**Abstract**

In the present work, chemical precipitation method was employed for the preparation of CdS quantum dots. XRD studies reveal that CdS in single phase hexagonal structure. The particle size of CdS nanoparticles is obtained as 3 nm and also confirmed through HRTEM. Morphology and elemental mapping of the synthesized nanoparticles were studied by SEM and EDX analyses. The optical properties were studied by the ultraviolet–visible absorption spectrum and photoluminescence spectroscopy. The DC electrical measurements of CdS nanoparticles pellet were performed using two probe techniques. The AC conductivity and dielectric properties of pellet analyzed in the frequency range 100 kHz–1 MHz indicates that the dielectric constant and loss tangent increases with increase in temperature and decrease with increase in frequency in addition it supported the hopping mechanism