

Polymers and polymerisation

What are polymers and how are they made?

D: Identify some examples of polymers

C: Describe and use the terms 'monomer' and 'polymer'

B: Explain the process of polymerisation

A: Analyse some specific polymers including PTFE

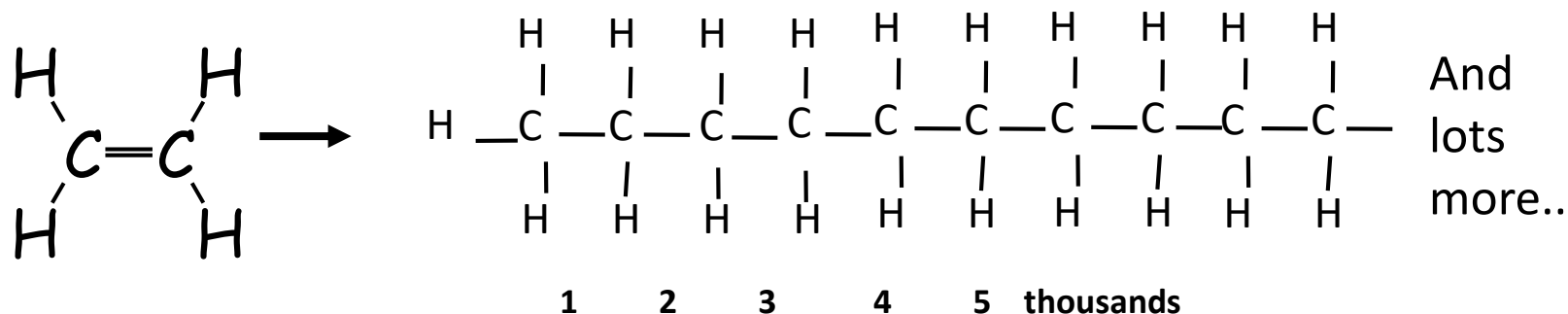
A*: Link the uses of polymers to social, economic and environmental factors

Starter

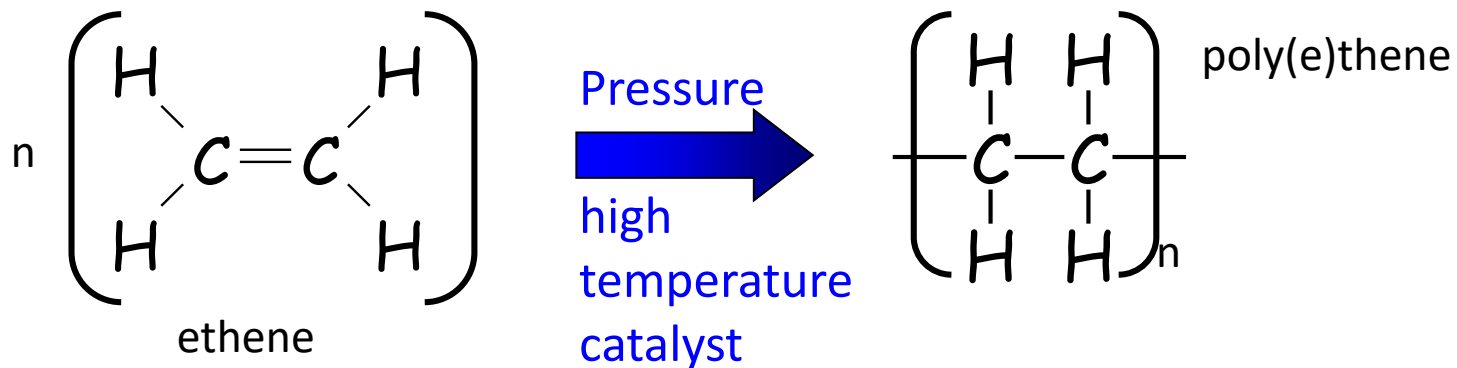
1. Copy title, date, and driving question – rate your starting grade

Poly(e)thene

- One important reaction of alkenes involves the joining together of alkene molecules.

