Glossary

Activity | An effective concentration used in non-ideal solutions and gases to account for deviations from ideal behavior.

Adiabatic Process | A thermodynamic process in which no heat is exchanged between a system and its surroundings.

Avogadro's Law | States that equal volumes of gases at the same temperature and pressure contain an equal number of molecules.

Born-Haber Cycle | A thermodynamic cycle used to calculate lattice energy in ionic solids.

Buffer | A solution that resists changes in pH when small amounts of acid or base are added.

Calorimetry | The measurement of heat flow in chemical reactions and physical changes.

Carnot Cycle | A theoretical thermodynamic cycle that describes the most efficient heat engine possible.

Chemical Potential | The change in a system's Gibbs energy with the addition of a mole of a substance, at constant temperature and pressure.

Clapeyron Equation | Describes the relationship between pressure, temperature, and phase equilibrium.

Colligative Properties | Properties of solutions that depend on solute particle number rather than type, such as boiling point elevation.

Degree of Dissociation | The fraction of a dissolved substance that separates into ions in solution.

Electrochemical Cell | A system that generates electrical energy from chemical reactions.

Enthalpy | The heat content of a system at constant pressure.

Entropy | A measure of disorder or randomness in a system.

Equation of State | A mathematical equation that describes the state of matter under given conditions, such as the ideal gas law.

Free Energy | A thermodynamic quantity used to predict whether a reaction is spontaneous at constant pressure and temperature.

Fugacity | A corrected pressure term used to describe real gas behavior.

Gibbs-Duhem Equation | Relates the chemical potentials of components in a mixture.

Graham's Law of Effusion | States that the rate of effusion of a gas is inversely proportional to the square root of its molar mass.

Half-Life | The time required for half of a reactant to be consumed in a reaction.

Helmholtz Energy | A thermodynamic function that measures the work potential of a system at constant volume and temperature.

Ideal Gas Law | An equation describing the state of an ideal gas: $PV = nRT$.

Joule-Thomson Effect | Describes the temperature change of a real gas when it is expanded or compressed without heat exchange.

Kinetic Molecular Theory | A model that explains gas behavior based on particle motion and collisions.

Lattice Energy | The energy required to separate an ionic solid into its gaseous ions.

Le Chatelier's Principle | States that a system at equilibrium will adjust to counteract applied changes.

Maxwell's Relations | A set of thermodynamic equations derived from the symmetry of second derivatives of thermodynamic potentials.

Michaelis-Menten Mechanism | A model describing enzyme-catalyzed reactions.

Non-Ideal Solution | A solution that deviates from Raoult's law due to intermolecular interactions.

Partial Molar Volume | The volume contribution of a component in a mixture.

Phase Diagram | A graphical representation of phase stability as a function of temperature and pressure.

Pressure Dependence of Gibbs Energy | Describes how Gibbs energy varies with pressure.

Raoult's Law | States that the vapor pressure of a solvent is proportional to its mole fraction in solution.

Reaction Mechanism | A step-by-step description of how a chemical reaction occurs.

Reaction Rate | The speed at which reactants are converted to products.

Solubility | The ability of a substance to dissolve in a solvent.

Standard Reduction Potential | A measure of the tendency of a chemical species to gain electrons.

Steady-State Approximation | Assumes that the concentration of reaction intermediates remains constant over time.

Temperature Dependence of Equilibrium Constant | Describes how equilibrium constants change with temperature.

Transition State Theory | A model describing the high-energy transition state of a reaction.

Van 't Hoff Equation | Relates temperature changes to equilibrium constant changes.

Volume Dependence of Helmholtz Energy | Explains how Helmholtz energy changes with volume variations.