

5.ACIDS,BASES AND SALTS(Practice Questions)

1. What are the common characteristics of acids?
2. What is acid rain?
3. What are environmental problems caused by acid rains?
4. Why it is said that the surrounding factories causes fading the brightness of Taj Mahal?
5. What measures can be taken against acid rain?
6. What are the common characteristics of Alkalis?
7. Write down the equation of reaction of calcium oxide (CaO) with water. Identify the chemical nature of calcium oxide.
8. Categorise the given oxides [NO₂, SO₃, CaO, K₂O, P₂O₅, Na₂O, MgO, CO₂] as metallic oxides and non metallic oxide. And also find out acidic and alkaline substances from them.
9. Write down the chemical formula of sulphuric acid, Hydrochloric acid, Carbonic acid and nitric acid and find out the common element present in them.
10. Give the equation of the reaction between Iron and dilute hydrochloric acid.
11. Acids get ionised when they are dissolved in water.
Write down the ionisation equation of HCl.
12. Give a definition for acids.
13. Acids are classified as monobasic, dibasic and tribasic acids.
 - a. What is the basis of this categorisation?
 - b. Give an example for each one.
14. Sulphuric acid (H₂SO₄), a dibasic acid, ionises in two stages. Write down the ionisation equations.
15. Sodium hydroxide, Calcium hydroxide, Ammonium hydroxide, magnesium hydroxide, potassium hydroxide etc. are examples for alkalis. Write down their chemical formula and identify the common component present in them.
16. Find out the alkalis which are known as Caustic soda, Milk of lime, Caustic potash.
17. Like acids, alkalis also ionise when they dissolve in water. Write down the ionisation equations of NaOH and Ca(OH)₂ and find out the common ion releases from them.
18. Give a definition for Alkali.
19. What is neutralisation? Give one example for the same.
20. What are called Antacids? Identify their chemical property.
21. Antacids are the medicines used for reducing acidity in the stomach. Name the reaction that leads to reduce acidity?
22. It is customary to sprinkle slaked lime in farms.
 - a. Give chemical name and chemical formula of slaked lime.
 - b. What is the science behind the sprinkling of slaked lime in farms?
23. Give a brief note on pH value.
24. Write down a neutralisation reaction and find out the substances formed.
25. It is given a list of few salts. Identify the acid and alkali that took part in the reaction of the formation of each salt. NaCl, MgSO₄, CaCO₃, KCl, Zn(NO₃)₂.
26. Briefly explain the method of arriving chemical formula of salts.
27. It is given positive ions Ca²⁺, NH₄⁺ and negative ions Cl⁻, SO₄²⁻, PO₄³⁻.
Write down the names and chemical formula of all the salts likely to be formed by combining one from each.
28. We use various salts in our daily life. Write down the chemical name and chemical formula of the following salts.
Washing soda, Blue vitriol, Common salt, Baking soda, Sylvine(Inthuppu), Gypsum.
29. Water is a neutral substance.
 - a. What is the pH value of pure water?
 - b. Find out a substance from the bracket whose pH value is less than 7.
(dilute hydrochloric acid, calcium hydroxide, caustic soda)
30. Fill the blanks.
 - a. In a solution having pH value is 9, the concentration of H⁺ ions is than that of OH⁻ ions.
(more/less)
 - b. When dilute hydrochloric acid reacts with a metal hydrogen gas is liberated. If it reacts with a

carbonate, will be released.

c. The basicity of Sulphuric acid (H_2SO_4) is

d. HNO_3 is an example for (monobasic acid/dibasic acid/tribasic acid)

e. When a few drops of phenolphthalein is added to a liquid, it doesn't show pink colour. Then the liquid is (either acidic or neutral/ basic/definitely acidic)

f. In all neutralisation reaction, a salt and are formed.

g. If a blue litmus is dipped into a solution of pH value 8, (it turns red/ its colour doesn't change)

h. When pH value increases, acidic property (increases/decreases)

i. When sodium hydroxide solution is added to dilute acid, the concentration of H^+ ions(increases/decreases)

31. See the table.

a. Find out the substance having highest concentration of OH^- ions .

b. What about the nature of blood? Basic or acidic?

c. Which is the substance having least concentration of H^+ ions?

d. Which one in the list is comparatively strong acidic?

