Pauta Aux 3 ME4601

P1] $T_{Fus}(Pb) = 327,502°C$

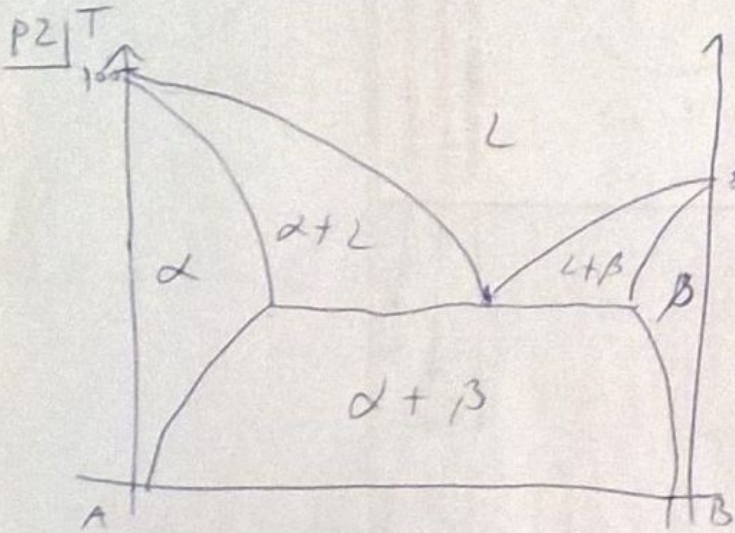
$T_{Fus}(Bi) = 271,442°C$

- Rxn eutéctica: $L \rightarrow \varepsilon + (Bi)$ (55,2%Bi, 123,5°C)
- Rxn Peritéctica: $L + (Pb) \rightarrow \varepsilon$ (37,2%Bi 187°C)
- Rxn eutectoide: $\varepsilon \rightarrow (Pb) + (Bi)$ (27,7%C, -46°C)

Solubilidad Bi en Pb $\simeq$ 19,5% Bi

Solubilidad Pb en Bi $\simeq$ 99% Bi = 1% Pb

P2]



Ley de Fases de Gibbs

$P + F = C + 1$

(P: N° Fases; F: N° Variables; C: N° componentes)

* En Rxn eutéctica

$P = 3 (L, \alpha, \beta)$

$C = 2 (A, B)$

$\Rightarrow 3 + F = 2 + 1 \Rightarrow \boxed{F = 0}$ No hay variables ↳ T constante //

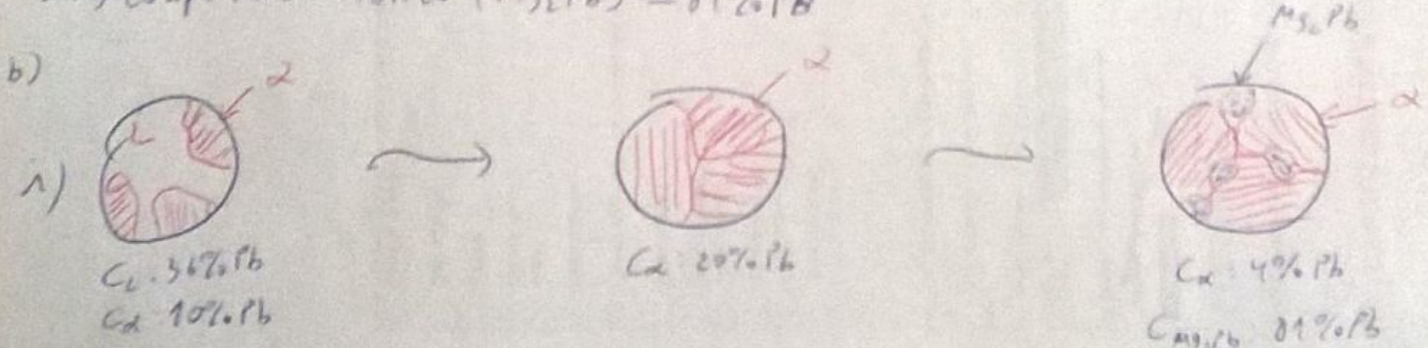
P3]

