The H_2S tolerance of ceria coated Ni/Al anode for molten carbonate fuel cells

강민구[1,2], 박동녘[1], 송신애[1], 한종희[1], 윤성필[1], 남석우[1],
김성현[2,*]
[1]한국과학기술연구원; [2]고려대학교 화공생명공학과
(kimsh@korea.ac.kr*)

The hydrosulfied included in fuel gas is well established as an impurity for the molten carbonate fuel cells (MCFCs). H_2S content is limited to 100 ppm in fuel gas. The Ni based anode of the MCFC reacts with H_2S to form nickel sulfide, which can block active electrochemical reaction sites. And it is directly concerned in the cell performance. The ceria is a good candidate material as a desulfurization sorbent. It is well known that ceria reacts with H_2S to form cerium oxysulfide and water. For this reason, we used ceria coated Ni-Al alloy anode to enhance the cell performance of anode in the MCFCs. The ceria coated anode was prepared by vacuum suction method using ceria sol. The physical properties of the modified anode were evaluated using the SEM, XRD, Hg porosimeter. To analyze the effect of sulfur on the cell performance, the MCFC single cell (10cm × 10 cm) was used. The MCFC single cell was operated at 650℃ under a current density of 150mA/cm^2. During the introduction of H_2S, the I-V curve was measured under H_2S concentration in the range of 100 ppm. These results were compared with the single cell performance used uncoated anode.