

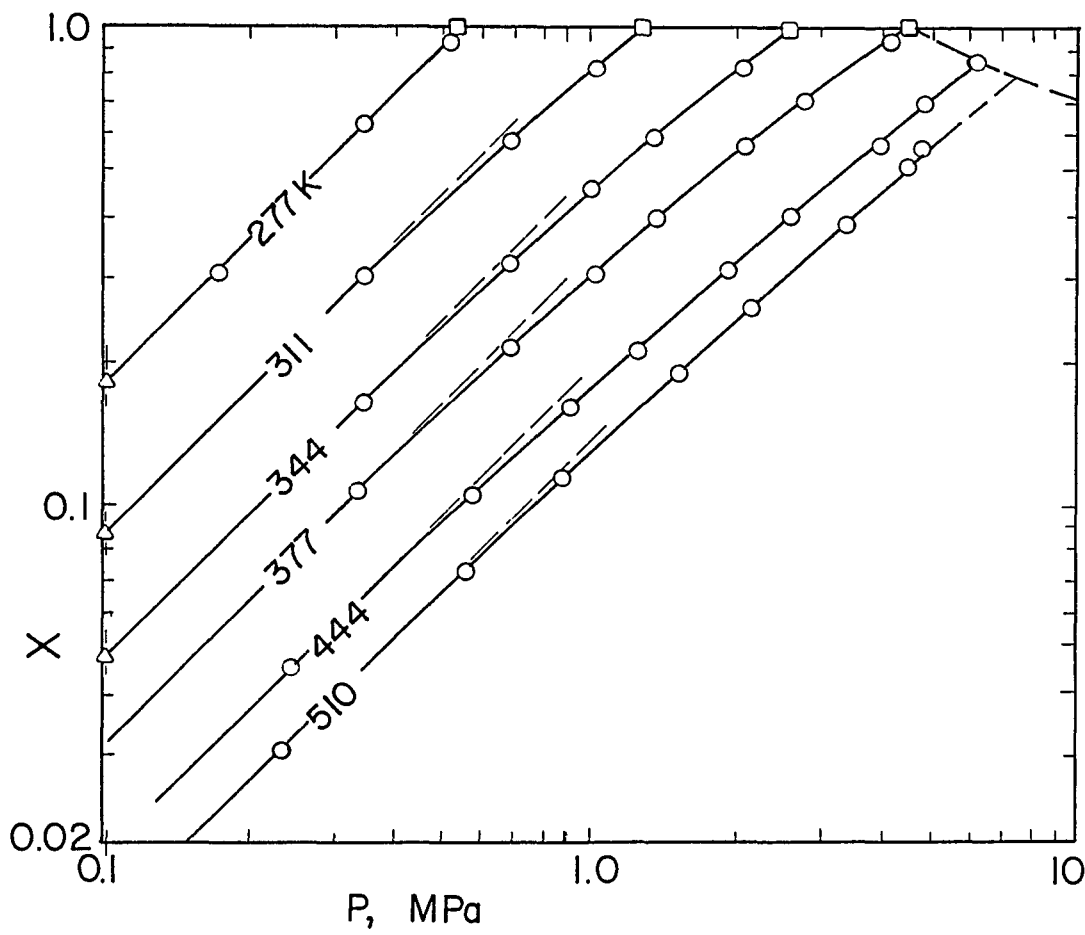
<p>COMPONENTS:</p> <p>(1) Propane; C_3H_8; [74-98-6] Butane; C_4H_{10}; [106-97-8] 2-Methylpropane; C_4H_{10}; [75-28-5]</p> <p>(2) Alkane solvents at high pressure</p>	<p>EVALUATOR:</p> <p>Walter Hayduk Department of Chemical Engineering University of Ottawa Ottawa, Canada K1N 9B4</p> <p>July, 1984</p>
--	--

CRITICAL EVALUATION:

The solubility of *propane* is available for pressures above 101.325 kPa (1 atm) in *butane* and *2-methylpropane* solvents (1). These data may also be considered as vapor-liquid equilibria because of the closeness of the boiling points of the solute and solvents. *Propane* solubilities are available in *pentane* for temperatures up to 110 K (2) and *decane* (3). The solubility of *butane* is also available in *decane* over a wide temperature and pressure range (4). These data appear highly consistent although there are no two sources for any of them; they are all classified as tentative.

The above-mentioned data were tested for consistency by plotting the mole fraction solubility of solute versus the solute partial pressure on log scales. On such a graph the solubility-pressure relation is nearly linear; at low pressure, the lines are linear with a slope of unity for solubilities expressed by Henry's law. Hence, the solubility at 101.325 kPa pressure can usually be obtained from such a graph by extrapolation of data in the low pressure region. Similarly, by extrapolation to high pressures, the pure solute vapor pressure is obtained at the particular temperature. An example of the consistency test is shown in Figure 1 representing some of the solubility data of Reamer and Sage for *propane* dissolved in *decane* (3). A slope of one for the data at relatively low pressures indicates that for that pressure range Henry's law is obeyed. Estimated values for solubilities in *decane* at 101.325 kPa are based on

Figure 1. Solubility of *propane* in *decane* at high pressure (3).



<p>COMPONENTS:</p> <p>(1) Propane; C₃H₈; [74-98-6] Butane; C₄H₁₀; [106-97-8] 2-Methylpropane; C₄H₁₀; [75-28-5]</p> <p>(2) Alkane solvents at high pressure</p>	<p>EVALUATOR:</p> <p>Walter Hayduk Department of Chemical Engineering University of Ottawa Ottawa, Canada K1N 9B4</p> <p>July, 1984</p>
<p>CRITICAL EVALUATION:</p> <p>solubilities in <u>dodecane</u> (see Alkane Solvents) and adjusted by a constant factor. It is also apparent that in each case the <i>propane</i> vapor pressure represents a termination of the solubility relation with the exception that at high pressures, exceeding the <i>propane</i> critical pressure, the solution critical pressure is reached. Thus such a diagram is useful to check the consistency of high pressure solubility data because it utilizes parameters and relationships which are independently known.</p> <p>The dew point and bubble point data of Kay and Kay et al. for <i>propane</i> in <u>butane</u>, <u>pentane</u> (5) and <u>octane</u> (6) solvents as well as that of Kay and Kay et al. for <i>butane</i> in <u>heptane</u> (7) and <u>octane</u> (6) cannot readily be used to determine gas solubility. Hence, these data are simply unclassified. While they may be of interest to research workers who are measuring solubilities at high pressure, they cannot be used for actual comparisons of data.</p> <p>There are no solubility data reported for <i>2-methylpropane</i> as a solute in alkane solvents at high pressure.</p> <p><u>References</u></p> <ol style="list-style-type: none"> 1. Skripka, V.G.; Nikitina, I.E.; Zhdanovich, L.A.; Sirotin, A.G.; Benyaminovich, O.A. <i>Gasov. Prom.</i> <u>1970</u>, <i>15</i>, 35-36. 2. Vjrosta, J.; Wichterle, I. <i>Coll. Czech. Chem. Comm.</i> <u>1974</u>, <i>39</i>, 1246-8. 3. Reamer, H.H.; Sage, B.H. <i>J. Chem. Eng. Data</i> <u>1966</u>, <i>11</i>, 17-24. 4. Reamer, H.H.; Sage, B.H.; Lacey, W.N. <i>Ind. Eng. Chem.</i> <u>1946</u>, <i>38</i>, 986-9. 5. Kay, W.B. <i>J. Chem. Eng. Data</i> <u>1970</u>, <i>15</i>, 46-52. 6. Kay, W.B.; Genco, J.; Fichtner, D.A. <i>J. Chem. Eng. Data</i> <u>1974</u>, <i>19</i>, 275-280. 7. Kay, W.B. <i>Ind. Eng. Chem.</i> <u>1941</u>, <i>33</i>, 590-4. 	

