Silver nanoparticle induced enhancement and quenching of fluorescence of thiol-capped CdS quantum dot

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Abstract

This work deals with the investigation on the photophysical properties of benzyl mercaptan (thiol) capped CdS quantum dot (QDs) in *N*, *N*-dimethylformamide (DMF) solution. The effect of silver nanoparticles (AgNPs) on the photophysical properties of thiol-capped CdS QDs has also been studied for different concentrations of AgNPs. Both nanoparticles were characterized with Transmission Electron Microscopy (TEM). From the photophysical measurements, we have observed AgNPs induced enhancement and quenching of fluorescence from thiol-capped CdS QDs in DMF solution depending upon the concentration of AgNPs. At relatively lower concentrations of AgNPs, the QDs fluorescence was found to increase with the increase in nanoparticles (NPs) concentration up to a critical value of concentration. On the other hand, quenching of thiol-capped CdS