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Class - 10

Chapter - 1

Chemical Reactions and Equations

Part-3

TYPES OF CHEMICAL REACTIONS

Disha Pamecha

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Physical States of Reactants and Products in an Equation

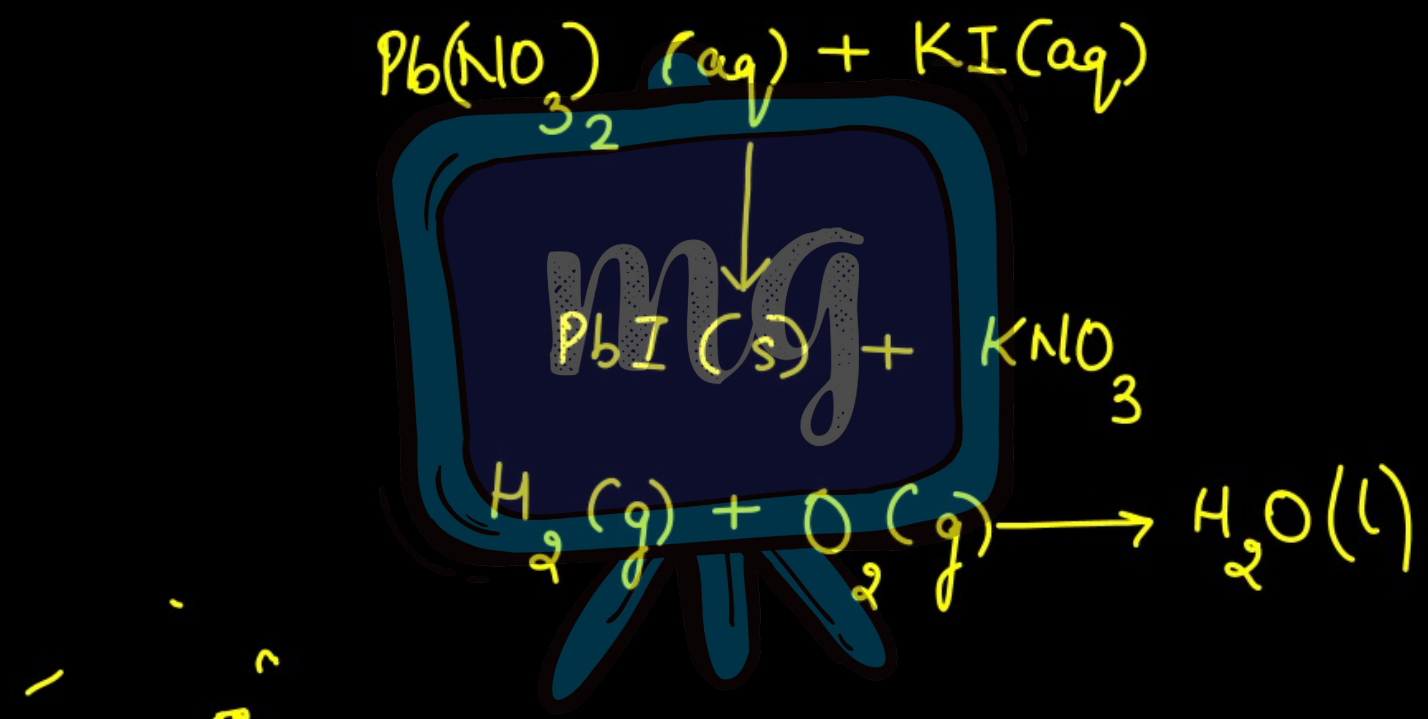
gas
(g)

State	Symbols
Solid	(s)
Liquid	(l)
Aqueous	aq
Gaseous	(g)

Note : Aqueous (aq) is written if the reactant or product is present as a solution in water. Symbol (g) is used with H_2O to indicate presence of water as steam.

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Conditions under which the Reaction takes place

- Temperature
- Pressure
- Catalyst
- Indicated above the arrow and/or below the arrow in the equation.

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$$CO_{(g)} + 2H_{2(g)} \xrightarrow{340\ atm} CH_3OH_{(\ell)}$$



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$$6CO_{2(aq)} + 12H_2O_{(l)} \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} C_6H_{12}O_{6(aq)} + 6O_{2(aq)} + 6H_2O_{(l)}$$

(Glucose)



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Define a chemical reaction. State four observations which help us to determine that a chemical reaction has taken place. Write one example of each observation with a balanced chemical equation.

