ANSKEY

Thermochemistry Review (Chapter 17)

1) Explain the difference between exothermic and endothermic. How would each "feel" to you? exothermic → heat released, "feels" warm
endothermic → heat absorbed, "feels" cold

2) What is the difference between temperature & heat? What are the units that we use for heat? temp. can be measured, measures average kinetic energy
heat is a type of energy that flows (Joules or calories)

3) On what law does calorimetry (experiments involving heat exchange) depend on? (hint: think about our labs) Law of conservation of mass

4) What is specific heat? What are the usual units for specific heat? What about heat of fusion and vaporization? C_p = amount of heat required to raise 1g 1°C
ΔH_{vap} = Heat required to boil C_p = J/g°C ΔH_{Fus} = heat required to melt

5) What type of energy changes during a phase change? What type of energy changes what temperature changes?
Potential Kinetic

6) The specific heat of a metal is 1.35 J/g°C. Calculate the energy required to raise 30.5 grams of the metal 11.5°C. 474 J

7) A piece of unknown metal with a mass of 33.5 grams is heated to 65.5°C and placed in 195 mL of 10.8°C water. The final temperature of the mixture is 21.0°C. What is the specific heat of the metal? (J/g°C) 5.58 J/g°C

8) How much heat is required to heat 100.0g of water from 55.0°C to 155°C?(ΔH_{fus} = 6.01 kJ/mol ΔH_{vap} = 40.7 kJ/mol) (Specific heat of water vapor = 1.9 J/g°C) 18,810 J
226.1 kJ
10,450 J
255 kJ

9) 200.0 grams of ethanol (C_2H_5OH), is burned and 2355 kJ of heat is produced, what is the heat of combustion in kJ/mol for ethanol?
541.7 kJ/mol

10) What mass of propane, C_3H_8 must be burned in order to produce 16,000 kJ of energy? $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$ ΔH = -2200 kJ

$$\frac{16{,}000\text{ kJ}}{2200\text{ kJ}} \left| \frac{1\text{ mol } C_3H_8}{1\text{ mol } C_3H_8} \right| \frac{44\text{ g } C_3H_8}{} = 32\text{ g } C_3H_8$$