

A Level Bridging Work 2020-2021

Chemistry

The tasks below are designed to support you as you prepare to start A Level Chemistry.

These tasks have been developed to build on your GCSE knowledge and help with the transition into sixth form, using your time wisely over the coming months to ensure you maintain a level of education that will be needed to be successful in your subject when you enroll into the sixth form in August/ September.

Plan how you will use your time over the next 3 months – these tasks are designed to give you work to do throughout this time.

Complete each of the tasks below and bring your work to your first lesson – be prepared to share what you have done.

Task 1: Folder Preparation

Being organised is a key part to your success at A Level.

So you are ready for September please get yourself 2 folders. One a smaller ring binder, this will be your day-to-day folder that you must bring to each and every lesson, and a larger A4 lever arch file, this will be for the long term storage of your notes. **Please bring these folders along with your other bridging work to the first lesson.**

Inside your lever arch file you will need dividers for the following topics:

Year 12

- 1: Atomic Structure and the Periodic Table
- 2: Bonding and Structure
- 3: Redox I
- 4: Inorganic Chemistry and the Periodic Table
- 5: Formulae, Equations and Amounts of Substance
- 6: Organic Chemistry I
- 7: Modern Analytical Techniques I
- 8: Energetics I
- 9: Kinetics I
- 10: Equilibrium I

Year 13

- 11: Equilibrium II
- 12: Acid-base Equilibria
- 13: Energetics II
- 14: Redox II
- 15: Transition Metals
- 16: Kinetics II
- 17: Organic Chemistry II
- 18: Organic Chemistry III
- 19: Modern Analytical Techniques II

Inside your day-to-day folder, please split into these sections:

- Teacher 1**
- Teacher 2**
- Assessments**

Keep all your bridging work in this folder

Task 2 – GCSE Chemistry Revision use the information below to guide your revision around key topics from GCSE to ensure your knowledge and skills are secure for you to be successful as you start at A Level Chemistry.	
Revision topics AQA GCSE Chemistry - Specification On the AQA website	Topics that were not covered in trilogy chemistry (combined) but you need to be aware of.
4.1 Atomic structure and the periodic table	<ul style="list-style-type: none"> Properties of transition metals – comparison and typical properties https://www.bbc.co.uk/bitesize/guides/z97yw6f/revision/1
4.2 Bonding, structure, and the properties of matter.	<ul style="list-style-type: none"> Sizes of particles and their properties Uses of nanoparticles https://www.bbc.co.uk/bitesize/guides/z8m8pbk/revision/1
4.3 Quantitative chemistry	<ul style="list-style-type: none"> Percentage yield Atom economy Using concentrations of solutions in mol/dm³ Use of amount of substance in relation to volumes of gases https://www.bbc.co.uk/bitesize/topics/z87mw6f
4.4 Chemical changes	<ul style="list-style-type: none"> Titrations https://www.bbc.co.uk/bitesize/guides/zx98pbk/revision/1
4.5 Energy changes	<ul style="list-style-type: none"> Cell and fuel cells https://www.bbc.co.uk/bitesize/guides/z2396yc/revision/1
4.7 Organic chemistry	<ul style="list-style-type: none"> Structure and formulae of alkenes Reactions of alkenes Alcohols Carboxylic acids Addition polymerization https://www.bbc.co.uk/bitesize/guides/z3v4xfr/revision/1
4.8 Chemical analysis	<ul style="list-style-type: none"> Flame tests Metal hydroxides test Carbonate test Halides tests Sulfate test https://www.bbc.co.uk/bitesize/guides/zxtvw6f/revision/1
<u>Essential skills – These will be assessed early in September as part of your baseline assessment</u>	
<p>In order to do well at chemistry you will need be confident in the following skills. If you are struggling with these skills seek support as early as you can when you start the course.</p> <ul style="list-style-type: none"> Give formula of a compound from its name and write the name of a compound from its formula https://www.bbc.co.uk/bitesize/guides/z8d2bk7/revision/1 Calculate relative formula mass https://www.bbc.co.uk/bitesize/guides/z84wfrd/revision/1 Recall lots of information – Define key terms Write word equations and balanced symbol equations with state symbols for the reactions. https://www.bbc.co.uk/bitesize/guides/zg2h4qt/revision/6 Determine the structure of a chemical from its name or formula and predict its bonding https://www.bbc.co.uk/bitesize/guides/zg2h4qt/revision/1 Predict, describe and explain properties based on its structure https://www.bbc.co.uk/bitesize/topics/z33rrwx Describe changes in models over time https://www.bbc.co.uk/bitesize/guides/z3sg2nb/revision/1 Extend - Work out unknown concentrations from titrations (Mole calculations) https://www.bbc.co.uk/bitesize/guides/zx98pbk/revision/3 Basic Maths - Rearrange formulae in equations https://www.bbc.co.uk/bitesize/guides/z36vcj6/revision/4 https://www.bbc.co.uk/bitesize/guides/zqpfj6/revision/5 	

