

PROPERTIES OF CdS And CdSe NANOPARTICLES IN POLY(2-(DIMETHYLAMINO)ETHYL METHACRYLATE-CO-ACRYLIC ACID) CO-POLYMER MATRIX

L. V. Trandafilović¹, N. Bibić¹, J. Blanuša¹, M. K. Georges², T. Radhakrishnan², V. Djoković¹

¹*“Vinča” Institute of Nuclear Sciences P.O. Box 522, 11001 Belgrade, Serbia*

²*Department of Chemistry, University of Toronto at Mississauga, Mississauga, Ontario, L5L 1C6, Canada*

lidija@vin.bg.ac.yu

CdS and CdSe nanoparticles were synthesized in poly(2-(dimethylamino) ethyl methacrylate-co-acrylic acid (pDMAEMA-AA) co-polymer. Poly(2-(dimethylamino)ethyl methacrylate-co-acrylic acid) has been synthesized by free radical polymerization in different co-monomer mol ratios (1:1, 1:2, 2:1; DMAEMA:AA; P11, P12, P21). The obtained nanocomposites were investigated using structural and optical methods. XRD measurements showed the cubic crystal phase of the CdS and CdSe nanoparticles. TEM analysis revealed the presence of the spherical nanoparticles well dispersed in the co-polymer matrix. Size of the particles was calculated from the UV VIS absorption spectra using Brus equation. The results were compared to the particle size distribution obtained from the TEM micrographs. A possible interaction between semiconductor nanoparticles and the polymer matrices was studied by means of FTIR spectroscopy.

References:

- [1] L. V. Trandafilovic, V. Djokovic, N. Bibic, M. K. Georges, T. Radhakrishnan, *Opt. Mater.* **30** (2008) 1208
 [2] L. Brus *J.Chem. Phys.* **90** (1986) 2555
 [3] L.Brus *J.Chem. Phys.* **80** (1984) 4403

Figures:

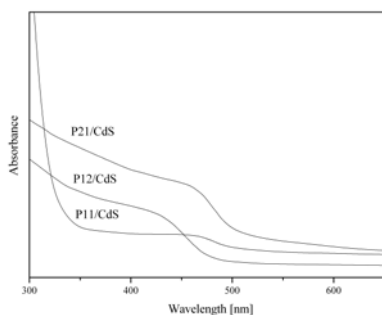


FIGURE 1. Absorption spectra of CdS nanocomposites

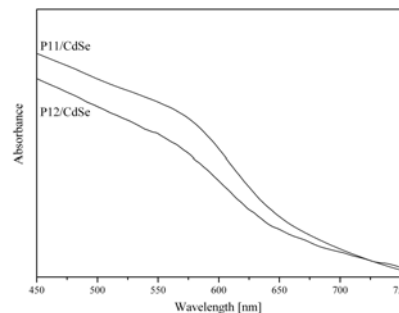


FIGURE 2. Absorption spectra of CdSe nanocomposites

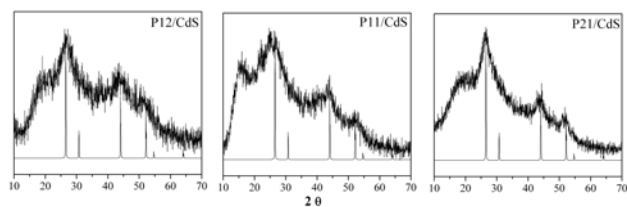


FIGURE 3. XRD spectra of CdS nanocomposites.

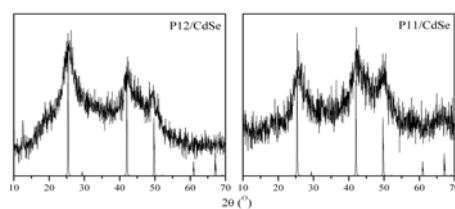


FIGURE 4. XRD spectra of CdSe nanocomposites.

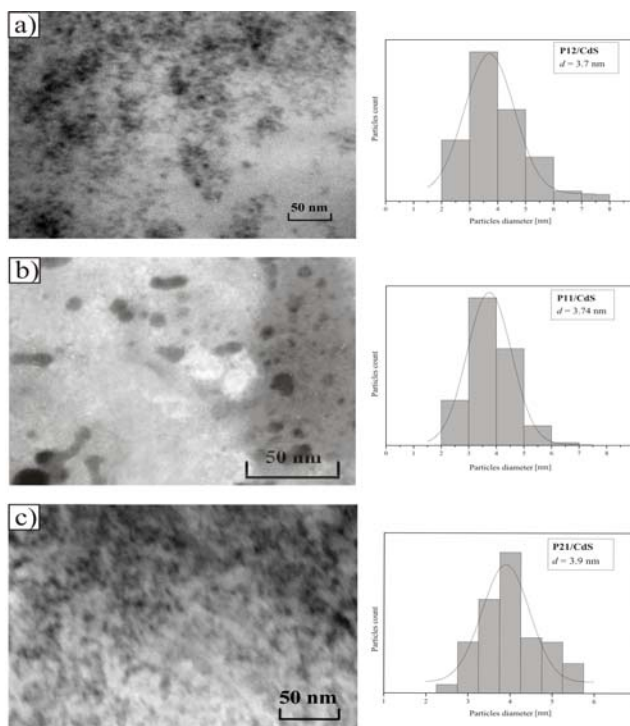


FIGURE 5. TEM micrographs and corresponding size distribution histograms of CdS nanoparticles

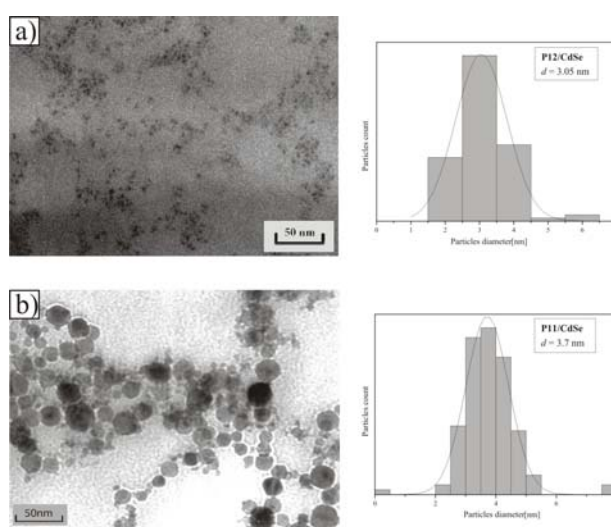


FIGURE 6. TEM micrographs and corresponding size distribution histograms of CdSe nanoparticles