

Glossary

Absolute zero: The lowest possible temperature at which translational motion ceases. Also, it is defined as zero on the Kelvin scale.

Absorption spectrum: The few dark spaces in the continuous spectrum representing the radiation absorbed by the matter.

Accuracy: Refers to how close a measurement is to the true or correct value.

Acid ionization constant (K_a): The equilibrium constant expression for a weak acid.

Acid mine drainage: Water with a high concentration of sulphuric acid (H_2SO_4) that drains from mines.

Acid rain: A mixture of wet and dry acidic depositions from the atmosphere containing higher than normal amounts of nitric and sulphuric acids.

Acid: A compound that increases the H^+ concentration in aqueous solution.

Acidic solution: A solution in which some solute has made the molar concentration of H_3O^+ greater than that of OH^- ; $pH < 7$.

Actinoids: The 15 metallic elements between actinium and lawrencium.

Activity series: A list of metals in order of their reactivity as reducing agents.

Addition reaction: A reaction that results in an increase in the number of groups attached to a pair of atoms joined by a double or triple bond. An addition reaction is the opposite of an elimination reaction.

Adiabatic process: A process in which there is no transfer of heat between the system and surrounding.

Aliphatic compound: A non-aromatic compound such as an alkane, cycloalkane, alkene or alkyne.

Alkali metals: The metals which have one loosely held valence electron in their outermost shell and typically form univalent, ionic and colorless compounds.

Alkaline earth metals: A series of elements comprising Group 2 of the periodic table.

Alkanes: The hydrocarbons in which all the carbon – carbon bonds are single bonds.

Alkenes: The hydrocarbons that contain a carbon – carbon double bond.

Alkyl group: A functional group which consists of single bonded carbon and hydrogen atom.

Alkynes: The hydrocarbons with a carbon – carbon triple bond.

Allotrope: Different form of the same element arising due to different manner of the bonding of the atoms of the element.

Alpha (α)-hydrogen atom: A hydrogen atom attached to the α -carbon atom.

Alpha (α)-particle: A relatively slow-moving decay product consisting of two protons and two neutrons.

Amphiprotic: A molecule or ion that has both a conjugate acid and a conjugate base.

Amphoteric oxide: An oxide that can act both as an acid as well as a base.

Amphoteric substance: A substance that can be either an acid or a base depending on the other substance present.

Anion: A negatively charged ion.

Anode: The electrode at which oxidation takes place.

Antacids: The drugs which neutralize the acidity in stomach.

Antibonding molecular orbitals: The molecular orbitals that remove the electron density from between the nuclei and destabilize a molecule when occupied by electrons.

Aqueous tension: The pressure exerted by the liquid's vapor present in the space above *any* liquid.

Aromatic compound: A cyclic conjugated unsaturated molecule or ion that is stabilized by π electron delocalization. These organic compounds contain a benzene ring with a sweet aromatic fragrance.

Aromatization: The conversion of non-aromatic hydrocarbon to an aromatic hydrocarbon.

Arrhenius concept of acids and bases: Acids produce H^+ ions and bases produce OH^- ions in water.

Atom: The smallest fundamental particle of an element that has the properties of that element.

Atomic mass units: Numerically equal to $1.6605402 \times 10^{-24}$ g. It is also 1/12th of the mass of one atom of ^{12}C . Sometimes given the symbol amu. Nowadays, symbol u in used.

Atomic mass: The average mass (in u, unified mass) of the atoms of the isotopes of a given element as they occur naturally.

Atomic models: Models of the atom to explain the distribution of charged particles within the atom.

Atomic number (Z): The number of protons in the nucleus.

Atomic orbital: The specific shells and subshells in an atom where the probability of finding an electron is high.

Atomic radius: The distance from the nucleus of an atom to the outermost electron.

Atomic spectrum: The line spectrum produced when energized or excited atoms emit electromagnetic radiation.

Aufbau's principle: A set of rules enabling the construction of an electron structure of an atom from its atomic number.

Average atomic mass: The atomic mass computation including the existence of isotopes and their relative abundance.

Avogadro's constant: The number of particles in one mole of gas, that is, 6.023×10^{23} .

Avogadro's law: When measured at the same temperature and pressure, equal volumes of gases contain equal numbers of moles.

Avogadro's number: It is dimensionless and numerically equal to Avogadro's constant:

Axial bonds: Covalent bonds oriented parallel to the vertical axis in a trigonal bipyramidal molecule.

Azeotropic mixture: The liquid solutions of two (or more) components which have a composition that does not change on distillation.

Azimuthal or subsidiary quantum number: Describes the three-dimensional shape of the orbital occupied by an electron. It is represented by l and can have values from 0, 1, ... ($n - 1$).

Balanced equation: An equation that contains the same number of each kind of atom on each side of the equation.

Balmer formula: The empirical formula given by Balmer to calculate the wave number $\bar{\nu}$ of any line in the visible spectrum of atomic hydrogen.

Balmer series: The series of lines observed in the visible region given by the Balmer formula.

Base ionization constant (K_b): The equilibrium constant expression for a weak base.

Base: A compound that increases the OH^- concentration in aqueous solution.

Basic solution: A solution in which the molar concentration of OH^- exceeds that of H_3O^+ ; $\text{pH} > 7$.

Benzenoid aromatic compound: An aromatic compound whose molecules have one or more benzene rings.

Beta (β)-particle: A fast-moving electron that is ejected from an unstable nucleus. The electron is produced when a neutron transforms into a proton and electron.

Binary acid: Binary compounds between hydrogen and non-metals.

Biological oxygen demand (BOD): The amount of oxygen required for biochemical decomposition.

Biomagnification: The accumulation or increase in the concentration of a substance in the living tissue as it moves through a food web. Also known as bioaccumulation.

Blackbody radiation: The radiation emitted by a blackbody.

Blackbody: A body which can emit or absorb radiation of all frequencies.

Body burden: The content of heavy metals in our bodies.

Bohr model: A model of the atom in which electrons orbit around a central nucleus in discrete energy levels.

Bohr radius: The radii of the stationary states expressed as $r_n = n^2 a_0$.

Boiling point: The temperature at which the vapor pressure of the liquid equals the atmospheric pressure.

Bond angle: The angle between the orbitals containing bonding electron pairs around the central atom in a molecule.

Bond dipole: The dipoles associated with the bonds themselves.

Bond dissociation enthalpy: The standard enthalpy change when one mole of bond is broken through homolytic cleavage.

Bond enthalpy: The amount of energy required to break all the bonds present in one mole of a compound.