31. A list of anions are given. Name each of them.

NO_3^{1-} , PO_4^{3-} , CO_3^{2-} , Cl^{1-} , HSO_4^{1-} ,

32. Complete the ionisation reaction of the following.

a. $\text{Mg}(\text{OH})_2 \rightarrow \dots + \dots$

b. $\text{H}_2\text{SO}_4 \rightarrow \dots + \dots$

c. $\text{HNO}_3 \rightarrow \dots + \dots$

d. $\text{HCl} \rightarrow \dots + \dots$

Substance	pH value
Vinegar	4.2
Lime water	10.5
Milk	6.4
Water	7
Tooth paste	8.7
Blood	7.36

Laymans Science

5.ACIDS,BASES AND SALTS(Practice Questions & Answers)

1. What are the common characteristics of acids?

Ans. have sour taste, liberate hydrogen while reacting with metals, turn blue litmus red, release carbon dioxide while reacting with carbonates.

2. What is acid rain?

Ans.The gases like $\text{NO}_2, \text{CO}_2, \text{SO}_2$ present in the atmosphere dissolve in rainwater and reaches the soil as acids. This is known as acid rain. Acid rain is detrimental to living beings.

3. What are environmental problems caused by acid rains?

Ans. Cause the destruction of plants,aquatic animals and corals. It also leads to the destruction of ancient buildings like TajMahal.

4. Why it is said that the surrounding factories causes fading the brightness of Taj Mahal?

Ans.The factories release the gases like SO_2 to the atmosphere in excess. This causes acid rain. It destroys Taj Mahal which is made of marble.

5. What measures can be taken against acid rain?

Ans. Reduce the use of fossil fuels like petrol, diesel etc.

Remove sulphur compounds from the fossil fuels as far as possible before use.

6.What are the common characteristics of Alkalis?

Ans. Alkaline taste, soapy to touch, turn red litmus blue.

7. Write down the equation of reaction of calcium oxide (CaO)with water. Identify the chemical nature of calcium oxide.

Ans. $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2$. CaO is an alkaline substance as it is an oxide of metal.

8. Categorise the given oxides [$\text{NO}_2, \text{SO}_3, \text{CaO}, \text{K}_2\text{O}, \text{P}_2\text{O}_5, \text{Na}_2\text{O}, \text{MgO}, \text{CO}_2$] as metallic oxides and non metallic oxide. And also find out acidic and alkaline substances from them.

Ans.

Metallic oxides (Alkaline substances)	Non metallic oxides(acidic substances)
$\text{CaO}, \text{K}_2\text{O}, \text{Na}_2\text{O}, \text{MgO}$	$\text{NO}_2, \text{SO}_3, \text{P}_2\text{O}_5, \text{CO}_2,$

9. Write down the chemical formula of sulphuric acid, Hydrochloric acid, Carbonic acid and nitric acid and find out the common element present in them.

Ans. sulphuric acid: H_2SO_4 , Hydrochloric acid: HCl ,

Carbonic acid: H_2CO_3 , Nitric acid: HNO_3

The common element present in all these acid is Hydrogen.

10. Give the equation of the reaction between Iron and dilute hydrochloric acid.

Ans. $\text{Fe} + 2\text{HCl} \rightarrow \text{H}_2 + \text{FeCl}_2$.

11. Acids get ionised when they are dissolved in water.

Write down the ionisation equation of HCl.

Ans. $\text{HCl} \rightarrow \text{H}^+ + \text{Cl}^-$ $\text{H}_2\text{O} + \text{H}^+ \rightarrow \text{H}_3\text{O}^+$

12. Give a definition for acids.

Ans. Acids are the substances that can increase the concentration of hydrogen ions (H^+) in an aqueous solution.

13. Acids are classified as monobasic, dibasic and tribasic acids.

a. What is the basis of this categorisation? b. Give an example for each one.

