

FREEZING POINT OF PHENYL SALICYLATE (#5.2)

The CCLI Initiative
Computers in Chemistry Laboratory Instruction

Learning Objectives

The objectives of this experiment are to...

- demonstrate the general features of a cooling curve.
- measure the freezing point of a compound.

Background

In this experiment students will measure the freezing point of an organic compound, phenyl salicylate. A sample of the compound, which is a solid at room temperature, will be warmed until it melts and the temperature of the liquid is well above its freezing point. The sample then will be cooled and stirred, and its temperature monitored with a temperature probe. A graph of temperature *versus* time (called a cooling curve) will be made.

Temperature probe calibration

The temperature probe will be calibrated at a minimum of three temperatures from near freezing to around 80 °C.

Setting up the apparatus

The apparatus for this experiment is shown in Figure 2. This allows a clear view of the phenyl salicylate, and controlled loss of heat for accurate measurement of the freezing point.

Running the experiment

The experiment should be repeated several times in order to get an average freezing point for the most accurate results.

Data Analysis

Guidance is given in interpreting the results.

Instructor Resources Provided

1. Sample Report Sheets providing the format to organize the data collection with sample data.
2. Questions to consider, answer and turn-in with suggested answers.
3. Tips and Traps section to assist the instructor with potential problems and solutions.
4. Sample *MicroLAB* screen shots and graphs.
5. Laboratory preparation per student station.

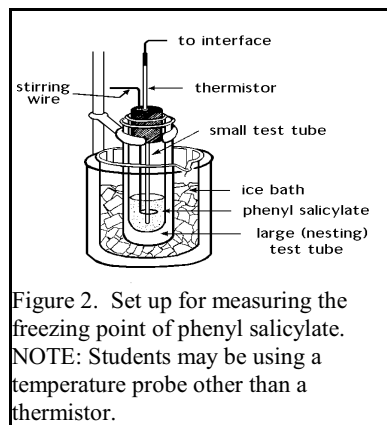


Figure 2. Set up for measuring the freezing point of phenyl salicylate. NOTE: Students may be using a temperature probe other than a thermistor.

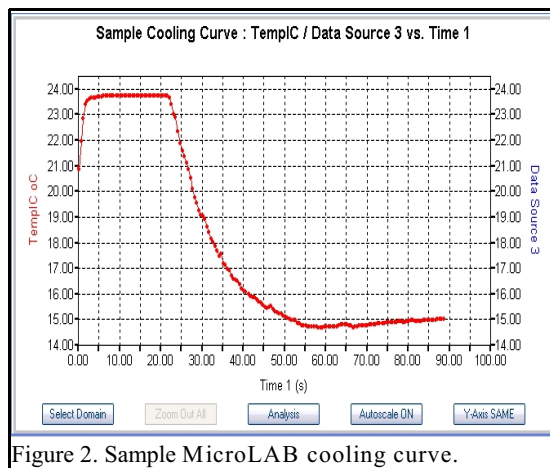


Figure 2. Sample MicroLAB cooling curve.