COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; H_3N; [7664-41-7] 2. Hydrocarbons	Bell, R. P. *J. Chem. Soc.* <u>1931</u>, 1371-82.
VARIABLES:	PREPARED BY: P. G. T. Fogg

EXPERIMENTAL VALUES:

Solvent	Partition coeff. mol_{NH_3} dm^{-3}(soln)/ mol_{NH_3} dm^{-3}(gas)	Mole fraction x_{NH_3} (1 atm)
Hexane; C_6H_{14}; [110-54-3]	4.16	0.0223
*Octane; C_8H_{18}; [111-65-9]	2.56	0.0170
*Dodecane; $C_{12}H_{26}$; [112-40-3]	2.13	0.0197
*Hexadecane; $C_{16}H_{34}$; [544-76-3]	1.84	0.0219
Benzene; C_6H_6; [71-43-2]	9.95	0.0474
Methylbenzene; C_7H_8; [108-88-3]	7.23	0.0313

Temperature = 293.2 K   1 atm = 1.015 x 10^5 Pascal

* Unpublished measurements by Brönsted and Volqvartz reported by Bell.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE

Ammonia at barometric pressure was passed through the solvent in a graduated glass vessel for about 3 hours. The temperature was controlled to ±0.01 K by a thermostat bath. Dissolved ammonia in a measured volume of solution was removed by a current of air over a period of 8-10 hours, trapped in U-tubes containing hydrochloric acid and estimated by titration. Solubilities were corrected to 1 atm by making corrections for the vapor pressure of the solvent, barometric pressure and hydrostatic pressure of liquid in the absorption vessel. Mole fraction solubilities were calculated by the author on the assumption that densities of solutions obey the ideal mixture law.

SOURCE AND PURITY OF MATERIALS

Solvents "zur Analyse" grade from Merck or Kahlbaum; dried over $CaCl_2$ and distilled.

C_6H_{14}: b.p. 67.1 - 67.6°C

C_6H_6 : b.p. 79.60 - 79.65°C

C_7H_8 : b.p. 110.0 - 111.0°C.

The author stated that measurements were reproducible to within 1%.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Hexane; C_6H_{14}; [110-54-3]	Patyi, L.; Furmer, I. E.; Makranczy, J.; Sadilenko, A. S.; Stepanova, Z. G.; Berengarten, M. G. *Zh. Prikl. Khim.* <u>1978</u>, *51*, 1296-1300.

VARIABLES:	PREPARED BY:
	C. L. Young

EXPERIMENTAL VALUES:

T/K	α^a	Mole fraction of ammonia at a partial pressure of 101.325 kPa x_{NH_3}
298.15	2.48	0.01457

[a] Volume of gas (calculated for 101.325 kPa and 273.15 K) dissolved by one volume of solvent when the partial pressure of gas was 101.325 kPa.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The authors stated that they used a static method previously described by Bodor *et al.* (ref. 1). However, Bodor *et al.* described apparatus for use below 0 °C but referred to another paper (ref 2.) in which an apparatus for use above 0 °C was described. Bodor *et al.* stated that, in each case, the volume of gas absorbed by a given quantity of liquid at a particular pressure was measured by a gas burette. Bodor *et al.* gave details of a method of calculating gas solubilities, applicable to either apparatus, with allowance for the vapor pressure of the solvent.	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.* <u>1957</u>, *1*, 55. 2. Schay, G.; Szekely, G.; Racz, Gy.; Traply, G. *Periodica Polytechnica Ser. Chem. Eng. (Budapest)* <u>1958</u>, *2*, 1.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Ammonia; NH_3; [7664-41-7] (2) Hexane; C_6H_{14}; [110-54-3] 2,2,4-Trimethylpentane or iso-octane; C_8H_{18}; [540-84-1]	Horsman-van den Dool, L. E. W.; Warman, J. W. Interuniversity Reactor Institute (IRI)-Report 134-81-01
VARIABLES: T/K = 292.4 p_1/kPa not given	PREPARED BY: H. L. Clever

EXPERIMENTAL VALUES:

Temperature		Ostwald Coefficient	Number of Runs
$t/^0C$	T/K	L/cm^3 cm^{-3}	
Hexane			
19.2	292.4	2.51	2
2,2,4-Trimethylpentane			
19.2	292.4	2.45	2

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
A cylindrical glass container of approximately 15 cm³ volume is partly filled with solvent and closed with a half-hole septum. An amount of the gaseous solute is added to the container. The closed container is shaken for 30 minutes. Samples of both the vapor and liquid phases are taken in calibrated syringes. The samples are injected into a gas chromatograph. The Ostwald coefficient is calculated from the known sample size and the measured peak areas. The chromatograph is a Hewlett-Packard model 5750 equiped with a thermal conductivity cell detector. The carrier gas is helium. A 90 cm column packed with Porapak Q coated with 10 percent polyethyleneimine is used for the separation.	(1) Ammonia. Baker Chemical Co. Anhydrous, 99.99 percent. Used as received. (2) Hexane and 2,2,4-Trimethylpentane. Both Merck, Uvasol Spektroskopie grade. Impurities which give the same retention time as the gas are removed before the experiment by adsorption or distillation.
	ESTIMATED ERROR: $\delta L/L$ = ± 0.05
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH ; [7664-41-7] 2. Various organic liquids.	Gerrard, W. *"Solubility of Gases and Liquids"*, Plenum Press, New York, <u>1976</u>, pp.164-165.

VARIABLES:
 	
        Temperature, pressure
	PREPARED BY:
	
	        P. G. T. Fogg

EXPERIMENTAL VALUES:

The general pattern of variation of mole fraction of NH_3 with variation
of pressure of NH_3 from 0-1 atm at 273.2 K has been presented in graphical
form for the following liquids:

Decane; $C_{10}H_{22}$; [124-18-5]

1,3,5-Trimethylbenzene; C_9H_{12};
      [108-67-8]

N,N-Diethylbenzenamine; $C_{10}H_{15}N$;
      [91-66-7]

1,1'-Oxybisoctane; $C_{16}H_{34}O$;
      [629-82-3]*

1-Octanamine; $C_8H_{19}N$; [111-86-4]

Trichloromethane; $CHCl_3$; [67-66-3]

Benzenamine; C_6H_7N; [62-53-3]

Octanol; $C_8H_{18}O$; [29063-28-3]**

Benzenemethanol; C_7H_8O;
      [100-51-6]

2,2,2-Trichloroethanol; $C_2H_3Cl_3O$
      [115-20-8]

Benzeneethanamine; $C_8H_{11}N$;
      [64-04-0]

N,N-Dimethylformamide; C_3H_7NO;
      [68-12-2]

The mole fraction of NH_3 at 1 atm and 293.2 K has been given in graphical
form for the following liquids:

Octane; C_8H_{18}; [111-65-9]

Dodecane; $C_{12}H_{26}$; [112-40-3]

Hexadecane; $C_{16}H_{34}$; [544-76-3]

*   formula incorrectly printed as $(n-C_{18}H_{17})_2O$;
**   formula incorrectly printed as $n-C_6H_7OH$.

Correct formulae are given in the manuscript copy of the book held at the
Polytechnic of North London.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:

Adsorption at barometric pressure was measured by bubbling ammonia 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.
 	
Solubilities at lower 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).
	Not given.
	
	ESTIMATED ERROR:
	
	REFERENCES:
	1. Gerrard, W.
	   "Solubility of Gases and Liquids"
	   Plenum Press, New York, <u>1976</u>,
	   pp.3-5.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH₃; [7664-41-7] 2. Hexadecane; C₁₆H₃₄; [544-76-3]	Tremper, K.K.; Prausnitz, J.M. *J. Chem. Engng. Data* 1976, *21*, 295-9

VARIABLES:	PREPARED BY:
Temperature	C.L. Young

EXPERIMENTAL VALUES:

T/K	Henry's Constant /atm	Mole fraction[b] of ammonia at 1 atm partial pressure, x_{NH_3}
300	45.8	0.0218
325	59.0	0.0169
350	73.4	0.0136
375	87.6	0.0114
400	100.0	0.0100
425	112.0	0.00893
450	122.0	0.00820
475	129.0	0.00775

a. Authors stated measurements were made at several pressures and values of solubility used were all within the Henry's Law region.

b. Calculated by compiler assuming linear relationship between mole fraction and pressure.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Volumetric apparatus similar to that described by Dymond and Hildebrand (1). Pressure measured with a null detector and precision gauge. Details in ref. (2).	Solvent degassed. No other details given.

