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90932M



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NEW ZEALAND QUALIFICATIONS AUTHORITY  
MANA TOHU MĀTAURANGA O AOTEAROA

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

SUPERVISOR'S USE ONLY

## Te Mātauranga Matū, Kaupae 1, 2016

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

2.00 i te ahiahi Rāhina 21 Whiringa-ā-rangi 2016  
Whiwhinga: Whā

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

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.**

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

MĀ TE KAIMĀKA ANAKE

## TŪMAHI TUATAHI

- (a) Tātuhia ngā tātai hanganga o te pōwaro me te waiwaro rua pōwaro ki ngā pouaka i raro.

Pōwaro	Waiwaro rua pōwaro

- (b) (i) He aha te momo honohono i roto i tētahi rāpoi ngota pōwaro?

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Hōmai tētahi pūtake mō tāu whakautu.

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- (ii) He aha te rerekētanga o te hanganga waiwaro rua pōwaro ki te pōwaro?

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**QUESTION ONE**ASSESSOR'S  
USE ONLY

- (a) Draw the structural formulae of propane and propene in the boxes below.

Propane	Propene

- (b) (i) What is the type of bonding present in a molecule of propane?

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Give a reason for your answer.

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- (ii) How does the structure of propene differ to propane?

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- (c) Ka tāea te whakamahi ngā waiwaro tahi hei kora. Whakatauritehia: te ngingiha otinga o ngā waiwaro tahi, he whakanao hauhā (waro hāora-rua); me te ngingiha otikore, he whakanao haukino (waro hāora-tahi) me te waro i tua atu i te hauhā.

I tō tuhinga, me:

- whakamahi i te pūwaro hei tauira i tō whakautu
- tuhi he whakamāramatanga o tētahi pānga ki te taiao mō ngā hua ngingiha e RUA
- whakauru mai i ngā whārite tohu taurite mō ngā tauhohenga kei te puta, ki ngā pouaka tapa i raro.

Whārite tohu taurite mō te ngingiha **otinga** o te pūwaro:

Whārite tohu taurite mō te ngingiha **otikore** o te pūwaro:

- In your answer, you should:

- use butane as an example to illustrate your answer
- give an explanation of an effect on the environment for TWO combustion products
- include balanced symbol equations for the reactions occurring, in the labelled boxes below.

Balanced symbol equation for the **incomplete** combustion of butane:

## TŪMAHI TUARUA

- (a) Tātuhia ngā tātai hanganga o te waihā mewaro me te waihā ewaro ki ngā pouaka i raro.

Waihā mewaro	Waihā ewaro

- (b) (i) Ko te pae koropupū mō te waihā mewaro he 65°C me te 78°C mō te waihā ewaro.

He aha e teitei ake ai te pae koropupū o te waihā ewaro i te waihā mewaro?

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- (ii) He aha i rewa ai te waihā mewaro me te waihā ewaro i roto i te wai?

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**QUESTION TWO**ASSESSOR'S  
USE ONLY

- (a) Draw the structural formulae of methanol and ethanol in the boxes below.

Methanol	Ethanol

- (b) (i) The boiling point for methanol is 65°C and ethanol is 78°C.

Why does ethanol have a higher boiling point than methanol?

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- (ii) Why are both methanol and ethanol soluble in water?

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- 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 pouaka tapa i raro.

Whārite tohu taurite mō te whakariterite i te waihā ewaro mā te whakamahi i te tukanga moī:



- 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.

Balanced symbol equation for preparation of ethanol using fermentation.

## TŪMAHI TUATORU

Ka iheu tauwehetia te hinu māori i roto i ngā pourewa teitei, pēnei i ēnei e whakaaturia ana ki te whakaahua i raro. He maha ngā whakamahitanga o ngā hautau rerekē ka whakanaohia.

[http://photoartforums.com/forums/uploads/1277616145/gallery\\_85\\_17\\_924301.jpg](http://photoartforums.com/forums/uploads/1277616145/gallery_85_17_924301.jpg)

- (a) Tuhia kia RUA ngā hautau ka riro mai i tētahi pourewa iheunga tauwehe, me te whakaahua i tētahi whakamahinga KOTAHI mō ia hautau.

Hautau	Ingoa	Whakamahinga
1		
2		

- (b) (i) He aha te take ka iheu tauwehetia te hinu māori i mua i te whakamahinga?

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### QUESTION THREE

Crude oil undergoes fractional distillation in tall towers, like the ones shown in the photograph below. The different fractions produced have many uses.



[http://photoartforums.com/forums/uploads/1277616145/gallery\\_85\\_17\\_924301.jpg](http://photoartforums.com/forums/uploads/1277616145/gallery_85_17_924301.jpg)

- (a) Name TWO of the fractions obtained from a fractional distillation tower, and describe ONE use for each.

Fraction	Name	Use
1		
2		

- (b) (i) Why does crude oil need to undergo fractional distillation before it can be used?

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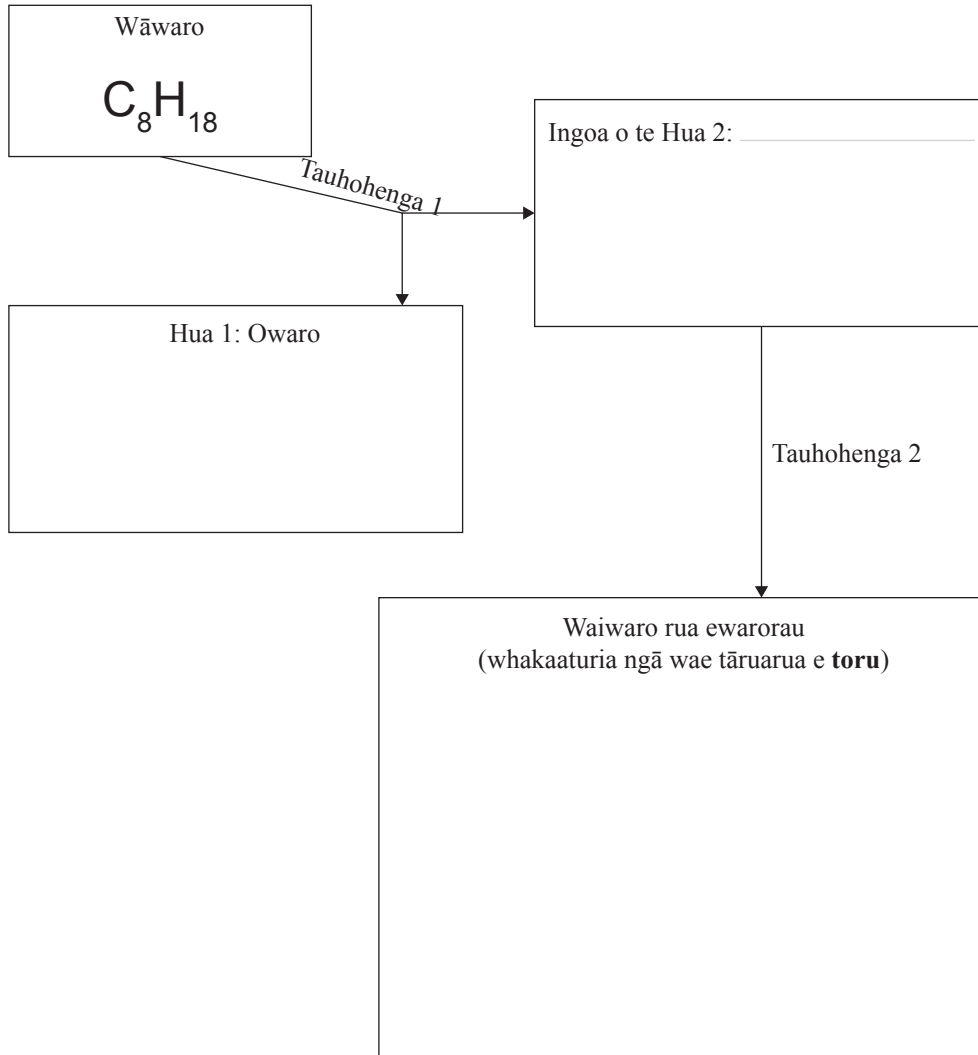
I tō whakautu me tūhono e koe ngā tukanga o te iheunga tauwehe ki ngā āhuatanga ōkiko me te hanganga matū o ngā waiwaro i roto i te hinu māori.

Te Mātauranga Matū 90932M, 2016

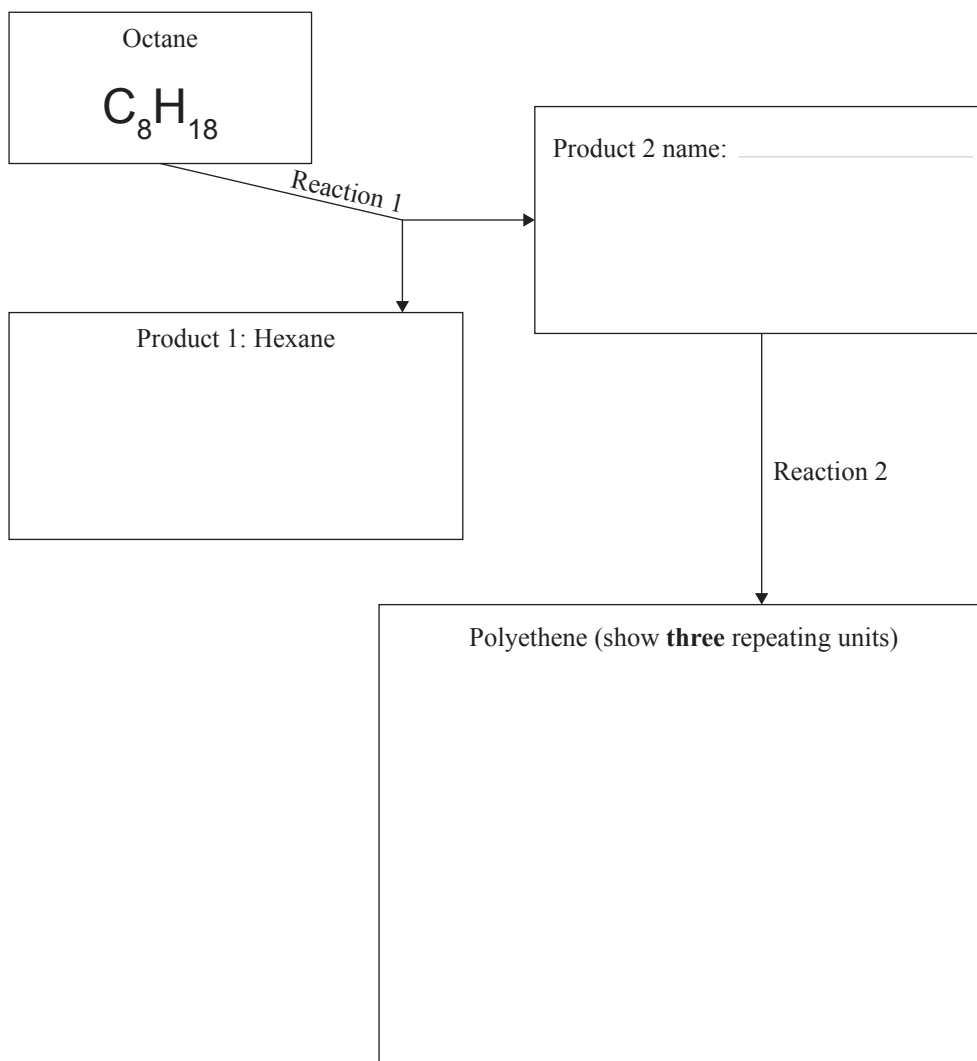
- In your answer you should link the process of fractional distillation to the physical properties and chemical structure of the hydrocarbons in crude oil.

**Question Three continues  
on page 15.**

- (c) Ka taea te wāwaro te whakamahi hei whakanao i te waerau, te waiwaro rua ewarorau (polyethene). Ka whakaurua te wāwaro ki te Tauhohenga 1 hei hanga owaro me te Hua 2. Ka tāea te Hua 2 te whakamahi hei whakanao waiwaro rua ewarorau.
- (i) Whakaotihia te mahere tauhohe mā te whakakī i ngā pouaka hei whakaatu i ngā tātai hanganga katoa, me te ingoa anō mō te Hua 2.



- (c) Octane can be used to produce the polymer, polyethene. Octane undergoes Reaction 1 to form hexane and Product 2. Product 2 can be used to produce polyethene.
- (i) Complete the reaction scheme by filling in the boxes to show all structural formulae, as well as the name for Product 2.



- tuhi i ngā momo tauhohenga kei te puta
- tuhi i ngā āhuatanga katoa e hiahiatia ana mō ia tauhohenga
- whakamārama me pēhea te mahi waiwaro rua ewarorau mai i te Hua 2.



In your answer, you should:

- name the types of reactions occurring
- give the conditions required for each reaction
- explain how polyethene can be made from Product 2.

**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

ASSESSOR'S  
USE ONLY

*English translation of the wording on the front cover*

## Level 1 Chemistry, 2016

### 90932 Demonstrate understanding of aspects of carbon chemistry

2.00 p.m. Monday 21 November 2016  
Credits: Four

90932M

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.**

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.**