

Acid, Bases and Salt

Chemistry – X CBSE

Questions & Answers

BOOST YOUR KNOWLEDGE

- Acids are identified by their sour taste.
- Souring of milk is due to the presence of lactic acid.
- The acid present in the stomach is hydrochloric acid and causes acidity.
- Acids obtained from rocks and minerals are called mineral acids.
- Acids obtained from plants and animals are known as organic acids.
- Bases are identified by their bitter taste and soapy touch.
- Sodium hydroxide (NaOH) and potassium hydroxide (KOH) have strong corrosive action on skin- These are called caustic alkalies.
- In aqueous solution, an acid gives H^+ ions while a base releases OH^- ions.
- The main acid-base indicators are litmus solution, phenolphthalein and methyl orange.
- The acid-base indicators are mostly organic dyes with characteristic colours.
- Litmus is the extract of the plant lichen. Phenolphthalein and methyl orange are synthesised in the laboratory.
- The indicators impart different colours to the acid/base solutions and help in their identification.
- Active metals lie above hydrogen in the activity series and liberate hydrogen gas on reacting with dilute acids.
- Oxides of metals are basic in nature while those of non metals are of acidic nature.
- For strong acids and strong bases, degree of dissociation (α) is nearly 1 (i.e., they are almost completely dissociated). For weak acids and weak bases, it is comparatively less.
- In dry or anhydrous state, neither acids nor bases show any acidic or basic character.
- A strong acid or base remains strong even if it is diluted with water. A weak acid or base remains weak even if the solution is highly concentrated.
- Basicity of acid does not depend upon the number of hydrogen atoms present but upon the number of replaceable hydrogen atoms.
- Acidity of base does not depend upon the number of OH groups present but upon the number of replaceable OH groups.
- Water helps in separating ions from acid and base and thus helps in their dissociation.
- The acids and bases are not conducting in the dry or gaseous state and are conducting either in molten state or when dissolved in water.
- An acid solution in water always contains some OH^- ions. Similarly, a base solution in water always contains some H^+ ions.
- Reaction between acid and base to form salt and water is called neutralisation reaction.
- Neutralisation reactions are always exothermic and are accompanied by evolution of heat.
- pH value and $[H^+]$ of a solution are inversely proportional to each other.
- Higher the pH value, weaker is the acid and stronger is the base.
- pH of a neutral solution is 7 and of human blood ranges between 7.36 to 7.42.
- Salts are generally formed as a result of neutralisation reactions between acids and bases.
- On the basis of the chemical formulae, salts are classified as normal, acidic and basic salts.
- Salts with pH equal to 7 are neutral. Those with pH less than 7 are acidic while the salts with pH more than this value are basic in nature.
- Rock salt is chemically sodium chloride (NaCl).
- NaCl is useful in muscle contraction and also helps in conduction of nerve impulses.

- A strong solution of sodium chloride in water (about 30%) is called brine.
- Baking powder is a mixture of baking soda and tartaric acid.
- Antacid is a substance which can neutralise acidity in the stomach.
- The constituents of soda-acid fire extinguisher are sodium hydrogen carbonate and sulphuric acid.
- Bleaching powder (CaOCl_2) is prepared commercially by reacting chlorine with slaked lime.
- Gypsum is chemically $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$. Upon heating, it changes to Plaster of Paris $\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$.
- Plaster of Paris is used for making casts or moulds of different types and also for setting fractured bones.
- Hydrated copper sulphate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$) is blue in colour while anhydrous salt (CuSO_4) is colourless.

Test Assignment

1. Name the acid present in Lemon juice.

Ans. Citric acid

2. Is it possible to taste all acids and bases ?

Ans. No.

3. Name the acid present in bees. What is its nature ?

Ans. Formic acid, highly poisonous.

4. Can you regard Ca(OH)_2 as an alkali ?

Ans. No, because it does not dissolve in water

5. Does phenolphthalein impart some characteristic colour to dilute HCl solution ?

Ans. No, it does not

6. What will you notice if a drop of blue litmus is added to a tube containing NaOH solution ?

Ans. It will remain blue

7. Name the acid which lends fizz to soft drinks.

Ans. Carbonic acid (H_2CO_3)

8. Which acid constitutes vinegar ?

Ans. Acetic acid

9. To the aqueous solution of a substance 'A', a few drops of methyl orange indicator were added. As a result, the solution became reddish. Predict the nature of the solution.

Ans. Acidic

10. Point out whether the following statements are true or false :

- An acid when dissolved in water furnishes H^+ ions.
 - Phenolphthalein becomes reddish in acidic medium.
 - Sodium hydroxide is also called caustic potash.
 - An Indicator has different colours in the acidic and basic solutions.
 - An acid solution in water turns red litmus blue.
 - Water soluble hydroxides of metals are known as alkalis.
 - An aqueous solution of ammonia is also called ammonium hydroxide.
- Ans. (i) True (ii) False (iii) False (iv) True (v) False (vi) True (vii) true.

11. Out of Mg and Cu, which will displace hydrogen gas from dilute H_2SO_4 ?

Ans. Mg

12. What is the nature of oxides of metals ?

Ans. Basic

13. H_2SO_4 is a dibasic acid. What does it indicate ?

Ans. It has two replaceable hydrogen atoms.

14. A substance 'X' is insoluble in water. When reacted with dilute HCl, it produces a gas which turns lime water milky. Predict the substance.

Ans. It is probably CaCO_3 .

15. Does the presence of hydrogen atoms in a substance make it an acid ?

Ans. No, it must have replaceable H atoms

16. Can dry HCl act as an acid ?

Ans. No.

17. How do H^+ ions exist in water ?

Ans. H_3O^+ (hydronium) ions

18. What is the nature of neutralisation reaction ?

Ans. Exothermic

19. pH of a solution is close to 2. Predict its nature.

Ans. Strongly acidic

20. How do farmers neutralise the effect of acidity in the soil ?

Ans. By adding slaked lime

21. Can we dilute concentrated sulphuric acid by adding water to it ?

Ans. No, acid should be added to water

22. What is the pH range of a universal pH paper ?

24. Suggest an antacid to give relief to a patient suffering from high acidity ?

Ans. Milk of magnesia

25. Which acid is secreted by nettle plants ?

Ans. Methanoic

26. Can a solution have pH more than 14 ?

Ans. No

27. The pH of three acids A, B and C in aqueous solution are 4.0, 6.0, 2.0. Arrange them in decreasing order of acidic strength.

Ans. C, A, B

28. A first aid manual suggests that vinegar should be used to treat wasp stings. What is the chemical nature of wasp sting ?

Ans. It is basic in nature.

29. Why does HCl form normal salt while H_2SO_4 forms both normal and acid salts ?

Ans. HCl is monobasic while H_2SO_4 is dibasic

30. What is the expected pH of an acid salt solution ?

Ans. less than 7

31. What is the nature of an aqueous solution of sodium carbonate ?

Ans. Basic

32. What is the difference between washing soda and washing powder ?

Ans. Washing soda ($Na_2CO_3 \cdot 10H_2O$); washing powder ($Na_2CO_3 \cdot H_2O$).

33. Name the gas which is evolved when slaked lime is heated with ammonium chloride.

Ans. Ammonia gas

34. Name the acid normally used in acid soda fire extinguishers.

Ans. H_2SO_4

35. What are the constituents of baking powder ?

Ans. From 0 to 14

23. What will be the expected pH of a solution when an aqueous solution of HCl is mixed with an aqueous solution NaOH ?

Ans. Nearly

Ans. Baking soda and tartaric acid

36. What is the chemical formula of bleaching powder ?

Ans. $CaOCl_2$

37. How does bleaching powder sterilise drinking water ?

Ans. Chlorine evolved in the reaction sterilises drinking water due to oxidation

38. How many H_2O molecules are present in gypsum ?

Ans. Two

39. Why is blue vitriol blue in colour ?

Ans. Due to the presence of molecules of water of crystallisation

40. A substance loses all its molecules of water of crystallisation when exposed to air. How will you name it ?

Ans. Efflorescent substance

41. Can we weigh sodium hydroxide accurately ?

Ans. No, due to its deliquescent nature

42. Which substances are normally used as drying agents ?

Ans. Hygroscopic substances

43. Identify the bases and acids from which the following salts have been prepared : magnesium sulphate, copper sulphate, sodium carbonate, ammonium chloride.

Ans. $Mg(OH)_2$ and H_2SO_4 ; $Cu(OH)_2$ and H_2SO_4 ; $NaOH$ and H_2CO_3 ; NH_4OH and HCl

44. Which out of NaCl, $NaHCO_3$ and $NaNO_3$ is an acid salt ?

Ans. $NaHCO_3$.

NCERT IN TEXT PROBLEMS

Q.1. 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 ?

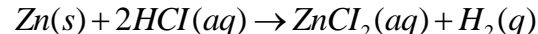
Ans. Take a small volume of all the three liquids in three test tubes. Dip red litmus paper strips separately in all the three. The tube in which red litmus strip turns blue, contains basic solution. Now remove the blue litmus paper and dip it in one of the remaining test tubes. The tube in which the colour of the blue litmus paper changes to red, contains the acidic solution. The tube in which the colour remains unchanged, contains distilled water.

Q.2. Why should not curd and sour substances be kept in containers made up of brass or copper ?

Ans. Both curd and sour substances contain some acids in them. They react with copper to form certain salts which are of poisonous nature. Therefore, it is not advisable to keep them in these containers.

Q.3. 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 ?

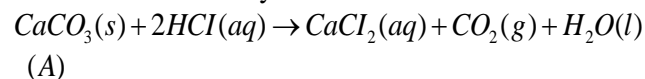
Ans. Metals are mostly reactive in nature. They react with dilute acids (HCl and H_2SO_4) to evolve hydrogen gas. For example,



The gas burns with a pop sound when a burning candle is brought near it. For details, consult text part.

Q.4. A 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. Since the gas is evolved with effervescence and extinguishes fire, it is expected to be CO_2 gas. As calcium chloride is formed as one of the products, this means that the substance must be calcium carbonate. It reacts with dilute hydrochloric acid as :



Q.5. Aqueous solutions of HCl , HNO_3 and H_2SO_4 etc. show acidic character while those of the compounds like ethyl alcohol (C_2H_5OH) and glucose ($C_6H_{12}O_6$) fail to do so. Explain.

Ans. All the acids that have been listed have replaceable hydrogen atoms which they release in

aqueous solution as H^+ ions. Therefore, they show acidic character. However, both ethyl alcohol (C_2H_5OH) and glucose ($C_6H_{12}O_6$) do not have replaceable hydrogen atoms. They fail to evolve hydrogen gas and do not show any acidic character.

Q.6. Why does aqueous solution of an acid (HA) conduct electricity ?

Ans. Aqueous solution of an acid (HA) releases H^+ ions and anions (A^-) in solution. Since ions are the carrier of charge, the aqueous solution of an acid conducts electricity.

Q.7. Why does not dry HCl gas change the colour of the dry litmus paper ?

Ans. Dry HCl gas fails to release any H^+ ions which means that it is not acidic. It fails to change the colour of the dry litmus paper which has also no moisture present.

Q.8. While diluting an acid, why is it not recommended that acid should be added to water and not water to the acid ?

Ans. Acids particularly the mineral acids like H_2SO_4 , HNO_3 and HCl etc., have strong affinity for water. The dilution process is highly exothermic in nature. The heat evolved may crack or break the container and may also convert the acid into fog which is likely to pollute the atmosphere. In order to control the heat evolved, it is advisable to add acid drop by drop to water. In case water is added to acid, then the entire acid will get itself involved in the exothermic process. It may not be possible to control the heat evolved.

Q.9. How is concentration of hydronium ions (H_3O^+) affected when solution of an acid is diluted with water ?

Ans. An acid dissociates into hydronium ions (H_3O^+) and anions when dissolved in water. Upon dilution, the volume of the solution increases and the number of ions per unit volume decreases.

Q.10. How is concentration of hydroxyl (OH^-) ions affected when excess of base is dissolved in solution of sodium hydroxide ?

Ans. Sodium hydroxide ($NaOH$) is a strong base. It immediately dissociates in solution to give OH^- ions and cations. Upon dissolving more of base in the

solution. the concentration of OH^- ions will further increase.

Q.11. You have two solutions A and B. The pH of solution A is 6 and that of solution B is 8. Which solution has more hydrogen ion concentration ? Which of these is acidic and which one is basic ?

Ans. The pH of a solution is inversely proportional to the concentration of H^+ ions in solution. Lesser the pH of the solution, more will be the H^+ ion concentration. The solution A with pH 6 has more H^+ ion concentration than the solution with pH equal to 8. The solution A is acidic because its pH is less than 7 and the solution B is basic because its pH is more than 7.

Q. 12. What effect does concentration $H^+(aq)$ ions have on acidic nature of a solution ?

Ans. The acidic nature of a solution is directly related to the concentration of H^+ ions. As the concentration of H^+ ions increases, the acidic nature of solution also increases.

Q.13. Do basic solutions also have $H^+(aq)$ ions ? If yes, then why are these basic ?

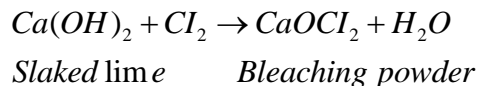
Ans. Yes, basic solutions have also $H^+(aq)$ ions present in them. Actually, these solutions are prepared in water. Being a weak electrolyte, it dissociates to give H^+ and OH^- ions. However, the number of H^+ ions is very small as compared to the number of OH^- ions which are released by the base and also by water. Therefore, the solutions as a whole are of basic nature.

Q.14. Under what soil conditions, do you think a farmer would spread or treat the soil of his field with quick lime (calcium oxide) or slaked lime (calcium hydroxide) or chalk (calcium carbonate) ?

Ans. A soil usually becomes acidic when there is either a high peat content. Iron minerals or there is some rotting vegetable. In order to reduce the acidic strengths, 'liming of soil' is usually done. For this, any of the substances that have been mentioned are added to the soil since these are of basic nature.

