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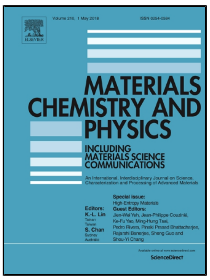

Electrospun CuO nanofibers for room temperature volatile organic compound sensing applications

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Electrospun CuO nanofibers for room temperature volatile organic compound sensing applications

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Abstract

Volatile organic compound (VOC) sensing performance and kinetics of adsorption onto electrospun CuO nanofibers have been studied. The effect of the relative humidity (between 5%-50%) on VOC sensing behavior and adsorption kinetics have also been investigated. The formation of single phase monoclinic CuO nanofibers with preferentional orientiation of (002) were confirmed by X-ray diffraction and scanning electron microscopy studies. Three different kinetic models, Elovich model, pseudo first-order equation, and the Ritchie's equation were selected to follow the adsorption process. Sensing studies revealed that electrospun CuO nanofibers have a great potential for room temperature VOC sensing applications with high sensitivity, short response and recovery times. From the analysis of kinetic studies, it was observed that the kinetics of VOC vapors onto the electrospun CuO nanofibers strongly depends on level of the relative humidity and the concentration of VOC vapors.

Keywords: Electrospun, CuO nanofibers, Adsorption kinetics, VOC sensing.

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