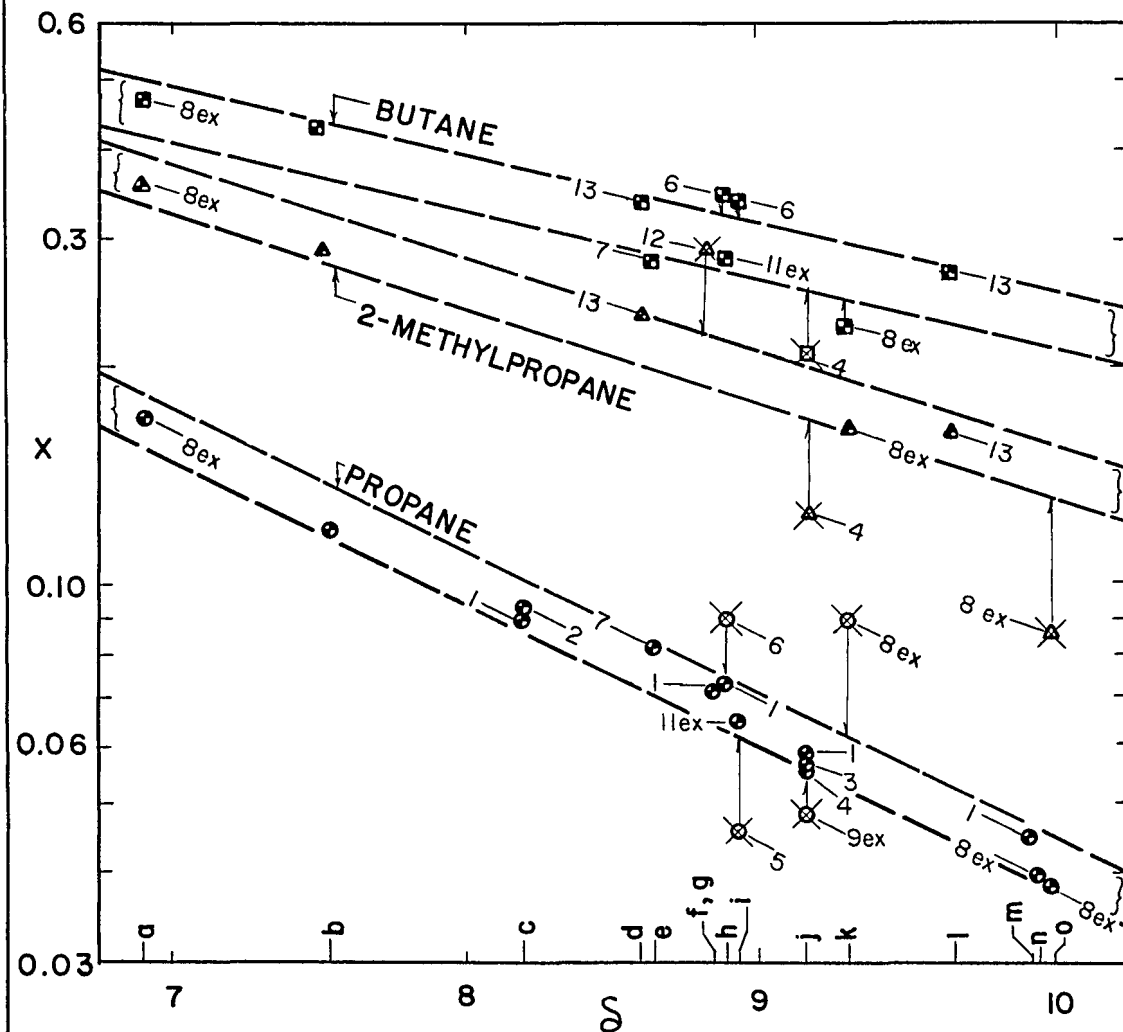


COMPONENTS:	EVALUATOR:
(1) Propane; C_3H_8 ; [74-98-6] Butane; C_4H_{10} ; [106-97-8] 2-Methylpropane; C_4H_{10} ; [75-28-5]	Walter Hayduk Department of Chemical Engineering University of Ottawa Ottawa, Canada K1N 9B4
(2) Non-polar solvents excluding alkanes and organohalides	March, 1984

CRITICAL EVALUATION:

The solubilities of *propane*, *butane* and *2-methylpropane* in non-polar solvents excluding the alkanes and organohalides (dealt with elsewhere in this volume) were tested for consistency using solvent solubility parameters (14). The source of the solubility parameters was mainly that prepared by Martin (15). The consistency test involved plotting the mole fraction solubility on a logarithmic scale as a function of solubility parameter. For solvents which form regular solutions with the solute gases, a consistent relation is expected for each gas. While not expected to indicate the accuracy of particular solubilities, the consistency test is considered helpful in revealing major deviations from normal solubility behavior and hence possible major errors. The diagram below shows the mole fraction solubility at 298.15 K and a gas partial pressure of 101.325 kPa, x , for the three gases as a function of the solvent solubility parameter, δ . When extrapolation was required to a temperature of 298.15 K, "ex" is shown on the diagram next to the reference number. For comparison, the solubility in normal octane, as estimated from data or equations

Solubility at 298.15 K as a function of solubility parameter



<p>COMPONENTS:</p> <p>(1) Propane; C₃H₈; [74-98-6] Butane; C₄H₁₀; [106-97-8] 2-Methylpropane; C₄H₁₀; [75-28-5]</p> <p>(2) Non-polar solvents excluding alkanes and organohalides</p>	<p>EVALUATOR:</p> <p>Walter Hayduk Department of Chemical Engineering University of Ottawa Ottawa, Canada K1N 9B4</p> <p>March, 1984</p>
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CRITICAL EVALUATION: continued

available for the low molecular weight alkane solvents, are included in the diagram (see Critical Evaluation in alkane solvents). Furthermore, because of the lack of data for solubilities of *butane* and *2-methylpropane*, some additional data, representing solubilities in the organohalides, tetrachloromethane and chlorobenzene (13) were also used. The latter data are discussed in more detail in the Critical Evaluation of solubilities in organohalide solvents.

The sources of data and letter code for reference to the diagram are listed in order of increasing solubility parameter: (a) octamethylcyclotetrasiloxane (OMTS) (8), (b) n-octane, (c) cyclohexane (1,2), (d) tetrachloromethane (13), (e) decahydronaphthalene (decalin) (8), (f) ethylbenzene (1), (g) 1,3,5-trimethylbenzene (mesitylene) (12), (h) 1,3-dimethylbenzene (m-xylene) (1,6), (i) methylbenzene (toluene) (5,6,11), (j) benzene (1,3,4,9), (k) 1,1'-bicyclohexyl (8), (l) chlorobenzene (13), (m) carbon disulfide (1), (n) 1,1'-methylenebisbenzene (diphenylmethane) (8), (o) 1-methylnaphthalene (8) and 1,1'-oxybismethane (diethylether) (9,10).

Because of the scarcity of data, dashed lines, 20% apart, indicate an approximate range of solubilities for the three gases as a function of solubility parameter. There are more data for *propane* solubilities than for the other two gases.

Because the solubility of *propane* in (i) toluene of Waters et al. (5) is much lower than the extrapolated value of Hannaert et al. (11) and those of other solvents of comparable solubility parameter, it is rejected. The solubilities of Gerrard (6,12) involving all three gases in the aromatic solvents (h) m-xylene, (i) toluene and (g) mesitylene appear too high, especially for the *propane* and *2-methylpropane* gases as previously observed for other solubilities reported by that author (see Critical Evaluation in alkane solvents). These data in the latter two solvents are rejected. The data of Jadot (4) for solubilities of *butane* and *2-methylpropane* in benzene are classified as doubtful. The data of Chappelow and Prausnitz (8) for the solubilities of *propane* in bicyclohexyl and of *2-methylpropane* in methylnaphthalene appear much different than would be expected for the particular solvent solubility parameters and are also classified as doubtful. The solubilities of Lebeau (9,10) in diethylether, of historic interest only, appear much too low and are rejected. The solubility of *propane* in benzene by that worker, while rejected, is at least of the correct order.

The remaining data are classified as tentative.

The data of Chappelow and Prausnitz (8) cover a large temperature range, from 300 K to 425 or 475 K. Those workers used high boiling solvents in order to extend the temperature range normally used for solubility measurements.

A summary of the evaluation of the solubility data is given below; included are tentative values for the solubilities at 298.15 K when applicable.

The summary is in the form of a table (next page).

