

PhazeComp-Generated L^AT_EX Report Template

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1. Executive Summary

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4. Conclusions

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Nomenclature

References

Tables

Table 1: Essential Properties for Characterization “13-Component”

| Component | MW | Tc (R) | Pc (psia) | AF | VTran | ZcVis |
|----------------|---------|-----------|--------------|---------|----------|---------|
| N2 | 28.014 | 227.16 | 492.84 | 0.03700 | −0.16758 | 0.29178 |
| CO2 | 44.010 | 547.42 | 1069.51 | 0.22500 | 0.00191 | 0.27433 |
| C1 | 16.043 | 343.01 | 667.03 | 0.01100 | −0.14996 | 0.28620 |
| C2 | 30.070 | 549.58 | 706.62 | 0.09900 | −0.06280 | 0.27924 |
| C3 | 44.097 | 665.69 | 616.12 | 0.15200 | −0.06381 | 0.27630 |
| C4 | 58.123 | 770.55 | 556.35 | 0.19035 | −0.05148 | 0.29206 |
| C5 | 72.150 | 852.96 | 500.01 | 0.23310 | −0.02686 | 0.29228 |
| C6-C7 | 92.913 | 957.51 | 439.44 | 0.28705 | 0.00610 | 0.24409 |
| C8-C9 | 117.701 | 1061.72 | 385.52 | 0.34954 | 0.03925 | 0.24281 |
| C10-C13 | 154.722 | 1189.32 | 324.05 | 0.44915 | 0.08644 | 0.24042 |
| C14-C19 | 215.832 | 1346.58 | 255.70 | 0.60920 | 0.14304 | 0.23771 |
| C20-C29 | 307.945 | 1508.35 | 194.70 | 0.83951 | 0.19198 | 0.23720 |
| C30+ | 550.068 | 1744.52 | 124.17 | 1.32402 | 0.22741 | 0.24769 |

Table 2: Binary Interaction Parameters for Characterization “13-Component”

| | N2 | CO2 | C1 | C2 |
|----------------|-----------|------------|-----------|-----------|
| CO2 | 0.00000 | | | |
| C1 | 0.02500 | 0.10500 | | |
| C2 | 0.01000 | 0.13000 | 0.00134 | |
| C3 | 0.09000 | 0.12500 | 0.00440 | 0.00089 |
| C4 | 0.09500 | 0.11500 | 0.00895 | 0.00341 |
| C5 | 0.11000 | 0.11500 | 0.01298 | 0.00607 |
| C6-C7 | 0.11000 | 0.11500 | 0.01850 | 0.01004 |
| C8-C9 | 0.11000 | 0.11500 | 0.02475 | 0.01485 |
| C10-C13 | 0.11000 | 0.11500 | 0.02852 | 0.01784 |
| C14-C19 | 0.11000 | 0.11500 | 0.03854 | 0.02609 |
| C20-C29 | 0.11000 | 0.11500 | 0.04996 | 0.03583 |
| C30+ | 0.11000 | 0.11500 | 0.06720 | 0.05103 |

Table 2: Binary Interaction Parameters for Characterization “13-Component” (cont.)

| | C3 | C4 | C5 | C6-C7 |
|----------------|-----------|-----------|-----------|--------------|
| C4 | 0.00082 | | | |
| C5 | 0.00232 | 0.00039 | | |
| C6-C7 | 0.00499 | 0.00178 | 0.00051 | |
| C8-C9 | 0.00855 | 0.00412 | 0.00199 | 0.00049 |
| C10-C13 | 0.01088 | 0.00579 | 0.00320 | 0.00116 |
| C14-C19 | 0.01758 | 0.01095 | 0.00727 | 0.00395 |
| C20-C29 | 0.02585 | 0.01773 | 0.01299 | 0.00841 |
| C30+ | 0.03921 | 0.02922 | 0.02312 | 0.01693 |

Table 2: Binary Interaction Parameters for Characterization “13-Component” (cont.)

| | C8-C9 | C10-C13 | C14-C19 | C20-C29 |
|----------------|--------------|----------------|----------------|----------------|
| C10-C13 | 0.00014 | | | |
| C14-C19 | 0.00167 | 0.00083 | | |
| C20-C29 | 0.00489 | 0.00336 | 0.00085 | |
| C30+ | 0.01179 | 0.00936 | 0.00464 | 0.00153 |

Table 3: Additional Properties for Characterization “13-Component”

| Component | Tb (F) | SG | LMW | LTb (F) | LSG |
|------------------|-------------------|-----------|------------|--------------------|------------|
| N2 | −320.625 | 0.28339 | | | |
| CO2 | −126.879 | 0.76193 | | | |
| C1 | −258.868 | 0.14609 | | | |
| C2 | −127.690 | 0.32976 | | | |
| C3 | −43.989 | 0.50977 | | | |
| C4 | 32.510 | 0.59506 | 50.417 | −6.9085 | 0.56000 |
| C5 | 97.899 | 0.64655 | 64.304 | 62.2405 | 0.61945 |
| C6-C7 | 183.230 | 0.70287 | 77.919 | 122.8177 | 0.66418 |
| C8-C9 | 272.714 | 0.75073 | 104.954 | 227.8896 | 0.72816 |
| C10-C13 | 390.606 | 0.79956 | 131.233 | 318.0091 | 0.77102 |
| C14-C19 | 549.581 | 0.84928 | 182.092 | 466.6699 | 0.82520 |
| C20-C29 | 729.046 | 0.89125 | 255.871 | 634.9664 | 0.87073 |
| C30+ | 1014.737 | 0.93912 | 374.278 | 827.5892 | 0.90993 |

