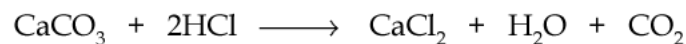


- Q1.** A solution reacts with crushed egg-shells to give a gas that turns lime-water milky. The solution contains
(a) NaCl (b) HCl (c) LiCl (d) KCl
- Q2.** 10 mL of a solution of NaOH is found to be completely neutralised by 8 mL of a given solution of HCl. If we take 20 mL of the same solution of NaOH, the amount of 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
- Q3.** Write word equations and then balanced equations for the reaction taking place when:
(a) dilute sulphuric acid reacts with zinc granules.
(b) dilute hydrochloric acid reacts with magnesium ribbon.
- Q4.** Write word equations and then balanced equations for the reaction taking place when:
(a) dilute sulphuric acid reacts with aluminium powder.
(b) dilute hydrochloric acid reacts with iron filings.
- 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?
- Q6.** Why does an aqueous solution of an acid conduct electricity?
- Q7.** Why does dry HCl gas not change the colour of the dry litmus paper?
- Q8.** While diluting an acid, why is it recommended that the acid should be added to water and not water to the acid?
- Q9.** How is the concentration of hydronium ions (H₃O⁺) affected when a solution of an acid is diluted?
- Q10.** How is the concentration of hydroxide ions (OH⁻) affected when excess base is dissolved in a solution of sodium hydroxide?
- Q11.** What effect does the concentration of H⁺ (aq) ions have on the nature of the solution?
- Q12.** A solution turns red litmus blue, its pH is likely to be
(a) 1 (b) 4 (c) 5 (d) 10
- Q13.** Which one of the following types of medicines is used for treating indigestion?
(a) Antibiotic (b) Analgesic (c) Antacid (d) Antiseptic
- Q14.** What is the common name of the compound CaOCl₂?
- Q15.** Name the substance which on treatment with chlorine yields bleaching powder.
- Q16.** Name the sodium compound which is used for softening hard water.
- Q17.** Write an equation to show the reaction between plaster of Paris and water.
- Q18.** Why should curd and sour substances not be kept in brass and copper vessels?

- Q19.** 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?
- Q20.** 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.
- Q21.** What is a neutralisation reaction? Give two examples.
- Q22.** Why does distilled water not conduct electricity, whereas rain water does?
- Q23.** Why do acids not show acidic behaviour in the absence of water?
- Q24.** 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 (CH_3COOH) is added to test tube B. In which test tube will the fizzing occur more vigorously and why?
- Q25.** 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 solution, how will you identify the contents of each test tube?
- Q26.** 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?
- Q27.** Do basic solutions also have H^+ (aq) ions? If yes, then why are these basic?
- Q28.** 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)?
- Q29.** Fresh milk has a pH of 6. How do you think the pH will change as it turns into curd? Explain your answer.
- Q30.** What will happen if a solution of sodium hydrogencarbonate is heated? Give the equation of reaction involved.
- Q31.** 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?
- Q32.** Plaster of Paris should be stored in a moisture-proof container. Explain why?
- Q33.** Give two important uses of washing soda and baking soda.
- Q34.** 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 alkaline?
Arrange the pH in increasing order of hydrogen-ion concentration.
- Q35.** Compounds such as alcohols and glucose also contain hydrogen but are not categorised as acids. Describe an activity to prove it.

- S1.** Egg-shells contain calcium carbonate which reacts with an acid to liberate carbon dioxide which turns lime-water milky.



Lime water

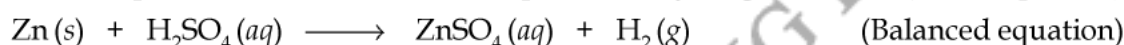
Hence, out of the given options, option (b), *i.e.*, HCl is correct.

- S2.** The amount of HCl required will increase proportionately because the concentrations of both the NaOH and HCl solutions remain the same. The amount of HCl required will be

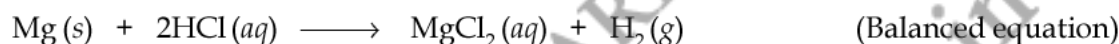
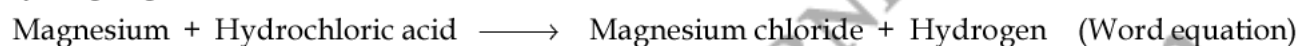
$$8 \times \frac{20}{10} = 16 \text{ mL}$$

Thus, option (d), is correct.

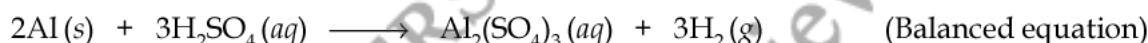
- S3.** (a) Dilute sulphuric acid reacts with zinc forming zinc sulphate and evolving hydrogen gas.



