CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
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Project Number
J0522

Project Title
I'm Melting

Abstract

Objectives/Goals
The main purpose of this experiment #I#m Melting# is to find a substance that would melt ice just as fast as salt, yet at the same time not harm any vegetation or concrete. Salt, which is commonly used to melt ice at a fast rate, is effective but harms vegetation and concrete. If a substance is found through this experiment that is more effective and safer than salt, then people could save money on concrete repair and replacing dead plants.

Methods/Materials
The experiment was performed over a 2 ½ hour period. First, 8 blocks of ice were put on separate blocks of concrete with a rose laid next to each (roses are very sensitive to change). The substances were put onto the blocks of ice and observations were taken every 15 minutes or so. The independent variable of this experiment was the different substances that were put onto each of the ice blocks. These substances were Epson salt, citric acid, magnesium chloride, calcium chloride acetate, aluminum chloride, and sodium sulfate. The observations were taken over time (dependant variable).

Results
Through testing of the different substances it was learned that salt is an exceptional substance to use on ice because it melts ice straight through to the bottom of the block. However salt only melts ice where it is applied directly. This means that much more salt is needed and the more salt that is added to the ice the more devastating the results to the concrete and vegetation. Another important discovery was that calcium chloride acetate was fast at melting the ice block, but the rose next to it turned black on the tips and began splitting apart. Also, the concrete the ice was sitting on had erosion on the surface and a white slippery residue was left behind after the ice had melted.Some substances like flour that are powdery will increase the speed of melting however they only are thermal conductors and they don#t dissolve with the ice to lower the freezing point.

Conclusions/Discussion
The experiment was limited to small ice blocks with only a volume of 13½ inches cubed and only 2.5 ml of each substance was used. If this experiment were to be continued in the future, the next step that could be taken would be to perform this experiment on a larger scale using much more of each substance and a much larger surface area of ice. Also, more substances should be added, increasing the information gained.

Summary Statement
This project is about finding a substance that melts ice quickly and is still safe for vegetation and concrete, unlike salt.

Help Received
Father supervised while I applied substances; Also Father helped take notes while I did experiment.