

长余辉发光材料 $\text{SrAl}_2\text{O}_4:\text{Eu}^{2+},\text{Dy}^{3+}$ 的配位包覆及其性能研究

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摘要 采用三种不同的有机物马来酸酐、油酸、2,2'-

联吡啶作为配位体与 $\text{SrAl}_2\text{O}_4:\text{Eu}^{2+},\text{Dy}^{3+}$ 发光粉进行了配位包覆形成有机-无机杂化发光材料. 通过 IR、XRD、

SEM、荧光光谱分析和耐水性测试结果表明: 包覆层由三种有机物通过 O 或 N 原子与发光粉晶体表面的 Sr^{2+}

配位键合而成, 包覆后晶体结构和荧光光谱峰形和峰值没改变, 发光强度降低, 表面粗糙度变大,

在水中的稳定性增强, 其中马来酸酐是最好的配位体, 包覆后荧光强度和余辉时间分别为包覆前的 97% 和 95%.

关键词 [发光粉](#) [配位体](#) [包覆](#) [有机-无机杂化](#)

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Coordination Encapsulation on $\text{SrAl}_2\text{O}_4:\text{Eu}^{2+}, \text{Dy}^{3+}$ Phosphor and Its Characterization

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Abstract Three organic-inorganic hybrid phosphors were synthesized by a surface coordination method with $\text{SrAl}_2\text{O}_4:\text{Eu}^{2+}, \text{Dy}^{3+}$ powder and maleic anhydride, oleic acid and 2,2'-dipyridyl ligand respectively, and characterized by means of IR, SEM, XRD, fluorescent spectra and water resistance experiments. The results show that Sr^{2+} on the surface of $\text{SrAl}_2\text{O}_4:\text{Eu}^{2+}, \text{Dy}^{3+}$ phosphor is coordinated with O and N atoms of maleic anhydride and oleic acid and 2,2'-dipyridyl ligand respectively. The crystal structures, the shapes and positions of excitation and emission peak of coated phosphors are the same as that of uncoated phosphors, but after coordination encapsulation, the relative luminous intensity and the afterglow life are decreased, and the roughness of crystal structure is increased, and the stability in water is improved. The best ligand is maleic anhydride. The luminous intensity and afterglow life of the phosphors coordinated with maleic anhydride are less 3% and 5% respectively than that of the uncoated phosphors.

Key words [phosphor](#) [ligand](#) [encapsulation](#) [organic-inorganic hybrid](#)

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