PHOTOLUMINESCENCE OF CdSe NANOPARTICLES IN ELECTRIC FIELD

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S u m m a r y

We investigate the influence of an electric field on photoluminescence (PL) spectra of CdSe nanoparticles of 1.6 and 2.8 nm in size. The electric field was varied in the range 0–4×10^6 V/m. In PL spectra, bands corresponding to the exciton, defect, impurity, or surface transitions are observed. Under the action of the electric field, the intensity of the exciton PL bands of CdSe nanoparticles of various sizes decreases. In the electric field lower than 1.8×10^6 V/m, there occur a decrease of the intensity of the exciton band for nanoparticles 2.8 nm in size and the intensification of the defect-impurity one, which can be explained by the transfer of charge carriers between various radiation centers. In the electric field higher than 1.8×10^6 V/m, one observes an abrupt decrease of the intensity of luminescence, which probably represents a result of the extraction of carriers beyond the limits of the region of radiative recombination under the action of the electric field.