



CALIFORNIA STATE SCIENCE FAIR 2017 PROJECT SUMMARY

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| Name(s) Ani A. Karajayan | Project Number J0610 |
| Project Title Electrolysis | |
| <p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my goal was to see which electrolyte solution would conduct electricity the best through the process of electrolysis-saltwater, sodium bicarbonate + water or citric acid + water.</p> <p>Methods/Materials To conduct my project I used 10% of the electrolyte and 90% distilled water to make the different solutions, a multimeter to check the voltage and amperage of each solution, a light bulb for conductance, and battery as a power source.</p> <p>Results The different electrolyte solution's voltage, amperage, and conductance was measured at three temperatures in three different trials. My investigation showed that the saltwater solution conducts electricity the best in all the different temperatures I tested because it has the highest voltage, amperage, and conductance.</p> <p>Conclusions/Discussion How well a liquid or solution conducts electricity all comes down to if it has a supple of ions in it. The movement of the ions in the solution is what makes it conductive. Without the ions that are being attracted to the cathode and anode that are placed in the solution it wouldn't be conductive. Because most of the molecules in the saltwater solution break up and form ions, the flow of ions in the solution is high and it conducts an electric current well. When citric acid is dissolved in the water, only a small amount of the molecules become ions. Therefore there is a less flow of ions and less electricity is produced. The sodium bicarbonate solution was as almost as good of a conductor as saltwater. It had slightly less ions therefore less electricity produced. Since my results show that saltwater is the best conductor electricity, we can think about using the oceanwater as an alternative of saltwater. Although it is expensive to find a powerful energy source that can separate the ions in the solution, it is convenient for us since 97% of much of the water we have on our planet is saltwater but also because while we're producing energy, we are also producing chemical substances at each electrode that can be used for many purposes. We can also think about using the sun's energy as the power source to separate the ions in the solutions and also to heat the liquid since my results prove that as the temperature increase so does the conductivity of the solution. Why can't we use the ocean water and sunlight, two renewable energy sources, to provide us with energy and chemical substances we use in our every day lives?</p> | |
| Summary Statement My experiment was conducted to see if we can use saltwater to provide people with energy and chemical substances through the chemical process of electrolysis since we have so much water on our planet that we can use. | |
| Help Received I learned how to read a multimeter by myself and watched videos about the process of electrolysis to understand why saltwater is the best conductor of electricity. | |