

Characterisation, analysis and optical properties of nanostructure ZnO using the sol –gel method

Abstract

Nanostructure ZnO was grown on thin aluminium layer, deposited on silicon substrate using the sol–gel method. The surface morphologies of nanostructure ZnO at different precursor concentrations were studied using scanning electron microscopy. Raman spectroscopy suggested that nanorods started to grow along with nanoflakes at a precursor concentration of 50 mM and the density of the nanorods significantly increases when the concentration was raised to 75 mM. Raman spectra were intensified and red shifted with the increment of precursor concentration. Optical properties of refractive index and optical dielectric constant are investigated. The structural defects at lower level of precursor were probably due to the hypoxic environment, whereas the red shift of Raman spectra was due to the structural change of ZnO nanocrystals.