

PhazeComp-Generated L^AT_EX Report Template

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January 3, 2026

Contents

List of Tables	ii
List of Figures	iii
1. Executive Summary	1
2. Introduction	2
2.1. A New Section	2
3. A New Chapter	3
3.1. A New Section	3
3.1.1. A new sub-section	3
4. Conclusions	5
Acknowledgements	6
Nomenclature	7
References	8
Tables	9
Figures	32

List of Tables

1.	Essential Properties for Characterization “SCN EOS”	10
2.	Binary Interaction Parameters for Characterization “SCN EOS”	11
3.	Additional Properties for Characterization “SCN EOS”	15
4.	Mixture “Lab1_Oil_Analysis_1” Compositions	16
5.	Mixture “Lab1_Oil_Analysis_2” Compositions	17
6.	Mixture “Lab1_Recombined_Oil” Compositions	18
7.	Mixture “Lab2_Recombined_Oil” Compositions	19
8.	Mixture “Lab2_Reported_Slimtube_Oil” Compositions	20
9.	Mixture “Lab2_Slimtube_Oil” Compositions	21
10.	Mixture “Lab1_Recombined_Oil” Compositions	22
11.	Lab1 Single-Stage Separation	22
12.	Mixture “Lab1_Swelling_Gas” Compositions	23
13.	Lab2 Separator Test #1	23
14.	Lab2 Separator Test #2	23
15.	Lab2 Separator Test #3	24
16.	Lab2 Separation of Slimtube Sample	24
17.	Mixture “Lab3_MDT1_Oil” Compositions	25
18.	Separation of Lab3_MDT1_Oil	25
19.	Mixture “Lab3_Surface_Oil” Compositions	26
20.	Separation of Lab3_Surface_Oil	26
21.	Mixture “Lab3_Swelling_Gas” Compositions	27
22.	Mixture “Lab3_MDT2_Oil” Compositions	28
23.	Single-Stage Separation of Lab3_MDT2_Oil	28
24.	Multi-Stage Separation of Lab3_MDT2_Oil	29
25.	Mixture “Lab3_MDT3_Oil” Compositions	30
26.	Single-Stage Separation of Lab3_MDT3_Oil	30

List of Figures

1.	Specific Gravity vs. Molecular Weight for EOS Fluid Characterization “SCN EOS.”	32
2.	Boiling Temperature vs. Molecular Weight for EOS Fluid Characterization “SCN EOS.”	33
3.	Critical Temperature vs. Molecular Weight for EOS Fluid Characterization “SCN EOS.”	33
4.	Critical Pressure vs. Molecular Weight for EOS Fluid Characterization “SCN EOS.”	34
5.	Acentric Factor vs. Molecular Weight for EOS Fluid Characterization “SCN EOS.”	34
6.	Volume Translation vs. Molecular Weight for EOS Fluid Characterization “SCN EOS.”	35
7.	Critical Z-Factor vs. Molecular Weight for EOS Fluid Characterization “SCN EOS.”	35
8.	Viscosity Z-Factor vs. Molecular Weight for EOS Fluid Characterization “SCN EOS.”	36
9.	Liquid Viscosity vs. Molecular Weight for EOS Fluid Characterization “SCN EOS.”	36
10.	Parachor vs. Molecular Weight for EOS Fluid Characterization “SCN EOS.”	37
11.	Saturation Pressure vs. Mass Fraction Injectant for Lab1 Swelling Test.	37
12.	Overall Density vs. Mass Fraction Injectant for Lab1 Swelling Test.	38
13.	Liquid Volume Fraction vs. Mass Fraction Injectant for Lab1 Swelling Test.	38
14.	Liquid Phase Viscosity vs. Mole Fraction Injectant for Lab1 Viscosity Test.	39
15.	Liquid Volume Fraction, After Removal, vs. Pressure for P/V Test on Lab1 0% Solvent/Oil Mixture.	39
16.	Liquid Volume Fraction, After Removal, vs. Pressure for P/V Test on Lab1 23% Solvent/Oil Mixture.	40
17.	Liquid Volume Fraction, After Removal, vs. Pressure for P/V Test on Lab1 54% Solvent/Oil Mixture.	40
18.	Liquid Volume Fraction, After Removal, vs. Pressure for P/V Test on Lab1 61% Solvent/Oil Mixture.	41
19.	Liquid Volume Fraction, After Removal, vs. Pressure for P/V Test on Lab1 65% Solvent/Oil Mixture.	41
20.	Liquid Volume Fraction, After Removal, vs. Pressure for P/V Test on Lab1 78% Solvent/Oil Mixture.	42
21.	Relative Volume vs. Pressure for Lab2 Constant Composition Expansion.	42
22.	Liquid Volume vs. Pressure for Lab2 Differential Liberation.	43
23.	Cumulative Removal vs. Pressure for Lab2 Differential Liberation.	43
24.	Liquid Phase Density vs. Pressure for Lab2 Differential Liberation.	44
25.	Liquid Phase Viscosity vs. Pressure for Lab2 Differential Liberation.	44
26.	Gas Phase Z-Factor vs. Pressure for Lab2 Differential Liberation.	45

27.	Gas Specific Gravity vs. Pressure for Lab2 Differential Liberation.	45
28.	Gas Phase Viscosity vs. Pressure for Lab2 Differential Liberation.	46
29.	Overall Density vs. Pressure for Lab2 CCE of Surface Sample.	46
30.	Relative Volume vs. Pressure for CCE of Lab3_MDT1_Oil.	47
31.	Liquid Saturation vs. Pressure for CCE of Lab3_MDT1_Oil.	47
32.	Liquid Phase Density vs. Pressure for CCE of Lab3_MDT1_Oil.	48
33.	Volume, After Removal, vs. Pressure for DLE of Lab3_MDT1_Oil.	48
34.	Cumulative Removal vs. Pressure for DLE of Lab3_MDT1_Oil.	49
35.	Liquid Phase Viscosity vs. Pressure for DLE of Lab3_MDT1_Oil.	49
36.	Gas Phase Density vs. Pressure for DLE of Lab3_MDT1_Oil.	50
37.	Gas Specific Gravity vs. Pressure for DLE of Lab3_MDT1_Oil.	50
38.	Gas Phase Z-Factor vs. Pressure for DLE of Lab3_MDT1_Oil.	51
39.	Saturation Pressure vs. Relative Moles Injected for Swelling of Lab3_Surface_Oil with 23% C2+ Gas.	51
40.	Liquid Volume Fraction vs. Relative Moles Injected for Swelling of Lab3_Surface_Oil with 23% C2+ Gas.	52
41.	Overall Density vs. Relative Moles Injected for Swelling of Lab3_Surface_Oil with 23% C2+ Gas.	52
42.	Relative Volume vs. Relative Moles Injected for Swelling of Lab3_Surface_Oil with 23% C2+ Gas.	53
43.	Relative Volume vs. Pressure for CCE of 100% Lab3_Surface_Oil, 0% Injectant. .	53
44.	Liquid Saturation vs. Pressure for CCE of 100% Lab3_Surface_Oil, 0% Injectant. .	54
45.	Overall Density vs. Pressure for CCE of 100% Lab3_Surface_Oil, 0% Injectant. .	54
46.	Relative Volume vs. Pressure for CCE of 80% Lab3_Surface_Oil, 20% Injectant. .	55
47.	Liquid Saturation vs. Pressure for CCE of 80% Lab3_Surface_Oil, 20% Injectant. .	55
48.	Overall Density vs. Pressure for CCE of 80% Lab3_Surface_Oil, 20% Injectant. .	56
49.	Relative Volume vs. Pressure for CCE of 60% Lab3_Surface_Oil, 40% Injectant. .	56
50.	Liquid Saturation vs. Pressure for CCE of 60% Lab3_Surface_Oil, 40% Injectant. .	57
51.	Overall Density vs. Pressure for CCE of 60% Lab3_Surface_Oil, 40% Injectant. .	57
52.	Relative Volume vs. Pressure for CCE of 50% Lab3_Surface_Oil, 50% Injectant. .	58
53.	Liquid Saturation vs. Pressure for CCE of 50% Lab3_Surface_Oil, 50% Injectant. .	58
54.	Overall Density vs. Pressure for CCE of 50% Lab3_Surface_Oil, 50% Injectant. .	59
55.	Relative Volume vs. Pressure for CCE of 40% Lab3_Surface_Oil, 60% Injectant. .	59
56.	Liquid Saturation vs. Pressure for CCE of 40% Lab3_Surface_Oil, 60% Injectant. .	60
57.	Overall Density vs. Pressure for CCE of 40% Lab3_Surface_Oil, 60% Injectant. .	60
58.	Liquid Saturation vs. Pressure for CCE of 10% Lab3_Surface_Oil, 90% Injectant. .	61
59.	Overall Density vs. Pressure for CCE of 10% Lab3_Surface_Oil, 90% Injectant. .	61
60.	Liquid Volume Fraction vs. Pressure for CCE of Lab3_MDT2_Oil.	62
61.	Relative Volume vs. Pressure for CCE of Lab3_MDT2_Oil.	62
62.	Liquid Phase Density vs. Pressure for CCE of Lab3_MDT2_Oil.	63
63.	Cumulative Removal vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.	63
64.	Liquid Phase Density vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.	64
65.	Liquid Volume vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.	64
66.	Liquid Phase Viscosity vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.	65
67.	Gas Phase Density vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.	65
68.	Gas Specific Gravity vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.	66
69.	Gas Phase Z-Factor vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.	66
70.	Gas Phase Viscosity vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.	67
71.	Gas C1 Mole Fraction vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.	67

72.	Gas C2 Mole Fraction vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.	68
73.	Gas C3 Mole Fraction vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.	68
74.	Gas C4+ Mole Fraction vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.	69
75.	Cumulative Removal vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.	69
76.	Liquid Phase Density vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.	70
77.	Liquid Volume vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.	70
78.	Liquid Phase Viscosity vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.	71
79.	Gas Phase Density vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.	71
80.	Gas Specific Gravity vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.	72
81.	Gas Phase Z-Factor vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.	72
82.	Gas Phase Viscosity vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.	73
83.	Gas C1 Mole Fraction vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.	73
84.	Gas C2 Mole Fraction vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.	74
85.	Gas C3 Mole Fraction vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.	74
86.	Gas C4+ Mole Fraction vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.	75

1. Executive Summary

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4. Conclusions

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Nomenclature

References

Tables

Table 1: Essential Properties for Characterization “SCN EOS”

Component	MW	Tc (K)	Pc (bar)	AF	VTran	ZcVis	Pchor
N2	28.014	126.200	33.9800	0.03700	−0.16758	0.29178	59.10
CO2	44.010	304.120	73.7400	0.22500	0.00191	0.27433	80.00
C1	16.043	190.560	45.9900	0.01100	−0.14996	0.28620	71.00
C2	30.070	305.320	48.7200	0.09900	−0.06280	0.27924	111.00
C3	44.097	369.830	42.4800	0.15200	−0.06381	0.27630	151.00
I-C4	58.123	407.850	36.4000	0.18600	−0.06197	0.28199	188.80
N-C4	58.123	425.120	37.9600	0.20000	−0.05393	0.27385	191.00
I-C5	72.150	460.390	33.8100	0.22900	−0.05646	0.27231	227.40
N-C5	72.150	469.700	33.7000	0.25200	−0.02928	0.26837	231.00
C6	84.751	513.482	33.2738	0.24565	−0.02474	0.26937	238.40
C7	98.595	548.497	30.6745	0.28230	−0.00820	0.26470	271.63
C8	112.460	579.790	28.5096	0.31809	0.00569	0.26382	304.90
C9	126.496	608.034	26.6688	0.35344	0.01630	0.26193	338.59
C10	140.601	633.638	25.0637	0.38879	0.02551	0.26089	372.44
C11	154.767	656.967	23.6316	0.42389	0.03433	0.26023	406.44
C12	168.989	678.316	22.3551	0.45899	0.04227	0.25991	440.57
C13	183.259	697.934	21.2094	0.49067	0.04946	0.25980	474.82
C14	197.571	716.029	20.1758	0.52390	0.05598	0.25987	509.17
C15	211.919	732.779	19.2390	0.55671	0.06189	0.26006	543.61
C16	226.301	748.334	18.3869	0.58907	0.06723	0.26035	578.12
C17	240.711	762.825	17.6091	0.62093	0.07203	0.26073	612.71
C18	255.149	776.364	16.8968	0.65228	0.07634	0.26119	647.36
C19	269.611	789.048	16.2427	0.68308	0.08019	0.26171	682.07
C20	284.096	800.961	15.6403	0.71332	0.08359	0.26230	716.83
C21	298.601	812.177	15.0840	0.74300	0.08660	0.26294	751.64
C22	313.126	822.761	14.5690	0.77210	0.08923	0.26363	786.50
C23	327.669	832.769	14.0910	0.80064	0.09152	0.26437	821.41
C24	342.230	842.251	13.6463	0.82860	0.09349	0.26514	856.35
C25	356.807	851.252	13.2316	0.85600	0.09518	0.26596	891.34
C26	371.400	859.812	12.8441	0.88284	0.09660	0.26681	926.36
C27	386.007	867.964	12.4812	0.90912	0.09777	0.26769	961.42
C28	400.628	875.742	12.1406	0.93486	0.09873	0.26859	996.51
C29	415.262	883.172	11.8204	0.96007	0.09948	0.26952	1031.63
C30+	602.891	956.060	8.9445	1.23959	0.09809	0.28233	1481.94

Table 2: Binary Interaction Parameters for Characterization “SCN EOS”

	N2	CO2	C1	C2	C3
CO2	−0.01200				
C1	0.03600	0.09600			
C2	0.10000	0.10000	0.00189		
C3	0.10000	0.10000	0.00622	0.00023	
I-C4	0.10000	0.10000	0.01188	0.00079	0.00017
N-C4	0.10000	0.10000	0.01118	0.00071	0.00013
I-C5	0.10000	0.10000	0.01602	0.00127	0.00042
N-C5	0.10000	0.10000	0.01626	0.00130	0.00044
C6	0.10000	0.10000	0.01933	0.00168	0.00067
C7	0.10000	0.10000	0.02346	0.00222	0.00103
C8	0.10000	0.10000	0.02734	0.00275	0.00140
C9	0.10000	0.10000	0.03101	0.00326	0.00178
C10	0.10000	0.10000	0.03450	0.00376	0.00215
C11	0.10000	0.10000	0.03785	0.00425	0.00253
C12	0.10000	0.10000	0.04104	0.00473	0.00290
C13	0.10000	0.10000	0.04408	0.00518	0.00326
C14	0.10000	0.10000	0.04698	0.00563	0.00362
C15	0.10000	0.10000	0.04975	0.00605	0.00396
C16	0.10000	0.10000	0.05239	0.00646	0.00430
C17	0.10000	0.10000	0.05490	0.00686	0.00463
C18	0.10000	0.10000	0.05730	0.00723	0.00494
C19	0.10000	0.10000	0.05958	0.00760	0.00524
C20	0.10000	0.10000	0.06175	0.00794	0.00554
C21	0.10000	0.10000	0.06383	0.00828	0.00582
C22	0.10000	0.10000	0.06580	0.00860	0.00609
C23	0.10000	0.10000	0.06769	0.00891	0.00635
C24	0.10000	0.10000	0.06950	0.00920	0.00660
C25	0.10000	0.10000	0.07122	0.00948	0.00685
C26	0.10000	0.10000	0.07287	0.00976	0.00708
C27	0.10000	0.10000	0.07444	0.01002	0.00730
C28	0.10000	0.10000	0.07596	0.01027	0.00752
C29	0.10000	0.10000	0.07741	0.01051	0.00773
C30+	0.12663	0.12663	0.11847	0.03959	0.03651

Table 2: Binary Interaction Parameters for Characterization “SCN EOS” (cont.)

	I-C4	N-C4	I-C5	N-C5	C6
N-C4	0.00000				
I-C5	0.00006	0.00008			
N-C5	0.00006	0.00009	0.00000		
C6	0.00017	0.00021	0.00003	0.00003	
C7	0.00037	0.00042	0.00013	0.00012	0.00004
C8	0.00060	0.00067	0.00029	0.00027	0.00013
C9	0.00086	0.00094	0.00047	0.00045	0.00026
C10	0.00112	0.00122	0.00067	0.00065	0.00042
C11	0.00140	0.00151	0.00089	0.00087	0.00060
C12	0.00168	0.00180	0.00112	0.00109	0.00079
C13	0.00196	0.00209	0.00135	0.00132	0.00098
C14	0.00224	0.00238	0.00158	0.00155	0.00118
C15	0.00252	0.00266	0.00182	0.00178	0.00139
C16	0.00279	0.00294	0.00205	0.00201	0.00159
C17	0.00305	0.00321	0.00228	0.00224	0.00179
C18	0.00331	0.00347	0.00250	0.00246	0.00199
C19	0.00356	0.00373	0.00272	0.00268	0.00219
C20	0.00380	0.00398	0.00294	0.00289	0.00238
C21	0.00404	0.00422	0.00314	0.00310	0.00257
C22	0.00427	0.00445	0.00335	0.00330	0.00275
C23	0.00449	0.00468	0.00354	0.00349	0.00293
C24	0.00470	0.00490	0.00373	0.00368	0.00311
C25	0.00491	0.00511	0.00392	0.00387	0.00328
C26	0.00511	0.00531	0.00410	0.00405	0.00344
C27	0.00530	0.00551	0.00427	0.00422	0.00360
C28	0.00549	0.00570	0.00444	0.00439	0.00376
C29	0.00567	0.00588	0.00460	0.00455	0.00391
C30+	0.03417	0.03441	0.03294	0.03288	0.03213

Table 2: Binary Interaction Parameters for Characterization “SCN EOS” (cont.)

	C7	C8	C9	C10	C11
C8	0.00003				
C9	0.00010	0.00002			
C10	0.00021	0.00008	0.00002		
C11	0.00033	0.00017	0.00007	0.00002	
C12	0.00048	0.00027	0.00014	0.00006	0.00001
C13	0.00063	0.00039	0.00023	0.00012	0.00005
C14	0.00080	0.00052	0.00033	0.00019	0.00010
C15	0.00097	0.00066	0.00044	0.00028	0.00016
C16	0.00114	0.00081	0.00056	0.00038	0.00024
C17	0.00131	0.00095	0.00068	0.00048	0.00032
C18	0.00148	0.00110	0.00081	0.00058	0.00041
C19	0.00165	0.00125	0.00094	0.00069	0.00050
C20	0.00182	0.00140	0.00107	0.00081	0.00060
C21	0.00199	0.00154	0.00119	0.00092	0.00070
C22	0.00215	0.00169	0.00132	0.00103	0.00079
C23	0.00231	0.00183	0.00145	0.00114	0.00089
C24	0.00246	0.00197	0.00157	0.00125	0.00099
C25	0.00262	0.00210	0.00169	0.00136	0.00109
C26	0.00276	0.00223	0.00181	0.00147	0.00118
C27	0.00291	0.00236	0.00193	0.00157	0.00128
C28	0.00305	0.00249	0.00204	0.00168	0.00137
C29	0.00318	0.00261	0.00215	0.00178	0.00146
C30+	0.03127	0.03058	0.03001	0.02954	0.02913

Table 2: Binary Interaction Parameters for Characterization “SCN EOS” (cont.)

	C12	C13	C14	C15	C16
C13	0.00001				
C14	0.00004	0.00001			
C15	0.00009	0.00004	0.00001		
C16	0.00014	0.00007	0.00003	0.00001	
C17	0.00021	0.00012	0.00006	0.00003	0.00001
C18	0.00028	0.00018	0.00011	0.00006	0.00002
C19	0.00036	0.00024	0.00016	0.00009	0.00005
C20	0.00044	0.00031	0.00021	0.00014	0.00008
C21	0.00052	0.00038	0.00027	0.00018	0.00012
C22	0.00060	0.00045	0.00033	0.00024	0.00016
C23	0.00069	0.00053	0.00040	0.00029	0.00021
C24	0.00078	0.00060	0.00046	0.00035	0.00026
C25	0.00086	0.00068	0.00053	0.00041	0.00031
C26	0.00095	0.00076	0.00060	0.00047	0.00036
C27	0.00104	0.00083	0.00067	0.00053	0.00041
C28	0.00112	0.00091	0.00073	0.00059	0.00047
C29	0.00120	0.00099	0.00080	0.00065	0.00052
C30+	0.02879	0.02850	0.02824	0.02802	0.02783

Table 2: Binary Interaction Parameters for Characterization “SCN EOS” (cont.)

	C17	C18	C19	C20	C21
C18	0.00001				
C19	0.00002	0.00000			
C20	0.00004	0.00002	0.00000		
C21	0.00007	0.00004	0.00002	0.00000	
C22	0.00010	0.00006	0.00003	0.00001	0.00000
C23	0.00014	0.00009	0.00006	0.00003	0.00001
C24	0.00018	0.00013	0.00008	0.00005	0.00003
C25	0.00023	0.00016	0.00011	0.00007	0.00004
C26	0.00027	0.00020	0.00014	0.00010	0.00006
C27	0.00032	0.00024	0.00018	0.00013	0.00009
C28	0.00037	0.00028	0.00021	0.00016	0.00011
C29	0.00041	0.00033	0.00025	0.00019	0.00014
C30+	0.02767	0.02752	0.02740	0.02729	0.02720

Table 2: Binary Interaction Parameters for Characterization “SCN EOS” (cont.)

	C22	C23	C24	C25	C26
C23	0.00000				
C24	0.00001	0.00000			
C25	0.00002	0.00001	0.00000		
C26	0.00004	0.00002	0.00001	0.00000	
C27	0.00006	0.00004	0.00002	0.00001	0.00000
C28	0.00008	0.00005	0.00003	0.00002	0.00001
C29	0.00010	0.00007	0.00005	0.00003	0.00002
C30+	0.02712	0.02704	0.02698	0.02693	0.02688

Table 2: Binary Interaction Parameters for Characterization “SCN EOS” (cont.)

	C27	C28	C29
C28	0.00000		
C29	0.00001	0.00000	
C30+	0.02684	0.02680	0.02677

Table 3: Additional Properties for Characterization “SCN EOS”

Component	SG	Tb (C)	Zc	Visc (cp)
N2	0.28339	−195.90291	0.29178	
CO2	0.76193	−88.26608	0.27433	
C1	0.14609	−161.59338	0.28620	
C2	0.32976	−88.71667	0.27924	
C3	0.50977	−42.21618	0.27630	
I-C4	0.57043	−11.65811	0.28199	
N-C4	0.59055	−0.51619	0.27385	
I-C5	0.62952	28.01296	0.27231	
N-C5	0.63585	36.18684	0.26837	
C6	0.69921	64.83930	0.26937	
C7	0.72940	94.25535	0.26470	
C8	0.75398	121.35092	0.26056	0.25399
C9	0.77457	146.51023	0.25684	0.31400
C10	0.79195	169.99044	0.25345	0.38383
C11	0.80682	191.98102	0.25031	0.46429
C12	0.81967	212.63178	0.24738	0.55621
C13	0.83088	232.06704	0.24461	0.66040
C14	0.84075	250.39330	0.24195	0.77761
C15	0.84950	267.70376	0.23940	0.90859
C16	0.85730	284.08099	0.23692	1.05401
C17	0.86430	299.59884	0.23450	1.21454
C18	0.87063	314.32372	0.23213	1.39081
C19	0.87636	328.31560	0.22981	1.58340
C20	0.88158	341.62882	0.22754	1.79286
C21	0.88635	354.31270	0.22531	2.01972
C22	0.89074	366.41217	0.22311	2.26448
C23	0.89477	377.96816	0.22096	2.52760
C24	0.89850	389.01807	0.21884	2.80952
C25	0.90196	399.59611	0.21676	3.11066
C26	0.90517	409.73362	0.21472	3.43140
C27	0.90817	419.45935	0.21272	3.77212
C28	0.91096	428.79974	0.21075	4.13319
C29	0.91358	437.77907	0.20882	4.51492
C30+	0.93649	528.47876	0.18723	11.32510

Table 4: Mixture “Lab1_Oil_Analysis_1” Compositions

Component	Mole Fractions	Mass Fractions
N2	0.003056	0.000795
CO2	0.020013	0.008176
C1	0.452604	0.067402
C2	0.054715	0.015272
C3	0.047222	0.019330
I-C4	0.007591	0.004096
N-C4	0.020604	0.011117
I-C5	0.008084	0.005414
N-C5	0.011830	0.007923
C6	0.019433	0.015288
C7	0.023648	0.021643
C8	0.034839	0.036370
C9	0.029556	0.034705
C10	0.028128	0.036712
C11	0.022754	0.032689
C12	0.020663	0.032414
C13	0.018452	0.031389
C14	0.015738	0.028863
C15	0.015525	0.030539
C16	0.012089	0.025395
C17	0.010677	0.023857
C18	0.009989	0.023659
C19	0.009328	0.023346
C20	0.007348	0.019378
C21	0.005284	0.014647
C22	0.004801	0.013956
C23	0.005549	0.016879
C24	0.005054	0.016054
C25	0.004194	0.013892
C26	0.004384	0.015112
C27	0.003343	0.011979
C28	0.004010	0.014913
C29	0.003531	0.013612
C30+	0.055963	0.313189
MW		107.73

Table 5: Mixture “Lab1_Oil_Analysis_2” Compositions

Component	Mole Fractions	Mass Fractions
N2	0.001875	0.000493
CO2	0.012433	0.005141
C1	0.439100	0.066181
C2	0.055257	0.015610
C3	0.052396	0.021707
I-C4	0.009374	0.005119
N-C4	0.027530	0.015033
I-C5	0.011644	0.007892
N-C5	0.017564	0.011905
C6	0.031332	0.024947
C7	0.031656	0.029322
C8	0.038464	0.040638
C9	0.026339	0.031301
C10	0.024253	0.032036
C11	0.018932	0.027527
C12	0.016922	0.026865
C13	0.016301	0.028065
C14	0.013095	0.024306
C15	0.013045	0.025971
C16	0.011325	0.024078
C17	0.009035	0.020432
C18	0.008930	0.021407
C19	0.008182	0.020723
C20	0.006591	0.017590
C21	0.005193	0.014567
C22	0.005959	0.017530
C23	0.004884	0.015034
C24	0.005440	0.017490
C25	0.004675	0.015671
C26	0.004483	0.015642
C27	0.004302	0.015602
C28	0.004492	0.016905
C29	0.003916	0.015279
C30+	0.055083	0.311989
MW		106.44

Table 6: Mixture “Lab1_Recombined_Oil” Compositions

Component	Mole Fractions	Mass Fractions
N2	0.001828	0.000497
CO2	0.012150	0.005184
C1	0.447841	0.069648
C2	0.053900	0.015712
C3	0.051208	0.021890
I-C4	0.009176	0.005170
N-C4	0.027044	0.015237
I-C5	0.011497	0.008041
N-C5	0.017422	0.012185
C6	0.031206	0.025638
C7	0.031720	0.030317
C8	0.038652	0.042137
C9	0.026488	0.032480
C10	0.024371	0.033217
C11	0.018994	0.028496
C12	0.016935	0.027742
C13	0.016316	0.028985
C14	0.013152	0.025190
C15	0.013071	0.026852
C16	0.011349	0.024898
C17	0.009015	0.021035
C18	0.008932	0.022091
C19	0.008184	0.021389
C20	0.006638	0.018280
C21	0.005189	0.015021
C22	0.005970	0.018122
C23	0.004945	0.015706
C24	0.005447	0.018069
C25	0.004704	0.016271
C26	0.004518	0.016265
C27	0.004268	0.015972
C28	0.004526	0.017579
C29	0.003894	0.015675
C30+	0.049450	0.289007
MW		103.16

Table 7: Mixture “Lab2_Recombined_Oil” Compositions

Component	Mole Fractions	Mass Fractions
N2	0.001369	0.000376
CO2	0.009147	0.003951
C1	0.467470	0.073605
C2	0.051637	0.015239
C3	0.049992	0.021636
I-C4	0.008905	0.005080
N-C4	0.026055	0.014863
I-C5	0.011292	0.007996
N-C5	0.016738	0.011853
C6	0.024060	0.020013
C7	0.033301	0.032224
C8	0.034266	0.037821
C9	0.027117	0.033665
C10	0.024212	0.033411
C11	0.020488	0.031121
C12	0.017281	0.028662
C13	0.015229	0.027390
C14	0.014607	0.028323
C15	0.011824	0.024592
C16	0.010690	0.023744
C17	0.009225	0.021793
C18	0.008838	0.022133
C19	0.008460	0.022387
C20	0.006904	0.019249
C21	0.006192	0.018147
C22	0.005712	0.017553
C23	0.004957	0.015942
C24	0.004645	0.015603
C25	0.004407	0.015434
C26	0.003839	0.013992
C27	0.003559	0.013483
C28	0.003213	0.012635
C29	0.003059	0.012466
C30+	0.051312	0.303616
MW		101.89

Table 8: Mixture “Lab2_Reported_Slimtube_Oil” Compositions

Component	Mole Fractions	Mass Fractions
N2	0.008579	0.002300
CO2	0.011634	0.004900
C1	0.450066	0.069100
C2	0.055947	0.016100
C3	0.053790	0.022700
I-C4	0.008809	0.004900
N-C4	0.025528	0.014200
I-C5	0.010717	0.007400
N-C5	0.015352	0.010600
C6	0.021823	0.017700
C7	0.032112	0.030300
C8	0.034286	0.036900
C9	0.027920	0.033800
C10	0.022444	0.030200
C11	0.018567	0.027500
C12	0.016448	0.026600
C13	0.015680	0.027500
C14	0.014015	0.026500
C15	0.013214	0.026800
C16	0.011497	0.024900
C17	0.009637	0.022200
C18	0.009583	0.023400
C19	0.009030	0.023300
C20	0.007062	0.019200
C21	0.006439	0.018400
C22	0.005907	0.017700
C23	0.005453	0.017100
C24	0.004977	0.016300
C25	0.004715	0.016100
C26	0.004136	0.014700
C27	0.003952	0.014600
C28	0.003782	0.014500
C29	0.003724	0.014800
C30+	0.053174	0.306800
MW		104.49

Table 9: Mixture “Lab2_Slimtube_Oil” Compositions

Component	Mole Fractions	Mass Fractions
N2	0.011535	0.003120
CO2	0.015595	0.006627
C1	0.429506	0.066534
C2	0.074702	0.021690
C3	0.070480	0.030010
I-C4	0.011136	0.006250
N-C4	0.031570	0.017718
I-C5	0.012156	0.008469
N-C5	0.016855	0.011742
C6	0.021379	0.017495
C7	0.028832	0.027448
C8	0.029603	0.032146
C9	0.023760	0.029020
C10	0.019003	0.025799
C11	0.015693	0.023451
C12	0.013894	0.022671
C13	0.013243	0.023433
C14	0.011836	0.022579
C15	0.011159	0.022834
C16	0.009709	0.021215
C17	0.008138	0.018915
C18	0.008092	0.019937
C19	0.007626	0.019852
C20	0.005963	0.016359
C21	0.005437	0.015677
C22	0.004988	0.015081
C23	0.004605	0.014569
C24	0.004203	0.013888
C25	0.003982	0.013717
C26	0.003492	0.012524
C27	0.003337	0.012439
C28	0.003194	0.012354
C29	0.003145	0.012610
C30+	0.062155	0.361829
MW		103.56

Table 10: Mixture “Lab1_Recombined_Oil” Compositions

Component	Mole Fractions	Mass Fractions
N2	0.001828	0.000497
CO2	0.012150	0.005184
C1	0.447841	0.069648
C2	0.053900	0.015712
C3	0.051208	0.021890
I-C4	0.009176	0.005170
N-C4	0.027044	0.015237
I-C5	0.011497	0.008041
N-C5	0.017422	0.012185
C6	0.031206	0.025638
C7	0.031720	0.030317
C8	0.038652	0.042137
C9	0.026488	0.032480
C10	0.024371	0.033217
C11	0.018994	0.028496
C12	0.016935	0.027742
C13	0.016316	0.028985
C14	0.013152	0.025190
C15	0.013071	0.026852
C16	0.011349	0.024898
C17	0.009015	0.021035
C18	0.008932	0.022091
C19	0.008184	0.021389
C20	0.006638	0.018280
C21	0.005189	0.015021
C22	0.005970	0.018122
C23	0.004945	0.015706
C24	0.005447	0.018069
C25	0.004704	0.016271
C26	0.004518	0.016265
C27	0.004268	0.015972
C28	0.004526	0.017579
C29	0.003894	0.015675
C30+	0.049450	0.289007
MW		103.16

Table 11: Lab1 Single-Stage Separation

Temp	Pres	GOR	
(C)	(barg)	(sm3/m3)	
		Expt	Calc
15.000	0.0	137.00	140.39
RMS % Err			2.47
Ave % Bias			2.47

Table 12: Mixture “Lab1_Swelling_Gas” Compositions

Component	Mole Fractions	Mass Fractions
N2	0.003298	0.003597
CO2	0.015292	0.026200
C1	0.685160	0.427904
C2	0.108146	0.126594
C3	0.094353	0.161970
I-C4	0.000000	0.000000
N-C4	0.044478	0.100638
I-C5	0.000000	0.000000
N-C5	0.019290	0.054181
C6	0.029982	0.098916
MW		25.69

Table 13: Lab2 Separator Test #1

Temp (C)	Pres (barg)	Tot Vol 2 (m3)		Cum GOR (sm3/m3)		Liq Den (kg/m3)	
		Expt	Calc	Expt	Calc	Expt	Calc
38.000	40.000	1.0990	1.1038	92.66	91.36		805.91
38.000	12.500	1.0580	1.0639	113.43	110.10		822.08
15.000	0.000	1.0000	1.0110	136.58	129.08	843.80	845.73
RMS % Err			0.53		2.10		0.23
Ave % Bias			0.57		−2.20		0.23

Table 14: Lab2 Separator Test #2

Temp (C)	Pres (barg)	Tot Vol 2 (m3)		Cum GOR (sm3/m3)		Liq Den (kg/m3)	
		Expt	Calc	Expt	Calc	Expt	Calc
38.000	40.000	1.1020	1.1093	92.16	91.36		805.91
15.000	0.000	1.0000	1.0031	137.33	133.97	848.10	848.93
RMS % Err			0.64		0.95		0.10
Ave % Bias			0.57		−1.05		0.10

