

Core questions – Chemistry unit 7 - Organic chemistry

No.	Question	Answer
1	What is an organic compound?	Something that contains carbon atoms
2	How did crude oil form?	From the remains of dead animals and plants millions of years ago
3	What is crude oil a mixture of?	Hydrocarbons
4	What is a hydrocarbon?	Molecules made up of hydrogen and carbon atoms <u>only</u>
5	What is an alkane?	A saturated hydrocarbon
6	What is the general formula for an alkane?	C_nH_{2n+2}
7	What is a saturated hydrocarbon?	Contains only single covalent bonds between atoms
8	What is displayed formula?	Represents the covalent bonds present in a molecule as lines
9	How do we name alkanes?	Look at the carbon chain length, apply the right prefix and add 'ane' on the end
10	What is the prefix for 1 carbon?	Meth-
11	What is the prefix for 2 carbons?	Eth-
12	What is the prefix for 3 carbons?	Prop-
13	What is the prefix for 4 carbons?	But-
14	How are the hydrocarbons in crude oil separated?	Fractional distillation
15	What is a fractional distillation 'fraction'?	Contains molecules with a similar number of carbon atoms
16	Describe temperature changes in the fractional distillation column?	Hotter at the bottom, colder at the top
17	Why do the different fractions condense at different temperatures?	Different chain lengths have different boiling points
18	What are the 2 physical changes involved in fractional distillation?	Evaporation and condensation
19	What can crude oil fractions be used for?	Fuels and as a raw material for the petrochemical industry
20	What different fuels come from crude oil?	Petrol, diesel, kerosene, heavy fuel oil, petroleum gases
21	What substances are made from crude oil, other than fuels?	Solvents, lubricants, polymers, detergents
22	What properties are affected by hydrocarbon chain length?	Boiling point, viscosity, flammability
23	How does hydrocarbon chain length affect boiling point?	The longer the chain, the higher the boiling point
24	What is flammability?	How easily a substance ignites or burns
25	How does hydrocarbon chain length affect the flammability?	The longer the chain, the less flammable it is
26	What is viscosity?	How thick a liquid is
27	How does hydrocarbon chain length affect viscosity?	The longer the chain length, the more viscous it is
28	Why do we burn hydrocarbon fuels?	To release energy
29	What type of reaction is combustion?	Oxidation
30	What are the two products when a hydrocarbon undergoes complete combustion?	Carbon dioxide, water
31	What is cracking?	Breaking down large hydrocarbons to smaller, more useful molecules
32	Why are smaller hydrocarbons more useful than larger molecules?	Make better fuels
33	What are the two types of cracking?	Catalytic cracking, steam cracking

34	What conditions are needed for catalytic cracking?	Vapour passed over a hot catalyst at high temperature
35	What conditions are needed for steam cracking?	Mix vapours with steam at high temperature
36	What are the products of cracking?	Alkane(s) and alkene(s)
37	What is an alkene?	An unsaturated hydrocarbon with a carbon-carbon double bond
38	What is the test for an alkene?	Turns bromine water from orange to colourless
39	What are alkenes used for?	Producing polymers and other chemicals
40	How do we name alkenes? (Triple only)	Look at the carbon chain length, apply the right prefix and add 'ene' on the end
41	What does the 'functional group' on a molecule determine? (Triple only)	How it reacts
42	What functional group do alkenes contain? (Triple only)	Carbon-carbon double bond (C=C)
43	What is a homologous series? (Triple only)	A series of compounds with the same functional group
44	What causes incomplete combustion? (Triple only)	A lack of oxygen
45	What are the products of incomplete combustion? (Triple only)	Carbon monoxide, soot, water
46	What is an addition reaction? (Triple only)	A reaction that add a molecule across the carbon-carbon double bond
47	What conditions are needed for the addition of hydrogen to alkenes? (Triple only)	A heated catalyst of nickel at 300°C
48	What is produced when an alkene reacts with hydrogen? (Triple only)	A saturated hydrocarbon
49	What conditions are needed for the addition of water to alkenes? (Triple only)	React with steam passed over a catalyst of hot phosphoric acid
50	What is the product when an alkene reacts with water? (Triple only)	Ethanol
51	What functional group do alcohols contain? (Triple only)	-OH
52	What are the main uses of alcohols? (Triple only)	Fuels and solvent, making alcoholic drinks and bread
53	How do we name alcohols? (Triple only)	Look at the carbon chain length and apply the right prefix and add 'anol' on the end
54	What are two ways alcohols can be produced? (Triple only)	Fermentation and hydration of ethene
55	What conditions are needed for the fermentation of sugar? (Triple only)	Add sugar to yeast at 25-40°C in anaerobic conditions
56	What are the products of the fermentation of glucose? (Triple only)	Ethanol and carbon dioxide
57	What is produced when an alcohol reacts with oxygen? (Triple only)	Carbon dioxide and water
58	What gas is produced when an alcohol reacts with sodium? (Triple only)	Hydrogen
59	What is formed when alcohols react with an oxidising agent? (Triple only)	A carboxylic acid and water
60	What is formed when alcohol is dissolved in water? (Triple only)	A neutral solution
61	What functional group do carboxylic acids contain? (Triple only)	-COOH
62	How do we name carboxylic acids? (Triple only)	Look at the carbon chain length and apply the right prefix and add 'anoic' on the end

63	What is formed when a carboxylic acid dissolves in water? (Triple only)	An acidic solution
64	Why do carboxylic acids form weak acids in solution? (Triple only)	They are only partially ionised in water
65	What is produced when a carboxylic acid reacts with a metal? (Triple only)	A salt and hydrogen
66	What is produced when carboxylic acids react with carbonates? (Triple only)	Salt, carbon dioxide, water
67	What is produced in a reaction between carboxylic and alcohols? (Triple only)	An ester and water
68	What ester is produced in the reaction between ethanoic acid and ethanol? (Triple only)	Ethyl ethanoate
69	What is a monomer? (Triple only)	A molecule that can be bonded to other identical molecules to form a polymer
70	What is a polymer? (Triple only)	A long chain molecule made from many monomers
71	What is addition polymerisation? (Triple only)	A reaction that joins many monomers together to form a polymer
72	Why can alkenes be used in addition polymerisation? (Triple only)	They contain a double bond
73	How are polymers represented? (Triple only)	The displayed formulae are written as repeating units with a square bracket at each end, with an n outside the bracket
74	What is condensation polymerisation? (HT) (Triple only)	When monomers with different functional groups react to produce a new functional group plus a small molecule
75	How is the polymer structure represented after a condensation reaction? (Triple only)	-[[X][Y]]-
76	What functional groups do amino acids contain? (Triple only)	H ₂ N, COOH
77	What polymer is formed from amino acids? (Triple only)	Proteins
78	What is DNA? (Triple only)	A naturally occurring polymer essential for life
79	What is the function of DNA? (Triple only)	Encodes genetic instructions for the development and functioning of living organisms and viruses
80	What is the structure of DNA? (Triple only)	Two polymer chains, made from four different monomers called nucleotides, in a double helix
81	What are other examples of naturally occurring polymers? (Triple only)	Proteins, starch, cellulose
82	What polymers are formed from glucose monomers? (Triple only)	Starch and cellulose