COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Methanol; CH_4O; [67-56-1]	Delépine, *J. Pharm. Chim.* 1892, *25*, 496-7.
VARIABLES:	PREPARED BY: P. G. T. Fogg

EXPERIMENTAL VALUES:

T/K	g_{NH_3}/dm^3 solution	Density of solution /g cm^{-3}	Ostwald coefficient, L	Mole fraction* x_{NH_3} (1 atm)
273.2	218.0	0.770	425.0	0.426

Pressure = 760 mmHg = 1 atm = 1.013×10^5 Pa.

* Calculated by compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
No information given.	No information given.
	ESTIMATED ERROR:
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Methanol; CH_4O; [67-56-1]	de Bruyn, L. *Rec. Trav. Chim. Pays-Bas* 1892, *11*, 112-191.
VARIABLES: Temperature	PREPARED BY: P. G. T. Fogg

EXPERIMENTAL VALUES:

T/K	g_{NH_3}/ 100 $g_{solution}$	Mol_{CH_4O}/ mol_{NH_3}	Mole fraction* x_{NH_3} (1 atm)
273.2	29.3	1.28	0.439
279.2	26	1.51	0.398
284.9	23.5	1.73	0.366
287.9	21.8	1.91	0.344
290.2	20.8	2.02	0.331
295.2	18.3	2.37	0.297
301.6	14.8	3.05	0.247

Pressure = 1 atm = 1.013×10^5 Pa.

* Calculated by compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Dry ammonia at barometric pressure was introduced into small glass bulbs (2-3 cm^3) of known weight which were about half full of solvent and held in a thermostat bath. The bulbs were subsequently sealed, reweighed and broken under dilute acid. The ammonia was then estimated by titration.

SOURCE AND PURITY OF MATERIALS:

No information given.

ESTIMATED ERROR:

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Methanol; CH_4O; [67-56-1]	Hatem, S. *Bull. Soc. Chim. Fr.* 1949, *16*, 337-340.
VARIABLES:	PREPARED BY: P. G. T. Fogg

EXPERIMENTAL VALUES:

T/K	mol_{NH_3} dm^{-3} (soln.)	Mole fraction*, x_{NH_3}
273.2	13.65	0.449
283.2	10.85	0.375
288.2	9.66	0.341
293.2	8.42	0.304
298.2	7.30	0.270
303.2	6.19	0.234
308.2	5.34	0.206
313.2	4.60	0.180

The total pressure was equal to barometric pressure (unspecified).

* The densities of other solutions of ammonia in methanol of various concentrations at temperatures from 273.2 K to 303.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction solubilities from molar concentrations given in the paper.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Ammonia from a cylinder was bubbled, for about one hour in each case, through portions of methanol in a graduated glass absorption vessel held in a thermostat controlled to ±0.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a pyknometer.	1. Obtained from a cylinder; passed over CaO. 2. Free from traces of H_2O and $(CH_3)_2CO$; b.p. 65 °C; density (15 °C) 0.794 g cm^{-3}; n_D (temp. not stated) 1.330.
	ESTIMATED ERROR:
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Aliphatic monohydric alcohols	Kuznetsov, A. I.; Panchenkov, G. M.; Gogoleva, T. V. *Zh. Fiz. Khim.* 1968, *42*, 982-3 (*Russ. J. Phys. Chem.* 1968, *42*, 510-11).
VARIABLES:	PREPARED BY: P. G. T. Fogg

EXPERIMENTAL VALUES:

Solvent	T/K	p_{NH_3}/mmHg	Mole ratio $mol_{NH_3}/mol_{solv.}$	Mole fraction* x_{NH_3}
Methanol; CH_4O; [67-56-1]	291.2	760	0.54	0.35
Ethanol; C_2H_6O; [64-17-5]	291.2	760	0.49	0.33
1-Propanol; C_3H_8O; [71-23-8]	291.2	760	0.34	0.25
2-Propanol; C_3H_8O; [67-63-0]	291.2	760	0.34	0.25

The authors stated that the total pressure was varied from about 100 mmHg to about 800 mmHg but only solubilities at p_{NH_3} = 760 mmHg were reported.

