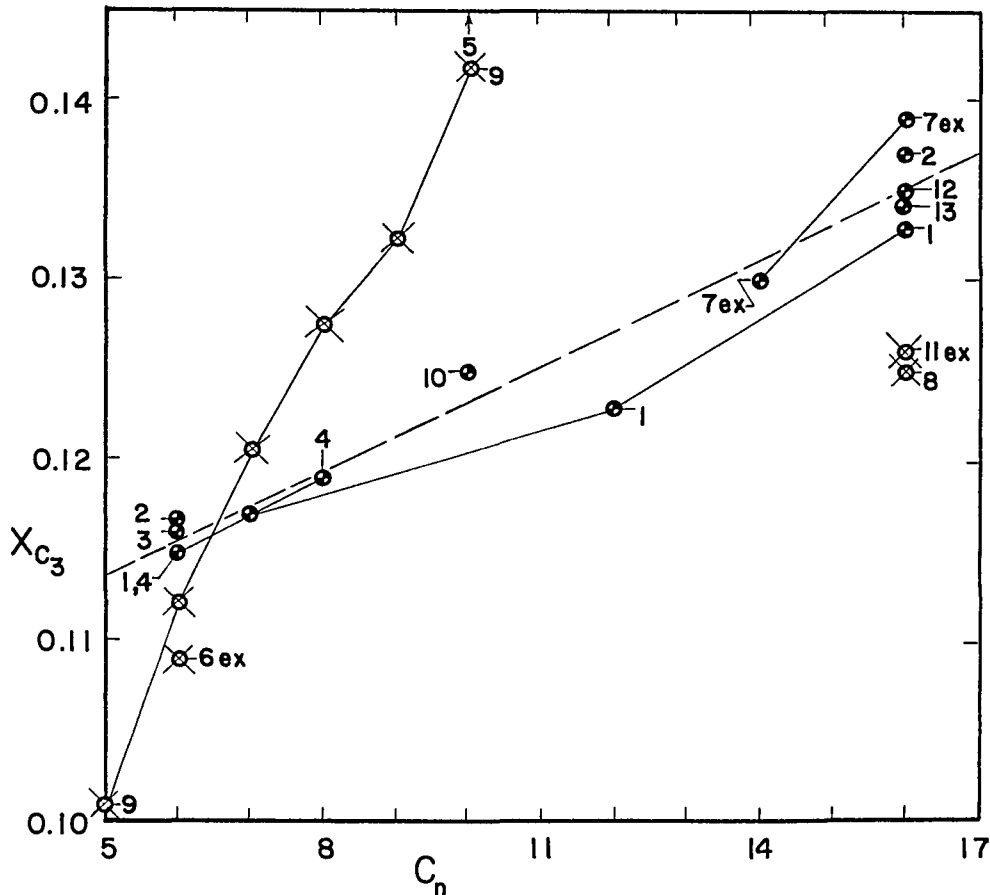


COMPONENTS:	EVALUATOR:
(1) Propane; C_3H_8 ; [74-98-6] Butane; C_4H_{10} ; [106-97-8] 2-Methylpropane; C_4H_{10} ; [75-28-5]	Walter Hayduk Department of Chemical Engineering University of Ottawa Ottawa, Canada K1N 9B4
(2) Alkane solvents	January, 1984

CRITICAL EVALUATION:

The solubility of *propane* in the *n*-alkanes which are normally liquid has been studied by at least thirteen groups of workers. The sources for the *propane* solubilities in the particular *n*-alkane solvents are: pentane (9), hexane (1,2,3,4,6), heptane (1,9), octane (4,9), nonane (9), decane (5,9,10), dodecane (1), tetradecane (7), and hexadecane (1,2,7,8,11,12,13). Data from these sources are shown in the diagram below as the mole fraction *propane* solubility for a gas partial pressure at 101.325 kPa and 298.15 K, x_1 , as a linear function of the number of carbon atoms in the solvent molecule, C_n . In a number of instances an extrapolation of the data was required for comparison at 298.15 K and for these cases "ex" has been added after the reference number. Except for the solubilities in hexane and heptane, the data of Jadot (9) appear to be erratic and are rejected. The chromatographic method used, effectively at low gas partial pressures, may have contributed to the apparently unreliable results. The data of Gerrard (5) for the solubility in decane is very much higher than any other data and is also rejected. The extrapolated data of Tilquin et al. (6) in hexane, of Chappelow and Prausnitz (11) in hexadecane and of Lin and Parcher (8) also in hexadecane appear to be at least 5% lower than those of several other workers and are classified as doubtful. The remaining data, classified as tentative, were used to determine a regression line which is shown in Figure 1 as a dashed line:

$$x_{C_3} = 0.1036 + 0.00197 C_n \quad \text{Correlation coefficient} = 0.975$$

Figure 1. Solubility of *propane* in *n*-alkane solvents at 298.15 K.

COMPONENTS:

- (1) Propane; C_3H_8 ; [74-98-6]
 Butane; C_4H_{10} ; [106-97-8]
 2-Methylpropane; C_4H_{10} ; [75-28-5]
 (2) Alkane solvents

EVALUATOR:

Walter Hayduk
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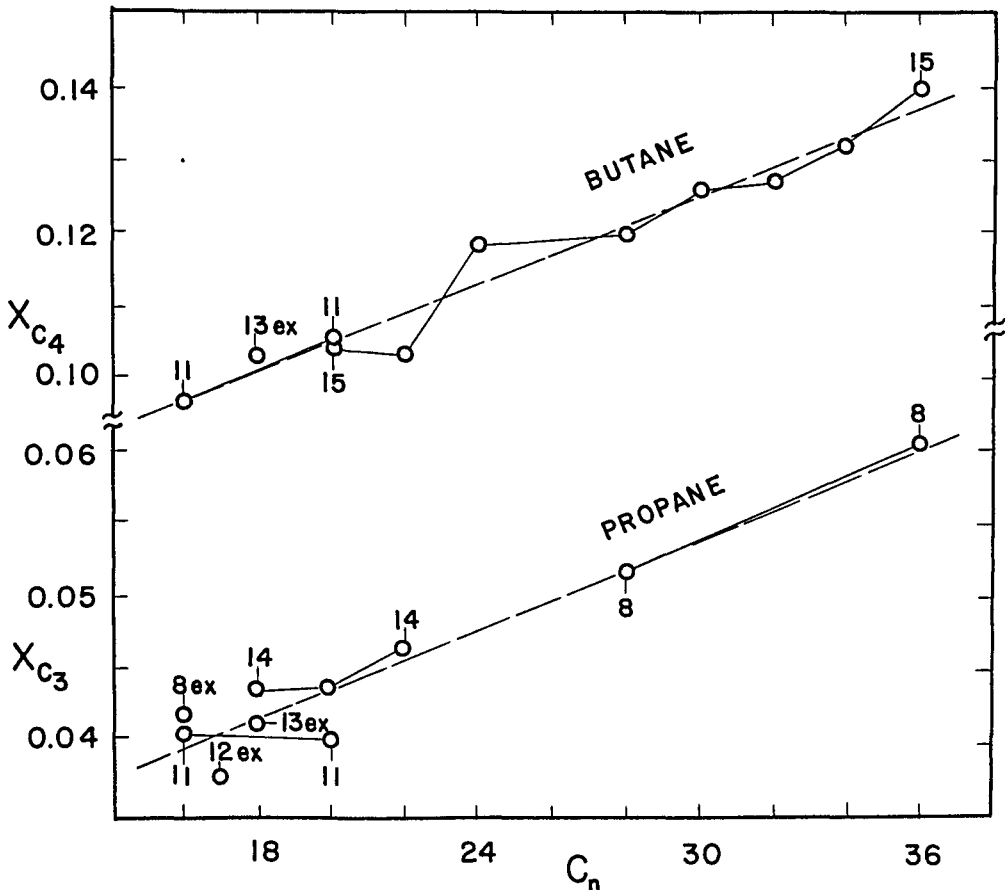
January, 1984

CRITICAL EVALUATION:

There are conflicting data for the solubility in branched isomers of alkane solvents. The solubilities in the four branched C_6 solvents, 2-methylpentane, 3-methylpentane, 2,2'-dimethylbutane, (neo-hexane) and 2,3-dimethylbutane reported in ref.(3) are all similar to those in n-hexane; the mean value at 298.14 K is almost identical to that calculated from the equation shown above. These data suggest that branching in solvents has only a small effect if any on the solubility, provided that the same number of carbons are present in the solvent molecules. On the other hand, the extrapolated data for the solubility in 2,2'-dimethylbutane of Tilquin et al.(6) is some 15% higher than that for n-hexane solvent. Yet a similar comparison for butane gas solubility by those authors indicates a butane solubility in 2,2'-dimethylbutane which is significantly lower than in n-hexane. Furthermore, the propane solubility in 2,2,4,6,8,8-heptamethylnonane ($C_{16}H_{34}$) as reported by Richon and Renon (13) at 298.15 K is almost four times as great as that in n-hexadecane also as reported by the same authors, an incredible difference. It may be concluded that there are insufficient data to form a sound opinion concerning the effect of branching in alkane solvents.

The solubility of propane in n-alkane solvents of higher molecular weight are compared at 373.15 K, a temperature at which all the normally solid alkanes are liquids, in Figure 2. Extrapolation was

Figure 2. Solubility of propane and butane in high molecular weight n-alkane solvents at 373.15 K.



COMPONENTS:

- (1) Propane; C_3H_8 ; [74-98-6]
 Butane; C_4H_{10} ; [106-97-8]
 2-Methylpropane; C_4H_{10} ; [75-28-5]
- (2) Alkane solvents

EVALUATOR:

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

January, 1984

CRITICAL EVALUATION:

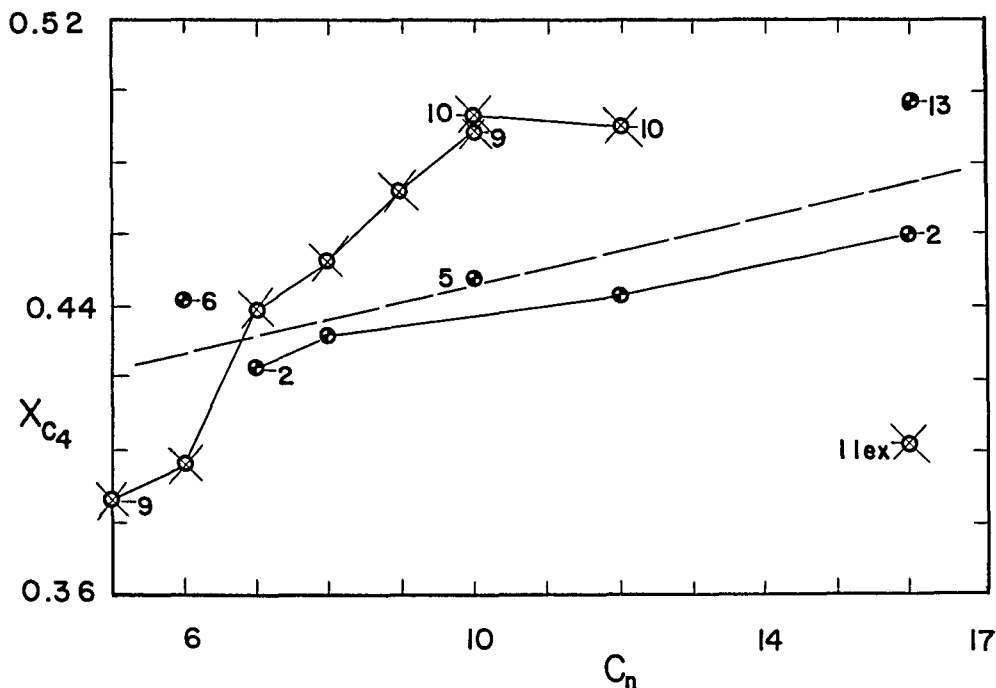
required in several instances to estimate the solubility at 373.15 K. Although scarce, the data show a trend consistent with that of lower molecular weight alkanes, a linear increase in mole fraction solubility with number of carbons per molecule of solvent. The data sources are: for heptadecane (12), octadecane (13,14), eicosane (11,14), docosane (14), octacosane (8) and hexatriacontane (8). These data are all classified as tentative. A straight line through the (extrapolated) data points, shown as a dashed line in Figure 2, has the following constants for use at 373.15 K:

$$x_{C_3} = 0.02250 + 0.00105 C_n \quad \text{Correlation coefficient} = 0.964$$

The solubility of *propane* in the branched alkane, 2,6,10,15,19,23-hexamethyltetracosane or squalane ($C_{30}H_{62}$) at 373.15 K (11) is similar to that for an n-alkane with the same number of carbons. These data are also classified as tentative.

The data for the solubility of *butane* in n-alkane solvents from pentane to hexadecane for a temperature of 298.15 K are shown in Figure 3. The sources of data are listed according to solvent: pentane (9), hexane (6,9), heptane (2,9), octane (2,9), nonane (9), decane (5,9,10), dodecane (2,10), and hexadecane (2,11,13). Except for the solvents hexane and heptane, the solubilities of Jadot (9) appear erratic as they did for *propane* solubilities and hence are rejected. The data of Montfort and Arriaga in decane and dodecane (10) appear too high and are also rejected. The extrapolated data of Chappelow and Prausnitz in hexadecane (11) appear low by more than 5% as they did for *propane* gas in the same solvent, and are rejected. The remaining data (2,5,6,13) are classified as tentative and were used to obtain a regression line for the mole fraction solubility at 298.15 K:

Figure 3. Solubility of *butane* in n-alkane solvents at 298.15 K.



