

UPDAAN



2025

Bharat Mata Ki Jai

CHEMICAL REACTIONS AND EQUATIONS

Combination Reactions and Its Types in
One Shot → (LIVE EXPERIMENTS)

CHEMISTRY

Lecture - 04

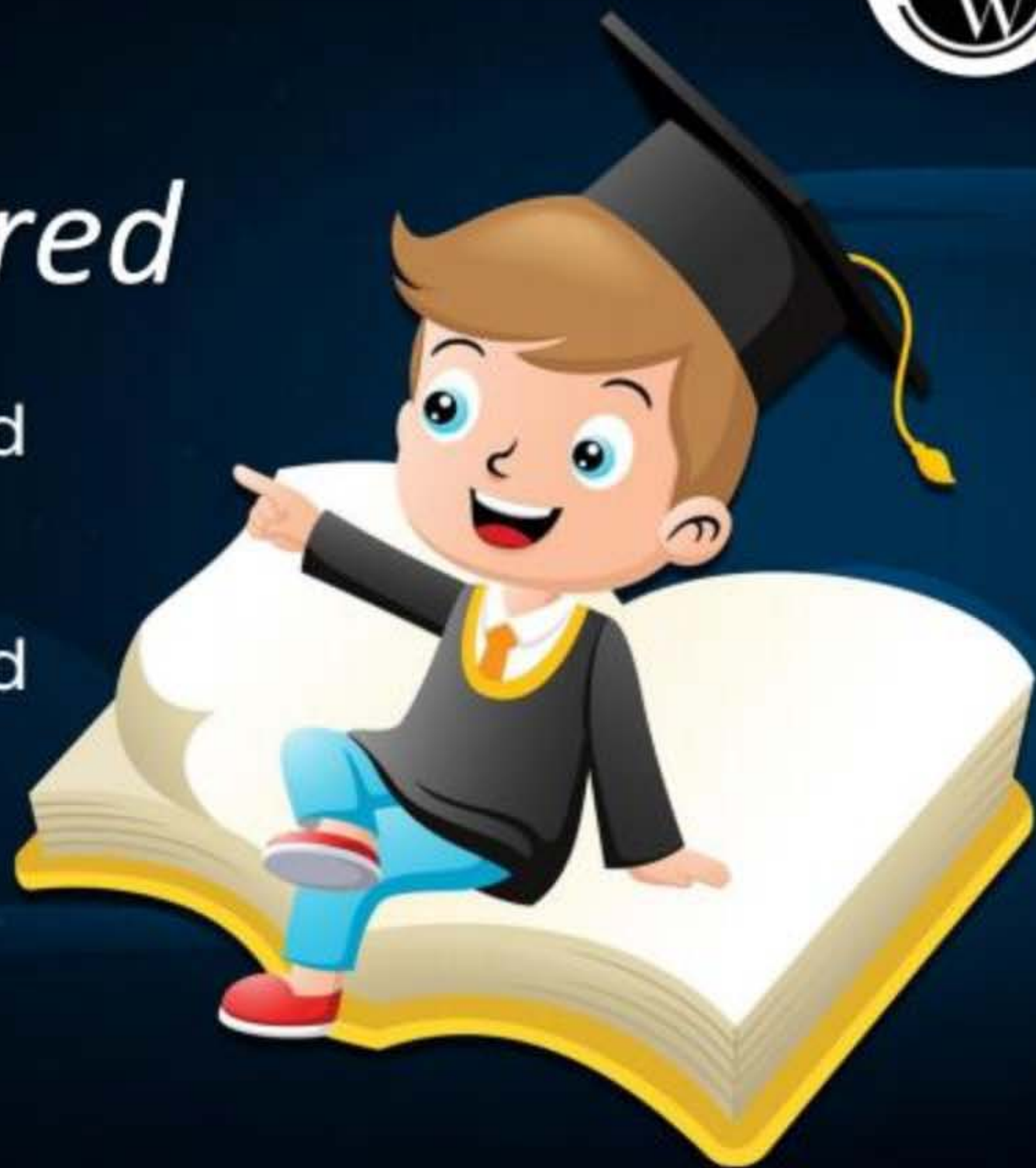
BY: SUNIL BHAIIYA



Topics

to be covered

- 1 Limitations of Chemical Equations and Their Removal (Contd.) (✓)
- 2 Combination/Synthesis Reactions and Its Types (✓)





SUNIL BHAIYA

JOIN MY OFFICIAL TELEGRAM CHANNEL



SUGGESTION

Imp. News



Question + Concept Revision [Mind Maps]



