

# SCIENCE



## TOP 5 QUESTIONS

### • Chemical Reactions and Equations

1. Solid calcium oxide was taken in a container and water was added slowly to it. (CBSE 2013, 2019)
  - (a) Write the observations.
  - (b) Write the chemical formula of the product formed.
2. What change in color is observed when white silver chloride is left exposed to sunlight? State the type of chemical reaction in this change. (CBSE 2014, 2019, 2023)
3. Write the chemical equation of the reaction in which the following changes take place with an example of each. (CBSE 2023, 2015)
  - (a) Change in color
  - (b) Change in temperature
4. In the electrolysis of water, (CBSE 2020, 2013, SP-2018)
  - A. Name of the gases liberated at anode & cathode.
  - B. Why is it that the volume of gas collected on one electrode is two times that on the other electrode?
  - C. What would happen if dilute  $H_2SO_4$  is not added to water?
5. A shining metal 'M' on burning gives a dazzling white flame & changes to a white powder 'N'. (CBSE 2020, 2022)
  - A. Identify 'M' & 'N'.
  - B. Represent the above reaction in the form of a balanced chemical equation.
  - C. Does 'M' undergo oxidation or reduction in this reaction? Justify.

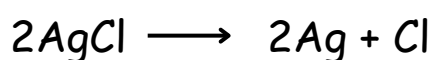
# Solutions

1. (i) Following are the two observations:

- Calcium oxide reacts vigorously with water to form slaked lime.
- The container becomes hot because a large amount of heat is released during this reaction.

(ii) The product formed is slaked lime for which the chemical formula is  $\text{Ca(OH)}_2$ .

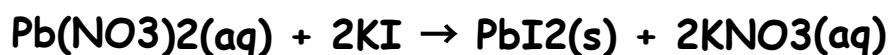
2. When white silver chloride exposed to sunlight it produces black metallic coloured silver along with liberation of chlorine gas



it is photodecomposition reaction.

3. (i) Change in colour:

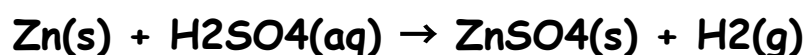
The reaction between lead nitrate solution and potassium iodide solution.



In this reaction colour changes from colourless to yellow.

(ii) Change in temperature:

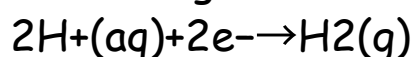
The action of dilute sulphuric acid on zinc.



In this reaction, heat is evolved. <sup>4</sup>

4. (a) At cathode,  $\text{H}_2$  is evolved and at anode  $\text{O}_2$  is evolved.

(b) At cathode,  $\text{H}^+$  ion takes two electron to convert itself into  $\text{H}_2$  gas. 2 moles of  $\text{H}^+$  gives 1 mole of  $\text{H}_2$ .



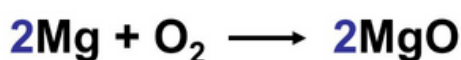
At anode, OH<sup>-</sup> ion releases two electrons to convert into water and O<sub>2</sub>. 2 mole OH<sup>-</sup> gives 0.5 mole O<sub>2</sub>, i.e why volume of one gas collected at one electron is double of another.

c) Acid is added to make the water conduct electricity as the distilled water is a non-conductor of electricity.

### 5. A. Reaction of Magnesium metal:

1. As, it is given that the metal 'M' on burning gives the dazzling white flame and also changes to the white powder 'N'.
2. So, the metal 'M' would be Magnesium metal as on the reaction of burning in the air, Magnesium reacts with the Oxygen present in the air and gives the white powder on burning.
3. This Magnesium metal is basically the chemically active one.
4. Hence, the metal 'M' : Magnesium burns in the presence of Oxygen to form 'N' Magnesium oxide.

B. The balanced chemical equation for the above reaction would be:



### C. Oxidation of Magnesium:

1. Oxidation is basically the loss of electrons or the increase in the oxidation state of an atom, ion or the molecule.
2. So previously when solid Magnesium was present it's oxidation state was 0 as the element Magnesium was present with not any bond.
3. But, as soon as it burns in the presence of Oxygen forming the Magnesium oxide, it will lose two electrons for getting stable
4. So, the Oxidation state of Mg in MgO is +2
5. Hence, Oxidation of Magnesium will take place.