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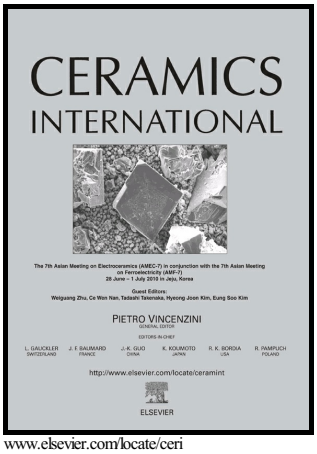

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Abstract

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, $La_{0.6}Sr_{0.4}Fe_{0.9}Sc_{0.1}O_{3-\delta}$ 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