

BFB3

AC Impedance Characteristics of PAFC Single Cells with Different Fabrication Parameters 제조조건에 따른 인산형 연료전지 단전지의 교류 임피던스 특성

송락현, 김창수, 신동열, 최수현
한국에너지기술연구소

Phosphoric acid fuel cell (PAFC) is the most advanced technology among several types of fuel cells. Since the PAFC single cell consists of electrode, electrolyte matrix, and bipolar plate, the cell performance is related to a capability of each component. Especially, the cell performance is known to depend on electrolyte impregnation treatment in the matrix and electrode, the alloy catalyst of the electrode, and the single cell structure. In the present work, these effects on the cell performance were studied by using ac impedance technique. From the impedance analysis, the interfacial resistance of the cathode and the internal resistance of the single cell were determined. The internal resistance did not depend on impregnation temperature but the interfacial resistance of the cathode increased with increasing impregnation temperature, which is attributed to a poor formation of three-phase boundary. As compared with the cathode of Pt catalysts, the alloy catalyst of Pt-Ni showed a lower interfacial resistance per Pt mass. Also, the cathode of the ribbed substrate cell indicated a higher interfacial resistance value than those of the ribbed separator and the nonporous type, which is related to the presence of the porous bipolar plate acting as gas supply barrier in the ribbed substrate type.