

Honors Chemistry Thermochemistry Test Review

Solve. For each problem: List knowns and unknown, equation used, substitution, answer, and units. Draw a box around your final answer.

1. The specific heat capacity of aluminum is $0.878 \text{ J/g}\cdot^\circ\text{C}$. Calculate the energy required to raise the temperature of 225 g of aluminum by 184°C .
2. Calculate the heat absorbed by the water in a calorimeter when 175 grams of lead cools from 125.0°C to 22.0°C . The specific heat capacity of lead is $0.1295 \text{ J/g}\cdot^\circ\text{C}$.
3. How much heat is required to raise the temperature of $5.00 \times 10^2 \text{ g}$ of aluminum by 45.0°C ? (specific heat of aluminum = $0.878 \text{ J/g}\cdot^\circ\text{C}$)
4. It takes 22,736 joules of energy to raise the temperature of 319 g of copper by 184°C . What is the specific heat capacity of copper?
5. It takes 43,002 joules of energy to raise the temperature of 225.35 g of a piece of metal from 25.0°C to 450.0°C . What is the specific heat capacity of this metal? What is this metal?

6. Assume 444.55 joules of heat are added to 8.50 g of water originally at 25.0°C. What would be the final temperature of the water?
7. Find the specific heat capacity of iron if a 125.0 g sample of iron with an initial temperature of 98.0°C is placed into 132.85 g of water with an initial temperature of 34.0 °C. The final temperature of the water and the iron is 40.0 °C. Remember the specific heat capacity of water is 4.184 J/g°C.
8. **(Show All Work)**
How much heat is absorbed by 225.0 g of ice at - 25.0 °C to liquid water at 8.0 °C?

9. How much heat is required to raise the temperature of 4.5 grams of water from 15°C to 106°C?

10. State whether each situation describes an exothermic or endothermic energy change, if there is a temperature change, and if q is positive or negative

	Endo/Exo	ΔT (yes/no)	q (ΔH) (+/-)
a. Water being heated from 5°C to 98°C	_____	_____	_____
b. Condensation	_____	_____	_____
c. Sublimation	_____	_____	_____
d. Ice being cooled from -10°C to -30°C	_____	_____	_____

11. Draw a heating curve for water. Label the y-axis with the temperatures for the phase changes, where solid, liquid and gas states are, and the names of all the phase changes with an arrow pointing in the direction they occur at, where kinetic energy is changing, where potential energy is changing, and directions of exothermic and endothermic energy changes.

1. What is the difference between an endothermic and an exothermic process?
2. What happens to the temperature in an endothermic process?
3. What happens to the temperature in an exothermic process?
4. What is the relationship between specific heat and the change in temperature?
5. What happens when you place a piece of hot metal into cold water?
6. What happens to the temperature during an exothermic phase change?
7. What happens to the kinetic energy during an exothermic phase change?
8. What happens to the potential energy during an exothermic phase change?
9. What happens to the temperature during an endothermic phase change?
10. What happens to the kinetic energy during an endothermic phase change?
11. What happens to the potential energy during an endothermic phase change?
12. What is the first law of thermodynamics?
13. What happens when you put ice into warm water?
14. What is the difference between heat and temperature?