Electronic Supplementary Material (ESI) for RSC Advances.

Electronic Supplementary Information (ESI)

One-step reduction and decoration simultaneously on various porous substrates: toward oil filtration from water

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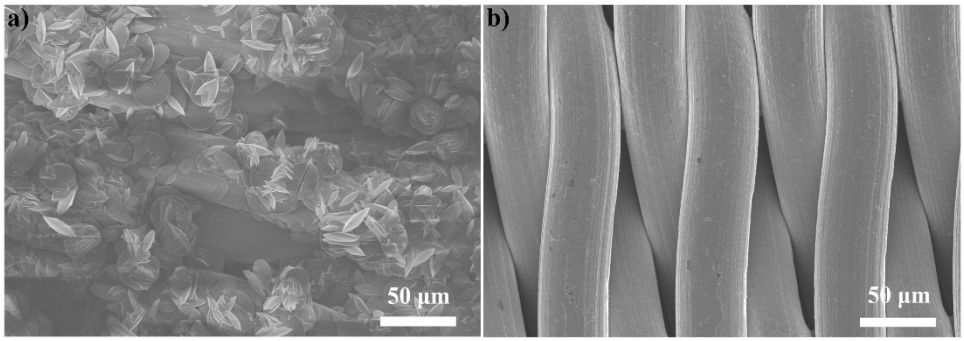

Fig. S1 FESEM images of SSMs after chemical reduction of copper acetate by dopamine with adding Tris buffer for reacting 24 h and without adding Tris buffer for reacting 48 h, respectively.

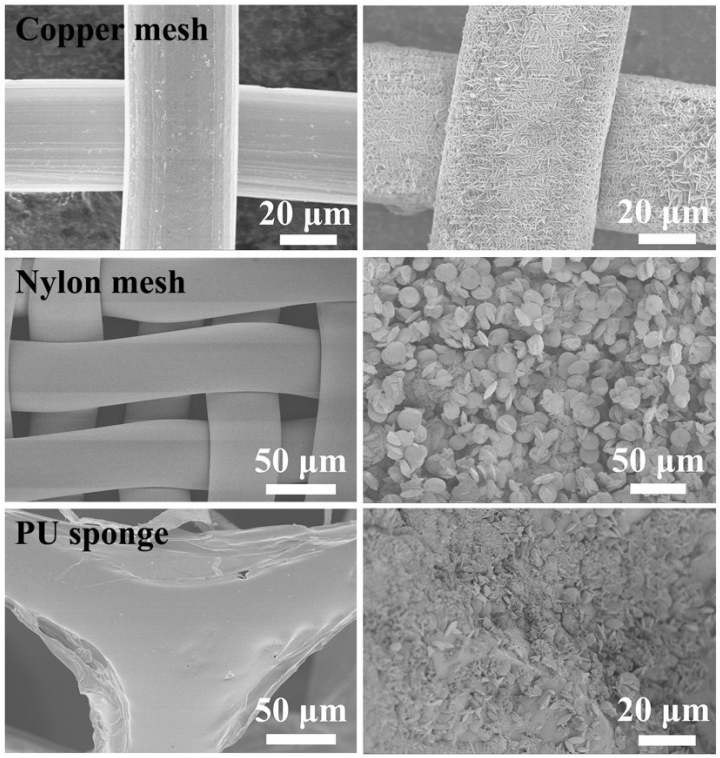

Fig. S2 FESEM images of copper mesh, nylon mesh and PU sponge before and after chemical reduction of copper acetate by dopamine. The as-prepared morphologies displayed the similar architecture as that of as-presented SSM surface.

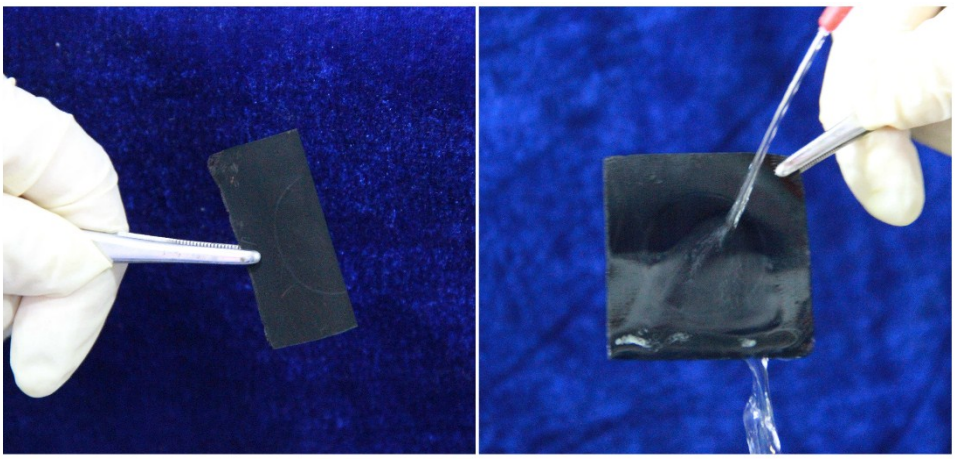

Fig. S3 The mechanical strength of the PDA-Cu decorated copper mesh.

