

# PhazeComp-Generated L<sup>A</sup>T<sub>E</sub>X Report Template

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# 1. Executive Summary

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## 4. Conclusions

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# Acknowledgements

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# Nomenclature

# References

# Tables

Table 1: Essential Properties for Characterization “Michelsen”

Component	MW	Tc (R)	Pc (psia)	AF	VTran	ZcVis
<b>N2</b>	28.010	227.270	493.000	0.04000	−0.17520	0.29100
<b>C1</b>	16.040	343.040	667.800	0.01300	−0.16510	0.29000
<b>C2</b>	30.070	549.760	707.800	0.09860	−0.10700	0.28500
<b>C3</b>	44.100	665.680	616.300	0.15240	−0.08477	0.27700
<b>C4</b>	58.120	765.320	550.700	0.20100	−0.06858	0.27400
<b>C5</b>	72.150	845.370	488.600	0.25390	−0.04103	0.26900

Table 2: Binary Interaction Parameters for Characterization “Michelsen”

<b>N2</b>	
<b>C1</b>	0.03600
<b>C2</b>	0.05000
<b>C3</b>	0.08000
<b>C4</b>	0.09000
<b>C5</b>	0.10000

Table 3: Mixture “Michelsen\_Gas” Compositions

Component	Mole Fractions	Mass Fractions
<b>N2</b>	0.304000	0.359463
<b>C1</b>	0.547900	0.370999
<b>C2</b>	0.070800	0.089874
<b>C3</b>	0.036700	0.068324
<b>C4</b>	0.020800	0.051034
<b>C5</b>	0.019800	0.060307
<b>MW</b>		<b>23.69</b>

Table 4: Essential Properties for Characterization “Macondo”

Component	MW	Tc (R)	Pc (psia)	AF	VTran	ZcVis	Pchor
<b>N2</b>	28.014	227.16	492.84	0.03700	−0.16758	0.29178	59.10
<b>CO2</b>	44.010	547.42	1069.51	0.22500	0.00191	0.27433	80.00
<b>C1</b>	16.043	343.01	667.03	0.01100	−0.14996	0.28620	71.00
<b>C2</b>	30.070	549.58	706.62	0.09900	−0.06280	0.27924	111.00
<b>C3</b>	44.097	665.69	616.12	0.15200	−0.06381	0.27630	151.00
<b>C4-C5</b>	63.370	787.52	521.40	0.21328	−0.05005	0.27048	204.93
<b>C6-C7</b>	89.779	941.56	449.50	0.27691	0.00117	0.26458	250.47
<b>C8-C9</b>	113.271	1041.98	397.68	0.33414	0.02830	0.26393	306.85
<b>C10-C12</b>	151.237	1171.61	337.32	0.42755	0.05886	0.26340	397.97
<b>C13-C19</b>	215.517	1330.41	270.20	0.57931	0.08930	0.26000	552.24
<b>C20+</b>	441.107	1606.72	182.26	1.09027	0.00389	0.28268	1093.66

Table 5: Binary Interaction Parameters for Characterization “Macondo”

	<b>N2</b>	<b>CO2</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>
<b>CO2</b>	0.00000				
<b>C1</b>	0.02500	0.10500			
<b>C2</b>	0.01000	0.13000	0.00097		
<b>C3</b>	0.09000	0.12500	0.00319	0.00000	
<b>C4-C5</b>	0.09943	0.11587	0.00689	0.00000	0.00000
<b>C6-C7</b>	0.11000	0.11500	0.01123	0.00000	0.00000
<b>C8-C9</b>	0.11000	0.11500	0.01478	0.00000	0.00000
<b>C10-C12</b>	0.11000	0.11500	0.01981	0.00000	0.00000
<b>C13-C19</b>	0.11000	0.11500	0.02690	0.00000	0.00000
<b>C20+</b>	0.09453	0.09962	0.06074	0.02106	0.02106

Table 5: Binary Interaction Parameters for Characterization “Macondo” (cont.)

	<b>C4-C5</b>	<b>C6-C7</b>	<b>C8-C9</b>	<b>C10-C12</b>	<b>C13-C19</b>
<b>C6-C7</b>	0.00000				
<b>C8-C9</b>	0.00000	0.00000			
<b>C10-C12</b>	0.00000	0.00000	0.00000		
<b>C13-C19</b>	0.00000	0.00000	0.00000	0.00000	
<b>C20+</b>	0.02106	0.02106	0.02106	0.02106	0.02106



Table 6: Mixture “Macondo\_Fluid” Compositions

<b>Component</b>	<b>Mole Fractions</b>	<b>Mass Fractions</b>
<b>N2</b>	0.003377	0.001795
<b>CO2</b>	0.009477	0.007916
<b>C1</b>	0.649893	0.197879
<b>C2</b>	0.067630	0.038596
<b>C3</b>	0.048197	0.040337
<b>C4-C5</b>	0.052307	0.062909
<b>C6-C7</b>	0.033645	0.057328
<b>C8-C9</b>	0.035766	0.076888
<b>C10-C12</b>	0.029424	0.084456
<b>C13-C19</b>	0.036554	0.149516
<b>C20+</b>	0.033730	0.282379
<b>MW</b>		<b>52.69</b>

Table 7: Essential Properties for Characterization “Reservoir Fluid A”

Component	MW	Tc (R)	Pc (psia)	AF	VTran	ZcVis	Pchor
<b>CO2</b>	44.010	547.57	1071.60	0.22500	0.02700	0.27500	44.01
<b>C1</b>	16.040	343.04	667.80	0.01300	−0.11800	0.29000	16.04
<b>C2</b>	30.070	549.76	707.80	0.09860	−0.10700	0.28500	30.07
<b>C3</b>	44.100	665.68	616.30	0.15240	−0.08477	0.27700	44.10
<b>n-C4</b>	58.120	765.32	550.70	0.20100	−0.06858	0.27400	58.12
<b>n-C5</b>	72.150	845.37	488.60	0.25390	−0.04103	0.26900	72.15
<b>C6-C7</b>	94.200	975.92	458.68	0.26950	−0.00076	0.26630	94.20
<b>C8-C10</b>	116.000	1087.87	408.08	0.33280	0.05973	0.25890	116.00
<b>C11-C14</b>	169.500	1223.01	305.18	0.48560	0.08719	0.25460	169.50
<b>C15-C19</b>	232.600	1353.35	248.53	0.64360	0.09684	0.26910	232.60
<b>C20-C29</b>	328.000	1458.33	227.27	0.79260	−0.06104	0.31650	328.00
<b>C30+</b>	628.000	1670.24	168.56	1.05360	−0.13829	0.36760	628.00

Table 8: Binary Interaction Parameters for Characterization “Reservoir Fluid A”

	<b>CO2</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>
<b>C1</b>	0.10278			
<b>C2</b>	0.12500	0.00178		
<b>C3</b>	0.12500	0.00572	0.00113	
<b>n-C4</b>	0.12500	0.01022	0.00351	0.00066
<b>n-C5</b>	0.12500	0.01514	0.00664	0.00231
<b>C6-C7</b>	0.12500	0.02063	0.01047	0.00477
<b>C8-C10</b>	0.12500	0.02751	0.01561	0.00843
<b>C11-C14</b>	0.12500	0.04221	0.02732	0.01761
<b>C15-C19</b>	0.12500	0.05584	0.03877	0.02715
<b>C20-C29</b>	0.15169	0.06552	0.04667	0.03506
<b>C30+</b>	0.20328	0.12004	0.09115	0.05587

Table 8: Binary Interaction Parameters for Characterization “Reservoir Fluid A” (cont.)

	<b>n-C4</b>	<b>n-C5</b>	<b>C6-C7</b>	<b>C8-C10</b>
<b>n-C5</b>	0.00050			
<b>C6-C7</b>	0.00189	0.00045		
<b>C8-C10</b>	0.00440	0.00194	0.00000	
<b>C11-C14</b>	0.01156	0.00730	0.00000	0.00000
<b>C15-C19</b>	0.01957	0.01394	0.00000	0.00000
<b>C20-C29</b>	0.02645	0.01988	0.00000	0.00000
<b>C30+</b>	0.04435	0.03530	0.03286	0.03286

Table 8: Binary Interaction Parameters for Characterization “Reservoir Fluid A” (cont.)

	<b>C11-C14</b>	<b>C15-C19</b>	<b>C20-C29</b>
<b>C15-C19</b>	0.00000		
<b>C20-C29</b>	0.00000	−0.07264	
<b>C30+</b>	0.03286	0.03286	0.04416

Table 9: Mixture “RFA” Compositions

<b>Component</b>	<b>Mole Fractions</b>	<b>Mass Fractions</b>
<b>CO2</b>	0.053600	0.018847
<b>C1</b>	0.433800	0.055592
<b>C2</b>	0.041300	0.009922
<b>C3</b>	0.028600	0.010077
<b>n-C4</b>	0.020500	0.009519
<b>n-C5</b>	0.014800	0.008531
<b>C6-C7</b>	0.039000	0.029352
<b>C8-C10</b>	0.079600	0.073772
<b>C11-C14</b>	0.078600	0.106441
<b>C15-C19</b>	0.071600	0.133058
<b>C20-C29</b>	0.062800	0.164571
<b>C30+</b>	0.075800	0.380318
<b>MW</b>		<b>125.16</b>

Table 10: Mixture “SOLVENT” Compositions

<b>Component</b>	<b>Mole Fractions</b>	<b>Mass Fractions</b>
<b>CO2</b>	0.221800	0.281588
<b>C1</b>	0.234900	0.108690
<b>C2</b>	0.235000	0.203846
<b>C3</b>	0.274500	0.349207
<b>n-C4</b>	0.033800	0.056669
<b>MW</b>		<b>34.67</b>

# Figures

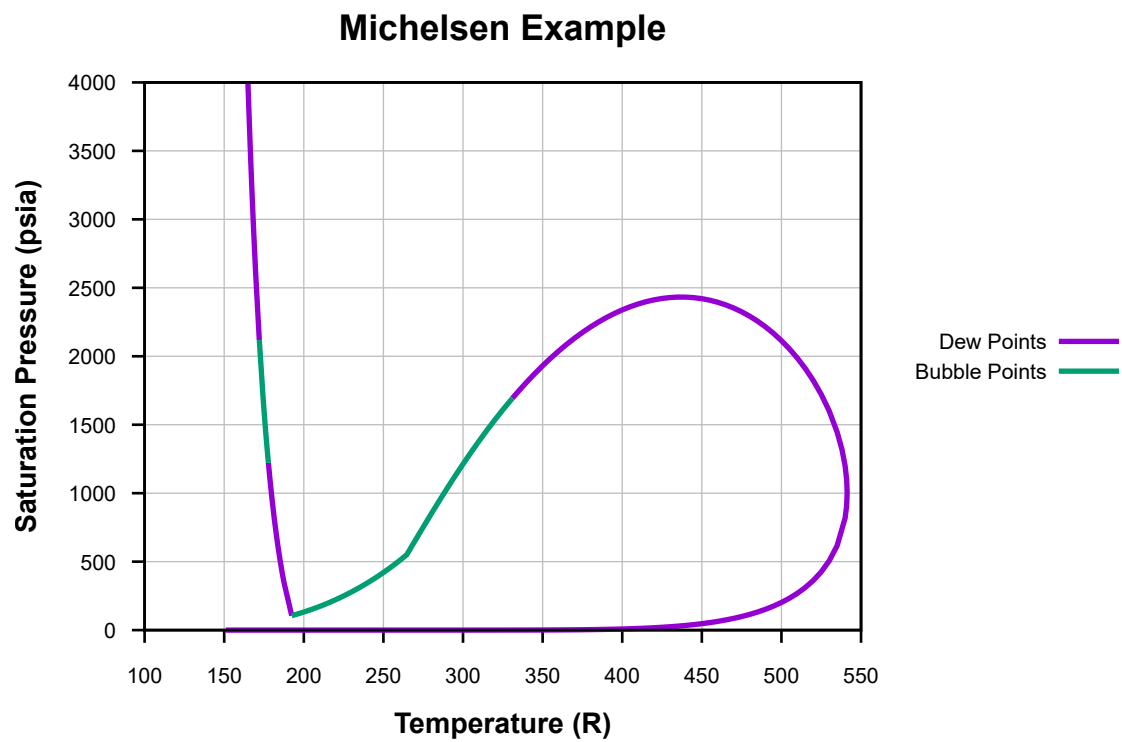


Figure 1: Saturation Pressure vs. Temperature, Michelsen Example.

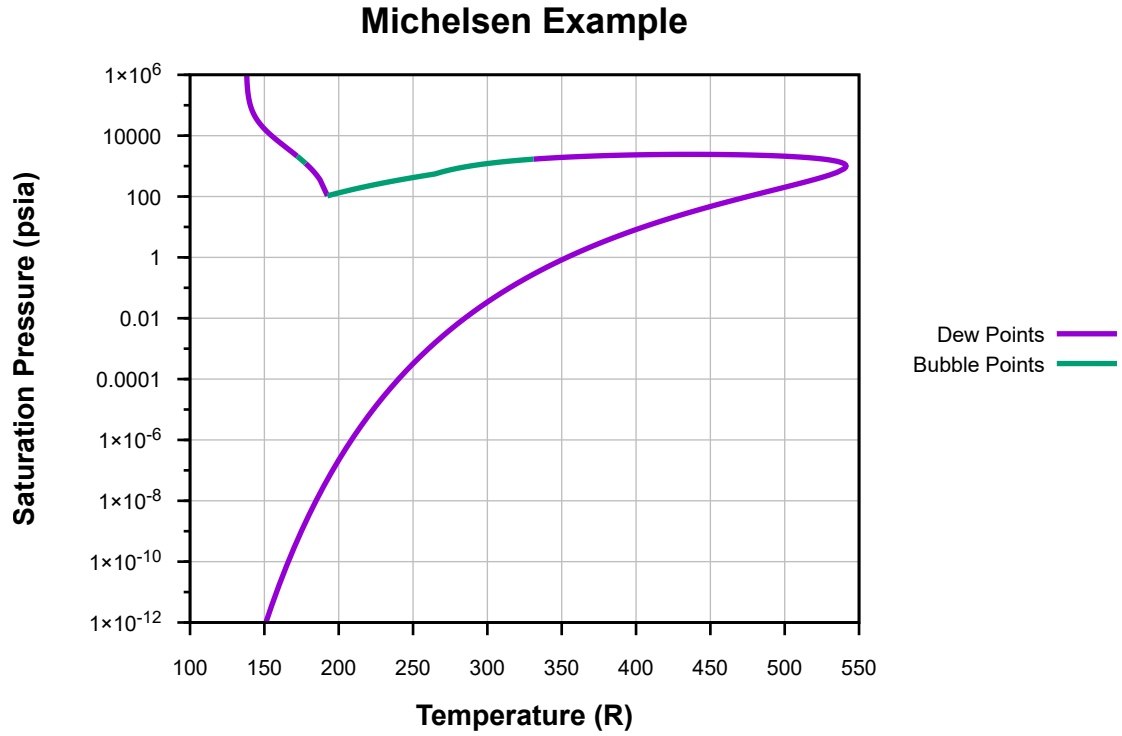


Figure 2: Log of Saturation Pressure vs. Temperature, Michelsen Example.

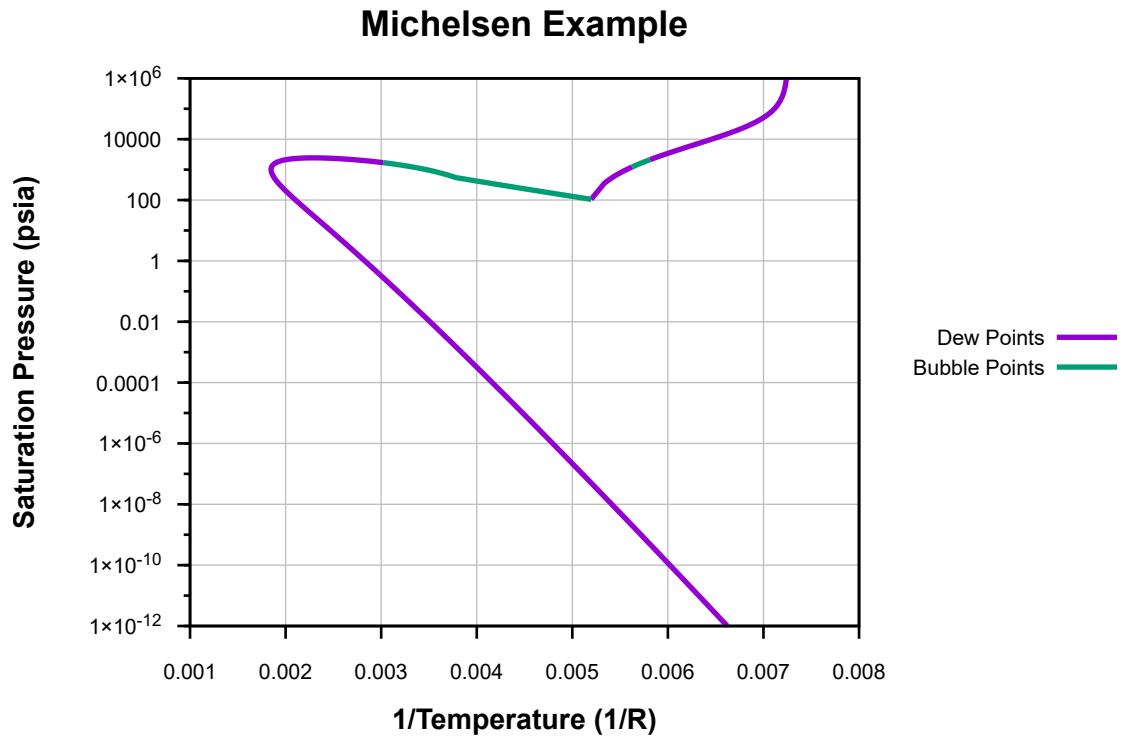


Figure 3: Log of Saturation Pressure vs.  $1/\text{Temperature}$ , Michelsen Example.

