

## Sn/Ni-YSZ SOFC anode catalysts with minimized coking for methane fuel

간혁, 이현주\*

연세대학교

(azhyun@yonsei.ac.kr\*)

Direct conversion of hydrocarbon fuels at the anodes in solid oxide fuel cell(SOFC) has received a great attention for efficient conversion of chemical energy to electric power. Its major problem is a significant carbon deposition on the anodes. The Ni-YSZ anode, which is a composite of Ni metal and yttria-stabilized zirconia, is the most common in SOFCs with H<sub>2</sub> as a fuel. However, it is not suitable for direct utilization of dry hydrocarbon fuels because Ni catalyzes the decomposition of hydrocarbon and causes serious carbon deposition.

Here, we prepared Sn doped Ni-YSZ and showed that the doping significantly reduce the coking. When the Sn doped Ni-YSZ anodes were exposed to methane at 800°C, the amount of carbon deposition on the anode decreased. In this work, anode supported electrolytes were fabricated by performing dip-coating of electrolyte YSZ slurry on pressurized anode pellet composed of Sn/NiO/YSZ powder and sintering at 1400°C for 3h. The LSM-YSZ cathode was coated on the anode-supported electrolyte by the screen printing method. The power density of anode supported unit cells prepared in this work were evaluated and long term stability was tested for methane fuel.