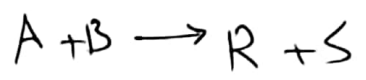


~~المسوحة ضوئياً بـ~~

Q1

$$C_{A0} = 100$$
$$C_{B0} = 200$$



$$X_A = 0.8$$
$$X_B = ?$$
$$C_A = ?$$
$$C_B = ?$$

$$V_{q_0} = 100A + 200B + 0R + 0S = 300$$

$$V_f = 0A + 100B + 100R + 100S = 300$$

$$\sum R = 0$$

$$\sum A = \frac{300 - 300}{300} = 0$$

$$\textcircled{1} \frac{C_A}{C_{A0}} = \frac{1 - X_A}{1 + \sum A X_A} \Rightarrow C_A = 100 \left[\frac{1 - 0.8}{1 + 0} \right]$$
$$C_A = 20$$

② ~~المسوحة ضوئياً بـ~~

$$\frac{C_{A0} X_A}{a} = \frac{C_{B0} X_B}{b}$$

إذا تم استيراد قوائين Case 2
لا ي، $X_B = 0.8$ ~~هو~~ X_B ~~لا~~ $X_B = 0.8$

$$\frac{100 (0.8)}{1} = \frac{100 (X_B)}{1}$$

وهذا لا يمكن، بل إن ~~هو~~
Case 1 إذا تم استيراد قوائين $\sum A = 0$

$$\therefore X_B = 0.8$$

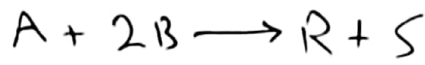
$$\textcircled{3} \frac{C_B}{C_{B0}} = \frac{1 - X_B}{1 + \sum B X_B} \Rightarrow C_B = 20$$

Q2

dilute eqy ears \Rightarrow Case 1

$$C_{A0} = 100$$

$$C_{B0} = 100$$



$$C_A = 20$$

$$C_B = ?$$

$$X_A = ?$$

$$X_B = ?$$

$$X_A = 1 - \frac{C_A}{C_{A0}} = 1 - \frac{20}{100}$$

$$X_A = 0.8$$

$$\frac{C_{A0} X_A}{a} = \frac{C_{B0} X_B}{b} \Rightarrow \frac{100 \times 0.8}{1} = \frac{100 \times X_B}{2}$$

$$X_B = 1.6$$

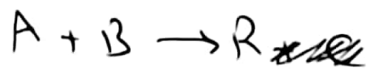
لِي هذه اليا لا يمكن
كامله اكل لانه صفة X_B في صيغة
صحة لا يمكن ان تكون اكثر من 1 في التفاعل
الكيميائي

Q3

gaseous feed

$$C_{A0} = 200$$

$$C_{B0} = 100$$



$$C_A = 50$$

$$C_B = ?$$

$$X_A = ?$$

$$X_B = ?$$

Sol

at $X_A = 0$ $V_0 = 200A + 100B + 0R = 300$

at $X_A = 1$ $V_f = 0A - 100B + 200R = 100$

في البداية 200 ل A

والجواب 100 في البداية

$$\Rightarrow \Sigma_A = \frac{100 - 300}{300} = -0.667$$

$$X_A = \frac{200 - 50}{200 - (0.667 \times 50)} \approx 0.9$$

$$\frac{a \Sigma_A}{C_{A0}} = \frac{b \Sigma_B}{C_{B0}} \Rightarrow \frac{-0.667}{200} = \frac{\Sigma_B}{100}$$

$$\Sigma_B = -0.336$$

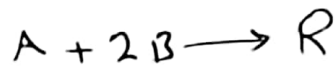
$$\Sigma_B X_B = \Sigma_A X_A \Rightarrow X_B = \frac{0.9 \times -0.667}{-0.336}$$

$$X_B = 1.78$$

impossible to complete the solution and find C_B because the value of X_B is not real as it can't be more 1

Q7 Gaseous Feed

$$C_{A0} = 100$$



$$C_B = 20 \quad X_B = ?$$

$$C_{B0} = 100$$

$$C_A = ? \quad X_A = ?$$

Σ_A

$$X_A=0 \quad V_0 = 100A + 100B + 0R = 200$$

$$X_A=1 \quad V_f = 0A - 100B + 100R = 0$$

$$\Sigma_A = \frac{0 - 200}{200} = -1$$

$$\frac{C_A \Sigma_A}{C_{A0}} = \frac{b \Sigma_B}{\Sigma_{B0}} \Rightarrow \frac{1 \cdot -1}{100} = \frac{2 \Sigma_B}{100} \Rightarrow \Sigma_B = -\frac{1}{2}$$

$$X_B = \frac{C_{B0} - C_B}{C_{B0} + \Sigma_B C_B} \Rightarrow \frac{100 - 20}{100 + (-0.5 \cdot 20)} = \frac{80}{90} = 0.888$$

$$\Sigma_A X_A = \Sigma_B X_B \Rightarrow -1 \cdot X_A = -0.5 \cdot 0.888$$

$$\therefore X_A = 0.444$$

$$C_A = C_{A0} \left[\frac{1 - X_A}{1 + \Sigma_A X_A} \right]$$

$$= 100 \left[\frac{1 - 0.444}{1 + (-1 \cdot 0.444)} \right]$$

$C_A = 100$ this result impossible because there change in conversion of A

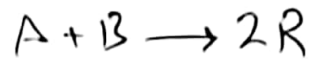
4.5

$$T_0 = 400 \text{ K}$$

$$P_0 = 4 \text{ atm}$$

$$C_{A0} = 100$$

$$C_{B0} = 200$$



$$T = 300 \text{ K}$$

$$P = 3 \text{ atm}$$

$$C_A = 20$$

$$x_A = ? \quad x_B = ?$$

$$C_B = ?$$

$$\text{at } x_A = 0 \quad V = 100A + 200B + 0R = 300$$

$$\text{at } x_A = 1 \quad V = 0A + 100 + 200R = 300$$

$$\sum A = \frac{300 - 300}{300}$$

$$= 0$$

$$x_A = \frac{1 - \frac{C_A}{C_{A0}} \left(\frac{T P_0}{T_0 P} \right)}{1 + \sum_A \frac{C_A}{C_{A0}} \left(\frac{T P_0}{T_0 P} \right)}$$

$$= \frac{1 - (20/100) (300 \cdot 4 / 400 \cdot 3)}{1 + 0} = 0.8$$

$$\frac{C_{A0} x_A}{a} = \frac{C_{B0} x_B}{b} \Rightarrow 100 (0.8) = 200 x_B$$

$$x_B = 0.4$$

$$C_B = C_{B0} \left[\frac{1 - x_B}{1 + \sum_B x_B} \right] \left[\frac{T_0 P}{P_0 T} \right]$$

$$\frac{a \sum A}{C_{A0}} = \frac{b \sum b}{C_{B0}}$$

$$\text{when } \sum A = 0$$

$$\therefore \sum B = 0$$

$$\rightarrow C_B = 120$$

4.6 Home works

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$$A \rightarrow 31 R$$

حجم التربة ارتفع
بمقدار 31 مرة

what the fractional $x_A = ?$

$$28 = 31(X) + 1(1-X)$$

ذرة حجم صكوله + ذرة صكوله = الكمية الخارجة

$$\Rightarrow X = 0.9 \quad \text{صفا، الخرج}$$