Chapter 9

Behavior of Solutions

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a_{Cu}

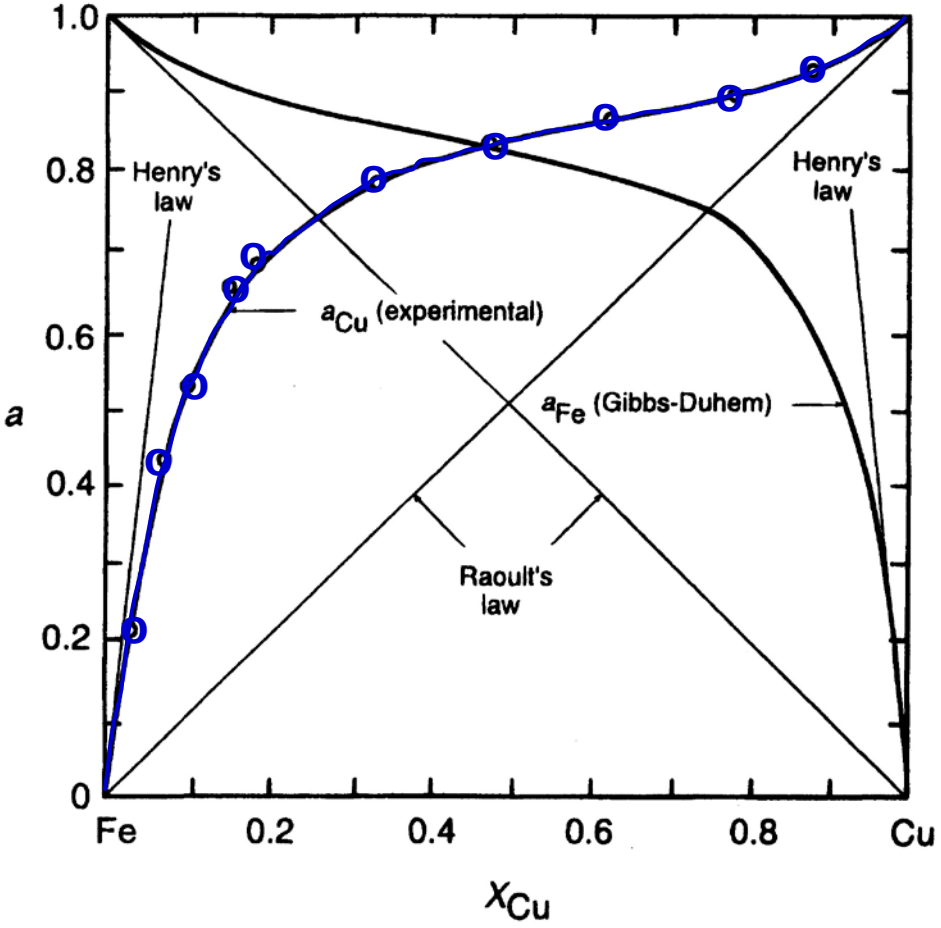

Figure 9.9 Activities in the system iron-copper at 1550°C. (From J. P. Morris and G. R. Zellars, "Vapor Pressure of Liquid Copper and Activities in Liquid Fe-Cu Alloys," *Trans. AIME* (1956), vol. 206, p. 1086.)

