

Factors That Affect Chemical Kinetics (Rate of a rxn)

① HEAT → Speed up molecules.
↑ # collisions / time

effective collision between molecules, HEAD ON

② Pressure (mainly gases)
↑ collisions / time
 (↓ V)

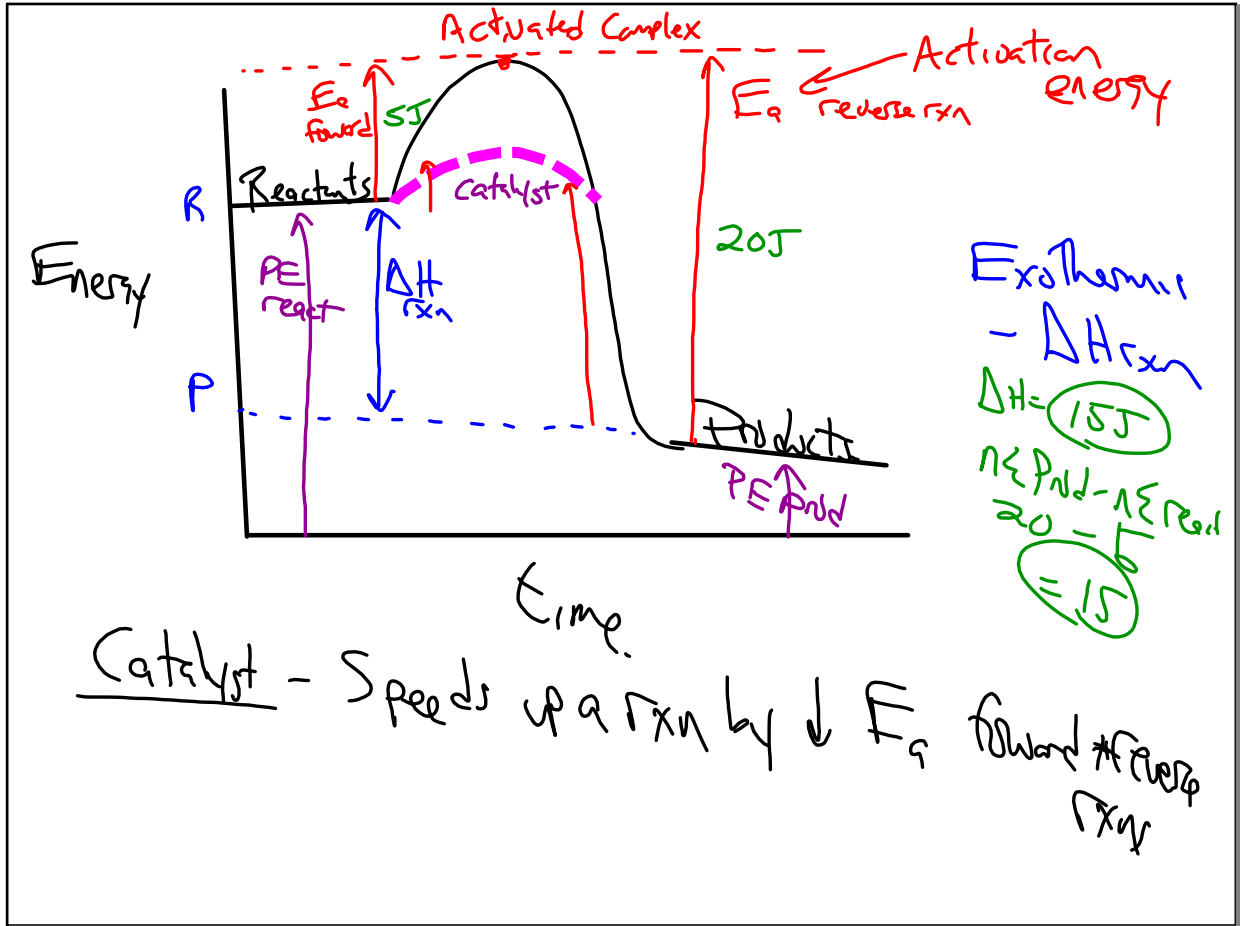
Feb 8-7:24 AM

③ Concentration of the reactant(s)
 (# molecules present)

