

LESSON NOTES

Subject: Basic Science

Year/Level: 10

Week 25

Strand	2: MATTER
Sub Strand	2.3 : REACTIONS
Content Learning Outcome	Investigate the different types of chemical reactions and discuss the factors that affect the rates of reactions.

2.3.1 : CHEMICAL REACTIONS

- Consider the following situations of daily life and think what happens when:
 - ❖ milk is left at room temperature during a hot day.
 - ❖ an iron nail is left exposed to humid atmosphere.
 - ❖ pineapple becomes rotten.
 - ❖ food is cooked.
 - ❖ food gets digested in our body.
 - ❖ we respire.
- In all the above situations, the nature and the identity of the initial substance have somewhat changed.
- Whenever a chemical change occurs, we can say that a chemical reaction has taken place.
- **Chemical reaction** - is when a new substance is formed with a new characteristics and composition, also known as chemical change.
- Examples:
 - ❖ fireworks exploding to produce spectacular colour
 - ❖ coke producing gas bubbles
 - ❖ making cake
 - ❖ nail turning rusty
- A Chemical reaction has taken place when there is a:
 - ❖ change in state (forming of precipitate)
 - ❖ change in colour
 - ❖ release of a gas
 - ❖ change in temperature.
- During chemical reaction products are formed from reactants

REACTANTS \longrightarrow **PRODUCTS**

Reactants – substance present at the beginning of a chemical reaction.

Products – substance formed in a chemical reaction.

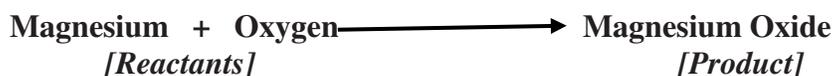
Properties of Chemical Reaction

- One or more new chemical substances are formed
- Heat is often released
- Change is usually difficult to reverse (to change back to its original substance)

2.3.2 : WRITING AND BALANCING CHEMICAL EQUATIONS

Chemical Equations

- Represents a chemical reaction by briefly summarizing what has happened.
- shows the substances that are reacting (reactants) and the substances that are formed (product)
- Symbols and formulae are used.
- An arrow in the equation represents the change that takes place in the reaction, from the reactants to the products.
- Chemical equations can be written into 2 ways:
 - 1) word equation
 - 2) chemical equation.
- For example, the **word equation** for Activity 1 would be:



- **Chemical equations** can be made more meaningful and useful if we use chemical formulae instead of words. A chemical equation represents a chemical reaction.

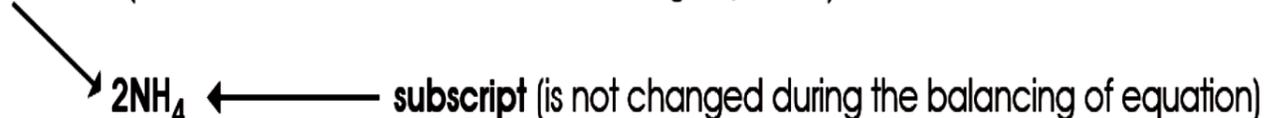


- ❖ Count and compare the number of atoms of each element on the LHS and RHS of the arrow.
- ❖ Is the number of atoms of each element the same on both the sides?
- ❖ If not, then the equation is unbalanced because the mass is not the same on both sides of the equation.
- ❖ Such a chemical equation is a **skeletal chemical equation** for a reaction.

Balancing Chemical Equations

- One of the most important rules of chemistry is that matter is not created or destroyed in a chemical reaction. It only changed into a new form.
- Law of Conservation of Mass:
states that in a chemical reaction, the mass of the product is equal to the mass of the reactants.
- Balanced chemical equation has the same number of atoms of each element on each side.
- To balance the equation, we place coefficients in front of each chemical.

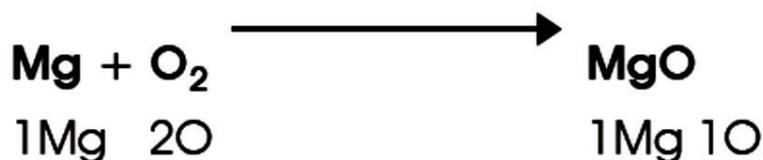
coefficient (is added to the formulae in balancing equation)



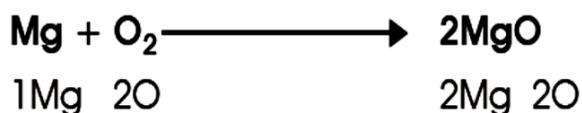
- Consider the skeletal equation for the above reaction



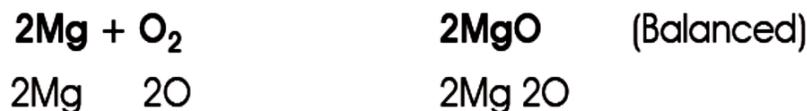
- Count the atoms on each side.



- Balance the oxygen atoms



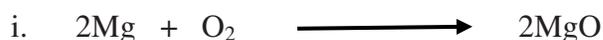
- Balance the magnesium atom



(The number of atoms on the LHS is equal to the number of atoms on the RHS)

ACTIVITY:

Write the names of the reactants and products in the following equations:



Mg _____

O _____

MgO _____



Zn _____

HCl _____

ZnCl₂ _____

...STAY SAFE...

