

See back cover for an English translation of this cover

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90944M



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

SUPERVISOR'S USE ONLY

Pūtaiao, Kaupae 1, 2012

90944M Te whakaatu māramatanga ki ngā āhuatanga o te waikawa me te pāpāhua

9.30 i te ata Rāhina 19 Whiringa-ā-rangi 2012
Whiwhinga: Whā

Paetae	Paetae Kaiaka	Paetae Kairangi
Te whakaatu māramatanga ki ngā āhuatanga o te waikawa me te pāpāhua.	Te whakaatu māramatanga hōhonu ki ngā āhuatanga o te waikawa me te pāpāhua.	Te whakaatu māramatanga matawhānui ki ngā āhuatanga o te waikawa me te pāpāhua.

Tirohia mehemea e ōrite ana te Tau Ākongā ā-Motu (NSN) kei tō pepa whakauru ki te tau kei runga ake nei.

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

Tangohia te Pukaiti Rauemi 90944MR i waenga o tēnei pukapuka.

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

Tirohia mehemea 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.

PĀTAI TUATAHI: NGĀ NGOTA ME NGĀ KATOTE

- (a) Whakaotihia te papatau i raro nei mō ngā katote ka hangaia e Ca, F, me Cl.

Ngota	Tau iraoho	Whakanaha irahiko o te ngota	Whakanaha irahiko o te katote	Tohu katote
Ca	20			
F	9			
Cl	17			

- (b) Whakamāramahia ngā hihiko ki ngā katote e toru KATOA e ai ki te whakanaha irahiko me te maha o ngā iraoho.

- (c) Whakamahia ō rātou tūnga i te taka pūmotu hei whakamārama i te take ka hangaia e ētahi ngota e rua ētahi katote e **ōrite ana te hihiko**, Ā, ka hangaia hoki e ētahi ngota e rua ētahi katote e **ōrite ana te whakanaha irahiko**.



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

QUESTION ONE: ATOMS AND IONS

- (a) Complete the table below for ions formed by Ca, F, and Cl.

Atom	Atomic number	Electron arrangement of atom	Electron arrangement of ion	Ion symbol
Ca	20			
F	9			
Cl	17			

- (b) Explain the charges on ALL three ions, in terms of electron arrangement and number of protons.

- (c) Use their positions on the periodic table to explain why two of the atoms form ions with the **same charge**, AND two of the atoms form ions with the **same electron arrangement**.

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PĀTAI TUARUA: NGĀ PĀHARE

I te hiahia tētahi ākonga ki te mahi i te pāhare ngū, arā, te konutai pākawa ota.

- (a) Whakamāramahia he pēhea te hanga konutai pākawa ota mā te ranu i ngā mehanga konutai pākawa waro me te waikawa hauota ki ngā taputapu pūtaiao o te kura (ka taea te whakamahi tuhipoka, hoahoa rānei mō tō whakamāramatanga).

QUESTION TWO: SALTS

A student wanted to make the neutral salt, sodium nitrate.

- (a) Explain how to make sodium nitrate by mixing sodium carbonate and nitric acid solutions using school laboratory equipment (your explanation may use notes and diagrams).

- (b) Whakamāramahia he pēhea te whakamahi i te pepa tohu waikawa ki te whakaatu he **ngū** te pāhare kua hangaia.

- (c) Tuhia tētahi whārite kupu ME tētahi whārite tohu taurite mō te tauhohenga i waenga i te konutai pākawa waro me te waikawa hauota.

Whārite kupu

Whārite tohu

- (b) Explain how litmus paper could be used during the process described to show the salt being produced is **neutral**.

- (c) Write a word equation AND a balanced symbol equation for the reaction between sodium carbonate and nitric acid.

Word equation

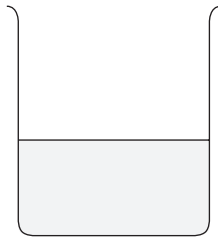
Symbol equation

PĀTAI TUATORU: NGĀ WAIKAWA ME NGĀ PĀPĀHUA

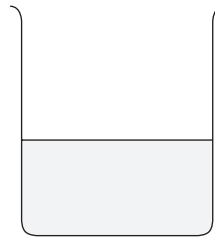
E rua ngā ipurau e whakaaturia ana i raro nei. He mehanga waikawa pungatara, he 5 pata hoki o te ranunga taetohu kei roto i te ipurau tuatahi.

He wai māori, he 5 pata hoki o te ranunga taetohu kei roto i te ipurau tuarua.

Ka tāpiri atu he konutai waihā ki ngā ipurau e rua kia kore rā anō e kitea he panonitanga.

