CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)
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Project Number
S0619

Project Title
Efficiency of a Fuel Cell Car

Abstract

Objectives/Goals
The purpose of this experiment is to discover how efficient a hydrogen fuel cell car is. In order to do this, I#ll be using a small-scale fuel cell car and testing the distance it can cover in one tank of distilled water. The reason for all of this is that hydrogen fuel cell cars have been seen on the news and in magazines describing how they give off zero pollutants and are a much easier fuel source to obtain, especially with new salt to fresh water converters recently invented. However, nobody knows how far it can take you.

Methods/Materials
Materials: Hydrogen and oxygen water fuel cell tank, Hydrogen and oxygen gas tanks, Electric motor (powered by electrolysis from fuel cell), Basswood frame, Fuel cell, Small tubing, Axels, Straws (to allow the cars axels to spin freely), Wheels, Battery pack, AA batteries, Electric wires for motor, Calculator, Sand paper, Video camera, Timer, Small post it slips, Epoxy glue, Distilled water, Small syringe

Results
It turned out that the hydrogen fuel cell car in my small-scale model got an average of 31.6 miles per gallon (7.4 L/100km). It ranged from a high of 59.3 miles per gallon (4.0 L/100km) to a low of 20.3 miles per gallon (11.6 L/100km).

Conclusions/Discussion
Throughout my experiment I have come to a conclusion that disproves my hypothesis. The gas mileage of a hydrogen fuel cell car is actually quite pleasing. I hypothesized that a hydrogen fuel cell car would not get that great of gas mileage since putting hydrogen and oxygen ions back together is such a simple process. I expected the process to go very quickly. However, the combination of hydrogen and oxygen ions through reverse electrolysis creates a strong, long-lasting electrical current to power the car for a considerably long amount of time. So my conclusion is that the fuel cell cars get a far greater gas mileage than most cars using internal combustion engines. If I could change the experiment I would like to find a more efficient way to measure the distance. The motor might not have run as long if it had been affected by friction from rolling on the ground.

Summary Statement
My project is about testing the gas mileage of a fuel cell car to be able to compare it to that of a fossil fuel car to notice a difference in efficiency.

Help Received
Dad helped me lay out the board.