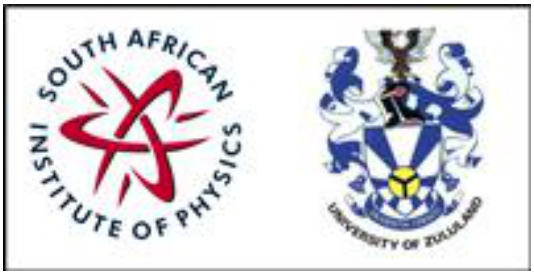

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Sol-gel synthesis and characterization of terbium ion doped zinc oxide nanoparticles

Tuesday, 9 July 2013 17:40 (1 hour)

Abstract content
   (Max 300 words)

Zinc oxide (ZnO) nanoparticles doped with terbium (1 mol %) was synthesized by sol-gel process. The samples were characterized by X-ray diffraction (XRD), Ultra Violet – Visible (UV-VIS) spectroscopy and Photoluminescence (PL) spectroscopy. The XRD patterns revealed that the diffraction peaks of both undoped and doped samples were readily indexed to ZnO wurtzite structure without any other phase and that the prepared materials were of crystalline nature. The UV-VIS was used to study the absorption characteristic of the samples. Infrared absorption spectra were also measured and discussed. The PL study revealed that Tb3+ ions were emitting in the host through the f-f internal orbital transitions. It was also observed that the radiative transitions from the 5D4 state to 7Fj (j=6, 5, 4, 3, 2) state of Tb3+ appeared at 501 nm, 542 nm, 604 nm, 652 nm, 702 nm position, respectively. Moreover, 5D4-7F5 (542 nm) electric dipole transition was the most intensive. The optical properties of the as prepared and annealed samples are compared.

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