The low heat of ionization of 2,6-lutidine compared with pyridine has been ascribed to the lower heat of hydration of the BH^+ species (*4*); in the 2,6-lutidine ion the two alpha-methyl groups prevent strong solvation of the $N—H^+$.

Our heats of solution may be considered to occur via the following steps:

$$B_{(liquid)} + aq. = B_{(aq)} \quad (2)$$

$$B_{(aq)} + 2N\ HCl = BH^+ + Cl^- \text{ in } 2N\ HCl \quad (3)$$

Table II. Heats of Solution, Ionization (*5*), and pK$_a$ Values (*1*) of Bases

Base	pK$_a$	$-\Delta H_s$, Kcal./Mole	$-\Delta H_i$, Kcal./Mole
Pyridine	5.17	8.41	5.70
3-Picoline	5.68	9.27	6.70
2-Picoline	5.97	10.17	6.95
4-Picoline	6.02	9.64	7.03
4-Ethylpyridine	6.02	9.57	...
2,6-Lutidine	6.75	11.99	6.15

The heat evolved in Equation 1 differs from that evolved in Equation 3 mainly by the heat of dilution and it is likely that this will be similar for all of the bases in 2*N* HCl considered. The main difference then lies in the heat change in Equation 2—i.e., the heat of hydration of liquid base. This would be expected to be greater for 2,6-lutidine because of the larger inductive effect produced by the two methyl groups. This would explain the high value of the heat of solution of 2,6-lutidine.

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Precision Densities of Dilute Aqueous Solutions of the Isomeric Butanols

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The densities of aqueous solutions of the four isomeric butanols in the molal concentration range 0.003 < *m* < 0.2 have been determined at 0.5°, 5°, 25°, and 40° C. by means of a magnetic float technique, capable of a precision of better than 1 p.p.m. The solute apparent molal volumes have been evaluated.

THE VOLUMETRIC properties of aqueous solutions of nonelectrolytes are of interest in the elucidation of solute-water interactions. In conjunction with other thermodynamic properties, they provide information about the phenomena of hydrophobic hydration and specific hydrogen bonding (*2*). These properties are affected both by the steric configurations of alkyl groups and the relative strengths of the solute-water hydrogen bonds. The water-butanol systems were therefore selected for study, since both these effects could be examined.

To obtain the limiting solute partial molal volumes $\bar{V}_2^\circ$, density data on dilute solutions must be available. As the concentration is reduced, the uncertainties in $\bar{V}_2$, corresponding to a given experimental error in the solution density, rapidly increase, so that at concentrations below 0.1*m*, density errors must not exceed ±1 p.p.m.

EXPERIMENTAL

The magnetic float technique was selected as being capable of producing data of the required precision, and details of the apparatus and its method of operation have already been described elsewhere (*3, 11*). Briefly, a quartz float, containing a small bar magnet of 100 c.g.s. unit pole strength, was weighted with platinum loops until it just sank in the solution under test. Different currents, *i*, were then applied to a solenoid wound around the outside of the solution cell and the times, *t*, taken by the float to rise through a given distance were determined. From the t^{-1} (*i*) relationship, the extrapolated current i_0 could be evaluated for which the electrical forces balanced those due to buoyancy. Thus;

$$i_0 = \frac{(1 - d/D)\,w}{f} + \frac{W - dV}{f}$$

where *d* and *D* are the densities of the solution and platinum, respectively, *W* and *w* are the weights of the float and the platinum loops, *V* is the volume of the float, and *f* is the solenoid constant.

The cell was constructed in such a manner that progressive solute additions could be made without disturbing the float. The apparatus was immersed in a double thermostat, the temperature of which could be controlled to ±0.001°, this being essential for measurements at 25° and above. Absolute temperatures were determined to ±0.002° with National Physical Laboratory calibrated thermometers. Values of *i* were obtained by measuring the potential drop across a standard 2-ohm resistance. Since no sufficiently accurate data exist for nonelectrolytes, the

