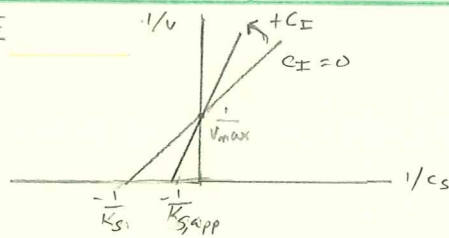
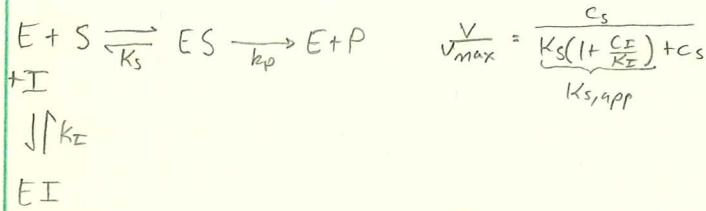


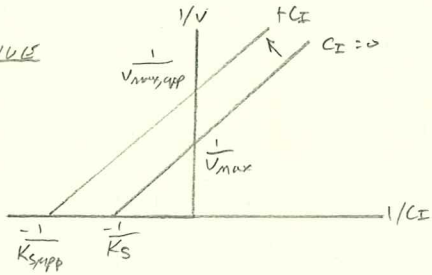
COMPETITIVE



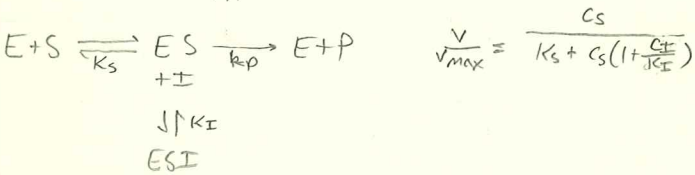
$$\frac{1}{v} = \frac{K_s}{v_{max}} \left(1 + \frac{C_I}{K_I}\right) \frac{1}{c_s} + \frac{1}{v_{max}}$$



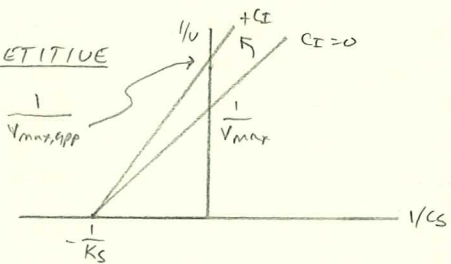
UNCOMPETITIVE



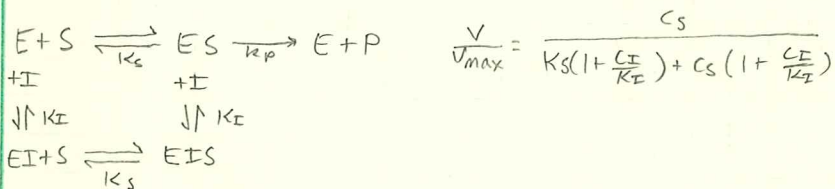
$$\frac{1}{v} = \frac{K_s}{v_{max}} \frac{1}{c_s} + \frac{1}{v_{max}} \left(1 + \frac{C_I}{K_I}\right)$$



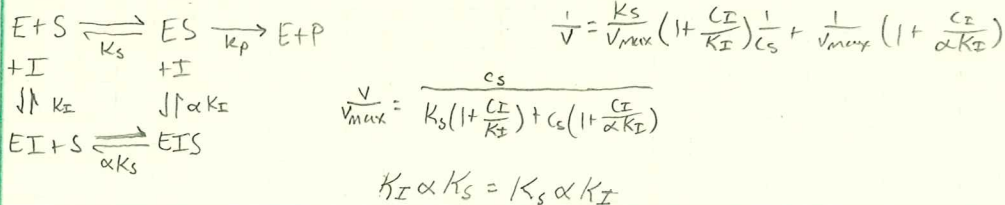
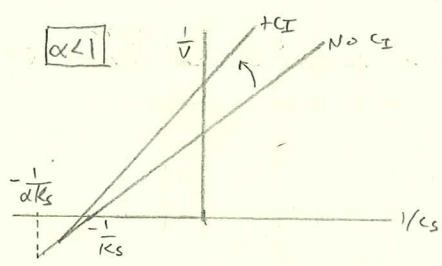
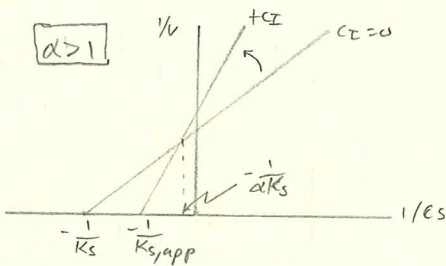
NON-COMPETITIVE



