

Lesson 8: C7.8 – Alcohols

Connection

Q1. Write the balanced equation for complete combustion

Q2. Write the balanced equation for incomplete combustion

Q3. Draw a diagram for an addition reaction for ethene and bromine

Activation

LI: recognise alcohols from their names or from given formulae

1. <https://www.youtube.com/watch?v=vVwLa1fRsVY>
2. Make a note of the title and the LI
3. Read pages 242-243
4. Define “alcohol” and “fermentation” using the glossary
5. Copy the table showing different alcohols
6. Describe the step by step process of producing ethanol

Consolidation

Complete and self assess the relevant past paper question for this topic -
From the C7 DIP file

Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

Demonstration

Attempt questions 1-5

In 15 mins answer as many questions as you can.

Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:

Green questions to GCSE Level 3

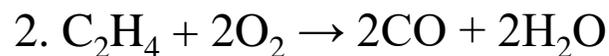
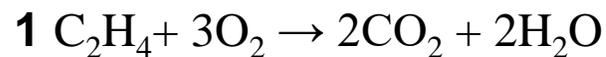
Blue questions to GCSE Level 6

Purple questions to GCSE Level 9

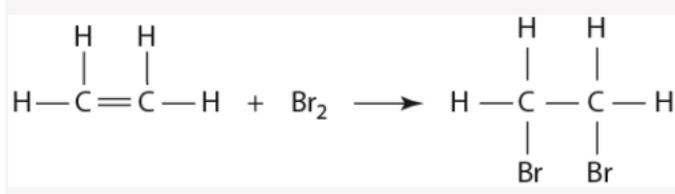


Answers: C7.8 – Alcohols

Connection

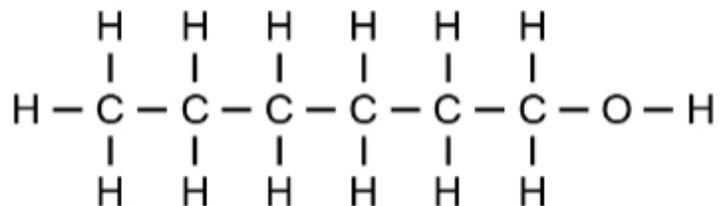


3.



Demonstration

1



2 CO₂ and H₂O (assuming complete combustion).

3 Conditions need to be free of oxygen (anaerobic). Oxygen will be present if the flask is open.

4 Bubbles since carbon dioxide gas is produced.



Lesson 9: C7.9 – Carboxylic acids

Connection

Q1. What is the functional group of alcohols?

Q2. What is the formula for Pentanol

Q3. Draw a diagram showing the structure of pentanol

Activation

LI: describe the reactions of carboxylic acids

1. <https://www.youtube.com/watch?v=3YeXGpDdgZw>
2. Make a note of the title and the LI
3. Read pages 244-245
4. Describe what Carboxylic acids are
5. Copy the table showing the series of carboxylic acids
6. Copy the table showing how esters are created



Consolidation

Complete and self assess the relevant past paper question for this topic -
From the C7 DIP file

Demonstration

Attempt questions 1-15

In 15 mins answer as many questions as you can.

Self mark the questions you have done making any necessary corrections in blue pen



Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

Challenge yourself to answer as many as you can:

Green questions to GCSE Level 3

Blue questions to GCSE Level 6

Purple questions to GCSE Level 9



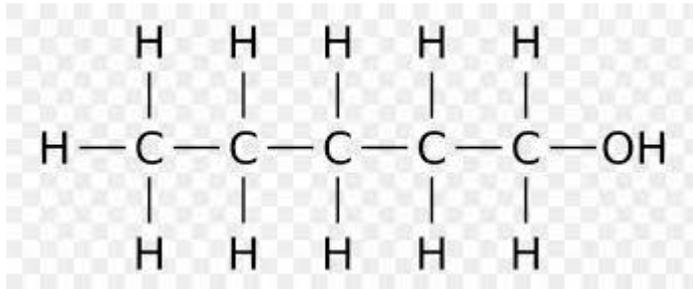
Answers: C7.9 – Carboxylic acids

Connection

1 -OH

2 $C_5H_{11}OH$

3



Demonstration

1 Fizzing / bubbling. Carbon dioxide is produced.

2 Potassium ethanoate.

3 Ester butanoate

4 Propanoic acid is only partially ionised whereas hydrochloric acid is completely ionised. So with propanoic acid, there will be a lower concentration of hydrogen ions compared to hydrochloric acid.

