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$$\Delta G = X_A \overline{\Delta G}_A + X_B \overline{\Delta G}_B \quad \text{in both phase.}$$

for liquid phase.

$$\Delta G_L = X_A \overline{\Delta G}_{L,A} + X_B \overline{\Delta G}_{L,B}$$

for solid phase

$$\Delta G_S = X_A \overline{\Delta G}_{S,A} + X_B \overline{\Delta G}_{S,B}$$

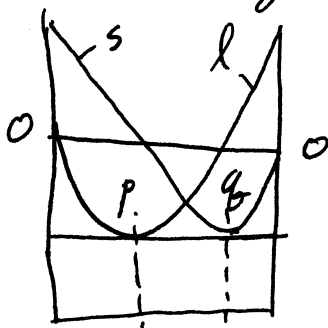
regarding regular solution model

$$\overline{\Delta G}_{L,A} = \Delta G_{L,A}^0 + RT \ln a_{L,A}, \quad \overline{\Delta G}_{S,A} = \Delta G_{S,A}^0 + RT \ln a_{S,A}$$

The condition of phase equilibrium is;

$$(1) \quad \overline{\Delta G}_{L,A} = \overline{\Delta G}_{S,A}, \quad (2) \quad \overline{\Delta G}_{L,B} = \overline{\Delta G}_{S,B}$$

To satisfy two above condition.



intersection point of common tangent line and each free energy curve is the only answer (p, q).