SCIENCE



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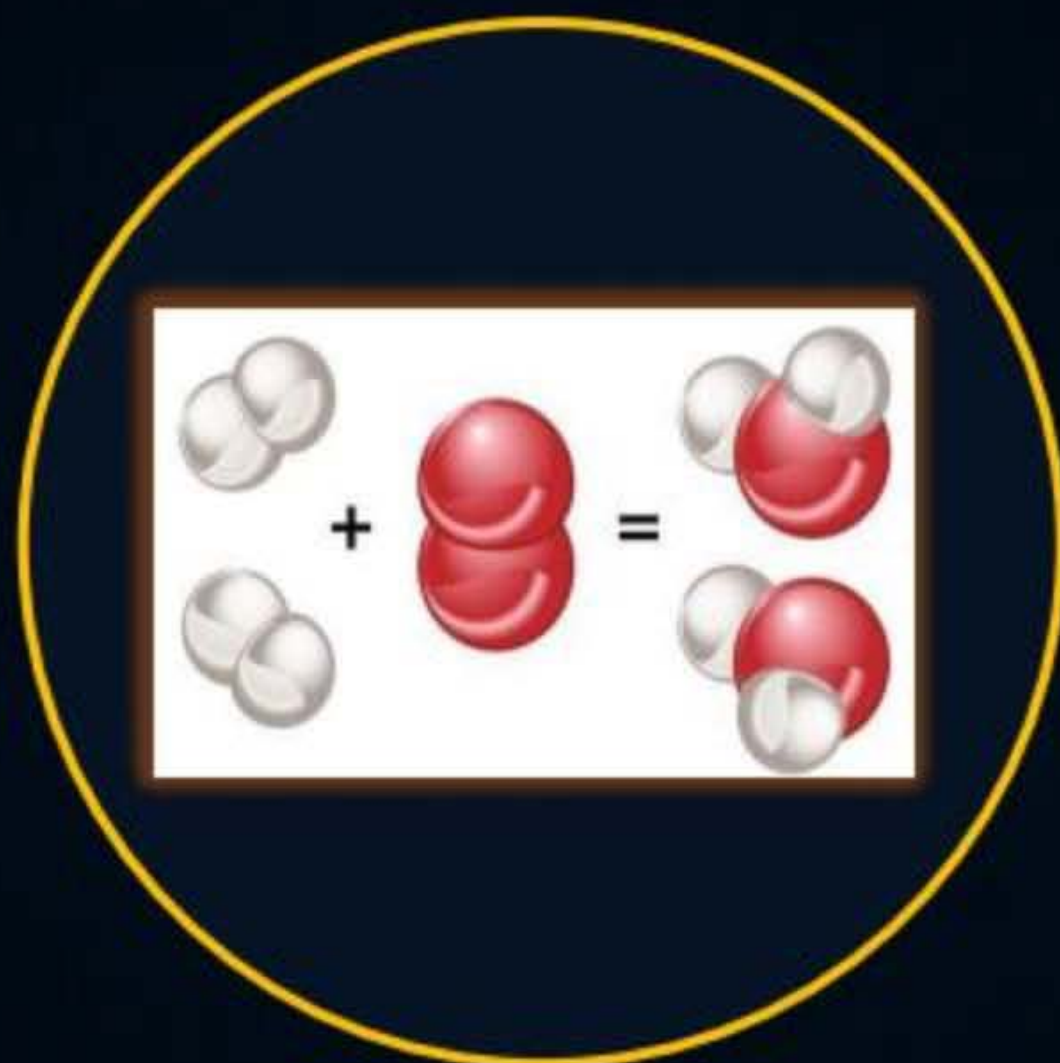


Knowledge Ride On



Limitations of Chemical Equations
and Their Removal (Contd.)

Knowledge Ride On



Combination/Synthesis Reactions
and Its Types

Knowledge Ride On



Efficiency Hacks by Sunil Bhaiya ✓

Knowledge Ride On



Insaniyat Ka Gyaan ✓



I am a word formed by the chemical symbols of deuterium and iodine written twice. This is also a blood relation!

I

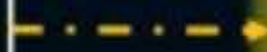
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I am a word formed by the chemical symbols of deuterium and iodine written twice. This is also a blood relation!

