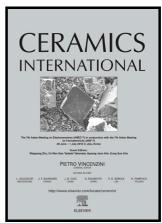
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ACCEPTED MANUSCRIPT

Redox stability of $La_{0.6}Sr_{0.4}Fe_{1-x}Sc_xO_{3-\delta}$ for tubular solid oxide

cells interconnector

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Abstract

Sc-substituted $La_{0.6}Sr_{0.4}FeO_{3-\delta}$ (LSFSc) has been synthesized for utilization as an

integrated ceramic interconnector of tubular-solid oxide cells (SOCs). Redox stability and

electric conductivity of LSFSc were improved by optimizing the scandium (Sc) doping

concentration, the pH of the synthetic solutions and the calcination temperature of the organic

precursors. The crystalline phases of LSFSc were stable when the pH of the synthetic

solution was below 2 and the calcination temperature was over 1200 °C. As the Sc

concentration increased, redox stability was improved while the electrical conductivity

decreased. To consider the trade-off relationship between electrical conductivity and phase

stability, La_{0.6}Sr_{0.4}Fe_{0.9}Sc_{0.1}O_{3-δ} can be considered as one of the stable compositions for an

integrated ceramic interconnector of tubular-SOCs.

Keywords

solid oxide cells; ceramic interconnector; LSFSc; redox stability; electric conductivity

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