The authors also stated that Henry's law in the form:

$$mol_{NH_3}/mol_{solvent} = p_{NH_3} \times \text{constant}$$

was "satisfactorily" obeyed except by methanol close to atmospheric pressure.

*Calculated by the compiler. 760 mmHg = 1 atm = 1.013×10^5 Pa.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Conventional gas handling apparatus attached to a vacuum line was used. A measured volume of solvent was admitted to the absorption vessel which was fitted with a magnetic stirrer. Portions of ammonia at a measured volume and pressure were admitted to the absorption vessel and equilibrium pressures in this vessel were measured by a mercury manometer. Allowance was made for the vapor pressure of the solvent but the method of making this allowance was not stated.

SOURCE AND PURITY OF MATERIALS:

1. Obtained from a commercial cylinder.
2. Methanol: "analytical reagent" grade; ethanol: 92% pure; propanol: "chemically pure" grade.

ESTIMATED ERROR:

$\delta T/K = \pm 0.5$; $\delta p/mmHg = \pm 0.5$ (estimated by authors).

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Ethanol; C_2H_6O; [64-17-5]	Delépine, *J. Pharm. Chim.* 1892, *25*, 496-7.
VARIABLES:	PREPARED BY:
Temperature	P. G. T. Fogg

EXPERIMENTAL VALUES:

T/K	g_{NH_3}/dm^3 solution	Density of solution /g cm^{-3}	Ostwald coefficient, L	Mole fraction* x_{NH_3} (1 atm)
273.2	130.5	0.782	209.5	0.351
283.2	108.5	0.787	164.3	0.302
293.2	75.0	0.791	106.6	0.221
303.2	51.5	0.798	97.0	0.157

Pressure = 760 mmHg = 1 atm = 1.013 × 10^5 Pa.

* Calculated by compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
No information given.	No information given.
	ESTIMATED ERROR:
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Ethanol; C_2H_6O; [64-17-5]	de Bruyn, L. *Rec. Trav. Chim. Pays-Bas* 1892, *11*, 112-191.
VARIABLES: Temperature	PREPARED BY: P. G. T. Fogg

EXPERIMENTAL VALUES:

T/K	g_{NH_3}/ 100 $g_{solution}$	$Mol_{C_2H_6O}$/ mol_{NH_3}	Mole fraction* x_{NH_3} (1 atm)
273.2	19.7	1.51	0.398
279.2	17.1	1.79	0.358
284.9	14.1	2.25	0.308
287.9	13.2	2.43	0.292
290.2	12.6	2.56	0.281
295.2	10.9	3.02	0.249
301.6	9.2	3.73	0.211

Pressure = barometric (approx. 760 mmHg).

760 mmHg = 1 atm = 1.013×10^5 Pa.

* Calculated by compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Dry ammonia at barometric pressure was introduced into small glass bulbs (2-3 cm^3) of known weight which were about half full of solvent and held in a thermostat bath. The bulbs were subsequently sealed, reweighed and broken under dilute acid. The ammonia was then estimated by titration.	No information given.
	ESTIMATED ERROR:
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7]	Barclay, I.M.; Butler, J.A.V.
2. Ethanol; C_2H_6O; [64-17-5]	*Trans. Faraday Soc.* 1938,*34*, 1445-54.
VARIABLES: Pressure, temperature	PREPARED BY: P.G.T. Fogg.

EXPERIMENTAL VALUES:

T/K	Mole fraction in solution, x_{NH_3}	Wt % NH in condensate	p_{NH_3}/mmHg *
298.2	4.053×10^{-3}	4.482	7.47
298.2	3.983×10^{-3}	4.40	7.33
308.2	3.94×10^{-3}	3.59	10.42
308.2	3.896×10^{-3}	3.59	10.42

* Units of pressure were not given in the original paper but calculations by the compiler have shown that the authors measured pressures in mmHg.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Dry N_2 was passed through a row of six bulbs containing solution of known concentration. The ethanol vapor which emerged was trapped in a tube cooled by solid CO_2. Ammonia was absorbed in a second tube containing solvent and estimated by titration. The mole ratio of ammonia to ethanol in the total condensate was equal to the ratio in the vapor phase. It was assumed that the partial pressure of ethanol over the solution could be calculated from the concentration by use of Raoult's law because the solution was dilute. The partial pressure of ammonia over the solution was taken to be equal to the product of the mole ratio of ammonia to ethanol in the vapor phase and the partial pressure of ethanol in the vapor phase.

SOURCE AND PURITY OF MATERIALS:

2. Purified and dried; b.p. 78.47°C (760 mmHg).

ESTIMATED ERROR:

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Ethanol; C_2H_6O; [64-17-5]	Hatem, S. *Bull. Soc. Chim. Fr.* 1949, *16*, 337-340.
VARIABLES:	PREPARED BY:
Temperature	P. G. T. Fogg

EXPERIMENTAL VALUES:

T/K	mol_{NH_3} dm^{-3} (soln.)	Mole fraction*, x_{NH_3}
273.2	8.65	0.308
283.2	6.62	0.246
288.2	5.69	0.215
293.2	5.02	0.192
298.2	4.32	0.167
303.2	3.79	0.148
308.2	3.30	0.130

The total pressure was equal to barometric pressure (unspecified).

* The densities of other solutions of ammonia in ethanol of various concentrations at temperatures from 273.2 K to 308.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction solubilities from molar concentrations given in the paper.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Ammonia from a cylinder was bubbled, for about an hour in each case, through portions of ethanol in a graduated absorption vessel held in a thermostat controlled to ±0.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a pyknometer.

SOURCE AND PURITY OF MATERIALS:

1. Obtained from a cylinder; passed over CaO.
2. Absolute alcohol: distilled from CaO; b.p. 78.35 °C; n_D^{20} 1.3614; density (20 °C) 0.7901 g cm^{-3}.

ESTIMATED ERROR:

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. 1-Propanol; C_3H_8O; [71-23-8]	Hatem, S. *Bull. Soc. Chim. Fr.* 1949, *16*, 337-340.
VARIABLES:	PREPARED BY: P. G. T. Fogg

EXPERIMENTAL VALUES:

T/K	mol_{NH_3} dm^{-3} (soln.)	Mole fraction*, x_{NH_3}
273.2	7.07	0.388
283.2	5.3	0.314
288.2	4.65	0.284
293.2	4.15	0.259
298.2	3.62	0.232
303.2	3.25	0.213
308.2	2.39	0.163

The total pressure was equal to barometric pressure (unspecified).

* The densities of other solutions of ammonia in 1-propanol of various concentrations at temperatures from 273.2 K to 308.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction solubilities from molar concentrations given in the paper.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Ammonia from a cylinder was bubbled, for about an hour in each case, through portions of propanol in a graduated absorption vessel held in a thermostat controlled to ±0.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and tiration with sulfuric acid. Densities of solutions were measured with a pyknometer.

SOURCE AND PURITY OF MATERIALS:

1. Obtained from a cylinder; passed over CaO.
2. Distilled twice; b.p. 94.4 °C; density (20 °C) 0.8038 g cm^{-3}.

ESTIMATED ERROR:

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. 2-Propanol; C_3H_8O; [67-63-0]	Hatem, S. *Bull. Soc. Chim. Fr.* 1949, *16*, 337-340.
VARIABLES: Temperature	PREPARED BY: P. G. T. Fogg

EXPERIMENTAL VALUES:

T/K	mol_{NH_3} dm^{-3} (soln.)	Mole fraction* x_{NH_3}	
273.2	6	0.349	The total pressure was equal to barometric pressure (unspecified).
283.2	4.55	0.283	
288.2	4.05	0.258	
293.2	3.48	0.228	
298.2	2.98	0.200	
303.2	2.52	0.173	
308.2	2.25	0.157	

* The densities of other solutions of ammonia in 2-propanol of various concentrations at temperatures from 273.2 K to 308.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction solubilities from molar concentrations given in the paper.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Ammonia from a cylinder was bubbled, for about an hour in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to ±0.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a pyknometer.

