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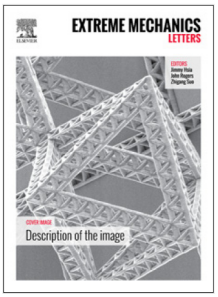

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Compressible Hexagonal-Structured Triboelectric Nanogenerators for Harvesting Tire Rotation Energy

Tong Guo[1, 2, 3, 4, §], Guoxu Liu[1, 3, 4, §], Yaokun Pang[1, 3, 4], Bo Wu[1, 3, 4], Fengben Xi[1, 3, 4], Junqing Zhao[1, 3, 4], Tianzhao Bu[1, 3, 4], Xianpeng Fu[1, 3, 4], Xinjian Li[2, *], Chi Zhang[1, 3, 4, *], Zhong Lin Wang[1, 3, 4, 5, *]

[1] Beijing Institute of Nanoenergy and Nanosystems, Chinese Academy of Sciences, Beijing 100083, China

[2] Department of Physics and Laboratory of Material Physics, Zhengzhou University, Zhengzhou 450052, People's Republic of China

[3] National Center for Nanoscience and Technology (NCNST), Beijing 100190, China

[4] University of Chinese Academy of Sciences, Beijing 100049, People's Republic of China

[5] School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, GA 30332-0245, USA

Abstract

Mechanical energy in a rolling tire is strong and stable, but it is always wasted and there is no effective means for harvesting. Herein, we demonstrate an array of compressible hexagonal-structured triboelectric nanogenerators (CH-TENGs) for harvesting the mechanical energy from a rolling tire. The CH-TENG units can be stacked in parallel connections and fixed in a rubber tire. The energy harvesting performances are systematically investigated and the maximum instantaneous power is 1.9 mW with the CH-TENG in 8 units, a weight load of 10 N and a speed of 2.51 m/s. The CH-TENGs have stable and durable characteristics for a 30-day continuous work and can drive a wireless tire pressure sensor once every 14 minutes when the moving speed is 2.51 m/s and weight load is 10 N. On the basis of the measured