

Honors Chemistry Lab #27: Calorimetry Investigation

Introduction: Enthalpy is a measure of the total energy of a thermodynamic system. It includes the system's internal energy and thermodynamic potential (a state function), as well as its volume and pressure (the energy required to "make room for it" by displacing its environment, which is an extensive quantity). The unit of measurement for enthalpy in the International System of Units (SI) is the joule, but other historical, conventional units are still in use, such as the British thermal unit and the calorie. The enthalpy is the preferred expression of system energy changes in many chemical, biological, and physical measurements, because it simplifies certain descriptions of energy transfer. Enthalpy change accounts for energy transferred to the environment at constant pressure through expansion or heating. Chemical and physical changes are always accompanied by a change in energy. Most commonly this energy change is observed as a flow of heat energy. The purpose of this lab is to understand the basics of heat transfer and to apply knowledge of the various types of energy and thermodynamics.

Question: How can you design a calorimetry experiment to determine the specific heat capacity of an unknown substance?

Materials: This depends on your experimental design. I would recommend a Styrofoam calorimeter.

Procedure: Detail each step of your design.

Evidence: Collect your data in a data table of your choice. Make sure your results are replicable.

Claim: Based on your collected data and evidence state your claim.

Conclusion: Write a detailed conclusion and self-assess your lab report using the checklist/rubric.

