

Supporting Information

Amphiphobic triboelectric nanogenerators based on silica enhanced thermoplastic polymeric nanofiber membranes

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Keywords: Triboelectric nanogenerators; Thermoplastic polymeric nanofiber membranes; Silica; Fluorine-containing polymer; Amphiphobicity

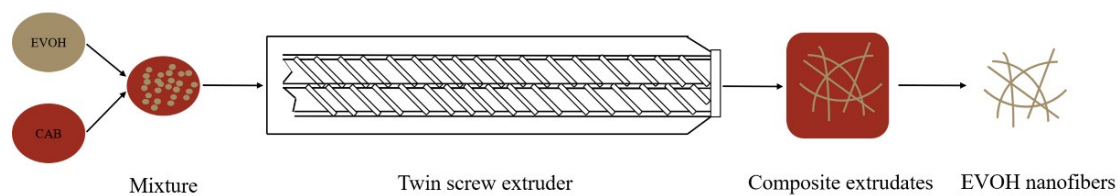


Figure S1. Schematic diagram of the melt-blending extrusion for the preparation of EVOH nanofibers.

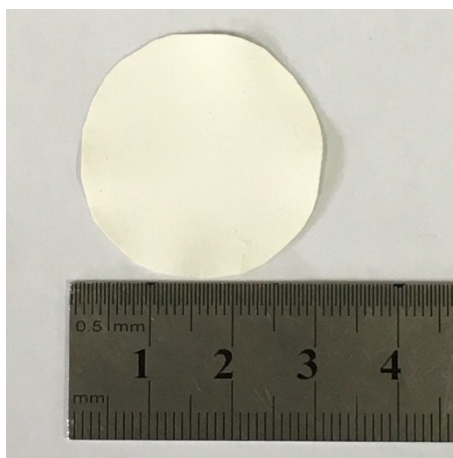


Figure S2. The size of as-prepared PTFE/PVDF/EVOH composite nanofiber membranes.

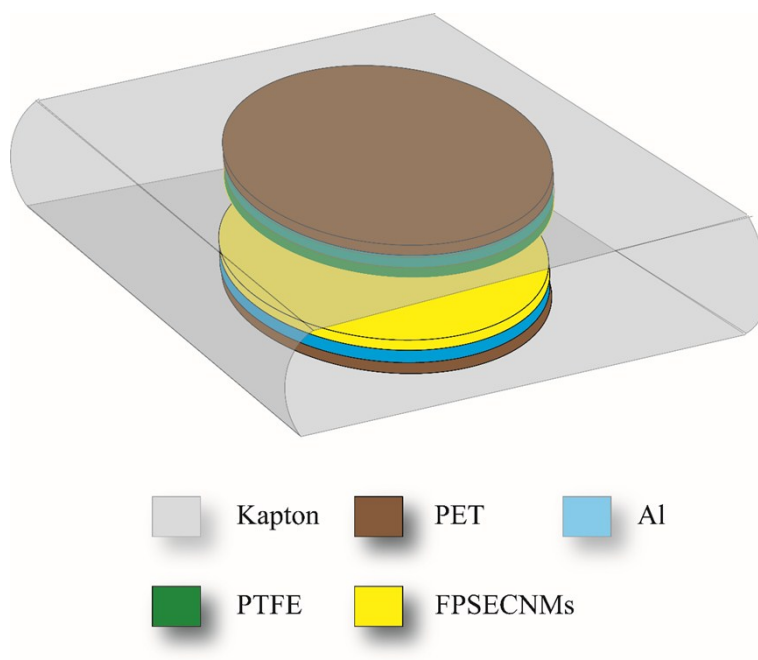


Figure S3. The prototype structure of as-fabricated FPSECNM-TENG device.

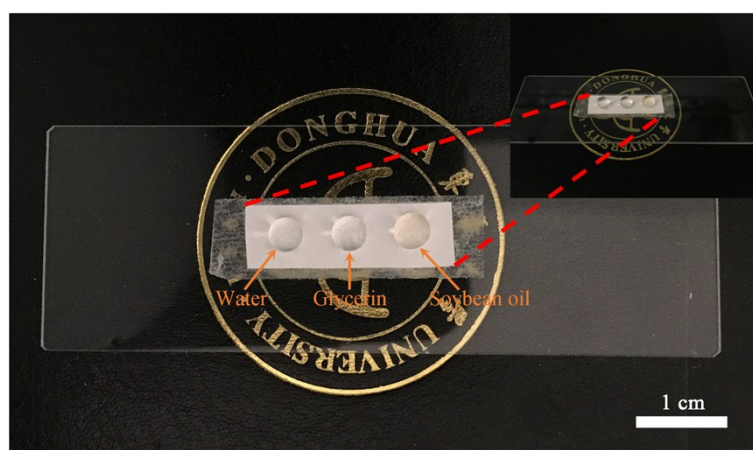


Figure S4. A snapshot of water, glycerin and soybean oil on the surface of FPSECNMs showing excellent amphiphobicity.

