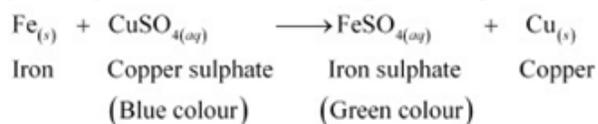


Class: X  
Subject: Chemistry  
Topic: Chemical reactions and equations  
No. of Questions: 20

Q1. Why does the colour of copper sulphate solution change when an iron nail is dipped in it?

Ans. When an iron nail is placed in a copper sulphate solution, iron displaces copper from copper sulphate solution forming iron sulphate, which is green in colour.



Q2. In the equations given below, state giving reasons, whether substances have been oxidised or reduced. (i)  $\text{PbO} + \text{CO} \rightarrow \text{Pb} + \text{CO}_2$  (ii)  $\text{H}_2\text{S} + \text{Cl}_2 \rightarrow 2\text{HCl} + \text{S}$ .

Ans. (i) Carbon monoxide is oxidised as it gains oxygen.  
(ii) Chlorine is reduced as it gains hydrogen.

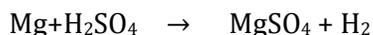
Q3. The oxidation reaction which produces heat and light is

- A. Endothermic
- B. Photochemical
- C. Combustion
- D. Exothermic

Ans. C

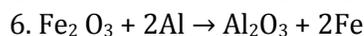
Q4. Define displacement

Ans. A reaction in which an atom or group of atoms present in a molecule is displaced by another atom is known as displacement reaction. For example,



Q5. Why is photosynthesis considered as an endothermic reaction?

Ans. Photosynthesis is an endothermic reaction. This is because light energy in the form of sun light is absorbed during the process of photosynthesis by green plants.



Q6. The above reaction is an example of a

- A. Combination reaction
- B. Double displacement reaction
- C. Decomposition reaction
- D. Displacement reaction

Ans. D The given reaction is an example of a displacement reaction.

Q7. What are the characteristics of chemical reactions?

- Ans.
- 1. Evolution of a gas
  - 2. Formation of a precipitate
  - 3. Change the colour
  - 4. Change in temperature
  - 5. Change in state.

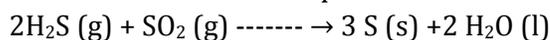
Q8. To balance a chemical equation, can we change the formulae of either reactants or Products

Ans. No, we cannot change the chemical formulae of reactants or products to balance a chemical reaction.

Q9. What is the ratio of number of moles of reactants to the number of moles of products in the equation.



Ans. The balanced chemical equation is



Total number of moles of reactants = 2 + 1 = 3

Total number of moles of products = 3 + 2 = 5

∴ ratio of moles of reactant to the number of moles of product is 3 : 5.

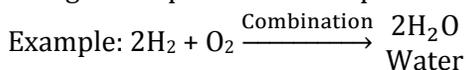
Q10. The conversion of  $K_2Cr_2O_7$  into  $Cr_2(SO_4)_3$  is a process of

- A. Oxidation
- B. Reduction
- C. Decomposition
- D. Substitution

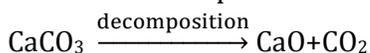
Ans. B

Q11. Why are decomposition reactions called the opposite of combination reactions? Write equations for these reactions.

Ans. In combination reaction two or more substances (elements or compounds) combine to form a single new product or compound.



These reactions in which a compound splits up into two or more simpler substances are known as decomposition reaction, Example,



Thus it is clear that decomposition and combination reactions are opposite from each other.

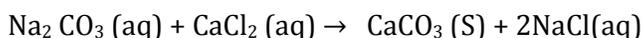
Q12. Amino acid is formed by decomposition of which component of our diet?

- A. Carbohydrate
- B. Starch
- C. Protein
- D. Fat

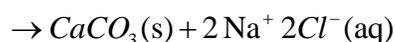
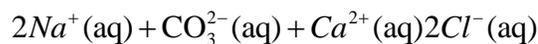
Ans. C

Q13. A solution of  $Na_2CO_3$  is mixed with a solution of  $CaCl_2$ . Predict what happens.

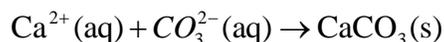
Ans. The four ions involved are  $Na^+$ ,  $CO_3^{2-}$ ,  $Ca^{2+}$  and  $Cl^-$ . The combinations of the  $Na^+$  and  $Cl^-$  and the  $Ca^{2+}$  and  $CO_3^{2-}$  produce the compounds  $NaCl$  and  $CaCO_3$ . If both of these compounds are soluble, no reaction occurs. In this case, however,  $CaCO_3$  is insoluble. Thus a reaction occurs that we can illustrate with balanced reaction in molecular form.



The equation written in total ionic form is



The net ionic equation will be



Q14. The oxidation of iron to rust is a problem, but the oxidation of aluminium to aluminium oxide is not why?

Ans. Iron oxidizes in presence of atmospheric oxygen and water to form iron oxide tri-hydrate ( $\text{Fe}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$ ), known as rust. It peels off exposing fresh iron surface for further rusting. While, aluminium oxidized in presence of atmospheric oxygen to form a thin, transparent and non water-soluble layer of aluminium oxide ( $\text{Al}_2\text{O}_3$ ), which shield the metal from further oxidation and maintains its metallic shine. Hence, the oxidation of iron to rust is a problem for structural engineers but the oxidation of aluminium oxide is not.

Q15. Can rancidity be retarded by storing foods away from light?

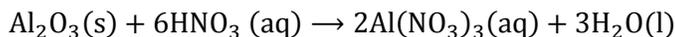
Ans. In the absence of light, the oxidation of fats and oils present in food is slowed down and hence the development of rancidity is retarded.

Q16. What are the different ways can make more informative about the chemical equation?

Ans. 1. By indicating the "physical states" of the reactants and products.  
2. By indicating the "heat changes" taking place in the reaction.  
3. By indicating the "conditions" under which the reaction takes place.

Q17. (a) Would you expect aluminium oxide to be a solid, liquid, or gas at room temperature?  
(b) write the balanced chemical equation for the reaction of aluminium oxide with nitric acid.

Ans. (a) Because aluminium oxide is the oxide of a metal, we would expect it to be an ionic solid. indeed it is, and has a very high melting point,  $2072^\circ\text{C}$ .  
(b) In its compounds, aluminium has a 3 + charge,  $\text{Al}^{3+}$ , the oxide ion is  $\text{O}^{2-}$ , Consequently, the formula of aluminium oxide is  $\text{Al}_2\text{O}_3$ . Metal oxides tend to be basic and therefore to react with acids to form salts and water. In this case the salt formed is aluminium nitrate,  $\text{Al}(\text{NO}_3)_3$ . The balanced chemical equation is



- Q18. Loss of electrons is called\_\_\_\_\_
- A. Reduction
  - B. Oxidation
  - C. Can be oxidation or reduction
  - D. None of these

Ans. B

- Q19. What is the difference between displacement and double displacement reactions? Write equation for these reactions.

Ans. In displacement reaction , more reactive metal can displace less reactive metal from its salt  
 $\text{Zn}(\text{s}) + \text{CaCl}_2(\text{aq}) \rightarrow \text{ZnCl}_2(\text{aq}) + \text{Cu}(\text{s})$   
In double displacement reaction, two compounds exchange their ions to form two new compounds e.g.,  
 $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$

- Q20. A shiny brown coloured element 'X' on heating in air becomes black in Colour. Name the element 'X' and the black coloured compound formed.

Ans. X is copper.

Copper gets oxidised to copper oxide which is black in colour.

