

How To Melt Ice Faster

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## Hypothesis

If I test salt, sand, kitty litter, vinegar, sugar beet juice, alfalfa meal, coffee grinds, calcium chloride, and Safe paw to melt ice, then I think the sugar beet juice will work better because it has a lot of good nutrients so that it doesn't hurt animals and plants but it also doesn't make your car rust underneath. I also think it will melt better because it has some good reviews and it can bring the ice temperatures down.

Scientists have been studying the best way to melt ice off a driveway for a long time. They have tested many materials to try and melt ice quicker. Some different ideas that scientists have studied to get the best results include: salt, sand, kitty litter, vinegar, sugar beet juice, alfalfa meal, coffee grinds, calcium chloride and safe paw.

The first place to ever use salt to melt ice was in New Hampshire. It was tested on roads and it worked and it melted the ice. This theory was tested in 1938 . In the 1940's other states started to use salt. It is commonly used today but it can harmfully affect nature. (Blank industries,2020)

Why do scientists continue to test different ways to melt ice? Salt affects the Earth's groundwater and plants. It has affected so many lives, not just human, but animal's lives too. Animals and plants can't get enough nutrients from resources harmed by salt. What about all of those aquatic animals not doing too well from all the salt that has gone into the water?

Salt is the most popular ice melt to use these days but why isn't it really good for nature? Salt is a common thing to use and it gets the job done but it can damage metal and cause cars to start to rust at the bottom.(Trudell, 2018)

Alfalfa meal is a fertilizer but it can be used on ice. It is better to use alfalfa meal than another fertilizer like urea because alfalfa meal has less nitrogen. The pellets also provide traction on an icy driveway while the ice is still melting. (Trudell, 2018)

Sugar beet juice is also a good way to melt ice. It is completely harmless to plants, underground waterways, and pets. The juice will lower the freezing point of water and is a natural way to melt ice. However, sugar beet juice for melting ice must be purchased, it is not just squeezed from beets at home. (Trudell, 2018)

Coffee grinds have nitrogen and natural acids in it. The grinds' texture helps with traction and makes a driveway less slippery. The dark color of the grinds will absorb more of the sun's heat to speed up the melting process as well. Just think about it, coffee helps with a frozen brain that won't wake up and a frozen driveway too! (Trudell,2018)

For dog owners, there is a special salt made for pets. It is called Safe Paw. Safe Paw is a company that makes a natural deicer that will not hurt the environment or hurt the bottom of a cat or dog's paw like salt would. (Armour, 2017)

Vinegar helps with melting ice. A mixture can be made by adding 1 part water and 1 part vinegar to a spray bottle. After mixing it well the mixture is sprayed on the ice. Then just walk away and wait for the ice to melt. (Carpey, 2012)

Sand is not the best thing to use for melting ice. It can create good traction so people don't slip but is it a good way to melt ice? For sand to actually melt the ice off of a driveway it needs some heat. The sand absorbs sunlight which creates heat and that's how it melts ice.(Day, N.D)

Calcium chloride is another type of ice melt. In the winter the ice is cold and little pellets of calcium chloride lowers the freezer temperature of the ice. When it lowers that temperature it starts to melt. Calcium chloride lowers the freezing point of water more than any other melting products.

As mentioned before, salt can hurt plants, animals' paws, and it can even damage the bottom of people's cars. Well kitty litter is different. It doesn't hurt pet paws or plants or the bottoms of cars. It doesn't need the sunlight to help it melt like sand. It even helps with traction. This is a good product to use. (Shauers, 1989)

There are good ways to melt ice but salt is not one of them. They can really harm the environment. Salt is not a good thing to use. There are many different options that can be used like sugar beet juice or alfalfa meal. All of those things are better than salt. If people don't stop using salt, eventually we will be looking at animals dying and plants too.

What happens when the ground is frozen? The ground can become slippery and a person can fall easily. Water freezes between rocks, in soil, and even inside the rocks. This type of ice is called pore ice. Ice can damage the roads. When ice forms in the soil under the roads it can cause major damage; this is called frost heave. As people can tell, ice can be very deadly and can cause car crashes and bad slips and falls. (Natural Snow and Ice Data Center, 2020)

Ice can't go far down into the earth because of the warmth inside of the earth. It can still go down pretty far though. All it needs is some cold, snowy weather. When it gets hot then all the ice goes away. The ice also melts by the warmth of the inside of the earth. (Natural Snow and Ice Data Center, 2020).

These are some reasons that some material that can melt ice is important in our lives. It helps people and cars not to slip or slide on the sidewalks or icy roads. So different scientists continue to test different materials to melt ice. There are some that help a lot and some that are very harmful to the environment like salt and calcium chloride. There is still room for improvement.

## Materials

Plastic container that can hold about 12oz

Salt

Sand

Kitty litter

Vinegar

Sugar beet juice

Alfalfa meal

Coffee grinds

Calcium chloride

Safe paw

Timer

Beaker

Measuring spoon

## Procedure

First I am going to put 3 cubes of ice into a bowl. I am going to put  $\frac{1}{2}$  teaspoons of a type of material into the plastic container. I will put it outside and wait an half hour to check on it. I will come back outside and see what happened. When I check on it I see that some of the ice has melted. I will pour that into a measuring cup and measure it. Then I will melt the left over ice and that is how much hasn't melted. Then I will do the process over again with different material.

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