90944M

909445

1

SUPERVISOR'S USE ONLY

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

Pūtaiao, Kaupae 1, 2018

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

9.30 i te ata Rāpare 15 Whiringa-ā-rangi 2018
Whiwhinga: Whā

Paetae	Kaiaka	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 mēnā e rite ana te Tau Ākonga ā-Motu (NSN) kei runga i tō puka whakauru ki te tau kei runga i tēnei whārangi.

Me whakamātau koe i ngā tūmahi KATOA kei roto i tēnei pukapuka.

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

Mēnā ka hiahia whārangi atu anō koe mō ō tuhinga, whakamahia ngā whārangi wātea kei muri o tēnei pukapuka, ka āta tohu ai i te tau tūmahi.

Tirohia mēnā e tika ana te raupapatanga o ngā whārangi 2–15 kei roto i tēnei pukapuka, ka mutu, kāore tētahi o aua whārangi i te takoto kau.

ME HOATU RAWA KOE I TĒNEI PUKAPUKA KI TE KAIWHAKAHAERE Ā TE MUTUNGA O TE WHAKAMĀTAUTAU.

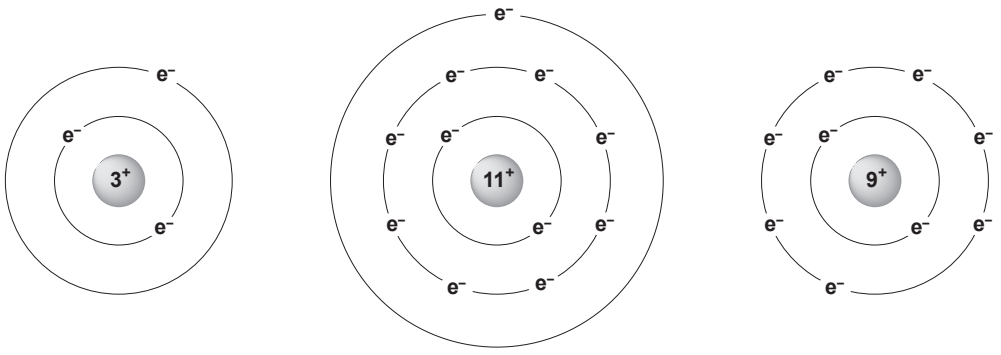
TAPEKE

MĀ TE KAIMĀKA ANAKE

TŪMAHI TUATAHI

MĀ TE KAIMĀKA ANAKE

E whakaatu ana ngā hoahoa i raro nei i ngā tauira o ngā ngota rerekē e toru.



Konukōhatu Konutai Haukōwhai

Whakamahia ngā hoahoa hei whakautu i ngā wāhanga (a), (b), me (c).

(a) He aha te take kei roto te konukōhatu me te konutai i te rōpū kotahi (pou) o te Taka Pūmotu, engari kei ngā kapa rerekē (rārangi huapae)?

(b) Ka puta i te konutai me te haukōwhai ngā katote e ōrite ana te nahanaha irahiko.

He aha te take he ōrite te nahanaha irahiko o te konutai me te haukōwhai engari he rerekē ngā whana?

I tō tuhinga, me kōrero koe mō te maha o ngā iraoho, te whana, me te nahahana irahiko o ngā ngota me ngā katote e rua.

MĀ TE KAIMĀKA ANAKE

(c) Ko te tātai o te konupora pūkōwhai he MgF_2.

Whakamāramatia mai he pēhea te hono o te ōwehenga o ngā katote i roto i te tātai ki te whana o ngā katote.

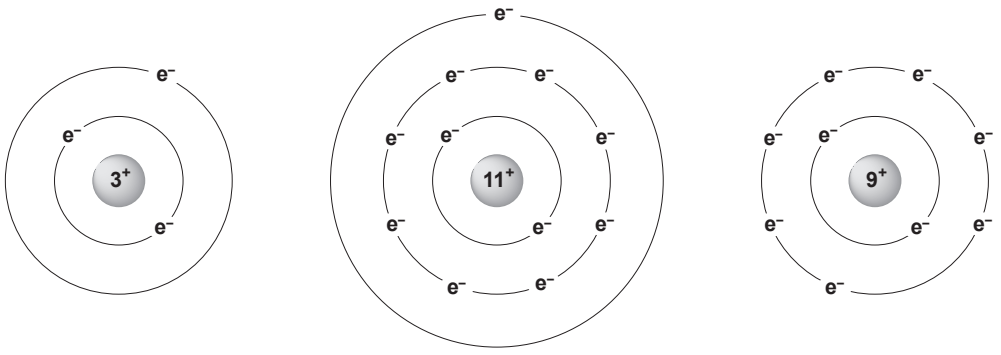
I tō tuhinga, me whakauru e koe te maha o ngā irahiko ka whiwhi, ka ngaro rānei i ia ngota ina puta ana hei pūhui katote.