Table 15: Lab2 Separator Test #3

Temp (C)	Pres (barg)	Tot Vol 2 (m3)		Cum GOR (sm3/m3)		Liq Den (kg/m3)	
		Expt	Calc	Expt	Calc	Expt	Calc
74.000	9.6800	1.0620	1.0644	132.73	130.19		821.36
74.000	3.2200	1.0520	1.0537	137.62	134.85		825.40
15.000	0.0000	1.0000	1.0187	149.12	140.52	853.40	852.46
RMS % Err			0.51		2.28		0.11
Ave % Bias			0.46		-2.43		-0.11

Table 16: Lab2 Separation of Slimtube Sample

Temp (F)	Pres (psig)	Cum GOR (scf/bbl)		Rel Vol 2		Liq Den (g/cm3)	
		Expt	Calc	Expt	Calc	Expt	Calc
68.000	0.0	878.00	878.80		0.67269	0.86280	0.86398
60.000	0.0	881.00	880.45	0.67100	0.67143	0.86600	0.86560
RMS % Err			0.08		0.06		0.10
Ave % Bias			0.01		0.06		0.04

Table 17: Mixture “Lab3_MDT1_Oil” Compositions

Component	Mole Fractions	Mass Fractions
N2	0.001755	0.000480
CO2	0.012850	0.005520
C1	0.443321	0.069419
C2	0.054820	0.016090
C3	0.054017	0.023250
I-C4	0.009289	0.005270
N-C4	0.027621	0.015670
I-C5	0.011246	0.007920
N-C5	0.016188	0.011400
C6	0.023742	0.019640
C7	0.033044	0.031800
C8	0.034454	0.037820
C9	0.027375	0.033800
C10	0.024272	0.033310
C11	0.019409	0.029320
C12	0.017012	0.028060
C13	0.017141	0.030660
C14	0.016298	0.031430
C15	0.015050	0.031130
C16	0.013319	0.029420
C17	0.012454	0.029260
C18	0.011412	0.028420
C19	0.009827	0.025860
C20	0.007703	0.021360
C21	0.006420	0.018710
C22	0.005903	0.018040
C23	0.005481	0.017530
C24	0.004748	0.015860
C25	0.004370	0.015220
C26	0.004080	0.014790
C27	0.004087	0.015400
C28	0.003810	0.014900
C29	0.003368	0.013650
C30+	0.044115	0.259597
MW		102.45

Table 18: Separation of Lab3_MDT1_Oil

Temp (C)	Pres (bar)	GOR (sm3/m3)		Liq Den (g/cm3)	
		Expt	Calc	Expt	Calc
15.000	1.0000	145.20	140.65	0.85300	0.85266
RMS % Err			3.13		0.04
Ave % Bias			-3.13		-0.04

Table 19: Mixture “Lab3_Surface_Oil” Compositions

Component	Mole Fractions	Mass Fractions
N2	0.002882	0.000819
CO2	0.013832	0.006176
C1	0.466309	0.075903
C2	0.056416	0.017212
C3	0.054692	0.024470
I-C4	0.009163	0.005404
N-C4	0.026960	0.015899
I-C5	0.010716	0.007845
N-C5	0.015312	0.011209
C6	0.022243	0.019126
C7	0.031315	0.031326
C8	0.033934	0.038720
C9	0.025741	0.033037
C10	0.022343	0.031874
C11	0.018204	0.028585
C12	0.016131	0.027657
C13	0.015056	0.027995
C14	0.012998	0.026055
C15	0.013255	0.028501
C16	0.010870	0.024959
C17	0.009495	0.023188
C18	0.009185	0.023779
C19	0.008446	0.023104
C20	0.007138	0.020574
C21	0.006374	0.019310
C22	0.005680	0.018045
C23	0.005352	0.017792
C24	0.004760	0.016527
C25	0.004425	0.016021
C26	0.004095	0.015431
C27	0.004048	0.015852
C28	0.003651	0.014841
C29	0.003602	0.015178
C30+	0.045380	0.277587
MW		98.56

Table 20: Separation of Lab3_Surface_Oil

Temp (C)	Pres (psig)	GOR (sm ³ /m ³)		Liq Den (g/cm ³)	
		Expt	Calc	Expt	Calc
15.000	0.0	156.00	155.67	0.85880	0.85529
RMS % Err			0.21		0.41
Ave % Bias			-0.21		-0.41

Table 21: Mixture “Lab3_Swelling_Gas” Compositions

Component	Mole Fractions	Mass Fractions
N2	0.001800	0.002195
CO2	0.013500	0.025866
C1	0.753400	0.526204
C2	0.088100	0.115333
C3	0.080700	0.154926
I-C4	0.011800	0.029859
N-C4	0.029900	0.075659
I-C5	0.007100	0.022302
N-C5	0.007800	0.024500
C6	0.003600	0.013283
C7	0.002300	0.009872
MW		22.97

Table 22: Mixture “Lab3_MDT2_Oil” Compositions

Component	Mole Fractions	Mass Fractions
N2	0.002125	0.000600
CO2	0.011044	0.004899
C1	0.449515	0.072685
C2	0.057070	0.017297
C3	0.055563	0.024695
I-C4	0.009728	0.005699
N-C4	0.027307	0.015997
I-C5	0.011136	0.008098
N-C5	0.015948	0.011598
C6	0.023760	0.020296
C7	0.032799	0.032593
C8	0.035812	0.040592
C9	0.027446	0.034993
C10	0.024693	0.034993
C11	0.019741	0.030794
C12	0.017316	0.029494
C13	0.016726	0.030894
C14	0.014862	0.029594
C15	0.013996	0.029894
C16	0.011791	0.026895
C17	0.010344	0.025095
C18	0.009953	0.025595
C19	0.009235	0.025095
C20	0.007577	0.021696
C21	0.006843	0.020596
C22	0.006019	0.018996
C23	0.005631	0.018596
C24	0.005072	0.017497
C25	0.004671	0.016797
C26	0.004354	0.016297
C27	0.004446	0.017297
C28	0.003665	0.014797
C29	0.003798	0.015897
C30+	0.040015	0.243151
MW		99.22

Table 23: Single-Stage Separation of Lab3_MDT2_Oil

Temp (C)	Pres (kPa)	GOR (sm3/m3)		Liq Den (g/cm3)		Liq MW	
		Expt	Calc	Expt	Calc	Expt	Calc
15.000	101.33	154.50	147.91	0.85930	0.85071	225.00	220.51
RMS % Err			4.26		1.00		2.00
Ave % Bias			-4.26		-1.00		-2.00

Table 23: Single-Stage Separation of Lab3_MDT2_Oil (cont.)

Temp (C)	Pres (kPa)	C1 y (%)		C2 y (%)		C4+ y (%)	
		Expt	Calc	Expt	Calc	Expt	Calc
15.000	101.33	70.770	72.457	9.0000	9.0225	9.7000	8.1537
RMS % Err			2.38		0.25		15.94
Ave % Bias			2.38		0.25		-15.94

Table 24: Multi-Stage Separation of Lab3_MDT2_Oil

Temp (C)	Pres (kPa)	Liq Vol (m3)		Cum GOR (sm3/m3)		Liq Den (g/cm3)	
		Expt	Calc	Expt	Calc	Expt	Calc
67.000	1599.6	1.1040	1.0818	114.50	121.49	0.80300	0.81037
85.000	179.0	1.0770	1.0306	132.10	143.59	0.79500	0.81959
15.000	101.3	1.0000	0.9926	142.20	149.09	0.85700	0.85096
RMS % Err			2.72		6.14		1.78
Ave % Bias			-2.30		5.95		1.01

Table 24: Multi-Stage Separation of Lab3_MDT2_Oil (cont.)

Temp (C)	Pres (kPa)	C1 y (%)		C2 y (%)		C4+ y (%)	
		Expt	Calc	Expt	Calc	Expt	Calc
67.000	1599.6	78.172	77.862	8.751	8.584	4.392	4.887
85.000	179.0	28.398	28.034	11.531	12.280	38.405	37.311
15.000	101.3		53.554		9.020		8.930
RMS % Err			0.43		4.70		2.21
Ave % Bias			-0.43		2.52		-0.78

Table 25: Mixture “Lab3_MDT3_Oil” Compositions

Component	Mole Fractions	Mass Fractions
N2	0.001778	0.000500
CO2	0.011315	0.005002
C1	0.454433	0.073222
C2	0.056638	0.017105
C3	0.055109	0.024407
I-C4	0.009253	0.005402
N-C4	0.026731	0.015605
I-C5	0.010905	0.007902
N-C5	0.015737	0.011403
C6	0.023738	0.020206
C7	0.032729	0.032410
C8	0.035867	0.040512
C9	0.027242	0.034610
C10	0.024368	0.034410
C11	0.019370	0.030109
C12	0.016915	0.028709
C13	0.016304	0.030009
C14	0.014518	0.028809
C15	0.013582	0.028909
C16	0.011487	0.026108
C17	0.010054	0.024307
C18	0.009642	0.024707
C19	0.008977	0.024307
C20	0.007362	0.021006
C21	0.006638	0.019906
C22	0.005853	0.018406
C23	0.005471	0.018005
C24	0.004947	0.017005
C25	0.004634	0.016605
C26	0.004130	0.015405
C27	0.004154	0.016105
C28	0.003754	0.015105
C29	0.003694	0.015405
C30+	0.042671	0.258378
MW		99.57

Table 26: Single-Stage Separation of Lab3_MDT3_Oil

Temp (C)	Pres (kPa)	GOR (sm3/m3)		Liq Den (g/cm3)		Liq MW	
		Expt	Calc	Expt	Calc	Expt	Calc
15.000	101.33	149.80	148.41	0.85830	0.85219	228.00	223.40
RMS % Err			0.93		0.71		2.02
Ave % Bias			-0.93		-0.71		-2.02

Table 26: Single-Stage Separation of Lab3_MDT3_Oil (cont.)

Temp (C)	Pres (kPa)	C1 y (%)		C2 y (%)		C4+ y (%)	
		Expt	Calc	Expt	Calc	Expt	Calc
15.000	101.33	72.450	72.846	9.0200	8.9076	8.1500	8.0050
RMS % Err			0.55		1.25		1.78
Ave % Bias			0.55		-1.25		-1.78

Figures

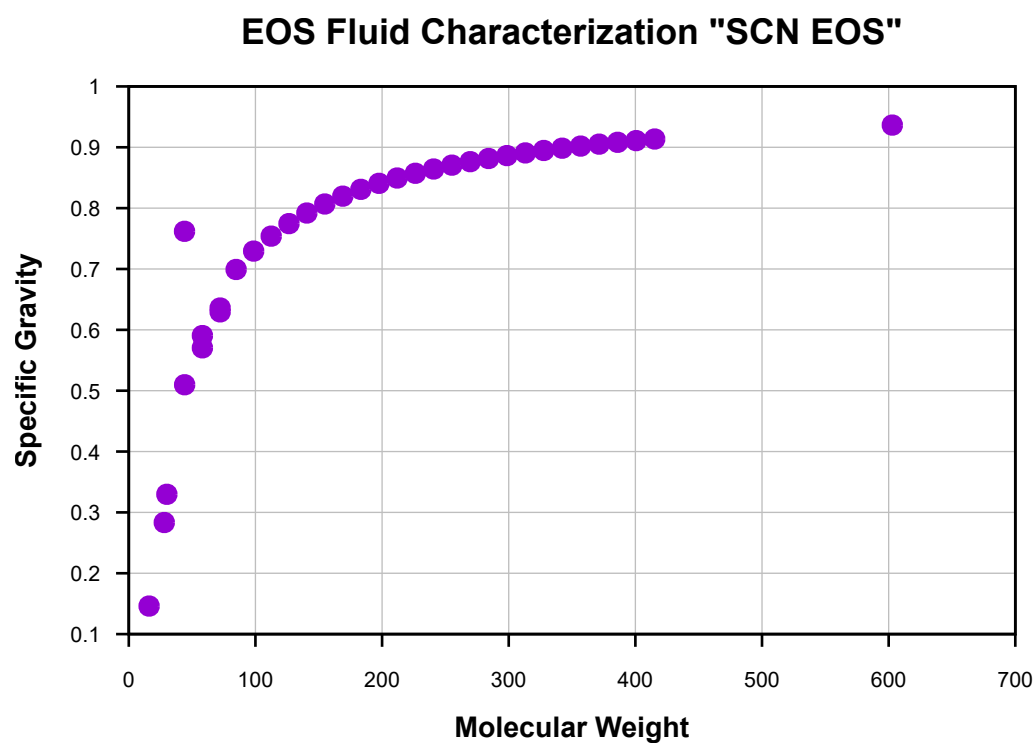


Figure 1: Specific Gravity vs. Molecular Weight for EOS Fluid Characterization "SCN EOS."

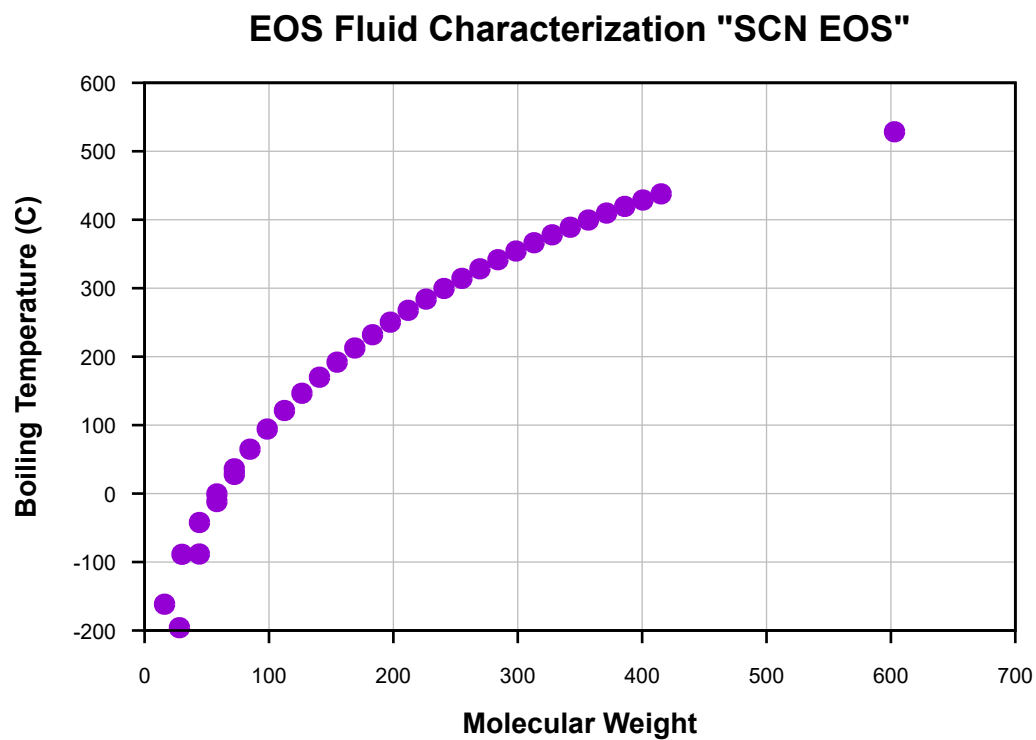


Figure 2: Boiling Temperature vs. Molecular Weight for EOS Fluid Characterization "SCN EOS."

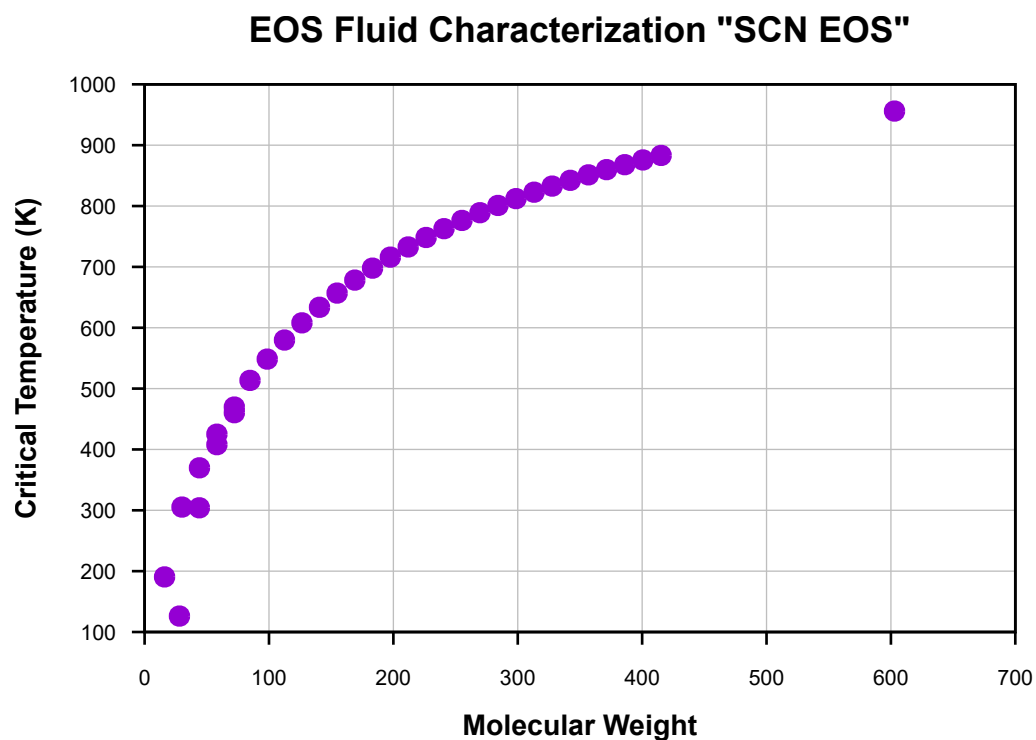


Figure 3: Critical Temperature vs. Molecular Weight for EOS Fluid Characterization "SCN EOS."

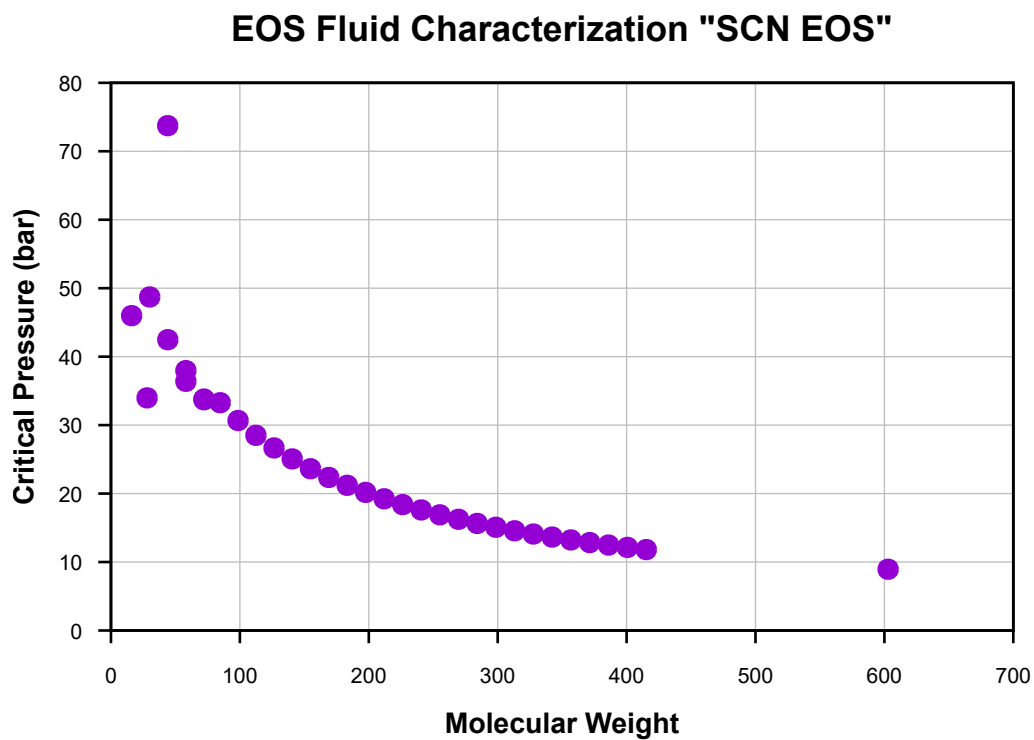


Figure 4: Critical Pressure vs. Molecular Weight for EOS Fluid Characterization “SCN EOS.”

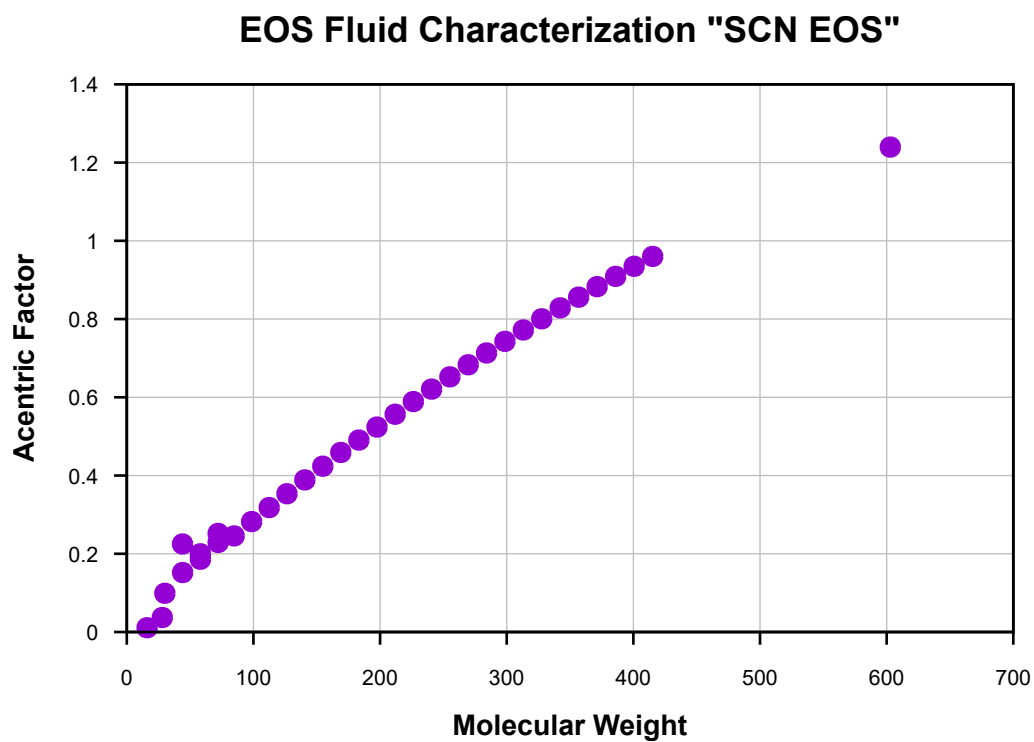


Figure 5: Acentric Factor vs. Molecular Weight for EOS Fluid Characterization “SCN EOS.”

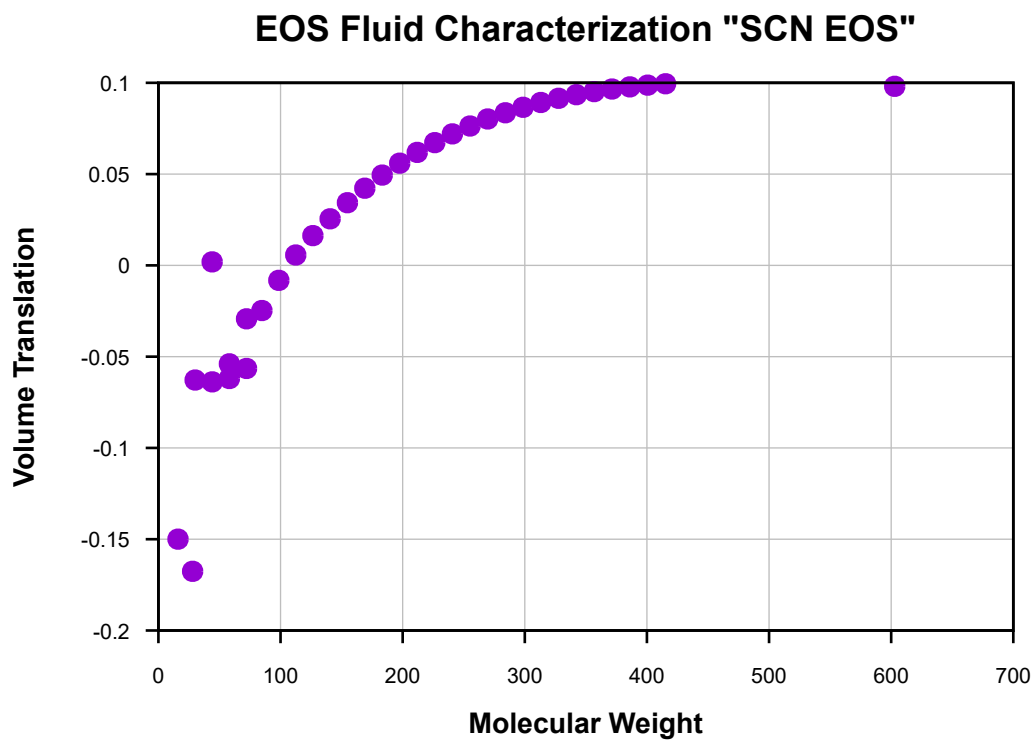


Figure 6: Volume Translation vs. Molecular Weight for EOS Fluid Characterization "SCN EOS."

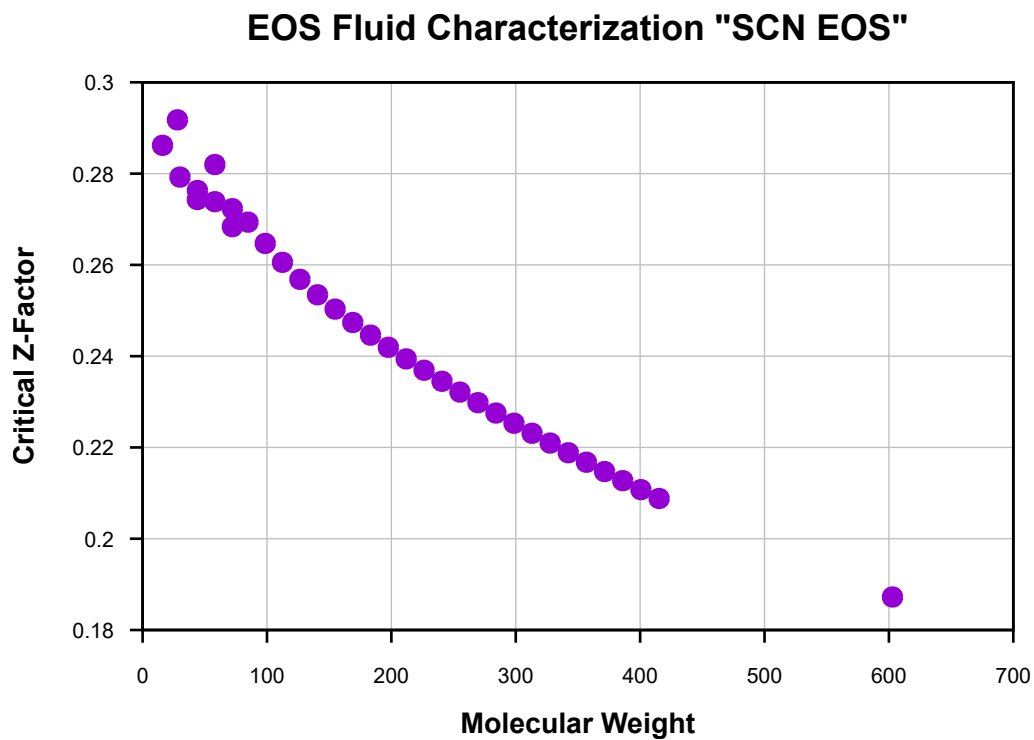


Figure 7: Critical Z-Factor vs. Molecular Weight for EOS Fluid Characterization "SCN EOS."

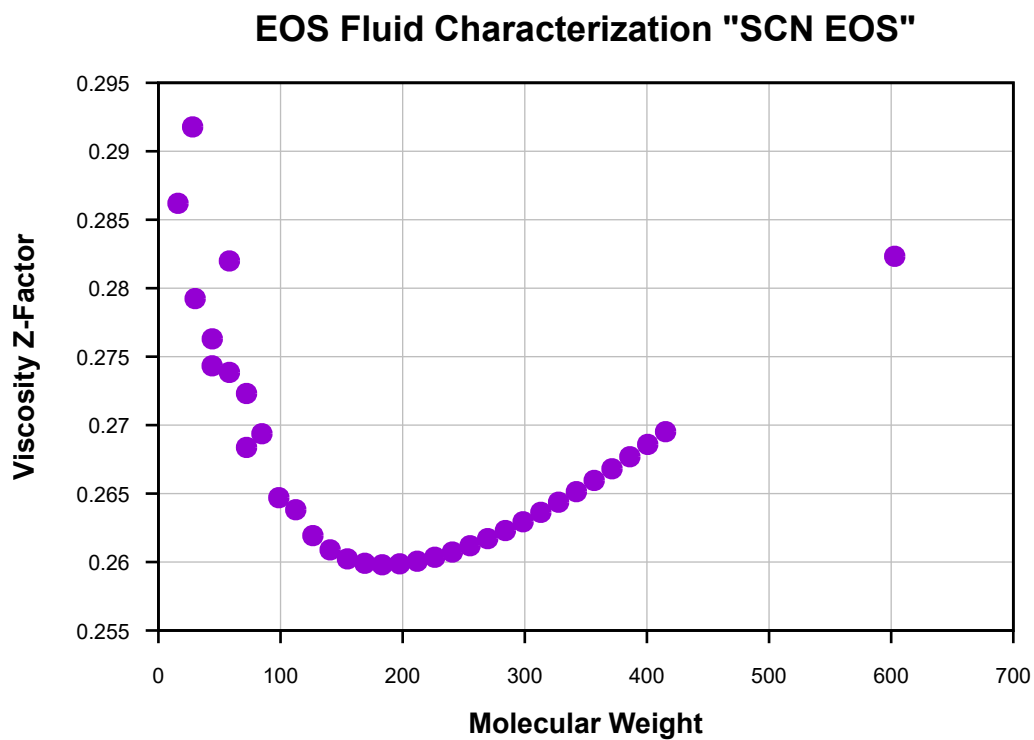


Figure 8: Viscosity Z-Factor vs. Molecular Weight for EOS Fluid Characterization "SCN EOS."

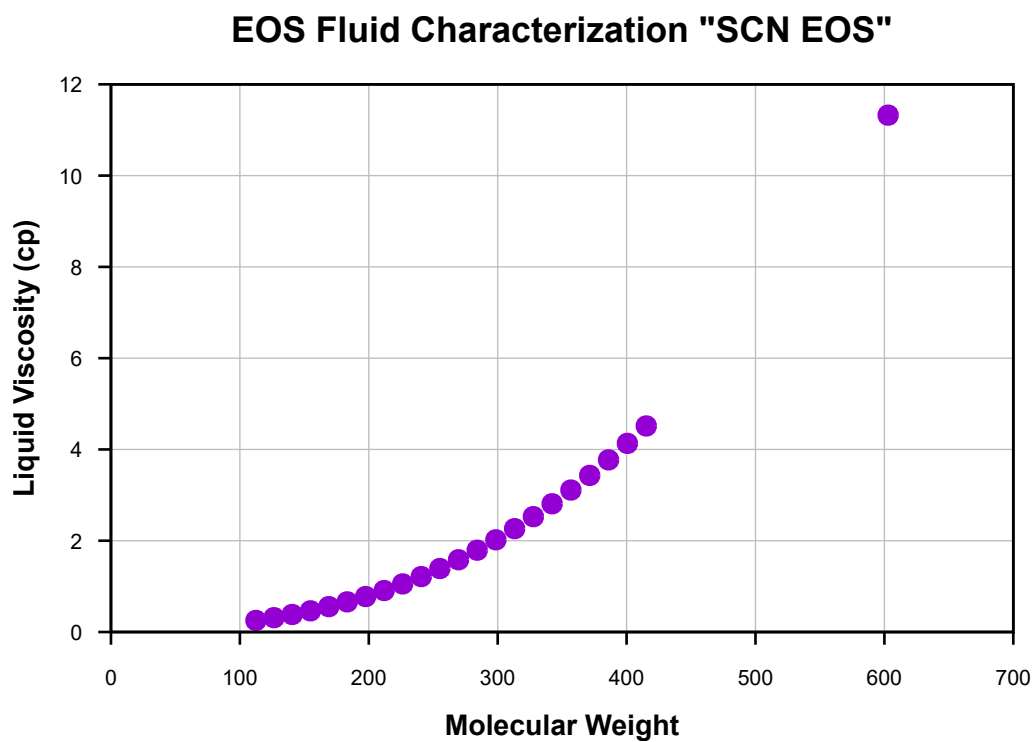


Figure 9: Liquid Viscosity vs. Molecular Weight for EOS Fluid Characterization "SCN EOS."

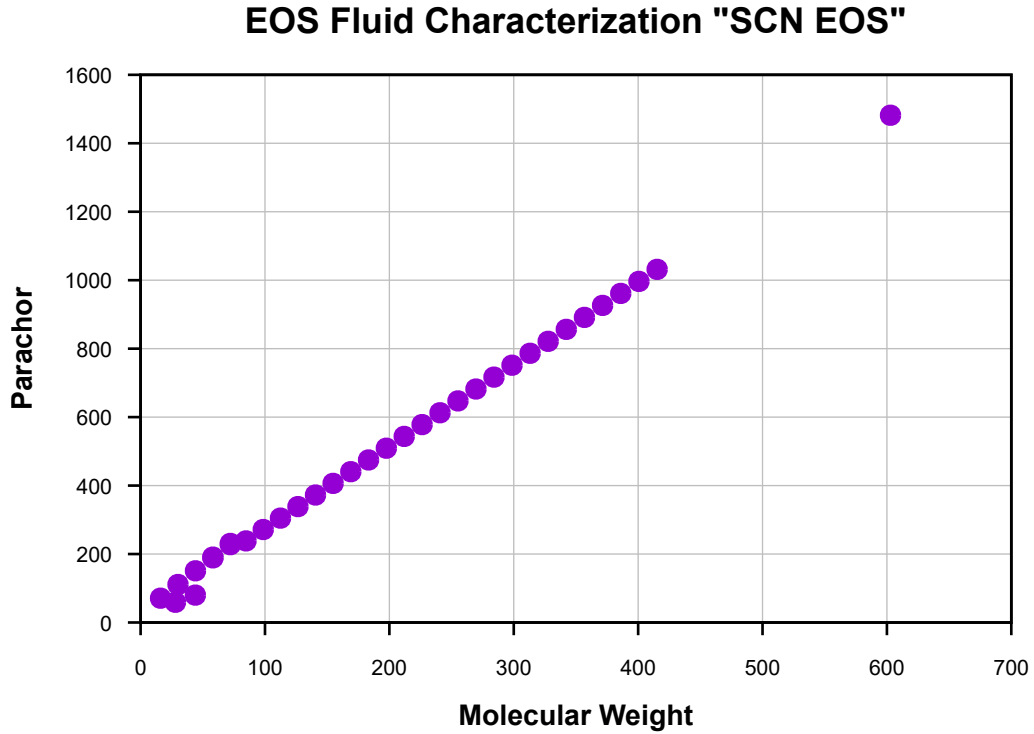


Figure 10: Parachor vs. Molecular Weight for EOS Fluid Characterization “SCN EOS.”

