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High Performance Nanogenerators for Energy Harvesting and Sensing Applications

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Abstract

Nanogenerators convert ubiquitously-available mechanical energy to electrical energy and thus attracted tremendous interests in past 15 years. By exploring novel materials and device structures, the performance of nanogenerators have been improved significantly and the applications of nanogenerators have been extended to different areas. In this talk, I will present the latest progress in nanogenerator research in past few years, including piezoelectric nanogenerators (PENGs) based on one-dimensional (1D)/ two-dimensional (2D) hybrid zinc oxide nanostructures; PENGs based on selfassembled highly ordered porous perovskite/polyvinylidene fluoride (PVDF) composite films; devices employed 2D organic-inorganic hybrid perovskite nano-sheets with superior transverse piezoelectricity, to name a few. A highly integrated uniaxial tristate hybrid nanogenerator was also demonstrated by using Inorganic-organic perovskite/polymer nano-composite. A self-powered multi-broadcasting wireless sensing system was realized with an all-in-one triboelectric nanogenerator. A nanogenerator-based self-powered sensor with deep learning technique was developed for intelligent sound monitoring and identification.

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