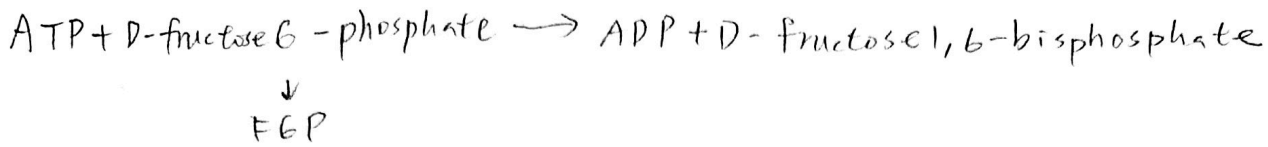


4. a)



$$V(\dots)_j = \frac{\sum_{i \in \{x_j\}} W_i f_i(\dots)}{\sum_{j \in C_j} W_j f_j(\dots)}$$

$$r_1 = k_{cat} E_1 \left(\frac{F6P}{K_{F6P} + F6P} \right) \left(\frac{ATP}{K_{ATP} + ATP} \right)$$

$$\begin{cases} \hat{r}_1 = r_1 V_1 \\ V_1 = \frac{W_1 + W_2 f}{1 + W_1 + W_2 f} \\ f_1 = \frac{\left(\frac{x}{K_1}\right)^n}{1 + \left(\frac{x}{K_1}\right)^n} \end{cases}$$

$$[F6P] = 0.1 \text{ mM}$$

$$[ATP] = 2.3 \text{ mM}$$

$$[PEK(E_1)] = 0.12 \text{ } \mu\text{M}$$

$$K_{F6P} = 0.11 \text{ mM}$$

$$K_{ATP} = 0.42 \text{ mM}$$

$$k_{cat} = 0.4 \text{ s}^{-1}$$

$$\begin{aligned} 1^\circ \Rightarrow r_1 &= 0.4 \text{ s}^{-1} \times 0.12 \text{ } \mu\text{M} \times \left(\frac{0.1 \text{ mM}}{0.11 \text{ mM} + 0.1 \text{ mM}} \right) \cdot \left(\frac{2.3 \text{ mM}}{0.42 \text{ mM} + 2.3 \text{ mM}} \right) \\ &= 0.0193 \text{ } \mu\text{M/s} = 69.58 \text{ } \mu\text{M/hr} \end{aligned}$$

$$2^\circ [3'-5'\text{-AMP}] = 0, f_1 = 0, \hat{r}_1 = 3.0003$$

$$\Rightarrow 3.0003 = 69.58 \frac{W_1}{1 + W_1} \quad ; \quad \boxed{W_1 = 0.0451} \quad \#$$

$$3^\circ [3'-5'\text{-AMP}] = 0.99 \text{ mM}, \hat{r}_1 = 68.653 \text{ and } f_1 \hat{=} 1 \text{ (assume)}$$

$$\Rightarrow 68.653 = 69.58 \times \frac{0.0451 + W_2}{1 + 0.0451 + W_2} \quad ; \quad \boxed{W_2 = 74.01} \quad \#$$

4. b)

Guess n and K
 \uparrow \uparrow
order parameter binding constant

The estimation is $n = 2.488$
 $K = 0.665$

\Rightarrow Calculation shown in excel file.

4. c)

Plot shown in excel and jpg file. #

\Rightarrow The estimated model fits the data pretty good.