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**Effect of Er Doping on the Ammonia Sensing Properties of Zno Thin Films Prepared by A Nebulizer Spray Technique**

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**Abstract**

Erbium (Er)-doped ZnO thin films were deposited on glass substrates by nebulizer spray pyrolysis with different doping concentrations (0wt%, 1 wt%, 3 wt% and 5 wt%). The deposited films are polycrystalline with a hexagonal structure with a (002) predominant plane. The Erdoped ZnO films have greater surface roughness than the undoped ZnO film. The optical transmittance of the undoped ZnO film is about 80% in the visible range. The optical bandgap of the undoped ZnO thin film is 3.29 eV, which is very close to the bulk ZnO. From photoluminescence spectra, sharp UV emission is observed at 385 nm for all the prepared films. The response of the films to ammonia (NH3) vapour is high when the Er concentration is 3% or less, and for higher concentrations of Er, the response is low. All the deposited Er-doped ZnO films show short response time and recovery time with regard to NH3.

**Keywords:**

Rare-earth-doped ZnO, Nebulizer spray pyrolysis, Optical bandgap, Photoluminescence, Ammonia sensing

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