CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Adeline Chiang

Project Number
S0605

Project Title
The Effect of Temperature on Ascorbic Acid in Orange Juice

Abstract

Objectives/Goals
The objective was to determine if temperature affects the ascorbic concentration of orange juices, and if there is an effect, what temperature affects it most and least?

Methods/Materials
The types of orange juices used were 100% pure, natural orange juice, orange juice from concentrate, and fresh squeezed orange juice. The orange juices were all poured into flasks for preparation. Then, they were placed in different temperatures for 6 hours. I conducted my experiment at 3 and 6 hours by inserting 5mL of an iodine indicator solution into the test tubes. Then, I recorded the number of orange juice drops the indicator solution required to reach the equivalence point. The lower the number of juice drops, the more ascorbic acid present. The indicator solution is blue until equivalence point is reached turning it clear.
I also calculated the ascorbic concentration of the trials by figuring out the molar mass of ascorbic acid and the mol of iodine used in my indicator solution.

Results
My data showed that the heated orange juices needed the most drops to titrate and room temperature needs least. This means that the heated orange juices contained the least amount of ascorbic acid and room temperature contained the most amount of ascorbic acid instead of chilled as I predicted.

Conclusions/Discussion
My data shows that my hypothesis is correct. Heated orange juices do contain the least amount of ascorbic acid and chilled contain most. If I were to do this experiment again, I would test if air exposure does decrease the ascorbic concentration of orange juice and the effect of temperature on orange juice after a longer period of time. To keep the chilled orange juices in the same condition while I'm experimenting, I will put the flask of orange juice in cold water. To ensure accuracy, I hope I will be able to use micropipettes because they can accurately dispense the correct amount every time.

Summary Statement
My project is about how temperature affects the ascorbic content of the orange juice after being placed in a certain temperature for 6 hours.

Help Received
Chemistry teacher helped me understand the scientific terms and how to calculate the ascorbic concentration of the orange juices.