Supporting Materials

Facilely spraying fabrication of highly flexible and mechanically robust superhydrophobic F-SiO_2@PDMS coatings for self-cleaning and drag-reduction applications

Yu Wu,[a] Yizhou Shen,*,[a] Jie Tao,*,[a,c] Zhaoru He,[a] Yuehan Xie,[a] Haifeng Chen,[b] Mingming Jin[a] and Wenqing Hou[a]

[a] College of Materials Science and Technology, Nanjing University of Aeronautics and Astronautics, Nanjing 210016, P. R. China

[b] Department of Materials Chemistry, Qiuzhen School, Huzhou University, 759, East 2nd Road, Huzhou 313000, P. R. China

[c] Jiangsu Collaborative Innovation Center for Advanced Inorganic Function Composites, Nanjing Tech University, Nanjing 210016, P. R. China

* Correspondence to taojie@nuaa.edu.cn (Prof. J. Tao)
shenyizhou@nuaa.edu.cn (A/Prof. Y. Shen)

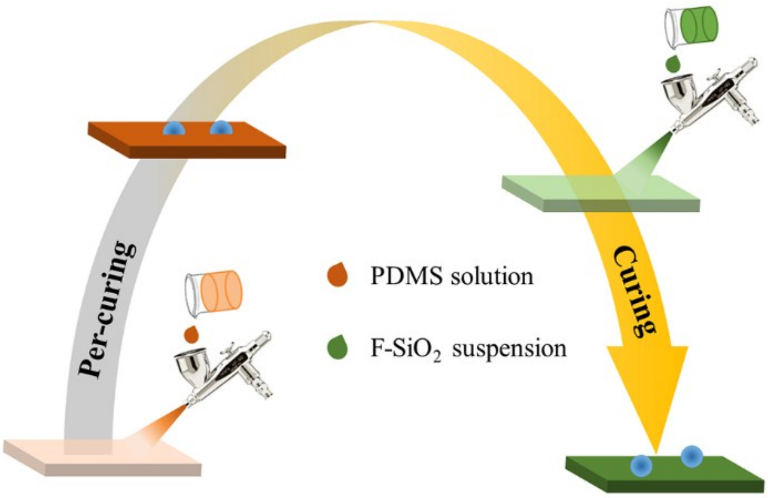

Figure S1. Schematic diagram of synthesizing superhydrophobic F-SiO_2@PDMS coatings.

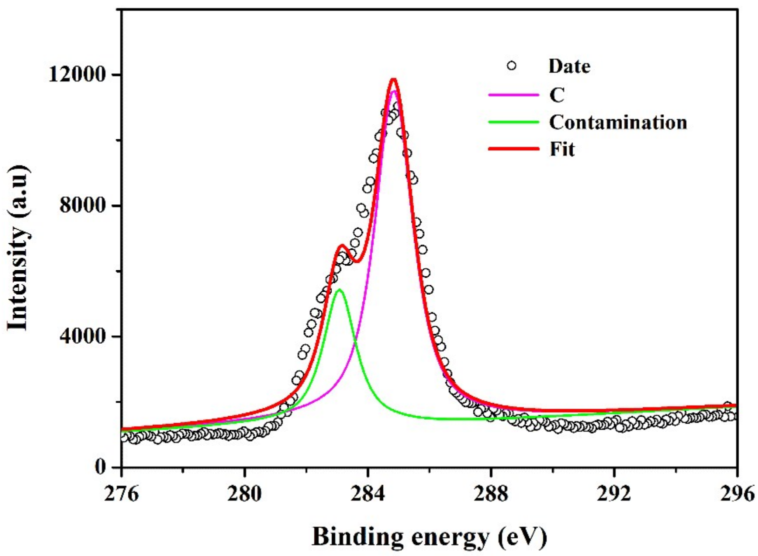

Figure S2. High-resolution C 1s of raw SiO_2 nanoparticles. The peak located at 284.8 eV corresponds to the standard C element. Also, it has been confirmed that the peak at 283.0 eV originates from the contaminant in measurement environment.

