COMPONENTS:	EVALUATOR:
1. Methane; CH_4; [74-82-8]	Colin L. Young, School of Chemistry, University of Melbourne, Parkville, Victoria 3052, Australia.
2. Propane; C_3H_8; [74-98-6]	February 1984

EVALUATION:

The most extensive study on this system is due to Wichterle and Kobayashi (1) who studied the system at temperatures from 130 K to 214 K. This work extended earlier work by Price and Kobayashi (2) who studied this system in the temperature range 144 K to 278 K. The data of Price and Kobayashi (2) at 213.7 K and at lower temperatures are less accurate than those of Wichterle and Kobayashi (1). The data of Sage and coworkers (3), (4) cover the temperature range 277 K to 363 K. Their data are only of moderate accuracy due to the techniques available at that time. The data of Akers, Burns and Fairchild (5) are also only of moderate accuracy and cover the temperature range 158 K to 273 K. The data of Poon and Lu (6) are thought to be of fairly high accuracy.

The data of Wichterle and Kobayashi (1) and Poon and Lu (8) are classified as recommended, whereas those of Price and Kobayashi (2) and Sage and coworkers (3), (4) are of lower accuracy. The data of Akers, Burns and Fairchild (5) are superseded by the more recent and more accurate data of Wichterle and Kobayashi (1).

The limited data of Cheung and Wang (7) are restricted to pressures below 2 atmospheres and are classified as tentative. The four measurements by Kalra and Robinson (8) were determined to test the reliability of their apparatus and agree well with the data tiven in ref. (1) at 213.7 K. The data of Frolich *et al.* (9) at 298 K which were presented in graphical form are rejected.

References

1. Wichterle, I.; Kobayashi, R. *J. Chem. Eng. Data*, 1972, *17*, 4.

2. Price, R. A.; Kobayashi, R. *J. Chem. Eng. Data*, 1959, *4*, 40.

3. Sage, B. H.; Lacey, W. N.; Schassfma, J. G. *Ind. Eng. Chem.*, 1934, *26*, 214.

4. Reamer, H. H.; Sage, B. H.; Lacey, W. N. *Ind. Eng. Chem.*, 1950, *42*, 534.

5. Akers. W. W.; Burns, J. F.; Fairchild, W. R. *Ind. Eng. Chem.*, 1954, *46*, 2531.

6. Poon, D. P. L.; Lu, B. C.-Y. *Adv. Cryog. Eng.*, 1973, *19*, 292.

7. Cheung, H.; Wang, D. I. J. *Ind. Eng. Chem. Fundam.*, 1964, *3*, 355.

8. Kalra, H.; Robinson, D. B. *Cryogenics*, 1975, *15*, 409.

9. Frolich, P. K.; Tauch, E. J.; Hogan, J. J.; Peer, A. A. *Ind. Eng. Chem.*, 1931, *23*, 548.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8] 2. Propane; C_3H_8; [74-98-6]	Frolich, P.K.; Tauch, E.J.; Hogan, J.J.; Peer, A.A. *Ind. Eng. Chem.* 1931, *23*, 548-550.
VARIABLES: Pressure	PREPARED BY: C.L. Young

EXPERIMENTAL VALUES:

T/K	P/MPa	Solubility*, S	Mole fraction of methane in liquid,+ x_{CH_4}
298.15	1.0	19.4	0.0660
	2.0	38.7	0.124
	3.0	58.1	0.175
	4.0	80.4	0.227
	5.0	102	0.271
	6.0	124	0.311
	7.0	146	0.347
	8.0	168.5	0.380
	9.07	208	0.431

* Data taken from graph in original article.

