# 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.

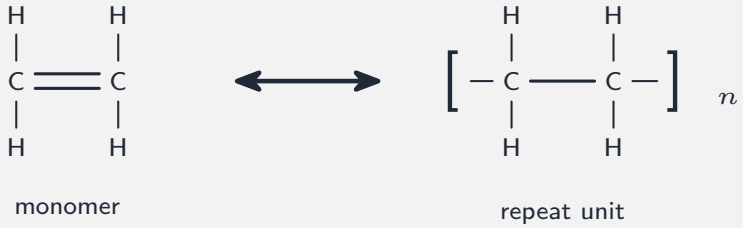
### 1 Addition polymerisation

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.

$$n\,\mathrm{CH_2{=}CH_2} \rightarrow -(\mathrm{CH_2{-}CH_2})_n-$$




For **PVC**: $n\,\mathrm{CH_2{=}CHCl} \rightarrow -(\mathrm{CH_2{-}CHCl})_n-$.

### 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]

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**20.5** The repeat unit of a polymer is $-(CH_2-CHCl)-$. Draw the monomer. [1]

**20.6 Challenge.** The monomer propene is $CH_2{=}CHCH_3$. Draw the repeat unit of poly(propene). [2]