CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
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Project Number
J0505

Project Title
Boiling Point

Abstract

Objectives/Goals

If I boil water, sugar and salt solution which one will have the highest boiling point?

How does thermal energy break the molecular bonds?

Methods/Materials

A pan; Water - 1 liter (4 cups); Sugar solution- 1cup of sugar in 1 liter of water; Salt solution- 1 cup of salt in 1 liter of water; A thermometer; A stop watch; Stove.

1. Take one third of water in a pan. 2. Place a thermometer in the pan. 3. Place the pan on a stove. 4. Then turn on the stove and start the stop watch. 5. Check temperature of water every 30 seconds.

Continue till the water boils and temperature remains steady for some time. That temperature is the boiling point of water. Repeat the experiment with Sugar solution and Salt solution. Record the temperature every 30 seconds on the table. Thus we can find which liquid has the highest boiling point.

Results

In my data, at 1 minute the salt solution had the highest, it was 36 degree Celsius. Water was 30 degree Celsius, and sugar solution was 34 degree Celsius. At 6-10 minute all solution had reached its boiling point. For water it was 100 degree Celsius, for sugar solution it was 104 degree Celsius and with the highest boiling point salt solution had 106 degree Celsius

More heat energy was needed to break the ionic bond in salt solution than the covalent bond in sugar solution so the boiling point of salt solution was higher.

Conclusions/Discussion

My hypothesis was if I boil the water, sugar solution and salt solution, the sugar solution will have the highest boiling point, because sugar molecules are larger. But the salt solution has the highest boiling point.

Boiling point elevation states that a solution has a higher boiling point than the pure solvent. A solution has a higher boiling point because the intermolecular forces have been increased and increasing the boiling point. Hence, it takes more heat to raise the solution to 1 atom (normal boiling point) than would the pure solvent.

Salt is a very small molecule. In addition it splits into two particles when in water, the sodium atom and

Summary Statement

Ionic bond is much stronger than Covalent bond

Help Received

Mom helped in finiding the project and Dad helped setting up the display board.