

Lab 5 Phase Change

Objectives

In this lab, students will study the phase changing process of ice and observe the temperature of melting ice.

Supplies

[Temperature of Melting Ice](#) on YouTube.

Theory

As discussed in the lecture, phase change is the state change of a matter, such as from ice to liquid water, from liquid water to steam, or the other way around. When phase change happens, the temperature of the substance stays the same, but a large amount of energy (heat) is required for the change to happen. For example, when snow melts, it absorbs a lot of heat from the surroundings. This energy can be calculated using the following formula:

$$Q = mL$$

, where L means the latent heat of a substance changing from one state to another. For example, L_f means the latent heat of fusion. The L_f of water is 80 cal/g (Remember that the specific heat capacity of water is $1 \text{ cal/g} \cdot ^\circ\text{C}$), which means that 1 g of ice needs to absorb 80 calories of heat to melt and becomes liquid water.

Procedure

Watch the [Temperature of Melting Ice](#) (multiple times if necessary) and answer the questions listed below.

Questions and Problems

1. What is the temperature shown on the scale all the time as ice slowly melts? What should be the unit of the reading?

2. Did the temperature change as time lapsed? Explain why?

3. In this process, was the ice absorbing energy (heat) from the surroundings?

4. What are the factors that decide the total energy (heat) the ice needs to absorb to melt completely?

5. Which will be bigger, the heat required to increase 1 *g* of water by 1 °C, or the heat required to change 1 g of ice to liquid water? Explain.

First and last name:

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