CHAPTER THREE

COMPUTATIONAL TECHNIQUES

As observed in the Irving-Rossotti titration curves Fig. II 1 - II 18, for the same value of alkali the reagent titration curve indicated higher values of pH than the acid titration curve, because it contained less titratable hydrogen ions, as it would happen when the complexing agent was a base. From the displacement of these two curves $\bar{n}_H$ can be calculated. Further, the metal complex is formed by reaction of the type

$$M + LH^+ \longrightarrow ML + H^+$$

Thus, the ligand which had been first protonated sheds these protons on coordination, so that the ~~first i.e. the~~ metal + ligand curve contains more titratable hydrogen ions as compared to only ligand curve. Hence the metal titration curve would indicate lower pH value for the same volume of alkali than in the ligand titration curve. The calculations of $\bar{n}$ could then be made from the difference in the volumes of alkali required to produce the same pH value in the metal and the reagent titrations. In other words, the displacement of the metal curve has to be measured with respect to the reagent curve along the volume axis of a 'pH-versus-alkali volume' plot.

A. Calculation of $\bar{n}_H$ and K_n^H -

The stoichiometric hydrogen ion concentration $[H]'$ at any point of the acid titration curve is given by :

$$[H]' = E' + [OH]' - Na' \quad .... \quad (3.1)$$

where E' = concentration of mineral acid in solution, and

Na' = concentration of Na^+ ions from the NaOH added. The latter term does not include the Na^+ ions present due to the addition of a neutral salt like $NaClO_4$ to maintain a constant ionic strength throughout the titration. The term $[OH]^{\circ}$ results from hydrolysis which nullifies the effect of the addition of alkali and hence is positive.

For the reagent titration the corresponding equation is

$$[H]'' = E'' + [OH]'' - Na'' + YT_L'' - \bar{n}_H'' T_L'' \quad ...(3.2)$$

The term YT_L'' represents the number of titratable hydrogen ions (replaceable hydrogen ions) in gram ion per litre, arising from the complexing agent. It would be HYL when the complexing agent is an acid. But when the complexing agent is a base Y will be zero. The last term $\bar{n}_H'' T_L''$ gives the number of hydrogen ions removed as a result of the formation of proton ligand complexes and results from the definition of $\bar{n}_H$ given previously.

If two solutions have the same ionic strength, it follows from the equation[1-3] :

$$-\log [H] = B + \log f + \log U_H^{\circ} \quad ... \quad (3.3)$$

that for points on the corresponding titration curve where the B values are identical.

$$[H]' = [H]'' \quad ..... \quad (3.4)$$

Since $[H]$ and $[OH]$ are related by the ionic product of water which is constant at constant ionic strength and temperature ; so

$$[OH]' = [OH]'' \quad ..... \quad (3.5)$$

Thus from (3.1) and (3.2) the following relationship is obtained :

$$\bar{n}_H'' = \frac{\{(E''-E') - (Na''-Na') + YT_L''\}}{T_L''} \quad \ldots\ldots \quad (3.6)$$

Further, if for two titrations the initial volumes of solutions, V^o, the initial mineral acid concentration, E^o, and the concentration of alkali, N, are the same and T_L^o is the initial total ligand concentration, the following equations can be obtained if v' and v'' are the volumes of alkali needed for reaching the same pH value in both the titrations.

$$E'' = V^oE^o / (V^o + v'') \quad \ldots\ldots \quad (3.7)$$

$$Na'' = v''N / (V^o + v'') \quad \ldots\ldots \quad (3.8)$$

and $$T_L'' = V^oT_L^o / (V^o + v'') \quad \ldots\ldots \quad (3.9)$$

Similar equations would represent the values for E', Na', T_L' and v'. Then from (3.1)

$$\bar{n}_H = \left\{ YT_L^o + \frac{(v'-v'')(N+E^o)}{(V^o+v')} \right\} \Big/ T_L^o \quad \ldots\ldots \quad (3.10)$$

The advantage of the Irving-Rossotti method of determination of formation constants is that proton ligand stability constants can also be determined simultaneously under the experimental conditions from the values of $\bar{n}_H$ calculated. Since the ligands used are tertiary bases, they can take up protons to form the corresponding conjugate acids. Depending upon the number of basic centres one or

more protons can be taken up resulting in the formation of the protonated species. The reaction can be considered to take place in steps as follows :

$$L + H \rightleftharpoons LH$$

$$LH + H \rightleftharpoons LH_2$$

Each of the equilibrium is governed by its constant :

$$K_n^H = \frac{[LH_n]}{[L]\ [H]^n} \quad \ldots\ldots \qquad (3.11)$$

These constants are termed as ' Proton ligand stability constants'.

Since the ligands used, pyridine and its methyl substituted derivatives are having only one basic centre, the formation function of the proton ligand complexes (equ. 1.15 Chapter I) reduces to

$$\bar{n}_H + (\bar{n}_H - 1)\ {}^{P}K_1^H\ [H] = 0 \quad \ldots\ldots \qquad (3.12)$$

$$\therefore \quad \bar{n}_H = (1 - \bar{n}_H)\ {}^{P}K_1^H\ [H] \quad \ldots\ldots \qquad (3.13)$$

$$\therefore \quad \log \frac{\bar{n}_H}{1 - \bar{n}_H} = \log {}^{P}K_1^H - B \quad \ldots\ldots \qquad (3.14)$$

or $$B + \log \frac{\bar{n}_H}{1 - \bar{n}_H} = \log {}^{P}K_1^H \quad \ldots\ldots \qquad (3.15)$$

This relation suggests that the plot of $\log \frac{\bar{n}_H}{1-\bar{n}_H}$ against B should be a straight line. The values of $\bar{n}_H$ in the case of pyridine, picolines, lutidines and collidine were determined from the titration curves using the equation (3.10). The value of Y in all the calculations was considered to be zero. The final values of $\bar{n}_H$ are

precised up to the second place of decimal because they depend upon the burette readings which in our experiment have an accuracy of ± 0.01 ml. The values of log $\bar{n}_H$ / $(1-\bar{n}_H)$ (Tables III 1A(i) to III 9A(ii)) were calculated at each point and plotted against the corresponding pH. The straight lines thus obtained have been presented in Fig. III 1 - III 9. Such plots are important because they eliminate the widely divergent values. In all the cases, however, majority of the points fall on the straight line. $^{P}K^{H}$ values at each point on the straight line can be calculated from the relationship

$$\log {}^{P}K^{H} = B + \log \frac{\bar{n}_H}{1 - \bar{n}_H} \quad \ldots\ldots \qquad (3.16)$$

The mean values of $^{P}K^{H}$ were obtained from the values calculated at each point. The values have been reported in Table III 8.

In case of 2-aminopyridine and 2-amino-4-methyl-pyridine, there are two basic centres, the ring nitrogen and the amino group nitrogen in the side chain. The formation of a biprotonated species can therefore, be expected. So the reaction can be considered to take place in two stages. If the first and second proton ligand stability constants are not simulteneous, at each stage $\bar{n}_H \begin{matrix} > 0 \\ < 1 \end{matrix}$ and $\bar{n}_H \begin{matrix} > 1 \\ < 2 \end{matrix}$, the linear relationship between pH and log $\bar{n}_H$ / $(1 - \bar{n}_H)$ can be expected. The values of $\bar{n}_H$ were calculated in case of aminopyridine and methyl aminopyridine considering Y=0. In the calculations for aminopyridine $\bar{n}_H$ values more than 1 could not be obtained even at pH 2. This indicates that

the $-NH_2$ group has very small tendency to associate with the protons. Consequently the values of $^{P}K_2^{H}$ will be very low. It could not be calculated in the present investigation. In case of methyl aminopyridine $\bar{n}_H > 1$ were obtained and $^{P}K_1^{H}$ as well as $^{P}K_2^{H}$ could be determined using the linear plots in the range $\bar{n}_H \lessgtr 1$ and $\bar{n}_H > 1$ respectively (Fig. III 9(i), (ii)). In the range $\bar{n}_H > 1$ the actual values of $\bar{n}_H$ used in the linear plot were those obtained by removing the whole number. The values of $^{P}K_1^{H}$ for aminopyridine and $^{P}K_1^{H}$ and $^{P}K_2^{H}$ for methyl aminopyridine have also been presented in Table III B.

The calculations were repeated at 35 and 45°C in each case.

B. Metal ligand stability constant -

(1) Calculation of $\bar{n}$ - At any point on the metal titration curves (Fig. II 1(i) II 18),

$$[H]''' = E''' + YT_L''' + [OH]''' - Na''' + \bar{n}_H''' T_L''' + \bar{n}_H''' \bar{n}''' T_M''' \quad \ldots\ (3.17)$$

If the pH meter readings, B and the ionic strength of this solution are the same as those given by equation (3.2) for the same point on the curve (i.e. the same ordinate, B) then

$$[H]'' = [H]''', \quad [OH]'' = [OH]''' \quad \text{and}$$

$$\bar{n}_H'' = \bar{n}_H''' \quad \text{so that}$$

$$\bar{n} = \frac{\{(E''-E''')+(T_L''-T_L''')(Y-\bar{n}_H)-(Na''-Na''')\}}{\bar{n}_H''' \cdot T_M'''} \quad \ldots(3.18)$$

If the initial volumes, V^0 and concentrations of acid, E^0 and of ligand, T_L^0 were the same in each solution and volumes v'' and v''' of alkali of concentration N were added to reach the points Na'' and Na''', then from (3.18) the equations similar to (3.7) to (3.9) the following expression for $\bar{n}$ will be obtained.

$$\bar{n} = \frac{(v''' - v'')\left\{N + E^0 + T_L^0 (Y - \bar{n}_H)\right\}}{(V^0 + v'')\,\bar{n}_H\, T_M} \quad \ldots\ldots \quad (3.19)$$

Now if $N \gg E^0$ and $V^0 \gg v''$, then

$$\bar{n} = (v''' - v'')\, N/V^0\, \bar{n}_H\, T_M \quad \ldots\ldots\ldots \quad (3.20)$$

(2) Calculation of $\bar{n}$ from the titrations in which the total concentration of the ligand is varied -

In this method a solution containing mineral acid alone and another containing metal ion and mineral acid are titrated with a solution of ligand.

For any point on a titration curve of a volume V^0 of a solution containing metal ions and acid of initial concentrations T_M^0 and E^{0}'', wi-th a ligand solution of molar concentration L

$$[H]''' = E'' + [OH]''' - (\bar{n}_H''' - Y)T_L''' + \bar{n}'''\,\bar{n}_H'''\,T_M''' \quad \ldots\ldots \quad (3.21)$$

at the same pH in the acid curve

$$[H]'' = E'' - [OH]'' - (\bar{n}_H'' - Y)\,T_L$$

If the volumes v'' and v''' of ligand solutions are required to give a pH meter reading B, on the acid and acid + metal curves respectively :

$$[H]''' = [H]''$$

therefore

$$\bar{n}''' = (v''' - v'') \{ E^{o}'' + (\bar{n}_H'' - Y)L \} \; / (V^o + v'')\bar{n}_H'' T_M^o \quad \ldots(3.22)$$

and if $V^o \gg v''$ and $(\bar{n}_H'' - Y)L \gg E^o$ then

$$\bar{n}''' = (v''' - v'')(\bar{n}_H'' - Y)L \; / \; V^o . \bar{n}_H'' T_M^o \quad \ldots\ldots \quad (3.23)$$

Since $Y = 0$, the above equation reduces to

$$\bar{n}''' = (v''' - v'')L \; / \; V^o . T_M \quad \ldots\ldots \quad (3.24)$$

In the present investigation $\bar{n}$ values have been determined by both the methods at 35°C. and by the first method at 45°C. also. In the first method $\bar{n}$ values were calculated by using the titration curves with NaOH as titrant (Fig.II 1 - II 18) and employing the equation (3.19). $\bar{n}$ have been calculated till the values show an increase. The fall in the values of $\bar{n}$ indicates the decomposition of the complex due to hydrolysis. The higher pH values have been avoided in order to eliminate the possibility of the formation of hydroxocomplexes. The points in higher acidic range (i.e. below 3.5 pH) have not been considered because of a very low separation between the ligand and metal-ligand curves resulting in very small values of $(v''' - v'')$. A slight error in the experimental observation in this region can therefore, introduce a considerable error in the calculation of $\bar{n}$. The calculations were repeated using titration curves of different ligands. The values of $\bar{n}$ have been reported in Tables III 1(i) - III 9(vi).

The calculations of $\bar{n}$ for the different complexes at 35°C. were further repeated using the titration curves where the ligand is the titrant (Fig.II 19 - II 26) and

substituting the values in equation (3.24). The values thus obtained have also been tabulated in Tables III 1C(i)-III 9C(vi) along with $\bar{n}$ values calculated by the first method. It is observed that at a particular pH the values of $\bar{n}$ obtained by both the methods are almost the same. In case of 2-amino-4-methylpyridine the second method i.e. taking ligand as titrant, could not be attempted as the ligand is less soluble and it is not possible to prepare a concentrated aqueous solution of the ligand to be used as titrant.

