

Rate(speed) of Reaction

Question Paper 3

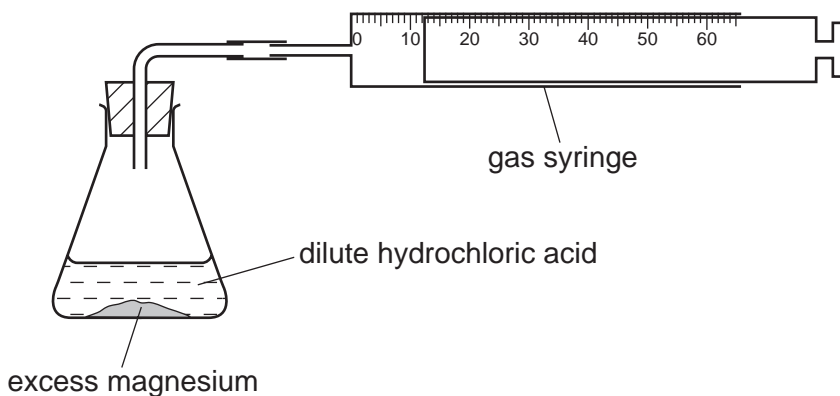
Level	IGCSE
Subject	Chemistry
Exam Board	CIE
Topic	Chemical Reactions
Sub-Topic	Rate (speed) of Reactions
Paper Type	Alternative to Practical
Booklet	Question Paper 3

Time Allowed: 42 minutes

Score: /35

Percentage: /100

- 1 The speed of reaction between excess magnesium and dilute hydrochloric acid was investigated using the apparatus below.



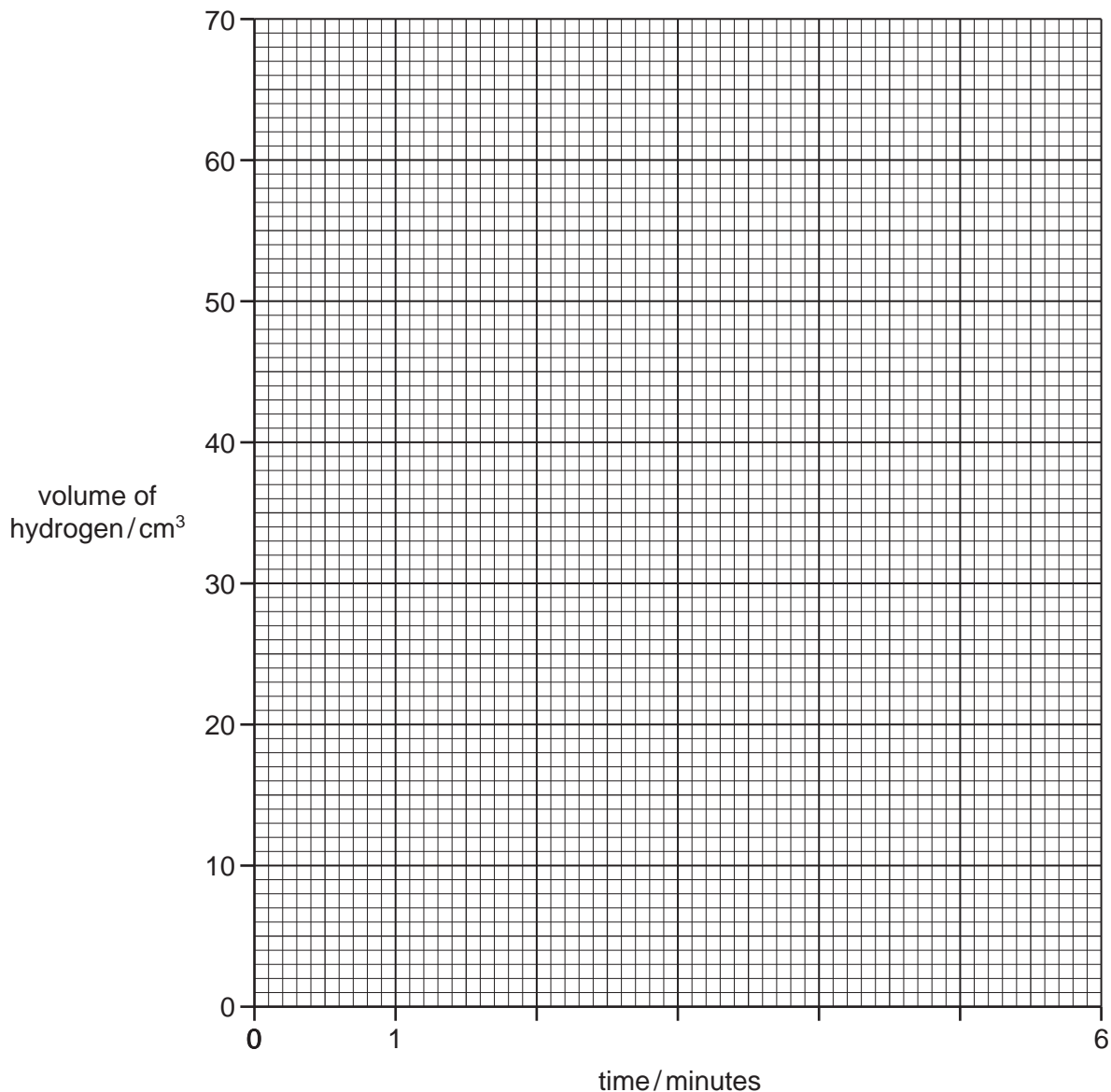
The volume of hydrogen produced was measured every minute for six minutes.

