Reaction of Sodium Thiosulphate with Hydrochloric acid

Safety: Good laboratory practice should be followed. Concentrations of hydrochloric acid stronger than 2M but weaker than 6.5M should be labelled IRRITANT but this investigation does not need concentrations approaching 2M

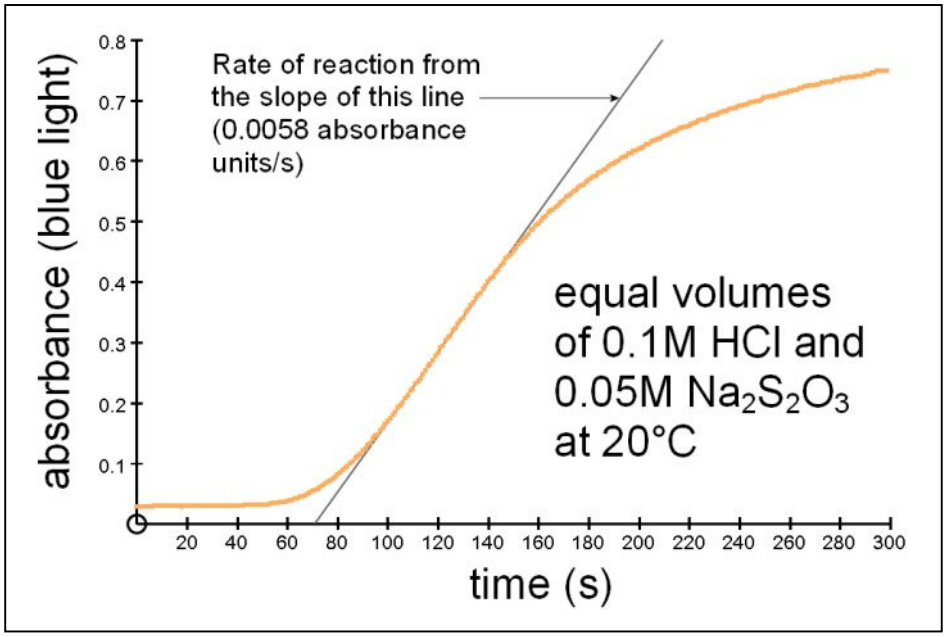
Reaction: Chloride displaces thiosulphate. In the first reaction thiosulphuric acid is formed. This is unstable and decomposes producing sulphur dioxide and solid sulphur that is forms the cloudy precipitate.

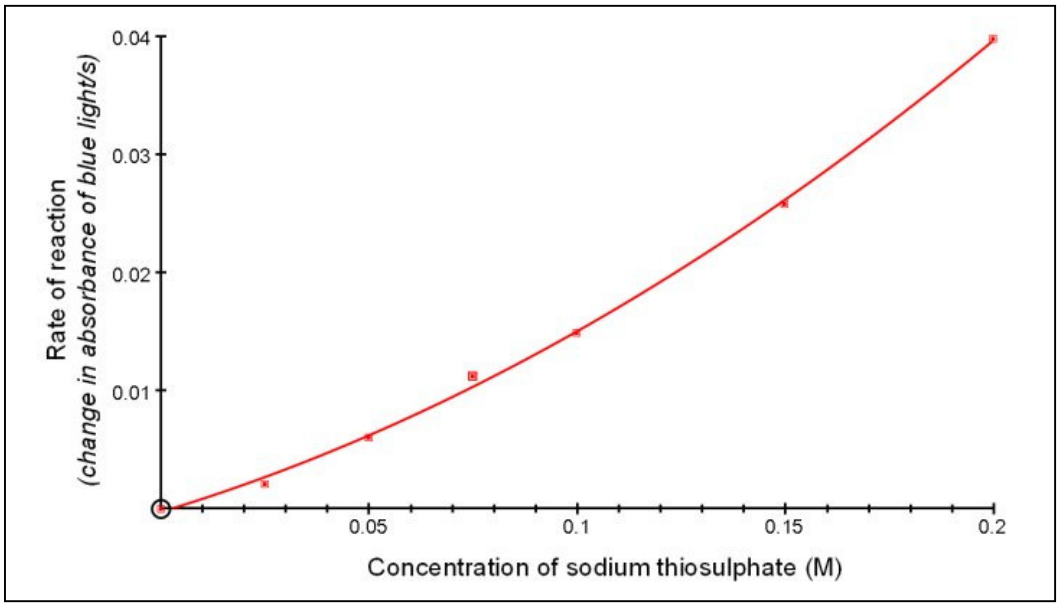
$$\mathbf{Na_2S_2O_{3\,(aq)} + 2HCl_{\,(aq)} \rightarrow 2NaCl_{\,(aq)} + S_{\,(s)} + SO_{2\,\,(g)} + H_2O_{\,(l)}}$$

1. $Na_2S_2O_{3\,(aq)} + 2HCl_{\,(aq)} \rightarrow 2NaCl_{\,(aq)} + H_2S_2O_{3(aq)}$
2. $H_2S_2O_{3(aq)} \rightarrow S_{\,(s)} + SO_{2\,\,(g)} + H_2O_{\,(l)}$

The rate of the reaction depends on the concentrations of acid and sodium thiosulphate and on the temperature. These dependencies can be demonstrated and accurately measured using the colorimeter.

Using the Mystrica colorimeter to measure reaction rates:
Measure the absorbance of blue light. The colorimeter can be used stand-alone or connected to a computer.





See a video clip of this reaction on the Mystrica website

www.mystrica.com