

研究论文

核/壳型CdTe@SiO₂荧光纳米复合粒子的制备与表征

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摘要 利用反相微乳法, 以巯基乙酸修饰的水溶性CdTe量子点为核, 包覆SiO₂, 制备得到核壳型CdTe@SiO₂荧光纳米复合粒子. 用紫外-可见(UV-vis)分光光度计, 荧光(PL)分光光度计, 红外(FT-IR)光谱仪, 透射电子显微镜(TEM)等分析测试手段, 对得到的荧光纳米复合粒子的性能进行表征, 结果表明: 得到的CdTe@SiO₂

纳米复合粒子是核壳型结构, 由SiO₂壳层包覆多个量子点, 其大小均匀, 水溶性好, 有效地提高了量子点的稳定性, 大大增强了其抗光漂白性能, 为该材料的进一步生物应用打下了良好的基础.

关键词 [量子点](#) [纳米复合粒子](#) [核壳结构](#) [光漂白](#)

分类号

Preparation and Characterization of CdTe@SiO₂ Core/Shell Luminescent Composite

Nanoparticles

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Abstract CdTe@SiO₂ core/shell luminescent composite nanoparticles were synthesized by the method of reverse microemulsion to coat SiO₂ on water-soluble CdTe QD (quantum dot) cores. And the properties of the as-prepared nanoparticles were characterized by different ways including ultraviolet spectra (UV-vis), fluorescence spectra (FL), FT-IR spectra, and transmission electron microscopy (TEM). The results indicated that the as-prepared nanoparticles had a core/shell structure in which multi-QDs were encapsulated in a single composite nanoparticle. Moreover, the homogeneous nanoparticles had excellent water solubility as well as improved stability and photobleaching resistance. The approach introduced in this paper lays a solid foundation for the biological applications of the nanoparticles.

Key words [quantum dot \(QD\)](#) [composite nanoparticle](#) [core/shell structure](#) [photobleaching](#)

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