COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H_2S; [7783-06-4] 2. Benzenamine (*aniline*); C_6H_7N; [62-53-3]	Bancroft, W.D.; Belden, B.C. *J. Phys. Chem.* 1930, *34*, 2123-4.

VARIABLES:	PREPARED BY:
Pressure	P.G.T. Fogg

EXPERIMENTAL VALUES:

P_{H_2S}/mmHg	P_{H_2S}/bar*	Wt. of H_2S per unit volume of benzenamine /mg cm^{-3}	Mole fraction of H_2S in liquid*
a 102	0.136	2.74	0.0073
199	0.265	5.32	0.0141
296	0.395	8.13	0.0213
390	0.520	10.6	0.0276
484	0.645	13.2	0.0342
579	0.772	15.8	0.0406
676	0.901	18.6	0.0475
874	1.165	24.0	0.0604
1160	1.547	31.6	0.0781
b 750	1.000	20.8	0.0528
591	0.788	16.4	0.0421
513	0.684	14.3	0.0369
406	0.541	11.3	0.0294
310	0.413	8.45	0.0221
178	0.237	4.64	0.0123

* calculated by the compiler.   T/K = 295.2

Set *a* coresponds to successive increases in pressure; set *b* to decreases.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The apparatus and procedure described in (1) were used. A glass vessel containing a sample of benzenamine was connected via a vacuum line to a manometer and gas burette containing H_2S. Experiments appear to have been carried out at room temperature as there is no mention of the use of a thermostat.	1. Prepared by heating Sb_2S_3 with conc. HCl; washed with water and dried over P_2O_5. 2. Freshly distilled before use.

ESTIMATED ERROR:
$\delta T/K = \pm 1$

REFERENCES:
1. Bancroft, W.D.; Barnett, C.E. *J. Phys. Chem.* 1930, *34*, 449.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H_2S; [7783-06-4] 2. Benzenamine (Aniline); C_6H_7N; [62-53-3]	Lenoir, J-Y.; Renault, P.; Renon, H. J. Chem. Eng. Data, 1971, 16, 340-2.

VARIABLES:	PREPARED BY:
	C. L. Young

EXPERIMENTAL VALUES:

T/K	Henry's constant H_{H_2S}/atm	Mole fraction at 1 atm* x_{H_2S}
298.2	15.1	0.0662

* Calculated by compiler assuming a linear function of P_{H_2S} vs x_{H_2S}, i.e., $x_{H_2S}(1\ atm) = 1/H_{H_2S}$

AUXILIARY INFORMATION	
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
A conventional gas-liquid chromato-graphic 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 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:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H_2S; [7783-06-4] 2. Benzenamine (Aniline); C_6H_7N; [62-53-3]	Gerrard, W. *J. Appl. Chem. Biotechnol.*, <u>1972</u>, *22*, 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_{H_2S}
265.15	755	100.7	0.143	0.125
267.15	755	100.7	0.136	0.120
273.15	755	100.7	0.110	0.099
283.15	755	100.7	0.081	0.075
293.15	755	100.7	0.065	0.061

[+]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.	1 and 2. Components were purified and attested by conventional methods.
	ESTIMATED ERROR: $\delta T/K = \pm 0.2$; $\delta x_{H_2S} = \pm 4\%$
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H_2S; [7783-06-4] 2. Benzenamine and Methylbenzenamines	Patyi, L.; Furmer, I. E.; Makranczy, J.; Sadilenko, A. S.; Stepanova, Z. G.; Berengarten, M. G. *Zh. Prikl. Khim.* 1978, *51*, 1296-1300.

VARIABLES:	PREPARED BY:
	C. L. Young

EXPERIMENTAL VALUES:

T/K	$\alpha^{\dagger}$	Mole fraction of hydrogen sulfide at a partial pressure of 101.325 kPa x_{H_2S}
Benzenamine (Aniline); C_6H_7N; [62-53-3]		
298.15	11.0	0.043
N-Methylbenzenamine (Methylaniline); C_7H_9N; [100-61-8]		
298.15	9.8	0.045
N,N-Dimethylbenzenamine (Dimethylaniline); $C_8H_{11}N$; [121-69-7]		
298.15	10.5	0.056

$\dagger$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. *Veszpremi. Vegyip. Egy. Kozl.* 1957, *1*, 55.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H$_2$S; [7783-06-4] 2. N,N-Dimethylbenzenamine; (Dimethylaniline); C$_8$H$_{11}$N; [121-69-7]	Gerrard, W. *J. Appl. Chem. Biotechnol.*, <u>1972</u>, *22*, 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_{H_2S}
278.15	755	100.7	0.132	0.117
283.15	755	100.7	0.114	0.102
293.15	755	100.7	0.091	0.083