Table 4: Mixture “Oil1_Before_Adjustments” Compositions

| Component | Mole Fractions | Mass Fractions |
|----------------|----------------|----------------|
| N2 | 0.008430 | 0.002300 |
| CO2 | 0.011433 | 0.004900 |
| C1 | 0.442275 | 0.069100 |
| C2 | 0.054978 | 0.016100 |
| C3 | 0.052859 | 0.022700 |
| C4 | 0.033743 | 0.019100 |
| C5 | 0.025617 | 0.018000 |
| C6-C7 | 0.053048 | 0.048000 |
| C8-C9 | 0.061679 | 0.070700 |
| C10-C13 | 0.074197 | 0.111800 |
| C14-C19 | 0.069984 | 0.147100 |
| C20-C29 | 0.054485 | 0.163400 |
| C30+ | 0.057272 | 0.306800 |
| MW | | 102.68 |

Table 5: Mixture “Oil1_After_Adjustments” Compositions

| Component | Mole Fractions | Mass Fractions |
|----------------|----------------|----------------|
| N2 | 0.008123 | 0.002286 |
| CO2 | 0.011016 | 0.004871 |
| C1 | 0.462611 | 0.074572 |
| C2 | 0.052974 | 0.016005 |
| C3 | 0.050931 | 0.022567 |
| C4 | 0.032513 | 0.018988 |
| C5 | 0.024683 | 0.017894 |
| C6-C7 | 0.051113 | 0.047718 |
| C8-C9 | 0.059430 | 0.070284 |
| C10-C13 | 0.071492 | 0.111143 |
| C14-C19 | 0.067432 | 0.146235 |
| C20-C29 | 0.052499 | 0.162440 |
| C30+ | 0.055183 | 0.304997 |
| MW | | 99.52 |

Table 6: Separator Test 1

| Temp (C) | Pres (barg) | Tot Vol 2 (m3) | | Removed (sm3) | | Cum GOR (sm3/m3) | |
|-------------------|----------------|-------------------|--------|------------------|--------|---------------------|--------|
| | | Expt | Calc | Expt | Calc | Expt | Calc |
| 38.000 | 40.000 | 1.0990 | 1.1005 | 101.84 | 104.07 | 92.66 | 94.57 |
| 38.000 | 12.500 | 1.0580 | 1.0582 | 120.01 | 121.39 | 113.43 | 114.71 |
| 15.000 | 0.000 | 1.0000 | 1.0059 | 136.58 | 134.74 | 136.58 | 133.95 |
| RMS % Err | | | 0.32 | | 1.36 | | 1.48 |
| Ave % Bias | | | 0.23 | | 0.43 | | 0.14 |

Table 6: Separator Test 1 (cont.)

| Temp (C) | Pres (barg) | Liq Den (kg/m3) | | Liq MW | | Gas Grav | |
|-------------------|----------------|--------------------|--------|--------|--------|----------|--------|
| | | Expt | Calc | Expt | Calc | Expt | Calc |
| 38.000 | 40.000 | | 803.70 | | 165.48 | 0.6660 | 0.6655 |
| 38.000 | 12.500 | | 820.69 | | 188.23 | 0.7510 | 0.7558 |
| 15.000 | 0.000 | 843.80 | 844.29 | 209.99 | 209.68 | 1.1480 | 1.1765 |
| RMS % Err | | | 0.06 | | 0.15 | | 1.45 |
| Ave % Bias | | | 0.06 | | -0.15 | | 0.95 |

