

COMPONENTS:

1. Methane; CH₄; [74-82-8]
2. Decane; C₁₀H₂₂; [124-18-5]

EVALUATOR:

Colin L. Young,
School of Chemistry,
University of Melbourne,
Parkville, Victoria 3052,
Australia.

March 1982

EVALUATION:

This system has been investigated by four groups. Reamer *et al.* (1) studied this system at temperatures between 311 K and 511 K, Beaudoin and Kohn (2) between 248 K and 423 K, Lin *et al.* (3) between 423 K and 583 K and Koonce and Kobayashi (4) between 244 K and 278 K. There appears to be fair agreement between all sets of data where they overlap, therefore all sets are classified as tentative.

There is good agreement (i.e., within 3%) between the data of Reamer *et al.* (1) and Lin *et al.* (4) at 237.8 °C. The agreement between the data of Beaudoin and Kohn (2) and Lin *et al.* (3) at 150 °C is fair (i.e., within 5%), the mole fraction solubilities of Beaudoin and Kohn (2) being slightly smaller. Although there is no directly comparable data from the measurements of Koonce and Kobayashi (4) and Beaudoin and Kohn (2) since the isotherm temperatures are different, it appears that the results of Beaudoin and Kohn (2) are slightly low and extrapolation of the data of Koonce and Kobayashi (4) to higher temperatures would give values in good agreement with those of Reamer *et al.* (1).

References

1. Reamer, H. H.; Olds, R. H.; Sage, B. H.; Lacey, W. N.
Ind. Eng. Chem., 1942, *34*, 1526.
2. Beaudoin, J. M.; Kohn, J. P.
J. Chem. Eng. Data, 1967, *12*, 189.
3. Koonce, K. T.; Kobayashi, R.
J. Chem. Eng. Data, 1964, *9*, 490.
4. Lin, H.-M.; Sebastian, H. M.; Simnick, J. J.; Chao, K.-C.
J. Chem. Eng. Data, 1979, *24*, 146.

COMPONENTS:		ORIGINAL MEASUREMENTS:			
1. Methane; CH ₄ ; [74-82-8] 2. Decane; C ₁₀ H ₂₂ ; [124-18-5]		Reamer, H. H.; Olds, R. H.; Sage, B. H.; Lacey, W. N. <i>Ind. Eng. Chem.</i> 1942, 34, 1526-1531.			
VARIABLES:		PREPARED BY:			
Temperature, pressure		C. L. Young			
EXPERIMENTAL VALUES:					
T/K	P/MPa	Wt-fraction of methane		Mole fraction of methane	
		in liquid	in gas	in liquid, x_{CH_4}	in gas, y_{CH_4}
310.92	0.14	0.00080	0.9663	0.00705	0.9961
	0.28	0.00161	0.9816	0.01410	0.9979
	0.41	0.00241	0.9868	0.02098	0.9985
	0.55	0.00321	0.9895	0.02777	0.9988
	0.69	0.00401	0.9910	0.03448	0.9990
	1.38	0.00798	0.9939	0.06661	0.9993
	2.76	0.01587	0.9950	0.12515	0.9994
	4.14	0.02372	0.9951	0.17731	0.9994
	5.52	0.03157	0.9948	0.22432	0.9994
	6.89	0.03963	0.9941	0.26797	0.9993
	8.62	0.04990	0.9925	0.31783	0.9991
	10.34	0.06054	0.9905	0.36373	0.9989
	12.07	0.07180	0.9875	0.40695	0.99858
	13.79	0.08350	0.9835	0.44697	0.99811
	15.51	0.09570	0.9775	0.48421	0.99741
	17.24	0.1082	0.9700	0.5184	0.99653
	18.96	0.1214	0.9615	0.5507	0.99551
	20.68	0.1360	0.9510	0.5827	0.99423
	22.41	0.1505	0.9380	0.6111	0.99260
	24.13	0.1652	0.9220	0.6371	0.99055
	25.86	0.1815	0.9008	0.6630	0.98774
	27.58	0.1984	0.8720	0.6871	0.98372
	29.30	0.2183	0.8388	0.7124	0.97880
(cont.)					
AUXILIARY INFORMATION					
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:		
PVT cell charged with mixture of known composition. Bubble point and dew point determined for various compositions. Pressure measured with pressure balance. Temperature measured using platinum resistance thermometer. Coexisting liquid and gas phase properties determined by graphical means. Details of apparatus in ref. (1).			1. Crude sample, treated for removal of higher alkanes, carbon dioxide and water. Final purity 99.97 mole per cent.		
			2. Eastman Kodak Co. sample. Distilled several times, dried over sodium. $n_{D,20} = 1.4100$. Mainly decane isomers.		
			ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta P/MPa = \pm 0.005$; $\delta(\text{wt-fraction}) = \pm 0.003$.		
			REFERENCES: 1. Sage, B. H.; Lacey, W. N. <i>Trans. Am. Inst. Mining and Met. Engrs.</i> 1940, 136, 136.		

