

| <p>COMPONENTS:</p> <ol style="list-style-type: none"> Hydrogen sulfide; H₂S; [7783-06-4] Ethylene glycols | <p>ORIGINAL MEASUREMENTS:</p> <p>Byeseda, J.J.; Deetz, J.A.; Manning, W.P.</p> <p><i>Proc.Laurance Reid Gas Cond.Conf.</i> <u>1985.</u></p> | | | | | | | | | |
|---|---|--|------------------------|--|---|-----|--------|--|------|--------|
| <p>VARIABLES:</p> | <p>PREPARED BY:</p> <p>P.G.T. Fogg</p> | | | | | | | | | |
| <p>EXPERIMENTAL VALUES:</p> <table border="1" data-bbox="111 526 1232 828"> <thead> <tr> <th data-bbox="111 526 669 623">Solvent</th> <th data-bbox="669 526 879 623">Ostwald coeff. L</th> <th data-bbox="879 526 1232 623">Mole fraction in liquid* x_{H₂S}</th> </tr> </thead> <tbody> <tr> <td data-bbox="111 623 669 741">1,2-Ethanediol (ethylene glycol); C₂H₆O₂; [107-21-1]</td> <td data-bbox="669 623 879 741">6.3</td> <td data-bbox="879 623 1232 741">0.0160</td> </tr> <tr> <td data-bbox="111 741 669 828">2,2' [1,2-ethanedylbis(oxy)]bis- ethanol, (triethylene glycol); C₆H₁₄O₄; [112-27-6]</td> <td data-bbox="669 741 879 828">11.9</td> <td data-bbox="879 741 1232 828">0.0618</td> </tr> </tbody> </table> <p>T/K = 297.1 P_{H₂S}/psia = 14.73 P_{H₂S}/bar = 1.016</p> <p>* calculated by the compiler.</p> | | Solvent | Ostwald coeff. L | Mole fraction in liquid* x _{H₂S} | 1,2-Ethanediol (ethylene glycol); C ₂ H ₆ O ₂ ; [107-21-1] | 6.3 | 0.0160 | 2,2' [1,2-ethanedylbis(oxy)]bis- ethanol, (triethylene glycol); C ₆ H ₁₄ O ₄ ; [112-27-6] | 11.9 | 0.0618 |
| Solvent | Ostwald coeff. L | Mole fraction in liquid* x _{H₂S} | | | | | | | | |
| 1,2-Ethanediol (ethylene glycol); C ₂ H ₆ O ₂ ; [107-21-1] | 6.3 | 0.0160 | | | | | | | | |
| 2,2' [1,2-ethanedylbis(oxy)]bis- ethanol, (triethylene glycol); C ₆ H ₁₄ O ₄ ; [112-27-6] | 11.9 | 0.0618 | | | | | | | | |
| <p>AUXILIARY INFORMATION</p> | | | | | | | | | | |
| <p>METHOD/APPARATUS/PROCEDURE:</p> <p>The H₂S was contained in a thermostatted metal cylinder connected to a pressure gage, vacuum pump and supply of gas. A tight fitting internal piston sealed with an O-ring fitted into the cylinder so that the volume of gas could be changed by controlled movement of the piston. A measured volume of solvent was injected into the cylinder by a syringe. The absorption of gas was found from the movement of the piston which was necessary to maintain constant pressure.</p> | <p>SOURCE AND PURITY OF MATERIALS:</p> <p>No information</p> <hr/> <p>ESTIMATED ERROR:</p> <hr/> <p>REFERENCES:</p> | | | | | | | | | |

| COMPONENTS: 1. Hydrogen sulfide; H ₂ S; [7783-06-4] 2. Oxybispropanol; (Dipropylene glycol); C ₆ H ₁₄ O ₃ ; [25265-71-8] | ORIGINAL MEASUREMENTS: Lenoir, J-Y.; Renault, P.; Renon, H.; <i>J. Chem. Eng. Data</i> , <u>1971</u> , 16, 340-2. | | | | | | | | | | | | |
|---|---|---------------------------------------|---|---------------------------------------|-------|------|--------|-------|------|--------|-------|------|--------|
| VARIABLES: Temperature | PREPARED BY: C. L. Young | | | | | | | | | | | | |
| EXPERIMENTAL VALUES: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">T/K</th> <th style="text-align: center;">Henry's constant H_{H_2S}/atm</th> <th style="text-align: center;">Mole fraction at 1 atm* x_{H_2S}</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">298.2</td> <td style="text-align: center;">22.9</td> <td style="text-align: center;">0.0437</td> </tr> <tr> <td style="text-align: center;">323.2</td> <td style="text-align: center;">30.7</td> <td style="text-align: center;">0.0326</td> </tr> <tr> <td style="text-align: center;">343.2</td> <td style="text-align: center;">74.3</td> <td style="text-align: center;">0.0135</td> </tr> </tbody> </table> <p>* Calculated by compiler assuming a linear function of P_{H_2S} vs x_{H_2S}, i.e., $x_{H_2S}(1 \text{ atm}) = 1/H_{H_2S}$</p> | | T/K | Henry's constant H_{H_2S}/atm | Mole fraction at 1 atm* x_{H_2S} | 298.2 | 22.9 | 0.0437 | 323.2 | 30.7 | 0.0326 | 343.2 | 74.3 | 0.0135 |
| T/K | Henry's constant H_{H_2S}/atm | Mole fraction at 1 atm* x_{H_2S} | | | | | | | | | | | |
| 298.2 | 22.9 | 0.0437 | | | | | | | | | | | |
| 323.2 | 30.7 | 0.0326 | | | | | | | | | | | |
| 343.2 | 74.3 | 0.0135 | | | | | | | | | | | |
| AUXILIARY INFORMATION | | | | | | | | | | | | | |
| METHOD/APPARATUS/PROCEDURE: A conventional gas-liquid chromatographic unit fitted with a thermal conductivity detector was used. The carrier gas was helium. The value of Henry's law constant was calculated from the retention time. The value applies to very low partial pressures of gas and there may be a substantial difference from that measured at 1 atm. pressure. There is also considerable uncertainty in the value of Henry's constant since surface adsorption was not allowed for although its possible existence was noted. | SOURCE AND PURITY OF MATERIALS: (1) L'Air Liquide sample, minimum purity 99.9 mole per cent. (2) Touzart and Matignon or Serlabo sample, purity 99 mole per cent. ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta H/\text{atm} = \pm 6\%$ (estimated by compiler). REFERENCES: | | | | | | | | | | | | |

| | | | | | |
|--|--|---|--|-------|--------|
| COMPONENTS: 1. Hydrogen sulfide; H ₂ S; [7783-06-4] 2. 2,2'[1,2-ethanediylbis(oxy)]bis-ethanol, (triethylene glycol); C ₆ H ₁₄ O ₄ ; [112-27-6] | | ORIGINAL MEASUREMENTS: Blake, R.J. <i>Oil & Gas J.</i> 1967, 65(2), 105-108. | | | |
| VARIABLES: Temperature, pressure. | | PREPARED BY: P.G.T. Fogg | | | |
| EXPERIMENTAL VALUES: The author presented smooth curves showing the variation of the absorption coefficient, α , (volume of gas reduced to 273.15 K and 1.013 bar dissolved by one volume of the solvent at the experimental temperature) with change of T/°F. These curves were for partial pressures of 0, 25, 50, 10 & 150 psig. The compiler has used the curves to prepare the tables below. | | | | | |
| Values of α for various temperatures and pressures | | | | | |
| T/K | Partial pressure of H ₂ S/bar | | | | |
| | 1.013 | 2.737 | 4.460 | 7.908 | 11.355 |
| 273.15 | 21.5 | 41.3 | | | |
| 283.15 | 16.4 | 31.6 | 50.5 | | |
| 293.15 | 12.8 | 25.9 | 41.4 | | |
| 303.15 | 10.2 | 21.6 | 35.0 | 64.2 | |
| 313.15 | 8.1 | 18.5 | 30.2 | 55.2 | |
| 323.15 | 6.8 | 16.0 | 26.2 | 47.9 | 75.8 |
| 333.15 | 5.6 | 14.2 | 23.1 | 42.0 | 63.7 |
| 343.15 | 5.0 | 12.5 | 20.1 | 36.7 | 54.9 |
| 353.15 | 4.4 | 11.1 | 17.7 | 32.2 | 47.2 |
| 363.15 | 4.2 | 10.2 | 15.4 | 27.8 | 40.7 |
| 373.15 | 4.0 | 9.6 | 13.5 | 23.9 | 34.7 |
| T/K | P _{H₂S} /bar | | Mole fraction in liquid x _{H₂S} | | |
| 273.15 | 1.013 | | 0.114 | | |
| | 2.737 | | 0.199 | | |
| 283.15 | 1.013 | | 0.090 | | |
| | 2.737 | | 0.160 | | |
| | 4.460 | | 0.233 | | |
| 293.15 | 1.013 | | 0.071 | | |
| | 2.737 | | 0.135 | | |
| | 4.460 | | 0.199 | | |
| | 7.908 | | 0.309 | | |
| 303.15 | 1.013 | | 0.058 | | |
| | 2.737 | | 0.115 | | |
| | 4.460 | | 0.174 | | |
| | 7.908 | | 0.278 | | |
| 313.15 | 1.013 | | 0.047 | | |
| | 2.737 | | 0.100 | | |
| | 4.460 | | 0.154 | | |
| | 7.908 | | 0.249 | | |
| AUXILIARY INFORMATION | | | | | |
| METHOD/APPARATUS/PROCEDURE: No information. | | SOURCE AND PURITY OF MATERIALS: No information. | | | |
| | | ESTIMATED ERROR: | | | |
| | | REFERENCES: | | | |

| COMPONENTS: 1. Hydrogen sulfide; H ₂ S; [7783-06-4] 2. Polyethylene glycols (α-hydro-ω-hydroxy-poly(oxy-1,2-ethanediyl); (C ₂ H ₄ O) _n H ₂ O; [25322-68-3] | ORIGINAL MEASUREMENTS: Gestrich, W.; Reinke, L. <i>Chem.-Ing.-Tech.</i> <u>1983</u> , 55, 629-631 | | | | | | | | | | | | | | | | |
|---|--|----------|-----------------------|----------|-----------------------|---------------------------------|--------|--------|--------|--|--------|--------|--------|----------------------------------|--------|--------|--------|
| VARIABLES: Temperature, pressure. | PREPARED BY: P.G.T. Fogg | | | | | | | | | | | | | | | | |
| EXPERIMENTAL VALUES: <p>Solubilities were measured at temperatures from 70 °C to 150 °C and pressures from 196 to 695 Torr. Over this pressure range the weight of gas absorbed per gram of solvent was found to be proportional to the pressure. Values of this proportionality constant were graphically displayed by the authors in small scale diagrams and also presented as equations of the form:</p> $\ln (S/\text{mg}) = - A + B/(T/K)$ <p>In these equations <i>S</i> is the weight of gas absorbed by 1 g of solvent for a pressure of gas of 1 bar.</p> <table border="1" data-bbox="115 818 1243 872"> <thead> <tr> <th></th> <th><i>A</i></th> <th><i>B</i></th> <th><i>r</i>²</th> </tr> </thead> <tbody> <tr> <td>Polyethylene glycol <i>P200</i></td> <td>3.7573</td> <td>1915.0</td> <td>0.9943</td> </tr> <tr> <td>Polyethylene glycols <i>P300</i> & <i>P400</i></td> <td>3.6376</td> <td>1904.0</td> <td>0.9894</td> </tr> <tr> <td>Polyethylene glycol <i>P1000</i></td> <td>4.6163</td> <td>2263.6</td> <td>0.9995</td> </tr> </tbody> </table> <p><i>P200</i>, <i>P300</i> etc. correspond to the nomenclature of the suppliers, Chemischen Werke Hüls.</p> <p><i>r</i> = correlation coefficient.</p> | | | <i>A</i> | <i>B</i> | <i>r</i> ² | Polyethylene glycol <i>P200</i> | 3.7573 | 1915.0 | 0.9943 | Polyethylene glycols <i>P300</i> & <i>P400</i> | 3.6376 | 1904.0 | 0.9894 | Polyethylene glycol <i>P1000</i> | 4.6163 | 2263.6 | 0.9995 |
| | <i>A</i> | <i>B</i> | <i>r</i> ² | | | | | | | | | | | | | | |
| Polyethylene glycol <i>P200</i> | 3.7573 | 1915.0 | 0.9943 | | | | | | | | | | | | | | |
| Polyethylene glycols <i>P300</i> & <i>P400</i> | 3.6376 | 1904.0 | 0.9894 | | | | | | | | | | | | | | |
| Polyethylene glycol <i>P1000</i> | 4.6163 | 2263.6 | 0.9995 | | | | | | | | | | | | | | |
| AUXILIARY INFORMATION | | | | | | | | | | | | | | | | | |
| METHOD/APPARATUS/PROCEDURE: No information | SOURCE AND PURITY OF MATERIALS: ESTIMATED ERROR: REFERENCES: | | | | | | | | | | | | | | | | |

