AQA GCSE Chemistry | 8462

SPECIFICATION POINT 4.8.3.2

Metal hydroxides

Past-paper questions

Tier	**Foundation**
Question groups	**17**
Available paper years	**2007–2025**

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

4.8.3.2 Metal hydroxides

Question 01

November 2007 | CHY1A | Original Q1 | Legacy

QUESTION ONE

The equation shows how sodium reacts with water.

2Na	+	$2H_2O$	→	2NaOH	+	H_2
sodium		water		sodium hydroxide		hydrogen

Match words, **A**, **B**, **C** and **D**, with the numbers **1–4** in the sentences.

A atoms

B compounds

C elements

D molecules

In the equation:

2Na represents two . . . **1** . . . of sodium.

$2H_2O$ represents two . . . **2** . . . of water.

Water and sodium hydroxide are . . . **3** . . . .

Sodium and hydrogen are . . . **4** . . . .

4.8.3.2 Metal hydroxides

Question 02

January 2008 | CHY2F | Original Q4 | Legacy

4 The electrolysis of sodium chloride solution produces useful substances.

(a) (i) Choose a word from the box to complete the sentence.

covalent	**ionic**	**non-metallic**

Electrolysis takes place when electricity passes through ..... compounds when they are molten or in solution.

(1 mark)

(ii) Choose a word from the box to complete the sentence.

alkenes	**elements**	**salts**

During electrolysis the compound is broken down to form ..... .

(1 mark)

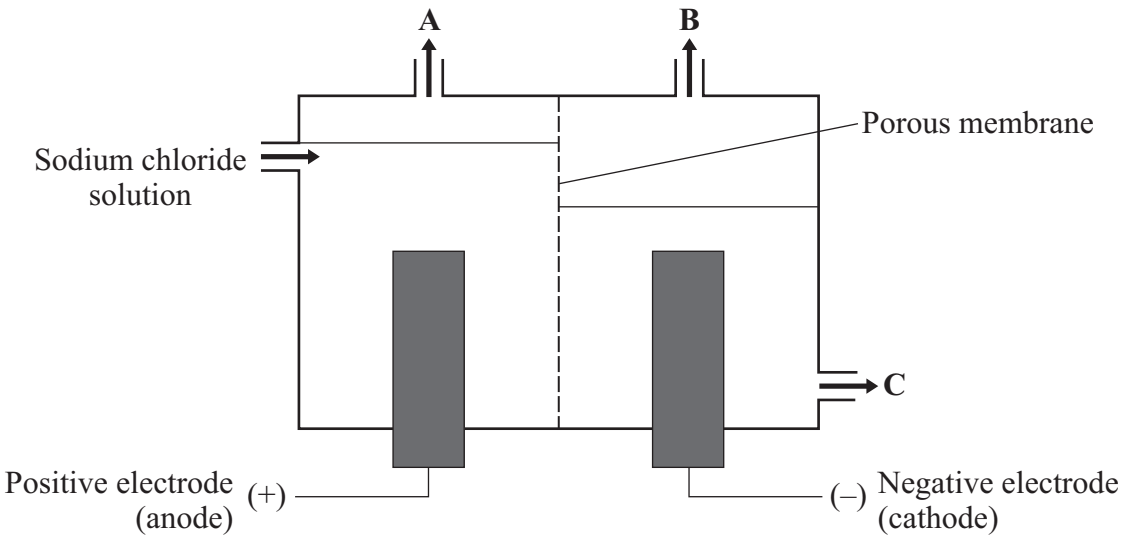
4.8.3.2 Metal hydroxides

Question 02 · continued

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(b) The table of ions on the Data Sheet may help you to answer this question.

The diagram shows an apparatus used for the electrolysis of sodium chloride solution.



Identify the products **A**, **B** and **C** on the diagram using substances from the box.

chlorine gas	**hydrogen gas**	**oxygen gas**
sodium hydroxide solution		**sodium metal**

(i) **A** is ..... .
(1 mark)

(ii) **B** is ..... .
(1 mark)

(iii) **C** is ..... .
(1 mark)

5

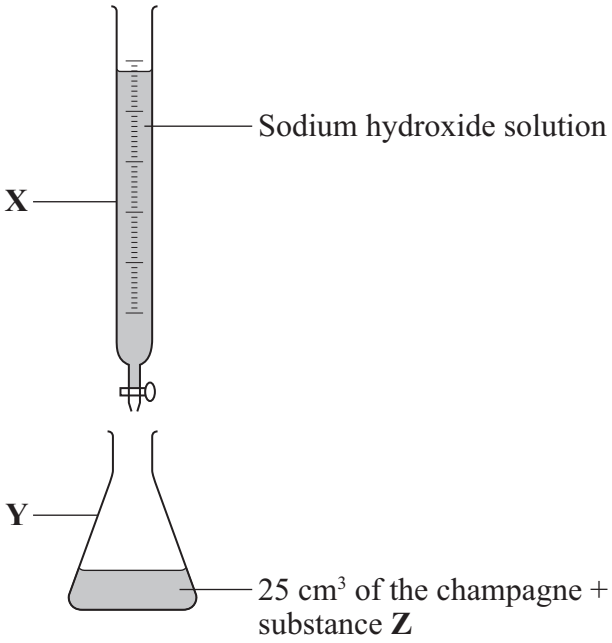
4.8.3.2 Metal hydroxides

Question 03

January 2008 | CHY3F | Original Q3 | Legacy

3 In 1916 a ship was sunk by a German submarine. The ship was carrying bottles of champagne. The wreck was discovered in 1997 and the champagne was brought to the surface and analysed.

The diagram shows the apparatus used to find the amount of acid in 25 cm^3 of the champagne.



(a) Choose the correct words from the box to name apparatus **X** and **Y**.

beaker	**burette**	**conical flask**	**measuring cylinder**

(i) Apparatus **X** is a ..... .

(1 mark)

(ii) Apparatus **Y** is a ..... .

(1 mark)

4.8.3.2 Metal hydroxides

Question 03 · continued

BLANK

(b) Sodium hydroxide solution was added to this champagne until substance **Z** showed that the reaction was complete. The volume of sodium hydroxide used was recorded. The result was used to calculate the amount of acid present.

Complete these sentences by drawing a ring around the correct answer.

(i) Substance **Z** is

a catalyst

a conductor

an indicator

.

(1 mark)

(ii) The reaction was complete when substance **Z**

changed colour

formed a gas

gave a precipitate

.

(1 mark)

(iii) The name of this method of analysis is

distillation

filtration

titration

.

(1 mark)

(c) 250 cm^3 of this champagne were found to contain 1 g of acid.

Calculate the mass of acid in 750 cm^3 of this champagne.

.....

.....

.....

Mass = ... g

(2 marks)

Question 3 continues on the next page

4.8.3.2 Metal hydroxides

Question 03 · continued

BLANK

(d) (i) Which **one** of the following ions makes champagne acidic?

Draw a ring around your answer.

chloride **hydrogen** **sodium**

(1 mark)

(ii) The acid in champagne is a *weak* acid.

Complete this sentence by drawing a ring around the correct answer.

The word *weak* means that the acid

has a low boiling point
is dilute
is partially ionised

.

(1 mark)

9

4.8.3.2 Metal hydroxides

Question 04

June 2009 | CHY2F | Original Q8 | Legacy

8 This question is about methods of treating water.

8 (a) Chlorine is used to kill microorganisms in water. When chlorine is added to water a chemical reaction takes place. The equation for this reaction is shown below.

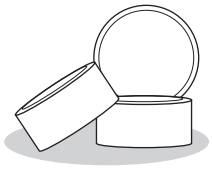
$$Cl_2(g) + H_2O(l) \rightleftharpoons 2H^+(aq) + OCl^-(aq) + Cl^-(aq)$$

An acidic solution is produced when chlorine reacts with water.

Which ion, shown in the equation, makes the solution acidic? .....

(1 mark)

8 (b) Calcium hypochlorite tablets are added to water in some swimming pools to kill microorganisms.



The formula of calcium hypochlorite is $CaCl_2O_2$

8 (b) (i) Calculate the relative formula mass (M_r) of calcium hypochlorite.

Relative atomic masses: O = 16; Cl = 35.5; Ca = 40.

.....

.....

Relative formula mass (M_r) of calcium hypochlorite = ...

(2 marks)

8 (b) (ii) Calculate the percentage by mass of chlorine in calcium hypochlorite.

.....

.....

Percentage by mass of chlorine in calcium hypochlorite = ... %

(2 marks)

4.8.3.2 Metal hydroxides

Question 04 · continued

for mark

8 (b) (iii) Calculate the mass of chlorine in a 20 g tablet of calcium hypochlorite.

.....

.....

Mass of chlorine = ... g

(1 mark)

8 (c) Waste water from some industrial processes sometimes contains harmful metal ions, such as chromium ions. These ions must be removed from the water before it can be returned to a river.
A method of removing chromium ions (Cr^{3+}) from water is represented by this equation.

$$Cr^{3+}(aq) + 3OH^{-}(aq) \rightarrow Cr(OH)_3(s)$$

8 (c) (i) What type of substance would be added to the water to provide the OH^- ions?

.....

.....

(1 mark)

8 (c) (ii) A *precipitate* is formed in this reaction.

What is a *precipitate*?

.....

.....

(1 mark)

8 (c) (iii) What method could be used to separate the precipitate from the solution?

.....

.....

(1 mark)

9

4.8.3.2 Metal hydroxides

Question 05

4 Alums are salts. They have been used since ancient times in dyeing and medicine and still have many uses today.

Three alums are shown in the table:

Name	Ions present		
Ammonium alum	NH_4^+	Al^{3+}	SO_4^{2-}
Potassium alum	K^+	Al^{3+}	SO_4^{2-}
Sodium alum	Na^+	Al^{3+}	SO_4^{2-}

A student tested these alums to show which ions were present.

4 (a) The student did a flame test on these alums. A sample of each alum was held on a wire in a colourless flame.

In (a)(i) and (a)(ii) use the correct word from the box to complete each sentence.

blue	**lilac**	**yellow**	**green**

4 (a) (i) Sodium ions give a ..... flame.

(1 mark)

4 (a) (ii) Potassium ions give a ..... flame.

(1 mark)

4 (a) (iii) Draw a ring around the correct answer to complete the sentence.

The wire used in a flame test should have a high

density.
electrical conductivity.
melting point.

(1 mark)

4.8.3.2 Metal hydroxides

Question 05 · continued

for mark

4 (b) Draw a ring around the correct word to complete the sentences.

4 (b) (i) The student tested a solution of each salt for sulfate ions (SO_4^{2-}).

The student added dilute hydrochloric acid and [barium chloride / nitric acid / silver nitrate] solution and a white [gas / liquid / solid] was formed.

(2 marks)

4 (b) (ii) The student tested a solution of each salt for aluminium ions (Al^{3+}).

The student added sodium hydroxide solution and a [green / red / white] precipitate was formed. When excess sodium hydroxide solution was added, the precipitate [boiled. / condensed. / dissolved.]

(2 marks)

7

4.8.3.2 Metal hydroxides

Question 06

June 2010 | CHY3F | Original Q4 | Legacy

4 Chemical tests can be used to detect and identify elements and compounds.

A jar of a chemical from 1870 is shown.



Copperas was a name used for iron(II) sulfate, $FeSO_4$. It does not contain any copper!

4 (a) A student tested solutions of copperas to show which ions it contained.

Draw a ring around the correct answer to complete each sentence.

4 (a) (i) The student tested for iron(II) ions, Fe^{2+}

The student added a solution of

barium chloride.

silver nitrate.

sodium hydroxide.

The colour of the precipitate formed was

green.

red.

white.

The precipitate was a

liquid.

gas.

solid.

(3 marks)

4.8.3.2 Metal hydroxides

Question 06 · continued

4 (a) (ii) The student tested for sulfate ions, SO_4^{2-}

The student added dilute hydrochloric acid and [barium chloride / silver nitrate / sodium hydroxide] solution.

The colour of the precipitate formed was [green. / red. / white.]

Sulfuric acid (H_2SO_4) should **not** be used instead of hydrochloric acid (HCl) when testing for sulfate ions. This is because sulfuric acid contains [chloride ions, Cl^- / nitrate ions, NO_3^- / sulfate ions, SO_4^{2-}]

(3 marks)

4 (b) A flame test can be used to identify the metal ions in a compound.

How do you carry out a flame test?

.....

.....

(1 mark)

4 (c) The elements in a compound can also be detected and identified using instrumental methods of analysis.

State **one** advantage of using instrumental methods compared with chemical tests.

.....

.....

(1 mark)

8

4.8.3.2 Metal hydroxides

Question 07

2 Read the information in the box and then answer the questions.

> Seidlitz Powder is a medicine.
>
> Seidlitz Powder comes as two powders. One powder is wrapped in white paper and contains tartaric acid. The other powder is wrapped in blue paper and contains sodium hydrogencarbonate.
>
> The contents of the blue paper are dissolved in water and the contents of the white paper are added. This causes a reaction that produces carbon dioxide gas. The mixture is safe to drink when the reaction stops.

2 (a) Suggest why Seidlitz Powder comes as two separate powders.

.....

(1 mark)

2 (b) The reaction produces carbon dioxide gas.

2 (b) (i) What would you see during the reaction?

.....

(1 mark)

2 (b) (ii) Which state symbol in a chemical equation shows that carbon dioxide is a gas?

Draw a ring around **one** answer.

(s) **(l)** **(aq)** **(g)**

(1 mark)

2 (b) (iii) Draw a ring around the correct answer to complete the sentence.

Carbon dioxide can be identified because it turns [limescale / limestone / limewater] milky.

(1 mark)

4.8.3.2 Metal hydroxides

Question 07 · continued

2 (c) Sodium hydrogencarbonate contains sodium ions. Sodium ions can be identified by flame tests.

Draw a ring around the correct answer to complete the sentence.

Sodium ions give a [blue / red / yellow] flame.

(1 mark)

2 (d) Some Seidlitz Powder was bought on the Internet for £5. However, when tested, it was found to be only magnesium sulfate, worth a few pence.

Draw a ring around the correct answer to complete each sentence.

2 (d) (i) The test for sulfate ions uses [barium chloride / silver nitrate / sodium hydroxide] solution.

(1 mark)

2 (d) (ii) A positive test for sulfate ions produces a [blue / red / white] precipitate.

(1 mark)

2 (d) (iii) Suggest **one** disadvantage of buying medicines on the Internet.

.....

.....

(1 mark)

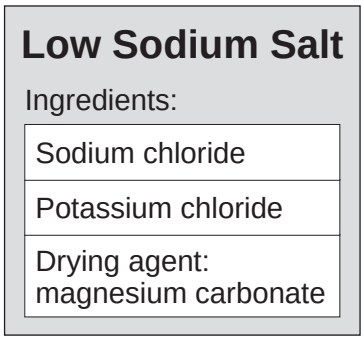
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4.8.3.2 Metal hydroxides

Question 08

June 2013 | CH3FP | Original Q2 | Legacy

2 Low sodium salt is used on food. This label is from a packet of low sodium salt.



A chemist tests the low sodium salt for the substances on the label.

2 (a) The chemist tests for sodium ions and potassium ions using a flame test.

Draw a ring around the correct answer to complete each sentence.

2 (a) (i) In a flame test, sodium ions produce a [lilac / red / yellow] colour.

(1 mark)

2 (a) (ii) In a flame test, potassium ions produce a [lilac / red / yellow] colour.

(1 mark)

4.8.3.2 Metal hydroxides

Question 08 · continued

2 (b) The chemist added hydrochloric acid to low sodium salt. Carbon dioxide gas was produced.

Describe the test for carbon dioxide and give the result of the test.

.....

.....

.....

.....

(2 marks)

2 (c) The chemist made a solution of low sodium salt.

2 (c) (i) Tick (✓) **one** box to show the chemical used to test for chloride ions.

	Tick (✓)
Barium chloride solution	
Silver nitrate solution	
Sodium sulfate solution	

(1 mark)

2 (c) (ii) Sodium hydroxide solution is used to test for magnesium ions.

Draw a ring around the colour of precipitate produced by this test.

brown **green** **white**

(1 mark)

6

Turn to page 7 for the next question

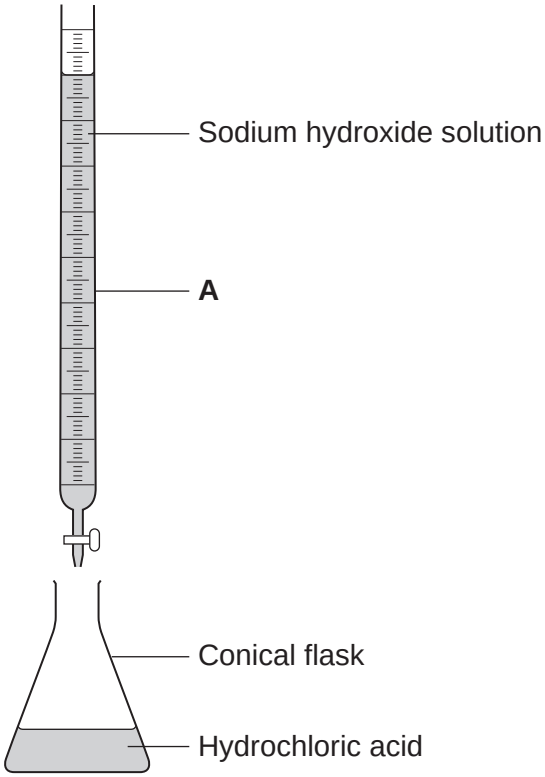
4.8.3.2 Metal hydroxides

Question 09

June 2014 | CH3FP | Original Q3 | Legacy

3 A student used the apparatus in **Figure 2** to do a titration.

Figure 2



3 (a) (i) What is the name of the piece of apparatus labelled **A**?

Draw a ring around the correct answer.

[1 mark]

burette **measuring cylinder** **test tube**

3 (a) (ii) What should the student add to the acid in the conical flask?

Draw a ring around the correct answer.

[1 mark]

catalyst **indicator** **water**

3 (a) (iii) What would the student see when the end point of the titration has been reached?

[1 mark]

.....

4.8.3.2 Metal hydroxides

Question 09 · continued

3 (b) The student does the titration three times.

3 (b) (i) State **one** variable that the student needs to keep the same to make it a fair test.

[1 mark]

.....

3 (b) (ii) The student's results are shown in **Table 1**.

Table 1

Titration	Volume of sodium hydroxide solution added in cm^3
1	22.40
2	22.20
3	22.30

Calculate the mean volume of sodium hydroxide solution added.

[1 mark]

..... cm^3

5

4.8.3.2 Metal hydroxides

Question 10

6 (a) The colours of fireworks are produced by chemicals.

Figure 8



Three of these chemicals are lithium sulfate, potassium chloride and sodium nitrate.

6 (a) (i) A student wants to carry out flame tests on these three chemicals.

Describe how to carry out a flame test.

[2 marks]

.....

.....

.....

.....

6 (a) (ii) Draw **one** line from each chemical to the correct flame colour.

The first one has been done for you.

[2 marks]

Chemical	Flame colour
lithium sulfate	crimson
potassium chloride	
sodium nitrate	
	green
	yellow
	lilac

4.8.3.2 Metal hydroxides

Question 10 · continued

6 (a) (iii) Dilute nitric acid and silver nitrate solution are added to solutions of the three chemicals.

A white precipitate forms in one of the solutions.

Which chemical produces the white precipitate?

[1 mark]

.....

6 (b) The student tests a fourth chemical, **X**.

6 (b) (i) The student adds sodium hydroxide solution to a solution of chemical **X**.

A blue precipitate is formed.

Which metal ion is in chemical **X**?

[1 mark]

.....

6 (b) (ii) The student adds dilute hydrochloric acid to a solution of chemical **X** and then adds barium chloride solution.

A white precipitate is formed.

Which negative ion is in chemical **X**?

Draw a ring around the correct answer.

[1 mark]

chloride **nitrate** **sulfate**

7

4.8.3.2 Metal hydroxides

Question 11

June 2015 | CH3FP | Original Q6 | Legacy

6 This question is about chemical tests.

6 (a) Solutions of copper(II) ions and iron(III) ions produce coloured precipitates with sodium hydroxide solution.

Draw **one** line from each metal ion to the colour of the precipitate it produces.

[2 marks]

Metal ion	Colour of precipitate
Copper(II) (Cu^{2+})	Blue
	Brown
	Green
Iron(III) (Fe^{3+})	White

6 (b) Sodium hydroxide solution was added to a solution containing ions of a metal.

A white precipitate was produced. The white precipitate dissolved in excess sodium hydroxide solution.

Use the correct answer from the box to complete the sentence.

[1 mark]

aluminium	**magnesium**	**potassium**

The ions in the solution were ions of ..... .

4.8.3.2 Metal hydroxides

Question 11 · continued

6 (c) Low sodium salt contains sodium chloride and potassium chloride.

A student used a flame test on low sodium salt.

6 (c) (i) What is the colour produced by sodium ions in a flame test?

[1 mark]

.....

6 (c) (ii) What is the colour produced by potassium ions in a flame test?

[1 mark]

.....

6 (c) (iii) Why is it **not** possible to tell from the flame test that both ions are present in low sodium salt?

[1 mark]

.....

.....

6

4.8.3.2 Metal hydroxides

Question 12

June 2015 | CH3FP | Original Q7 | Legacy

7 Some pollutants cause acid rain.

A student tested 25.0 cm^3 samples of three types of rainwater, **P**, **Q** and **R**.
The student titrated the samples with sodium hydroxide solution (an alkali).

The student recorded the volume of sodium hydroxide solution needed to neutralise the rainwater. The student's results are shown in **Table 1**.

Table 1

	Volume of sodium hydroxide needed to neutralise the rainwater in cm^3				
Type of rainwater	**Titration 1**	**Titration 2**	**Titration 3**	**Titration 4**	**Mean value**
P	18.0	15.5	14.5	15.0	15.0
Q	13.0	10.0	11.0	10.5	10.5
R	23.0	19.5	18.5	19.0	19.0

7 (a) (i) The student calculated the mean value for rainwater **R** as 19.0 cm^3.

Show how the student calculated the mean value for rainwater **R**.

[2 marks]

.....

.....

.....

.....

7 (a) (ii) Write down **P**, **Q** and **R** in order of their acidity.

[2 marks]

Most acidic .....

.....

Least acidic .....

4.8.3.2 Metal hydroxides

Question 12 · continued

7 (b) A second student repeated the experiment and recorded the results in **Table 2**.

Table 2

	Volume of sodium hydroxide needed to neutralise the rainwater in cm^3	
Type of rainwater	**Titration 1**	**Titration 2**
P	17	15
Q	11	9
R	20	18

Use **Table 1** and **Table 2** to suggest **two** improvements the second student could make to obtain more accurate results.

[2 marks]

.....

.....

.....

.....

7 (c) The results of the two students show that the experiment is reproducible.

Give the reason why.

[1 mark]

.....

.....

7

4.8.3.2 Metal hydroxides

Question 13

June 2019 | 8462/2F | Original Q1

0 1 This question is about drinking water.

There are two main steps in producing drinking water from fresh water.

0 1 . 1 Draw **one** line from each step to the reason for the step.

[2 marks]

Step	Reason for step
	Desalination
Filtration	Improve taste
	Increase pH
Sterilisation	Kill bacteria
	Remove solids

0 1 . 2 Which **two** substances are used to sterilise fresh water?

[2 marks]

Tick (✓) **two** boxes.

- Ammonia ☐
- Chlorine ☐
- Hydrogen ☐
- Nitrogen ☐
- Ozone ☐

4.8.3.2 Metal hydroxides

Question 13 · continued

A large amount of aluminium sulfate was accidentally added to the drinking water supply at a water treatment works.

0 1 . 3 Scientists tested a sample of the drinking water to show that it contained dissolved solids.

Which **two** methods show the presence of dissolved solids in the sample of drinking water?

[2 marks]

Tick (✓) **two** boxes.

- Add damp litmus paper to the sample. ☐
- Evaporate all water from the sample. ☐
- Measure the sample's boiling point. ☐
- Test the sample with a glowing splint. ☐

4.8.3.2 Metal hydroxides

Question 13 · continued

0 1 . 4 Scientists tested two water samples from the drinking water supply.

The scientists tested one sample for aluminium ions and the other sample for sulfate ions.

Draw **one** line from each ion to the compound needed to identify the ion.

[2 marks]

Ion	Compound needed to identify ion
	Barium chloride
Aluminium ion	Copper sulfate
	Silver nitrate
Sulfate ion	Sodium hydroxide
	Sulfuric acid

0 1 . 5 How could pure water be produced from drinking water that contained dissolved solids?

[1 mark]

Tick (✓) **one** box.

- Chromatography ☐
- Cracking ☐
- Distillation ☐
- Sedimentation ☐

9

4.8.3.2 Metal hydroxides

Question 14

November 2020 | 8462/2F | Original Q8

0 8 This question is about chemical analysis.

A student tested copper sulfate solution and calcium iodide solution using flame tests.

This is the method used.

1. Dip a metal wire in copper sulfate solution.

2. Put the metal wire in a blue Bunsen burner flame.

3. Record the flame colour produced.

4. Repeat steps 1 to 3 using the same metal wire but using calcium iodide solution.

0 8 . 1 What flame colour is produced by copper sulfate solution?

[1 mark]

0 8 . 2 Calcium compounds produce an orange-red flame colour.

The student left out an important step before reusing the metal wire.

The student's method did **not** produce a distinct orange-red flame colour using calcium iodide solution.

Explain why.

[2 marks]

4.8.3.2 Metal hydroxides

Question 14 · continued

0 8 . 3 The student added sodium hydroxide solution to:

- copper sulfate solution
- calcium iodide solution.

Give the results of the tests.

[2 marks]

Copper sulfate solution _____

_____

Calcium iodide solution _____

_____

0 8 . 4 To test for sulfate ions the student added dilute hydrochloric acid to copper sulfate solution.

Name the solution that would show the presence of sulfate ions when added to this mixture.

[1 mark]

_____

0 8 . 5 To test for iodide ions the student added dilute nitric acid to calcium iodide solution.

Name the solution that would show the presence of iodide ions when added to this mixture.

Give the result of the test.

[2 marks]

Solution _____

Result _____

_____

8

4.8.3.2 Metal hydroxides

Question 15

November 2021 | 8462/2F | Original Q6

0 6 Potash alum is a chemical compound.

Potash alum contains potassium ions, aluminium ions and sulfate ions.

0 6 . 1 Which **two** methods can be used to identify the presence of potassium ions in potash alum solution?

[2 marks]

Tick (✓) **two** boxes.

- Flame emission spectroscopy ☐
- Flame test ☐
- Measuring boiling point of solution ☐
- Paper chromatography ☐
- Using litmus paper ☐

0 6 . 2 Sodium hydroxide solution is used to test for some metal ions.

Sodium hydroxide solution is added to a solution of potash alum until a precipitate forms.

Complete the sentence.

Choose the answer from the box.

[1 mark]

blue	**brown**	**green**	**white**

The colour of the precipitate formed is _____.

4.8.3.2 Metal hydroxides

Question 15 · continued

0 6 . 3 Complete the sentence.

Choose the answer from the box.

[1 mark]

barium chloride solution	**limewater**
red litmus paper	**silver nitrate solution**

Sulfate ions can be identified using dilute hydrochloric acid

and _____.

0 6 . 4 A solution of potash alum has a concentration of 258 g/dm^3

Calculate the mass of potash alum needed to make 800 cm^3 of a solution of potash alum with a concentration of 258 g/dm^3

Give your answer to 3 significant figures.

[4 marks]

Mass (3 significant figures) = _____ g

8

4.8.3.2 Metal hydroxides

Question 16

June 2022 | 8462/2F | Original Q1

0 1 This question is about water.

A student investigated pure water.

The student measured:

- the boiling point of pure water
- the pH of pure water.

0 1 . 1 Complete the sentences.

Choose answers from the box.

[2 marks]

0	**4**	**7**	**10**	**25**	**100**

Pure water has a boiling point of _____ °C.

Pure water has a pH of _____.

0 1 . 2 What could the student use to measure the pH of pure water?

[1 mark]

_____

_____

4.8.3.2 Metal hydroxides

Question 16 · continued

A different student investigated sea water.

Sea water contains dissolved solids.

This is the method used.

1. Measure a 50 cm^3 sample of the sea water.
2. Heat the sample until all the water has evaporated.
3. Measure the mass of solid that remains.
4. Repeat steps 1 to 3 three more times.

0 1 . 3 Which **two** pieces of equipment were needed in this investigation?

[2 marks]

Tick (✓) **two** boxes.

- Balance ☐
- Measuring cylinder ☐
- Ruler ☐
- Thermometer ☐
- Timer ☐

Question 1 continues on the next page

4.8.3.2 Metal hydroxides

Question 16 · continued

0 1 . 4 **Table 1** shows the results.

Table 1

Sea water sample	Mass of solid that remained in grams
1	1.73
2	1.70
3	1.75
4	1.78

Calculate the mean mass of solid that remained.

[2 marks]

Mean mass = _____ g

0 1 . 5 A 50 cm^3 sample of sea water from a different source contained 1.50 g of dissolved solids.

Calculate the mass of dissolved solids in 1000 cm^3 of this sea water.

[2 marks]

Mass = _____ g

4.8.3.2 Metal hydroxides

Question 16 · continued

Sodium chloride is a dissolved solid in sea water.

Sodium chloride contains sodium ions and chloride ions.

0 1 . 6 Complete the sentence.

Choose the answer from the box.

[1 mark]

crimson	lilac	yellow

The student tested sea water for sodium ions using a flame test.

The colour of the flame was _____.

0 1 . 7 Complete the sentence.

Choose the answer from the box.

[1 mark]

brown	green	white

The student tested sea water for chloride ions by adding nitric acid and silver nitrate solution.

The colour of the precipitate formed was _____.

11

4.8.3.2 Metal hydroxides

Question 17

June 2025 | 8462/2F | Original Q1

0 1 This question is about chemical analysis.

Some metal ions can be identified using a flame test.

0 1 . 1 Describe how to do a flame test using a metal wire and a Bunsen burner.

[2 marks]

0 1 . 2 Draw **one** line from each metal ion to the flame colour produced by the metal ion.

[2 marks]

Metal ion	Flame colour
Lithium	Crimson
Potassium	Green
	Lilac
	Orange-red
	Yellow

4.8.3.2 Metal hydroxides

Question 17 · continued

0 1 . 3 Which gas is produced when carbonates are reacted with dilute acids?

[1 mark]

Tick (✓) **one** box.

Carbon dioxide ☐

Hydrogen ☐

Oxygen ☐

0 1 . 4 Which solution is used to test for sulfate ions?

[1 mark]

Tick (✓) **one** box.

Barium chloride solution ☐

Magnesium chloride solution ☐

Sodium chloride solution ☐

Precipitates are used to identify some ions.

0 1 . 5 Complete the sentence.

Choose the answer from the box.

[1 mark]

gas	**liquid**	**solid**

A precipitate is a _____.

4.8.3.2 Metal hydroxides

Question 17 · continued

0 1 . 6 Some metal ions in solution can be identified by adding sodium hydroxide solution.

Draw **one** line from each metal ion to the colour of the precipitate produced by the metal ion.

[2 marks]

Metal ion	Colour of precipitate
Copper(II)	Blue
	Brown
Magnesium	Green
	White
	Yellow

0 1 . 7 Dilute nitric acid and silver nitrate solution were added to a solution containing iodide ions.

Complete the sentence.

Choose the answer from the box.

[1 mark]

brown	**green**	**yellow**

The colour of the precipitate produced is _____.

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