Task 3 – Key words

Learn definitions of the following words from GCSE

Mass Number, Relative atomic mass, Isotopes, Diatomic molecule, Atom, Element, Compound, Ion, Oxidation, Reduction, Ionic Bonding, Covalent Bonding, Metallic bonding

Learn the following 50 new key words – They will mostly be new to you and discussed over the next 2 years of A Level study

1 – absorption; 2 – adsorption; 3 – pi (π) orbitals; 4 – sigma (σ) orbitals; 5 – aliphatic; 6 – aromatic; 7- reforming; 8 – spectroscopy; 9 – Avogadro; 10 - Fehling; 11 - homolytic; 12 – heterolytic; 13 - hydrolysis; 14 - dipole; 15 - Kelvin; 16 - lattice; 17 – Maxwell-Boltzmann; 18 - miscible; 19 - nucleophile; 20 - electrophile; 21 – octahedral; 22 – reflux; 23 – precipitate; 24 – quantitative; 25 - qualitative; 26 – carbocation; 27 – calorimeter; 28 - colourimeter; 29 – Chadwick; 30 – cis/trans isomerism; 31 – decomposition 32 – Dalton ; 33 - disproportionation; 34 – dynamic equilibrium; 35 - electrolyte; 36 – Hess; 37 – equivalence point; 38 – allotrope; 39 - homogenous; 40 - heterogenous; 41 - shielding; 42- spectator ion; 43 – phenolphthalein: 44 – methyl orange; 45 – Benedict’s; 46 – mechanism; 47 - substitution; 48 - addition; 49 – elimination; 50 - constant

Challenge – Define these key words

Task 4 – Research

This task is for you to research ideas and areas that you think are important to chemistry. Write your ideas as an extend piece of writing. Aim for around a page.

- (a) Research the historical events that contribute to our modern day model of the atom and periodic table.
Extend – Within this, discuss how the structure of the atom is linked to the chemical and physical properties of elements. Use this to justify the modern arrangement of elements in the periodic table.
- (b) Research a topical chemistry subject – e.g. how a particular pharmaceutical works; how to reduce CO₂ emissions using chemistry; development of a new material. This is anything that interests you; surprise me!

Task 5 – Multiple Choice Questions

Print them 2 pages per side of A4 if you can or write down on paper. Complete the multiple choice questions (*see end of this document*) on

SECTION A - Atomic Structure and The Periodic Table

SECTION B - Structure and Bonding

SECTION C - Organic Chemistry

INSTRUCTIONS – Each is out of 20 - Read the question carefully. Circle the correct letter. Answer all questions

Task 6 – Summarising ideas with 5 sentences, 5 words

4 different sections – 23 questions in total.

