

COMPONENTS:			ORIGINAL MEASUREMENTS:
1. Ammonia; NH_3 ; [7664-41-7]			Chang, E.T.; Gocken, N.A. Poston, T.M.;
2. Hydrazine; N_2H_4 ; [302-01-2]			<i>J. Chem. Engng. Data.</i> <u>1971</u> , 16, 404-8
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}
278.12	0.3857	39.08	0.0556
	0.6818	69.08	0.1003
	1.0351	104.88	0.1481
298.16	1.9597	198.57	0.3058
	0.2812	28.49	0.0218
	0.5695	54.66	0.0444
	0.8516	86.29	0.0661
313.22	1.2207	123.69	0.0975
	1.9332	195.88	0.1553
	0.3305	33.49	0.0171
	0.6661	67.49	0.0334
	1.0049	101.82	0.0501
	1.3176	133.51	0.0689
	2.1154	214.34	0.1125
+ partial pressure of ammonia.			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
Volumetric apparatus consisting of solvent vessel and buret with three calibrated bulbs. Pressure measured with mercury manometer and cathetometer. Solvent stirred with magnet enclosed in glass. Mole fraction absorbed calculated from knowledge of amount of gas before and after absorption. Solvent carefully degassed.		1. Research grade gas, purity 99.99 mole per cent minimum.	
		2. Sample of purity 99 mole per cent further purified by double vacuum distillation.	
		ESTIMATED ERROR: $\delta T/\text{K} = \pm 0.1$; $\delta p/\text{kPa} = \pm 0.01$; $\delta x_{\text{NH}_3} < \pm 2\%$.	
		REFERENCES:	

COMPONENTS:			ORIGINAL MEASUREMENTS:
1. Ammonia; NH ₃ ; [7664-41-7]			Chang, E.T.; Gocken, N.A. Poston, T.M.
2. Methylhydrazine; N ₂ H ₃ CH ₃ ; [60-34-4]			<i>J. Chem. Engng. Data.</i> <u>1971</u> , 16, 404-8
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}
253.17	0.1561	15.82	0.0786
	0.2693	27.29	0.1310
273.15	0.1825	18.49	0.0424
	0.5266	53.36	0.1157
293.15	0.3425	34.70	0.0423
	0.6206	62.88	0.0752
	1.0055	101.88	0.1190
+ partial pressure of ammonia.			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
Volumetric apparatus consisting of solvent vessel and buret with three calibrated bulbs. Pressure measured with mercury manometer and cathetometer. Solvent stirred with magnet enclosed in glass. Mole fraction absorbed calculated from knowledge of amount of gas before and after absorption. Solvent carefully degassed.		1. Research grade gas, purity 99.99 mole per cent minimum.	
		2. Sample of purity 99 mole per cent, further purified by double vacuum distillation.	
		ESTIMATED ERROR:	
		$\delta T/K = \pm 0.1$; $\delta p/kPa = \pm 0.01$; $\delta x_{\text{NH}_3} < \pm 2\%$	
		REFERENCES:	

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. Ammonia; NH_3 ; [7664-41-7] 2. 1,1-Dimethylhydrazine; $\text{N}_2\text{H}_2(\text{CH}_3)_2$ [57-14-7]		Chang, E.T.; Gocken, N.A.; Poston, T.M. <i>J. Chem. Engng. Data.</i> <u>1971</u> , 16, 404-8	
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}
253.17	0.0752	7.62	0.0320
	0.2328	23.59	0.0973
	0.9413	95.38	0.3315
273.15	1.5035	152.34	0.6222
	0.3133	31.75	0.0650
	0.4827	48.91	0.0982
	1.1635	117.89	0.2456
293.14	1.8406	186.50	0.3963
	0.3336	33.80	0.0363
	0.7237	73.33	0.0786
	0.9594	97.21	0.1042
	1.4999	151.98	0.1662
	2.1459	217.43	0.2377
+ partial pressure of ammonia.			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
Volumetric apparatus consisting of solvent vessel and buret with three calibrated bulbs. Pressure measured with mercury manometer and cathetometer. Solvent stirred with magnet enclosed in glass. Mole fraction absorbed calculated from knowledge of amount of gas before and after absorption. Solvent carefully degassed.		1. Research grade gas, purity 99.99 mole per cent minimum.	
		2. Sample of purity 99 mole per cent further purified by vacuum distillation.	
		ESTIMATED ERROR:	
		$\delta T/\text{K} = \pm 0.1$; $\delta p/\text{kPa} = \pm 0.01$; $\delta x_{\text{NH}_3} < \pm 2\%$.	
		REFERENCES:	