(3) Calculation of pL -

The pL is calculated in the following manner :

Equation (1.19) is written in the modified and rearranged form using equations (1.13) and (1.17) as under:

$$\frac{1}{[L]^{"'}} = \frac{\sum_{i=0}^{j} \beta_i^H \, [H]^{i"'}}{T_L^{"'} - \bar{n}^{"'} \cdot T_M^{"'}} \quad \ldots\ldots \qquad (3.25)$$

Taking logarithms on both the sides, and by a simple transformation, the following expression results -

$$pL = \log \frac{1}{[L]^{"'}} = \log \left[\frac{\sum_{i=0}^{j} \frac{\beta_i^H}{(f.U_H^o)^i} \left[f \, U_H^o \cdot [H]^{"'} \right]^i}{T_L^{"'} - \bar{n}^{"'} \cdot T_M^{"'}} \right] \quad \ldots (3.26)$$

Equation similar to (3.9) and (3.26) can now be written as :

$$pL = \log \left[\frac{\sum_{i=0}^{j} \left\{ P\beta_i^H \left[\frac{1}{\text{antilog } B^{"'}} \right]^i \right\}}{T_L^o - \bar{n}^{"'} \cdot T_M^o} \cdot \frac{V^o + V^{"'}}{V^o} \right] \quad \ldots (3.27)$$

But when the ligand has got only one proton ligand stability constant ($^{P}K^{H}$) the above equation is reduced to the form :

$$pL = \log \left[\frac{1 + {}^{P}K^{H} \left(\frac{1}{\text{antilog } B} \right)}{T_L^\circ - \bar{n} \cdot T_M^\circ} \cdot \frac{V^\circ + V''}{V^\circ} \right] \quad (3.28)$$

This is the equation which was employed for calculating the pL values in all the cases except in case of 2-amino-4-methylpyridine which has got two proton ligand stability constants ($^{P}K_1^{H}$ and $^{P}K_2^{H}$). In this case the equation (3.27) becomes as follows :

$$pL = \log \left[\frac{1 + {}^{P}K_1^{H} \left(\frac{1}{\text{antilog } B} \right) + {}^{P}K_1^{H} \cdot {}^{P}K_2^{H} \left(\frac{1}{\text{antilog } B} \right)^2}{T_L^\circ - \bar{n} \cdot T_M^\circ} \cdot \frac{V^\circ + V''}{V^\circ} \right] \quad .....(3.29)$$

It is, however, observed that in the calculations of pL in case of 2-amino-4-methylpyridine, the values of $^{P}K_2^{H}$ being very small, the second part of right hand side of the equation becomes negligible. Thus the value of $^{P}K_2^{H}$ does not affect the value of pL. The consideration of $^{P}K_1^{H}$ alone in the calculations of metal -aminopyridine complexes will not, therefore, make the pL values less precise. The pL values calculated have been reported in Tables III 1 C(i) - III 9 C(vi). The values of $\bar{n}$ have an accuracy of $\pm$ 0.01 depending upon the burette precision and the values of pL are significant up to $\pm$ 0.05 depending upon the readability of the pH meter scale.

Values of $\bar{n}$ obtained have been plotted against pL

in the Figs. III 10 - III 36. log K_1 and log K_2 have been calculated from pL values at $\bar{n} = 0.5$ and $\bar{n} = 1.5$ respectively. The values have been reported in the Tables III D(i) - (iii). The values of log K_1 and log K_2 do not differ significantly. Further, the formation curve do not show flattening at $\bar{n} = 1$ indicating that the spreading factor in the formation of the first and second steps of the metal ligand complexes is not high. Values of the formation constants obtained at half integral values are therefore, less precise.

Different workers have adopted different methods, suitable to their experimental conditions, for finding out the precise values of formation constants. These have been reviewed by Irving and Rossotti[4] and Sullivan and Hindman[5]. Of all these methods, those suggested by Bjerrum[6,7] have widely been used, specially for a system where N = 2.

Out of these the method of Successive approximation has been applied in the preseht investigation to improve the values of formation constants obtained by interpolation at half integral values.

The formation function for the complex ML_2, where N = 2, is reported as :

$$\bar{n} + (\bar{n} - 1) K_1 [L] + (\bar{n} - 2) [L]^2 K_1 K_2 = 0 \quad \ldots \quad (3.30)$$

From this equation following expression for K_1 and K_2 can be drawn -

$$K_1 = \frac{1}{[L]} \cdot \frac{\bar{n}}{(1 - \bar{n}) + (2 - \bar{n}) K_2 [L]} \quad \ldots \quad (3.31)$$

$$K_2 = \frac{1}{[L]} \cdot \frac{\bar{n} + (\bar{n} - 1) K_1 [L]}{(2 - \bar{n}) K_1 [L]} \quad \ldots \quad (3.32)$$

By substituting the values of K_2 obtained by half integral method in equation (3.31) values of K_1 have been obtained at points having different $\bar{n}$ and $[L]$ values. The values obtained have been summed up to find the average value of log K_1.

Similarly the value of K_1 at half integral value has been substituted in equation (3.32) at different points to get the value of K_2. All the values have been summed up and the average value of log K_2 has been obtained.

The values of first and second formation constants obtained by the two methods have been tabulated in Tables III D(i) - (iii). The values have an accuracy of $\pm$ 0.05.

Table III 1 A(i)

B, $\bar{n}_H$, log $\bar{n}_H$ / (1 - $\bar{n}_H$) data for pyridine at 35°C.

B	V'	V''	(V' - V'')	$\bar{n}_H$	log $\bar{n}_H/(1 - \bar{n}_H)$
3.50	5.83	1.06	4.77	0.93_4	1.15_1
3.60	5.84	1.09	4.75	0.29_9	1.11_6
3.70	5.84	1.12	4.72	0.92_4	1.08_4
3.80	5.84	1.16	4.68	0.91_6	1.03_8
4.00	5.84	1.26	4.59	0.89_8	0.90_3
4.10	5.84	1.32	4.52	0.88_5	0.88_5
4.20	5.85	1.40	4.45	0.87_1	0.82_9
4.30	5.85	1.50	4.35	0.85_1	0.75_8
4.35	5.85	1.55	4.30	0.84_2	0.68_6
4.40	5.85	1.60	4.25	0.83_2	0.67_4
4.50	5.85	1.72	4.13	0.80_8	0.61_4
4.60	5.85	1.86	3.99	0.78_1	0.55_2
4.70	5.86	2.04	3.82	0.74_7	0.476
4.80	5.86	2.24	3.62	0.70_8	0.38_5
4.90	5.86	2.45	3.41	0.66_7	0.30_2

Table III 1 A(ii)

B, $\bar{n}_H$, log $\bar{n}_H/(1 - \bar{n}_H)$ data for pyridine at 45°C.

B	V'	V''	(V' - V'')	$\bar{n}_H$	log $\bar{n}_H/(1 - \bar{n}_H)$
3.50	5.87	1.07	4.80	0.93_9	1.11_8
3.60	5.88	1.10	4.78	0.93_5	1.15_8
3.70	5.88	1.14	4.74	0.92_7	1.10_5
3.80	5.88	1.17	4.71	0.92_1	1.06_8
4.00	5.90	1.27	4.63	0.90_5	0.97_9
4.10	5.90	1.34	4.56	0.89_2	0.91_6
4.20	5.90	1.42	4.48	0.87_5	0.84_5
4.30	5.90	1.52	4.38	0.85_6	0.77_6
4.40	5.90	1.66	4.24	0.82_9	0.68_6
4.50	5.90	1.80	4.10	0.80_2	0.60_7
4.60	5.91	2.05	3.86	0.75_5	0.48_8
4.70	5.91	2.33	3.58	0.70_0	0.36_8
4.80	5.91	2.60	3.31	0.64_7	0.26_3
4.90	5.91	2.87	3.04	0.59_4	0.09_3

Table III 2 A(i)

B, $\bar{n}_H$, log $\bar{n}_H/(1 - \bar{n}_H)$ data for α-picoline at 35°C.

B	V'	V"	(V' - V")	$\bar{n}_H$	log $\bar{n}_H/(1 - \bar{n}_H)$
3.80	5.84	1.06	4.78	0.93_5	1.16_2
3.90	5.84	1.07	4.77	0.93_4	1.14_9
4.00	5.84	1.08	4.76	0.93_2	1.13_5
4.10	5.84	1.08	4.76	0.93_2	1.13_5
4.20	5.85	1.09	4.76	0.93_1	1.13_3
4.30	5.85	1.10	4.75	0.93_0	1.12_1
4.40	5.85	1.11	4.74	0.92_8	1.07_7
4.50	5.85	1.13	4.72	0.92_5	1.09_0
4.60	5.85	1.16	4.69	0.91_8	1.04_8
4.70	5.85	1.22	4.63	0.90_6	0.98_4
4.80	5.85	1.29	4.56	0.89_2	0.91_9
4.90	5.86	1.38	4.48	0.87_7	0.85_2
5.00	5.86	1.49	4.37	0.85_5	0.77_2
5.10	5.86	1.62	4.24	0.83_0	0.68_8
5.20	5.86	1.75	4.11	0.80_4	0.61_3
5.30	5.86	1.91	3.95	0.77_3	0.53_2
5.40	5.86	2.09	3.77	0.73_8	0.45_9
5.50	5.86	2.28	3.58	0.70_0	0.36_9
5.60	5.86	2.47	3.39	0.66_4	0.29_6
5.70	5.86	2.78	3.08	0.60_3	0.18_1

Table III 2 A(ii)

B, $\bar{n}_H$, log $\bar{n}_H/(1 - \bar{n}_H)$ data for α-picoline at 45°C.

B	V'	V''	(V' - V'')	$\bar{n}_H$	log $\bar{n}_H/(1 - \bar{n}_H)$
3.80	5.88	1.09	4.79	0.93_7	1.17_2
3.90	5.89	1.10	4.79	0.93_7	1.17_0
4.00	5.90	1.12	4.78	0.93_5	1.15_5
4.10	5.90	1.14	4.76	0.93_1	1.12_8
4.20	5.90	1.16	4.74	0.92_7	1.09_2
4.30	5.90	1.19	4.71	0.92_1	1.06_5
4.40	5.90	1.21	4.69	0.91_7	1.04_3
4.50	5.90	1.24	4.66	0.91_1	1.01_1
4.60	5.90	1.30	4.60	0.89_9	0.95_2
4.70	5.90	1.36	4.54	0.88_8	0.89_8
4.80	5.90	1.44	4.46	0.87_2	0.83_3
4.90	5.90	1.54	4.36	0.85_2	0.77_1
5.00	5.91	1.70	4.21	0.82_3	0.66_7
5.10	5.91	1.85	4.06	0.79_4	0.58_5
5.20	5.91	2.02	3.89	0.76_0	0.50_1
5.30	5.91	2.18	3.73	0.72_9	0.43_0
5.40	5.92	2.40	3.52	0.68_8	0.34_3
5.50	5.92	2.60	3.32	0.64_9	0.26_6
5.60	5.92	2.81	3.11	0.60_8	0.19_0
5.70	5.92	3.08	2.84	0.56_8	0.11_9

Table III 3 A(i)

B, $\bar{n}_H$, log $\bar{n}_H/(1 - \bar{n}_H)$ data for β-picoline at 35°C.

B	V'	V''	(V' - V'')	$\bar{n}_H$	log $\bar{n}_H/(1 - \bar{n}_H)$
3.80	5.84	1.02	4.82	0.94_3	1.22_2
3.90	5.84	1.04	4.80	0.94_0	1.19_2
4.00	5.84	1.06	4.78	0.93_6	1.16_2
4.10	5.84	1.08	4.76	0.93_2	1.12_5
4.20	5.84	1.11	4.73	0.92_6	1.09_7
4.30	5.85	1.13	4.72	0.92_4	1.06_6
4.40	5.85	1.16	4.69	0.92_0	1.06_4
4.50	5.85	1.21	4.64	0.90_8	0.99_3
4.60	5.85	1.28	4.57	0.89_4	0.92_7
4.70	5.85	1.36	4.49	0.87_9	0.86_0
4.80	5.85	1.47	4.38	0.85_7	0.77_9
4.90	5.86	1.60	4.26	0.83_3	0.69_9
5.00	5.86	1.78	4.08	0.79_8	0.59_8
5.10	5.86	1.98	3.88	0.75_8	0.49_5
5.20	5.87	2.19	3.68	0.72_0	0.41_0
5.30	5.87	2.40	3.47	0.67_9	0.32_5
5.40	5.87	2.60	3.27	0.64_0	0.24_9
5.50	5.87	2.83	3.04	0.59_5	0.16_7
5.60	5.87	3.19	2.68	0.53_4	0.07_6

Table III 3 A(ii)

B, $\bar{n}_H$, log $\bar{n}_H/(1 - \bar{n}_H)$ data for β-picoline at 45°C.

B	V'	V"	(V' - V")	$\bar{n}_H$	log $\bar{n}_H/(1 - \bar{n}_H)$
3.80	5.89	1.04	4.85	0.94_8	1.26_4
3.90	5.89	1.07	4.82	0.94_2	1.21_5
4.00	5.90	1.10	4.80	0.93_8	1.18_3
4.10	5.90	1.14	4.76	0.93_1	1.12_8
4.20	5.90	1.17	4.73	0.92_5	1.09_0
4.30	5.90	1.21	4.69	0.91_7	1.04_3
4.40	5.90	1.25	4.65	0.90_9	1.00_1
4.50	5.90	1.31	4.59	0.89_7	0.94_3
4.60	5.90	1.41	4.49	0.87_8	0.85_6
4.70	5.90	1.52	4.38	0.85_6	0.77_5
4.80	5.90	1.68	4.22	0.82_7	0.67_9
4.90	5.90	1.85	4.05	0.79_2	0.58_1
5.00	5.91	2.04	3.87	0.75_6	0.49_2
5.10	5.91	2.22	3.69	0.72_1	0.41_3
5.20	5.91	2.40	3.51	0.68_6	0.34_0
5.30	5.91	2.62	3.29	0.64_3	0.25_6
5.40	5.91	2.88	3.03	0.59_2	0.16_2
5.50	5.91	3.18	2.73	0.53_6	0.06_2

Table III 4 A(i)

B, $\bar{n}_H$, log $\bar{n}_H/(1 - \bar{n}_H)$ data for γ-picoline at 35°C.

B	V'	V''	(V' - V'')	$\bar{n}_H$	log $\bar{n}_H/(1 - \bar{n}_H)$
3.80	5.84	1.06	4.78	0.93_6	1.16_2
3.90	5.84	1.07	4.77	0.93_4	1.14_9
4.00	5.84	1.08	4.76	0.93_2	1.12_5
4.10	5.84	1.09	4.75	0.93_0	1.12_2
4.20	5.85	1.10	4.75	0.93_0	1.08_1
4.30	5.85	1.12	4.73	0.92_6	1.07_6
4.40	5.85	1.14	4.71	0.92_2	1.07_1
4.50	5.86	1.16	4.70	0.92_0	1.05_8
4.60	5.86	1.18	4.68	0.91_6	1.03_5
4.70	5.86	1.22	4.64	0.90_8	0.99_3
4.80	5.86	1.26	4.60	0.90_0	0.95_6
4.90	5.86	1.32	4.54	0.88_8	0.90_1
5.00	5.86	1.39	4.47	0.87_5	0.84_4
5.10	5.86	1.50	4.36	0.85_3	0.76_4
5.20	5.86	1.62	4.24	0.83_0	0.69_6
5.30	5.86	1.76	4.10	0.78_4	0.55_9
5.40	5.87	1.90	3.97	0.77_7	0.54_1
5.50	5.87	2.11	3.76	0.73_6	0.44_5
5.60	5.87	2.32	3.55	0.69_4	0.35_7
5.70	5.87	2.58	3.29	0.64_4	0.25_7
5.80	5.87	2.80	3.07	0.60_1	0.17_8
5.90	5.87	3.02	2.85	0.55_8	0.10_0
6.00	5.87	3.25	2.62	0.51_3	0.02_2

Table III 4 A(ii)

B, $\bar{n}_H$, log $\bar{n}_H/(1 - \bar{n}_H)$ data for γ-picoline at 45°C.