EXPERIMENTAL VALUES:							
T/K	P/10 ⁵ Pa	Mole fraction of propane		T/K	P/10 ⁵ Pa	Mole fraction of propane	
		in liquid,	in vapor,			in liquid,	in vapor,
		$x_{C_3H_8}$	$y_{C_3H_8}$			$x_{C_3H_8}$	$y_{C_3H_8}$
363.05	15.51	0.1468	-	417.05	37.92	-	0.1468
368.75	17.24	0.1468	-	417.95	38.61	-	0.1468
378.45	20.68	0.1468	-	418.35	38.96	-	0.1468
387.25	24.13	0.1468	-	418.55	39.13	-	0.1468
395.25	27.58	0.1468	-	418.65	39.30	-	0.1468
402.65	31.03	0.1468	-	358.05	17.24	0.3085	-
409.15	34.47	0.1468	-	367.95	20.68	0.3085	-
412.35	36.20	0.1468	-	376.65	24.13	0.3085	-
414.25	37.23	0.1468	-	384.65	27.58	0.3085	-
415.55	37.92	0.1468	-	391.85	31.03	0.3085	-
416.75	38.61	0.1468	-	398.45	34.47	0.3085	-
417.35	38.96	0.1468	-	401.75	36.20	0.3085	-
417.65	39.13	0.1468	-	404.75	37.92	0.3085	-
418.05	39.30	0.1468	-	405.95	38.61	0.3085	-
368.95	15.51	-	0.1468	407.15	39.30	0.3085	-
374.25	17.24	-	0.1468	408.35	39.99	0.3085	-
383.15	20.68	-	0.1468	409.05	40.33	0.3085	-
391.45	24.13	-	0.1468	409.95	40.68	0.3085	-
398.95	27.58	-	0.1468	367.25	17.24	-	0.3085
405.65	31.03	-	0.1468	376.55	20.68	-	0.3085
411.75	34.47	-	0.1468	384.15	24.13	-	0.3085
414.55	36.20	-	0.1468	391.05	27.58	-	0.3085
416.05	37.23	-	0.1468	397.35	31.03	-	0.3085
(cont.)							
AUXILIARY INFORMATION							
METHOD/APPARATUS/PROCEDURE:				SOURCE AND PURITY OF MATERIALS:			
Sample of known composition confined in thick-walled glass tube over mercury. Temperature measured with thermocouple and pressure with Bourdon gauge. Dew point and bubble point determined.				1. and 2. Phillips Petroleum samples purity better than 99.9 mole per cent.			
ESTIMATED ERROR:							
$\delta T/K = \pm 0.02$; $\delta P/10^5 Pa = \pm 0.07$;							
$\delta x_{C_3H_8}, \delta y_{C_3H_8} = \pm 0.0002$.							
REFERENCES:							

COMPONENTS:				ORIGINAL MEASUREMENTS:			
(1) Propane; C ₃ H ₈ ; [74-98-6]				Kay, W. B.,			
(2) Butane; C ₄ H ₁₀ ; [106-97-8]				<i>J. Chem. Eng. Data</i> <u>1970</u> , 15, 46-52.			
EXPERIMENTAL VALUES: (concluded)							
T/K	P/10 ⁵ Pa	Mole fraction of propane		T/K	P/10 ⁵ Pa	Mole fraction of propane	
		in liquid, <i>x</i> C ₃ H ₈	in vapor, <i>y</i> C ₃ H ₈			in liquid, <i>x</i> C ₃ H ₈	in vapor, <i>y</i> C ₃ H ₈
403.05	34.47	-	0.3085	382.85	41.37	0.7545	-
405.65	36.20	-	0.3085	383.95	42.06	0.7545	-
407.95	37.92	-	0.3085	384.45	42.40	0.7545	-
408.85	38.61	-	0.3085	385.15	42.75	0.7545	-
409.75	39.30	-	0.3085	385.55	42.92	0.7545	-
410.65	39.99	-	0.3085	351.35	20.68	-	0.7545
410.95	40.33	-	0.3085	358.45	24.13	-	0.7545
411.05	40.68	-	0.3085	365.05	27.58	-	0.7545
344.15	17.24	0.5211	-	371.05	31.03	-	0.7545
354.95	20.68	0.5211	-	376.35	34.47	-	0.7545
363.55	24.13	0.5211	-	378.75	36.20	-	0.7545
371.25	27.58	0.5211	-	381.15	37.92	-	0.7545
378.25	31.03	0.5211	-	382.95	39.30	-	0.7545
384.85	34.47	0.5211	-	384.55	40.68	-	0.7545
388.05	36.20	0.5211	-	385.25	41.37	-	0.7545
391.05	37.92	0.5211	-	385.95	42.06	-	0.7545
393.45	39.30	0.5211	-	386.25	42.40	-	0.7545
395.85	40.68	0.5211	-	386.45	42.75	-	0.7545
395.15	41.37	0.5211	-	386.51	42.02	-	0.7545
397.75	41.71	0.5211	-	342.75	24.13	0.9258	-
398.50	42.06	0.5211	-	349.75	27.58	0.9258	-
399.65	42.39	0.5211	-	356.25	31.03	0.9258	-
355.95	17.24	-	0.5211	361.95	34.47	0.9258	-
364.85	20.68	-	0.5211	364.75	36.20	0.9258	-
372.55	24.13	-	0.5211	367.15	37.92	0.9258	-
379.35	27.58	-	0.5211	369.55	39.30	0.9258	-
385.45	31.03	-	0.5211	371.55	40.68	0.9258	-
390.95	34.47	-	0.5211	372.55	41.37	0.9258	-
393.45	36.20	-	0.5211	373.55	42.06	0.9258	-
395.85	37.92	-	0.5211	374.05	42.40	0.9258	-
397.55	39.30	-	0.5211	374.55	42.75	0.9258	-
399.15	40.68	-	0.5211	346.05	24.13	-	0.9258
399.75	41.37	-	0.5211	352.75	27.58	-	0.9258
400.05	41.71	-	0.5211	358.65	31.03	-	0.9258
400.25	42.06	-	0.5211	364.15	34.47	-	0.9258
343.05	20.68	0.7545	-	366.65	36.20	-	0.9258
351.05	24.13	0.7545	-	369.15	37.92	-	0.9258
358.65	27.58	0.7545	-	370.95	39.30	-	0.9258
365.45	31.03	0.7545	-	372.75	40.68	-	0.9258
371.55	34.47	0.7545	-	373.55	41.37	-	0.9258
374.55	36.20	0.7545	-	374.35	42.06	-	0.9258
377.35	37.92	0.7545	-	374.75	42.40	-	0.9258
379.55	39.30	0.7545	-	375.05	42.75	-	0.9258
381.75	40.68	0.7545	-				

EXPERIMENTAL VALUES:			Mole fraction		
T/K (T/°C)	Bubble pt. pressure P/kg f cm ⁻²	pressure P/MPa	Dew pt. pressure P/kg f cm ⁻²	pressure P/MPa	$x_{C_3H_8}$
253.2 (-20)	0.46	0.045	0.46	0.045	0.00
	0.55	0.054	0.49	0.048	0.05
	0.84	0.082	0.57	0.056	0.20
	1.21	0.119	0.73	0.072	0.40
	1.62	0.159	0.91	0.089	0.60
	2.04	0.200	1.21	0.119	0.80
	2.36	0.231	2.02	0.198	0.95
263.2 (-10)	2.46	0.241	2.46	0.241	1.00
	0.71	0.070	0.71	0.070	0.00
	0.84	0.082	0.74	0.073	0.05
	1.21	0.119	0.88	0.086	0.20
	1.72	0.169	1.10	0.095	0.40
	2.27	0.223	1.37	0.134	0.60
	2.87	0.281	1.93	0.189	0.80
273.2 (0)	3.34	0.328	2.92	0.286	0.95
	3.49	0.342	3.49	0.342	1.00
	1.05	0.103	1.05	0.103	0.00
	1.20	0.118	1.09	0.107	0.05
	1.69	0.166	1.20	0.118	0.20
	2.39	0.234	1.42	0.139	0.40
	3.16	0.310	1.83	0.179	0.60
	3.97	0.389	2.67	0.262	0.80
	4.60	0.451	4.12	0.404	0.95
4.81	0.472	4.81	0.472	1.00	

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

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

SOURCE AND PURITY OF MATERIALS:

1 and 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:
(1) Propane; C₃H₈; [74-98-6]
(2) Butane; C₄H₁₀; [106-97-8]

ORIGINAL MEASUREMENTS:
Skripka, V. G.; Nikitina, I. E.; Zhdanovich, L. A.; Sirotin, A. G.; Benyaminovich, O. A.
Gazov. Prom.
1970, 15, 35-36.

