

A level Chemistry A

H432/01 Periodic table, elements and physical chemistry

Question Set 4

4. (a)

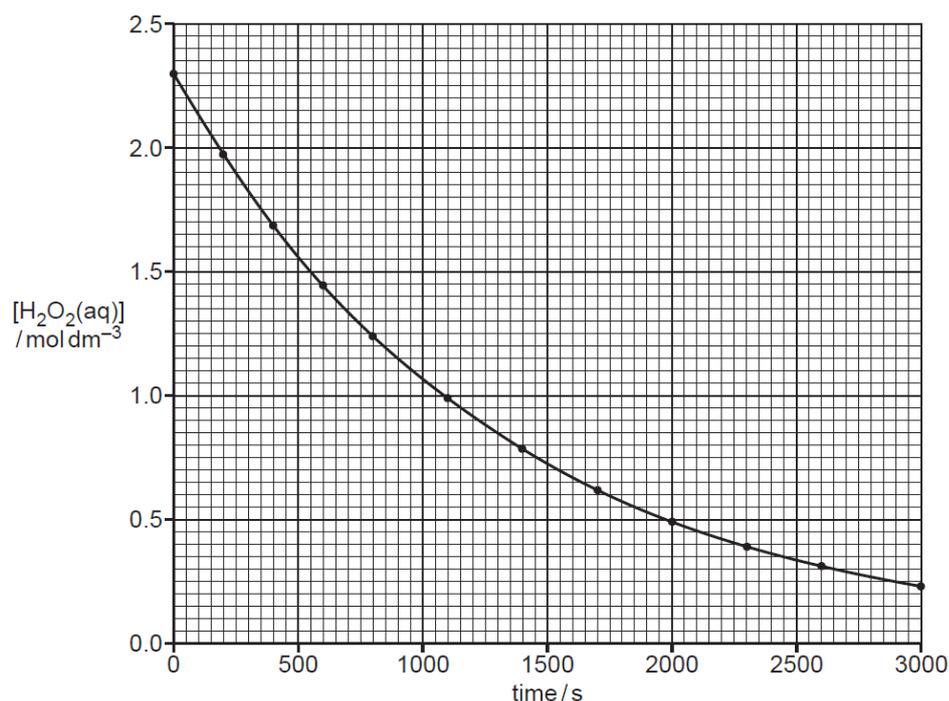
Aqueous solutions of hydrogen peroxide, $\text{H}_2\text{O}_2(\text{aq})$, decompose as in the equation below.



A student investigates the decomposition of $\text{H}_2\text{O}_2(\text{aq})$ by measuring the volume of oxygen gas produced over time. All gas volumes are measured at room temperature and pressure.

The student uses 25.0 cm^3 of $2.30 \text{ mol dm}^{-3} \text{ H}_2\text{O}_2$.

From the results, the student determines the concentration of $\text{H}_2\text{O}_2(\text{aq})$ at each time. The student then plots a concentration–time graph.



Determine the total volume of oxygen, measured at room temperature and pressure, that the student should be prepared to collect in this investigation.

Suggest apparatus that would allow this gas volume to be collected, indicating clearly the scale of working.

[3]

(b)

Suggest a different experimental method that would allow the rate of this reaction to be followed over time.

[1]

(c)* Determine the initial rate of reaction, the order with respect to H_2O_2 , and the rate constant.

Your answer must show full working on the graph and on the lines below.

[6]

Total Marks for Question Set 4: 10

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