

研究论文

常温直接沉淀法制备 ZnO 纳米棒

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摘要 在常温下, 以 PEG-400(聚乙二醇400)为表面活性剂, 采用直接沉淀法合成了 ZnO 纳米棒. 产物用 XRD, TEM, SAED 和 HRTEM 等进行了表征. 结果表明, 所得 ZnO 为一维的纳米棒, 属于六方纤维矿的单晶结构. ZnO 纳米棒的直径在 20~40 nm 之间, 长度在 300~800 nm 范围. (0001) 面为 ZnO 纳米棒的生长方向. 讨论了 ZnO 相的生成和 ZnO 纳米棒的形成机理以及 PEG-400 在其形成过程中的作用.

关键词 ZnO 纳米棒 晶体生长 直接沉淀 常温

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Synthesis of ZnO Nanorods by a Direct Precipitation Method at Room Temperature

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Abstract Zinc oxide(ZnO) nanorods were successfully synthesized by a simple approach *via* a direct precipitation method in the presence of PEG-400(polyethylene glycol 400) at room temperature. The characterizations of ZnO nanorods were carried out by XRD, TEM, SAED and HRTEM. The results show that the as-prepared ZnO crystals are one-dimensional nanorods which are single crystals with a hexagonal wurtzite structure. The ZnO nanorods are uniform with 20—40 nm diameter and lengths ranging from 300 to 800 nm. The (0001) face is the growth direction of the ZnO nanorods. The possible mechanism of the growth of ZnO crystal and the form of ZnO nanorods along with the important effect of PEG-400 on the fabrication of ZnO nanorods were discussed.

Key words ZnO nanorods; Crystal growth; Direct precipitation; Room temperature

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