[+]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.	1 and 2. Components were purified and attested by conventional methods.
	ESTIMATED ERROR: $\delta T/K = \pm 0.2$; $\delta x_{H_2S} = \pm 4\%$
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H₂S; [7783-06-4] 2. Ethylbenzenamines	Patyi, L.; Furmer, I. E.; Makranczy, J.; Sadilenko, A. S.; Stepanova, Z. G.; Berengarten, M. G. *Zh. Prikl. Khim.* 1978, *51*, 1296- 1300.
VARIABLES:	PREPARED BY: C. L. Young

EXPERIMENTAL VALUES:

T/K	$\alpha^\dagger$	Mole fraction of hydrogen sulfide at a partial pressure of 101.325 kPa x_{H_2S}
N-Ethylbenzenamine (Ethylaniline); C₈H₁₁N; [103-69-5]		
298.15	10.3	0.055
N,N-Diethylbenzenamine (Diethylaniline); C₁₀H₁₅N; [91-66-7]		
298.15	8.9	0.060

$\dagger$ 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: δT/K = ±0.1; δα = ±4% or less.

	REFERENCES:
	1. Bodor, E.; Bor, G. J.; Mohai,
	   B.; Sipos, G.
	   Veszpremi. Vegyip. Egy. Kozl.
	   1957, *1*, 55.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H_2S; [7783-06-4] 2. Pyridine; C_5H_5N; [110-86-1]	Gerrard, W. *J. Appl. Chem. Biotechnol*, <u>1972</u>, *22*, 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_{H_2S}
265.15	752	100.3	0.266	0.210
267.15	752	100.3	0.243	0.195
273.15	752	100.3	0.187	0.158
283.15	752	100.3	0.134	0.118
293.15	752	100.3	0.103	0.093

[+]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.	1 and 2. Components were purified and attested by conventional methods.
	ESTIMATED ERROR: $\delta T/K = \pm 0.2$; $\delta x_{H_2S} = \pm 4\%$
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H_2S; [7783-06-4] 2. Quinoline; C_9H_7N; [91-22-5]	Gerrard, W. · *J. Appl. Chem. Biotechnol.*, 1972, 22, 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_{H_2S}
265.15	748	99.7	0.246	0.197
267.15	748	99.7	0.224	0.183
273.15	748	99.7	0.175	0.149
283.15	748	99.7	0.129	0.114
293.15	748	99.7	0.098	0.089

[+]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.	1 and 2. Components were purified and attested by conventional methods.
	ESTIMATED ERROR: $\delta T/K = \pm 0.2$; $\delta x_{H_2S} = \pm 4\%$
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H_2S; [7783-06-4] 2. Acetonitrile, C_2H_5N; [75-05-8] 3. Water; H_2O, [7732-18-5] Perchloric acid, lithium salt; $LiClO_4$; [7791-03-9]	Evans, J.F.; Blount, H.N. *Anal. Lett.* 1974, *7(6)*, 445-451.
VARIABLES:	PREPARED BY:
Concentrations of water and of lithium perchlorate	P.G.T. Fogg

EXPERIMENTAL VALUES:

Concn. of H_2O /mol dm^{-3}	Concn. of $LiClO_4$ /mol dm^{-3}	Concn. of H_2S /mol dm^{-3}	Method of analysis	Number of analyses	Mole fraction x_{H_2S}
0	0	0.532 ± 0.004	I	7	0.027*
0	0	0.525 ± 0.006	G	10	
0.111	0	0.536 ± 0.003	I	4	
0.278	0	0.544 ± 0.003	I	4	
0.556	0	0.519 ± 0.001	I	4	
0	0.0999	0.537 ± 0.002	I	4	
0	0.201	0.547 ± 0.005	I	4	

Total pressure = 759 torr = 1.012 bar
Temperature = 298.2 K

I - iodimetry;   G - gravimetry.

* calculated by the compiler from the density of acetonitrile in ref. (1)
and an average value of 0.528 mol dm^{-3} for the concentration of H_2S.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Hydrogen sulfide was bubbled through anhydrous acetonitrile and then through the liquid under test in a thermostatted absorption vessel. Samples of solution were subsequently withdrawn, diluted and analysed. Some samples were analysed by titration with acidic aqueous standard iodine solution. Others were analysed by addition of silver nitrate solution followed by the weighing of the silver sulfide formed. The absence of a spectral band at 266.5 nm was taken to indicate that formation of thioacetamide did not occur under the experimental conditions.	1. from Matheson Gas Products; dried with activated alumina. 2. u.v. grade from Burdick & Jackson Labs., Muskegon, Michigan; fractionally distilled from CaH_2 and passed through an activated alumina column to remove further traces of water; final water content 2.2 × 10^{-3} mol dm^{-3}. 3. $LiClO_4$ - *Alfa*: recrystallised from distilled water; air dried; crushed; vacuum dried at 160 °C.

