CAIE Chemistry A-level

Topic 8 - Reaction Kinetics

Flashcards

What is meant by *rate of reaction*?

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The change in concentration of reactants or products over time.

How does concentration affect rate of reaction?

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- Increasing the concentration increases the number of molecules per unit volume.
- This leads to more frequent collisions and hence a greater frequency of successful collisions.
- This increases the rate of reaction.

What is activation energy E_A?

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The minimum amount of energy required for a particular reaction to occur between two colliding particles.

What is the Boltzmann distribution?

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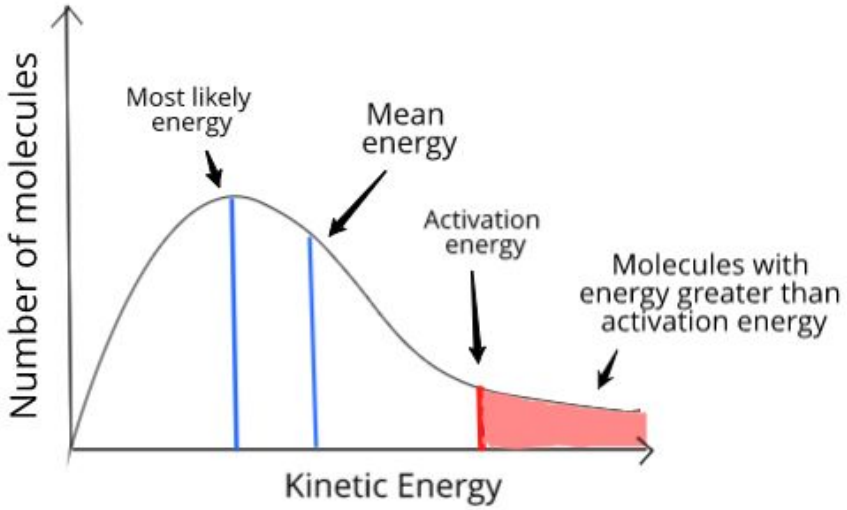


- The Boltzmann distribution shows the relative energies of molecules.
- Area under the graph = total number of molecules.
- Only a small proportion of molecules have energies greater than the activation energy.

Explain the effect of temperature on the rate of reaction

Explain the effect of temperature on the rate of reaction

Increasing the temperature means the particles will have more kinetic energy and so will move faster. If the molecules are moving faster they will collide more often and, since they've gained kinetic energy, a larger proportion of the particles will have at least the activation energy. For both these reasons the rate of reaction increases.

What is catalysis?

What is catalysis?

The increase in the rate of a chemical reaction due to the addition of a catalyst.

What is a homogeneous catalyst?

What is a homogeneous catalyst?

A catalyst that is in the same state as the reactants.

What is a heterogeneous catalyst?

What is a heterogeneous catalyst?

A catalyst that is in a different state to the reactants.

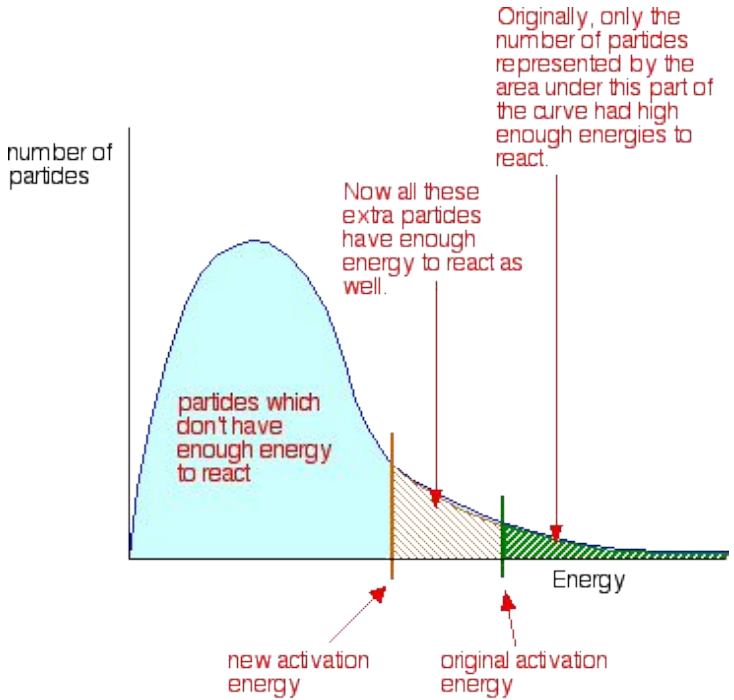
Why do catalysts increase the rate of reaction?

Why do catalysts increase the rate of reaction?

A catalyst provides an alternative reaction pathway which has a lower activation energy.

Use a Boltzmann distribution to show the effect of catalysts

Use a Boltzmann distribution to show the effect of catalysts



Jim Clark, 'The effect of catalysts on reaction rates', Chemguide

What are enzymes?

What are enzymes?

Enzymes are biological catalysts that increase the rate of biochemical reactions.

They are proteins with a specific structure which typically only catalyse a specific reaction.