VARIABLES:
T/K: 253.2-273.2
P/MPa: 0.045-0.472

PREPARED BY:
C. L. Young

EXPERIMENTAL VALUES:			
T/K (T/°C)	Bubble pt. pressure P/kg f cm ⁻² P/MPa	Dew pt. pressure P/kg f cm ⁻² P/MPa	Mole fraction [∞] C ₃ H ₈
253.2 (-20)	0.74 0.073	0.74 0.073	0.00
	0.81 0.079	0.77 0.076	0.05
	1.06 0.104	0.88 0.086	0.20
	1.39 0.136	1.06 0.104	0.40
	1.74 0.171	1.28 0.126	0.60
	2.10 0.206	1.61 0.158	0.80
	2.37 0.232	2.20 0.216	0.95
	2.46 0.241	2.46 0.241	1.00
263.2 (-10)	1.10 0.108	1.10 0.108	0.00
	1.21 0.119	1.13 0.111	0.05
	1.52 0.149	1.27 0.125	0.20
	1.98 0.194	1.47 0.144	0.40
	2.47 0.242	1.76 0.173	0.60
	2.98 0.292	2.36 0.231	0.80
	3.35 0.329	3.17 0.311	0.95
	3.49 0.342	3.49 0.342	1.00
273.2 (0)	1.59 0.156	1.59 0.156	0.00
	1.73 0.170	1.64 0.160	0.05
	2.17 0.213	1.80 0.177	0.20
	2.78 0.273	2.10 0.206	0.40
	3.42 0.335	2.64 0.259	0.60
	4.10 0.402	3.41 0.334	0.80
	4.62 0.453	4.40 0.431	0.95
	4.81 0.472	4.81 0.472	1.00
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
Recirculating vapor flow apparatus fitted with magnetic stirrer. Temperature measured with platinum resistance thermometer. Liquid and gas analysed by gas chromatography. Details of apparatus in ref. (1)		1 and 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. <i>Gazov. Prom.</i> 1964, 14, 11.	

COMPONENTS:

(1) Propane; C₃H₈; [74-98-6]

(2) 2-Methylpropane; C₄H₁₀; [75-28-5]

ORIGINAL MEASUREMENTS:

Skripka, V. G.; Nikitina, I. E.; Zhdanovich, L. A.; Sirotin, A. G.; Benyaminovich, O. A.
Gazov. Prom.
1970, 15, 35-36.

VARIABLES:

T/K: 253.2-273.2

P/MPa: 0.073-0.472

PREPARED BY:

C. L. Young

EXPERIMENTAL VALUES:									
T/K	P/10 ⁵ Pa	Mole fraction of propane in liquid, in gas, T/K		T/K	P/10 ⁵ Pa	Mole fraction of propane in liquid, in gas,			
		^x C ₃ H ₈	^y C ₃ H ₈			^x C ₃ H ₈	^y C ₃ H ₈		
63.41	3.34	0.055	0.299	71.11	22.13	0.854	0.957		
	4.94	0.142	0.526		23.29	0.886	0.968		
	5.73	0.186	0.590		24.29	0.928	0.980		
	7.25	0.270	0.696		25.29	0.964	0.990		
	7.93	0.303	0.724		26.00	0.982	0.995		
	8.94	0.358	0.765		87.77	5.82	0.051	0.230	
	9.67	0.396	0.792			8.05	0.138	0.455	
	12.56	0.546	0.864			11.33	0.258	0.640	
	15.52	0.695	0.919			12.26	0.292	0.669	
	17.67	0.788	0.946			13.78	0.346	0.722	
	19.10	0.849	0.962			14.97	0.390	0.752	
	20.18	0.890	0.972			19.22	0.536	0.831	
	20.94	0.924	0.982			23.85	0.689	0.896	
	21.94	0.963	0.991			27.31	0.788	0.924	
	22.35	0.982	0.996			29.68	0.846	0.946	
	71.11	4.00	0.054			0.281	31.17	0.886	0.957
		5.81	0.140			0.508	32.78	0.981	0.970
8.43		0.263	0.682	34.54		0.962	0.985		
9.15		0.306	0.709	35.28		0.981	0.993		
10.44		0.367	0.767	92.55		6.42	0.050	0.208	
13.60		0.506	0.842			8.77	0.135	0.435	
14.44		0.549	0.861			12.33	0.261	0.614	
17.54	0.676	0.905	15.00		0.352	0.697			
17.91	0.684	0.911	16.16		0.392	0.732			
(cont.)									
AUXILIARY INFORMATION									
METHOD/APPARATUS/PROCEDURE: Static equilibrium cell fitted with magnetically operated mixer which periodically sprays liquid into the vapor phase. Pressure transmitted through a transducer to a Bourdon gauge. Temperature measured with platinum resistance thermometer. Samples analysed by gas chromatography. Details in ref. 1.				SOURCE AND PURITY OF MATERIALS:					
				1. Fluka research grade purity 99.9 mole per cent.					
				2. Fluka research grade purity 99.98 mole per cent.					
				ESTIMATED ERROR: $\delta T/K = \pm 0.01$; $\delta P/10^5 Pa = \pm 0.05$; $\delta x_{C_3H_8}, \delta y_{C_3H_8} = \pm 1\%$.					
				REFERENCES: 1. Vejrosta, J.; Wichterle, I.; Wicar, S., <i>Coll. Czech. Chem. Comm.</i> , <u>1974</u> , 39, 206.					

COMPONENTS:				ORIGINAL MEASUREMENTS:				
(1) Propane; C ₃ H ₈ ; [74-98-6] (2) Pentane; C ₅ H ₁₂ ; [109-66-0]				Vejrosta, J.; Wichterle, I., <i>Coll. Czech. Chem. Comm.</i> , <u>1974</u> , 39, 1246-8.				
EXPERIMENTAL VALUES: (concluded)								
T/K	P/10 ⁵ Pa	Mole fraction of propane		T/K	P/10 ⁵ Pa	Mole fraction of propane		
		in liquid, x _{C₃H₈}	in gas, y _{C₃H₈}			in liquid, x _{C₃H₈}	in gas, y _{C₃H₈}	
92.55	19.01	0.488	0.790	94.52	35.76	0.903	0.955	
	25.23	0.667	0.872		36.63	0.923	0.964	
	29.46	0.777	0.916		37.66	0.938	0.970	
	31.96	0.840	0.938		100.00	13.84	0.251	0.576
	34.64	0.904	0.957		16.82	0.350	0.678	
	35.48	0.924	0.965		21.08	0.465	0.762	
	37.45	0.961	0.982		28.15	0.664	0.857	
	38.33	0.981	0.991		33.52	0.794	0.911	
	94.52	6.68	0.047		0.202	36.72	0.858	0.928
		9.07	0.133		0.431	39.09	0.902	0.945
16.68		0.396	0.724	40.76	0.932	0.960		
19.46		0.478	0.781	110.00	16.21	0.251	0.552	
26.00		0.665	0.868	19.62	0.343	0.644		
30.85		0.800	0.918	24.42	0.466	0.736		
32.96		0.843	0.934	32.67	0.658	0.833		
33.70		0.857	0.939	38.83	0.792	0.881		

