Carolina Quick Tips®

Ice Creamer

This cool investigation yields a sweet reward! By using sodium chloride (table salt) to lower the freezing temperature of ice and water below 0° C, the ice/water mixture becomes cold enough to freeze a nondairy instant creamer.

- NGSS Scientific and Engineering Practice: Planning and Carrying Out Investigations and Constructing Explanations
- NGSS Core Idea: Physical Science 1: Matter and Interactions and PS 3: Energy

Materials Required

Carolina ChemKits®: Ice Cream and Freezing-Point Depression (840890)

Activity Procedure

1. Place 1/2" of sodium chloride in the deli container.
2. Place the unopened nondairy creamer cup in the container.
3. Fill the deli container first with ice, then with water. Leave a little room so you can attach the lid.
4. Snap on the deli container lid so it's secure.
5. Swirl the container vigorously for at least 3 minutes—5 if using hazelnut-flavored creamer.
6. Remove the lid and the creamer cup from the deli container. Open the creamer cup, and enjoy!

Results/Summary

Here's the science behind this activity. We're illustrating the concept of colligative properties, which states that the boiling point can be elevated or the freezing point depressed for every mole of particles dissolved per kilogram of solvent. With water, the freezing point can be depressed 1.86° C below 0° C for every mole of particles that are dissolved. We've mixed enough sodium chloride with the ice water to lower the freezing point 5–10° C below 0° C, which is sufficient to freeze a nondairy creamer.

Additional Information

View more information, content links, and products related to this activity at www.carolina.com/takeaways.

Safety

As you mix the sodium chloride and ice water, be careful not to splash any in your eyes. Make sure the deli container lid is on tight before swirling.



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