

Stoichiometry Assignment #4

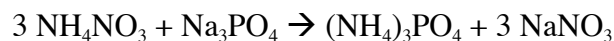
Name _____

1. Define the terms *limiting reactant* and *excess reactant*.
2. What information must you have to determine which of two reactants is the limiting reactant in a reaction?
3. What information must you have to determine how much of the excess reactant remains after the reaction has taken place?

For the following reactions, find the following:

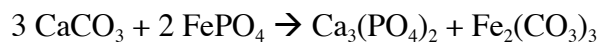
- a) Which of the reagents is the limiting reagent?***
- b) What is the maximum amount of each product that can be formed?***
- c) How much of the other reagent is left over after the reaction is complete?***

- 1) Consider the following reaction:



Answer the questions above, assuming we started with 30 grams of ammonium nitrate and 50 grams of sodium phosphate.

2) Consider the following reaction:



Answer questions a, b, and c, for Problem 1, assuming we start with 100 grams of calcium carbonate and 45 grams of iron (III) phosphate.

In each problem below, you will need to begin the problem with the limiting reactant. First, calculate and identify the limiting reactant and the excess reactant before attempting to solve the problem as written. Also, calculate how much of the excess reactant will remain. Then solve the problem as written.

3.) In the reaction between magnesium and hydrochloric acid, how many grams of magnesium chloride could be recovered if 12.5 grams of magnesium were to react with an solution of hydrochloric acid that contained 8.00 grams of HCl?

4.) In the reaction $2\text{H}_{2(g)} + \text{O}_{2(g)} \rightarrow 2\text{H}_2\text{O}_{(g)}$

A. How many moles of water will be produced if 6 moles of hydrogen and 2 moles of oxygen are available to react?

B. How many grams of water are produced if 10.0 grams of hydrogen and 10.0 grams of oxygen react?

5. Define percent yield, and write the equation.

In the reaction in #4B above, calculate the percent yield when 8.45 grams of water are collected after the reaction is complete.