An introduction to AS Level organic chemistry

A-Level Chemistry · Vocabulary in context

Word	Example
hydrocarbon /ˈhaɪdrəkɑːbən/	Methane is the simplest **hydrocarbon**: it has only carbon and hydrogen.
alkane /ˈælkeɪn/	Methane and ethane are each an **alkane**.
functional group /ˈfʌŋkʃənl gruːp/	The –OH **functional group** makes a compound an alcohol. –OH
general formula /ˈdʒenərəl ˈfɔːmjʊlə/	The **general formula** of the alkanes is CnH2n+2. CnH2n+2
molecular formula /məˈlekjʊlə ˈfɔːmjʊlə/	The **molecular formula** of glucose is C6H12O6. C6H12O6
structural formula /ˈstrʌktʃərəl ˈfɔːmjʊlə/	The **structural formula** of ethanol is CH3CH2OH. CH3CH2OH
displayed formula /dɪˈspleɪd ˈfɔːmjʊlə/	A **displayed formula** shows every atom and every bond.
skeletal formula /ˈskelɪtl ˈfɔːmjʊlə/	In a **skeletal formula**, each corner of a line is a carbon atom.
empirical formula /emˈpɪrɪkl ˈfɔːmjʊlə/	The **empirical formula** of glucose is CH2O. CH2O
nomenclature /nəˈmeŋklətʃə/	**Nomenclature** gives every compound one clear name.
homologous series /həˈmɒləgəs ˈsɪəriːz/	The alkanes form a **homologous series**: each member has one more CH2. CH2

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saturated /ˈsætʃəreɪtɪd/	Ethane is **saturated**: it has only single bonds.
unsaturated /ʌnˈsætʃəreɪtɪd/	Ethene is **unsaturated**: it has a double bond.
homolytic fission /ˌhɒməˈlɪtɪk ˈfɪʃn/	In **homolytic fission**, each atom takes one electron from the bond.
free radical /friː ˈrædɪkl/	A chlorine atom with one unpaired electron is a **free radical**.
heterolytic fission /ˌhetrəˈlɪtɪk ˈfɪʃn/	In **heterolytic fission**, one atom takes both electrons from the bond.
nucleophile /ˈnjuːklɪəfaɪl/	The hydroxide ion acts as a **nucleophile**.
electrophile /ɪˌlektrəʊˈfaɪl/	Bromine acts as an **electrophile** when it attacks a double bond.
addition /əˈdɪʃn/	Bromine joins ethene in an **addition** reaction.
substitution /ˌsʌbstɪˈtjuːʃn/	In a **substitution** reaction, one atom takes the place of another.
elimination /ɪˌlɪmɪˈneɪʃn/	In **elimination**, a small molecule is removed and a double bond forms.
hydrolysis /haɪˈdrɒləsɪs/	**Hydrolysis** uses water to break a large molecule into smaller ones.
condensation /kɒndenˈseɪʃn/	In **condensation**, two molecules join and give off water.
initiation /ɪˌnɪʃiˈeɪʃn/	In **initiation**, ultraviolet light splits chlorine into two radicals.

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Word	Example
propagation /ˌprɒpəˈgeɪʃn/	In **propagation**, each step uses one radical and makes another.
termination /ˌtɜːmɪˈneɪʃn/	In **termination**, two radicals join and the chain stops.
free-radical substitution /friː ˈrædɪkl ˌsʌbstɪˈtjuːʃn/	Methane reacts with chlorine by **free-radical substitution**.
electrophilic addition /ɪˌlektrəʊˈfɪlɪk əˈdɪʃn/	Ethene reacts with bromine by **electrophilic addition**.
nucleophilic substitution /ˌnjuːklɪəˈfɪlɪk ˌsʌbstɪˈtjuːʃn/	A halogenoalkane reacts with hydroxide ions by **nucleophilic substitution**.
nucleophilic addition /ˌnjuːklɪəˈfɪlɪk əˈdɪʃn/	Hydrogen cyanide reacts with a ketone by **nucleophilic addition**.
curly arrow /ˈkɜːli ˈærəʊ/	A **curly arrow** shows where a pair of electrons moves.
lone pair /ləʊn peə/	Water has two **lone pair**s of electrons on its oxygen atom.
cyclic /ˈsaɪklɪk/	Cyclohexane is a **cyclic** molecule: its carbon atoms form a ring.
hybridisation /ˌhaɪbrɪdaɪˈzeɪʃn/	In methane, **hybridisation** gives four equal bonds.
planar /ˈpleɪnə/	Ethene is **planar**: all its atoms lie flat.
sigma bond /ˈsɪgmə bɒnd/	A single bond is a **sigma bond**.
pi bond /paɪ bɒnd/	A double bond has one sigma bond and one **pi bond**.

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isomerism /ˈaɪsəmərɪzəm/	Butane and methylpropane show **isomerism**: same formula, different structure.
structural isomerism /ˈstrʌktʃərəl ˈaɪsəmərɪzəm/	**Structural isomerism** means the atoms are joined in a different order.
chain isomerism /tʃeɪn ˈaɪsəmərɪzəm/	Butane and methylpropane show **chain isomerism**.
positional isomerism /pəˈzɪʃənl ˈaɪsəmərɪzəm/	Propan-1-ol and propan-2-ol show **positional isomerism**. -1- -2-
functional group isomerism /ˈfʌŋkʃənl gruːp ˈaɪsəmərɪzəm/	Ethanol and methoxymethane show **functional group isomerism**.
stereoisomerism /ˈsterɪəʊɪsəmərɪzəm/	In **stereoisomerism**, the atoms are joined the same way but point in different directions.
geometrical isomerism /ˌdʒiːəʊˈmetrɪkl ˈaɪsəmərɪzəm/	But-2-ene shows **geometrical isomerism**. -2-
restricted rotation /rɪˈstrɪktɪd rəʊˈteɪʃn/	A double bond causes **restricted rotation**: the two ends cannot twist.
cis /sɪs/	In **cis** but-2-ene, both methyl groups are on the same side. -2-
trans /trænz/	In **trans** but-2-ene, the methyl groups are on opposite sides. -2-
optical isomerism /ˈɒptɪkl ˈaɪsəmərɪzəm/	Your left and right hands are like **optical isomerism**: mirror images that do not match.

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Word	Example
chiral /ˈkaɪrəl/	Your hand is **chiral**: its mirror image does not fit on top of it.
chiral centre /ˈkaɪrəl ˈsentə/	A carbon with four different groups is a **chiral centre**.
enantiomers /eˈnæntɪəməz/	**Enantiomers** are mirror images of each other.

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