



共掺La<sup>3+</sup>对Sr<sub>2</sub>SnO<sub>4</sub>:Sm<sup>3+</sup>的余辉增强  
Enhanced Long Persistence of Sr<sub>2</sub>SnO<sub>4</sub>:Sm<sup>3+</sup> Phosphor by Co-doping with La<sup>3+</sup>

摘要点击: 77 全文下载: 49

[查看全文](#) [查看/发表评论](#) [下载PDF阅读器](#)

中文关键词: [发光学](#) [余辉](#) [Sr<sub>2</sub>SnO<sub>4</sub>](#) [镧](#) [钐](#) [热释光](#)

英文关键词: [optics](#) [long afterglow](#) [Sr<sub>2</sub>SnO<sub>4</sub>](#) [lanthanum](#) [samarium](#) [thermoluminescence](#)

基金项目:

作者	单位
<a href="#">沙 磊</a>	<a href="#">暨南大学化学系纳米化学研究所, 广州 510632</a>
<a href="#">刘应亮</a>	<a href="#">暨南大学化学系纳米化学研究所, 广州 510632</a>
<a href="#">雷炳富</a>	<a href="#">暨南大学物理系, 广州 510632</a>
<a href="#">阳 区</a>	<a href="#">暨南大学化学系纳米化学研究所, 广州 510632</a>
<a href="#">余彩霞</a>	<a href="#">暨南大学化学系纳米化学研究所, 广州 510632</a>

中文摘要:

研究了以La<sup>3+</sup>离子为辅助激活剂, 对Sm<sup>3+</sup>掺杂的发光材料Sr<sub>2</sub>SnO<sub>4</sub>:Sm<sup>3+</sup>余辉性能的影响。采用传统的高温固相法合成Sr<sub>2</sub>SnO<sub>4</sub>:Sm<sup>3+</sup>, La<sup>3+</sup>红色长余辉发光材料。利用X射线粉末衍射仪、荧光光谱仪、热释光剂量仪等手段对粉末样品进行了表征。分析结果表明, 在1 400 °C得到了单相Sr<sub>2</sub>SnO<sub>4</sub>:Sm<sup>3+</sup>, La<sup>3+</sup>发光粉末有563、599和646 nm 3个发射峰, 与Sm<sup>3+</sup>单掺杂的Sr<sub>2</sub>SnO<sub>4</sub>:Sm<sup>3+</sup>相比, 其光谱发射峰位没有明显变化。余辉亮度衰减曲线表明适量的La<sup>3+</sup>掺杂可以延长Sr<sub>2</sub>SnO<sub>4</sub>:Sm<sup>3+</sup>的余辉时间。通过对热释光谱的分析, 解释了双掺杂发光粉余辉性能增强的原因, La<sup>3+</sup>掺杂增加了更多适宜深度的陷阱(V<sub>Sr</sub><sup>''</sup>), 可以有效存储光能, 增强余辉的时间和强度。

英文摘要:

It is necessary to further improve the afterglow properties of Sr<sub>2</sub>SnO<sub>4</sub>:Sm<sup>3+</sup> red afterglow phosphors in consideration of its potential practical applications. In this work, Sr<sub>2</sub>SnO<sub>4</sub>:Sm<sup>3+</sup> red afterglow phosphors were prepared via the conventional solid-state reaction route and the enhanced properties were observed when La<sup>3+</sup> ions were co-doped. The as-synthesized Sr<sub>2</sub>SnO<sub>4</sub>:Sm<sup>3+</sup>, La<sup>3+</sup> phosphors were characterized by using XRD, photoluminescence and thermoluminescence spectroscopy. Sr<sub>2</sub>SnO<sub>4</sub>:Sm<sup>3+</sup> red afterglow phosphors are pure phase at 1 400 °C under atmospheric pressure. The emission spectrum shows that there are at least three peaks located at 563, 599 and 646 nm, and the peaks can be assigned to the <sup>4</sup>G<sub>5/2</sub>→<sup>6</sup>H<sub>J</sub> (J=5/2, 7/2, 9/2) transitions of Sm<sup>3+</sup> ion. The presence of La<sup>3+</sup> ion does not cause any change in the emission spectrum of samarium. The decay patterns of afterglow curves demonstrate that the afterglow time of Sr<sub>2</sub>SnO<sub>4</sub>:Sm<sup>3+</sup> could be extended by the incorporation of La<sup>3+</sup>. The thermoluminescence glow curve results confirm that the enhanced afterglow properties of Sr<sub>2</sub>SnO<sub>4</sub>:Sm<sup>3+</sup>, La<sup>3+</sup> is comparable to Sr<sub>2</sub>SnO<sub>4</sub>:Sm<sup>3+</sup>. This implies that the codoping increases more appropriate traps (V<sub>Sr</sub><sup>''</sup>) which are in favour of energy storage, higher brightness and longer lasting time.

您是第1114676位访问者

主办单位: 中国化学会 单位地址: 南京大学化学楼

服务热线: (025)83592307 传真: (025)83592307 邮编: 210093 Email: [wjhx@netra.nju.edu.cn](mailto:wjhx@netra.nju.edu.cn)

本系统由北京勤云科技发展有限公司设计