*See back cover for an English translation of this cover*

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**90932M**

909325

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NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

# Te Mātauranga Matū, Kaupae 1, 2013

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

9.30 i te ata Rāpare 21 Whiringa-ā-rangi 2013
Whiwhinga: Whā

| Paetae | Paetae Kaiaka | Paetae 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 mehemea e ōrite ana te Tau Ākonga ā-Motu kei tō pepa whakauru ki te tau kei runga ake nei.

**Me whakautu e koe ngā pātai KATOA kei roto i te pukapuka nei.**

Ki te hiahia koe ki ētahi atu wāhi hei tuhituhi whakautu, whakamahia te (ngā) whārangi kei muri i te pukapuka nei, ka āta tohu ai i ngā tau pātai.

Tirohia mēnā kei roto nei ngā whārangi 2–19 e raupapa tika ana, ā, kāore hoki he whārangi wātea.

**HOATU TE PUKAPUKA NEI KI TE KAIWHAKAHAERE HEI TE MUTUNGA O TE WHAKAMĀTAUTAU.**

**TAPEKE**

MĀ TE KAIMĀKA ANAKE

Kia 60 meneti hei whakautu i ngā pātai o tēnei pukapuka.

MĀ TE KAIMĀKA ANAKE

## PĀTAI TUATAHI: WAIHĀ MEWARO

(a) Tūhia te tātai hanganga o te waihā mewaro.

(b) (i) Tautuhia te momo honohono i roto i tētahi rāpoi ngota waihā mewaro.

(ii) Homai tētahi pūtake mō tō kōwhiringa.

(c) Whakatauritea te ngingiha **oti**[1] o te waihā mewaro ki te ngingiha **otikore** o te wāwaro.

I tō whakautu:

- whakatauritea ngā tauhohenga ngingiha o ngā kora e rua
- whakatauritea ngā pānga o ngā hua ngingiha o ngā kora e **rua** ki te hauora o te tangata, te taiao **rānei**
- tuhia he whārite tohu taurite mō te ngingiha oti o te waihā mewaro.

[1] **paruhi**

MĀ TE KAIMĀKA ANAKE

Whārite tohu taurite:

You are advised to spend 60 minutes answering the questions in this booklet.

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## QUESTION ONE: METHANOL

(a) Draw the structural formula of methanol.

(b) (i) Identify the type of bonding within a molecule of methanol.

(ii) Give a reason for your choice.

(c) Compare and contrast the **complete** combustion of methanol to the **incomplete** combustion of octane.

In your answer:

- compare and contrast the combustion reactions of both fuels
- compare and contrast the impacts of the combustion products of **both** fuels on human health **or** the environment
- write a balanced symbol equation for the complete combustion of methanol.

ASSESSOR'S USE ONLY

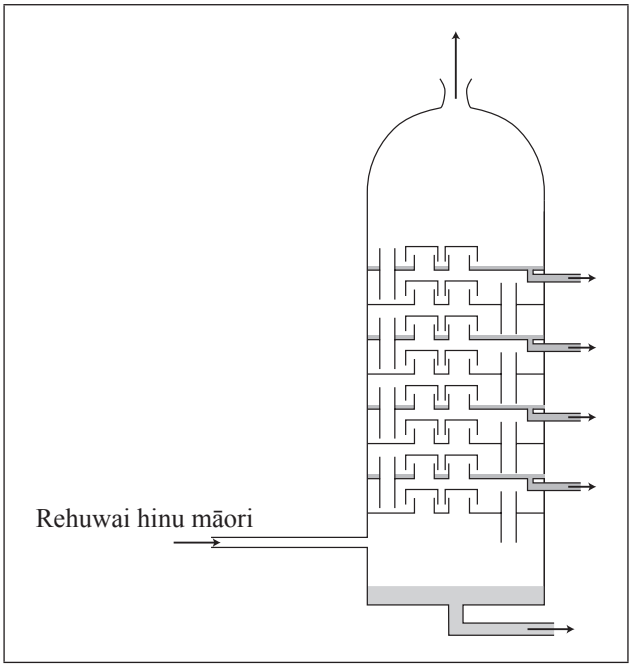
Balanced symbol equation:

## PĀTAI TUARUA: IHEUNGA TAUWEHE

MĀ TE KAIMĀKA ANAKE

Whakahaerehia ai ngā mahi iheunga tauwehe o te hinu māori i roto i ngā pourewa teitei, e ai ki te whakaaturanga i raro, kia riro mai ai ngā hua whaitake.

*He tapu tēnei rauemi. E kore taea te tuku atu. Aata tirohia ki ngā kupu kei raro iho i te pouaka nei.*




http://photoartforums.com/forums/uploads/1277616145/gallery_85_17_924301.jpg

(a) Whakamāramahia te take he aha i iheuheu tauwehetia ai te hinu māori i mua i te whakamahinga.

(b) Whakaingoahia kia RUA ngā hau i riro mai i te pourewa iheunga tauwehe, ā, ka whakamārama kia KOTAHI te whakamahinga mō ia hau.

| Hau | Ingoa | Whakamahinga |
|---|---|---|
| 1 | | |
| 2 | | |

(c) Whakamāramahia te take e whakahaerehia ana te iheunga tauwehe i roto i ngā pourewa.

Me kōrero koe mō te hanganga matū me ngā āhuatanga ōkiko o ngā waiwaro o te hinu māori, me te āhua e mahi ai te pourewa iheunga tauwehe.

MĀ TE KAIMĀKA ANAKE

## QUESTION TWO: FRACTIONAL DISTILLATION

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Crude oil is fractionally distilled in tall towers, like the ones shown below, to obtain useful products.

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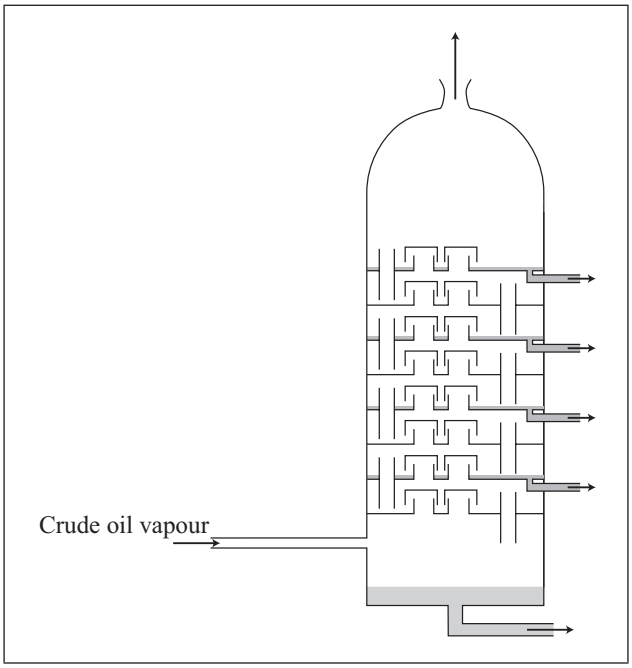



http://photoartforums.com/forums/uploads/1277616145/gallery_85_17_924301.jpg

(a) Explain why crude oil must be fractionally distilled before it can be used.

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

| Fraction | Name | Use |
|---|---|---|
| 1 | | |
| 2 | | |

(c) Explain why fractional distillation is carried out in towers.

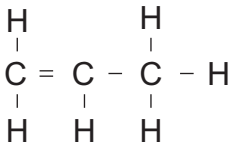
You will need to refer to the chemical structure and physical properties of the hydrocarbons that make up crude oil, and the way the fractional distillation tower operates.

ASSESSOR'S USE ONLY

## PĀTAI TUATORU: WAIWARO RUA PŌWARORAU [POLYPROPENE]

MĀ TE KAIMĀKA ANAKE

**Te hanganga matū o te waiwaro rua pōwaro**



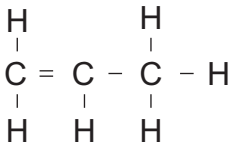
(a) Tuhia kia TORU ngā wae tāruarua hei whakaatu i te waerau ka hangaia e te waiwaro rua pōwaro.

(b) Whakamārama he aha i taea ai te whakamahi i te waiwaro rua ki te hanga waerau, engari kaua te waiwaro tahi.

## QUESTION THREE: POLYPROPENE

ASSESSOR'S USE ONLY

**The chemical structure of propene**



(a) Draw THREE repeating units to show the polymer that propene forms.

(b) Explain why alkenes can be used to make polymers, but alkanes cannot.

(c) He maha ngā whakamahinga o te waiwaro rua pōwarorau e tūhonoa ana ki ōna āhuatanga matū, ōkiko hoki.

MĀ TE KAIMĀKA ANAKE

Whakaingoahia kia RUA ngā whakamahinga o te waiwaro rua pōwarorau.

Tūhonoa ia whakamahinga ki ngā āhuatanga matū, ōkiko rānei/hoki e RUA o te waiwaro rua pōwarorau.

(c) Polypropene (polypropylene) has many uses that are linked to its chemical and physical properties.

Name TWO uses of polypropene.

Link each use to TWO physical and / or chemical properties of polypropene.

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## PĀTAI TUAWHĀ: EWARO ME TE WAIHĀ EWARO

MĀ TE KAIMĀKA ANAKE

(a) Tuhia ngā hanganga matū mō te ewaro me te waihā ewaro.

| | |
|---|---|
| | |
| Ewaro | Waihā ewaro |

(b) Tātarihia ngā rerekētanga i waenga i te ewaro me te waihā ewaro mā te whai whakaaro ki ngā ōritenga me ngā rerekētanga o ō rāua hanganga matū me ō rāua āhuatanga ōkiko.

Me whakauru ki tō whakautu, mō te ewaro me te waihā ewaro:

- tō rāua āhua i te pāmahana rūma
- ō rāua ake pae rewa, koropupu hoki
- ō rāua memehatanga i rō wai.

## QUESTION FOUR: ETHANE AND ETHANOL

ASSESSOR'S USE ONLY

(a) Draw the chemical structures for ethane and for ethanol.

| | |
|---|---|
| | |
| Ethane | Ethanol |

(b) Analyse the differences between ethane and ethanol by considering the similarities and differences of their chemical structures and their physical properties.

In your answer include, for both ethane and ethanol:

- their state at room temperature
- their relative melting and boiling points
- their solubility in water.

(c) Ko te moītanga[2] tētahi tūmahi ka taea te whakamahi hei whakanao waihā ewaro.

MĀ TE KAIMĀKA ANAKE

Whakawhānuihia he pēhea te whakamahi i te moītanga hei whakanao waihā ewaro.
Me whakauru ki tō whakautu:

- tētahi whakamāramatanga o ngā rawa ka whakamahia me ngā hua ka riro mai
- ngā āhuatanga e hiahiatia kia mahi ai te moītanga
- tētahi whārite tohu taurite.

Whārite tohu taurite:

[2] toroītanga

(c) Fermentation is one method that can be used to produce ethanol.

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Elaborate on how fermentation is used to produce ethanol.

In your answer include:

- an explanation of the materials used and the products obtained
- the conditions required for fermentation to occur
- a balanced symbol equation.

Balanced symbol equation:

**He puka anō mēnā ka hiahiatia.**
**Tuhia te (ngā) tau pātai mēnā e hāngai ana.**

TAU PĀTAI

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 1 Chemistry, 2013

## 90932 Demonstrate understanding of aspects of carbon chemistry

9.30 am Thursday 21 November 2013
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. |

90932M

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 space for any answer, use the page(s) 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.**