# AQA Chemistry A-Level

## RP3 - Effect of temperature on rate of a reaction

Flashcards

# How can rate of reaction be measured?

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- 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.

# Why does rate of reaction increase with increasing temperature?

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- As temperature increases, the kinetic energy of the molecules increases. This means more molecules have energy greater than the activation energy and can therefore react.
- Also as kinetic energy of molecules increases, their velocities increase resulting in more frequent and successful collisions.

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- This reaction produces a cloudy sulfur precipitate.
- To measure rate, time how long it takes for a cross underneath the beaker to disappear, using a stopwatch (as more sulfur is produced, it will prevent you from seeing the cross).
- Repeat this at 5+ different temperatures and compare times taken.

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- The disappeared cross is judged by eye and can therefore be unreliable.
- There may be a delayed reaction time with the stopwatch.
- At low temperatures the reaction may be too slow.
- There may not be enough precipitate for the cross to disappear.

# How could you analyse the data?

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- For a graph of the amount of sulfur against time, it would be a straight line at the beginning as the reaction has only just begun.
- Therefore the gradient of this straight section = rate of reaction.
- Compare the rate of reaction for each temperature. For further analysis, you could even plot a graph of rate of reaction against temperature.

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A variable that is kept constant throughout the experiment.

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- Concentrations of reactants and products.
- Volumes of reactants and products.
- Use the same beaker and cross underneath.
- Use the same person to decide when the cross has disappeared.

# How can we keep a substance at a constant temperature?

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Using a water bath keeps the temperature constant. For this experiment you can set up water baths of different temperatures to see how it affects the rate of reaction.