

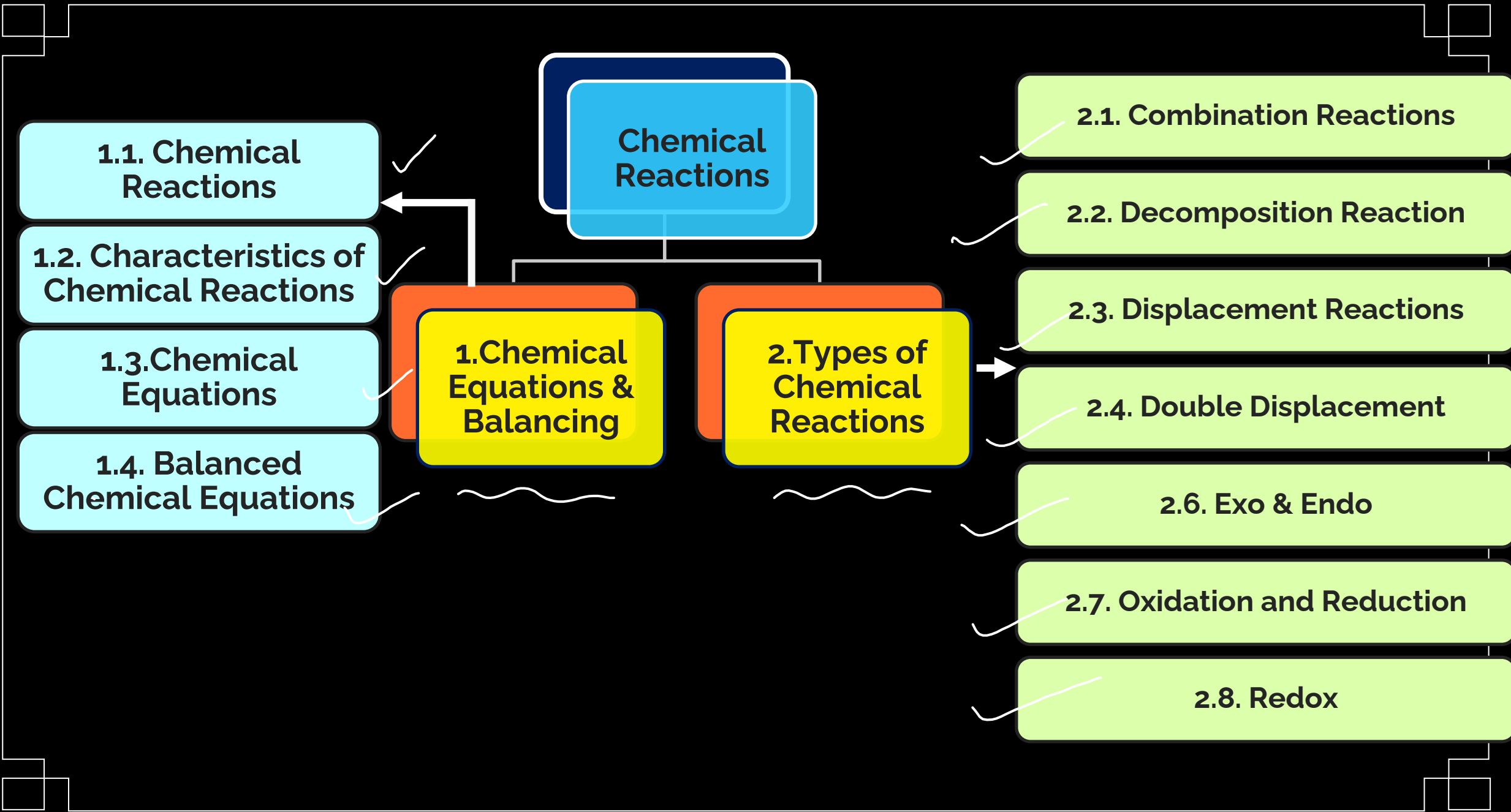
**CLASS 10<sup>TH</sup> MID TERM**

**SCORE**  
**BOOSTER**



**CHEMICAL**  
**REACTIONS**

**CHEMISTRY**

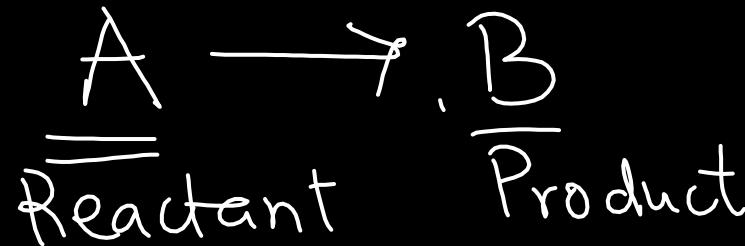
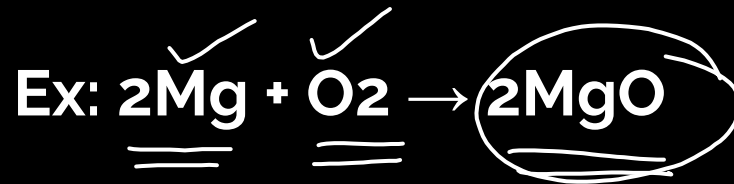


# 1. Chemical Equations & Balancing

## → 1.1 Chemical Reaction

One chemical substance gets converted to another chemical substance.

Reactants and Products.



# Your Roadmap to Success

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 13th Sept 2024

Topic	PDF	Link
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# 1. Chemical Equations & Balancing

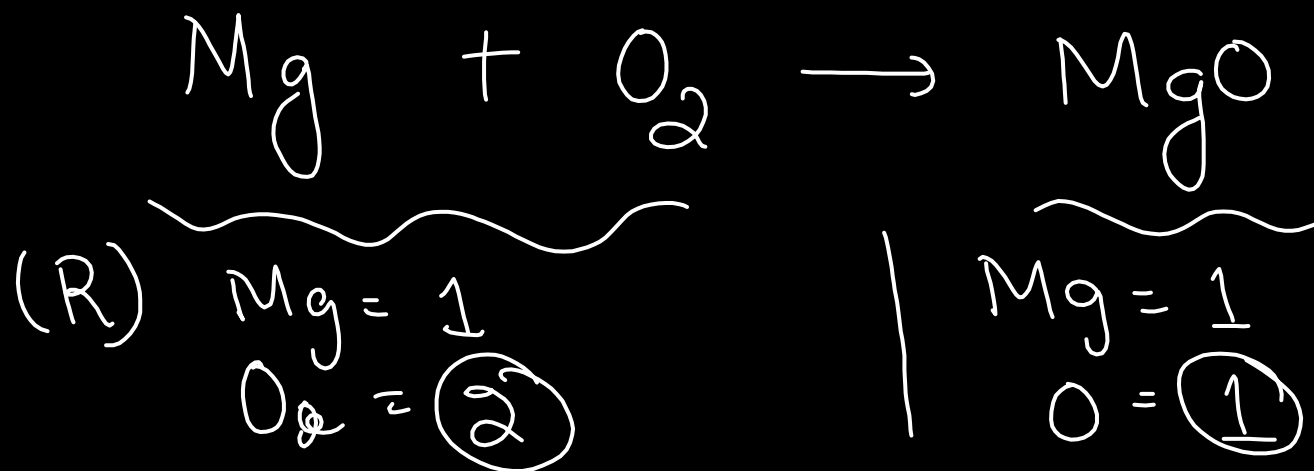
## 1.2. Characteristics of Chemical Reactions

- Change in state
- Change in colour
- Change in Temperature
- Evolution of gas

# 1. Chemical Equations & Balancing

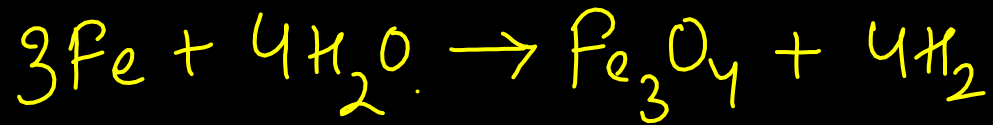
## 1.3. Chemical Equations

- **Symbolic way to represent Chemical reaction in form of symbols and formulae.**
- **Example:**
- **Magnesium + Oxygen → Magnesium oxide**



# 1. Chemical Equations & Balancing

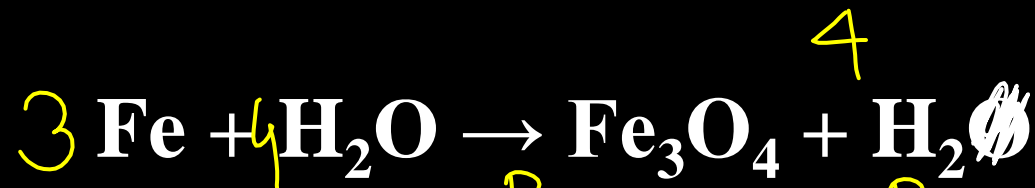
## 1.4. Balanced Chemical Equation



	R	P
Fe	3	3
H	8	8
O	4	4

- No of the atoms of each element is equal in the reactant and product side.

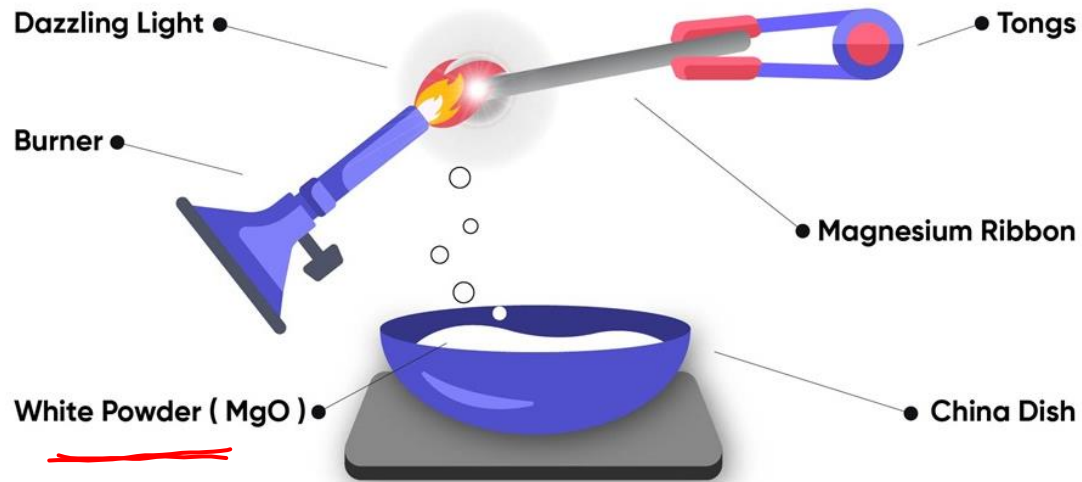
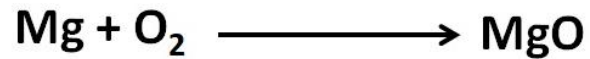
Examples:



	R	P
Fe	3	3
H	8	2
O	4	4

## MCQs

### Burning of Magnesium Ribbon



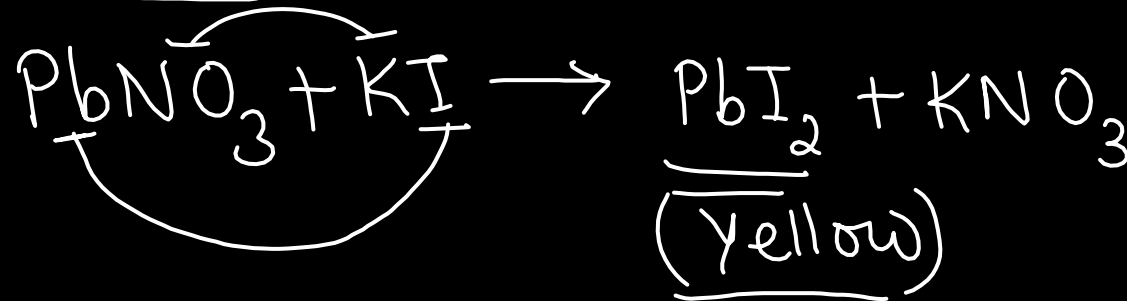
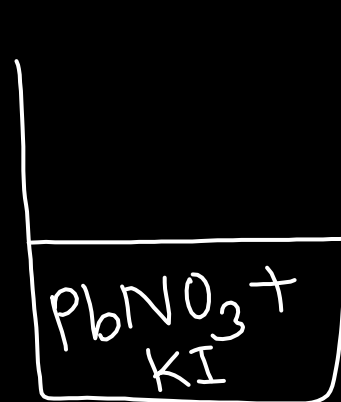
Q1. Which of the following is the correct observation of the reaction shown in the above set up?

- a) Brown powder of Magnesium oxide is formed.
- b) Colourless gas which turns lime water milky is evolved. ( $\text{CO}_2$ ) X
- e) Magnesium ribbon burns with brilliant white light. ✓
- d) Reddish brown gas with a smell of burning Sulphur has evolved. X



## MCQs

Q2. Reema took 5ml of Lead Nitrate solution in a beaker and added approximately 4ml of Potassium Iodide solution to it. What would she observe?



- (A) The solution turned red.
- (B) Yellow precipitate was formed.
- (C) White precipitate was formed.
- (D) The reaction mixture became hot.

# MCQs



$$w = 1$$

$$x = 2$$

$$y = 1$$



(A) 1,1,1

(B) 1,2,1

(C) 1,2,2

(D) 1,1,2

w, x, y, z

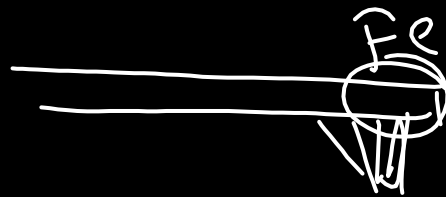
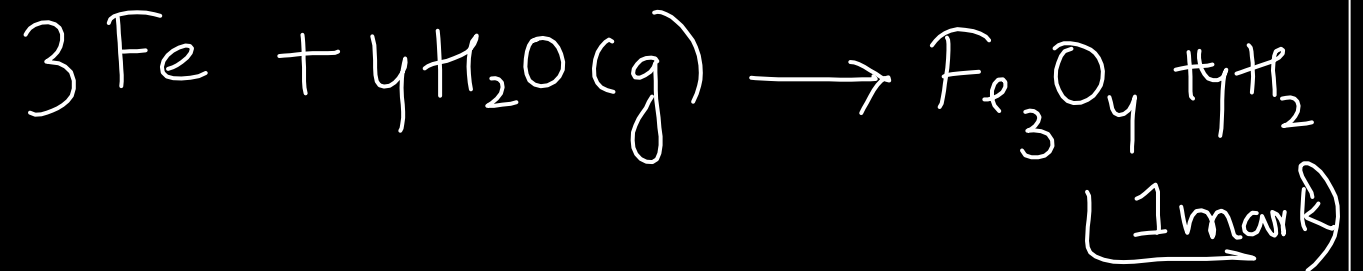
$$w \text{ SnO}_2 + x \text{ H}_2 \rightarrow y \text{ Sn} + z \text{ H}_2\text{O}$$

	R	P
Sn	1	1
O	2	1
H	2	2

## Very Short Answer (2 Mark)

Q4. What happens when steam is passed over red hot iron? Write the equation.

Is heating Fe to red hot a physical or chemical change?

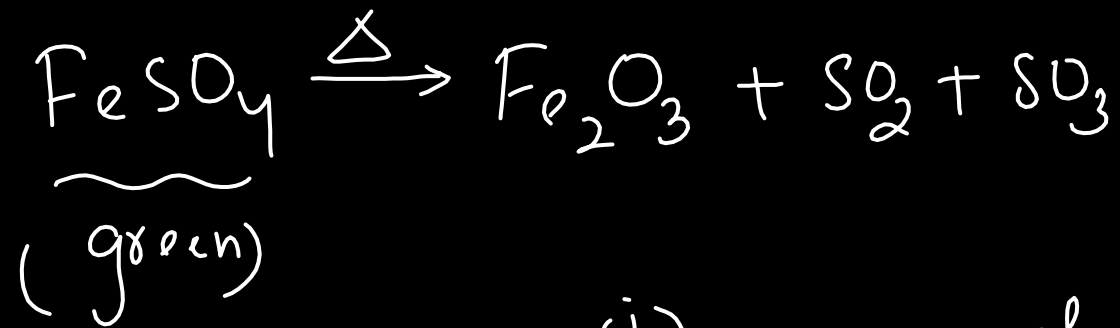


(ii) physical change

(1 mark)

## Very Short Answer (2 Mark)

**Q5. List any two observations when  $\text{FeSO}_4$  is heated in a dry test tube.**



(i) green colour  $\rightarrow$  brown colour

(ii) colourless gas

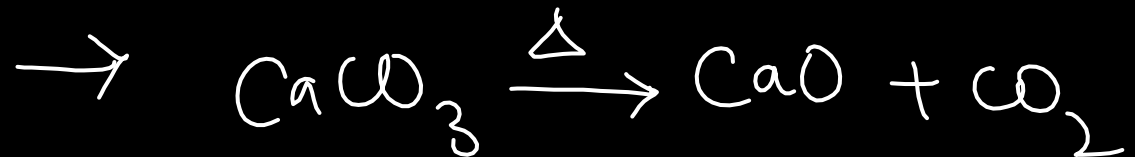
## Very Short Answer (2 Mark)

Q6. What is a balanced chemical equation? Give an example.

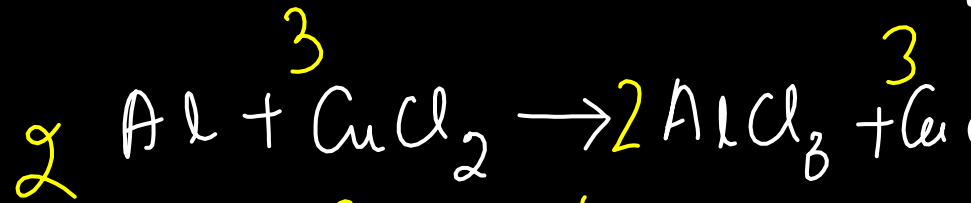
① Def<sup>n</sup> ⊥

② Ex ⊥

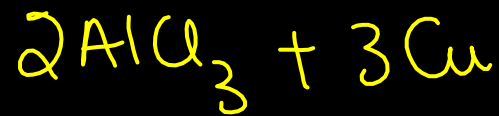
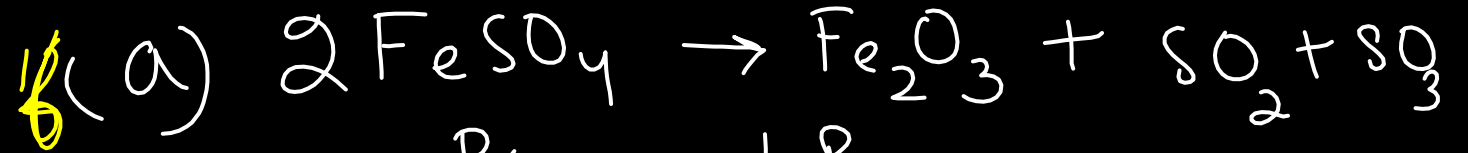
→ A balanced chemical eq<sup>n</sup> is an eq<sup>n</sup> where the no of atoms of each element is same on the reactant side & on the product side



## Very Short Answer (2 Mark)



	R	P
Al	1   2	1   2
Cu	1   3	1   3
Cl	2   6	3   6



	R	P
Fe	1   2	2   ✓
S	1   2	2   ✓
O	4   8	8   ✓

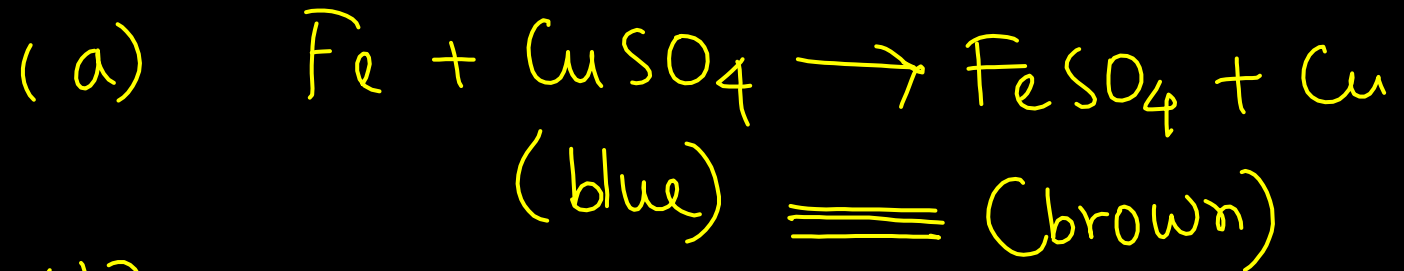
## Short Answer (3 Mark)

Q8. Write the chemical equation of the following changes with one example for each:

a) Change of colour

b) Change in Temperature

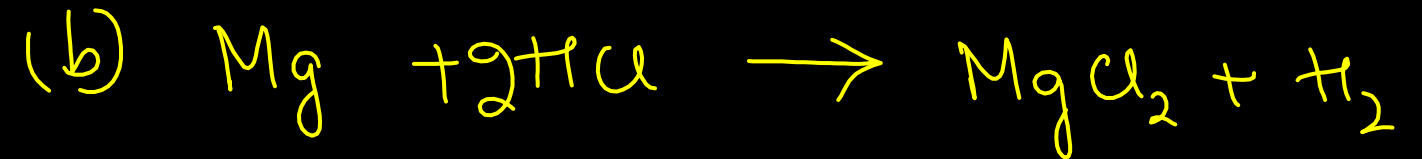
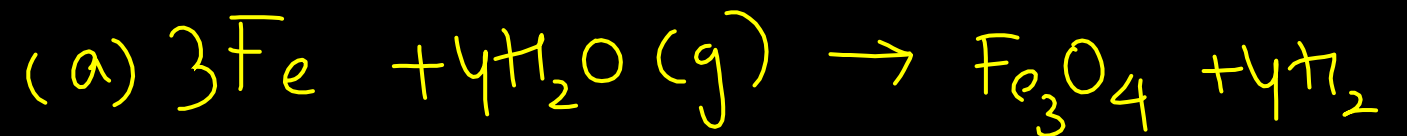
c) Formation of Precipitate



## Short Answer (3 Mark)

Q9. Write the chemical equations for chemical reactions taking place:

- a) Iron reacts with steam
- b) Mg reacts with dil HCl
- c) Cu is heated in air





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## Short Answer (3 Mark)

Q10. 2g of  $\text{FeSO}_4$  are heated in dry boiling tube.

- a) List any 1 observations.
- b) Name the type of chemical reaction.
- c) Write the chemical equation.