<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</p>	<p>EVALUATOR:</p> <p>Walter Hayduk Department of Chemical Engineering University of Ottawa Ottawa, Canada K1N 9B4</p> <p>January, 1984</p>
<p>CRITICAL EVALUATION: continued</p> $x_{C_4} = 0.3975 + 0.00484 C_n \quad \text{Correlation coefficient} = 0.813$ <p>The solubility of <i>butane</i> in <u>2,2'-dimethylbutane</u> (neohexane) (6) is classified as tentative. The solubility in <u>2,2,4,4,6,8,8-heptamethylnonane</u> (13) is rejected because of an impossible fractional value for Henry's law constant.</p> <p><i>Butane</i> solubilities at 373.15 K in the high molecular weight (and normally solid) n-alkane solvents from <u>hexadecane</u> to <u>hexatriacontane</u> are shown in Figure 2. Mainly the data of Parcher et al. (15) are available for these solvents. The solvents and sources are: <u>hexadecane</u> (11), <u>octadecane</u> (13), <u>eicosane</u> (11, 15), <u>docosane</u> (15), <u>tetracosane</u> (15), <u>octacosane</u> (15), <u>triacontane</u> (15), <u>dotriacontane</u> (15), <u>tetratriacontane</u> (15) and <u>hexatriacontane</u> (15). These data are all classified as tentative. A regression equation for the solubility of <i>butane</i> at 373.15 K in high molecular weight n-alkane solvents is:</p> $x_{C_4} = 0.06414 + 0.00203 C_n \quad \text{Correlation coefficient} = 0.980$ <p>The solubility of <i>butane</i> in <u>2,6,10,15,19,23-hexamethyltetracosane</u> ($C_{30}H_{62}$) (11), as observed for <i>propane</i>, is similar to that for an alkane with the same number of carbons. These data are classified as tentative.</p> <p>There are three sources of data for the solubility of <i>2-methylpropane</i> in n-alkane solvents. These are listed by solvent: <u>pentane</u> (9), <u>hexane</u> (6,9), <u>heptane</u> (9), <u>octane</u> (9), <u>nonane</u> (9), and <u>decane</u> (5,9). There are insufficient data for the solubility of <i>2-methylpropane</i> alone to assess the reliability of the Jadot data (9); however, based on the erratic nature of the solubilities of <i>propane</i> and <i>butane</i> by the same worker when compared with those of other workers, these data are also rejected. Only the data of Tilquin et al. (6) in <u>heptane</u> and of Gerrard (5) in <u>decane</u> remain; these are classified as tentative.</p> <p>The solubility of <i>2-methylpropane</i> in <u>eicosane</u> (11) is also classified as tentative.</p> <p>In all cases the regression equations given in this Critical Evaluation are <i>approximate</i> only, because they are based, at least in part, on extrapolated and/or too few data to be highly reliable. Nor is it possible to ascribe useful limits of accuracy to them.</p> <p>The solubility of the gases <i>propane</i>, <i>2-methylpropane</i>, and <i>butane</i> appear to increase in the order listed, in each of the n-alkane solvents. The order of increasing solubility of gases has been related to the order of increasing normal boiling points of the gases (17) as obtained here.</p> <p><u>References</u></p> <ol style="list-style-type: none"> Hayduk, W.; Walter, E.B.; Simpson, P. J. <i>Chem. Eng. Data</i> <u>1972</u>, <i>17</i>, 59-61. Hayduk, W.; Castañeda, R. <i>Can. J. Chem. Eng.</i> <u>1973</u>, <i>51</i>, 353-358. 	

<p>COMPONENTS:</p> <p>(1) Propane; C₃H₈; [74-98-6] Butane; C₄H₁₀; [101-97-8] 2-Methylpropane; C₄H₁₀; [75-28-5]</p> <p>(2) Alkane solvents</p>	<p>EVALUATOR:</p> <p>Walter Hayduk Department of Chemical Engineering University of Ottawa Ottawa, Canada K1N 9B4</p> <p>January, 1984</p>
<p>CRITICAL EVALUATION: continued</p> <ol style="list-style-type: none"> 3. Fleury, D.; Hayduk, W. <i>Can. J. Chem. Eng.</i> <u>1975</u>, <i>53</i>, 195-199. 4. Thomsen, E.S.; Gjaldbaek, J.C. <i>Acta Chem. Scand.</i> <u>1963</u>, <i>17</i>, 134-138. 5. Gerrard, W. <i>J. Appl. Chem. Biotechnol.</i> <u>1973</u>, <i>23</i>, 1-17. 6. Tilquin, G.; Decanniere, L.; Fontaine, R.; Claes, P. <i>Ann. Soc. Sc. Bruxelles (Belgium)</i> <u>1967</u>, <i>81</i>, 191-199. 7. King, M.B.; Al-Najjar, H. <i>Chem. Eng. Sci.</i> <u>1977</u>, <i>32</i>, 1241-1246. 8. Lin, P.J.; Parcher, J.F. <i>J. Chromatog. Sci.</i> <u>1982</u>, <i>20</i>, 33-38. 9. Jadot, R. <i>J. Chim. Phys.</i> <u>1972</u>, <i>69</i>, 1036-1040. 10. Montfort, J.P.; Arriaga, J.L. <i>Chem. Eng. Commun.</i> <u>1980</u>, <i>7</i>, 17-25. 11. Chappelow, C.C.; Prausnitz, J.M. <i>A.I.Ch.E.J.</i> <u>1974</u>, <i>20</i>, 1097-1104. 12. Lenoir, J.-Y.; Renault, P.; Renon, H. <i>J. Chem. Eng. Data</i> <u>1971</u>, <i>16</i>, 340-342. 13. Richon, D.; Renon, H. <i>J. Chem. Eng. Data</i> <u>1980</u>, <i>25</i>, 59-60. 14. Ng, S.; Harris, H.G.; Prausnitz, J.M. <i>J. Chem. Eng. Data</i>, <u>1969</u>, <i>14</i>, 482-483. 15. Parcher, J.F.; Weiner, P.H.; Hussey, C.L.; Westlake, T.N. <i>J. Chem. Eng. Data</i> <u>1975</u>, <i>20</i>, 145-151. 16. Gerrard, W. <i>Solubility of Gases and Liquids</i>, Plenum Press, New York <u>1976</u>, Chapter 12. 17. Blais, C.; Hayduk, W. <i>J. Chem. Eng. Data</i> <u>1983</u>, <i>28</i>, 181-183. 	

<p>COMPONENTS:</p> <p>(1) Propane; C₃H₈; [74-98-6]</p> <p>(2) Pentane; C₅H₁₂; [109-66-0] or Hexane; C₆H₁₄; [110-54-3]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Jadot, R. <i>J. Chim. Phys.</i> <u>1972</u>, 69, 1036-40</p>												
<p>VARIABLES:</p> <p>T/K: 298.15</p> <p>P/kPa: 101.3</p>	<p>PREPARED BY:</p> <p>C.L. Young</p>												
<p>EXPERIMENTAL VALUES:</p>													
<table border="1"> <thead> <tr> <th>T/K</th> <th>Henry's Law Constant, <i>H</i> /atm</th> <th>Mole fraction⁺ at partial pressure of 101.3 kPa, <i>x</i>_{C₃H₈}</th> <th>#Δ<i>H</i>[∞] /cal mol⁻¹ (/J mol⁻¹)</th> </tr> </thead> <tbody> <tr> <td>298.15</td> <td>9.916</td> <td>0.1008</td> <td>-</td> </tr> <tr> <td>298.15</td> <td>8.924</td> <td>0.1121</td> <td>200 (837)</td> </tr> </tbody> </table>		T/K	Henry's Law Constant, <i>H</i> /atm	Mole fraction ⁺ at partial pressure of 101.3 kPa, <i>x</i> _{C₃H₈}	#Δ <i>H</i> [∞] /cal mol ⁻¹ (/J mol ⁻¹)	298.15	9.916	0.1008	-	298.15	8.924	0.1121	200 (837)
T/K	Henry's Law Constant, <i>H</i> /atm	Mole fraction ⁺ at partial pressure of 101.3 kPa, <i>x</i> _{C₃H₈}	#Δ <i>H</i> [∞] /cal mol ⁻¹ (/J mol ⁻¹)										
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<p>Pentane; C₅H₁₂; [109-66-0]</p> <p>Hexane; C₆H₁₄; [110-54-3]</p>													
<p>+ Calculated by compiler assuming $x_{C_3H_8} = 1/H$</p> <p># Excess partial molar enthalpy of solution at infinite dilution.</p>													
<p>AUXILIARY INFORMATION</p>													
<p>METHOD/APPARATUS/PROCEDURE:</p> <p>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.</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <p>No details given.</p> <p>ESTIMATED ERROR:</p> <p>δ<i>T</i>/K = ±0.05; δ<i>H</i> = ±2%</p> <p>REFERENCES:</p>												

COMPONENTS: (1) Propane; C ₃ H ₈ ; [74-98-6] (2) Hexane; C ₆ H ₁₄ ; [110-54-3]	ORIGINAL MEASUREMENTS: Hayduk, W.; Walter, E.B.; Simpson, P. <i>J. Chem. Eng. Data</i> <u>1972</u> , <i>17</i> , 59-61.								
VARIABLES: T/K: 298.15 P/kPa: 101.325	PREPARED BY: W. Hayduk								
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;">Ostwald Coefficient¹ L/cm³ cm⁻³</th> <th style="text-align: center;">Bunsen Coefficient² α/cm³ (STP) cm⁻³ atm⁻¹</th> <th style="text-align: center;">Mole Fraction¹ x₁</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">298.15</td> <td style="text-align: center;">23.75</td> <td style="text-align: center;">21.76</td> <td style="text-align: center;">0.115</td> </tr> </tbody> </table>		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	298.15	23.75	21.76	0.115
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						
298.15	23.75	21.76	0.115						
¹ Original data. ² Calculated by compiler. ³ ΔG° calculated by compiler: $\Delta G^\circ / \text{J mol}^{-1} = -RT \ln x_1 = 5.361$									
AUXILIARY INFORMATION									
METHOD/APPARATUS/PROCEDURE: 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).	SOURCE AND PURITY OF MATERIALS: 1. Matheson Co. Specified as instrument grade of minimum purity 99.5 per cent. 2. Canlab. Chromatoquality grade of minimum specified purity 99.9 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> <u>1971</u> , <i>61</i> , 1078.								

COMPONENTS: (1) Propane; C ₃ H ₈ ; [74-98-6] (2) Hexane; C ₆ H ₁₄ ; [110-54-3]	ORIGINAL MEASUREMENTS: Hayduk, W.; Castañeda, R. <i>Can. J. Chem. Eng.</i> <u>1973</u> , <i>51</i> , 353-358.										
VARIABLES: T/K: 298.15 P/kPa: 101.325	PREPARED BY: W. Hayduk										
EXPERIMENTAL VALUES:											
<table border="1"> <thead> <tr> <th data-bbox="97 600 189 687">T/K</th> <th data-bbox="189 600 510 687">Ostwald Coefficient¹ L/cm³ cm⁻³</th> <th data-bbox="510 600 844 687">Bunsen Coefficient² α/cm³ (STP) cm⁻³ atm⁻¹</th> <th data-bbox="844 600 1071 687">Mole fraction¹ x₁</th> <th data-bbox="1071 600 1212 687">ΔG°³ /J mol⁻¹</th> </tr> </thead> <tbody> <tr> <td data-bbox="97 721 189 751">298.15</td> <td data-bbox="189 721 510 751">24.0</td> <td data-bbox="510 721 844 751">22.0</td> <td data-bbox="844 721 1071 751">0.1166</td> <td data-bbox="1071 721 1212 751">5327.0</td> </tr> </tbody> </table>		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	ΔG° ³ /J mol ⁻¹	298.15	24.0	22.0	0.1166	5327.0
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	ΔG° ³ /J mol ⁻¹							
298.15	24.0	22.0	0.1166	5327.0							
<p>¹ Original data.</p> <p>² Calculated by compiler.</p> <p>³ Calculated by compiler from the following equation: $\Delta G^\circ/\text{J mol}^{-1} = -RT \ln x_1$</p>											
AUXILIARY INFORMATION											
METHOD/APPARATUS/PROCEDURE: 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).	SOURCE AND PURITY OF MATERIALS: 1. Matheson Co. Specified as instrument grade of minimum purity 99.5 per cent. 2. Canlab. 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> <u>1971</u> , <i>61</i> , 1078.										

COMPONENTS: (1) Propane; C ₃ H ₈ ; [74-98-6] (2) Hexane; C ₆ H ₁₄ ; [110-54-3]	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 data-bbox="150 520 255 600">T/K</th> <th data-bbox="294 520 593 600">Ostwald Coefficient² L/cm³ cm⁻³</th> <th data-bbox="632 520 931 600">Bunsen Coefficient¹ α/cm³ (STP) cm⁻³ atm⁻¹</th> <th data-bbox="971 520 1176 600">Mole Fraction² x₁</th> </tr> </thead> <tbody> <tr> <td data-bbox="150 620 255 651">298.15</td> <td data-bbox="294 620 593 651">23.7</td> <td data-bbox="632 620 931 651">21.6</td> <td data-bbox="971 620 1176 651">0.115</td> </tr> </tbody> </table>		T/K	Ostwald Coefficient ² L/cm ³ cm ⁻³	Bunsen Coefficient ¹ α/cm ³ (STP) cm ⁻³ atm ⁻¹	Mole Fraction ² x ₁	298.15	23.7	21.6	0.115
T/K	Ostwald Coefficient ² L/cm ³ cm ⁻³	Bunsen Coefficient ¹ α/cm ³ (STP) cm ⁻³ atm ⁻¹	Mole Fraction ² x ₁						
298.15	23.7	21.6	0.115						
<p>¹Original data.</p> <p>²Calculated by compilers using a real gas molar volume.</p>									
AUXILIARY INFORMATION									
METHOD/APPARATUS/PROCEDURE: <p>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.</p> <p>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.</p>	SOURCE AND PURITY OF MATERIALS: <ol style="list-style-type: none"> Phillips Petroleum Co. Specified as research grade and GC analysis indicated 0.1 per cent air and 0.03 per cent ethane impurities. Merck. Purity not given. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta x_1/x_1 = 0.015$ REFERENCES: <ol style="list-style-type: none"> Gjaldbaek, J.C. <i>Acta Chem. Scand.</i> <u>1952</u>, <i>6</i>, 623. 								

