

Forraszanyagok térfogati és határfelületi modellezése

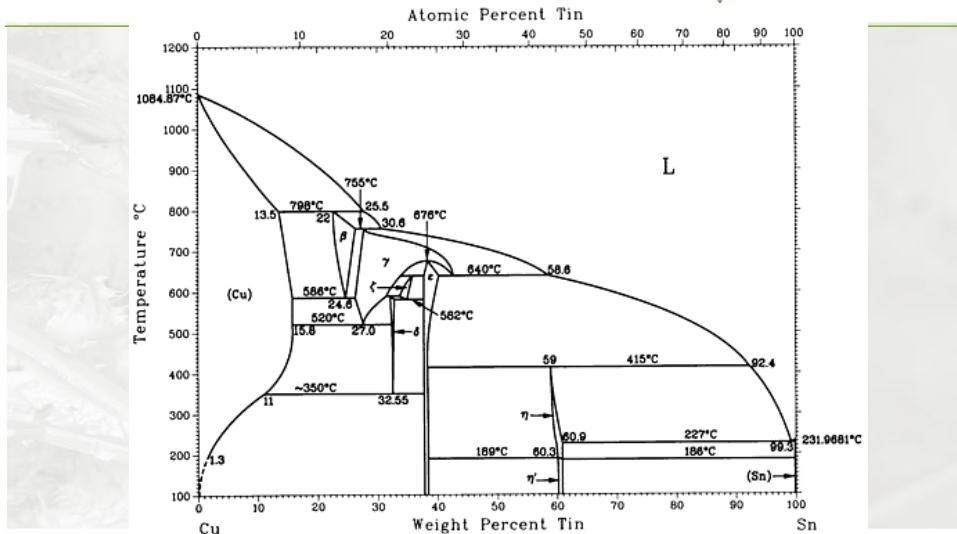
Dr. Kaptay György, Dezső András, Mekler Csaba, Végh Ádám

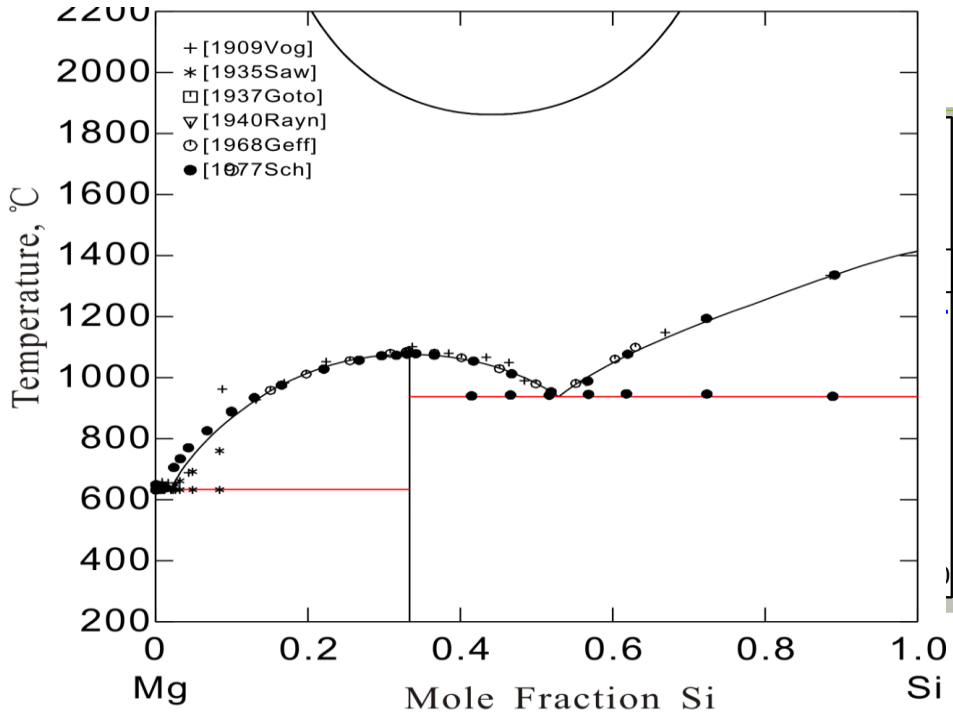
Bay Zoltán Nonprofit kft, BAY-LOGI, Miskolc
Nano-anyagok Osztály

2014. Március 5. Miskolc, FORRÁSZ szakmai nap



Térfogati modellezés

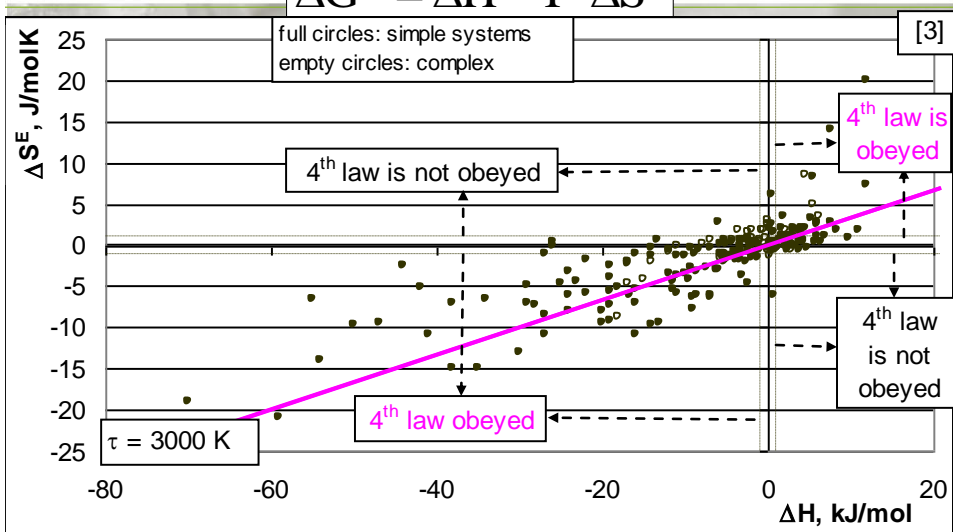




A többlet Gibbs energia T-függése



$$\Delta G^E = \Delta H - T \cdot \Delta S^E$$

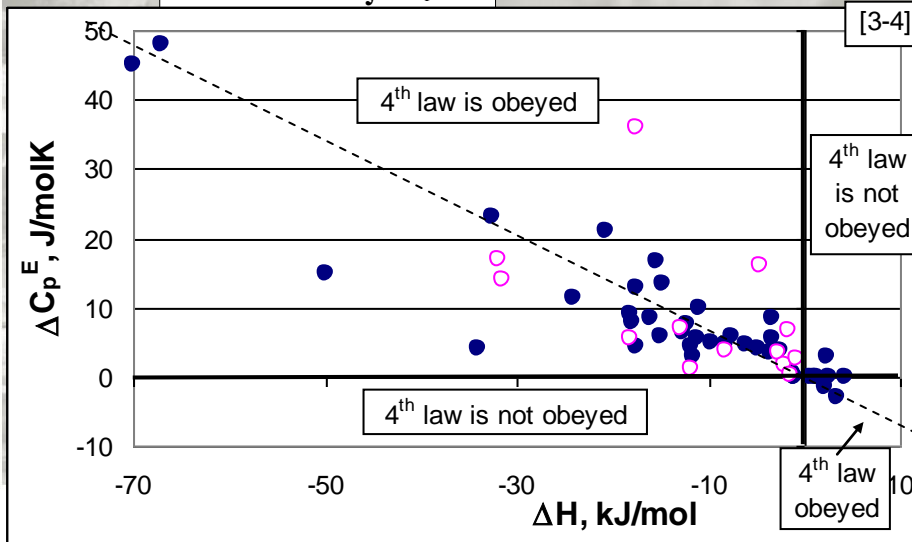


A projekt az Európai Unió támogatásával, az Európai Szociális Alap társfinanszírozásával valósult meg.

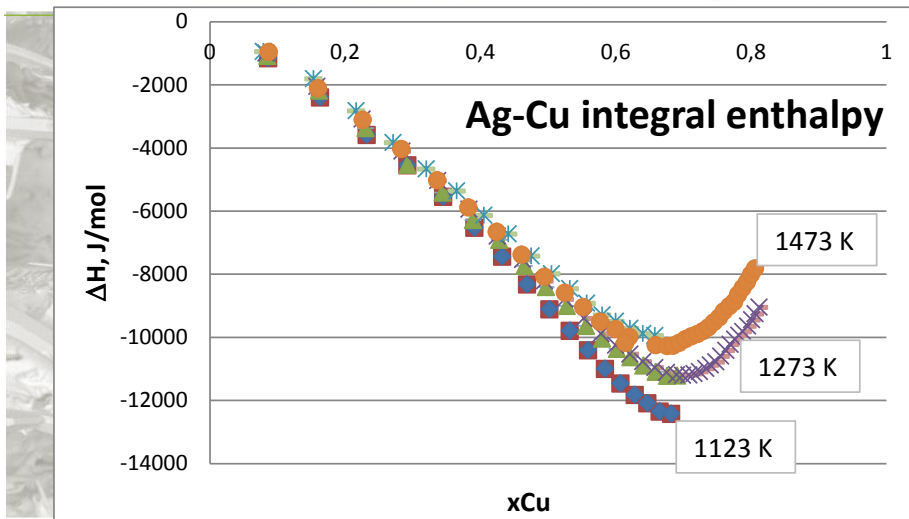
A többlet Gibbs energia T-függése



$$\Delta H_{T_2} = \Delta H_{T_1} + \int_{T_1}^{T_2} \Delta C_p^E \cdot dT$$



Az oldódási entalpia T-függése (Ipsen, 2014)



Térfogati modellezés



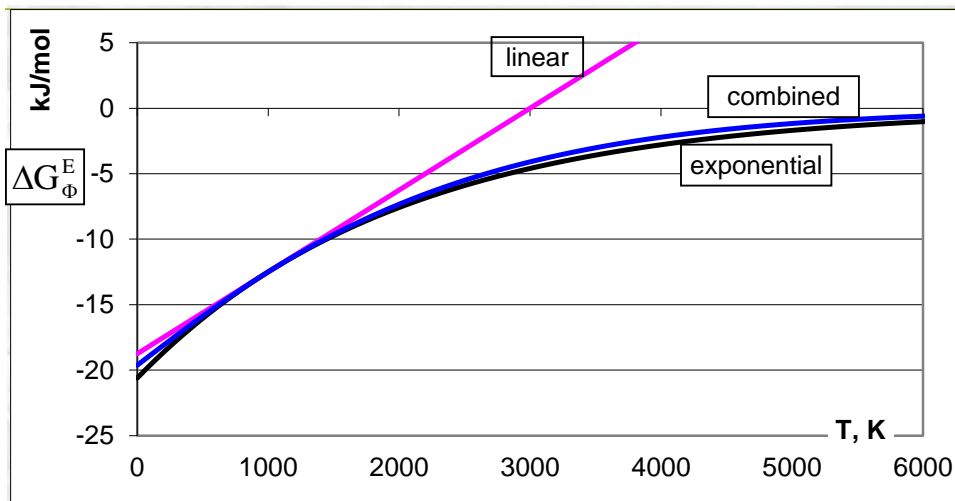
$$\Delta G_{\Phi}^E \cong x \cdot (1-x) \cdot (h - T \cdot s)$$

$$\Delta G_{\Phi}^E \cong x \cdot (1-x) \cdot h_e \cdot \exp\left(-\frac{T}{\tau_e}\right)$$

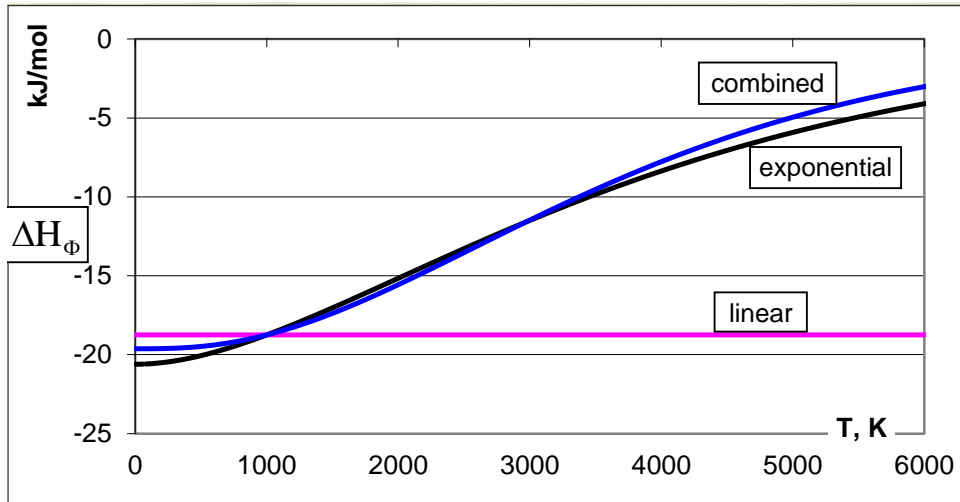
$$\Delta G_{\Phi}^E \cong x \cdot (1-x) \cdot (h_c - T \cdot s_c) \cdot \exp\left(-\frac{T}{\tau_c}\right)$$