COMPONENTS:		ORIGINAL MEASUREMENTS:			
1. Methane; CH ₄ ; [74-82-8]		Reamer, H. H.; Olds, R. H.;			
2. Decane; C ₁₀ H ₂₂ ; [124-18-5]		Sage, B. H.; Lacey, W. N.			
		Ind. Eng. Chem.			
		1942, 34, 1526-1531.			
EXPERIMENTAL VALUES:					
T/K	P/MPa	Wt-fraction of methane		Mole fraction of methane	
		in liquid	in gas	in liquid, x_{CH_4}	in gas, y_{CH_4}
310.92	31.03	0.2408	0.7970	0.7378	0.97209
	32.75	0.2720	0.7490	0.7682	0.9636
	34.47	0.3195	0.6880	0.8064	0.95137
	36.20	0.4110	0.5910	0.8609	0.92763
	344.26	0.14	0.00070	0.8414	0.00618
0.28		0.00142	0.9110	0.01246	0.9891
0.41		0.00213	0.9364	0.01858	0.9924
0.55		0.00285	0.9496	0.02473	0.9941
0.69		0.00357	0.9577	0.03080	0.9950
1.38		0.00714	0.9742	0.05997	0.9970
2.76		0.01429	0.9823	0.11395	0.9980
4.14		0.02148	0.9840	0.16299	0.9982
5.52		0.02875	0.9840	0.20798	0.9982
6.89		0.03615	0.9827	0.24965	0.9980
8.62		0.04574	0.9800	0.29835	0.9977
10.34		0.05558	0.9770	0.34300	0.9974
12.07		0.06585	0.9732	0.38474	0.9969
13.79		0.07647	0.9682	0.42348	0.9963
15.51		0.08750	0.9625	0.45965	0.9956
17.24		0.09926	0.9533	0.49433	0.9945
18.96		0.1117	0.9426	0.5273	0.9932
20.68		0.1252	0.9295	0.5594	0.9915
22.41		0.1400	0.9115	0.5909	0.9892
24.13		0.1555	0.8900	0.6203	0.9863
25.86	0.1730	0.8640	0.6498	0.9826	
27.58	0.1930	0.8330	0.6796	0.9779	
29.30	0.2169	0.7970	0.7107	0.9721	
31.03	0.2469	0.7550	0.7441	0.9647	
32.75	0.2850	0.7010	0.7795	0.9541	
34.47	0.3455	0.6240	0.8340	0.9364	
377.59	0.14	0.00059	0.5554	0.00521	0.9172
	0.28	0.00124	0.7151	0.01089	0.9570
	0.41	0.00189	0.7864	0.01652	0.9703
	0.55	0.00253	0.8267	0.02201	0.9769
	0.69	0.00318	0.8538	0.02752	0.9811
	1.38	0.00643	0.9103	0.05429	0.9890
	2.76	0.01299	0.9421	0.10454	0.9931
	4.14	0.01966	0.9505	0.15103	0.9942
	5.52	0.02651	0.9536	0.19457	0.9945
	6.89	0.03352	0.9547	0.23528	0.9947
	8.62	0.04251	0.9530	0.28256	0.9945
	10.34	0.05205	0.9500	0.32754	0.9941
	12.07	0.06210	0.9432	0.37002	0.9933
	13.79	0.07241	0.9338	0.40915	0.9938
	15.51	0.08320	0.9230	0.44600	0.9907
	17.24	0.09440	0.9095	0.48044	0.9889
	18.96	0.1065	0.8935	0.5139	0.9867
	20.68	0.1195	0.8750	0.5463	0.8750
	22.41	0.1345	0.8530	0.5796	0.9809
	24.13	0.1512	0.8270	0.6124	0.9770
25.86	0.1695	0.7941	0.6442	0.9716	
27.58	0.1920	0.7605	0.6782	0.9657	
29.30	0.2205	0.7182	0.7150	0.9576	
31.03	0.2579	0.6668	0.7551	0.9467	
32.75	0.3195	0.5900	0.8064	0.9274	
410.93	0.14	0.00044	0.2414	0.00389	0.7384
	0.28	0.00104	0.4202	0.00915	0.8654
	0.41	0.00163	0.5245	0.01428	0.9073