<p>COMPONENTS:</p> <p>1. Ammonia; NH_3; [7664-41-7]</p> <p>2. Benzenamine (aniline); $\text{C}_6\text{H}_7\text{N}$; [62-53-3]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Stoica, T.; Bota, T. D.; Teusdea, G. M.; Sarbu, L.; Herscovici, J.</p> <p><i>Rev. Chim. (Bucharest)</i> <u>1981</u> 32, 1018-1019.</p>	
<p>VARIABLES:</p> <p style="text-align: center;">Temperature</p>	<p>PREPARED BY:</p> <p style="text-align: center;">P. G. T. Fogg</p>	
<p>EXPERIMENTAL VALUES:</p>		
<p style="text-align: center;">T/K</p>	<p style="text-align: center;">Bunsen coefficient# β</p>	<p style="text-align: center;">Mole fraction*, x_{NH_3}</p>
<p style="text-align: center;">298.2</p>	<p style="text-align: center;">33.34</p>	<p style="text-align: center;">0.1198</p>
<p style="text-align: center;">323.2</p>	<p style="text-align: center;">17.29</p>	<p style="text-align: center;">0.0672</p>
<p style="text-align: center;">343.2</p>	<p style="text-align: center;">10.04</p>	<p style="text-align: center;">0.0409</p>
<p style="text-align: center;">368.2</p>	<p style="text-align: center;">4.60</p>	<p style="text-align: center;">0.0196</p>
<p style="text-align: center;">393.2</p>	<p style="text-align: center;">1.59</p>	<p style="text-align: center;">0.0070</p>
<p style="text-align: center;">423.2</p>	<p style="text-align: center;">1.07</p>	<p style="text-align: center;">0.0049</p>
<p># Volume of NH_3 (corrected to 273.2K and 1atm) dissolved by one volume of $\text{C}_6\text{H}_7\text{N}$ when the total pressure is 1 atm. (Incorrectly stated by the authors to be the Bunsen α coefficient.)</p> <p>* Calculated by the compiler using densities of benzenamine given in ref. 1. Values correspond to a total pressure equal to barometric (unspecified).</p>		
<p>AUXILIARY INFORMATION</p>		
<p>METHOD APPARATUS/PROCEDURE:</p> <p>Benzenamine was saturated with ammonia at a total pressure equal to barometric pressure (unspecified) by bubbling the gas through a known volume of liquid. The dissolved ammonia was then removed from the solution by a stream of air which, in turn, passed through a known volume of standard sulfuric acid. The ammonia was then estimated by back titration. The authors do not seem to have made any allowance for the vapor pressure of the benzenamine.</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <p style="text-align: center;">No details given.</p>	
	<p>ESTIMATED ERROR:</p>	
	<p>REFERENCES:</p> <p>1. Timmermans, J. <i>Physico-Chemical Constants of Pure Organic Compounds</i>, Vol. 2, Elsevier, New York, <u>1965</u>.</p>	

