Cambridge IGCSE
Topical Past Papers

CHEMISTRY

0620 P6

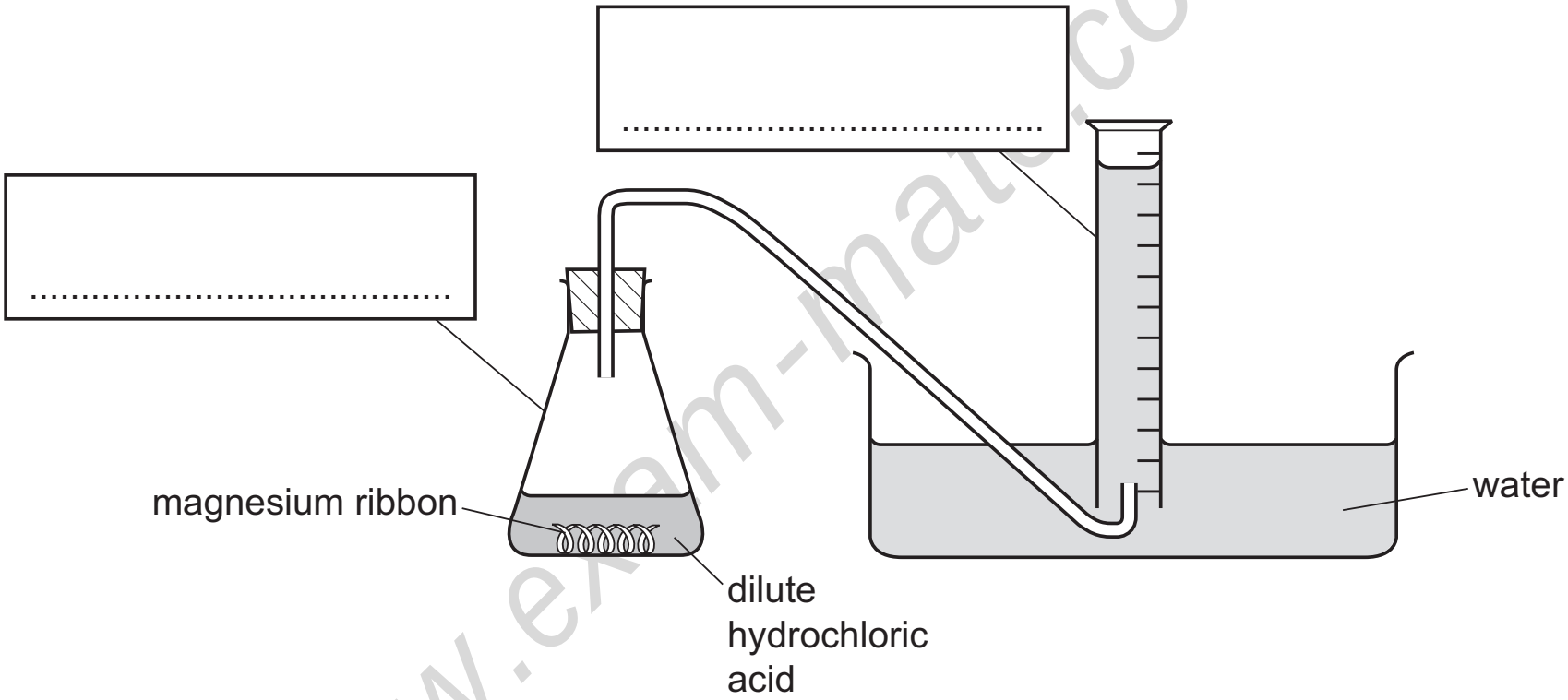
2017 — 2024

CHAPTER 1

STATES OF MATTER

1 - (0620/62_Summer_2017_Q1) ANSWER

A student investigated the rate of reaction between an excess of dilute hydrochloric acid and magnesium ribbon. The apparatus is shown.



