(Two pages abstract format: including figures and references. Please follow the model below.)

Experimental evaluation of the operating parameters impact on the performance of anode-supported solid oxide fuel cell

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Abstract (Arial 10)

The issue of renewable energy is becoming significant due to increasing power demand, instability of the rising oil prices and environmental problems. Among the various renewable energy sources, solid oxide fuel cell is gaining more popularity due to their higher efficiency, cleanliness and fuel flexibility. The performance of solid oxide fuel cells (SOFCs) is affected by various polarization losses, namely, ohmic polarization, activation polarization and concentration polarization. Under given operating conditions, these polarization losses are largely dependent on cell materials, electrode microstructures, and cell geometric parameters. Solid oxide fuel cells (SOFC) with yttria-stabilized zirconia (YSZ) electrolyte, Ni–YSZ anode support, Ni–YSZ anode interlayer, strontium doped lanthanum manganate (LSM)–YSZ cathode interlayer, and LSM current collector, were fabricated. The effect of various parameters on cell performance was evaluated. The parameters investigated were: (1) YSZ electrolyte thickness, (2) fuel composition, (3) anode support thickness, and (4) anode support porosity, (5) time and temperature impact. The effect of these cell parameters on ohmic polarization and on cell performance was experimentally measured. Cell parameter study, a cell with optimized parameters was fabricated and tested. The corresponding maximum power density at 800 ◦C was ∼0.5 Wcm^{-2}.

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Figures