

Unit 15: Halogen compounds

Subunit 15.1: Halogenoalkanes

Topical Question No: 1

- 22 Which radical is most likely to form by the homolytic fission of one covalent bond in bromochloromethane, CH_2BrCl ?

A $\cdot\text{CH}_2\text{Cl}$ B $\cdot\text{CH}_2\text{Br}$ C $\cdot\text{CHBrCl}$ D $\cdot\text{CH}_2\text{BrCl}$

Topical Question No: 2

- 38 Which statements help to explain the mechanism of the reaction between 1-chloropropane and ammonia?

- 1 1-chloropropane has a δ^- chlorine atom that forms hydrogen bonds with a δ^+ hydrogen atom in ammonia.
- 2 1-chloropropane is a polar compound with a δ^+ carbon atom.
- 3 There is a lone pair of electrons on the nitrogen atom in ammonia.

Topical Question No: 3

- 21 An organic ion containing a carbon atom with a negative charge is called a carbanion.

An organic ion containing a carbon atom with a positive charge is called a carbocation.

The reaction between aqueous sodium hydroxide and 1-bromobutane proceeds by an $\text{S}_{\text{N}}2$ mechanism.

What is the first step in the mechanism?

- A attack by a nucleophile on a carbon atom with a partial positive charge
B heterolytic bond fission followed by attack by an electrophile on a carbanion
C heterolytic bond fission followed by attack by a nucleophile on a carbocation
D homolytic bond fission followed by attack by a nucleophile on a carbocation

Topical Question No: 4

- 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

Topical Question No: 5

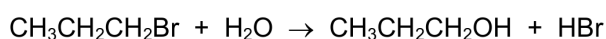
- 38** Organic compound X gives a precipitate when warmed with aqueous silver nitrate. This precipitate dissolves when concentrated aqueous ammonia is added.

What could X be?

- 1** 1-bromopropane
- 2** 2-chlorobutane
- 3** 2-iodo-2-methylpropane

Topical Question No: 6

- 24** Bromopropane reacts with water as shown.



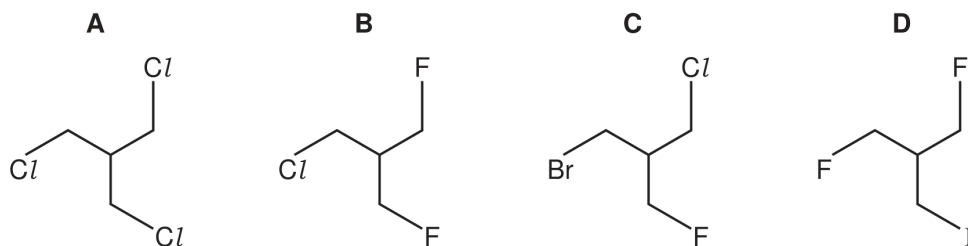
Which statement is correct?

- A** This is an elimination reaction.
- B** This is a hydrolysis reaction.
- C** This is a redox reaction.
- D** This reaction tends to proceed via the $\text{S}_{\text{N}}1$ mechanism.

Topical Question No: 7

- 28** The presence of halogen in an organic compound may be detected by warming the organic compound with aqueous silver nitrate.

Which compound would produce a precipitate quickest?



Topical Question No: 8

- 37** Which are properties of fluoroalkanes?

- 1** They are less reactive than the corresponding chloroalkanes.
- 2** They are non-flammable.
- 3** The C–F bond is stronger than the C–Cl bond.

Topical Question No: 9

- 25** A carbanion is an organic ion in which a carbon atom has a negative charge. A carbocation is an organic ion in which a carbon atom has a positive charge.

What is involved in the mechanism of the reaction between aqueous sodium hydroxide and 2-bromo-2-methylbutane?

- A** heterolytic bond fission followed by an attack by an electrophile on a carbanion
- B** heterolytic bond fission followed by an attack by a nucleophile on a carbocation
- C** homolytic bond fission followed by an attack by an electrophile on a carbanion
- D** homolytic bond fission followed by an attack by a nucleophile on a carbocation

Topical Question No: 10

- 30** $\text{CCl}_2\text{FCClF}_2$ can be converted into CH_2FCF_3 by the following route.



What type of reaction is step 1?

- A** addition
- B** elimination
- C** isomerisation
- D** oxidation

Answer Key

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2. Error
3. Error
4. Error
5. Error
6. Error
7. Error
8. Error
9. Error
10. Error