COMPONENTS:				ORIGINAL MEASUREMENTS:			
(1) Propane; C ₃ H ₈ ; [74-98-6]				Kay, W. B.,			
(2) Pentane; C ₅ H ₁₂ ; [109-66-0]				<i>J. Chem. Eng. Data</i> <u>1970</u> , 15, 46-52.			
VARIABLES:				PREPARED BY:			
T/K: 321.35-457.35				C. L. Young			
P/MPa: 1.034-4.482							
EXPERIMENTAL VALUES:							
T/K	P/10 ⁵ Pa	Mole fraction of propane		T/K	P/10 ⁵ Pa	Mole fraction of propane	
		in liquid, in vapor, <i>x</i> _{C₃H₈}	<i>y</i> _{C₃H₈}			in liquid, in vapor, <i>x</i> _{C₃H₈}	<i>y</i> _{C₃H₈}
374.15	10.34	0.1470	-	356.85	13.79	0.3873	-
390.15	13.79	0.1470	-	369.85	17.24	0.3873	-
404.65	17.24	0.1470	-	381.55	20.68	0.3873	-
416.55	20.68	0.1470	-	392.25	24.13	0.3873	-
426.35	24.13	0.1470	-	401.45	27.58	0.3873	-
435.25	27.58	0.1470	-	409.95	31.03	0.3873	-
443.95	31.03	0.1470	-	417.95	34.47	0.3873	-
452.35	34.47	0.1470	-	425.95	37.92	0.3873	-
453.95	35.16	0.1470	-	434.35	41.37	0.3873	-
455.65	35.85	0.1470	-	436.45	42.06	0.3873	-
457.35	36.54	0.1470	-	364.05	6.89	-	0.3873
376.55	6.89	-	0.1470	379.95	10.34	-	0.3873
394.35	10.34	-	0.1470	391.65	13.79	-	0.3873
407.95	13.79	-	0.1470	401.25	17.24	-	0.3873
419.65	17.24	-	0.1470	409.85	20.68	-	0.3873
428.95	20.68	-	0.1470	417.15	24.13	-	0.3873
437.55	24.13	-	0.1470	424.35	27.58	-	0.3873
445.15	27.58	-	0.1470	430.05	31.03	-	0.3873
452.15	31.03	-	0.1470	435.15	34.47	-	0.3873
457.85	34.47	-	0.1470	439.65	37.92	-	0.3873
458.95	35.16	-	0.1470	441.55	41.37	-	0.3873
459.75	35.85	-	0.1470	440.85	42.06	-	0.3873
460.35	36.54	-	0.1470	321.35	10.34	0.6162	-
341.05	10.34	0.3873	-				(cont.)
AUXILIARY INFORMATION							
METHOD/APPARATUS/PROCEDURE:				SOURCE AND PURITY OF MATERIALS:			
Samples of known composition confined in thick-walled glass tube over mercury. Temperature measured with thermocouple and pressure with Bourdon gauge. Dew point and bubble point determined.				1. and 2. Phillips Petroleum sample, purity better than 99.9 mole per cent.			
				ESTIMATED ERROR:			
				$\delta T/K = \pm 0.02$; $\delta P/kPa = \pm 7$;			
				$\delta x_{C_3H_8}, \delta y_{C_3H_8} = \pm 0.0002$.			
				REFERENCES:			

COMPONENTS:				ORIGINAL MEASUREMENTS:			
(1) Propane; C ₃ H ₈ ; [74-98-6]				Kay, W. B.,			
(2) Pentane; C ₅ H ₁₂ ; [109-66-0]				<i>J. Chem. Eng. Data</i> <u>1970</u> , 15, 46-52.			
EXPERIMENTAL VALUES: (concluded)							
T/K	P/10 ⁵ Pa	Mole fraction of propane		T/K	P/10 ⁵ Pa	Mole fraction of propane	
		in liquid, $x_{C_3H_8}$	in vapor, $y_{C_3H_8}$			in liquid, $x_{C_3H_8}$	in vapor, $y_{C_3H_8}$
335.45	13.79	0.6162	-	395.95	44.82	0.7862	-
347.65	17.24	0.6162	-	344.35	10.34	-	0.7862
358.45	20.68	0.6162	-	354.75	13.79	-	0.7862
368.25	24.13	0.6162	-	363.35	17.24	-	0.7862
376.65	27.58	0.6162	-	370.65	20.68	-	0.7862
384.65	31.03	0.6162	-	377.15	24.13	-	0.7862
391.95	34.47	0.6162	-	382.95	27.58	-	0.7862
399.35	37.92	0.6162	-	388.35	31.03	-	0.7862
406.05	41.37	0.6162	-	393.05	34.47	-	0.7862
413.95	44.82	0.6162	-	397.15	37.92	-	0.7862
353.25	6.89	-	0.6162	400.25	41.37	-	0.7862
366.65	10.34	-	0.6162	401.65	44.82	-	0.7862
376.35	13.79	-	0.6162	330.05	17.24	0.8778	-
384.75	17.24	-	0.6162	339.45	20.68	0.8778	-
391.35	20.68	-	0.6162	347.65	24.13	0.8778	-
397.75	24.13	-	0.6162	355.35	27.58	0.8778	-
407.95	31.03	-	0.6162	362.35	31.03	0.8778	-
412.55	34.47	-	0.6162	368.55	34.47	0.8778	-
416.35	37.92	-	0.6162	374.45	37.92	0.8778	-
419.35	41.37	-	0.6162	380.25	41.37	0.8778	-
419.95	44.82	-	0.6162	386.55	44.82	0.8778	-
325.35	13.79	0.7862	-	352.85	17.24	-	0.8778
336.65	17.24	0.7862	-	359.45	20.68	-	0.8778
346.35	20.68	0.7862	-	365.35	24.13	-	0.8778
354.75	24.13	0.7862	-	370.15	27.58	-	0.8778
362.45	27.58	0.7862	-	375.25	31.03	-	0.8778
369.65	31.03	0.7862	-	379.65	34.47	-	0.8778
376.35	34.47	0.7862	-	383.65	37.92	-	0.8778
382.95	37.92	0.7862	-	387.05	41.37	-	0.8778
389.05	41.37	0.7862	-	388.65	44.82	-	0.8778

