

Colligative Properties

"infinitely" dilute systems
condensed aqueous phases
solutions

solute
+ water
Ideal Solution

Freezing Point Depression	↓ T_f
Boiling Point Elevation	↑ T_B

Osmotic Pressure

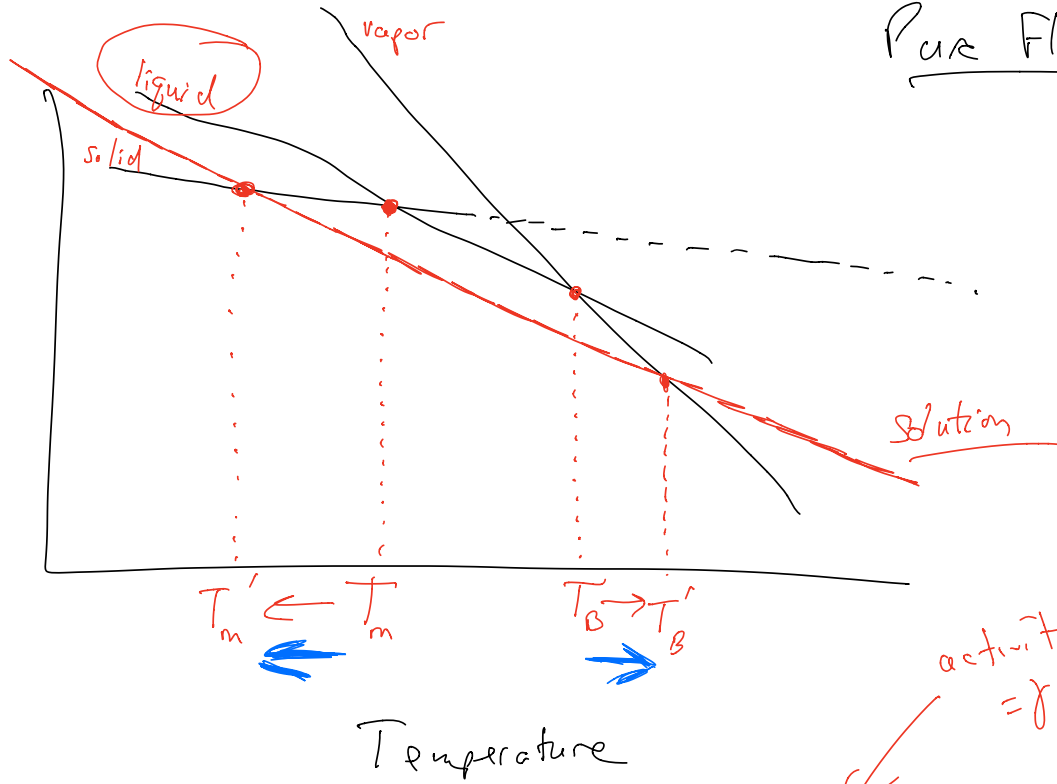
Osmosis

Chemical Potential

$$d\mu = \bar{V} dp - \bar{S} dT \quad \frac{d\mu}{dT} = -\bar{S}$$
$$d\mu = -\bar{S} dT$$

Pure Fluid

μ



activity
 $= \gamma_i P_i$

$$\mu_i(T, P, X_i) = \mu_i(T, P_{\text{pure}}, P_0) + RT \ln X_i$$

\uparrow
water
 \uparrow
water

$$\Delta_{\text{mixing}} = -RT [x_A \ln x_A + x_B \ln x_B]$$