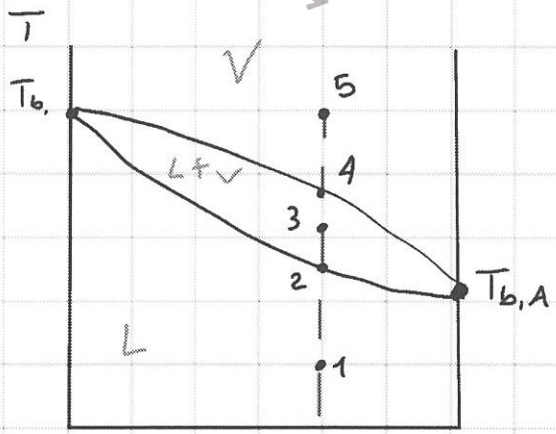
Passi:

1) EQUILIBRIO
2) BILANCIO DI MATERIA
3) BILANCIO ENTALPICO
4) EQUAZIONE DI FLUSSO / CINETICA

master COPY COPISTERIA

DISTILLAZIONE



1 liquido sottoraffreddato
2 Punto di bolla
3 miscela liquido vapore
4 Punto di rugiada
5 Vapore surriscaldato

LE COMPOSIZIONI SI DETERMINANO DALLA REGOLA DELLA LEVA CHE DERIVA DA UN BILANCIO DI MASSA

$$F \cdot z_A = L_3 x_{A3} + V_3 y_{A3}$$

$$F = L_3 + V_3$$

SOSTITUENDO:

$$\frac{L_3}{V_3} = \frac{y_{A3} - z_A}{z_A - x_{A3}}$$

EQUILIBRIO

$$\varphi_A y_A P_{TOT} = \gamma_A x_A P_A^{SAT}(T) \quad , \quad \varphi_B y_B P_{TOT} = \gamma_B x_B P_B^{SAT}(T)$$

$\varphi_A \simeq 1 \iff P_{TOT} \leq 70\% P_c$

$\gamma_A \simeq 1 \iff$ MISCELA LIQUIDA IDEALE

$y_A P_{TOT} = x_A P_A^{SAT}(T)$ LEGGE DI RAOULT

γ_A SI TROVA CON RELAZIONI WILSON, VAN LEAR, MARGULES

$$\frac{y_A}{x_A} = K_A = \frac{\gamma_A P_A^{SAT}(T)}{P_{TOT}}$$ COEFF. DI RIPARTIZIONE

