

Development of a novel membrane electrode assembly for the polymer electrolyte fuel cells under the high temperature and low humidified operation conditions

류성관, 최영우*, 박진수¹, 양태현, 임성대, 김한성², 김창수
한국에너지기술연구원; ¹상명대학교; ²연세대학교
(cozmoz67@kier.re.kr*)

Recently, high temperature polymer electrolyte fuel cells(PEFCs) are focused on their attractive features such as simplified water/heat management, enhanced CO anti-poisoning and faster electrode kinetics. However, at high operating temperature over 100 oC, membrane stability and proton conductivity are key issues. Especially, proton conductivity decreases drastically due to the dehydration of water in the polymer under the high temperature operation of PEFCs. Many researches are in progress to improve the proton conductivity. In particular, ionic liquids can be used as a water-alternative in proton conducting polymer due to their intrinsic properties under the low humidified operation conditions. In this study, we have prepared the membrane electrode assemblies (MEAs) containing the various IL content in a catalyst layer. The electrochemical properties of the prepared MEAs were investigated by cyclic voltammetry experiments and single cell performances.