LUMINESCENT NANOPARTICULES: SYNTHESIS AND CHARACTERIZATION OF COLOIDAL SEMICONDUCTOR QUANTUM DOTS AND POLYMER DOTS.

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The semiconductor nanocrystals have emerged as an important class of new materials in which the charge carriers are confined in all spatial directions, displaying size-dependent optical properties that can be tuned by controlling the preparative procedure. As another option, nanoparticles produced from semiconductor polymers, Pdots, has attracted considerable interest because of its outstanding qualities as fluorescent probes. In the present work, luminescent nanoparticles were produced by various synthesis techniques. Different chemical synthesis routes were used to obtain colloidal CdS quantum dots stabilized with TGA (thioglycolic acid) and CdTe quantum dots stabilized with two different stabilizers: TGA and GSH (glutathione). The CdS and CdTe quantum dots of different sizes were obtained with different luminescent emission in the visible spectrum region. Pdots were produced by precipitation technique of the conjugated polymers MEH-PPV (Poly[2-methoxy-5-(2-ethylhexyloxy)-1,4-phenylenevinylene). In addition, we synthetized Pdots produced in the presence of surfactant sodium dodecyl sulfate (*SDS*): Pdot-SDS. Optical characterizations by means of ultraviolet-visible absorption and photoluminescence (PL) spectroscopy were performed at room temperature. Particle size distributions were obtained from analysis of atomic force microscopy (AFM) images generated for several dot samples. Our results for the nanocrystals of CdS and CdTe indicate that its sizes depend strongly on the initial synthesis conditions and their optical properties change with the size of nanoparticles. On the other hand, the shape and the peak position of the emission spectra obtained from the Pdots' solutions hardly differs from that of the Pdot-SDS. AFM images attest the presence of Pdots and showed that Pdots-SDS presented smaller average diameters when compared to those produced with the original synthesis. This work was supported by the Brazilian agencies FAPEMIG and CNPq.