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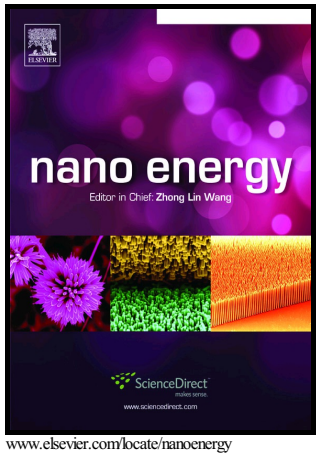

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Ultrasensitive Flexible Self-Powered Ammonia Sensor based on Triboelectric Nanogenerator at room temperature

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Abstract

An ultrasensitive self-powered ammonia (NH_3) sensing system based on a vertical contact-separate mode triboelectric nanogenerator (TENG) has been proposed for room temperature detection of NH_3 concentrations both in the ambient environment and in human exhaled gases. Owing to the special output characteristics of the TENG adjusted by the load resistance of the NH_3 sensor, output voltage of the fabricated gas sensor has a proportional relationship with NH_3 concentration, which is the fundamental working mechanism of the self-powered gas-sensing system. The triboelectric ammonia sensor (TEAS) based on PANI-MWCNTs composite thin film possesses a NH_3-sensing response of 10% at 0.01 ppm NH_3 and exhibits a great response of 255% at 100 ppm NH_3. Meanwhile, the TEAS also holds fast