Ans.a.On the basis of the number hydrogen ions (H^+) obtained from one acid molecule.

b. Mono basic acid- Hydrochloric acid: HCl . Dibasic acid: Sulphuric acid. - H_2SO_4

Tribasic acid : Phosphoric acid. - H_3PO_4

14. Sulphuric acid (H_2SO_4), a dibasic acid, ionises in two stages. Write down the ionisation equations.

Ans. $\text{H}_2\text{SO}_4 \rightarrow \text{H}^+ + \text{HSO}_4^{1-}$. $\text{HSO}_4^{1-} \rightarrow \text{H}^+ + \text{SO}_4^{2-}$

15. Sodium hydroxide, Calcium hydroxide, Ammonium hydroxide, magnesium hydroxide, potassium hydroxide etc. are examples for alkalis. Write down their chemical formula and identify the common component present in them.

Ans. Sodium hydroxide: NaOH , Calcium hydroxide: Ca(OH)_2 .

Ammonium hydroxide : $\text{NH}_4(\text{OH})$ magnesium hydroxide : Mg(OH)_2 .

potassium hydroxide : KOH

Common component present in all these alkalis is OH

16 Find out the alkalis which are known as Caustic soda, Milk of lime, Caustic potash.

Ans. Caustic soda : NaOH, Milk of lime : Ca(OH)₂, Caustic potash: KOH.

17. Like acids, alkalis also ionise when they dissolve in water. Write down the ionisation equations of NaOH and Ca(OH)₂ and find out the common ion releases from them.

Ans NaOH ----> Na⁺ + OH⁻. Ca(OH)₂ -----> Ca²⁺ + 2OH⁻.

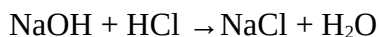
Common ion is OH⁻

18. Give a definition for Alkali.

Ans. Alkalies are the substances that can increase the concentration of hydroxide ions (OH⁻) in an aqueous solution.

19. What is neutralisation? Give one example for the same.

Ans. It is the reaction of acid and alkali by which their individual properties get nullified.



20. What are called Antacids? Identify their chemical property.

Ans. The medicines used for reducing acidity in the stomach are known as Antacids. They are alkaline substances.

21. Antacids are the medicines used for reducing acidity in the stomach. Name the reaction that leads to reduce acidity?

Ans. Neutralisation.

22. It is customary to sprinkle slaked lime in farms.

a. Give chemical name and chemical formula of slaked lime.

b. What is the science behind the sprinkling of slaked lime in farms?

Ans. a. Calcium hydroxide: Ca(OH)₂

b. Slaked lime is sprinkled in the soil where acidity is high. When slaked lime which is an alkali is added, acidity of soil decreases due to neutralisation.

23. Give a brief note on pH value.

Ans. By determining pH value of a substance, its acidic/alkaline property can be found out. pH scale is designed on the basis of the concentration of H⁺ ions present in aqueous solution. According to this scale, pH value of a substance lies between 0 and 14.

If pH value of a substance is less than 7, it will be acidic and if the value is greater than 7, it will be basic substance. PH value of neutral substance is 7.

That is, the concentration of the H⁺ ions and hence acidity of the substance decreases with increase of pH value.

24. Write down a neutralisation reaction and find out the substances formed.

Ans. NaOH + HCl ----> NaCl + H₂O

By neutralisation, a salt and water are formed.

25. It is given a list of few salts. Identify the acid and alkali that took part in the reaction of the formation of each salt. NaCl, MgSO₄, CaCO₃, KCl, Zn(NO₃)₂.

Ans (i). NaCl : HCl + NaOH (ii). MgSO₄: H₂SO₄ + Mg(OH)₂ (iii). CaCO₃:H₂CO₃ + Ca(OH)₂

(iv).KCl: HCl + KOH (v). Zn(NO₃)₂:.HNO₃ + Zn(OH)₂.

26. Briefly explain the method of arriving chemical formula of salts.

Ans. (i) Write the symbol of cation and then the symbol of anion. (Example. MgCl)

(ii) Write down the number of charges as subscript after interchanging them. (Example. Mg₁Cl₂)

(iii) Simplify the subscript and write them in the smallest number.

27. It is given positive ions Ca²⁺, NH₄⁺ and negative ions Cl⁻, SO₄²⁻, PO₄³⁻.

Write down the names and chemical formula of all the salts likely to be formed by combining one from each.

