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90171

NZQA

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

For Supervisor's use only

Level 1 Chemistry, 2009

90171 Describe chemical reactions

Credits: Four
2.00 pm Friday 27 November 2009

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 periodic table and other reference material are provided in the 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 2–7 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 chemical reactions.	☐	Interpret information about chemical reactions.	☐	Apply understanding of chemical reactions.	☐
Overall Level of Performance	☐				

You are advised to spend 40 minutes answering the questions in this booklet.

Assessor's use only

QUESTION ONE: PRECIPITATION

Discuss what happens when a solution of potassium hydroxide is added to a solution of calcium nitrate.

$$KOH(aq) + Ca(NO_3)_2(aq) \rightarrow ?$$

In your answer:

- describe the observations you would make
- predict the products that will form
- explain what happens to **each ion** present in the solutions used in this reaction
- write a net ionic equation for the precipitation reaction.

You may use the Solubility Rules in the Resource Booklet provided.

The net ionic equation for the precipitation reaction is:

QUESTION TWO: THERMAL DECOMPOSITION

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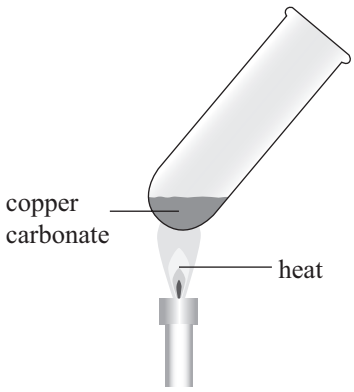
Some green copper(II) carbonate powder is heated in a boiling tube over a Bunsen flame. A burning splint inserted into the top of the boiling tube goes out.



Discuss the chemistry in this thermal decomposition reaction by:

- describing ONE other observation that would be made during this reaction
- linking the observations to the relevant chemical species
- writing a balanced equation.

The balanced equation is:

QUESTION THREE: CALCULATING MASS

Assessor's use only

Calculate the mass of lead iodide, PbI_2, produced when 5.00 grams of sodium iodide, NaI, is reacted with an excess of a solution of lead nitrate.

$$Pb(NO_3)_2(aq) + 2NaI(s) \rightarrow PbI_2(s) + 2NaNO_3(aq)$$

Refer to the Resource Booklet provided for the relative atomic mass values.

Show your working clearly for **every step** of your calculation. Round your answer appropriately.

Begin by calculating the molar masses of sodium iodide and lead iodide.

Molar mass, M, of sodium iodide is:

Molar mass, M, of lead iodide is:

Mass of lead iodide produced from 5.00 grams of sodium iodide is:

QUESTION FOUR: OXIDATION-REDUCTION

Assessor's use only

Iron can be extracted from its ore, iron(III) oxide, Fe_2O_3, by heating it strongly with coke or carbon, C. This is an oxidation-reduction reaction.

Discuss the chemistry of this reaction.

In your answer:

- state what you would observe as this reaction proceeds
- explain why this is an oxidation-reduction reaction
- identify the reduction and oxidation processes
- include all appropriate equations in your discussion.

Equations:

QUESTION FIVE: DETERMINING A FORMULA

Assessor's use only

A sample of a compound is analysed and found to contain 123 grams of carbon, 6.80 grams of hydrogen and 121 grams of chlorine.

The molar mass of the compound is 147.

Determine the formula of this compound.

Refer to the Resource Booklet provided for relative atomic mass values.
Show your working clearly for **every step** of your calculation.

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

Assessor's use only

Question number

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