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材料合成及性能

Er³⁺, Yb³⁺共掺杂NaGd(MoO₄)₂荧光粉的发光特性

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摘要：采用高温固相法制备了Er³⁺, Yb³⁺共掺杂的NaGd(MoO₄)₂荧光粉,通过X射线衍射对样品的物相结构进行了分析,采用荧光光谱手段对样品的下转换发光特性和上转换发光特性进行了研究。通过对激发、发射光谱的分析,发现基质到Er³⁺存在有效的能量传递。通过对样品上转换发光光谱的分析,发现在不同Yb³⁺掺杂浓度样品中,红光和绿光上转换发光均为双光子过程,并对样品上转换发光强度与LD泵浦电流和掺杂离子浓度的关系进行了讨论。

关键词：高温固相法 上转换 NaGd(MoO₄)₂ 能量传递

Luminescence Properties of Er³⁺, Yb³⁺ Co-doped NaGd(MoO₄)₂ Phosphors

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Abstract: Er³⁺, Yb³⁺ co-doped NaGd(MoO₄)₂ phosphors were synthesized via solid-state reaction method. Their structures were investigated with X-ray diffraction at first, and the down-conversion and up-conversion properties of the phosphors were investigated as well. On one hand, it is confirmed that the excitation energy can be effectively transferred from host lattice to luminescent centers, Er³⁺, upon analyzing excitation spectrum and emission spectrum. On the other hand, it is found, from the up-conversion luminescent spectrum, that the two-photon process is responsible for both red and green up-conversion emissions in the samples of wide range of Yb³⁺ concentrations. In addition the effect of LD pump current and dopant concentrations on up-conversion luminescence intensity were studied. Finally, the mechanism of up-converting luminescence was interpreted.

Keywords: up-conversion solid-state reaction method NaGd(MoO₄)₂ energy transfer

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