20 Addition polymerisation – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	**Write it 3 times** (English)		
alkene			
repeat unit			
monomer			
polymer			
addition polymerisation			

Recall

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

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

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

New ideas

Read these first, then do the Practice.

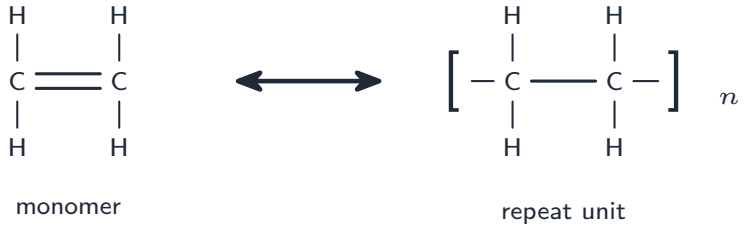
■ 1 Addition polymerisation

In **addition polymerisation** , 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** 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.

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



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

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]

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]