PS 14

3rd order (3°)

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

$\frac{M}{1} = \frac{Mole}{\ell}$

$\frac{1}{\frac{Mole^2}{\ell^2} \cdot sec} = \frac{\ell^2}{Mole^2 \cdot sec}$

$= \ell^2 \cdot Mole^{-2} \cdot sec^{-1}$

Feb 6-7:40 AM

(2) $-\frac{1}{3}\frac{\Delta[H_2]}{\Delta t} = \frac{1}{2}\frac{\Delta[NH_3]}{\Delta t}$

$-\frac{2}{3}\frac{\Delta[H_2]}{\Delta t} = \frac{\Delta[NH_3]}{\Delta t}$

$\frac{2}{3}(1.72)$

Feb 6-7:52 AM

⑤ $\ln A_t = -Kt + \ln A_0$

$\ln A_t = (-3.4\times10^{-3})(120) \ln(0.5)$

sec sec

$t_{1/2} = \frac{1}{K[A_0]}$ 2°

1 → ½ → ¼

⑥ 0.8M ① → 0.4 ② → a?

$t_{1/2} = \frac{0.693}{K}$ 1° = $t_{1/2}$ never changes

Feb 6-7:57 AM

⑦ 1° $\ln A_t = -Kt + \ln A_0$

$\ln(\frac{1}{4}) = (-5.2\times10^{-3})t + \ln 1$

$t = 266$ sec

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

1 ① → ½ ② → ¼

2 HL's

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

$= \frac{0.693}{5.2\times10^{-3}}$

$= 133$ sec | HL

×2

266 sec

Feb 6-8:02 AM

(10) $\text{Rate} = K[NO_2]^2[H_2]^1$

$(0.5)^2(0.5)^1 = 0.125$

12.5 %

rate of disappearance

$2NO_2 + 2H_2 \rightarrow N_2 + 2H_2O$

Use 50% Use 50%

1:1

Mole ratio

Feb 6-8:07 AM

(11) $1.5^x = 2.3$

$\ln 1.5^x = \ln 2.3$

$x \ln 1.5 = \ln 2.3$

$\frac{x \ln 1.5}{\ln 1.5} = \frac{\ln 2.3}{\ln 1.5}$

Feb 6-8:11 AM

(12) $\ln A_t = -kt + \ln A_0$

$\ln A_t = -(3.4)(1) + \ln 1$

Feb 6-8:12 AM

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

90% used
10% left
0.1(0.1) = 0.01

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

$t = 6428.57\ \text{sec.}$

Feb 6-8:20 AM

(18) $t_{1/2} = \frac{1}{k[A_0]}$

$46 = \frac{1}{k(0.040)}$

$k = \frac{1}{46(0.040)} =$

Feb 6-8:25 AM