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Investigation of Aluminum Titanate Doped Solid Oxide Fuel Cell Anodes

Developing new ways to obtain sufficient energy away from coal and oil production is a pressing challenge of today. Fuel cells are one viable option for facing this problem and have a great potential to change how energy is produced in the future. It is important to focus on reliability and longevity in design without sacrificing efficiency of the cell and is largely the focus of this project. The addition of ALT to Ni-YSZ has been found to improve the desired properties for the anode and finding the optimal amount to add is the core of this project. In order to be practical for commercial implementation, a new procedure needs to be developed to create samples of roughly 0.5mm thick. This is a reduction in size from the 2mm thick samples tested in the past and is important since a difference in thickness can have a large effect on the material properties and performance of the anode and especially its ability to provide enough strength and support to the rest of the fuel cell. At first, it was attempted to simply cut down on the amount of powder used for each sample and continue with the previous pressing procedure. It was discovered that roughly .5 grams of ceramic powder was the lower limit to what would provide a viable sample. After sintering, these samples were still too thick for the application. Future work will involve the testing and developing of a tape casting procedure that should allow for the creation of thin viable samples for testing.