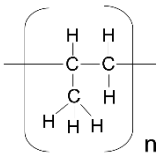
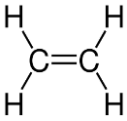
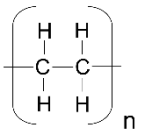
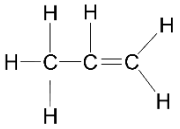
Knowledge check

Subject area: Organic chemistry | **Level: 14–16 years (Higher)**

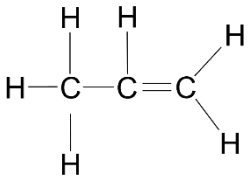
Topic: Addition polymerisation | **Source: rsc.li/2GRWsij**

1. This question is about molecules in the table.

Complete the table.

				
Tick to show if diagram is a polymer	***Answer:*** ✓		***Answer:*** ✓	
Name of substance	***Answer:*** *Poly(propene)*	***Answer:*** *Ethene*	***Answer:*** *Poly(ethene)*	***Answer:*** *Propene*
Unsaturated or saturated	***Answer:*** *Saturated*	***Answer:*** *Unsaturated*	***Answer:*** *Saturated*	***Answer:*** *Unsaturated*
Observation on adding orange bromine water	***Answer:*** *Stays orange*	***Answer:*** *Orange to colourless*	***Answer:*** *Stays orange*	***Answer:*** *Orange to colourless*

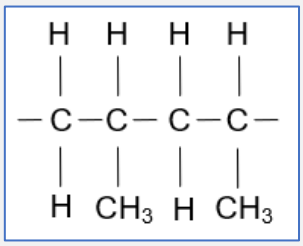
2. This question is about the molecule below.



a) Name the molecule.

Answer: *Propene.*

b) Draw a section of the polymer in which two repeating units are shown bonded together.



c) What is the name of the polymer in part b)

Answer: *Poly(propene).*

d) Explain what happens to the carbon double bond in the molecule in part a) when it makes a polymer.

Answer: *It forms a carbon single bond.*
Each carbon atom then forms two more carbon single bonds to other monomer units.

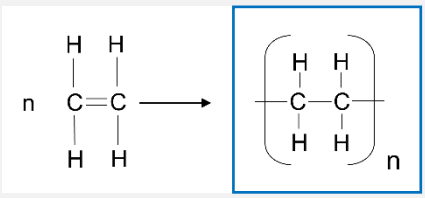
e) What type of polymerisation occurs to make the polymer in part b)?

Answer: *Addition polymerisation.*

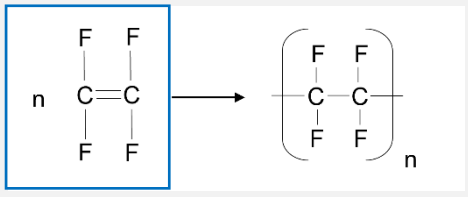
3. The equations below show monomers forming polymers.

Complete each equation by drawing the structure of the monomer or polymer in the box.

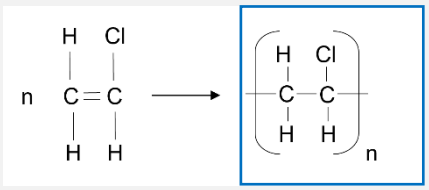
a)



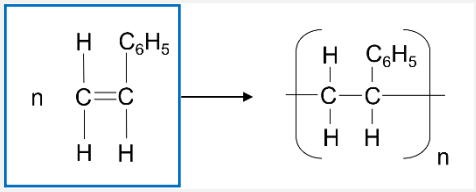
b)



c)



d)



4. Polymers are very useful, but there are problems associated with their use.

Briefly describe why each of the following is a problem.

a) The resources needed to make them.

Answer: *Most polymers use substances in crude oil, and this is a finite resource.*

b) Disposal in landfill sites.

Answer: *Most are non-biodegradable and take thousands of years to degrade.*

c) Disposal by combustion.

Answer: *Toxic gases produced, for example, hydrogen chloride from PVC.*
High temperature incineration may also form harmful products.