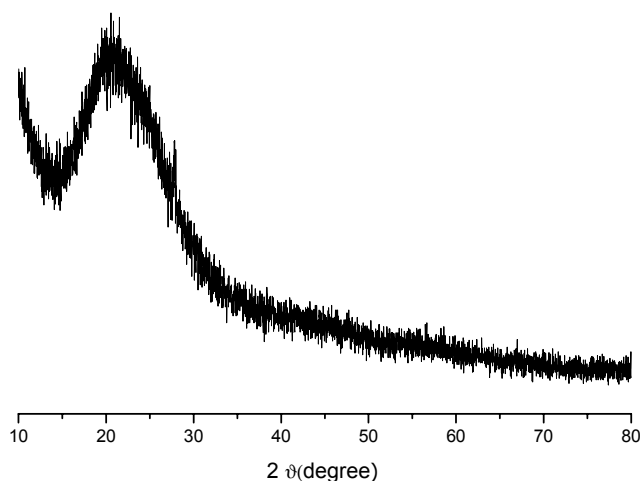


## Supplementary Information

### A novel approach to raspberry-like particles for superhydrophobic materials

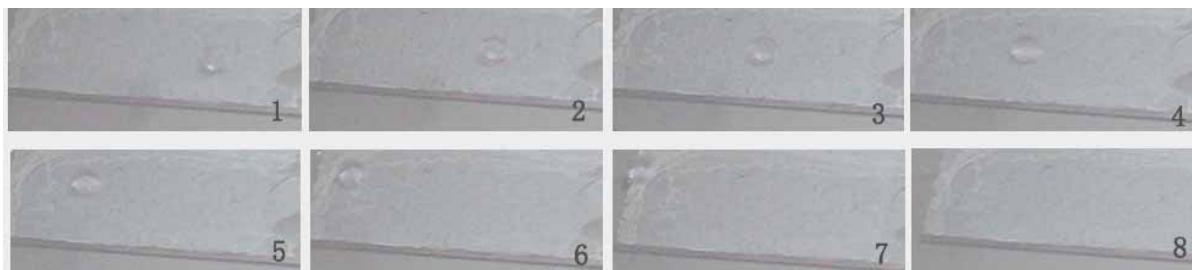
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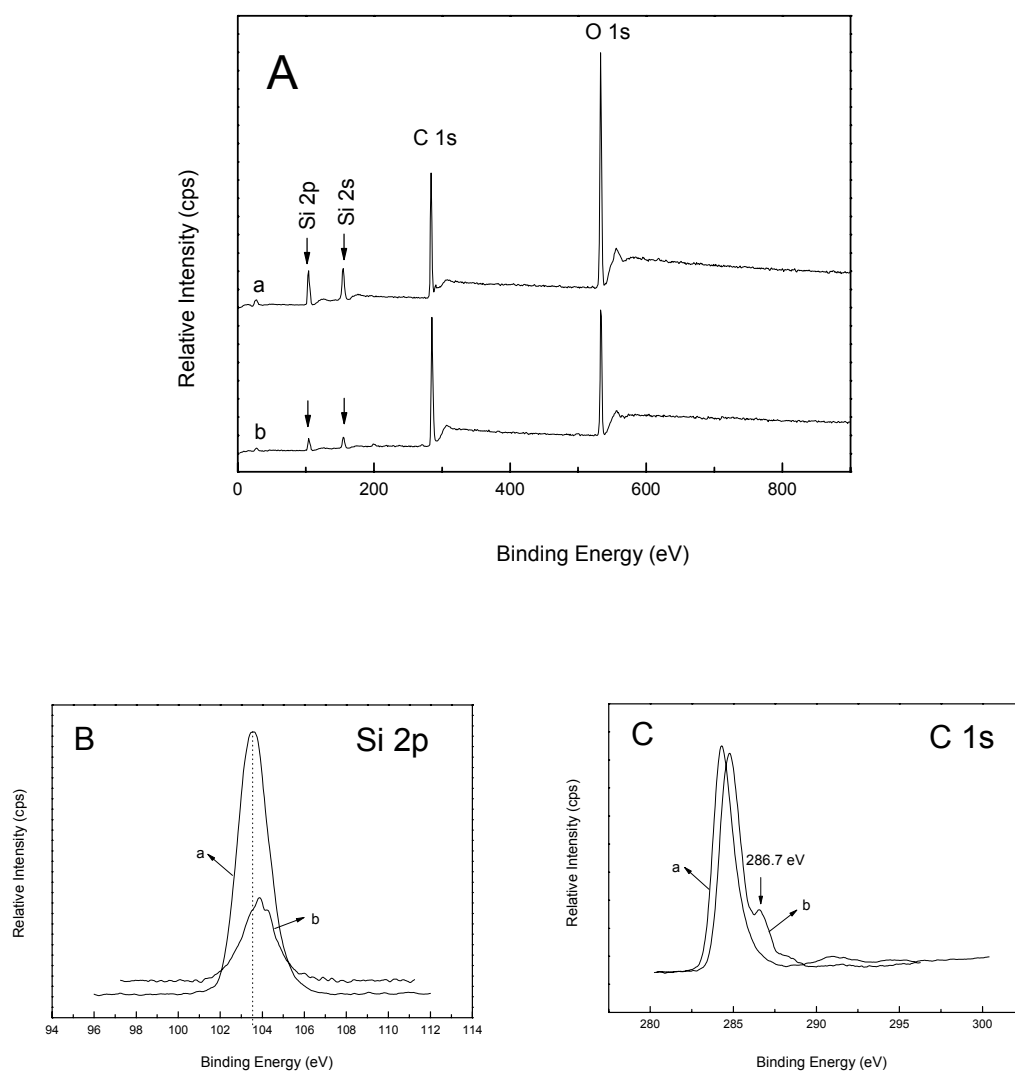


