

GRADE 7 SCIENCE

CHAPTER 7: ACIDS, BASES AND SALTS

QUESTION BANK

A. Multiple choice questions

Choose the correct options. There may be more than one correct option for some questions.

- _____ is an organic acid.
a. tartaric acid b. nitric acid c. carbonic acid d. sulphuric acid
- Soft drinks and soda water are tangy because they contain _____ acid.
a. Lactic b. ascorbic c. acetic d. carbonic
- Acids react with carbonates to produce _____ gas.
a. Hydrogen b. carbon c. oxygen d. nitrogen
- _____ is used as an antacid (milk of magnesia) to neutralise stomach acidity.
a. zinc oxide b. sodium hydroxide c. magnesium hydroxide d. calcium oxide
- Usage of excess chemical fertilisers makes the soil acidic. The substance used to neutralise the acids in the soil is _____
a. calcium chloride b. calcium oxide c. calcium d. calcium sulphate

Ans: 1. a 2. d 3. b 4. c 5. b

B. Answer in brief.

- What are organic acids? Give examples.

Ans: Acids that are naturally occurring and are present in plants and animals are called organic acids.

Examples include lactic acid in milk, citric acid in lemons, oranges etc.

- What are mineral acids? Give examples

Ans: Acids such as sulphuric acid and nitric acid that are commonly used in laboratories, are called mineral acids

- Which are the strong and weak acids?

Ans: Acids that are naturally occurring and are present in plants and animals are called organic acids. They are weak acids.

Acids such as sulphuric acid and nitric acid that are commonly used in laboratories, are called mineral acids. They are strong acids.

4. Which is the weak mineral acid found in soft drinks?

Ans: Soft drinks and soda contain carbonic acid which is a weak mineral acid. It gives a tangy taste to these drinks.

5. What are concentrated and dilute acids?

Ans: If we dissolve a large quantity of hydrogen chloride gas in a small amount of water, we get concentrated hydrochloric acid.

If we dissolve a small quantity of hydrogen chloride gas in a large amount of water, we get dilute hydrochloric acid.

6. How can we dilute a concentrated acid?

Ans: It is possible to dilute concentrated acid by increasing the amount of water.

7. How can we concentrate a dilute acid?

Ans: It is also possible to concentrate a dilute acid by evaporating the water it contains.

8. What are alkalis?

Ans: Bases that are soluble in water are called alkalis.

9. Write a short note on strong and weak bases.

Ans: Bases can be either strong or weak. Strong bases can also burn our skin. Sodium hydroxide and potassium hydroxide are some examples of strong bases. Weak bases are very mild. For example, magnesium hydroxide is a weak base. It is consumed as an antacid to get relief from excessive acidity in the stomach.

10. What is milk of magnesia?

Ans: magnesium hydroxide is a weak base. It is also called milk of magnesia and consumed as antacid to get relief from excessive acidity in the stomach.

11. Name one example each of acidic, basic and neutral substances.

Ans: Acidic—hydrochloric acid; basic—baking soda; neutral—common salt

12. What is an indicator?

Ans: An indicator is a substance that changes colour in the presence of an acid or a base.

13. Name three substances that we use as indicators.

Ans: Litmus solution, turmeric and purple cabbage juice can act as indicators.

14. A few drops of purple cabbage juice are added to the colourless solution of a salt. The resulting solution becomes light purple. What does it indicate about the nature of salt?

Ans: It indicates that the salt is neutral. In acidic or basic conditions, the colour changes.

15. Give the colour change of litmus paper in acids and bases.

Ans: Paper that is soaked in litmus solution and dried is called litmus paper. When added to an acidic solution, it turns red, and when added to a basic solution, it turns blue.

16. How can China rose indicator be prepared in the laboratory?

Ans: China rose indicator is prepared by adding warm water to China rose petals in a beaker. After some time the water acquires a colour. It can be used as an indicator. It turns: (i) magenta in acidic solutions (ii) green in basic solutions

17. What are neutral substances?

Ans: Materials that are neither acidic nor basic are called neutral substance.

18. Does the neutral substance change the colour of indicators?

Ans: It doesn't change the colour of the indicator.

19. What is a neutralisation reaction? Give the chemical reaction to show the formation of common salt.

Ans: The reaction between an acid and a base resulting in the formation of salt and water is called a neutralisation reaction. Heat is produced during the reaction. The common salt we use in our food is sodium chloride (NaCl). It is formed by the neutralisation reaction between hydrochloric acid and sodium hydroxide as shown below:



20. What is neutralisation? What decides the nature of a salt formed during a neutralisation reaction?

Ans: In a neutralisation reaction, an acid and a base react to give salt and water. The nature of the salt depends on the strength of the acid and base used, for example, the salt of hydrochloric acid and ammonium hydroxide will be acidic whereas the salt of acetic acid and sodium hydroxide will be basic.

21. Will the product of neutralisation be always neutral?

Ans: No. The nature of the salt depends on the strength of the acid and base used

- When the acid is stronger, the salt is acidic
- When the base is stronger, the salt is basic
- When both the acid and base are equally strong, the salt is neutral.

