AQA Chemistry GCSE

RP5 - Rates of Reaction

Flashcards

What are three ways of measuring the rate of a reaction?

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- Observe how quickly a precipitate forms
- Measure the change in mass
- Measure the volume of gas given off

How do you calculate the rate of reaction?

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Rate of Reaction =

$$\frac{\text{Amount of product formed or reactant used}}{\text{Time}}$$

How could the rate of reaction be measured if a precipitate is produced?

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- Place piece of paper with a black cross below the reaction vessel and observe this cross through the solution
- Measure how long it takes for the cross disappear

How can you measure the rate of reaction if the coloured reactants form a colourless solution?

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Time how long it takes for the reactants to turn colourless

Why is the precipitate rate experiment not very reliable?

Why is the precipitate and colour change rate experiment not very reliable?

It is very subjective - people might disagree over the exact point when the mark disappears or the solution changes colour

How can you measure the rate of reaction when there is a change in mass?

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Carry out the experiment on a mass balance:

- Measure initial mass
- Combine reactants
- Take measurements of the mass at regular intervals as the reactants react
- Rate = change in mass ÷ time

How can you measure the rate of reaction when a gas is given off?

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- Add reactants to a conical flask
- Immediately attach a gas syringe to the conical flask with a bung to ensure minimal gas escapes
- Take regular measurements of the volume of gas in the gas syringe
- Rate = total volume of gas produced ÷ time

How can you find the rate of reaction of a reaction after 30 seconds? (Higher)

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(Higher)

Plot results on a graph

- X axis: time
- Y axis: amount of product formed or reactant used

Draw a tangent at 30 seconds and calculate the gradient (change in y ÷ change in x) to calculate the rate of reaction

What are the units of rate of reaction if you are measuring a change in mass?

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g/s

What are the units of rate of reaction if you are measuring the volume of gas given off?

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cm^3/s

How could you investigate how HCl concentration affects the rate of reaction when magnesium is added?

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Gas is produced so the volume of gas produced can be measured:

- Place the HCl in a conical flask
- Add the magnesium ribbon and quickly fit the bung and gas syringe
- Record volume of gas collected every 10 seconds
- Repeat with a different concentration of HCl
- Compare the rates for each concentration

How could you investigate how sodium thiosulfate concentration affects the rate of reaction when reacted with HCl?

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Precipitate produced so measure the time it takes to cover a cross

- Add 30cm^3 of sodium thiosulfate to a conical flask
- Add 10 cm^3 dilute HCl
- Measure the time it takes for the cross to disappear
- Repeat three times for mean time
- Repeat the experiment with different concentrations of sodium thiosulfate
- Compare the times for each experiment