

Sensing Characteristics of Gold Nanoparticles Decorated Sputtered Tin Oxide Thin Films as Nitrogen Oxide Sensor

Authors : Qasem Drmash, Zain Yamai, Amar Mohamedkhair, Abdulmajid Hendi

Abstract : In recent years, there has been a growing interest in the reduction of the nitrogen oxides NO_x (NO₂, NO) gases resulting from automotive or combustion emissions. Recently, metal additives in nanometer dimension onto the surface of SnO₂ nanorods, nanowires and nanotubes sensitizer to further increase the sensor response have been used. In contrast, there is a lack study focused on modifying the surface of SnO₂ thin films by nanoparticles. The challenge in case of thin films is how to fabricate these nanoparticles on the surfaces in cost-effective method, high purity as well as without hampering electrical and topographical properties. Here in this report, a simple and facile strategy has been demonstrated to acquire high sensitive and fast response NO₂ gas sensor. Structural, electrical, morphological, optical, and compositional properties of the fabricated sensors were investigated through different analytical technique including X-ray diffraction (XRD), Field emission scanning emission microscope (FESEM) and X-ray photoelectron spectroscopy (XPS). The sensing performance of the prepared sensors are studied at different temperatures for various concentrations of NO₂ and compared with pristine SnO₂ film.

Keywords : NO₂ sensor, SnO₂, sputtering, thin films

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