

Practical 1 – Chapter 6

Designing an experiment to investigate the effect of concentration on reaction rate

In this experiment you will study how changing concentration affects the rate of a reaction.

The reaction you will study is that between sodium thiosulfate solution and hydrochloric acid:



The reaction produces a precipitate of sulfur. You will time how long it takes to obscure a cross drawn on a piece of paper placed under the reaction flask. In other words, you will measure the time it takes to produce a fixed amount of sulfur.

You will use 2 mol dm^{-3} HCl (**Care!**) and 0.15 mol dm^{-3} $\text{Na}_2\text{S}_2\text{O}_3$.

Safety

- 2 mol dm^{-3} HCl is an irritant.
- The reaction produces SO_2 , which is toxic and is an irritant to the eyes and respiratory system.
- Wear eye protection.

Full list of apparatus and chemicals

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Method

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Complete the table to show how you will vary the concentration:

Expt. no.	Volume of $\text{Na}_2\text{S}_2\text{O}_3$ / cm^3	Volume of H_2O / cm^3	Volume of HCl / cm^3	Concentration of $\text{Na}_2\text{S}_2\text{O}_3$ / mol dm^{-3}
1	50	0	5	0.15
2			5	
3			5	
4			5	
5			5	

Now complete this table:

Independent variable	What you change to investigate its effect	
Dependent variable	What you measure	
Controlled variables	Factors which could affect the outcome of the experiment and must be kept constant	

Explain how the controlled variables will be controlled.

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