T1 element	T1 compound	T1 mixture
T1 homogeneous	T1 heterogeneous	T1 filtration
T1 evaporation	T1 crystallization	T1 distillation

T1 A combination of substances that are not chemically bonded together in fixed proportions.	T1 A substance containing two or more different elements chemically bonded in fixed proportions.	T1 A substance made of atoms with the same proton number.
T1 Separating insoluble particles from a fluid by passing the mixture through a porous barrier.	T1 Of a mixture: not uniform, with visibly different parts or phases.	T1 Of a mixture: uniform throughout, with one phase and no visible boundaries.
T1 Separating substances by vaporising and condensing them, using differences in volatility or boiling point.	T1 Forming solid crystals from a solution, often by cooling or evaporating the solvent.	T1 The escape of particles from the surface of a liquid into its vapour without the whole liquid boiling.

T1 solvation	T1 saturated	T1 kinetic molecular theory
T1 sublimation	T1 endothermic	T1 deposition
T1 exothermic	T1 purity	T1 average kinetic energy

T1 The model that matter is made of particles in constant motion whose energy rises with temperature.	T1 Describing fatty acids whose hydrocarbon chains contain no carbon-carbon double or triple bonds.	T1 Solvent molecules surrounding and attracting dissolved particles.
T1 A gas changing directly into a solid.	T1 Describing a process that takes in heat from its surroundings.	T1 The direct change of a substance from solid to gas without passing through a liquid phase.
T1 The mean energy of motion of the particles, proportional to absolute temperature.	T1 How free a substance is of other substances; a pure substance has a sharp melting point.	T1 Describing a process that transfers heat to its surroundings.

T1 absolute zero	T2 nucleus	T2 proton
T2 neutron	T2 electron	T2 nucleon
T2 atomic number	T2 mass number	T2 nuclear symbol

T2 A positively charged subatomic particle found in an atom's nucleus.	T2 The small, dense central part of an atom, containing protons and usually neutrons.	T1 The lowest temperature on the thermodynamic temperature scale, equal to zero kelvin.
T2 A proton or neutron in an atomic nucleus.	T2 A negatively charged subatomic particle found outside an atom's nucleus.	T2 An electrically neutral subatomic particle found in most atomic nuclei.
T2 Notation writing the mass number at the top left and the atomic number at the bottom left of the element symbol.	T2 The total number of protons and neutrons in an atomic nucleus.	T2 The number of protons in the nucleus of an atom.

T2 ion	T2 isotope	T2 abundance
T3 electromagnetic spectrum	T3 photon	T3 continuous spectrum
T3 line emission spectrum	T3 energy level	T3 excited state

T2 The amount or relative frequency of a particular entity, such as a species or an isotope.	T2 An atom of an element with the same proton number but a different neutron number from another atom of that element.	T2 An atom or group of atoms with a net electric charge from losing or gaining electrons.
T3 A spectrum containing all wavelengths in a range without gaps.	T3 A quantum of electromagnetic radiation with energy equal to Planck's constant multiplied by its frequency.	T3 The complete range of electromagnetic radiation, ordered by frequency or wavelength.
T3 States of a system with energy above its ground-state energy.	T3 An allowed value of energy that a quantum system can have.	T3 Separate coloured lines of light emitted when excited electrons fall to lower levels.

T3 quantized	T3 converge	T3 convergence limit
T3 principal quantum number	T3 sublevel	T3 atomic orbital
T3 degenerate	T3 Aufbau principle	T3 Pauli exclusion principle

T3 The frequency where spectral lines merge, used to find ionization energy.	T3 Of spectral lines: get closer together toward higher frequency.	T3 Able to take only certain fixed values, like the energies of electrons in an atom.
T3 A region around the nucleus where an electron is likely to be found; it holds up to two electrons.	T3 A division of an energy level: s, p, d or f.	T3 The positive integer identifying an electron's main shell and helping determine its orbital energy and size.
T3 An orbital holds at most two electrons, and they must have opposite spins.	T3 Electrons fill the lowest-energy orbitals available first.	T3 Of orbitals: having the same energy, like the three 2p orbitals.