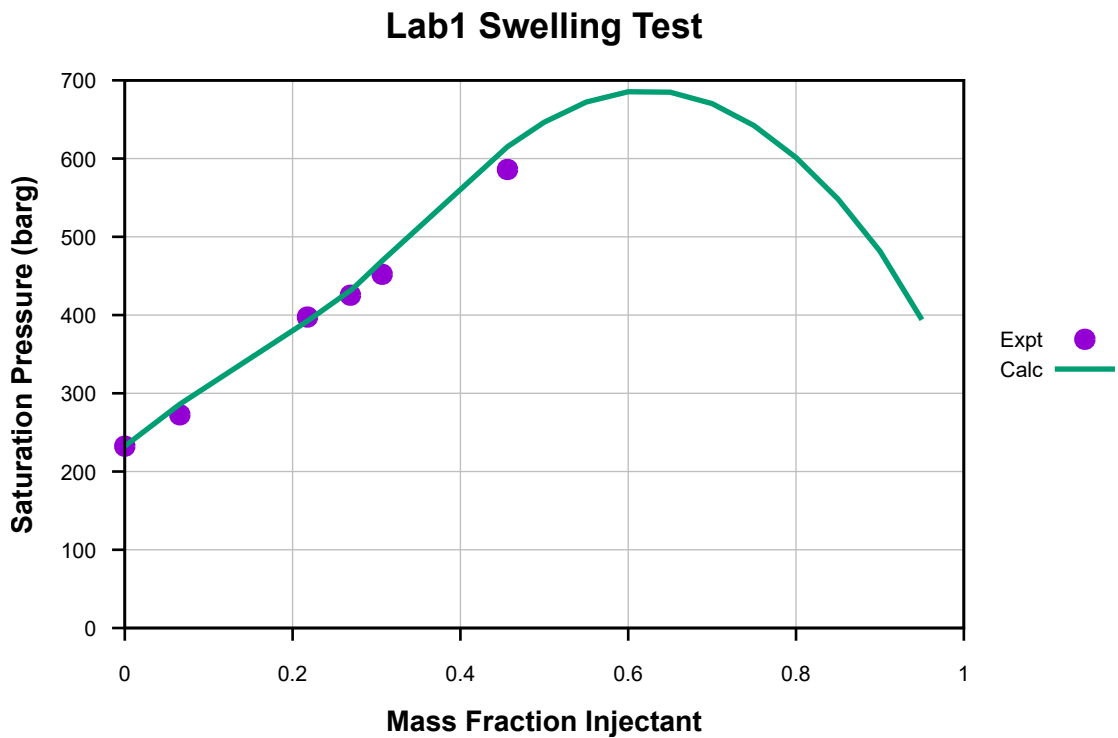


Figure 11: Saturation Pressure vs. Mass Fraction Injectant for Lab1 Swelling Test.

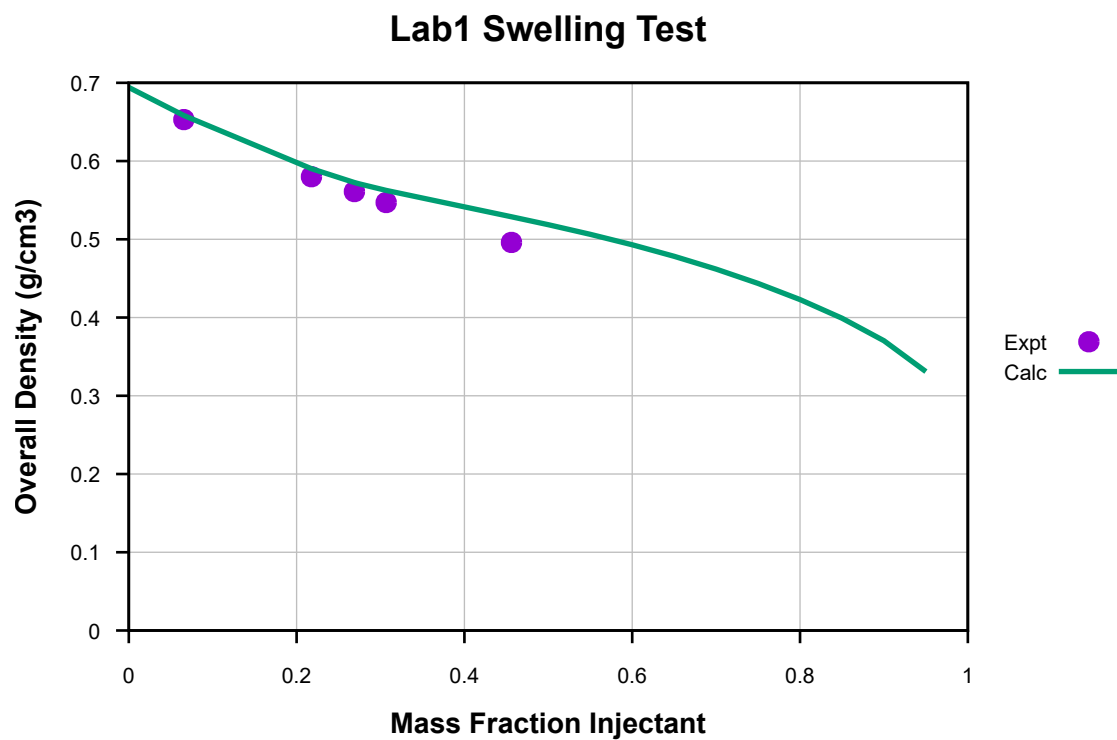


Figure 12: Overall Density vs. Mass Fraction Injectant for Lab1 Swelling Test.

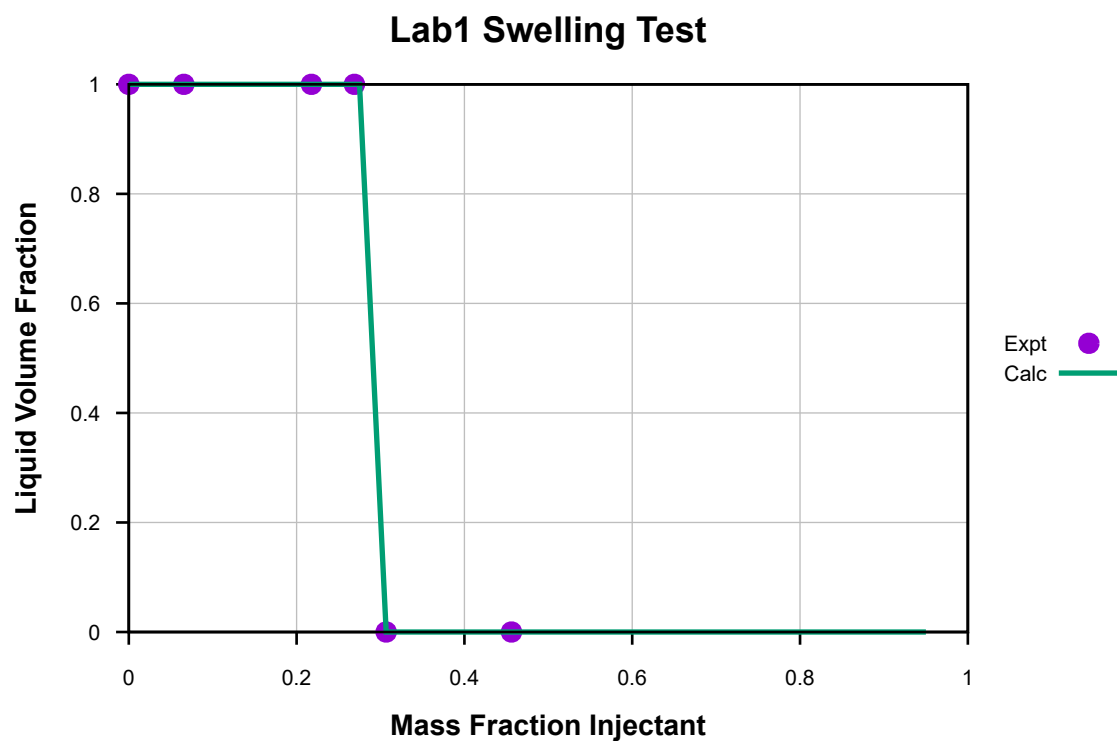


Figure 13: Liquid Volume Fraction vs. Mass Fraction Injectant for Lab1 Swelling Test.

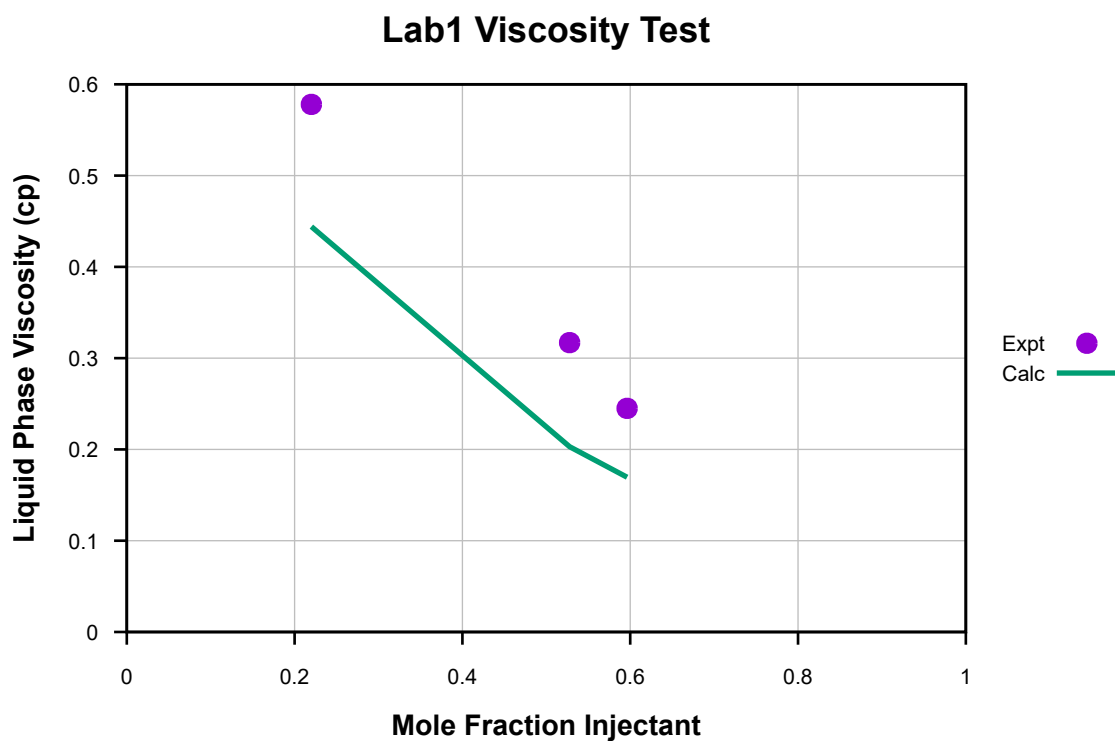


Figure 14: Liquid Phase Viscosity vs. Mole Fraction Injectant for Lab1 Viscosity Test.

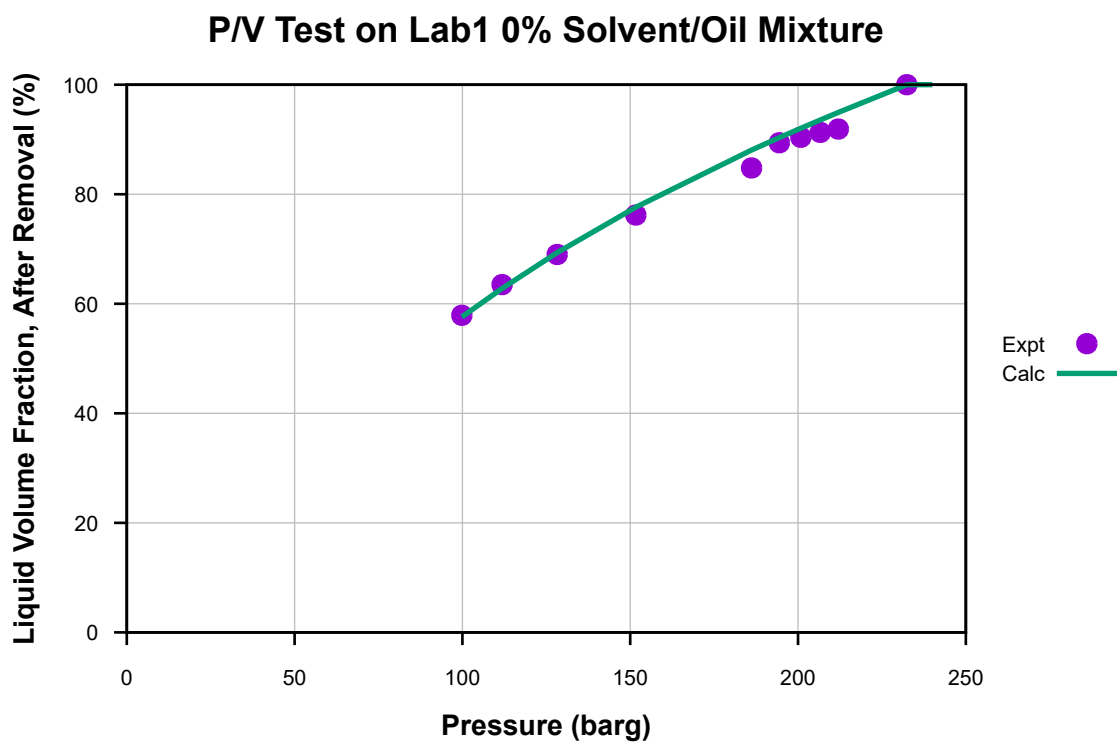


Figure 15: Liquid Volume Fraction, After Removal, vs. Pressure for P/V Test on Lab1 0% Solvent/Oil Mixture.

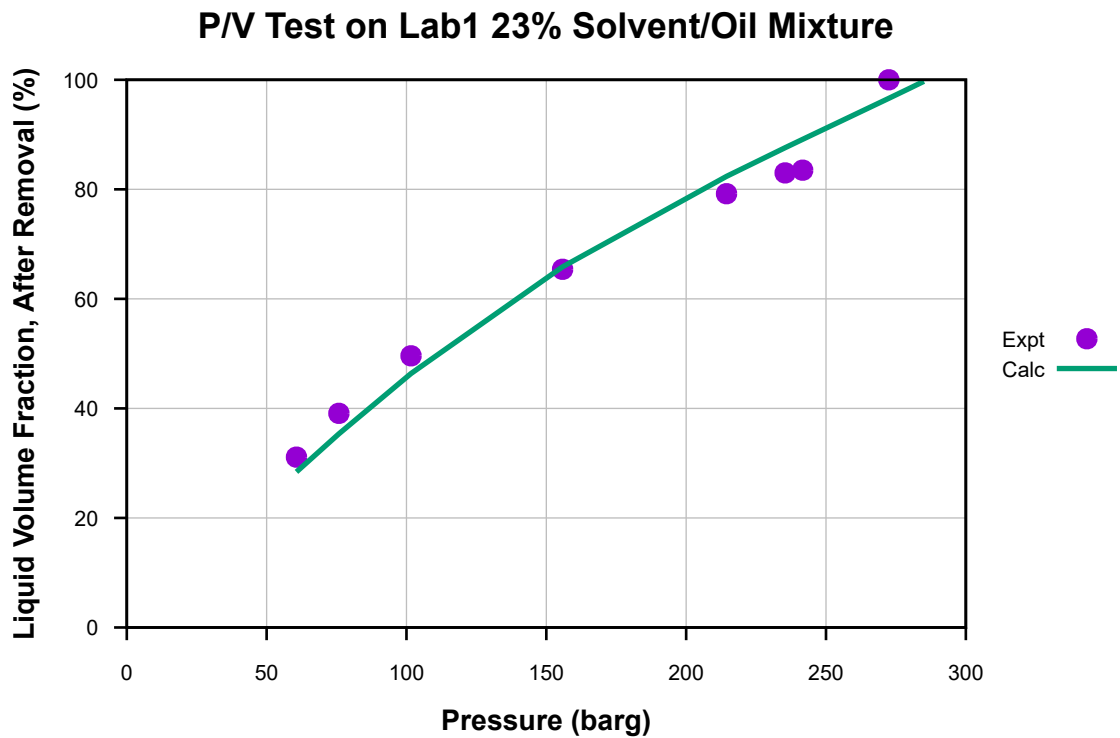


Figure 16: Liquid Volume Fraction, After Removal, vs. Pressure for P/V Test on Lab1 23% Solvent/Oil Mixture.

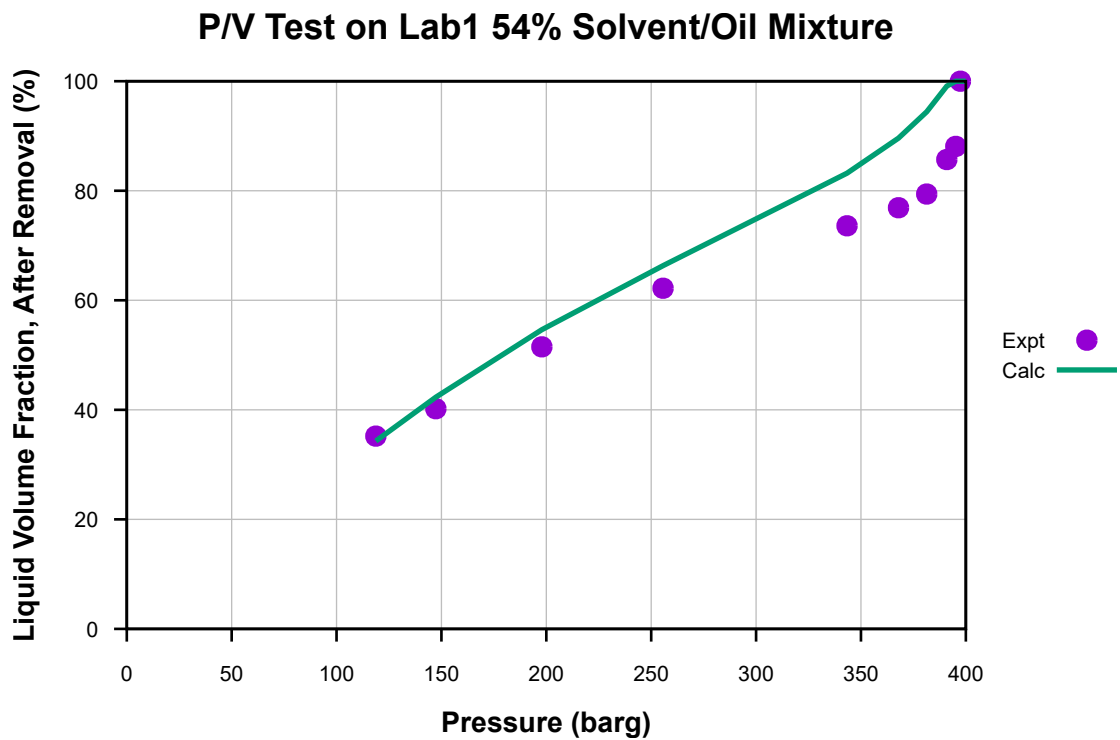


Figure 17: Liquid Volume Fraction, After Removal, vs. Pressure for P/V Test on Lab1 54% Solvent/Oil Mixture.

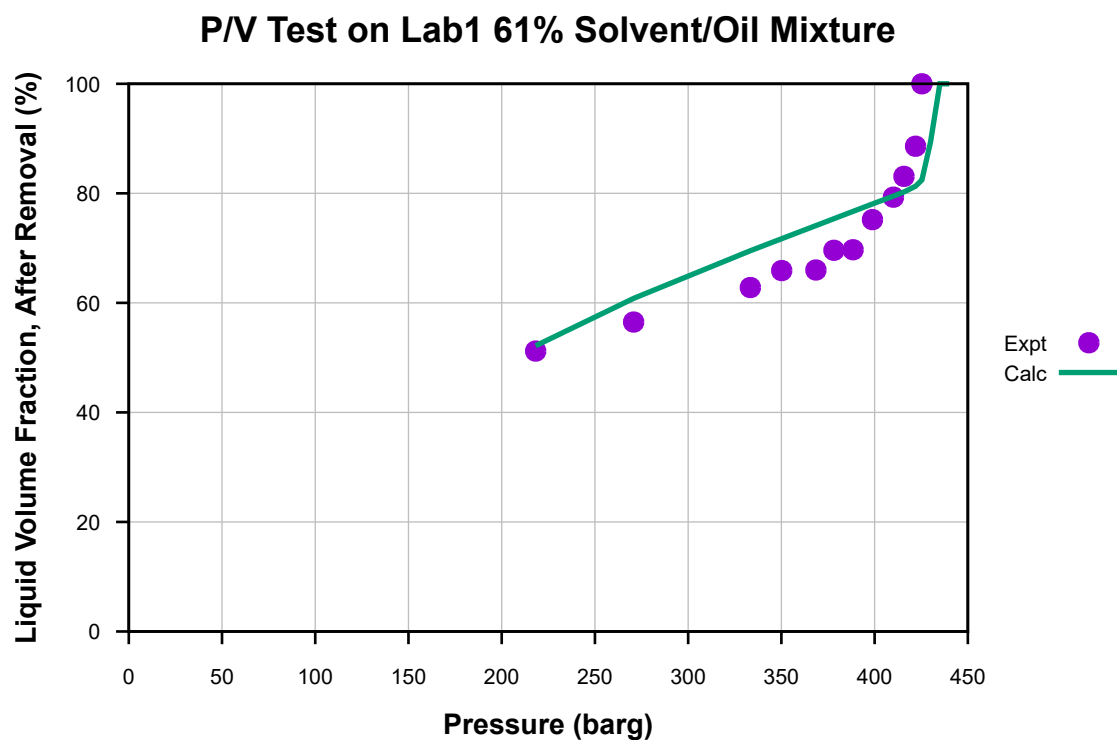


Figure 18: Liquid Volume Fraction, After Removal, vs. Pressure for P/V Test on Lab1 61% Solvent/Oil Mixture.

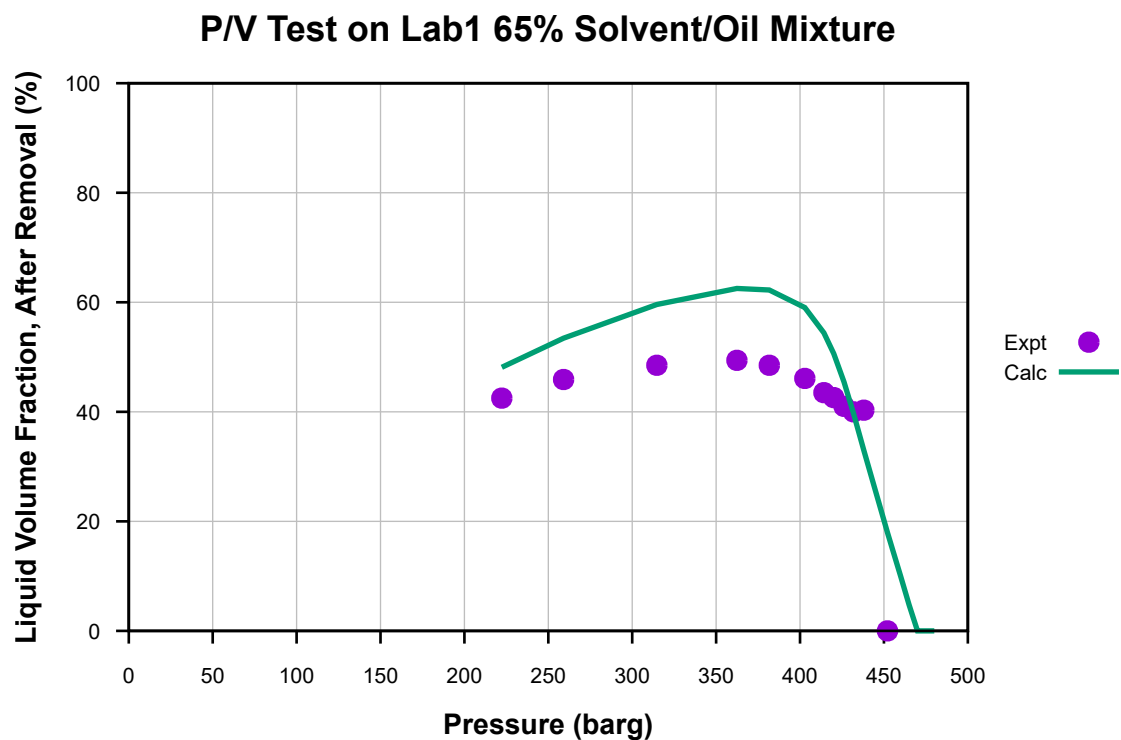


Figure 19: Liquid Volume Fraction, After Removal, vs. Pressure for P/V Test on Lab1 65% Solvent/Oil Mixture.

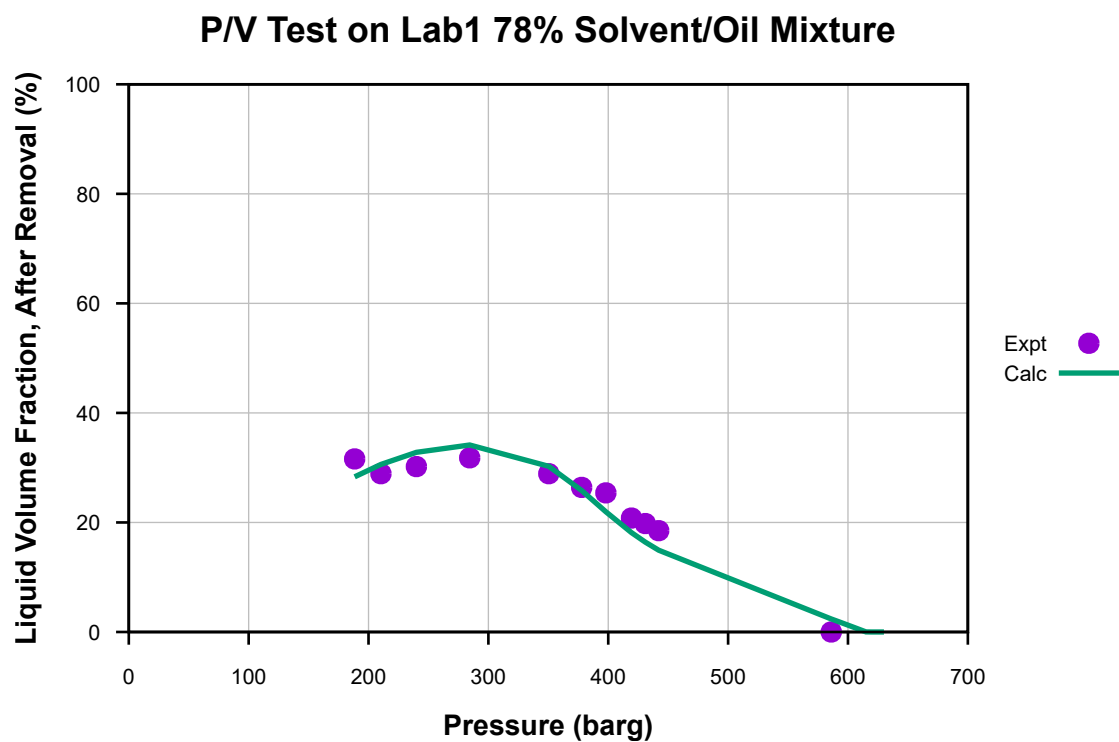


Figure 20: Liquid Volume Fraction, After Removal, vs. Pressure for P/V Test on Lab1 78% Solvent/Oil Mixture.

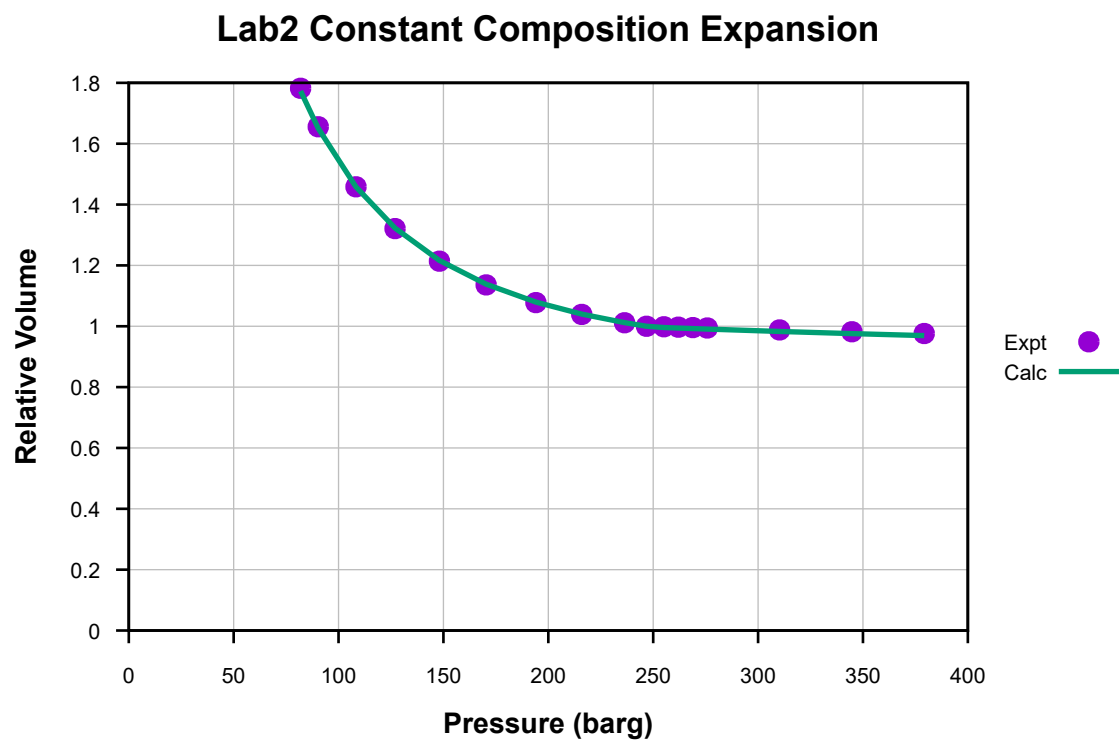


Figure 21: Relative Volume vs. Pressure for Lab2 Constant Composition Expansion.

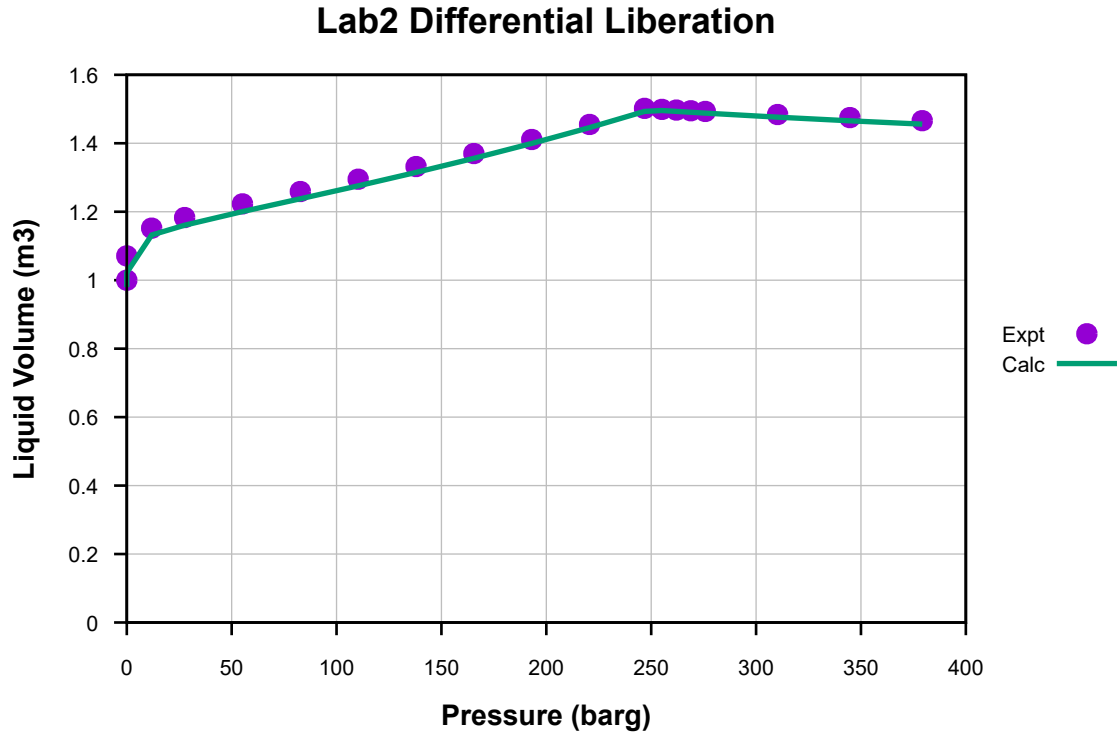


Figure 22: Liquid Volume vs. Pressure for Lab2 Differential Liberation.

