

论文摘要

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超声波作用下用氧化锌和硫化钠反应合成纳米硫化锌

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摘要: 以氧化锌和硫化钠为原料, 采用固液化学反应, 在超声波的作用下, 制备纳米硫化锌。实验得出最佳反应条件为: 反应温度80 °C, Na₂S浓度2.0 mol/L, 反应时间2 h, 反应前超声分散15 min。对最佳条件下得到的纳米硫化锌颗粒进行X射线衍射、扫描电镜、红外光谱及热重-微分热重分析。结果表明: 该颗粒为结晶完全的闪锌矿, 平均粒度为50 nm, 且颗粒在400~4 000 cm⁻¹具有红外透光性, 在纯氧气氛中具有良好的热稳定性。

关键字: 超声波; 氧化锌; 纳米硫化锌; 晶体

Preparation of nanoparticles ZnS by solid-liquid chemical reaction with ZnO and Na₂S under ultrasonic

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Abstract: Nanoparticles ZnS were prepared with ZnO and Na₂S by solid-liquid chemical reaction under ultrasonic condition. The optimum conditions gained from experiment are as follows: reacting temperature 80 °C, Na₂S concentration 2.0 mol/L, reacting time 2 h, and dispersing with ultrasonic 15 min before reaction. The nanoparticles ZnS obtained by the optimum conditions were characterized by X-ray diffractometry (XRD), scan electron microscopy (SEM), infrared (IR) and thermogravimetry-differential thermogravimetry (TG-DTG). The results show that these particles are good crystal zinc blende with average size of 50 nm, and these particles also possess good IR transmittance in the range from 400 to 4 000 cm⁻¹ and good thermal stability in oxygen.

Key words: ultrasonic; ZnO; nano-ZnS; crystal

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