Bond length: The distance between two atoms involved in a chemical bond.

Bond order: The number of pairs of electrons shared between two bonded atoms in a molecule.

Bonding molecular orbitals: The molecular orbitals which concentrate electron density between nuclei and stabilize a molecule when occupied by electrons.

Bond-line formula: A formula that shows the carbon skeleton of a molecule with lines. The number of hydrogen atoms necessary to fulfill each carbon's valence is assumed to be present but not written in. Other atoms (e.g., O, Cl, N) are written in.

Borax bead test: B_2O_3 or borax when heated in a Bunsen burner flame with metal oxides on a loop of platinum wire forms a glass-like metaborate bead. The metaborate beads of many transition metals have characteristic colors and this test is used in identifying the metal.

Born-Haber cycle: A cycle devised by Born and Haber in 1919 that relates the formation of a crystal to thermochemical data.

Boundary surface diagrams: Diagrams showing constant probability density for different orbitals giving information about the shape of orbitals.

Boundary: A wall (visible or invisible) separating a system from its surrounding.

Boyle's law: The volume of a given amount of gas held at constant temperature varies inversely with the applied pressure.

Brønsted-Lowry acids and bases: Acids are proton donors and bases are proton acceptors.

Buffer: A solution that resists changes in pH and contains both a weak acid and a weak base.

Calorimeter: An apparatus used for measuring the amount of heat involved in a chemical reaction or other process.

Calorimetry: The science to calculate the heat of a reaction by using a calorimeter.

Canal/anode rays: Rays of positively charged particles that travel from the anode to the cathode.

Capillary action: The spontaneous rising of a liquid in a narrow tube.

Carbanion: A chemical species in which a carbon atom bears a formal negative charge.

Carbocation: A chemical species in which a trivalent carbon atom bears a formal positive charge.

Carcinogenic: A compound or substance which is cancerous in nature.

Catalyst: A substance which alters the rate of a chemical reaction without appearing in the end product of the reaction.

Catenation: Bonding of atoms of the same element into chains or rings.

Cathode rays: Rays of negatively charged particles moving from the negative electrode (the cathode) to the positive electrode (the anode), giving a bright spot on ZnS screen at the anode.

Cathode: The electrode at which reduction takes place.

Cation: A positively charged ion.

Celsius scale: A temperature scale on which water freezes at 0 °C and boils at 100 °C (at 1 atm) and that has 100 divisions called Celsius degrees between those two points.

Chalcogens: The elements with ns^2np^4 configuration (oxygen, sulphur, selenium, tellurium and polonium) comprising Group 16.

Charles' law: The volume of a gas is directly proportional to the Kelvin temperature (T) at constant pressure.

Chemical bonds: The force of electrical attraction that holds atoms together in compounds.

Chemical equation: A shorthand expression for a chemical change or reaction. It uses the chemical symbols and formulas of the reactants and products and other symbolic terms to represent a chemical reaction.

Chemical equilibrium: The state when the rate of forward reaction is equal to the rate of reverse reaction.

Chemical properties: The properties that describe the ability of a substance to form new substances, either by reaction with other substances or by decomposition.

Chemistry: The science that deals with the composition, structure and properties of substances and the reactions by which one substance is converted into another.

Chlorofluorocarbons (CFCs): The non-toxic, non-flammable organic molecules which are commonly used in refrigerators, food containers, insulation materials and plastic foam.

Chlorosis: A phenomenon in which long exposure to sulphur dioxide slows down the formation of chlorophyll in leaves, causing them to turn yellow.

Chromatography: A method of separating a mixture of components into individual components by equilibrium distribution between a stationary phase and a mobile phase.

Closed system: A system with a sealed boundary where matter cannot be transferred but energy can be transformed in the form of heat or work to and from the surroundings.

Coal gas: A mixture of CO, H₂, CH₄ and CO₂.

Coal gasification: The process of obtaining syngas from coke.

Combined gas law: The product of pressure and volume divided by temperature for a given gas sample is a constant.

Common ion effect: The solubility of one salt is reduced by the presence of another having a common ion.

Common ion: The ion in a mixture of ionic substances that is common to the formulas of at least two.

Compound: The substance that contains more than one element combined in fixed proportions.

Compressed natural gas: A colorless, odorless, tasteless gas consisting mainly of methane.

Concentrated solution: A solution containing a relatively large amount of a specified solute per unit volume.

Concentration table: A part of the strategy for organizing data needed to make certain calculations, particularly any involving equilibria.

Concentration: The amount of solute present in a specified amount of solvent or solution.

Condensed formula: A formula that shows atomic connectivity without showing bonds.

Conformation: Any three-dimensional arrangement of atoms that results from rotation about a single bond.

Conjugate acid–base pair: Two substances in a reaction that differ from each other only by one proton.

Continuous spectrum: The electromagnetic spectrum corresponding to the mixture of frequencies present (ranging from 7.5×10^{-14} Hz for violet to 4×10^{14} Hz for red) in white light.

Conversion factor: A fraction formed from a valid relationship or equality between units and is used to switch from one system of measurement and units to another.

Core electrons: The inner electrons of an atom that are not exposed to the electrons of other atoms when chemical bonds form.

Corrosion: The slow oxidation of metals exposed to air or water.

Covalent bond or electron pair bond: The bond formed between two atoms by mutual sharing of their outer electrons so as to complete their octets or duplets (in case of hydrogen which has only one shell).

Covalent radius: Represents the typical contribution by the element to the length of a predominantly covalent bond.

Critical pressure (p_c): The vapor pressure of a substance at its critical temperature.

Critical temperature (T_c): The temperature above which a substance cannot exist as a liquid regardless of the pressure.

Critical volume (V_c): The volume of one mole of gas at critical temperature.

Crystalline solid: A solid with a regular, symmetrical shape where the molecules or ions occupy set positions in the crystal lattice.

Crystallization: A process of purification of solid organic compounds based on the differences in solubilities of the compound and the impurities in the solvent.

Cyclic compound: A saturated hydrocarbon containing only one ring.

Dalton's atomic theory: Matter consists of tiny, indestructible particles called atoms. All atoms of one element are identical. The atoms of different elements have different masses. Atoms combine in definite ratios by atoms when they form compounds.

Dalton's law of partial pressures: The total pressure of a mixture of gases is the sum of their individual partial pressures.

Daniell cell: A voltaic cell made up of zinc and copper electrodes immersed in solutions of their respective ions that are connected by a salt bridge.

d-Block elements: Groups 3–12 of the periodic table which form the transition elements.