COMPONENTS:			EVALUATOR:			
(1) Propane; C ₃ H ₈ ; [74-98-6] Butane; C ₄ H ₁₀ ; [106-97-8] 2-Methylpropane; C ₄ H ₁₀ ; [75-28-5]			Walter Hayduk Department of Chemical Engineering University of Ottawa Ottawa, Canada K1N 9B4			
(2) Non-polar solvents excluding alkanes and organohalides			March, 1984			
CRITICAL EVALUATION:						
Solubilities at 298.15 K						
Solvent (Ref.)	Propane		Butane		2-Methylpropane	
	<i>x</i>	class.	<i>x</i>	class.	<i>x</i>	class.
(a) OMCTS (8)	0.170 ¹	tentative	0.476 ¹	tentative	0.349 ¹	tentative
(b) n-octane	0.119	-	0.436	-	0.29 ¹	-
(c) Cyclohexane (1,2)	0.0910 ²	tentative	-	-	-	-
(d) Carbon tetra- chloride (13)	-	-	0.339	-	0.238	-
(e) Decalin (7)	0.0826	tentative	0.280	tentative	-	-
(f) Ethyl- benzene (1)	0.0724	tentative	-	-	-	-
(g) Mesitylene (12)	-	-	-	-	-	rejected
(h) M-xylene (1)	0.0731	tentative	-	-	-	-
M-xylene (6)	-	rejected	0.353 ¹	tentative	-	-
(i) Toluene (11)	0.065 ¹	tentative	0.285 ¹	tentative	-	-
Toluene (15)	-	rejected	-	-	-	-
(j) Benzene (1,3)	0.0573 ²	tentative	-	-	-	-
Benzene (4,9)	-	rejected	-	rejected	-	rejected
(k) Bicyclohexyl (8)	-	rejected	0.226 ¹	tentative	0.164 ¹	tentative
(l) Chlorobenzene (13)	-	-	0.269	-	0.162	-
(m) Carbon disulfide (1)	0.0446	tentative	-	-	-	-
(n) Diphenyl- methane (8)	0.0395 ¹	tentative	-	-	-	-
(o) Methyl- naphthalene (8)	0.0380 ¹	tentative	-	-	-	rejected
Diethylether (9,10)	-	rejected	-	rejected	-	rejected
¹ Extrapolated or estimated.						
² Average value.						

COMPONENTS:

- (1) Propane; C₃H₈; [74-98-6]
 Butane; C₄H₁₀; [106-97-8]
 2-Methylpropane; C₄H₁₀; [75-28-5]
- (2) Non-polar solvents excluding
 alkanes and organohalides

EVALUATOR:

Walter Hayduk
 Department of Chemical Engineering
 University of Ottawa
 Ottawa, Canada K1N 9B4

March, 1984

CRITICAL EVALUATION:

References

1. Fleury, D.; Hayduk, W. *Can. J. Chem. Eng.* 1975, *53*, 195-199.
2. Miller, K.W. *J. Phys. Chem.* 1968, *72*, 2248-2249.
3. Thomsen, E.S.; Gjaldbaek, J.C. *Acta Chem. Scand.* 1963, *17*, 134-138.
4. Jadot, R. *J. Chim. Phys.* 1972, *69*, 1036-1040.
5. Waters, J.A.; Mortimer, G.A.; Clements, H.E. *J. Chem. Eng. Data* 1970, *15*, 174-176.
6. Gerrard, W. *J. Appl. Chem. Biotechnol.* 1973, *23*, 1-17.
7. Lenoir, J.-Y.; Renault, P.; Renon, H. *J. Chem. Eng. Data* 1971, *16*, 340-342.
8. Chappelow, C.C.; Prausnitz, J.M. *A.I.Ch.E.J.* 1974, *20*, 1097-1104.
9. Lebeau, P. *Compt. Rend.* 1905, *140*, 1454-1456 and 1572.
10. Lebeau, P. *Bull. Acad. Roy. Belg.* 1908, 300-304.
11. Hannaert, H.; Haccuria, M.; Mathieu, M.P. *Ind. Chem. Belge* 1967, *32*, 156-164.
12. Gerrard, W. *Solubility of Gases and Liquids*, Plenum Press, New York 1976, Chapter 12.
13. Blais, C.; Hayduk, W. *J. Chem. Eng. Data* 1983, *28*, 181-183.
14. Hildebrand, J.H.; Prausnitz, J.M.; Scott, R.L. *Regular and Related Solutions*, Van Nostrand Reinhold, New York 1970, Chapter 8.
15. Martin, R.A. *Table of Solubility Parameters, Third Ed.*, Union Carbide Corporation, Tarrytown, New York 1975.

COMPONENTS:		ORIGINAL MEASUREMENTS:			
(1) Propane; C ₃ H ₈ ; [74-98-6] (2) Carbon disulfide; CS ₂ ; [75-15-0]		Fleury, D.; Hayduk, W. <i>Can. J. Chem. Eng.</i> 1975 , <i>53</i> , 195-199.			
VARIABLES:		PREPARED BY:			
T/K: 258.15-308.15 P/kPa: 101.325		W. Hayduk			
EXPERIMENTAL VALUES:					
T/K	Ostwald Coefficient ¹ L/cm ³ cm ⁻³	Bunsen Coefficient ² α/cm ³ (STP)cm ⁻³ atm ⁻¹	Mole Fraction ¹ x ₁		
258.15	61.4	65.0	0.146 (0.1440) ³		
273.15	34.3	34.3	0.0842 (0.0862)		
298.15	18.4	16.9	0.0446 (0.0435)		
308.15	14.5	12.9	0.0345 (0.0348)		
¹ Original data. ² Calculated by compiler. ³ The mole fraction solubility of the original data was used to determine the following equations for ΔG° and ln x ₁ and table of smoothed values: $\Delta G^\circ/\text{J mol}^{-1} = -RT \ln x_1 = 611.03 T - 78.581 T \ln T - 40920$ $\ln x_1 = 4921.83/T + 9.45166 \ln T - 73.4939$ Std. deviation for ΔG° = 44.4 J mol ⁻¹					
T/K	ΔG°/J mol ⁻¹	x ₁	T/K	ΔG°/J mol ⁻¹	x ₁
258.15	4159	0.1440	293.15	7342	0.0492
263.15	4636	0.1202	298.15	7769	0.0435
273.15	5566	0.0862	303.15	8190	0.0388
283.15	6468	0.0641	308.15	8603	0.0348
AUXILIARY INFORMATION					
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:		
A volumetric method using a glass apparatus was employed. Degassed solvent contacted the gas while flowing as a thin film, at a constant rate, through an absorption spiral into a solution buret. A constant solvent flow was obtained by means of a calibrated syringe pump. The solution at the end of the spiral was considered saturated. Dry gas was maintained at atmospheric pressure in a gas buret by mechanically raising the mercury level in the buret at an adjustable rate. The solubility was calculated from the constant slope of volume of gas dissolved and volume of solvent injected. Degassing was accomplished using a two stage vacuum process described by Clever et al. (1).			1. Matheson Co. Specified as instrument grade of minimum purity 99.5 per cent. 2. Fisher Scientific. Specified minimum purity 99.0 per cent.		
			ESTIMATED ERROR:		
			$\delta T/K = 0.1$ $\delta x_1/x_1 = 0.01$		
			REFERENCES:		
			1. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M. <i>J. Phys. Chem.</i> 1971 , <i>61</i> , 1078.		

COMPONENTS:		ORIGINAL MEASUREMENTS:			
(1) Propane; C ₃ H ₈ ; [74-98-6] (2) Cyclohexane; C ₆ H ₁₂ ; [110-82-7]		Fleury, D.; Hayduk, W. <i>Can. J. Chem. Eng.</i> 1975 , <i>53</i> , 195-199.			
VARIABLES:		PREPARED BY:			
T/K: 283.15-343.15 P/kPa: 101.325		W. Hayduk			
EXPERIMENTAL VALUES:					
T/K	Ostwald Coefficient ¹ L/cm ³ cm ⁻³	Bunsen Coefficient ² α/cm ³ (STP) cm ⁻³ atm ⁻¹	Mole Fraction ¹ x ₁		
283.15	33.5	29.3	0.136 (0.136) ³		
298.15	22.6	20.7	0.0924 (0.0936)		
323.15	13.6	11.5	0.0555 (0.0545)		
343.15	9.49	7.55	0.0371 (0.0374)		
¹ Original data. ² Calculated by compiler. ³ The mole fraction solubility of the original data was used to determine the following equations for ΔG° and ln x ₁ and table of smoothed values: ΔG°/J mol ⁻¹ = -RT ln x ₁ = 77.819 T - 17330 ln x ₁ = 2084.4/T - 9.3600 Std. deviation for ΔG° = 36.9 J mol ⁻¹ ; Correlation coefficient = 0.9998					
T/K	ΔG°/J mol ⁻¹	x ₁	T/K	ΔG°/J mol ⁻¹	x ₁
283.15	4705	0.1356	313.15	7039	0.0670
293.15	5483	0.1054	323.15	7817	0.0545
298.15	5872	0.0936	333.15	8596	0.0449
303.15	6261	0.0834	343.15	9374	0.0374
AUXILIARY INFORMATION					
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:		
A volumetric method using a glass apparatus was employed. Degassed solvent contacted the gas while flowing as a thin film, at a constant rate, through an absorption spiral into a solution buret. A constant solvent flow was obtained by means of a calibrated syringe pump. The solution at the end of the spiral was considered saturated. Dry gas was maintained at atmospheric pressure in a gas buret by mechanically raising the mercury level in the buret at an adjustable rate. The solubility was calculated from the constant slope of volume of gas dissolved and volume of solvent injected.			1. Matheson Co. Specified as instrument grade of minimum purity 99.5 per cent. 2. Fisher Scientific. Specified minimum purity 99.0 per cent.		
Degassing was accomplished using a two stage vacuum process described by Clever et al. (1).			ESTIMATED ERROR:		
			δT/K = 0.1 δx ₁ /x ₁ = 0.01		
			REFERENCES:		
			1. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M. <i>J. Phys. Chem.</i> 1971 , <i>61</i> , 1078.		

