

# WJEC (Wales) Chemistry A-level

## SP 2.2b - Study of an 'Iodine Clock' reaction

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## SP 2.2b - 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<sup>3</sup> measuring cylinders
- 25 cm<sup>3</sup> bulb/volumetric pipette with safety filler
- 50 cm<sup>3</sup> burette and funnel
- Burette clamp and stand
- 5 x 250 cm<sup>3</sup> conical flasks
- 0.1 mol dm<sup>-3</sup> H<sub>2</sub>O<sub>2</sub> solution
- 1.0 mol dm<sup>-3</sup> H<sub>2</sub>SO<sub>4</sub> solution
- 0.1 mol dm<sup>-3</sup> KI solution
- 0.005 mol dm<sup>-3</sup> Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>
- Starch solution

### Safety Considerations

- ★ 1.0 mol dm<sup>-3</sup> H<sub>2</sub>SO<sub>4</sub> solution - irritant



### Planning

1. Decide what volumes of H<sub>2</sub>O<sub>2</sub> solution and deionised water you will mix together to get at least **5 different concentrations** of H<sub>2</sub>O<sub>2</sub>. The total volume must not exceed 5 cm<sup>3</sup>.





## 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<sup>3</sup> **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 <sub>2</sub> SO <sub>4</sub> (cm <sup>3</sup> )	Volume Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (cm <sup>3</sup> )	Volume KI (cm <sup>3</sup> )	Volume H <sub>2</sub> O (cm <sup>3</sup> )	Volume H <sub>2</sub> O <sub>2</sub> (cm <sup>3</sup> )
1	10	10	25		
2	10	10	25		
3	10	10	25		
4	10	10	25		
5	10	10	25		