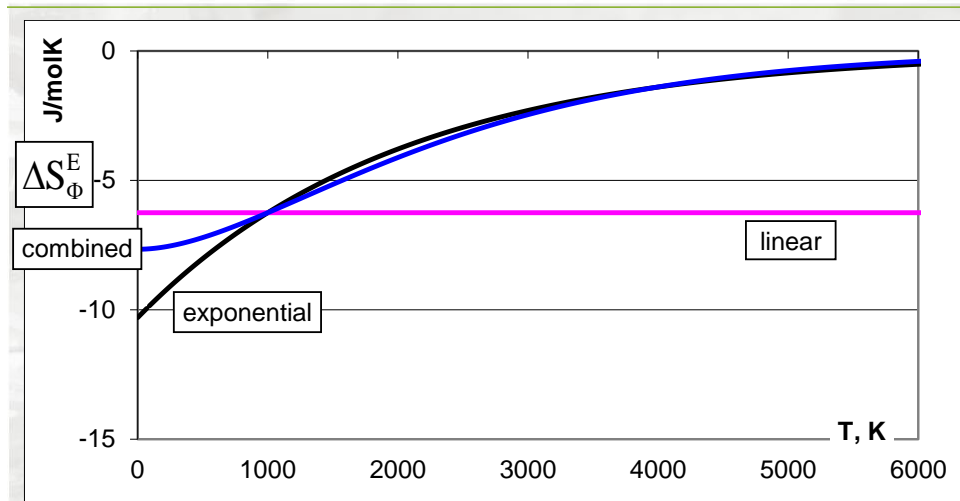
Térfogati modellezés



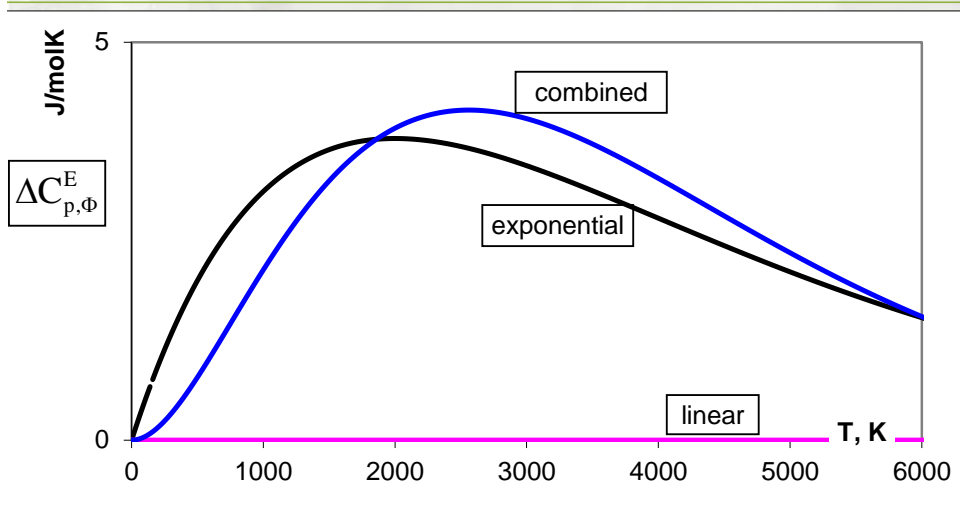
Térfogati modellezés



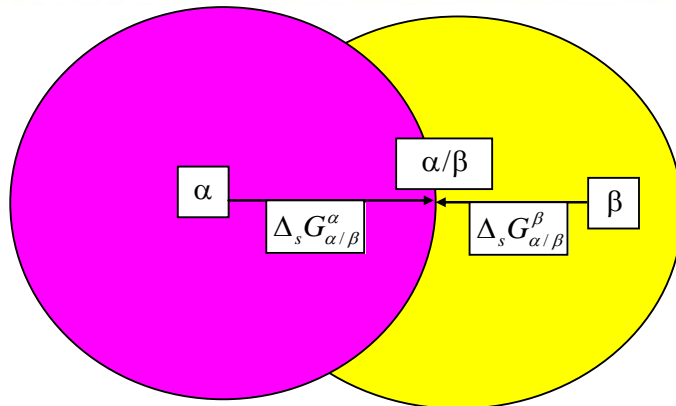
Térfogati modellezés



Térfogati modellezés



Határfelületi modellezés



$$\sigma_{\alpha/\beta} = \frac{(\Delta_s H_{\alpha/\beta}^\alpha + \Delta_s H_{\alpha/\beta}^\beta) - T \cdot (\Delta_s S_{\alpha/\beta}^\alpha + \Delta_s S_{\alpha/\beta}^\beta)}{f \cdot (V_\alpha \cdot V_\beta \cdot N_{Av})^{1/3}}$$

$$\sigma_A = \sigma_B = \sigma$$



Határfelületi modellezés



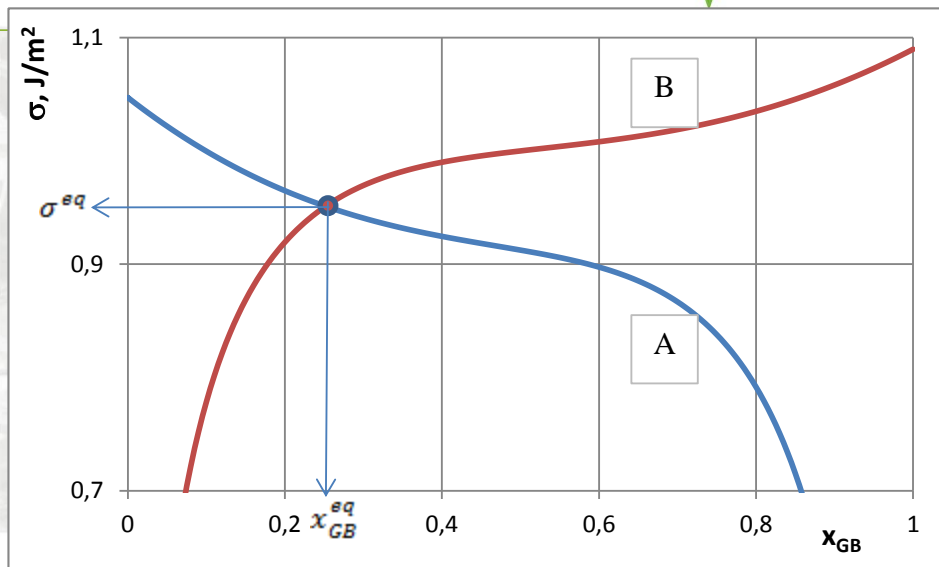
$$\sigma = \sigma_A = \sigma_B$$

$$\sigma = \sigma_A^o + \frac{2}{f \cdot (V_A^o)^{2/3} \cdot N_{Av}^{1/3}} \cdot \left[R \cdot T \cdot \ln \left(\frac{1 - x_{GB}}{1 - x} \right) + \Omega \cdot (\beta \cdot x_{GB}^2 - x^2) \right] =$$

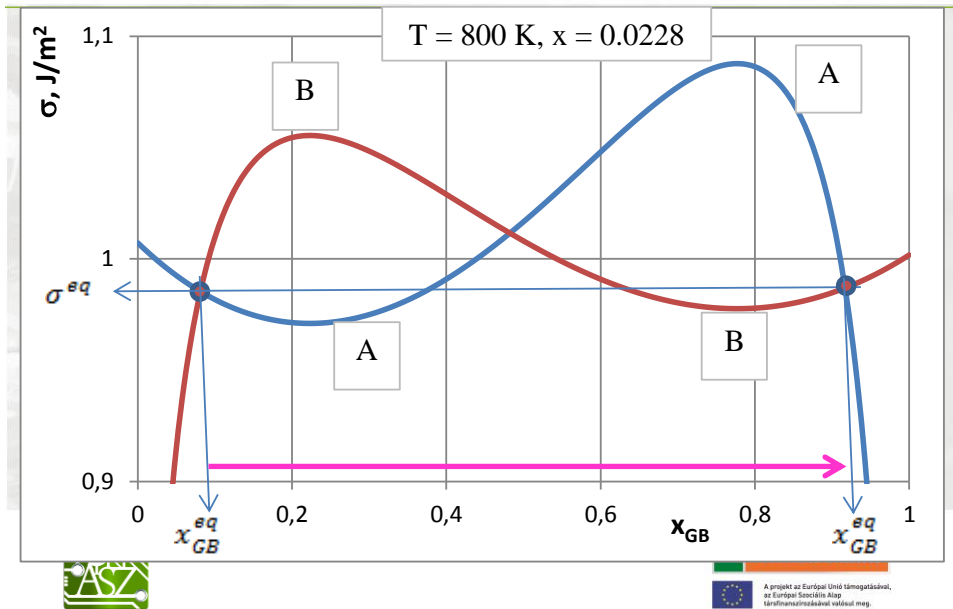
$$= \sigma_B^o + \frac{2}{f \cdot (V_B^o)^{2/3} \cdot N_{Av}^{1/3}} \cdot \left\{ R \cdot T \cdot \ln \frac{x_{GB}}{x} + \Omega \cdot [\beta \cdot (1 - x_{GB})^2 - (1 - x)^2] \right\}$$