COMPONENTS: (1) Propane; C ₃ H ₈ ; [74-98-6] (2) Cyclohexane; C ₆ H ₁₂ ; [110-82-7]	ORIGINAL MEASUREMENTS: Miller, K. W. <i>J. Phys. Chem.</i> <u>1968</u> , <i>72</i> , 2248 - 2249.																																																				
VARIABLES: T/K: 280.15 - 305.25 p ₁ /kPa: 101.325 (1 atm)	PREPARED BY: H. L. Clever																																																				
EXPERIMENTAL VALUES: <table border="1" data-bbox="194 491 1123 731"> <thead> <tr> <th colspan="2">Temperature</th> <th>Mol Fraction</th> <th>Bunsen Coefficient</th> <th>Ostwald Coefficient</th> </tr> <tr> <th>t/°C</th> <th>T/K</th> <th>x₁</th> <th>α/cm³ (STP) cm⁻³ atm⁻¹</th> <th>L/cm³ cm⁻³</th> </tr> </thead> <tbody> <tr><td>7.0</td><td>280.15</td><td>0.1318</td><td>31.97</td><td>32.79</td></tr> <tr><td>12.8</td><td>285.95</td><td>0.1155</td><td>27.31</td><td>28.59</td></tr> <tr><td>18.7</td><td>291.85</td><td>0.1016</td><td>23.48</td><td>25.09</td></tr> <tr><td>25.0</td><td>298.15</td><td>0.0896</td><td>20.28</td><td>22.14</td></tr> <tr><td>28.5</td><td>301.65</td><td>0.0833</td><td>18.65</td><td>20.60</td></tr> <tr><td>32.1</td><td>305.25</td><td>0.0776</td><td>17.19</td><td>19.21</td></tr> </tbody> </table> <p data-bbox="115 753 1097 802">The Bunsen and Ostwald coefficients were calculated by the compiler assuming ideal gas behavior and Henry's law is obeyed.</p> <p data-bbox="115 812 873 836">Smoothed Data: For use between 280.15 and 305.25 K.</p> <p data-bbox="352 848 843 872">ln x₁ = -8.4498 + 17.9925/(T/100K)</p> <p data-bbox="234 883 1106 907">The standard error about the regression line is 1.75 x 10⁻⁴.</p> <table border="1" data-bbox="452 919 801 1124"> <thead> <tr> <th>T/K</th> <th>Mol Fraction x₁</th> </tr> </thead> <tbody> <tr><td>283.15</td><td>0.1230</td></tr> <tr><td>288.15</td><td>0.1102</td></tr> <tr><td>293.15</td><td>0.0990</td></tr> <tr><td>298.15</td><td>0.0894</td></tr> <tr><td>303.15</td><td>0.0809</td></tr> </tbody> </table>		Temperature		Mol Fraction	Bunsen Coefficient	Ostwald Coefficient	t/°C	T/K	x ₁	α/cm ³ (STP) cm ⁻³ atm ⁻¹	L/cm ³ cm ⁻³	7.0	280.15	0.1318	31.97	32.79	12.8	285.95	0.1155	27.31	28.59	18.7	291.85	0.1016	23.48	25.09	25.0	298.15	0.0896	20.28	22.14	28.5	301.65	0.0833	18.65	20.60	32.1	305.25	0.0776	17.19	19.21	T/K	Mol Fraction x ₁	283.15	0.1230	288.15	0.1102	293.15	0.0990	298.15	0.0894	303.15	0.0809
Temperature		Mol Fraction	Bunsen Coefficient	Ostwald Coefficient																																																	
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METHOD/APPARATUS/PROCEDURE: The liquid is saturated with the gas at a partial pressure of one atm. The apparatus is that described by Dymond and Hildebrand (1). It uses an all-glass pumping system to spray slugs of degassed solvent into the gas. The amount of gas dissolved is calculated from the initial and final gas pressures.	SOURCE AND PURITY OF MATERIALS: (1) Propane. Phillips Petroleum Co. Research grade. Dried before use. (2) Cyclohexane. Matheson, Coleman and Bell. "Spectroquality". Used as received.																																																				
ESTIMATED ERROR:																																																					
REFERENCES: 1. Dymond, J. H.; Hildebrand, J. H. <i>Ind. Eng. Chem. Fundam.</i> <u>1967</u> , <i>6</i> , 130.																																																					

COMPONENTS: (1) Propane; C ₃ H ₈ ; [74-98-6] (2) Benzene; C ₆ H ₆ ; [71-43-2]	ORIGINAL MEASUREMENTS: Thomsen, E.S.; Gjaldbaek, J.C. <i>Acta Chem. Scand.</i> <u>1963</u> , <i>17</i> , 134-138.								
VARIABLES: T/K : 298.15 P/kPa : 101.325	PREPARED BY: E.S. Thomsen, W. Hayduk								
EXPERIMENTAL VALUES:									
<table border="1"> <thead> <tr> <th>T/K</th> <th>Ostwald Coefficient² $L/cm^3\ cm^{-3}$</th> <th>Bunsen Coefficient¹ $\alpha/cm^3\ (STP)\ cm^{-3}\ atm^{-1}$</th> <th>Mole Fraction² x_1</th> </tr> </thead> <tbody> <tr> <td>298.15</td> <td>16.13</td> <td>14.7</td> <td>0.0564</td> </tr> </tbody> </table>		T/K	Ostwald Coefficient ² $L/cm^3\ cm^{-3}$	Bunsen Coefficient ¹ $\alpha/cm^3\ (STP)\ cm^{-3}\ atm^{-1}$	Mole Fraction ² x_1	298.15	16.13	14.7	0.0564
T/K	Ostwald Coefficient ² $L/cm^3\ cm^{-3}$	Bunsen Coefficient ¹ $\alpha/cm^3\ (STP)\ cm^{-3}\ atm^{-1}$	Mole Fraction ² x_1						
298.15	16.13	14.7	0.0564						
¹ Original data. ² Calculated by compilers using a real gas molar volume.									
AUXILIARY INFORMATION									
METHOD/APPARATUS/PROCEDURE: The method utilizes a combined glass manometer and bulb enclosed in an air thermostat which is shaken until equilibrium is established. Mercury is used for calibrating the volumes and as the confining liquid. Details in reference 1. The absorbed gas volume is calculated from the initial dry gas, and final solvent vapor-saturated gas volume. The amount of solvent is determined by measuring the mass of mercury displaced.	SOURCE AND PURITY OF MATERIALS: 1. Phillips Petroleum Co. Specified as research grade and GC analysis indicated 0.1 per cent air and 0.03 per cent ethane impurities. 2. Merck. Purified by freezing and fractionation. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta x_1/x_1 = 0.015$ REFERENCES: 1. Gjaldbaek, J.C. <i>Acta Chem. Scand.</i> <u>1952</u> , <i>6</i> , 623.								

COMPONENTS:		ORIGINAL MEASUREMENTS:	
(1) Propane; C ₃ H ₈ ; [74-98-6] (2) Benzene; C ₆ H ₆ ; [71-43-2]		Jadot, R. <i>J. Chim. Phys.</i> <u>1972</u> , <i>69</i> , 1036-40	
VARIABLES:		PREPARED BY:	
T/K: 298.15 P/kPa: 101.3		C.L. Young	
EXPERIMENTAL VALUES:			
T/K	Henry's Law Constant, H/atm	Mole fraction ⁺ at partial pressure of 101.3 kPa, x _{C₃H₈}	#ΔH [∞] /cal mol ⁻¹ (/J mol ⁻¹)
298.15	18.165	0.05505	730 (3054)
+ Calculated by compiler assuming x _{C₃H₈} = 1/H. # Excess partial molar enthalpy of solution at infinite dilution.			
AUXILIARY INFORMATION			
METHOD APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
The conventional gas chromatographic technique was used. The carrier gas was helium. The value of Henry's law constant was calculated from the retention time. The value applies to very low partial pressures of gas and there may be a substantial difference from that measured at 1 atm. pressure. There is also considerable uncertainty in the value of Henry's constant since no allowance was made for surface adsorption.		No details given.	
		ESTIMATED ERROR:	
		δT/K = ±0.05; δH = ±2%	
		REFERENCES:	

COMPONENTS:		ORIGINAL MEASUREMENTS:			
(1) Propane; C ₃ H ₈ ; [74-98-6] (2) Benzene; C ₆ H ₆ ; [71-43-2]		Fleury, D.; Hayduk, W. <i>Can. J. Chem. Eng.</i> <u>1975</u> , <i>53</i> , 195-199.			
VARIABLES:		PREPARED BY:			
T/K: 283.15-343.15 P/kPa: 101.325		W. Hayduk			
EXPERIMENTAL VALUES:					
T/K	Ostwald Coefficient ¹ L/cm ³ cm ⁻³	Bunsen Coefficient ² α/cm (STP) cm ⁻³ atm ⁻¹	Mole Fraction ¹ 10 ⁴ x ₁		
283.15	23.0	22.2	813 (815) ³		
298.15	16.6	15.2	581 (586)		
323.15	10.8	9.13	370 (361)		
343.15	7.61	6.06	255 (258)		
¹ Original data.					
² Calculated by compiler.					
³ The mole fraction solubility of the original data was used to determine the following equations for ΔG° and ln x ₁ and table of smoothed values: $\Delta G^\circ/\text{J mol}^{-1} = -RT \ln x_1 = 75.483 T - 15471$ $\ln x_1 = 1860.8/T - 9.0790$ Std. deviation for ΔG° = 44.1 J mol ⁻¹ ; Correlation coefficient = 0.9998					
T/K	ΔG°/J mol ⁻¹	10 ⁴ x ₁	T/K	ΔG°/J mol ⁻¹	10 ⁴ x ₁
283.15	5902	815	313.15	8166	434
293.15	6657	651	323.15	8921	361
298.15	7034	586	333.15	9676	304
303.15	7412	528	343.15	10430	258
AUXILIARY INFORMATION					
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:		
A volumetric method using a glass apparatus was employed. Degassed solvent contacted the gas while flowing as a thin film, at a constant rate, through an absorption spiral into a solution buret. A constant solvent flow was obtained by means of a calibrated syringe pump. The solution at the end of the spiral was considered saturated. Dry gas was maintained at atmospheric pressure in a gas buret by mechanically raising the mercury level in the buret at an adjustable rate. The solubility was calculated from the constant slope of volume of gas dissolved and volume of solvent injected. Degassing was accomplished using a two stage vacuum process described by Clever et al. (1).			1. Matheson Co. Specified as instrument grade of minimum purity 99.5 per cent.		
			2. Phillips Petroleum. Specified minimum purity 99.0 per cent.		
			ESTIMATED ERROR:		
			δT/K = 0.1		
			δx ₁ /x ₁ = 0.01		
			REFERENCES:		
			1. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M. <i>J. Phys. Chem.</i> <u>1971</u> , <i>61</i> , 1078.		

COMPONENTS: (1) Propane; C_3H_8 ; [74-98-6] (2) Water, Benzene, Ethanol, Diethylether, Chloroform, Turpentine	ORIGINAL MEASUREMENTS: Lebeau, P. <i>Compt. Rend.</i> <u>1905</u> , 140, 1454-6 and 1572. <i>Bull. Soc. Chim.</i> [3] <u>1905</u> , 33, 1137-9.																																																								
VARIABLES: $T/K = 290.8 - 294.8$ $p/kPa = 100.4 - 100.9$	PREPARED BY: H. L. Clever																																																								
EXPERIMENTAL VALUES: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Temperature</th> <th colspan="2" style="text-align: center;">Pressure^a</th> <th style="text-align: center;">Solubility</th> </tr> <tr> <th style="text-align: left;">$t/^\circ C$</th> <th style="text-align: center;">T/K</th> <th style="text-align: center;">$p/mmHg$</th> <th style="text-align: center;">Volume propane/100 Volumes Solvent</th> </tr> </thead> <tbody> <tr> <td colspan="4">Water; H_2O; [7732-18-5]</td> </tr> <tr> <td>17.8</td> <td>291.0</td> <td>753</td> <td>6.5</td> </tr> <tr> <td colspan="4">Benzene; C_6H_6O; [71-43-2]</td> </tr> <tr> <td>21.5</td> <td>294.7</td> <td>757</td> <td>1452</td> </tr> <tr> <td colspan="4">Ethanol; C_2H_6O; [64-17-5]</td> </tr> <tr> <td>16.6</td> <td>290.8</td> <td>754</td> <td>790</td> </tr> <tr> <td colspan="4">1,1'-Oxybisethane or diethylether; $C_4H_{10}O$; [60-29-7]</td> </tr> <tr> <td>16.6</td> <td>290.8</td> <td>757</td> <td>926</td> </tr> <tr> <td colspan="4">Chloroform or trichloromethane; $CHCl_3$; [67-66-3]</td> </tr> <tr> <td>21.6</td> <td>294.8</td> <td>757</td> <td>1299</td> </tr> <tr> <td colspan="4">Oil of turpentine</td> </tr> <tr> <td>17.7</td> <td>290.9</td> <td>757</td> <td>1587</td> </tr> </tbody> </table> <p>^a Not clear whether this is total pressure or propane partial pressure. It is probably total pressure.</p>		Temperature	Pressure ^a		Solubility	$t/^\circ C$	T/K	$p/mmHg$	Volume propane/100 Volumes Solvent	Water; H_2O ; [7732-18-5]				17.8	291.0	753	6.5	Benzene; C_6H_6O ; [71-43-2]				21.5	294.7	757	1452	Ethanol; C_2H_6O ; [64-17-5]				16.6	290.8	754	790	1,1'-Oxybisethane or diethylether; $C_4H_{10}O$; [60-29-7]				16.6	290.8	757	926	Chloroform or trichloromethane; $CHCl_3$; [67-66-3]				21.6	294.8	757	1299	Oil of turpentine				17.7	290.9	757	1587
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METHOD/APPARATUS/PROCEDURE: Details not given. The data are reported in both papers.	SOURCE AND PURITY OF MATERIALS: (1) Propane. Prepared by author from carefully purified propyl iodide by reaction with sodium in liquid ammonia. Melting point/ $^\circ C = -195$ Boiling point/ $^\circ C = -44.5$ Critical temperature/ $^\circ C = 102$. (2) Solvents. No information.																																																								
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COMPONENTS: (1) Butane; C_4H_{10} ; [106-97-8] (2) Benzene; C_6H_6 ; [71-43-2]		ORIGINAL MEASUREMENTS: Jadot, R. <i>J. Chim. Phys.</i> <u>1972</u> , 69, 1036-40	
VARIABLES: T/K : 298.15 P/kPa : 101.3		PREPARED BY: C.L. Young	
EXPERIMENTAL VALUES:			
T/K	Henry's Law Constant, H/atm	Mole fraction ⁺ at partial pressure of 101.3 kPa, $x_{C_4H_{10}}$	# ΔH^∞ /cal mol ⁻¹ (/J mol ⁻¹)
298.15	4.82	0.207	850 (3556)
+ Calculated by compiler assuming $x_{C_4H_{10}} = 1/H$.			
# Excess partial molar enthalpy of solution at infinite dilution.			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE: The conventional gas chromatographic technique was used. The carrier gas was helium. The value of Henry's law constant was calculated from the retention time. The value applies to very low partial pressures of gas and there may be a substantial difference from that measured at 1 atm. pressure. There is also considerable uncertainty in the value of Henry's constant since no allowance was made for surface adsorption.		SOURCE AND PURITY OF MATERIALS: No details given	
		ESTIMATED ERROR: $\delta T/K = \pm 0.05$; $\delta H = \pm 2\%$	
		REFERENCES:	

COMPONENTS:			ORIGINAL MEASUREMENTS:		
(1) Propane; C ₃ H ₈ ; [74-98-6] (2) Methylbenzene (toluene); C ₇ H ₈ ; [108-88-3]			Waters, J.A.; Mortimer, G.A.; Clements, H.E. <i>J. Chem. Eng. Data</i> 1970, 15, 174-176.		
VARIABLES:			PREPARED BY:		
T/K: 253.15-298.15 P/kPa: 101.325			W. Hayduk		
EXPERIMENTAL VALUES:					
T/K	Solubility ¹ $c_1/\text{mol dm}^{-3}\text{atm}^{-1}$	Ostwald Coefficient ² $L/\text{cm}^3\text{cm}^{-3}$	Bunsen Coefficient ¹ ${}^3\alpha/$	Mole Fraction ² x_1	Method
253.15	3.228	66.61	72.35	0.2473	A
253.15	3.175	65.51	71.16	0.2443	B
273.15	1.107	24.81	24.81	0.1030	A
273.15	1.177	26.38	26.38	0.1089	B
294.15	0.450	10.94	10.09	0.0456	A
296.15	0.452	11.04	10.12	0.0458	B
298.15	0.446	10.99	9.99	0.0454	A
¹ Original data. ${}^3\alpha/\text{cm}^3$ (STP) $\text{cm}^{-3}\text{atm}^{-1}$					
² Calculated by compiler.					
The mole fraction solubility obtained using method A was used to determine equations for ΔG° and $\ln x$ and table of smoothed values:					
$\Delta G^\circ/\text{J mol}^{-1} = -RT \ln x = 716.83T - 92.18 T \ln T - 49383.3$					
$\ln x = 11.088 \ln T + 5939.8/T - 84.2224$					
Standard error of estimate for x is 0.0020; correlation coefficient=0.9997					
T/K	$\Delta G^\circ/\text{J mol}^{-1}$	x_1	T/K	$\Delta G^\circ/\text{J mol}^{-1}$	x_1
253.15	2942.6	0.247	283.15	6220.3	0.0712
263.15	4069.7	0.156	293.15	7246.1	0.0512
273.15	5161.9	0.103	298.15	7747.2	0.0439
AUXILIARY INFORMATION					
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:		
Two methods (A and B) were employed. Method A was considered more accurate while method B was utilized mainly as a check on method A.			1. Matheson Co. Research grade; specified as 99.99 mole per cent pure.		
Method A: A removable 500-cm ³ glass absorption cell was used for the gas solubility measurements. The gas was supplied from a steel reservoir equipped with a pressure gauge and two pressure regulators. The pressure change in the reservoir was used to determine the quantity of gas dissolved. The solvent was degassed in the equilibrium cell. A correction was applied for non-ideality of the gas.			2. Fisher Co. Spectrophotometric grade, of unspecified purity.		
Method B: The increase in mass of the solvent was determined by removing the absorption cell and weighing it before and after a solubility determination.			ESTIMATED ERROR: $\delta T/\text{K} = 0.1$ $\delta P/\text{kPa} = 0.1$ $\delta c_1/c_1 = 0.02$ (compiler for Method A)		
			REFERENCES:		

COMPONENTS: (1) Propane; C ₃ H ₈ ; [74-98-6] (2) Methylbenzene or toluene Dimethylbenzene	ORIGINAL MEASUREMENTS: Hannaert, H.; Haccuria, M.; Mathieu, M. P. <i>Ind. Chim. Belge</i> <u>1967</u> , <i>32</i> , 156 - 164.																									
VARIABLES: $T/K = 243.15 - 293.15$	PREPARED BY: E.L. Boozer, H.L. Clever																									
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<table border="1"> <thead> <tr> <th>Temperature Interval of Measurements T/K</th> <th>Propane Mol % Range $10^2 x_1 / \text{mol } \%$</th> <th>$K\pi v / \text{atm}^1$ at 293.15 K</th> <th>Enthalpy of Dissolution $\Delta H / \text{kcal mol}^{-1}$</th> <th>Constant A</th> </tr> </thead> <tbody> <tr> <td colspan="5">Methylbenzene or toluene; C₇H₈; [108-88-3]</td> </tr> <tr> <td>243.15-293.15</td> <td>1 - 10</td> <td>12.8</td> <td>3.79</td> <td>3.93</td> </tr> <tr> <td colspan="5">Dimethylbenzene mixture; C₈H₁₀; [1330-20-7]</td> </tr> <tr> <td>243.15-293.15</td> <td>1 - 10</td> <td>12.5</td> <td>4.15</td> <td>4.20</td> </tr> </tbody> </table>		Temperature Interval of Measurements T/K	Propane Mol % Range $10^2 x_1 / \text{mol } \%$	$K\pi v / \text{atm}^1$ at 293.15 K	Enthalpy of Dissolution $\Delta H / \text{kcal mol}^{-1}$	Constant A	Methylbenzene or toluene; C ₇ H ₈ ; [108-88-3]					243.15-293.15	1 - 10	12.8	3.79	3.93	Dimethylbenzene mixture; C ₈ H ₁₀ ; [1330-20-7]					243.15-293.15	1 - 10	12.5	4.15	4.20
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The function, $K\pi v / \text{atm}$, is equivalent to a Henry's constant in the form $H_{1,2} / \text{atm} = (f_1 / \text{atm}) / x_1$ where f_1 is the fugacity.																										
AUXILIARY INFORMATION																										
METHOD/APPARATUS/PROCEDURE: The authors describe three methods: 1.A. [Saturat. n° 1]. A measure of the static pressure of saturation in an apparatus which gave a precision of 10 - 15 %. 1.B. [Saturat. n° 2]. A measure of the static pressure of saturation in an apparatus which gave a precision of 2 - 5 %. 2. [Chromato]. A Gas liquid chromatographic method estimated to have a precision of 2 - 5 %. 3. [Anal. directe]. Direct analysis of the gaseous and liquid phases. Method 1.A. was used for these systems.	SOURCE AND PURITY OF MATERIALS: (1) Propane. Matheson. C. P. Purified on fractionation column. Purity > 99 %. (2) Methylbenzene. Qualite UCB. Density $\rho^2 / \text{g cm}^{-3} = 0.8689$. Dimethylbenzene. Merck. Mixture of 90% dimethylbenzenes, 5 % methyl benzene, and 5 % ethylbenzene. ESTIMATED ERROR: REFERENCES:																									

COMPONENTS:		ORIGINAL MEASUREMENTS:			
(1) Propane; C ₃ H ₈ [74-98-6] (2) Ethylbenzene; C ₈ H ₁₀ [100-41-4]		Fleury, D.; Hayduk, W. <i>Can. J. Chem. Eng.</i> 1975 , <i>53</i> , 195-199.			
VARIABLES:		PREPARED BY:			
T/K: 273.15-323.15 P/kPa: 101.325		W. Hayduk			
EXPERIMENTAL VALUES:					
T/K	Ostwald Coefficient ¹ L/cm ³ cm ⁻³	Bunsen Coefficient ² α/cm ³ (STP) cm ⁻³ atm ⁻¹	Mole Fraction ¹ x ₁		
273.15	28.6	28.6	0.134 (0.133) ³		
298.15	15.3	14.0	0.0724 (0.0734)		
323.15	9.87	8.34	0.0447 (0.0444)		
¹ Original data. ² Calculated by compiler. ³ The mole fraction solubility of the original data was used to determine the following equations for ΔG° and ln x ₁ and table of smoothed values: ΔG°/J mol ⁻¹ = -RT ln x ₁ = 75.712 T - 16099 ln x ₁ = 1936.4/T - 9.1066 Std. deviation for ΔG° = 29.6 J mol ⁻¹ ; Correlation coefficient = 0.9999					
T/K	ΔG°/J mol ⁻¹	x ₁	T/K	ΔG°/J mol ⁻¹	x ₁
273.15	4852	0.133	303.15	6853	0.0659
283.15	5339	0.104	313.15	7610	0.0538
293.15	6096	0.0820	323.15	8367	0.0444
298.15	6474	0.0734			
AUXILIARY INFORMATION					
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:		
<p>A volumetric method using a glass apparatus was employed. Degassed solvent contacted the gas while flowing as a thin film, at a constant rate, through an absorption spiral into a solution buret. A constant solvent flow was obtained by means of a calibrated syringe pump. The solution at the end of the spiral was considered saturated. Dry gas was maintained at atmospheric pressure in a gas buret by mechanically raising the mercury level in the buret at an adjustable rate. The solubility was calculated from the constant slope of volume of gas dissolved and volume of solvent injected.</p> <p>Degassing was accomplished using a two stage vacuum process described by Clever et al. (1).</p>			<ol style="list-style-type: none"> Matheson Co. Specified as instrument grade of minimum purity 99.5 per cent. Phillips Petroleum. Specified minimum purity 99.0 per cent. 		
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COMPONENTS: (1) Propane; C ₃ H ₈ ; [74-98-6] (2) 1,3-Dimethylbenzene (<i>m</i> -xylene); C ₈ H ₁₀ ; [108-38-3]	ORIGINAL MEASUREMENTS: Fleury, D.; Hayduk, W. <i>Can. J. Chem. Eng.</i> <u>1975</u> , <i>53</i> , 195-199.																														
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VARIABLES: T/K: 268.2-293.2 P/kPa: 101.3	PREPARED BY: C. L. Young															
EXPERIMENTAL VALUES: <p style="text-align: center;">Total pressure = 101.3 kPa</p>																
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">T/K</th> <th style="text-align: left;">Mole ratio</th> <th style="text-align: left;">Mole fraction of propane[#]</th> </tr> </thead> <tbody> <tr> <td>268.2</td> <td>0.190</td> <td>0.160</td> </tr> <tr> <td>278.2</td> <td>0.169</td> <td>0.145</td> </tr> <tr> <td>283.2</td> <td>0.154</td> <td>0.133</td> </tr> <tr> <td>293.2</td> <td>0.113</td> <td>0.102</td> </tr> </tbody> </table>		T/K	Mole ratio	Mole fraction of propane [#]	268.2	0.190	0.160	278.2	0.169	0.145	283.2	0.154	0.133	293.2	0.113	0.102
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AUXILIARY INFORMATION																
METHOD APPARATUS/PROCEDURE: <p>Gas was passed into a known weight of pure liquid in a bubbler tube at a total pressure measured using a manometer assembly. The amount of absorbed gas was estimated by weighing. The temperature was controlled to within 0.2 K. The apparatus and procedure are described by Gerrard, ref. (1).</p>	SOURCE AND PURITY OF MATERIALS: <p>No details given except that "all compounds were purified by conventional procedures".</p> <hr/> ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta x/x = \pm 3\%$ (estimated by compiler).															
REFERENCES: 1. Gerrard, W. <i>J. Appl. Chem. Biotechnol.</i> <u>1972</u> , 22, 623.																

COMPONENTS: (1) Propane; C_3H_8 ; [74-98-6] (2) Octamethylcyclotetrasiloxane; $C_8H_{24}O_4Si_4$; [556-67-2]		ORIGINAL MEASUREMENTS: Chappelow, C.C.; Prausnitz, J.M. <i>A.I.Ch.E.J.</i> <u>1974</u> , <i>20</i> , 1097-1104.	
VARIABLES: T/K : 300-425 P/kPa : 101.325		PREPARED BY: C.L. Young	
EXPERIMENTAL VALUES:			
T/K	Henry's Constant ^a H/atm	Mole fraction ^b of propane at 1 atm. partial pressure, $x_{C_3H_8}$	
300	6.09	0.1642	
325	9.72	0.1029	
350	14.5	0.0690	
375	19.9	0.0503	
400	25.2	0.0397	
425	30.0	0.0333	
<p>^a Authors stated measurements were made at several pressures and values of solubility used were all within the Henry's law region.</p> <p>^b Calculated by compiler assuming linear relationship between mole fraction and pressure.</p>			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE: Volumetric apparatus similar to that described by Dymond and Hildebrand (1). Pressure measured with a null detector and precision gauge. Details in ref. (2).		SOURCE AND PURITY OF MATERIALS: Solvent degassed; no other details given.	
		ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta x_{C_3H_8} = \pm 1\%$	
		REFERENCES: 1. Dymond, J.; Hildebrand, J.H. <i>Ind. Eng. Chem. Fundam.</i> <u>1967</u> , <i>6</i> , 130. 2. Cukor, P.M.; Prausnitz, J.M. <i>Ind. Eng. Chem. Fundam.</i> <u>1971</u> , <i>10</i> , 638.	

COMPONENTS: (1) Propane; C_3H_8 ; [74-98-6] (2) Decahydronaphthalene, (Decalin); $C_{10}H_{18}$; [91-17-8]	ORIGINAL MEASUREMENTS: Lenoir, J.-Y.; Renault, P.; Renon, H. <i>J. Chem. Eng. Data</i> <u>1971</u> , <i>16</i> , 340-2.									
VARIABLES: T/K : 298, 323 P/kPa : 101.325	PREPARED BY: C.L. Young									
EXPERIMENTAL VALUES:										
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">T/K</th> <th style="text-align: center;">Henry's constant $H_{C_3H_8}/atm$</th> <th style="text-align: center;">Mole fraction at 1 atm* $x_{C_3H_8}$</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">298</td> <td style="text-align: center;">12.1</td> <td style="text-align: center;">0.0826</td> </tr> <tr> <td style="text-align: center;">323</td> <td style="text-align: center;">16.4</td> <td style="text-align: center;">0.0610</td> </tr> </tbody> </table>		T/K	Henry's constant $H_{C_3H_8}/atm$	Mole fraction at 1 atm* $x_{C_3H_8}$	298	12.1	0.0826	323	16.4	0.0610
T/K	Henry's constant $H_{C_3H_8}/atm$	Mole fraction at 1 atm* $x_{C_3H_8}$								
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<p>* Calculated by compiler assuming a linear function of $p_{C_3H_8}$ vs $x_{C_3H_8}$, i.e., $x_{C_3H_8}(1 atm) = 1/H_{C_3H_8}$.</p>										
<p style="text-align: center;">AUXILIARY INFORMATION</p>										
METHOD/APPARATUS/PROCEDURE: A conventional gas-liquid chromatographic unit fitted with a thermal conductivity detector was used. The carrier gas was helium. The value of Henry's law constant was calculated from the retention time. The value applies to very low partial pressures of gas and there may be a substantial difference from that measured at 1 atm. pressure. There is also considerable uncertainty in the value of Henry's constant since surface adsorption was not allowed for although its possible existence was noted.	SOURCE AND PURITY OF MATERIALS: 1. L'Air Liquide sample, minimum purity 99.9 mole per cent. 2. Touzart and Matignon or Serlabo sample, purity 99 mole per cent. ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta H/atm = \pm 6\%$ (estimated by compiler). REFERENCES:									

EXPERIMENTAL VALUES:		
<i>T</i> /K	Henry's Constant ^a <i>H</i> /atm	Mole fraction ^b of propane at 1 atm. partial pressure, $x_{C_3H_8}$
300	27.1	0.0369
325	41.1	0.0243
350	58.0	0.0172
375	77.1	0.0130
400	97.7	0.0102
425	118	0.00847
450	135	0.00741
475	146	0.00685

^a Authors stated measurements were made at several pressures and values of solubility used were all within the Henry's law region.

^b Calculated by compiler assuming linear relationship between mole fraction and pressure.

AUXILIARY INFORMATION	
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Volumetric apparatus similar to that described by Dymond and Hildebrand (1). Pressure measured with a null detector and precision gauge. Details in ref. (2).	Solvent degassed; no other details given.
	ESTIMATED ERROR:
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	REFERENCES:
	1. Dymond, J.; Hildebrand, J.H. <i>Ind. Eng. Chem. Fundam.</i> 1967 , <i>6</i> , 130.
	2. Cukor, P.M.; Prausnitz, J.M. <i>Ind. Eng. Chem. Fundam.</i> 1971 , <i>10</i> , 638.

COMPONENTS: (1) Propane; C_3H_8 ; [74-98-6] (2) 1,1'-Bicyclohexyl; $C_{12}H_{22}$; [92-51-3]		ORIGINAL MEASUREMENTS: Chappelow, C.C.; Prausnitz, J.M. <i>A.I.Ch.E.J.</i> <u>1974</u> , 20, 1097-1104.	
VARIABLES: T/K: 300-475 P/kPa: 101.325		PREPARED BY: C.L. Young	
EXPERIMENTAL VALUES:			
T/K	Henry's Constant ^a H/atm	Mole fraction ^b of propane at 1 atm. partial pressure, $x_{C_3H_8}$	
300	11.7	0.0855	
325	19.0	0.0526	
350	28.4	0.0352	
375	40.0	0.0250	
400	53.1	0.0188	
425	66.4	0.0151	
450	77.3	0.0129	
475	76.6	0.0131	
<p>^a Authors stated measurements were made at several pressures and values of solubility used were all within the Henry's law region.</p> <p>^b Calculated by compiler assuming linear relationship between mole fraction and pressure.</p>			
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METHOD/APPARATUS/PROCEDURE: Volumetric apparatus similar to that described by Dymond and Hilderbrand (1). Pressure measured with a null detector and precision gauge. Details in ref. (2).		SOURCE AND PURITY OF MATERIALS: Solvent degassed; no other details given.	
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		REFERENCES: 1. Dymond, J.; Hildebrand, J.H. <i>Ind. Eng. Chem. Fundam.</i> <u>1967</u> , 6, 130. 2. Cukor, P.M.; Prausnitz, J.M. <i>Ind. Eng. Chem. Fundam.</i> <u>1971</u> , 10 638.	

COMPONENTS: (1) Propane; C ₃ H ₈ ; [74-98-6] (2) Diphenylmethane, (1,1'-Methylenebisbenzene); C ₁₃ H ₁₂ ; [101-81-5]	ORIGINAL MEASUREMENTS: Chappelow, C.C.; Prausnitz, J.M. <i>A.I.Ch.E.J.</i> <u>1974</u> , 20, 1097-1104.																											
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COMPONENTS: (1) Butane; C ₄ H ₁₀ ; [106-97-8] (2) Methylbenzene or toluene or phenylmethane Dimethylbenzenes	ORIGINAL MEASUREMENTS: Hannaert, H.; Haccuria, M.; Mathieu, M. P. <i>Ind. Chim. Belge</i> <u>1967</u> , <i>32</i> , 156-164.																									
VARIABLES: T/K = 243.15 - 293.15	PREPARED BY: E. L. Boozer H. L. Clever																									
EXPERIMENTAL VALUES:																										
<table border="1"> <thead> <tr> <th>Temperature Interval Measurements T/K</th> <th>Butane Mol % Range 10²x₁/mol %</th> <th>Kπv¹/atm at 293.15 K</th> <th>Enthalpy of Dissolution ΔH/kcal mol⁻¹</th> <th>Constant A</th> </tr> </thead> <tbody> <tr> <td colspan="5">Methylbenzene or toluene or phenylmethane; C₇H₈; [108-88-3]</td> </tr> <tr> <td>243.15-293.15</td> <td>3 - 20</td> <td>3.0</td> <td>4.84</td> <td>4.08</td> </tr> <tr> <td colspan="5">Dimethylbenzenes; C₈H₁₀; [1330-20-7]</td> </tr> <tr> <td>243.15-293.15</td> <td>3 - 20</td> <td>3.2</td> <td>4.94</td> <td>4.18</td> </tr> </tbody> </table>		Temperature Interval Measurements T/K	Butane Mol % Range 10 ² x ₁ /mol %	Kπv ¹ /atm at 293.15 K	Enthalpy of Dissolution ΔH/kcal mol ⁻¹	Constant A	Methylbenzene or toluene or phenylmethane; C ₇ H ₈ ; [108-88-3]					243.15-293.15	3 - 20	3.0	4.84	4.08	Dimethylbenzenes; C ₈ H ₁₀ ; [1330-20-7]					243.15-293.15	3 - 20	3.2	4.94	4.18
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The author's definitions are:																										
$K = y_1/x_1 = \frac{\text{mole fraction gas in gas phase}}{\text{mole fraction gas in liquid phase}},$ <p>π/atm = total pressure, v = coefficient of fugacity.</p>																										
The function, Kπv/atm, is equivalent to a Henry's constant in the form H _{1,2} /atm = (f ₁ /atm)/x ₁ where f ₁ is the fugacity.																										
AUXILIARY INFORMATION																										
METHOD/APPARATUS/PROCEDURE: The authors describe three methods: 1.A. [Saturat. n°1]. A measure of the static pressure of saturation in an apparatus which gave a precision of 10 - 15 %. 1.B. [Saturat. n°2]. A measure of the static pressure of saturation in an apparatus which gave a precision of 2 - 5 %. 2. [Chromato]. A Gas liquid chromatographic method estimated to have a precision of 2 - 5 %. 3. [Anal. directe]. Direct analysis of the gaseous and liquid phases. Method 1.A. was used for these systems.	SOURCE AND PURITY OF MATERIALS: (1) Butane. Matheson Co., Inc. Fractionated, purity > 99.5 per cent. (2) Methylbenzene. Qualité UCB. Density, ρ ²⁰ /g cm ⁻³ = 0.8689. Dimethylbenzenes. Merck and Co. Mixture of 90% dimethylbenzenes, 5% methylbenzene, and 5% ethyl benzene. ESTIMATED ERROR: REFERENCES:																									

<p>COMPONENTS:</p> <p>(1) Butane; C_4H_{10}; [106-97-8] (2) Methylbenzene (toluene); C_7H_8; [108-88-3]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Gerrard, W. <i>J. Appl. Chem. Biotechnol.</i> <u>1973</u>, 23, 1-17.</p>						
<p>VARIABLES:</p> <p>T/K: 283.2 P/kPa: 101.3</p>	<p>PREPARED BY:</p> <p>C. L. Young</p>						
<p>EXPERIMENTAL VALUES:</p> <p style="text-align: center;">Total pressure = 101.3 kPa</p>							
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 20%;">T/K</th> <th style="text-align: left; width: 30%;">Mole ratio</th> <th style="text-align: left; width: 50%;">Mole fraction of butane[#]</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">283.2</td> <td style="text-align: left;">1.45</td> <td style="text-align: left;">0.592</td> </tr> </tbody> </table>		T/K	Mole ratio	Mole fraction of butane [#]	283.2	1.45	0.592
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<p>[#] Calculated by compiler.</p>							
<p>AUXILIARY INFORMATION</p>							
<p>METHOD/APPARATUS/PROCEDURE:</p> <p>Gas was passed into a known weight of pure liquid in a bubbler tube at a total pressure measured using a manometer assembly. The amount of absorbed gas was estimated by weighing. The temperature was controlled to within 0.2 K. The apparatus and procedure are described by Gerrard, ref. (1).</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <p>No details given except that "all compounds were purified by conventional procedures".</p> <p>ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta x/x = \pm 3\%$ (estimated by compiler).</p> <p>REFERENCES:</p> <p>1. Gerrard, W. <i>J. Appl. Chem. Biotechnol.</i> <u>1972</u>, 22, 623.</p>						

COMPONENTS: (1) Butane; C ₄ H ₁₀ ; [106-97-8] (2) 1,3-Dimethylbenzene (<i>m</i> -xylene); C ₈ H ₁₀ ; [108-38-3]	ORIGINAL MEASUREMENTS: Gerrard, W. <i>J. Appl. Chem. Biotechnol.</i> <u>1973</u> , 23, 1-17.												
VARIABLES: T/K: 278.2-293.2 P/kPa: 101.3	PREPARED BY: C. L. Young												
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METHOD/APPARATUS/PROCEDURE: <p>Gas was passed into a known weight of pure liquid in a bubbler tube at a total pressure measured using a manometer assembly. The amount of absorbed gas was estimated by weighing. The temperature was controlled to within 0.2 K. The apparatus and procedure are described by Gerrard, ref. (1).</p>	SOURCE AND PURITY OF MATERIALS: <p>No details given except that "all compounds were purified by conventional procedures".</p> ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta x/x = \pm 3\%$ (estimated by compiler).												
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COMPONENTS: (1) Butane; C_4H_{10} ; [106-97-8] (2) Octamethylcyclotetrasiloxane; $C_8H_{24}O_4Si_4$; [556-67-2]	ORIGINAL MEASUREMENTS: Chappelow, C.C.; Prausnitz, J.M. <i>A.I.Ch.E.J.</i> <u>1974</u> , <i>20</i> , 1097-1104.														
VARIABLES: T/K : 300-425 P/kPa : 101.325	PREPARED BY: C.L. Young														
EXPERIMENTAL VALUES:															
T/K	<table border="1"> <thead> <tr> <th data-bbox="646 493 809 614">Henry's Constant^a H/atm</th> <th data-bbox="809 493 1204 614">Mole fraction^b of butane at 1 atm. partial pressure, $x_{C_4H_{10}}$</th> </tr> </thead> <tbody> <tr><td>300</td><td>0.4566</td></tr> <tr><td>325</td><td>0.2625</td></tr> <tr><td>350</td><td>0.1582</td></tr> <tr><td>375</td><td>0.1064</td></tr> <tr><td>400</td><td>0.0787</td></tr> <tr><td>425</td><td>0.0625</td></tr> </tbody> </table>	Henry's Constant ^a H/atm	Mole fraction ^b of butane at 1 atm. partial pressure, $x_{C_4H_{10}}$	300	0.4566	325	0.2625	350	0.1582	375	0.1064	400	0.0787	425	0.0625
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AUXILIARY INFORMATION															
METHOD/APPARATUS/PROCEDURE: Volumetric apparatus similar to that described by Dymond and Hildebrand (1). Pressure measured with a null detector and precision gauge. Details in ref. (2).	SOURCE AND PURITY OF MATERIALS: Solvent degassed; no other details given. ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta x_{C_4H_{10}} = \pm 1\%$ REFERENCES: 1. Dymond, J.; Hildebrand, J.H. <i>Ind. Eng. Chem. Fundam.</i> <u>1967</u> , <i>6</i> , 130. 2. Cukor, P.M.; Prausnitz, J.M. <i>Ind. Eng. Chem. Fundam.</i> <u>1971</u> , <i>10</i> , 638.														

COMPONENTS: (1) Butane; C_4H_{10} ; [106-97-8] (2) Decahydronaphthalene, (Decalin); $C_{10}H_{18}$; [91-17-8]	ORIGINAL MEASUREMENTS: Lenior, J-Y.; Renault; P. Renon, H. <i>J. Chem. Eng. Data</i> <u>1971</u> , <i>16</i> , 340-2	
VARIABLES: T/K : 298.15, 323.15 P/kPa : 101.3	PREPARED BY: C.L. Young	
EXPERIMENTAL VALUES:		
T/K	Henry's Constant $H_{C_4H_{10}}/atm$	Mole fraction at 1 atm* $x_{C_4H_{10}}$
298.15	3.57	0.280
323.15	4.91	0.204
<p>* Calculated by compiler assuming a linear function of $p_{C_4H_{10}}$ vs $x_{C_4H_{10}}$, ie. $x_{C_4H_{10}}(1 atm) = 1/H_{C_4H_{10}}$.</p>		
AUXILIARY INFORMATION		
METHOD/APPARATUS/PROCEDURE: A conventional gas-liquid chromatographic unit fitted with a thermal conductivity detector was used. The carrier gas was helium. The value of Henry's law constant was calculated from the retention time. The value applies to very low partial pressures of gas and there may be a substantial difference from that measured at 1 atm. pressure. There is also considerable uncertainty in the value of Henry's constant since surface adsorption was not allowed for although its possible existence was noted.	SOURCE AND PURITY OF MATERIALS: (1) L'Air Liquide sample; minimum purity 99.9 mole per cent. (2) Touzart and Matignon or Serlabo sample, purity 99 mole per cent.	
	ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta H/atm = \pm 6\%$ (estimated by compiler).	
	REFERENCES:	

EXPERIMENTAL VALUES:		
T/K	Henry's Constant ^a H/atm	Mole fraction ^b of butane at 1 atm. partial pressure, $x_{C_4H_{10}}$
300	4.59	0.2179
325	7.34	0.1362
350	11.4	0.0877
375	17.2	0.0581
400	24.3	0.0421
425	31.9	0.0313
450	39.5	0.0253
475	46.4	0.0216

^a Authors stated measurements were made at several pressures and values of solubility used were all within the Henry's law region.

