

Nome: Nicole mais Argemoliz

Modelo:

$$\frac{dT}{dt} = \frac{F}{V} (T_{im} - T) - \frac{UA}{C_p V} (T - T_j) - \frac{UA_{ra}}{C_p V} (T - T_a) + \frac{P_e}{C_p V}$$

$$\frac{dT_j}{dt} = \frac{F_j}{V_j} (T_{im} - T_j) + \frac{UA}{C_p V_j} (T - T_j) - \frac{UA_{ja}}{C_p V_j} (T_j - T_a)$$

$$\frac{dCA}{dt} = \frac{F}{V} (CA_{im} - CA) - \frac{P_e}{(-\Delta H) V}$$

$$P_e = (-\Delta H) K_0 e^{-E/RT} CA \cdot V$$

Matriz A:

$$\begin{bmatrix} \frac{df_1}{dT} & \frac{df_1}{dT_j} & \frac{df_1}{dCA} \\ \frac{df_2}{dT} & \frac{df_2}{dT_j} & \frac{df_2}{dCA} \\ \frac{df_3}{dT} & \frac{df_3}{dT_j} & \frac{df_3}{dCA} \end{bmatrix}$$

$$\frac{df_1}{dT} = \frac{-F}{V} - \frac{UA}{C_p V} - \frac{U A R_A}{C_p V} + \frac{C_A \cdot -\Delta H \cdot K_0 \cdot E}{C_p V} \cdot \frac{e^{-E/RT}}{RT^2}$$

$$\frac{df_1}{dT_j} = \frac{UA}{C_p V}$$

$$\frac{df_1}{dC_A} = K_0 e^{-E/RT} \cdot V$$

$$\frac{df_2}{dT} = \frac{UA}{C_p V_j}$$

$$\frac{df_2}{dT_j} = -\frac{F_j}{V_j} - \frac{UA}{C_p V_j} - \frac{U A_j A}{C_p V_j}$$

$$\frac{df_2}{dC_A} = 0$$

$$\frac{df_3}{dT} = \frac{E}{RT^2} e^{-E/RT} \cdot K_0 \cdot C_A$$

$$\frac{df_3}{dT_j} = 0$$

$$\frac{df_3}{dC_A} = -\frac{F}{V} - K_0 e^{-E/RT}$$

onde:

$$\overline{T} = T - T_s$$

$$\overline{T}_j = T_j - T_{js}$$

$$\overline{CA} = CA - C_{AS}$$

$$\overline{T}(0) = T_0 - T_s$$

$$\overline{T}_j(0) = T_{j0} - T_{js}$$

$$\overline{CA}(0) = CA_0 - C_{AS}$$