,

COMPONENTS:	EVALUATOR:
1. Methan-d ₃ -amine; CH ₃ D ₂ N; $[5581-55-5]$ Methanamine-d ₂ ; CH ₃ D ₂ N; $[2614-35-9]$ Methanamine-d ₂ : CD ₂ N: $[3767-37-1]$	P. G. T. Fogg, School of Chemistry,
Ethanamine- d_2 ; $C_2H_5D_2N$; [5852-45-0]	Polytechnic of North London, Holloway,
<pre>N-Methylmethanamine-d; C2H6DN; [917-72-6] N-(Methyl-d3)-methan-d3-amine;</pre>	London N7 8DB, United Kingdom
$C_{2}HD_{6}N;$ [14802-36-9]	October 1983
$C_2D_7N;$ [22024-52-8]	
1-Propanamine-d ₂ ; C ₃ H ₇ ND ₂ ; [25837-80-3] 2-Propanamine-d ₂ ; C ₃ H ₇ ND ₂ ; [7395-10-0]	
2. Organic liquids	
The variation of total vapor pressure with var	iation of concentration has
been measured by Wolff <i>et al.</i> (1-6) for soluti propanamines, <i>N</i> -deuterated ethanamine and deut in hexane. In addition measurements have bee ethanamine in butane and on <i>N</i> -deuterated metha methanamine. In each case the variation of p component with variation of composition may be values for the system containing the correspon also studied by Wolff <i>et al.</i>	ons of deuterated methanamines, erated N-methylmethanamines n made on N-deuterated namine in N,N-dimethyl- eartial pressure of either calculated and compared with ding non-deuterated amine,
The relative solubilities of a deuterated and deuterated amine in the same solvent depent up partial pressure. Differences may be up to a been discussed by Wolff <i>et al.</i> in terms of rel the same mole fraction concentration.	a corresponding non- on the temperature and the bout 10%. Differences have ative partial pressures at
On the basis of the systems which have been st	udied it appears that, at all
groups are more volatile than the correspondin	g unsubstituted amines under
the same conditions. At low concentrations m which have deuterium atoms substituted on the	ost of the amines studied nitrogen atom are also more
volatile than the corresponding amines contain	ing = $\dot{N}H$ or $-NH_2$ groups.
at the same partial pressure and temperature,	the deuterated compound may
et al. showed that differences may be due to c	hanges in vibrational fre-
quencies causing changes in partition function between condensed and gaseous state.	s governing the distribution
Increase in concentration causes the partial p amine to decrease relative to that of the corr pound. The effect is more marked the lower to to the N-deuterated compound having the greated partial pressure and temperature. Wolff <i>et a</i> due to N-deuterated amines having a greater tex liquid phase than the corresponding N-hydrogen by deuterium atoms is stronger than hydrogen be that effects due to association are likely to b	ressure of a N-deuterated esponding N-hydrogen com- he temperature and may lead r solubility at the same 1. considered that this was ndency to associate in the compounds because bonding onding. It was pointed out be enhanced with decrease in
There appears to be no investigations of phase	oquilibria in doutorated
amine systems by other workers for comparison we have a systems by other workers for comparison we have the opinion of the evaluator, this of high standard and should be accepted as rel:	with the work of Wolff <i>et al.</i> work is self-consistent and iable.
References	
1. Wolff, H.; Höpfner, A.	10-716
2. Wolff, H.; Höpfner, A.	10-/10.
Ber. Bunsenges. Phys. Chem. <u>1967</u> , 71, 4 3. Wolff, H.; Hoppel, HE.	61-466.
Ber. Bunsenges. Phys. Chem. <u>1966</u> , 70, 8 [°] 4. Wolff. H.: Wirtz R	74-883.
Ber. Bunsenges. Phys. Chem. <u>1968</u> , 72, 10 Wolff H. Wührtz	01-109.
Z. Phys. Chem. (Frankfurt am Main) <u>1969</u>	, 67, 115-121.
6. WOLTT, H.; Shadiakhy, A. Fluid Phase Equilibria <u>1983</u> , 11, 267-28	7.

COMPONENTS:			ORIGINAL MEASU	REMENTS :		
l. Methan-	damine; CH_I	D _n N;	Wolff, H.; Höpfner, A.			
[5581	-55-5]	3	Ber. Bunsenges. Phys. Chem.			
			1967, 71, 461-466.			
2. Hexane;	$C_{6}^{H}_{14}; [110-5]$	4-3]				
VARIABLES:			PREPARED BY:			
Comp	osition, tempe	erature	1 :	P. G. T. Fogg		
_	•					
EXPERIMENTAL.	VALUES		l			
Vari temperatu	ation of the t	otal vapor pr	CH_D_N in th	with variation e liquid phase	n of	
comperatu			02-3 in on	e rrdara buab	^{CH} 2 ^D 3 ^N	
			T/K			
^x CH_D_N	218.15	233.15	253.15	273.15	293,15	
0	1.4	3.8	14.1	45.2	120.8	
0.00905	7.9	16.0	39.1	90.1	192.8	
0.0187	13.8	27.7	64.5	135.3	267.1	
0.0392	23.5	40.0	170.2	223.5	414./ 627.5	
0.1023	37.0	85.0	209.4	433.3	793.7	
0.128	39.5	93.2	235.8	497.0	919.0	
0.145	40.6	97.3	250.6	532.6	990.2	
0.185	42.1 43 2	108.3	278.6	607.6	1253 2	
0.263	44.2	112.5	313.1	704.8	1372.2	
0.305	45.0	115.2	324.4	746.4	1464.5	
0.340	45.1	116.9	333.8	774.4	1538.8	
0.379	45.2	118.1	341.4	800.6	1611.6	
0.419	45.5	120.2	352.5	841.7	1728.6	
0.488	45.9	120.7	356.5	856.7	1771.3	
0.517	45.9	121.4	358.9	868.0	1804.9	
				Cor	nt.	
	······	AUXILIARY	INFORMATION			
METHOD APPARA	IUS/PROCEDURE:		SOURCE AND PUR	TTY OF MATERIALS		
Apparatus	described prev	iously was	1. CD ₃ NH ₃ C1	from Merck wa	as treated	
used (1).	Liquid mixtur	es oi tion were	with KOH	and gave CD ₃ N	which	
introduced	into a cell h	eld in a	fraction	ation as for ($CH_{2}ND_{2}$ (4).	
thermostat	controlled to	± 0.02 ⁰ C.			3 2	
The total	pressure was m	easured by	2. Supplied	by Fluka; pu	rity	
a mercury	manometer.		99.96 mo	1 б.		
The author	s calculated a	ctivity				
coefficien	ts of each com	ponent by a				
Constants	for Redlich-Ki	ster(3)		<u> </u>		
equations	for activity c	oefficients	ESTIMATED ERRO	R:		
were evalu	ated and repor	ted.	$\delta T/K = \pm 0.0$	02 (estimate	ed by authors	
			PEEEDENCUS.			
			1. Wolff, H	; Höpfner, A.	Z. Elektro-	
			chem. <u>19</u>	<u>62</u> , 66, 149.	at	
			2. Barker, 6	J.A. Aust. J.	cnem. 1953,	
			3. Redlich,	O.; Kister, A	.T. Ind. Eng	
			Chem. <u>19</u>	48, 21, 345.	D.u. D	
			4. WOLIT, H aes. Phu	.; норгпег, А. <u>s. Chem.</u> 1965.	вег. Bunsen 69, 710.	