^b Calculated by compiler assuming linear relationship between mole fraction and pressure.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Volumetric apparatus similar to that described by Dymond and Hildebrand (1). Pressure measured with a null detector and precision gauge. Details in ref. (2).	Solvent degassed; no other details given.
	ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta x_{C_4H_{10}} = \pm 1\%$
	REFERENCES: 1. Dymond, J.; Hildebrand, J.H. <i>Ind. Eng. Chem. Fundam.</i> <u>1967</u> , <i>6</i> , 130. 2. Cukor, P.M.; Prausnitz, J.M. <i>Ind. Eng. Chem. Fundam.</i> <u>1971</u> , <i>10</i> , 638.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Butane; C_4H_{10} ; [106-97-8] (2) 1,1'-Bicyclohexyl; $C_{12}H_{22}$; [92-51-3]	Chappelow, C.C.; Prausnitz, J.M. <i>A.I.Ch.E.J.</i> <u>1974</u> , <i>20</i> , 1097-1104.
VARIABLES:	PREPARED BY:
T/K: 300-475 P/kPa: 101.325	C.L. Young

COMPONENTS:		ORIGINAL MEASUREMENTS:	
(1) 2-Methylpropane; C ₄ H ₁₀ ; [75-28-5]		Jadot, R.	
(2) Benzene; C ₆ H ₆ ; [71-43-2]		<i>J. Chim. Phys.</i> <u>1972</u> , 69, 1036-40	
VARIABLES:		PREPARED BY:	
T/K: 298.15		C.L. Young	
P/kPa: 101.325			
EXPERIMENTAL VALUES:			
T/K	Henry's Law Constant, H/atm	Mole fraction ⁺ at partial pressure of 101.3 kPa, $x_{C_4H_{10}}$	# ΔH^∞ /cal mol ⁻¹ (/J mol ⁻¹)
298.15	8.160	0.1225	1100 (4602)
+ Calculated by compiler assuming $x_{C_4H_{10}} = 1/H$.			
# Excess partial molar enthalpy of solution at infinite dilution.			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
The conventional gas chromatographic technique was used. The carrier gas was helium. The value of Henry's law constant was calculated from the retention time. The value applies to very low partial pressures of gas and there may be a substantial difference from that measured at 1 atm. pressure. There is also considerable uncertainty in the value of Henry's constant since no allowance was made for surface adsorption.		No details given.	
		ESTIMATED ERROR:	
		$\delta T/K = \pm 0.05$; $\delta H = \pm 2\%$	
		REFERENCES.	

COMPONENTS: (1) 2-Methylpropane, (<i>isobutane</i>); C_4H_{10} ; [75-28-5] (2) 1,3,5-Trimethylbenzene, (<i>mesitylene</i>); C_9H_{12} ; [108-67-8]	ORIGINAL MEASUREMENTS: Gerrard, W. <i>Solubility of Gases and Liquids</i> , Plenum, New York, <u>1976</u> , Chapter 12.		
VARIABLES: T/K : 273.15 P/kPa : 13.3-101.3	PREPARED BY: C.L. Young		
EXPERIMENTAL VALUES:			
T/K	$P/mmHg$	P/kPa	Mole fraction of 2-methyl propane in liquid, $x_{C_4H_{10}}$
273.15	100	13.3	0.058
	200	26.7	0.117
	300	40.0	0.180
	400	53.3	0.245
	500	66.7	0.322
	600	80.0	0.404
	700	93.3	0.496
	760	101.3	0.568
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE: <p>Gas was passed into a known weight of pure liquid in a bubbler tube at a total pressure measured by a manometer assembly. The amount of absorbed gas was estimated by weighing. The temperature was manually controlled to within 0.2K. The apparatus and procedure are described by Gerrard (1, 2).</p>	SOURCE AND PURITY OF MATERIALS: <p style="text-align: center;">No details given.</p>		
	ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta x/x = \pm 3\%$ (estimated by compiler)		
	REFERENCES: 1. Gerrard, W. <i>J. Appl. Chem. Biotechnol.</i> <u>1972</u> , 22, 623-650. 2. Gerrard, W. <i>Solubility of Gases and Liquids</i> , Plenum Press, New York, <u>1976</u> , Chapter 1.		

COMPONENTS: (1) 2-Methylpropane; C ₄ H ₁₀ ; [75-28-5] (2) 1-Methylnaphthalene; C ₁₁ H ₁₀ ; [1321-94-4]	ORIGINAL MEASUREMENTS: Chappelow, C.C.; Prausnitz, J.M.; <i>A.I.Ch.E.J.</i> 1974, 20, 1097-1104.	
VARIABLES: <i>T</i> /K: 300-475 <i>P</i> /kPa: 101.325	PREPARED BY: C.L. Young	
EXPERIMENTAL VALUES:		
<i>T</i> /K	Henry's Constant ^a <i>H</i> /atm	Mole fraction ^b of 2- methyl propane at 1 atm. partial pressure, <i>x</i> _{C₄H₁₀}
300	12.0	0.0833
325	19.9	0.0503
350	30.3	0.0330
375	42.8	0.0234
400	57.1	0.0175
425	72.1	0.0139
450	86.8	0.0115
475	92.9	0.0108
<p>^a Authors stated measurements were made at several pressures and values of solubility used were all within the Henry's law region.</p> <p>^b Calculated by compiler assuming linear relationship between mole fraction and pressure.</p>		
AUXILIARY INFORMATION		
METHOD/APPARATUS/PROCEDURE: Volumetric apparatus similar to that described by Dymond and Hilderbrand (1). Pressure measured with a null detector and precision gauge. Details in ref. (2).	SOURCE AND PURITY OF MATERIALS: Solvent degassed; no other details given.	
	ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta x_{C_4H_{10}} = \pm 1\%$	
	REFERENCES: 1. Dymond, J.; Hilderbrand, J.H. <i>Ind. Eng. Chem. Fundam.</i> <u>1967</u> , 6, 130. 2. Cukor, P.M.; Prausnitz, J.M. <i>Ind. Chem. Eng. Fundam.</i> <u>1971</u> , 10, 638.	

COMPONENTS: (1) 2-Methylpropane; (isobutane); C_4H_{10} ; [75-28-5] (2) 1,1'-Bicyclohexyl; $C_{12}H_{22}$; [92-51-3]	ORIGINAL MEASUREMENTS: Chappelow, C.C, Prausnitz, J.M. <i>A.I.Ch.E.J.</i> <u>1974</u> , <i>20</i> , 1097-1104.	
VARIABLES: T/K : 300-475 P/kPa : 101.325	PREPARED BY: C.L. Young	
EXPERIMENTAL VALUES:		
T/K	Henry's Constant ^a H/atm	Mole fraction ^b of 2- methyl propane at 1 atm. partial pressure, $x_{C_4H_{10}}$
300	6.43	0.158
325	10.5	0.0952
350	16.3	0.0613
375	23.0	0.0435
400	31.3	0.0319
425	41.4	0.0242
450	50.6	0.0198
475	55.7	0.0180
<p>^a Authors stated measurements were made at several pressures and values of solubility used were all within the Henry's law region.</p> <p>^b Calculated by compiler assuming linear relationship between mole fraction and pressure.</p>		
AUXILIARY INFORMATION		
METHOD/APPARATUS/PROCEDURE: Volumetric apparatus similar to that described by Dymond and Hildebrand (1). Pressure measured with a null detector and precision gauge. Details in ref. (2).	SOURCE AND PURITY OF MATERIALS: Solvent degassed; no other details given.	
	ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta x_{C_4H_{10}} = \pm 1\%$.	
	REFERENCES: 1. Dymond, J.; Hildebrand, J.H. <i>Ind. Eng. Chem. Fundam.</i> <u>1967</u> , <i>6</i> , 130. 2. Cukor, P.M.; Prausnitz, J.M. <i>Ind. Chem. Eng. Fundam.</i> <u>1971</u> , <i>10</i> , 638.	

COMPONENTS: (1) 2-Methylpropane, (isobutane); C_4H_{10} ; [75-28-5] (2) Octamethylcyclotetrasiloxane; $C_8H_{24}O_4Si_4$; [556-67-2]	ORIGINAL MEASUREMENTS: Chappelow, C.C.; Prausnitz, J.M. <i>A.I.Ch.E.J.</i> <u>1974</u> , <i>20</i> , 1097-1104.																					
VARIABLES: T/K : 300-425 P/kPa : 101.325	PREPARED BY: C.L. Young																					
EXPERIMENTAL VALUES:																						
<table border="1"> <thead> <tr> <th data-bbox="102 550 438 671">T/K</th> <th data-bbox="438 550 826 671">Henry's Constant^a /atm</th> <th data-bbox="826 550 1221 671">Mole fraction^b of 2- methylpropane at 1 atm. partial pressure, $x_{C_4H_{10}}$</th> </tr> </thead> <tbody> <tr> <td>300</td> <td>2.98</td> <td>0.336</td> </tr> <tr> <td>325</td> <td>5.05</td> <td>0.198</td> </tr> <tr> <td>350</td> <td>7.96</td> <td>0.126</td> </tr> <tr> <td>375</td> <td>11.4</td> <td>0.0877</td> </tr> <tr> <td>400</td> <td>15.4</td> <td>0.0649</td> </tr> <tr> <td>425</td> <td>20.3</td> <td>0.0493</td> </tr> </tbody> </table>		T/K	Henry's Constant ^a /atm	Mole fraction ^b of 2- methylpropane at 1 atm. partial pressure, $x_{C_4H_{10}}$	300	2.98	0.336	325	5.05	0.198	350	7.96	0.126	375	11.4	0.0877	400	15.4	0.0649	425	20.3	0.0493
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