(a) Greenish colour changes to brown colour └

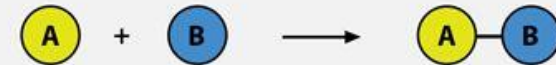
(b) Decomposition reaction └



# Topic 1.2: Types of reactions

## Types of Chemical Reactions

### 1. Combination or Synthesis Reaction



### 2. Decomposition Reaction



### 3. Single-replacement Reaction



### 4. Double-replacement Reaction



### 5. Combustion Reaction



## Topic 1.2: Types of reactions

Types of Chemical Reactions	Explanation	General Reaction
2.1. Combination reaction	<u>Two or more compounds combine to form one compound.</u>	<u><math>A + B \rightarrow AB</math></u>
2.2 Decomposition reaction	The opposite of a combination reaction – <u>a complex molecule breaks down to make simpler ones.</u>	$AB \rightarrow A + B$

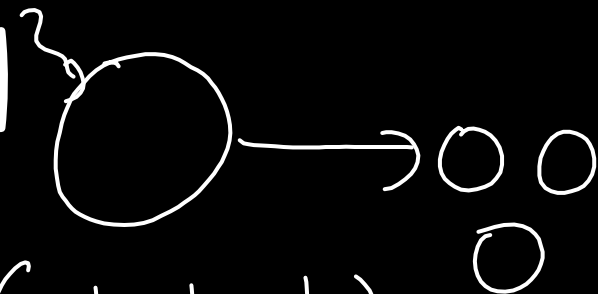
## Topic 1.2: Types of reactions

Types of Chemical Reactions	Explanation	General Reaction
2.3. Displacement reaction	One element takes place with <u>another element in the compound.</u>	$A + BC \rightarrow AC + B$ 
2.4. Double Displacement Reactions	when a part of two <u>ionic compounds</u> is exchanged and makes two <u>new components.</u>	$AB + CD \rightarrow AC + BD$ 

# Topic 1.2: Types of reactions

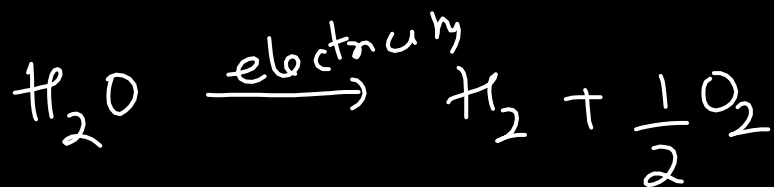
3 mark

## Decomposition Reaction

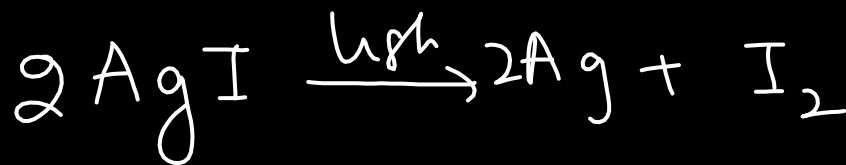


### Electrical decomposition

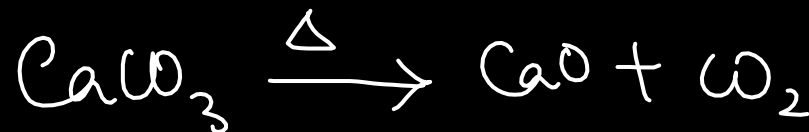
(electricity)



### Photochemical decomposition (light)



### Thermal Decomposition (heat)



## Topic 1.2: Types of reactions

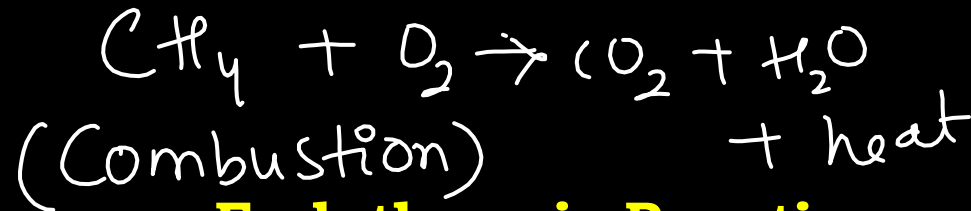
Neutralisation rxn



**Exothermic Reaction**

(heat is released)

⇒ heat is a product



**Endothermic Reaction**

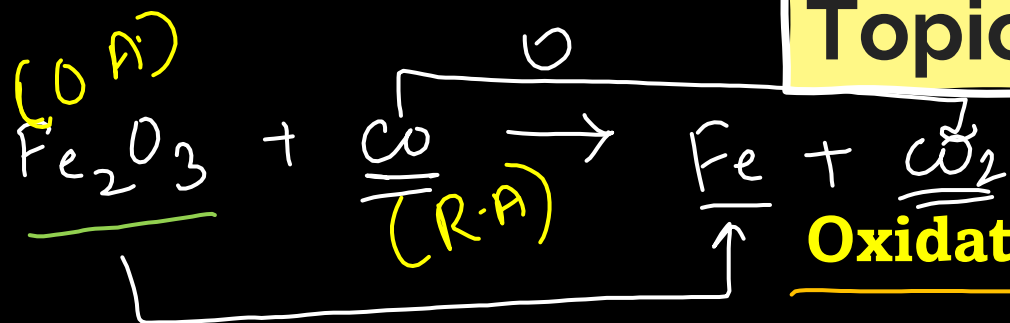
(heat is given)

(Thermal decomp)

→ heat is a reactant



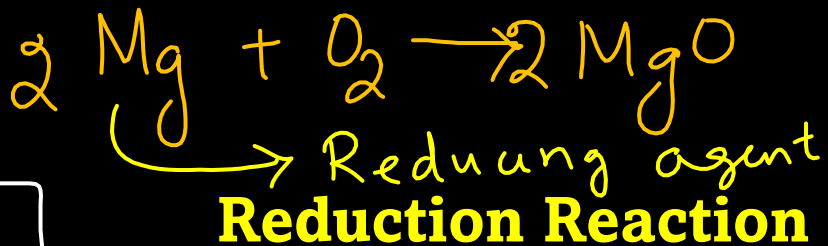
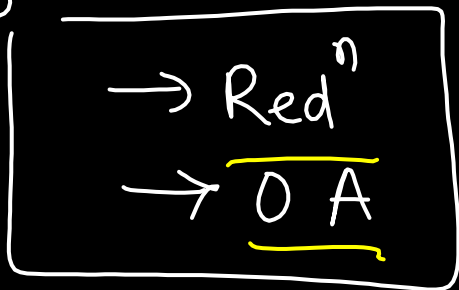
# Topic 1.2: Types of reactions



