MEA Performance in PEFC Prepared by Decal Technique in Pilot Scale Production

류성관[1,2,*], 이종욱[1], 박석희[1], 김창수[1], 남기석[2]
[1]한국에너지기술연구원; [2]전북대학교
(muse78@kier.re.kr*)

Membrane electrode assembly for polymer electrolyte fuel cell is commonly prepared by spraying, screen-printing, brushing, and knife-coating techniques. In these processes, the most important step is to make catalyst slurry in high dispersion. Generally, mechanical mixing such as ultrasonics, magnetic stirrer, and homogenizer was employed to disperse catalyst with Nafion binder in the mixture of water, alcohol and some viscosity enhancing material. In this work, we use high-shear type Mixer to achieve high catalytic dispersion. The prepared slurry shows particle distribution in sub-micro scale in narrow regime. Catalyst slurry was prepared from 40 wt% Pt/C from Johnson Matthey, 20 wt% Nafion solution from DuPont and mixed solvent of water, 1-propanol and 2-propanol.
We coated the prepared slurry onto the PET film using pilot scale coater (Coatema). Then the dried catalyst layer on PET film was laminated to Nafion membrane by hot-pressing technique at 120~140℃. The transfer efficiency onto membrane was 100% in this study. Performance of such MEA shows higher cell performance than the conventional process.