

Supporting Information

High-output tubular triboelectric nanogenerator for wave energy collection and its application in self-powered anti-corrosion applications

Wentao Li^{a,d}, Yupeng Liu^{c,e}, Weixiang Sun^c, Hanchao Wang^c, Wenqi Wang^{a,c}, Jie Meng^c, Xiaoqing Wu^c, Chuanpeng Hu^d, Daoai Wang^{b,c*} and Ying Liu^{a,*}

^a Institute of Materials Science and Engineering, Ocean University of China, Qingdao 266100, China;

^b Center of Materials Science and Optoelectronics Engineering, University of Chinese Academy of Sciences, Beijing 100049, China;

^c State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, Lanzhou 730000, China;

^d Shandong Laboratory of Advanced Materials and Green Manufacturing at Yantai, Yantai 264000, China.

^e Key Laboratory of Rubber-Plastics of the Ministry of Education, School of Polymer Science & Engineering, Qingdao University of Science and Technology, Qingdao 266042, P. R. China

***Corresponding Author.** Tel: +86-931-4968169; E-mail: wangda@licp.cs.cn (D. Wang); liuyingwda@ouc.edu.cn(Y. Liu)

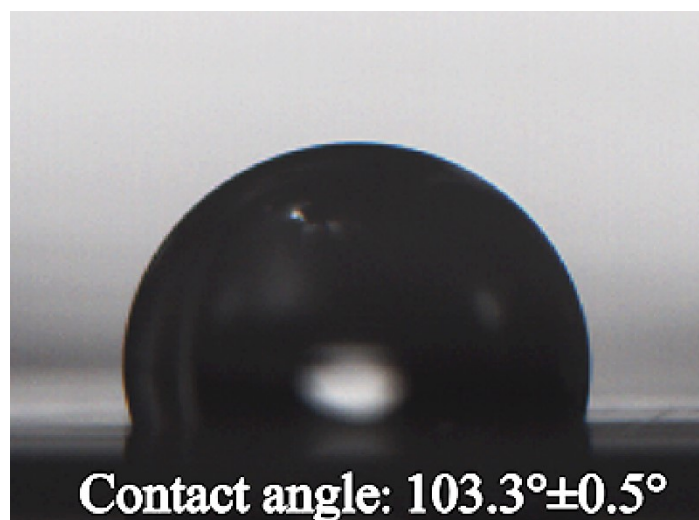


Figure S1 Contact angle of the PTFE film.

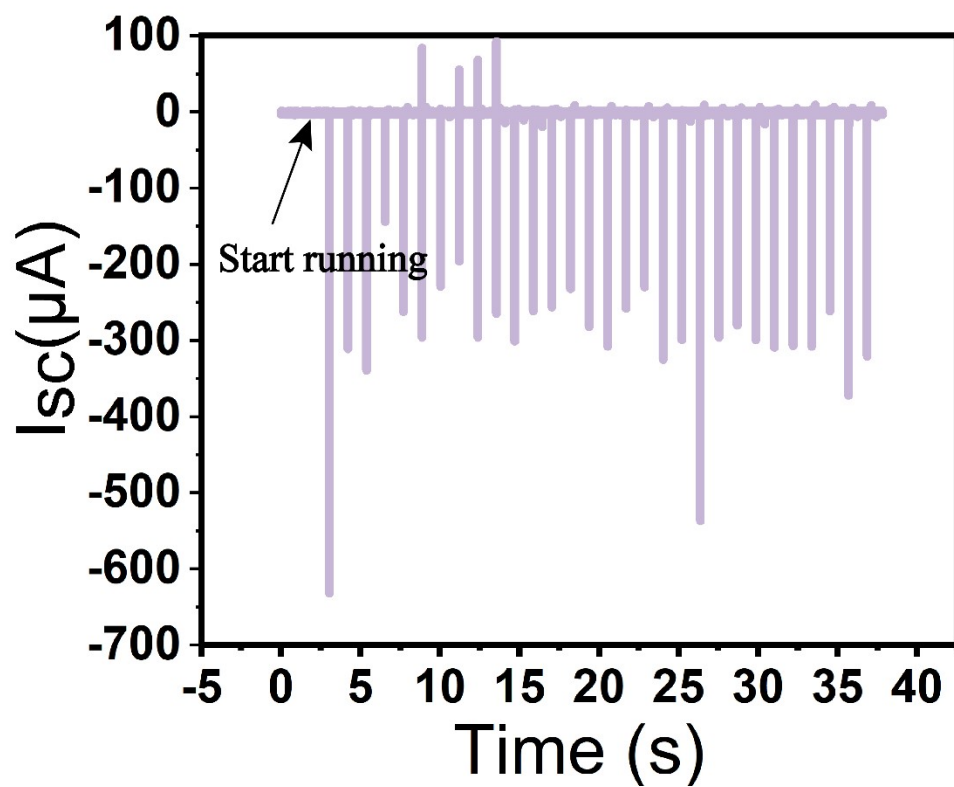


Figure S2 Pre charging process.

