

Work in Groups of NO MORE THAN THREE to answer each of the following.

The density of water in the liquid state at 0°C is 0.9999 g/mL and the density of ice at 0°C is 0.9164 g/mL. The heat of fusion of water is 333 J/g.

1. A graduated cylinder containing a thermo-equilibrium mixture of ice and water (0°C) had a volume reading of 53.500 mL.

a. How much heat in Joules must be added to melt 10.00 grams of ice?

b. What would the change in volume be (assume the temperature remains at 0°C)?

c. What would the new volume reading be?

2. A chemical reaction was carried out in an apparatus as shown in the lab manual. The volume change of the ice/water mixture was found to be 0.5177 mL during the time of the reaction.

a. Determine the mass of ice that was melted.

b. Determine the quantity of heat (in Joules) generated by the reaction.

c. If 0.0040 moles of the limiting reactant was used in the reaction. Determine  $\Delta H$  per mole of limiting reactant.

d. Use thermodynamic tables to calculate the value of  $\Delta H$  for the following reaction:

