

Molar Heat of Fusion of Water

The laboratory investigation today is a study of that area of chemistry called thermochemistry. As the word suggests, energy is involved in this study. The question you will answer today is "How much heat is liberated or absorbed when a mole of water changes from a solid to a liquid?" Chemists refer to this as the molar heat of fusion of water. Coffee cup calorimeters work well for this determination. Your teacher will discuss this with you.

Accurately weigh a quantity (somewhere around 100 grams should be sufficient) of water that is somewhat close to room temperature. You can probably do this best in the calorimeter cup itself.

Record any changes in temperature that are occurring inside the cup for a couple of minutes. Carefully dry an ice cube. Drop it into the calorimeter and continue to monitor the temperature for several minutes after it reaches its lowest temperature. Determine the mass of the ice cube by reweighing the cup and contents at this point. Use your data to determine the amount of heat gained by the ice cube as it changed from a solid to a liquid. When you have completed that task, determine the heat gained by one mole of water as it changes from a solid to a liquid. Compare the value you determined with the value given in the literature.

Write up the lab using the standard headings (Title, purpose, procedure, data - with tables that have proper sig. figs, and conclusion with sources of error) and include all calculations of work under your data tables. Calculations included should be all the work needed to determine the molar heat of fusion of water and your percent error.

