



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Meghan E. McKenzie	Project Number J0511
Project Title Manipulating the Electrical Conductivity of Different Solutions: Agent Sodium Chloride Strikes Again!	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals This project focuses on manipulating the electrical conductivity of different solutions via electrolysis. There were three types of water tested: hard, soft, and R.O.(water purified through reverse osmosis). After testing these three types of water, I added approximately 58.443 grams of sodium chloride to each in hopes of increasing their electrical conductivity. My hypothesis was that if I sent an electric current through the previously mentioned solutions, then soft water with sodium chloride added would produce the most hydrogen and oxygen/chlorine gas.</p> <p>Methods/Materials To set up this experiment, I plugged the beaker with the rubber plugs with pencils inserted, propped the beaker on three wood blocks, and filled it with one liter of water. If I was running a test with sodium chloride, I would measure out 58.443 grams of it (to create a 1 mole solution) and mix it with the water in a separate bowl, then pour the solution into the beaker. Next, I connected a volt meter between the nine-volt battery and the electrodes in order to measure the amount of current flowing through the circuit. Next, I set the timer for one hour and connected the clips to the tips of the pencils that were protruding from the bottom of the beaker. For the sodium chloride tests, however, I was only able to run each test for fifteen minutes because each test tube had filled half-way with gas at that mark, so they would have overflowed by the time even a half-hour had passed. I took the results from those tests and multiplied them by four in order to figure how much gas would have been produced in an hour. I cleaned the beakers out and changed out the electrodes after each test.</p> <p>Results As for my results, hard water with sodium chloride added produced the most hydrogen and chlorine gas of all of the solutions, followed by soft water with sodium chloride added, then R.O. water with sodium chloride added, plain soft water, plain hard water, and finally, plain R.O. water with the least amount of gases produced.</p> <p>Conclusions/Discussion Hard water with sodium chloride added produced more hydrogen and chlorine gas than soft water with sodium chloride added because though soft water contains a high concentration of sodium; it lacks the metals and minerals that hard water contain This may have affected the level of conductivity because hard water has both minerals and sodium for conductivity while soft water has just sodium.</p>	
Summary Statement This project focuses on manipulating the electrical conductivity of different solutions via electrolysis.	
Help Received Parents helped assemble board; Michael "Tio" Stewart and Father provided equipment and suggestions; Mother helped edit typed documents; Ms. Chelsea McQuade helped guide and advise project; Grandfather gave suggestions.	