

COMPONENTS:

1. Methane; CH₄; [74-82-8]
2. Hexane; C₆H₁₄; [110-54-3]

EVALUATOR:

Colin L. Young,
 School of Chemistry,
 University of Melbourne,
 Parkville, Victoria 3052,
 Australia.
 March 1982

EVALUATION:

The most extensive study of this system has been undertaken by Lin *et al.* (1). Their data cover the temperature range 182.5 K to 273.2 K and are classified as recommended.

The data of Frolich *et al.* (2) at 298.2 K are rejected on the grounds that the data were presented in graphical form and have been superseded by more recent data. Gunn *et al.* (3) studied the vapor composition in this system but used literature values for the coexisting liquid phase compositions. Chen *et al.* (4) also studied the dew point loci for the methane + hexane system at temperatures between 182.5 K and 273.2 K. The data in refs. (3) and (4) are not considered further.

The data of Boomer and Johnson (5) are classified as tentative. The methane in their work contained a significant proportion of nitrogen. Sage, Webster and Lacey (6) reported the solubility of methane in hexane at three temperatures, 37.78 °C (100 °F), 71.11 °C (160 °F) and 104.4 °C (220 °F), but only three compositions were studied. These data are classified as tentative but limited in scope.

The remaining three studies of Poston and McKetta (7), Shim and Kohn (8) and Schoch *et al.* (9) are all classified as tentative. There is reasonable agreement between the three sets of data. The data of Shim and Kohn (8) deviates slightly from the data of Lin *et al.* (1) in the temperature range where the two sets of data overlap, the deviations being greatest at the lowest temperature. The data of Lin *et al.* (1) are superior in this region.

References

1. Lin, Y. N.; Chen, R. J. J.; Chappellear, P. S.; Kobayashi, R. *J. Chem. Eng. Data*, 1977, *22*, 402.
2. Frolich, P. K.; Tauch, E. J.; Hogan, J. J.; Peer, A. A. *Ind. Eng. Chem.*, 1931, *23*, 548.
3. Gunn, R. D.; McKetta, J. J.; Ata, N. *Am. Inst. Chem. Engrs. J.*, 1974, *20*, 347.
4. Chen, R. J. J.; Chappellear, P. S.; Kobayashi, R. *J. Chem. Eng. Data*, 1976, *21*, 213.
5. Boomer, E. H.; Johnson, C. A. *Can. J. Res.*, 1938, *16B*, 328.
6. Sage, B. H.; Webster, D. C.; Lacey, W. N. *Ind. Eng. Chem.*, 1936, *28*, 1045.
7. Poston, R. S.; McKetta, J. J. *J. Chem. Eng. Data*, 1966, *11*, 362.
8. Shim, J.; Kohn, J. P. *J. Chem. Eng. Data*, 1972, *7*, 3.
9. Schoch, E. P.; Hoffmann, A. E.; Mayfield, F. D. *Ind. Eng. Chem.*, 1941, *33*, 688.

COMPONENTS:			ORIGINAL MEASUREMENTS:	
1. Methane; CH ₄ ; [74-82-8] 2. Hexane; C ₆ H ₁₄ ; [110-54-3]			Sage, B. H.; Webster, D. C.; Lacey, W. N. <i>Ind. Eng. Chem.</i> <u>1936</u> , 28, 1045-1047.	
VARIABLES:			PREPARED BY:	
			C. L. Young	
EXPERIMENTAL VALUES:				
T/K (T/°F)	p/psi	P/MPa [†]	Mass fraction of methane	Mole fraction [†] of methane, x_{CH_4}
310.9 (100)	655 1623 2412	4.52 11.19 16.63	0.0424 0.1233 0.1920	0.1920 0.4301 0.5605
344.3 (160)	739 1775 2528	5.10 12.24 17.43	0.0424 0.1233 0.1920	0.1920 0.4301 0.5605
377.6 (220)	795 1855 2508	5.48 12.79 17.29	0.0424 0.1233 0.1920	0.1920 0.4301 0.5605
† calculated by compiler.				
AUXILIARY INFORMATION				
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:	
PVT cell charged with mixture of known composition. Pressure measured with pressure balance. Bubble point determined from the discontinuity in the pressure, volume isotherm. Details of apparatus in ref. (1).			1. Prepared from natural gas, treated for removal of higher alkanes, carbon dioxide and water vapor. Final purity 99.9 mole per cent. 2. Eastman Kodak Co. sample, used without further purification.	
			ESTIMATED ERROR:	
			$\delta T/K = \pm 0.1$; $\delta P/MPa = \pm 0.02$; $\delta x_{CH_4} = \pm 0.002$ (estimated by compiler).	
			REFERENCES:	
			1. Sage, B. H.; Lacey, W. N. <i>Ind. Eng. Chem.</i> <u>1934</u> , 26, 103.	

