

SYNTHESIS, OPTICAL AND HUMIDITY SENSING PROPERTIES OF PURE ZNO AND ZNO: SNO₂ THIN FILMS

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ABSTRACT

In the present work, we have investigated optical properties including UV-visible transmission and photoluminescence (PL) spectroscopy of titled thin films prepared by sol-gel spin coating method. In UV-visible spectroscopy result shows that the prepared thin film is transparent and transmission spectra varies between 68 to 90% in visible and infrared region with sharp cut off at 300 nm. In PL study shows several visible emission peaks ranging from 380 to 650 nm with near band edge (NBE) peak at 380 nm. The ratio 1:5 of ZnO:SnO₂ shows maximum PL intensity. The PL intensity is found to decrease with increase the ratio of SnO₂ in ZnO. The highest intensity peak centered at 380 to 420 nm which show the violet emission. The presence of different broad peak shows the defect of the synthesis of the thin film. When the ratio are increased i.e. 1:2, 1:3, 1:4, 1:5 (ZnO:SnO₂), it shifted towards lower wavelength i.e. blue shifting takes place. The humidity sensing of pure ZnO and ZnO:SnO₂ thin films shows promising properties and the details study is included in this work. Response and recovery time of samples is very low which shows suitability of prepared samples for sensors.

KEYWORDS: Zno, Sno₂, Spin Coating, UV, PL Aand Humidity Sensing.