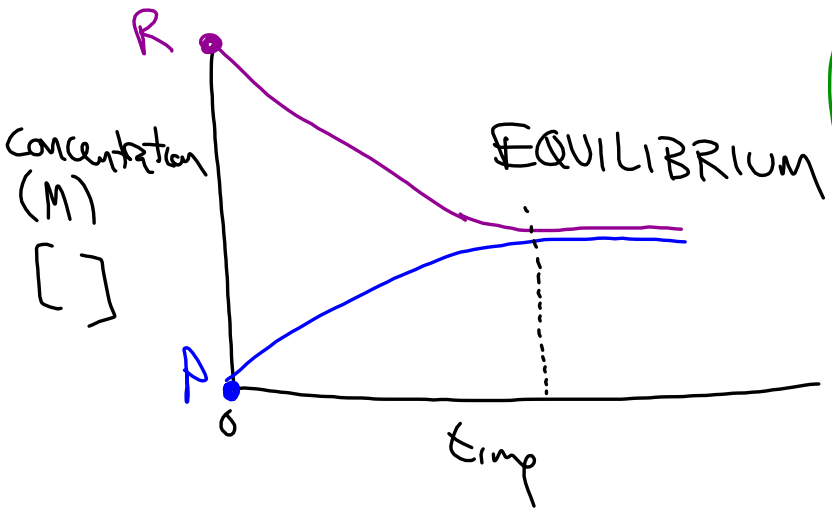
Chap 14 - Chemical Kinetics

Rate of a chemical rxn
(movement R → P)

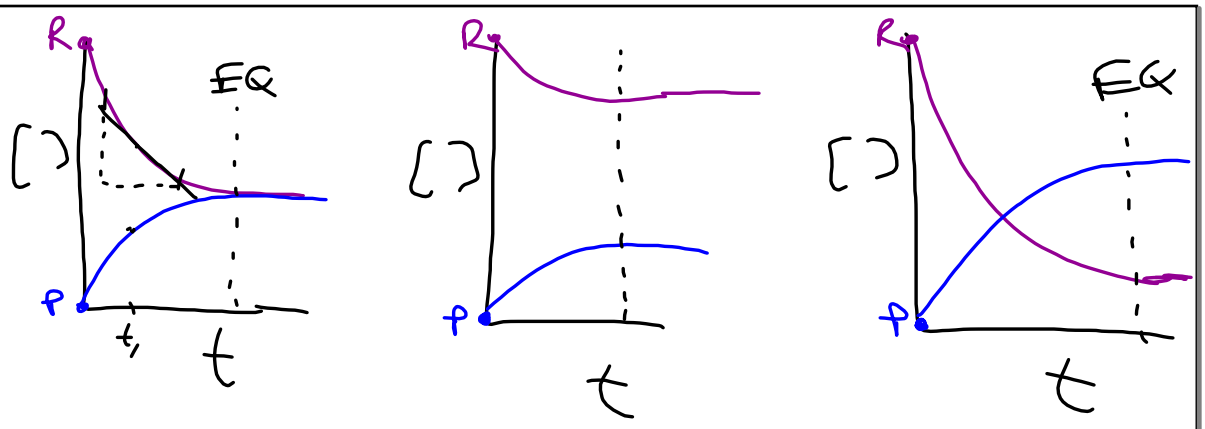


AT EQ

$R \rightleftharpoons P$

Rate → equals ← Rate

Jan 30-8:11 AM



Rate = $\frac{\Delta[\ ]}{\Delta t}$ = $\frac{\text{Change in concentration}}{\text{Change in time}}$

