

Rate of reaction graphs

Information

Six experiments are carried out in which:

- marble chips (calcium carbonate) are added to hydrochloric acid
- the volume of carbon dioxide produced is measured over the same period of time
- **the marble chips are completely used up, in every case**
- the results are used to draw graphs of the volume of carbon dioxide produced against time.

Please note: For each experiment, assume that the hydrochloric acid is in excess.

The conditions for the experiments are:

Experiment 1

100 cm³ of 1 mol dm⁻³ hydrochloric acid added to 1 g of small lumps of calcium carbonate at 20 °C

Experiment 2

100 cm³ of 1 mol dm⁻³ hydrochloric acid added to 2 g of small lumps of calcium carbonate at 20 °C

Experiment 3

200 cm³ of 1 mol dm⁻³ hydrochloric acid added to 1 g of small lumps of calcium carbonate at 20 °C

Experiment 4

100 cm³ of 2 mol dm⁻³ hydrochloric acid added to 1 g of small lumps of calcium carbonate at 20 °C

Experiment 5

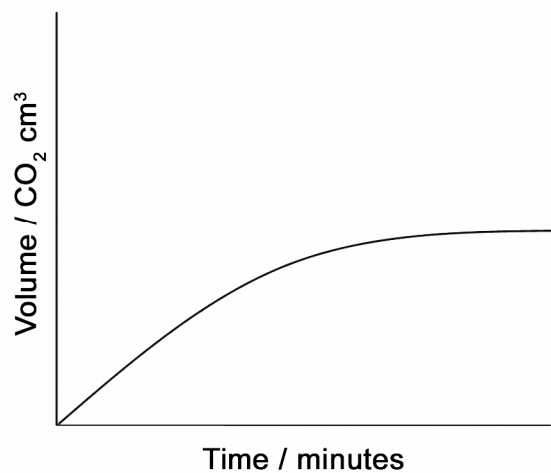
100 cm³ of 1 mol dm⁻³ hydrochloric acid added to 1 g of small lumps of calcium carbonate at 30 °C

Experiment 6

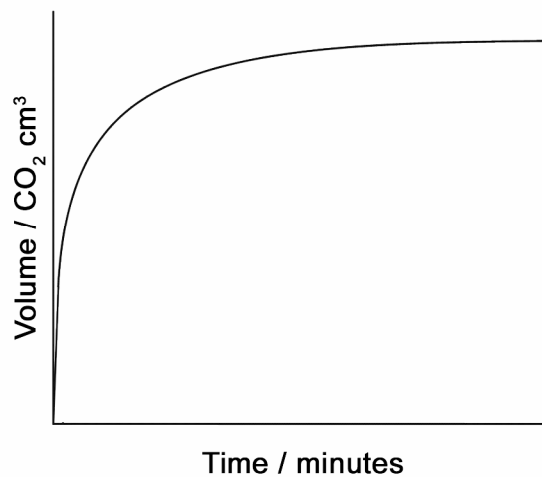
100 cm³ of 2 mol dm⁻³ hydrochloric acid added to 2 g of small lumps of calcium carbonate at 20 °C

The graphs below show how carbon dioxide is produced over a period of time in the experiments when hydrochloric acid is added to marble chips (calcium carbonate).

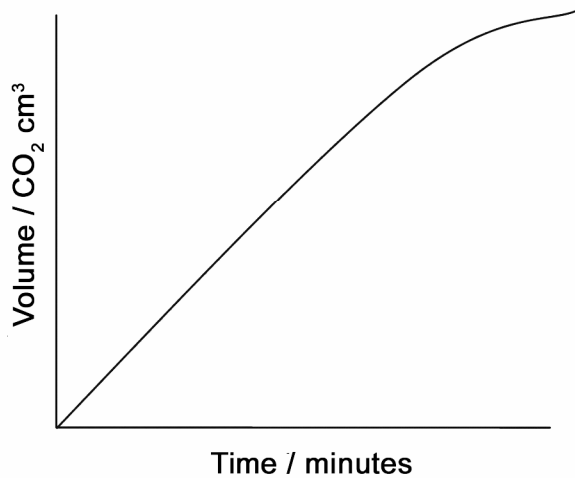
Graph A



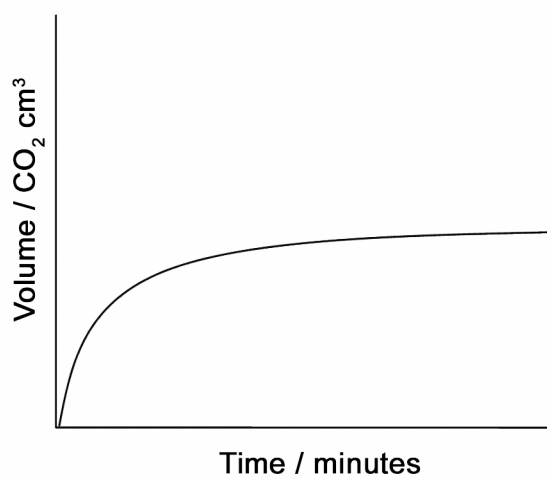
Graph B



Graph C



Graph D



Rate of reaction graphs

Name

Look at the graphs and the conditions in the experiments on your Information sheet.

Graph A was drawn using the results from Experiment 1.

Your task is to:

- choose the graph most likely to be produced from each of the other five experiments
- explain your choice in the spaces below.

You can select the same graph for more than one experiment.

Please note: For each experiment, assume that the hydrochloric acid is in excess.

The graph which is most likely to be produced from **Experiment 2** is Graph...

because...

The graph which is most likely to be produced from **Experiment 3** is Graph...

because...

The graph which is most likely to be produced from **Experiment 4** is Graph...

because...

The graph which is most likely to be produced from **Experiment 5** is Graph...

because...

The graph which is most likely to be produced from **Experiment 6** is Graph...

because...

After talking to other students I have modified my ideas: