

Edexcel Chemistry A-Level

Core Practical 13 - Iodine reactions

Flashcards

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What is meant by 'rate of reaction'?



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The change in concentration of reactants or products over time.



How can rate of reaction be measured?



How can rate of reaction be measured?

- Initial rates method- i.e. the iodine clock reaction
- A continuous monitoring method- i.e. measuring the volume of gas released in a reaction over time.



What is a continuous monitoring method?



What is a continuous monitoring method?

This involves measuring the change in concentration of a reactant or product over time (or measuring volume of gas released) as the reaction progresses.



Give an example of a continuous monitoring method.



Give an example of a continuous monitoring method.

- Mix propanone with sulfuric acid and iodine in a beaker. Start a stopwatch.
- Using a pipette, remove a sample of the mixture and add NaHCO_3 . This stops the reaction. Note the time at which it is added.
- Titrate the remaining iodine present in the sample with sodium thiosulfate(VI) solution, using starch as the indicator.
- Repeat titrations with samples taken every 3 minutes (treat with NaHCO_3)



How would you analyse the results from this reaction?



How would you analyse the results from this reaction?

- Plot a graph of titre against time.
Concentration of iodine is proportional to titre.
- By comparing the shape of the graph to known order concentration-time graphs, determine the order of reaction with respect to I_2 .



What is an initial rates method?



What is an initial rates method?

The method involves measuring the initial rate of reaction for multiple different concentrations to observe how rate of reaction varies.

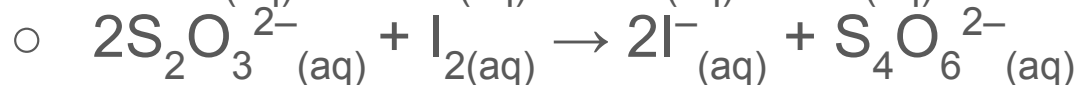
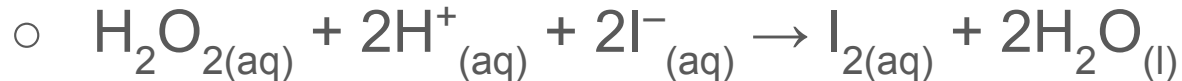


Give an example of an initial rates method.



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- The 'Iodine Clock' experiment:



- The I_2 produced reacts with all of the thiosulfate ions present. Excess I_2 remains in solution which then reacts with starch to form a blue-black solution.
- Time how long it takes for this blue-black colour to appear. You can vary $[\text{I}^-]$ to then determine the order with respect to the iodide ions.



What are the issues with this experiment?



What are the issues with this experiment?

- Some low I^- concentrations may take too long to react.
- Delayed stopwatch reactions.
- Concentrations may not be exact due to measuring apparatus.



What are some potential hazards and risks in the laboratory?



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Hazard	Risk	Control
Iodopropanone	Strong irritant to eyes.	Wear eye protection and gloves. Once each measurement is complete, the reaction mixture should be immediately disposed of with lots of running water using a sink in a fume cupboard
Propanone	Irritant, highly flammable.	Handle with care and with gloves. Wear eye protection. Keep away from an open flame.
Sodium thiosulfate	Releases sulfur dioxide which is toxic and corrosive.	Ensure room is well ventilated. Don't ingest.
Glassware i.e beakers, test tubes.	May break and cut you.	Handle with care. Keep away from edge of the desk.

