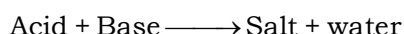


Chapter

5

ACIDS, BASES AND SALTS

- **Acids** : Acids (latin word acids which means sour) are sour in taste, turn blue litmus paper red and give hydronium ions (H_3O^+) in solution.
e.g., HCl , H_2SO_4 , HNO_3 etc.
- **Bases** : Bases are bitter in taste, have soapy touch, turns red litmus paper blue and give hydroxide ion (OH^-) in solution. e.g. – NaOH , KOH etc.
- **Salts** : A salt is a compound which is formed by neutralization reaction between an acid and a base.
e.g. : NaCl is formed by reaction between HCl and Sodium hydroxide.

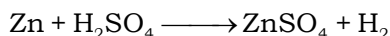
➤ **Indicator :**

Indicators are substances which indicate the acidic and basic nature of the solution by their colour change. The colour of some acid-base indicators in acidic and basic medium are given below :

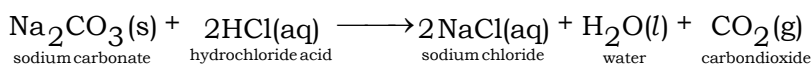
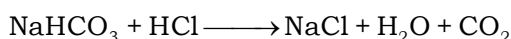
	Indicators	Colour in acidic medium	Colour in basic medium
1.	Litmus Solutions	Red	Blue
2.	Methyl orange	Pink	Orange (Yellow)
3.	Phenolphthalein	Colourless	Pink
4.	Methyl Red	Yellow	Red

➤ **Chemical properties of Acids :**

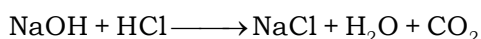
- (i) Acids react with active metal to give hydrogen gas.



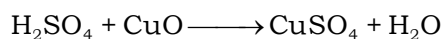
- (ii) Acids react with metals carbonate and metals hydrogen carbonate to give carbon dioxide.



- (iii) Acids react with bases to give salt and water. This reaction is called Neutralization reaction.



- (iv) Acids react with metals oxides to give salt and water.



- All acids contain hydrogen but all hydrogen containing compounds are not acids, for example,
- Glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) and alcohol ($\text{C}_2\text{H}_5\text{OH}$) contain hydrogen but they are not acids.
- Acids are the substances which contain hydrogen and which when dissolved in water give H^+ ions in the solution.
- Greater the amount of H^+ (aq) ions in the solution, stronger is the acid.
- The dilution of an acid with water is an exothermic reaction i.e. on mixing water to an acid, heat is produced.

Antacid is called as 'Milk of Magnesia'.

➤ **Chemical properties of bases**

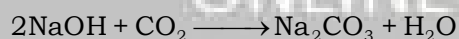
- **Reaction with metals :** Certain metals such as Zinc, Aluminium, Tin react with Alkali solutions on heating and hydrogen gas is evolved. All metals do not react with bases to form salts and hydrogen gas.



- **Reaction with acids :** Bases react with acids to form salt and water.



- **Reaction with non metallic oxides :** Non metallic oxides are generally acidic in nature. They react with bases to form salt and water.



- A base which is soluble in water is called an **alkali**. e.g. Sodium hydroxide (NaOH), Potassium hydroxide (KOH), Calcium hydroxide [$\text{Ca}(\text{OH})_2$].
- Metal carbonate and metal hydrogen carbonates are also considered to be bases because they neutralize the acids.

- **Strong and weak acids :** An acid which completely dissociates into ions in aqueous solution is called strong acid. Such as HCl , H_2SO_4 and HNO_3 etc. Weak acids are those which are weakly dissociated in its aqueous solution such as CH_3COOH , H_2CO_3 and HCN etc.

- **Strong and weak bases :** A base such as NaOH or KOH which is completely dissociated in aqueous solution is called a strong base. On the other hand a base which is weakly dissociated such as NH_4OH in its aqueous solution is called a weak base.

- **pH scale** : The concentration of hydrogen ions in solution is expressed in terms of pH. The pH of a solution is defined as the negative logarithm of hydrogen ion (H^+) or (H_3O^+) concentration in, moles per litre.

$$pH = -\log (H^+)$$

$$pH = -\log (H_3O^+)$$

Where (H^+) or (H_3O^+) represents concentrations of hydrogen ions in solution.