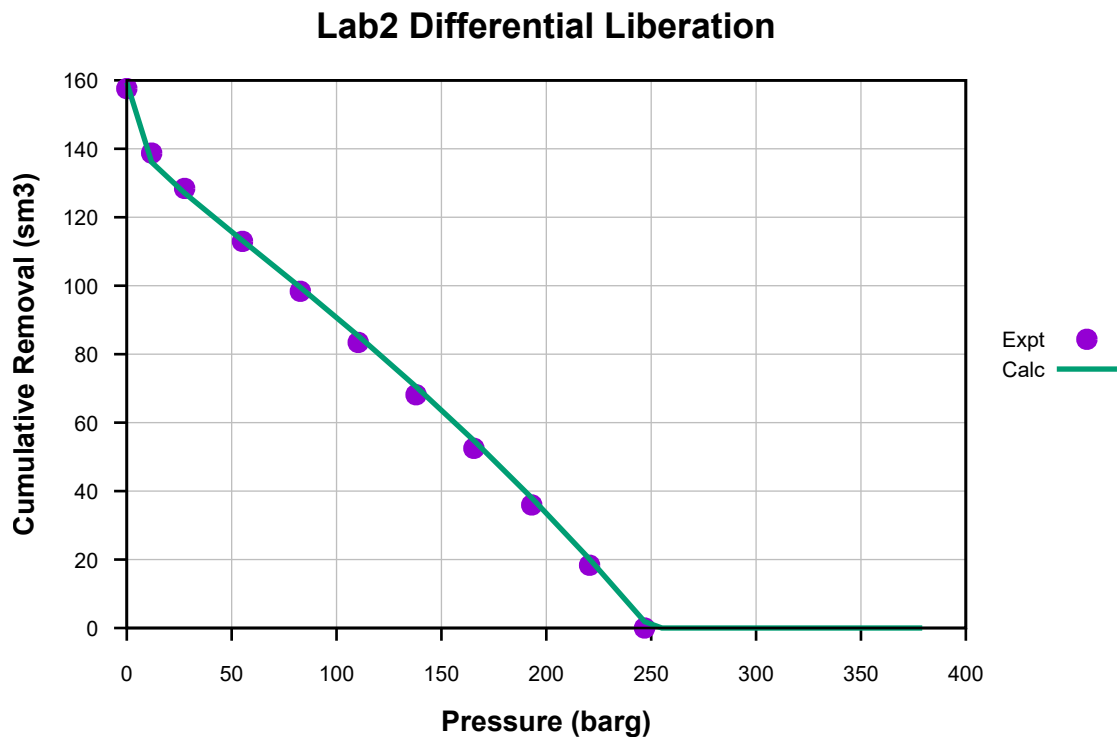


Figure 23: Cumulative Removal vs. Pressure for Lab2 Differential Liberation.

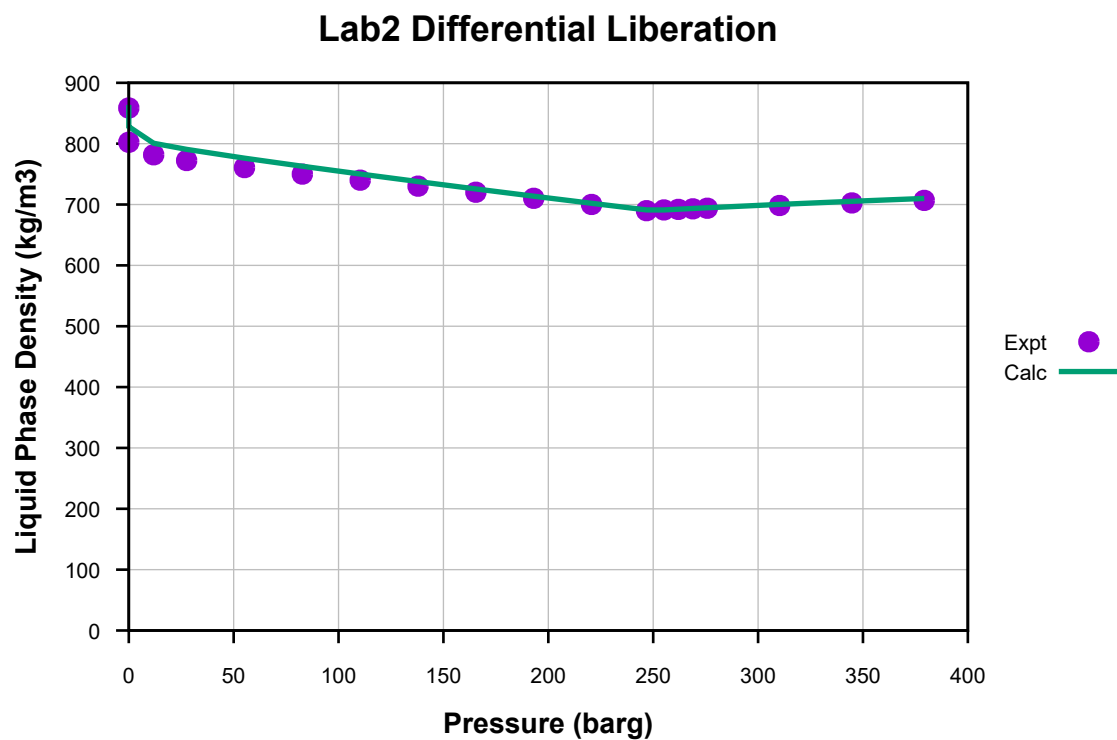


Figure 24: Liquid Phase Density vs. Pressure for Lab2 Differential Liberation.

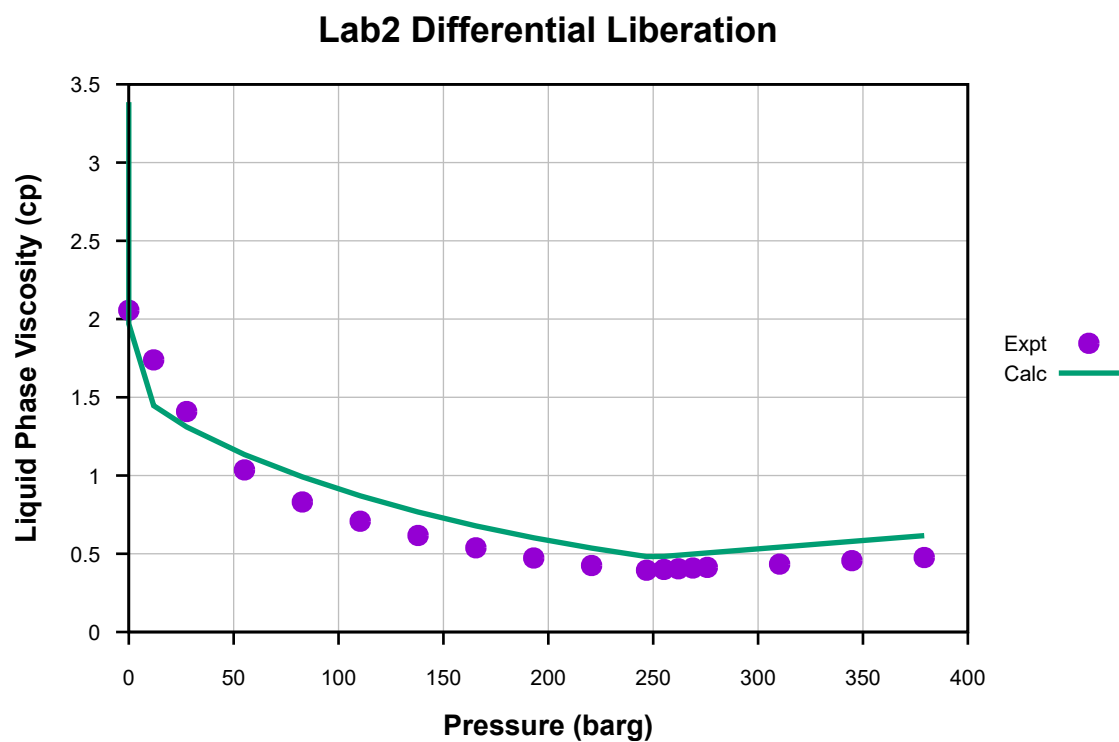


Figure 25: Liquid Phase Viscosity vs. Pressure for Lab2 Differential Liberation.

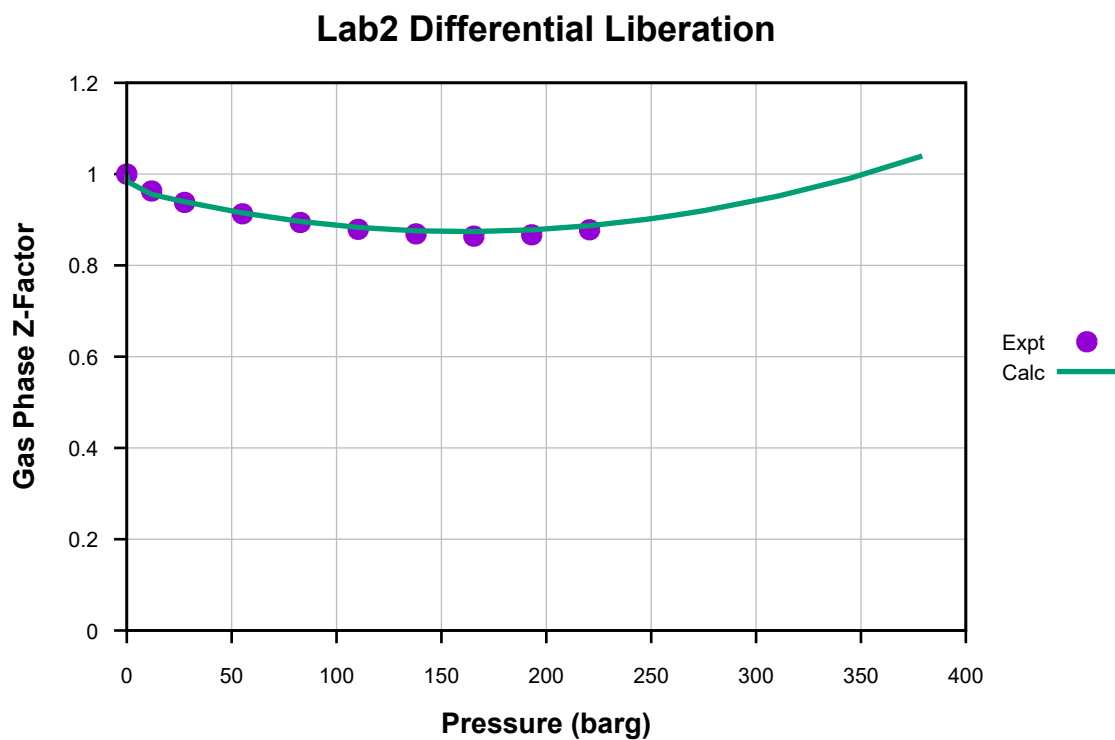


Figure 26: Gas Phase Z-Factor vs. Pressure for Lab2 Differential Liberation.

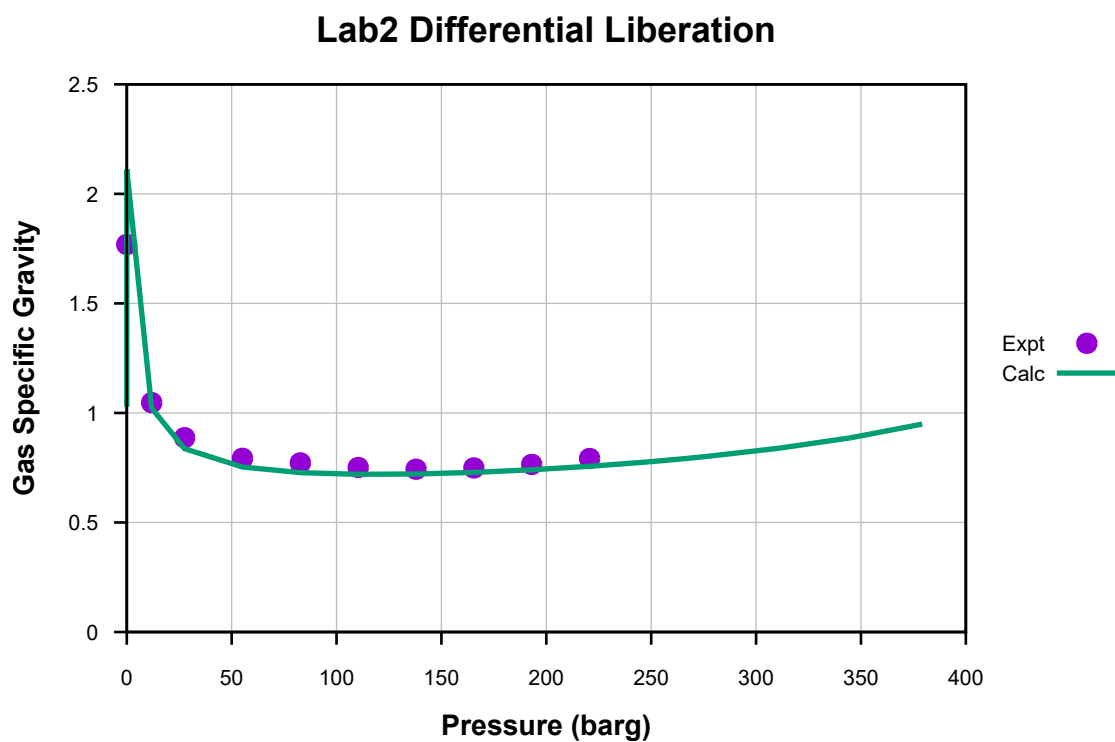


Figure 27: Gas Specific Gravity vs. Pressure for Lab2 Differential Liberation.

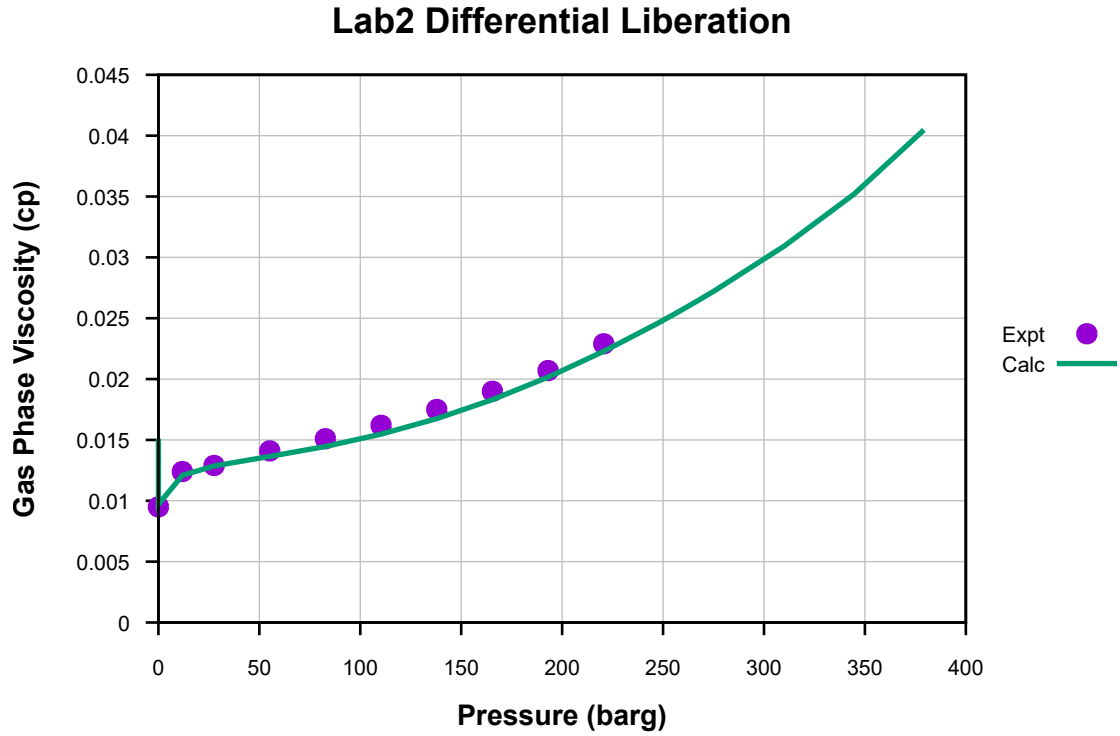


Figure 28: Gas Phase Viscosity vs. Pressure for Lab2 Differential Liberation.

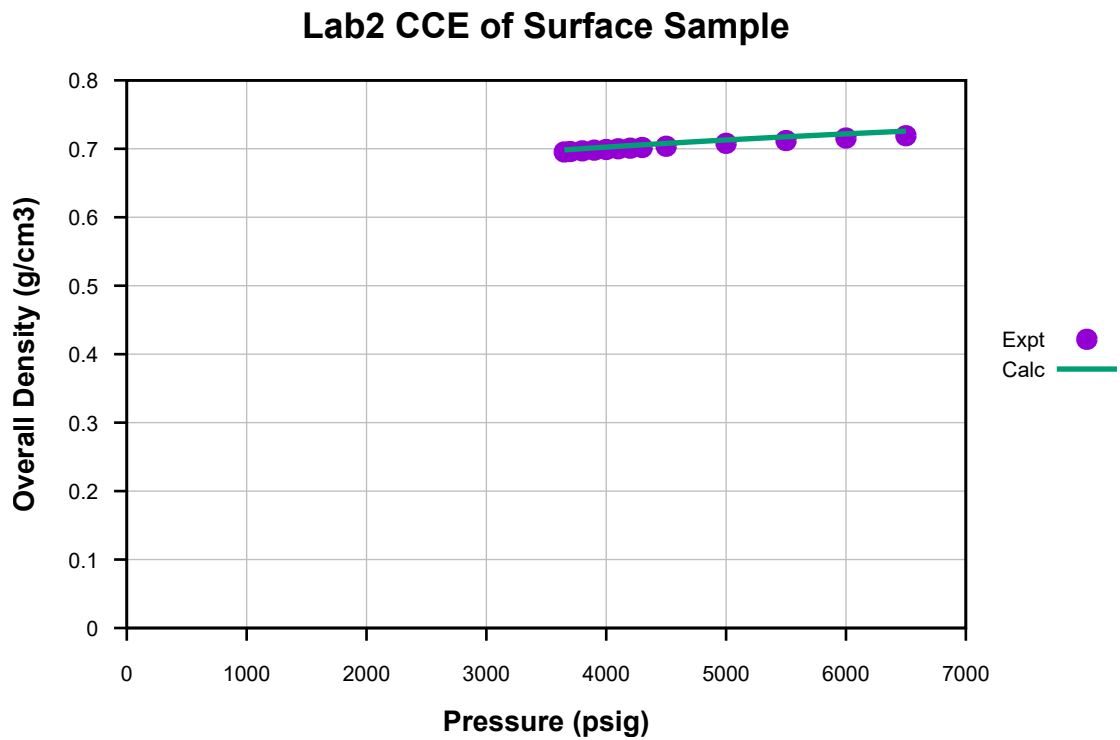


Figure 29: Overall Density vs. Pressure for Lab2 CCE of Surface Sample.

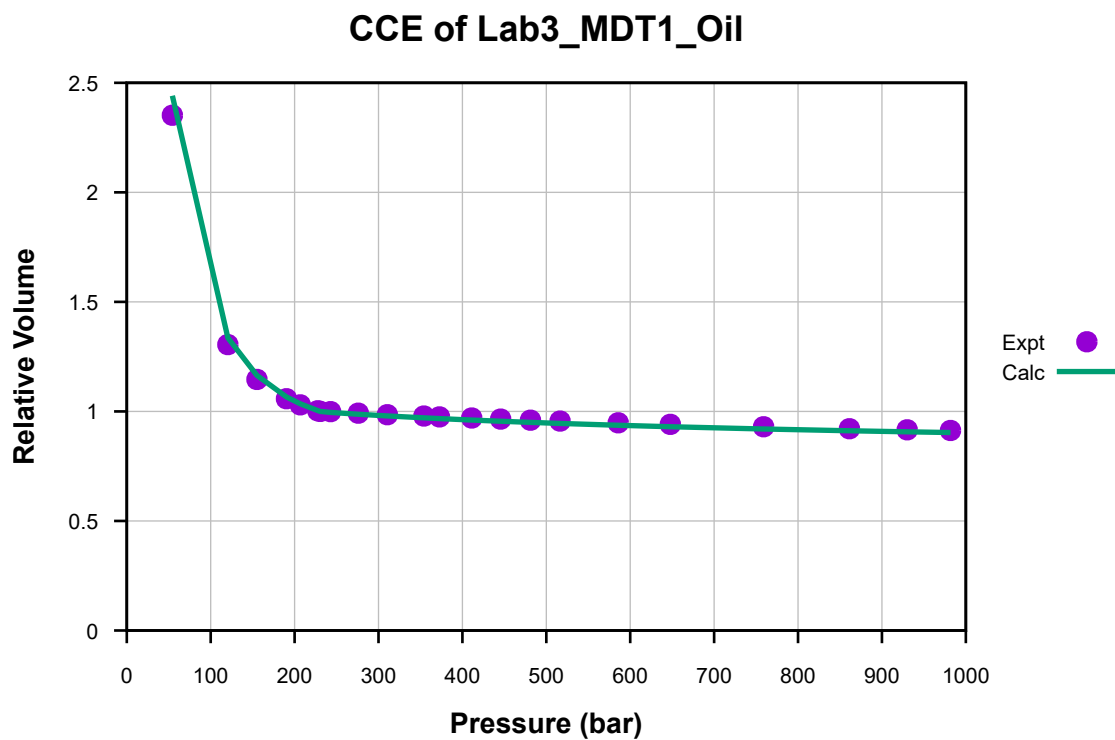


Figure 30: Relative Volume vs. Pressure for CCE of Lab3_MDT1_Oil.

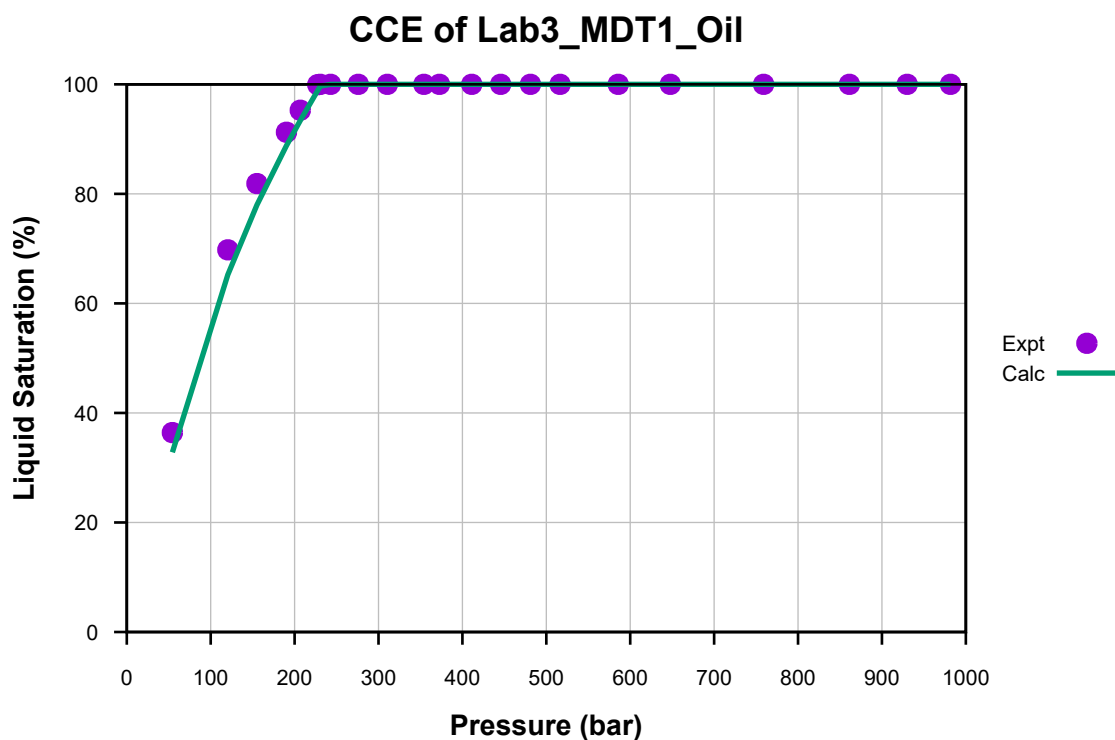


Figure 31: Liquid Saturation vs. Pressure for CCE of Lab3_MDT1_Oil.

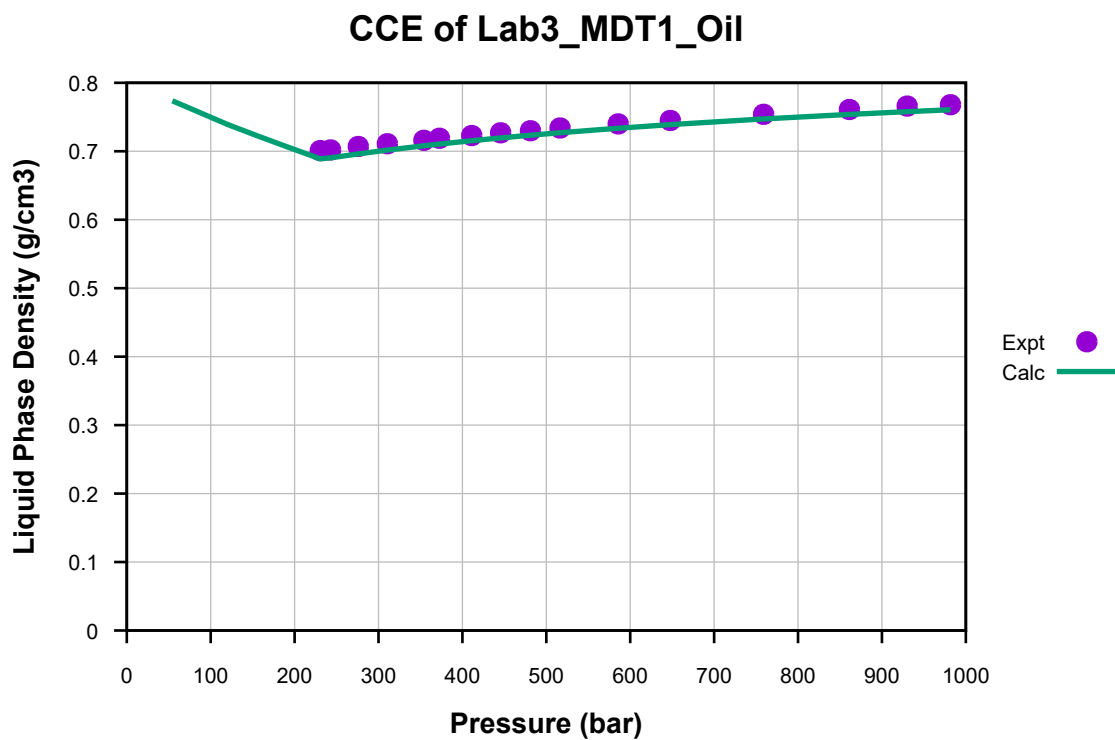


Figure 32: Liquid Phase Density vs. Pressure for CCE of Lab3_MDT1_Oil.

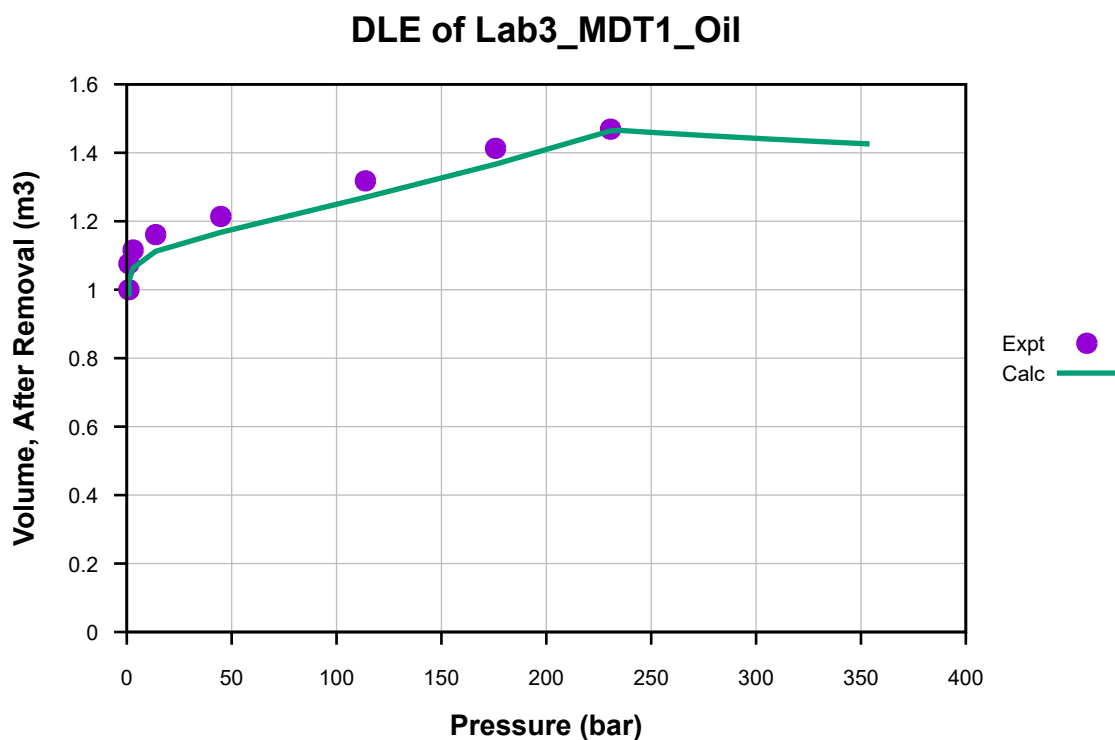


Figure 33: Volume, After Removal, vs. Pressure for DLE of Lab3_MDT1_Oil.

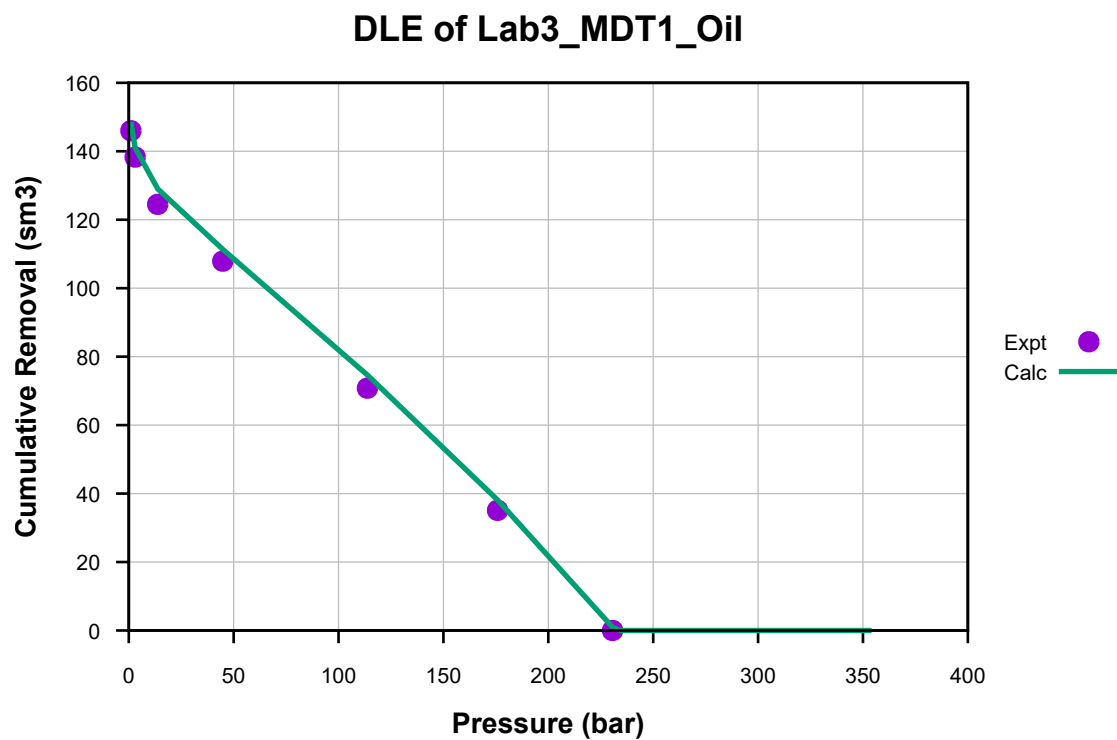


Figure 34: Cumulative Removal vs. Pressure for DLE of Lab3_MDT1_Oil.

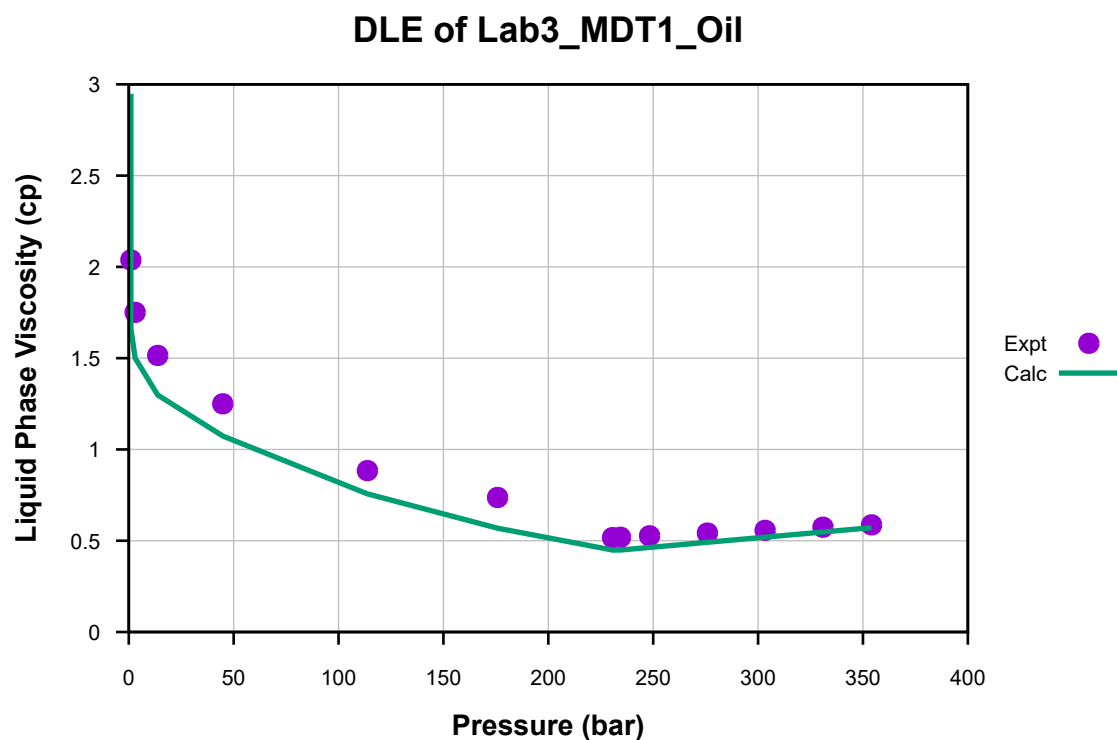


Figure 35: Liquid Phase Viscosity vs. Pressure for DLE of Lab3_MDT1_Oil.

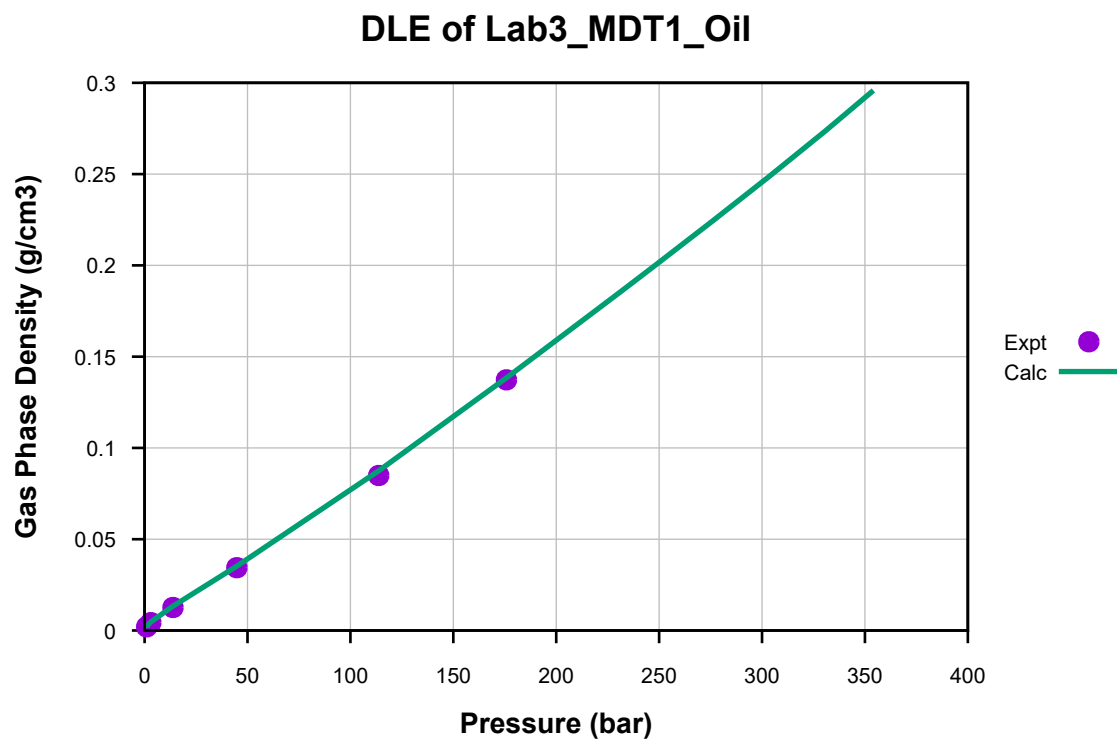


Figure 36: Gas Phase Density vs. Pressure for DLE of Lab3_MDT1_Oil.

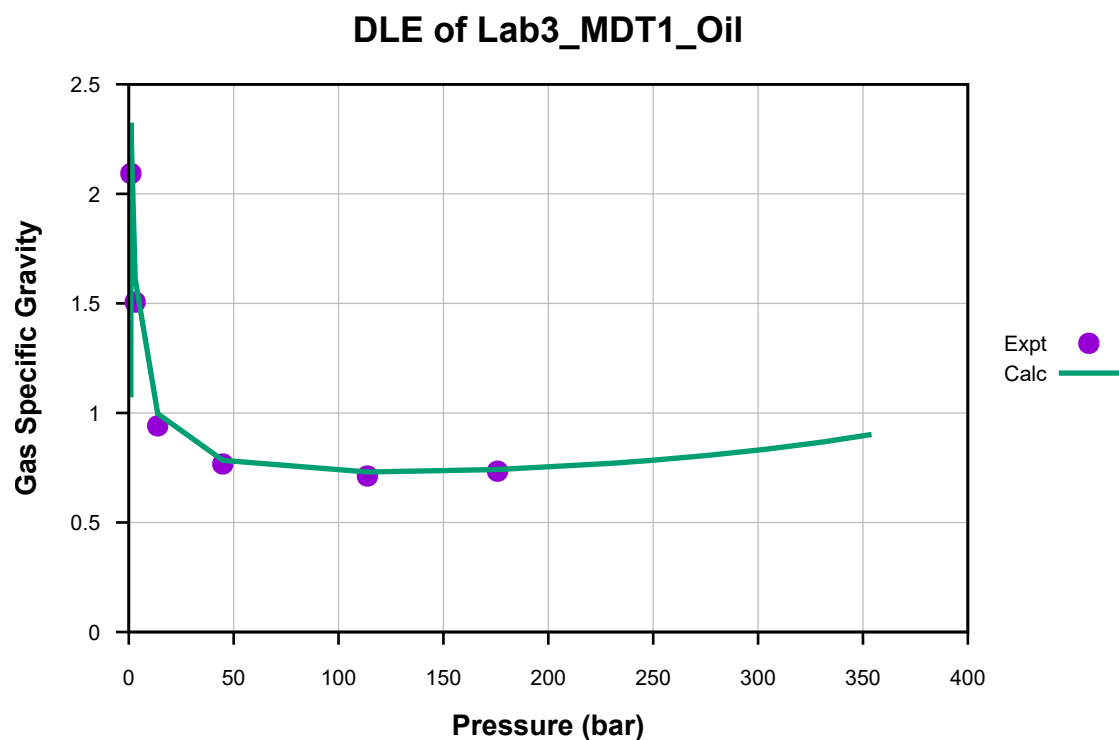


Figure 37: Gas Specific Gravity vs. Pressure for DLE of Lab3_MDT1_Oil.

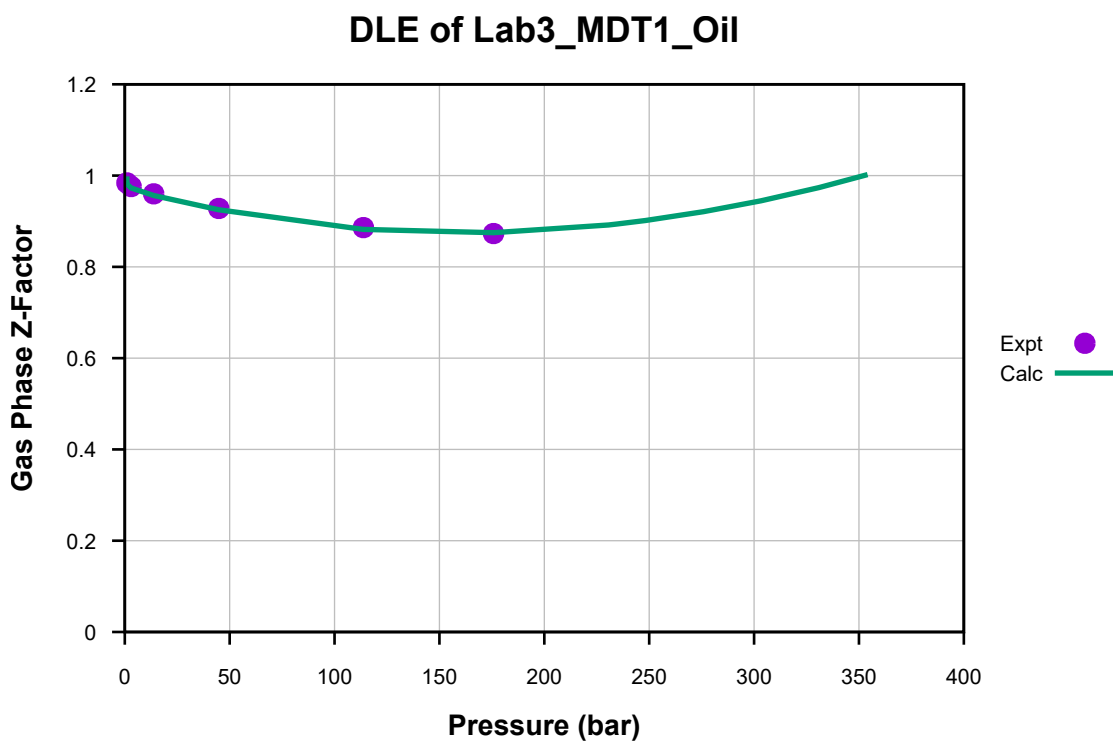


Figure 38: Gas Phase Z-Factor vs. Pressure for DLE of Lab3_MDT1_Oil.

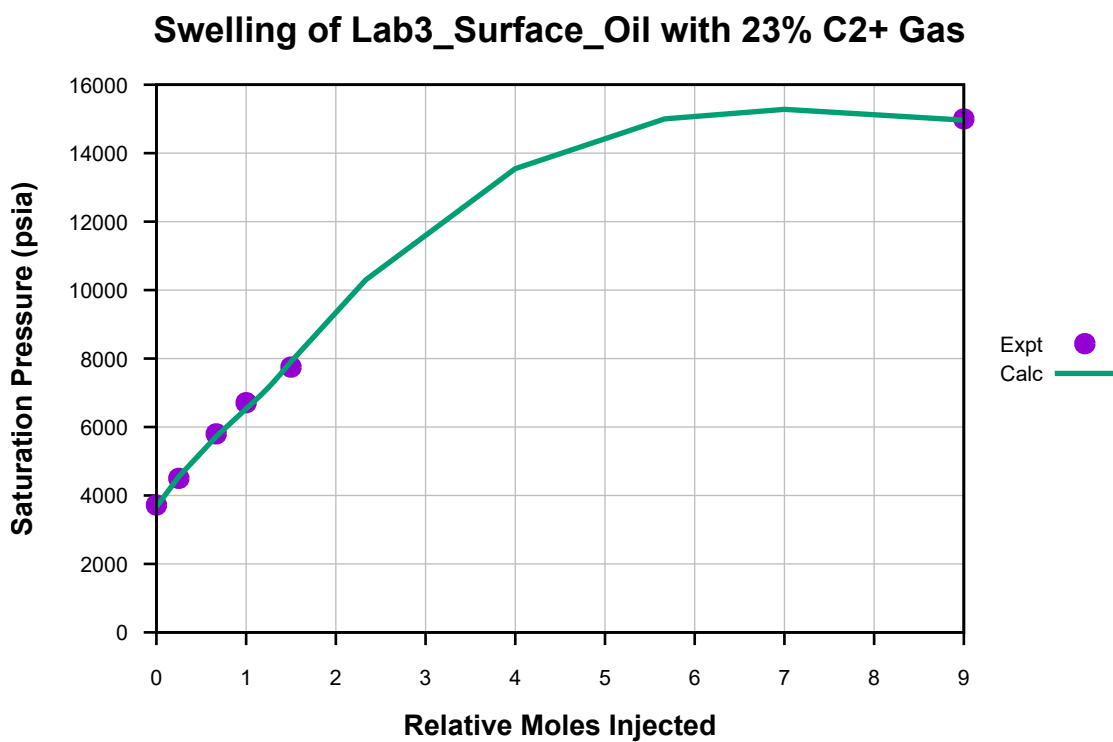


Figure 39: Saturation Pressure vs. Relative Moles Injected for Swelling of Lab3_Surface_Oil with 23% C2+ Gas.

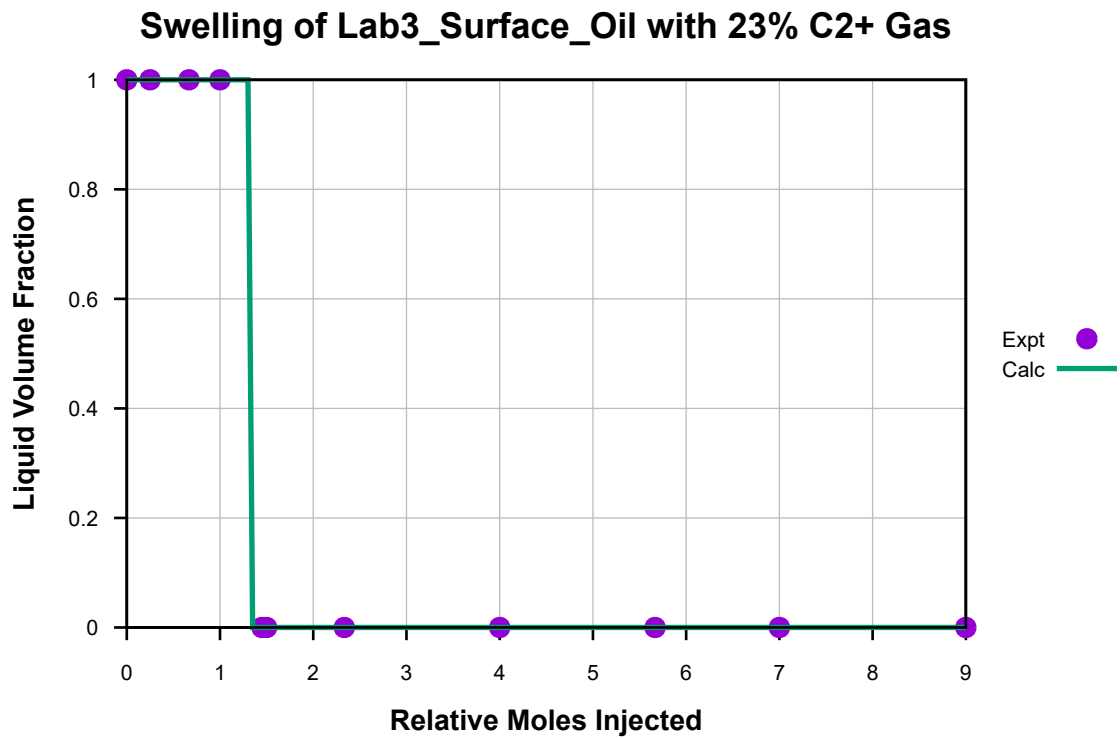


Figure 40: Liquid Volume Fraction vs. Relative Moles Injected for Swelling of Lab3_Surface_Oil with 23% C2+ Gas.

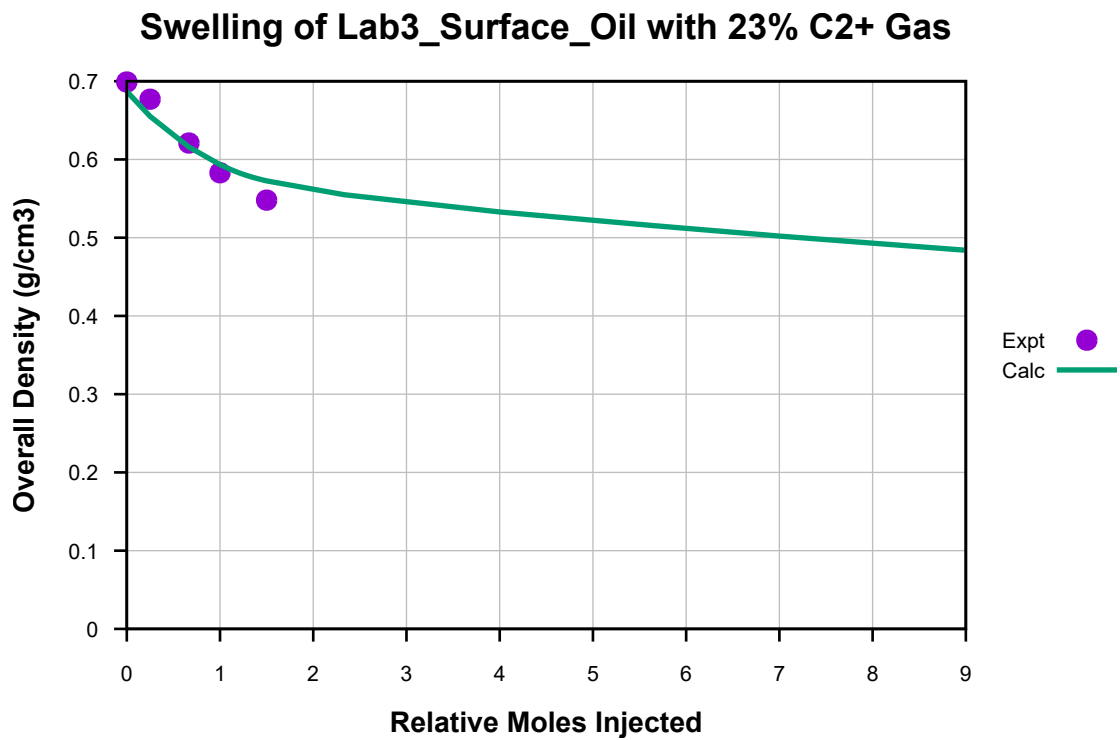


Figure 41: Overall Density vs. Relative Moles Injected for Swelling of Lab3_Surface_Oil with 23% C2+ Gas.

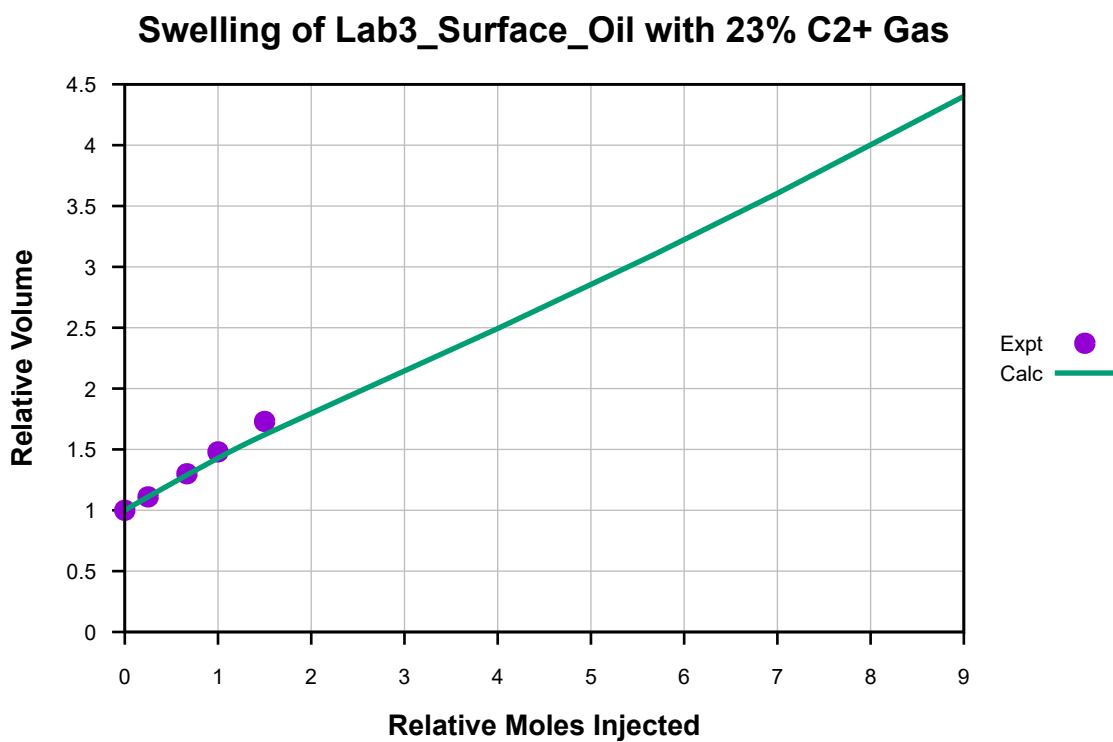


Figure 42: Relative Volume vs. Relative Moles Injected for Swelling of Lab3_Surface_Oil with 23% C2+ Gas.

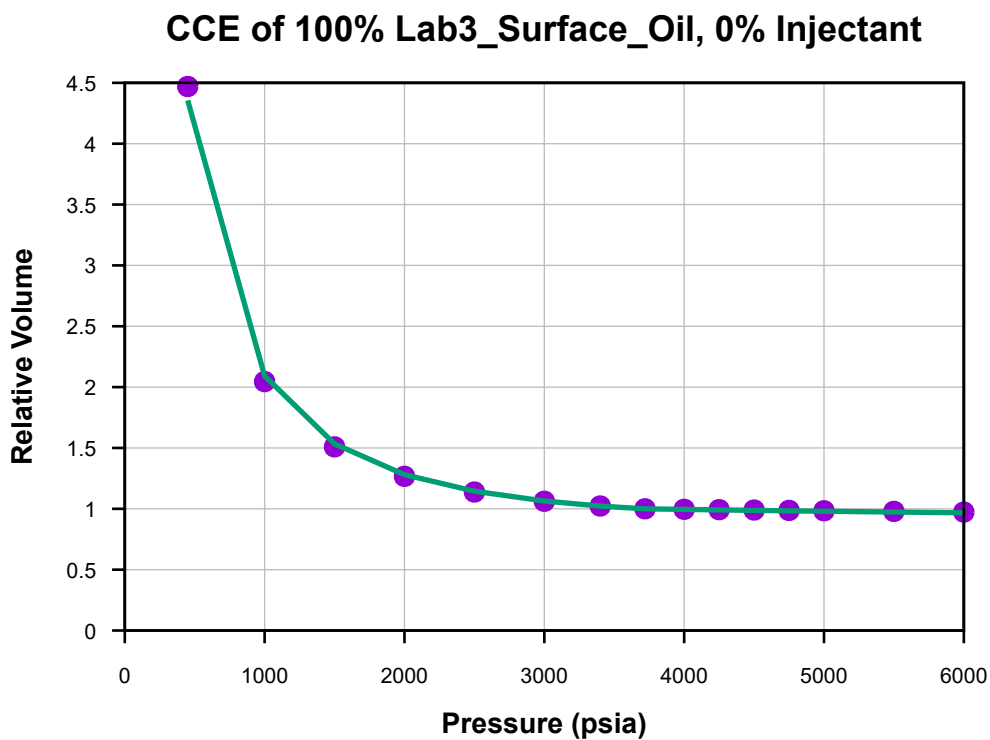


Figure 43: Relative Volume vs. Pressure for CCE of 100% Lab3_Surface_Oil, 0% Injectant.

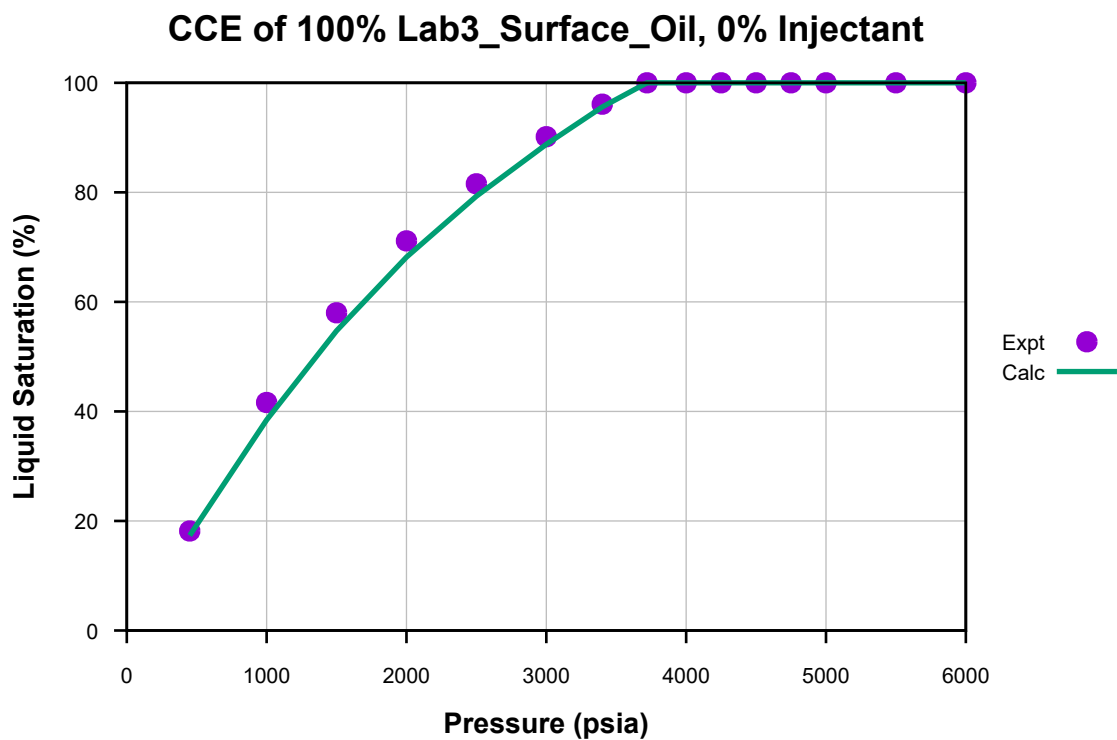


Figure 44: Liquid Saturation vs. Pressure for CCE of 100% Lab3_Surface_Oil, 0% Injectant.

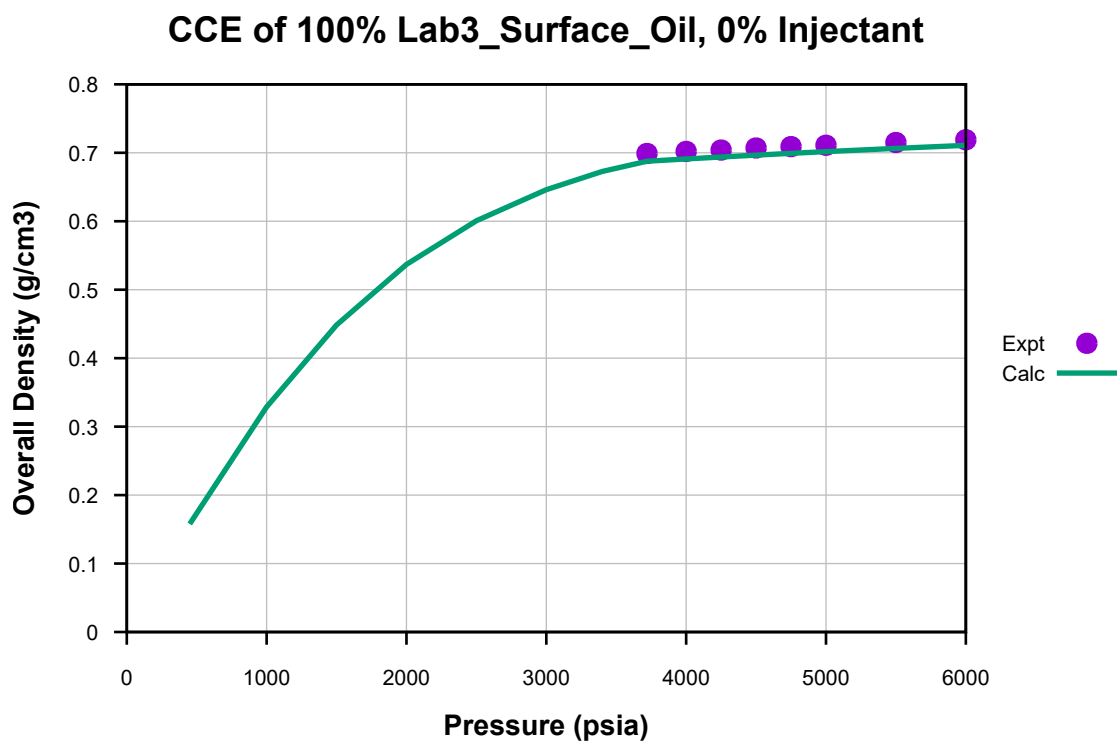


Figure 45: Overall Density vs. Pressure for CCE of 100% Lab3_Surface_Oil, 0% Injectant.

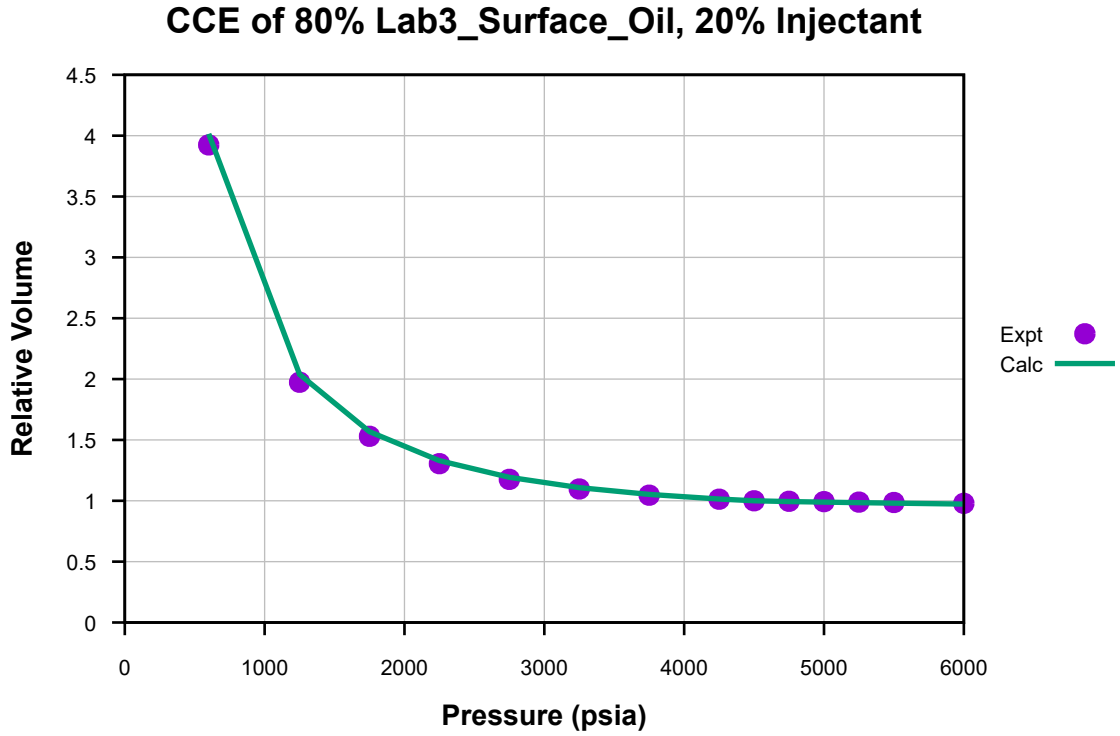


Figure 46: Relative Volume vs. Pressure for CCE of 80% Lab3_Surface_Oil, 20% Injectant.

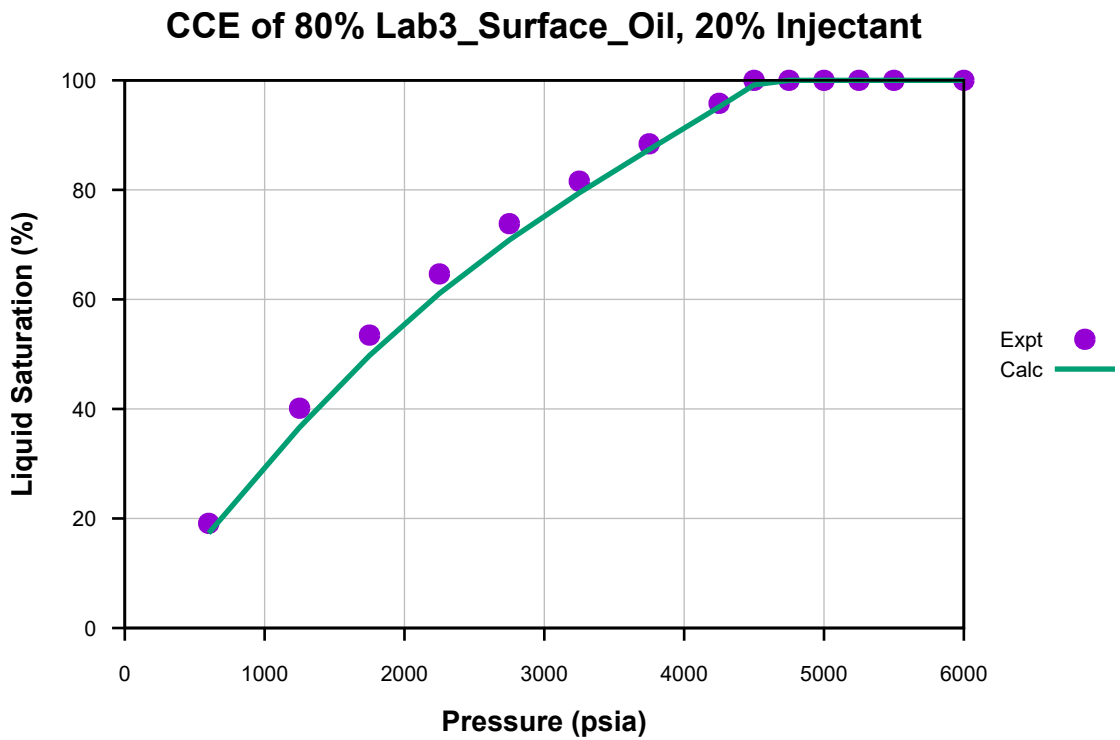


Figure 47: Liquid Saturation vs. Pressure for CCE of 80% Lab3_Surface_Oil, 20% Injectant.

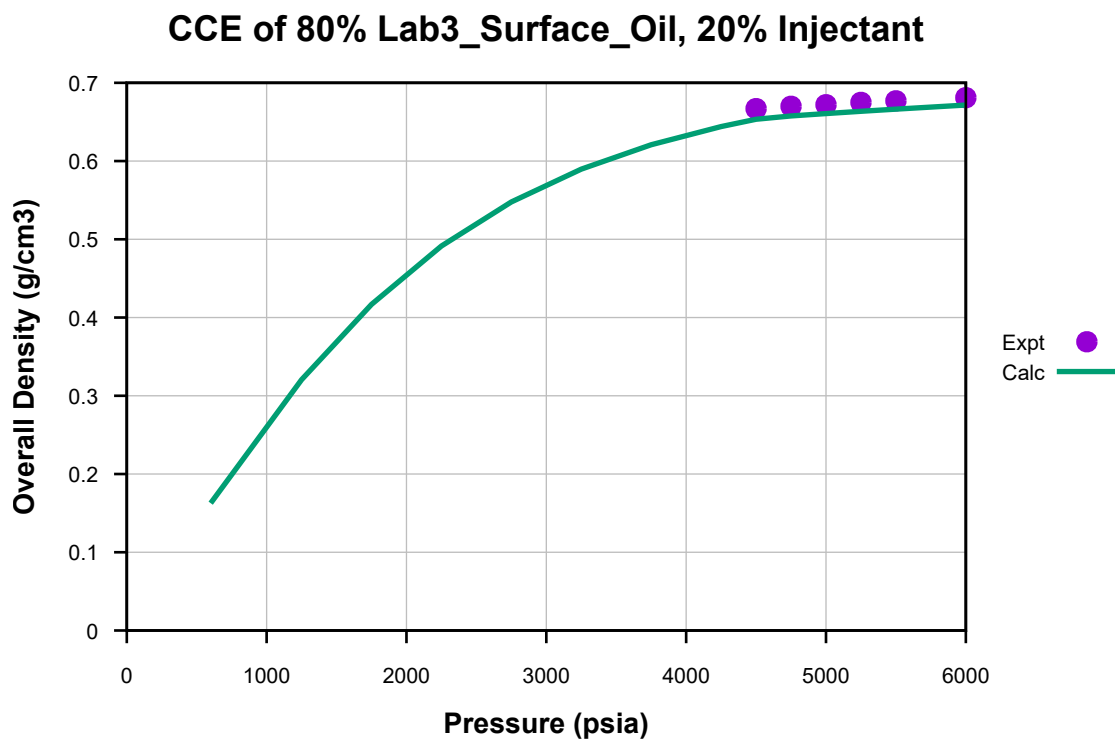


Figure 48: Overall Density vs. Pressure for CCE of 80% Lab3_Surface_Oil, 20% Injectant.

