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91165M



911655



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

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Te Mātauranga Matū, Kaupae 2, 2019

91165M Te whakaatu māramatanga ki ngā āhuatanga o ētahi pūhui whaiwaro

2.00 i te ahiahi Rāhina 11 Whiringa-ā-rangi 2019
Whiwhinga: Whā

Paetae	Kaiaka	Kairangi
Te whakaatu māramatanga ki ngā āhuatanga o ētahi pūhui whaiwaro.	Te whakaatu māramatanga hōhonu ki ngā āhuatanga o ētahi pūhui whaiwaro.	Te whakaatu māramatanga matawhānui ki ngā āhuatanga o ētahi pūhui whaiwaro.

Tirohia mēnā e rite ana te Tau Ākonga ā-Motu (NSN) kei runga i tō puka whakauru ki te tau kei runga i tēnei whārangi.

Me whakamātau koe i ngā tūmahi KATOĀ kei roto i tēnei pukapuka.

He taka pūmotu kua whakaritea ki te Puka Rauemi L2-CHEMMR.

Mēnā ka hiahia whārangi atu anō koe mō ō tuhinga, whakamahia ngā whārangi wātea kei muri o tēnei pukapuka, ka āta tohu ai i te tau tūmahi.

Tirohia mēnā e tika ana te raupapatanga o ngā whārangi 2–17 kei roto i tēnei pukapuka, ka mutu, kāore tētahi o aua whārangi i te takoto kau.

ME HOATU RAWA KOE I TĒNEI PUKAPUKA KI TE KAIWHAKAHAERE Ā TE MUTUNGA O TE WHAKAMĀTAUTAU.

TAPEKE

MĀ TE KAIMĀKA ANAKE

TŪMAHI TUATAHI

(a) Whakaotihia te tūtohi e whai ake nei.

Pūhui	Ingoa nahanaha IUPAC
$ \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}-\text{C}-\text{C}-\text{C} \\ \quad \quad \diagup \quad \diagdown \\ \text{H} \quad \text{H} \quad \text{O} \quad \text{OH} \end{array} $	
	amine-2-pōwaro
$ \begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \\ \quad \quad \quad \quad \\ \text{H}-\text{C}=\text{C}-\text{C}-\text{C}-\text{C}-\text{Cl} \\ \quad \quad \quad \quad \\ \quad \quad \text{H} \quad \text{H} \quad \text{H} \end{array} $	
	2,3-mewaro-rua pūwaro

(b) Tātuhia ngā poinanaha hanganga e whā o te $\text{C}_4\text{H}_{10}\text{O}$ he waiwaihā.

Whakarōpūhia ngā waiwaihā hei mea tuatahi, tuarua, tuatoru rānei.

1.	2.
Momo waiwaihā:	Momo waiwaihā:
3.	4.
Momo waiwaihā:	Momo waiwaihā:

QUESTION ONE

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(a) Complete the following table.

Compound	IUPAC (systematic name)
$ \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}-\text{C}-\text{C}-\text{C} \\ \quad \quad \diagup \diagdown \\ \text{H} \quad \text{H} \quad \text{O} \quad \text{OH} \end{array} $	
	propan-2-amine
$ \begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \\ \quad \quad \quad \quad \\ \text{H}-\text{C}=\text{C}-\text{C}-\text{C}-\text{C}-\text{Cl} \\ \quad \quad \quad \quad \\ \quad \quad \text{H} \quad \text{H} \quad \text{H} \end{array} $	
	2,3-dimethylbutane

 (b) Draw four structural (constitutional) isomers of $\text{C}_4\text{H}_{10}\text{O}$ that are alcohols.

Classify the alcohols as either primary, secondary or tertiary.

1.	2.
Type of alcohol:	Type of alcohol:
3.	4.
Type of alcohol:	Type of alcohol:

- | | |
|----------|---|
| A | $\text{CH}_3 - \text{CH} = \text{CH} - \text{CH}_3$ |
| B | $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$ |

- | | |
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- I tō tuhinga me:

- tautohu te momo tauhohenga kei te puta
- whakaahua ngā kitenga hāngai.

- Whakatauritea ēnei tauhohenga mā te kōrero mō ngā āhuatanga e hiahiaitia ana, ngā kitenga, ngā hua i puta me te momo tauhohenga.

- (iii) Explain how acidified potassium permanganate solution, $\text{KMnO}_4/\text{H}^+(\text{aq})$, can be used to distinguish between compounds **A** and **B**.

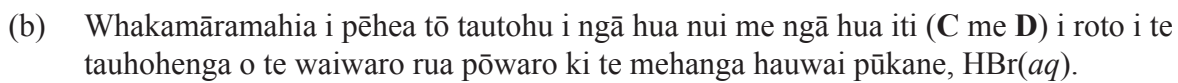
In your answer you should:

- identify the type of reaction
- describe any relevant observations.

- (iv) Compounds **A** and **B** will both react with bromine water, $\text{Br}_2(\text{aq})$.

