



Chemistry Activity Grip 2020

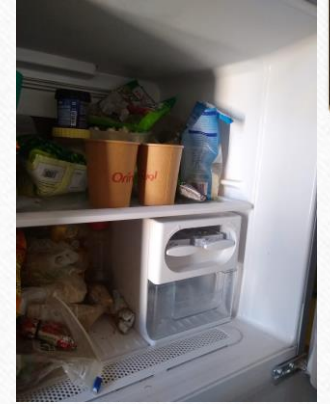
DHRUV JAIN (Grade 10)

Experiment - 1

Saltwater Freezing Experiment

Procedure

- Take 2 empty cups
- Fill each of them with water
- Add a tablespoon of salt to one cup.
- Place the 2 cups in a freezer.
- Now check the glasses after every 10 minutes.



Observations

1. After 10 Minutes



2. After 20 minutes



3. After 30 minutes



The salt water (right) and normal water (left) are both in liquid state. The cloudy appearance of salt water gradually fades.

4. After 40 Minutes



5. After 50 Minutes



6. After 60 Minutes



The normal water (left) develops a top thin sheet of ice after 40 minutes. This sheet gradually hardens and thickens. The tap water (right) developed a very thin sheet of ice after 60 minutes

7. After 70 Minutes



8. After 80 Minutes



9. After 90 Minutes



The normal water (left) had built a very thick sheet of ice and after 80 minutes completely solidified. The salt water (right) on the other hand developed a thicker sheet of ice and was yet to completely solidify even after 90 minutes

10 . After 100 minutes

Conclusion

Both the solutions have solidified. This experiment helped us identify the property of salt in decreasing the freezing point of water. This phenomenon is called freezing point depression. The presence of salt makes it harder for water molecules to bond to the ice structure, because ice naturally repels salt molecules.

The salt also bumps into the ice, knocking water molecules off of the structure and that is how salt melts ice. Hence we come on to our second experiment.



Experiment - 2

Salt's action on Ice Cube Experiment

Procedure

- Put two ice cubes in separate dishes.
- Put a tablespoon of a salt on one of the ice cubes and leave the apparatus.

Observation

- The ice cube with salt covering melted faster than the normal ice cube.

(LINK TO VIDEO : Google Drive Link - https://drive.google.com/file/d/1uf9fs-EXsoyE1xLYZ8fN_sPaAdNzil7Z/view?usp=sharing Youtube Link - <https://youtu.be/QNTC9cVxXQU>)

Conclusion

We learnt about salt's property of decreasing the melting point of ice. With this property more than 20 million tons of salt are used every year to melt snow and ice in cold northern regions. Putting salt on ice isn't the only time freezing point depression occurs. Another good example of freezing point depression is vodka.

Some examples of salts being used to change the freezing point of substances for benefit :

- Ethylene Glycol is added to water in car radiators while driving in a hill station

Ethylene Glycol lowers the freezing point of water. Hilly stations have low temperatures, here the water may freeze in the radiator and hence it may not work. Ethylene Glycol prevents the water in radiator from freezing and thus it is mixed with the water in the radiator.

- The use of camphor as a solvent for measuring the mass of Naphthalene by Rast Method

Camphor has a very high molal depression constant of 39.8 degrees. Hence even a small amount of solute causes a large depression in melting point of solution. Hence we can tell the molecular mass of naphthalene from camphor with this concept.