$ORIGIN := 1$

$A := \begin{pmatrix} 11.6834 \\ 10.9237 \end{pmatrix}$ $B := \begin{pmatrix} 3816.44 \\ 3166.28 \end{pmatrix}$ $C := \begin{pmatrix} -46.13 \\ -80.15 \end{pmatrix}$

$P := 1$ $R := 8.314$ $T := 361$ $z := \begin{pmatrix} 0.75 \\ 0.25 \end{pmatrix}$

$$\gamma(x) := \left| \begin{array}{l} g_{12} \leftarrow 9218.30 \\ g_{21} \leftarrow -414.77 \\ \alpha \leftarrow 0.3 \\ \tau_{12} \leftarrow \dfrac{g_{12}}{R \cdot T} \\ \tau_{21} \leftarrow \dfrac{g_{21}}{R \cdot T} \\ G_{12} \leftarrow \exp(-\alpha \cdot \tau_{12}) \\ G_{21} \leftarrow \exp(-\alpha \cdot \tau_{21}) \\ \gamma_1 \leftarrow \exp\left[(x_2)^2 \cdot \left[\tau_{21} \cdot \left(\dfrac{G_{21}}{x_1 + x_2 \cdot G_{21}} \right)^2 + \dfrac{\tau_{12} \cdot G_{12}}{(x_2 + G_{12} \cdot x_1)^2} \right] \right] \\ \gamma_2 \leftarrow \exp\left[(x_1)^2 \cdot \left[\tau_{12} \cdot \left(\dfrac{G_{12}}{x_2 + x_1 \cdot G_{12}} \right)^2 + \dfrac{\tau_{21} \cdot G_{21}}{(x_1 + G_{21} \cdot x_2)^2} \right] \right] \\ \begin{pmatrix} \gamma_1 \\ \gamma_2 \end{pmatrix} \end{array} \right.$$

$P1 := \exp\left(A_1 - \dfrac{B_1}{C_1 + T} \right) = 0.646$ $P2 := \exp\left(A_2 - \dfrac{B_2}{C_2 + T} \right) = 0.705$

Initial estimates

$x := \begin{pmatrix} 0.9 \\ 0.1 \end{pmatrix}$ $y := \begin{pmatrix} 0.62 \\ 0.38 \end{pmatrix}$ $VF := 0.5$

Given

$$P \cdot y_1 = P1 \cdot x_1 \cdot \gamma(x)_1$$

$$P \cdot y_2 = P2 \cdot x_2 \cdot \gamma(x)_2$$

$$x_1 + x_2 = 1$$

$$y_1 + y_2 = 1$$

$$VF = \frac{z_1 - x_1}{y_1 - x_1}$$

$$\begin{pmatrix} x \\ y \\ VF \end{pmatrix} := \text{Find}(x , y , VF)$$

$$x = \begin{pmatrix} 0.931 \\ 0.069 \end{pmatrix} \qquad y = \begin{pmatrix} 0.619 \\ 0.381 \end{pmatrix} \qquad VF = 0.581$$