Figures

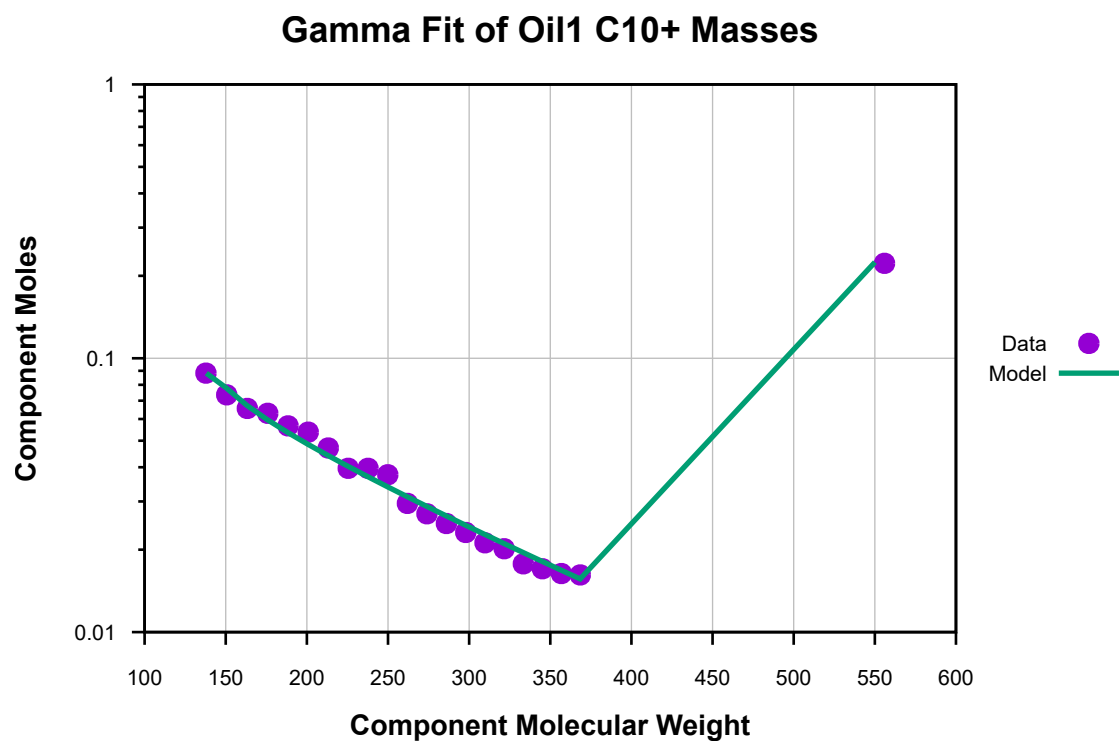


Figure 1: Molar Gamma Fit of Oil1 C10+ Masses. Gamma Shape = 0.87535, Average = 293.64, Bound = 132.89, Origin = 132.89.

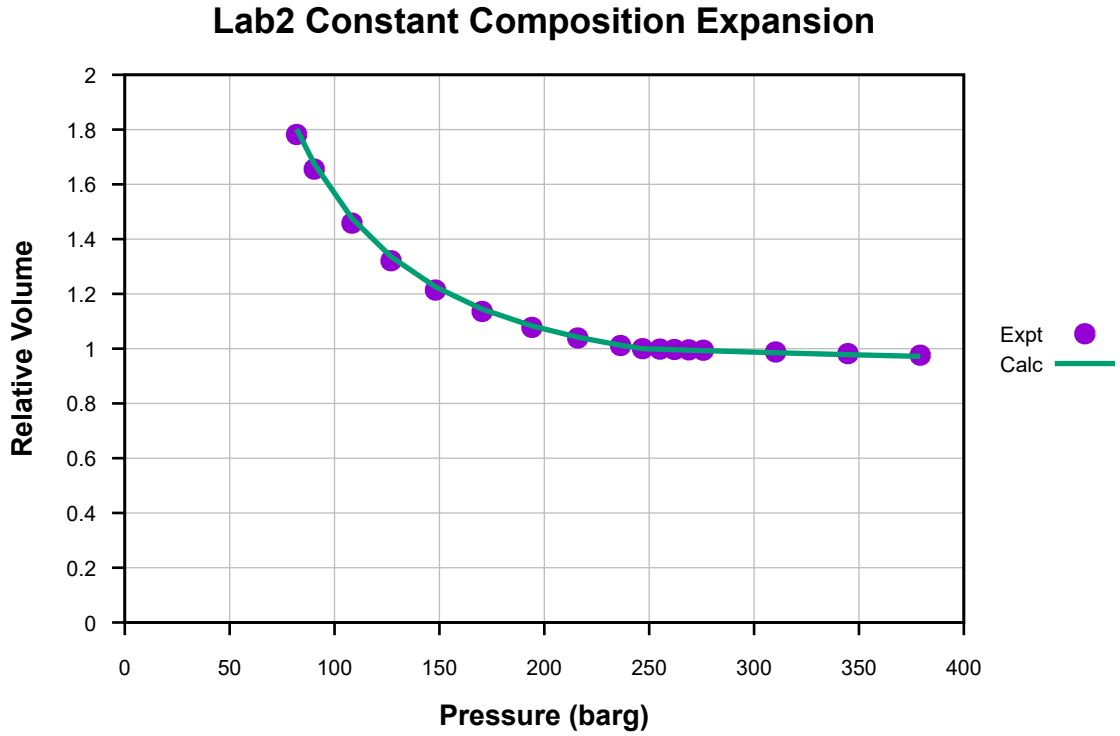


Figure 2: Relative Volume vs. Pressure for Lab2 Constant Composition Expansion.