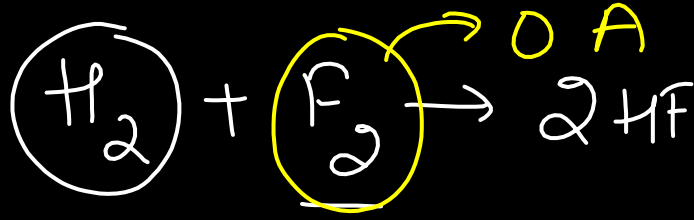
**Oxidation Reaction**

add<sup>n</sup> of O  
 removal of H  
 loss of electrons

Very imp



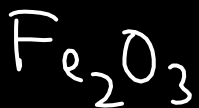
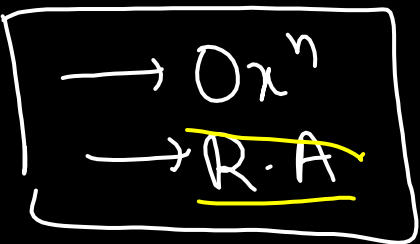
Mg is oxidised



removal of O  
 add of H  
 gain of e<sup>-</sup>

F<sub>2</sub> is reduced  
**Redox Reaction**

Red<sup>n</sup> & Ox<sup>n</sup> occurs together



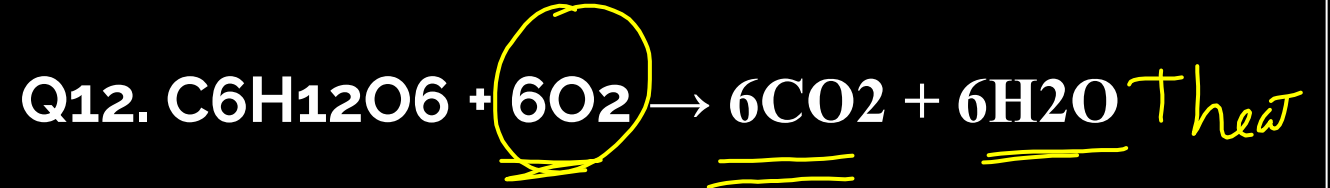


## MCQs

Q11. Which of the following is an example of single displacement reaction?

- A.  $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$  *decom*
- B.  $\text{CaO} + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2\text{O}$
- C.  $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$  (*single displ*)
- D.  $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$

## MCQs



A. displacement

B. endothermic

C. exothermic

D. neutralisation

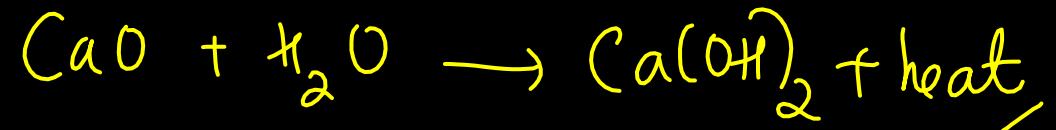
*Combustion*

## MCQs



13. **Assertion (A):** Reaction of quicklime with water is an exothermic reaction.

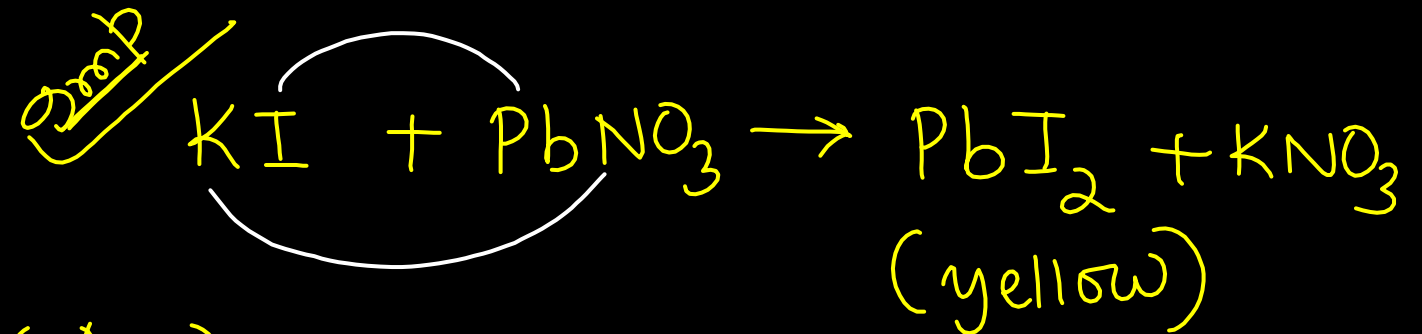
**Reason (R):** Quicklime reacts vigorously with water releasing a large amount of heat.



- A. Both the (A) and (R) are true, and the reason is the correct explanation for the (A).
- B. Both the (A) and (R) are true, but the reason is not the correct explanation for the (A).
- C. The (A) is true, but the (R) is not.
- D. The (A) is false, but the (R) is true.

## Ver Short Answer (2 Mark)

Q13. What is observed when a solution of potassium iodide is added to a solution of lead nitrate taken in a test tube?  
What type of reaction is this?



(Ans) We can observe yellow ppt.  
↳ due to the formation of  $PbI_2$   
↳  $\rightarrow Rx^n$   
↳ Double displacement  $Rx^n$

## Ver Short Answer (2 Mark)

Q14. Why is respiration an exothermic reaction ?

(i) Def<sup>n</sup> of exo  
→ heat is released  $\perp\perp$

(ii) Rx<sup>n</sup> in respiration  $\perp$

(not mand<sup>atm</sup>)  
Conclusion: - Since  $\Delta$  is produced + heat  
in resp - exothermic rx<sup>n</sup>

$$C_6H_{12}O_6 + O_2 \rightarrow CO_2 + H_2O$$

## Short Answer (3 Mark)

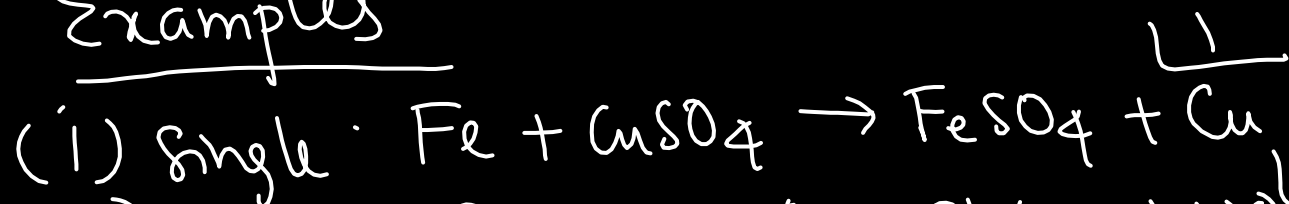


Identify the types of the reaction (a) and (b). Give one example of each type.

