Polymers Map

OCR A Level Chemistry A · 6.2.3 Polyesters and polyamides

1 Polyamides

6.2.3(a)

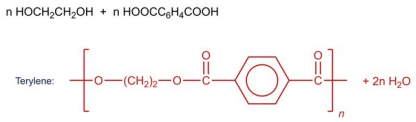
- Diamine + diacid
- Amide links, –CONH–
- Or one amino acid
- Nylon 6,6 and Kevlar



2 Polyesters

6.2.3(a)

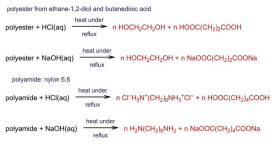
- Diol + diacid
- Ester links, –COO–
- Or one hydroxy acid
- Terylene

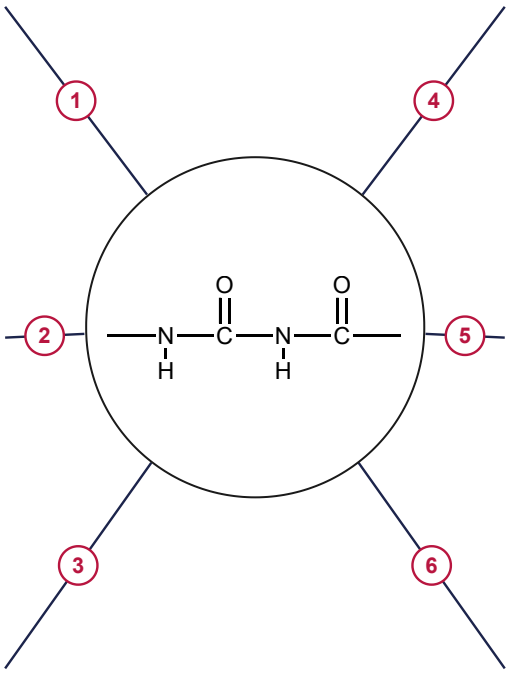


3 Acid hydrolysis

6.2.3(b)

- Heat with dilute acid
- Ester: **diol + diacid**
- Amide: diacid + NH_3^+ salt
- Water adds at each link





4 Base hydrolysis

6.2.3(b)

- Heat with NaOH(aq)
- Ester: diol + COO^- salt
- Amide: **free amine**
- Plus COO^- salt



5 Repeat units

6.2.3(c)

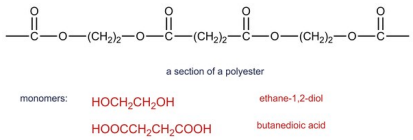
- Addition: open the C=C
- Condensation: remove H, OH
- Show each monomer once
- Keep every side group



6 Predicting

6.2.3(c)

- C=C: addition
- Two groups: condensation
- Chain: put C=C back
- Or break each link



Hydrolysis at a glance

products on heating

Polymer	Hot dilute acid	Hot NaOH(aq)
Terylene	Diol + diacid	Diol + carboxylate salt
Poly(lactic acid)	Lactic acid	Lactate salt
Nylon 6,6	Diacid + ammonium salt	Diamine + carboxylate salt
Nylon 6	Amino acid cation	Amino acid salt

Worked examples

Chain length

- Mr of chain 48 000
- Terylene unit 192
- **250 units**

Moles of water

- 19.2 g Terylene: 0.100 mol units
- Two links per unit
- **0.200 mol**

Monomers

- $–O(CH_2)_2OCO(CH_2)_2CO–$
- Break each ester link
- **A diol and a diacid**

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