

PS 14

① Rate = $K [NO]^2 [H_2]^1$

3rd order rxn

$\frac{M}{l} = \frac{\text{Mole}}{l}$

$K = \frac{1}{M^2 \cdot \text{sec}}$

$\frac{1}{\text{Mole}^2 \cdot l} \cdot \text{sec}$

$\frac{1}{l} \div \frac{\text{Mole}}{l}$

$\frac{1}{l} * \frac{l}{\text{Mole}} = \frac{1}{\text{Mole}}$

$\frac{l^2}{\text{Mole}^2 \cdot \text{sec}} = l^2 \cdot \text{Mole}^{-2} \cdot \text{sec}^{-1}$

$$\textcircled{2} \quad \frac{2}{1} - \frac{1}{3} \frac{\Delta[\text{H}_2]}{\Delta t} = \frac{2}{1} + \frac{1}{2} \frac{\Delta[\text{NH}_3]}{\Delta t}$$

$$\frac{2}{1} - \frac{1}{3} X = \frac{2}{1} + \frac{1}{2} \textcircled{4}$$

$$\frac{2}{3} \frac{\Delta[\text{H}_2]}{\Delta t} = \frac{\Delta[\text{NH}_3]}{\Delta t}$$

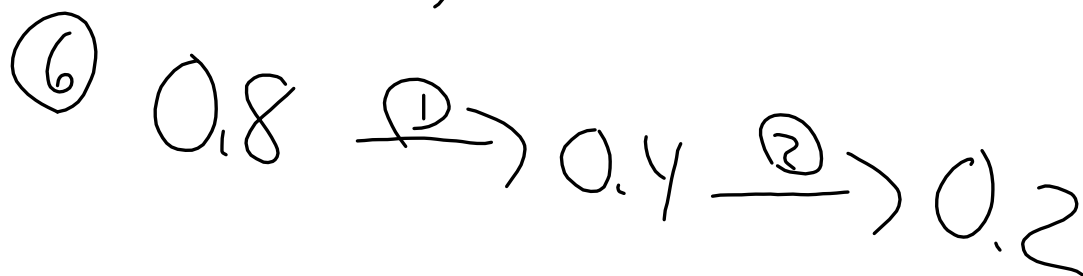
(1.72)

$$\textcircled{4} \quad \frac{1}{4} \frac{\Delta[\text{NO}_2]}{\Delta t} = \frac{\Delta[\text{O}_2]}{\Delta t}$$

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

$$\textcircled{5} \quad \text{Rate} = k [\text{N}_2\text{O}]^1 \quad \leftarrow \begin{array}{l} 1 = \text{order} \\ \text{rxn} \end{array}$$

$$\ln A_t = -kt + \ln A_0$$
$$\ln A_t = \left(3.4 \times 10^{-3} \frac{\text{sec}^{-1}}{\text{sec}^{-1}} \right) (120) + \ln (0.50)$$