SOURCE AND PURITY OF MATERIALS:

1. From a cylinder; passed over CaO.
2. b.p. 82.7 °C; n_D^{17} 1.380; density (17 °C) 0.790 g cm^{-3}

ESTIMATED ERROR:

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Aliphatic monohydric alcohols	Kuznetsov, A. I.; Panchenkov, G. M.; Gogoleva, T. V. *Zh. Fiz. Khim.* 1968, *42*, 982-3 (*Russ. J. Phys. Chem.* 1968, *42*, 510-11).
VARIABLES:	PREPARED BY: P. G. T. Fogg

EXPERIMENTAL VALUES:

Solvent	T/K	p_{NH_3}/mmHg	Mole ratio $mol_{NH_3}/mol_{solv.}$	Mole fraction* x_{NH_3}
1-Butanol; $C_4H_{10}O$; [71-36-3]	291.2	760	0.36	0.26
2-Methyl-1-propanol; $C_4H_{10}O$; [78-83-1]	291.2	760	0.38	0.28
3-Methyl-1-butanol (isopentyl alcohol); $C_5H_{12}O$; [123-51-3]	288.2	760	0.38	0.28

The authors stated that the total pressure was varied from about 100 mmHg to about 800 mmHg but only solubilities at p_{NH_3} = 760 mmHg were reported.

The authors also stated that Henry's law in the form:

$$mol_{NH_3}/mol_{solvent} = p_{NH_3} \times \text{constant}$$

was "satisfactorily" obeyed.

*Calculated by the compiler. 760 mmHg = 1 atm = 1.013×10^5 Pa.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Conventional gas handling apparatus attached to a vacuum line was used. A measured volume of solvent was admitted to the absorption vessel which was fitted with a magnetic stirrer. Portions of ammonia at a measured volume and pressure were admitted to the absorption vessel and equilibrium pressures in this vessel were measured by a mercury manometer. Allowance was made for the vapor pressure of the solvent but the method of making this allowance was not stated.

SOURCE AND PURITY OF MATERIALS:

1. Obtained from a commercial cylinder.
2. Butanol: "chemically pure" grade; 2-methyl-1-propanol: "analytical reagent" grade; 3-methyl-1-butanol: "pure grade".

ESTIMATED ERROR:

$\delta T/K = \pm 0.5$; $\delta p/mmHg = \pm 0.5$ (estimated by authors).

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Butanols, $C_4H_{10}O$;	Maladkar, V.K. Thesis, Univ. of London, 1970 (See also Gerrard, W.; Maladkar, V.K. *Chem. Ind.* 1970, 925-926).
VARIABLES:	PREPARED BY: P.G.T. Fogg.

EXPERIMENTAL VALUES:

Compound	T/K	$Moles_{NH_3}/moles_{solvent}$ (1 atm)	Mole fraction * x_{NH_3} (1 atm)
1-butanol; [71-36-3]	273.2	0.5813	0.368
2-butanol [78-92-2]	273.2	0.4510	0.311
2-methyl-2-propanol; [75-65-0]	273.2	0.3590	0.264
2-methyl-1-propanol; [78-83-1]	273.2	0.6000	0.375

* Calculated by compiler

1 atm = 1.013×10^5 Pa

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Ammonia at barometric pressure was bubbled through a weighed quantity (about 1 g) of solvent in a glass vessel held in a thermostat until saturation was achieved. The concentration of ammonia was calculated from the increase in weight of the vessel after an allowance had been made for the weight of ammonia in the gas phase above the saturated solution. Details of the apparatus are given in ref. (1).

SOURCE AND PURITY OF MATERIALS:

1. Obtained from a cylinder; dried by KOH pellets and a cold trap.
2. 1-&2- butanols: distilled from CaO digested over BaO;distilled from Na.

   2-methyl-2-propanol: distilled from CaO; crystallised; fractionally distilled.