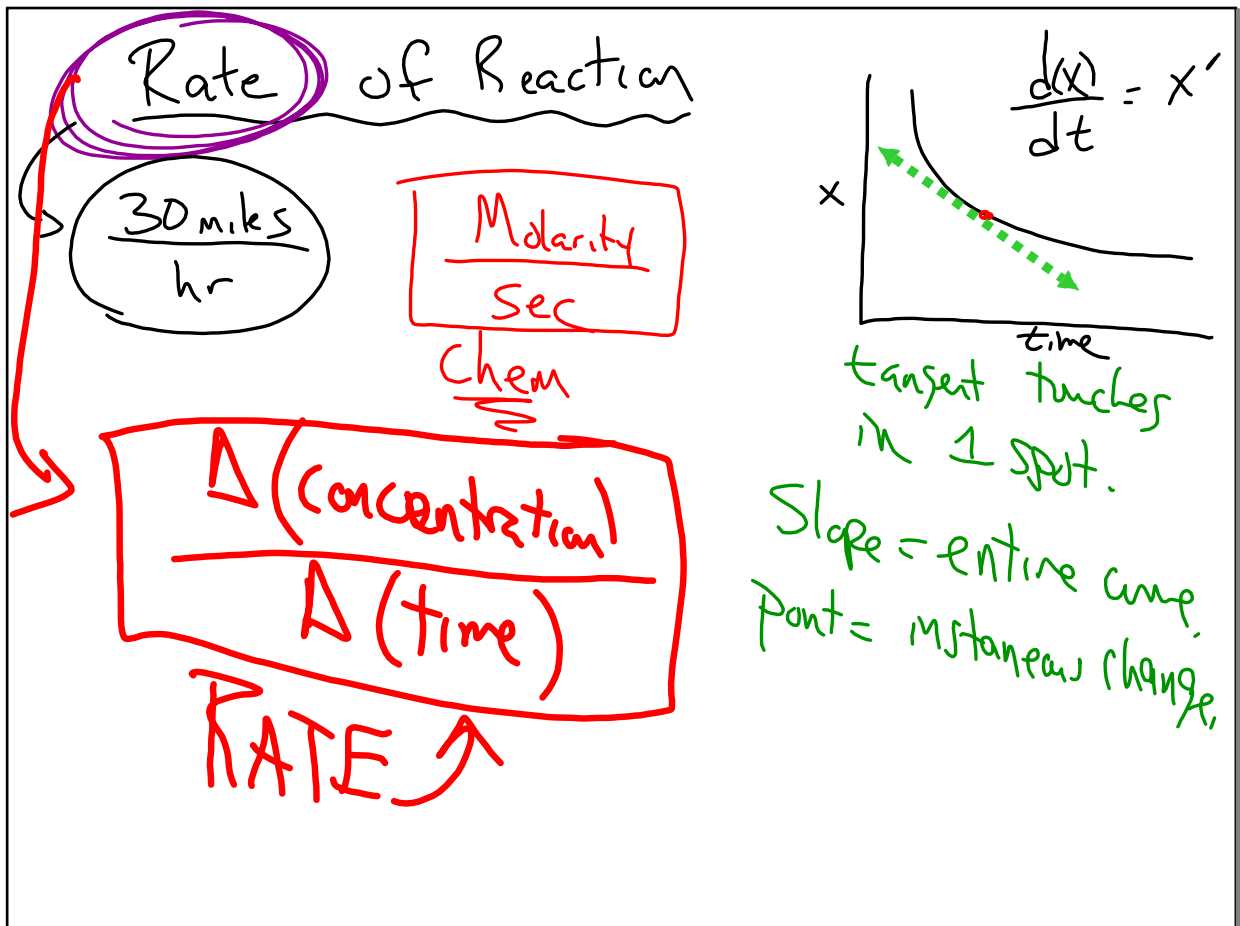
④ Surface area
 Sugar cube → granulated sugar → powdered sugar