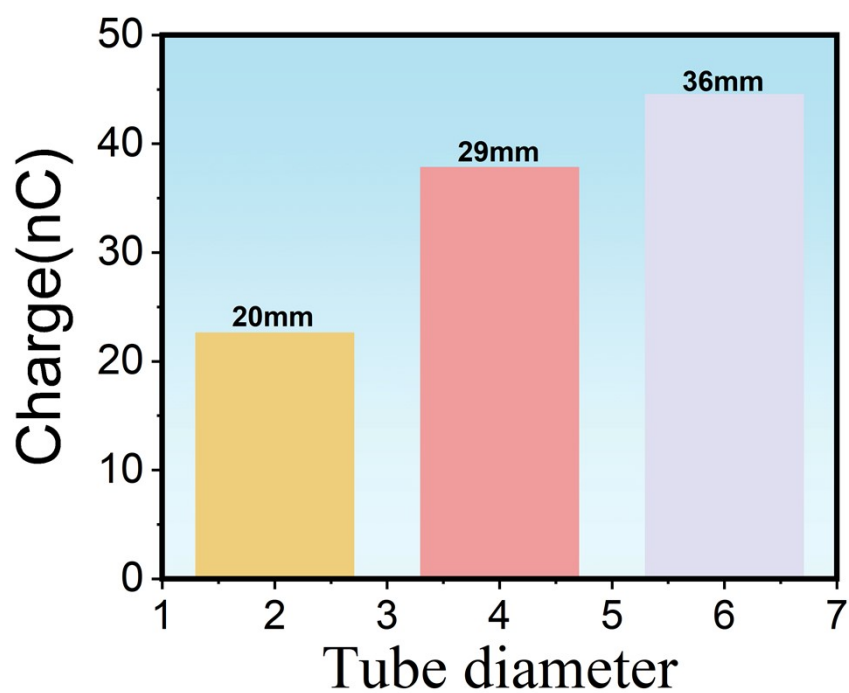


Figure S3 The amount of charge brought about by rubbing 5 mL of tap water with PTFE tubes of different diameters.

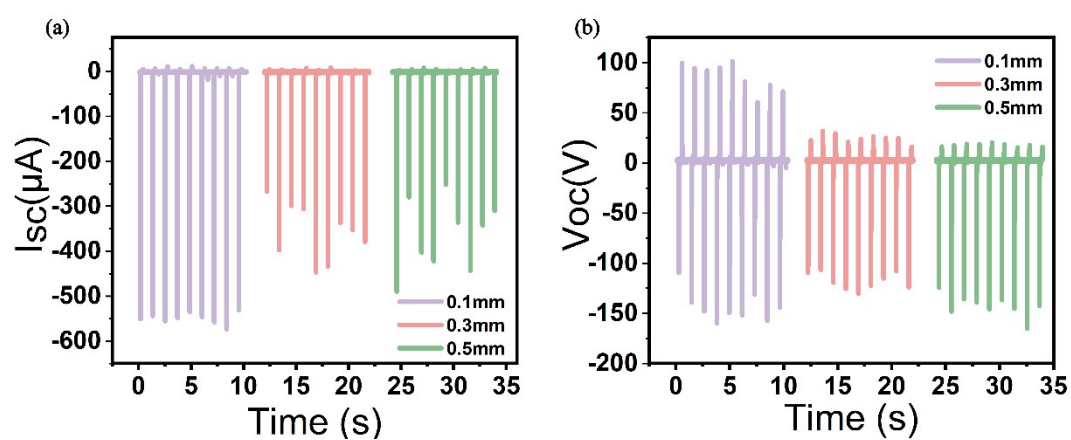


Figure S4 The influence of membrane thickness on device output.

