CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
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Project Number
J1509

Project Title
The Effects of Different Salts on the Time Required to Make Homemade Ice Cream

Abstract

Objectives/Goals

Purpose:The purpose of this project is to see which of the six salts will make ice cream the quickest. It is also to see which of the salts will cause the temperature of the ice mixture in the ice cream maker to drop to the lowest degrees Celsius.

Hypothesis:Our hypothesis is that sodium chloride will make the ice mixture drop to the lowest temperature. We also hypothesize that the sodium chloride in the ice cream maker will make ice cream quicker.

Methods/Materials

Materials list

1. vanilla flavor; 2. Sugar; 3. Ice cream maker; 4. Beakers; 5. Thermometer; 6. Table salt (sodium chloride); 7. Driveway salt (calcium chloride); 8. Epsom salt (magnesium sulfate heptahydrate); 9. Potash (potassium chloride); 10. Baking soda (sodium hydrogen carbonate); 11. Ammonium chloride (nushadir salt); 12. Magnetic stirrer; 13. Stir bars; 14. Scale; 15. Ice; 16. Timer.

Procedure

1. While the salt was dissolving we mixed the ice cream ingredients into the Industrial Revolution Play and Freeze ice cream maker. 2. We put into the other side of the ice cream maker, 2000 ml or 2 liters of ice. We then put the dissolved salt mixture on top of ice in ice cream maker. The timer was started. 3. The ice cream maker was turn back over and the lid was removed from the side with the ice cream mixture. 4. We determined that the ice cream was complete when all of the liquid ice cream mixture appeared to have changed into ice cream. 5. Once the ice cream was made, we immediately put the lid on and turned over the maker, opened the other lid and measured the ice mixture's temperature using a (-20 - 110) oC alcohol thermometer. 6. The thermometer was taken out after 30 seconds and the temperature was then recorded.

Results

Salt Chemical Name (Chemical Formula)	Average Temp. with Average Deviation (seconds)	Average Temperature with Average Deviation (celsius)
Ammonium chloride (NH4Cl)	215 (+/- 3.3)	-11.0 (+/- 0.67)
Sodium chloride (NaCl)	231.7 (+/- 5.1)	-10.17 (+/- 0.56)

Conclusions/Discussion

Summary Statement

The purpose of this project was to determine what common salt will lower the freezing point of water the most.

Help Received

Paxtons dad Kip for teaching us about the chemistry of making ice cream and helping us put the graphs together. Paxtons mom Melissa for helping with getting materials setup. Kacis parents Liz and Brian for helping with the poster board.