Note Title 11/10/2016

CONSTANT VOLUME DEPLETION (Gas Condensates / Volatile Oils)

PVT Test designed to obtain PVT data:

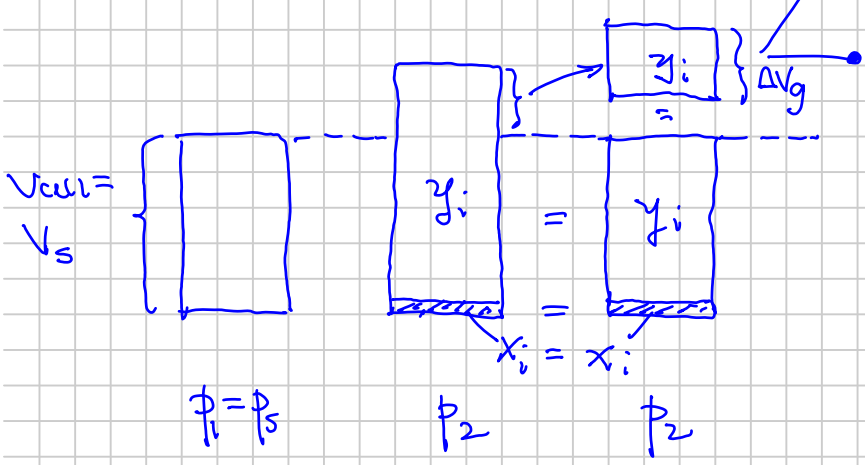
- Gas phase properties $(\rho, Z, \mu_g, M_g \mid \underbrace{y_i \in C_{4+}}_{\text{"}K_i\text{"}}) = f(p<p_s)$
- Oil amounts $V_o(p<p_s)$
  - Gas Condensates: magnitude of $V_o(p)$ not really important to reservoir performance because $\lambda_o(p<p_s) \sim 0$

Experimental Procedure:

T_R = const.
$p \leq p_s$
} Use a Windowed PVT Cell

Cell Volume always returns to the initial V_s

$V_s(T_R, p_s)$



- Flash (to STC) & GC - Record $\Rightarrow y_i(p_2) \Rightarrow M_g, \gamma_g$

Δn_g, $\Delta V_g \Rightarrow Z_g = \dfrac{p\,\Delta V_g}{RT\,\Delta n_g}$

$\therefore\therefore\therefore$ $N_{CVD} \sim 6-9$

Last Stage p_N : ($p_{N-1} \downarrow p_N$) Bleeding Process

- $(\bar{y}_i)_N$ Not Eq.
- $(x_i)_N$ Residual Oil } *

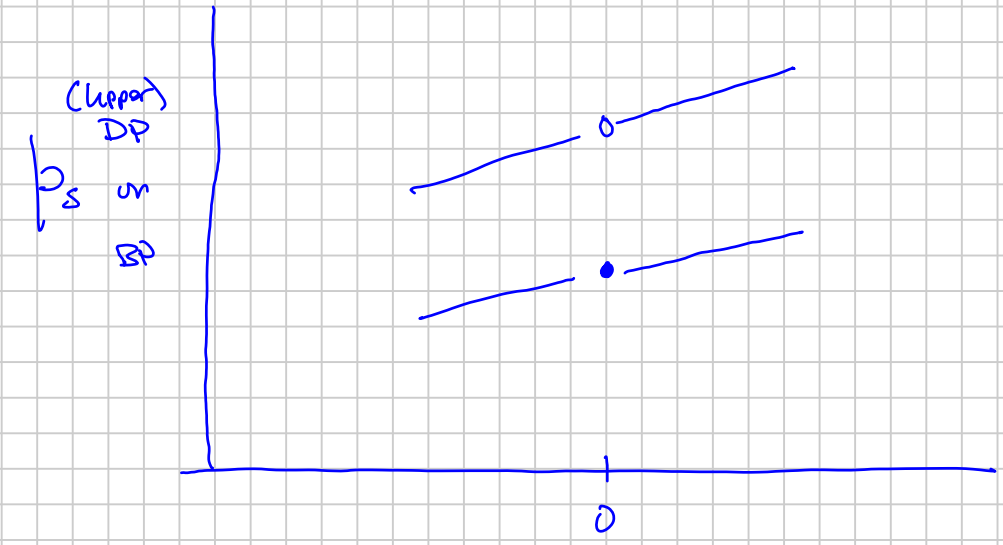
  Mor for

* Useful for Backward Mat. Bal. $\Rightarrow (z_i)_{P_s}$

$\overset{vs}{=}$

Lab $(z_i)_{P_s}$

BIPs $C_1 - C_{2+}$



k_{ij} : $C_1 - C_{2+}$

DP : C_{2+} - dominant phase that appears

P_s Calc :

BP : C_1 - dominant phase that appears

z_{c_1} K_{c_1}

K_{C_1} ↑ P_b ↑ BP

$K_{C_1} = \frac{y_{C_1}}{x_{C_1}} = \frac{y_{C_1}}{z_{C_1}}$

$(K_{C_1 - C_{7+}} > 0)$

$K_{C_{7+}}$ ↓ P_d ↑

$K_{C_{7+}} = \frac{y_{C_{7+}}}{x_{C_{7+}}} = \frac{z_{C_{7+}}}{x_{C_{7+}}}$

entire dist. of comp in C_{7+}

$K_{C_{30+}}$

$K_{C_{20}}$

Entering PVT Data in Phz

MIX FEED Tank-Name (1 MOLE) Amount: Moles, Mass, Tanks

- Component Tank
- EQV EQL NFV NFL
  - EQV EQL: y_i x_i; $0 \le F_v \le 1$
  - NFV NFL: y_i x_i; $F_v > 1$, $F_v < 0$
- Previously-defined / filled tanks
  - Entered manually
  - Created by calcs in experiments (EQV EQL NFV NFL column headers)

Equilibrium

Two Calculation no data (Not experiments)

FLASH - Flash @ (p, T)

SATP - Upper sat. pressure @ T

DEWP - Lower — " —

VAPP - Psendo Vapor Pressure @ T
$(\bar{a}, \bar{b}) \rightarrow EOS \rightarrow p_v(T)$

$T > T_c$

$\rho(T, p)$ = Finds

TEMP 100 C PRES 100 BAR FLASH $\rho(T_c, p_c)$ Critical Isochor

TEMP ~100 C PDEW

(Internal Phz unit defaults for output)

Reset Phz (p, T) defaults for output

PRES o MPA

TEMP o K

DEWP

EXPERIMENTS:

MIX FEED ———

{ Must have a PRES & TEMP currently defined
- Specify: TEMP 200 F PRES 6000 PSIA
- Last (P,T) from the most recent equilibrium calculation }

- Used to define "Relative Quantities"

LRVOL
= ≡ ~
Phase (L,G) Quantity

VRMOL

VRVOL

RVOL

Default Amount for defining Relative Quantities is 1 mol

Change BASIS 100 LB

mass mole volume

MIX FEED OIL 1 MOLE

TEMP 200 F PRES 6000 PSIA

CCE

BASIS 1 BBL

Headers → STAGE TEMP PSAT LDEN ... ..

Units → F BAR G/CC - .. -

{ WtRow } →