Mā te hoahoa pea tō tuhinga e āwhina.

QUESTION ONE

ASSESSOR'S USE ONLY

The diagrams show models of three different atoms:



Lithium Sodium Fluorine

Use the diagrams to answer parts (a), (b), and (c).

(a) Why are lithium and sodium in the same group (column) of the Periodic Table, but in different periods (rows)?

(b) Sodium and fluorine form ions that both have the same electron arrangement.

How can sodium and fluoride ions have the same electron arrangement but different charges?

In your answer you should refer to the number of protons, charge, and electron arrangement of the two atoms and ions.

ASSESSOR'S USE ONLY

(c) Magnesium fluoride has the formula MgF_2.

Explain how the ratio of ions in the formula is linked to the charge on the ions.

In your answer you should include the number of electrons gained or lost by each atom as it forms the ionic compound.

A diagram may assist your answer.

TŪMAHI TUARUA

MĀ TE KAIMĀKA ANAKE

Ka tāpirihia tahitia ngā mehanga o te konurehu waihā, KOH, me te waikawa pungatara, H_2SO_4, ki roto i tētahi ipurau.

(a) Whakaingoatia te momo tauhohenga kei te puta.

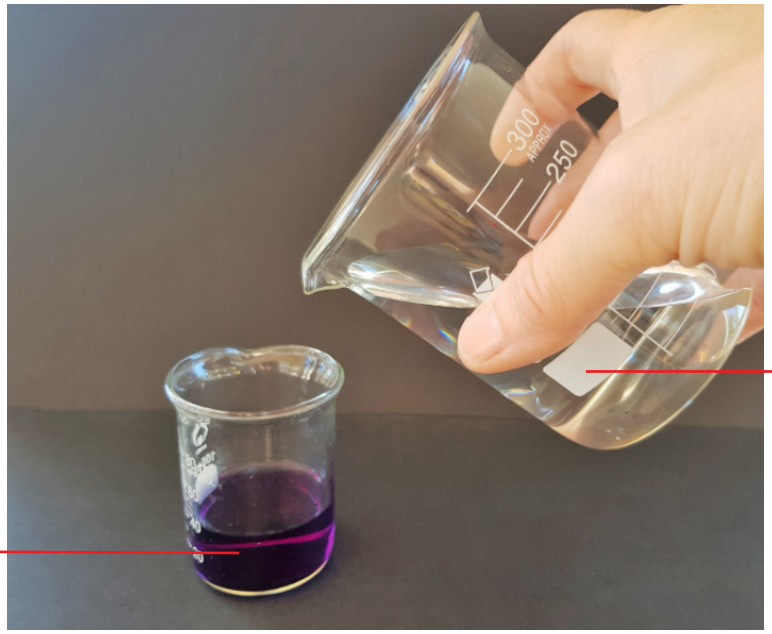
(b) Tuhia te whārite kupu me te whārite tohu taurite mō tēnei tauhohenga.

Whārite kupu

Whārite tohu taurite

(c) Ka raua he mehanga o te konurehu waihā ki roto i te ipurau. Ka tāpirihia anō te ranunga taetohu. He waiporoporo te mehanga, e ai ki te hoahoa i raro.

Ka āta tāpiritia atu he waikawa pungatara ki te ipurau **kia kore rā anō e kitea he panonitanga tae**.



QUESTION TWO

ASSESSOR'S USE ONLY

Solutions of potassium hydroxide, KOH, and sulfuric acid, H_2SO_4, are added together in a beaker.

(a) Name the type of reaction occurring.

(b) Write the word equation and the balanced symbol equation for this reaction.

Word equation

Balanced symbol equation

(c) A solution of potassium hydroxide is placed in a beaker. Universal indicator is added to it. The solution is purple, as shown in the diagram below.

Sulfuric acid is slowly added to the beaker until **no more colour changes are seen**.

Āta whakamāramatia ka ahatia te **tae** o te mehanga i te wā e tāpirihia ana te waikawa pungatara ki te konurehu waihā.

Honoa tō tuhinga ki te kukūtanga o ngā **katote** me te panonitanga o te **pH** o te mehanga.

MĀ TE KAIMĀKA ANAKE

Explain in detail what happens to the **colour** of the solution while the sulfuric acid is being added to the potassium hydroxide.

Link your answer to the concentration of **ions** and the changing **pH** of the solution.

ASSESSOR'S USE ONLY

TŪMAHI TUATORU

MĀ TE KAIMĀKA ANAKE

Ka raua atu he paura konupora pākawa waro ki te waikawa hauota waimeha i tētahi puoto koeko tuwhera. Kei runga te puoto i tētahi ine-taumaha tāhiko, e ai ki te pikitia.

