20. Polymerisation

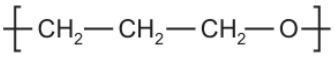
20.1 Addition polymerisation

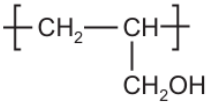
Paper 1

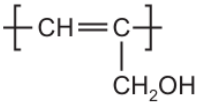
Question Paper

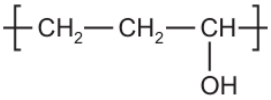
1 Synthetic resins can be made by polymerisation of a variety of monomers including prop-2-en-1-ol, $CH_2=CHCH_2OH$.

Which structure represents the repeat unit in the polymer poly(prop-2-en-1-ol)?

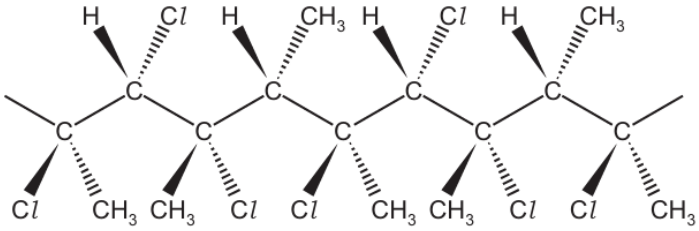
A 

B 

C 

D 

2 The diagram shows a section of an addition polymer. The polymer is made using two different monomers.



What are the names of the two monomers needed to make this polymer?

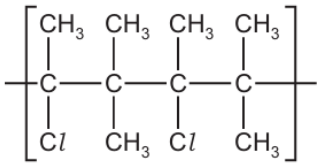
A 1,2-dichloropropene and 2-chlorobut-2-ene

B 2,3-dichlorobut-2-ene and chloropropene

C 1,2-dichloropropene and chloroethene

D chloropropene and 2-chlorobut-2-ene

3 A section showing two repeat units of an addition polymer is shown.



What is the identity of the monomer that produced this polymer?

A 2-chloro-3-methylbutane

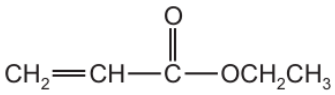
B 2-chloro-3-methylbut-2-ene

C 2-chloropent-2-ene

D 2,4-dichloro-3,3,4,5-tetramethylhexane

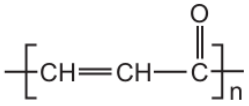
4 An addition polymer is made from monomer Z.

monomer Z



What is the structure of the polymer made from this monomer?

A



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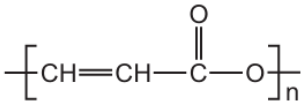

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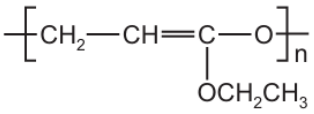

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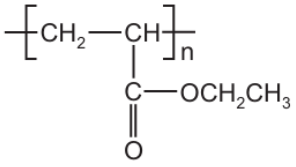


5 The diagram shows a section of a polymer molecule.

$$–CH_2–CH=CH–CH_2–CH_2–CH=CH–CH_2–$$

Which monomer will produce this polymer?

A $CH_2=CH_2$

B $CH_3CH=CH_2$

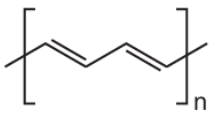
C $CH_3CH=CHCH_3$

D $CH_2=CH–CH=CH_2$

6 The monomer buta-1,3-diene can undergo addition polymerisation in various ways. Two of the polymers that can be made are called *cis*-poly(buta-1,3-diene) and *trans*-poly(buta-1,3-diene). In these names *cis* and *trans* have their usual meanings.

What is the structure of the repeat unit of *cis*-poly(buta-1,3-diene)?

