Specific Heat of a Solid Substance

Objective: Verify the specific heat of a metal using a calorimeter and the equations learned in class.

Procedure:
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1. Create Data Tables similar to the ones below.
2. Place your block in the boiling water bath. Let the block sit in the boiling water bath gaining heat until it comes to equilibrium
3. Find the mass of the inside metal can of the calorimeter. Change your answer to kg and record.
4. Place the inside metal can in the ice container so that its temperature drops to 0 °C
5. Place between 250 and 300 mL of water in a beaker and place the ice in the beaker to bring the water temperature down to 0 °C
6. Record the specific heat capacity of the calorimeter can, the water, and the block in the table. You can find these values in your textbook.
7. Once the water is boiling and the water temperature has approached 0 °C the experiment can be performed.
8. Place 150 mL of ice water into the cold calorimeter cup. To do this decant the ice water into a graduated cylinder and then poor it from the graduated cylinder into the calorimeter cup.
9. Place the cup into the calorimeter, close the lid and measure the temperature of the water and the calorimeter can.
10. Now get your block. If the water the block is in, is boiling, the block is at 100 °C.
11. Quickly place the hot block into the calorimeter cup and place the lid back on the can.
12. Watch the temperature change until the heat of the system reaches equilibrium.
13. Record the final temperature of the system.
14. Remove the block and measure its math.
15. Preform the calculations to determine the initial energy of each of the items involved and total energy of the system. Record your answers.
16. Calculate the theoretical final temperature of the system based on the total initial energy.
17. Calculate the percent error in this laboratory.

Date Table:

Initials

Mass of Calorimeter Can(kg) =	
Specific Heat Capacity for Aluminum (J/(kg*°C)) =	
Calorimeter Temperature (°C) =	
Calculated Heat Energy in Calorimeter cup (J) =	

Mass of Water in Can (kg) =	
Specific Heat Capacity for Water (J/(kg*°C)) =	
Water Temperature (°C) =	
Calculated Heat Energy in Water (J) =	

Mass of heated block (kg) =	
Specific Heat Capacity for block (J/(kg*°C)) =	
Block Temperature (°C) =	
Calculated Heat Energy in Block (J) =	

Total internal energy in system (J) =	

Final

Calculated (Theoretical) Temperature of System (°C) =	
Experimental Temperature of System (°C) =	

Percent Error (%) =	