Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Chapter 12 Test Review**

1. Given the following equation: 2 C4H10 + 13 O2 ---> 8 CO2 + 10 H2O, show what the following

molar ratios should be.

a. C4H10 / O2

b. O2 / CO2

c. O2 / H2O

d. C4H10 / CO2

e. C4H10 / H2O

2. Given the following equation: 2 KClO3 ---> 2 KCl + 3 O2

a. How many moles of O2 can be produced by letting 12.00 moles of KClO3 react?

3. Given the following equation: 2 K + Cl2 ---> 2 KCl

a. How many grams of KCl is produced from 2.50 g of K and excess Cl2 ?

b. How many grams of KCl is produced from 1.00 g of Cl2 and excess K ?

4. Given the following equation: \_\_Na2O + \_\_H2O ---> \_\_ NaOH

a. How many grams of NaOH is produced from 1.20 x 102 grams of Na2O?

b How many grams of Na2O are required to produce 1.60 x 102 grams of NaOH?

5. Given the following equation: \_\_ Fe + \_\_ S8 ---> \_\_ FeS

a. What mass of iron is needed to react with 16.0 grams of sulfur?

b. How many grams of FeS are produced?

6. Determine the products of the following chemical reactions and, using the solubility rules, determine the states of matter of the products as well.

*Solubility Rules*

* *All elements in Column 1A (alkali metals) and ammonium (NH4) are soluble.*
* *All compounds containing nitrate (NO3) are soluble*
* *All compounds containing Column 7A elements (Halogens) with metals are soluble EXCEPT with silver, mercury and lead*
* *All compounds containing sulfate (SO4) are soluble except with barium, strontium, lead, calcium, silver and mercury.*
* *All carbonates (CO3), hydroxides (OH), oxalates (C2O4) and phosphates (PO4) are insoluble unless they have an alkali metal/ammonium.*

a. \_\_Na2SO4(aq) + \_\_Ba(NO3)2(aq) 🡪 \_\_ + \_\_

b. \_\_KOH(aq) + \_\_CuCl2(aq) 🡪 \_\_ + \_\_

***c.*** Aqueous solutions of silver nitrate and ammonium phosphate are mixed.

7. Given the following equation: \_\_ Cu + \_\_ AgNO3 ---> \_\_ Cu(NO3)2 + \_\_ Ag

a. How many moles of Cu are needed to react with 3.50 moles of AgNO3?

b. If 89.5 grams of Ag were produced, how many grams of Cu reacted?

c. If 25.0 grams of Cu and 140 grams of AgNO3 react together, which is your limiting reactant?

8. Molten iron and carbon monoxide are produced in a blast furnace by the reaction of iron(III) oxide and coke (pure carbon). The reaction is: Fe2O3 + 3 C ---> 2 Fe + 3 CO

a. If 25.0 grams of pure Fe2O3 is used, how many grams of iron can be produced?

b. If you actually get 14.3 grams of iron in your experiment. Find the percent yield of your reaction.

9. The average human requires 120.0 grams of glucose (C6H12O6) per day. The photosynthetic

reaction is: \_\_ CO2 + \_\_ H2O ---> \_\_C6H12O6 + \_\_ O2

a. How many grams of CO2 (in the photosynthesis reaction) are required for this amount of glucose?

b. If you start with 29.0 grams of Carbon dioxide and 20 grams of water, which is your limiting reactant?

c. Say you only get 110.7 grams of glucose via photosynthesis. Find the percent yield.

*This problem is slightly different from those above.*

10. Given the reaction: \_\_ NH3 (g) + \_\_ O2 (g) ---> \_\_ NO (g) + \_\_ H2O (l)

When 1.20 mole of ammonia reacts, the total number of moles of products formed is:

1. 1.20 b. 1.50 c. 1.80 d. 3.00 e. 12.0

***Answer Key:***

***2. a) 18.0 mol O2***

***3. a) 4.77 g KCl***
***3. b) 2.1 g KCl***
***4. a) 154.8 g NaOH***
***4. b) 124 g Na2O***
***5. a) 27.87 g Fe***
***5. b) 43.9 g FeS
6. a) NaNO3(aq) + BaSO4(s)
6. b) KCl(aq) + Cu(OH)2(s)6. c) Ag3PO4(s) + NH4NO3(aq)
7. a) 1.75 mol Cu
7. b) 26.4 g Cu
7. c) Copper
8. a) 17.49 g Fe
8 b) 81.7% yield
9. a) 175.8 g CO2
9. b) CO29c) 92.25% yield
10) d. 3.0***