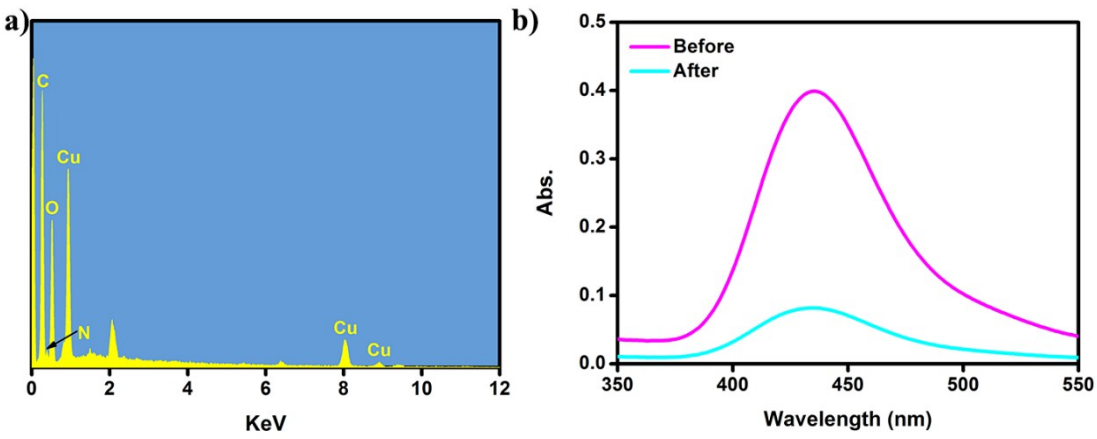

Fig. S4 a) EDX spectra of PDA-Cu decorated nylon mesh showing strong Cu peaks. b) UV-Vis spectra of Cu^{2+} solution before and after chemical reduction by dopamine.

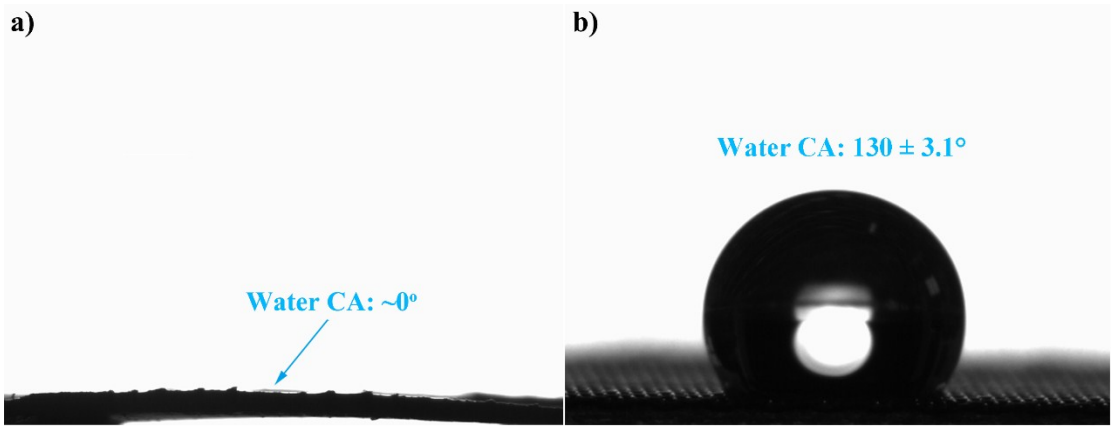

Fig. S5 Photographs of a water droplet on the PDA-Cu decorated copper mesh and the nascent copper mesh before chemical reduction of copper acetate by dopamine, respectively.

