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NZQA

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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SUPERVISOR'S USE ONLY

Level 1 Chemistry, 2011

90932 Demonstrate understanding of aspects of carbon chemistry

9.30 am Tuesday 22 November 2011
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.

Check that this booklet has pages 2–9 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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You are advised to spend 60 minutes answering the questions in this booklet.

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QUESTION ONE: FUELS

(a) Draw the **structural formulae** for the following molecules.

Butane	Methanol

Both butane and methanol can be used as fuels.

(b) A sample of butane burns in air with a yellow flame, while a sample of methanol burns in air with an almost invisible flame.

Compare and contrast the combustion of these two fuels.

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(c) Write a balanced symbol equation for the combustion of methanol, which burns with an almost invisible flame.

(d) Combustion of fuels can have negative effects on both human health and the environment.

Identify and explain TWO negative effects of the combustion of fuels on both human health and the environment.

Your answer should include:

- ONE negative effect on human health, and
- ONE negative effect on the environment.

QUESTION TWO: FRACTIONAL DISTILLATION

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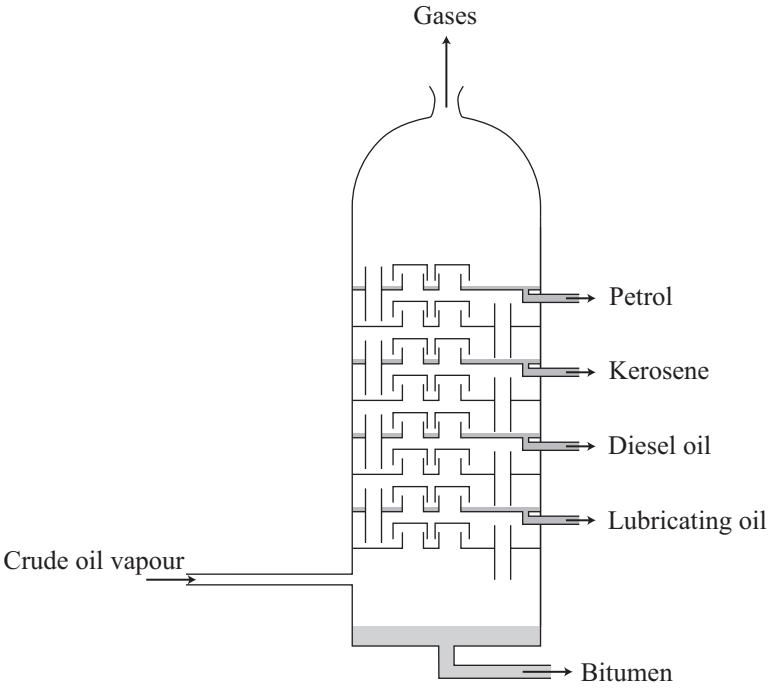

Give a detailed account of the fractional distillation of crude oil.

In your answer you should:

- describe the composition of crude oil
- explain how the process of fractional distillation is carried out
- link the process of fractional distillation to the physical **properties** and chemical **structure** of hydrocarbons.

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QUESTION THREE: MAKING POLYMERS

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Propene is used to make the polymer **polypropene**.

(a) Draw diagrams to show the chemical structure of both propene and polypropene.

Propene	Polypropene (show at least TWO repeating units)

(b) Outline in full the chemical reaction that occurs between propene molecules to form the polymer polypropene.

(c) Polypropene has many uses that are related to its properties.

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Describe TWO uses of polypropene and link these uses to named physical and chemical properties of polypropene.

QUESTION FOUR: PROPERTIES OF CARBON COMPOUNDS

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Hexane and ethanol are organic compounds, which are liquid at room temperature.

Using **only** water and a Bunsen burner, explain one chemical AND one physical test that could be used to identify hexane and ethanol.

Your answer must include:

- a description of each test
- the observations that would be made for each test for BOTH compounds
- an explanation of the chemical and physical properties of BOTH compounds that allow identification with your tests.

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

QUESTION NUMBER

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