

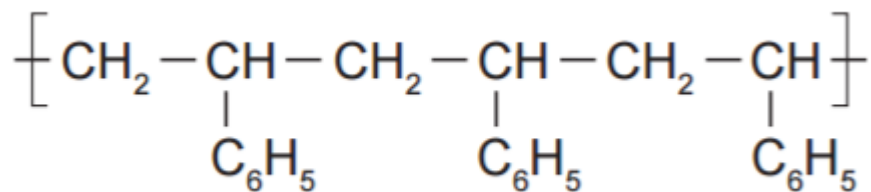
AS 91165

Demonstrate understanding of the properties of selected organic compounds

Collated Polymer questions

(2016)

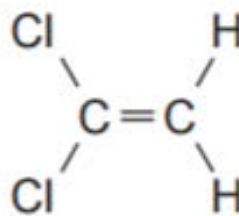
(b) Polystyrene is a polymer with the structure:



- Draw the monomer used to make the polymer polystyrene.
- Explain why the formation of polystyrene from its monomer is classified as an addition polymerisation reaction.

(2015)

Cling Wrap is a polymer that can be made from the monomer 1,1-dichloroethene.



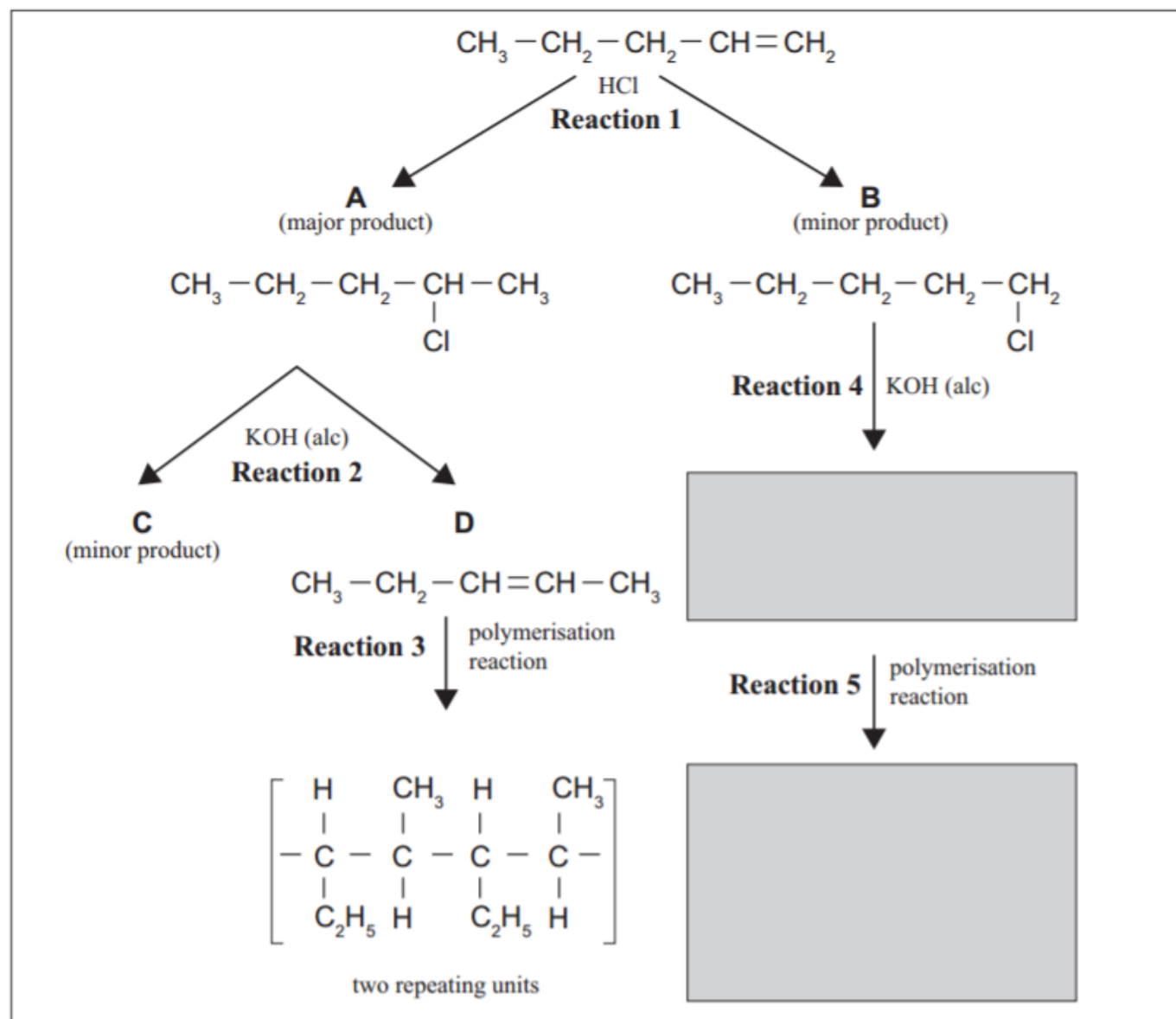
1,1-dichloroethene

- Draw THREE repeating units of the polymer formed.