COMPONENTS: (1) Propane; C ₃ H ₈ ; [74-98-6] (2) Hexane; C ₆ H ₁₄ ; [110-54-3]	ORIGINAL MEASUREMENTS: Tilquin, B.; Decanniere, L.; Fontaine, R.; Claes, P. <i>Ann. Soc. Sc. Bruxelles (Belgium)</i> <u>1967, 81, 191-199.</u>										
VARIABLES: <i>T</i> /K: 288.15 <i>P</i> /kPa: 5.04-7.31	PREPARED BY: W. Hayduk										
EXPERIMENTAL VALUES:											
<table border="1"> <thead> <tr> <th><i>t</i>/°C</th> <th><i>T</i>/K</th> <th>Ostwald coefficient¹ L/cm³cm⁻³</th> <th>Mole fraction² /<i>x</i>₁</th> <th>Henry's constant² H/atm</th> </tr> </thead> <tbody> <tr> <td>15.0</td> <td>288.15</td> <td>29.3</td> <td>0.1382</td> <td>27.2</td> </tr> </tbody> </table>		<i>t</i> /°C	<i>T</i> /K	Ostwald coefficient ¹ L/cm ³ cm ⁻³	Mole fraction ² / <i>x</i> ₁	Henry's constant ² H/atm	15.0	288.15	29.3	0.1382	27.2
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15.0	288.15	29.3	0.1382	27.2							
<p>¹Original data at low pressure reported as a distribution coefficient; if Henry's law and ideal gas law apply, the distribution coefficient is equivalent to the Ostwald coefficient as shown here.</p> <p>²Calculated by compiler for a gas partial pressure of 101.325 kPa assuming that Henry's law and ideal gas law apply.</p>											
AUXILIARY INFORMATION											
METHOD/APPARATUS/PROCEDURE: An all glass apparatus was used at a very low gas partial pressure. It contained a replaceable degassed solvent ampule equipped with a breakable point which could be broken by means of a magnetically activated plunger. The quantity of gas fed into the system was determined by measuring the pressure change in a known volume. The quantity of liquid was measured by weight. The pressure change was observed after the solvent was released. Experimental details are described by Rząd and Claes.	SOURCE AND PURITY OF MATERIALS: <ol style="list-style-type: none"> Source not given; minimum purity specified as 99.0 mole per cent. Fluka pure grade; minimum purity specified as 99.0 mole per cent. ESTIMATED ERROR: <i>T</i> /K = 0.05 (estimated by compiler) $\delta x_1/x_1 = 0.01$ REFERENCES: <ol style="list-style-type: none"> Rząd, S.; Claes, P. <i>Bull. Soc. Chim. Belges, 1964, 73, 689.</i> 										

COMPONENTS:		ORIGINAL MEASUREMENTS:			
(1) Propane; C ₃ H ₈ ; [74-98-6] (2) Hexane; C ₆ H ₁₄ ; [110-54-3]		Fleury, D.; Hayduk, W. <i>Can. J. Chem. Eng.</i> 1975 , <i>53</i> , 195-199.			
VARIABLES:		PREPARED BY:			
T/K: 258.15-323.15 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		
258.15	83.4	88.2	0.336 (0.3352) ³		
278.15	40.4	41.2	0.188 (0.1894)		
298.15	23.6	21.6	0.116 (0.1154)		
323.15	13.9	11.7	0.0675 (0.0676)		
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: $\Delta G^\circ/\text{J mol}^{-1} = 61.609 T + 2.0476 T \ln T - 16494$ $\ln x_1 = 1983.9/T - 0.24628 \ln T - 7.4103$ Std. deviation for ΔG° = 12.3 J mol ⁻¹					
T/K	ΔG°/J mol ⁻¹	x ₁	T/K	ΔG°/J mol ⁻¹	x ₁
258.15	2346	0.3352	298.15	5353	0.1154
273.15	3472	0.2168	303.15	5730	0.1030
283.15	4224	0.1662	313.15	6484	0.0829
293.15	4976	0.1298	323.15	7238	0.0676
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:		
			$\delta T/K = 0.1$ $\delta x_1/x_1 = 0.01$		
REFERENCES:			1. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M. <i>J. Phys. Chem.</i> 1971 , <i>61</i> , 1078.		

COMPONENTS: (1) Propane; C ₃ H ₈ ; [74-98-6] (2) 2-Methylpentane; C ₆ H ₁₄ ; [107-83-5]	ORIGINAL MEASUREMENTS: Fleury, D.; Hayduk, W. <i>Can. J. Chem. Eng.</i> <u>1975</u> , <i>53</i> , 195-199																														
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COMPONENTS:		ORIGINAL MEASUREMENTS:			
(1) Propane; C ₃ H ₈ ; [74-98-6]		Fleury, D.; Hayduk, W.			
(2) 3-Methylpentane; C ₆ H ₁₄ ; [96-14-0]		Can. J. Chem. Eng. <u>1975</u> , 53, 195-199			
VARIABLES:		PREPARED BY:			
T/K: 258.15-323.15		W. Hayduk			
P/kPa: 101.325					
EXPERIMENTAL VALUES:					
T/K	Ostwald Coefficient ¹ L/cm ³ cm ⁻³	Bunsen Coefficient ¹ α/cm ³ (STP) cm ⁻³ atm ⁻¹	Mole Fraction ¹ x ₁		
258.15	84.2	89.1	0.338 (0.339) ³		
278.15	42.2	41.4	0.193 (0.190)		
298.15	23.3	21.3	0.113 (0.115)		
323.15	13.8	11.7	0.0673 (0.0669)		
¹ Original data.					
² Calculated by compiler.					
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 = 76.094 T - 17324					
ln x ₁ = 2083.7/T - 9.1525					
Std. deviation for ΔG° = 33.7 J/ mol ⁻¹ ; Correlation coefficient = 0.9999					
T/K	ΔG°/J mol ⁻¹	x ₁	T/K	ΔG°/J mol ⁻¹	x ₁
258.15	2319	0.339	298.15	5363	0.115
273.15	3460	0.218	303.15	5743	0.102
283.15	4221	0.166	313.15	6504	0.0822
293.15	4982	0.130	323.15	7265	0.0669
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. Phillips Petroleum. 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. J. Phys. Chem. <u>1971</u> , 61, 1078.		

COMPONENTS: (1) Propane; C ₃ H ₈ ; [74-98-6] (2) 2,2'-Dimethylbutane (Neo-hexane); C ₆ H ₁₄ ; [75-83-2]	ORIGINAL MEASUREMENTS: Tilquin, B.; Decanniere, L.; Fontaine, R.; Claes, P. <i>Ann. Soc. Sc. Bruxelles (Belgium)</i> <u>1967, 81, 191-199.</u>										
VARIABLES: T/K: 288.15 P/kPa: 2.15-2.47	PREPARED BY: W. Hayduk										
EXPERIMENTAL VALUES:											
<table border="1"> <thead> <tr> <th>$t/^{\circ}\text{C}$</th> <th>T/K</th> <th>Ostwald coefficient¹ $\text{L}/\text{cm}^3\text{cm}^{-3}$</th> <th>Mole fraction² x_1</th> <th>Henry's constant² H/atm</th> </tr> </thead> <tbody> <tr> <td>15.0</td> <td>288.15</td> <td>37.0</td> <td>0.1735</td> <td>35.0</td> </tr> </tbody> </table>		$t/^{\circ}\text{C}$	T/K	Ostwald coefficient ¹ $\text{L}/\text{cm}^3\text{cm}^{-3}$	Mole fraction ² x_1	Henry's constant ² H/atm	15.0	288.15	37.0	0.1735	35.0
$t/^{\circ}\text{C}$	T/K	Ostwald coefficient ¹ $\text{L}/\text{cm}^3\text{cm}^{-3}$	Mole fraction ² x_1	Henry's constant ² H/atm							
15.0	288.15	37.0	0.1735	35.0							
<p>¹Original data at low pressure reported as a distribution coefficient; if Henry's law and ideal gas law apply, the distribution coefficient is equivalent to the Ostwald coefficient as shown here.</p> <p>²Calculated by compiler for a gas partial pressure of 101.325 kPa assuming that Henry's law and ideal gas law apply.</p>											
AUXILIARY INFORMATION											
METHOD/APPARATUS/PROCEDURE: <p>An all glass apparatus was used at a very low gas partial pressure. It contained a replaceable degassed solvent ampule equipped with a breakable point which could be broken by means of a magnetically activated plunger. The quantity of gas fed into the system was determined by measuring the pressure change in a known volume. The quantity of liquid was measured by weight. The pressure change was observed after the solvent was released.</p> <p>Experimental details are described by Rząd and Claes(1).</p>	SOURCE AND PURITY OF MATERIALS: <ol style="list-style-type: none"> Source not given; minimum purity specified as 99.0 mole per cent. Fluka pure grade; minimum purity specified as 99.0 mole per cent. ESTIMATED ERROR: $T/\text{K} = 0.05$ (estimated by compiler) $\delta x_1/x_1 = 0.01$										
REFERENCES: <ol style="list-style-type: none"> Rząd, S.; Claes, P. <i>Bull. Soc. Chim. Belges, 1964, 73, 689.</i> 											

COMPONENTS:		ORIGINAL MEASUREMENTS:			
(1) Propane; C ₃ H ₈ ; [74-98-6] (2) 2,2-Dimethylbutane; C ₆ H ₁₄ ; [75-83-2]		Fleury, D.; Hayduk, W. <i>Can. J. Chem. Eng.</i> <u>1975</u> , <i>53</i> , 195-199.			
VARIABLES:		PREPARED BY:			
T/K: 258.15-313.15 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	86.7	91.7	0.346 (0.3467) ³		
278.15	41.9	41.1	0.195 (0.1954)		
298.15	23.8	21.8	0.116 (0.1146)		
313.15	15.6	13.6	0.0779 (0.0786)		
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: $\Delta G^\circ/\text{J mol}^{-1} = -RT \ln x_1 = 63.901 T \ln T - 346.07 T$ $\ln x_1 = 41.6253 - 7.6860 \ln T$ Std. deviation for ΔG° = 18.9 J mol ⁻¹ ; Correlation coefficient = 0.9999					
T/K	ΔG°/J mol ⁻¹	x ₁	T/K	ΔG°/J mol ⁻¹	x ₁
258.15	2273	0.3467	293.15	4963	0.1305
273.15	3391	0.2246	298.15	5370	0.1146
278.15	3776	0.1954	303.15	5783	0.1008
283.15	4166	0.1704	313.15	6623	0.0786
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. Phillips Petroleum. Specified minimum purity 99.0 per cent.		
Degassing was accomplished using a two stage vacuum process described by Clever et al. (1).			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> <u>1971</u> , <i>61</i> , 1078.		

COMPONENTS:		ORIGINAL MEASUREMENTS:			
(1) Propane; C ₃ H ₈ ; [74-98-6] (2) 2,3-Dimethylbutane; C ₆ H ₁₄ ; [79-29-8]		Fleury, D.; Hayduk, W. <i>Can. J. Chem. Eng.</i> <u>1975</u> , <i>53</i> , 195-199.			
VARIABLES:		PREPARED BY:			
T/K: 258.15-318.15 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	86.3	91.3	0.341 (0.344) ³		
278.15	41.9	41.1	0.191 (0.190)		
298.15	24.2	22.2	0.115 (0.114)		
318.15	14.7	12.6	0.0718 (0.0724)		
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: $\Delta G^\circ/\text{J mol}^{-1} = -RT \ln x_1 = 77.533 T - 17724$ $\ln x_1 = 2131.8/T - 9.3256$ Std. deviation for ΔG° = 26./J mol ⁻¹ ; Correlation coefficient = 0.9999					
T/K	ΔG°/J mol ⁻¹	x ₁	T/K	ΔG°/J mol ⁻¹	x ₁
258.15	2291	0.344	298.15	5392	0.114
273.15	3454	0.219	303.15	5780	0.101
283.15	4229	0.166	313.15	6555	0.0806
293.15	5004	0.128	318.15	6943	0.0724
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:		
			$\delta T/K = 0.1$ $\delta x_1/x_1 = 0.01$		
			REFERENCES:		
			1. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M. <i>J. Phys. Chem.</i> <u>1971</u> , <i>61</i> , 1078.		

COMPONENTS:			ORIGINAL MEASUREMENTS:		
(1) Propane; C ₃ H ₈ ; [74-98-6] (2) Heptane; C ₇ H ₁₆ ; [142-82-5]			Hayduk, W.; Walter, E.B.; Simpson, P. <i>J. Chem. Eng. Data</i> <u>1972</u> , <i>17</i> , 59-61.		
VARIABLES:			PREPARED BY:		
T/K: 298.15-318.15 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		
298.15	21.65	19.8	0.117		
308.15	17.30	15.3	0.0942		
318.15	14.60	12.5	0.0798		
¹ Original data. ² Calculated by compiler. 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: $\Delta G^\circ/\text{J mol}^{-1} = -RT \ln x_1 = 68.488 T - 15085$ $\ln x_1 = 1814.4/T - 8.2377$ Std. deviation for ΔG° = 28.4 J mol ⁻¹ ; Correlation coefficient = 0.9994					
T/K	ΔG°/J mol ⁻¹	x ₁	T/K	ΔG°/J mol ⁻¹	x ₁
298.15	5335	0.116	313.15	6362	0.0868
303.15	5677	0.105	318.15	6705	0.0793
308.15	6020	0.0954			
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. Canlab. Chromatoquality grade of minimum specified purity 99.0 per cent.		
Degassing was accomplished using a two stage vacuum process described by Clever et al. (1).			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> <u>1971</u> , <i>61</i> , 1078.		

