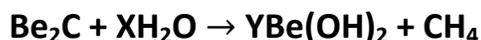




SCIENCE CLASS X

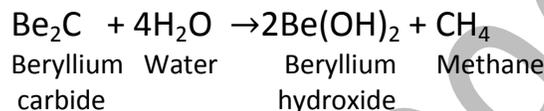
CHAPTER-1 CHEMICAL REACTIONS AND EQUATIONS

Q.1. In the reaction



Write the values of X and Y.

Ans. On balancing the given equation



Hence, X = 4 and Y = 2

Q.2. The carbonate of metal X is a white solid. It decomposes when heated to form carbon dioxide and a yellow solid oxide. What is metal X.

Ans. Metal X is lead carbonate (PbCO_3).



Q.3. Which type of glasses can be used for storage of fresh sample of an oil for a long time?

Ans. Helium (He) and nitrogen (N_2) can be used because both are unreactive gases hence prevent oxidation of oil and also its rancidity.

Q.4. Is burning of a candle wax a physical change or a chemical change?



Ans. Burning of a candle wax is a chemical change because candle wax is a hydrocarbon which burns to produce carbon dioxide.

Q.5. Write difference between a physical change and a chemical change ?

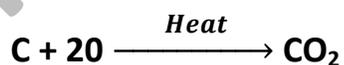
Ans. The differences between a physical change and a chemical change are

S.No.	Physical change	Chemical change
(i)	No new chemical substance is formed.	A new chemical substance is formed.
(ii)	The change is reversible.	The change is normally difficult to reverse.
(iii)	Its examples are melting, freezing, evaporation, condensation, boiling, sublimation, dissolving and expansion.	Its examples are combustion, oxidation, chemical decomposition and chemical combination.

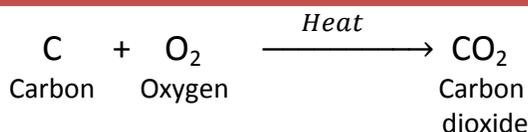
Q.6. Which one is a chemical change-melting of iron or rusting of iron?

Ans. Rusting of iron is a chemical change because this reaction cannot be reversed.

Q.7. What is incorrect in the following equation ?



Ans. It is incorrect to write oxygen as 2O. It should be written as O₂

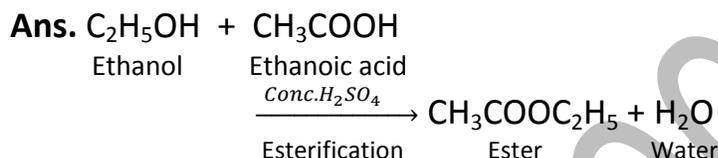


Q.8. Give one use of quick lime.

Ans. Quick lime (CaO) is used in the manufacture of cement.

Q.9. Write a balanced chemical equation for the following reaction

Ethanol is warmed with ethanoic acid to form ethyl acetate in the presence of concentrated H₂SO₄.

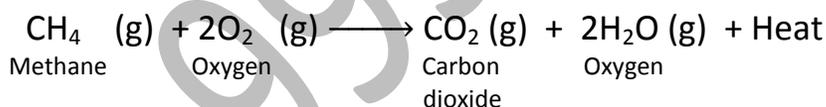


The reaction is double displacement type.

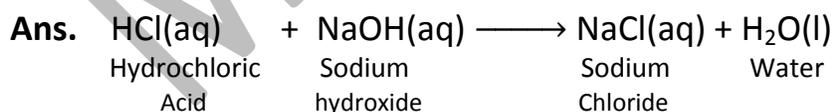
Q.10. Give an example of exothermic reaction.

Ans. Examples of exothermic reaction is burning of natural gas.

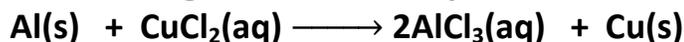
The reaction involved is



Q.11. Give an example of double displacement reaction. (Write a balanced equation only).



