Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Robust Superhydrophobic TiO_2@fabrics for UV Shielding, Self-cleaning and Oil-water Separation

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Supporting movie and figure captions:

Movie S1. Underwater robust sueperhydrophobicity of F17/TiO_2@fabric surface.

Movie S2. Dynamic impacting of ejected water drops on superhydrophobic F17/TiO_2@fabric.

Movie S3. Self-cleaning performance of the superhydrophobic F17/TiO_2@fabric.

Movie S4. Oil/water separation capability of the superhydrophobic F17/TiO_2@fabric.

Figure S1. XRD patterns of pristine cotton fabric (a) and TiO_2@cotton fabric (b) prepared by a low temperature hydrothermal process (80 ^oC for 20 h).

Figure S2. SEM image (a) and corresponding EDS mapping image of Ti element (b), O element (c), C element (d), Au element (e), and EDS spectrum of the as-prepared TiO_2@fabric without F17 modification (f).

Figure S3. FESEM images showing the as-prepared flower-liked TiO_2 particles on polyester fabric was deposited in 0.1 mM PTO solution at 80^oC for 30 h.

Figure S4. The force-distance curves recorded by a droplet contact and move away the superhydrophobic F13/TiO_2@fabric surface under 80 ^oC in 0.1 mM PTO solution for different deposition durations.

Figure S5. The force-distance curves recorded by a droplet contact and move away the superhydrophobic F17/TiO_2@fabric surface under 80 ^oC in 0.1 mM PTO solution for different deposition durations.

Figure S6. The correlation of static contact angle on superhydrophobic F17/TiO_2@fabric for different deposition time with 1200# sand paper abrasion cycles. The inset demonstrated the surface texture of the TiO_2 coated fibers after being scratched for 30 cycles.

Figure S7. SEM images of F17/TiO_2@fabric after 5 washing cycles with standard machine laundry.

Figure S8. Contact angle and sliding angle changes on F17/TiO_2@fabric depending on the washing cycles. Comparison of droplet adhesion changes on F17 modified pristine fabric and F17/TiO_2@fabric with various washing cycles.

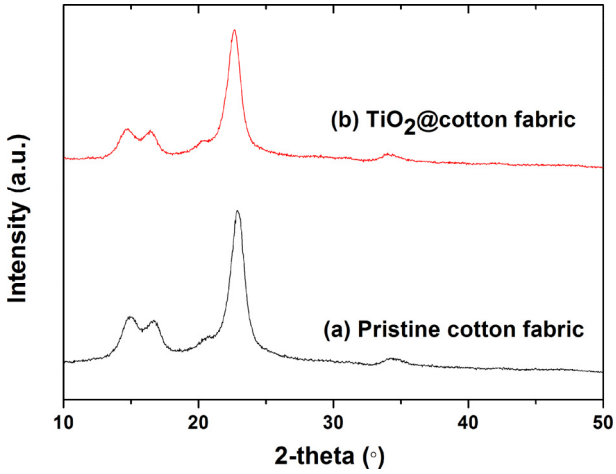


Figure S1. XRD patterns of pristine cotton fabric (a) and TiO_2@cotton fabric (b) prepared by a low temperature hydrothermal process (80 ºC for 20 h).

