

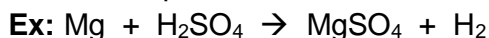
## 02. CHEMICAL REACTIONS AND EQUATIONS

### Questions and Answers

#### 1. What is a balanced chemical equation?

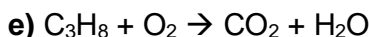
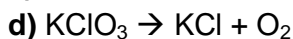
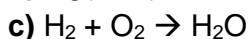
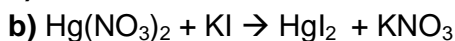
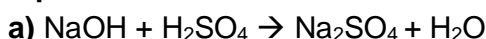
**Why should chemical equations be balanced?**

**A.** When the total number of atoms of each element is same on both sides in a chemical equation, then the chemical equation is said to be a balanced chemical equation.

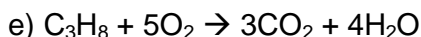
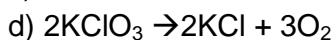
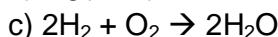
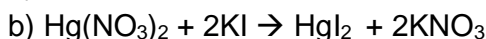
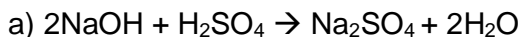


The chemical equation should be balanced to show that it can follow the law of conservation of mass.

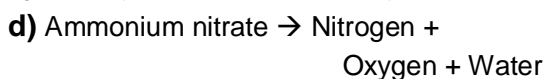
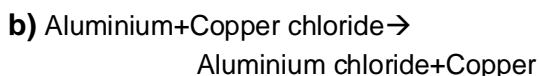
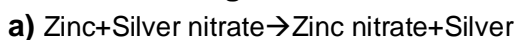
#### 2. Balance the following chemical equations?



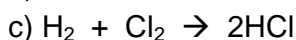
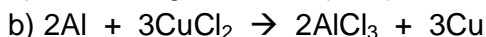
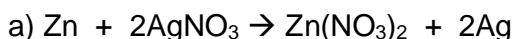
#### **A. The balanced chemical equations are:**



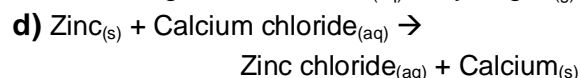
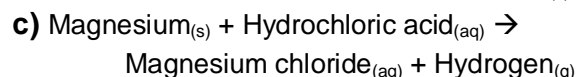
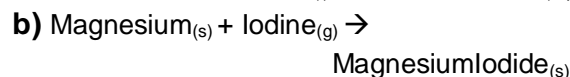
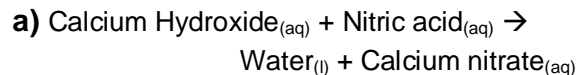
#### 3. Write the balanced chemical equations for the following reactions.



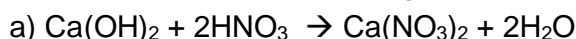
#### **A. The balanced chemical equations are:**



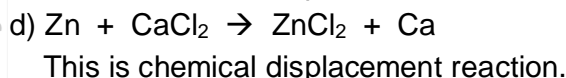
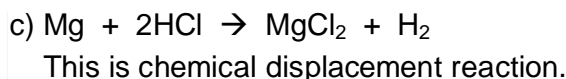
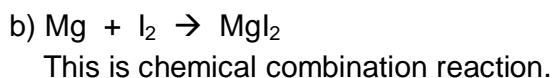
#### 4. Write the balanced chemical equations for the following and. Identify the type of reaction in each case.



#### **A. The balanced chemical equations are:**

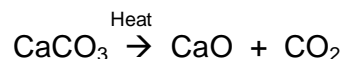


This is chemical double displacement reaction.



#### 5. Write an equation for decomposition reaction where energy is supplied in the form of Heat/light/electricity.

**A. (i)** The decomposition reaction where energy is supplied in the form of Heat is called thermal decomposition reaction.



**(ii)** The decomposition reaction where energy is supplied in the form of light is

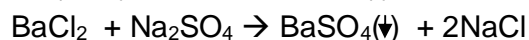
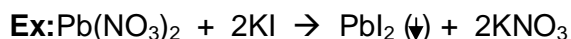


**(iii)** The decomposition reaction where energy is supplied in the form of electricity is



#### 6. What do you mean by precipitate reaction?

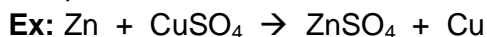
**A.** If a precipitate is formed in a chemical reaction, it is called precipitate reaction. Precipitates are indicated with downward arrow mark in the reactions.



7. How chemical displacement reactions differ chemical decomposition reaction? Explain with an example for each.

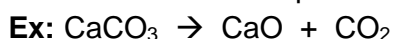
**A. Chemical displacement reaction:**

In a displacement reaction one element replaces another element from its compound.



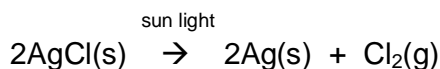
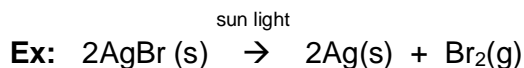
**Chemical decomposition reaction:**

In a decomposition reaction one substance (reactant) decomposes into two or more new compounds.