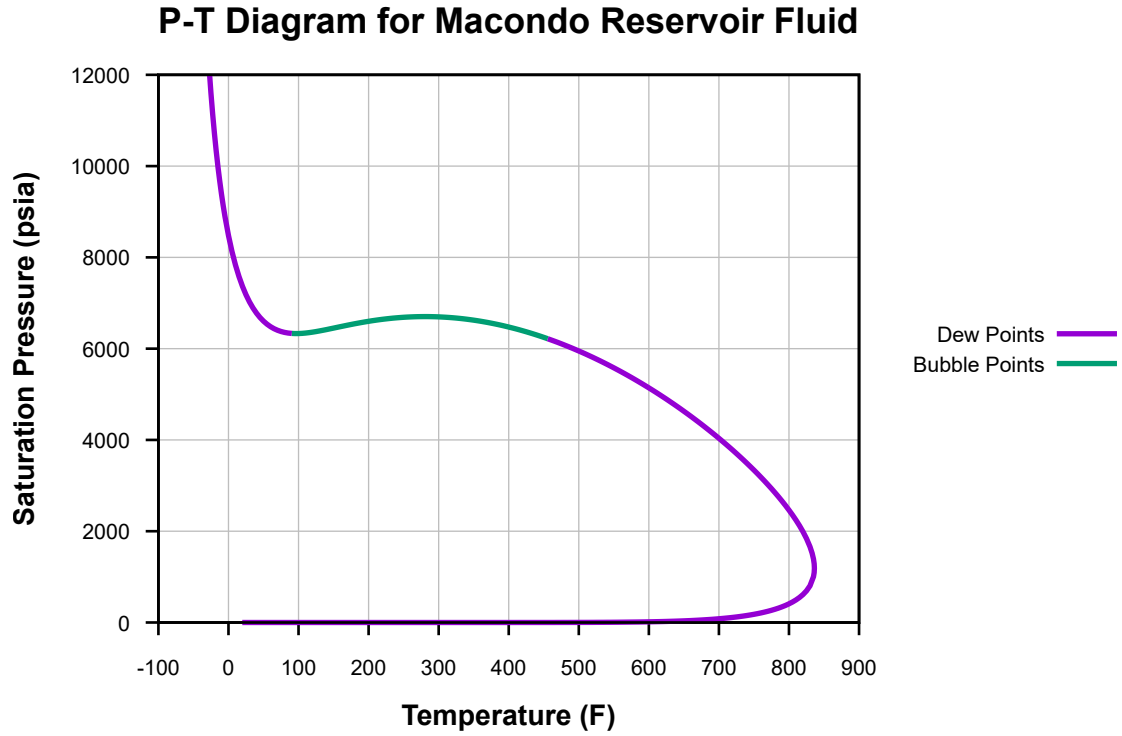


Figure 4: Saturation Pressure vs. Temperature, P-T Diagram for Macondo Reservoir Fluid.

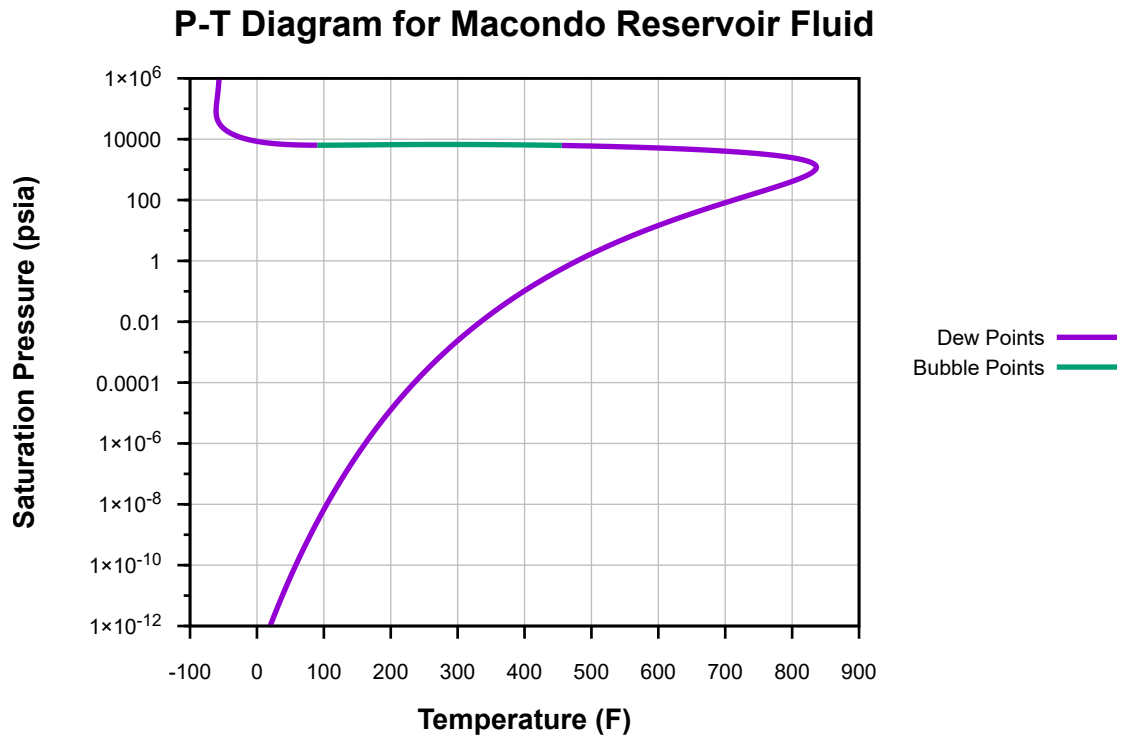


Figure 5: Log of Saturation Pressure vs. Temperature, P-T Diagram for Macondo Reservoir Fluid.

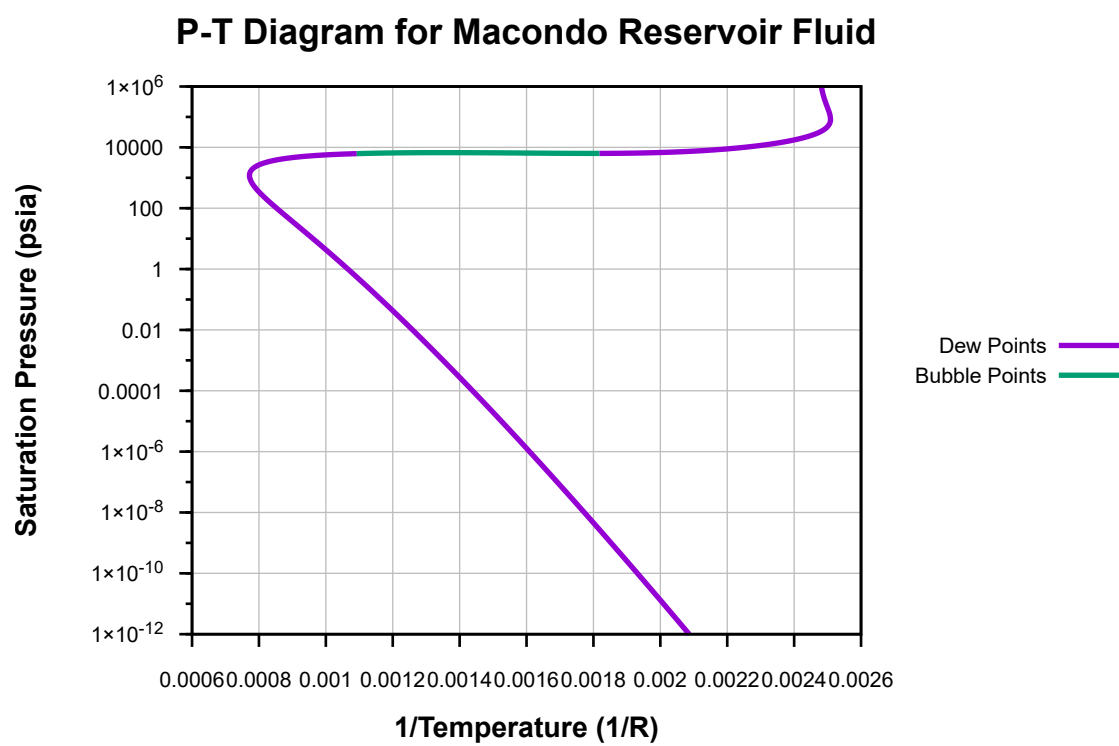


Figure 6: Log of Saturation Pressure vs.  $1/\text{Temperature}$ , P-T Diagram for Macondo Reservoir Fluid.

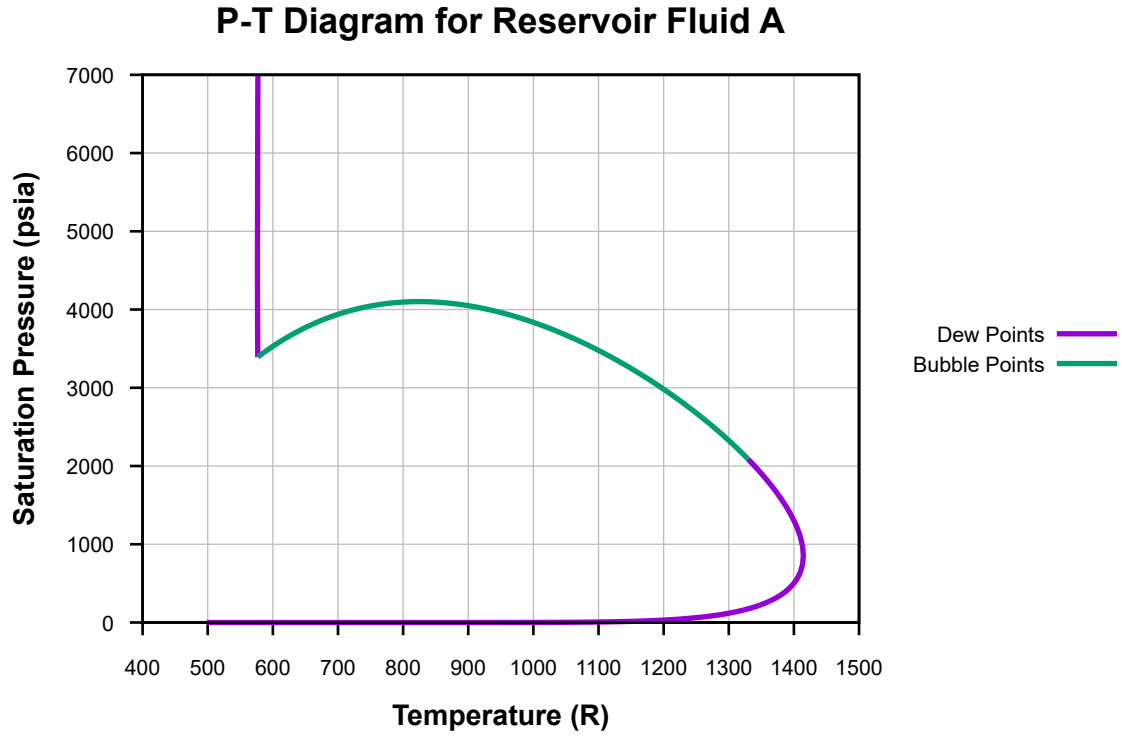


Figure 7: Saturation Pressure vs. Temperature, P-T Diagram for Reservoir Fluid A.

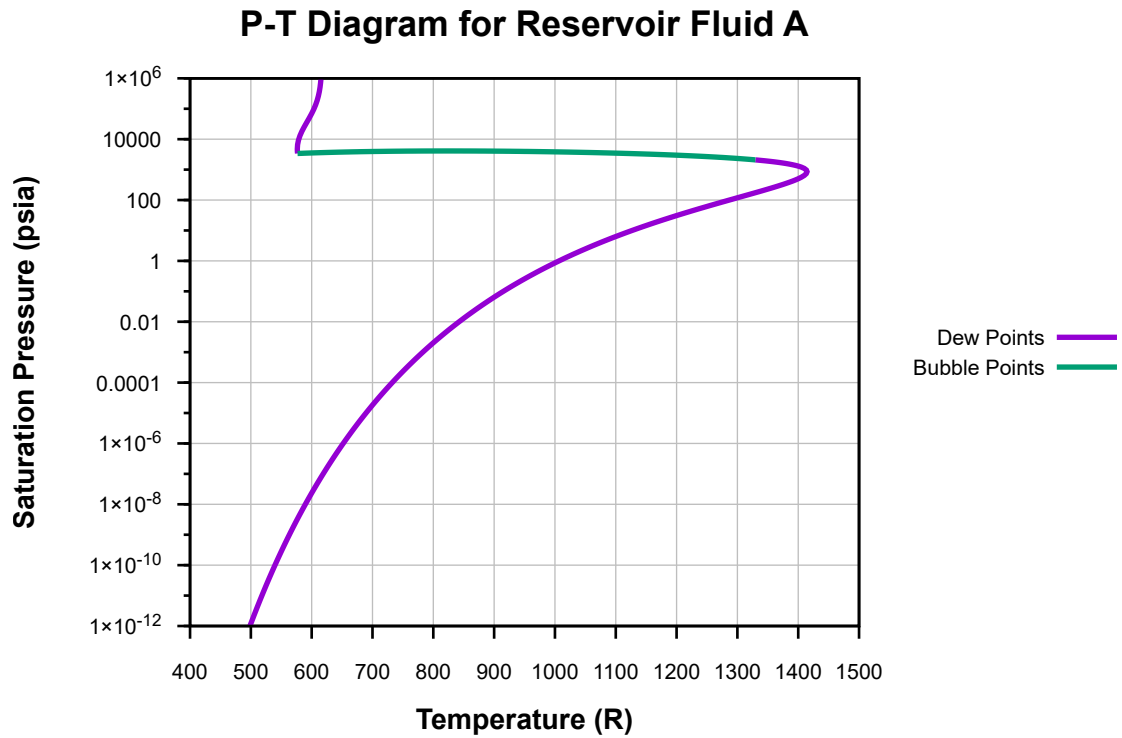


Figure 8: Log of Saturation Pressure vs. Temperature, P-T Diagram for Reservoir Fluid A.



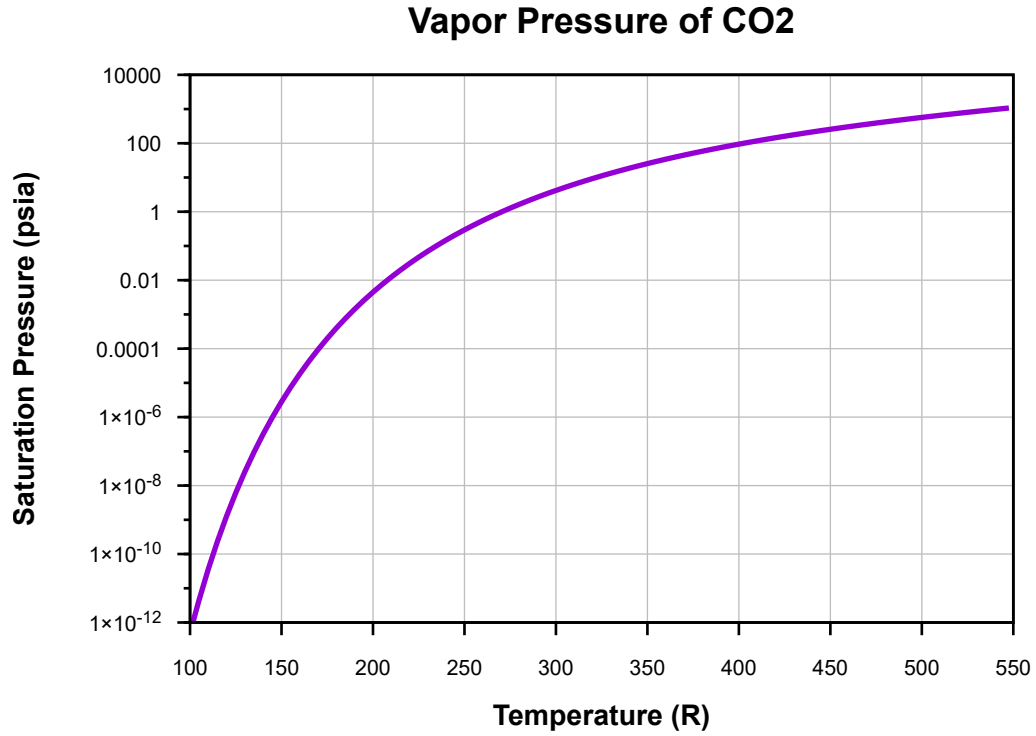


Figure 9: Log of Saturation Pressure vs. Temperature, Vapor Pressure of CO2.