A



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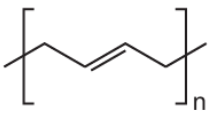

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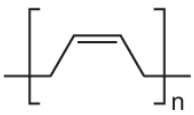
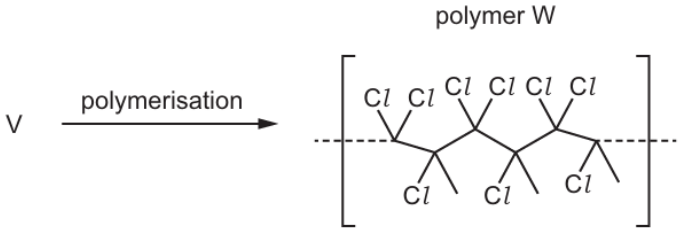


D

7 Compound V polymerises to form polymer W. A section of polymer W is shown.



What is the correct name of compound V?

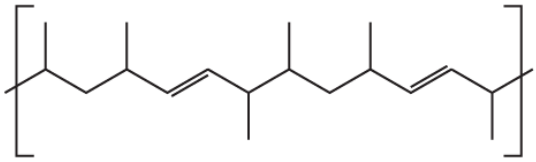
A 1,1,2-trichlorobutene

B 1,1,2-trichloroethene

C 1,1,2-trichloropropene

D 1,1,2-trichloro-2-methylethene

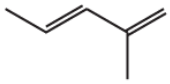
8 The diagram shows a section of an addition polymer formed from two different monomers.



One of the monomers is propene.

What is the other monomer?

A



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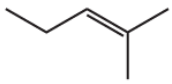

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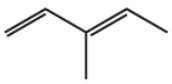

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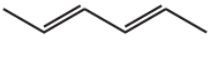
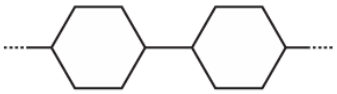


9 Cyclohexene, as shown in the diagram, can form an addition polymer.

cyclohexene

Which structure represents a section of the polymer?

A



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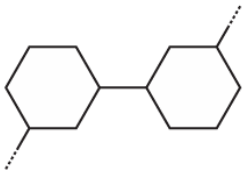

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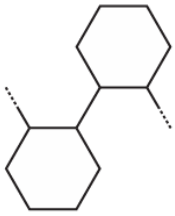


D

10 Which statement is correct when referring to the complete combustion of PVC?

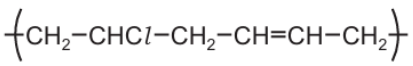
A A gas is made which contributes to global warming.

B Carbon dioxide and water are the only products.

C If water is used to clean the exhaust gases, the water becomes alkaline.

D There is no need to treat the exhaust gases as the products are non-hazardous.

11 A polymer has the following repeat unit. It is made from two different monomers.



Which pair of monomers could be used to make this polymer?

A CH_2=CHCl and CH_2=CH_2

B CH_2=CHCl and CH_2=CH–CH=CH_2

C CH_3–CH_2Cl and CH_3–CH=CH–CH_3

D CH_3–CH=CH–CH_3 and CH_2=CHCl

12 Poly(propene) is an addition polymer.

What are the C–C–C bond angles along its polymer chain?

A They are all 109°.

B Half of them are 109° and half are 120°.

C Half of them are 90° and half are 180°.

D They are all 120°.

13 PVC is used as a packaging material.

What holds the different polymer strands together in a piece of solid PVC?

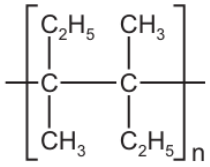
A covalent bonds

B hydrogen bonds

C ionic bonds

D van der Waals' forces

14 The diagram shows the repeat unit of an addition polymer.



What is the correct name for the monomer that would form this polymer?

A cis-1,2-diethyl-1,2-dimethylethene

B cis-2-ethyl-3-methylpent-2-ene

C trans-2-ethyl-3-methylpent-2-ene

D trans-3,4-dimethylhex-3-ene

15 Polyethene is made by the polymerisation of ethene.

Which statement is correct?

A The monomer and the polymer have different empirical formulae.

B The monomer can be oxidised without heat whereas the polymer cannot.

C The monomer can be used as a fuel whereas the polymer cannot.

D The monomer has greater van der Waals' forces than the polymer.