

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. Hydrogen sulfide; H ₂ S; [7783-06-4]		Bell, R.P.	
2. Substituted methanes		<i>J. Chem. Soc.</i> <u>1931</u> , 1371-1382.	
VARIABLES:		PREPARED BY:	
		C.L. Young.	
EXPERIMENTAL VALUES:			
Solvent	T/K	Partition coefficient, s^+	Mole fraction [§] of hydrogen sulfide in liquid, $x_{\text{H}_2\text{S}}$
Tetrachloromethane, (Carbon tetrachloride); CCl ₄ ; [56-23-5]	293.15	10.79	0.0419
Trichloromethane; (Chloroform); CHCl ₃ [67-66-3]		32.8	0.103
Tribromomethane, (Bromoform); CHBr ₃ ; [75-25-2]		16.76	0.0581
s^+ defined as $s = 22.4 \times \frac{293}{273} \times c$ where c is the "solubility in equivalents/litre".			
§ for a partial pressure of 101.325 kPa.			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
Volumetric apparatus consisting of bulb (~50cm ³ capacity) extended at the top as a graduated tube and joined at bottom to a capillary u-tube. Liquid saturated with gas at atmospheric pressure. Gas withdrawn in a current of air, absorbed in sodium hydroxide and hydrogen peroxide. Excess hydrogen peroxide removed by heating and excess sodium hydroxide titrated.		1. Prepared by reaction of sodium sulfide on hydrochloric acid.	
		2. Merck and Kahlbaum samples dried over calcium chloride and fractionally distilled.	
		ESTIMATED ERROR:	
		$\delta T/K = \pm 0.1$; $\delta x_{\text{H}_2\text{S}} = \pm 1\%$.	
		(estimated by compiler)	
		REFERENCES:	

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. Hydrogen sulfide; H ₂ S; [7783-06-4] 2. Halogenated ethanes		Bell, R.P. <i>J. Chem. Soc.</i> , <u>1931</u> , 1371-1382	
VARIABLES:		PREPARED BY:	
		C. L. Young	
EXPERIMENTAL VALUES:			
Solvent	T/K	Partition Coefficient, S^+	Mole fraction [§] of hydrogen sulfide in liquid, $x_{\text{H}_2\text{S}}$
Pentachloroethane; (Pentachloroethane); C ₂ HCl ₅ ; [76-01-7]	293.15	10.63	0.0514
Bromoethane; (Ethyl bromide); C ₂ H ₅ Br; [74-96-4]	293.15	43.3	0.126
1,1,2,2-Tetrachloroethane; (s-Tetrachloroethane); C ₂ H ₂ Cl ₄ ; [79-34-5]	293.15	16.66	0.0702
1,1,2,2-Tetrabromoethane; (s-Tetrabromoethane); C ₂ H ₂ Br ₄ ; [79-27-6]	293.15	9.49	0.0446
S^+ defined as $= 22.4 + \frac{293}{273} \times C$ where C is the "solubility in equivalents/litre"			
\S for a partial pressure of 101.325 kPa			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
Volumetric apparatus consisting of bulb (~50 cm ³ capacity) extended at the top as a graduated tube and joined at bottom to a capillary U-tube. Liquid saturated with gas at atmospheric pressure. Gas withdrawn in a current of air, absorbed in sodium hydroxide and hydrogen peroxide. Excess hydrogen peroxide removed by heating and excess sodium hydroxide titrated.		1. Prepared by reaction of sodium sulfide on hydrochloric acid. 2. Merck and Kahlbaum samples dried over calcium chloride and fractionally distilled, except tetrachloroethane which was fractionally distilled from commercial sample.	
		ESTIMATED ERROR:	
		$\delta T/K = \pm 0.1$; $\delta x_{\text{H}_2\text{S}} = \pm 1\%$ (estimated by compiler)	
		REFERENCES:	

