

O-I 42-47

S-I 23-35

O-II 1-4

$$(43) \text{ Rate} = k [A]^1$$

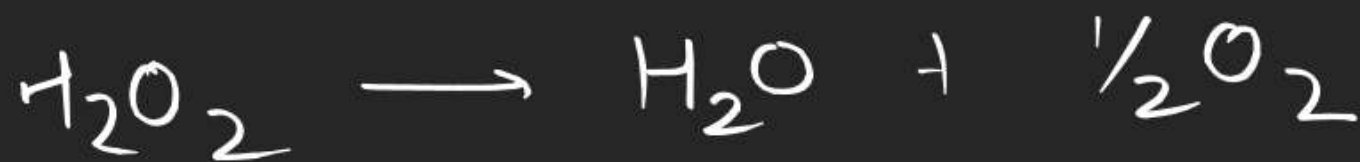
$$6.930 \times 10^{-6} = k (0.01)$$

$$6.93 \times 10^{-4} = k$$

$$t = 50 \times 60 = 3000$$

$$-\frac{d[A]}{dt} = k [A]_0 e^{-kt}$$

(17)



a

a-x

0

$$x_{1/2} \propto 5$$

$$a_{1/2} \propto 50$$

$$x \propto 10$$

$$a \propto 100$$

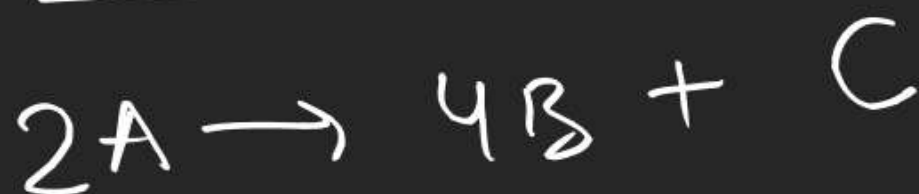
$$k = \frac{1}{20} \ln \frac{100}{90}$$

$$(29) \quad k_1 = \frac{1}{53} \ln \frac{100}{50} \quad \underline{600}$$

$$k_2 = \frac{1}{100} \ln \frac{100}{27}$$



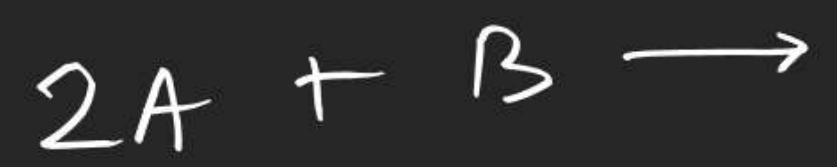
$$(32) \quad \begin{array}{ccc} \text{time} & 30 & \infty \\ \text{Pressure} & 284.5 & 584.5 \end{array}$$



$$\begin{array}{ccc} (P_A)_0 & 2x & x/2 \\ (P_A)_0 - x & 2(P_A)_0 & (P_A)_0/2 \\ 0 & & \end{array}$$

$$k_A = \frac{1}{t} \ln \frac{(P_A)_0}{(P_A)_0 - x}$$

$$(k_2) = \frac{k_A}{2}$$



$$(35) \quad k = \frac{1}{t} \ln \frac{42.03 - 19.24}{42.03 - 24.2}$$

~~20~~  $(0-1)$

$$k \underline{t} = 2 \left( \sqrt{A_0} - \underline{\sqrt{A_t}} \right)$$

$$k t_{1/2} = 2 \sqrt{A_0} \left( 1 - \frac{1}{\sqrt{2}} \right)$$

$$k t_{3/4} = 2 \sqrt{A_0} \left( 1 - \frac{1}{2} \right)$$

③



$$\frac{d[C]}{dt} = \frac{dx}{dt} = k(2-2x)(1-x)^{-1}$$

$$\frac{dx}{dt} = 2k$$

$$[C] = \cancel{x} = 2kt$$

③ By optical rotation  $\rightarrow$

$$\alpha \propto Cl$$

$$\alpha = \alpha^{\circ} C l$$

$\uparrow$   
 specific  
 rotation

Inversion of cane sugar



$$\alpha_s^{\circ} > 0 \quad \alpha_g^{\circ} > 0 \quad \alpha_f^{\circ} < 0$$

$$k = \frac{1}{t} \ln \frac{[\text{Sucrose}]_0}{[\text{Sucrose}]_t} = \frac{1}{t} \ln \frac{a}{a-x}$$