REFERENCES:

1. Riddick, J.A.; Bunger, W.B.
   Techniques of Chemistry, Vol.II,
   Wiley-Interscience, New York,
   1970.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H_2S; [7783-06-4] 2. Acetonitrile; C_2H_3N; [75-05-8] N,N-Dimethylformamide; C_3H_7NO; [68-12-2] N,N-Dimethylacetamide; C_4H_9NO; [127-19-5]	Hayduk, W.; Pahlevanzadeh, H. Can. J. Chem. Eng. 1987, 65, 299-307.
VARIABLES: Temperature	PREPARED BY: P.G.T. Fogg

EXPERIMENTAL VALUES:

T/K	Total press. /kPa	Mole fraction solubility at total press.	Mole fraction solubility at partial press. of 101.325 kPa.	Ostwald[*] coeff. L
Acetonitrile				
268.15	100.0	0.100	0.103	49.3
298.15	100.7	0.0421	0.0476	22.9
333.15	101.7	0.0110	0.0211	10.6
N,N-Dimethylformamide				
268.15	100.7	0.252	0.253	97.2
298.15	102.0	0.116	0.116	41.1
333.15	100.8	0.0520	0.0541	19.3
N,N-Dimethylacetamide				
268.15	100.7	0.303	0.304	104.1
298.15	100.9	0.145	0.146	44.7
333.15	100.8	0.0646	0.0661	19.9

* The Oswald coefficient was calculated as the volume of gas at a gas partial pressure of 1 atm. which will completely dissolve in one volume of solvent.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Solubilities were measured using a constant solvent flow apparatus described in (1). Solvent vapor pressures were calculated from Antoine constants given in (2). Densities of solvents were as reported in (3). The gas molar volumes were calculated using the second virial coefficient given in (4).	1. from Matheson of Canada. 2. from Aldrich Chemicals; HPLC grade; minimum purity 99.9%
	ESTIMATED ERROR:
	REFERENCES: 1. Asatani, H.; Hayduk, W. Can.J.Chem.Eng. 1983, 61, 227. 2. Reid, R.C.; Prausnitz, J.M.; Sherwood, T.K. The Properties of Gases and Liquids, 1977, McGraw-Hill, New York. 3. Zhang, G.; Hayduk, W. Can.J.Chem. Eng. 1984, 62, 713. 4. Dymond, J.H.; Smith, E.B. The Virial Coefficients of Pure Gases and Mixtures, 1980, Oxford University Press, New York.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H₂S; [7783-06-4] 2. Benzonitrile; C₇H₅N; [100-47-0]	Gerrard, W. *J. Appl. Chem. Biotechnol.*, <u>1972</u>, *22*, 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_{H_2S}
265.15	749	99.9	0.186	0.157
267.15	749	99.9	0.166	0.142
273.15	749	99.9	0.133	0.117
283.15	749	99.9	0.101	0.092
293.15	749	99.9	0.088	0.081

[+]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.	1 and 2. Components were purified and attested by conventional methods.
	ESTIMATED ERROR: $\delta T/K = \pm 0.2$; $\delta x_{H_2S} = \pm 4\%$
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H_2S; [7783-06-4] 2. 3-Methyl-1H-pyrazole; $C_4H_6N_2$; [1453-58-3] 1,3-Dimethyl-1H-pyrazole; $C_5H_8N_2$; [694-48-4]	Egorova, V.I.; Grishko, N.I. Neokladnova, L.N.; Furmanov, A.S. Podvigailova, I.G. *Deposited Document* <u>1975</u>, *VINITI 2907-76*
VARIABLES:	PREPARED BY:
Temperature	P.G.T. Fogg

EXPERIMENTAL VALUES:

Solvent	T/K	Absorption coeff.† α	Henry's law constant* H/mmHg	Mole fraction** P_{H_2S} = 1 atm x_{H_2S}
3-Methyl-1H-pyrazole	283.2		7910	0.096
	298.2	9.1	11220	0.068
	313.2		13200	0.058
1,3-Dimethyl-1H-pyrazole	283.2		5490	0.138
	298.2	21.5	8260	0.092
	313.2		10420	0.073

$$760 \text{ mmHg} = 1.013 \text{ bar} = 1.013 \times 10^5 \text{ Pascal}$$

* defined as:
$$H = P_{H_2S} / x_{H_2S}$$

** calculated by the compiler.

† volume of gas, reduced to 273.15 K and 1.013 bar, absorbed by one volume of liquid when the partial pressure of gas is 1.013 bar.

AUXILIARY INFORMATION	
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The volume of gas absorbed by the solvent held in a thermostatted cell was measured at several pressures to a total pressure of about 760 mmHg. The temperature was controlled to ± 0.1 °C.	2. $C_4H_6N_2$: b.pt. 204 °C $C_5H_8N_2$: b.pt. 131-145 °C
	ESTIMATED ERROR:
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H₂S; [7783-06-4] 2. N,N-Dimethylformamide; C₃H₇NO; [68-12-2]	DuPont de Nemours and Co. (Inc.) *Chem. Eng. News* 1955, *33*, 2366.

VARIABLES:	PREPARED BY:
	P.G.T. Fogg

EXPERIMENTAL VALUES:

T/K	P_{H_2S}	Vol. of H₂S absorbed[†] per volume of DMF	Mole fraction [*] x_{H_2S} (1 atm)
298.2	1 atm (1.013 bar)	35	0.109

[*] calculated by the compiler using the density of DMF at 298.2 K from (1).

[†] the volume of the gas has been reduced to 273.15 K and 1.013 bar.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Not stated.	Not stated.
	ESTIMATED ERROR:
	REFERENCES: 1. *Lange's Handbook of Chemistry 12th edition*, McGraw-Hill, New York. 1979.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H₂S; [7783-06-4] 2. N,N-Dimethylformamide; C₃H₇NO; [68-12-2]	Gerrard, W.· *J. Appl. Chem. Biotechnol.* 1972, 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 H₂S[*] x_{H_2S}
265.15	750	1.000	0.387	0.279
267.15	750	1.000	0.360	0.265
273.15	750	1.000	0.286	0.222
283.15	750	1.000	0.205	0.170
293.15	750	1.000	0.151	0.131

[*] 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: δx_{H_2S} = ± 4% (author)
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H$_2$S; [7783-06-4]	Byeseda, J.J.; Deetz, J.A.; Manning, W.P.
2. N,N-Dimethylformamide; C$_3$H$_7$NO; [68-12-2]	*Proc.Laurance Reid Gas Cond.Conf.* <u>1985</u>.

VARIABLES:	PREPARED BY:
	P.G.T. Fogg

EXPERIMENTAL VALUES:

T/K	P_{H_2S}/psia	P_{H_2S}/bar*	Ostwald coeff. L	Mole fraction in liquid* x_{H_2S}
297.1	14.73	1.016	33.6	0.097

       * calculated by compiler

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The H$_2$S 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.	
	ESTIMATED ERROR:
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H_2S; [7783-06-4] 2. 1-Methyl-2-pyrrolidinone; C_5H_9NO; [872-50-4]	Lenoir, J-Y.; Renault, P.; Renon, H. J. Chem. Eng. Data 1971, 16, 340-2

VARIABLES:	PREPARED BY:
	C.L. Young

EXPERIMENTAL VALUES:

T/K	Henry's constant H_{H_2S}/atm	Mole fraction at 1 atm* x_{H_2S}
298.15	5.56	0.180

* Calculated by compiler assuming a linear function of P_{H_2S} vs x_{H_2S}, i.e. x_{H_2S} (1 atm) = $1/H_{H_2S}$

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: $\delta T/K = \pm 0.1$; δH/atm $= \pm 6\%$ (estimated by compiler).
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H_2S; [7783-06-4] 2. 1-Methyl-2-pyrrolidinone; C_5H_9NO; [872-50-4]	Rivas, O.R.; Prausnitz, J.M. *Am. Inst. Chem. Engnrs. J.* <u>1979</u>, *25*, 975-984.

VARIABLES:	PREPARED BY:
Temperature	C.L. Young

EXPERIMENTAL VALUES:

T/K	Henry's constant, H /MPa	Mole fraction of hydrogen[+] sulfide in liquid, x_{H_2S}
263.15	0.31	0.327
298.15	0.76	0.133
323.15	1.35	0.0751
348.15	2.17	0.0467
373.15	3.21	0.0316

+   at a partial pressure of 101.3 kPa calculated by
    compiler assuming Henry's law applies at that
    pressure.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Volumetric apparatus with a fused quartz precision bourdon pressure gauge. Solubility apparatus carefully thermostatted. Solvent degassed *in situ*. Apparatus described in ref. (1) and modifications given in source.	1. and 2. Purity at least 99 mole per cent.

ESTIMATED ERROR:

$\delta T/K = \pm 0.05$; $\delta x_{H_2S} = \pm 1\%$.

REFERENCES:
1. Cukor, P.M.; Prausnitz, J.M.

    Ind. Eng. Chem. Fundam. <u>1971</u>,
    10, 638.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H_2S; [7783-06-4] 2. 1-Methyl-2-pyrrolidinone; C_5H_9NO; [872-50-4]	Rivas, O.R.; Prausnitz, J.M. *Ind. Eng. Chem. Fundam.* 1979, 18, 289-292.

VARIABLES:	PREPARED BY:
Temperature	C.L. Young

EXPERIMENTAL VALUES:

T/K	Henry's constant / atm.	Mole fraction at 1atm partial pressure
296.65	7.2	0.139
308.15	9.5	0.105

* Calculated by compiler assuming mole fraction solubility linear with pressure.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Volumetric apparatus with a fused quartz precision bourdon pressure gauge. Solubility apparatus carefully thermostatted. Solvent degassed *in situ*. Apparatus described in ref (1) and modifications given in source.	No details given.

ESTIMATED ERROR:

$\delta T/K = \pm 0.05$; $\delta x_{H_2S} = \pm 1\%$.

REFERENCES:

1. Cukor, P.M.; Prausnitz, J.M. *Ind. Eng. Chem. Fundam.* 1971, 10, 638.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H$_2$S; [7783-06-4] 2. 1-Methyl-2-pyrrolidinone; C$_5$H$_9$NO; [872-50-4] 3. 2-(2-Aminoethoxy)-ethanol,(Diglycolamine); C$_4$H$_{11}$NO$_2$; [929-06-6]	Rivas, O.R.; Prausnitz, J.M.; *Ind. Eng. Chem. Fundam.* <u>1979</u>, *18*, 289-292.

VARIABLES:	PREPARED BY:
Temperature, liquid composition	C.L. Young.

EXPERIMENTAL VALUES:

T/K	P/mmHg	P/kPa	Component	Mole fraction in liquid, x	Mole fraction in gas, y
348.7	239.8	31.97	1	0.0207	0.9714
			2	0.8585	0.0276
			3	0.1208	0.0010
	355.4	47.38	1	0.0297	0.9808
			2	0.8506	0.0186
			3	0.1197	0.0006
382.65	196.4	26.19	1	0.0101	0.8812
			2	0.8678	0.1140
			3	0.1221	0.0048
	368.3	49.10	1	0.0179	0.9367
			2	0.8609	0.0607
			3	0.1212	0.0026

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Volumetric apparatus with a fused quartz precision bourdon pressure gauge. Solubility apparatus carefully thermostatted. Solvent degassed *in situ*. Apparatus described in ref (1) and modifications given in source.	No details given.

ESTIMATED ERROR:

$\delta T/K = \pm 0.05$; $\delta x_{H_2S} = \pm 1\%$.

REFERENCES:

1. Cukor, P.M.; Prausnitz, J.M.
   Ind. Eng. Chem. Fundam. <u>1971</u>, *10*, 638.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H_2S; [7783-06-4] 2. 1-Methyl-2-pyrrolidinone, (N-Methylpyrrolidone); C_5H_9NO; [872-50-4]	Yarym-Agaev, N. L.; Matvienko, V. G.; Povalyaeva, N. V. *Zh. Prikl. Khim.* <u>1980</u>, *53*, 2456-2461. *J. Appl. Chem. (Russ).* <u>1980</u>, *53*, <u>1810-1814.</u>

VARIABLES:	PREPARED BY:
	C. L. Young

EXPERIMENTAL VALUES:

T/K	P_{H_2S}/atm	$P^a_{H_2S}$/MPa	Solubility[b]	Mole fraction of[a] hydrogen sulfide, x_{H_2S}
273.2	1.00	0.101	90	0.285
	2.00	0.203	180	0.443
	3.00	0.304	270	0.544
	4.00	0.405	360	0.614
	5.00	0.507	462	0.672
	6.00	0.608	632	0.737
	7.00	0.709	880	0.796
	8.00	0.811	1290	0.851
	9.00	0.912	2220	0.908
278.2	1.00	0.101	76	0.252
	2.00	0.203	150	0.399
	3.00	0.304	225	0.499
	4.00	0.405	300	0.570
	5.00	0.507	378	0.626
	6.00	0.608	484	0.682
	7.00	0.709	640	0.739
	8.00	0.811	830	0.786
	9.00	0.912	1170	0.838
	10.0	1.013	1820	0.890
283.2	1.00	0.101	66	0.226
	2.00	0.203	130	0.365
	3.00	0.304	193	0.461
	4.00	0.405	257	0.532
	5.00	0.507	322	0.588

(cont.)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Apparatus for high pressure work consisted of a thermostatted steel absorption vessel containing a weighed quantity of solvent and connected through valves to a thermostatted cylinder of liquid H_2S . High pressures were generated by heating the cylinder in a second thermostat and estimated from data given in ref. (1) and (2). The gas which dissolved in the liquid was estimated from the increase in weight of the vessel with allowance for the H_2S present in the gas phase. A flow technique was used at partial pressures of H_2S of equal to atmospheric pressure or less. The composition of the $N_2 + H_2S$ flow stream was adjusted to obtain the desired partial pressure of H_2S	1. Prepared by heating sulfur with paraffin and purified by freezing in liquid nitrogen. 2. Technical grade, distilled at 15-20 mmHg; contained 0.05% water; RI 1.4705 (20°C)

	ESTIMATED ERROR: $\delta T/K = \pm 0.1$; δP/atm $= \pm 0.05$; $\delta x_{H_2S} = \pm 4\%$ (estimated by compiler)
	REFERENCES: 1. *Technical Encyclopedia. Handbook of Physical Chemical and Technological Data, Vol.5*, Izd. Sov. Entsiklop. Moscow 1930. 2. *Chemist's Handbook Vol.1,* Leningrad-Moscow 1962.

COMPONENTS:	ORIGINAL MEASUREMENTS:

1. Hydrogen sulfide; H₂S; [7783-06-4]
 	
2. 1-Methyl-2-pyrrolidinone,
   (N-Methylpyrrolidone); C₅H₉NO;
   [872-50-4]
	Yarym-Agaev, N. L.; Matvienko, V. G.;
	Povalyaeva, N. V.
	Zh. Prikl. Khim., <u>1980</u>, *53*,2456-2461
	J. Appl. Chem. (Russ), <u>1980</u>, *53*,
	1810-1814.

EXPERIMENTAL VALUES:

T/K	P_{H_2S}/atm	$P_{H_2S}^a$/MPa	Solubility[b]	Mole fraction of[a] hydrogen sulfide, x_{H_2S}
283.2	6.00	0.608	390	0.633
	7.00	0.709	482	0.681
	8.00	0.811	616	0.732
	9.00	0.912	800	0.780
	10.0	1.013	1060	0.824
	11.0	1.115	1440	0.864
	12.0	1.216	2200	0.907
288.2	1.00	0.101	57	0.201
	2.00	0.203	112	0.331
	3.00	0.304	167	0.425
	4.00	0.405	222	0.496
	5.00	0.507	278	0.552
	6.00	0.608	334	0.596
	7.00	0.709	402	0.640
	8.00	0.811	478	0.679
	9.00	0.912	574	0.718
	10.0	1.013	700	0.756
	11.0	1.115	890	0.798
	12.0	1.216	1160	0.837
	13.0	1.317	1590	0.876
293.2	1.00	0.101	49	0.178
	2.00	0.203	96	0.298
	3.00	0.304	141	0.384
	4.00	0.405	188	0.454
	5.00	0.507	235	0.510
	6.00	0.608	282	0.555
	7.00	0.709	334	0.596
	8.00	0.811	394	0.636
	9.00	0.912	460	0.671
	10.0	1.013	550	0.709
	11.0	1.115	674	0.749
	12.0	1.216	834	0.787
	13.0	1.317	1066	0.825
	14.0	1.419	1400	0.861
	15.0	1.520	1860	0.892
298.2	1.00	0.101	42	0.156
	2.00	0.203	84	0.271
	3.00	0.304	121	0.349
	4.00	0.405	167	0.425
	5.00	0.507	210	0.482
	6.00	0.608	252	0.527
	7.00	0.709	296	0.567
	8.00	0.811	340	0.601
	9.00	0.912	390	0.633
	10.0	1.013	448	0.665
	11.0	1.115	526	0.699
	12.0	1.216	625	0.734
	13.0	1.317	750	0.768
	14.0	1.419	910	0.801
	15.0	1.520	1120	0.832
	16.0	1.621	1380	0.859
	17.0	1.723	1740	0.885
	18.0	1.824	2280	0.910
303.2	1.00	0.101	38	0.144
	2.00	0.203	75	0.249
	3.00	0.304	113	0.333
	4.00	0.405	150	0.399
	5.00	0.507	187	0.453

(cont.)

COMPONENTS:	ORIGINAL MEASUREMENTS:

1. Hydrogen sulfide; H$_2$S; [7783-06-4]
 	
2. 1-Methyl-2-pyrrolidinone,
   (N-Methylpyrrolidone); C$_5$H$_9$NO;
   [872-50-4]
	Yarym-Agaev, N. L.; Matvienko, V. G.;
	Povalyaeva, N. V.
	Zh. Prikl. Khim., <u>1980</u>, 53, 2456-2461.
	J. Appl. Chem. (Russ), <u>1980</u>, 53,
	1810-1814.

