Name _____ Period _____

Themochemistry Worksheet #2

The **molar enthalpy of reaction** (ΔH_{rxn}) is the amount of heat transferred during a reaction. It is reported in kilojoules per mole of reactant. A reaction that produces heat is **exothermic** and has a negative ΔH_{rxn}. A reaction that absorbs heat is **endothermic** and has a positive ΔH_{rxn}.

Answer the following questions. Show all work and report answers with units.

How much heat will be released when 6.44 g of sulfur reacts with excess O_2 according to the following equation?

$$2\ S + 3O_2 \rightarrow 2SO_3 \quad \Delta H = -791.4\ kJ$$

How much heat will be released when 4.72 g of carbon reacts with excess O_2 according to the following equation?

$$C + O_2 \rightarrow CO_2 \quad \Delta H = -393.5\ kJ$$

How much heat will be absorbed when 38.2 g of bromine reacts with excess H_2 according to the following equation?

$$H_2 + Br_2 \rightarrow 2HBr \quad \Delta H = +72.80\ kJ$$

How much heat will be released when 1.48 g of chlorine reacts with excess phosphorus according to the following equation?

$$2P + 5Cl_2 \rightarrow 2PCl_5 \quad \Delta H = -886\ kJ$$

What mass of propane, C_3H_8 must be burned in order to produce 76,000 kJ of energy?

$$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O \quad \Delta H = -2200 \text{ kJ}$$

How much heat will be absorbed when 13.7 g of nitrogen reacts with excess O_2 according to the following equation?

$$N_2 + O_2 \rightarrow 2NO \quad \Delta H = +180 \text{ kJ}$$

What mass of iron must react to produce 3600 kJ of energy?

$$3Fe + 2O_2 \rightarrow Fe_3O_4 \quad \Delta H = -1120 \text{ kJ}$$

How much heat will be released when 12.0 g of H_2 reacts with 76.0 g of O_2 according to the following equation?

$$2H_2 + O_2 \rightarrow 2H_2O \quad \Delta H = -571.6 \text{ kJ}$$