Characteristics of Sm-doped ceria powders with nanometer size for SOFC electrolyte

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Ceria has been investigated as an oxide-ion electrolyte competitive with stabilized zirconia for use in solid-oxide fuel cell(SOFC). Advantage of using ceria-based electrolytes is well known as higher ionic conductivity. In this study, nano-sized samaria-doped ceria(SDC) powders were prepared by spray pyrolysis from the spray solution with organic additive. The precursor powders with hollow structure and thin wall structure turned to the nano-sized SDC powders after post-treatment at high temperatures. The doping concentration of samarium was fixed at 20 mol% of cerium component. The mean size of the SDC powders were controlled by changing the post-treatment temperatures. The effect of mean size of SDC powders on the morphological and electrical characteristics of SDC pellets were investigated.