

Chemistry definitions carry a condition more often than any other subject – a state, a number, “one mole”, “at constant temperature”. The condition is usually the second mark, so learn the whole sentence.

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States of matter and atoms

Diffusion – the spreading out of particles from a high to a low concentration, caused by their random movement; lighter gases diffuse faster

Element / compound / mixture – a substance made of one type of atom; two or more elements chemically combined; two or more substances not chemically combined and separable by physical means

Isotope – atoms of the same element with the same number of protons but different numbers of neutrons

Proton number / nucleon number – the number of protons in an atom; the total number of protons and neutrons in an atom

Relative atomic mass – the average mass of the isotopes of an element compared to one twelfth of the mass of an atom of carbon-12

Mole – the amount of substance that contains 6.02×10^{23} particles

Bonding and structure

Ionic bond – the strong electrostatic attraction between oppositely charged ions

Covalent bond – a shared pair of electrons between two atoms

Metallic bond – the attraction between positive metal ions and a sea of delocalised electrons

Giant covalent structure – a lattice of many atoms held by strong covalent bonds, giving a very high melting point – diamond, graphite, silicon dioxide

Alloy – a mixture of a metal with other elements, harder than the pure metal because the different-sized atoms stop the layers sliding

Chemical reactions

Oxidation / reduction – gain of oxygen or loss of electrons; loss of oxygen or gain of electrons

Oxidising agent – a substance that oxidises another substance and is itself reduced

Exothermic reaction – a reaction that transfers energy to the surroundings, so the temperature of the surroundings rises

Endothermic reaction – a reaction that takes in energy from the surroundings, so the temperature of the surroundings falls

Activation energy – the minimum energy that colliding particles must have to react

Catalyst – a substance that increases the rate of a reaction and is not changed by the reaction

Reversible reaction – a reaction that can go forwards and backwards, shown by the $\rightleftharpoons$ sign

Equilibrium – in a closed system, when the forward and reverse reactions happen at the same rate and the concentrations do not change

Rate of reaction – the change in the amount of a reactant or product per unit time

Acids, bases and salts

Acid – a substance that produces hydrogen ions in aqueous solution, giving a pH below 7

Base / alkali – a substance that neutralises an acid; an alkali is a soluble base, which produces hydroxide ions in solution

Neutralisation – the reaction of an acid with a base to form a salt and water

Salt – the compound formed when the hydrogen of an acid is replaced by a metal or an ammonium ion

Strong acid / weak acid – an acid completely ionised in water; an acid only partially ionised in water – strength is about ionisation, not concentration

Amphoteric oxide – an oxide that reacts with both acids and alkalis to form salts, such as aluminium oxide and zinc oxide

Electrochemistry and the periodic table

Electrolysis – the breakdown of an ionic compound, molten or in aqueous solution, by the passage of electricity

Electrolyte – a molten or aqueous substance that conducts electricity and is broken down by it

Cathode / anode – the negative electrode, where positive ions gain electrons; the positive electrode, where negative ions lose electrons

Group – a vertical column of the periodic table; elements in it have the same number of outer-shell electrons and similar chemical properties

Period – a horizontal row of the periodic table; the number of the period is the number of occupied electron shells

Transition element – a metal from the central block, with variable oxidation states, coloured compounds, and catalytic behaviour

Reactivity series – metals arranged in order of their tendency to form positive ions; a more reactive metal displaces a less reactive one from its compound

Organic chemistry and the environment

Homologous series – a family of similar compounds with the same general formula and the same functional group, whose properties change gradually

Functional group – the atom or group of atoms responsible for the characteristic reactions of a compound

Saturated / unsaturated – containing only single carbon-carbon bonds; containing at least one carbon-carbon double bond

- Structural isomers** – compounds with the same molecular formula but different structural formulae
- Addition polymerisation** – many small alkene molecules joining to form one long molecule, with no other product
- Fractional distillation** – the separation of a mixture of liquids using the differences in their boiling points
- Greenhouse gas** – a gas that absorbs infrared radiation re-emitted by the Earth, warming the atmosphere – carbon dioxide, methane
- Catalytic converter** – a device in an exhaust that converts carbon monoxide and nitrogen oxides into carbon dioxide and nitrogen