

NAME:

CLASS:

EXPERIMENT 1
DETERMINATION OF THE FORMULA UNIT OF A COMPOUND

Course Learning Outcome:

Solve chemistry related problems by applying basic concepts and principles in physical chemistry. (C4, PLO4, CTPS3, MQF LO6)

Learning Outcomes:

At the end of this lesson, students should be able to:

- i. Define the terms compound, formula unit, empirical formula and molecular formula
- ii. Determine the formula unit of a compound
- iii. Identify the safety precautions of the experiment

Student Learning Time:

Face-to-face	Non face-to-face
1 hour	1 hour

Instruction:

- 1) Read over the lab manual and then answer the following question.**
- 2) Drag and drop the answer for the questions below.**
- 3) Choose the multiple choice question of Data Analysis.**
- 4) Click FINISH when you already done and print screen your result and share into the telegram class/ google classroom.**

0.30	2	1
<i>lowest whole number</i>	Al_2O_3	<i>smallest mole ratio</i>
1.5	<i>actual mole ratio</i>	0.20
3	<i>elements</i>	

Introduction:

1. Define the term *compound*.

A substance composed of two or more _____ that are combined in fixed proportions.

2. What is a formula unit of a compound?

The empirical formula of an ionic compound which represent the _____ ratio of the ions in the compound.

3. State the difference between empirical formula and molecular formula.

Empirical formula represents the _____ while the molecular formula is the _____ of the constituent elements in a chemical compound.

4. The formula unit of a compound can be determined if the composition or the ratio of the elements in the compound is known. Consider a compound that contains 0.20 mole of aluminum and 0.30 mole of oxygen. Determine its formula unit.

Element	<i>Al</i>	<i>O</i>
Mole (mol)		
Mole Ratio		
Simplest Ratio		
Formula unit		

<i>explosive</i>	<i>Mass</i>	<i>crucible</i>
<i>moisture</i>	<i>sublimation</i>	<i>Zinc chloride</i>
<i>zinc powder</i>	<i>flames</i>	

Procedure:

1. List the safety cautions in this experiment.

a. *Wet hydrogen gas is very _____ . No _____ are permitted in the laboratory when the gas is released.*

b. *_____ is caustic and must be handled carefully in order to avoid any contact with your skin. Should you come in contact with it, immediately wash the area.*

2. The compound should not be heated to the point that it melts. Explain.

Some of the compound will be lost due to _____

3. Why is the compound reheated, cooled and reweighed after the first heating?

To be certain that all the _____ is removed

4. Construct a table to record the data for the experiment.

1.	<i>Mass of _____ + lid</i>	=	<i>x</i>	<i>g</i>
2.	<i>Mass of crucible + lid + _____</i>	=	<i>y</i>	<i>g</i>
3.	<i>Mass of zinc powder</i>	=	<i>y-x</i>	<i>g</i>
4.	<i>Mass of crucible + lid + zinc chloride:</i>			
	<i>first weighing</i>	=	<i>AA</i>	<i>g</i>
	<i>second weighing</i>	=	<i>BB</i>	<i>g</i>
	<i>third weighing</i>	=	<i>CC</i>	<i>g</i>
5.	<i>_____ of zinc chloride</i>	=	<i>(AA@BB@CC-y)</i>	<i>g</i>

Experiment 1 : Data Analysis

An experiment was conducted to determine the formula unit of magnesium oxide. The following data was recorded.

Mass of empty crucible + lid	= 24.0037 g
Mass of crucible + lid + magnesium strip	= 24.3046 g
Mass of crucible + lid + magnesium oxide:	
a) after first heating	= 24.5278 g
b) after second heating	= 24.5097 g

Determine the formula unit of the compound.

<i>Mass of magnesium</i>	= 0.3009 g
<i>Mass of magnesium oxide</i>	= 0.5060 g
<i>Mass of oxygen</i>	= 0.2051 g

<i>Element</i>	<i>Mg</i>	<i>O</i>
<i>Mass (g)</i>		
<i>Mole (mol)</i>		
<i>Mole Ratio</i>		
<i>Formula unit</i>		