(cont.)

COMPONENTS:		ORIGINAL MEASUREMENTS:			
1. Methane; CH ₄ ; [74-82-8]		Reamer, H. H.; Olds, R. H.;			
2. Decane; C ₁₀ H ₂₂ ; [124-18-5]		Sage, B. H.; Lacey, W. N.			
		<i>Ind. Eng. Chem.</i>			
		<u>1942, 34, 1526-1531.</u>			
EXPERIMENTAL VALUES:					
T/K	P/MPa	Wt-fraction of methane		Mole fraction of methane	
		in liquid	in gas	in liquid,	in gas,
				x_{CH_4}	y_{CH_4}
410.93	0.55	0.00223	0.5932	0.01944	0.9282
	0.69	0.00283	0.6429	0.02456	0.9411
	1.38	0.00585	0.7647	0.04961	0.9665
	2.76	0.01202	0.8454	0.09741	0.9798
	4.14	0.01839	0.8751	0.14251	0.9842
	5.52	0.02499	0.8893	0.18525	0.9862
	6.89	0.03180	0.8954	0.22562	0.9870
	8.62	0.04077	0.8980	0.27380	0.9874
	10.34	0.05018	0.8955	0.31911	0.9870
	12.07	0.06020	0.8878	0.36234	0.9860
	13.79	0.07066	0.8772	0.40280	0.9845
	15.51	0.08173	0.8596	0.44120	0.9819
	17.24	0.09355	0.8384	0.47795	0.9787
	18.96	0.1063	0.8167	0.5134	0.9753
	20.68	0.1201	0.7933	0.5477	0.9715
	22.41	0.1360	0.7670	0.5827	0.9669
	24.13	0.1536	0.7342	0.6168	0.9608
	25.86	0.1746	0.6960	0.6524	0.9531
	27.58	0.2015	0.6510	0.6912	0.9430
	29.30	0.2400	0.5920	0.7369	0.9279
	31.03	0.3120	0.4900	0.8009	0.8950
444.26	0.14	0.00019	0.0501	0.00168	0.3187
	0.28	0.00076	0.1727	0.00670	0.6493
	0.41	0.00133	0.2625	0.01168	0.7595
	0.55	0.00191	0.3324	0.01669	0.8154
	0.69	0.00249	0.3878	0.02166	0.8489
	1.38	0.00541	0.5483	0.04603	0.9150
	2.76	0.01146	0.6868	0.09325	0.9511
	4.14	0.01773	0.7441	0.13802	0.9627
	5.52	0.02427	0.7693	0.18077	0.9673
	6.89	0.03105	0.7804	0.22135	0.9693
	8.62	0.04000	0.7861	0.26987	0.9702
	10.34	0.04957	0.7843	0.31632	0.9699
	12.07	0.05977	0.7751	0.36058	0.9683
	13.79	0.07059	0.7600	0.40254	0.9656
	15.51	0.08241	0.7416	0.44343	0.9622
	17.24	0.09520	0.7200	0.4828	0.9580
	18.96	0.1098	0.6988	0.5225	0.9532
	20.68	0.1258	0.6712	0.5607	0.9477
	22.41	0.1449	0.6389	0.6005	0.9401
	24.13	0.1691	0.6093	0.6435	0.9326
	25.86	0.1955	0.5405	0.6831	0.9125
	27.58	0.2390	0.4580	0.7359	0.8823
477.59	0.28	0.00026	0.0295	0.00230	0.2124
	0.41	0.00085	0.0891	0.00749	0.4646
	0.55	0.00145	0.1399	0.01272	0.5907
	0.69	0.00205	0.1837	0.01790	0.6663
	1.38	0.00515	0.3333	0.04391	0.8160
	2.76	0.01138	0.4873	0.09265	0.8940
	4.14	0.01788	0.5609	0.13904	0.9189
	5.52	0.02472	0.6019	0.18357	0.9306
	6.89	0.03183	0.6215	0.22579	0.9358
	8.62	0.04117	0.6308	0.27583	0.9381
	10.34	0.05113	0.6340	0.32342	0.9389
	12.07	0.06155	0.6301	0.36782	0.9379
	13.79	0.07320	0.6189	0.41199	0.9351
	15.51	0.08620	0.6000	0.45558	0.9301
	17.24	0.1007	0.5736	0.49833	0.9227

