

**Optimization of Mn-Co-O spinel spray coatings for SOFC applications
Using the Design of Experiment Method**

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Ferritic stainless steel interconnects are generally used in planar type SOFC stacks, due to their low-cost, chromia scale-forming behavior, and good thermal expansion match to other stack components. However, volatile Cr-containing species, which originate from the oxide scale, can poison the cathode material in the cells and subsequently cause power deterioration in the device. A conductive MnCo spinel coating has been developed for preventing cathode poisoning and to provide low electrical resistance in SOFC stacks. It is essential that the spinel coating be sufficiently dense to block the Cr-containing species volatilization, so it is important to develop an optimized process for fabricating the coatings. This paper will summarize development of an ultrasonic spray coating method and optimization of the process using design of experiment methodology with Taguchi and ANOVA analysis. Using spray parameters obtained from the DOE optimization, dense spinel layers with about 2-micrometer thickness have been fabricated. The results of this work demonstrate the possibility of automated mass production of dense conductive spinel-coated interconnect materials.