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材料合成及性能

$Ba_{10}(PO_4)_4(SiO_4)_2$：Eu^{2+}荧光体的光谱特性

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摘要： 采用高温固相法合成了荧光体$Ba_{10}(PO_4)_4(SiO_4)_2$：Ce^{3+}和$Ba_{10}(PO_4)_4(SiO_4)_2$：Eu^{2+}，研究了两种荧光体的光谱特性。结果表明，两者都呈现较强的宽带激发特征。根据同种基质中Eu^{2+}和Ce^{3+}两种离子光谱特征的相关性，通过测得的$Ba_{10}(PO_4)_2(SiO_4)_2$基质中Ce^{3+}的光谱数据估算了$Ba_{10}(PO_4)_2(SiO_4)_2$：Eu^{2+}中Eu^{2+}的斯托克斯位移（ΔS）和激发能量，估算结果与$Ba_{10}(PO_4)_2(SiO_4)_2$：Eu^{2+}样品的光谱分析结果十分吻合。$Ba_{10}(PO_4)_2(SiO_4)_2$：Eu^{2+}可以同时被紫光和蓝光激发，发出偏白的绿光，可用作白光LED的荧光粉。

关键词： 发光材料 光谱 Eu^{2+} Ce^{3+} $Ba_{10}(PO_4)_2(SiO_4)_2$

Spectra Properties of $Ba_{10}(PO_4)_4(SiO_4)_2$：Eu^{2+} Phosphor

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Abstract: The phosphors composed of Eu or Ce ions doped in $Ba_{10}(PO_4)_4(SiO_4)_2$ matrix were prepared by solid state reaction. The PL spectra properties of $Ba_{10}(PO_4)_4(SiO_4)_2$:Eu^{2+} and $Ba_{10}(PO_4)_2(SiO_4)_2$:Ce^{3+} were investigated. Strong broad excitation band was observed in both samples. The Eu^{2+} of Stokes shift (ΔS) and excitation energy of $Ba_{10}(PO_4)_4(SiO_4)_2$:Eu^{2+} were calculated by the PL spectra of $Ba_{10}(PO_4)_2(SiO_4)_2$:Ce^{3+}. The estimated excitation energy and the experiment result are closely coincided. $Ba_{10}(PO_4)_4(SiO_4)_2$:Eu^{2+} can be excited by UV-LED or blue LED, and emits absinthe-green light.

Keywords: phosphors spectra Eu^{2+} Ce^{3+} $Ba_{10}(PO_4)_2(SiO_4)_2$
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