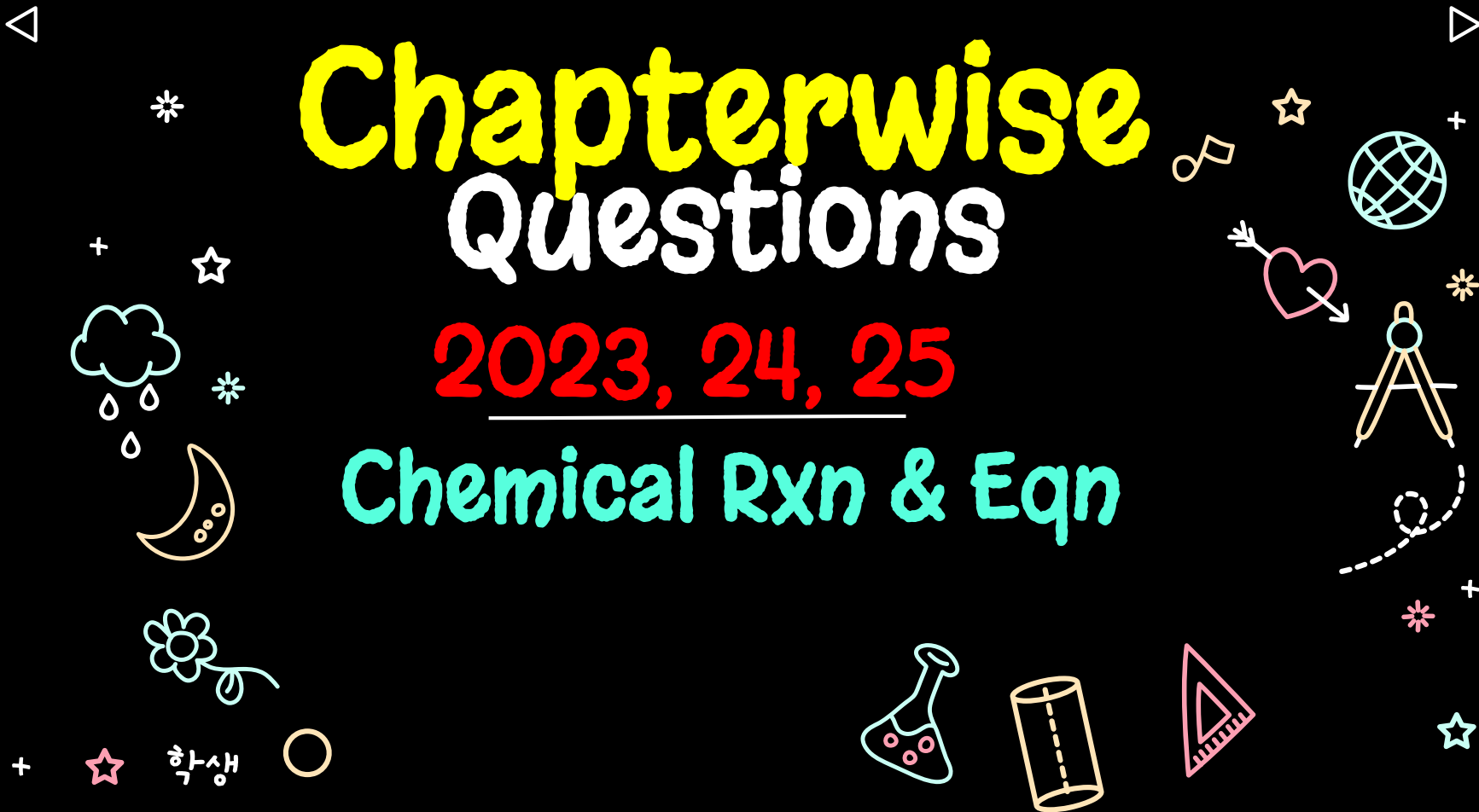


# Chapterwise Questions

2023, 24, 25

Chemical Rxn & Eqn







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Electrolysis of water is a decomposition reaction. The mass ratio ( $M_H : M_O$ ) of hydrogen and oxygen gases liberated at the electrodes during electrolysis of water is :