B	V'	V"	(V' - V")	$\bar{n}_H$	log $\bar{n}_H/(1 - \bar{n}_H)$
3.80	5.89	1.05	4.84	$0.9_4{}_6$	$1.2_4{}_7$
3.90	5.89	1.06	4.83	$0.9_4{}_4$	$1.2_3{}_1$
4.00	5.90	1.07	4.83	$0.9_4{}_4$	$1.2_2{}_9$
4.10	5.90	1.09	4.81	$0.9_4{}_0$	$1.1_9{}_8$
4.20	5.90	1.11	4.79	0.93_6	$1.1_6{}_9$
4.30	5.90	1.13	4.77	0.93_3	$1.1_4{}_1$
4.40	5.90	1.15	4.75	0.92_9	$1.1_1{}_5$
4.50	5.90	1.18	4.72	0.92_3	$1.0_7{}_7$
4.60	5.90	1.22	4.68	0.91_5	$1.0_3{}_1$
4.70	5.90	1.28	4.62	0.90_3	0.97_0
4.80	5.90	1.35	4.55	0.89_0	0.90_6
4.90	5.90	1.45	4.45	0.87_0	0.82_6
5.00	5.91	1.59	4.32	$0.8_4{}_4$	0.72_6
5.10	5.91	1.70	4.21	0.82_3	0.66_7
5.20	5.91	1.86	4.05	0.79_2	0.58_0
5.30	5.91	2.00	3.91	0.76_4	0.51_1
5.40	5.91	2.20	3.71	0.72_5	0.42_1
5.50	5.91	2.41	3.50	0.68_6	0.33_9
5.60	5.91	2.60	3.31	$0.6_4{}_9$	0.26_7
5.70	5.92	2.85	3.07	0.60_0	0.17_6
5.80	5.92	3.06	2.86	0.55_9	0.10_3
5.90	5.92	3.30	2.62	0.51_2	0.02_4

Table III 5 A(i)

B, $\bar{n}_H$, log $\bar{n}_H/(1 - \bar{n}_H)$ data for 2,4-lutidine at 35°C.

B	V'	V"	(V' - V")	$\bar{n}_H$	log $\bar{n}_H/(1 - \bar{n}_H)$
4.00	5.84	1.80	4.04	0.79_1	0.57_8
4.20	5.85	1.81	4.04	0.79_1	0.57_7
4.40	5.85	1.82	4.03	0.78_9	0.57_2
4.50	5.85	1.83	4.02	0.78_7	0.56_7
4.60	5.85	1.83	4.02	0.78_7	0.56_7
4.80	5.86	1.84	4.02	0.78_6	0.56_6
4.90	5.86	1.85	4.01	0.78_4	0.56_3
5.00	5.86	1.86	4.00	0.78_3	0.55_6
5.10	5.86	1.87	3.99	0.78_1	0.55_1
5.20	5.86	1.90	3.96	0.77_5	0.53_7
5.30	5.86	1.92	3.94	0.77_1	0.52_7
5.40	5.86	1.96	3.90	0.76_3	0.50_8
5.50	5.86	2.00	3.86	0.75_5	0.48_9
5.60	5.87	2.05	3.82	0.74_7	0.47_1
5.70	5.87	2.12	3.75	0.73_4	0.44_0
5.80	5.87	2.20	3.67	0.71_8	0.40_6
5.90	5.87	2.31	3.56	0.69_6	0.31_7
6.00	5.87	2.42	3.45	0.67_5	0.30_3
6.10	5.87	2.54	3.33	0.65_1	0.27_2
6.20	5.87	2.68	3.19	0.62_4	0.22_0
6.30	5.87	2.82	3.05	0.59_7	0.17_0
6.40	5.87	2.92	2.95	0.57_7	0.13_5
6.50	5.87	3.11	2.76	0.54_0	0.07_0

Table III 5 A(ii)

B, $\bar{n}_H$, log $\bar{n}_H/(1 - \bar{n}_H)$ data for 2:4-lutidine at 45°C.

B	V'	V"	(V' - V")	$\bar{n}_H$	log $\bar{n}_H/(1 - \bar{n}_H)$
4.00	5.90	1.79	4.11	0.80_3	0.61_2
4.20	5.90	1.80	4.10	0.80_2	0.60_7
4.40	5.90	1.82	4.08	0.79_8	0.59_6
4.50	5.90	1.83	4.07	0.79_6	0.59_1
4.60	5.90	1.84	4.06	0.79_4	0.58_5
4.70	5.90	1.85	4.05	0.79_2	0.58_1
4.80	5.90	1.86	4.04	0.79_0	0.57_5
4.90	5.90	1.87	4.03	0.78_8	0.57_0
5.00	5.91	1.88	4.03	0.78_8	0.56_9
5.10	5.91	1.89	4.02	0.78_6	0.56_4
5.20	5.91	1.92	3.99	0.78_0	0.55_0
5.30	5.91	1.97	3.94	0.77_0	0.52_5
5.40	5.91	2.02	3.89	0.76_0	0.50_1
5.50	5.91	2.10	3.81	0.74_5	0.46_5
5.60	5.91	2.16	3.75	0.73_1	0.43_5
5.70	5.91	2.24	3.67	0.71_7	0.40_4
5.80	5.91	2.37	3.54	0.69_0	0.34_7
5.90	5.92	2.48	3.44	0.67_2	0.31_2
6.00	5.92	2.60	3.32	0.64_9	0.26_7
6.10	5.92	2.76	3.16	0.61_8	0.20_8
6.20	5.92	2.93	2.99	0.58_4	0.14_8
6.30	5.92	3.10	2.82	0.55_1	0.08_9
6.40	5.92	3.24	2.68	0.52_4	0.04_1

Table III 6 A(i)

B, $\bar{n}_H$, log $\bar{n}_H/(1 - \bar{n}_H)$ data for 2:6-lutidine at 35°C.

B	V'	V''	(V' − V'')	$\bar{n}_H$	log $\bar{n}_H/(1 - \bar{n}_H)$
4.20	5.85	0.88	4.97	0.97_3	1.55_2
4.40	5.85	0.89	4.96	0.97_1	1.52_0
4.50	5.85	0.90	4.95	0.96_9	1.49_1
4.60	5.85	0.91	4.94	0.96_7	1.46_4
4.70	5.86	0.92	4.94	0.96_6	1.46_0
4.80	5.86	0.94	4.92	0.96_3	1.41_2
4.90	5.86	0.96	4.90	0.95_9	1.36_7
5.00	5.86	0.98	4.88	0.95_5	1.32_5
5.10	5.86	1.01	4.85	0.94_9	1.26_8
5.20	5.86	1.05	4.81	0.94_1	1.20_3
5.30	5.86	1.09	4.77	0.93_3	1.14_6
5.40	5.86	1.13	4.73	0.92_5	1.09_4
5.50	5.86	1.18	4.71	0.91_6	1.03_6
5.60	5.86	1.27	4.59	0.89_8	0.94_5
5.70	5.86	1.38	4.48	0.87_7	0.85_1
5.80	5.87	1.50	4.37	0.85_5	0.77_2
5.90	5.87	1.62	4.25	0.83_2	0.69_3
6.00	5.87	1.80	4.07	0.79_6	0.59_2
6.10	5.87	1.98	3.89	0.76_1	0.50_3
6.20	5.87	2.16	3.71	0.72_6	0.42_3
6.30	5.87	2.40	3.47	0.67_9	0.32_5
6.40	5.87	2.62	3.25	0.63_6	0.24_2
6.50	5.87	2.91	2.96	0.57_9	0.13_9

Table III 6 A(ii)

B, $\bar{n}_H$, $\log \bar{n}_H/(1 - \bar{n}_H)$ data for 2:6-lutidine at 45°C.

B	V'	V''	(V' - V'')	$\bar{n}_H$	$\log \bar{n}_H/(1 - \bar{n}_H)$
4.20	5.90	0.89	5.01	0.97_9	1.67_9
4.40	5.90	0.90	5.00	0.97_8	1.64_2
4.50	5.90	0.92	4.98	0.97_4	1.55_7
4.60	5.90	0.94	4.96	0.97_0	1.50_8
4.70	5.90	0.95	4.95	0.96_8	1.47_6
4.80	5.90	0.97	4.93	0.96_4	1.42_5
4.90	5.90	0.99	4.91	0.96_0	1.38_1
5.00	5.91	1.02	4.89	0.95_6	1.33_6
5.10	5.91	1.06	4.85	0.94_8	1.26_0
5.20	5.91	1.10	4.81	0.94_0	1.19_6
5.30	5.91	1.15	4.76	0.93_0	1.12_7
5.40	5.91	1.21	4.70	0.91_9	1.05_3
5.50	5.91	1.30	4.61	0.90_1	0.96_0
5.60	5.91	1.38	4.53	0.88_5	0.88_8
5.70	5.91	1.48	4.43	0.86_6	0.81_0
5.80	5.91	1.60	4.31	0.84_3	0.72_9
5.90	5.91	1.76	4.15	0.81_1	0.63_3
6.00	5.91	1.91	4.00	0.78_2	0.55_5
6.10	5.92	2.09	3.83	0.74_8	0.47_4
6.20	5.92	2.30	3.62	0.70_7	0.38_3
6.30	5.92	2.50	3.42	0.66_8	0.30_4

Table III 7 A(i)

B, $\bar{n}_H$, log $\bar{n}_H/(1 - \bar{n}_H)$ data for 2:4:6-collidine at 35°C.

B	V'	V"	(V' - V")	$\bar{n}_H$	log $\bar{n}_H/(1 - \bar{n}_H)$
4.20	5.85	0.94	4.91	0.95_9	1.37_1
4.40	5.85	0.96	4.89	0.95_7	1.34_7
4.60	5.85	0.96	4.89	0.95_7	1.34_7
4.70	5.86	0.97	4.89	0.95_7	1.34_5
4.80	5.86	0.98	4.88	0.95_5	1.32_5
4.90	5.86	0.99	4.87	0.95_3	1.30_5
5.00	5.86	1.00	4.86	0.95_1	1.28_6
5.10	5.86	1.01	4.85	0.94_9	1.26_8
5.20	5.86	1.03	4.83	0.94_5	1.23_5
5.30	5.86	1.05	4.81	0.94_1	1.20_3
5.40	5.86	1.08	4.78	0.93_5	1.16_0
5.50	5.86	1.10	4.76	0.93_3	1.14_5
5.60	5.86	1.14	4.72	0.92_3	1.08_1
5.70	5.86	1.19	4.67	0.91_4	1.03_1
5.80	5.87	1.24	4.63	0.90_6	0.98_3
5.90	5.87	1.30	4.57	0.89_4	0.92_6
6.00	5.87	1.36	4.51	0.88_2	0.87_5
6.10	5.87	1.43	4.44	0.86_9	0.82_1
6.20	5.87	1.50	4.37	0.85_3	0.76_5
6.30	5.87	1.60	4.27	0.83_5	0.70_5
6.40	5.87	1.70	4.17	0.81_6	0.63_2
6.50	5.87	1.81	4.06	0.79_4	0.58_7
6.60	5.87	1.92	3.95	0.77_3	0.53_2
6.70	5.87	2.04	3.83	0.75_0	0.47_6

Table III 7 A(ii)

B, $\bar{n}_H$, log $\bar{n}_H/(1 - \bar{n}_H)$ data for 2:4:6-collidine at 45°C.

B	V'	V''	(V' - V'')	$\bar{n}_H$	log $\bar{n}_H/(1 - \bar{n}_H)$
4.20	5.90	0.95	4.95	0.96_8	1.47_9
4.40	5.90	0.96	4.94	0.96_6	1.45_1
4.60	5.90	0.97	4.93	0.96_4	1.42_5
4.70	5.90	0.98	4.92	0.96_2	1.40_3
4.80	5.90	0.99	4.91	0.96_0	1.381
4.90	5.90	1.01	4.89	0.95_6	1.336
5.00	5.91	1.03	4.88	0.95_4	1.316
5.10	5.91	1.05	4.86	0.95_0	1.27_8
5.20	5.91	1.07	4.84	0.94_6	1.24_4
5.30	5.91	1.10	4.81	0.94_0	1.196
5.40	5.91	1.14	4.77	0.93_2	1.14_0
5.50	5.91	1.17	4.74	0.92_7	1.10_1
5.60	5.91	1.22	4.69	0.91_7	1.04_7
5.70	5.91	1.28	4.63	0.90_5	0.97_9
5.80	5.91	1.34	4.57	0.89_5	0.93_2
5.90	5.92	1.42	4.50	0.87_9	0.86_3
6.00	5.92	1.50	4.42	0.86_4	0.80_2
6.10	5.92	1.60	4.32	0.84_4	0.73_4
6.20	5.92	1.70	4.22	0.82_5	0.67_3
6.30	5.92	1.80	4.12	0.80_5	0.616
6.40	5.92	1.94	3.98	0.778	0.54_4
6.50	5.92	2.07	3.85	0.75_2	0.48_3

Table III 8 A(i)

B, $\bar{n}_H$, log $\bar{n}_H/(1 - \bar{n}_H)$ data for 2-amino pyridine at 35°C.