COMPONENTS:				ORIGINAL MEASUREMENTS:			
(1) Propane; C ₃ H ₈ ; [74-98-6]				Kay, W. B.; Genco, J.;			
(2) Octane; C ₈ H ₁₈ ; [111-65-9]				Fichtner, D. A.,			
				<i>J. Chem. Eng. Data</i> <u>1974</u> , <i>19</i> ,			
				275-280.			
EXPERIMENTAL VALUES: (concluded)							
T/K	P/10 ⁵ Pa	Mole fraction of propane		T/K	P/10 ⁵ Pa	Mole fraction of propane	
		in liquid, in vapor,				in liquid, in vapor,	
		<i>x</i> _{C₃H₈}	<i>y</i> _{C₃H₈}			<i>x</i> _{C₃H₈}	<i>y</i> _{C₃H₈}
385.65	27.58	0.5729	-	492.05	48.26	-	0.7175
407.15	31.03	0.5729	-	489.65	51.71	-	0.7175
417.35	34.47	0.5729	-	485.15	55.16	-	0.7175
427.45	37.92	0.5729	-	481.45	56.54	-	0.7175
437.65	41.37	0.5729	-	475.95	57.92	-	0.7175
447.65	44.82	0.5729	-	342.15	20.68	0.8640	-
458.15	48.26	0.5729	-	351.65	24.13	0.8640	-
469.65	51.71	0.5729	-	359.85	27.58	0.8640	-
475.15	53.09	0.5729	-	367.55	31.03	0.8640	-
478.15	53.78	0.5729	-	374.55	34.47	0.8640	-
498.65	53.78	0.5729	-	381.75	37.92	0.8640	-
481.65	54.47	0.5729	-	387.95	41.37	0.8640	-
495.15	54.47	0.5729	-	394.65	44.82	0.8640	-
488.45	54.05	0.5729	-	401.15	48.26	0.8640	-
479.15	17.24	-	0.5729	408.05	51.71	0.8640	-
487.65	20.68	-	0.5729	416.15	55.16	0.8640	-
495.15	24.13	-	0.5729	420.85	56.54	0.8640	-
500.65	27.58	-	0.5729	437.65	24.13	-	0.8640
505.15	31.03	-	0.5729	441.95	27.58	-	0.8640
508.65	34.47	-	0.5729	445.65	31.03	-	0.8640
511.65	37.92	-	0.5729	448.65	34.44	-	0.8640
512.85	41.37	-	0.5729	450.95	37.92	-	0.8640
513.15	44.82	-	0.5729	452.45	41.37	-	0.8640
511.35	48.26	-	0.5729	452.65	44.82	-	0.8640
505.65	51.71	-	0.5729	452.65	48.26	-	0.8640
502.15	53.09	-	0.5729	451.55	51.71	-	0.8640
329.15	13.79	0.7175	-	449.25	55.16	-	0.8640
343.65	17.24	0.7175	-	447.65	56.54	-	0.8640
356.65	20.68	0.7175	-	443.15	57.92	-	0.8640
367.45	24.13	0.7175	-	438.15	57.92	-	0.8640
377.15	27.58	0.7175	-	435.95	58.47	-	0.8640
386.15	31.03	0.7175	-	334.75	20.68	0.9589	-
394.35	34.47	0.7175	-	343.15	24.13	0.9589	-
402.65	37.92	0.7175	-	350.25	27.58	0.9589	-
410.65	41.37	0.7175	-	356.65	31.03	0.9589	-
418.75	44.82	0.7175	-	362.95	34.44	0.9589	-
427.15	48.26	0.7175	-	369.05	37.92	0.9589	-
435.35	51.71	0.7175	-	374.95	41.37	0.9589	-
444.25	55.16	0.7175	-	380.55	44.82	0.9589	-
449.15	56.54	0.7175	-	387.15	48.26	0.9589	-
455.45	57.92	0.7175	-	388.15	24.13	-	0.9589
458.65	58.61	0.7175	-	395.75	31.03	-	0.9589
471.15	58.61	0.7175	-	400.65	34.44	-	0.9589
466.35	58.94	0.7175	-	403.15	37.92	-	0.9589
450.15	13.79	-	0.7175	404.95	41.37	-	0.9589
458.75	17.24	-	0.7175	405.05	44.82	-	0.9589
466.15	20.68	-	0.7175	403.55	48.26	-	0.9589
472.15	24.13	-	0.7175	403.15	48.95	-	0.9589
478.15	27.58	-	0.7175	391.25	49.64	-	0.9589
484.15	31.03	-	0.7175	402.35	49.64	-	0.9589
488.75	34.47	-	0.7175	393.45	50.33	-	0.9589
491.65	37.92	-	0.7175	401.15	50.33	-	0.9589
492.75	41.37	-	0.7175	398.05	50.91	-	0.9589
492.75	44.82	-	0.7175				

EXPERIMENTAL VALUES:							
T/K	P/10 ⁵ Pa	Mole fraction of propane in liquid, in vapor,		T/K	P/10 ⁵ Pa	Mole fraction of propane in liquid, in vapor,	
		^x C ₃ H ₈	^y C ₃ H ₈			^x C ₃ H ₈	^y C ₃ H ₈
371.15	6.89	0.2143	-	422.65	20.68	0.3306	-
400.65	10.34	0.2143	-	439.15	24.13	0.3306	-
426.15	13.79	0.2143	-	454.65	27.58	0.3306	-
447.15	17.24	0.2143	-	469.15	31.03	0.3306	-
467.15	20.68	0.2143	-	483.15	34.47	0.3306	-
483.15	24.13	0.2143	-	497.15	37.92	0.3306	-
500.15	27.58	0.2143	-	512.05	41.37	0.3306	-
515.65	31.03	0.2143	-	515.85	42.06	0.3306	-
531.15	34.47	0.2143	-	533.65	42.06	0.3306	-
535.15	35.16	0.2143	-	520.15	42.75	0.3306	-
539.65	35.85	0.2143	-	531.15	42.75	0.3306	-
547.15	35.85	0.2143	-	526.15	43.21	0.3306	-
543.15	36.25	0.2143	-	516.65	20.68	-	0.3306
520.55	17.24	-	0.2143	524.15	24.13	-	0.3306
530.15	20.68	-	0.2143	530.65	27.58	-	0.3306
538.85	24.13	-	0.2143	536.15	31.03	-	0.3306
545.65	27.58	-	0.2143	539.65	34.47	-	0.3306
550.45	31.03	-	0.2143	539.65	37.92	-	0.3306
549.85	34.47	-	0.2143	535.65	41.37	-	0.3306
549.15	35.16	-	0.2143	344.95	13.79	0.5729	-
365.65	10.34	0.3306	-	360.15	17.24	0.5729	-
386.15	13.79	0.3306	-	373.65	20.68	0.5729	-
405.65	17.24	0.3306	-	385.15	24.13	0.5729	-

(cont.)

AUXILIARY INFORMATION	
<p>METHOD / APPARATUS / PROCEDURE:</p> <p>Samples of known composition confined in thick-walled glass tube over mercury. Temperature measured with thermocouple and pressure with Bourdon gauge. Dew point and bubble point determined.</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <p>1. and 2. Phillips Petroleum samples purity better than 99.9 mole per cent.</p>
	<p>ESTIMATED ERROR:</p> <p>$\delta T/K = \pm 0.02$; $\delta P/10^5 Pa = \pm 0.07$;</p> <p>$\delta x_{C_3H_8}, \delta y_{C_3H_8} = \pm 0.0002$.</p>
	<p>REFERENCES:</p>

EXPERIMENTAL VALUES:			Mole fraction of propane in liquid, $x_{C_3H_8}$		in vapor, $y_{C_3H_8}$	
T/K (t/°F)	P/psi	P/MPa				
277.59 (40)	25 50 75	0.172 0.345 0.517	0.3042 0.6172 0.9463		0.9996 0.9998 0.9999	
310.93 (100)	50 100 150	0.345 0.689 1.03	0.2973 0.5746 0.8253		0.9979 0.9989 0.9996	
344.26 (160)	50 100 150 200 300	0.345 0.689 1.03 1.38 2.07	0.1652 0.3178 0.4584 0.5899 0.8275		0.9910 0.9948 0.9961 0.9969 0.9985	
377.59 (220)	50 100 150 200 300 400 600 678 ^a 618 ^b	0.345 0.689 1.03 1.38 2.07 2.76 4.14 4.67 4.26	0.1077 0.2110 0.3070 0.3971 0.5591 0.7003 0.9167 0.9870 -		0.9652 0.9810 0.9863 0.9890 0.9915 0.9923 0.9929 0.9870 0.993	
(cont.)						
AUXILIARY INFORMATION						
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:			
<p>PVT cell charged with mixture of known composition. Pressure measured with pressure balance. Temperature measured using resistance thermometer. Bubble and dew points determined for various compositions. Co-existing liquid and gas phase properties determined by graphical means. Details in ref. (1).</p>			<p>1. Phillips Petroleum research grade sample, purity 99.6 mole per cent.</p> <p>2. Phillips Petroleum Co. sample, purity 99.38 mole per cent.</p>			
			ESTIMATED ERROR:			
			<p>$\delta T/K = \pm 0.05$; $\delta P/MPa = \pm 0.01$; $\delta x_{C_3H_8}, \delta y_{C_3H_8} = \pm 0.003$</p>			
			REFERENCES:			
			<p>1. Sage, B. H.; Lacey, W. N.; <i>Trans. Inst. Mining Met. Engrs.</i> <u>1940, 136, 136.</u></p>			

COMPONENTS:

(1) Propane; C_3H_8 ; [74-98-6]

(2) Decane; $C_{10}H_{22}$; [124-18-5]

ORIGINAL MEASUREMENTS:

Reamer, H. H.; Sage, B. H.
J. Chem. Eng. Data
1966, 11, 17-24.

