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论文

室温下激发强度对ZnO晶须发光的影响

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摘要:

采用浮区法(FZ)在高氧压条件下生长出大尺寸的ZnO单晶晶须. X射线衍射(XRD)和拉曼光谱(Raman)分析结果表明, 生长的ZnO单晶晶须为六方结构晶体, 沿(100)晶面方向有明显的择优生长取向. 研究了0.3 MPa氧压下生长的ZnO晶须的变功率光致发光光谱, 结果表明, 晶须在室温下有比较高的紫外光致发光效率和较低的缺陷, 其紫外发光激发强度的阈值>1 kW/cm^2.

关键词: 氧化锌; 晶须; X射线衍射; 拉曼光谱; 光致发光

Influence of Excitation Intensities on Photoluminescence of ZnO(Wurtzite) Whiskers at Room Temperature

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Abstract:

ZnO(wurtzite) whiskers were grown with a floating zone method using ZnO powder as starting materials under 0.3 MPa oxygen pressures. The as-grown samples were characterized by X-ray diffraction and Raman scattering, and their characteristic peaks verify that the as-grown ZnO whiskers have excellent hexagonal wurtzite phase and (100) orientation. The photoluminescence properties of the as-grown ZnO whiskers were measured under 266 nm-light excitation from a Nd:YAG laser, and the influence of various laser intensity on the photoluminescence of the ZnO whiskers was investigated. It was found that the threshold of UV was higher than 1 kW/cm^2.

Keywords: ZnO; Whisker; X-ray diffraction; Raman spectrum; Photoluminescence

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