

研究论文

用微波均相沉淀法合成Sc₂O₃纳米粉

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摘要: 以硫酸钪为母盐, 尿素为沉淀剂, 采用微波加热方式合成了水合碱式碳酸硫酸钪先驱体。用差式扫描量热法(DSC)、热重分析(TG)、红外光谱(IR)、X-射线衍射(XRD)分析了加热过程中先驱沉淀物的物相变化。采用高温煅烧和高能微波辐照两种方法制备了Sc₂O₃粉体。结果表明, 将先驱沉淀物分别在1000℃煅烧3 h和在900℃微波辐照20 min, 均制备出高纯、超细、粒度分布窄、分散性好、近似球形的Sc₂O₃纳米粉。

关键词: 无机非金属材料 Sc₂O₃ 微波均相沉淀法 均相沉淀法

Synthesis of Nanocrystalline Sc₂O₃ Powder Using a Microwave Homogenous Precipitation Approach

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Abstract: The hydrated basic carbonate-sulfate precursor was synthesized using scandium sulfate as mother liquor and urea as a precipitating agent by a microwave heating approach. The phase transformation processes of the precipitate precursor were analyzed by DSC/TG, FTIR and XRD. Two synthesis methods of Sc₂O₃ powder were compared. The results showed that highly pure, ultrafine, well dispersed, narrow particle size distribution and spherical Sc₂O₃ nanopowders can be obtained by calcination at 1000^oC for 3 h in resistance furnace or irradiation at 900^oC for 20 min in microwave furnace.

Keywords: inorganic non-metallic materials scandium oxide microwave homogenous precipitation approach homogenous precipitation method

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