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CuOx/SnO2 nanostructures by microwave-assisted thermal oxidation for ethanol sensing

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In this work, CuOx/SnO2 nanostructures were synthesized by a microwave-assisted thermal oxidation. Mixture of Sn and Cu2O with various ratio was loaded into a cylindrical quartz tube and further radiated in a microwave oven under atmospheric ambient. The as-synthesized products were characterized by transmission electron microscope and x-ray diffractometer. The results showed that CuOx/SnO2 nanoparticles were obtained in two minute of microwave radiation. Brown content of the products was increased as amount of Cu2O in the mixture increasing. Most of the products were in nanoparticle form with the diameter ranging from 20 ⊠⊠ 150 nm. The SnO2 nanoparticles were in the cassiterite rutile structure phase. Both CuO and Cu4O3 phase were observed in the products and confirmed to be monoclinic and tetragonal phase, respectively. In addition, the CuOx/SnO2 nanoparticles were applied as ethanol sensor. The results showed that the CuOx/SnO2 nanoparticles exhibited extra high sensitivity to ethanol vapor.

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