

Class 10 science Important Questions

Chapter 2 – Acids, Bases and Salts

1. (a) Name the raw materials used in the manufacture of sodium carbonate by Solvay process?

(b) How is sodium hydrogen carbonate from a mixture of NH_4Cl and $NaHCO_3$?

Ans. (a) Raw materials used are – $NaCl$, lime stone or $CaCO_3$ and NH_3

(b) Sodium hydrogen carbonate ($NaHCO_3$) is sparingly soluble or less soluble in water and it gets separated as a precipitate while NH_4Cl remains in solution. This precipitate is removed by filtration.

2. Write equations for the following reactions

(i) Dilute sulphuric acid reacts with zinc granules

(ii) Dilute hydrochloric acid reacts with magnesium ribbon.

(iii) Dilute sulphuric acid reacts with aluminum powder.

Ans. (i) $Zn(S) + H_2SO_4(dil) \rightarrow ZnSO_4(aq) + H_2(g)$

(ii) $Mg(S) + 2HCl(dil) \rightarrow MgCl_2(aq) + H_2(g)$

(iii) $2Al(S) + 3H_2SO_4(dil) \rightarrow Al_2(SO_4)_3(aq) + 3H_2(g)$

$$PH = \log \left[\frac{1}{H^+} \right] = -\log [H^+]$$
$$= -\log [10^{-2}] = -(-2)\log 10 = 2$$

3. (a) An aqueous solution has a PH value of 7.0. Is this solution acidic, basic or neutral?

(b) If H^+ concentration of a solution is $1 \times 10^{-2} \text{ mol L}^{-1}$ what will be its PH value?

(c) Which has higher PH value: 1-M HCl or 1-M NaOH

Ans. (a) The solution is neutral is nature

(b)

$$\begin{aligned} PH &= \log \left[\frac{1}{H^+} \right] = -\log [H^+] \\ &= -\log [10^{-2}] = -(-2) \log 10 = 2 \end{aligned}$$

(c) 1 M NaOH solution (basic) higher PH. Value

1 M HCl solution (acidic) lower PH. Value

4. What will you observe when:

(i) Red litmus is introduced into a solution of sodium sulphate.

(ii) Methyl orange is added to dil HCl.

(iii). Blue litmus is introduced into a solution of ferric chloride

Ans. (i) It will undergo any colour change because solution of Na_2SO_4 is water is almost neutral.

(ii) In the acidic solution, the colour of methyl Orange will change to reddish.

(iii) FeCl_3 solution on reacting with water will form ferric hydroxide and hydrochloric acid. Since the acid is strong, the solution will be acidic. Therefore the colour of blue litmus will change to red.

5. A first aid manual suggests that vinegar should be used to treat wasp sting and baking soda for bee stings.

(a) What does this information tell you about the chemical name of the wasp sting?

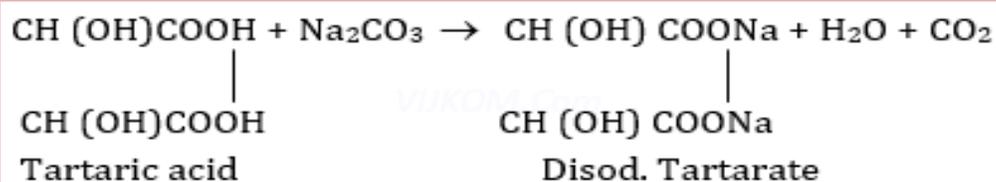
(b) If there were no baking soda in the house, what other household substances would you use to treat stings?

Ans. (a) The chemical present in the sting must be base because vinegar (acetic acid) is used to heal or neutralize the effect of wasp stings.

(b) Since bee stings are treated by baking soda which is a base it means they must contain some acid. If baking soda is not available in the house, solution of ammonium hydroxide NH_4OH can be used for the same purpose.

6. Does Tartaric acid help in making cake or bread fluffy. Justify.

Ans. No, tartaric acid does not evolve any carbon dioxide during baking. Its role is to react with Na_2CO_3 formed when NaHCO_3 decomposes.



7. Explain why?

(a) Common salt becomes sticky during the rainy season.

(b) Blue vitriol changes to white upon heating.

Ans. (a) Common salt contains impurity of magnesium chloride (MgCl_2) which is of deliquescent nature. When exposed to atmosphere, it becomes moist. Therefore common salt becomes sticky during the rainy season.

(b) Blue vitriol ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$) during heating changes to an anhydrous copper sulphate (CuSO_4) which is white in colour.

8. Explain why-

(i) Anhydrous calcium chloride is used in desiccators

(ii) If a bottle full of concentrated H_2SO_4 is left open in the atmosphere by accident, the acid starts flowing out of the bottle of its own.

Ans. (a) Anhydrous calcium chloride (CaCl_2) is highly hygroscopic in nature; it readily absorbs moisture and is therefore used as a drying agent.

(b) Concentrated sulphuric acid is highly hygroscopic; it absorbs moisture from air and gets diluted. Since the volume increases, the acid starts flowing out of the bottle.

9. Why do HCl, HNO_3 etc. show acidic characters in aqueous solution while solutions of compounds like alcohol and glucose do not show acidic character?

Ans. Compounds like HCl and HNO_3 release hydrogen ions in solution, therefore they show acidic character.

While compounds like alcohol and glucose do not release hydrogen ions. Therefore they do not show acidic properties.

10. 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 ions concentration? Which is acidic and which one is basic?

Ans. A solution having pH less than 7 is acidic and that having pH more than 7 is basic. So, solution 'A' is acid and 'B' is basic. Naturally 'A' which is acidic has greater concentration of hydrogen ions concentrations.