This work investigates synthesis and characterization of Cu-Fe-O/LaCrO٣ spinel composite coatings on Crofer ٢٢ APU and AISI ٤٣٠ ferritic stainless steels (F) with emphasis on the oxidation behavior and electrical conductivity of these coatings. The $Cu_xFe_{٣-x}O_٤$ (٠,٧٥?x?١,٢٥) and LaCrO٣ nano-crystalline powders were prepared by glycine–nitrate process (GNP) followed by calcination. The powders were then applied on stainless steel substrates by screen printing method. The results of electrical conductivity and thermal expansion coefficient (TEC) measurement, thermal stability in air and chemical compatibility with cathode material showed that the $CuFe_٢O_٤$ spinel is a good candidate as coating on stainless steel interconnects of SOFCs. The results of long term oxidation experiments and area specific resistance (ASR) measurements showed that the spinel protection layer not only significantly decreased the ASR, but also inhibited the $Cr_٢O_٣$ subscale growth by acting as a barrier to the inward diffusion of oxygen as well as the chromium migration into the coating surface even after ٤٠٠ h oxidation at ٨٠٠ °C in air. Besides, $CuFe_٢O_٤$/LaCrO٣ composite coatings had an ASR value of ٧,٧ after ٤٠٠ h oxidation which is smaller than ١٣,٨ for $CuFe_٢O_٤$ spinel coating as well as ٥١,٧ for un-coated Crofer ٢٢ APU sample.

Keywords: Cu-Fe-O/LaCrO٣; Spinel; Ferritic stainless steel; Interconnect; Solid oxide fuel cell