**CBSE 2025**

(A) 8 : 1

(B) 2 : 1

(C) 1 : 2

(D) 1 : 8



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The correct balanced chemical equation showing exothermic reaction in which natural gas burns in air is :

CBSE 2025

- (A)  $\text{CH}_4 + \text{O}_2 \longrightarrow \text{CO}_2 + 2\text{H}_2\text{O}$
- (B)  $\text{CH}_4 + 2\text{O}_2 \longrightarrow 2\text{CO}_2 + 2\text{H}_2\text{O} + \text{Energy}$
- (C)  $\text{CH}_4 + 2\text{O}_2 \longrightarrow \text{CO}_2 + 2\text{H}_2\text{O}$
- (D)  $\text{CH}_4 + 2\text{O}_2 \longrightarrow \text{CO}_2 + 2\text{H}_2\text{O} + \text{Energy}$
- ▷
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In which one of the following situations a chemical reaction does **not** occur?

**CBSE 2025**

- (a) Milk is left open at room temperature during summer
- (b) Grapes get fermented
- (c) An iron nail is left exposed to humid atmosphere
- (d) Melting of glaciers





The main observations while performing the experiment of burning magnesium ribbon in air are : **CBSE 2025**

- (i) Magnesium ribbon burns with a dazzling white flame.
- (ii) A white powder is formed.
- (iii) Magnesium ribbon vapourises.
- (iv) Aqueous solution of the white powder turns blue litmus to red.

(A) (i) and (iv)

(B) (ii) and (iii)

(C) (i) and (ii)

(D) (iii) and (iv)

A metal, M, displaces iron from aqueous solution of ferrous sulphate but fails to do so in case of aqueous solution of aluminium sulphate. The metal M is

**CBSE 2025**

(A) Magnesium

(B) Copper

(C) Lead

(D) Zinc



**Assertion (A)** : Silver chloride turns grey in sunlight.

**Reason (R)** : Decomposition of silver chloride into silver and chlorine takes place by sunlight.

- (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
- (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
- (C) Assertion (A) is true, but Reason (R) is false.
- (D) Assertion (A) is false, but Reason (R) is true.

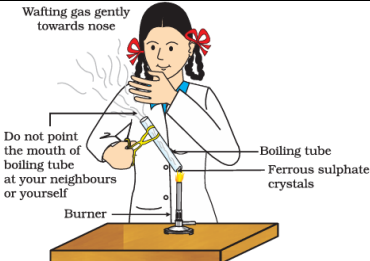
**CBSE 2025**

A crystalline substance of green colour 'X' emits gases of characteristic odour when heated over a flame. It first loses water and changes colour. On further heating, it decomposes and produces a solid compound Y.

(a) Identify 'X' and 'Y'.

CBSE 2025

(b) State the change in colour observed when 'X' is heated.



**Activity 1.5**

- Take about 2 g ferrous sulphate crystals in a dry boiling tube.
- Note the colour of the ferrous sulphate crystals.
- Heat the boiling tube over the flame of a burner or spirit lamp as shown in Fig. 1.4.
- Observe the colour of the crystals after heating.

**Figure 1.4**  
Correct way of heating the boiling tube containing crystals of ferrous sulphate and of smelling the odour

Have you noticed that the green colour of the ferrous sulphate crystals has changed? You can also smell the characteristic odour of burning sulphur.

$$2\text{FeSO}_4(\text{s}) \xrightarrow{\text{Heat}} \text{Fe}_2\text{O}_3(\text{s}) + \text{SO}_2(\text{g}) + \text{SO}_3(\text{g}) \quad (1.19)$$

(Ferrous sulphate) (Ferric oxide)

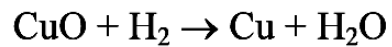
In this reaction you can observe that a single reactant breaks down to give simpler products. This is a decomposition reaction. Ferrous sulphate crystals ( $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ ) lose water when heated and the colour of the crystals changes. It then decomposes to ferric oxide ( $\text{Fe}_2\text{O}_3$ ), sulphur dioxide ( $\text{SO}_2$ ) and sulphur trioxide ( $\text{SO}_3$ ). Ferric oxide is a solid, while  $\text{SO}_2$  and  $\text{SO}_3$  are gases.