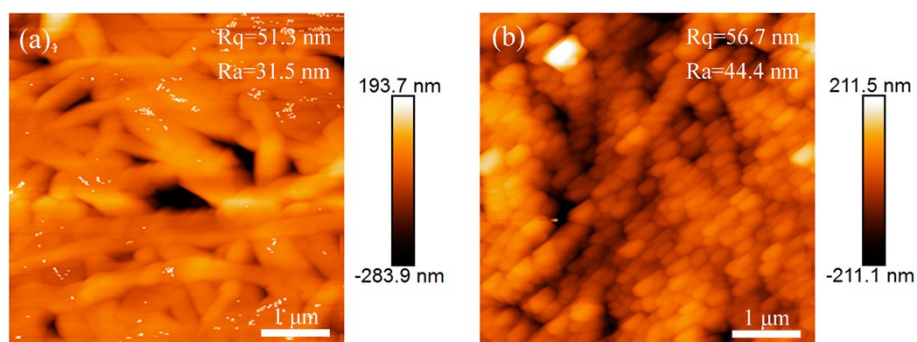


Figure S5. The AFM images of (a) EVOH and (b) SiO_2/EVOH composite nanofiber membranes with measured surface roughness.

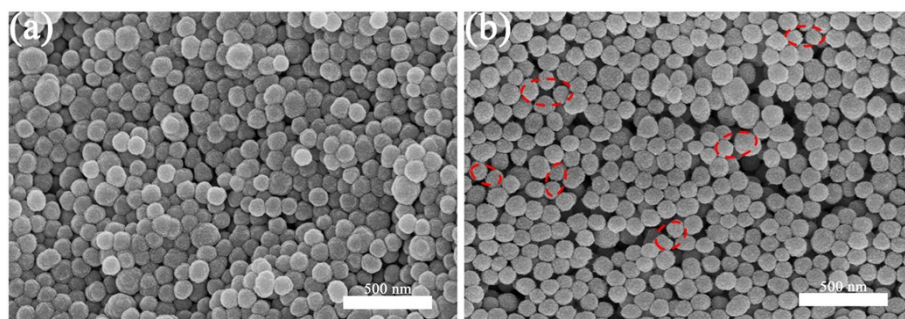


Figure S6. The FE-SEM images of prepared SiO_2 nanoparticles (a) before and (b) after introducing FAS.

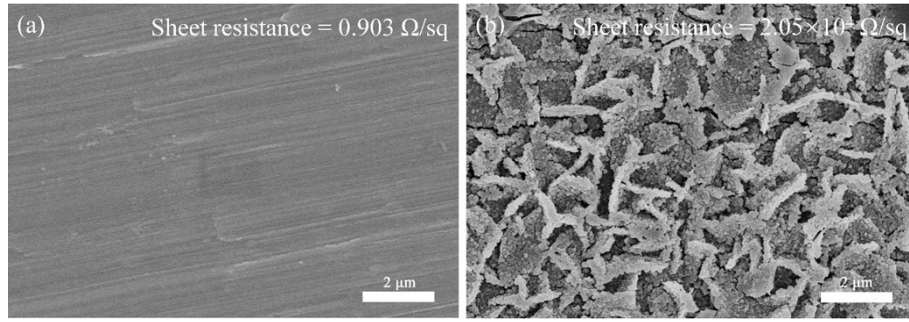


Figure S7. The FE-SEM image of Al foil (a) before and (b) after etched by 1M EVOH for 1 min (insert is the respective sheet resistance value analyzed by a four-point probe measurement (Loresta-GX MCP-T700, Mitsubishi Chemical Analytech Co., Ltd, Japan)).