Table I. Densities and Apparent Molal Volumes of Aqueous Solutions of *n*-BuOH

Concentration, *m*	Density, G. per Cc.	ϕ_v Cc. per Mole
0.5° ± 0.002°		
Run 1		
0.000000	0.999872	. . .
0.003115	0.999836	85.72
0.004639	0.9998185	85.64
0.006392	0.9997985	85.62
0.008587	0.9997715	85.86
0.01079	0.999746	85.81
0.01243	0.999727	85.80
0.01478	0.999699	85.84
0.01870	0.9996535	85.84
0.02155	0.9996205	85.82
0.02408	0.999591	85.83
0.02736	0.9995525	85.83
0.03082	0.9995125	85.82
0.03625	0.9994505	85.80
0.03967	0.9994105	85.80
0.04379	0.9993635	85.79
0.04774	0.9993195	85.76
0.05109	0.9992805	85.76
0.05109	0.999280	85.77
0.05492	0.999236	85.77
0.05928	0.9991875	85.74
0.06265	0.9991495	85.73
0.06707	0.9990995	85.71
0.07253	0.9990385	85.69
Run 2		
0.00000	0.999872	. . .
0.02312	0.999602	85.83
0.03533	0.9994615	85.79
0.05667	0.9992185	85.72
0.05667	0.9992165	85.76
0.07254	0.999039	85.68
0.08555	0.9988945	85.64
0.10475	0.9986825	85.59
0.11855	0.998532	85.55
0.11855	0.998530	85.57
0.14982	0.9981965	85.46
0.16290	0.9980575	85.43
0.18344	0.9978435	85.36
5° ± 0.002°		
0.000000	0.999965	. . .
0.003161	0.9999285	85.68
0.006298	0.999890	86.04
0.009383	0.999854	85.98
0.01407	0.9997985	85.97
0.01861	0.9997455	85.93
0.02234	0.999701	85.96
0.02661	0.999651	85.94
0.03117	0.999598	85.93
5° ± 0.002°		
Run 2		
0.03533	0.999550	85.90
0.04032	0.9994925	85.89
0.04555	0.999433	85.85
0.04902	0.9993925	85.85
0.05347	0.9993415	85.84
0.05728	0.9992985	85.81
0.05728	0.999299	85.81
0.06080	0.999259	85.80
0.06513	0.999209	85.79
0.07097	0.9991435	85.76
0.07781	0.9990665	85.74
25° ± 0.002°		
0.000000	0.997048	. . .
0.002729	0.9970145	86.67
0.005560	0.996980	86.59
0.008847	0.006940	86.61
0.01363	0.9968825	86.55
0.01765	0.9968335	86.58
0.02229	0.99677	86.63
0.02664	0.9967235	86.62
0.03165	0.9966635	86.60
0.03753	0.996593	86.58
0.04337	0.996522	86.58
0.04967	0.9964465	86.57
0.04967	0.9964465	86.57
0.05654	0.9963645	86.56
0.06108	0.9963105	86.54
0.06835	0.996225	86.52
0.07617	0.9961325	86.51
40° ± 0.002°		
0.000000	0.992220	. . .
0.003582	0.992174	87.85
0.006424	0.992138	87.68
0.008678	0.992109	87.70
0.01411	0.9920405	87.67
0.01788	0.9919935	87.60
0.02612	0.9918895	87.58
0.03462	0.991782	87.60
0.04307	0.9916775	87.55
0.05077	0.991581	87.54
0.05077	0.9915785	87.60
0.05854	0.9914825	87.58
0.06647	0.9913825	87.57
0.07446	0.991284	87.55
0.08226	0.991188	87.54
0.08955	0.9910965	87.54
0.09705	0.991006	87.51

Table II. Densities and Apparent Molal Volumes of Aqueous Solutions of isoBuOH

Concentration, *m*	Density, G. per Cc.	ϕ_v Cc. per Mole
0.5° ± 0.002°		
0.000000	0.999872	. . .
0.002823	0.9998365	86.64
0.005050	0.9998115	86.13
0.007149	0.9997865	86.11
0.01042	0.999748	86.04
0.01446	0.9996995	86.07
0.01777	0.999660	86.06
0.02126	0.999619	86.06
0.02546	0.9995695	86.04
0.02850	0.9995345	86.00
0.03157	0.999498	86.02
0.03684	0.999435	86.03
0.04084	0.999389	86.00
0.04607	0.999328	85.99
0.05012	0.999281	85.97
0.05012	0.9992805	85.98
0.05610	0.9992125	85.95
0.05964	0.999172	95.93
0.06442	0.9991175	85.91
0.06878	0.999067	85.90
0.07418	0.999007	85.87
0.07828	0.998960	85.86
0.08258	0.998911	85.85
5° ± 0.002°		
0.000000	0.999965	. . .
0.004777	0.9999075	86.14
0.007514	0.9998745	86.20
0.01063	0.999837	86.18
0.01566	0.999777	86.13
0.02109	0.9997125	86.11
0.02651	0.9996485	86.09
0.03134	0.999592	86.06
0.03696	0.9995255	86.06
0.04186	0.9994675	86.05
0.04771	0.9993995	86.02
0.05181	0.9993515	86.01
0.05181	0.999353	85.98
0.05711	0.999291	85.98
0.06176	0.9992375	85.96
0.06665	0.9991805	85.96
0.07153	0.999125	85.94
0.0697	0.9990625	85.92
5° ± 0.002°		
0.08116	0.999015	85.91
0.08836	0.998934	85.88
25° ± 0.002°		
0.000000	0.997048	. . .
0.002758	0.9970135	86.83
0.005782	0.9969765	86.81
0.009130	0.9969365	86.63
0.01459	0.996869	86.71
0.01837	0.996822	86.72
0.02374	0.9967575	86.66
0.02804	0.9967045	86.70
0.03267	0.996648	86.68
0.03763	0.996588	86.67
0.04318	0.9965215	86.64
0.04759	0.9964665	86.67
0.04759	0.9964685	86.64
0.05277	0.996406	86.63
0.05713	0.996353	86.64
0.06553	0.9962525	86.62
0.07432	0.9961475	86.61
0.08325	0.996041	86.60
0.09253	0.9959335	86.56
40° ± 0.002°		
0.000000	0.992220	. . .
0.003565	0.9921745	87.69
0.008570	0.992110	87.77
0.01339	0.992050	87.64
0.01850	0.9919865	87.55
0.02538	0.991898	87.62
0.03120	0.9918255	87.58
0.03734	0.9917475	87.60
0.04423	0.991662	87.57
0.05246	0.9915575	87.59
0.05246	0.991557	87.60
0.06107	0.9914505	87.56
0.06961	0.9913445	87.55
0.07770	0.991244	87.55
0.08636	0.991137	87.54
0.09435	0.9910395	87.52
0.10300	0.990933	87.51

method was tested with dilute solutions of NaCl and KCl in the molal concentration range $0.003 < m < 0.1$. Good agreement was obtained with the results of Geffcken and Price (*6*) and Kruis (*8*) which are generally considered to be the most accurate density measurements on aqueous solutions (*10*). Thus at 25°, $\bar{V}_2^\circ$ values for NaCl and KCl were obtained as 16.65 (16.65) and 26.90 (26.85) cc. per mole, respectively, the figures in parentheses referring to the literature data (*6*, *8*).

The butanols were purified by refluxing over CaO for 24 hours and subsequent fractionation. Their densities were determined pycnometrically. In the purification of water, extensive fractionation had to be avoided, because of isotope separation leading to density uncertainties. Hence deionized water, having a conductivity of $< 2 \times 10^{-6}$ ohm^{-1} was employed throughout. The water density data of Kell (*7*) were used but were converted from grams per milliliter to grams per cubic centimeter (1 ml. = 1.000028 cc.).

RESULTS AND DISCUSSION

Densities and solute apparent molal volumes, ϕ_v, are presented in Tables I through IV. ϕ_v values were calculated from the experimental densities by use of the relation

$$\phi_v = \frac{1000}{mdd_0}(d_0 - d) + \frac{M}{d}$$

where d_0 is the density of water, and M is the solute molecular weight. The effect δd on the solution density by uncertainties in W, V, D, w, and i indicated that values of d were precise to well within ±1 p.p.m. The limiting factors determining δd were an accurate knowledge of D and the temperature control (at 25° and above).

