

Edexcel IGCSE Chemistry

Topic 4: Organic chemistry

Alkanes

Notes





4.19 know the general formula for alkanes

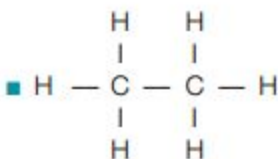
- C_nH_{2n+2} is the general formula
- E.g. ethane is C_2H_6

4.20 explain why alkanes are classified as saturated hydrocarbons

- Contain no C=C double bonds, therefore the carbons are saturated, because each carbon has formed its maximum of 4 single bonds

4.21 understand how to draw the structural and displayed formulae for alkanes with up to five carbon atoms in the molecule, and to name the unbranched-chain isomers

- Alkane molecules can be represented in the following forms:



Covalent bond

- The first 4 alkanes are methane, ethane, propane and butane (MEPB: Monkeys Eat Peanut Butter)

alkane	structural formula	displayed formula
methane	CH_4	$\begin{array}{c} \text{H} \\ \\ \text{H} - \text{C} - \text{H} \\ \\ \text{H} \end{array}$
ethane	CH_3CH_3	$\begin{array}{c} \text{H} & \text{H} \\ & \\ \text{H} - \text{C} - & \text{C} - \text{H} \\ & \\ \text{H} & \text{H} \end{array}$
propane	$CH_3CH_2CH_3$	$\begin{array}{c} \text{H} & \text{H} & \text{H} \\ & & \\ \text{H} - \text{C} - & \text{C} - & \text{C} - \text{H} \\ & & \\ \text{H} & \text{H} & \text{H} \end{array}$





butane	$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$	<pre> H H H H H-C - C - C - C-H H H H H</pre>
pentane	$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$	<pre> H H H H H H-C - C - C - C - C-H H H H H H</pre>

4.22 describe the reactions of alkanes with halogens in the presence of ultraviolet radiation, limited to mono-substitution; knowledge of reaction mechanisms is not required

- $\text{Br}_2 + \text{C}_2\text{H}_6 \xrightarrow{\text{UV}} \text{C}_2\text{H}_5\text{Br} + \text{HBr}$
- Halogen + alkane $\xrightarrow{\text{UV}}$ halogenoalkane + hydrogen halide

