



材料合成及性能

$\text{NaLn}_{4-x}(\text{SiO}_4)_3\text{F}: x\text{RE}^{3+}$ ($\text{Ln}=\text{La}, \text{Gd}; \text{RE}=\text{Tb}, \text{Dy}, \text{Sm}, \text{Tm}$) 荧光材料的发光性能

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摘要： 利用简单的高温固相法合成稀土离子掺杂的 $\text{NaLn}_{4-x}(\text{SiO}_4)_3\text{F}: x\text{RE}^{3+}$ ($\text{Ln}=\text{La}, \text{Gd}; \text{RE}=\text{Tb}, \text{Dy}, \text{Sm}, \text{Tm}$) 系列荧光粉, 利用X射线粉末衍射仪和荧光分光光度计分别测试其物相结构和发光性能。结果表明, 所合成样品均为纯的六方晶系结构, 在紫外光激发下所合成样品均表现出所掺杂稀土离子的 $f-f$ 特征能级跃迁, Tb^{3+} 、 Dy^{3+} 、 Sm^{3+} 和 Tm^{3+} 等激活离子分别发出蓝绿色、白色、橙色以及蓝色等荧光发射。

关键词： 氟氧化物基质 稀土离子 荧光粉 高温固相合成

Luminescence Characterization in The Phosphors of $\text{NaLn}_{4-x}(\text{SiO}_4)_3\text{F}: x\text{RE}^{3+}$ ($\text{Ln}=\text{La}, \text{Gd}; \text{RE}=\text{Tb}, \text{Dy}, \text{Sm}, \text{Tm}$)

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Abstract: A series of $\text{NaLn}_{4-x}(\text{SiO}_4)_3\text{F}: x\text{RE}^{3+}$ ($\text{Ln}=\text{La}, \text{Gd}; \text{RE}=\text{Tb}, \text{Dy}, \text{Sm}, \text{Tm}$) phosphors were synthesized by the conventional solid-state reaction at 950°C for 2 h. The samples were characterized by X-ray diffraction (XRD) and photoluminescence (PL) spectra. The experimental results indicate that all the obtained-samples are pure hexagonal phase. Under UV light excitation, the doped rare earth ions (Tb^{3+} , Dy^{3+} , Sm^{3+} and Tm^{3+}) phosphor give blue-green, white, orange, and blue emission, respectively.

Keywords: oxyfluoride system rare earth ion phosphor solid-state method

收稿日期 2013-06-17 修回日期 2013-08-15 网络版发布日期

基金项目:

国家自然科学基金(21161004); 广西自然科学基金(2011GXNSFA018048)资助项目

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