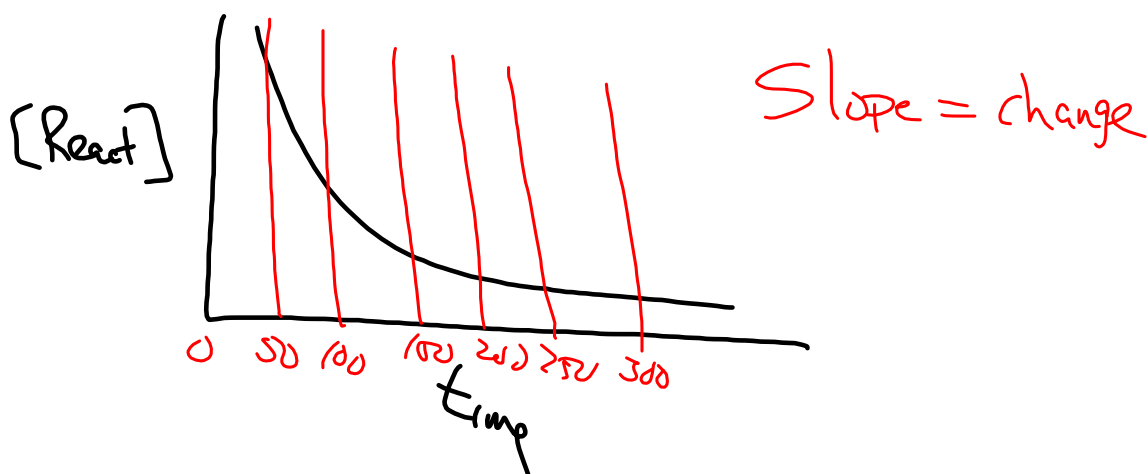


① Appearance = Disappearance



Feb 1-7:38 AM

② RATE LAW

Rate of rxn depends on the
 Concentration/Pressure of **REACTANTS**
 (g) (l)

Feb 1-8:05 AM



3rd order rxn

$$\text{Rate} = k[\text{NO}]^2 [\text{H}_2]^1$$

	[NO]	[H ₂]	Rate
1	0.1	0.1	1.23×10^{-3}
2	0.1	0.2	2.46×10^{-3}
3	0.2	0.1	4.92×10^{-3}

$2 \times \frac{\text{NO}}{1} = 4$

 $2 \times \frac{\text{H}_2}{1} = 2$

Feb 1-8:40 AM

$$\text{Rate} = k[\text{NO}]^2 [\text{H}_2]^1 \quad \text{3rd order}$$

Double Both

$$\text{Rate} = (2^2)(2^1) = 2^3$$

$$\text{Rate} = (4)(2) = 8x$$

Triple Both

$$= (3^2)(3^1) = 3^3 = 27$$

Double [NO]
 $\frac{1}{2} [\text{H}_2]$
 $= (2^2)(\frac{1}{2})$
 $= 2$

Feb 1-8:51 AM

Units for Rate constant (K)

Zero order
 Rate = $k[A]^0$
 $\frac{M}{sec} = k (M)^0$

$\frac{M^0}{sec} = k$
 ~~$M^{-1} \cdot sec$~~

First order
 Rate = $k[A]^1$
 $\frac{1}{M} \frac{M}{sec} = k (M)$

$\frac{1}{sec} = k$
 $sec^{-1} =$
 $Hz =$
 $\frac{M^0}{sec}$
 ~~$M^{-1} \cdot sec$~~

Feb 1-8:55 AM

Second order
 Rate = $k[A]^2$
 OR Rate = $k[A]^1[B]^1$
 $\frac{1}{M^2} \frac{M}{sec} = k M^2$

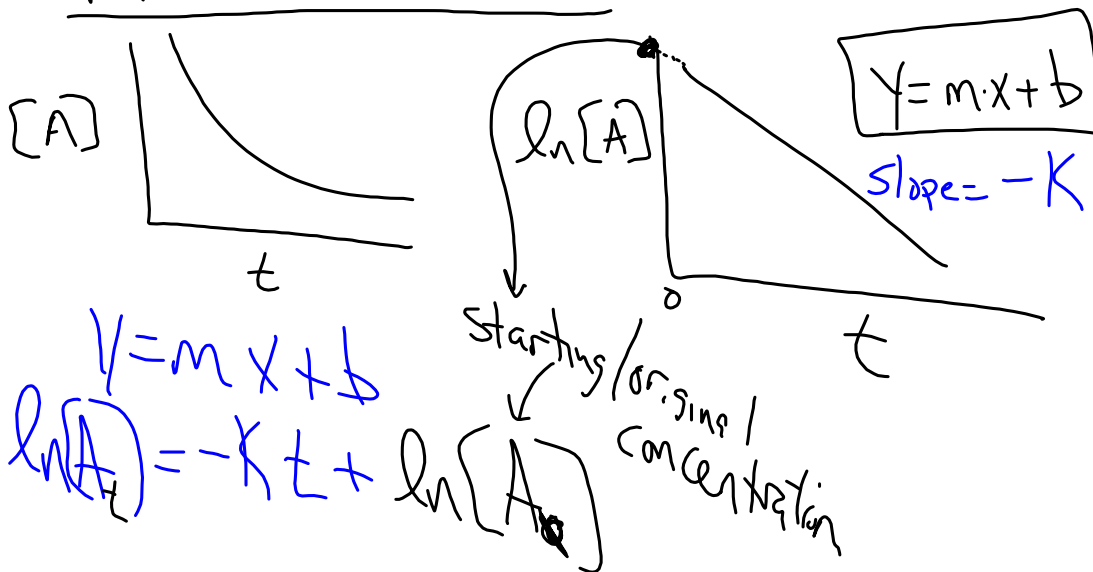
~~$M^{-1} \cdot sec$~~ = k
 $\frac{M^{-1}}{sec} = k$

Third order
 Rate = $k[A]^3$
 $\frac{1}{M^3} \frac{M}{sec} = k M^3$

$\frac{1}{M^2 \cdot sec} = k$
 $\frac{M^{-2}}{sec} = k$

Feb 1-8:59 AM

First order rxn



Feb 1-9:06 AM

K and t ~~MUST~~

use same time units.

Feb 1-9:11 AM

$$\ln[A_t] = -kt + \ln[A_0]$$

$K = 1.45 \text{ yr}^{-1}$
 $\frac{1}{\text{yr}}$

June 1 2017 $[5 \times 10^{-7}]$
 June 1 2018 $[?]$

$$\ln(A_t) = (-1.45)(1) + \ln(5 \times 10^{-7})$$

$$\ln(A_t) = -15.9586$$

$$[A_t] = 1.172 \times 10^{-7} \text{ M}$$

Feb 1-9:11 AM

$$14 / 32 + 38$$

Feb 1-9:17 AM