Q.15. Name the substance which upon treating with chlorine gives bleaching powder. Write the chemical equation for the reaction.

Ans. Slaked lime is the substance which reacts with chlorine to give bleaching powder

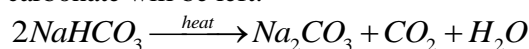


Q.16. Name the sodium compound used for softening hard water.

Ans. Washing soda or sodium carbonate. It is chemically sodium carbonate decahydrate ($Na_2CO_3 \cdot 10H_2O$).

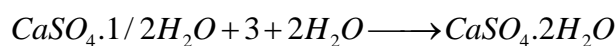
Q.17. What will happen if the solution of sodium hydrogen carbonate is heated ? Write the chemical equation involved.

Ans. Carbon dioxide gas will evolve and sodium carbonate will be left.



Q.18. Write the chemical equation for the reaction between Plaster of Paris and water.

Ans.



Plaster of Paris

Gypsum

NCERT EXERCISE

Q.19. A solution turns red litmus blue. Its pH is likely to be

- (a) 2 (b) 4
(c) 7 (d) 10.

Ans. The solution is basic. Its pH is likely to be 10. Therefore, (d) is the correct answer.

Q.20. 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. The crushed egg-shells consist of a layer of carbonate which reacts with dilute HCl to evolve $CO_2(g)$. The gas turns lime water milky. Therefore (b) is the correct choice.

Q.21. 10 mL of a solution of $NaOH$ is found to be completely neutralized 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 will be
(a) 4 mL (b) 8 mL (c) 12 mL (d) 16 mL.

Ans. 10 mL of $NaOH$ will require $HCl = 8$ mL. and 20 mL of $NaOH$ will require $HCl = 16$ mL. Therefore, (d) is the correct answer.

Q.22. Write the following types of medicines is used for treating indigestion ?

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

Ans. Antacid is used for treating Indigestion. The correct answer is (c).

Q.23. Write the word equations and the balanced equations for the reactions when :

(a) dilute sulphuric acid reacts with zinc granules.

(b) dilute hydrochloric acid reacts with magnesium ribbon.

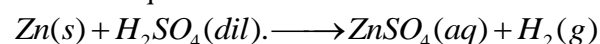
(c) dilute sulphuric acid reacts with aluminium powder.

(d) dilute hydrochloric acid reacts with iron filings.

Ans. (a) Word equation :

Zinc + Sulphuric acid \rightarrow Zinc sulphate + Hydrogen

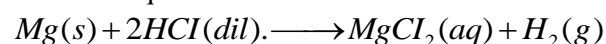
Balanced equation :



(b) Word equation :

Magnesium + Hydrochloric acid \longrightarrow Magnesium chloride + Hydrogen

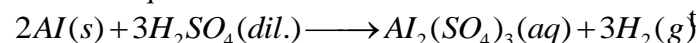
Balanced equation :



(c) Word equation :

Aluminium + Sulphuric acid \longrightarrow Aluminium sulphate + Hydrogen.

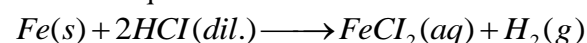
Balanced equation :



(d) Word equation :

Iron + Hydrochloric acid \longrightarrow Iron chloride + Hydrogen

Balanced equation :



Q.24. Compounds like alcohol and glucose also contain hydrogen but are not characterised as acids. Describe an activity to prove It.

Ans. The chemical formula of ethyl alcohol is $\text{C}_2\text{H}_5\text{OH}$ which is an alcohol and of glucose is $\text{C}_6\text{H}_{12}\text{O}_6$. Both are organic compounds and contain hydrogen atoms. However, they do not behave as acids. This can be shown by the following activity : In a glass beaker, take a dilute solution of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$). Fix two small nails of iron in a rubber cork and place the cork in the beaker as shown in the figure, Connect the nails to the terminals of a 6 volt battery through a bulb. Switch on the current. The bulb will not glow. This shows that the electric

current has not passed through the glucose solution . As the current is carried by the movement of ions, this shows that in solution, glucose has not given any H^+ ions.

Now repeat the same experiment with ethyl alcohol ($\text{C}_2\text{H}_5\text{OH}$) . The bulb will not glow in this case also.

This shows that both of them do not behave as acids although they contain hydrogen atoms in their molecules.

Q.25. Why does not distilled water conduct electricity whereas rain water does ?

Ans. Pure water (or distilled water) is a very weak electrolyte and does not dissociate into ions. Therefore it does not conduct electricity. However, rain water contains some dissolved acids like carbonic acid (H_2CO_3) and sulphurous acid (H_2SO_3). Actually air contains traces of both CO_2 and SO_2 gases which dissolve in rain water to produce corresponding acids. As a result, water becomes acidulated and gets ionised easily. Therefore, rain water conducts electricity.

Q.26. Why does not an acid show any acidic behaviour in the absence of water ?

Ans. An acid gets ionised only in aqueous solution i.e. in the presence of water. In other words, an acid releases H^+ ions or shows acidic behaviour only in the presence of water.

Q.27. Five solutions A, B, C, D and E when tested with universal indicator show pH as 4, 2, 12, 7 and 9 respectively Which solution is :

(a) neutral (b) strongly alkaline (c) strongly acidic (d) weakly alkaline (e) weakly acidic (f) Arrange the pH in increasing order of H^+ ion concentration.

Ans. (a) Neutral :

D with pH = 7 (b) Strongly alkaline :

C with pH = 12 (d) Strongly acidic :

B with pH = 2 (d) Weakly alkaline :

E with pH = 9 (e) Weakly acidic :

A with pH = 4 (f)

Increasing order of H^+ ions concentration : C < E < D < A < B

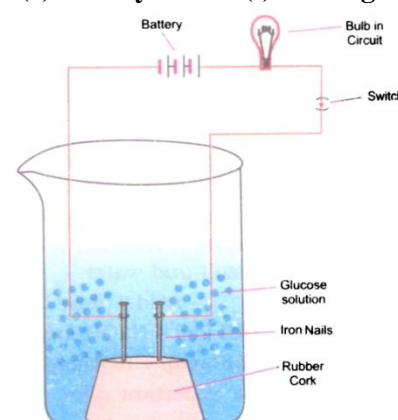
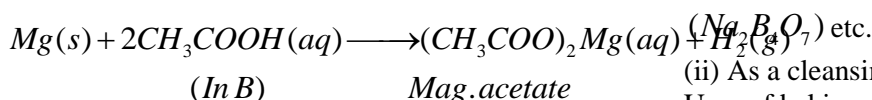
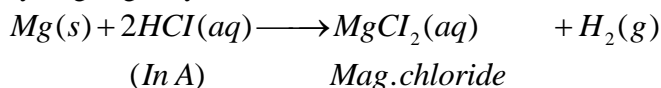


FIGURE. GLUCOSE SOLUTION IN WATER DOES NOT CONDUCT ELECTRIC CURRENT

Q.28. 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. In which case, fizzing occurs more vigorously and why ?

Ans. Fizzing In the reaction is due to the evolution of hydrogen gas by the action of metal on the acid



Since hydrochloric acid is a stronger acid than acetic acid, fizzing occurs more readily in tube A than in tube B. Actually hydrogen gas will evolve at more brisk speed in test tube A.

Q.29. Fresh milk has a pH of 6. How do you think the pH will change as it turns into curd ? Explain your answer.

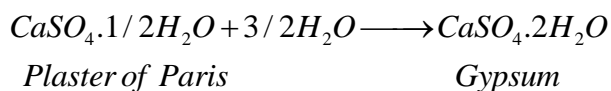
Ans. When milk changes into curd, the pH decreases. Actually, lactose (carbohydrate) present in milk gets converted into lactic acid. As more of acid is formed, pH of the medium decreases.

Q.30. Why does milk take a long time to set as curd if a small amount of baking soda is added to it ?

Ans. When milk sets as curd, it becomes more acidic and pH decreases. In the alkaline medium, it takes longer time to achieve acidic medium back, so that milk may set as curd.

Q.31. Why should Plaster of Paris be stored in a moisture-proof container ?

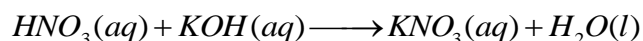
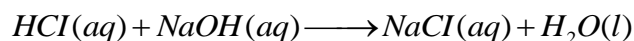
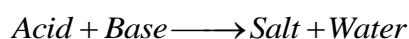
Ans. In the presence of moisture, Plaster of Paris gets hydrated and changes to Gypsum which is a hard mass



It can be no longer used for making moulds and statues. Therefore, Plaster of Paris is kept in moisture proof containers or bags.

Q.32. What is neutralisation reaction ? Give two examples.

Ans. Neutralisation reaction is the reaction between acid and base dissolved in aqueous solution to form salt and water.



Q.33. Give two important uses of washing soda and baking soda.

Ans. Uses of washing Soda.

(i) In the manufacture of glass, soap, paper and chemicals like caustic soda (NaOH) and borax

(ii) As a cleansing agent for domestic purposes.

Uses of baking soda.

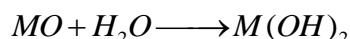
(i) In baking powder used for preparing cakes.

(ii) In antacids to reduce acidity in the stomach.

CONCEPT BASED QUESTIONS

Q.34. The oxide of a metal M was water soluble. When a blue litmus strip was dipped in this solution it did not undergo any change in colour. Predict the nature of the oxide.

Ans. The metal oxide (MO) is of basic in nature. It dissolves in water to form metal hydroxide as follows :



A blue litmus does not undergo any change to colour in the basic medium.

Q.35. Acetic acid is highly soluble in water but is still a weak acid. Why ?

Ans. The strength of an acid is not related to its solubility in water. It depends upon the extent of its dissociation i.e., upon the value of α . For acetic acid, α is quite small. This means that it is weakly dissociated in water and is a weak acid.

Q.36. Dry hydrogen chloride gas does not change the colour of blue litmus. Assign reason.

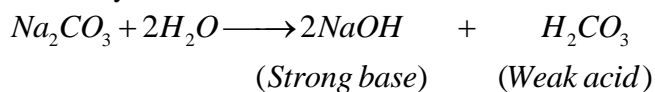
Ans. In dry state, hydrogen chloride (HCl) does not give any H^+ ions. In other words, it does not behave as an acid and does not bring any change in the colour of blue litmus.

Q.37. How will you establish that a given salt is a carbonate of a metal ?

Ans. To the salt, add a few drops of dilute HCl (or dilute H_2SO_4). If a colourless and odourless gas is evolved with brisk effervescence, pass the vapours of the same through lime water. In case lime water becomes milky, the gas is carbon dioxide and the salt is carbonate of some metal.

Q.38. An aqueous solution of sodium carbonate is basic and not acidic. Assign reason.

Ans. Sodium carbonate reacts with water to form sodium hydroxide and carbonic acid.



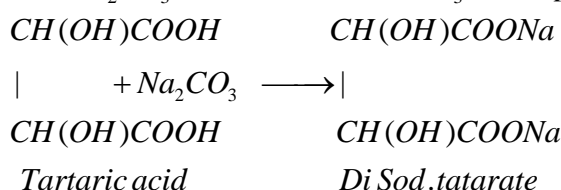
Since the base is strong while acid is weak, the solution is basic and not acidic.

Q.39. A number of methods are available for the manufacture of sodium carbonate but Solvay process is the best. Justify.

Ans. Common salt and lime stone are the main raw materials for the process and both of them are quite cheap. Moreover, sodium carbonate formed is about 99.5% pure and further purification is not needed.

Q.40. Does tartaric acid help in making cake or bread fluffy? Explain.

Ans. No, tartaric acid with the formula $CH(OH)COOHCH(OH)COOH$ does not evolve any carbon dioxide during baking. Its role is to react with Na_2CO_3 formed when $NaHCO_3$ decomposes.



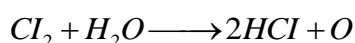
If it is not done, Na_2CO_3 will impart a bitter taste to the cake.

Q.41. An old person complained of acute pain in the stomach. Doctor gave him a small antacid tablet and he got immediate relief. What actually happened?

Ans. The old person was suffering from acute acidity. Antacid tablet contains sodium hydrogen carbonate ($NaHCO_3$). It reacts with the acid (HCl) formed because of acidity and neutralizes its effect. For more details, consult text part.

Q.42. Bleaching by chlorine released from bleaching powder is permanent. Explain.

Ans. Chlorine bleaches the colour (an organic dye) from the cloth in the presence of moisture due to oxidation

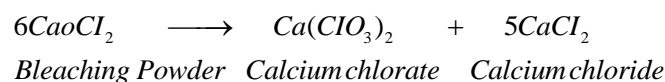


Coloured cloth + (O) \longrightarrow Bleached (colourless).

Once the cloth is bleached, it cannot regain its original colour.

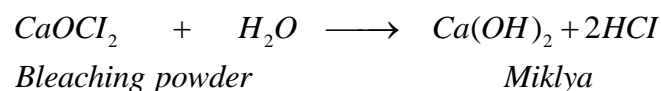
Q.43. A sample of bleaching powder was kept in an air tight container. After a month. It lost some of its chlorine content. How will you account for it?

Ans. Bleaching powder if kept even in an air tight container, will slowly decompose of its own and from calcium chlorate and calcium chloride. The reaction is called auto-oxidation. This will result in decrease in chlorine contents.



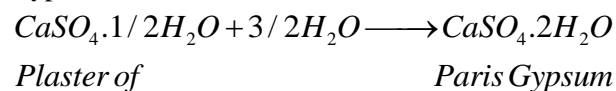
Q.44 Bleaching powder forms a milky solution in water. Explain.

Ans. When bleaching powder is dissolved in water, the solution becomes milky due to the formation of a small amount of $Ca(OH)_2$.



Q.45. A doctor applied surgical bandages on the fractured bones of a patient after making them wet. What changes are likely to occur?

Ans. Surgical bandages are made from Plaster of Paris. When applied on the fractured bones after making them wet. It changes into a hard mass called Gypsum.