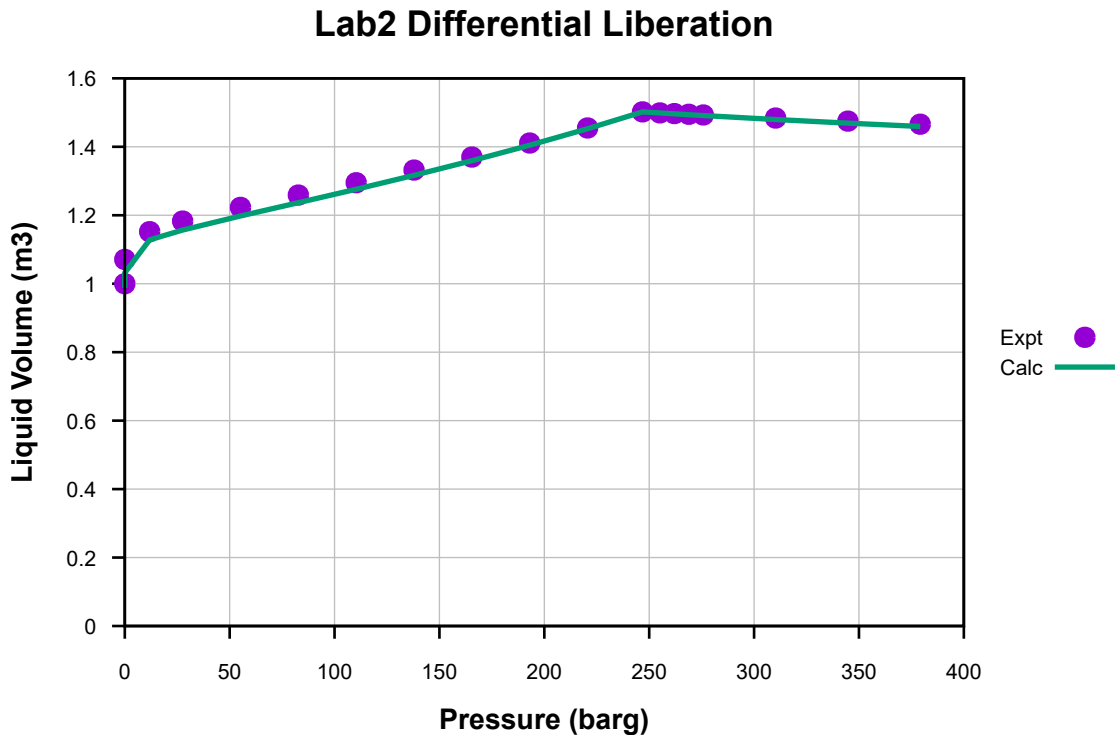


Figure 3: Liquid Volume vs. Pressure for Lab2 Differential Liberation.

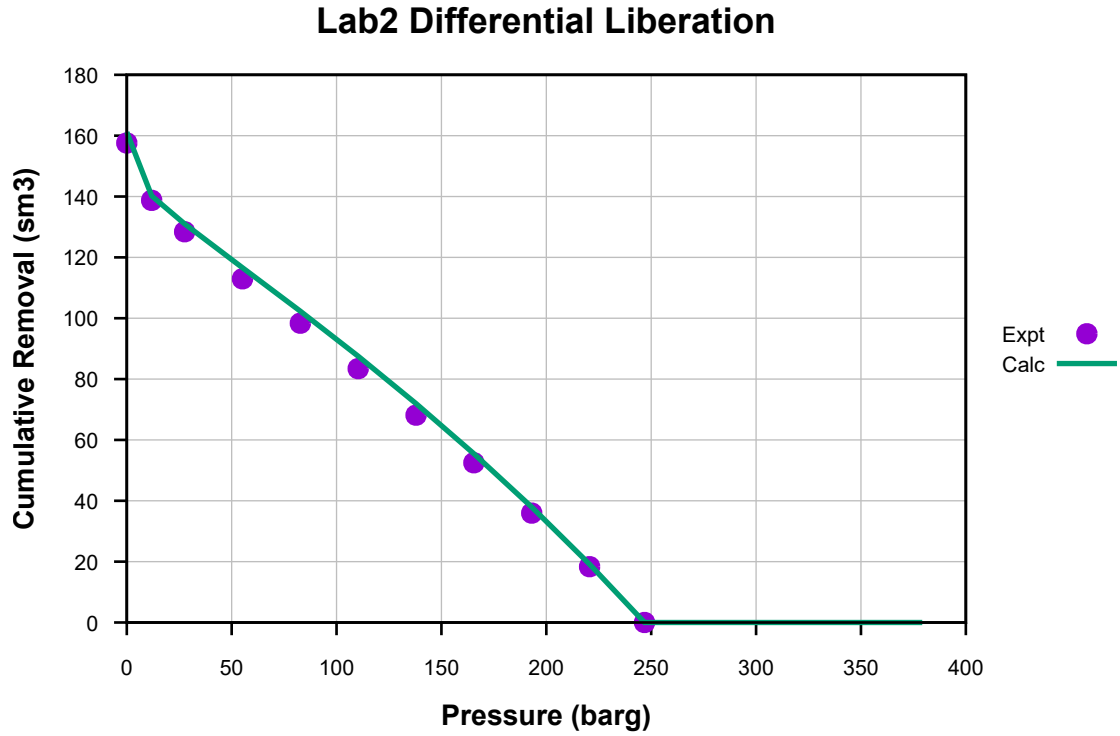


Figure 4: Cumulative Removal vs. Pressure for Lab2 Differential Liberation.