COMPONENTS:		ORIGINAL MEASUREMENTS:	
(1) Propane; C ₃ H ₈ ; [74-98-6] (2) Heptane; C ₇ H ₁₆ ; [142-82-5] or Octane; C ₈ H ₁₈ ; [111-65-9]		Jadot, R. <i>J. Chim. Phys.</i> <u>1972</u> , <i>69</i> , 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, $x_{\text{C}_3\text{H}_8}$	# ΔH^∞ /cal mol ⁻¹ (/J mol ⁻¹)
		Heptane; C ₇ H ₁₆ ; [142-82-5]	
298.15	8.29	0.1206	215 (900)
		Octane; C ₈ H ₁₈ ; [111-65-9]	
298.15	7.84	0.1276	230 (962)
+ Calculated by compiler assuming $x_{\text{C}_3\text{H}_8} = 1/H$			
# 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) Propane; C ₃ H ₈ ; [74-98-6] (2) Octane; C ₈ H ₁₈ ; [111-65-9]	ORIGINAL MEASUREMENTS: Thomsen, E.S.; Gjaldbaek, J.C. <i>Acta Chem. Scand.</i> <u>1963</u> , 17, 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 data-bbox="142 540 242 620">T/K</th> <th data-bbox="286 540 580 620">Ostwald Coefficient² L/cm³ cm⁻³</th> <th data-bbox="619 540 913 620">Bunsen Coefficient¹ α/cm³ (STP)cm⁻³atm⁻¹</th> <th data-bbox="952 540 1159 620">Mole Fraction² x₁</th> </tr> </thead> <tbody> <tr> <td data-bbox="142 641 242 667">298.15</td> <td data-bbox="286 641 580 667">19.86</td> <td data-bbox="619 641 913 667">18.1</td> <td data-bbox="952 641 1159 667">0.1191</td> </tr> </tbody> </table>		T/K	Ostwald Coefficient ² L/cm ³ cm ⁻³	Bunsen Coefficient ¹ α/cm ³ (STP)cm ⁻³ atm ⁻¹	Mole Fraction ² x ₁	298.15	19.86	18.1	0.1191
T/K	Ostwald Coefficient ² L/cm ³ cm ⁻³	Bunsen Coefficient ¹ α/cm ³ (STP)cm ⁻³ atm ⁻¹	Mole Fraction ² x ₁						
298.15	19.86	18.1	0.1191						
¹ Original data. ² Calculated by compilers using a real gas molar volume.									
AUXILIARY INFORMATION									
METHOD/APPARATUS/PROCEDURE: <p>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.</p> <p>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.</p>	SOURCE AND PURITY OF MATERIALS: <ol style="list-style-type: none"> Phillips Petroleum Co. Specified as research grade and GC analysis indicated 0.1 per cent air and 0.03 per cent ethane impurities British Drug House. Fractionation yielded boiling range of 0.02 K. Estimated about 1 per cent impurity. ESTIMATED ERROR: δT/K = 0.05 δx ₁ x ₁ = 0.015 REFERENCES: <ol style="list-style-type: none"> Gjaldbaek, J.C. <i>Acta Chem. Scand.</i> <u>1952</u>, 6, 623. 								

<p>COMPONENTS:</p> <p>(1) Propane; C_3H_8; [74-98-6]</p> <p>(2) Nonane; C_9H_{20}; [111-84-2]</p> <p>or</p> <p>Decane; $C_{10}H_{22}$; [124-18-5]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Jadot, R.</p> <p><i>J. Chim. Phys.</i> <u>1972</u>, <i>69</i>, 1036-40</p>																				
<p>VARIABLES:</p> <p>T/K: 298.15</p> <p>P/kPa: 101.3</p>	<p>PREPARED BY:</p> <p>C.L. Young</p>																				
<p>EXPERIMENTAL VALUES:</p> <table border="1"> <thead> <tr> <th data-bbox="194 506 244 530">T/K</th> <th data-bbox="297 506 602 556">Henry's Law Constant, H/atm</th> <th data-bbox="659 475 939 566">Mole fraction⁺ at partial pressure of 101.3 kPa, $x_{C_3H_8}$</th> <th data-bbox="994 481 1139 556">#ΔH^∞ /cal mol⁻¹ (/J mol⁻¹)</th> </tr> </thead> <tbody> <tr> <td colspan="4" data-bbox="501 626 863 651" style="text-align: center;">Nonane; C_9H_{20}; [111-84-2]</td> </tr> <tr> <td data-bbox="168 673 257 697">298.15</td> <td data-bbox="400 673 476 697">7.566</td> <td data-bbox="734 673 823 697">0.1322</td> <td data-bbox="994 673 1139 697">260 (1088)</td> </tr> <tr> <td colspan="4" data-bbox="501 721 876 745" style="text-align: center;">Decane; $C_{10}H_{22}$; [124-18-5]</td> </tr> <tr> <td data-bbox="168 768 257 792">298.15</td> <td data-bbox="400 768 476 792">7.058</td> <td data-bbox="734 768 823 792">0.1417</td> <td data-bbox="994 768 1139 792">270 (1130)</td> </tr> </tbody> </table>		T/K	Henry's Law Constant, H/atm	Mole fraction ⁺ at partial pressure of 101.3 kPa, $x_{C_3H_8}$	# ΔH^∞ /cal mol ⁻¹ (/J mol ⁻¹)	Nonane; C_9H_{20} ; [111-84-2]				298.15	7.566	0.1322	260 (1088)	Decane; $C_{10}H_{22}$; [124-18-5]				298.15	7.058	0.1417	270 (1130)
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<p>+ Calculated by compiler assuming $x_{C_3H_8} = 1/H$</p> <p># Excess partial molar enthalpy of solution at infinite dilution.</p>																					
<p>AUXILIARY INFORMATION</p>																					
<p>METHOD/APPARATUS/PROCEDURE:</p> <p>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.</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <p>No details given.</p> <p>ESTIMATED ERROR:</p> <p>$\delta T/K = \pm 0.05$; $\delta H = \pm 2\%$</p> <p>REFERENCES:</p>																				

<p>COMPONENTS:</p> <p>(1) Propane; C_3H_8; [74-98-6] (2) Decane; $C_{10}H_{22}$; [124-18-5]</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: 268.2-298.2 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 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>0.355</td><td>0.262</td></tr> <tr><td>273.2</td><td>0.322</td><td>0.244</td></tr> <tr><td>278.2</td><td>0.303</td><td>0.233</td></tr> <tr><td>283.2</td><td>0.287</td><td>0.223</td></tr> <tr><td>293.2</td><td>0.266</td><td>0.210</td></tr> <tr><td>298.2</td><td>0.258</td><td>0.205</td></tr> </tbody> </table>		T/K	Mole ratio	Mole fraction of propane [#]	268.2	0.355	0.262	273.2	0.322	0.244	278.2	0.303	0.233	283.2	0.287	0.223	293.2	0.266	0.210	298.2	0.258	0.205
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<p style="text-align: center;">[#] calculated by compiler.</p>																						
<p style="text-align: center;">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>																					

<p>COMPONENTS:</p> <p>(1) Propane; C_3H_8; [74-98-6]</p> <p>(2) Decane; $C_{10}H_{22}$; [124-18-5]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Monfort, J. P.; Arriaga, J. L. <i>Chem. Eng. Commun.</i> <u>1980</u>, 7, 17-25.</p>						
<p>VARIABLES:</p> <p>T/K: 298.15</p> <p>P/kPa: 101.325</p>	<p>PREPARED BY:</p> <p>C. L. Young</p>						
<p>EXPERIMENTAL VALUES:</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;">Henry's Law Constant, H/atm</th> <th style="text-align: left;">Mole fraction* of propane at 101.3 kPa partial pressure $x_{C_3H_8}$</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">298.15</td> <td style="text-align: left;">8.02</td> <td style="text-align: left;">0.125</td> </tr> </tbody> </table>		T/K	Henry's Law Constant, H/atm	Mole fraction* of propane at 101.3 kPa partial pressure $x_{C_3H_8}$	298.15	8.02	0.125
T/K	Henry's Law Constant, H/atm	Mole fraction* of propane at 101.3 kPa partial pressure $x_{C_3H_8}$					
298.15	8.02	0.125					
<p>* Calculated by compiler assuming a linear relationship between $p_{C_3H_8}$ and $x_{C_3H_8}$ (i.e., $x_{C_3H_8}(1 atm) = 1/H_{C_3H_8}$).</p>							
<p>AUXILIARY INFORMATION</p>							
<p>METHOD/APPARATUS/PROCEDURE:</p> <p>Chromatographic determination with exponential dilutor. Solvent saturated with gas. A stripping gas was slowly passed through the solution and the concentration of dissolved gas measured using gas chromatography. Details in source.</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <ol style="list-style-type: none"> 1. Matheson sample, purity 99 per cent by mass. 2. Merck spectroscopic grade. <p>ESTIMATED ERROR:</p> <p>$\delta T/K = \pm 0.03$; $\delta H = \pm 3\%$.</p> <p>REFERENCES:</p>						

COMPONENTS:		ORIGINAL MEASUREMENTS:			
(1) Propane; C ₃ H ₈ ; [74-98-6] (2) Dodecane; C ₁₂ H ₂₆ ; [112-40-3]		Hayduk, W.; Walter, E.B.; Simpson, P. <i>J. Chem. Eng. Data</i> <u>1972</u> , <i>17</i> , 59-61.			
VARIABLES: T/K: 298.15-318.15 P/kPa: 101.325		PREPARED BY: 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		
298.15	14.95	13.70	0.123		
308.15	12.24	10.85	0.101		
318.15	10.21	8.77	0.0831		
¹ Original data. ² Calculated by compiler. 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: $\Delta G^\circ/\text{J mol}^{-1} = -RT \ln x_1 = 69.328 T - 15480$ $\ln x_1 = 1861.9/T - 8.3387$ Std. deviation for ΔG° = 8.0 J mol ⁻¹ ; Correlation coefficient = 0.9999					
T/K	ΔG°/J mol ⁻¹	x ₁	T/K	ΔG°/J mol ⁻¹	x ₁
298.15	5190	0.123	313.15	6230	0.0914
303.15	5536	0.111	318.15	6576	0.0832
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. Canlab. Specified olefin-free and of 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:			ORIGINAL MEASUREMENTS:		
(1) Propane; C ₃ H ₈ ; [74-98-6] (2) Tetradecane; C ₁₄ H ₃₀ ; [629-59-4]			King, M.B.; Al-Najjar, H. <i>Chem. Eng. Sci.</i> <u>1977</u> , <i>32</i> , 1241-1246.		
VARIABLES:			PREPARED BY:		
T/K: 303.15-343.15 P/kPa: 101.325			W. Hayduk, C.L. Young		
EXPERIMENTAL VALUES:					
T/K	Ostwald Coefficient ² L/cm ³ cm ⁻³	Bunsen Coefficient ² α/cm ³ (STP)cm ⁻³ atm ⁻¹	Mole Fraction ¹ x ₁		
303.15	12.36	11.07	0.117 (0.117) ³		
323.15	8.71	7.30	0.0817(0.0817)		
343.15	6.47	5.10	0.0596(0.0596)		
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 = 65.955 T - 14585.2					
ln x ₁ = 1754.29/T - 7.9330 Correlation coefficient = 0.9999					
T/K	ΔG°/J mol ⁻¹	x ₁	T/K	ΔG°/J mol ⁻¹	x ₁
303.15	5408.4	0.1170	333.15	7387.0	0.0695
313.15	6068.0	0.0972	343.15	8046.6	0.0596
323.15	6727.5	0.0817			
AUXILIARY INFORMATION					
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:		
The apparatus consists of a gas burette, an absorption spiral, a degassing chamber, a solution pipette and a magnetic stirrer. The solvent is degassed by spraying into an evacuated chamber. The solvent is then displaced by continuously injecting mercury, forcing the solvent into the absorption spiral which is also connected to the gas burette. Absorption takes place in the spiral while mixing is provided in the solution pipette at the gas-liquid interface to ensure that equilibrium is achieved. The volume of solution collected and corresponding volume of dry gas expelled from the gas burette are used in the calculation of solubility.			1. Source not specified. Impurities not exceeding 0.6%.		
			2. Source and purity not specified.		
			ESTIMATED ERROR:		
			ΔT/K = 0.1		
			δx ₁ /x ₁ = 0.013 (authors)		
			REFERENCES:		

COMPONENTS:		ORIGINAL MEASUREMENTS:			
(1) Propane; C ₃ H ₈ ; [74-98-6] (2) Hexadecane; C ₁₆ H ₃₄ ; [544-76-3]		Hayduk, W.; Walter, E.B.; Simpson, P. <i>J. Chem. Eng. Data</i> <u>1972</u> , <i>17</i> , 59-61.			
VARIABLES: T/K: 298.15-318.15 P/kPa: 101.325		PREPARED BY: 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		
298.15	12.65	11.59	0.133		
308.15	10.25	9.09	0.109		
318.15	8.58	7.37	0.0896		
¹ Original data. ² Calculated by compiler. 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: $\Delta G^\circ/\text{J mol}^{-1} = -RT \ln x_1 = 69.053 T - 15592$ $\ln x_1 = 1875.4/T - 8.3056$ Std. deviation for ΔG° = 7.3 J mol ⁻¹ ; Correlation coefficient = 0.9999					
T/K	ΔG°/J mol ⁻¹	x ₁	T/K	ΔG°/J mol ⁻¹	x ₁
298.15	4996	0.133	313.15	6032	0.0986
303.15	5342	0.120	318.15	6377	0.0897
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. Canlab. Specified olefin-free and of 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) Hexadecane; C ₁₆ H ₃₄ ; [544-76-3]	ORIGINAL MEASUREMENTS: Hayduk, W.; Castañeda, R. <i>Can. J. Chem. Eng.</i> 1973, 51, 353-358.										
VARIABLES: T/K: 298.15 P/kPa: 101.325	PREPARED BY: W. Hayduk										
EXPERIMENTAL VALUES:											
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T/K	Ostwald Coefficient ¹ L/cm ³ cm ⁻³	Bunsen Coefficient ² α/cm (STP) cm ⁻³ atm ⁻¹	Mole Fraction ¹ x ₁	ΔG° ³ /J mol ⁻¹							
298.15	12.93	11.85	0.1370	4927.3							
<p>¹ Original data.</p> <p>² Calculated by compiler.</p> <p>³ Calculated by compiler from the following equation: $\Delta G^\circ / \text{J mol}^{-1} = -RT \ln x_1$</p>											
AUXILIARY INFORMATION											
METHOD/APPARATUS/PROCEDURE: <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>	SOURCE AND PURITY OF MATERIALS: <ol style="list-style-type: none"> Matheson Co. Specified as instrument grade of minimum purity 99.5 per cent. Canlab. Specified minimum purity 99.0 per cent. ESTIMATED ERROR: $\delta T / K = 0.1$ $\delta x_1 / x_1 = 0.01$ REFERENCES: <ol style="list-style-type: none"> Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M. <i>J. Phys. Chem.</i> 1971, 61, 1078. 										

