

Development of Fe doped Ni-Co spinel for use in SOFC interconnects

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Fuel cells are an attractive alternative for the production of energy with few environmental impacts and high yield conversion of chemical energy into electrical energy. Interconnects in Intermediate Temperature Solid Oxide Fuel Cell (ITSOFC) provide electric contact between the electrodes as well as separation of air and fuel. The metallic interconnect has many advantages of low material cost, good mechanical properties, high thermal conductivity and easy manufacturing process to large area. However, one major concern with metallic interconnects is their oxidation during ITSOFC operation (600 – 800 °C), which affects their long-term stability and contact resistance. One approach to improving the oxide growth resistance of metallic interconnects is to apply a coating that may reduce the rate of oxide formation as well as modify the properties of the oxide that is generated by the substrate. Therefore, compact, electronically conductive and low-cost surface coatings for metallic interconnects need to be developed. The oxides of type spinel are more applicable due to its thermal expansion coefficient compatible with the other components, barrier volatilization of chromium and oxygen diffusion. The aim of this work is to obtain coatings based Fe doped Ni-Co, using the technique of dip-coating on ferritic stainless steel. After heat treatment, we obtain the phase of the spinel in order to protect stainless steel against oxidation, other than those previously reported. The films are characterized by SEM, EDS, XRD and also for adherence. We intend to develop a uniform film, adherent and without cracks.