOTS-AP-coated SSMs. Hexane and isooctane were used to prepare water-in-oil and oil-in-water emulsion, respectively.