

PHY2048L Lab 5 Heat Fusion

Latent Heat Of Fusion

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1. Introduction

Below I will discuss topics that need to be introduced and defined in this section of the lab report.

- Thermal Energy, which is the **"internal energy"** associated with the rapid movement of atoms and molecules.
- **Internal Energy** increases as an object or substance is gradually heated up, and the random motions of all atoms or molecules inside become more energetic to increase the internal energy.
- Internal energy is stored as two types: Potential and Kinetic Energy as given by: $E_{Internal} = E_{Kinetic} + E_{Potential}$
- Speak about and define **work, energy, and power** as well as their units
- Talk about and define Status Change Of Materials
- Define and discuss **Specific Heat, Latent Heat Of Fusion, and Heat of Vaporization**
- Read through all of Part 1 from the PPT lecture, Part 2 will not be done for this term/ semester.
- On Monday, November 24th 2025 we did not redo the lab, instead we measured and calculated q, and C for the specific heat
- We measured the PCM Headband again and got accurate results, relative to last week
- We utilized one thermometer instead of two this time, and recorded the temperature of the thermometer after a certain number of seconds denpting the temperature for the PCM headband to melt at a specific time
- We then calculated Q, heat, by multiplying time in seconds by the Power in Watts at 270 provided by the other lab section under Dr. Bae
- It is also possible to do a lab uncertainty analysis
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The objective of this experiement is to plot the graph of the phase changes as it pertains to heat and rates of change as the experimental group tracked the increase in temperature overtime of the PCM headband, in a pot of water.

In this experiment, (we did not take on the role of any engineering team, as far as I know, will confirm later)

2. Principles

1. Experimental Setup

Below I will detail the experimnt, as best as I can remember

- Once in Lab, we were given a PPT lectures so that we could have a foundation of what to do for the Lab, what materials were going to be used, and how the process would transpire.
- We used a type of stove top burner and placed it on level 3 for the first trial of the experiment.
- We initially ran into issues with the water heating the PCM too quickly and therefore messing with the readings and data of our experiment, this caused us to have to re-do the experiment as well as plan to do another full trial on Monday, November 24th 2025.
- Before placing the PCM into the water, we measured the temperature of the water, but I did not record this temperature in my excel (**Need to get this from a lab member**).
- Initially we had three thermometers, and had 1 in the water to keep equilibrium while stirring the water, while the other 2 are inside of the PCM during the process.
- The three thermometers were reduced to two for the first completed (but unsuccessful as far as data) trial, to allow for ease of readings as temperatures climbed rapidly.
- During the unsuccessful initial trial, we went ahead and measured every 10 seconds, but this proved to be too quick of a pace with threee temp readings.
- During the successful first trial, we used only two thermometers and measured every 20 seconds and took the readings to the nearest 0.1 .
- We measured both trials with the stovetop burner on a level of 3.
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4. Results

5. Discussion

This is the section where the failed lab results will go, including the graph

6. Conclusion