The Practise Ground

Class 12 Chemistry

# Chemical Kinetics

Rate laws, order and the Arrhenius equation

1

$$\text{Rate} = k[A]^m[B]^n$$

**Rate law**

Orders m and n come from experiment, not the equation

2

$$[A] = [A]_0 - kt$$

**Zero-order reaction**

Rate does not depend on concentration

3

$$\ln[A] = \ln[A]_0 - kt$$

**First-order reaction**

Half-life $t_{1/2} = 0.693 / k$

4

$$k = A e^{(-E_a / RT)}$$

**Arrhenius equation**

The rate constant rises sharply with temperature

## Remember

A first-order half-life does not depend on the starting concentration.

A catalyst lowers the activation energy Ea. It does not change ΔH.

## Quick example

A first-order reaction has k = 0.0693 per minute.

$t_{1/2} = 0.693 / 0.0693 = 10$ minutes

After 20 minutes (two half-lives), 25% remains.


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