**Specific Heat Lab**

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October 13, 2013

**Introduction**

The purpose of this is to obtain the specific heat of an unknown metal. This can be done through using the Law of Conservation of Energy. Heat that is lost in a process must equal heat that is gained. In this case a metal sample was heated and transferred to room temperature water. In theory the amount of heat lost by the metal must be equal to the heat gained by the water.

Specific heat is a physical property of matter which is a measurement of the heat required, in joules, to raise the temperature of one gram of a substance one degree Celsius.

The first law of Thermodynamics allows for the determination for a specific heat was done in this lab. The first law of Thermodynamics states that when heat is added to a system, some of that energy stays in the system and some leaves the system. The energy that leaves does work on the area around it and the energy that stays in the system creates an increase in the internal energy of the system. When the hot metal was added to the cold water at first the temperature of the system rose. Then the system released some energy in the form of steam.

The likely sources of error are the energy/temperature lost upon transfer of the beaker to the cup of room temperature water. Other sources of error could be the water that was at "room temperature" was sitting in the sun so there was a difference in temperature. This seemed to have caused a slight error when finding the difference in temperature.

**Data**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Metal Mass | Water Mass | Water tj ­ (degrees) | Metal t­i (degrees) | Final Temp (degrees) |
| 22.42g | 30.48g | 24 | 99 | 30 |
| 20.80g | 32.84g | 26 | 98 | 29 |

**Calculations**

-[ Mass(metal) x ∆t(metal) x Cs (metal)] = [ Mass(water) x ∆t(water) x Cs (water)]

-[22.42g x (30-99) \* Cs ] = [ 30.48 \* (30 - 24) \* 4.184 j/gC ] = 0.495j/gC

-[20.80g x (29-98) \* Cs ] = [ 32.84 \* (29 - 26) \* 4.184 j/gC ] = 0.287j/gC

Average of the specific Heats

( H1 +H2 ) / 2 = Cs(av)

(.495 + .287) / 2 = 0.391j/g\*gC

**Conclusion**

|  |  |
| --- | --- |
| Cs (metal) for Trial 1 | 0.495j/gC |
| Cs (metal) for Trial 2 | 0.287j/gC |
| Cs(average) | 0.391j/g\*gC |