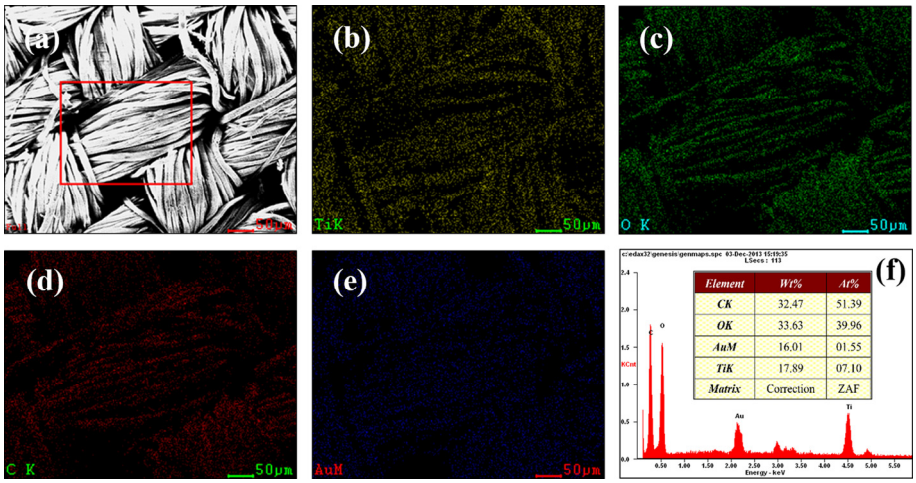


Figure S2. SEM image (a) and corresponding EDS mapping image of Ti element (b), O element (c), C element (d), Au element (e), and EDS spectrum of the as-prepared TiO_2@fabric without F17 modification (f).

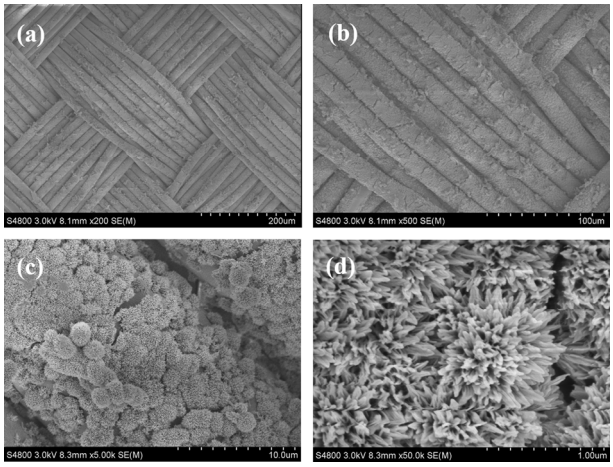
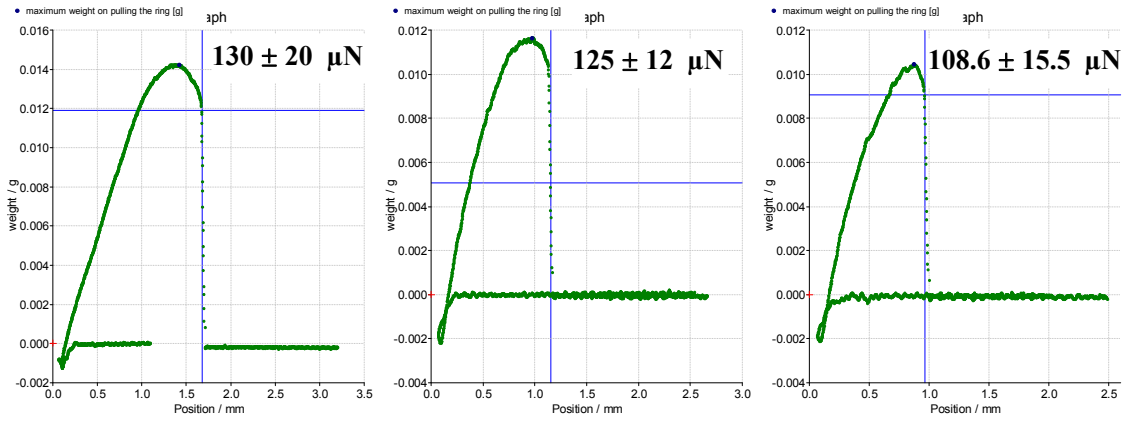
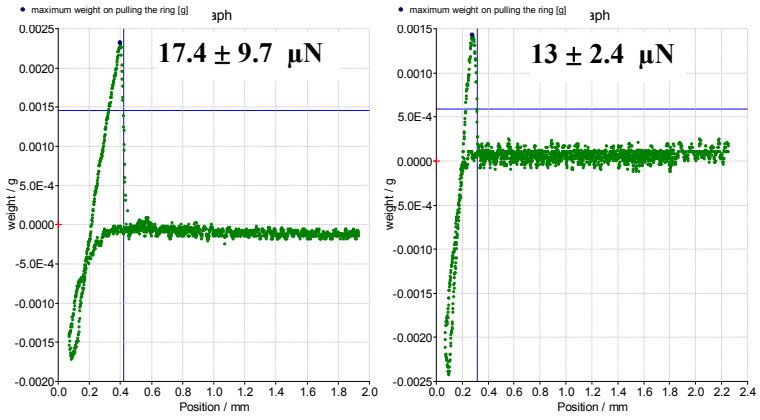


Figure S3. FESEM images showing the as-prepared flower-liked TiO_2 particles on polyester fabric was deposited in 0.1 mM PTO solution at 80ºC for 30 h.

