

Nanostructured Zinc Oxide Synthesized via Hydroxide Route as Liquid Petroleum Gas Sensor

Bal Chandra Yadav*, Richa Srivastava and Anuradha Yadav

Nanomaterials and Sensors Research Laboratory
Department of Physics, University of Lucknow, Lucknow-226007, U.P., India

(Received April 12, 2008; accepted November 10, 2008)

Key words: LPG sensor, ZnO nanomaterial, SEM, XRD

In this paper, we report the liquid petroleum gas (LPG) sensing of nanostructured zinc oxide synthesized via the hydroxide route. Variations in resistance with exposure of gas to the sensing element have been observed. The average sensitivities for different exposure times of 2, 5, and 8 min to gas have been estimated. The maximum average sensitivity observed is 7.81 M Ω /min for an exposure time of 8 min to the sensor. Sensor response (*SR*) as a function of exposure time to the gas has been calculated. Scanning electron microscopy (SEM) and X-ray diffraction studies of samples have been carried out. SEM images show that the material is porous and has a nanosheet-like morphology before exposure to the LPG. The thicknesses of the nanosheets vary from 60–200 nm. Nanowires of different diameters of ZnO can be observed after exposure to LPG. The diameters of these nanowires vary from 80–300 nm. XRD patterns reveal the amorphous nature of the material. The sensor is quite sensitive to LPG, and the results are reproducible. Furthermore, the LPG sensor reported is cost-effective, user friendly, and easy to fabricate.

*Corresponding author: e-mail: balchandra_yadav@rediffmail.com