Дано:
$[M]$, $[HA]$
k_u, k_p, k_o
$k_{перм}$

$[R^+]$ - ? $\bar{x}_n$ - ?
V - ?, $P_n(3)$ - ?

№1

$$k_u[HA][M] = k_o[R^\oplus]$$

$$[R^\oplus] = \frac{k_u[HA][M]}{k_o}$$

$$V = k_p[R^\oplus][M]$$

$$V = \frac{k_u k_p [HA][M]^2}{k_o}$$

$$\bar{x}_n = \frac{1}{\bar{x}_n} = \frac{k_o}{k_p[M]} + C_M$$

$$C_M = \frac{k_{перм}}{k_p}$$

$$P_n(x) = p^{x-1}(1-p)$$

$$p = \frac{W_p}{W_p + W_{перм} + W_o}$$

$$p = \frac{k_p[M]}{k_p[M] + k_{перм}[M] + k_o}$$

$W_p = k_p[R^+][M]$

$W_{перм} = k_{перм}[R^+][M]$

$W_o = k_o[R^+]$

№2.

Дано:

$[I]_0$

k_p, t $[H]_0$

V - ? γ_h - ?

$$-\frac{d[H]}{dt} = k_p [I]_0 [H]$$

$$-\int_{[H]_0}^{[H]} \frac{d[H]}{[H]} = k_p [I]_0 \int_0^t dt$$

$$\ln\left(\frac{[H]}{[H]_0}\right) = -k_p [I]_0 t$$

$$[H] = [H]_0 e^{-k_p [I]_0 t}$$

$$\gamma_h = \frac{[H]_0 - [H]}{[I]_0}$$

$$V = k_p [H] [I]_0$$

№3

Дано:

k_p^+, k_p^-, $a = 0$

$[H]_0$, $[I]_0$

k', t

γ_h - ? V - ?

$$-\frac{d[H]}{dt} = \frac{k_p^+}{\sqrt{k_a}} [I]_0^{0,5} [H]$$

$$k_a = \frac{k_p^+}{k_p^-}$$

$$[H] = [H]_0 e^{-k_{эф} t}$$

$$V = k_{эф} [I]_0 [H]$$

$$\gamma_h = \frac{[H]_0 - [H]}{[I]_0}$$

№4

Дано:
r_1, r_2
f_1

F_1 - ?

$f_1 + f_2 = 1$

$F_1 + F_2 = 1$

$$\frac{F_1}{F_2} = \frac{f_1}{f_2} \frac{(r_1 f_1 + f_2)}{(r_2 f_2 + f_1)}$$

$$\frac{F_1}{1-F_1} = \frac{f_1}{1-f_1} \frac{(r_1 f_1 + 1 - f_1)}{(r_2(1-f_1) + f_1)}$$

F_1

№5

$\Delta H^0, \Delta S^0$
ρ

$\sim R^* + M \rightleftarrows \sim R^*$

$$K = \frac{[R^*]}{[R^*][M]_{равн}} = \frac{1}{[M]_{равн}}$$

$\Delta G^0 = -RT \ln K = RT \ln [M$

$\Delta H^0 - T\Delta S^0 = RT \ln [M]_{равн}$

$$\ln [M]_{равн} = \frac{\Delta H^0 - T\Delta S^0}{RT}$$

$$\rho_{равн} = \frac{[M]_0 - [M]_{равн}}{[M]_0}$$

$[г/см^3]$

$$[M]_0 = \frac{1000\rho}{M}$$

$[M]_{равн}$

$[г/моль]$

№6

Дано:

k_p^-, $k_p^\pm$

t, $[I]_0$, $[H]_0$

кг

X_h - ? V - ?

$$-\frac{d[H]}{dt} = k_p [I]_0 [H]$$

$$-\int_{[H]_0}^{[H]} \frac{d[H]}{[H]} = \int_0^t k_p [I]_0 dt$$

$$\ln\left(\frac{[H]}{[H]_0}\right) = -k_p [I]_0 t$$

$$[H] = [H]_0 e^{-k_p [I]_0 t}$$

$$k_p = \alpha k_p^- + (1-\alpha) k_p^\pm$$

$$\alpha = \sqrt{\frac{k_g}{[I]_0}}$$

$$V = k_p [H] [I]_0$$

$$X_h = \frac{[H]_0 - [H]}{[I]_0}$$

Дано:

$[M]_0$, $[I]_0$

k_0, k_p

t

V - ?

ρ - ?

$$-\frac{d[M]}{dt} = k_p[R^\cdot][M]$$

$$-\frac{d[R^\cdot]}{dt} = k_0[R^\cdot]$$

$$-\int_{[R]_0}^{[R]} \frac{d[R]}{[R]} = \int_0^t k_0 dt$$

$$[R^\cdot] = [I]_0 e^{-k_0 t}$$

$$-\frac{d[M]}{dt} = k_p[I]_0 e^{-k_0 t}[M]$$

$$-\int_{[M]_0}^{[M]} \frac{d[M]}{[M]} = k_p[I]_0 \int_0^t e^{-k_0 t} dt$$

$$\ln\left(\frac{[M]}{[M]_0}\right) = \frac{k_p[I]_0\left(e^{-k_0 t} - 1\right)}{k_0}$$

$$\Rightarrow [M]$$

№8

Дано:
ρ, t
k_p

$[I]_0$ - ?
X_h - ? (если $[M]_0$)

$$\ln\left(\frac{[M]}{[M]_0}\right) = -k_p [I]_0 t$$

$$\rho = \frac{[M]_0 - [M]}{[M]_0} = 1 - \frac{[M]}{[M]_0}$$

$$\frac{[M]}{[M]_0} = 1 - \rho$$

$$\ln(1-\rho) = -k_p [I]_0 t$$

$$[I]_0$$

$$X_h = \frac{[M]_0 - [M]}{[I]_0}$$