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Simulation and experimental analysis on the performance of PEMFC based on bipolar plate designs

A polymer electrolyte membrane fuel cell (PEMFC) shows different levels of performance analysis depending on the bipolar plate designs of the flow fields. The designs of the flow fields vary depending on the diffusion flux, which is the flow in a channel moving through a layer of gas diffusion to catalyst layers. However, flow fields that can suppress concentration loss in the area of high-current density have been suggested. The bottom of the cathode channel was fabricated in a parallel type and the anode channel was fabricated in a serpentines type to increase the velocity gradient of the flow from the gas diffusion layer. Experiments were conducted to compare the simulation results. It is demonstrated that the simulation results are in agreement with the experimental ones for bipolar plate, therefore the simulation model could be employed as a predictive tool to provide optimal parameters for better performance of a polymer electrolyte membrane fuel cell (PEMFC).

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