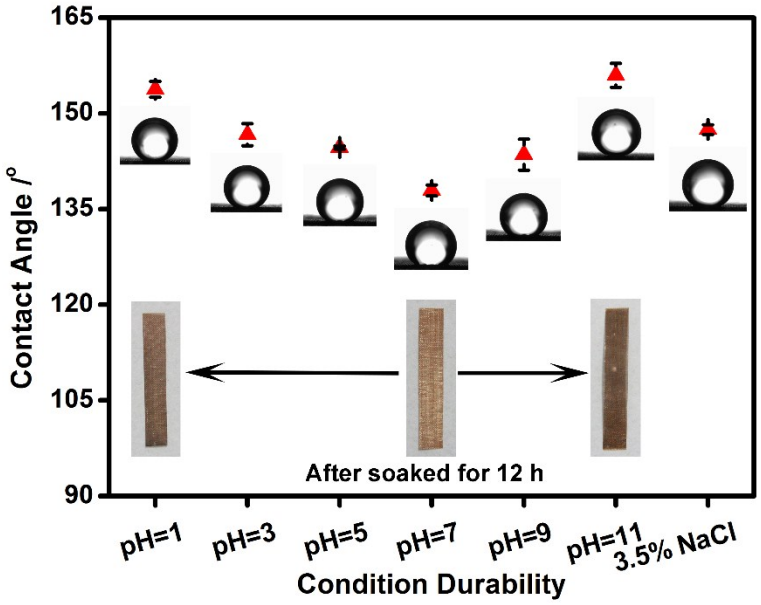

Fig. S6 Acidic/alkaline endurability test of the nascent copper mesh before chemical reduction of copper acetate by dopamine after soaked in different aqueous solutions with pH ranging from 1 to 11 and concentrated salt condition for 12 h, respectively.

Video 1 Diesel/water separation process of the PDA-Cu decorated SSM. Water selectively permeated through the mesh, while oil was blocked in the upper glass tube.

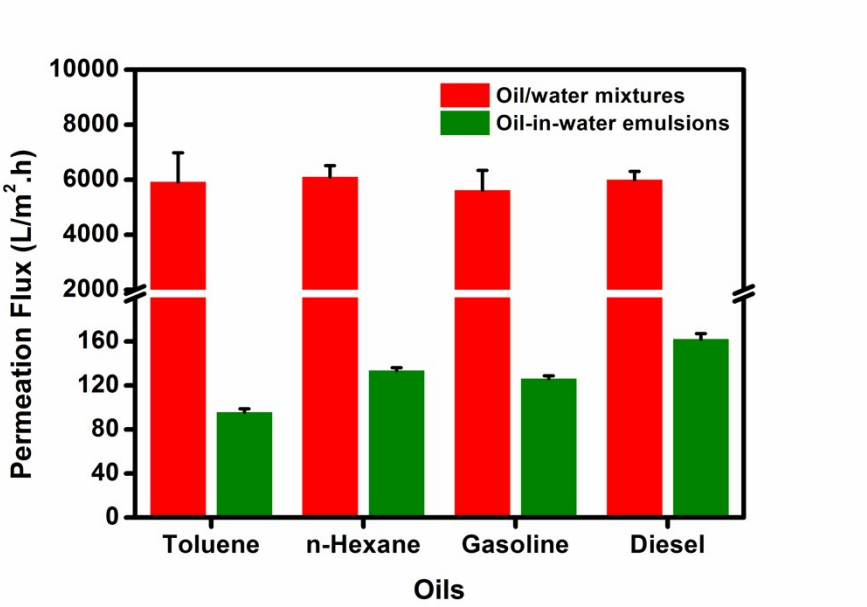

Fig. S7 Permeation flux of oil/water mixtures and Tween 20-stabilized oil-in-water emulsions.

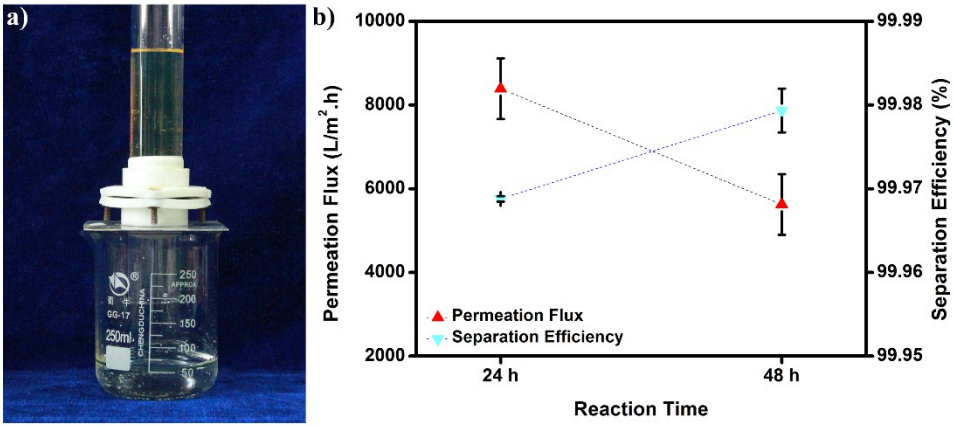

Fig. S8 a) Separation apparatus of the original SSM towards gasoline/water mixtures, where the mixture flowed through the mesh quickly. b) Permeation flux and separation efficiency towards gasoline/water mixtures of the PDA-Cu decorated SSM obtained by reacting for 24 h and 48 h, respectively.