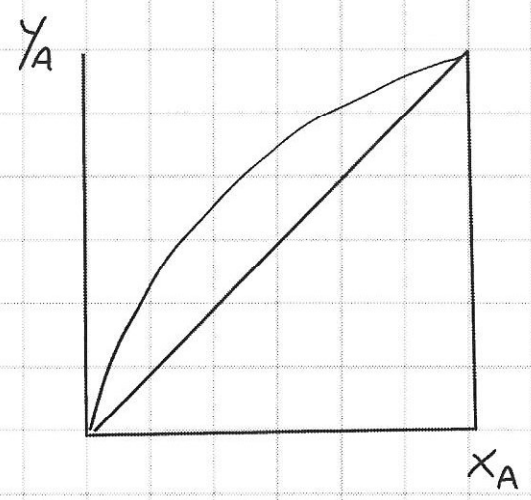


DIAGRAMMA DI Y IN FUNZIONE DI X

master COPY
master COPY COPISTERIA

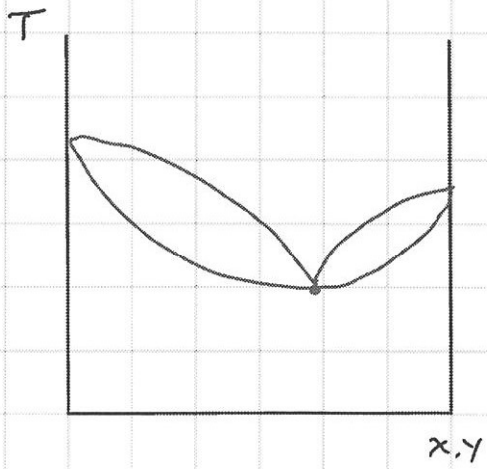
VOLATILITÁ RELATIVA

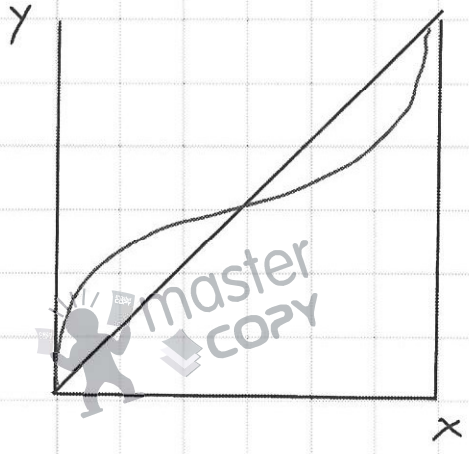
$$\alpha_{AB} = \frac{K_A}{K_B} = \frac{y_A / x_A}{y_B / x_B} = \frac{y_A / x_A}{(1 - y_A)/(1 - x_A)} = \frac{\gamma_A P_A^{SAT}(T)}{\gamma_B P_B^{SAT}(T)}$$

$$y_A = \frac{\gamma_A x_A P_A^{SAT}(T)}{P_{TOT}} = \frac{\gamma_A x_A P_A^{SAT}(T)}{\gamma_A x_A P_A^{SAT}(T) + \gamma_B (1 - x_A) P_B^{SAT}(T)} =$$

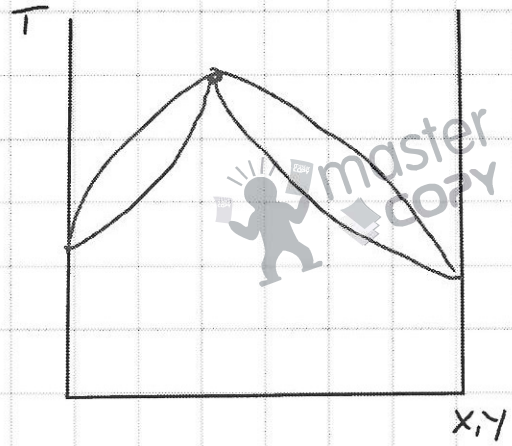
$$= \frac{\alpha_{AB} x_A}{\alpha_{AB} x_A + (1 - x_A)} = \frac{\alpha_{AB} x_A}{1 + (\alpha_{AB} - 1) x_A}$$

