

Chapter 2 – Acids, Bases and Salts

In-text Questions and Exercise Answers

Answers to In-text Questions

Question 1.

You are given three test tubes. One contains distilled water, one an acidic solution, and the third a basic solution. If only red litmus paper is given, how will you identify them?

Answer:

- Dip red litmus paper into all three solutions.
- The solution that turns red litmus blue is basic.
- Now use the blue litmus obtained from the basic solution in the remaining two test tubes.
- The solution that turns blue litmus red is acidic.
- The remaining test tube contains distilled water.

Question 2.

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

Answer:

Curd and sour substances are acidic. They react with metals and form poisonous salts which are harmful to health.

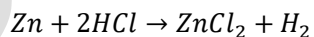
Question 3.

Which gas is usually evolved when acids react with metals? Explain with an example.

Answer:

Hydrogen gas is usually evolved.

Example



Test for Hydrogen Gas

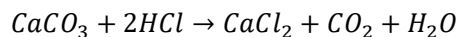
Bring a burning splinter near the gas. It burns with a “pop” sound.

Question 4.

A metal compound ‘A’ reacts with dilute HCl to produce effervescence. The gas extinguishes a burning candle. One product formed is calcium chloride. Write the balanced equation.

Answer:

Compound ‘A’ is calcium carbonate.



Question 5.

Why do HCl and HNO₃ show acidic character in aqueous solution, whereas glucose and alcohol do not?

Answer:

HCl and HNO_3 produce H^+ ions in water, so they show acidic character.

Glucose and alcohol do not produce H^+ ions in water, so they do not show acidic character.

Question 6.

Why do aqueous solutions of acids conduct electricity?

Answer:

Because acids dissociate into ions in water, and ions conduct electricity.

Question 7.

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

Answer:

Because HCl does not produce H^+ ions in the absence of water.

Question 8.

Why should acid be added to water and not water to acid?

Answer:

Adding acid to water releases heat safely.

If water is added to acid, the reaction may become violent and acid may splash out.

Question 9.

What happens to the concentration of hydronium ions (H_3O^+) when an acid solution is diluted?

Answer:

The concentration of H_3O^+ ions decreases.

Question 10.

What happens to the concentration of hydroxide ions (OH^-) when excess base is dissolved in water?

Answer:

The concentration of OH^- ions increases.

Question 11.

You have two solutions A and B. The pH of A is 6 and the pH of B is 8. Which has more hydrogen ion concentration?

Answer:

- Solution A has higher H^+ ion concentration.
- A is acidic.
- B is basic.

Question 12.

What effect does the concentration of H^+ ions have on the nature of a solution?

Answer:

- More H^+ ions \rightarrow More acidic solution
- Fewer H^+ ions \rightarrow Less acidic solution

Question 13.

Do basic solutions also contain H⁺ ions?

Answer:

Yes, but their concentration is lower than OH⁻ ions.

Question 14.

Under what soil conditions would a farmer use quicklime, slaked lime, or chalk?

Answer:

A farmer uses these substances when the soil becomes acidic.

Question 15.

What is the common name of Ca(OCl)₂?

Answer:

Bleaching powder

Question 16.

Which substance reacts with chlorine to form bleaching powder?

Answer:

Dry slaked lime [Ca(OH)₂]

Question 17.

Which sodium compound is used for softening hard water?

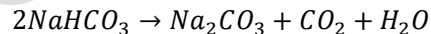
Answer:

Washing soda (Na₂CO₃·10H₂O)

Question 18.

What happens when sodium hydrogen carbonate is heated?

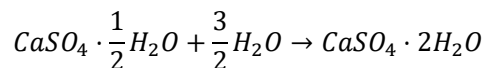
Answer:



Question 19.

Write the equation for the reaction of Plaster of Paris with water.

Answer:



Exercise Answers

Question 1.

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

Answer:

(d) 10

Question 2.

A solution reacts with crushed egg shells to produce a gas that turns lime water milky. What does the solution contain?

Answer:

(b) HCl

Question 3.

10 mL of NaOH solution completely neutralizes 8 mL of HCl solution. How much HCl will be required to neutralize 20 mL of the same NaOH solution?

Answer:

(d) 16 mL

Question 4.

Which medicine is used for treating indigestion?

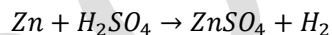
Answer:

(c) Antacid

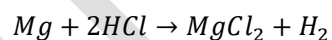
Question 5.

Write word equations and balanced chemical equations.

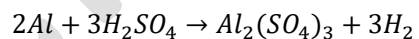
(a) Zinc + Dilute Sulphuric Acid



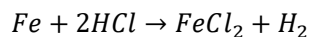
(b) Magnesium + Dilute Hydrochloric Acid



(c) Aluminium + Dilute Sulphuric Acid



(d) Iron + Dilute Hydrochloric Acid



Question 6.

Alcohol and glucose also contain hydrogen, but they are not classified as acids. Prove this with an activity.

Answer:

Their aqueous solutions do not conduct electricity because they do not produce H⁺ ions.

Question 7.

Why does distilled water not conduct electricity whereas rainwater does?

Answer:

Distilled water has no ions, while rainwater contains dissolved salts and ions.

Question 8.

Why does dry HCl gas not behave as an acid in the absence of water?

Answer:

Because HCl cannot produce H^+ ions without water.

Question 9.

Five solutions A, B, C, D, and E have pH values 4, 1, 11, 7, and 9 respectively.

Solution	pH
A	4
B	1
C	11
D	7
E	9

Answers:

- (a) Neutral \rightarrow D
- (b) Strongly basic \rightarrow C
- (c) Strongly acidic \rightarrow B
- (d) Weakly acidic \rightarrow A
- (e) Weakly basic \rightarrow E

Increasing order of H^+ ion concentration:

$C < E < D < A < B$

Question 10.

In which test tube will effervescence occur more rapidly and why?

Answer:

Effervescence will occur faster in the HCl test tube because HCl is a strong acid.

Question 11.

Fresh milk has a pH of 6. What happens to its pH when it turns into curd?

Answer:

The pH decreases because lactic acid is formed.

Question 12.

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

(a) Why does he make the milk slightly basic?

Answer:

To prevent the milk from becoming acidic quickly.

(b) Why does this milk take longer to set into curd?

Answer:

Because the baking soda neutralizes the acid formed in milk.

Question 13.

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

Answer:

Because it reacts with moisture and forms hard gypsum.

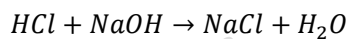
Question 14.

What is a neutralization reaction? Give two examples.

Answer:

A reaction between an acid and a base to form salt and water is called neutralization.

Example



Question 15.

Write two uses each of washing soda and baking soda.

Uses of Washing Soda

1. Washing clothes
2. Softening hard water

Uses of Baking Soda

1. Making cakes and bread
2. Used as an antacid