

SCOBA
CHEMISTRY TEST

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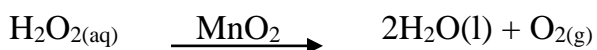
INSTRUCTIONS:

This paper consist of only one section.

Answer all questions in this paper

Answers must be written on answer sheets

1. Oxygen is formed from hydrogen peroxide in the presence of manganese (V) oxide according to the following equation.



- a) In an experiment, a certain volume of hydrogen peroxide was used to prepare oxygen at room temperature.

With the aid of a suitable diagram, describe how the following can be determined.

- i) The volume of oxygen evolved
- ii) The rate of evolution of oxygen.

- b) In another experiment, one half of the volume of hydrogen peroxide used in (a) was diluted with an equal volume of water.

On the same axes, draw graph to show the variation of volume of oxygen with time for experiments in (a) and (b).

- c) Oxygen produced from 200cm^3 of a 0.5M hydrogen peroxide solution was reacted completely with magnesium.

Calculate the mass of magnesium that reacted.

2. Describe an experiment to show how surface area can affect the rate of the reaction between calcium carbonate and 2M hydrochloric acid. Your answer must include:

- A labelled diagram of apparatus
- Sketch of expected graphs
- Mention of how the graphs can be used to reach conclusion. (11 ½ mks)

- b) Briefly explain why, when a 4M hydrochloric acid was used instead of the 2M acid, the rate of the reaction was faster. Explain the observation. (2 ½ mks)
- c) State one factor other than those mentioned above that can affect the rate of the reaction between hydrochloric acid and calcium carbonate. (1 mk)

3. An experiment was carried out to investigate the rate of reaction between Zinc and aqueous sulphuric acid under different conditions.

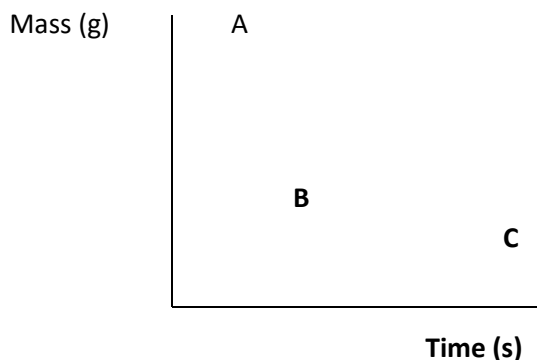
In experiment A, an excess of granulated Zinc was reacted with a known volume of aqueous sulphuric acid at 20⁰c.

In experiment B, the reactants and temperature were the same as in experiment A but this time a few drops of aqueous copper(II) sulphat were added.

The results obtained are in table below;

Time (min)	0	1	2	3	4	5	6	7	8
Volume of gas evolved in experiment A, cm ³	0	20	37	50	60	67	72	74	74
Volume of gas evolved in experiment B, Cm ³	0	24	44	63	74	74	74	74	74

- a) Using the same axes draw a graph to show the variation in volume of gas evolved with time in experiments A and B.
- b) i) Explain the difference in the curves in (b) above.
ii) Explain why the volume of gas evolved during each one minute decreases.
- c) State what would happen to the innitial rate of reaction and to the final volume of gas if the following changes were made.
i) the temperature was increased to 30⁰C.
ii) the concentration of acid was doubled.
iii) powered zinc was used instead of granulated Zinc.
4. The graph below shows loss in mass produced when a fixed mass of marble chips was reacted with excess dillute hydrochloric acid.



- a) Describe the shape of the graph. (4 mks)
- b) Explain the changes in mass along.
- i) AB (3 mks)
 - ii) BC (3 mks)
- c) Write equation for the reaction that takes place. (2 mks)
- d) State three ways in which the rate of reaction could be increased. (3 mks)

“EVERY SOUL SHOULD PASS CHEM”

END

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