a) i) Rxn eutéctica ($L \rightarrow \alpha + Mg_2Pb$): T = 466,2°C, C $\simeq$ 67%Pb

ii) Rxn eutéctica ($L \rightarrow \beta + Mg_2Pb$): T = 248,7°C, C = 95%Pb

iii) Comp. intermetálico (Mg_2Pb) $\simeq$ 81%Pb

b)

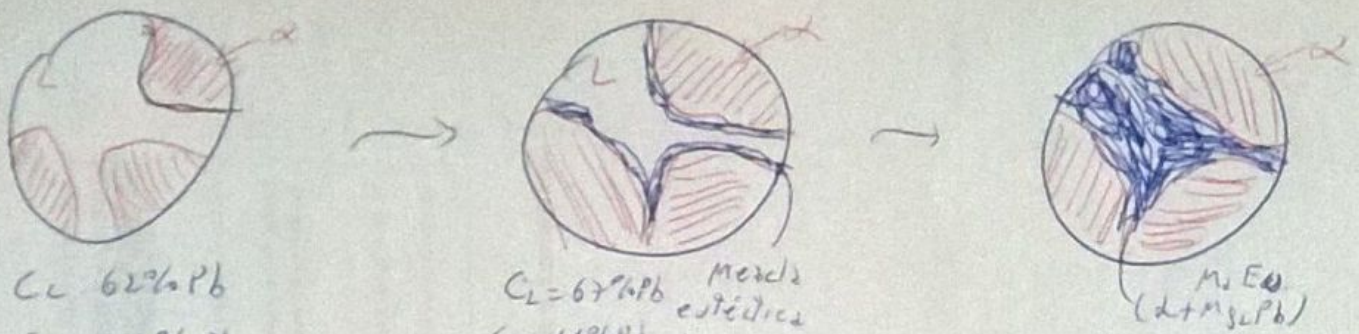


i) C_L: 36%Pb, C_α: 10%Pb

C_α: 20%Pb

C_α: 4%Pb, C_{Mg_2Pb}: 81%Pb

ii)

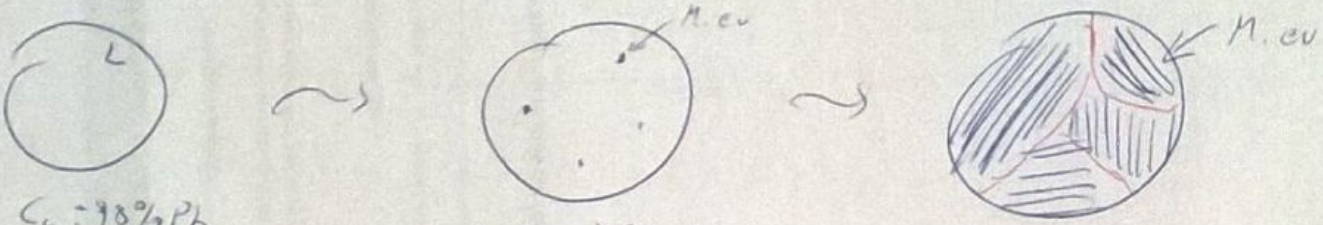


C_L 62% Pb
C_α 34% Pb

C_L = 67% Pb Mezcla eutéctica
C_α 41% Pb (α+Mg_2Pb)
C_{eu} 67% Pb

C_α 18% Pb

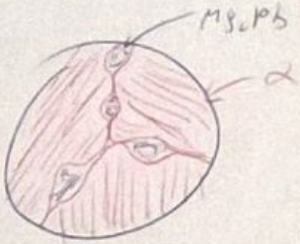
iii)



