

Structural, Morphological and Optical Properties of $Zn(1-x)Cd_xO$ thin films grown on a glass substrate by spray pyrolysis method.

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Abstract : Method on the glass substrate at 450°C. For Cd doping, various concentrations of cadmium nitrate $Cd(NO_3)_2$ (2–8 wt%) was used in the spraying precursor solution. The structural, Zinc oxide (ZnO) and $Zn_xCd_{1-x}O$ thin films were deposited using a low cost spray pyrolysis morphological, and optical properties of ZnO and Cd:ZnO films were investigated using X-ray diffraction (XRD), scanning electron microscope (SEM), atomic force microscope (AFM), UV–vis. X-ray diffraction study reveals that the ZnO and Cd:ZnO films are possessing hexagonal wurtzite structure. SEM and AFM studies reveal that the grain size and roughness of the films are decreased with increasing Cd doping concentration. Optical transmittance spectra of the CdO film decreases with increasing doping concentration of cadmium. The optical band gap of the films decreases from 3.25 eV to 2.90 eV with increasing concentration of cadmium. On increasing Cd concentration in ZnO binary system, the absorption edge of the films showed the red shifting.

Keywords : Cd-doped ZnO, Spray pyrolysis, X-ray diffraction, optical properties