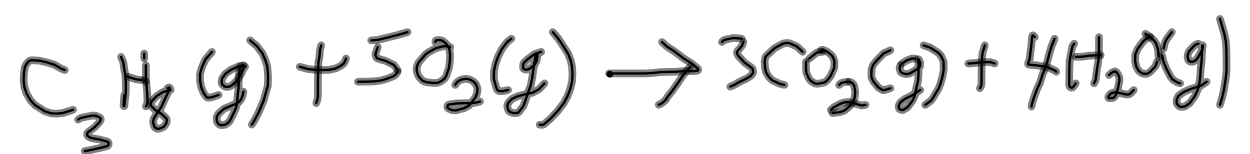


$$\begin{aligned}R &= 3.2 \text{ mol}^{-1} \text{ L s}^{-1} [\text{A}] [\text{B}] \\&= 3.2 \text{ mol}^{-1} \text{ L s}^{-1} (0.0025 \text{ mol L}^{-1}) (0.0075 \text{ mol L}^{-1}) \\&= 6.0 \times 10^{-5} \text{ mol L}^{-1} \text{ s}^{-1}\end{aligned}$$



if elem. $R = k[\text{A}]^2[\text{B}]$

actually $R = k[\text{A}][\text{B}]$



INTEGRATED RATE LAWS



Zero, first, and second order

ZERO ORDER

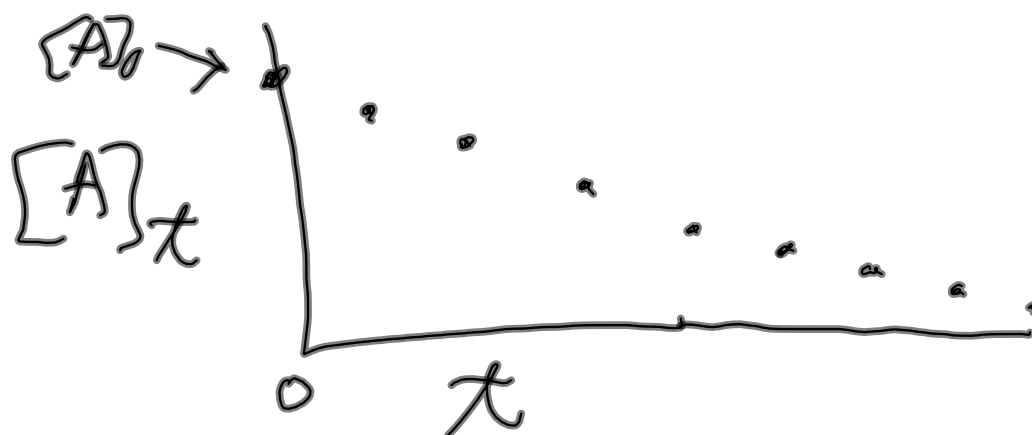


$$R = k[A]^0 = k(1) = k$$

$$R = k$$

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

$$y = b + mx$$



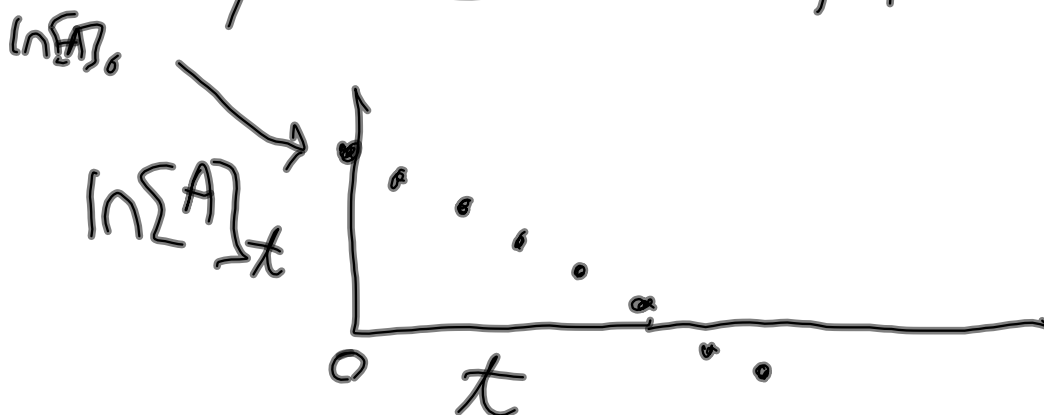
FIRST ORDER



$$R = k[A]^1 = k[A]$$

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

$$Y = b + mX$$



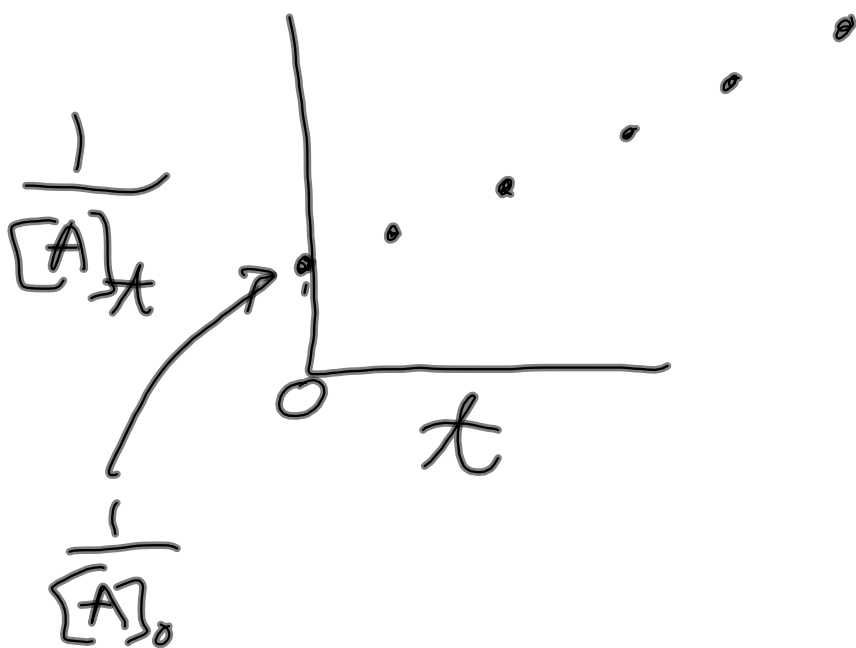
SECOND ORDER



$$R = k[A]^2$$

$$\frac{1}{[A]_t} = \frac{1}{[A]_0} + kt$$

$$y = b + mx$$



HALF-LIFE

When $t = t_{\frac{1}{2}}$

$$\text{then } [A]_t = \frac{1}{2} [A]_0 = \frac{[A]_0}{2}$$

ZERO ORDER

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

$$\frac{1}{2} [A]_0 = [A]_0 - kt_{\frac{1}{2}}$$

$$\frac{1}{2} [A]_0 - [A]_0 = -kt_{\frac{1}{2}}$$

$$\cancel{\frac{1}{2}} [A]_0 = \cancel{-k} t_{\frac{1}{2}}$$

$t_{\frac{1}{2}} = \frac{[A]_0}{2k}$	ZERO ORDER HALF-LIFE
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$$k = \frac{[A]_0}{2 t_{\frac{1}{2}}}$$