Decarboxylation: A reaction involving removal of carbon dioxide.

Decomposition reaction: A reaction involving breakdown of a reactant to two or more products.

Dehydrohalogenation: The removal of hydrogen halide from haloalkane.

Density: The ratio of an object's mass to its volume.

Deuterium: Isotope of hydrogen containing one proton and one neutron, represented as ${}^2_1\text{D}$.

Diagonal relationship: The similarities shown by elements diagonally across the periodic table, such as Li and Mg; Be and Al; B and Al.

Diamagnetic: A substance which is not attracted to magnetic field because of the absence of unpaired electrons.

Dilute solution: A solution containing a relatively small amount of a specified solute per unit volume.

Dimensional analysis: A problem-solving technique that converts from one unit to another by use of conversion factors.

Dipole moment (μ): The product of the sizes of the partial charges in a dipole multiplied by the distance between them; a measure of the polarity of a molecule.

Dipole–dipole forces: The forces of attraction between molecules possessing permanent dipoles.

Dipole-induced dipole forces: The forces experienced when a polar molecule having permanent dipole moment distorts the electron cloud of any neighboring molecule lacking permanent dipole, thus causing an induced dipole to be developed on the neighboring molecule.

Displacement reaction: A reaction in which one element of the compound is replaced by atom or ion of another element.

Disproportionation reaction: A reaction in which an element in a compound is simultaneously oxidized as well as reduced.

Distillation: A laboratory procedure where a solution is separated into its components by boiling the mixture and condensing the vapor to form a liquid.

Dobereiner's triads: The arrangement of several groups of three elements showing similarity in physical and chemical properties, in which the atomic weight of middle element was average of the atomic weight of the first and third elements.

Dot-density diagram: Illustrates the way the probability of finding the electron varies in space for an orbital.

Double bond: A covalent bond formed by sharing two pairs of electrons.

Dry deposition: The deposition of acidic oxides occurring directly on the solid and liquid ground surfaces.

Dynamic equilibrium: The two processes (a forward reaction in which reactants give product(s) and a backward or reverse reaction in which product(s) combine to give the original reactants) occur simultaneously, but at the same rate.

Effective nuclear charge: The net positive charge experienced by the outer shell electrons due to shielding effect.

Electric dipole: Two poles of electric charge separated by a distance.

Electrode potential: The potential associated with each electrode.

Electrode: A surface in a cell where the oxidation or reduction reaction takes place.

Electrolysis: The process of forcing electrical energy through an electrolytic cell, thereby causing a chemical reaction.

Electrolyte: A solute whose aqueous solution or molten state conducts electricity.

Electromagnetic radiation: The waves transmitted by alternating electrical and magnetic fields produced by accelerating charged particles.

Electromagnetic spectrum: The distribution of frequencies of electromagnetic radiation among various types of such radiation – microwave, infrared, visible, ultraviolet, X-rays and γ -rays.

Electromeric effect: A temporary displacement of π electrons in a multiple bond towards one of the bonded atoms at the demand of an attacking species.

Electron cloud: Because of its wave properties, an electron's influence spreads out like a cloud around the nucleus.

Electron density: The concentration of the electron's charge within a given volume.

Electron dot structures: A formula in which the bonding and non-bonding electrons are represented by dots.

Electron gain enthalpy: The energy released when an extra electron is added to a neutral gaseous atom.

Electron spin: The spinning of an electron about its axis that is believed to occur because the electron behaves as a tiny magnet.

Electron: A subatomic particle with a charge of $1-$ and mass of 0.0005486 u ($9.109383 \times 10^{-28} \text{ g}$) that occurs outside an atomic nucleus. It is the particle that moves when an electric current flows.

Electronegativity: The tendency of an atom to attract electrons for the formation of ionic bonds.

Electronic configuration: The assignment of all the electrons in an atom into specific shells and subshells.

Electronic theory of valency: The formation of a chemical bond between two or more atoms can be explained as tendency of elements to attain stable configuration of electrons in the outermost shell. The combining atoms may rearrange their electrons either by complete transfer of electrons from one atom to another or by sharing of electrons.

Electrophile: A Lewis acid or an electron-pair acceptor or an electron-seeking reagent.

Electropositive metals: The metals having the tendency to lose electrons and form cations.

Element: The substances that contain only one kind of particle – atoms or molecules.

Elimination: A reaction that results in the loss of two groups from the substrate and the formation of a π bond. The most

common elimination is a 1,2-elimination or β -elimination, in which the two groups are lost from adjacent atoms.

Emission spectrum: The spectrum of radiation emitted by a substance that has absorbed electromagnetic radiation.

Empirical formula: The simplest formula that gives the smallest whole number ratio of atoms present in a compound.

Energy level: A particular energy an electron can have in an atom or a molecule.

Energy: The energy associated with regions of the electromagnetic spectrum is related to wavelengths and frequency by the equation: $E = hc/\lambda$.

Enthalpy (H) of reaction: The amount of heat absorbed or evolved in a particular reaction, when the number of moles of reactants as represented by the balanced chemical equation change completely into the products.

Enthalpy change (ΔH): The difference in enthalpy between the initial state and the final state for some change.

Entropy: A thermodynamic property that is a measure of randomness or disorder of molecules in a system.

Environmental pollution: Disruption in the natural environment caused by the release of harmful contaminants (pollutants) into the air, water or soil by natural or artificial activities.

Equatorial bonds: A covalent bond located in the plane perpendicular to the long axis of a trigonal bipyramidal molecule.

Equilibrium constant expression: The ratio of the concentrations of the reactants and products.

Equilibrium constant: The value that the mass action expression has when the system is at equilibrium.

Eutrophication: A process by which a body of water develops a high concentration of nutrients, such as nitrogen and phosphorus.

Excited state: A term describing an atom or molecule where all of the electrons are not in their lowest possible energy levels.

Extensive property: A property that depends on the quantity of matter present in the system.

Fahrenheit scale: A temperature scale on which water freezes at 32 °F and boils at 212 °F (at 1 atm) and between which points there are 180 degree divisions called Fahrenheit degrees.

Fajans' rules: Set of rules stated by Fajans for the partial covalent character of ionic bonds due to polarization of the ions.

f-Block elements: Lanthanoids and actinoids of the periodic table placed separately at the bottom of the periodic table which form the inner transition elements.

Filtration: A laboratory procedure where solids are removed from liquids by passing the heterogeneous mixture through a filter.

First law of thermodynamics: An application of the law of conservation of energy, which states that energy can neither be created nor destroyed, that is, the total energy of the system remains constant, though it may change from one form to another. $\Delta E = q + W$.