time	0	t	$\infty$
Rotation	$\lambda_0$	$\lambda_t$	$\lambda_\infty$

S	$\rightarrow$	G	+	F
a		0		0
a-x		x		x
0		a		a

$$\frac{a}{a-x} = \frac{\lambda_\infty - \lambda_0}{\lambda_\infty - \lambda_t}$$

$$k = \frac{1}{t} \ln \frac{\lambda_\infty - \lambda_0}{\lambda_\infty - \lambda_t}$$

$$\lambda_0 = \lambda_s^0 a \quad \text{--- ①}$$

$$\lambda_t = \lambda_s^0 (a-x) + \lambda_g^0 x + \lambda_f^0 x \quad \text{--- ②}$$

$$\lambda_\infty = \lambda_g^0 a + \lambda_f^0 a \quad \text{--- ③}$$

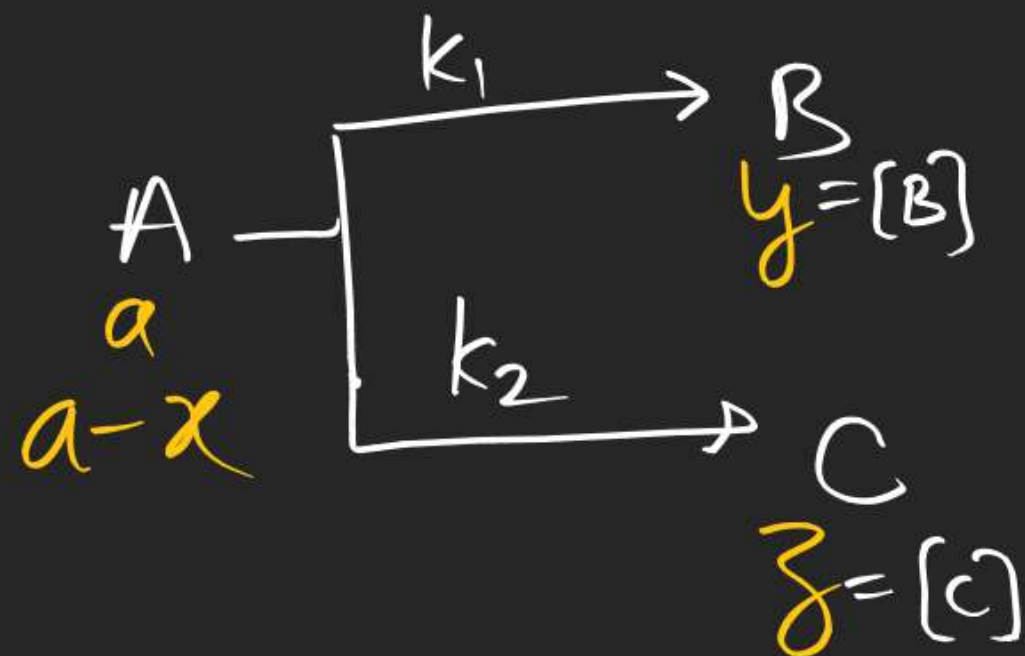
by eq ③ - eq ①

$$\lambda_\infty - \lambda_0 = a(-\lambda_s^0 + \lambda_g^0 + \lambda_f^0) \quad \text{--- ④}$$

by eq ②

$$\lambda_t - \lambda_0 = x(-\lambda_s^0 + \lambda_g^0 + \lambda_f^0) \quad \text{--- ⑤}$$

$$\lambda_\infty - \lambda_t = (a-x)(-\lambda_s^0 + \lambda_g^0 + \lambda_f^0) \quad \text{--- ⑥}$$