(a) Single displacement rxn  $\underline{\underline{1/2}}$

(b) double dis rxn  $\underline{\underline{1/2}}$

Examples



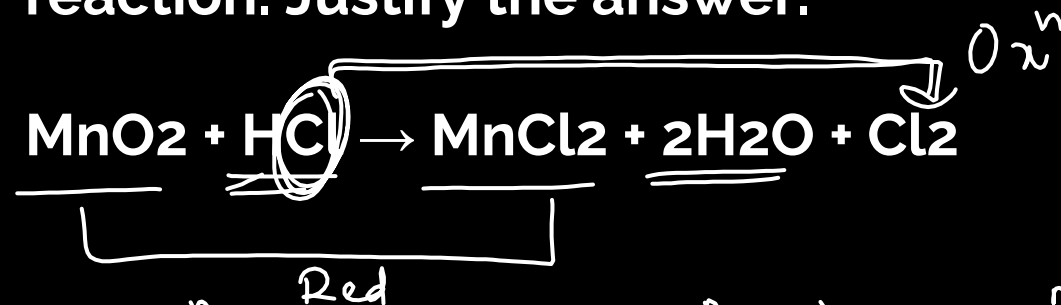
## Short Answer (3 Mark)

① → Def<sup>n</sup> Redox ✓

② → Ox<sup>n</sup> ✓

③ → Red<sup>n</sup> ✓ Ans

Q16. Mark the chemical reaction is redox reaction. Justify the answer.



Def<sup>n</sup> Redox rx<sup>n</sup> are those rx<sup>n</sup> where Ox<sup>n</sup> & Red<sup>n</sup> occurs simultaneously ✓

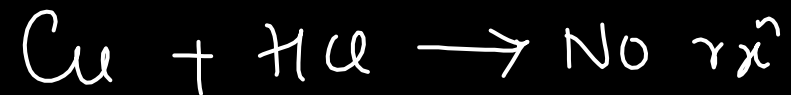
② MnO<sub>2</sub> is reduced as O is removed ✓

③ HCl is oxidised as H is removed ✓

Conclusion: Since Red<sup>n</sup> & Ox<sup>n</sup> is taking place simultaneously ✓

## Short Answer (3 Mark)

Q17. Zn liberates H<sub>2</sub> gas with HCl but Cu does not. Why?



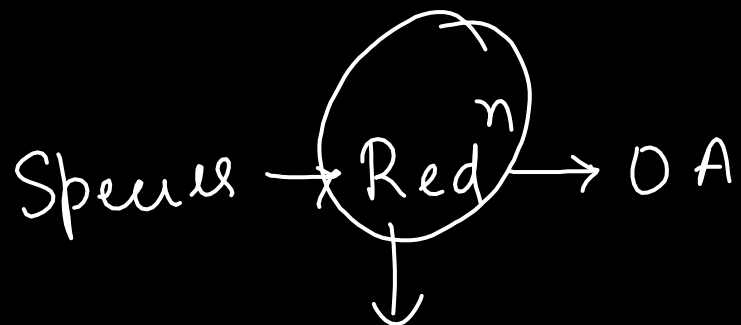
✓ (i) Zn is more reactive than H & it can replace H from its salt.

✓ (ii) Cu is less reactive than H & hence it can't displace H from its salt.

✓ (iii) Zn produces H<sub>2</sub> but not Cu.



## Short Answer (3 Mark)

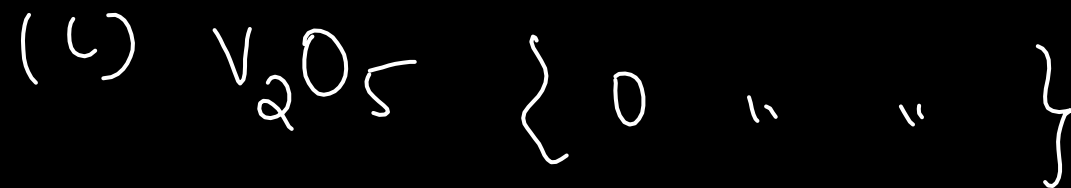
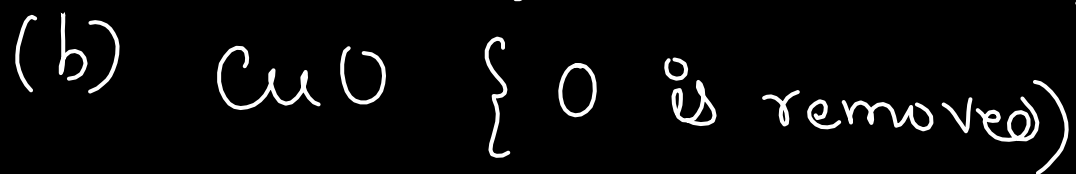


