

BLACK-OIL PVT TABLES - ECL100

JKIGC.ecl on Handouts

Same reservoir fluid as the gas condensate PVT report.

What are Black-oil PVT tables (Ch. 7)

① BO PVT Properties (Parameters)?
Surface Process

$$B, R_s, r_s = f(T, p, \underline{P}, S/U)$$

OIL PHASE

μ_o R_s B_o

$$B_o \equiv \frac{V_o(p, T)}{V_{oo}} \quad \text{same "v"}$$

$$R_s \equiv \frac{V_{go}}{V_{oo}}$$

GAS PHASE

μ_g $r_s (R_v)$ B_{gd}

$$B_{gd} \equiv \frac{V_g(p, T)}{V_{gg}}$$

$$r_s \equiv \frac{V_{og}}{V_{gg}}$$

Saturated Tables

$$p = p_b @ T \quad ("x": R_s)$$

$$p = p_d @ T \quad ("y": r_s)$$

	$p = p_b$	R_s	μ_{ob}	B_{ob}
P_{bi}	5200	R_{s1}		
	5000	R_{s2}		

	$p = p_d$	r_s	μ_{gd}	$B_{gd,d}$
P_{di}	5200	r_{s1}		
	5000	r_{s2}		

4500
 ⋮
 250
 (15)

15 values

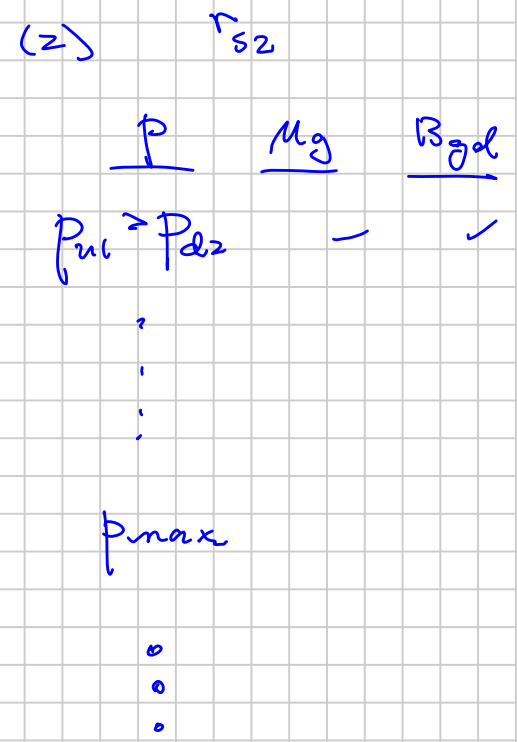
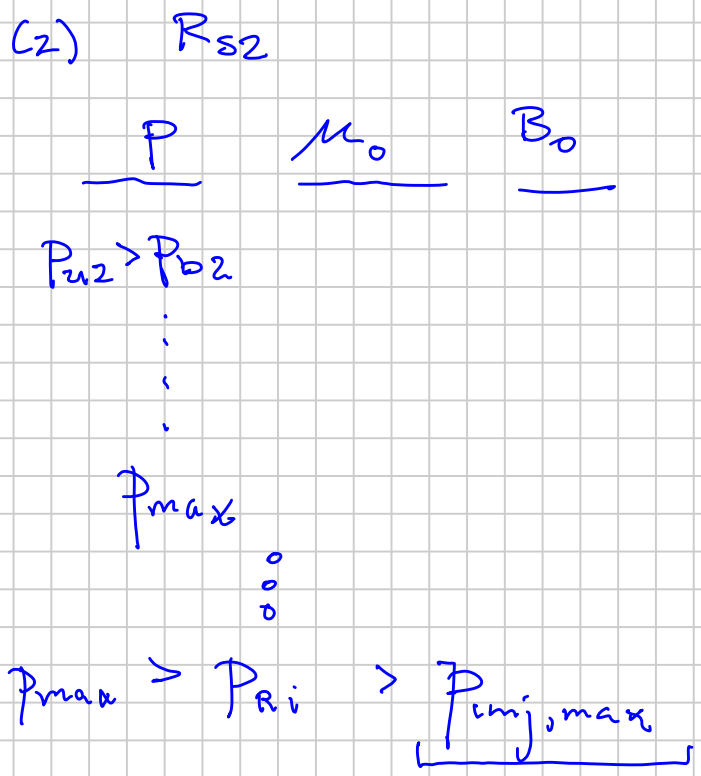
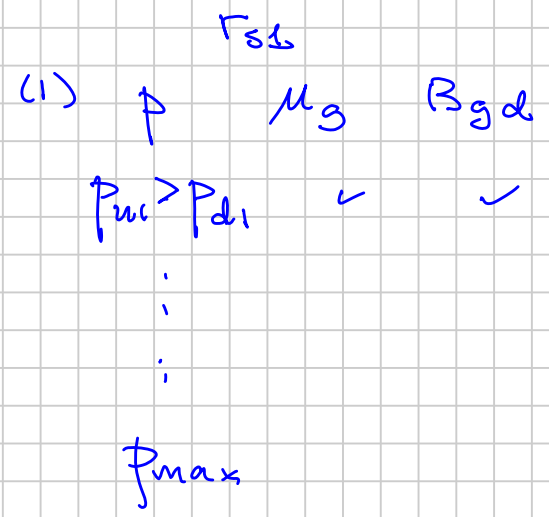
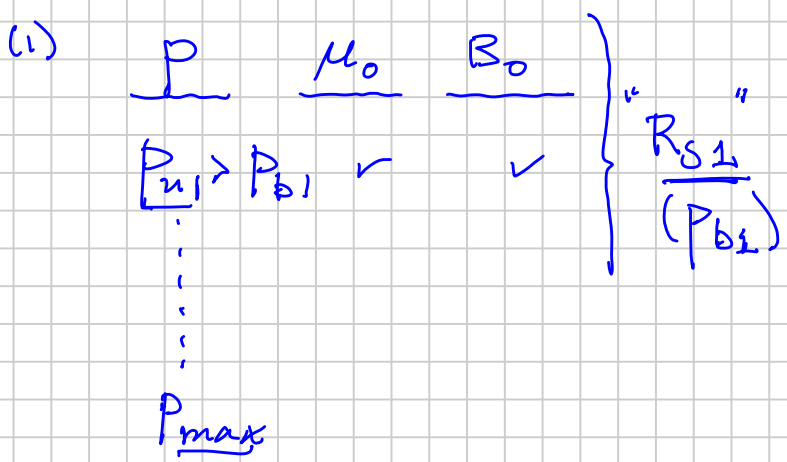
4500
 ⋮
 250
 (15)

