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SYNTHESIS, SPECTROSCOPIC INVESTIGATION, AND MOLECULAR INTERACTIONS BETWEEN ACIVICIN AND CdSe QUANTUM DOTS

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Abstract

Water-Soluble and fluorescent thiol capped CdSe quantum dots (QDs) were synthesized by chemical rout. The structure of CdSe QDs was investigated by means of X-ray diffraction (XRD), energy-dispersive X-ray analysis (EDX), UV-visible, Fourier transform infrared (FT-IR) spectroscopy and transmission electron microscopy (TEM). The crystal phase of the CdSe QDs confirmed with XRD diffraction technique. The average size of CdSe QDs was calculated to be 3 nm by different spectroscopic techniques. CdSe capped with mercaptopropionic acid (MPA) shows a characteristic fluorescent peak at 590 nm, which is highly dependant on the pH value. The interaction of the water-soluble MPA-CdSe and acivicin (AC) was investigated in 50 mM sodium acetate buffer pH 7.4 by fluorescence spectroscopy. The interaction between acivicin and MPA-CdSe shows a dynamic quenching process. Analysis of the circular dichorism (CD) spectra indicated higher interaction of the MPA-CdSe-AC complex with human serum albumin than the individual AC drug.

Keywords

Author Keywords: CdSe QDs; Antibiotics Interactions; Acivicin; Optical Properties; Quenching Mechanisms

KeyWords Plus: PROTEIN SECONDARY STRUCTURE; CIRCULAR-DICHROISM; SERUM-ALBUMIN; CDTE; NANOPARTICLES; CYTOTOXICITY; FLUORESCENCE; ACID

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