EXPERIMENTAL VALUES:

T/K	P_{H_2S}/atm	$P_{H_2S}^a$/MPa	Solubility[b]	Mole fraction of[a] hydrogen sulfide, x_{H_2S}
303.2	6.00	0.608	225	0.499
	7.00	0.709	264	0.539
	8.00	0.811	302	0.572
	9.00	0.912	340	0.601
	10.0	1.013	384	0.630
	11.0	1.115	436	0.659
	12.0	1.216	506	0.691
	13.0	1.317	594	0.724
	14.0	1.419	694	0.754
	15.0	1.520	810	0.781
	16.0	1.621	940	0.806
	17.0	1.723	1100	0.830
	18.0	1.824	1340	0.856
	19.0	1.925	1660	0.880
	20.0	2.027	2120	0.904
313.2	1.00	0.101	29	0.114
	2.00	0.203	57	0.201
	3.00	0.304	85	0.273
	4.00	0.405	113	0.333
	5.00	0.507	141	0.384
	6.00	0.608	169	0.428
	7.00	0.709	197	0.466
	8.00	0.811	225	0.499
	9.00	0.912	256	0.531
	10.0	1.013	286	0.559
	11.0	1.115	320	0.586
	12.0	1.216	364	0.617
	13.0	1.317	412	0.646
	14.0	1.419	466	0.673
	15.0	1.520	526	0.699
	16.0	1.621	590	0.723
	17.0	1.723	660	0.745
	18.0	1.824	740	0.766
	19.0	1.925	840	0.788
	20.0	2.027	970	0.811
273.2	0.075	0.0076	7.5	0.032
	0.278	0.0282	26.7	0.106
	0.488	0.0494	45.0	0.166
	0.779	0.0789	73.1	0.244
	0.976	0.0989	88.7	0.282
260.1	1.00	0.101	147	0.394
273.2	1.00	0.101	90.9	0.287
283.8	1.00	0.101	64.6	0.222
289.2	1.00	0.101	55.8	0.198
300.8	1.00	0.101	40.5	0.152
303.2	1.00	0.101	37.1	0.141
313.2	1.00	0.101	29.0	0.114
314.4	1.00	0.101	27.8	0.110
323.2	1.00	0.101	21.5	0.087
333.2	1.00	0.101	17.8	0.073
342.9	1.00	0.101	14.7	0.061
355.4	1.00	0.101	11.0	0.046
364.7	1.00	0.101	8.99	0.0382
399.2	1.00	0.101	5.10	0.0221

[a] Calculated by compiler

[b] Volume of hydrogen sulfide measured at 0 °C and
1 atmosphere dissolved in 1 g of N-methylpyrrolidone.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H_2S; [7783-06-4] 2. 1-Methyl-2-pyrrolidinone, (*N-methylpyrrolidone*); C_5H_9NO; [872-50-4]	Murrieta-Guevara, F; Rodriguez, A.T. *J.Chem.Eng.Data* <u>1984</u>, *29*, 456 - 460.
VARIABLES: Concentration	PREPARED BY: P.G.T. Fogg

EXPERIMENTAL VALUES:

T/K	Mole fraction in liquid phase x_{H_2S}	P_{H_2S}/atm	P_{H_2S}/bar[*]
298.15	0.034	0.207	0.210
	0.057	0.395	0.400
	0.087	0.638	0.646
	0.119	0.911	0.923
	0.150	1.191	1.207
	0.192	1.619	1.640

[*] calculated by compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The apparatus consisted of a glass equilibrium cell fitted with inlet tube ending in a porous glass disc. The cell was attached to a gas storage cylinder. Pressure in the cylinder was measured by a Bourdon tube gage and in the cell by a pressure transducer. Measured amounts of solvent and of H_2S were passed into the cell and vapor was then continuously circulated by a magnetic pump with liquid stirred by a magnetic stirrer. Temperatures were controlled by an air bath. Equilibrium pressures were measured after about 30 min.	1. from Matheson; purity 99.5% 2. purity > 99.5%

| | ESTIMATED ERROR:

$\delta T/K = \pm 0.1$; $\delta P = \pm 0.1\%$;
$\delta x_{H_2S} = \pm 5\%$ (authors) |
| | REFERENCES: |

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H₂S; [7783-06-4] 2. 1-Methyl-2-pyrrolidinone, (*N-methylpyrrolidone*); C₅H₉NO; [872-50-4] 3. 2-Aminoethanol, (*monoethanolamine*); C₂H₇NO; [141-43-5]	Murrieta-Guevara, F; Rodriguez, A.T. *J.Chem.Eng.Data* <u>1984</u>, 29, 456 - 460.

