

Fabrication and its performance of 5x5 cm² SOFC singlecell based on SDC for low temperature operation

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The 5x5 cm² anode supported SOFC with samarium doped ceria (SDC) electrolyte was fabricated for low temperature operation. The cermet of SDC and lanthanum strontium cobalt ferrite (LSCF) was used as cathode layer. The thicknesses of electrolyte and cathode layer were 11 and 13 μm, respectively. 30 vol.% PMMA was added as pore former in order to make optimum anode micro-structure. The surface of SDC electrolyte was sufficiently dense to inhibit crossover of hydrogen to cathode side. The 11-μm thick SDC doped single cell was tested between 500 and 600 °C. The open circuit voltage (OCV) was 0.84 V at 500 °C with humidified hydrogen (3 % H₂O) and decreased to 0.78 V at 600 °C due to thermodynamic effect. The stability test was performed for 100 h. There was no sudden voltage drop. And voltage was maintained over the 100 h. I-V performance and electrochemical properties will be discussed.