$\frac{\text{Miles}}{\text{hr}}$ $\frac{M}{\text{Sec}}$

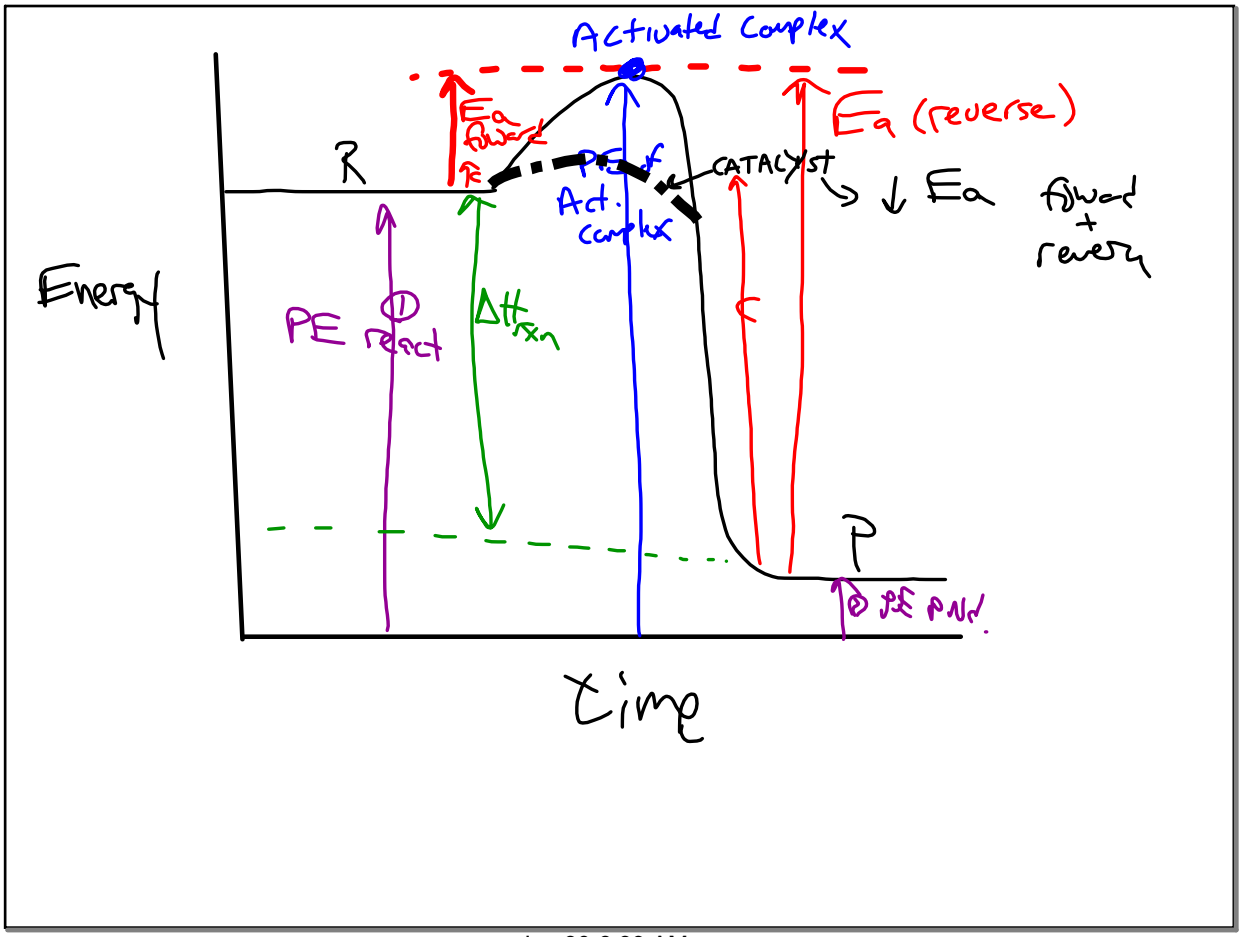
Jan 30-8:21 AM

R → P Affect RATE

