

REACTION MECHANISMS

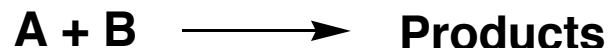
A **reaction mechanism** is the step by step sequence of **elementary reactions** for an overall chemical reaction.

An **elementary reaction** is a chemical reaction in which one or more chemical species react directly to form products in a single reaction step and with a **single transition state**.

In a **unimolecular elementary reaction** a single species, **A**, dissociates or isomerises to form the product(s).



In a **bimolecular elementary reaction**, two species, **A** and **B**, react together to form the product(s).



Rate laws can be written for each elementary step, and all terms collected for each species.

The collection of differential equations must then be solved to give the concentration vs time plots for each species.

For simple mechanisms, an overall rate law for the reaction can sometimes be derived using some assumptions about the relative rates of elementary steps - e.g. **equilibrium assumption** and **steady-state approximation**.

A mechanism describes in detail exactly what takes place at each stage of a chemical reaction. A complete mechanism must also account for all **reactants**, **intermediates**, **catalysts**, and all **products** formed.