First transition series: The set of transition elements with incomplete 3d shells.

Formal charge: The charge that each atom in a molecule would have if the electrons in the bonds were divided equally between the two atoms.

Formula mass: The sum of the atomic masses of the elements in the formula.

Fossil fuels: Fuels formed by anaerobic decomposition of dead buried organisms.

Free expansion: Expansion of a gas in vacuum.

Frequency (ν): The number of waves that pass a fixed point in unit time. Its unit is s^{-1} or Hz.

Functional group: The particular group of atoms in a molecule that primarily determines how the molecule reacts.

Gamma (γ)-ray: The packet of electromagnetic energy released when a nucleus remains unstable after α - or β -decay. γ -rays travel at the speed of light and carry no charge.

Gas constant: In ideal gas law, when p is in atmospheres and V is in liters, the value of R (gas constant) is 0.0821 L atm $mol^{-1} K^{-1}$ or 8.314 JK $^{-1} mol^{-1}$.

Gas: One of the states of matter with no definite shape or volume.

Gay-Lussac's law of gaseous volumes: When measured at constant T and p , the ratios of the volumes of reacting gases are small whole numbers.

Gay-Lussac's law: The pressure of a fixed amount of gas held at constant volume is directly proportional to the Kelvin temperature.

Gibbs energy (G): A thermodynamic quantity that relates enthalpy (H), entropy (S) and temperature (T) by the equation: $G = H - TS$.

Global warming: The rise in temperature of the earth's atmosphere caused due to increased absorption of greenhouse gases.

Green chemistry: A field of chemistry in which various processes are carried out in a way that there is no adverse impact on the environment.

Greenhouse effect: A naturally occurring process in which planetary thermal radiation is absorbed by atmospheric greenhouse gases and is reflected back to the earth in order to maintain the earth's temperature for sustaining life.

Ground state: The lowest energy state of an atom or molecule.

Group: The eighteen vertical columns of the periodic table.

Gypsum: A very soft sulphate mineral composed of calcium sulphate dihydrate.

Half-reaction: The oxidation or reduction process in a redox reaction written separately.

Halogens: The elements with ns^2np^5 configuration (fluorine, chlorine, bromine, iodine and actinium) comprising Group 17.

Hard water: The water containing an appreciable quantity of dissolved minerals, such as calcium and magnesium.

Heat capacity: The heat required to raise the temperature of a unit mass by 1 °C (or 1 K) at a specified temperature.

Heat: The energy transferred because of temperature difference between two systems.

Heisenberg's uncertainty principle: It is impossible to know both the position and momentum of a fast-moving particle accurately.

Hess's law: The heat absorbed or liberated in a given chemical equation is always constant and is the same whether the process occurs in one step or in several steps.

Heterocyclic compound: A compound whose molecules have a ring containing an element other than carbon.

Heterogeneous equilibrium: An equilibrium system involving more than one phase.

Heterogeneous mixture: The mixture which is non-uniform containing two or more components where portions of each component are large enough to be detected.

Heterolytic cleavage: The cleavage of a covalent bond so that one fragment departs with both of the electrons of the covalent bond that joined them. Heterolysis of a bond normally produces positive and negative ions.

Homocyclic or alicyclic compound: Compound in which the carbon atoms are joined in the form of a ring.

Homogeneous equilibrium: An equilibrium system in which all components are in the same phase.

Homogeneous mixture: The mixture which is the same throughout and the components disperse uniformly into each other.

Homologous series: A series of compounds in which each member differs from the next member by a constant unit.

Homolytic cleavage: The cleavage of a covalent bond so that each fragment departs with one of the electrons of the covalent bond that joined them.

Hund's rule of maximum multiplicity: Electrons that occupy orbitals of equal energy are distributed with unpaired spins as much as possible among all such orbitals.

Hybridization: A process of forming hybrid orbitals by mixing pure *s*, *p* and *d* orbitals. They overlap better with other orbitals than the pure atomic orbitals from which they are formed, so bonds formed by hybrid orbitals are stronger than those formed by ordinary atomic orbitals.

Hydrate: The solids that consist of molecules of a compound together with water molecules.

Hydration enthalpy: The energy released when one mole of gaseous atoms combine with water to form hydrated ions.

Hydrides: The binary compounds of the elements with hydrogen.

Hydrocarbons: The compounds composed only of hydrogen and carbon.

Hydrogen bond: Generally restricted to molecules having an N – H, O – H or F – H bond, where the hydrogen in these bonds exhibits Coulombic interaction with a lone-pair on an F, O or N atom of another molecule.

Hydrogen peroxide (H₂O₂): The simplest compound containing an oxygen – oxygen single bond.

Hydrogenation: A chemical reaction involving addition of hydrogen atom to unsaturated compound.

Hydrolysis: The reaction of an anion as a base with water or a cation as an acid.

Hydronium ion: A representation of the hydrogen ion in aqueous solution (H₃O⁺).

Hydrosphere: The combined water resources available on the earth.

Hygroscopic: The property of absorbing moisture from the air.

Hyperconjugation: The electron delocalization (via orbital overlap) from a filled bonding orbital to an adjacent unfilled orbital or to an atom of an unsaturated system.

Ideal gas law/equation: The product of pressure times volume of an ideal gas divided by the product of amount of gas times absolute temperature is a constant, that is, $pV = nRT$ (also known as equation of state).

Ideal gas: A gas that obeys the gas laws exactly over all temperatures and pressures.

Inductive effect: An intrinsic electron-withdrawing or electron-releasing effect that results from a nearby dipole in the molecule and that is transmitted through space and through the bonds of a molecule.

Inert pair effect: The ability of the *s* electrons in the outer shell to remain paired and not participate in bonding.

Infrared radiation: Radiation with wavelengths somewhat longer than those of red light in the visible spectrum.

Instantaneous dipole: A momentary dipole in an atom, ion or molecule caused by the erratic movement of electrons, thereby making it to become unsymmetrical.

Integrated waste management (IWM): A set of management alternatives that includes reuse, source reduction, recycling, composting, landfill and incineration.

Intensive property: A property that is independent of the quantity of matter present in the system.

Intermediate: A transient species that exists between reactants and products in a state corresponding to energy minimum on a potential energy diagram.

Intermolecular forces: The forces of attractions and repulsions between molecules.

Intermolecular hydrogen bond: The hydrogen bonding occurs between an H atom of one molecule and an electronegative atom of a second molecule.

Internal energy: The sum of all of the kinetic energies and potential energies of the particles within a system.

International System of Units: The successor to the metric system of measurements that retains most of the units of the metric system and their decimal relationships but employs new reference standards.

Intramolecular forces: The chemical bonds that hold molecules together.

Intramolecular hydrogen bond: The hydrogen bond is formed between hydrogen and an electronegative atom (F, O, N), within the same molecule.

Ion–electron method: A method for balancing redox reactions that uses half-reactions.

Ionic bond: A chemical bond in which one atom loses an electron to form a positive ion and the other atom gains an electron to form a negative ion.

Ionic equilibrium: Equilibrium involving ions in aqueous solutions.

Ionic product constant of water (K_w): The quantitative relationship between the hydronium and hydroxide ions.

Ionic radii: The radius of the ion of an atom.

Ionization enthalpy: The energy required to remove the electron from the atom in the gaseous state and convert it into an ion.

Ionization: The process of forming an ion or ions from a molecule or atom.

Isobars: The lines obtained in the plots of volume vs. temperature in which pressure is kept constant.

Isochores: The lines obtained in the plot of pressure vs. temperature in which volume is kept constant.

Isoelectronic species: The ions possessing equal number of electrons.

Isolated system: A system with a sealed and insulated boundary where neither energy nor matter can be transformed to or from the surroundings.

Isomers: They have same chemical formula but different arrangements of the atoms.

Isotherm: The lines obtained in the plot of pressure vs. 1/volume in which temperature is kept constant.

Isotope effects: The differences in properties which arise from differences in mass.

Isotopes: The atoms of an element with same atomic number but different mass numbers. They are atoms of the same element with different number of neutrons in their nuclei.

Kelvin (K): One degree on the Kelvin scale of temperature and identical in size to the Celsius degree.

Kelvin temperature scale: The temperature scale on which water freezes at 273.15 K and boils at 373.15 K and that has 100 degree divisions called kelvins between these points. $K = ^\circ\text{C} + 273.15$.

Kinetic energy: The energy as a result of motion equal to $(1/2)mv^2$.

Kinetic molecular theory of gases: A set of postulates used to explain the gas laws. A gas consists of an extremely large number of very tiny, very hard particles in constant random motion. They have negligible volume and, between collisions, experience no forces between themselves.

Lanthanoid contraction: Contraction in the radii of the atoms or ions from La to Lu due to increase in effective nuclear charge experienced by each $4f$ electron because of increase in atomic number and nuclear charge.

Lanthanoids: The series of fifteen metallic elements from lanthanum to lutetium in the periodic table in which the $4f$ orbitals are successively filled (also called rare earth metals).

Lattice enthalpy: The energy required to completely separate the ions in one mole of a solid compound from each other to form gaseous ions.

Law of conservation of mass: The matter is neither gained nor lost during a chemical reaction.

Law of definite proportions: A compound always contains two or more elements combined in a definite proportion by mass.

Law of mass action: The rate of a reaction is proportional to the product of effective concentration of the reacting species, each raised to a power which is equal the corresponding stoichiometric number of the substance in the balanced chemical equation.

Law of multiple proportions: The atoms of two or more elements may combine in different ratios to form more than one compound.

Le Chatelier's principle: If a system under equilibrium is subjected to a change, the system reacts in such a way so as to oppose the applied change, that is, the system tends to counteract the effects of any imposed stress.

Lewis acids and bases: Acids are ionic or molecular species that accept a pair of electrons in the formation of a coordinate covalent bond. Bases are any ionic or molecular species that can donate a pair of electrons in the formation of a coordinate covalent bond.

Lewis structure: A structural formula drawn with Lewis symbols and that uses dots and dashes to show the valence electrons and shared pair of electrons.

Lewis symbols: The symbol in which the electrons in the valence shell of an atom or an ion are represented by dots placed around the symbol of the atom.

Ligand: An atom, ion or molecule that binds to a central metal ion to form a coordination complex.

Limiting reagent: The reactant that produces the least amount of product if specific amounts of each reactant are mixed in a chemical reaction.

Line spectrum: An atomic spectrum so named because the light emitted by an atom and focused through a narrow slit yields a series of lines when projected on a screen.

Linear combination of atomic orbitals (LCAO): Mathematical approximation to generate molecular orbitals for some small diatomic molecules.

Linear molecule: A molecule in which all the atoms lie in a straight line.

Liquefied petroleum gas: A gaseous mixture of aliphatic hydrocarbons (olefins) including propane, butane and their isomers, which becomes liquid on moderately compressing at room temperature.

Liquid: One of the states of matter with a definite volume but no definite shape.

London or dispersion forces: Weak attractive forces caused by instantaneous dipole-induced dipole attractions.

Lone pair: A pair of electrons in the valence shell of an atom that is not shared with another atom.

Long form of periodic table: The modern periodic table of the elements which is a complete list of the elements, arranged in order from smallest to largest atomic number (also known as Bohr table).

Magnetic orbital quantum number (m_l): A quantum number used to describe the orientation in space of a particular orbital. It can have values from $-l$ to $+l$.

Main group or representative elements: The elements which involve outer shells consisting solely of s and p electrons. In particular, they are either the s -block or p -block elements.

Markovnikov's rule: A rule stating that with addition of a hydrogen halide to an alkene, the acid hydrogen (H) becomes attached to the carbon with fewer alkyl substituents, and the halide (X) group becomes attached to the carbon with more alkyl substituents.

Mass number (A): The total number of nucleons (protons and neutrons) in the atom.

Mass percent: The mass of solute per 100 g of solution.

Mass: The amount of matter in the object.

Matter: Anything that has mass and occupies space.

Melting point: The temperature at which solid changes to liquid state.

Mendeleev's periodic law: A law stating that the properties of the elements are a periodic function of their atomic weights.

Metallic radius: The radius obtained from the non-bonded distance of closest approach between atoms that are in contact with, but not bonded to one another.

Metalloids: The elements with properties intermediate between metals and non-metals. These consist of many of the elements on the metal–non-metal borderline in the periodic table.

Metals: Elements with comparatively low ionization enthalpies that form positive ions in compounds. Generally, metals are hard, lustrous elements that are ductile and malleable.

Milk of lime: A suspension of fine calcium hydroxide particles in water.

Mist: Particles produced by spray of liquids or condensation of vapors in the air.

Mixture: A material containing two or more substances and can be either heterogeneous or homogeneous.

Modern periodic law: A law stating that the physical and chemical properties of elements are periodic functions of their atomic numbers.

Molality: The number of moles of solute dissolved per kg of solvent.