Sisters be like



Sunil Bhaiya

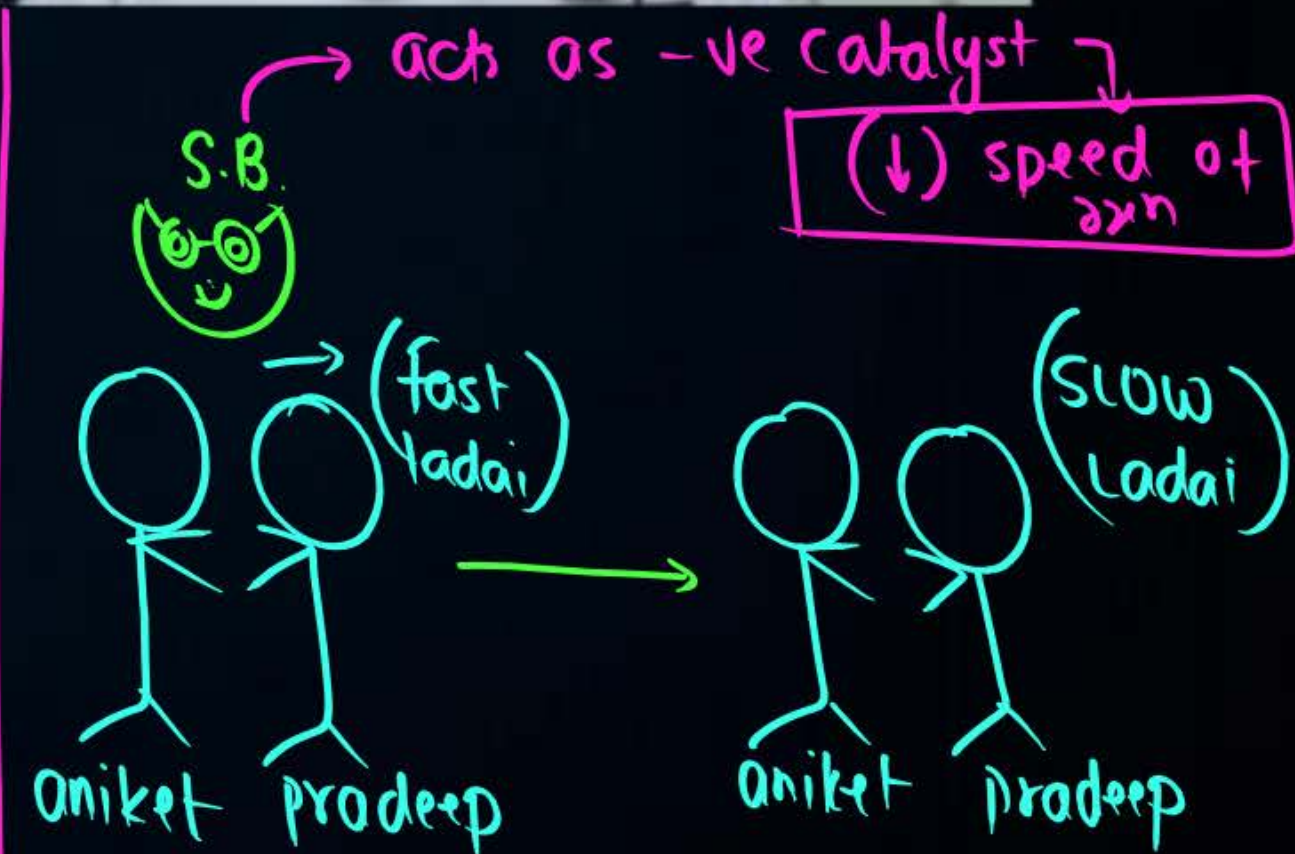
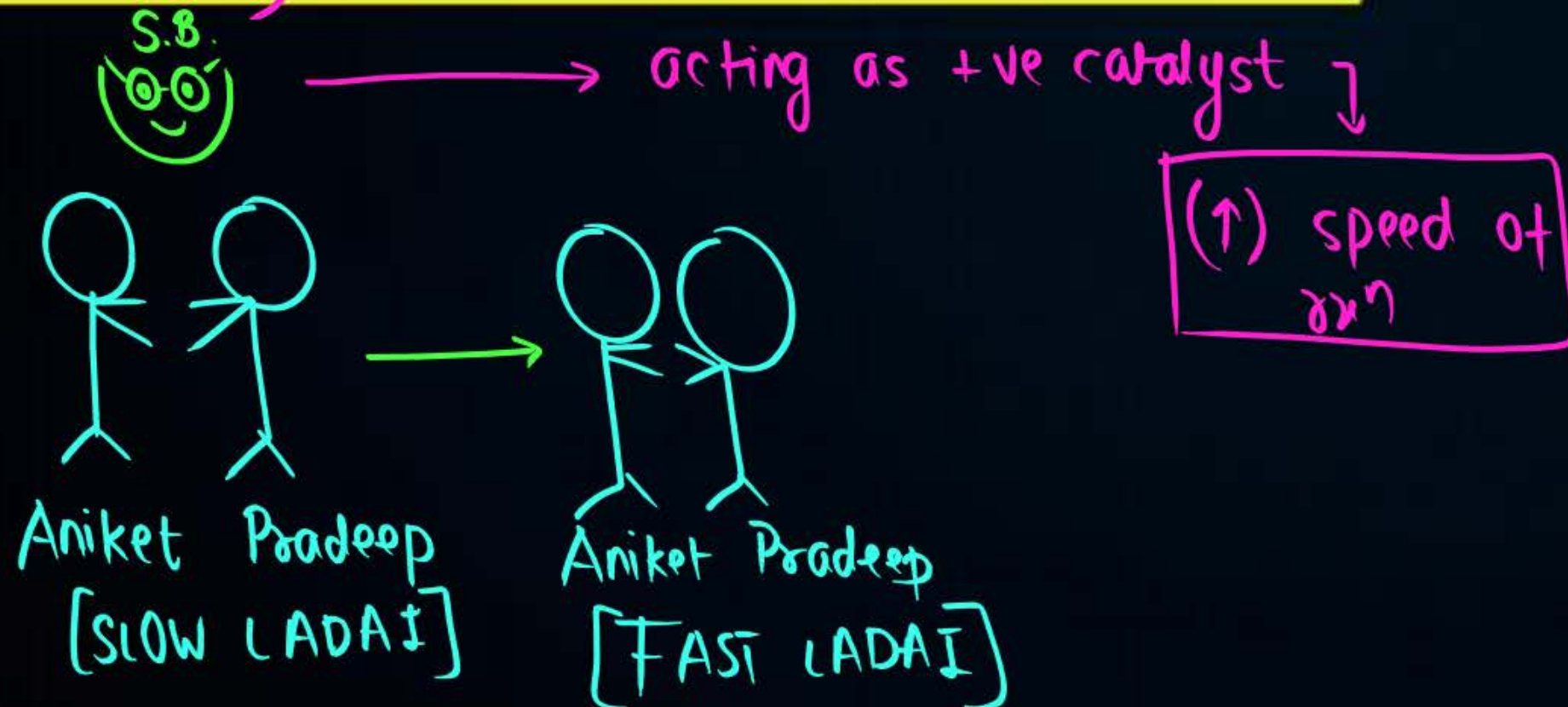
भैया मेरे राखी
के बंधन

