

Acid, Bases and Salts

1. **Question:** What are acids? Give two examples and describe their general properties.

- **Answer:** Acids are substances that release hydrogen ions (H^+) when dissolved in water. They have a sour taste, turn blue litmus paper red, and have a pH less than 7. Two common examples are hydrochloric acid (HCl) and sulfuric acid (H_2SO_4).

2. **Question:** Explain the role of acids in everyday life with two examples.

- **Answer:** Acids play significant roles in daily life. For example, acetic acid is present in vinegar used in cooking, and citric acid is found in citrus fruits, providing a sour taste. Additionally, hydrochloric acid aids in digestion in the human stomach.

3. **Question:** How can you test for the presence of an acid in a solution?

- **Answer:** To test for the presence of an acid, use litmus paper or pH indicators. Acids turn blue litmus paper red. Additionally, pH paper or a pH meter can be used to determine the acidity, where a pH value less than 7 indicates an acidic solution.

Topic: Bases and Their Properties

4. **Question:** Define bases and provide two examples.

- **Answer:** Bases are substances that release hydroxide ions (OH^-) when dissolved in water.

They have a bitter taste, slippery feel, and turn red litmus paper blue. Examples include sodium hydroxide (NaOH) and calcium hydroxide (Ca(OH)₂).

5. **Question:** What are the general properties of bases?

- **Answer:** Bases have a bitter taste, slippery texture, and turn red litmus paper blue. They are typically insoluble in water but, when dissolved, have a pH greater than 7. Some common bases include sodium hydroxide (NaOH) and ammonia (NH₃).

6. **Question:** How do bases behave in neutralization reactions?

- **Answer:** In neutralization reactions, bases react with acids to form salt and water. For example, sodium hydroxide reacts with hydrochloric acid to produce sodium chloride (NaCl) and water (H₂O). The reaction typically results in the neutralization of the acidic and basic properties.

Topic: pH Scale and Indicators

7. **Question:** What is the pH scale, and how does it classify substances as acids or bases?

- **Answer:** The **pH scale** is a measurement system used to indicate the acidity or basicity (alkalinity) of a solution. It ranges from 0 to 14:
- A **pH of 7** is considered neutral (e.g., pure water).
- A **pH less than 7** indicates an acidic solution (e.g., lemon juice has a pH around 2).
- A **pH greater than 7** indicates a basic (alkaline) solution (e.g., baking soda has a pH around 9)..

8. **Question:** Explain how universal indicators are used to measure pH.

- **Answer:** Universal indicators are mixtures of dyes that change color based on the pH of a solution. They provide a color scale corresponding to specific pH values. For example, a red color indicates a strong acid, green indicates neutral, and blue or violet indicates a strong base.

Topic: Neutralization Reactions

9. **Question:** What is a neutralization reaction? Provide an example.

- **Answer:** A neutralization reaction occurs when an acid reacts with a base to form salt and water. For example, hydrochloric acid (HCl) reacts with sodium hydroxide (NaOH) to produce sodium chloride (NaCl) and water (H₂O).



10. **Question:** Why are neutralization reactions important in daily life? Provide an example.

- **Answer:** Neutralization reactions are important in daily life for controlling pH. For example, antacids are bases that neutralize excess stomach acid, relieving indigestion. Similarly, agricultural lime (calcium hydroxide) is used to neutralize acidic soils.

Topic: Salts and Their Formation

11. **Question:** What are salts, and how are they formed?

- **Answer:** Salts are ionic compounds formed from the neutralization reaction between an acid and a

base. For example, when hydrochloric acid (HCl) reacts with sodium hydroxide (NaOH), the salt sodium chloride (NaCl) is formed along with water.



12. **Question:** Explain the importance of salts in daily life with examples.

- **Answer:** Salts have various applications in daily life. Sodium chloride (NaCl), commonly known as table salt, is used in cooking. Calcium carbonate (CaCO₃) is used in construction as limestone, and potassium nitrate (KNO₃) is used in fertilizers to promote plant growth.

13. **Question:** Differentiate between normal salts, acidic salts, and basic salts with examples.

- **Answer:** Normal salts are formed when all the hydrogen ions of an acid are replaced by metal ions (e.g., NaCl). Acidic salts are formed when only some of the hydrogen ions are replaced (e.g., NaHSO₄), while basic salts are formed from partial neutralization of a base (e.g., Mg(OH)Cl).

Topic: Strong and Weak Acids and Bases

14. **Question:** What is the difference between strong and weak acids? Provide examples.

- **Answer:** Strong acids completely dissociate into ions in water, while weak acids partially dissociate. For example, hydrochloric acid (HCl) is a strong acid, whereas acetic acid (CH₃COOH) is a weak acid.

15. **Question:** Compare strong and weak bases with examples.

- **Answer:** Strong bases fully dissociate in water to release hydroxide ions (OH^-), while weak bases partially dissociate. Sodium hydroxide (NaOH) is a strong base, and ammonia (NH_3) is a weak base.

Common Industrial Uses of Acids, Bases, and Salts

16. **Question:** List two industrial applications of acids and bases.

- **Answer:** Acids like sulfuric acid (H_2SO_4) are used in the manufacture of fertilizers and batteries. Bases such as sodium hydroxide (NaOH) are used in the production of soaps and detergents.

17. **Question:** How are salts used in industries? Give two examples.

- **Answer:** Salts are widely used in industries. Sodium chloride (NaCl) is used in the chemical industry for producing chlorine gas and caustic soda. Calcium carbonate (CaCO_3) is used in cement and glass manufacturing.