COMPONENTS:

1. Methane; CH_4; [74-82-8]
2. Pentane; C_5H_{12}; [109-66-0]

EVALUATOR:

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March 1982

EVALUATION:

This system has been studied over the temperature range 176.2 K to 444.3 K. The data of Frolich *et al.* (1) are classified as doubtful on account of their low precision and graphical presentation. The data of Boomer *et al.* (2) are also classified as doubtful in view of the fact that significant amounts of nitrogen were present in the system. The more limited data of Velikovskii *et al.* (3) are rejected since they are restricted to 273.2 K and the methane used contained about 1.5 mole per cent nitrogen.

The data of Prodany and Williams (4) and Sage and coworkers (5), (6) are classified as tentative. The earlier data of Sage *et al.* (5) are more limited than the latter data (6) although they cover part of the same temperature range. The later data covers the temperature range 310 K - 344 K (100 °F - 340 °F). The data published by Prodany and Williams (4) are probably more accurate than those of Sage and coworkers (5) and (6) but are restricted to 377.6 K (220 °F).

The data of Kahre (7) and Chu *et al.* (8) cover a similar temperature (176 K to 283 K) and pressure range. However, recommendation of either set of data is unwarranted since there are some discrepancies between the two sets of data. Both sets of data are therefore classified as tentative.

Dew point data for this system has been obtained by Chen *et al.* (9) but are not compiled nor evaluated here.

References

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

2. Boomer, E. H.; Johnson, C. A.; Piercey, A. G. A.
Can. J. Res., 1938, *B16*, 319.

3. Velikovskii, A. S.; Stepanova, G. S.; Vybornova, Ya. I.
Gazov. Prom., 1964, *9* (2), 1.

4. Prodany, N. W.; Williams, B.
J. Chem. Eng. Data, 1971, *16*, 1.

5. Sage, B. H.; Webster, D. C.; Lacey, W. N.
Ind. Eng. Chem., 1936, *28*, 1045.

6. Sage, B. H.; Reamer, H. H.; Olds, R. H.; Lacey, W. N.
Ind. Eng. Chem., 1942, *34*, 1108.

7. Kahre, L. C.
J. Chem. Eng. Data, 1975, *20*, 363.

8. Chu, T. C.; Chen, R. J. J.; Chappelear, P. S.; Kobayashi, R.
J. Chem. Eng. Data, 1976, *21*, 41.

9. Chen, R. J. J.; Chappelear, P. S.; Kobayashi, R.
J. Chem. Eng. Data, 1974, *19*, 58.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8] 2. Pentane; C_5H_{12}; [109-66-0]	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*	Mole fraction of methane in liquid+, x_{CH_4}
298.15	1.0	15	0.066
	2.0	31	0.128
	3.0	45	0.176
	4.0	61	0.225
	5.0	77	0.268
	6.0	95	0.311
	7.0	113	0.349
	8.0	129	0.380
	9.0	147	0.411
	10.0	166	0.441

* Data taken from graph in original article. Volume of gas measured at 101.325 kPa pressure and 298.15 K dissolved by unit volume of liquid measured under the same conditions.

\+ 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 the vapor pressure of the liquid and the solubility of the gas at atmospheric pressure. Details in source.	Stated that the materials were the highest purity available. Purity 98 to 99 mole per cent.
	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. Pentane; C_5H_{12}; [109-66-0]	Sage, B. H.; Webster, D. C.; Lacey, W. N. *Ind. Eng. Chem.* 1936, *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	854	5.89	0.0715	0.257
(100)	1945	13.41	0.2031	0.534
	2228	15.36	0.2706	0.625
344.3	968	6.67	0.0715	0.257
(160)	2064	14.23	0.2031	0.534
	2327	16.04	0.2706	0.625
377.6	1043	7.19	0.0715	0.257
(220)	2026	13.97	0.2031	0.534
	2152	14.84	0.2706	0.625

† calculated by compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

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).

SOURCE AND PURITY OF MATERIALS:

1. Prepared from natural gas, treated for removal of higher alkanes, carbon dioxide and water vapor. Final purity 99.9 mole per cent.
2. Phillips petroleum sample, fractionally distilled, final purity probably better than 99.8 mole per cent.