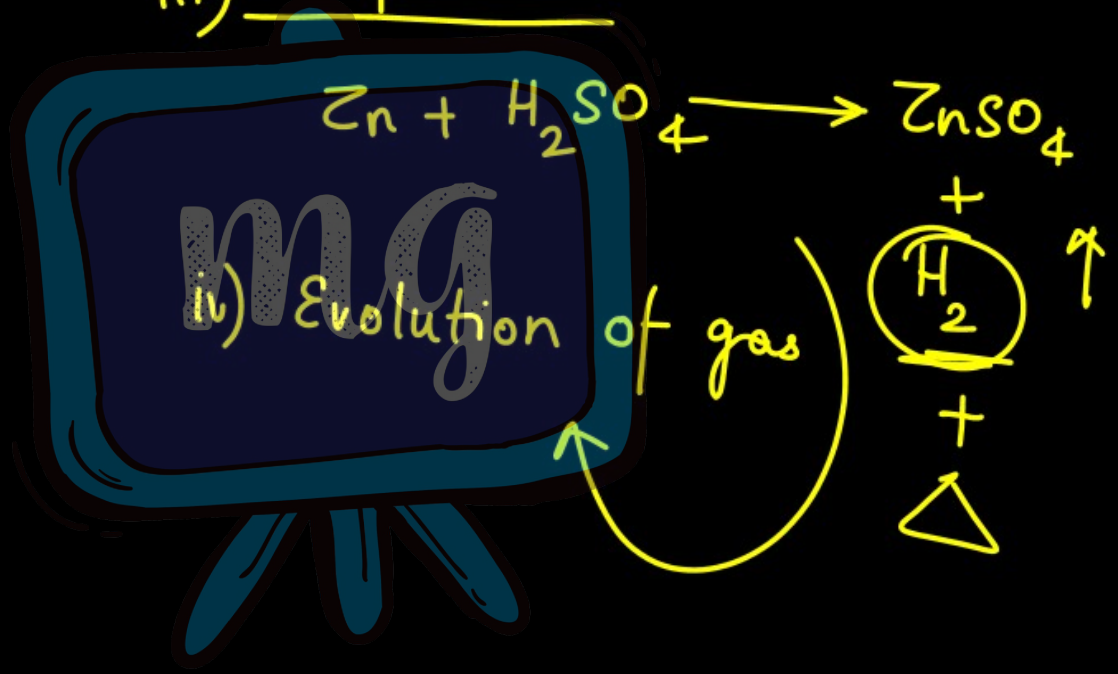
(2016)

i) State
ii) Colour — $Ag + H_2S \rightarrow AgS$.

