

# OCR (A) Chemistry A-level

## Topic 4.1.1 - Basics of Organic Chemistry

### Flashcards



# What does nomenclature mean?



What does nomenclature mean?

The system used for naming organic compounds



# What does the term empirical formula mean?



What does the term empirical formula mean?

Simplest whole number ratio of atoms in a molecule



# What does the term molecular formula mean?



What does the term molecular formula mean?

It provides the actual number of atoms of different elements in a molecule



What does the term displayed formula mean?



What does the term displayed formula mean?

It shows every atom and every bond in a molecule



# What does the term structural formula mean?



What does the term structural formula mean?

It shows the arrangement of atoms in a molecule without showing every bond



# Define skeletal formula



## Define skeletal formula

A type of formula which is drawn as lines with each vertex being a carbon atom.

Carbon atoms not drawn, assumed each C atom has all unspecified bonds as C-H



# Define homologous series



Define homologous series

A series of organic compounds having the same functional group but with each successive member differing by  $\text{CH}_2$



# What is a functional group?



What is a functional group?

A group of atoms responsible for characteristic reactions of a compound



# What is an aliphatic hydrocarbon?



What is an aliphatic hydrocarbon?

Hydrocarbon with carbon atoms joined together in a straight line or branched chain



# What is an alicyclic hydrocarbon?



What is an alicyclic hydrocarbon?

Hydrocarbons arranged in non aromatic rings with or without side chains



# What is an aromatic hydrocarbon?



What is an aromatic hydrocarbon?

Hydrocarbon that contains at least one benzene ring



# Give the suffixes for:

- a) No double bonds
- b) At least one double bond
- c) An alcohol
- d) An aldehyde
- e) A ketone
- f) A carboxylic acid



Give the suffixes for:

- a) No double bonds **-ane**
- b) At least one double bond **-ene**
- c) An alcohol **-ol**
- d) An aldehyde **-al**
- e) A ketone **-one**
- f) A carboxylic acid **-oic acid**



# Give the prefixes for:

- a)  $\text{CH}_3$  group
- b)  $\text{C}_2\text{H}_5$  group
- c)  $\text{C}_3\text{H}_7$  group
- d)  $\text{C}_4\text{H}_9$  group
- e) Cl group
- f) Br group
- g) I group



Give the prefixes for:

- a)  $\text{CH}_3$  group methyl-
- b)  $\text{C}_2\text{H}_5$  group ethyl-
- c)  $\text{C}_3\text{H}_7$  group propyl-
- d)  $\text{C}_4\text{H}_9$  group butyl-
- e) Cl group chloro-
- f) Br group bromo-
- g) I group iodo-



What is the general formula of alkanes?



What is the general formula of alkanes?



# What is the general formula of alkenes?



What is the general formula of alkenes?



# What is the general formula of alcohols?



What is the general formula of alcohols?



# What does saturated mean?



What does saturated mean?

Organic compounds which only contain single bonds



# What are unsaturated compounds?



What are unsaturated compounds?

Organic compounds that contain at least one carbon carbon double covalent bond



# Define structural isomerism



Define structural isomerism

When molecules have the same molecular formula but different structural formula



What are the 3 ways in which structural isomers can be formed?



What are the 3 ways in which structural isomers can be formed?

1. Alkyl groups can be in different places
2. Functional groups can be bonded to different parts
3. There can be different functional groups



# What are stereoisomers?



What are stereoisomers?

Organic compounds with the same molecular formula but have different arrangement of atoms in space



What is E-Z isomerism and how are the E and Z isomers decided?



What is E-Z isomerism and how are E and Z isomers differentiated?

E-Z isomerism is caused by the limited rotation about C=C double bonds

If the two substituents with the highest molecular mass are on the same side of the double bond, it is the Z (zusammen) isomer

If they are on different sides, it is the E (entgegen) isomer



# What is Cis-trans isomerism?



What is Cis-trans isomerism?

Special type of E/Z isomerism where the two substituents on each carbon atom are the same



# What is homolytic fission?



What is homolytic fission?

It happens when each bonding atom receives one electron from the bonded pair forming two radicals



# What is heterolytic fission?



What is heterolytic fission?

When one bonding atom receives both electrons from the bonded pair



# What are radicals?



What are radicals?

Highly reactive, neutral species



How is a covalent bond  
formed from two radicals?



How is a covalent bond formed from two radicals?

The radicals collide and the electrons are involved in the bond formation