COMPONENTS:		ORIGINAL MEASUREMENTS:
1. Methane; CH ₄ ; [74-82-8] 2. Hexane; C ₆ H ₁₄ ; [110-54-3]		Schoch, E.P.; Hoffmann, A.E.; Mayfield, F.D. <i>Ind. Eng. Chem.</i> <u>1941</u> , 33, 688-691.
VARIABLES:		PREPARED BY:
Temperature, pressure		C.L. Young
EXPERIMENTAL VALUES:		
T/K	$p/10^5\text{Pa}$	Mole fraction of methane in liquid, x_{CH_4}
311.08	42.7	0.1829
	52.2	0.2205
	75.01	0.3030
	94.73	0.3743
	117.7	0.4517
	139.7	0.5218
	156.7	0.5758
	175.8	0.6411
	189.2	0.6997
	194.8	0.7401
	198.0	0.8822
	344.26	40.6
59.1		0.2203
83.08		0.3037
104.3		0.3719
129.2		0.4491
150.7		0.5167
167.3		0.5716
184.2		0.6373
195.5		0.6987
197.7		0.7351
200.9		0.7653
377.59		46.4
	82.39	0.2875
AUXILIARY INFORMATION		
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
Rocking equilibrium cell fitted with stirring paddles. Temperature measured with Beckmann thermometer calibrated against standard Pt resistance thermometer. Pressure measured with Bourdon gauge. Samples injected into cell using mercury displacement. Equilibrium pressure measured. Bubble point determined from change in slope of pressure volume isotherms. Details in ref. (1).		1. Crude sample treated for removal of oxygen, carbon dioxide water vapor and liquids condensable at 200K. Distilled. 2. Eastman Kodak Co. sample.
		ESTIMATED ERROR:
		$\delta T/K = \pm 0.03$; $\delta p/10^5\text{Pa} = \pm 0.1$; $\delta x_{\text{CH}_4} = \pm 0.001$. (estimated by compiler)
		REFERENCES:
		1. Schoch, E.P., Hoffmann, A.E. Kasperik, A.S.; Lightfoot, J.H. Mayfield, F.D. <i>Ind. Eng. Chem.</i> <u>1940</u> , 32, 788.

COMPONENTS:

1. Methane; CH₄; [74-82-8]
2. Hexane; C₆H₁₄; [110-54-3]

ORIGINAL MEASUREMENTS:

Schoch, E.P.; Hoffmann, A.E.;
Mayfield, F.D.

Ind. Eng. Chem. 1941, 33, 688-691.

EXPERIMENTAL VALUES:

T/K	$p/10^5\text{Pa}$	Mole fraction of methane in liquid, x_{CH_4}
377.59	106.9	0.3662
	131.0	0.4407
	151.8	0.5180
	172.2	0.5964
	184.9	0.6805
	189.8	0.7549

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. Methane; CH ₄ ; [74-82-8] 2. Hexane; C ₆ H ₁₄ ; [110-54-3]		Shim, J.; Kohn, J.P. <i>J. Chem. Engng. Data</i> , <u>1962</u> , 7, 3-8	
VARIABLES:		PREPARED BY:	
Temperature, pressure		C.L. Young	
EXPERIMENTAL VALUES:			
T/K	P/MPa	Mole fraction of methane in liquid, x_{CH_4}	in gas, y_{CH_4}
183.15	0.51	0.0920	-
	1.01	0.1820	-
	1.52	0.2740	-
	2.03	0.3668	-
	2.53	0.4550	-
	3.04	0.5675	-
	3.55	0.7120	-
	3.634	1.0000	-
198.15	0.51	0.0630	-
	1.01	0.1240	-
	1.52	0.1844	-
	2.03	0.2405	-
	2.53	0.2930	-
	3.04	0.3480	-
	3.55	0.3970	-
	4.05	0.4455	-
	4.56	0.4953	-
	5.07	0.5610	-
	5.57	0.6225	-
	6.08	0.6870	-
223.15	1.01	0.0880	-
	2.03	0.1705	-
	3.04	0.2473	-
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. (1) and source ref. Samples of methane added to hexane, equilibrated. Liquid phase composition estimated from known overall composition and volume of both phases.		1. Phillips Petroleum Co. sample, pure grade purified by passing through silica gell and activated charcoal. Final purity better than 99.5 mole per cent.	
		2. Phillips Petroleum Co. sample purity 99 mole per cent.	
		ESTIMATED ERROR:	
		$\delta T/K = \pm 0.07$; $\delta P/MPa = \pm 0.01$; $\delta x_{CH_4}, \delta y_{CH_4} = \pm 0.10$;	
		REFERENCES:	
		1. Kohn, J.P.; Kurata, F.; <i>Petrol Process</i> , <u>1956</u> , 11, 57.	

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1.	Methane; CH ₄ ; [74-82-8]	Shim, J.; Kohn, J.P.	
2.	Hexane; C ₆ H ₁₄ ; [110-54-3]	<i>J. Chem. Engng. Data</i> , <u>1962</u> , 7, 3-8	
EXPERIMENTAL VALUES:			
T/K	P/MPa	Mole fraction of methane in liquid, x_{CH_4}	Mole fraction of methane in gas y_{CH_4}
223.15	4.05	0.3197	-
	5.07	0.3865	-
	6.08	0.4560	-
	7.09	0.5225	-
	8.11	0.5880	-
248.15	1.01	0.0695	-
	2.03	0.1366	-
	3.04	0.1995	-
	4.05	0.2570	-
	5.07	0.3120	-
	6.08	0.3643	-
	7.09	0.4140	-
	8.11	0.4660	-
	9.12	0.5245	-
	10.13	0.5825	-
273.15	1.01	0.0560	-
	2.03	0.1108	-
	3.04	0.1637	-
	4.05	0.2135	-
	5.07	0.2590	-
	6.08	0.3045	-
	7.09	0.3493	-
	8.11	0.3910	-
	9.12	0.4300	-
	10.13	0.4720	-
298.15	1.01	0.0490	0.9530
	2.03	0.0978	0.9728
	3.04	0.1450	0.9795
	4.05	0.1890	0.9830
	5.07	0.2316	0.9850
	6.08	0.2710	0.9863
	7.09	0.3090	0.9871
	8.11	0.3447	0.9868
	9.12	0.3810	0.9854
	10.13	0.4125	0.9833
	12.16	0.4740	-
	14.19	0.5370	-
	16.21	0.6090	-
323.15	1.01	0.0422	0.9021
	2.03	0.0860	0.9465
	3.04	0.1290	0.9614
	4.05	0.1690	0.9680
	5.07	0.2080	0.9719
	6.08	0.2458	0.9747
	7.09	0.2820	0.9765
	8.11	0.3186	0.9770
	9.12	0.3540	0.9768
	10.13	0.3850	0.9751
	12.16	0.4475	-
	14.19	0.5070	-
	16.21	0.5720	-
348.15	1.01	0.0364	0.8460
	2.03	0.0767	0.9028
	3.04	0.1165	0.9267
	4.05	0.1543	0.9385
	5.07	0.1920	0.9457
	6.08	0.2280	0.9492

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. Methane; CH ₄ ; [74-82-8]		Shim, J.; Kohn, J.P.	
2. Hexane; C ₆ H ₁₄ ; [110-54-3]		J. Chem. Engng. Data, <u>1962</u> , 7, 3-8.	
EXPERIMENTAL VALUES:			
T/K	P/MPa	Mole fraction of methane in liquid, x_{CH_4}	Mole fraction of methane in gas, y_{CH_4}
348.15	7.09	0.2625	0.9524
	8.11	0.2963	0.9555
	9.12	0.3295	0.9580
	10.13	0.3600	0.9605
	12.16	0.4192	-
	14.19	0.4830	-
	16.21	0.5530	-
373.15	1.01	0.0300	0.7875
	2.03	0.0688	0.8316
	3.04	0.1065	0.8760
	4.05	0.1440	0.8970
	5.07	0.1810	0.9082
	6.08	0.2160	0.9158
	7.09	0.2490	0.9224
	8.11	0.2807	0.9280
	9.12	0.3135	0.9321
	10.13	0.3434	0.9340
	12.16	0.4033	-
	14.19	0.4700	-
	16.21	0.5560	-
423.15	1.01	0.0110	0.4420
	2.03	0.0464	0.5625
	3.04	0.0826	0.6695
	4.05	0.1187	0.7220
	5.07	0.1553	0.7520
	6.08	0.1915	0.7675
	7.09	0.2278	0.7780
	8.11	0.2645	0.780
	9.12	0.3040	0.760
	10.13	0.3440	0.738

EXPERIMENTAL VALUES:			Mole fraction of methane		
T/K	P/atm	P/MPa	in liquid, x_{CH_4}	in vapor, y_{CH_4}	
310.93	34.01	3.446	0.153	0.969	
	68.03	6.893	0.286	0.980	
	102.04	10.339	0.404	0.979	
	136.05	13.785	0.511	0.970	
	170.07	17.232	0.638	0.969	
	183.67	18.610	0.694	0.970	
	188.10	19.059	0.715	0.968	
	193.54	19.610	0.756	0.964	
	192.18	19.473	0.740	0.962	
	195.24	19.783	0.764	0.957	
	197.41	20.003	Critical point		
	344.26	34.01	3.446	0.135	0.937
		68.03	6.893	0.258	0.953
102.04		10.339	0.371	0.962	
136.05		13.785	0.485	0.946	
170.07		17.232	0.594	0.928	
183.67		18.610	0.668	0.913	
187.07		18.955	0.701	0.911	
190.14		19.266	0.703	0.885	
191.63		19.417	Critical point		
(cont.)					
AUXILIARY INFORMATION					
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:		
<p>Stainless steel glass windowed cell. Vapor recycled using high pressure magnetic pump. Pressure measured using Bourdon gauge and temperature measured using thermocouples. Samples of both phases withdrawn at constant pressure and analysed by gas chromatography. Details of apparatus in source and ref. (1).</p>			<p>1. Phillips Petroleum Co. sample, purity better than 99.9 mole per cent.</p> <p>2. Phillips Petroleum Co. sample, purity better than 99.9 mole per cent.</p>		
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1$; $\delta P/MPa = \pm 0.014$; $\delta x_{CH_4}, \delta y_{CH_4} = \pm 0.002$.		
REFERENCES:			REFERENCES:		
			<p>1. Roberts, L. R.; Azarnoosh, A.; Wong, R.; McKetta, J. J. <i>J. Chem. Eng. Data</i> <u>1962</u>, <u>7</u>, 484.</p>		

COMPONENTS:

1. Methane; CH₄; [74-82-8]

2. Hexane; C₆H₁₄; [110-54-3]

ORIGINAL MEASUREMENTS:

Poston, R. S.; McKetta, J. J.
J. Chem. Eng. Data
1966, 11, 362-3.

VARIABLES:

Temperature, pressure

PREPARED BY:

C. L. Young

COMPONENTS:			ORIGINAL MEASUREMENTS:	
1. Methane; CH ₄ ; [74-82-8]			Poston, R. S.; Mcketta, J. J.	
2. Hexane; C ₆ H ₁₄ ; [110-54-3]			<i>J. Chem. Eng. Data</i> 1966, 11, 362-3.	
EXPERIMENTAL VALUES:				
T/K	P/atm	P/MPa	Mole fraction of methane in liquid, x_{CH_4}	in vapor, y_{CH_4}
377.55	34.01	3.446	0.119	0.871
	68.03	6.893	0.240	0.911
	102.04	10.339	0.351	0.908
	136.05	13.785	0.477	0.895
	170.07	17.232	0.604	0.861
	172.79	17.508	0.618	0.822
	175.51	17.784	0.650	0.817
	177.89	18.025	0.675	0.784
	178.37	18.073	Critical point	
	410.95	34.01	3.446	0.103
68.03		6.893	0.223	0.811
102.04		10.339	0.345	0.830
136.05		13.785	0.477	0.803
144.90		14.682	0.528	0.768
148.30		15.026	0.556	0.751
151.16		15.316	0.598	0.725
152.86		15.489	Critical point	
444.25	24.76	2.509	0.025	0.438
	34.01	3.446	0.079	0.522
	68.03	6.893	0.208	0.654
	102.04	10.339	0.363	0.660
	107.14	10.856	0.388	0.658
	111.09	11.256	0.422	0.641
	114.76	11.628	Critical point	

COMPONENTS: 1. Methane; CH ₄ ; [74-82-8] 2. Hexane; C ₆ H ₁₄ ; [110-54-3]		ORIGINAL MEASUREMENTS: Lin, Y-N; Chen, R.J.J.; Chappellear, P.S.; Kobayashi, R. <i>J. Chem. Engng. Data</i> , <u>1977</u> , <u>22</u> , 402-8.	
VARIABLES: Temperature, pressure		PREPARED BY: C.L. Young	
EXPERIMENTAL VALUES:			
T/K	P/MPa	Mole fraction of methane in liquid x_{CH_4}	Mole fraction of methane in vapor y_{CH_4}
273.16	0.1731	0.0097	0.9643
	0.3454	0.0196	0.9815
	0.6902	0.0387	0.9898
	1.0349	0.0567	0.99266
	1.3796	0.0744	0.99396
	2.0691	0.1116	0.99528
	2.7586	0.1469	0.99566
	4.1368	0.2127	0.99578
	5.5158	0.2742	0.99549
	6.8947	0.3328	0.99465
	8.2737	0.3886	0.99343
	9.6526	0.4435	0.99166
	11.032	0.4924	0.9891
	12.410	0.5400	0.9849
	13.789	0.5933	0.9797
	15.168	0.6401	0.9692
	15.857	0.6564	-
	16.547	0.6949	0.9565
	17.237	0.7195	-
	17.582	0.7462	0.9400
	17.926	0.7758	0.9366
	18.271	0.8025	0.9348
	18.443 (a)	0.9290	0.9290
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE: Recirculating vapor flow apparatus. Temperature measured with platinum resistance thermometer. Pressure measured with Bourdon gauge. Liquid sample added to windowed cell, air removed. Methane added to cell and recirculated for at least 1/2 hour. Samples analysed by gas chromatography.		SOURCE AND PURITY OF MATERIALS: 1. Ultra-high purity sample from Union Carbide Chemicals Corp. purity 99.97 mole per cent. 2. Research grade sample from Phillips Petroleum Co. Purity 99.99 mole per cent.	
		ESTIMATED ERROR: $\delta T/K = \pm 0.2$; $\delta P/MPa = \pm 0.007$; $\delta x_{\text{max}} = \pm 2\%$ or 0.005 (whichever is greater); $(1-\delta y)_{\text{max}} = \pm 2\%$. See source for fuller details of errors.	
		REFERENCES: 1. Elliot, D.G.; Chen, R.J.J.; Chappellear, P.S.; Kobayashi, R., <i>J. Chem. Engng. Data</i> . <u>1974</u> , <u>19</u> , 71.	

