WJEC (Eduqas) Chemistry A-level

SP C2.3b - Study of an 'Iodine Clock' Reaction

Methods and images taken from the WJEC practical handbook

SP C2.3b - Study of an 'Iodine Clock' Reaction

Aim

To study the **kinetics** of the **oxidation of iodide ions** by hydrogen peroxide in acid solution.

Apparatus and Chemicals

- Deionised water
- Stopwatch
- 4 x 10 cm^3 measuring cylinders
- 25 cm^3 bulb/volumetric pipette with safety filler
- 50 cm^3 burette and funnel
- Burette clamp and stand
- 5 x 250 cm^3 conical flasks
- 0.1 mol dm^{-3} H_2O_2 solution
- 1.0 mol dm^{-3} H_2SO_4 solution
- 0.1 mol dm^{-3} KI solution
- 0.005 mol dm^{-3} $Na_2S_2O_3$
- Starch solution

Safety Considerations

★ 1.0 mol dm^{-3} H_2SO_4 solution - irritant

Planning

1. Decide what volumes of H_2O_2 solution and deionised water you will mix together to get at least **5 different concentrations** of H_2O_2. The total volume must not exceed 5 cm^3.

Method

1. In separate conical flasks, make up the **solutions** according to the table below. Do not add the hydrogen peroxide yet.
2. Add 1 cm^3 starch solution to each flask and **mix** thoroughly.
3. Rapidly add the hydrogen peroxide to flask 1, starting the **stopwatch** immediately after this addition.
4. **Swirl** to mix the reaction mixture thoroughly.
5. Stop timing when the solution turns **blue-black** and record the time.
6. **Repeat** the experiment for flasks 2-5.

Flask	Volume H_2SO_4 (cm^3)	Volume $Na_2S_2O_3$ (cm^3)	Volume KI (cm^3)	Volume H_2O (cm^3)	Volume H_2O_2 (cm^3)
1	10	10	25		
2	10	10	25		
3	10	10	25		
4	10	10	25		
5	10	10	25		