90934M

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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!

Te Mātauranga Matū, Kaupae 1, 2017

90934M Te whakaatu māramatanga ki ētahi āhuatanga o te tauhohe matū

9.30 i te ata Rātū 14 Whiringa-ā-rangi 2017
Whiwhinga: Whā

Paetae	Kaiaka	Kairangi
Te whakaatu māramatanga ki ngā āhuatanga o ētahi tauhohe matū.	Te whakaatu māramatanga hōhonu ki ngā āhuatanga o ētahi tauhohe matū.	Te whakaatu māramatanga matawhānui ki ngā āhuatanga o ētahi tauhohe matū.

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.

He taka pūmotu me ētahi atu rauemi tautoko kei te Pukapuka Rauemi L1–CHEMMR.

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

Tirohia mēnā e tika ana te raupapatanga o ngā whārangi 2–19 kei roto i tēnei pukapuka, ka mutu, kāore tētahi o aua whārangi i te takoto kau.

HOATU TE PUKAPUKA NEI KI TE KAIWHAKAHAERE HEI TE MUTUNGA O TE WHAKAMĀTAUTAU.

TAPEKE

MĀ TE KAIMĀKA ANAKE

TŪMAHI TUATAHI

MĀ TE KAIMĀKA ANAKE

(a) (i) Whakaotia te tūtohi i raro nei hei whakaatu i te momo tauhohenga matū ka puta.

Tauhohenga	Tauhohenga Matū	Te momo tauhohenga matū ka puta
1	Ka tukuna he wāhanga konupora ki te mura kikorangi o te muratahi.	
2	Ka raua he mehanga haitorana ōkai-rua ki te ipuipu me tētahi paura konupango hāora-rua iti noa.	
3	Ka whakawerahia he paura konukōhatu pākawa waro iti noa ki roto i tētahi ipuipu nui.	
4	Ka raua he mehanga konutea pākawa pungatara iti ki te ipuipu me te tāpiri i tētahi wāhanga mā o te konumohe.	

(ii) He aha ka kitea i te **Tauhohenga 1** me te **Tauhohenga 2**?

Tūhonohonotia ngā kitenga ki ngā momo e kitea ana i roto te tauhohenga.

Tauhohenga 1:

Tauhohenga 2:

(iii) Tuhia he whārite kupu mō te **Tauhohenga 3** ki te tapawhā i raro nei.

Te whārite kupu mō te **Tauhohenga 3**:

QUESTION ONE

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(a) (i) Complete the table below to show the type of chemical reaction occurring.

Reaction	Chemical Reaction	Type of chemical reaction occurring
1	A piece of magnesium metal is held in a blue Bunsen burner flame.	
2	Some hydrogen peroxide solution is placed in a test tube with a small amount of manganese dioxide powder.	
3	A small amount of lithium carbonate powder is heated in a boiling tube.	
4	A small volume of zinc sulfate solution is placed into a test tube and a clean piece of aluminium metal added.	

(ii) What would be observed during **Reaction 1** and **Reaction 2**?

Link the observations to species involved.

Reaction 1:

Reaction 2:

(iii) Write a word equation for **Reaction 3** in the box below.

Word equation for **Reaction 3**:

MĀ TE KAIMĀKA ANAKE

(iv) Whakaotihia te whārite tohu mō te **Tauhohenga 4** ki te tapawhā i raro nei.

Whārite tohu taurite mō te **Tauhohenga 4**:

$$ZnSO_4 \quad + \quad Al \rightarrow$$

(b) Ka taea ngā pūhui hou te hanga i roto i ngā tauhohenga matū.

Whakatauritea ngā tikanga ka taea te whakamahi hei whakarite i ngā tīpakonga rino pungatara, pungatara hāora-rua me te konukura ōkai.

I tō tuhinga, mō te whakarite i ia pūhui, me:

- tautohu te momo tauhohenga kei te puta
- whakaahua ngā kitenga ka kitea, me te tūhono i ēnei ki ngā pūmatū hohe me ngā hua
- tuhi ngā whārite tohu taurite.

Ngā whārite tohu taurite:

He wāhi anō mō tō tuhinga mō tēnei tūmahi kei te whārangi 6.

ASSESSOR'S USE ONLY

(iv) Complete the symbol equation for **Reaction 4** in the box below.

Balanced symbol equation for **Reaction 4**:

$$ZnSO_4 \quad + \quad Al \rightarrow$$

(b) New compounds can be formed during chemical reactions.

Compare and contrast the methods that could be used to prepare samples of iron sulfide, sulfur dioxide and copper oxide.

In your answer, for the preparation of each compound, you should:

- identify the type of reaction occurring
- describe any observations that would be seen, and link these to the reactants and products
- write balanced symbol equations.

Balanced symbol equations:

There is more space for your answer to this question on page 7.

MĀ TE KAIMĀKA ANAKE

ASSESSOR'S USE ONLY

TŪMAHI TUARUA

MĀ TE KAIMĀKA ANAKE

(a) Ka tauhohe te konutea ki te konumatā pākawa ota i roto i tētahi tauhohenga pei. Ka tauhohe anō te mehanga konutea pūhaumāota ki te konumatā pākawa ota; engari ehara tēnei i te tauhohenga pei.

(i) Whakaotihia ngā whārite kupu i raro mō ēnei tauhohenga e rua.

konutea + konumatā pākawa ota →

konutea pūhaumāota + konumatā pākawa ota →

(ii) Whakamāramahia te take **kāore** e whakarōpūtia te tauhohenga i waenga i te konutea pūhaumāota me te konumatā pākawa ota i te tauhohenga pei, engari he tauhohenga pei te tauhohenga i waenga i te konutea me te konumatā pākawa ota.

I tō tuhinga, me tautohu he aha te momo tauhohenga e puta ana i waenga i te konutea pūhaumāota me te konumatā pākawa ota.

QUESTION TWO

ASSESSOR'S USE ONLY

(a) Zinc metal reacts with lead nitrate in a displacement reaction. Zinc chloride solution also reacts with lead nitrate; however, this is not a displacement reaction.

(i) Complete the word equations below for these two reactions.

zinc + lead nitrate $\rightarrow$

zinc chloride + lead nitrate $\rightarrow$

(ii) Explain why the reaction between zinc chloride and lead nitrate is **not** classified as a displacement reaction, but the reaction between zinc metal and lead nitrate is.

In your answer, you should identify what type of reaction is occurring between zinc chloride and lead nitrate.

(b) Ka taea ngā konganuku te whakauru ki tētahi raupapatanga hohe e ai ki ngā tauhohenga i waenga i ngā konganuku me ngā mehanga. E whakaatu ana te tūtohi i raro i ngā hua o te rau konganuku **A**, **B**, me **C** ki ngā mehanga pākawa pungatara konganuku.

MĀ TE KAIMĀKA ANAKE

Mehanga	Konganuku **A**	Konganuku **B**	Konganuku **C**
Konganuku **A pākawa pungatara**		Kāore he tauhohenga	Kāore he tauhohenga
Konganuku **B pākawa pungatara**	Ka pei i a **B**		Ka pei i a **B**
Konganuku **C pākawa pungatara**	Ka pei i a **C**	Kāore he tauhohenga	

Tātarihia ngā kitenga hei whakarite i te raupapa o te kaha hohe o ngā konganuku e toru **A**, **B**, me **C**.

Parauhautia tō tuhinga mā te hono i ngā kitenga ki tō mōhio ki ngā tauhohenga pei.

EHARA i te mea me tautohu koe i ia konganuku.

ASSESSOR'S USE ONLY

(b) Metals can be put into a reactivity series based on the reactions between metals and solutions. The table below shows the results of putting metals **A**, **B**, and **C** into metal sulfate solutions.

Solution	Metal **A**	Metal **B**	Metal **C**
Metal **A sulfate**		No reaction	No reaction
Metal **B sulfate**	Displaces **B**		Displaces **B**
Metal **C sulfate**	Displaces **C**	No reaction	

Analyse the results to determine the order of reactivity for the three metals **A**, **B**, and **C**.

Justify your answer by linking the results to your knowledge of displacement reactions.

You do NOT need to identify each metal.

TŪMAHI TUATORU

MĀ TE KAIMĀKA ANAKE

(a) (i) Ko ēhea o ngā matū e whai ake ka memeha i roto i te wai?

Ka āhei koe ki te whakamahi i ngā ture mehamehanga kei roto i te pukapuka rauemi.

Matū	**Ka memeha i te wai? Āe/Kāo**
Konutea pākawa waro	
Konurehu waihā	
Konu-okehu pūhaumāota	

(ii) Mō ia takirua mehanga i raro, me tautohu mēnā ka puta he huatoka ina ranua ngā mehanga.

Whakaingoatia ngā huatoka ka puta.

Ngā mehanga e whakaranua ana	**Ka huatoka? Āe/Kāo**	**Ingoa o te huatoka**
konutai pākawa waro me te konupūmā pūhaumāota		
konutai waihā me te konurehu pākawa ota		
konutai pākawa pungatara me te konumatā pākawa ota		

(iii) Kōwhirihia kia KOTAHI te takirua o ngā mehanga mai i te tūtohi i runga ake **ka huatoka**, me te āta whakamārama i te tauhohenga ka puta.

I tō tuhinga, me:

- whakaahua ngā kitenga ka kitea, me te tūhono ki ngā pūmatū hohe me ngā hua kei roto
- whakamārama mai he aha i whakarōpūtia ai te tauhohenga hei tauhohenga huatoka mā te kōrero mō ngā katote i roto i ngā mehanga e rua me te huatoka ka puta.

QUESTION THREE

ASSESSOR'S USE ONLY

(a) (i) Which of the following substances are soluble in water?

You may use the solubility rules provided in the resource booklet.

Substance	**Soluble in water? Yes/No**
Zinc carbonate	
Potassium hydroxide	
Barium chloride	

(ii) For each of the pairs of solutions below, identify whether a precipitate will form when the solutions are mixed.

Name any precipitates that form.

Solution being mixed	**Precipitate forms? Yes/No**	**Name of precipitate**
sodium carbonate and calcium chloride		
sodium hydroxide and potassium nitrate		
sodium sulfate and lead nitrate		

(iii) Choose ONE of the pairs of solutions from the table above that **forms a precipitate**, and elaborate on the reaction occurring.

In your answer, you should:

- describe any observations that would be seen, and link them to the reactants and products involved
- explain why the reaction is classified as a precipitation reaction by referring to the ions in both solutions and the precipitate formed.

(b) Kua hē te tapa i ngā mehanga e toru kua whai katote tōraro.

He katote pākawa pungatara kei roto i tētahi mehanga, he katote pūhaumāota kei tētahi, he katote kahautawa kei tētahi atu.

E mōhiotia ana kāore he katote tōraro atu anō kei ngā mehanga.

Me pēhea te whakamātau i ngā mehanga kia mōhiotia ai kei ēhea o ngā mehanga ngā katote e toru: te pākawa pungatara, te pūhaumāota me te kahautawa?

I tō tuhinga, me:

- whakaahua he tikanga ka taea te whakahaere ki tētahi taiwhanga pūtaiao kura, mā te whakamahi i te konu-okehu pākawa ota me te hiriwa pākawa ota hei mehanga whakamātau
- tautohu ngā huatoka ka puta me tūhono i ēnei ki ngā kitenga ka taea
- whakamārama he pēhea te whakamahi i ngā kitenga hei tautohu i ngā mehanga
- homai ngā whārite katote taurite mō ngā huatoka KATOA ka puta.

Ka āhei koe ki te whakamahi i ngā ture mehamehanga kei roto i te pukapuka rauemi.

MĀ TE KAIMĀKA ANAKE

ASSESSOR'S USE ONLY

(b) Three solutions containing negative ions/anions have been mislabelled.

One of the solutions contains sulfate ions, one of them contains chloride ions, and one contains iodide ions.

It is known that the solutions contain no other negative ions/anions.

How could the solutions be tested to determine which solutions contain each of the three ions: sulfate, chloride, and iodide?

In your answer, you should:

- describe a method that could be carried out in a school laboratory, using barium nitrate and silver nitrate as test solutions
- identify any precipitates formed and link these to any observations that would be made
- explain how the results could be used to identify the solutions
- give balanced ionic equations for ALL precipitates formed.

You may use the solubility rules provided in the resource booklet.

MĀ TE KAIMĀKA ANAKE

ASSESSOR'S USE ONLY

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

Level 1 Chemistry, 2017

90934 Demonstrate understanding of aspects of chemical reactions

9.30 a.m. Tuesday 14 November 2017
Credits: Four

90934M

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of aspects of chemical reactions.	Demonstrate in-depth understanding of aspects of chemical reactions.	Demonstrate comprehensive understanding of aspects of chemical reactions.

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.

A periodic table and other reference material are provided in the Resource Booklet L1–CHEMR.

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 – 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.