

# The effect of concentration on reaction rate – teacher notes

## Introduction

Sodium thiosulfate solution is reacted with acid – a sulfur precipitate forms. The time taken for a certain amount of sulfur to form can be used to indicate the rate of the reaction. This experiment should take around 60 minutes

## Equipment

### Apparatus

- Eye protection
- Conical flask, 250 cm<sup>3</sup>
- Measuring cylinder, 100 cm<sup>3</sup>

### Chemicals

- Sodium thiosulfate solution 50 g dm<sup>-3</sup>
- Hydrochloric acid 2 mol dm<sup>-3</sup>

### Health, safety and technical notes

- Read our standard health and safety guidance here <https://rsc.li/3GkcuHG>
- Always wear eye protection.
- Sodium thiosulfate solution 50 g dm<sup>-3</sup> is low hazard (see CLEAPPS Hazcard [HC095a](#)).
- Dilute hydrochloric acid is low hazard at the concentration used (see CLEAPSS Hazcard [HC057a](#)).

### Notes

- Sulfur dioxide (a toxic gas) forms as a by-product. Ensure good ventilation. If there are asthmatics in the class, the risk assessment should take this into account and necessary adjustments made, such as working in a fume cupboard, reducing the scale etc.
- As soon as the reaction is complete, pour the solutions away, preferably into the fume cupboard sink. Wash away with plenty of water.
- A light sensor can be used to monitor the precipitation on a computer. The result, in the form of graphs on the computer, can be analysed using data logging software.
- A light sensor clamped against a plastic cuvette filled with the reactants substitutes for a colorimeter. The data logging software shows the turbidity on a graph, and this tends to yield more detail than the standard end-point approach. The rate of change can be measured using the slope of the graph or the time taken for a change to occur.