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. Methane; CH ₄ ; [74-82-8]		Lin, Y-N; Chen, R.J.J.;	
2. Hexane; C ₆ H ₁₄ ; [110-54-4]		Chappelear, P.S.; Kobayashi, R.	
		<i>J. Chem. Engng. Data.</i> <u>1977</u> , <i>22</i> , 402-8.	
EXPERIMENTAL VALUES:			
T/K	P/MPa	Mole fraction of methane, in liquid, in vapor	
		x_{CH_4}	y_{CH_4}
248.14	0.13858	0.009486	0.98990
	0.17306	0.01152	0.99179
	0.34543	0.02320	0.99557
	0.69016	0.04638	0.99757
	1.0349	0.06884	0.99817
	1.3796	0.08998	0.99847
	2.0691	0.1340	0.99872
	2.7586	0.1819	0.99879
	4.1368	0.2595	0.99863
	5.5158	0.3347	0.99820
	6.8947	0.3998	0.99759
	8.2737	0.4672	0.99632
	9.6526	0.5252	0.99416
	11.032	0.5804	0.99052
	11.721	0.6123	0.9889
	12.410	0.6382	0.9844
	13.789	0.6937	0.9752
15.168	0.7601	0.9644	
15.858	0.8191	0.9593	
16.113 (a)	0.9564	0.9564	
223.15	0.13927	0.01415	0.99841
	0.17375	0.01710	0.99872
	0.34612	0.03370	0.999343
	0.69085	0.06372	0.999632
	1.0356	0.09213	0.999713
	1.3803	0.1218	0.999757
	2.0698	0.1771	0.999775
	2.7593	0.2394	0.999795
	4.1368	0.3282	0.999594
	5.5158	0.4207	0.999256
	6.8947	0.4952	0.99851
	8.2737	0.5893	0.99613
	9.6526	0.6518	0.99013
	10.342	0.7011	0.9871
	11.032	0.7423	0.9841
	11.721	0.7774	0.9816
	12.066	0.8022	-
12.238	0.8189	-	
12.342	0.8444	-	
12.410	0.8522	-	
12.431	0.8922	-	
12.438 (a)	0.9784	0.9784	
210.15	0.13927	0.01563	0.999495
	0.17375	0.01867	0.999589
	0.34612	0.03782	0.999781
	0.69085	0.07307	0.999868
	1.0356	0.1079	0.999888
	1.3803	0.1411	0.999903
	2.0698	0.2071	0.999894
	2.7593	0.2700	0.999878
	4.1368	0.3881	0.999798
	5.5158	0.5139	0.999402
	6.8947	0.6162	0.99730
	8.2737	0.7156	0.99177
	8.9631	0.7575	-
	9.6526	0.8091	0.9882
	9.7905	0.8279	-
	9.8939	0.8568	-
	9.9284	0.8713	-