(cont.)

COMPONENTS:		ORIGINAL MEASUREMENTS:			
1. Methane; CH ₄ ; [74-82-8]		Reamer, H. H.; Olds, R. H.;			
2. Decane; C ₁₀ H ₂₂ ; [124-18-5]		Sage, B. H.; Lacey, W. N.			
		<i>Ind. Eng. Chem.</i>			
		1942, 34, 1526-1531.			
EXPERIMENTAL VALUES:					
T/K	P/MPa	Wt-fraction of methane		Mole fraction of methane	
		in liquid	in gas	in liquid,	in gas,
				x_{CH_4}	y_{CH_4}
477.59	18.96	0.1180	0.5440	0.54271	0.9137
	20.68	0.1402	0.5122	0.59125	0.9031
	22.41	0.1711	0.4640	0.64678	0.8848
	24.13	0.2260	0.3930	0.72147	0.8517
510.93	0.14	0.00052	0.0246	0.00459	0.1828
	0.28	0.00118	0.0534	0.01037	0.3335
	0.41	0.00458	0.1675	0.03922	0.6409
	0.55	0.01152	0.3015	0.09370	0.7929
	0.69	0.01880	0.3840	0.14528	0.8469
	1.38	0.02630	0.4300	0.19329	0.8700
	2.76	0.03398	0.4532	0.23783	0.8803
	4.14	0.04392	0.4665	0.28953	0.8858
	5.52	0.05430	0.4700	0.33746	0.8872
	6.89	0.06560	0.4672	0.38378	0.8861
	8.62	0.07780	0.4558	0.42804	0.8814
	10.34	0.09300	0.4328	0.47633	0.8713
	12.07	0.1160	0.3960	0.53791	0.8533
	13.79	0.1530	0.3400	0.61574	0.8205