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Define oxidation. Identify and name the substance oxidised in the following reaction :

**CBSE 2025**

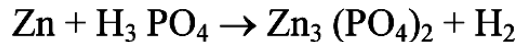




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- (A) Why do we balance a chemical equation? Name and state the law that suggests the balancing of a chemical equation? Balance the following chemical equation :

**CBSE 2025**



**OR**

- (B) Define a precipitation reaction. Give its example and also express the reaction that occurs in the form of a balanced chemical equation.





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List the possible sources of energy required in decomposition reactions. Illustrate any one with a suitable example. **CBSE 2025**

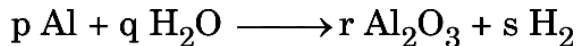
**OR**

What is observed when hydrated ferrous sulphate crystals are heated in a dry boiling tube ? Give balanced chemical equation(s) of the reactions(s) that occur(s).



Consider the following chemical equation :

CBSE 2025



To balance this chemical equation, the values of 'p', 'q', 'r' and 's' must be respectively :

(A) 3, 2, 2, 1

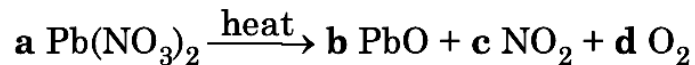
(B) 2, 3, 3, 1

(C) 2, 3, 1, 3

(D) 3, 1, 2, 2

The values of **a**, **b**, **c** and **d** in the following balanced chemical equation are respectively :

CBSE 2025



(A) 1, 1, 2, 1

(B) 1, 1, 1, 2

(C) 2, 2, 1, 4

(D) 2, 2, 4, 1



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- (a) (i) Define the term decomposition reaction. Write one chemical equation each for decomposition reaction where energy is supplied in the form of heat, light or electricity.
- (ii) Decomposition of vegetable matter into compost is considered an exothermic reaction. Why ?

**OR**

**CBSE 2025**

- (b) Why are decomposition reactions called the opposite of combination reactions ? Write one chemical equation each for these two types of reactions mentioning the name of the reactant(s) and the product(s) involved in the reactions.

The decomposition of vegetable matter into compost is an exothermic reaction because microbes need energy to break the bond of the vegetable. That's why it produces heat energy hence this decomposition reaction is an exothermic reaction

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*Assertion (A) :* Decomposition reactions are generally endothermic reactions.

*Reason (R) :* Decomposition of organic matter into compost is an exothermic process.

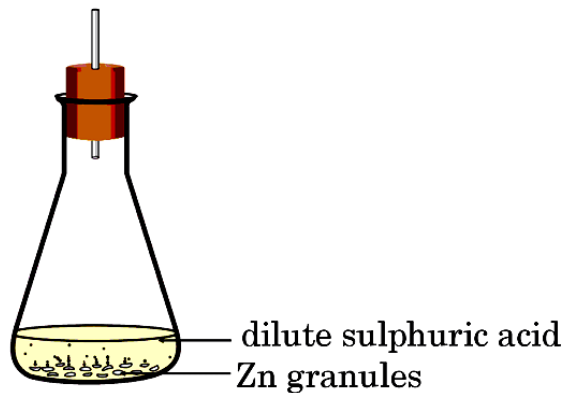
- (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
- (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is **not** the correct explanation of Assertion (A).
- (C) Assertion (A) is true, but Reason (R) is false.
- (D) Assertion (A) is false, but Reason (R) is true.

CBSE 2025

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A student performs the following experiment in his school laboratory.

**CBSE 2025**



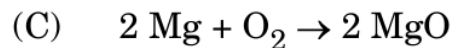
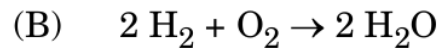
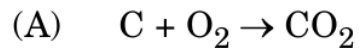
List two observations to justify that in this experiment a chemical change has taken place.





Which of the following is a redox reaction, but ***not*** a combination reaction ?

**CBSE 2024**

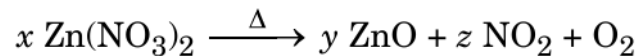




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To balance the following chemical equation, the values of the coefficients  $x$ ,  $y$  and  $z$  must be respectively :

**CBSE 2024**



(A) 4, 2, 2

(B) 4, 4, 2

(C) 2, 2, 4

(D) 2, 4, 2





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Select from the following a process in which a combination reaction is involved :

**CBSE 2024**

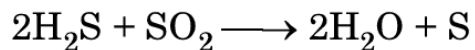
- (A) Black and White photography (B) Burning of coal  
(C) Burning of methane (D) Digestion of food





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Identify the correct statement about the following reaction :



**CBSE 2024**

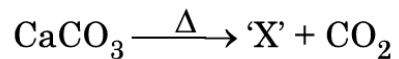
- (A)  $\text{H}_2\text{S}$  is oxidising agent and  $\text{SO}_2$  is reducing agent.
- (B)  $\text{H}_2\text{S}$  is reduced to sulphur.
- (C)  $\text{SO}_2$  is oxidising agent and  $\text{H}_2\text{S}$  is reducing agent.
- (D)  $\text{SO}_2$  is oxidised to sulphur.





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Identify the product 'X' obtained in the following chemical reaction :



**CBSE 2024**

(A) Quick lime

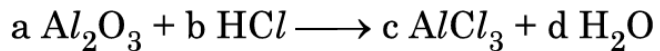
(B) Gypsum

(C) Lime Stone

(D) Plaster of Paris



Consider the following Chemical equation :



**CBSE 2024**

In order to balance this chemical equation, the values of a, b, c and d must be

(A) 1, 6, 2 and 3

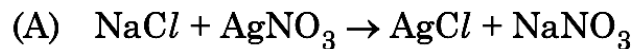
(B) 1, 6, 3 and 2

(C) 2, 6, 2 and 3

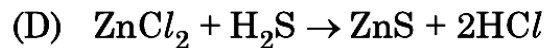
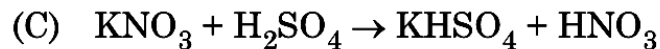
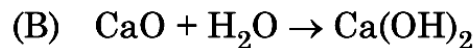
(D) 2, 6, 3 and 2

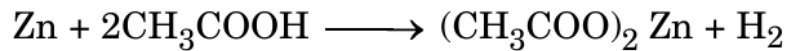


Which one of the following reactions is different from the remaining three ?



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**CBSE 2024**

The above reaction is a :

- |                                  |                           |
|----------------------------------|---------------------------|
| (A) Decomposition reaction       | (B) Displacement reaction |
| (C) Double displacement reaction | (D) Combination reaction  |





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Write chemical equation for the chemical reaction which occurs when the aqueous solutions of barium chloride and sodium sulphate react together. Write the symbols of the ions present in the compound precipitated in the reaction.

**CBSE 2024**



Copper powder is taken in a china dish and heated over a burner. Name the product formed and state its colour. Write the chemical equation for the reaction involved.

**CBSE 2024**



- (a) “No precipitation reaction can occur without exchange of ions between the two reactants.” Justify this statement giving a balanced chemical equation for the reaction.

**CBSE 2024**

**OR**

- (b) Giving one example of each, differentiate between a displacement reaction and a double displacement reaction.



Select from the following a decomposition reaction in which source of energy for decomposition is light :

**CBSE 2024**

- (a)  $2\text{FeSO}_4 \rightarrow \text{Fe}_2\text{O}_3 + \text{SO}_2 + \text{SO}_3$
- (b)  $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$
- (c)  $2\text{AgBr} \rightarrow 2\text{Ag} + \text{Br}_2$
- (d)  $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$





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The reaction given above is a redox reaction because in this case :

- (a)  $\text{MnO}_2$  is oxidised and  $\text{HCl}$  is reduced. **CBSE 2024**
- (b)  $\text{HCl}$  is oxidised.
- (c)  $\text{MnO}_2$  is reduced.
- (d)  $\text{MnO}_2$  is reduced and  $\text{HCl}$  is oxidised.



