

10. Organic Chemistry

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Keyword	Definition
Addition Polymers	When alkenes undergo addition reactions by breaking their double bond and joining together to produce long chains.
Addition Reactions	A reaction where an atom or group of atoms is added onto an organic molecule without any other atoms being lost.
Alcohols	A homologous series of compounds all possessing the hydroxyl functional group -OH
Aldehyde	A homologous series containing the functional group -CHO.
Aliphatics	A branch of organic compounds that do not contain a benzene ring.
Alkanes	A homologous series of compounds, all containing only carbon and hydrogen joined together by single covalent bonds only.
Alkyl	The hydrocarbon part of an organic molecule
Arenes	A class of compounds that are derived from benzene.
Aromatic Compounds	Any molecule that contains a benzene ring.
Aromatics	A branch of organic compounds containing a benzene ring.
Benzene	C_6H_6 all arranged in a ring arrangement with a delocalised ring of electrons adding stability to the molecule.
Carboxylic Acids	A homologous series of compounds all possessing the -COOH functional group
Catenation	Carbon's ability to link it itself to form chains and rings.
Chain Reaction	A reaction which creates products that can act as reactants, perpetuating the reaction until a termination step.
Climate Change	The changing of the planet's climate system due to global warming and the high level of greenhouse gases.
Condensation Reaction	A reaction where two reactants join together and in the process a small molecule such as H_2O , HCl or NH_3 is lost
Condensed Structural Formula	A representation of a molecule that omits bonds where they can be assumed, and groups atoms together.
Curly Arrow	Represents the movement of a pair of electrons in organic reaction mechanisms.
Delocalised π Electron Cloud	Found in benzene rings, where electron density is concentrated in two donut-shaped rings above and below the plane of the ring. This is a very stable arrangement and lowers the internal energy of the molecule.
Distillation	The action of purifying a liquid by a process of evaporation and condensation.
Electron Deficient	An atom or group of atoms which has a partially positive charge.
Electrophiles	An electron-deficient species that is attracted to parts of molecules that are electron rich.
Electrophilic Substitution	A reaction where two electrophiles are exchanged in an organic molecule.
Empirical Formula	The simplest whole number ratio of the atoms a compound contains.
Fish-Hook	Represents the movement of a single electron in organic reaction mechanisms.

Fossil Fuels	Energy sources derived from fossilised organic matter. Coal, oil and gas.
Fractions	A group of chemicals that have similar boiling points.
Free Radicals	An atom or molecule with an unpaired electron, they are very reactive.
Full Structural Formula	A representation of a molecule that shows every atom and bond angle.
Functional Group	A group of atoms responsible for the characteristic reaction of a particular compound.
Global Dimming	A decrease in the amount of sunlight reaching the surface of the Earth, believed to be due to increased particulate matter in the atmosphere.
Global Warming	The overall warming of the planet due to the presence of high levels of greenhouse gases.
Greenhouse Gases	Gases that are held in the Earth's atmosphere and help to absorb heat, warming the planet.
Heterolytic Fission	When a bond breaks by both of the shared pair of electrons moving to one of the products. This creates a cation and an anion.
Homologous Series	A sequence of compounds with the same functional group and similar chemical properties.
Homolytic Fission	When a bond breaks by splitting the shared pair of electrons between the two products producing two free radicals.
Hydration	The reaction of water with alkenes that produces an alcohol.
Hydrocarbon Skeleton	A framework consisting of carbon and hydrogen only.
Hydrogenation	When hydrogen reacts with alkenes to form alkanes in the presence of a nickel catalyst at about 150C.
Ketone	A homologous series containing the functional group -CO-
Leaving Group	An atom or group of atoms which detaches from a compound during an organic reaction.
Molecular Formula	The actual number of atoms of each element present in a molecule.
Monomer	The alkene used in addition polymerisation reactions.
Nomenclature	The specific name given to a molecule, often following IUPAC naming conventions.
Nucleophiles	An electron-rich species that is attracted to parts of molecules that are electron deficient.
Nucleophilic Substitution	A reaction where two nucleophiles are exchanged in an organic molecule.
Photochemical Homolytic Fission	When a bond breaks by splitting the shared pair of electrons between the two products producing two free radicals. This is facilitated by the presence of UV light.
Prefix	The beginning of an organic compound name.
Primary Alcohols	An alcohol with the hydroxyl group attached to a carbon which is joined to only one other carbon.
Primary Carbon Atom	The carbon attached to the functional group and also to at least two hydrogen atoms.
R	An abbreviation for the alkyl part of a molecule
Reaction Mechanism	The sequence of steps that happens during a reaction.
Reflux	The process of boiling a liquid so that any vapour is condensed and returned

