

AP CHEM

RATE LAWS

REVIEW



RATE LAWS

reaction orders, determined experimentally



rate constant

→ overall reaction order

$$= m + n$$

USING EXP DATA

1. compare 2 trials where **one reactant's** concentration changes

- **doubling** $[A]$ doubles rate = 1st order in A
- **doubling** $[A]$ quadruples rate = 2nd order in A
- **doubling** $[A]$ does nothing = 0th order in A

INTEGRATED RATE LAWS

→ allows reaction order to be determined from a graph

0th order: $[A]$ vs time is linear

1st order: $\ln[A]$ vs time is linear

2nd order: $\frac{1}{[A]}$ vs time is linear

HALF - LIFE

→ time for [reactant] drops to half its original value

0th order: $t_{\frac{1}{2}} = \frac{[A]_0}{2k}$ rate constant ↗

1st order: $t_{\frac{1}{2}} = \frac{0.693}{k}$

2nd order: $t_{\frac{1}{2}} = \frac{1}{k[A]_0}$

**follow for
more!**



@mightochondria



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