

Ασκηση 4.88

3 mol H_2 και 3 mol I_2 , $K_c = 36$ $P_{x_2} = 8 \text{ atm}$



αρχ: 3 mol 3 mol

αλη: -x -x 2x

x.λ.: 3-x 3-x 2x

$$K_c = \frac{[HI]^2}{[H_2][I_2]} \Rightarrow 36 = \frac{\left(\frac{2x}{V}\right)^2}{\left(\frac{3-x}{V}\right)^2} \Rightarrow 6 = \frac{2x}{3-x} \Rightarrow 18 - 6x = 2x$$

$$\Rightarrow 8x = 18 \Rightarrow x = 2,25 \text{ mol}$$

$$\alpha = \frac{x}{3} = \frac{2,25}{3} = 0,75 \text{ ή } 75\%$$

b)

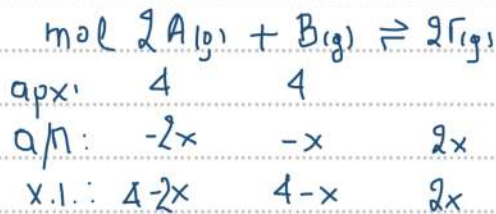
$$\frac{P_{x_2}}{P_{H_2}} = \frac{n_{x_2}}{n_{H_2}} \Rightarrow \frac{8}{P_{H_2}} = \frac{6}{4,5} \Rightarrow P_{HI} = 6 \text{ mol}, P_{H_2} = 1 \text{ mol}, P_{I_2} = 1 \text{ mol}$$

Απαντήσεις στο Βονόλια ταφης

Άσκηση 4.89

$$V=10L \quad T=273+127=400K \quad 4\text{mol A και } 4\text{mol B} \quad P_{\text{στ}}=24,6\text{atm}$$

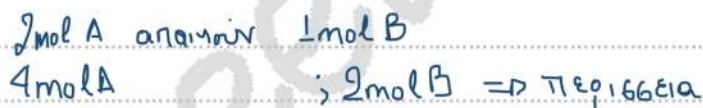
α.;



$$\text{για τη x.ι.: } P_{\text{στ}} \cdot V = n_{\text{στ}} \cdot R \cdot T \Rightarrow 24,6 \cdot 10 = n_{\text{στ}} \cdot 0,082 \cdot 400 \Rightarrow n_{\text{στ}} = 7,5 \text{ mol}$$

$$\text{άρα: } n_{\text{στ}} = 4 - 2x + 4 - x + 2x = 8 - x = 7,5 \Rightarrow x = 0,5 \text{ mol}$$

Έλεγχος περιβάσεως:



Η ποσότητα του Γ που θα παίρνουμε αν η αντίδραση ήταν μονόδρομη υπολογίζεται με βάση το σώμα αντιδρά πλήρως:



$$\text{απόδοση: } \alpha = \frac{2x}{4} = \frac{2 \cdot 0,5}{4} = 0,25 \text{ ή } 25\%$$

Άσκηση 4.90

$$V=5L \quad 4\text{mol A} \quad T=273+227=500K \quad K_c=1,8$$



$$\text{αρχ: } 4\text{mol}$$

$$\text{απ: } -x \quad x \quad x$$

$$\text{x.ι.: } 4-x \quad x \quad x$$

$$\Rightarrow K_c = \frac{[B][\Gamma]}{[A]} = \frac{\frac{x}{5} \cdot \frac{x}{5}}{\frac{4-x}{5}}$$

$$\Rightarrow 1,8 = \frac{x^2}{5 \cdot (4-x)} \Rightarrow 9 \cdot (4-x) = x^2 \Rightarrow$$

$$36 - 9x = x^2 \Rightarrow x^2 + 9x - 36 = 0 \Rightarrow (x+12)(x-3) = 0 \Leftrightarrow x = -12 \text{ απορ.}$$

$$x = +3 \text{ δεκτό}$$

$$a = \frac{x}{4} = \frac{3}{4} = 0,75 \text{ ή } 75\%$$

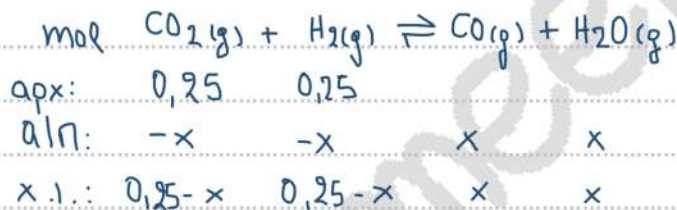
β)

$$\left. \begin{aligned} P_{O_2} \cdot V &= n_{O_2} \cdot R \cdot T \\ n_{O_2} &= 4 - x + x + x = 4 + x = 4 + 3 = 7 \end{aligned} \right\} \Rightarrow P_{O_2} = \frac{7 \cdot 0,082 \cdot 500}{5} = 57,4 \text{ atm}$$

Άσκηση 4.91

$$V_{\mu} = 11,2 \text{ L (STP)} \quad V = 5 \text{ L} \quad K_c = 4$$

$$a) \quad V_{\mu} = 11,2 \Rightarrow \eta_{\mu} = \frac{11,2}{22,4} = 0,5 \Rightarrow n_1 = n_2 = 0,25 \text{ mol}$$



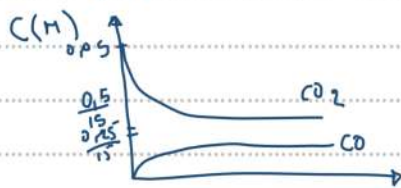
$$K_c = \frac{[\text{CO}][\text{H}_2\text{O}]}{[\text{CO}_2][\text{H}_2]} \Rightarrow 4 = \frac{\left(\frac{x}{5}\right)^2}{\left(\frac{0,25-x}{5}\right)^2} \Rightarrow 2 = \frac{x}{0,25-x} \Rightarrow$$

$$\Rightarrow 0,5 - 2x = x \Rightarrow 0,5 = 3x \Rightarrow x = \frac{0,5}{3} \text{ mol}$$

$$a = \frac{x}{0,25} = \frac{0,5}{3 \cdot 0,25} = \frac{0,5}{0,75} = \frac{2}{3} \text{ ή } \approx 67\%$$

$$b) \quad [\text{CO}_2]_0 = \frac{0,25}{5} = 0,05 \text{ M} \quad [\text{CO}_2]_{x.1} = \frac{0,25}{5} - \frac{0,5}{3} = \frac{0,25}{15}$$

$$[\text{CO}]_0 = 0 \text{ M} \quad [\text{CO}]_{x.1} = \frac{0,5}{3 \cdot 5} = \frac{0,5}{15}$$



γ) $P_{O_2} = 6 \text{ ατμόσφαιρα}$, $\Delta H < 0$ (εξοδ.)