AQA GCSE Chemistry | 8462

SPECIFICATION POINT 4.8.2.4

Test for chlorine

Past-paper questions

Tier	**Higher**
Question groups	**3**
Available paper years	**2010–2025**

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.

4.8.2.4 Test for chlorine

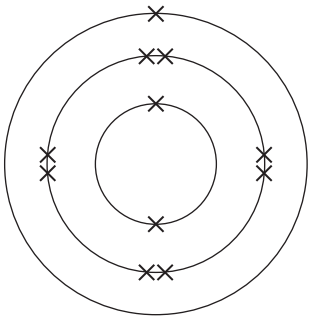
Question 01

1 Sodium chloride is a raw material.

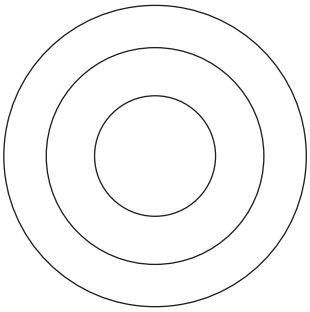
1 (a) The electronic structure of a sodium atom is shown below.

Complete the diagram for the electronic structure of a chlorine atom. A chlorine atom has 17 electrons.

Sodium atom



Chlorine atom



(1 mark)

1 (b) When sodium and chlorine react to form sodium chloride they form sodium ions (Na^+) and chloride ions (Cl^-).

How does a sodium atom change into a sodium ion?

.....

.....

.....

.....

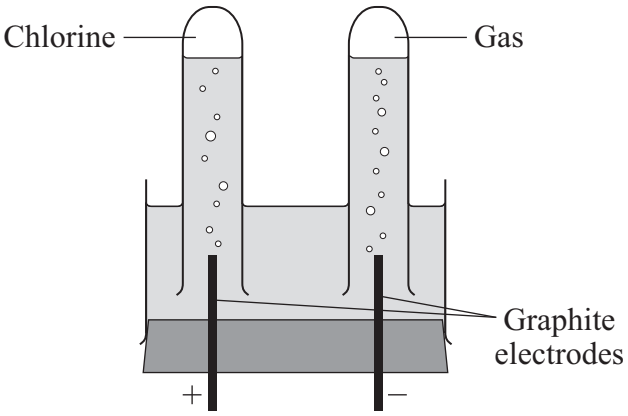
(2 marks)

4.8.2.4 Test for chlorine

Question 01 · continued

for mark

1 (c) The diagram shows apparatus used in a school laboratory for the electrolysis of sodium chloride solution.



The solution contains sodium ions (Na^+), chloride ions (Cl^-), hydrogen ions (H^+) and hydroxide ions (OH^-).

1 (c) (i) Why do chloride ions move to the positive electrode?

.....

(1 mark)

1 (c) (ii) Name the gas formed at the negative electrode.

.....

(1 mark)

Question 1 continues on the next page

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for mark

1 (d) Chlorine and chlorine compounds are used to bleach wood pulp that is used to make paper.

The article below is from a newspaper.

> Local people have been protesting outside a paper factory. They say:
> 'We want the company to stop using chlorine compounds. Chlorine compounds release poisons into the environment. The company should use safer compounds.'
>
> The company replied:
> 'Chlorine has been used safely for many years to treat drinking water. Only tiny amounts of chlorine are released, which cause no harm. Using other compounds will be more expensive and may put us out of business.'

1 (d) (i) Why are some local people worried about the use of chlorine compounds?

.....

.....

(1 mark)

1 (d) (ii) Why might other local people want the company to continue to use chlorine compounds?

.....

.....

(1 mark)

1 (d) (iii) It is decided to have an enquiry.
Why should this be done by independent scientists?

.....

.....

(1 mark)

8

4.8.2.4 Test for chlorine

Question 02

June 2022 | 8462/2H | Original Q5

0 5 This question is about water.

0 5 . 1 Sewage is waste water.

Sewage contains organic matter.

Describe how sewage is treated to remove organic matter.

[4 marks]

Question 5 continues on the next page

4.8.2.4 Test for chlorine

Question 02 · continued

Sea water and ground water are treated to make them potable.

Table 5 shows information about the composition and treatment of sea water and of ground water.