Write one chemical equation each for the chemical reaction in which the following have taken place :

**CBSE 2024**

(i) Change in colour

(ii) Change in temperature

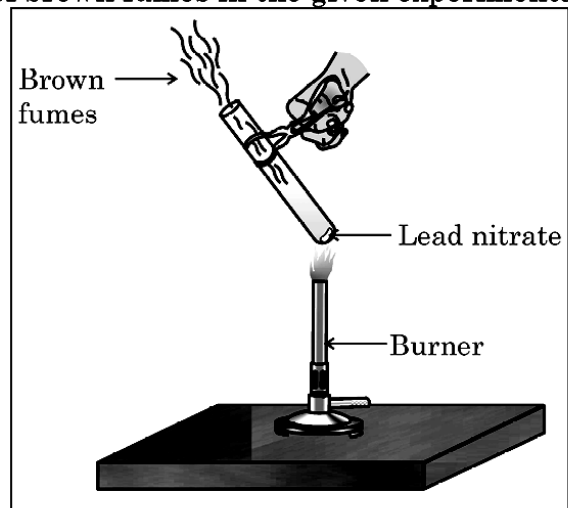
(iii) Formation of precipitate

Mention colour change/temperature change (rise/fall)/compound precipitated along with equation.



The emission of brown fumes in the given experimental set-up is due to

**CBSE 2023**



- (a) thermal decomposition of lead nitrate which produces brown fumes of nitrogen dioxide.
- (b) thermal decomposition of lead nitrate which produces brown fumes of lead oxide.
- (c) oxidation of lead nitrate forming lead oxide and nitrogen dioxide.
- (d) oxidation of lead nitrate forming lead oxide and oxygen.

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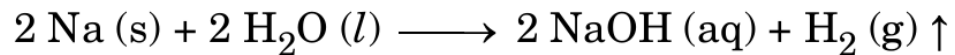
The balanced chemical equation showing reaction between quicklime and water is :

**CBSE 2023**

- (a)  $2 \text{CaO} + \text{H}_2\text{O} \longrightarrow 2 \text{CaOH} + \text{H}_2 + \text{Heat}$
  - (b)  $\text{CaO} + \text{H}_2\text{O} \longrightarrow \text{Ca(OH)}_2 + \text{H}_2 + \text{Heat}$
  - (c)  $\text{CaO} + \text{H}_2\text{O} \longrightarrow \text{Ca(OH)}_2 + \text{Heat}$
  - (d)  $2 \text{CaO} + 3 \text{H}_2\text{O} \longrightarrow 2 \text{Ca(OH)}_3 + \text{O}_2 + \text{Heat}$
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Study the following chemical reaction :

**CBSE 2023**



The reducing agent in this reaction is :

(a) Na

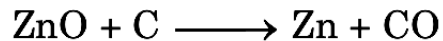
(b) H<sub>2</sub>O

(c) NaOH

(d) H<sub>2</sub>

*Assertion (A)* : In the following reaction

**CBSE 2023**

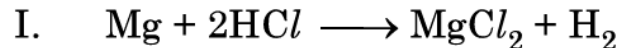


ZnO undergoes reduction.

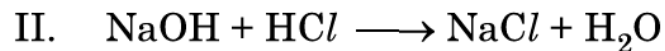
*Reason (R)* : Carbon is a reducing agent that reduces ZnO to Zn.

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
- (b) Both Assertion (A) and Reason (R) are true, but Reason (R) is **not** the correct explanation of the Assertion (A).
- (c) Assertion (A) is true, but Reason (R) is false.
- (d) Assertion (A) is false, but Reason (R) is true.

