



材料合成及性能

水热法制备钼掺杂ZnO纳米结构及其光学特性研究

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摘要：用水热法以 $Zn(NO_3)_2 \cdot 6H_2O$ 和NaOH为原料,分别以十六烷基三甲基氯化铵(CTAB)、十二烷基硫酸钠(SDS)、聚乙烯吡咯烷酮-K30(PVP-K30)、聚乙二醇400(PEG400)、乙二胺四乙酸(EDTA)为添加剂,制备钼掺杂的纳米ZnO。扫描电镜(SEM)结果表明,通过改变添加剂的种类可以合成不同形貌钼掺杂的ZnO;X射线衍射(XRD)结果表明,掺杂的ZnO纳米粉体为六方纤锌矿结构,随着钼掺杂浓度的增加,衍射峰强度明显增大,结晶质量得到明显改善;室温下的光致发光(PL)图谱表明,掺杂的样品在385 nm处有一紫光发射峰,在约572 nm处有一绿光发射峰,Mo掺杂后明显提高了样品的发光强度。

关键词：钼掺杂 水热法 光致发光

Hydrothermal Synthesis of Molybdenum Doped ZnO Nanostructures and Its Photoluminescence Property

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Abstract: Different contents of molybdenum-doped ZnO were prepared by hydrothermal method, using Zn $(NO_3)_2 \cdot 6H_2O$ and NaOH as precursors, CTAB, SDS, PVP-K30, PEG400, EDTA as additive. SEM images show that various morphologies of molybdenum doped ZnO can be obtained by changing the types of additives. XRD results indicate that the doped ZnO were wurtzite structure. With the increasing of the molybdenum concentration, the diffraction peak intensity are significantly enhanced and the crystalline quality is improved. There are violet emission peak at 385 nm and green emitting at 572 nm in the PL spectra of ZnO:Mo. The luminous intensity varies with the molybdenum concentration.

Keywords: molybdenum doped hydrothermal method photoluminescence

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