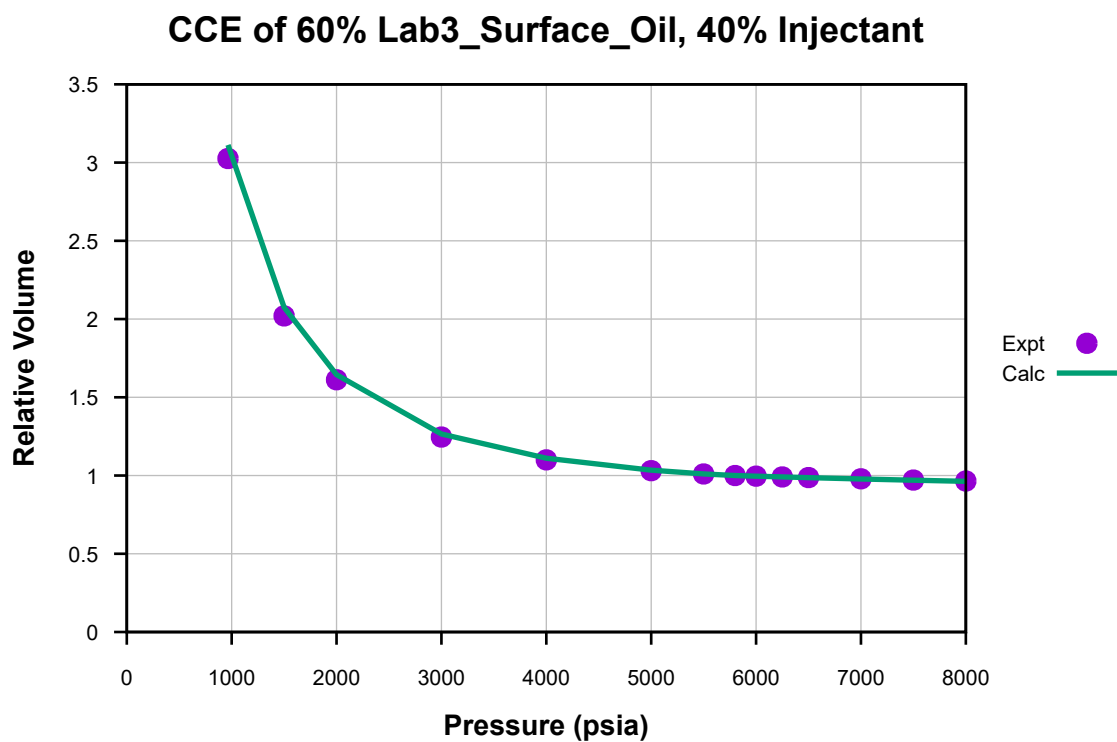


Figure 49: Relative Volume vs. Pressure for CCE of 60% Lab3_Surface_Oil, 40% Injectant.

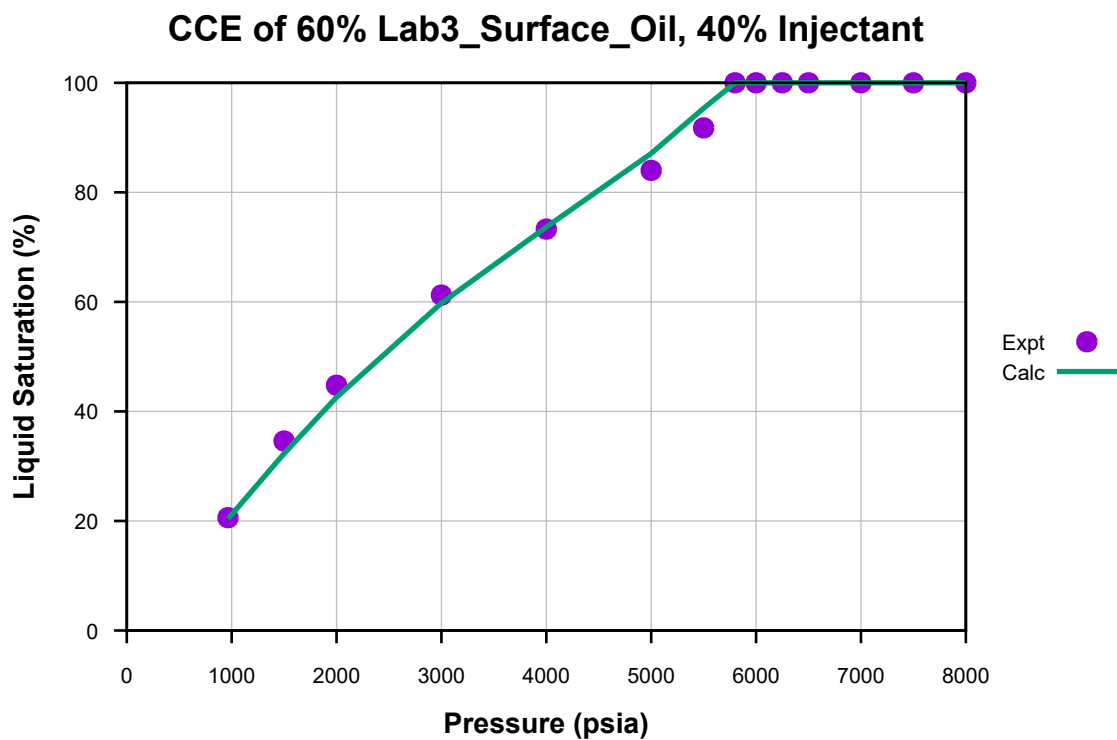


Figure 50: Liquid Saturation vs. Pressure for CCE of 60% Lab3_Surface_Oil, 40% Injectant.

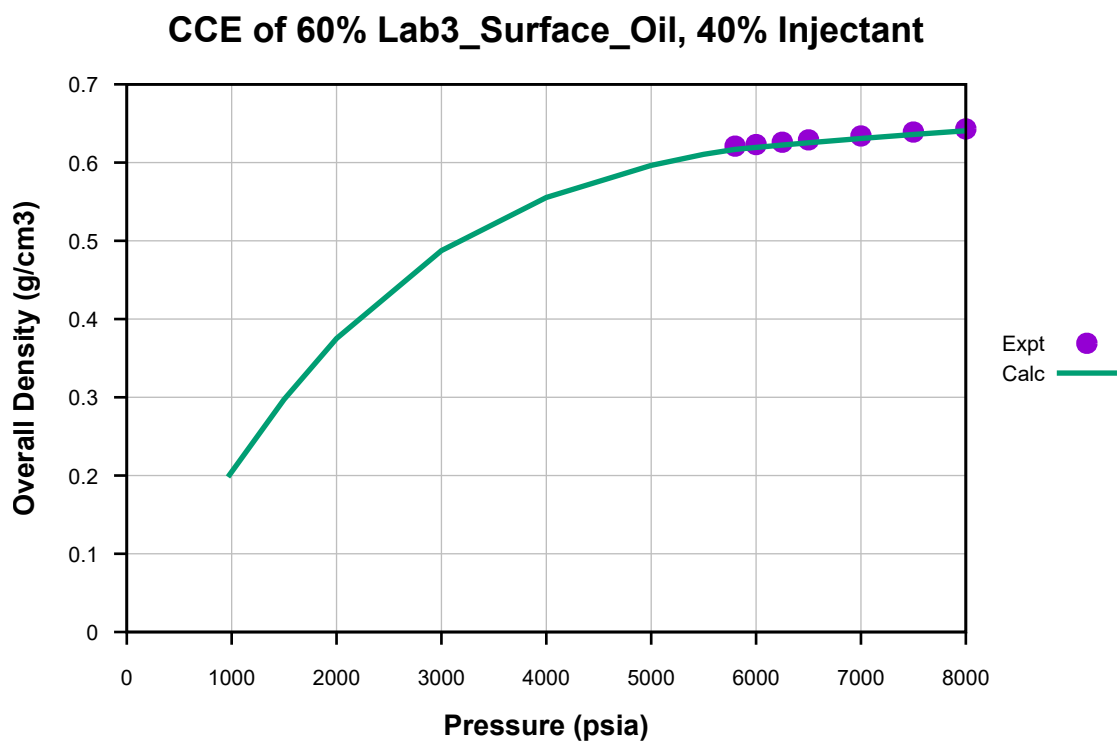


Figure 51: Overall Density vs. Pressure for CCE of 60% Lab3_Surface_Oil, 40% Injectant.

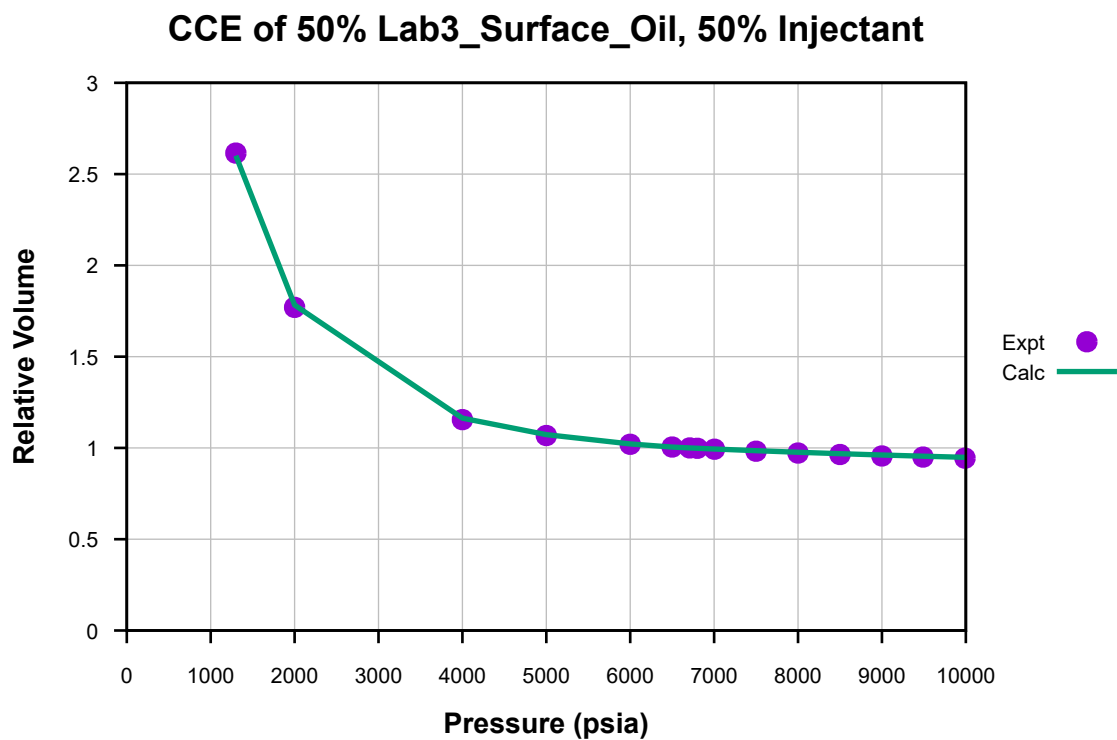


Figure 52: Relative Volume vs. Pressure for CCE of 50% Lab3_Surface_Oil, 50% Injectant.

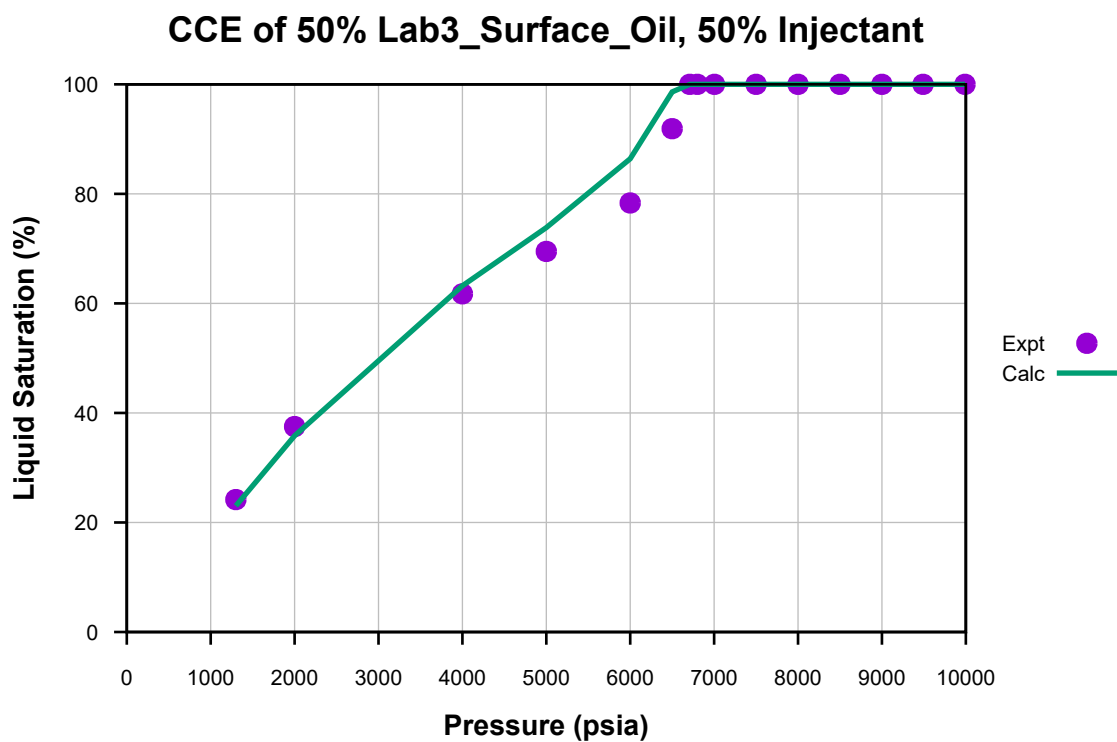


Figure 53: Liquid Saturation vs. Pressure for CCE of 50% Lab3_Surface_Oil, 50% Injectant.

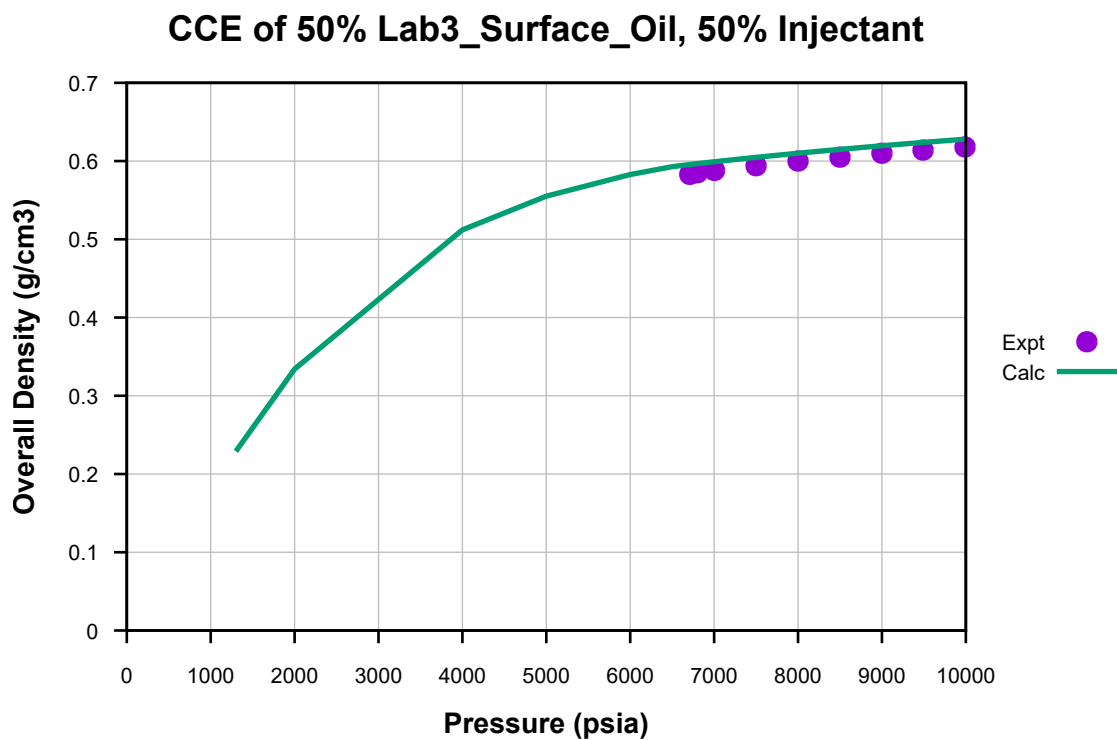


Figure 54: Overall Density vs. Pressure for CCE of 50% Lab3_Surface_Oil, 50% Injectant.

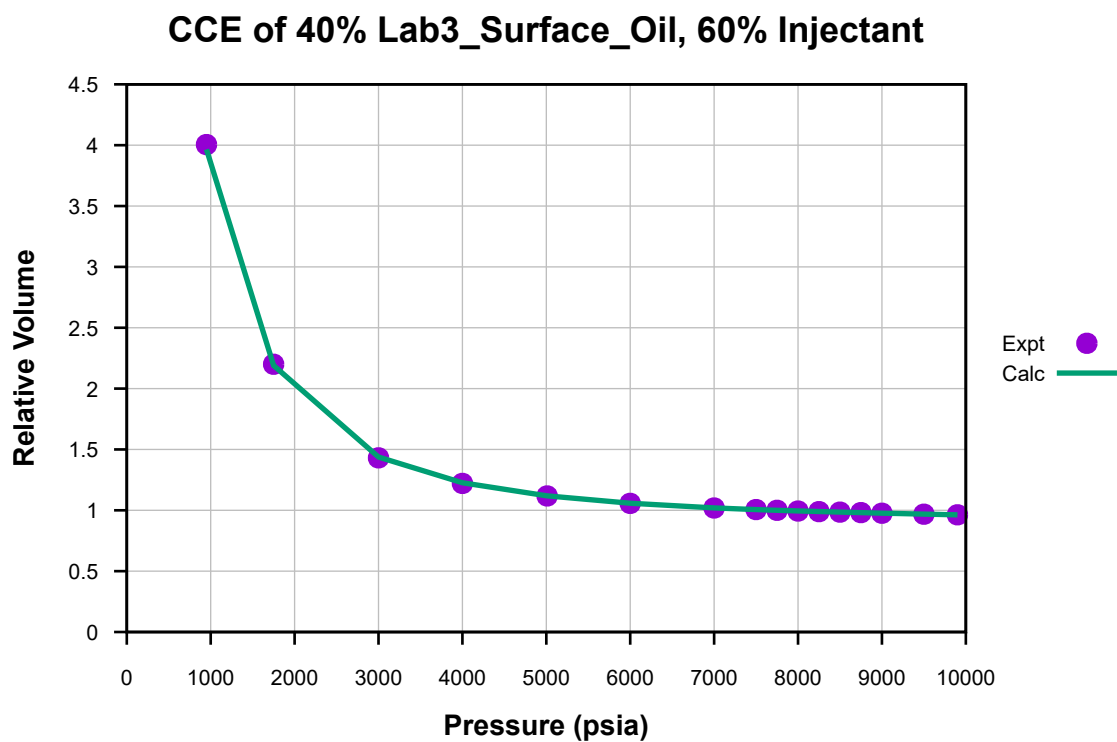


Figure 55: Relative Volume vs. Pressure for CCE of 40% Lab3_Surface_Oil, 60% Injectant.

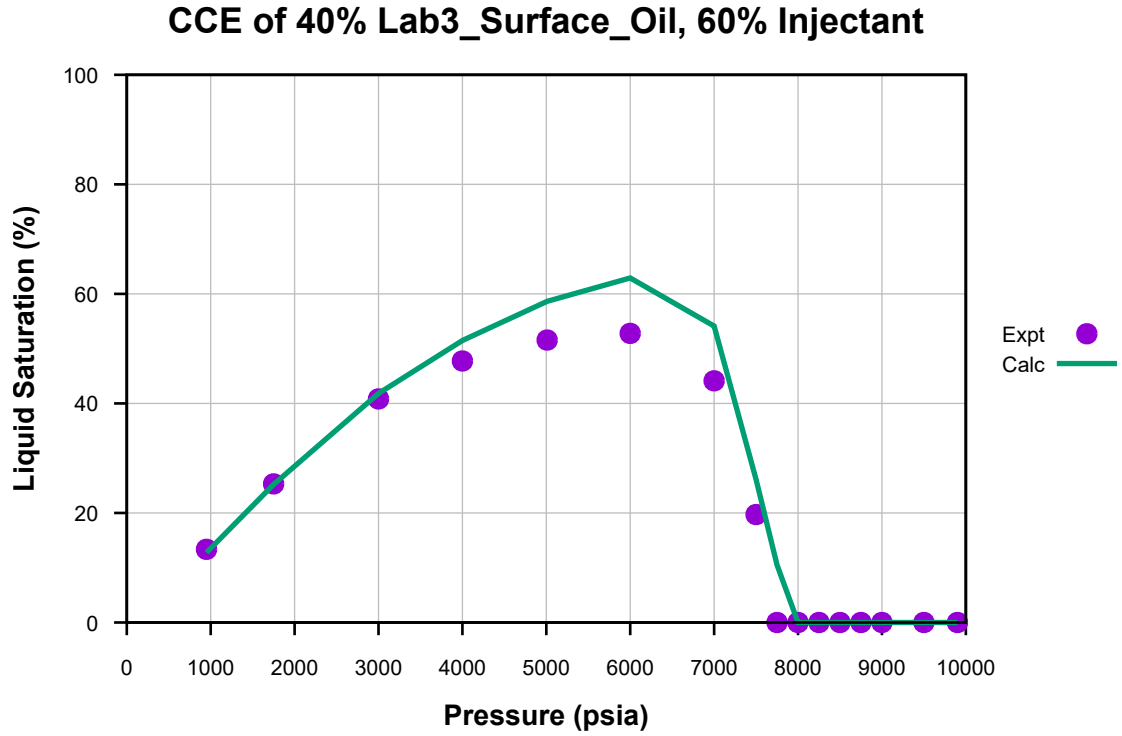


Figure 56: Liquid Saturation vs. Pressure for CCE of 40% Lab3_Surface_Oil, 60% Injectant.

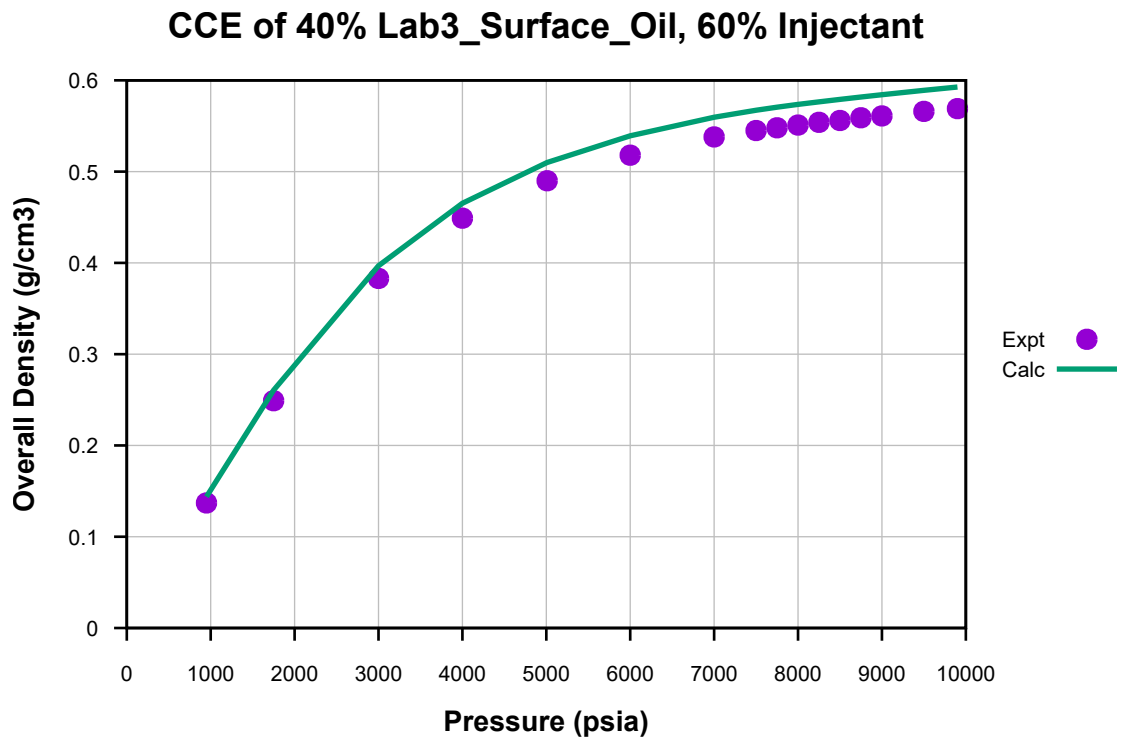


Figure 57: Overall Density vs. Pressure for CCE of 40% Lab3_Surface_Oil, 60% Injectant.

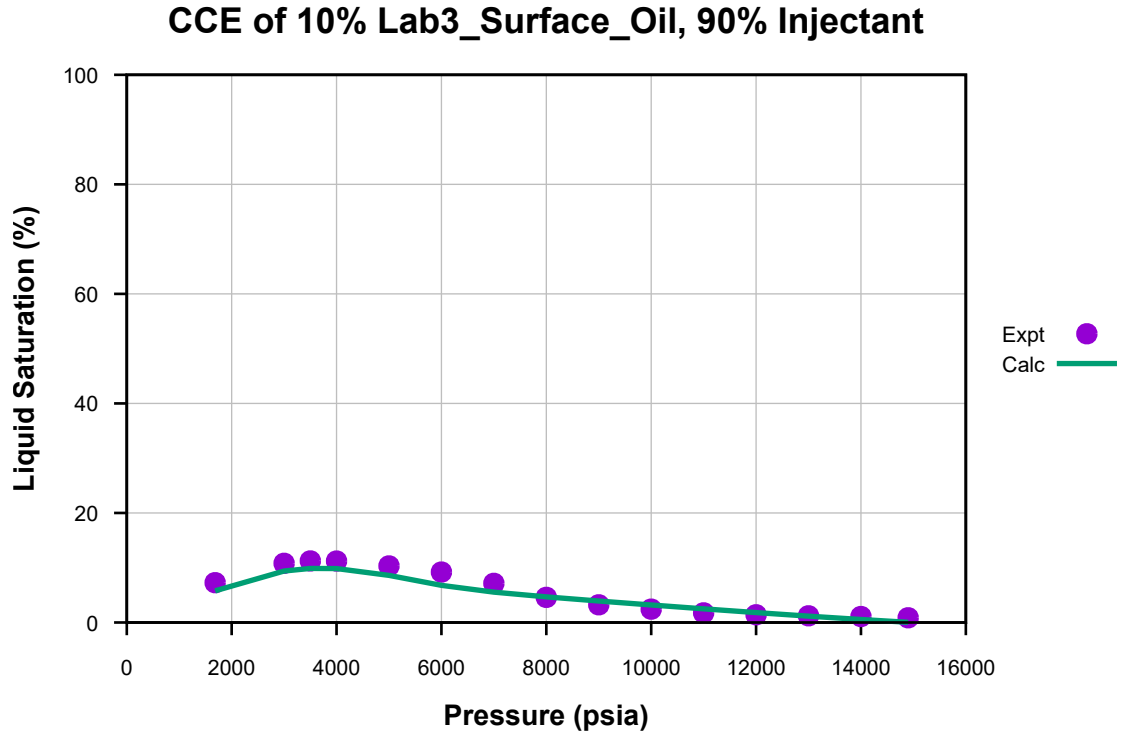


Figure 58: Liquid Saturation vs. Pressure for CCE of 10% Lab3_Surface_Oil, 90% Injectant.

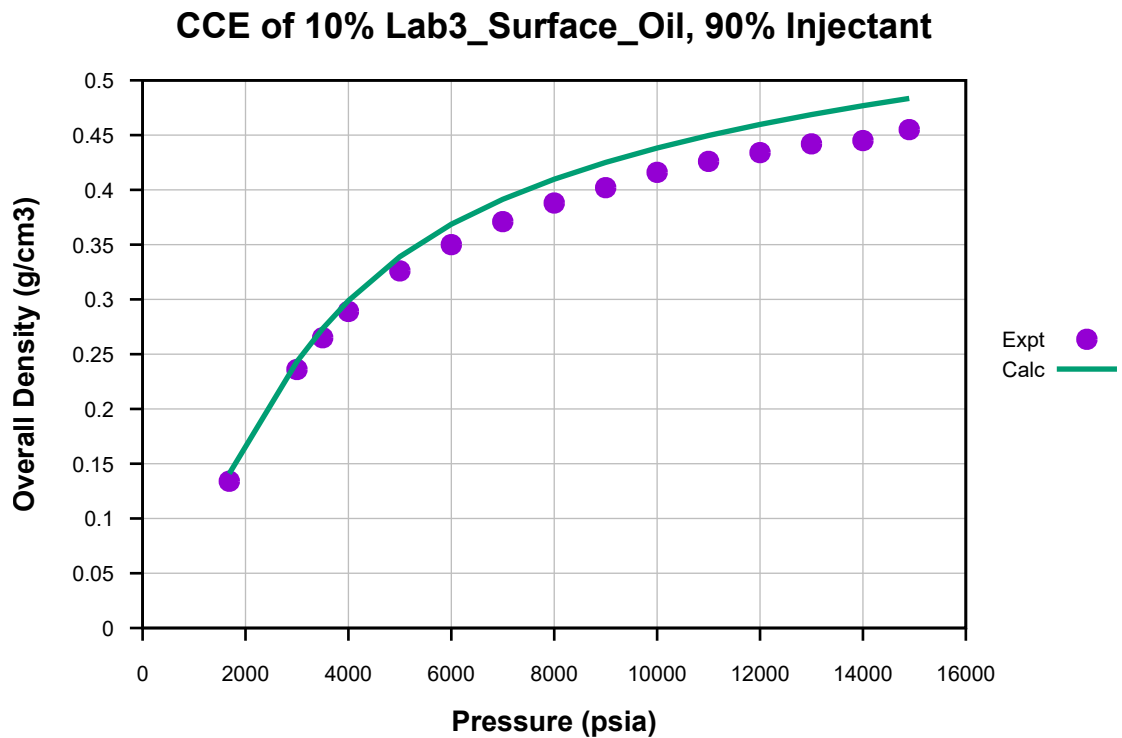


Figure 59: Overall Density vs. Pressure for CCE of 10% Lab3_Surface_Oil, 90% Injectant.

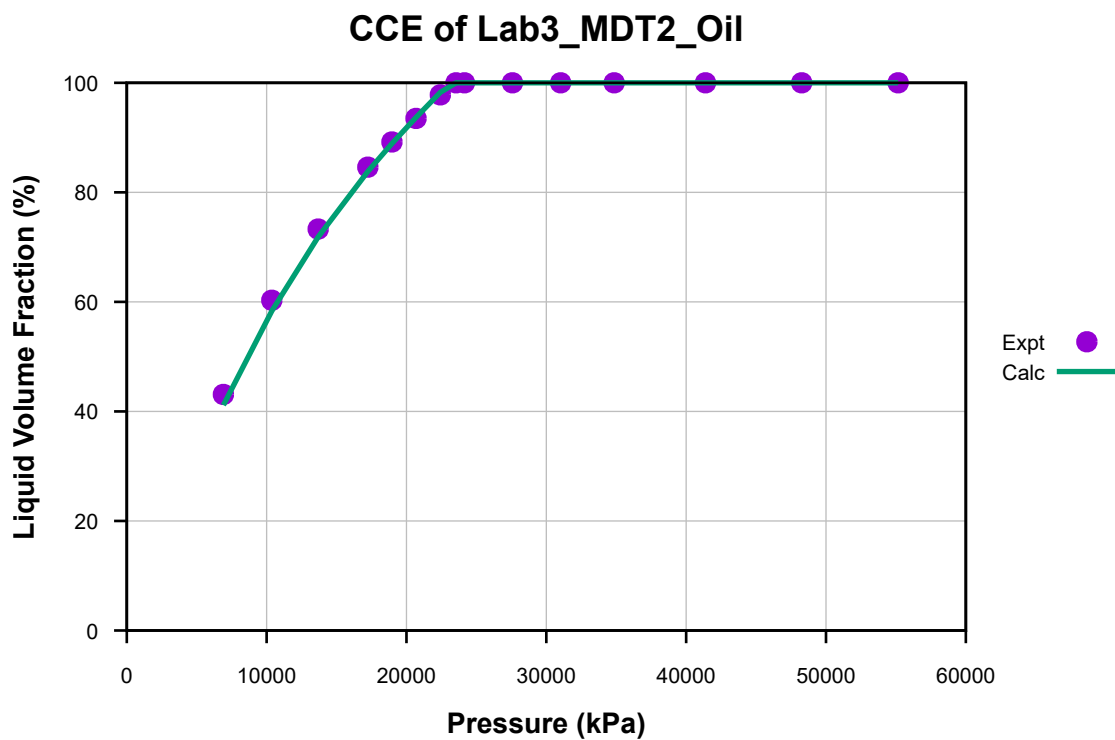


Figure 60: Liquid Volume Fraction vs. Pressure for CCE of Lab3_MDT2_Oil.