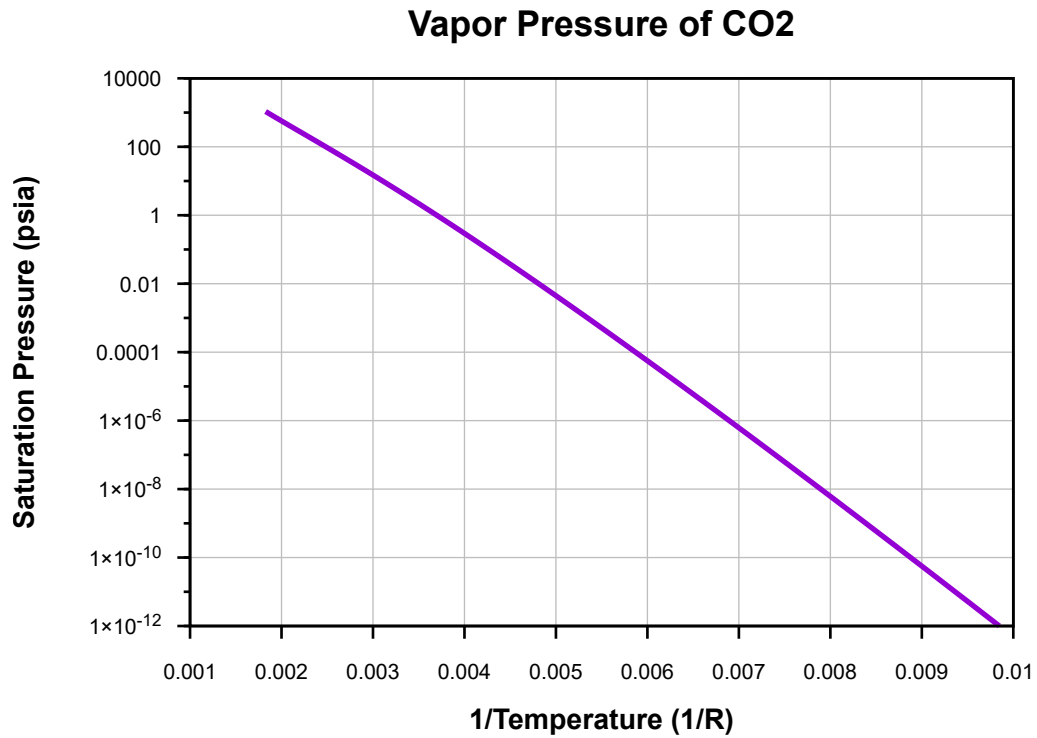


Figure 10: Log of Saturation Pressure vs. 1/Temperature, Vapor Pressure of CO2.

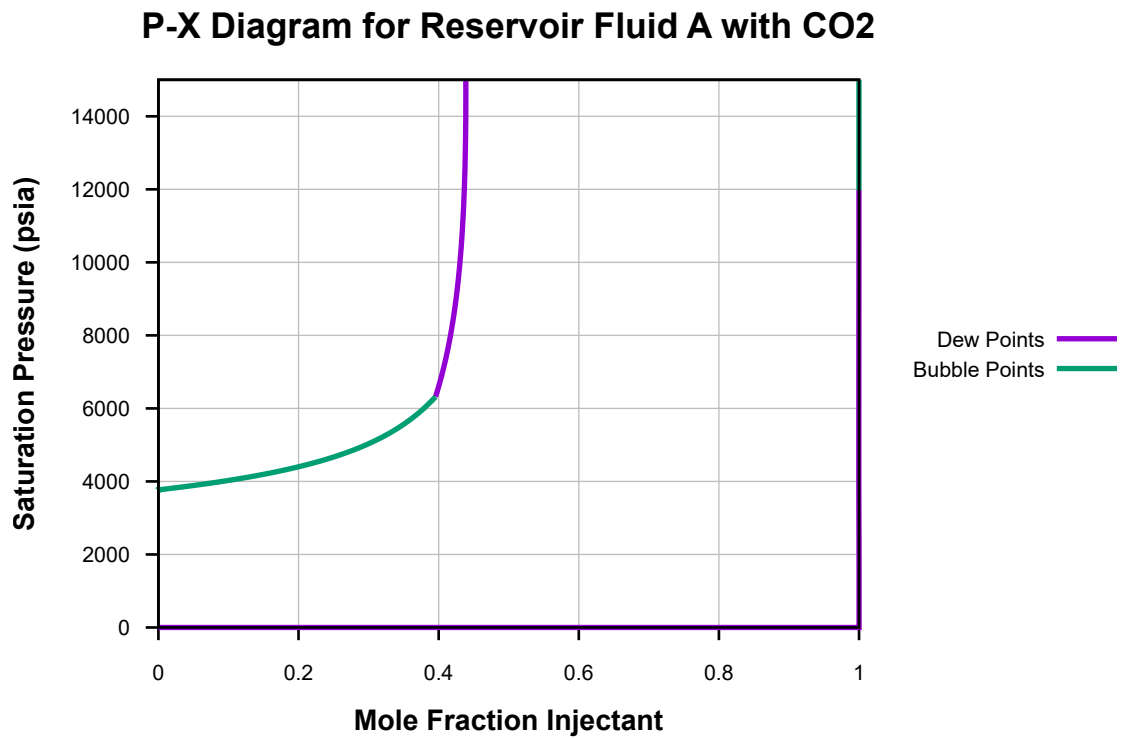


Figure 11: Saturation Pressure vs. Mole Fraction Injectant at 650 R, P-X Diagram for Reservoir Fluid A with CO<sub>2</sub>.

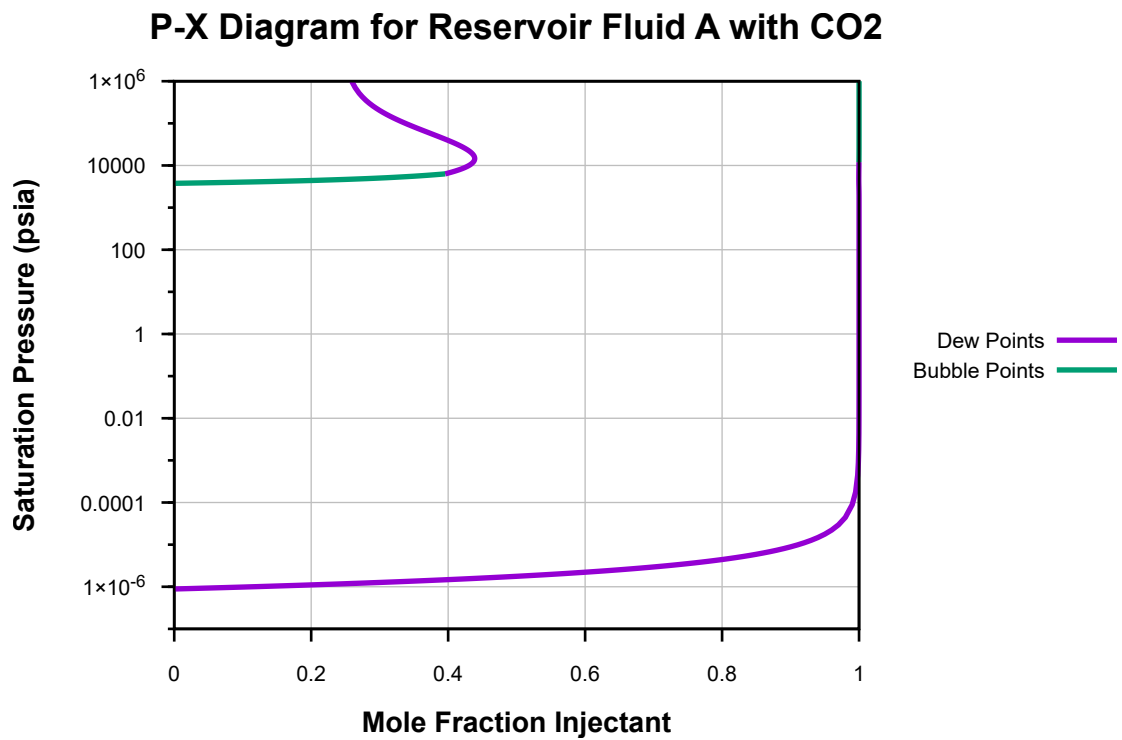


Figure 12: Log of Saturation Pressure vs. Mole Fraction Injectant at 650 R, P-X Diagram for Reservoir Fluid A with CO<sub>2</sub>.

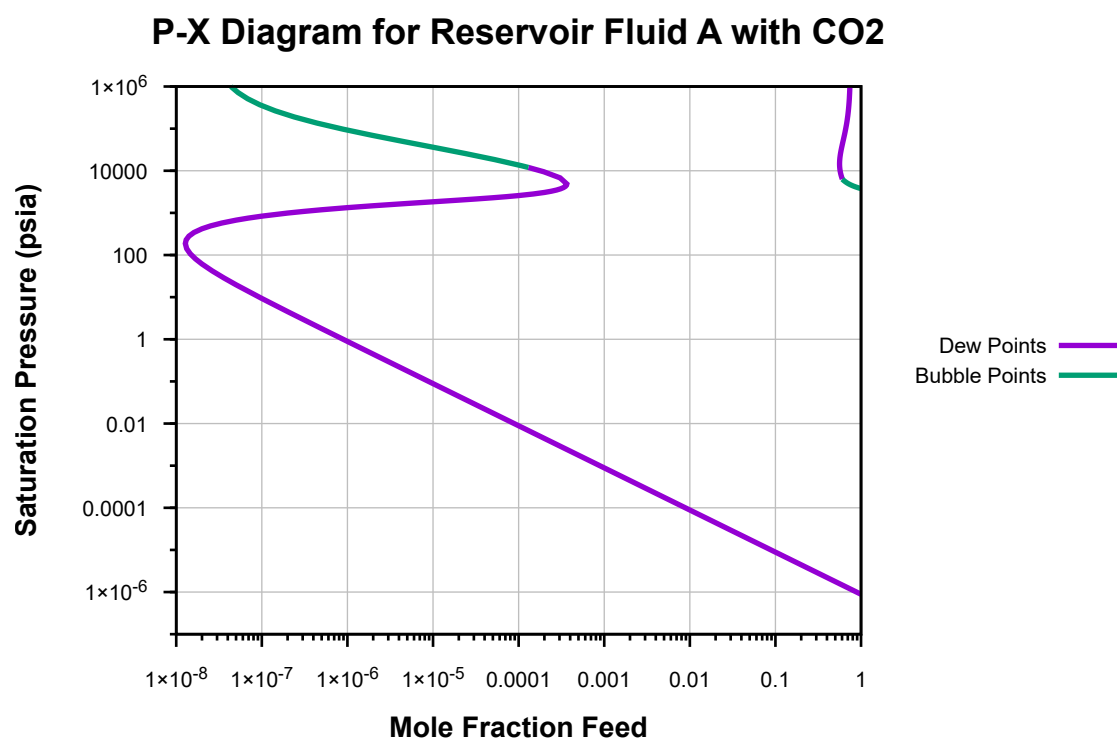


Figure 13: Log of Saturation Pressure vs. Log of Mole Fraction Feed at 650 R, P-X Diagram for Reservoir Fluid A with CO<sub>2</sub>.

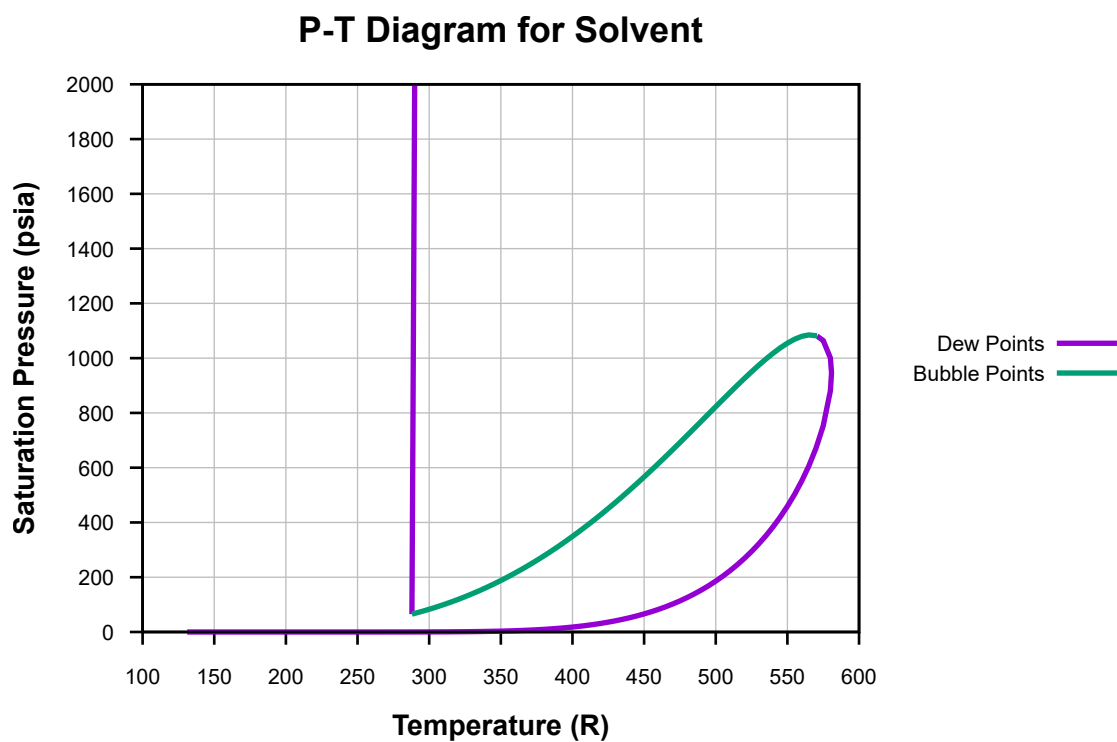


Figure 14: Saturation Pressure vs. Temperature, P-T Diagram for Solvent.

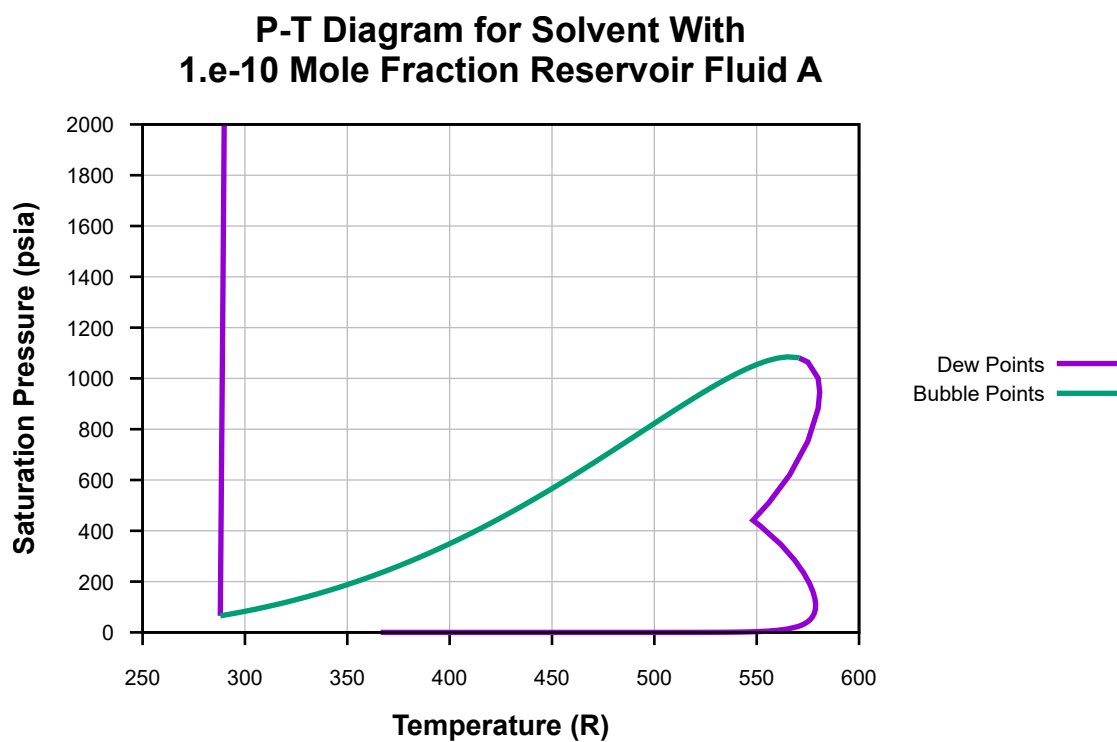


Figure 15: Saturation Pressure vs. Temperature, P-T Diagram for Solvent With, 1.e-10 Mole Fraction Reservoir Fluid A.