**Figure S1.** XRD pattern of the RS-2

Powder X-ray powder diffraction (XRD) pattern of as-synthesized sample was recorded with a Japan Rigaku D/max  $\gamma_A$  X-ray diffractometer equipped with graphite monochromatized Cu  $K\alpha$  irradiation ( $\lambda = 0.154178$  nm), employing a scanning rate of  $0.02^\circ\text{s}^{-1}$  in the  $2\theta$  range from 10 to  $80^\circ$ . The XRD pattern of the raspberry-like particles RS-2 is shown in Figure S1. No sharp peaks in the spectrum of the raspberry-like particles RS-2 indicates that the silica particles assembled on the surface of RS-2 are in the amorphous state.



**Figure S2.** (1-8) Snapshot photographs of a water droplet (10  $\mu\text{L}$ ) rolling off of the hierarchically structured surface comprised of raspberry-like particles RS-3. It took ca. 0.6 s from 1 to 8. The titling angle is ca.  $3.2^\circ$ . The corresponding contact angle is described in the Figure 8d. The length of the substrate is approximately 7 cm.



**Figure S3.** XPS full-scan spectra of the raspberry-like particles RS-2 (Figure S3A a)

and the silanized raspberry-like particles RS-2 (Figure S3A b). High-resolution XPS spectra of Si 2p(B) and C 1s(C) of the raspberry-like particles RS-2 (a) and the silanized raspberry-like particles RS-2 (b).

From the XPS full-scan spectra of the raspberry-like particles RS-2 (Figure S3A a) and the silanized raspberry-like particles RS-2 (Figure S3A b), we can see that the relative atomic concentration of oxygen decrease greatly from 43% to 30%, which indicate that the surface of the particulate films have been silanized. Because  $-\text{COOH}$  groups at the surface of poly(S-co-AA) particles and  $-\text{OH}$  groups at the surface of silica particles have reacted with dodecyltrichlorosilane, which result in the decrease of relative atomic concentration of oxygen. In the high-resolution XPS spectra of Si 2p(Figure S3B a,b), we can see that the relative atomic concentration of silica decrease greatly from 14% to 6%, which indicate that the surface of the silica particles have been modified by dodecyltrichlorosilane. Also the shoulder peak of C 1s (Figure S3C b) at 286.7 eV correspond to the bond of C-O-Si, which confirm that  $-\text{COOH}$  groups at the surface of poly(S-co-AA) particles have reacted with dodecyltrichlorosilane.

**Table S1.** Advancing and receding angles of the dodecyltrichlorosilane modified particulate films

Runs	Advancing Contact Angles ( $^{\circ}$ )	Receding Contact Angles ( $^{\circ}$ )
RS-1	152.6	143.6
RS-2	158.5	156.7
RS-3	168.5	166.9
RS-4	132.8	103.8

Advancing and receding angles of the dodecyltrichlorosilane modified particulate films were measured with Contact Angle Meter SL200B (Solon Tech. Co., Ltd.) by tilting the table. By adjusting the tilting gradient accurately with the instrument's equipment very slowly ( $0.02^{\circ}/\text{s}$ ), we can stop tilting the table to prevent the water droplets from rolling off when the droplets slid very slowly and then measured all the advancing and receding contact angles exactly. For each experimental condition, three specimens were analyzed, and the mean value was taken as the final result. The

deviation of the measured contact angles between various specimens of the same condition was less than  $2.5^\circ$ . Doubly distilled water with a measured surface tension of  $72 \text{ mN/m}$  was used in this analysis. From Table S1, the advancing and receding contact angles measured for the particulate film comprised of RS-3 were  $168.5$  and  $166.9^\circ$ , respectively, which show high performance in superhydrophobicity.