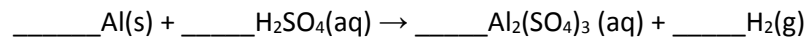




- **Mass-to-mass Stoichiometry**

Refer to the following reaction to answer the next set of problems. (Balance the reaction before you start!)



1. A) How many grams of aluminum can be reacted using 23.65 g H<sub>2</sub>SO<sub>4</sub>?

B) As the reaction in part A progresses, how many grams of H<sub>2</sub> gas are produced?

2. In a completely separate setup, I need to make 10.00g Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>. How many grams of Al should I begin the reaction with?

3. If I begin with 9.72 mol H<sub>2</sub>SO<sub>4</sub>, how many grams of H<sub>2</sub> can I make?

4. For the reaction shown, calculate how many grams of oxygen form when each quantity of reactants completely reacts.



A) 2.97 g  $\text{KClO}_3$

B) 0.7541 g  $\text{KClO}_3$

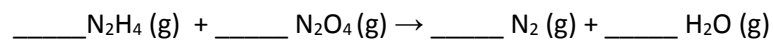
C) 15.69 kg  $\text{KClO}_3$  (NOTE THE kg!!)

D) How many grams of KCl will also form when 0.7541g  $\text{KClO}_3$  react? (Same mass as Part B)

E) Use your answer for parts B and D to show that you have not violated the Law of Mass Conservation. (Add the masses of the 2 products that you calculated, is this equal to the mass of the reactant you began with?)

▪ **Theoretical Yield/Percent Yield**

1. Consider the reaction below:



A) A reaction initially contains 5.27g of  $\text{N}_2\text{H}_4$ , and excess  $\text{N}_2\text{O}_4$ . What is the theoretical yield of  $\text{N}_2$  for the reaction?

B) You recover 4.95g of  $\text{N}_2$  at the end of the reaction. What is the percent yield for the reaction?

2. A scientist calculated that he should make 20.32g of a drug he is synthesizing from a reaction. The known percent yield of the reaction is 64.23%. How much of the drug can he expect to recover at the end of his reaction?

3. A different scientist calculated that she should synthesize 8.54g of her product but only recovers 2.98g of it. What is the percent yield of the reaction?