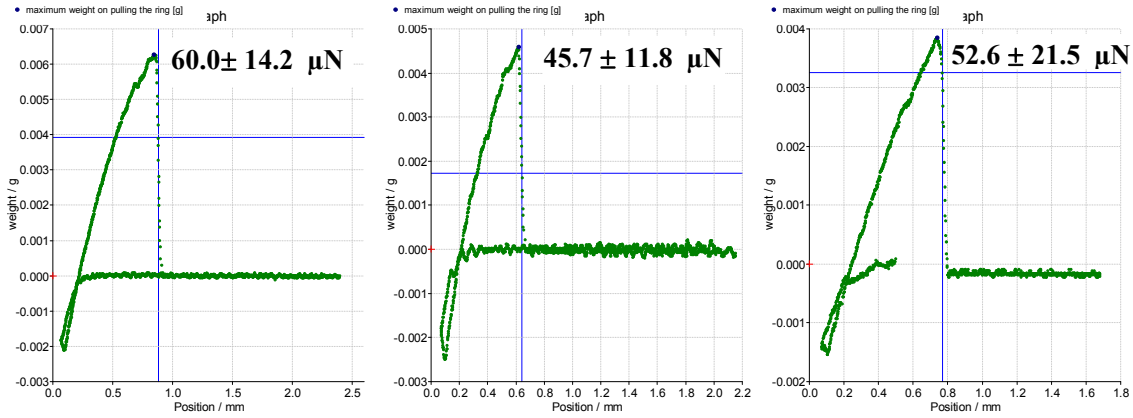


(a) 2 h **(b) 5 h** **(c) 10 h**

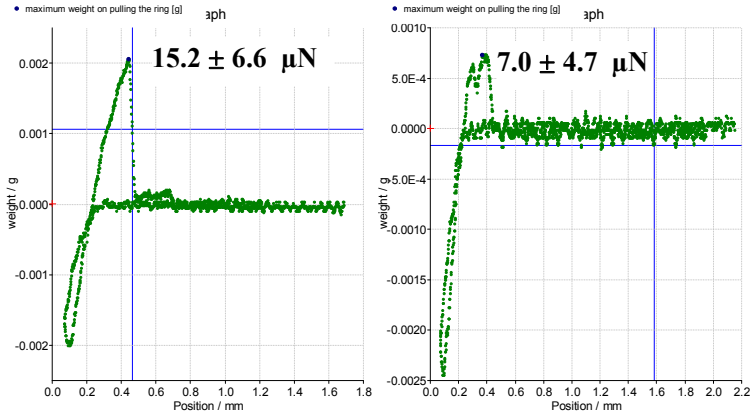


(d) 20 h **(e) 30 h**

Figure S4. The force-distance curves recorded by a droplet contact and move away the superhydrophobic F13/TiO_2@fabric surface under 80 ºC in 0.1 mM PTO solution for different deposition durations.



(b) 2 h **(b) 5 h** **(c) 10 h**



(d) 20 h **(e) 30 h**

Figure S5. The force-distance curves recorded by a droplet contact and move away the superhydrophobic F17/TiO_2@fabric surface under 80 ºC in 0.1 mM PTO solution for different deposition durations.

