EVAPORATION THROUGH STAGNANT GAS ($y_{AL}=0$)

$$\Phi_A = \frac{-P D_{AB} \ln(1-y_{A0})}{LRT}$$

$$\dot{n}_A = \frac{-P D_{AB} S \ln(1-y_{A0})}{LRT}$$

LEVEL DECREASES ($y_{AL}=0$)

$$\frac{C_{A(LIQ)}}{2}\left[L_1^2 - L_0^2\right] = \frac{-P D_{AB} \ln(1-y_{A0}) t_1}{RT}$$

LEVEL DECREASES ($y_{AL}\neq 0$)

$$\frac{C_{A(LIQ)}}{2}\left[L_1^2 - L_0^2\right] = \frac{-P D_{AB} \ln\left[\frac{1-y_{A0}}{1-y_{AL}}\right] t_1}{RT}$$

FLUX TO A "MICROBE" WITH $x_A=0$ @ $r=r_1$

$$\dot{n}_A|_{r_1} = 4\pi c D_{AB} r_1 \ln(1-x_{AEXT})$$

STEADY-STATE DIFFUSION ACROSS A "FILM"

$$C_A = C_{A0} - \frac{z}{L}(C_{A0} - C_{AL})$$

$$\Phi_A = \frac{D_{AB}(C_{A0} - C_{AL})}{L}$$

STEADY-STATE DIFFUSION ACROSS A "MEMBRANE"

$$C_A = H C_{A0} - \frac{z}{L} H (C_{A0} - C_{AL})$$

$$\Phi_A = \frac{D_{AB} H (C_{A0} - C_{AL})}{L} = \frac{P_{AB}(P_{A0} - P_{AL})}{LRT}$$

EQUIMOLAR COUNTERDIFFUSION

$$N_{Da} = \frac{k' L}{D_{AB}} \qquad \frac{y_{A0}}{y_{AL}} = N_{DA} + 1$$

$$\Phi_A = \frac{c D_{AB} y_{A0}}{L}\left(\frac{N_{DA}}{N_{DA}+1}\right)$$

DIFFUSION THROUGH A CYLINDRICAL TUBE

$$\dot{n}_A = \frac{-2\pi L_c D_{AB}(x_{A1} - x_{A2})}{\ln(r_1/r_2)}$$