B	V'	V"	(V' - V")	$\bar{n}_H$	log $\bar{n}_H/(1 - \bar{n}_H)$
4.20	5.85	0.92	4.93	0.96_3	1.41_8
4.40	5.85	0.94	4.91	0.96_1	1.39_2
4.50	5.85	0.94	4.91	0.96_1	1.39_2
4.60	5.85	0.95	4.90	0.95_9	1.36_9
4.70	5.85	0.96	4.89	0.95_7	1.34_7
4.80	5.86	0.98	4.88	0.95_5	1.32_5
4.90	5.86	1.00	4.86	0.95_1	1.28_6
5.00	5.86	1.02	4.84	0.94_7	1.25_1
5.10	5.86	1.04	4.82	0.94_3	1.21_9
5.20	5.86	1.08	4.78	0.93_5	1.16_0
5.30	5.86	1.12	4.74	0.92_7	1.10_6
5.40	5.86	1.18	4.68	0.91_6	1.03_5
5.50	5.86	1.24	4.62	0.90_5	0.97_3
5.60	5.86	1.32	4.54	0.88_8	0.90_1
5.70	5.87	1.42	4.45	0.87_1	0.82_9
5.80	5.87	1.55	4.32	0.84_3	0.73_1
5.90	5.87	1.70	4.17	0.81_4	0.63_9
6.00	5.87	1.84	4.03	0.78_8	0.57_1
6.10	5.87	2.00	3.87	0.75_7	0.49_4
6.20	5.87	2.20	3.67	0.71_8	0.40_6
6.30	5.87	2.42	3.45	0.67_5	0.30_7
6.40	5.87	2.70	3.17	0.62_0	0.21_3
6.50	5.87	2.90	2.97	0.58_3	0.14_5

Table III 8 A(ii)

B, $\bar{n}_H$, $\log \bar{n}_H/(1 - \bar{n}_H)$ data for 2-aminopyridine at 45°C.

B	V'	V"	(V' - V")	$\bar{n}_H$	$\log \bar{n}_H/(1 - \bar{n}_H)$
4.20	5.90	0.94	4.96	0.97_0	1.50_8
4.40	5.90	0.97	4.93	0.96_4	1.42_5
4.50	5.90	0.98	4.92	0.96_3	1.42_0
4.60	5.90	1.00	4.90	0.95_8	1.35_9
4.70	5.90	1.01	4.89	0.95_8	1.35_7
4.80	5.90	1.04	4.86	0.95_0	1.28_0
4.90	5.90	1.07	4.83	0.94_4	1.22_9
5.00	5.91	1.10	4.81	0.94_0	1.196
5.10	5.91	1.14	4.77	0.93_2	1.14_0
5.20	5.91	1.20	4.71	0.92_1	1.06_4
5.30	5.91	1.26	4.65	0.90_8	0.99_5
5.40	5.91	1.33	4.58	0.89_5	0.93_2
5.50	5.92	1.40	4.52	0.88_3	0.87_9
5.60	5.92	1.54	4.38	0.85_6	0.77_4
5.70	5.92	1.70	4.22	0.82_5	0.67_3
5.80	5.92	1.83	4.09	0.79_9	0.60_0
5.90	5.92	2.00	3.92	0.76_6	0.51_5
6.00	5.92	2.20	3.72	0.72_7	0.42_5
6.10	5.92	2.40	3.52	0.68_8	0.34_3
6.20	5.92	2.63	3.29	0.64_3	0.25_5
6.30	5.92	3.20	2.72	0.53_2	0.05_5

Table III 9 A(i)

B, $\bar{n}_H$, log $\bar{n}_H/(1 - \bar{n}_H)$ data for 2-amino-4-methylpyridine at 35°C.

B	V'	V''	(V' - V'')	$\bar{n}_H$	log $\bar{n}_H/(1 - \bar{n}_H)$
2.02	4.38	0.30	4.08	1.05_8	$\bar{2}.79_0$
2.10	4.68	0.60	4.08	1.05_2	$\bar{2}.73_9$
2.20	4.95	0.88	4.07	1.04_4	$\bar{2}.66_3$
2.30	5.16	1.11	4.05	1.03_5	$\bar{2}.56_0$
2.40	5.30	1.26	4.04	1.03_0	$\bar{2}.49_5$
2.50	5.43	1.40	4.03	1.02_5	$\bar{2}.40_9$
2.60	5.55	1.51	4.04	1.02_5	$\bar{2}.40_9$
2.70	5.64	1.60	4.04	1.02_3	$\bar{2}.37_2$
2.80	5.70	1.67	4.03	1.02_0	$\bar{2}.29_2$
3.00	5.78	1.76	4.02	1.01_6	$\bar{2}.21_1$
3.20	5.83	1.82	4.01	1.01_3	$\bar{2}.12_0$
3.50	5.88	1.85	4.03	1.01_7	$\bar{2}.23_8$
3.70	5.90	1.87	4.03	1.01_6	$\bar{2}.21_1$
4.00	5.91	1.88	4.03	1.01_4	$\bar{2}.14_2$
4.20	5.91	1.89	4.02	1.01_4	$\bar{2}.14_2$
4.50	5.92	1.90	4.02	1.01_3	$\bar{2}.12_0$

contd.....

Table III 9 A(i) contd.

4.70	5.92	1.92	4.00	1.00_9	$\bar{3}.95_8$
5.00	5.93	1.94	3.99	1.00_6	$\bar{3}.78_1$
5.10	5.93	1.95	3.98	1.00_3	$\bar{3}.47_8$
5.20	5.93	1.96	3.97	1.00_1	$\bar{3}.00_0$
5.30	5.93	1.97	3.96	0.99_9	2.85_3
5.40	5.94	1.98	3.96	0.99_8	2.79_5
5.50	5.94	1.99	3.95	0.99_6	2.35_5
5.60	5.94	2.01	3.93	0.99_1	2.02_3
5.70	5.94	2.03	3.91	0.98_6	1.83_5
5.80	5.94	2.06	3.88	0.97_8	1.64_6
5.90	5.94	2.09	3.85	0.97_0	1.51_7
6.00	5.95	2.13	3.82	0.96_3	1.41_2
6.10	5.95	2.18	3.77	0.95_0	1.27_8
6.20	5.95	2.25	3.70	0.93_2	1.14_0
6.30	5.95	2.32	3.63	0.91_5	1.03_0
6.40	5.96	2.40	3.56	0.89_7	0.93_9
6.50	5.96	2.58	3.38	0.85_3	0.71_0

Table III 9 A(ii)

B, $\bar{n}_H$, log $\bar{n}_H/(1 - \bar{n}_H)$ data for 2-amino-4-methylpyridine at 45°C.

B	V'	V"	(V' - V")	$\bar{n}_H$	log $\bar{n}_H/(1 - \bar{n}_H)$
1.80	4.20	0.10	4.10	1.06_7	$\bar{2}.45_9$
1.90	4.56	0.53	4.03	1.03_9	$\bar{2}.60_8$
2.00	4.86	0.83	4.03	1.03_5	$\bar{2}.56_0$
2.10	5.11	1.06	4.05	1.03_6	$\bar{2}.57_2$
2.20	5.28	1.25	4.03	1.02_8	$\bar{2}.46_0$
2.30	5.40	1.40	4.00	1.01_8	$\bar{2}.26_3$
2.40	5.52	1.50	4.02	1.02_1	$\bar{2}.33_1$
2.50	5.60	1.58	4.02	1.02_0	$\bar{2}.31_0$
2.70	5.72	1.70	4.02	1.01_7	$\bar{2}.23_8$
2.80	5.76	1.76	4.00	1.01_1	$\bar{2}.04_6$
2.90	5.79	1.80	3.99	1.00_8	$\bar{3}.90_7$
3.00	5.81	1.82	3.99	1.00_8	$\bar{3}.90_7$
3.20	5.84	1.85	3.99	1.00_8	$\bar{3}.90_7$
4.00	5.90	1.90	4.00	1.00_9	$\bar{3}.95_8$
4.20	5.91	1.90	4.01	1.01_1	$\bar{3}.87_9$
4.50	5.91	1.92	3.99	1.00_7	$\bar{3}.85_0$
4.70	5.92	1.94	3.98	1.00_3	$\bar{3}.47_8$

contd...

Table III 9 A(ii) contd.

5.00	5.92	1.96	3.96	0.99_8	2.79_5
5.10	5.92	1.97	3.95	0.99_6	2.38_2
5.20	5.92	1.98	3.94	0.99_1	2.03_2
5.30	5.92	2.00	3.92	0.98_8	1.92_7
5.40	5.93	2.02	3.91	0.98_6	1.84_0
5.50	5.93	2.05	3.88	0.97_8	1.65_0
5.60	5.93	2.08	3.85	0.97_1	1.52_0
5.70	5.93	2.12	3.81	0.96_0	1.38_6
5.80	5.93	2.17	3.76	0.94_8	1.26_0
5.90	5.94	2.22	3.72	0.93_8	1.17_7
6.00	5.94	2.30	3.64	0.91_7	1.04_6
6.10	5.94	2.38	3.56	0.89_7	0.93_8
6.20	5.94	2.48	3.46	0.87_2	0.83_4
6.30	5.94	2.58	3.36	0.84_7	0.74_2

Table III B

Proton ligand stability constants of the ligands

Ligand	P_K^H values	
	35°C	45°C
Pyridine	$1.07_6 \times 10^5$	$9.12_0 \times 10^4$
α-Picoline	$6.3^4{}_6 \times 10^5$	$5.09_8 \times 10^5$
β-Picoline	$4.13_5 \times 10^5$	$3.2^4{}_5 \times 10^5$
γ-Picoline	$8.53_1 \times 10^5$	$6.66_1 \times 10^5$
2:4-Lutidine	$2.75_5 \times 10^6$	$2.09_1 \times 10^6$
2:6-Lutidine	$4.06_2 \times 10^6$	$3.4^4{}_1 \times 10^6$
2:4:6-Collidine	$8.59_2 \times 10^6$	$6.37_1 \times 10^6$
2-Aminopyridine	$3.76_1 \times 10^6$	$2.75_0 \times 10^6$
2-Amino-4-methylpyridine :		
$P_{K_1}^H$	$2.60_8 \times 10^7$	$1.32_0 \times 10^7$
$P_{K_2}^H$	$1.19_9 \times 10^2$	$3.19_1 \times 10^1$

Table III 1 C(i)

$\bar{n}$, pL data for Ni-pyridinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
3.50	1.10	0.04	0.41_9	2.84_6	0.40
3.60	1.13	0.04	0.42_1	2.74_6	0.40
3.70	1.16	0.04	0.42_4	2.64_7	0.45
3.80	1.20	0.04	0.42_7	2.54_7	0.45
4.00	1.31	0.05	0.54_5	2.34_9	0.55
4.10	1.38	0.06	0.66_4	2.25_1	0.65
4.20	1.48	0.08	0.89_9	2.15_4	0.90
4.30	1.59	0.09	1.03_5	2.05_6	1.05
4.40	1.71	0.11	1.29_4	1.95_9	1.25
4.50	1.85	0.13	1.57_0	1.88_3	1.50
4.60	2.00	0.14	1.75_4	1.76_6	1.75
4.70	2.20	0.16	2.09_4	1.67_0	1.95
4.80	2.40	0.16	2.21_0	1.57_3	2.05

Table III 1 C(ii)

$\bar{n}$, pL data for Ni-pyridinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
3.50	1.10	0.03	0.31_3	2.77_3
3.70	1.18	0.04	0.42_2	2.57_5
3.80	1.21	0.04	0.42_5	2.47_5
4.00	1.32	0.05	0.54_0	2.27_7
4.10	1.41	0.07	0.76_8	2.18_0
4.20	1.50	0.08	0.89_2	2.08_3
4.30	1.61	0.09	1.02_8	1.98_6
4.40	1.78	0.12	1.30_8	1.88_8
4.50	1.93	0.13	1.58_7	1.79_2
4.60	2.19	0.14	1.80_9	1.69_6
4.70	2.48	0.15	2.10_0	1.59_1

Table III 1 C(iii)

$\bar{n}$, pL data for Cd-pyridinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (Second method)
3.50	1.09	0.03	0.31_5	2.84_5	0.30
3.60	1.12	0.03	0.31_6	2.74_4	0.30
3.70	1.16	0.04	0.42_4	2.64_7	0.35
3.80	1.20	0.04	0.42_7	2.54_7	0.40
4.00	1.30	0.04	0.43_7	2.34_8	0.45
4.10	1.37	0.05	0.52_8	2.24_9	0.55
4.20	1.46	0.06	0.67_4	2.15_2	0.65
4.30	1.58	0.08	0.91_9	2.05_5	0.90
4.40	1.70	0.10	1.17_7	1.95_8	1.10
4.50	1.84	0.12	1.45_0	1.86_2	1.40
4.60	1.99	0.13	1.62_9	1.76_5	1.60
4.70	2.18	0.14	1.83_2	1.66_7	1.80
4.80	2.39	0.15	2.07_2	1.57_2	1.95
4.90	2.60	0.15	2.20_1	1.47_5	1.85

Table III 1 C(iv)

$\bar{n}$, pL data for Cd-pyridinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
3.50	1.09	0.02	0.20_8	2.77_1
3.70	1.17	0.03	0.31_8	2.57_3
3.80	1.20	0.03	0.31_8	2.47_4
4.00	1.31	0.04	0.42_3	2.27_6
4.10	1.39	0.05	0.54_8	2.17_8
4.20	1.48	0.06	0.67_0	2.08_1
4.30	1.60	0.08	0.91_4	1.98_4
4.40	1.76	0.10	1.18_0	1.88_6
4.50	1.92	0.12	1.46_4	1.79_0
4.60	2.18	0.13	1.69_7	1.69_5
4.70	2.47	0.14	1.91_1	1.59_9
4.80	2.73	0.13	1.96_4	1.50_1

Table III 1 C(v)

$\bar{n}$, pL data for Mg-pyridinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
3.80	1.18	0.02	0.21_6	2.54_5	0.20
3.90	1.23	0.03	0.32_3	2.44_6	0.30
4.00	1.29	0.03	0.32_7	2.34_7	0.35
4.10	1.36	0.04	0.44_3	2.24_8	0.45
4.20	1.44	0.04	0.45_2	2.14_9	0.50
4.30	1.55	0.05	0.57_5	2.05_1	0.55
4.40	1.66	0.06	0.70_6	1.95_3	0.70
4.50	1.80	0.08	0.96_0	1.85_7	0.85
4.60	1.94	0.08	0.99_2	1.75_8	1.00
4.70	2.13	0.09	1.17_9	1.66_1	1.15
4.80	2.34	0.10	1.38_2	1.56_5	1.25