SECTION 1 – Atomic Structure and the Periodic Table

SECTION 2 – Structure and Bonding

SECTION 3 – Quantitative Chemistry and Chemical Analysis

SECTION 4 – Organic Chemistry

INSTRUCTIONS

- For each statement, use either the suggested website or your own resources to write a 5-point summary. In examinations, answers frequently require more than 1 key word for the mark, so aim to include a few key words.
- It is important to stick to 5 sentences. It is the process of selecting the most relevant information and summarising it that will help you remember it.
- Write concisely and do not elaborate unnecessarily, it is harder to remember and revise facts from a big long paragraph.
- Finally, identify 5 key words that you may have difficulty remembering and include a brief definition. You might like to include a picture to help you remember it.

Task 7 – Optional Reading list

There is a selection of wider reading suggestions at the end of this document

SECTION 1 – Atomic Structure and the Periodic Table

EXAMPLE QUESTION: Explain the reactivity in Group 1.

Keywords: reactivity, attraction, further away, weaker, remove

Website –

1. <http://www.bbc.co.uk/schools/gcsebitesize/science/aqa/fundamentals/theperiodictablerev2.shtml>
2. <http://www.s-cool.co.uk/gcse/chemistry/the-periodic-table/revise-it/group-i-and-group-ii>

1. The reactivity increases as you go down the group.
2. They have the same number of electrons in their outer shells.
3. The further down the group, the further away the electron is from the nucleus.
4. Therefore, the electron is better shielded and the attraction is weaker.
5. As a consequence, the electron is easier to remove.

QUESTION 1: Explain the reactivity of the Group 7 halogens..

Website –

- <https://www.youtube.com/watch?v=J7b2aBKa6-U>
- <https://www.bbc.co.uk/education/guides/z3vwxnb/revision/4>

QUESTION 2: Describe the sub atomic particles and their arrangement in the atom.

Website –

- <https://tse2.mm.bing.net/th?id=OIP.SxZZQN5LZoRtrb4caYulVwEsD-&w=251&h=213&c=7&qit=90&o=4&dpr=1.5&pid=1.7>
- <http://chemistry.tutorcircle.com/inorganic-chemistry/atomic-structure.html>

QUESTION 3: Explain how the arrangement of the periodic table is related to the electron arrangement in atoms.

Website –

- <https://www.visionlearning.com/en/library/Chemistry/1/The-Periodic-Table-of-Elements/52>
- http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa_pre_2011/atomic/atomstrucrev5.shtml

QUESTION 4: Compare the general properties of transition metals and alkali metals.

Website –

- <http://www.gcsescience.com/pt20.htm>
- <http://www.gcsescience.com/pt5.htm>

QUESTION 5: Describe metals and non-metals and explain the differences between their physical and chemical properties.

Website –

- <https://www.thoughtco.com/metals-versus-nonmetals-608809>
- <http://www.differencebetween.com/difference-between-metals-and-nonmetals/>

SECTION 2 – Structure and Bonding

EXAMPLE - Explain the bonding in diamond and how it relates to its properties.

Keywords: covalent, giant, lattice, electrons, sharing

Website –

- <http://chemguide.co.uk/atoms/structures/giantcov.html>
- http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_gateway/chemical_economics/nanochemistryrev1.shtml
 1. Diamond has strong covalent bonds (the sharing of electrons).
 2. It requires a lot of energy to break the bonds.
 3. Which explains why diamond is very hard and has a high melting point.
 4. Diamond does not conduct electricity.
 5. As it uses all the 4 carbon bonds so has no free electrons.

QUESTION 6. Explain the bonding in graphite and how this relates to its properties.

Website –

- http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_gateway/chemical_economics/nanochemistryrev1.shtml
- <http://www.gcscience.com/a34-structure-graphite-giant-molecule.htm>

QUESTION 7. Compare nanoparticles to their regular sized particles.

Website –

- http://www.bbc.co.uk/schools/gcsebitesize/science/21c/materials_choices/nanotechnologyrev2.shtml
- <https://www.youtube.com/watch?v=VB3nqIXzb0w>

QUESTION 8. Explain the three states of matter.