$$\gamma_{Cu} = \frac{a_{Cu}}{X_{Cu}}$$

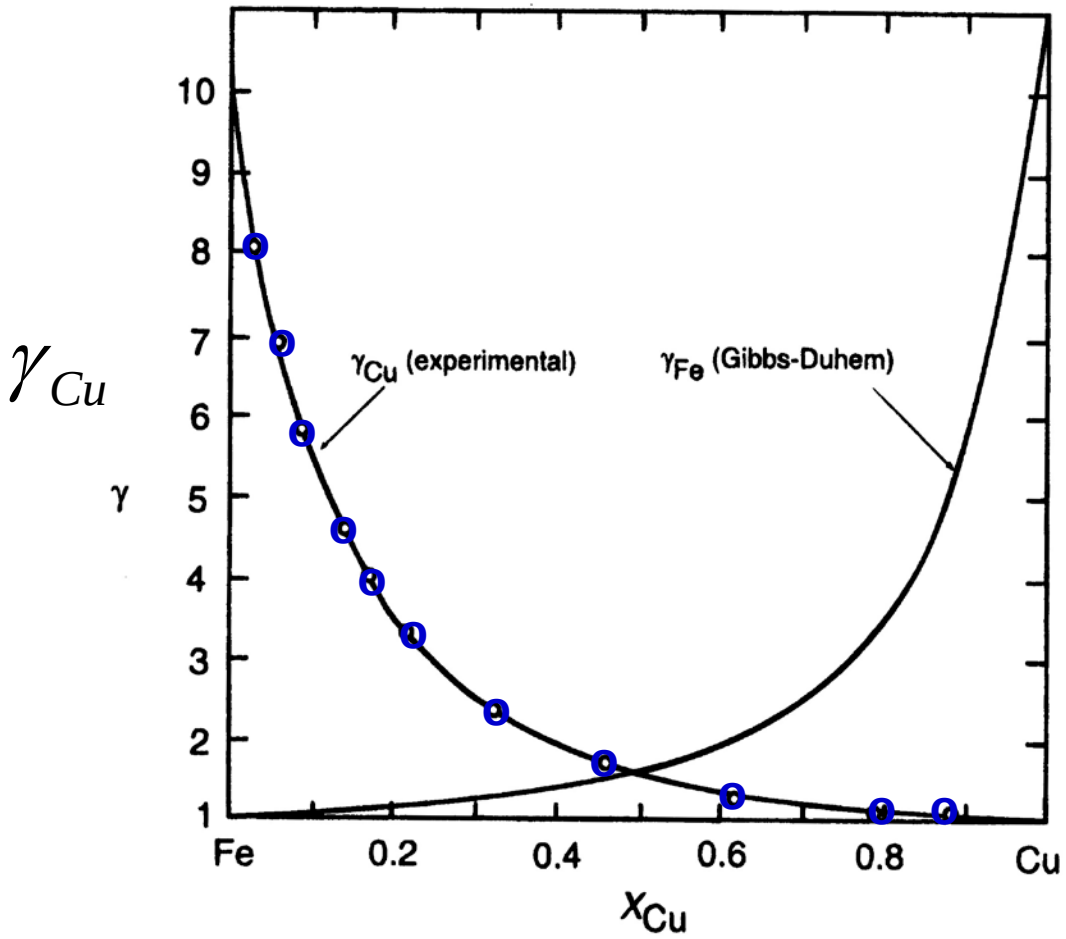

Figure 9.11 Activity coefficients in the system iron-copper at 1550°C.

$$\ell n\gamma_{Fe} = -\int_{\ell n\gamma_{Cu}(X_{Fe}=1)}^{\ell n\gamma_{Fe}(X_{Fe})} \frac{X_{Cu}}{X_{Fe}} d\ell n\gamma_{Cu}$$

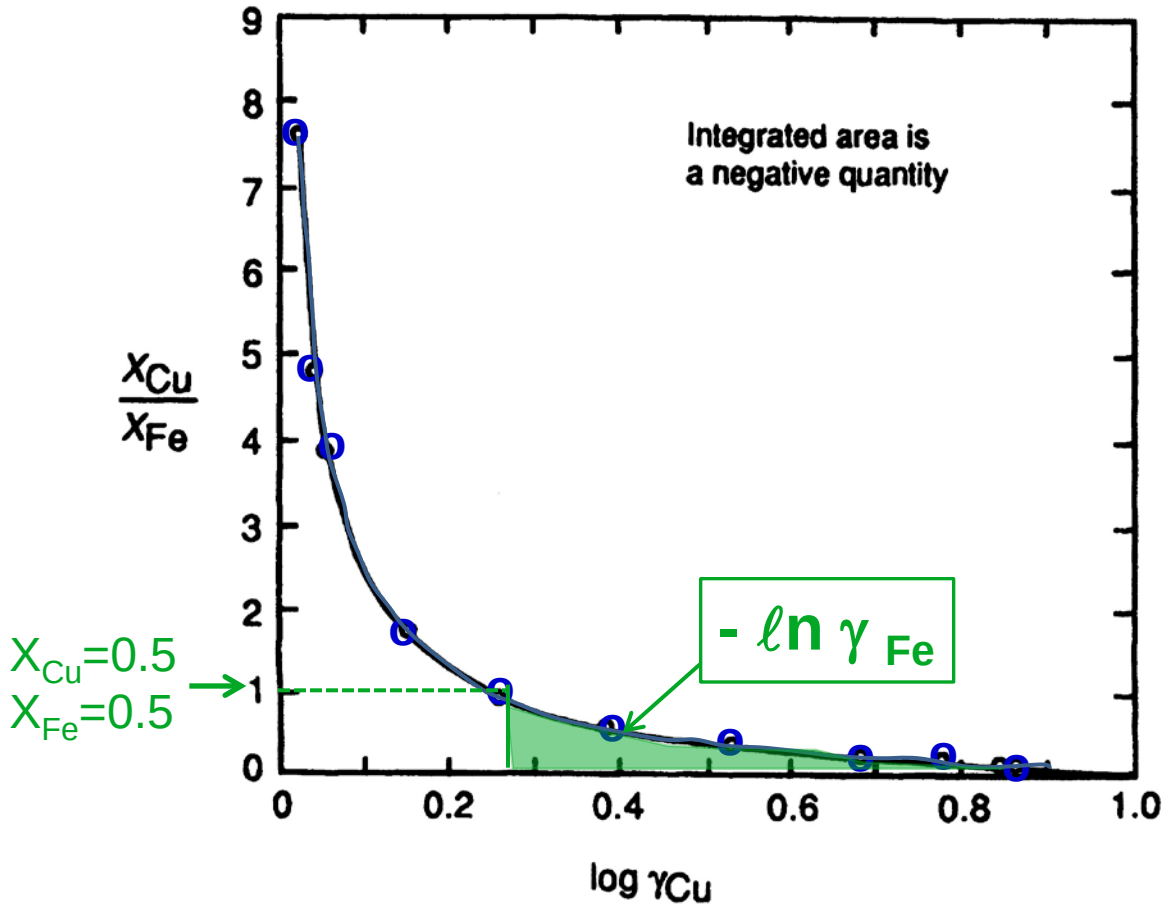

Figure 9.15 Application of the Gibbs-Duhem equation to determination of the activity of iron in the system iron-copper.

$$\ell n\gamma_{Fe} = -X_{Cu}X_{Fe}\alpha_{Cu} - \int_{X_{Fe}=1}^{X_{Fe}} \alpha_{Cu}\, dX_{Fe}$$

