

Influence of absorption of Au nanoparticles in quantum dots–Au nanoparticles composites

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The semiconductor quantum dots (QDs)-metal composites have attracted a lot of attention because of their interesting properties such as photoluminescence (PL) enhancement and quenching effects. Although the mechanisms of these properties have been reported in the literature, the influence of scattering and absorption of gold nanoparticles (Au NPs) on the quenching phenomenon in QDs-metal composites has not been fully understood yet. In this work, we designed a series of experiments to study on the influence of absorption and scattering of Au NPs with concentration variation after interaction with amine-functionalized CdSe/ZnS core/shell QDs solution. The absorption spectra were obtained using UV-visible spectrometer and PL spectra were collected using photomultiplier tube through a monochromator for QDs only and QDs-Au NP composites. We focus on the influence of Au NPs on the effective excitation and QD emission intensity in the quenching phenomenon by the scattering and absorption of Au NPs in the QD-Au NP composites solution.