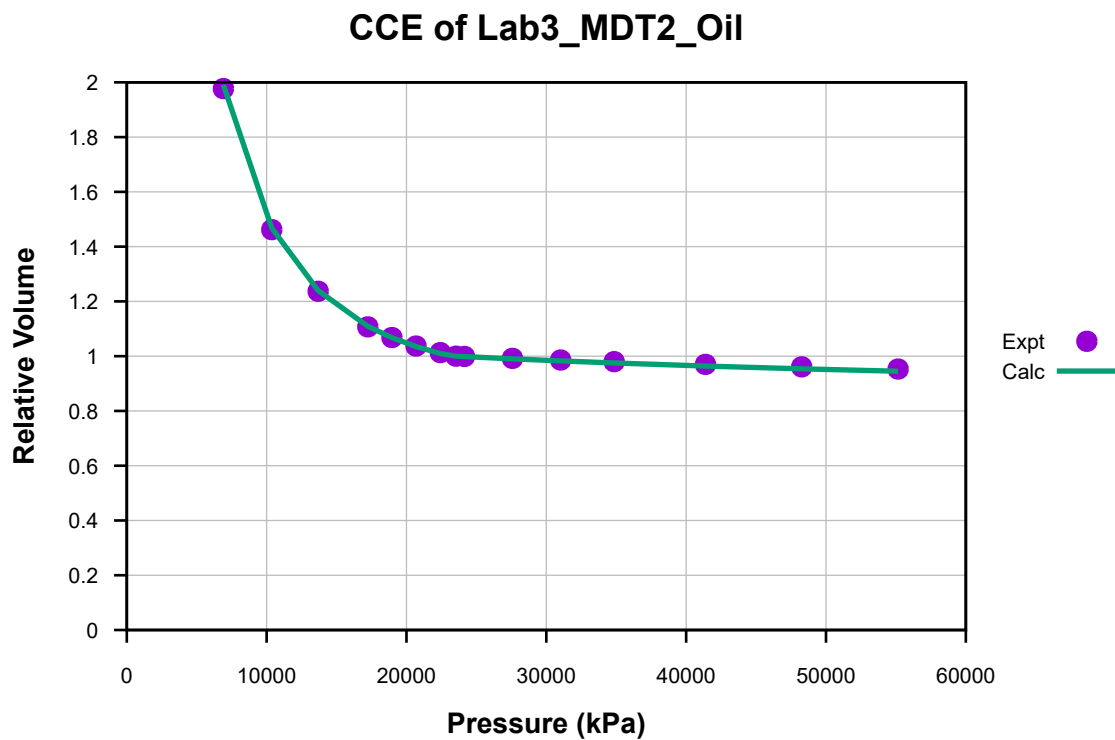


Figure 61: Relative Volume vs. Pressure for CCE of Lab3_MDT2_Oil.

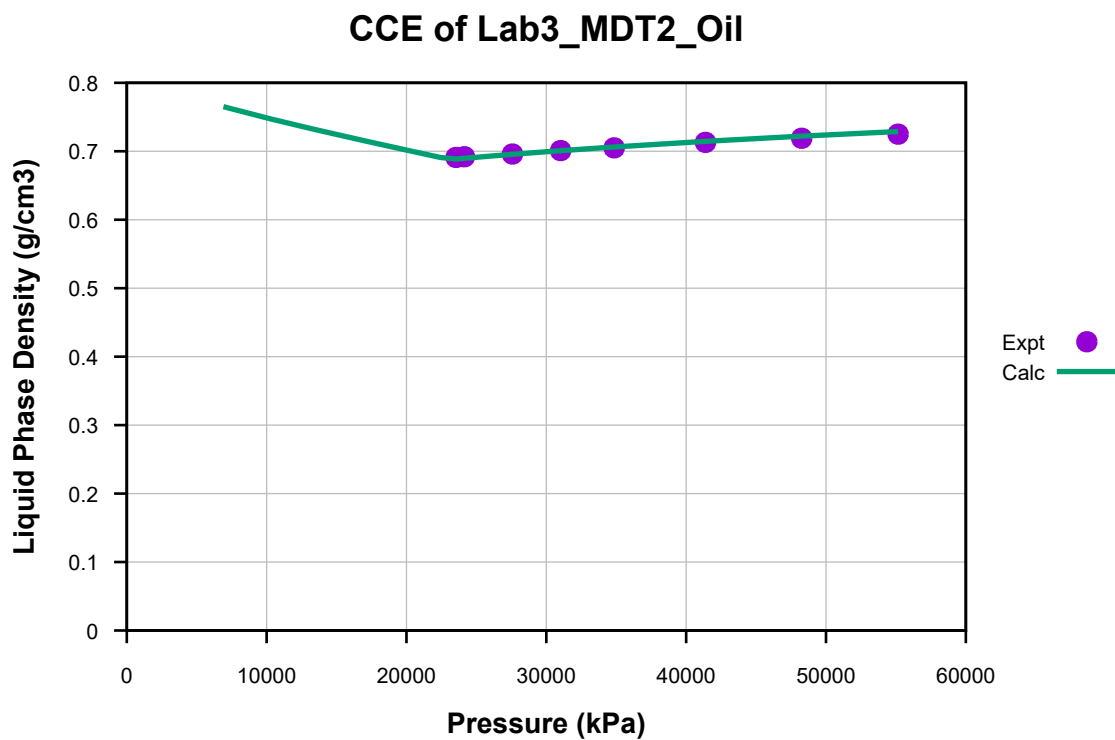


Figure 62: Liquid Phase Density vs. Pressure for CCE of Lab3_MDT2_Oil.

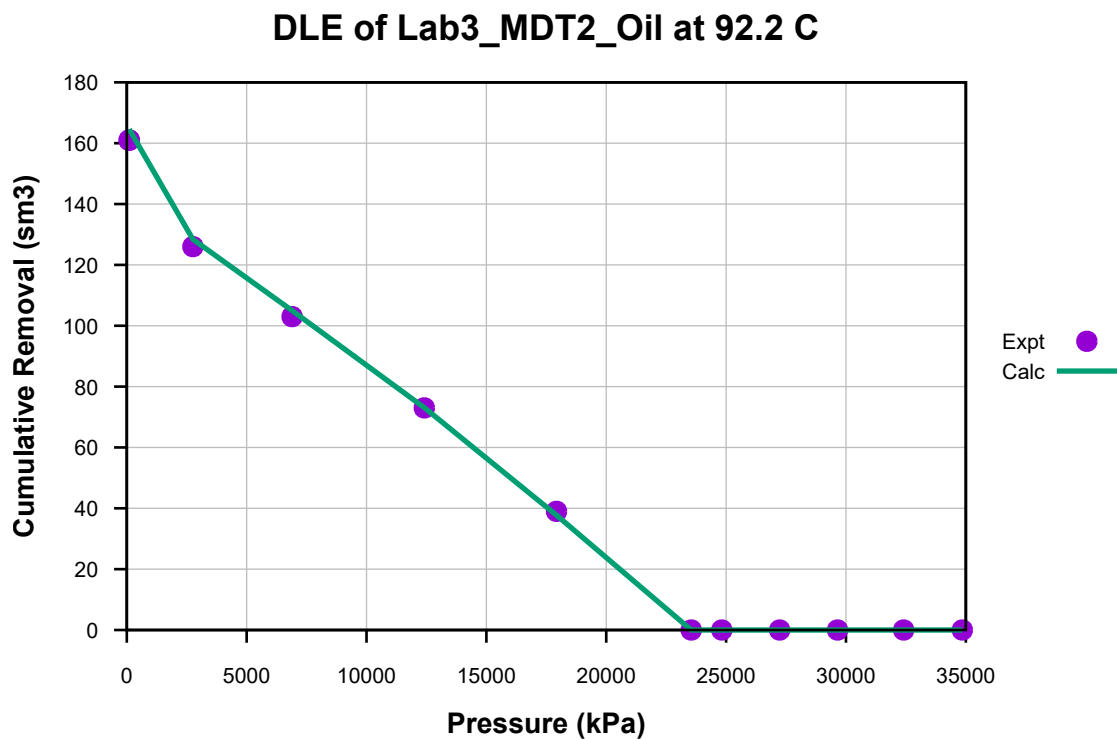


Figure 63: Cumulative Removal vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.

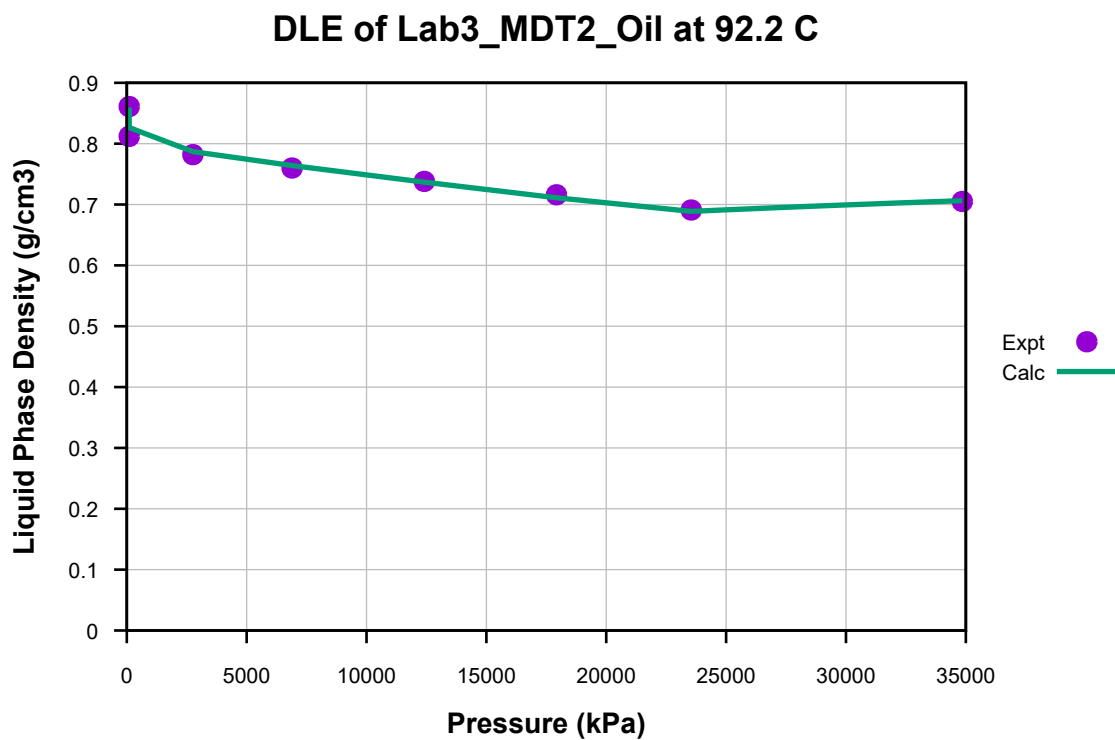


Figure 64: Liquid Phase Density vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.

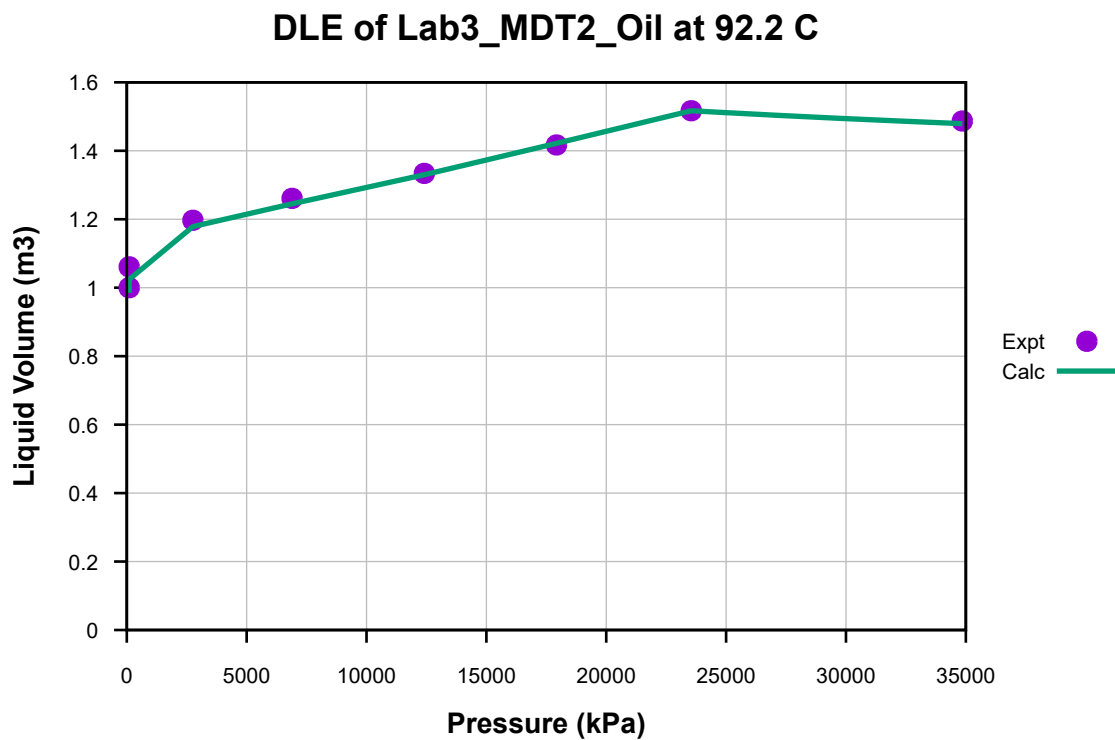


Figure 65: Liquid Volume vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.

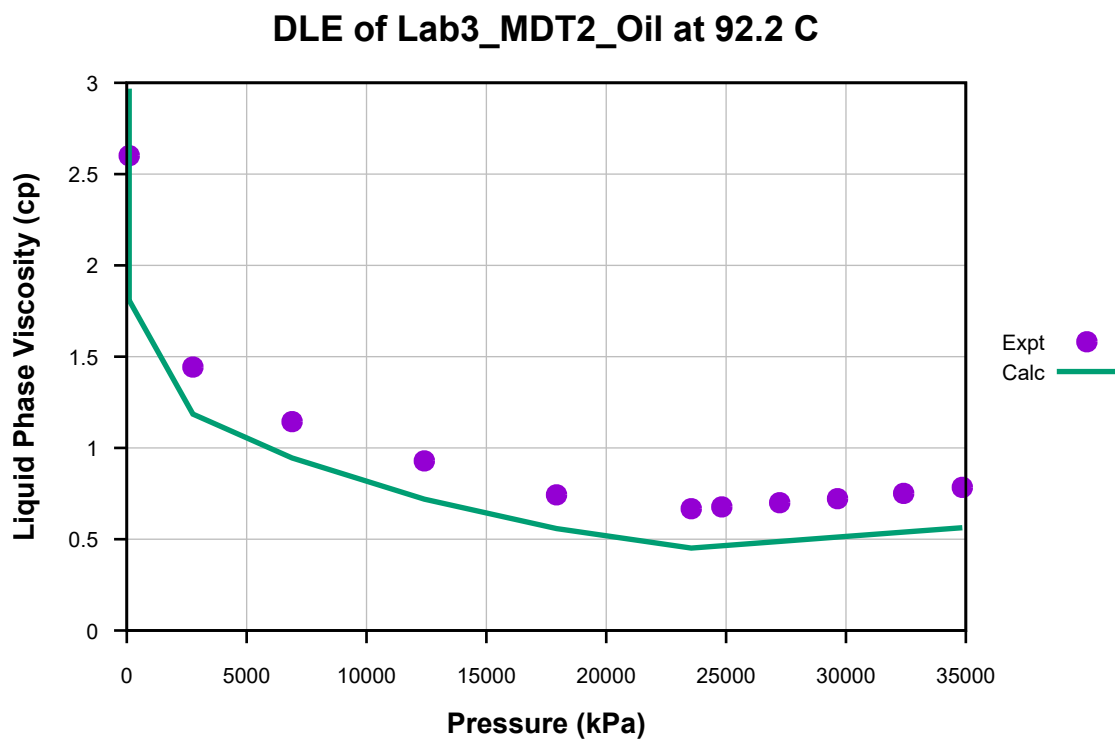


Figure 66: Liquid Phase Viscosity vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.

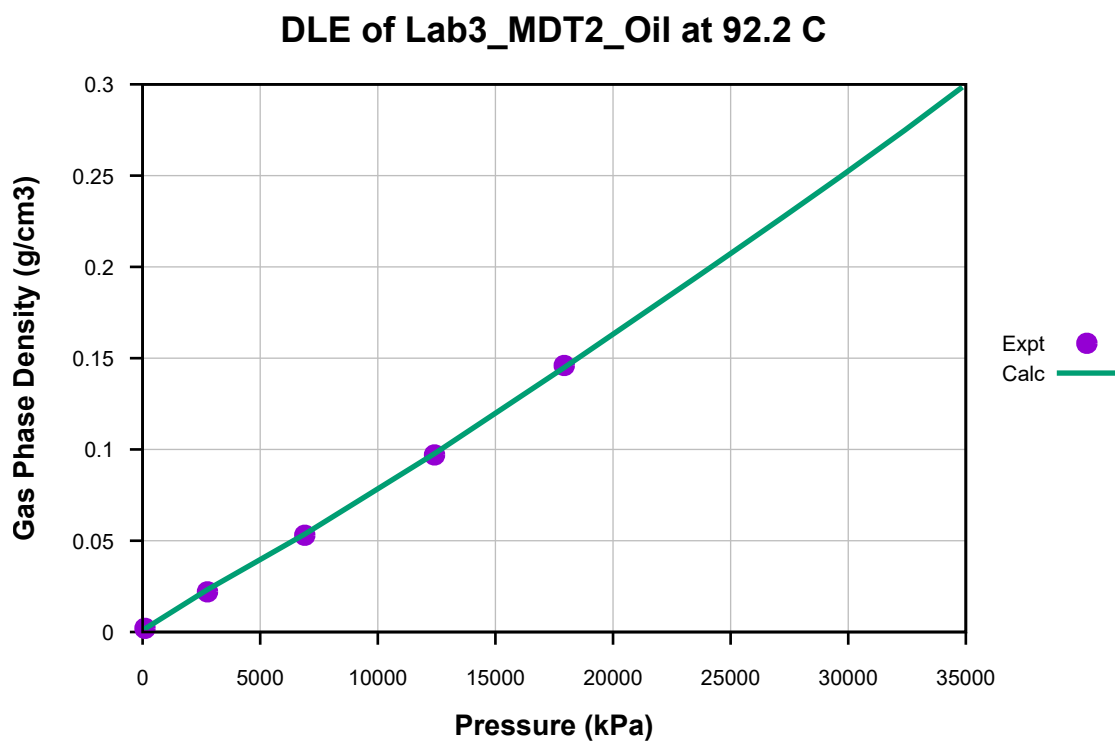


Figure 67: Gas Phase Density vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.

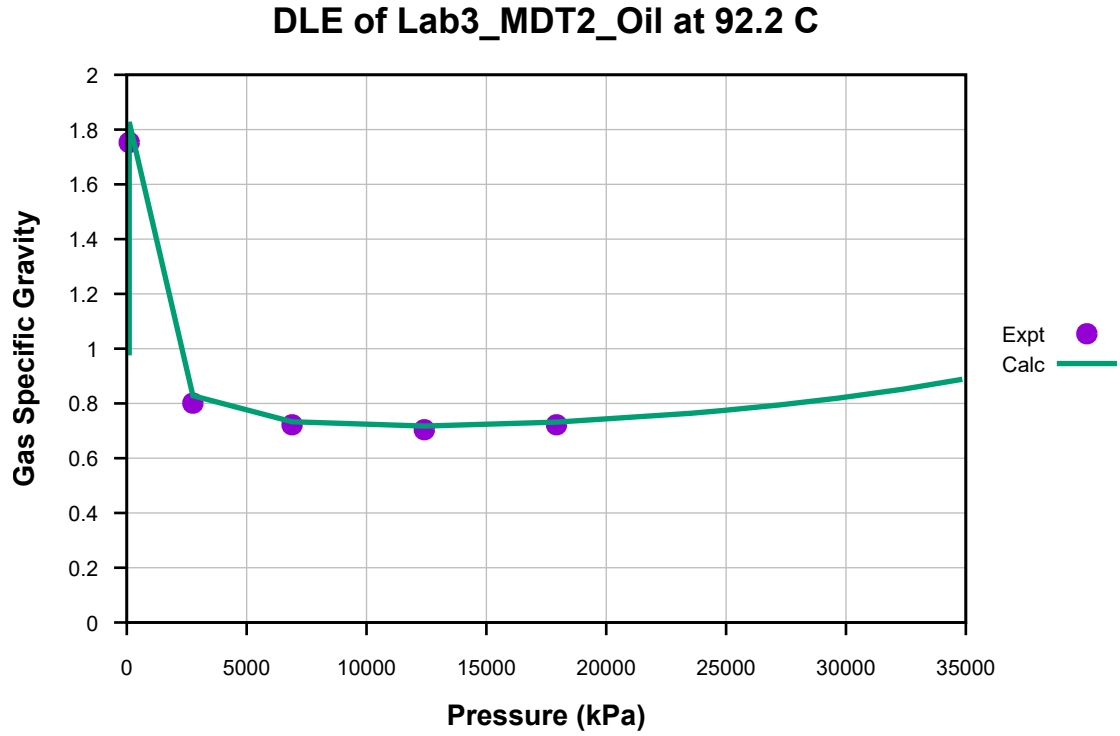


Figure 68: Gas Specific Gravity vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.

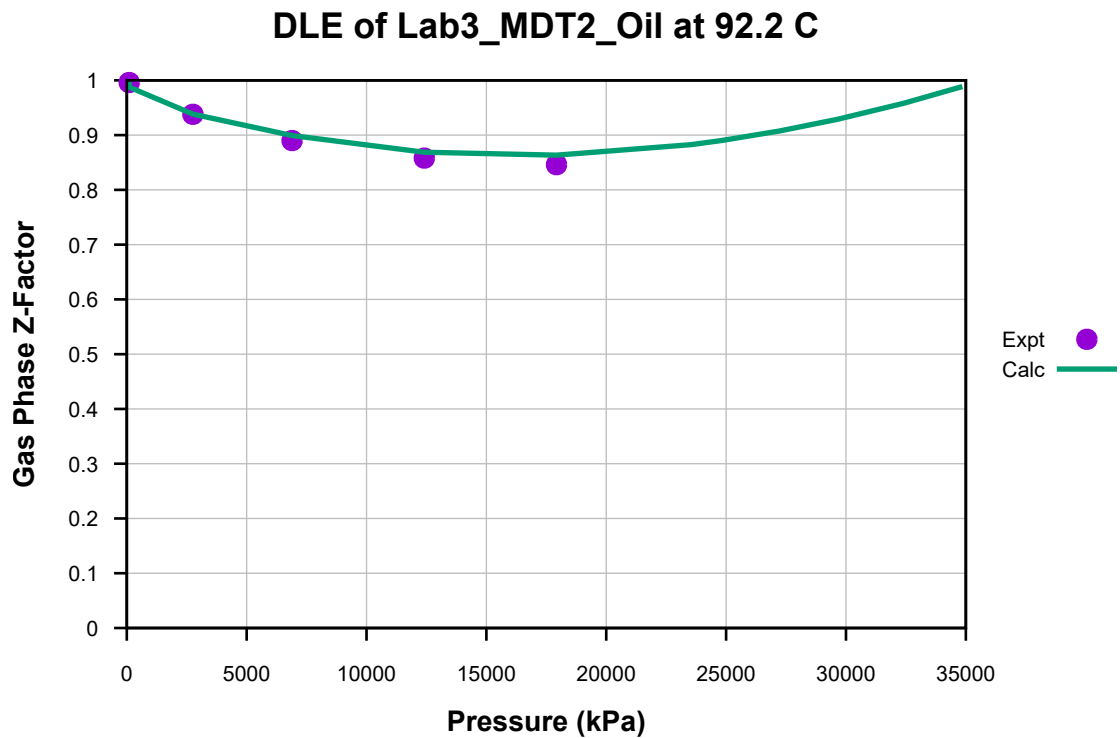


Figure 69: Gas Phase Z-Factor vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.

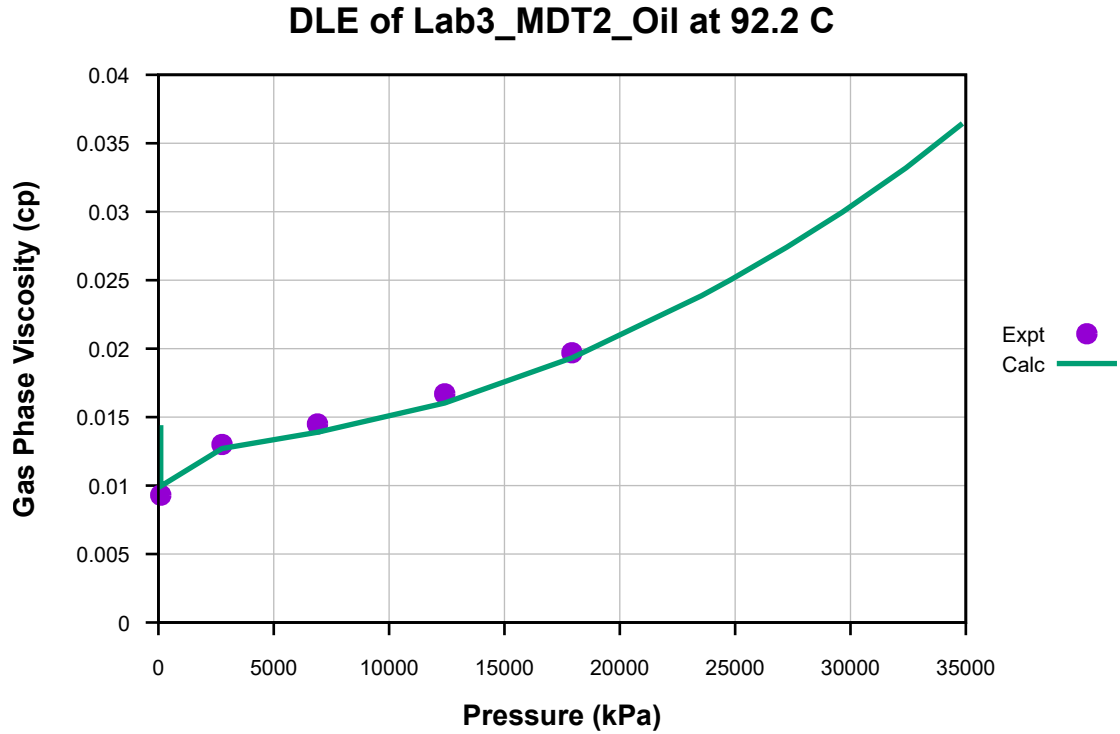


Figure 70: Gas Phase Viscosity vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.

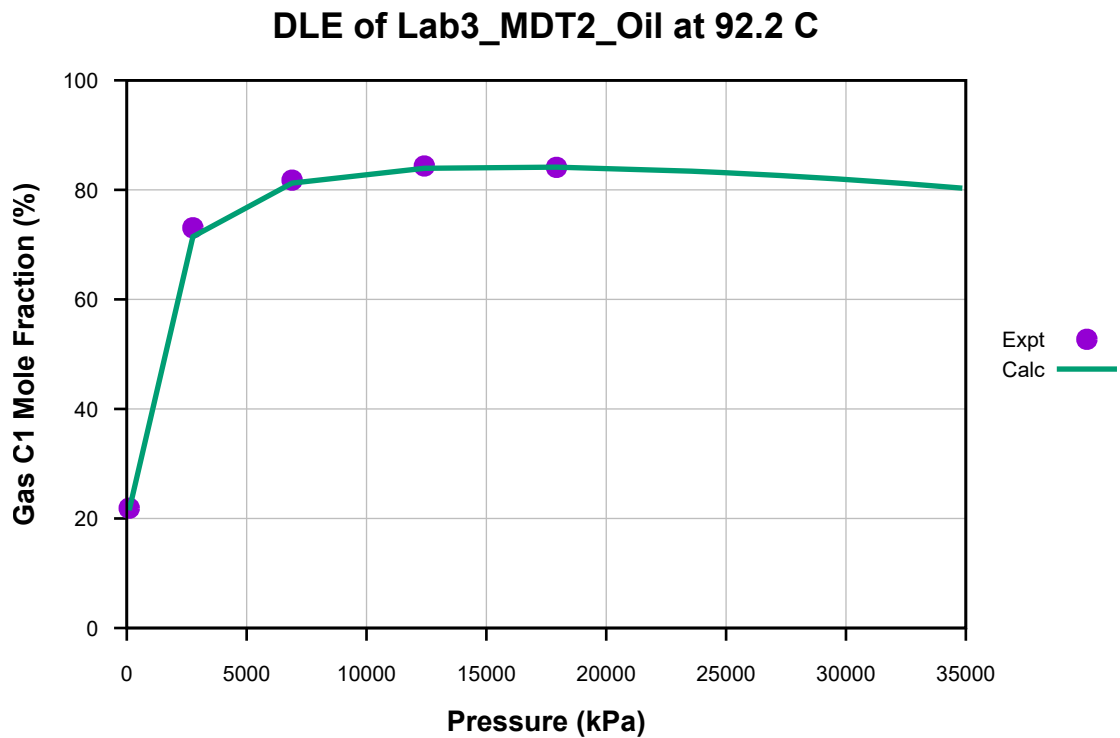


Figure 71: Gas C1 Mole Fraction vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.

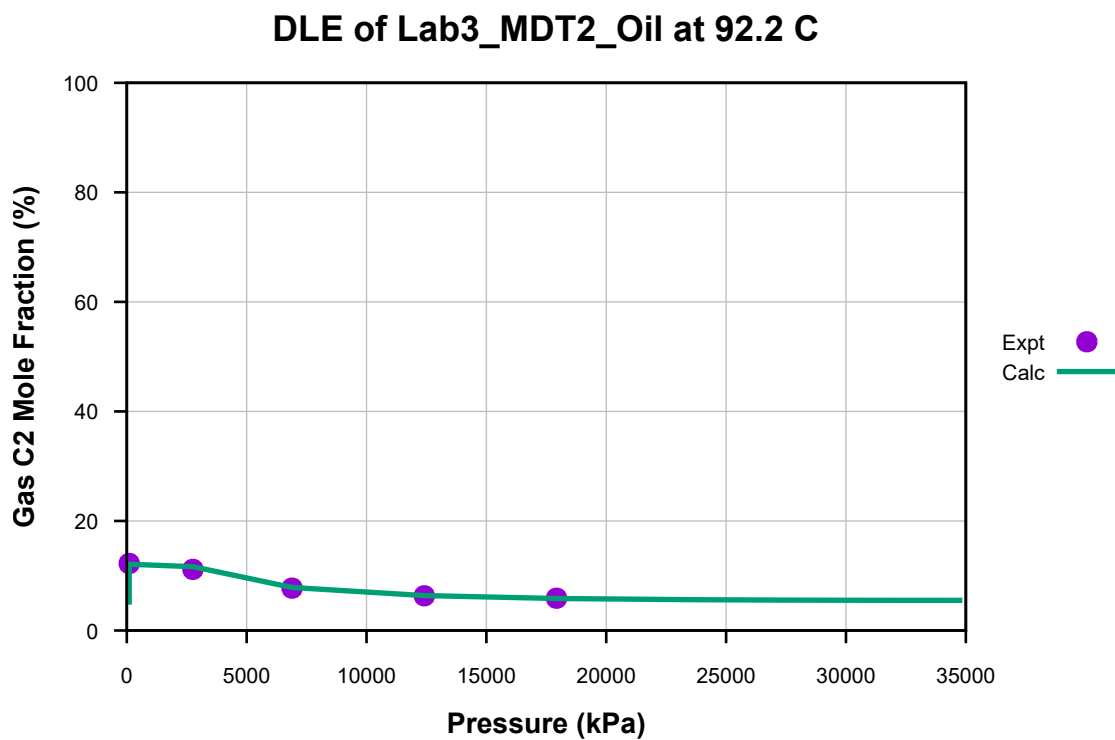


Figure 72: Gas C2 Mole Fraction vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.

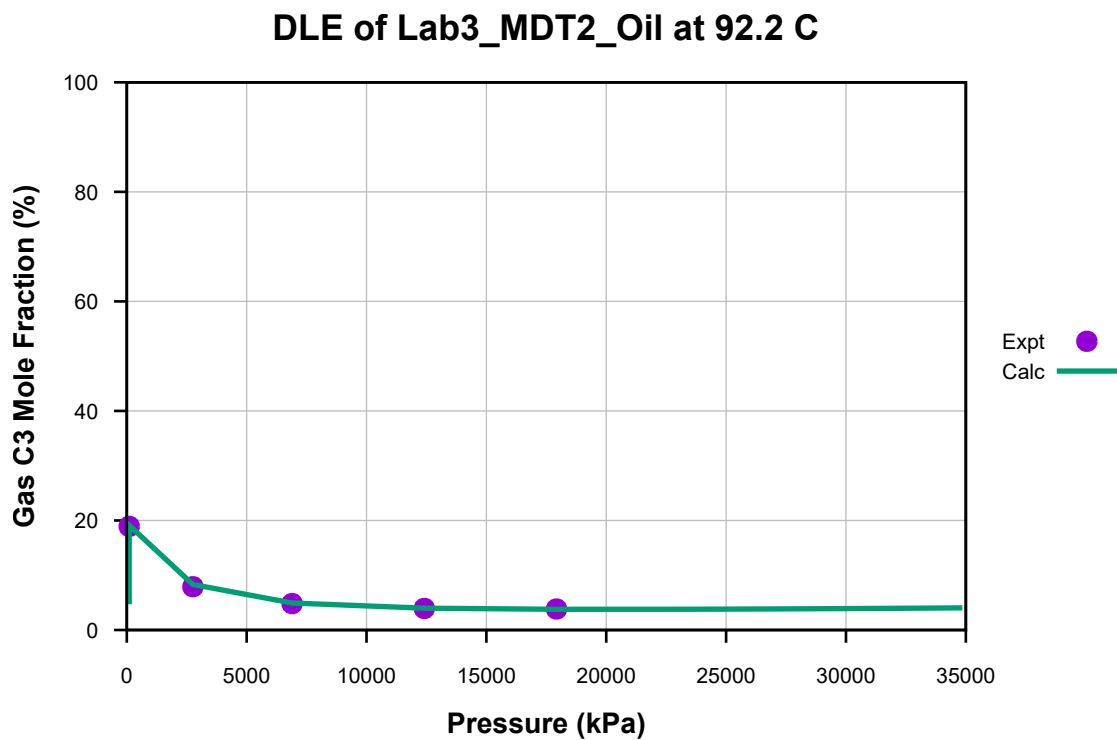


Figure 73: Gas C3 Mole Fraction vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.