| | | | |
|---|--------|--|--|
| COMPONENTS: | | ORIGINAL MEASUREMENTS: | |
| 1. Hydrogen sulfide; H ₂ S; [7783-06-4] 2. Polyethylene glycols (α-Hydro-ω-hydroxy-poly(oxy-1,2-ethanediyl); (C ₂ H ₄ O) _n H ₂ O; [25322-68-3] | | Härtel, G.H. <i>J. Chem. Eng. Data</i> <u>1985</u> , 30, 57-61. | |
| VARIABLES: | | PREPARED BY: | |
| Temperature | | P.G.T. Fogg | |
| EXPERIMENTAL VALUES: | | | |
| | T/K | Henry's constant [†] H _{H₂S} /bar | Mole fraction solubility x _{H₂S} (1.013 bar)* |
| Polyethylene glycol 200 | 333.15 | 21.989 | 0.046 |
| | 353.15 | 33.121 | 0.031 |
| | 373.15 | 44.812 | 0.023 |
| Polyethylene glycol 400 | 333.15 | 9.498 | 0.107 |
| | 353.15 | 15.023 | 0.067 |
| | 373.15 | 20.598 | 0.049 |
| Henry's constant is given by : | | | |
| $H_{H_2S} = \frac{\text{pressure}}{\text{mole fraction solubility}}$ | | | |
| Solubilities were measured at concentrations not greater than x _{H₂S} = 0.16. The variation of mole fraction solubility with pressure was found to be almost linear with a correlation coefficient of better than 0.99. | | | |
| * Calculated by the compiler assuming that the variation of mole fraction solubility with variation of pressure was linear to 1.013 bar. | | | |
| † There is some ambiguity in the manner in which data are tabulated in the original paper. The compiler considers that these values correspond to experimental measurements by the author. | | | |
| AUXILIARY INFORMATION | | | |
| METHOD/APPARATUS/PROCEDURE: | | SOURCE AND PURITY OF MATERIALS: | |
| Absorption was found from the decrease in pressure when a known volume of gas came into contact with a known mass of degassed solvent. Pressure changes were found by use of a transducer with a mercury manometer to provide a reference pressure. | | 1. From Matheson, Heusenstamm, FRG; minimum purity 99.5%. | |
| | | ESTIMATED ERROR: δP = ± 0.25 mbar (author) | |
| | | REFERENCES: | |

| | | | | | |
|---|---------------------------|---|--|---|--------------------------|
| COMPONENTS: | | ORIGINAL MEASUREMENTS: | | | |
| 1. Hydrogen sulfide; H ₂ S; [7783-06-4] 2. 1,1'-Oxybisethane, (diethyl ether); C ₄ H ₁₀ O; [60-29-7] | | Parsons, L.B. <i>J. Amer. Chem. Soc.</i> <u>1925</u> , 47, 1820-1830. | | | |
| VARIABLES: | | PREPARED BY: | | | |
| | | P.G.T. Fogg | | | |
| EXPERIMENTAL VALUES: | | | | | |
| $P(\text{total})$ /mmHg | $P(\text{total})$ /bar | T/K | Concentrations of H ₂ S / Normality | Average concentration* /mol dm ⁻³ | $x_{\text{H}_2\text{S}}$ |
| 740 | 0.987 | 299.2 | 0.506 | 0.256 | 0.026 |
| | | | 0.520 | | |
| | | | 0.505 | | |
| | | | 0.515 | | |
| * estimated by the compiler on the assumption that dissolution of gas caused negligible change of volume. | | | | | |
| AUXILIARY INFORMATION | | | | | |
| METHOD/APPARATUS/PROCEDURE: | | | SOURCE AND PURITY OF MATERIALS: | | |
| The ether appears to have been saturated with hydrogen sulfide by bubbling the gas through the solvent at room temperature and a total pressure equal to barometric pressure. The gas dissolved by a measured volume of solution was then allowed to react with a 3% aqueous solution of cadmium sulfate so as to produce a precipitate of cadmium sulfide and a solution of sulfuric acid. There was good agreement between the amount of hydrogen sulfide calculated from the weight of cadmium sulfide and the amount calculated from the quantity of sulfuric acid. | | | 1. Prepared from 25% solution of sodium sulfide by treatment with concentrated acid. Washed with distilled water and dried with CaCl ₂ and P ₂ O ₅ . 2. Distilled from fused CaCl ₂ and then treated with sodium wire; redistilled. | | |
| | | | ESTIMATED ERROR: | | |
| | | | REFERENCES: | | |

| <p>COMPONENTS:</p> <ol style="list-style-type: none"> Hydrogen sulfide; H₂S; [7783-06-4] 1,1'-Oxybisoctane; C₁₄H₃₄O₃; [629-82-3] | <p>ORIGINAL MEASUREMENTS:</p> <p>Gerrard, W.</p> <p><i>J. Appl. Chem. Biotechnol.</i> <u>1972</u>, 22, 623-650.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--------------|---------------|--|------------|--|--------|-----|-------|-------|-------|--------|-----|-------|-------|-------|--------|-----|-------|-------|-------|--------|-----|-------|-------|-------|--------|-----|-------|-------|-------|
| <p>VARIABLES:</p> <p>Temperature</p> | <p>PREPARED BY:</p> <p>P.G.T. Fogg</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>EXPERIMENTAL VALUES:</p> <table border="1" data-bbox="101 534 1226 828"> <thead> <tr> <th>T/K</th> <th>P(total)/mmHg</th> <th>P(total)/bar</th> <th>Mole ratio</th> <th>Mole fraction of H₂S* $x_{\text{H}_2\text{S}}$</th> </tr> </thead> <tbody> <tr> <td>265.15</td> <td>761</td> <td>1.015</td> <td>0.237</td> <td>0.192</td> </tr> <tr> <td>267.15</td> <td>761</td> <td>1.015</td> <td>0.223</td> <td>0.182</td> </tr> <tr> <td>273.15</td> <td>761</td> <td>1.015</td> <td>0.184</td> <td>0.155</td> </tr> <tr> <td>283.15</td> <td>761</td> <td>1.015</td> <td>0.138</td> <td>0.121</td> </tr> <tr> <td>293.15</td> <td>761</td> <td>1.015</td> <td>0.110</td> <td>0.099</td> </tr> </tbody> </table> <p>* calculated by the compiler for the stated total pressure.</p> | | T/K | P(total)/mmHg | P(total)/bar | Mole ratio | Mole fraction of H ₂ S* $x_{\text{H}_2\text{S}}$ | 265.15 | 761 | 1.015 | 0.237 | 0.192 | 267.15 | 761 | 1.015 | 0.223 | 0.182 | 273.15 | 761 | 1.015 | 0.184 | 0.155 | 283.15 | 761 | 1.015 | 0.138 | 0.121 | 293.15 | 761 | 1.015 | 0.110 | 0.099 |
| T/K | P(total)/mmHg | P(total)/bar | Mole ratio | Mole fraction of H ₂ S* $x_{\text{H}_2\text{S}}$ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 265.15 | 761 | 1.015 | 0.237 | 0.192 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 267.15 | 761 | 1.015 | 0.223 | 0.182 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 273.15 | 761 | 1.015 | 0.184 | 0.155 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 283.15 | 761 | 1.015 | 0.138 | 0.121 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 293.15 | 761 | 1.015 | 0.110 | 0.099 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>AUXILIARY INFORMATION</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>METHOD/APPARATUS/PROCEDURE:</p> <p>Hydrogen sulfide was bubbled into a weighed amount of component 2 in a bubbler tube as described in detail in the source. The amount of gas absorbed at equilibrium for the observed temperature and pressure was found by weighing. Pressure was measured with a mercury manometer.</p> | <p>SOURCE AND PURITY OF MATERIALS:</p> <p>It was stated that "All materials purified and attested by conventional methods."</p> <p>ESTIMATED ERROR:</p> <p>$\delta x_{\text{H}_2\text{S}} = \pm 4\%$ (author)</p> <p>REFERENCES:</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | |
|---|---------|--------|---|--|
| COMPONENTS: | | | ORIGINAL MEASUREMENTS: | |
| 1. Hydrogen sulfide; H ₂ S; [7783-06-4] | | | Gerrard, W. | |
| 2. Ethoxybenzene, (ethylphenyl ether); C ₈ H ₁₀ O; [103-73-1] | | | <i>J. Appl. Chem. Biotechnol.</i> , <u>1972</u> , <i>22</i> , 623-650 | |
| VARIABLES: | | | PREPARED BY: | |
| Temperature | | | C.L. Young | |
| EXPERIMENTAL VALUES: | | | | |
| T/K | P*/mmHg | P*/kPa | Mole ratio | Mole fraction ⁺ of hydrogen sulfide in liquid, $x_{\text{H}_2\text{S}}$ |
| 265.15 | 748 | 99.7 | 0.175 | 0.149 |
| 267.15 | 748 | 99.7 | 0.164 | 0.141 |
| 273.15 | 748 | 99.7 | 0.135 | 0.119 |
| 283.15 | 748 | 99.7 | 0.100 | 0.091 |
| 293.15 | 748 | 99.7 | 0.078 | 0.072 |
| ⁺ calculated by compiler *total pressure | | | | |
| AUXILIARY INFORMATION | | | | |
| METHOD/APPARATUS/PROCEDURE: | | | SOURCE AND PURITY OF MATERIALS: | |
| Hydrogen sulfide was bubbled into a weighed amount of component 2. in a bubbler tube as described in detail in the source. The amount of gas absorbed at equilibrium and at the observed temperature and pressure was determined by weighing. Pressure was measured with a mercury manometer. The amount of gas absorbed at successively lower pressures was measured. Eventually the pressure was reduced to the vapor pressure of component 2. The refractive index and infrared spectrum of the liquid showed it to be essentially pure component 2. | | | 1 and 2. Components were purified and attested by conventional methods. | |
| | | | ESTIMATED ERROR: | |
| | | | $\delta T/K = \pm 0.2$; $\delta x_{\text{H}_2\text{S}} = \pm 4\%$ | |
| | | | REFERENCES: | |
| | | | | |

