

Multiple Choice Questions

1. What is the chemical reaction between an acid and a base called?
 - ☐ A) Oxidation reaction
 - ☐ B) Neutralization reaction
 - ☐ C) Synthesis reaction
 - ☐ D) Decomposition reaction
2. Which of the following is a characteristic of acids?
 - ☐ A) They taste bitter
 - ☐ B) They turn red litmus blue
 - ☐ C) They turn blue litmus red
 - ☐ D) They are slippery to touch
3. What is the pH of a neutral solution?
 - ☐ A) 5
 - ☐ B) 6
 - ☐ C) 7
 - ☐ D) 8
4. Which acid is commonly found in tomatoes?
 - ☐ A) Citric acid
 - ☐ B) Oxalic acid
 - ☐ C) Lactic acid
 - ☐ D) Hydrochloric acid
5. What type of acid completely dissociates in water?
 - ☐ A) Weak acid
 - ☐ B) Strong acid
 - ☐ C) Base
 - ☐ D) Salt
6. Which of the following is a strong acid?
 - ☐ A) Acetic acid
 - ☐ B) Citric acid
 - ☐ C) Hydrochloric acid (HCl)
 - ☐ D) Formic acid
7. What is the product of a neutralization reaction between an acid and a base?
 - ☐ A) Only salt
 - ☐ B) Only water
 - ☐ C) Salt and water
 - ☐ D) Acid and base
8. Which of the following bases is commonly used in soap?
 - ☐ A) Sodium hydroxide (NaOH)
 - ☐ B) Potassium hydroxide (KOH)
 - ☐ C) Both A and B
 - ☐ D) Calcium hydroxide

9. What is the pH range of the human body?
- ☐ A) 6.0 to 7.0
 - ☐ B) 7.0 to 7.8
 - ☐ C) 8.0 to 9.0
 - ☐ D) 9.0 to 10.0
10. Which salt does not contain water of crystallization?
- ☐ A) Blue vitriol
 - ☐ B) Baking soda
 - ☐ C) Washing soda
 - ☐ D) Gypsum
11. What is the chemical formula for calcium carbonate?
- ☐ A) CaO
 - ☐ B) Ca(OH)_2
 - ☐ C) CaCO_3
 - ☐ D) CaCl_2
12. Which of the following is a weak acid?
- ☐ A) Hydrochloric acid (HCl)
 - ☐ B) Nitric acid (HNO_3)
 - ☐ C) Acetic acid (CH_3COOH)
 - ☐ D) Sulfuric acid (H_2SO_4)
13. What happens when zinc metal is treated with a dilute solution of a strong acid?
- ☐ A) A base is formed
 - ☐ B) A salt is formed
 - ☐ C) Hydrogen gas is evolved
 - ☐ D) Oxygen gas is evolved
14. Which of the following is a basic salt?
- ☐ A) Sodium chloride (NaCl)
 - ☐ B) Calcium phosphate ($\text{Ca}_3(\text{PO}_4)_2$)
 - ☐ C) Sodium carbonate (Na_2CO_3)
 - ☐ D) Copper sulfate (CuSO_4)
15. What is the Arrhenius definition of an acid?
- ☐ A) A substance that accepts a proton
 - ☐ B) A substance that donates a proton
 - ☐ C) A substance that releases hydroxide ions
 - ☐ D) A substance that absorbs water
16. Which of the following is an example of a non-metallic oxide that forms an acid when dissolved in water?
- ☐ A) Calcium oxide (CaO)
 - ☐ B) Sulfur dioxide (SO_2)
 - ☐ C) Iron oxide (Fe_2O_3)
 - ☐ D) Aluminum oxide (Al_2O_3)

17. What is the nature of calcium phosphate?
- ☐ A) Acidic
 - ☐ B) Basic
 - ☐ C) Neutral
 - ☐ D) Amphoteric
18. Which of the following substances turns pH paper yellowish-orange?
- ☐ A) Lemon juice
 - ☐ B) Vinegar
 - ☐ C) Common salt
 - ☐ D) Acidic soil solution
19. What would change the color of pH paper from yellowish-orange to greenish-blue?
- ☐ A) Lemon juice
 - ☐ B) Vinegar
 - ☐ C) Common salt
 - ☐ D) An antacid
20. Which of the following is not a characteristic of bases?
- ☐ A) They taste bitter
 - ☐ B) They turn red litmus blue
 - ☐ C) They are slippery to touch
 - ☐ D) They turn blue litmus red

