

Related Q: Effect of non-volatile solid B on the  $A(s) \rightleftharpoons A(l)$  equilibrium?

( $s \rightarrow l$  is "fusion";  $l \rightarrow s$  is "freezing")

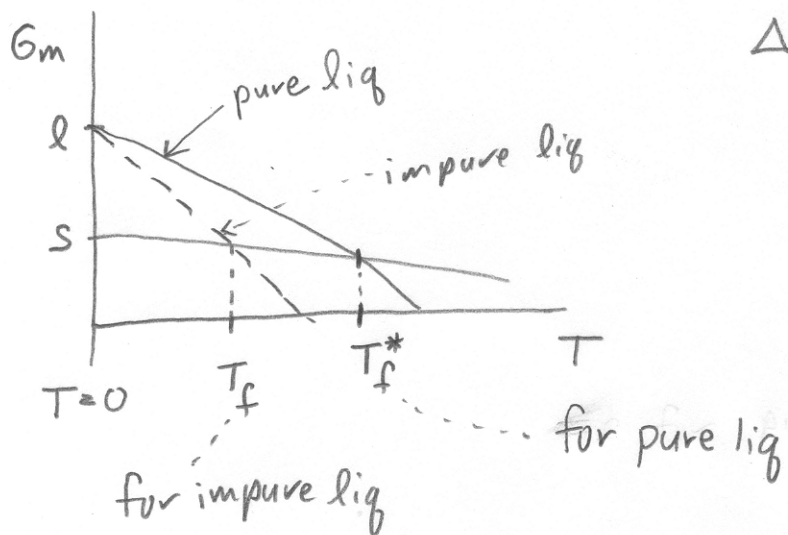
When an impure liq A freezes,

$$\mu_A^\ominus(\text{pure } s) = \mu_A^\ominus(\text{impure } l)$$

phase separation [COMP DEMOS]

Impact on freezing/fusion point ( $T_f$ )?

Qualitatively, for  $A(l) + B(s) \rightarrow A(\text{impure } l)$



$$\Delta G = \Delta H - T\Delta S$$

$$\Delta H = 0 \quad (\text{ideal sol'n})$$

$$\Delta S > 0 \quad (\text{mixing})$$

$$T_f - T_f^* < 0$$

i.e. freezing pt depression

Adding B drops  $A(l)$ 's chemical potential at the expense of  $A(s)$  and  $A(g)$  (lower  $T_f$ , higher  $T_b$ ) ... thermo imperialism!

Compare (again) Atkins and de Paula Fig. 5-21.

Quantitatively, apply the boiling pt elevation eqn we have derived mutatis mutandis ...

