

Heat of fusion of ice. Determining the energy of phase change.

This lab explores the heat of fusion of ice. When substances go through phase changes (solid to liquid, liquid to gas and gas to plasma) the substances don't change temperature, they change phase.. but similarly to the discussion of Specific Heat Capacity, the amount of energy required to change phase, depends on the substance. This lab then, attempts to measure how many joules (per gram) are required to cause ice to melt (from zero degree solid ice to zero degree, cold water).

Procedure:

Measure out a mass of water into a beaker (between 100-300 grams).	Mass =
Record the initial temperature of the water	$T_0 =$
Place on a hot plate and record the temperature every minute, until the water starts to boil.. once boiling, record the temperature for two more minutes (it should stay level).	Create a table to record data.
Remove the beaker of boiling water (using tongs). Don't drop it!	
Measure out a mass of ice (dry it first!).. roughly a 'fist-full' (between 50-100 grams) and add to the glass of just-boiled water (still should be close to boiling point, ~ 95C?	Mass of ice =
Use the thermometer to stir until all of the ice is melted.. once melted, record the final temperature.	Final temp

Calculations to perform.

1. Determine how much heat the Hot water must have lost to cool down to the final temperature. (using the specific heat equation).
2. Determine how much heat the melted ice water must have gained (using the mass of ice which melted into the same mass of ice-cold water).
3. Subtract the former from the latter to determine how much heat must have been consumed to melt the ice (that was the phase change!)
4. Divide the heat used to melt the ice by the mass of ice to determine the Heat of Fusion for ice (joules/gram).
5. Determine the Percent Error using the accepted value of 334 joules/gram for comparison.
6. Write this lab up in 'mini-lab' format (just a short introduction of the main purpose with a clear, step by step sequence of ideas, actions and mathematics. (one to three pages, max!)