

Sensitivity analysis of parameters used in 1D dynamic PEMFC modeling

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Proton Exchanger Membrane Fuel Cells (PEMFC) are electrochemical devices, which convert oxygen and hydrogen to electric energy. PEMFCs do not emit pollutants like greenhouse gas when compared to conventional power station such as thermoelectric power plant. In this study, a simple 1-D dynamic PEMFC model is developed by gPROMs of PSE. For the accuracy of simulation, it is important to determine the values of parameters. Since the PEMFC performance is strongly affected by modeling parameters, sensitive analysis to find relation between modeling parameters and results is conducted. Average current density is one of the parameters, which has a large influence on the performance of the PEMFC. Other parameters to consider are charge transfer coefficient and electric conductivity of membrane. These parameters are used to calculate voltage loss of PEMFC. This study shows the relative influence of parameters on PEMFC performance.