The hard mass keeps the bones in proper position and the gap is slowly filled because of calcification that is taking place on the broken part. This helps in uniting broken bones and they change to a single piece again.

VERY SHORT ANSWER QUESTIONS

Q.46. Give the names and formulae of two (i) strong monobasic acids (ii) two weak dibasic acids?

Q.47. How will you show that acetic acid is monobasic acid?

Q.48. Why alkalis like sodium hydroxide and potassium hydroxide should not be left exposed to air?

Q.49. What is the relation between hydrogen ion concentration of an aqueous solution and pH?

Q.50. The pH of an aqueous solution decreases from 3 to 2. What will happen to the nature of the solution ?

Q.51. What happens to the crystals of washing soda when exposed to air ?

Q.52. State whether an aqueous solution of washing soda is acidic or alkaline.

Q.53. Name a compound of sodium which is used for the softening of hard water.

Q.54. What is the chemical name and chemical formula of baking soda ?

Q.55. When a few drops of phenolphthalein Indicator were added to the solution of some compound 'A' the solution became pink. What does it indicate ?

Q.56. Which is a stronger acid ? A solution with pH 5 and a solution with pH 2 ?

Q.57. What is the nature of NaHCO_3 salt ?

Q.58. Give two examples of the salts belonging to the chloride family.

Q.59. What will be the colour acquired by a basic solution if a few drops of indicator methyl orange are added to it?

Q.60. Name any two olfactory indicators.

Q.61. The pH of three solutions A, B and C are 4, 9 and 6 respectively. Arrange them in increasing order of acidic strength.

Q.62. Name the acid and base that have constituted the salt ammonium nitrate.

Q.63. Name the chemical substance which constitutes bee sting.

Q.64. Which substance constitutes the enamel coating of our teeth ?

Q.65. Suggest a way to reduce the alkaline nature of the soil.

SHORT ANSWER QUESTIONS

Q.66. A solution of acetic acid in water is highly concentrated. Will you call it a strong acid ? Explain.

Q.67. Why is not proper to call HCl(g) as hydrochloric acid ?

Q.68. An acidic solution always contains some OH^- ions in it. Comment.

Q.69. A milkman adds very small amount of baking soda to fresh milk. What happens to its pH ?

Q.70. Dry ammonia has no action on litmus paper but a solution of ammonia in water turns red litmus paper blue. Why is it so ?

Q.71. A few drops of phenolphthalein indicator were added to an unknown solution A. It acquired pink colour. Now another unknown solution B was added to it drop wise and the solution ultimately became colourless. Predict the nature of the solutions A and B.

Q.72. Classify the following as strong and weak acids :

Q.73. What will happen to the pH of an aqueous solution if a few drops of acid be added to it ?

Q.74. Explain why HCl is a strong acid while CH_3COOH is a weak acid.

Q.75. What is efflorescence ? Name the compound which shows efflorescence. Support your answer with a reaction.

Q.76. A baker found that the cake prepared by him is hard and small in size. Which ingredient has he forgotten to add that would have made the cake fluffy ? Give reason.

LONG ANSWER QUESTION

Q.77. What will you observe when :

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

(iii) Methyl orange is added to dilute hydrochloric acid.

(iv) A drop of phenolphthalein is added to the solution of lime water.

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

Q.78. Discuss the role of water in the ionisation of acids and bases.

Q.78. Explain why :

- (i) Common salt becomes sticky during the rainy season
- (ii) Blue vitriol changes to white upon heating
- (iii) Anhydrous calcium chloride is used in desiccators
- (iv) If bottle full of concentrated sulphuric acid is left open in the atmosphere by accident, the acid starts flowing out of the bottle of its own.

Q.80. How are salts formed? Discuss their classification based upon their chemical formulae as well as pH values.

Q.81. Discuss briefly some applications of pH in daily life.

PREVIOUS YEAR'S BOARD QUESTIONS WITH ANSWERS

Q.82. (a) A solution has a pH 7. Explain how you would :

- (i) increase its pH (ii) decrease its pH
 - (b) If a solution changes the colour of the litmus from red to blue, what can you say about its pH?
 - (c) What can you say about the pH of a solution that liberates carbon dioxide from sodium carbonate?
- (C.B.S.E. Delhi 1999)

Q.83. A compound which is prepared from Gypsum has a property of hardening when mixed with proper quantity of water. Identify the compound. Write chemical equation to prepare the compound. Mention one important use of the compound.

(C.B.S.E. Delhi 1999)

Q.84. (a) Give chemical names of the following compounds. Also state one use in each case.

- (i) Washing soda (ii) Baking soda (iii) Bleaching powder.

(C.B.S.E. Delhi 2000 Supp.)

Q.85. A chemical compound having smell of chlorine is used to remove yellowness of white clothes in laundries. Name the compound and write the chemical equation involved in its preparation.

(C.B.S.E. Delhi 2001 Supp.)

Q.86. Explain giving reasons :

- (i) Tartaric acid is a component of baking powder used in making cakes. (C.B.S.E. Sample Paper 2003)
- (ii) Gypsum. $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ is used in the manufacture of cement. (C.B.S.E. Sample Paper 2003)

Q.87. What happens when crystals of washing soda are exposed to air?

(C.B.S.E. Delhi 2003 : C.B.S.E. All India 2005)

Q.88. How is chloride of lime chemically different from calcium chloride? Why does chloride of lime gradually lose its chlorine when kept exposed to air?

(C.B.S.E. All India 2001)

Q.89. What is the chemical name of washing soda? Name three raw materials used in making washing soda by Solvay process.

(C.B.S.E. Delhi 2004)

Q.90. State the chemical property in each case on which the following uses of baking soda are based :

- (i) as an antacid
- (ii) as a constituent of baking powder.

(C.B.S.E. Delhi 2004)

Q.91. How is Plaster of Paris obtained? What reactions are involved in the setting of Plaster of Paris?

(C.B.S.E. Delhi 2004)

Q.92. How is Plaster of Paris chemically different from gypsum? How may these be inter converted? Write one use of Plaster of Paris.

Q.93. Name two industries based on the uses of washing soda.

(C.B.S.E. All India 2005)

Q.94. Write chemical name and formula of washing soda. What are the raw materials used for its manufacture by Solvay process? What happens when crystals of washing soda are exposed to air?

(C.B.S.E. Delhi 2005 Sept.)

Q.95. (a) Name the two chief chemicals used for making a soda acid fire extinguisher.

(b) How does the soda-acid fire extinguisher help to extinguish the fire?

(C.B.S.E. All India 2006)

Q.96. What is efflorescence? Give an example.

(C.B.S.E. Delhi 2006)

Q.97. (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 a higher pH value : 1M HCl or 1M NaOH solution?

(C.B.S.E. Delhi 2006)

Q.98. Out of calcium compounds calcium carbonate, quick lime and slaked lime, which one can be used for removing moisture from ammonia gas and why ? (C.B.S.E. Foreign 2006)

Q.99. (a) Name the raw materials used in the manufacture of sodium carbonate by Solvay process. (b) How is sodium hydrogen carbonate formed during Solvay process separated from a mixture of NH_4Cl and $NaHCO_3$?

(c) How is sodium carbonate obtained from sodium hydrogen carbonate ? (C.B.S.E. All India 2006)

Q.100. (a) What is the action of red litmus on (i) dry ammonia gas (ii) solution of ammonia gas in water ? (b) State the observations you would make on adding ammonium hydroxide to aqueous solution of (i) ferrous sulphate (ii) aluminium chloride. (C.B.S.E. All India 2006)

CBSE SAMPLE PAPER 2008

Q.101. Tooth enamel is one of the hardest substances in our body. How does it undergo damage due to the eating of chocolates and sweets ? What should we do to prevent it ?

Q.102. Baking soda is used in small amount in making bread and cake. It helps to make these soft and spongy. An aqueous solution of baking soda turns red litmus blue. It is also used in soda acid fire extinguisher.

Use this information to answer the following questions :

- How does Baking Soda help to make cakes and bread soft and spongy ?
- How does it help in extinguishing fire ?
- Is the pH value of baking soda solution lesser than or greater than 7 ?

Ans. (i) Baking soda is chemically sodium hydrogen carbonate. When the cake or bread is baked in microwave or oven, the compound decomposes to evolve carbon dioxide gas.



When the gas escapes as bubbles, it leaves behind pores which make the cakes or bread soft and spongy.

(ii) Baking soda is used in fire extinguishers along with sulphuric acid. When the need arises, the two react to evolve CO_2 gas. It escapes from the nozzle of the fire extinguisher with force and forms a cover or blanket around the fire. Since the gas does not support combustion, the fire gets extinguished.

(iii) Baking soda is an acid salt ($NaHCO_3$) since it still contains a hydrogen atom. In solution, it forms sodium hydroxide and carbonic acid.



Since $NaOH$ is a strong base, the pH of solution will be more than seven.

Q.103. Answer the following :

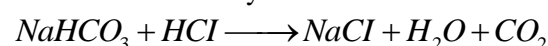
(a) Why is Plaster of Paris written as $CaSO_4 \cdot 1/2H_2O$? How is it possible to have half a water molecule attached to $CaSO_4$?

(b) Why is sodium hydrogen carbonate an essential ingredient in antacids ?

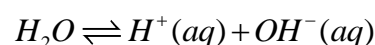
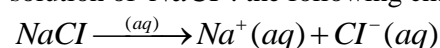
(c) When electricity is passed through an aqueous solution of sodium chloride, three products are obtained. Why is the process called chloro-alkali ?

Ans. (a) The actual formula of Plaster of Paris is $2CaSO_4 \cdot H_2O$ which means that one molecule of H_2O is associated with two molecules of $CaSO_4$. The formula is simplified and written as $CaSO_4 \cdot 1/2H_2O$.

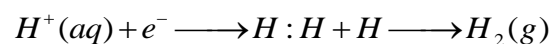
(b) Sodium hydrogen carbonate is an essential constituent of antacids because it neutralizes the effect of hydrochloric acid which is released in the stomach. That is why it is called antacid.



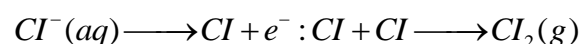
(c) Upon passing electricity through an aqueous solution of $NaCl$, the following changes occur.



At cathode : H^+ ions are discharged in preference to Na^+ ions which remain in solution. Hydrogen gas is evolved at cathode.



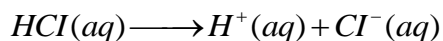
At anode : Cl^- ions are discharged in preference to OH^- ions which remain in solution. Chlorine gas is evolved at anode.



Both Na^+ ions and OH^- ions are present in solution as sodium hydroxide. Since an alkali ($NaOH$) and chlorine are formed in the reaction, the process is called chloro-alkali.

Q.104. Dry hydrogen chloride gas does not turn blue litmus red whereas hydrochloric acid does. Give one reason.

Ans. in the dry state. hydrogen chloride (HCl) does not release any H^+ ions. Therefore. It cannot behave as an acid. When dissolved in water. It forms hydrochloric acid which is written as $HCl(aq)$. It dissociates to give H^+ ions in solution. Therefore, it turns blue litmus red.



Q.105. During summer season, a milkman adds a very small amount of baking soda to fresh milk. Give one reason.

Ans. Milk contains in it a small amount of lactic acid. When the acid is in excess. the milk becomes sour. In summer. milk may undergo fermentation releasing more of lactic acid. As a result. it is likely to become sour. In order to neutralise the effect of lactic acid, a milkman generally adds a small amount of baking soda ($NaHCO_3$) to fresh milk.

MULTIPLE CHOICE QUESTIONS MCQS BASED ON TEXT PART

Select the correct Answers :

1. An acid can react with :

- (a) $AgCl$ (b) Na_2CO_3
(c) $PbSO_4$ (d) Na_2SO_4

2. A salt derived from strong acid and weak base will dissolve in water to give a solution which is :

- (a) acidic (b) basic
(c) neutral (d) none of these.

3. Which of the following does not form an acid salt ?

- (a) Phosphoric acid (b) Hydrochloric acid
(c) Carbonic acid (d) Sulphuric acid.

4. Which of the following metals can displace hydrogen from the aqueous solution of sodium hydroxide ?

- (a) Mg (b) Cu
(c) Al (d) Ag.

5. An aqueous solution with $pH = \text{zero}$ is :

- (a) acidic (b) alkaline
(c) neutral (d) amphoteric

6. The pH of a solution of hydrochloric acid is 4. The molarity of solution is :

- (a) 4.0 (b) 0.4 (c) 0.0001 (d) 0.04

7. When water is added to quick lime, the reaction is :

- (a) explosive (b) endothermic (c) exothermic
(d) photochemical.

8. Carbonic acid (H_2CO_3) is :

- (a) strong acid (b) weak acid
(c) strong base (d) weak base.

9. If pH of solution is 13, it means that it is:

- (a) weakly acidic (b) weakly basic
(c) strongly acidic (d) strongly basic.

10. Which is a base and not an alkali ?

- (a) $NaOH$ (b) KOH
(c) $Fe(OH)_3$ (d) none of these

11. The H^+ ion concentration of a solution is $1.0 \times 10^{-5} M$. The solution is :

- (a) acidic (b) alkaline
(c) neutral (d) amphoteric.

12. Which of the following salts on dissolving in water will give a solution with pH less than 7 at 298 K ?

- (a) KCN (b) CH_3COONa
(c) $NaBr$ (d) NH_4Cl

13. Which of the following gives carbon dioxide on heating ?

- (a) Slaked lime (b) Lime stone
(c) Quick lime (d) Soda ash.

14. Materials used in the manufacture of bleaching powder are :

- (a) lime stone and chlorine (b) quick lime and chlorine
(c) slaked lime and HCl (d) slaked lime and chlorine

15. Bleaching powder gives smell of chlorine because it:

- (a) is unstable
(b) gives chlorine on exposure to atmosphere
(c) is a mixture of chlorine and slaked lime
(d) contains excess of chlorine.

16. Baking powder contains baking soda and :

- (a) tartaric acid
(b) calcium bicarbonate
(c) sodium carbonate
(d) vinegar.

