

Investigation of physicochemical properties of Ag doped ZnO nanoparticles prepared by chemical route

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Abstract

In this report we have demonstrated the synthesis of silver doped and pure ZnO nanoparticles using facile chemical precipitation method. The crystal structure, optical and magnetic properties of the synthesized nanocrystals were determined from XRD, UV-Vis, PL and VSM respectively. A small variation was found in the particle size after calcination at high temperature 400°C. The UV-Vis spectra clearly showed a blue shift in optical bandgap due to silver doping and it is observed that the optical absorption is maximum for 3w% silver doped ZnO nanocrystals. SEM-EDAX and TEM-SAED were performed to analyse morphology, chemical composition and size of the nanocrystals. The doping of Ag into ZnO was confirmed from FTIR results. To investigate the effect of Ag ion impregnation into the ZnO lattice, laser raman spectra was recorded at room temperature. It is suggested that the ZnO lattice experiences lattice stress arising from the doping of silver ions. The enhancement in room temperature ferromagnetism in ZnO:Ag was achieved.