

Chemistry – Chapter 17 Book problems #2: Thermochemistry

1. When 435 J of heat is added to 3.4 g of olive oil at 21°C, the temperature increases to 85°C. What is the specific heat of the olive oil?
2. How much heat is required to raise the temperature of 250.0 g of mercury 52°C? (specific heat of mercury = 0.14 J/g C°)
3. When 50.0 mL of water containing 0.50 mol HCl at 22.5°C is mixed with 50.0 mL of water containing 0.50 moles of NaOH at 22.5°C in a calorimeter, the temperature of the solution increases to 26.0°C. How much heat (in kJ) is released by this reaction?
4. A small pebble is heated and placed in a foam cup calorimeter containing 25.0 mL of water at 25.0°C. The water reaches a maximum temperature of 26.4°C. How many joules of heat are released by the pebble?
5. Make the following conversions:
 - a. 8.50×10^2 cal to Calories
 - b. 444 cal to joules
 - c. 1.8 kJ to joules
 - d. 4.5×10^{-1} kJ to calories
6. How much heat is required to raise the temperature of 400.0 g of silver 45°C? (specific heat of silver = 0.24 J/g C°)
7. How many kilojoules of heat are absorbed when 1.00 L of water is heated from 18°C to 85°C?
8. A 1.55-g piece of stainless steel absorbs 141 J of heat when its temperature increases by 178°C. What is the specific heat of the stainless steel?
9. An orange contains 106 Calories. What mass of water could this same amount of energy raise from 25.0°C to the boiling point?