Molar mass: The mass of one mole of a substance; the mass in grams equal to the sum of the atomic masses of the atoms in a substance, with units of g mol^{-1} .

Molarity: The number of moles of solute dissolved per liter of solution.

Mole fraction: The ratio of the number of moles of a given component to the total number of moles of all components.

Mole percent: The mole fraction composition of a mixture is expressed on a percentage basis.

Mole: An amount of a chemical substance that contains 6.023×10^{23} formula units.

Molecular formula: The true formula representing the total number of atoms of each element present in one molecule of a compound.

Molecular mass: The sum of the atomic masses of the elements in the molecule.

Molecular orbital (MO) theory: A theory about covalent bonds that views a molecule as a collection of positive nuclei surrounded by electrons distributed among a set of bonding, antibonding, and non-bonding orbitals of different energies.

Molecular orbitals: An orbital that extends over two or more atomic nuclei.

Molecule: A neutral particle composed of two or more atoms combined in a definite ratio of whole numbers.

Neutral solution: The molar concentrations of H_3O^+ and OH^- are equal; neither ion is present in a greater concentration than the other; $\text{pH} = 7$.

Neutron: A subatomic particle with a charge of zero, a mass of 1.0086649 u ($1.674927 \times 10^{-24} \text{ g}$) and that exists in all atomic nuclei except those of the ^1_1H isotope.

Newland's law of octaves: The arrangement of 56 elements known till that time in order of increasing atomic weight in which every eighth element had properties similar to the first.

Noble gas: Group 18 elements with a completely filled outer s and p subshell.

Nodal plane: A plane that can be drawn to separate opposing lobes of p , d and f orbitals.

Node: A place where the amplitude or intensity of a wave is zero.

Non-benzenoid aromatic compound: An aromatic compound, such as azulene, that does not contain benzene rings.

Non-bonding molecular orbitals: The molecular orbitals which do not affect the energy of the molecule and has no net effect on the stability of a molecule.

Non-metals: The elements to the right in the periodic table. These elements generally lack metallic properties. They have relatively high ionization enthalpies.

Non-polar bond: A covalent bond in which electrons are shared equally.

Nucleons: The protons and neutrons that make up the nucleus of the atom.

Nucleophile: A Lewis base or an electron pair donor that seeks a positive center in a molecule.

Nucleus: The core of the atom containing neutrons, protons and most of the mass.

Octahedral molecule: A molecule in which a central atom is surrounded by six atoms located at the vertices of an imaginary octahedron.

Octet rule: Atoms tend to gain or lose electrons until they have achieved an outer shell that contains an octet of electrons (eight electrons).

Open system: A system with an open boundary where both energy and matter can be transferred to and from the surroundings.

Orbital diagram: A diagram in which the electrons in an atom's orbitals are represented by arrows to indicate paired and unpaired spins.

Orbital: The region in space where the probability of finding an electron is high. It has a unique set of values for the quantum numbers n , l and m_l . The four types of orbitals are s , p , d and f .

Organometallic compound: The functional group in which carbon is bound to a metal atom.

Outer shell: The occupied shell in an atom having the highest principal quantum number (n).

Overlap of orbitals: The portions of two atomic orbitals from different atoms sharing the same space.

Oxidation number method: A method of balancing oxidation–reduction reactions that focuses on the atoms of the elements undergoing a change in oxidation state.

Oxidation number: The charge that atom would have if all electrons in its bonds were assigned to the more electronegative atom. It can be used interchangeably with oxidation state.

Oxidation state: The charge left on the central atom when all the other atoms of the compound have been removed in their usual oxidation states. It can be used interchangeably with oxidation number.

Oxidation: A change in which an oxidation number increases (becomes more positive). It involves a loss of electrons.

Oxidizing agent: The substance that causes oxidation and that is itself reduced.

Oxoacid: Acids composed of hydrogen, oxygen and some other element.

Ozone: A natural trace gas in the earth's lower atmosphere (troposphere), which helps trap heat to keep the earth warm and filter harmful ultraviolet (UV) rays from the sun.

Paramagnetic: The weak magnetism of a substance whose atoms, molecules or ions have one or more unpaired electrons.

Partial charges: Charges at opposite ends of a dipole that are fractions of full $1+$ or $1-$ charges.

Particulate: The matter comprising small particles present in the air, like smoke and dust or liquid droplets, with size ranging from 0.002μ to 500μ .

Pauli's exclusion principle: No two electrons in one atom can have all the four quantum numbers the same.

p-Block elements: Group 13–18 elements of the periodic table which along with s-block elements form the main group or the representative elements.

Period: The seven horizontal rows of the periodic table.

Periodic table: The table which classifies all the known elements in accordance with their properties in such a way that elements with similar properties are grouped together in the same vertical column and dissimilar elements are separated from one another.

Periodicity: The recurrence of properties at regular intervals.

Permanent hardness: The water containing chlorides and sulphates of calcium and magnesium, which cannot be removed by boiling.

Petrolatum: A liquid mixture of high molecular weight alkanes, derived from petroleum refining.

pH scale: The measurement of hydronium ion concentration expressed on logarithmic scale.

pH: The negative of the common logarithm of the H_3O^+ concentration.

Photoelectric effect: The phenomenon in which electrons are emitted from a metal surface when radiation of sufficient energy falls on it.

Photoelectrons: The electrons ejected from the metal plate with the aid of light.

Photons: A unit of energy in electromagnetic radiation equal to $h\nu$, where ν is the frequency of the radiation and h is the Planck's constant.

Physical change: A change that in a substance does not involve any alteration in the composition of the substance but is simply a change in physical state or dimensions.

Physical properties: The inherent characteristics of a substance that can be determined without altering its composition.

Pi (π) bond: The bond formed by sideways overlap of orbitals and it merely shortens the bond length.

Planar triangular molecule: A molecule in which three atoms are located at the corners of a triangle and are bonded to a fourth atom that lies in the center of the triangle.

Planck's constant: The ratio of the energy of a photon to its frequency with a value of $6.6260755 \times 10^{-34} \text{ J Hz}^{-1}$.

pOH: The negative of the common logarithm of the OH^- concentration.

Polar bond: A covalent bond that has a partial separation of charge due to the unequal sharing of electrons.

Polarizability: A measure of the ease with which the electron cloud is distorted.

Polarization effects: The tendency of a cation to distort the electron cloud of an anion by attraction.

Polyacidic base: Bases capable of supplying more than one OH^- per molecule of base in aqueous solution.

Polybasic or polyprotic acid: Acids capable of supplying more than one H^+ per molecule of acid in aqueous solution.

