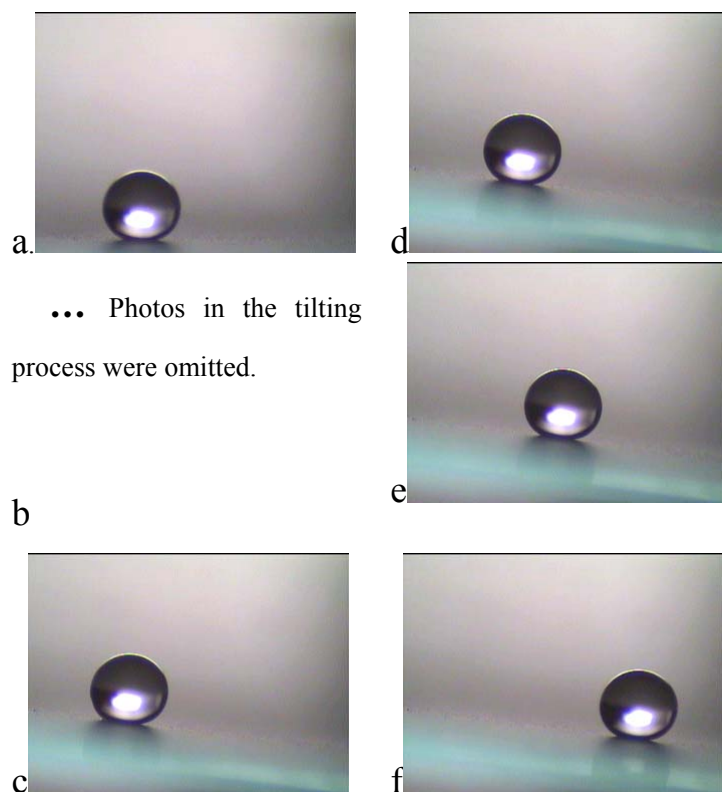


# Supporting Information

## Sliding behavior of water drop on the superhydrophobic surface

A water droplet of 5  $\mu\text{L}$  was carefully put on the surface and then the substrate was tilted slowly until the droplet began to roll. The whole process was monitored with a charge coupled device (CCD) at a speed of 25 frames per second. The SA of the superhydrophobic copolymer surface prepared is  $7.0 \pm 1.0^\circ$ , as shown in the Figure S1. The interval between each image is 40 ms.



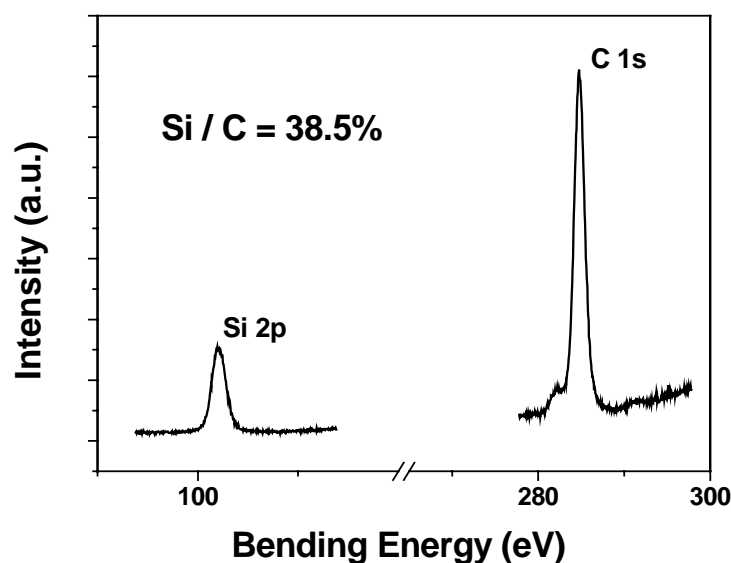
**Figure S1.** Sliding behavior of 5  $\mu\text{L}$  water drop on the superhydrophobic PS-b-PDMS surface.

