CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
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Project Number
J0604

Project Title
Carbonation Countdown

Abstract

Objectives/Goals
To investigate whether temperature will affect the reaction rate and affect how fast an Alka Seltzer tablet will dissolve in water.

Methods/Materials
Materials:
Clear measuring glass cup, Alka Seltzer tablets, Thermometer, Hot and cold water, Stopwatch, Pen and paper (to record results).
Procedure:
In a clear glass cup put 240 ml of room temperature water and measure its temperature. Put an alka Seltzer tablet in the cup and calculate the time needed for it to completely dissolve. Repeat this step 2 times and calculate the average time. Do all these steps again using boiled water one time and ice water the other time. Record all data in a table for further analysis

Results
When we used the room temperature water (22 C), the average time for the tablet to dissolve was 28.3 seconds. When using the boiled water (90 C), the average time was 19.3 seconds. Finally upon using the cold water (4 C), the average time was 52 seconds. The time needed for the tablet to completely dissolve was very short in the case of the boiled water. On the other hand the tablets dissolved in the cold water took the longest time. This means the higher the water temperature the faster the reaction and the shorter the time needed to completely dissolve the tablets.

Conclusions/Discussion
Raising the temperature increases the reaction rate and made the tablets dissolve faster. Raising the temperature increased the rate at which the bicarbonate reacts with the acid in the Alka Seltzer.
Particles can only react when they collide. At higher temperatures, particles collide more frequently and with greater intensity resulting in speeding up the reaction rate.
Increasing the temperature causes also some of the lower speed molecules to move faster. The result is more molecules with high enough kinetic energy to complete the reaction and produce the final products.
Thus there are two effects of increasing temperature: greater collision intensity and more frequent collisions. That is why the time the tablet took to dissolve in the boiled water was the smallest and that of the cold water was the longest.

Summary Statement
To see the effect of temperature on the rate of the reaction.

Help Received
Mother bought materials, took the pictures and supervised the process.