

Luminescence of CdSe quantum dots near a layer of silver nanoparticles ion-synthesized in sapphire

Galyametdinov Y., Shamilov R., Nuzhdin V., Valeev V., Stepanov A.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2016, Pleiades Publishing, Ltd. We study the characteristics of the luminescence of composite films based on polymethyl methacrylate with CdSe quantum dots deposited from solution onto the surface of a sapphire substrate containing a preliminarily formed layer with ion-synthesized silver nanoparticles. The sapphire layer with silver nanoparticles exhibits selective plasmon absorption in the visible spectral range with a peak at 463 nm. Enhancement in the exciton luminescence intensity of quantum dots with a peak at 590 nm is observed upon excitation at wavelengths lying in the region of plasmon resonance of metal nanoparticles, as well as luminescence quenching for quantum dots located in the vicinity of silver nanoparticles.

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