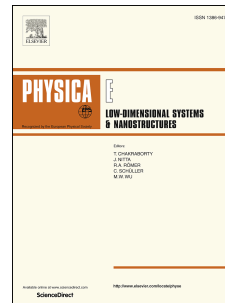


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ZnO Nanorods Patterned-Textile Using a Novel Hydrothermal Method for Sandwich Structured-Piezoelectric Nanogenerator for Humam Energy Harvesting

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Abstract: With the development of wearable and flexible electronics, PENGs based on ZnO nanorod arrays patterned-textile have aroused great interests. Nevertheless, the currently used hydrothermal method to fabricate ZnO nanorods and the performance of ZnO structures prepared at present still need to be further improved. Hence, ZnO nanorods patterned textile based-PENG (ZnO-T-PENG) has been developed in this paper, which consists of vertically arranged ZnO nanorod arrays sandwiched between two symmetrically layers of silver (Ag) coated-fabrics. A facile screen printing method was utilized to plate Ag paste on the fabric surface as electrodes. In particular, a novel hydrothermal method which requires single precursor solution was employed to synthesize ZnO nanorod arrays. Results reveal ZnO nanorod arrays which are uniformly, densely, and vertically arranged on the surface of Ag coated-fabric, have been synthesized successfully. Atomic force microscope (AFM) analysis proves the ZnO nanorods possess excellent coupled piezoelectric and semiconducting properties. This PENG can harvest the energy from human bodies with output voltages of 4 V,

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