

SrO-CeO₂体系化合物的固相反应机理研究

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摘要 以SrCO₃和CeO₂为原料, 采用XRD和TG/DTA分析技术研究了SrO-CeO₂体系化合物的物相形成过程. 结果发现, 当灼烧温度低于950℃时, 原始粉料只反应生成Sr₂CeO₄; 而当灼烧温度高于950℃时, 在反应的初始阶段, 原始粉料中同时出现SrCeO₃和Sr₂CeO₄物相, 在950℃附近, 主要产物为Sr₂CeO₄, 在1000℃以上, 主要产物为SrCeO₃. SrCeO₃和Sr₂CeO₄物相分别存在着两种形成机制, 当温度高于1000℃时, SrCeO₃由SrO和CeO₂直接反应生成, 而Sr₂CeO₄则由SrCeO₃和SrO反应生成; 当温度低于950℃时, Sr₂CeO₄由SrO和CeO₂直接反应生成, 而在950℃附近SrCeO₃则由Sr₂CeO₄和CeO₂反应生成.

依据这些实验结果, 给出了SrO-CeO₂体系固相反应规律, 并对SrCeO₃衍射数据JCPDS36-980的错误结果进行了分析. 荧光光谱测试结果表明, Sr₂CeO₄物相的形成机制对其激发光谱产生明显的影响.

关键词 [形成机制](#) [SrCeO3](#) [Sr2CeO4](#) [SrO-CeO2体系](#)

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Solid State Reaction Mechanism of SrO-CeO₂ System

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Abstract The solid state reaction process of the mixture of SrCO₃ and CeO₂ powders with different Sr/Ce ratios was studied by using XRD and TG/DTA methods. The results show that only Sr₂CeO₄ phase is formed for a firing temperature lower than 950℃ while Sr₂CeO₄ and SrCeO₃ phases are simultaneously developed in the initial stages of the reaction for a firing temperature above 950℃. In the initial stages of the reaction above 950℃, the major product is Sr₂CeO₄ for close to 950℃ and it becomes SrCeO₃ above 1000℃. There are two types of formation mechanism for SrCeO₃ and Sr₂CeO₄, respectively. When the firing temperature is above 1000℃, SrCeO₃ is formed directly by SrO and CeO₂ while Sr₂CeO₄ is created by SrCeO₃ and SrO. However, SrO and CeO₂ convert directly to Sr₂CeO₄ below 950℃ and SrCeO₃ is produced by the reaction of Sr₂CeO₄ and CeO₂ for close to 950℃. Based on these results, the reaction mechanism of SrO-CeO₂ system is derived and the wrong results in the XRD data of SrCeO₃ (JCPDS36-980) have been clarified. The fluorescence spectra of Sr₂CeO₄ show that the formation mechanism has effect on its excitation spectra.

Key words [formation mechanism](#) [SrCeO3](#) [Sr2CeO4](#) [SrO-CeO2 system](#)

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