T3 opposite spins	T3 Hund's rule	T3 full electron configuration
T3 condensed configuration	T3 orbital diagram	T3 negative ion
T3 positive ion	T3 transition element	T4 mole

T3 The complete list of occupied sublevels, such as $1s^2$ $2s^2$ $2p^6$ $3s^1$ for sodium.	T3 Electrons fill degenerate orbitals singly, with parallel spins, before pairing.	T3 The two allowed spin states of electrons sharing an orbital, shown as up and down arrows.
T3 An atom or group that has gained electrons and carries a negative charge.	T3 Boxes for orbitals with arrows for electrons showing their spins.	T3 An electron configuration starting from the previous noble gas, such as [Ne] $3s^1$.
T4 The SI unit of amount of substance, containing exactly 6.02214076 times ten to the power 23 specified entities.	T3 A d-block element that forms at least one ion with a partly filled d sublevel.	T3 An atom or group that has lost electrons and carries a positive charge.

T4 amount of substance	T4 Avogadro constant	T4 formula unit
T4 relative atomic mass	T4 relative formula mass	T4 molar mass
T4 empirical formula	T4 molecular formula	T4 solution

T4 The simplest ratio of ions in an ionic compound, such as NaCl.	T4 The number of specified elementary entities in one mole, exactly 6.02214076 times ten to the power 23 per mole.	T4 The quantity of particles in a sample, measured in moles.
T4 The mass of one mole of a substance.	T4 The sum of the relative atomic masses in one formula unit.	T4 The weighted mean mass of an element's atoms relative to one twelfth of the mass of a carbon-12 atom.
T4 A homogeneous mixture in which one or more solutes are dissolved in a solvent.	T4 A formula showing the actual numbers of atoms of each element in one molecule.	T4 A formula showing the simplest whole-number ratio of atoms of each element in a compound.

T4 solute	T4 solvent	T4 concentration
T4 standard solution	T4 Avogadro's law	T5 kinetic molecular theory
T5 ideal gas	T5 elastic	T5 pressure

T4 The amount of a substance per unit volume of a mixture or solution.	T4 The substance in which a solute dissolves to form a solution.	T4 A substance dissolved in a solvent to form a solution.
T5 The model that matter is made of particles in constant motion whose energy rises with temperature.	T4 Equal volumes of all gases, at the same temperature and pressure, contain equal numbers of molecules.	T4 A solution of accurately known concentration.
T5 Force acting normally per unit area.	T5 Of gas collisions: losing no kinetic energy overall.	T5 A model of a gas with point particles that exert no intermolecular forces except during perfectly elastic collisions.

T5 kelvin scale	T5 absolute zero	T5 Avogadro's law
T5 molar volume	T5 ideal gas equation	T5 gas constant
T5 real gas	T6 ionic model	T6 ion

T5 Equal volumes of all gases, at the same temperature and pressure, contain equal numbers of molecules.	T5 The lowest temperature on the thermodynamic temperature scale, equal to zero kelvin.	T5 The absolute temperature scale starting at absolute zero; K = °C + 273.15.
T5 $R = 8.31\ J\ K^{-1}\ mol^{-1}$, the constant in the ideal gas equation.	T5 $pV = nRT$, linking pressure, volume, amount and temperature of a gas.	T5 The volume of one mole of gas, 22.7 dm^3 at STP.
T6 An atom or group of atoms with a net electric charge from losing or gaining electrons.	T6 A bonding model in which oppositely charged ions are held together by electrostatic attraction.	T5 A gas whose particles have volume and attract each other, deviating at high pressure and low temperature.

T6 cation	T6 anion	T6 transition element
T6 polyatomic ion	T6 ionic bond	T6 electrostatic attraction
T6 electronegativity	T6 lattice	T6 lattice enthalpy

T6 A d-block element that forms at least one ion with a partly filled d sublevel.	T6 An ion with a negative electric charge.	T6 An ion with a positive electric charge.
T6 The pull between opposite charges, the basis of ionic and other bonding.	T6 The electrostatic attraction between oppositely charged ions.	T6 A group of covalently bonded atoms that carries an overall charge.
T6 The energy to separate one mole of an ionic solid into gaseous ions.	T6 A regular, repeating arrangement of particles or points in a solid.	T6 The tendency of an atom in a chemical bond to attract the shared electrons towards itself.

T6 volatility	T7 covalent bond	T7 intermolecular force
T7 shared pair	T7 octet rule	T7 incomplete octet
T7 lone pair	T7 Lewis formula	T7 coordination bond

T7 An attraction between separate molecules.	T7 A chemical bond involving a shared pair of electrons attracted to the nuclei of bonded atoms.	T6 The tendency of a substance to vaporise readily under given conditions.
T7 An atom with fewer than eight outer electrons in a molecule, such as boron in BF_3.	T7 Atoms tend to bond until they have eight electrons in their outer shell.	T7 Two electrons shared between two atoms, forming a covalent bond.
T7 A covalent bond in which both shared electrons come from one atom.	T7 A diagram showing all valence electrons as bonding pairs and lone pairs.	T7 A pair of outer-shell electrons on one atom that is not shared in a covalent bond.

T7 valence shell electron pair repulsion	T7 electron domain	T7 molecular geometry
T7 electronegativity	T7 polar bond	T7 polar
T7 dipole moment	T7 covalent network structure	T7 allotrope

T7 The 3-D arrangement of the atoms in a molecule.	T7 A region of electron density around an atom: a lone pair or a single, double or triple bond.	T7 The theory that electron domains around a central atom repel and spread as far apart as possible.
T7 Having a separation of charge, with a partly positive and a partly negative end.	T7 A covalent bond with unequal sharing because the atoms differ in electronegativity.	T7 The tendency of an atom in a chemical bond to attract the shared electrons towards itself.
T7 A different structural form of the same element, such as diamond and graphite.	T7 A giant structure of atoms joined by covalent bonds, such as diamond or silicon dioxide.	T7 A measure of the charge separation in a bond or molecule.

T7 delocalized	T7 silicon dioxide	T7 London force
T7 dipole–dipole force	T7 hydrogen bonding	T7 van der Waals force
T7 volatility	T7 chromatography	T7 stationary phase

T7 A weak attraction from temporary induced dipoles, present between all molecules.	T7 The compound SiO_2, whose common solid forms contain a network of silicon and oxygen atoms joined by covalent bonds.	T7 Of electrons: spread over several atoms instead of held between two.
T7 A general name for the weak intermolecular forces: London and dipole forces.	T7 An attraction involving a hydrogen atom bonded to an electronegative atom and an electron-rich site on another atom.	T7 An attraction between the permanent dipoles of polar molecules.
T7 The phase that remains fixed in a chromatography system and interacts differently with components of a mixture.	T7 A separation technique based on different affinities of substances for a stationary phase and a mobile phase.	T7 The tendency of a substance to vaporise readily under given conditions.

T7

mobile phase

T7

retardation factor

T8

metallic model

T8

cation

T8

lattice

T8

delocalized electron

T8

metallic bond

T8

non-directional

T8

electrical conductivity

T8 A bonding model with positive metal ions held together by attraction to delocalized electrons.	T7 Rf: distance moved by a spot divided by distance moved by the solvent front.	T7 The solvent that moves through the stationary phase in chromatography.
T8 An electron distributed over several atoms rather than confined to one atom or a single bond.	T8 A regular, repeating arrangement of particles or points in a solid.	T8 An ion with a positive electric charge.
T8 A measure of how readily a material allows electric current to flow through it.	T8 Acting equally in all directions, like metallic and ionic bonding.	T8 The electrostatic attraction between a lattice of cations and the delocalized electrons.

T8 thermal conductivity	T8 malleability	T8 ductility
T9 material	T9 bonding triangle	T9 alloy
T9 polymer	T9 monomer	T9 repeating unit

T8 the strain at fracture, the property heat treatment trades away for strength	T8 The ability to be hammered into shape without breaking.	T8 Delocalized electrons (and vibrating ions) pass kinetic energy quickly through the metal.
T9 A mixture of a metal with other metals, or with a non-metal such as carbon.	T9 A triangle chart using electronegativity to place a substance between ionic, covalent and metallic bonding.	T9 A substance chosen for its properties to make something, such as a metal, ceramic, polymer or composite.
T9 The part of a polymer chain that repeats again and again.	T9 A molecule that can join with other molecules to form a polymer.	T9 A large molecule made from many linked repeating units derived from smaller molecules.

T9 biodegradable	T9 addition polymerization	T10 periodic table
T10 periodicity	T10 period	T10 group
T10 block	T10 metalloid	T10 alkali metal

T10 An arrangement of chemical elements by atomic number that displays recurring patterns in their properties.	T9 Joining monomers with C=C double bonds into a polymer with no other product.	T9 Able to be broken down by living organisms.
T10 A vertical column in the periodic table whose elements have related outer-electron configurations and chemical properties.	T10 A horizontal row of the periodic table, corresponding to the principal shell occupied by the outer electrons of its elements.	T10 A repeating pattern in element properties across the periodic table.
T10 A group 1 metal, such as sodium, that reacts vigorously with water.	T10 An element with properties between metals and non-metals, such as silicon.	T10 The region of the periodic table named by the sublevel being filled: s, p, d or f.

T10 halogen	T10 nuclear charge	T10 shielding
T10 electron affinity	T10 basic	T10 acidic
T10 amphoteric	T10 acid deposition	T10 ocean acidification

T10 The reduction in nuclear attraction experienced by an electron because of repulsion from other electrons.	T10 The total positive charge of an atomic nucleus, determined by its number of protons.	T10 The elements in group 17 of the periodic table.
T10 Of an oxide: reacting with bases, typical of non-metal oxides.	T10 Of an oxide: reacting with acids, typical of metal oxides.	T10 The energy change when a gaseous atom gains one electron.
T10 The fall in ocean pH as seawater absorbs more carbon dioxide.	T10 Acidic substances from sulfur and nitrogen oxides falling to the ground as rain or dry particles.	T10 Able to react as both an acid and a base, like aluminium oxide.

T10 oxidation state	T11 skeletal formula	T11 phenyl
T11 functional group	T11 homologous series	T11 structural isomer
T11 primary	T11 secondary	T11 tertiary

T11 The C_6H_5– group, a benzene ring attached to the rest of a molecule.	T11 A formula drawn as lines, with carbon at corners and line ends and hydrogens on carbon not shown.	T10 The charge an atom would have if all its bonds were ionic.
T11 A compound with the same molecular formula but atoms joined in a different order.	T11 A family of compounds with the same functional group and the same general formula.	T11 An atom or group of atoms responsible for characteristic chemical reactions of an organic compound.
T11 Of an alcohol or halogenoalkane: the functional carbon bonded to three other carbons.	T11 Of an alcohol or halogenoalkane: the functional carbon bonded to two other carbons.	T11 Of an alcohol or halogenoalkane: the functional carbon bonded to one other carbon.

T11 index of hydrogen deficiency	T11 mass spectrometer	T11 molecular ion
T11 wavenumber	T11 fingerprint region	T11 nuclear magnetic resonance
T11 chemical shift	T11 integration	T12 exothermic

T11 An ion formed from a whole molecule by gaining or losing electrons without breaking the molecule into fragments.	T11 An instrument that separates ions by mass-to-charge ratio to find isotopes and their abundances.	T11 The number of rings plus π bonds in a molecule, found from its formula.
T11 A technique using magnetic fields to show the environments of hydrogen atoms in a molecule.	T11 The complex infrared region below about 1500 cm^{-1}, unique to each compound.	T11 The reciprocal of wavelength, in cm^{-1}, used for infrared absorptions.
T12 Describing a process that transfers heat to its surroundings.	T11 Measuring the area under an NMR signal to determine the relative number of nuclei producing it.	T11 The position of an NMR signal relative to a reference, reflecting the chemical environment of the nucleus.

T12 enthalpy change	T12 endothermic	T12 activation energy
T12 limiting reactant	T12 uncertainty	T13 energy cycle
T13 bond enthalpy	T13 average bond enthalpy	T13 Hess's law

T12 The minimum energy that reacting particles need for a successful reaction.	T12 Describing a process that takes in heat from its surroundings.	T12 The heat transferred in a reaction or process at constant pressure.
T13 A diagram of different routes between the same start and end, used with Hess's law.	T12 An estimate of the possible range of error in a measurement.	T12 The reactant that is used up first and therefore limits the amount of product formed.
T13 The total enthalpy change of a reaction is the same whatever route is taken, because energy is conserved.	T13 The mean energy to break one mole of a bond, averaged over many compounds.	T13 The energy needed to break one mole of a covalent bond, with the substances in the gaseous state.

