

## 钇对掺铒多孔硅体系1.54 $\mu\text{m}$ 发光的增强作用

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收稿日期 修回日期 网络版发布日期 接受日期

**摘要** 首次报道了用恒电位电解法将铒、钇共掺入多孔硅 (porous silicon, PS) 中,经高温退火处理后,观察到了在近红外区 (1.54  $\mu\text{m}$ ) 室温下较强的光致发光 (photoluminescence, PL),并与掺铒多孔硅 (erbium-doped porous silicon, PS:Er) 做了比较,发现钇的共掺入对掺铒多孔硅体系1.54  $\mu\text{m}$ 发射起了增强作用

。研究了铒、钇共掺杂多孔硅 (erbium and yttrium co-doped porous silicon, PS:Er, Y)

光致发光强度随温度的变化,发现PS:Er与Si:Er材料相似,有较强的 温度猝灭效应,而PS:Er,

Y体系的PL强度随温度升高趋于平稳,且有增强的趋势,受温度影响不明显,并初步探讨了其发光机制。

**关键词** [硅](#) [铒](#) [钇](#) [掺杂](#) [光致发光](#) [电解](#) [荧光猝灭剂](#)

分类号 [0612](#)

## Enhanced 1.54 $\mu\text{m}$ Luminescence from Erbium and Yttrium Co-doped Porous Silicon

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**Abstract** Fabrication of erbium (Er) and yttrium (Y) co-doped porous silicon (PS:Er,Y) is firstly reported. Enhancement of Er-related photoluminescence at 1.54  $\mu\text{m}$  has been achieved by the co-doping of Y<sup>3+</sup>. The dependence of photoluminescence intensity on temperature was investigated. Luminescence quenching was observed for PS: Er, similar to that for Si:Er, while 1.54  $\mu\text{m}$  luminescence intensity from PS:Er,Y was found to increase a little when the photoluminescence spectra were measured at a higher temperature. A possible enhanced photoluminescence mechanism was proposed.

**Key words** [SILICON](#) [SILICON](#) [YTTRIUM](#) [DOPE](#) [PHOTOLUMINESCENCE](#) [ELECTROLYSIS](#) [FLUORESCENCE QUENCHER](#)

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