

# Definitions and Concepts for AQA Chemistry GCSE

## Topic 7 - Organic Chemistry

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*Definitions in **bold** are for higher tier only*

*Definitions marked by '\*' are for separate sciences only*

*Definitions have been taken, or modified from the [AQA Specification for GCSE Chemistry, 8462, Version 1.1 04 October 2019](#).*

**\*Addition polymerisation:** A reaction where many small molecules (monomers) join together to form very large molecules (polymers).

**Alcohols:** Alcohols contain the functional group –OH. The first four members of a homologous series of alcohols are methanol, ethanol, propanol and butanol.

**Alkanes:** Alkanes are the most common hydrocarbon found in crude oil. Alkanes have the general formula  $C_nH_{2n+2}$ .

**Alkenes:** Alkenes are hydrocarbons with a double bond between two of the carbon atoms in their chain, causing them to be unsaturated. They have the general formula  $C_nH_{2n}$ .

**\*Amino acids:** Amino acids have two different functional groups in a molecule. They react by condensation polymerisation to produce polypeptides.

**Carboxylic acids:** Carboxylic acids have the functional group –COOH. The first four members of a homologous series of carboxylic acids are methanoic acid, ethanoic acid, propanoic acid and butanoic acid.

**Catalytic cracking:** Long-chain hydrocarbons are heated to turn them into a gas. The vapour is then passed over a hot powdered aluminium oxide catalyst. The long chain molecules split apart on the surface of the catalyst.

**Combustion:** Combustion of hydrocarbon fuels releases energy. During combustion, the carbon and hydrogen in the fuels are oxidised.

**Complete combustion:** Water and carbon dioxide are the only products of the complete combustion of a hydrocarbon.

**Crude oil:** A finite resource found in rocks. It is the remains of an ancient biomass consisting mainly of plankton that was buried in mud. Most of the compounds in crude oil are hydrocarbons.



**\*Condensation polymerisation:** These reactions involve monomers with two functional groups. When these monomers react they join together and lose small molecules such as water.

**Cracking:** A process that involves breaking down larger hydrocarbons to produce smaller more useful molecules. Cracking can be done by catalytic cracking or steam cracking.

**\*DNA:** DNA encodes genetic instructions for the development and functioning of living organisms and viruses. Most DNA molecules are two polymer chains, made from four different nucleotides, in the form of a double helix.

**Esters:** The product of a condensation reaction between a carboxylic acid and alcohol. For example: ethanol + ethanoic acid → ethyl ethanoate.

**Fermentation:** A chemical process by which molecules such as glucose are broken down anaerobically. Ethanol is produced when sugar solutions are fermented using yeast.

**Fractional distillation:** A method of separating a mixture of substances according to their different boiling points. Commonly used to separate crude oil into different fractions.

**Homologous series:** A series of compounds with the same functional group and similar chemical properties.

**Hydrocarbons:** Molecules that are made up of hydrogen and carbon atoms only.

**\*Nucleotides:** The monomers which make up DNA.

**\*Polyesters:** A category of polymers which contain the ester functional group in their main chain. Formed from condensation polymerisation.

**Polymers:** Large long-chain molecules made up of lots of small monomers joined together by covalent bonds.

**Polypeptide:** A chain of amino acids.

**\*Repeat unit:** The part of a polymer whose repetition would produce the complete polymer chain.

**Steam cracking:** Long-chain hydrocarbons are heated to turn them into a gas. The hydrocarbon vapour is then mixed with steam and heated to a very high temperature which caused them to split into smaller molecules.