   2-methyl-1-propanol: dried over BaO; distilled.

ESTIMATED ERROR:

REFERENCES:

1. Gerrard, W.; *"Solubility of Gases and Liquids"*, Plenum Press, New York, 1976, p.3.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Ammonia; NH_3; [7664-41-7] (2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	Short, I.; Sahgal, A.; Hayduk, W. *J. Chem. Eng. Data* 1983,
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	213.1	221.2	0.472 (0.4721)[3]
298.15	73.0	66.9	0.217 (0.2170)
333.15	32.0	26.2	0.1007 (0.1007)

[1]Original data

[2]Calculated by compiler

[3]The mole fraction solubility of the original data was used to determine the following equations for $\Delta G°$ and $\ln x_1$ and table of smoothed values:

$$\Delta G°/\text{J mol}^{-1} = -RT \ln x_1 = 1022.0\ T \ln T - 6177.75\ T + 143147$$

$$\ln x_1 = 75.287 - 1744.5/T - 12.455 \ln T$$

T/K	$10^{-4}\Delta G°$/J mol^{-1}	x_1	T/K	$10^{-4}\Delta G°$/J mol^{-1}	x_1
263.15	1.621	0.4721	303.15	4.075	0.1943
273.15	2.179	0.3782	313.15	4.776	0.1559
283.15	2.776	0.3028	323.15	5.510	0.1252
293.15	3.408	0.2425	333.15	6.275	0.1007
298.15	3.737	0.2170			

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

A volumetric method using a glass apparatus was employed. Degassed solvent contacted the gas while flowing as a thin film, at a constant rate, through an absorption spiral into a solution buret. A constant solvent flow was obtained by means of a calibrated syringe pump. The solution at the end of the spiral was considered saturated. Dry gas was maintained at atmospheric pressure in a gas buret by mechanically raising the mercury level in the buret at an adjustable rate. The solubility was calculated from the constant slope of volume of gas dissolved and volume of solvent injected.

Degassing was accomplished using a two stage vacuum process described by Clever et al. (1).

SOURCE AND PURITY OF MATERIALS:

1. Liquid Carbonic. Specified minimum purity 99.99 per cent.
2. Canlab. Specified minimum purity 99.0 per cent.

ESTIMATED ERROR:

δT/K = 0.1

$\delta x_1/x_1$ = 0.01

REFERENCES:

1. Clever, H.L.; Battino, R.; Saylor, J.H.: Gross, P.M. *J. Phys. Chem.* 1957, *61*, 1078.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Octanol; $C_8H_{18}O$; [111-87-5]	Gerrard, W.; Maladkar, V.K. *Chem. Ind.* 1970, 925-926. Maladkar, V.K. Thesis, Univ. of London, 1970.
VARIABLES: Temperature, pressure	PREPARED BY: P.G.T. Fogg.

EXPERIMENTAL VALUES:

T/K	Moles $_{NH_3}$/moles $_{C_8H_{18}O}$ (1 atm)	Mole fraction* x_{NH_3} (1 atm)
273.2	0.56	0.359

The variation of moles $_{NH_3}$/moles $_{C_8H_{18}O}$ (p_{NH_3} = 1 atm) with temperature from 263 K to 293 K was given in graphical form. The variation of moles $_{NH_3}$/moles $_{C_8H_{18}O}$ (T = 273.2 K) with pressure from 0 to 1 atm was also given in the form of a graph.

* Calculated by compiler.

