LESSON NOTES

Year/Level: 11 C/D Week 10 **Subject:** Chemistry

Strand	3 Reactions
Sub Strand	3.2 types of reactions
Content Learning Outcome	Distinguish and describe different types of reactions based on chemical statements and balanced chemical equations (combustion & synthesis)

Chemical Reactions

The study of chemical reactions is an integral aspect of chemistry. It equips us with the ability to understand and explain the chemical principles that involves changes.

These chemical reactions are:

1) Combustion
2) Synthesis
3) Decomposition
4) Neutralisation
5) Double displacement
6) Precipitation
7) Oxidation-Reduction

COMBUSTION

- Is the chemical term for the burning of substances in oxygen to form compounds called oxides
- Metals will burn completely in oxygen to form metallic oxides.
- The oxides are ionic compounds and are basic in nature.

Example

Calcium + Oxygen $\longrightarrow$ calcium oxide

$Ca + O \longrightarrow CaO$

- Non-metals burn completely in oxygen to form non-metal oxides
- These oxides are molecular substances and are acidic in nature; most are gases at room temperature.

Example

Carbon + Oxygen $\longrightarrow$ carbondioxide

$C + O \longrightarrow CO_2$

- Organic compounds burns completely in oxygen to produce carbon dioxide and water; a lot of energy is released
- Incomplete combustion will form harmful products such as carbon monoxide, soot (un-burnt carbon) and less heat is released.

Example

Glucose + Oxygen $\longrightarrow$ Carbon dioxide + Water

$C_6H_{12}O_6 + 3O_2 \longrightarrow 6CO_2 + 6H_2O$

SYNTHESIS

- Naturally occurring elements combine chemically to form a compound.
- When two non-metals combine, a covalent substance is formed.
- However, metals combine with a non-metal to form ionic compounds.

Example 1: Combination of two non-metals.

$C(s) + S(s) \longrightarrow CS_2$, Carbon disulphide

Example 2: Combination of a metal and a non-metal

$Fe(s) + S(s) \longrightarrow FeS(s)$ Iron sulphide

Example 3: Formation of oxides

All combustion of elements is synthesis reaction.

Activity

1.Combustion reactions always involve:

A. Hydrogen
B. Carbon
C. Oxygen
D. Nitrogen

2.For each reaction below:

i. Write a balanced equation.
ii. Classify the type of reaction and give a reason for your choice.

a) Formation of iron sulphide from reacting iron and sulphur

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b) Burning of magnesium

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c) Formation of ammonia from nitrogen gas and hydrogen gas.

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