Supporting Information

Single-Electrode Triboelectric Nanogenerator for Scavenging Friction Energy from Rotation Tires

Yanchao Mao,[a,b] Dalong Geng,[a] Erjun Liang,[b] Xudong Wang[a*]

[a]Department of Materials Science and Engineering, University of Wisconsin-Madison, Madison, WI 53706, USA

[b]Key Laboratory of Materials Physics of Ministry of Education of China, School of Physical Science & Engineering, Zhengzhou University, Zhengzhou 450052, China

* Email: xudong@engr.wisc.edu

Figure S1 shows the SEM image of the sand paper mold surface. There are many micro peaks with sharp tips locate on the sand paper surface. These tips result in micro pores and rough surface of the PDMS thin film. The entire surface morphology corresponds to that of the prepared PDMS thin film.

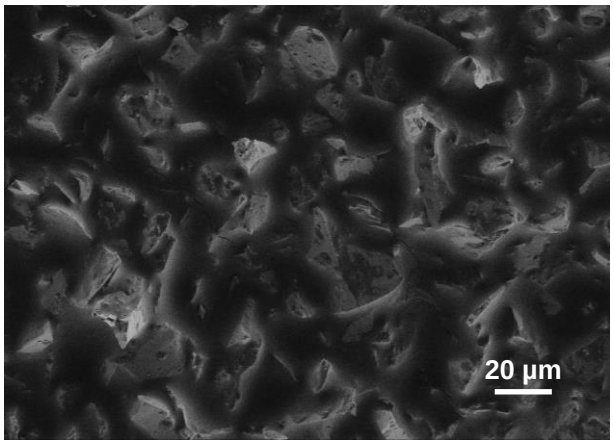

Figure S1. SEM image of the surface of sand paper mold.

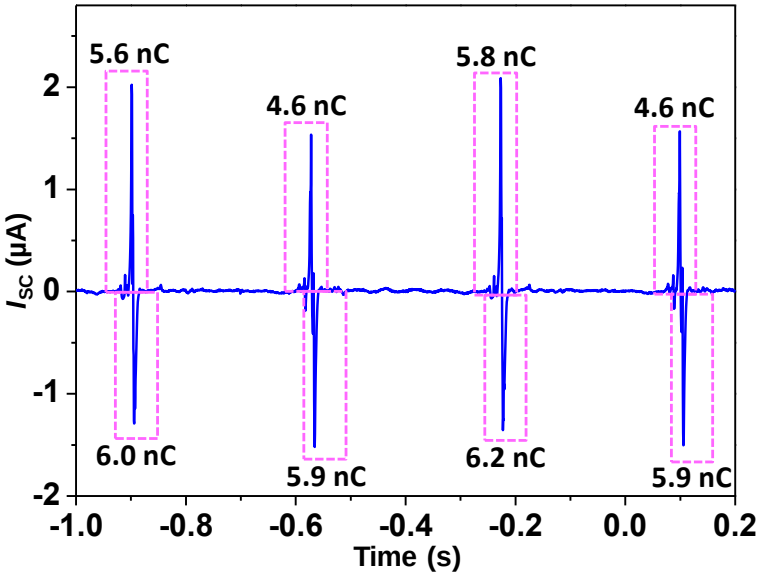

Figure S2. Current output signal of the S-TENG. The corresponding numbers of induced charge were calculated by area integration of the I-t curve. The integrated amounts of charge from the positive peaks are always smaller than the negative peaks. The smaller positive charge is believed to be a result of the induced charge loss while the S-TENG moves in air after leaving the ground surface.

