

Lab Prep - Finding the Specific Heat of a Metal

Name Key

Using the data table, complete the questions below.

#1	1. Mass of empty test tube	29.51 g
	2. Mass of metal + test tube	67.49 g
#2	3. Mass of Styrofoam cup	2.23 g
	4. Mass of Styrofoam cup + water	125.15 g
#3	5. Initial temperature of metal in boiling water	50.30 degrees C
	6. Initial temperature of water in Styrofoam cup	19.90 degrees C
#4	7. Final temperature of water and metal pieces	22.50 degrees C

1. Calculate the mass of the metal pieces in grams.

$$\begin{array}{r} 67.49 \text{ g} \\ - 29.51 \text{ g} \\ \hline 37.98 \text{ g} \end{array}$$

2. Calculate the mass of the water in the calorimeter in grams.

$$\begin{array}{r} 125.15 \text{ g} \\ - 2.23 \text{ g} \\ \hline 122.92 \text{ g} \end{array}$$

3. Calculate the change in temperature of the metal pieces.

$$\begin{array}{r} 22.50 \text{ }^\circ\text{C} \\ - 50.30 \text{ }^\circ\text{C} \\ \hline -27.80 \text{ }^\circ\text{C} \end{array}$$

4. Calculate the change in temperature of the water in the calorimeter.

$$\begin{array}{r} 22.5 \text{ }^\circ\text{C} \\ - 19.9 \text{ }^\circ\text{C} \\ \hline 2.6 \text{ }^\circ\text{C} \end{array}$$

5. Calculate the heat gained by the water.

$$Q = mc\Delta T \quad Q = (122.92)(4.184)(2.6) = 1337 \rightarrow \boxed{1340 \text{ J}}$$

6. Find the heat lost by the metal.

$$-1340 \text{ J}$$

7. Calculate the experimental specific heat for this metal.

$$-1340 \text{ J} = (37.98)(c)(-27.8) \quad \boxed{c = 1.27 \text{ J/g}^\circ\text{C}}$$

8. Using 0.900 J/gK, calculate the percent error for your lab.

$$\frac{\text{Exp} - \text{Accepted}}{\text{Accepted}} \times 100\% \quad \boxed{41.1\%}$$