**Abstract**

Ag doped ZnO nanoparticles were synthesized by wet chemical process. The synthesized Ag doped ZnO nanoparticles were characterized by different characterization techniques like UV double beam spectrophotometer, X-ray diffraction (XRD), Photoluminescence (PL), Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscopy (SEM) along with Energy Dispersive X-ray analysis (EDAX). From the optical characterization it was found that Ag doped ZnO nanoparticles exhibit a broad absorption peak corresponding to 380nm to 400nm. The band gap energy of the as prepared Ag doped ZnO nanoparticles were calculated. From the PL spectra the emission band was found at 555nm. The structural characterization reveals that the synthesized nanoparticles were highly crystalline in nature, possessing spherical and cube shaped grains and are grown in high density. The average grain size was determined from X-ray line broadening spectra using Debye-Scherrer equation. From the characterizations it was found that Ag doped ZnO nanoparticle have a wide range of optical applications.