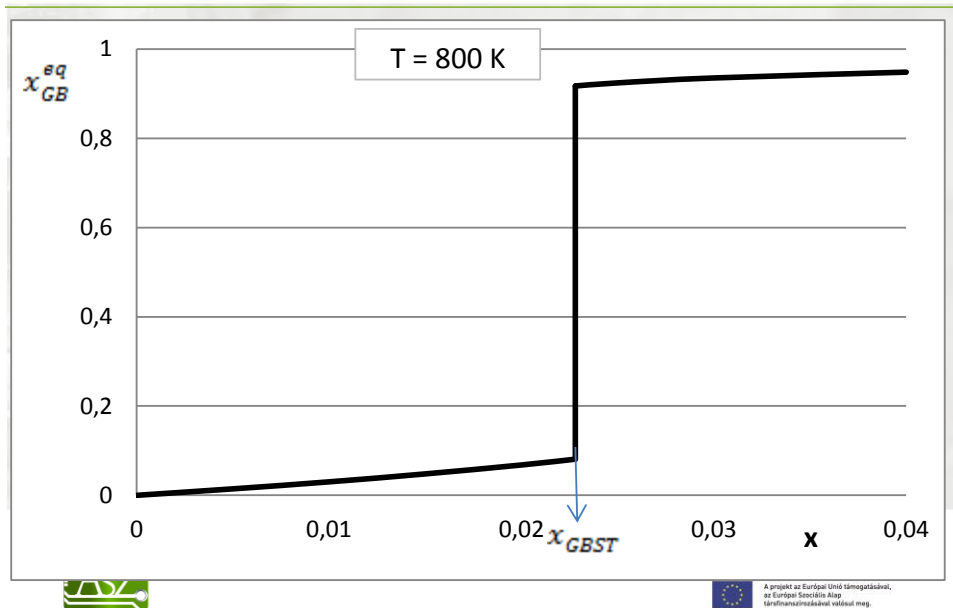
Határfelületi modellezés

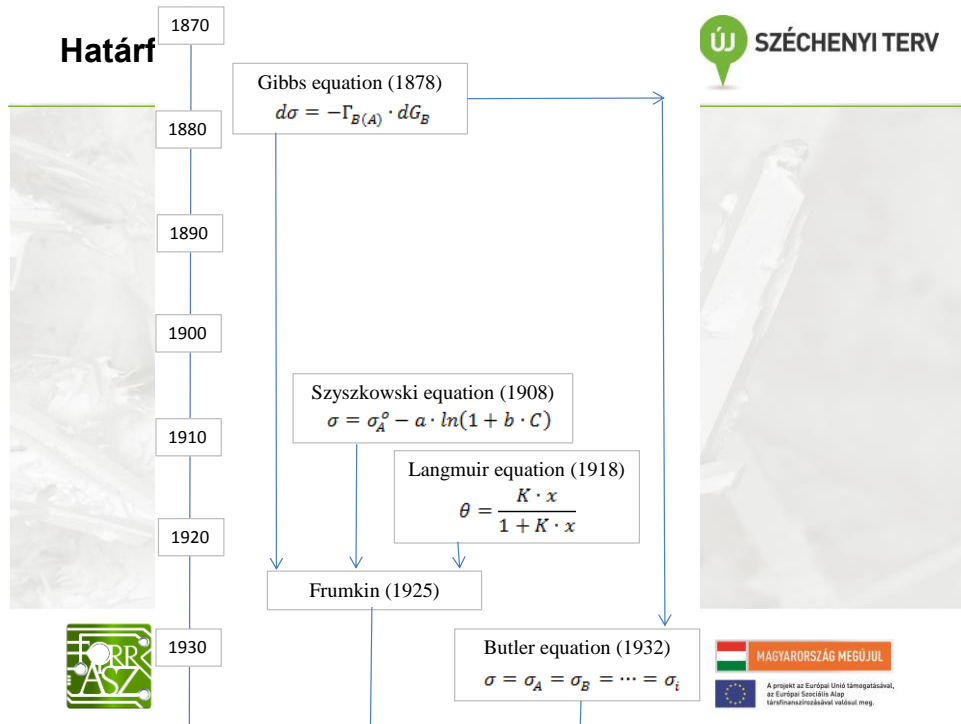


Határfelületi modellezés

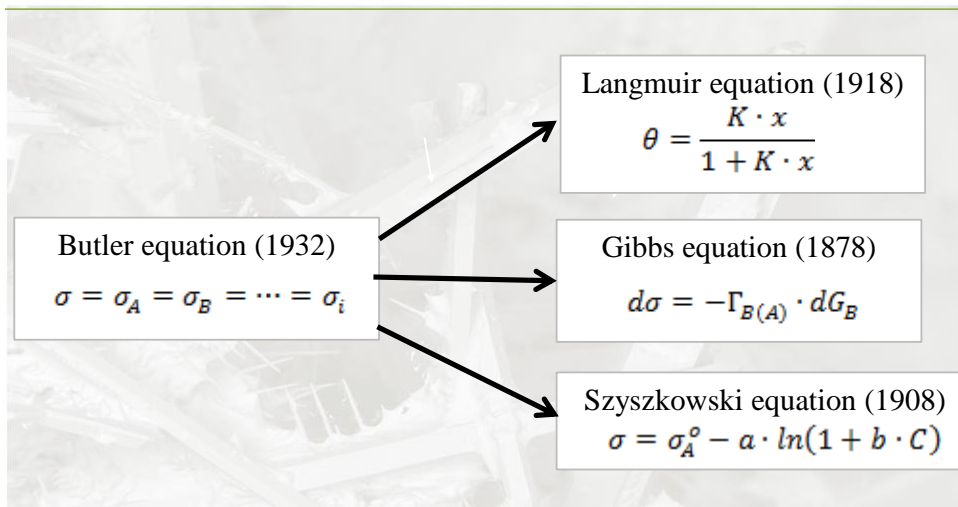


Határfelületi modellezés

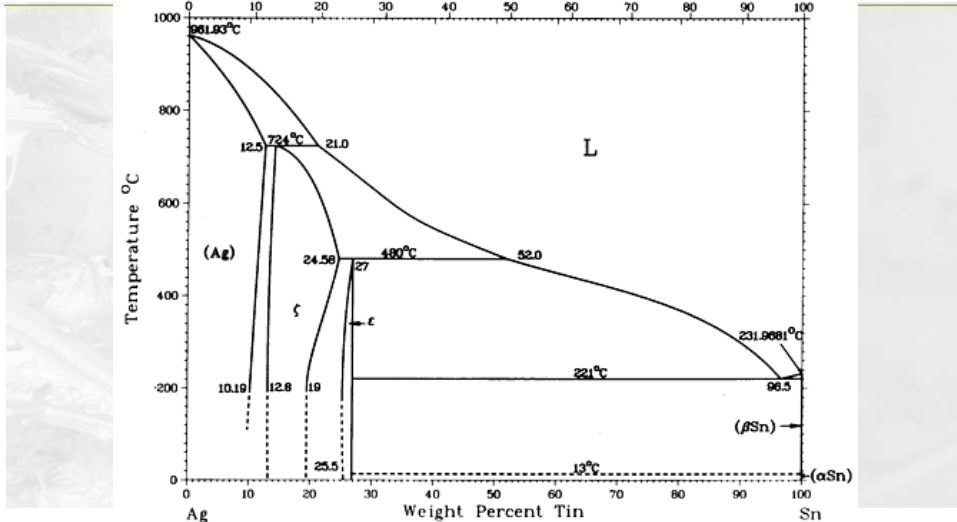




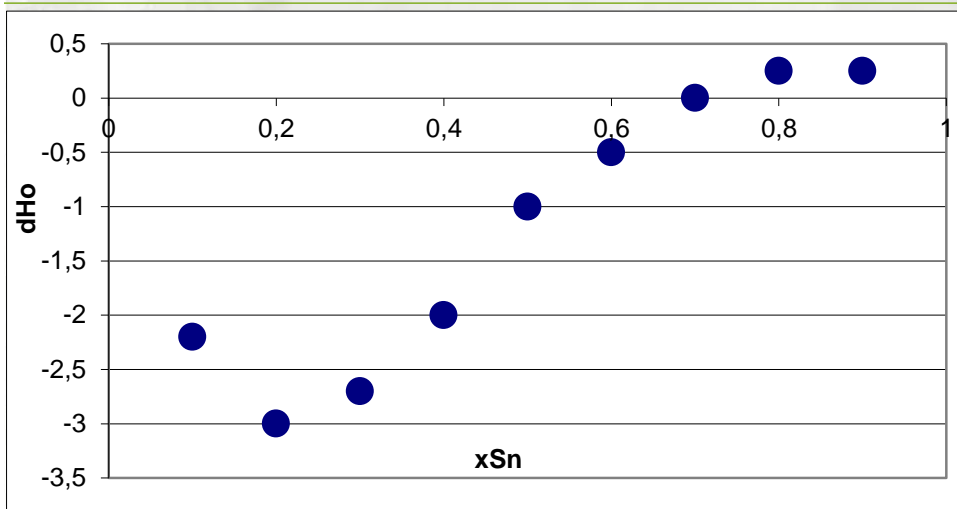