Q.12. Balance the given chemical equation.





Chemical equations with two different kinds of arrows (\uparrow and \downarrow) along with product. What do these two different arrows indicate?

Ans. (\uparrow) indicates the gaseous state.

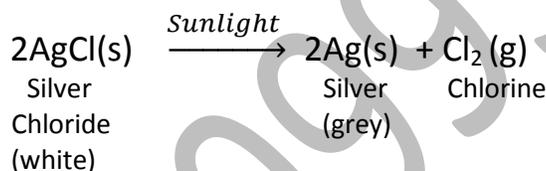
(\downarrow) indicates the solid state or precipitate.

Q.18. A brown substance X on heating in air forms a substance Y. When hydrogen gas is passed over heated Y it again changes back into X.

Ans. The substance X is copper and Y is copper (II) oxide or CuO.

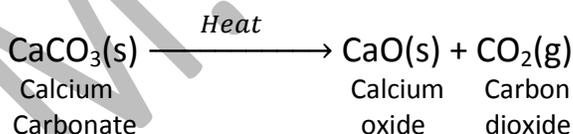
Q.19. What change in colour is observed when white silver chloride is left exposed in sunlight? State the type of chemical reaction in this change.

Ans. The colour of silver chloride changes from white to grey. The reaction is an example of photochemical decomposition.



Q.20. State the chemical change that takes place when lime stone is heated.

Ans. Calcium carbonate (limestone) decomposes on heating to give calcium oxide and carbon dioxide.



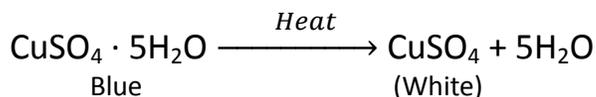
Q.21. Write balanced chemical equation for the following

Phosphorus burns in oxygen to give phosphorus pentoxide

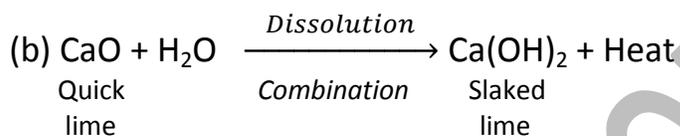


Ans. The two reactions given below justify that chemical reactions are also determined by change in colour and change in temperature.

(a) Heating of copper sulphate crystals



i.e., colour changes



i.e., temperature increases.

Q.25. Aluminium is a reactive metal but is still used for packing food articles.

Why?

Ans. Aluminium is quite reactive when it is kept in air or oxygen for sometime, it is converted into its oxide called aluminium oxide (Al_2O_3). This gets deposited as the surface of the metal as a thin coating .

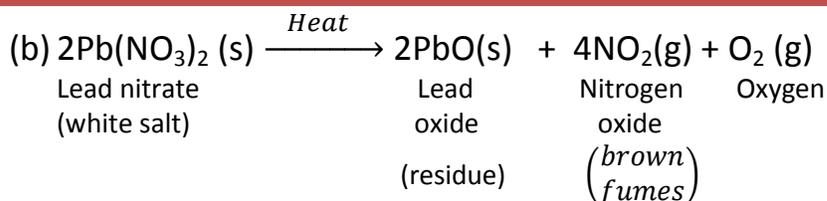
This aluminium oxide is passive which means that it is not reactive. Therefore, this metal is used for packing food articles which do not get spoiled in the foil.

Q.26. A white salt on heating decomposes to give brown fumes and residue is left behind,

(a) Name the salt.

(b) Write the equation for the decomposition reaction.

