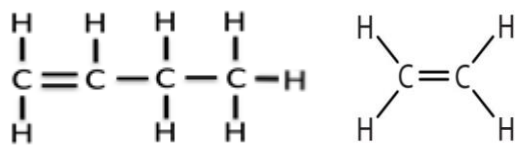


Topic 7

1. How is crude oil made?	Crude Oil is the remains of an ancient biomass mainly of plankton that was buried in mud.
2. What is the main type of compounds found in Crude Oil?	Hydrocarbons are the main compounds found in Crude Oil.
3. What is the general formula for alkanes?	C_nH_{2n+2}
4. What are the names of the first 4 compounds in the homologous series of the alkanes?	Methane, ethane, propane and butane.
5. Draw the displayed formula for the following alkanes: a). Propane b). Ethane	$ \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}-\text{C}-\text{C}-\text{H} \\ \quad \\ \text{H} \quad \text{H} \end{array} \quad \begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \\ \quad \quad \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{H} \\ \quad \quad \\ \text{H} \quad \text{H} \quad \text{H} \end{array} $
6. What is the name of the process used to separate Crude Oil?	Fractional Distillation
7. What are the fractions used for?	The fractions are used as fuels e.g. petrol, diesel and kerosene and feedstock for the petrochemical industry e.g. solvents, lubricants and polymers.
8. Describe what happens during Fractional Distillation.	The Crude Oil is heated, to different boiling points depending on the size of the molecules. The short chain molecules have low boiling points and evaporate first and are collected at the top of the fractionating column. Once the liquid has evaporated, the heat is removed and the vapour condenses back into a liquid.
9. If a hydrocarbon has a high viscosity and a low volatility is it: a) Long chain molecule b) Short chain molecule	Long chain molecule
10. What 2 properties could be used to describe a short chain hydrocarbon molecule?	<ul style="list-style-type: none"> ● Low boiling point ● High volatility (can easily change into a gas) ● Low viscosity (very runny) ● High flammability (sets alight easily)

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<p>11. Write a word and balanced symbol equation for the complete combustion of methane (CH₄)</p>	<p>Methane + Oxygen → Carbon Dioxide + Water</p> $\text{CH}_4(\text{g}) + 2\text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l})$
<p>12. What are the chemical test used to show the presence of: a). Carbon Dioxide? b). Water?</p>	<p>a) Carbon Dioxide - the gas is bubbled through limewater which will change from clear to cloudy. b) Water - condensation can be seen on the sides of the glass OR blue cobalt chloride turns pink in the presence of water.</p>
<p>13. If incomplete combustion happens - what are the 2 different products formed?</p>	<p>1). Carbon Monoxide 2). Carbon particles (soot)</p>
<p>14. Why are long chain hydrocarbon molecules cracked?</p>	<p>To breakdown the long chain molecules into smaller more useful compounds.</p>
<p>15. What are the 2 conditions for cracking long chain hydrocarbon molecules?</p>	<p>1). A catalyst. 2). A high temperature.</p>
<p>16. What chemical test could be used to show that an alkane has been cracked and an alkene has been formed?</p>	<p>Bromine water is orange/brown in the presence of alkanes and colourless in the presence of alkenes.</p>
<p>17. What is the general formula for alkenes?</p>	<p>C_nH_{2n}</p>
<p>18. Draw the displayed formula for the following alkenes: a). Butene b). Ethene</p>	
<p>19. What is the difference between a saturated and unsaturated hydrocarbon?</p>	<p>An unsaturated hydrocarbon has a double bond between 2 carbon atoms and have 2 fewer hydrogen atoms than in an alkane.</p>
<p>20. What product is formed when ethene reacts with steam and a catalyst?</p>	<p>Ethene + steam ----- ethanol</p> $\text{C}_2\text{H}_4(\text{g}) + \text{H}_2\text{O}(\text{l}) \text{-----} \text{C}_2\text{H}_5\text{OH}$
<p>21. When the alkenes react with any of the halogens, what product is formed?</p>	<p>Ethene + Chlorine → Dichlorethane</p> $\text{C}_2\text{H}_4(\text{g}) + \text{Cl}_2(\text{aq}) \rightarrow \text{C}_2\text{H}_4\text{Cl}_2$
<p>22. What is the functional group for alcohols?</p>	<p>- OH</p>

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23. What are the reactants, products and conditions needed for fermentation?	Reactants: Glucose, Yeast Product: Ethanol, Carbon Dioxide Conditions: Warm and moist
24. What is the functional group for carboxylic acids?	-COOH
25. When carboxylic acids are reacted with a metal carbonate, what products are formed?	Products: A salt, water, Carbon Dioxide
26. Why are carboxylic acids classed as weak acids?	Carboxylic acids are weak acids as they do not complete ionise in an aqueous solution. I.e. not all the H ⁺ ions split up from the rest of the compound.
27. What general product is formed when a carboxylic acid reacts with an alcohol?	An ester
28. What is the name of the ester formed when ethanoic acid reacts with ethanol?	Ethyl Ethanoate
29. Name the two types of polymerisation reactions.	Addition Polymerisation Condensation Polymerisation
30. What is the difference between an addition and condensation polymerisation reaction?	Addition reaction - 1 reactant 1 product Condensation reaction: 2 reactants with different functional groups 2 products a polymer and water
31. What is made if different amino acids are combined in the same chain?	Proteins
32. What is the name of the monomers that combine to make DNA?	Nucleotides