

Nanotechnology for Energy Harvesting Applications

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Abstract : The rising interest in harvesting power is because of the capabilities application of expanding self-powered systems based on nanostructures. Using renewable and self-powered sources is necessary for the growth of green electronics and could be of the capability to wireless sensor networks. The ambient mechanical power is among the ample sources for various power harvesting device configurations that are published. In this work, we design and fabricate a paper-based nanogenerator (NG) utilizing piezoelectric zinc oxide (ZnO) nanowires (NWs) grown hydrothermally on a paper substrate. The fabricated NG can harvest ambient mechanical energy from various kinds of human motions, such as handwriting. The fabricated NG from a single ZnO NWs/PVDF-TrFE NG has been used firstly as handwriting-driven NG. The mechanical pressure applied on the paper platform while handwriting is harvested by the NG to deliver electrical energy; depending on the mode of handwriting, a maximum harvested voltage of 4.8 V was obtained.

Keywords : nanostructure, zinc oxide, nanogenerator, energy harvesting

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