- (a) Use the gas syringe diagrams to complete the table.

Table of results

time / minutes	gas syringe diagram	volume of hydrogen / cm ³
0		
1		
2		
3		
4		
5		
6		

(b) Plot the results on the grid below. Draw a smooth line graph.



[4]

(c) Why is the volume of gas given off the same at 5 minutes and 6 minutes?

.....

[1]

(d) Which point appears to be inaccurate? Explain why.

.....

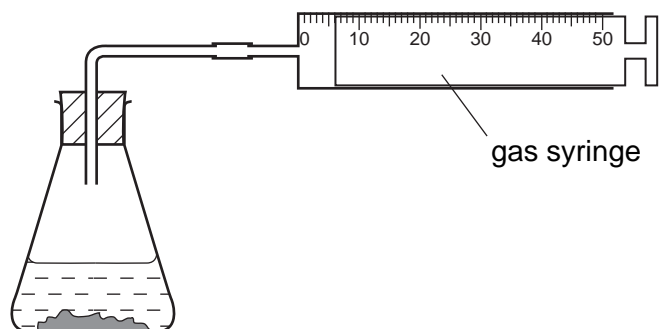
[2]

(e) Sketch on the grid the graph you would expect if the experiment were repeated using the same volume of acid which was half as concentrated. [2]

[Total: 13]

2 Hydrogen peroxide breaks down to form oxygen.

The volume of oxygen given off can be measured using the apparatus below.



Solids **W** and **X** both catalyse the breakdown of hydrogen peroxide. The syringe diagrams show the volume of oxygen formed every 20 seconds using these catalysts at 25 °C.

