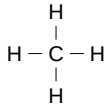
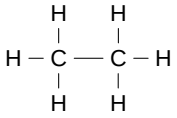
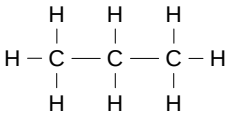
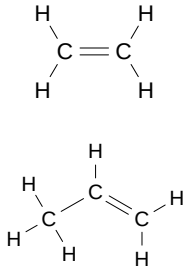
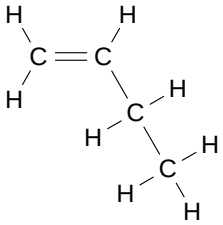
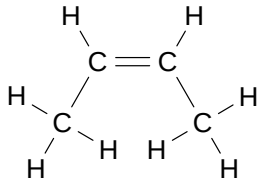
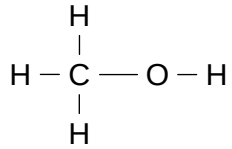
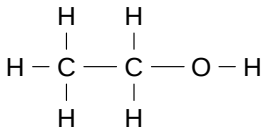
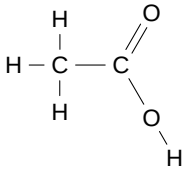
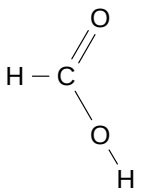
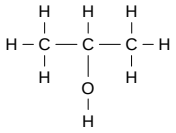
 CH_4	 C_2H_6	 C_3H_8	C_4H_{10} C_5H_{12} C_6H_{14}
methane	*ethane*	*propane*	*butane, pentane & hexane*
C_nH_{2n+2} Saturated hydrocarbons Insoluble in water	C_nH_{2n} Unsaturated hydrocarbons Insoluble in water	Burns in plentiful O_2 with a clean flame to give CO_2, H_2O & max. amount of energy	Burns in limited O_2 with dirty flame to give C, CO, CO_2 & H_2O & less than max. amount of energy
alkanes	*alkenes*	*complete combustion*	*incomplete combustion*
As the number of C atoms increase in the alkanes, the melting points and boiling points…	Hydrocarbons are separated in fractional distillation because they have different…	The shorter the hydrocarbon chain, the _____ its boiling point	Smaller molecules condense at the top, bigger at the middle, biggest at the bottom in…
increase	*boiling points*	*lower*	*fractional distillation*
Higher boiling point Less volatile More viscous Ignites less easily	Lower boiling point More volatile Less viscous Ignites more easily	Alkanes eg methane, propane & butane, and some bigger alkanes, are used mainly as …	Makes things dirty (sooty)
large molecules	*small molecules*	*fuels*	*carbon*

Large less useful hydrocarbons are broken into smaller and unsaturated molecules by…	Cracking produces more molecules that can be used as fuels as well as the more useful…	Molecules with a C=C bond are important starting points for the manufacture of…	Polythene, polypropene, PVC, PTFE are all examples of…
cracking	*unsaturated molecules eg ethene*	*polymers (plastics)*	*polymers (plastics)*
The reaction where monomers are joined together to form polymers is called…	Hydrocarbons where each C is bonded to the max. no. (4) of other atoms are called…	Hydrocarbons where each C is bonded to less than the max. no. (4) of other atoms are called…	As no. of C increase in a molecule, m.pt. and b.pt. increase due to greater…
polymerisation	*saturated*	*unsaturated*	*weak attractive forces between molecules*
Occurs in natural gas, marsh gas, released by flatulent ruminants	CH_4 is compressed as CNG which is…	CH_4 is a linked with global warming and the climate change and is a…	The main ingredients of LPG (liquid petroleum gas) are…
CH_4	*compressed natural gas*	*"greenhouse gas"*	*propane and butane*
$C_3H_8 + \_\_O_2$ → $\_\_ CO_2 + \_\_ H_2O$	CO is poisonous, There is less O_2 carried by the blood because CO binds to ___ in red blood cells	___ gas is particularly dangerous because it is colourless, odourless and poisonous	___ can cause irritation of lungs, respiratory problems eg bronchitis & asthma
$5O_2$ $3CO_2$ $4H_2O$	*haemoglobin*	*Carbon monoxide CO*	*Carbon C*

