



**PERFORMANCE ANALYSIS PROTON EXCHANGE MEMBRANE FUEL
CELL (PEMFC) STACK BY USING TEST RIG**

MOHD FADHLI AZIZI B. MD ZAILAN

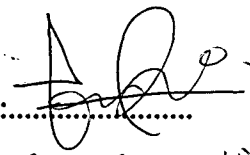
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“I declared that this thesis is the result of my own work except the ideas and summaries which I have clarified their source. The thesis has not been accepted for any degree and not concurrently submitted in candidature of any degree.”

Signed : 
Date : 24.5.2010

Mohd Fadhli Azizi b. Md Zailan

UiTM No. : 2007270976

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ABSTRACT

The purpose of this project is to study on the performance analysis PEMFC stack by using Test Station. The performance of a PEM fuel cell was investigated to find the best power output, temperature in every stack and find the damage in the stack. The power output of a PEMFC stack is influenced by several independent variables. The tests were performed on a 0.5kW(20cells) stack and 1kW(60cells). In this work, a further experimental analysis has been carried out on a very significant factor. Its effects on the electrical power of the PEMFC stack have been investigated. The stack characteristics have been obtained by running a predefined loading pattern. Some parameters were kept constant during the tests: anode and cathode inlet temperature, anode and cathode inlet relative humidity and anode stoichiometry. The fuel cell was tested for different pressure of hydrogen, pressure of air, the stack temperature, voltage and current of overall stack, voltage of every single stack. The higher stack temperature, pressure, as well as stoichiometric of reactants produced had enhanced the performance of the fuel cell as expected. Different pressure of hydrogen and oxygen were measured in every experiment so that it can produce various results with different values. Graphs of voltage versus current and temperature versus time were then plotted with the results obtained. This research definitely is useful to give more exposure and knowledge about this fuel cell performance by investigating the voltage, current, temperature, power output and the damage in the stack.

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