(2014)

- (c) (i) Draw TWO repeating units of the polymer formed in Reaction 5.
- (ii) Compare and contrast the polymer formed in Reaction 5 to the polymer formed in Reaction 3. In your answer you should explain why the polymers formed in these two reactions are different.

A reaction scheme is shown below.

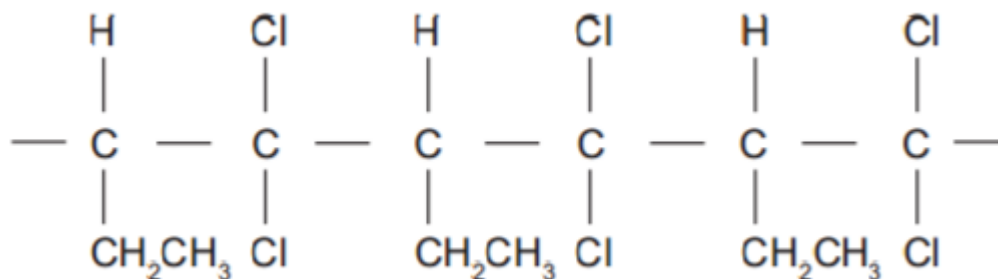


(2013)

- (a) (i) The molecule tetrafluoroethene, shown below, is the monomer for the polymer commonly known as Teflon. $\text{CF}_2=\text{CF}_2$

Draw TWO repeating units for the Teflon polymer.

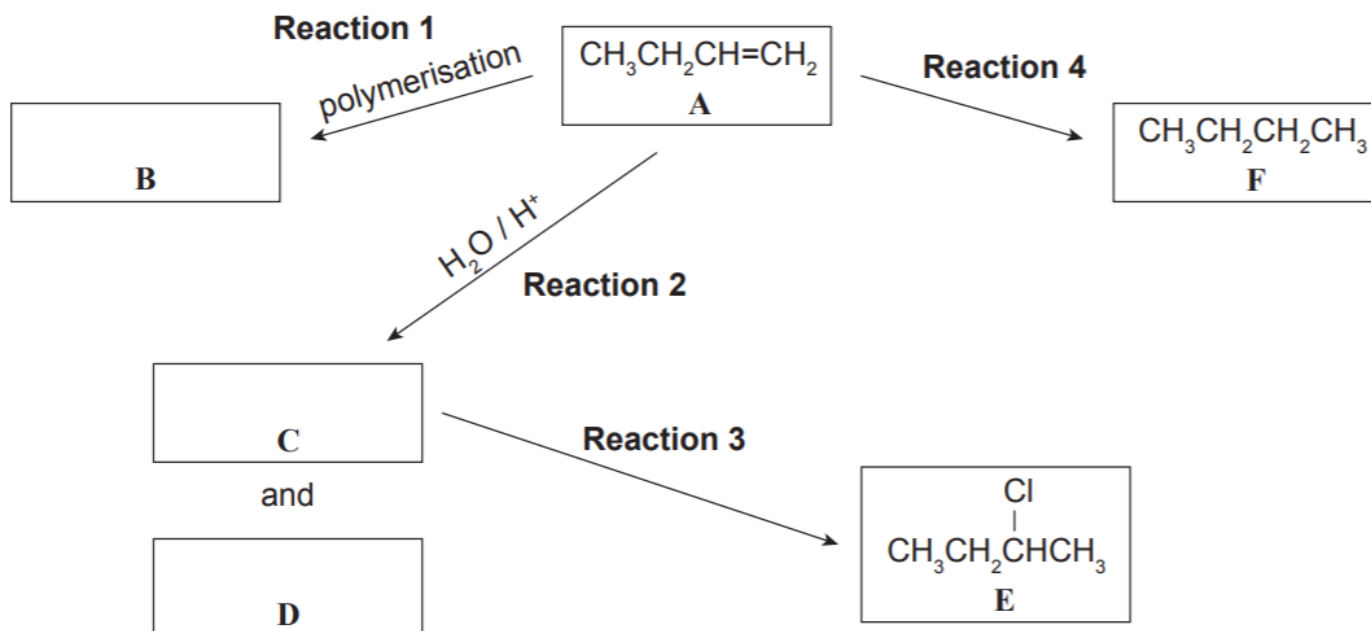
- (ii) The following diagram shows three repeating sections of another polymer.