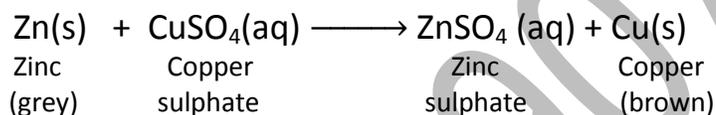
Ans. (a) Lead nitrate



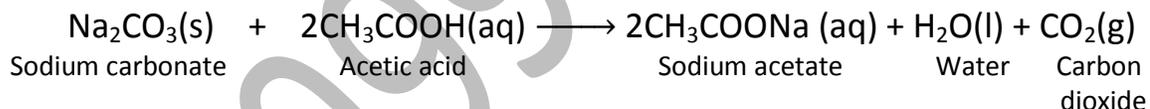
Q.27. Write any two observations in an activity which may suggest that a chemical reaction has taken place. Give an example in support of your answer.

Ans. Two observation are

(i) Change in colour of the reaction mixture



(ii) Evolution of a gas



CO₂ is produced and it is observed in the form of effervescence in the reaction mixture.

Q.28. When the powder of a common metal is heated in an open China dish, its color turns black. However, when hydrogen is passed over the hot black substance so formed, it regains its original colour.

Based on the given information, answer the following questions

(a) What type of chemical reaction takes place in each of the two given steps?

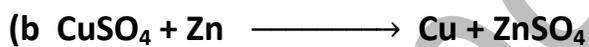
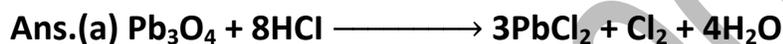


Q.30. Which among the following changes are exothermic or endothermic in nature?

- (a) Decomposition of ferrous sulphate.
- (b) Dilution of sulphuric acid.
- (c) Dissolution of sodium hydroxide in water.
- (d) Dissolution of ammonium chloride in water.

Ans. (a) Endothermic (b) Exothermic
(c) Exothermic (d) Endothermic

Q.30. Identify the oxidising agents (oxidants) in the following reactions



Ans. (a) Pb_3O_4 (b) CuSO_4

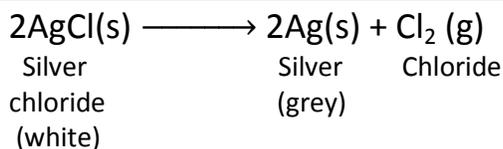
Q.31. Why do fire flies glow at night?

Ans. Fire flies have a special kind of substance i.e., luciferin that undergoes oxidation (in the presence of air) in the presence of an enzyme. This reaction is accompanied by emission of light. Therefore, fire flies glow at night.

Q.32. Why do we store silver chloride in dark coloured bottles?

Ans. Dark coloured bottles interrupt the path of light such that light cannot reach silver chloride in the bottles and its decomposition is prevented. It is known that silver chloride decomposes to silver and chloride in the presence of light.

This is shown in the reaction given below

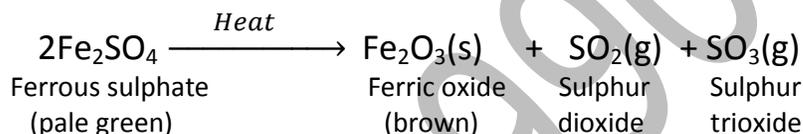


Q.33. Bhawna took a pale green substance A in a test tube and heated it over the flame of a burner. A brown coloured residue B was formed alongwith the evolution of two gases with burning smell of sulphur. Identify A and B. Write the chemical reaction involved.

Ans. Substance A is ferrous sulphate FeSO_4

Substance B is ferric oxide Fe_2O_3

The reaction involved is



Q.34. A silver article generally turn black when kept in the open for a few days.

The article when rubbed with toothpaste again starts shining.

(a) Why do they turn black? Name the phenomenon involved.

(b) Name the black substance formed and write its formula.

Ans. (a) Silver article reacts with sulphur compounds such as H_2S present in air.

The phenomenon is called corrosion. For silver particularly, it is called tarnishing of silver.

