



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Richard A. Korshkov	Project Number 36172
Project Title Got Water? Salt Water to Fresh Water	
Objectives/Goals -What is a more effective desalination process? -Can fresh water be produced from decanoic acid and coconut oil at various temperatures. Is the directional solvent extraction method efficient?(MIT Model) Abstract Methods/Materials Mix 35g of NaCl, pour into 1000mL of deionized water. (Dissolve). Place 5 grams of decanoic acid and 200mL of Coconut oil and heat the mixture to 40°C. Mix 10 grams of the salt solution with the heated acid mixture. Continue to mix for 60 minutes, while keeping the mixture at 40°C. Separate the acid from the beaker into conical tubes, incubate in a 34°C water bath for 72 hours. Repeat steps 1-4 for 50°C and again for 60°C. Complete 7 trials minimum for each temperature range. After 72 hours, puncture a hole at the bottom of the conical tubes, and collect the freshwater. Don't allow any of the acid to be collected with the water. Measure the salinity of the water. Weigh the mass of the water and acid. Allow the water to sit again for 72 hours. 1000mL Distilled water, 600 mL coconut oil, 35g Sodium Chloride, Erlenmeyer Flask, 15g Decanoic Acid solid/powder, 400 mL beakers, 25mL beakers, Hot Plate, Magnetic stirrers, Conical Tubes, Thermometers, Water Bath, Salt Meter, Mass Scale, Fume Hood, pipettes, Sharp instrument, Safety Equipment All equipment borrowed from school except for the water bath, conical tubes and the pipettes, which were ordered online. Results 50°C: The mass of the acid ranged from 20.09g. to 20.45g., water/coconut oil solvent ranged from 0.71g. to 1.03g. The acid and water had a mean of 20.32g and 0.88g. 60°C: The mass of the acid ranged from 18.12g. to 20.41g., water/coconut oil solvent ranged from 0.67g. to 1.59g. The acid and water had a mean of 19.82g. and 1.25g.. Most freshwater was produced. 70°C: The mass of the acid ranged from 20.20g. to 20.63g., water/coconut oil solvent ranged from 0.51g. to 0.75g. The acid and water had a mean of 20.36g and 0.65g.. Least amount of freshwater. Conclusions/Discussion Despite many obstacles, I experienced a measure of success. Although I was not able to separate the two materials, I was able to separate the acid and salt from the water and coconut oil, which was the main purpose for this experiment. All in all, it is reasonable to say that the decanoic acid method of desalination is an energy and cost efficient way of desalination.	
Summary Statement Desalination of salt water using decanoic acid and coconut oil in a directional solvent extraction method.	
Help Received Scientific Advisors/Mentors: Angela Ziegler(CLS), Kelly Samuelson(Teacher). MIT(Research Cited)	