Short Communication

Intermediate Temperature Electrochemical Properties of Yb³⁺ Doped SrCeO₃- carbonate and Chloride Composite Electrolytes

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In this work, novel SrCe_{0.9}Yb_{0.1}O_{3-α}-(Li/Na)₂CO₃ (SCYb-LN) and SrCe_{0.9}Yb_{0.1}O_{3-α}-LiCl-SrCl₂ (SCYb-LS) electrolyte composites were successfully fabricated at low temperature. The SEM image results show that the composites possess sufficient density. The highest conductivity is observed to be 3.5×10^{-2} and 1.2×10^{-1} S·cm⁻¹ for SCYb-LS, SCYb-LN at 600 °C, respectively. In a hydrogen-containing atmosphere, the composites are almost pure ionic conductors, according to the $\log \sigma \sim \log (pO_2)$ plots results. Using SCYb-LN and SCYb-LS as electrolytes, the H₂/O₂ fuel cells produce the maximum power densities of 294 and 147 mW·cm⁻² at 600 °C, correspondingly.

Keywords: SrCeO₃; Composite; Electrolyte; Fuel cell; Conductivity

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