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CHEMISTRY

ORGANIC CHEMISTRY

Level & Board	AQA (A-LEVEL)
TOPIC:	HALOGENOALKANES
PAPER TYPE:	QUESTION PAPER - 2
TOTAL QUESTIONS	10
TOTAL MARKS	21

Halogenoalkanes - 2

1. Acrylic acid reacts with prop-2-en-1-ol to produce an ester.

(a) Complete the balanced equation for this reaction.

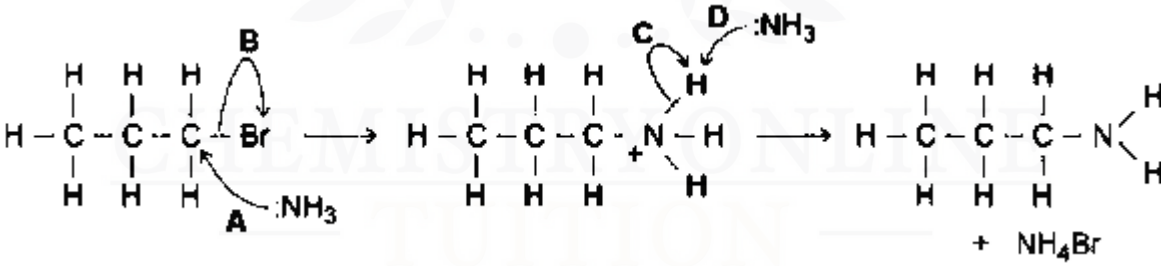
$CH_2=CHCOOH + CH_2=CHCH_2OH \rightarrow$ ..... + ...

(2)

(b) Draw the structure of the ester.
Clearly display all of the functional groups.

(2)

2. Which of the arrows, labelled A, B, C or D in the mechanism in the diagram, is not correct?



A. A
B. B
C. C
D. D

(1)

3. A student reacted 8.72 g of bromobutane with an excess of OH^-.

The student produced 4.28 g of butan-1-ol.

In this reaction the hydroxide ion acts as a nucleophile.

(a) What name is given to this type of reaction?

(1)

(b) Explain the term nucleophile.

(1)

(c) Outline the mechanism for this reaction.
Show curly arrows and relevant dipoles.

(4)

4. Which compound can react with ammonia to produce propylamine?

A. $CH_3CH{=}CH_2$
B. $CH_3CH_2CH_2OH$
C. $CH_3CH_2CH_2Br$
D. $CH_3CH_2CH_3$

(1)

5. 2-bromo-2-methylpentane is heated with potassium hydroxide dissolved in ethanol.

Two structural isomers are formed.

(a) State the meaning of the term structural isomers.

(1)

(b) Name and draw the mechanism for the formation of one of the isomers.

(5)

6. Which one of the following mechanisms is not involved in the reaction sequence below?

$CH_3CH_3 \rightarrow CH_3CH_2Cl \rightarrow CH_3CH_2OH \rightarrow CH_2{=}CH_2 \rightarrow CH_3CH_2Br$

A. electrophilic addition
B. electrophilic substitution
C. nucleophilic substitution
D. free-radical substitution

(1)

7. Haloalkanes also undergo elimination reactions to produce alkenes.

Outline a mechanism for the elimination reaction in which 2-bromopropane reacts with potassium hydroxide to form propene.

(3)

8. Which compound could not be produced by reacting 2-bromo-3-methylbutane with sodium hydroxide?

A. 2-methylbut-1-ene
B. 3-methylbut-1-ene
C. 2-methylbut-2-ene
D. 3-methylbutan-2-ol

(1)

9. Chlorofluoroalkanes, CFCs, were developed from fluoroalkanes and were used in aerosols and as refrigerants.

Under the Montreal Protocol, CFCs are now largely banned because of their ozone-depleting properties.

CFCs have now been replaced in many applications.
Suggest two reasons why there is still concern about ozone depletion.

(2)

10. Which species could act as a nucleophile?

A. BH_3
B. NH_4^+
C. PH_3
D. SiH_4

(1)