Table III 1 C(vi)

$\bar{n}$, pL data for Mg-pyridinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
3.80	1.19	0.02	0.21_3	2.47_1
4.00	1.30	0.03	0.32_4	2.27_5
4.10	1.38	0.04	0.44_0	2.17_7
4.20	1.46	0.04	0.44_7	2.07_7
4.30	1.57	0.05	0.57_1	1.98_1
4.40	1.72	0.06	0.70_8	1.88_2
4.50	1.87	0.07	0.85_4	1.78_4
4.60	2.13	0.08	1.03_7	1.68_8
4.70	2.42	0.09	1.25_7	1.59_3
4.80	2.68	0.08	1.22_7	1.49_5

Table III 2 C(i)

$\bar{n}$, pL data for Ni-α-picolinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
3.80	1.09	0.03	0.31_4	3.31_5	0.30
3.90	1.10	0.03	0.31_5	3.21_6	0.35
4.00	1.11	0.04	0.42_1	3.11_7	0.40
4.10	1.12	0.04	0.42_1	3.01_7	0.45
4.20	1.14	0.05	0.52_4	2.91_8	0.55
4.30	1.17	0.07	0.73_7	2.82_6	0.70
4.40	1.20	0.09	0.94_9	2.72_2	0.90
4.50	1.24	0.11	1.16_2	2.62_4	1.10
4.60	1.29	0.13	1.38_7	2.52_7	1.30
4.70	1.36	0.14	1.51_1	2.42_8	1.50
4.80	1.45	0.16	1.75_4	2.33_2	1.70
4.90	1.55	0.17	1.89_7	2.23_4	1.90
5.00	1.66	0.17	1.94_5	2.13_5	2.00

Table III 2 C(ii)

$\bar{n}$, pL data for Ni-α-picolinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
3.80	1.12	0.03	0.31_4	3.22_1
3.90	1.13	0.03	0.31_4	3.12_1
4.00	1.16	0.04	0.41_8	3.02_2
4.10	1.18	0.04	0.42_0	2.92_2
4.20	1.21	0.05	0.52_8	2.82_3
4.30	1.25	0.06	0.63_7	2.72_5
4.40	1.29	0.08	0.85_3	2.62_7
4.50	1.34	0.10	1.07_3	2.52_9
4.60	1.42	0.12	1.30_4	2.43_2
4.70	1.50	0.14	1.54_2	2.33_5
4.80	1.60	0.16	1.79_4	2.23_8
4.90	1.70	0.16	1.83_5	2.13_9
5.00	1.87	0.17	2.01_8	2.04_2

Table III 2 C(iii)

$\bar{n}$, pL data for Cd-α-picolinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
4.00	1.10	0.02	0.21_0	3.11_5	0.25
4.20	1.12	0.03	0.31_5	2.91_6	0.35
4.30	1.14	0.04	0.42_1	2.81_7	0.40
4.40	1.15	0.04	0.42_2	2.71_7	0.45
4.50	1.18	0.05	0.52_8	2.61_9	0.55
4.60	1.23	0.07	0.74_6	2.52_1	0.70
4.70	1.30	0.08	0.86_4	2.42_2	0.85
4.80	1.39	0.10	1.09_6	2.32_5	1.05
4.90	1.50	0.12	1.33_9	2.22_8	1.25
5.00	1.62	0.13	1.48_7	2.13_0	1.45
5.10	1.76	0.14	1.65_1	2.03_3	1.65
5.20	1.90	0.15	1.82_5	1.93_6	1.80
5.30	2.06	0.15	1.89_9	1.83_8	1.90

Table III 2 C(iv)

$\bar{n}$, pL data for Cd-α-picolinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
4.00	1.14	0.02	0.20_9	3.02_0
4.10	1.17	0.03	0.30_8	2.92_1
4.20	1.19	0.03	0.31_6	2.82_2
4.30	1.23	0.04	0.42_5	2.72_3
4.40	1.25	0.04	0.42_6	2.62_3
4.50	1.29	0.05	0.53_6	2.52_4
4.60	1.37	0.07	0.76_1	2.42_7
4.70	1.45	0.09	0.99_1	2.32_9
4.80	1.55	0.11	1.21_6	2.23_2
4.90	1.66	0.12	1.37_7	2.13_5
5.00	1.83	0.13	1.54_4	2.03_6
5.10	1.99	0.14	1.72_5	1.94_1
5.20	2.17	0.15	1.92_9	1.84_4
5.30	2.32	0.14	1.87_8	1.74_5

Table III 2 C(v)

$\bar{n}$, pL data for Mg-α-picolinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
4.00	1.10	0.02	0.21_0	3.11_4	0.20
4.10	1.10	0.02	0.21_0	3.01_4	0.25
4.20	1.12	0.03	0.31_5	2.91_6	0.30
4.30	1.13	0.03	0.31_6	2.81_6	0.35
4.40	1.15	0.04	0.42_4	2.71_7	0.40
4.50	1.17	0.04	0.42_3	2.61_7	0.45
4.60	1.21	0.05	0.53_3	2.51_8	0.55
4.70	1.28	0.06	0.64_8	2.42_0	0.65
4.80	1.36	0.07	0.76_7	2.32_2	0.75
4.90	1.45	0.07	0.78_1	2.22_3	0.85
5.00	1.57	0.08	0.91_5	2.12_5	0.95
5.10	1.70	0.08	0.94_3	2.02_6	1.00
5.20	1.84	0.09	1.09_5	1.92_9	1.05
5.30	2.00	0.09	1.13_9	1.83_1	1.10

Table III 2 C(vi)

$\bar{n}$, pL data for Mg-α-picolinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
4.00	1.14	0.02	0.20_9	3.02_0
4.10	1.16	0.02	0.21_0	2.92_0
4.20	1.19	0.03	0.31_6	2.82_1
4.30	1.22	0.03	0.31_7	2.72_2
4.40	1.25	0.03	0.32_0	2.62_0
4.50	1.28	0.04	0.42_9	2.52_3
4.60	1.35	0.05	0.54_4	2.42_5
4.70	1.41	0.05	0.55_1	2.32_5
4.80	1.51	0.07	0.78_8	2.22_6
4.90	1.62	0.08	0.91_8	2.13_0
5.00	1.78	0.08	0.95_0	2.03_2
5.10	1.94	0.09	1.10_9	1.93_5
5.20	2.12	0.10	1.28_5	1.83_8

Table III 3 C(i)

$\bar{n}$, pL data for Ni-β-picolinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
3.80	1.05	0.03	0.31_1	3.12_9	0.30
3.90	1.08	0.04	0.41_7	3.03_0	0.40
4.00	1.10	0.04	0.41_8	2.93_1	0.45
4.10	1.13	0.05	0.52_5	2.83_2	0.55
4.20	1.18	0.07	0.74_0	2.73_4	0.70
4.30	1.22	0.09	0.95_3	2.63_6	0.95
4.40	1.27	0.11	1.16_9	2.53_9	1.15
4.50	1.33	0.12	1.29_3	2.44_0	1.30
4.60	1.42	0.14	1.53_1	2.34_3	1.50
4.70	1.52	0.16	1.78_2	2.24_6	1.65
4.80	1.63	0.16	1.82_7	2.14_8	1.80
4.90	1.77	0.17	1.99_5	2.05_0	1.90
5.00	1.93	0.15	1.83_9	1.950	1.80

Table III 3 C(ii)

$\bar{n}$, pL data for Ni-β-picolinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
3.80	1.07	0.03	0.30_9	3.02_4
3.90	1.11	0.04	0.41_5	2.92_4
4.00	1.14	0.04	0.41_7	2.82_6
4.10	1.19	0.05	0.52_5	2.72_7
4.20	1.24	0.07	0.74_0	2.62_9
4.30	1.30	0.09	0.95_9	2.53_2
4.40	1.36	0.11	1.18_2	2.43_4
4.50	1.43	0.12	1.30_7	2.33_6
4.60	1.55	0.14	1.55_9	2.23_9
4.70	1.67	0.15	1.71_2	2.14_2
4.80	1.84	0.16	1.89_2	2.04_5
4.90	2.01	0.16	1.97_4	1.94_7
5.00	2.20	0.16	2.06_3	1.84_9

Table III 3 C(iii)

$\bar{n}$, pL data for Cd-β-picolinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
3.80	1.05	0.03	0.31_1	3.12_9	0.30
3.90	1.07	0.03	0.31_2	3.02_9	0.35
4.00	1.10	0.04	0.41_8	2.93_1	0.40
4.20	1.15	0.04	0.42_3	2.73_1	0.45
4.30	1.17	0.04	0.42_4	2.63_1	0.50
4.40	1.21	0.05	0.53_2	2.53_7	0.55
4.50	1.28	0.07	0.69_8	2.43_5	0.70
4.60	1.37	0.09	0.98_4	2.33_8	0.95
4.70	1.47	0.11	1.20_3	2.24_1	1.20
4.80	1.60	0.13	1.48_5	2.14_4	1.45
4.90	1.74	0.14	1.64_4	2.04_7	1.65
5.00	1.93	0.15	1.83_9	1.95_0	1.65
5.10	2.13	0.15	1.89_9	1.85_2	-

Table III 3 C(iv)

$\bar{n}$, pL data for Cd-β-picolinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
3.80	1.07	0.03	0.30_9	3.02_4
3.90	1.10	0.03	0.31_1	2.92_5
4.00	1.13	0.03	0.31_2	2.82_5
4.10	1.18	0.04	0.42_0	2.72_5
4.20	1.21	0.04	0.42_3	2.62_6
4.30	1.25	0.04	0.42_6	2.52_7
4.40	1.30	0.05	0.53_8	2.42_8
4.50	1.38	0.07	0.78_2	2.33_1
4.60	1.50	0.09	1.00_2	2.23_6
4.70	1.63	0.11	1.25_6	2.13_7
4.80	1.81	0.13	1.53_7	2.04_1
4.90	1.99	0.14	1.72_9	1.94_6
5.00	2.19	0.15	1.93_9	1.84_8

Table III 3 C(v)

$\bar{n}$, pL data for Mg-β-picolinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
3.80	1.04	0.02	0.20_7	3.12_8	0.20
4.00	1.08	0.02	0.20_9	2.92_9	0.25
4.20	1.14	0.03	0.31_7	2.73_0	0.30
4.30	1.16	0.03	0.31_8	2.63_0	0.35
4.40	1.20	0.04	0.42_3	2.53_2	0.40
4.50	1.26	0.05	0.53_9	2.43_3	0.50
4.60	1.34	0.06	0.65_6	2.33_5	0.65
4.70	1.43	0.07	0.78_2	2.23_7	0.80
4.80	1.55	0.08	0.91_3	2.13_9	0.90
4.90	1.69	0.09	1.05_6	2.04_1	1.00
5.00	1.87	0.09	1.10_4	1.94_3	1.15
5.10	2.07	0.09	1.16_2	1.84_5	1.05

Table III 3 C(vi)

$\bar{n}$, pL data for Mg-β-picolinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
3.80	1.06	0.02	0.20_6	3.02_3
4.00	1.12	0.02	0.20_8	2.82_3
4.10	1.17	0.03	0.30_8	2.72_5
4.20	1.20	0.03	0.31_6	2.62_5
4.30	1.24	0.03	0.32_0	2.52_6
4.40	1.29	0.04	0.43_0	2.42_7
4.50	1.36	0.05	0.54_5	2.32_9
4.60	1.47	0.06	0.66_8	2.23_1
4.70	1.60	0.08	0.92_1	2.13_4
4.80	1.76	0.08	0.94_6	2.03_6
4.90	1.94	0.09	1.11_1	1.93_9
5.00	2.13	0.09	1.16_3	1.84_0

Table III 4 C(i)

$\bar{n}$, pL data for Ni-Y-picolinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
3.80	1.09	0.03	0.31_4	3.44_4	0.30
3.90	1.11	0.04	0.41_9	3.34_5	0.35
4.00	1.12	0.04	0.42_0	3.24_5	0.40
4.10	1.13	0.04	0.42_1	3.14_5	0.45
4.20	1.15	0.05	0.52_6	3.04_8	0.55
4.30	1.19	0.07	0.74_0	2.94_9	0.70
4.40	1.23	0.09	0.956	2.85_1	0.90
4.50	1.27	0.11	1.170	2.75_3	1.10
4.60	1.31	0.13	1.390	2.65_5	1.30
4.70	1.36	0.14	1.50_9	2.55_7	1.50
4.80	1.42	0.16	1.73_9	2.460	1.75
4.90	1.48	0.16	1.76_2	2.350	1.80
5.00	1.56	0.17	1.90_1	2.26_2	1.90

Table III 4 C(ii)

$\bar{n}$, pL data for Ni-Y-picolinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
3.80	1.08	0.03	0.310	3.336
3.90	1.09	0.03	0.31_1	3.23_7
4.00	1.11	0.04	0.41_3	3.13_8
4.10	1.13	0.04	0.41_6	3.03_8
4.20	1.16	0.05	0.52_2	2.93_9
4.30	1.20	0.07	0.73_4	2.84_1
4.40	1.24	0.09	0.94_7	2.74_3
4.50	1.29	0.11	1.16_5	2.64_6
4.60	1.35	0.13	1.38_9	2.54_8
4.70	1.42	0.14	1.51_5	2.45_0
4.80	1.50	0.15	1.64_9	2.35_2
4.90	1.61	0.16	1.798	2.25_4
5.00	1.75	0.16	1.85_2	2.15_6
5.10	1.86	0.16	1.90_0	2.05_7

Table III 4 C(iii)

$\bar{n}$, pL data for Cd-Y-picolinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
3.80	1.09	0.03	0.31_4	3.44_4	0.25
3.90	1.10	0.03	0.31_4	3.34_4	0.25
4.00	1.11	0.03	0.31_5	3.24_4	0.30
4.10	1.13	0.04	0.42_1	3.14_5	0.35
4.20	1.14	0.04	0.42_1	3.04_5	0.40
4.30	1.16	0.04	0.42_3	2.94_6	0.45
4.40	1.19	0.05	0.53_1	2.84_7	0.55
4.50	1.23	0.07	0.74_5	2.74_9	0.75
4.60	1.27	0.09	0.96_0	2.65_1	0.95
4.70	1.33	0.11	1.18_5	2.55_4	1.15
4.80	1.39	0.13	1.41_3	2.45_7	1.35
4.90	1.46	0.14	1.54_2	2.35_8	1.55
5.00	1.55	0.16	1.78_9	2.26_1	1.70
5.10	1.66	0.16	1.83_5	2.16_2	-