Draw the structural formula of the monomer molecule used to make this polymer.

(2012)

But-1-ene is used in the reaction sequence shown below.

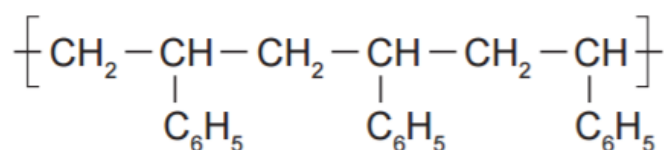


- (a) (i) Draw two repeating units of the polymer, B, formed in Reaction 1.

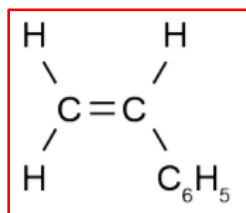
Collated Polymer questions - answers

(2016)

(b) Polystyrene is a polymer with the structure:



(i) Draw the monomer used to make the polymer polystyrene.

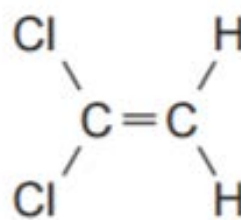


(ii) Explain why the formation of polystyrene from its monomer is classified as an addition polymerisation reaction.

Since the monomer for this reaction, styrene, is an alkene, when polymerisation occurs, the double bond in each styrene molecule is broken, freeing up a bonding space on each of the C atoms that was part of the double bond. This allows the monomers to join together by forming covalent bonds to make polystyrene. Since double bonds in styrene are being broken and molecules added into the freed-up bonding spaces to make polystyrene, this is an addition reaction. Polymerisation reactions occur when many monomers are chemically joined.

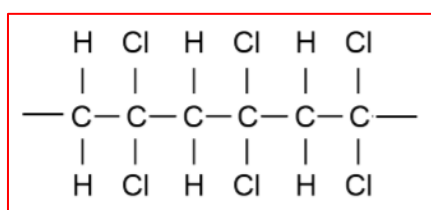
(2015)

Cling Wrap is a polymer that can be made from the monomer 1,1-dichloroethene.

