

Ch.11-MOLES / Ch.12-STOICHIOMETRY Practice

Name: _____

Unit 6: Chapter 11: The MOLE

1. How many moles of water are there if you have 2.52×10^{25} molecules of water?
2. How many grams of pure mercury are in 2.54×10^{23} atoms of mercury?
3. How many formula units (f.u.) of copper (II) sulfate are in 1.43 grams of copper (II) sulfate?

PERCENT COMPOSITION (% Comp) & EMPIRICAL FORMULAS (E.F.):

1. Calculate the percent composition of each element in a compound containing 1.94 g carbon, 0.480 g hydrogen, and 2.58 g sulfur.
2. Quantitative analysis shows that a compound contains 32.4% Na, 22.6% S and 45.0% O. Find the empirical formula of this compound.
3. Determine the empirical formula of a compound containing 1.73 g carbon, 0.289 g hydrogen and 0.459 g oxygen.

MOLECULAR FORMULAS (M.F.) & HYDRATES:

1. The mass percent of a compound is discovered to be 40.0% Carbon, 6.67% Hydrogen, and 53.3% Oxygen. Further analysis shows that the M.F. molar mass is 180. g/mol. What is the molecular formula (M.F.) of this sweet compound?

2. The empirical formula (E.F.) of a compound is NO_2 . The molar mass of the M.F. is 92.0 g/mol. What is the molecular formula (M.F.)?

3. An 8.61 gram sample of hydrated beryllium oxide is heated inside a crucible. After heating, the amount of the anhydrous (dehydrated) was determined to be 3.60 grams. What is the chemical formula of this hydrate?

Unit 7: Chapter 12: STOICHIOMETRY

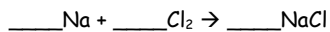
1. In a combustion reaction, how many moles of carbon dioxide will be produced in the burning of 5.65 moles of butane, C_4H_{10} , in a reaction with oxygen?
$$\underline{\hspace{1cm}} \text{C}_4\text{H}_{10} + \underline{\hspace{1cm}} \text{O}_2 \rightarrow \underline{\hspace{1cm}} \text{CO}_2 + \underline{\hspace{1cm}} \text{H}_2\text{O}$$

2. Sodium Chlorate decomposes into sodium chloride and oxygen. How many grams of sodium chloride are produced from 7.90 grams of sodium chlorate?
$$\underline{\hspace{1cm}} \text{NaClO}_3 \rightarrow \underline{\hspace{1cm}} \text{NaCl} + \underline{\hspace{1cm}} \text{O}_2$$

3. In this single replacement reaction where zinc chloride and hydrogen are produced, how many grams of hydrogen are produced from the reaction of 3.00 moles of zinc with an excess of hydrochloric acid?
$$\underline{\hspace{1cm}} \text{Zn} + \underline{\hspace{1cm}} \text{HCl} \rightarrow \underline{\hspace{1cm}} \text{ZnCl}_2 + \underline{\hspace{1cm}} \text{H}_2$$

LIMITING (L.R.) & EXCESS REACTANT (E.R.):

1. You synthesize 50.0 grams of sodium with 60.0 grams of chlorine gas to produce table salt, sodium chloride. Identify the following:

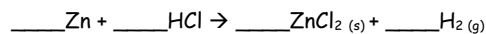


a. What is the Limiting Reactant (L.R.)?

b. What is the Excess Reactant (E.R.)?

c. How many grams of sodium chloride are produced?

2. In a single replacement reaction between 50.0 g of zinc and 30.0 g of hydrochloric acid, identify the following:

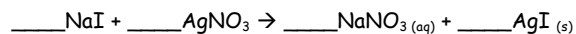


a. What is the Limiting Reactant (L.R.)?

b. What is the Excess Reactant (E.R.)?

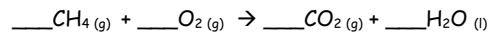
c. How many moles of zinc chloride are produced?

3. 45.0 g of sodium iodide are reacted with 55.0 g of silver nitrate in this D-R reaction. How many moles of silver iodide are produced?



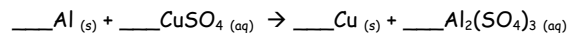
PERCENT YIELD (% Yield):

1. The combustion reaction of methane (CH_4) produces carbon dioxide and water. Assume that 2.00 mol of CH_4 burned in the presence of 6.00 mol of oxygen. What is the percent yield if the reaction actually produces 68.5 g of water?



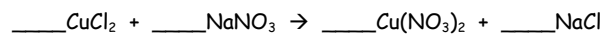
b. What is the **percent error (%)** of this reaction?

2. In this single replacement reaction, aluminum reacts with copper (II) sulfate to produce copper and aluminum sulfate. If 2.95 grams of the limiting reactant, aluminum, reacts and the percent yield of copper is 90.5%, what mass of copper is actually produced?



b. What is the **percent error (%)** of this reaction?

3. If 15.0 grams of copper (II) chloride react with 20.0 grams of sodium nitrate, what is the percent yield of this reaction if 11.3 grams of sodium chloride are experimentally produced in this reaction?



b. What is the **percent error (%)** of this reaction?