

Name: _____ Date: _____ Mods: _____

Lab # 6 – Mathematics of Chemistry: Molar Mass Calculations

Introduction

Calculating molar mass, also called gram formula mass, involves using the Periodic Table. You take the number of each element and multiply it by the atomic mass listed for that element. Add up the total mass of each element to get the molar mass.

Example: To get the molar mass of $C_6H_{12}O_6$:

$$C = 6 \times 12 \text{ g} = 72 \text{ g/mol}$$

$$H = 12 \times 1 \text{ g} = 12 \text{ g/mol}$$

$$O = 6 \times 16 \text{ g} = 96 \text{ g/mol}$$

Now add the results for each element:

$$72 + 12 + 96 = 180 \text{ g/mol}$$

Objectives

This activity will review various math skills that you will use throughout the year in chemistry.

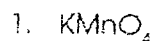
Calculate the molar masses of the following chemicals (show work):

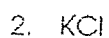
Cl_2	UF_6
KOH	SO_2
$BeCl_2$	H_3PO_4
$FeCl_3$	$(NH_4)_2SO_4$
BF_3	CH_3COOH
CCl_2F_2	$Pb(NO_3)_2$

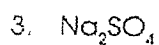
GRAM FORMULA MASS

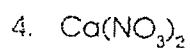
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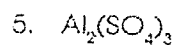
Determine the gram formula mass (the mass of one mole) of each compound below.

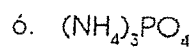


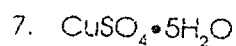


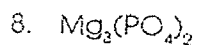


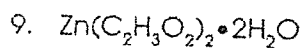




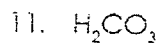


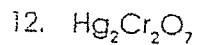


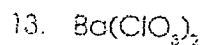


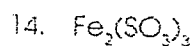


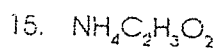












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Lab # 5 – Mathematics of Chemistry: Mole Calculations

Objectives

This activity will review various math skills that you will use throughout the year in chemistry.

The mole is the basic counting unit used in chemistry and is used to keep track of the amount of matter being measured or transferred. Performing calculations using molar relationships is essential to understanding chemistry. A mole is represented by Avogadro's number (6.02×10^{23}). One mole of an element is equal to its atomic mass number in grams.

Given the following, find the number of moles:	Given the following, find the number of grams:
1. 30 grams of H_3PO_4	1. 4 moles of $\text{Cu}(\text{CN})_2$
2. 25 grams of HF	2. 5.6 moles of C_6H_6
3. 110 grams of NaHCO_3	3. 21.3 moles of BaCO_3
4. 1.1 grams of FeCl_3	4. 1.2 moles of $(\text{NH}_4)_3\text{PO}_3$
5. 987 grams of $\text{Ra}(\text{OH})_2$	5. 9.3×10^{-3} moles of SmO
6. 564 grams of copper	6. 6.6 moles of ZnO
7. 12.3 grams of CO_2	7. 5.4 moles of K_2SO_4
8. 89 grams of $\text{Pb}(\text{CH}_3\text{COO})_4$	8. 88.4 moles of NI_3

MOLES AND MASS

Name _____

Determine the number of moles in each of the quantities below.

1. 25 g of NaCl	_____
2. 125 g of H_2SO_4	_____
3. 100. g of KMnO_4	_____
4. 74 g of KCl	_____
5. 35 g of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$	_____

Determine the number of grams in each of the quantities below.

1. 2.5 moles of NaCl	_____
2. 0.50 moles of H_2SO_4	_____
3. 1.70 moles of KMnO_4	_____
4. 0.25 moles of KCl	_____
5. 3.2 moles of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$	_____