

## CBSE Test Paper-02

### Chapter 01 Chemical Reactions and Equations

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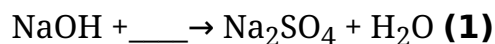
- When zinc metal is dipped in copper sulphate solution **(1)**
  - No reaction takes place
  - The solution remains blue and copper metal gets deposited
  - The solution becomes colourless and reddish brown copper metal gets deposited
  - The solution becomes green and copper metal gets deposited
- Which gases are given out when Lead nitrate is heated? **(1)**
  - $\text{NO}_2, \text{O}_2$
  - $\text{N}_2\text{O}_4, \text{O}_2$
  - $\text{PbO}, \text{O}_2$
  - $\text{NO}, \text{O}_3$
- Find the incorrect statement : **(1)**

(I) Oxygen is highly combustible and hydrogen is supporter of combustion,  
(II) Oxygen and hydrogen both are highly combustible,  
(III) Oxygen and hydrogen both are supporters of combustion,  
(IV) Hydrogen is highly combustible and oxygen is supporter of combustion

  - I, II and III
  - I, III and IV
  - IV, I and II
  - I, II and IV
- Which of the following decolourizes a blue solution of copper sulphate? **(1)**
  - Al
  - Zn
  - Fe
  - (A), (B) and (C)
  - (B) only
  - (A) only
  - (C) only
- The reaction  $\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$  represents: **(1)**

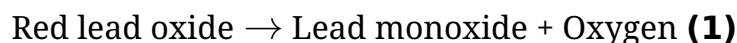
- a. Decomposition
- b. Oxidation
- c. Combination
- d. Reduction

6. Complete and balance the following chemical reaction.



7. Why does the colour of heated copper powder becomes black when air is passed over it? **(1)**

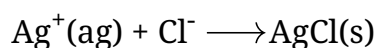
8. Write the formula and then balance the following equation.



9. Define a displacement reaction. **(1)**

10. Two beakers A and B contain Iron (II) sulphate solution. In the beaker A is placed a small piece of copper and in the beaker B is placed a small piece of zinc. It is found that a grey deposit forms on the zinc but not on the copper. What can be concluded from these observations? **(3)**

11. When solutions of silver nitrate and sodium chloride are mixed, white precipitate forms. The ionic equation for the reaction is **(3)**



- i. a. What is the name of the white precipitate?
- b. Is it a soluble or insoluble compound?
- ii. Is the precipitation of silver chloride a redox reaction?

12. Name the method used to balance a chemical equation. **(3)**

13. What is a balanced chemical equation ? Why should chemical equations be balanced ? **(3)**

14. What are the types of combination reactions ? Give example of each type. **(5)**

15. How will you write a chemical equation ? **(5)**

## CBSE Test Paper-02

### Chapter 01 Chemical Reactions and Equations

#### Answers

1. c. The solution becomes colourless and reddish brown copper metal gets deposited

**Explanation:**

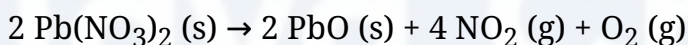
Zn	+	CuSO <sub>4</sub>	→	Cu	+	ZnSO <sub>4</sub>
Gray		blue		reddish brown		colourless

Zinc is more reactive than copper. zinc displace copper from copper sulphate and Copper metal is deposited.

2. a. NO<sub>2</sub>, O<sub>2</sub>

**Explanation:** A decomposition reaction takes place on heating Pb(NO<sub>3</sub>)<sub>2</sub> to form PbO, NO<sub>2</sub> and O<sub>2</sub>.

Lead (II) nitrate → Lead (II) oxide + Nitrogen dioxide + Oxygen



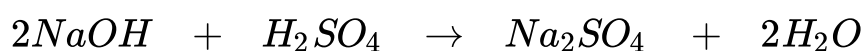
3. a. I, II and III **Explanation:** Only Hydrogen is combustible and Oxygen is a supporter of combustion

4. a. (A), (B) and (C)

**Explanation:** All Zn, Al and Fe are above Cu in the reactivity series so they can displace Cu from CuSO<sub>4</sub> Solution.

