employed instead of the aliphatic alcohols. Pyridine resembles the aliphatic alcohols (namely, isopropanol and tertiary butanol) in its complete miscibility with water, but is very unlike them in its chemical properties.

The methods and experimental procedure were essentially identical with those used previously (1) and if details are desired, reference should be made to the previous paper. The authors feel that the results obtained are not in error more than one per cent. in any case; and that the results can be reproduced with less deviation than this by a person experienced in this type of work. Plait points and percentage deviations are given in the following table and charts. C. P. pyridine, d_4^{20} 0.9812, was used throughout this investigation, without purification.

Empirical equations were derived to fit these data. It was found that the exponential equation

$$\text{(A)}\quad y = a + b(10)^{-cx}$$

where y = weight percentage of pyridine, x = weight percentage of salt, and a, b and c are arbitrary constants, gave the best fit in practically all cases. However, in the salt-rich solutions of ammonium sulfate and sodium chloride, the power equation

$$\text{(B)}\quad y = a + bx^{-c}$$

gave a better fit.

The values of the constants and the limiting values of x are given in the accompanying table.

TABLE I

			Pyridine-rich section					Salt-rich section			
Dev. curve	Salt	Eq.	a	b	c	Limit for "x"	Eq.	a	b	c	"x" at plait point
6	Na_2SO_4	A	17.2	43.5	0.1754	4.8	A	1.20	64.4	0.0975	4.97
9	KCl	A	−24.0	102.6	.0238	13.5	A	0	175.8	.0626	11.77
4	KF	A	9.8	57.45	.1402	4.4	A	1.17	88.1	.1332	4.11
5	$MgSO_4$	A	46.95	37.0	2.060	0.6	A	0	51.9	.0687	5.31
8	$NaNO_3$	A	−45.9	153.6	.01234	35.8	A	1.62	45960	.1047	29.93
3	Na_2CO_3	A	23.90	38.10	.3365	3.0	A	0.20	57.2	.1126	3.22
7	$Na_2S_2O_3$	A	22.65	48.35	.1527	6.1	A	.80	79.4	.0744	5.76
10	K_2CO_3	A	8.0	50.7	.0974	4.2	A	1.31	68.9	.0983	4.92
1	$(NH_4)_2SO_4$	A	22.8	47.15	.1682	5.9	B	−4.35	251.6	1.176	5.90
2	NaCl	A	17.1	104.7	.0722	12.5	B	0	96380	3.220	12.46

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A New Relation between Viscosity, Vapor Pressure and Density

BY FRANK HOVORKA

In attempting to make some useful calculations between the viscosity and the vapor pressure of liquids, it was found that the empirical equation $S = \eta P^{1/4} d^{1/2}$, where η is the viscosity, P the vapor pressure, d the density, and S a constant characteristic of the substance under consideration, holds very closely for a great many organic liquids.

In Table I are represented at random a few of the substances of different homologous series for which the constant S was calculated. It may be noticed in Table I that the variation of constant S is very small, and falls probably in many cases within the experimental error of the determination of the three properties involved in the calculation. About the same variation was found in the case of thirty or more other substances for which the constant S was calculated. In taking the values of S for aliphatic esters from methyl formate to methyl isobutyrate it was found that the constant S is approaching a constant value characteristic of that series. The same is indicated for the saturated hydrocarbons. If the value of S, for instance, obtained for ethyl acetate is used for any higher ester in calculating the density, vapor pressure, or the viscosity, the error in most of the cases proved to be very small. These same effects have been noticed for other series which thus far have been calculated only approximately due to the lack of experimental data.

TABLE I

VALUES OF CONSTANT S AT DIFFERENT PRESSURES

V. p., mm.	$CHCl_3$	$(C_2H_5)_2O$	$n\text{-}C_5H_{12}$	$n\text{-}C_7H_{16}$	$(CH_3)_2CO$	$CH_3COOC_3H_7$	$C_3H_7COOCH_3$
100	0.0244	0.0934	0.00868	0.00855	0.0108	0.0124	0.0124
200	.0244	.0936	.00870	.00857	.0108	.0124	.0124
400	.0244	.0938	.00871	.00859	.0109	.0124	.0123
600	.0243	.0939	.00870	.00859	.0110	.0123	.0123

An attempt is being made to evaluate the constant S independently.

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A Quantitative Study of the Lanthanum-Neodymium Separation

BY P. W. SELWOOD

The writer had occasion for another investigation to prepare a considerable quantity of a lanthanum-neodymium mixture and, during recovery of this material, opportunity has been taken to make quantitative measurements on eight separation procedures including all standard methods available for the cerium group. The fractions were analyzed by means of their magnetic susceptibilities. The original mixture contained 29.6% Nd. Six-gram samples of the mixed oxides were taken in each case.

While the above results have not necessarily been obtained through the optimum conditions for all or any one of the separations, yet Prandtl's basic ammonia separation is shown to be definitely the most efficient of the methods as described in the literature. In actual practice it is frequently found that a reversal of the solubility order facilitates rapid purification. The oxalate method, which is the most efficient of the solubility