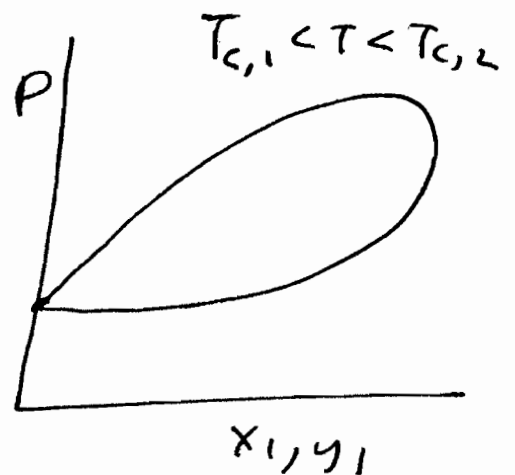
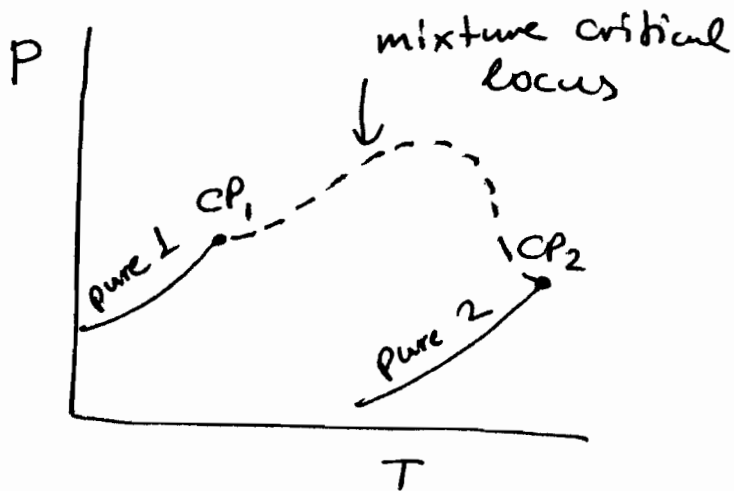


CBE 2+6 High P Equil.

High Pressure Equilibria / Supercritical comp.

Need unified description of all phases  $\rightarrow$   
Equations of State

$$f_{i,I}(T, P, \{x\}) = f_{i,II}(T, P, \{y\}) \Rightarrow \phi_{i,I} x_i = \phi_{i,II} y_i$$



Recall Eq. 8.52

$$\ln \frac{f_i}{x_i P} = \ln \phi_i = \frac{1}{RT} \int_{\infty}^v \left[ \frac{RT}{v} - N \left. \frac{\partial P}{\partial N_i} \right|_{T, v, N_{j \neq i}} \right] dv - \ln z$$

P from Equation of State, e.g.  $P = \frac{RT}{v-b} - \frac{a}{v^2}$  (vdw)

$$a = \sum_i \sum_j x_i x_j a_{ij} \quad a_{ij} = \sqrt{a_i a_j} (1 - k_{ij})$$

$\hookrightarrow$  adjustable parameter

$$b = \sum_i x_i b_i$$