

# ERQ II – Prática 1

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## Conteúdo

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# Absorvancia Experimental

$$\int \text{Abs}_i = (t_i - t_{i-1}) \frac{\text{Abs}_i + \text{Abs}_{i-1}}{2}$$

# Distribuição de tempos de residência

$$E(t) = \frac{C(t)}{\int_0^\infty C(t) \, dt} = \frac{\varepsilon A(t)}{\int_0^\infty \varepsilon A(t) \, dt} = \frac{A(t)}{\int_0^\infty A(t) \, dt}$$
$$\int_0^\infty E(t) \, dt = 1$$

Função cumulativa de tempos de residência

$$F(t) = \int_0^t E(t) \, dt = F_{i-1} + (t_i - t_{i-1}) \frac{E_i + E_{i+1}}{2}$$

# Tempo espacial

$$\tau = \int_0^{\infty} t E(t) \, dt = \sum (t_i - t_{i-1}) \frac{t_{m,i} - t_{m,i-1}}{2}$$

$$t_m = t E(t)$$

# Funções em tempo adimensional

$$\theta(t) = t/t_m; \quad E(\theta) = t_m E(t);$$

$$F(\theta) = \int_0^\theta E(\theta) \, \mathrm{d}\theta = F_{i-1} + (\theta_i - \theta_{i-1}) \frac{E_i + E_{i-1}}{2}$$

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# II – Prática 2

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$$X_{exp} = 1 - \frac{Abs_{est}}{Abs_0}; \quad v_0 = \frac{V_m}{t}; \quad \tau = \frac{V_{ativo}}{v_0}; \quad k = \left( (X_{exp}^{-1} - 1) \tau \right)^{-1}$$



# Modelo de Segregação

$$X = 1 - \exp (-k t)$$

$$\bar{X} = \int_0^{\infty} X E(t) \, dt = \Delta t \frac{(X E(t))_i + (X E(t))_{i-1}}{2}$$

# Modelo de Máxima Mistura

$$\mathbf{X}_i = \mathbf{X}_{i-1} + \left( -k (1 - \mathbf{X}_{i-1}) + \frac{E_{i-1}(\lambda) \mathbf{X}_{i-1}}{1 - F_{i-1}(\lambda)} \right) \Delta \lambda$$

$$\frac{dx}{d\lambda} = \frac{r_A}{C_{A,0}} + \frac{E X}{1 - F} \Rightarrow$$

$$\Rightarrow \frac{\Delta X}{\Delta \lambda} = \frac{X_i - X_{i-1}}{\Delta \lambda} = \frac{-k C_{A,0} (1 - X_{i-1})}{C_{A,0}} + \frac{E_{i-1}(\lambda) X_{i-1}}{1 - F_{i-1}(\lambda)} \Rightarrow$$

$$\Rightarrow X_i = X_{i-1} + \left( -k (1 - X_{i-1}) + \frac{E_{i-1}(\lambda) X_{i-1}}{1 - F_{i-1}(\lambda)} \right) \Delta \lambda$$

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# Segregação

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$$k = \frac{Abs_0 / Abs_{est} - 1}{\tau}$$

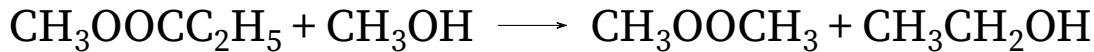
$$X_i = \Delta t \frac{(X * E_{calc})_i + (X * E_{calc})_{i-1}}{2}$$

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# III – Prática 3

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$$\frac{N_{Ac}}{N_{C9}} = Fr \frac{A_{Ac}}{A_{C9}} \implies N_{Ac} = Fr N_{C9} \frac{A_{Ac}}{A_{C9}}$$



$$\ln \frac{1}{1-X} = \frac{W}{V} k'_{ap} t$$

$$-r_A = k'_{ap} C_A = k'_{ap} C_{A,0}(1-X); \quad \frac{dN_A}{dt} = W r_A \implies$$

$$\implies -r_A = \frac{N_{A,0}}{W} \frac{dX}{dt} = k'_{ap} C_{A,0}(1-X) \implies$$

$$\implies \int \frac{dX}{1-X} = \ln \frac{1}{1-X} = \int \frac{W}{N_{A,0}} k'_{ap} C_{A,0} dt = \frac{W}{N_{A,0}/C_{A,0}} k'_{ap} \int dt = \frac{W}{V_A} k'_{ap} t$$



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$$k'_{Ap} = \text{Declive} \frac{V_A}{W}$$

$$X = 1 - \frac{N_{Ac,t}}{N_{Ac,0}}$$