T14 functional unit	T14 life-cycle assessment	T15 conservation of mass
T15 coefficient	T15 mole ratio	T15 stoichiometry
T15 molar volume	T15 titration	T15 standard solution

T15 The principle that total mass remains unchanged in an ordinary chemical reaction within a closed system.	T14 Assessing a product's environmental impact from raw materials to disposal.	T14 A specified amount of service or function used as the common basis for comparing products in a life-cycle assessment.
T15 The quantitative relationships between reactants and products specified by a balanced chemical equation.	T15 The ratio of amounts of substances measured in moles, often given by the coefficients in a balanced equation.	T15 A numerical or constant factor multiplying a term in an expression.
T15 A solution of accurately known concentration.	T15 A method of finding an unknown concentration by measuring the volume needed to react with a solution of known concentration.	T15 The volume of one mole of gas, 22.7 dm^3 at STP.

T15 pipette	T15 indicator	T15 burette
T15 end point	T15 titre	T15 concordant
T15 limiting reactant	T15 in excess	T15 theoretical yield

T15 A graduated tube with a tap used to deliver accurately measured volumes of liquid.	T15 A substance that shows a change in chemical conditions through an observable change, often in colour.	T15 Glassware that delivers an exact volume of liquid.
T15 Of titres: agreeing closely, usually within 0.10 cm^3.	T15 The volume of solution added from the burette to reach the end point.	T15 The observed signal used to stop a titration, such as an indicator's colour change, which should be close to equivalence.
T15 The mass of product calculated from the limiting reactant.	T15 Present in more than the amount needed to react completely.	T15 The reactant that is used up first and therefore limits the amount of product formed.

T15 atom economy	T16 rate of reaction	T16 tangent
T16 initial rate	T16 collision theory	T16 activation energy
T16 Maxwell–Boltzmann distribution	T16 surface area	T16 catalyst

T16 A straight line that touches a curve at a point and has the same direction there.	T16 The change in the amount or concentration of a reactant or product per unit time.	T15 The mass of the desired product as a percentage of the total mass of all products.
T16 The minimum energy that reacting particles need for a successful reaction.	T16 The explanation that reactions require collisions with sufficient energy and suitable orientation.	T16 The rate of a reaction or process measured at or very near its beginning.
T16 A substance that increases a reaction rate without being used up overall.	T16 The total area of the outer surfaces of a three-dimensional object.	T16 The graph of how many particles have each kinetic energy at a given temperature.

T16 alternative reaction pathway	T17 reversible reaction	T17 dynamic equilibrium
T17 closed system	T17 isotope	T17 equilibrium constant
T17 position of equilibrium	T17 Le Chatelier's principle	T17 yield

T17 A state in which opposing processes continue at equal rates, so there is no overall change in composition.	T17 A reaction whose products can react to form the original reactants under suitable conditions.	T16 A different route with lower activation energy, provided by a catalyst.
T17 A value relating the equilibrium activities, concentrations or partial pressures of products and reactants at a specified temperature.	T17 An atom of an element with the same proton number but a different neutron number from another atom of that element.	T17 A system that does not exchange matter with its surroundings, although energy may be transferred.
T17 The amount of product obtained in a reaction, often expressed as a percentage of the theoretical amount.	T17 When a system at equilibrium is disturbed, the position of equilibrium shifts to reduce the effect of the change.	T17 The relative amounts of reactants and products present when forward and reverse reaction rates are equal.

T17 compromise	T18 proton	T18 Brønsted–Lowry acid
T18 Brønsted–Lowry base	T18 conjugate acid–base pair	T18 amphiprotic
T18 ionic product of water	T18 strong acid	T18 weak acid

T18 A proton (H^+) donor.	T18 A positively charged subatomic particle found in an atom's nucleus.	T17 Industrial conditions chosen to balance yield, rate and cost.
T18 Able both to donate and to accept a proton, like water.	T18 Two species differing by exactly one proton, such as NH4+ and NH3.	T18 A proton (H^+) acceptor.
T18 An acid that only partially ionises in aqueous solution.	T18 An acid that essentially completely ionises in aqueous solution at the concentrations being considered.	T18 $Kw = [H^+][OH^-] = 1.00 \times 10^{-14}$ at 298 K.

