

## **Supporting Information**

### **Preparation of Mechanically Stable Superamphiphobic Coatings via Combining Phase Separation of Adhesive and Fluorinated SiO<sub>2</sub> for Anti-icing**

Jinfei Wei <sup>1,2</sup>, Weidong Liang <sup>1,\*</sup>, and Junping Zhang <sup>2,\*</sup>

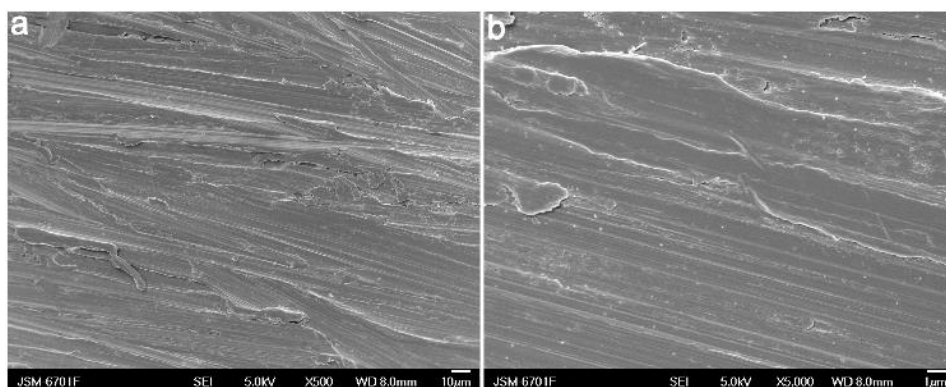
<sup>1</sup> Department of Chemical Engineering, College of Petrochemical Engineering,  
Lanzhou University of Technology, Lanzhou 730050, China

<sup>2</sup> Center of Eco-material and Green Chemistry, Lanzhou Institute of Chemical Physics,  
Chinese Academy of Sciences, Lanzhou 730000, China

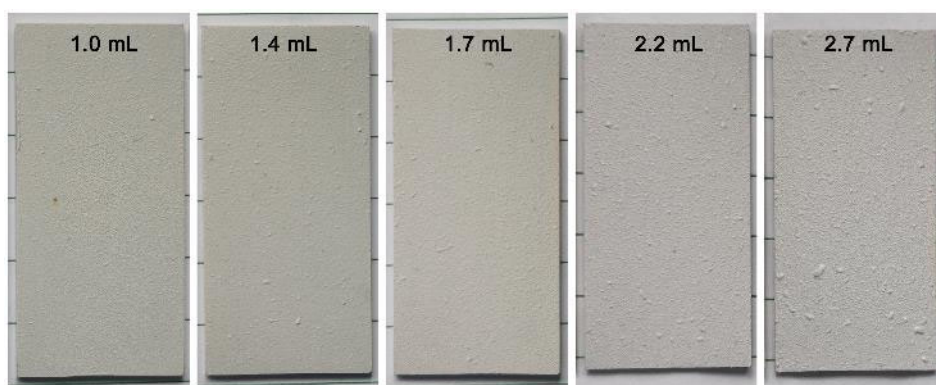
\*Corresponding authors: wliangh@lut.cn (W.L.); jpzhang@licp.cas.cn (J.Z.)



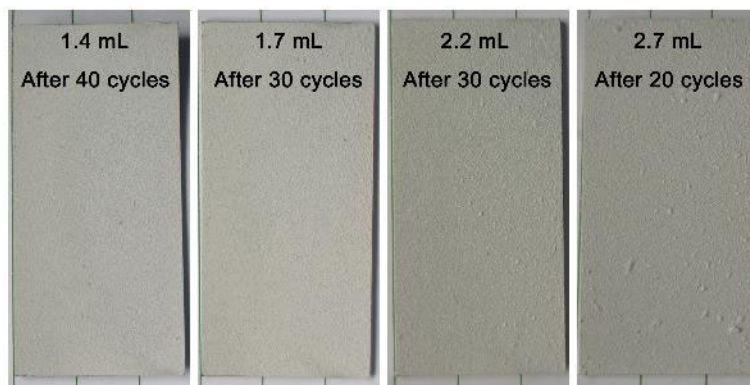
**Figure S1.** Photograph of the SPET/FD-POS@SiO<sub>2</sub> dispersion liquid.  $V_{\text{non-solvent}} = 1.7$  mL,  $m_{\text{SPET}} = 2.4$  g.



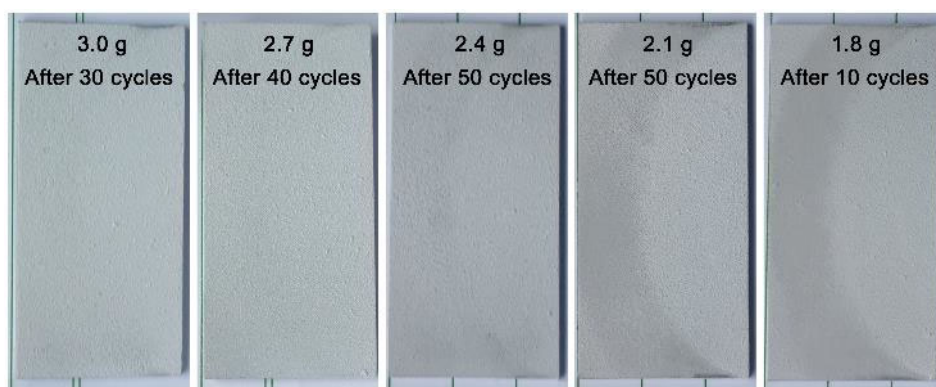
**Figure S2.** SEM images of the Al alloy plate.



