Addition Reactions of Alkenes

Question Paper 7

Level	A Level
Subject	Chemistry
Exam Board	AQA
Module	3.3 Organic Chemistry
Topic	3.3.4 Alkenes
Sub-Topic	3.3.4.2 Addition Reactions of Alkenes
Booklet	Question Paper 7

Time Allowed: **24 minutes**

Score: **/24**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	75%	70%	60%	55%	50%	<50%

Q1. Which one of the following does **not** represent an oxidation?

A propene → propane

B propan-l-ol → propanal

C propan-l-ol → propanoic acid

D propanal → propanoic acid

(Total 1 mark)

Q2. (a) In the manufacture of margarine, unsaturated vegetable oils such as sunflower oil are hardened.

(i) State the reagent and conditions used in this process.

Reagent .....

Conditions .....

.....

(ii) Soft and hard margarines are obtained from the same vegetable oil. How does the structure and the melting point of a soft margarine differ from that of a hard one?

Difference in structure .....

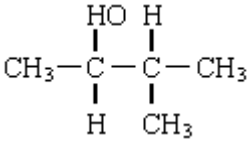
.....

Difference in melting point .....

.....

(5)

(b) In the presence of reagent **X**, the alcohol shown below undergoes a reaction to form two isomeric alkenes.



(i) Name this alcohol.

.....

(ii) Give the name of the type of reaction involved in the formation of the two alkenes.

.....

(iii) Suggest the identity of reagent **X**.

.....

(iv) Give the structural formulae of the two isomeric alkenes.

Alkene 1 *Alkene 2*

(5)
(Total 10 marks)

Q3. Which one of the following reactions involves nucleophilic addition?

A $CH_3CH = CH_2 + HBr \rightarrow CH_3CHBrCH_3$

B $CH_3CH_2CH_3 + Cl_2 \rightarrow CH_3CHClCH_3 + HCl$

C $CH_3CH_2CH_2Br + NaOH \rightarrow CH_3CH_2CH_2OH + NaBr$

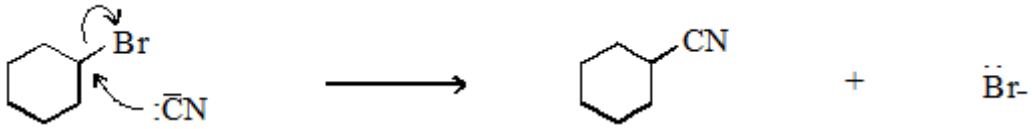
D $CH_3CH_2CHO + HCN \rightarrow CH_3CH_2CH(OH)CN$

(Total 1 mark)

Q4. In which one of the following are the curly arrows **not** used correctly?

A

B



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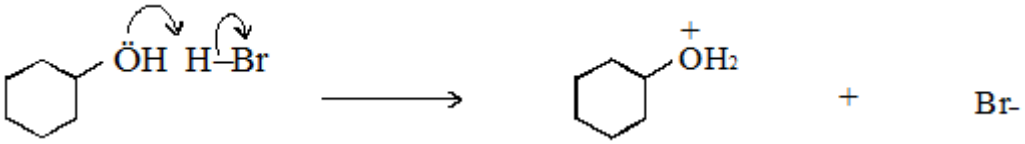

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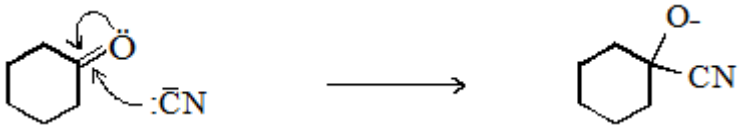
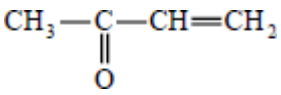


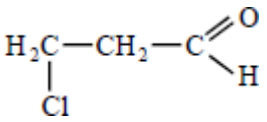
(Total 1 mark)

Q5. Which one of the following can react both by nucleophilic addition and by nucleophilic substitution?

A



B



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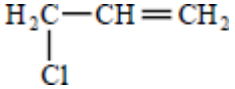

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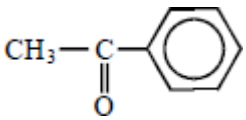

(Total 1 mark)

Q6. Propene reacts with bromine by a mechanism known as electrophilic addition.

(a) Explain what is meant by the term *electrophile* and by the term *addition*.

Electrophile .....

.....

Addition .....

.....

(2)

(b) Explain why bromine, a non-polar molecule, is able to react with propene.

.....

.....

.....

(2)

(c) Outline the mechanism for the electrophilic addition of bromine to propene. Give the name of the product formed.

Mechanism

Name of product .....

(5)

(d) The polymerisation of propene to form poly(propene) is an important industrial

process.

Name the type of polymerisation involved.

.....

(1)

(Total 10 marks)