1 atm = 1.013×10^5 Pascal.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Absorption at barometric pressure was measured by bubbling ammonia through a weighed quantity (about 2 g) of octanol in a glass vessel held in a thermostat until saturation was achieved. The concentration of ammonia was calculated from the increase in weight of the vessel after an allowance had been made for the weight of ammonia in the gas phase above the saturated solution. Solubilities at low pressures were calculated from weight changes when solutions which had been previously saturated at barometric pressure were allowed to come to equilibrium under a lower pressure of ammonia. Details of the apparatus are given in ref. (1).	1. Obtained from a cylinder; dried by KOH pellets and a cold trap. 2. Dried over $CaCl_2$; distilled under reduced pressure. ESTIMATED ERROR: REFERENCES: 1. Gerrard, W. *"Solubility of Gases and Liquids,"* Plenum Press, New York, 1976, p.3.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Cyclohexanol; $C_6H_{12}O$; [108-93-0]	Cauquil, G. *J. Chim. Phys. Phys. Chim. Biol.* 1927, *24*, 53-55.
VARIABLES:	PREPARED BY: P. G. T. Fogg

EXPERIMENTAL VALUES:

T/K	p_{H_3N}/mmHg	Ostwald coefficient L	Mole fraction* x_{NH_3} (1 atm)
299.2	755	28.166	0.108

760 mmHg = 1 atm = 1.013×10^5 Pa.

* Value of x_{NH_3} (1 atm) has been calculated by the compiler using densities of cyclohexanol at 293.2 K and 303.2 K given in refs. (1) and (2), respectively, and values of van der Waals constants for ammonia given in ref. (1).

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

A measured volume of cyclohexanol was put into contact with a measured volume of ammonia in a graduated tube over mercury. The final volume of gas and the temperature and pressure were measured when equilibrium had been reached. The author considered that no allowance for the vapor pressure of cyclohexanol at the temperature of measurement was necessary.

SOURCE AND PURITY OF MATERIALS:

2. Dissolved air removed by boiling; b.p. 334.1 K (766 mmHg).

ESTIMATED ERROR:

REFERENCES:

1. *Handbook of Chemistry and Physics*, (61st edition) C.R.C. Press, Cleveland, Ohio, 1980.
2. Timmermans, J. *Physico-Chemical Constants of Pure Organic Compounds*, Vol. II, Elsevier, London, 1965.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Ammonia; NH_3; [7664-41-7] (2) 1,2-Ethanediol (ethylene glycol); $C_2H_6O_2$; [107-21-1]	Short, I.; Sahgal, A.; Hayduk, W. *J. Chem. Eng. Data* 1983,
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	727	754.6	0.652 (0.652)[3]
298.15	296.2	271.4	0.406 (0.406)
333.15	120.3	98.6	0.202 (0.202)

[1]Original data

[2]Calculated by compiler

[3]The mole fraction solubility of the original data was used to determine the following equations for $\Delta G°$ and ln x_1 and table of smoothed values:

$$\Delta G°/\text{J mol}^{-1} = -RT \ln x_1 = 2150.45\ T \ln T - 13905.13\ T + 514826$$

$$\ln x_1 = 169.459 - 6274.08/T - 26.2071 \ln T$$

T/K	$10^{-4}\Delta G°$/J mol^{-1}	x_1	T/K	$10^{-4}\Delta G°$/J mol^{-1}	x_1
263.15	0.924	0.6520	303.15	2.463	0.3715
273.15	1.193	0.5872	313.15	3.032	0.3073
283.15	1.541	0.5151	323.15	3.669	0.2507
293.15	1.966	0.4417	333.15	4.373	0.2020
298.15	2.205	0.4060			

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

A volumetric method using a glass apparatus was employed. Degassed solvent contacted the gas while flowing as a thin film, at a constant rate, through an absorption spiral into a solution buret. A constant solvent flow was obtained by means of a calibrated syringe pump. The solution at the end of the spiral was considered saturated. Dry gas was maintained at atmospheric pressure in a gas buret by mechanically raising the mercury level in the buret at an adjustable rate. The solubility was calculated from the constant slope of volume of gas dissolved and volume of solvent injected.

Degassing was accomplished using a two stage vacuum process described by Clever et al. (1).

SOURCE AND PURITY OF MATERIALS:

1. Liquid Carbonic. Specified minimum purity 99.99 per cent.
2. Canlab. Baker Analyzed grade of minimum purity 99.8 per cent.

