

Supporting Information

**Fluorine-free coating-based droplet triboelectric nanogenerators
for highly efficient energy harvesting**

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Supplementary materials

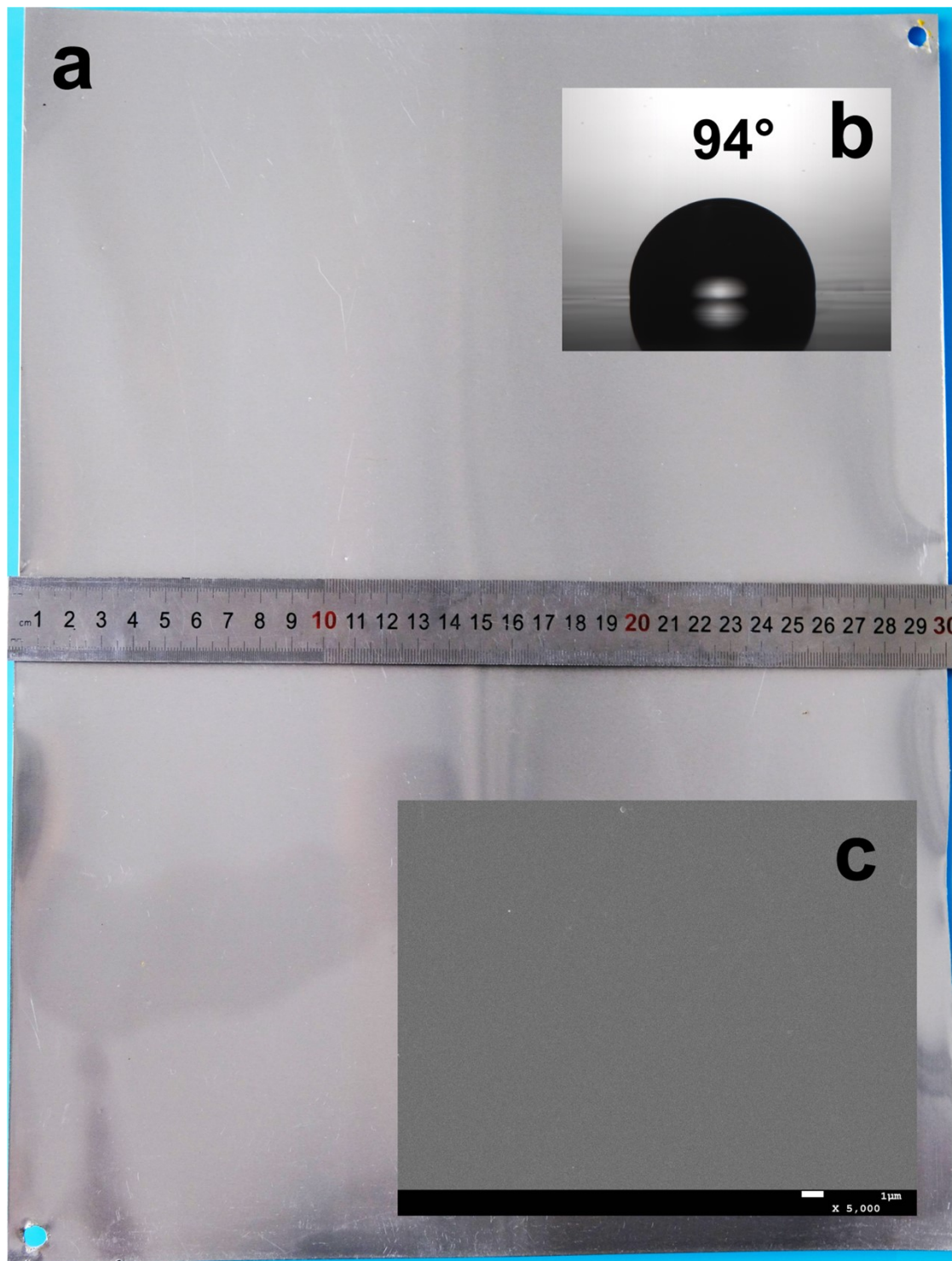


Figure S1. (a) The silicon-modified acrylic resin coating prepared on aluminum sheets using the spray deposition process (30 cm × 40 cm) exhibits a (b) hydrophobic angle of 94° and a (c) smooth, even surface.