C_L = 98% Pb

C_L 98% Pb
C_{eu} = 98% Pb

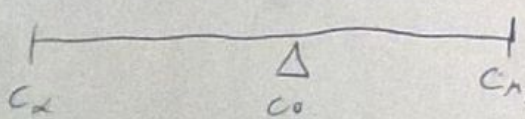
c) Mg-20 Pb a 200°C ⟶



* Según diagrama de fase: C_α = 4% Pb
C_{Mg_2Pb} = 81% Pb (C_0 = 20% Pb)
$C_\beta \simeq$ 99% Pb

* Usando regla de la palanca:

iv)



(α Libre v/s Mg_2Pb)

- $M_{\alpha_l} = M_T \left(\frac{C_{Mg_2Pb} - C_0}{C_{Mg_2Pb} - C_\alpha} \right) = 15,8$ ton
- $M_{Mg_2Pb} = M_T - M_{\alpha_l} = 4,2$ ton

P3)

a) Martensita y bainita no están en el diagrama, por ser estructuras fuera de equilibrio

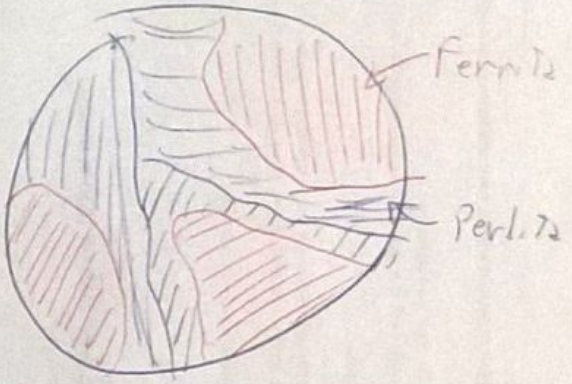
b) i) Rxn eutéctica ($L \rightarrow$ Austenita + Cementita) ; $T = 1148°C$; $C = 4,3\%C$
(Ledeburita)

ii) Rxn. eutectoide (Austenita $\rightarrow$ Ferrita + Cementita) ; $T = 727°C$; $C = 0,77\%C$
(Perlita)

iii) Rxn. peritéctica (L + Ferrita $\delta \rightarrow$ Austenita) ; $T = 1493°C$, $C = 0,16\%C$

iv) Comp intermetálico (Cementita) ; $C = 6,67\%C$

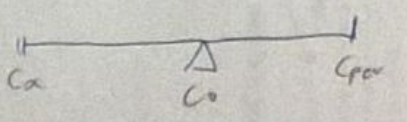
c) SAE 1040 $\rightarrow$ 0,4% C (Material hipoeutectoide)



d) Regla de la palanca

$\rightarrow$ Podemos calcular la masa de
- Ferrita libre
- Ferrita a Perlita
- Ferrita Total
- Perlita
- Cementita

• Ferrita libre v/s Perlita



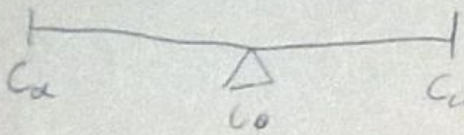
$C_\alpha = 0\%C$

$C_{per} = 0,77\%C$

$$\Rightarrow M_{\alpha l} = \frac{C_{per} - C_0}{C_{per} - C_\alpha} \cdot M_T = 2,403 \text{ Ton}$$

$$M_{per} = M_T - M_{\alpha l} = 2,597 \text{ ton}$$

- Ferrita total V/S Cementita



$C_\alpha = 0\%$

$C_{cem} = 6,67\%$

$$M_{\alpha T} = \frac{C_{cem} - C_o}{C_{cem} - C_\alpha} \quad M_T = 4,7 \text{ ton}$$

$$M_{cem} = 0,3 \text{ ton}$$

- Ferrita en perlita

$$M_{\alpha p} = M_{\alpha T} - M_{\alpha l}$$

$$M_{\alpha p} = 2,297 \text{ ton}$$