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. Methane; CH ₄ ; [74-82-8]		Lin, Y-N.; Chen, R.J.J.;	
2. Hexane; C ₆ H ₁₄ ; [110-54-3]		Chappellear, P.S.; Kobayashi, R.	
		<i>J. Chem. Engng. Data.</i> <u>1977</u> , 22, 402-8.	
EXPERIMENTAL VALUES:			
T/K	P/MPa	Mole fraction of methane in liquid, x_{CH_4}	Mole fraction of methane in vapor, y_{CH_4}
210.15	9.9491	0.9872	0.9872
198.05	0.13721	0.01950	0.999848
	0.17237	0.02438	0.999885
	0.34474	0.04742	0.999927
	0.68947	0.09603	0.999949
	1.0342	0.1390	0.999955
	1.3789	0.1813	0.999952
	2.0684	0.2660	0.999939
	2.7579	0.3412	0.999919
	3.4474	0.4225	0.999893
	4.1368	0.5076	0.999832
	4.8263	0.5936	0.999640
	5.5158	0.6872	0.99789
	6.2053	0.7596	0.99572
	6.8947	0.8117	0.99435
	7.2395	0.8468	-
7.2739	0.8932	-	
7.2877 (a)	0.99364	0.99364	
195.91	0.13789	0.02082	-
	0.34474	0.04831	-
	0.68947	0.09528	-
	1.0342	0.1407	-
	1.3789	0.1849	-
	2.0684	0.2698	-
	2.7579	0.3555	-
	3.4474	0.4429	-
	4.1368	0.5323	-
	4.8263	0.6422	-
5.2055 (b)	0.7177	0.99763	
193.15	0.13858	0.02210	0.999905
	0.17306	0.02728	0.999932
	0.69016	0.09964	0.999964
	2.0691	0.2851	0.999970
	3.4474	0.4697	0.999932
	4.1368	0.5802	0.999830
	4.6539	0.6902	0.999567
	4.7712 (b)	0.7239	0.999393
	4.7712 (b)	0.9864 (L ₁)	0.999393
4.8263	0.9914 (L ₁)	0.99898	
4.8815 (a)	0.9988 (L ₁)	0.99882	
190.50	0.13789	0.02256	0.999924
	0.17237	0.02803	0.999960
	0.68947	0.1047	0.999970
	2.0684	0.3004	0.999988
	3.4446	0.5041	0.999907
	4.1368	0.6487	0.999814
	4.3988 (b)	0.7438	0.999611
	4.3788 (b)	0.9695 (L ₁)	0.999611
	4.4471 (b)	0.9724 (L ₁)	0.999577
	4.4816	0.9745 (L ₁)	0.999587
	4.5161	0.9897 (L ₁)	0.999609
	4.5505	0.9919 (L ₁)	0.999687
	4.5850 (a)	0.999847 (L ₁)	0.999847
	186.23	0.34474	0.06129
0.68947		0.1189	-
1.0342		0.1813	-

COMPONENTS:		ORIGINAL MEASUREMENTS:		
1. Methane; CH ₄ ; [74-82-8]		Lin, Y-N.; Chen, R.J.J.;		
2. Hexane; C ₆ H ₁₄ ; [110-54-3]		Chappelear, P.S.; Kobayashi, R.		
		<i>J. Chem. Engng. Data.</i> <u>1977</u> , <i>22</i> , 402-8.		
EXPERIMENTAL VALUES:				
T/K	P/MPa	Mole fraction of methane in liquid, x_{CH_4}	Mole fraction of methane in vapor, y_{CH_4}	
186.23	1.3789	0.2357	-	
	2.0684	0.3412	-	
	2.7579	0.4593	-	
	3.4474	0.6010	-	
	3.7232	0.6826	-	
	3.8541 (b)	0.8057	0.999837	
	3.8541 (b)	0.9505 (L ₁)	0.999837	
	3.9576	0.9776 (L ₁)	-	
	3.9920	0.9871 (L ₁)	-	
	182.46	0.13789	0.02768	-
0.17237		0.03463	-	
0.34474		0.06623	-	
0.68947		0.1308	-	
1.0342		0.1907	-	
1.3789		0.2560	-	
2.0684		0.3822	-	
2.7579		0.5178	-	
3.1026		0.6100	-	
3.3095		0.7426	-	
3.4149		0.9286	0.999946	
3.5163		0.9640 (L ₁)	-	
3.5508		0.9876 (L ₁)	-	
(a)		critical pressure.		
(b)		pressure at which liquid-liquid-gas equilibrium exists.		
(L ₁)	light liquid in equilibrium with vapor.			

COMPONENTS:			ORIGINAL MEASUREMENTS:		
1. Methane; CH ₄ ; [74-82-8]			Merrill, R. C.; Luks, K. D.;		
2. Hexane; C ₆ H ₁₄ ; [110-54-3]			Kohn, J. P.		
			<i>J. Chem. Eng. Data</i>		
			1983, 28, 210-215.		
VARIABLES:			PREPARED BY:		
			C. L. Young		
EXPERIMENTAL VALUES:					
Phases in equilibrium	T/K	P/atm	P/MPa	Mole fraction of a,b methane, x_{CH_4} in L ₁ in L ₂	
L ₁ ,L ₂ ≡ V	195.72	51.33	5.201	0.7677	0.9833
L ₁ ,L ₂ ,V	194.00	48.67	4.931	0.7475	0.9821
	192.00	45.81	4.642	0.7542	0.9714
	190.00	43.08	4.365	0.7698	0.9647
	188.00	40.51	4.105	0.7855	0.9566
	186.00	37.98	3.848	0.8018	0.9434
	184.00	35.61	3.608	0.8159	--
L ₁ ≡ L ₂ ,V	182.73	34.05	3.450	0.8521	0.8521
<p>^a Each point given is the average of several data points.</p> <p>^b The original article gave the mole fraction of hexane.</p>					
AUXILIARY INFORMATION					
METHOD APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:		
Glass equilibrium cell. Temperature measured with platinum resistance thermometer and pressure with Bourdon gauge. Stoichiometry and volumetric measurements were used to obtain liquid phase compositions and molar volumes. Gas phase assumed to be pure methane. Molar volume data in source. Details of apparatus in ref. (1).			1. Linde, Ultra Pure grade sample, purity 99.97 moles per cent.		
			2. Humphrey Chemical Co. sample, purity 99 moles per cent.		
			ESTIMATED ERROR: $\delta T/K = \pm 0.03$; $\delta P/MPa = \pm 0.007$; $\delta x/x$ (hexane) = ± 0.006 .		
			REFERENCES:		
			1. Hottovy, J. D.; Kohn, J. P.; Luks, K. D. <i>J. Chem. Eng. Data</i> 1981, 26, 135.		

COMPONENTS:			ORIGINAL MEASUREMENTS:					
1. Methane; CH ₄ ; [74-82-8] 2. Nitrogen; N ₂ ; [7727-37-9] 3. Hexane; C ₆ H ₁₄ ; [110-54-3]			Boomer, E. H.; Johnson, C. A. <i>Can. J. Res. B</i> <u>1938</u> , 16, 328-335.					
VARIABLES:			PREPARED BY:					
Temperature, pressure			C. L. Young					
EXPERIMENTAL VALUES:								
T/K	P/atm	P/MPa	Mole fractions					
			in liquid			in vapor		
			x _{CH₄}	x _{N₂}	x _{C₆H₁₄}	y _{CH₄}	y _{N₂}	y _{C₆H₁₄}
298.15	1	0.1	-	-	-	0.804	-	0.196
	36.2	3.67	0.159	0.002	0.839	0.897	0.070	0.033
			0.162	0.003	0.835	0.920	0.054	0.026
	68.4	6.93	0.278	0.009	0.713	0.934	0.048	0.018
	101.7	10.30	0.392	0.012	0.596	0.909	0.070	0.021
			0.390	0.013	0.597	0.916	0.063	0.021
	134.7	13.65	0.485	0.021	0.494	0.888	0.082	0.030
	167.9	17.01	0.578	0.030	0.392	0.883	0.071	0.046
			0.583	0.027	0.390	0.896	0.057	0.047
	202.0	20.47	0.690	0.031	0.279	0.844	0.075	0.081
			0.689	0.037	0.274	0.838	0.080	0.082
	208.2	21.10	0.734	0.029	0.237	0.838	0.057	0.105
			0.726	0.038	0.236	0.833	0.063	0.104
	229.3	23.23	0.771	0.049	0.180	0.779	0.046	0.175
328.15	1	0.1	-	-	-	0.3685	-	0.6315
	36.2	3.67	0.142	0.003	0.855	0.873	0.078	0.049
	101.7	10.30	0.355	0.017	0.628	0.899	0.067	0.034
	167.9	17.01	0.553	0.026	0.421	0.882	0.060	0.057
	202.0	20.47	0.662	0.035	0.303	0.827	0.064	0.109
			0.654	0.040	0.306	0.828	0.063	0.109
	208.2	21.10	0.710	0.041	0.249	0.808	0.046	0.146
			0.715	0.035	0.250	0.808	0.047	0.145
	219.1	22.20	0.768	0.043	0.189	0.768	0.046	0.186
AUXILIARY INFORMATION								
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:					
Rocking autoclave stirred by steel piston falling under gravity. Samples of vapor and liquid trapped in two auxiliary high pressure cells. Equilibrium samples analysed in complicated volumetric and combustion apparatus. Details in ref. (1).			1. and 2. Natural gas sample containing 94.4 mole per cent of methane and 5.6 mole per cent of nitrogen. Impurities may have been present amounting to 0.1 mole per cent. 3. Synthesized from propyl bromide; product fractionated.					
NOTE: The source reference also contains data on a mixture of hexanes + methane + nitrogen. Since the isomeric composition of the hexane mixture is not known, the data have not been included here.			ESTIMATED ERROR: δT/K = ±0.1; δP/MPa = ±0.02; δx, δy = ±1% (estimated by compiler).					
			REFERENCES: 1. Boomer, E. H.; Johnson, C. A.; Argue, G. H. <i>Can. J. Res. B</i> <u>1937</u> , 15, 367.					

