

Unit 5: Thermochemistry

#2 Specific Heat Problems



Solve the following problems dealing with specific heat, c . Show your work.

1. Convert 250 Joules to kilojoules and calories.
2. The specific heat of ethanol is $2.46 \text{ J/g}^\circ\text{C}$. Find the heat required to raise the temperature of 193 g of ethanol from 19°C to 35°C .
3. When a 120 g sample of aluminum (Al) absorbs 9612 J of energy, its temperature increases from 25°C to 115°C . Find the specific heat of aluminum. Be sure to include the correct unit for specific heat.
4. The specific heat of lead (Pb) is $0.129 \text{ J/g}^\circ\text{C}$. Find the amount of heat released when 2.4 mol of lead are cooled from 37.2°C to 22.5°C .
5. How many kJ of energy are needed to raise the temperature of 165 mol of water from 10.55°C to 47.32°C ? (Hint: How many J are in 1 kJ?)

6. How much heat must be absorbed by 375 grams of water to raise its temperature by 25° C?
7. What mass of water can be heated from 25.0° C to 50.0° C by the addition of 2825 J?
8. What is the final temperature when 625 grams of water at 75.0° C loses 7.96×10^4 J?
9. Two objects which have the same mass each absorb 100 J of energy. The temperature of object A increases by 2°C, while the temperature of object B increases by 20°C. Which object has the higher heat capacity? Explain.
10. Water has a specific heat capacity of 4.18 J/g°C, while copper has a specific heat capacity of 0.387 J/g°C. If 50.0 g of each material absorbs the same quantity of heat, which one will experience the greater increase in temperature? Explain.