$$\textcircled{7} \quad k = 5.2 \times 10^{-3} \text{ sec}^{-1}$$

Find t

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

$$\ln(0.25) = (-5.2 \times 10^{-3})t + \ln 1$$

$\textcircled{1}$

$$\frac{1}{\text{M}^0 \times \text{sec}}$$

$$A_0 = 1$$

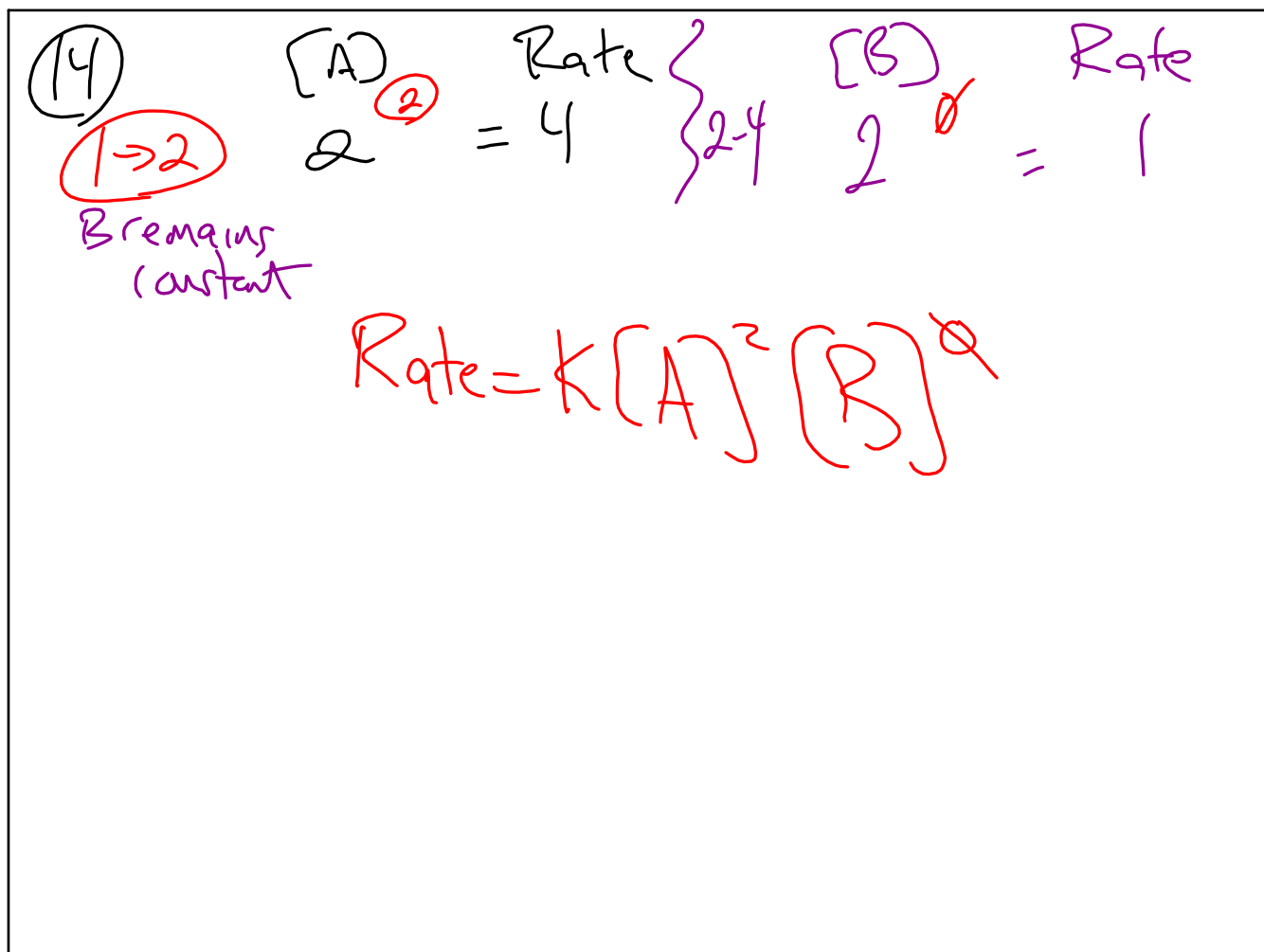
$$A_t = 0.25$$

$\textcircled{13}$

$$t_{1/2} = \frac{0.693}{k}$$

\Rightarrow

$$\frac{k}{1} = \frac{0.693}{t_{1/2}} = \frac{0.693}{0.910}$$



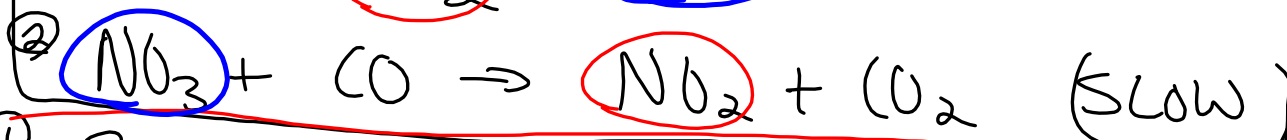
(17) $[A_0]$ = how much you have to start (1) (100%)
 $[A_t]$ = how much you have after some time "t"
If 75% decomposed then $A_t = 0.25$

(17) Rate = $k [C_4H_6]^2$ $A_0 = 0.1$
 $k = 0.014 \frac{1}{\text{m}\cdot\text{sec}}$, Find t $A_t = 0.01$
90% reacted \Rightarrow have 10% left