COMPONENTS:			ORIGINAL MEASUREMENTS:							
1. Methane; CH ₄ ;	[74-82-8]		Boomer, E. H.; Johnson, C. A.							
2. Nitrogen; N ₂ ;	[7727-37-9]		<i>Can. J. Res. B</i>							
3. Hexane; C ₆ H ₁₄ ;	[110-54-3]		<u>1938</u> , 16, 328-335.							
EXPERIMENTAL VALUES:										
T/K	P/atm	P/MPa	in liquid			Mole fractions			in vapor	
			x _{CH₄}	x _{N₂}	x _{C₆H₁₄}	y _{CH₄}	y _{N₂}	y _{C₆H₁₄}		
358.15	35.5	3.60	0.126	0.003	0.871	0.829	0.058	0.113		
	101.4	10.27	0.333	0.016	0.651	0.893	0.047	0.060		
	167.6	16.98	0.537	0.020	0.443	0.850	0.052	0.098		
	187.9	19.04	0.611	0.037	0.352	0.801	0.060	0.139		
			0.603	0.033	0.364	0.807	0.058	0.135		
	201.0	20.37	0.714	0.036	0.250	0.703	0.047	0.250		

COMPONENTS:			ORIGINAL MEASUREMENTS:	
1. Methane; CH ₄ ; [74-82-8] 2. 3-Methylpentane; C ₆ H ₁₄ ; [96-14-0]			Kohn, J. P.; Haggin, J. H. S. <i>J. Chem. Engng. Data</i> 1967, 12, 313-5.	
VARIABLES:			PREPARED BY:	
			C. L. Young	
EXPERIMENTAL VALUES:				
T/K	p/atm	p/MPa	Mole fractions	
			in liquid, x_{CH_4}	in vapor, y_{CH_4}
298.15	0.2225	0.02254	0.000	0.000
	5	0.51	0.0234	-
	10	1.01	0.0480	0.9510
	15	1.52	0.0726	0.9639
	20	2.03	0.0965	0.9712
	25	2.53	0.1202	0.9758
323.15	0.646	0.655	0.1440	0.9787
	5	0.51	0.000	0.000
	10	1.01	0.0191	-
	15	1.52	0.0411	0.9001
	20	2.03	0.0630	0.9277
	25	2.53	0.0847	0.9451
348.15	0.646	0.655	0.1061	0.9552
	5	0.51	0.1273	0.9602
	10	1.01	0.000	0.000
	15	1.52	0.0149	-
	20	2.03	0.0357	0.8410
	25	2.53	0.0559	0.8760
			0.0757	0.8984
			0.0949	0.9132
			0.1142	0.9233
(cont.)				
AUXILIARY INFORMATION				
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:	
Borosilicate glass static equilibrium cell. Temperature measured with platinum resistance thermometer. Pressure measured with dead weight gauge. Samples of methane added to 3-methylpentane. Liquid phase composition estimated from known overall composition and volume of both phases. Dew point composition determined using similar procedure but with a cell fitted with a capillary tube at lower end so very small amounts of liquid could be measured.			1. Phillips Petroleum Co. sample, purity 99 mole per cent. Purified by passage over silica gel and activated carbon. Final purity about 99.5 mole per cent.	
			2. Phillips Petroleum Co. sample. Degassed. Purity at least 99 mole per cent.	
			ESTIMATED ERROR:	
			$\delta T/K = \pm 0.02$; $\delta P/MPa = \pm 0.006$; $\delta x_{\text{CH}_4} = \pm 0.001$; $\delta y_{\text{CH}_4} = \pm 0.002$.	
			REFERENCES:	

COMPONENTS:

1. Methane; CH_4 ; [74-82-8]
2. 3-Methylpentane; C_6H_{14} ; [96-14-0]

ORIGINAL MEASUREMENTS:

Kohn, J. P.; Haggin, J. H. S.
J. Chem. Engng. Data
1967, 12, 313-5.

EXPERIMENTAL VALUES:

T/K	p/atm	p/MPa	Mole fractions	
			in liquid x_{CH_4}	in vapor, y_{CH_4}
373.15	2.786	0.2823	0.000	0.000
	5	0.51	0.0089	-
	10	1.01	0.0297	0.7292
	15	1.52	0.0480	0.7810
	20	2.03	0.0669	0.8190
	25	2.53	0.0860	0.8460
	30	3.04	0.1049	0.8655