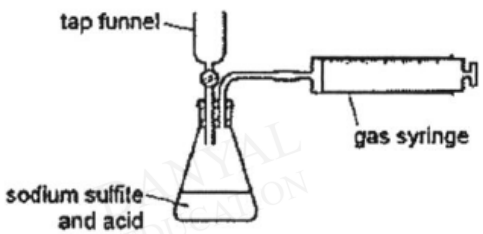
# O Level Pure Chemistry MCQs

## Speed of Reaction Test 4.0

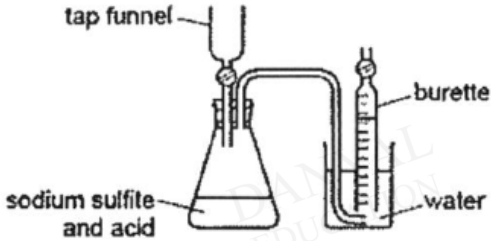
Q1

A student wanted to follow how the speed of the reaction of sodium sulfite with acid varies with time. The reaction produces gaseous sulfur dioxide. Which apparatus is not suitable?

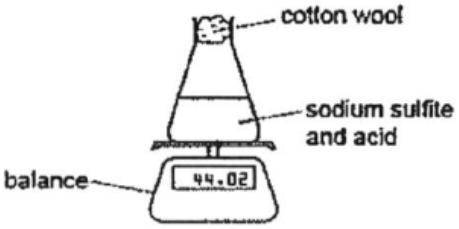
A



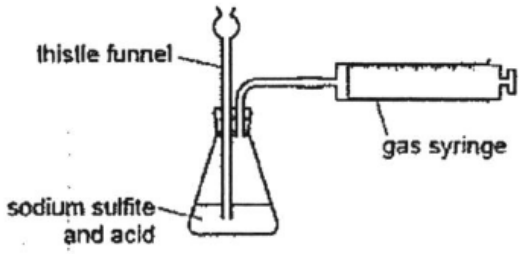

B




C



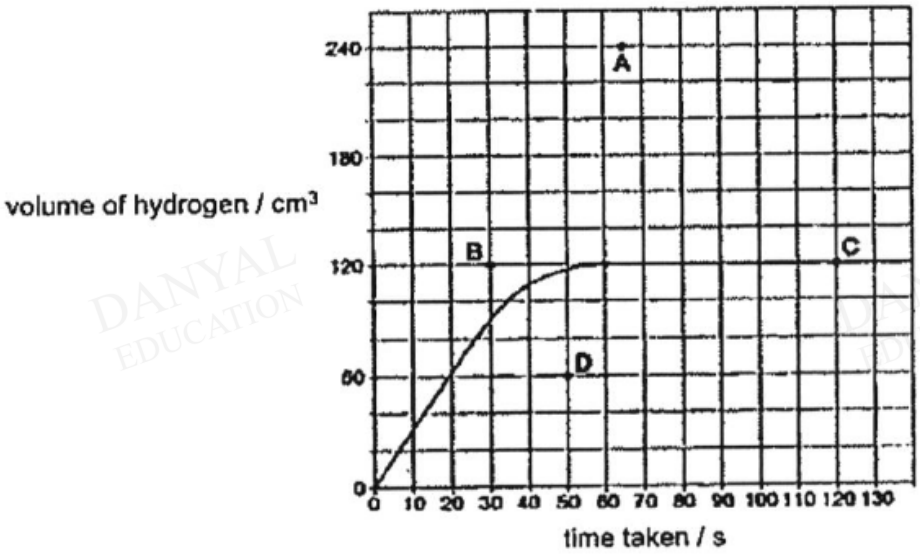

D




Q2

In an experiment, 0.12 g of magnesium reacts with an excess of dilute hydrochloric acid. The graph shows the volume of hydrogen produced over time in the reaction. In a second experiment, 0.24 g of magnesium reacts with an excess of dilute hydrochloric acid.

At which point will the graph become horizontal for the second experiment?



Q3

Methane gas reacts extremely slowly with air at room temperature. If a piece of warm platinum is held in a methane-air mixture, methane ignites. Which of the following statements correctly describe the reaction with platinum?

I The activation energy is lower.
II The energy change is greater.
III The energy of the reactants is lower than expected.
IV The rate of reaction is greater.

A I and II
B I and IV
C I, II and IV
D I, II, III and IV

Q4

A student investigates how the concentration of an acid affects the speed of reaction with 0.5 g of magnesium at 30 °C.

The student has a beaker, concentrated acid, water and the apparatus below.

P : a mass balance
Q : a stopwatch
R : a measuring cylinder
S : a thermometer

Which pieces of apparatus do the student use?

A P, Q and R only
B P, Q and S only
C Q, R and S only
D P, Q, R and S

Q5

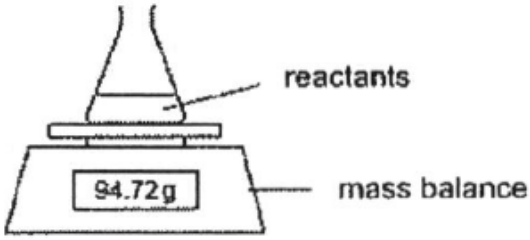
Which of the following changes slow down the reaction between magnesium and air?

1. heating the magnesium to a higher temperature
2. using pure oxygen instead of air
3. using magnesium ribbon instead of powdered magnesium

A 1 only B 2 only C 3 only D 1, 2 and 3

Q6

The rates of some chemical reactions can be measured by using the apparatus shown.




For which reaction is this apparatus suitable?

A $Mg + ZnCl_2 \rightarrow MgCl_2 + Zn$

B $MgO + 2HCl \rightarrow MgCl_2 + H_2O$

C $MgCl_2 + 2NaOH \rightarrow Mg(OH)_2 + 2NaCl$

D $MgCO_3 + 2HCl \rightarrow MgCl_2 + CO_2 + H_2O$

Q7

Which row correctly describes what happens when the temperature of a chemical reaction is decreased?

| | activation energy ($E_a$) | number of effective collisions |
|---|---|---|
| A | decreases | decreases |
| B | decreases | increases |
| C | remains the same | decreases |
| D | remains the same | increases |

Q8

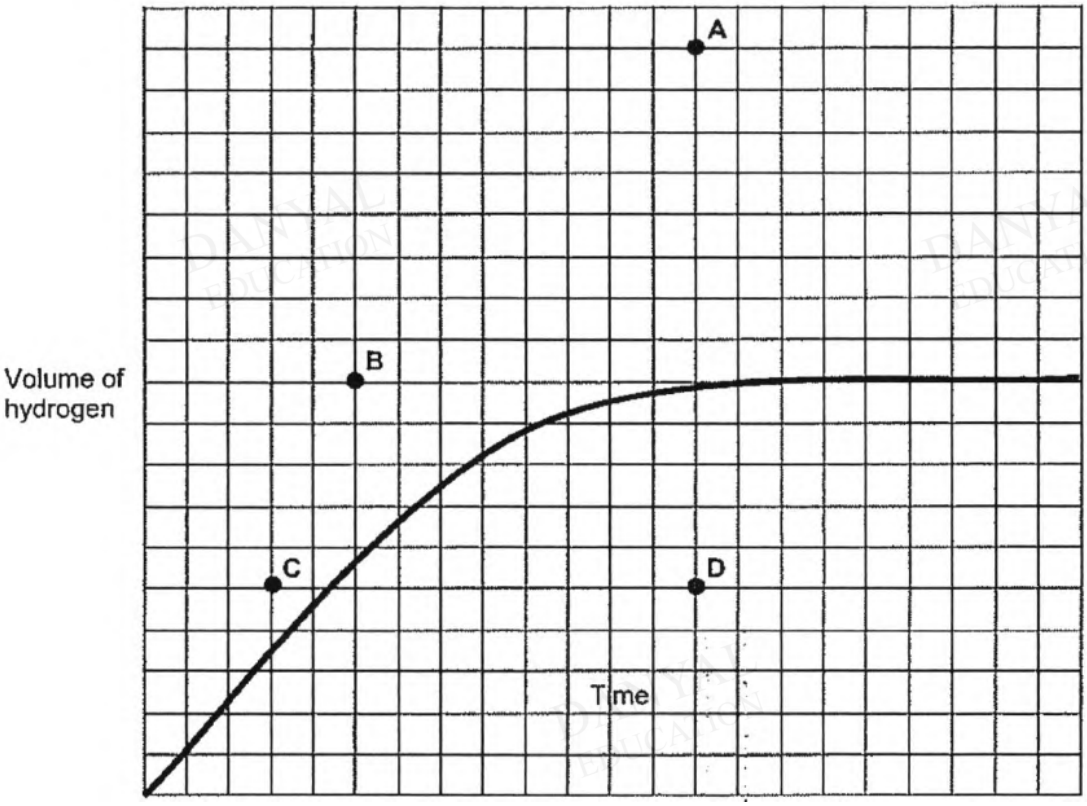
When a magnesium strip was dropped into excess hydrochloric acid, the rate of reaction increased for the first few seconds. What could be a possible explanation for this increase?

A The mass of magnesium increased as the reaction proceeds.
B The reaction between magnesium and hydrochloric acid is exothermic.
C The magnesium acts as a catalyst for this reaction.
D The volume of magnesium decreases as the reaction proceeds.

Q9

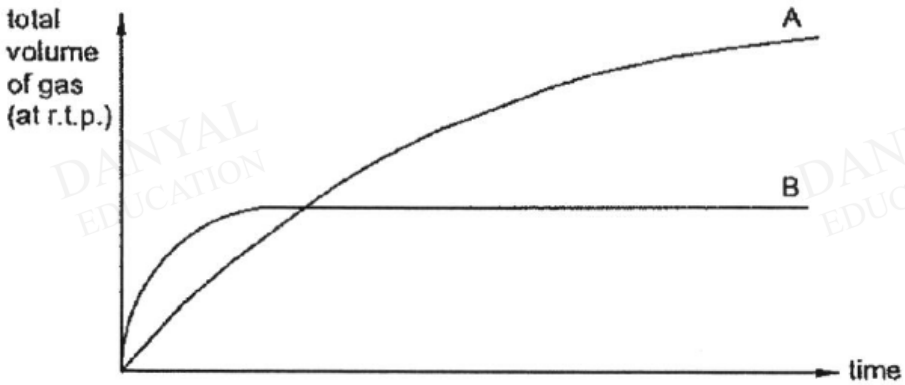
In an experiment, an excess of zinc reacts with 200 $cm^3$ of 0.1 $mol/dm^3$ of hydrochloric acid. The graph shows how the volume of hydrogen produced varies with time.

In a second experiment, the same mass of zinc reacts with 100 $cm^3$ of 0.2 $mol/dm^3$ of hydrochloric acid. For the second experiment, at which point will the graph become horizontal?




Q10

In the graph, curve A represents the results of reacting 1.0 g of magnesium granules with an excess of acid at 40°C.




Which changes could produce curve B?

A using 1.0 g of magnesium granules and an excess of acid at 30°C
B using 1.0 g of magnesium powder and an excess of acid at 50°C
C using 0.5 g of magnesium granules and an excess of acid at 30°C
D using 0.5 g of magnesium powder and an excess of acid at 50°C

## Answers

## Speed of Reaction Test 4.0

Q1 B

Q2 A

Q3 B

Q4 D

Q5 C

Q6 D

Q7 C

Q8 B

Q9 B

Q10 D