\+ calculated by compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Static equilibrium cell. Liquid saturated with gas and after equilibrium established samples removed and analysed by volumetric method. Allowance was made for vapor pressure of liquid and the solubility of the gas at atmospheric pressure. Details in source.	Stated that the materials were the highest purity available.
	ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta x_{CH_4} = \pm 5\%$
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8] 2. Propane; C_3H_8; [74-98-6]	Sage, B. H.; Lacey, W. N.; Schaafsma, J. G. *Ind. Eng. Chem.* 1934, *26*, 214-217.
VARIABLES: Temperature, pressure	PREPARED BY: C. L. Young

EXPERIMENTAL VALUES:

T/K	$P/10^5$Pa	Mole fraction of methane in liquid, x_{CH_4}	in vapor, y_{CH_4}
293.15	10.1	0.008	0.132
	15.2	-	0.386
	20.3	0.062	0.505
	25.4	-	0.575
	30.4	0.116	0.619
	35.5	-	0.654
	40.5	0.176	0.681
	45.6	-	0.701
	50.7	0.236	0.714
	60.8	0.298	0.728
	70.9	0.363	0.736
	81.1	0.436	0.734
	91.19	0.524	0.714
	96.26	0.583	0.690
313.15	15.2	0.007	0.079
	20.3	0.035	0.273
	25.4	-	0.379
	30.4	0.092	0.451
	35.5	-	0.503
	40.5	0.149	0.543
	45.6	-	0.571
	50.7	0.208	0.592
	55.7	-	0.606
	60.8	0.260	0.615

(cont.)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
PVT cell charged with mixture of known composition. Dew point or bubble point determined from PVT data and vapor-liquid equilibrium data obtained by graphical means. Pressure measured with pressure balance and temperature measured with a copper-constantan thermocouple. Details in source and ref. (1).	1. Prepared from natural gas, carbon dioxide, water and hydrocarbons removed. Distilled. Final purity 99.47 mole per cent; major impurities, nitrogen (0.5 mole per cent) and ethane and higher hydrocarbons (0.03 mole per cent). 2. Phillips Petroleum Co. sample.
	ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta P/MPa = \pm 0.01$; δx_{CH_4}, $\delta y_{CH_4} = \pm 0.001$.
	REFERENCES: 1. Sage, B. H.; Lacey, W. N. *Ind. Eng. Chem.* 1934, *26*, 103.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8]	Sage, B. H.; Lacey, W. N.; Schaafsma, J. G.
2. Propane; C_3H_8; [74-98-6]	*Ind. Eng. Chem.* 1934, *26*, 214-217.

EXPERIMENTAL VALUES:

T/K	$P/10^5$Pa	Mole fraction of methane in liquid, x_{CH_4}	in vapor, y_{CH_4}
313.15	70.9	0.329	0.622
	81.1	0.395	0.621
	86.1	0.439	0.614
	91.2	0.506	0.593
328.15	20.3	0.005	0.037
	25.4	-	0.196
	30.4	0.055	0.292
	35.5	-	0.355
	40.5	0.108	0.401
	45.6	-	0.439
	50.7	0.167	0.470
	60.8	0.228	0.511
	70.9	0.292	0.524
	76.0	0.326	0.521
	81.1	0.375	0.501
343.15	30.4	0.021	0.103
	35.5	-	0.189
	40.5	0.074	0.252
	45.6	-	0.299
	50.7	0.130	0.336
	60.8	0.199	0.388
	65.9	0.241	0.392
353.15	35.5	0.020	0.085
	40.5	0.046	0.149
	45.6	-	0.202
	50.7	0.106	0.243
	55.7	0.028	0.274
	60.8	0.183	0.273
363.15	40.5	0.010	0.044
	45.6	0.038	0.121
	50.7	0.069	0.152

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8] 2. Propane; C_3H_8; [74-98-6]	Reamer, H. H.; Sage, B. H.; Lacey, W. N. *Ind. Engng. Chem.* 1950, *42*, 534-539.
VARIABLES: Temperature, pressure	PREPARED BY: C. L. Young

EXPERIMENTAL VALUES:

T/K	$P/10^5$Pa	Mole fraction of methane in liquid, x_{CH_4}	Mole fraction of methane in vapor, y_{CH_4}	T/K	$P/10^5$Pa	Mole fraction of methane in liquid, x_{CH_4}	Mole fraction of methane in vapor, y_{CH_4}
277.59	6.89	0.0099	0.2034	277.59	86.18	0.5492	0.8222
	10.34	0.0324	0.4432		89.63	0.5773	0.8222
	13.79	0.0549	0.5627		93.08	0.6080	0.8217
	17.24	0.0779	0.6382		96.53	0.6434	0.8173
	20.68	0.1008	0.6875		99.97	0.6891	0.7924
	24.13	0.1242	0.7235		101.63	0.7459	0.7459
	27.58	0.1471	0.7505	294.26	10.34	0.0106	0.1513
	31.03	0.1695	0.7677		13.79	0.0321	0.3435
	34.47	0.1923	0.7819		17.24	0.0535	0.4575
	37.92	0.2171	0.7966		20.68	0.0749	0.5338
	41.37	0.2378	0.8042		24.13	0.0959	0.5853
	44.82	0.2607	0.8099		27.58	0.1168	0.6231
	48.26	0.2834	0.8135		31.03	0.1372	0.6501
	51.71	0.3060	0.8159		34.47	0.1580	0.6721
	55.16	0.3289	0.8180		37.92	0.1782	0.6908
	58.61	0.3517	0.8188		41.37	0.1987	0.7038
	62.05	0.3769	0.8199		44.82	0.2196	0.7141
	65.50	0.3986	0.8205		48.26	0.2407	0.7228
	68.95	0.4226	0.8208		51.71	0.2616	0.7300
	72.39	0.4473	0.8211		55.16	0.2828	0.7357
	75.84	0.4719	0.8214		58.61	0.3042	0.7403
	79.29	0.4968	0.8217		62.05	0.3261	0.7442
	82.74	0.5225	0.8220		65.50	0.3481	0.7471

(cont.)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

PVT cell charged with mixture of known composition. Pressure measured with pressure balance. Temperature measured using resistance thermometer. Bubble point and dew point determined for various compositions. Co-existing liquid and gas phase properties determined by graphical means. Details in source and ref. (1).

SOURCE AND PURITY OF MATERIALS:

1. Crude sample treated for removal of alkanes, CO_2 and H_2O; final purity 99.9 mole per cent.
2. Phillips Petroleum Co. sample distilled; initial purity 99.9 mole per cent.

ESTIMATED ERROR:

$\delta T/K = \pm 0.1$; $\delta P/Pa = \pm 0.05\%$;

δx_{CH_4}, $\delta y_{CH_4} = \pm 0.002$.

REFERENCES:

1. Sage, B. H.; Lacey, W. N. *Trans. Am. Inst. Mining and Met. Engnrs.* 1940, *136*, 136.

COMPONENTS:

1. Methane; CH_4; [74-82-8]
2. Propane; C_3H_8; [74-98-6]

ORIGINAL MEASUREMENTS:

Reamer, H. H.; Sage, B. H.; Lacey, W. N.
Ind. Engng. Chem.
1950, *42*, 534-539.

EXPERIMENTAL VALUES:

T/K	$P/10^5$Pa	Mole fraction of methane in liquid, x_{CH_4}	in vapor, y_{CH_4}	T/K	$P/10^5$Pa	Mole fraction of methane in liquid, x_{CH_4}	in vapor, y_{CH_4}
294.26	68.95	0.3707	0.7497	327.59	31.03	0.0664	0.2964
	72.39	0.3938	0.7520		34.47	0.0852	0.3418
	75.84	0.4179	0.7539		37.92	0.1040	0.3797
	79.29	0.4425	0.7553		41.37	0.1227	0.4109
	82.74	0.4679	0.7567		44.82	0.1419	0.4361
	86.18	0.4954	0.7570		48.26	0.1612	0.4582
	89.63	0.5244	0.7561		51.71	0.1810	0.4768
	93.08	0.5670	0.7503		55.16	0.2008	0.4938
	96.53	0.6046	0.7309		58.61	0.2213	0.5086
	99.97	0.6772	0.6772		62.05	0.2430	0.5224
310.93	13.79	0.0049	0.0521		65.50	0.2652	0.5351
	17.24	0.0257	0.2184		68.95	0.2885	0.5459
	20.68	0.0460	0.3255		72.39	0.3118	0.5532
	24.13	0.0652	0.3949		75.84	0.3361	0.5546
	27.58	0.0845	0.4472		79.29	0.3654	0.5473
	31.03	0.1040	0.4884		82.74	0.4101	0.5130
	34.47	0.1235	0.5209		83.98	0.4691	0.4691
	37.92	0.1432	0.5481	344.26	27.47	0.0063	0.0276
	41.37	0.1630	0.5714		31.03	0.0249	0.0981
	44.82	0.1821	0.5911		34.47	0.0433	0.1550
	48.26	0.2019	0.6073		37.92	0.0622	0.2007
	51.71	0.2216	0.6210		41.37	0.0813	0.2392
	55.16	0.2418	0.6321		44.82	0.1002	0.2712
	58.61	0.2611	0.6420		48.26	0.1199	0.2983
	62.05	0.2836	0.6503		51.71	0.1402	0.3215
	65.50	0.3051	0.6572		55.16	0.1618	0.3414
	68.95	0.3271	0.6635		58.61	0.1820	0.3566
	72.39	0.3498	0.6691		62.05	0.2081	0.3656
	75.84	0.3731	0.6738		65.50	0.2375	0.3678
	79.29	0.3969	0.6767		68.95	0.2800	0.3558
	82.74	0.4226	0.6779		70.33	0.3228	0.3228
	86.18	0.4511	0.6766	360.93	37.92	0.0107	0.0280
	89.63	0.4889	0.6643		41.37	0.0333	0.0798
	93.08	0.5610	0.6087		44.82	0.0555	0.1208
	93.29	0.5882	0.5882		48.26	0.0786	0.1489
327.59	20.68	0.0104	0.0699		49.99	0.0926	0.1570
	24.13	0.0289	0.1663		51.71	0.1120	0.1601
	27.57	0.0480	0.2414		52.88	0.1400	0.1400

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8] 2. Propane; C_3H_8; [74-98-6]	Akers, W. W.; Burns, J. F.; Fairchild, W. R. *Ind. Eng. Chem.* 1954, *46*, 2531-2534.
VARIABLES: Temperature, pressure	PREPARED BY: C. L. Young

EXPERIMENTAL VALUES:

T/K	P/MPa	Mole fraction of methane in liquid, x_{CH_4}	in vapor, y_{CH_4}
273.15	0.689	0.012	0.230
	1.38	0.059	0.566
	2.07	0.106	0.715
	2.76	0.152	0.780
	3.45	0.200	0.808
	4.14	0.248	0.830
	4.83	0.296	0.843
	5.52	0.347	0.852
	6.21	0.399	0.856
	6.89	0.451	0.854
	7.58	0.508	0.850
	8.27	0.568	0.833
	8.96	0.628	0.812
	9.65	0.700	0.781
	10.00	0.745	0.745
256.48	0.689	0.034	0.560
	1.38	0.089	0.767
	2.07	0.142	0.832
	2.76	0.197	0.861
	3.45	0.249	0.880
	4.14	0.303	0.888
	4.83	0.357	0.890
	5.52	0.410	0.892 (cont.)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Equilibrium cell containing liquid and vapor phases. Vapor portion recirculated via external line and re-entered the cell through liquid phase. Equilibrium established with a fixed quantity of vapor and liquid. Details of apparatus and procedure in source.

SOURCE AND PURITY OF MATERIALS:

1. Phillips Petroleum Co. sample, purity better than or equal to 99 mole per cent. Major impurities: nitrogen (0.3 mole per cent) and ethane (0.5 mole per cent).
2. Phillips Petroleum Co. sample, purity better than or equal to 99 mole per cent.

ESTIMATED ERROR:

$\delta T/K = \pm 0.5$; $\delta P/MPa = \pm 0.007$; δx_{CH_4}, $\delta y_{CH_4} = \pm 0.005$ (estimated by compiler).

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8]	Akers, W. W.; Burns, J. F.; Fairchild, W. R.
2. Propane; C_3H_8; [74-98-6]	*Ind. Eng. Chem.*
	1954, *46*, 2531-2534.

EXPERIMENTAL VALUES:

T/K	P/MPa	Mole fraction of methane in liquid, x_{CH_4}	in vapor, y_{CH_4}
256.48	6.21	0.464	0.891
	6.89	0.518	0.889
	7.58	0.572	0.882
	8.27	0.636	0.869
	8.96	0.718	0.845
	9.52	0.80	0.80
241.48	0.689	0.050	0.765
	1.38	0.112	0.868
	2.07	0.175	0.902
	2.76	0.237	0.920
	3.45	0.300	0.930
	4.14	0.361	0.933
	4.83	0.422	0.936
	5.52	0.485	0.935
	6.21	0.548	0.933
	6.89	0.609	0.930
	7.58	0.671	0.919
	8.27	0.734	0.910
	8.96	0.796	0.872
	9.45	0.835	0.835
226.48	0.689	0.061	0.850
	1.38	0.136	0.915
	2.07	0.208	0.937
	2.76	0.284	0.946
	3.45	0.361	0.952
	4.14	0.440	0.960
	4.83	0.522	0.964
	5.52	0.605	0.963
	6.21	0.696	0.960
	6.89	0.792	0.952
	7.58	0.897	0.925
	7.67	0.921	0.921
213.15	0.689	0.100	0.920
	1.38	0.198	0.955
	2.07	0.290	0.966
	2.76	0.382	0.970
	3.45	0.469	0.972
	4.14	0.552	0.972
	4.83	0.638	0.970
	5.52	0.720	0.968
	6.21	0.804	0.961
	6.89	0.890	0.951
	7.31	0.945	0.945
194.82	0.689	0.140	0.975
	1.38	0.280	0.985
	2.07	0.420	0.991
	2.76	0.560	0.995
	3.45	0.700	0.990
	4.14	0.840	0.975
	4.76	0.960	0.960
174.26	0.689	0.237	0.997
	1.38	0.499	0.998
	2.07	0.769	0.999
	2.69	0.999	0.999
157.59	0.345	0.170	1.00
	0.689	0.355	1.00
	1.38	0.907	1.00

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8]	Price, A. R.; Kobayashi, R.
2. Propane; C_3H_8; [74-98-6]	*J. Chem. Engng. Data*
	1959, *4*, 40-52.
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}	T/K	P/MPa	Mole fraction of methane in liquid, x_{CH_4}	in vapor, y_{CH_4}
283.15	2.76	0.128	0.685	255.37	8.96	0.708	0.845
	4.14	0.216	0.762	227.59	0.689	0.0769	0.840
	5.52	0.300	0.788		1.38	0.146	0.9216
	6.89	0.413	0.805		2.76	0.296	0.9493
	7.58	0.451	0.803		4.14	0.438	0.9585
	8.27	0.498	0.784		5.52	0.581	0.959
255.37	0.689	0.0358	0.573		6.89	0.736	0.9458
	1.38	0.0904	0.768	199.82	0.689	0.125	0.9591
	2.76	0.199	0.862		1.38	0.222	0.9792
	4.14	0.311	0.891		2.76	0.477	0.9855
	5.52	0.415	0.899		5.52	0.744	0.9852
	6.89	0.522	0.895	172.04	0.689	0.238	0.9932
	7.58	0.582	0.888		1.38	0.502	0.9955
	8.27	0.637	0.873	144.26	0.689	0.802	0.9993

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Recirculating vapor flow apparatus with modified Jerguson sight gauge for equilibrium cell. Vapor recycled with magnetic pump. Pressure measured with Bourdon pressure gauge and temperature measured with thermocouple. Details in source.

SOURCE AND PURITY OF MATERIALS:

1. Phillips Petroleum Co. research grade, purity 99.5 mole per cent.

2. Phillips Petroleum Co. pure grade, purity 99.0 mole per cent.

ESTIMATED ERROR:

$\delta T/K = \pm 0.06$; $\delta P/MPa = \pm 1\%$;

δx_{CH_4}, $\delta y_{CH_4} = \pm 2\%$ (estimated by compiler).

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-6] 2. Propane; C_3H_8; [74-98-6]	Cheung, H.; Wang, D. I. J. *Ind. Eng. Chem. Fundam.* 1964, *3*, 355.
VARIABLES:	PREPARED BY: C. L. Young

EXPERIMENTAL VALUES:

T/K	P/cmHg	P/kPa	Mole fraction of methane in liquid, x_{CH_4}
91.7	0.8	1.1	0.0272
91.7	4.7	6.3	0.234
91.8	6.4	8.5	0.374
91.7	7.0	9.3	0.473
112.5	4.3	5.7	0.0268
112.7	30.8	41.0	0.232
112.5	43.1	57.4	0.372
128.4	10.4	13.9	0.0264
128.4	78.1	104.0	0.230
128.3	112.7	163.5	0.371

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Static equilibrium cell of accurately known volume. Solvent added then solute gas added. Liquid composition determined from known volume of cell and liquid and amounts of solvent and solute present. Pressure measured with mercury manometer and temperature measured with thermocouple.	No details given.
	ESTIMATED ERROR: δT/K = ±0.1; δP/cmHg = ±0.1; δx_{CH_4} = ±7% (estimated by compiler).
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8] 2. Propane; C_3H_8; [74-98-6]	Skripka, V. G.; Nikitina, I. E.; Zhdanovich, L. A.; Sirotin, A. G.; Benyaminovich, O. A. *Gazov. Prom.* 1970, *15*, 35-36.
VARIABLES:	PREPARED BY: C. L. Young

EXPERIMENTAL VALUES:

T/K (T/°C)	Bubble pt. pressure P/kg f cm^{-2}	P/MPa	Mole fraction, x_{CH_4}	T/K (T/°C)	Bubble pt. pressure P/kg f cm^{-2}	P/MPa	Mole fraction, x_{CH_4}
123.2	0.00005	0.000005	0.00	143.2	0.001	0.0001	0.00
(-150)	0.17	0.017	0.05	(-130)	0.50	0.049	0.05
	0.65	0.064	0.20		1.94	0.190	0.20
	1.24	0.122	0.40		3.65	0.358	0.40
	1.72	0.169	0.60		5.13	0.503	0.60
	2.08	0.204	0.80		6.46	0.634	0.80
	2.34	0.229	0.95		7.37	0.723	0.95
	2.43	0.238	1.00		7.67	0.752	1.00
133.2	0.0003	0.00003	0.00	153.2	0.004	0.0004	0.00
(-140)	0.38	0.037	0.05	(-120)	0.86	0.084	0.05
	1.35	0.132	0.20		3.15	0.309	0.20
	2.31	0.227	0.40		5.80	0.569	0.40
	3.09	0.303	0.60		8.14	0.798	0.60
	3.80	0.373	0.80		10.24	1.004	0.80
	4.33	0.425	0.95		11.72	1.149	0.95
	4.51	0.442	1.00		12.18	1.194	1.00

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Recirculating vapor flow apparatus fitted with magnetic stirrer. Temperature measured with platinum resistance thermometer. Liquid analysed by gas chromatography. Details of apparatus in ref. (1).

SOURCE AND PURITY OF MATERIALS:

1. Purity 99.9 per cent by volume.
2. Purity 99.5 per cent by volume.

ESTIMATED ERROR:

REFERENCES:

1. Skripka, V. G.; Barsuk, S. D.; Nikitina, I. E.; Ben'yaminovic, O.A.
Gazov. Prom.
1964, *14*, 11.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8] 2. Propane; C_3H_8; [74-98-6]	Wichterle, I.; Kobayashi, R. *J. Chem. Eng. Data* 1972, *17*, 4-9.
VARIABLES: Temperature, pressure	PREPARED BY: C. L. Young

EXPERIMENTAL VALUES:

T/K	P/MPa	Mole fraction of methane in liquid, x_{CH_4}	in vapor, y_{CH_4}
213.71	0.189	0.0205	0.7669
	0.355	0.0443	0.8706
	0.689	0.0899	0.9288
	1.034	0.1358	0.9505
	2.067	0.2709	0.9698
	2.756	0.3656	0.9741
	3.445	0.4580	0.9760
	4.139	0.5563	0.9767
	4.828	0.6555	0.9755
	5.517	0.7573	0.9726
	6.206	0.8600	0.9646
	6.475	0.9053	0.9519
	6.510	0.9469	0.9469
195.2	0.211	0.0377	0.9244
	0.362	0.0677	0.9541
	0.517	0.0958	0.9670
	0.683	0.1263	0.9742
	1.378	0.2545	0.9845
	2.067	0.3969	0.9882
	2.756	0.5392	0.9898
	3.445	0.6947	0.9904
	3.795	0.7734	0.9905
	4.139	0.8454	0.9905

(cont.)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Recirculating vapor flow apparatus with magnetic vapor pump. Pressure measured with Bourdon gauge and temperature with a platinum resistance thermometer. Samples of both phases analysed using gas chromatography with flame ionisation detector. Details in source and ref. (1).	1. Matheson Gas Products sample, purity 99.97 mole per cent; purified by passage through molecular sieve. 2. Phillips Petroleum Co. research grade sample, purity 99.99 mole per cent.
	ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta P/MPa = \pm 0.015$ or less; $\delta x_{CH_4} \simeq \delta y_{CH_4} = \pm 2\%$ (details in source).
	REFERENCES: 1. Chang, H. L.; Hunt, L. J.; Kobayashi, R. *Am. Inst. Chem. Engnrs. J.* 1966, *11*, 1212.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8]	Wichterle, I.; Kobayashi, R.
2. Propane; C_3H_8; [74-98-6]	*J. Chem. Eng. Data*
	1972, *17*, 4-9.

EXPERIMENTAL VALUES:

T/K	P/MPa	Mole fraction of methane in liquid, x_{CH_4}	in vapor, y_{CH_4}
195.2	4.484	0.9061	0.99075
	4.742	0.9546	0.9912
	4.884	0.9719	0.9911
	4.990	0.9856	0.9856
192.3	0.207	0.0409	0.9355
	0.345	0.0692	0.9601
	0.517	0.1052	0.9718
	0.689	0.1379	0.9783
	1.378	0.2737	0.9874
	2.067	0.4207	0.9899
	2.756	0.5819	0.9913
	3.445	0.7529	0.9919
	3.967	0.8728	0.9924
	4.509	0.9578	0.9941
	4.590	0.9782	0.9953
	4.646	0.9844	0.9957
	4.747	0.9926	0.9926
187.54	0.283	0.0629	0.9656
	0.689	0.1506	0.9839
	1.378	0.3042	0.9907
172.04	0.213	0.0692	0.9862
	0.362	0.1196	0.9915
	0.689	0.2270	0.99505
158.15	0.172	0.0873	0.9958
	0.355	0.1791	0.99793
	0.689	0.3510	0.99888
144.26	0.214	0.2109	0.99940
	0.331	0.3005	0.99959
130.37	0.186	0.3924	0.99921

Additional vapor-liquid equilibrium data in which the mole fraction is greater than 0.30 are given in source.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8] 2. Propane; C_3H_8; [74-98-6]	Poon, D.P.L.; Lu, B.C.Y. *Advan. Cryog. Engng.* 1973, *19*, 292-299.
VARIABLES: Temperature, pressure	PREPARED BY: C.L. Young

EXPERIMENTAL VALUES:

T/K	P/psia	P/MPa	Mole fraction of methane in liquid x_{CH_4}	in vapor y_{CH_4}
114.1	6.1	0.042	0.1812	0.9990
	8.6	0.059	0.2911	0.9995
	11.2	0.077	0.4102	0.9997
	13.0	0.090	0.5488	1.0
	14.0	0.097	0.6647	0.9998
	16.2	0.112	0.8812	1.0
	17.8	0.123	1.0	1.0
118.3	7.9	0.054	0.1775	0.9986
	11.0	0.076	0.2717	0.9993
	14.1	0.097	0.3909	0.9997
	17.6	0.121	0.5714	0.9992
	19.6	0.135	0.6540	0.9999
	20.6	0.142	0.7399	1.0
	22.9	0.158	0.9031	1.0
	24.7	0.170	1.0	1.0
122.2	7.1	0.049	0.1130	0.9976
	9.1	0.063	0.1409	0.9986
	13.1	0.090	0.2219	0.9996
	13.5	0.093	0.2253	0.9996
	18.8	0.130	0.3701	0.9999
	23.1	0.159	0.5297	0.9999
	26.9	0.185	0.7090	0.9999
	28.8	0.199	0.8095	1.0
	31.0	0.214	0.8910	1.0
	32.3	0.223	1.0	1.0

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Recirculating vapor flow apparatus constructed from 100 ml. Jerguson gauge with stainless steel body. Temperature measured using copper-constantan thermocouples. Pressure measured using Bourdon gauges. Magnetic circulating pump. Cell charged vapour recirculated for 2 or more hours. Samples of vapor and liquid removed at constant pressure and analysed using gas chromatography. Details in source.

SOURCE AND PURITY OF MATERIALS:

1. Matheson research grade, purity 99.99 mole per cent.
2. Phillips Petroleum Co. sample, research grade purity 99.99 mole per cent.

ESTIMATED ERROR:

$\delta T/K = \pm 0.05$; $\delta P/MPa \sim \pm 0.005$; $\delta x_{CH_4} + \pm 1\%$; $\delta y_{CH_4} = \pm 0.0001$

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8] 2. Propane; C_3H_8; [74-98-6]	Kalra, H.; Robinson, D. B. *Cryogenics* 1975, *15*, 409.
VARIABLES:	PREPARED BY: C. L. Young

EXPERIMENTAL VALUES:

T/K (T/°F)	P/psia	P/MPa	Mole fraction of methane in liquid, x_{CH_4}	in vapor, y_{CH_4}
213.8 (-74.9)	109.1	0.7522	0.0949	0.941
	295.5	2.037	0.271	0.972
	494	3.406	0.450	0.977
	686	4.730	0.642	0.978

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Windowed equilibrium cell constructed of stainless steel fitted with specially made sampling valves. Contents of cell mixed with a high speed magnetic stirrer rotating at more than 500 rpm. Temperature measured with a copper-constantan thermocouple and pressure measured with Bourdon gauges. Details in source.	No details given.
	ESTIMATED ERROR: $\delta T/K = \pm 0.06$; $\delta P/lbs\ in^{-2} = \pm 1.0$; δx_{CH_4}, $\delta y_{CH_4} = \pm 0.005$.
	REFERENCES: