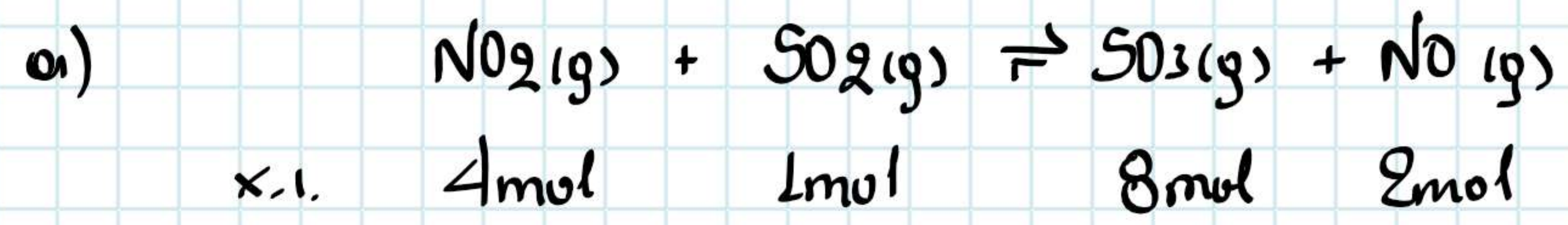


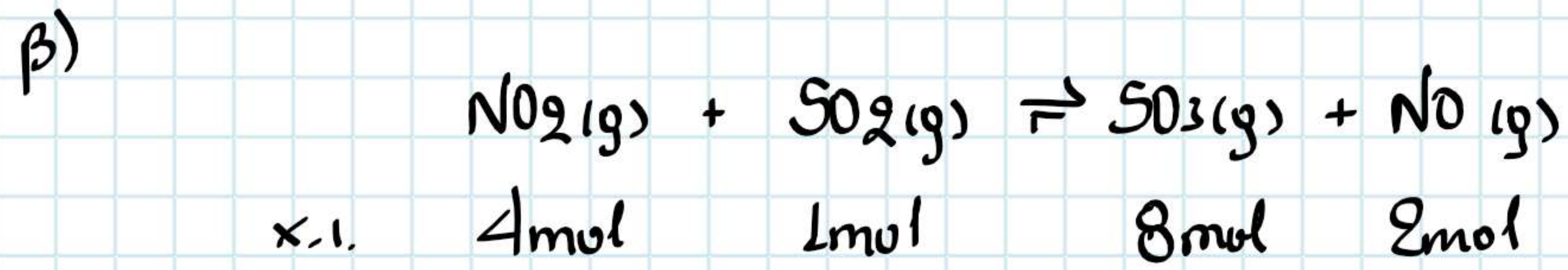
Άσκηση 4.80

4 mol NO<sub>2</sub>  
1 mol SO<sub>2</sub>  
8 mol SO<sub>3</sub>  
2 mol NO



Ισχύει: 
$$K_c = \frac{[\text{SO}_3][\text{NO}]}{[\text{NO}_2][\text{SO}_2]}$$

$$K_c = \frac{\frac{8}{V} \cdot \frac{2}{V}}{\frac{4}{V} \cdot \frac{1}{V}} = 4 \text{ στους } 50^\circ\text{C}$$

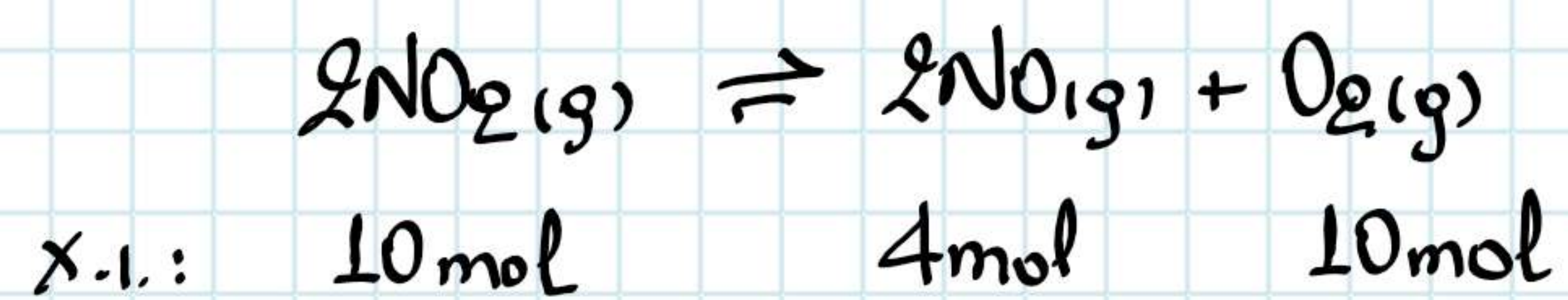


Μεταβ: + 0,5 mol      + x mol

Για να μην μεταβληθούν οι ποσότητες των δύο ουσιών θα πρέπει να μην μεταβληθεί η x.i.

