

HONORS CHEMISTRY
WORKSHEET 8c.

Name: _____

FINISH AT HOME ANY PROBLEMS THAT WE DO NOT FINISH IN CLASS

Specific heat capacities:

SHOW ALL WORK

Water	$1.00 \text{ cal / g } ^\circ\text{C} = 4.18 \text{ J / g K}$	$1 \text{ cal} = 4.18 \text{ J}$
Aluminum	$.215 \text{ cal / g } ^\circ\text{C} = 0.897 \text{ J / g K}$	
Iron	$.107 \text{ cal / g } ^\circ\text{C} = 0.449 \text{ J / g K}$	
Gold	$.031 \text{ cal / g } ^\circ\text{C} = 0.129 \text{ J / g K}$	

1. Calculate the energy required to raise the temperature of 230. g of water from 20.0°C to 35.0°C .

2. A 250.0 g gold statue at 21.0°C is placed in a tank containing 1105. g of water at an initial temperature of 80°C . If no heat enters or leaves the system, find the final equilibrium temperature.

3. Some students heated up a 31.2 g aluminum bar in a beaker of boiling water at 100.0°C . After it reached equilibrium with the water, they transferred the aluminum to a beaker containing 236.0 g of room temperature water at 21.0°C .
When the aluminum and water reached thermal equilibrium, the final temperature was 23.0°C .
 - a. Use the students' data to find the specific heat capacity of aluminum.
 - b. Compare this value with the value at the top of this page and calculate a percentage error.
 - c. What is the most likely source of experimental error?

4. Use the following data to calculate the energy needed to convert 0.500 kg of ice at -20°C into steam at 250°C .

Specific heat capacity of ice = $2.03 \text{ J / g } ^\circ\text{C} = 2.03 \text{ J/g K}$	Heat of fusion at $0^\circ\text{C} = 6.02 \text{ kJ/mol}$
Specific heat capacity of water = 4.18 J/g K	Heat of vaporization at $100^\circ\text{C} = 40.7 \text{ kJ/mol}$
Specific heat capacity of steam = 2.0 J/g K	