Journal Name

Supporting information

A Self-powered System Based on Triboelectric Nanogenerator and Supercapacitor for Metal Corrosion Prevention

Xiaoyi Li,†[abc] Juan Tao,†[b] Wenxi Guo, [bd] Xiaojia Zhang,[b] Jianjun Luo,[b] Mengxiao Chen,[b] Caofeng Pan*[b] and Jing Zhu*[ac]

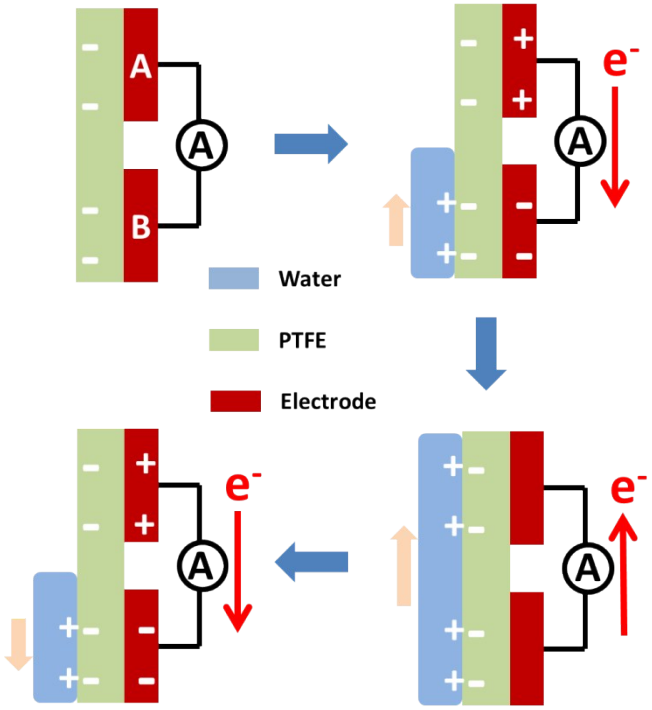

Figure S1. Electricity generating process of the TENG.
Once electrode B is submerged by the rising water wave, positive charges in water (such as hydroxonium) screen the negative triboelectric charges on the PTFE surface by forming an interfacial electrical double layer. As a result, the unbalanced electric potential between the two electrodes due to the asymmetric distribution of charges drives free electrons to flow from electrode A to electrode B.
As electrode A starts to sink in the water, induced electrons flow back to electrode A because the electric potential distribution varies toward equilibrium. Finally, when the device is completely covered by water, triboelectric charges are entirely screened. Consequently, all induced charges vanish.
If the wave then recedes, another current is then produced.

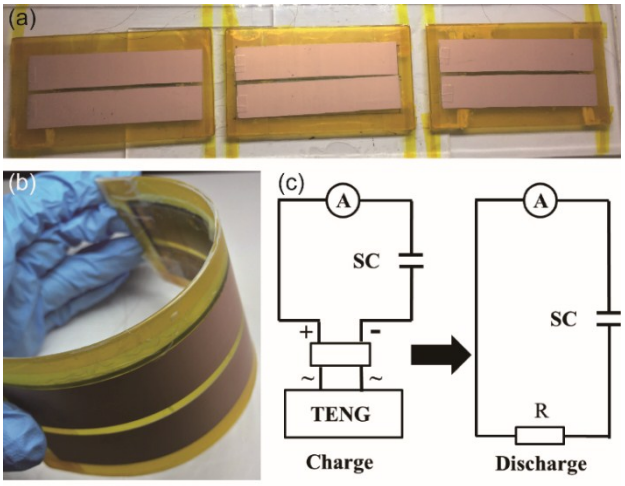

Figure S2. (a) Optical image of the TENG network with unit number n=3. (b) Digital image of the flexible TENG which can harvest blue energy from the ocean. (c) The circuit diagram when the TENG is charging the SC and the SC is discharging (R=100 KΩ).

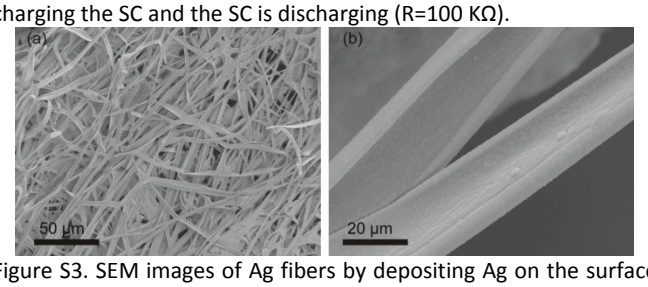

Figure S3. SEM images of Ag fibers by depositing Ag on the surface of PVB fibers and dissolving the PVB.

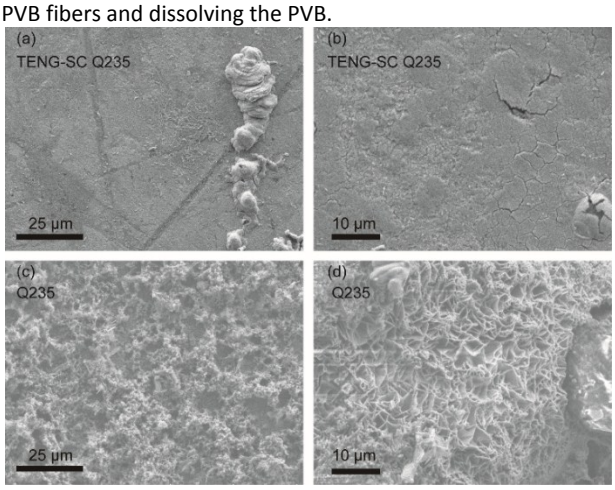

Figure S4. (a-b) The SEM images of the Q235 powered by TENG-SC after immersing into the 0.5 M NaCl solution for 6h. (c-d) The SEM images of the Q235 without TENG-SC after immersing into the 0.5 M NaCl solution for 6h.