

## **Synthesis and characterization of CdSe NCs onto PAA template**

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In this study, cadmium selenide nanocrystals (CdSe NCs) were synthesized by chemical route process. CdSe NCs have been successfully embedded into porous anodic alumina (PAA) template by chemical bath deposition (CBD) method. The influence of thermal annealing in air at 350°C on the morphological, microstructural and optical properties of CdSe in PAA template has been studied by AFM, SEM, EDX, XRD, UV-Vis and PL analysis. The annealing temperature at 350°C caused an important change in the morphology of CdSe nanoparticles, from hemispherical nanocrystals (NCs) into elongated nanorods (NRs) array with pyramidal ends onto all sides of PAA matrix. XRD study shows the phase transformation of the deposited CdSe NCs on the PAA template from cubic to hexagonal structure. Optical properties results showed that the crystal quality was significantly improved after annealing step, bringing about an enhancement in PL and a decrease in optical band gap from 2.44 to 2.17 eV exhibiting a red shift.