

Synthesis of colloidal ZnSe nanoparticles using an ultrasonic-assisted aerosol spray system

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TOPO (trioctylphosphine oxide)-capped ZnSe nanoparticles has been prepared by an ultrasonic-assisted aerosol spray system using a mixture of zinc oxide/oleic acid/octadecene/TOPO and selenium powder/trioctylphosphine as a precursor. The particles were collected in a toluene-filled bubbler. The nanoparticles obtained here show quantum size effect in their optical spectra and exhibit near band-edge luminescence and a blue shift of 0.42 eV in relation to the bulk material was observed. The X-ray diffraction (XRD) pattern shows the structure to be cubic (zinc blende structure). Transmission electron microscopy (TEM) reveals the presence of polycrystalline nanoparticles with diameter of about 40 nm by coagulation of nanocrystals with size of about 2 nm.