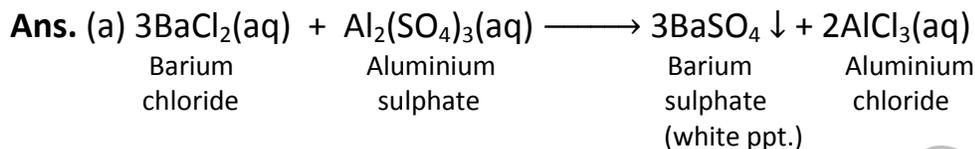
(b) The black substance is silver sulphide (Ag_2S).

Q.35. 'Barium chloride reacts with aluminium sulphate to give aluminium chloride and a precipitate of barium sulphate'.



(a) Translate the above statement into a chemical equation.

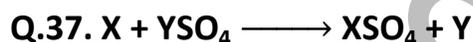
(b) State two types in which this reaction can be classified.



(b) Double displacement and precipitation

Q.36. Combustion of some fuels cause environmental pollution as well as acid rain. This effect is due to the presence of some elements. Name these elements.

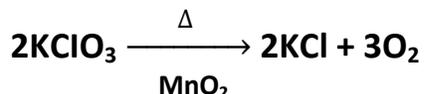
Ans. These elements are nitrogen and sulphur (N and S). Fuels containing elements like sulphur and nitrogen when burnt in air, cause pollution and acid rain both, because oxides of sulphur and nitrogen are acidic in nature and dissolve in water to produce strong acids H_2SO_4 , HNO_3 , etc.



In the above two reactions elements X or Y. Which is more reactive and Why?

Ans. X is more reactive than Y since it has displaced Y in the displacement reaction.

Q.38. In the reaction



What do the symbol Δ and MnO_2 signify?

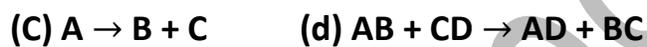
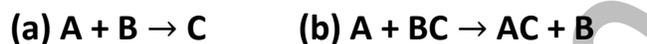


Ans. The symbol Δ signifies that the reaction takes place on heating whereas MnO_2 represents the catalyst present to speed up the reaction.

Q.39. What is the colour of ferrous sulphate crystals? How does this colour change after heating?

Ans. The colour of ferrous sulphate crystals is green. On heating ferrous sulphate ($\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$) first decomposes to form anhydrous ferrous sulphate (FeSO_4) which is white in colour.

Q.40. What type of chemical reactions are represented by the following equations?



Ans. (a) Combination reaction
(b) Displacement reaction
(c) Decomposition reaction
(d) Double displacement reaction

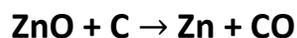
Q.41. Why is photosynthesis considered an endothermic reaction?

Ans. photosynthesis is considered an endothermic reaction because energy in the form of sunlight is absorbed by the green plants.

Q.42. What is an oxidation reaction? Identify in the following reaction

(a) the substance oxidized.

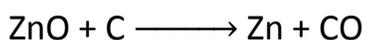
(b) the substance reduced.





Ans. Oxidation involves the addition of oxygen or the removal hydrogen in a chemical reaction. In the given reaction, carbon is oxidized to carbon monoxide while zinc oxide is reduced to zinc.

Oxidation (gain of oxygen)



Reduction (removal of oxygen)

Q.43. Zinc liberates hydrogen gas when reacted with dilute hydrochloric acid, whereas copper does not. Explain, why?

Ans. The position of zinc in the reactivity series is above hydrogen whereas that of copper is below hydrogen. It means that zinc oxidises (loses electron) more easily than hydrogen whereas copper does not do so. So, copper does not displace H_2 from dilute acids.

Q.44. Why should a magnesium ribbon be cleaned before burning in air?

Ans. Magnesium being a reactive metal, reacts with atmospheric oxygen and moisture to form a layer of magnesium oxide and hydroxide. It prevents the magnesium metal to burn quickly in air. Therefore before burning, the metal is rubbed with a sand paper, which removes the deposited compounds layer and make combustion reaction of magnesium faster.