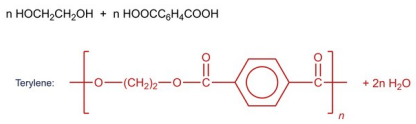
Polymers Map

Cambridge International · Topic 35 Polymerisation

1 Polyesters 35.1.1

- Diol + diacid: H_2O lost
- Or a dioyl chloride: HCl
- Or a hydroxy acid
- Ester links, –COO–



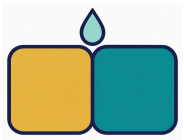
2 Polyamides 35.1.2

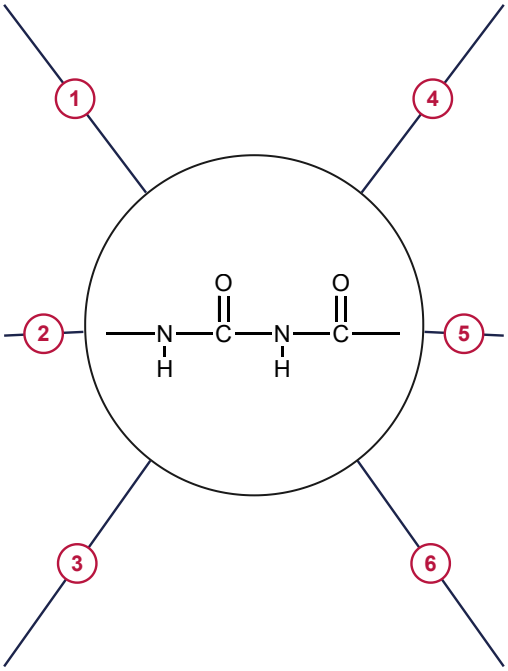
- Diamine + diacid
- Or a dioyl chloride
- Or an amino acid
- Amide links, –CONH–



3 Repeat units 35.1.3, 35.1.4

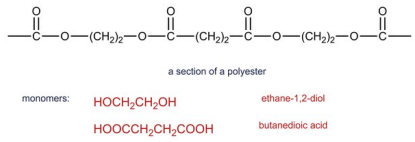
- Remove H and OH
- Show each monomer once
- Keep every side group
- To go back: break each link





4 Predicting type 35.2

- C=C: addition
- Two groups: condensation
- Only C in the backbone: addition
- Ester or amide: condensation



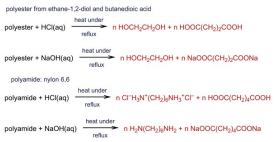
5 Inert and light 35.3.1, 35.3.2

- Poly(alkenes) are inert
- Hard to biodegrade
- C=O groups absorb light
- Chains then break



6 Biodegrading 35.3.3

- Polar links break
- Acid: COOH, NH_3^+
- Alkali: COO^-, NH_2
- Diol the same in both



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

- 9.60 g Terylene: 0.0500 mol units
- Two links per unit
- **0.100 mol**

Monomers

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

Online Learning System · onlinelearningsystem.net · © 2026 Online Learning System. All rights reserved. Not for redistribution.