ESTIMATED ERROR:

δT/K = 0.1

$\delta x_1/x_1$ = 0.01

REFERENCES:

1. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M. *J. Phys. Chem.* 1957, *61*, 1078.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. 2,2'-Oxybisethanol (diethylene glycol); $C_4H_{10}O_3$; [111-46-6]	Timonin, V. E.; Timofeeva, E. G.; Marchenkova, T. G.; Marchenkov, V. F. 1980, VINITI deposited document 2874-80.
VARIABLES: Temperature, pressure	PREPARED BY: P. G. T. Fogg

EXPERIMENTAL VALUES:

T/K	p_{NH_3}/atm	Bunsen coeff. α	Mole fraction# x_{NH_3}	T/K	p_{NH_3}/atm	Bunsen coeff. α	Mole fraction# x_{NH_3}
298.2	0.025	5.1	0.021	313.2	0.14	18.9	0.075
	0.067	13.8	0.055		0.29	33.5	0.125
	0.113	27.0	0.103		0.43	45.4	0.162
	0.18	37.1	0.136		0.54	54.8	0.190
	0.35	67.3	0.222		0.63	61.1	0.207
	0.53	93.8	0.285		0.71	69.4	0.229
	0.61	104	0.306		0.83	78.1	0.250
	0.74	119	0.336		0.90	83.6	0.263
	0.86	137	0.368		2.76	256	0.522
	3.00	390	0.623		3.64	323	0.580
	5.80	730	0.756		4.00	329	0.584
	5.96	814	0.776		5.92	498	0.680
	7.28	1127	0.827		6.84	540	0.697
	7.44	1156	0.831		8.72	727	0.756
	8.08	1542	0.867		9.40	742	0.760
	8.52	1871	0.888		9.60	916	0.796
	8.56	1956	0.893		9.88	932	0.799
					11.8	1291	0.846
					13.3	1755	0.882
					15.0	2525	0.915

Calculated by the compiler using densities of solvent given in ref. 1.

1 atm = 1.013×10^5 Pa.

(cont.)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Apparatus described previously was used (ref. 2). A quantity of gas, measured by changes in pressure of a known volume, was allowed into contact with solvent in a thermostatted absorption vessel. The liquid was magnetically stirred and the final pressure of gas in contact with solvent was measured.

SOURCE AND PURITY OF MATERIALS:

1. Dried with silica gel; nitrogen removed by repeated condensation.
2. Analytically pure; cooled in liquid nitrogen and degassed under vacuum.

ESTIMATED ERROR:

REFERENCES:

1. Timmermans, J. *Physico-Chemical Constants of Pure Organic Compounds*, Vol. II, Elsevier, Amsterdam, 1965.
2. Braude, G. E.; Leites, I. L.; Dedova, I. V. *Khim. Prom.* 1961, 232.

COMPONENTS:

1. Ammonia; NH_3; [7664-41-7]
2. 2,2'-Oxybisethanol (diethylene glycol); $C_4H_{10}O_3$; [111-46-6]

ORIGINAL MEASUREMENTS:

Timonin, V. E.; Timofeeva, E. G.; Marchenkova, T. G.; Marchenkov, V. F. 1980, VINITI deposited document 2874-80.

EXPERIMENTAL VALUES:

T/K	p_{NH_3}/atm	Bunsen coeff. α	Mole fraction# x_{NH_3}	T/K	p_{NH_3}/atm	Bunsen coeff. α	Mole fraction# x_{NH_3}
328.2	0.25	16.8	0.0673	343.2	0.28	13.1	0.054
	0.44	28.4	0.109		0.49	22.4	0.088
	0.59	37.7	0.139		0.66	28.4	0.109
	0.70	44.2	0.159		0.75	33.5	0.126
	0.77	50.0	0.177		0.83	36.6	0.136
	0.84	62.8	0.212		0.87	38.7	0.143
	0.90	57.6	0.198		0.91	40.0	0.147
	5.00	251	0.519		7.40	256	0.525
	5.04	264	0.531		14.4	404	0.635
	8.44	458	0.663		15.1	541	0.700
	8.72	460	0.664		24.1	1232	0.842
	9.56	522	0.691		25.8	1428	0.860
	10.1	575	0.712		28.2	2044	0.898
	10.2	589	0.717		29.6	2269	0.907
	17.1	1212	0.839		32.3	2950	0.927
	19.8	2032	0.897				
	21.7	2844	0.924				

Calculated by the compiler using densities of solvent given in ref. 1.

