

Experimental Part

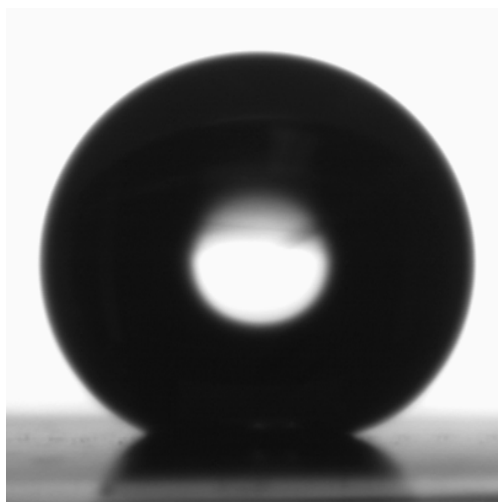
The substrate is copper plate (cold-rolled alloy C194) which has a nominal composition of 2.4% iron, 0.03% phosphorus, and 0.1% zinc, with the balance of copper. The copper plates were pretreated by electrolytic degreasing and acid cleaning process, then were rinsed by deionized water. To fabricate the lotus leaf-like substrate, the first step is the preparation of Cu cones by immersing the pre-treated Cu foil in to the chemical deposition bath containing (). Then the prepared Cu cone substrate was immersed into the bath containing 0.02M AgNO_3 , 0.04M $\text{Na}_2\text{S}_2\text{O}_3$ and 0.02M $\text{K}_2\text{S}_2\text{O}_5$. The deposition of the petal-like Ag film is immersing the pre-treated Cu foil into the chemical deposition bath consist of 0.02M $\text{C}_2\text{H}_3\text{AgO}_2$ and a certain amount of NH_4OH to adjust the pH value to 9. Then the substrates were rinsed with distilled water.

The as-prepared specimen were immersed in the ethanol solution (0.02mol/L) of n-hexadecanethiol for 30min. Then they were cleaned ultrasonically with ethanol for 10min. Subsequently, they were dried at room temperature.

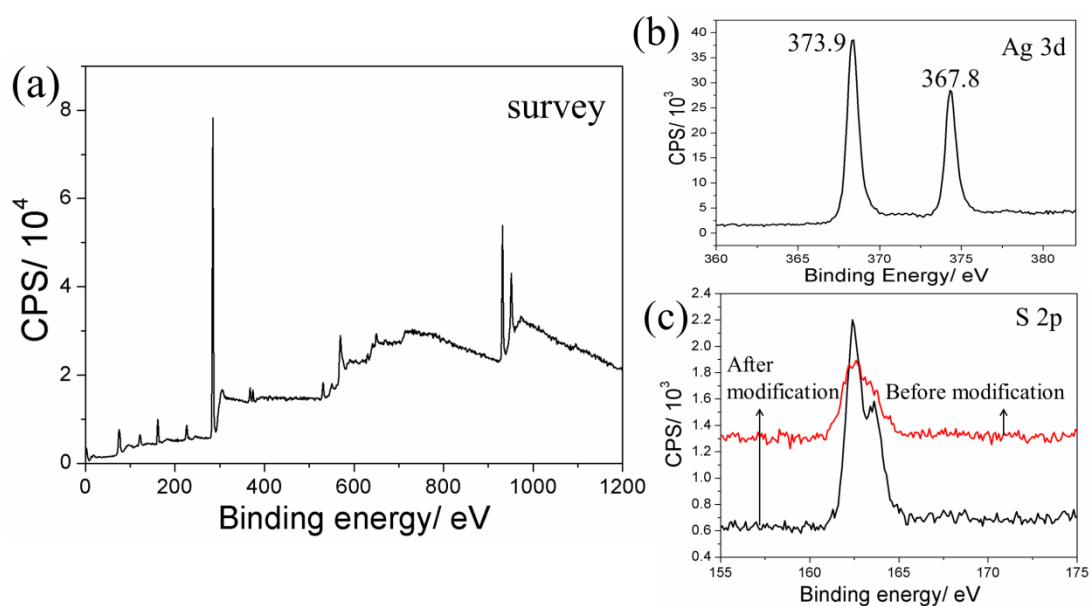
All of the reagents above are of chemical grade bought from Sinopharm Chemical Reagent Co.,Ltd.

The structure of as-deposited silver products were characterized by scanning electron microscopy (SEM, FEI SIRION 200). Water contact angle and sliding angle (SA) of the films were measured with 4 μL water droplet at ambient temperature using an optical contact angle meter (Data physics OCA20). The surface chemical composition was investigated by X-ray photoelectron spectroscopy (XPS, Kratos AXIS UltraDLD). X-ray diffraction pattern was recorded from 20° to 100°, using Rigaku D/MAX-III A X-ray polycrystalline diffractometer with Cu K α radiation ($\lambda=0.15418\text{ nm}$). Transmission electron microscopy (TEM) images were recorded on an FEI Tecnai 20 (200 kV).