Consider the following chemical equation I and II



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The correct statement about these equations is –

- (a) 'I' is a displacement reaction and 'II' is a decomposition reaction.
- (b) 'I' is a displacement reaction and 'II' is double displacement reaction.
- (c) Both 'I' and 'II' are displacement reactions.
- (d) Both 'I' and 'II' are double-displacement reactions.



State whether the given chemical reaction is a redox reaction or not.

Justify your answer.

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With the help of an appropriate example, justify that some of the chemical reactions are determined by

**CBSE 2023**

- (a) Change in temperature,
- (b) Evolution of a gas, and
- (c) Change in colour

Give chemical equation for the reaction involved in each case.



In order to balance the above chemical equation, the values of  $x$ ,  $y$  and  $z$  respectively are :

(a) 6, 2, 2

(b) 4, 1, 2

(c) 4, 2, 1

(d) 2, 2, 1

**CBSE 2023**

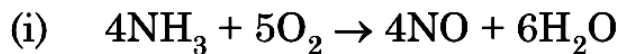




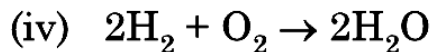
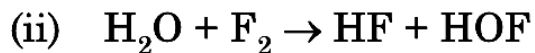
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(a) Identify the reducing agent in the following reactions :

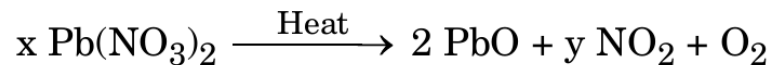


**CBSE 2023**



(b) Define a redox reaction in terms of gain or loss of oxygen.

In order to balance the following chemical equation, the values of the coefficients x and y respectively are : **CBSE 2023**



(a) 2, 4

(b) 2, 2

(c) 2, 3

(d) 4, 2



What is observed when aqueous solutions of potassium iodide and lead nitrate are mixed together ? Name the type of reaction and write the chemical equation for the reaction that occurs. **CBSE 2023**





When copper powder is heated in a watch glass, a black substance is formed.

**CBSE 2023**

- (i) Why is this black substance formed ? Name it.
- (ii) How can this black substance be reversed to its original form ?



Silver chloride kept in a china dish turns grey in sunlight. **CBSE 2023**

- (a) Write the colour of silver chloride when it was kept in the china dish.
- (b) Name the type of chemical reaction taking place and write the chemical equation for the reaction.
- (c) State one use of the reaction. Name one more chemical which can be used for the same purpose.

When aqueous solutions of potassium iodide and lead nitrate are mixed, an insoluble substance separates out. The chemical equation for the reaction involved is :

**CBSE 2023**

- (a)  $\text{KI} + \text{PbNO}_3 \longrightarrow \text{PbI} + \text{KNO}_3$
- (b)  $2\text{KI} + \text{Pb}(\text{NO}_3)_2 \longrightarrow \text{PbI}_2 + 2\text{KNO}_3$
- (c)  $\text{KI} + \text{Pb}(\text{NO}_3)_2 \longrightarrow \text{PbI} + \text{KNO}_3$
- (d)  $\text{KI} + \text{PbNO}_3 \longrightarrow \text{PbI}_2 + \text{KNO}_3$

A metal ribbon 'X' burns in oxygen with a dazzling white flame forming a white ash 'Y'. The correct description of X, Y and the type of reaction is :

- (a)  $X = \text{Ca}$  ;  $Y = \text{CaO}$  ; Type of reaction = Decomposition
- (b)  $X = \text{Mg}$  ;  $Y = \text{MgO}$  ; Type of reaction = Combination
- (c)  $X = \text{Al}$  ;  $Y = \text{Al}_2\text{O}_3$  ; Type of reaction = Thermal decomposition
- (d)  $X = \text{Zn}$  ;  $Y = \text{ZnO}$  ; Type of reaction = Endothermic **CBSE 2023**

**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 (A) and (R) are true and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).
- (c) (A) is true but (R) is false.
- (d) (A) is false but (R) is true.

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*Thank You !*