Bentley Wood
High School for Girls

Chemistry Bridging Work

Year 10 into 11 for 2023/24

Name: _____

Tutor Group: _____

Teacher: _____

Year 10 into 11 Chemistry Bridging Work

Congratulations on completing Year 10 and entering the final stage of your chemistry journey! This bridging work will help you review and reinforce key ideas from Year 10, ensuring a supported transition into Year 11.

There are three sections to this booklet. These are:

1. Reviews of each Required Practical you have covered so far in chemistry with an opportunity to review different aspects of individual practical work;
2. Exam Question Practice – get into the mindset of an examiner! Practice some commonly tested exam questions in chemistry with top tips from our exam board, AQA.
3. Autumn Term Preparation

Together with this, there will be links to useful videos that directly link to the module/topic in case you need further support. Please also use your CGP and Kerboodle textbooks to support with your revision. Recommended Websites:

- Savemyexams
- BBC Bitesize
- AHammondBiology
- Thesciencehive

This is the first piece of work you will be assessed in September and will set the tone for the rest of the academic year. It's an opportunity for you to showcase your knowledge, skills, and growth since Year 10. Work hard, stay focused, and demonstrate what you are capable of achieving.

Section 1: Required Practicals

Recommended Videos (remember reactants / reagents can vary and will not always be the same!):

1. Preparation of a pure, dry salt
    a. Making Salts - GCSE Science Required Practical
    b. GCSE Chemistry - Neutralisation Reactions
2. Electrolysis
    a. Electrolysis - GCSE Science Required Practical
    b. GCSE Chemistry - Electrolysis Part 3 - Aqueous Solutions
3. Temperature Changes
    a. Temperature Changes - GCSE Science Required Practical
    b. AQA GCSE Science Revision Chemistry "Required Practical 4: Temperature Changes
4. Rates of Reaction
    a. Rates Of Reaction - GCSE Science Required Practical
    b. Rates Of Reaction 2 (Collecting Gas) - GCSE Science Required Practical

For any practical activity can students answer these 10 questions?

1. What is the dependent variable and the independent variable?
2. Therefore, what other factors could affect the results and need to be controlled (control variables)?
3. What will I measure or record?
4. What would an appropriate experimental control be?
5. How could I improve the accuracy of my experiment/investigation?
6. How could I improve the precision of my experiment/investigation?
7. How could I improve the validity of my experiment/investigation?
8. What else could I do with this experiment? What could I change to investigate something else?
9. What is my greatest source error?
10. What pattern or trend do my results show and how do I explain this?

Please note because not all investigations have all these characteristics, not all of these questions can be answered for all Required Practicals.

1 – Preparation of a pure, dry salt

Correctly order the steps to produce soluble salts:

_ Filter the excess solid out of the solution

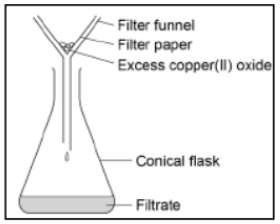
_ Keep adding the solid until no more reacts

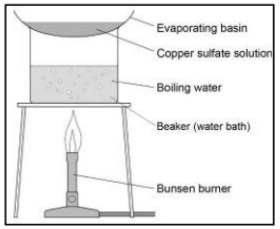
_ Heat the solution to evaporate some of the water

_ Leave the salt solution to cool and dry so it crystallises

_ React an acid with a solid insoluble substance (e.g. metal, metal oxide, or metal carbonate)

Name the separation technique shown in each diagram





Name the type of reaction that takes place when dilute hydrochloric acid reacts with calcium oxide.

Write a balanced symbol equation for the reaction of dilute hydrochloric acid with calcium oxide.

When carrying out this reaction, the student used an **excess** of calcium oxide. Why?

A student added solid calcium oxide to dilute hydrochloric acid in a beaker.
The student added solid calcium carbonate to dilute hydrochloric acid in another beaker.
Describe **one** difference between the two reactions that the student would **see**.

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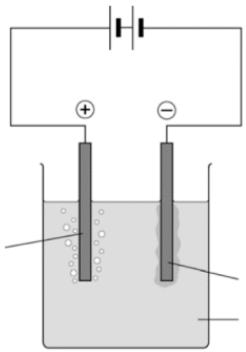
2 - Electrolysis

Label the diagram using the following words

anode **cathode** **salt solution**



Predict the products at each electrode in the electrolysis of:

Sodium bromide solution

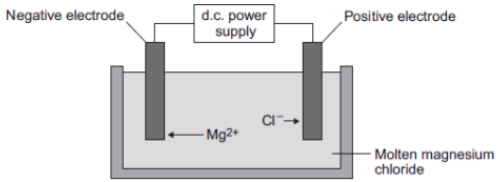
Positive electrode:

Negative electrode:

Copper nitrate solution

Positive electrode:

Negative electrode:



Why does the magnesium need to be molten?

What would you **see** at the positive electrode?

A student calculated the mass of magnesium produced and got these results

Experiment	Mass of magnesium produced in grams
1	1.13
2	0.63
3	1.11
4	1.09

Suggest **one** possible reason for the anomalous result.

Calculate the mean mass of magnesium

Complete the table to identify the element produced at each electrode

Solution	Positive electrode (anode)			Negative electrode (cathode)		
	Observations	Element formed	State	Observations	Element formed	State
Copper (II) chloride	Bubbles of gas Bleaches blue litmus white			Brown/red solid coating on rod		
Sodium chloride	Bubbles of gas Bleaches blue litmus white			Bubbles of gas (more rapid production)		

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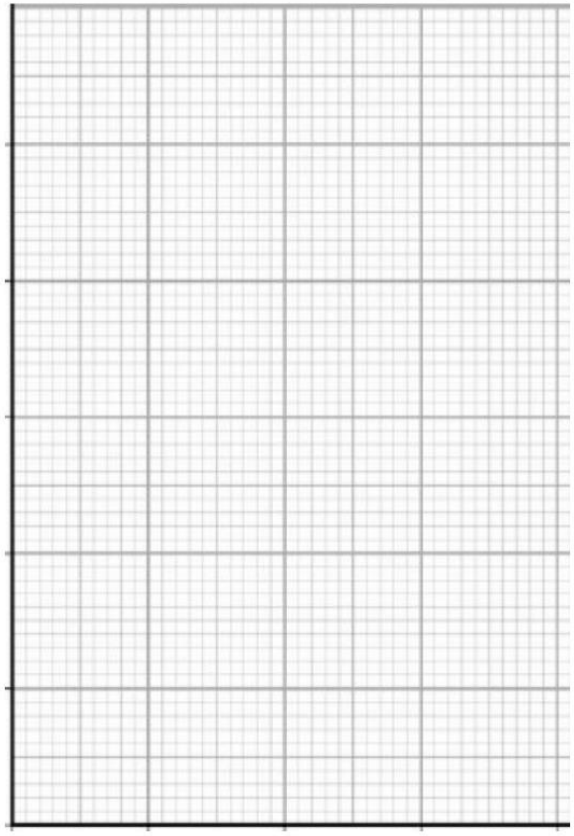
3 – Temperature changes

Total volume of NaOH added / cm^3	Mean maximum temperature / °C
0	22.5
5	24.3
10	27.2
15	29.1
20	31.1
25	31.9
30	32.3
35	31.6
40	30.8

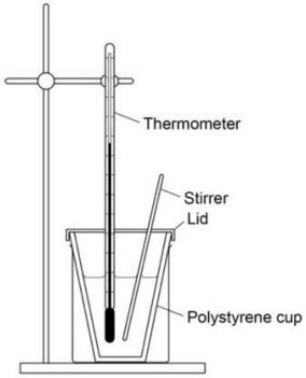
A student added sodium hydroxide to hydrochloric acid and measured the temperature.

Plot a graph of the student's results and draw two straight lines of best fit.

From the graph read off the maximum temperature change.



This is an example of an exothermic reaction. Can you explain why the results show the temperature starting to fall after a certain volume of sodium hydroxide had been added?



A student uses the above equipment to measure the energy change from the combustion of methanol.

What safety precautions should the student take?

The neutralisation reaction is exothermic. Sketch an energy profile diagram for this reaction.

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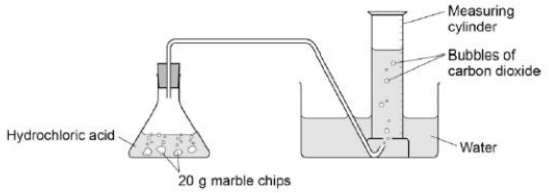
4 – Rates of reaction

A student measures the volume of gas produced during a reaction using the equipment shown.



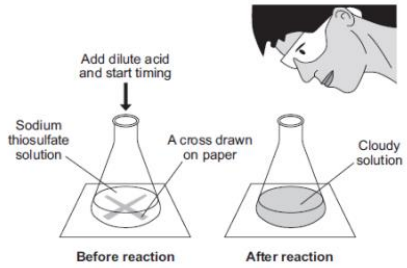
Plot a graph of the results.

Time in s	Volume of gas in dm^3
0	0.000
30	0.030
60	0.046
90	0.052
120	0.065
150	0.070
180	0.076
210	0.079
240	0.080
270	0.080

Volume of gas in dm^3

Time in s

Describe and explain the shape of the graph.



A student reacted sodium thiosulfate and hydrochloric acid. He changed the concentration of hydrochloric acid each time.

The student measured the time taken for the cross to no longer be visible.

Complete the sentence.

As the student increases the concentration of the hydrochloric acid, the time taken for the cross to disappear will _____.

Explain your answer using collision theory.

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Section 2: Exam Question Practice

Recommended Video: GCSE Chemistry - Allotropes of Carbon - Diamond and Graphite

Explain why graphite conducts electricity.

Answer in terms of the structure and bonding in graphite.

(3)

Describe the structure and bonding of diamond.

[3 marks]

Explain why diamond has a very high melting point.

[3 marks]

Recommended Videos: Making Salts - GCSE Science Required PracticalGCSE Chemistry - Neutralisation Reactions

This question is about zinc and compounds of zinc.

A student produces pure crystals of zinc chloride by reacting zinc oxide with hydrochloric acid.

The equation for the reaction is:

$$ZnO(s) + 2HCl(aq) \rightarrow ZnCl_2(aq) + H_2O(l)$$

The student adds zinc oxide to hydrochloric acid until the zinc oxide is in excess.

Give **one** observation that the student could make to show that the zinc oxide is in excess.

[1 mark]

Why is excess zinc oxide used rather than excess hydrochloric acid?

[1 mark]

Name **one other** compound that the student could add to hydrochloric acid to produce zinc chloride.

[1 mark]

Describe how the student should obtain crystals of zinc chloride from a solution of zinc chloride.

[2 marks]

A student is given three metals, **X**, **Y** and **Z** to identify.

The metals are magnesium, iron and copper.

Plan an investigation to identify the three metals by comparing their reactions with dilute hydrochloric acid.

Your plan should give valid results.

[4 marks]

Recommended Video: GCSE Chemistry - Global Warming & Climate Change

Carbon dioxide is a greenhouse gas.

Describe the greenhouse effect in terms of the interaction of short and long wavelength radiation with matter.

(4)

Section 3: Autumn Term Preparation

You will have a baseline exam in September. Please use your Year 10 mock QLA as well as this work to support with you prioritising and focusing your revision so you continue to make progress.

You first topic coming back in will be:

- Equilibria

Please read ahead on this topic and bring in any revision to your first lesson to show to your teacher.

Go Further Research Task

How was chemistry used to discover that this painting bought for £800 was an authentic Degas painting (worth £800,000!)?

Degas: "The Little Dancer"