

Thermal annealing effects on photoluminescence and structural properties of CdSe nanoparticles

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The annealing effects on the structural and optical properties of CdSe nanoparticles have been elucidated. Efficiency improvement and cell stabilization of CdSe nanoparticles can be achieved by controlling the annealing parameters in air or oxygen at relatively higher temperatures (250 °C ~ 450 °C). The obtained samples were characterized by TEM, XRD, X-ray photoelectron spectroscopy (XPS), UV-Vis absorption spectra and PL spectra. TEM results revealed that after annealing at 450 °C nanodots were changed to nanorods having hexagonal phase. XRD analysis exhibited air annealing-induced phase transition in the nanocrystalline CdSe from cubic Zinc Blende to hexagonal Wurtzite structure. After annealing at 250 °C and 350 °C, the intensity of PL emission peak was substantially increased. This considerably enhances the electronic properties of the CdSe nanocrystals.

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