Title
Acids, Bases, And Salts: A Chemical Conundrum

Topic
Acids, Bases, And Salts

Country
India

Class/Grade
10th

Curriculum
ICSE

Subject
Chemistry

Difficulty Level
Intermediate

Number Of Questions
20

Number Of Individual Questions
15

Number Of Comprehension Passages
1

Number Of Questions (In Each Passage)
5

Acids, Bases, and Salts: A Chemical Conundrum

Created By Afia Siddiqui

Standalone Questions

Questions:

1. Which of the following is a characteristic property of a base?
   - Turns blue litmus red
   - Has a sour taste
   - Reacts with metals to produce hydrogen gas
   - Feels slippery or soapy to the touch
2. What is the chemical formula for sulfuric acid?
   - \ce{HCl}
   - \ce{HNO3}
   - \ce{H2SO4}
   - \ce{CH3COOH}
3. When an acid reacts with a metal carbonate, what gas is produced?
   - Hydrogen
   - Oxygen
   - Carbon dioxide
   - Nitrogen
4. Which of the following is a weak acid?
   - Hydrochloric acid (\ce{HCl})

- Sulfuric acid (\ce{H2SO4})
- Nitric acid (\ce{HNO3})
- Acetic acid (\ce{CH3COOH})

5. What is the pH of a neutral solution?
   - 0
   - 7
   - 10
   - 14
6. Which of the following salts is formed by the partial replacement of hydrogen ions in sulfuric acid (\ce{H2SO4}) ?
   - \ce{Na2SO4}
   - \ce{NaHSO4}
   - \ce{NaCl}
   - \ce{NaOH}
7. What is the name of the reaction between an acid and a base?
   - Decomposition
   - Combustion
   - Neutralization
   - Single displacement
8. Which of the following is a strong base?
   - Ammonium hydroxide (\ce{NH4OH})
   - Calcium hydroxide (\ce{Ca(OH)2})
   - Potassium hydroxide (\ce{KOH})
   - Water (\ce{H2O})
9. What type of salt is formed when all the replaceable hydrogen ions of an acid are completely replaced by a metal ion?
   - Acidic salt
   - Basic salt
   - Neutral salt
   - Double salt
10. A solution turns red litmus paper blue. Which of the following could be the pH of the solution?

- 3
- 7
- 9
- 11

11. What is the chemical formula of baking soda, which is a common ingredient used in baking and is also known as sodium bicarbonate?
    - \ce{NaOH}
    - \ce{Na2CO3}
    - \ce{NaHCO3}
    - \ce{NaCl}
12. Which of the following acids is found in our stomach and helps in digestion?
    - Sulfuric acid
    - Nitric acid
    - Hydrochloric acid
    - Acetic acid
13. What is the term used to describe the fixed number of water molecules present in one formula unit of a salt?
    - Hydrated salt
    - Anhydrous salt
    - Water of crystallization
    - Deliquescence
14. Which of the following is NOT a use of bases?
    - Manufacturing of soap
    - Neutralizing acidic soil
    - Production of car batteries
    - As an antacid to relieve indigestion
15. What happens to the pH of a solution when a strong acid is added to it?
    - The pH increases.
    - The pH decreases.
    - The pH remains the same.
    - The pH becomes neutral.

Answers:

1. Feels slippery or soapy to the touch
2. \ce{H2SO4}
3. Carbon dioxide
4. Acetic acid (\ce{CH3COOH})
5. 7
6. \ce{NaHSO4}
7. Neutralization
8. Potassium hydroxide (\ce{KOH})
9. Neutral salt
10. 11
11. \ce{NaHCO3}
12. Hydrochloric acid
13. Water of crystallization
14. Production of car batteries
15. The pH decreases.

Comprehension Passages

Passage 1:

In a chemistry lab, students were tasked with identifying different solutions as acids, bases, or salts. They were provided with litmus paper, magnesium ribbon, and phenolphthalein solution. One solution, labeled 'A', turned blue litmus red, reacted vigorously with magnesium ribbon to produce a colorless gas, and remained colorless upon adding phenolphthalein.

Questions:

1. **Based on the observations, what type of solution is solution 'A' most likely to be?**
   - A strong acid
   - A weak acid
   - A strong base
   - A salt
2. **Which of the following gases is most likely produced in the reaction between solution 'A' and magnesium ribbon?**
   - Oxygen
   - Carbon dioxide
   - Hydrogen
   - Nitrogen

3. **What color change would you expect to observe if red litmus paper was dipped in solution 'A'?**
   - The red litmus paper would turn blue.
   - The red litmus paper would remain red.
   - The red litmus paper would turn green.
   - The red litmus paper would turn yellow.
4. **If solution 'A' is neutralized with a base, what type of reaction will occur?**
   - Decomposition reaction
   - Neutralization reaction
   - Combustion reaction
   - Displacement reaction
5. **Which of the following could be a possible chemical formula for solution 'A'?**
   - NaOH
   - HCl
   - NaCl
   - H2O

Answers:

1. A strong acid
2. Hydrogen
3. The red litmus paper would remain red.
4. Neutralization reaction
5. HCl