VARIABLES:

T/K: 277.6-510.9

P/MPa: 0.172-7.09

PREPARED BY:

C. L. Young

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Propane; C ₃ H ₈ ; [74-98-6]	Reamer, H. H.; Sage, B. H.
(2) Decane; C ₁₀ H ₂₂ ; [124-18-5]	<i>J. Chem. Eng. Data</i> 1966, 11, 17-24.

EXPERIMENTAL VALUES: (concluded)

T/K (t/°F)	P/psi	P/MPa	Mole fraction of propane	
			in liquid, $x_{C_3H_8}$	in vapor, $y_{C_3H_8}$
410.93 (280)	50	0.345	0.0732	0.8903
	100	0.689	0.1488	0.9403
	150	1.03	0.2195	0.9571
	200	1.38	0.2856	0.9654
	300	2.07	0.4057	0.9737
	400	2.76	0.5139	0.9766
	600	4.14	0.7023	0.9770
	800	5.52	0.8629	0.9671
	873 ^a	6.02	0.9283	0.9283
	622 ^b	4.29	-	0.977
444.26 (340)	50	0.345	0.0459	0.7147
	100	0.689	0.1051	0.8469
	150	1.03	0.1606	0.8914
	200	1.38	0.2128	0.9128
	300	2.07	0.3099	0.9343
	400	2.76	0.3988	0.9427
	600	4.14	0.5595	0.9463
	800	5.52	0.7043	0.9420
	980 ^a	6.76	0.8673	0.8673
	628 ^b	4.33	-	0.946
477.59 (400)	50	0.345	0.0190	0.3637
	100	0.689	0.0679	0.6647
	150	1.03	0.1144	0.7645
	200	1.38	0.1588	0.8145
	300	2.07	0.2419	0.8624
	400	2.76	0.3188	0.8827
	600	4.14	0.4615	0.8990
	800	5.52	0.5988	0.8945
	1000 ^a	6.89	0.7450	0.8456
	1028 ^b	7.09	0.7993	0.7993
640 ^b	4.41	-	0.900	
510.93 (460)	100	0.689	0.0311	0.3382
	150	1.03	0.0731	0.5416
	200	1.38	0.1136	0.6432
	300	2.07	0.1890	0.7379
	400	2.76	0.2586	0.7803
	600	4.14	0.3867	0.8129
	800	5.52	0.5168	0.8104
	988 ^a	6.81	0.7120	0.7120
	650 ^b	4.48	-	0.814

^a Estimated critical state.

^b Estimated maxcondentherm.

EXPERIMENTAL VALUES:							
T/K	T/°F	P/MPa (P/psi)	Mole fraction of butane in liquid, $x_{C_4H_{10}}$	T/K	T/°F	P/MPa (P/psi)	Mole fraction of butane in liquid, $x_{C_4H_{10}}$
454.26	358.0	0.689	0.000	422.76	301.3	1.379	0.40
449.3	349	(100)	0.02	410.15	278.6	(200)	0.50
444.54	340.5		0.04	399.21	258.9		0.60
439.54	331.5		0.06	389.26	241.0		0.70
430.4	315		0.10	380.65	225.5		0.80
419.8	296		0.15	373.26	212.2		0.90
410.09	278.5		0.20	367.93	202.6		1.00
393.1	248		0.30	521.04	478.2	2.068	0.00
379.54	223.5		0.40	517.59	472.0	(300)	0.02
368.7	204		0.50	514.09	465.7		0.04
359.8	188		0.60	510.43	459.1		0.06
351.92	173.8		0.70	503.32	446.3		0.10
344.54	160.5		0.80	494.26	430.0		0.15
339.26	151.0		0.90	485.48	414.2		0.20
336.48	146.0		1.00	468.43	383.5		0.30
494.65	430.7	1.379	0.00	452.59	355.0		0.40
490.37	423.0	(200)	0.02	438.26	329.2		0.50
486.48	416.0		0.04	425.93	307.0		0.60
482.37	408.6		0.06	415.26	287.8		0.70
474.43	394.3		0.10	405.37	270.0		0.80
464.59	376.6		0.15	396.48	254.0		0.90
455.09	359.5		0.20	389.26	241.0		1.00
437.82	328.4		0.30			(cont.)	
AUXILIARY INFORMATION							
METHOD/APPARATUS/PROCEDURE:				SOURCE AND PURITY OF MATERIALS:			
Samples of known composition confined in thick-walled glass tube over mercury. Temperature measured with thermocouple and pressure with Bourdon gauge. Dew point and bubble point determined. Details in ref. (1).				1 and 2. Samples purified by distillation and dried. Final purities probably about 99.5 mole per cent.			
				ESTIMATED ERROR: $\delta T/K = \pm 0.02$; $\delta P/MPa = \pm 0.007$; $\delta x_{C_4H_{10}}$, $\delta y_{C_4H_{10}} = \pm 0.002$ (estimated by compiler).			
				REFERENCES: 1. Kay, W. B. <i>Ind. Eng. Chem.</i> <u>1938</u> , 30, 459.			

COMPONENTS:				ORIGINAL MEASUREMENTS:			
(1) Butane; C_4H_{10} ; [106-97-8]				Kay, W. B.			
(2) Heptane; C_7H_{16} ; [142-82-5]				<i>Ind. Eng. Chem.</i>			
				1941, 33, 590-594.			
EXPERIMENTAL VALUES: (cont.)							
T/K	T/°F	P/MPa (P/psi)	Mole fraction of butane in liquid, $x_{C_4H_{10}}$	T/K	T/°F	P/MPa (P/psi)	Mole fraction of butane in liquid, $x_{C_4H_{10}}$
539.71	511.8	2.758	0.011	441.37	334.8	3.447	0.80
535.37	504.0	(400)	0.04	429.76	313.9	(500)	0.90
532.09	498.1		0.06	425.32	305.9		1.00
525.93	487.0		0.10	500.15	440.6	3.792	0.465
517.59	472.0		0.15	493.71	429.0	(550)	0.50
509.26	457.0		0.20	485.09	413.5		0.55
492.32	426.5		0.30	477.04	399.0		0.60
476.09	397.3		0.40	462.65	373.1		0.70
461.21	370.5		0.50	449.54	349.5		0.80
448.15	347.0		0.60	436.71	326.4		0.90
436.15	325.4		0.70	425.37	306.0		1.00
424.71	304.8		0.80	488.15	419.0	3.964	0.573
414.26	286.0		0.90	482.76	409.3	(575)	0.60
405.93	271.0		1.00	474.82	395.0		0.65
515.93	469.0	3.447	0.30	467.26	381.4		0.70
506.54	452.1	(500)	0.35	453.53	356.7		0.80
497.59	436.0		0.40	440.93	334.0		0.90
481.54	407.1		0.50	438.43	329.5		0.92
467.32	381.5		0.60	436.04	325.2		0.94
453.76	357.1		0.70	435.93	325.0		0.945
			Mole fraction of butane in vapor, $y_{C_4H_{10}}$				Mole fraction of butane in vapor, $y_{C_4H_{10}}$
448.43	347.5	0.689	0.10	494.93	431.2	2.068	0.30
442.15	336.2	(100)	0.20	485.54	414.3	(300)	0.40
435.65	324.5		0.30	475.65	396.5		0.50
428.71	312.0		0.40	464.54	376.5		0.60
421.37	298.8		0.50	451.98	353.9		0.70
412.71	283.2		0.60	437.09	327.1		0.80
402.59	265.0		0.70	428.15	311.0		0.85
389.26	241.0		0.80	417.59	292.0		0.90
380.65	225.5		0.85	412.71	283.2		0.92
370.43	207.1		0.90	407.59	274.0		0.94
365.93	199.0		0.92	402.04	264.0		0.96
360.93	190.0		0.94	395.93	253.0		0.98
354.98	179.3		0.96	392.65	247.1		0.99
347.59	166.0		0.98	530.82	495.8	2.758	0.10
342.71	157.2		0.99	521.21	478.5	(400)	0.20
487.54	417.9	1.379	0.10	511.48	461.0		0.30
479.93	404.2	(200)	0.20	501.32	442.7		0.40
472.04	390.0		0.30	490.48	423.2		0.50
463.76	375.1		0.40	478.87	402.3		0.60
454.82	359.0		0.50	465.93	379.0		0.70
444.54	340.5		0.60	450.43	351.1		0.80
432.59	319.0		0.70	441.48	335.0		0.85
418.71	294.0		0.80	431.15	316.4		0.90
410.04	278.4		0.85	426.59	308.2		0.92
399.54	259.5		0.90	421.76	299.5		0.94
394.76	250.9		0.92	416.65	290.3		0.96
389.26	241.0		0.94	411.48	281.0		0.98
383.15	230.0		0.96	405.93	271.0		0.99
375.93	217.0		0.98	516.93	470.8	3.447	0.31
372.04	210.0		0.99	516.71	470.4	(500)	0.32
512.65	463.1	2.068	0.10				
504.09	447.7	(300)	0.20				(cont.)

COMPONENTS:				ORIGINAL MEASUREMENTS:			
(1) Butane; C_4H_{10} ; [106-97-8]				Kay, W. B.			
(2) Heptane; C_7H_{16} ; [142-82-5]				<i>Ind. Eng. Chem.</i>			
				<u>1941</u> , 33, 590-594.			
EXPERIMENTAL VALUES: (concluded)							
T/K	T/°F	P/MPa (P/psi)	Mole fraction of butane in vapor, $y_{C_4H_{10}}$	T/K	T/°F	P/MPa (P/psi)	Mole fraction of butane in vapor, $y_{C_4H_{10}}$
515.76	468.7	3.447	0.34	478.15	401.0	3.792	0.70
514.32	466.1	(500)	0.36	462.82	373.4	(550)	0.80
510.59	459.4		0.40	453.71	357.0		0.85
500.37	441.0		0.50	444.21	339.9		0.90
488.37	419.4		0.60	434.65	322.7		0.95
475.26	395.8		0.70	488.26	419.2	3.964	0.584
459.59	367.6		0.80	487.98	418.7	(575)	0.60
440.43	333.1		0.90	485.98	415.1		0.63
430.04	314.4		0.95	483.21	410.1		0.66
500.32	440.9	3.792	0.469	478.65	401.9		0.70
500.32	440.9	(550)	0.48	471.59	389.2		0.75
499.71	439.8		0.50	463.59	374.8		0.80
497.76	436.3		0.53	454.82	359.0		0.85
495.04	431.4		0.56	445.43	342.1		0.90
490.82	423.8		0.60	437.59	328.0		0.94

COMPONENTS: (1) Butane; C ₄ H ₁₀ ; [106-97-8] (2) Octane; C ₈ H ₁₈ ; [111-65-9]	ORIGINAL MEASUREMENTS: Kay, W. B.; Genco, J.; Fichtner, D. A. <i>J. Chem. Eng. Data</i> 1974, 19, 275-280.
VARIABLES: T/K: 339.5-555.5 P/MPa: 0.689-4.309	PREPARED BY: C. L. Young

EXPERIMENTAL VALUES:

T/K	P/psi	P/MPa	Mole fraction of butane in liquid, $x_{C_4H_{10}}$	in vapor, $y_{C_4H_{10}}$
426.9	100	0.689	0.1823	-
455.9	150	1.034	0.1823	-
478.3	200	1.379	0.1823	-
496.5	250	1.724	0.1823	-
512.1	300	2.068	0.1823	-
526.7	350	2.413	0.1823	-
539.7	400	2.758	0.1823	-
545.0	420	2.896	0.1823	-
547.7	430	2.965	0.1823	-
550.9	440	3.034	0.1823	-
537.9	300	2.068	-	0.1823
546.2	350	2.413	-	0.1823
553.7	400	2.758	-	0.1823
555.5	420	2.896	-	0.1823
555.5	430	2.965	-	0.1823
554.2	440	3.034	-	0.1823
375.9	100	0.689	0.4631	-
400.4	150	1.034	0.4631	-
420.0	200	1.379	0.4631	-
436.8	250	1.724	0.4631	-
451.5	300	2.068	0.4631	-
465.3	350	2.413	0.4631	-
478.0	400	2.758	0.4631	-

(cont.)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE: Samples of known composition confined in thick-walled glass tube over mercury. Temperature measured with thermocouple and pressure with Bourdon gauge. Dew point and bubble point determined.	SOURCE AND PURITY OF MATERIALS: 1 and 2. Phillips Petroleum samples, purity better than 99.9 mole per cent.
	ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta P/MPa = \pm 0.007$; $\delta x_{C_4H_{10}}, \delta y_{C_4H_{10}} = \pm 0.0002$.
	REFERENCES:

COMPONENTS:			ORIGINAL MEASUREMENTS:	
(1) Butane; C_4H_{10} ; [106-97-8]			Kay, W. B.; Genco, J.;	
(2) Octane; C_8H_{18} ; [111-65-9]			Fichtner, D. A.	
			<i>J. Chem. Eng. Data</i>	
			<u>1974</u> , 19, 275-280.	
EXPERIMENTAL VALUES: (cont.)				
T/K	P/psi	P/MPa	Mole fraction of butane in liquid, $x_{C_4H_{10}}$	Mole fraction of butane in vapor, $y_{C_4H_{10}}$
490.0	450	3.103	0.4631	-
501.9	500	3.447	0.4631	-
506.8	520	3.585	0.4631	-
512.0	540	3.723	0.4631	-
514.7	550	3.792	0.4631	-
516.4	555	3.827	0.4631	-
518.7	560	3.861	0.4631	-
515.2	300	2.068	-	0.4631
519.8	350	2.413	-	0.4631
524.0	400	2.758	-	0.4631
527.3	450	3.103	-	0.4631
529.5	500	3.447	-	0.4631
529.6	520	3.585	-	0.4631
528.4	540	3.723	-	0.4631
526.7	550	3.792	-	0.4631
525.1	555	3.827	-	0.4631
523.2	560	3.861	-	0.4631
354.5	100	0.689	0.6709	-
376.4	150	1.034	0.6709	-
393.6	200	1.379	0.6709	-
408.2	250	1.724	0.6709	-
421.2	300	2.068	0.6709	-
432.9	350	2.413	0.6709	-
443.7	400	2.758	0.6709	-
453.8	450	3.103	0.6709	-
463.7	500	3.447	0.6709	-
473.4	550	3.792	0.6709	-
484.1	600	4.137	0.6709	-
486.4	610	4.206	0.6709	-
487.7	615	4.240	0.6709	-
487.3	300	2.068	-	0.6709
491.9	350	2.413	-	0.6709
495.8	400	2.758	-	0.6709
499.4	450	3.103	-	0.6709
501.4	500	3.447	-	0.6709
502.6	550	3.792	-	0.6709
500.7	600	4.137	-	0.6709
499.0	610	4.206	-	0.6709
497.1	615	4.240	-	0.6709
347.0	100	0.689	0.8183	-
366.5	150	1.034	0.8183	-
382.0	200	1.379	0.8183	-
394.8	250	1.724	0.8183	-
406.7	300	2.068	0.8183	-
417.0	350	2.413	0.8183	-
426.7	400	2.758	0.8183	-
435.6	450	3.103	0.8183	-
444.1	500	3.447	0.8183	-
452.5	550	3.792	0.8183	-
461.7	600	4.137	0.8183	-
463.7	610	4.206	0.8183	-
466.2	620	4.275	0.8183	-
468.2	625	4.309	0.8183	-
(cont.)				