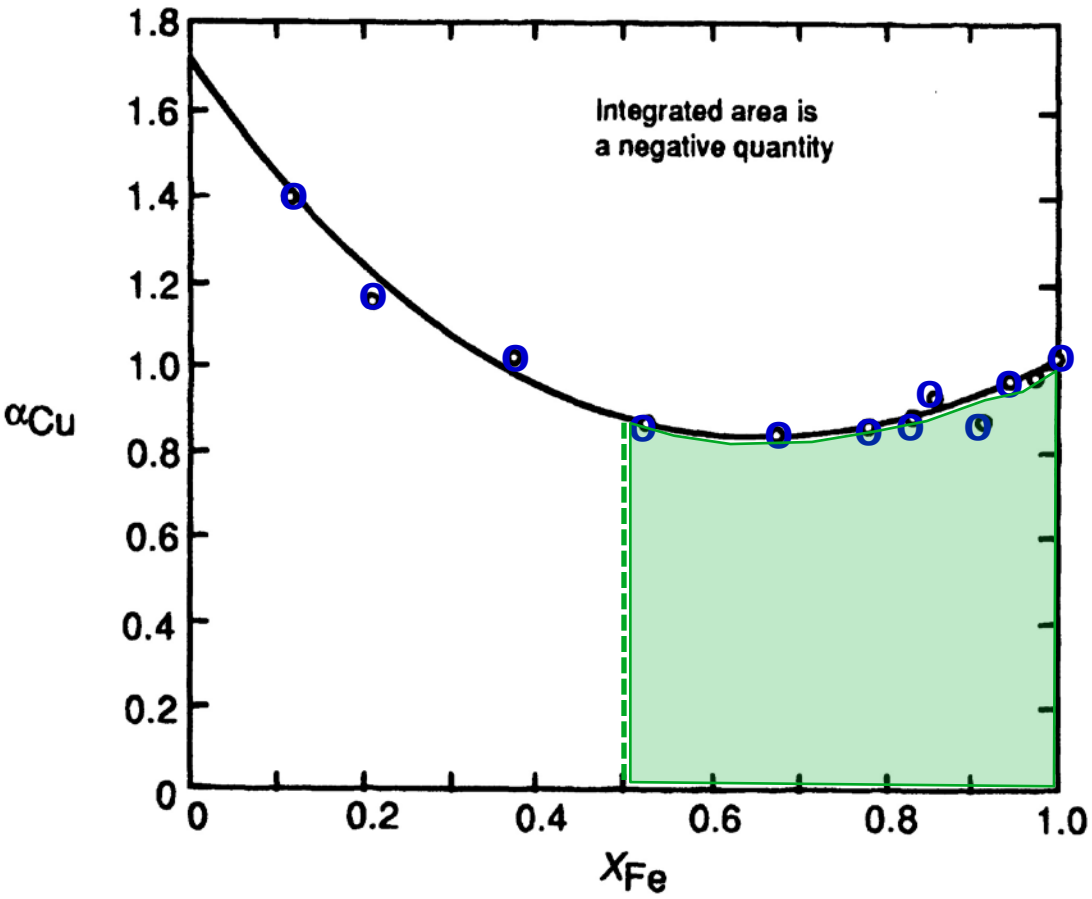

Figure 9.17 The variation of α_{Cu} with composition in the system iron-copper.

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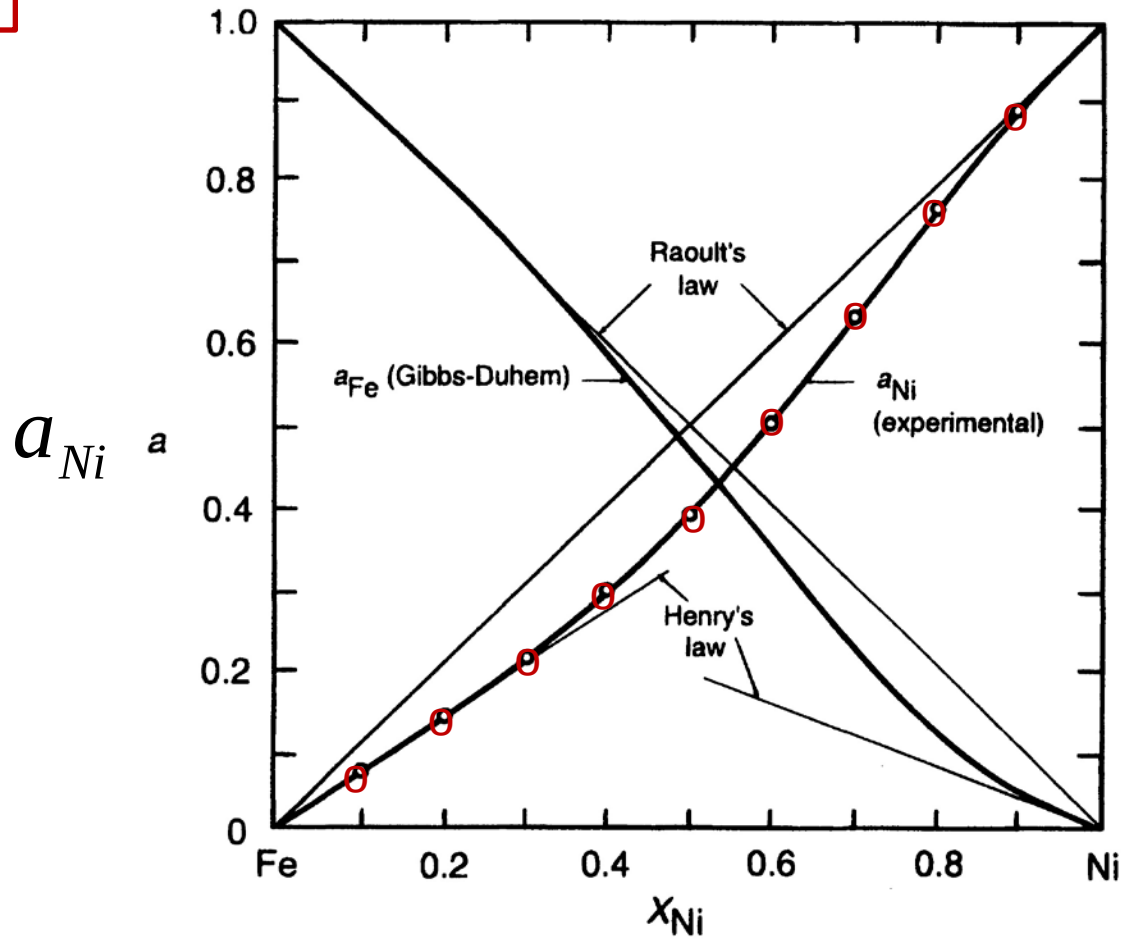