Ans. (i). CaCl₂ : Calcium chloride. (ii). CaSO₄ : Calcium sulphate

(iii). Ca₃(PO₄)₂: Calcium phosphate (iv). NH₄Cl: Ammonium chloride

(v).(NH₄)₂SO₄:Ammonium sulphate (vi). (NH₄)₃PO₄: Ammonium phosphate.

28. We use various salts in our daily life. Write down the chemical name and chemical formula of the following salts.

Washing soda, Blue vitriol, Common salt, Baking soda, Sylvine(Inthuppu), Gypsum.

Ans. a. Washing soda: Sodium carbonate - Na₂CO₃. b. Blue vitriol: Copper sulphate - CuSO₄

c. Common salt: Sodium chloride - NaCl. d. Baking soda: Sodium bicarbonate - NaHCO₃.

e. Sylvine: Potassium chloride - KCl. f. Gypsum: Calcium sulphate -CaSO₄.

29. Water is a neutral substance.

- What is the pH value of pure water?
- Find out a substance from the bracket whose pH value is less than 7.
(dilute hydrochloric acid, calcium hydroxide, caustic soda)

Ans. a. 7 b. dilute hydrochloric acid.

30. Fill the blanks.

- In a solution having pH value is 9, the concentration of H^+ ions is than that of OH^- ions.
(more/less)
- When dilute hydrochloric acid reacts with a metal hydrogen gas is liberated. If it reacts with a carbonate, will be released.
- The basicity of Sulphuric acid (H_2SO_4) is
- HNO_3 is an example for (monobasic acid/dibasic acid/tribasic acid)
- When a few drops of phenolphthalein is added to a liquid, it doesn't show pink colour. Then the liquid is ...
(either acidic or neutral/ basic/definitely acidic)
- In all neutralisation reaction, a salt and are formed.
- If a blue litmus is dipped into a solution of pH value 8, (it turns red/ its colour doesn't change)
- When pH value increases, acidic property (increases/decreases)
- When sodium hydroxide solution is added to dilute acid, the concentration of H^+ ions(increases/decreases)

- Ans.** a. In a solution having pH value is 9, the concentration of H^+ ions is less than that of OH^- ions.
 b. When dilute hydrochloric acid reacts with a metal, hydrogen gas is liberated. If it reacts with a carbonate, carbon dioxide will be released.
 c. The basicity of Sulphuric acid (H_2SO_4) is two.
 d. HNO_3 is an example for monobasic acid.
 e. When a few drops of phenolphthalein is added to a liquid, it doesn't show pink colour. Then the liquid is ...
either acidic or neutral.
 f. In all neutralisation reaction, a salt and water are formed.
 g. If a blue litmus is dipped into a solution of pH value 8, its colour doesn't change.
 h. When pH value increases, acidic property decreases.
 i. When sodium hydroxide solution is added to dilute acid, the concentration of H^+ ions decreases

31. See the table.

- Find out the substance having highest concentration of OH^- ions .
- What about the nature of blood? Basic or acidic?
- Which is the substance having least concentration of H^+ ions?
- Which one in the list is comparatively strong acidic?

Ans. a. Lime water.

- Basic.
- Lime water.
- Vinegar.

31. A list of anions are given. Name each of them.

NO_3^{1-} , PO_4^{3-} , CO_3^{2-} , Cl^{1-} , HSO_4^{1-} ,

Ans. a. NO_3^{1-} : nitrate. b. PO_4^{3-} : phosphate c. CO_3^{2-} : carbonates

Cl^{1-} : Chloride HSO_4^{1-} : bisulphate

32. Complete the ionisation reaction of the following.

- $Mg(OH)_2 \rightarrow \dots + \dots$
- $H_2SO_4 \rightarrow \dots + \dots$
- $HNO_3 \rightarrow \dots + \dots$
- $HCl \rightarrow \dots + \dots$

Ans. a. $Mg(OH)_2 \rightarrow Mg^{2+} + 2OH^{1-}$

b. $H_2SO_4 \rightarrow 2H^{1+} + SO_4^{2-}$

c. $HNO_3 \rightarrow H^{1+} + NO_3^{1-}$

d. $HCl \rightarrow H^{1+} + Cl^{1-}$

Substance	pH value
Vinegar	4.2
Lime water	10.5
Milk	6.4
Water	7
Tooth paste	8.7
Blood	7.36