Cambridge AS & A Level

CHEMISTRY

Paper 1

Topical Past Paper Questions

+ Answer Scheme

2015 - 2021

PapaCambridge

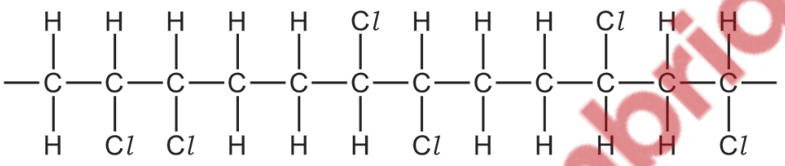
Chapter 20

Polymerisation

20.1 Addition polymerisation

1172. 9701_m22_qp_12 Q: 37

A molecule of a polymer contains the sequence shown.



Which monomer could produce this polymer by addition polymerisation?

A $CHCl{=}CHCl$

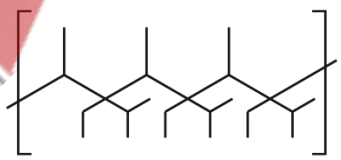
B $CH_2{=}CHCl$

C $CH_3CCl{=}CHCl$

D $CH_3CCl{=}CH_2$

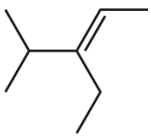
1173. 9701_m20_qp_12 Q: 24

A section of a polymer chain is shown.



What is the correct monomer?

A



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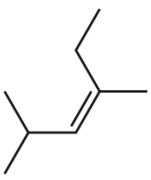
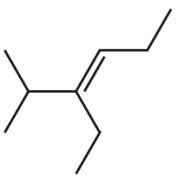


C



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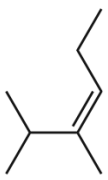


1174. 9701_s20_qp_12 Q: 29

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

1175. 9701_w20_qp_11 Q: 22

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.

1176. 9701_w20_qp_12 Q: 22

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

$$\left(CH_2{-}CHCl{-}CH_2{-}CH{=}CH{-}CH_2\right)$$

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

A $CH_2{=}CHCl$ and $CH_2{=}CH_2$

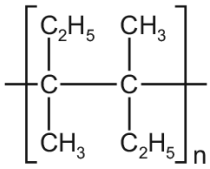
B $CH_2{=}CHCl$ and $CH_2{=}CH{-}CH{=}CH_2$

C $CH_3{-}CH_2Cl$ and $CH_3{-}CH{=}CH{-}CH_3$

D $CH_3{-}CH{=}CH{-}CH_3$ and $CH_2{=}CHCl$

1177. 9701_s19_qp_12 Q: 22

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

1178. 9701_m18_qp_12 Q: 27

A reaction occurs when a sample of 1-chloropropane is heated under reflux with sodium hydroxide dissolved in ethanol.

Which row is correct?

	type of reaction	name of product
A	elimination	propan-1-ol
B	elimination	propene
C	substitution	propan-1-ol
D	substitution	propene

1179. 9701_s18_qp_13 Q: 22

Which statement is **not** correct?

A Combustion of PVC produces a highly acidic gas.

B PVC molecules are saturated.

C The empirical formula of PVC is the same as the empirical formula of its monomer.

D The repeat unit of PVC is $-(CHClCHCl)-$.

1180. 9701_w18_qp_12 Q: 22

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.

1181. 9701_m17_qp_12 Q: 24

Polymerisation of ethene gives poly(ethene).

How does the bonding between carbon atoms in poly(ethene) compare with that in ethene?

A longer and stronger in poly(ethene)

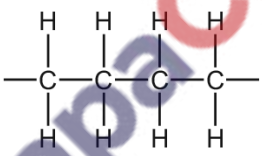
B longer and weaker in poly(ethene)

C shorter and stronger in poly(ethene)

D shorter and weaker in poly(ethene)

1182. 9701_s17_qp_11 Q: 23

The diagram shows a short length of an addition polymer chain.



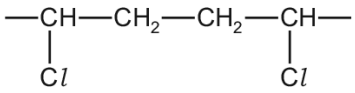
The polymer has a relative molecular mass of approximately 10 000.

Approximately how many monomer units are joined together in each polymer molecule?

A 180 **B** 360 **C** 625 **D** 710

1183. 9701_w17_qp_11 Q: 23

A section of an addition polymer chain is shown.



Which monomer could be used to make this polymer?

A CH_2CHCH_2Cl

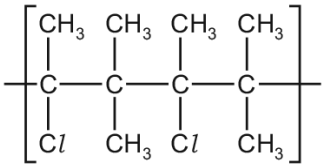
B CH_2CHCl

C $CH_3CHCHCl$

D $CHClCHCH_2CH_2Cl$

1184. 9701_m16_qp_12 Q: 22

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

1185. 9701_m16_qp_12 Q: 29

Which statement about poly(chloroethene) is correct?

A The polymer can be cracked to produce chlorinated alkenes.

B The polymer has harmless combustion products.

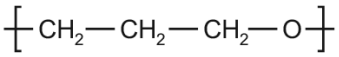
C The polymer is readily biodegradable when buried.

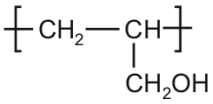
D The repeat unit of the polymer has an M_r of 97.

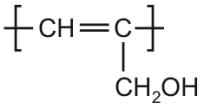
1186. 9701_s16_qp_12 Q: 21

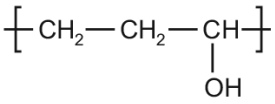
Synthetic resins can be made by polymerisation of a variety of monomers including prop-2-en-1-ol, CH_2=$CHCH_2OH$.

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

A 

B 

C 

D 

1187. 9701_w16_qp_11 Q: 22

PVC is difficult to dispose of. Two possible methods are burying it in landfill sites and disposal by combustion.

Which row of the table is correct?

	rate of biodegradation of PVC in landfill sites	gases produced when PVC combusts
A	fast	CO_2, H_2O, HCl
B	fast	CO_2, H_2O, Cl_2
C	slow	CO_2, H_2O, Cl_2
D	slow	CO_2, H_2O, HCl
