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Effect of Cr and Fe Doping on the Structural and Optical Properties of ZnO Nanostructures

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Abstract : In the present study, we have synthesized Cr and Fe doped zinc oxide (ZnO) nano-structures (Zn1-δCraFebO; where δ= a + b=20%, a = 5, 6, 8 & 10% and b=15, 14, 12 & 10%) via sol-gel method at different doping concentrations. The synthesized samples were characterized for structural properties by X-ray diffractometer and field emission scanning electron microscope and the optical properties were carried out through photoluminescence and UV-visible spectroscopy. The particle size calculated through field emission scanning electron microscope varies from 41 to 96 nm for the samples synthesized at different doping concentrations. The optical band gaps calculated through UV-visible spectroscopy are found to be decreasing from 3.27 to 3.02 eV as the doping concentration of Cr increases and Fe decreases.

Keywords : nano-structures, optical properties, sol-gel method, zinc oxide
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