**NCERT IN–TEXT QUESTIONS SOLVED**

**Q1.**   You have been provided with three test tubes, one of them contains distilled water and the other two contain an acidic solution and a basic solution respectively. If you are given only red litmus paper; how will you identify the contents of each test tube?

**Ans.** Add few drops of solution from all three test tubes on the red litmus paper separately. The solution which turns red litmus to blue contains basic solution. Use this blue litmus paper to test the solutions in other two test tubes. The solution from the test tube which turns blue litmus paper to red will be the acidic solution and solution of the test tube which do not change either red or blue litmus paper contain water.

**Q2.**   Why should curd and sour substances not be kept in brass and copper vessels?

**Ans.** Curd and sour substances contain acids which can react with copper vessels and brass to form toxic compounds.

**Q3.**   Which gas is usually liberated when an acid reacts with a metal? Illustrate with an example. How will you test for the presence of this gas?

**Ans.** When an acid react with a metal it liberates hydrogen gas.

            E.g., Zn(s) + 2HCl(aq) → ZnCl2 (aq) + H2(g)

            To test the presence of H2 gas, bring a burning splinter near the mouth of the test tube where H2 gas is released, the match stick bums with a pop sound.

**Q4.**   Metal compound A reacts with dilute hydrochloric acid to produce effervescence. The gas evolved extinguishes a burning candle. Write a balanced chemical equation for the reaction if one of the compounds formed is calcium chloride.

**Ans.** Metal compound A is CaCO3

            Gas evolved is CO2

            Balanced equation:

            CaCO3(s) + 2HCl(aq) → CaCl2(aq) + CO2(g) + H2O(l)

**Q5.**   Why do HCl, HNO3 etc., show acidic characters in aqueous solutions while solutions of compounds like alcohol and glucose do not show acidic character?

**Ans.** Solutions like HCl, HNO3 etc. get ionised in aqueous solutions and due to the presence of H+ ions they show acidic characters. While solutions of compounds like alcohol and glucose do not form any such ions so they do not show acidic characters.

**Q6.**   Why does an aqueous solution of an acid conduct electricity?

**Ans.** Acid when forms a solution in water gets ionised, due to the presence of these ions electricity is conducted through it.

**Q7.**   Why does dry HCl gas not change the colour of the dry litmus paper?

**Ans.** Dry HCl gas does not release H+ ions and hence, the acidic property of gas is not imparted.

**Q8.**   While diluting an acid, why is it recommended that the acid should be added to water and not water to the acid?

**Ans.** When acid and water mix, the reaction is highly exothermic, the acid may splash, cause burns and even the bottle/container can break. To avoid this and allow the heat evolved to be absorbed by water slowly, acid is added to water for diluting it.

**Q9.**   How is the concentration of hydronium ions (H30+) affected when a solution of an acid is diluted?

**Ans.** When the solution of acid is diluted the H+ ions are released from the acid to combine with H2O and H3O+ ions is increased.

**Q10.**   How is the concentration of hydroxide ions (OH– ) affected when excess base is dissolved in a solution of sodium hydroxide?

**Ans.** When base is mixed with water there is decrease in the concentration of OH– ions per unit volume.

**Q11.**   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 this is acidic and which one is basic?

**Ans.** A with pH = 6 is acidic B with pH = 8 is basic ‘A’ has more hydrogen ion concentration.

**Q12.**   What effect does the concentration of H+ (aq) ions, have on the nature of the solution?

**Ans.** If a solution has higher concentration of H+ ions it is more acidic in nature.

**Q13.**   Do basic solutions also have H+ (aq) ions? If yes, then why are these basic?

**Ans.** Yes basic solutions also have H+ ions, but they are basic in nature due to more number of OH– ions.

**Q14.**   Under what soil condition do you think a farmer would treat the soil of his fields with quick lime (calcium oxide) or slaked lime (calcium hydroxide) or chalk (calcium carbonate)?

**Ans.** When the soil is acidic in nature, the farmer would add quick lime (CaO) or slaked lime (Ca(OH)2) or chalk (CaCO3)to make it neutral.

**Q15.**   What is the common name of the compound CaOCl2?

**Ans.** The common name of CaOCl2 is bleaching powder and chemical name is calcium oxychloride.

**Q16.**   Name the substance which on treatment with chlorine yields bleaching powder.

**Ans.** Calcium hydroxide (Ca(OH)2) when treated with chlorine yields bleaching powder.

            Ca(OH)2 + Cl2 → CaOCl2 + H2O

**Q17.**   Name the sodium compound which is used for softening hard water.

**Ans.** Sodium carbonate.

**Q18.**   What will happen if a solution of sodium hydrocarbonate is heated? Give the equation of the reaction involved.

**Ans.** When sodium hydrocarbonate is heated, sodium carbonate, water, and carbon dioxide gas is obtained.

**Q19.**   Write an equation to show the reaction between Plaster of Paris and water.

**QUESTIONS FROM NCERT TEXTBOOK**

**Q1.**   A solution turns red litmus blue, its pH is likely to be

           (a) 1           (b) 4

           (c) 5           (d) 10

**Ans.** (d) 10

**Q2.**   A solution reacts with crushed egg-shells to give a gas that turns lime water milky. The solution contains:

           (a) NaCl           (b) HCl

           (c) LiCl           (d) KCl

**Ans.** (b) HCl

**Q3.**   10 ml of a solution of NaOH is found to be completely neutralised by 8 ml of a given solution of HCl. If we take 20 ml of the same solution of NaOH, the amount HCl solution (the same solution as before) required to neutralise it will be

           (a) 4 ml           (b) 8 ml

           (c) 12 ml           (d) 16 ml

**Ans.** (d) 16 ml

**Q4.**   Which one of the following types of medicines is used for treating indigestion?

           (a) Antibiotic           (b) Analgesic           (c) Antacid           (d) Antiseptic

**Ans.** (c) Antacid.

**Q5.**   Write word equations and then balance equations for the reaction taking place when:

           (a) dilute sulphuric acid reacts with zinc granules.

