

Latent Heat of Fusion of Ice

Purpose

To experimentally determine the latent heat of fusion of ice

Materials

goggles, large plastic foam cup, balance, thermometer, stirring rod, 2 to 6 ice cubes, 200 mL water, 100 mL graduated cylinder, hot plate, 250 mL beaker, paper towel, balance

Procedure

1. Fill the beaker with about 200 mL water. Heat the water on a hot plate. You will need water that is about 10 °C above room temperature.
2. Place the plastic foam cup and stirring rod on the balance together. Record the combined mass.
3. Keep the cup and stirring rod on the balance. Carefully fill the cup about half-full with the warm water. Record the combined mass. Take care not to pour water on the balance!
4. Calculate and record the mass of the warm water ($m_{\text{warm water}}$). Put the foam cup on the lab counter. Stir the water carefully with the stirring rod and record the temperature (T_i).
5. Immediately add 2 to 4 ice cubes that have been dried with paper towels.
6. Stir slowly until all the ice has melted. Record the temperature of the water in the cup; it should be about 10 °C below room temperature. If you need to bring the temperature down, you can add more dried ice cubes. Make sure to get a final temperature reading of the water (T_f).
7. Obtain and record the mass of the cup, stirring rod and cool water.

Data

Data Table: $c_{p,w} = 4.186 \text{ J/g} \cdot ^\circ\text{C}$

	Mass (g)	Temperature (°C)
Foam cup and stirring rod		—
Foam cup, stirring rod, and warm water		—
Warm water	$m_{\text{warm water}}$	T_i
Equilibrium temperature	T_f	T_f
Foam cup, stirring rod, and cold water		—
Ice added	m_{ice}	—
Energy lost		
Energy gained		
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