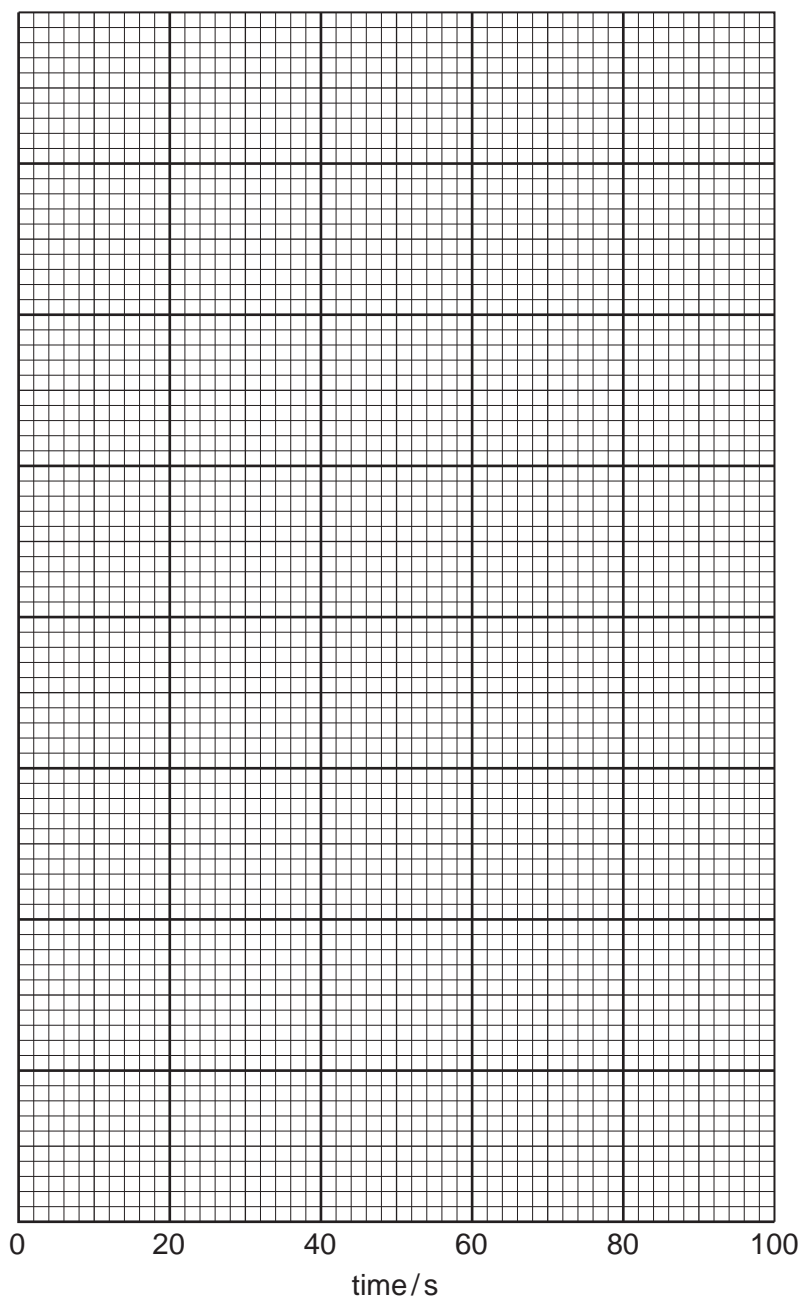
time/s	using catalyst W	using catalyst X
0		
20		
40		
60		
80		
100		

(a) Use the gas syringe diagrams to complete the table.

time / s	volume of oxygen / cm ³	
	catalyst W	catalyst X
0		
20		
40		
60		
80		
100		

[3]

(b) Plot a graph to show each set of results. Clearly label the curves.



[6]

(c) Which solid is the better catalyst in this reaction? Give a reason for your choice.

solid

reason

..... [2]

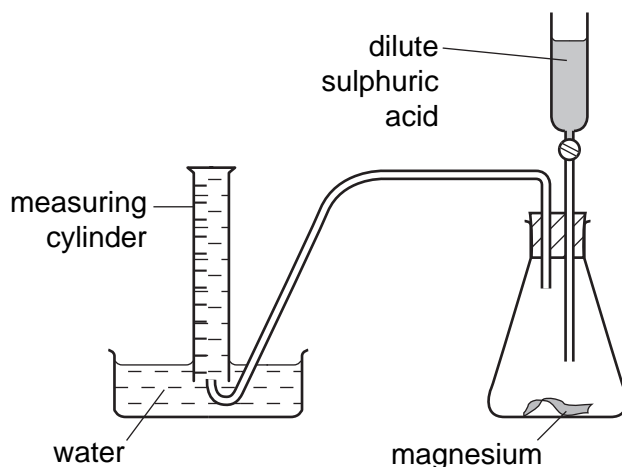
(d) Why is the final volume of oxygen the same in each experiment?

