



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Stephanie M. Liu	Project Number J0617
Project Title The Most Efficient Electrolyte for Hydrogen Production through Electrolysis	
Objectives/Goals This study determined which electrolyte from iodized table salt, baking soda, calcium chloride, sea salt, and lye was most efficient in harnessing hydrogen through electrolysis. The hypothesis was that the iodized table salt would help produce the most hydrogen.	
Abstract Methods/Materials A 5% solution of each electrolyte was made and brought to a temperature of 38 degrees Celsius. Electric current from a 9 volt battery was passed through 400ml of solution using copper wires attached to graphite rods as electrodes for 5 minutes. The hydrogen was captured by a test tube also filled with the solution that was placed over the negatively charged graphite rod. The hydrogen was measured by drawing a line on the test tube and measuring the amount of water filling up to that line in milliliters. This procedure was repeated 5 times for each electrolyte.	
Results On average calcium chloride harnessed 1.8ml of hydrogen, baking soda 3.1ml, sea salt 6.6ml, iodized table salt 6.74ml, and lye harnessed an average of 17.94ml. Lye was the most efficient electrolyte.	
Conclusions/Discussion Lye was the most efficient of those tested, harnessing over twice the hydrogen that iodized table salt did. But lye is more than twice as expensive as iodized table salt, making iodized table salt the most economical choice. This is an important factor given that one of the biggest problems with clean hydrogen is cost. At the moment gasoline is the cheapest, most readily available way of powering our vehicles, but with increasing oil prices and negative impact on the environment, gasoline may soon no longer be an option. Hydrogen energy is a possible solution to this problem, and the cleanest way of obtaining hydrogen is through electrolysis.	
Summary Statement The testing of the efficiency of different electrolytes in the harnessing of hydrogen through electrolysis.	
Help Received Mother helped put together display board and took some pictures	