ESTIMATED ERROR:

$$\delta T/K = \pm 0.1; \quad \delta x_{NH_3} = \pm 1\%$$

REFERENCES:

1. Dymond, J.; Hildebrand, J.H. *Ind.Chem.Eng.Fundam.* 1967,*6*,130.
2. Cukor, P.M.; Prausnitz, J.M. *Ind.Chem.Eng.Fundam.* 1971,*10*,638.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Kerosine	Messow, U.; Pape, D. *Pol. J. Chem.* 1980, *54*, 2001-2009.

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

EXPERIMENTAL VALUES:

T/K	Mole fraction (1 atm), x_{NH_3}
303.2	0.02513
333.2	0.01698
363.2	0.01227

Total pressure = 1 atm = 1.013×10^5 Pa.

The authors stated that the kerosine had the following properties:

Average molecular weight/g mol^{-1} = 209

Average b.p./K = 462

Molar volume at 25 °C/cm^3 mol^{-1} = 257.75

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The authors claimed to have made measurements in the pressure range from 1 atm to 10 atm but no further experimental results or details were given.	No details given.
	ESTIMATED ERROR:
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH$_3$; [7664-41-7] 2. Diesel fuel	Messow, U.; Pape, D. *Pol. J. Chem.* <u>1980</u>, *54*, 2001-2009.
VARIABLES: Temperature	PREPARED BY: P. G. T. Fogg

EXPERIMENTAL VALUES:

T/K	Mole fraction (1 atm), x_{NH_3}
303.2	0.02127
333.2	0.01577
363.2	0.01195

Total pressure = 1 atm = 1.013×10^5 Pa.

The authors stated that the diesel fuel had the following properties:

Average molecular weight/g mol^{-1} = 234

Average b.p./K = 553

Molar volume at 25 °C/cm^3 mol^{-1} = 300.12

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The authors claimed to have made measurements in the pressure range from 1 atm to 10 atm but no further experimental results or details were given.	No details given.
	ESTIMATED ERROR:
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Ammonia; NH_3; [7664-41-7] (2) Cyclohexane; C_6H_{12}; [110-82-7] 1,4-Dioxane; $C_4H_8O_2$; [123-91-1]	Hentz, R. R.; Sherman, W. V. *J. Phys. Chem.* <u>1968</u>, *72*, 2635-41.

VARIABLES:	PREPARED BY:
$T/K = \sim297$ p_1/kPa not given	H. L. Clever

EXPERIMENTAL VALUES:

Temperature		Ostwald Coefficient
$t/^0C$	T/K	L/cm^3 cm^{-3}
Cyclohexane		
~24	~297	2.0
1,4-Dioxane		
~24	~297	17.

<div align="center">AUXILIARY INFORMATION</div>

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The apparatus consisted of a solvent bulb, a gas and mixing bulb of known volume, and a manometer. A 100 cm³ sample of solvent was placed in the solvent bulb. It was degassed by repeated pumping and shaking. The solvent was brought to the temperature of the measurement and its vapor pressure measured. Gas was added to the gas and mixing bulb, and its pressure measured. The gas was condensed. The degassed solvent was transferred to the bulb. The bulb contents were brought back to the temperature of the measurement and shaken vigorously to establish equilibrium. The pressure was measured and the Ostwald coefficient calculated from the decrease in pressure suitably corrected for the solvent vapor pressure.	(1) Ammonia. Matheson Co., Inc. Purified by three trap to trap distillations. Degassed by pumping at -196 ⁰C. (2) Cyclohexane. Fisher. Spectro-analyzed grade. Passed through silica gel, stored over sodium. 1,4-Dioxane. Matheson, Coleman & Bell. Spectroscopic reagent. Passed over alumina, refuxed over Na under N_2, distilled.
	ESTIMATED ERROR: $\delta L/L = \pm 0.10$ (authors)
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Cyclohexane; C_6H_{12}; [110-82-7]	Kuznetsov, A. I.; Panchenkov, G. M.; Gogoleva, T. V. *Zh. Fiz. Khim.* 1968, *42*, 982-3. (*Russ. J. Phys. Chem.* 1968, *42*, 510-511).

