

SYNTHESIS AND CHARACTERIZATION OF LUMINESCENT NANOMATERIALS

Final Report of The Minor Research Project

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Brief summary of the report

‘Synthesis and characterization of luminescent nanomaterials’

Zinc oxide nanoparticles were successfully synthesized by co-precipitation method using zinc sulphate and sodium hydroxide as precursors. Poly ethylene glycol (PEG) was used as a chelating agent. Silver doped ZnO nanoparticles were also synthesized. The synthesized samples were characterized using X-Ray Diffraction (XRD), Fourier Transform Infra Red (FTIR), Transmission Electron Microscopy (TEM) and Photoluminescence.

The X-Ray analysis shows that all the diffraction peaks of ZnO matched well with the JCPDS data no. 36–1451, reveals hexagonal wurtzite structure of ZnO. The sample Ag doped ZnO also reveals hexagonal wurtzite structure of ZnO. From the XRD data, the average crystallite sizes of ZnO were found to be 24 nm. TEM images reveal that the synthesized ZnO particles are nearly rod like structure with breadth 22 nm and length in the micrometre range. While Ag:ZnO particles have elongated spherical shape with breadth 63nm and length in micrometer range. The crystallite size calculated using the Debye Scherrer’s equation and the TEM data matches very well.

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