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

Si Wang^a, Guangzhong Xie^a, Huiling Tai^{*,a}, Yuanjie Su^a, Boxi Yang^a, Qiuping Zhang^a,

Xiaosong Du^a, Yadong Jiang^a

^aState Key Laboratory of Electronic Thin Films and Integrated Devices, School of Optoelectronic Science and Engineering, University of Electronic Science and Technology of China (UESTC), Chengdu 610054, China

*To whom correspondence should be addressed: taitai1980@uestc.edu.cn

Abstract

An ultrasensitive self-powered ammonia (NH₃) sensing system based on a vertical contact-separate mode triboelectric nanogenerator (TENG) has been proposed for room temperature detection of NH₃ 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 NH₃ sensor, output voltage of the fabricated gas sensor has a proportional relationship with NH₃ 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 NH₃-sensing response of 10% at 0.01 ppm NH₃ and exhibits a great response of 255% at 100 ppm NH₃. Meanwhile, the TEAS also holds fast

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