

Property of NiO-YSZ particle synthesized by Aerosol Flame Deposition

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Aerosol Flame Deposition (AFD) process was capable of producing mixed metal oxide powders with 10~500 nm size from low-cost and easy-synthesized precursors. In this study, the nickel oxide - yttria stabilized zirconia (NiO-YSZ) used as the anode of SOFC has been synthesised as powders and thin films by using the AFD process. This process was suitable for fabricating the nano-sized and spherical NiO-YSZ particles capable of enhancing TPB(three phase boundary) areas. The synthesized samples were studied by changing processing parameters such as the concentration of the precursor solution, the composition ratio of precursor solution and the flow rates of the oxygen-hydrogen flame. The NiO-YSZ particles were sufficiently crystallized and the shape of particles was observed by SEM and TEM. The image contains particles with two drastically different size ranges, which reflects the bimodal size distribution. An impedance analyzer was applied to measure conductivities of NiO/YSZ pellets with the various Ni content prepared from precursor solution with 20, 40, 60 and 80 mol% of Ni source.

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