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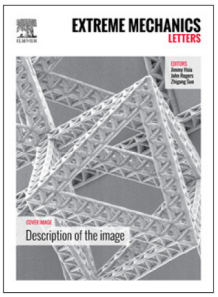

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Flexure Hinges Based Triboelectric Nanogenerator by 3D Printing

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Abstract

Triboelectric nanogenerator (TENG) has been developed as an effective way to harvest mechanical energy, which is expected for application in mechanical components. In this study, we report a kind of flexure hinges based triboelectric nanogenerator (FH-TENG) by 3D printing with great structural integration and stability. Based on the flexure hinges as a mechanical elastomer, the FH-TENG can convert mechanical energy into electricity by utilizing the contact electrification between fluorinated ethylene propylene and copper films. For a two-layer FH-TENG, it can deliver a maximal output voltage of 191 V and an instantaneous output power of 64 μW on the external load of 210 MΩ at a frequency of 0.8 Hz and a force of ~20 N. The output performances of the FH-TENGs with different layers, areas, minimum