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Near Infrared Photoresponse in Annealed CdSe Nanocrystal Films LIWEI LIU, PAUL STOKES, ARTEM E. MASUNOV, SAIFUL I. KHONDAKER, NANOSCIENCE TECHNOLOGY CENTER, DEPARTMENTS OF PHYSICS & CHEMISTRY, UNIVERSITY OF CENTRAL FLORIDA TEAM — We found unexpected near infrared (NIR) photo response in CdSe nanocrystal superlattice film annealed above 400 C in air. The current voltage characteristic measured in a planer device geometry show a large increase in NIR current over dark current. The calculated external quantum efficiency of the device is up to 10.6 % at -5V and the responsivity is 0.7A/W obtained under 1.32 μW IR irradiation. UV-VIS absorption of annealed CdSe shows the redshifting and broadening of exciton peak and a decrease of band gap as the annealing temperature is increased. TEM image show that CdSe nanocrystals have been melted to fuse to different size distribution nanoparticles during annealing. We discuss possible reason for this unexpected behavior.

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