Question-21
Write the balanced equation for the following chemical reactions.
i. Hydrogen + Chloride → Hydrogen chloride
ii. Barium chloride + Aluminium sulphate → Barium sulphate + Aluminium chloride
iii. Sodium + water → Sodium hydroxide + Hydrogen
Solution:
i. $H_2 + Cl_2 \rightarrow 2HCl$
ii. $3BaCl_2 + Al_2(SO_4)_3 \rightarrow 3BaSO_4 + 2AlCl_3$
iii. $2Na + 2H_2O \rightarrow 2NaOH + H_2$

Question-22
Write a balanced chemical equation and state symbols for the following reactions.
a. Solutions of barium chloride and sodium sulphate in water react to give insoluble barium sulphate and the solution of sodium chloride
b. Sodium hydroxide solution (in water) reacts with hydrochloric acid solution (in water) to produce sodium chloride solution and water.
Solution:
a. $BaCl_2(aq) + Na_2SO_4(aq) \rightarrow BaSO_4\downarrow + 2NaCl(aq)$
b. $NaOH(aq) + HCl(aq) \rightarrow NaCl(aq) + H_2O(aq)$

Question-23
A solution of a substance 'X' is used for white washing.
Name the substance 'X' and write its formula.
(i) Write the reaction of the substance 'X; named in (ii) above with water
Solution:
i. Calcium oxide (quick lime) and CaO
ii. $CaO + H_2O \longrightarrow Ca(OH)_2\,(s)$
Calcium Oxide — Calcium hydroxide

Question-24
Why does the colour of copper sulphate solution change when an iron nail is dipped into it?
Solution:
In this reaction, iron displaces copper from copper sulphate solution. The deep blue colour of copper sulphate solution fades due to the formation of light green solution of iron sulphate. A red-brown coating of copper metal is formed on the surface of the iron metal. This displacement reaction occurs because iron is more reactive than copper.
Question-25
Identify the substances that are oxidised and the substances that are reduced in the following reactions.

i. $4Na(s) + O_2(g) \longrightarrow 2Na_2O(s)$

ii. $CuO(s) + H_2(g) \longrightarrow Cu(s) + H_2O(l)$

Solution:

i. $4Na(s) + O_2(g) \longrightarrow 2Na_2O(s)$

Here oxygen is added to sodium. The addition of oxygen is called oxidation. So the substance that is oxidized is sodium Na.

ii. $CuO(s) + H_2(g) \longrightarrow Cu(s) + H_2O(l)$

In this reaction, copper oxide (CuO) gives the oxygen required for the oxidation of hydrogen; therefore, copper oxide is the oxidizing agent. Hydrogen is responsible for removing oxygen from copper oxide; therefore, hydrogen is the reducing agent here.

********** END **********