Fabrication of Cathode using Non-Precious Metal Catalyst for Membrane Electrode Assembly of Polymer Electrolyte Membrane Fuel Cell

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PEMFC is received worldwide attention because it can be used in the fuel cell electric vehicle (FCEV), which are about to start to run on the road as the ultimate eco-car having high efficiency and clean emission. Despite several advantages of FCEV, there are still challenges to address for the wide expansion of FCEV into the market such as cost because of PGM catalyst. To reduce the cost of the fuel cell system, many researchers have been developing a non-Pt catalyst as a cathode catalyst. In many studies, many researchers have been struggling to make electrode using non-PGM catalyst, due to the thickness of the catalyst layer in the membrane electrode assembly (MEA). In this work, three type of GDE fabricated by different preparation method (spray, doctor blade, brush) were used to find optimum fabrication method. In addition, various I/C ratios (ionomer/catalyst weight ratios) was tested. As a result, I/C value 1.0 displayed the highest MEA performance. MEA fabricated using GDE synthesized by doctor blade shows the improved current density (0.13 A/cm2 at 0.6V).