⑤ Presence of a catalyst
 Bio = enzymes

Feb 8-8:29 AM



Feb 8-8:33 AM



Feb 8-8:44 AM

4 Tires + 1 Engine → 1 Car

Reactants → Product

Use 4 x tires as engines

Reactants get used up to form product

Mahagic Car Company

7:20 AM → 2:02 PM

Open → Close

Start: All raw material → Products

⊖ (change) - (decrease) → ⊕ increase

End: Less raw material → Lots of Product

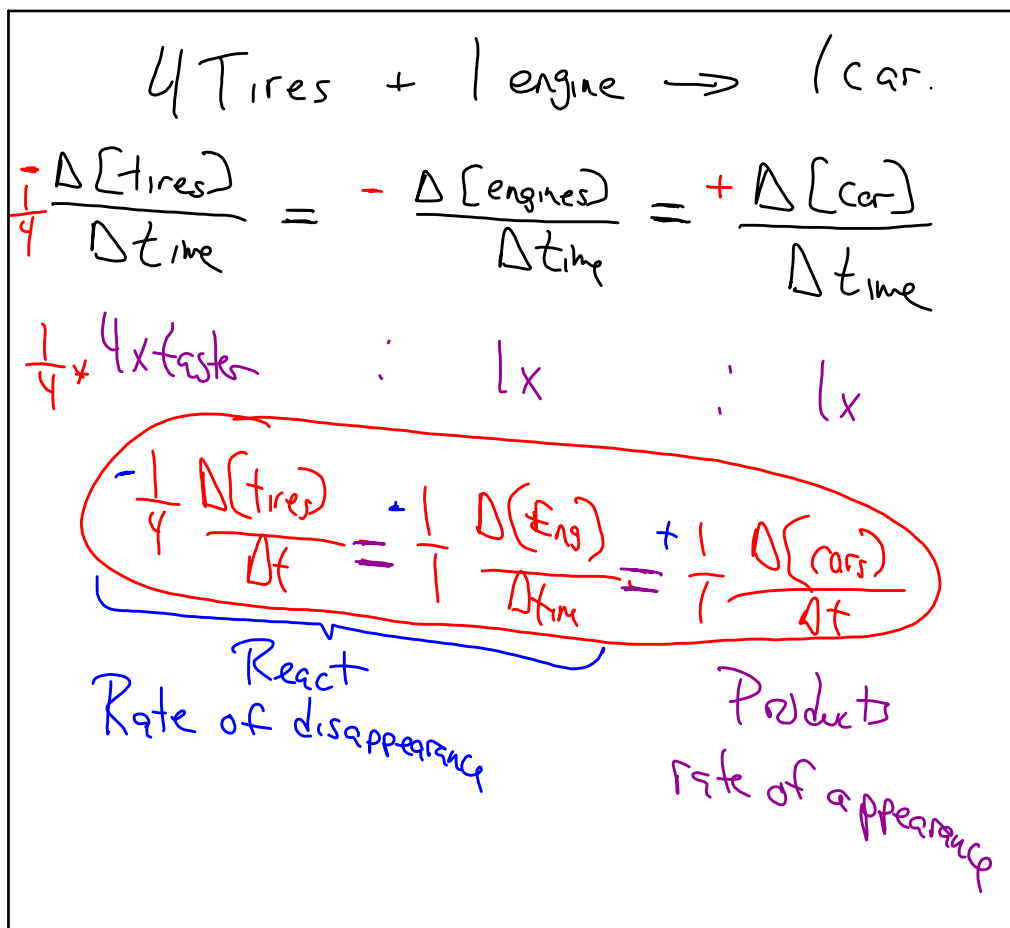
Feb 8-8:52 AM

Concentration

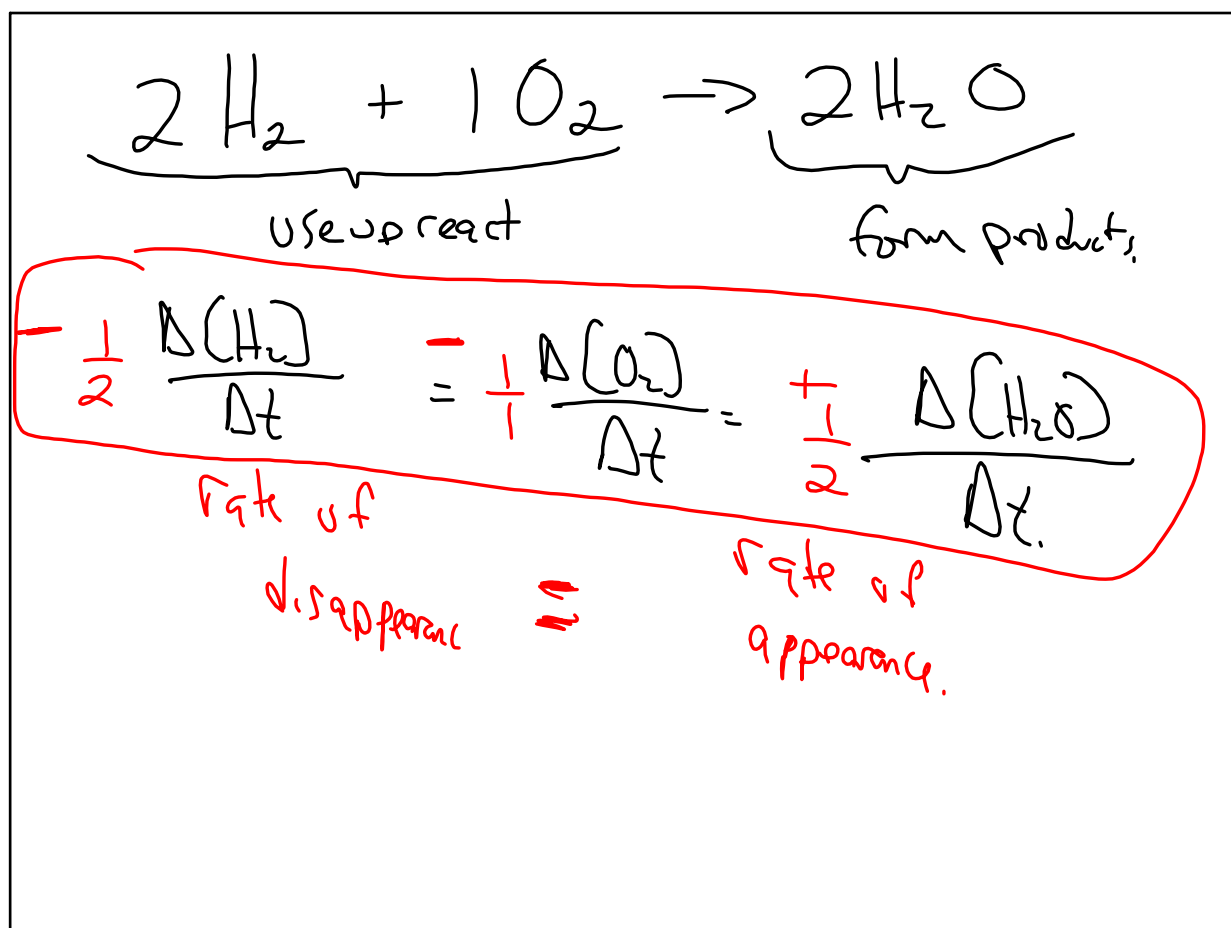
	4 Tires	+	1 Engine	→	1 Car
[Start] 7:20	100		100		0
[change]	-80 (4:1)		-20 (1:1)		+20
[End] 2:02	20		80		20

MOLE RATIO

Feb 8-8:59 AM



Feb 8-9:03 AM



Feb 8-9:07 AM

$$aA + bB \rightarrow cC + dD$$

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

React
disapp

Product.
appear.

Average
Point instantaneous

Feb 8-9:09 AM

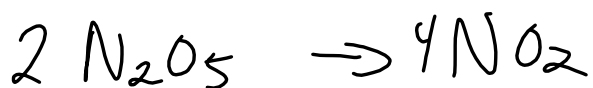
