

1

SUPERVISOR'S USE ONLY

90932M



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

Te Mātauranga Matū, Kaupae 1, 2018

90932M Te whakaatu māramatanga ki ētahi āhuatanga o te matū ā-waro

2.00 i te ahiahi Rāpare 15 Whiringa-ā-rangi 2018 Whiwhinga: Whā

Paetae	Kaiaka	Kairangi
Te whakaatu māramatanga ki ētahi āhuatanga o te matū ā-waro.	Te whakaatu māramatanga hōhonu ki ētahi āhuatanga o te matū ā-waro.	Te whakaatu māramatanga matawhānui ki ētahi āhuatanga o te matū ā-waro.

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 KATOA kei roto i tēnei pukapuka.

He taka pūmotu me ētahi atu rauemi tautoko kei te Pukapuka Rauemi L1-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 2–19 kei roto i tēnei pukapuka, ka mutu, kāore tētahi o aua whārangi i te takoto kau.

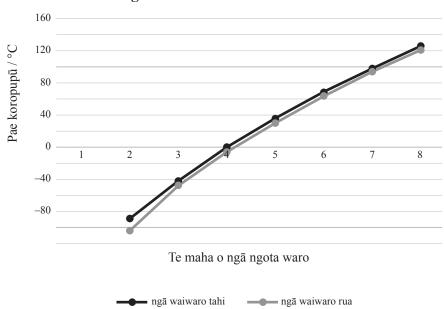
ME HOATU RAWA KOE I TĒNEI PUKAPUKA KI TE KAIWHAKAHAERE Ā TE MUTUNGA O TE WHAKAMĀTAUTAU.

TAPEKE

- (a) Kua whakarōpūhia te ewaro me te waiwaro rua ewaro hei waiwaro.
 - (i) Tātuhia ngā tātai hanganga o te ewaro me te waiwaro rua ewaro ki ngā tapawhā i raro nei:

Ewaro	Waiwaro rua ewaro

Ngā pae koropupū o ngā waiwaro tahi me ngā waiwaro rua mekameka tōtika



- (ii) Whakatauritea ngā waiwaro tahi me ngā waiwaro rua e pā ana ki:
 - te hanganga me te honohono o ngā waiwaro tahi me ngā waiwaro rua
 - ngā ia i ngā pae koropupū.

I tō tuhinga, me kōı	rero koe mō te l	kauwhata i ru	ınga, me tō	mōhio mō te	hanganga	o ngā
waiwaro tahi me ng	gā waiwaro rua.					

MĀ TE KAIMĀKA ANAKE

_	
_	
_	
_	
_	
_	
_	
-	
_	
	te waihā ewaro e whakarōpūhia hei waiwaro. Tātuhia te tātai hanganga o te waihā ewaro ki te tapawhā i raro:
	Tātuhia te tātai hanganga o te waihā ewaro ki te tapawhā i raro:
	Tātuhia te tātai hanganga o te waihā ewaro ki te tapawhā i raro:
	Tātuhia te tātai hanganga o te waihā ewaro ki te tapawhā i raro:
	Tātuhia te tātai hanganga o te waihā ewaro ki te tapawhā i raro:
	Tātuhia te tātai hanganga o te waihā ewaro ki te tapawhā i raro:
	Tātuhia te tātai hanganga o te waihā ewaro ki te tapawhā i raro:
	Tātuhia te tātai hanganga o te waihā ewaro ki te tapawhā i raro: Waihā ewaro
	Tātuhia te tātai hanganga o te waihā ewaro ki te tapawhā i raro:
	Tātuhia te tātai hanganga o te waihā ewaro ki te tapawhā i raro: Waihā ewaro
	Tātuhia te tātai hanganga o te waihā ewaro ki te tapawhā i raro: Waihā ewaro
	Tātuhia te tātai hanganga o te waihā ewaro ki te tapawhā i raro: Waihā ewaro

(b)

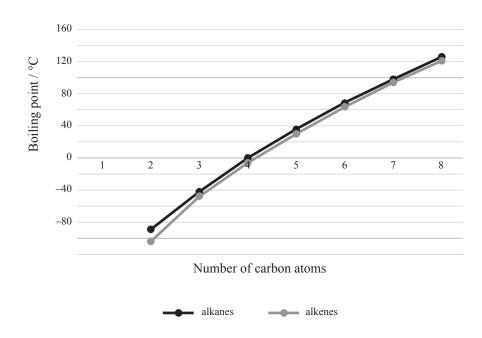
QUESTION ONE

ASSESSOR'S USE ONLY

- (a) Both ethane and ethene are classified as hydrocarbons.
 - (i) Draw the structural formulae of ethane and ethene in the boxes below:

Ethane	Ethene

Boiling points of straight chain alkanes and alkenes



- (ii) Compare and contrast alkanes and alkenes in relation to:
 - the structure and bonding of alkanes and alkenes
 - trends in their boiling points.

In your answer, you should	refer to the graph	above, and your	r knowledge of the
structure of alkanes and alk	enes.		

ol is not cla	assified as a	hydrocarbon				
		hydrocarbon		ov balow:		
		hydrocarbon mula of ethar		ox below:		
	tructural for	mula of ethar		ox below:		
	tructural for			ox below:		
	tructural for	mula of ethar		ox below:		
	tructural for	mula of ethar		ox below:		
	tructural for	mula of ethar		ox below:		
	tructural for	mula of ethar		ox below:		
	tructural for	mula of ethar		ox below:		
	tructural for	mula of ethar		ox below:		
Draw the s	Eth	mula of ethar	nol in the b			
Draw the s	Eth	mula of ethar	nol in the b			
Draw the s	Eth	mula of ethar	nol in the b			
Draw the s	Eth	mula of ethar	nol in the b			
Draw the s	Eth	mula of ethar	nol in the b			
Draw the s	Eth	mula of ethar	nol in the b			

(b)

i	Ka taea te waiwaro rua ewaro te hanga mā te wāwāhi i ngā waiwaro mekameka roa pērā te owaro kei roto i te hinu māori. Kātahi ka taea te waiwaro rua ewaro te whakamahi ki e hanga i te waiwaihā, arā te waihā ewaro.	MĀ KAIM ANA						
Ka taea anō te waihā ewaro te hanga mā te whakamoī.								
	He pēhea te rerekē o te tukanga o te hanga i te waiwaro rua ewaro mai i te owaro wāwāhinga), i te tukanga o te whakamoī hei hanga waihā ewaro?							
Ι	tō tuhinga, me whakauru:							
•	he whakaahuatanga o ngā tukanga e rua							
•	ngā whakamāramatanga o ngā āhuatanga e hiahiatia ana							
•	ngā whārite tohu taurite mō ngā tauhohenga kei te puta, ki ngā tapawhā whai tapanga i raro.							
_								
_								
-								
-								
_								
_								
_								
_								
-								
_								
_								
	Te whārite tohu taurite mō te wāwāhi owaro hei hanga i te waiwaro rua ewaro:							
ŀ	Te whārite tohu taurite mō te whakariterite i te waihā ewaro mā te tukanga moī:							
	Te whatte tonu taurite mo te whakariterite i te wama ewaro ma te tukanga mor.							

	thene can by produced by cracking long-chain hydrocarbons such as hexane in crude. The ethene can then be used to produce the alcohol, ethanol.
	anol can also be produced by fermentation.
Ľu.	ianor can also be produced by termentation.
	w does the process of producing ethene from hexane (cracking), differ from the cess of fermentation to form ethanol?
In :	your answer, you should include:
•	a description of the two processes
•	explanations of any conditions required
•	balanced symbol equations for any reactions occurring, in the labelled boxes below.
В	alanced symbol equation for the cracking of hexane to form ethene:
В	alanced symbol equation for preparation of ethanol using fermentation:
Ì	

TŪMAHI TUARUA

MĀ TE KAIMĀKA ANAKE

- (a) Ka tauhohe ngā kora pērā i te pūwaro ki te hāora hei whakaputa pūngao.
 - (i) Tātuhia te tātai hanganga o te pūwaro ki te tapawhā i raro:

Pūwaro					

(ii) Ina tauhohe te pūwaro ki te hāora, ka puta te rehuwai, me te hauhā (waro hāorarua), haukino (waro hāora-tahi), ngā korakora whaiwaro (awe) hoki/rānei e ai ki ngā āhuatanga.

Whakamāramahia i runga i ēhea āhuatanga ka puta ēnei hua rerekē.

I tō tuhinga, me tuhi e koe te (ngā) momo tauhohenga kei te puta me te tuhi i ngā whārite tohu taurite mō t(aua) tauhohenga.							

QUESTION TWO

ASSESSOR'S USE ONLY

(a)]	Fuels	such	as	butane	react	with	oxygen	to r	elease	energy
		, -		~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	***	C 01 00011 0		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	U11 / DU11			

(i	Draw the structural	formula o	of butane	in the	box be	low:
٦							

Butane

(ii) When butane reacts with oxygen, water vapour is produced, as well as carbon dioxide, carbon monoxide, and/or carbon particles (soot), depending on the conditions.

Explain under what conditions these various products are produced.

In your answer, yo	ou should state the ty	pe of reaction(s)	occurring and	give balanced
symbol equations	for the reaction(s).			

(b) Ka taea ngā momo kora rerekē te whakamahi i rō pūkaha waka. E whakaaturia ana e te ripanga i raro ētahi āhuatanga o ngā kora e rua nei.

MĀ TE KAIMĀKA ANAKE

Kora	Ngā mea i roto	Paemahana mura*/°C	Pūngao i puta/kJ L ⁻¹
Waihā ewaro	C ₂ H ₅ OH	16.6	29 700
Penehīni	he ranunga o ngā waiwaro	-43	35 000

^{*} Ko te paemahana mura te paemahana pāpaku rawa e mura ai ngā rehuwai o te kora.

Tātaihia te whaitake o te whakakapi i te penehīni ki te waihā ewaro hei kora mō roto i ngā waka.

I tō tuhinga, me:

• kōrero mō ngā raraunga hāngai mai i te ripanga i runga ake

vhakauru ngā pānga o ia kora ki te hauora o te tangata me te taiao.	whai whakaaro ki ngā tauhohenga ngingiha o ia kora					
	whakauru ngā	i pānga o 1a kora	kı te hauora o	te tangata me	e te taiao.	

(b) A variety of fuels can be used in car engines. The table below shows some properties of two of these fuels.

ASSESSOR'S USE ONLY

Fuel	Content	Flashpoint* / °C	Energy released/kJ L ⁻¹
Ethanol	C ₂ H ₅ OH	16.6	29 700
Petrol	mixture of hydrocarbons	-43	35 000

^{*} Flashpoint is the lowest temperature at which the vapours of the fuel will ignite.

Evaluate the feasibility of replacing petrol with ethanol as a fuel for use in cars. In your answer, you should:

• refer to relevant data from the table above

refer to relevant data from the table above				
consider the combustion reactions of each fuel				
include the effects of each fuel on human health and on the environment.				

TŪMAHI TUATORU

MĀ TE
KAIMĀKA
ANAKE

(i)	te poritene. He aha te ingoa o te waetahi i mahia mai ai te poritene?				
(ii)	Whakamārama whānuitia te tauhohenga waerautanga e pā ana ki te hanga poritene.				
	I tō tuhinga me:				
	 kōrero mō te hanganga o te waetahi 				
	 tuhi ngā āhuatanga e hiahiatia ana mō te tauhohenga, ka whakamārama he aha t take e hiahiatia ana 				
	• homai te tātai hanganga o te poritene.				

Ka haere tonu te Tūmahi Tuatoru i te whārangi 14.

QUESTION THREE

(a)

ASSE	SSOR'S
LISE	ONLY

What is the name of the monomer unit that polyethene is made from?				
Elaborate on the polymerisation reaction involved in producing polyethene.				
In your answer you should:				
refer to the structure of the monomer unit				
 state any conditions required for the reaction, and explain why they are needed give the structural formula of polyethene. 				

Question Three continues on page 15.

(b) E whakaatu ana te ripanga e whai ake i ngā raraunga kua tīpakohia mō ngā pūhui e toru, A, B, me C.

MĀ TE KAIMĀKA ANAKE

Pūhui	Mehamehanga i rō wai	Te maha o ngā rāpoi ngota o te CO ₂ ka puta mō ia rāpoi ngota o te pūhui i te wā o te ngingiha
A	Memeha	2
В	Meha-kore	3
С	Meha-kore	2

E mōhiotia ana ko ngā pūhui ko: te ewaro, te waihā ewaro me te pōwaro.

Whakamahia ngā kōrero i roto i te ripanga hei tautohu i ia pūhui kua rārangitia i runga ake.

Pūhui A	
Pūhui B	
Pūhui C	
Parahautia ō kōv	whiringa mā te kōrero mō ngā mōhiohio kei roto i te ripanga i runga ake.
Whakamāramah wehewehe tētah	ia mai i pēhea tō whakamahi i te hanganga me ngā āhuatanga o ēnei pūhui hei i tētahi.

(b) The following table shows selected data for three compounds, A, B, and C.

ASSES	SOR'S
USE	ONLY

Compound	Solubility in water	Number of molecules of CO ₂ produced per molecule of compound during complete combustion
A	Soluble	2
В	Insoluble	3
С	Insoluble	2

It is known that the compounds are: ethane, ethanol, and propane.

Use the information in the table to identify each of the compounds listed above.

Compound A	
Compound B	
Compound C	
Justify your cho	ices by referring to the information given in the table above.
Explain how you them.	u used the structure and properties of these compounds to distinguish between

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

MĀ TE KAIMĀKA ANAKE

		Extra paper if required.	
HESTION		Write the question number(s) if applicable.	
QUESTION NUMBER		(с) и орринения	

	He whārangi anō ki te hiahiatia.	M KA
TAU TŪMAHI	Tuhia te (ngā) tau tūmahi mēnā e tika ana.	A

	Extra paper if required.
QUESTION	Write the question number(s) if applicable.
QUESTION NUMBER	Titto tilo quotion numbol (o) il appilouoio

ASSESSOR'S USE ONLY

English translation of the wording on the front cover

Level 1 Chemistry, 2018

90932 Demonstrate understanding of aspects of carbon chemistry

2.00 p.m. Thursday 15 November 2018 Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of aspects of carbon chemistry.	Demonstrate in-depth understanding of aspects of carbon chemistry.	Demonstrate comprehensive understanding of aspects of carbon chemistry.

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 and other reference material are provided in the Resource Booklet L1–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 2–19 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.