

## **Rare bi-wetting TiO<sub>2</sub>-F/SiO<sub>2</sub>/F-PEG fabric coating for self-cleaning and oil/water separation**

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### **Supporting Information**

Figure S1. Photos of liquid droplets on the coated fabric. Water and hexadecane were colored with Reactive Blue 4 and Oil Red O, respectively.

Figure S2. Variation of oil/water separation efficiency via coated fabric in different does (pH=3, 5, 7, 9, 11).

Table S1. Element contents from XPS.

Table S2. Mechanical tensile strength.

Movie S1. Self-cleaning process.

Movie S2. Oil/water separation process.

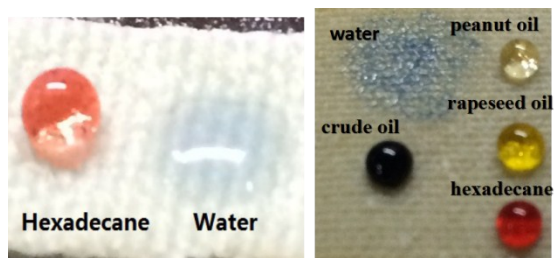


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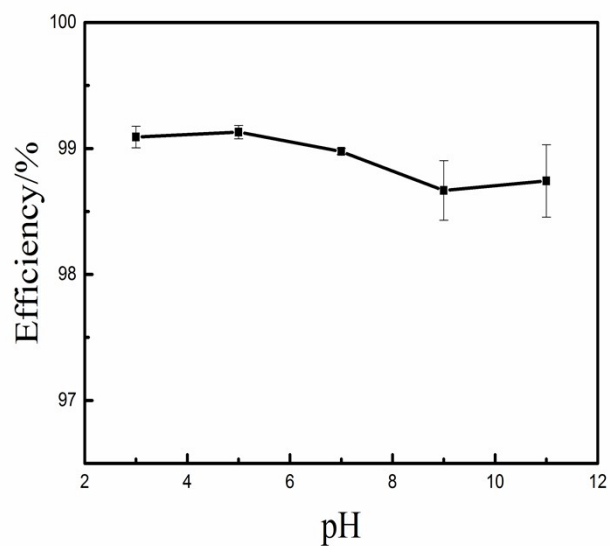


Figure S2. Variation of oil/water separation efficiency via coated fabric in different does (PH=3, 5, 7, 9, 11).

As shown in Figure S2, the material in acid and alkali conditions can maintain oil-water separation performance, indicating that the material own better performance of acid and alkali resistance. Oil water separation efficiency under the alkali environment has a slight decline, but also maintained at more than 98%.

Table S1. Element contents from XPS.

sample	F 1s	O 1s	Ti 2p	N 1s	C 1s	Si 2p	O/C	F/C	OA	WA
TiO <sub>2</sub> -F/SiO <sub>2</sub> /F-PEG	24.50	18.01	2.04	1.03	53.41	1.01	0.34	0.46	142	0
F-PEG	22.16	19.14	/	2.84	55.85	/	0.34	0.39	106	14.3
E-44	/	20.42	/	/	79.58	/	0.25	/	18	52.5

Table S2. Mechanical tensile strength

Mechanical tensile strength/ Mpa	
Pristine polyester fabric	41.46 ± 4.48
Coated polyester fabric	46.86 ± 1.96

Tensile tests were carried out on a LD26.10 microcomputer control electronic universal testing machine. The tensile properties of isotropic and orthotropic fiber reinforced composites were tested by the experiment at room temperature. The tensile speed and fixture spacing is 2mm/min and 10 mm, respectively. Thus the average of five samples were taken as shown in Table S2. Compared with the pristine polyester fabric and the coated polyester fabric, the mechanical tensile strength of the coated fabric was increased by 13%. To a certain extent, TiO<sub>2</sub>-F/SiO<sub>2</sub>/F-PEG coating can enhance the mechanical tensile strength of the fabric.