Όπως για την x.i. ισχύει: 
$$K_c = \frac{\frac{8}{V} \cdot \frac{(2+x)}{V}}{\frac{4,5}{V} \cdot \frac{1}{V}} = 4 \Rightarrow 8(2+x) = 18 \Rightarrow 2+x = 2,25$$
  
$$K_c = 4 \text{ στους } 50^\circ\text{C} \Rightarrow x = 0,25 \text{ mol NO}$$

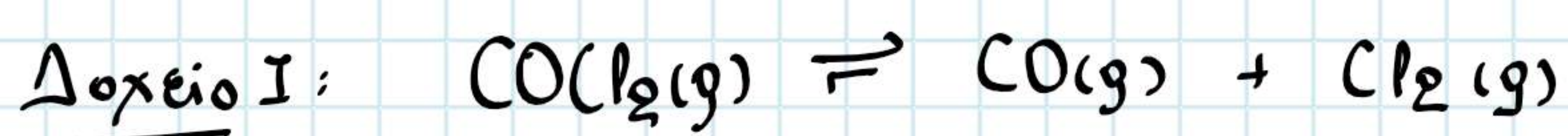
Άσκηση 4.81.



$$K_c = 0,4 \Rightarrow K_c = \frac{[\text{NO}]^2 \cdot [\text{O}_2]}{[\text{NO}_2]^2} \Rightarrow 0,4 = \frac{\frac{4^2}{V^2} \cdot \frac{10}{V}}{\frac{10^2}{V^2}} \Rightarrow 0,4 = \frac{16}{10V} \Rightarrow V = \frac{16}{4} = 4 \text{ L}$$

Άσκηση 4.82

$$V_1 = 2 \text{ L } \quad \theta^\circ\text{C}$$



x.i.(L): 0,5 mol      0,1 mol      0,2 mol

$$K_c = \frac{[\text{CO}][\text{Cl}_2]}{[\text{COCl}_2]} = \frac{\frac{0,1}{2} \cdot \frac{0,2}{2}}{\frac{0,5}{2}} = \frac{0,02}{1} = 0,02 \text{ στους } \theta^\circ\text{C}$$



x.i. : x mol      x mol      x mol

$$M_u = x \cdot M_{r1} + x \cdot M_{r2} + x \cdot M_{r3} \Rightarrow 39,6 = 99x + 28x + 71x \Rightarrow$$

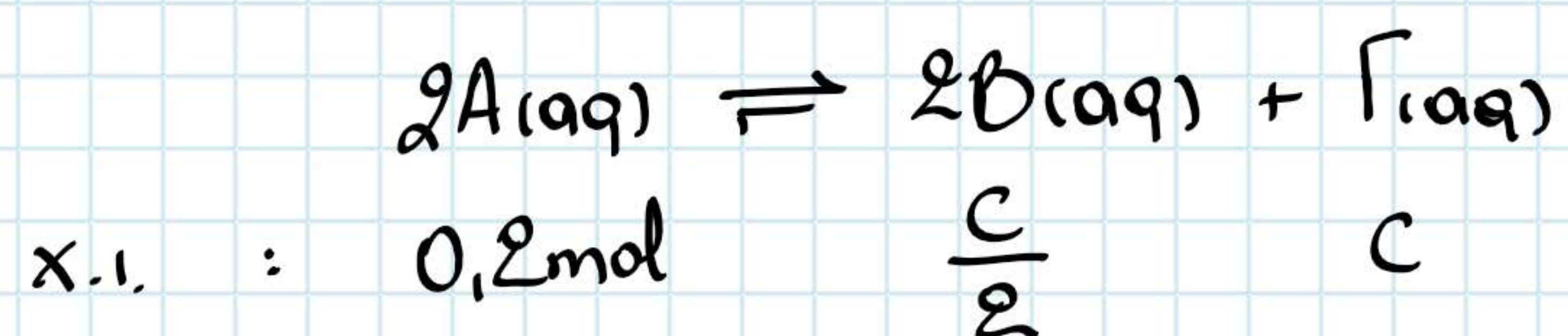
$$\Rightarrow 198x = 39,6 \Rightarrow x = \underline{0,2}$$

$\theta \Rightarrow$  σταθ άρα και  $K_c =$  σταθ.

$$0,02 = \frac{\frac{0,2}{V} \cdot \frac{0,2}{V}}{\frac{0,2}{V}} \Rightarrow V = \underline{10 \text{ L}}$$