VARIABLES:	PREPARED BY:
Concentration	P.G.T. Fogg

EXPERIMENTAL VALUES:

Composition of solvent before addition of H₂S	Mole fraction in liquid phase x_{H_2S}	P_{H_2S}/atm	P_{H_2S}/bar*
NMP + 5.1 wt% MEA	0.089	0.199	0.202
	0.129	0.377	0.382
	0.167	0.661	0.670
	0.208	1.052	1.066
	0.237	1.387	1.405
	0.264	1.735	1.758
NMP + 14.3 wt% MEA	0.080	0.134	0.136
	0.147	0.308	0.312
	0.207	0.619	0.627
	0.252	1.108	1.123
	0.274	1.439	1.458
	0.285	1.586	1.607

T/K = 273.2   * calculated by compiler.

NMP = 1-methyl-2-pyrrolidinone; (*N-methylpyrrolidone*)

MEA = 2-aminoethanol (*monoethanolamine*)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The apparatus consisted of a glass equilibrium cell fitted with inlet tube ending in a porous glass disc. The cell was attached to a gas storage cylinder. Pressure in the cylinder was measured by a Bourdon tube gage and in the cell by a pressure transducer. Measured amounts of solvent and of H₂S were passed into the cell and vapor was then continuously circulated by a magnetic pump with liquid stirred by a magnetic stirrer. Temperatures were controlled by an air bath. Equilibrium pressures were measured after about 30 min.	1. from Matheson; purity 99.5% 2. & 3. purity > 99.5%
	ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta P = \pm 0.1\%$; $\delta x_{H_2S} = \pm 5\%$ (authors)
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H_2S; [7783-06-4] 2. Hexahydro-1-methyl-2H-azepin-2-one (*N-methyl-ε-caprolactam*); $C_7H_{13}NO$; [2556-73-2]	Wehner, K.; Burk, W. Kisan, W. *Chem. Tech. (Leipzig)* <u>1977</u>, *29(8)*, 445-448.

VARIABLES:	PREPARED BY:
	P.G.T. Fogg

EXPERIMENTAL VALUES:

T/K	Kuenen coefficient, S,[*] $/cm^3 g^{-1} atm^{-1}$	Mole fraction (1.013 bar)[**] x_{H_2S}
293.2	37.8	0.178

The authors also gave a small scale graph showing tha variation of Kuenen coefficient with temperature from about 280 K to about 400 K.

$$1 \text{ atm} = 1.013 \text{ bar} = 1.013 \times 10^5 \text{ Pascal}$$

[*] This is the volume of gas, reduced to 273.5 K and 1 atm, which is dissolved by 1 g of solvent, divided by the partial pressure of the gas in atmospheres.

[**] Calculated by the compiler on the assumption that the value of S is applicable to a partial pressure of 1 atm.

AUXILIARY INFORMATION	
METHOD/APPARATUS/PROCEDURE: No details given except that measurements were made by staff at VEB Leuna-Werke 'Walter Ulbricht'.	SOURCE AND PURITY OF MATERIALS: No information given.
	ESTIMATED ERROR:
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:

1. Hydrogen sulfide; H_2S;
    [7783-06-4]
 	
2. Nitrobenzene; $C_6H_5NO_2$;
    [98-95-3]
	Lenoir, J-Y.; Renault, P.; Renon, H.
	
	$J.$ $Chem.$ $Eng.$ $Data,$ <u>1971</u>, 16, 340-2

VARIABLES:	PREPARED BY: C. L. Young

EXPERIMENTAL VALUES:

T/K	Henry's constant H_{H_2S}/atm	Mole fraction at 1 atm* x_{H_2S}
298.2	18.7	0.0535

* Calculated by compiler assuming a linear function of P_{H_2S} vs x_{H_2S}, i.e.,
x_{H_2S}(1 atm) = $1/H_{H_2S}$

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
A conventional gas-liquid chromato-graphic 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: $\delta T/K = \pm 0.1$; δH/atm = $\pm 6\%$ (estimated by compiler).
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Hydrogen sulfide; H_2S; [7783-06-4] 2. Nitrobenzene; $C_6H_5NO_2$; [98-95-3]	Gerrard, W. *J. Appl. Chem. Biotechnol.*, <u>1972</u>, *22*, 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_{H_2S}
265.15	748	99.7	0.146	0.127
267.15	748	99.7	0.127	0.113
273.15	748	99.7	0.098	0.089
283.15	748	99.7	0.074	0.069
293.15	748	99.7	0.056	0.053

[+]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.	1 and 2. Components were purified and attested by conventional methods.
	ESTIMATED ERROR: $\delta T/K = \pm 0.2$; $\delta x_{H_2S} = \pm 4\%$
	REFERENCES: