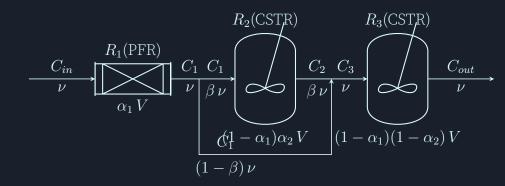# ERQ II – P1 Modelo 2.1

Felipe B. Pinto 61387 – MIEQB

22 de maio de 2024

Conteúdo

1 Modelo

Calculos

1.1 C2

$$C_{2,i+1} = C_{2,i} + \frac{C_{1,i} - C_{2,i}}{\tau} \, \frac{\beta}{(1 - \alpha_1)\,(1 - \alpha_1)\,\alpha_2} \, \Delta t$$

$$\beta\,\nu\,C_1 = \beta\,\nu\,C_2 + (1 - \alpha_1)\,\alpha_2\,V\,\frac{\mathrm{d}C_2}{\mathrm{d}t} \implies$$

$$\implies \beta\,C_1 = \beta\,C_2 + (1 - \alpha_1)\,\alpha_2\,\tau\,\frac{\mathrm{d}C_2}{\mathrm{d}t} \implies$$

$$\implies \frac{\mathrm{d}C_2}{\mathrm{d}t} = \frac{C_1 - C_2}{(1 - \alpha_1)\,\alpha_2\,\tau}\,\beta \implies$$

$$\implies \frac{\Delta C_2}{\Delta t} = \frac{C_{2,i+1} - C_{2,i}}{\Delta t} = \frac{C_{1,i} - C_{2,i}}{(1 - \alpha_1)\,\alpha_2\,\tau}\,\beta \implies$$

$$\implies C_{2,i+1} = C_{2,i} + \frac{C_{1,i} - C_{2,i}}{(1 - \alpha_1)\,\alpha_2\,\tau}\,\beta\,\Delta t$$

1.2 C3

$$C_3 = \beta\,C_2 + (1 - \beta)\,C_1$$

$\nu\,C_3 = \beta\,\nu\,C_2 + (1 - \beta)\,\nu\,C_1 \implies$
$\implies C_3 = \beta\,C_2 + (1 - \beta)\,C_1$

1.3 C out

$$C_{out,i+1} = C_{out,i} + \frac{C_{out,i} - C_{3,i}}{(1 - \alpha_1)(1 - \alpha_2)\,\tau}\,\Delta t$$

$$\nu\, C_{out} = \nu\, C_3 + (1 - \alpha_1)(1 - \alpha_2)\, V\, \frac{\mathrm{d}C_{out}}{\mathrm{d}t} \implies$$

$$\implies C_{out} = C_3 + (1 - \alpha_1)(1 - \alpha_2)\, \tau\, \frac{\mathrm{d}C_{out}}{\mathrm{d}t} \implies$$

$$\implies \frac{\mathrm{d}C_{out}}{\mathrm{d}t} = \frac{C_{out} - C_3}{(1 - \alpha_1)(1 - \alpha_2)\,\tau} \implies$$

$$\implies \frac{\Delta C_{out}}{\Delta t} = \frac{C_{out,i+1} - C_{out,i}}{\Delta t} = \frac{C_{out,i} - C_{3,i}}{(1 - \alpha_1)(1 - \alpha_2)\,\tau} \implies$$

$$\implies C_{out,i+1} = C_{out,i} + \frac{C_{out,i} - C_{3,i}}{(1 - \alpha_1)(1 - \alpha_2)\,\tau}\,\Delta t$$