CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
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Project Number
J0531

Project Title
Influencing Surface Tension

Abstract

Objectives/Goals
I wanted to find out if I could influence ordinary tap water to make the surface tension change, and if it did, how it would change. I tried it by adding salt, oil, detergent, and heating the water.

Methods/Materials
I decided to test surface tension by taking a round piece of aluminum foil and placing it on the water so that it just floats on the surface of the water. (I had read in my research that only something flat could test the surface tension, and figured out why during my experiment.) I used pennies that were made from 1985-2006, which I had figured out were 3 grams each. I stacked pennies on the floating aluminum until it sank. Then, I converted the amount if pennies it took to grams, and then converted the grams into dynes. That would be the measurement of the surface tension of the tap water itself. I used ordinary tap water as my controlled variable for this experiment. I then ran this experiment adding 1/4 teaspoon of salt and the same amount of oil and detergent (without mixing), and ran the experiment after heating the water to 60C°

Results
When I applied my procedure to my variables, my results showed that tap water with no influence has an average surface tension of 12356 dynes. Tap water with ¼ teaspoon of salt is 3432 dynes. Tap water with ¼ teaspoon of oil is 10624 dynes. Tap water with ¼ teaspoon of detergent is 6306 dynes, and tap water heated to 60°C is 6376 dynes.

Conclusions/Discussion
All the influences I tried lowered the surface tension of water. That could mean that the surface tension of water is relatively high. Out of all the influences, salt made the surface tension the lowest, which surprised me because boats float better in salt water. That proves that surface tension and the floating of boats are two different cases. When oil was added to water, it formed into round bubble like areas of oil. My conclusion for that is that oil molecules and water molecules do not cohere.

Summary Statement
I disovered that it is relatively easy to lower the surface tension of water with everyday influences such as heat, salt, detergent and oil.

Help Received
A classmate helped with the quality of visual display, parents and teachers edited reports and fixed grammatical and spelling errors.