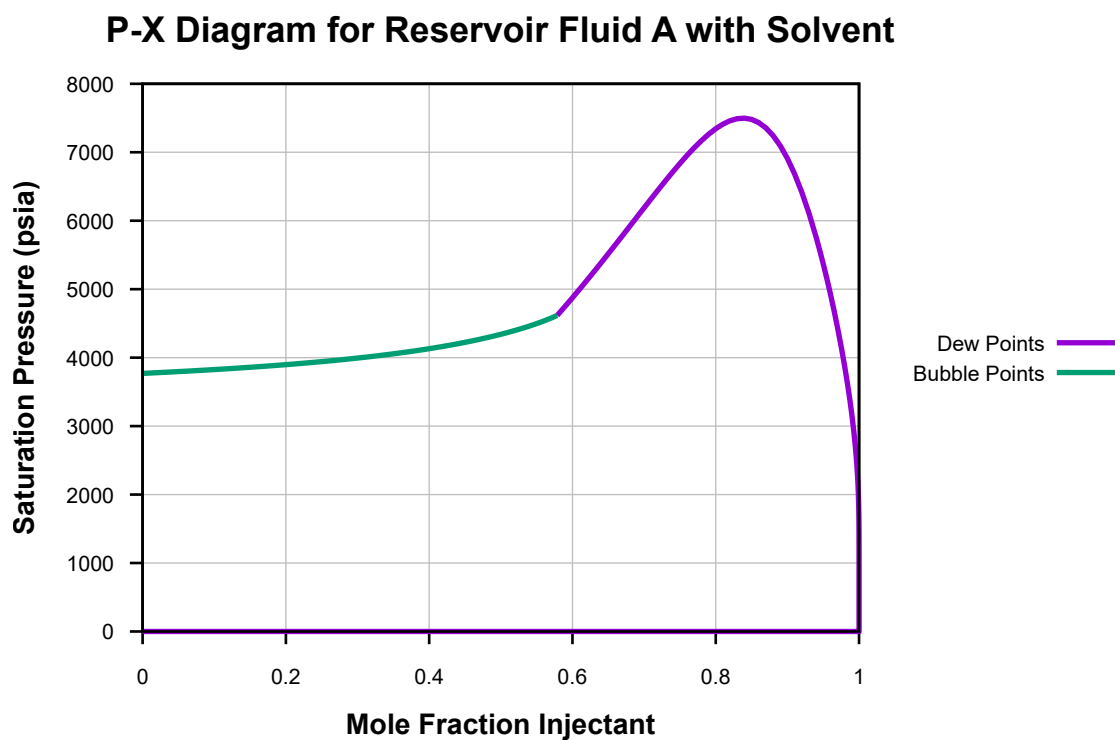


Figure 16: Saturation Pressure vs. Mole Fraction Injectant at 650 R, P-X Diagram for Reservoir Fluid A with Solvent.

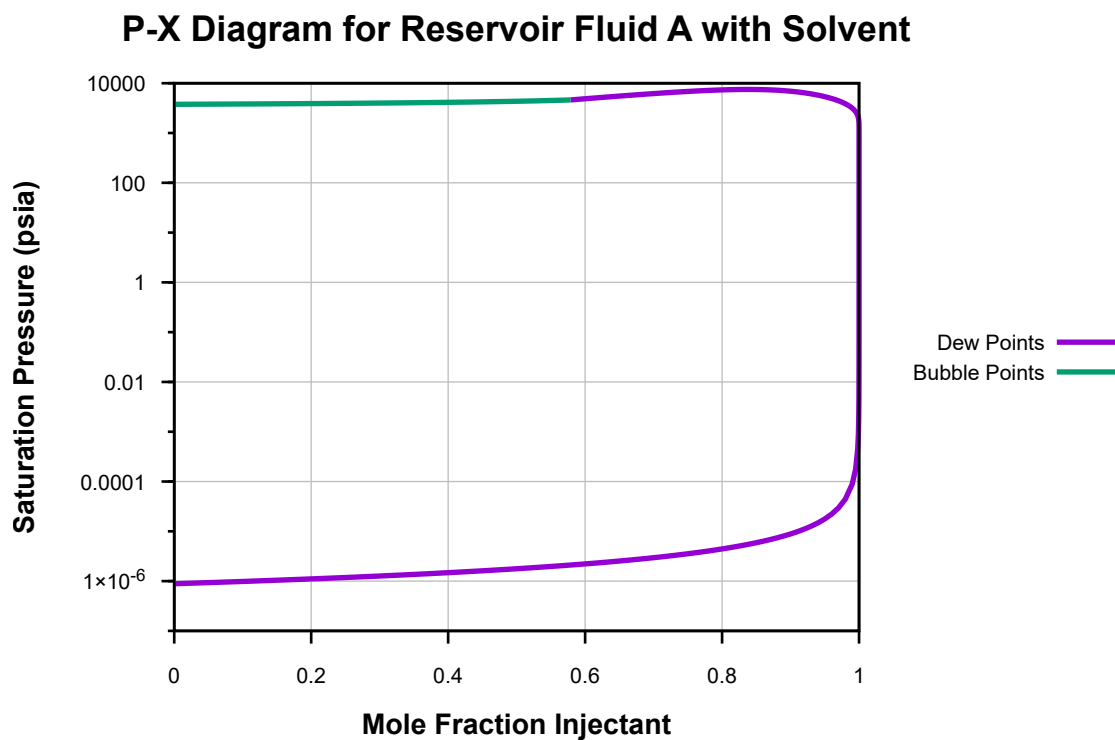


Figure 17: Log of Saturation Pressure vs. Mole Fraction Injectant at 650 R, P-X Diagram for Reservoir Fluid A with Solvent.

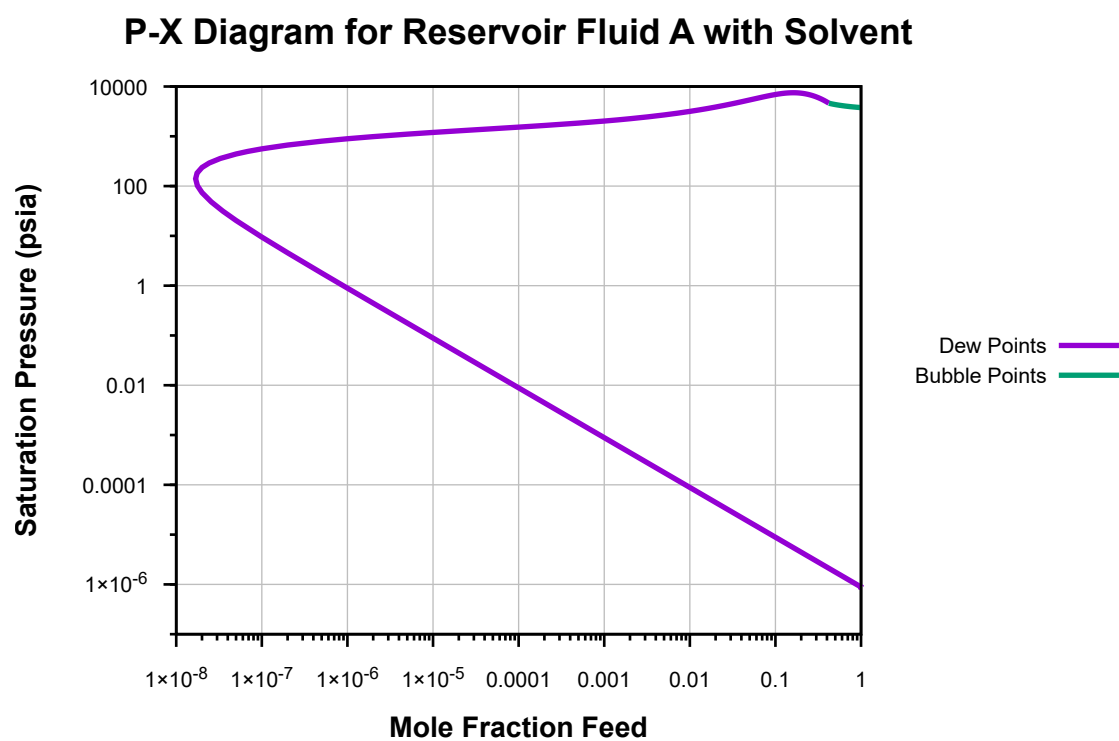


Figure 18: Log of Saturation Pressure vs. Log of Mole Fraction Feed at 650 R, P-X Diagram for Reservoir Fluid A with Solvent.

### Reservoir Fluid A Swollen with Solvent Just Above the Saturation Temperature Minimum

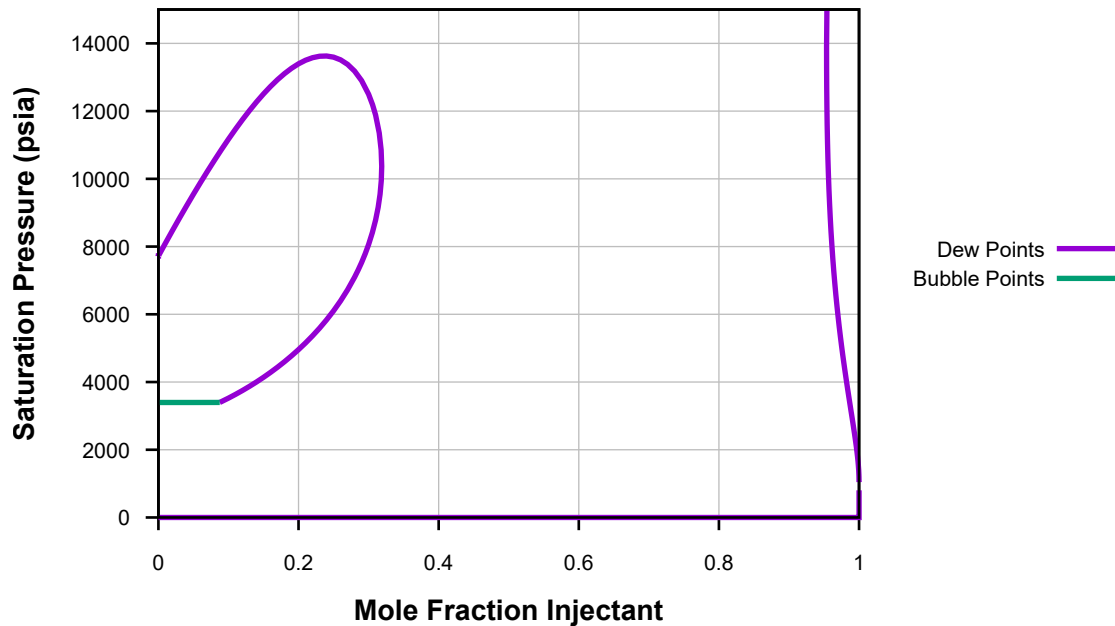


Figure 19: Saturation Pressure vs. Mole Fraction Injectant at 577.375 R, Reservoir Fluid A Swollen with Solvent, Just Above the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Above the Saturation Temperature Minimum

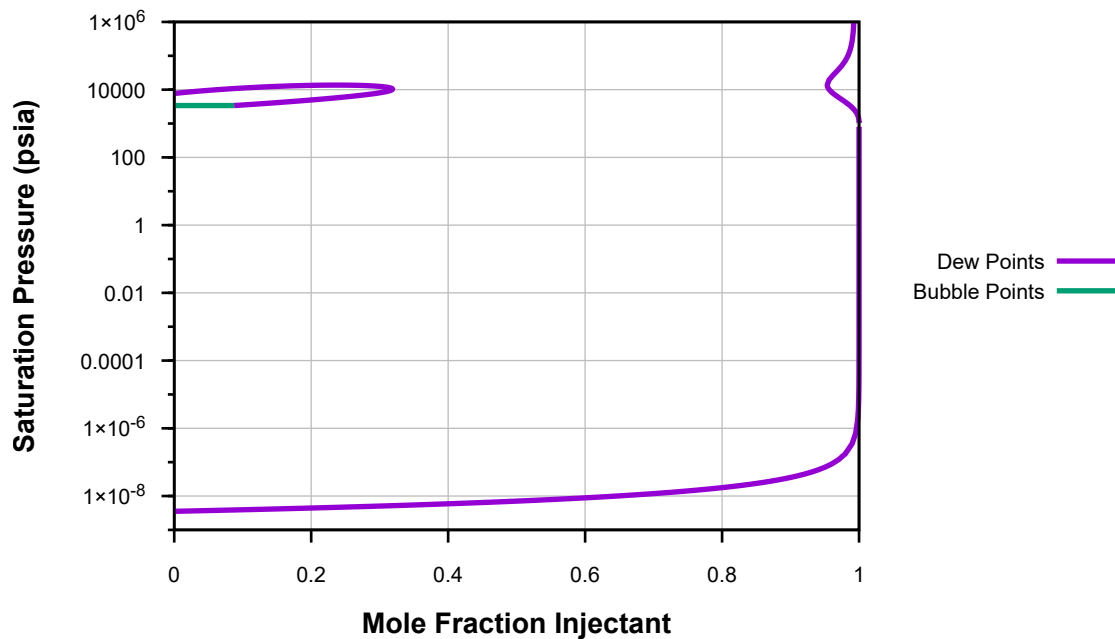


Figure 20: Log of Saturation Pressure vs. Mole Fraction Injectant at 577.375 R, Reservoir Fluid A Swollen with Solvent, Just Above the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Above the Saturation Temperature Minimum

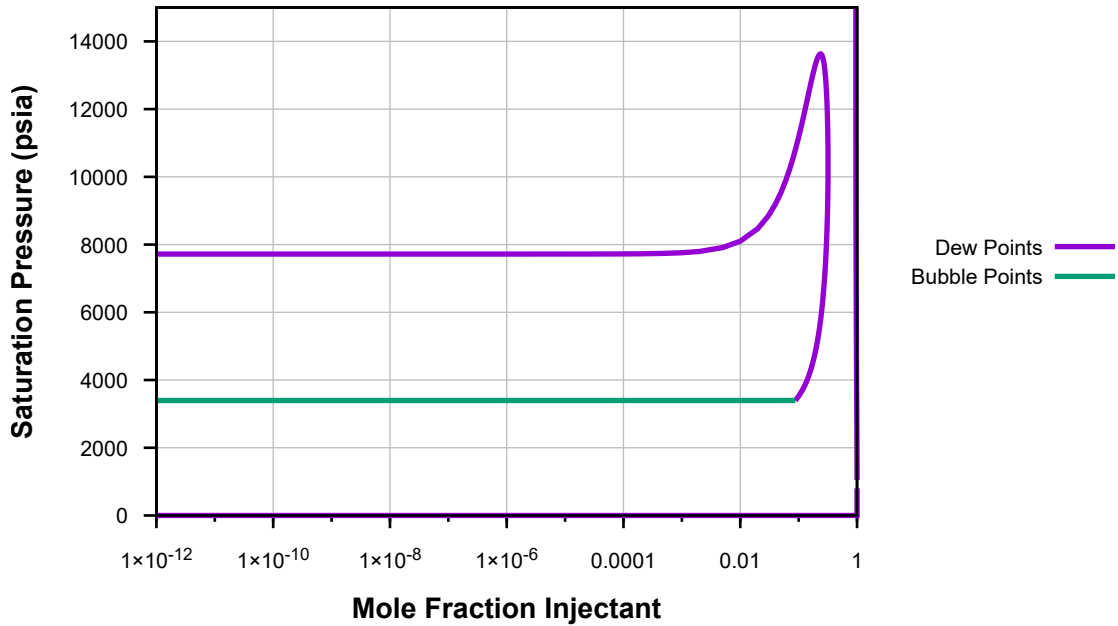


Figure 21: Saturation Pressure vs. Log of Mole Fraction Injectant at 577.375 R, Reservoir Fluid A Swollen with Solvent, Just Above the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Above the Saturation Temperature Minimum

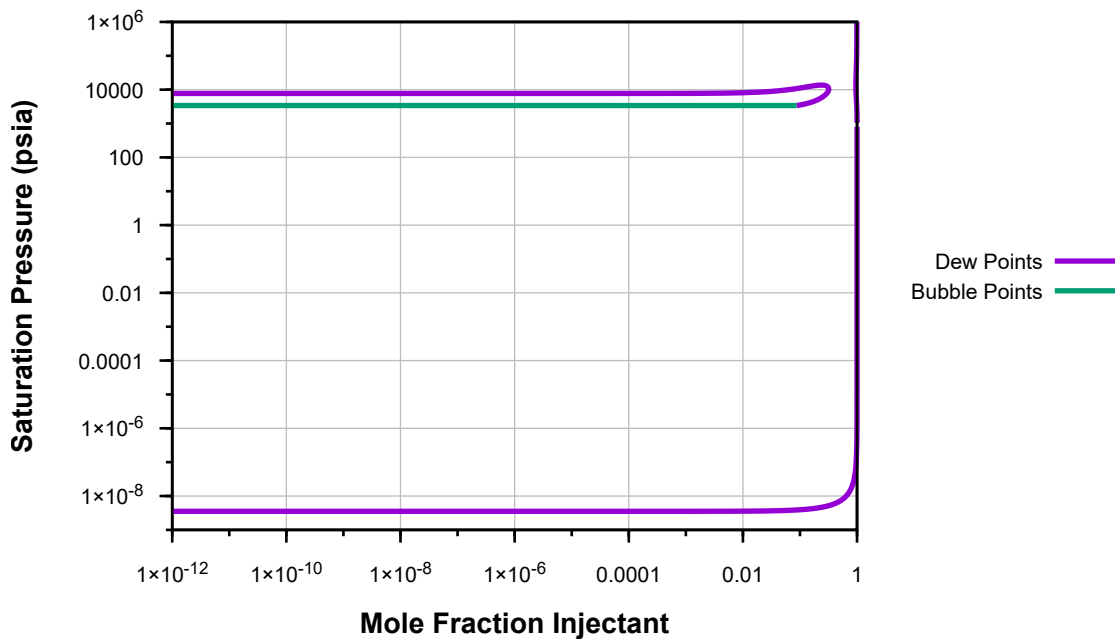


Figure 22: Log of Saturation Pressure vs. Log of Mole Fraction Injectant at 577.375 R, Reservoir Fluid A Swollen with Solvent, Just Above the Saturation Temperature Minimum.