Figure 9.8 Activities in the system iron-nickel at 1600°C. (From G. R. Zellars, S. L. Payne, J. P. Morris, and R. L. Kipp, "The Activities of Iron and Nickel in Liquid Fe-Ni Alloys," *Trans. AIME* (1959), vol. 215, p. 181.)

$$\gamma_{Ni} = \frac{a_{Ni}}{X_{Ni}}$$

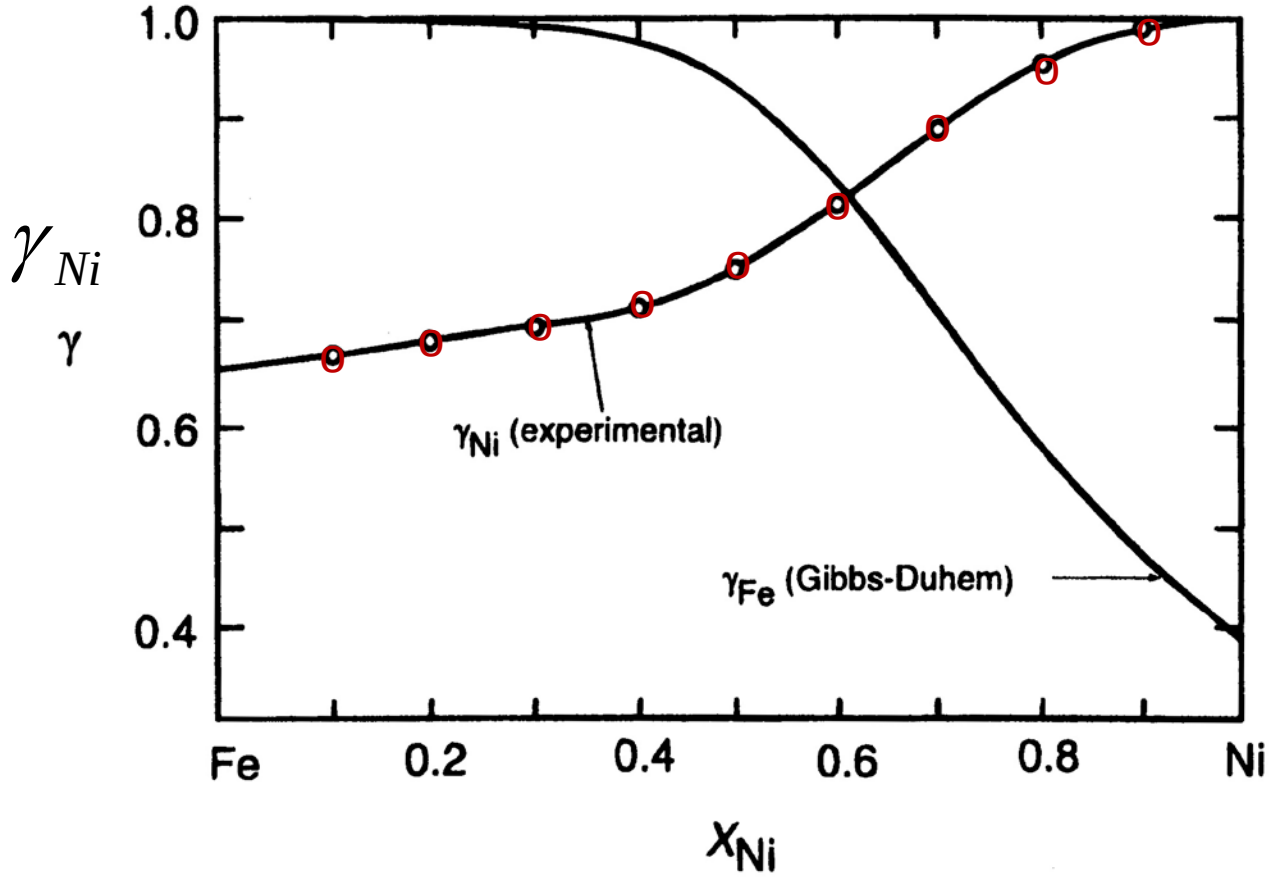

Figure 9.10 Activity coefficients in the system iron-nickel at 1600°C.

$$\ell n\gamma_{Fe} = -\int_{\ell n\gamma_{Ni}(X_{Fe}=1)}^{\ell n\gamma_{Fe}(X_{Fe})} \frac{X_{Ni}}{X_{Fe}} d\ell n\gamma_{Ni}$$

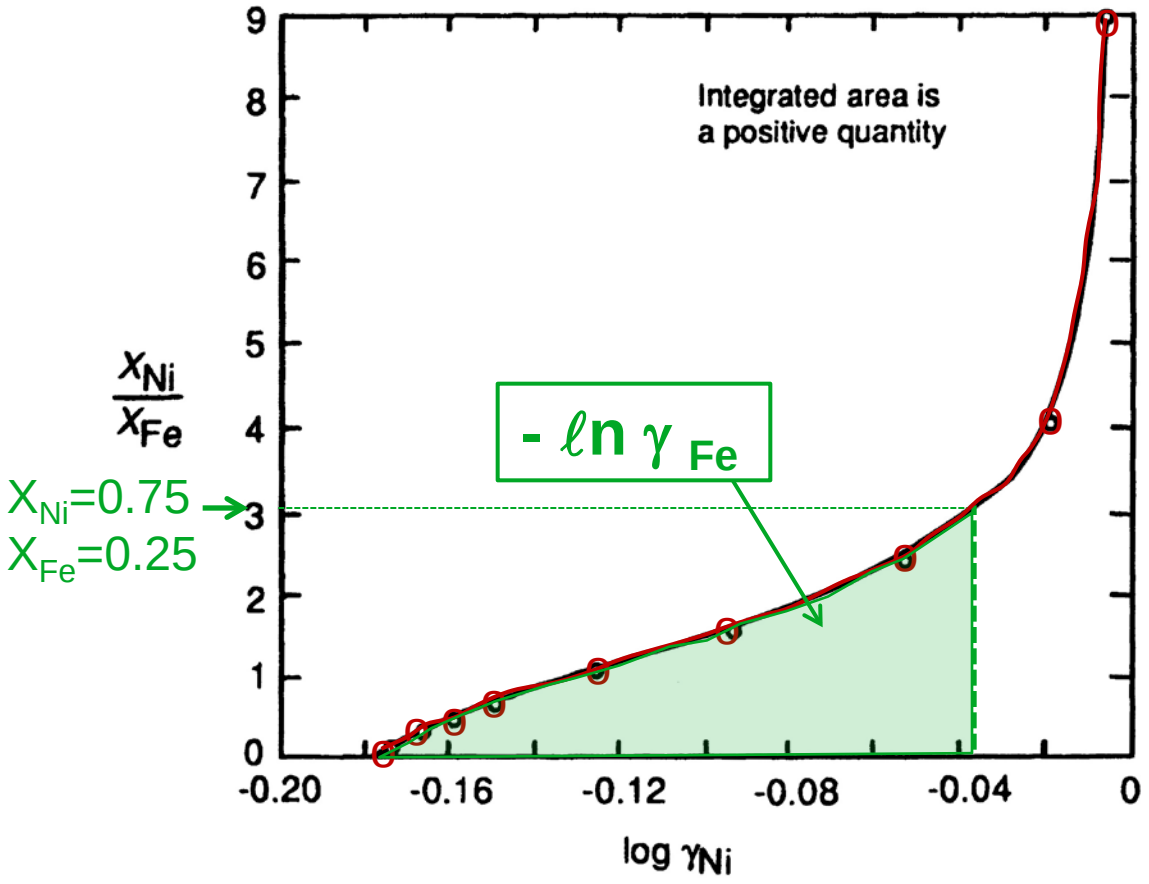

Figure 9.14 Application of the Gibbs-Duhem equation to determination of the activity of iron in the system iron-nickel.

$$\ell n\gamma_{Fe} = -X_{Ni}X_{Fe}\alpha_{Ni} - \int_{