Άσκηση 4.83

$$V = 500 \text{ ml} \quad K_c = 0,1 \text{ M}$$



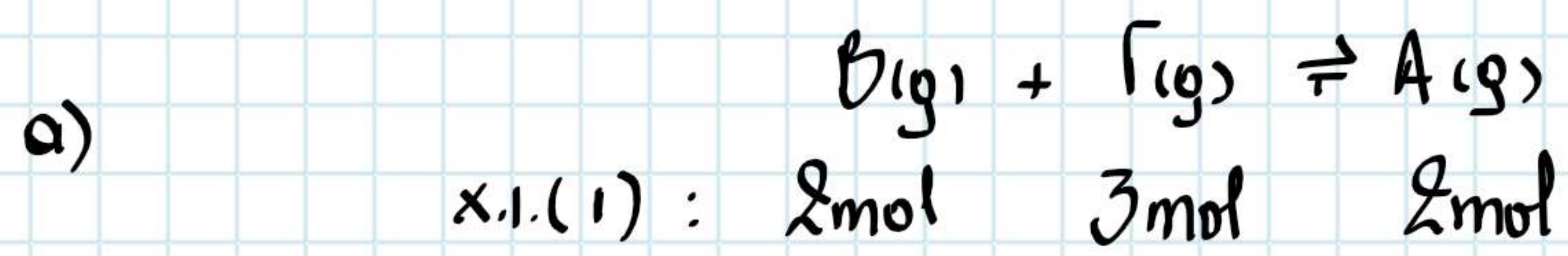
$$K_c = \frac{[\text{B}]^2 \cdot [\Gamma]}{[\text{A}]^2} \Rightarrow 0,1 = \frac{\left(\frac{C}{2}\right)^2 \cdot C}{\left(\frac{0,2}{0,5}\right)^2} \Rightarrow 0,1 = \frac{\frac{C^3}{4}}{0,16} \Rightarrow 0,016 = \frac{C^3}{4}$$

$$\Rightarrow C^3 = 0,064 \Rightarrow C = 0,4 \text{ M} \Rightarrow \text{για το } \Gamma$$

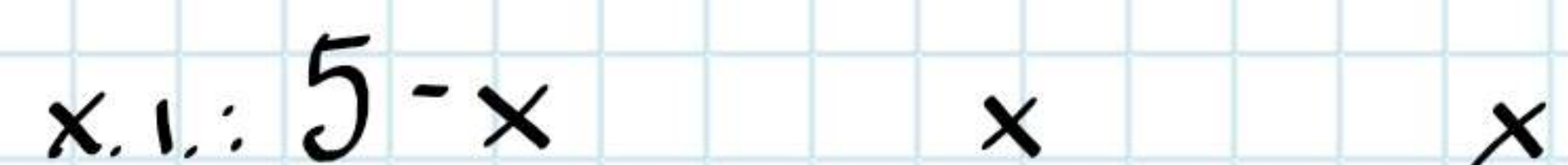
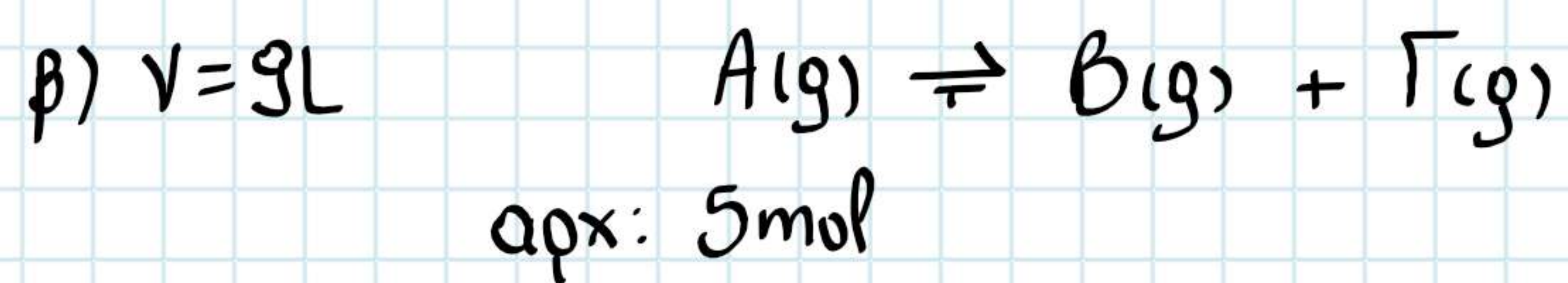
Άρα x.i. :  $[\text{A}] = 0,4 \text{ M} \quad [\text{B}] = 0,2 \text{ M} \quad [\Gamma] = 0,4 \text{ M}$

Άσκηση 4.84

$V=6L$   $0^\circ C$



$$K_c = \frac{[A]}{[B] \cdot [\Gamma]} = \frac{\frac{2}{6}}{\frac{2}{6} \cdot \frac{3}{6}} = 2 \text{ στους } 0^\circ C$$



