



# KHS Chemistry Revision

## *Topic 1*

*Chemical Changes, Physical Changes,  
Elements & Compounds,  
Reaction Rates, Graph Drawing,  
Use of Data Booklet*



1. The periodic table on the back page of your data booklet shows the names of the elements.

<b>A</b>	chlorine	<b>B</b>	copper	<b>C</b>	oxygen
<b>D</b>	lithium	<b>E</b>	sulphur	<b>F</b>	bromine

- a) Identify the *two* elements in the same group as fluorine.
- b) Identify the element which is a transition metal.
- c) Identify the *two* elements which were discovered in 1774
2. *If a piece of aluminium foil is held under mercury and scratched with a sharp object, something unusual happens to it when it is removed. Almost immediately a white substance appears to grow up from the scratch marks. As this happens, the foil becomes distinctly warm.*

What evidence is there that a chemical reaction has taken place?

3. Over 100 elements are known. Six are shown below.

<b>A</b>	krypton	<b>B</b>	bromine	<b>C</b>	oxygen
<b>D</b>	carbon	<b>E</b>	iron	<b>F</b>	calcium

- a) Identify the transition metal.
- b) Identify the element in Group 6.
- c) Identify the element that is very unreactive.
- d) Identify the liquid non-metal.

4. The symbols of some elements are shown below.  
You may wish to use your data booklet.

<b>A</b>	Kr	<b>B</b>	Po	<b>C</b>	K
<b>D</b>	P	<b>E</b>	Pt	<b>F</b>	Pb

- a) Identify the symbol for potassium.
- b) Identify the *two* elements discovered in the same year.
- c) Identify the element used as a catalyst in a catalytic converter.
5. Over 2 million tonnes of sulphuric acid are made in the UK every year.

*The main reaction is very exothermic and involves the conversion of sulphur dioxide to sulphur trioxide using a catalyst.*

- a) What is meant by the term exothermic?
- b) Why is a catalyst used?
6. Over 100 elements are known. Four are shown below.

<b>A</b>	barium	<b>B</b>	lithium
<b>C</b>	rubidium	<b>D</b>	caesium

Identify the element which is not an alkali metal?

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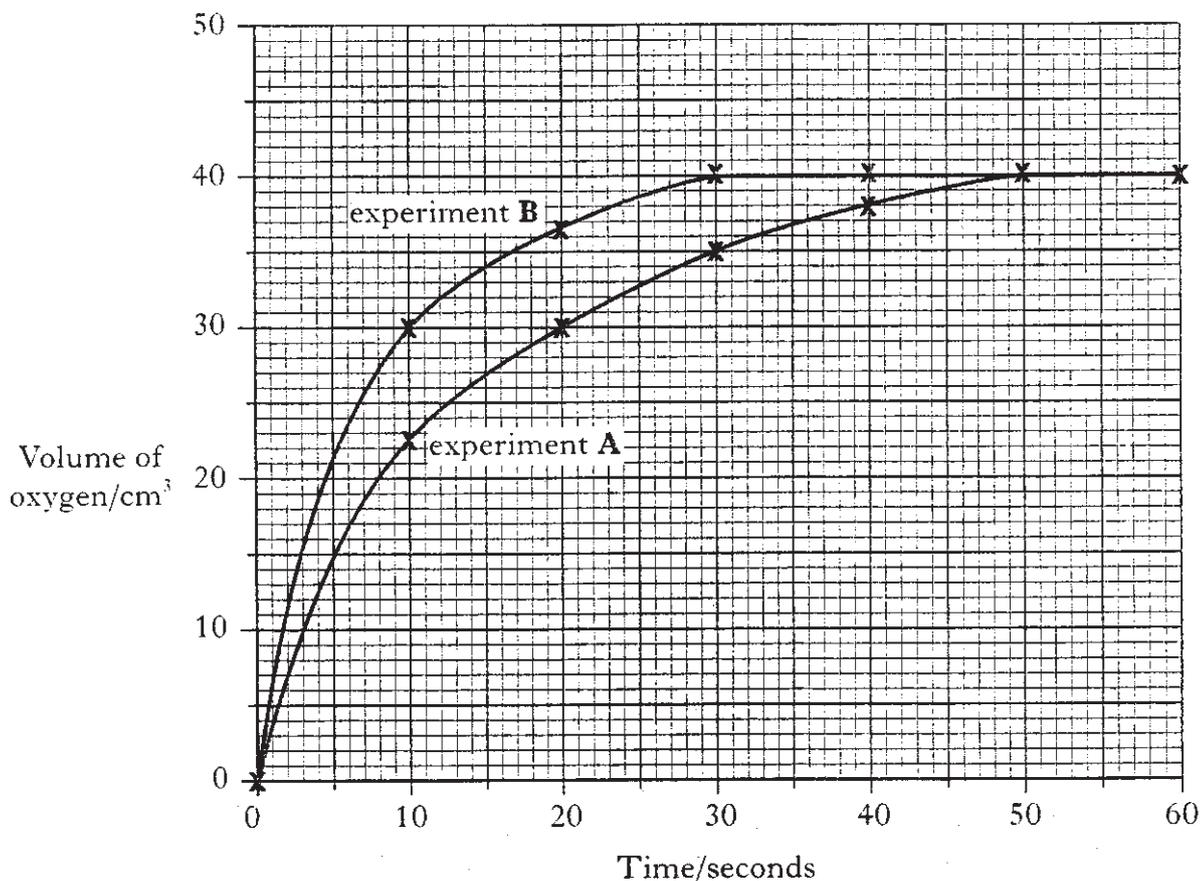
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7. Sam added manganese dioxide to hydrogen peroxide solution and measured the volume of oxygen gas produced.

