

Effect of Reaction Media on Photoluminescence of Colloidal CdTe Nanocrystals Synthesized from an Aerosol Flow System

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The reaction media used for synthesis of nanocrystals have a significant effect on the photoluminescence (PL) properties of colloidal CdTe nanocrystals. The colloidal CdTe nanocrystals used were synthesized from the ultrasonic-assisted aerosol flow system with cadmium oxide (CdO) as the Cd precursor and TOPTe as the Te source. The temporal evolution of the optical properties (absorption and luminescence) of the CdTe nanocrystals synthesized at different reaction temperatures was monitored in detail. The reaction media affect the number of surface-adsorbed molecules available for surface passivation and the removal of surface ligands, so that PL intensities can either be enhanced or diminished depending on the synthetic conditions. A comprehensive examination on the control of the PL properties was performed by systematically varying the ratio of the reaction media. The investigated reaction media were oleic acid (OA), oleylamine, tri-*n*-octylphosphine (TOP), tri-*n*-octylphosphine oxide (TOPO), and octadecene (ODE).