



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Manaal A. Sayed	Project Number J0615
Project Title Rate of Crevice Corrosion	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my experiment was to determine how the increase in temperature of an acid bath affects the corrosion of aluminum. My hypothesis states there is a direct correlation between temperature and the corrosion of aluminum. As temperature increases, the aluminum corrosion rate increases and as the temperature decreases the corrosion rate decreases.</p> <p>Methods/Materials I created three different temperature conditions using a bath of 250ml of vinegar and 4 grams of sodium chloride at 61°C (using an incubator), 32°C (using an aquarium heater) and 20°C (room temperature) each in three beakers. Aluminum strips were submerged into each beaker for a period of 4 days. I observed the rate of corrosion occurring on each aluminum strip and recorded the results.</p> <p>Results The aluminum strip in the first beaker had the highest corrosion rate, while the beaker at room temperature of 20°C had the lowest corrosion rate. I noticed that most of the corrosion occurred at the crevice points of the aluminum strips where there is a greater concentration of oxygen. Adding sodium chloride to vinegar also accelerates the corrosion process.</p> <p>Conclusions/Discussion My hypothesis was supported by the evidence recorded in my notes. As the temperature of the acid bath increases, the corrosion rate of aluminum increases and if the solution temperature is decreased the corrosion rate will decrease. I learned that when manufacturing goods from aluminum, temperature is a key factor to consider. I also learned why machine shops that use aluminum for manufacturing must operate in controlled temperature environments. Negative effects of corrosion can be harmful for our environment, if not controlled properly.</p>	
Summary Statement This experiment attempts to answer the question of how temperature of an acid bath affects the corrosion rate of aluminum.	
Help Received My parents guided me through this project and got all the materials I needed. My Dad helped me with all the printing. My science teacher, Sr. Abir helped me develop an analytical interest in Science. The Culver City library staff assisted me with finding the resources I needed for the project.	