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| PHYS 101 – Wed class |
| Specific Heat |
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Specific Heat

Objective:

The purpose of this activity is to identify the composition of metal specimens by measuring their specific heat.

Theory:

If we isolate two materials having different temperatures and bring them into contact, heat will gradually flow from the hotter material to the colder material until the temperature equalizes. The heat flow out of the hotter material will equal toe heat flow into the colder material. So if we know the specific heat of one material, we can use the temperature measurements to infer the specific heat of the other.

Procedure:

* Determine the mass of the 5 metal specimen and the Styrofoam cup.
* Fill the cup ¾ full of room temperature water and determine the mass of cup with water. Subtract the mass of the cup to determine the mass of the water.
* Fill a glass beaker with tap water and bring to boil on a hotplate. Suspend the metal specimen in the boiling water for about 5 min so that its temperature is 100 °C
* Using DataStudio software, put the sensor into the water and record the temperature. (Just before immersing the metal specimen into the water.)
* Quickly move the specimen into the Styrofoam cup and cover with the lid.
* Put the sensor through the hole in the cover and start taking the temperature until it reaches equilibrium (temp stops going up)
* Record final temperature.

Data:



Results

Based on the data, we found that:

Specimen A was Zinc

Specimen B was Aluminum

Specimen C was Stainless Steel

Specimen D was Copper

Specimen E was Brass

Error analysis:

Some of the errors may have come from the experiment. Not allowing enough time for the specimen to get to 100 °C before putting into the cup with room temperature water. Not being quick enough when transferring the specimen, losing temperature in between transfer. Not swishing the specimen in the cup hard enough.

Conclusion:

We concluded that heat does flow from one material to another and that taking the difference or change in temperature we can determine a material by its specific heat. By taking the mass of one material multiplied by the specific heat and the change in the temperature of that material and then dividing it by the mass times the change in temperature of the second material. Calculations shown in spread sheet. We also concluded that the inclusion of the Styrofoam cup’s specific heat has very little to no effect on the results, so we should not include it.