COMPONENTS: (1) Propane; C ₃ H ₈ ; [74-98-6] (2) Hexadecane; C ₁₆ H ₃₄ ; [544-76-3]		ORIGINAL MEASUREMENTS: King, M.B.; Al-Najjar, H. <i>Chem. Eng. Sci.</i> <u>1977</u> , <i>32</i> , 1241-1246.			
VARIABLES: T/K: 303.15-343.15 P/kPa: 101.325		PREPARED BY: W. Hayduk, C.L. Young			
EXPERIMENTAL VALUES:					
T/K	Ostwald Coefficient ² L/cm ³ cm ⁻³	Bunsen Coefficient ² α/cm ³ (STP)cm ⁻³ atm ⁻¹	Mole Fraction ¹ x ₁		
303.15	11.86	10.62	0.125 (0.1246) ³		
323.15	8.25	6.91	0.0865(0.0871)		
343.15	6.06	4.77	0.0625(0.0623)		
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: $\Delta G^\circ/\text{J mol}^{-1} = -RT \ln x_1 = 46.512 T \ln T - 248.46 T$ $\ln x_1 = 29.883 - 5.5941 \ln T, \text{Correlation coefficient} = 0.9998$					
T/K	ΔG°/J mol ⁻¹	x ₁	T/K	ΔG°/J mol ⁻¹	x ₁
303.15	5249.8	0.1246	333.15	7231.7	0.0735
313.15	5895.9	0.1039	343.15	7920.9	0.0623
323.15	6556.6	0.0871			
AUXILIARY INFORMATION					
METHOD/APPARATUS/PROCEDURE: The apparatus consists of a gas burette, an absorption spiral, a degassing chamber, a solution pipette and a magnetic stirrer. The solvent is degassed by spraying into an evacuated chamber. The solvent is then displaced by continuously injecting mercury, forcing the solvent into the absorption spiral which is also connected to the gas burette. Absorption takes place in the spiral while mixing is provided in the solution pipette at the gas-liquid interface to ensure that equilibrium is achieved. The volume of solution collected and corresponding volume of dry gas expelled from the gas burette are used in the calculation of solubility.			SOURCE AND PURITY OF MATERIALS: 1. Source not specified. Impurities not exceeding 0.6%. 2. Source and purity not specified.		
			ESTIMATED ERROR: δT/K = 0.1 δx ₁ /x ₁ = 0.013 (authors)		
			REFERENCES:		

COMPONENTS: (1) Propane; C_3H_8 ; [74-98-6] (2) Hexadecane; $C_{16}H_{34}$; [544-76-3]	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	<table border="1"> <thead> <tr> <th data-bbox="672 516 830 574">Henry's Constant^a H/atm</th> <th data-bbox="834 516 1233 614">Mole fraction^b of propane at 1 atm. partial pressure, $x_{C_3H_8}$</th> </tr> </thead> <tbody> <tr><td>300</td><td>0.120</td></tr> <tr><td>325</td><td>0.0775</td></tr> <tr><td>350</td><td>0.0538</td></tr> <tr><td>375</td><td>0.0394</td></tr> <tr><td>400</td><td>0.0301</td></tr> <tr><td>425</td><td>0.0240</td></tr> <tr><td>450</td><td>0.0200</td></tr> <tr><td>475</td><td>0.0171</td></tr> </tbody> </table>	Henry's Constant ^a H/atm	Mole fraction ^b of propane at 1 atm. partial pressure, $x_{C_3H_8}$	300	0.120	325	0.0775	350	0.0538	375	0.0394	400	0.0301	425	0.0240	450	0.0200	475	0.0171
Henry's Constant ^a H/atm	Mole fraction ^b of propane at 1 atm. partial pressure, $x_{C_3H_8}$																		
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<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> , 6, 130. 2. Cukor, P.M.; Prausnitz, J.M. <i>Ind. Eng. Chem. Fundam.</i> <u>1971</u> , 10, 638.																		

COMPONENTS:		ORIGINAL MEASUREMENTS:	
(1) Propane; C_3H_8 ; [74-98-6]		Lenoir, J-Y.; Renault, P.; Renon, H.	
(2) Hexadecane; $C_{16}H_{34}$; [544-76-3] or Heptadecane; $C_{17}H_{36}$; [629-78-7]		<i>J. Chem. Eng. Data</i> , <u>1971</u> , 16, 340-2	
VARIABLES:		PREPARED BY:	
T/K : 298.2, 323.2		C. L. Young	
P/kPa : 101.3			
EXPERIMENTAL VALUES:			
T/K	Henry's constant $H_{C_3H_8}/atm$	Mole fraction at 1 atm* $x_{C_3H_8}$	
298.2	Hexadecane; $C_{16}H_{34}$; [544-76-3] 7.41	0.135	
323.2	Heptadecane; $C_{17}H_{36}$; [629-78-7] 12.5	0.080	
* Calculated by compiler assuming a linear function of $p_{C_3H_8}$ vs $x_{C_3H_8}$, i.e., $x_{C_3H_8}(1 atm) = 1/H_{C_3H_8}$			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
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.		(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:	

<p>COMPONENTS:</p> <p>(1) Propane; C_3H_8; [74-98-6] (2) Hexadecane; $C_{16}H_{34}$; [544-76-3] or Octadecane; $C_{18}H_{38}$; [593-45-3]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Richon, D.; Renon, H. <i>J. Chem. Eng. Data</i> <u>1980</u>, <i>25</i>, 59-60.</p>	
<p>VARIABLES:</p> <p>T/K: 298.15, 323.15 P/kPa: 101.3</p>	<p>PREPARED BY:</p> <p>C.L. Young</p>	
<p>EXPERIMENTAL VALUES:</p>		
	<p>Limiting value of Henry's constant, H^∞ / atm</p>	<p>Mole fraction of propane, * $x_{C_3H_8}$</p>
<p>T/K</p> <p>298.15</p> <p>323.15</p>	<p>Hexadecane</p> <p>7.45</p> <p>Octadecane</p> <p>11.3</p>	<p>0.134</p> <p>0.0885</p>
<p>* Calculated by compiler assuming mole fraction is a linear function of pressure up to 1 atm.</p>		
<p>AUXILIARY INFORMATION</p>		
<p>METHOD APPARATUS/PROCEDURE:</p> <p>Inert gas stripping plus gas chromatographic method. Details given in ref. (1). Method based on passing constant stream of inert gas through dissolved gas-solvent mixture and periodically injecting mixture into gas chromatograph. Henry's law constant determined from variation of gas peak area with time.</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <ol style="list-style-type: none"> 1. L'Air Liquide sample, purity 99.5 mole per cent. 2. Hexadecane was a Merck sample, Octadecane was a Fluka sample, both had purities of not less than 99 mole per cent. <p>ESTIMATED ERROR: $\delta T/K = \pm 0.05$; $\delta x_{C_3H_8} = \pm 4\%$ (estimated by compiler).</p> <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Leroi, J. C.; Masson, J. C.; Renon, H.; Fabries, J. F.; Sannier, H. <i>Ind. Eng. Chem. Process. Des. Develop.</i> <u>1977</u>, <i>16</i>, 139. 	

COMPONENTS: (1) Propane; C_3H_8 ; [74-98-6] (2) 2,2,4,4,6,8,8-Heptamethyl nonane; $C_{16}H_{34}$; [4390-04-9]	ORIGINAL MEASUREMENTS: Richon, D.; Renon, H. <i>J. Chem. Eng. Data</i> <u>1980</u> , 25, 59-60.
VARIABLES: T/K : 298.15 P/kPa : 101.3	PREPARED BY: C. L. Young
EXPERIMENTAL VALUES:	
T/K	Limiting value of Henry's constant, H^∞/atm
298.15	2.01
AUXILIARY INFORMATION	
METHOD APPARATUS/PROCEDURE: <p>Inert gas stripping plus gas chromatographic method. Details given in ref. (1). Method based on passing constant stream of inert gas through dissolved gas-solvent mixture and periodically injecting mixture into gas chromatograph. Henry's law constant determined from variation of gas peak area with time.</p>	SOURCE AND PURITY OF MATERIALS: <ol style="list-style-type: none"> 1. L'Air Liquide sample, purity 99.5 mole per cent. 2. Sigma sample, purity not less than 99 mole per cent. ESTIMATED ERROR: $\delta T/K = \pm 0.05$; $\delta H^\infty = \pm 4\%$ (estimated by compiler). REFERENCES: <ol style="list-style-type: none"> 1. Leroi, J. C.; Masson, J. C.; Renon, H.; Fabries, J. F.; Sannier, H. <i>Ind. Eng. Chem. Process. Des. Develop.</i> <u>1977</u>, 16, 139.

<p>COMPONENTS:</p> <p>(1) Propane; C_3H_8; [74-98-6]</p> <p>(2) Octadecane; $C_{18}H_{38}$; [593-45-3]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Ng. S.; Harris, H.G.; Prausnitz, J.M.</p> <p><i>J. Chem. Eng. Data.</i> <u>1969</u>, <i>14</i>, 482-3.</p>																					
<p>VARIABLES:</p> <p>T/K: 308.2-423.2</p> <p>P/kPa: 101.325</p>	<p>PREPARED BY:</p> <p>C.L. Young</p>																					
<p>EXPERIMENTAL VALUES:</p>																						
<table border="1"> <thead> <tr> <th data-bbox="93 495 392 600">T/K</th> <th data-bbox="392 495 659 600">Henry's Constant, $H/atm.$</th> <th data-bbox="659 495 1213 600">Mole fraction⁺ of propane in liquid, $x_{C_3H_8}$</th> </tr> </thead> <tbody> <tr> <td>308.2</td> <td>8.0</td> <td>0.125</td> </tr> <tr> <td>323.2</td> <td>10.7</td> <td>0.0935</td> </tr> <tr> <td>343.2</td> <td>15.1</td> <td>0.0662</td> </tr> <tr> <td>363.2</td> <td>20.6</td> <td>0.0485</td> </tr> <tr> <td>373.2</td> <td>23.1</td> <td>0.0433</td> </tr> <tr> <td>423.2</td> <td>39.2</td> <td>0.0255</td> </tr> </tbody> </table>		T/K	Henry's Constant, $H/atm.$	Mole fraction ⁺ of propane in liquid, $x_{C_3H_8}$	308.2	8.0	0.125	323.2	10.7	0.0935	343.2	15.1	0.0662	363.2	20.6	0.0485	373.2	23.1	0.0433	423.2	39.2	0.0255
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<p>AUXILIARY INFORMATION</p>																						
<p>METHOD/APPARATUS/PROCEDURE:</p> <p>Gas chromatographic method. Solvent supported on Chromosorb P in 6m column. Gas injected as sample, helium used as carrier gas. Henry's law constant calculated from knowledge of retention time and flow rate.</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <ol style="list-style-type: none"> Matheson sample, purity greater than 99 mole per cent. Matheson, Coleman and Bell sample, m.pt. 27-28.5°C. <p>ESTIMATED ERROR:</p> <p>$\delta T/K = \pm 0.1$; $\delta H/atm = \pm 5\%$.</p> <p>REFERENCES:</p>																					

COMPONENTS: (1) Propane; C ₃ H ₈ ; [74-98-6] (2) Eicosane; C ₂₀ H ₄₂ ; [112-95-8]	ORIGINAL MEASUREMENTS: Chappelow, C.C.; Prausnitz, J.M. <i>A.I.Ch.E.J.</i> <u>1974</u> , 20, 1097-1104.	
VARIABLES: T/K: 325-475 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, $x_{C_3H_8}$
325	12.7	0.0787
350	18.3	0.0546
375	25.6	0.0391
400	34.1	0.0293
425	43.1	0.0232
450	52.0	0.0192
475	60.3	0.0166
<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: <ol style="list-style-type: none"> Dymond, J.; Hildebrand, J.H. <i>Ind. Eng. Chem. Fundam.</i> <u>1967</u>, 6, 130. Cukor, P.M.; Prausnitz, J.M. <i>Ind. Eng. Chem. Fundam.</i> <u>1971</u>, 10, 638. 		

<p>COMPONENTS:</p> <p>(1) Propane; C_3H_8; [74-98-6]</p> <p>(2) Eicosane; $C_{20}H_{42}$; [112-95-8]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Ng. S.; Harris, H.G., Prausnitz, J.M. <i>J. Chem. Eng. Data</i>, <u>1969</u>, 14, 482-3.</p>																		
<p>VARIABLES:</p> <p>T/K: 323.2-413.2</p> <p>P/kPa: 101.325</p>	<p>PREPARED BY:</p> <p>C. L. Young</p>																		
<p>EXPERIMENTAL VALUES:</p> <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/atm</th> <th style="text-align: center;">* Mole fraction of propane in liquid, $x_{C_3H_8}$</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">323.2</td> <td style="text-align: center;">10.6</td> <td style="text-align: center;">0.0943</td> </tr> <tr> <td style="text-align: center;">343.2</td> <td style="text-align: center;">14.9</td> <td style="text-align: center;">0.0671</td> </tr> <tr> <td style="text-align: center;">373.2</td> <td style="text-align: center;">22.9</td> <td style="text-align: center;">0.0437</td> </tr> <tr> <td style="text-align: center;">393.2</td> <td style="text-align: center;">28.9</td> <td style="text-align: center;">0.0346</td> </tr> <tr> <td style="text-align: center;">413.2</td> <td style="text-align: center;">36.3</td> <td style="text-align: center;">0.0275</td> </tr> </tbody> </table>		T/K	Henry's Constant, H/atm	* Mole fraction of propane in liquid, $x_{C_3H_8}$	323.2	10.6	0.0943	343.2	14.9	0.0671	373.2	22.9	0.0437	393.2	28.9	0.0346	413.2	36.3	0.0275
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<p>METHOD/APPARATUS/PROCEDURE:</p> <p>Gas chromatographic method. Solvent supported on Chromosorb P in 6 m column. Gas injected as sample, helium used as carrier gas. Henry's law constant calculated from knowledge of retention time and flow rate.</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <ol style="list-style-type: none"> Matheson sample, purity greater than 99 mole per cent. Matheson, Coleman and Bell sample, m.pt. 35-36.5°C. <p>ESTIMATED ERROR:</p> <p>$\delta T/K = \pm 0.1$; $\delta H/atm = \pm 5\%$</p> <p>REFERENCES:</p>																		

COMPONENTS: (1) Propane; C_3H_8 ; [74-98-6] (2) Docosane; $C_{22}H_{46}$; [629-97-0]	ORIGINAL MEASUREMENTS: Ng, S.; Harris, H.G.; Prausnitz, J.M. <i>J. Chem. Eng. Data</i> , <u>1969</u> , <i>14</i> , 482-3.																					
VARIABLES: T/K : 333.2-473.2 P/kPa : 101.325	PREPARED BY: C. L. Young																					
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ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta H/atm = \pm 5\%$																						
REFERENCES:																						

