CHE 305 – Separation Processes
Spring 2010 - Exercise on Absorber Height

Given:

- $K_y a = 10$ mol/ft^3 hr
- $K_x a = 8$ mol/ft^3 hr
- L = 400 mol/hr
- V = 300 mol/hr
- S = 9 ft^2
- EQ Curve: y* = 0.8x*
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$$N_{Oy} = \int \frac{dy}{y - y^*} = \frac{\Delta y}{\overline{\Delta y}_L} \qquad N_{Ox} = \int \frac{dx}{x^* - x} = \frac{\Delta x}{\overline{\Delta x}_L}$$

$$H_{Oy} = \frac{V/S}{K_y a} \qquad H_{Ox} = \frac{L/S}{K_x a}$$

$$\overline{\Delta Q}_L = \frac{(Q - Q^*)_{Top} - (Q - Q^*)_{Bottom}}{\ln\left(\frac{(Q - Q^*)_{Top}}{(Q - Q^*)_{Bottom}}\right)} = \frac{(Q^* - Q)_{Top} - (Q^* - Q)_{Bottom}}{\ln\left(\frac{(Q^* - Q)_{Top}}{(Q^* - Q)_{Bottom}}\right)}$$

Determine the column height (Z_T) given the following mole fraction gradients in the gas and liquid phases.