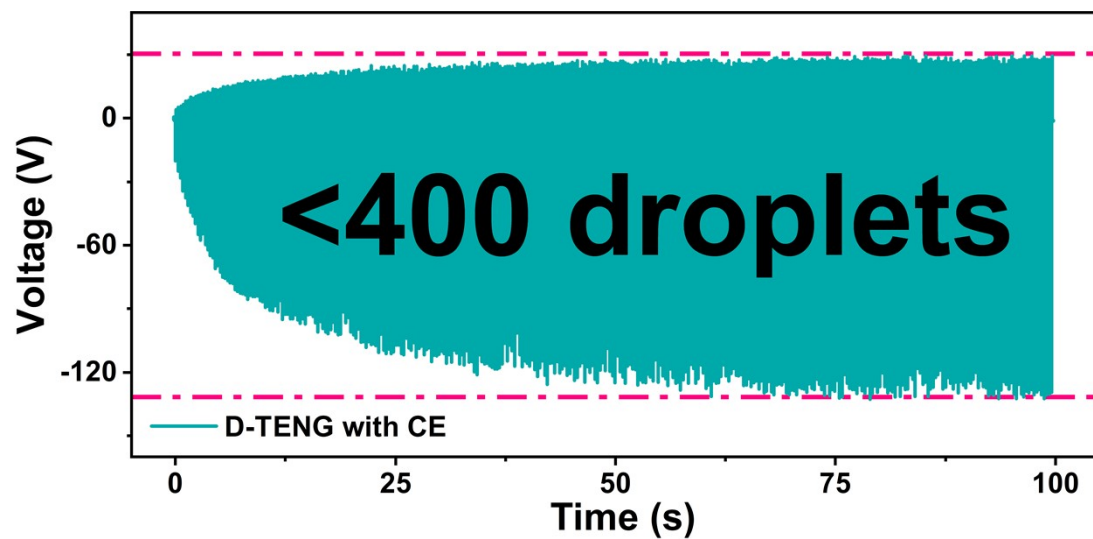


Figure S2. The negatively charged accumulation on the coating surface progressively reached saturation (less than 400 droplets).

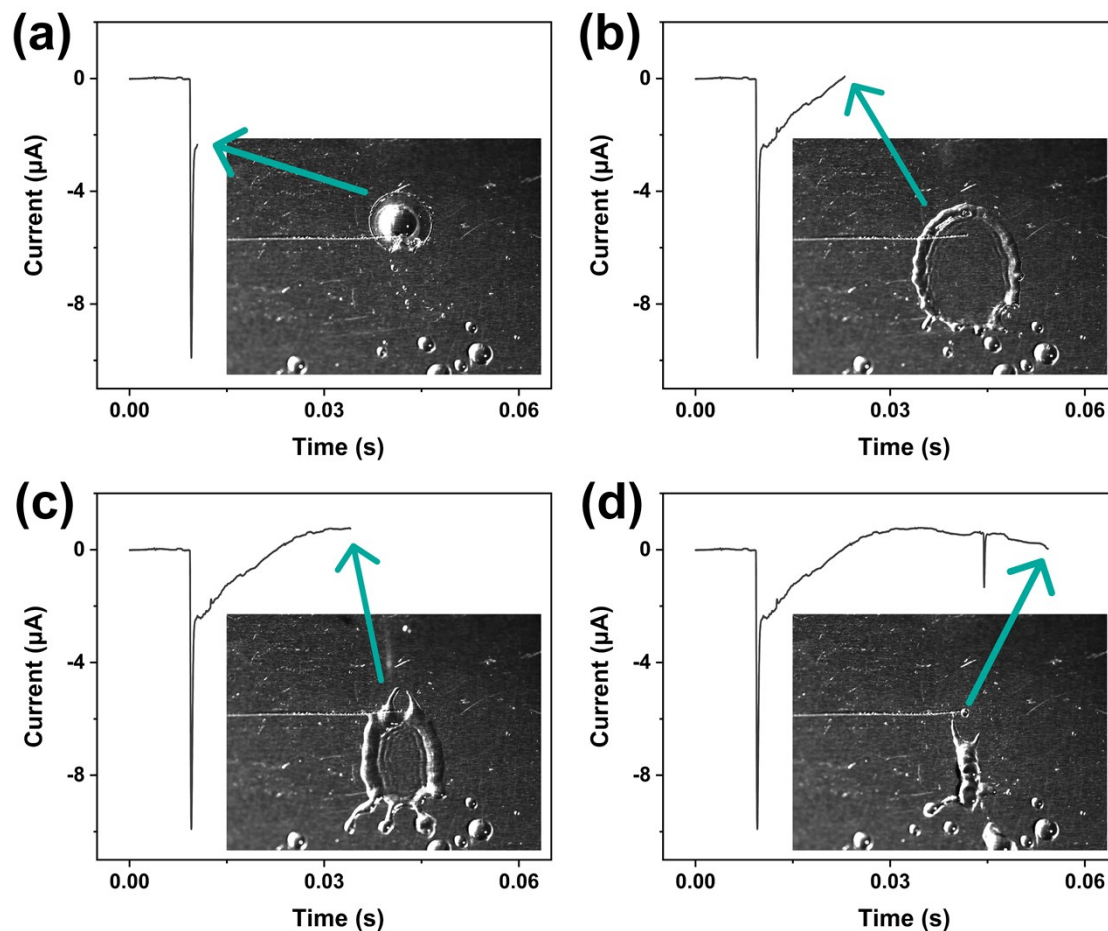


Figure S3. Correspondence between current signal and water droplet motion state. (a) The water droplet comes into contact with electrode E_1 , initiating the discharge of capacitor C_a . (b) The water droplet spreads and reaches its maximum area, marking the completion of C_a discharge and the commencement of its charging phase. (c) As the water droplet contracts, the voltage across C_a during its charging phase reaches its maximum value. (d) The water droplet ceases to make contact with E_1 , resulting in circuit interruption.

Video S1: Correspondence between current signal and water droplet motion state.

Video S2: E_{TL} illuminates 180 LEDs with a single droplet of water.

Video S3: The demonstration of device charges a $1\mu\text{F}$ capacitor.