COMPONENTS:	<u></u>		ORIGINAL MEASUR	REMENTS:	
1. Methan-o	1 ₃ -amine; CH ₂ D	3 ^N ;	Wolff, H.;	Höpfner, A.	
[5581-55-5]		Ber. Bunser	iges. Phys. Ch	iem.	
2. Hexane;	C ₆ H ₁₄ ; [110-5	4-3]	<u>1967</u> , 71, 4	461-466.	
VARIABLES:		<u></u>	PREPARED BY:		
Compos	sition, temper	ature	1	P. G. T. Fogg	
-	-				
EXPERIMENTAL V	ALUES: Cont.				
^{<i>x</i>} CH ₂ D ₃ N	218.15	233.15	253.15	273.15	293.15
					······································
0.540	46.2	121.6	360.9	876.8	1829.2 1861 6
0.601	45.0	121.9	366.4	896.1	1889.5
0.623	45.7	122.4	367.7	902.7	1909.6
0.709	45.7	123.4	373.5	925.8	1979.0
0.715	45.8	122.9	373.8	927.9	1986.5
0.785	45.7	124.4	384.8	946.4	2035.0
0.897	46.1	126.4	389.4	982.0	2132.4
0.946	47.0	128.4	396.2 407.4	1003.0	2186.5
- -	40.0	20200			
					}

COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. Methan-d₃-amine; CH₂D₃N; [5581-55-5]</pre>	Wolff, H.; Höpfner, A. Ber. Bunsenges. Phys. Chem.
2. Hexane; C ₆ H ₁₄ ; [110-54-3]	<u>1967</u> , 71, 461-466.

EXPERIMENTAL VALUES:

	the Redlich-Kister equations given below				
т/к	А	В	с	D	E
218.15	2.385	0.094	0.421	-0.012	0.106
223.15	2.338	0.107	0.413	+0.072	0.136
233.15	2.208	0.121	0.351	+0.074	0.080
243.15	2.087	0.147	0.301	+0.093	0.069
253.15	1.959	0.165	0.268	+0.094	0.043
263.15	1.832	0.179	0.231	+0.090	0.027
273.15	1.708	0.191	0.206	+0.080	0.006
283.15	1.585	0.200	0.188	+0.074	-0.006
293.15	1.467	0.203	0.179	+0.067	-0.022

Constants for calculation of activity coefficients from

$$\ln f_{1} = A x_{2}^{2} - B x_{2}^{2} (1 - 4 x_{1}) + C x_{2}^{2} (1 - 8 x_{1} + 12 x_{1}^{2}) - D x_{2}^{2} (1 - 12 x_{1} + 36 x_{1}^{2} - 32 x_{1}^{3}) + E x_{2}^{2} (1 - 16 x_{1} + 72 x_{1}^{2} - 128 x_{1}^{3} + 80 x_{1}^{4}) \ln f_{2} = A x_{1}^{2} + B x_{1}^{2} (1 - 4 x_{2}) + C x_{1}^{2} (1 - 8 x_{2} + 12 x_{2}^{2}) + D x_{1}^{2} (1 - 12 x_{2} + 36 x_{2}^{2} - 32 x_{2}^{3}) + E x_{1}^{2} (1 - 16 x_{2} + 72 x_{2}^{2} - 128 x_{2}^{3} + 80 x_{2}^{4})$$
where f_{1} = activity coefficient of methan-d₃-amine
 f_{2} = activity coefficient of hexane
 x_{1} = mole fraction of methan-d₃-amine in the liquid phase

 x_2 = mole fraction of hexane in the liquid phase

COMPONENTS :		ORIGINAL MEASUREME	ENTS:	
<pre>1. Methanamine-d₂; CH₃D₂N; [2614-35-9] 2. Hexane; C₆H₁₄; [110-54-3]</pre>		Wolff, H.; Höpfner, A. Ber. Bunsenges. Phys. Chem. <u>1965</u> , 69, 710-716.		
VARIABLES:		PREPARED BY:		
Composition, temperate	ıre	Р.	G. T. Fogg	
EXPERIMENTAL VALUES:				
Variation of the total vapo and of mole fraction	or pressure of CH3D2N	e/Torr with vari in the liquid p /w	ation of temphase, ^x CH ₃ D ₂	perature N
	Т			
^x CH ₃ D ₂ N 218.15	233.15	253.15	273.15	293.15
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	3.7 17.8 28.9 44.1 52.4 60.8 66.7 75.9 82.4 89.3 94.4 98.6 100.6 103.5 104.6 105.9 106.7 107.5	14.3 43.1 66.8 102.2 122.4 144.7 161.3 189.8 211.7 237.3 257.1 274.2 286.2 300.3 307.5 315.9 320.7 324.8	45.4 96.9 140.3 207.5 247.2 294.1 330.6 393.3 447.7 513.2 568.6 620.5 657.8 704.7 729.2 758.9 778.8 794.5	121.0 204.0 275.1 388.6 458.0 540.7 606.3 724.7 830.1 965.9 1086.2 1204.7 1292.0 1411.9 1474.9 1558.6 1613.6 1660.8 Cont.
	AUXILIARY	INFORMATION		
METHOD/APPARATUS/PROCEDURE: Apparatus described previous used (1). Liquid mixtures of accurately known composition introduced into a cell held thermostat controlled to ± (The total vapor pressure was by a mercury manometer. The authors calculated active coefficients of each compone method described by Barker (Constants for Redlich-Kister for activity coefficients we evaluated and reported.	sly was of n were in a 0.02°C. s measured vity ent by a 2). c equations are	<pre>SOURCE AND PURITY 1. Prepared fr repeatedly first and 1 pressures w than 0.5 To scopic meas the product 2. Material of over P₂O₅; ly fraction last fracti pressures a manometer (ESTIMATED ERROR:</pre>	OF MATERIALS: om CH ₃ NH ₂ and fractionated ast fraction ast fraction of mathematical of mathematical was 98-99% p high purity distilled and ated until f: ons had the s indicated by (estimated by Copfner, A. 2. 66, 149. Aust. J. Ch ; Kister, A.7 1948, 21, 345	d D ₂ O; until s had vapor d by less Spectro- icated that oure. d repeated- irst and same vapor by a <i>elektro-</i> <i>em.</i> <u>1953</u> , <i>i. Ind.</i>