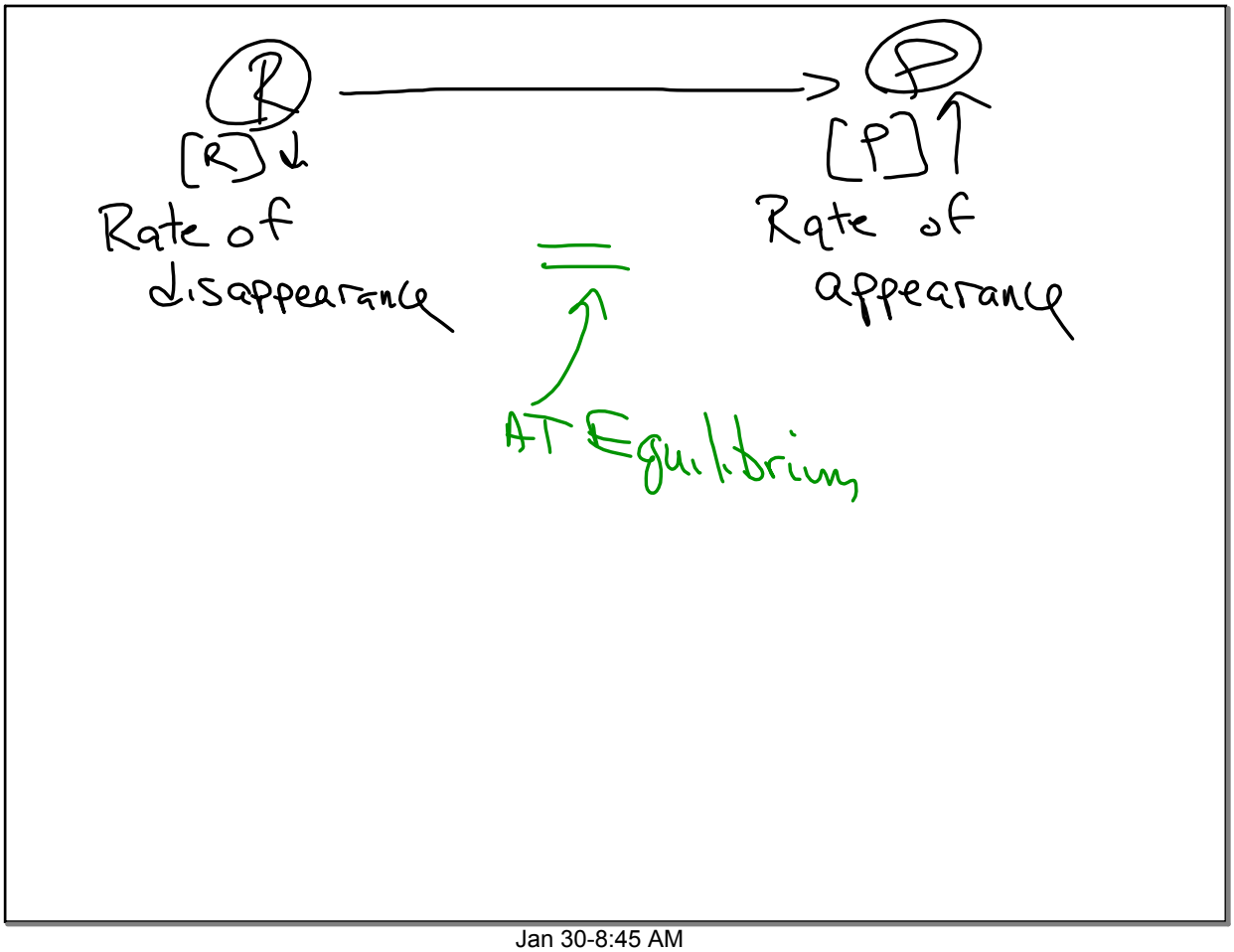
↑ #collisions, head on.

1. ↑ T
2. ↑ P (gases) (↓ volume)
3. STIR, Shake, Mix.
4. ↑ Surface area
5. ↑ M
6. Catalyst