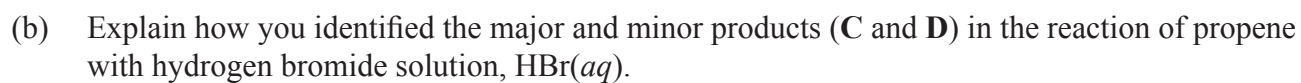
Compare and contrast these reactions by referring to the conditions required, the observations, the products formed, and the type of reaction.

(a) Whakaotihia te hoahoa tauhohenga e whai ake mō te waiwaro rua pōwaro, C_3H_6 , mā te tātuhi i ngā ture tātai hanganga o ngā pūhui whaiwaro **A** ki **D**, te whakaingoa i te pūhui **A** me te tautohu i ngā Whakahohe **1** me **2**, me ngā āhuatanga.



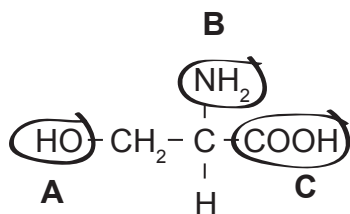
- (c) Whakatauritea te tauhohenga ka puta i te pūhui **B** ki te tauhohenga anga whakamuri i puta ai te waiwaro rua pōwaro, C_3H_6 , mai i te pūhui **B**.

(a) Complete the following reaction scheme for propene, C_3H_6 , by drawing the structural formulae for the organic compounds **A** to **D**, naming compound **A** and identifying Reagents **1** and **2**, including any conditions.



- (c) Compare and contrast the reaction that forms compound **B** to the reverse reaction that forms propene, C_3H_6 , from compound **B**.

(a) Each circled functional group is found in different organic molecules commonly used in school laboratories:



- red litmus paper
- bromine water, $\text{Br}_2(aq)$
- blue litmus paper
- acidified dichromate solution, $\text{H}^+/\text{Cr}_2\text{O}_7^{2-}(aq)$

	Functional Group	Chemical test	Observations
A			
B			
C			

- Ewaro pūkane:

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Whakahohe 1: _____

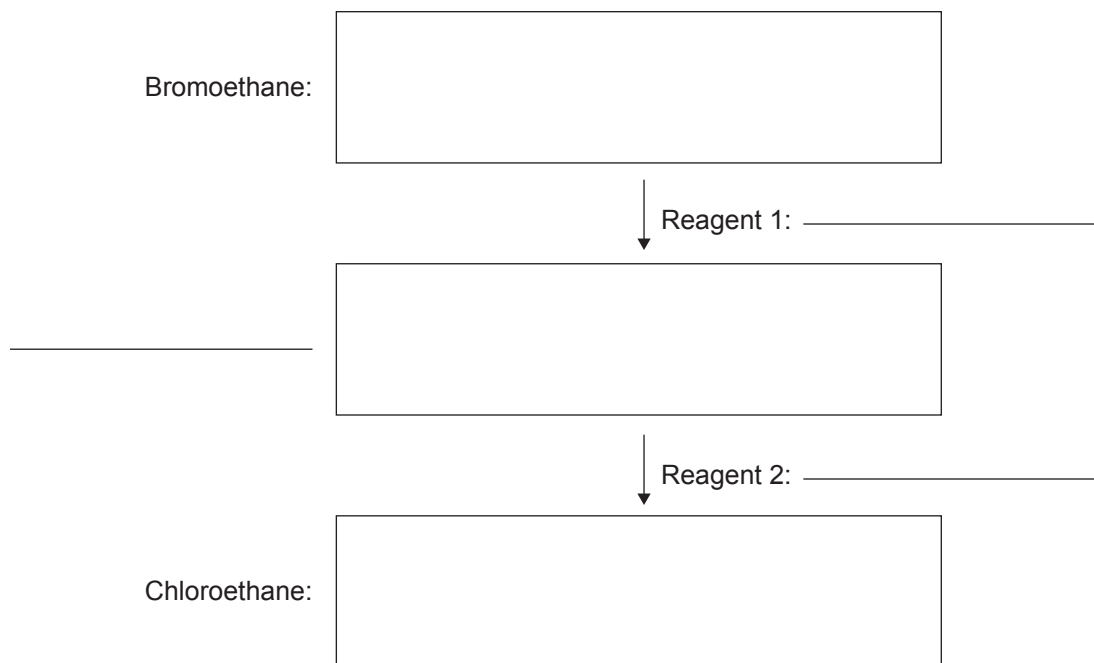
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Whakahohe 2: _____

Ewaro haumāota:

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- (i) Use this information to complete the reaction scheme below by drawing the structural formulae of each organic molecule and naming the intermediate alcohol and the reagents required.



- In your answer, you should identify:

- any conditions needed for each step of the conversion
- the type of reaction occurring for each step of the conversion.

**He whārangi anō ki te hiahiatia.
Tuhia te (ngā) tau tūmahi mēnā e tika ana.**

TAU TŪMAHI

MĀ TE
KAIMĀKA
ANAKE

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

QUESTION
NUMBER

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English translation of the wording on the front cover

Level 2 Chemistry, 2019

91165 Demonstrate understanding of the properties of selected organic compounds

2.00 p.m. Monday 11 November 2019
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–CHEMMR.

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 2–17 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.