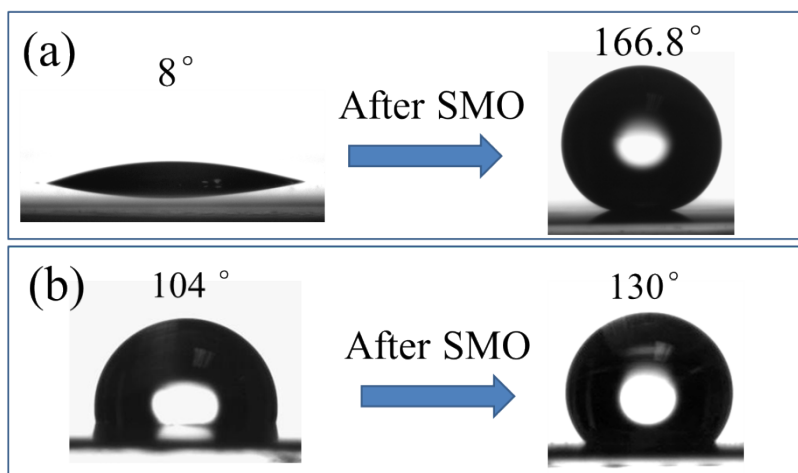
SI 1 is the SA test record of the lotus leaf-like substrate.



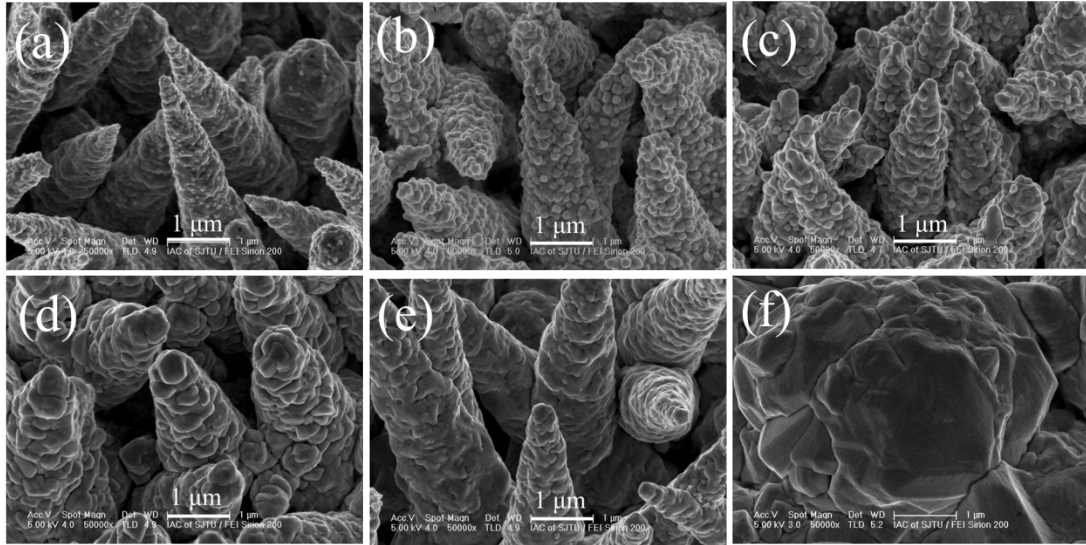
SI 2. The contact angle of a 4 μ L water drop on a petal-like surface after SMO.



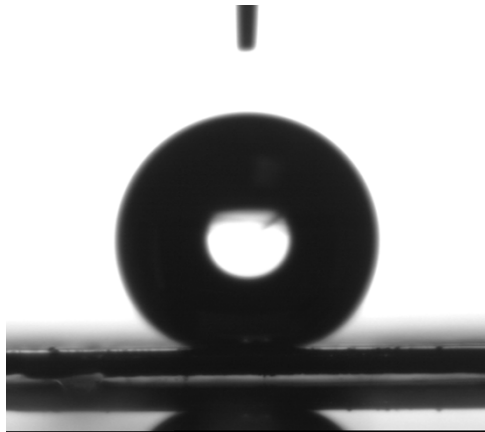
SI 3. XPS spectra of the lotus leaf-like surface after SMO: (a) the survey spectra; (b) the spectra of Ag; (c) the spectra of S.



SI 4. Contact angle before and after SMO based on (a) lotus leaf-like substrate; (b) common Cu foil.



SI 5. Surface structure based on Cu cones with different deposition time of Ag. (a) 10min; (b) 20min; (c) 30min; (d) 60min; (e) 90min; (f) 18h.



SI 6. Contact angle of a 4 μ L water drop on a lotus leaf-like surface after 2 months exposure to outer environment.