Polychlorinated biphenyls (PCBs): The organic compounds composed of 2–10 chlorine atoms attached to biphenyl, causing water pollution.

Position isomer: Any of the two or more isomers that differ only in the position occupied by substituent.

Potential energy: The energy as a result of position or composition.

Precision: Refers to how closely repeated measurements of a quantity come to each other and to the average.

Pressure: The force per unit area.

Primary pollutants: The pollutants which when formed and released into the environment remain there as such, causing harmful effects.

Principal quantum number: The quantum number that defines the principal energy levels and that can have values of 1, 2, 3, ..., ∞ .

Producer gas: A mixture of CO and N₂.

Protium: Isotope of hydrogen containing only one proton, represented as ${}^1_1\text{H}$.

Proton: A subatomic particle, with a charge of 1+ and a mass of 1.0072765 u ($1.6726217 \times 10^{-24}$ g) and that is found in atomic nuclei.

Pyrolysis: The process by which the carbon-carbon bonds and carbon-hydrogen bonds of higher alkanes are broken by action of heat to yield lower alkanes, alkenes and some hydrogen.

Qualitative observations: Observations that do not involve numerical information.

Quanta: Packets of electromagnetic radiation now commonly called photons.

Quantitative observations: An observation involving a measurement and numerical information.

Quantum mechanics: A theory of atomic structure based on wave-particle duality of matter.

Quantum number: A number related to the energy, shape, orientation of an orbital, or to the spin of an electron.

Radiation: Particles or high-energy light rays that are emitted by an atom or a nucleus of an atom.

Radical (or free radical): An uncharged chemical species that contains an unpaired electron.

Radioactivity: The emission of various atomic radiations or γ -rays.

Reaction mechanism: A step-by-step description of the events that are postulated to take place at the molecular level as reactants are converted to products.

Reaction quotient (Q): The numerical value of the mass action expression.

Rearrangement: A reaction that results in a product with a different carbon skeleton from the reactant. The type of rearrangement called a 1,2-shift involves the migration of an organic group (with its electrons) from one atom to the atom next to it.

Redox couple: Refers to the oxidized and reduced forms of a substance which take part in oxidation or reduction reaction are present together.

Redox reaction: A chemical reaction involving an exchange of electrons.

Reducing agent: A substance that causes reduction and is itself oxidized.

Reduction: A change in which an oxidation number decreases (becomes less positive and more negative). It involves a gain of electrons.

Resonance effect: An effect by which a substituent exerts either an electron-releasing or electron-withdrawing effect through the π system of the molecule.

Resonance hybrid: The actual structure of a molecule or polyatomic ion taken as a composite or average of the resonance or contributing structures.

Resonance structures (or resonance contributors): Lewis structures that differ from one another only in the position of their electrons. A single resonance structure will not adequately represent a molecule. The molecule is better represented as a *hybrid* of all of the resonance structures.

Reversible process: A process where both a forward reaction (forming products) and a reverse reaction (reforming reactants) can occur.

Rock salt: The salt which exists as large beds of sedimentary material formed by evaporation of water from lakes, seas and other water bodies.

Rutherford's nuclear model of atom: The atoms are composed of a nucleus containing protons and/or neutrons surrounded by electrons which occupy mostly empty space.

Rydberg's equation: An equation used to calculate the wavelengths of all the spectral lines of hydrogen.

Salt bridge: An aqueous gel that allows anions to migrate between compartments in a voltaic cell.

Saturated hydrocarbon: A saturated carbon-hydrogen compound with no double or triple bond.

s-block: Groups 1 and 2 of periodic table in which the highest energy (last) electron is present in the *s*-orbital. These elements along with *p*-block elements form the main group or representative elements.

Scientific notation: Writing a number as the product of a number between 1 and 10 multiplied by 10 raised to some power.

Second law of thermodynamics: The entropy of the universe (system + surroundings) increases whenever a spontaneous change occurs.

Secondary pollutants: The pollutants that are formed by the chemical reactions between primary pollutants present in atmosphere or hydrosphere.

Shell: All of the orbitals associated with a given value of *n* (the principal quantum number).

Shielding: The outer shell electrons do not experience the full force of attraction of the positive charge on nucleus due to presence of intervening inner orbital electrons.

Sigma (σ) bond: The bond formed by head-on overlap of orbitals and the electron density is concentrated in between two atoms, and along the line joining the two atoms.

Significant figures: The digits in a physical measurement that are known to be certain added to the first digit that contains uncertainty.

Silicones: A group of organosilicon polymers.

Single bond: The bond formed by the sharing of *one* pair of electrons between two atoms.

Skeletal structures: A formula in which bonds are represented by lines, C atoms are not shown and H atoms are shown only when attached to atoms other than C.

Skeleton equation: An unbalanced equation showing only the formulas of reactants and products.

Smog: A type of air pollution caused by burning of large amounts of coal within a city.

Smoke (soot): The smallest sized particles (0.005μ) which are released into the atmosphere by incomplete combustion of fossil fuels, garbage, dry leaves, oil, cigarette, etc.

Sodium sesquicarbonate: A double salt of sodium bicarbonate and sodium carbonate with a needle-like crystal structure.

Soft water: The water which forms soft and creamy lather with soap.

Solid: One of the states of matter with a definite shape and volume.

Solubility product constant (K_{sp}): The equilibrium constant associated with the solution of ionic compounds.

Solubility: The concentration of a saturated solution of a solute in a given solvent at a particular temperature.

Spectroscopy: The study of emission or absorption of radiation.

Spin quantum number (m_s): The quantum number associated with the two possible orientations of the spin axis of the electron and can have a value of $+1/2$ or $-1/2$.

Spontaneous process: The process which occurs on its own accord.

Standard conditions of temperature and pressure (STP): Standard reference conditions for gases. 273.15 K (0°C) and 1 bar (10^5 Pa).

Standard electrode potential: The potential of each electrode when the concentration of the participating species in electrode reaction is unity and the temperature is 298 K.

Standard enthalpy of atomization (symbol: $\Delta_a H^\circ$): The amount of energy needed to break all the chemical bonds in one mole of gaseous molecules to give gaseous atoms as products.

Standard enthalpy of combustion: The enthalpy change when one mole of the substance is completely burnt in excess of air.

Standard enthalpy of formation: The enthalpy change when one mole of a compound is formed from its constituent elements at 298 K and 1 atm pressure.

Standard enthalpy of fusion: The enthalpy change of the system when one mole of a solid substance is converted into the liquid state at its melting point.

