

GCSE Combined Science: Trilogy

Worksheet: Test for chlorine

TIME 30 min	TOTAL 26 marks	CALCULATOR Allowed	DIFFICULTY Easy, Medium
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Topics: Test for chlorine

NAME	CLASS	DATE
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- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Answer all questions in the spaces provided.
- In all calculations, show clearly how you work out your answer.
- The marks for questions are shown in brackets.

0 1

Damp blue litmus paper is placed in a gas jar of chlorine.

0 1 . 1

What colour change is observed?

Tick (✓) **one** box.

Stays blue

☐

Turns red and stays red

☐

Turns red then is bleached white

☐

Turns green

☐

[1 mark]

0 2

A student wants to find out whether a gas is chlorine.

0 2 . 1

Name the type of paper used in the test for chlorine.

.....

.....

.....

[1 mark]

0 2 . 2

State what happens to the paper if the gas is chlorine.

.....

.....

[1 mark]

0 2 . 3

Suggest why this test should be done in a fume cupboard.

.....

.....

[1 mark]

0 3

0 3 . 1

Which test result shows that a gas is chlorine?

Tick (✓) **one** box.

Damp litmus paper is bleached

☐

Damp red litmus paper turns blue

☐

A glowing splint relights

☐

Limewater turns milky

☐

[1 mark]

0 3 . 2

Why must the litmus paper be damp?

.....

.....

[1 mark]

0 3 . 3

Give **one** safety precaution a student should take when testing for chlorine.

.....

.....

[1 mark]

0 4

A student holds damp blue litmus paper in three unknown gases, D, E and F. Table 1 shows the results.

Table 1

Gas	Result
D	litmus turns red
E	litmus turns red then is bleached white
F	litmus is unaffected

0 4 . 1

Which gas, D, E or F, is chlorine?
Give a reason for your answer.

.....

.....

.....

.....

[2 marks]

0 4 . 2

Suggest what type of gas D could be, and explain why the litmus result alone cannot identify it precisely.

.....

.....

.....

.....

[2 marks]

.....

0 5

Chlorine is used to treat the water in swimming pools. A pool technician thinks that chlorine gas may be leaking from a store of pool chemicals.

0 5 . 1

Describe how the technician could test the air near the store for chlorine, and give the result if chlorine is present.

.....

.....

.....

.....

[2 marks]

0 5 . 2

Explain why chlorine is used to treat the water in swimming pools.

.....

.....

[1 mark]

0 5 . 3

Suggest why the technician should not try to find the leak by smelling the air.

.....

.....

[1 mark]

0 6

Some bleaches contain sodium chlorate(I). The label on one bottle of bleach warns that the bleach must not be mixed with acidic cleaning products because a toxic gas is produced.

0 6 . 1

A scientist mixed a small amount of the bleach with dilute hydrochloric acid in a fume cupboard. The scientist thought the gas produced was chlorine. Describe a test the scientist could use to confirm this. Give the result.

.....

.....

.....

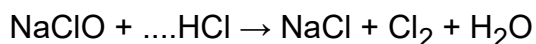
.....

[2 marks]

0 6 . 2

Sodium chlorate(I) has the formula NaClO.

Balance the equation for the reaction between sodium chlorate(I) and hydrochloric acid.



.....

.....

[1 mark]

0 6 . 3

Suggest why the scientist did **not** try to identify the gas by its smell.

.....

.....

[1 mark]

0 7

A student thinks a gas produced in a reaction might be chlorine.

0 7 . 1

Describe how the student should carry out the test for chlorine, including a safety precaution.

.....

.....

.....

.....

.....

.....

[3 marks]

0 7 . 2

Suggest why the litmus paper must be damp rather than dry for this test.

.....

.....

[1 mark]

0 8

A student electrolysed sodium chloride solution. A pale green gas was produced at the positive electrode.

0 8 . 1

Describe the test to show that the gas is chlorine. Give the result.

.....

.....

.....

.....

[2 marks]

0 8 . 2

Carbon dioxide is also an acidic gas.

Suggest why carbon dioxide does **not** give the same result as chlorine in this test.

.....

.....

[1 mark]

END OF QUESTIONS

Original practice questions written to match the specification. Not produced by, affiliated with or endorsed by AQA.

Mark scheme

GCSE Combined Science: Trilogy · Worksheet: Test for chlorine · 26 marks

Question 1 (1 mark)

01.1 [1 mark]

Correct: Turns red then is bleached white

Question 2 (3 marks)

02.1 [1 mark]

Answer: (damp) litmus paper

- (damp) litmus paper (1)
-

02.2 [1 mark]

- it is bleached / turns white (1)

Notes: Allow: blue litmus turns red and then white.

02.3 [1 mark]

- chlorine is toxic / poisonous (1)
-
-

Question 3 (3 marks)

03.1 [1 mark]

Correct: Damp litmus paper is bleached

03.2 [1 mark]

- so that the chlorine can dissolve in / react with the water (to bleach the paper) (1)
-

03.3 [1 mark]

- use a fume cupboard / well-ventilated room (because chlorine is toxic) (1)

Notes: Ignore 'wear goggles' or 'wear gloves'.

Question 4 (4 marks)

04.1 [2 marks]

Answer: E

- E (1)
- only E bleaches the litmus paper; D only turns it red and F has no effect (1)

04.2 [2 marks]

- D is probably an acidic gas (e.g. carbon dioxide, sulfur dioxide or hydrogen chloride), because acidic gases turn damp blue litmus paper red without bleaching it (1)
- the litmus test only shows that a gas is acidic; further tests (e.g. limewater) are needed to identify exactly which acidic gas it is (1)

Question 5 (4 marks)

05.1 [2 marks]

- hold damp (blue) litmus paper in the air near the store (1)
- the paper is bleached / turns white (1)

Notes: Allow: turns red and then white.

05.2 [1 mark]

- to kill microorganisms / bacteria (to sterilise the water) (1)

05.3 [1 mark]

- chlorine is toxic / harmful to breathe in (1)
-

Question 6 (4 marks)

06.1 [2 marks]

- hold damp litmus paper in the gas (1)
- the paper is bleached / turns white (1)

Notes: The first mark needs damp (moist / wet) litmus paper. Allow 'blue litmus paper turns red and then white' for the second mark.

06.2 [1 mark]

Answer: $\text{NaClO} + 2\text{HCl} \rightarrow \text{NaCl} + \text{Cl}_2 + \text{H}_2\text{O}$

- 2 (HCl) (1)

06.3 [1 mark]

- chlorine is toxic (so must not be inhaled) (1)

Question 7 (4 marks)

07.1 [3 marks]

- work in a fume cupboard or a well-ventilated area, since chlorine is toxic (1)
- hold a piece of damp blue litmus paper (using tongs, not fingers) in the gas (1)
- the paper turns red and then is bleached white if the gas is chlorine (1)

Notes: For the third mark, allow 'bleached / turns white' without the red stage.

07.2 [1 mark]

- chlorine needs to dissolve in the water on the paper (forming an acidic, bleaching solution) before it can bleach the litmus dye (1)

Question 8 (3 marks)

08.1 [2 marks]

- hold damp litmus paper in the gas (1)
- the paper is bleached / turns white (1)

08.2 [1 mark]

- carbon dioxide does not bleach the (litmus) paper / carbon dioxide would only turn (blue) litmus paper red (1)

Notes: Allow 'only chlorine is a bleaching agent'.