

Synthesis and surface modification of biocompatible water soluble core-shell quantum dots

ABSTRACT

In this study, the applications of CdSe/ZnS quantum dots (QDs) and its role in advanced sensings has been explored. The CdSe/ZnS was synthesized by using hot injection method with the shell ZnS layer was made using successive ionic layer adsorption and reaction (SILAR) method. The morphology of the CdSe/ZnS QDs was studied using Transmission Electron Microscope (TEM) and the average particle size was in 10-12 nm range. The prepared QDs were optically characterized using spectrofluorescence and strong emission was observed at 620 nm. Comparison of the fluorescence emissions of CdSe/ZnS capped with various capping ligands such as L-cysteine, thioglycolic acid (TGA), mercaptopropionic acid (MPA), mercaptosuccinic acid (MSA) and mercaptoundecanoic acid (MUA) were studied. The CdSe/ZnS capped with TGA gave the strongest fluorescence emission compared to others.

Keyword: Organic ligand; Quantum dot (QD); Semiconducting nanocrystals; Surface modification