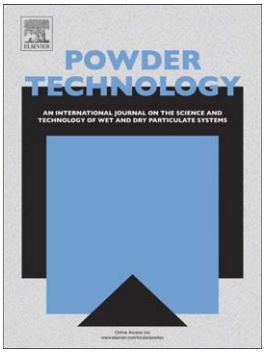

Facile Co-precipitation synthesis and ethanol sensing performance of Pd loaded Sr doped SnO_2 nanoparticles

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Facile Co-precipitation synthesis and ethanol sensing performance of Pd loaded Sr doped SnO_2 nanoparticles

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Abstract:

In present communication, we have presented a high performance ethanol sensor based on Pd loaded Sr doped SnO_2 nanomaterial. The (0.5, 1.5, 2.5 and 3) wt% Pd loaded 4 mol% Sr doped SnO_2 nanoparticles were prepared using a co-precipitation method. The samples were characterized by X-ray Diffraction (XRD), High Resolution Transmission Electron Microscope (HR-TEM), Selected Area Electron Diffraction (SAED), Field Emission Gun-Scanning Electron Microscope (FEG-SEM), (SEM-EDAX) Scanning Electron Microscope-Energy Dispersive Analysis by X-ray techniques. The gas response studies such as sensitivity, selectivity and stability towards liquid petroleum gas (LPG), ammonia (NH_3), acetone (CH_3COCH_3) and ethanol (C_2H_5OH) were measured at 100 ppm concentrations. The results show that optimum Pd loading (2.5 wt%) results in smaller crystallite size (~3.7 nm), lower operating temperature (275 °C), higher gas response (93%),better selectivity, faster response (~1 sec) and quicker recovery (~5 sec) towards ethanol.

Keywords: Tin dioxide; Pd loading, Strontium oxide; Screen printing; Thick film; Ethanol sensor

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