OCR
Oxford Cambridge and RSA

GCSE Chemistry B (Twenty First Century Science)

J258/04 Depth in chemistry (Higher Tier)

Question Set 25

1. Beth does an experiment to measure the rate of reaction between zinc and dilute hydrochloric acid.

(a) Complete the word and balanced symbol equation for the reaction.

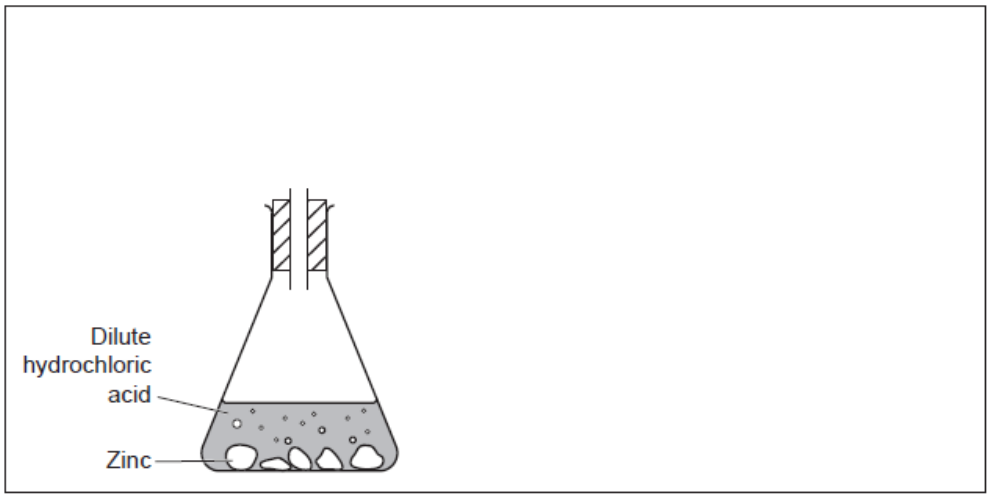
zinc + hydrochloric acid → hydrogen + ...

Zn + ...HC*l* → ..... + $ZnCl_2$

[2]

(b) Complete the diagram to suggest how the hydrogen gas could be collected and measured.

Include labels on your diagram.



[2]

(c) Beth repeats her experiment with different concentrations of dilute hydrochloric acid. She uses the same volume of acid each time.

She measures the volume of gas collected in 20 s for each experiment.

Fig. 4.1 shows her **five** results.

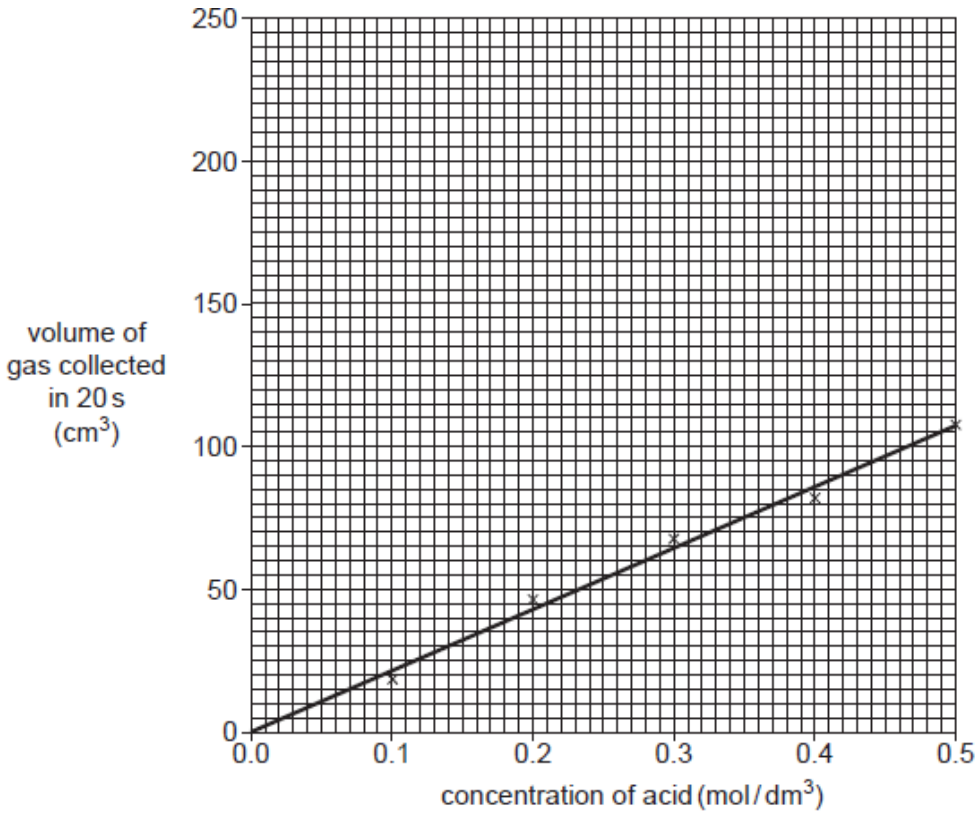


Fig. 4.1

(i) Calculate the gradient of the line.

Show your working on the graph.

Gradient = ... cm^3 / mol / dm^3 **[2]**

(ii) Estimate the concentration of dilute hydrochloric acid needed to produce 250 cm^3 of gas in 20 s.

Use the equation:
volume of gas produced in 20 s = gradient × concentration of acid

Concentration = ... mol / dm^3 **[2]**

(d) Beth repeats her experiment again but this time measures the rate of reaction between zinc and dilute sulfuric acid, H_2SO_4, rather than dilute hydrochloric acid, HC*l* .

Table 4.1 shows her results.

Concentration of dilute sulfuric acid H_2SO_4 (mol/dm^3)	Volume of gas produced in 20 s (cm^3)
0.1	40
0.2	85
0.3	125
0.4	170
0.5	215

Table 4.1

(i) Plot the results in **Table 4.1** on **Fig. 4.1**.

Draw a line of best fit.

[2]

(ii) Explain why the two lines on **Fig. 4.1** have different gradients. **[2]**

Total Marks for Question Set 25: 12