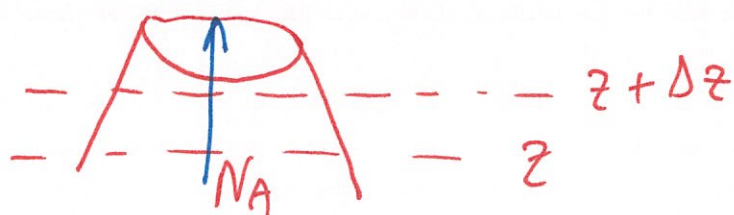
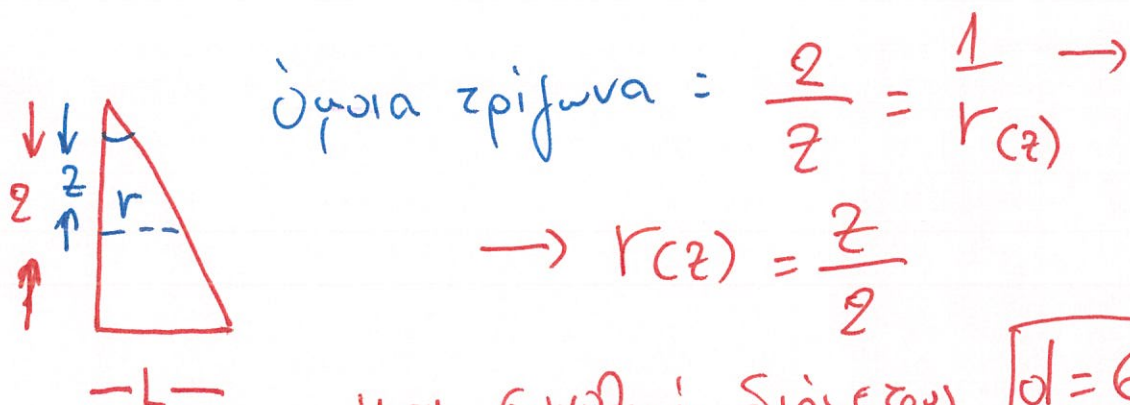


Η εξίσωση λαμβάνει χώρα στο κωνικό τμήμα



$$\text{I.M.} \rightarrow S N_A|_z - S N_A|_{z+\Delta z} = \phi \xrightarrow{\frac{\Delta z}{\lim \Delta z \rightarrow 0}} \phi$$

$$\rightarrow \frac{d}{dz} (S \cdot N_A) = \phi \quad (1) \quad \text{όπου } S \text{ μεταβλητή}$$



Όμοια τρίγωνα = $\frac{r}{z} = \frac{1}{2} \rightarrow$

$$\rightarrow r(z) = \frac{z}{2}$$

και συνολική διαίεση $d = 6 - z$

Fick: $N_{Az} = -C D_{AB} \frac{dx_A}{dz} + X_A (N_{Az} + N_{Bz})$ (για ϕ)

$$\rightarrow N_{Az} = - \frac{C D_{AB}}{1 - X_A} \frac{dx_A}{dz} \quad (2)$$

$$(1) \xrightarrow{(2)} \frac{d}{dz} \left\{ \frac{\pi}{4} (6-z)^2 \left(\frac{-C D_{AB}}{1-X_A} \right) \frac{dx_A}{dz} \right\} = 0$$

\rightarrow ολοκληρώνοντας τις
για $C \cdot D_{AB} = \text{σταθερό}$

$$-\ln(1-X_A) = \frac{-C_1}{6-z} + C_2$$

$$\Sigma \Sigma 1 : \quad z = \phi \rightarrow X_A = 0.16 \rightarrow C_1 = 2.04$$

$$\Sigma \Sigma 2 : \quad z = 2 \rightarrow X_A = \phi \rightarrow C_2 = 0.52$$

$$X_A = 1 - e^{\frac{2.04}{6-z} - 0.52} \quad (3)$$

$$W_A = S \cdot N_A |_{z=\phi}$$

$$\text{Υπολογισμός} \quad \frac{dX_A}{dz} : \frac{d}{dz} \left\{ 1 - e^{\frac{2.04}{6-z} - 0.52} \right\}$$

$$\rightarrow \frac{dX_A}{dz} = - \frac{2.04}{(6-z)^2} e^{\frac{2.04}{6-z} - 0.52} \quad (4)$$

$$(2) \xrightarrow{(3),(4)} N_{A_z} = \frac{C D_{AB}}{e^{\frac{2.04}{6-z} - 0.52} (6-z)^2} \cdot \frac{2.04}{e^{\frac{2.04}{6-z} - 0.52}}$$

$$= \frac{2.04 \cdot C D_{AB}}{(6-z)^2} \rightarrow N_{A_{z=0}} = 3.72 \cdot 10^{-5} \frac{\text{mol}}{\text{m}^2 \cdot \text{s}}$$

$$\text{Είναρ} \quad C = \frac{P}{RT} = \frac{1 \text{ atm}}{0.082 \frac{\text{L} \cdot \text{atm}}{\text{mol} \cdot \text{K}} \cdot 298 \text{ K}} = 0.04 \frac{\text{mol}}{\text{L}}$$

$$\text{ουρ} \quad W_{A_{z=0}} = N_{A_{z=0}} \cdot \pi \cdot 6^2 / 4$$

Τι αλλοίρει στο Ερωτήμα (θ)?

* S είναι σταθερό

$$I.M = \frac{d}{dz} (N_{Az}) = \phi$$

Fick : όπως στο Ερωτήμα (α)

και
$$-\ln(1-X_A) = C_3 z + C_4$$

Δεν αλλοιώνει
$$\left. \begin{array}{l} \sum \cdot \sum \downarrow \\ \sum \cdot \sum \cdot \cdot \end{array} \right\} \begin{array}{l} z = \phi \rightarrow X_A = 0.16 \\ z = \ell \rightarrow X_A = \phi \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} \begin{array}{l} C_3 = -0.087 \\ C_4 = 0.174 \end{array}$$

άρα

$$X_A = 1 - e^{0.087 \cdot z - 0.174} \quad (5)$$

και ακολουθώντας τη βήματα (β)
Ερωτήμα (α) :

$$N_{Az}|_{z=\phi} = 0.087 C D_{AB}$$

$$\text{και } W_A|_{z=\phi} = \frac{\pi \cdot 6^2}{4} \cdot 0.087 C D_{AB}$$