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

EXPERIMENTAL VALUES:

T/K	p_{NH_3}/mmHg	$mol_{NH_3}/mol_{solvent}$	Mole fraction* x_{NH_3}
292.2	760	0.29	0.22

T.e 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:

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

was "satisfactorily" obeyed.

$$760 \ mmHg = 1 \ atm = 1.013 \times 10^5 \ Pa.$$

* 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. "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. Cyclohexane; C_6H_{12}; [110-82-7]	Patyi, L.; Furmer, I. E.; Makranczy, J.; Sadilenko, A. S.; Stepanova, Z. G.; Berengarten, M. G. *Zh. Prikl. Khim.* <u>1978</u>, *51*, 1296-1300.

VARIABLES:	PREPARED BY:
	C. L. Young

EXPERIMENTAL VALUES:

T/K	α^a	Mole fraction of ammonia at a partial pressure of 101.325 kPa x_{NH_3}
298.15	7.52	0.03501

[a] Volume of gas (calculated for 101.325 kPa and 273.15 K) dissolved by one volume of solvent when the partial pressure of gas was 101.325 kPa.

AUXILIARY INFORMATION

METHOD APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The authors stated that they used a static method previously described by Bodor *et al.* (ref. 1). However, Bodor *et al.* described apparatus for use below 0 °C but referred to another paper (ref. 2) in which an apparatus for use above 0 °C was described. Bodor *et al.* stated that, in each case, the volume of gas absorbed by a given quantity of liquid at a particular pressure was measured by a gas burette. Bodor *et al.* gave details of a method of calculating gas solubilities, applicable to either apparatus, with allowance for the vapor pressure of the solvent.	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.* <u>1957</u>, *1*, 55. 2. Schay, G.; Szekely, G.; Racz, Gy.; Traply, G. *Periodica Poly-technica Ser. Chem. Eng. (Budapest)* <u>1958</u>, *2*, 1.

COMPONENTS:	ORIGINAL MEASUREMENTS:

(1) Ammonia; NH_3; [7664-41-7]
 	
(2) Cyclohexane; C_6H_{12}; [110-82-7]
 	
   Methylcyclohexane; C_7H_{14};
   [108-87-2]
	Horsman-van den Dool, L. E. W.;
	   Warman, J. W.
	
	Interuniversity Reactor Institute
	(IRI)-Report 134-81-01

VARIABLES: T/K = 292.5, 297.5
       p_1/kPa   not given
	PREPARED BY:
	
	               H. L. Clever

EXPERIMENTAL VALUES:

Temperature		Ostwald Coefficient	Number of Runs
$t/°C$	T/K	L/cm^3 cm^{-3}	
Cyclohexane			
19.3	292.5	2.36	3
Methylcyclohexane			
24.3	297.5	2.48	2

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
A cylindrical glass container of approximately 15 cm^3 volume is partly filled with solvent and closed with a half-hole septum. An amount of the gaseous solute is added to the container. The closed container is shaken for 30 minutes. Samples of both the vapor and liquid phases are taken in calibrated syringes. The samples are injected into a gas chromatograph. The Ostwald coefficient is calculated from the known sample size and the measured peak areas. The chromatograph is a Hewlett-Packard model 5750 equiped with a thermal conductivity cell detector. The carrier gas is helium. A 90 cm column packed with Porapak Q coated with 10 % polyethyleneimine is used for the separation.	(1) Ammonia. Baker Chemical Co. Anhydrous, 99.99 percent. Used as received. (2) Cyclohexane. Merck Uvasol Spektro-skopie grade. Methylcyclohexane. Fluka. UV-Spektrskopie grade. Impurities which gave the same retention time as the gas are removed before the experiment by adsorption or distillation.