### Reservoir Fluid A Swollen with Solvent Just Above the Saturation Temperature Minimum

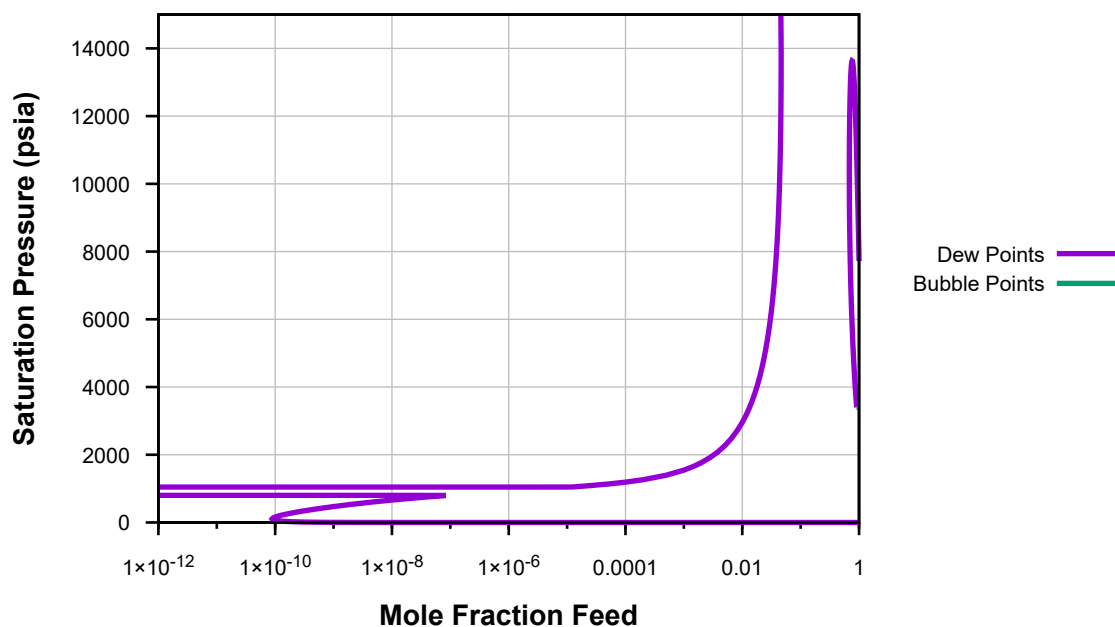


Figure 23: Saturation Pressure vs. Log of Mole Fraction Feed at 577.375 R, Reservoir Fluid A Swollen with Solvent, Just Above the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Above the Saturation Temperature Minimum

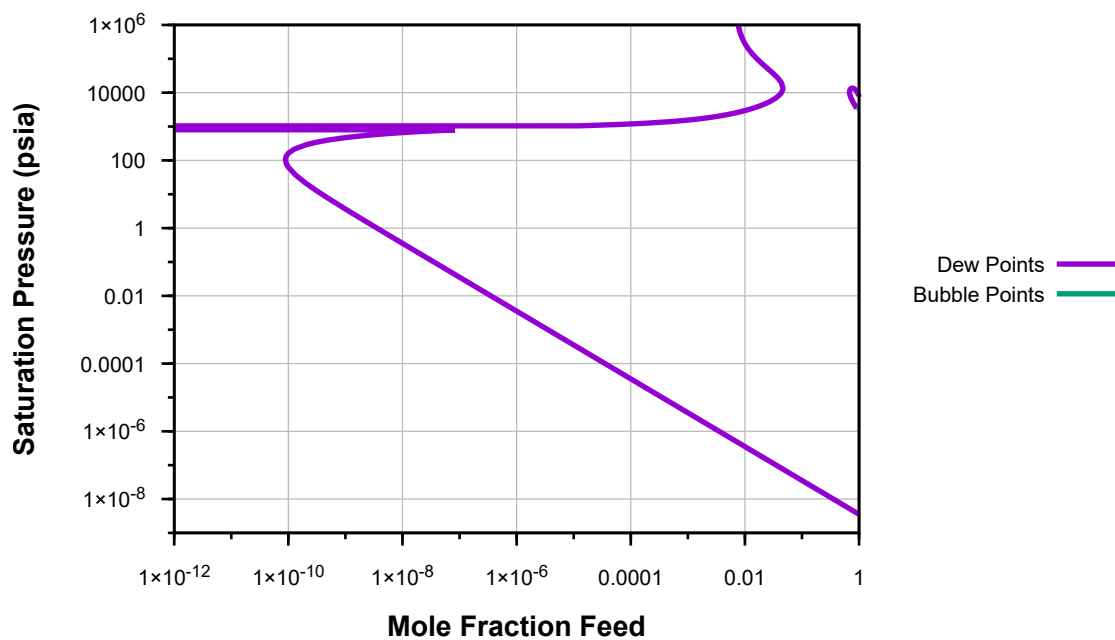


Figure 24: Log of Saturation Pressure vs. Log of Mole Fraction Feed at 577.375 R, Reservoir Fluid A Swollen with Solvent, Just Above the Saturation Temperature Minimum.

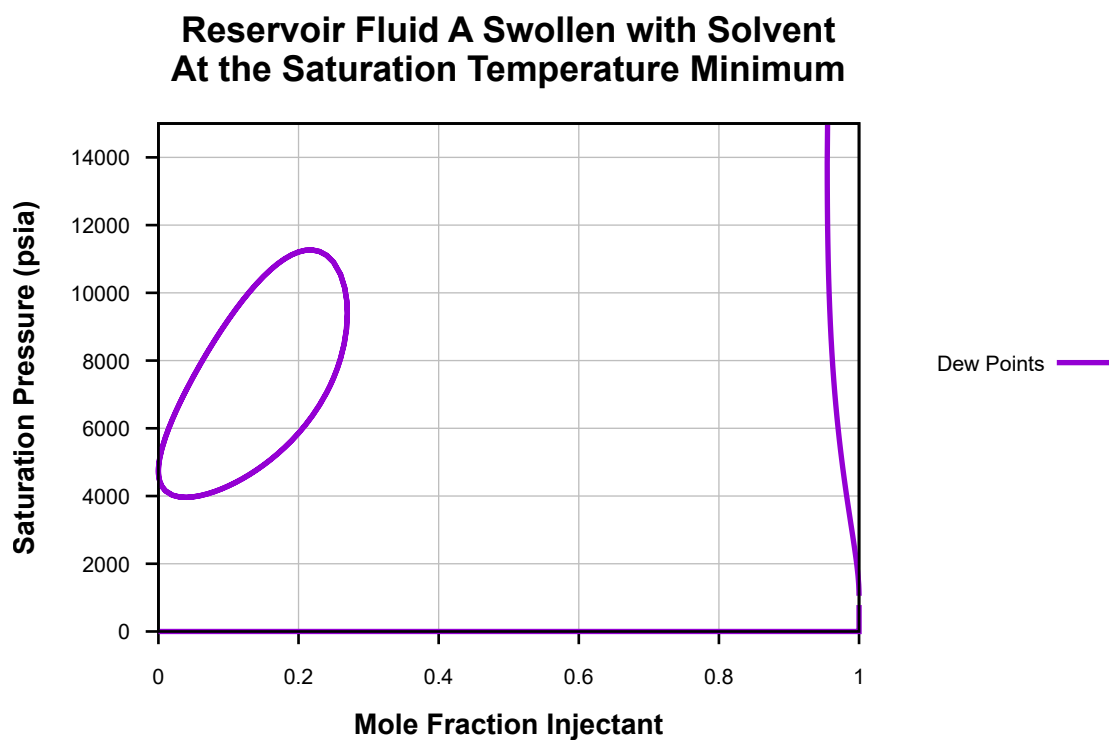


Figure 25: Saturation Pressure vs. Mole Fraction Injectant at 576.375 R, Reservoir Fluid A Swollen with Solvent, At the Saturation Temperature Minimum.

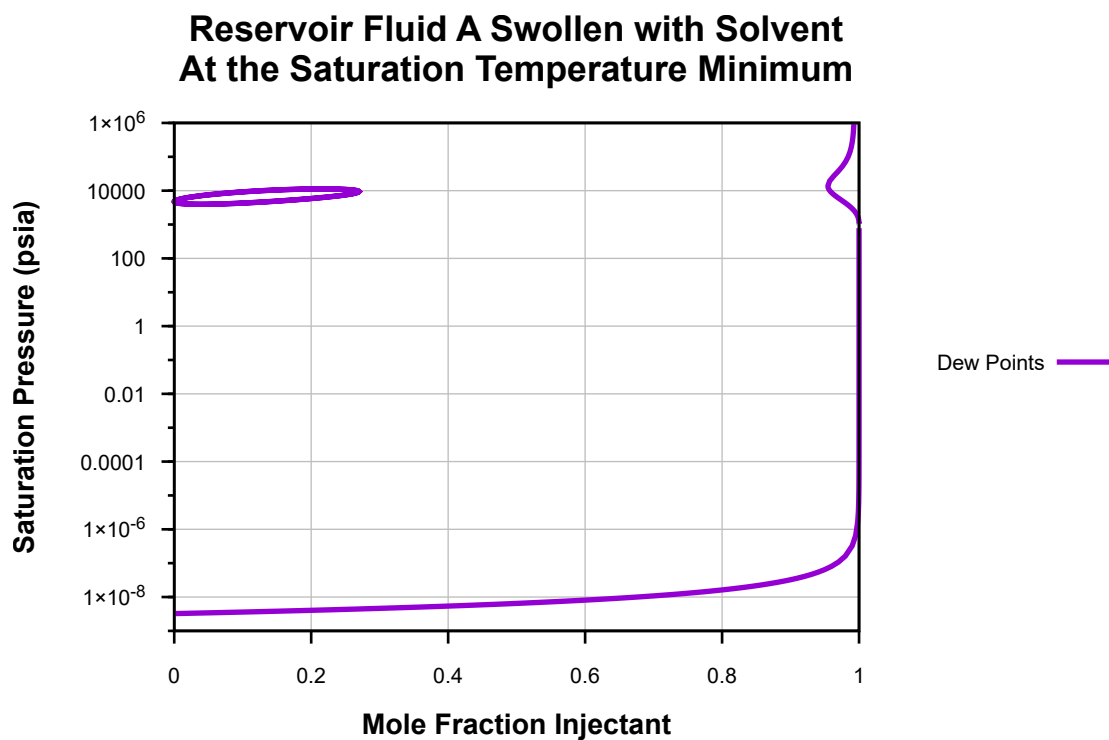


Figure 26: Log of Saturation Pressure vs. Mole Fraction Injectant at 576.375 R, Reservoir Fluid A Swollen with Solvent, At the Saturation Temperature Minimum.

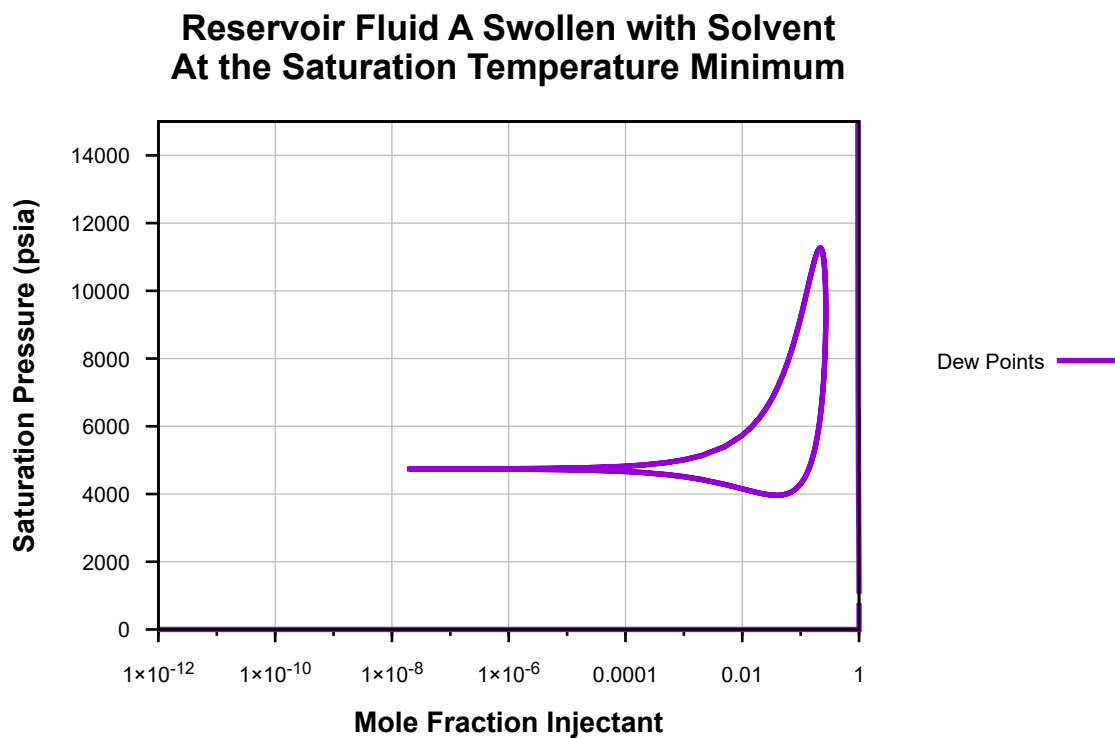


Figure 27: Saturation Pressure vs. Log of Mole Fraction Injectant at 576.375 R, Reservoir Fluid A Swollen with Solvent, At the Saturation Temperature Minimum.

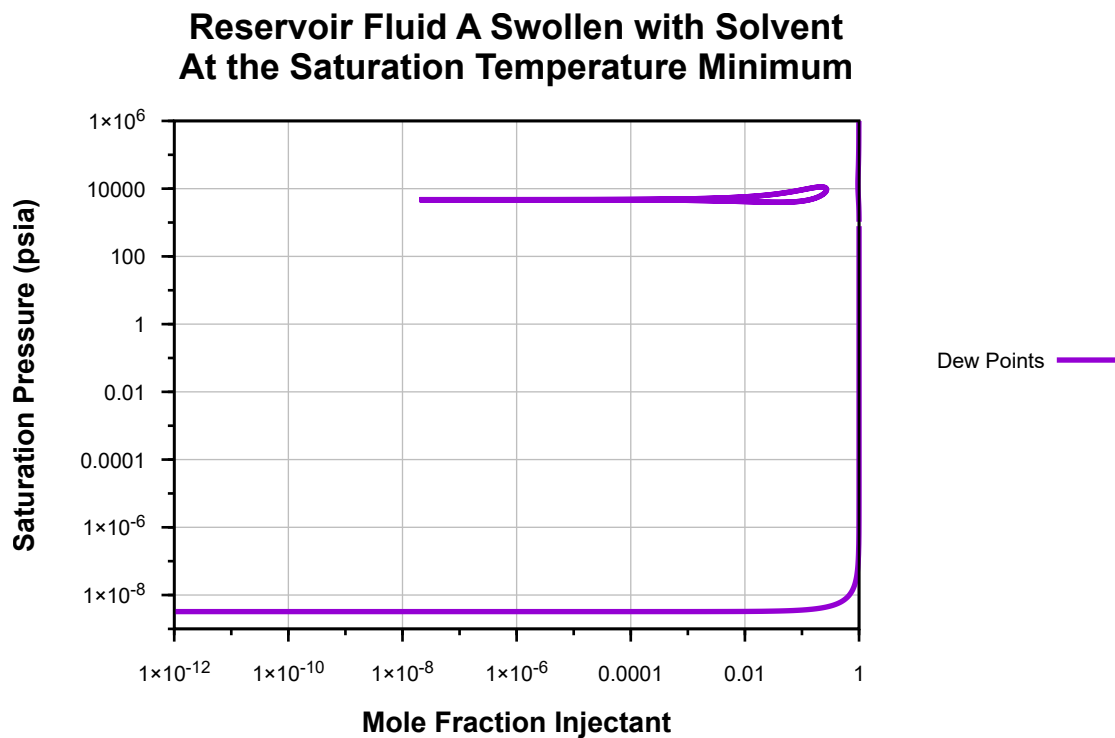


Figure 28: Log of Saturation Pressure vs. Log of Mole Fraction Injectant at 576.375 R, Reservoir Fluid A Swollen with Solvent, At the Saturation Temperature Minimum.