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. Hydrogen sulfide; H_2S ; [7783-06-4] 2. Ethene derivatives		Bell, R.P. <i>J. Chem. Soc.</i> , <u>1931</u> , 1371-1382	
VARIABLES:		PREPARED BY:	
		C. L. Young	
EXPERIMENTAL VALUES:			
Solvent	T/K	Partition Coefficient, S^+	Mole fraction [§] of hydrogen sulfide in liquid, x_{H_2S}
Tetrachloroethene, (Tetrachloroethylene); C_2Cl_4 ; [127-18-4]	293.15	8.90	0.0372
Trichloroethene, (Trichloroethylene); C_2HCl_3 ; [79-01-6]		13.16	0.0482
1,2-Dibromoethane; (Ethylene bromide); $C_2H_4Br_2$; [106-93-4]		17.80	0.0608
1,2-Dichloroethane; (Ethylene chloride); $C_2H_4Cl_2$; [107-06-2]		23.0	0.0719
S^+ defined as $S = 22.4 \times \frac{293}{273} \times C$ where C is the "solubility in equivalents/litre"			
$§$ for partial pressure of 101.325 kPa			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
Volumetric apparatus consisting of bulb (.50 cm ³ capacity) extended at the top as a graduated tube and joined at bottom to a capillary U-tube. Liquid saturated with gas at atmospheric pressure. Gas withdrawn in a current of air, absorbed in sodium hydroxide and hydrogen peroxide. Excess hydrogen peroxide removed by heating and excess sodium hydroxide titrated.		1. Prepared by reaction of sodium sulfide on hydrochloric acid. 2. Merck and Kahlbaum samples dried over calcium chloride and fractionally distilled.	
		ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta x_{H_2S} = \pm 1\%$ (estimated by compiler)	
		REFERENCES:	

<p>COMPONENTS:</p> <p>1. Hydrogen sulfide; H₂S; [7783-06-4]</p> <p>2. Compounds containing chlorine</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Gerrard, W.</p> <p><i>J. Appl. Chem. Biotechnol.</i> <u>1972</u>, 22, 623-650.</p>																																			
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COMPONENTS:		ORIGINAL MEASUREMENTS:		
1. Hydrogen sulfide; H ₂ S; [7783-06-4] 2. 1-Bromooctane; C ₈ H ₁₇ Br; [111-83-1]		Gerrard, W. <i>J. Appl. Chem. Biotechnol.</i> <u>1972</u> , 22, 623-650.		
VARIABLES:		PREPARED BY:		
Temperature		P.G.T. Fogg		
EXPERIMENTAL VALUES:				
T/K	P(total)/mmHg	P(total)/bar	Mole ratio	Mole fraction of H ₂ S* ^x H ₂ S
265.15	755	1.007	0.167	0.143
267.15	755	1.007	0.156	0.135
273.15	755	1.007	0.128	0.113
283.15	755	1.007	0.097	0.088
293.15	755	1.007	0.080	0.074
* calculated by the compiler for the stated 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 for the observed temperature and pressure was found by weighing. Pressure was measured with a mercury manometer.		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:		

COMPONENTS:			ORIGINAL MEASUREMENTS:	
1. Hydrogen sulfide; H ₂ S; [7783-06-4]			Gerrard, W.	
2. Chlorobenzene; C ₆ H ₅ Cl; [108-90-7]			<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 _{H₂S}
265.15	752	100.3	0.124	0.110
267.15	752	100.3	0.115	0.103
273.15	752	100.3	0.094	0.086
283.15	752	100.3	0.075	0.070
293.15	752	100.3	0.057	0.054
⁺ 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: δT/K = ±0.2; δx _{H₂S} = ±4%	
			REFERENCES:	