Table III 4 C(iv)

$\bar{n}$, pL data for Cd-Y-picolinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
3.80	1.07	0.02	0.20_7	3.33_5
3.90	1.09	0.03	0.31_1	3.23_7
4.00	1.10	0.03	0.31_1	3.13_7
4.10	1.12	0.03	0.31_2	3.03_7
4.20	1.15	0.04	0.41_8	2.93_8
4.30	1.17	0.04	0.41_9	2.83_8
4.40	1.20	0.05	0.52_7	2.73_9
4.50	1.25	0.07	0.74_2	2.64_2
4.60	1.31	0.09	0.96_2	2.54_4
4.70	1.39	0.11	1.18_8	2.44_7
4.80	1.48	0.13	1.42_9	2.35_0
4.90	1.60	0.15	1.69_6	2.25_3
5.00	1.74	0.15	1.73_6	2.15_5
5.10	1.85	0.15	1.78_1	2.05_6

Table III 4 C(v)

$\bar{n}$, pL data for Mg-Y-picolinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
4.00	1.10	0.02	0.21_0	3.24_3	0.20
4.10	1.12	0.03	0.31_6	3.14_4	0.25
4.20	1.13	0.03	0.31_6	3.04_4	0.30
4.30	1.15	0.03	0.31_7	2.94_5	0.35
4.40	1.18	0.04	0.42_6	2.84_6	0.40
4.50	1.21	0.05	0.53_2	2.74_7	0.50
4.60	1.24	0.06	0.64_1	2.64_8	0.65
4.70	1.30	0.08	0.86_2	2.55_1	0.80
4.80	1.34	0.08	0.87_0	2.45_1	0.90
4.90	1.41	0.09	0.99_1	2.35_3	1.00
5.00	1.48	0.09	1.00_7	2.25_4	1.05
5.10	1.59	0.09	1.03_2	2.15_5	1.00

Table III 4 C(vi)

$\bar{n}$, pL data for Mg-Y-picolinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
3.80	1.07	0.02	0.20_7	3.33_4
4.00	1.09	0.02	0.20_7	3.13_5
4.10	1.12	0.03	0.31_2	3.03_7
4.20	1.14	0.03	0.31_3	2.93_7
4.30	1.16	0.03	0.31_5	2.83_7
4.40	1.19	0.04	0.42_1	2.73_8
4.50	1.23	0.05	0.53_0	2.64_0
4.60	1.28	0.06	0.64_1	2.54_1
4.70	1.36	0.08	0.86_6	2.44_4
4.80	1.44	0.09	0.98_9	2.34_6
4.90	1.54	0.09	1.01_5	2.24_6
5.00	1.68	0.09	1.04_2	2.14_8
5.10	1.80	0.10	1.18_8	2.05_0

Table III 5 C(i)

$\bar{n}$, pL data for Ni-2:4-lutidinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
4.00	1.83	0.03	0.37_1	3.76_0	0.30
4.20	1.84	0.03	0.37_1	3.56_0	0.35
4.40	1.85	0.03	0.37_2	3.36_0	0.40
4.50	1.87	0.04	0.49_8	3.26_1	0.50
4.60	1.88	0.05	0.62_2	3.16_3	0.60
4.80	1.90	0.06	0.74_7	2.96_4	0.80
4.90	1.93	0.08	0.99_8	2.86_6	0.95
5.00	1.96	0.10	1.25_0	2.76_9	1.20
5.10	1.99	0.12	1.50_4	2.67_2	1.45
5.20	2.03	0.13	1.64_2	2.57_1	1.60
5.30	2.06	0.14	1.776	2.47_2	1.70
5.40	2.10	0.14	1.795	2.37_5	1.80
5.50	2.15	0.15	1.94_4	2.27_7	1.90
5.60	2.20	0.15	1.96_3	2.17_7	1.95

Table III 5 C(ii)

$\bar{n}$, pL data for Ni-2:4-lutidinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
4.00	1.82	0.03	0.36_5	3.64_0
4.20	1.83	0.03	0.366	3.44_0
4.40	1.86	0.03	0.368	3.24_0
4.50	1.87	0.04	0.49_1	3.14_2
4.60	1.89	0.05	0.616	3.04_3
4.70	1.91	0.06	0.74_0	2.94_4
4.80	1.94	0.08	0.99_0	2.84_7
4.90	1.97	0.10	1.24_1	2.74_9
5.00	2.00	0.11	1.366	2.65_1
5.10	2.01	0.12	1.49_3	2.55_4
5.20	2.05	0.13	1.62_9	2.45_5
5.30	2.11	0.14	1.776	2.35_7
5.40	2.17	0.15	1.92_9	2.25_7
5.50	2.25	0.15	1.96_9	2.15_8
5.60	2.32	0.16	2.13_9	2.06_0

Table III 5 C(iii)

$\bar{n}$, pL data for Cd-2:4-lutidinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
4.00	1.82	0.02	0.24_7	3.75_9	0.25
4.20	1.83	0.02	0.24_7	3.55_9	0.30
4.40	1.85	0.03	0.37_2	3.36_0	0.35
4.50	1.86	0.03	0.37_3	3.26_0	0.40
4.60	1.87	0.04	0.49_8	3.16_1	0.50
4.80	1.89	0.05	0.62_2	2.96_3	0.70
4.90	1.92	0.07	0.87_3	2.86_5	0.85
5.00	1.95	0.09	1.12_5	2.76_8	1.10
5.10	1.98	0.11	1.37_8	2.67_0	1.35
5.20	2.02	0.12	1.51_6	2.57_2	1.50
5.30	2.05	0.13	1.65_0	2.47_2	1.60
5.40	2.09	0.13	1.67_0	2.37_4	1.70
5.50	2.14	0.14	1.81_3	2.27_5	1.80
5.60	2.19	0.14	1.83_2	2.17_6	1.85

Table III 5 C(iv)

$\bar{n}$, pL data for Cd-2:4-lutidinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
4.00	1.81	0.02	0.24_4	3.63_9
4.20	1.82	0.02	0.24_4	3.43_9
4.40	1.85	0.03	0.36_8	3.24_0
4.50	1.86	0.03	0.36_9	3.14_0
4.60	1.88	0.04	0.49_3	3.04_2
4.70	1.90	0.05	0.61_7	2.94_3
4.80	1.92	0.06	0.74_3	2.84_4
4.90	1.95	0.08	0.99_3	2.74_7
5.00	1.97	0.09	1.11_7	2.64_8
5.10	2.00	0.11	1.36_9	2.55_1
5.20	2.04	0.12	1.50_3	2.45_4
5.30	2.10	0.13	1.65_0	2.35_6
5.40	2.16	0.14	1.80_0	2.25_6
5.50	2.24	0.14	1.83_8	2.15_7
5.60	2.31	0.15	2.00_8	2.05_9

Table III 5 C(v)

$\bar{n}$, pL data for Mg-2:4-lutidinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
4.20	1.83	0.02	0.24_2	3.55_9	0.20
4.40	1.84	0.02	0.24_8	3.35_9	0.25
4.60	1.86	0.03	0.37_3	3.16_0	0.35
4.70	1.87	0.03	0.37_3	3.06_0	0.40
4.80	1.88	0.04	0.50_1	2.96_2	0.50
4.90	1.90	0.05	0.62_4	2.86_3	0.60
5.00	1.92	0.06	0.75_0	2.76_4	0.75
5.10	1.94	0.07	0.87_7	2.66_4	0.85
5.20	1.97	0.07	0.88_2	2.56_6	0.95
5.30	2.00	0.08	1.03_5	2.46_7	1.05
5.40	2.05	0.09	1.12_7	2.36_9	1.10
5.50	2.09	0.09	1.16_6	2.26_9	1.15
5.60	2.14	0.09	1.17_8	2.17_0	1.20

Table III 5 C(vi)

$\bar{n}$, pL data for Mg-2:4-lutidinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
4.20	1.82	0.02	0.24_4	3.43_9
4.40	1.84	0.02	0.24_5	3.23_9
4.60	1.87	0.03	0.37_0	3.04_1
4.70	1.88	0.03	0.37_0	2.94_1
4.80	1.90	0.04	0.49_5	2.84_2
4.90	1.92	0.05	0.62_0	2.74_3
5.00	1.94	0.06	0.74_5	2.64_5
5.10	1.96	0.07	0.87_1	2.54_6
5.20	2.00	0.08	1.00_2	2.44_7
5.30	2.05	0.08	1.01_5	2.34_8
5.40	2.11	0.09	1.15_7	2.25_0

Table III 6 C(i)

$\bar{n}$, pL data for Ni-2:6-lutidinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
4.20	0.91	0.03	0.30_2	3.72_0	0.30
4.40	0.92	0.03	0.30_2	3.52_0	0.35
4.50	0.94	0.04	0.40_4	3.42_1	0.40
4.60	0.96	0.05	0.50_6	3.32_2	0.50
4.70	0.98	0.06	0.60_7	3.22_4	0.65
4.80	1.02	0.08	0.81_3	3.12_6	0.80
4.90	1.05	0.09	0.91_8	3.02_7	0.95
5.00	1.09	0.11	1.12_7	2.92_9	1.15
5.10	1.14	0.13	1.34_1	2.83_1	1.35
5.20	1.20	0.15	1.56_0	2.73_4	1.55
5.30	1.24	0.15	1.57_2	2.63_4	1.70
5.40	1.30	0.17	1.79_7	2.53_7	1.80
5.50	1.35	0.17	1.81_7	2.43_7	1.85
5.60	1.44	0.17	1.85_1	2.33_9	1.90
5.70	1.55	0.17	1.94_1	2.24_0	1.95

Table III 6 C(ii)

$\bar{n}$, pL data for Ni-2:6-lutidinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
4.20	0.92	0.03	0.29_9	3.64_8
4.40	0.93	0.03	0.30_0	3.44_8
4.50	0.96	0.04	0.40_2	3.34_9
4.60	0.99	0.05	0.50_4	3.25_1
4.70	1.02	0.07	0.70_8	3.15_3
4.80	1.05	0.08	0.81_2	3.05_6
4.90	1.08	0.09	0.91_6	2.95_8
5.00	1.13	0.11	1.12_5	2.85_9
5.10	1.19	0.13	1.43_3	2.76_1
5.20	1.25	0.15	1.56_0	2.66_4
5.30	1.30	0.15	1.57_0	2.56_5
5.40	1.37	0.16	1.70_2	2.46_7
5.50	1.47	0.17	1.84_4	2.36_7
5.60	1.55	0.17	1.87_7	2.26_8
5.70	1.65	0.17	1.91_9	2.16_9

Table III 6 C(iii)

$\bar{n}$, pL data for Cd-2:6-lutidinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
4.20	0.91	0.03	0.30_2	3.72_0	0.25
4.40	0.92	0.03	0.30_2	3.52_0	0.30
4.50	0.93	0.03	0.30_3	3.42_0	0.35
4.60	0.95	0.04	0.40_5	3.32_1	0.40
4.70	0.97	0.05	0.50_0	3.22_2	0.50
4.80	1.00	0.06	0.61_2	3.12_3	0.65
4.90	1.04	0.08	0.81_6	3.02_4	0.80
5.00	1.08	0.10	1.02_4	2.92_6	1.00
5.10	1.13	0.12	1.23_7	2.82_8	1.20
5.20	1.19	0.14	1.45_7	2.73_1	1.40
5.30	1.24	0.15	1.57_3	2.63_2	1.55
5.40	1.28	0.15	1.58_6	2.53_5	1.65
5.50	1.34	0.16	1.71_0	2.43_6	1.70

Table III 6 C(iv)

$\bar{n}$, pL data for Cd-2:6-lutidinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
4.20	0.92	0.03	0.29_9	3.64_8
4.40	0.93	0.03	0.30_0	3.44_8
4.50	0.95	0.03	0.30_1	3.34_8
4.60	0.98	0.04	0.40_3	3.25_0
4.70	1.00	0.05	0.50_5	3.14_9
4.80	1.03	0.06	0.60_9	3.05_0
4.90	1.07	0.08	0.81_5	2.95_2
5.00	1.12	0.10	1.02_3	2.85_4
5.10	1.18	0.12	1.23_8	2.75_7
5.20	1.23	0.13	1.35_2	2.66_0
5.30	1.30	0.15	1.57_6	2.56_2
5.40	1.36	0.15	1.59_6	2.46_3
5.50	1.45	0.15	1.62_8	2.36_4
5.60	1.54	0.16	1.76_6	2.26_6
5.70	1.64	0.16	1.80_6	2.16_8

Table III 6 C(v)

$\bar{n}$, pL data for Mg-2:6-lutidinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
4.20	0.90	0.02	0.20_1	3.71_9	0.20
4.40	0.91	0.02	0.20_2	3.51_9	0.25
4.60	0.94	0.03	0.30_3	3.32_0	0.30
4.70	0.95	0.03	0.30_4	3.22_1	0.35
4.80	0.98	0.04	0.40_7	3.12_2	0.40
4.90	1.01	0.05	0.51_0	3.02_3	0.50
5.00	1.04	0.06	0.61_5	2.92_4	0.60
5.10	1.08	0.07	0.72_2	2.82_5	0.70
5.20	1.12	0.07	0.72_8	2.72_6	0.80
5.30	1.17	0.08	0.83_9	2.62_7	0.90
5.40	1.22	0.09	0.95_1	2.52_9	0.95
5.50	1.27	0.09	0.96_2	2.42_9	1.00
5.60	1.36	0.09	0.98_0	2.33_0	1.05
5.70	1.48	0.10	1.11_6	2.23_2	1.10

Table III 6 C(vi)

