

# Moles and Stoich Test Review Sheet

Name \_\_\_\_\_

Directions: Show all work for each problem below.

## 1) Gram Formula Mass

Determine the gram formula mass (mass of one mole) of each compound below.

$\text{KMnO}_4$  \_\_\_\_\_

$\text{Al}_2(\text{SO}_4)_3$  \_\_\_\_\_

$\text{Na}_2\text{SO}_4$  \_\_\_\_\_

$\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  \_\_\_\_\_

## 2) Percent Composition

Determine the percent composition for each of the following compounds.

a)  $\text{NaBr}$                       %Na:                      %Br:

b)  $\text{H}_2\text{O}_2$                       %H:                      %O:

c)  $\text{Ba}_3(\text{PO}_4)_2 \cdot 2\text{H}_2\text{O}$                       %Ba:                      %P:                      %O:                      %H<sub>2</sub>O:

## 3. Mole Conversions

a) 25 g of  $\text{NaCl}$  = \_\_\_\_\_ moles

d) 1.5 moles of  $\text{CaSO}_4$  = \_\_\_\_\_  
formula units

b) 0.50 moles of  $\text{H}_2\text{SO}_4$  = \_\_\_\_\_ g

e)  $1.204 \times 10^{24}$  atoms of Sr = \_\_\_\_\_  
moles

c) 3.2 moles of  $\text{O}_2$  = \_\_\_\_\_ L

f)  $1.5 \times 10^{20}$  molecules of  $\text{CO}_{2(g)}$  @ STP = \_\_\_\_\_ L

h) How many moles are there in 1.35 Liters of  $\text{CO}_2$ ? \_\_\_\_\_ mole

g) How many grams are there in  $1.5 \times 10^{25}$  molecules of  $\text{CO}_2$ ?

#### 4. Empirical Formulas

a) 22.1% aluminum, 25.4% phosphorus, and 52.5% oxygen:

b) 13% magnesium and 87% bromine:

#### 5. Molecular Formulas

a) The empirical formula of a compound is  $\text{NO}_2$ . Its molecular mass is 230 g/mol. What is its molecular formula?

b) The empirical formula of a compound is  $\text{CH}_2$ . Its molecular mass is 70 g/mol. What is its molecular formula?

## 6) Stoichiometry Practice

- a) Determine the moles of lithium hydroxide produced when 0.38 moles of lithium nitride react with water according to the following equation:  **$\text{Li}_3\text{N} + 3\text{H}_2\text{O} \rightarrow \text{NH}_3 + 3\text{LiOH}$**
- b) How many moles of sodium chloride are produced when chlorine reacts with 0.29 g of sodium iodide? (Hint: Write out the equation and balance it first!)
- c) Find the moles of sugar ( $\text{C}_6\text{H}_{12}\text{O}_6$ ) required to produce 1.82 L of carbon dioxide gas at STP from the reaction described by the following equation:  **$\text{C}_6\text{H}_{12}\text{O}_6 \rightarrow 2\text{C}_2\text{H}_6\text{O} + 2\text{CO}_2$**
- d) Determine the mass of antimony produced when 0.46 g of antimony (III) oxide reacts with carbon according to the following equation:  **$\text{Sb}_2\text{O}_3 + 3\text{C} \rightarrow 2\text{Sb} + \text{CO}$**
- e) Find the mass of sodium required to produce 5.68 L of hydrogen gas at STP from the reaction describe by the following equation:  **$2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$** .

- f) How many liters of oxygen are necessary for the combustion of 277 g of carbon monoxide, assuming that the reaction occurs at STP? The balanced equation is:  $2\text{CO} + \text{O}_2 \rightarrow 2\text{CO}_2$ .
- g) Glucose ( $\text{C}_6\text{H}_{12}\text{O}_6$ ) burns in oxygen to produce carbon dioxide and water vapor as describe in the following equation:  $\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{H}_2\text{O} + 6\text{CO}_2$ . What volume of carbon dioxide is produced when 3.7 L of oxygen are consumed?