Limitations of Chemical Equations and Their Removal (Contd.)

→ Catalyst → (Experiential Learning)

What is a catalyst?

(A catalyst is a substance that increases or decreases the rate of the reaction without itself being consumed in the reaction.)



EXTRA

Formation of ammonia

Iron → +ve catalyst

Decomposition of hydrogen peroxide

Phosphoric Acid → -ve catalyst



KYA BOLTI PUBLIC



aye bhaiya♡

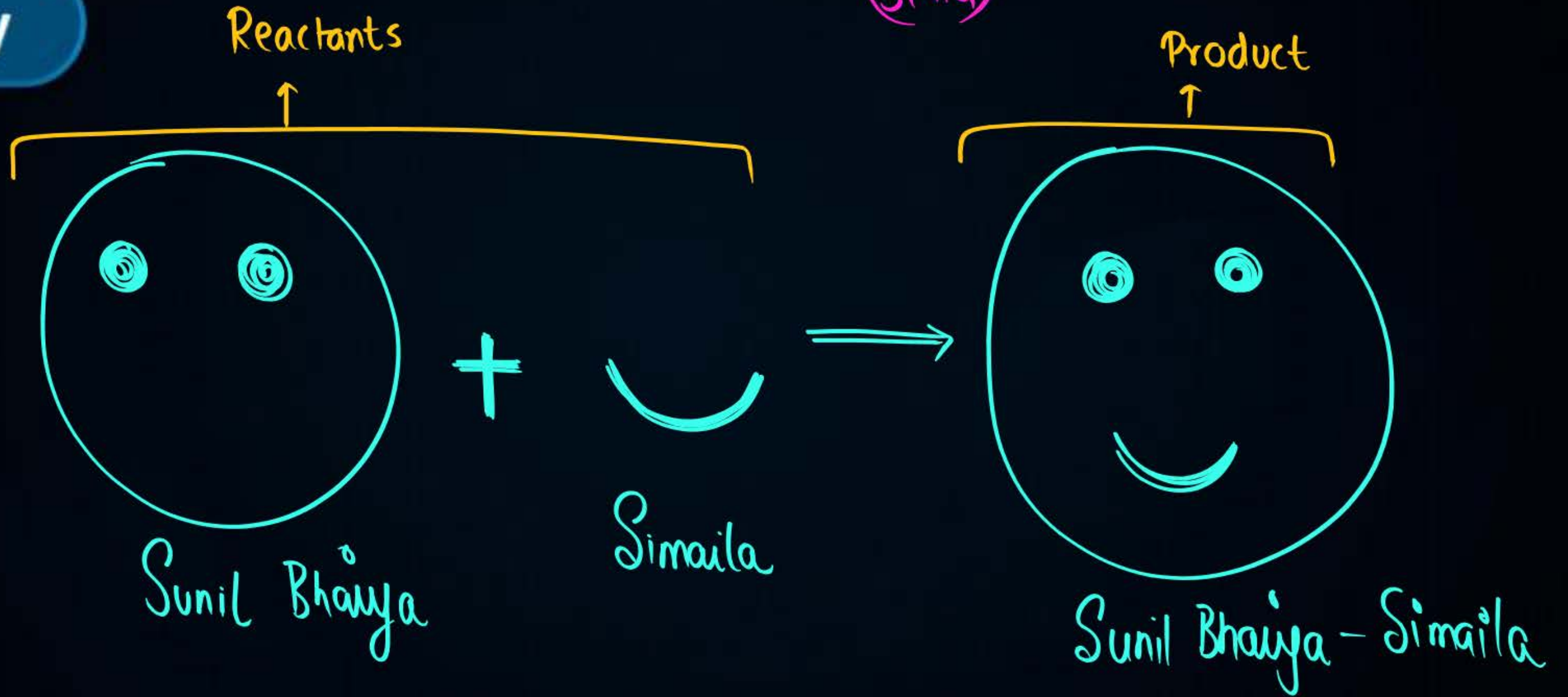
Combination/Synthesis Reactions and Its Types

ICSE

A chemical reaction in which two or more elements or compounds (reactants) react to form a single compound (product).



Analogy



Generally, there are three types of combination reactions possible:



✓ (i) Combination of two elements to form a compound

→ 'Our Syllabus'

✓ (ii) Combination of two compounds to form a compound

✓ (iii) Combination of an element and a compound to form a compound

Many other types also possible....



(i) Combination of two elements to form a compound

→ Element-element
Combination rxn

Representation



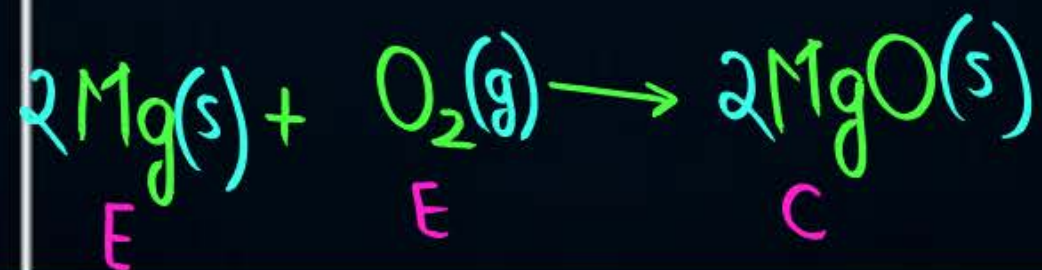
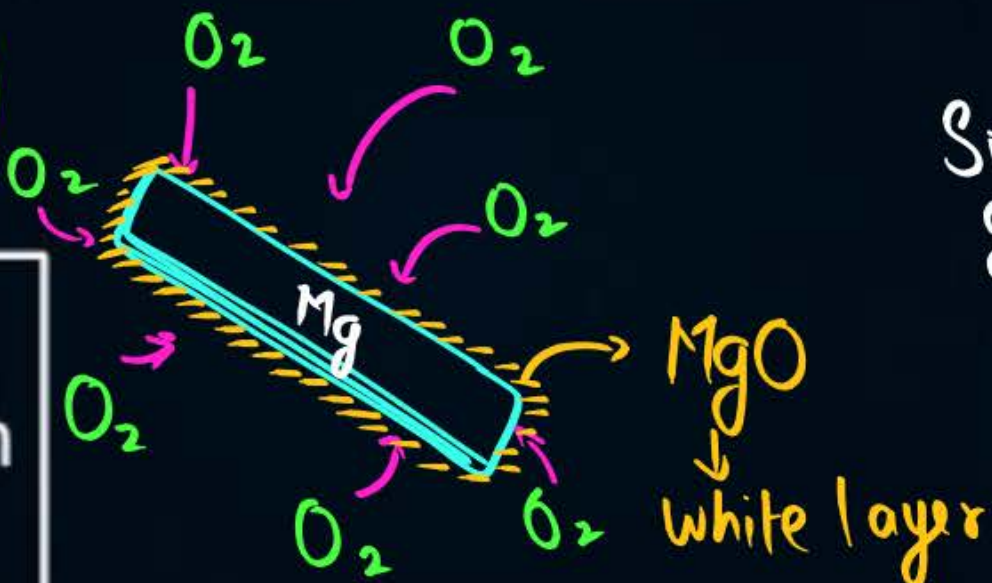
Burning of Magnesium Ribbon

(i) At room temperature (25°C)

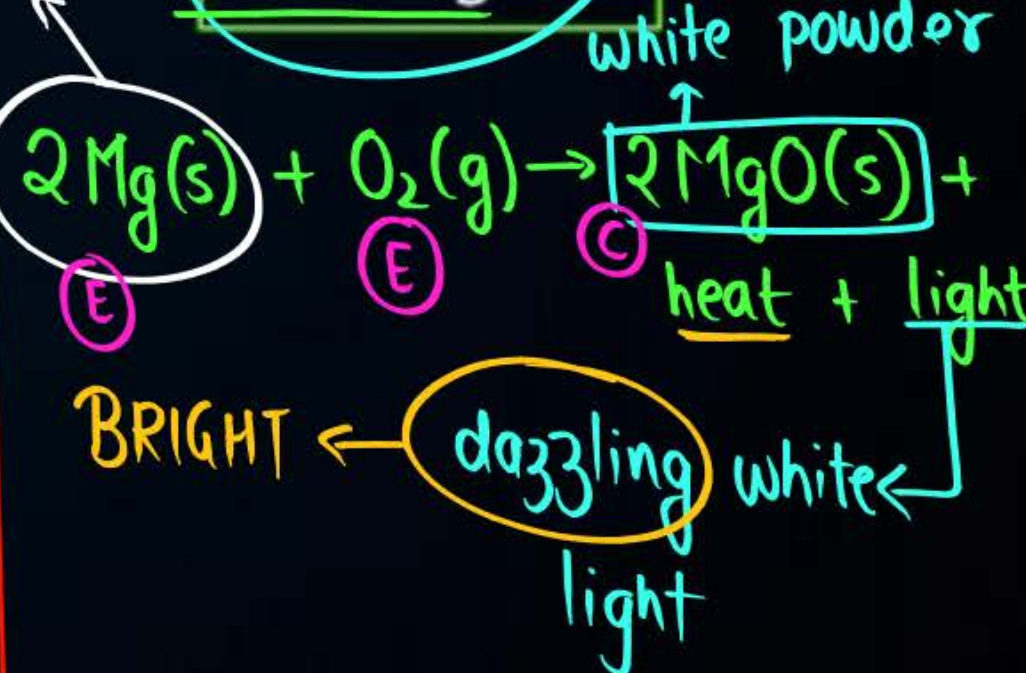
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Magnesium reacts with oxygen present in air to form a layer of magnesium oxide on its surface.

