Short Communication

Characterization and Intermediate Temperature Solid Oxide Fuel Cell Performances of BaCe_{0.9}Tm_{0.1}O_{3-α}-KCl-NaCl Composite Electrolyte

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In this study, BaCe_{0.9}Tm_{0.1}O_{3-α} was prepared via a sol-gel combustion method using cerium nitrate, thulium oxide and barium nitrate as raw materials. Subsequently, it was reacted with the binary KCl-NaCl salts to obtain BaCe_{0.9}Tm_{0.1}O_{3-α}-KCl-NaCl composite electrolyte. The structure, morphology, conductivity and fuel cell performance of the obtained samples were investigated. SEM images showed that KCl-NaCl inorganic molten salts covered and filled in the areas between the BaCe_{0.9}Tm_{0.1}O_{3-α} particles. The highest power density and conductivity of BaCe_{0.9}Tm_{0.1}O_{3-α}-KCl-NaCl were 244.4 mW·cm⁻² and 2.1×10⁻¹ S·cm⁻¹ at 700 °C, respectively.

Keywords: Composite electrolyte; BaCeO₃; Molten salt; Fuel cell; Conductivity

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