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iii) temperature



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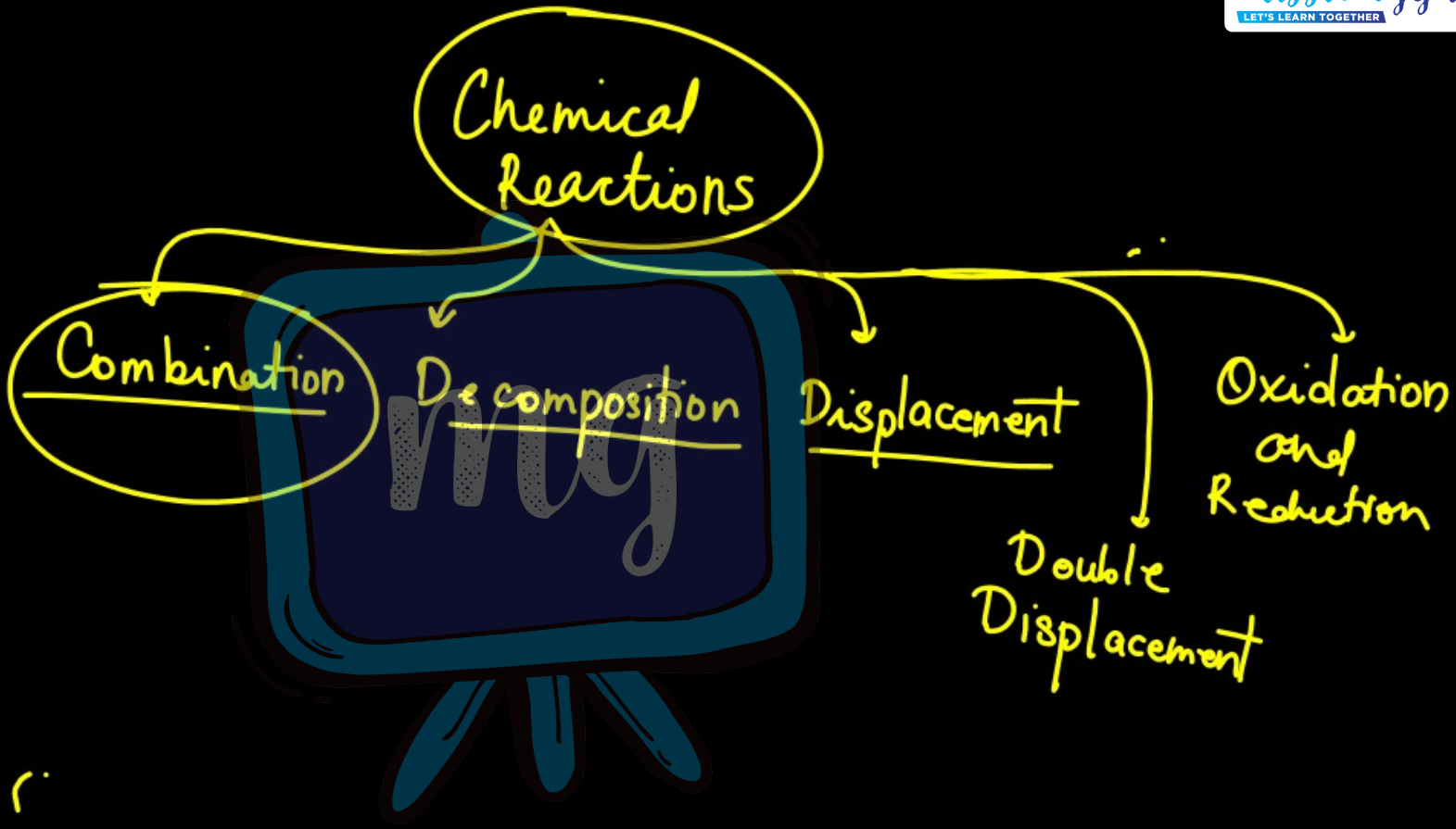
What is meant by a balanced chemical equation?

Why is it necessary for the equation to be balanced?

→ Law of Conservation of Mass (2024)

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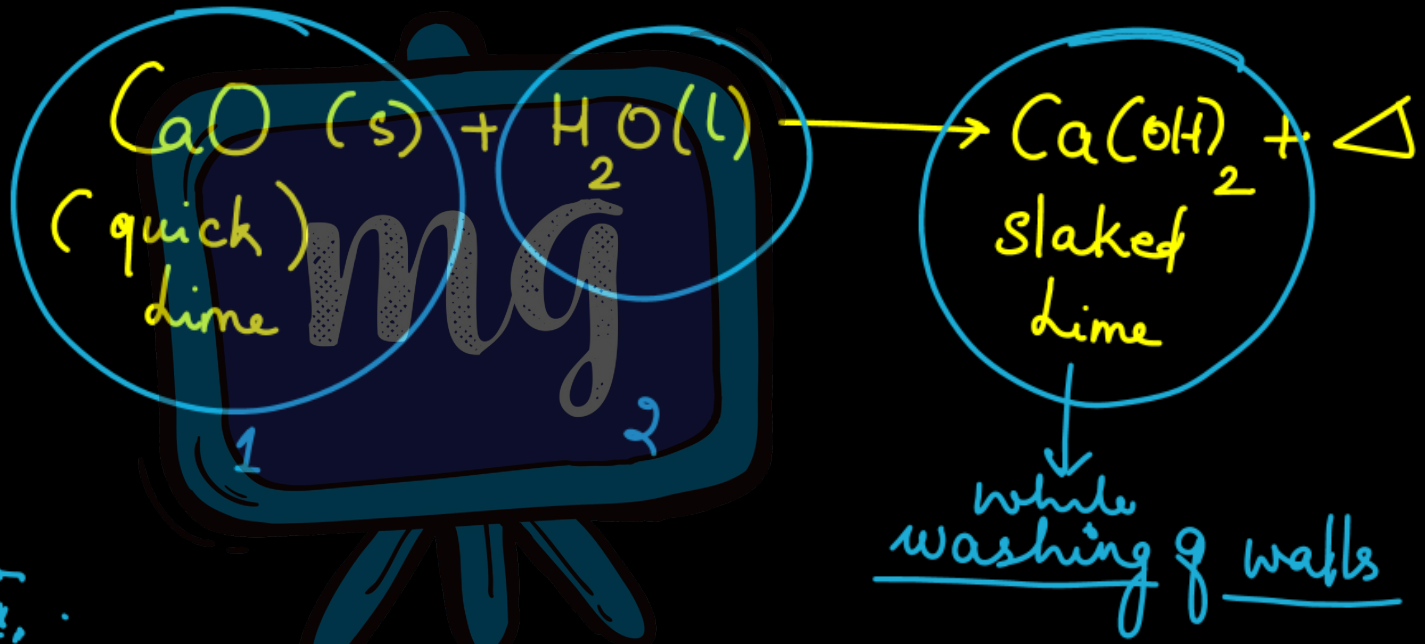
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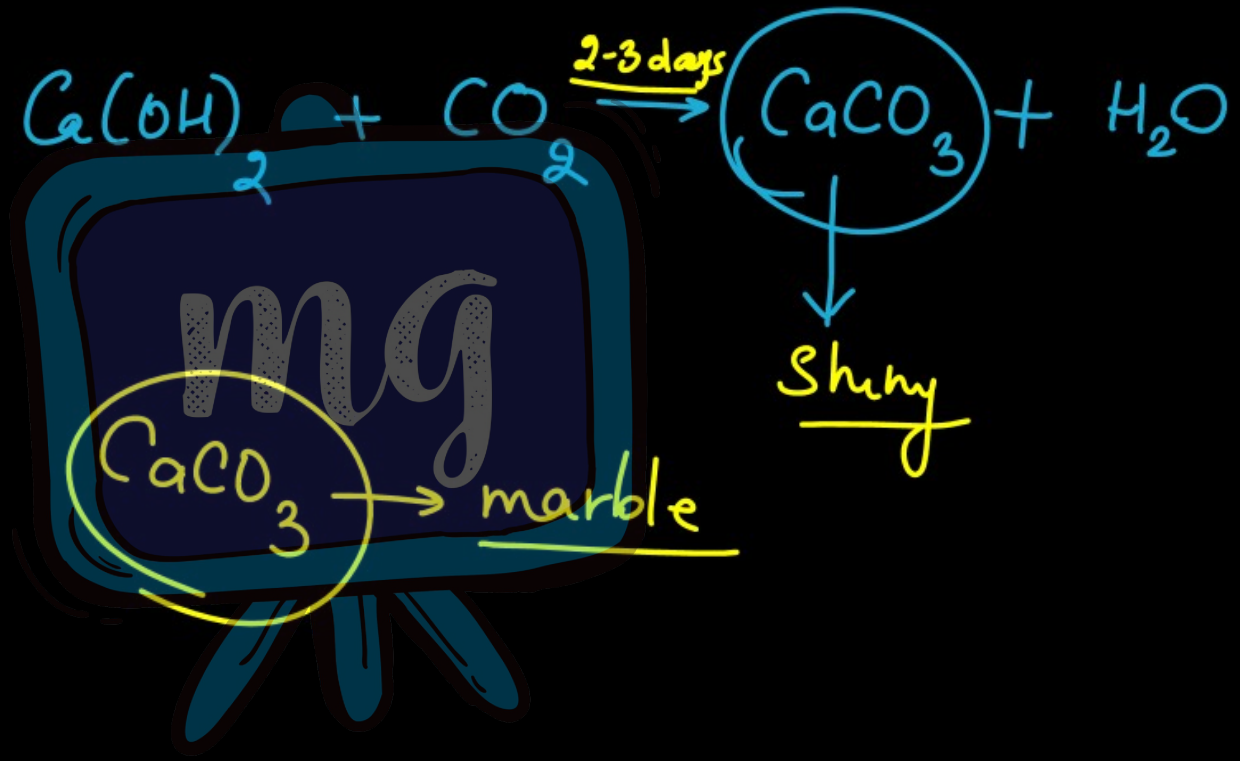
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1) Combination Reaction :



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TYPES OF CHEMICAL REACTIONS

Combination Reaction

- Two or more reactants combine to form a single product.

$$A + B + C \rightarrow D$$

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Examples :

Burning of coal

$$C\,(s) + O_2\,(g) \rightarrow CO_2\,(g)$$

Formation of water

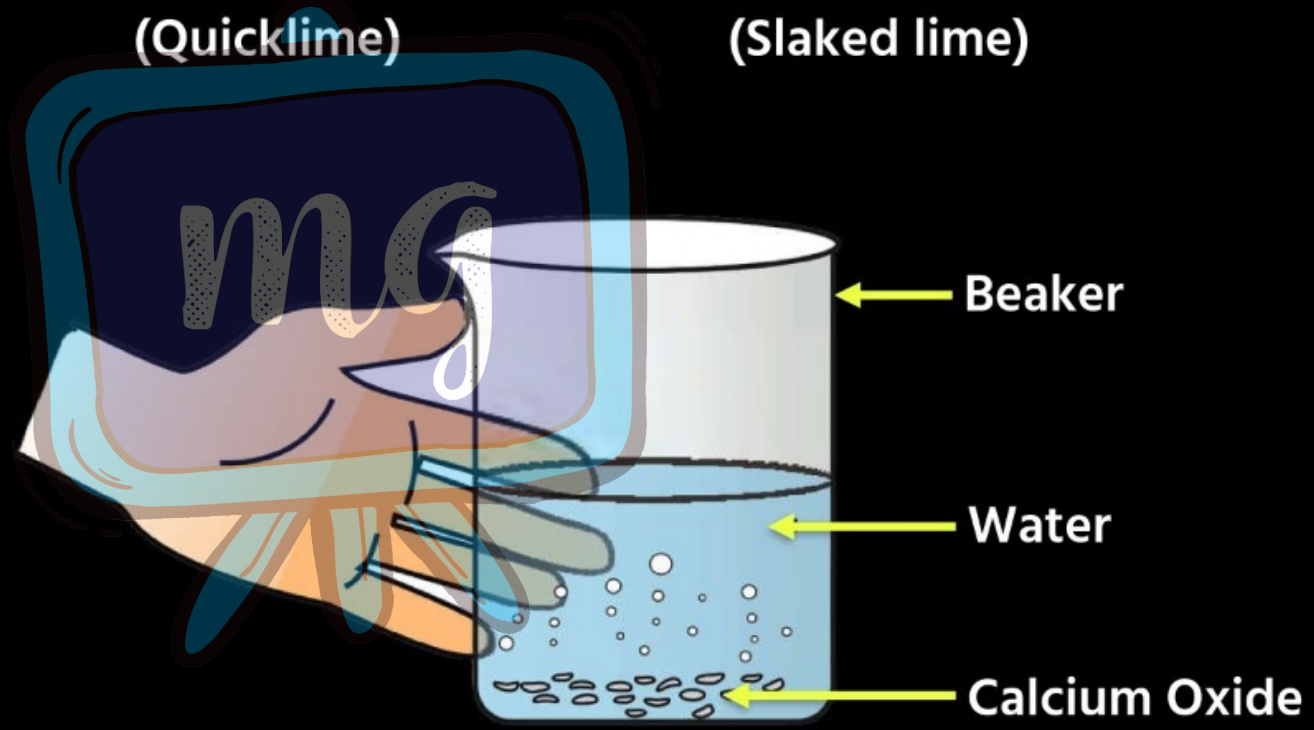
$$2H_2\,(g) + O_2\,(g) \rightarrow 2H_2O\,(l)$$

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$$CaO(s) + H_2O(l) \rightarrow Ca(OH)_{2(aq)} + Heat$$

(Quicklime) (Slaked lime)



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CaO (quick lime) reacts vigorously with water.

Produce $Ca(OH)_2$ (slaked lime).

A large amount of heat is released:

Exothermic Reaction

- Slaked Lime Solution

- Used for white washing walls.

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$$Ca(OH)_{2(aq)} + CO_{2(g)} \rightarrow CaCO_{3(s)} + H_2O_{(l)}$$