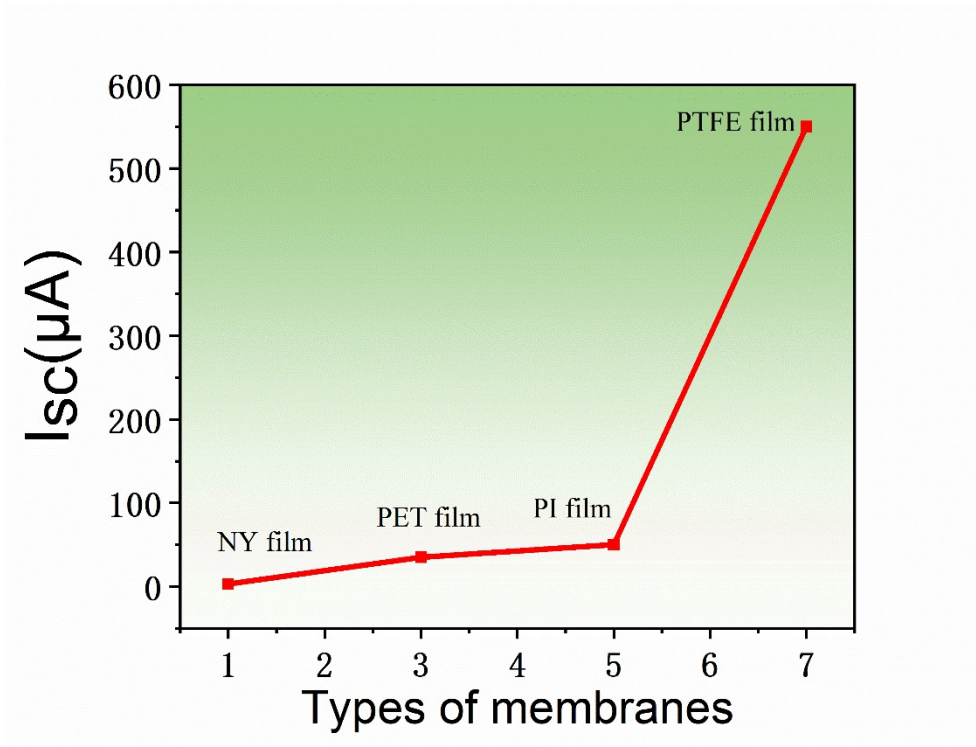
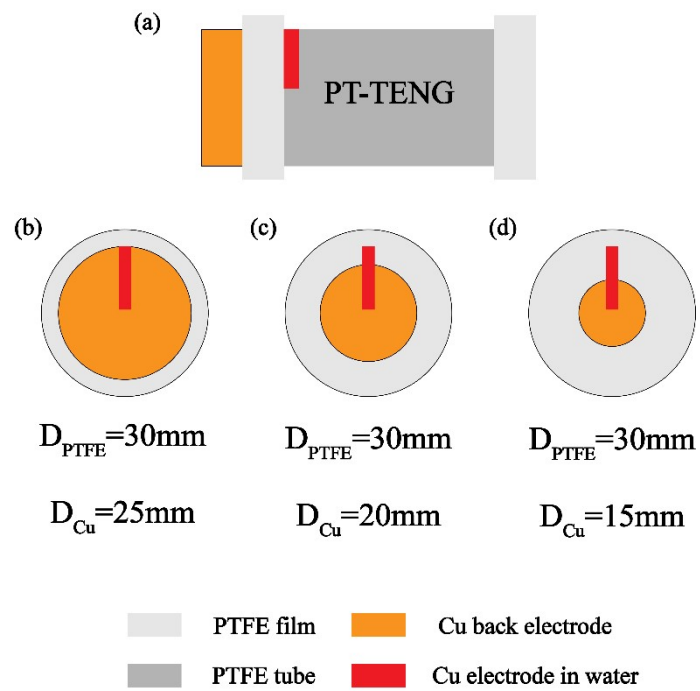


Figure S5 The influence of types of membranes on device output.



