



STUDENT WORKSHEET

BASIC LAWS CHEMISTRY

Phase E/ X Class

Autors:

Shafna Nor Janah

Lecturer:

Bertha Yonata, S.Pd., M.Pd.

Meeting 1



LKPD 1: Student Activity Sheet

Basic Laws of Chemistry

Group :

Group Members :

1.
2.
3.



Subject : **Chemistry**
Classes/Phases : **X/Phase E**
Topic : **Basic Laws of Chemistry**

Learning Objectives

1. Learners can analyze the law of mass poverty (Lavonier) based on experimental data correctly through group discussion.
2. Learners can analyze the law of fixed proportions (Proust) based on experimental data correctly through group discussion.
3. Learners can analyze the law of comparative multiples (Dalton) based on experimental data correctly through group discussion.
4. Learners can analyze the law of volume comparison (Boyle-Gay lussac) based on experimental data correctly through group discussion.

Instructions for use

1. Read every command on E-LKPD carefully!
2. Have a discussion with your group members to answer the questions in E-LKPD!
3. You can explore reading sources from various sources that can be accounted for
4. If there are unclear instructions, or there are things that need to be discussed, please ask your teacher!

Activity 1: Law of Conservation of Mass (Lavoisier's Law)



Discuss in groups to answer the following questions!

1. In a laboratory experiment, a group of students burned magnesium bands of a certain mass to produce magnesium oxide compounds. The results of the experiment are shown in the following table!

No	Mass Mg (grams)	Mass O ₂ (grams)	Mass MgO (grams)
1	24	16	40
2	24	24	40
3	36	24	60
4	48	16	40

Based on the data from the experiment results above, any number of experiments applies to law

conservation of mass? Give a reason!

2. A total of 18 grams of glucose burned with oxygen produces 26.4 grams of carbon dioxide gas and 10.8 grams of water vapor. How many grams of oxygen has reacted in the combustion? Give an explanation!

3. Make a conclusion from Lavoisier's law of mass poverty? Can Lavoisier's law apply to every chemical reaction?

Activity 2: The Law of Fixed Proportions (Proust's Law)

4. In a laboratory experiment, a group of students reacted ferrous metal with sulfur with a certain mass to produce an iron sulfide compound. The results of the experiment are shown in the following table!

No.	Fe mass (grams)	Mass S (grams)	FeS mass (grams)	Remaining elements
1	28	16	44	-
2	56	40	88	8 grams S
3	32	16	44	4 grams of Fe
4	14	16	X	Y/Z

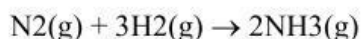
Based on the data from the experiment above, what is the ratio of mass of Fe and atomic mass S constituent of FeS compounds?

5. A mixture containing 48 grams of sulfur is completely burned so that all sulfur in the mixture turns into SO_3 . If 80 grams of SO_3 is formed, calculate the sulfur content (in %) in the mixture again! (ar s = 32, ar o = 16).

6. Make a conclusion from the law of fixed proportions according to Proust!

Activity 3: Law of Volume Comparison (Gay Lussac's Law)

In ammonia production in the laboratory, nitrogen gas and hydrogen gas are reacted under certain conditions according to the following reaction:



The experimental result data are presented in the following table!

No Trial	Volume of nitrogen gas (liters)	Volume of hydrogen gas (liters)	Volume of ammonia gas (liters)
1	1	3	2
2	2	6	4

7. From the reaction equation of ammonia formation NH_3
- Determine the reaction coefficient ratio between N_2 , H_2 , and NH_3 ?
 - Based on the data from experiment number (1), determine the ratio of the volume of nitrogen gas and the volume of hydrogen gas that reacts and the volume of ammonia gas produced!
 - How is the relationship between the ratio of the coefficients of the reacting gases and the reaction result with the comparison of the volume of the reacting gases and the reaction result.

8. In a tightly closed bottle there is a gas whose pressure is 1 atm, the volume is 20 liters and the temperature is 27°C . Then the bottle is heated to a temperature of 117°C . Calculate the gas pressure in the bottle now. (Consider bottle expansion negligible)!

9. Make a conclusion from the law of fixed proportions according to Gay Lussac?

Activity 4: Law of Comparative Multiples (Dalton's Law)

In the laboratory, when sulfur and oxygen are reacted, it will produce sulfur oxide compounds with the following experimental results:

Types of Compounds	Mass of reacted sulfur (grams)	Mass of reacted oxygen (grams)	Mass of sulfur oxide compounds formed (grams)
Compound 1	31	24	55
Compound 2	31	40	71

10. Based on the experimental table, calculate the ratio of sulfur mass and oxygen mass in compound 1 and compound 2!

11. Does the experimental data above apply to the law of comparison multiples?

12. Make a conclusion from the statement of the law of comparative multiples according to

