

CBSE Test Paper-01
Chapter 01 Chemical Reactions and Equations

1. Match the following with correct response. (1)

(1) Combination reaction	(A) $ZnO + C \rightarrow Zn + CO$
(2) Decomposition reaction	(B) $\rightarrow + O_2$
(3) Displacement reaction	(C) $2Mg + O_2 \rightarrow 2MgO$
(4) Redox reaction	(D) $Fe + CuSO_4 \rightarrow FeSO_4 + Cu$

- a. 1-D, 2-A, 3-C, 4-B
- b. 1-C, 2-B, 3-D, 4-A
- c. 1-B, 2-D, 3-A, 4-C
- d. 1-A, 2-C, 3-B, 4-D

2. The chemical formula of lead sulphate is (1)

- a. Pb_2SO_4
- b. $PbSO_4$
- c. $Pb_2(SO_4)_3$
- d. $Pb(SO_4)_2$

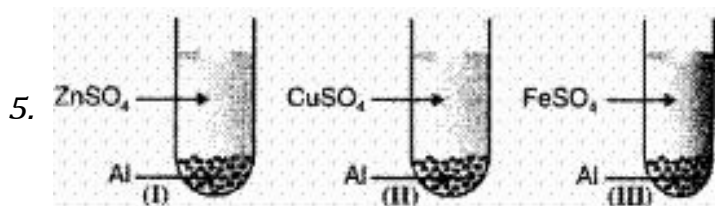
3. The colour of zinc metal is (1)

- a. Reddish brown
- b. silvery
- c. white
- d. Grey

4. When you place an iron nail in copper sulphate solution, the reddish brown coating formed on the nail is (1)

- a. smooth and shiny
- b. rough and granule
- c. soft and dull

d. hard and flaky



Observation	I	II	III
Solution after reaction	Colourless	Colourless	Colourless
Metal Deposited	Zn	Cu	Fe

Which of the following is correct conclusion? (1)

- Al is more reactive than Cu and Fe but less reactive than Zn
- Al is more reactive than Cu but less reactive than Zn and Fe
- Al is more reactive than Zn and Cu but less reactive than Fe
- Al is more reactive than Zn, Cu, Fe

6. Oil and fat containing food items are flushed with nitrogen. Why? (1)

7. What happens when copper powder is heated? (1)

8. What is the principle of balancing of chemical equation? (1)

9. Why are food items packed in aluminium foils? (1)

10. Predict whether gold can displace copper from copper sulphate solution. (3)

11. What does one mean by exothermic and endothermic reactions? Give examples. (3)

12. What are double displacement reaction? (3)

13. In the reaction $PbS(s) + 4H_2O_2(aq) \rightarrow PbSO_4(s) + 4H_2O(l)$, which is oxidizing agent and which is reducing agent? (3)

14. Write the formula and then balance the following equations. (5)

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- a. *Butane (C_4H_{10}) + Oxygen \rightarrow Carbon dioxide + Water*
 - b. *Magnesium + Silver nitrate \rightarrow Magnesium nitrate + Silver*
 - c. *Lime water + Carbon dioxide \rightarrow Calcium carbonate + Water*
 - d. *Sodium + Water \rightarrow Sodium hydroxide + Hydrogen*
 - e. *Calcium carbonate + Water + Carbon dioxide \rightarrow Calcium bicarbonate*

15. *There are different types of chemical reactions occurring around us or being carried out for the benefit of mankind, e.g. combination reactions, decomposition reactions, displacement reactions, precipitation reactions, reduction-oxidation (redox) reactions, photochemical reactions etc.*

Now answer the following questions: (5)

- i. *Combustion of coke is a combination reaction. CO_2 is not a pollutant. Then why is combustion of coke harmful?*
- ii. *Which reaction followed by two combination reactions are involved in white wash of walls?*
- iii. *Give one use of tin plating in daily life.*
- iv. *How photochemical reactions have played an important role in photography?*

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Answers

1. b. 1-C, 2-B, 3-D, 4-A

Explanation: 2 or more joining together to form single product is combination
Breaking of single reactant into 2 or more is decomposition
Both oxidation and reduction occurring simultaneously is redox reaction
More reactive metal displacing less reactive metal from its salt displacement reaction

2. b. $PbSO_4$

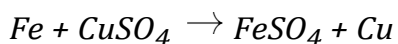
Explanation: $PbSO_4$

3. d. Grey

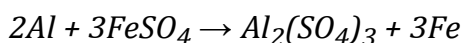
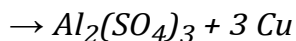
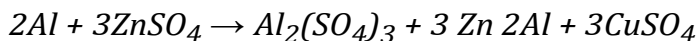
Explanation: It is whitish or bluish grey in colour.

4. c. soft and dull

Explanation: When you dip an iron nail in $CuSO_4$, iron replaces copper from $CuSO_4$, since it is more reactive than copper. The displaced copper gets deposited on the nail, which is soft and dull in nature.



5. d. Al is more reactive than Zn, Cu, Fe **Explanation:**



Al is more reactive than Zn, Cu and Fe because it displaces them from their salt solution.

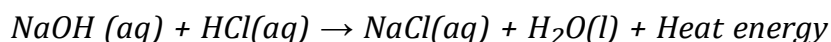
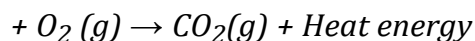
6. In the presence of oxygen in the air, the fats present in the fatty food are oxidised to compounds which have a bad smell i.e. the food becomes rancid. Flushing with nitrogen cuts off the contact of food with oxygen and protects the food from rancidity.

