# Reaction Kinetics

Achievers Dream

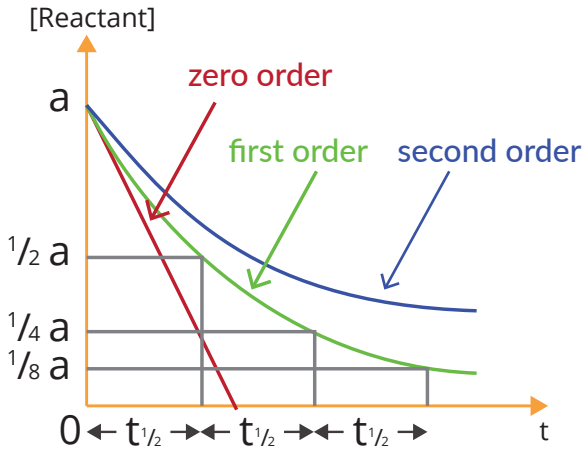
We Believe You Can Fly

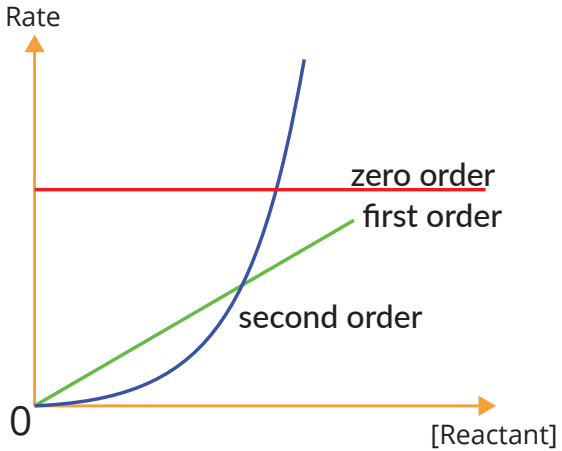
The Chemistry Specialist

# Reaction Kinetics

## Mechanism, Catalysts, Expt Methods

| Order of Reaction | Zero<br>A ⟶ Products | First<br>A ⟶ Products | Second<br>A ⟶ Products |
|---|---|---|---|
| Rate Law/ Equation | Rate = k $[A]^0$ | Rate = k $[A]^1$ | Rate = k $[A]^2$<br>*Or Rate = k [A][B] for A + B→ products* |
| Unit of k | mol $dm^{-3}$ $s^{-1}$ | $s^{-1}$ | $mol^{-1}$ $dm^3$ $s^{-1}$ |
| Half life, $t_{½}$ | Decreases with time | $t_{½} = \frac{\ln 2}{k}$<br>is a constant | Increases with time |




*The order of reaction is usually determined experimentally. It is **not related to the coefficient** of the stoichiometric equation UNLESS:*

- *It is an **elementary reaction** (i.e. reactants react in a **single-step** reaction) or*
- *It is the **slow** step in a **multi-step** reaction (rate-determining step)*