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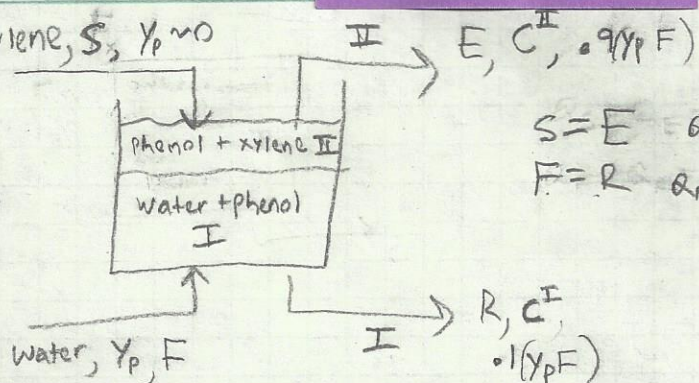
$$M = 1.4 = \frac{C^{\text{II}}}{C^{\text{I}}}$$

a) $Q^{\text{II}}/Q^{\text{I}} = ?$

$$C^{\text{I}} = \frac{C_F \left(\frac{Q^{\text{I}}}{Q^{\text{II}}} \right) + C_S}{\frac{Q^{\text{I}}}{Q^{\text{II}}} + M}$$

$$0.1 C_F = \frac{C_F \left(\frac{Q^{\text{I}}}{Q^{\text{II}}} \right)}{\frac{Q^{\text{I}}}{Q^{\text{II}}} + 1.4}$$

Xylene, $S, Y_P \approx 0$



$$S = E \quad Q_S = Q_E = Q^{\text{II}}$$

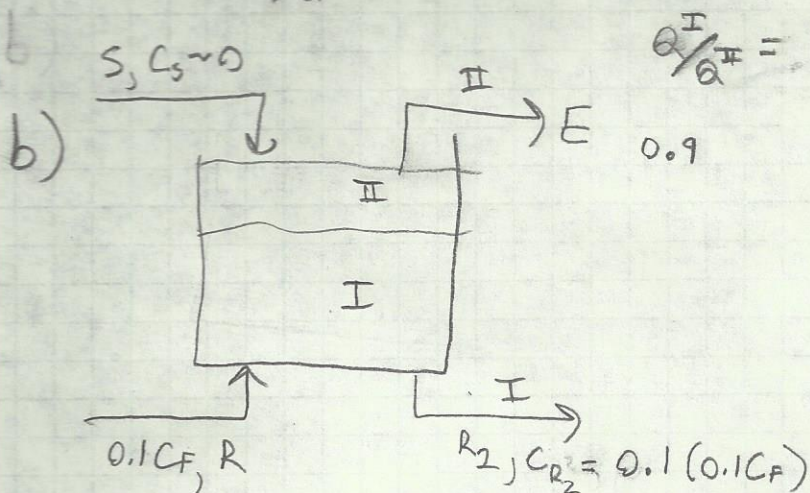
$$F = R \quad Q_F = Q_R = Q^{\text{I}}$$

$$0.1 C_F F = C^{\text{I}} R$$

$$0.1 C_F \frac{Q^{\text{I}}}{Q^{\text{II}}} + 0.14 C_F = C_F \left(\frac{Q^{\text{I}}}{Q^{\text{II}}} \right)$$

$$0.14 = 0.9 \frac{Q^{\text{I}}}{Q^{\text{II}}}$$

$$\frac{Q^{\text{I}}}{Q^{\text{II}}} = 0.156 \Rightarrow \frac{Q^{\text{II}}}{Q^{\text{I}}} = \boxed{6.43}$$



$$0.01 C_F = \frac{0.1 C_F \left(\frac{Q^{\text{I}}}{Q^{\text{II}}} \right)}{\left(\frac{Q^{\text{I}}}{Q^{\text{II}}} \right) + 1.4}$$

$$0.01 C_F \frac{Q^{\text{I}}}{Q^{\text{II}}} + 0.014 C_F = 0.1 C_F \left(\frac{Q^{\text{I}}}{Q^{\text{II}}} \right)$$

$$0.014 = 0.09 \frac{Q^{\text{I}}}{Q^{\text{II}}}$$

$$\frac{Q^{\text{II}}}{Q^{\text{I}}} = \boxed{6.43}$$