

Name _____ Date _____ Period _____

Energy Ws #4: Thermochemical Equations and Stoichiometry

1. On average, each person in USA consumes 110.0 g of sugar daily. If all of this sugar is assumed to be glucose, how much heat energy from glucose is obtained by a person through respiration each day? $C_6H_{12}O_6(s) + 6O_2(g) \rightarrow 6CO_2(g) + 6H_2O(l)$ $\Delta H_{rxn} = -2870 \text{ kJ}$

2. How many kilojoules of heat would be provided by the combustion of 10.0 g of butane?
 $2C_4H_{10}(g) + 13O_2(g) \rightarrow 8CO_2(g) + 10H_2O(l)$ $\Delta H_{comb} = -5.756 \times 10^3 \text{ kJ}$

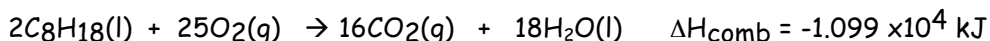
3. How much heat will be released when 6.44 g of sulfur reacts with excess O_2 according to the following equation? $2S + 3O_2 \rightarrow 2SO_3$ $\Delta H = -791.4 \text{ kJ}$

4. How much heat will be released when 4.72 g of carbon reacts with excess O_2 according to the following equation? $C + O_2 \rightarrow CO_2$ $\Delta H = -393.5 \text{ kJ}$

5. How much heat will be released if 1.0 g of hydrogen peroxide decomposes, according to the following equation? $2H_2O_2(l) \rightarrow 2H_2O(l) + O_2(g)$ $\Delta H = -190 \text{ kJ}$

6. How much heat is transferred when 147g of $NO_2(g)$ is dissolved in 100 g of water, according to the following equation? $3NO_2(g) + H_2O(l) \rightarrow 2HNO_3(aq) + NO(g)$ $\Delta H = -138 \text{ kJ}$

7. What is the minimum mass of gasoline that must be delivered by the carburetor or fuel injection system to a car's engine in order for it to generate the 5000kJ of energy?



8. What is the minimum volume of oxygen gas (at STP) that must be delivered by the carburetor or fuel injection system to a car's engine in order for it to generate the 5000kJ of energy?