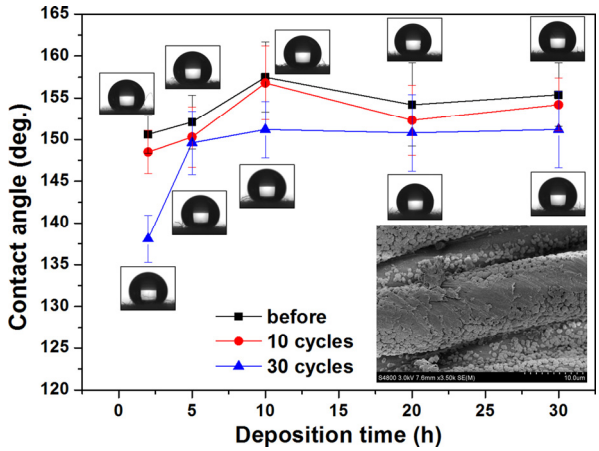


Figure S6. The correlation of static contact angle on superhydrophobic F17/TiO_2@fabric for different deposition time with 1200# sand paper abrasion cycles. The inset demonstrated the

surface texture of the TiO_2 coated fibers (0.1 M PTO for 20 h) after being scratched for 30 cycles.

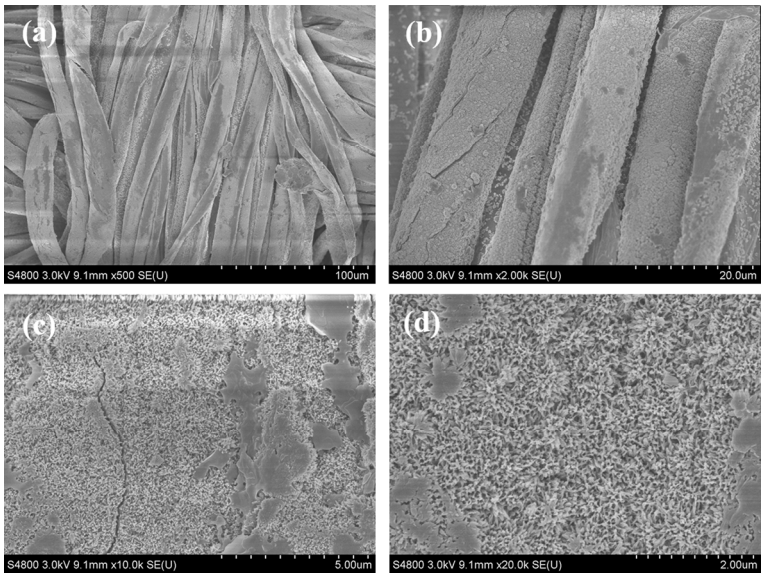


Figure S7. SEM images of F17/TiO_2@fabric after 5 washing cycles with standard machine laundry. The washing durability of F17/TiO_2@fabrics were evaluated by a standard procedure according to GB/T 3921-2008.

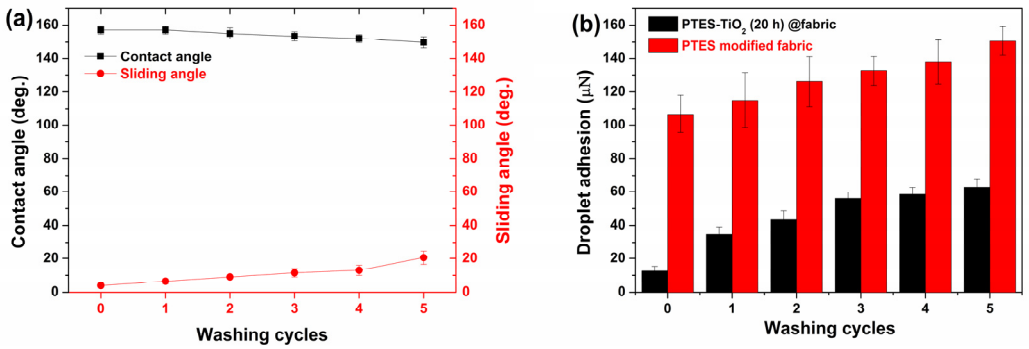


Figure S8. Contact angle and sliding angle changes on F17/TiO_2@fabric depending on the washing cycles. Comparison of droplet adhesion changes on F17 modified pristine fabric and F17/TiO_2@fabric with various washing cycles.