

Porosity Effects of Catalyst Layers in Membrane-Electrode Assembly (MEA) Using Hydrocarbon-Based Membrane and Ionomer on the Electrochemical Characteristics of Polymer Electrolyte Membrane Fuel Cell

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Membrane-electrode assembly (MEA) consisting of the hydrocarbon-based membrane and ionomer binder was developed for the polymer electrolyte membrane fuel cell (PEMFC). In this study porosity effects of catalyst layers in MEA on their electrochemical characteristics of PEMFC were investigated to optimize interfacial compatibility with prepared polymer electrolyte membranes. Several catalyst slurries with different compositions of catalyst, ionomer solution as a binder and alcohol as a dispersant were used to prepare MEAs for the PEMFC application. The prepared MEAs were characterized by electrical impedance spectroscopy and cyclic voltammetry to investigate the interfacial compatibility. In addition, the performance of the MEAs under fuel cell operating conditions was evaluated by plotting the I-V curves.