Incomplete combustion also wastes ___ & ___ because less than the max. energy is released	Products of combustion experiment: lime water tests for…	Products of combustion experiment: iced water is to…	Products of combustion experiment: cobalt chloride paper tests for…
fuel and $$$	*carbon dioxide*	*condense the steam to water*	*water (blue paper turns pink in water)*
C_nH_{2n} ethene propene butene	C=C Double bond Found in alkenes Molecule is called…		
alkenes (first 3 members)	*unsaturated*	*ethene & propene*	*1-butene*
	Alkenes will burn but are not wasted as fuels as are more useful to make other chemicals eg…	The name for the type of reactions done by alkenes is _____ reactions	$nC_2H_4 \rightarrow$ $-(CH_2\text{-}CH_2)\text{-}_n$ represents the process called…
2-butene	*polymers (plastics)*	*addition*	*polymerisation (making polythene in this eg.)*
The "building blocks" or individual units of the polymer are called….	The polymer polypropene is made up from the monomer called…	The polymerisation process requires the use of ___ , ___ & a ___	$C_nH_{2n+1}OH$ CH_3OH C_2H_5OH C_3H_7OH etc
monomers	*propene*	*heat, pressure & a catalyst*	*alcohols – methanol, ethanol, & propanol*

 CH_3OH	C_2H_5OH Colourless liquid Soluble in water Characteristic odour	Alcohol used as solvent fuel & is in alcoholic drinks	Anaerobic respiration *uses/doesn't use* O_2
methanol	*ethanol*	*ethanol*	*Doesn't use O_2 (don't say "air")*
 C_2H_5OH	Combustion of ethanol C_2H_5OH + __O_2 → __CO_2 + __H_2O	Ethanol is produced by anaerobic respiration by yeast, aka …	The first few members of the alcohol family are _____ in water
ethanol	*$3O_2$ $2CO_2$ $3H_2O$*	*fermentation*	*soluble*
Fermentation of sugar solution occurs best around __ - __°C: yeast contains enzymes	The name for a biological catalyst is …	Alcohols have higher m.pts and b.pts that the corresponding….	 CH_3COOH
25-40	*an enzyme*	*alkanes* *eg ethane (g)* *ethanol (l)*	*ethanoic acid (old name acetic acid)*
Carboxylic acids are found in many fruits. Ethanoic acid however is found in …..	 HCOOH	Molecules with the –COOH functional group are called…	Ethanol is converted to ethanoic acid by the process called….
vinegar	*methanoic acid (old name formic acid)*	*carboxylic acids*	*oxidation*

ethanoic acid, CH_3COOH, can be used for….	Alkanes are used for fuels because…	long molecule made up of many **repeating** units (**monomers**)	*how do ethene molecules join together to form polyethene*
vinegar (as a preservative) & as a flavouring in food	*burn easily & release a lot of energy*	*polymer*	*double bond breaks & single bonds form between the ethene molecules*
organic molecules that are insoluble in water are	organic molecules that are soluble in water are	what microbe carries out anaerobic respiration / fermentation of sugar?	$C_6H_{12}O_6 \rightarrow 2CH_3CH_2OH + 2CO_2$ This reaction is…
alkanes and alkenes	*alcohols & carboxylic acids (up to about C_3)*	*yeast (fungi)*	*fermentation / anaerobic respiration*
type of formula $CH_3CH(OH)CH_3$ for propanol	type of formula  for propanol	type of formula C_3H_7OH for propanol	
condensed structural formula	*full structural formula (all bonds shown)*	*molecular formula (just how many atoms)*	