

O Level Pure Chemistry MCQs

Speed of Reaction Test 3.0

Q1

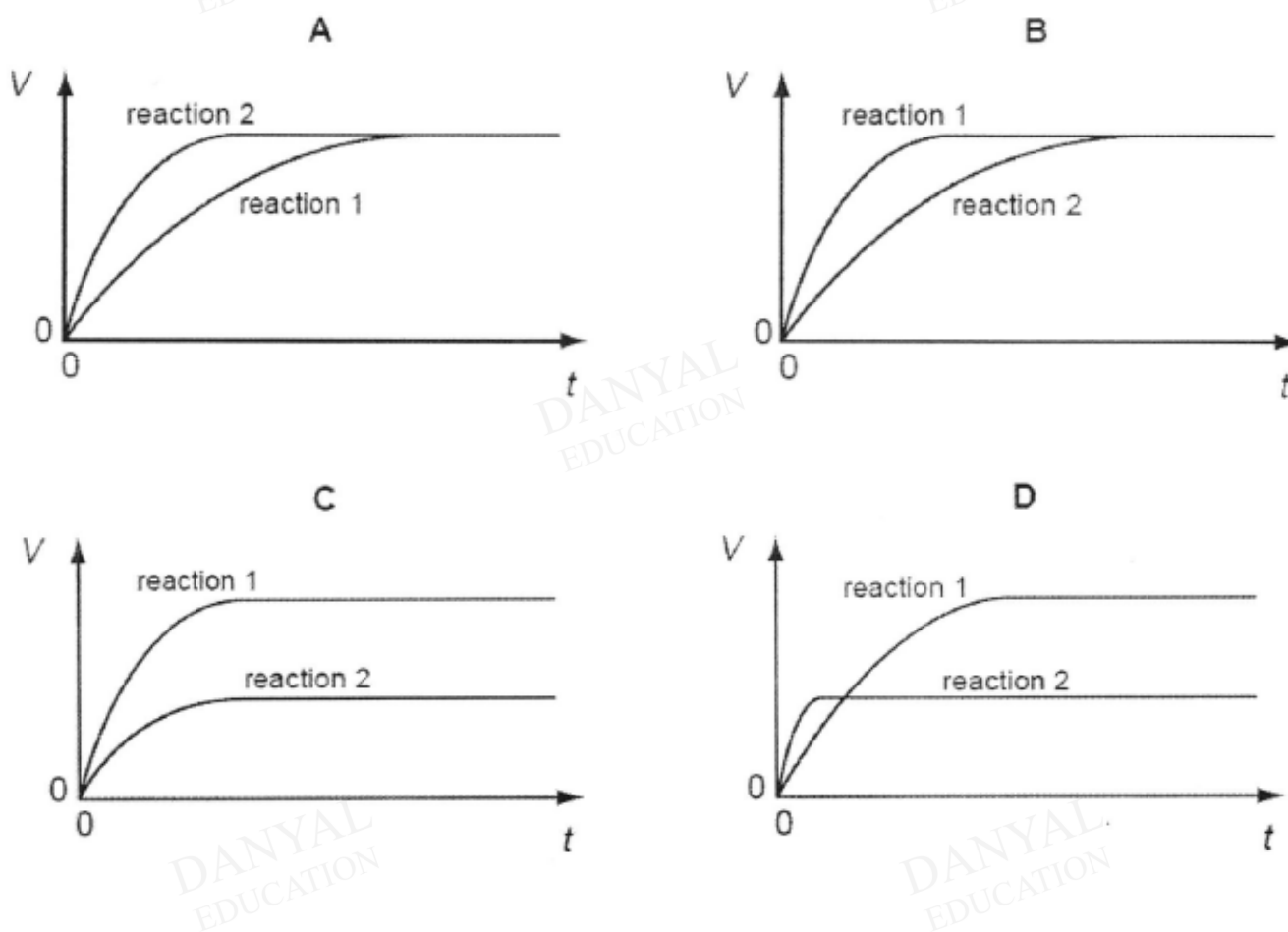
A student performs two reactions.

Reaction 1: 10 g of magnesium ribbon with excess 2.0 mol/dm^3 dilute hydrochloric acid

Reaction 2: 5 g of magnesium powder with excess 2.0 mol/dm^3 dilute hydrochloric acid

In both experiments, the volume of hydrogen produced, V , is measured against time, t .

Which set of graphs correctly shows the results obtained for the two experiments?



Q2

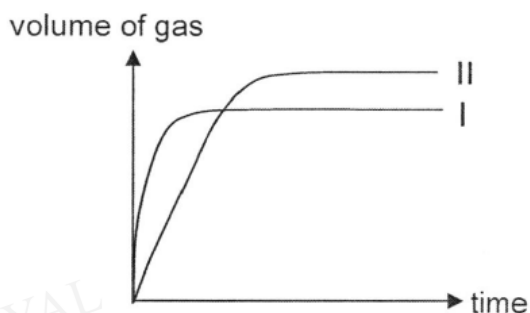
Which apparatus should the student use for the two experiments in Q1 ?

- P an electronic balance
- Q a stopwatch
- R a measuring cylinder
- S a gas syringe

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

Q3

In the graph, curve I represents the result of a reaction between 1.0 g of calcium granules and excess water at 25 °C.

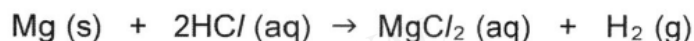


Which alteration to the conditions would produce curve II?

- A 1.0 g of calcium powder with excess water at 25 °C.
- B 1.0 g of calcium powder with excess water at 50 °C.
- C 1.15 g of calcium granules with excess water at 15 °C.
- D 1.15 g of calcium granules with excess water at 50 °C.

Q4

Excess magnesium was reacted with dilute hydrochloric acid at room temperature.

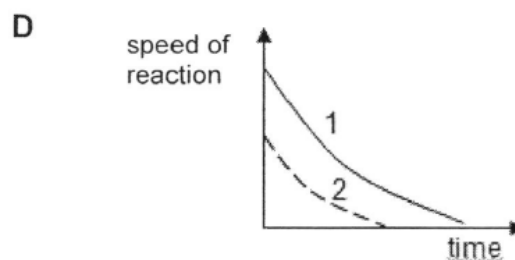
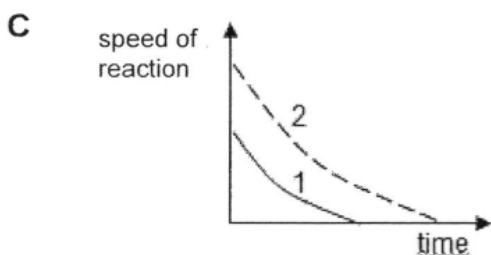
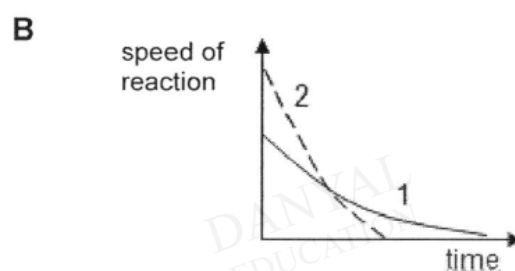
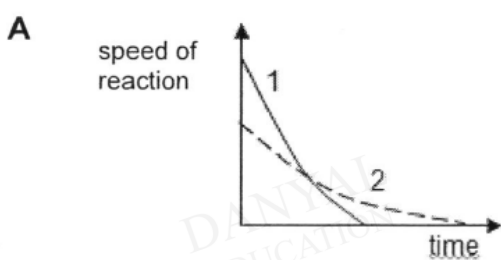


Two experiments were carried out.

Experiment 1: 40 cm³ of 1 mol/dm³ hydrochloric acid

Experiment 2: 15 cm³ of 2 mol/dm³ hydrochloric acid

Which graph shows how the speed of reaction varied with time in each experiment?



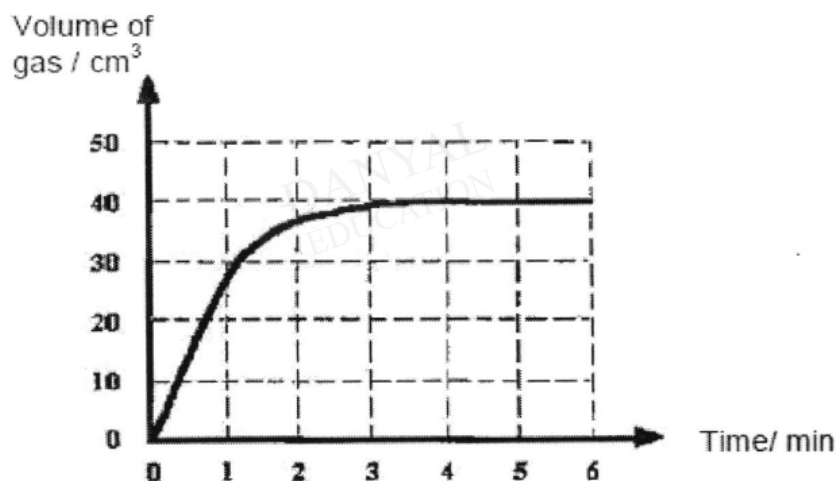
Q5

In which reaction is the pressure **least** likely to affect the rate of the reaction?

- A $C(s) + CO_2(g) \rightarrow 2CO(g)$
- B $2SO_2(g) + O_2(g) \rightarrow 2SO_3(g)$
- C $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$
- D $NaOH(aq) + HCl(aq) \rightarrow NaCl(aq) + H_2O(l)$

Q6

The rate of reaction between pieces of zinc and 1.0 mol/dm^3 hydrochloric acid was investigated. The total volume of gas produced every minute was recorded over a period of time. The zinc had completely reacted in the reaction and the results are shown in the graph below.

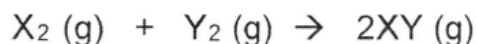


What would be expected if the experiment was repeated using the same mass of zinc and the same volume of 2.0 mol/dm^3 hydrochloric acid?

