

Bimetallic Cermet Anode Materials for Solid Oxide Fuel Cells Showing Sulfur Tolerance: Electrochemical Performance and Metallic Species Characterization

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Alternate, clean energy sources are in high demand due to increasing costs of crude oil and continuing increasing demand. Highly efficient energy sources, such as solid oxide fuel cells (SOFCs), are becoming increasingly necessary to meet these criteria. Until the predicted switch to a hydrogen economy, SOFCs can bridge the gap, providing energy with methane fuel by utilizing the existing natural gas infrastructure until the switch can be made on a large scale. Sulfur tolerant anode materials are necessary, since otherwise poisoning will rapidly occur with natural gas fuel. Bimetallic cermet anode materials containing Ni have been prepared and characterized by various electrochemical methods (electrochemical impedance spectroscopy, chronoamperometry, cyclic voltammetry) in fuels containing 10% H<sub>2</sub>S as poison. The metallic species responsible for the observed tolerance have also been investigated by physical characterization methods.