For Example : If (H^+) = $10^{-1} \text{ mol L}^{-1}$, then $pH = -\log (10^{-1}) = \log 10 = 1$

If (H^+) = $10^{-2} \text{ mol L}^{-1}$, then $pH = -\log (10^{-2}) = 2\log 10 = 2$

For water or neutral solutions,

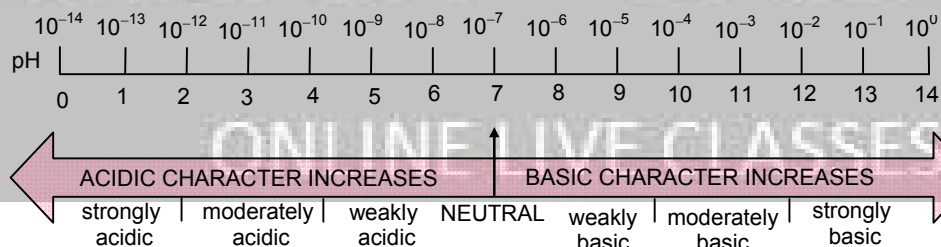
$$pH = 7$$

For acidic solutions, $pH < 7$

For basic solutions, $pH > 7$

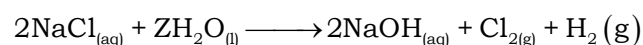
• **pH of salts :**

- (a) pH of salts of strong acid – strong base such as NaCl = 7
 (b) pH of salts of strong acid – weak base such as $CaSO_4$ is < 7
 (c) pH of salts of weak acid – strong base such as $CH_3COONa > 7$



➤ **Some important chemical compounds :**

- **Common salt (NaCl)** : Sodium chloride is known as common salt. Its main source is sea water. It also exists in the form of rocks and sodium chloride obtained from rocks is called rock salt. Common salt is an important component of our food. It is also used for preparing sodium hydroxide, baking soda, washing soda etc.
- **Sodium hydroxide or caustic soda (NaOH)** : Sodium hydroxide is prepared by passing electricity through an aqueous solution of sodium chloride (also known as brine).

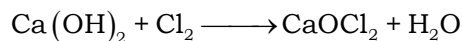


This process is known as Chlor-Alkali Process due to the formation of chlor for chlorine and alkali for sodium hydroxide as the products.

Properties :

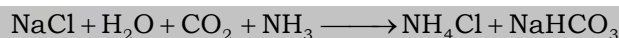
1. It is a white translucent solid.
2. It is readily soluble in water to give a strongly alkaline solution.
3. Crystals of sodium hydroxide are deliquescent.

- **Bleaching powder (CaOCl₂)** : Its chemical name is calcium oxy-chloride. It is prepared by passing chlorine gas through slaked lime.

**Uses :**

1. For bleaching cotton and linen in textile industry.
2. For bleaching wood pulp in paper industry.
3. For disinfecting drinking water

- **Baking Soda (NaHCO₃)** : Its chemical name is sodium hydrogen carbonate. It is prepared by passing CO₂ gas through brine solution saturated with ammonia.

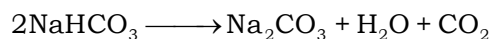


The precipitated sodium hydrogen carbonate is filtered off.

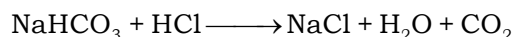
The function of adding tartaric acid or citric acid to baking soda in preparation of baking powder is to neutralize the sodium carbonate (Na₂CO₃) formed during heating of baking soda (during baking), as otherwise the cake or bread will taste bitter (sodium carbonate is basic in nature and have bitter taste).

Properties :

1. It is white crystalline solid, sparingly soluble in water at room temperature.
2. Its aqueous solution is weakly alkaline due to hydrolysis.
3. On heating, it decomposes to give sodium carbonate and carbon dioxide.

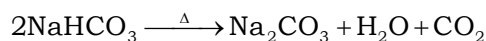
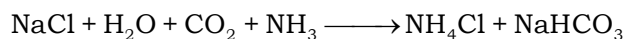


4. It reacts with acids to give CO₂ gas.

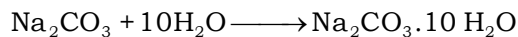
**Uses:**

1. It is used as a component of baking powder. In addition to sodium hydrogen carbonate baking soda contains tartaric acid.
2. It is used in soda-acid fire extinguisher.
3. It acts as mild antiseptic and antacid.