	ESTIMATED ERROR: $\delta L/L$ = ± 0.05

	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7]	Tremper, K.K.; Prausnitz, J.M.
2. 1,1'-Bicyclohexyl; $C_{12}H_{22}$; [92-51-3]	*J. Chem. Engng. Data* 1976, *21*, 295-9

VARIABLES:	PREPARED BY:
Temperature	C.L. Young

EXPERIMENTAL VALUES:

T/K	Henry's Constant[a] /atm	Mole fraction[b] of ammonia at 1 atm partial pressure, x_{NH_3}
300	101.0	0.00990
325	168.0	0.00595
350	213.0	0.00469
375	243.0	0.00412
400	265.0	0.00377
425	285.0	0.00351
450	299.0	0.00334
475	304.0	0.00329

a. Authors stated measurements were made at several pressures and values of solubility used were all within the Henry's Law region.

b. Calculated by compiler assuming linear relationship between mole fraction and pressure.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Volumetric apparatus similar to that described by Dymond and Hildebrand (1). Pressure measured with a null detector and precision gauge. Details in ref. (2).	Solvent degassed. No other details given.
	ESTIMATED ERROR:
	$\delta T/K = \pm 0.1$; $\delta x_{NH_3} = \pm 1\%$
	REFERENCES: 1. Dymond, J.; Hildebrand, J.H. *Ind.Eng.Chem.Fundam.* 1967,*6*,130. 2. Cukor, P.M.;Prausnitz, J.M. *Ind.Eng.Chem.Fundam.* 1971,*10*,638.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Ammonia; NH_3; [7664-41-7] (2) 1,1'-Bicyclohexyl; $C_{12}H_{22}$; [92-51-3]	Horsman-van den Dool, L. E. W.; Warman, J. W. Interuniversity Reactor Institute (IRI)-Report 134-81-01
VARIABLES: T/K = 295.6, 301.2 p_1/kPa not given	PREPARED BY: H. L. Clever

EXPERIMENTAL VALUES:

Temperature		Ostwald Coefficient	Number of Runs
$t/^0C$	T/K	$L/cm^3\ cm^{-3}$	
22.4	295.6	1.77	2
28.0	301.2	1.70	1

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
A cylindrical glass container of approximately 15 cm^3 volume is partly filled with solvent and closed with a half-hole septum. An amount of the gaseous solute is added to the container. The closed container is shaken for 30 minutes. Samples of both the vapor and liquid phases are taken in calibrated syringes. The samples are injected into a gas chromatograph. The Ostwald coefficient is calculated from the known sample size and the measured peak areas. The chromatograph is a Hewlett-Packard model 5750 equiped with a thermal conductivity cell detector. The carrier gas is helium. A 90 cm column packed with Porapak Q coated with 10 % polyethyleneimine is used for the separation.	(1) Ammonia. Baker Chemical Co. Anhydrous, 99.99 percent. Used as received. (2) 1,1'Bicyclohexyl. Fluka. purum grade. Impurities which give the same retention time as the gas are removed before the experiment by adsorption or distillation.
	ESTIMATED ERROR: $\delta L/L$ = ± 0.05
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:

(1) Ammonia; NH_3; [7664-41-7]
 	
(2) cis-Decahydronaphthalene or cis-decalin; $C_{10}H_{18}$; [493-01-6]
 	
  trans-Decahydronaphthalene or trans-decalin; $C_{10}H_{18}$; [493-02-7]
	Horsman-van den Dool, L. E. W.;
	  Warman, J. W.
	
	Interuniversity Reactor Institute
	(IRI)-Report 134-81-01

VARIABLES:	PREPARED BY:
T/K = 300.1, 301.3 p_1/kPa not given	H. L. Clever

EXPERIMENTAL VALUES:

Temperature		Ostwald Coefficient	Number of Runs
$t/^0C$	T/K	L/cm^3 cm^{-3}	
cis-Decalin			
26.9	300.1	1.78	2
trans-Decalin			
28.1	301.3	1.94	1

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
A cylindrical glass container of approximately 15 cm^3 volume is partly filled with solvent and closed with a half-hole septum. An amount of the gaseous solute is added to the container. The closed container is shaken for 30 minutes. Samples of both the vapor and liquid phases are taken in calibrated syringes. The samples are injected into a gas chromatograph. The Ostwald coefficient is calculated from the known sample size and the measured peak areas. The chromatograph is a Hewlett-Packard model 5750 equiped with a thermal conductivity cell detector. The carrier gas is helium. A 90 cm column packed with Porapak Q coated with 10 % polyethyleneimine is used for the separation.	(1) Ammonia. Baker Chemical Co. Anhydrous, 99.99 percent. Used as received. (2) cis-Decalin and trans-Decalin. Merck. Zur Synthese grade. Impurities which give the same retention time as the gas are removed before the experiment by adsorption or distillation.
	ESTIMATED ERROR: $\delta L/L$ = ± 0.05
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH$_3$; [7664-41-7] 2. Cyclohexene; C$_6$H$_{10}$; [110-83-8]	Noda, K.; Morisue, T.; Ishida, K. *J. Chem. Eng. Japan.* <u>1975</u>, *8*, 104-8.

VARIABLES:
 	
  Temperature, pressure
	PREPARED BY:
	
	    C.L. Young

EXPERIMENTAL VALUES:

T/K	P/atm	P/kPa	Mole fraction of ammonia in liquid, x_{NH_3}	in vapor, y_{NH_3}
273.15	1.12	113	0.025	0.922
	1.83	185	0.043	0.953
	2.09	212	0.054	0.961
	2.49	252	0.069	0.973
	3.52	357	0.122	0.985
	3.80	385	0.149	0.984
	4.00	405	0.161	0.988
	4.22	428	0.262*	0.986
	4.21	427	0.808*	0.989
	4.22	428	0.978*	0.988
293.15	1.40	142	0.019	–
	2.45	248	0.035	0.944
	4.62	468	0.092	0.975
	5.80	588	0.130	0.978
	6.46	655	0.161	0.983
	7.25	735	0.206	0.978
	7.81	791	0.255	0.982
	8.34	845	0.384*	0.987
	8.33	844	0.557*	0.984
	8.33	844	0.948*	0.988
	8.35	846	0.966	0.985
	8.38	849	0.978	0.993
	8.41	852	0.983	0.993

* three phase region

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Pyrex glass cell fitted with gaseous sample port and Bourdon pressure gauge. Composition of liquid phase estimated from known volume of system and amounts added. Gas sample analysed by GC. Details in source.	1. Commercial product, fractionated at least four times under pressure. 2. Commercial sample, distilled middle fraction used.

	ESTIMATED ERROR:
	    $\delta T/K = \pm0.02$; $\delta P/kPa = \pm1$;
	    δx_{NH_3}, $\delta y_{NH_3} = \pm0.003$
	    (estimated by compiler)

	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Aromatic compounds	Bell, R.P. *J. Chem. Soc.* <u>1931</u>, 1371-1382.
VARIABLES:	PREPARED BY: C.L. Young

EXPERIMENTAL VALUES:

Solvent	T/K	Partition coefficient, s^+	Mole fraction of ammonia in liquid, x_{NH_3}
Benzene, C_6H_6; [71-43-2]	293.15	9.95	0.0474
Methylbenzene; (Toluene); C_7H_8; [108-88-3]		7.23	0.0313
Bromobenzene; C_6H_5Br; [108-86-1]		8.08	0.0340
Chlorobenzene; C_6H_5Cl; [108-90-7]		11.35	0.0423
Chloromethylbenzene; (Benzyl chloride); C_7H_7Cl; [100-44-7].		12.20	0.0556

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 hydrochloric acid. Excess hydrochloric acid titrated with sodium hydroxide.	1. Obtained from cylinder, no other details given. 2. Merck or Kahlbaum samples dried over calcium chloride and fractionally distilled.

	ESTIMATED ERROR:
	     $\delta T/K = \pm 0.1$; $\delta x_{NH_3} = \pm 1\%$.
	