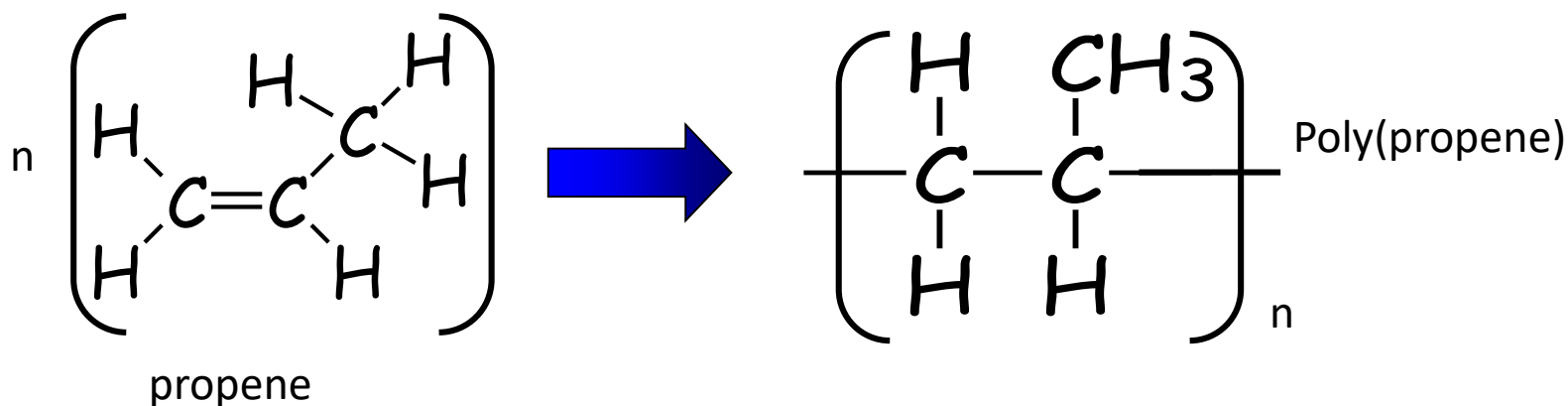


This is called **addition polymerisation** and is written as:



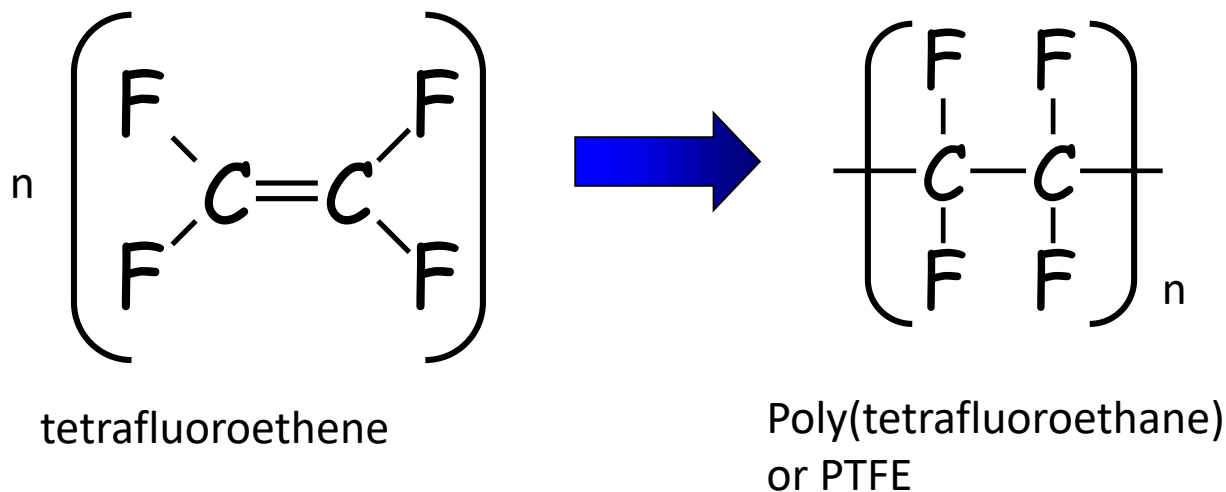
Polypropene

- Ethene is only one alkene. Other unsaturated molecules such as propene, vinyl chloride and styrene can also be **polymerised** to produce a range of plastics. E.g. propene