- **Washing Soda ($\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$)** : Its chemical name is sodium carbonate decahydrate. It is obtained by heating baking soda, obtained by passing CO_2 gas through sodium chloride solution saturated with ammonia.



Re-crystallization of sodium carbonate gives washing soda.

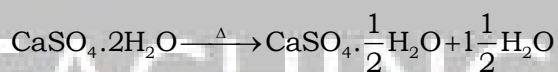


Anhydrous sodium carbonate Na_2CO_3 is called soda ash.

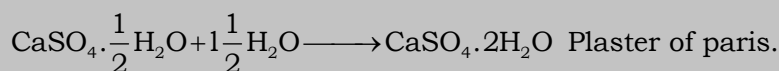
Uses :

1. It is used in glass, soap and paper industries.
2. It is used for removing permanent hardness of water.
3. It can be used as a cleaning agent for domestic purposes.

- **Plaster of paris ($\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$)** : Its chemical name is calcium sulphate hemihydrates. It is obtained by heating Gypsum up to 373K.



On treatment with water it is again converted in to Gypsum and sets as a hard mass.



Uses :

1. It is used by Doctors for setting fractured bones.
2. It is used for making statues, models and other decorative materials.



SOLVED EXAMPLE**Example 1:**

Name the acid-base indicator extracted from Lichen.

Solution:

Litmus.

Example 2:

What colour do the following indicators turn when added to an acid ?

- (a) Litmus (b) Phenolphthalein
(c) Methyl orange

Solution:

- (a) Blue Litmus to red (b) Colourless
(b) Pink

Example 3:

Name the acids present in (i) Vinegar (ii) Orange

Solution:

- (i) Acetic acid (ii) Citric acid

Example 4:

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

- (a) NaCl (b) HCl
(c) LiCl (d) KCl

Solution:

- (b) HCl

Example 5:

A metal X reacts with dilute sulphuric acid to form a gas Y which burns with a 'pop' sound making a little explosion. If one of the compounds formed is zinc sulphate:

- (a) Name the metal X
(b) Name the gas Y
(c) Write a balanced chemical equation of metal X with dilute sulphuric acid.

Solution:

- (a) Zn
(b) H₂ gas
(c) $\text{Zn} + \text{H}_2\text{SO}_4 \longrightarrow \text{ZnSO}_4 + \text{H}_2 \uparrow$

Example 6:

Explain why, while diluting an acid, the acid should be added to water and not water to the acid ?

Solution:

We know that dilution of concentrated acid is a highly exothermic process. If water is added to concentrated acid, the heat produced is so large that the solution may splash out and it may even break the beaker in which the dilution is carried out. Hence, while diluting a concentrated acid; acid should be added to water and not vice-versa.

Example 7:

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 ?

Solution:

- (a) Put the red litmus paper in all the test-tubes, turn by turn. The solution which turns red litmus paper to blue will be a basic solution.
- (b) Now put the blue litmus paper (obtained above) in the remaining two test-tubes, one by one. The solution which turns blue litmus paper to red, will be the acidic solution.

Example 8:

How is the concentration of hydroxide ion (OH^-) affected when excess of base is dissolved in a solution of sodium hydroxide ?

Solution:

The concentration of hydroxide ion (OH^-) increases.

Example 9:

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

Solution:

Slaked lime, $\text{Ca}(\text{OH})_2$

Example 10:

In addition to sodium hydrogen carbonate (NaHCO_3) baking powder contains a substance X. Name the substance X.

Solution:

Tartaric Acid.

Example 11:

What happens when blue crystals of CuSO_4 are heated ?

Solution:

When blue crystals of copper sulphate are heated, the water of crystallization is removed and anhydrous copper sulphate is formed.

Example 12:

Explain why plaster of paris should be stored in a moisture proof container ?

Solution:

Plaster of paris should be stored in a moisture proof container because in presence of moisture it gets hydrated. This will make it useless after some time.

□□□□□

TEACHING CARE

ONLINE LIVE CLASSES

EXERCISE**LEVEL-I**

1. Name two natural indicators.
2. Name two synthetic indicators.
3. What change in colour do you observe when methyl orange is mixed with an acid?
4. What are those indicators called whose odour changes in acidic or basic media ?
5. Name two olfactory indicators.
6. What is the effect of acid and base on phenolphthalein solution ?
7. Name the gas evolved when dilute acid reacts with a metal.
8. Define neutralization reaction.
9. Name the acid produced by our stomach.
10. Name the group of substances, used to neutralize the excess acid in our stomach.
11. What will be the effect on pH on increasing the hydronium ion concentration?
12. What is meant by dilution ?
13. Why does Bee-sting cause pain and irritation ?
14. What are alkalis ?
15. Why acids do not show acidic behaviour in absence of water?
16. Give reason:- Acids conduct electricity only in presence of water.
17. How is the concentration of hydronium ion (H_3O^+) affected when a solution of acid is diluted ?
18. Name the components present in baking powder ?
19. Why is tartaric acid added to baking soda in manufacturing baking powder ?

LEVEL-II

1. Four test tubes A, B, C and D contain the solutions having pH 3, 5, 8 and 12 respectively. Arrange them in increasing order of acidic character.
2. Write two differences between acidic and basic salts.
3. Why does distilled water not conduct electricity, whereas rain water does?

4. What happens when metal carbonates and metal hydrogen carbonates react with acids? Give the chemical equations for each.
5. Define water of crystallization. Give examples of two salts having water of crystallization.
6. What will happen when sodium hydrogen carbonate is heated? Write the chemical equation of the reaction involved.
7. Under what soil condition do you think a farmer would treat the soil of his field with quick lime (CaO) or slaked lime $\text{Ca}(\text{OH})_2$? What should be the nature of soil for a healthy growth of plants?
8. A milkman added a small amount of baking soda to fresh milk.
 - (a) Why does he shift the pH of fresh milk to slightly alkaline?
 - (b) Why does this milk take a longer time to set as curd?
9. Define antacids. Give any one example of antacids.
10. 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.
11. A metal compound X reacts with dilute Hydrochloric acid to produce effervescence. The gas evolved extinguishes a burning candle and turns lime water milky. Identify the gas evolved. Write a balanced chemical equation for the reaction if one of the compound formed is CaCl_2 .
12. Give reason - HCl, HNO_3 , etc. show acidic characters in aqueous solutions while alcohol and glucose solutions do not show acidic character?
13. Why should plaster of paris be stored in a moisture proof container? Write a chemical equation of the reaction between plaster of paris and water.

LEVEL-III

1. Name the acid present in following natural sources:-
 - (i) Vinegar
 - (ii) Tomato
 - (iii) Tamarind
2. Name the gas liberated when an acid reacts with a metal. Illustrate with an example. How will you test the presence of this gas?
3. Name the hardest chemical substance in the body of which tooth enamel is made. At what pH in the mouth does it get corroded? What kind of toothpaste should we use to protect our teeth?

4. Name the raw materials used in manufacturing of Baking soda. Write two important uses of baking soda.
5. A sanitary worker uses a white chemical having strong smell of chlorine gas to disinfect the water tank. Identify the chemical compound. Write its chemical formula. Give the chemical equation for its preparation.
6. On passing excess carbon dioxide gas through lime water, it first turns milky and then becomes colourless. Explain why? Write the chemical reactions taking place.
7. What changes will occur in mouth if the pH of the mouth is lower than 5.5 ? How can this change be controlled ? Write any two measures.
8. (i) Five test tubes A, B, C, D and E contain solutions having pH 2, 4, 7 and 8 respectively. Among these solutions which one is:-
 - (a) Strongly acidic.
 - (b) Strongly basic.
 - (c) Neutral
 - (d) Weakly acidic.
 - (e) Weakly basic.(ii) Arrange the pH in decreasing order of hydrogen ion concentration. Give one example for each of the above types. Give one important difference between weak acid and a strong acid.
9. What is chlor-alkali process ? Write the chemical reaction taking place. Name the gases given off at the anode and the cathode respectively. Write one use each of any two products produced in this process.
10. What happens when:-
 - (a) Excess of carbon dioxide is passed through lime water.
 - (b) Dry chlorine gas is passed over slaked lime.
 - (c) Electricity is passed through an aqueous solution of sodium chloride.
 - (d) Gypsum is heated at 373K.
 - (e) A solution of sodium hydrogen carbonate is heated.
11. Out of sodium hydrogen carbonate, sodium carbonate, plaster of paris, bleaching powder, and sodium hydroxide.
 - (a) Name the compound used for setting fractured bones.
 - (b) Name the compound used for making baking powder.
 - (c) Name the compound used for softening hard water.
 - (d) Name the compound used for bleaching cotton in textile industry.
 - (e) Name the compound used for making soaps and detergents.

