

20.8: End of Chapter Key Terms

Density, Mole, and Molarity Key Terms

1. **Density:** The mass of a substance per unit volume, often measured in grams per cubic centimeter (g/cm^3) or kilograms per cubic meter (kg/m^3).
2. **Mass:** The amount of matter in an object, usually measured in grams (g) or kilograms (kg).
3. **Volume:** The amount of space occupied by an object or substance, often measured in liters (L), cubic meters (m^3), or cubic centimeters (cm^3).
4. **Specific Gravity:** The ratio of the density of a substance to the density of a reference substance, typically water.
5. **Archimedes' Principle:** A principle stating that an object submerged in a fluid is buoyed up by a force equal to the weight of the fluid displaced by the object.
6. **Buoyancy:** The upward force exerted by a fluid on a submerged or partially submerged object.
7. **Mole (mol):** The SI unit for the amount of substance, defined as the amount of substance that contains as many entities (atoms, molecules, ions, etc.) as there are atoms in 12 grams of carbon-12 (approximately 6.022×10^{23} entities).
8. **Avogadro's Number:** The number of atoms, molecules, or particles in one mole of a substance, 6.022×10^{23} .
9. **Molar Mass:** The mass of one mole of a substance, usually expressed in grams per mole (g/mol).
10. **Molar Volume:** The volume occupied by one mole of a substance, typically measured for gases at standard temperature and pressure (STP).
11. **Standard Temperature and Pressure (STP):** Standard conditions for measuring gases, defined as a temperature of 0°C (273.15 K) and a pressure of 1 atm.
12. **Concentration:** The amount of a substance in a given volume of solution, typically expressed as molarity (M).
13. **Molarity (M):** A unit of concentration, defined as the number of moles of solute per liter of solution.
14. **Molality (m):** A unit of concentration, defined as the number of moles of solute per kilogram of solvent.
15. **Parts per Million (ppm):** A unit of concentration, defined as the number of parts of solute per million parts of solution, often used for very dilute solutions.
16. **Dilution:** The process of reducing the concentration of a solute in solution, usually by adding more solvent.
17. **Stock Solution:** A concentrated solution that can be diluted to a lower concentration for actual use.
18. **Dilution Formula:** The equation $C_1V_1 = C_2V_2$, where C_1 and V_1 are the concentration and volume of the stock solution, and C_2 and V_2 are the concentration and volume of the diluted solution.
19. **Equivalent Weight:** The mass of a substance that will react with or supply one mole of hydrogen ions (H^+) or hydroxide ions (OH^-) in an acid-base reaction, or one mole of electrons in a redox reaction.
20. **Normality (N):** A unit of concentration, defined as the number of equivalents of solute per liter of solution.
21. **Percent Composition:** The percentage by mass of each element in a compound.
22. **Empirical Formula:** The simplest whole-number ratio of atoms of each element in a compound.
23. **Molecular Formula:** The actual number of atoms of each element in a molecule of a compound.
24. **Density Formula:** The equation $\rho = \frac{m}{V}$, where ρ is density, m is mass, and V is volume.
25. **Ideal Gas Law:** The equation $PV = nRT$, where P is pressure, V is volume, n is moles of gas, R is the gas constant, and T is temperature in Kelvin.
26. **Gas Constant (R):** A constant used in the ideal gas law, typically $8.314 \text{ J/mol}\cdot\text{K}$ or $0.0821 \text{ L}\cdot\text{atm/mol}\cdot\text{K}$.
27. **Concentration Units:** Various units used to express concentration, including molarity (M), molality (m), normality (N), and parts per million (ppm).
28. **Stoichiometry:** The calculation of reactants and products in chemical reactions using the balanced chemical equation.
29. **Limiting Reactant:** The reactant that is completely consumed in a chemical reaction, limiting the amount of product formed.
30. **Excess Reactant:** The reactant that is not completely consumed in a chemical reaction and remains after the reaction is complete.

- 31. **Theoretical Yield:** The maximum amount of product that can be produced in a chemical reaction based on the amount of limiting reactant.
 - 32. **Actual Yield:** The amount of product actually produced in a chemical reaction.
 - 33. **Percent Yield:** The ratio of the actual yield to the theoretical yield, multiplied by 100 to give a percentage.
 - 34. **Solution Preparation:** The process of making a solution of a specific concentration by dissolving a known amount of solute in a specific volume of solvent.
 - 35. **Serial Dilution:** A stepwise dilution of a substance in solution, often used to create a series of solutions with decreasing concentrations.
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