

Required Practical Rates of Reaction

GCSE Chemistry · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Identify the independent, dependent and two control variables in the disappearing cross practical. (4 marks)

Step 1 · Independent

Concentration of sodium thiosulfate solution.

Step 2 · Dependent

Time taken for the cross to disappear.

Step 3 · Controls

Any two: volume and concentration of acid; total volume of solution; temperature; the same cross and the same person observing.

Answer: IV: concentration; DV: time; controls: e.g. acid volume and temperature

Check: The total volume is kept the same by adding water.

2. Now try one with the steps

The cross disappears after 25 s. Calculate 1/time measure of rate. (1 mark)

Step 1 · Reciprocal

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. State the independent variable in the disappearing cross practical. [1]

2. State the dependent variable. [1]

3. Give two control variables. [2]

4. Explain why the same person should judge when the cross disappears. [1]

5. The cross disappears after 25 s. Calculate $1/\text{time}$ in s^{-1} . [1]
6. At concentrations of 8, 24 and 40 g/dm^3 the cross disappeared after 110 s, 37 s and 22 s. Describe the relationship between concentration and time. [1]
7. Explain the effect of concentration on rate using collision theory. [2]
8. In the gas-collection method, name a piece of apparatus to measure the volume of hydrogen. [1]
9. In the gas method, explain why the same length of magnesium ribbon is used each time. [1]
10. The thiosulfate reaction produces sulfur dioxide. Give one precaution and explain why it is needed. [2]
11. Explain why $1/\text{time}$ is used measure of rate. [1]
12. At 32 g/dm^3 the time is 28 s. Calculate $1/\text{time}$ in s^{-1} to 3 significant figures. [1]
13. In one set of results, concentration $\times$ time was about 880 for every concentration. Predict the time, in s, for a concentration of 20 g/dm^3 . [2]
14. Suggest one way to make the timing of the end point less subjective. [1]

4. Before you hand it in

"A longer time means a faster rate."

Shorter time = faster rate. Use $1/\text{time}$ to plot rate.

Changing the volume of thiosulfate without adding water

Keep the total volume constant by making up with water.

Forgetting the gas is toxic

Ventilate well and dispose of mixtures promptly