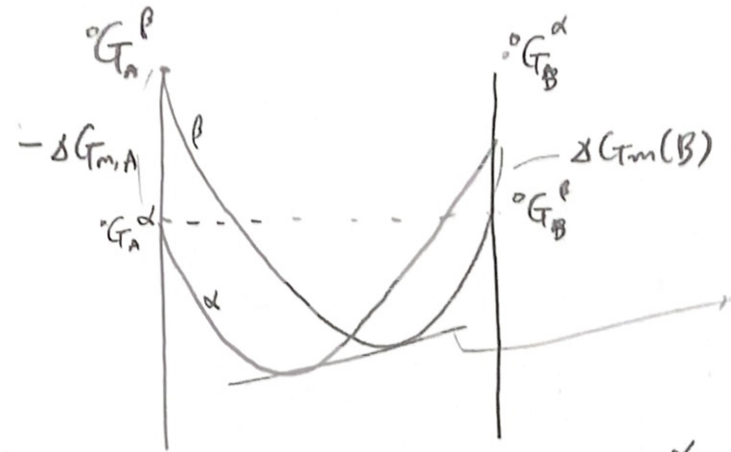
20192466 서경보



$$\Rightarrow \left.\frac{\partial G_m^\alpha}{\partial x_B}\right|_{x_B = x_B^\alpha} = \left.\frac{\partial G_m^\beta}{\partial x_B}\right|_{x_B = x_B^\beta}$$

$$\begin{cases} G_m^\alpha = x_A^\alpha\,{}^\circ G_A^\alpha + x_B^\alpha\,{}^\circ G_B^\alpha + RT\left(x_A^\alpha \ln x_A^\alpha + x_B^\alpha \ln x_B^\alpha\right) + x_A^\alpha x_B^\alpha L_{A,B}^\alpha \\ G_m^\beta = x_A^\beta\,{}^\circ G_A^\beta + x_B^\beta\,{}^\circ G_B^\beta + RT\left(x_A^\beta \ln x_A^\beta + x_B^\beta \ln x_B^\beta\right) + x_A^\beta x_B^\beta L_{A,B}^\beta \end{cases}$$

since, $\begin{cases} x_B^\alpha + x_A^\alpha = 1 \\ x_B^\beta + x_A^\beta = 1 \end{cases} \Rightarrow \begin{cases} x_A^\alpha = 1 - x_B^\alpha \\ x_A^\beta = 1 - x_B^\beta \end{cases}$

$$\begin{cases} G_m^\alpha = (1-x_B^\alpha)\,{}^\circ G_A^\alpha + x_B^\alpha\,{}^\circ G_B^\alpha + RT\left((1-x_B^\alpha)\ln(1-x_B^\alpha) + x_B^\alpha \ln x_B^\alpha\right) + (1-x_B^\alpha)x_B^\alpha L_{A,B}^\alpha \\ G_m^\beta = (1-x_B^\beta)\,{}^\circ G_A^\beta + x_B^\beta\,{}^\circ G_B^\beta + RT\left((1-x_B^\beta)\ln(1-x_B^\beta) + x_B^\beta \ln x_B^\beta\right) + (1-x_B^\beta)x_B^\beta L_{A,B}^\beta \end{cases}$$

$$\left.\frac{\partial G_m^\alpha}{\partial x_B}\right|_{x_B = x_B^\alpha} = \left.\frac{\partial G_m^\beta}{\partial x_B}\right|_{x_B = x_B^\beta}$$

$$\cancel{-{}^\circ G_A^\alpha + {}^\circ G_A^\alpha} + RT\left(-\ln(1-x_B^\alpha) \cancel{-1} + \ln x_B^\alpha \cancel{+1}\right) + (1-x_B^\alpha)L_{A,B}^\alpha - x_B^\alpha L_{A,B}^\alpha$$

$$= \cancel{-{}^\circ G_A^\beta + {}^\circ G_A^\beta} + RT\left(-\ln(1-x_B^\beta) \cancel{-1} + \ln x_B^\beta \cancel{+1}\right) + (1-x_B^\beta)L_{A,B}^\beta - x_B^\beta L_{A,B}^\beta$$

$$RT\ln\frac{x_B^\alpha}{1-x_B^\alpha} + (1-2x_B^\alpha)L_{A,B}^\alpha = RT\ln\frac{x_B^\beta}{1-x_B^\beta} + (1-2x_B^\beta)L_{A,B}^\beta$$

$\Rightarrow$ Reference state에 무관하게 상평형 조성은 결정됨.