☑  
⊖  $K_c' = \frac{1}{K_c} \Rightarrow K_c' = \frac{1}{2} = 0,5 \Rightarrow \frac{\frac{x^2}{9^2}}{\frac{5-x}{9}} = 0,5 \Rightarrow \frac{x^2}{9(5-x)} = 0,5 \Rightarrow$

$$\Rightarrow x^2 = 4,5(5-x) \Rightarrow x^2 = 22,5 - 4,5x \Rightarrow$$

$$\Rightarrow x^2 + 4,5x - 22,5 = 0$$

$$x_{1,2} = \frac{-4,5 \pm \sqrt{4,5^2 + 4 \cdot 1 \cdot 22,5}}{2} = \frac{-4,5 \pm 10,5}{2} = \begin{cases} 3 \text{ δεκτό} \\ -7,5 \text{ απορ.} \end{cases}$$

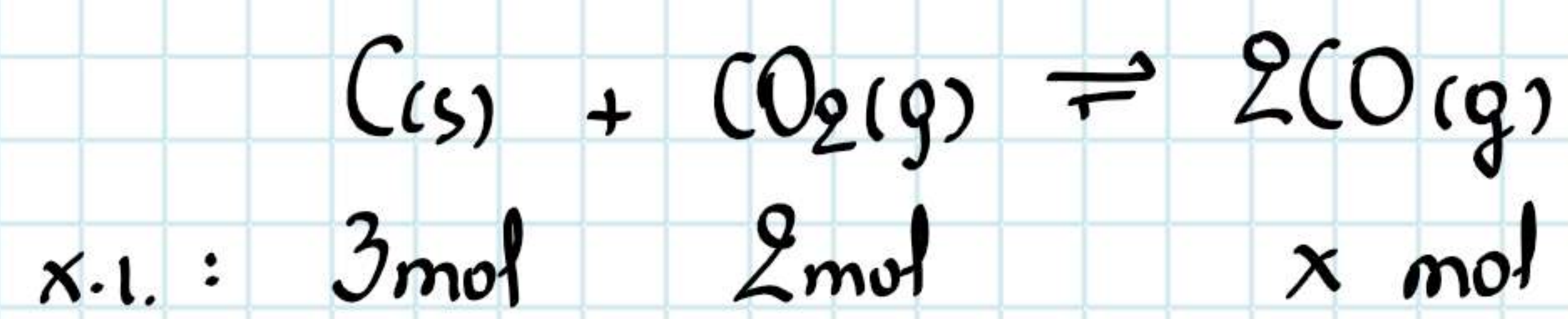
Άρα:  $\alpha = \frac{x}{5} = \frac{3}{5} = 0,6$  ή 60%



Άσκηση 4.86.

2 mol CO<sub>2</sub>, 3 mol C, x mol CO

P = 8,2 atm T = 500 K V = 20 L



$$P \cdot V = n_{\text{αε}} \cdot R \cdot T \Rightarrow 8,2 \cdot 20 = (2+x) \cdot 0,082 \cdot 500 \Rightarrow 2000 = (2+x) \cdot 500 \Rightarrow 2+x = 4$$
$$\Rightarrow x = 2$$

$$K_c = \frac{[\text{CO}]^2}{[\text{CO}_2]} = \frac{\left(\frac{2}{20}\right)^2}{\frac{2}{20}} = 0,1 \text{ στους } 500 \text{ K}$$

Άσκηση 4.87.



A: 5% w/v M<sub>rA</sub> = 50  $\Rightarrow C_A = \frac{m_A}{M_r \cdot V} = \frac{5}{50 \cdot 0,1} = 1 \text{ M}$

B: 4% w/v M<sub>rB</sub> = 80  $\Rightarrow C_B = \frac{m_B}{M_r \cdot V} = \frac{4}{80 \cdot 0,1} = 0,5 \text{ M}$

Γ: 4,5% w/v M<sub>rΓ</sub> = ?

Σε κάθε αντίδραση η μάζα διατηρείται σταθερή, άρα:

$$M_r \text{ αντιδρώντων μορίων} = M_r \text{ προϊόντων μορίων}$$

$$\Rightarrow 2M_{rA} + M_{rB} = 2 \cdot M_{rΓ}$$

$$\Rightarrow 2 \cdot 50 + 80 = 2 \cdot M_{rΓ} \Rightarrow M_{rΓ} = 90$$

Άρα:  $C_{\Gamma} = \frac{m_{\Gamma}}{M_{r\Gamma} \cdot V} = \frac{4,5}{90 \cdot 0,1} = \frac{4,5}{9} = 0,5 \text{ M}$

$$K_c = \frac{[\Gamma]^2}{[A]^2 \cdot [B]} = \frac{0,5^2}{1^2 \cdot 0,5} = 0,5$$