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SYNTHESIS, STRUCTURAL AND OPTICAL PROPERTIES OF NI-DOPED ZnO NANORODS PREPARED BY THE CO-PRECIPITATION METHOD

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ABSTRACT

Zinc oxide nanorods and diluted magnetic semiconducting Ni-doped ZnO nanorods had been prepared byco-precipitation method. This method is straightforward and costs powerful. Ni-doped and undoped ZnO of trendy components nanoparticles $Zn_{1-x}Ni_xO$, (where x = 0, 0.02, 0.04, 0.05, 0.06 and 0.08) were correctly synthesized by co-precipitation approach. The structure and the optical properties of obtained samples have been investigated using X-ray Diffraction (XRD), energy dispersive X-ray spectroscopic analysis (EDX), Transmission Electron Microscope (TEM) and UV–visible absorption spectroscopy.

XRD patterns of doped samples display that the lattice constants of $Zn_{1-x}Ni_xO$, of $x > 0.0$ are slightly larger than the ones of pure ZnO. However, XRD reveals that both exhibit hexagonal wurtzite structure. The energy band gap has also been estimated using measured UV-VIS optical absorption spectra. EDX spectroscopy was used to identify the elemental constituents of a material. Also, TEM investigations give further insight to the morphology and the structural features of Ni-doped ZnO nanorods.

KEYWORDS: Nanocrystals, Co-Precipitation Method, Optical Properties, XRD, EDX, TEM