The accuracy of ϕ_v depends on the precision of d and m. Thus for dilute solutions,

$$\delta\phi_v = -(1000/m)\delta d$$

Table III. Densities and Apparent Molal Volumes of Aqueous Solutions of *sec*-BuOH

Concentration, m	Density, G. per Cc.	ϕ_v Cc. per Mole
0.5° ± 0.002°		
Run 1		
0.000000	0.999872	...
0.002679	0.9998385	86.56
0.004914	0.9998125	86.22
0.007010	0.999786	86.38
0.009239	0.999760	86.25
0.01241	0.999722	86.23
0.01598	0.999678	86.30
0.01985	0.9996325	86.21
0.02439	0.9995775	86.23
0.02902	0.999522	86.23
0.03373	0.999467	86.18
0.03786	0.9994165	86.20
0.04257	0.999361	86.18
0.04711	0.9993085	86.14
0.05291	0.9992405	86.13
0.05695	0.9991925	86.12
0.05695	0.999192	86.13
0.06152	0.9991385	86.12
0.06529	0.999095	86.10
0.06936	0.999048	86.08
0.07333	0.9990015	86.08
0.07762	0.998954	86.04
0.08149	0.9989075	86.05
0.08540	0.9988645	86.02
0.08877	0.9988255	86.01
Run 2		
0.00000	0.999872	...
0.01231	0.999723	86.26
0.02328	0.9995815	86.20
0.02974	0.999511	86.30
0.04410	0.9993415	86.21
0.05196	0.9992505	86.15
0.06114	0.999142	86.14
0.06614	0.999140	86.17
0.06873	0.999052	86.13
0.07945	0.998929	86.08
0.08768	0.998835	86.05
0.09535	0.998747	86.03
0.10843	0.998599	85.99
0.11885	0.998483	85.94
0.12981	0.998362	85.89
0.14144	0.9982335	85.86
0.14144	0.9982335	85.86
0.15279	0.9981095	85.82
0.16707	0.9979545	85.77
0.17662	0.9978525	85.74
0.18754	0.9988375	85.70
0.19774	0.997631	85.66
0.21193	0.997481	85.62
0.22790	0.9973170	85.56
0.22790	0.9973145	85.57
0.24088	0.997183	85.53
0.25500	0.007039	85.48
0.27341	0.9968545	85.43
0.28574	0.9967325	85.39
5° ± 0.002°		
0.000000	0.999965	...
0.004200	0.9999145	86.16
0.007604	0.9998725	86.32
5° ± 0.002°		
Run 2		
0.01068	0.999836	86.24
0.01541	0.999779	86.22
0.01839	0.9997425	86.23
0.02268	0.999691	86.23
0.02725	0.9996365	86.21
0.03269	0.999572	86.17
0.03927	0.9994945	86.15
0.04484	0.999428	86.14
0.05039	0.999365	86.09
0.05592	0.9992085	86.10
0.05592	0.999299	86.09
0.06245	0.999223	86.07
0.06764	0.9991625	86.05
0.07389	0.999091	86.03
0.07912	0.999030	86.02
0.08509	0.998962	86.00
0.09048	0.998901	85.97
0.09470	0.9988525	95.97
0.09913	0.998802	85.96
25° ± 0.002°		
0.000000	0.997048	...
0.003450	0.9970075	86.18
0.006702	0.9969665	86.54
0.01011	0.9969255	86.51
0.01378	0.996881	86.53
0.01820	0.996829	86.46
0.02223	0.996779	86.52
0.02730	0.9967185	86.51
0.03182	0.9966645	86.49
0.03689	0.996603	86.51
0.04262	0.9965345	86.50
0.4806	0.996470	86.49
0.04806	0.996471	86.46
0.05431	0.996307	86.45
0.06085	0.996320	86.44
0.06740	0.996242	86.43
0.07306	0.996176	86.42
0.08113	0.996081	86.41
0.09075	0.9959685	86.40
0.10172	0.995841	86.38
40° ± 0.002°		
0.000000	0.992220	...
0.004886	0.992159	87.39
0.009657	0.9920995	87.42
0.01322	0.992055	87.41
0.01964	0.9919765	87.32
0.02594	0.9918985	87.33
0.03275	0.991814	87.33
0.03903	0.991737	87.32
0.04604	0.991652	87.29
0.05211	0.9915775	87.29
0.05211	0.9915775	87.32
0.05875	0.9914945	87.31
0.06456	0.991424	87.29
0.07545	0.991293	87.26
0.08588	0.991168	87.24
0.09740	0.9910295	87.22
0.10921	0.9908895	87.20

Table IV. Densities and Apparent Molal Volumes of Aqueous Solutions of *tert*-BuOH

Concentration, m	Density, G. per Cc.	ϕ_v Cc. per Mole
0.5° ± 0.002°		
0.000000	0.999872	...
0.003714	0.999821	87.85
0.006526	0.999782	87.93
0.009660	0.999739	87.89
0.01287	0.9996935	88.02
0.01595	0.9996525	87.91
0.02017	0.9995945	87.92
0.02349	0.999550	87.87
0.02744	0.9994965	87.85
0.03153	0.9994405	87.86
0.03406	0.9994065	87.83
0.03762	0.999358	87.84
0.04119	0.9993115	87.80
0.04541	0.9992535	87.80
0.04541	0.9992515	87.84
0.04958	0.9991965	87.81
0.05494	0.9991255	87.79
0.06173	0.9990345	87.78
0.06554	0.9989835	87.76
0.07014	0.9989225	87.75
0.07620	0.998843	87.73
0.08106	0.9987805	87.70
0.08510	0.998727	87.69
0.09185	0.998639	87.66
0.09185	0.998637	87.68
0.09226	0.9985415	87.65
0.10662	0.9984465	87.63
0.11302	0.998365	87.60
0.12733	0.998182	87.55
5° ± 0.002°		
0.000000	0.999965	...
0.003890	0.9999115	87.84
0.006904	0.9998705	87.85
0.01028	0.9998235	87.88
0.01526	0.9997565	87.79
0.01875	0.999708	87.84
0.02258	0.9996565	87.82
0.02726	0.9995925	87.81
0.03088	0.9995435	87.80
0.03486	0.999491	87.77
0.03948	0.9994285	87.76
0.04547	0.9993485	87.73
0.05127	0.9992705	87.73
0.05127	0.9992715	87.71
0.05716	0.9991936	87.69
0.06306	0.9991155	87.67
5° ± 0.002°		
0.06827	0.999047	87.65
0.07375	0.998975	87.63
0.08000	0.998894	87.60
0.08522	0.9988265	87.58
0.09038	0.998760	87.56
0.09640	0.9986825	87.54
0.10184	0.9986125	87.52
25° ± 0.002°		
0.000000	0.997048	...
0.002923	0.9970085	87.90
0.005601	0.9969725	87.86
0.007725	0.9969435	87.93
0.01113	0.996899	87.81
0.01580	0.9968375	87.74
0.01957	0.996787	87.79
0.02480	0.996718	87.76
0.03052	0.9966425	87.73
0.03508	0.996583	87.71
0.04147	0.996498	87.72
0.04458	0.996457	87.82
0.04458	0.996457	87.83
0.04854	0.9964065	87.69
0.05481	0.9963245	87.68
0.06032	0.996252	87.69
0.06735	0.996160	87.68
0.07334	0.9960835	87.65
0.08013	0.995996	97.64
0.08623	0.9959165	87.64
0.09797	0.995767	87.61
40° ± 0.002°		
0.000000	0.992220	...
0.001529	0.992200	88.13
0.004735	0.992158	88.05
0.009462	0.992094	88.28
0.01484	0.992021	88.36
0.01794	0.9910805	88.29
0.02171	0.991930	88.30
0.02793	0.9918475	88.29
0.03295	0.9917805	88.28
0.04002	0.9916875	88.27
0.04552	0.991614	88.28
0.05420	0.991499	88.28
0.06339	0.9913775	88.28
0.07369	0.991242	88.27
0.08356	0.991113	88.26
0.09284	0.9909925	88.24

$$= -\frac{1000}{m^2}\,(d^{-1} - d_0^{-1})\;\delta m$$

An error analysis showed that for $m = 0.1$, the precision of ϕ_v is ±0.02 cc. per mole, whereas for $m = 0.01$, the precision is at least ±0.1 cc. per mole, as is also the accuracy of $\bar{V}_2^\circ$ (*11*). Within the concentration range $m \leq 0.1$, ϕ_v is a linear function of m at the lower temperatures, although a limiting $d\phi_v/dm$ value of zero becomes apparent for *sec*-BuOH and *tert*-BuOH at 40°. In the one case, *sec*-BuOH at 0.5°, where measurements were extended to higher concentrations, a distinct curvature in the $\phi_v(m)$ plot was found at $m > 0.2$, in agreement with Pasfield's values for *n*-BuOH at 30° (*9*).

For the linear parts of the plots, $\bar{V}_2$ can be easily obtained from

$$\bar{V}_2 = \phi_v + m(d\phi_v/dm)$$

but the normal procedure of extrapolating ϕ_v data from relatively high concentrations to infinite dilution has no theoretical basis, and this aspect is discussed elsewhere (*4*).

