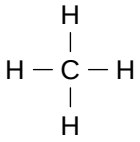
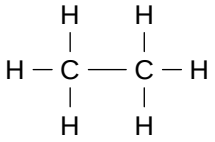
Chemistry 90648
Describe properties and reactions of carbon and its compounds

Alkanes: C1- C6 (names and structural formulae)
Alkenes: ethene and propene (names and structural formulae)
Carboxylic acid: ethanoic acid (name and structural formula)

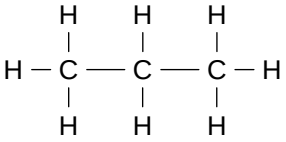
ALKANES C_nH_{2n+2}



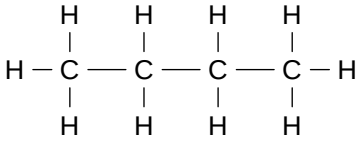
methane
CH_4



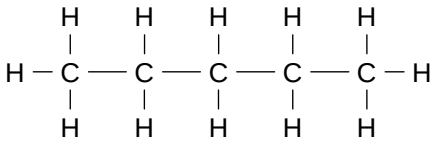
ethane
C_2H_6



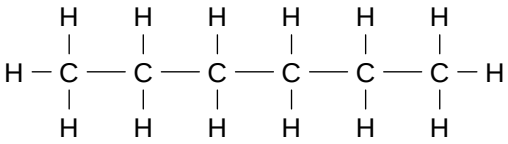
propane
C_3H_8



butane
C_4H_{10}

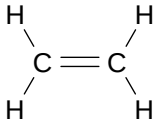


pentane
C_5H_{12}

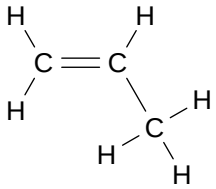


hexane
C_6H_{14}

ALKENES C_nH_{2n}

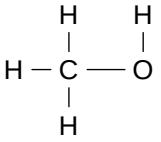


ethene
C_2H_4

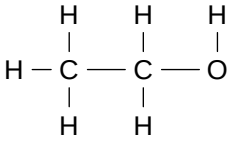


propene
C_3H_6

ALCOHOLS $C_nH_{2n+1}OH$

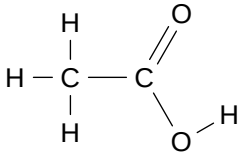


methanol
CH_3OH



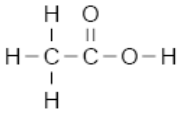
ethanol
C_2H_5OH

CARBOXYLIC ACID

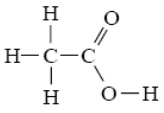


ethanoic acid
CH_3COOH

This may be drawn slightly differently, as shown below, but you can clearly see that it has the same structure.



and



are the same.

<u>Naming organic compounds</u>: No. of carbon atoms: 1 meth-; 2 eth-; 3 prop-; 4 but-; 5 pent-; 6 hex-.

HOMOLOGOUS SERIES

alkanes	single bonds between all carbon atoms
alkenes	double bond between one pair of carbon atoms
alcohols	have an -OH group

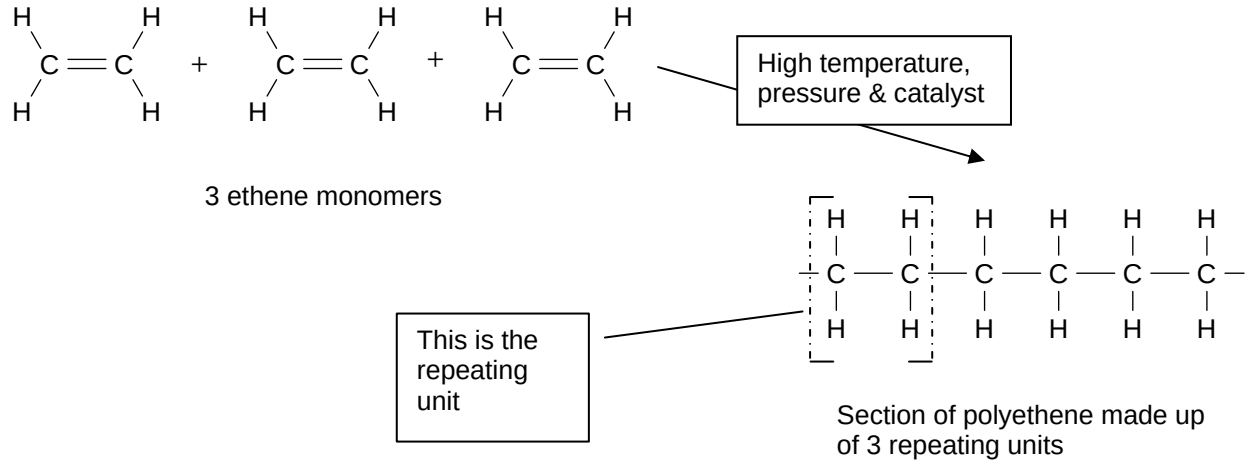
Alkanes: General formula C_nH_{2n+2}. Alkanes contain only <u>single bonds</u> between carbon atoms (called <u>saturated</u> hydrocarbons). Hydrocarbons are compounds containing carbon and hydrogen atoms only. For alkanes up to C_3H_8 there is only one possible structure.

