

7.14: End of Chapter Key Terms

Solutions, Acids, Bases, and pH

1. **Solution:** A homogeneous mixture composed of two or more substances, where one substance (solute) is dissolved in another (solvent).
2. **Solute:** The substance that is dissolved in a solution.
3. **Solvent:** The substance that dissolves the solute to form a solution; usually the component in greater quantity.
4. **Concentration:** The amount of solute present in a given quantity of solvent or solution; commonly expressed in molarity (M), which is moles of solute per liter of solution.
5. **Molarity (M):** A unit of concentration, defined as the number of moles of solute per liter of solution.
6. **Solubility:** The maximum amount of solute that can dissolve in a given amount of solvent at a specific temperature and pressure.
7. **Saturated Solution:** A solution that contains the maximum amount of dissolved solute at a given temperature and pressure.
8. **Unsaturated Solution:** A solution that contains less than the maximum amount of dissolved solute at a given temperature and pressure.
9. **Supersaturated Solution:** A solution that contains more dissolved solute than it would under normal circumstances, typically achieved by changing the temperature or pressure.
10. **Dilution:** The process of reducing the concentration of a solute in solution, usually by adding more solvent.
11. **Acid:** A substance that donates hydrogen ions (H^+) in an aqueous solution; characterized by a sour taste and the ability to turn blue litmus paper red.
12. **Base:** A substance that accepts hydrogen ions (H^+) or donates hydroxide ions (OH^-) in an aqueous solution; characterized by a bitter taste and slippery feel, and the ability to turn red litmus paper blue.
13. **pH Scale:** A logarithmic scale used to measure the acidity or basicity of a solution, ranging from 0 to 14, where 7 is neutral, values below 7 are acidic, and values above 7 are basic.
14. **pH:** The negative logarithm of the hydrogen ion concentration in a solution, $pH = -\log[H^+]$.
15. **pOH:** The negative logarithm of the hydroxide ion concentration in a solution, $pOH = -\log[OH^-]$.
16. **pKa:** The negative logarithm of the acid dissociation constant (K_a), a measure of the strength of an acid; lower pKa values indicate stronger acids.
17. **pKb:** The negative logarithm of the base dissociation constant (K_b), a measure of the strength of a base; lower pKb values indicate stronger bases.
18. **Buffer:** A solution that resists changes in pH upon the addition of small amounts of an acid or base, typically composed of a weak acid and its conjugate base or a weak base and its conjugate acid.
19. **Acid-Base Titration:** A laboratory technique used to determine the concentration of an acid or base by reacting it with a standard solution of known concentration.
20. **Equivalence Point:** The point in a titration at which the amount of titrant added is exactly enough to completely neutralize the analyte solution.
21. **Indicator:** A substance that changes color at a specific pH range, used to determine the endpoint of a titration.
22. **Strong Acid:** An acid that completely ionizes in aqueous solution (e.g., hydrochloric acid, HCl).
23. **Weak Acid:** An acid that partially ionizes in aqueous solution (e.g., acetic acid, CH_3COOH).
24. **Strong Base:** A base that completely dissociates in aqueous solution (e.g., sodium hydroxide, NaOH).
25. **Weak Base:** A base that partially ionizes or dissociates in aqueous solution (e.g., ammonia, NH_3).
26. **Acid Dissociation Constant (K_a):** A quantitative measure of the strength of an acid in solution, given by the equilibrium constant for the dissociation of the acid into its conjugate base and a hydrogen ion.
27. **Base Dissociation Constant (K_b):** A quantitative measure of the strength of a base in solution, given by the equilibrium constant for the dissociation of the base into its conjugate acid and a hydroxide ion.
28. **Neutralization Reaction:** A chemical reaction in which an acid and a base react to form water and a salt.
29. **Salt:** An ionic compound formed from the neutralization reaction of an acid and a base.
30. **Le Chatelier's Principle:** A principle stating that if a dynamic equilibrium is disturbed by changing the conditions, the position of equilibrium moves to counteract the change.
31. **Hydronium Ion (H_3O^+):** A water molecule with an extra proton, representing the form in which hydrogen ions exist in aqueous solution.

32. **Autoionization of Water:** The process by which water molecules dissociate into hydrogen ions (H^+) and hydroxide ions (OH^-), expressed as $\text{H}_2\text{O} \rightleftharpoons \text{H}^+ + \text{OH}^-$.
33. **Ion Product of Water (K_w):** The product of the concentrations of hydrogen ions and hydroxide ions in water, equal to 1.0×10^{-14} at 25°C .
34. **Standard Solution:** A solution of known concentration used in titrations.
35. **Molar Mass:** The mass of one mole of a substance, usually expressed in grams per mole (g/mol).
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