

It follows from thermodynamics that the change in Gibb's energy by a path from metastable to stable form, ΔG , is given by

$$\Delta G = -RT \ln \left[\frac{P_{\text{metastable}}}{P_{\text{stable}}} \right] \quad (8.1)$$

It is negative, so the form with the highest vapor pressure at a given temperature is the least stable (metastable) compound. The term metastability (rather than instability) is used because under advantageous conditions the metastable compound may be "stable", i.e., not change for years or even decades.

3. SOLUBILITIES OF POLYMORPHS

It can be shown via Henry's law that solubilities are (approximately) linearly related to vapor pressures (actually activities as solubility are linearly related to fugacities). The graphs in Figs. 1 and 2 then become as shown in Figs. 5 and 6.

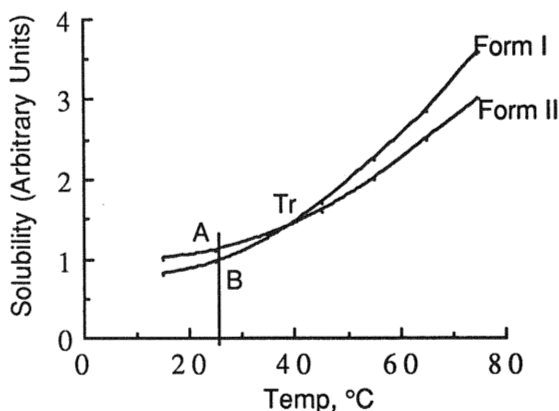


Fig. 5 Solubilities (in mass of solute per mass of solvent) of an enantiotropic pair.

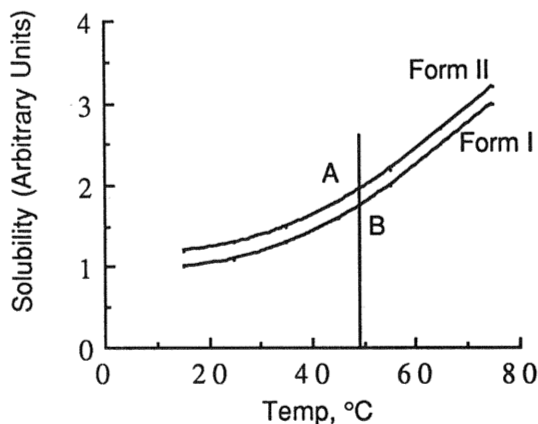


Fig. 6 Solubilities (e.g., in mass of solute per mass of solvent) of a monotropic pair.