Name : _____

Date : _____

Chemistry Worksheet : Stoichiometry

1. Balance the following chemical reaction and then answer the given questions.

$$NH_3(g) + \quad O_2(g) \rightarrow \quad NO(g) + \quad H_2O(g)$$

a. How many moles of NO are formed if 824 g of NH_3 react?

b. How many grams of water are formed if 2.55 mol of ammonia are oxidized?

2. Mercury (II) oxide decomposes into mercury and oxygen gas as follows:

$$2\ HgO \rightarrow 2\ Hg + O_2$$

a. How many moles of mercury (II) oxide are needed to produce 125 g of oxygen?

b. How many grams of mercury are produced if 2.45 moles of mercury (II) oxide decompose?

3. Consider the following reaction:

$$Mg + 2\ HCl \rightarrow MgCl_2 + H_2$$

a. How many grams of HCl are consumed by the reaction of 2.5 moles of magnesium?

b. What is the mass in grams of H_2 gas when 4 moles of HCl is added to the reaction?

4. Acetylene (C_2H_2) gas is produced as a result of the following reaction:

$$CaC_2 + 2\ H_2O \rightarrow C_2H_2 + Ca(OH)_2$$

a. If 3.2 moles of CaC_2 are consumed in this reaction, how many grams of H_2O are needed?

b. How many grams of $Ca(OH)_2$ would be formed with 3.2 moles of CaC_2?

Name : _____

Date : _____

Chemistry Worksheet : Stoichiometry

Answers

1. Balance the following chemical reaction and then answer the given questions.

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

a. How many moles of NO are formed if 824 g of NH_3 react?

824 g NH_3 x (1 mol NH_3/ 17 g NH_3) x (4 mol NO/4 mol NH_3) = 48.5 mol NO

b. How many grams of water are formed if 2.55 mol of ammonia are oxidized?

2.55 mol NH_3 x (6 mol H_2O/4 mol NH_3) x (18 g H_2O/1 mol H_2O) = 68.85 g H_2O

2. Mercury (II) oxide decomposes into mercury and oxygen gas as follows:

$$2\ HgO \rightarrow 2\ Hg + O_2$$

a. How many moles of mercury (II) oxide are needed to produce 125 g of oxygen?

125 g O_2 x (1 mol O_2/32 g O_2) x (2 mol HgO/1 mol O_2) = 7.81 mol HgO

b. How many grams of mercury are produced if 2.45 moles of mercury (II) oxide decompose?

2.45 mol HgO x (2 mol Hg/2 mol HgO) x (200.6 g Hg/1 mol Hg) = 491 g Hg

3. Consider the following reaction:

$$Mg + 2\ HCl \rightarrow MgCl_2 + H_2$$

a. How many grams of HCl are consumed by the reaction of 2.5 moles of magnesium?

2.5 mol Mg x (2 mol HCl/1 mol Mg) x (36.5 g HCl/ 1 mol HCl) = 180 g HCl

b. What is the mass in grams of H_2 gas when 4 moles of HCl is added to the reaction?

4 mol HCl x (1 mol H_2/2 mol HCl) x (2 g H_2/1 mol H_2) = 4 g H_2

4. Acetylene (C_2H_2) gas is produced as a result of the following reaction:

$$CaC_2 + 2\ H_2O \rightarrow C_2H_2 + Ca(OH)_2$$

a. If 3.2 moles of CaC_2 are consumed in this reaction, how many grams of H_2O are needed?

3.2 mol CaC_2 x (2 mol H_2O/ 1 mol CaC_2) x (18 g H_2O/1 mol H_2O) = 115.2 g H_2O

b. How many grams of $Ca(OH)_2$ would be formed with 3.2 moles of CaC_2?

3.2 mol CaC_2 x (1 mol $Ca(OH)_2$/ 1 mol CaC_2) x (74 g $Ca(OH)_2$/1 mol $Ca(OH)_2$) = 236.8 g $Ca(OH)_2$