	     (estimated by compiler)

	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Benzene; C_6H_6; [71-43-2]	Noda, K.; Morisue, T.; Ishida, K. *J. Chem. Eng. Japan.* <u>1975</u>, *8*, 104-8

VARIABLES:	PREPARED BY:
Temperature, pressure	C.L. Young

EXPERIMENTAL VALUES:

T/K	P/atm	P/kPa	Mole fraction of ammonia in liquid, x_{NH_3}	in vapor, y_{NH_3}
273.15	1.48	150	0.079*	0.974
	1.73	175	0.112	0.970
	1.84	186	0.122	0.961
	2.14	217	0.152	-
	2.71	275	0.229	0.974
	3.08	312	0.296	0.982
	3.41	346	0.390	0.987
	3.60	365	0.472	0.984
	3.79	384	0.606	0.988
	3.86	391	0.689	0.991
	3.93	398	0.793	-
	4.03	408	0.901	0.991
	4.12	417	0.957	0.993
293.15	1.35	137	0.046	0.903
	2.78	282	0.109	0.964
	3.81	386	0.164	0.979
	5.34	541	0.290	0.981
	6.21	629	0.396	0.992
	6.82	691	0.510	0.991
	7.18	728	0.598	0.989
	7.60	770	0.769	0.993
	7.65	775	0.794	0.991
	7.67	777	0.799	0.987
	7.90	800	0.883	0.993
	8.34	845	0.978	0.995

*three phase region

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Pyrex glass cell fitted with gaseous sample port and Bourdon pressure gauge. Composition of liquid phase estimated from known volume of system and amounts added. Gas sample analysed by GC. Details in source.	1. Commercial product, fractionated at least four times under pressure. 2. Guaranteed reagent sample.
	ESTIMATED ERROR: $\delta T/K = \pm 0.02$; $\delta P/kPa = \pm 1$; δx_{NH_3}, $\delta y_{NH_3} = \pm 0.003$. (estimated by compiler).
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Benzene; C_6H_6; [71-43-2]	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	α^a	Mole fraction of ammonia at a partial pressure of 101.325 kPa x_{NH_3}
298.15	6.52	0.02573

^{a} Volume of gas (calculated for 101.325 kPa and 273.15 K) dissolved by one volume of solvent when the partial pressure of gas was 101.325 kPa.

AUXILIARY INFORMATION

METHOD APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The authors stated that they used a static method previously described by Bodor *et al.* (ref. 1). However, Bodor *et al.* described apparatus for use below 0 °C but referred to another paper (ref. 2) in which an apparatus for use above 0 °C was described. Bodor *et al.* stated that, in each case, the volume of gas absorbed by a given quantity of liquid at a particular pressure was measured by a gas burette. Bodor *et al.* gave details of a method of calculating gas solubilities, applicable to either apparatus, with allowance for the vapor pressure of the solvent.	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. 2. Schay, G.; Szekely, G.; Racz, Gy.; Traply, G. *Periodica Poly-technica Ser. Chem. Eng. (Budapest)* 1958, *2*, 1.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. Benzene; C_6H_6; [71-43-2] 3. Cyclohexene; C_6H_{10}; [110-83-8]	Noda, K.; Morisue, T.; Ishida, K. *J. Chem. Eng. Japan.* <u>1975</u>, *8*, 104-8.

VARIABLES:	PREPARED BY:
Pressure, composition	C.L. Young

EXPERIMENTAL VALUES:

T/K	p/atm	p/kPa	Mole fraction of § benzene in liquid $x_{C_6H_6}$	in gas, $y_{C_6H_6}$	Mole fraction of ammonia in liquid, x_{NH_3}	in gas, y_{NH_3}
293.15	2.51	254	0.083	0.110	0.048	0.978
	5.53	560		0.086	0.137	0.985
	6.33	641		0.089	0.178	0.989
	7.61	771		0.081	0.278	0.990
	8.26	837		0.072	0.522*	0.990
	8.29	840		0.064	0.752*	0.991
	8.32	843		0.049	0.900*	0.992
	2.48	251	0.212	0.205	0.050	0.972
	3.07	311		0.198	0.067	0.972
	5.91	599		0.215	0.178	0.989
	6.43	652		0.202	0.209	0.987
	7.68	778		0.195	0.336	0.991
	8.16	827		0.155	0.491	0.992
	8.19	830		0.147	0.658*	0.990
	8.22	833		0.132	0.801*	0.993
	8.27	838		0.105	0.915*	0.991
	8.30	841		0.065	0.956	0.992
	1.97	200	0.532	0.492	0.051	0.947
	3.43	348		0.484	0.100	0.979
	4.37	443		0.488	0.147	0.980
	5.95	603		0.465	0.244	0.987
	6.99	708		0.458	0.365	0.991
	7.71	781		0.412	0.572	0.991
	7.94	805		0.376	0.750	0.992

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Pyrex glass cell fitted with gaseous sample port and Bourdon pressure gauge. Composition of liquid phase estimated from known volume of system and amounts added. Gas sample analysed by GC. Details in source.	1. Commercial product, fractionated at least four times under pressure. 2. Guaranteed reagent sample 3. Commercial sample, distilled middle fraction used.