COMPONENTS: (1) Propane; C_3H_8 ; [74-98-6] (2) 2,6,10,15,19,23-Hexamethyl-tetracosane, (squalane); $C_{30}H_{62}$; [111-01-3]	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																											
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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:		ORIGINAL MEASUREMENTS:	
(1) Propane; C_3H_8 ; [74-98-6] (2) Hexadecane; $C_{16}H_{34}$; [544-76-3] Octacosane; $C_{28}H_{58}$; [630-02-4] Hexatriacontane; $C_{36}H_{74}$; [630-06-8]		Lin, P. J.; Parcher, J. F. <i>J. Chromatog. Sci.</i> <u>1982</u> , 20, 33-38.	
VARIABLES:		PREPARED BY:	
T/K : 298.2-413.2 P_1/kPa : 101.325		C. L. Young	
EXPERIMENTAL VALUES:			
T/K	Henry's law constant, H/atm	Mole fraction at a partial pressure of 1 atmosphere $x_{C_3H_8}$	
	Hexadecane; $C_{16}H_{34}$; [544-76-3]		
298.2	7.99	0.125	
313.2	10.1	0.0990	
328.2	13.4	0.0746	
	Octacosane; $C_{28}H_{58}$; [630-02-4]		
353.2	15.4	0.0649	
373.2	19.3	0.0518	
393.2	24.7	0.0405	
	Hexatriacontane; $C_{36}H_{74}$; [630-06-8]		
353.2	12.7	0.0787	
373.2	16.5	0.0606	
393.2	21	0.0476	
413.2	25.7	0.0389	
AUXILIARY INFORMATION			
METHOD APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
Henry's law constant determined from retention volume of gas on a chromatographic column. Helium was used as a carrier gas and a mass spectrometer was used as a detector. The measured Henry's law constants were independent of sample size, flow rate and composition of injected sample. The dead volume was determined by two independent methods and the values agreed within experimental error.		No details given.	
		ESTIMATED ERROR:	
		$\delta T/K = \pm 0.1$; $\delta x_{C_3H_8} = \pm 5\%$ (estimated by compiler).	
		REFERENCES:	

COMPONENTS: (1) Butane; C ₄ H ₁₀ ; [106-97-8] (2) Pentane; C ₅ H ₁₂ ; [109-66-0] or Hexane; C ₆ H ₁₄ ; [110-54-3]	ORIGINAL MEASUREMENTS: Jadot, R. <i>J. Chim. Phys.</i> <u>1972, 69</u> , 1036-40																				
VARIABLES: <i>T</i> /K: 298.15 <i>P</i> /kPa: 101.3	PREPARED BY: C.L. Young																				
EXPERIMENTAL VALUES:																					
<table border="1"> <thead> <tr> <th data-bbox="189 540 252 566"><i>T</i>/K</th> <th data-bbox="306 540 615 590">Henry's Law Constant, <i>H</i>/atm</th> <th data-bbox="673 530 964 626">Mole fraction⁺ at partial pressure of 101.3 kPa, <i>x</i>_{C₄H₁₀}</th> <th data-bbox="1013 540 1157 610">#Δ<i>H</i>[∞] /cal mol⁻¹ (/J mol⁻¹)</th> </tr> </thead> <tbody> <tr> <td colspan="4" data-bbox="512 673 895 699" style="text-align: center;">Pentane; C₅H₁₂; [109-66-0]</td> </tr> <tr> <td data-bbox="189 721 279 747">298.15</td> <td data-bbox="411 721 485 747">2.594</td> <td data-bbox="749 721 837 747">0.3858</td> <td data-bbox="1059 721 1072 747">-</td> </tr> <tr> <td colspan="4" data-bbox="512 772 878 798" style="text-align: center;">Hexane; C₆H₁₄; [110-54-3]</td> </tr> <tr> <td data-bbox="189 818 279 844">298.15</td> <td data-bbox="411 818 485 844">2.524</td> <td data-bbox="749 818 837 844">0.3962</td> <td data-bbox="1013 818 1143 844">150 (628)</td> </tr> </tbody> </table>		<i>T</i> /K	Henry's Law Constant, <i>H</i> /atm	Mole fraction ⁺ at partial pressure of 101.3 kPa, <i>x</i> _{C₄H₁₀}	#Δ <i>H</i> [∞] /cal mol ⁻¹ (/J mol ⁻¹)	Pentane; C ₅ H ₁₂ ; [109-66-0]				298.15	2.594	0.3858	-	Hexane; C ₆ H ₁₄ ; [110-54-3]				298.15	2.524	0.3962	150 (628)
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COMPONENTS:		ORIGINAL MEASUREMENTS:			
(1) Butane; C ₄ H ₁₀ ; [106-97-8] (2) Hexane; C ₆ H ₁₄ ; [110-54-3]		Hayduk, W., Castañeda, R. <i>Can. J. Chem.</i> <u>1973</u> , <i>51</i> , 353-358.			
VARIABLES:		PREPARED BY:			
T/K: 278.15-323.15 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		
278.15	480.3	471.7	0.737 (0.732) ³		
298.15	113.4	103.9	0.386 (0.390)		
323.15	47.4	40.1	0.199 (0.198)		
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: $\Delta G^\circ/\text{J mol}^{-1} = -RT \ln x_1 = 80.652 T - 21713$ $\ln x_1 = 2611.6/T - 9.7007$ Std. deviation for ΔG° = 22.9 J mol ⁻¹ ; Correlation coefficient = 0.9999					
T/K	ΔG°/J mol ⁻¹	x ₁	T/K	ΔG°/J mol ⁻¹	x ₁
278.15	720.2	0.732	303.15	2737	0.338
283.15	1124	0.621	313.15	3543	0.256
293.15	1930	0.453	323.15	4350	0.198
298.15	2333	0.390			
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. Canlab. 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:		ORIGINAL MEASUREMENTS:		
(1) Butane; C ₄ H ₁₀ ; [106-97-8] (2) Hexane; C ₆ H ₁₄ ; [110-54-3]		Tilquin, B.; Decanniere, L.; Fontaine, R.; Claes, P. <i>Ann. Soc. Sc. Bruxelles (Belgium)</i> <u>1967</u> , 81, 191-199.		
VARIABLES:		PREPARED BY:		
T/K: 288.15 P/kPa: 7.97-8.11		W. Hayduk		
EXPERIMENTAL VALUES:				
<i>t</i> /°C	<i>T</i> /K	Ostwald Coefficient ¹ L/cm ³ cm ⁻³	Mole fraction ² / <i>x</i> ₁	Henry's constant ² H/atm
15.0	288.15	142.1	0.441	2.267
<p>¹Original data at low pressure reported as a distribution coefficient; if Henry's law and ideal gas law apply, the distribution coefficient is equivalent to the Ostwald coefficient as shown here.</p> <p>²Calculated by compiler for a gas partial pressure of 101.325 kPa assuming that Henry's law and ideal gas law apply.</p>				
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<p>An all glass apparatus was used at a very low gas partial pressure. It contained a replaceable degassed solvent ampule equipped with a breakable point which could be broken by means of a magnetically activated plunger. The quantity of gas fed into the system was determined by measuring the pressure change in a known volume. The quantity of liquid was measured by weight. The pressure change was observed after the solvent was released.</p> <p>Experimental details are described by Rząd and Claes (1).</p>		<p>1. Source not given; minimum purity specified as 99.0 mole per cent.</p> <p>2. Fluka pure grade; minimum purity specified as 99.0 mole per cent.</p>		
		<p>ESTIMATED ERROR:</p> <p><i>T</i>/K = 0.05 (estimated by compiler) $\delta x_1/x_1 = 0.01$</p>		
		REFERENCES:		
		<p>1. Rząd, S.; Claes, P. <i>Bull. Soc. Chim. Belges</i>, <u>1964</u>, 73, 689.</p>		

COMPONENTS: (1) Butane; C ₄ H ₁₀ ; [106-97-8] (2) 2,2'-Dimethylbutane (Neo-hexane); C ₆ H ₁₄ ; [75-83-2]	ORIGINAL MEASUREMENTS: Tilquin, B.; Decanniere, L.; Fontaine, R.; Claes, P. <i>Ann. Soc. Sc. Bruxelles (Belgium)</i> <u>1967, 81, 191-199.</u>										
VARIABLES: T/K: 288.15 P/kPa: 3.68-3.71	PREPARED BY: W. Hayduk										
EXPERIMENTAL VALUES:											
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COMPONENTS: (1) Butane; C ₄ H ₁₀ ; [106-97-8] (2) Heptane; C ₇ H ₁₆ ; [142-82-5]	ORIGINAL MEASUREMENTS: Hayduk, W.; Castañeda, R. <i>Can. J. Chem. Eng.</i> <u>1973</u> , <i>51</i> , 353-358.																														
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<p>VARIABLES:</p> <p>T/K: 298.15 P/kPa: 101.3</p>	<p>PREPARED BY:</p> <p>C.L. Young</p>																				
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VARIABLES: <i>T</i> /K: 298.15 <i>P</i> /kPa: 101.3		PREPARED BY: C.L. Young	
EXPERIMENTAL VALUES:			
<i>T</i> /K	Henry's Law Constant, <i>H</i> /atm	Mole fraction ⁺ at partial pressure of 101.3 kPa, $x_{C_4H_{10}}$	# ΔH^∞ /cal mol ⁻¹ (/J mol ⁻¹)
	Nonane; C_9H_{20} ; [111-84-2]		
298.15	2.12	0.472	205 (858)
	Decane; $C_{10}H_{22}$; [124-18-5]		
298.15	2.0	0.4888	210 (879)
+ 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:	

<p>COMPONENTS:</p> <p>(1) Butane; C_4H_{10}; [106-97-8]</p> <p>(2) Decane; $C_{10}H_{22}$; [124-18-5]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Monfort, J. P.; Arriaga, J. L. <i>Chem. Eng. Commun.</i> <u>1980</u>, 7, 17-25.</p>	
<p>VARIABLES:</p> <p>T/K: 298.15</p> <p>P/kPa: 101.325</p>	<p>PREPARED BY:</p> <p>C. L. Young</p>	
<p>EXPERIMENTAL VALUES:</p>		
<p>T/K</p>	<p>Henry's Law Constant, H/atm</p>	<p>Mole fraction⁺, $x_{C_4H_{10}}$</p>
<p>298.15</p>	<p>2.03</p>	<p>0.4926</p>
<p>⁺ Calculated by compiler assuming $x_{C_4H_{10}} = 1/H$.</p>		
<p>AUXILIARY INFORMATION</p>		
<p>METHOD/APPARATUS/PROCEDURE:</p> <p>Chromatographic determination with exponential dilutor. Solvent saturated with gas. A stripping gas was slowly passed through the solution and the concentration of dissolved gas measured using gas chromatography. Details in source.</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <ol style="list-style-type: none"> Matheson sample, purity 99 per cent by mass. Merck spectroscopic grade. 	
	<p>ESTIMATED ERROR:</p> <p>$\delta T/K = \pm 0.03$; $\delta H = \pm 3\%$.</p>	
	<p>REFERENCES:</p>	

COMPONENTS:			ORIGINAL MEASUREMENTS:	
(1) Butane; C_4H_{10} ; [106-97-8] (2) Decane; $C_{10}H_{22}$; [124-18-5]			Gerrard, W. <i>J. Appl. Chem. Biotechnol.</i> <u>1973</u> , 23, 1-17.	
VARIABLES:			PREPARED BY:	
T/K : 268.2-298.2 P/kPa : 73.3, 101.3			C. L. Young	
EXPERIMENTAL VALUES:				
T/K	$p^*/mmHg$	P^*/kPa	Mole ratio	Mole fraction of propane #
268.2	550	73.3	7.33	0.880
278.2	760	101.3	4.23	0.809
283.2	760	101.3	2.334	0.700
293.2	760	101.3	1.040	0.510
298.2	760	101.3	0.810	0.448
<p>* Total pressure.</p> <p># Calculated by compiler.</p>				
AUXILIARY INFORMATION				
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:	
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).			No details given except that "all compounds were purified by conventional procedures".	
			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.	

<p>COMPONENTS:</p> <p>(1) Butane; C_4H_{10}; [106-97-8]</p> <p>(2) Dodecane; $C_{12}H_{26}$; [112-40-3]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Monfort, J. P.; Arriaga, J. L. <i>Chem. Eng. Commun.</i> <u>1980</u>, 7, 17-25.</p>	
<p>VARIABLES:</p> <p>T/K: 278.15, 298.15</p> <p>P/kPa: 101.325</p>	<p>PREPARED BY:</p> <p>C. L. Young</p>	
<p>EXPERIMENTAL VALUES:</p>		
<p>T/K</p>	<p>Henry's Law Constant, H/atm</p>	<p>Mole fraction⁺, $x_{C_4H_{10}}$</p>
<p>278.15 298.15</p>	<p>1.02 2.04</p>	<p>0.9804 0.4902</p>
<p>⁺ Calculated by compiler assuming $x_{C_4H_{10}} = 1/H$.</p>		
<p>AUXILIARY INFORMATION</p>		
<p>METHOD/APPARATUS/PROCEDURE:</p> <p>Chromatographic determination with exponential dilutor. Solvent saturated with gas. A stripping gas was slowly passed through the solution and the concentration of dissolved gas measured using gas chromatography. Details in source.</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <ol style="list-style-type: none"> Matheson sample; purity 99 per cent by mass. Merck spectroscopic grade. <p>ESTIMATED ERROR:</p> <p>$\delta T/K = \pm 0.03$; $\delta H = \pm 3\%$.</p> <p>REFERENCES:</p>	

COMPONENTS:		ORIGINAL MEASUREMENTS:			
(1) Butane; C ₄ H ₁₀ ; [106-97-8] (2) Dodecane; C ₁₂ H ₂₆ ; [112-40-3]		Hayduk, W.; Castañeda, R. <i>Can. J. Chem. Eng.</i> <u>1973</u> , <i>51</i> , 353-358.			
VARIABLES:		PREPARED BY:			
T/K: 278.15-323.15 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		
278.15	429	421.3	0.814 (0.0810) ³		
298.15	83.8	76.8	0.443 (0.447)		
323.15	34.1	28.8	0.236 (0.235)		
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 = 75.594 T - 20540 ln x ₁ = 2470.5/T - 9.0924 Std. deviation for ΔG° = 17.1 J mol ⁻¹ ; Correlation coefficient = 0.9999					
T/K	ΔG°/J mol ⁻¹	x ₁	T/K	ΔG°/J mol ⁻¹	x ₁
278.15	486.7	0.180	303.15	2377	0.390
283.15	864.7	0.693	313.15	3133	0.300
293.15	1621	0.514	323.15	3888	0.235
298.15	1999	0.447			
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 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. Canlab. 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> 1971, <i>61</i> , 1078.		