17. Plaster of Paris Is made from :

- (a) lime stone (b) slaked lime
(c) quick lime (d) gypsum.

18. Which of the following Is evolved when Na_2CO_3 is heated ?

- (a) CO_2 gas (b) CO gas
(c) O_3 gas (d) No gas.

19. Setting of plaster of Paris takes place due to :

- (a) oxidation (b) reduction
(c) dehydration (d) hydration.

20. Chemical formula of baking soda is :

- (a) $MgSO_4$ (b) Na_2CO_3
(c) $NaHCO_3$ (d) $MgCO_3$

21. A white chemical becomes hard on mixing with water and Is used In surgery. It is :

- (a) baking soda (b) baking powder
(c) washing soda (d) Plaster of Paris.

22. The chemical name of marble is :

- (a) Calcium carbonate (b) Magnesium carbonate
(c) Calcium chloride (d) Calcium sulphate.

23. Washing soda has the formula :

- (a) $Na_2CO_3 \cdot 7H_2O$ (b) $Na_2CO_3 \cdot 10H_2O$
(c) $Na_2CO_3 \cdot H_2O$ (d) Na_2CO_3

14. The raw materials required for the manufacture of Na_2CO_3 by Solvay process are :

- (a) $CaCl_2 \cdot (NH_4)_2CO_3 \cdot NH_3$ (b) $NH_4Cl \cdot NaCl \cdot Ca(OH)_2$
(c) $NaCl \cdot (NH_4)_2CO_3 \cdot NH_3$ (d) $NaCl, NH_3, CaCO_3$

25. Plaster of Paris hardens by :

- (a) Giving off CO_2 (b) Changing into $CaCO_3$
(c) Combining with water (d) Giving out water

26 The difference of water molecules In gypsum and Plaster of Paris is :

- (a) 5/2 (b) 2
(c) 1/2 (d) 3/2

MCQS BASED ON PRACTICAL SKILLS

- (i) (a) and (b) only
(ii) (a) and (c) only

Select the correct Answers :

27. Which one of the following is not required to find the pH of a solution ?

- (a) pH paper (b) Litmus paper
(c) Universal indicator (d) standard pH value chart
(C.B.S.E. All India 2007)

28. A drop of liquid sample was put on the pH paper. The colour of the pH paper turned blue, The liquid sample could be that of :

- (a) Lemon juice (b) Hydrochloric acid
(c) Sodium bicarbonate (d) Ethanoic acid
(C.B.S.E. All India 2007)

29. Dilute hydrochloric acid is added to solid sodium carbonate. It is observed that:

- (a) no change takes place (b) a loud sound Is produced
(c) brisk effervescence occurs (d) the solution turns blue
(C.B.S.E. AB India 2007)

30. The odour of acetic acid resembles that of :

- (a) rose (b) burning plastic
(c) vinegar (d) Kerosene
(C.B.S.E. AU India 2007)

31. Sodium bicarbonate solution is added to dilute ethanoic acid. It Is observed that :

- (a) a gas evolves (b) a solid settles at the bottom
(c) the mixture becomes warm (d) the colour of the mixture becomes light yellow
(C.B.S.E. AU India 2007)

32. A teacher gave two test tubes one containing water and the other containing sodium hydroxide to the students and asked them to identify the test tube containing sodium hydroxide solution. Which one of the following can be used for the Identification ?

- (a) Blue litmus (b) Red litmus
(c) Sodium carbonate solution
(d) Dilute hydrochloric acid
(C.B.S.E. AU India 2007)

33. Given below are certain chemical properties of a substance :

- (a) It turns blue litmus red
(b) It turns red litmus blue
(c) It reacts with zinc and a gas evolves
(d) It reacts with solid sodium carbonate to give brisk effervescence

Which out the following properties are shown by dilute hydrochloric acid ?

- (iii) (a), (c) and (d) only
(iv) (c) and (d) only (C.B.S.E. All India 2007)

34. Iron filings were added to solution of copper sulphate. After 10 minutes, it was observed that the blue colour of the solution changed and layer got deposited on iron filings. The colour of the solution and that of the layer would respectively be:

- (a) yellow and green
 - (b) brown and blue
 - (c) red and greenish blue
 - (d) green and reddish brown
- (C.B.S.E. All India 2007)

35. A dilute hydrochloric acid is dropped on a pH paper. The colour of pH paper turns to :

- (a) red
 - (b) light green
 - (c) light blue
 - (d) bright yellow
- (C.B.S.E. Delhi 2007)

36. When the stopper of a bottle containing colourless liquid was removed, the bottle gave a smell like that of vinegar. The liquid in the bottle could be :

- (a) hydrochloric acid solution
 - (b) sodium hydroxide solution
 - (c) acetic acid
 - (d) saturated sodium bicarbonate solution
- (C.B.S.E. Delhi 2007)

37. Two solutions A and B were found to have pH value of 6 and 8 respectively. The inference which can be drawn is that :

- (a) the acid strength of the solution A is higher than that of B
 - (b) A is an acid while B is a base
 - (c) both are acid solutions
 - (d) both are base solutions
- (C.B.S.E. Delhi 2007 Comptt.)

38. Acetic acid was added to a solid X kept in test tube. A colourless and odourless gas was evolved. The gas was passed through lime water which turned milky. It was concluded that :

- (a) solid X is sodium hydroxide and the gas evolved is CO_2 .
 - (b) solid X is sodium bicarbonate and the gas evolved is CO_2 .
 - (c) solid X is sodium acetate and the gas evolved is CO_2 .
 - (d) solid X is sodium bicarbonate and the gas evolved is CO_2 .
- (C.B.S.E. Delhi 2007 Comptt.)

39. Which of the following can be used to test the pH of a neutral solution ?

- (a) Red litmus paper
 - (b) Blue litmus paper
 - (c) Phenolphthalein
 - (d) Universal indicator
- (C.B.S.E. Delhi 2007 Comptt.)

Answers – zone

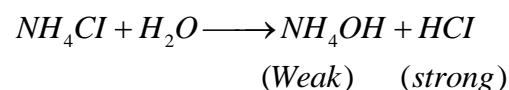
1. b	2. a	3. b	4. c	5. a	6. c	7. c	8. b
9. d	10. c	11. a	12. d	13. b	14. d	15. a	16. b
17. d	18. d	19. d	20. c	21. d	22. a	23. b	24. d
25. c	26. d	27. b	28. c	29. c	30. c	31. a	32. a
33. b	34. d	35. a	36. c	37. c	38. b	39. d	

3. (b) Hydrochloric acid (HCl) as it has only one replaceable

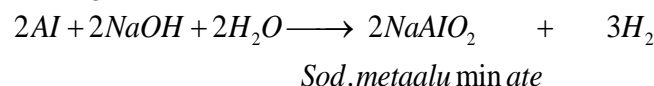
hydrogen atom present.