| | | | | | |
|---|-------------------|---|---|-------|--|
| COMPONENTS: | | ORIGINAL MEASUREMENTS: | | | |
| 1. Hydrogen sulfide; H ₂ S; [7783-06-4] | | Sciamanna, S.F. Ph.D. Dissertation, Department of Chemical Engineering, University of California, Berkeley, U.S.A. 1986. (Directed by Lynn, S.) | | | |
| 2. Polyglycol ethers | | | | | |
| VARIABLES: | | PREPARED BY: | | | |
| Temperature | | P.G.T. Fogg | | | |
| EXPERIMENTAL VALUES: | | | | | |
| Solvent | A/K | B | H'/MPa 298.15 K 373.15 K | | |
| 1,1'-Oxybis(2-methoxyethane), (diethylene glycol dimethyl ether; diglyme); C ₆ H ₁₄ O ₃ ; [111-96-6] | -2095.9 ± 1.8% | 13.483 ± 0.8% | 2.50 | 10.27 | |
| 2,5,8,11-Tetraoxadodecane, (triethylene glycol dimethyl ether; triglyme); C ₈ H ₁₈ O ₄ ; [112-49-2] | -2147.2 ± 3.4% | 13.443 ± 1.5% | 2.69 | 11.42 | |
| 2,5,8,11,14-Pentaoxapentadecane, (tetraethylene glycol dimethyl ether; tetraglyme); C ₁₀ H ₂₂ O ₅ ; [143-24-8] | -2257.1 ± 0.4% | 13.616 ± 0.2% | 2.75 | 12.61 | |
| 2-(2-methoxyethoxy)ethanol, (diethylene glycol monomethyl ether; methyl carbitol); C ₅ H ₁₂ O ₃ ; [111-77-3] | -1943.2 ± 1.0% | 13.255 ± 0.4% | 2.97 | 11.02 | |
| 3,6,9,12-Tetraoxahexadecan-1-ol, (tetraethylene glycol monobutyl ether); C ₁₂ H ₂₆ O ₅ ; [1559-34-8] | -1817.2 ± 1.7% | 12.500 ± 0.7% | 4.10 | 13.97 | |
| Values of H' are Henry's law constants, extrapolated to zero pressure, as defined by the equation: | | | | | |
| $H' = \text{partial pressure of gas} / \text{weight fraction solubility}$ | | | | | |
| If Henry's law is taken to be of the form: | | | | | |
| $H = \text{partial pressure of gas} / \text{mole fraction solubility.}$ | | | | | |
| then the Henry's laws constant, H, extrapolated to zero partial pressure is given by: | | | | | |
| $H / \text{kPa} = \exp [A/T + B]$ | | | | | |
| The values of A and B are based upon experimental measurements of solubilities carried out in the temperature range 288.2 K to 373.2 K at pressures which did not exceed 133 kPa. | | | | | |
| AUXILIARY INFORMATION | | | | | |
| METHOD/APPARATUS/PROCEDURE | | | SOURCE AND PURITY OF MATERIALS | | |
| Dried solvent was added to a flask of known weight. The solvent was then heated, degassed, and the flask reweighed. Subsequent steps were automated and data stored in a computer. The solvent vapor pressure was recorded after each increment of temperature of 5 K from 288.2 to 373.2 K. The flask was then cooled, a predetermined mass of gas added and total pressures recorded at intervals of 5 K. The process was repeated with further additions of gas. | | | 2-(2-methoxyethoxy)ethanol was referred to by the trade name ®Dowanol DM ; 3,6,9,12-tetraoxahexadecan-1-ol by the trade name ®Dowanol TBH. | | |
| | | | ESTIMATED ERROR: | | |
| | | | As indicated above. | | |
| | | | REFERENCES: | | |