$\bar{n}$, pL data for Mg-2:6-lutidinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
4.20	0.91	0.02	0.20_0	3.64_7
4.40	0.92	0.02	0.20_0	3.44_7
4.50	0.94	0.02	0.20_1	3.34_7
4.60	0.97	0.03	0.30_2	3.24_8
4.70	0.98	0.03	0.30_3	3.14_9
4.80	0.99	0.04	0.40_6	3.05_0
4.90	1.04	0.05	0.50_9	2.95_1
5.00	1.08	0.06	0.61_4	2.85_1
5.10	1.13	0.07	0.72_2	2.75_4
5.20	1.18	0.08	0.83_2	2.65_5
5.30	1.23	0.08	0.84_1	2.55_6
5.40	1.30	0.09	0.95_7	2.45_7
5.50	1.39	0.09	0.97_7	2.35_8
5.60	1.47	0.09	0.99_4	2.25_9
5.70	1.57	0.09	1.01_6	2.16_0

Table III 7 C(i)

$\bar{n}$, pL data for Ni-2:4:6-collidinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
4.20	0.97	0.03	0.30_7	4.0_46	0.30
4.40	0.99	0.03	0.30_7	3.8_46	0.35
4.60	1.00	0.0_4	0.40_9	3.6_47	0.4_0
4.70	1.02	0.05	0.51_1	3.5_48	0.50
4.80	1.04	0.06	0.61_5	3.4_49	0.65
4.90	1.07	0.08	0.82_2	3.35_1	0.80
5.00	1.09	0.09	0.92_8	3.25_3	0.95
5.10	1.12	0.11	1.13_2	3.15_5	1.15
5.20	1.16	0.13	1.3_46	3.05_7	1.35
5.30	1.20	0.15	1.56_0	2.95_9	1.55
5.40	1.2_4	0.16	1.67_4	2.86_1	1.70
5.50	1.27	0.17	1.78_2	2.76_2	1.80
5.60	1.31	0.17	1.80_1	2.66_2	1.85
5.70	1.37	0.18	1.92_8	2.56_4	1.90
5.80	1.4_2	0.18	1.9_44	2.46_4	1.95

Table III 7 C(ii)

$\bar{n}$, pL data for Ni-2:4:6-collidinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
4.20	0.98	0.03	0.30_3	3.9_14
4.40	0.99	0.03	0.30_4	3.7_14
4.60	1.01	0.04	0.40_6	3.5_17
4.70	1.03	0.05	0.50_8	3.4_19
4.80	1.05	0.06	0.59_7	3.32_0
4.90	1.09	0.08	0.81_8	3.22_2
5.00	1.13	0.10	1.02_4	3.12_4
5.10	1.17	0.12	1.23_7	3.02_6
5.20	1.21	0.14	1.4_46	2.92_8
5.30	1.25	0.15	1.56_0	2.83_0
5.40	1.30	0.16	1.67_8	2.73_1
5.50	1.3_4	0.17	1.79_4	2.63_3
5.60	1.4_0	0.18	1.91_9	2.53_4
5.70	1.46	0.18	1.9_44	2.4_35

Table III 7 C(iii)

$\bar{n}$, pL data for Cd-2:4:6-collidinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
4.20	0.96	0.02	0.20_4	4.04_5	0.25
4.40	0.99	0.03	0.30_7	3.84_6	0.30
4.60	0.99	0.03	0.30_7	3.64_6	0.35
4.70	1.01	0.04	0.40_9	3.54_8	0.40
4.80	1.03	0.05	0.51_1	3.44_8	0.50
4.90	1.05	0.06	0.61_6	3.35_0	0.65
5.00	1.08	0.08	0.82_3	3.25_2	0.80
5.10	1.10	0.09	1.03_0	3.15_4	1.00
5.20	1.14	0.11	1.13_9	3.05_5	1.15
5.30	1.18	0.13	1.35_2	2.95_7	1.35
5.40	1.23	0.15	1.56_6	2.86_0	1.55
5.50	1.25	0.15	1.57_2	2.76_0	1.65
5.60	1.30	0.16	1.69_5	2.66_1	1.75
5.70	1.36	0.17	1.82_1	2.56_3	1.90
5.80	1.41	0.17	1.83_5	2.46_4	1.85

Table III 7 C(iv)

$\bar{n}$, pL data for Cd-2:4:6-collidinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
4.20	0.97	0.02	0.20_2	3.91_5
4.40	0.99	0.03	0.30_3	3.71_6
4.60	1.00	0.03	0.30_4	3.51_6
4.70	1.02	0.04	0.40_6	3.41_8
4.80	1.04	0.05	0.50_9	3.31_9
4.90	1.07	0.06	0.61_4	3.22_0
5.00	1.11	0.08	0.83_9	3.12_2
5.10	1.15	0.10	1.02_9	3.02_4
5.20	1.19	0.12	1.24_0	2.92_6
5.30	1.24	0.14	1.45_5	2.82_9
5.40	1.29	0.15	1.57_3	2.73_0
5.50	1.33	0.16	1.68_9	2.63_1
5.60	1.38	0.16	1.70_6	2.53_2
5.70	1.45	0.17	1.83_5	2.43_4

Table III 7 C(v)

$\bar{n}$, pL data for Mg-2:4:6-collidinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
4.20	0.96	0.02	0.20_4	4.04_5	0.20
4.40	0.98	0.02	0.20_5	3.84_5	0.25
4.60	0.99	0.03	0.30_7	3.64_6	0.30
4.70	1.00	0.03	0.30_7	3.54_6	0.35
4.80	1.02	0.04	0.41_0	3.44_7	0.40
4.90	1.03	0.04	0.41_1	3.34_8	0.45
5.00	1.05	0.05	0.51_4	3.24_9	0.50
5.10	1.07	0.06	0.61_9	3.15_0	0.60
5.20	1.10	0.07	0.72_5	3.05_1	0.70
5.30	1.13	0.08	0.83_2	2.95_2	0.80
5.40	1.16	0.08	0.83_7	2.85_2	0.85
5.50	1.19	0.09	0.92_2	2.75_3	0.90
5.60	1.23	0.09	0.95_4	2.65_4	0.95
5.70	1.28	0.09	0.96_4	2.55_5	1.00
5.80	1.33	0.09	0.97_2	2.45_5	1.00
5.90	1.39	0.09	0.98_9	2.35_6	1.00

Table III 7 C(vi)

$\bar{n}$, pL data for Mg-2:4:6-collidinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
4.20	0.97	0.02	0.20_2	3.91_5
4.40	0.98	0.02	0.20_2	3.71_5
4.60	1.00	0.03	0.30_4	3.51_6
4.70	1.01	0.03	0.30_5	3.41_7
4.80	1.03	0.04	0.40_7	3.31_8
4.90	1.05	0.04	0.40_8	3.21_8
5.00	1.08	0.05	0.51_2	3.11_9
5.10	1.11	0.06	0.61_8	3.02_0
5.20	1.14	0.07	0.72_3	2.92_1
5.30	1.18	0.08	0.83_2	2.82_3
5.40	1.22	0.08	0.83_9	2.72_3
5.50	1.26	0.09	0.94_9	2.62_4
5.60	1.31	0.09	0.95_9	2.52_5
5.70	1.37	0.09	0.97_2	2.42_5
5.80	1.43	0.09	0.98_3	2.32_6

Table III 8 C(i)

$\bar{n}$, pL data for Ni-2-aminopyridinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
4.20	0.95	0.03	0.30_5	3.68_7	0.30
4.40	0.98	0.04	0.40_7	3.48_8	0.40
4.50	0.99	0.05	0.50_9	3.38_9	0.50
4.60	1.01	0.06	0.61_2	3.29_1	0.60
4.70	1.04	0.08	0.81_8	3.19_2	0.80
4.80	1.08	0.10	1.02_4	3.09_5	1.00
4.90	1.12	0.12	1.23_5	2.99_7	1.20
5.00	1.15	0.13	1.34_3	2.89_8	1.35
5.10	1.19	0.15	1.55_7	2.80_0	1.50
5.20	1.24	0.16	1.67_4	2.70_2	1.65
5.30	1.29	0.17	1.79_4	2.60_3	1.80
5.40	1.36	0.18	1.92_4	2.50_5	1.90
5.50	1.42	0.18	1.99_4	2.40_6	2.00
5.60	1.50	0.18	2.02_6	2.30_7	2.05

Table III 8 C(ii)

$\bar{n}$, pL data for Ni-2-aminopyridinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
4.20	0.97	0.03	0.30_2	3.55_1
4.40	1.01	0.04	0.40_6	3.35_3
4.50	1.03	0.05	0.50_7	3.25_4
4.60	1.07	0.07	0.71_4	3.15_6
4.70	1.10	0.09	0.91_8	3.05_8
4.80	1.15	0.11	1.13_2	2.96_0
4.90	1.20	0.13	1.34_6	2.86_2
5.00	1.24	0.14	1.45_5	2.76_4
5.10	1.29	0.15	1.57_3	2.66_5
5.20	1.36	0.16	1.69_3	2.56_7
5.30	1.43	0.17	1.82_4	2.46_9
5.40	1.50	0.17	1.85_6	2.37_0
5.50	1.58	0.18	1.99_2	2.27_2

Table III 8 C(iii)

$\bar{n}$, pL data for Cd-2-amino-pyridinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
4.20	0.95	0.03	0.30_5	3.68_7	0.25
4.40	0.97	0.03	0.30_5	3.48_7	0.30
4.50	0.98	0.04	0.40_7	3.38_8	0.40
4.60	1.00	0.05	0.51_0	3.39_0	0.55
4.70	1.03	0.07	0.71_6	3.19_2	0.70
4.80	1.06	0.08	0.82_0	3.09_3	0.85
4.90	1.10	0.10	1.02_9	2.99_5	1.00
5.00	1.13	0.11	1.13_1	2.89_6	1.15
5.10	1.17	0.13	1.34_9	2.79_8	1.30
5.20	1.23	0.15	1.57_0	2.70_1	1.45
5.30	1.27	0.15	1.58_2	2.60_1	1.60
5.40	1.34	0.16	1.71_0	2.50_3	1.70
5.50	1.41	0.17	1.84_0	2.40_5	1.80
5.60	1.49	0.17	1.85_0	2.30_6	1.85

Table III 8 C(iv)

$\bar{n}$, pL data for Cd-2-amino-pyridinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
4.20	0.97	0.03	0.30_2	3.55_1
4.40	1.00	0.03	0.31_9	3.35_2
4.50	1.02	0.04	0.40_6	3.25_2
4.60	1.05	0.05	0.51_0	3.15_4
4.70	1.08	0.07	0.71_4	3.05_7
4.80	1.13	0.09	0.92_6	2.95_8
4.90	1.18	0.11	1.13_9	2.86_0
5.00	1.22	0.12	1.24_8	2.76_2
5.10	1.27	0.13	1.36_3	2.66_3
5.20	1.35	0.15	1.59_2	2.56_6
5.30	1.41	0.15	1.61_4	2.46_7
5.40	1.49	0.16	1.74_7	2.36_9
5.50	1.57	0.17	1.89_2	2.27_1

Table III 8 C(v)

$\bar{n}$, pL data for Mg-2-amino-pyridinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL	$\bar{n}$ (second method)
4.20	0.94	0.02	0.20_3	3.68_6	0.20
4.40	0.96	0.02	0.20_4	3.48_6	0.25
4.60	0.98	0.03	0.30_6	3.28_7	0.30
4.70	1.00	0.04	0.40_9	3.18_9	0.40
4.80	1.03	0.05	0.51_2	3.09_0	0.50
4.90	1.06	0.06	0.61_7	2.99_1	0.60
5.00	1.09	0.07	0.72_3	2.89_2	0.70
5.10	1.12	0.08	0.82_8	2.79_3	0.80
5.20	1.17	0.09	0.94_1	2.69_5	0.90
5.30	1.21	0.09	0.95_2	2.59_5	0.95
5.40	1.27	0.09	0.96_2	2.49_6	1.00
5.50	1.34	1.00	1.08_2	2.39_7	1.05
5.60	1.42	1.00	1.09_9	2.29_8	1.10

Table III 8 C(vi)

$\bar{n}$, pL data for Mg-2-amino-pyridinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
4.20	0.96	0.02	0.20_2	3.55_0
4.40	0.99	0.02	0.20_2	3.35_1
4.60	1.03	0.03	0.30_6	3.15_2
4.70	1.05	0.04	0.40_8	3.05_3
4.80	1.09	0.05	0.51_4	2.95_4
4.90	1.13	0.06	0.62_1	2.85_5
5.00	1.17	0.07	0.72_8	2.75_7
5.10	1.22	0.08	0.83_9	2.65_8
5.20	1.28	0.08	0.84_9	2.55_9
5.30	1.34	0.08	0.86_0	2.45_9
5.40	1.42	0.09	0.98_2	2.36_1
5.50	1.50	1.00	1.07_9	2.26_3
5.60	1.64	1.00	1.14_1	2.16_4

Table III 9 C(i)

$\bar{n}$, pL data for Ni-2-amino-4-methyl pyridinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
5.00	1.97	0.03	0.376	3.737
5.10	1.98	0.03	0.377	3.638
5.20	2.00	0.04	0.504	3.539
5.30	2.02	0.05	0.631	3.440
5.40	2.04	0.06	0.757	3.341
5.50	2.07	0.08	1.013	3.244
5.60	2.11	0.10	1.272	3.146
5.70	2.14	0.11	1.407	3.048
5.80	2.18	0.12	1.592	2.950
5.90	2.22	0.13	1.690	2.851
6.00	2.26	0.13	1.702	2.752
6.10	2.32	0.14	1.857	2.653
6.20	2.39	0.14	1.892	2.554

Table III 9 C(ii)

$\bar{n}$, pL data for Ni-2-amino-4-methyl pyridinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
5.00	1.99	0.03	0.379	3.442
5.10	2.00	0.03	0.380	3.342
5.20	2.02	0.04	0.509	3.243
5.30	2.05	0.05	0.638	3.145
5.40	2.08	0.06	0.767	3.046
5.50	2.13	0.08	1.031	2.949
5.60	2.18	0.10	1.298	2.852
5.70	2.23	0.11	1.444	2.753
5.80	2.29	0.12	1.596	2.655
5.90	2.35	0.13	1.747	2.557
6.00	2.43	0.13	1.785	2.458
6.10	2.52	0.14	1.967	2.360
6.20	2.62	0.14	2.023	2.262

Table III 9 C(iii)

