

Structural and Optical Properties of Pr³⁺ Doped ZnO and PVA:Zn98Pr2O Nanocomposites Free Standing Film

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Abstract : We report a systematic study of structural and optical properties of Pr-doped ZnO nanostructures and PVA:Zn98Pr2O polymer matrix nanocomposites free standing films are performed. These particles are synthesized through simple wet chemical route and solution casting technique at room temperature, respectively. Structural studies carried out by X-ray diffraction method, confirms that the prepared pure ZnO and Pr-doped ZnO nanostructures are in hexagonal wurtzite structure and the microstrain is increased upon doping. TEM analysis reveals that the prepared materials are in the sheet-like nature. Absorption spectra show free excitonic absorption band at 370 nm and red shift for the Pr-doped ZnO nanostructures. The PVA:Zn98Pr2O composite film exhibits both free excitonic and PVA absorption bands at 282 nm. Fourier transform infrared spectral studies confirm the presence of A1 (TO) and E1 (TO) modes of Zn-O bond vibration and the formation of polymer composite materials.

Keywords : Pr doped ZnO, polymer nanocomposites, optical properties, free standing film

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