Carolina Quick Tips®

Ice Creamer

By using sodium chloride (table salt) to lower the freezing temperature of water below 0° C, the ice and water mixture becomes cold enough to freeze a nondairy creamer solution into ice cream

- Scientific and Engineering Practice: 3A Develop explanations and propose solutions.
- Content Knowledge: CHEM.11 Science concepts. The student understands and can apply the factors that influence the behaviors of solutions.

Materials Required

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

Activity Procedure

1. Fill the deli container with sodium chloride to a height of ½".
2. Place the unopened nondairy creamer cup in the deli container.
3. Fill the deli container with ice.
4. Fill the deli container with water, leaving enough room to attach the lid.
5. Place the lid securely on the deli container.
6. Swirl the container vigorously for a minimum of 3 minutes (5 minutes if using hazelnut-flavored creamer).
7. Remove the lid from the deli container. Remove the creamer cup from the deli container, open the creamer cup, and enjoy the ice cream!

Results/Summary

This activity illustrates 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. In the case of water, the freezing point can be depressed 1.86° C below 0° C for every mole of particles that are dissolved. Enough sodium chloride is added to the ice water in the container to lower the freezing point 5–10° C below 0° C, which is sufficient to freeze a nondairy creamer solution.

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 lid is securely on the deli container before swirling.



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