	ESTIMATED ERROR:
	  $\delta T/K = \pm 0.02$; $\delta P/kPa = \pm 1$;
	  δx_{NH_3}, $\delta y_{NH_3} = \pm 0.003$.
	  (estimated by compiler)

	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7]	Noda, K.; Morisue, T.; Ishida, K.
2. Benzene; C_6H_6; [71-43-2]	
3. Cyclohexene; C_6H_{10}; [110-83-8]	*J. Chem. Eng. Japan.* <u>1975</u>, *8*, 104-8

EXPERIMENTAL VALUES:			Mole fraction of § benzene		Mole fraction of ammonia	
T/K	p/atm	p/kPa	in liquid $x_{C_6H_6}$	in gas $x_{C_6H_6}$	in liquid y_{NH_3}	in gas, y_{NH_3}
293.15	8.03	814	0.532	0.321	0.848	0.992
	8.27	838		0.238	0.954	0.993
	1.50	152	0.739	0.698	0.040	0.960
	2.92	296		0.695	0.097	0.961
	3.55	360		0.707	0.130	0.960
	4.74	480		0.665	0.205	0.984
	6.05	613		0.647	0.320	0.989
	6.79	688		0.640	0.426	0.990
	7.05	714		0.635	0.472	0.984
	7.12	721		0.646	0.491	0.991
	7.32	742		0.612	0.552	0.993
	7.74	784		0.553	0.740	0.992
	8.00	811		0.487	0.881	0.992
	8.05	816		0.445	0.898	0.993

§   Mole fraction on ammonia free basis.

*   total composition in two liquid phase region.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH₃; [7664-41-7] 2. Methylbenzene; C₇H₈; [108-88-3]	Gerrard, W.; Maladkar, V.K. *Chem. Ind.* 1970, 925-926. Maladkar, V.K. Thesis, Univ. of London, 1970.

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

EXPERIMENTAL VALUES:

T/K	Moles $_{NH_3}$/moles $_{C_7H_8}$ (1 atm)	Mole fraction* x_{NH_3} (1 atm)
273.2	0.085	0.078

* Calculated by compiler.

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

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
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).	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.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3; [7664-41-7] 2. 1-Methylnaphthalene; $C_{11}H_{10}$; [1321-94-4]	Tremper, K.K.; Prausnitz, J.M. *J. Chem. Engng. Data* 1976, *21*, 295-9
VARIABLES: Temperature	PREPARED BY: C.L. Young

EXPERIMENTAL VALUES:

T/K	Henry's Constant[a] /atm	Mole fraction[b] of ammonia at 1 atm partial pressure x_{NH_3}
300	30.5	0.0328
325	49.6	0.0202
350	68.1	0.0147
375	86.1	0.0116
400	104.0	0.00962
425	121.0	0.00826
450	139.0	0.00719
475	154.0	0.00649

a. Authors stated measurements were made at several pressures and values of solubility used were all within the Henry's Law region.

b. Calculated by compiler assuming linear relationship between mole fraction and pressure.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Volumetric apparatus similar to that described by Dymond and Hildebrand (1). Pressure measured with a null detector and precision gauge. Details in ref. (2).	Solvent degassed, no other details given.
	ESTIMATED ERROR: $\delta T/K = \pm 0.1$; $\delta x_{NH_3} = \pm 1\%$.
	REFERENCES: 1. Dymond, J.; Hildebrand, J.H. *Ind.Eng.Chem.Fundam.* 1967,*6*,130. 2. Cukor, P.M.; Prausnitz, J.M. *Ind.Eng.Chem.Fundam.* 1971,*10*,638.