1st order parallel

$$x = y + z$$

$$\frac{dx}{dt} = \frac{dy}{dt} + \frac{dz}{dt}$$

$$-\frac{d[A]}{dt} = \frac{d[B]}{dt} + \frac{d[C]}{dt}$$

$$-\frac{d[A]}{dt} = (k_1 + k_2)[A]$$

$$[A]_t = [A]_0 e^{-(k_1 + k_2)t}$$

$$k_{\text{Total}} = k_1 + k_2$$

$$t_{1/2} = \frac{\ln 2}{k_1 + k_2}$$

$$-\frac{d[A]}{dt} = -\frac{d(a-x)}{dt} = \frac{dx}{dt}$$

$$\frac{d[B]}{dt} = k_1[A] \quad \frac{d[C]}{dt} = k_2[A]$$



$$\int_0^t d[B] = \int_0^t k_1 [A] dt$$

$$[B] = \int k_1 [A]_0 e^{-(k_1+k_2)t} dt$$

$$[B] = \frac{k_1}{k_1+k_2} [A]_0 \{1 - e^{-(k_1+k_2)t}\}$$

$$[C] = \frac{k_2}{k_1+k_2} [A]_0 \{1 - e^{-(k_1+k_2)t}\}$$

$$\frac{[B]}{[C]} = \frac{k_1}{k_2}$$

$$\left(\frac{2}{3}\right)$$

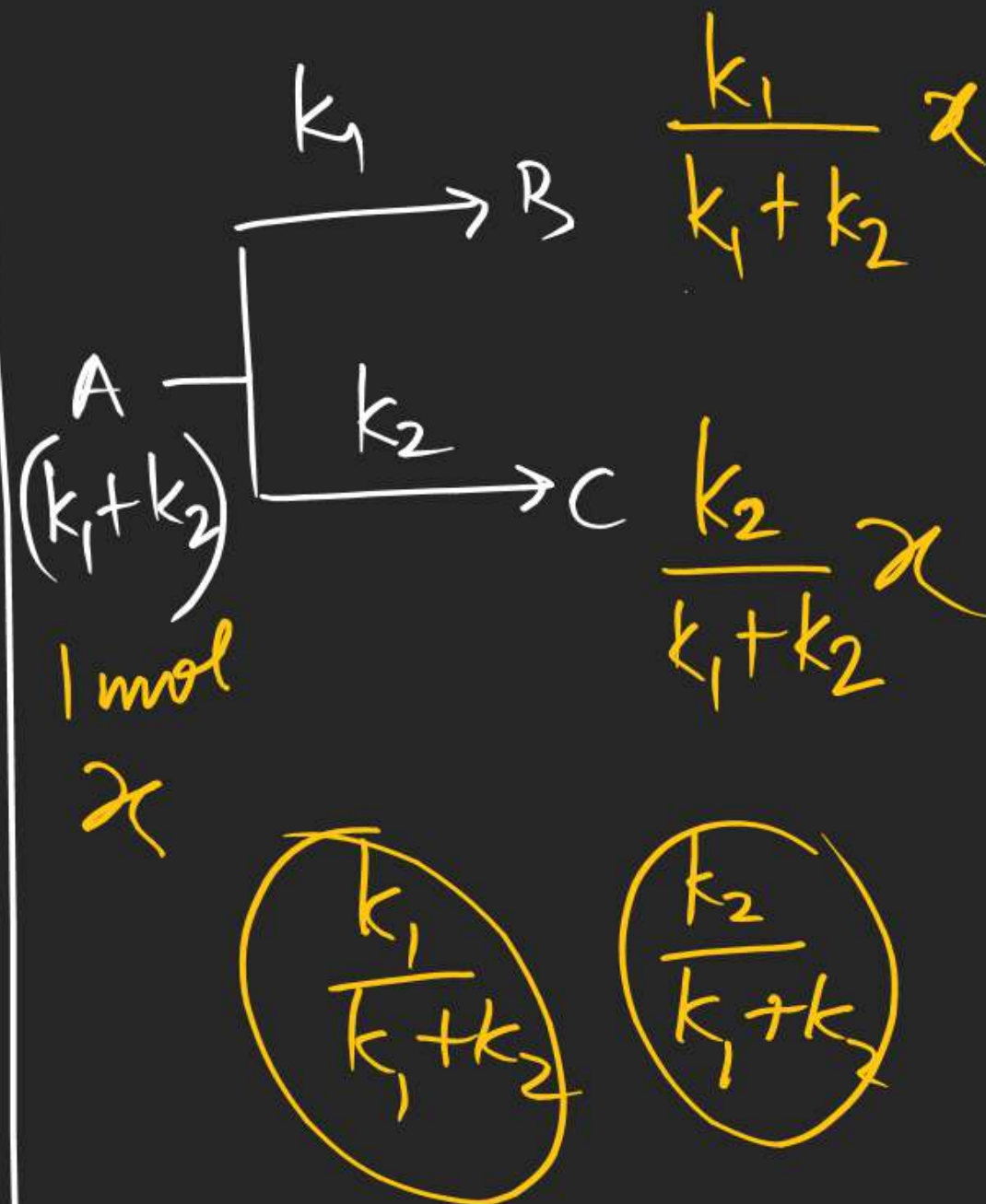
$$\begin{aligned} x &= [A]_0 - [A]_t \\ &= [A]_0 \{1 - e^{-(k_1+k_2)t}\} \end{aligned}$$

$$= \frac{k_1}{k_1+k_2} x$$

$$= \frac{k_2}{k_1+k_2} x$$

$$\frac{2}{5} \times 100$$

$$\frac{3}{5} \times 100$$



O-I

48-51

S-I

36-38