COMPONENTS:			ORIGINAL MEASUREM	ENTS:	
 Methanan [2614- Hexane; 	mine-d ₂ ; CH ₃ D ₂ N; -35-9] ^C 6 ^H 14; [110-54-	-3]	Wolff, H.; H& Ber. Bunsenge <u>1965</u> , 69, 710	Spfner, A. es. Phys. Cher 0-716.	n .
VARIABLES:			PREPARED BY:		
Compo	osition, tempera	ature	Ρ.	G. T. Fogg	
EXPERIMENTAL V	ALUES: Cont.	<u>uesan. 100 - 2 10</u>	т/к		
[∞] CH ₃ D ₂ N	218,15	233.15	253.15	273.15	293.15
0.535 0.567 0.629 0.680 0.730 0.802 0.872 0.918 0.957 0.972 1	40.0 39.9 40.3 40.2 40.0 40.3 40.1 40.4 41.1 41.2 41.4 ponstants for cal	108.3 108.5 109.1 109.4 110.4 110.6 111.4 112.5 114.0 114.5 116.1	329.9 331.8 336.0 339.0 341.2 346.3 351.0 355.9 361.0 363.5 368.7 activity coeff	815.6 824.1 840.7 853.3 864.5 881.6 899.7 915.2 930.7 937.6 950.2	1727.1 1753.0 1805.6 1842.6 1876.5 1928.3 1980.7 2021.5 2059.4 2074.8 2107.7
	T/K	h-Kister eq A	ations given b B	c C	
	218.15 223.15 228.15 233.15 243.15 253.15 263.15 273.15 283.15 293.15	2.460 2.377 2.320 2.252 2.135 2.008 1.884 1.764 1.640 1.519	0.141 0.110 0.124 0.122 0.148 0.166 0.185 0.201 0.207 0.211	0.601 0.508 0.458 0.405 0.325 0.269 0.221 0.190 0.163 0.142	•
$ \ln f_1 \\ \ln f_2 \\ where f \\ f \\ x \\ x \\ x x $	= $A x_2^2 - B$ = $A x_1^2 + B$ 1 = activity co 2 = activity co 1 = mole fracti 2 = mole fracti	$x_{2}^{2}(1 - 4 x_{1})$ $x_{1}^{2}(1 - 4 x_{2})$ efficient of efficient of on of methan on of hexane) + C $x_2^2(1)$) + C $x_1^2(1)$ methanamine-d hexane amine-d_in th in the liquid	$- 8 x_1 + 12 x_2$ $- 8 x_2 + 12 x_2$ 2 e liquid phase phase	e

Solubilities of Deuterated Amines

COMPONENTS:			ORIGINAL MEASUREMENTS:			
1. Methana	amine-d ₅ ; CD ₅ N;	[3767-37-1]	Wolff, H.; Höpfner, A.			
2 Hoyano.	сн. [110-54	-31	Ber. Bunsenge	s. Phys. Chem.		
z. nexane,	6"14' [110 54	5]	<u>1967</u> , 71, 461-466.			
NADIADI PC .						
VARIABLES.			PREPARED BY:			
Comp	position, temper	ature	Р.	G. T. Fogg		
EXPERIMENTAL	VALUES:					
Variation of the total vapor pressure/Torr with variation of temperature and of mole fraction of $CD_{s}N$ in the liquid phase.					erature	
			у Т/К			
[∞] cd ₅ №	218.15	233.15	253.15	273.15	293.15	
0	1.0	3.7	14.3	45.4	121.0	
0.0112	9.4	19.2	45.8	101.7	211.1	
0.0221	15.7 20.6	32.1 42.8	73.6 98.5	199.7	373.6	
0.0434	24.3	51.9	119.8	242.2	447.3	
0.0538	27.2	59.2	139.5	281.7	516.3	
0.0737	29.8 31.4	70.7	171.4	350.1	638.8	
0.0878	33.7	77.1	190.4	392.7	719.5	
0.1016	35.0	82.2	206.9	431.1 462.1	792.6	
0.154	38.6	94.9	252.2	547.7	1032.0	
0.191	40.0	100.3	274.1	609.4	1167.6	
0.238	40.9	105.0	294.4	668.8	1311.2	
0.239	40.9	107.2	304.7	702.5	1386.7	
0.308	41.6	108.5	313.0	732.5	1463.7	
0.336	41.2 41.6	109.2	318.8	785.4	1609.9	
0.000				Cont.		
		AUXILIARY	INFORMATION			
METHOD/APPARA	TUS/PROCEDURE:		SOURCE AND PURITY	OF MATERIALS:		
Apparatus	described previ	OUSLY WAS	L CD NH CL fr	om Merck was t	reated	
used (1).	Liquid mixture	s of	with KOH to	give CD ₂ NH ₂ w	hich was	
accurately	known composit	ion were	then allowe	d to react wit	h D ₂ 0 to	
thermostat	controlled to	$\pm 0.02^{\circ}C.$	repeated fr	actionation as	for	
The total	vapor pressure	was	CH_3ND_2 (4).			
measured b	y a mercury man	ometer.	2 Supplied by	שר דוצא א כ		
The author	s calculated ac	tivity	99.96 mol %		Jurity	
coefficien	ts of each comp	onent by a				
Constants	for Redlich-Kis	r (2). ter(3)				
equations	for activity co	efficients	ESTIMATED ERROR:			
were evalu	ated and report	ed.	$\delta T/K = \pm 0.02$	(authors' esti	mate)	
			REFERENCES:	Hönfner A 7	Elektro-	
			chem. <u>1962</u> ,	66, 149.	m 1053	
			6, 207.	•	···· <u>1999</u> /	
			3. Redlich, O. Chem. 1948,	; Kister, A.T. 21, 345.	ind. Eng.	
			4. Wolff, H.; ges. Phys.	Höpfner, A. <i>Be</i> Chem. 1965. 69	r. Bunsen- .710.	

