

Activity 2: Melting Point Depression

Equipment	Quantity
Xplorer GLX	1
Fast-response Temperature Probes	2
Test Tubes	2
Test Tube Rack	1
Deionized Water	110 mL
NaCl	1 g

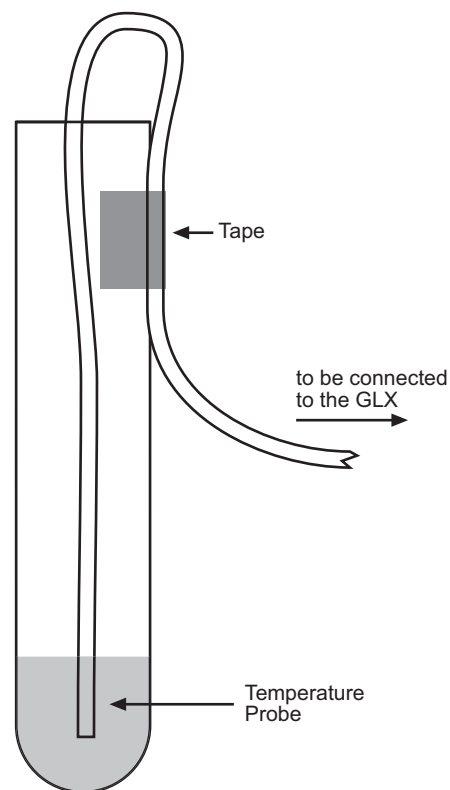
Background

How does the addition of salt affect the melting point of a solution? In this experiment, you will measure the temperature over time of frozen salt water and pure water as they melt. From the recorded data, you will identify and compare the melting points of both liquids.

Pre-lab: Prepare Frozen Solutions

Prepare the frozen solutions at least one day in advance.

1. Make a solution of 1 g NaCl in 100 ml of deionized water. Add enough to a test tube to fill it to a depth of about 1 cm.
2. Add the same amount of deionized water to a second identical test tube.
3. Place a fast-response temperature probe in each test tube. The ends of the probes should be immersed. Use tape to secure the probes in place.
4. Label both test tubes and label the connectors of both probes for easier identification.
5. Place both test tubes (along with the probes) in a freezer.



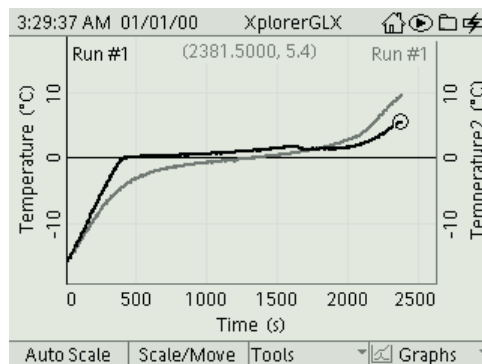
Before You Begin

Start a new experiment on the GLX.

1. Press ⏠ to go to the Home Screen.
2. Use the arrow keys to highlight the Data Files icon and press ✓ to open the Data Files screen.
3. Press F4 to open the Files menu and press 1page to select New File.
4. When the GLX asks if you would like to save the previous file, press F1 to save or F2 not to save.

Procedure

1. Remove the frozen solutions from the freezer.
2. Connect the temperature probes.
 - a) Connect the temperature probe measuring the pure water ice to Temperature Port 1 on the left side of the GLX.
 - b) Connect the other probe to Temperature Port 2.
3. Press ▶ to start data collection.
4. Set up the Graph to display both temperature measurements.
 - a) Press ⏠ to return to the Home Screen; press F1 to open the Graph.
 - b) Press F4 to open the Graphs menu; press 3ways to select Two Measurements mode.
 - c) Press F1 to automatically scale the Graph.
5. Continue data collection until both solutions have reached 5°C . Press ▶ to stop data collection.



Graph in Two Measurements mode displaying both temperatures

Analysis

Describe the temperature versus time plots of both solutions. How are they similar? How do they differ? Which solution melts at a lower temperature?