Hence, it is cleaned with a sandpaper before burning.



On strong heating



Is burning of Mg ribbon exothermic or endothermic?

☒ (A) Exothermic

☐ (B) Endothermic



amount of heat > amount of heat
released given



Give a Thought



Why it is advised to wear eye protection during the burning of
magnesium ribbon?



Give a Thought



Why it is advised to wear eye protection during the burning of magnesium ribbon?

When magnesium ribbon burns in air, dazzling white light is produced which contain ultraviolet light that can cause photokeratitis or it can permanently damage the eye.

(pain in eyes)

PYQ's Wallah

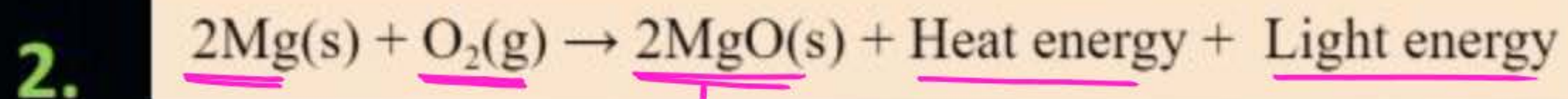


PW Ka **ChemStar!**

1. A shining metal 'M' on burning gives a dazzling white flame & changes to a white powder 'N'. Identify 'M' & 'N'.
2. Represent the above reaction in the form of a balanced chemical equation.

1. A shining metal 'M' on burning gives a dazzling white flame & changes to a white powder 'N'. Identify 'M' & 'N'.
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1. M and N: Magnesium and Magnesium oxide



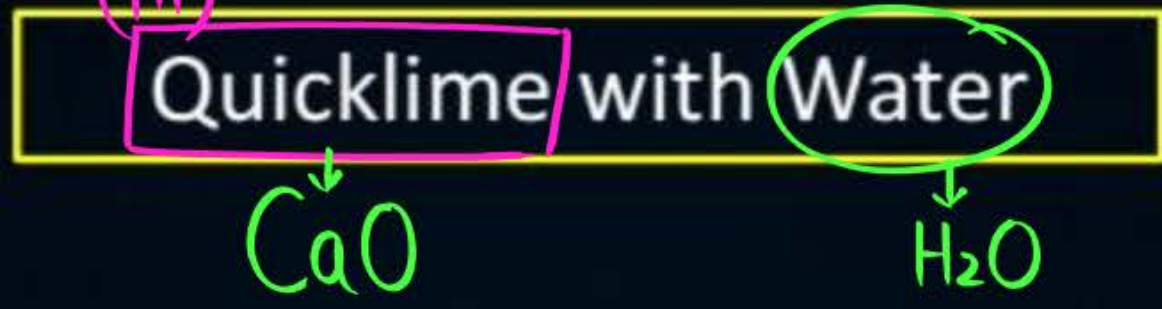
↓
white powder



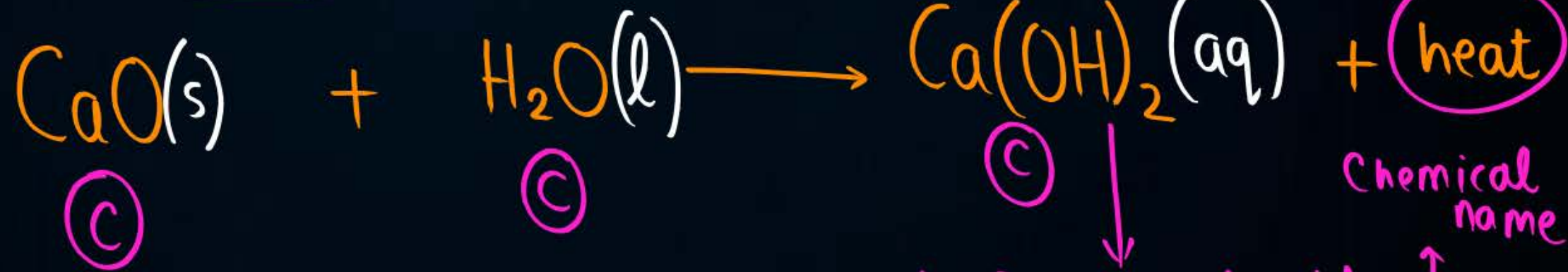
(ii) Combination of two compounds to form a compound

Compound-Compound Combination Rxn

Representation



NCERT Concept



- (*) Compound-Compound Combination Rxn
- (*) Exothermic Rxn

- Chemical name
- (i) Calcium hydroxide
 - (ii) Slaked lime → Common name

CaO → Calcium oxide
(Chemical name)

Common name

- (i) Lime
- (ii) Burnt lime



Observations when quicklime is added to water

→ ✓ (i) Very fast reaction (*Vigorous*).