7. *Copper is oxidised to copper oxide. It means addition of oxygen. Oxygen is reduced to copper oxide. It means addition of metal i.e reduction. So, balanced chemical equation is: $2\text{Cu} + \text{O}_2 \rightarrow 2\text{CuO}$ A black colour copper (II) oxide is formed.*
8. *Chemical reactions follow the law of conservation of mass, meaning that the total mass of the reactants has to be equal to the total mass of the products. The number of each type of atom must also be conserved from reactants to products. Atoms cannot be created or destroyed, so if the equation cannot be balanced, there must be another reactant or product involved. Uncovering these missing materials can shed light on how the reactions take place, how to get a better yield of the products, or what waste products may be generated.*
9. *A protective coating of aluminium oxide (Al_2O_3) is formed on the surface of the foil which prevents it from getting corroded in the presence of air and water. Hence, food items are saved from getting spoilt when packed in aluminium foils.*
10. *Gold lies below copper in the activity series. This means that gold cannot displace copper from copper sulphate solution.*

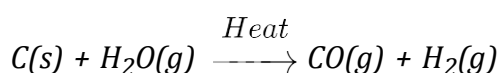
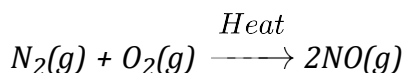
K	Potassium	
Na	Sodium	
Ca	Calcium	
Mg	Magnesium	
Al	Aluminium	
C	Carbon	
Zn	Zinc	
Fe	Iron	
Sn	Tin	
Pb	Lead	
H	Hydrogen	
Cu	Copper	
Ag	Silver	
Au	Gold	
Pt	Platinum	
C H added for comparison		
Reactivity Series of Metals		

11. **Exothermic reaction:** *A chemical reaction in which heat is given out is known as*

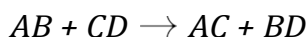
exothermic reaction. For example $C(s)$



Endothermic reaction: A chemical reaction in which heat energy is absorbed is known as endothermic reaction. For example

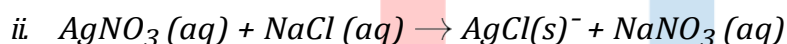
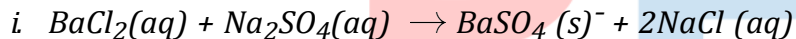


12. Reactions in which ions are exchanged between two reactants forming new compounds are called double displacement reactions.



These are the reactions in which two different atoms or groups of atoms are displaced by another atoms/groups of atoms.

Example :



Such reactions usually occur in ionic compound and are very fast reactions.

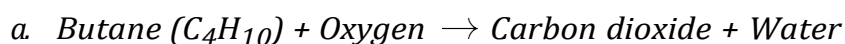
13. **Oxidation** - involves the loss of electrons or hydrogen OR gain of oxygen OR increase in oxidation state.

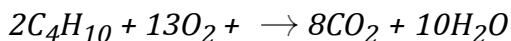
Reduction - involves the gain of electrons or hydrogen OR loss of oxygen OR decrease in oxidation state.

In the reaction $PbS(s) + 4H_2O_2(aq) \rightarrow PbSO_4(s) + 4H_2O(l)$, Our reactant is PbS , it takes up oxygen from H_2O_2 and changes to $PbSO_4$. It has undergone oxidation, or it has been oxidized.

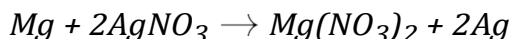
H_2O_2 has lost oxygen and has changed to water, H_2O . so it has been reduced.

14. The formula and balanced equations are:

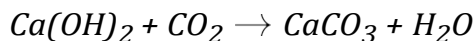




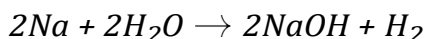
b. Magnesium + Silver nitrate \rightarrow Magnesium nitrate + Silver



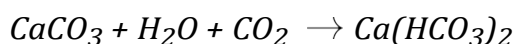
c. Lime water + Carbon dioxide \rightarrow Calcium carbonate + Water



d. Sodium + Water \rightarrow Sodium hydroxide + Hydrogen

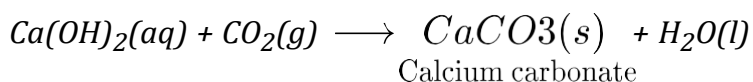
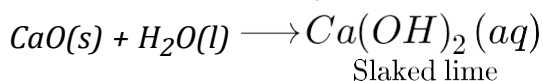
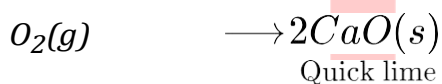


e. Calcium carbonate + Water + Carbon dioxide \rightarrow Calcium bicarbonate



15. i. CO_2 is not considered a pollutant up to a certain level. Rather, it helps in maintaining the temperature of the Earth. Combustion of coke is harmful as it increases the concentration of CO_2 in the atmosphere which causes global warming due to the greenhouse effect.

ii. The reaction of calcium with oxygen gives quicklime (CaO) which when mixed with water forms slaked lime $Ca(OH)_2$ [combination reaction] and when slaked lime is applied on walls then it reacts with CO_2 of the air to form $CaCO_3$.



iii. Tin-plating is preferred in the tiffin boxes because tin is non-poisonous and hence, does not contaminate the food kept in them.

iv. A photographic film used in black and white photography is a celluloid film coated with silver chloride. The silver chloride decomposes in the presence of sunlight and its working is totally based on this decomposition reaction giving silver which forms the image on the film.