Table 5

	Sea water	Ground water
Concentration of sodium ions and chloride ions before **Process 1**	Na^+ : 0.5 mol/dm^3 Cl^- : 0.5 mol/dm^3	Na^+ : 0.001 mol/dm^3 Cl^- : 0.001 mol/dm^3
Process 1	Reverse osmosis	Filtration
Concentration of sodium ions and chloride ions after **Process 1**	**X**	Na^+ : 0.001 mol/dm^3 Cl^- : 0.001 mol/dm^3
Process 2	Add ozone	Expose to ultraviolet light

0 5 . 2 Sea water is desalinated during **Process 1**.

Which pair of concentrations could represent **X** in **Table 5**?

[1 mark]

Tick (✓) **one** box.

Na^+ : 0.003 mol/dm^3 Cl^- : 0.003 mol/dm^3 ☐

Na^+ : 0.003 mol/dm^3 Cl^- : 0.5 mol/dm^3 ☐

Na^+ : 0.5 mol/dm^3 Cl^- : 0.003 mol/dm^3 ☐

Na^+ : 0.5 mol/dm^3 Cl^- : 0.5 mol/dm^3 ☐

0 5 . 3 Explain why the concentrations of sodium ions and of chloride ions in the ground water in **Table 5** are unchanged by **Process 1**.

[2 marks]

4.8.2.4 Test for chlorine

Question 02 · continued

0 5 . 4 Explain why the ground water in **Table 5** requires **Process 2** before the water is safe to drink.

[2 marks]

0 5 . 5 After treatment the ground water in **Table 5** is sold by a company as pure water.

The ground water in **Table 5** is not chemically pure because the water contains sodium ions and chloride ions.

Suggest what the company means by 'pure'.

[1 mark]

0 5 . 6 Chlorine is also used to treat some ground water.

Describe the test for chlorine gas.

Give the result of the test.

[2 marks]

Test

Result

12

4.8.2.4 Test for chlorine

Question 03

0 5 This question is about unsaturated hydrocarbons.

0 5 . 1 **Table 6** shows the boiling points of some unsaturated hydrocarbons.

Table 6

Formula of unsaturated hydrocarbon	Boiling point in °C
C_2H_4	– 104
C_3H_6	– 47
C_4H_8	**X**
C_5H_{10}	30
C_6H_{12}	63

Estimate the boiling point **X** in **Table 6**.

[1 mark]

_____ °C

0 5 . 2 C_2H_4 reacts with water vapour (steam).

Name the compound produced when C_2H_4 reacts with water vapour.

[1 mark]

_____

Question 5 continues on the next page

4.8.2.4 Test for chlorine

Question 03 · continued

C_4H_8 reacts with chlorine (Cl_2).

0 5 . 3 Describe the test for chlorine.

Give the result of the test.

[2 marks]

Test _____

_____

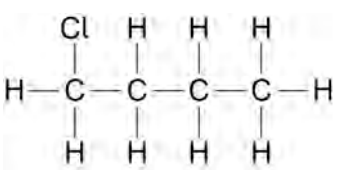
Result _____

_____

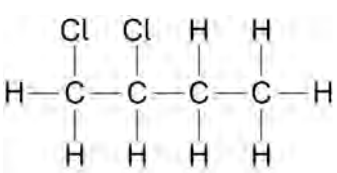
0 5 . 4 Which is the displayed formula of the organic compound produced when C_4H_8 reacts with chlorine?

[1 mark]

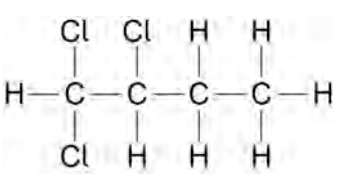
Tick (✓) **one** box.



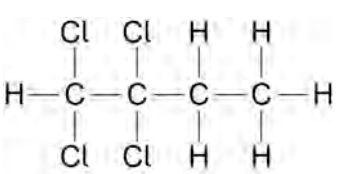
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4.8.2.4 Test for chlorine

Question 03 · continued

0 5 . 5 Name the unsaturated hydrocarbon with the formula C_3H_6

[1 mark]

0 5 . 6 Why does C_3H_6 tend to burn in air with a smoky flame?

[1 mark]

0 5 . 7 C_3H_6 is a gas at room temperature and pressure.

Calculate the volume of 2.1 g of C_3H_6 at room temperature and pressure.

Give your answer in cm^3.

The volume of one mole of any gas at room temperature and pressure is 24 dm^3.

Relative atomic masses (A_r): H = 1 C = 12

[5 marks]

Volume = _____ cm^3

12