..... [1]

(e) Sketch a line on the grid to show the shape of the graph you would expect if the reaction with catalyst **X** was repeated at 40 °C. [2]

[Total: 14]

- 3 Magnesium reacts with dilute sulphuric acid to form hydrogen gas. The speed of the reaction was investigated using the apparatus below.

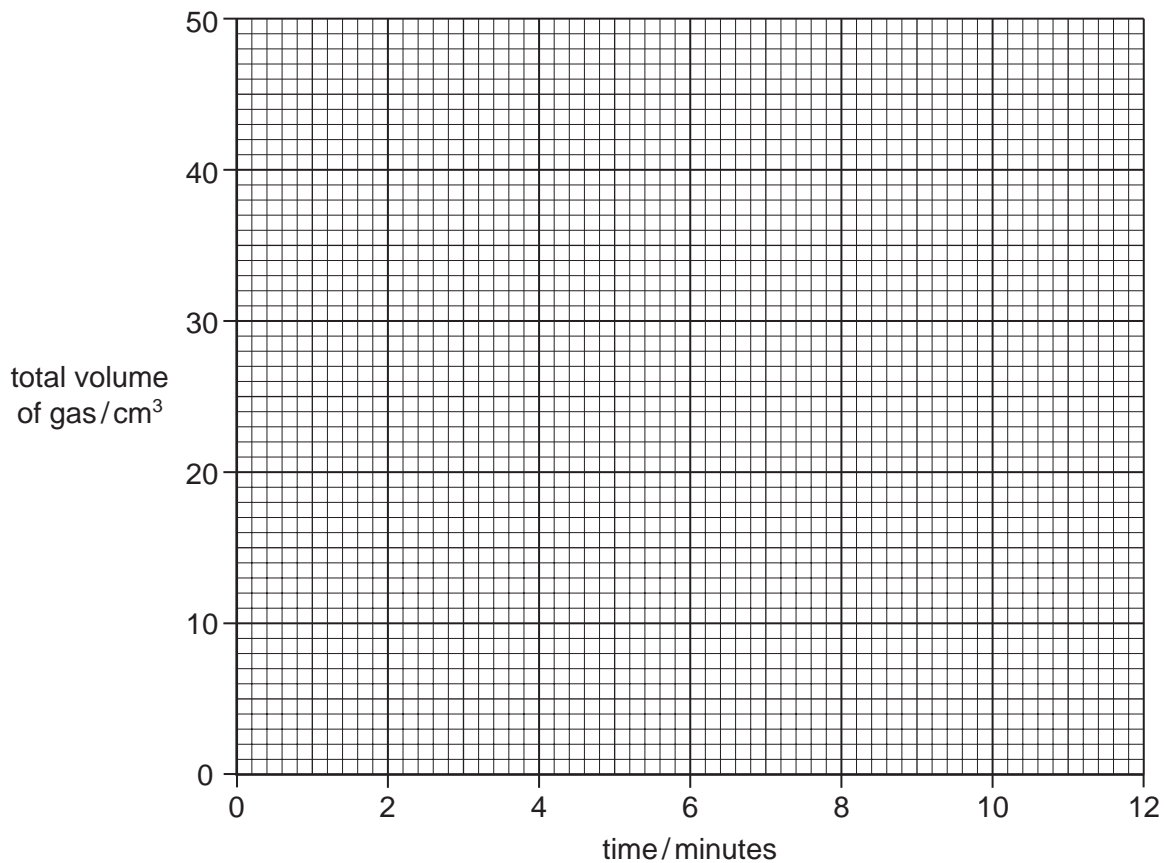


In an experiment 50 cm^3 of dilute sulphuric acid was added to a large piece of magnesium. A student measured the total volume of gas produced at 2 minute intervals.

Use the measuring cylinder diagrams to complete the table.

time / minutes	measuring cylinder diagram	total volume of collected / cm^3
0		
2		
4		
6		
8		
10		
12		

(a) Plot the student's results on the grid. Use the points to draw a smooth line graph.



[3]

(b) (i) At which time does the result appear to be inaccurate?

..... [1]

(ii) Use the graph to deduce what the correct volume should be at this time.

..... [1]

[Total:8]