

# **GCSE Chemistry/ Science**

## **5CH1F/01 (Foundation Tier)**

### **Support Materials**

**Top 10 Tips from the Principal Examiner for C1 and exemplar materials for the six-marker questions from the November 2011 session**

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# Top 10 Tips from the Principal Examiner for Chemistry 5CH1F (Foundation Tier)

The top ten areas that candidates should focus on in order to improve their grades are:

1. **Learn the meanings of the key scientific words** - these are listed in the glossary in the textbook.
2. **Revise all of the topics** carefully so that you understand them.
3. **Revise the experiments** you have carried out, seen demonstrated or on video clips or animations. Make sure that you can describe the experiment, explain what is happening and know the important observations.
4. **Learn how to test for the gases** hydrogen, oxygen, carbon dioxide and chlorine, and the correct observation for each test.
5. Practise **writing word equations** for the reactions in the specification. Only use formulae if you are sure they are correct.
6. **Read all of the information** in the questions carefully and use it to help you to answer the question.
7. Try to **write your answers in more detail**, for example, in question 3(e), a phrase such as 'bad for the environment' did not score a mark. The answer would need to explain why it is bad.
8. Practise **selecting correct information from a table of data** to answer a question and don't just write down all the data as some of it may be inappropriate for the question. For example, in question 6(c)(i), it was incorrect to write that steel is a good conductor of electricity as pylons support the electricity cables but do not carry the current.
9. Practise **answering the six-mark questions** so that you understand how to improve your answers and progress from one level to the next.
10. If you have time left at the end of the examination, **check through your answers** to see if you have made any errors or can add more detail to them.

## Exemplar Materials for Question 4(c)

### Sample A

2 marks

This response is marking level one for the statement that copper reacts with oxygen. To progress to level two, there would need to be a clear statement that oxygen has been removed from the air in the syringe or the volume of air has decreased.

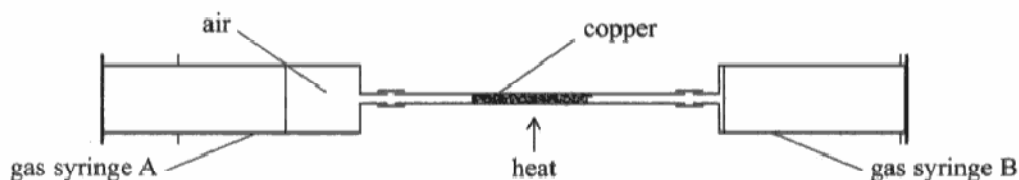
\* (c) Experiments can be carried out to find the volume of oxygen in a given volume of air.

When hot, copper reacts with oxygen.

In one experiment the following apparatus is used.

At the start of the experiment, 100 cm<sup>3</sup> of air is in gas syringe A.

The air is passed backwards and forwards over the heated copper.



Describe how the apparatus can be used to show that the 100 cm<sup>3</sup> of air contained 21 cm<sup>3</sup> of oxygen.

(6)

~~Be~~ because copper reacts with oxygen it shows how much oxygen is in the air by marking how much air was in syringe A before heating then after heating marking how much air (oxygen) was in syringe B to see how much oxygen in the air.

## Sample B

2 marks

This response is level one for the statement that copper was reacting with oxygen. Unfortunately the candidate thought that 21 cm<sup>3</sup> of oxygen was left in the syringe rather than used up, otherwise it would be worth more marks.

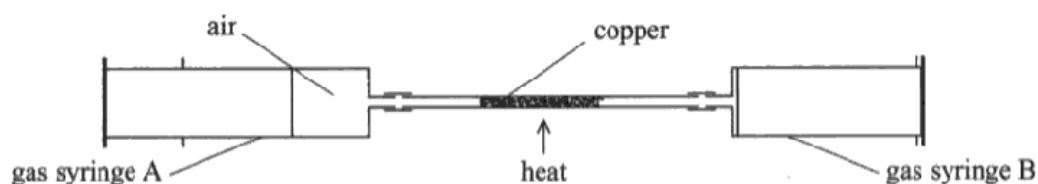
\*(c) Experiments can be carried out to find the volume of oxygen in a given volume of air.

