

## Supplementary Information

### **A self-roughened and biodegradable superhydrophobic coating with UV shielding, solar-induced self-healing and versatile oil-water separation property**

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#### **Supplemental figure captions:**

**Figure S1.** Contact angle and adhesion force of superhydrophobic cotton fabric with different concentration of stearic acid.

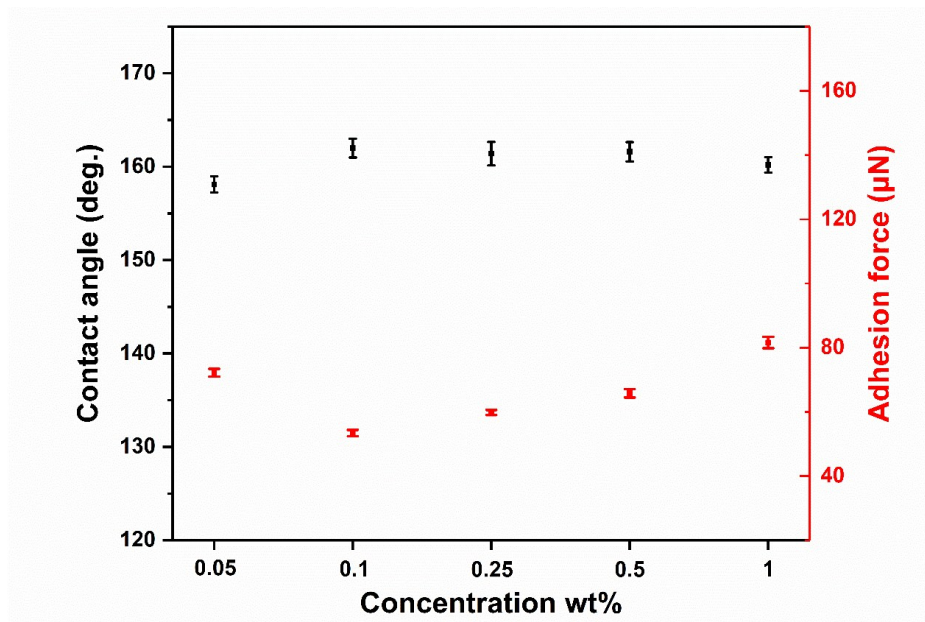
**Figure S2.** The cotton fabric modified by the dipping STA emulsions (a) newly prepared and (b) after stored for 10 weeks and ultrasonically (40 kHz) treated at 50 °C for 5 min. The insert images are corresponding water droplet images with displayed CA.

**Figure S3.** The contact angle of STA/PDA@ cotton fabric with different abrasion cycles before and after self-healing.

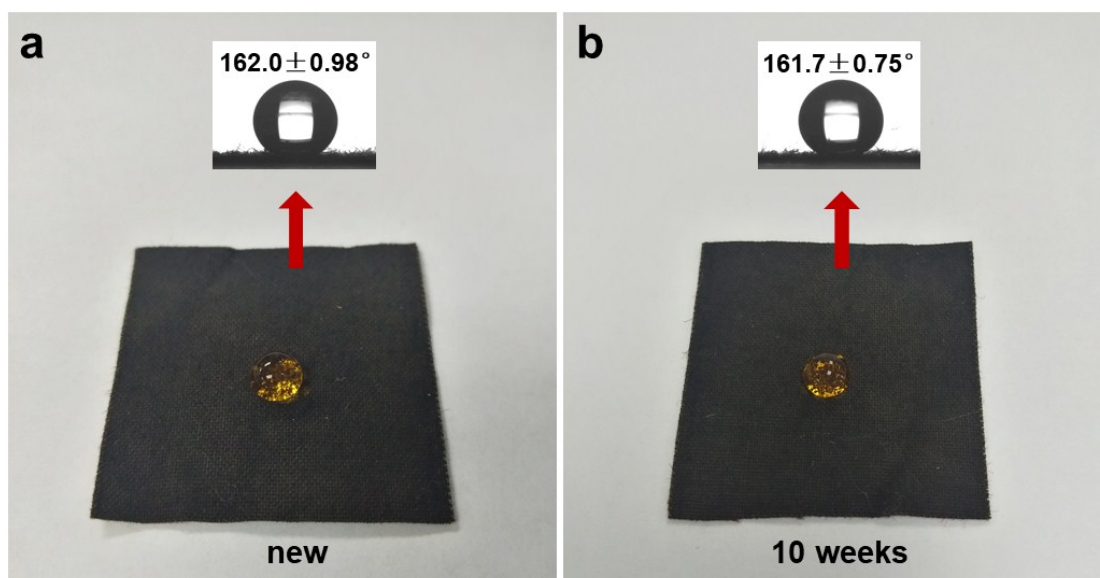
**Figure S4.** The volume of water and heavy oil before and filtration for one and five times.

**Figure S5.** The volume of water and light oil before and filtration for one and five times.

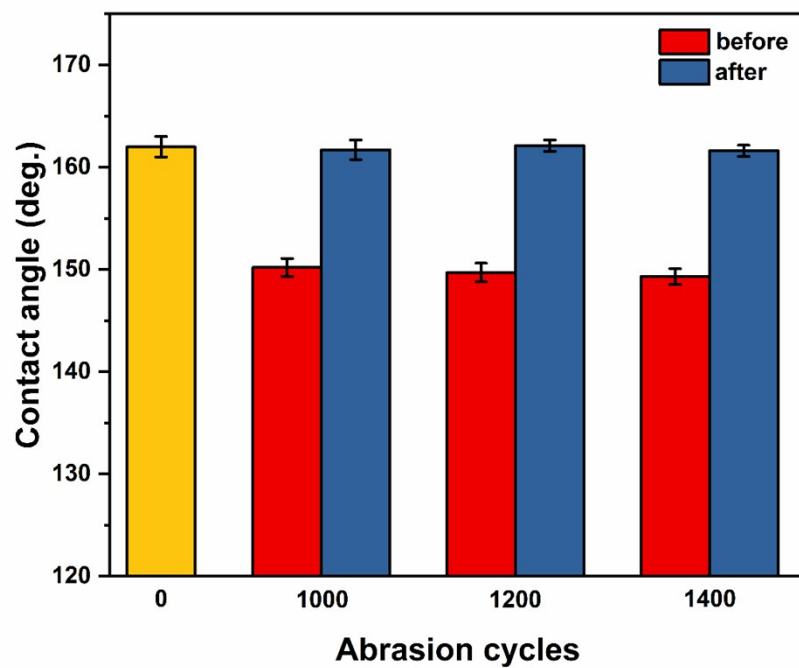
**Figure S6** Sequence of the separation process for the corrosive mixtures of oil and acid/alkali solutions, and the volume of water and oil before and after separation.



