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钇掺杂镨酸钡超细粉体的合成与性能

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摘 要：采用溶胶低温燃烧法和硝酸盐水溶液超声喷雾热解法制备钇掺杂的镨酸钡($BaPr_{0.9}Y_{0.1}O_{3-\delta}$)超细陶瓷粉体。应用XRD、SEM、TEM和激光粒度分析仪对陶瓷粉体的结构和组成进行表征。研究结果表明：采用溶胶低温燃烧法制备的$BaPr_{0.9}Y_{0.1}O_{3-\delta}$(BPY)为近似球形、粒径小于200 nm以及粒度分布范围窄的超细粉体；用硝酸盐水溶液经喷雾热解法制备的BPY为空心球形、粒径为1 μm左右以及窄分布的超细粉体；BPY粉体可以在1 250和1 300 ℃烧结致密；C_2的选择性和收率较低。

关键字： BaPr0.9Y0.1O3-δ；固体电解质；超细陶瓷粉；热解

Synthesis and characteristics of Y-dope BaPrO3 ultrafine powders

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Abstract: BaPr0.9Y0.1O3−δ ultrafine powders with homogeneous composition were synthesized via low temperature combustion process and ultrasonic spray pyrolysis method. The BaPr0.9Y0.1O3−δ powders, obtained by combustion and spray pyrolysis, were characterized using X-ray diffractometer, scanning electron microscope, transmission electron microscope and laser particle size analyzer. The results show that the powders obtained by combustion are nano-particles with size less than 200 nm, showing almost-spherical morphology. The powders obtained by spray pyrolysis are uniform hollow spherical particles with about 1 μm in diameter and agglomerate free with a narrow size distribution. When pressed and sintered in air at 1 250 ℃ and 1 300 ℃ for 8 h, dense sintered samples can be obtained. C2 yield and selectivity are low.

Key words: BaPr0.9Y0.1O3−δ; solid electrolyte; ultrafine ceramic powder; pyrolysis

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