Lab: Determining the Specific Heat Capacity of an Unknown

Procedure

1. Mass an unknown solid on the balance. Record values in chart below.
2. Place the unknown solids in beaker with enough water to completely cover the solids. Heat the water to 100°C or close to it so that the water is boiling. This will be the initial temperature reading for the solid.
3. Measure out 100 g of water from the tap in a Styrofoam calorimeter. Take the initial temperature of the water.
4. With tongs, remove the solid from the boiling water and quickly transfer it to the Styrofoam cup and cover.
5. Take the final temperature reading (water + solid). Make sure the thermometer has reached a stable temperature.
6. Use the above information to calculate specific heat capacity for the unknown solid.
7. Compare your value to Table of values on the back. Choose the solid that best matches your calculated value in order to identify the solid.

Data Table

Mass of Solid	
Initial Temp of Solid	
Mass of Water in Styrofoam Cup	
Initial Temperature of Water	
Final Temperature (water + solid)	
Specific Heat Capacity of Water	

Data Processing

Conclusion: Identity of Unknown Solid: _____

1. Your calculated Specific Heat Capacity: _____

2. Actual Identity of Solid is _____

3. Actual Specific Heat Capacity from chart:_____

4. Percent Error

5. What two assumptions are made in this experiment?

Table of Specific Heat Capacities

MATERIAL	'c' (J/g°C)
aluminum	**0.903**
brass	**0.402**
copper	**0.385**
iron/steel	**0.449**
lead	**0.128**
tin	**0.227**
zinc	**0.388**
gold	**0.129**
silver	**0.235**
nickel	**0.444**
platinum	**0.133**