Undersaturated Tables

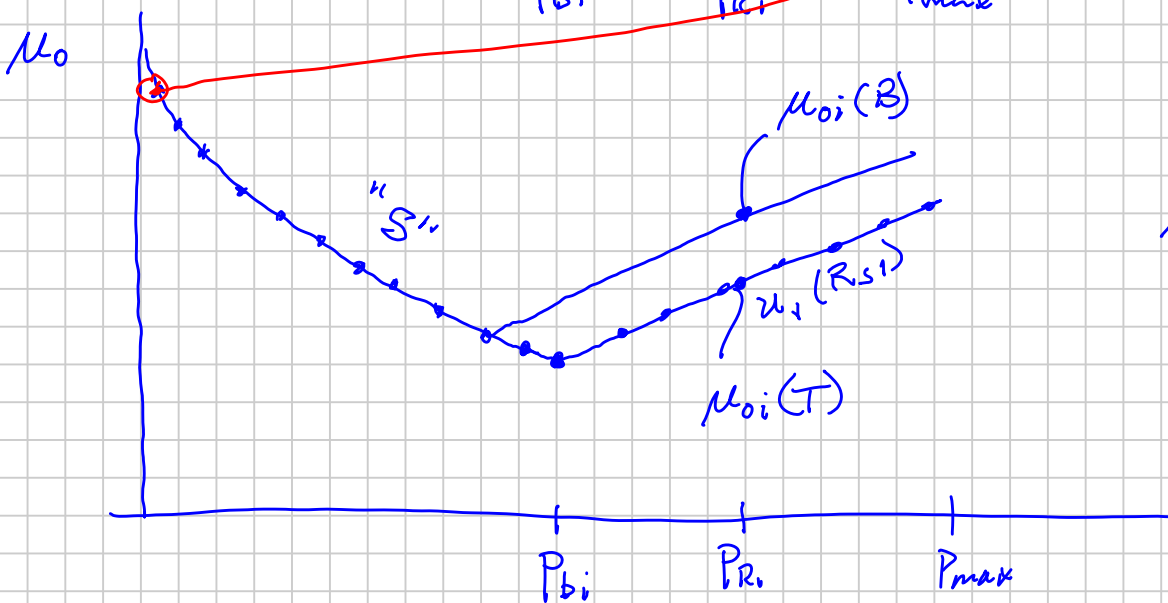
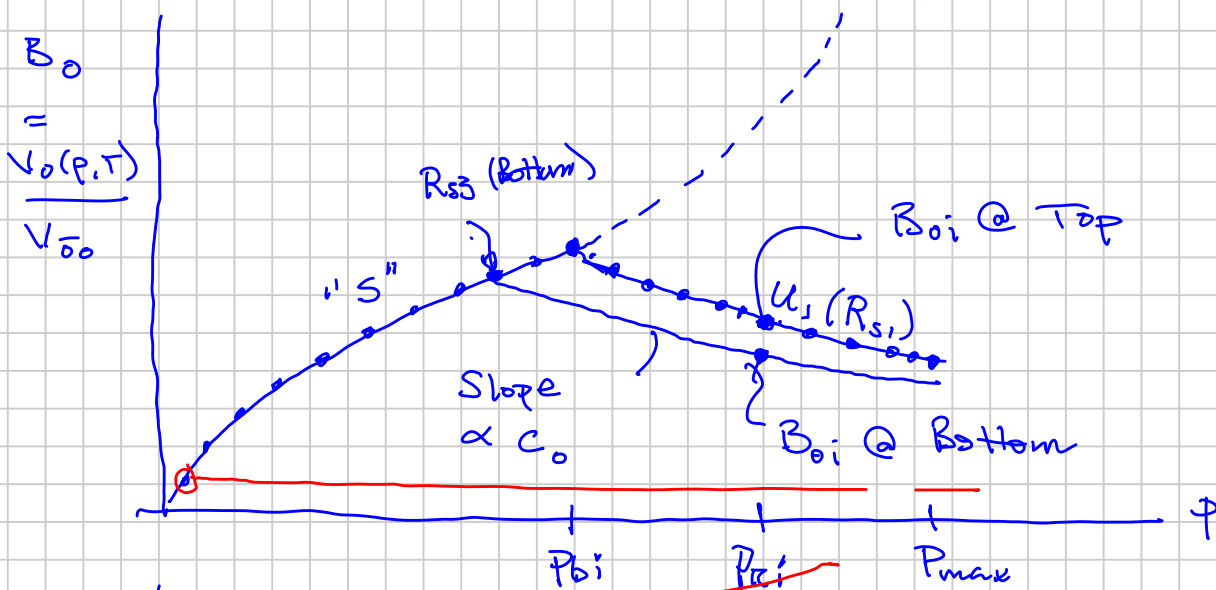
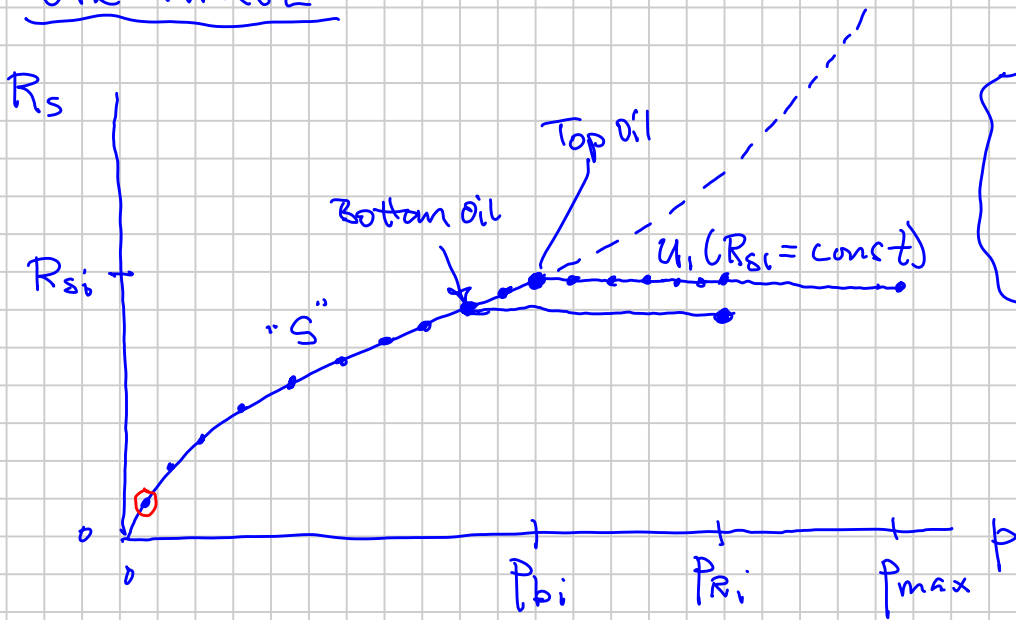
For each saturated oil (R_s, P_b) , we need μ_o, B_o @ $P > P_b$

Likewise for gas phases @ "U" pressures

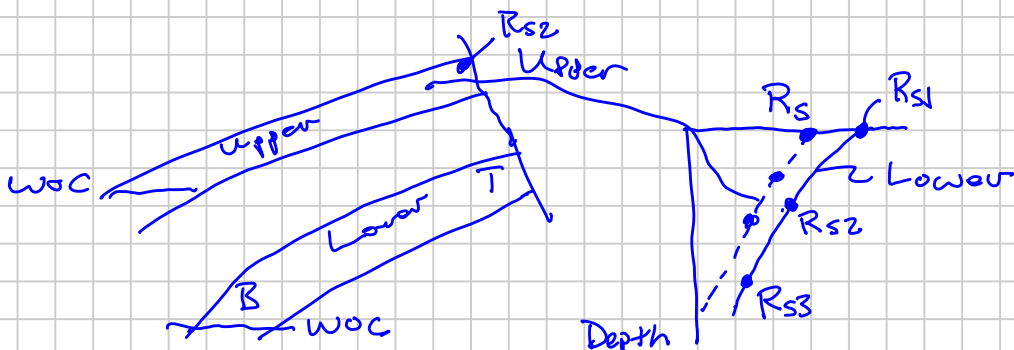
15 "U" tables



OIL PHASE



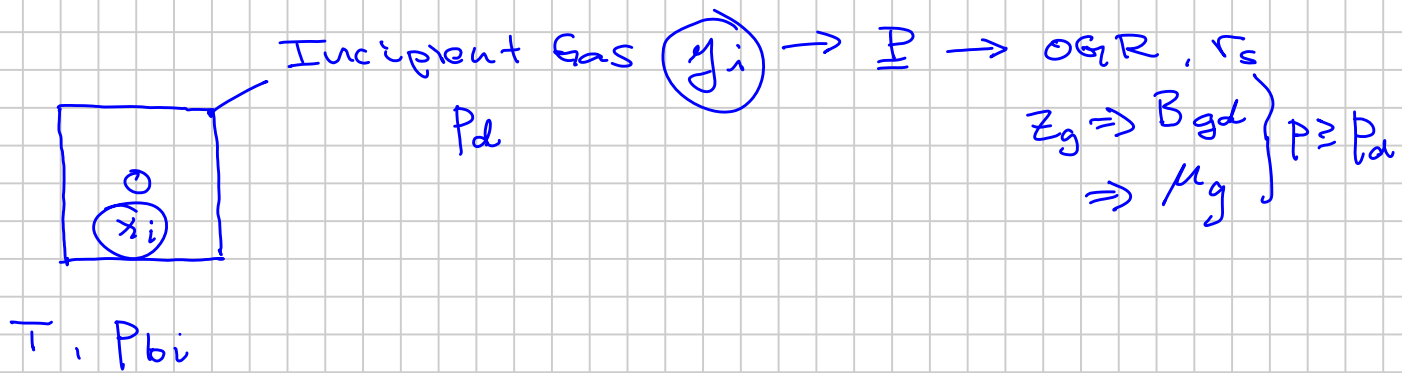
$$\mu_o \propto p_o^4$$



$$p_{ri} \sim 7000$$

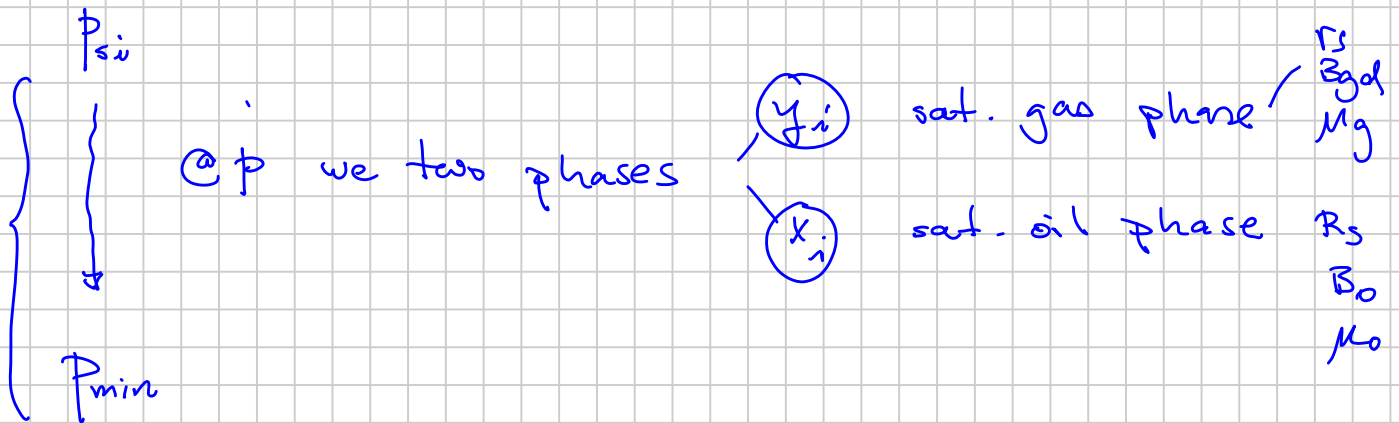
ECLIPSE 100 Bo PVT FORMAT (PVT0 | PVTG)

most commonly used



Saturated Stage 2, 3, ...

Depletion Test : CCE (1), CVD (2), DLE (3)



Footnote:

Bo PVT Assumes surface gas (\bar{g}) = constant γ_g
