

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.

<i>0.30</i>	<i>2</i>	<i>1</i>
<i>lowest whole number</i>	<i>Al₂O₃</i>	<i>smallest mole ratio</i>
<i>1.5</i>	<i>actual mole ratio</i>	<i>0.20</i>
<i>3</i>	<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.

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

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

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.

Mass of magnesium = 0.3009 g

Mass of magnesium oxide = 0.5060 g

Mass of oxygen = 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>		