O Level Pure Chemistry MCQs

Speed of Reaction Test 2.0

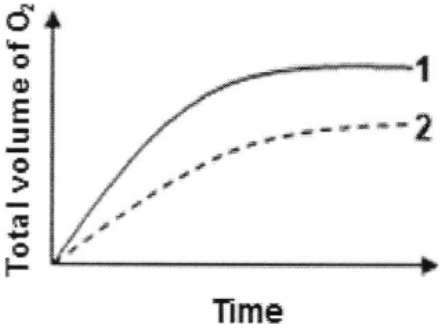
Q1

Aqueous hydrogen peroxide decomposes to form water and oxygen gas. Two experiments were carried out to measure the rate of production of oxygen from aqueous hydrogen peroxide.

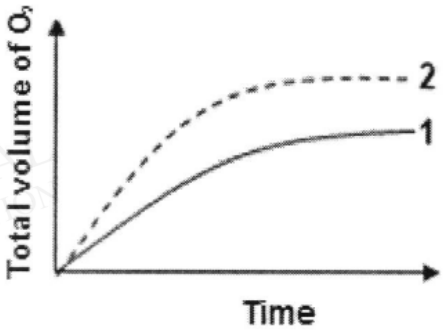
Which graph shows how the how the volume of oxygen gas varies with time in each experiment?

experiment	reagent used
1	400 cm^3 of 0.2 mol/dm^3 hydrogen peroxide
2	100 cm^3 of 1.0 mol/dm^3 of hydrogen peroxide

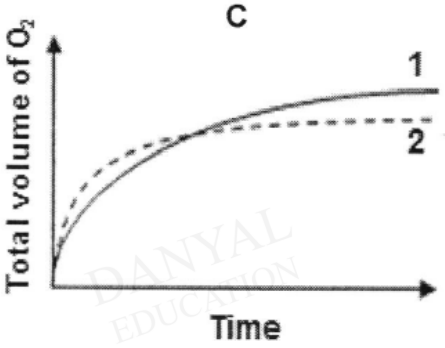
A



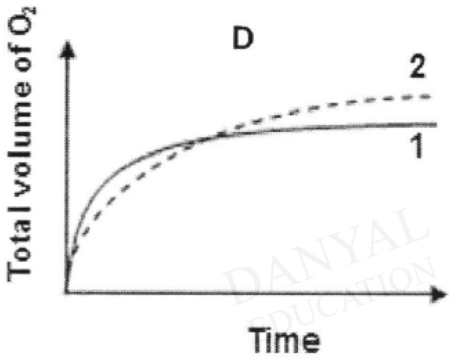
B



C



D



Q2

The reaction of manganate(VII) ions with hydrogen peroxide in acid solution may be represented by the following equation.

$$2MnO_4^-(aq) + 6H^+(aq) + 5H_2O_2(aq) \rightarrow 2Mn^{2+}(aq) + 5O_2(g) + 8H_2O(l)$$

The rate of reaction can be determined by measuring changes in different variables of the reaction.

Which of the following methods of monitoring the rate of reaction are suitable?

I. volume of gas produced
II. pH of the reaction mixture
III. mass of the reaction mixture
IV. amount of precipitate obtained
V. intensity of the purple colour of the reaction mixture

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

Q3

Which change would increase the speed of reaction between 1 mole of two gases?

A a decrease in surface area of the catalyst
B a decrease in temperature
C a decrease in the size of the reaction flask
D a decrease in the pressure of the gases

Q4

If the pressure on the reactants in a gaseous reaction is decreased, which of the following is **true**?

	concentration	rate of reaction
A	decreases	increases
B	decreases	decreases
C	increases	increases
D	no effect	decreases