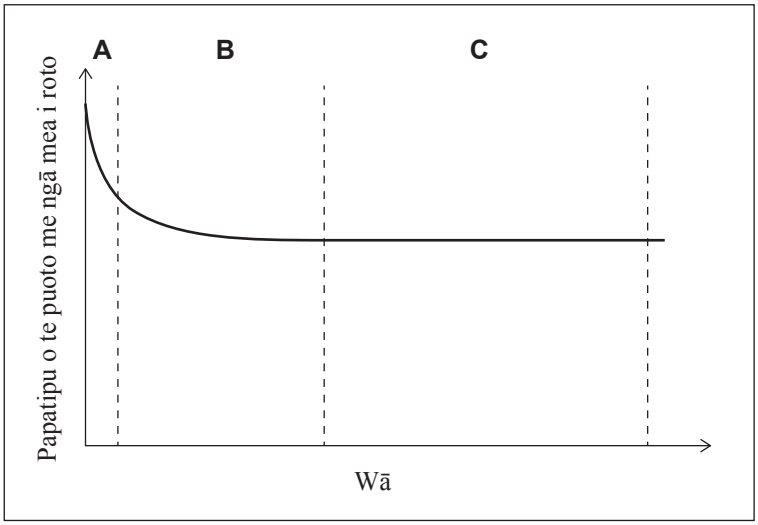
(a) Tuhia te whārite kupu ME te whārite tohu taurite mō te tauhohenga i waenga i te waikawa hauota me te konupora pākawa waro.

Whārite kupu

Whārite tohu taurite

Ko te papatipu tapeke o te puoto me ngā mea i roto ka inea i roto i te wā me te tuhi ki te kauwhata i raro.

Rerekētanga ki te papatipu i roto i te wā



(b) (i) He aha te take ka heke iho te papatipu o te puoto me ngā mea i roto i te wā o te tauhohenga?

(ii) Whakamāramatia mai kei te aha i ngā wāhanga A, B, me C o te kauwhata.

Me hono tō tuhinga ki ngā pāpātanga tauhohenga me ngā tukinga korakora.

MĀ TE KAIMĀKA ANAKE

(c) Whakamāramatia he aha i tere ake ai te tauhohenga i waenga i te konupora pākawa waro me te waikawa hauota mā te whakapiki i te **paemahana**.

Me hono tō tuhinga ki ngā pāpātanga tauhohenga me ngā tukinga korakora.

QUESTION THREE

ASSESSOR'S USE ONLY

Some magnesium carbonate powder is added to dilute nitric acid in an open conical flask. The flask is on an electronic balance, as shown in the illustration.

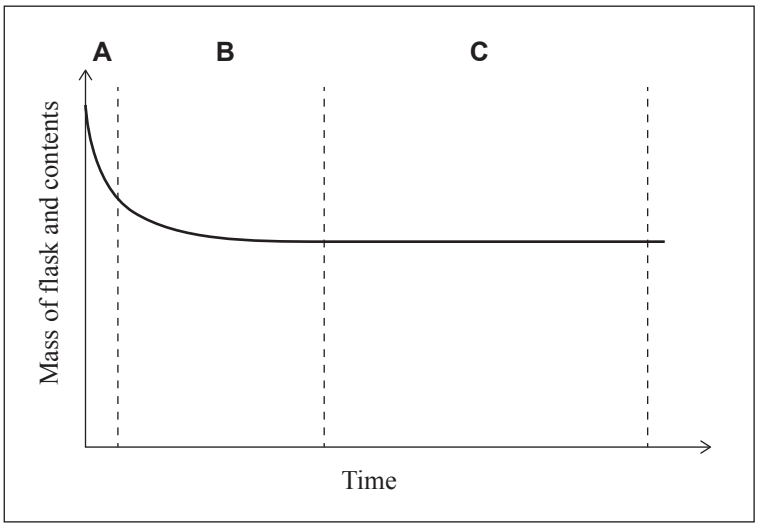
(a) Write the word equation AND the balanced symbol equation for the reaction between the nitric acid and magnesium carbonate.

Word equation

Balanced symbol equation

The total mass of the flask and its contents is measured over time and recorded on the graph below.

Change in mass over time



(b) (i) Why does the mass of the flask and its contents decrease during the reaction?

ASSESSOR'S USE ONLY

(ii) Explain what is happening in sections A, B, and C of the graph.

Link your answer to rates of reaction and particle collisions.

(c) Explain how increasing the **temperature** will make the reaction between magnesium carbonate and nitric acid faster.

Link your answer to rates of reaction and particle collisions.

He whārangi anō ki te hiahiatia.
Tuhia te (ngā) tau tūmahi mēnā e tika ana.

TAU TŪMAHI

MĀ TE KAIMĀKA ANAKE

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

QUESTION NUMBER

ASSESSOR'S USE ONLY

English translation of the wording on the front cover

Level 1 Science, 2018

90944 Demonstrate understanding of aspects of acids and bases

9.30 a.m. Thursday 15 November 2018
Credits: Four

90944M

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 room for any answer, use the extra space provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–15 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.