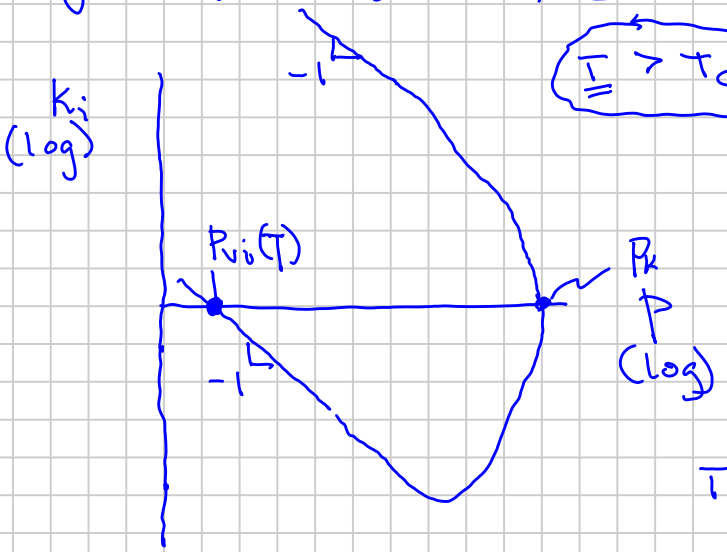
Note Title 2/8/2018

Quiz: K-values

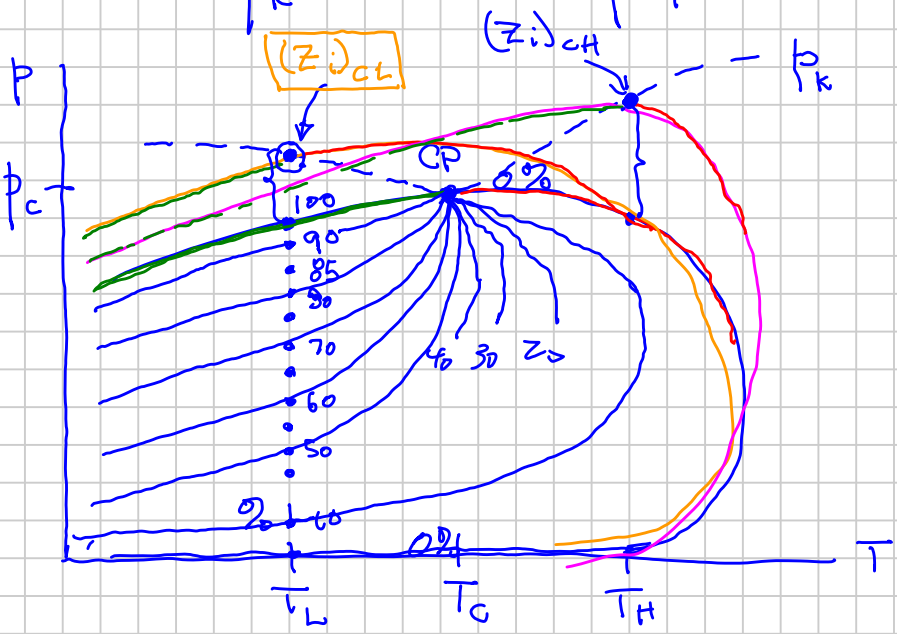
1. Define $K_i = y_i / x_i$
2. For $K_i > 1$
   - Which components? Lighter, e.g. C_1
   - What does it mean? i "prefers" to be in Vapor phase
3. Which component i has the lowest K_i value — heaviest component
4. What happens as all $K_i \to 1$? $y_i = x_i$
5. When does $K_i = 1$? @ p_k for T^* | @ (T_c, p_c) — physical
6. What is $K_i = f(\underline{p}, T, \underline{z}, \theta_i)$ "p_k"
7. What is the fundamental K_i equation @ "low" p's
   $K_i \simeq p_{v_i}(T)/p$; $\log K_i = \log p_{v_i} - \log p$
8. Sketch K_i vs p for given T^* & z_i^* for the lightest i and the heaviest i (log-log)



$T > T_{c_i}$ $K_i > 1$

$T < T_{c_i}$ $K_i < 1$

Relation between $p_K(T)$ and (p_c, T_c)



Phase Diagram for "z_i"

z_i : $(z_i)_{c@T}$

{ is on the Critical Tie Line

How do we know if our mixture z_i is close to or far from its C.P. i.e., $T_R \sim T_c$?

Only measurement made is $p_s(T_R)$ and $V_o(p < p_s)$

If V_o changes dramatically (10 vol% / 10 bar) wrt $p < p_s \Rightarrow T \sim T_c$

slowly wrt $p < p_s \Rightarrow T \not\sim T_c$

(a) If I am near a C.P. @ measured $p_s(T_R)$ what is the relationship $p_s(T_R) \sim p_K$ "close"

Use measured $p_s(T)$ { How to estimate p_K used in modified Wilson K_i equation?

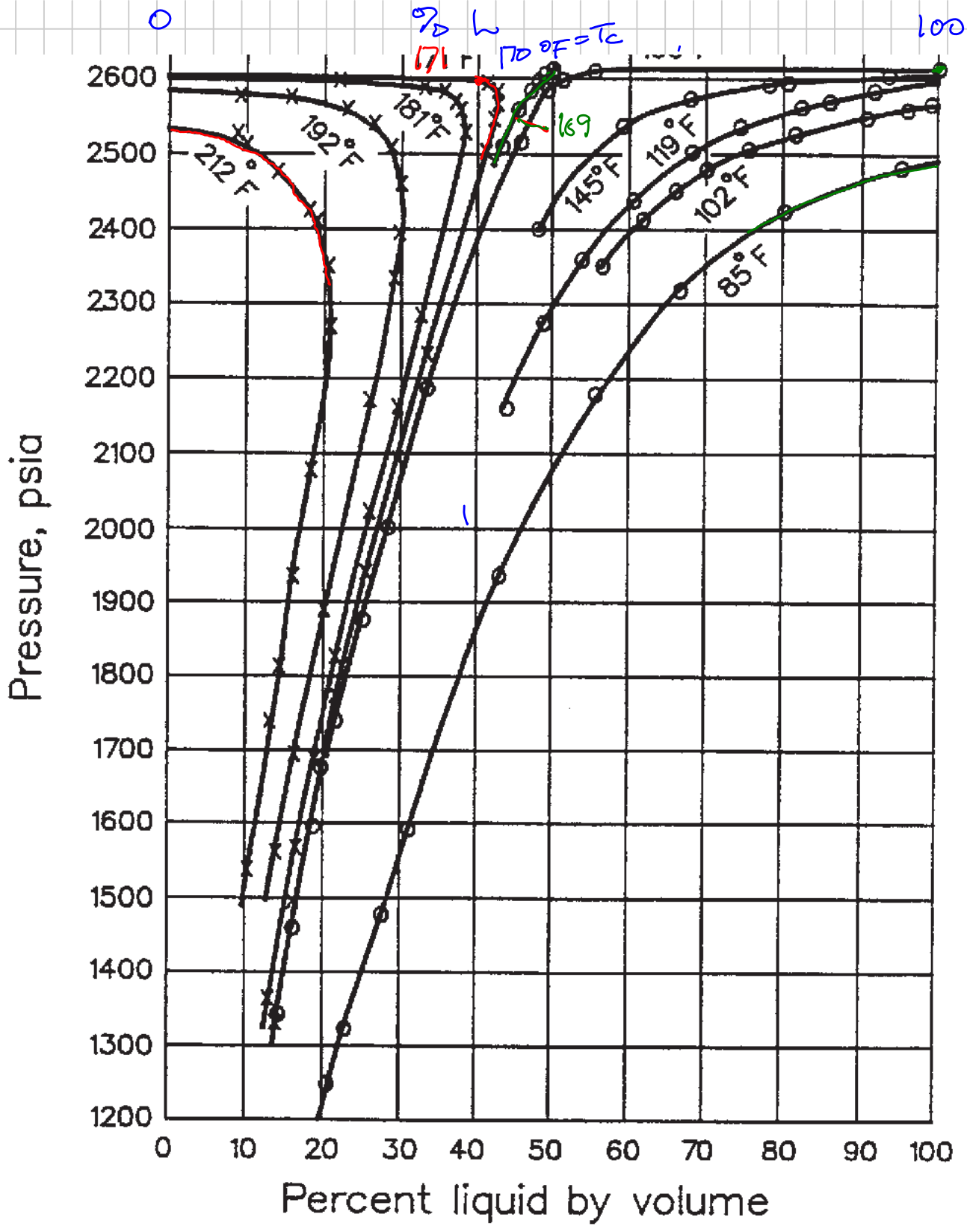


Fig. 2.13—Volume isotherms for the gas-condensate *p-T* diagram in Fig. 2.12 (after Katz *et al.*[5])