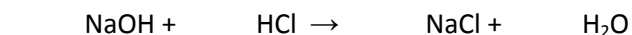


## Stoichiometry Test Review

### Terms:

1. What is stoichiometry?
2. Stoichiometry is based on what law?
3. What is a mole ratio?
4. What is the limiting reagent?
5. What is an excess reactant (reagent)?
6. What is the percent yield of an experiment?
7. What is a molecular formula?
8. What is an empirical formula?

### Problems:



9. 12.5 g of NaOH are reacted with excess hydrochloric acid. How many grams of water are produced?



10. When 9.8 g aluminum oxide decomposes, how many moles of Al metal are produced?



11. Identify the limiting reactant when 16.25 g of iron reacts with 26.25 g of sulfur.

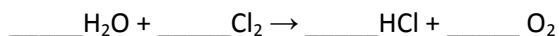
12. What is the mass of iron (II) sulfide produced from problem #11?



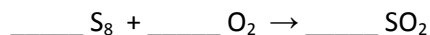
13. Identify the limiting reactant when 1.22 moles of  $\text{O}_2$  reacts with 1.75 moles of  $\text{H}_2$  to produce water. How many moles of water are produced?



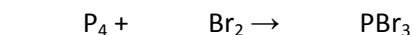
14. What is the limiting reactant when 6.58 g of sulfur dioxide reacts with 1.64 g of water to form sulfurous acid? What is the excess reactant? What mass of sulfurous acid will be produced? If Ralph produced 7.03 g sulfurous acid after performing the experiment, what was his percent yield?



15. What mass of hydrochloric acid (HCl) is produced if 3.47 mol chlorine reacts with 2.51 mol water? Which reactant is the excess reactant?



16. What number of moles of  $\text{SO}_2$  are produced from the reaction of 3.15 g of  $\text{S}_8$  and 3.65 g  $\text{O}_2$ ?



17. Phosphorous and bromine react violently in a synthesis reaction. If 5.00 g of phosphorous and 35.0 g bromine react, what is the limiting reactant? Excess reactant? How many grams of  $\text{PBr}_3$  will be produced? If the actual yield of  $\text{PBr}_3$  is 30.0 g, what is the percent yield?

18. An oxide of chromium is found to have the following percent composition: 68.4% Cr and 31.6% O. Determine the compound's empirical formula. If the compound's molecular mass is 303.98 g/mol, determine the compound's molecular formula.

19. A compound is found to have the following percent composition: 63.5% Ag, 8.2% N, and 28.3% O. Determine the compound's empirical formula. What is its molecular formula if it has a mass of 509.61 g/mol?

20. Determine the empirical formula of a sample of an unidentified compound that is found to contain 17.55% Na, 39.7% Cr, and 42.7% O.

## Answers

1. See Notes/Text
2. See Notes/Text
3. See Notes/Text
4. See Notes/Text
5. See Notes/Text
6. See Notes/Text
7. See Notes/Text
8. See Notes/Text
9. Coefficients = 1, 1, 1, 1  
5.63 g H<sub>2</sub>O produced
10. Coefficients = 2, 4, 3  
0.19 mol Al produced
11. Coefficients = 8, 1, 8  
LR = Fe
12. 25.60g FeS produced
13. Coefficients = 2, 1, 2  
LR = H<sub>2</sub>  
1.75 mol H<sub>2</sub>O produced
14. Coefficients = 1, 1, 1  
LR = H<sub>2</sub>O  
XR = SO<sub>2</sub>  
7.48 g H<sub>2</sub>SO<sub>3</sub> produced  
94.0% yield H<sub>2</sub>SO<sub>3</sub>
15. Coefficients = 2, 2, 4  
183 g HCl  
XR = Cl<sub>2</sub>
16. Coefficients = 1, 8, 8  
0.0981 mol SO<sub>2</sub>
17. Coefficients = 1, 6, 4  
LR = Br<sub>2</sub>  
XR = P<sub>4</sub>  
39.5 g PBr<sub>3</sub> produced  
75.9% yield PBr<sub>3</sub>
18. Cr<sub>2</sub>O<sub>3</sub> – Cr<sub>4</sub>O<sub>6</sub>
19. AgNO<sub>3</sub> – Ag<sub>3</sub>N<sub>3</sub>O<sub>9</sub>
20. Na<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>