For Supervisor's use only

2

90315

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Level 2 Science, 2003

90315 Describe naturally occurring organic mixtures and the production of derived consumer products

Credits: Four
9.30 am Thursday 13 November 2003

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 answer ALL the questions in this booklet.

If you need more space for any answer, use the pages provided at the back of this booklet and clearly number the question.

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.

For Assessor's use only

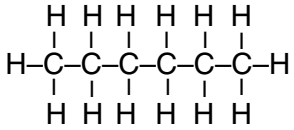
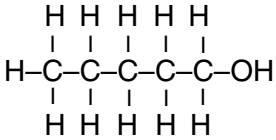
Achievement Criteria		
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Describe organic compounds, and the composition and uses of naturally occurring organic mixtures. ☐	Link the composition of naturally occurring organic mixtures and the derived consumer products to their uses. ☐	Explain the usefulness of naturally occurring organic mixtures and the derived consumer products in terms of their properties. ☐
Describe key steps in the production of consumer products from naturally occurring organic mixtures. ☐	Link the key steps in the consumer production process to the properties of the naturally occurring organic mixtures involved. ☐	Explain the purpose of individual steps in the consumer production process. ☐
Overall Level of Performance (all criteria within a column are met) ☐		

You are advised to spend 45 minutes answering the questions in this booklet.

Assessor's use only

QUESTION ONE – Organic Compounds

Complete (a)–(e) in the following table by either drawing the structure for each named compound or naming the compound for each given structure.

Name	Structure
Methanol	(a)
(b)	
Butene	(c)
(d)	
Propanoic acid	(e)

QUESTION TWO – Organic Mixtures

Assessor's use only

Part A: Beer

Beer is an organic mixture that is made from organic substances.

(a) Name FOUR substances used to make beer.

(1) _____

(2) _____

(3) _____

(4) _____

(b) Describe how the starting organic mixture is modified to make beer.

_____

_____

_____

_____

_____

_____

(c) Give the name and structure of the alcohol formed when beer is produced.

Name	Structure

(d) Beer has certain flavours. Explain how the alcohol in beer improves the flavours of the beer produced.

_____

_____

_____

_____

_____

_____

_____

_____

Part B: Natural Gas

Assessor's use only

(e) Name FOUR components of natural gas.

(1) _____

(2) _____

(3) _____

(4) _____

(f) Two products derived from natural gas are CNG and LPG. For each product, give ONE common use of the product.

(i) CNG

Common use: _____

_____

(ii) LPG

Common use: _____

_____

Part C: Petroleum

Assessor's use only

(g) (i) Give the **name and use** for THREE different products derived from petroleum.

Petroleum product (1)

Name: _____

Use: _____

Petroleum product (2)

Name: _____

Use: _____

Petroleum product (3)

Name: _____

Use: _____

(ii) Choose ONE of the petroleum products in (g)(i) and explain how its properties make it suitable for the selected use.

Product name: _____

Properties: _____

_____

_____

_____

(h) Discuss the refining of petroleum and the processes used to increase the amount of petrol per barrel of crude oil.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

QUESTION THREE – Production of Consumer Products

Assessor's use only

Wine has many important contexts in society today, as it has had for thousands of years.
The basic fermentation process is very simple. The steps below follow the process of production from grapes to wine.

Step 1: Harvesting

(a) What is measured by a grower to determine that the grapes are ready to harvest?

Step 2: Crushing, de-stemming and pressing

(b) Explain why the grapes are crushed, de-stemmed and pressed.

(c) During this process, sulfur dioxide may also be added to the mixture.
Explain why this is done.

Assessor's use only

Step 3: Fermentation

(d) The fermentation reaction produces alcohol. Complete the following to give a balanced chemical **equation** for the production of alcohol.

_____ + Yeast ⟶ _____ + _____

(e) Discuss **how** the conditions required for fermentation are managed to ensure that the fermentation reactions successfully make wine.

Step 4: Purification and bottling

As part of the processes involved in purification and bottling, the unwanted solids, salts and micro-organisms are removed and then the wine is bottled and matured.

(f) Identify the micro-organism that is removed and **explain** why it is removed.

(g) These days, many wines are bottled under carbon dioxide.
Explain why this process is carried out.

Extra paper for continuation of answers if required.
Clearly number the question.

Assessor's use only

Question Number

Extra paper for continuation of answers if required.
Clearly number the question.

Assessor's use only

Question Number