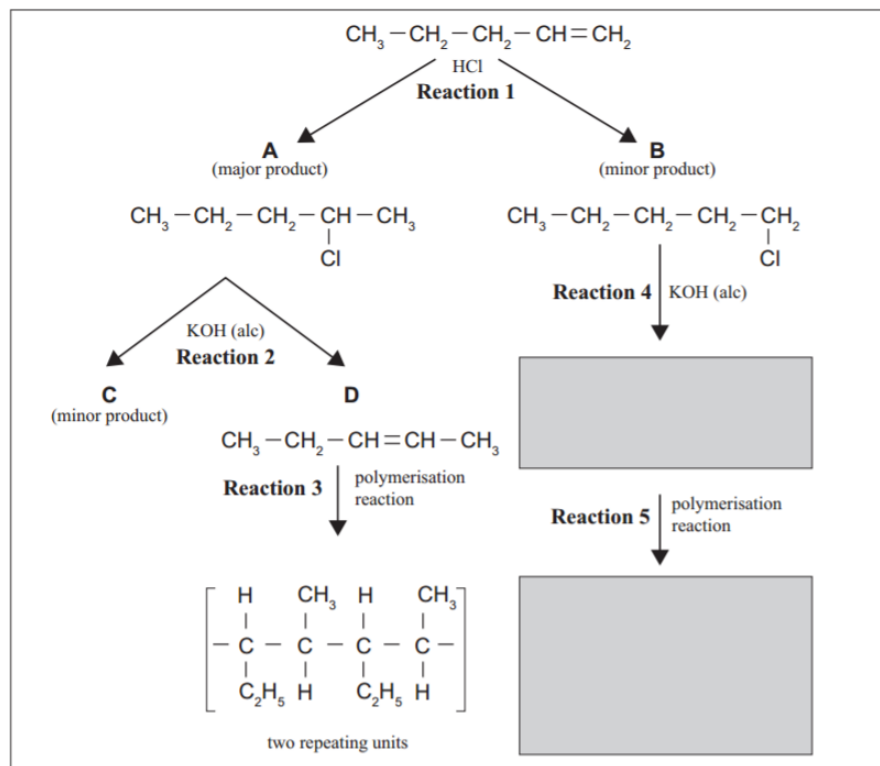


1,1-dichloroethene

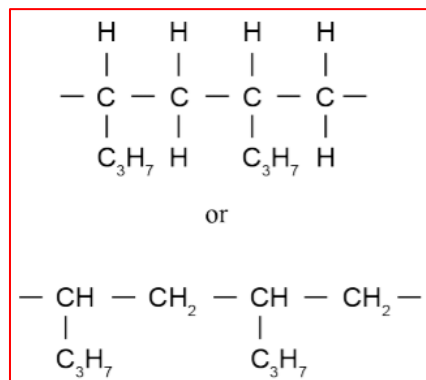
(a) (i) Draw THREE repeating units of the polymer formed.



A reaction scheme is shown below.



- (c) (i) Draw TWO repeating units of the polymer formed in Reaction 5.

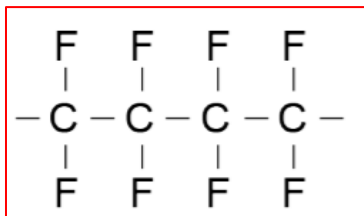


- (iii) Compare and contrast the polymer formed in Reaction 5 to the polymer formed in Reaction 3. In your answer you should explain why the polymers formed in these two reactions are different. The molecular formulae of the two repeating units of both polymers are the same, but the structural formulae are different. OR States repeating units are structural isomers. Addition polymerisation occurs when the $\text{C}=\text{C}$ breaks and the carbon atoms in this double bond join to each other from adjacent molecules to form long chains. In Reaction 3, the polymer formed will have a carbon with one hydrogen and a methyl group, and a carbon with one hydrogen and an ethyl group, as its repeating unit, due to the double bond being on the C2 position. In Reaction 5, since the double bond is in a different position (the C1 position), the polymer formed will have as its repeating unit a carbon atom with 2 hydrogen atoms attached, and a carbon atom with one hydrogen attached and a propyl group attached.

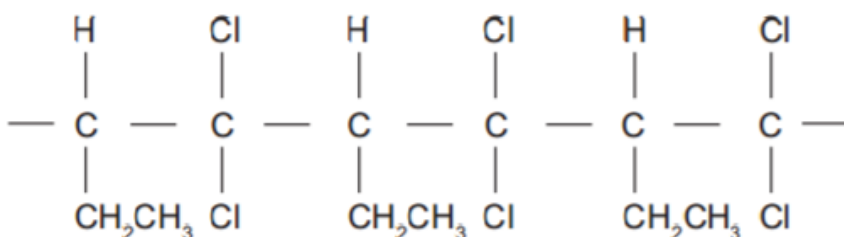
(2013)

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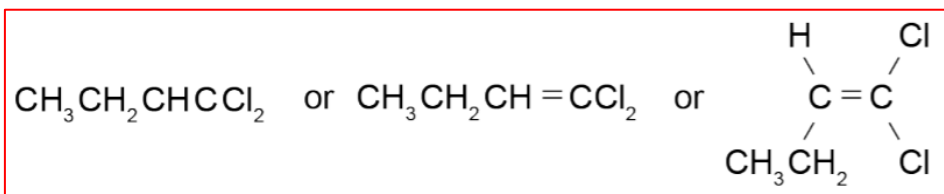
Draw TWO repeating units for the Teflon polymer.



- (iii) The following diagram shows three repeating sections of another polymer.

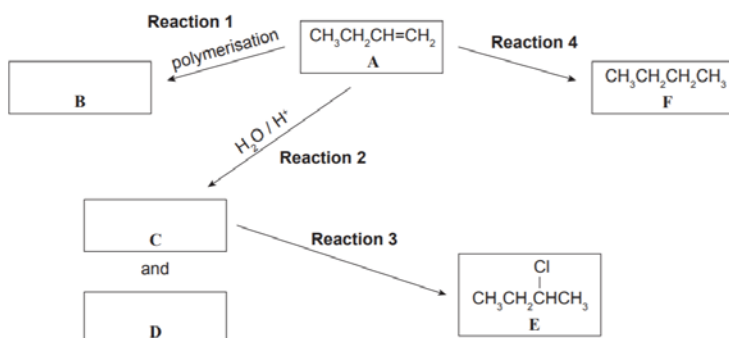


Draw the structural formula of the monomer molecule used to make this polymer.



(2012)

But-1-ene is used in the reaction sequence shown below.



- (a) (i) Draw two repeating units of the polymer, B, formed in Reaction 1.