	to the vessel being heated.
Repeating Unit	A representation of the structure of a polymer with open bonds at each end to symbolise the long chain.
Resonance Energy	The amount of energy needed to overcome the special stability of the delocalised ring. Also called the stabilisation energy.
Saturated Hydrocarbons	Molecules that contain only single bonds and so cannot add any additional atoms without losing another. Alkanes are an example.
Secondary Alcohols	An alcohol with the hydroxyl group attached to a carbon which is joined to two other carbons.
Secondary Carbon Atom	The carbon attached to the functional group and also to one hydrogen atom and two alkyl groups.
Skeletal Structure	A representation of a molecule showing how the atoms are bonded to each other but leaving out the H atoms.
Stabilisation Energy	The amount of energy needed to overcome the special stability of the delocalised ring. Also called the resonance energy.
Stereochemical Formula	A representation that attempts to show the relative positions of atoms and groups around carbon in three dimensions
Structural Formula	A representation of a molecule showing how the atoms are bonded to each other.
Structural Isomers	Molecules that have the same molecular formula but different arrangements of the atoms
Substituents	Side chains or functional groups in addition to the one used in the suffix.
Substitution	When one reactant takes the place of a hydrogen atom in an alkane.
Suffix	The ending of an organic compound name replacing the -ane ending present in the parent alkane.
Tertiary Alcohols	An alcohol with the hydroxyl group attached to a carbon which is joined to three other carbons
Tertiary Carbon Atom	The carbon attached to the functional group and also to three alkyl groups and no hydrogen atoms.
Unsaturated Hydrocarbons	A hydrocarbon molecule containing a carbon-carbon double bond.

Higher Keywords

Keywords	Definitions
Analyser	A polarizer that can be rotated until the light passes through it and so deduce the extent and direction of rotation of the isomer.
Aprotic Solvents	Solvents that are not able to form hydrogen bonds as they do not contain -OH or -NH bonds, although they may have strong dipoles.
Asymmetric	A carbon atom attached to four different atoms or groups.
Asymmetric Synthesis	A process in which only one enantiomer is formed using a chiral catalyst.
Bimolecular	A reaction that involves two species of reactant particles.
Carbocation Intermediate	A positive ion with the charge centred on a carbon atom, formed as a transition state during the course of a reaction.
Chiral	A carbon atom attached to four different atoms or groups.
Chiral	Molecules which contain a chiral carbon, they have no plane of symmetry.

Molecules	
Cis Isomer	An isomer that has the same groups on the same side of the double bond or ring.
Diastereomers	Molecules which have different configurations at one or more, but not all, chiral centres. They are not mirror images of each other.
E/Z Isomers	A type of stereoisomerism that exists because of restricted rotation about double bonds.
Electrophilic Addition Reactions	A reaction in which an electrophile is added to a molecule.
Enantiomers	Two non-superimposable forms of isomers
Markovnikov's Rule	In addition reactions to unsymmetrical alkenes, the electron-rich component of the reagent adds to the carbon atom with the fewer hydrogen atoms bonded to it.
Nitrating Mixture	A mixture of concentrated nitric and concentrated sulphuric acid at 50°C which produces a NO_2^+ ion.
Non-Superimposable	Mirror images, things that do not line up if they are placed on top of each other.
Optical Isomerism	Compounds which contain an asymmetric carbon atom form stereoisomers that differ in their effect on plane polarised light.
Plane-Polarized Light	When only light waves oscillating in a single plane pass through something while light waves in all other planes are blocked out.
Polarimeter	An instrument which measures the amount and direction of rotation of optical isomers.
Polarizer	A device through which only the light waves oscillating in a single plane pass through.
Positive Inductive Effect	An atom or group of atoms which has an electron-donating effect on a molecule.
Precursors	Small fragments of organic molecules which have been broken down which will eventually yield the target molecule.
Primary Carbocation	A charged organic molecule where the carbon which carries the positive charge is only attached to one other alkyl group
Protic Solvents	Solvents that contain -OH or -NH and are able to form hydrogen bonds.
Racemate	A mixture containing equal amounts of the two enantiomers.
Racemic Mixture	A mixture containing equal amounts of the two enantiomers.
Resolution	A process to separate two enantiomers from a racemic mixture, using the two molecules distinct chemical and physical properties.
Retrosynthetic Analysis	A technique for planning a synthesis of complex organic molecules, whereby the complex target molecule is reduced into a sequence of progressively simpler structures which leads to the identification of a simple starting molecule.
Rules of Priority	Atoms with the higher atomic number will have higher priority. If the atoms are the same then apply the same rule to the next bonded atom.
Secondary Carbocation	A charged organic molecule where the carbon which carries the positive charge is attached to two other alkyl groups, which may be the same or different.
$\text{S}_{\text{N}}1$	Substitution nucleophilic unimolecular reaction
$\text{S}_{\text{N}}2$	Substitution nucleophilic bimolecular reaction.
Stereocentre	A carbon atom attached to four different atoms or groups.

Stereoisomerism	Where molecules have atoms attached in the same order but differ in their spatial or three-dimensional arrangement.
Stereospecific	When the three-dimensional arrangement of the reactants determines the three-dimensional configuration of the products.
Steric Hindrance	When bulky groups (like alkyl ones) make it difficult for an incoming group to attack a neighbouring carbon atom.
Synthetic Route	A series of discrete steps involved in turning organic compounds into different forms, usually working with a readily available starting material and organising several reactions in sequence.
Target Molecule	The desired organic product that is being synthesised.
Trans Isomer	An isomer which has the same groups on opposite sides or across the reference plane of a double bond.
Transition State	An unstable species formed during the course of a reaction that will be changed into the final product before the end.
Unimolecular	A reaction that involves one species of a reactant particle