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.
Ind. Eng. Chem.
1934, *26*, 103.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8] 2. Pentane; C_5H_{12}; [109-66-0]	Sage, B.H.; Reamer, H.H.; Olds, R.H. Lacey, W.N. *Ind. Eng. Chem.* 1942, *34*, 1108-1117
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 gas, y_{CH_4}
310.93	1.38	0.0015	0.2090
	2.76	0.0085	0.5893
	4.14	0.0154	0.7160
	5.52	0.0221	0.7797
	6.89	0.0288	0.8178
	10.34	0.0458	0.8696
	13.79	0.0626	0.8940
	20.68	0.0957	0.9195
	27.58	0.1282	0.9320
	41.37	0.1911	0.9430
	55.16	0.2508	0.9460
	68.95	0.3077	0.9470
	86.18	0.3748	0.9460
	103.4	0.4390	0.9410
	120.7	0.5041	0.9330
	137.9	0.5788	0.9204
	155.1	0.6770	0.8972
	169.3	0.8236	0.8236
344.26	4.14	0.0054	0.2805
	5.52	0.0115	0.4505
	6.89	0.0176	0.5524
	10.34	0.0329	0.6894
	13.79	0.0480	0.7568
	20.68	0.0777	0.8186
	27.58	0.1070	0.8485

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. Coexisting liquid and gas phase properties determined by graphical means. Details in ref. (1).

SOURCE AND PURITY OF MATERIALS:

1. Crude sample purified by removal of CO_2 and hydrocarbons. Final purity of 99.9 mole per cent.
2. Phillips petroleum sample purified fractionated purity better than 99.9 mole per cent.

ESTIMATED ERROR:

$\delta T/K = \pm 0.03$; $\delta P/10$ Pa $= \pm 0.1$
δx_{CH_4}, $\delta y_{CH_4} = \pm 0.002$.
(estimated by compiler)

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. Pentane; C_5H_{12}; [109-66-0]

ORIGINAL MEASUREMENTS

Sage, B.H.; Reamer, H.H.; Olds, R.H. Lacey, W.N.

Ind. Eng. Chem. 1942, *34*, 1108-1117.

EXPERIMENTAL VALUES:

T/K	$P/10^5$Pa	Mole fraction of methane in liquid x_{CH_4}	in gas, y_{CH_4}
344.26	41.37	0.1655	0.8785
	55.16	0.2213	0.8900
	68.95	0.2743	0.8937
	86.18	0.3381	0.8929
	103.4	0.4002	0.8875
	120.7	0.4670	0.8772
	137.9	0.5460	0.8558
	155.1	0.6654	0.8142
	161.2	0.7665	0.7665
377.59	6.89	0.0015	0.0458
	10.34	0.0159	0.3304
	13.79	0.0301	0.4722
	20.68	0.0587	0.6138
	27.58	0.0870	0.6846
	41.37	0.1435	0.7566
	55.16	0.1984	0.7880
	68.95	0.2509	0.7981
	86.18	0.3156	0.8009
	103.4	0.3817	0.7940
	120.7	0.4564	0.7584
	137.9	0.5659	0.7420
	143.5	0.6705	0.6705
410.93	13.79	0.0043	0.0578
	20.68	0.0338	0.3051
	27.58	0.0623	0.4289
	41.37	0.1178	0.5532
	55.16	0.1728	0.6134
	68.95	0.2297	0.6429
	86.18	0.3068	0.6420
	103.4	0.4076	0.6010
	111.0	0.5211	0.5211
444.26	27.58	0.0231	0.0938
	41.37	0.0853	0.2795
	55.16	0.1534	0.3561
	68.95	0.2569	0.3364
	70.67	0.2950	0.2950

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8] 2. Pentane; C_5H_{12}; [109-66-0]	Prodany, N.W.; Williams, B. *J. Chem. Engng. Data.* 1971, *16*, 1-6.
VARIABLES: 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}
377.59	69.02	0.247	0.805
	69.29	0.248	0.814
	70.53	0.253	0.806
	84.87	0.306	0.810
	86.87	0.310	0.816
	87.22	0.324	0.812
	103.49	0.382	0.808
	103.56	0.380	0.808
	122.52	0.456	0.788
	137.83	0.532	0.740

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Stirred equilibrium cell fitted with vapor and liquid sampling valves. Temperature measured with mercury in glass thermometer. Pressure measured with Bourdon gauge. Cell charged with components and contents equilibriated. Vapor and liquid samples withdrawn through pressure lock systems. Analysed using gas chromatography. Details in source.

SOURCE AND PURITY OF MATERIALS:

1. Phillips Petroleum Co., sample purity 99.3 mole per cent (0.6 mole per cent nitrogen, 0.1 mole per cent ethane).
2. Phillips Petroleum Co. sample purity 99.9 mole per cent.

ESTIMATED ERROR:

$\delta T/K = \pm 0.3$; $\delta p/MPa = \pm 0.02$; $\delta x_{CH_4} = \pm 0.75\%$.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8] 2. Pentane; C_5H_{12}; [109-66-0]	Chu, T.C.; Chen, R.J.J.; Chappelear, P.S.; Kobayashi, R. *J. Chem. Eng.ng. Data.* 1976, *21*, 41-4.
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}
273.16	1.3803	0.09091	0.9758
	2.7593	0.1653	0.9839
	4.1369	0.2320	0.9855
	5.5158	0.2920	0.9856
	6.8948	0.3481	0.9839
	8.2737	0.4005	0.9818
	9.6527	0.4480	0.9782
	11.0316	0.4980	0.9722
	12.4106	0.5501	0.9623
	13.7895	0.6117	0.9450
	14.48	0.661	-
	14.82	0.695	-
	15.10	0.695	-
	15.1685	0.9089	0.9089
248.34	0.6909	0.04943	0.9876
	1.3803	0.1119	0.99281
	2.7593	0.2089	0.99475
	4.1369	0.2958	0.99478
	5.5158	0.3695	0.99400
	6.8948	0.4309	0.99223
	8.2737	0.4765	0.9900
	9.6527	0.5708	0.9845
	11.0316	0.6491	0.9753
	12.4106	0.7279	0.9587
	12.76	0.759	-

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Recirculating vapor flow apparatus. Temperature measured with Platinum resistance thermometer. Pressure measured with Bourdon gauge. Liquid added to windowed cell and air removed. Methane added to cell and vapor recirculated until equilibrium established. (average time ~ 4 hours) Samples analysed by gas chromatography.

SOURCE AND PURITY OF MATERIALS:

1. Ultra high purity sample from Matheson; purity 99.97 mole per cent.
2. Phillips Petroleum Co. sample purity 99.93 mole per cent.

ESTIMATED ERROR: $\delta T/K = \pm 0.02$; $\delta P/MPa = \pm 0.007$; $\delta x_{CH_4} \leq \pm 2\%$; $\delta(1-y_{CH_4}) = \pm 2\%$ or 0.00001 whichever is largest.

REFERENCES:

1. Chen, R.J.J.; Chappelear, P.S.; Kobayashi, R.,
J. Chem. Engng. Data. 1974, *19*, 58.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8]	Chu, T.C.; Chen, R.J.J.; Chappelear, P.S.; Kobayashi, R.
2. Pentane; C_5H_{12}; [109-66-0]	*J. Chem. Engng. Data.* 1976, *21*, 41-4.

EXPERIMENTAL VALUES:

T/K	P/MPa	Mole fraction of methane in liquid, x_{CH_4}	in vapor, y_{CH_4}
248.34	12.96	0.811	-
	13.03	0.859	-
223.92	0.6909	0.08592	0.99738
	1.3803	0.1667	0.99842
	2.7593	0.2878	0.99848
	4.1369	0.3888	0.99815
	5.5158	0.4737	0.99738
	6.8948	0.5652	0.99522
	8.2737	0.6850	0.99071
	8.963	0.750	-
	9.170	0.785	-
	9.446	0.841	-
	9.653	0.9437	-
199.86	0.3461	0.0566	0.99933
	0.6909	0.1166	0.999576
	1.3803	0.2212	0.999667
	2.7593	0.3758	0.999581
	4.1369	0.5265	0.999324
	4.826	0.6552	-
	5.171	0.7333	-
	5.378	0.799	-
	5.447	0.863	-
194.17	0.6902	0.1251	0.999735
	1.3794	0.2378	0.999781
	2.7586	0.4041	0.999732
	4.1369	0.6226	0.999404
	4.482	0.7386	-
	4.619	0.8438	-
	4.688	0.90431	-
192.62	0.6909	0.1297	0.999767
	1.3803	0.2320	0.999811
	2.7593	0.4083	0.999775
	4.1369	0.6667	0.999425
	4.413	0.835	-
	4.488	0.9057	-
	4.551	0.9538	-
176.21	0.1386	0.03195	0.999844
	0.3461	0.08509	0.999915
	0.6909	0.1681	0.999939
	1.0356	0.2504	0.999946
	1.3803	0.3316	0.999949
	1.724	0.403	-
	2.0698	0.4819	0.999951
	2.415	0.6262	-
	2.551	0.759	-

+ vapor phase composition quoted here and in original were interpolated from data given in reference 1.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-8208] 2. Pentane; C_5H_{12}; [109-66-0]	Kahre, L.C. *J. Chem. Engng. Data.* 1975, *20*, 20, 363-7
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 vapor y_{CH_4}
177.6	3.40	0.345	0.0785 a	0.999937
	6.80	0.689	0.157	0.999961
	13.61	1.379	0.321	0.999970
	20.41	2.068	0.510	0.999956
	23.81	2.413	0.623	0.999949
	27.08	2.744	0.829	0.999938
	27.90	2.827	0.897	0.999935
	30.01	3.041	1.000	1.0000
186.0	3.40	0.345	0.064 a	0.99983
	6.80	0.689	0.128	0.999903
	13.61	1.379	0.260	0.999921
	20.41	2.068	0.392	0.999917
	27.22	2.758	0.540	0.999885
	30.62	3.103	0.618	0.99986
	34.02	3.447	0.740	0.99979
	36.06	3.654	0.865	0.99973
	37.01	3.750	0.9545	0.99971
	38.03	3.853	0.9715	0.99978
	39.33	3.985	1.000	1.000
191.0	3.40	0.345	0.058 a	0.99976
	6.80	0.689	0.116	0.99984
	13.61	1.379	0.228	0.99988
	20.41	2.068	0.343 a	0.99988

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 equilibrium cell, air removed. Methane added to cell and recirculated for at least half an hour. Samples of both phases analysed by GC.

SOURCE AND PURITY OF MATERIALS:

1. Phillips research grade, purity 99.98 mole per cent.
2. Phillips research grade, purity 99.99 mole per cent.

ESTIMATED ERROR:

$\delta T/K = \pm 0.6$; $\delta P/MPa = \pm 0.013$; $\delta x_{CH_4} = \pm 2\%$; $\delta(1-y_{CH_4}) = \pm 5\%$

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8]	Kahre, L.C.
2. Pentane; C_5H_{12}; [109-66-0]	*J. Chem. Engng. Data*, 1975, *20*, 363-7.

EXPERIMENTAL VALUES:

T/K	P/atm	P/MPa	Mole fraction of methane in liquid x_{CH_4}	in vapor y_{CH_4}
191.0	27.22	2.758	0.465	0.99984
	34.02	3.447	0.609 a	0.99976
	40.82	4.136	0.817	0.99946
	42.46	4.302	0.9311	0.99928
	43.68	4.426	0.9732	0.99922
	44.29	4.488	-	0.99923
	44.97	4.557	-	0.99931
	45.86	4.647	Critical opalescence observed.	
198.2	3.40	0.345	0.051 a	0.99950
	6.80	0.689	0.1015	0.99971
	13.61	1.379	0.205	0.99978
	20.41	2.068	0.298 a	0.99978
	27.22	2.758	0.391	0.99976
	34.02	3.447	0.485 a	0.99967
	40.82	4.136	0.595	0.99947
	47.63	4.826	0.737	0.99890
	51.03	5.171	0.866	0.9980
	52.39	5.308	0.956	0.9970
	53.55	5.426	Critical opalescence observed.	
227.6	3.40	0.345	0.031 a	0.9938
	6.80	0.689	0.062 a	0.9966
	27.22	2.758	0.248	0.9983
	47.63	4.826	0.411	0.9976
	68.04	6.894	0.564	0.9951
	81.65	8.273	0.657	0.9906
	95.26	9.652	0.770	0.9833
	100.70	10.203	0.831	0.9702
	102.60	10.396	Critical opalescence observed.	
255.4	3.40	0.345	0.023 a	0.9686
	6.80	0.689	0.046 a	0.9832
	13.61	1.379	0.095	0.9902
	27.22	2.758	0.183	0.9932
	40.82	4.136	0.267	0.9935
	54.43	5.515	0.348	0.9924
	68.04	6.894	0.424	0.9909
	102.06	10.341	0.597	0.9807
	122.47	12.409	0.712	0.9690
	136.08	13.788	0.811	0.9449
	136.83	13.864	Critical opalescence observed.	
283.2	6.80	0.689	0.036 a	0.9376
	13.61	1.379	0.075 a	0.9650
	20.41	2.068	0.113	0.9735
	61.24	6.205	0.320	0.9810
	88.45	8.962	0.438	0.9751
	115.67	11.720	0.558	0.9637
	136.08	13.788	0.649	0.9436
	149.67	15.165	0.725	0.9306
	156.49	15.856	Critical opalescence observed.	

a = Values estimated in original paper.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methane; CH_4; [74-82-8] 2. Nitrogen; N_2; [7727-37-9] 3. Pentane; C_5H_{12}; [109-66-0]	Boomer, E. H.; Johnson, C. A.; Piercey, A. G. A. *Can. J. Res. B* 1938, *16*, 319-327.
VARIABLES: Temperature, pressure	PREPARED BY: C. L. Young

EXPERIMENTAL VALUES:

			Mole fractions in liquid			Mole fractions in vapor		
T/K	P/atm	P/MPa	x_{CH_4}	x_{N_2}	$x_{C_5H_{12}}$	y_{CH_4}	y_{N_2}	$y_{C_5H_{12}}$
298.15	35.5	3.60	0.156	0.005	0.839	0.848	0.069	0.083
			0.161	0.003	0.836	0.884	0.033	0.083
	68.1	6.90	0.298	0.004	0.698	0.880	0.069	0.051
	101.4	10.27	0.421	0.012	0.567	0.889	0.064	0.047
			0.426	0.007	0.567	0.892	0.056	0.052
	134	13.6	0.536	0.014	0.450	0.874	0.068	0.058
	167.6	16.98	0.683	0.036	0.281	0.831	0.047	0.122
			0.677	0.041	0.282	0.820	0.058	0.122
	188	19.0	0.729	0.046	0.225	0.734	0.041	0.225
328.15	35.5	3.60	0.139	0.003	0.858	0.815	0.047	0.138
	101.4	10.27	0.386	0.011	0.603	0.862	0.057	0.081
			0.380	0.014	0.606	0.851	0.065	0.084
	134	13.6	0.495	0.023	0.482	0.841	0.056	0.103
	167.6	16.98	0.667	0.033	0.300	0.772	0.043	0.185
			0.661	0.039	0.300	0.762	0.047	0.191
	174.4	17.67	0.734	0.041	0.225	0.738	0.039	0.223
358.15	35.2	3.57	0.121	0.003	0.876	0.770	0.040	0.190
	100.7	10.20	0.353	0.014	0.633	0.791	0.064	0.145
	133.7	13.55	0.478	0.025	0.497	0.773	0.050	0.177
			0.485	0.020	0.494	0.766	0.057	0.177
	147.2	14.92	0.543	0.029	0.428	-	-	-
			0.538	0.031	0.431	0.745	0.047	0.208
			0.542	0.028	0.430	0.748	0.040	0.212
	160.1	16.22	0.750	0.042	0.208	0.750	0.044	0.206

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). NOTE: The source reference also contains data on a mixture of pentanes + methane + nitrogen. Since the isomeric composition of the pentane mixture is not known, the data have not been included here.	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. Commercial product, chemically purified, dried and fractionated.
	ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta P/MPa = \pm 0.02$; δx, $\delta y = \pm 1\%$ (estimated by compiler).
	REFERENCES: 1. Boomer, E. H.; Johnson, C. A.; Argue, G. H. *Can. J. Res. B* 1937, *15*, 367.