 surface oil (\bar{o}) = constant

$\int \bar{g} = \text{constant}$
 $\int \bar{o} = \text{constant}$ } but they aren't! API

- which two values to choose?

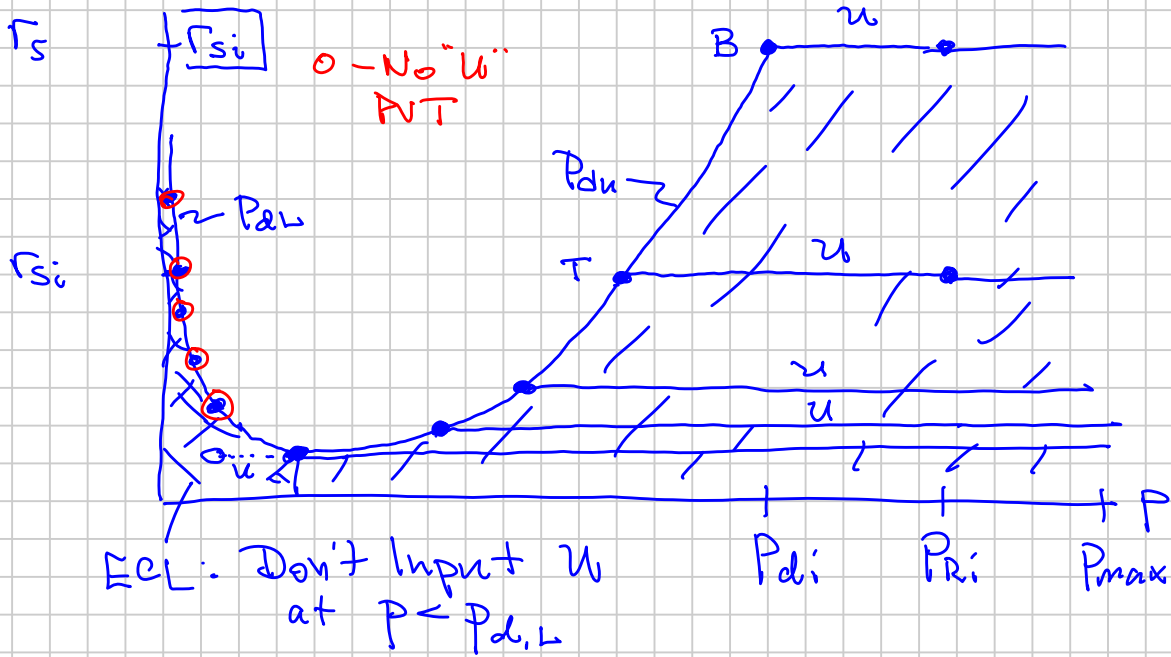
- what are these two values used for?

ONLY TO CALC:

- $$f_o(p) = \frac{f_o + f_g \cdot R_s(p)}{B_o(p)}$$

- $$f_g(p) = \frac{f_g + f_o \cdot r_s(p)}{B_g(p)}$$

Gas PVT G:



$B_{gd} (S | u)$

$M_g (S | u)$