No other density data are available with which the results here presented can be compared. Alexander (*1*) and Fried-

Table V. Limiting Molal Volumes, $\bar{V}_2^\circ$, and Normalized Slopes of $\phi_v(m)$ Isotherms for Butanols in Aqueous Solution at 0.5°

	$\bar{V}_2^\circ$, Cc. per Mole			$-10^2 (1/\bar{V}_2^\circ)\, d\phi_v/dm$ per Mole		
	This work	Ref. (*1*)[a]	Ref. (*5*)[b]	This work	Ref. (*1*)[a]	Ref. (*5*)[b]
n-BuOH	85.90	85.7	85.72	3.61	2.89	1.98
isoBuOH	86.15	...	86.07	3.86	...	2.86
sec-BuOH	86.33	...	86.02	4.27	...	2.40
tert-BuOH	87.95	...	...	3.17	...	...

[a] at 0° C. [b] at 1° C.

man and Scheraga (*5*) carried out pycnometric density determinations on some of the compounds in a higher concentration range ($m > 0.1$). In both cases, linear ϕ_v extrapolations, based on measurements at only five concentrations, were performed to evaluate $\bar{V}_2^\circ$. The agreement between the literature values of $\bar{V}_2^\circ$ and those obtained in this study is reasonable, but this is not true for the slopes of the $\phi_v(m)$ isotherms, as is shown in Table V.

Unfortunately, Friedman and Scherega state neither the numerical values of d_0 nor the density units—i.e., grams per milliliter or grams per cubic centimeter—used in their calculations, and this makes the comparison somewhat uncertain.

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Dielectric Constants, Densities, and Viscosities of Acetone–1-Propanol and Acetone–*n*-Hexane Mixtures at 25° C.

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The dielectric constants, densities, and viscosities of acetone–1-propanol and acetone–*n*-hexane mixtures from 0 to 100% composition (at an interval of 10%) are reported at 25° C.

According to Stokes' law the mobility of a given ion is inversely related to the viscosity of the medium, so that the Walden product, $\Lambda^\circ\eta$, in a variety of solvents should remain constant. For ions which experience specific solvation effects (short range) $\Lambda^\circ\eta$ generally varies in different solvents. Even in the absence of any ion-solvent interaction $\Lambda^\circ\eta$ varies with the dielectric constant of the medium. Fuoss (*4, 10*) has suggested that the inconstancy is due to an additional frictional force produced as a result of dielectric relaxation induced by the ionic motion in polar solvents. Boyd (*3*) and Zwanzig (*18*) treated this subject theoretically and found that the frictional force consequent to dielectric relaxation depends upon the dielectric constant of the solvent. More recently, Atkinson (*2*) examined the applicability of the Fuoss-Boyd-Zwanzig equation to ionic solutions.

It seems appropriate at this stage to study the dependence of Λ° on either of the physical properties, the viscosity or the dielectric constant, singly. In the majority of conductance studies intended to examine the continuum model hydrodynamically the Fuoss effect is to be taken into account (*8*), as only change in the viscosity of the solvent is usually accompanied by a change in the dielectric constant. Mixed solvents in which either of the two physical properties remains constant throughout the whole composition range would provide a better resolution of the factors that affect Λ°. We report data on the physical properties of two mixed solvents, acetone-1-propanol and acetone-*n*-hexane, to call attention to the utility of these solvent systems in studies involving the Fuoss-Onsager conductance theory.

EXPERIMENTAL

1-Propanol. Reagent grade 1-propanol (E. Merck, Germany) was dried over $CaCl_2$, refluxed with pieces of sodium, and fractionally distilled. Traces of water were removed as a ternary azeotrope with benzene as a third component. 1-Propanol used in the preparation of mixtures had a specific conductance of $< 9 \times 10^{-9}$ cm.$^{-1}$ ohm^{-1}.

***n*-Hexane.** *n*-Hexane (British Drug Houses, London) was shaken several times with concentrated sulfuric acid, washed and again shaken with 0.1*N* $KMnO_4$ in 10% NaOH, washed again, and kept over P_2O_5. The decanted product was refluxed with sodium and fractionally distilled twice.

Acetone. Acetone was purified by the method described earlier (*8*).

Measurements. Densities were measured with a single-stem pycnometer made from a 28-ml. Erlenmeyer flask. The pycnometer was calibrated with water at 25° C. Four

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