**Ch3/ PowerPoint Study-Stoichiometry – 4 Limiting Reagent/Excess Reagent**

**Name:**_____

*Answer these questions as you are watching the videos. They are due in class.*
*These questions are not just for you to answer but also to prepare you for the exam.*
*Make sure you understand what you are writing and not just copy from the text book.* **Show all work.**

Calculating limiting reagent, theoretical yield, percent yield and excess reagent.

The first step in the Ostwald process for producing nitric acid is

$$4NH_3(g) + 5O_2(g) \rightarrow 4NO(g) + 6H_2O(g)$$

a) If the reaction of 150. g of ammonia with 150. g of oxygen gas yields 87.0 g of nitric oxide (NO) then what is the percent yield of this reaction?
b) How much in grams is the excess reagent left?

**Strategy: For solving part a**

1. Convert g $NH_3$ → mol $NH_3$ → mol ratio to NO

2. Convert g $O_2$ → mol $O_2$ → mol ratio to NO

3. Write down the limiting reagent. (Which mols of the product are less in steps 1 and 2. The reagent giving the lower mols is the limiting reagent as it will finish first).

4. Convert the lesser of the mols of NO to g of NO. This is the theoretical yield of NO.

5. Calculate % yield (87.0 g NO divided by the theoretical yield in grams (calculated from step 4) and multiply by 100%.

**Strategy: For solving part b**

6. Subtract the smaller number from the larger number of mols from steps 1 and 2. This is mols of the reagent that is excess in quantity.

7. Convert mols of the excess reagent → mol ratio to the starting material → g of the starting material.