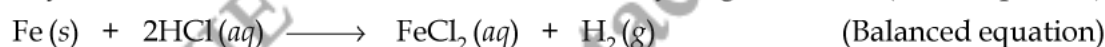
- (b) Dilute hydrochloric acid reacts with magnesium ribbon forming magnesium chloride and evolving hydrogen gas.



- S4.** (a) Dilute sulphuric acid reacts with aluminium powder to form aluminium sulphate with the evolution of hydrogen gas.



- (b) Dilute hydrochloric acid reacts with iron filings to give iron chloride and hydrogen gas.



- S5.** Compounds like HCl and HNO₃ release H⁺ ions in solution. Therefore they show acidic properties.

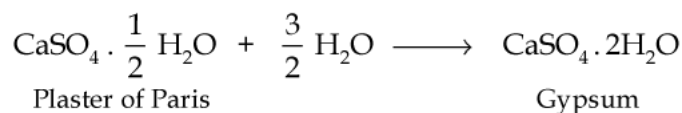
Compounds like alcohol and glucose do not release H⁺ ions in solution. Therefore, they do not show acidic properties.

- S6.** Electricity is conducted in a solution by ions. An acid releases H⁺ ions in solution, therefore, aqueous solution of an acid conducts electricity.

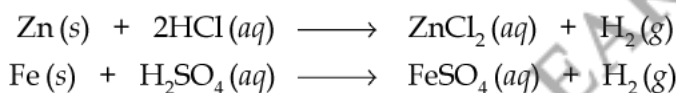
- S7.** Colour of litmus paper changes only when it comes into contact with H⁺ ions. Hydrogen ions are produced only when HCl gas comes into contact with water. Therefore, dry HCl gas does not change the colour of dry litmus paper.

- S8.** Addition of water to acid is an exothermic process. If we add water to the acid, a lot of heat is produced. Acid being in bulk spurts out. When the acid is added to water, it being heavier settles down at the bottom. Water being in bulk, no spurting takes place. Due to this reason, a small amount of acid is added to water with constant stirring in order to dilute the acid.

- S9.** Concentration of hydronium ions is decreased when the solution of an acid is diluted.
- S10.** Excess base dissolved in a solution of sodium hydroxide will release more hydroxide ions. Therefore, concentration of hydroxide ions (OH^-) will increase.
- S11.** Higher the concentration of H^+ (*aq*) ions, greater is the acidic nature of the solution.
- S12.** The solution turns red litmus blue, therefore, it is a basic solution. Basic solutions have pH more than 7. Out of options given above, option (d), *i.e.*, pH = 10 is correct
- S13.** Indigestion is caused by excess acid produced in the stomach. To treat excess acid, the medicine required is antacid. Thus, option (c), *i.e.*, antacid is correct.
- S14.** Bleaching powder.
- S15.** Slaked lime or calcium hydroxide, $\text{Ca}(\text{OH})_2$.
- S16.** Sodium carbonate is used for softening hard water.
- S17.** The reaction between plaster of Paris and water is as under:



- S18.** Brass which contains copper and zinc metals, reacts with the organic acids present in curd and sour substances forming soluble salts. These salts are poisonous in nature and make curd and sour substances unfit for consumption.
- S19.** Usually hydrogen gas is liberated when an acid reacts with a metal. This is illustrated by taking examples of zinc and iron metals.



Test for Hydrogen gas

Hydrogen gas burns with a pop sound. It is lighter than air. When hydrogen gas is passed through soap solution, soap bubbles are formed which being lighter than air rise up.

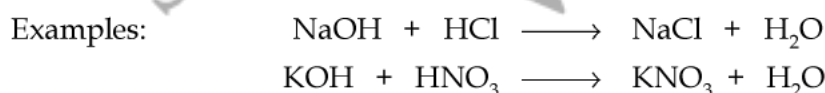
The pop sound is due to the combustion of hydrogen producing water.



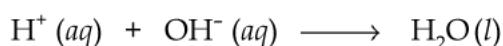
- S20.** 1. As one of the compounds formed is calcium chloride, it means metal compound 'A' is a salt of calcium.
2. A burning candle is extinguished by carbon dioxide. This means carbon dioxide is produced by the reaction of 'A' with hydrochloric acid.
3. Carbon dioxide is produced by the action HCl on a carbonate that means 'A' is calcium carbonate.
- The reaction can be written as under:



- S21.** The reaction between an acid and base to give salt and water is called neutralisation reaction.



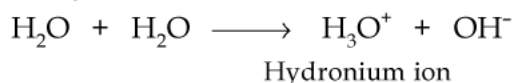
It can also be viewed as a reaction between H^+ (*aq*) ions produced by the acid and OH^- (*aq*) ions produced by the base.



S22. Rain water contains small amounts of acid (H^+ ions) because of which it conducts electricity. Distilled water is pure water. It contains no traces of H^+ ions. Therefore, it does not conduct electricity.

For water to conduct electricity, it is necessary for it to contain ions either the H^+ ion or any other ions.

