CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
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Project Number
22087

Project Title
Fuel Cells: Power of the Future?

Abstract

Objectives/Goals
I did this project to test a simple hydrogen proton exchange membrane (PEM) fuel cell designed by the Schatz Energy Research Center. I wanted to show that the simple fuel cell works just like full-scale pow| fuel cells. I also wanted to show that the fuel cell could be run and tested in a junior high school classroom so that kids can learn about how hydrogen fuel cells work.

Methods/Materials
I assembled a PEM hydrogen fuel cell and tested it under different working conditions. Through mt background research I found variables that should affect he current and voltage output of the cell. My variables were hydrogen pressure, airflow, moisture of the proton exchange membrane and compression of the fuel cell.

Results
Hydrogen pressure did affect the performance of the cell. The correlation between hydrogen pressure and current was almost -1. The correlation between airflow and current was -0.5. Compression made tht biggest difference. The correlation was 1 based on estimated factors for compression. Moisture had a noticeable affect on the power output of the cell. The power output dropped about a half of a percent per minute if I didn't add water to the cell.

Conclusions/Discussion
My fuel cell did perform like the full-scale fuel cells for two of my variables, cell moisture at compression. My fuel cell results for hydrogen pressure and airflow did not compare well with full-scale| cells.
My results did show that students can assemble and test simple fuel cells and there is a lot students ca| learn, I know I did.

Summary Statement
I assembled a proton exchange membrane hydrogen fuel cell and tested it under different working conditions.

Help Received
Received help from Schatz Energy Research Center in cell assembly and testing. My dad helped me with the backboard.