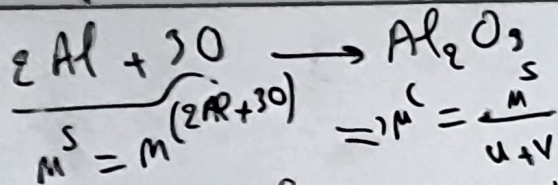


Exercice 1:



C1: NbO : C.I.D à fusion congruente

C2: NbO₂ : C.I.D à fusion congruente

C3: Nb₂O₅ : C.I.D à fusion non congruente

3 paliers invariants :

à T_{E1} = 1915 °C : transformation eutectique

à T_{E2} = 1810 °C : transformation eutectique

à T_p = 1512 °C : transformation peritectique

E₁ (% W_O = 10,5% , T_{E1} = 1915 °C)

E₂ (% X_O = 60,7% , T_{E2} = 1810 °C)

P (% X_O = 73% , T_p = 1512 °C)

$$① (*) C_1 : NbO : \begin{cases} u=1 \\ v=1 \end{cases}$$

$$\% X_{O}^{C_1} = \frac{v}{u+v} \times 100$$

$$\% X_{O}^{C_1} = 50 \%$$

$$(*) C_2 : NbO_2 : \begin{cases} u=1 \\ v=2 \end{cases}$$

$$\% X_{O}^{C_2} = \frac{v}{u+v} \times 100$$

$$\% X_{O}^{C_2} = 66,66 \%$$

$$(*) C_3 : Nb_2O_5 : \begin{cases} u=2 \\ v=5 \end{cases}$$

$$\% X_{O}^{C_3} = \frac{v}{u+v} \times 100$$

$$\% X_{O}^{C_3} = 71,4 \%$$

2a)
$$X_0 = \frac{w_0}{w_0 + (1-w_0) \frac{M_0}{M_{Nb}}}$$

$$X_0 = \frac{\% w_0}{\% w_0 + (100 - \% w_0) \frac{M_0}{M_{Nb}}}$$

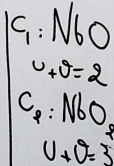
$$\% X_0 = \frac{\% w_0}{\% w_0 + (100 - \% w_0) \frac{M_0}{M_{Nb}}} \times 100$$

b) AN:

$$\% X_0^{L, E_1} = \frac{10,5}{10,5 + 89,5 \times \frac{16}{92,9}} \times 100$$

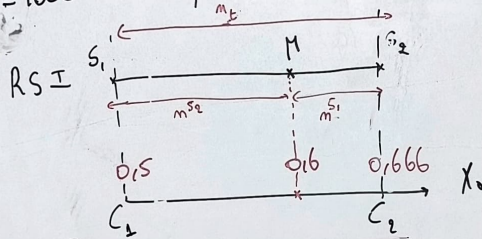
$$\% X_0^{L, E_1} = 40,5\%$$

Rq:
$$m^c = \frac{n^s}{u+v}$$



4) $\begin{cases} n_0 = 2,25 \text{ mol} \\ m_{Nb} = 1,5 \text{ mol} \end{cases} \Rightarrow \% X_0^G = \frac{n_0}{n_0 + m_{Nb}} \times 100 = 60\%$

$\bar{a} T = 1600^\circ C: M \in \{C_1(nat) + C_2(nat)\}$



$$\begin{cases} n^{S_1} + m^{S_2} = n_T = 3,75 \text{ mol} \\ \frac{n^{S_1}}{m^{S_1}} = \frac{MS_2}{S_1M} = \frac{0,666 - 0,16}{0,16 - 0,15} = 0,66 \end{cases}$$

$$n^{S_1} = 0,66 m^{S_2}$$

$$m^{S_2} = \frac{n_T}{1,66} = \frac{3,75}{1,66} = 2,25 \text{ mol}$$

$$m^{S_1} = n_T - m^{S_2} = 1,5 \text{ mol}$$

$$m^{S_1} = \frac{n^{S_1}}{2} = 0,75 \text{ mol}$$

$$m^{S_2} = \frac{n^{S_2}}{3} = 0,75 \text{ mol}$$