           (b) dilute hydrochloric acid reacts with magnesium ribbon.

           (c) dilute sulphuric acid reacts with aluminium powder,

           (d) dilute hydrochloric acid reacts with ions filings.

**Ans.** (a) **Step I** Zinc granule + dil. Hydrochloric acid → Zinc chloride + Hydrogen gas

**Step II** Zn(s) + 2HC1 (aq) → ZnCl2(aq) + H2(g)

           (b) **Step I** Magnesium+dil. Hydrochloric acid → Magnesium chloride + Hydrogen gas

**Step II** Mg(s) + 2HCl(aq) → MgCl2(aq) + H2(g)

           (c) **Step I** Aluminium + dil. Sulphuric acid → Aluminium sulphate + Hydrogen gas

**Step II** 2Al(s) + 3H2SO4(aq) → Al2(SO4)3(aq) + 3H2(g)

           (d) Step I Iron + dil. Hydrochloric acid → Iron chloride + Hydrogen

**Step II** 2Fe(s) + 3HCl(aq) → Fe2Cl3(aq) + 3H2(g)

**Q6.**   Compounds such as alcohols and glucose also contain hydrogen but are not categorized as acids. Describe an activity to prove it.

**Ans.** •  Take a cork with two nails fixed on it.

           •  Keep this cork inside the beaker.

           •  Connect the nails to the battery, bulb and key as shown in the figure.

           •  Now add ethanol in it and record your observation repeat the same set up for glucose and record your observations.

**Observation:** The bulb will not glow because charge is not flowing through it.

**Conclusion:** The experiment shows that glucose and ethanol do not ionise, H+ ions are not released therefore, they are not categorised as acids.

**Q7.**   Why does distilled water not conduct electricity, whereas rain water does?

**Ans.** Distilled water is pure water and it does not form ions. Whereas rain water contains impurities in it like acid which contains ions and release them when dissolved in water. Hence no ions in distilled water, so electricity is not conducted but ions are there is rain water so electricity is conducted.

**Q8.**   Why do acids not show acidic behaviour in the absence of water?

**Ans.** Acids cannot release H+ ions in absence of water, only on dissolving in water acids release H+ ions. Acids show acidic behaviour only due to H+ ions released in presence of water.

**Q9.**   Five solutions A, B, C, D and E when tested with universal indicator showed pH as 4, 1, 11, 7 and 9 respectively. Which solution is

           (a) neutral?           (b) strongly alkaline?

           (c) strongly acidic?           (d) weakly acidic?

           (e) weakly alkaline?

           Arrange the pH in increasing order of hydrogen ion concentration.

**Ans.** (i) A with pH = 4 is weakly acidic

                B with pH = 1 is strongly acidic

                C with pH = 11 is strongly alkaline

                D with pH = 7 is neutral

                E with pH = 9 is weakly alkaline

           (ii) (a) ‘D’ with pH = 7 is neutral

                (b) lC with pH = 11 is strongly alkaline

                (c) ‘B’ with pH = 1 is strongly acidic

                (d) A’ with pH = 4 is weakly acidic

                (e) ‘E’ with pH = 9 is weakly alkaline

           (iii) pH in increasing order of hydrogen ion concentration

**Q10.**   Equal lengths of magnesium ribbons are taken in test tubes A and B. Hydrochloric acid (HCl) is added to test tube A, while acetic acid (CH3COOH) is added to test tube B. Amount and concentration taken for both the acids are same. In which test tube will the fizzing occur more vigorously and why?

**Ans.** In test tube A hydrochloric acid is present which is a strong acid as compared to acetic acid present in test tube B.

           The fizzing occurs more vigorously in test tube A as HCl is strong and dissociates completely into H+ and Cl ions for the reaction.

**Q11.**   Fresh milk has pH of 6. How do you think the pH will change as it turns into curd? Explain your answer.

**Ans.** pH of milk will decrease when it turns into curd due to the formation of lactic acid.

**Q12.**   A milkman adds a very small amount of baking soda to fresh milk.

           (a) Why does he shift the pH of the fresh milk from 6 to slightly alkaline?

           (b) Why does this milk take a long time to set as curd?

**Ans.** (a) pH is shifted to alkaline so that milk does not spoil by becoming sour by releasing lactic acid.

           (b) Milk is made alkaline by adding baking soda and the lactic acid formed, will get neutralised and therefore will take a little more time to set become acidic.

**Q13.**   Plaster of Paris should be stored in a moisture-proof container. Explain why?

**Ans.** Plaster of Paris reacts with moisture/water to form gypsum.

**Q14.**   What is a neutralisation reaction? Give two examples.

**Ans.** The reaction in which acid reacts with base (loses their property) to form salt and water is called neutralisation reaction.

**Q15.**   Give two important uses of washing soda and baking soda.

**Ans.** Washing soda

           (i) It is used in glass, soap and paper industries.

           (ii) It is used to remove permanent hardness of water.

**Baking Soda**

           (i) It is used as an antacid.

           (ii) It is used in soda, acid fire extinguisher.