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研究论文

$Ba_{1-x}Pr_xCoO_3$阴极材料在中温SOFC中的应用

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摘要 采用湿化学法合成系列阴极材料$Ba_{1-x}Pr_xCoO_3$(x=0.3, 0.4, 0.5, 0.6). TG-DTA和烧结曲线测试结果表明, 在950 ℃时样品发生相变, 形成了晶相. 样品的SEM结果显示, Pr离子掺杂到一定量时, 将抑制晶粒长大, 减少阴极的孔洞率. 单电池测量结果表明, 用x=0.5的阴极材料制成的单电池表现出最好的输出特性, 具有最大短路电流密度和最大输出功率密度, 是掺杂Y的$BaCeO_3$基电解质的一种优化配比阴极材料.

关键词 中温固体氧化物燃料电池(IT-SOFC) 阴极 热重-差热 烧结曲线

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Application of $Ba_{1-x}Pr_xCoO_3$ Cathode Materials in IT-SOFC

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Abstract Cathode materials $Ba_{1-x}Pr_xCoO_3$(x=0.3, 0.4, 0.5, 0.6) were prepared with wet chemical method. TG-DTA and sintering curves show that the materials were crystallized in a single perovskite phase at around 950 ℃. The SEM images show that the prohibition of the particle growth and the decrease of the hole ratio were produced when the increase of Pr ions dopant to a certain quantity. The results of the single cell tests show that the fuel cell with the cathodes x=0.5 have the best output performance and the greatest short current density and the maximum output power density, so it has more proper ratio than the other samples and fit Y^{3+}-doped $BaCeO_3$ based solid electrolyte material perfectly.

Key words IT-SOFC Cathode TG-DTA Sintering Curve

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