COMPONENTS:	·····		ORIGINAL MEASUREMENTS:			
l. Methar	namine-d ₅ ; CD ₅ N;	[3767-37-1]	Wolff, H; Höpfner, A.			
2. Hexane	e; C _c H ₁₄ ; [110-54	-3]	Ber. Bunsenge	s. Phys. Chem.		
	0 I4		<u>1967</u> , 71, 461	-466.		
VARIABLES:			PREPARED BY:	,,,,,,,,_,,_,,_,,_,,,,,,,,,,		
Comp	osition, tempera	ture	P.	G. T. Fogg		
EXPERIMENTAL	VALUES: Cont.					
			т/к			
^x CD _c N	218.15	233.15	253.15	273.15	293.15	
0.436	41.0	111.0	332.8	806.1	1666.0	
0.452	41.6	111.8	334.5	812.5	1684.9	
0.479	41.2	112 5	337.3	823.0	1/1/.0	
0.522	41 5	112.5	341.4	030.3	1001 6	
0.501	41.5	113.0	345.7	863 7	10/1 6	
0.663	41.7	113.5	349.3	877 0	1885 4	
0 717	41.7	114.3	353.0	889.3	1922 0	
0.786	41.8	114.4	357.0	905.4	1973.4	
0.838	41.6	115.0	360.6	919.0	2011.6	
0.910	42.3	116.5	367.3	942.4	2075.1	
0.942	42.6	118.0	371.6	954.3	2105.5	
0.979	42.9	119.4	377.5	972.0	2146.3	
1	43.2	120.2	380.4	981.6	2170.4	
]						
	760 Torr =	1 atm = 1.0	13 x 10 ⁵ Pa.			
	Constants for ca the Redli	alculation of tch-Kister ec	activity coeff ations given b	icients from elow.		
т/к	А	в	c	D .	Е	
	<u></u>					
218.15	2.456	0.050	0.445	0.140	0.275	
223.15	2.399	0.089	0.436	0.087	0.177	
233.15	2.272	0.106	0.372	0.100	0.123	
243.15	2.141	0.134	0.329	0.092	0.071	
253.15	2.018	0.157	0.290	0.107	0.054	
263.15	1.886	0.170	0.245	0.099	0.030	
2/3.15	1 630	0.106	0.212	0.096	0.024	
203.15	1.519	0.195	0.163	0.093		
ln f	$F_1 = A x_2^2 -$	$B x_2^2 (1 - 4)$	x_1) + C x_2^2 (1	$-8x_1 + 12x_1$	²)	
[- ² / ₂	- 10 m + 3	<u> </u>	-	_	
}	- D [#] 2 (1	12 . 1 + 3				
	+ $E x_2^2$ (1	$-16 x_1 + 7$	$2x_1^2 - 128x_1^3$	+ 80 x_1^4)		
In f	$r = A x_{2}^{2} +$	$B_{x_{2}}^{2}(1-4)$	$(x_{-}) + C x_{-}^{2}(1)$	$-8x_{0}+12x_{0}$	2	
,	21	1 (2^{2} 2^{2} 2^{2} 3^{2}	2	2 '	
	$+ D x_{1} (1)$	$-12x_2+3$	$5x_2 - 32x_2$			
	+ $E x_1^2$ (1	$-16 x_2 + 7$	$2 x_2^2 - 128 x_2^3$	+ 80 x_2^4)		
where	$f_{\star} = activity$	coefficient	of methanamine	-d_		
		anofficies	of house	-5		
ļ	$J_2 = activity$	coerficient	or nexane			
	$x_1 = mole fractions$	ction of met	hanamine-d ₅ in [.]	the liquid pha	se	
	x_{-}^{-} = mole fraction	ction of bex	ane in the liqu	id phase.		
1	2					

COMPONENTS :		ORIGINAL N	EASUREMENTS:		
l. Ethanamine-d.; C	H-DN;	Wolff,H.; Höpfner, A.			
[5852-45-9]	252	Bon Bu	nsences. Phus.	Chem	
		1965 6	9. 710-716.		
2. Hexane; C ₆ H ₁₄ ; [110-54-3]	1305, 0	<i>3,</i> /10-/10.		
VARIABLES:		PREPARED	BY:		
Composition M					
Composition, T	emperature		P. G. T. F	ogg	
EXPERIMENTAL VALUES:	· · · · · · · · · · · · · · · · · · ·			·····	
Variation of	the total vapor p	ressure/T	orr with varia	tion of	
temperature and of t	mole fraction of	^C 2 ^H 5 ^D 2 ^N 1	n the liquid p	hase, ^x C ₂ H ₅ D ₂ N	
		т/к			
^x C ₂ H ₅ D ₂ N	233.15	253.15	273.15	293.15	
0	3.9	14.6	45.9	121.1	
0.0176	8.0	25.0	67.9	162.4	
0.0329	12.9	33.0	85.5	221.4	
0.0891	18.2	55.1	138.3	301.9	
0.1165	20.0	62.7	158.2	344.7	
0.2095	24.6	79.4	207.2	458.1	
0.305	26.7	88.9	239.9	540.6	
0.339	28.1	93.4	249.7	564.6	
0.362	27.6	94.0	254.6	577.3	
0.409	28.3	99.7	273.5	629.3	
0.468	29.2	100.5	275.8	636.4	
0.517	29.6	102.9	284.1	659.5	
0.582	30.1 30.7	105.9	294.0	686.2 701 3	
0.683	31.0	110.1	307.5	725.8	
0.723	31.7	112.1	314.1	741.8	
				Cont.	
	AUXILIARY	INFORMATIO	IN		
		Louper w			
METHOD/APPARATUS/PROCEDU	RE:	1. Prepa	red from C ₂ H ₂	NH ₂ and D ₂ O;	
Apparatus described	l previously was	repea	tedly fraction	nated until first	
used (1). Liquid m	ixtures of	and 1	ast fractions	had vapor fforod by 0 4	
accurately known co	mposition were	Torr	at 20°C. Spec	ctroscopic	
thermostat controll	.ed to $\pm 0.02^{\circ}C$.	measu	rements indica	ated that the	
The total vapor pre	ssure was	produ	ict was at leas	st 99% pure.	
measured by a mercu	iry manometer.	over	P205; distille	ed and repeatedly	
The authors calcula	ted activity	fract	ionated until	first and last	
coefficients of eac	h component by a	press	ures as indica	ated by a	
method described by	Barker (2).	manom	eter (1).		
equations for activ	itv coefficients	ESTIMATED	ERROR:		
were evaluated and	reported.	δт/к =	± 0.02 (estima	ated by authors)	
				- · · · · · · · · ·	
		REFERENCE	S: . H.: Hönfner	A. Z. Elektro-	
1		chem.	1962, 66, 14	9.	
		2. Barke	er, J.A. Aust.	J. Chem. <u>1953</u> ,	
1		3. Red1	ch. O.: Kister	c, A.T. Ind. Eng.	
		Chem.	1948, 21, 34	5.	

