

20 Addition polymerisation – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary

*Write each word three times.***English****Write it 3 times** (English)

poly(ethene)

non-biodegradable

recycle

incinerate

Recall

From Part 1 you know addition polymers like **poly(ethene)** and **PVC** are long chains of carbon. Their strength and stability are useful – but they make them hard to throw away.

- The same strong C–C chain that makes plastics useful makes them hard to break down.
- Disposal is a real environmental problem.

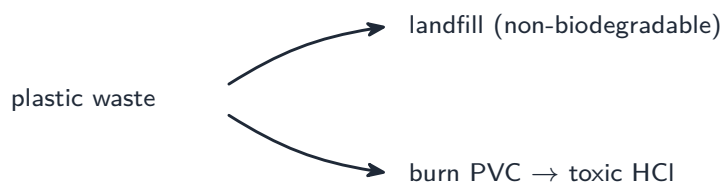
New ideas

Read these first, then do the Practice.

■ 1 Why disposal is hard

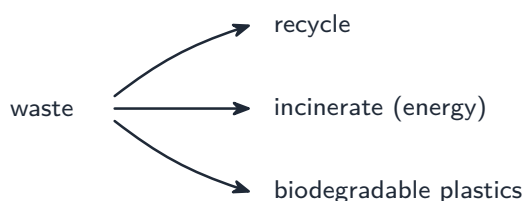
Poly(alkene)s are very hard to get rid of:

- they are **non-biodegradable** – microbes cannot break them down, so they stay in the ground for a very long time.
- **burning** them can release harmful gases – for example, burning **PVC** gives off toxic **hydrogen chloride** (HCl).



■ 2 Ways to deal with the waste

- **recycle** – sort, melt and remould the plastic.
- **incinerate** – burn it (with the heat used for energy), but the gases must be cleaned.
- develop **biodegradable** plastics that microbes **can** break down.



Watch out: poly(alkene)s are non-biodegradable *because* their C–C and C–H bonds are strong and unreactive – the very property that makes them durable and useful. Burning PVC also releases toxic HCl.

Practice

Try these in order.

20.1 What does *non-biodegradable* mean? [1]

20.2 Why are poly(alkene)s non-biodegradable? [2]

20.3 Name the toxic gas given off when PVC is burned. [1]

20.4 State two ways to deal with plastic waste. [2]

20.5 Suggest one advantage of developing biodegradable plastics. [1]

20.6 Challenge. Explain why the very property that makes poly(alkene)s useful as materials also makes them a disposal problem. [2]