| COMPONENTS: 1. Hydrogen sulfide; H ₂ S; [7783-06-4] 2. 2,5,8,11,14-Pentaoxapentadecane; (tetraethylene glycol dimethyl ether); C ₁₀ H ₂₂ O ₅ ; [143-24-8] | ORIGINAL MEASUREMENTS: Härtel, G.H. <i>J.Chem.Eng.Data</i> <u>1985</u> , 30, 57-61. | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|--------|-------|-------|--------|-------|-------|--------|-------|-------|--------|--------|-------|--------|--------|-------|--|
| VARIABLES: Temperature | PREPARED BY: P.G.T. Fogg | | | | | | | | | | | | | | | | | | | |
| EXPERIMENTAL VALUES: | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>T/K</th> <th>Henry's constant $H_{\text{H}_2\text{S}}$/bar</th> <th>Mole fraction solubility $x_{\text{H}_2\text{S}}$ (1.013 bar)*</th> </tr> </thead> <tbody> <tr> <td>293.15</td> <td>3.390</td> <td>0.299</td> </tr> <tr> <td>313.15</td> <td>6.179</td> <td>0.164</td> </tr> <tr> <td>333.15</td> <td>8.310</td> <td>0.122</td> </tr> <tr> <td>353.15</td> <td>11.321</td> <td>0.089</td> </tr> <tr> <td>373.15</td> <td>16.901</td> <td>0.060</td> </tr> </tbody> </table> | T/K | Henry's constant $H_{\text{H}_2\text{S}}$ /bar | Mole fraction solubility $x_{\text{H}_2\text{S}}$ (1.013 bar)* | 293.15 | 3.390 | 0.299 | 313.15 | 6.179 | 0.164 | 333.15 | 8.310 | 0.122 | 353.15 | 11.321 | 0.089 | 373.15 | 16.901 | 0.060 | |
| T/K | Henry's constant $H_{\text{H}_2\text{S}}$ /bar | Mole fraction solubility $x_{\text{H}_2\text{S}}$ (1.013 bar)* | | | | | | | | | | | | | | | | | | |
| 293.15 | 3.390 | 0.299 | | | | | | | | | | | | | | | | | | |
| 313.15 | 6.179 | 0.164 | | | | | | | | | | | | | | | | | | |
| 333.15 | 8.310 | 0.122 | | | | | | | | | | | | | | | | | | |
| 353.15 | 11.321 | 0.089 | | | | | | | | | | | | | | | | | | |
| 373.15 | 16.901 | 0.060 | | | | | | | | | | | | | | | | | | |
| Henry's constant is defined as : | | | | | | | | | | | | | | | | | | | | |
| $H_{\text{H}_2\text{S}} = \frac{\text{pressure}}{\text{mole fraction solubility}}$ | | | | | | | | | | | | | | | | | | | | |
| Solubilities were measured at concentrations not greater than $x_{\text{H}_2\text{S}} = 0.16$. The variation of mole fraction solubility with pressure was found to be almost linear with a correlation coefficient of better than 0.99. | | | | | | | | | | | | | | | | | | | | |
| * Calculated by the compiler assuming that the variation of mole fraction solubility with variation of pressure was linear to 1.013 bar. (The value for 293.15 K lies outside the range for which linearity was experimentally demonstrated by the author) | | | | | | | | | | | | | | | | | | | | |
| AUXILIARY INFORMATION | | | | | | | | | | | | | | | | | | | | |
| METHOD/APPARATUS/PROCEDURE Absorption was found from the decrease in pressure when a known volume of gas came into contact with a known mass of degassed solvent. Pressure changes were found by use of a transducer with a mercury manometer to provide a reference pressure. | SOURCE AND PURITY OF MATERIALS 1. From Matheson, Heusenstamm, FRG; minimum purity 99.5%. <hr/> ESTIMATED ERROR $\delta P = \pm 0.25 \text{ mbar (author)}$ <hr/> REFERENCES | | | | | | | | | | | | | | | | | | | |

| <p>COMPONENTS:</p> <ol style="list-style-type: none"> 1. Hydrogen sulfide; H₂S; [7783-06-4] 2. 2,5,8,11,14-Pentaoxapentadecane (tetraethylene glycol dimethyl ether); C₁₀H₂₂O₅; [143-24-8] 3. Tricyclodecanedimethanol C₁₂H₁₈O₂; [26896-48-0] | <p>ORIGINAL MEASUREMENTS:</p> <p>Härtel, G.H. <i>J.Chem.Eng.Data</i> <u>1985</u>, 30, 57-61.</p> | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|--------|-------|-------|--------|-------|-------|--------|--------|-------|--------|--------|-------|--------|--------|-------|
| <p>VARIABLES:</p> <p>Temperature</p> | <p>PREPARED BY:</p> <p>P.G.T. Fogg</p> | | | | | | | | | | | | | | | | | | |
| <p>EXPERIMENTAL VALUES:</p> <p>The solvent consisted of a mixture of tetraethylene glycol dimethyl ether (85 wt%) and tricyclodecanedimethanol (15 wt%)</p> <table border="1" data-bbox="113 714 1237 1004"> <thead> <tr> <th>T/K</th> <th>Henry's constant $H_{\text{H}_2\text{S}}$/bar</th> <th>Mole fraction solubility $x_{\text{H}_2\text{S}}$ (1.013 bar)*</th> </tr> </thead> <tbody> <tr> <td>293.15</td> <td>5.169</td> <td>0.196</td> </tr> <tr> <td>313.15</td> <td>8.487</td> <td>0.119</td> </tr> <tr> <td>333.15</td> <td>12.097</td> <td>0.084</td> </tr> <tr> <td>353.15</td> <td>15.464</td> <td>0.066</td> </tr> <tr> <td>373.15</td> <td>21.551</td> <td>0.047</td> </tr> </tbody> </table> <p>Henry's constant is defined as :</p> $H_{\text{H}_2\text{S}} = \frac{\text{pressure}}{\text{mole fraction solubility}}$ <p>Solubilities were measured at concentrations not greater than $x_{\text{H}_2\text{S}} = 0.16$. The variation of mole fraction solubility with pressure was found to be almost linear with a correlation coefficient of better than 0.99.</p> <p>* Calculated by the compiler assuming that the variation of mole fraction solubility with variation of pressure was linear to 1.013 bar. (The value for 293.15 K lies outside the range for which linearity was experimentally demonstrated by the author)</p> | | T/K | Henry's constant $H_{\text{H}_2\text{S}}$ /bar | Mole fraction solubility $x_{\text{H}_2\text{S}}$ (1.013 bar)* | 293.15 | 5.169 | 0.196 | 313.15 | 8.487 | 0.119 | 333.15 | 12.097 | 0.084 | 353.15 | 15.464 | 0.066 | 373.15 | 21.551 | 0.047 |
| T/K | Henry's constant $H_{\text{H}_2\text{S}}$ /bar | Mole fraction solubility $x_{\text{H}_2\text{S}}$ (1.013 bar)* | | | | | | | | | | | | | | | | | |
| 293.15 | 5.169 | 0.196 | | | | | | | | | | | | | | | | | |
| 313.15 | 8.487 | 0.119 | | | | | | | | | | | | | | | | | |
| 333.15 | 12.097 | 0.084 | | | | | | | | | | | | | | | | | |
| 353.15 | 15.464 | 0.066 | | | | | | | | | | | | | | | | | |
| 373.15 | 21.551 | 0.047 | | | | | | | | | | | | | | | | | |
| <p>AUXILIARY INFORMATION</p> | | | | | | | | | | | | | | | | | | | |
| <p>METHOD/APPARATUS/PROCEDURE</p> <p>Absorption was found from the decrease in pressure when a known volume of gas came into contact with a known mass of degassed solvent. Pressure changes were found by use of a transducer with a mercury manometer to provide a reference pressure.</p> | <p>SOURCE AND PURITY OF MATERIALS</p> <p>1. From Matheson, Heusenstamm, FRG; minimum purity 99.5%.</p> <hr/> <p>ESTIMATED ERROR</p> <p>$\delta P = \pm 0.25$ mbar (author)</p> <hr/> <p>REFERENCES</p> | | | | | | | | | | | | | | | | | | |