Határfelületi modellezés



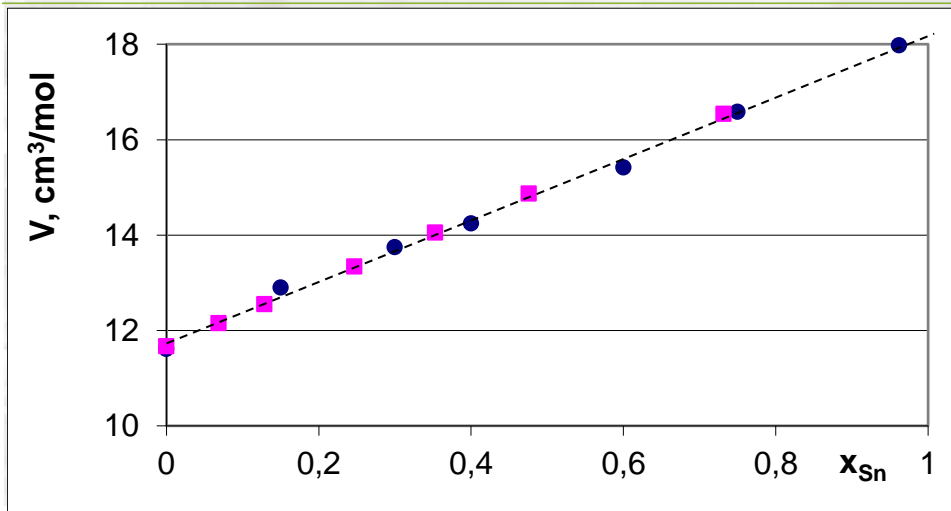
Sn-Ag



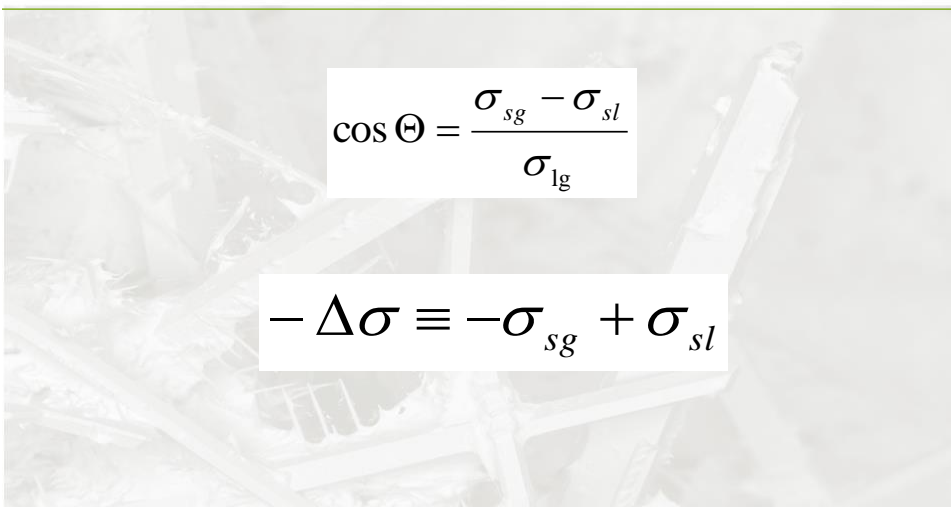
Sn-Ag



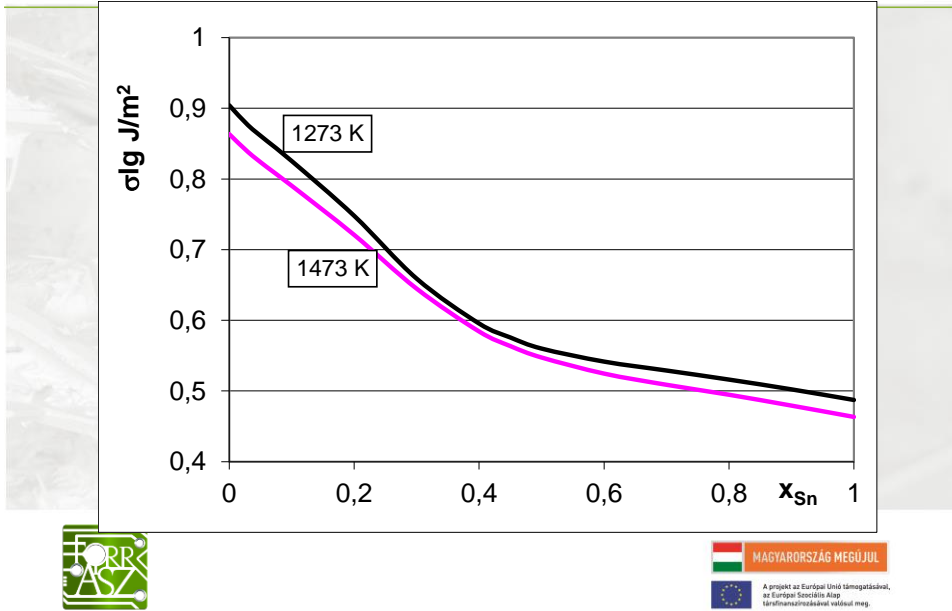
Sn-Ag



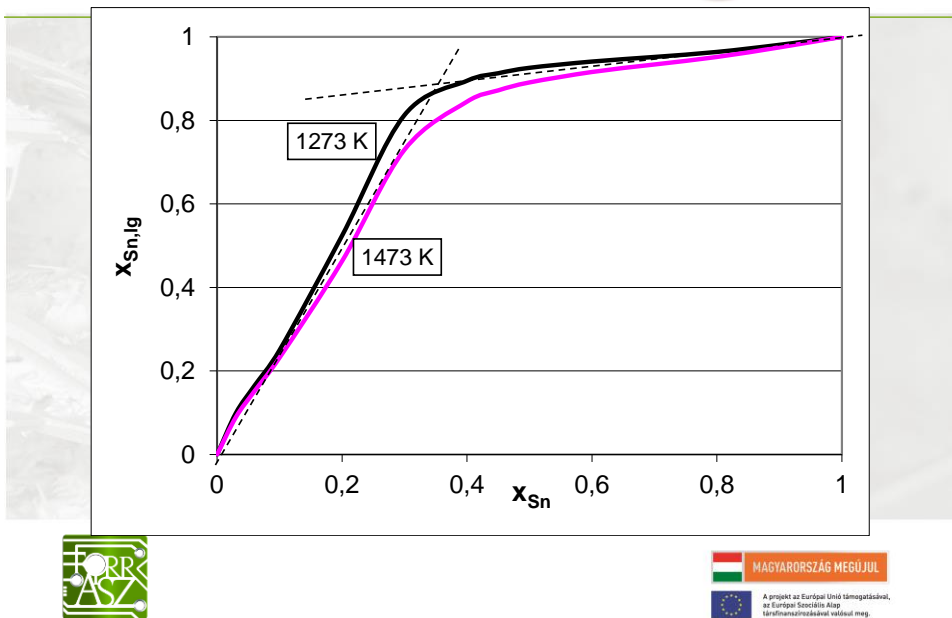
A peremszög modellezése



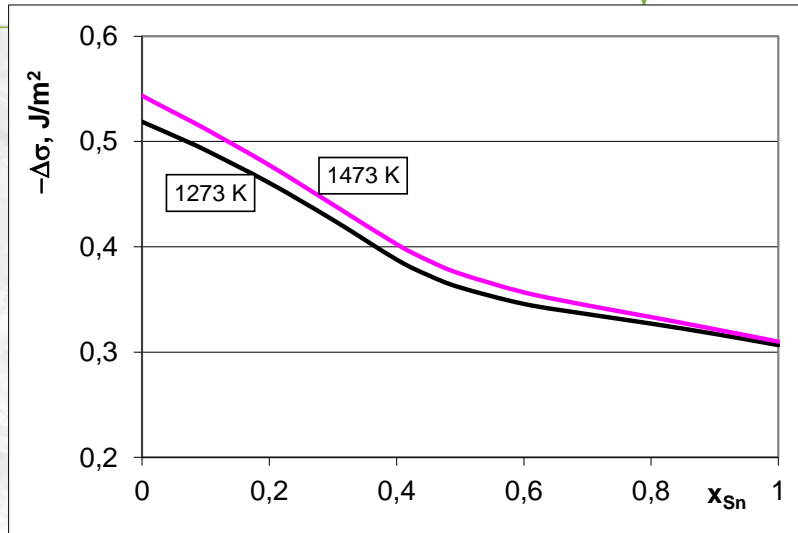
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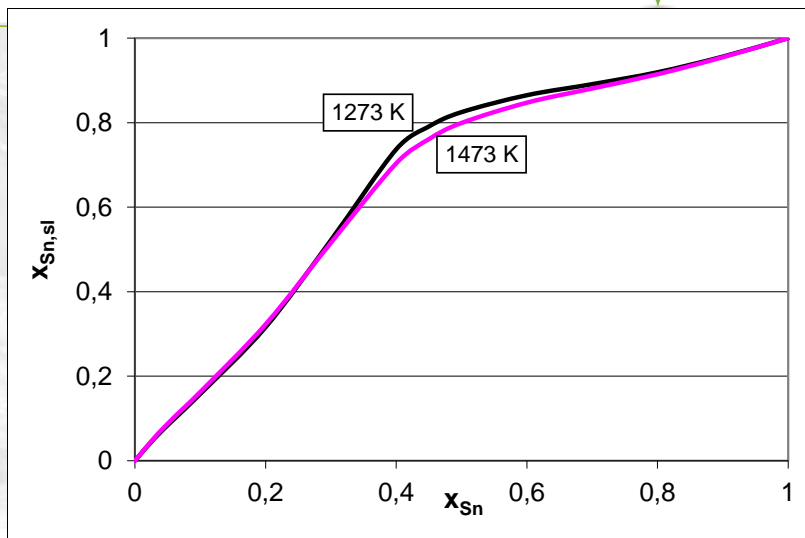
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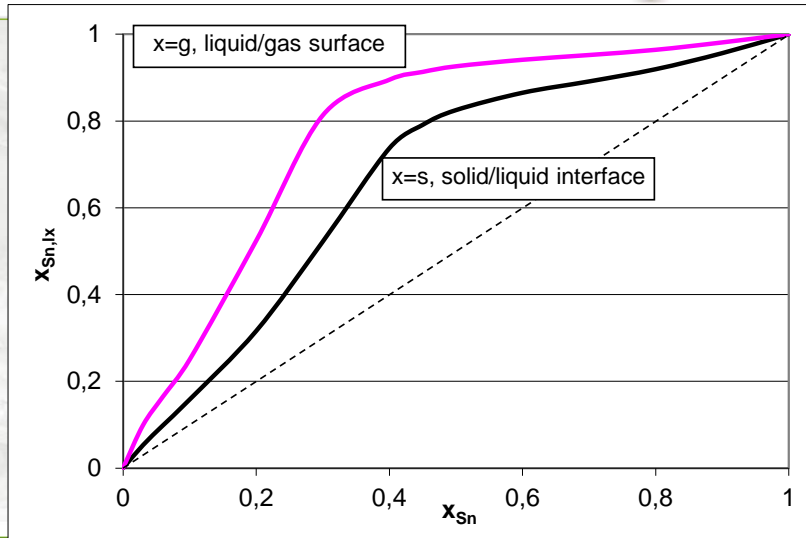
Sn-Ag


 ÚJ SZÉCHENYI TERV


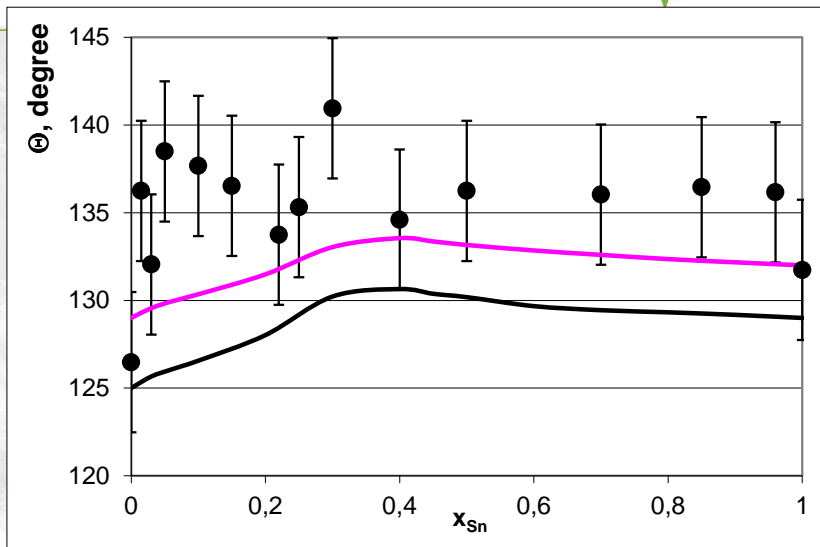
Sn-Ag


 ÚJ SZÉCHENYI TERV


Sn-Ag



Sn-Ag





Köszönöm a megtisztelő figyelmet!

"A bemutatott kutató munka a TÁMOP-4.2.2.A-11/1/KONV-2012-0019 jelű projekt részeként az Európai Unió támogatásával, az Európai Szociális Alap társfinanszírozásával valósul meg"