5 Hydrogen ion, H^+ , and hexanoate ion, $CH_3CH_2CH_2CH_2CH_2COO^-$.

Connection

Q1. What three elements make up Carboxylic Acid?

Q2. What is the formula for pentanoic acid?

Q3. Draw a diagram showing the structure of pentanoic acid

Lesson 10: C7.10 – Addition polymerisation

Activation

LI: recognise addition polymers and monomers from diagrams

1. <https://www.youtube.com/watch?v=sk6h4oaArE0>
2. Make a note of the title and the LI
3. Read pages 246-247
4. Define “Polymer” and “Monomer” using the glossary
5. Draw and label the diagram showing the polymerisation of a monomer

Consolidation

Complete and self assess the relevant past paper question for this topic -
From the C7 DIP file

Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

Demonstration

Attempt questions 1-7

In 15 mins answer as many questions as you can.

Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:

- Green questions to GCSE Level 3
- Blue questions to GCSE Level 6
- Purple questions to GCSE Level 9

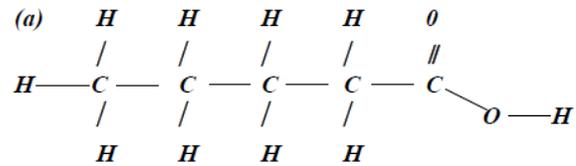
Answers: C7.10 – Addition polymerisation

Connection

Q1. Carbon, Oxygen,
Hydrogen

Q2. C_4H_9COOH

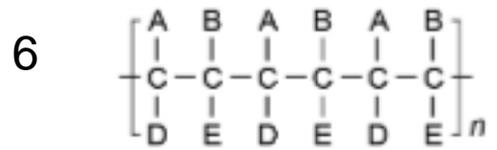
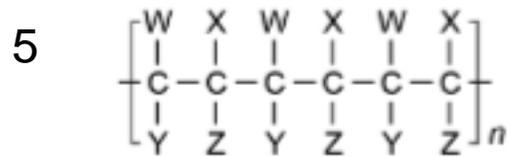
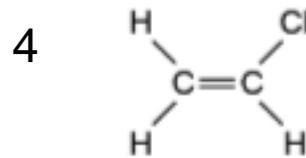
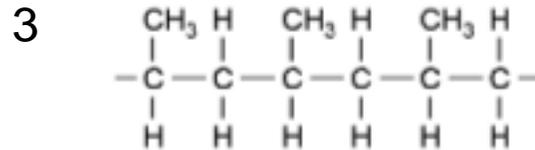
Q3.



Demonstration

1-O-O-O-

2 It has a C=C bond. Monomers add across the C=C double bond, which breaks.



Lesson 11: C7.11 – Condensation polymerisation

Connection

- Q1. What are polymers made of?
- Q2. What are the two ways polymers can be made?
- Q3. Draw the diagram for polyethene?

Activation

LI: explain the basic principles of condensation polymerisation

1. <https://www.youtube.com/watch?v=-d14DmSBuAQ>
2. Make a note of the title and the LI
3. Read pages 248-249
4. Define “Condensation polymer” using the glossary
5. Draw and label figure 7.18



Consolidation

Complete and self assess the relevant past paper question for this topic -
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Demonstration

Attempt questions 1-6

In 15 mins answer as many questions as you can.

Self mark the questions you have done making any necessary corrections in blue pen



Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

Challenge yourself to answer as many as you can:

- Green questions to GCSE Level 3
- Blue questions to GCSE Level 6
- Purple questions to GCSE Level 9