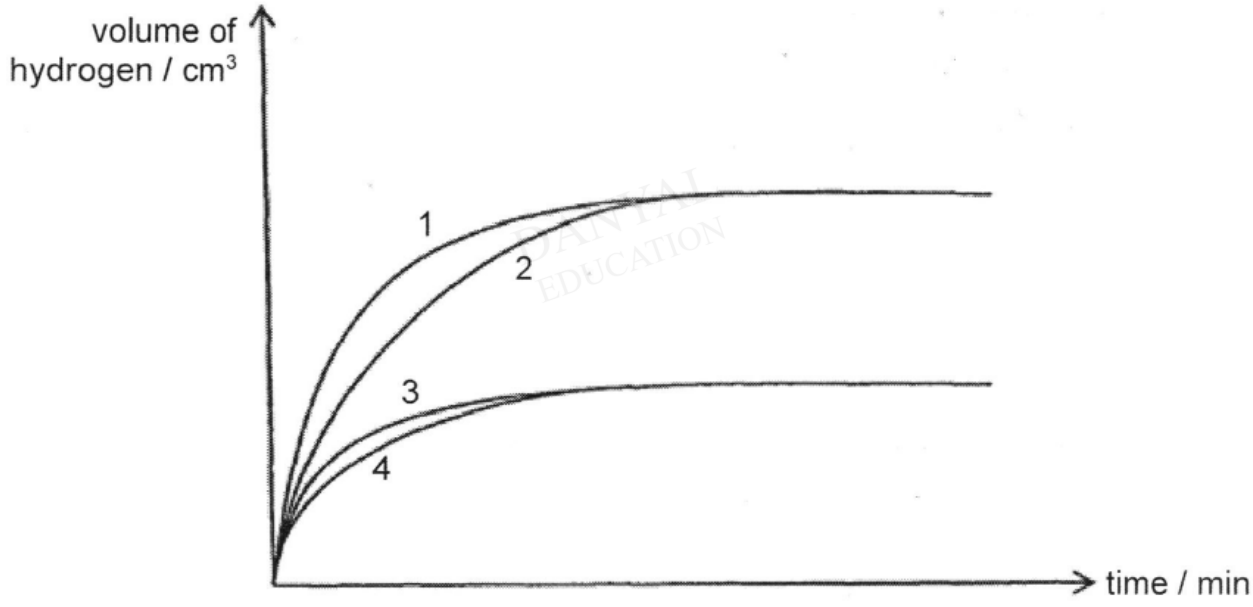
Q5

Four experiments were carried out by adding samples of zinc of different size and mass to excess 1.0 mol/dm^3 hydrochloric acid in four separate conical flasks. The volume of hydrogen gas evolved was collected and measured at regular time interval for each experiment.

The set of conditions for the four experiments are shown in the table below.

set of conditions	particle size of zinc	mass of zinc / g
W	granular	5.0
X	granular	10.0
Y	powder	5.0
Z	powder	10.0

The graph of the results from the four experiments are labelled 1, 2, 3 and 4 as shown below.

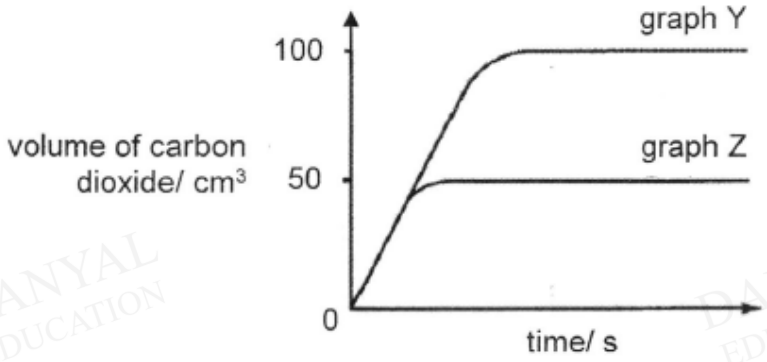


Which of the following correctly matches the graphs of experiments 1, 2, 3 and 4 with the set of conditions W, X, Y and Z?

	W	X	Y	Z
A	3	2	1	4
B	3	2	4	1
C	4	1	3	2
D	4	2	3	1

Q6

Some sodium carbonate pellets were added to an excess of sulfuric acid at room temperature. The volume of carbon dioxide produced was measured over a period of time. Graph Y shows the results obtained.

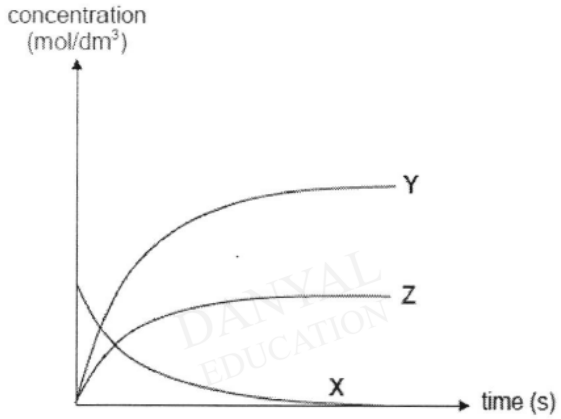


Which change could have produced graph Z?

A Acid of half the original concentration was used.
B A lower temperature was used instead.
C Half the mass of sodium carbonate pellets was used.
D Powdered sodium carbonate of the same mass was used.

Q7

The following graph shows the change in reactant and product concentrations with time during a chemical reaction.

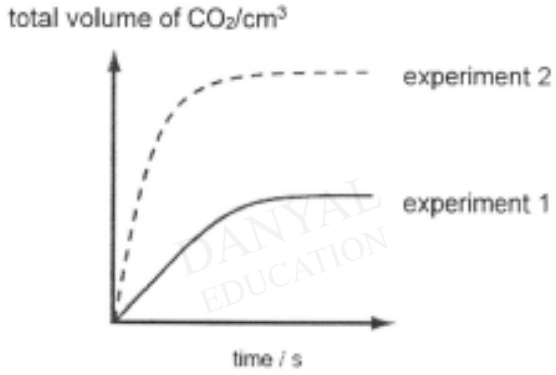


Which equation represents the reaction?

A $X \rightarrow Y + Z$
B $X \rightarrow 2Y + Z$
C $Z \rightarrow 2X + Y$
D $Z \rightarrow 2Y + X$

Q8

The reaction of iron(II) carbonate with an excess of dilute hydrochloric acid is investigated.
In experiment 1, 100 cm^3 of 0.10 mol/dm^3 hydrochloric acid and 0.5 g of iron(II) carbonate chips are used.

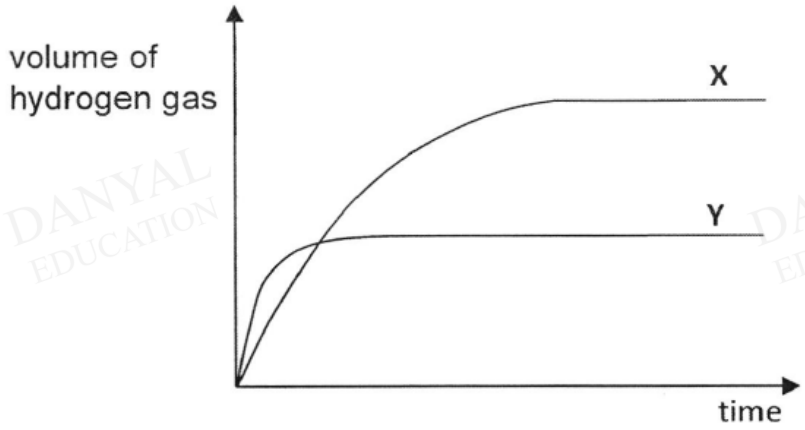


What conditions will produce the curve for experiment 2?

A 100 cm^3 of 0.10 mol/dm^3 of dilute hydrochloric acid and 1.0 g of iron(II) carbonate chips
B 100 cm^3 of 0.20 mol/dm^3 of dilute hydrochloric acid and 0.5 g of iron(II) carbonate chips
C 100 cm^3 of 0.20 mol/dm^3 of dilute hydrochloric acid and 1.0 g of iron(II) carbonate chips
D 200 cm^3 of 0.10 mol/dm^3 of dilute hydrochloric acid and 0.5 g of iron(II) carbonate chips

Q9

Two experiments on the reaction between zinc and sulfuric acid are carried out and their results are given in the graph below.



If 10 g of zinc granules reacts with 0.50 dm^3 of 1 mol/dm^3 sulfuric acid to produce graph **X**, which of the following could give rise to graph **Y**?

A 5 g zinc granules in 0.500 dm^3 of 1 mol/dm^3 sulfuric acid
B 5 g zinc granules in 0.500 dm^3 of 2 mol/dm^3 sulfuric acid
C 10 g zinc granules in 0.250 dm^3 of 2 mol/dm^3 sulfuric acid
D 10 g zinc granules in 0.125 dm^3 of 2 mol/dm^3 sulfuric acid

Q10

Answers

Speed of Reaction Test 2.0

Q1 B

Q2 D

Q3 C

Q4 B

Q5 D

Q6 C

Q7 B

Q8 C

Q9 B

Q10