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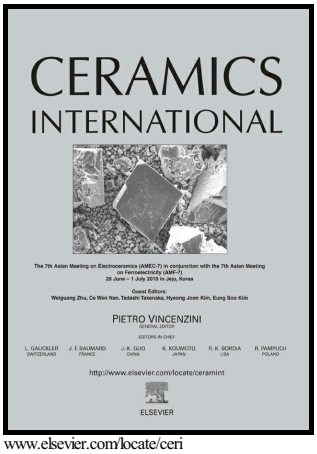

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Catalysts for composite cathodes of protonic ceramic fuel cells

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Abstract

Unlike oxygen ion-conducting fuel cells (OCFCs), protonic ceramic fuel cells (PCFCs) generate steam at the cathodes. Many different catalysts have been developed for OCFC anodes; therefore, in this work, potential catalysts for steam-generating cathodes of PCFCs were investigated. The steam generation reaction at the PCFC cathode can be enhanced by the use of suitable cathodic catalysts. PCFCs with composite cathodes comprising (La,Sr)FeO_3 and Y-doped Ba(Ce,Zr)O_3 were fabricated by infiltrating small amounts of alkali oxides into the composite as cathodic reaction catalysts. The results obtained from symmetric half-cells demonstrated that lithium oxide catalysts significantly improve the cathodic performance. A plausible mechanism for the enhancement in the cathode reaction is also proposed.

Keywords: protonic ceramic fuel cells; alkali oxide; catalysts; composite cathode; infiltration method

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