1 atm = 1.013×10^5 Pa.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. 1,2,3-Propanetriol (glycerol); $C_3H_8O_3$; [56-81-5] 2-Propanone (acetone); C_3H_6O; [67-64-1]	Kuznetsov, A. I.; Panchenkov, G.M.; Gogoleva, T. V. *Zh. Fiz. Khim.* 1968, *42*, 982-3. (*Russ. J. Phys. Chem.* 1968, *42*, 510-11)
VARIABLES:	PREPARED BY: P. G. T. Fogg

EXPERIMENTAL VALUES:

Solvent	T/K	p_{NH_3}/mmHg	$mol_{NH_3}/mol_{solvent}$	Mole fraction* x_{NH_3}
1,2,3-Propanetriol	291.2	760	1.03	0.51
2-Propanone	292.2	760	0.38	0.28

The authors stated that the total pressure was varied from about 100 mmHg to about 800 mmHg although only solubilities at p_{NH_3} = 760 mmHg were reported.

The authors also stated that Henry's law in the form:

$$mol_{NH_3}/mol_{solvent} = p_{NH_3} \times \text{constant}$$

was "satisfactorily" obeyed except by glycerol close to atmospheric pressure.

760 mmHg = 1 atm = 1.013×10^5 Pa.

* Calculated by the compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Conventional gas handling apparatus attached to a vacuum line was used. A measured volume of solvent was admitted to the absorption vessel which was fitted with a magnetic stirrer. Portions of ammonia at a measured volume and pressure were then admitted to the absorption vessel and equilibrium pressures in this vessel were measured by a mercury manometer. Allowance was made for the vapor pressure of the solvent but the method of making this allowance was not stated.	1. Obtained from a commercial cylinder. 2. Acetone was of "analytical reagent" grade; 1,2,3-Propanetriol was of "pure" grade.
	ESTIMATED ERROR: δT/K = ±0.5; δp/mmHg = ±0.5 (estimated by the authors).
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia, NH_3; [7664-41-7] 2. Chloroethanols	Gerrard, W.; Maladkar, V.K. *Chem. Ind.* 1970, 925-926.
VARIABLES:	PREPARED BY: P.G.T. Fogg.

EXPERIMENTAL VALUES:

Compound	$Moles_{NH_3}/moles_{solvent}$ (1 atm)	Mole fraction * x_{NH_3} (1 atm)
2-Chloroethanol C_2H_5ClO; [59826-67-4]	1.03	0.507
2,2-Dichloroethanol $C_2H_4Cl_2O$; [598-38-9]	1.31	0.567
2,2,2-Trichloroethanol $C_2H_3Cl_3O$; [115-20-8]	1.33	0.571

All measurements were made at T = 273.2 K

In the case of 2,2,2-trichloroethanol the variation of $moles_{NH_3}/moles_{C_2H_3Cl_3O}$ (T = 273.2 K) with pressure from 0 - 1 atm was given in the form of a graph.

* Calculated by compiler.

1 atm = 1.013×10^5 Pa

AUXILIARY INFORMATION

METHOD APPARATUS/PROCEDURE:

Ammonia at barometric pressure was bubbled through a weighed quantity (about 2 g) of solvent in a glass vessel held in a thermostat until saturation was achieved. The concentration of ammonia was calculated from the increase in weight of the vessel after an allowance had been made for the weight of ammonia in the gas phase above the saturated solution. Details of the apparatus are given in ref. (1).

SOURCE AND PURITY OF MATERIALS:

1. Obtained from a cylinder; dried by KOH pellets and a cold trap.

ESTIMATED ERROR:

REFERENCES:

1. Gerrard, W. *"Solubility of Gases and Liquids"*, Plenum Press, New York, 1976, p.3.