

عنوان مقاله:

Solution Processed ZnO Nanorod Arrays for Room Temperature Operated Optical CO Gas Sensing Application

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خلاصه مقاله:

Nowadays, with the rapid development of industries and growth of population, environmental gas monitoring and control of industrial emissions are crucial for most of the industrial applications and domestic activities. The demand for high quality and low temperature active materials for gas sensing application has increased extensively in recent years. One-dimensional nanomaterials, for instance, zinc oxide (ZnO) nanorods in this study has been substantially used as gas sensing material due to their high surface to volume ratio and positive polar (0001) plane, which directly expedites the adsorption of gas molecules on the ZnO nanorod surface. In this work, ZnO nanorod arrays (NRAs) was synthesized using a facile wet chemical approach. A low cost and room temperature (25°C) optical absorbance-based gas sensing approach is introduced to examine the sensor response of ZnO NRAs sample toward the highly hazardous carbon monoxide (CO) gas. The highly oriented (002) ZnO NRAs with a diameter of (25.3 ± 3.8) nm reported herein shows an exquisite response with absolute optical absorbance change (OAC) of 0.054 a.u. within 2 minutes towards 10 ppm of CO gas. This work provides a simple and feasible method to develop a room temperature operating optical absorbance-based gas sensor for hazardous gas detection.

کلمات کلیدی:

optical gas sensor; room temperature; carbon monoxide; zinc oxide, nanorod

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