Website –

- <https://www.youtube.com/watch?v=KCL8zqiXbME>
- <http://www.bbc.co.uk/education/guides/zccmn39/revision>

QUESTION 9. Explain the properties of Graphene and Fullerene in relation to their properties.

Website –

- http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa/bonding/structure_propertiesrev8.shtml
- <https://www.youtube.com/watch?v=6iCJXhusl2M>

QUESTION 10. Describe how polymers are bonded and how it affects their properties.

Website –

- http://www.bbc.co.uk/schools/gcsebitesize/science/aqa_pre_2011/oils/polymersrev5.shtml

SECTION 3 – Quantitative Chemistry and Chemical Analysis

QUESTION 11. Explain the conservation of mass and how we use it.

Website –

- <https://www.thoughtco.com/definition-of-conservation-of-mass-law-604412>
- http://www.bbc.co.uk/schools/gcsebitesize/science/edexcel/materials_from_earth/conservation_of_massrev1.shtml

QUESTION 12. How do we use Avogadro constant as scientists?

Website –

- http://www.bbc.co.uk/bitesize/higher/chemistry/calculations_1/mole/revision/1/

QUESTION 13. How can you predict masses in a reaction?

Website –

- <https://www.bbc.co.uk/bitesize/guides/z3kg2nb/revision/4>

QUESTION 14. What equations link moles, Relative Formula Mass, Mass, Concentration, Volume?

Website –

- <https://www.bbc.co.uk/bitesize/topics/z87mw6f>

QUESTION 15. Describe the neutralization of sodium hydroxide and hydrochloric acid, include a balanced symbol equation.

Website –

- http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_21c/chemical_synthesis/whychemicalsrev10.shtml
- <http://www.gcsescience.com/aa27.htm>

QUESTION 16. Identify the common tests for chlorine, oxygen, carbon dioxide and hydrogen.

Website –

- http://www.bbc.co.uk/schools/gcsebitesize/science/edexcel_pre_2011/chemicalreactions/preparinggasesrev4.shtml
- <https://www.youtube.com/watch?v=LiAvDpl5aJA>

QUESTION 17. Describe how flame tests are used to identify cations.

Website –

- <http://chemguide.co.uk/inorganic/group1/flametests.html>
- https://www.youtube.com/watch?v=1EXr_L7Ojgg

QUESTION 18. Describe the tests for anions.

Website –

- <https://www.bbc.co.uk/education/guides/z27ycdm/revision>
- <https://www.youtube.com/watch?v=3KdpmlaP4Xs>

SECTION 4 – Organic Chemistry

EXAMPLE QUESTION: Explain how addition polymerisation occurs.

Keywords: monomer, polymer, saturated, unsaturated, repeating unit

Website –

- <http://www.chemguide.co.uk/organicprops/alkenes/polymerisation.html>
- http://www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway_pre_2011/carbon_chem/5_making_polymers3.shtml

6. Many monomers containing C=C double bonds.
7. The monomer is unsaturated because of the double bond.
8. One of the doubles breaks and they join up end to end.
9. A long chain polymer is produced which is saturated.
10. The polymer repeating unit looks the same as the monomer with the exception of the double bond

QUESTION 19: Explain how condensation polymerisation occurs.

Website –

- http://www.bbc.co.uk/bitesize/intermediate2/chemistry/carbon_compounds/plastics_synthetic_fibres/revision/5/
- <http://www.s-cool.co.uk/a-level/chemistry/aromatic-and-plastics/revise-it/polymerisation>

QUESTION 20: Name and draw the structural formula for the first four members of the homologous series alcohols.

Then predict the fifth structural formula.

Website –

- http://www.bbc.co.uk/schools/gcsebitesize/science/triple_aqa/alcohols_carboxylic_acids_esters/alcohols/revision/1/rev4.shtml
- <http://www.docbrown.info/page06/FunctionalGroups.htm>

QUESTION 21: Explain how an alcohol can be made into an ester.