Ipurau tuatahi

Waikawa pungatara +
5 pata ranunga taetohu

Ipurau tuarua

Wai māori +
5 pata ranunga taetohu

- (a) Tuhia tētahi whārite kupu ME tētahi whārite tohu taurite mō te tauhohenga i waenga i te waikawa pungatara me te konutai waihā.

Whārite kupu

Whārite tohu

- (b) He aha te tae o te ranunga taetohu i ia mehanga i te **tīmatanga**?

Ipurau tuatahi (waikawa) _____

Ipurau tuarua (wai) _____

- (c) Whakaahuatia te panoni o ngā tae i te wā ka tāpirihia te mehanga konutai waihā ki ia ipurau, \bar{A} , ka whakamārama i te panoni haere o te pH o ia mehanga.

Ipurau tuatahi: _____

Ipurau tuarua: _____

- (d) Whakamāramahia te pānga i waenga i te pH o ngā mehanga me ngā **katote** i ngā mehanga, ina ka tāpiri haere te konutai waihā ki ia ipurau.

Ipurau tuatahi: _____

Ipurau tuarua: _____

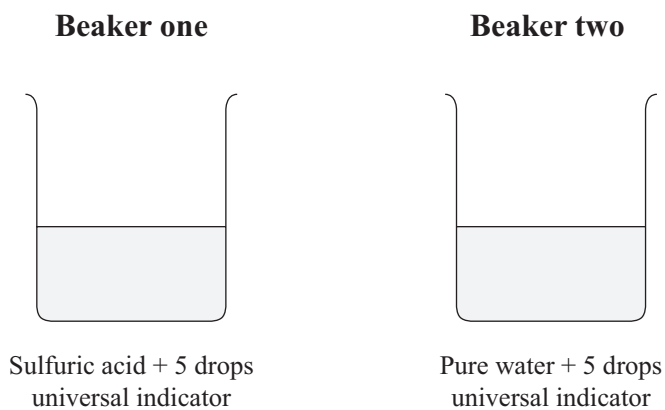


QUESTION THREE: ACIDS AND BASES

Two beakers are shown below. Beaker one contains sulfuric acid solution and 5 drops of universal indicator.

Beaker two contains pure water and 5 drops of universal indicator.

Sodium hydroxide solution was added to both beakers until no more changes were observed.



- (a) Write a word equation AND a balanced symbol equation for the reaction between sulfuric acid and sodium hydroxide.

Word equation

Symbol equation

- (b) What is the colour of universal indicator in each solution at the **start**?

Beaker one (acid) _____

Beaker two (water) _____

- (c) Describe the colour changes as sodium hydroxide solution is added to each beaker, AND explain what this tells you about the changing pH of each solution.

Beaker one: _____

Beaker two: _____

- (d) Explain the relationship between the pH of the solutions and the **ions** in the solutions, as the sodium hydroxide is added to each of the beakers.

