Important Short Questions

1. **Question:** Define an acid according to the Arrhenius theory.
    - **Answer:** An Arrhenius acid is a substance that increases the concentration of hydrogen ions (H^+) in an aqueous solution. For example, hydrochloric acid (HCl) dissociates in water to produce H^+ ions.
2. **Question:** What are bases? Give two examples.
    - **Answer:** Bases are substances that accept protons (H^+) or donate hydroxide ions (OH^-) in a solution. Examples include sodium hydroxide (NaOH) and potassium hydroxide (KOH).
3. **Question:** What is the pH scale?
    - **Answer:** The pH scale is a logarithmic scale used to measure the acidity or alkalinity of a solution. It ranges from 0 to 14, where a pH less than 7 indicates an acid, a pH of 7 indicates neutrality, and a pH greater than 7 indicates a base.
4. **Question:** What is a neutralization reaction? Provide a general equation.
    - **Answer:** A neutralization reaction occurs when an acid reacts with a base to form a salt and water. The general equation is: Acid+Base→Salt+Water\text{Acid} + \text{Base} \rightarrow \text{Salt} + \text{Water}Acid+Base→Salt+Water
5. **Question:** Explain the term "self-ionization of water."
    - **Answer:** Self-ionization of water refers to the process where water molecules react with each other to form hydronium ions (H_3O^+) and hydroxide ions (OH^-). This equilibrium can be represented as: 2H2O↔H3O++OH−2\text{H}_2\text{O} \leftrightarrow \text{H}_3\text{O}^+ + \text{OH}^-2H2O↔H3O++OH−
6. **Question:** How do you test for acids and bases using litmus paper?
    - **Answer:** To test for acids, blue litmus paper turns red in acidic solutions. Conversely, red litmus paper turns blue in basic solutions. Neutral solutions do not change the color of either paper.
7. **Question:** What is the significance of the pH of 7 in solutions?
    - **Answer:** A pH of 7 signifies a neutral solution, meaning the concentrations of hydrogen ions (H^+) and hydroxide ions (OH^-) are equal. Pure water has a pH of 7 at 25°C.
8. **Question:** Describe the method of preparing salts by neutralization with an example.
    - **Answer:** Salts can be prepared by the neutralization of an acid with a base. For example, when hydrochloric acid (HCl) reacts with sodium hydroxide (NaOH), sodium chloride (NaCl) and water are produced: HCl+NaOH→NaCl+H2O\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}HCl+NaOH→NaCl+H2O

9. **Question:** What are the general properties of acids?
    - **Answer:** Acids typically have a sour taste, can conduct electricity, turn blue litmus paper red, and react with metals to produce hydrogen gas. They also have a pH less than 7.
10. **Question:** Explain the concept of strong and weak acids.
    - **Answer:** Strong acids fully dissociate into ions in aqueous solutions (e.g., hydrochloric acid), while weak acids only partially dissociate (e.g., acetic acid). This difference affects their conductivity and reactivity.