Website –

- <http://chemguide.co.uk/organicprops/alcohols/oxidation.html>
- http://www.bbc.co.uk/bitesize/higher/chemistry/carbon/reaction_carbon/revision/2/

QUESTION 22: Describe DNA as a polymer.

Website –

- http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_gateway/living_growing/moleculesrev3.shtml
- <http://www.chem.wisc.edu/deptfiles/genchem/netorial/modules/biomolecules/modules/dna1/dna13.htm>

QUESTION 23: Describe how alkanes undergo combustion and predict the products formed.

Website –

- <https://www.bbc.co.uk/education/guides/zvwxnb/revision>
- <https://www.youtube.com/watch?v=iMBygFyUuSM>

Task 5 - Multiple Choice Questions

Section A – Atomic Structure and the Periodic Table

- The centre of an atom is called the:
 - Nucleus
 - Neutron
 - Shell
 - Centre
- The sub-atomic particles found in the centre of an atom are:
 - Electrons and neutrons
 - Protons and electrons
 - Protons and neutrons
 - Protons and nucleus
- The charge of the centre is:
 - Positive
 - Negative
 - Neutral
 - Positive and negative
- An isotope always has the same number of:
 - Electrons
 - Neutrons
 - Protons
 - Atoms
- Isotopes of an element have a different number of:
 - Electrons
 - Neutrons
 - Protons
 - Atoms
- Elements in the same group have:
 - Different properties
 - The same number of outer shell electrons
 - The same number of electron shells
 - The same number of protons

7. Elements in the same period have:
 - a. The same properties
 - b. The same number of outer shell electrons
 - c. The same number of electron shells
 - d. The same number of protons

8. Elements with the same number of outer shell electrons have:
 - a. The same properties
 - b. Different properties
 - c. The same number of electron shells

9. Mendeleev organised his periodic table by:
 - a. Atomic number
 - b. Proton number
 - c. Electron number
 - d. Atomic mass

10. The reactivity of group 1 increases:
 - a. As you go down the group
 - b. As you go up the group
 - c. It does not change
 - d. Until potassium, then it stays the same

11. The reactivity of group 7 increases:
 - a. As you go down the group
 - b. As you go up the group
 - c. It does not change
 - d. Until bromine then it stays the same

12. The charge of the electron is:
 - a. Positive
 - b. Negative
 - c. Neutral
 - d. Positive and negative

13. Group 1 metals are:
 - a. Reactive with water and hard to cut
 - b. Reactive with water and soft to cut
 - c. Not reactive with water and hard to cut
 - d. Not reactive with water and soft to cut

14. Group 0 elements:
- Are all solids at room temperature
 - Are all unreactive as they have a full outer shell of electrons
 - Are all liquids at room temperature
 - Are all very reactive as they have a full outer shell of electrons
15. Group 1 and Group 7 elements reactive together because:
- They are metals and none metals
 - They can transfer one electron to complete both outer shells
 - They are all very reactive
 - The proton numbers are compatible
16. Properties of transition metals include:
- Strong, low melting points with a high density
 - Weak, low melting points with a high density
 - Strong, high melting point with a low density
 - Strong, high melting point with a high density
17. A lithium atom has:
- 3 protons, 3 electrons and 4 neutrons
 - 3 protons, 4 electrons and 3 neutrons
 - 3 protons, 3 electrons and 7 neutrons
 - 3 protons, 7 electrons and 7 neutrons
18. The modern periodic table is arranged by:
- Mass number
 - Electron number
 - Atomic mass
 - Atomic number
19. The correct word equation for lithium reacting with iodine is:
- Lithium + Iodine \rightarrow Lithium iodine + water
 - Lithium + Iodine \rightarrow Lithium iodide
 - Lithium + Iodine \rightarrow Lithium iodide + water
 - Lithium + Iodine \rightarrow Lithium iodine
20. The symbol equation for the reaction between lithium and iodine is:
- $\text{Li} + \text{I} \rightarrow \text{LiI} + \text{H}_2\text{O}$
 - $\text{Li} + \text{I}_2 \rightarrow \text{LiI}_2 + \text{H}_2\text{O}$
 - $2\text{Li} + \text{I}_2 \rightarrow 2\text{LiI}_2$
 - $2\text{Li} + \text{I}_2 \rightarrow 2\text{LiI}$

Section B – Structure and Bonding

1. A solid represented by the particle model is:
 - a. Lots of spheres all vibrating in a fixed position.
 - b. Lots of spheres all moving randomly.
 - c. A few spheres all vibrating around a fixed position.
 - d. A few spheres all moving randomly.

