

Full Paper

一种新颖的合成碱土硅酸盐长余辉发光材料 $\text{Sr}_3\text{MgSi}_2\text{O}_8:\text{Eu}^{2+},\text{Dy}^{3+}$ 的方法

潘文, 宁桂玲*, 王静慧, 林源

精细化工国家重点实验室, 大连理工大学, 116012 辽宁, 中国

收稿日期 2006-4-25 修回日期 2007-1-8 网络版发布日期 2007-5-28 接受日期

摘要 本文介绍了一种新颖的方法合成碱土硅酸盐长余辉发光材料 $\text{Sr}_3\text{MgSi}_2\text{O}_8:\text{Eu}^{2+},\text{Dy}^{3+}$ 。采用正硅酸乙酯 (TEOS) 和无机粉末在乙醇体系中, 通过冰醋酸调整溶液体系pH值控制正硅酸乙酯 (TEOS) 的水解。前驱体形貌, 晶体结构和光谱特征分别通过透射电镜 (TEM), X射线粉末衍射仪 (XRD) 和荧光分光光度计表征。通过透射电镜照片可观察到前驱体具有核壳结构和准球形的形貌。与高温固相法相比, 纳米包覆的方法具有较低的合成温度, 并且具有较好的发光强度和余辉性能。

关键词 [纳米包覆](#), [前驱体](#), [磷光体](#), [\$\text{Sr}_3\text{MgSi}_2\text{O}_8:\text{Eu}^{2+},\text{Dy}^{3+}\$](#)

分类号

A Novel Synthesis of Alkaline Earth Silicate Phosphor $\text{Sr}_3\text{MgSi}_2\text{O}_8:\text{Eu}^{2+},\text{Dy}^{3+}$

PAN Wen, NING Gui-Ling*, WANG Jing-Hui, LIN Yuan

State Key Laboratory of Fine Chemicals, Dalian University of Technology, Dalian, Liaoning 116012, China

Abstract A novel method for synthesizing long afterglow silicate phosphor $\text{Sr}_3\text{MgSi}_2\text{O}_8:\text{Eu}^{2+},\text{Dy}^{3+}$ using TEOS and inorganic powders as reactants was reported. Acetic acid as a catalyzer controlled the hydrolysis of TEOS by adjusting pH value of the system. The morphologies of precursor were characterized by transmission electron microscope (TEM). The structure and optical properties of the phosphor powders were systematically investigated by means of X-ray diffraction and spectrofluorometry. TEM images have reflected the core-shell structure and quasi-spherical morphology of the precursor particles. It was found that the single-phase $\text{Sr}_3\text{MgSi}_2\text{O}_8$ crystalline structures were obtained at 1050 and 1250 °C for the samples prepared with the nano-coating method and the solid state reaction, respectively. The emission intensities of the phosphors prepared by the present method were higher than those by the conventional process. Also, the afterglow characteristic was better than that prepared by solid-state reaction in the comparable condition.

Key words [nano-coating](#), [precursor](#), [phosphor](#), [\$\text{Sr}_3\text{MgSi}_2\text{O}_8:\text{Eu}^{2+},\text{Dy}^{3+}\$](#)

DOI:

通讯作者 宁桂玲 ninggl@dlut.edu.cn

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF\(OKB\)](#)

▶ [\[HTML全文\]\(OKB\)](#)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [复制索引](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中 包含 “\[纳米包覆, 前驱体, 磷光体, \\$\text{Sr}_3\text{MgSi}_2\text{O}_8:\text{Eu}^{2+},\text{Dy}^{3+}\\$ ” 的 相关文章\]\(#\)](#)

▶ [本文作者相关文章](#)

- [潘文](#)
- [宁桂玲](#)
- [王静慧](#)
- [林源](#)