

Chemical analysis – GCSE Chemistry

1. No.1

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
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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]

A different student investigated sea water.

Sea water contains dissolved solids.

This is the method used.

1. Measure a 50 cm³ 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
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 Which **two** pieces of equipment were needed in this investigation?

[2 marks]

Tick (✓) **two** boxes.

Balance

☐

Measuring cylinder

☐

Ruler

☐

Thermometer

☐

Timer

☐

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 cm³ sample of sea water from a different source contained 1.50 g of dissolved solids.

Calculate the mass of dissolved solids in 1000 cm³ of this sea water.

[2 marks]

Mass = _____ g

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

The colour of the precipitate formed was _____.

2. No.8

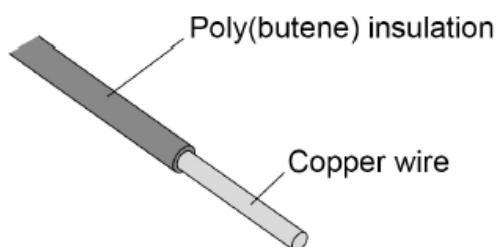
0 8

This question is about copper wire and copper compounds.

Copper is used to make electrical wires.

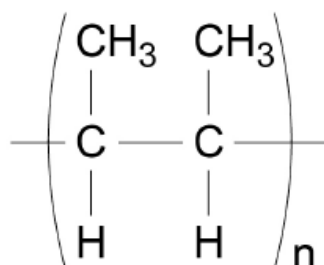
Figure 9 shows how copper electrical wire is insulated using an addition polymer called poly(butene).

Figure 9



0 8 . 1

The addition polymer poly(butene) has the displayed structural formula:

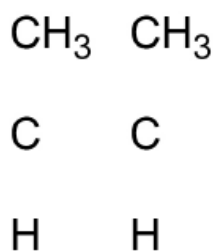


Poly(butene) is produced from the monomer butene.

Complete **Figure 10** to show the displayed structural formula of butene.

[2 marks]

Figure 10



Copper can be obtained by recycling scrap copper wire.

0 8 . 2

Suggest why poly(butene) insulation must be removed from scrap copper wire before the copper is recycled.

[1 mark]

0 8 . 3

Describe how scrap copper wire can be recycled to make new copper water pipes.

[2 marks]

0 8 . 4

Suggest **two** reasons why recycling scrap copper is more sustainable than extracting copper from copper ores.

[2 marks]

1 _____

2 _____

Copper sulfate is a compound of copper.

Copper sulfate solution contains copper(II) ions and sulfate ions.

0 8 . 5

A solution can be added to copper sulfate solution to show the presence of copper(II) ions.

Name the solution added.

Give the result of the test.

[2 marks]

Name of solution added _____

Result _____

0 8 . 6

Describe **one** test to show the presence of sulfate ions in copper sulfate solution.

Give the result of the test.

[2 marks]

Test _____

Result _____

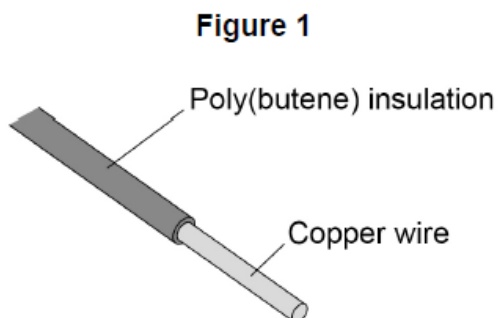
3. No.1

0 1

This question is about copper wire and copper compounds.

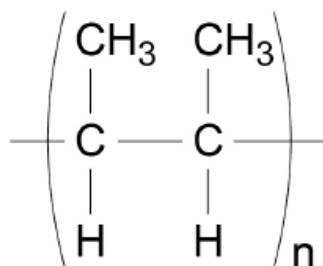
Copper is used to make electrical wires.

Figure 1 shows how copper electrical wire is insulated using an addition polymer called poly(butene).



0 1 . 1

The addition polymer poly(butene) has the displayed structural formula:

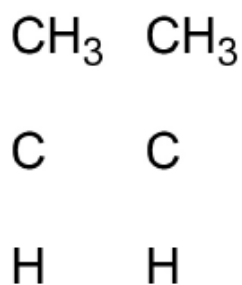


Poly(butene) is produced from the monomer butene.

Complete **Figure 2** to show the displayed structural formula of butene.

[2 marks]

Figure 2



Copper can be obtained by recycling scrap copper wire.

0 1 . 2

Suggest why poly(butene) insulation must be removed from scrap copper wire before the copper is recycled.

[1 mark]

0 1 . 3

Describe how scrap copper wire can be recycled to make new copper water pipes.

[2 marks]

0 1 . 4

Suggest **two** reasons why recycling scrap copper is more sustainable than extracting copper from copper ores.

[2 marks]

1

2

Copper sulfate is a compound of copper.

Copper sulfate solution contains copper(II) ions and sulfate ions.

0 1 . 5

A solution can be added to copper sulfate solution to show the presence of copper(II) ions.

Name the solution added.

Give the result of the test.

[2 marks]

Name of solution added _____

Result _____

0 1 . 6

Describe **one** test to show the presence of sulfate ions in copper sulfate solution.

Give the result of the test.

[2 marks]

Test _____

Result _____