Standard enthalpy of sublimation: The enthalpy change when one mole of a solid is directly converted into the gaseous form at a temperature below its melting point.

Standard enthalpy of vaporization: The enthalpy change of the system when one mole of liquid is converted into vapor or gaseous state at its boiling point.

Standard molar volume: The volume occupied by one mole of gas at STP.

Standard state: The pure form of a substance at a given temperature and a pressure of 1 bar.

State function: Any property that depends only on an object's current state.

States of matter: A physical state of a substance – solid, liquid or gas.

Stereoisomers: Compounds with the same molecular formula that differ *only* in the arrangement of their atoms in space. Stereoisomers have the same connectivity and, therefore, are not constitutional isomers.

Stoichiometry: The quantitative relationships among reactants and products.

Stratosphere: The layer that lies between troposphere and mesosphere between 10 km and 50 km above sea level, which shows stratification (building of layers) and is vertical in nature due to the temperature difference between its upper and lower layers.

Stratospheric pollution: The pollution related to formation and breakdown of ozone.

Structural formula: A chemical formula that shows how the atoms of a molecule or polyatomic ion are arranged, to which other atoms they are bonded, and the kinds of bonds (single, double or triple) present.

Structural isomers: Compounds with the same molecular formula and different atomic connections. The four types of structural isomerism are chain, position, functional group and position isomerisms.

Subatomic particles: Particles such as electrons, protons, neutrons and atomic nuclei.

Sublimation: A process by which a solid directly changes to vapor state without passing through the liquid state.

Subshells: All of the orbitals of a given shell that have the same value of their azimuthal or subsidiary quantum number, l .

Substituted benzene: A substituent on a carbon atom adjacent to a benzene ring.

Substitution reaction: A reaction in which one group replaces another in a molecule.

Substrate: The molecule or ion that undergoes reaction.

Sulphonation: The replacement of hydrogen atom in an alkane by sulphonic acid ($-\text{SO}_3\text{H}$) group.

Superoxide ion: The ion $[\text{O}_2]^-$, which has an unpaired electron and possesses highly oxidizing properties.

Surface tension: The force that causes the surface of a liquid to contract.

Surface tension: The force that causes the surface of a liquid to contract and take a shape that yields the minimum surface area.

Surrounding: The area surrounding the system.

Syngas: A mixture of gases containing varying amount of carbon monoxide and hydrogen.

System: Any region of space which is under thermodynamic investigation.

Temperature: A property related to the average kinetic energy of the atoms and molecules in a sample, which determines the direction of heat flow – from high temperature to low temperature.

Temporary hardness: The water which contains bicarbonates of calcium and magnesium.

Tetrahedral molecule: A molecule with a central atom bonded to four other atoms located at the corners of an imaginary tetrahedron.

Thermodynamics: The study of flow of heat into or out of a system as it undergoes a physical or chemical transformation.

Third law of thermodynamics: All substances in their normal crystalline state at absolute zero temperature would be in the condition of maximum ordered arrangement because all motion has essentially ceased at 0 K.

Thomson model of atom: An atomic sphere of approximate radius 10^{-10} m contains the negatively charged particles – electrons and the positively charged particles in equal number. The positive charge is assumed to be spread throughout the atom, forming a pudding with negative electrons suspended like plums, also called plum-pudding model.

Threshold frequency (ν_0): The minimum value of frequency of the incident required for ejection of electrons from a metal surface.

Threshold limit value: The permissible value of a pollutant at which it does not cause any adverse effects to persons exposed to it for eight working hours a day.

Trigonal bipyramidal molecule: A molecule in which the central atom is located in the middle of the triangular plane shared by the upper and lower trigonal pyramids and is bonded to five atoms.

Triple bond: A covalent bond in which three pairs of electrons are shared.

Tritium: Isotope of hydrogen containing one proton and two neutrons, represented as ${}^3_1\text{T}$.

Troposphere: The layer closest to the earth spanning across 10 km from sea level having a lot of turbulence and vertical mixing.

Tropospheric pollution: Pollution caused due to undesirable gaseous and solid emissions from vehicles, thermal power plants, industries and refineries.

Ultraviolet radiation: Radiation with wavelengths somewhat shorter than those of violet light.

Uncertainty in measurement: The amount by which a measured quantity deviates from the true or actual value.

Unit: A definite quantity adapted as a standard of measurement.

Universe: The entity comprising the system and the surroundings together.

Unsaturated hydrocarbons: The hydrocarbons having double or triple covalent bonds between adjacent carbon atoms.

Valence bond theory: A theory of covalent bonding that views a bond as being formed by the sharing of one pair of electrons between two overlapping atomic or hybrid orbitals.

Valence electrons: The electrons of an atom in its valence shell that participate in the formation of chemical bonds.

Valence shell electron pair repulsion (VSEPR) model: The bonding and non-bonding (lone pair) electron domains in the valence shell of an atom seek an arrangement that leads to minimum repulsions, and thereby determine the geometry of a molecule.

Valence shell: The electron shell with the highest principal quantum number, n , that is occupied by electrons.

van der Waals forces: Relatively weak electric forces that attract neutral molecules to one another in gases in liquified and solidified gases, and in almost all organic liquids and solids.

Vapor pressure: The pressure exerted by the vapor above a liquid (usually referring to the *equilibrium* vapor pressure when the vapor and liquid are in equilibrium with each other).

Viscosity: A measure of its resistance to flow.

Visible spectrum: That region of the electromagnetic spectrum whose frequencies can be detected by the human eye.

Volume: The space that a certain quantity of matter occupies.

Water gas: A synthetic gas containing carbon monoxide and hydrogen.

Wave function: A mathematical function that describes the intensity of an electron wave at a specified location in an atom. The square of the wave function at a particular location specifies the probability of finding an electron there.

Wave number: The reciprocal of wavelength.

Wavelength (λ): The distance between two maxima of either electrical or magnetic components of the wave.

Wave-particle duality: A particle such as the electron behaves like a particle in some experiments and like a wave in others.

Weight: The measure of the effect of gravity on the object.

Wet deposition: The deposition in which the gases carried by wind from drier regions to wetter regions, undergo oxidation and dissolve in rainwater to form nitric acid, sulphuric acid, sulphurous acid, etc., causing acid rain.

Work: The action/displacement of system against some force originating from the surroundings and acting on the boundary of the system.

X-rays: A stream of very high-energy photons emitted by substances when they are bombarded by high-energy beams of electrons.

Zeolites: The naturally occurring hydrated aluminosilicate minerals.

Zincate: An oxide containing zinc and a less electronegative element.