Low Temperature Densification and Electrochemical Properties of $\text{Sm}_{0.16}\text{Ce}_{0.84}\text{O}_{1.92}$ electrolyte by Zn Doping

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$\text{Zn}_x\text{Sm}_{0.16}\text{Ce}_{0.84-x}\text{O}_{1.92-x}$ ($0 \leq x \leq 0.1$) oxides were prepared by solid state reaction. Zn as sintering additive and dopant was investigated. Zn can be doped into the fluorite structure at $x \leq 0.04$, and at $x = 0.1$ the secondary phase ZnO can be identified. The sintering activity increased with increasing of x . At 1200 °C, the relative density runned up to 95% at $x \geq 0.02$, while the relative density of Zn-free composition reached only 75%. In order to get the relative density above 95%, the Zn-free sample need to be sintered at 1400 °C. The conductivity can also be improved by appropriate Zn doping.

Keywords: $\text{Zn}_x\text{Sm}_{0.16}\text{Ce}_{0.84-x}\text{O}_{1.92-x}$; densification; sintering; electrical properties

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