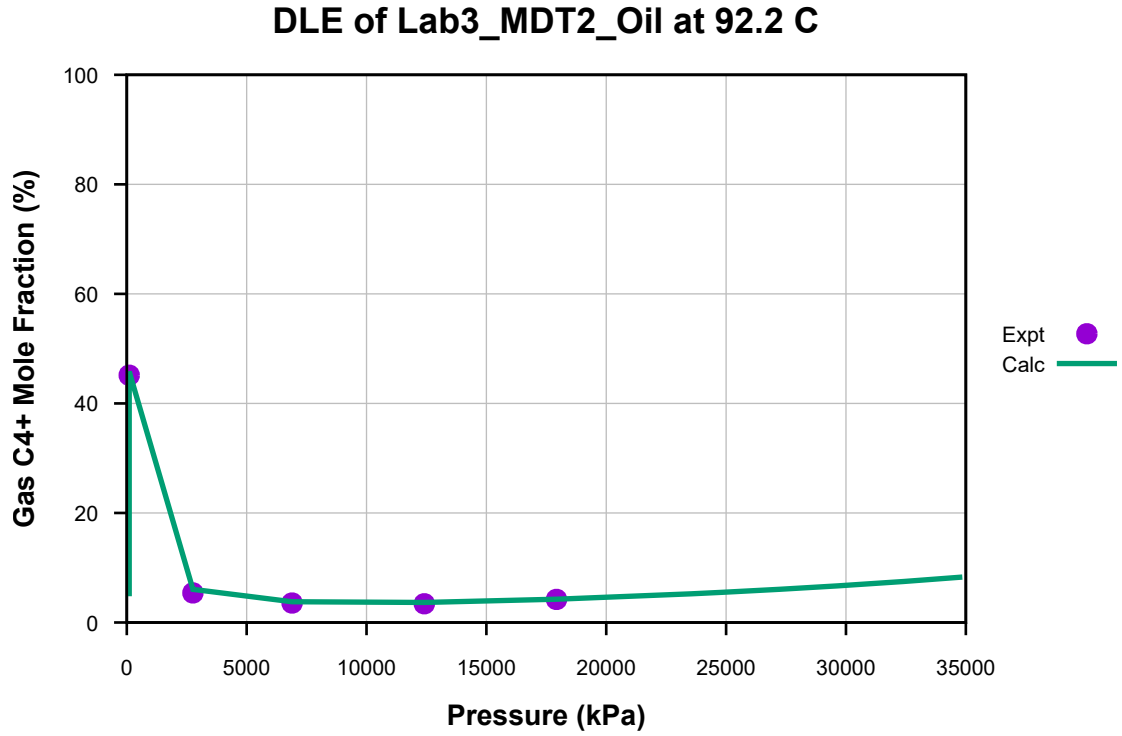


Figure 74: Gas C4+ Mole Fraction vs. Pressure for DLE of Lab3_MDT2_Oil at 92.2 C.

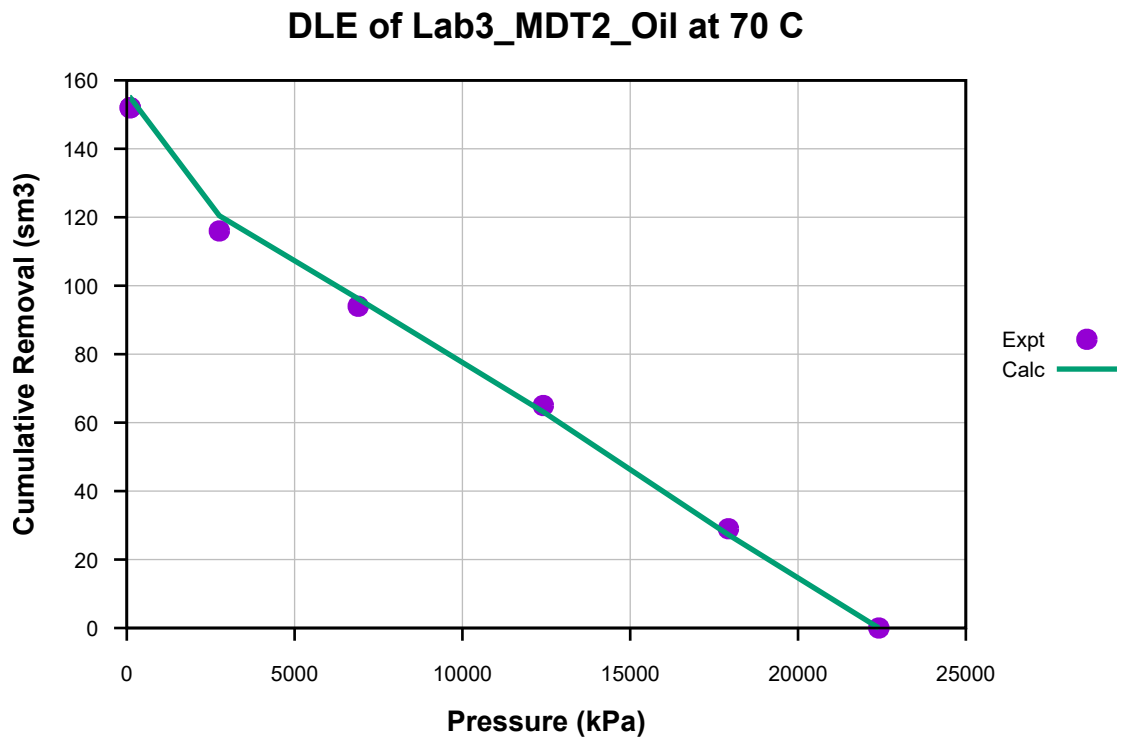


Figure 75: Cumulative Removal vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.

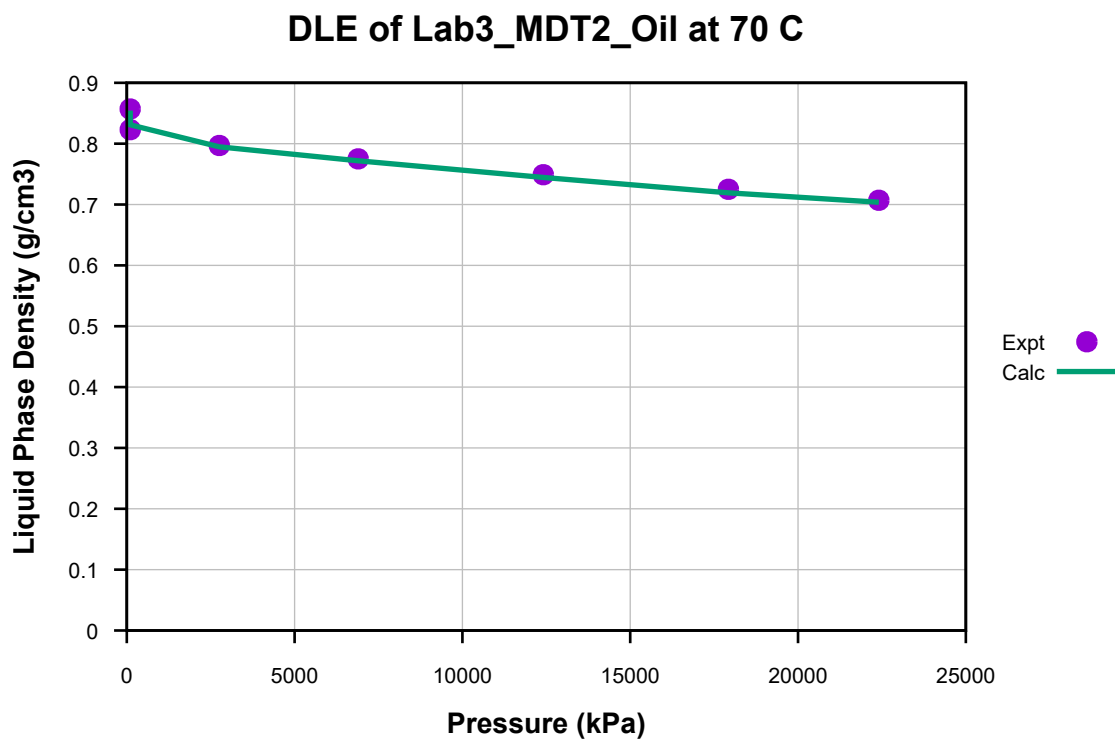


Figure 76: Liquid Phase Density vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.

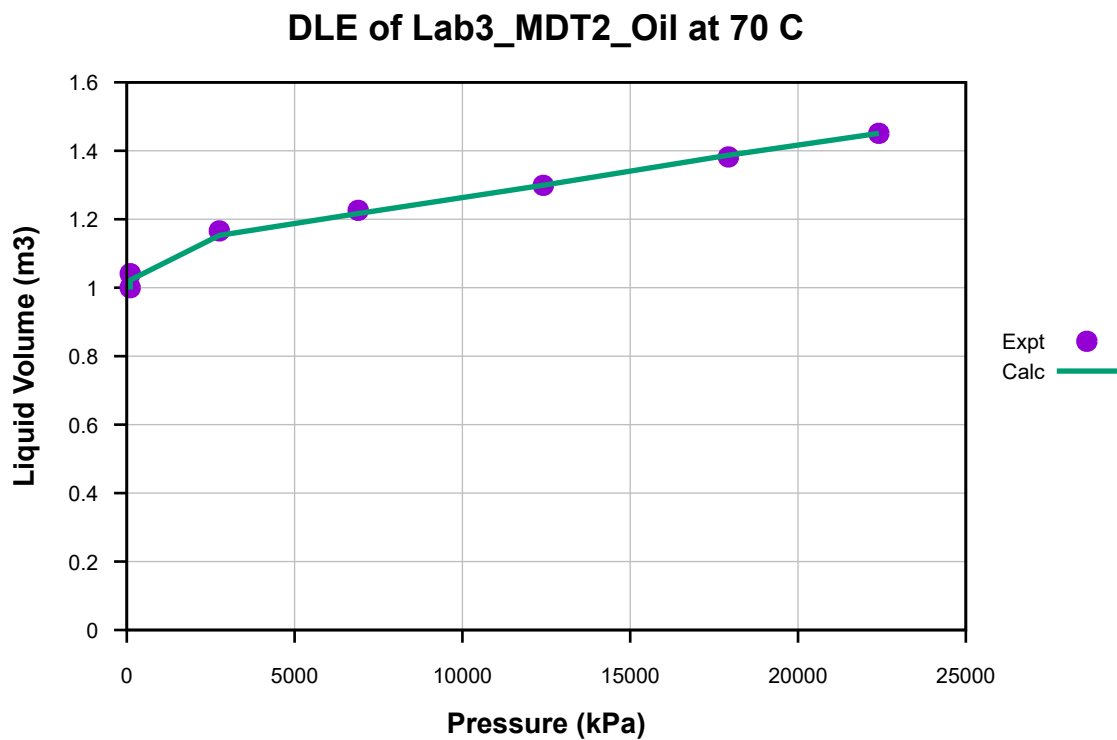


Figure 77: Liquid Volume vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.

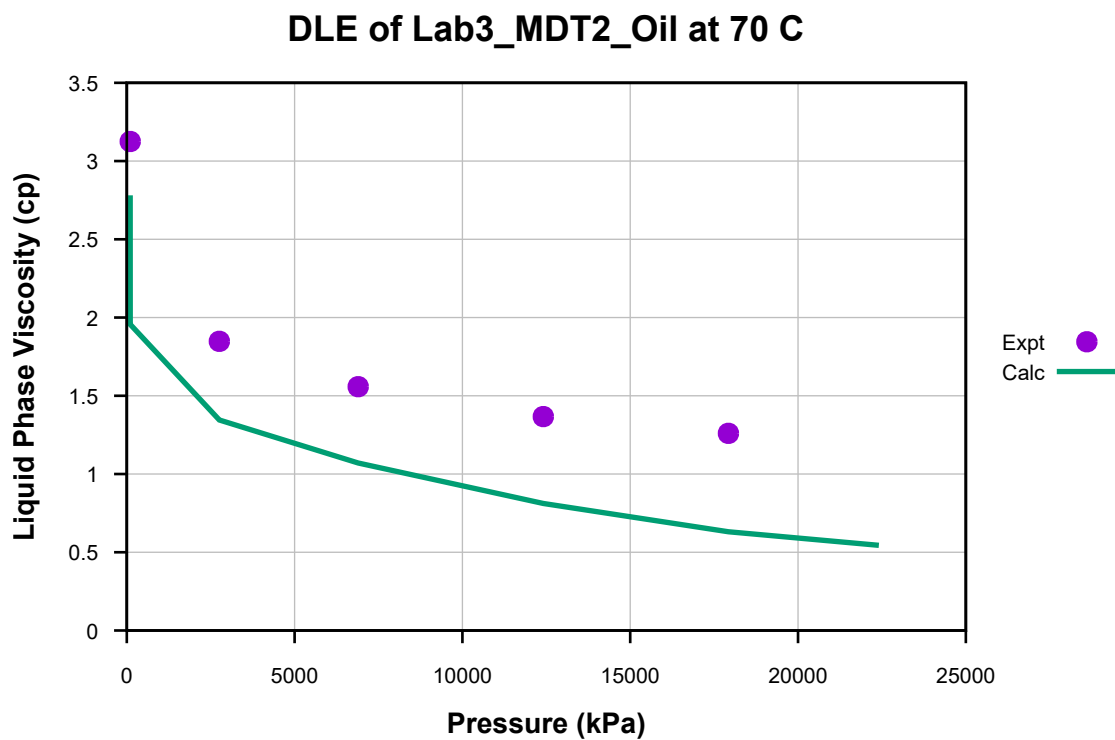


Figure 78: Liquid Phase Viscosity vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.

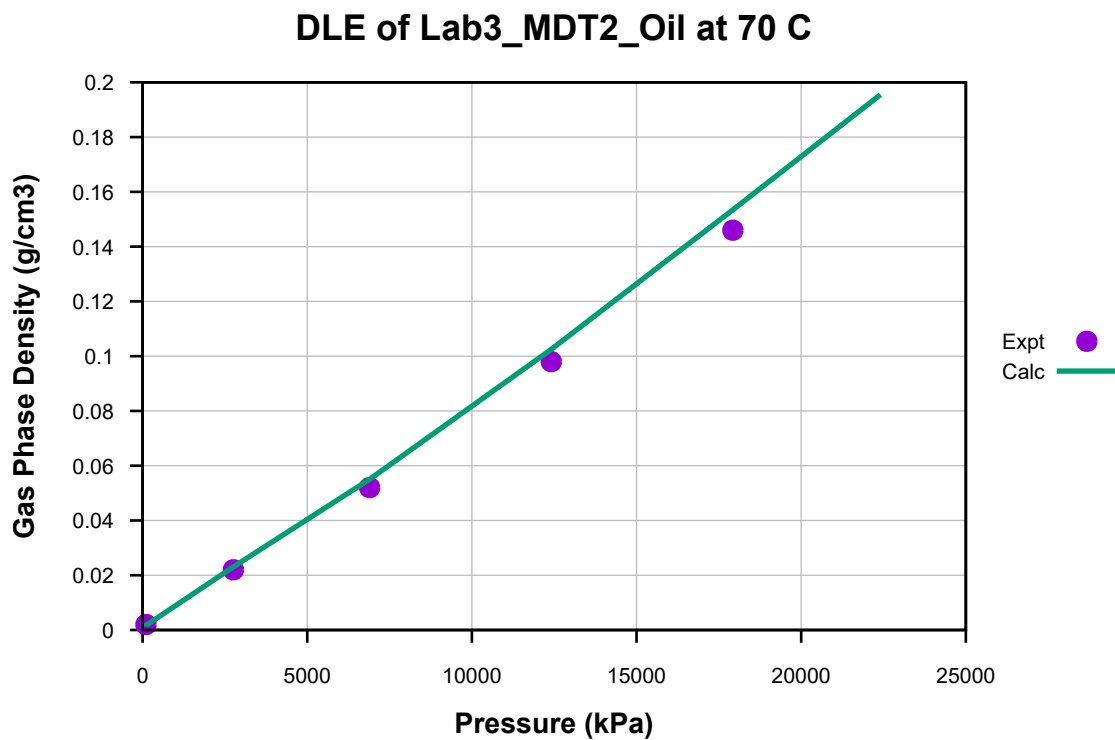


Figure 79: Gas Phase Density vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.

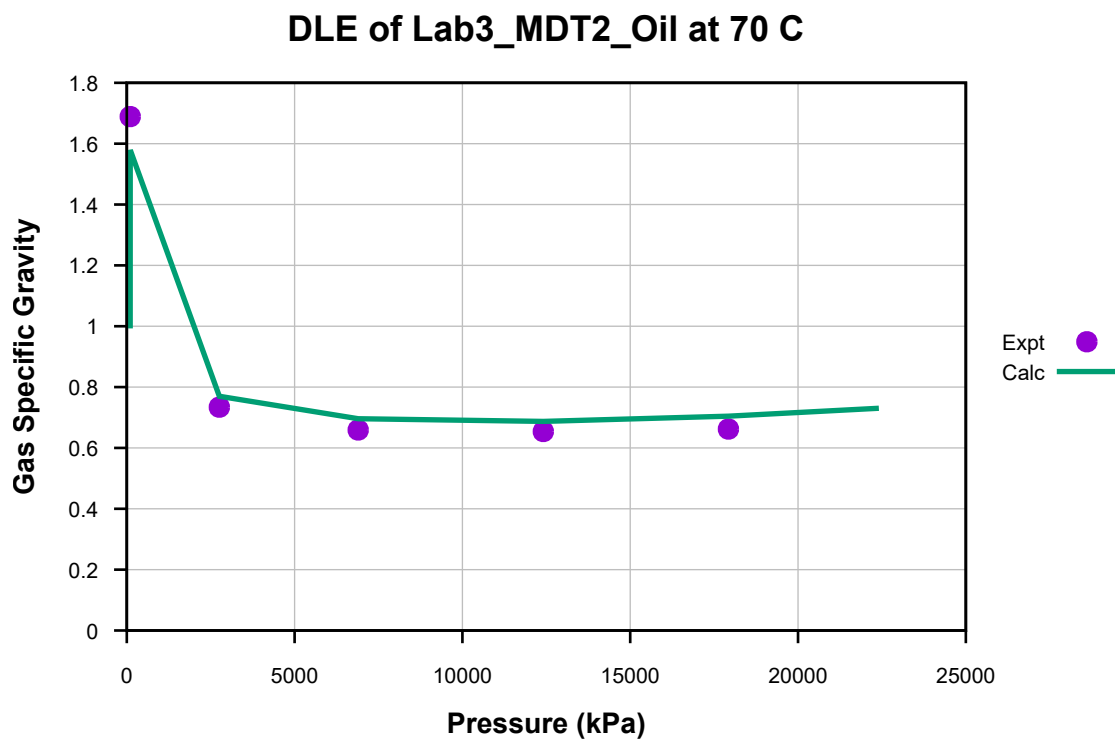


Figure 80: Gas Specific Gravity vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.

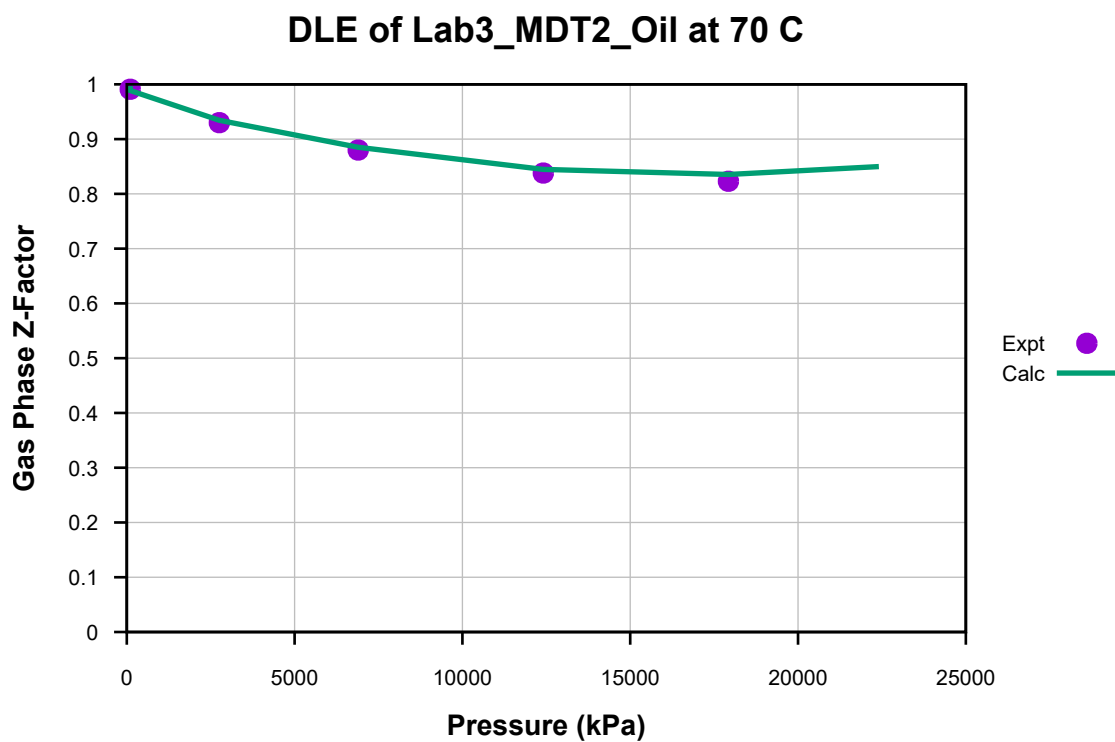


Figure 81: Gas Phase Z-Factor vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.

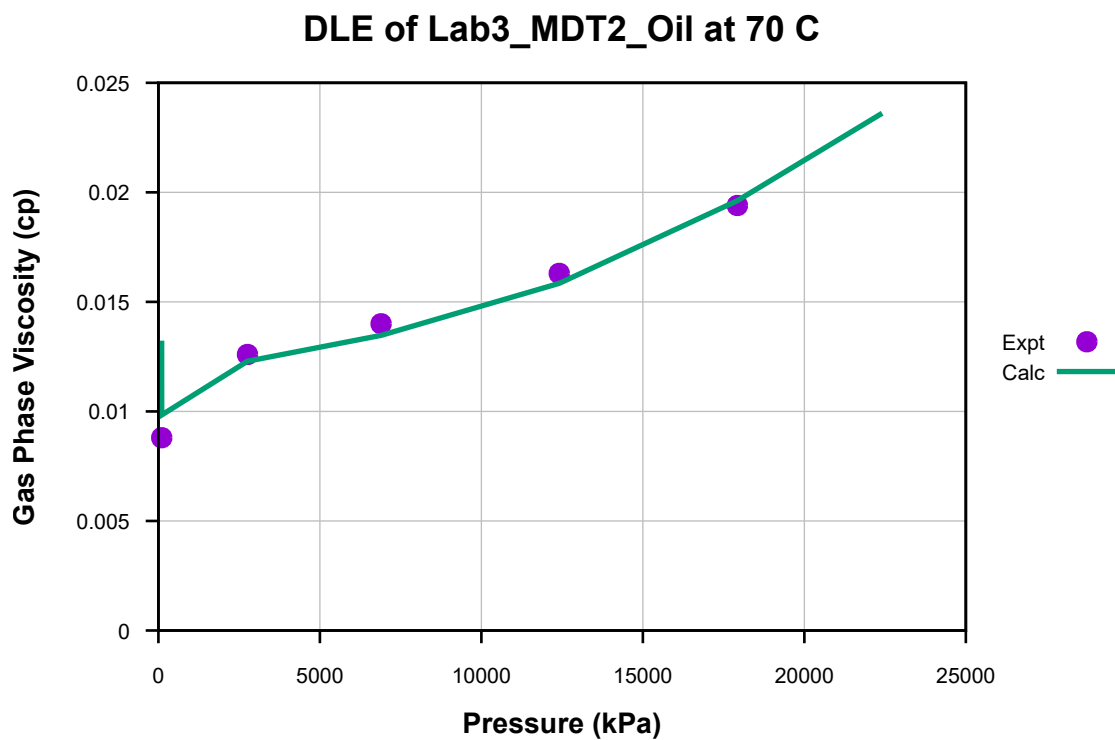


Figure 82: Gas Phase Viscosity vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.

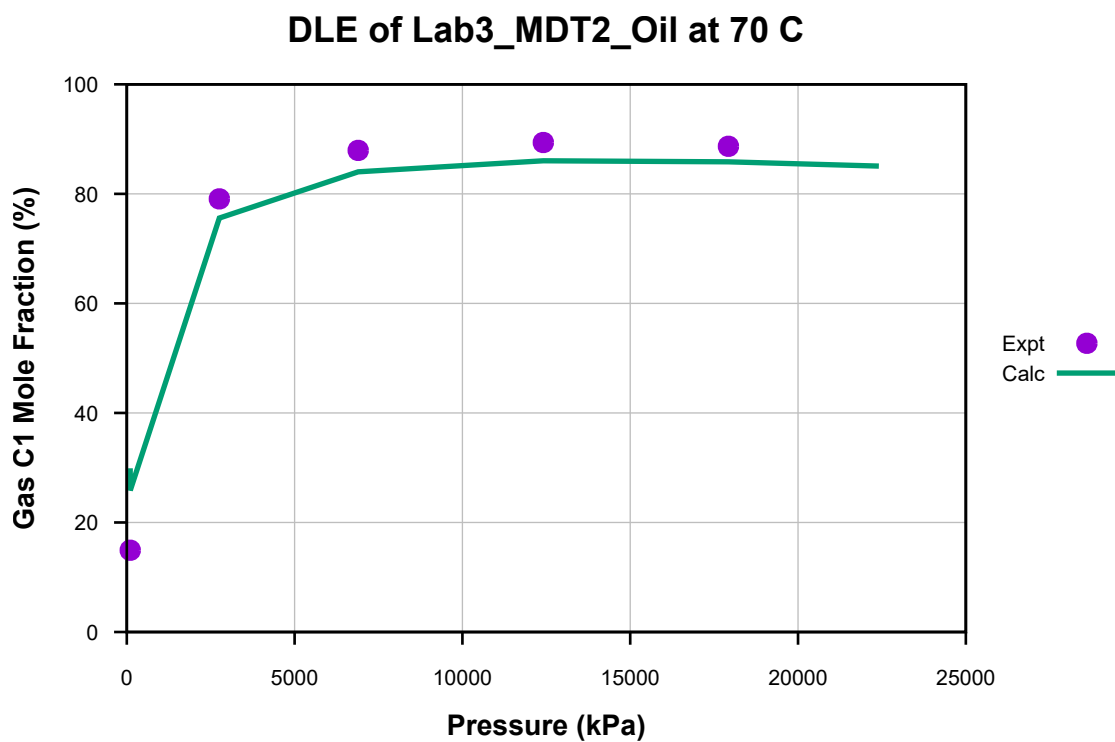


Figure 83: Gas C1 Mole Fraction vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.

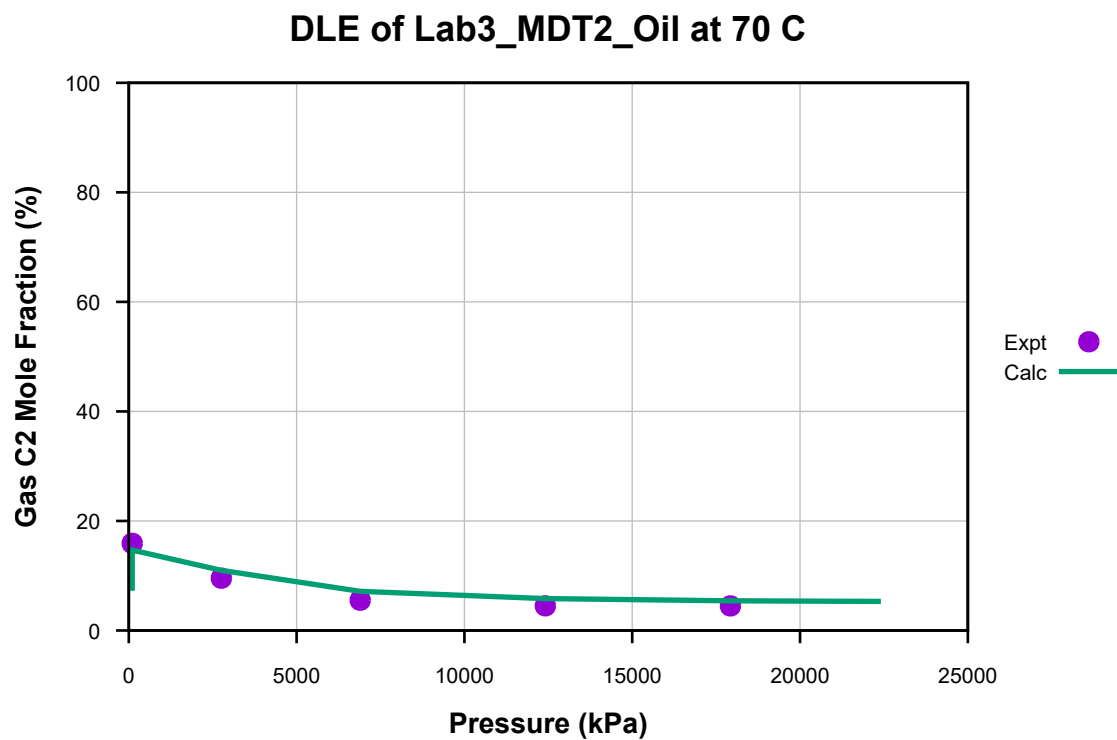


Figure 84: Gas C2 Mole Fraction vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.

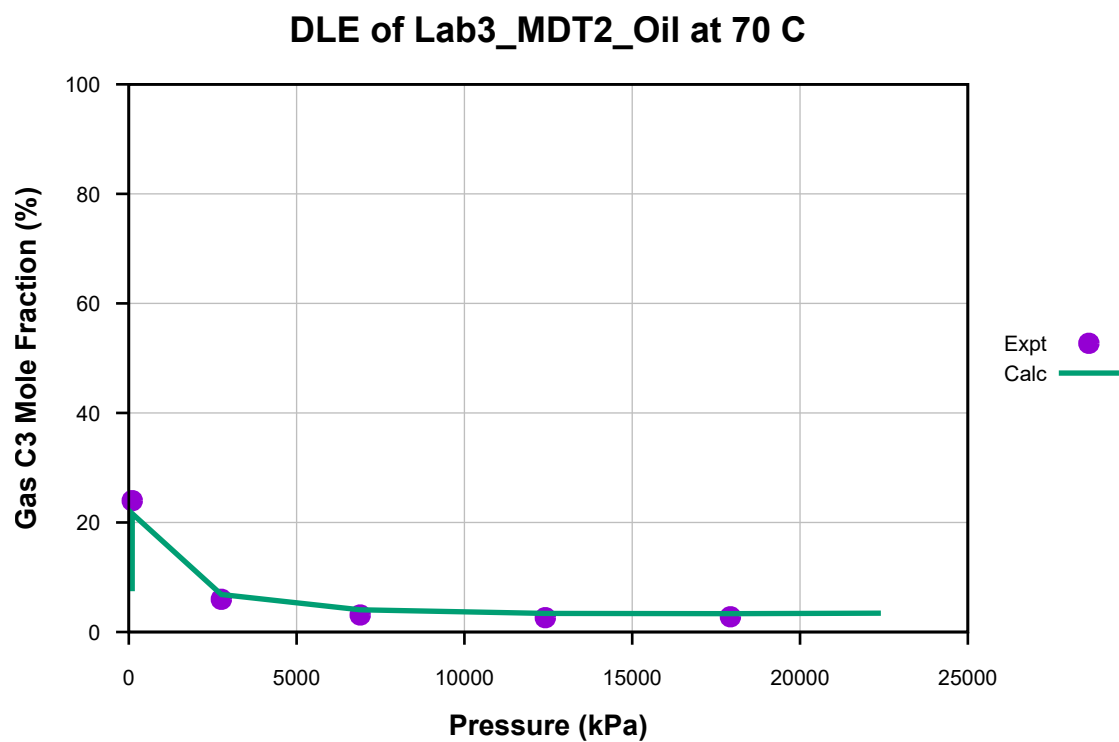


Figure 85: Gas C3 Mole Fraction vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.

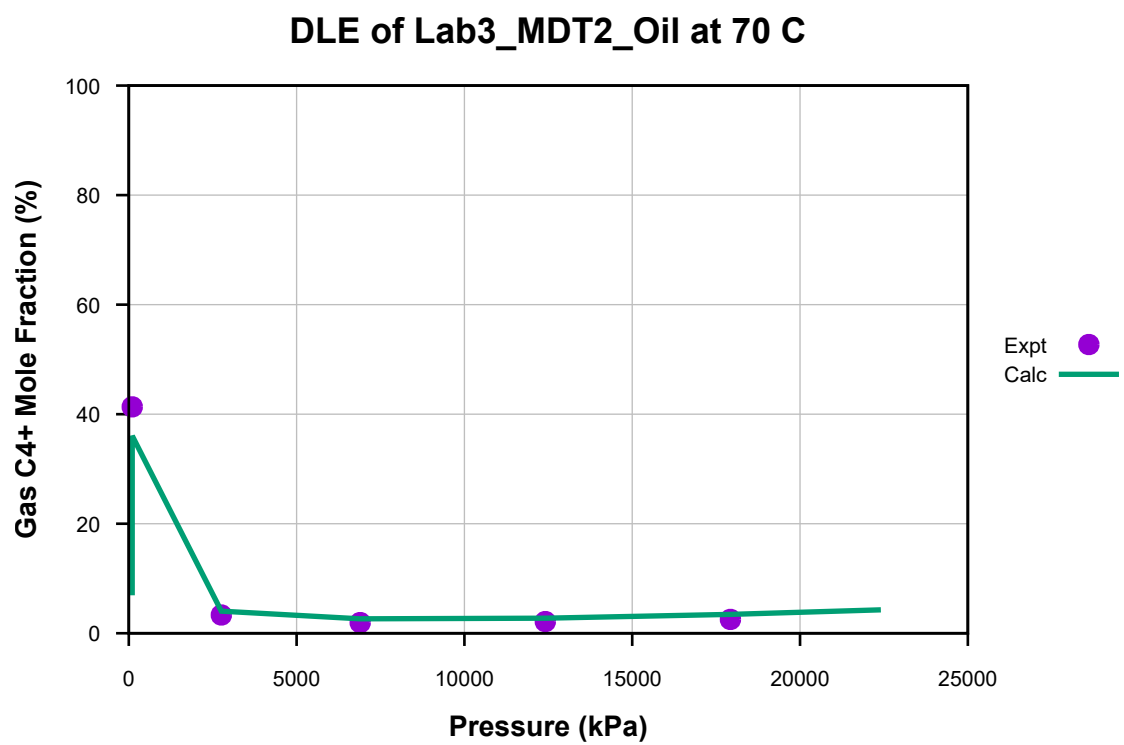


Figure 86: Gas C4+ Mole Fraction vs. Pressure for DLE of Lab3_MDT2_Oil at 70 C.