World Academy of Science, Engineering and Technology
International Journal of Chemical and Molecular Engineering
Vol:11, No:01, 2017

Biocompatibility and Sensing Ability of Highly Luminescent Synthesized Core-Shell Quantum Dots

Authors : Mohan Singh Mehata, R. K. Ratnesh

Abstract : CdSe, CdSe/ZnS, and CdSe/CdS core-shell quantum dots (QDs) of 3-4 nm were developed by using chemical route and following successive ion layer adsorption and reaction (SILAR) methods. The prepared QDs have been examined by using X-ray diffraction, high-resolution electron microscopy and optical spectroscopy. The photoluminescence (PL) quantum yield (QY) of core-shell QDs increases with respect to the core, indicating that the radiative rate increases by the formation of shell around core, as evident by the measurement of PL lifetime. Further, the PL of bovine serum albumin is quenched strongly by the presence of core-shall QDs and follow the Stern-Volmer (S-V) relation, whereas the lifetime does not follow the S-V relation, demonstrating that the observed quenching is predominantly static in nature. Among all the QDs, the CdSe/ZnS QDs shows the least cytotoxicity hence most biocompatibility.

Keywords : biocompatibility, core-shell quantum dots, photoluminescence and lifetime, sensing ability
Conference Title : ICP 2017 : International Conference on Photochemistry
Conference Location : Zurich, Switzerland
Conference Dates : January 13-14, 2017