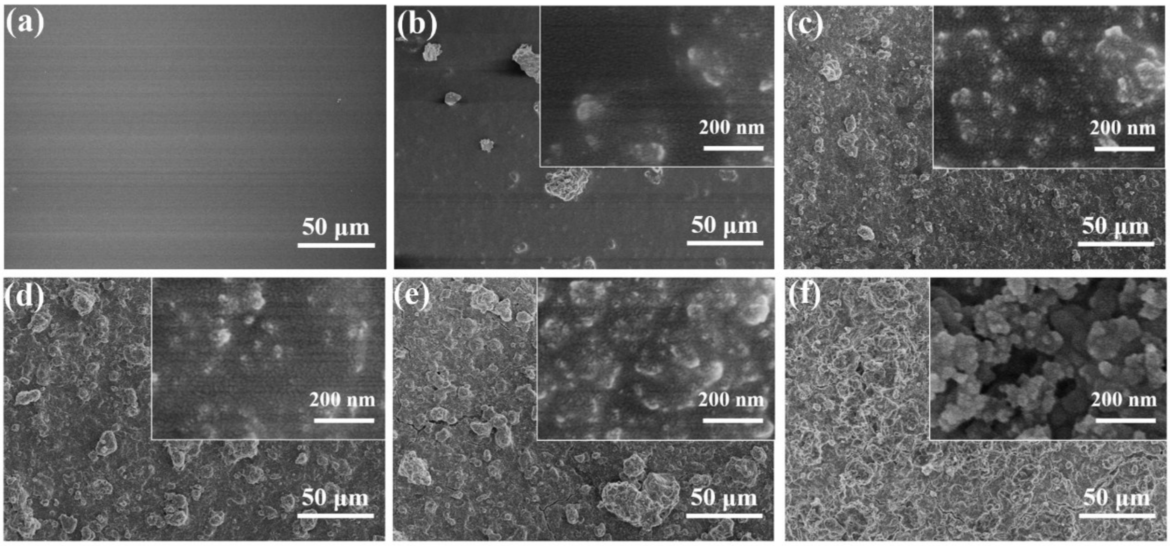

Figure S3. SEM images of prepared coatings with different silica content of 0, 0.22%, 0.44%, 0.66%, 0.88% and 1.76%, respectively.

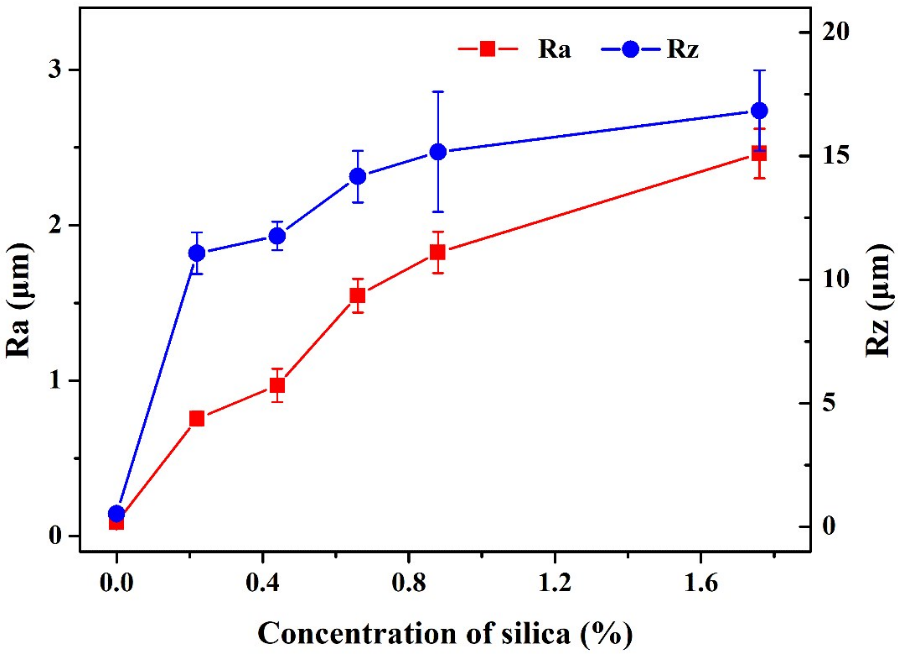

Figure S4. The surface roughness of prepared coatings with different silica content.