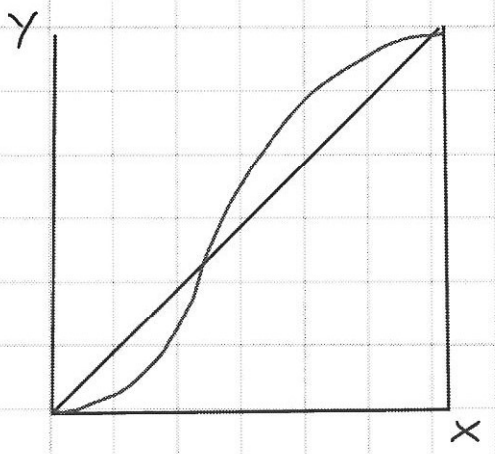
AZEOTROPO DI MINIMO



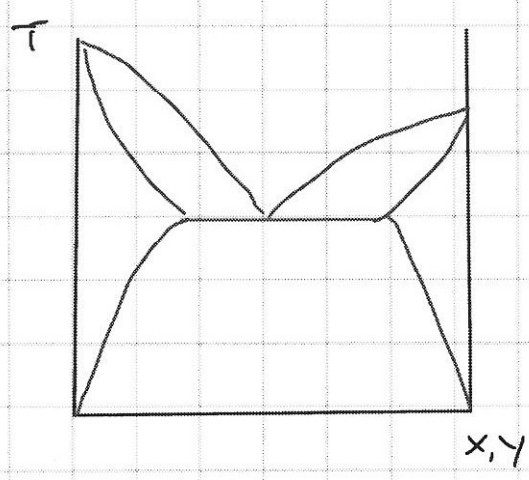


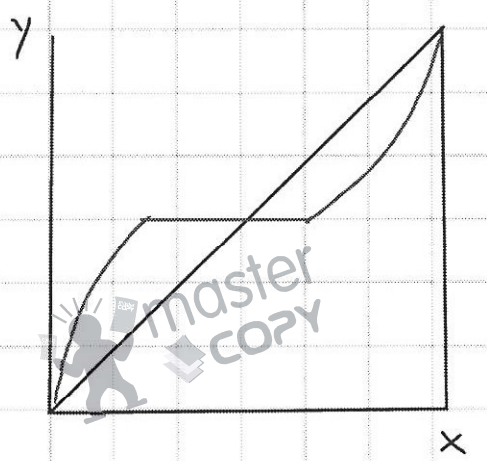
AZEOTROPO DI MASSIMO





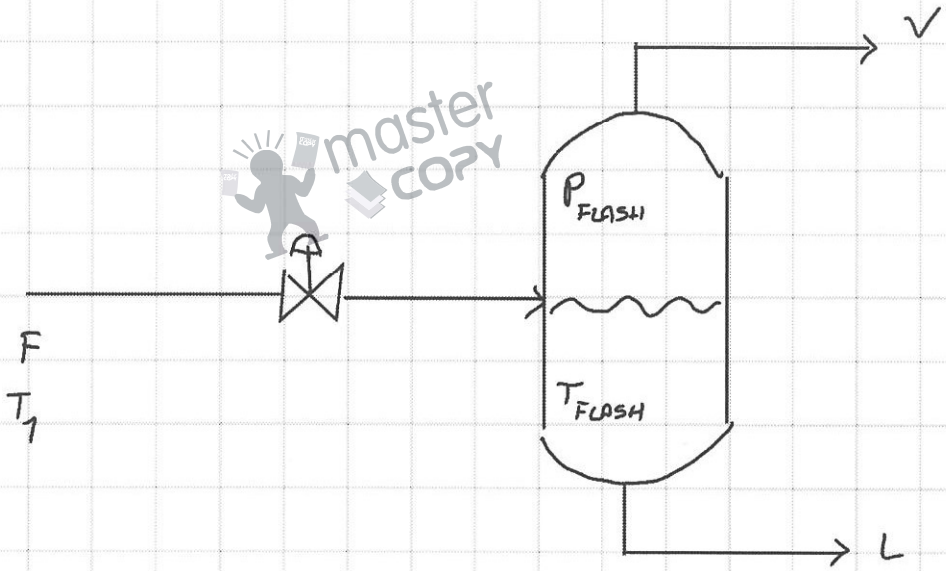
AZEOTROPO ETEROGENEO





CONDENSANO DUE DIVERSE FASI

VAPORIZZATORE PARZIALE DI EQUILIBRIO (VPE)



1) $P_{FLASH} = P^{SAT}(T_{FLASH})$
2) $F = V + L$
3) $FH_F = VH_V + LH_L$

$$\begin{cases} H_L = C_{p_L}(T_{FLASH} - T_{RIF}) \\ H_F = C_{p_L}(T_1 - T_{RIF}) \\ H_V = C_{p_L}(T_{FLASH} - T_{RIF}) + \lambda(T_{FLASH}) \end{cases}$$

Perché vaporizzi qualcosa $T_1 > T^{SAT}(P_{FLASH})$

N.B PRENDENDO $T_{RIF} = T_{FLASH} \Rightarrow H_L = 0$, $H_V = \lambda$

SI TROVA $\frac{V}{F}$



$FH_F + Q = VH_V + LH_L$

$Q = FH_1 - FH_F$

Come cambiano i bilanci se preriscaldo