NEATH PORT TALBOT COLLEGE
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School of Maths & Science
Science Practical

Experiment to investigate the effect of temperature on the rate of reaction

◆ Aim

At the end of the experiment you should be able to see how temperature affects the rate of the reaction.

◆ Introduction

The reaction used here is the same as that used to investigate the effect of concentration on rate, I.E. Dilute hydrochloric acid / sodium thiosulfate solution.

In this experiment the concentrations of all the reactions are kept constant and the reactions are carried out at different temperatures.

◆ Safety

Control Measures

- The wearing of **safety glasses, gloves** and a **laboratory coat** at all times will be sufficient to take account of most hazards and significant risks.
- Keep stoppers on bottles as much as possible.
- All waste is to be placed in the labelled container immediately after use.
- You are reminded of the need for good laboratory practice in order to maintain a safe working environment.

Hazards

Irritant — Hydrochloric acid

Harmful / Irritant — Sodium thiosulfate solution

Toxic — Sulfur dioxide gas

◆ Procedure

Measure 50 cm^3 of the given solution of sodium thiosulfate into a conical flask. Heat the contents of the flask to the approximate temperature required. Remove the flask from the heat and place it on the X on the paper. Add $5cm^3$ dilute hydrochloric acid and start the clock.

Measure the temperature of the solution and note the time taken for the cross to disappear from view.

Carry out measurements at approximately 10^0C – 15^0C intervals up to around 80^0C.

Results

Experiment Number	1	2	3	4	5	6
Temperature / ^0C						
Time / S						

Treatment of Results

Draw a graph of temperature against time.

Questions

1. What do you notice about the time as the temperature rises?

2. Remember that rate $\alpha \frac{1}{\text{Time}}$

   What happens to the rate of reaction as temperature increases?

3. Can you suggest a reason for the answer to question 2?