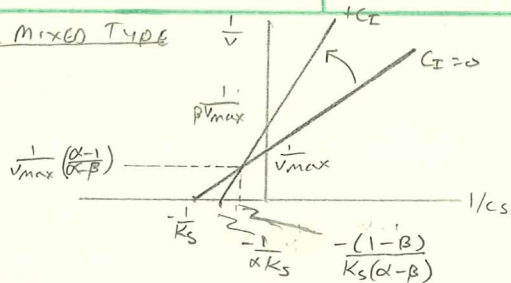
$$\frac{1}{v} = \frac{K_s}{v_{max}} \left(1 + \frac{C_I}{K_I}\right) \frac{1}{c_s} + \frac{1}{v_{max}} \left(1 + \frac{C_I}{K_I}\right)$$



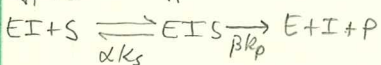
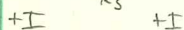
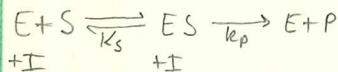
MIXED TYPE



PARTIAL MIXED TYPE



$$\frac{1}{v} = \frac{K_S}{v_{max}} \left[\frac{1 + \frac{C_I}{K_I}}{1 + \frac{\beta C_I}{\alpha K_I}} \right] \frac{1}{c_s} + \frac{1}{v_{max}} \left[\frac{1 + \frac{C_I}{\alpha K_I}}{1 + \frac{\beta C_I}{\alpha K_I}} \right]$$

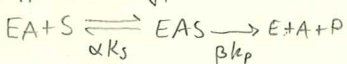
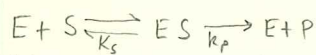
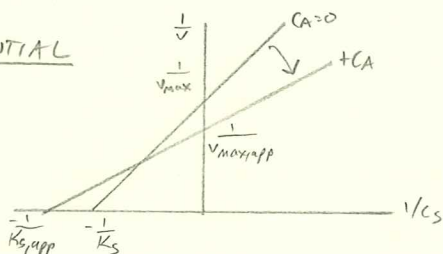


$$\frac{v}{v_{max}} = \frac{c_s (1 + \frac{\beta C_I}{\alpha K_I})}{K_S (1 + \frac{C_I}{K_I}) + c_s (1 + \frac{C_I}{\alpha K_I})}$$

$\beta < 1$

$$v = k_p c_s E + \beta k_p c_s EIS$$

NON-ESSENTIAL

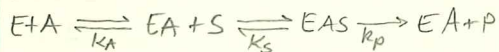
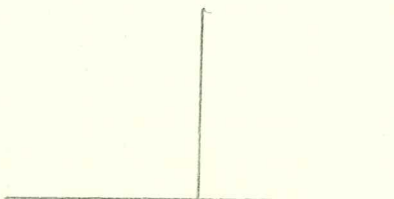


$$\frac{v}{v_{max}} = \frac{c_s}{K_S (1 + \frac{C_A}{K_A}) + c_s (1 + \frac{\beta C_A}{\alpha K_A})}$$