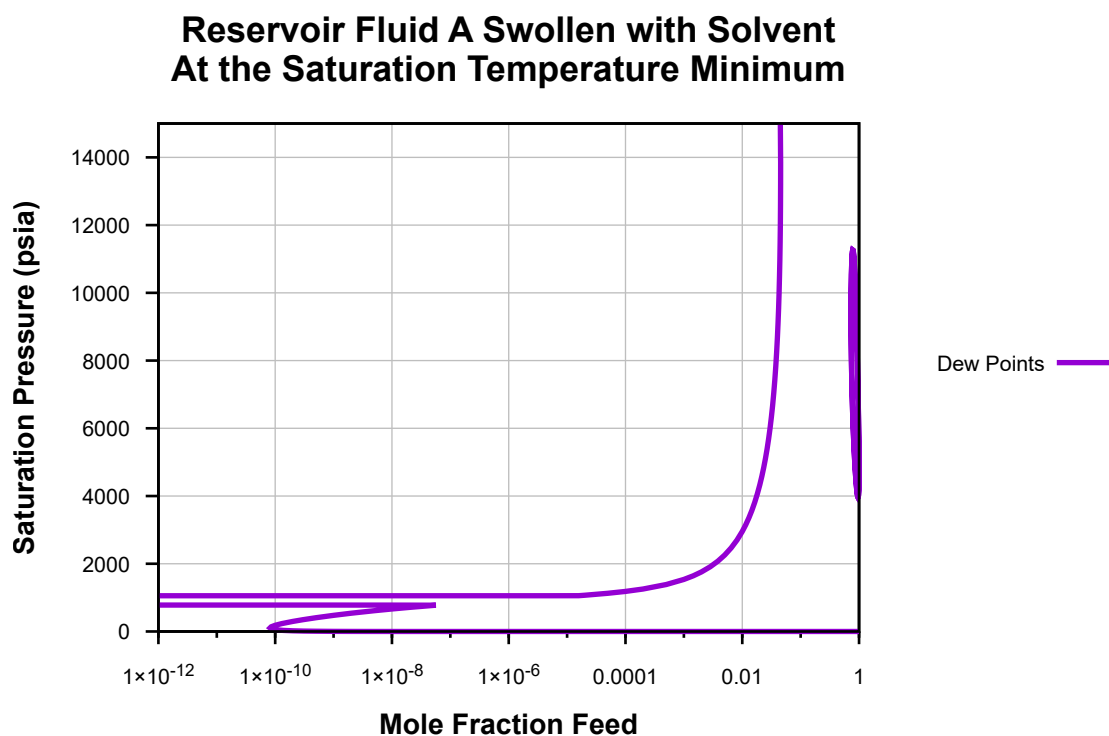


Figure 29: Saturation Pressure vs. Log of Mole Fraction Feed at 576.375 R, Reservoir Fluid A Swollen with Solvent, At the Saturation Temperature Minimum.

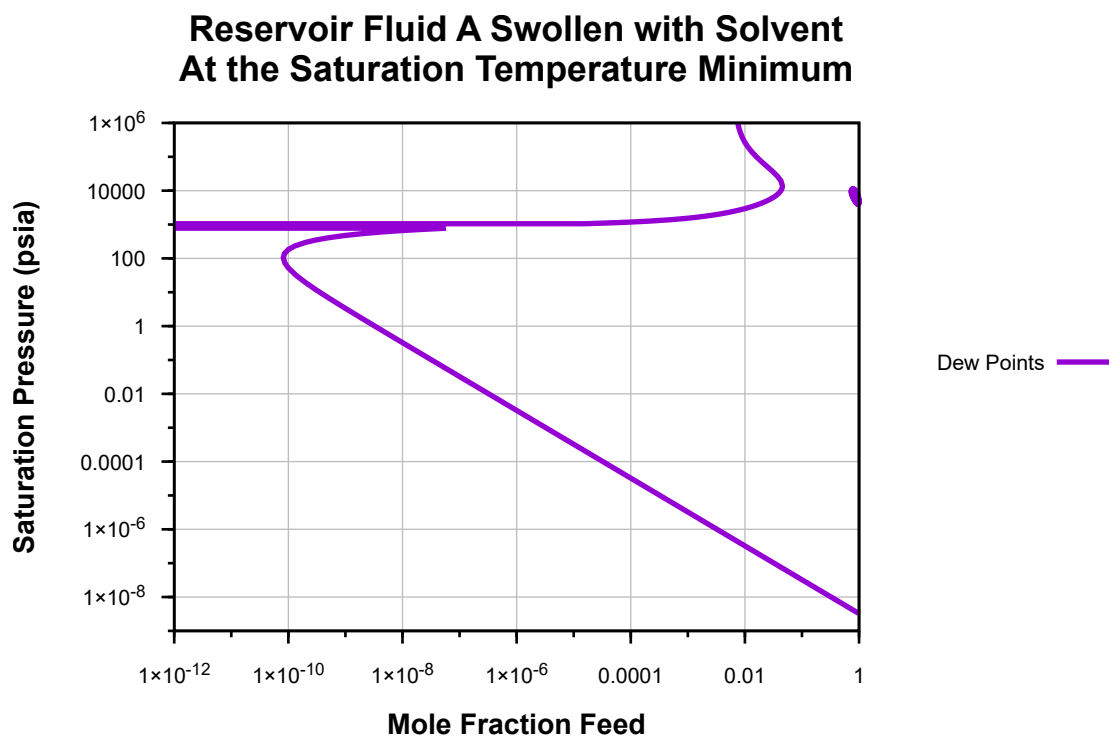


Figure 30: Log of Saturation Pressure vs. Log of Mole Fraction Feed at 576.375 R, Reservoir Fluid A Swollen with Solvent, At the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Below the Saturation Temperature Minimum

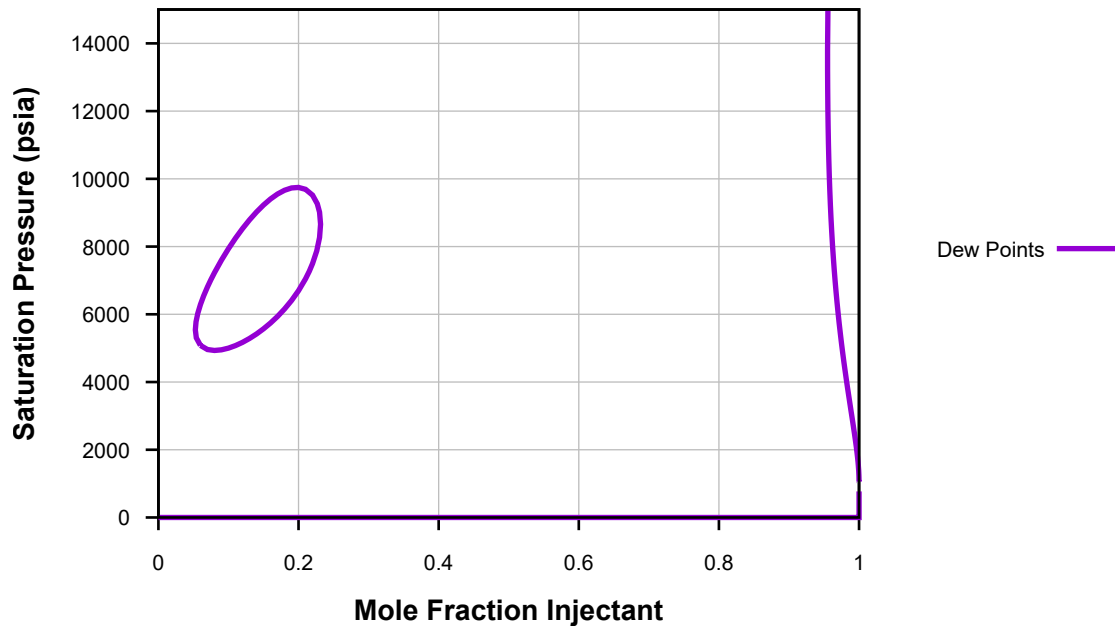


Figure 31: Saturation Pressure vs. Mole Fraction Injectant at 575.875 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Below the Saturation Temperature Minimum

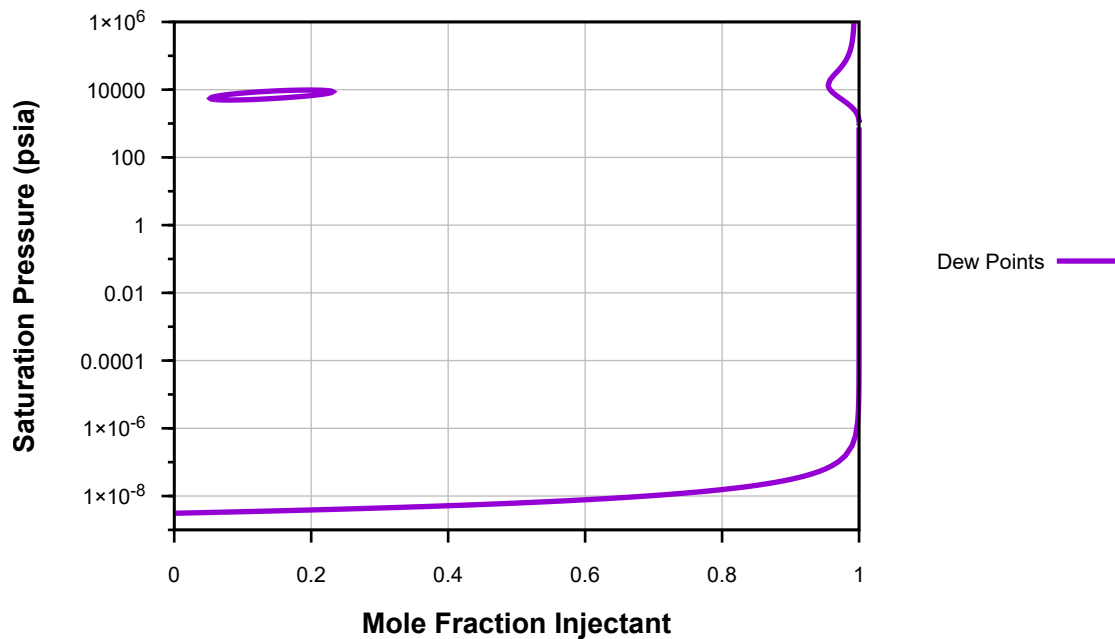


Figure 32: Log of Saturation Pressure vs. Mole Fraction Injectant at 575.875 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Below the Saturation Temperature Minimum

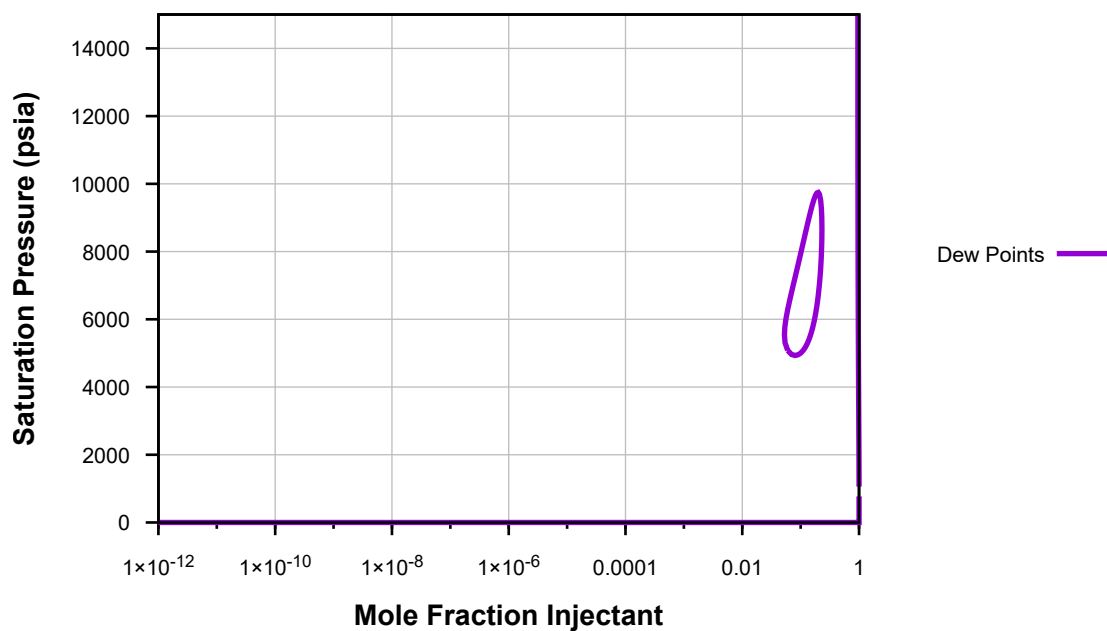


Figure 33: Saturation Pressure vs. Log of Mole Fraction Injectant at 575.875 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Below the Saturation Temperature Minimum

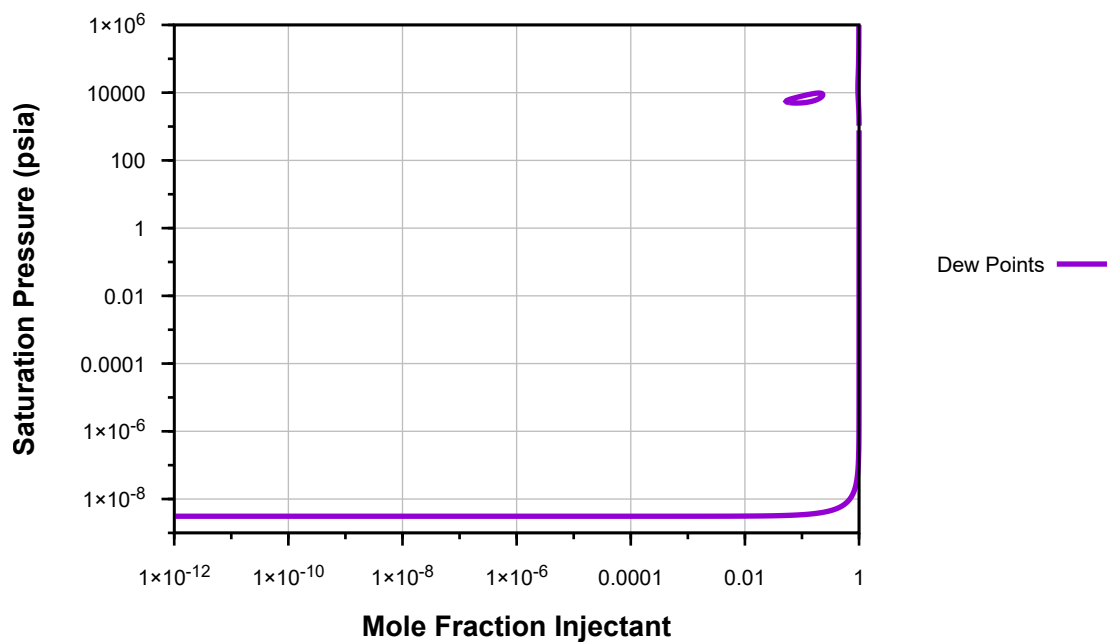


Figure 34: Log of Saturation Pressure vs. Log of Mole Fraction Injectant at 575.875 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Below the Saturation Temperature Minimum

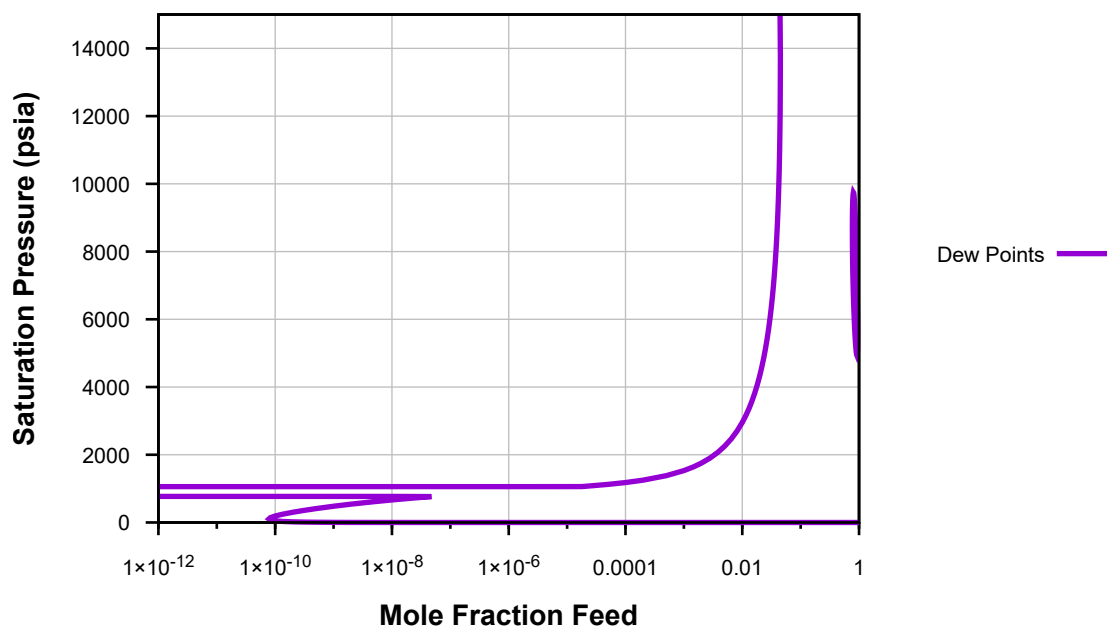


Figure 35: Saturation Pressure vs. Log of Mole Fraction Feed at 575.875 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Below the Saturation Temperature Minimum

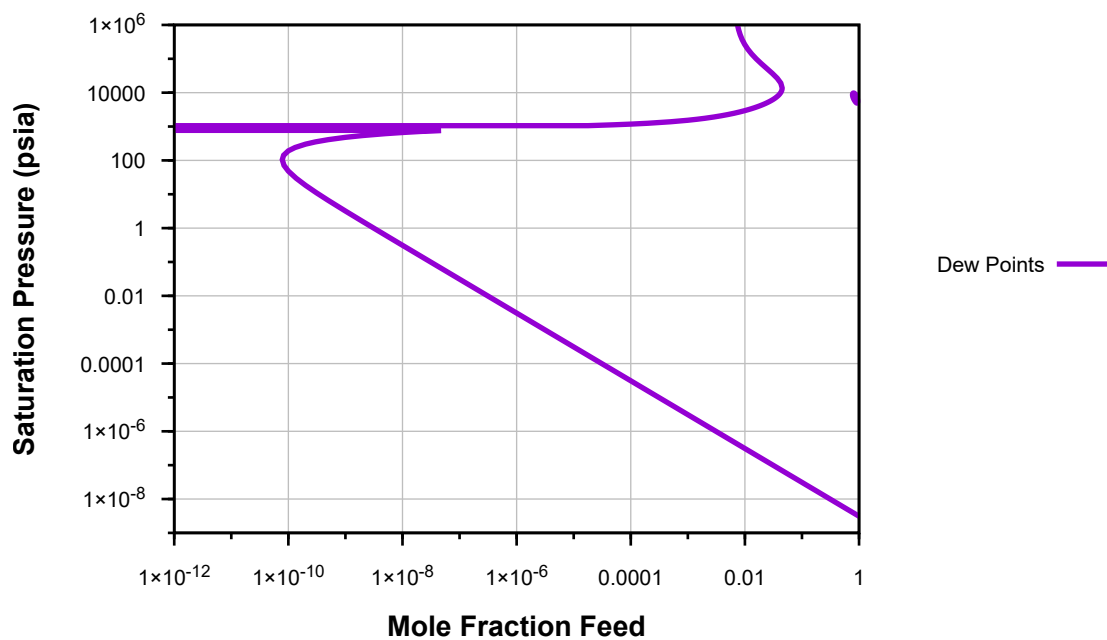


Figure 36: Log of Saturation Pressure vs. Log of Mole Fraction Feed at 575.875 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Below the Saturation Temperature Minimum

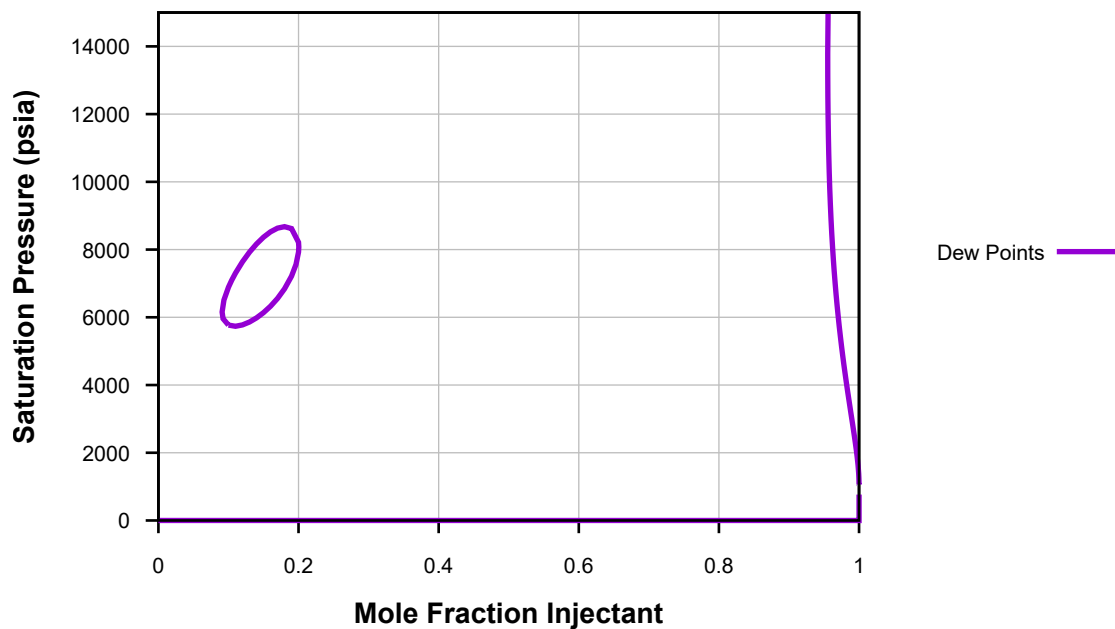


Figure 37: Saturation Pressure vs. Mole Fraction Injectant at 575.625 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Below the Saturation Temperature Minimum

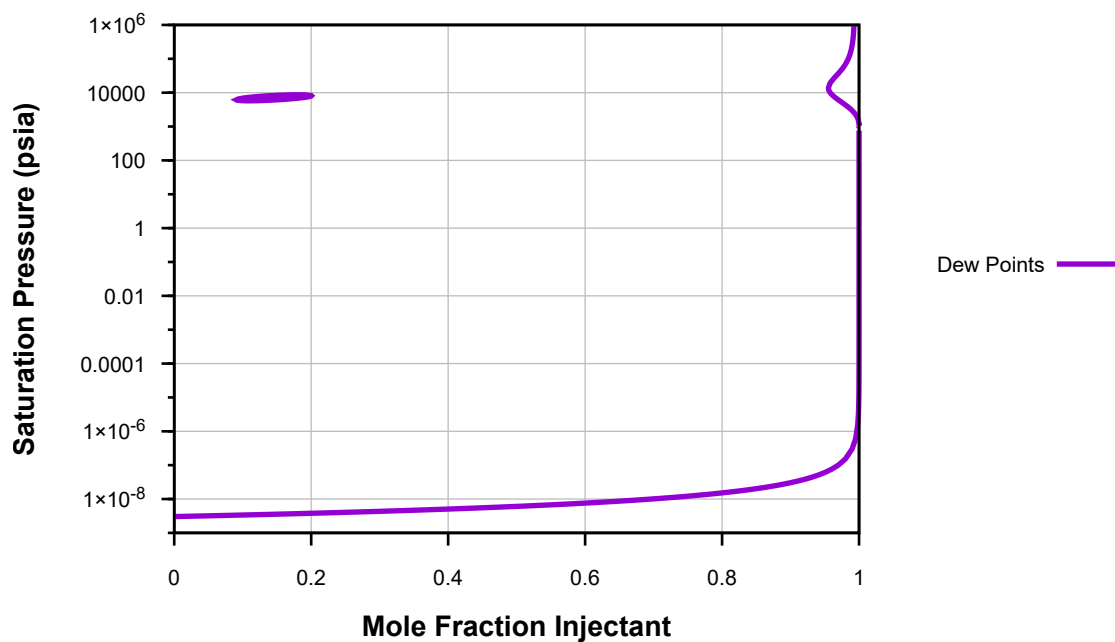


Figure 38: Log of Saturation Pressure vs. Mole Fraction Injectant at 575.625 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.



### Reservoir Fluid A Swollen with Solvent Just Below the Saturation Temperature Minimum

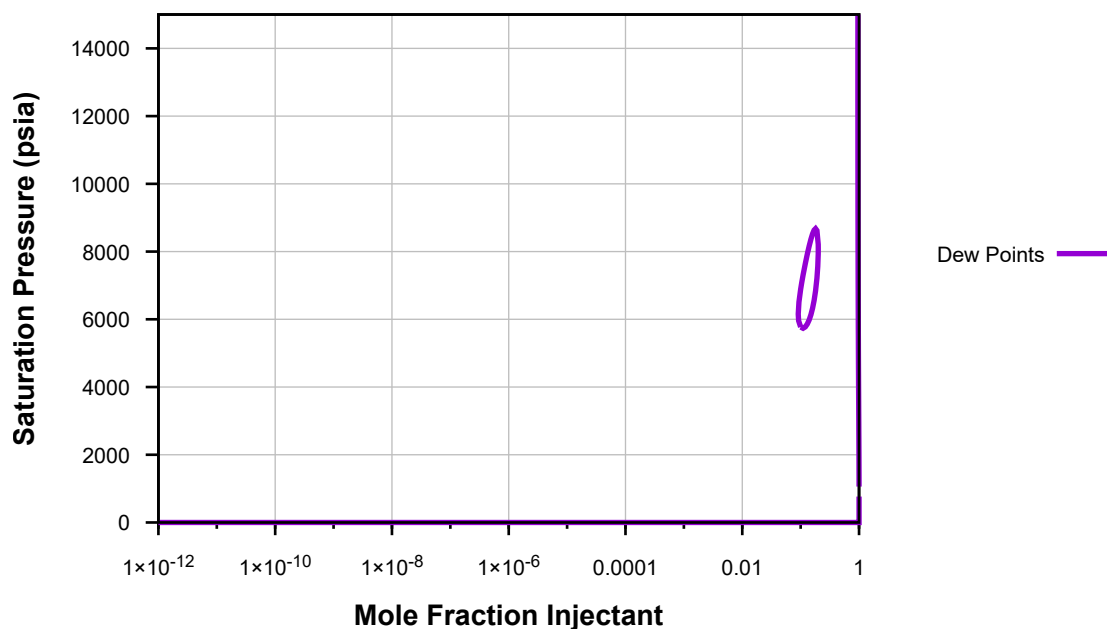


Figure 39: Saturation Pressure vs. Log of Mole Fraction Injectant at 575.625 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Below the Saturation Temperature Minimum

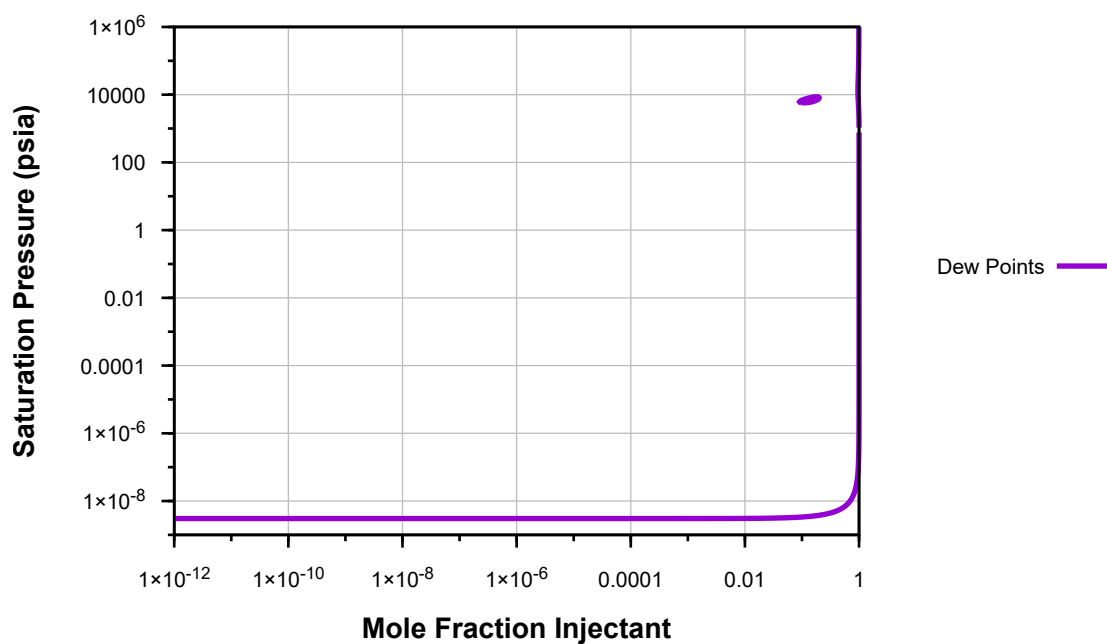


Figure 40: Log of Saturation Pressure vs. Log of Mole Fraction Injectant at 575.625 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.

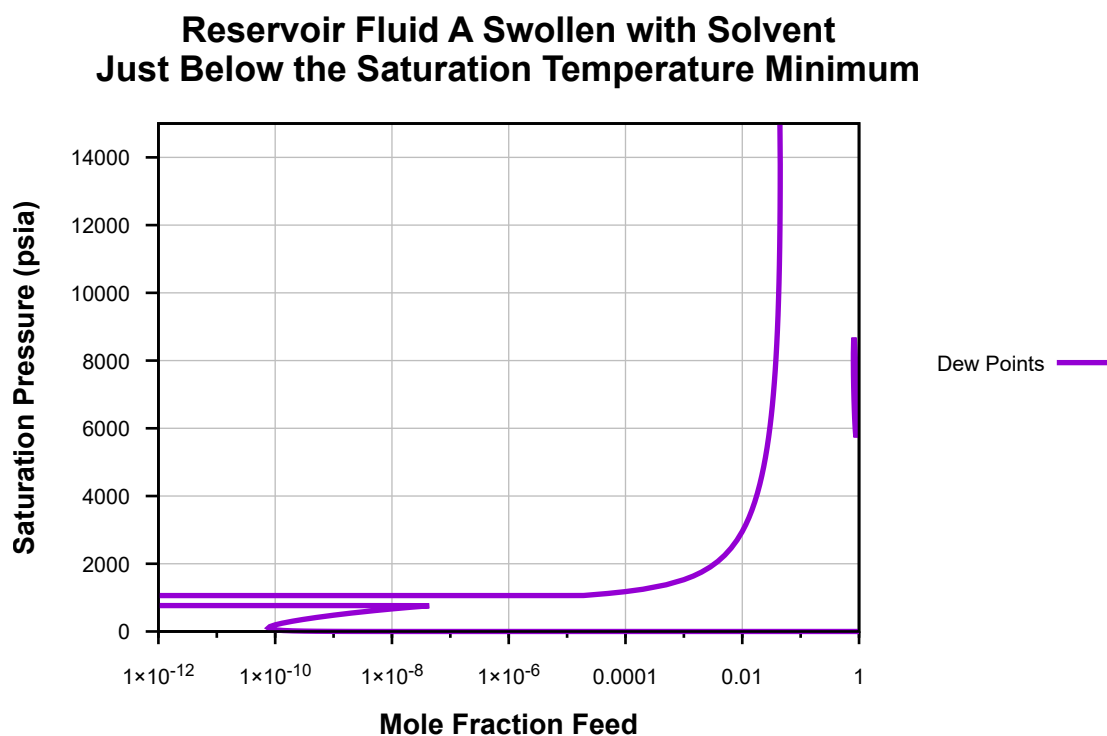


Figure 41: Saturation Pressure vs. Log of Mole Fraction Feed at 575.625 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.

