

## 多孔纳米氧化锌的模板法优化制备与电致发光特性

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收稿日期 2006-9-7 修回日期 2006-11-19 网络版发布日期 2007-8-25 接受日期

**摘要** 采用溶胶-凝胶法在中性条件下合成了孔径大小不同的介孔ZnO前驱体. 通过热氧化法, 在空气中煅烧前驱体制备了ZnO纳米晶颗粒. 讨论了反应条件对发光强度的影响, 并确定了最佳反应条件. 电致发光测试结果表明, 前驱体制备过程中, 表面活性剂的处理不会使发光特征峰发生移动; 相同测试条件下, 由介孔结构前驱体煅烧而成的ZnO样品其电致发光强度明显增强, 十八胺、F-127处理过的样品发光强度分别是普通样品的3.7倍和5.6倍. 发光强度的显著增强可能是由颗粒内介孔结构引起.

**关键词** [ZnO](#) [电致发光](#) [模板剂](#) [介孔](#)

分类号 [0472](#)

## Optimized Fabrication of the Mesoporous ZnO via Template Method and Its Electroluminescence Characteristics

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**Abstract** Mesoporous ZnO precursors with different apertures were synthesized by a sol-gel method under neutral conditions. With the thermal oxidation method, ZnO nanocrystalline particles were prepared by calcining the precursor of the mesoporous materials in air, and then the influence of reaction conditions on the luminescence intensity was discussed. The electroluminescence results indicate that there is neither blue-shift nor red-shift in their EL spectra by comparing the EL spectra of the samples dealt with the template agents with that of the samples dealt without surfactant. Under the same electric field intensity, the EL emission intensity of calcined mesoporous precursor ZnO is enhanced enormously. In detail, the intensities of samples dealt with ODA and F-127 are 2.7 and 4.6 times higher than that of the samples dealt without template, respectively. The enhanced EL intensity may be resulted from the mesoporous structure remained on the particles surface.

**Key words** [ZnO](#) [EL](#) [template](#) [mesoporous](#)

DOI:

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