Short Communication

Comparison of Ethanol Gas Sensors based on PbS nanoparticles and Bulk PbS

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An attempt is made to fabricate the ethanol gas sensor at room temperature. A cost-effective and simple chemical reduction route is used to grow cubic and spherical PbS nanoparticles using Ethylene Diamine as a capping agent. Bulk PbS is grown by a simple chemical method without using any capping agent. Structural characterization of samples is done by X-ray diffraction (XRD), transmission electron microscopy(TEM), and scanning electron microscopy(SEM). Optical characterization is done by UV-Visible-NIR absorption spectroscopy. The gas sensor is fabricated based on cubic, spherical PbS nanoparticles, and bulk PbS. Sensitivity measurement is done at room temperature for ethanol gas by three types of sensors. Ethanol gas Response, Response time, and Recovery time are calculated for different shapes of PbS nanoparticles and bulk PbS. Gas sensitivity is found to be high for sensor-based on spherical PbS nanoparticles and is less for sensors based on bulk PbS.

Keywords: Lead Sulfide, Nanoparticles, X-Ray diffraction, Gas Sensor, Ethanol, Sensitivity.

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