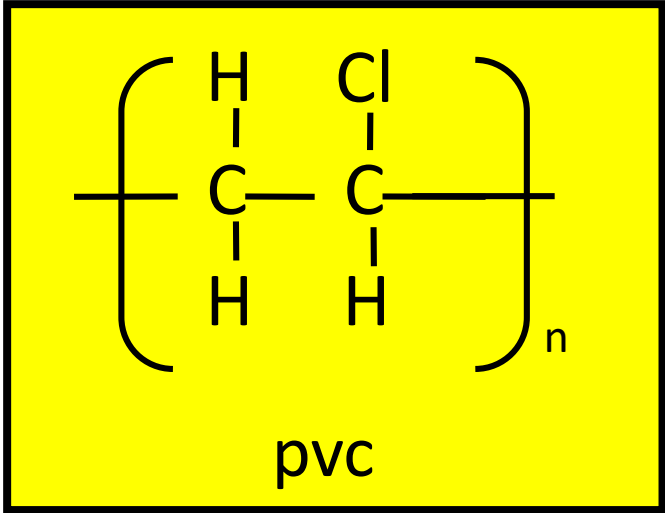
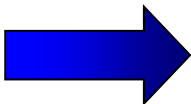
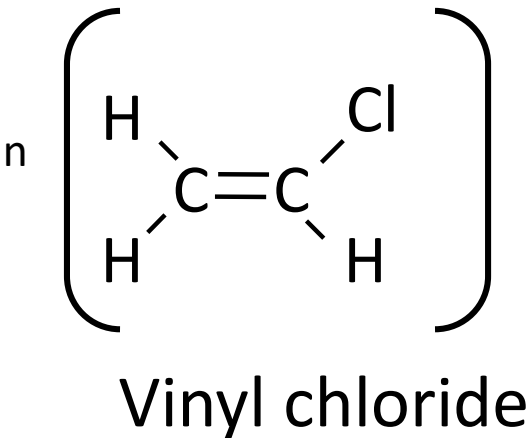


PTFE

- Tetrafluoroethane is another alkene that is made into an important plastic used to coat non-stick pans: polytetrafluoroethane or PTFE.