COMPONENTS :	<u></u>	ORIGINAL MEAS	SUREMENTS:	<u> </u>
1. Ethanamine-d.; C.H.D	N •	Wolff H.:	UAnfror A.	
[5852-45-9]	2'''	Ber. Bunse	naes. Phys.	Chem.
2 Hexane: C.H. : [110-	51-31	<u>1965</u> , 69,	710-716.	0110111.
2. nexune, 6-14'	24-21			
VARIABLES:	<u> </u>	PREPARED BY:	<u></u>	
Composition, Tempe	rature		ם ה. ה. ד ס	<i>aa</i>
			F. G. I	99
EXPERIMENTAL VALUES: Cont				
		T/K		
^{<i>x</i>} C ₂ H ₅ D ₂ N	233.15	253.15	273.15	293.15
				
0.793 - 0.832	32.1 32.5	114.7 116.5	323.9 329.6	767.0 782.8
0.898	33.7	119.6	339.2	806.9
0.987 1	34.9 34.8	123.9 124.5	352.2 354.7	841.3 847.2
		_		
760 Torr = 1 at	$n = 1.013 \times 10^{-10}$	0 ⁵ Pa		
Constants for from the	or calculation Redlich-Kist	n of activity er equations	y coefficien ¤iven below	ts
т/к	A	В	c	
233.15	1.728	-0.078	0.191	
243.15	1.630	-0.036	0.174	
253.15	1.535	+0.001	0.148	
263.15	1.434	+0.017	0.109	
273.15	1.332	+0.037	0.087	-
283.15	1.237	+0.048	0.066	
293.15	1.145	+0.061	0.063	
$\ln f_1 = A x_2^2 -$	$Bx_2^2(1-4)$	x_1) + C x_1	$2^{2}(1 - 8 x_{1})$	+ 12 x_1^2)
$\ln f_2 = A x_1^2 +$	$B x_1^2 (1 - 4)$	x_{2}) + C x_{2}	$\frac{1}{1}^{2}(1 - 8x_{2})$	+ 12 x_2^2)
where $f_{\star} = activ:$	+ +v coefficier	2 of ethana	mine -d_	4
$f_{2} = activ:$	itv coefficier	nt of hexane		
$x_1 = \text{mole}$	fraction of e	thanamine-d ₂	in the liqu	id phase
$x_2^{\perp} = \text{mole}$	fraction of he	exane in the	liquid phase	e.
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COMPONENTS:	·····	ORIGINAL MEASUREMENTS:			
1. N-Methyl-methanamine-d; C	2 ^H 6 ^{DN;}	Wolff, H.	; Würtz, 1	R.	
[917-72-6]		J. Phys. Chem.			
2. Hexane; C _c H _{1,4} ; [110-54-3]		<u>1970</u> , 74,	1600-160	б.	
6 14					
VARIABLES:		PREPARED BY:			
Composition, temperatu	re		P. G. T.	Fogg	
EXPERIMENTAL VALUES:					
Variation of the tota temperature and of mole	l vapor p fraction	ressure/Tor: of C _{2^H6^{DN} in}	r with van n the liqu	riation of uid phase,	^x C2 ^H 6 ^{DN}
		T/K			
^x C ₂ H ₆ DN 223.15 233.15 243.	15 253.1	5 263.15	273.15	283.15	293.15
0 2.2 3.8 7. 0.0048 2.5 5.0 9. 0.0075 3.0 5.7 10.	7 14.3 4 17.3 8 19.7	26.7 30.8 33.8	45.5 52.4 56.6	75.6 85.2 91.0	121.1 133.4 141.3
0.0207 4.9 9.0 15.	3 27.9	45.3	74.1	114.8	173.2
$\begin{bmatrix} 0.0254 & 5.6 & 10.0 & 18. \\ 0.0484 & 8.2 & 15.2 & 26. \end{bmatrix}$	6 44.3	70.6	108.9	163.2	238.6
$\begin{bmatrix} 0.0705 & 10.2 & 18.9 & 33. \\ 0.0922 & 11.8 & 22.5 & 39 \end{bmatrix}$	3 55.0	87.4 102 3	133.6	198.3	286.4
$\begin{bmatrix} 0.1541 \\ 15.2 \\ 28.9 \\ 51. \end{bmatrix}$	7 86.6	137.5	209.8	307.9	437.8
0.2535 18.3 35.7 64.	9 111.3	178.2	276.6	409.5	584.6
0.3053 19.1 37.7 $69.10.3526$ 20.1 40.1 73.1	9 128.3	209.5	327.1	448.8	706.3
0.4109 20.9 41.8 78.	2 135.5	223.0	350.7	527.6	765.1
0.4494 21.5 43.2 80.	2 140.4 6 147.1	243.4	384.5	582.0	846.3
0.6055 23.1 47.3 88.	8 157.3	262.1	417.3	635.5	932.2
0.6554 25.8 48.4 91. 0.7038 24.6 49.7 94.	0 167.3	279.5	432.1	685.0	1009.4
0.7538 25.0 50.9 96.	7 172.2	288.2	461.5	708.6	1046.4
				Cont.	
	AUXILIARY	INFORMATION	DT TSL OF MAT	WDIALC.	
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PU	RITI OF MAI	ERIALS;	
Apparatus described previousl used (1). Liquid mixtures of accurately known composition introduced into a cell held i thermostat controlled to ± 0.	y was were n a 02 ⁰ C.	1. Prepare chlorid until f had vap Torr.	d from di le; repeat irst and or pressu	methylamm edly frac last frac res withi	onium tionated tions n 0.2
The total vapor pressure was by a mercury manometer. The authors calculated activi	measured.	2. Research grade (Phillips Petroleum Co., Bartlesville, Oklahoma).			
coefficients of each component the vapor pressure data by a	t from method				
described by Barker (2). Con for Redlich-Kister equations activity coefficients were ev	for for valuated	ESTIMATED ERF $\delta T/K = \pm 0$.02 (esti	mated by	authors)
and reported.					
		REFERENCES:		om 7 7	El altera
		chem. 1 2. Barker,	<u>962</u> , 66, J.A. Aus	149. t. J. Che	m. <u>1953</u>
		6, 207. 3. Redlich <i>Chem</i> . <u>1</u>	, O.; Kis <u>948</u> , 21,	ter, A.T. 345.	Ind. Eng

