

20.1 Addition polymerisation

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS repeat unit 重复单元 • monomer 单体 • addition polymerisation 加成聚合
 • polymer 聚合物 • poly(ethene) 聚乙烯

Objective

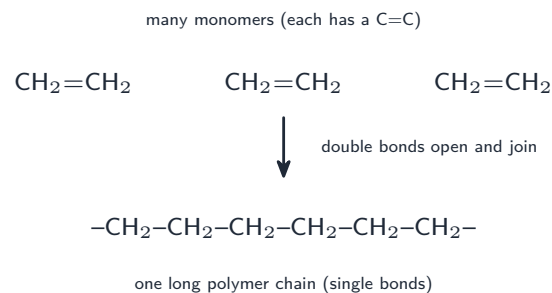
Build the skills to answer exam questions on **addition polymerisation** 加成聚合 — drawing **repeat units** 重复单元, finding **monomers** 单体, and the problems of disposal.

You must be able to:

- describe addition polymerisation (poly(ethene), PVC)
- deduce the repeat unit from a monomer, and the monomer from a polymer
- explain the difficulty of disposing of poly(alkene)s

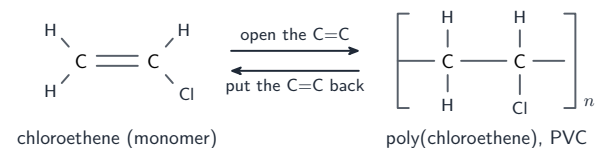
1 Worked examples

■ Addition polymerisation

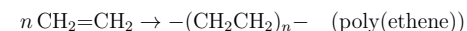


Many unsaturated monomers join into one long chain, with no other product

■ Repeat unit and monomer

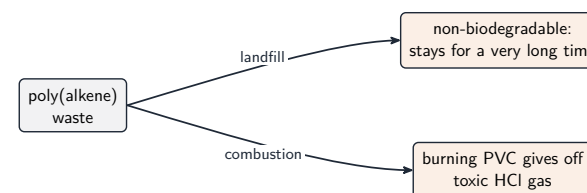


Repeat unit: change the monomer's C=C to a single bond and draw bonds out at each end



To find the **monomer** from a polymer: take one repeat unit and put the C=C back.

■ Disposal



*Poly(alkene)s are **non-biodegradable** and their combustion can release harmful gases (e.g. PVC gives toxic HCl)*

2 Practice

2.1 State what is meant by the **repeat unit** of a polymer. [1]

2.2 State **two** problems of disposing of poly(alkene)s. [2]

3 Exam-style questions

3.1 Which feature must a monomer have to undergo addition polymerisation? [1]

- | | |
|---|---|
| A | B |
| C | D |
- A** an –OH group
B a C=C double bond
C a benzene ring
D an ionic bond

3.2 Burning PVC is a particular problem because it releases: [1]

- | | |
|---|---|
| A | B |
| C | D |
- A** carbon dioxide only
B toxic hydrogen chloride
C water vapour
D nitrogen

3.3 Propene is $\text{CH}_3\text{CH}=\text{CH}_2$.

(a) Draw the repeat unit of poly(propene). [2]

(b) A section of a polymer is $-(\text{CH}_2\text{CHCl})_n-$. Draw the monomer it was made from. [1]

3.4 Explain why addition polymers are described as non-biodegradable. [2]