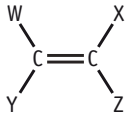
Chapter 6
Polyesters and polyamides

Print out and complete this worksheet to generate a summary for Chapter 6.

Addition polymers

1 a (i) Addition polymers are formed from alkenes. Write a balanced equation for the polymerisation of:



(ii) Draw propene and phenylethene (styrene) in the following format:

(iii) Draw poly(propene), showing two repeat units.

(iv) Draw poly(phenylethene), showing two repeat units.

Chapter 6 Polyesters and polyamides

b Draw three structural isomers of C_4H_8. Name each isomer. Draw two repeat units of the polymer that could be formed from each alkene.

Isomer of C_4H_8	Name	Two repeat units of the polymer

c **(i)** Why are addition polymers unreactive?

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(ii) Explain why it is difficult to dispose of addition polymers.

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d Why are addition polymers good electrical insulators?

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e On burning, addition polymers produce toxic fumes. Suggest three toxic gases that could be formed from the combustion of poly(chloroethene) (PVC).

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Chapter 6 Polyesters and polyamides

Condensation polymers

Polyesters

2 a (i) Draw and name the two monomers used to make the polyester Terylene®.

(ii) Draw a section of the polymer Terylene® showing one repeat unit.

Polyamides

b (i) Draw and name the two monomers used to make the polyamide nylon-6,6.

(ii) Draw a section of the polymer nylon-6,6, showing one repeat unit.

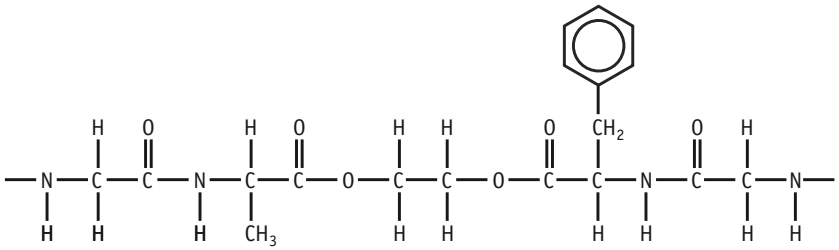
c (i) Draw and name the two monomers used to make the polyamide Kevlar®.

Chapter 6 Polyesters and polyamides

(ii) Draw a section of the polymer Kevlar®, showing one repeat unit.

d Explain why polyamides and polyesters are more reactive than addition polymers.

e Draw a circle around each amide and ester linkage in the polymer section below. Identify the monomers from which the polymer was made.

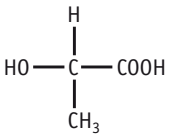


Monomers:

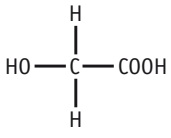
Poly(lactic acid), PLA and poly(glycolic acid), PGA

3 Polymers such as poly(lactic acid), PLA, and poly(glycolic acid), PGA, are renewable and biodegradable.

The structure of lactic acid is:



The structure of glycolic acid is:



Chapter 6 Polyesters and polyamides

a Draw sections of PLA and PGA to show two repeat units.

PLA:

PGA:

b Explain why PLA and PGA are:

(i) renewable

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(ii) biodegradable

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