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Sol-Gel Derived ZnO Nanostructures: Optical Properties

Authors : Sheo K. Mishra, Rajneesh K. Srivastava, R. K. Shukla

Abstract : In the present work, we report on the optical properties including UV-vis absorption and photoluminescence (PL) of ZnO nanostructures synthesized by sol-gel method. Structural and morphological investigations have been performed by X-ray diffraction method (XRD) and scanning electron microscopy (SEM). The XRD result confirms the formation of hexagonal wurtzite phase of ZnO nanostructures. The presence of various diffraction peaks suggests polycrystalline nature. The XRD pattern exhibits no additional peak due to by-products such as Zn(OH)2. The average crystallite size of prepared ZnO sample corresponding to the maximum intensity peaks is to be ~38.22 nm. The SEM micrograph shows different nanostructures of pure ZnO. Photoluminescence (PL) spectrum shows several emission peaks around 353 nm, 382 nm, 419 nm, 441 nm, 483 nm and 522 nm. The obtained results suggest that the prepared phosphors are quite suitable for optoelectronic applications.

Keywords : ZnO, sol-gel, XRD, PL
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