COMPONENTS: (1) Butane; C ₆ H ₁₄ ; [106-97-8] (2) Hexadecane; C ₁₆ H ₃₄ ; [544-76-3]		ORIGINAL MEASUREMENTS: Hayduk, W.; Castañeda, R. <i>Can. J. Chem. Eng.</i> <u>1973</u> , <i>61</i> , 353-358.	
VARIABLES: T/K: 298.15-323.15 P/kPa: 101.325		PREPARED BY: 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
298.15	68.8	63.0	0.460
323.15	28.5	24.1	0.249
¹ Original data. ² Calculated by compiler. 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: $\Delta G^\circ/\text{J mol}^{-1} = -RT \ln x_1 = 72.417 T - 19666$ $\ln x_1 = 2365.4/T - 8.7102$			
T/K	ΔG°/J mol ⁻¹	x ₁	
298.15	1925	0.460	
303.15	2287	0.404	
313.15	3011	0.315	
323.15	3736	0.249	
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE: 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).		SOURCE AND PURITY OF MATERIALS: 1. Matheson Co. Specified as instrument grade of minimum purity 99.5 per cent. 2. Canlab. 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> <u>1971</u> , <i>61</i> , 1078.	

COMPONENTS:		ORIGINAL MEASUREMENTS:	
(1) Butane; C_4H_{10} ; [106-97-8] (2) Hexadecane; $C_{16}H_{34}$; [544-76-3]		Chappelow, C.C., Prausnitz, J.M. <i>A.I.Ch.E.J.</i> <u>1974</u> , 20, 1097-1104.	
VARIABLES:		PREPARED BY:	
T/K : 300-475 P/kPa : 101.325		C.L. Young	
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	2.60	0.3846	
325	4.18	0.2392	
350	7.08	0.1412	
375	10.8	0.0925	
400	15.4	0.0649	
425	20.8	0.0481	
450	26.8	0.0373	
475	33.1	0.0302	
<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:		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:	
		<ol style="list-style-type: none"> Dymond, J.; Hildebrand, J.H. <i>Ind. Eng. Chem. Fundam.</i> <u>1967</u>, 6, 130. Cukor, P.M.; Prausnitz, J.M. <i>Ind. Eng. Chem. Fundam.</i> <u>1971</u>, 10, 638. 	

<p>COMPONENTS:</p> <p>(1) Butane; C₄H₁₀; [106-97-8] (2) 2,2,4,4,6,8,8-Heptamethyl nonane; C₁₆H₃₄; [4390-04-9]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Richon, D.; Renon, H. <i>J. Chem. Eng. Data</i> <u>1980</u>, <i>25</i>, 59-60.</p>
<p>VARIABLES:</p> <p><i>T</i>/K: 298.15 <i>P</i>/kPa: 101.3</p>	<p>PREPARED BY:</p> <p>C. L. Young</p>
<p>EXPERIMENTAL VALUES:</p>	
<p>T/K</p>	<p>Limiting value of Henry's constant, H[∞]/atm</p>
<p>298.15</p>	<p>0.56₆</p>
<p>Evaluator's note: Value for Henry's law constant as it is found here and original reference appears <u>incorrect</u> because it cannot be less than one (giving a mole fraction solubility greater than one); hence this value is rejected.</p>	
<p>AUXILIARY INFORMATION</p>	
<p>METHOD /APPARATUS/PROCEDURE:</p> <p>Inert gas stripping plus gas chromatographic method. Details given in ref. (1). Method based on passing constant stream of inert gas through dissolved gas-solvent mixture and periodically injecting mixture into gas chromatograph. Henry's law constant determined from variation of gas peak area with time.</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <ol style="list-style-type: none"> 1. L'Air Liquide sample, purity 99 mole per cent. 2. Sigma sample, purity not less than 99 mole per cent. <p>ESTIMATED ERROR: $\delta T/K = \pm 0.05$; $\delta H^{\infty} = \pm 4\%$ (estimated by compiler).</p>
	<p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Leroi, J. C.; Masson, J. C.; Renon, H.; Fabries, J. F.; Sannier, H. <i>Ind. Eng. Chem. Process. Des. Develop.</i> <u>1977</u>, <i>16</i>, 139.

<p>COMPONENTS:</p> <p>(1) Butane; C₄H₁₀; [106-97-8] (2) Hexadecane; C₁₆H₃₄; [544-76-3] or Octadecane; C₁₈H₃₈; [593-45-3]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Richon, D.; Renon, H. <i>J. Chem. Eng. Data</i> <u>1980</u>, <i>25</i>, 59-60.</p>
<p>VARIABLES:</p> <p>T/K: 298.15, 323.15 P/kPa: 101.3</p>	<p>PREPARED BY:</p> <p>C. L. Young</p>
<p>EXPERIMENTAL VALUES:</p>	
<p>T/K</p>	<p>Limiting value of Henry's constant, H[∞]/atm</p>
<p>298.15</p>	<p>Hexadecane 2.01</p>
<p>323.15</p>	<p>Octadecane 3.72</p>
<p>AUXILIARY INFORMATION</p>	
<p>METHOD APPARATUS/PROCEDURE:</p> <p>Inert gas stripping plus gas chromatographic method. Details given in ref. (1). Method based on passing constant stream of inert gas through dissolved gas-solvent mixture and periodically injecting mixture into gas chromatograph. Henry's law constant determined from variation of gas peak area with time.</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <ol style="list-style-type: none"> 1. L'Air Liquide sample, purity 99 mole per cent. 2. Hexadecane was a Merck sample, Octadecane was a Fluka sample, both had purities of not less than 99 mole per cent. <p>ESTIMATED ERROR: $\delta T/K = \pm 0.05$; $\delta H^{\infty} = \pm 4\%$ (estimated by compiler).</p> <p>REFERENCES.</p> <ol style="list-style-type: none"> 1. Leroi, J. C.; Masson, J. C.; Renon, H.; Fabries, J. F.; Sannier, H. <i>Ind. Eng. Chem. Process. Des. Develop.</i> <u>1977</u>, <i>16</i>, 139.

COMPONENTS: (1) Butane; C_4H_{10} ; [106-97-8] (2) Eicosane; $C_{20}H_{42}$; [112-95-8]	ORIGINAL MEASUREMENTS: Chappelow, C.C.; Prausnitz, J.M. <i>A.I.Ch.E.J.</i> <u>1974</u> , 20, 1097-1104.																
VARIABLES: T/K : 325-475 P/kPa : 101.325	PREPARED BY: C.L. Young																
EXPERIMENTAL VALUES:																	
T/K	<table border="1"> <thead> <tr> <th data-bbox="646 526 804 647">Henry's Constant^a H/atm</th> <th data-bbox="804 526 1204 647">Mole fraction^b of butane at 1 atm. partial pressure, $x_{C_4H_{10}}$</th> </tr> </thead> <tbody> <tr><td>325</td><td>0.2564</td></tr> <tr><td>350</td><td>0.1587</td></tr> <tr><td>375</td><td>0.1012</td></tr> <tr><td>400</td><td>0.0714</td></tr> <tr><td>425</td><td>0.0532</td></tr> <tr><td>450</td><td>0.0403</td></tr> <tr><td>475</td><td>0.0340</td></tr> </tbody> </table>	Henry's Constant ^a H/atm	Mole fraction ^b of butane at 1 atm. partial pressure, $x_{C_4H_{10}}$	325	0.2564	350	0.1587	375	0.1012	400	0.0714	425	0.0532	450	0.0403	475	0.0340
Henry's Constant ^a H/atm	Mole fraction ^b of butane at 1 atm. partial pressure, $x_{C_4H_{10}}$																
325	0.2564																
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<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> , 6, 130. 2. Cukor, P.M.; Prausnitz, J.M. <i>Ind. Eng. Chem. Fundam.</i> <u>1971</u> , 10, 638.																	

COMPONENTS: (1) Butane; C_4H_{10} ; [106-97-8] (2) Eicosane; $C_{20}H_{42}$; [112-95-8] or Docosane; $C_{22}H_{46}$; [629-97-0]		ORIGINAL MEASUREMENTS: Parcher, J. F.; Weiner, P. H.; Hussey, C. L.; Westlake, T. N. <i>J. Chem. Eng. Data</i> 1975, 20, 145-151.	
VARIABLES: T/K : 353.2-393.2 P_1/kPa : 101.325		PREPARED BY: C. L. Young	
EXPERIMENTAL VALUES:			
T/K	Specific retention volume $/cm^3 g^{-1}$	Henry's law Constant ^a H/atm	Mole fraction at a partial pressure of 1 atm ^b
353.2	Eicosane; $C_{20}H_{42}$; [112-95-8] 11.48	6.91	0.145
353.2	Docosane; $C_{22}H_{46}$; [629-97-0] 10.69	6.75	0.148
373.2	7.42	9.72	0.103
393.2	5.63	12.82	0.0780
<p>^a Calculated by compiler using equation given by authors (see below).</p> <p>^b Calculated by compiler assuming Henry's law is valid up to 1 atmosphere.</p>			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE: Gas chromatographic method in which butane was used as injected solute and long chain alkane as stationary liquid. Thermal conductivity detector used. Calculation of mole fraction at 1 atmosphere pressure involves considerable approximation. No allowance was made for the presence of the carrier gas when estimating gas phase imperfection contribution to Henry's law constant. Henry's law constant given by		SOURCE AND PURITY OF MATERIALS: 2. No impurity detected when analysed by GC on SE-30 column.	
$H = \frac{273.15R}{MW_{\text{solvent}} \times \text{Specific retention volume}}$		ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta H/atm = \pm 1.0\%$ (estimated by compiler).	
		REFERENCES:	

COMPONENTS:		ORIGINAL MEASUREMENTS:	
(1) Butane; C_4H_{10} ; [106-97-8] (2) Tetracosane; $C_{24}H_{50}$; [646-31-1] or Octacosane; $C_{28}H_{58}$; [630-02-4]		Parcher, J. F.; Weiner, P. H.; Hussey, C. L.; Westlake, T. N. <i>J. Chem. Eng. Data</i> <u>1975</u> , 20, 145-151.	
VARIABLES: T/K : 353.2-393.2 P/kPa : 101.325		PREPARED BY: C. L. Young	
EXPERIMENTAL VALUES:			
T/K	Specific retention volume $/cm^3 g^{-1}$	Henry's law Constant ^a H/atm	Mole fraction at a partial pressure of 1 atm ^b
	Tetracosane; $C_{24}H_{50}$; [646-31-1]		
353.2	10.34	6.40	0.156
373.2	7.82	8.46	0.118
	Octacosane; $C_{28}H_{58}$; [630-02-4]		
353.2	9.95	5.71	0.175
373.2	6.84	8.30	0.120
393.2	5.00	11.35	0.0881
<p>^a Calculated by compiler using equation given by authors (see below).</p> <p>^b Calculated by compiler assuming Henry's law is valid up to 1 atmosphere.</p>			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
Gas chromatographic method in which butane was used as injected solute and long chain alkane as stationary liquid. Thermal conductivity detector used. Calculation of mole fraction at 1 atmosphere pressure involves considerable approximation. No allowance was made for the presence of the carrier gas when estimating gas phase imperfection contribution to Henry's law constant. Henry's law constant given by		2. No impurity detected when analysed by GC on SE-30 column.	
$H = \frac{273.15R}{MW_{\text{solvent}} \times \text{Specific retention volume}}$		ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta H/atm = \pm 1.0\%$ (estimated by compiler).	
		REFERENCES:	

COMPONENTS: (1) Butane; C_4H_{10} ; [106-97-8] (2) 2,6,10,15,19,23-Hexamethyl-tetracosane, (squalane); $C_{30}H_{62}$; [111-01-3]	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	<table border="1"> <thead> <tr> <th data-bbox="661 526 813 641">Henry's Constant^a H/atm</th> <th data-bbox="813 526 1218 641">Mole fraction^b of butane at 1 atm. partial pressure, $x_{C_4H_{10}}$</th> </tr> </thead> <tbody> <tr><td>300</td><td>0.4762</td></tr> <tr><td>325</td><td>0.3390</td></tr> <tr><td>350</td><td>0.1942</td></tr> <tr><td>375</td><td>0.1199</td></tr> <tr><td>400</td><td>0.0820</td></tr> <tr><td>425</td><td>0.0613</td></tr> <tr><td>450</td><td>0.0493</td></tr> <tr><td>475</td><td>0.0417</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	0.4762	325	0.3390	350	0.1942	375	0.1199	400	0.0820	425	0.0613	450	0.0493	475	0.0417
Henry's Constant ^a H/atm	Mole fraction ^b of butane at 1 atm. partial pressure, $x_{C_4H_{10}}$																		
300	0.4762																		
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<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. Eng. Chem. Fundam.</i> <u>1971</u> , <i>10</i> , 638.																		

