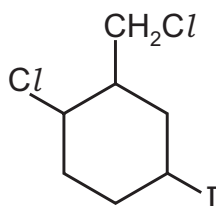


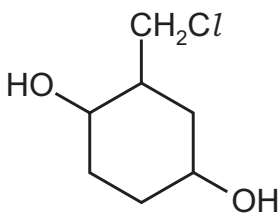
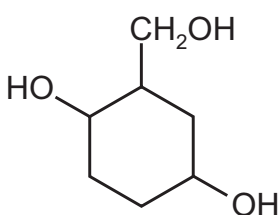
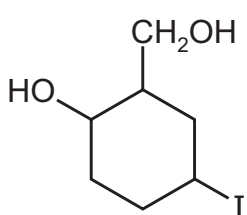
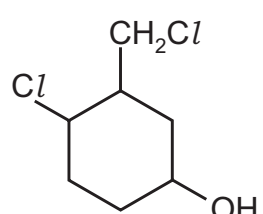
- 30** Compound X, $C_7H_{11}ICl_2$, is dissolved in ethanol and the solution mixed with warm aqueous silver nitrate.

A precipitate is seen immediately.

compound X



What is the colour of this precipitate and what is the structural formula of the **first** organic product?

	colour of the precipitate	structural formula of the first organic product
A	cream	
B	cream	
C	white	
D	yellow	

- 31** 1,4-dibromobutane reacts with an excess of ethanolic sodium hydroxide until no further reaction takes place.

What is the relative formula mass of the major organic product?

- A** 54 **B** 56 **C** 74 **D** 90

30 Which reaction mixture produces a nitrile?

- A** halogenoalkane with KCN in ethanol
- B** halogenoalkane with NH_3 in ethanol
- C** ketone with 2,4-DNPH
- D** carboxylic acid with NH_3 in water

31 Which reaction is classified as $\text{S}_{\text{N}}1$?

- A** the reaction of 1-chloropropane with ammonia in ethanol
- B** the reaction of 1-chloropropane with potassium hydroxide in ethanol
- C** the reaction of 2-chloro-2-methylpropane with potassium cyanide in ethanol
- D** the reaction of 2-chloro-2-methylpropane with potassium hydroxide in ethanol

27 Structural and stereoisomerism should be considered when answering this question.

A mixture of 1-chlorobutane and 2-chlorobutane is heated with an excess of NaOH in ethanol.

How many different organic molecules will be produced?

- A** 1 **B** 2 **C** 3 **D** 4

30 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 NaOH(aq) and 1-bromobutane proceeds by an $\text{S}_{\text{N}}2$ mechanism.

What is the first step in the mechanism?

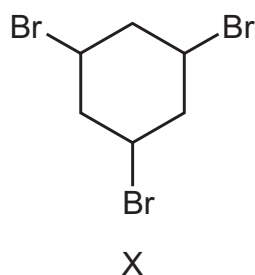
- A** attack by a nucleophile on a carbon atom with a partial positive charge
- B** heterolytic bond fission followed by attack by an electrophile on a carbanion
- C** heterolytic bond fission followed by attack by a nucleophile on a carbocation
- D** homolytic bond fission followed by attack by a nucleophile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

31 2-chloropropane and 2-bromopropane react separately with aqueous NaOH.

Which row is correct?

	comparison of rates of reaction	explanation of the difference in reaction rates
A	2-chloropropane reacts faster	chlorine is more reactive than bromine
B	2-chloropropane reacts faster	the C–Cl bond is more polar than the C–Br bond
C	2-bromopropane reacts faster	the first ionisation energy of bromine is lower than chlorine's
D	2-bromopropane reacts faster	the C–Br bond is weaker than the C–Cl bond

32 The diagram shows the structure of compound X.



X undergoes hydrolysis to form product Y in which all of the bromine atoms are replaced by hydroxyl groups. Product Z is formed by oxidation of Y.

Two suggestions are listed.

- 1 Y is a secondary alcohol.
- 2 Z is a ketone.

Which suggestions are correct?

- A** both 1 and 2
- B** 1 only
- C** 2 only
- D** neither 1 nor 2

38 When bromoethane, $\text{C}_2\text{H}_5\text{Br}$, is heated with NaOH in ethanol, which type of reaction occurs?

- A** electrophilic substitution
- B** elimination
- C** nucleophilic substitution, mainly via an $\text{S}_{\text{N}}1$ mechanism
- D** nucleophilic substitution, mainly via an $\text{S}_{\text{N}}2$ mechanism