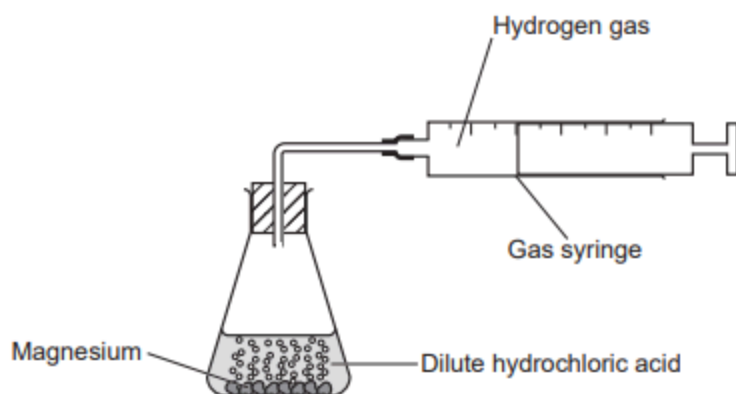


[Interpreting rate graphs (including steepness/gradient idea)]

Q1.a).(2021)

A student investigates the rate of reaction between magnesium and an **excess** of dilute hydrochloric acid.

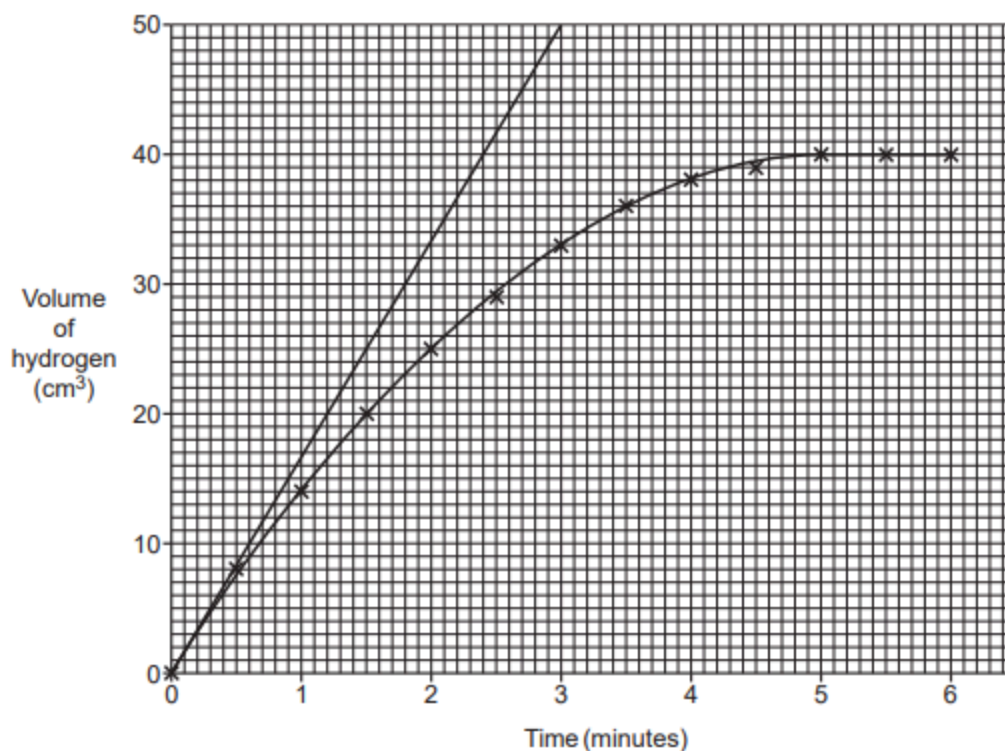
The diagram shows the equipment they use.



The student measures the total volume of hydrogen gas produced every 30 seconds.

The student plots a graph of their results.

They want to calculate the rate of reaction at the start of the reaction. They draw a tangent on the graph at the start of the reaction.



The gradient of the tangent gives the rate of reaction. Use the tangent to calculate the rate of reaction at the start of the reaction.

Give your answer to **1** decimal place.

Rate of reaction = ... $\text{cm}^3/\text{minute}$

Q1.b).(2021)

What happens to the **rate of reaction** as the reaction progresses?

Explain your answer using ideas about particles and collisions.

.....

.....

.....

Q1.c.i).(2021)

Another student repeats the experiment.

They increase the concentration of the dilute hydrochloric acid. They keep everything else in the experiment the same.

Does the gradient of the graph at the start of this student's reaction decrease, increase or stay the same compared to the first student's experiment?

Tick (✓) **one** box.

Decrease

☐

Increase

☐

Stay the same

☐

Give a reason for your answer.

.....

Q1.c).ii).(2021)

Write down the volume of hydrogen gas that is produced at the end of this reaction.

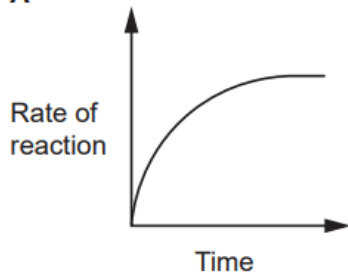
Volume = ... cm³

Q2.(2022)

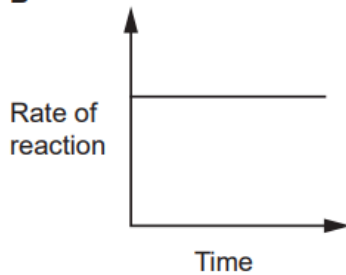
A student investigates the rate of reaction between magnesium and an excess of dilute sulfuric acid.

Which graph shows how the **rate of reaction** changes with time?

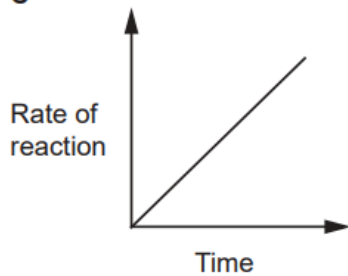
A



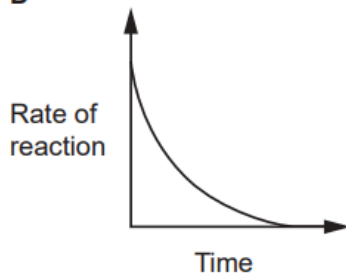
B



C



D



Your answer

