

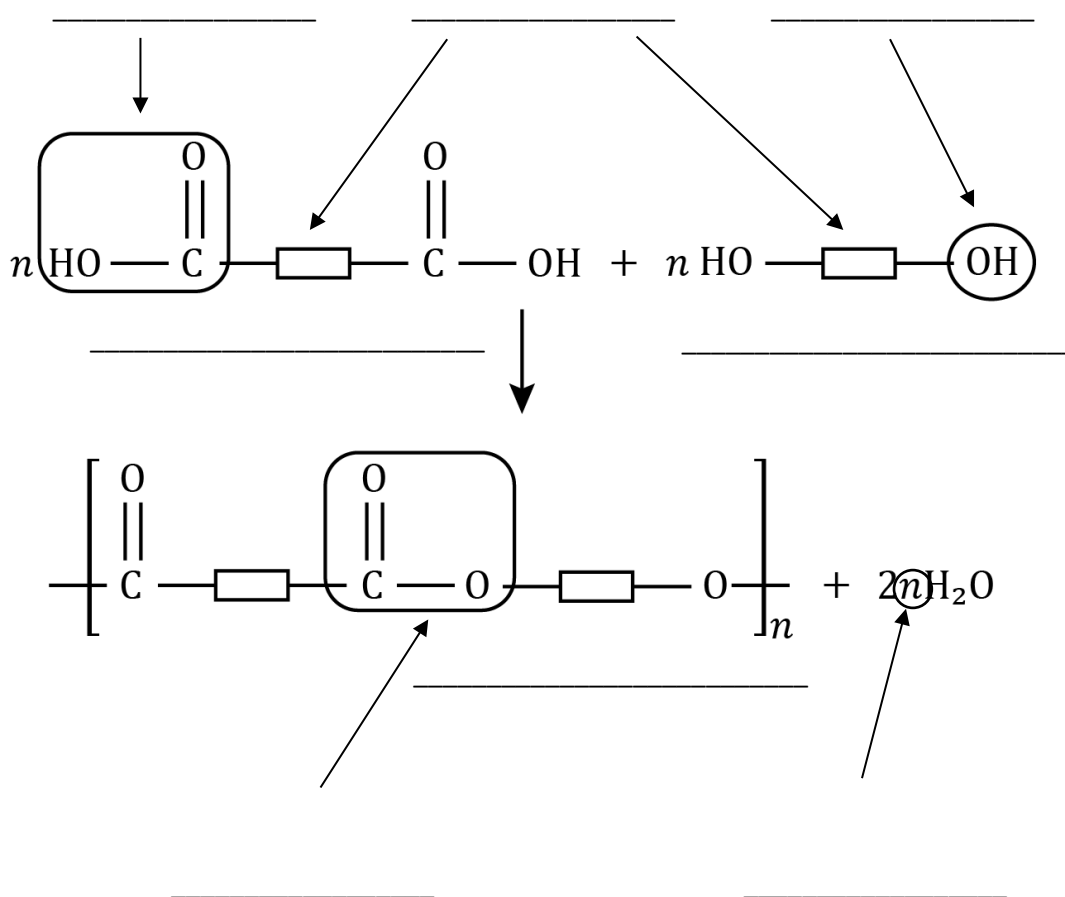


Condensation polymerisation: knowledge check

1.1 The diagram shows a dicarboxylic acid reacting with a diol in a condensation polymerisation reaction to produce a polyester and water.

Add labels to the diagram to identify each of the following:

carboxylic acid functional group alcohol functional group
 polyester diol dicarboxylic acid
 ester functional group a large number the rest of the molecule





- 1.2 Addition polymerisation and condensation polymerisation are two different types of polymerisation.

Place ticks in the correct column of the table to indicate whether each statement is describing addition polymerisation, condensation polymerisation or both.

	Addition polymerisation	Condensation polymerisation	Both
The monomers contain carbon-carbon double (covalent) bonds.			
The monomers used are small covalent molecules.			
The monomers only contain one functional group.			
The monomers contain two functional groups.			
Only one product is formed in the polymerisation process.			
Two products are formed in the polymerisation process.			
The polymers formed are large covalent molecules.			

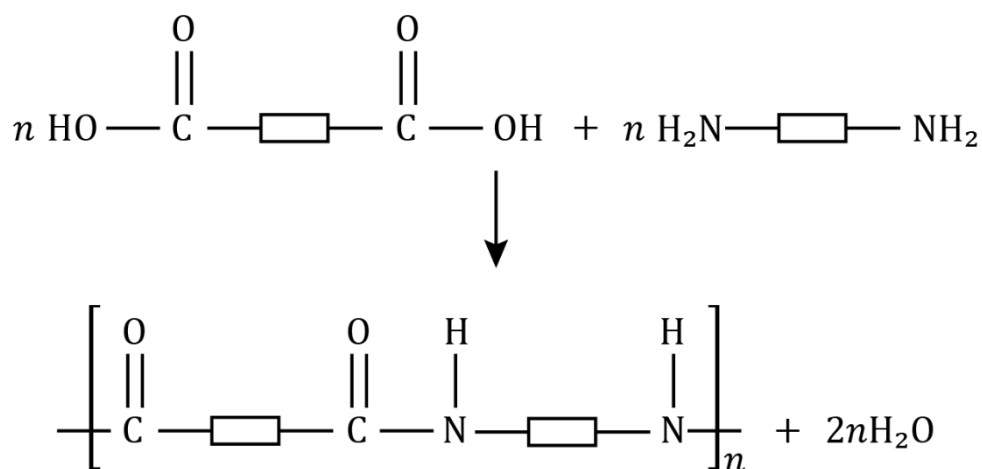


- 1.3 Add the correct term to match each of the descriptions in the table describing condensation polymerisation.

Description	Answer
Type of polymer produced from $\text{HOOC} - \text{CH}_2 - \text{CH}_2 - \text{COOH}$ and $\text{HO} - \text{CH}_2 - \text{CH}_2 - \text{OH}$.	
The small molecule produced as well as the polymer.	
Type of monomer including two carboxylic acid functional groups.	
Type of monomer including two alcohol groups.	
The short-form representation of $\text{HOOC} - \text{CH}_2 - \text{CH}_2 - \text{COOH}$.	
The short-form representation of $\text{HO} - \text{CH}_2 - \text{CH}_2 - \text{OH}$.	
Link formed between the two monomers.	



1.4 The diagram shows the condensation polymerisation reaction between a dicarboxylic acid and a diamine to produce the polyamide, nylon.



Complete the sentences describing this condensation polymerisation reaction.

The first monomer is a _____ containing two
_____ functional groups.

The second monomer is a _____ containing two
_____ functional groups.

The polymer formed is a _____, which contains the functional
group _____.



Condensation polymerisation: test myself

2.1 Circle the true statement describing the polymers formed in condensation polymerisation.

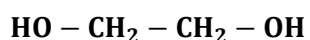
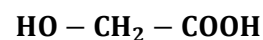
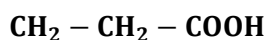
- A Polymers are small covalent molecules.
- B Polymers are very long chain-like covalent molecules.
- C Polymers are long chain-like ionic structures.
- D Polymers are small ionic substances.

2.2 Identify each of the following polymers as addition polymers or condensation polymers.

poly(ethene) poly(chloroethene) polyester
 poly(tetrafluoroethene) polyamide poly(propene)

Addition polymers	Condensation polymers

2.3 Which of the following monomers could join up to make a condensation polymer? Circle all that apply.

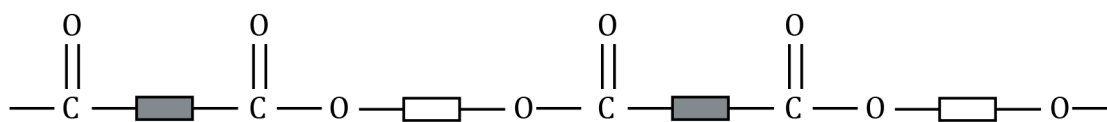




2.4 What property of monomers makes them suitable to use to make condensation polymers?

2.5 What is the correct definition of a dicarboxylic acid?

2.6 The diagram shows a short section of a condensation polymer. What is the name of this polymer?



2.7 Polypeptides are examples of condensation polymers.

What monomers are used to produce polypeptides?

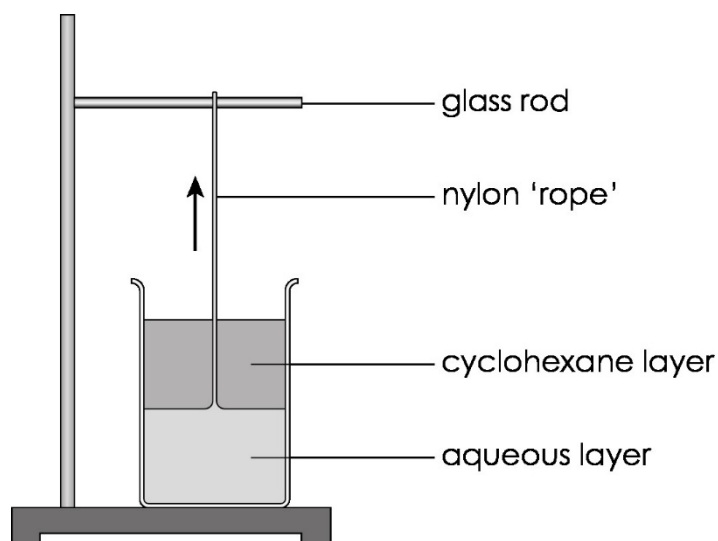


Condensation polymers: feeling confident?

3.1 This apparatus is used to make nylon in the lab.

The instructions for this process are given but they are in the incorrect order.

Use the table to order the instructions correctly.



- A** Pour about 10 cm³ of monomer X solution into a beaker.
- B** Wind the nylon rope around the glass rod and continue to gently lift it out of the beaker.
- C** Dissolve monomer X in deionised water.
- D** Use tweezers to gently lift the layer of nylon that forms at the interface.
- E** Dissolve monomer Y in cyclohexane.
- F** Carefully pour about 10 cm³ of monomer Y solution into the beaker so that it forms a layer on top of the aqueous layer.

Step	Instruction
1	
2	
3	
4	
5	
6	



3.2 The polyamide, Nylon 6,6 is made from the two monomers, $\text{HOOC}(\text{CH}_2)_4\text{COOH}$ and $\text{H}_2\text{N}(\text{CH}_2)_6\text{NH}_2$.

Write the correct formulas to complete the equation representing this reaction. Make sure your equation shows the repeating unit.





Condensation polymerisation: what do I understand?

Think about your answers and confidence level for each mini-topic. Decide whether you understand it well, are unsure or need more help. Tick the appropriate column.

Mini-topic	I understand this well	I think I understand this	I need more help
I can describe the characteristics of a polymer and an example of condensation polymerisation.			
I can describe the differences between addition polymerisation and condensation polymerisation.			
I can describe the monomers used to make condensation polymers and identify the functional groups.			
I understand the equation for the reaction to produce polyester, using block diagrams.			
I understand the equation for the reaction to produce nylon, using block diagrams.			
Feeling confident? topics	I understand this well	I think I understand this	I need more help
I can describe a process to make nylon in the laboratory.			
I can complete equations representing the reaction to produce nylon.			