$$\frac{1}{(A_t)} = kt + \frac{1}{(A_0)}$$

$$\frac{1}{0.01} = 0.014 t + \frac{1}{0.1}$$

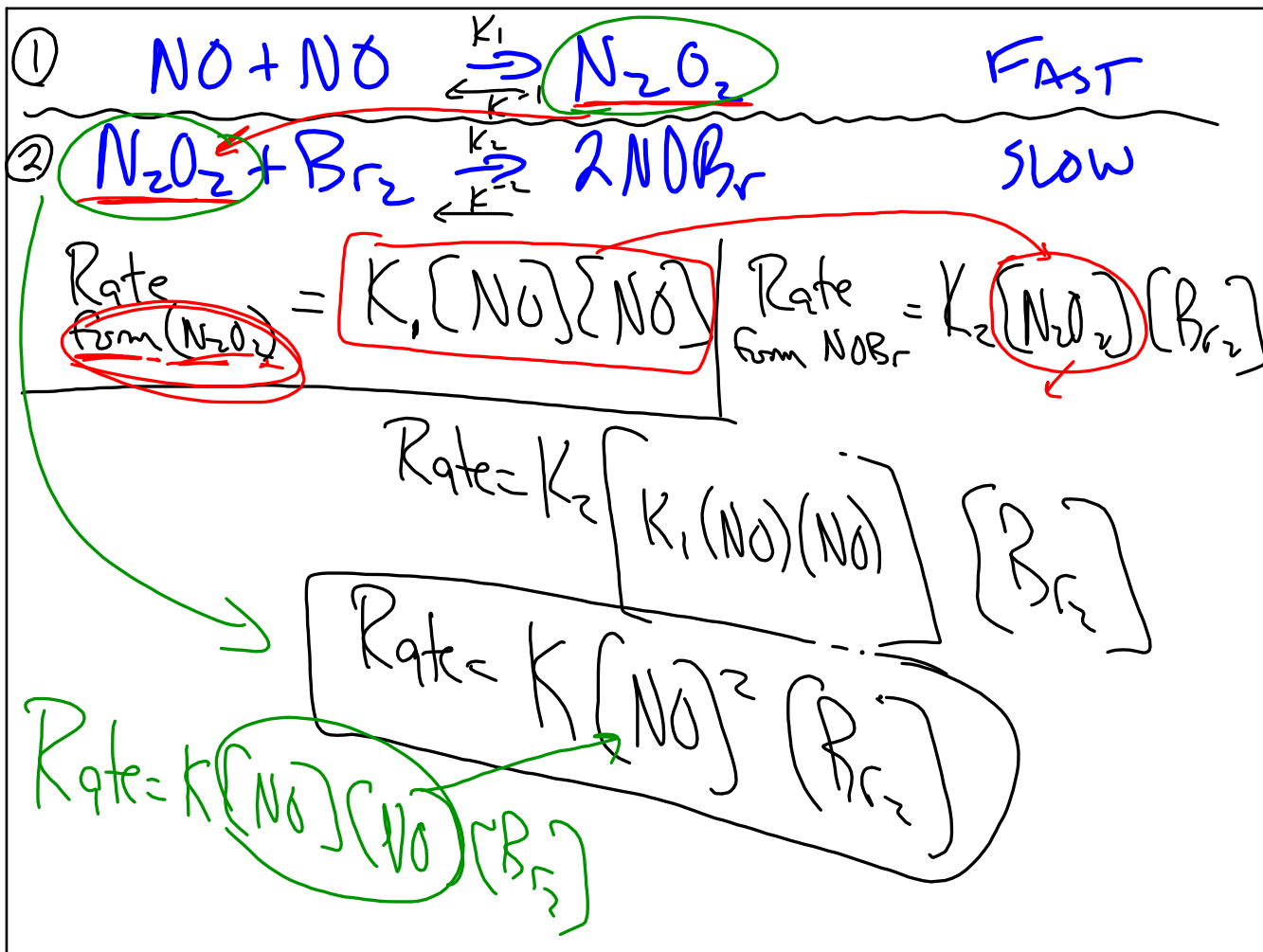
Rxn mechanisms



$$\textcircled{1} \text{Rate} = k [\text{NO}_2][\text{NO}_2]$$

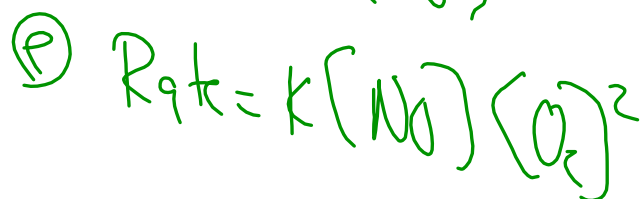
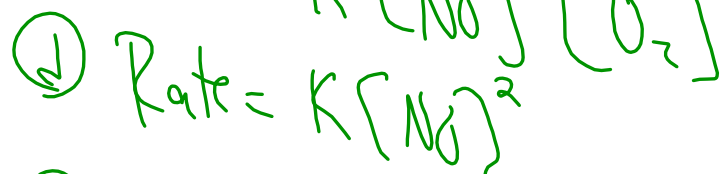
$$\textcircled{2} \text{Rate} = k [\text{NO}_3][\text{CO}]$$

$$\text{Rate} = k [\text{NO}_2][\text{CO}]$$



(14.1)

(25)



14-1 / 12, 18, 19
14-2 / 4-10