- | | Maximum volume of gas produced | Time at which maximum volume is obtained |
|---|--------------------------------|--|
| A | 40 cm^3 | less than 4 minutes |
| B | 40 cm^3 | longer than 4 minutes |
| C | 80 cm^3 | less than 4 minutes |
| D | 80 cm^3 | longer than 4 minutes |

Q7

The reaction represented by the equation below occurs by collisions between X_2 and Y_2 molecules.



Which of the following statement(s) is/are correct about this reaction?

- I: All collisions between X_2 and Y_2 molecules produce XY molecules.
- II: The frequency of collisions is increased by raising the concentration of X_2 and Y_2 molecules in the reaction mixture.
- III: The frequency of collisions is unaffected by raising the pressure exerted on the reaction mixture.
- IV: The frequency of collisions is increased markedly by even a small rise in the temperature of the reaction mixture.

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

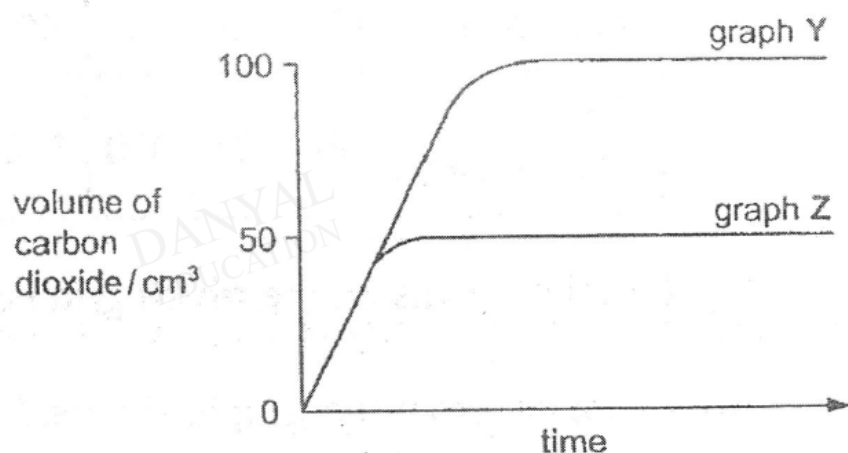
Q8

Which statement best explain why coal dust forms an explosive mixture with air?

- A Coal dust catalyse the explosion.
- B Crushing coal breaks chemical bonds.
- C Coal dust have a large surface area.
- D Crushing coal releases hydrogen from compounds in coal.

Q9

Some crystals of sodium carbonate were added to an excess of sulfuric acid at room temperature. The volume of carbon dioxide produced was measured over a period of time. The results are shown in graph Y. The experiment was repeated and graph Z was obtained.

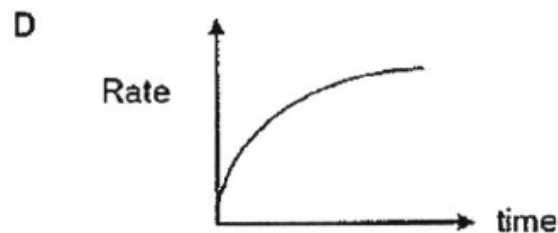
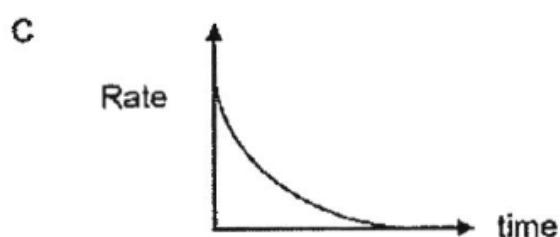
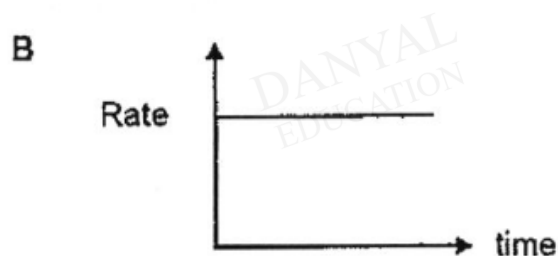
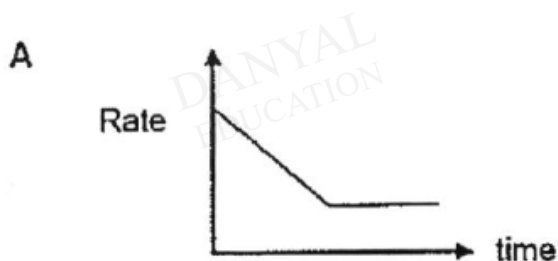


Which one of the following changes was made to obtain the results shown in graph Z?

- A Acid of half the original concentration was used.
- B A lower temperature was used.
- C Half the amount of sodium carbonate was used.
- D Larger crystals of sodium carbonate were used.

Q10

Which of the following graphs represents how the rate of reaction varies with time when an excess of calcium carbonate reacts with dilute hydrochloric acid?



Answers

Speed of Reaction Test 3.0

Q1 D

Q2 D

Q3 C

Q4 B

Q5 D

Q6 A

Q7 B

Q8 C

Q9 C

Q10 C

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