OCR
Oxford Cambridge and RSA

AS Level Chemistry A

H032/01 Breadth in chemistry

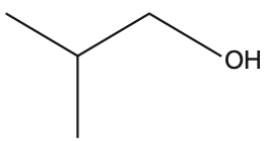
Question Set 22

1. This question is about alcohols and alkanes.

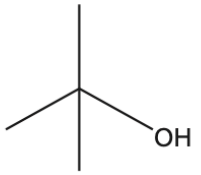
(a) Three alcohols **A**, **B** and **C** are structural isomers of $C_4H_{10}O$.

Each alcohol is refluxed with acidified potassium dichromate(VI), $H^+/Cr_2O_7^{2-}$.

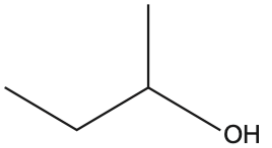
(i) Draw the structures for the organic products.
If there is no reaction, write '**NONE**'.



A



B



C

[3]

(ii) Write the systematic name for alcohol **C**.

[1]

(iii) Complete the equation below for the complete combustion of alcohol **A**.

$C_4H_{10}O$ ..... → ……

[1]

(b) Under suitable conditions, butane, C_4H_{10}, reacts with chlorine by radical substitution.
A mixture of organic compounds is formed, including C_4H_9Cl, and compounds **D** and **E**.

(i) Complete the table below to show the mechanism for the initiation and propagation stages of the reaction of C_4H_{10} with chlorine to form C_4H_9Cl.

Initiation	Equation ..... Conditions .....
Propagation	..... → .... → .....

In your equations, use molecular formulae and 'dots' (•) with any radicals.

[3]

(ii) Organic compound **D** is formed by substitution of **all** the H atoms in butane by Cl atoms.

Write the equation for the formation of compound **D** from butane.Use molecular formulae.

[1]

(iii) Organic compound **E** is formed by the substitution of **some** of the H atoms in butane by Cl atoms.

A chemist found that 0.636 g of compound **E** has a volume of 78.0 cm^3.Under the conditions used, the molar gas volume is 32.5 $dm^3\,mol^{-1}$.

Determine the molecular formula of compound **E**.

[3]

Total Marks for Question Set 22: 12