

CAIE Chemistry A-level

8: Reaction Kinetics Definitions

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Definitions and Concepts for CAIE Chemistry A-level Reaction Kinetics

Activation energy: The minimum amount of energy for particles to collide with for a successful reaction to take place.

Catalyst: A substance that increases the rate of a reaction without being changed in chemical composition or amount. They work by providing an alternative reaction pathway with a lower activation energy.

Collision theory: Reactions can only occur when collisions take place between particles that collide with sufficient energy and the correct orientation.

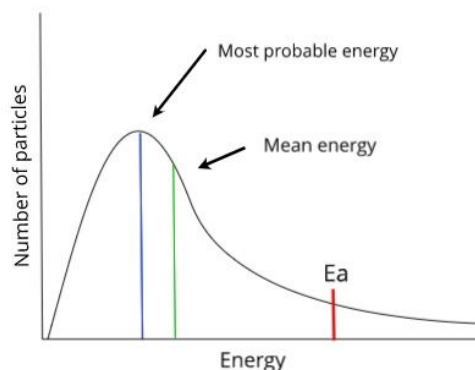
Effect of concentration on reaction rate: As the concentration of reactants increases, the reacting particles get closer together meaning they will collide more often. As a result, there will be a higher rate of successful collisions and a faster rate of reaction.

Effect of pressure on reaction rate: As the pressure of gaseous reactants increases, the reacting particles get closer together meaning they will collide more often. As a result, there will be a higher rate of successful collisions and a faster rate of reaction.

Effect of temperature on reaction rate: 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.

Energy profile: A graph used to show the relative energy levels of reaction species (including reactants and products) as a reaction proceeds.

Maxwell-Boltzmann distribution: Shows the distribution of the molecular energies in a gas at a constant temperature. The area under the curve indicates the total number of particles present.





Rate of reaction: The measure of the amount of product formed or reactant used over time. The units of rate of reaction may be given as g/s, cm^3/s or mol/s.

Successful collisions: Collisions that occur with sufficient energy for a reaction to occur.

