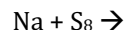**Chemistry 11**
Stoichiometry Practice Test

Name:
Date:
Block:

_____ 1. A reaction between magnesium and chlorine takes place. Which of the following is the correct unbalanced reaction?
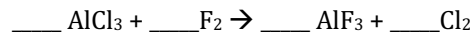 A. $Mg + Cl \rightarrow MgCl_3$
  B. $Mg + Cl_2 \rightarrow MgCl_2$
  C. $Mg_2 + Cl_2 \rightarrow MgCl_3$
  D. $Mg + Cl_2 \rightarrow Mg_2Cl$

_____ 2. Complete the following reaction:
$$Na + S_8 \rightarrow$$
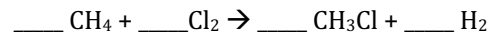 A. NaS
  B. Na_2S
  C. NaS_2
  D. NaS_3

_____ 3. When the following equation is balanced, what will the coefficient be for fluorine?
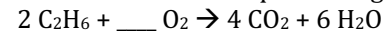$$\_\_\_\_ AlCl_3 + \_\_\_\_F_2 \rightarrow \_\_\_\_ AlF_3 + \_\_\_\_Cl_2$$

  A. 2
  B. 3
  C. 4
  D. 5

_____ 4. When the following equation is balanced, what will the coefficient be for chlorine?
$$\_\_\_\_ CH_4 + \_\_\_\_Cl_2 \rightarrow \_\_\_\_ CH_3Cl + \_\_\_\_ H_2$$
  A. 1
  B. 2
  C. 3
  D. 4

_____ 5. The following unbalanced chemical equation is given.
$$2 C_2H_6 + \_\_\_\_ O_2 \rightarrow 4 CO_2 + 6 H_2O$$
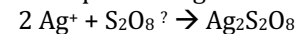How many moles of ethane, C_2H_6, reacts with 14 moles of oxygen?
  A. 1
  B. 2
  C. 4
  D. 8

6. Explain your answer to the question above:

_____ 7. The following chemical equation is given.
$$2 Ag^+ + S_2O_8{}^? \rightarrow Ag_2S_2O_8$$
What is the ionic charge on the S_2O_8 ion?
  A. 1+
  B. 1-
  C. 2+
  D. 2-

_____ 8. A reaction between $C_3H_8O_2$ and oxygen would produce:
  A. $C_3H_6O + H_2O$
  B. $CO_2 + H_2O$
  C. A salt and water
  D. Impossible to predict

_____ 9. Hydrochloric acid and sodium hydroxide react to produce
  A. An explosion
  B. $CO_2 + H_2O$
  C. A salt and water
  D. Impossible to predict

_____ 10. The equation to calculate percent purity is:

A. $\dfrac{Impure\ mass}{Pure\ mass}$

B. $\dfrac{Pure\ mass}{Impure\ mass}$

C. $\dfrac{Excess\ Yield}{Limiting\ Yield}$

D. $\dfrac{Limiting\ Yield}{Excess\ Yield}$

_____ 11. A substance that reacts with another substance and is completely reacted and consumed is called the:

A. A theoretical reactant
B. A limiting reactant
C. An excess reactant
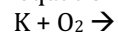D. A standard reactant

_____ 12. Consider the following reaction:

$$2\ H_2 + O_2 \rightarrow 2\ H_2O$$
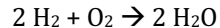
2.0 mol of H_2 reacts with 2.0 mol of O_2. What is the limiting reactant?

A. H_2
B. O_2
C. H_2O
D. The limiting reactant does not exist

13. Show your work for the question above:

_____ 14. After completing and balancing the reaction below, the mole ratio of potassium to oxygen in the chemical equation below is:

$$K + O_2 \rightarrow$$

A. 4 to 1
B. 4 to 2
C. 2 to 3
D. 1 to 1

_____ 15. A sample of cobalt (II) chloride has 94.0% purity. If the total sample weighs 15604g, what is the mass of pure cobalt (II) chloride?

A. 16600g
B. 15604g
C. 14700g
D. 94.0g

_____ 16. A sample of sodium metal has 0.200% purity. If only 13.5g of the sample reacts, what is the total mass of the sample?

A. 0.027g
B. 0.200g
C. 13.5g
D. 6750g

_____ 17. A reaction is expected to produce 94.0g of a product. However, only 17.0g is recovered at the end of the experiment. What was the percent yield?

A. 5.50%
B. 17.0%
C. 18.1%
D. 94.0%

18. Briefly explain your answer to the question above:

_____ 19. A reaction is known to only produce 90.0% yield. If the reaction is predicted to produce 90.0g, how much product will you actually produce?

A. 81.0g
B. 90.0g
C. 99.9g
D. 100.g

1. Write a **balanced** equation representing the following reactions. You only need to complete **three** equations. Indicate which equation you would like marked by a check mark in the box next to the equation. ☑

☐ Lead(IV) nitride reacts with lithium sulphide.

☐ Synthesis of potassium permanganate from its elements

☐ Sodium sulphate and copper(II) phosphate were produced in this reaction.

☐ Ammonium nitride and lead(III) chlorate react together.

☐ Iodine trifluoride, oxygen gas, and hydrofluoric acid (HF) react together at STP to form iodine tetrafluoride and water.
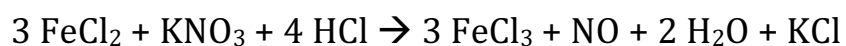
2. The equation for the reaction of aluminum metal with fluorine gas is:

$$Al + F_2 \rightarrow AlF_3$$
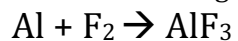
   a. What is the balanced chemical equation?

   b. If 102.0 L of F_2 is reacted with excess aluminum metal at STP, how much mass of the product is made?

3. Consider the following balanced reaction:

$$3 \, FeCl_2 + KNO_3 + 4 \, HCl \rightarrow 3 \, FeCl_3 + NO + 2 \, H_2O + KCl$$

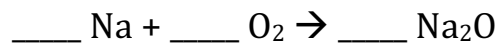   If 56.8g of $FeCl_2$ reacted with 14.9g of KNO_3 and 40.0g of HCl, find the mass of water produced

4. 6.57 g of lead (II) acetate are reacted with 24.8 mL of 1.50 M nitrous acid (HNO_2) according to the reaction:

$$Pb(CH_3COO)_2 + 2 \, HNO_2 \rightarrow Pb(NO_2)_2 + 2 \, CH_3COOH$$

   a) What mass of lead (II) nitrite will be formed?

   b) What mass or volume of the excess reactant will be left over?

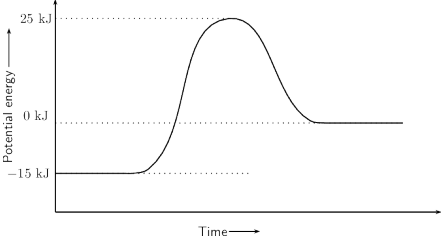5. Consider the reaction: _____ Na + _____ O_2 → _____ Na_2O

a) Sodium has a purity of 78.2%. How many grams of the product will be formed from a 56.0 g sample of sodium?

b) If the reaction has a 64.7% yield, what mass of each reactant would be needed to produce 100.0 g of the product? Assume each of the reactants are pure.

6. In an experiment, 3.44 g of 90.0% pure H_2 and 6.25 g of 80.0% pure O_2 are placed in a reaction vessel. The introduction of a spark causes a violent explosion that generates water.

a) What is the balanced reaction?

b) What is the limiting reactant?

7.

Reaction:	Is the reaction endothermic or exothermic?
1. K + D + heat → G	
2. U → C ΔH = - 60 kJ	
3. F + A → T + I ΔH = 60 kJ	
4. A + C → D + 45 kJ	
5.	