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NZQA
NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

For Supervisor's use only

Level 1 Chemistry, 2007

90648 Describe properties and reactions of carbon and its compounds

Credits: Three
9.30 am Monday 19 November 2007

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.

A metal activity series, solubility rules, a table of ions and a periodic table are provided in Resource Booklet L1–CHEMR.

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 2–10 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 properties and reactions of carbon and its compounds. ☐	Link properties and reactions of carbon and its compounds. ☐	Apply an understanding of properties and reactions of carbon and its compounds. ☐
Overall Level of Performance ☐		

You are advised to spend 30 minutes answering the questions in this booklet.

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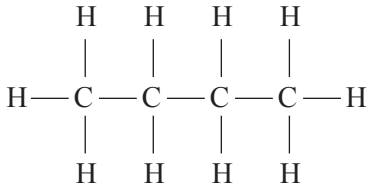
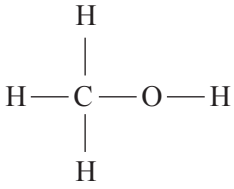
QUESTION ONE: ORGANIC COMPOUNDS

(a) Complete the following table, naming or drawing the structural formulae of the compounds as required.

Structure	Name
1 	
2	propene
3 	
4	ethanoic acid

(b) Two of the compounds in the table above are gases and two are liquids at room temperature.

State which compounds are liquid at room temperature.

_____

(c) Write a balanced chemical equation for the complete combustion of compound **1** from the table above.

_____

(d) Propene is used to make a polymer, polypropene.

Draw a short section of the polymer chain. Show THREE repeating units in your diagram.

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(e) Hexane and ethanol are two colourless liquids.

Compare the chemical and physical properties of these two compounds, and use this comparison to describe how to **safely** distinguish between these two liquids.

QUESTION TWO: CARBON CYCLE

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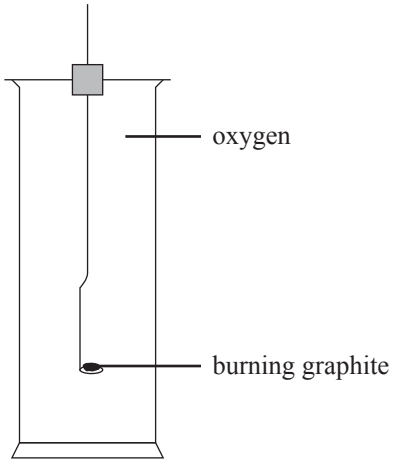
(a) A jar of carbon dioxide was produced by placing burning graphite powder into a gas jar of pure oxygen.



(i) State ONE observation that would be made during this reaction.

_____

(ii) Explain why carbon monoxide is also formed in this reaction.

_____

_____

_____

_____

_____

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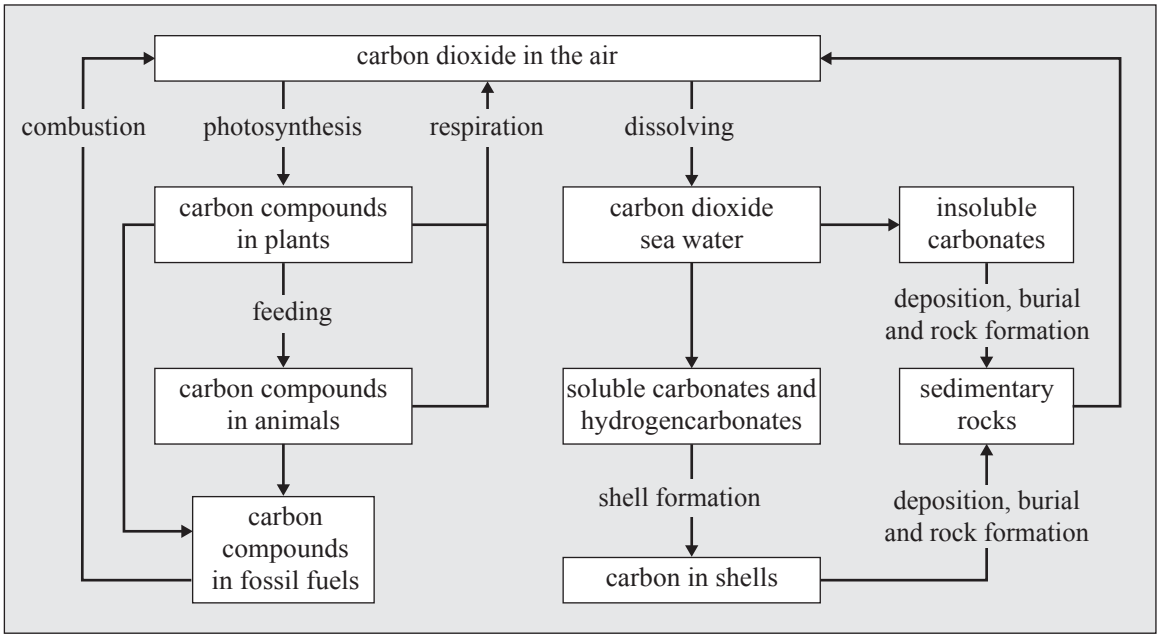
(b) Carbon dioxide is slightly soluble in water, and it also reacts with water.

(i) Write a balanced chemical equation for the reaction of carbon dioxide with water.

(ii) This reaction was carried out in a school laboratory. Blue litmus solution was added to the solution from (b)(i).

Describe the expected observation **and** explain why this observation would be made.

The Carbon Cycle



(c) Explain how respiration contributes carbon dioxide to the atmosphere in this cycle.

(d) Discuss the potential impact of **fossil fuel combustion** on the composition and properties of the atmosphere and therefore the global environment.

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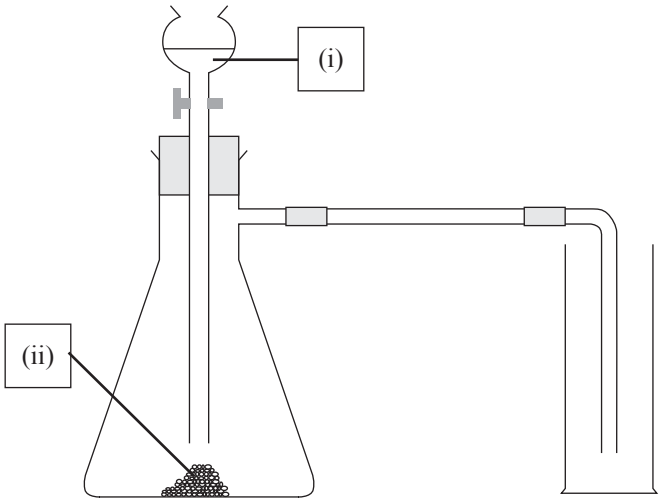
QUESTION THREE: USING CARBON DIOXIDE

An experiment was carried out to produce carbon dioxide.



(a) Name the reactants that could be used to produce carbon dioxide.

(i) _____

(ii) _____

(b) Some limewater was then added to the gas jar of carbon dioxide.

(i) Describe the expected observation.

_____

(ii) Write a balanced chemical equation for the reaction of carbon dioxide with limewater.

(c) Discuss fully the physical and chemical properties of carbon dioxide that make it suitable to use in a fire extinguisher.

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

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Question number	

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