Class- X

Chemistry

Topic - Question - Answer - 2. Chapter - 2.

Q. You have two solutions A and B. The pH of solution A is 6 and pH of solution B is 8. Which solution has more hydrogen ion concentration? Which of these is acidic and which one basic?

Ans. pH of a solution gives hydrogen ion concentration of the solution. Since pH of a solution is inversely proportional to hydrogen ion concentration. So, hydrogen ion concentration of solution A is more than that of solution B, because pH of solution A is less than solution B.

The solution having pH less than 7 is acidic and more than 7 is basic. So, solution A is acidic and solution B is basic.

Q. What effect does the concentration of $H^+(aq)$ ions have on the nature of the solution?

Ans. Concentration of $H^+(aq)$ ions tells about the nature of solution that whether the solution is more acidic or less. ~~basic~~. Therefore, higher the concentration of H^+ ions in a solution, more acidic will be the solution.

Q- Do basic solutions have $H^+(aq)$ ions? If yes, then why are these basic?

Ans— A basic solution also have $H^+(aq)$ ions in it. H^+ ions come from the ionisation of water in which base is dissolved.

The basic solution shows basic nature, because concentration of hydroxide (OH^-) ions is more than the concentration of H^+ ions present in it.

Q. Under what soil condition do you think a farmer would treat the soil of his fields with quicklime (CaO) or slaked lime [$Ca(OH)_2$] or chalk ($CaCO_3$)?

Ans. Quicklime (CaO), slaked lime [$Ca(OH)_2$] and chalk ($CaCO_3$) all are ~~bases~~ bases. So, a farmer would treat the soil with any one of these chemicals, if soil is highly acidic having low pH to reduce its acidity.

Q. What is the common name of the compound $CaOCl_2$?

Ans. The common name of the compound $CaOCl_2$ is Bleaching powder.

Q. Name the substance which on treatment with chlorine yields bleaching powder.

Ans. Slaked lime [$Ca(OH)_2$] yields bleaching powder on treatment with chlorine.

Q. Name the sodium compound which is used for softening hard water.

Ans. Sodium carbonate (washing soda) is used for softening hard water.

Q. What will happen if a solution of sodium hydrogen carbonate is heated? Give equation the reaction.

Ans. On heating, sodium hydrogen carbonate decomposes to give sodium carbonate and carbon dioxide gas.

$$2NaHCO_3 \xrightarrow{Heat} Na_2CO_3 + CO_2 + H_2O.$$

Q. Write an equation to show the reaction between plaster of Paris and water.

Ans.

$$\underset{\text{Plaster of Paris}}{CaSO_4 \cdot \tfrac{1}{2} H_2O} + 1\tfrac{1}{2} H_2O \longrightarrow \underset{\text{Gypsum.}}{CaSO_4 \cdot 2H_2O}$$

Q. Write word equation and balanced equations for the reactions taking place when—

(a) dilute sulphuric acid reacts with zinc granules

Ans.

Sulphuric acid + Zinc → Zinc Sulphate + hydrogen

$$H_2SO_4 + Zn \longrightarrow ZnSO_4 + H_2$$

(b) dilute hydrochloric acid reacts with magnesium ribbon.

Ans– Hydrochloric acid + Magnesium → Magnesium chloride + Hydrogen

$$2HCl + Mg \longrightarrow MgCl_2 + H_2$$

(c) dilute sulphuric acid reacts with aluminium powder.

Sulphuric acid + Aluminium powder → Aluminium chloride + Hydrogen

$$3H_2SO_4 + 2Al \longrightarrow Al_2(SO_4)_3 + 3H_2$$

(d) dilute hydrochloric acid reacts with iron filings.

Hydrochloric acid + Iron filings → Iron(II) chloride + Hydrogen

$$2HCl + Fe \longrightarrow FeCl_2 + H_2$$