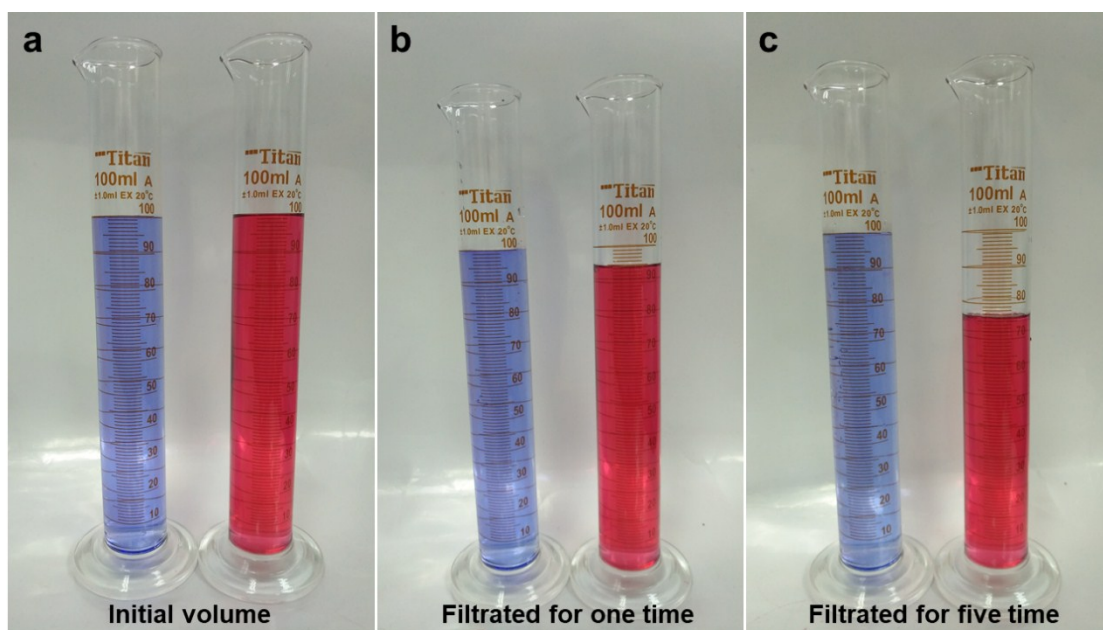
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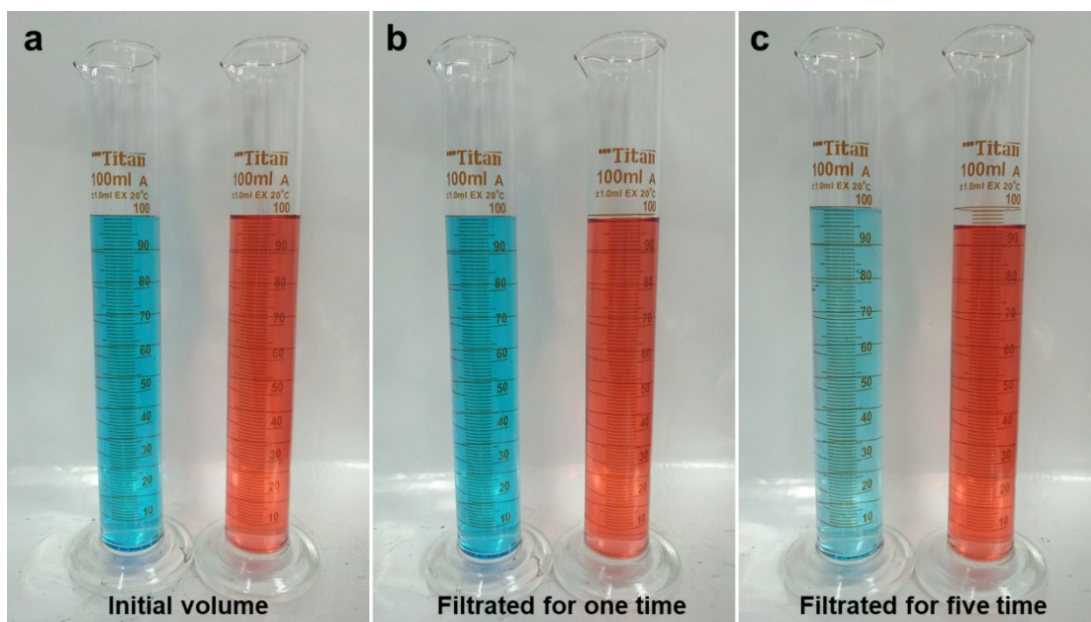
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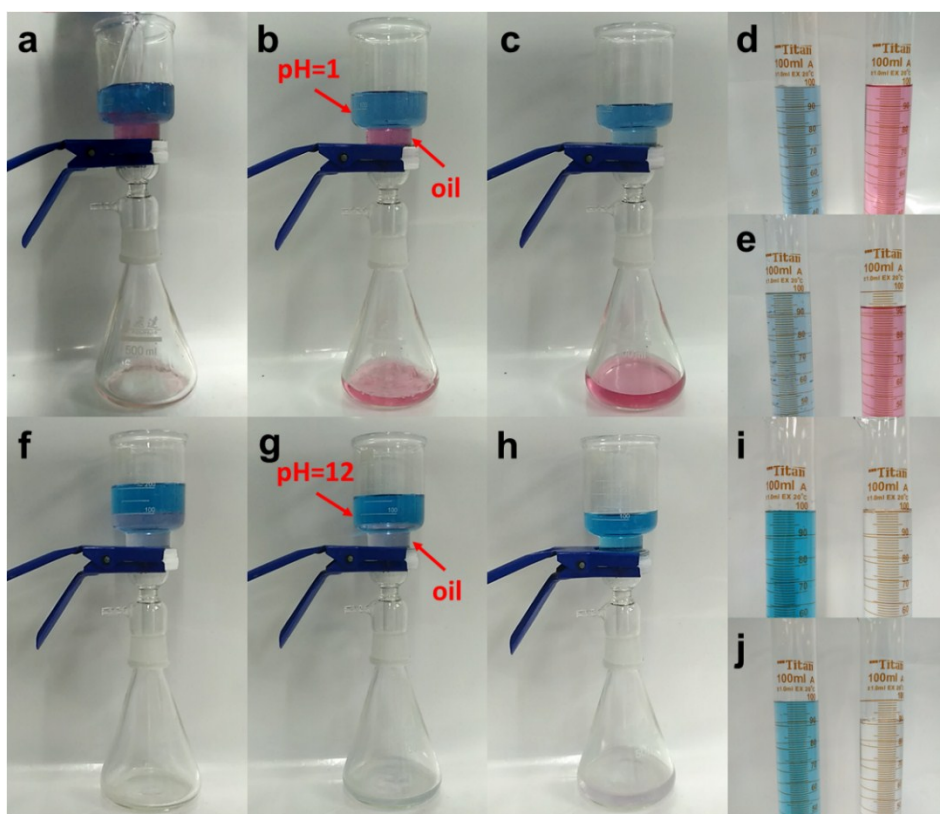
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**Figure S4.** The volume of water and heavy oil before and filtration for one and five times.



**Figure S5.** The volume of water and light oil before and filtration for one and five times.



**Figure S6.** Sequence of the separation process for the corrosive mixtures of oil and acid/alkali solutions, and the volume of water and oil before and after separation.