Her results for two experiments at different temperatures are shown below.



- a) What volume of oxygen was collected in experiment A?
- b) Which experiment had the higher reaction rate?
- c) Which experiment was carried out at the lower temperature?
- d) *The same volume and concentration of hydrogen peroxide was used in both experiments A and B.*

How can you tell this from the graph?

- e) *Hydrogen peroxide can break down to produce oxygen on its own but the reaction is extremely slow. The addition of manganese dioxide makes the reaction go much faster.*

What term can be used to describe manganese dioxide?

- f) *0.2g of manganese dioxide was present at the start of experiment A.*

What mass of manganese dioxide would be present at the end of the reaction?

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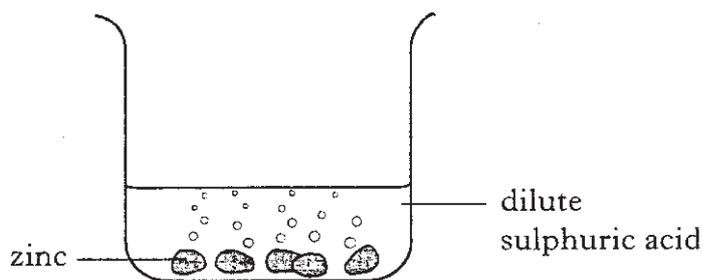
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8. The periodic table on the back page of your data booklet shows the names of the elements.

<b>A</b>	curium	<b>B</b>	lithium	<b>C</b>	magnesium
<b>D</b>	cobalt	<b>E</b>	platinum	<b>F</b>	aluminium

- a) Identify the alkali metal.
- b) Identify the element made by scientists.
9. Zinc reacts with dilute sulphuric acid.



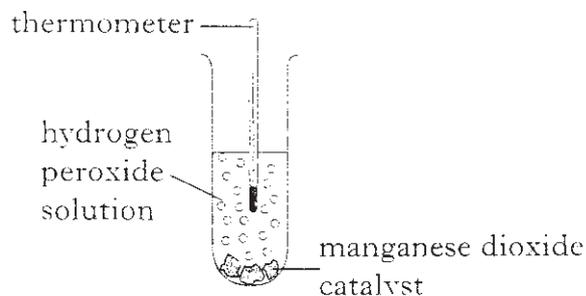
<b>A</b>	Using a larger volume of acid
<b>B</b>	Diluting the acid with water
<b>C</b>	Using a larger beaker
<b>D</b>	Heating the acid
<b>E</b>	Using a catalyst

Identify the factor(s) which will speed up the reaction.