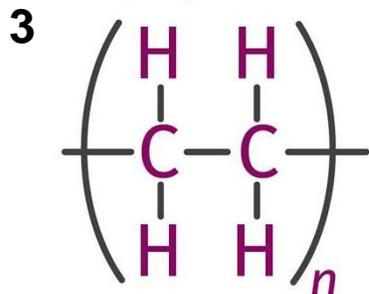


Answers: C7.11 – Condensation polymerisation

Connection

1 Monomers

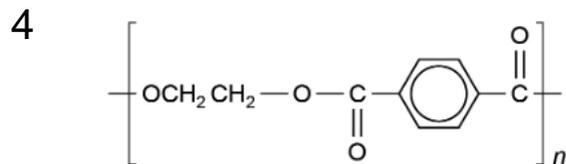
2 Addition and Condensation



Demonstration

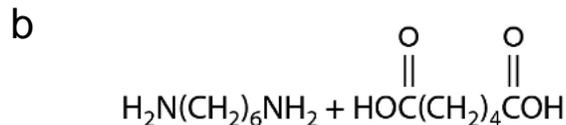
1 Addition polymers are formed from a single alkene monomer and have the structure $-\text{[X]}-\text{[X]}-\text{[X]}-$. The polymer has the same empirical formula as the monomer. Condensation polymers are usually formed from 2 different monomers and have the structure $-\text{[X][Y]}-\text{[X][Y]}-\text{[X][Y]}-$. A small molecule such as water is lost when the monomers react.

2 Ethanediol has 2 alcohol groups. Hexanedioic acid has 2 carboxylic acid groups. The alcohol reacts with the carboxylic acid to form the ester. Since both groups in each monomer can react, a chain can be formed linked by ester groups. A molecule of water is given off every time an ester group is formed.



5 Yes it can. It has two different functional groups in the same molecule. The carboxylic acid and alcohol react to form an polyester. A molecule of water is given off so it is a condensation polymer.

6 a It is a condensation polymer. A small molecule – water – is given off when the amine and carboxylic acid react to form the amide. $-\text{COOH} + -\text{NH}_2 \rightarrow -\text{CONH}- + \text{H}_2\text{O}$.



Lesson 12: C7.12 – Amino acids

Connection

Q1. What are the functional groups for: alcohol, a carboxylic acid and amine.

Q2. What is the general formula for a polymer made of two types of monomer?

Q3. What is the word equation for addition polymerisation for alcohol and carboxylic acid?



Activation

LI: explain how amino acids build proteins.

1. <https://www.youtube.com/watch?v=-iyjH9gsyB8>
2. Make a note of the title and the LI
3. Read pages 250-251
4. Copy the table showing four simple amino acids
5. Describe how amino acids build up to form proteins

Consolidation

Complete and self assess the relevant past paper question for this topic - From the C7 DIP file

Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher



Demonstration

Attempt questions 1-2

In 10 mins answer as many questions as you can.

Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:

- Green questions to GCSE Level 3
- Blue questions to GCSE Level 6
- Purple questions to GCSE Level 9



Answers: C7.12 – Amino acids

Connection

1 alcohol (–OH), a carboxylic acid (–COOH) or an amine (–NH₂)

2. The polymer structure is then represented as: –[[X][Y]]–_n

The [X] is one type of monomer and [Y] is another type of monomer.

3. alcohol + carboxylic acid → ester + water

Demonstration

1 They all have an amine group, a carboxylic acid group and a hydrogen atom attached to the same carbon. They all differ in the R group attached to the carbon. The general structure is H₂NCHR₁COOH.
2 –(–HNCH(CH₃)CO–)_n

Lesson 13: C7.13 – DNA and other naturally occurring polymers

Connection

Q1. What is the name of the simplest amino acid?

Q2. Describe how proteins are created?

Activation

LI: describe the components of natural polymers

1. https://www.youtube.com/watch?v=7o27fhO_nm0
2. Make a note of the title and the LI
3. Read pages 252-253
4. Draw and label figure 7.21
5. Draw and label figure 7.23



Consolidation

Complete and self assess the relevant past paper question for this topic -
From the C7 DIP file

Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

Demonstration

Attempt questions 1-4

In 10 mins answer as many questions as you can.

Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:

Green questions to GCSE Level 3

Blue questions to GCSE Level 6

Purple questions to GCSE Level 9



Answers: C7.13 – DNA and other naturally occurring polymers

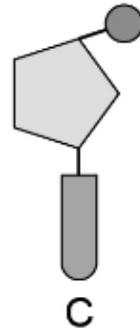
Connection

- 1 glycine
2. Amino acids react by condensation polymerisation to produce polypeptides. Different amino acids can be combined to make different polypeptides. Different polypeptides join to make proteins.

Demonstration

1 Strand needs to contain four phosphate/sugar groups in a row, with four bases. Order of bases (from left): T, A, G, C

2



3 Enzymes are biological catalysts. They increase the rate of biological reactions (which occur at the active site in the enzyme) by providing an alternative reaction route with lower activation energy.

