Available online at **www.joac.info**

ISSN: 2278-1862

Journal of Applicable Chemistry

2019, 8 (3): 1501-1504

(International Peer Reviewed Journal)

Optoelectronic Properties *of* ZnS and CdS Nano-Composites and their Applications

K. P. Tiwari

Department of Physics, Agra College, Agra-282002, **INDIA**

(Affiliated to Dr. B.R. Ambedkar University Agra-282002)

Email:drkptiwari@rediffmail.com

Accepted on 15th May, 2019

ABSTRACT

UV-Vis spectrum of PANI, CdS and ZnS nanoparticles and their composites with different weight % have been recorded on double beam spectrophotometer in the wavelength range 150-1000 nm to measure band gap and particle size of materials. It is generally noticed, that nano particles made of semiconducting elements change their optical properties in comparison to their bulk materials and a significant shift in optical absorption spectra towards blue region is noticed. The absorption band observed in the UV-Vis spectra of samples is recorded with corresponding optical band energies. The energy band gap and particle size of CdS and ZnS along with their nano composites are calculated from UV- Vis spectra and recorded simultaneously. On the basis of recorded data it is observed that, there are two absorption maxima, one in the UV region and other in the visible region for PANI. The fine structure absorption measures in the range 200-300 nm corresponding to absorption peaks, the band gap was calculated to be 2.61eV for CdS, which is larger than that of corresponding bulk material reported to be 2.40 eV. It is also observed that composites containing 5% and 10% show the enhanced absorption spectra as compared to other composites of different weight percentage simultaneously. In case of PANI-ZnS nanocomposites, two absorption bands are observed at 300 and around 550 nm coincide with those of pure PANI spectra. UV-Visible spectra of PANI-ZnS infers that particle size of nanoparticles of CdS is 3.8 nm and that of ZnS is 3.92 nm. The blue shift in absorption maxima and increased band gap of the synthesized CdS and ZnS confirms the formation of nano sized inorganic semiconductors. The calculated values of particle size and band gap energy of materials reveal the variation of opto-electronic properties. This study leads to develop the basis of photo chromic sensors and solar cell applications.

Keywords: UV-Visible spectroscopy, Semiconductor nano-composites, Energy band gap, Photo chromic sensors, Solar cell.