S23. Acids produce H^+ ions or H_3O^+ ions only in the presence of water. For example,



In the absence of water, hydronium ions are not produced. The acid show no acidic behaviour in the absence of water.

S24. HCl is a stronger acid than CH_3COOH . Therefore, H^+ ion concentration in test tube A will be more than that in test tube B. Hence, reaction will take place faster in test tube A than in test tube B. In other words, fizzing will occur more vigorously in test tube B.

S25. Add a few drops of red litmus solution to each test tube. Red colour will become light in the test tube containing water. Colour will turn blue in the test tube containing basic solution. Red colour will become dark in the test tube containing acidic solution.

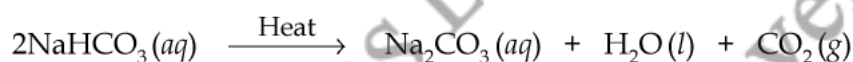
S26. A solution having pH less than 7 is acidic while that having pH more than 7 is basic. Consequently, 'A' is acidic and 'B' is basic. Naturally 'A' which is acidic has greater concentration of hydrogen ions.

S27. Acid and basic solutions both have H^+ (*aq*) ions. The difference is that in acids H^+ (*aq*) ion concentration is more than OH^- (*aq*) ion concentration while in basic solution OH^- (*aq*) ion concentration is more than H^+ (*aq*) concentration.

S28. When the soil receives acid rain or is acidic otherwise (pH less than 7), the farmer would treat the soil of his fields with one of the above [CaO , $\text{Ca}(\text{OH})_2$, CaCO_3] to neutralise the effect of acid.

S29. Bacteria change the fresh milk into curd producing lactic acid. Because of the presence of lactic acid in curd, the pH will come down from 6 to a lower value.

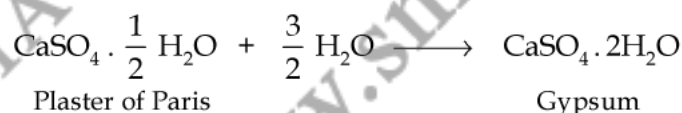
S30. Sodium hydrogencarbonate solution on heating gives sodium carbonate, carbon dioxide and water as per the following equation:



S31. (a) The pH of milk changes from pH 6 to slightly alkaline on addition of a very small amount of baking soda. This is because sodium hydrogencarbonate is basic in nature. This prevents the milk from souring.

(b) Lactic acid formed as a result of fermentation is neutralised by sodium hydrogencarbonate. This prolongs the time taken by milk to set as curd.

S32. Plaster of Paris reacts with moisture to form gypsum and sets to a hard mass.



Therefore, it should be stored in moisture-proof container.

S33. Uses of washing soda:

(a) As a cleansing agent for domestic purposes and for removing permanent hardness of water.

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

Uses of baking soda:

(a) For making baking powder which is a mixture of sodium hydrogencarbonate and a mild edible acid like tartaric acid.

(b) As an ingredient of antacid.

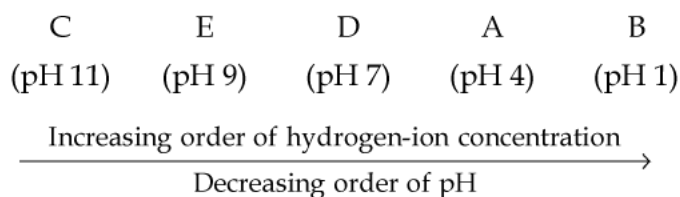
S34. A solution having pH equal to 7 is neutral. A solution with pH range 0 – 7 is acidic while a solution with pH range 7 – 14 is basic.

Smaller the value of pH in the range 0 – 7, stronger is the acid. Higher the value of pH in range 7 – 14, stronger is the base (alkali)

Based on above, we can decide the acidic or basic nature of A, B, C, D and E:

Solution	pH	Nature
A	4	Weakly acidic
B	1	Strongly acidic
C	11	strongly alkaline
D	7	Neutral
E	9	Weakly alkaline

The pH in increasing order of hydrogen ion concentration are:



S35. Alcohol (ethyl alcohol) has the formula C_2H_5OH and glucose has the formula $C_6H_{12}O_6$. Thus, both of them contain hydrogen but they are not categorised as acids. The following activity can be carried out to prove it.

Activity:

Materials required: Beaker, rubber cork, nails, 6 V battery, connecting wires, bulb, switch, ethyl alcohol.

Procedure:

1. Set up the apparatus as shown in the figure.
2. Take ethyl alcohol in the beaker such that the upper ends of the nail remain 2 cm above the level of alcohol.
3. When the switch is turned on, we observe that the bulb does not glow.
4. Repeat the experiment by taking glucose solution in place of alcohol. Again, we observe that the bulb does not glow.

This shows that the flow of current does not take place in both the cases. This proves that there are no H^+ ions in alcohol and glucose solution, as electricity is conducted through the ions (H^+ ions) in solution.

