Halogen compounds – 2022 Nov AS Chemistry 9701

1. Nov/2022/Paper_12/No.31

For which reaction will the major organic product have the lowest relative molecular mass?

A Bromoethane is heated under reflux with an aqueous solution of sodium hydroxide.

B Bromoethane is heated under reflux with a solution of sodium cyanide in ethanol.

C 2-bromopropane is heated under reflux with an aqueous solution of sodium hydroxide.

D 2-bromopropane is heated under reflux with concentrated ethanolic sodium hydroxide.

2. Nov/2022/Paper_12/No.32

C_4H_9Cl reacts with warm dilute aqueous sodium hydroxide solution.

Which isomer of C_4H_9Cl will form the most stable cation intermediate?

A 1-chlorobutane

B 2-chlorobutane

C 1-chloro-2-methylpropane

D 2-chloro-2-methylpropane

3. Nov/2022/Paper_21/No.3(c)

(c) PCl_5 reacts with alcohols to form chloroalkanes.

(i) Identify this type of reaction.

..... [1]

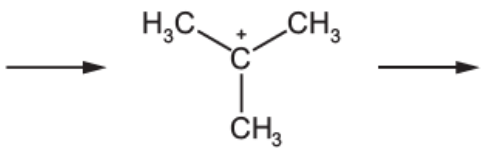
(ii) Draw the structure of the organic product formed in the reaction of an excess of PCl_5 with butane-1,3-diol.

[1]

4. Nov/2022/Paper_22/No.1(e)

(e) $OH^-(aq)$ reacts with 2-bromo-2-methylpropane in an S_N1 reaction.
The molecular ion $(CH_3)_3C^+$ forms as the intermediate in this reaction.

(i) Draw the mechanism for the S_N1 reaction of OH^- with 2-bromo-2-methylpropane.
Include charges, dipoles, lone pairs of electrons and curly arrows as appropriate.
Draw the structures of the organic reactant and organic product.



[3]

(ii) 2-bromo-2-methylpropane is a tertiary bromoalkane.

Define tertiary bromoalkane.

.....

..... [1]

(iii) Organic compound **M** forms when 2-bromo-2-methylpropane is heated with **ethanolic** OH^-.

Draw the structure of **M**.

[1]