

H_2S SENSING CHARACTERISTICS OF NANOCRYSTALLINE ZINC FERRITE

S. BHATTACHARYA, P. MITRA AND P. GHOSH
Dept. of Physics, the University of Burdwan, Golapbag, Burdwan

Abstract

Nanocrystalline $ZnFe_2O_4$ was synthesized by sol-gel self-combustion technique. X-ray diffraction (XRD) was utilized for structural characterization. Particle size estimated using X-ray line broadening method was ~24 nm. FTIR spectra show characteristic vibrational modes corresponding to $Fe-O$ stretching vibrations. Significant sensitivity of ~35% was observed in presence of 200 ppm hydrogen sulphide (H_2S). The sensitivity was enhanced to ~50% for milled sample having particle size ~20 nm. Milling The material shows a significantly high sensitivity of ~40-50% with a reasonably fast response in the temperature range 150-250C. The sensitivity increased for 5 hr milled sample indicating the effect of enhanced sensing activity with lowering of particle size.

Keywords: Zinc ferrite, XRD, Band gap, H_2S sensitivity