

Sol-gel derived ZnO nanoparticulate films for ultraviolet photodetector (UV) applications

Abstract

Zinc oxide nanoparticles based UV detector was fabricated on thermally oxidized silicon substrate. ZnO nanoparticle films were deposited using sol-gel route. The seed solution was prepared using two different solvents (methanol and isopropyl alcohol (IPA)). The surface morphology of the prepared films was characterized by FESEM. Structural characterization along with optical measurements was carried out using XRD and UV-vis spectroscopy. For the UV photo-detector, ZnO thin film prepared in IPA is selected based on their structural and optical analysis. The changes in photo-response of ZnO thin film with respect to time was studied under the dark and variable UV intensities. It was observed that the photocurrent increased with a factor of 4.82 under 1.16 mW of UV intensity. It is believe that the synthesized ZnO thin films have potential to use in the ultraviolet photo-detector applications.

Keywords

I-V; Sol-gel; Thin films; UV detector; Zinc oxide