X_{Fe}=1}^{X_{Fe}} \alpha_{Ni} dX_{Fe}$$

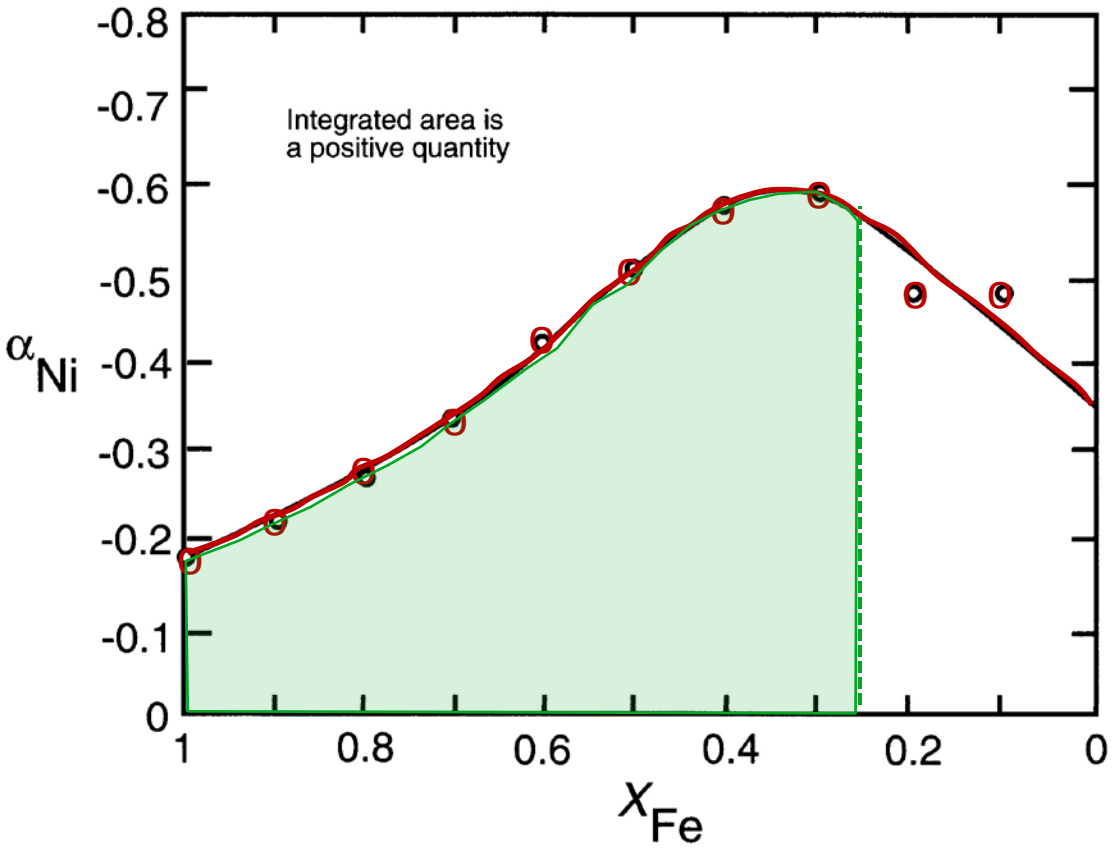

Figure 9.16 The variation of α_{Ni} with composition in the system iron-nickel.

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