

研究论文

Sm, Pr掺杂CeO₂和CeMoO₁₅基固体电解质的结构与性能

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摘要 采用溶胶凝胶法制备了Sm和Pr掺杂的CeO₂和CeMoO₁₅基固体电解质, 通过X射线衍射(XRD)、拉曼光谱(Raman)、场发射扫描电镜(FE-SEM)等手段对氧化物结构进行了分析, 用交流阻抗谱测试了其电性能, 并比较了不同基体及其掺杂体系的结构与电性能. 结果表明, Ce₆MoO₁₅基掺杂体系的导电性能高于CeO₂基掺杂体系; 元素Mo的加入使Ce₆MoO₁₅基材料的晶粒尺寸增大, 晶界相成分减少, 材料的晶界电导率增加, 600 °C以下材料导电性能明显提高; Pr的掺入减小了材料的晶粒尺寸, 提高了材料的晶界电导率.

关键词 [固体电解质](#) [电导率](#) [晶界](#)

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Structure and Electrical Properties of Pr and Sm Doped CeO₂ and Ce₆MoO₁₅ Based Solid Electrolytes

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Abstract Sm and Pr doped CeO₂ and Ce₆MoO₁₅ based materials were synthesized by sol-gel method. The structure of the powders were characterized by X-ray diffraction(XRD), Raman spectra, field emission scanning electron microscopy(FE-SEM) and the electrical conductivity of the samples was investigated by AC impedance spectroscopy. By comparing the structure and electrical properties of different systems, it could be concluded that the electrical property of Ce₆MoO₁₅ based system is better than that of CeO₂ system. The added Mo element resulted in the increase of grain size and improved the grain boundary conductivity notably below 600 °C, while the Pr dopant induced the smaller grain size and improved the grain boundary conductivity of the materials.

Key words [Solid electrolyte](#); [Conductivity](#); [Grain boundary](#)

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