HINTS & EXPLANATIONS

- (b) Acid reacts with Na_2CO_3 to evolve CO_2 gas.
- (a) A salt of strong acid and weak base (e.g., NH_4Cl) will dissolve in water to give acidic solution



- (c) Al metal can displace hydrogen (H_2) on reacting with $NaOH$ solution

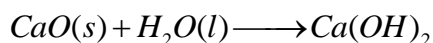


- (a) $pH = 0$, then $[H^+] = 10^0$. \therefore the solution is acidic

- (b) $pH = 4$ (given)

From the comparative chart, $[H^+] = 10^{-4} M$

- (c) The reaction is highly exothermic in nature



8. (b) H_2CO_3 is a weak acid
9. (d) Solution with pH = 13 is expected to be strongly basic.
10. (c) $Fe(OH)_3$ is a base and not alkali as it is not soluble in water.
11. (a) $[H^+] = 10^{-5} M$: $pH = 5$. The solution is acidic.
12. (d) The salt is of a weak base (NH_4OH) and strong acid (HCl).
13. (b) Lime stone evolves CO_2 on heating.
14. (d) is the correct answer.

15. (b) Bleaching powder gives chlorine on exposure to air by reacting with CO_2



16. (a) is correct answer.
17. (d) Plaster of Paris is formed by heating of Gypsum to 373 K.
18. (d) Na_2CO_3 does not decompose on heating. It simply melts.
19. (d) On hydration, the setting of Plaster of Paris takes place due to the formation of $CaSO_4 \cdot 2H_2O$ (Gypsum)
20. (c) is the correct answer.
21. (d) is the correct answer.
22. (a) Marble is calcium carbonate.
23. (b) is the correct answer.
24. (d) is the correct answer.
25. (c) Plaster of Paris is hardened by combining with water.
26. (d) Gypsum ($CaSO_4 \cdot 2H_2O$). Plaster of Paris ($CaSO_4 \cdot 1/2H_2O$)

Difference in no. of H_2O molecules = 3/2.

27. (b) A litmus paper cannot measure the pH of a solution.
28. (c) The sample is expected to give a weakly basic solution. It is sodium bicarbonate.
29. (c) Brisk effervescence will occur because $CO_2(g)$ will evolve as a result of the reaction.
30. (c) Acetic acid has vinegar smell.
31. (a) $CO_2(g)$ is evolved when sodium bicarbonate reacts with dilute ethanoic acid.
32. (b) The colour of the red litmus will change to blue.

SHORT ANSWER QUESTIONS

33. (iii) is the correct answer.
34. (d) is the correct answer.
35. (a) The colour of the pH paper will turn to red.
36. (d) Acetic acid has vinegar smell.
37. (c) The solution with pH 6 is an acid while the solution with pH 8 is a base.
38. (b) is the correct answer
39. (d) pH of a solution can be tested with universal Indicator.

SELF EVALUATION

VERY SHORT ANSWER QUESTIONS

1. Why is $NaOH$ an alkali while $Ca(OH)_2$ is not ?
2. Is ethanoic acid a tetra basic acid ?
3. What is the nature of neutralisation reaction ?
4. The pH of a solution is 9. Predict its nature.
5. What will happen to the colour of red litmus paper when dipped in the solution of an acid ?
6. Give two examples from daily life in which an alkali is used to counter the harmful effect of an acid.
7. What is 'Nettle stinging' ?
8. In what way are Plaster of Paris and Gypsum different ?
9. The $[H^+]$ of three solutions A, B and C are 10^{-4} , 10^{-10} , 10^{-12} . Arrange them in increasing acidic strength.
10. What is the difference between normal salt and acid salt ?
11. Why do blue crystals of copper sulphate turn white upon heating ?
12. What happens when water is added to Plaster of Paris ?
13. Why is it wrong to regard $HCl(g)$ as hydrochloric acid ?
14. Write the word equation and balanced equation for the reaction when carbon dioxide gas is bubbled through lime water.
15. Give two uses of washing soda.
16. What will happen to the pH of a solution if some hydrochloric acid is added to it ?
17. Give one example each of (i) normal salt (ii) acid salt (iii) basic salt.
18. What is the chemical formula of washing soda ?
19. In what respects do gypsum and Plaster of Paris differ ?
20. Which is a stronger acid : a solution with pH = 3 and a solution with pH = 5 ?

21. Point out whether the following statements are true or false :

- (i) More the pH value of a solution, more is its acidic character.
 (ii) Concentrated sulphuric acid is diluted by adding water to the acid.
 (iii) According to Arrhenius theory, acidic and basic character are shown only in aqueous solution.
 (iv) Slaked lime is used for the manufacture of bleaching powder.
22. Solutions *P*, *Q* and *R* have pH of 13, 8 and 2.
 (a) Which is a strong acid ?
 (b) Which is a strong base ?
 (c) Which is weakly basic in nature ?
23. An aqueous solution of sodium carbonate is basic in nature. How will you account for it ?
24. Doctors use paste of a white substance in water to maintain a fractured bone in fixed position. Identify the substance and write its chemical formula.
25. What is the role of baking soda in baking powder ?
26. What is the difference between strong acid and strong base according to Arrhenius theory ?
27. In the following salts, identify normal, acidic and basic salts.
 (a) Na_2HPO_4 (b) Na_2CO_3 (c) $KHCO_3$
 (d) $Ca(OH)Cl$ (e) NH_4HSO_4
28. Define the terms (i) deliquescence (ii) efflorescence.
29. pH of pure water is 7. Compare it with that of an aqueous solution of sulphur dioxide (SO_2) and ammonia (NH_3).
30. An aqueous solution of an acid contains some OH^- ions in it. Do you agree ? Justify your answer.
31. What is the role of pH in improving digestive system ?
32. Give three methods of preparation of salts along with chemical equation in each case.

LONG ANSWER QUESTIONS

33. What are strong and weak acids ? How will you know whether a particular acid is strong or weak ?

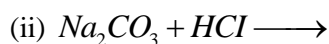
Predict the nature of the reaction when aqueous solution of an acid is mixed with an aqueous solution of a base.

34. How will you show that pure water does not conduct electricity while acidulated water is conducting in nature ?

38. Do acidic solutions also contain OH^- ions in them ? Justify your answer.

36. What is nettle stinging ? How does nature help in this regard ?

37. Complete the following equations :



38. Discuss the role of pH :

- (i) in human digestive system.
 (ii) in locating cause of tooth decay.
 (iii) in predicting the nature of soil.

39. Name the acids present in :

- (i) Oranges (ii) Ant sting (iii) Sour milk (iv) Tomatoes (v) Nettle sting (vi) Vinegar.

40. Cupric carbonate upon heating gave a black residue 'A' and a colourless gas 'B'. When the residue, 'A' was dissolved in warm and dilute sulphuric acid, blue solution was formed. This upon evaporation gave blue crystals of compounds 'C'. The gas 'B' when passed in to an aqueous solution 'D', turned the solution milky and when more of gas 'B' was passed into milky liquid, it turned colourless again. Identify A, B, C and D. Write equations for the reactions described.

41. From the formula listed below, choose one in each case corresponding to the salt having the given description.

- (i) an acid salt.
 (ii) an insoluble chloride.
 (iii) the salt changing from blue to white on treating with concentrated sulphuric acid.
 (iv) the salt changing from green to black on heating.
 (v) the salt giving nitrogen dioxide upon heating.

The End