True/False Questions

1. **True or False:** Acids always turn blue litmus red.
 - ☐ **Suggestion:** Acids are known for turning blue litmus red.
2. **True or False:** Bases are slippery to touch.
 - ☐ **Suggestion:** Bases often feel soapy or slippery.
3. **True or False:** Neutralization reactions always produce heat.
 - ☐ **Suggestion:** Neutralization reactions typically release heat.
4. **True or False:** All salts are neutral.
 - ☐ **Suggestion:** Salts formed from strong acids and strong bases are neutral.
5. **True or False:** Hydrochloric acid is a weak acid.
 - ☐ **Suggestion:** Hydrochloric acid is a strong acid.
6. **True or False:** The pH of a neutral solution is 7.
 - ☐ **Suggestion:** A pH of 7 indicates a neutral solution.
7. **True or False:** Oxalic acid is commonly found in tomatoes.

- **Suggestion:** Citric acid is more commonly associated with tomatoes.
- 8. **True or False:** Calcium phosphate is an acidic salt.
 - **Suggestion:** Calcium phosphate is a basic salt.
- 9. **True or False:** Sodium hydroxide is used in soap making.
 - **Suggestion:** Sodium hydroxide is commonly used in soap production.
- 10. **True or False:** The human body maintains a pH range of 6.0 to 7.0.
 - **Suggestion:** The human body maintains a pH range of 7.0 to 7.8.
- 11. **True or False:** Washing soda contains water of crystallization.
 - **Suggestion:** Washing soda does not contain water of crystallization.
- 12. **True or False:** Acetic acid is a strong acid.
 - **Suggestion:** Acetic acid is a weak acid.
- 13. **True or False:** Zinc reacts with a strong acid to produce oxygen gas.
 - **Suggestion:** Zinc reacts with a strong acid to produce hydrogen gas.
- 14. **True or False:** Sodium carbonate is a neutral salt.
 - **Suggestion:** Sodium carbonate is a basic salt.
- 15. **True or False:** Arrhenius defined an acid as a substance that accepts a proton.
 - **Suggestion:** Arrhenius defined an acid as a substance that donates a proton.

Short Answer Questions

1. **Explain the difference between strong and weak acids.**

Answer: Strong acids completely dissociate in water to produce a high concentration of hydrogen ions, while weak acids only partially dissociate, resulting in a lower concentration of hydrogen ions.

2. **Describe the characteristics of bases.**

Answer: Bases are substances that taste bitter, feel slippery, and turn red litmus blue. They neutralize acids to form salts and water.

3. **What is the significance of the pH scale?**

Answer: The pH scale measures the concentration of hydrogen ions in a solution, with a pH of 7 being neutral, below 7 being acidic, and above 7 being basic.

4. **Explain the process of neutralization between an acid and a base.**

Answer: Neutralization occurs when an acid reacts with a base to form a salt and water. This reaction typically releases heat.

5. What are the uses of baking soda and washing soda?

Answer: Baking soda (sodium bicarbonate) is used as a mouthwash and deodorant, while washing soda (sodium carbonate) is used for cleaning and removing stains.

Fill-in-the-Blank Questions

1. Acids are substances that _ a proton in aqueous solutions.

Answer:

2. The reaction between an acid and a base to form salt and water is known as a _ reaction.

Answer:

3. Bases are substances that taste _ and turn red litmus _.

Answer:

4. The pH of a neutral solution is _.

Answer:

5. Hydrochloric acid (HCl) is an example of a _ acid.

Answer:

6. Calcium phosphate is a _ salt because it is formed from a weak acid and a strong base.

Answer:

7. Sodium hydroxide (NaOH) is commonly used in _ making.

Answer:

8. The human body maintains a pH range of _ to _.

Answer:

9. Washing soda does not contain _ of crystallization.

Answer:

10. Acetic acid is an example of a _ acid.

Answer:

11. Zinc reacts with a strong acid to produce _ gas.

Answer:

12. Sodium carbonate is a _ salt.

Answer:

13. Arrhenius defined an acid as a substance that _ a proton.

Answer:

14. The pH scale measures the concentration of _ ions in a solution.

Answer:

15. Neutralization reactions typically _ heat.

Answer: