**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_ Hour\_\_\_\_\_\_\_\_**

**Stoichiomoetry and Thermostoich: Self-Assessment**

Remember to begin all questions by writing a balanced equation, and don't forget to include significant figures/digits and a proper unit in your final answer. Each equation will have three questions that pertain to it.

1. \_\_\_\_\_\_\_Al + \_\_\_\_\_\_HF 🡪 \_\_\_\_\_\_AlF3 + \_\_\_\_\_\_H2

a. If 30.2 g of aluminum reacts with hydrofluoric acid to produce aluminum fluoride and hydrogen gas, how many liters of hydrogen are produced at STP?

b. How many liters of HF are produced by the reaction of 5.7 L of hydrogen with an equal amount of chlorine?

c. How many molecules of Al are required to react with 0.45 mol HF to produce hydrogen gas and aluminum chloride?

2. 2C4H10(l) + 13O2(g) 🡪 8CO2(g) + 10H2O(l) + 2877kJ

a. How many moles of water are produced from the combustion of 0.450 mol of butane?

b. How many grams of CO2 are produced when 88 g of C4H10 are reacted with an excess of oxygen?

c. If 15.7 g of water were produced in the above reaction, how many kJ of heat were released?

3. Is the equation in question #2 an exothermic or endothermic reaction? How did you determine this?

4. \_\_\_\_\_\_ SrCl2(aq) + \_\_\_\_\_\_\_ H3PO4(aq) → \_\_\_\_\_\_HCl(aq) + \_\_\_\_\_\_Sr3(PO4)2(s) ΔH= +45.2 kJ

1. How many grams of strontium phosphate will be produced if strontium chloride is reacted with 1.3 moles of phosphoric acid?
2. If 245.6 kJ of energy is absorbed, how many moles of HCl will be produced?
3. If 0.873 mols of strontium chloride is reacted with an excess of phosphoric acid, how many kJ of heat will be absorbed?
4. Is this reaction exothermic or endothermic? How do you know?

ANSWERS:

1a. 37.6 L H2

1b. 11 L HF

1c. 9.0 x 1022 molecules H2

2a. 2.25 mol H2O

2b. 270 g CO2

2c. -251 kj or 251 kJ released

4a. 290 g Sr3(PO4)2

4b. 32.60 mol HCl

4c. 13.2 kJ