8. Name the reactions taking place in the presence of sunlight?

A. The reactions occur in the presence of sunlight is called photo chemical reactions.



9. Why does respiration considered as an exothermic reaction? Explain.

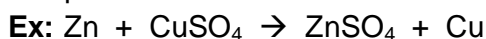
A. In respiration oxidation of glucose takes place which produce a large amount of heat energy. This is known as exothermic reaction. So respiration is considered as an exothermic reaction.



10. What is the difference between displacement and double displacement reactions? Write equations for these reactions?

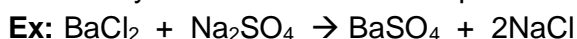
**A. Chemical displacement reaction:**

In a displacement reaction one element replaces another element from its compound.



**Chemical double displacement reaction:**

In a double displacement reaction the reactants exchange their constituents chemically and form two new compounds.



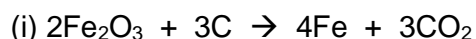
11.  $\text{MnO}_2 + 4 \text{HCl} \rightarrow \text{MnCl}_2 + 2 \text{H}_2\text{O} + \text{Cl}_2$   
In the above equation, name the compound which is oxidized and which is reduced?



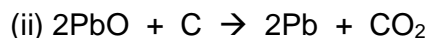
In this reaction Cl is oxidized and Mn is reduced.

12. Give two examples for oxidation – reduction reaction.

**A. Examples for oxidation – reduction reaction:**



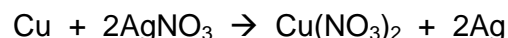
In this reaction  $\text{Fe}_2\text{O}_3$  is reduced and C is oxidized.



In this reaction PbO is reduced and C is oxidized.

13. In the refining of silver, the recovery of silver from silver nitrate solution involved displacement by copper metal. Write the reaction involved?

A. **Refining of silver:** Copper metal reacts with silver nitrate aqueous solution and form copper nitrate aqueous solution and silver metal. In this reaction copper occupies the place of silver by displace it from silver nitrate. So this is a chemical displacement reaction.



14. What do you mean by corrosion? How can you prevent it?

A. When some metals are exposed to moisture, acids, etc., they tarnish due to the formation of respective metal oxide on their surface. This process is called corrosion.

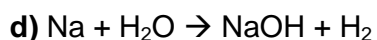
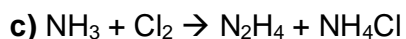
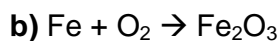
Corrosion can be prevented by shielding the metal surface, painting, oiling, greasing, galvanizing, chrome plating or making alloys.

### 15. Explain rancidity?

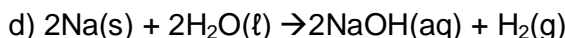
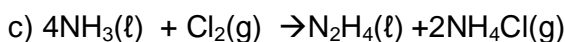
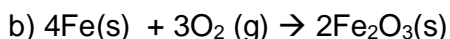
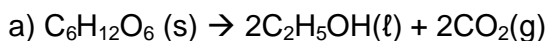
A. Rancidity is an oxidation reaction. When fats and oils are oxidized they become rancid. Their smell and taste changes. Oxidation reactions in food material that were left for a long period are responsible for spoiling of food.

Rancidity can be prevented by adding preservatives like vitamin C and vitamin E and also anti oxidants.

### 16. Balance the following chemical equations including the physical states.



### A. The balanced chemical equations are:



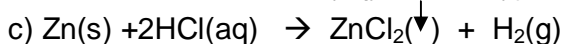
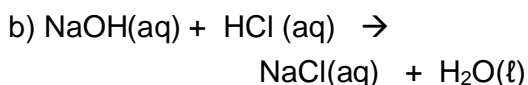
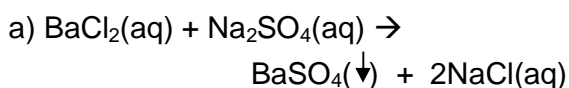
### 17. Balance the chemical equation by including the physical state of the substances for the following reactions.

a) Barium chloride and Sodium sulphate aqueous solutions react to give insoluble Barium sulphate and aqueous solution of Solution of sodium chloride.

b) Sodium hydroxide reacts with Hydrochloric acid to produce Sodium chloride and water.

c) Zinc pieces react with dilute hydrochloric acid to liberate hydrogen gas and forms Zinc chloride.

### A. The balanced chemical equations are:



### 18. A shiny brown coloured element 'X' on heating in air becomes black in colour. Can you predict the Element 'X' and the black coloured substance formed? How do you support your predictions?

A. Brown coloured element 'X' is copper. The black coloured substance is copper oxide. When brown colour copper (Cu) is heated it reacts with oxygen and forms black colour copper oxide (CuO).



### 19. Why do we apply paint on iron articles?

A. Iron articles when exposed to moist air, corrosion will take place. To prevent iron from corrosion, it is better to apply paint on them. The painting helps to slow down the oxidation process.

### 20. What is the use of keeping food in air tight containers?

A. Keeping food in air tight containers helps to slow down the oxidation process. If food items are kept in air tight bags, then the item does not react with oxygen. So they do not spoil.

### \* ADDITIONAL QUESTIONS \*

21. Give two examples for the reactions in which hydrogen gas is evolved?

22. Define chemical combination. Give one example.

23. What happens when an iron nail is put into copper sulphate solution?

24. How much Ammonium chloride is formed when 34g of Ammonia reacts with Hydrochloric acid?

25. Write the differences between exothermic and endothermic reactions.

26. What changes occur during a chemical change?

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