

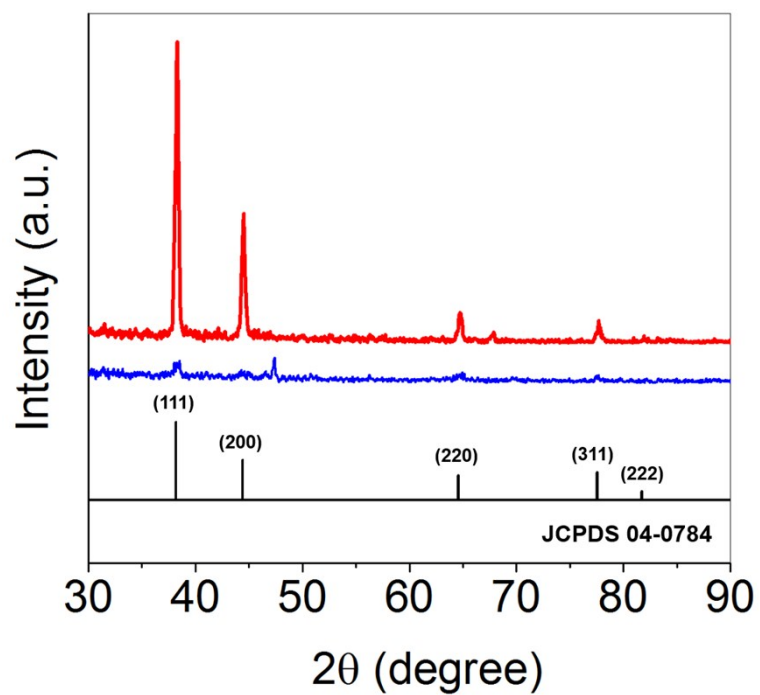
## Supplementary Information

### **Growth of hierarchical gold clusters for use in superomniphobic electrodes**

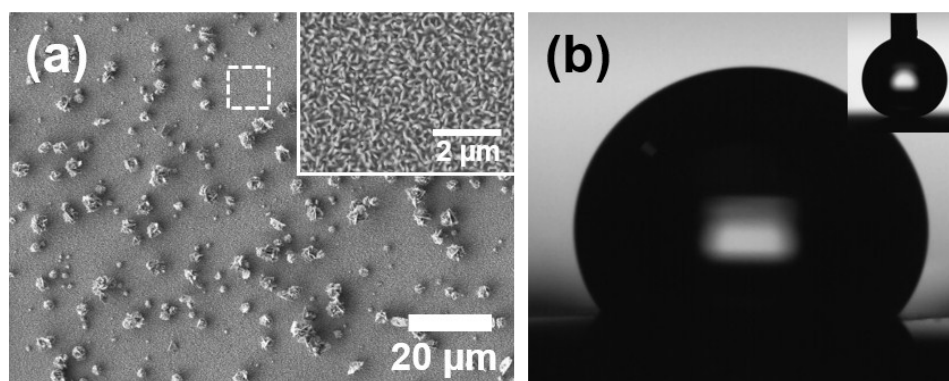
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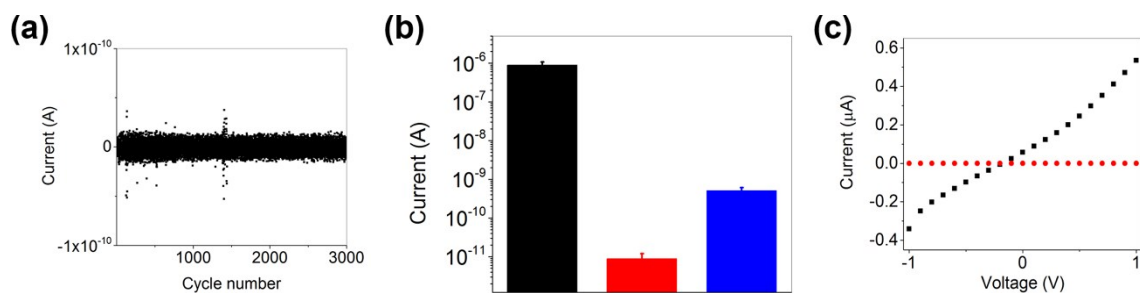
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**Fig. S1** X-ray diffraction patterns of the as-deposited gold film (blue) and the hierarchical gold cluster nanoflake surface fabricated by eight reduction cycles (red).



**Fig. S2** (a) SEM image of the gold microstructures fabricated by single reduction during 60 min. Inset of (a) is magnified images of the boxed regions. (b) Hexadecane contact angles after PFT treatment. Inset of (b) is water contact angle.



**Fig. S3** (a) Changes in the current under a PEDOT:PSS aqueous solution during the voltage sweeping from -0.5 to +0.5 V. (b) Currents of the hydrophilic electrodes in a PEDOT:PSS aqueous solution (black), the PFT-treated electrodes in a PEDOT:PSS aqueous solution (red) and the PFT-treated electrodes in PEDOT:PSS solution in a mixture of isopropanol and water (1:9) (blue). The applied voltage was 0.5 V. (c) I-V curves of gold cluster electrodes in 0.1 M NaCl solution without (black squares) and with (red circles) PFT treatment.