



Naming Alkanes

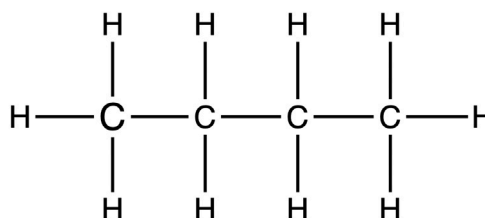
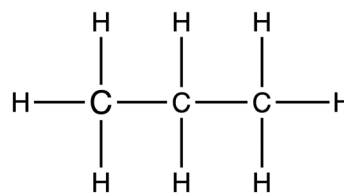
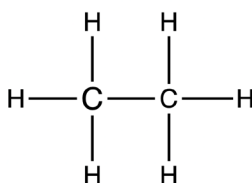
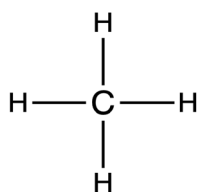
Topic Summary

- Organic chemistry focuses on carbon-based compounds, particularly those containing carbon-hydrogen bonds.
- Carbon's ability to form **four covalent bonds** makes it ideal for building complex molecules.
- Alkanes are **hydrocarbons**. Hydrocarbons are molecules that contain **ONLY** hydrogen and carbon atoms.
- Alkanes only contain **single** carbon-carbon and carbon-hydrogen bonds
- They are named with a prefix based on their number of carbon atoms and an ending **-ane**.
- The first 4 are methane, ethane, propane and butane after this they follow standard Greek numbering, similar to geometric shapes, with pentane, hexane, heptane etc...
- Their generic molecular formula is $C_n H_{(2n+2)}$
- You are required to convert between names, structural formulae and molecular formulae for the first 5-10 alkanes and complete molecular formulae for any alkane given either its number of carbons or its number of hydrogen atoms.



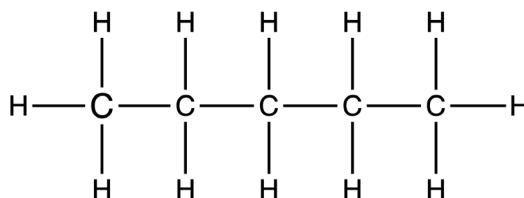
Easy ones first to build your confidence

Draw out the structural formulae of the first four alkanes (methane, ethane, propane and butane). Methane has been done for you.



Now a bit trickier

Name this alkane...



Why are alkanes referred to as hydrocarbons?

They contain **ONLY** hydrogen and carbon (answer **MUST** indicate that only H and C are present)
What is the general molecular formula for an alkane?

..... $C_n H_{(2n+2)}$

How many bonds must each carbon form in an alkane molecule?

.....FOUR.....



Complete these alkane molecules...

You'll need to remember the general molecular formula for alkanes to answer this question.
Try to name the molecule if you can.

C_5H_{12} pentane.....

C_8H_{18} octane.....

C_3H_8 propane.....

$C_{10}H_{22}$ decane.....

C_6H_{14} hexane.....



Now find the missing number of carbons...

You'll still need the general molecular formula for alkanes but now you have to work backwards to get the number of carbons.

$C_{16}H_{34}$ 7.....($16 - 2 = 14$, $14 / 2 = 7$).....

$C_{46}H_{94}$ 22.....

$C_{102}H_{206}$ 50.....



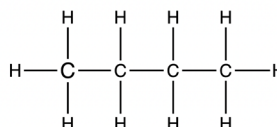
Do this later...

Give your brain a break and come back to these questions later. Cover the rest of the sheet while you have a go. By doing this 24-48 hours after watching the video you will boost your chances of remembering the key points in an exam. If you struggle with these questions, re-watch the video and then try again.

This is a mixed bag of examples to test you.

Name this alkane - C_3H_8 Propane.....

Draw the structural formula of butane



Complete this formula $C_{10}H_{22}$

Complete this formula $C_{19}H_{40}$