

# Organic Chemistry

## Question Paper

Level	GCSE
Subject	Chemistry
Exam Board	Edexcel IGCSE
Module	Single Award (Paper 2C)
Topic	Organic Chemistry
Sub-Topic	Organic Chemistry - Introduction
Booklet	Question Paper

**Time Allowed:** 36 minutes

**Score:** /30

**Percentage:** /100

**Grade Boundaries:**

A*	A	B	C	D	E	U
>85%	75%	70%	60%	55%	50%	<50%

1 Fractional distillation and cracking are important steps in processing crude oil.

(a) Place ticks (✓) in the columns to show which statements apply to each step.  
You may place a tick in one column, in both columns or in neither column.

The first one has been done for you.

(5)

Statement	Fractional distillation	Cracking
Crude oil is heated	✓	
A catalyst may be used		
Alkenes are formed		
Decomposition reactions occur		
Fuels are obtained		
Separation is the main purpose		

(b) The formula  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$  represents one of the compounds in crude oil.

(i) Give the molecular formula of this compound.

(1)

(ii) Give the displayed formula of this compound.

(1)

(iii) Give the empirical formula of this compound.

(1)

(iv) Give the name of this compound.

(1)

(v) Give the general formula of the homologous series that contains this compound.

(1)

(c) The products of the complete combustion of hydrocarbons are carbon dioxide and water.

(i) Balance the equation to show the complete combustion of ethene (C<sub>2</sub>H<sub>4</sub>).

(2)

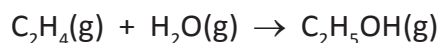


(ii) Draw a dot and cross diagram to show the bonding in an ethene molecule.

Show only the outer electrons in each atom.

(2)

(d) Ethanol can be manufactured by the hydration of ethene. The equation for this reaction is



(i) Identify the catalyst and state the temperature used in this process.

(2)

Catalyst.....

Temperature.....

(ii) A 20 mol sample of ethanol was produced using this reaction.

Deduce the amount, in moles, of ethene needed and the volume, in  $\text{dm}^3$ , that this amount of ethene would occupy at room temperature and pressure.

Assume that all of the ethene is converted into ethanol and that the molar volume of ethene is  $24 \text{ dm}^3$  at rtp.

(3)

Amount of ethene ..... mol

Volume of ethene

Volume = .....  $\text{dm}^3$

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**(Total for Question 1 = 19 marks)**

2 (a) The first two members of the homologous series of alcohols are methanol and ethanol.

(i) Give two characteristics of the compounds in a homologous series.

(2)

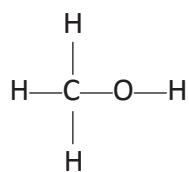
1 .....

.....

2 .....

.....

(ii) The displayed formula for methanol is

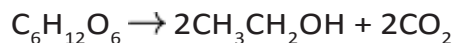


Suggest a displayed formula for ethanol,  $\text{CH}_3\text{CH}_2\text{OH}$

(1)



(c) The equation for the fermentation of glucose is



A mass of 3 600 kg of glucose was completely fermented.

- (i) Calculate the amount, in moles, of glucose that was fermented.  
( $M_r$  of glucose = 180)

(2)

amount of glucose = ..... mol

- (ii) Deduce the amount, in moles, of ethanol produced in this reaction.

(1)

amount of ethanol = ..... mol

- (iii) Calculate the volume, in  $\text{dm}^3$  at rtp, of carbon dioxide produced in this reaction.  
(1 mol of carbon dioxide occupies  $24 \text{ dm}^3$  at rtp)

(2)

volume of carbon dioxide = .....  $\text{dm}^3$

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**(Total for Question 2 = 11 marks)**