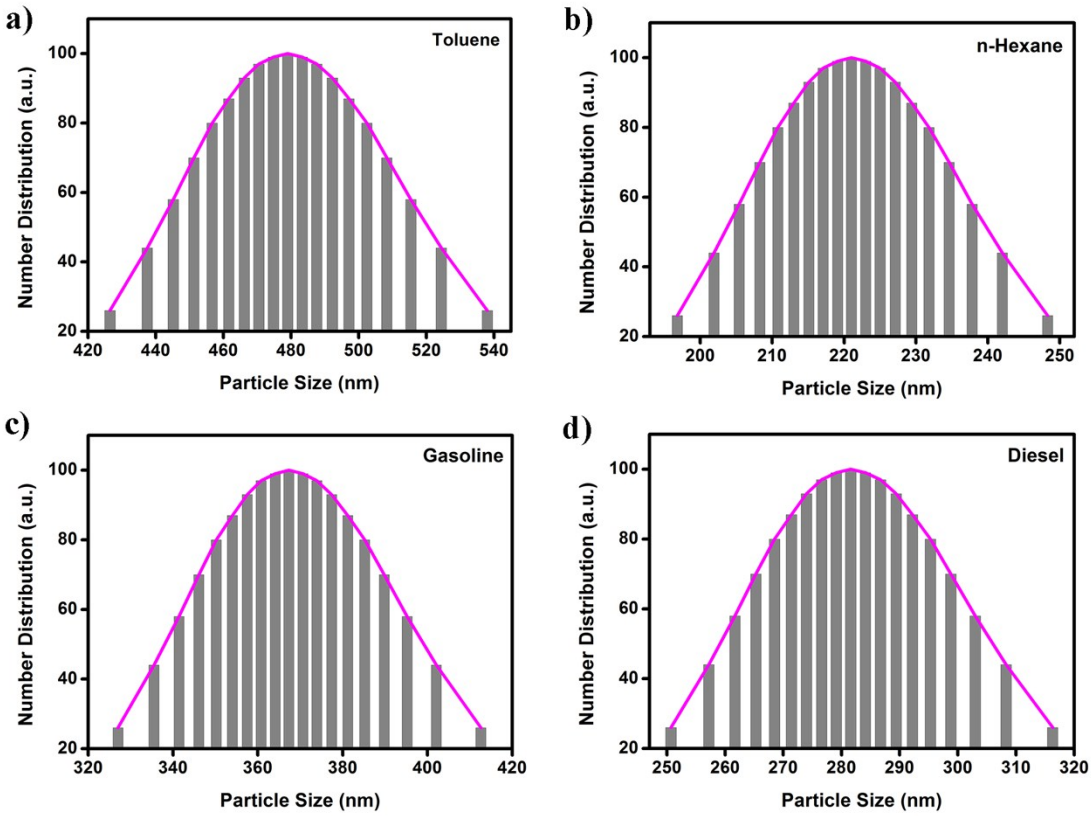

Fig. S9 DLS curves of the oil droplet size distribution for different kinds of oil-in-water emulsions stabilized with Tween 20.

Video 2 Tween 20-stabilized toluene-in-water emulsion separation process of the PDA-Cu decorated MCE membrane. As the emulsion de-emulsified and oil droplets was blocked by the membrane, whereas transparent water penetrated it and flowed into the vial.

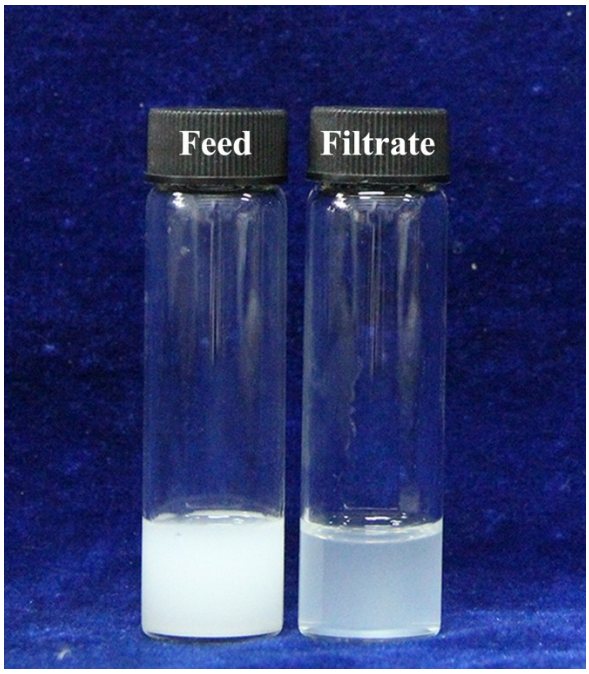

Fig. S10 Tween 20-stabilized toluene-in-water emulsion filtration procedure of the initial MCE substrate.