| COMPONENTS: 1. Hydrogen sulfide; H ₂ S; [7783-06-4] 2. Polar solvents | ORIGINAL MEASUREMENTS: Sweeney, C.W. <i>Chromatographia</i> <u>1984</u> , 18, 663-7. | | | | | | | | | | | | | | | | | | |
|---|--|----------|----------------------|--|--|----------|----------|--|------|------|--|------|------|--|------|------|--|------|------|
| VARIABLES: Temperature | PREPARED BY: P.G.T. Fogg | | | | | | | | | | | | | | | | | | |
| EXPERIMENTAL VALUES: <table style="width:100%; border:none;"> <thead> <tr> <th style="text-align:left;">Solvent</th> <th colspan="2" style="text-align:center;">Henry's constant/bar</th> </tr> <tr> <th></th> <th style="text-align:center;">298.15 K</th> <th style="text-align:center;">323.15 K</th> </tr> </thead> <tbody> <tr> <td>Phosphoric acid, tributyl ester (tributyl phosphate); C₁₂H₂₇PO₄; [126-73-8]</td> <td style="text-align:center;">4.14</td> <td style="text-align:center;">8.27</td> </tr> <tr> <td>4-Methyl-1,3-dioxolan-2-one (propylene carbonate); C₄H₆O₃; [108-32-7]</td> <td style="text-align:center;">22.6</td> <td style="text-align:center;">37.4</td> </tr> <tr> <td>1-Methyl-2-pyrrolidinone (N-methylpyrrolidone); C₅H₉NO; [872-50-4]</td> <td style="text-align:center;">5.81</td> <td style="text-align:center;">12.3</td> </tr> <tr> <td>2,5,8,11,14-Pentaoxapentadecane (tetraethylene glycol dimethyl ether); C₁₀H₂₂O₅; [143-24-8]</td> <td style="text-align:center;">3.91</td> <td style="text-align:center;">7.46</td> </tr> </tbody> </table> | | Solvent | Henry's constant/bar | | | 298.15 K | 323.15 K | Phosphoric acid, tributyl ester (tributyl phosphate); C ₁₂ H ₂₇ PO ₄ ; [126-73-8] | 4.14 | 8.27 | 4-Methyl-1,3-dioxolan-2-one (propylene carbonate); C ₄ H ₆ O ₃ ; [108-32-7] | 22.6 | 37.4 | 1-Methyl-2-pyrrolidinone (N-methylpyrrolidone); C ₅ H ₉ NO; [872-50-4] | 5.81 | 12.3 | 2,5,8,11,14-Pentaoxapentadecane (tetraethylene glycol dimethyl ether); C ₁₀ H ₂₂ O ₅ ; [143-24-8] | 3.91 | 7.46 |
| Solvent | Henry's constant/bar | | | | | | | | | | | | | | | | | | |
| | 298.15 K | 323.15 K | | | | | | | | | | | | | | | | | |
| Phosphoric acid, tributyl ester (tributyl phosphate); C ₁₂ H ₂₇ PO ₄ ; [126-73-8] | 4.14 | 8.27 | | | | | | | | | | | | | | | | | |
| 4-Methyl-1,3-dioxolan-2-one (propylene carbonate); C ₄ H ₆ O ₃ ; [108-32-7] | 22.6 | 37.4 | | | | | | | | | | | | | | | | | |
| 1-Methyl-2-pyrrolidinone (N-methylpyrrolidone); C ₅ H ₉ NO; [872-50-4] | 5.81 | 12.3 | | | | | | | | | | | | | | | | | |
| 2,5,8,11,14-Pentaoxapentadecane (tetraethylene glycol dimethyl ether); C ₁₀ H ₂₂ O ₅ ; [143-24-8] | 3.91 | 7.46 | | | | | | | | | | | | | | | | | |
| <p>The Henry's constant, H, was defined as :</p> $H = \frac{f_{\text{H}_2\text{S}}}{x_{\text{H}_2\text{S}}} \quad (x_{\text{H}_2\text{S}} \rightarrow 0)$ <p>where $f_{\text{H}_2\text{S}}$ is the fugacity of H₂S in the gas phase and $x_{\text{H}_2\text{S}}$ the mole fraction of H₂S in the liquid phase.</p> | | | | | | | | | | | | | | | | | | | |
| AUXILIARY INFORMATION | | | | | | | | | | | | | | | | | | | |
| METHOD/APPARATUS/PROCEDURE <p>Henry's constants were calculated from retention volumes measured with a modified 204 Series Pye-Unicam gas chromatograph. Helium was used as carrier gas and the support material was PTFE. Further details are given in refs. 1 - 3. The author noted that the Henry's constant which he reported for dissolution in N-methylpyrrolidone at 298 K was 16-20% lower than literature values and suggested that the discrepancy could be due to adsorption at the gas-liquid interface in these chromatographic measurements.</p> | SOURCE AND PURITY OF MATERIALS <ol style="list-style-type: none"> from Cambrian Gases, London; 97.5 - 99.9% pure. from Aldrich Chemicals, Gillingham, U.K.; re-distilled. ESTIMATED ERROR $\delta T/K = \pm 0.05$; $\delta H/H = \pm 0.05$ (author) REFERENCES: <ol style="list-style-type: none"> Conder, J.R.; Young C.L., "Physicochemical Measurements by Gas Chromatography", Wiley, Chichester, U.K. Ng, S.; Harris, H.G.; Prausnitz, J.M. <i>J. Chem. Eng. Data</i> <u>1969</u>, 14, 482. Lin, P.J.; Parcher, J.F. <i>J. Chromatogr. Sci.</i> <u>1982</u>, 20, 33. | | | | | | | | | | | | | | | | | | |

| COMPONENTS: 1. Hydrogen sulfide; H ₂ S; [7783-06-4] 2. 18-Methyl-2,5,8,11,14,17-hexaoxonadecane (pentaethylene glycol methyl isopropyl ether) C ₁₄ H ₃₀ O ₆ ; [63095-29-4] | ORIGINAL MEASUREMENTS: Härtel, G.H. <i>J. Chem. Eng. Data</i> <u>1985</u> , 30, 57-61. | | | | | | | | | | | | | | | | | | |
|---|---|--|--|--|--------|-------|-------|--------|-------|-------|--------|-------|-------|--------|--------|-------|--------|--------|-------|
| VARIABLES: Temperature | PREPARED BY: P.G.T. Fogg | | | | | | | | | | | | | | | | | | |
| EXPERIMENTAL VALUES: <table border="1" data-bbox="87 451 1214 714"> <thead> <tr> <th>T/K</th> <th>Henry's constant H_{H₂S}/bar</th> <th>Mole fraction solubility x_{H₂S} (1.013 bar)*</th> </tr> </thead> <tbody> <tr> <td>293.15</td> <td>2.804</td> <td>0.361</td> </tr> <tr> <td>313.15</td> <td>4.859</td> <td>0.208</td> </tr> <tr> <td>333.15</td> <td>6.667</td> <td>0.152</td> </tr> <tr> <td>353.15</td> <td>11.739</td> <td>0.086</td> </tr> <tr> <td>373.15</td> <td>17.921</td> <td>0.057</td> </tr> </tbody> </table> <p data-bbox="87 725 1214 839">Henry's constant is given by :</p> $H_{H_2S} = \frac{\text{pressure}}{\text{mole fraction solubility}}$ <p data-bbox="87 849 1214 963">Solubilities were measured at concentrations not greater than x_{H₂S} = 0.16. The variation of mole fraction solubility with pressure was found to be almost linear with a correlation coefficient of better than 0.99.</p> <p data-bbox="87 1025 1214 1170">* Calculated by the compiler assuming that the variation of mole fraction solubility with variation of pressure was linear to 1.013 bar. (Values for 293.15 K and 313.15 K lie outside the range for which linearity has been experimentally demonstrated).</p> | | T/K | Henry's constant H _{H₂S} /bar | Mole fraction solubility x _{H₂S} (1.013 bar)* | 293.15 | 2.804 | 0.361 | 313.15 | 4.859 | 0.208 | 333.15 | 6.667 | 0.152 | 353.15 | 11.739 | 0.086 | 373.15 | 17.921 | 0.057 |
| T/K | Henry's constant H _{H₂S} /bar | Mole fraction solubility x _{H₂S} (1.013 bar)* | | | | | | | | | | | | | | | | | |
| 293.15 | 2.804 | 0.361 | | | | | | | | | | | | | | | | | |
| 313.15 | 4.859 | 0.208 | | | | | | | | | | | | | | | | | |
| 333.15 | 6.667 | 0.152 | | | | | | | | | | | | | | | | | |
| 353.15 | 11.739 | 0.086 | | | | | | | | | | | | | | | | | |
| 373.15 | 17.921 | 0.057 | | | | | | | | | | | | | | | | | |
| AUXILIARY INFORMATION | | | | | | | | | | | | | | | | | | | |
| METHOD/APPARATUS/PROCEDURE: Absorption was found from the decrease in pressure when a known volume of gas came into contact with a known mass of degassed solvent. Pressure changes were found by use of a transducer with a mercury manometer to provide a reference pressure. | SOURCE AND PURITY OF MATERIALS: 1. From Matheson, Heusenstamm, FRG; minimum purity 99.5%. ESTIMATED ERROR: $\delta P = \pm 0.25$ mbar (author) REFERENCES: | | | | | | | | | | | | | | | | | | |

| | |
|---|---|
| COMPONENTS: 1. Hydrogen sulfide; H ₂ S; [7783-06-4] 2. <i>Sepasolv MPE</i> [†] | ORIGINAL MEASUREMENTS: Wolfer, W.; Schwarz, E.; Vodrazka, W.; Volkamer, K. <i>Oil Gas J.</i> <u>1980</u> , 78(3), 66-70. |
| VARIABLES: Temperature | PREPARED BY: P.G.T. Fogg |
| EXPERIMENTAL VALUES: The authors stated that BASF had developed <i>Sepasolv MPE</i> , a special mixture of oligoethylene glycol methyl isopropyl ethers with a mean relative molecular mass of 316. Solubilities of several gases were presented on a small scale graph with solubility, α , in units of m ³ /m ³ bar, plotted against temperature. No experimental points were shown. The solubility of H ₂ S was plotted over the temperature range -5 °C to 145 °C. The compiler found that the line plotted for this gas fits the equation: $\log_{10} (\alpha \text{ bar}) = - 2.24 + 1090 \text{ K/T}$ The compiler considers that α /pressure is the volume of gas absorbed, reduced to 273.15 K and 1 bar (or alternatively 1 atm), absorbed by one volume of solvent at the temperature of measurement. The pressure and temperatures at which measurements were made was not stated although the graphical information was intended to show behaviour of the solvent from low pressures to pressures greater than 1 bar. Use of the data implies an assumption that the reduced volume of gas absorbed is proportional to partial pressure of gas. The higher the pressure the greater the errors introduced by this assumption. [†] <i>Sepasolv MPE</i> is a registered trademark of BASF. | |
| AUXILIARY INFORMATION | |
| METHOD/APPARATUS/PROCEDURE: No information. | SOURCE AND PURITY OF MATERIALS: No information. ESTIMATED ERROR: $\delta\alpha/\alpha = \pm 10\%$ (estimated by the compiler) REFERENCES: |

| COMPONENTS: (1) Hydrogen sulfide; H ₂ S; [7783-06-4] (2) Furan, tetrahydro-; C ₄ H ₈ O; [109-99-9] | ORIGINAL MEASUREMENTS: Short, I.; Sahgal, A.; Hayduk, W. <i>J. Chem. Eng. Data</i> <u>1983</u> , | | | | | | | | | | | | | | | | | | |
|---|---|---|--|---|--|--------|--------|--------|-------|--------|--------|-------|--------|--------|-------|--------|--------|-------|--------|
| VARIABLES: T/K: 263.15-298.15 P/kPa: 101.325 | PREPARED BY: W. Hayduk | | | | | | | | | | | | | | | | | | |
| EXPERIMENTAL VALUES: | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>T/K</th> <th>Ostwald Coefficient¹ L/cm³ cm⁻³</th> <th>Bunsen Coefficient² α/cm³ (STP) cm⁻³ atm⁻¹</th> <th>Mole Fraction¹ x₁</th> </tr> </thead> <tbody> <tr> <td>263.15</td> <td>76.9</td> <td>79.82</td> <td>0.222</td> </tr> <tr> <td>298.15</td> <td>33.4</td> <td>30.60</td> <td>0.1014</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 | 263.15 | 76.9 | 79.82 | 0.222 | 298.15 | 33.4 | 30.60 | 0.1014 | | | | | | |
| 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 | | | | | | | | | | | | | | | | |
| 263.15 | 76.9 | 79.82 | 0.222 | | | | | | | | | | | | | | | | |
| 298.15 | 33.4 | 30.60 | 0.1014 | | | | | | | | | | | | | | | | |
| <p>¹Original data ²Calculated by compiler</p> <p>The mole fraction solubility of the original data was used to determine the following equations for ΔG° and ln x₁ and table of smoothed values:</p> $\Delta G^\circ/\text{J mol}^{-1} = -RT \ln x_1 = 671.24 T - 144.137$ $\ln x_1 = 1756.6/T - 8.1802$ <table border="1"> <thead> <tr> <th>T/K</th> <th>10⁻⁴ ΔG°/J mol⁻¹</th> <th>x₁</th> </tr> </thead> <tbody> <tr> <td>263.15</td> <td>3.250</td> <td>0.2220</td> </tr> <tr> <td>273.15</td> <td>3.921</td> <td>0.1739</td> </tr> <tr> <td>283.15</td> <td>4.592</td> <td>0.1385</td> </tr> <tr> <td>293.15</td> <td>5.264</td> <td>0.1121</td> </tr> <tr> <td>298.15</td> <td>5.600</td> <td>0.1014</td> </tr> </tbody> </table> | | T/K | 10 ⁻⁴ ΔG°/J mol ⁻¹ | x ₁ | 263.15 | 3.250 | 0.2220 | 273.15 | 3.921 | 0.1739 | 283.15 | 4.592 | 0.1385 | 293.15 | 5.264 | 0.1121 | 298.15 | 5.600 | 0.1014 |
| T/K | 10 ⁻⁴ ΔG°/J mol ⁻¹ | x ₁ | | | | | | | | | | | | | | | | | |
| 263.15 | 3.250 | 0.2220 | | | | | | | | | | | | | | | | | |
| 273.15 | 3.921 | 0.1739 | | | | | | | | | | | | | | | | | |
| 283.15 | 4.592 | 0.1385 | | | | | | | | | | | | | | | | | |
| 293.15 | 5.264 | 0.1121 | | | | | | | | | | | | | | | | | |
| 298.15 | 5.600 | 0.1014 | | | | | | | | | | | | | | | | | |
| 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"> Liquid Carbonic. Specified minimum purity 99.5 per cent. Canlab. Baker analyzed grade of minimum specified purity 99.0 per cent. ESTIMATED ERROR: δT/K = 0.1 δx 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> <u>1957</u>, <i>61</i>, 1078. | | | | | | | | | | | | | | | | | | |

| COMPONENTS: 1. Hydrogen sulfide; H ₂ S; [7783-06-4] 2. 1,4-Dioxane; C ₄ H ₈ O ₂ ; [123-91-1] | ORIGINAL MEASUREMENTS: Gerrard, W. <i>J. Appl. Chem. Biotechnol.</i> <u>1972</u> , 22, 623-650. | | | | | | | | | | | | | | | |
|--|--|--------------|---------------|---|------------|---|--------|-----|-------|-------|-------|--------|-----|-------|-------|-------|
| VARIABLES: Temperature | PREPARED BY: P.G.T. Fogg | | | | | | | | | | | | | | | |
| EXPERIMENTAL VALUES: <table border="1" data-bbox="153 547 1252 721"> <thead> <tr> <th>T/K</th> <th>P(total)/mmHg</th> <th>P(total)/bar</th> <th>Mole ratio</th> <th>Mole fraction of H₂S* x_{H₂S}</th> </tr> </thead> <tbody> <tr> <td>283.15</td> <td>752</td> <td>1.003</td> <td>0.147</td> <td>0.128</td> </tr> <tr> <td>293.15</td> <td>752</td> <td>1.003</td> <td>0.100</td> <td>0.091</td> </tr> </tbody> </table> * calculated by the compiler for the stated total pressure. | | T/K | P(total)/mmHg | P(total)/bar | Mole ratio | Mole fraction of H ₂ S* x _{H₂S} | 283.15 | 752 | 1.003 | 0.147 | 0.128 | 293.15 | 752 | 1.003 | 0.100 | 0.091 |
| T/K | P(total)/mmHg | P(total)/bar | Mole ratio | Mole fraction of H ₂ S* x _{H₂S} | | | | | | | | | | | | |
| 283.15 | 752 | 1.003 | 0.147 | 0.128 | | | | | | | | | | | | |
| 293.15 | 752 | 1.003 | 0.100 | 0.091 | | | | | | | | | | | | |
| AUXILIARY INFORMATION | | | | | | | | | | | | | | | | |
| METHOD/APPARATUS/PROCEDURE: Hydrogen sulfide was bubbled into a weighed amount of component 2 in a bubbler tube as described in detail in the source. The amount of gas absorbed at equilibrium for the observed temperature and pressure was found by weighing. Pressure was measured with a mercury manometer. | SOURCE AND PURITY OF MATERIALS: It was stated that "All materials purified and attested by conventional methods." ESTIMATED ERROR: $\delta x_{\text{H}_2\text{S}} = \pm 4\%$ (author) REFERENCES: | | | | | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|--|-------------|---|---|------|--|------|-------------|--|-----------------|--|
| <p>COMPONENTS:</p> <p>1. Hydrogen sulfide; H₂S; [7783-06-4]</p> <p>2. Crown Ethers</p> | <p>ORIGINAL MEASUREMENTS:</p> <p>Linford, R.G.; Thornhill, D.G.T. <i>J. Chem. Thermodynamics</i> <u>1985</u>, <i>17</i>, 701-702.</p> | | | | | | | | | | |
| <p>VARIABLES:</p> | <p>PREPARED BY:</p> <p>P.G.T. Fogg</p> | | | | | | | | | | |
| <p>EXPERIMENTAL VALUES:</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 60%;">Crown ether</td> <td style="text-align: right;">Mole fraction of H₂S in liquid, x_{H₂S}</td> </tr> <tr> <td>1,4,7,10-Tetraoxacyclododecane; (12-crown-4); C₈H₁₆O₄; [294-93-9]</td> <td style="text-align: right;">0.31</td> </tr> <tr> <td>1,4,7,10,13-Pentaoxacyclopentadecane; (15-crown-5); C₁₀H₂₀O₅; [33100-27-5]</td> <td style="text-align: right;">0.33</td> </tr> <tr> <td style="padding-left: 40px;">T/K = 295.2</td> <td></td> </tr> <tr> <td style="padding-left: 40px;">P/bar = 1.01325</td> <td></td> </tr> </table> | | Crown ether | Mole fraction of H ₂ S in liquid, x _{H₂S} | 1,4,7,10-Tetraoxacyclododecane; (12-crown-4); C ₈ H ₁₆ O ₄ ; [294-93-9] | 0.31 | 1,4,7,10,13-Pentaoxacyclopentadecane; (15-crown-5); C ₁₀ H ₂₀ O ₅ ; [33100-27-5] | 0.33 | T/K = 295.2 | | P/bar = 1.01325 | |
| Crown ether | Mole fraction of H ₂ S in liquid, x _{H₂S} | | | | | | | | | | |
| 1,4,7,10-Tetraoxacyclododecane; (12-crown-4); C ₈ H ₁₆ O ₄ ; [294-93-9] | 0.31 | | | | | | | | | | |
| 1,4,7,10,13-Pentaoxacyclopentadecane; (15-crown-5); C ₁₀ H ₂₀ O ₅ ; [33100-27-5] | 0.33 | | | | | | | | | | |
| T/K = 295.2 | | | | | | | | | | | |
| P/bar = 1.01325 | | | | | | | | | | | |
| <p>AUXILIARY INFORMATION</p> | | | | | | | | | | | |
| <p>METHOD/APPARATUS/PROCEDURE:</p> <p>Solubilities were determined by a method based upon that described by Gerrard (1) who measured increases in weight when gases were bubbled through solvents under test. In the case of these systems equilibrium was reached in 0.2 h.</p> | <p>SOURCE AND PURITY OF MATERIALS:</p> <ol style="list-style-type: none"> 1. supplied by Cambrian Chemicals; purity 99.6 mole %. 2. from Borregaard, Sarpsburg, Norway and supplied by Trafford Chemicals, Altrincham, U.K. <p>ESTIMATED ERROR:</p> <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Gerrard, W. <i>J. Appl. Chem. Biotechnol.</i> <u>1972</u>, <i>22</i>, 623. | | | | | | | | | | |