10. Manganese dioxide acts as a catalyst in the following reaction:



The diagram shows how the reaction can be carried out.



Several experiments were carried out using the same mass of manganese dioxide and the same volume of hydrogen peroxide solution.

	<i>Concentration of hydrogen peroxide solution (mol/l)</i>	<i>Temperature (°C)</i>	<i>Form of manganese dioxide</i>
<b>A</b>	0.5	20	powder
<b>B</b>	1.0	30	lump
<b>C</b>	1.5	20	lump
<b>D</b>	1.5	30	powder
<b>E</b>	0.5	20	lump
<b>F</b>	2.0	20	powder

- Identify the *two* experiments which should be compared to show the effect of particle size on the speed of the reaction.
- Identify the *two* experiments which should be compared to show the effect of concentration on the speed of the reaction.
- Identify the experiment with the *slowest* speed of reaction.
- Identify the experiment with the *fastest* speed of reaction.

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11. The periodic table on the back page of your data booklet shows the names of the elements.

<b>A</b>	magnesium	<b>B</b>	lithium	<b>C</b>	calcium
<b>D</b>	nickel	<b>E</b>	aluminium	<b>F</b>	potassium

- a) Identify the metal which was discovered in 1827.
- b) Identify the transition metal.

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12. The grid contains the names of some elements

<b>A</b>	neon	<b>B</b>	lithium	<b>C</b>	chlorine
<b>D</b>	oxygen	<b>E</b>	copper	<b>F</b>	argon

- a) Identify the alkali metal.
- b) Identify the element with the highest melting point.  
*You may wish to use page 3 of the data booklet to help you.*
- c) Identify the *two* very unreactive elements.

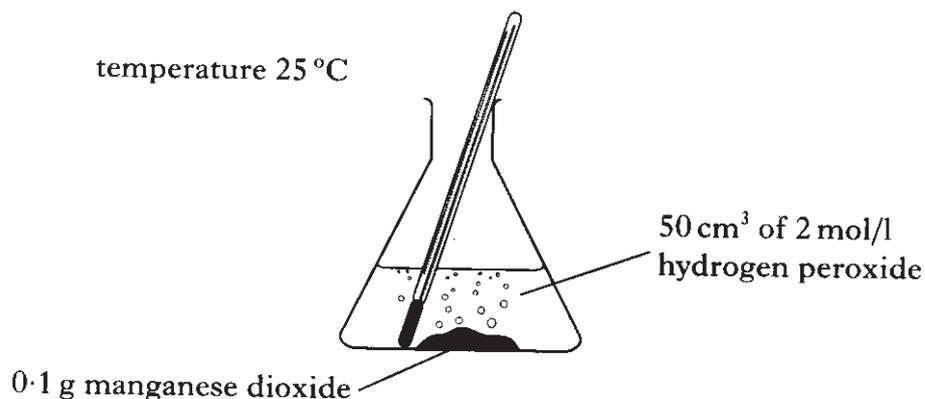
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13. When Matthew added manganese dioxide to hydrogen peroxide solution, oxygen was produced.

*Manganese dioxide is a catalyst.*



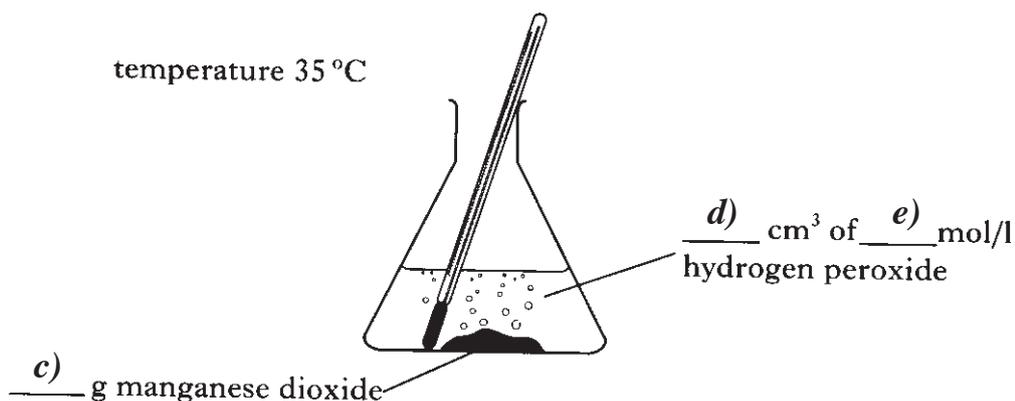
- a) What is the purpose of a catalyst?
- b) What will be the mass of the manganese dioxide at the end of the reaction?

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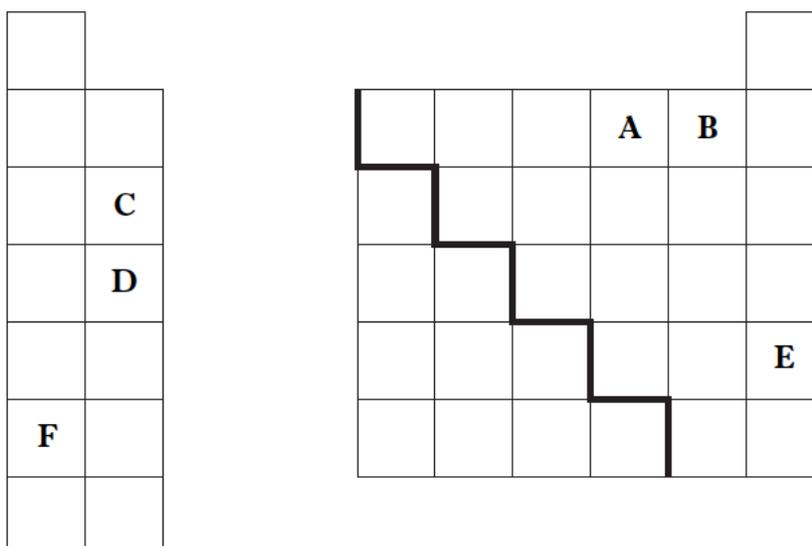
*Matthew then wanted to see if raising the temperature to 35 °C would speed up the reaction.*

What values would be needed to complete the labelling of the diagram to ensure that his second experiment was a fair test.



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14. The diagram shows part of the Periodic Table. The letters do not represent the symbols for the elements.



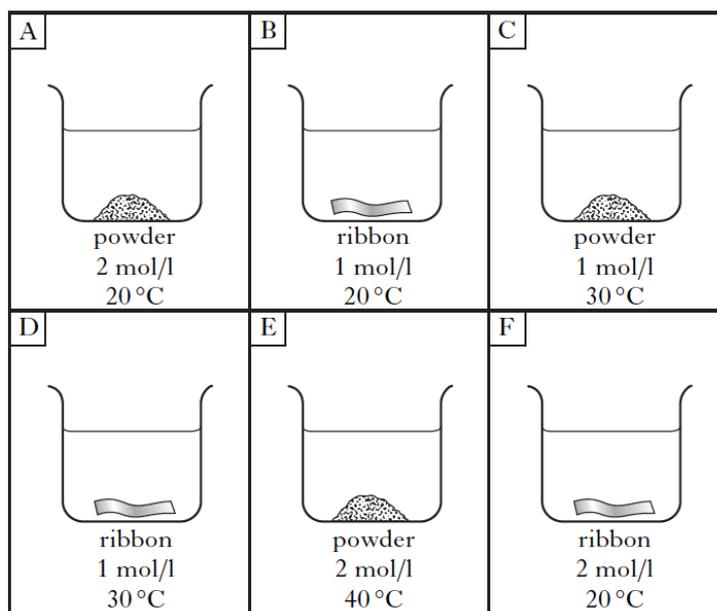
- a) Identify the unreactive element.
- b) Identify the *two* elements which are in the same group.
- b) Identify the *two* elements which are in the same period.

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15. Two students investigated the reaction between magnesium and dilute hydrochloric acid.



- a) Identify the *two* experiments which could be used to show the effect of concentration on the speed of reaction.
- b) Identify the experiment with the fastest speed of reaction.

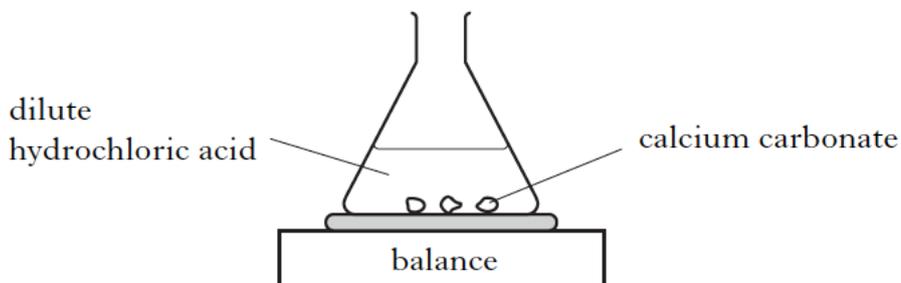
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16. The apparatus below was used to investigate the reaction between lumps of calcium carbonate and dilute hydrochloric acid.

Excess acid was used to make sure all the calcium carbonate reacted.

A balance was used to measure the mass lost during the reaction.



The results are shown in the table.

<b>Time/minutes</b>	0	0.5	1.0	2.0	3.0	4.0	5.0
<b>Mass lost/g</b>	0	0.36	0.52	0.70	0.80	0.86	0.86

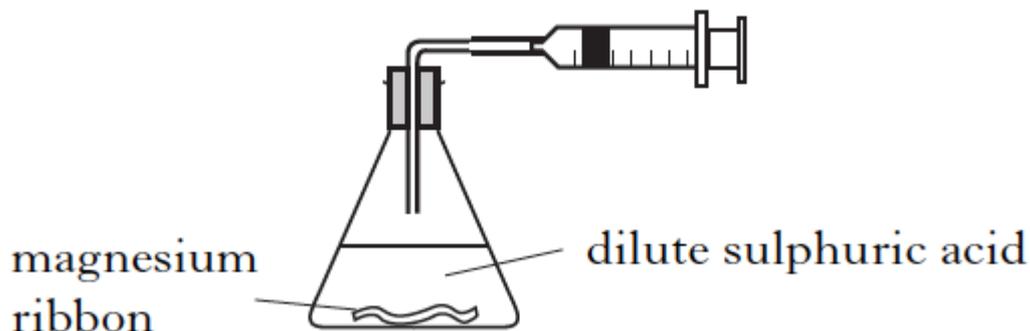
- a) Why is mass lost during the reaction? 1
- b) Draw a line graph of the results. 2
- c) The experiment was repeated using the same volume and concentration of acid.

The same mass of calcium carbonate was used but powder instead of lumps.

Suggest how much mass would have been lost after three minutes. 1

17. A student added magnesium ribbon to an excess of dilute sulphuric acid and measured the volume of hydrogen gas produced.

The reaction stopped when all the magnesium was used up.



The results are shown in the table.

Time/s	0	10	20	40	50	60	70
Volume of hydrogen gas/cm <sup>3</sup>	0	20	32	50	52	53	53

- a) Draw a line graph of the results.
- b) Using your graph, predict the volume of hydrogen gas produced during the first 30 seconds.
- c) The student repeated the experiment using a higher concentration of acid.

The same volume of acid and the same mass of magnesium ribbon were used.

What volume of hydrogen gas would have been produced after 60 seconds?

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