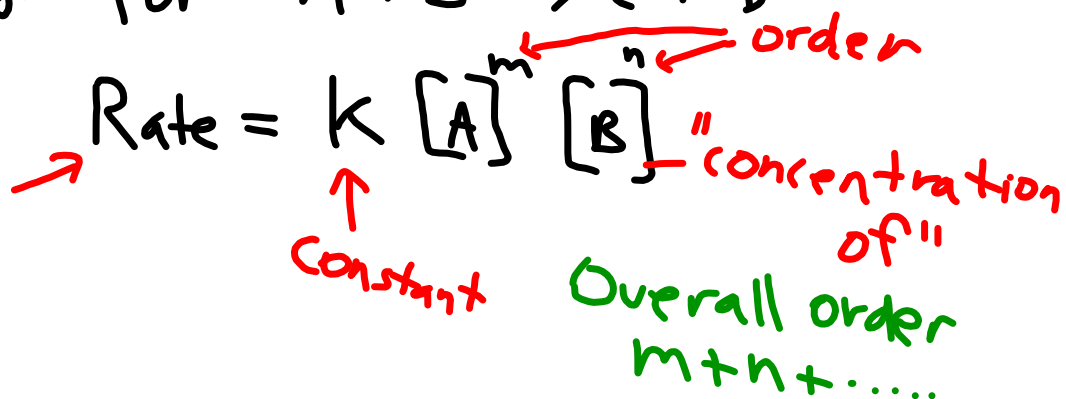


Experimental Rate Law

- Communicates how the concentration of each reactant affects the rate.

e.g. for $A + B \rightarrow C + D$



Examples-Determining Rate Law

p. 544 - table 17.3

Substance A -

Trial	[A]	[B]	Rate
1	0.100	0.100	2×10^{-3}
2	0.200	0.100	4×10^{-3}

control

$\Delta[A]$	ΔRate
$\frac{0.200}{0.100} = 2$	$\frac{4 \times 10^{-3}}{2 \times 10^{-3}} = 2$

$$\Delta[A]^n = \Delta \text{rate}$$

$$2^n = 2$$

$$2^1 = 2 \text{ so } n=1$$

Reaction is "first" order for A.

B. Use trials 2+3 where $[A]$ is constant

Trial	$[B]$	Rate
2	0.100	4×10^{-3}
3	0.200	16×10^{-3}

$[B]$	Rate
$\frac{0.200}{0.100} = 2$ times ^m	$\frac{16 \times 10^{-3}}{4 \times 10^{-3}} = 4$ times

$$\Delta[B] = \Delta \text{rate}$$

Second order $\rightarrow 2^m = 4$
 $m = 2$ (so $2^2 = 4$)

$$\text{So Rate} = k[A][B]^2$$

$$\text{overall order} = 1 + 2 = 3$$

p. 545 #16-18
 p. 555 #64, 69-71