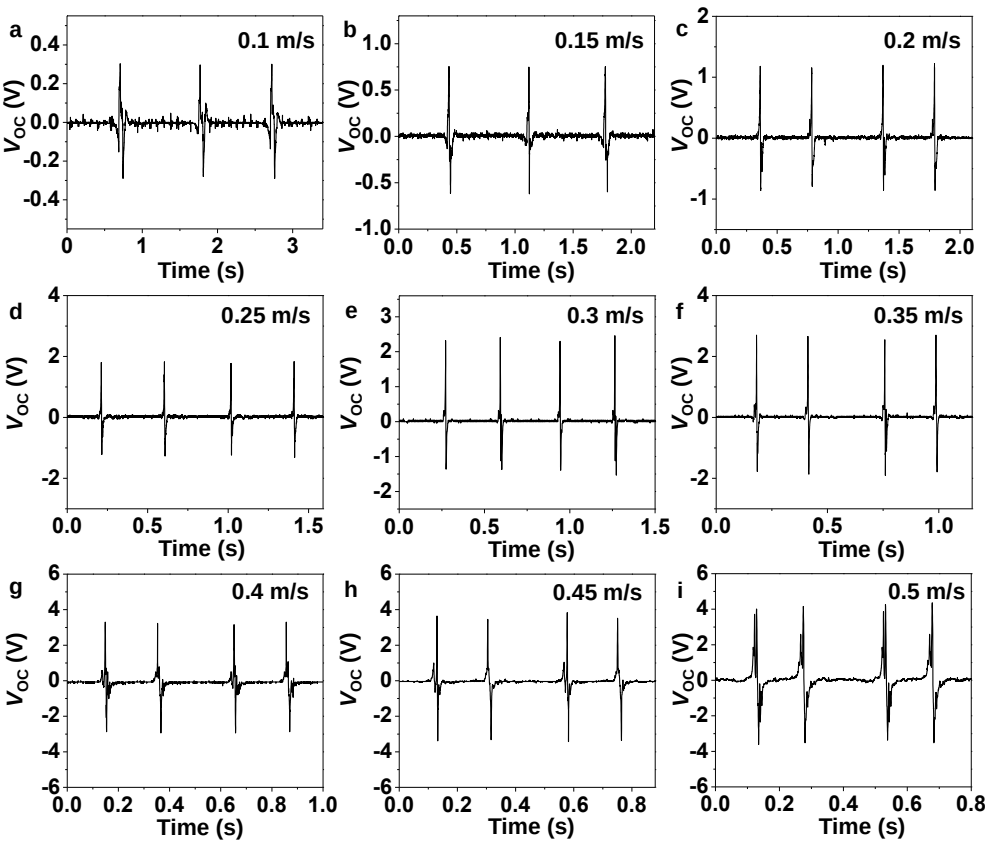

Figure S3. The voltage outputs generated from the S-TENG with different linear moving speeds of the wheel from 0.1 m/s to 0.5m/s, respectively.

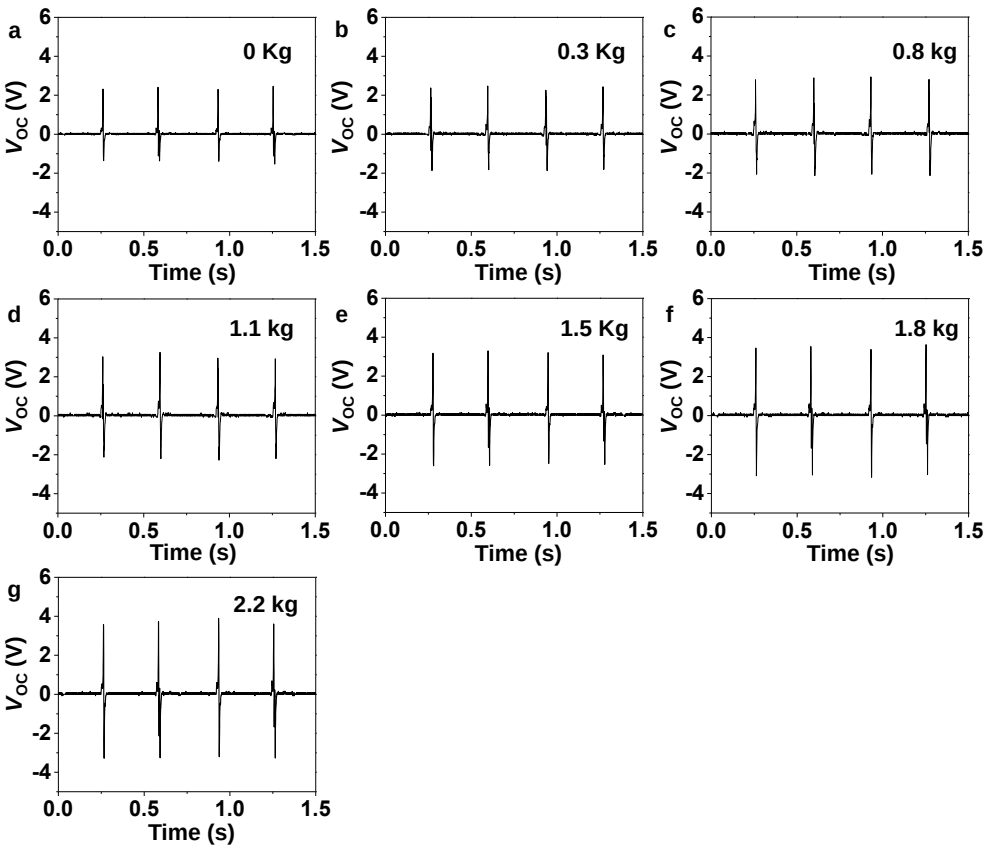

Figure S4. The voltage outputs generated from the S-TENG with different extra loads from 0 kg to 2.2 kg at the same linear moving speed of 0.3 m/s, respectively.

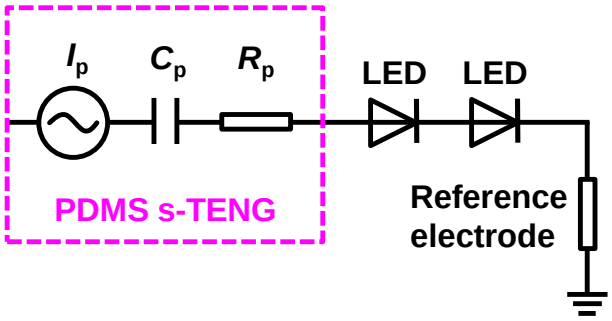

Figure S5. The equivalent circuit for powering LEDs by using PDMS s-TENG.

Video S1. The generated electricity of S-TENGs instantaneously powered 2 LED lights when the vehicle was moving on the ground.

Video S2. 6 LED headlights were simultaneously lighted up with a certain amount of additional force was applied to the vehicle by hand pushing when it was moving on the ground.