

- _____ 12. The amount of heat required to change the temperature of an object by exactly 1°C is the object's
- heat of combustion.
 - heat capacity.
 - enthalpy.
 - heat of formation.
- _____ 13. The number of calories required to raise the temperature of 55.0 g of water from 25°C to 45°C is
- 1.10×10^3 cal.
 - 1380 cal.
 - 2480 cal.
 - 55.0 cal.
- _____ 14. If 1 Calorie = 4.18 kJ, how many kJ of energy can be released by a banana containing 150 Cal?
- 6.3×10^5 kJ
 - 0.028 kJ
 - 36 kJ
 - 630 kJ
- _____ 15. The temperature of an 8.0-g sample of metal changed from 25°C to 50°C when it absorbed 420 J of heat. What is the specific heat of this sample?
- $130 \text{ J/g}\cdot^{\circ}\text{C}$
 - $2.1 \text{ J/g}\cdot^{\circ}\text{C}$
 - $1300 \text{ J/g}\cdot^{\circ}\text{C}$
 - $0.48 \text{ J/g}\cdot^{\circ}\text{C}$
- _____ 16. As perspiration evaporates from your skin, your body is cooled. With respect to your body, this process is said to be
- endothermic.
 - exothermic.
 - isothermic.
 - none of the above.
- _____ 17. A student mixes two water solutions beginning at 22.0°C to form a final solution with a mass of 58.0 g at 28.5°C . What is the heat change, in kJ, for this reaction?
- 37.3 kJ
 - 242 kJ
 - 27.2 kJ
 - 1.58 kJ
- _____ 18. Given the equation $\text{I}_2(\text{s}) + 62.4 \text{ kJ} \rightarrow \text{I}_2(\text{g})$, which of the following is true?
- The reaction is exothermic.
 - $\Delta H = +62.4 \text{ kJ}$
 - $\Delta H = -62.4 \text{ kJ}$
 - The reaction releases heat.
- _____ 19. Given the equation in question 18, how much heat is involved in the production of 3.5 mol $\text{I}_2(\text{g})$?
- 110 kJ
 - 62 kJ
 - 220 kJ
 - 3.5 kJ
- _____ 20. Given the equation $\text{C}_3\text{H}_8(\text{g}) + 5\text{O}_2(\text{g}) \rightarrow 3\text{CO}_2(\text{g}) + 4\text{H}_2\text{O}(\text{g}) + 2220 \text{ kJ}$, how much heat is produced when 80.0 g of O_2 react?
- 1110 kJ
 - 5.55×10^3 kJ
 - 2.50 kJ
 - 1.78×10^5 kJ
- _____ 21. Which of the following statements is true?
- $\Delta H_{\text{vap}} = \Delta H_{\text{cond}}$
 - $\Delta H_{\text{vap}} = -\Delta H_{\text{cond}}$
 - ΔH_{vap} is always negative.
 - ΔH_{cond} is always positive.

28. If 27.0 mL of water containing 0.035 mol HCl is mixed with 28.0 mL of water containing 0.035 mol NaOH in a calorimeter such that the initial temperature of each solution was 24.0°C and the final temperature of the mixture is 33.0°C, how much heat (in kJ) is released in the reaction? Assume that the densities of the solutions are 1.00 g/mL.
29. Given the equation $\text{C}_2\text{H}_4(\text{g}) + 3\text{O}_2(\text{g}) \rightarrow 2\text{CO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l}) + 1411 \text{ kJ}$, how much heat is released when 8.00 g of O_2 react?
30. How many grams of ice at 0°C can be melted into water at 0°C by the addition of 75.0 kJ of heat? ΔH_{fus} for water = 6.01 kJ/mol
31. What is the enthalpy change, ΔH in kJ, for the following reaction:
 $2\text{C}(\text{s}) + \text{O}_2(\text{g}) \rightarrow 2\text{CO}(\text{g})$
Given the following:
 $\text{C}(\text{s}) + \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) \quad \Delta H = -393.5 \text{ kJ}$
 $2\text{CO}(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{CO}_2(\text{g}) \quad \Delta H = -565.7 \text{ kJ}$
32. What is the heat of reaction (ΔH) for the combustion of benzene, $\text{C}_6\text{H}_6(\text{l})$, to form carbon dioxide gas and water? Write the final balanced equation for the reaction.
Standard heats of formation:
 $\text{C}_6\text{H}_6 = +48.50 \text{ kJ}$
 $\text{O}_2(\text{g}) = 0.0 \text{ kJ}$
 $\text{CO}_2(\text{g}) = -393.5 \text{ kJ}$
 $\text{H}_2\text{O}(\text{l}) = -285.8 \text{ kJ}$