MULTIPLE CHOICE QUESTIONS

Tick (✓) out the correct option :

- The acid used in making of vinegar is :
 - Formic acid
 - Acetic acid
 - Sulphuric acid
 - Nitric acid
- Common name of H_2SO_4 is
 - Oil of vitriol
 - Muriatic acid
 - Blue vitriol
 - Green vitriol
- $Zn + (X) \longrightarrow ZnSO_4 + H_2$.Here X is
 - $CuSO_4$
 - HCl
 - H_2SO_4
 - HNO_3
- Which of the following is the weakest base ?
 - NaOH
 - NH_4OH
 - KOH
 - $Ca(OH)_2$
- Reaction of an acid with a base is known as
 - Decomposition
 - Combination
 - Redox reaction
 - Neutralization
- When CO_2 is passed through lime water, it turns milky. The milkiness is due to the formation of
 - $CaCO_3$
 - $Ca(OH)_2$
 - H_2O
 - CO_2
- Caustic soda is the common name for
 - $Mg(OH)_2$
 - KOH
 - $Ca(OH)_2$
 - NaOH
- Antacids contain
 - Weak base
 - Weak acid
 - Strong base
 - Strong acid
- Calcium hydroxide (slaked lime) is used in –
 - Plastics and dyes
 - Fertilizers
 - Antacids
 - White washing
- Acids give
 - H^+ in water
 - OH^- in water
 - Both (a) & (b)
 - None of these

11. A solution turns red litmus blue. Its pH is likely to be :
- (a) 2 (b) 4
(c) 7 (d) 10
12. If pH of any solution is equal to zero then solution will be
- (a) Acidic (b) Basic
(c) Neutral (d) None of these
13. Methyl orange is
- (a) An acidic indicator (b) A basic indicator
(c) A neutral indicator (d) None of these
14. pH of Blood is –
- (a) 6.4 (b) 7.4
(c) 4.7 (d) 6.4
15. If pH of solution is 13, means that it is –
- (a) Weakly acidic (b) Weakly basic
(c) Strongly acidic (d) Strongly basic
16. Setting of plaster of paris takes place due to –
- (a) Oxidation (b) Reduction
(c) Dehydration (d) Hydration
17. Which is a base and not an alkali ?
- (a) NaOH (b) KOH
(c) $\text{Fe}(\text{OH})_3$ (d) None is these
18. Energy released in neutralization reaction which occurs between strong acid and strong base is
- (a) 57.8 kJ (b) 57.1 kJ
(c) 57.9 kJ (d) 56.1 kJ
19. A solution has pH 9. On dilution the pH value
- (a) Decreases (b) Increases
(c) Remain same (d) None of these
20. Which one of the following types of medicines is used for treating in digestion?
- (a) Antibiotic (b) Analgesic
(c) Antacid (d) Antiseptic
21. 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
22. The chemical name of marble is –
- (a) Calcium carbonate (b) Magnesium carbonate

- (c) Calcium chloride (d) Calcium sulphate
23. The raw materials required for the manufacture of NaHCO_3 by Solvay's process are –
- (a) $\text{CaCl}_2, (\text{NH}_4)_2\text{CO}_3, \text{NH}_3$ (b) $\text{NH}_4\text{Cl}, \text{NaCl}, \text{Ca}(\text{OH})_2$
(c) $\text{NaCl}, (\text{NH}_4)_2\text{CO}_3, \text{NH}_3$ (d) $\text{NaCl}, \text{NH}_3, \text{CaCO}_3, \text{H}_2\text{O}$
24. Plaster of Paris hardens by –
- (a) Giving off CO_2 (b) Changing into CaCO_3 .
(c) Combining with water. (d) Giving out water.
25. The difference in number of water molecules in gypsum and plaster of paris is -
- (a) $5/2$ (b) 2
(c) $1/2$ (d) $3/2$
26. H_2CO_3 is a
- (a) Strong acid (b) Weak acid
(c) Strong base (d) Weak base
27. Which of the following base ionizes in aqueous solution to produce three hydroxyl ions per molecule?
- (a) NaOH (b) $\text{Cu}(\text{OH})_2$
(c) $\text{Fe}(\text{OH})_3$ (d) KOH

