

# 20 Addition polymerisation – Part 1

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

## Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

| English                 | 中文   | Write it 3 times (English) |
|-------------------------|------|----------------------------|
| alkene                  | 烯烃   | _____                      |
| repeat unit             | 重复单元 | _____                      |
| monomer                 | 单体   | _____                      |
| polymer                 | 聚合物  | _____                      |
| addition polymerisation | 加成聚合 | _____                      |

## Recall

From the Alkenes sheet you know that many **alkene** 烯烃 molecules can join into one long chain. Here we look more closely at the **repeat unit** 重复单元 and how to read it.

- A small starting molecule is a **monomer** 单体.
- The long chain that forms is a **polymer** 聚合物.

Nothing here is harder than IGCSE — it just adds the repeat unit.

## New ideas

Read these first, then do the Practice.

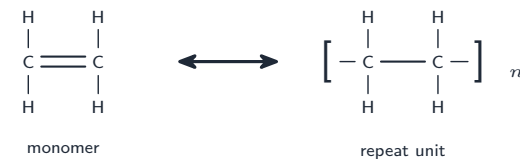
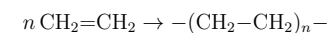
### ■ 1 Addition polymerisation

In **addition polymerisation** 加成聚合, many **monomers** (each with a **C=C** double bond) open their double bonds and join end to end into one long **polymer**, with **no other product**.



### ■ 2 The repeat unit

The **repeat unit** 重复单元 is the small part copied along the chain. To find it: take the monomer, change the C=C to a single **C—C**, and draw a bond going out at each end.



For **PVC**:  $n \text{CH}_2=\text{CHCl} \rightarrow \text{—}(\text{CH}_2-\text{CHCl})_n\text{—}$ .

### ■ 3 Finding the monomer

To go the other way, take one repeat unit and **put the C=C double bond back** — that gives you the monomer.

**Watch out:** for the repeat unit, change the C=C to C—C and draw a bond out at *each* end (inside brackets, with  $n$ ). To get back to the monomer, put the C=C double bond back in.

## Practice

Try these in order.

**20.1** What is the difference between a *monomer* and a *polymer*?

[2]

**20.2** What feature must a monomer have for addition polymerisation? [1]

**20.3** Draw the repeat unit of poly(ethene). [1]

**20.4** In addition polymerisation, what other product is made besides the polymer? [1]

**20.5** The repeat unit of a polymer is  $-(\text{CH}_2-\text{CHCl})-$ . Draw the monomer. [1]

**20.6 Challenge.** The monomer propene is  $\text{CH}_2=\text{CHCH}_3$ . Draw the repeat unit of poly(propene). [2]