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. Hydrogen sulfide; H ₂ S; [7783-06-4] 2. Chlorobenzene; C ₆ H ₅ Cl; [108-90-7] or Bromobenzene; C ₆ H ₅ Br; [108-86-1]		Patyi, L.; Furmer, I. E.; Makranczy, J.; Sadilenko, A. S.; Stepanova, Z. G.; Berengarten, M. G. <i>Zh. Prikl. Khim.</i> <u>1978</u> , <i>51</i> , 1296- 1300.	
VARIABLES:		PREPARED BY:	
		C. L. Young	
EXPERIMENTAL VALUES:			
T/K	α^\dagger	Mole fraction of hydrogen sulfide at a partial pressure of 101.325 kPa $x_{\text{H}_2\text{S}}$	
298.15	9.0	Chlorobenzene; C ₆ H ₅ Cl; [108-90-7]	0.039
298.15	8.3	Bromobenzene; C ₆ H ₅ Br; [108-86-1]	0.038
† volume of gas (measured at 101.325 kPa and 273.15 K) dissolved per volume of solvent.			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
Volumetric method. Pressure measured when known amounts of gas were added, in increments, to a known amount of liquid in a vessel of known dimensions. Corrections were made for the partial pressure of solvent. Details in ref. (1).		Purity better than 99 mole per cent as determined by gas chromatography.	
		ESTIMATED ERROR:	
		$\delta T/K = \pm 0.1$; $\delta \alpha = \pm 4\%$ or less.	
		REFERENCES:	
		1. Bodor, E.; Bor, G. J.; Mohai, B.; Sipos, G. <i>Veszpremi. Vegyip. Egy. Kozl.</i> <u>1957</u> , <i>1</i> , 55.	

COMPONENTS: (1) Hydrogen sulfide; H ₂ S; [7783-06-4] (2) Chlorobenzene; C ₆ H ₅ Cl; [108-90-7]		ORIGINAL MEASUREMENTS: Short, I.; Sahgal, A.; Hayduk, W. <i>J. Chem. Eng. Data</i> <u>1983</u> , 28, 63-66.			
VARIABLES: T/K: 263.15-333.15 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		
263.15	24.9	25.85	0.1039 (0.1039) ³		
298.15	12.62	11.56	0.0505 (0.0505)		
333.15	7.78	6.38	0.0294 (0.0294)		
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: $\Delta G^\circ/\text{J mol}^{-1} = -RT \ln x_1 = 1963.0T - 191.80 T \ln T - 186400$ $\ln x_1 = 2271.6/T + 2.3374 \ln T - 23.923$					
T/K	10 ⁻⁴ ΔG°/J mol ⁻¹	x ₁	T/K	10 ⁻⁴ ΔG°/J mol ⁻¹	x ₁
263.15	4.890	0.1039	303.15	7.643	0.0463
273.15	5.588	0.0826	313.15	8.315	0.0393
283.15	6.280	0.0670	323.15	8.891	0.0338
293.15	6.965	0.0553			
298.15	7.305	0.0505			
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>, 61, 1078. 		

COMPONENTS: 1. Hydrogen sulfide; H ₂ S; [7783-06-4] 2. Bromobenzene; C ₆ H ₅ Br; [108-86-1]		ORIGINAL MEASUREMENTS: Gerrard, W. <i>J. Appl. Chem. Biotechnol.</i> , <u>1972</u> , <u>22</u> , 623-650		
VARIABLES: Temperature		PREPARED BY: C.L. Young		
EXPERIMENTAL VALUES:				
T/K	P*/mmHg	P*/kPa	Mole ratio	Mole fraction ⁺ of hydrogen sulfide in liquid, $x_{\text{H}_2\text{S}}$
266.15	752	100.3	0.124	0.110
273.15	752	100.3	0.103	0.093
283.15	752	100.3	0.076	0.071
293.15	752	100.3	0.059	0.056
⁺ calculated by compiler *total pressure				
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 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.		SOURCE AND PURITY OF MATERIALS: 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] 2. Iodobenzene; C ₆ H ₅ I; [591-50-4]		Gerrard, W. . <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 _{H₂S}
265.15	752	100.3	0.139	0.122
273.15	752	100.3	0.106	0.096
283.15	752	100.3	0.080	0.074
293.15	752	100.3	0.060	0.057
⁺ calculated by compiler *total pressure				
AUXILIARY INFORMATION				
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		ESTIMATED ERROR:		
		$\delta T/K = \pm 0.2; \delta x_{H_2S} = \pm 4\%$		
		REFERENCES:		