

Fabrication and Characterization of 1kW Class SOFC Stack in KIER

이승복, 박광연, 임탁형*, 송락현, 신동열
KIER 신연료전지연구센터
(ddak@kier.re.kr*)

1 kW class anode-supported micro-tubular solid-oxide fuel cell (SOFC) stack for use as an auxiliary power unit (APU) for an automobile is fabricated and characterized. For the anode-supported tubular-type SOFC, a high-power single cell was fabricated that showed a cell performance of 0.60 W/cm^2 at 0.7V and 750°C . Additionally, a fuel manifold was designed by adopting a simulation method to supply fuel gas uniformly into a single unit cell. Finally, 1 kW class anode-supported micro-tubular SOFC stack was constructed by stacking bundles of the single cells in a series of electrical connections. The SOFC stack showed a high power density of 0.35 W/cm^2 . moreover, in order to verify the durability of the stack under various load conditions, a long-term stability test result for the developed SOFC stack was conducted under loads of 10A, 20A and 50A. Between constant load operations, the current load was changed to measure the I-V characteristics of the SOFC stack. Although the SOFC stack was operated under various operating conditions, the SOFC stack showed stable performances within the operating time.