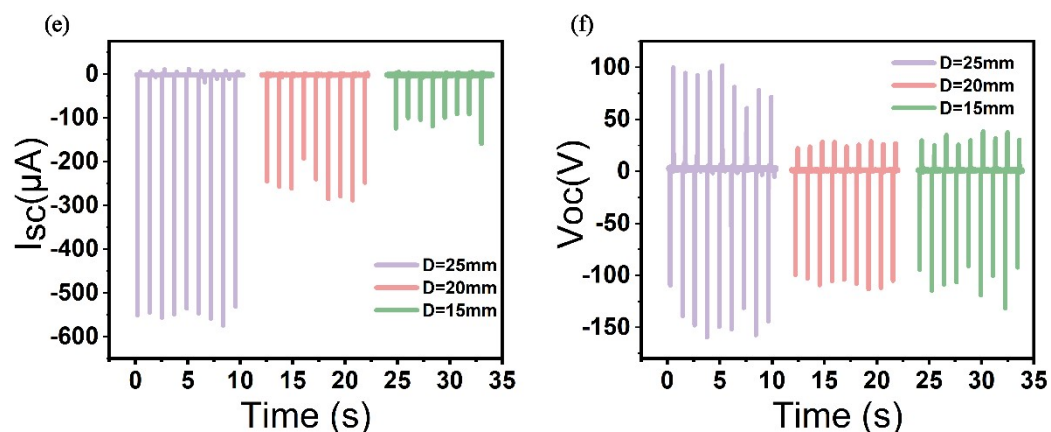


Figure S6 The influence of back electrode area on output. (a) Sectional view of PT-TENG. (b-d) Partial images of electrodes with diameters of 25mm, 20mm, and 15mm for Cu back electrode. (e-f) Changes in current and voltage with Cu back electrode area.

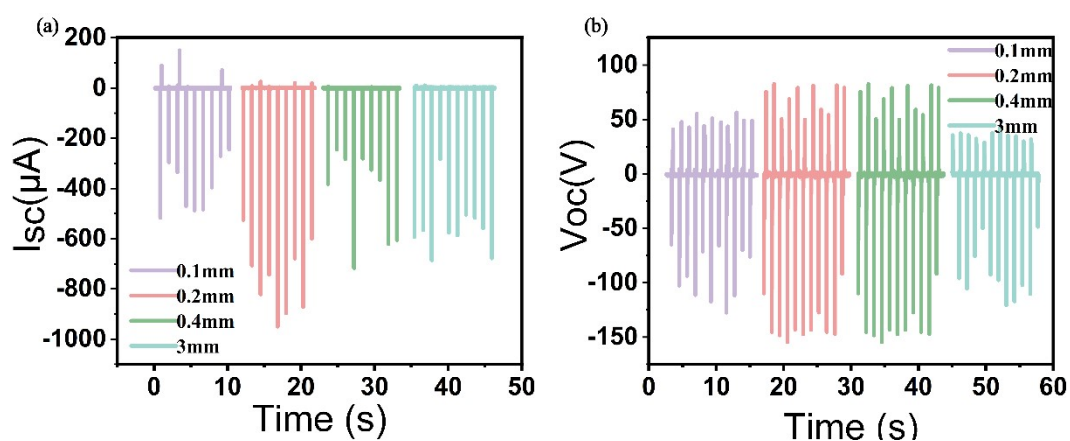


Figure S7 (a, b) Effect of the Cu electrode width in water on the current and voltage of the PT-TENG.