- Fill in the products that will be obtained from vinyl chloride



Some uses of plastics

Poly(e)thene

Shopping bags

Bottles

Buckets

Washing up bowls



Polypropene

Milk crates

Rope

Carpet fibres

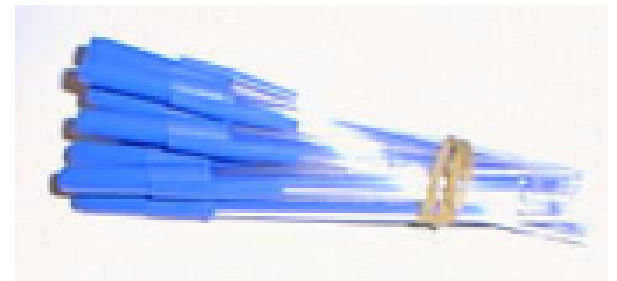


Polystyrene

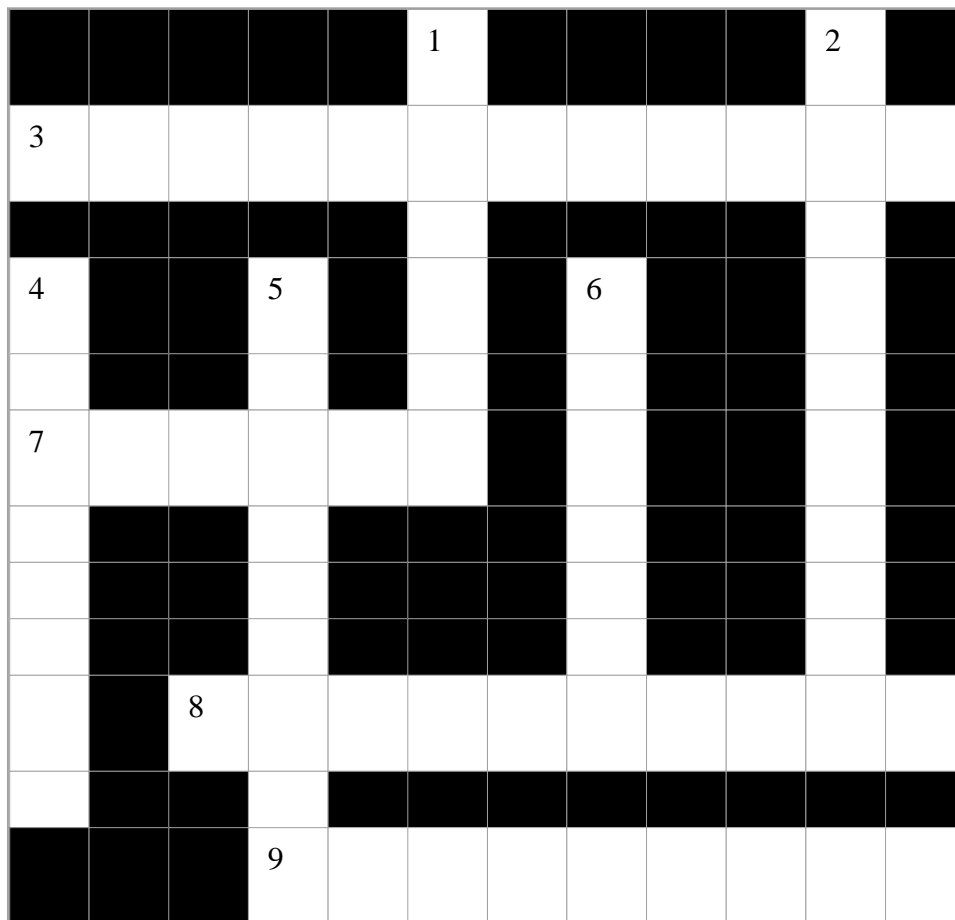
packing

insulation

Ball pens



Across	Down
3) separate substances with different boiling points	1) Contain a double bond
7) saturated hydrocarbon	2) a series of molecules differing by a CH ₂
8) joining of many small molecules	4) breaking up a large molecules
9) full up: unable to add more atoms	5) the different substances collected from distillation
	6) used to test for unsaturated molecules.



Answers

Across	Down
3) separate substances with different boiling points DISTILLATION	1) Contain a double bond ALKENE
7) saturated hydrocarbon ALKANE	2) a series of molecules differing by a CH ₂ HOMOLOGOUS
8) joining of many small molecules POLYMERISE	4) breaking up a large molecules CRACKING
9) full up: unable to add more atoms SATURATED	5) the different substances collected from distillation FRACTIONS
	6) used to test for unsaturated molecules. BROMINE

Which of these is an alkane?



Which of these is a true statement about alkenes?

A. They turn bromine water from colourless to red

B. They contain a double bond

C. The smallest alkene has 1 carbon atom

D. They have names that end in “ane.”

Which of these is a true statement about cracking?

A. it is the separation of molecules into fractions of different sizes.

B. it is carried out at low temperatures

C. it uses a catalyst.

D. It produces polymers

Which of these is a true statement about polymerisation?

A.it is the joining together of many small molecules.

B. it is the thermal decomposition of plastics

C.it is carried out using saturated molecules

D.it is a multiplication reaction

Which of these is an addition polymer?

A. styrene

B. ethene

C. p.v.c.

D. propane

How might you test to see if polystyrene still contained some unsaturated monomer (styrene)?

A. Crush it up and burn it.

B. Crush it up and add it to bromine water

C. Crush it up and dissolve it in petrol

D. Crush it up and add hydrochloric acid