Name: _____ Grade 10 _____ Date: _____

CHAPTER 9 REVIEW

Stoichiometry

SECTION 3: Limiting Reactants and Percentage Yield

1. _____ The actual yield of a reaction is 22 g and the theoretical yield is 25 g. Calculate the percentage yield.

2. 6.0 mol of N_2 are mixed with 12.0 mol of H_2 according to the following equation:

$$N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$$

_____ a. Which chemical is in excess? What is the excess in moles?

_____ b. Theoretically, how many moles of NH_3 will be produced?

_____ c. If the percentage yield of NH_3 is 80%, how many moles of NH_3 are actually produced?

3. 0.050 mol of $Ca(OH)_2$ are combined with 0.080 mol of HCl according to the following equation:

$$Ca(OH)_2(aq) + 2HCl(aq) \rightarrow CaCl_2(aq) + 2H_2O(l)$$

_____ a. What is the limiting reactant in this neutralization reaction?

_____ b. How many grams of water will form in this reaction?

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4. Acid rain can form in a two-step process, producing $HNO_3(aq)$.

$$N_2(g) + 2O_2(g) \rightarrow 2NO_2(g)$$

$$3NO_2(g) + H_2O(g) \rightarrow 2HNO_3(aq) + NO(g)$$

_____ a. A car burns 420 g of N_2 according to the above equations. How many grams of HNO_3 will be produced?

_____ b. How many grams of HNO_3 would have been produced with a percentage yield of 85%?

5. _____ If a reaction's theoretical yield is 8.0 g and the actual yield is 6.0 g, what is the percentage yield?

6. Joseph Priestley generated oxygen gas by strongly heating mercury (II) oxide according to the following equation:

$$2HgO(s) \rightarrow 2Hg(l) + O_2(g)$$

_____ a. If 15.0 g HgO decompose, how many moles of HgO does this represent?

_____ b. How many grams of O2 are theoretically produced?

_____ c. If the percentage yield is 95.0%, how many grams of O2 are actually collected?

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