QUESTIONS BASED ON HIGH ORDER THINKING SKILLS

1. Tooth enamel is one of the hardest substances in our body. How does it undergo damage due to eating chocolates and sweets? How do tooth pastes prevent this damage?
2. During summer season, a milkman usually adds a very small amount of baking soda to fresh milk. Give one reason.
3. A compound 'X' is used for drinking, has $\text{pH} = 7$. Its acidified solution undergoes decomposition in presence of electricity to produce gases 'Y' and 'Z'. The volume of Y is double than Z. Y is highly combustible whereas Z is supporter of combustion. Identify X, Y & Z and write the chemical reactions involved.
4. A compound X is bitter in taste. It is a component of washing powder and reacts with dil.HCl to produce brisk effervescence due to colourless, odourless gas Y which turns lime water milky due to formation of Z. When excess of CO_2 is passed, milkiness disappears due to formation of P. Identify X, Y, Z & P. Give the following reactions involved:
- (a) X with dil.HCl (b) Y with lime water

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 tells you about the chemical nature of the wasp stings ?
 - (b) If there were no baking soda in the house, what other household substance could you use to treat bee stings ?
6. 'A' is a soluble acidic oxide and 'B' is a soluble base. Compared to pH of pure water, what will be the pH of (a) solution of A (b) solution of B ?
7. A road tanker carrying an acid was involved in an accident and its contents spilled on the road. At the side of the road, iron drain covers began melting and fizzing as the acid ran over them. A specialist was called to see if the acid actually leaked into the nearby river.
 - (a) Explain how the specialist could carry out a simple test to see if the river water contains some acid or not.
 - (b) The word melting is incorrectly used in the report. Suggest a better name that should have been used.
 - (c) Explain why drain covers began fizzing as the acid run over them.
8. A compound 'X' on electrolysis in aqueous solution produces a strong base 'Y' along with two gases 'A' and 'B'. 'B' is used in manufacture of bleaching powder. Identify X, Y, A and B. Write chemical equations.
9. A yellow powder X gives a pungent smell if left open in air. It is prepared by the reaction of dry compound Y with chlorine gas. It is used for disinfecting drinking water. Identify X and Y. write the reaction involved.
10. When CO₂ gas pass through saturated solution of ammonical brine, two compound 'X' and 'Y' are formed. 'Y' is used as antacid and decomposes to form another solid 'Z'. Identify 'X', 'Y', 'Z' and write chemical equations.
11. A compound 'A' on heating at 373K gives 'B' used as plaster for supporting fractured bones in the right position. 'B' on mixing with water changes to 'A'. Identify 'A' and 'B' and write the chemical reaction.
12. A few drops of phenolphthalein indicator were added to an unknown solution A. It acquired pink colour. Another unknown solution B was added to it drop by drop and the solution becomes colourless. Predict the nature of A & B.
13. A student heated a few crystals of copper sulphate in a dry boiling tube.
 - (a) What will be the colour of the copper sulphate after heating ?
 - (b) What will you observe in the boiling tube ?
 - (c) Where have these come from ?
14. A substance 'X' used in the kitchen for making tasty crispy pakoras and is also an ingredient of antacid. Name the substance 'X'.

- (a) How does 'X' help to make cakes and bread soft and spongy.
- (b) Is the pH value of solution of 'X' lesser than or greater than 7.0 and why ?

