| | moles | P° (100 °F) | X |
|---|---|---|---|
| n-Propane | 1 | 187 | 0.5 |
| n-Butane | 1 | 52.2 | 0.5 |

| | |
|---|---|
| $P_T$ = | 100 |

$$x_1 = \frac{P_T - P_2^\circ}{P_1^\circ - P_2^\circ}$$

$$x_2 = \frac{P_T - P_1^\circ}{P_2^\circ - P_1^\circ}$$

**Liquid composition calculations:**

| | |
|---|---|
| X1 = | 0.3546 |
| X2 = | 0.6454 |

$$y_1 = \frac{P_1}{P_T} = \frac{x_1 P_1^\circ}{P_T}$$

$$y_2 = \frac{P_2}{P_T} = \frac{x_2 P_2^\circ}{P_T}$$

**Vapor composition calculations:**

| | |
|---|---|
| Y1 = | 0.6631 |
| Y2 = | 0.3369 |

**Dew point pressure calculations:**

| | |
|---|---|
| Y1 = | 0.50 |
| Y2 = | 0.50 |
| $P_T$ = | 81.62 |

$$P_T = \frac{-P_2^\circ}{\frac{y_1}{P_1^\circ}\left[P_1^\circ - P_2^\circ\right] - 1}$$

**Composition of the liquid at dew point:**

| | |
|---|---|
| X1 = | 0.2182 |
| X2 = | 0.7818 |

**Bubble point pressure calculations:**

| | |
|---|---|
| X1 = | 0.50 |
| X2 = | 0.50 |
| $P_T$ = | 119.6 |

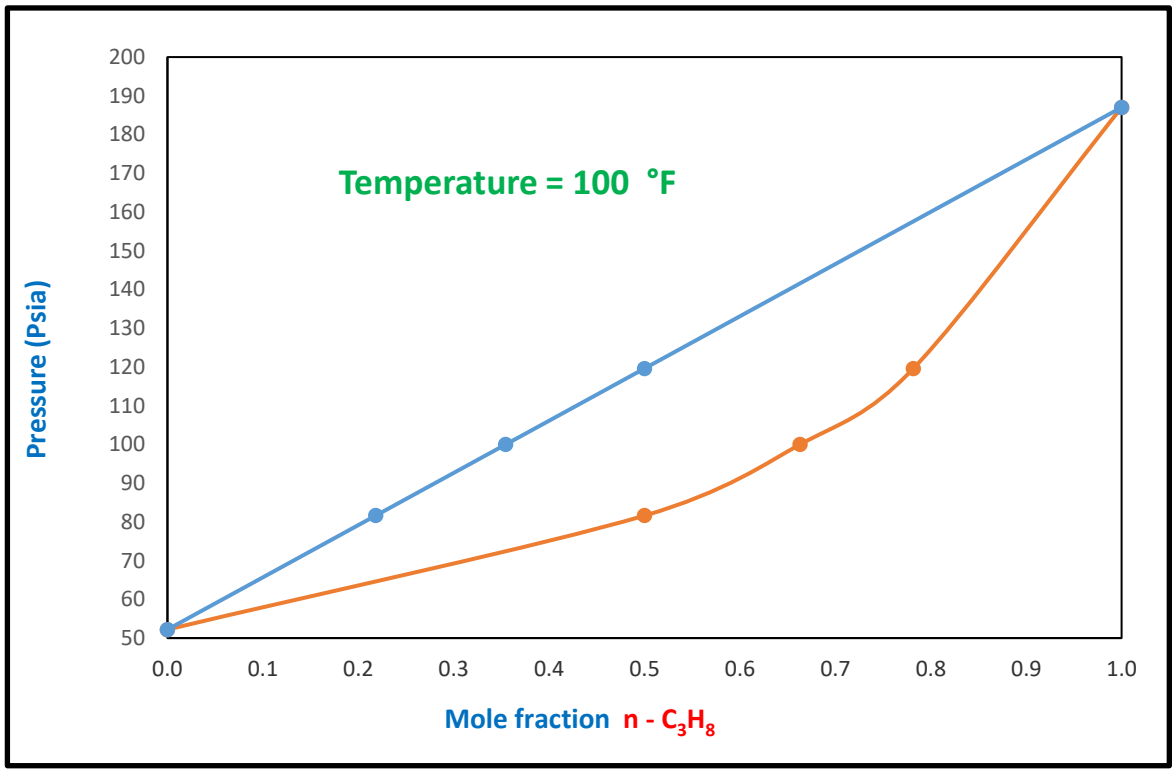
**n-Propane mole fraction**

| X | P |
|---|---|
| 0.0000 | 52.20 |
| 0.2182 | 81.62 |
| 0.3546 | 100.00 |
| 0.5000 | 119.60 |
| 1.0000 | 187.00 |

| Y | P |
|---|---|
| 0.0000 | 52.20 |
| 0.5000 | 81.62 |
| 0.6631 | 100.00 |
| 0.7818 | 119.60 |
| 1.0000 | 187.00 |

**Composition of the vapor at bubble point:**

| | |
|---|---|
| Y1 = | 0.7818 |
| Y2 = | 0.2182 |


Temperature = 100 °F
Pressure (Psia)
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Mole fraction n - C3H8