→ ✓ (ii) Heat is evolved (*Exothermic reaction*).

→ ✓ (iii) Water boils to form steam and produces a hissing sound. along with bubbles.

water-vapour/

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aye bhaiya





Let's Practice



PW Ka **ChemStar!**



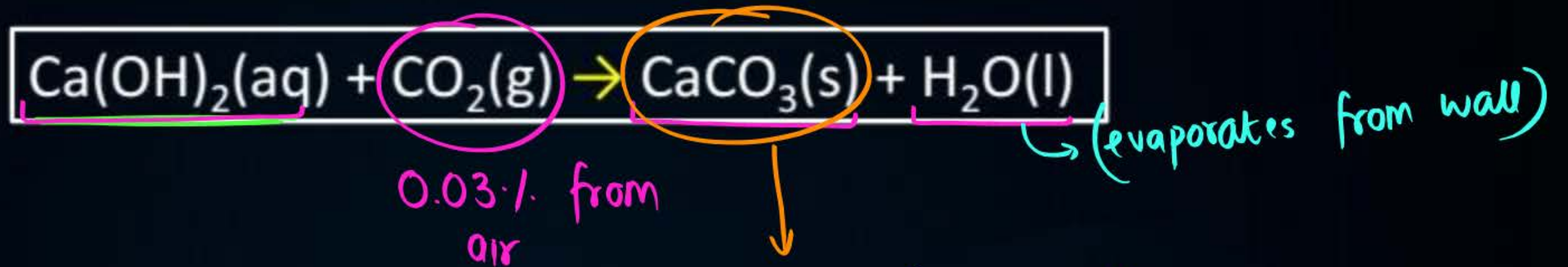
Calcium oxide reacts vigorously with water to produce slaked lime.
This reaction can be classified as:

- A** Combination Reaction (✓)
- B** Exothermic Reaction (✓)
- C** Endothermic Reaction
- D** Oxidation Reaction

Whitewash/Limewash



After 2-3 days of whitewash, there is a shiny finish on walls because:



Shiny finish is because of this

CaCO_3 → Calcium carbonate [Chemical name]

Common Name

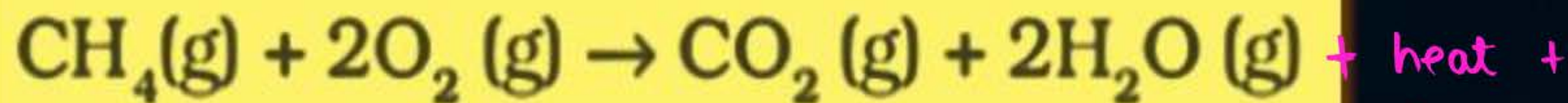
- (i) Marble
- (ii) Limestone
- (iii) Chalk

(iv) egg shells are made up of CaCO_3

Examples of Endothermic and Exothermic Reactions

Exothermic/Endothermic

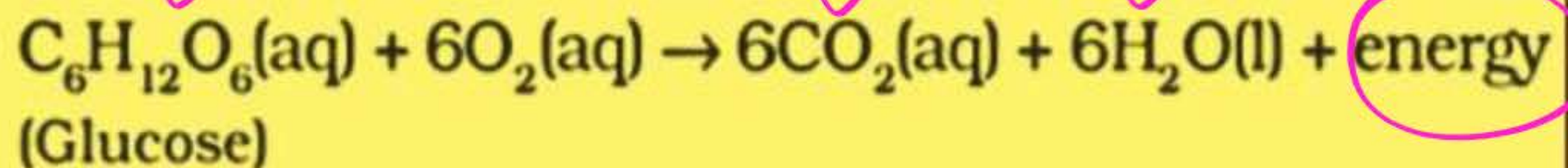
(i) Burning of natural gas



↳ (This rxn mechanism in CH-04)