T18

neutralization

T18

pH curve

T18

equivalence point

T19

oxidation

T19

reduction

T19

oxidation state

T19

oxidizing agent

T19

reducing agent

T19

half-equation

T18 The stage of a titration at which the reactants have been mixed in their stoichiometric proportions.	T18 A graph of pH against volume added during a titration.	T18 The reaction of an acid with a base to form a salt and water.
T19 The charge an atom would have if all its bonds were ionic.	T19 A chemical change involving a gain of electrons or a decrease in oxidation state.	T19 A chemical change involving a loss of electrons or an increase in oxidation state.
T19 An equation showing just the oxidation or just the reduction, with electrons.	T19 A substance that donates electrons to another substance and is itself oxidised.	T19 The one that is reduced.

T19 activity series	T19 displacement	T19 primary cell
T19 anode	T19 cathode	T19 salt bridge
T19 secondary cell	T19 fuel cell	T19 electrolytic cell

T19 A cell that cannot be recharged.	T19 A reaction in which one element replaces another in a compound.	T19 A list of metals in order of how readily they lose electrons.
T19 A link of ions between two half-cells that completes the circuit.	T19 An electrode at which reduction occurs.	T19 An electrode at which oxidation occurs.
T19 A cell in which an external electrical supply drives a non-spontaneous chemical reaction.	T19 An electrochemical device that converts the chemical energy of a continuously supplied fuel and oxidant into electricity.	T19 A rechargeable cell.

T19 electrolysis	T19 electrolyte	T19 distillation
T19 reflux	T19 hydrogenation	T20 free radical
T20 unpaired electron	T20 homolytic fission	T20 single-barbed arrow

T19 Separating substances by vaporising and condensing them, using differences in volatility or boiling point.	T19 A substance that conducts electricity when molten or dissolved because it contains mobile ions.	T19 The decomposition of an electrolyte by an electric current passing through its molten form or a solution.
T20 A species containing one or more unpaired electrons.	T19 The addition of hydrogen to a substance, often across a carbon-carbon double bond using a catalyst.	T19 Heating a reaction mixture while condensing its vapour and returning the condensate to the same vessel.
T20 A half-headed arrow showing the movement of one electron.	T20 Breaking a covalent bond so that each fragment receives one electron from the bonding pair.	T20 An electron alone in an orbital, as in a free radical.

T20 ultraviolet light	T20 non-polar	T20 radical substitution
T20 chain reaction	T20 initiation	T20 propagation
T20 termination	T20 product mixture	T20 chlorofluorocarbon

T20 Substitution by a radical chain: initiation by UV, propagation steps, and termination when radicals join.	T20 Having no overall separation of charge.	T20 High-energy light that can split bonds to form radicals.
T20 A chain step in a radical reaction that consumes one radical and produces another.	T20 The first stage of a chain reaction, in which reactive species such as free radicals are produced.	T20 A reaction in which each step makes a radical that continues the chain.
T20 A compound of carbon, chlorine and fluorine that releases chlorine radicals in the stratosphere.	T20 The mixture of several products formed, as in radical substitution.	T20 The ending stage of a process, such as completion of protein synthesis or the stopping of a reaction chain.

T20 stratosphere	T20 ozone	T21 nucleophile
T21 electrophile	T21 heterolytic fission	T21 curly arrow
T21 halogenoalkane	T21 nucleophilic substitution	T21 leaving group

T21 An electron-pair donor that forms a covalent bond to an electron-deficient centre.	T20 O_3, which absorbs harmful ultraviolet light in the stratosphere.	T20 The atmosphere layer from about 10 to 50 km up, containing the ozone layer.
T21 An arrow showing the movement of an electron pair in a mechanism.	T21 Breaking a covalent bond so that both electrons in the bonding pair go to the same fragment.	T21 A species that accepts an electron pair to form a covalent bond.
T21 The atom or group that departs with the bonding pair in a substitution.	T21 A reaction in which an electron-pair donor replaces a leaving group in a molecule.	T21 An alkane derivative in which one or more hydrogen atoms have been replaced by halogen atoms.

T21 electrophilic addition	T22 systematic error	T22 uncertainty

T22 An estimate of the possible range of error in a measurement.	T22 A consistent measurement bias caused by the method or instrument.	T21 A reaction in which an electron-pair acceptor initiates addition across a multiple bond.