COMPONENTS:		ORIGINAL MEASUREMENTS:		
1. Ammonia; NH ₃ ; [7664-41-7] 2. Amines and quinoline		Kuznetsov, A. I.; Panchenkov, G. M.; Gogoleva, T. V. <i>Zh. Fiz. Khim.</i> <u>1968</u> , <i>42</i> , 982-3 (<i>Russ. J. Phys. Chem.</i> <u>1968</u> , <i>42</i> , 510-11).		
VARIABLES:		PREPARED BY: P. G. T. Fogg		
EXPERIMENTAL VALUES:				
Solvent	T/K	p_{NH_3} /mmHg	Mole ratio mol _{NH₃} / mol _{solv.}	Mole fraction* x_{NH_3}
Benzenamine (aniline); C ₆ H ₇ N; [62-53-3]	291.2	760	0.15	0.13
2-Aminoethanol; C ₂ H ₇ NO; [141-43-5]	290.2	760	0.23	0.19
<i>N,N</i> -Diethylethanamine (triethylamine); C ₆ H ₁₅ N; [121-44-8]	294.2	760	0.09	0.08
Quinoline; C ₉ H ₇ N; [91-22-5]	291.2	760	0.06	0.06
<p>The authors stated that the total pressure was varied from about 100 mmHg to about 800 mmHg but only solubilities at $p_{\text{NH}_3} = 760$ mmHg were reported.</p> <p>The authors also stated that Henry's law in the form:</p> $\text{mol}_{\text{NH}_3} / \text{mol}_{\text{solvent}} = p_{\text{NH}_3} \times \text{constant}$ <p>was "satisfactorily" obeyed.</p> <p>* Calculated by the compiler. 760 mmHg = 1 atm = 1.013×10^5 Pa.</p>				
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 the allowance was not stated.		1. Obtained from a commercial cylinder.		
		2. "Pure" grade.		
		ESTIMATED ERROR: $\delta T/K = \pm 0.5$; $\delta p/\text{mmHg} = \pm 0.5$ (estimated by the authors).		
		REFERENCES:		

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. Ammonia; NH_3 ; [7664-41-7] 2. Hexanedinitrile (adiponitrile); $\text{C}_6\text{H}_8\text{N}_2$; [111-69-3]		Freidson, G. S.; Furmer, I. E.; Amelin, A. G. 1974, VINITI deposited document 1543-74.	
VARIABLES:		PREPARED BY:	
Temperature, pressure		P. G. T. Fogg	
EXPERIMENTAL VALUES:			
T/K	$p_{\text{NH}_3} / \text{mmHg}^*$	Volume of gas, corrected to 273.2 K and 760 mmHg, dissolved by one volume of solvent.*	Mole fraction [#] x_{NH_3}
283.2	67	3.7	0.018
	129	6.6	0.032
	287	14.7	0.068
	421	22.6	0.101
	530	28.2	0.123
	691	36.3	0.153
	719	38.2	0.160
	298.2	127	4.3
224		7.6	0.037
335		10.9	0.052
465		15.4	0.071
519		17.5	0.080
592		19.8	0.090
651		21.8	0.098
712		24.2	0.108
(cont.)			
* Values taken, by the compiler, from a graph showing experimental points which was given by the authors. # Calculated by the compiler using the density of the solvent at 20°C given in ref. 1. No allowance was made for change of density with temperature.			
AUXILIARY INFORMATION			
METHOD APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
A quantity of ammonia, measured by changes in pressure of a known volume, was allowed into contact with a known volume of solvent in a thermostatted absorption vessel. The liquid in this vessel was magnetically stirred and the final pressure of gas in contact with solution was measured (refs. 2-4). The authors gave the results in graphical form with volume of gas (corrected to 273.2 K and 1 atm) absorbed by one volume of solvent plotted as a function of gas pressure. One graph corresponded to pressures below 1 atm. In this case experimental points lay close to straight lines. Henry's law constants, based on these measurements below 1 atm, were given by the authors. A second graph corresponded to higher pressures. There was not a linear variation of corrected volume of gas absorbed with variation of pressure at these higher pressures.		No information given.	
		REFERENCES:	
		1. <i>Handbook of Chemistry and Physics</i> (63rd edition), C.R.C. Press, Cleveland, Ohio, 1982. 2. Shenderei, E.R.; Zel'venskii, Ya. D.; Ivanovskii, F.P. <i>Khim. Prom.</i> 1960, 370. 3. Braude, G. E.; Shakhova, S. F. <i>Khim. Prom.</i> 1961, 177. 4. Braude, G. E.; Leites, I. L.; Dedova, I. V. <i>Khim. Prom.</i> 1961, 232.	