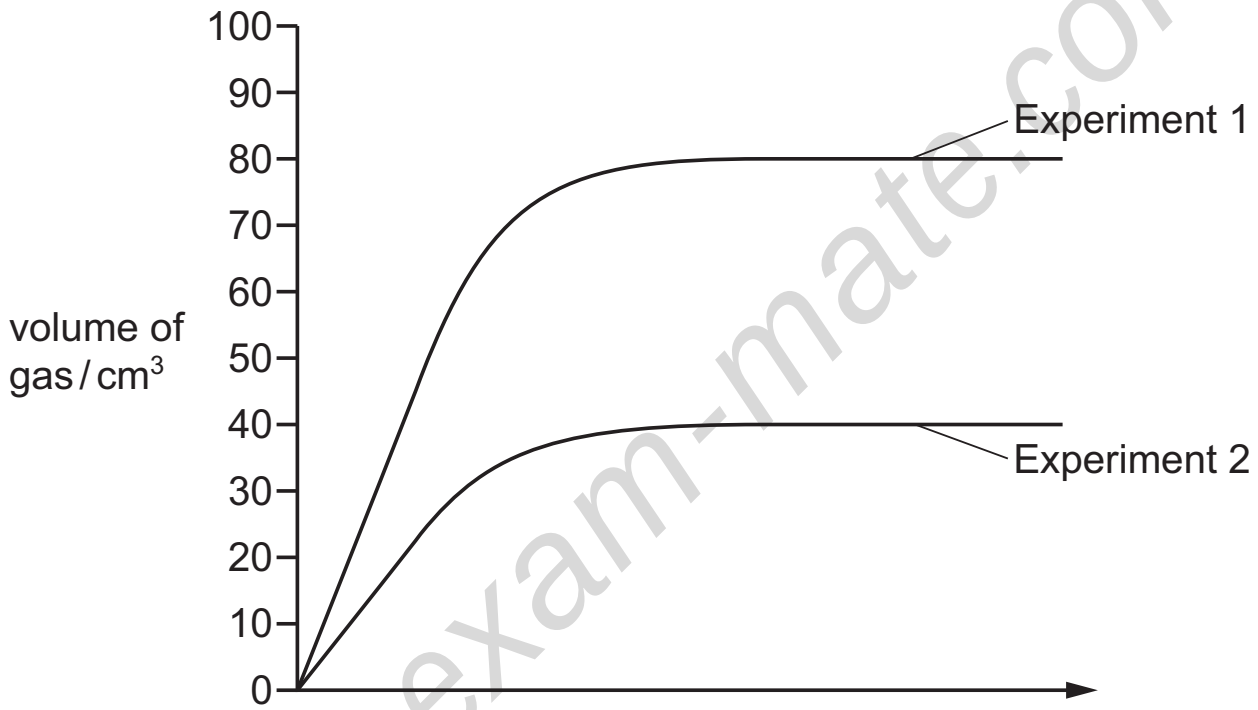
Two experiments were carried out. The temperature was the same in each case.

(a) Complete the boxes to identify the apparatus. [2]

(b) Give **one** observation expected during this reaction.

..... [1]

Graphs were drawn from the results for each experiment as shown.



(c) Label the *x*-axis of the graph. [2]

(d) (i) Give the volumes of gas at which the **two** graphs level out and compare these values.

....

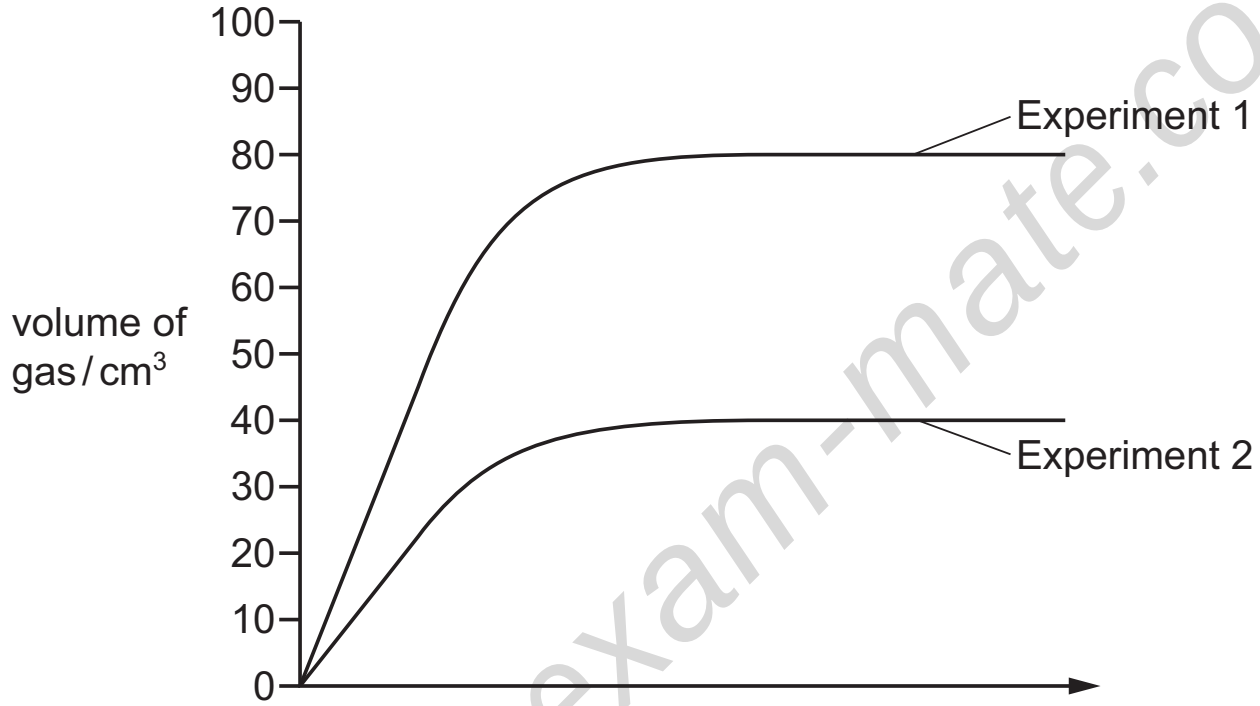
..... [2]

(ii) Suggest why the graphs level out at different volumes.