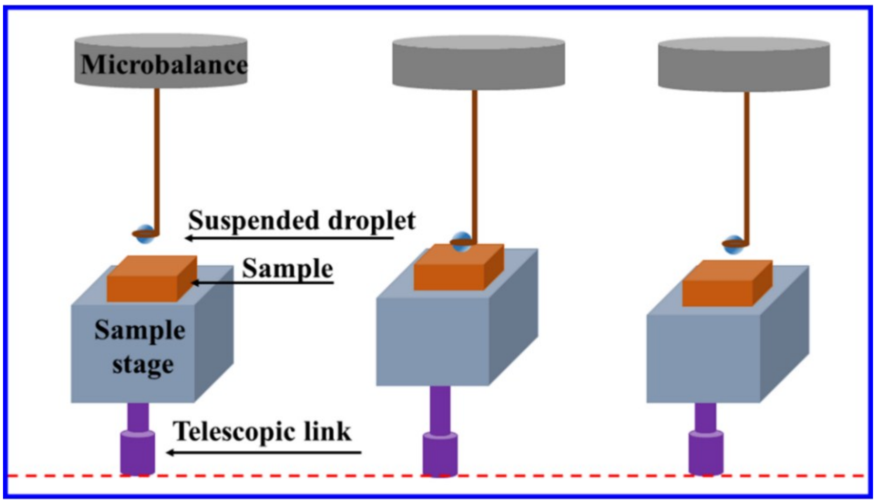

Figure S5. Schematic illustration of water droplet adhesion measurement system.

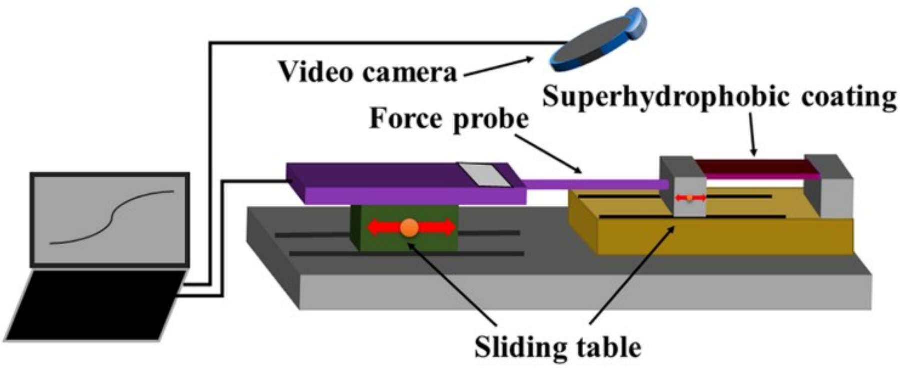

Figure S6. Schematic illustration of the man-made stretching setup used to characterize wettability of superhydrophobic F-SiO_2@PDMS coatings after being stretched in the present study.

Video Captions

Video S1: Methylene blue-dyed water dropped on the treated SiO_2 particles and formed liquid marbles.

Video S2: Droplets can easily roll off the surface.

Video S3: A jet of water from syringe impacted the coatings and easily bounced off the surface without leaving a trace.

Video S4: The dust on superhydrophobic F-SiO_2@PDMS coatings can be easily taken away by continuous flow.

Video S5: The superhydrophobic coatings were repeatedly immersed in the dyed water, and they did not get dirty.

Video S6: Bare and coated “ship” were released simultaneously and moved to the finish line under tensile. It took less time for the coated one to reach the destination.

Video S7: The superhydrophobic coatings were stretched by 50% of its length and still sustained their water-repellent property.