13. An introduction to AS Level organic chemistry

13.2 Characteristic organic reactions

Paper 1

Question Paper

1 What is true of **every** nucleophile?

A It attacks a double bond.

B It donates a lone pair of electrons.

C It is a single atom.

D It is negatively charged.

2 Which pair of reagents react together in a redox reaction?

A CH_3CHCH_2 + Br_2

B $CH_3CH_2CH_2OH$ + concentrated H_3PO_4

C CH_3COCH_3 + HCN

D $HCO_2C_2H_5$ + dilute H_2SO_4

3 The free-radical substitution reaction between methane and chlorine involves initiation, propagation and termination stages.

Which row is correct?

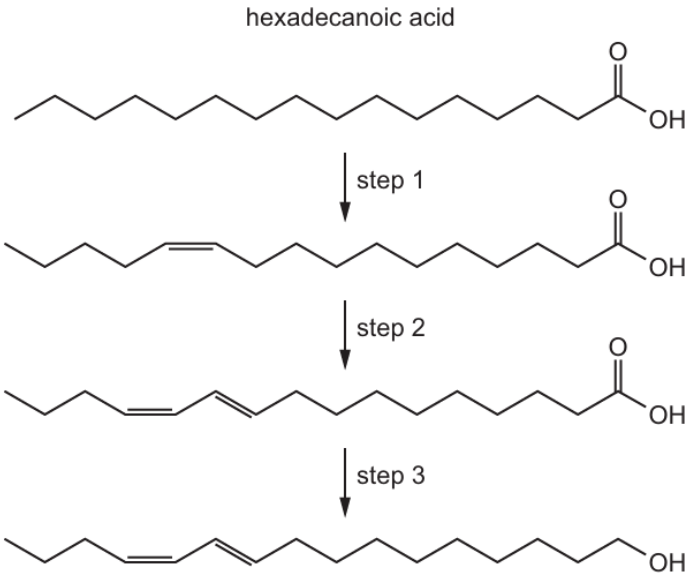
	involved in initiation stage	radical produced in a propagation stage
A	homolytic fission	H•
B	homolytic fission	CH_3•
C	heterolytic fission	H•
D	heterolytic fission	CH_3•

4 Bromomethane, CH_3Br, decomposes in the stratosphere forming methyl free radicals and bromine free radicals.

Which row correctly describes this decomposition?

	type of bond fission	number of electrons in a bromine free radical
A	homolytic	35
B	heterolytic	35
C	homolytic	36
D	heterolytic	36

5 Hexadeca-10,12-dien-1-ol is produced by silk moths from hexadecanoic acid in a three-step enzymic process.



Which row contains correct descriptions of the three steps?

	step 1	step 2	step 3
A	elimination	elimination	dehydration
B	elimination	reduction	reduction
C	oxidation	elimination	oxidation
D	oxidation	oxidation	reduction

6 Which row correctly shows the type of mechanism of each of the two reactions?

	C_2H_5Br + KCN	CH_3COCH_3 + HCN
A	electrophilic substitution	electrophilic addition
B	electrophilic substitution	nucleophilic addition
C	nucleophilic substitution	electrophilic addition
D	nucleophilic substitution	nucleophilic addition

7 What is true of **every** nucleophile?

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C It is a single atom.

D It is negatively charged.

8 The conversion of propene to propan-2-ol can be carried out in two stages represented by the equations shown.

reaction 1 $CH_3CH{=}CH_2(g) + HI(g) \rightarrow CH_3CHICH_3(l)$

reaction 2 $CH_3CHICH_3(l) + KOH(aq) \rightarrow CH_3CH(OH)CH_3(aq) + K^+(aq) + I^-(aq)$

How can these two reactions be described?

	reaction 1	reaction 2
A	addition	elimination
B	addition	substitution
C	elimination	substitution
D	substitution	elimination