EXOTHERMIC

(ii) Respiration



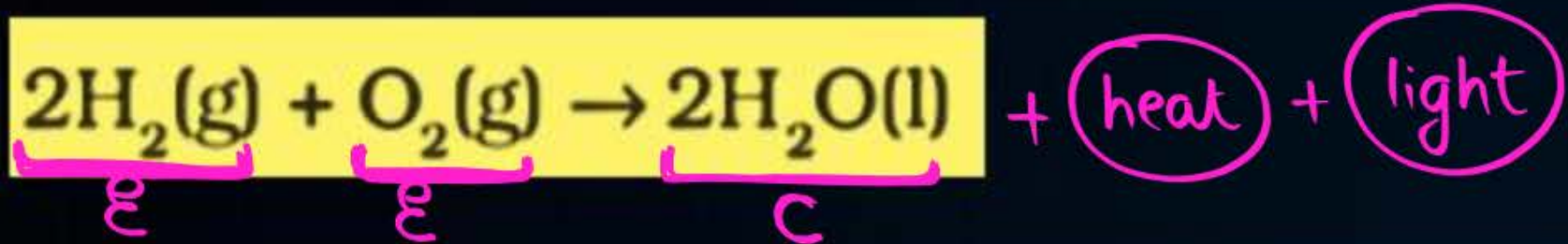
EXOTHERMIC



Examples of Endothermic and Exothermic Reactions

Exothermic/Endothermic

(iii) Burning of hydrogen gas

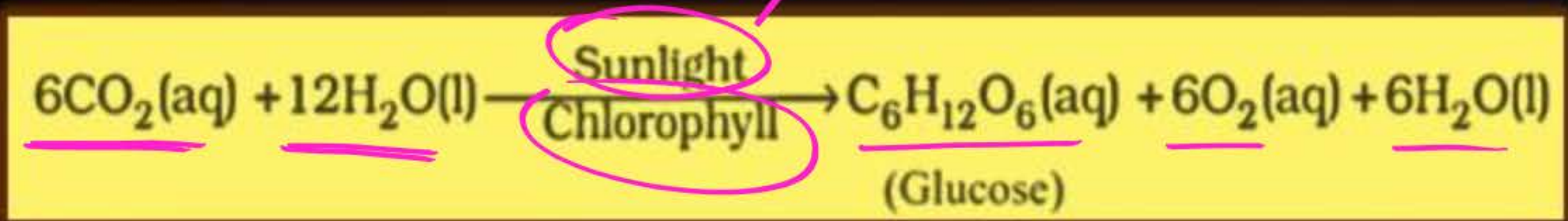


→ EXOTHERMIC

(iv) Decomposition of vegetable matter into compost

→ EXOTHERMIC

(v) Photosynthesis



→ input of energy

→ ENDOTHERMIC



Give a Thought



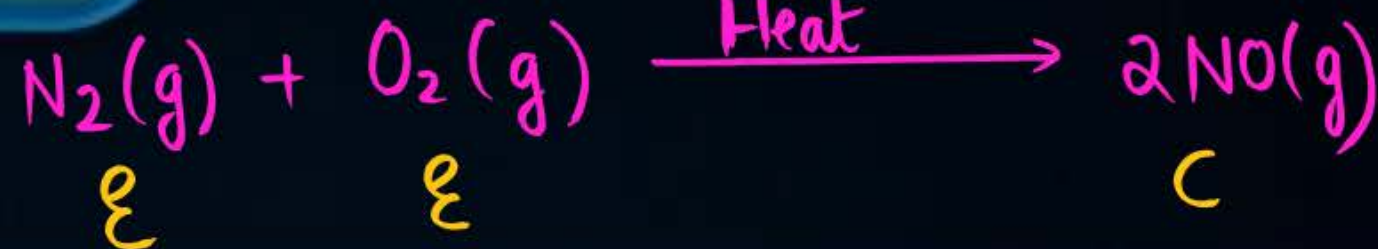
Are all combination reactions exothermic?

A. Yes

☒ B. No



Give a Thought



Are all combination reactions exothermic?

A. Yes

B. No

No! Not all combination reactions are exothermic. They can be endothermic too.



(The above reaction takes place when heat energy is provided through lightning.)



Out of NCERT Gyaan



Can be confirmed from Class XI \downarrow
s-block elements

- $\text{Ca(OH)}_2(\text{s})$: Slaked lime (White powder)
- $\text{Ca(OH)}_2(\text{aq})$: Limewater (Saturated aqueous solution) (colourless)
- Suspension of Ca(OH)_2 in water: Milk of lime or limewash or whitewash

\downarrow
(applied on walls)

Concept Polish (गृहकार्य)



A green chalkboard with a brown wooden frame. The text 'NO HOMEWORK!' is written in white, hand-drawn capital letters. At the bottom of the frame, there are three small white rectangular objects, likely representing chalk or erasers.

NO HOMEWORK!

THE FEYNMAN TECHNIQUE



STEP 1 - Pick and study a topic

STEP 2 - Explain the topic to someone, like a child, who is unfamiliar with the topic... and at their level of understanding. Use simple language.

STEP 3 - Identify any gaps in your understanding

STEP 4 - Return to the literature to understand better



Insaniyat Ka Gyaan



***Insaniyat Ka Gyaan
Jo Banae Behtar Insan***

SUNIL BHAIYA IS ALWAYS THERE FOR YOU.

#sbsathhai ✓

#pwsathhai ✓



**THANK
YOU**

