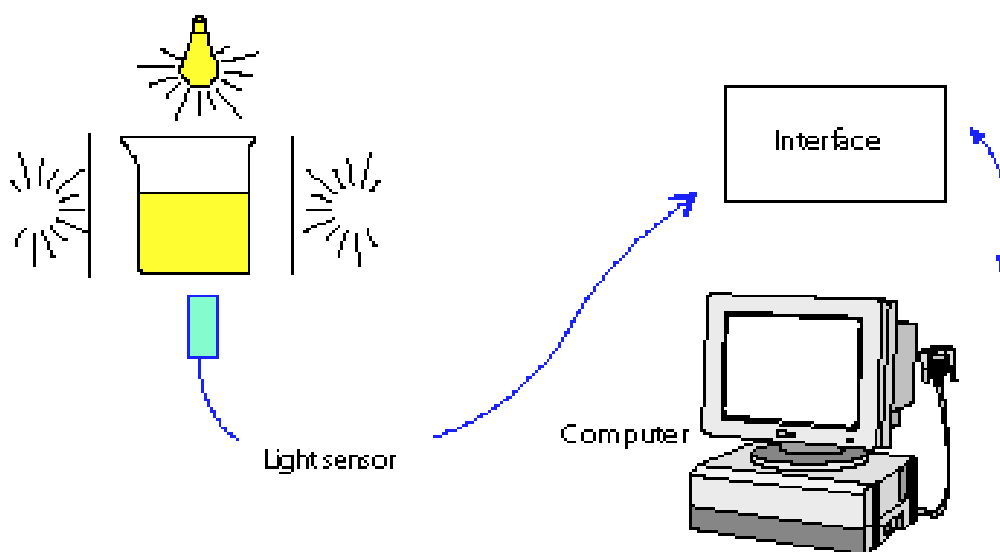


Rates: Thiosulphate and acid



Sodium thiosulphate and acid react to form a precipitate. The light sensor can be used, like a colorimeter, to monitor the rate of the reaction. In this experiment we study the effect of different amounts of acid on the reaction rate. It will also be possible to study the effect of temperature.

Apparatus

0.1M hydrochloric acid HCl, 0.1 M Sodium thiosulphate $\text{Na}_2\text{S}_2\text{O}_4$, distilled water, a sheet of black paper, interface and light sensor. Bright light source.

Setting up

Set up the light sensor and a beaker containing 30cm^3 of thiosulphate $\text{Na}_2\text{S}_2\text{O}_4$. (Better alternative: use a smaller volume in a plastic cuvette made from a pH indicator paper box).

Use black paper to shield the beaker from changes in the light level. Try not to completely cover the chemicals - it helps if you can see the chemical change occurring. Connect the light sensor to socket 1 on the interface. Some systems recognise the sensors you attach automatically, in others you do this yourself.

Start the computer recording and see if the trace is on screen. If the Light sensor is adjustable, change its range to get the trace on screen.

Recording the data

Add 5cm^3 acid to the beaker.

Record for 90 seconds. Avoid leaning over the beaker!

Replace the beaker and 30cm^3 thiosulphate solution. Repeat the experiment using 10cm^3 acid.

Using the results

How does the appearance of the solution change during the reaction?

What does the graph tell you about the progress of the reaction?

When was the reaction working at its fastest?

What condition did you change? How has this affected the graph? How has this affected the reaction?

Calculate the average gradient of the graphs. Which part of the graph should you use?

Save your data on disk. Print the graph.

