

GCSE Chemistry B (Twenty First Century Science)

J258/04 Depth in chemistry (Higher Tier)

Question Set 9

1 Eve measures the volume of gas given off when solid calcium carbonate reacts with a dilute acid.

Fig. 9.1 shows a graph of her results.

She draws a tangent at the start of her graph.

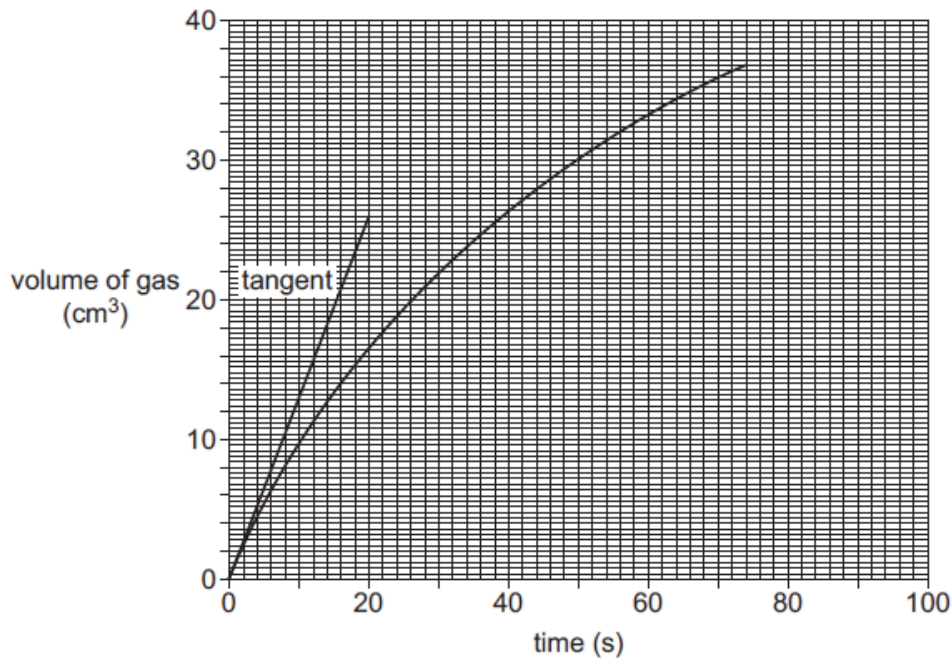


Fig. 9.1

- (a) (i) Calculate the rate of reaction at the start by calculating the gradient of the tangent. [3]
Rate = cm³/s
- (ii) Draw a new tangent on the graph at time = 60 s. [1]
- (iii) How do the tangents show that the rate of reaction has changed from the start to 60 s? [2]

(b) Eve does some more experiments.

This time she finds out the rate of reaction at the start when she reacts different concentrations of acid with solid calcium carbonate.

She plots a graph of rate of reaction against concentration, as shown in **Fig. 9.2**

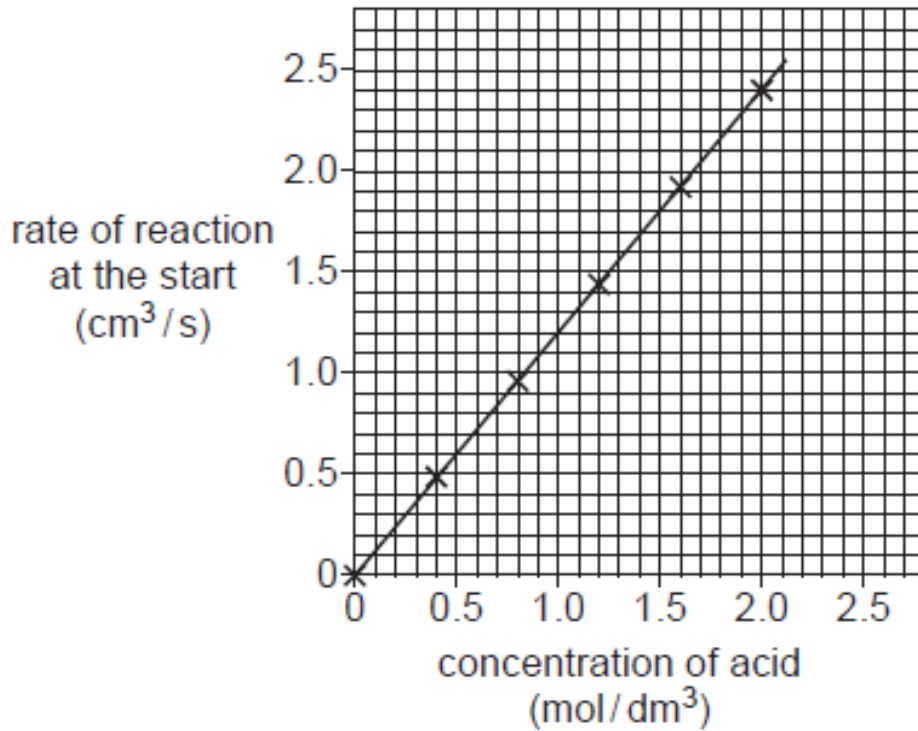


Fig. 9.2

(i) Eve thinks that the relationship between rate and concentration in the **graph** in **Fig. 9.2** can be shown using this equation:

$$\text{rate} \propto \text{concentration}$$

Does the graph in **Fig. 9.2** agree with this equation?

Use the data to explain your reasons.

[2]

(ii) Using the graph in **Fig. 9.2** estimate the rate of reaction when acid of concentration 3.0 mol / dm³ is used.

Rate of reaction = cm³ / s [2]

Total Marks for Question Set 9: 10

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