..... [1]

(iii) The graph has been drawn again.

Draw the curve expected if Experiment 1 were repeated using the same mass of magnesium powder instead of magnesium ribbon.



[2]

[Total: 10]

2 - (0620/63_Winter_2024_Q1) ANSWER

When crystals of hydrated calcium ethanedioate, $CaC_2O_4 \cdot H_2O$, are heated they decompose to form solid calcium carbonate, steam and carbon monoxide gas.

$$CaC_2O_4 \cdot H_2O(s) \rightarrow CaCO_3(s) + H_2O(g) + CO(g)$$

A student suggests using the apparatus shown in Fig. 1.1 to decompose hydrated calcium ethanedioate and obtain the products.

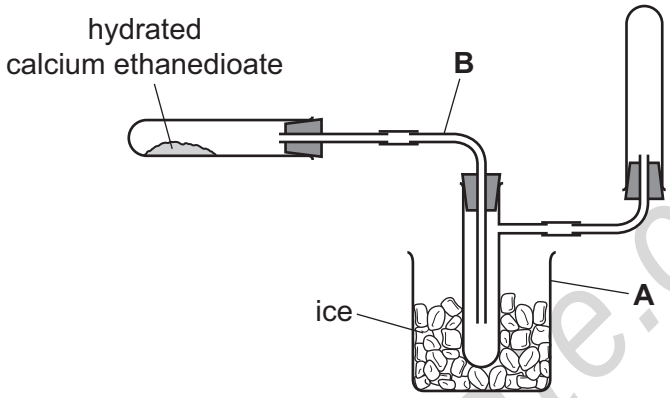


Fig. 1.1

Table 1.1 shows some information about carbon monoxide.

Table 1.1

	melting point /°C	boiling point /°C	density compared to air	solubility in water	safety warning
carbon monoxide	–205	–192	about the same	insoluble	toxic

(a) Name the items of apparatus labelled **A** and **B** in Fig. 1.1.

A .....

B .....

[2]

(b) The apparatus shown in Fig. 1.1 will **not** work because there is an error in how the gas is collected. This error makes it dangerous to use the apparatus.

Identify the error and explain why this error makes it dangerous to use the apparatus.

error .....

.....

explanation .....

.....

[2]

(c) Complete Fig. 1.2 to show how the gas could be collected safely.

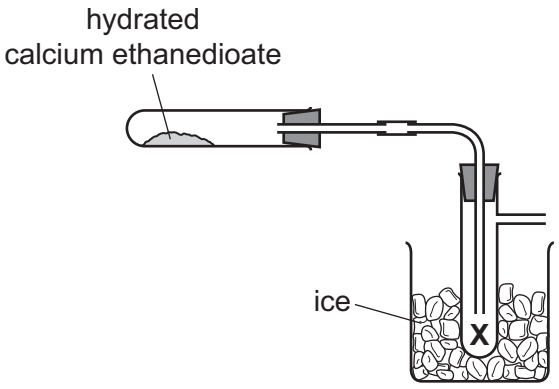


Fig. 1.2

[1]

(d) Add **one** arrow to Fig. 1.2 to show where the apparatus should be heated. [1]

(e) Identify the substance that collects at the point marked **X** on Fig. 1.2.

..... [1]

(f) Suggest why this experiment should be carried out in a fume cupboard.

.....

..... [1]

[Total: 8]

1 - (0620/62_Summer_2017_Q1) QUESTION

(a)	measuring cylinder	**1**
	conical flask	**1**
(b)	bubbles / fizz / effervescence	**1**
(c)	time (taken)	**1**
	s / seconds / secs	**1**
(d)(i)	80 and 40 (cm^3)	**1**
	Experiment 1 at twice / double the volume of Experiment 2	**1**
(d)(ii)	two times as much / mass / amount / length magnesium used (in Experiment 1)	**1**
(d)(iii)	curve drawn is steeper than Experiment1	**1**
	curve drawn finishes at the same level as Experiment 1	**1**

2 - (0620/63_Winter_2024_Q1)

(a)	**M1 A** beaker **M2 B** delivery tube	**2**
(b)	**M1** error: using a bung (in collecting tube) / the apparatus is sealed **M2** explanation: (pressure would increase and so the apparatus / tube would) explode/break	**2**
(c)	diagram showing collection over water **OR** using a gas syringe	**1**
(d)	an arrow pointing to the hydrated calcium ethanedioate	**1**
(e)	water / H_2O	**1**
(f)	carbon monoxide is toxic	**1**