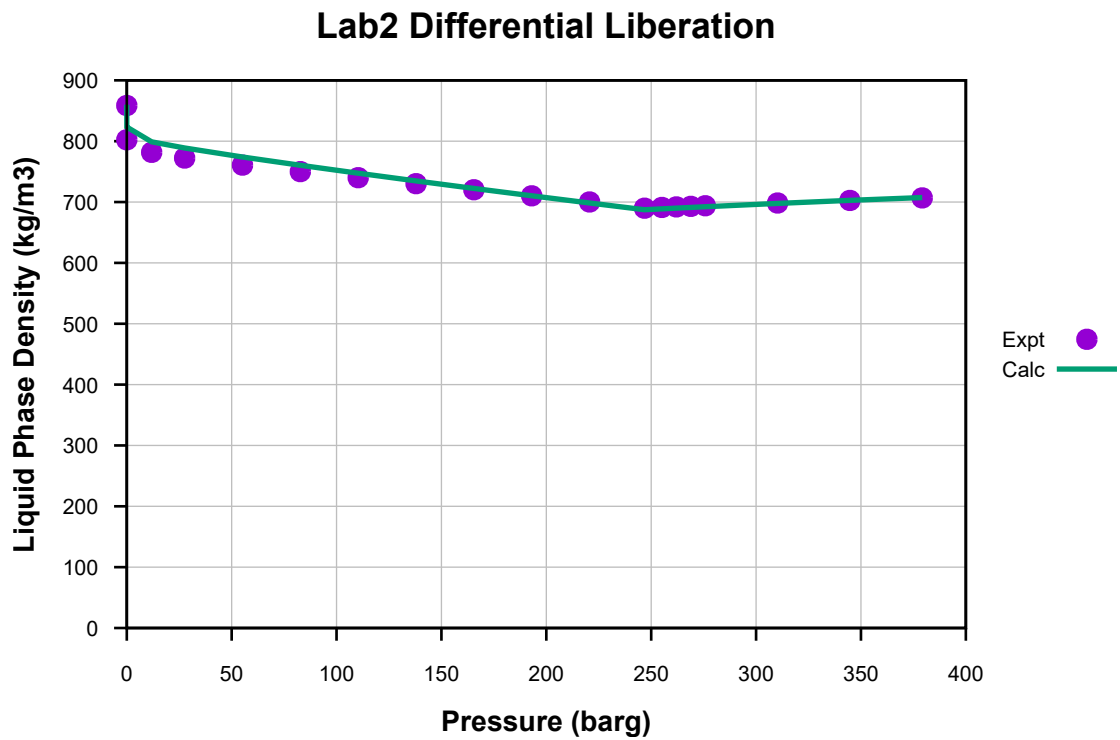


Figure 5: Liquid Phase Density vs. Pressure for Lab2 Differential Liberation.

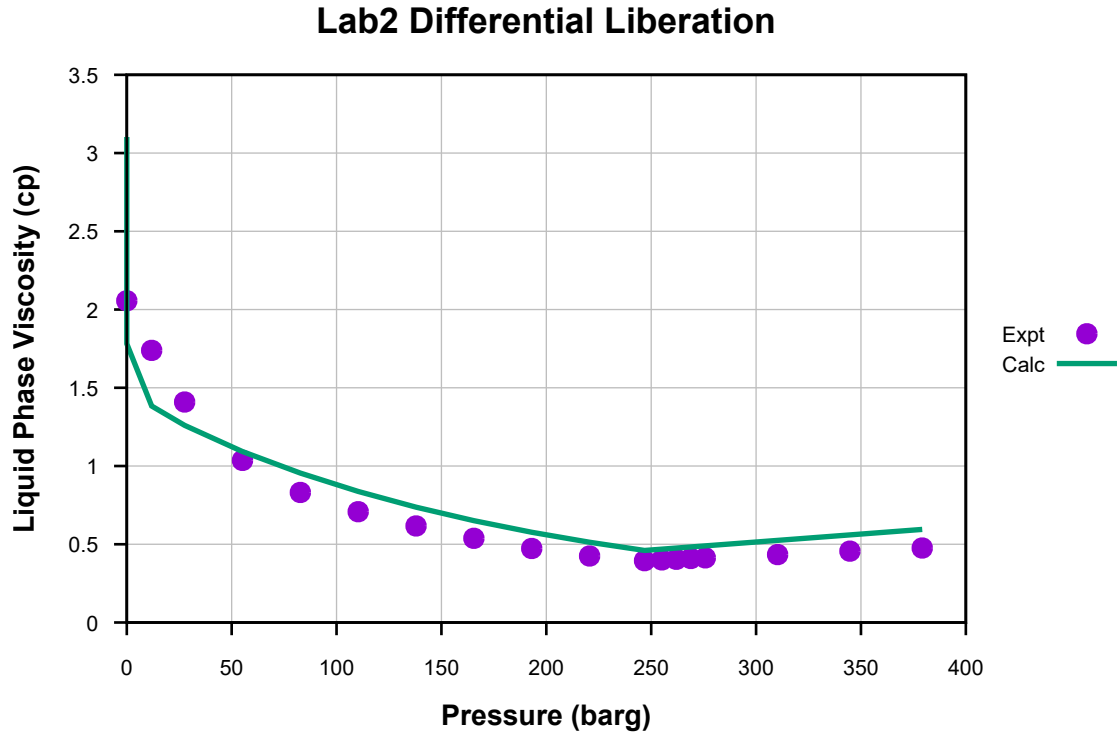


Figure 6: Liquid Phase Viscosity vs. Pressure for Lab2 Differential Liberation.

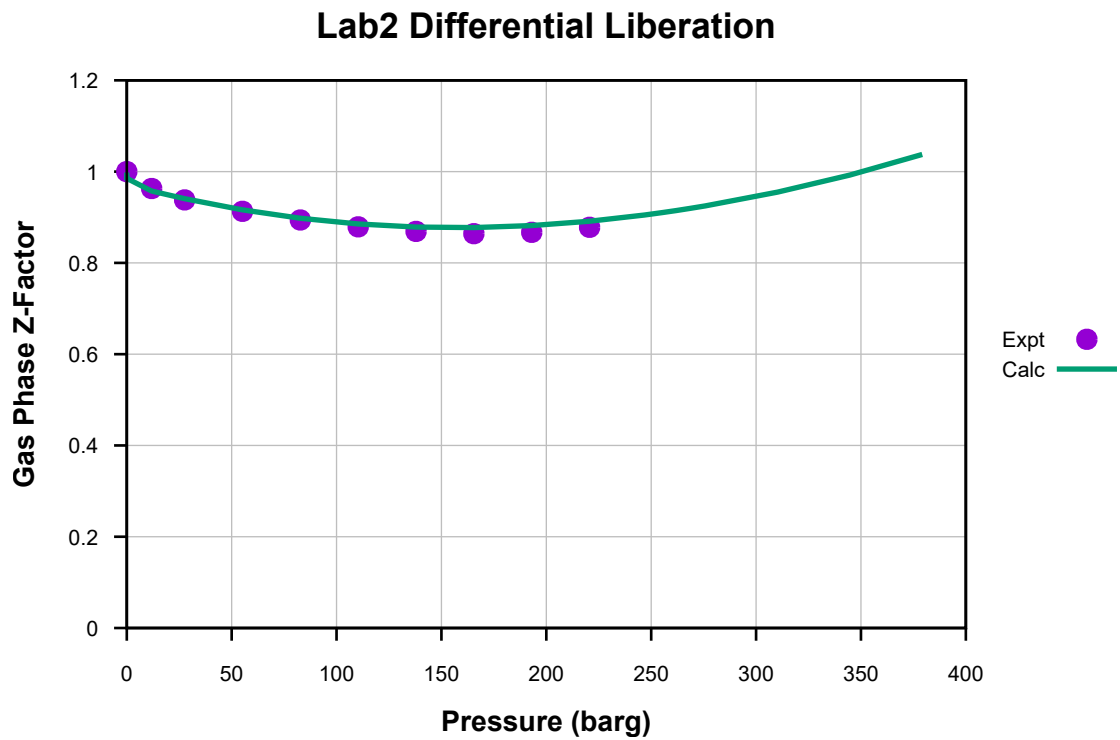


Figure 7: Gas Phase Z-Factor vs. Pressure for Lab2 Differential Liberation.

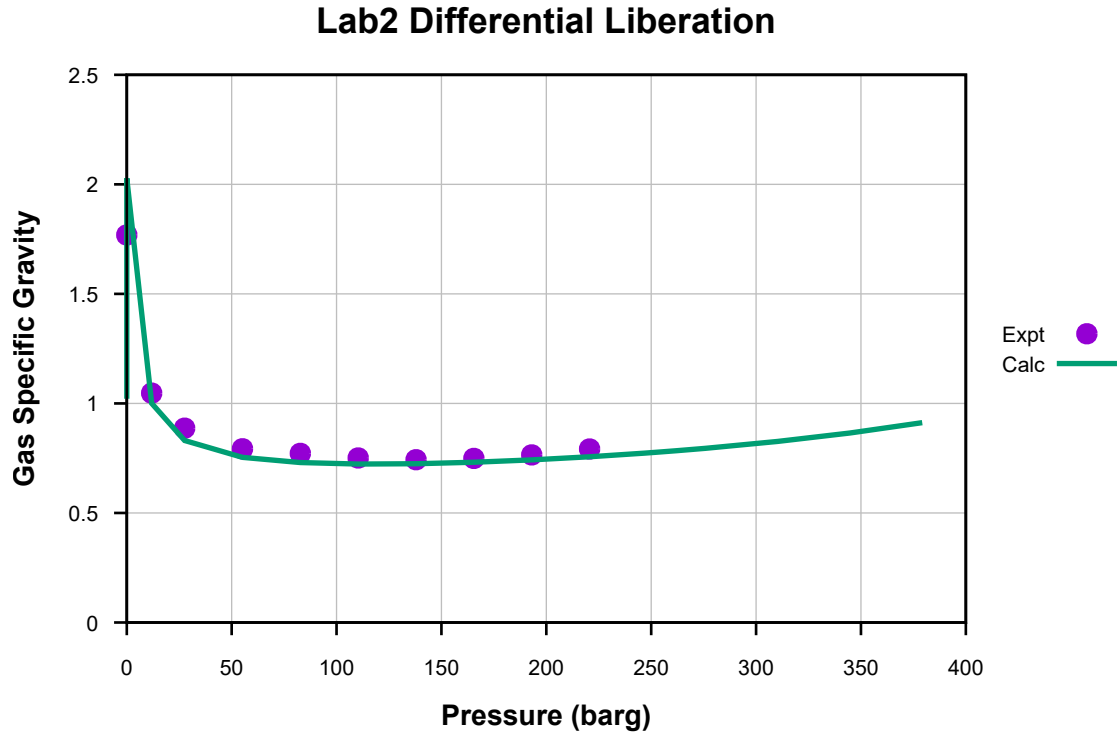


Figure 8: Gas Specific Gravity vs. Pressure for Lab2 Differential Liberation.

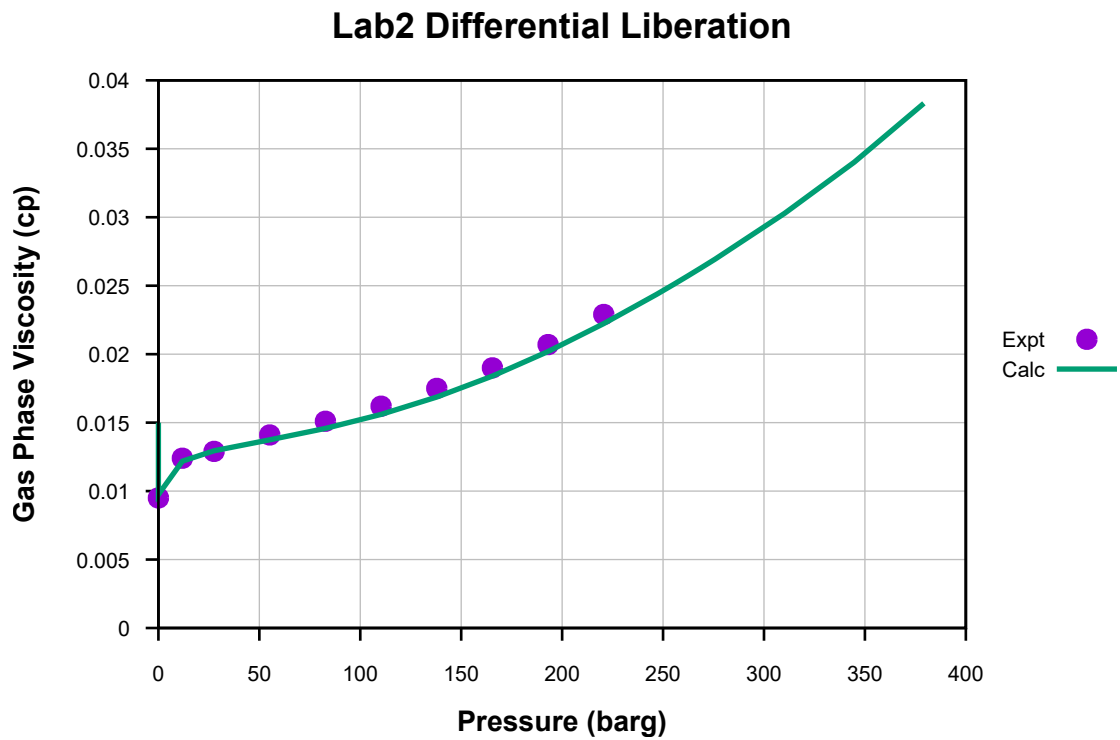


Figure 9: Gas Phase Viscosity vs. Pressure for Lab2 Differential Liberation.

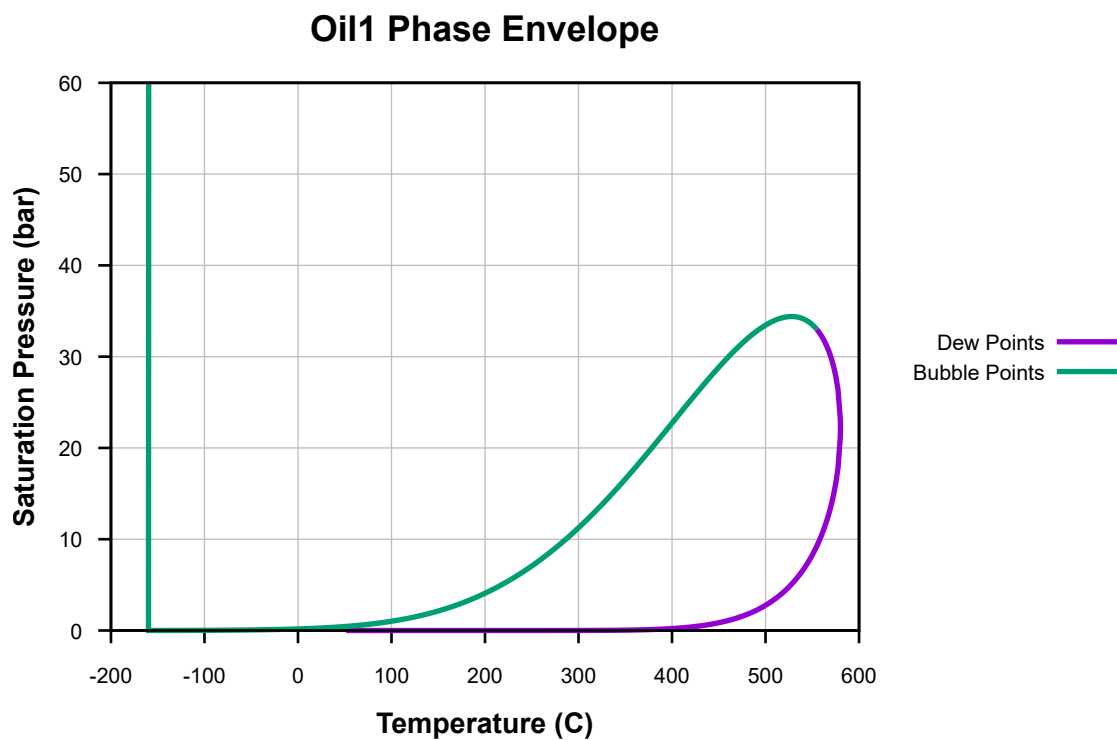


Figure 10: Saturation Pressure vs. Temperature, Oil1 Phase Envelope.

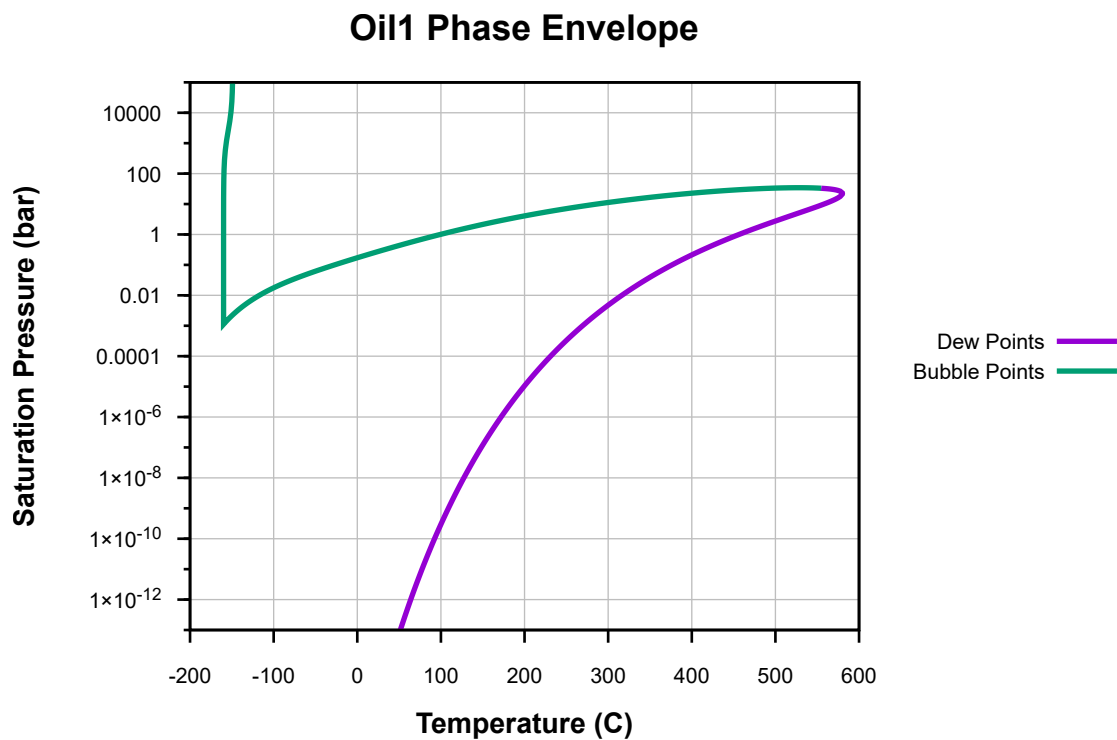


Figure 11: Log of Saturation Pressure vs. Temperature, Oil1 Phase Envelope.

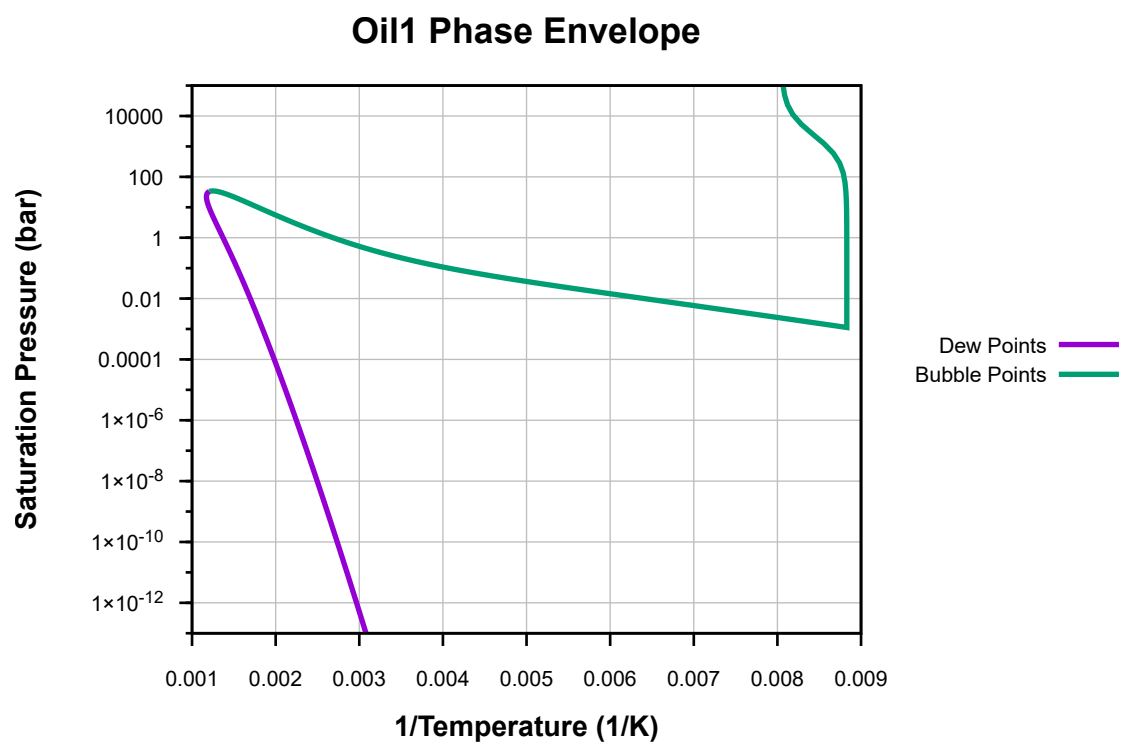


Figure 12: Log of Saturation Pressure vs. $1/\text{Temperature}$, Oil1 Phase Envelope.