VALUE BASED QUESTIONS

1. A student spills conc. H_2SO_4 on his hand. His friend washed his hand with water and also rubs solid sodium bicarbonate on his hand and then washed with water, finally burning sensation is relieved.
Answer the following questions based on situation.
- (i) Mention the values shown by student's friend.
- (ii) Can you recommend any other substance available in the laboratory which can be used instead of sodium bicarbonate ?
2. During chemistry practical some students were not serious about learning. They removed the labels from two bottles containing sulphuric acid and sodium hydroxide. Ankush approaches the teacher and informs about the incident.
Answer the following questions based on the situation.
- (i) Mention the values shown by Ankush.
- (ii) What could have happened if Ankush had informed the teacher about the incident ?
- (iii) Why is it important to be careful while handling chemicals in the laboratory ?
3. Farmers are using a large number of Pesticides and fertilizers in their fields to increase crop production and to enhance their profits. But by doing so they are causing damage to the soil as well as to the environment. Do you agree with this statement ? Why should we avoid eating fruits and vegetables without washing them properly ?
4. Shaan is a lazy boy but not interested in brushing his teeth regularly. His mother makes sure that he brushes his teeth twice a day.
- (i) Why does his mother insist on brushing teeth twice a day ?
- (ii) What values are promoted by his mother ?
5. If we eat sweets or otherwise after meals at night, it is suggested that we should brush our teeth. What quality (scientific, not brand) of tooth paste would you suggest? Also mention the values associated with it.
6. Incidents of acid throwing on faces, thereby causing burns on the face are being often reported. What steps should be taken to stop the incidents of acid throwing ? What values should be given to the students to avoid such incidents in future?

7. Liza's grandmother is suffering from high blood pressure. She suggested her grandmother to use less quantity of common salt. Why she has given such suggestion? What values are shown by Liza?

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TEACHING CARE

ONLINE LIVE CLASSES

WORKSHEET-1

1. (a) Fresh milk has a pH of 6. Write the change in pH when it turns into curd.
(b) Write the name and chemical formula of Plaster of Paris.
2. (a) Write the chemical name of milk of magnesia.
(b) Write the chemical name of bleaching powder and give its formula.
3. (a) Which ion causes basic nature of substance ?
(b) Three solution A, B, C have pH values 8, 9, 10 respectively. Arrange them in increasing order of their basic nature.
4. (a) What is brine ?
(b) Name the process involved in producing sodium hydroxide ?
5. (a) What is gypsum ?
(b) Write any two uses of washing soda.
6. (a) Name the indicator which can give us an idea of how strong or weak an acid or base is.
(b) Name two common antacids.
7. (a) A white powdery substance having a strong smell of chlorine is used for disinfecting drinking water supply at water works. Identify the substance.
(b) Name a sodium compound used for softening hard water.
8. (a) A milkman adds a very small amount of baking soda to fresh milk. Why ?
(b) State the important uses of baking soda (sodium hydrogen carbonate).



WORKSHEET-2

- Write the chemical formula of bleaching powder.
 - What happens when it is exposed to air?
- Identify these compounds:
 - A yellowish white powder which is a calcium compound used as a disinfectant and in textile industry.
 - A sodium salt containing ten molecules of water of crystallization.
 - A calcium salt which loses its water molecules to form a substance used as plaster for supporting fractured bones.
- Explain the term 'water of crystallization' with an example. What happens when copper sulphate crystals are heated strongly? Write equation of the reaction which takes place.
- Separate the following into substances having pH above and below 7. How do they influence litmus paper?
 - Lemon juice
 - Solution of washing soda
 - Toothpaste
 - Vinegar
 - Stomach juice
 - Milk of Magnesia
- What are alkalis? Give their examples.
 - Write the reaction between a metal oxide and dilute HCl acid.
- What is the importance of pH in everyday life?
 - What is water of crystallization? Give some examples of salts having water of crystallization?
- 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
 - Neutral
 - Strongly alkaline
 - Strongly acidic
 - Weakly acidic
 - Weakly alkaline
- What will happen if a solution of sodium hydrogen carbonate is heated? Give the equation of the reaction involved.
- With the help of a chemical reaction explain how a soda-acid fire extinguisher helps in putting out a fire.



WORKSHEET-3

1. Compounds like alcohols and glucose also contain hydrogen but are not categorized as acids. Why?
2. 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?
3. Why do HCl, HNO₃, etc. show acidic character in aqueous solutions while solutions of compounds like alcohol and glucose do not show acidic character?
4. (a) Why does distilled water not conduct electricity, whereas rain-water does ?
(b) Write some important chemical properties of bases.
5. Write balanced 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 aluminium powder.
 - (iv) Dilute hydrochloric acid reacts with iron filings.
6. Write some important chemical properties of acids.

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ONLINE LIVE CLASSES