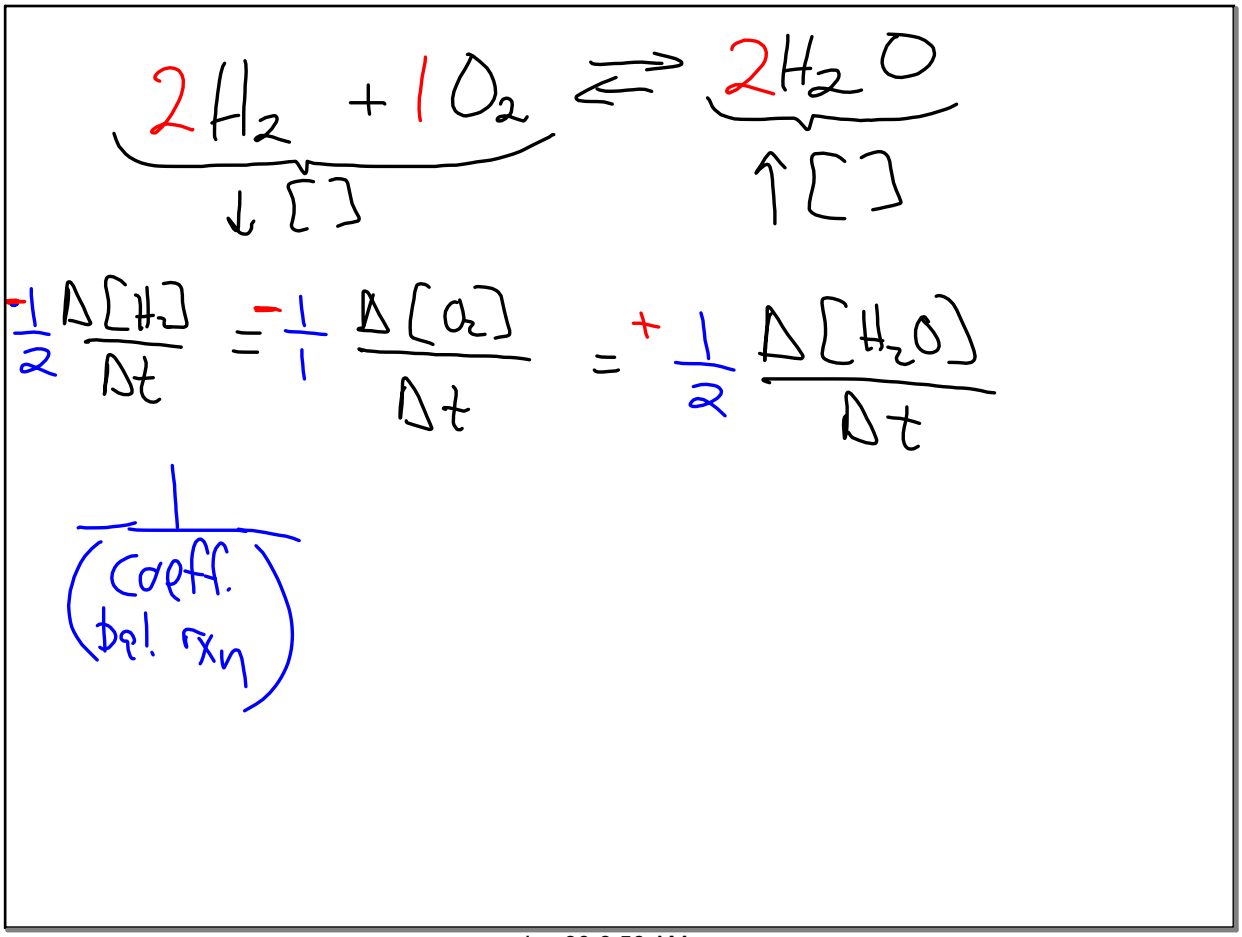
Jan 30-8:26 AM



Jan 30-8:39 AM



Jan 30-8:45 AM



Jan 30-8:56 AM

$$aA + bB \rightleftharpoons cC + dD$$

$$-\frac{1}{a}\frac{\Delta[A]}{\Delta t} = -\frac{1}{b}\frac{\Delta[B]}{\Delta t} = \frac{+1}{c}\frac{\Delta[C]}{\Delta t} = \frac{+1}{d}\frac{\Delta[D]}{\Delta t}$$

RATE OF Disappearing = RATE OF Appearing

Jan 30-9:03 AM

$$2O_{3(g)} \rightleftharpoons 3O_{2(g)}$$

$$-\frac{1}{2}\frac{\Delta[O_3]}{\Delta t} = \frac{+1}{3}\frac{\Delta[O_2]}{\Delta t}$$

Solve for the rate of disapp. of O_3 in terms of O_2

$$-\frac{1}{2}\frac{\Delta[O_3]}{\Delta t} = \frac{+1}{3}\frac{\Delta[O_2]}{\Delta t}$$

$$-\frac{\Delta[O_3]}{\Delta t} = \frac{2}{3}\frac{\Delta[O_2]}{\Delta t}$$

$$\frac{2}{2}x = \frac{3}{2}y$$

$$x = \frac{3}{2}y$$

Jan 30-9:05 AM

#3 Rate of a rxn depends on [Reactants] ONLY

$\left(\frac{\Delta[\ ]}{\Delta t}\right)$

Rate Law eqn

reaction orders

$\text{Rate} = k[\text{react 1}]^m[\text{react 2}]^n$

rate law constant

Jan 30-9:24 AM

14 / 18, 20, 22

Jan 30-9:30 AM