

材料科学

不同衬底对CBD法制备ZnO纳米棒阵列的影响

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摘要:

采用化学溶液沉积(CBD)法在3种不同衬底上生长ZnO纳米棒阵列, 并利用X射线衍射(XRD)、扫描电子显微镜(SEM)、原子力显微镜(AFM)和光致发光(PL)谱研究纳米棒的结构、形貌和光学特性. 结果表明: 产物均为ZnO纳米棒状结构且均匀分布在衬底上. 其中在氧化铟锡(ITO)导电玻璃衬底和玻璃衬底上生长的ZnO结晶质量优于在硅衬底上生长的样品, 而纳米棒在玻璃衬底上的覆盖密度最大且取向均一; 在Si衬底上生长纳米棒的发光性能最好; 3个样品的紫外峰位均发生微小移动, 这是由于纳米棒尺寸不同导致应力发生变化所致.

关键词: ZnO纳米棒 化学溶液沉积法 衬底 光学特性

Influence of ZnO Nanorod Arrays Prepared by Means of CBD Method on Various Substrates

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Abstract:

Zinc oxide (ZnO) nanorods were grown on three kinds of substrates by means of the chemical solution deposition (CBD) method. The crystal structure, morphologies and photoluminescence properties of the nanorods were studied by means of X-ray diffraction (XRD), scanning electron microscopy (SEM), atomic force microscopy (AFM) and photoluminescence spectroscopy (PL). The results show that the products, ZnO nanorods were uniformly distributed on the substrate, the crystallization quality of the ZnO on the ITO conducting glass and bare glass substrates are better than that of the sample on the Si substrate. And the nanorods grown on the bare glass have the most coverage density and their tropisms are unity. The ZnO nanorods grown on the Si substrate have the best photoluminescence. The small shift in the UV emission was caused by the stress due to the different sizes of the nanorods.

Keywords: ZnO nanorod chemical solution deposition method substrate photoluminescence property

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1. 郭文滨, 马春生, 陈维友, 张大明, 董纬, 陈开鑫, 刘彩霞, 刘式塘. 聚合物阵列波导光栅复用器/解复用器的参数设计与损耗分析[J]. 吉林大学学报(理学版), 2002,40(01): 80-83
2. 赵利军, 王丽丽, 宫杰, 郑伟涛. 衬底偏压对 $\gamma'$ -Fe<sub>4</sub>N薄膜磁性的影响[J]. 吉林大学学报(理学版), 2008,46(05): 963-966

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