Heat of Fusion Lab

Prelab Questions

1) How does added heat affect molecular motion?

2) What is the difference between heat and temperature?

3) What is meant by the term heat of fusion?

4) State the values for the specific heat(joules/gram degree) and heat of fusion of water (kJ/mole).

5) Why should a stirring rod and not a thermometer be used to stir a solution?

6) What is meant by the term latent heat?

Procedure

1) Find the mass of a clean, empty, dry foam cup.
2) Add approximately 200 mL of distilled water to a 600-mL beaker.
3) Heat the water to about 40 degrees Celsius.
4) Add the heated water to the foam cup until the cup is about half full. Find the mass of the cup and contents.
5) Measure the temperature of the water.
6) Select two medium-sized ice cubes and blot their surfaces dry with a piece of paper toweling. Carefully place the ice cubes into the plastic foam cup. Using a stirring rod, gently stir the ice and water mixture.
7) Once the ice cubes have completely melted, insert the thermometer into the solution and determine the temperature of the water. Remove the thermometer and mix the contents with a stirring rod. Continue monitoring the solution temperature until it remains at a fixed value. Record this temperature on the Report Sheet.
8) Find this new mass of the cup and contents and record it on the Report Sheet.

Data Table:

Mass of empty cup in grams	
Mass of cup + heated water	
Temperature of heated water	
Final temperature of mixture	
Final mass of cup + contents after melting	

Calculation Table:

Mass of heated water	
Temperature difference for heated water	
Temperature difference for melted ice water	
Mass of ice added	

Post-Lab Questions:

1) What happened to the heat released by the warm water?

2) Calculate the amount of heat lost, in Joules, by the heated water.

3) Determine the amount of heat absorbed, in Joules by the melted ice water as it warmed to the final equilibrium temperature.

4) Use your data to determine the amount of heat, in Joules, that was absorbed by the ice as it melted. Explain why you may *not* use $Q = mH_f$ to answer this question.

5) Use your data to calculate the heat of fusion for H_2O (in kilojoules/mole).

6) What factors might account for any differences between your calculated heat of fusion above and the value given in the prelab discussion and textbook?