2. In a gas, the particles have:
 - a. Less energy than a liquid and move around slowly.
 - b. Less energy than a liquid and move around quickly.
 - c. More energy than a liquid and move around quickly.
 - d. More energy than a liquid and move around slowly.

3. The force in an ionic bond is:
 - a. Magnetic.
 - b. Electrostatic.
 - c. Between the atoms.
 - d. Equal the gravity.

4. An ionic bond occurs:
 - a. Between oppositely charged ions.
 - b. Between oppositely charged atoms.
 - c. Between atoms of the same charge.
 - d. Between ions of the same charge.

5. Giant covalent lattices such as diamond have a high melting point due to:
 - a. Weak intermolecular forces of attraction between the atoms.
 - b. Strong ionic bonds that require a lot of energy to break them.
 - c. Strong covalent bonds that require a lot of energy to break them.
 - d. Strong intermolecular forces of attraction between the atoms.

6. A covalent bond is:
 - a. The transfer of electrons.
 - b. Between two metals.
 - c. The sharing of a pair of electrons.
 - d. Between a metal and a non-metal.

7. Metallic bonds occur between:
 - a. Oppositely charged ions.
 - b. Oppositely charged atoms.
 - c. The ion and a free electron.
 - d. The atom and a free electron.

8. Simple covalent molecules have low melting points because:
- They have weak bonds.
 - They need a lot of energy to overcome them.
 - They are gases.
 - They have weak intermolecular forces.
9. Ionic compounds form:
- Giant lattices.
 - Weak bonds.
 - Simple molecules.
 - Metals.
10. To form an ionic bond, metals always:
- Lose electrons.
 - Gain electrons.
 - Share electrons.
 - Become negative.
11. When an atom gains an electron it becomes:
- A positive atom.
 - A positive ion.
 - A negative atom.
 - A negative ion.
12. Carbon can form:
- 2 covalent bonds.
 - 5 covalent bonds.
 - 1 covalent bond.
 - 4 covalent bonds.
13. Graphite forms:
- 2 covalent bonds.
 - 3 covalent bonds.
 - 1 covalent bond.
 - 4 covalent bonds.
14. Graphite can conduct electricity because:
- It has a free electron that can move and carry charge.
 - It only has 2 bonds.
 - The atoms can vibrate and pass on energy.
 - The atoms are free to move and carry charge.
15. Graphite is slippery because:
- It has strong covalent bonds.
 - It has weak covalent bonds.
 - Strong intermolecular forces.
 - Weak intermolecular forces.

16. Nanoparticles have:
- A larger volume to surface area.
 - A larger density to surface area.
 - A smaller density to surface area.
 - A smaller volume to surface area.
17. Nanoparticles have:
- Different properties to the regular sized particle.
 - The same properties to the regular sized particles.
 - The same properties but on a smaller scale.
 - Cancer fighting properties.
18. Nanoparticles have health risks because:
- They cause cancer.
 - They have not been tested.
 - They are relatively new and so there are many unknowns.
 - They are absorbed by the skin.
19. Nanoparticles are _____ of normal sized particles:
- 10^{-10}
 - 10^{-9}
 - 10^9
 - 10^{10}
20. Thermosetting polymers have:
- Cross-link chains.
 - No links to connect the chains.
 - Weak intermolecular forces.
 - Strong intermolecular forces.

