

FABRICATION OF Ni-YSZ ANODE FOR SOFC BY ESD

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The commonly used Ni-YSZ cermet is known to have many desirable properties for use in SOFC anodes, such as high electronic and ionic conductivity, high electrochemical activity, and good microstructural stability. ESD(Electrostatic Spray Deposition) was applied to fabricate a thin-layer of yttria-stabilized zirconia(YSZ) electrolyte on a solid oxide fuel cell(SOFC) anode substrate consisting of Ni-YSZ cermet.

In this work, a solution of Ni-YSZ(Ni- 8 mol% yttria stabilized zirconia) in methanol was sprayed onto the substrate anode surface at 600-800°C by ESD. After sintering the deposited layer at 1100-1300°C for 5h depending on temperature, analyzed SEM images and XRD data. A Ni-YSZ composite material was used for the anode, with porosity and pore size, designed to ensure a large enough effective surface area for electrochemical oxidation. The studied deposition parameters were deposition temperature, distance between nozzle and substrate, solution flow rate and DC voltage.

The goal was to obtain porous and continuous 8YSZ coatings by ESD. We have checked the efficiency of this system by SOFC measuring apparatus. Solid Oxide Fuel Cells (SOFCs) are interested as an energy conversion system of future with high efficiency and environmental cleanness. We have checked the efficiency of this system by SOFC measuring apparatus.

References:

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Figures:

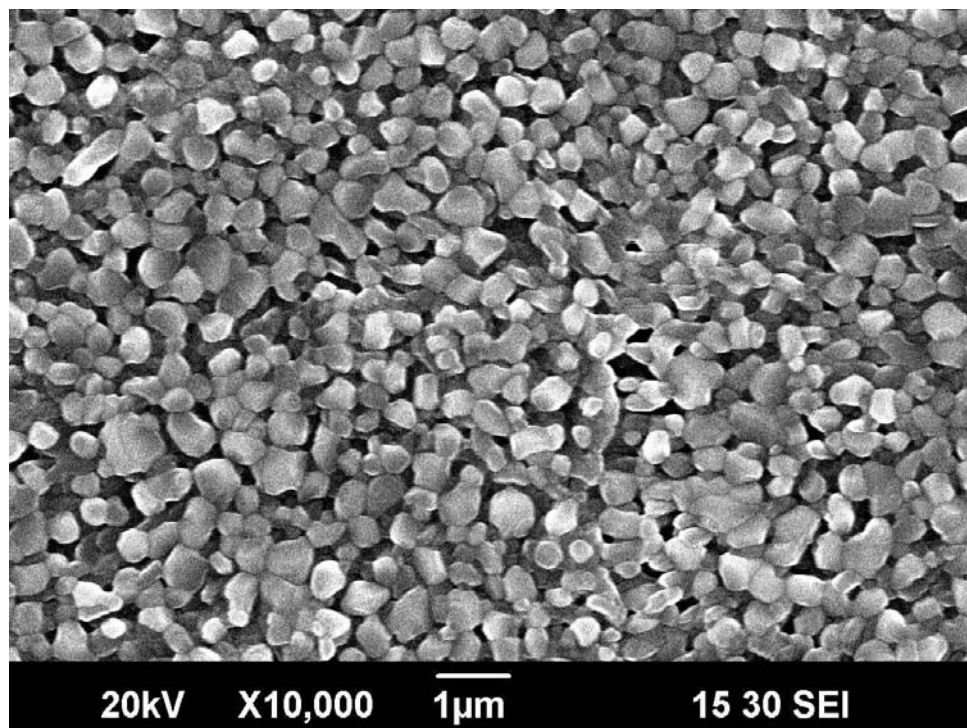


Figure 1. SEM image of a SOFC anode substrate. After sintering 1300 -5hr, Porous and continuous composition observed.