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COMPONENTS:	ORIGINAL MEASUREMENTS:				
<pre>1. N-Methyl-methanamine-d; C2^{H6DN}; [917-72-6]</pre>	Wolff, H.; Würtz, R. J. Phys. Chem.				
2. Hexane; C ₆ H ₁₄ ; [110-54-3]	<u>1970</u> , 74, 1600-1606.				
VARIABLES :	PREPARED BY:				
Composition, temperature	P. G. T. Fogg				
EXPERIMENTAL VALUES: Cont.					
	T/K				
^x C ₂ H ₆ DN 223.15 233.15 243.15 253.1	5 263.15 273.15 283.15 293.15				
0.8037 25.7 52.5 100.5 177.3 0.8545 26.6 54.2 102.4 182.6	297.6 477.2 734.1 1086.1 307.2 493.1 759.0 1125.1				
0.9021 27.3 55.6 105.7 188.3 1 28.8 58.9 112.2 201.0	316.8 509.3 784.9 1164.8 338.4 545.1 841.1 1249.2				
760 Torr = 1 atm = 1.013 x 1 Constants for calculation of Redlich-Kister equ T/K A 223.15 1.482 233.15 1.431 243.15 1.326 253.15 1.225 263.15 1.113 273.15 1.021 283.15 0.920 293.15 0.828	0 ⁵ Pa. activity coefficients from the lations given below. B C -0.081 0.119 -0.029 0.139 +0.002 0.111 +0.016 0.090 +0.033 0.066 +0.047 0.066 +0.053 0.068 +0.057 0.061				
$\ln f_1 = A x_2^2 - B x_2^2 (1 - 4)$	x_1) + C x_2^2 (1 - 8 x_1 + 12 x_1^2)				
$\ln f_2 = A x_1^2 + B x_1^2 (1 - 4)$	x_2) + C x_1^2 (1 - 8 x_2 + 12 x_2^2)				
where f_1 = activity coefficien f_2 = activity coefficien x_1 = mole fraction of the x_2 = mole fraction of he:	t of the amine t of hexane e amine in the liquid phase xane in the liquid phase				

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COMPONENTS:				ORIGINAL MEASUREMENTS:				
<pre>1. N-(methyl-d₃)-methan-d₃-amine; C₂HD_cN; [14802-36-9]</pre>					Wolff, H.; Würtz, R.			
2 6 2. Hexane; C ₂ H ₁ ; [110-54-3]					J. Phys. Chem. 1970. 74. 1600-1606.			
NADIADIEC.								
VARIABLES:	ngition tem	oratura		PREPA	ARED BY:	P. G. T.	Fogg	
Compe	Sition, cem	peracure					1033	
EXPERIMENTAL V	ALUES:							
Varia temperatur	ation of the re and of mol	total va le fracti	por pr on of	essu C ₂ HD	re/Torr c ^N in th	with vari ne liquid	lation of phase, x_i	THDN
				2 T/K	0		· · · · ·	211061
^x C ₂ ^{HD} 6 ^{N 223}	3.15 233.15	243.15	253.1	.5	263.15	273.15	283.15	293.15
0 2 2 0.0103 3	2.2 3.8 3.5 6.7	7.7	14.3		26.7 36.7	45.5	75.6 96.0	121.1 148.5
0.0254	3.9 16.4	18.6	31.4 46.4		51.2 73.9	81.9	124.7	247.1
0.0763 11	L.5 20.9 3.6 25.1	36.4 43.3	59.8 71.7		94.4 112.3	143.9 170.9	212.1 250.9	304.1 357.6
0.1504 16 0.2525 20	5.2 30.6 0.1 38.8	54.0 70.1	90.3		141.8	214.7 291.1	312.9 428.5	442.5
0.2685 20).3 39.8	72.2	122.0		195.3	299.3	441.2	626.0
0.3539 22	2.6 44.1	80.7	138.5		223.8	347.5	516.1	739.9
0.4063 23	3.4 46.1 3.7 46.8	84.5	146.0		237.7	370.4	553.2	795.8 819.9
0.5014 24	49.5 6.4 50.9	91.5 94.8	159.5		260.9 272.1	409.4 428.2	615.2 646.3	891.3 938.3
0.6053 26	5.9 52.3 7.0 53.9	97.8 100.9	172.2		283.4 292.8	447.9 463.9	677.9 703.8	987.1 1029.4
0.7044 28.5 55.3 103.8 182.5					303.3	480.9	732.0	1072.5
							Cont.	
		AUX	KI LI ARY	INFOR	MATION			
METHOD/APPARAT	CUS/PROCEDURE:	<u> </u>	·	SOUR	CE AND PUI	RITY OF MAT	ERIALS:	
Apparatus d	escribed pre	viouslv v	vas	1. F	repared	from (CD) NH _o Cl	(Merck,
used (1).	Liquid mixtu known compos	res of	re	Darmstadt); purified by repeated				
introduced	into a cell	held in a $-$		f	raction	s differe	d in vapo	r T
The total v	apor pressur	e was mea	asured	1	, , , , , , , , , , , , , , , , , , ,	s by ress		1011.
by a mercur	y manometer.			2. F	esearch	grade (P m Co., Ba	nillips rtlesvill	e,
coefficient	s of each co	activity mponent :	from		klahoma	•)		
the vapor p described b	ressure data y Barker (2)	by a met . Consta	thod ants	POPT		0.0.		
for Redlich activity co	-Kister equa efficients w	tions for ere evalu	r Jated	ESII	MAIED ERR	UK:		
and reporte	d.			6T/F	$x = \pm 0.1$	02 (estim	ated by a	uthors)
				REFE	RENCES			
				1. W	olff, H	.; Höpfne	r, A. Z.	Elektro-
				2. B	hem. <u>19</u> arker	62, 66, 1 J.A. Aust	49. . J. Chem	. 1953.
				3. F	, 207.	O.: Kie+	er. A.T.	Ind. Eng.
				S. Realicn, U.; Kister, A.T. Ind. Eng. Chem. <u>1948</u> , 21, 345.				

Solubilities of Deuterated Amines

COMPONENTS:		· <u>···</u> ································	ORIGINAL MEAS	UREMENTS:			
l. N-(met C ₂ HD	hyl-d ₃)-meth 6 ^{N;} [14802-3	an-d ₃ -amine; 6-9]	Wolff, H.; Würtz, R. J. Phys. Chem.				
2. Hexane; C ₆ H ₁₄ ; [110-54-3]			<u>1970</u> , 74,	1600-1606	•		
VARIABLES:	<u></u>	**************************************	PREPARED BY:		<u></u>		
Composition, temperature P. G. T. Fogg							
EXPERIMENTAL	EXPERIMENTAL VALUES: Cont.						
			т/к				
^{<i>x</i>} C ₂ ^{HD} 6 ^N 2	23.15 233.1	5 243.15 253.1	.5 263.15	273.15	283.15	293.15	
0.7546	28.6 56.9		312.9	497.9	759.1 785 0	1114.5	
0.8529	29.9 60.1	113.1 200.1	333.5	531.8	813.5	1198.5	
0.9218	31.2 63.0 32.8 66.0	118.4 209.2 124.8 221.1	349.8	558.7 591.5	906.6	1262.2	
Co	Constants for calculation of activity coefficients from the . Redlich-Kister equations given below						
	т/к	A	В	c			
	223.15 233.15 243.15 253.15 263.15 273.15 283.15 293.15	1.452 1.396 1.287 1.189 1.078 0.984 0.888 0.792	$\begin{array}{c} -0.029 \\ -0.010 \\ +0.014 \\ +0.033 \\ +0.047 \\ +0.054 \\ +0.061 \\ +0.063 \end{array}$	0.1 0.0 0.0 0.0 0.0 0.0 0.0	68 21 86 76 56 54 49 49		
ln f _l ln f ₂	$= A x_2^2$ $= A x_1^2$	$- B x_2^2 (1 - 4 x) + B x_1^2 (1 - 4 x)$	$(x_1) + C x_2$ $(x_2) + C x_1$	$2(1 - 8x_1)^2(1 - 8x_2)^2$	+ 12 x_1^2 + 12 x_2^2	2 2 2	
where f_1 = activity coefficient of the amine f_2 = activity coefficient of hexane x_1 = mole fraction of the amine in the liquid phase x_2 = mole fraction of hexane in the liquid phase							
[