When hot, copper reacts with oxygen.

In one experiment the following apparatus is used.

At the start of the experiment, 100 cm<sup>3</sup> of air is in gas syringe A.

The air is passed backwards and forwards over the heated copper.



Describe how the apparatus can be used to show that the 100 cm<sup>3</sup> of air contained 21 cm<sup>3</sup> of oxygen.

(6)

Because the copper was reacting with oxygen to make the syringe move back and forth - syringe A only has a small amount of air left which means oxygen has reacted with it. because there is only 21 cm<sup>3</sup> of air left in the syringe's which means its oxygen and its reacted with the copper.

## Sample C

3 marks

This response is level two for copper reacts with oxygen to make copper oxide. However, the spelling and grammar are so poor that 3 marks were awarded rather than 4.

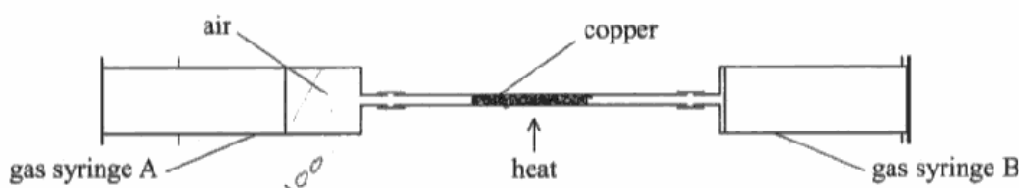
\*(c) Experiments can be carried out to find the volume of oxygen in a given volume of air.

When hot, copper reacts with oxygen.

In one experiment the following apparatus is used.

At the start of the experiment, 100 cm<sup>3</sup> of air is in gas syringe A.

The air is passed backwards and forwards over the heated copper.



Describe how the apparatus can be used to show that the 100 cm<sup>3</sup> of air contained 21 cm<sup>3</sup> of oxygen.

(6)

The copper reacts with the oxygen and will produce carbon dioxide and replace the <sup>oxygen</sup> that has been absorbed by the copper to make copper oxide. and the and you can see this because the syringe will get close as the oxygen is being used.

## Sample D

4 marks

This response is level two for copper reacts with oxygen to form copper oxide. It was awarded 4 marks.

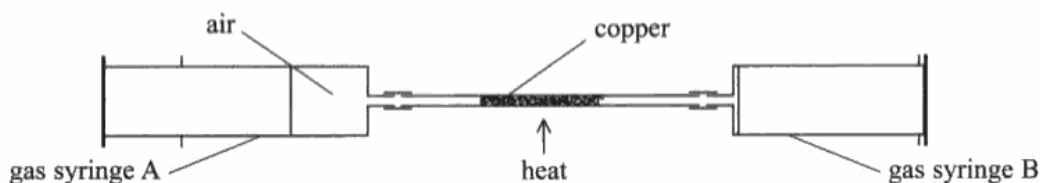
\*(c) Experiments can be carried out to find the volume of oxygen in a given volume of air.

When hot, copper reacts with oxygen.

In one experiment the following apparatus is used.

At the start of the experiment, 100 cm<sup>3</sup> of air is in gas syringe A.

The air is passed backwards and forwards over the heated copper.



Describe how the apparatus can be used to show that the 100 cm<sup>3</sup> of air contained 21 cm<sup>3</sup> of oxygen.

(6)

The apparatus shows this because when oxygen reacts with copper it forms copper oxide and then you can see how much copper oxide there is in the tube syringe.

## Sample E

5 marks

This is a good level three answer. The candidate has understood the experiment. The answer was awarded 5 marks as the candidate has not quite finished explaining how you know how much oxygen was used in the reaction.

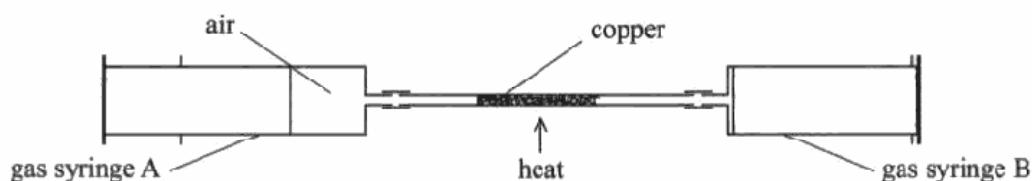
\*(c) Experiments can be carried out to find the volume of oxygen in a given volume of air.

When hot, copper reacts with oxygen.

In one experiment the following apparatus is used.

At the start of the experiment, 100 cm<sup>3</sup> of air is in gas syringe A.

The air is passed backwards and forwards over the heated copper.



Describe how the apparatus can be used to show that the 100 cm<sup>3</sup> of air contained 21 cm<sup>3</sup> of oxygen.

(6)

The apparatus can be used to show that the air contained 21 cm<sup>3</sup> of oxygen because the marking on gas syringe A shows where 100 cm<sup>3</sup> of air fills up to. After the gas has been passed through the heated copper and has reacted with the available oxygen, you will see in the syringe ~~has dropped~~ that the air level has dropped. Depending on how much is left, for instance 79 cm<sup>3</sup>, you ~~know~~ know how much oxygen was used in the reaction.



## Sample F

6 marks

This is a very good level three answer. The candidate has clearly understood the experiment and has explained it logically, using scientific terminology.

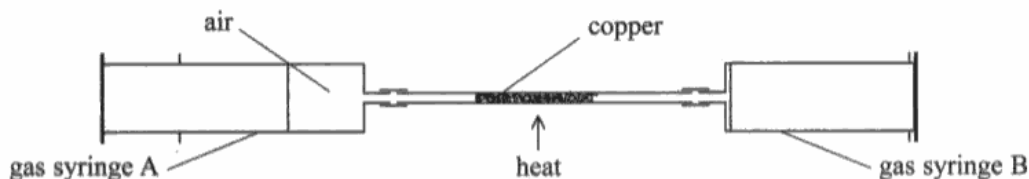
\*(c) Experiments can be carried out to find the volume of oxygen in a given volume of air.

When hot, copper reacts with oxygen.

In one experiment the following apparatus is used.

At the start of the experiment, 100 cm<sup>3</sup> of air is in gas syringe A.

The air is passed backwards and forwards over the heated copper.



Describe how the apparatus can be used to show that the 100 cm<sup>3</sup> of air contained 21 cm<sup>3</sup> of oxygen.

(6)

Because when the ~~air~~ air gets passed over the copper, the copper is reacting with the oxygen so the oxygen is being taken away from the air.

So after the experiment you could see how much air you have and if you have 79 cm<sup>3</sup> that shows there was 21 cm<sup>3</sup> of oxygen because the oxygen reacted with the copper to form copper oxide.

## Exemplar Materials for Question 6(d)

### Sample A

#### Zero marks

This response refers to global warming and deforestation. Unfortunately these are not relevant to the question.

\*(d) Iron for making steel, copper and aluminium is obtained from substances found in the Earth's crust.

The metals are made into many useful things.

When no longer required the metal articles are thrown away as waste or recycled.

Explain why it is important to recycle these metals rather than put them in general household waste.

(6)

It is very important to recycle the metals as waste metal creates carbon dioxide which creates heat energy which would lead to global warming. This would lead to deforestation which would cause loss of habitats for animals. Deforestation would also cause the levels of oxygen to decrease which affects every living thing. Also the heating of the ~~Plate~~ Planet would cause ice to melt which would also cause habitats to be destroyed but also cause ocean levels to increase.

## Sample B

2 marks

This answer is level one for the idea that if metals are recycled they can be used again so we have enough metals to make into useful things. There is not enough specific detail to progress to level two.

\*(d) Iron for making steel, copper and aluminium is obtained from substances found in the Earth's crust.

The metals are made into many useful things.

When no longer required the metal articles are thrown away as waste or recycled.

Explain why it is important to recycle these metals rather than put them in general household waste.

(6)  
if you recycle them they can be used again and again which means we will have more metal sources. it will help with global warming by not just dumping useful, reusable metals in the ground. If we run out of metals we cant go get anymore we need to recycle them so we have enough metals to make into useful things.

## Sample C

2 marks

This answer is level one for the idea that (some) metals do not decompose. If the idea of damage to wildlife habitats had been extended, for example, by stating that metal waste can destroy habitats, then this answer would have been level two.

\* (d) Iron for making steel, copper and aluminium is obtained from substances found in the Earth's crust.

The metals are made into many useful things.

When no longer required the metal articles are thrown away as waste or recycled.

Explain why it is important to recycle these metals rather than put them in general household waste.

(6)

Metals do not rot or decompose, they can  
~~react~~<sup>react</sup> with other chemicals to make them harmful,  
they are vulnerable to illegal trade, they can damage  
wildlife habitats.

## Sample D

4 marks

This answer is level two for the ideas that metals can be formed into different things instead of just being thrown away and less damage to the environment because we don't need to drill for more.

\*(d) Iron for making steel, copper and aluminium is obtained from substances found in the Earth's crust.

The metals are made into many useful things.

When no longer required the metal articles are thrown away as waste or recycled.

Explain why it is important to recycle these metals rather than put them in general household waste.

(6)

It is important to recycle these metals because they can then be formed into different things instead of just being thrown away. It also saves time and energy, ~~and~~ if we need we can just go back to the recycled same metal instead of ~~creating~~ <sup>using</sup> a new one. And because it would also be more environmentally friendly, instead of just throwing it away and drilling some more, ~~we~~ we can just keep re-using the same recycled metals.

~~and letting fumes of into the atmosphere~~ (Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 60 MARKS

## Sample E

4 marks

This answer is level two for the ideas that we recycle so the metals can be reused and so that we don't have to keep extracting metal from its ore as the ores will run out.

\*(d) Iron for making steel, copper and aluminium is obtained from substances found in the Earth's crust.

The metals are made into many useful things.

When no longer required the metal articles are thrown away as waste or recycled.

Explain why it is important to recycle these metals rather than put them in general household waste.

(6)

It is important to recycle the metals because then they can be reused to form many other things. If we keep on extracting metals from these ores there eventually won't be much left. So we should recycle so we don't have to keep extracting metal from its ores.

## Sample F

6 marks

This is a very good level three answer. The candidate has explained several points clearly and has written a logical account.

\* (d) Iron for making steel, copper and aluminium is obtained from substances found in the Earth's crust.

The metals are made into many useful things.

When no longer required the metal articles are thrown away as waste or recycled.

Explain why it is important to recycle these metals rather than put them in general household waste.

(6)

It is important to recycle these metals because there are a finite amount of resources such as metal ores. Therefore we cannot keep extracting metals forever as one day they will run out. Recycling helps to conserve resources also helping to make it better for the environment. Furthermore recycling means the process of combustion of fossil fuels does not need to take place; ~~this~~ as this leads to large amounts of carbon dioxide ( $\text{CO}_2$ ) being given off into the atmosphere.

Despite this recycling can be expensive and difficult because some products have to be separated as some types cannot be recycled. This means more people have to be employed to separate these products and the hiring of these people can be very expensive.

(Total for Question 6 = 12 marks)

**TOTAL FOR PAPER = 60 MARKS**