ACIDS, BASES AND SALTS

2 and 3 Marks questions

Q 1.What are indicators ? Name some common indicators

Ans. Indicators are substances that undergo definite color change in acids and bases solution. Some common indicators are – Litmus solution, methyl orange, phenolphthalein etc.

Q.2. What are alkalis? Write three examples.

Ans. The bases which dissolve in water to give OH- ions in solution are called alkalis, such as- NaOH, KOH, Ca(OH)2.

Q3. While diluting the acid, why is it recommended that acids should be added to water and not water to acid?

Ans. Mixing of water and acid is a highly exothermic process. When water is added to acid , due to small amount of water, evolved heat will change it to vapour and acid will spill out and may cause injury. So it is advised to mix acid to water and not water to acid.

Q4. Write the composition of baking powder. What will happen if tartaric acid is not added to it?

Ans. Baking powder is a mixture of sodium bicarbonate and tartaric acid. This acid neutralizes sodium carbonate formed on decomposition of baking soda. If tartaric acid is not present in baking powder‘, the food materials such as cake will taste bitter due to the presence of sodium carbonate.

Q5. What isBleaching powder? How is it prepared and write its two uses.

Ans. Bleaching powder is Calciumoxychloride and its formula is CaOCl2. It is prepared by passing chlorine gas through slaked lime.

$Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + Cl_2$

Two uses of bleaching powder-

1. It is used to disinfect water

2. It is used to bleach cotton and paper

Q.6. A student working in the laboratory added some water to a syrupy liquid taken in a tube. The tube immediately cracked and the liquid which escaped out of it, produced blisters on the skin of the student. What actually happened?

Ans. The syrupy liquid was concentrated sulphuric acid. On adding water, large amount of heat is released. For this reason the tube cracked and the acid produced blisters on the skin.

Q.7. The pH of rain water collected from two cities A and B was found to be 6 and 5 respectively. Water of which city is more acidic? Find out the ratio of hydrogen ion concentration in the two samples of the rain water.

Ans. Rain water with pH 5 obtained from city B is more acidic than the rain water of city A. The ratio of hydrogen ion concentration can be calculated as below: For city

A: pH= -log[H+]=1

6= -log[H+]

Log[H+]= -6

$[H+]= 10^{-6}$

Similarly,

for city B,

we can have $[H+]=10^{-5}$

Ratio of [H+] of samples

$= 10^{-6}/10^{-5} = 1/10$

= 1/10

Q.8. A compound X of sodium is commonly used for making crispy pakoras. It is also used for curing acidity in the stomach. Identify _X'. What is its formula? State the reaction that takes place when it is heated.

Ans. The compound X is baking soda, a constituent of baking powder. Its chemical name is sodium hydrogen carbonate and its formula is NaHCO3.

On heating this compound gives CO2 gas.

2NaHCO3 (s) ------> Na2CO3 + H2O + CO2

Q9. Dry hydrogen chloride gas does not turn blue litmus whereas hydrochloric acid does. Give one reason.

Ans. In the dry state, hydrogen chloride (HCl) does not release H+ ions. Therefore, it cannot behave as an acid. When dissolved in water, it forms hydrochloric acid. It dissociates to give H+ ion in solution and behaves as an acid. HCl (aq) -----> H+ (aq) + Cl- (aq)

Q.10. Why is Plaster of Paris written as CaSO4. ½ H2O ? How is it possible to have half a water molecule attached to CuSO4?

Ans. The actual formula of Plaster of Paris is 2CaSO4.H2O which means that one molecule of H2O is associated with two molecules of CaSO4. The formula for simplicity is written as CaSO4. ½H2O.