22. Farmers sometimes sprinkle white lime powder in their fields. How does this help?

Ans: Excessive use of chemical fertilisers turns the soil acidic; therefore, farmers have to sprinkle some bases, such as quicklime/slaked lime, to neutralise the acidic soil.

23. You are given three materials in the form of solutions – citric acid, magnesium hydroxide and sodium sulphate. Describe how will you classify the substances as acidic, basic and neutral using purple cabbage solution.

Ans: Citric acid (acid) solution will turn the juice to red; magnesium hydroxide solution (base) will turn the juice green whereas no change will be observed in sodium sulphate solution (neutral).

24. Why is a strong acid added slowly to water to dilute it? Why is water not added to a strong acid?

Ans: When an acid dissolves in water, a large amount of heat is generated. If water is

added to a concentrated strong acid, the amount of heat generated may break the glass container and cause an accident. For this reason, acids are diluted by adding the concentrated acid slowly to water while stirring.

25. How can China rose indicator be prepared in the laboratory?

Ans: China rose indicator is prepared by adding warm water to China rose petals in a beaker. After some time the water acquires a colour. It can be used as an indicator. It turns:

- (i) magenta in acidic solutions
- (ii) green in basic solutions

26. What is a neutralisation reaction? Give the chemical reaction to show the formation of common salt.

Ans: The reaction between an acid and a base resulting in the formation of salt and water is called a neutralisation reaction. Heat is produced during the reaction. The common salt we use in our food is sodium chloride (NaCl). It is formed by the neutralisation reaction between hydrochloric acid and sodium hydroxide as shown below:



C. Answer in detail.

1. Write a short note on salts.

Ans: An acid reacts with a base to form water and a salt. For example, common salt that we use in our food is sodium chloride (NaCl). It is formed by the reaction between hydrochloric acid and sodium hydroxide.

Salts can be neutral, acidic or basic depending on the nature of the acids and bases used in the reaction.

The salt formed by the neutralisation of a strong acid by a weak base is acidic. For example, ammonium chloride (salt) is formed by the reaction of hydrochloric acid (a strong acid) and ammonium hydroxide (a weak base). This salt is acidic in nature.

The salt formed by the neutralisation of a weak acid and a strong base is basic. For example, sodium acetate (salt) formed by the reaction of acetic acid (a weak acid) and sodium hydroxide (a strong base). This salt is basic in nature.

A salt formed by the neutralisation of a strong acid by a strong base is neutral; for example, sodium chloride (common salt) is a neutral salt.

2. What are effluents? What is the effect of effluents on nature? How is it taken care of?

Ans: Liquid wastes are called effluents. Many factory effluents are acidic in nature. Hence if they are allowed to flow into a waterbody without prior treatment, the aquatic life like water plants and fishes will get affected. To avoid this, the effluents should be treated with some basic substances to neutralise, before being let into the water bodies.

3. Describe some properties of acids

- Acids have a sour taste
- All acids are soluble in water
- Acids are corrosive
- Acids react with metals to form hydrogen and salt
- Acids react with carbonates to produce salt, water and carbon dioxide.
- All dilute acids conduct electricity
- Acids change litmus red.

4. How is turmeric and purple cabbage used as indicators?

Ans: Turmeric is an indicator that changes colour from yellow to red when it comes in contact with a base. It does not change its colour in contact with an acid or neutral substance.

Turmeric is an indicator only for a base.

Purple cabbage juice, changes colour from purple to red when it comes in contact with acid and purple to green with a base. Thus, it is an indicator for an acid as well as for a base.

Indicators do not change colour with neutral solutions.

5. a) What is an indicator?

b) Name 2 indicators and their colour change in acids and bases.

Ans: a) An indicator is a substance that changes colour in the presence of an acid or a base

b) Purple Cabbage

Acid: purple to red

Base: purple to green

- Litmus paper

Acid: blue to red

Base: red to blue

- China rose

Acid: red to magenta

Base: red to green

(any 2 indicators and their colour change in acids and bases)

6. a) What is neutralization reaction ?

b) Write any 2 applications of neutralisation in daily life.

c) Under what conditions is the product of neutralisation formed acidic?

Ans: The reaction between an acid and base to give salt and water is called neutralisation reaction

Acid + Base \rightarrow salt + water + heat

b) Indigestion

Milk of magnesia neutralises the excess hydrochloric acid in stomach and relieves the discomfort that we feel.

Ant bite

The formic acid released during ant bite can be neutralised by rubbing baking soda or calamine solution.

Soil

To neutralise the acidity of soil, farmers add quick lime or slaked lime to the soil.

To neutralise alkaline soil, farmers add organic matter to soil.

c) When the acid is stronger, the salt formed is acidic

D. Give a use for each of the following substances.

1. tartaric acid
2. nitric acid
3. benzoic acid
4. potassium hydroxide
5. calamine solution (zinc oxide)

Ans: 1. as a preservative in soft drinks 2. to produce fertilisers 3. to preserve food
4. in alkaline batteries 5. treatment for ant bites