CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
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Project Number
S0205

Project Title
Water to Energy

Abstract

Objectives/Goals
My objective was to create enough hydrogen to power a small gas engine: however, I was never able to produce enough.

Methods/Materials
Materials: 1.10 stainless steel plates (8 inches by 8 inches); 2.10 nylon bolts and nuts; 3.4ft high amp wires; 4.Battery or large battery charger (power supply); 5.Air tight container; 6.Salt; 7.Baking soda; 8.Distilled water; 9.Copper piping; 10.Rubber tubing; 11.Small gas engine; 12.Car alternator; 13. 6 stainless steel nuts and bolts; 14. Volt and amp meter.
Procedures: 1.Fill the plastic container with five liters of tap water. 2.Take the positive and negative anodes and hook them up to their respective power source. 3.Run the power for 20 minutes recording the power every minute. 4.To record the hydrogen produced, use a measuring cup that has ml on it and submerge the vessel. Feed the hydrogen that is being produced into the container and measure the water that is displaced every minute. 6.Repeat steps 1-6 using distilled water with salt ½ tsp salt, ½ tsp baking powder, and distilled water. 7.Run each experiment for at least 7 minutes. To get the best results run for 20 minutes or until loss of power. 8.Get compressed hydrogen that you either made from the hydrolyser or buy some. Take the compressed hydrogen and feed it into a carburetor of a lawnmower engine. 9.Have the lawnmower connect to a car alternator. 10.Start the engine up and record the amount of energy produced at one minute, then use a ratio to compare the input to the output.

Results
My results were similar to what my hypothesis predicted. In my hypothesis I stated that it would create at least 50% of the energy I used to separate the hydrogen from the oxygen; however, I ended up only gaining 40% of the initial energy I put into the reaction back. This resulted in a loss of 60% of the energy proving that this method of converting water into hydrogen was not very efficient.

Conclusions/Discussion
My hypothesis was right and wrong. I knew I would lose energy, but I had no idea I would lose so much. I ended up losing 61% of the energy I put into it. Most of the energy was combusted, and then a lot more was lost due to friction. I believe if I use a fuel cell next time, I will be able to drastically increase my efficiency.

Summary Statement
My project is about making hydrogen from water using electralysis, and then taking the hydrogen and trying to use it to power a gas engine.

Help Received
My father helped with some of the wiring.