COMPONENTS:					ORIGINAL MEASUREMENTS:				
<pre>1. N-(methyl-d₂)-methan-d₃-amine-d; C₂D₂N; [22024-52-8]</pre>					W	Dlff, H.	; Würtz, 1 Cham	R.	1
					J. Phys. Chem.				
2. Hexa	ne; ^C 6 ^H 1	.4' [110-	54-3]		=	<u>970</u> , 74,	1000-100	b.	
VARIABLES	•				PREI	PARED BY:	<u></u>	<u></u>	
c	ompositi	on, temp	erature				P. G. T.	Fogg	
EXPERIMENTAL VALUES:									
V tempe	Variation of the total vapor pr temperature and of mole fraction of					ure/Torr 7 ^{N in tl}	with var: he liquid	iation of phase, x	C ₂ D ₇ N
					т/1	ĸ			
^x C2 ^{D7N}	223.15	233.15	243.15	253.1	.5	263.15	273.15	283.15	293.15
0	2.2	3.8	7.7	14.3		26.7	45.5	75.6	121.1
0.0103	3.1 5.9	6.5 10.4	12.7	21.6		36.9 51.9	60.7 82.1	96.5 125.7	148.6
0.0503	8.9	16.1	28.0	46.6		73.9	114.1	170.5	247.5
	11.6	21.1	36.2	60.0		94.6	144.3	212.7	305.8
0.1516	15.9	30.4	53.9	90.3		142.9	218.0	320.3	456.3
0.2028	18.4	34.9	62.3	104.7		166.7	254.9	374.0	528.9
0.2538	19.8	37.9	68.7	117.0		187.6	288.6	426.0	605.5
0.3512	20.1	42.2	77.8	133.7		218.0	339.6	506.8	727.3
0.4005	22.2	43.8	81.7	141.9		232.0	363.0	544.4	785.2
0.4504	22.9	45.7	84.8	148.1		242.9	381.6 398 9	572.8	827.7
0.5485	23.2	47.2	91.1	159.8		264.6	418.1	633.7	924.4
0.6022	25.1	50.0	93.9	165.5		274.3	435.5	661.0	966.9
0.6533	25.5	51.2	96.8	171.3		284.9	453.2	690.7 714 2	1012.9
						293.4	400.0	/14·2	1030.0
								Cont.	
			AU 3	(ILIARY	INFO	RMATION			
METHOD/APP	PARATUS/PR	OCEDURE:			SOURCE AND PURITY OF MATERIALS:				
Apparatu	us descri	bed prev	viously w	vas	1.	(CD ₃) ₂ N	H ₂ Cl (Mer	ck, Darms	tadt)
accurate	ely knowr	n composi	res or ition wer	re		was use which w	d to prep as then c	onverted	^{2^{NH}}
introduc	ed into	a cell h	neld in g	3	l	$(CD_3)_{2N}$	D by the	action of	D ₂ 0.
The tota	at conti	colled to	5 ± 0.02	°C.	Purification was by repeated				
by a mer	cury mar	pressure nometer.	e was mea	isurea		last fr	nation un	til first	and
	-					within	0.2 Torr	(1), (4).	pressures
The auth	ors calc	ulated a	ctivity		2.	Researc	h grade (Phillips	Petroleum
the vapo	r pressu	ire data	bv a met	rom hođ		со., ва	rtlesvill	e, Oklaho	ma.)
described by Barker (2). Constants				FSTIMATED ERROR.					
tor Redl	.1ch-Kist	er equat	ions (3)	for	1				
and reported.				lated	δт	$/K = \pm 0$.02 (esti	mated by	authors)
								-	-
					REF	ERENCES:			
ļ					11.	Wolff,	H.; Höpfn	er, A. Z.	Elektro-
					2	<i>chem.</i> <u>1</u> Barker	962, 66,	149. t. J. Char	m 1050
ļ						<i>6</i> , 207.	J HUS	·• ·• · · · · · · · · · · · · · · · · ·	··· <u>1999</u> ,
					3. Redlich, O.; Kister, A.T. Ind. Eng				Ind. Eng
1					4.	Wolff	<u>948, 21,</u> H.: HAnfn	345. 9r. Δ Roy	n. Bungan
	_				l	ges. Phi	us. Chem.	1965. 69	. 710.

COMPONENTS:					ORIGINAL MEASUREMENTS:			
1. N-(methy1-d ₃)-methan-d ₃ -amine-d; C ₂ D ₇ N; [22024-52-8]					Wolff, H.; Würtz, R.			
				J. Phys. Chem.				
2. Hexane; $C_{6}^{H}_{14}$; [110-54-3]				<u>1970</u> , 74,	1000-1000			
VARIABLES:				P	REPARED BY:			<u></u>
Com	posit	ion, temp	erature			P. G. T.	Fogg	
				Í				
EXPERIMENTAL	VALUE	S: Cont	•			4	<u></u>	
				I	T/K			
*CDN 2	23 15	233 15	243 15	253 15	263 15	273 15	283 15	203 15
<u></u>								
0.7533	26.8	54,3	102.5	181.7	303.6	484.9	741.7	1092.5
0.8003	27.4	55.6	105.5	186.7	312.5	499.7	766.3	1130.4
0.8519	28.7	57.6	112 0	192.8	323.2	517.9	/95./ 823 0	1219 0
1	30.8	62.4	119.0	212.3	356.5	572.9	882.1	1309.7
[<u> </u>								
	760 T	orr = 1 a	tm = 1.0	13 x 10	⁵ Pa			
	Const	ants for	calculat	ion of	activity co	pefficien	ts from	
		the Red	lich-Kis	ster equ	ations give	en below		
		Т/К	А	1	В	C	2	
			1 /	95	_0 079	0 1		
ł		233.15	1.4	41	-0.016	0.1	151	
	:	243.15	1.3	28	+0.006	0.1	109	
]		253.15	1.2	28	+0.021	0.0	97	
		263.15	1.1	.⊥/ 23	+0.038	0.0)77)73	
		283.15	0.9	25	+0.045	0.0)67	
	:	293.15	0.8	24	+0.046	0.0	63	
	<u></u>							
ln f,	= 2	x_{2}^{2} -	B x 2 (1	$-4x_{1}$) + $C x_{2}^{\cdot -2}$	$(1 - 8 x_1)$	$+ 12 x_1^2$	²)
ln fo	= 2	$x^{2} +$	$Bx^{2}(1)$	- 4 x) + $c x_{-}^{2}$	(1 - 8x)	$+ 12 x_{-}^{+}$	2,
2 2		1	- 1 (-	- 2	, 1	(1 0 ~ 2	2 2	,
where	f, =	= activi	ty coeff	icient o	of the amin	е		
1	f_ =	= activi	ty coeff	icient d	of hexane			
	x_ =	= mole f:	- raction	of the a	amine in th	e liquid	phase	
ł	1 x - "	= mole f	raction	of hexa	ne in the 1	iquid pha	ise	
ļ	2							
ł								
}								
ļ								
						-		

