

91165



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SUPERVISOR'S USE ONLY

Level 2 Chemistry, 2018

91165 Demonstrate understanding of the properties of selected organic compounds

9.30 a.m. Monday 26 November 2018
Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of the properties of selected organic compounds.	Demonstrate in-depth understanding of the properties of selected organic compounds.	Demonstrate comprehensive understanding of the properties of selected organic compounds.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL the questions in this booklet.

A periodic table is provided in the Resource Booklet L2-CHEMR.

If you need more room for any answer, use the extra space provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–12 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

TOTAL

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QUESTION ONE

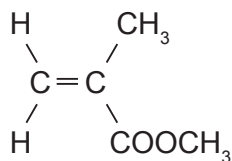
(a) Complete the following table.

Compound	IUPAC (systematic name)
$\text{CH}_2=\text{CH}-\text{CH}_2-\text{CH}_2-\text{CH}_3$	
$\begin{array}{ccccccc} \text{CH}_3 & - & \text{CH} & - & \text{CH} & - & \text{CH}_3 \\ & & & & & & \\ & & \text{CH}_3 & & \text{OH} & & \end{array}$	
	2-hydroxypropanoic acid

(b) Draw structural formulae for primary, secondary, and tertiary chloroalkane molecules that are constitutional (structural) isomers with the molecular formula $\text{C}_4\text{H}_9\text{Cl}$.

Classification of chloroalkane	Structural formula
Primary	
Secondary	
Tertiary	

- (c) Perspex® is a polymer used as an alternative to glass as it is transparent, lightweight, and shatter resistant. It can be made from the monomer shown below.



- (i) In the box below, draw THREE repeating units of the polymer formed.

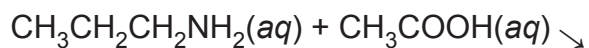
- (ii) Justify whether or not the **monomer** used to produce Perspex® is a geometric (cis-trans) isomer by explaining the features required for this type of isomerism.

QUESTION TWO

(a) Two bottles of different colourless organic liquids are unlabelled. They are known to be propan-1-amine, $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$, and ethanoic acid, CH_3COOH .

(i) Explain how you could identify these two liquids using only solid sodium hydrogen carbonate, $\text{NaHCO}_3(s)$.

(ii) Give the structural formula and name for the product of the reaction between propan-1-amine, $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$, and ethanoic acid, CH_3COOH to form a salt.

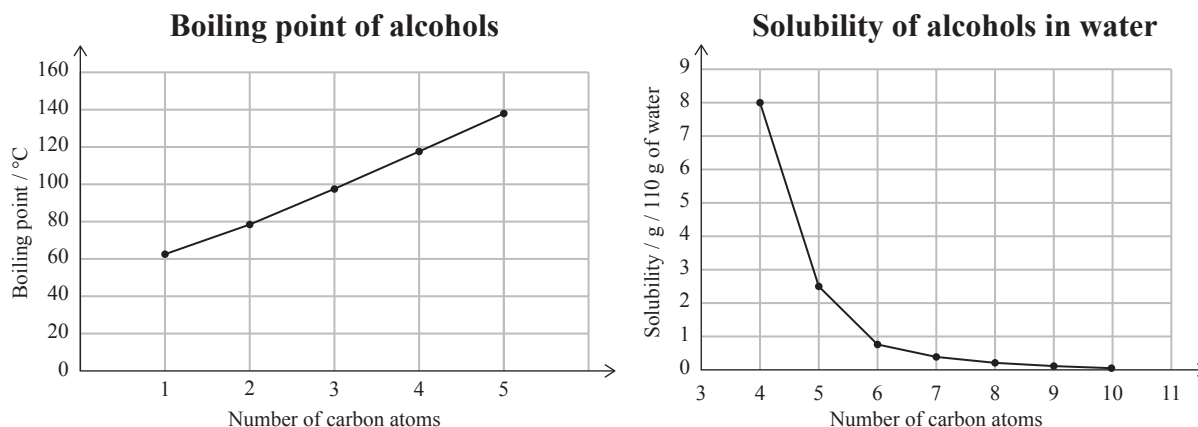


Name: _____

QUESTION THREE

The graphs below show trends in two physical properties of alcohols.

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- (a) Identify the trends shown on the graphs above.

- (b) Reacting 2-chloropropane with potassium hydroxide, KOH, can produce different products due to different reactions occurring.

- (i) Elaborate on the reactions of 2-chloropropane with potassium hydroxide, KOH.

In your answer you should:

- identify the conditions of the reagent KOH
- explain the types of reaction that occur with the reagent in each condition
- draw structural formulae of the organic products.

- (ii) Elaborate on chemical tests that could be used to identify the functional groups of the organic products formed in part (i).

In your answer, you should:

- identify chemicals and conditions required
- describe any observations
- state the type of reaction occurring
- explain why potassium permanganate solution, $\text{KMnO}_4(aq)$, cannot be used to distinguish between these organic products.

**Extra paper if required.
Write the question number(s) if applicable.**

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