CHEMISTRY ONLINE
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CHEMISTRY

ORGANIC CHEMISTRY

Level & Board	AQA (A-LEVEL)
TOPIC:	ALKENES
PAPER TYPE:	QUESTION PAPER - 4
TOTAL QUESTIONS	10
TOTAL MARKS	29

Alkenes - 4

1. A substitution reaction occurs when 2-bromopropane reacts with aqueous sodium hydroxide.

(a) Draw the structure of the organic product of this reaction and give its name.

(1)

(b) Name and outline the mechanism for this reaction.

(5)

2. What is the major product of the reaction between but-1-ene and DBr? (D is deuterium and represents ^{2}H)

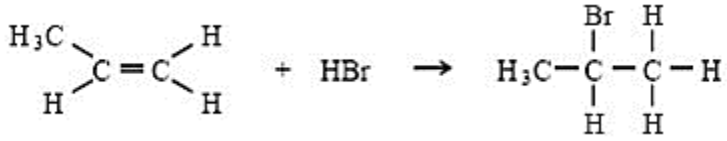
A. $CH_2DCH_2CH_2CH_2Br$
B. $CH_2DCH_2CHBrCH_3$
C. $CH_3CH_2CHBrCH_2D$
D. $CH_3CH_2CHDCH_2Br$

(1)

3. Organic reaction mechanisms help to develop an understanding of how and why reactions occur.

Propene reacts with hydrogen bromide by an electrophilic addition mechanism forming 2-bromopropane as the major product.

The equation for this reaction is shown below.



(a) Outline the mechanism for this reaction, showing the structure of the intermediate carbocation formed.

(3)

(b) Give the structure of the alternative carbocation which could be formed in the reaction between propene and hydrogen bromide.

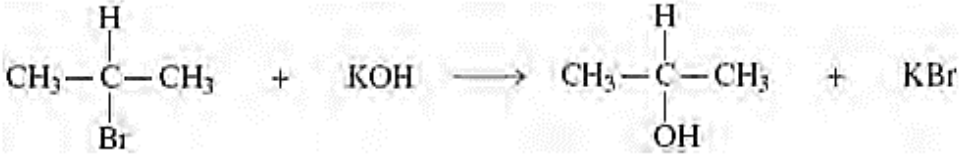
(2)

4. Which statement about ethene is correct?

A. It has no geometric isomers because there is free rotation around the C=C bond.
B. It reacts with HBr in a nucleophilic addition reaction.
C. It burns in excess oxygen to produce carbon dioxide and water.
D. The C=C bond is twice as strong as the C–C bond in ethane.

(1)

5. Consider the following reaction.



Name and outline a mechanism for this reaction.

(3)

6. Which statement about E-1,2-dichloroethene is correct?

A. It has the same boiling point as Z-1,2-dichloroethene.
B. It forms a polymer with the same repeating unit as Z-1,2-dichloroethene.
C. It has the same IR spectrum as Z-1,2-dichloroethene in the range 400–1500 cm^{-1} .
D. It has a molecular ion peak different from that of Z-1,2-dichloroethene in its mass spectrum.

(1)

7. In industry, ethanol is made from ethene in an acid-catalysed reaction. Name the type of reaction.

(a) Write an equation and identify a suitable catalyst for this reaction.

(3)

(b) Ethanol burns completely in a plentiful supply of air, but incomplete combustion occurs if the air supply is limited.

Write an equation for the incomplete combustion of ethanol to produce the solid pollutant and Identify the solid pollutant.

(2)

8. Consider the reaction between propene and hydrogen bromide to form the major product.

Which species is formed in the mechanism of this reaction?

A. $CH_3–C^+H–CH_2Br$
B. $CH_3–CHBr–C^+H_2$
C. $CH_3–C^+H–CH_3$
D. $CH_3–CH_2–C^+H_2$

(1)

9. The reaction of chlorine with ethene is similar to that of bromine with ethene.
Name and outline a mechanism for the reaction of chlorine with ethene to form 1,2-dichloroethane, as shown by the following equation.

$H_2C{=}CH_2 + Cl_2 \rightarrow ClCH_2CH_2Cl$

(5)

10. Which statement is correct about poly(chloroethene)?

A. It has the empirical formula CHCl
B. It decolourises bromine water

C. Its brittleness is reduced by plasticisers

D. Its polymer chain contains alternate single and double bonds

(1)

I am Sorry !!!!!

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