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COMPONENTS :			ORIGINAL MEASUREMENTS:				
1. Methanamine-d ₂ ; CH ₃ D ₂ N; [2614-35-9]			Wolff, H; Würtz, R. Z. Phus. Chem. (Frankfurt am Main)				
<pre>2. N, N-Dimethylmethanamine, (trimethylamine); C₃H₉N; [75-50-3]</pre>			<u>1969</u> , 67, 11	5-121			
VARIABLES:			PREPARED BY:				
Comp	position, temp	erature	P.	G. T. Fogg			
EXPERIMENTAL	VALUES:				·····		
Vari temperatu	lation of the are and of mol	total vapor pr e fraction of	cessure/Torr wi CH ₃ D ₂ N in the	th variation o liquid phase,	of ^x CH ₃ D ₂ N		
			T/K		•		
^x CH ₃ D ₂ N	223.15	233.15	253.15	273.15	293.15		
0	56.4	102.3	288.3	676.9	1387.0		
	57.8	105.0	293.2	687.1 708 1	1411.9		
0.0505	60.4	109.6	310.6	727.6	1495.2		
0.0689	61.8	111.7	316.7	744.3	1530.6		
0.0901	63.0	115.3	327.1	769.7	1582.1		
0.0994	65.0	119.2	341.0	807.3	1665.7		
0.1973	66.7	122.8	352.7	838.8	1737.0		
0.2475	68.0	125.2	362.6	864.6	1798.3		
0.2981	68.7	127.3	371.3	892.2	1862.5		
0.3664	69.5 69.8	130 3	3/9.1	920.4	1928.1		
0.4481	69.5	130.9	388.2	944.1	1991.0		
0.4980	70.0	131.9	391.5	956.8	2029.8		
0.5401	70.4	132.4	394.6	968.7	2053.0		
0.6020	69.3 69.5	131.5	396.5	976.9	2084.1 2107.0		
				- Cor	nt.		
		AUXILIARY	INFORMATION				
METHOD /APPARA	TUS / PROCEDURE :		SOURCE AND PURIT	Y OF MATERIALS.			
Apparatus used (1). accurately introduced	described pre Liquid mixtu known compos into a cell 1	viously was res of ition were held in a	 Prepared from CH₃NH₂ and D₂O; repeatedly fractionated until the first and last fractions had vapor pressures which differed by less than 0.5 torr at 20°C (4). 				
thermostat controlled to ± 0.02 C. The total vapor pressure was measured by a mercury manometer			 Prepared from trimethylammonium hydrochloride and purified as 1 				
The author coefficien	s calculated a ts of each cor	activity nponent by a	(5).	•	·		
method des Constants	cribed by Barl for Redlich-K:	ker (2). İster	LATIMATED FREOR.				
coefficien	() for active ts were evalue	ty ated and	$\delta T/K = \pm 0.02$ (actimated by anthema				
reported.			REFERENCES: 1. Wolff, H.; chem. 1962	Höpfner, A. Z	. Elektro-		
			2. Barker, J. 6, 207.	A. Aust. J. Ch	em. <u>1953</u> ,		
			3. Redlich, 0 Chem. <u>1948</u>	.; Kister, A.T , 21, 345.	. Ind. Eng.		
			Bunsenges.	Hopiner, A. B Phys. Chem. 1 Wurtz B Bar	er. <u>965</u> , 69,710 		
			ges. Phys. Chem. 1968, 72, 101.				

COMPONENTS :	<u></u>		ORIGINAL MEASUREM	ENTS:			
1 Mothana	minord , CH D I		Wolff H. Whata D				
	1 = 35 = 91	N /	WOIII, H; WUTZ, R. Z. Phys. Chem. (Engnkfunt om Main)				
			1969. 67. 11	5-121.	c am Macht		
2. <i>N,N-</i> Din (trim [75-5	nethylmethanamin nethylamine); C. 50-3]	ne, 3 ^H 9 ^N ;	<u>1305</u> , 07, 11				
VARIABLES:	<u></u>		PREPARED BY:	·····			
Comp	oosition, temper	rature	P.G.T. Fogg				
EXPERIMENTAL	VALUES: Cont.		T/K	<u></u>			
^{<i>x</i>} CH ₃ D ₂ N	223.15	233.15	253.15	273.15	293.15		
0.7466	68.7	129.6	396.7	989.2	2137.6		
0.8485	66.1	126.3	390.5	984.9	2145.6		
0.8965	64.3 61.7	120.3	385.5	978.8	2143.5		
1	59.1	115.6	367.4	947.8	2105.4		
Constants for calculation of activity coefficients from the Redlich-Kister equations given below							
	T/K	A	B	С	-		
	223.15	0.767	-0.075	0.139			
	233.15	0.749	-0.059	0.071			
	243.15	0.719	-0.013	0.036			
	253.15	0.692	+0.019	0.052			
	273.15	0.621	+0.028	0.028	-		
	283.15	0.578	+0.038	0.037			
	293.15	0.539	+0.031	0.040	_		
$\ln f_1$	$=$ A x_2^2 - E	$x_2^2(1 - 4 x)$	$(1) + C x_2^{2} (1)$	$-8x_1 + 12$	x1 ²)		
$ln f_{2}$	$= A x_1^2 + B$	$x_1^2(1 - 4 x)$	$(x_2) + C x_1^2 (1)$	$-8x_{2}+12$	(x_2^2)		
- 2	±	T	2 +	2.	4		
where f	l = activity co	pefficient of	methanamine-d	2			
f	2 = activity co	pefficient of	trimethylamin	Ð			
<i></i>	: _l = mole fracti	ion of methan	amine-d ₂				
<i>x</i>	$r_2 = mole fracti$	lon of trimet	hylamine.				
}							
}							