<p>COMPONENTS:</p> <p>1. Methane; CH₄; [74-82-8]</p> <p>2. Decane; C₁₀H₂₂; [124-18-5]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Koonce, K. T.; Kobayashi, R. <i>J. Chem. Eng. Data</i> 1964, 9, 490-494.</p>																																																	
<p>VARIABLES:</p> <p>Temperature, pressure</p>	<p>PREPARED BY:</p> <p>C. L. Young</p>																																																	
<p>EXPERIMENTAL VALUES:</p> <table border="1"> <thead> <tr> <th data-bbox="93 533 171 574">T/K</th> <th data-bbox="171 533 648 574">P/10⁵Pa</th> <th data-bbox="648 533 1205 615">Mole fraction of methane in liquid, x_{CH_4}</th> </tr> </thead> <tbody> <tr> <td data-bbox="93 656 171 697" rowspan="6">277.59</td> <td data-bbox="171 656 246 697">17.34</td> <td data-bbox="648 656 727 697">0.0947</td> </tr> <tr> <td data-bbox="171 697 246 717">22.66</td> <td data-bbox="648 697 727 717">0.1234</td> </tr> <tr> <td data-bbox="171 717 246 737">28.27</td> <td data-bbox="648 717 727 737">0.1498</td> </tr> <tr> <td data-bbox="171 737 246 758">37.70</td> <td data-bbox="648 737 727 758">0.1923</td> </tr> <tr> <td data-bbox="171 758 246 778">52.19</td> <td data-bbox="648 758 727 778">0.2525</td> </tr> <tr> <td data-bbox="171 778 246 799">63.82</td> <td data-bbox="648 778 727 799">0.2901</td> </tr> <tr> <td data-bbox="93 799 171 840" rowspan="5">266.48</td> <td data-bbox="171 799 246 819">15.66</td> <td data-bbox="648 799 727 819">0.0920</td> </tr> <tr> <td data-bbox="171 819 246 840">21.45</td> <td data-bbox="648 819 727 840">0.1246</td> </tr> <tr> <td data-bbox="171 840 246 860">34.43</td> <td data-bbox="648 840 727 860">0.1928</td> </tr> <tr> <td data-bbox="171 860 246 880">46.28</td> <td data-bbox="648 860 727 880">0.2433</td> </tr> <tr> <td data-bbox="171 880 246 901">66.87</td> <td data-bbox="648 880 727 901">0.3185</td> </tr> <tr> <td data-bbox="93 901 171 942" rowspan="5">255.37</td> <td data-bbox="171 901 246 921">15.65</td> <td data-bbox="648 901 727 921">0.0982</td> </tr> <tr> <td data-bbox="171 921 246 942">22.02</td> <td data-bbox="648 921 727 942">0.1356</td> </tr> <tr> <td data-bbox="171 942 246 962">29.93</td> <td data-bbox="648 942 727 962">0.1783</td> </tr> <tr> <td data-bbox="171 962 246 983">41.69</td> <td data-bbox="648 962 727 983">0.2402</td> </tr> <tr> <td data-bbox="171 983 246 1003">63.19</td> <td data-bbox="648 983 727 1003">0.3248</td> </tr> <tr> <td data-bbox="93 1003 171 1044" rowspan="5">244.26</td> <td data-bbox="171 1003 246 1024">16.00</td> <td data-bbox="648 1003 727 1024">0.1103</td> </tr> <tr> <td data-bbox="171 1024 246 1044">21.19</td> <td data-bbox="648 1024 727 1044">0.1453</td> </tr> <tr> <td data-bbox="171 1044 246 1064">31.88</td> <td data-bbox="648 1044 727 1064">0.2061</td> </tr> <tr> <td data-bbox="171 1064 246 1085">44.20</td> <td data-bbox="648 1064 727 1085">0.2640</td> </tr> <tr> <td data-bbox="171 1085 246 1105">69.00</td> <td data-bbox="648 1085 727 1105">0.3641</td> </tr> </tbody> </table>		T/K	P/10 ⁵ Pa	Mole fraction of methane in liquid, x_{CH_4}	277.59	17.34	0.0947	22.66	0.1234	28.27	0.1498	37.70	0.1923	52.19	0.2525	63.82	0.2901	266.48	15.66	0.0920	21.45	0.1246	34.43	0.1928	46.28	0.2433	66.87	0.3185	255.37	15.65	0.0982	22.02	0.1356	29.93	0.1783	41.69	0.2402	63.19	0.3248	244.26	16.00	0.1103	21.19	0.1453	31.88	0.2061	44.20	0.2640	69.00	0.3641
T/K	P/10 ⁵ Pa	Mole fraction of methane in liquid, x_{CH_4}																																																
277.59	17.34	0.0947																																																
	22.66	0.1234																																																
	28.27	0.1498																																																
	37.70	0.1923																																																
	52.19	0.2525																																																
	63.82	0.2901																																																
266.48	15.66	0.0920																																																
	21.45	0.1246																																																
	34.43	0.1928																																																
	46.28	0.2433																																																
	66.87	0.3185																																																
255.37	15.65	0.0982																																																
	22.02	0.1356																																																
	29.93	0.1783																																																
	41.69	0.2402																																																
	63.19	0.3248																																																
244.26	16.00	0.1103																																																
	21.19	0.1453																																																
	31.88	0.2061																																																
	44.20	0.2640																																																
	69.00	0.3641																																																
<p>AUXILIARY INFORMATION</p>																																																		
<p>METHOD/APPARATUS/PROCEDURE:</p> <p>Non-magnetic stainless steel equilibrium vessel, contents stirred with magnetically operated ball bearing. Pressure measured using dead weight piston gauge. Decane metered into a known amount of methane in cell. Pressure measured after equilibrium established. Details in source.</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <ol style="list-style-type: none"> <li data-bbox="676 1344 1205 1412">1. Dried, purity 99.7 mole per cent, 0.2 mole per cent nitrogen. <li data-bbox="676 1432 1205 1500">2. Phillips Petroleum sample, purity 99.35 mole per cent. <p>ESTIMATED ERROR: $\delta T/K = \pm 0.056$; $\delta P = \pm 0.1-0.15\%$; $\delta x_{\text{CH}_4} = \pm 2\%$ (estimated by compiler).</p>																																																	
	<p>REFERENCES:</p>																																																	

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. Methane; CH ₄ ; [74-82-8] 2. Decane; C ₁₀ H ₂₂ ; [124-18-5]		Beaudoin, J.M; Kohn, J.P. <i>J. Chem. Engng. Data</i> , <u>1967</u> , <i>12</i> , 189-191	
VARIABLES:		PREPARED BY:	
Temperature, pressure		C.L. Young	
EXPERIMENTAL VALUES:			
T/K	P/MPa	Mole fraction of methane in liquid, x_{CH_4}	in vapor, y_{CH_4}
423.15	1.01	0.0324	0.926
	2.03	0.0664	0.964
	3.04	0.0990	0.973
	4.05	0.1311	0.978
	5.07	0.1631	0.980
	6.08	0.1935	0.982
	7.09	0.2214	0.983
373.15	1.01	0.0372	0.988
	2.03	0.0735	0.994
	3.04	0.1080	0.996
	4.05	0.1417	0.996
	5.07	0.1730	0.997
	6.08	0.2022	0.996
	7.09	0.2298	0.996
	8.11	0.2542	0.996
	9.12	0.2766	0.996
	10.13	0.2989	0.996
348.15	1.01	0.0412	0.998
	2.03	0.0789	0.998
	3.04	0.1155	0.998
	4.05	0.1498	0.998
	5.07	0.1829	0.998
	6.08	0.2153	0.998
	7.09	0.2430	0.998
AUXILIARY INFORMATION			
METHOD / APPARATUS / PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
Borosilicate glass cell. Temperature measured with platinum resistance thermometer. Pressure measured on Bourdon gauge. Details in ref. (2). Samples of methane added to decane, equilibrated, vapor phase composition calculated assuming ideal gas behaviour liquid phase composition estimated from known overall composition and volumes of both phases.		1. Phillips Petroleum Co. sample, purified as in ref. (1).; final purity 99.5 mole per cent.	
		2. Phillips Petroleum Co. sample purity 99 mole per cent.	
		ESTIMATED ERROR: $\delta T/K = \pm 0.07$; $\delta P/MPa = \pm 0.01$; $\delta x_{CH_4}, \delta y_{CH_4} = \pm 0.0014$.	
		REFERENCES:	
		1. Kohn, J.P.; <i>J. Am. Inst. Chem. Engrs. J.</i> <u>1961</u> , <i>7</i> , 514. 2. Kohn, J.P. Kurata, F.; <i>Petrol Process.</i> , <u>1956</u> , <i>11</i> , 57.	

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. Methane; CH ₄ ; [74-82-8]		Beaudoin, J.M.; Kohn, J.P.	
2. Decane; C ₁₀ H ₂₂ ; [124-18-5]		<i>J. Chem. Engng. Data</i> , <u>1967</u> , 12, 189-191	
EXPERIMENTAL VALUES:			
T/K	P/MPa	Mole fraction of methane in liquid x_{CH_4}	Mole fraction of methane in vapor y_{CH_4}
348.15	8.11	0.2679	0.998
	9.12	0.2920	0.998
	10.13	0.3152	0.998
323.15	1.01	0.0450	-
	2.03	0.0867	-
	3.04	0.1259	-
	4.05	0.1622	-
	5.07	0.1968	-
	6.08	0.2291	-
	7.09	0.2569	-
	8.11	0.2822	-
	9.12	0.3082	-
	10.13	0.3344	-
298.15	1.01	0.0486	-
	2.03	0.0951	-
	3.04	0.1379	-
	4.05	0.1767	-
	5.07	0.2120	-
	6.08	0.2443	-
	7.09	0.2748	-
	8.11	0.3040	-
	9.12	0.3330	-
	10.13	0.3610	-
273.15	1.01	0.0560	-
	2.03	0.1086	-
	3.04	0.1553	-
	4.05	0.1991	-
	5.07	0.2388	-
	6.08	0.2763	-
	7.09	0.3120	-
	8.11	0.3443	-
	9.12	0.3741	-
	10.13	0.4040	-
248.15	1.01	0.0702	-
	2.03	0.1330	-
	3.04	0.1901	-
	4.05	0.2408	-
	5.07	0.2850	-
	6.08	0.3256	-
	7.09	0.3635	-
	8.11	0.4000	-
	9.12	0.4350	-
	10.13	0.4708	-

COMPONENTS:			ORIGINAL MEASUREMENTS:	
1. Methane; CH ₄ ; [74-82-8] 2. Decane; C ₁₀ H ₂₂ ; [124-18-5]			Lin, H-M.; Sebastian, H.M.; Simnick, J.J.; Chao, K-C. <i>J. Chem. Engng. Data</i> , <u>1979</u> , <i>24</i> , 146-9.	
VARIABLES:			PREPARED BY:	
Temperature, pressure			C. L. Young	
EXPERIMENTAL VALUES:				
T/K	p/atm.	p/MPa	Mole fraction of methane in liquid, x_{CH_4}	in gas, y_{CH_4}
423.2	30	3.04	0.1075	0.9738
	40	4.05	0.1375	0.9780
	50	5.07	0.1722	0.9801
	60	6.08	0.2035	0.9811
	70	7.09	0.2309	0.9819
511.0	27.2	2.76	0.0914	0.8029
	54.4	5.51	0.1866	0.8725
	85.1	8.62	0.2853	0.8912
	119.1	12.07	0.3855	0.8911
	153.1	15.51	0.4840	0.8737
	170.1	17.24	0.5430	0.8563
	184.4	18.68	0.5946	0.8318
542.8	30.10	3.050	0.0946	0.6795
	50.31	5.098	0.1706	0.7638
	100.05	10.138	0.3508	0.8051
	125.02	12.668	0.4440	0.7901
	149.45	15.143	0.6682	0.7116
AUXILIARY INFORMATION				
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:	
Flow apparatus with both liquid and gas components continually passing into a mixing tube and then into a cell in which phases separated under gravity. Liquid sample removed from bottom of cell and vapor sample from top of cell. Composition determined by gas chromatography. Details in source and ref. (1).			1. Matheson sample with purity better than 99 mole per cent. 2. Aldrich Chemical Co. sample purity better than 99 mole per cent.	
			ESTIMATED ERROR:	
			$\delta T/K = \pm 0.2$; $\delta p/MPa \leq \pm 0.03$; $\delta x_{CH_4}, \delta y_{CH_4} = \pm 2\%$.	
			REFERENCES:	
			1. Simnick, J.J.; Lawson, C.C.; Lin, H-M.; Chao, K-C.; <i>Am. Inst. Chem. Engrs. J.</i> , <u>1977</u> , <i>23</i> , 469.	

COMPONENTS:			ORIGINAL MEASUREMENTS:	
1. Methane; CH ₄ ; [74-82-8]			Lin, H.-M.; Sebastian, H. M.;	
2. Decane; C ₁₀ H ₂₂ ; [124-18-5]			Simmick, J. J.; Chao, K.-C.	
			<i>J. Chem. Engng. Data</i>	
			<u>1979, 24, 146-9.</u>	
T/K	p/atm.	p/MPa	Mole fraction of methane in liquid, x_{CH_4}	Mole fraction of methane in gas, y_{CH_4}
563.3	29.97	3.037	0.0911	0.5528
	50.04	5.070	0.1744	0.6690
	74.88	7.587	0.2744	0.7118
	99.65	10.097	0.3817	0.7055
	109.99	11.145	0.4399	0.6835
	114.62	11.614	0.4652	0.6604
583.1	30.24	3.064	0.0857	0.4133
	50.05	5.071	0.1794	0.5476
	70.25	7.118	0.2834	0.5749
	79.78	8.084	0.3481	0.5646
	85.23	8.636	0.4032	0.5177