

MUSRATA UNIVERSITY
PETROLEUM ENGINEERING DEPARTMENT
Gas Engineering

Final Exam
 Academic Year: 2015/16
 Time 3 hrs

Answer the following three questions

QUESTION ONE

(20 MARKS)

A- Consider a reservoir initially at 350°F and 3600 Pisa, represented by point 4i in Fig. 2.2. Describe briefly the phase behavior in both baths 4i-4o and 4i-4s

22 Properties of Natural Gases and Condensate Systems

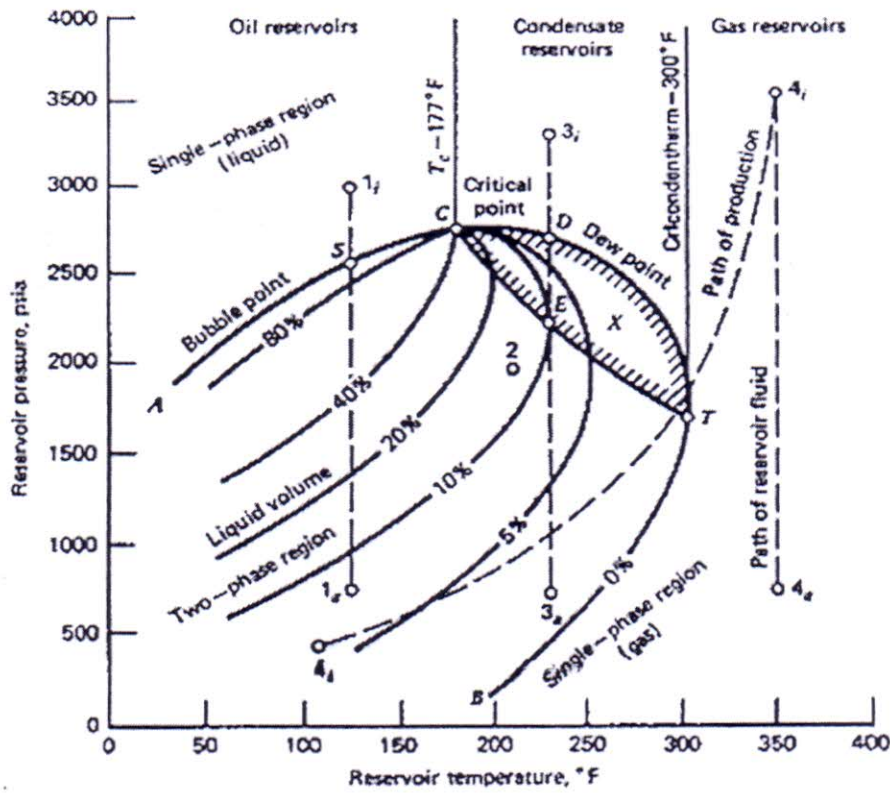


Fig. 2.2 Pressure-temperature phase diagram of a reservoir fluid.

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- B- Calculate the minimum required size of a standard oil/gas separator for the following conditions. Consider Horizontal separator.

Gas flow rate: 4.0 MMscfd

Gas-specific gravity: 0.7

Condensate-gas ratio (CGR): 15 bbl/MMscf

Condensate gravity: 65 0API

Operating pressure: 600 psig

Operating temperature: 70 °F

QUESTION TWO

(20 MARKS)

- A- Estimate water contents of a natural gas at a pressure of 2,000 psia and temperatures of 40, 80, 120, 160, 200, and 240 °F.
- B- Design an inlet scrubber , a glycol contactor, a glycol reconcentrator, The required heat load for the reboiler , size of the reboiler and A glycol flash separator for sufficient operation for a field dehydration installation to meet the following requirements. Consider trayed type contactors.

Gas flow rate: 10 MMscfd

Gas specific gravity: 0.65

Operating line pressure: 1,000 psig

Maximum working pressure of contactor: 1,440 psig

Gas inlet temperature: 90 °F

Outlet gas water content: 7 lb H₂O/MMscf

Design criteria: GWR = 3 gal TEG/lbm H₂O with 99.5% TEG

QUESTION THREE**(10 MARKS)**

For the following data given for a horizontal pipeline, estimate gas flow rate through the pipeline using the Weymouth, Panhandle A and Panhandle B equations.

Pipeline ID: 12.09 in

Pipeline length: 100 mile

Temperature: 70 °F

Gas-specific gravity: 0.65

Delivery pressure: 150 psia

Compressor pressure: 500 psia

The End

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