$\rightarrow$  rem of O

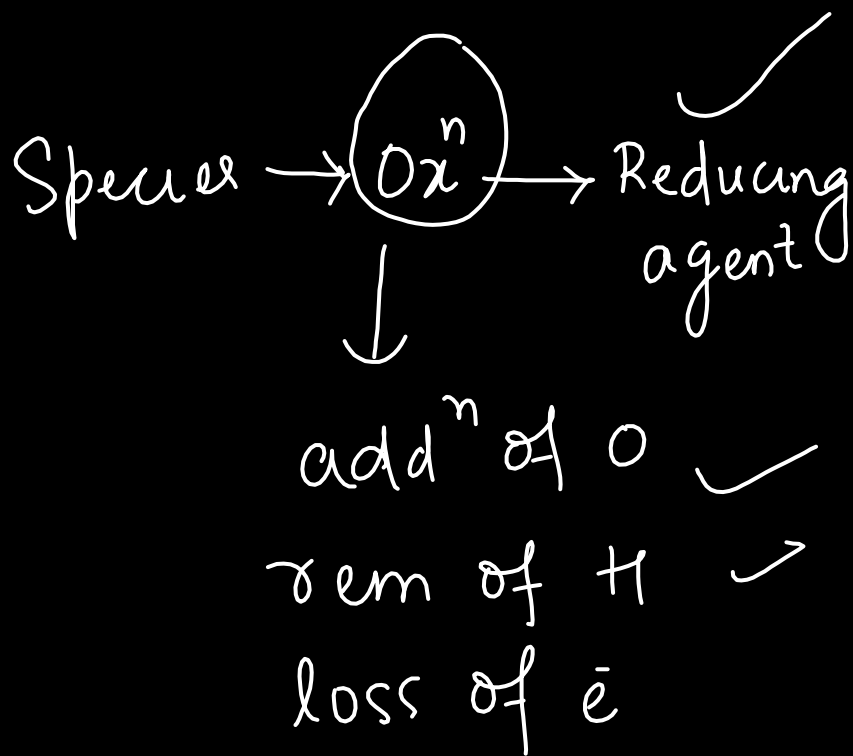
$\rightarrow$  add of H

$\rightarrow$  gain of  $e^-$

Q18. Identify the oxidizing agent in the following:



## Short Answer (3 Mark)



Q19. Identify the reducing agent in the following:



a)  $\text{NH}_3$  (H removed  
O added)

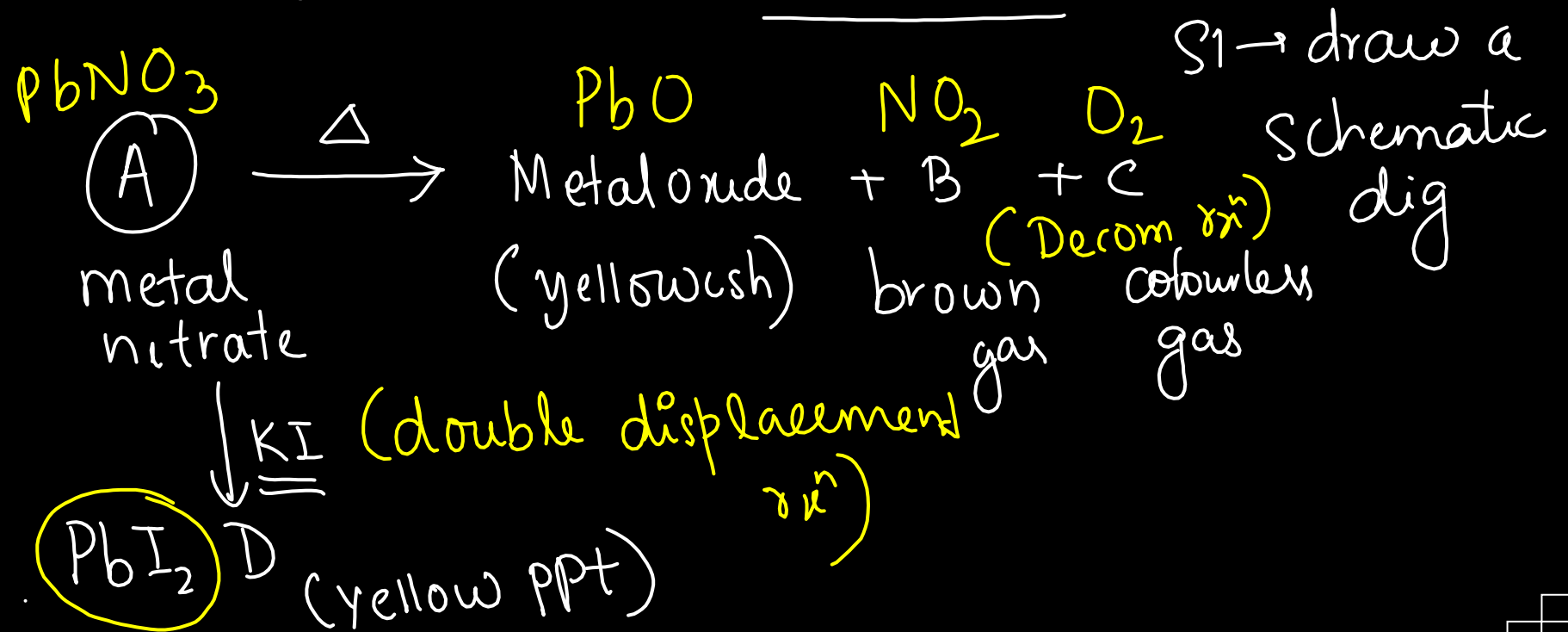
(b)  $\text{H}_2$  (O is added)

(c)  $\text{CO}$  (O is added)

## Long Answer (5 Mark)

Word Problems

Q20. A metal nitrate A on heating gives a yellowish brown coloured metal oxide along with brown gas B and a colourless gas C. An aqueous solution of A on reaction with potassium iodide forms a yellow precipitate of compound D. Identify A, B, C and D. Also, identify the types of reactions taking place. Metal present in A is used in an alloy which is used for soldering purposes.



## Test Yourself

**Q1. Why silver is stored in dark bottles ? (2 Marks)**

**Q2. Write one equation for decomposition reaction where energy is supplied in the form of heat, light and electricity ? (3 Marks)**

**Q3. What happens when piece of \_\_\_\_\_ (5 Marks)**

**(a) zinc metal is added to copper sulphate solution ?**

**(b) aluminium metal is added to dilute hydrochloric acid ?**


**(c) silver metal is added to copper sulphate solution ?**

**Also write the balanced chemical equation if the reaction occurs.**

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