Application of silver nanoparticles made by pulsed wire evaporation(PWE) method to SOFC cathode layer

정용민[1,2], 박석주[1,*], 이승복[1], 이종원[1], 송락현[1], 임탁형[1],
신동렬[1], 김동현[2]
[1]한국에너지기술연구원; [2]경북대학교
(sjpark@kier.re.kr*)

La0.6Sr0.4Co0.2Fe0.8O3-δ(LSCF) is a promising cathode material at the SOFC operating at the intermediate temperature (550-750℃). Silver has the highest electronic conductivity and a high catalytic property for oxygen reduction at the intermediate temperature. LSCF-CGO composite materials exhibit greatly improved cathode performance. Although LSCF-CGO composite cathodes have exhibited much improved catalysis properties, studies about alternative materials need to enhance the composite properties. In this paper, silver nanoparticles were used as the cathode catalyst to decrease cathode resistance at the intermediate temperature. Silver nanoparticles were made by a pulsed wire evaporation (PWE) method. The sliver nanoparticles were infiltrated into the cathode layer by a vacuum infiltration method. SOFC unit cell having the cathode layer with the silver nanoparticles and without the silver nanoparticles were tested at the temperature range of 600-700℃ with air oxidant and moist hydrogen fuel. The microstructures of the two type cathodes were observed by a scanning electron microscope (SEM).