Section C – Organic Chemistry

- The functional group for a carboxylic acid is:
 - $C=C$
 - $-COOH$
 - $-OH$
 - $-C-C-$
- All alkenes contain:
 - $C=C$
 - $-COOH$
 - $-OH$
 - $-C-C-$
- The formula for ethanol is:
 - C_2H_6
 - C_2H_4
 - C_2H_3OOH
 - C_2H_5OH
- When ethane burns during complete combustion, the products formed are:
 - $CO_2 + H_2O$
 - $CO + H_2O$
 - $CO_2 + CO$
 - $CO_2 + H_2$
- A monomer must contain:
 - A $C=C$ double bond.
 - A $C-C$ double bond.
 - A $C-C$ single bond.
 - Carbon and hydrogen.
- Addition polymerisation includes:
 - Adding monomers together by breaking the double bond.
 - Adding polymers together by breaking the double bond.
 - Adding many molecules together to form a long chain.
 - Adding molecules together to form different plastics.

7. The formula for ethanoic acid is:
- HCOOH
 - CH_3COOH
 - $\text{CH}_3\text{CH}_2\text{COOH}$
 - CH_3OOH
8. The formula for methane is:
- CH
 - CH_3OH
 - C_2H_6
 - CH_4
9. Poly(ethene) is produced from the monomer:
- Propene.
 - Ethane
 - Butene
 - Ethene
10. DNA is a type of:
- Monomer.
 - Alcohol.
 - Polymer.
 - Alkane.
11. The four monomer that produce DNA are known as:
- Nucleotides.
 - Prototides.
 - Genes.
 - ATBG.
12. Functional groups on molecules:
- Identify the homologous series.
 - Identify the heterologous series.
 - Identify the alcohol.
 - Identify the monomer.
13. Ethanoic acid is made by:
- Reduction of ethane.
 - Oxidisation of ethene.
 - Reduction of ethanol.
 - Oxidisation of ethanol.

14. Condensation polymerisation includes the functional groups:
- Diol and di-double bond.
 - Diol and diacid.
 - Diol, diacid and di-carbon bond.
 - Diacid and di-double bond.
15. Condensation polymerisation often produces:
- Water.
 - Hydrogen.
 - Alcohol.
 - Oxygen.
16. The functional group for an alkane is:
- COOH
 - C=C
 - C-C
 - OH
17. The formula for butane is:
- C_3H_6OH
 - C_4H_{10}
 - C_4H_9OH
 - C_3H_6
18. DNA is made from:
- Protein.
 - Fatty acids.
 - Amino acids.
 - Water.
19. The functional group of an alcohol is:
- OH
 - C=C
 - C-C
 - COOH
20. The only molecule below that is not an alcohol is:
- C_2H_5OH
 - CH_3OH
 - CH_4
 - C_3H_7OH

TASK 7 – Optional Wider reading list

There are lots of Chemistry related books out there. They also overlap with Medicine (particularly pharmaceuticals), Geography (climate change, pollution), Physics (atomic structure), Engineering and Materials Science (material development, Chemical Engineering).

Some include:

- Mendeleev's Dream: Strathern
- The Chemical Elements: Nechaev & Jenkins
- Atkins' Molecules: Atkins*
- Elementary, The Periodic Table Explained: Russell
- Severn Years to Save the Planet: McGuire
- The Chemists' War 1914-1918: Freemantle*
- Level 4 Virus Hunters of the CDC, McCormick & Fisher-Hoch
- Right hand, left hand: McManus*
- Silent Spring: Carson
- Genome: Ridley
- Biohazard: Alibek*

* These are harder and might be better for the enthusiast

Royal Society of Chemistry (www.rsc.org) has:

- How chemistry is helping the fight Covid19.
- **Education in Chemistry** magazine which has interesting articles on general chemistry as well as more teacher focused ones
- **Chemistry: Making the difference** has careers advice.
- **Chemistry World** is their monthly magazine which is available online
- Journals and Books on chemistry (many are fairly high level)

Lots of Universities, especially in the US, publish lectures online. Find some that interest you!