Alkenes: Contain one <u>C=C double bond</u> in each molecule. The general formula of the alkenes is C_nH_{2n}. They are <u>unsaturated.</u>

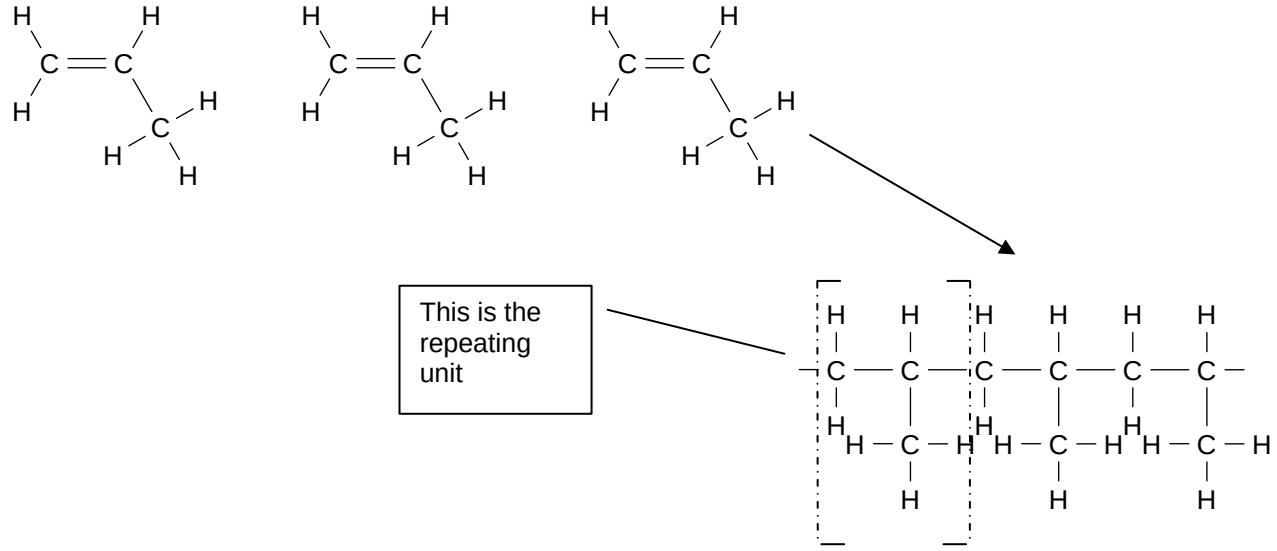
Polymerisation: E.g. ethene is polymerised to give polyethene (polythene), e.g. nC_2H_4 ---> $-(CH_2-CH_2)-n$ (where n is a very large number). Ethene is the simplest type of monomer (building block). This is an example of an "addition" reaction and can occur because the monomers are reactive (contain C=C).

POLYMERISATION

Ethene monomers polymerise to form polyethene (which we usually just call polythene).

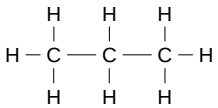


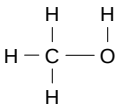
Propene monomers polymerise to form polypropene.

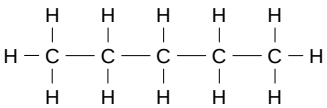


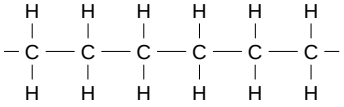
Answers to "Test Yourself"

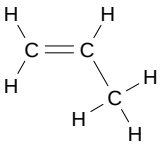
1. butane 2. ethene 3. ethanoic acid 4. ethanol 5. propene 6. methane

7. 

8. 

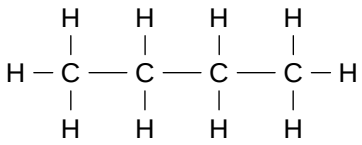
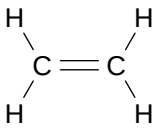
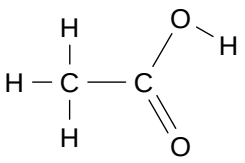
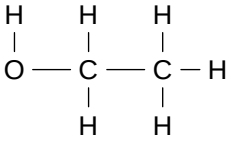
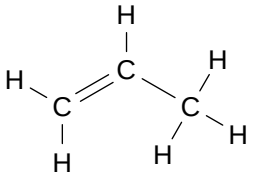
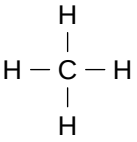
9. 

10. 

11. 

Test yourself

Name these organic compounds.

		
1.	2.	3.
		
4.	5.	6.

Draw these organic compounds.

7. propane	8. methanol	9. pentane

10. a section of the polymer, polyethene showing 3 repeating units

11. the monomer from which this polymer is formed.