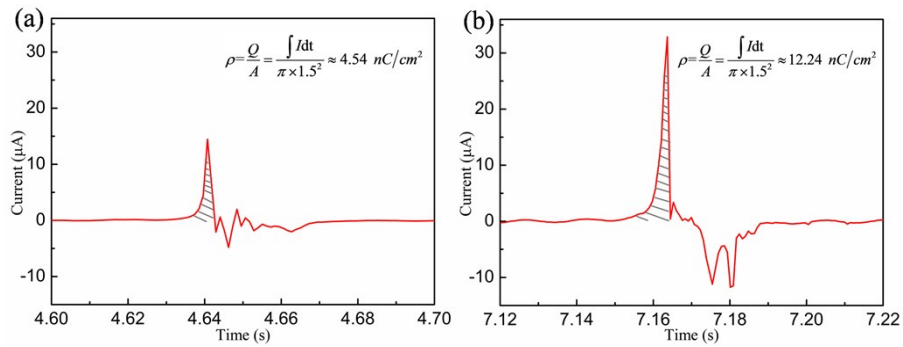


Figure S8. The respective calculated surface triboelectric charge density generated by (a) a bare EVOH, (b) SiO₂/EVOH composite nanofiber membranes and a PTFE film as the triboelectric pair.

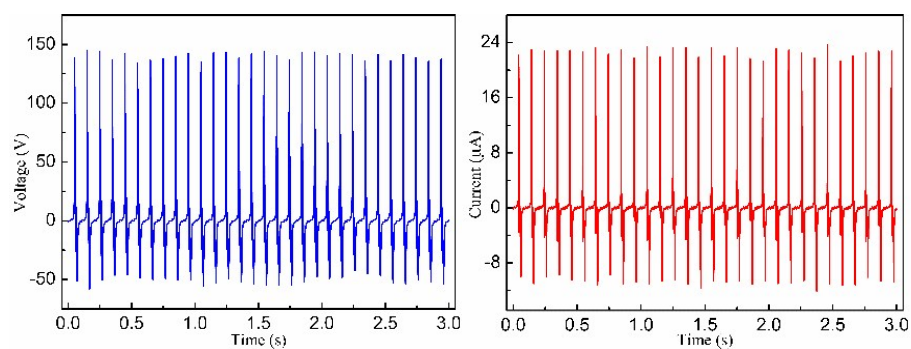


Figure S9. The output (left) open-circuit voltage and (right) short-circuit current generated by FPSECNMs and PTFE film as the triboelectric pair.

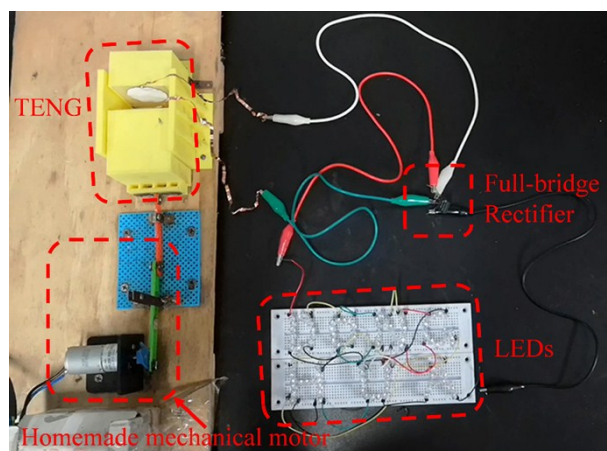


Figure S10. A photograph of power-supplying diagram of charging green LEDs by FPSECNM-TENGs with a rectifier circuit.

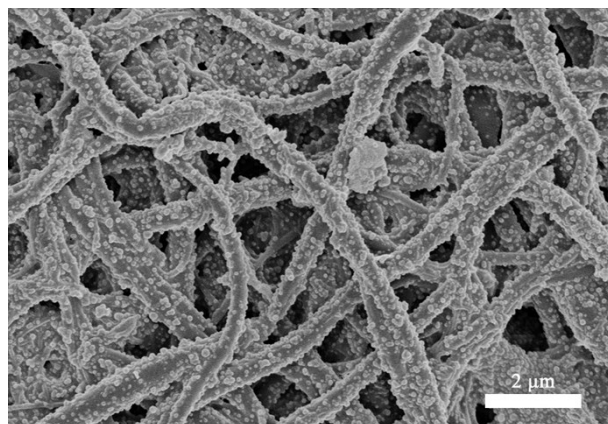


Figure S11. A FE-SEM image of FAS/PVDF-HFP/SiO₂/EVOH composite nanofiber membranes after more than 10000 contact-separation cycles.

Video S1. Self-cleaning effect of FPSECNMs for clay particles.

Video S2. 100 green LEDs composed of the letters “DONGHUA” could be lighted up sustainably by the fabricated TENG which contains FPSECNMs and a commercial PTFE film as a triboelectric pair after measuring continuous contact-separation operations for more than 10000 cycles.