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Polymer Matrix Role in Light Absorption and Emission by Nano-CdS/PVA Composite[1] ANDRII KOVALCHUK, GALYNA RUDKO, V. Lashkaryov Institute of Semiconductor Physics of National Academy of Sciences of Ukraine, VOLODYMYR FEDIV, Department of Biophysics and Medical Informatics, Bukovinian State Medical University, QIJUN REN, IRINA BUYANOVA, WEIMIN CHEN, Department of Physics, Chemistry and Biology, Linköping University, DEPARTMENT OF OPTICS TEAM, DEPARTMENT OF BIOPHYSICS AND MEDICAL INFORMATICS TEAM, DEPARTMENT OF PHYSICS, CHEMISTRY AND BIOLOGY TEAM — Influence of a polymeric medium on the light absorption and emission processes of composite nano-CdS/polyvinyl alcohol is studied by activating different absorption-emission routes via changing of excitation wavelengths. The mechanisms are analyzed by employing the time-resolved photoluminescence spectroscopy. It is shown that the polymeric component of the composite contributes mainly to the excitation processes of photoluminescence via absorption of external laser excitation and its following transfer to the CdS nanoparticles that are incorporated into polymer matrix. The composite emission occurs mostly within the nanoparticles. It is also shown that time-decays of the photoluminescence emission from the CdS nanoparticles embedded in the composite depend on the excitation wavelength. Such behavior is ascribed to the interplay between the intrinsic nanoparticles excitation and extrinsic feeding of the nanoparticles via energy transfer from the excited polymer matrix. Possible mechanisms of the observed energy transfer are also discussed.

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