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. Ammonia; NH ₃ ; [7664-41-7]		Freidson, G. S.; Furmer, I. E.;	
2. Hexanedinitrile (adiponitrile); C ₆ H ₈ N ₂ ; [111-69-3]		Amelin, A. G. 1974, VINITI deposited document 1543-74.	
EXPERIMENTAL VALUES:		Volume of gas, corrected to 273.2 K and 760 mmHg, dissolved by one volume of solvent.*	
T/K	p _{NH₃} / mmHg*		Mole fraction [#] x _{NH₃}
313.2	113	2.7	0.013
	202	4.6	0.022
	329	7.2	0.035
	401	9.1	0.043
	506	11.5	0.054
	674	15.5	0.072
328.2	715	16.3	0.075
	156	2.5	0.012
	300	4.4	0.021
	422	6.3	0.030
	495	7.6	0.037
	588	8.6	0.041
343.2	690	10.5	0.050
	714	10.8	0.051
	153	1.9	0.009
	241	3.0	0.015
	343	3.9	0.019
	420	4.9	0.024
	515	6.4	0.031
	577	6.9	0.033
	665	8.5	0.041
	712	8.9	0.043
* Values taken, by the compiler, from a graph showing experimental points which was given by the authors.			
# Calculated by the compiler.			
T/K	Henry's constant** /mmHg		
283.2	4480		
298.2	6720		
313.2	9610		
328.2	14080		
** Henry's constant = p _{NH₃} / x _{NH₃} .			
These values of the Henry's law constant are based upon measurements at pressures up to 1 atm and should not be used for calculating solubilities at higher pressures. The authors gave the following equation for the Henry's law constant, K _H .			
$\log_{10}(K_H/\text{mmHg}) = 7.19 - (1008/T).$			
However, the compiler considers that the values are better fitted by the following equation:			
$\log_{10}(K_H/\text{mmHg}) = 7.26 - (1023/T).$			
(cont.)			

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. Ammonia; NH ₃ ; [7664-41-7]		Freidson, G. S.; Furmer, I. E.;	
2. Hexanedinitrile (adiponitrile); C ₆ H ₈ N ₂ ; [111-69-3]		Amelin, A. G. 1974, VINITI deposited document 1543-74.	
EXPERIMENTAL VALUES:			
T/K	p_{NH_3} / atm *	Volume of gas, corrected to 273.2 K and 760 mmHg, dissolved by one volume of solvent.*	Mole fraction [#] x_{NH_3}
283.2	2.57	125	0.38
	3.13	176	0.47
	3.57	245	0.55
	4.21	359	0.64
	4.63	522	0.72
	5.62	1152	0.85
298.2	3.24	101	0.34
	6.18	359	0.64
	6.79	429	0.68
	6.98	502	0.71
	7.35	587	0.75
	8.00	891	0.82
	8.39	1064	0.84
	10.37	629	0.76
313.2	2.16	37	0.16
	4.58	108	0.35
	5.88	157	0.44
	7.13	230	0.53
	7.46	243	0.55
	7.78	274	0.58
	8.26	305	0.60
	9.06	370	0.65
	10.37	629	0.76
	11.54	1004	0.83
328.2	3.46	43	0.18
	4.88	67	0.25
	5.84	89	0.31
	7.11	115	0.36
	9.08	211	0.51
	10.24	258	0.56
	11.43	341	0.63
	11.89	377	0.65
	12.97	499	0.71
	14.14	712	0.78
	15.67	1173	0.85

* Values taken, by the compiler, from a graph showing experimental points which was given by the authors.

Calculated by the compiler.

760 mmHg = 1 atm = 1.013 × 10⁵ Pa.