COMPONENTS:		ORIGINAL MEASUREMENTS:	
(1) Butane; C_4H_{10} ; [106-97-8] (2) Triacontane; $C_{30}H_{62}$; [638-68-6] or Dotriacontane; $C_{32}H_{66}$; [544-85-4]		Parcher, J. F.; Weiner, P. H.; Hussey, C. L.; Westlake, T. N. <i>J. Chem. Eng. Data</i> <u>1975</u> , 20, 145-151.	
VARIABLES: T/K : 353.2-393.2 P/kPa : 101.325		PREPARED BY: C. L. Young	
EXPERIMENTAL VALUES:			
T/K	Specific retention volume $/cm^3 g^{-1}$	Henry's law Constant ^a H/atm	Mole fraction at a partial pressure of 1 atm ^b
	Triacontane; $C_{30}H_{62}$; [638-68-6]		
353.2	9.29	5.71	0.175
393.2	4.81	11.02	0.0907
	Dotriacontane; $C_{32}H_{66}$; [544-85-4]		
353.2	9.57	5.19	0.193
373.2	6.31	7.88	0.127
393.2	4.78	10.40	0.0962
<p>^a Calculated by compiler using equation given by authors (see below).</p> <p>^b Calculated by compiler assuming Henry's law is valid up to 1 atmosphere.</p>			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
Gas chromatographic method in which butane was used as injected solute and long chain alkane as stationary liquid. Thermal conductivity detector used. Calculation of mole fraction at 1 atmosphere pressure involves considerable approximation. No allowance was made for the presence of the carrier gas when estimating gas phase imperfection contribution to Henry's law constant. Henry's law constant given by		2. No impurity detected when analysed by GC on SE-30 column.	
$H = \frac{273.15R}{MW_{\text{solvent}} \times \text{Specific retention volume}}$		ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta H/atm = \pm 1.0\%$ (estimated by compiler).	
		REFERENCES:	

COMPONENTS:		ORIGINAL MEASUREMENTS:	
(1) Butane; C_4H_{10} ; [106-97-8] (2) Tetratriacontane; $C_{34}H_{70}$; [14167-59-0] or Hexatriacontane; $C_{36}H_{74}$; [630-06-8]		Parcher, J. F.; Weiner, P. H.; Hussey, C. L.; Westlake, T. N. <i>J. Chem. Eng. Data</i> <u>1975</u> , 20, 145-151.	
VARIABLES:		PREPARED BY:	
K/K: 353.2-393.2 P/kPa: 101.325		C. L. Young	
EXPERIMENTAL VALUES:			
T/K	Specific retention volume $/cm^3 g^{-1}$	Henry's law Constant ^a H/atm	Mole fraction at a partial pressure of 1 atm ^b
Tetratriacontane; $C_{34}H_{70}$; [14167-59-0]			
353.2	9.22	5.08	0.197
373.2	6.18	7.57	0.132
393.2	4.69	9.98	0.100
Hexatriacontane; $C_{36}H_{74}$; [630-06-8]			
353.2	9.05	4.88	0.205
373.2	6.19	7.14	0.140
393.2	4.55	9.72	0.103
<p>^a Calculated by compiler using equation given by authors (see below).</p> <p>^b Calculated by compiler assuming Henry's law is valid up to 1 atmosphere.</p>			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
Gas chromatographic method in which butane was used as injected solute and long chain alkane as stationary liquid. Thermal conductivity detector used. Calculation of mole fraction at 1 atmosphere pressure involves considerable approximation. No allowance was made for the presence of the carrier gas when estimating gas phase imperfection contribution to Henry's law constant. Henry's law constant given by		2. No impurity detected when analysed by GC on SE-30 column.	
$H = \frac{273.15R}{MW_{\text{solvent}} \times \text{Specific retention volume}}$		ESTIMATED ERROR:	
		$\delta T/K = \pm 0.1$; $\delta H/atm = \pm 1.0\%$ (estimated by compiler).	
		REFERENCES:	

COMPONENTS: (1) 2-Methylpropane; C ₄ H ₁₀ ; [75-28-5] (2) Pentane; C ₅ H ₁₂ ; [109-66-0] or Hexane; C ₆ H ₁₄ ; [110-54-3]	ORIGINAL MEASUREMENTS: Jadot, R. <i>J. Chim. Phys.</i> <u>1972</u> , <i>69</i> , 1036-40.																				
VARIABLES: <i>T</i> /K: 298.15 <i>P</i> /kPa: 101.325	PREPARED BY: C.L. Young																				
EXPERIMENTAL VALUES:																					
<table border="1"> <thead> <tr> <th data-bbox="190 554 243 580"><i>T</i>/K</th> <th data-bbox="296 554 598 604">Henry's Law Constant, <i>H</i>/atm</th> <th data-bbox="658 554 940 641">Mole fraction⁺ at partial pressure of 101.3 kPa, <i>x</i>_{C₄H₁₀}</th> <th data-bbox="980 554 1125 628">#Δ<i>H</i>[∞] /cal mol⁻¹ (/J mol⁻¹)</th> </tr> </thead> <tbody> <tr> <td colspan="4" data-bbox="493 675 875 701" style="text-align: center;">Pentane; C₅H₁₂; [109-66-0]</td> </tr> <tr> <td data-bbox="164 721 243 747">298.15</td> <td data-bbox="394 721 467 747">3.744</td> <td data-bbox="730 721 815 747">0.2650</td> <td data-bbox="1019 721 1033 747">-</td> </tr> <tr> <td colspan="4" data-bbox="493 776 861 802" style="text-align: center;">Hexane; C₆H₁₄; [110-54-3]</td> </tr> <tr> <td data-bbox="164 822 243 848">298.15</td> <td data-bbox="394 822 467 848">3.600</td> <td data-bbox="730 822 815 848">0.2778</td> <td data-bbox="980 822 1112 848">230 (962)</td> </tr> </tbody> </table>		<i>T</i> /K	Henry's Law Constant, <i>H</i> /atm	Mole fraction ⁺ at partial pressure of 101.3 kPa, <i>x</i> _{C₄H₁₀}	#Δ <i>H</i> [∞] /cal mol ⁻¹ (/J mol ⁻¹)	Pentane; C ₅ H ₁₂ ; [109-66-0]				298.15	3.744	0.2650	-	Hexane; C ₆ H ₁₄ ; [110-54-3]				298.15	3.600	0.2778	230 (962)
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<p>+ Calculated by compiler assuming $x_{C_4H_{10}} = 1/H$.</p> <p># Excess partial molar enthalpy of solution at infinite dilution.</p>																					
AUXILIARY INFORMATION																					
METHOD/APPARATUS/PROCEDURE: <p>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.</p>	SOURCE AND PURITY OF MATERIALS: <p style="text-align: center;">No details given.</p> <hr/> ESTIMATED ERROR: <p style="text-align: center;">$\delta T/K = \pm 0.05$; $\delta H = \pm 2\%$</p> <hr/> REFERENCES:																				

COMPONENTS: (1) 2-Methylpropane (isobutane); C_4H_{10} ; [75-28-5] (2) Hexane; C_6H_{14} ; [110-54-3]	ORIGINAL MEASUREMENTS: Tilquin, B.; Decanniere, L.; Fontaine, R.; Claes, P. <i>Ann. Soc. Sc. Bruxelles (Belgium)</i> <u>1967</u> , 81, 191-199.										
VARIABLES: T/K : 288.15 P/kPa : 5.04-5.17	PREPARED BY: W. Hayduk										
EXPERIMENTAL VALUES:											
<table border="1"> <thead> <tr> <th>$t/^\circ C$</th> <th>T/K</th> <th>Ostwald coefficient¹ $L/cm^3 cm^{-3}$</th> <th>Mole fraction² x_1</th> <th>Henry's constant² H/atm</th> </tr> </thead> <tbody> <tr> <td>15.0</td> <td>288.15</td> <td>82.0</td> <td>0.313</td> <td>3.195</td> </tr> </tbody> </table>		$t/^\circ C$	T/K	Ostwald coefficient ¹ $L/cm^3 cm^{-3}$	Mole fraction ² x_1	Henry's constant ² H/atm	15.0	288.15	82.0	0.313	3.195
$t/^\circ C$	T/K	Ostwald coefficient ¹ $L/cm^3 cm^{-3}$	Mole fraction ² x_1	Henry's constant ² H/atm							
15.0	288.15	82.0	0.313	3.195							
<p>¹Original data at low pressure reported as a distribution coefficient; if Henry's law and ideal gas law apply, the distribution coefficient is equivalent to the Ostwald coefficient as shown here.</p> <p>²Calculated by compiler for a gas partial pressure of 101.325 kPa assuming that Henry's law and ideal gas law apply.</p>											
AUXILIARY INFORMATION											
METHOD/APPARATUS/PROCEDURE: An all glass apparatus was used at a very low gas partial pressure. It contained a replaceable degassed solvent ampule equipped with a breakable point which could be broken by means of a magnetically activated plunger. The quantity of gas fed into the system was determined by measuring the pressure change in a known volume. The quantity of liquid was measured by weight. The pressure change was observed after the solvent was released. Experimental details are described by Rząd and Claes(1).	SOURCE AND PURITY OF MATERIALS: 1. Source not given; minimum purity specified as 99.0 mole per cent. 2. Fluka pure grade; minimum purity specified as 99.0 mole per cent. ESTIMATED ERROR: $\delta T/K = 0.05$ (estimated by compiler) $\delta x_1/x_1 = 0.01$ REFERENCES: 1. Rząd, S.; Claes, P. <i>Bull. Soc. Chim. Belges</i> , <u>1964</u> , 73, 689.										

COMPONENTS: (1) 2-Methylpropane (isobutane); C_4H_{10} ; [75-28-5] (2) 2,2'-Dimethylbutane (Neo-hexane); C_6H_{14} ; [75-83-2]	ORIGINAL MEASUREMENTS: Tilquin, B.; Decanniere, L.; Fontaine, R.; Claes, P. <i>Ann. Soc. Sc. Bruxelles (Belgium)</i> <u>1967</u> , 81, 191-199.										
VARIABLES: T/K : 288.15 P/kPa : 2.11-3.03	PREPARED BY: W. Hayduk										
EXPERIMENTAL VALUES:											
<table border="1"> <thead> <tr> <th>$t/^\circ C$</th> <th>T/K</th> <th>Ostwald coefficient¹ $L/cm^3 cm^{-3}$</th> <th>Mole fraction² x_1</th> <th>Henry's constant² H/atm</th> </tr> </thead> <tbody> <tr> <td>15.0</td> <td>288.15</td> <td>125.9</td> <td>0.420</td> <td>2.381</td> </tr> </tbody> </table>		$t/^\circ C$	T/K	Ostwald coefficient ¹ $L/cm^3 cm^{-3}$	Mole fraction ² x_1	Henry's constant ² H/atm	15.0	288.15	125.9	0.420	2.381
$t/^\circ C$	T/K	Ostwald coefficient ¹ $L/cm^3 cm^{-3}$	Mole fraction ² x_1	Henry's constant ² H/atm							
15.0	288.15	125.9	0.420	2.381							
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METHOD/APPARATUS/PROCEDURE: <p>An all glass apparatus was used at a very low gas partial pressure. It contained a replaceable degassed solvent ampule equipped with a breakable point which could be broken by means of a magnetically activated plunger. The quantity of gas fed into the system was determined by measuring the pressure change in a known volume. The quantity of liquid was measured by weight. The pressure change was observed after the solvent was released.</p> <p>Experimental details are described by Rzad and Claes(1).</p>	SOURCE AND PURITY OF MATERIALS: <ol style="list-style-type: none"> Source not given; minimum purity specified as 99.0 mole per cent. Fluka pure grade; minimum purity specified as 99.0 mole per cent. ESTIMATED ERROR: $T/K = 0.05$ (estimated by compiler) $\delta x_1/x_1 = 0.01$										
REFERENCES: <ol style="list-style-type: none"> Rzad, S.; Claes, P. <i>Bull. Soc. Chim. Belges</i>, <u>1964</u>, 73, 689. 											

<p>COMPONENTS:</p> <p>(1) 2-Methylpropane; C₄H₁₀; [75-28-5]</p> <p>(2) Heptane; C₇H₁₆; [142-82-5] or Octane; C₈H₁₈; [111-65-9]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Jadot, R. <i>J. Chim. Phys.</i> <u>1972</u>, <i>69</i>, 1036-40.</p>																				
<p>VARIABLES:</p> <p>T/K: 298.15 P/kPa: 101.325</p>	<p>PREPARED BY:</p> <p>C.L. Young</p>																				
<p>EXPERIMENTAL VALUES:</p>																					
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<p>+ Calculated by compiler assuming $x_{C_4H_{10}} = 1/H$.</p> <p># Excess partial molar enthalpy of solution at infinite dilution.</p>																					
<p style="text-align: center;">AUXILIARY INFORMATION</p>																					
<p>METHOD/APPARATUS/PROCEDURE:</p> <p>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.</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <p style="text-align: center;">No details given.</p> <p>ESTIMATED ERROR:</p> <p style="text-align: center;">$\delta T/K = \pm 0.05$; $\delta H = \pm 2\%$</p> <p>REFERENCES:</p>																				

COMPONENTS:		ORIGINAL MEASUREMENTS:		
(1) 2-Methylpropane, (isobutane) C ₄ H ₁₀ ; [75-28-5]		Gerrard, W.		
(2) Decane; C ₁₀ H ₂₂ ; [124-18-5]		<i>Solubility of Gases and Liquids</i> , Plenum, New York, 1976, Chapter 12.		
VARIABLES:		PREPARED BY:		
T/K: 273.15		C.L. Young		
P/kPa: 13.3-101.3				
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	0.093	
	200	26.7	0.180	
	300	40.0	0.270	
	400	53.3	0.345	
	500	66.7	0.438	
	600	80.0	0.520	
	700	93.3	0.600	
	760	101.3	0.645	
AUXILIARY INFORMATION				
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:		
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).		No details given.		
		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> 1972 22, 623-650.		
		2. Gerrard, W. <i>Solubility of Gases and Liquids</i> , Plenum Press, New York, 1976 Chapter 1.		

COMPONENTS:		ORIGINAL MEASUREMENTS:	
(1) 2-Methylpropane; C ₄ H ₁₀ ; [75-28-5]		Jadot, R.	
(2) Nonane; C ₉ H ₂₀ ; [111-84-2] or Decane; C ₁₀ H ₂₂ ; [124-18-5]		J. Chim. Phys. <u>1972</u> , <i>69</i> , 1036-40.	
VARIABLES:		PREPARED BY:	
T/K: 298.15 P/kPa: 101.325		C.L. Young	
EXPERIMENTAL VALUES:			
T/K	Henry's Law Constant, H/atm	Mole fraction ⁺ at partial pressure of 101.3kPa, $x_{C_4H_{10}}$	# ΔH^∞ /cal mol ⁻¹ (/J mol ⁻¹)
	Nonane; C ₉ H ₂₀ ; [111-84-2]		
298.15	2.984	0.3351	700 (2929)
	Decane; C ₁₀ H ₂₂ ; [124-18-5]		
298.15	2.880	0.3472	790 (3305)
+ 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; (isobutane), C_4H_{10} ; [75-28-5] (2) Eicosane; $C_{20}H_{42}$; [112-95-8]	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 : 325-475 P/kPa : 101.325	PREPARED BY: C.L. Young		
EXPERIMENTAL VALUES:			
	T/K	Henry's Constant ^a H/atm	Mole fraction of 2- methyl propane at 1 atm. partial pressure, $x_{C_4H_{10}}$
325	5.80	0.1724	
350	9.15	0.1093	
375	13.3	0.0752	
400	18.1	0.0552	
425	23.6	0.0424	
450	29.8	0.0336	
475	36.0	0.0278	
<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. Eng. Chem. Fundam.</i> <u>1971</u> , <i>10</i> , 638.		