

Advanced Chemistry
Calorimetry I WS

NAME: _____ **PER:** _____

Instructions: Complete the following problems. SHOW ALL WORK in the empty space below the questions. Remember the units. Round to the nearest hundredths place.

Solving for Heat (q)

1. How many joules of heat are required to raise the temperature of 550.0 g of water from 12.0°C to 18.0°C?
2. How much heat is lost when a 64.0 g piece of copper cools from 375.0°C to 26.0°C? (The specific heat of copper is 0.38452 J/g x °C). Place your answer in kJ.
3. The specific heat of iron is 0.4494 J/g x °C. How much heat is transferred when a 4.70 kg piece of iron is cooled from 180.0°C to 13.0°C? (Remember you must use the same units!)

Solving for Mass (m)

4. Precisely 8750.0 J of heat are applied to a piece of aluminum, causing a 56.0°C increase in its temperature. The specific heat of aluminum is 0.9025 J/g x °C. What is the mass of the aluminum?
5. Find the mass of a sample of water if its temperature dropped 24.8°C when it lost 870.0 J of heat.
6. How many grams of water would require 92.048 kJ of heat to raise its temperature from 34.0°C to 100.0°C? (Remember to change units first)

Solving for temperature (T)

7. How many degrees would the temperature of a 450.0 g piece of iron increase if 7600.0 J of energy are applied to it? The specific heat of iron is $0.4494 \text{ J/g} \times ^\circ\text{C}$.
8. A 250.0 g sample of water with an initial temperature of 98.8°C loses 7500.0 J of heat. What is the final temperature of the water?
9. How much change in temperature would the addition of 35,000.0 J of heat have on a 538.0 g sample of copper? Specific heat of copper is $0.38452 \text{ J/g} \times ^\circ\text{C}$.

Solving for Specific Heat Capacity (c)

10. Determine the specific heat of a certain metal if a 450.0 gram sample of it loses 34,500.0 J of heat as its temperature drops by 97.0°C .
11. What is the specific heat of the unknown material if 4786.0 J of heat are transferred to an 89.0 gram sample? The initial temperature of 23.0°C and the final temperature is 89.5°C ?
12. The temperature of a 55.6 gram sample of a certain metal drops by 113.0°C as it loses 3500.0 J of heat. What is the specific heat of the metal?