COMPONENTS:			ORIGINAL MEASUREMENTS:	
(1) Butane; C ₄ H ₁₀ ; [106-97-8]			Kay, W. B.; Genco, J.;	
(2) Octane; C ₈ H ₁₈ ; [111-65-9]			Fichtner, D. A.	
			<i>J. Chem. Eng. Data</i>	
			1974, 19, 275-280.	
EXPERIMENTAL VALUES: (concluded)				
T/K	P/psi	P/MPa	Mole fraction of butane in liquid, $x_{C_4H_{10}}$	in vapor, $y_{C_4H_{10}}$
457.0	300	2.068	-	0.8183
463.6	350	2.413	-	0.8183
469.1	400	2.758	-	0.8183
473.4	450	3.103	-	0.8183
476.4	500	3.447	-	0.8183
478.6	550	3.792	-	0.8183
478.6	600	4.137	-	0.8183
478	610	4.206	-	0.8183
406	620	4.275	-	0.8183
474.2	625	4.309	-	0.8183
339.5	100	0.689	0.9461	-
357.7	150	1.034	0.9461	-
371.9	200	1.379	0.9461	-
383.8	250	1.724	0.9461	-
394.3	300	2.068	0.9461	-
403.5	350	2.413	0.9461	-
412.0	400	2.758	0.9461	-
419.7	450	3.103	0.9461	-
426.9	500	3.447	0.9461	-
433.8	550	3.792	0.9461	-
436.6	570	3.930	0.9461	-
438.3	580	3.999	0.9461	-
439.5	585	4.033	0.9461	-
440.0	587.3	4.049	0.9461	-
440.7	588.5	4.058	0.9461	-
441.9	589.8	4.067	0.9461	-
424.8	350	2.413	-	0.9461
431.7	400	2.758	-	0.9461
437.1	450	3.103	-	0.9461
440.6	500	3.447	-	0.9461
442.6	550	3.792	-	0.9461
443.4	570	3.930	-	0.9461
443.6	580	3.999	-	0.9461
443.2	585	4.033	-	0.9461
440.0	587.3	4.049	-	0.9461

COMPONENTS:			ORIGINAL MEASUREMENTS:		
(1) Butane; C_4H_{10} ; [106-97-8]			Reamer, H. H.; Sage, B. H.;		
(2) Decane; $C_{10}H_{22}$; [124-18-5]			Lacey, W. N.		
			<i>Ind. Eng. Chem.</i>		
			<u>1946</u> , 38, 986-989.		
VARIABLES:			PREPARED BY:		
T/K: 310.9-510.9			C. L. Young		
P/kPa: 0-4.83					
EXPERIMENTAL VALUES:					
Smoothed data					
T/K (T/°F)	P/MPa	P/psi	Molar volumes		Mole fraction
			/cm ³ mol ⁻¹ /ft ³ (lb mol) ⁻¹		of butane,
					C_4H_{10}
310.93 (100)	0.0005	0.07	198.3	3.176	0.0
	0.036	5.1	188.3	3.017	0.1
	0.070	10.1	178.5	2.860	0.2
	0.104	15.1	168.9	2.706	0.3
	0.139	20.1	159.2	2.550	0.4
	0.173	25.1	149.7	2.398	0.5
	0.208	30.2	140.4	2.249	0.6
	0.244	35.4	131.3	2.103	0.7
	0.281	40.7	122.4	1.961	0.8
	0.318	46.1	113.5	1.818	0.9
	0.355	51.5	104.3	1.671	1.0
344.26 (160)	0.0028	0.40	205.5	3.292	0.0
	0.083	12.1	195.1	3.126	0.1
	0.164	23.8	185.2	2.966	0.2
	0.243	35.3	175.3	2.808	0.3
	0.321	46.6	165.6	2.652	0.4
	0.400	58.0	156.3	2.503	0.5
	0.479	69.5	147.1	2.357	0.6
	0.561	81.4	138.4	2.217	0.7
	0.647	93.9	129.7	2.078	0.8
	0.738	107.0	121.4	1.944	0.9
	0.832	120.6	113.2	1.813	1.0
(cont.)					
AUXILIARY INFORMATION					
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:		
PVT cell charged with mixture of known composition. Bubble and dew points determined for various compositions. Temperature measured with platinum resistance thermometer, pressure measured with pressure balance. Liquid compositions determined by graphical means. Details in source and ref. (1).			1. Obtained from Phillips Petroleum Co. Analyses indicate less than 0.3 mole per cent 2-methylpropane and negligible amounts of other impurities.		
			2. Mixture of isomers.		
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.02$; $\delta P/psi = \pm 3\%$;		
			$\delta x_{C_4H_{10}} = \pm 0.01$ (estimated by compiler).		
			REFERENCES:		
			1. Sage, B. H.; Lacey, W. N.		
			<i>Trans. Am. Inst. Mining Met. Engrs.</i>		
			<u>1940</u> , 136, 136.		

COMPONENTS:			ORIGINAL MEASUREMENTS:			
(1) Butane; C_4H_{10} ; [106-97-8]			Reamer, H. H.; Sage, B. H.;			
(2) Decane; $C_{10}H_{22}$; [124-18-5]			Lacey, W. N.			
			<i>Ind. Eng. Chem.</i>			
			<u>1946</u> , 38, 986-989.			
EXPERIMENTAL VALUES: (concluded)						
T/K (T/°F)	P/MPa	P/psi	Molar volumes		Mole fraction of butane, $x_{C_4H_{10}}$	
			/cm ³ mol ⁻¹	/ft ³ (lb mol) ⁻¹		
377.59 (220)	0.011	1.59	213.7	3.423	0.0	
	0.157	22.8	203.1	3.254	0.1	
	0.305	44.3	192.8	3.089	0.2	
	0.454	65.9	182.7	2.927	0.3	
	0.603	87.5	173.0	2.771	0.4	
	0.752	109.1	163.7	2.622	0.5	
	0.905	131.2	155.0	2.483	0.6	
	1.067	154.8	146.9	2.353	0.7	
	1.246	180.7	139.3	2.231	0.8	
	1.443	209.3	132.4	2.121	0.9	
	1.663	241.2	126.6	2.028	1.0	
	410.93 (280)	0.035	5.1	222.9	3.571	0.0
		0.259	37.5	212.6	3.406	0.1
0.486		70.5	202.5	3.243	0.2	
0.723		104.8	192.7	3.087	0.3	
0.969		140.5	183.3	2.936	0.4	
1.229		178.2	174.2	2.790	0.5	
1.509		218.8	165.6	2.652	0.6	
1.813		263	157.8	2.527	0.7	
2.151		312	151.6	2.429	0.8	
2.544		369	149.3	2.391	0.9	
3.006		436	156.1	2.501	1.0	
444.26 (340)		0.093	13.5	233.6	3.742	0.0
		0.407	59.0	224.1	3.589	0.1
	0.735	106.6	214.8	3.440	0.2	
	1.084	157.2	205.5	3.291	0.3	
	1.456	211.2	196.5	3.147	0.4	
	1.855	269	187.8	3.009	0.5	
	2.282	331	180.3	2.888	0.6	
	2.772	402	174.2	2.791	0.7	
	3.316	481	171.7	2.751	0.8	
	3.94	571	178.2	2.854	0.9	
	477.59 (400)	0.215	31.2	247.3	3.962	0.0
		0.623	90.3	238.1	3.814	0.1
		1.064	154.3	229.0	3.669	0.2
1.531		222.0	220.1	3.526	0.3	
2.05		297	211.8	3.393	0.4	
2.61		379	204.7	3.279	0.5	
3.22		467	200.1	3.205	0.6	
3.87		562	350.8	3.201	0.7	
4.53		657	214.2	3.431	0.8	
510.93 (460)		0.446	64.7	264.0	4.229	0.0
		0.948	137.5	255.1	4.087	0.1
		1.486	215.5	247.2	3.959	0.2
		2.08	301	239.8	3.841	0.3
	2.72	395	234.0	3.748	0.4	
	3.42	496	230.7	3.695	0.5	
	4.15	602	232.5	3.724	0.6	
	4.83	700	249.8	4.002	0.7	