CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)
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Project Number
J0615

Project Title
Does Freezing Carbonated Water Affect CO2 Coming Out of Solution?

Abstract

Objectives/Goals
This project was designed to find out if freezing carbonated water affected CO2 coming out of solution. The hypothesis was that if carbonated water was frozen, more CO2 would come out of solution than if carbonated water was kept at room temperature for the same amount of time.

Methods/Materials
80 ml of carbonated water was measured and put into 2 jars. Carbonated water was used because its only ingredients are CO2 and H2O. The pH of the carbonated water was measured and recorded using a digital pH meter. The pH meter was measuring the acidity from the carbonic acid made from the CO2 in the water. The test was placed in the freezer and the control was left to sit out at room temperature. The time of day was noted. After the test froze overnight, it was removed from the freezer and left to melt to room temperature. 24 hours after the initial pH test, the pH of both solutions was recorded. This procedure was repeated for three trials.

Results
The average difference between the initial and final pH for the carbonated water that had been frozen was 1.20. The average pH difference for the control was 2.19. This showed that less carbon dioxide came out of solution in the freezer than in the solution sitting out. Although the length of each trial was close to 24 hours, the time in the freezer was not controlled, so that might have affected the results.

Conclusions/Discussion
My hypothesis was incorrect. I said that in one day's time, freezing carbonated water would make CO2 come out of solution faster than letting carbonated water sit out. The results of my three trials showed that letting carbonated water sit out, increases the pH more than freezing and thawing it for the same amount of time. The more carbonic acid in the water, the lower the pH. This suggests that freezing carbonated water slows the amount of CO2 coming out of solution.

Summary Statement
In my experiment, I wanted to know if freezing carbonated water affected the rate of CO2 coming out of solution.

Help Received
My mom gave me format tips for my my back board and drove me places. Mr. Ennes, the 8th grade science teacher at my school, showed me how to use and lent me the digital pH meter I used for my project.