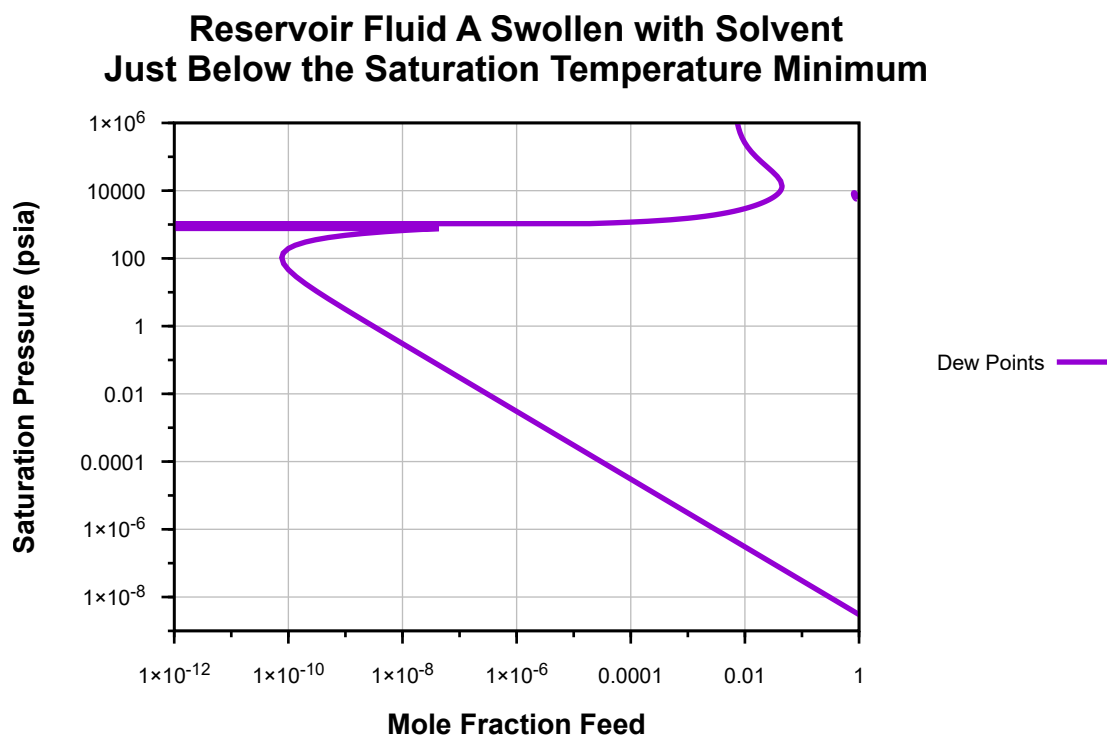


Figure 42: Log of Saturation Pressure vs. Log of Mole Fraction Feed at 575.625 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Below the Saturation Temperature Minimum

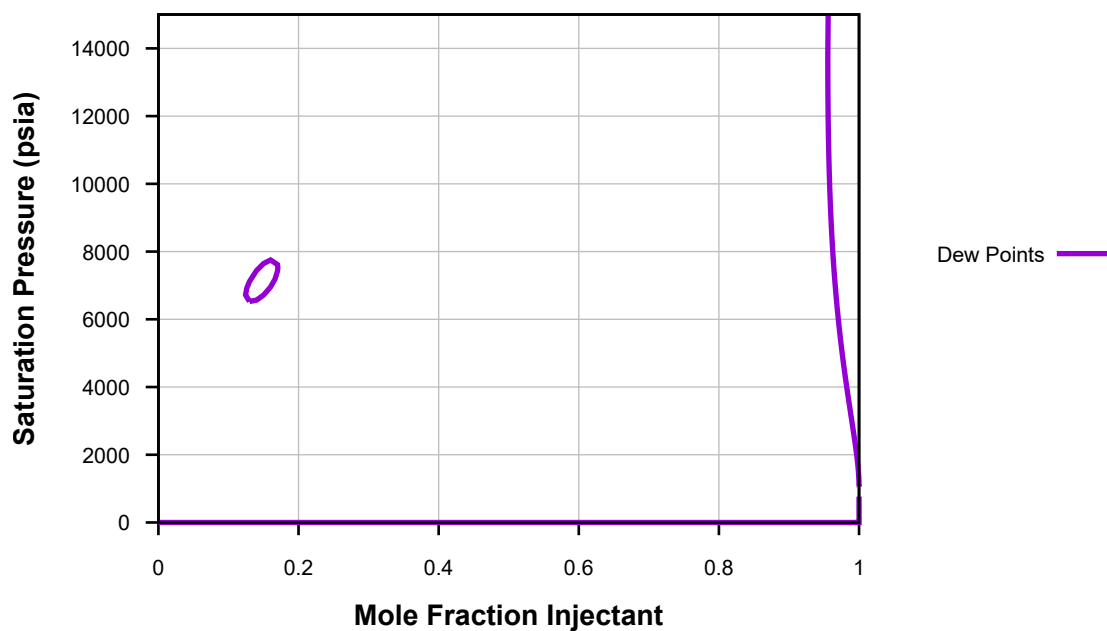


Figure 43: Saturation Pressure vs. Mole Fraction Injectant at 575.5 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Below the Saturation Temperature Minimum

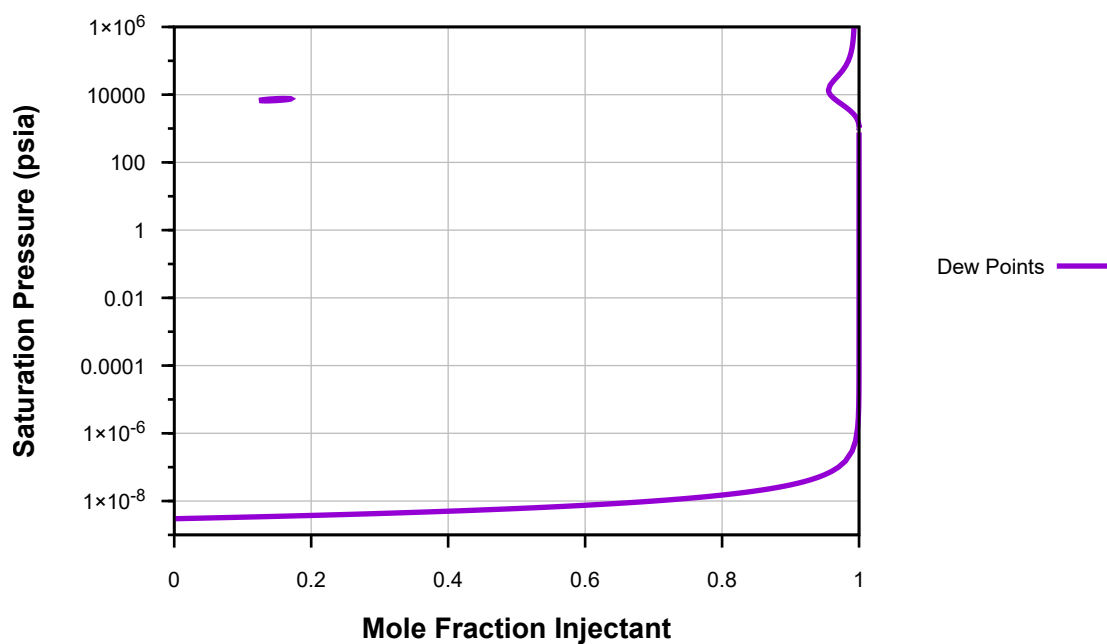


Figure 44: Log of Saturation Pressure vs. Mole Fraction Injectant at 575.5 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.

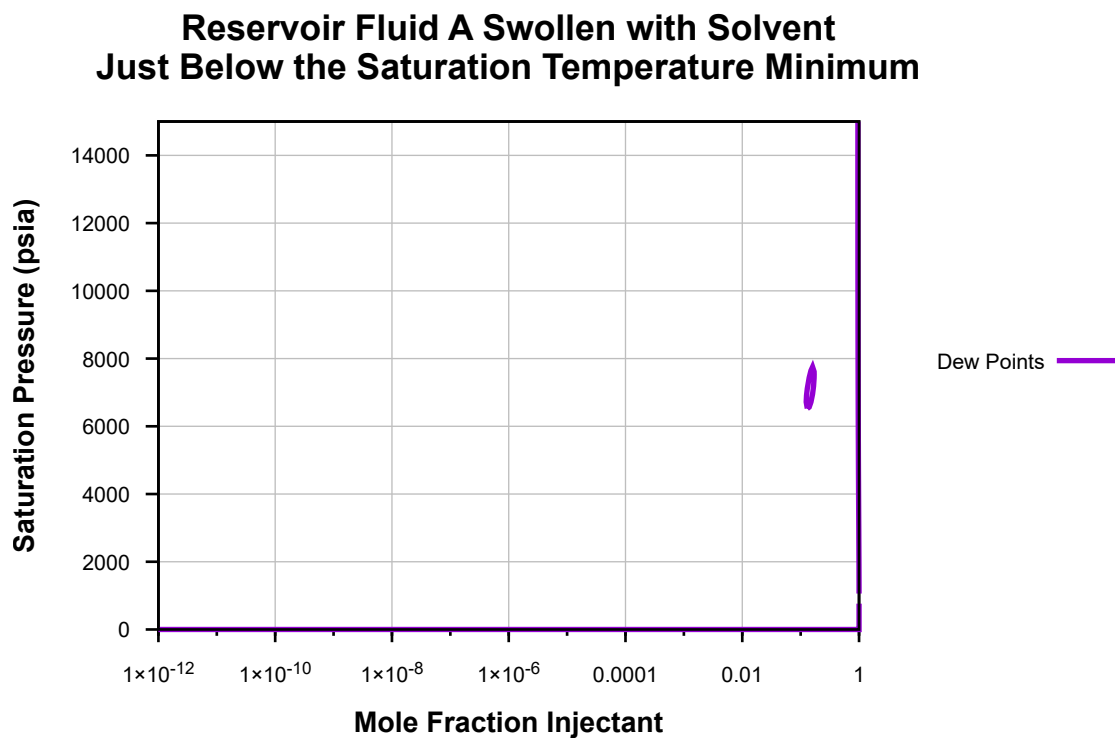


Figure 45: Saturation Pressure vs. Log of Mole Fraction Injectant at 575.5 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.

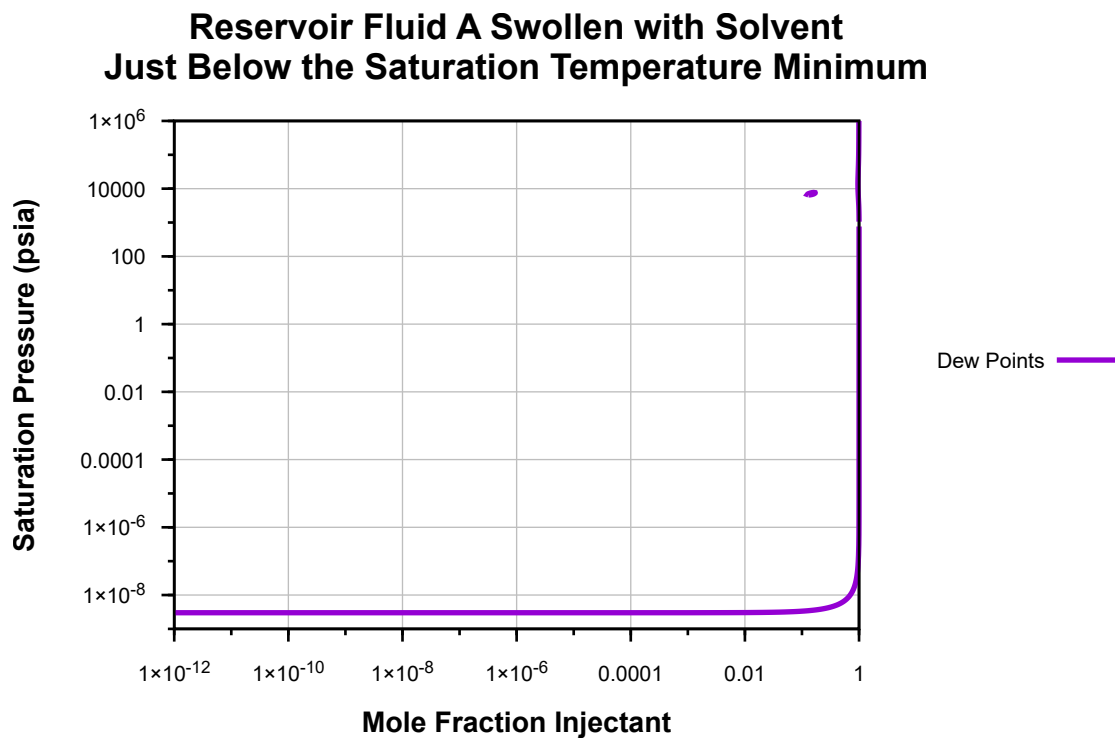


Figure 46: Log of Saturation Pressure vs. Log of Mole Fraction Injectant at 575.5 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Below the Saturation Temperature Minimum

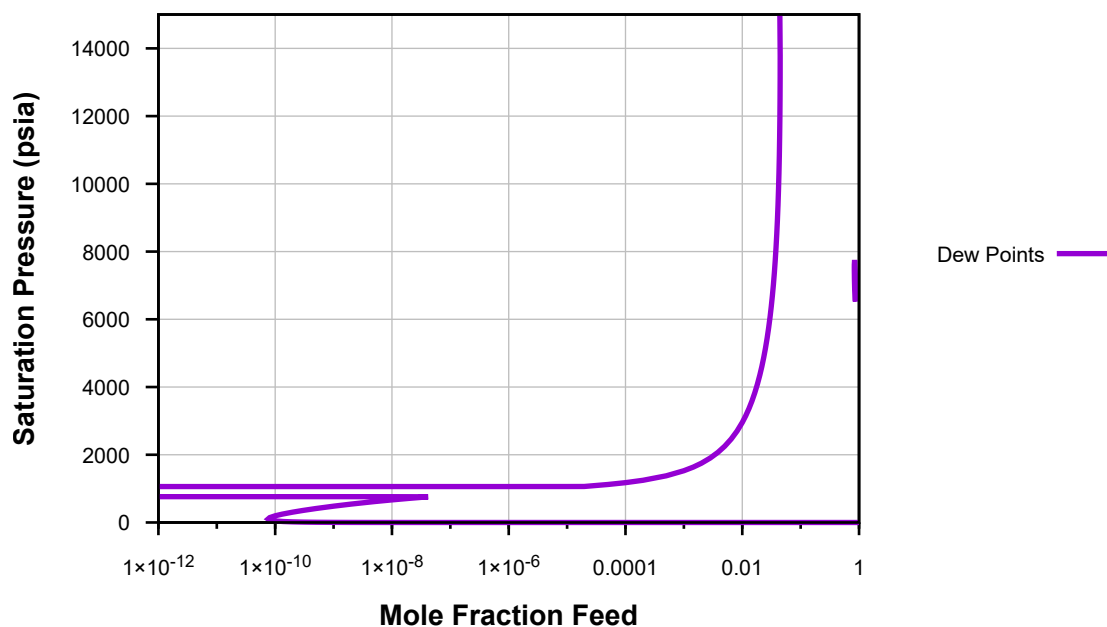


Figure 47: Saturation Pressure vs. Log of Mole Fraction Feed at 575.5 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.

### Reservoir Fluid A Swollen with Solvent Just Below the Saturation Temperature Minimum

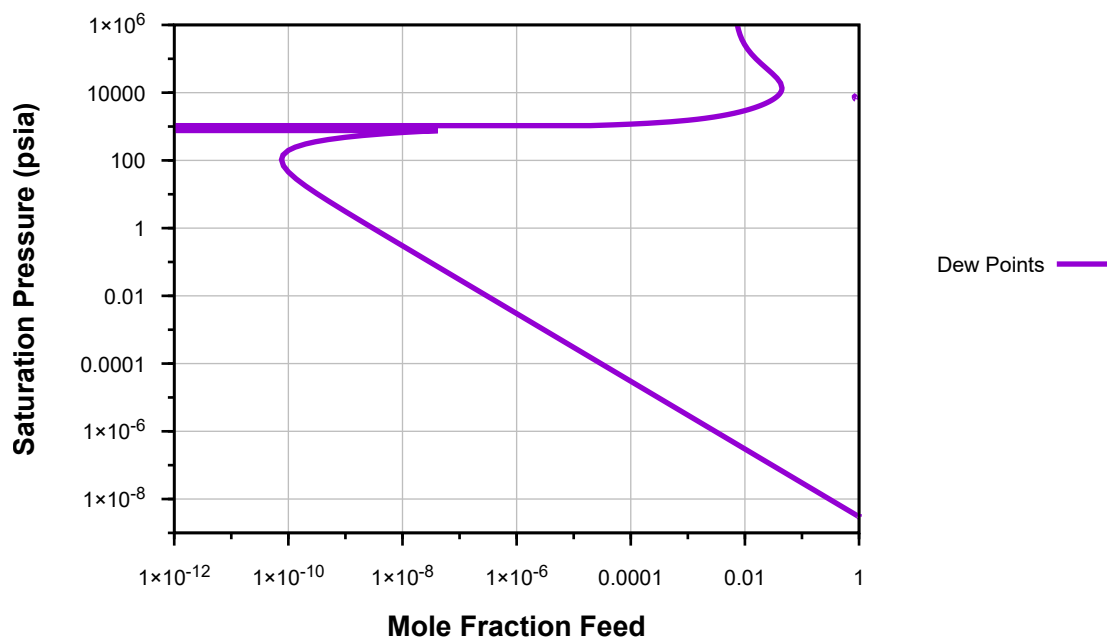


Figure 48: Log of Saturation Pressure vs. Log of Mole Fraction Feed at 575.5 R, Reservoir Fluid A Swollen with Solvent, Just Below the Saturation Temperature Minimum.