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# $(LaSr)_xMnO_3$ Cathode Stoichiometry Effects on Electrochemical Performance in Contact with AISI 441 Steel Interconnect

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**Abstract**

Cathode plays an important role in solid oxide fuel cell performance. This work studies the stoichiometry effect of $(LaSr)_xMnO_3$ (LSM) cathode on its electrochemical behaviors at 800°C by investigating the interfacial reaction of an AISI 441 interconnect/LSM electrode/yttria-stabilized zirconia (YSZ) electrolyte half-cell structure. Ohmic resistance and polarization resistance of the cathodes are analyzed by deconvoluting the electrochemical impedance spectroscopy (EIS) data. The results show that the polarization resistance is dominant for decreasing the half-cell performance. Microstructure and phase analyses show that A-site excessive LSM sample experiences stronger bonding with the YSZ electrolyte. Energy dispersive X-ray spectroscopy analyses reveal that Cr species first deposits and then is incorporated into the cathode perovskite structure by replacing Sr in the structure. Based on the above observations, the interaction mechanisms for the AISI 441 interconnect/LSM

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