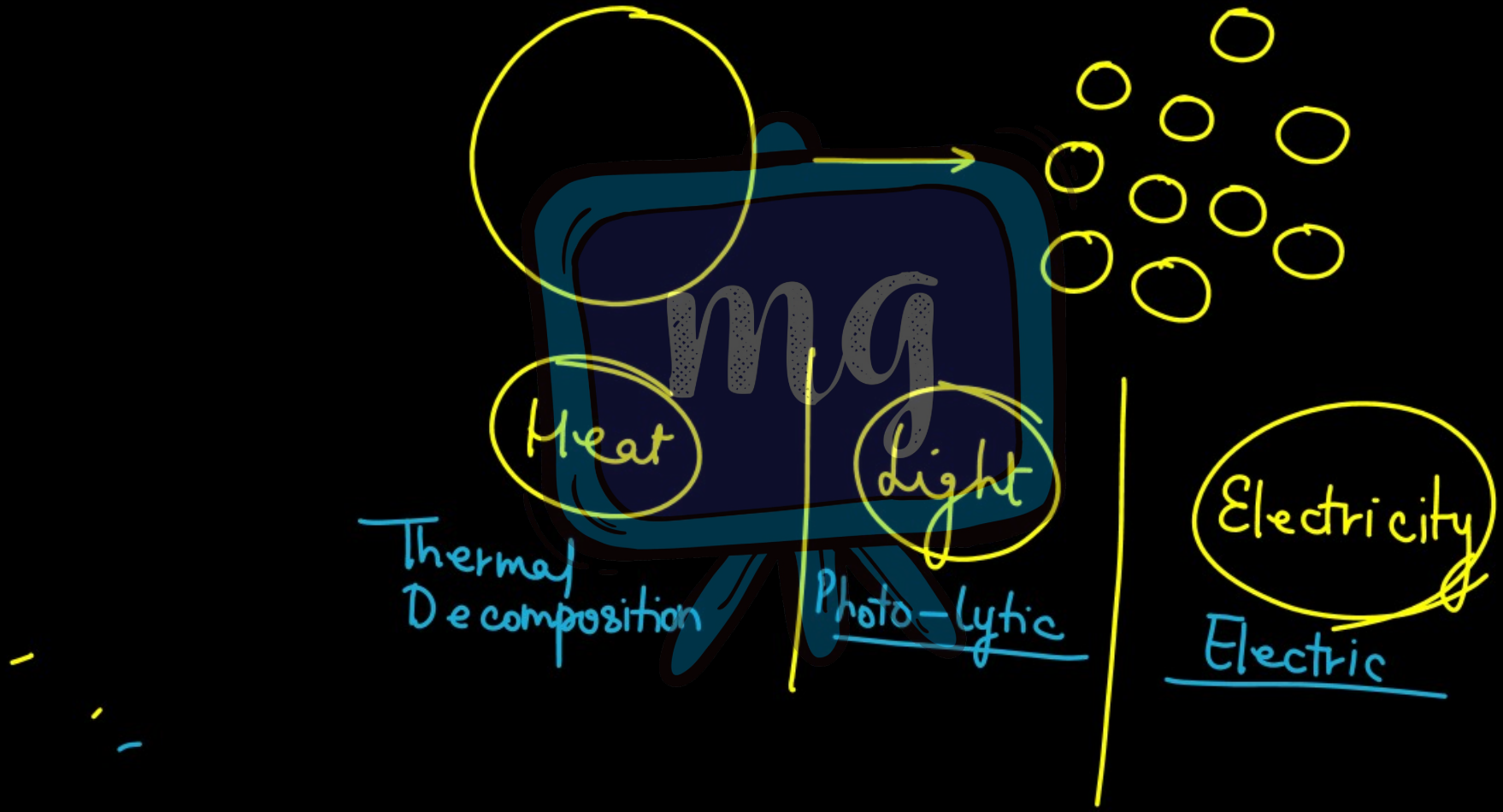
(Calcium hydroxide)

(Calcium carbonate)

- Calcium carbonate formed after two to three days of whitewashing.
- Gives a shiny finish to the walls.
- Marble: $CaCO_3$

