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Optimization of 16cm^2 active area on interdigitated flow channel of PEM fuel cell

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Abstract: The Proton Exchange Membrane Fuel Cell (PEMFC) is an electrochemical device and its performance depend on the flow channel design, number of flow path, channel depth and width, cross section of the flow channel, operating pressure ,temperature,relative humidity ,mass flow rate of the reactant gases and stoichiometric ratio of the reactants. In this paper, optimization of operating and design parameters on interdigitated flow channel of 16 cm^{2}effective area of the PEM fuel cell was considered. Creo Parametric 2.0 software used for modeling and CFD Fluent 14.5 software packages used for analysis of PEM fuel cell. The optimization was done by Taguchi method using Minitab 17 software. Based on the optimization study, the R: C- 1:1has maximum influence on PEM fuel cell performance and square of response factor (R^2) was achieved by Taguchi method as 95 %.

Keywords : Interdigitated flow channel; Taguchi method; Optimization; Design parameters; operating parameters.

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