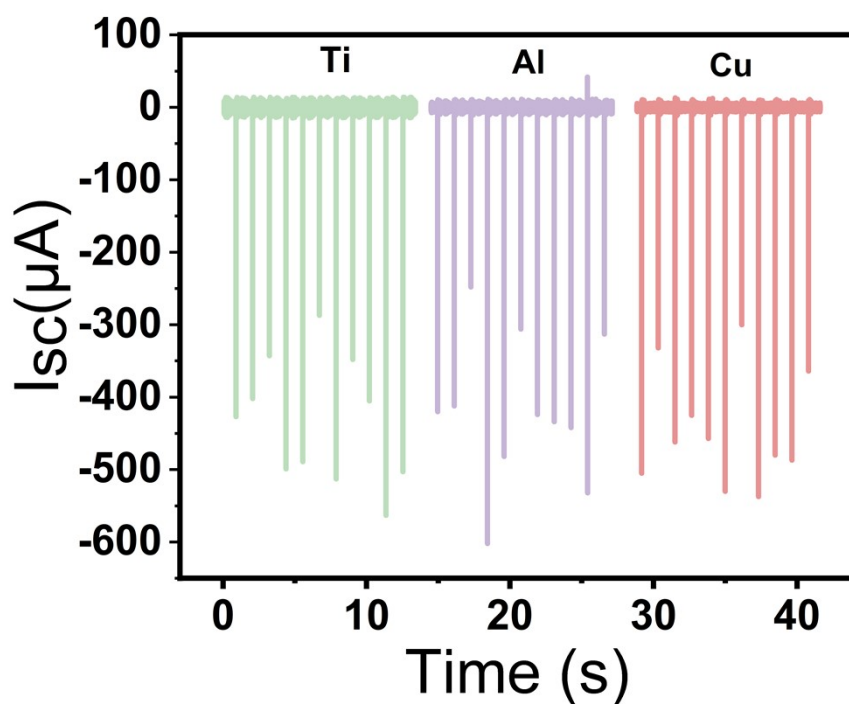


Figure S8 Effect of the Cu electrode material in water on the current induced by the PT-TENG.

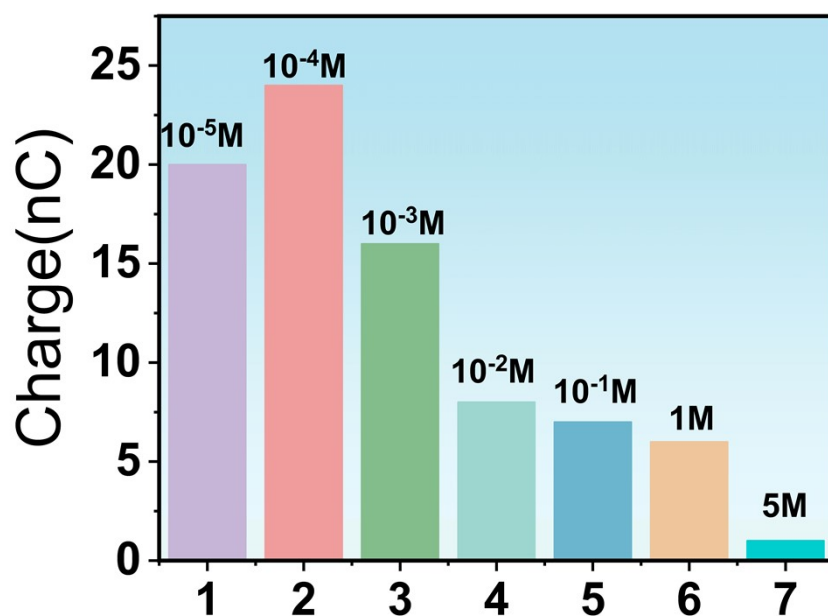


Figure S9 Charge transfer at different concentrations of sodium chloride.

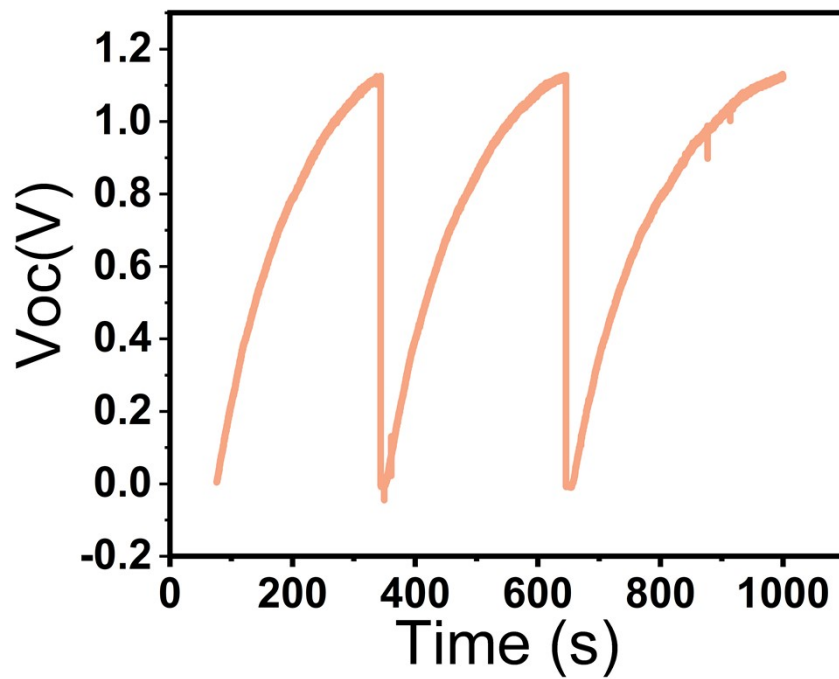


Figure S10 Three charge and discharge cycles for a 2.2 μF capacitor.