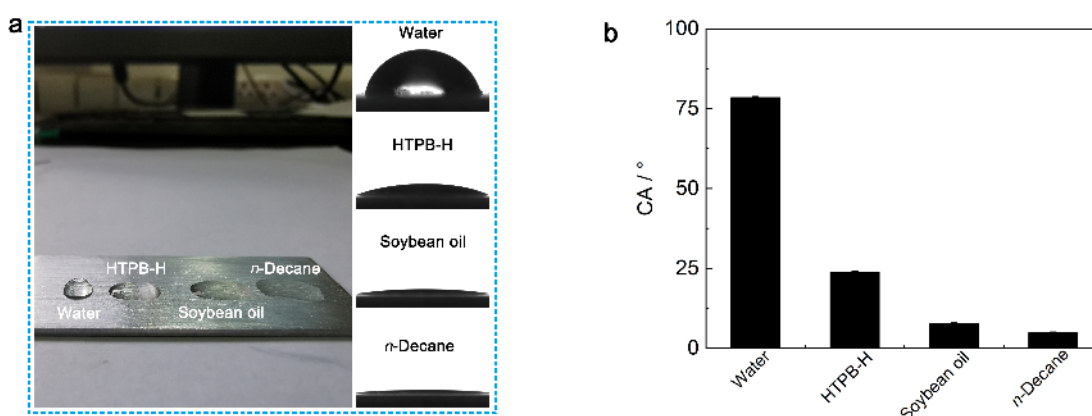
**Figure S3.** Photographs of the SPET/FD-POS@SiO<sub>2</sub> coatings with different non-solvent content.  $m_{\text{SPET}} = 3.0$  g.



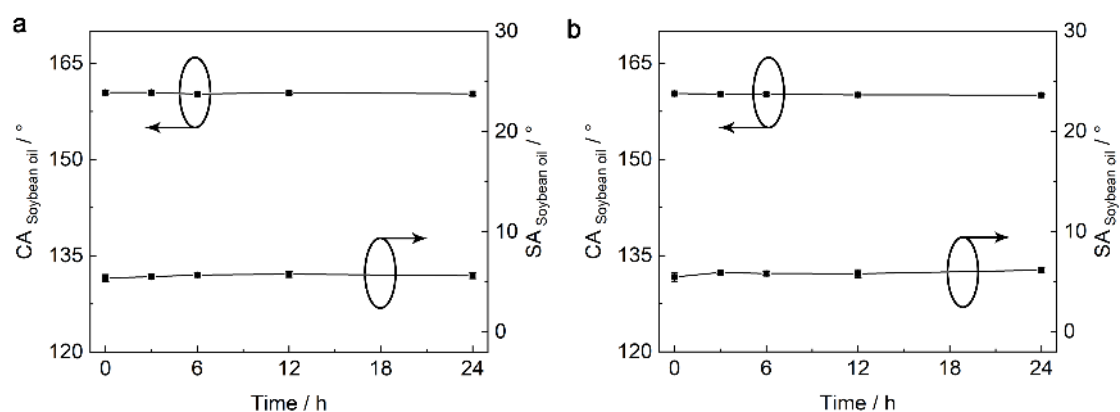
**Figure S4.** Photographs of the SPET/FD-POS@SiO<sub>2</sub> coatings with different non-solvent content after Taber abrasion test.  $m_{\text{SPET}} = 3.0$  g.



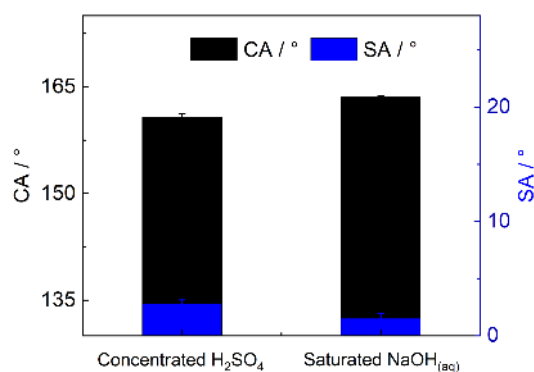
**Figure S5.** Photographs of SPET/FD-POS@SiO<sub>2</sub> coatings with different SPET amount after Taber abrasion test.  $V_{\text{non-solvent}} = 1.7$  mL.



**Figure S6.** (a) Photographs of the Al alloy plate with droplets of different surface tension on the surface. (b) CA of various liquids on the Al alloy plate.



**Figure S7.** Changes of  $CA_{\text{soybean oil}}$  and  $SA_{\text{soybean oil}}$  of the SPET/FD-POS@SiO<sub>2</sub> coating during immersion in (a) water and (b) soybean oil.  $V_{\text{non-solvent}} = 1.7 \text{ mL}$ ,  $m_{\text{SPET}} = 2.4 \text{ g}$ .



**Figure S8.** CA and SA of concentrated H<sub>2</sub>SO<sub>4</sub> and saturated NaOH<sub>(aq)</sub> on the SPET/FD-POS@SiO<sub>2</sub> coating.  $V_{\text{non-solvent}} = 1.7 \text{ mL}$ ,  $m_{\text{SPET}} = 2.4 \text{ g}$ .



**Figure S9.** Self-cleaning behavior of the SPET/FD-POS@SiO<sub>2</sub> coating.  $V_{\text{non-solvent}} = 1.7 \text{ mL}$ ,  $m_{\text{SPET}} = 2.4 \text{ g}$ .

**Movie S1.** Water droplet freezing process on the Al alloy plate.

**Movie S2.** Water droplet freezing process on the SPET/FD-POS@SiO<sub>2</sub> coated Al alloy plate.  $V_{\text{non-solvent}} = 1.7 \text{ mL}$ ,  $m_{\text{SPET}} = 2.4 \text{ g}$ .