

Starter

Why have you chosen A Level chemistry?



Learning objectives:

- To gain an understanding of the requirements of your chosen subject in preparation for a September 2026 start

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Key words:

Preparation
Organisation
Punctuality
Commitment
Success



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Explanation

Core Expectations for **Every Lesson**

1. Attend lessons on time and in professional attire
2. Be prepared for each lesson by ensuring you bring the appropriate equipment
3. Ensure all work is organised in the appropriate section of your subject folder
4. All deadlines must be met to avoid a 6 week “Risk of Failure” program
5. Respect the classroom, Replace chairs, Rubbish in bins
6. Speak to **ALL** members of the HT community with respect
7. No mobile phones/ear pods to be used in lessons or around the school
8. Starters are to be completed in silence
9. Be proactive and not reactive
10. Expect to work harder than you ever have before



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Task: To determine the percentage of a compound in a formula.

Copper(ii)carbonate basic is a solid consisting of copper(ii)carbonate and copper hydroxide.

Its formula is $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2(\text{s})$

It occurs in a mineral called Malachite.

It is used as a colorant in artist paints (often called mountain green) and in pottery glazes to achieve striking green.

It is also used in agriculture as a copper source in fertilizers and as an active ingredient in fungicides.



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Explanation

Your task is to determine the percentage of copper carbonate in the compound.



Can you remember the general reactions of acids and bases?

Acid + metal hydroxide \rightarrow salt + water

Acid + metal carbonate \rightarrow salt + water + carbon dioxide



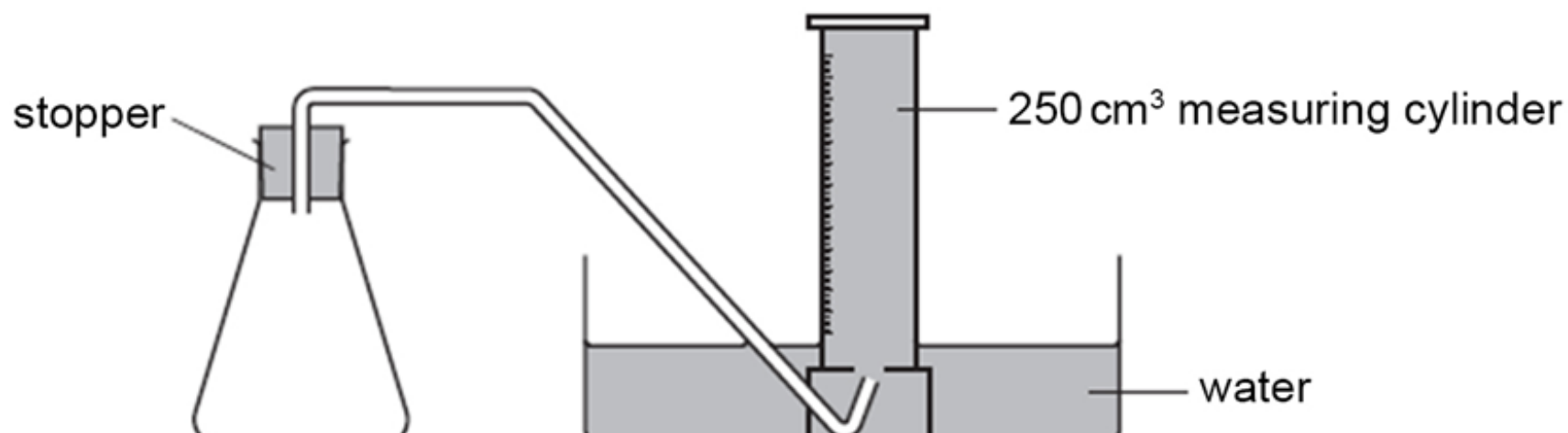
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Explanation

This is how you will collect the gas produced.

Marking the **start and end level** of the water will allow you to calculate the volume of gas produced.



Reaction happens here

As gas is produced it displaces the water from the measuring cylinder.

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Explanation

Calculations

1. Calculate the amount of carbon dioxide, $\text{CO}_2(\text{g})$, collected in moles. To do this you must divide the volume in cm^3 by 24000 (this is the molar gas volume at room temperature and pressure)

Moles of $\text{CO}_2 =$

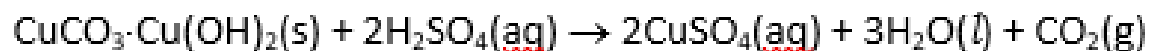


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Explanation

2. Copper(II) carbonate basic reacts with sulfuric acid as below:



The molar ratio between CO_2 and CuCO_3 is 1:1

How many moles of CuCO_3 reacted?

Moles of $\text{CuCO}_3 =$



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3. Use the number of moles to find a mass of CuCO_3

Molar mass(formula mass) of CuCO_3 =

Mass of CuCO_3 reacting =



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4. Calculate the percentage by mass of CuCO_3 in the original sample of $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2(\text{s})$. Give your answer to an appropriate number of significant figures.

Percentage by mass =



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Checking Progress

You all used copper carbonate basic from the same batch.

Are your answers reproducible?

Reasons for why they may not be reproducible.



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5. Calculate the percentage uncertainty in the measuring cylinder:

$$\text{Uncertainty/ actual measurement} \times 100$$

The uncertainty in a piece of equipment is half the resolution.

If you have taken 2 measurements then you double it.

Could this percentage account for the differences in your results?

Can you think of a different piece of equipment that is more precise?

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Explanation

<https://edu.rsc.org/future-in-chemistry/career-options/job-profiles>



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