

Specific Heat
 Chem Worksheet 16.1

Name _____

Use the data in the table to answer the following questions.

| Substance | Specific Heat Capacity (J/g °C) |
|-----------|------------------------------------|
| iron | 0.449 J/g °C |
| aluminum | 0.897 J/g °C |
| silver | 0.235 J/g °C |
| lead | 0.129 J/g °C |
| copper | 0.385 J/g °C |
| nickel | 0.444 J/g °C |
| gold | 0.129 J/g °C |
| zinc | 0.387 J/g °C |

| Useful Equations | |
|--|--|
| $q = m \cdot c \cdot \Delta T$ | $T_f = 100^\circ\text{C} - \Delta T_b$ |
| $\Delta T = T_{\text{final}} - T_{\text{initial}}$ | $T_b = T_c + \Delta T_b$ |
| $1 \text{ kg} = 1000 \text{ g}$ | $1 \text{ kcal} = 1000 \text{ cal}$ |
| $1 \text{ cal} = 4.184 \text{ J}$ | |

- Calculate the energy required to heat a bucket of water at 18 °C to boiling. The mass of the water is 75.0 g.
- A water heater warms 15.0 J of water from a temperature of 22.7 °C to a temperature of 44.7 °C. Determine the amount of energy (in joules) required.
- Determine the temperature change that will occur when 250.0 J of energy is applied to 20 g of gold.
- When 400 J of heat is applied to a sample of iron metal the temperature increases by 15.0 °C. Determine the mass of the metal sample.
- A silver ring has a mass of 178.07 g. How many calories of heat are required to increase the temperature from 11.0 °C to 102.5 °C?
- A heat energy of 147 J is applied to a sample of glass with a mass of 20.4 g. Its temperature increases from -11.0 °C to 105.5 °C. Calculate the specific heat of glass.
- What is the mass of copper that increases its temperature by 20.0 °C when 100,000 J of energy is applied?
- How much energy (in kilocalories) is 100 kg of ice water that goes from a temperature of 200 K to a temperature of 200 K?
- When 7000 joules of energy are applied to a 15.2 kg piece of lead metal, how much does the temperature change by?
- A 0.44 kg ingot of unknown metal is heated from 75.2 °F to 100.2 °F. This requires 3.40 kcal of energy. Calculate the specific heat of the metal and determine its identity.