$$2 \overset{4.2 \times 10^{-7}}{N_2O_5} \rightarrow \overset{8.4 \times 10^{-7}}{4NO_2} + \overset{2.1 \times 10^{-7}}{1O_2}$$

$$-\frac{1}{2} \frac{\Delta[N_2O_5]}{\Delta t} = \frac{+1}{4} \frac{\Delta[NO_2]}{\Delta t} = \frac{+1}{1} \frac{\Delta[O_2]}{\Delta t}$$

disappearance
rate of
4.2 × 10⁻⁷ M
Sec

Appearance

Feb 8-9:16 AM



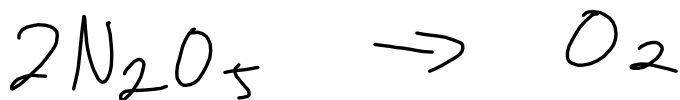
$$\frac{4}{1} \left(\frac{1}{2} \frac{\Delta[\text{N}_2\text{O}_5]}{\Delta t} = \frac{1}{4} \frac{\Delta[\text{NO}_2]}{\Delta t} \right) \times \frac{4}{1}$$

$$\frac{4}{2} \frac{\Delta[\text{N}_2\text{O}_5]}{\Delta t} = \frac{\Delta[\text{NO}_2]}{\Delta t}$$

$$\frac{4}{2} (4.2 \times 10^{-7})$$

$$\boxed{8.4 \times 10^{-7}}$$

Feb 8-9:22 AM



$$\frac{1}{2} \frac{\Delta[\text{N}_2\text{O}_5]}{\Delta t} = \frac{1}{1} \frac{\Delta[\text{O}_2]}{\Delta t}$$

$$\frac{1}{2} (4.2 \times 10^{-7})$$

$$2.1 \times 10^{-7}$$

Feb 8-9:24 AM

HW
14 /
Chart
18, 20
Eqs.

Feb 8-9:30 AM