$\beta > 1$
LIKELY $\alpha < 1$

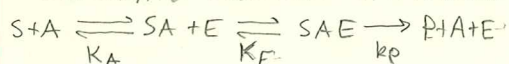
$$v = k_p c_s E + \beta k_p c_s EAS$$

ESSENTIAL



$$\frac{v}{v_{max}} = \frac{c_s}{K_S (1 + \frac{C_A}{K_A}) + c_s}$$

- SUBSTRATE ESSENTIAL ACTIVATION

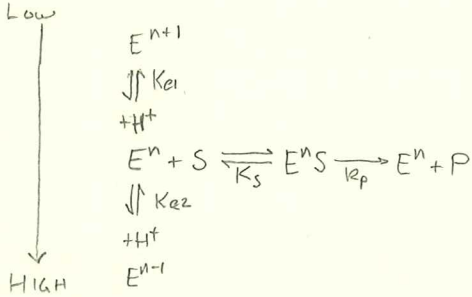


$$\frac{v}{v_{max}} = \frac{c_A c_S}{K_A K_E + c_A c_S}$$

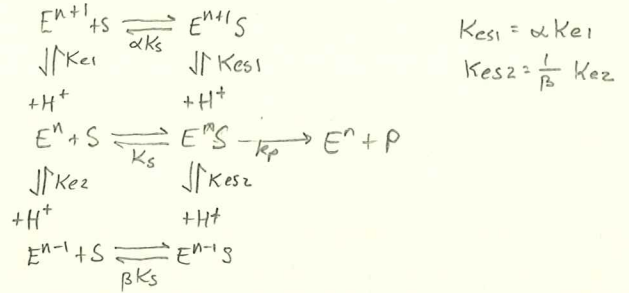
$$c_A c_S = K_A \frac{(C_{A,T} + C_{S,T} + K_A) - \sqrt{(C_{A,T} + C_{S,T} + K_A)^2 - 4 C_{A,T} C_{S,T}}}{2}$$

$$C_{A,T} = C_A + C_{SA} \quad C_{S,T} = C_S + C_{SA}$$

pH DEPENDENCE



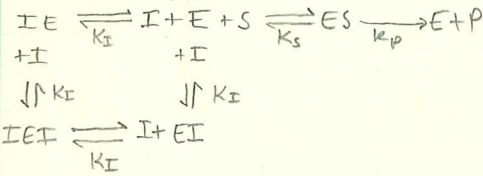
$$\frac{v}{v_{max}} = \frac{C_s}{K_s \left(1 + \frac{C_{H^+}}{K_{e1}} + \frac{K_{e2}}{C_{H^+}} \right) + C_s}$$



$K_{e1} = \alpha K_{e1}$
 $K_{e2} = \frac{1}{\beta} K_{e2}$

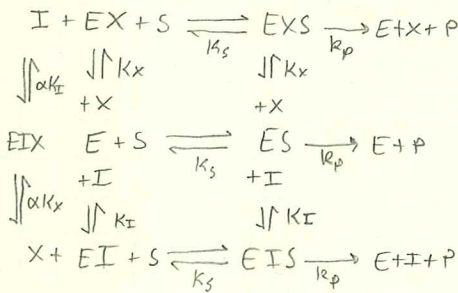
$$\frac{v}{v_{max}} = \frac{C_s}{K_s \left(1 + \frac{C_{H^+}}{K_{e1}} + \frac{K_{e2}}{C_{H^+}} \right) + C_s \left(1 + \frac{C_{H^+}}{K_{e1}} + \frac{K_{e2}}{C_{H^+}} \right)}$$

MULTIPLE INHIBITORS



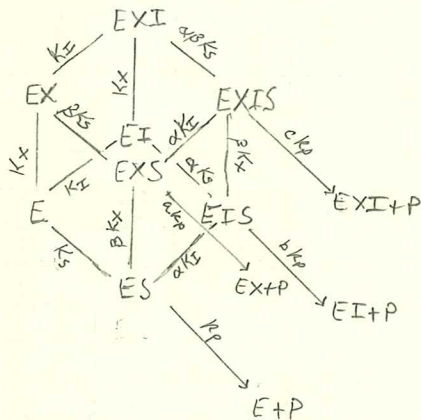
$$\frac{v}{v_{max}} = \frac{C_s}{K_s \left(1 + \frac{C_I}{K_I} \right)^2 + C_s}$$

MULTIVALENT INHIBITION



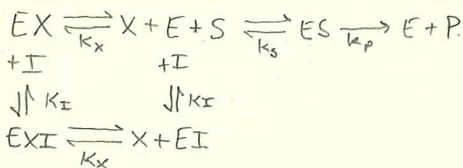
$$\frac{v}{v_{max}} = \frac{C_s}{K_s \left(1 + \frac{C_x}{K_x} + \frac{C_I}{K_I} + \frac{C_x C_I}{\alpha K_x K_I} \right) + C_s}$$

PARTIAL INHIBITION



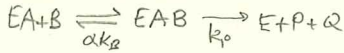
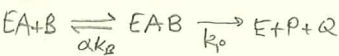
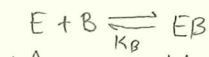
$$\frac{v}{C_{E,T}} = \frac{k_p C_E S + a k_p C_{EXS} + b k_p C_{EIS} + c k_p C_{EXIS}}{C_E + C_{ES} + C_{EXS} + C_{EIS} + C_{EXIS} + C_{EX} + C_{EI} + C_{EXI}}$$

SYNERGISTIC INHIBITION

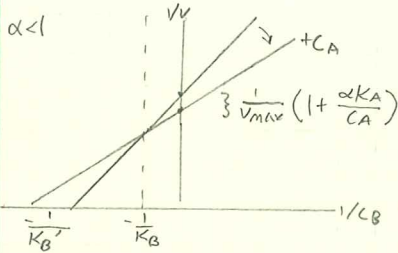


$$\frac{v}{v_{max}} = \frac{C_s / K_s}{1 + \frac{C_s}{K_s} + \frac{C_I}{K_i} + \frac{C_x}{K_x} + \frac{C_x C_s}{K_x K_s}}$$

RANDOM BIREACTANT ENZYME



$$\frac{v}{v_{max}} = \frac{CACB}{\alpha K_A K_B + \alpha K_A C_B + \alpha K_B C_A + C_A C_B}$$

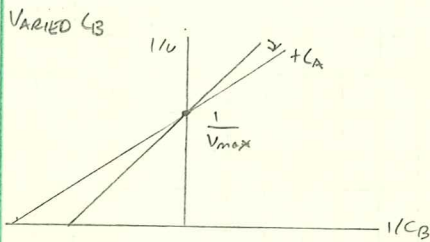


$$\frac{1}{v} = \frac{\alpha K_B}{v_{max}} \left(1 + \frac{K_A}{C_A}\right) \frac{1}{C_B} + \frac{1}{v_{max}} \left(1 + \frac{\alpha K_A}{C_A}\right)$$

ORDERED BIREACTANT

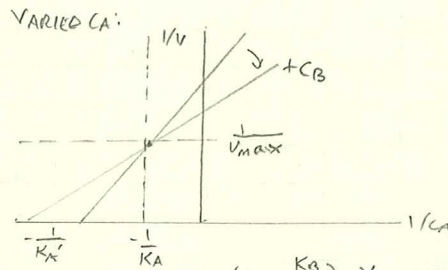


$$\frac{v}{v_{max}} = \frac{CACB}{K_A K_B + K_B C_A + C_A C_B}$$



$$\frac{v}{v_{max}} = \frac{C_B}{K_B \left(1 + \frac{K_A}{C_A}\right) + C_B}$$

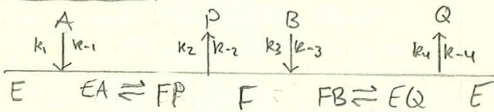
$$\frac{1}{v} = \frac{K_B}{v_{max}} \left(1 + \frac{K_A}{C_A}\right) \frac{1}{C_B} + \frac{1}{v_{max}}$$



$$\left(1 + \frac{K_B}{C_B}\right) \frac{v}{v_{max}} = \frac{C_A}{\frac{K_A}{\left(1 + \frac{C_B}{K_B}\right)} + C_A}$$

$$\frac{1}{v} = \frac{K_A}{v_{max}} \left(\frac{K_B}{C_B}\right) \frac{1}{C_A} + \frac{1}{v_{max}} \left(1 + \frac{K_B}{C_B}\right)$$

PING-PONG



$$\frac{v}{v_{max}} = \frac{CACB}{K_{m,A} C_B + K_{m,B} C_A + C_A C_B}$$