4 They are naturally occurring condensation polymers (polyamides). The amino acids are the monomers and when they form a polymer chain (protein) water is given off

Lesson 14: C7.14 – Key Concept: Intermolecular forces

Connection

Q1. What is the monomer of polysaccharides?

Q2. What are the four bases of DNA and their pairs?

Q3. What shape does DNA take?

Activation

LI: describe the effects of weak intermolecular forces on properties of substances.

1. <https://www.youtube.com/watch?v=9YwdeEDrfPI>
2. Make a note of the title and the LI
3. Read pages 254-255
4. Define “intermolecular” and “intramolecular” using the glossary
5. Draw and label the diagram showing how polymers stretch and are rigid.



Consolidation

Complete and self assess the relevant past paper question for this topic -
From the C7 DIP file

Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

Demonstration

Attempt questions 1-5

In 10 mins answer as many questions as you can.

Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:

Green questions to GCSE Level 3

Blue questions to GCSE Level 6

Purple questions to GCSE Level 9



Answers: C7.14 – Key Concept: Intermolecular forces

Connection

1 monosaccharides

2 A (adenine) T (thymine) G (guanine) and C (cytosine)

A pairs with T
C pairs with G

3. Double Helix

Demonstration

1 Ethene, ethanoic acid, glycine.

2 Decane has a longer chain than octane. There are greater intermolecular forces between decane chains. So more energy is required to separate decane chains and it has a higher boiling point.

3 Propene is a small molecule (alkene) with weak intermolecular forces.

Poly(propene) consists of long chains and therefore there are greater intermolecular forces compared to propene. Therefore it takes more energy to separate poly(propene) chains so it has a higher melting point.

4 It is a cross-linked polymer with chains held together with covalent bonds. This makes the polymer more rigid. Covalent bonds are much stronger than the intermolecular forces between chains. The covalent bonds prevent the chains from sliding over each other.

5 The intermolecular forces between ethane molecules is greater than between ethene molecules. It takes more energy to separate ethane molecules and it therefore has a higher boiling point.

C7 - Revision

Connection

Q1. Define dependent and independent variable.

Q2. How do you calculate the area of a circle?

Q3. How do you identify an anomalous result and what do you do with it?

Activation

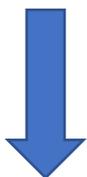
LI: Create a topic summary sheet

1. Fold an A3 sheet so it is divided into 8 sections
2. Look back over your lesson and group them into 8 main headings
3. Summarise the key points into each section, use keywords and diagrams and symbols rather than sentences



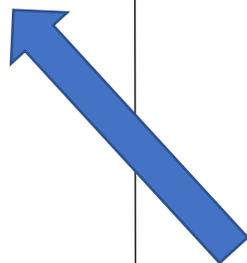
Consolidation

Look through the relevant past paper questions for this topic - From the C7 DIP file – see if you can complete any additional questions



Extension

Make a list of anything that you would like to ask your teacher to go over again



Demonstration

Test yourself by working with the person sitting next to you by talking through each box on your summary sheet and seeing how many key facts you can remember



Answers: C7 - Revision

Connection

1 Independent = the factor you change/investigate dependant = the factor that you measure

2 Use the formula πr^2

3 A result that doesn't fit the trend. You should repeat it or ignore it. It should not be used in your calculations



Attainment Band :	C7 Hydrocarbons (AQA)
	Knowledge and Understanding
Yellow Plus/ Yellow	<p>Explain the structures and formulae of alkanes.</p> <p>Explain why boiling points of the fractions are different.</p> <p>Explain how the properties are related to the size of hydrocarbon molecules.</p> <p>Explain the consequences of incomplete combustion.</p> <p>Explain how modern life depends on the uses of hydrocarbons.</p>
Blue	<p>Identify the hydrocarbons in the series of alkanes.</p> <p>Explain how crude oil is separated by fractional distillation.</p> <p>Identify the properties that influence the use of the fuel.</p> <p>Balance equations of combustion of hydrocarbons.</p> <p>Balance chemical equations as examples of cracking.</p>
Green	<p>Describe why crude oil is a finite resource.</p> <p>Describe how crude oil is used to provide modern materials.</p> <p>Describe how different hydrocarbon fuels have different properties.</p> <p>Describe the process of complete combustion.</p> <p>Describe usefulness of cracking.</p>
White	Some elements of the above have been achieved

