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论文

Eu(TTFA)₃掺杂SiO₂杂化胶体球的合成及特性

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摘要:

采用改进的碱催化法和种子法分别制得了稀土配合物Eu(TTFA)₃掺杂的SiO₂杂化胶体球,并用透射电子显微镜和荧光分光光度计对其显微形貌和荧光光谱特性进行了详细地研究.结果表明,两种方法都可以获得单分散性的、稀土配合物掺杂SiO₂杂化胶体球,且都具有Eu³⁺离子典型的荧光光谱特性.Eu(TTFA)₃掺杂入SiO₂胶体球中后,有机配体TTFA在短波长处的吸收明显增强了,最大的吸收峰位也向短波长方向移动大约20~30 nm,Eu³⁺离子5D₀→7F₂发射跃迁仍然具有良好的窄线发光特征,同时荧光峰值的形态和位置受SiO₂基体的影响发生轻微的变化.

关键词: SiO₂杂化胶体球 Eu(TTFA)₃ 碱催化法
种子法 光谱特性

Synthesis and Properties of Eu(TTFA)₃-doped SiO₂ Hybrid Spheres

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Eu(TTFA)₃-doped SiO₂ hybrid spheres are synthesized by the modified Stober method and seed growth method, and characterized by the transmission electron microscope and fluorescence spectrometer. The results show that SiO₂ hybrid spheres doped with Eu(TTFA)₃ synthesized by both the two methods have smooth surface and good monodispersity and exhibit the characteristic photoluminescence of the Eu³⁺ ions. After Eu(TTFA)₃ doped into SiO₂ spheres, the absorption intensities of the ligand TTFA obviously increase in the short wavelength range and its maximum accordingly shifts about 20 or 30 nm to shorter wavelength. Under the influence of SiO₂ matrix, 5D₀→7F₂ transition of Eu³⁺ ions doped into SiO₂ spheres still appears to be narrow and its fluorescent peaks slightly change.

Keywords: SiO₂ hybrid spheres Eu(TTFA)₃
Base-catalyzed method Seed-growth method
Fluorescence properties

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