## XPS characterization.

XPS was used to quantitatively determine the surface chemical composition of the copolymer at a takeoff angle of  $10^\circ$  (between the plane of the sample and the entrance lens of the detector optics) on an ESCALab220i-XL electron spectrometer from VG Scientific. Al  $K_\alpha$  radiation was used as the X-ray source and operated at 300W. The quantitative XPS analysis was followed the way that reported in ref.13b. The coatings for the XPS measurement were cast on a gold foil in order to avoid the influence of silicon in glass on the experiment results. It had been confirmed by SEM, CA and SA that there was no detectable change in the surface morphology and wetting behavior of the coatings cast on glass or gold. The atomic ratio of C1s and Si2p were used in the quantitative analysis. The intensity of Si2p was used to indicate the relative concentration of DMS ( $\text{SiOC}_2\text{H}_6$ ). The relative concentration of styrene ( $\text{C}_8\text{H}_8$ ) was indirectly computed by subtracting the C1s peak component contributed by PDMS from the total C1s peak contributed by both PS and PDMS. Therefore, the surface DMS molar fraction  $X$ , can be expressed as

$$X = \frac{N(DMS)}{N(DMS) + N(S)} = \frac{Si}{Si + \frac{C - 2Si}{8}} = \frac{8}{\frac{C}{Si} + 6} \quad (1)$$

where C and Si refer to the atomic percentages of carbon and silicon from XPS results. The  $X$  of the topmost layer of the copolymer surface cast from DMF was 52.6mol%, and it increased to 93.1 mol% when the copolymer cast from heptane, whose XPS pattern is shown in Figure S2.

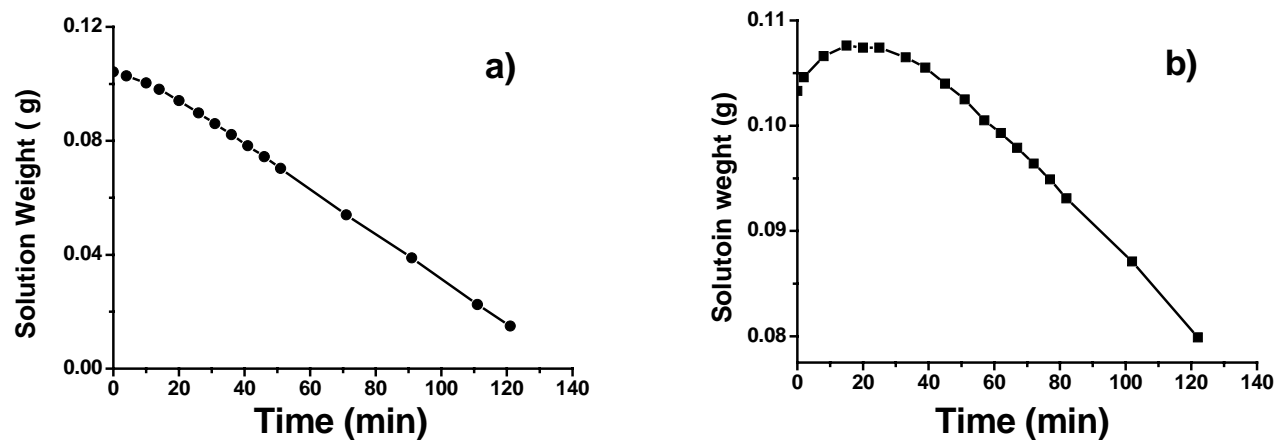


**Figure S2.** XPS spectrum of the copolymer cast from 5mg/mL micellar solution of PS-b-PDMS in heptane at a takeoff angle of 10°.

### **Weight change during the solidification of micellar solution in dry and humid air.**

A glass slide with the copolymer micellar solution in DMF cast on the surface was put on an electronic balance to monitor the weight change during the solvent evaporation process in different conditions, which was plotted as a function of time in Figure S3. From the plot a we can see that under a dry atmosphere (with a RH less than 30%), the weight of the solution decreases continuously until the solvent evaporated completely, as shown in Figure S3 a. In a humid condition (with a RH of  $60 \pm 5\%$ ), however, the weight of the micellar solution increases with the time at the initial stage until it reaches a summit and then decreases gradually.(Figure S3 b) The increase of the solution weight implied that certain amount of water had entered into the solution from the humid air before a saturated state was

reached. The water mixed with DMF, leading to a gradually poorer solvent for the copolymer, and thus induced the phase separation.



**Figure S3.** Weight change of micellar solution of PS-b-PDMS in DMF versus time during solidifying the solution in a (a) dry and (b) humid atmosphere at room temperature, respectively.