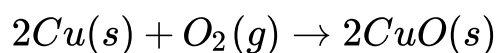
5. c. Combination

**Explanation:** Two reactants combine to give one product.

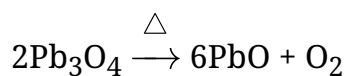


6. Sodium hydroxide      hydrogen sulfate      Salt cake      water

7. When copper powder is heated in the presence of air, a black coating of copper oxide is formed.

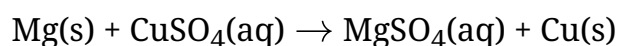


8. Red lead oxide  $\rightarrow$  Lead monoxide + Oxygen



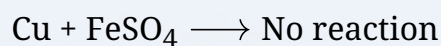
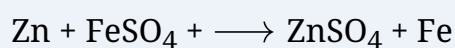
9. Displacement reaction is a chemical reaction in which a more reactive element displaces a less reactive element from its compound. Both metals and non-metals take part in displacement reactions.

Example : Reaction of iron nails with copper sulphate solution.



10. From these observation we can conclude that zinc is most active metal followed by iron and copper.

Copper does not react, but zinc reacts with ferrous sulphate solution. Thus, zinc is most reactive, followed by iron and copper.

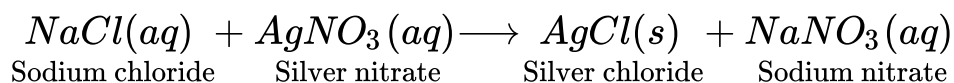


11. In this reaction, cations  $Ag^+$  and  $Na^+$  have exchanged their anions  $NO_3$  and  $Cl^-$  and a precipitate of  $AgCl$  has been formed. It is an example of double displacement and precipitation reactions.

i. a. White precipitate formed is  $AgCl$  (Silver chloride) .

b. It is an insoluble compound.

ii. It is not a redox reaction.



12. There are two methods of balancing chemical equation:

### 1. Hit and Trail Method:

(i) The symbols and formulae of the reactant and products are written as a skeletal equation.

(ii) Any elementary gas ( $O_2$ ,  $H_2$ ,  $N_2$  etc.) appearing on either side of the skeletal equation, is written in the atomic state.

(iii) The formula containing the maximum number of atoms is selected to begin the process of balancing. If this method is not convenient, then balancing of the atoms begin with atoms, which appear minimum number of times.

(iv) Atoms of elementary gases are balanced at the last.

(v) When the balancing is complete, the equation is converted to the molecular form.

2. **Partial equation method:** When equations contain many reactants and products they cannot be balanced by the hit and trial method. They are then balanced by the partial equation method. In this method the overall reaction is assumed to take place through two or more simpler reactions, which can be represented by partial equations. The steps involved are:

(i) The given chemical equation is split into two or more partial equations.

(ii) Each partial equation is separately balanced by the hit and trial method.

(iii) These balanced partial equations are multiplied with suitable coefficients in order to exactly cancel out those common substances which do not appear in the overall chemical equations.

(iv) The balanced partial equations so obtained, are added to arrive at the balanced chemical equation.

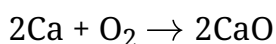
13. 1. A chemical equation in which the number of atoms of different elements on the reactants side (left side) are same as those on product side (right side) is called a balanced chemical equation.  $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2 \uparrow$
2. All the chemical equations must balance, because atoms are neither created nor destroyed in chemical reactions.
3. The number of atoms of each element before and after reaction must be the same.
4. According to the law of conservation of mass, the total mass of the substances that are taking part in a chemical reaction must be the same before and after the reaction.

14. **Combination reactions:** A combination reaction is one in which two or more reactants combine to form a single product. Combination reactions are again of three types.

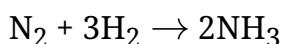
## Types of Combination reactions:

- i. Combination reactions between elements.
- ii. Combination reactions between compounds.
- iii. Combination reactions between elements and compounds.
- iv. **Combination reactions between elements:** In these reactions elements were combined to form a product.

Examples : Formation of calcium oxide by the combination elements calcium and oxygen.

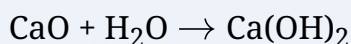


Formation of ammonia by the combination of elements nitrogen and hydrogen.



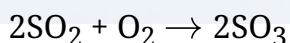
- v. **Combination reactions between compounds:** In these reactions compounds were combined to form product.

Example: Reaction of calcium oxide in water to form calcium hydroxide



- vi. **Combination reactions between elements and compounds:** In these reactions elements and compounds combined to form product.

Example: Formation of sulphur trioxide by the combination of sulphur dioxide and oxygen.



15. 1. A chemical equation is written in the following steps :
2. The symbols and formulae of the reactants are written on the left hand side.
  3. These are separated by plus (+) sign which means react with.
  4. The symbols and formulae of the products are written on the right hand side.
  5. These are also separated by plus (+) sign which means also or alongwith.
  6. The reactants and products are separated by arrow pointing towards products ( $\rightarrow$ ) which means to produce. For example