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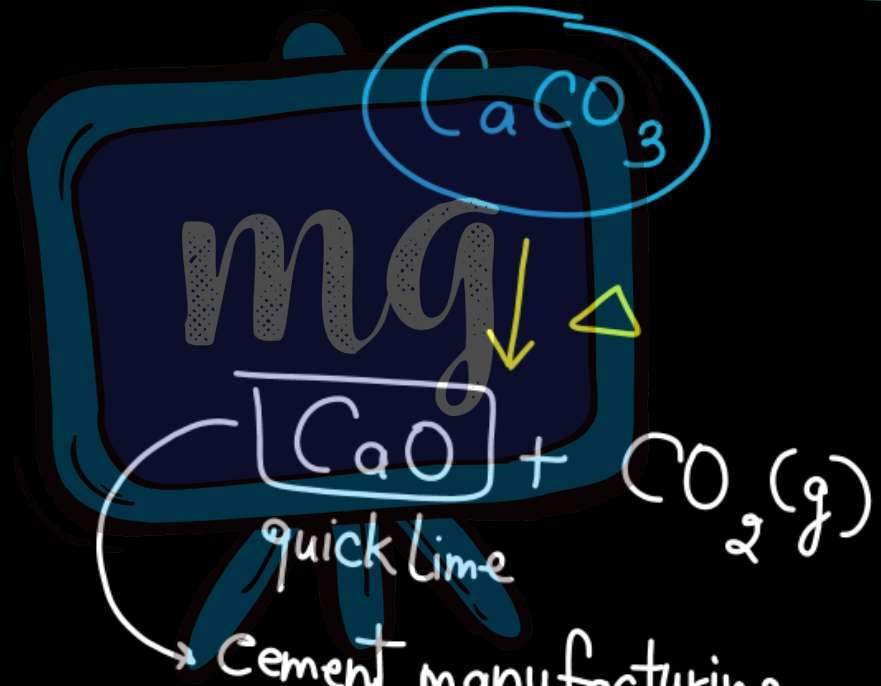
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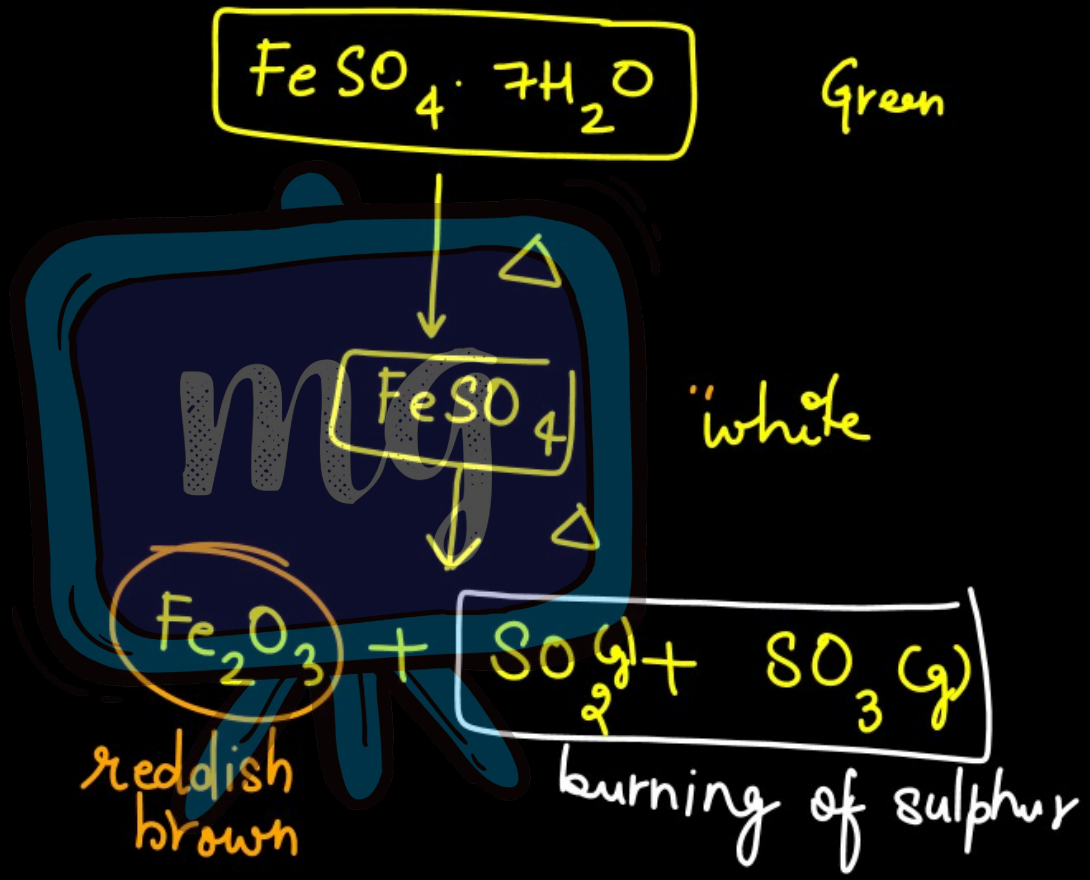
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Thermal Decomposition



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