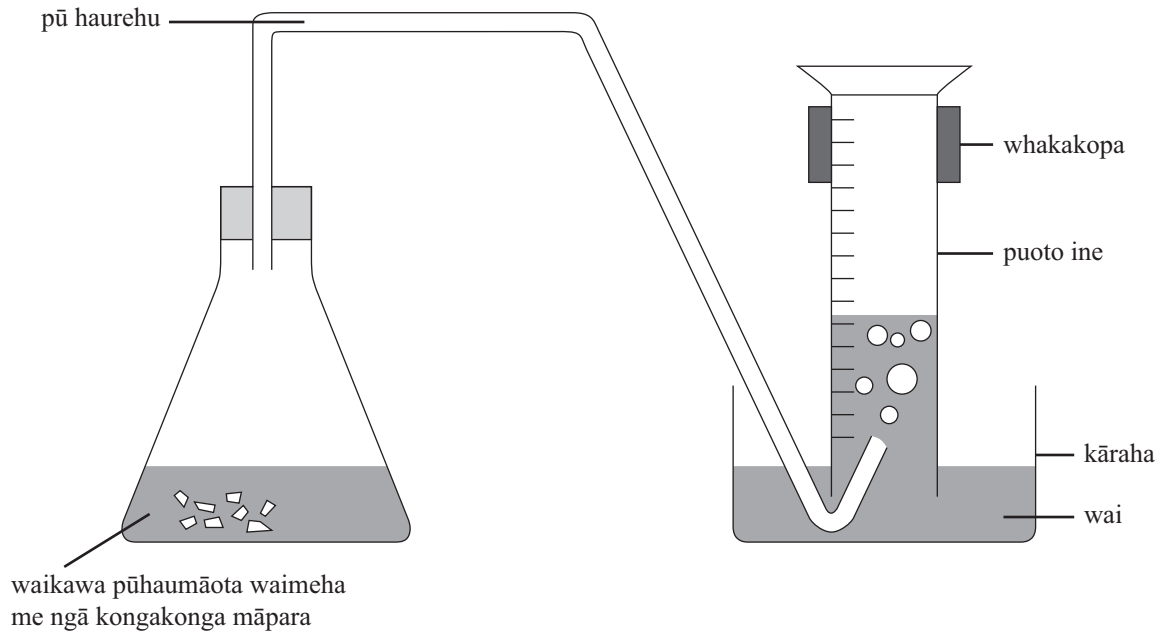
Beaker one: _____

Beaker two: _____

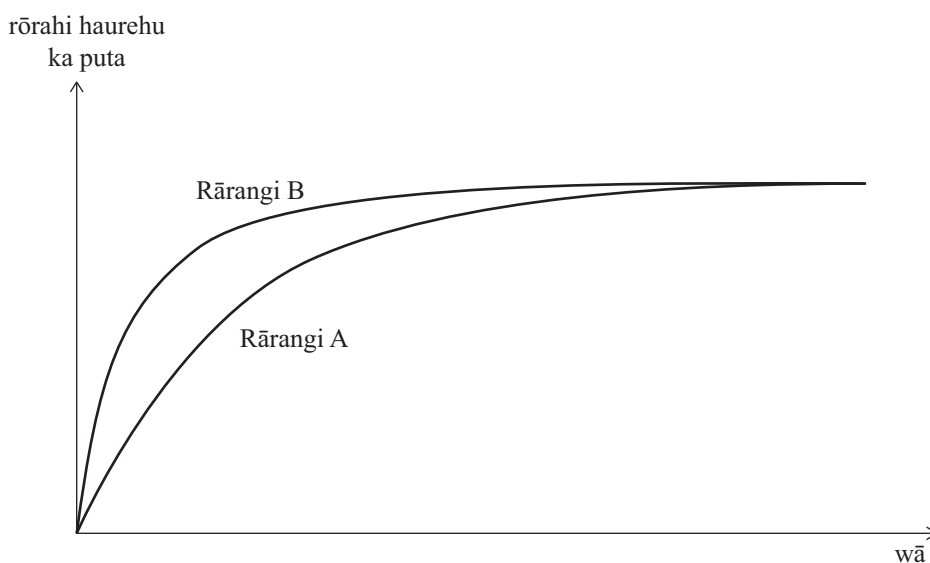
PĀTAI TUAWHĀ: NGĀ TERE TAUTOHENGA

I mahia te whakamātauranga e whai ake nei i te **20°C** kātahi ka tuaruatia i te **40°C**.

Ka raua atu he kongakonga māpara (konupūmā pākawa waro) ki te waikawa pūhaumāota i tētahi puoto koeko. Ko te papatipu me te rahi o ngā kongakonga māpara, te kukūtanga me te rōrahi o te waikawa pūhaumāota i whakamahia, he **ōrite** mō ngā whakamātauranga e rua. I tūhonotia te puoto ki tētahi puoto ine kōaro i tētahi kāraha wai, pērā i te mea e whakaaturia ana i te hoahoa i raro nei.



Ka inea te rōrahi haurehu ka puta mō ngā paemahana rerekē mō ētahi meneti, ā, i whakamahia ngā otinga ki te tuhi i te kauwhata i raro nei.



Kī mai ko tēhea rārangi o te kauwhata ka tohu i te tautohenga i te 40°C, ā, ka whakamārāma mai i pēhea tō tātai i tēnei.

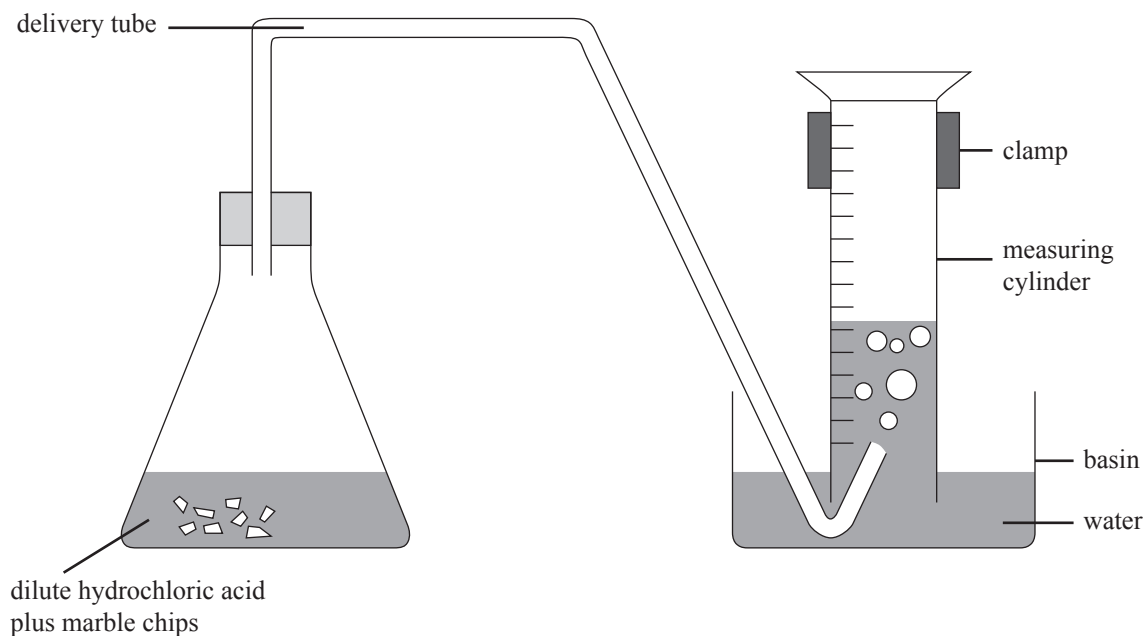
I tō whakautu me:

- tautohu ko tēhea te rārangi e tohu ana i te tautohenga i te 40°C
- whakamārāma te take i tohua e koe ko tērā te rārangi o te tautohenga i te 40°C
- homai ngā pūtaka mō ngā terenga rerekē o ngā tautohenga e ai ki ngā korakora
- whakamārāma he aha i pae ai ngā rārangi e rua i te mutunga.

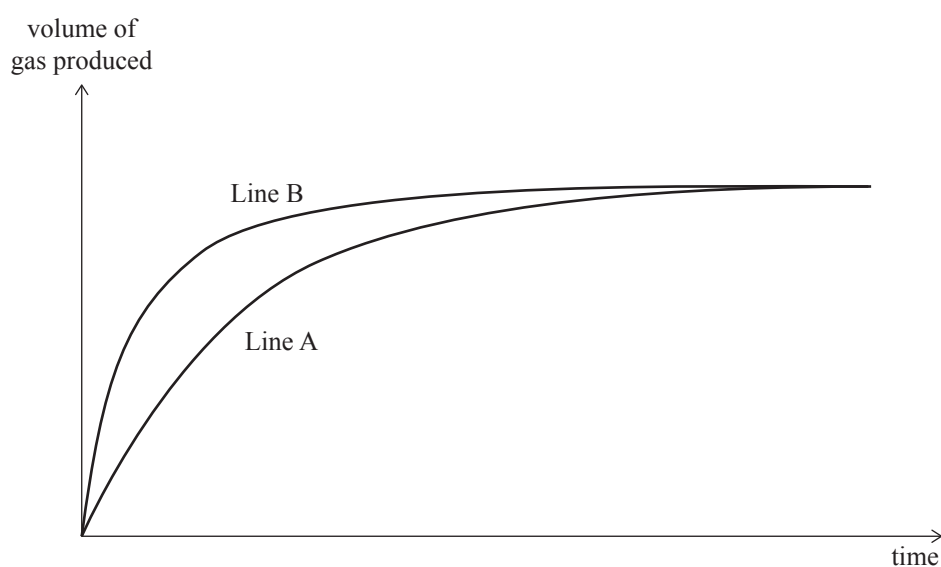
QUESTION FOUR: REACTION RATES

The following experiment was carried out at 20°C and then repeated at 40°C .

Marble chips (calcium carbonate) were added to hydrochloric acid in a conical flask. The mass and size of marble chips, and the concentration and volume of hydrochloric acid used, were the **same** for both experiments. The flask was connected to an inverted measuring cylinder in a basin of water, as shown in the diagram below.



The volume of gas produced at the two different temperatures was measured for a few minutes and the results were used to sketch the graph shown below.



State which line on the graph represents the reaction at **40°C** and explain how you worked this out.

In your answer you should:

- identify which line represents the reaction at 40°C
- explain why the line you have identified is the reaction at 40°C
- give reasons for the different rates of reaction in terms of particles
- explain why both lines end up horizontal.

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English translation of the wording on the front cover

Level 1 Science, 2012

90944 Demonstrate understanding of aspects of acids and bases

9.30 am Monday 19 November 2012
Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of aspects of acids and bases.	Demonstrate in-depth understanding of aspects of acids and bases.	Demonstrate comprehensive understanding of aspects of acids and bases.

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.

Pull out Resource Booklet 90944R from the centre of 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.

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