$\bar{n}$, pL data for Cd-2-amino-4-methyl pyridinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
5.00	1.96	0.02	0.25_1	3.73_6
5.10	1.98	0.03	0.37_7	3.63_7
5.20	1.99	0.03	0.37_7	3.53_7
5.30	2.01	0.04	0.50_5	3.43_9
5.40	2.03	0.05	0.63_1	3.34_0
5.50	2.05	0.06	0.75_9	3.24_1
5.60	2.09	0.08	1.03_3	3.14_4
5.70	2.13	0.10	1.27_8	3.04_7
5.80	2.17	0.11	1.44_0	2.94_8
5.90	2.21	0.12	1.55_9	2.85_0
6.00	2.25	0.12	1.57_1	2.75_0
6.10	2.31	0.13	1.72_4	2.65_2
6.20	2.38	0.13	1.75_7	2.55_3
6.30	2.46	0.14	1.93_2	2.45_5

Table III 9 C(iv)

$\bar{n}$, pL data for Cd-2-amino-4-methyl pyridinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
5.00	1.98	0.02	0.25_2	3.44_1
5.10	2.00	0.03	0.38_0	3.34_2
5.20	2.01	0.03	0.38_2	3.24_2
5.30	2.04	0.04	0.51_0	3.14_3
5.40	2.07	0.05	0.63_9	3.04_5
5.50	2.11	0.06	0.77_3	2.94_6
5.60	2.16	0.08	1.03_9	2.84_9
5.70	2.22	0.10	1.28_8	2.75_3
5.80	2.28	0.11	1.46_3	2.64_4
5.90	2.34	0.12	1.61_3	2.55_6
6.00	2.42	0.12	1.64_8	2.45_7
6.10	2.51	0.13	1.82_7	2.35_9

Table III 9 C(v)

$\bar{n}$, pL data for Mg-2-amino-4-methyl pyridinate at 35°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
5.00	1.96	0.02	0.24_7	3.73_6
5.20	1.98	0.02	0.24_8	3.53_6
5.30	2.00	0.03	0.37_9	3.43_7
5.40	2.02	0.04	0.51_3	3.33_9
5.50	2.04	0.05	0.63_3	3.24_0
5.60	2.07	0.06	0.76_3	3.14_1
5.70	2.10	0.07	0.89_5	3.04_3
5.80	2.14	0.08	1.03_1	3.94_4
5.90	2.17	0.08	1.03_9	2.84_5
6.00	2.22	0.09	1.17_9	2.74_7
6.10	2.27	0.09	1.21_2	2.64_7

Table III 9 C(vi)

$\bar{n}$, pL data for Mg-2-amino-4-methyl pyridinate at 45°C.

B	V'''	(V''' - V'')	$\bar{n}$	pL
5.00	1.98	0.02	0.25_2	3.44_1
5.20	2.00	0.02	0.25_4	3.24_1
5.30	2.03	0.03	0.38_3	3.14_2
5.40	2.06	0.04	0.51_1	3.04_4
5.50	2.10	0.05	0.64_4	2.94_5
5.60	2.14	0.06	0.77_9	2.84_6
5.70	2.19	0.07	0.91_9	2.74_7
5.80	2.25	0.08	1.06_4	2.65_1
5.90	2.30	0.08	1.08_1	2.55_1
6.00	2.38	0.08	1.09_9	2.45_2
6.10	2.47	0.09	1.26_0	2.35_4
6.20	2.57	0.09	1.30_0	2.24_6

Table III D(i)

Formation constants of Nickel complexes

Name of the complex	By half integral method				By successive approximation			
	35°C		45°C		35°C		45°C	
	log K_1	log K_2	log K_1	log K_2	log K_1	log K_2	log K_1	log K_2
Ni-pyridinate	2.42	1.88	2.33	1.81	2.40_3	1.85_5	2.29_2	1.79_1
Ni-α-picolinate	2.94	2.44	2.84	2.35	2.91_2	2.43_2	2.81_5	2.32_1
Ni-β-picolinate	2.85	2.35	2.75	2.26	2.81_8	2.36_5	2.73_0	2.23_7
Ni-γ-picolinate	3.06	2.56	2.95	2.46	3.10_1	2.51_1	2.99_3	2.50_9
Ni-2:4-lutidinate	3.26	2.67	3.14	2.56	3.24_3	2.65_4	2.09_2	2.56_4
Ni-2:6-lutidinate	3.32	2.77	3.25	2.70	3.35_1	2.82_3	3.29_1	2.74_3
Ni-2:4:6-collidinate	3.56	2.99	3.43	2.88	3.57_2	3.02_9	3.41_2	2.94_8
Ni-2-amino-pyridinate	3.40	2.84	3.26	2.72	3.29_4	2.78_9	3.21_6	2.64_7
Ni-2-amino-4-methyl pyridinate	3.54	3.00	3.25	2.73	3.70_1	3.13_1	3.48_9	2.98_1

Table III D(ii)

Formation constants of Cadmium complexes

Name of the complex	By half integral method				By successive approximation			
	35°C		45°C		35°C		45°C	
	log K_1	log K_2	log K_1	log K_2	log K_1	log K_2	log K_1	log K_2
Cd-pyridinate	2.28	1.83	2.20	1.77	2.24_0	1.796	2.16_2	1.72_8
Cd-α-picolinate	2.64	2.12	2.54	2.06	2.61_3	2.15_5	2.534	2.08_8
Cd-β-picolinate	2.57	2.12	2.48	2.05	2.54_4	2.08_7	2.47_3	2.00_3
Cd-γ-picolinate	2.88	2.39	2.76	2.30	2.94_7	2.36_5	2.834	2.36_7
Cd-2:4-lutidinate	3.16	2.58	3.03	2.46	3.10_3	2.57_0	3.10_1	2.42_3
Cd-2:6-lutidinate	3.22	2.70	3.15	2.63	3.36_1	2.74_3	3.21_1	2.68_0
Cd-2:4:6-collidinate	3.46	2.89	3.33	2.79	3.43_8	2.84_4	3.31_1	2.76_5
Cd-2-amino-pyridinate	3.30	2.65	3.16	2.56	3.21_5	2.70_1	3.18_2	2.65_3
Cd-2-amino-4-methyl pyridinate	3.44	2.91	3.15	2.63	3.50_5	3.01_2	3.364	2.76_0

Table III D(iii)

Formation constants of Magnesium complexes

Name of the complex	log K_1 values			
	By half integral method		By successive approximation	
	35°C	45°C	35°C	45°C
Mg-pyridinate	2.11	2.04	2.08_2	1.99_2
Mg-α-picolinate	2.54	2.45	2.58_7	2.50_1
Mg-β-picolinate	2.46	2.37	2.44_3	2.34_3
Mg-γ-picolinate	2.78	2.66	2.80_5	2.70_2
Mg-2:4-lutidinate	2.96	2.83	2.92_5	2.79_8
Mg-2:6-lutidinate	3.03	2.96	3.10_1	3.01_2
Mg-2:4:6-collidinate	3.27	3.14	3.30_2	3.18_4
Mg-2-amino-pyridinate	3.10	2.96	3.06_7	2.94_3
Mg-2-amino-4-methyl pyridinate	3.35	3.05	3.41_0	3.21_7

Fig. III 1.

Pyridine - 35°C.

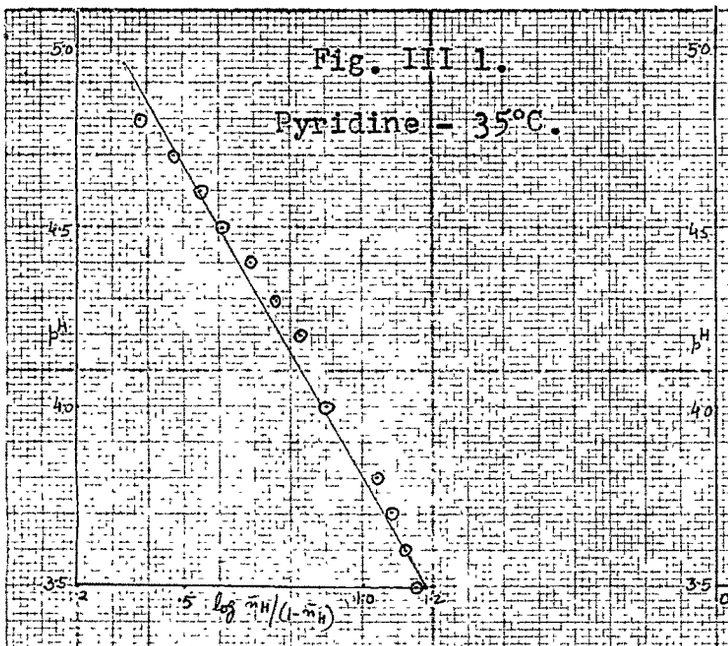


Fig. III 1.

Pyridine - 45°C.

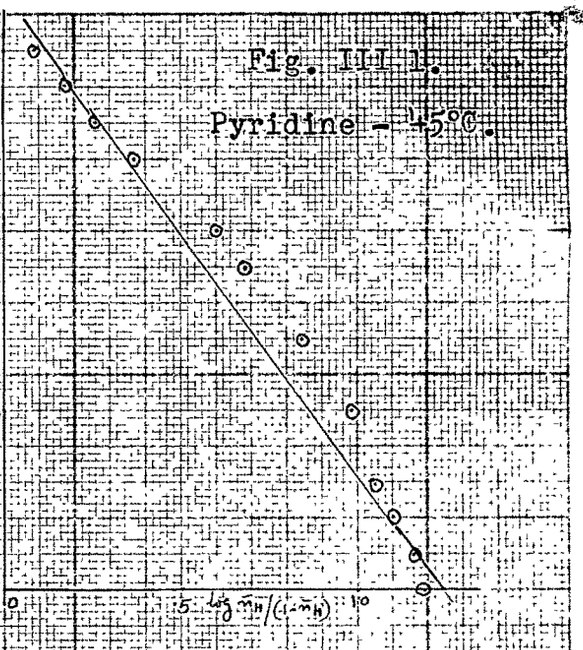


Fig. III 2.

α-picoline - 35°C.

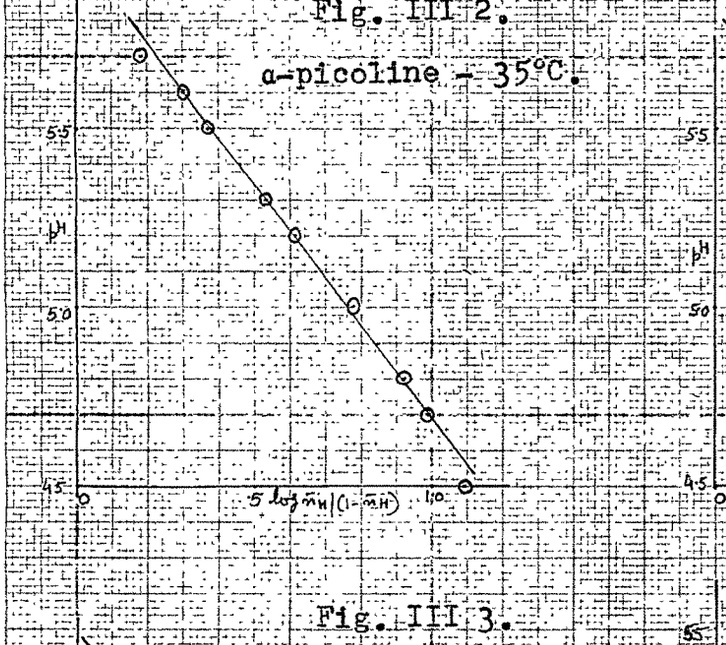


Fig. III 2.

α-picoline - 45°C.

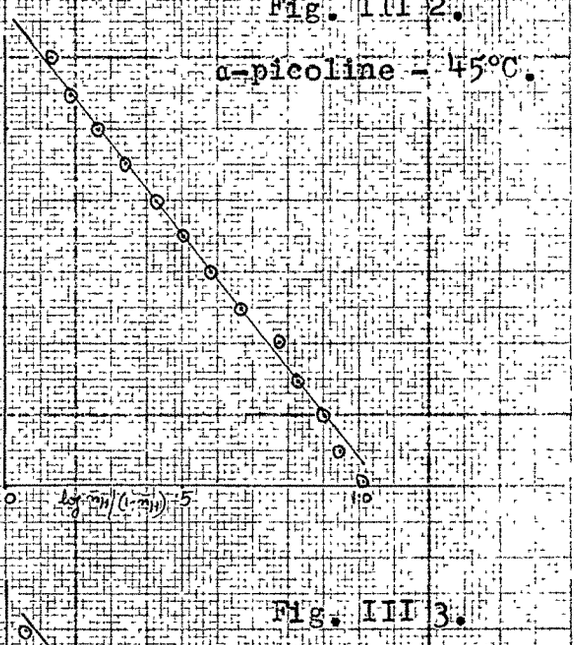


Fig. III 3.

β-picoline - 35°C.

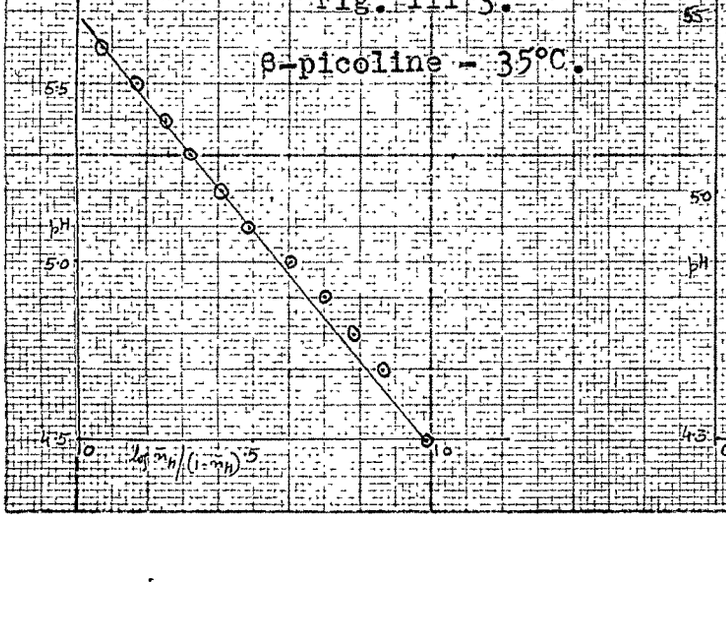


Fig. III 3.

β-picoline - 45°C.

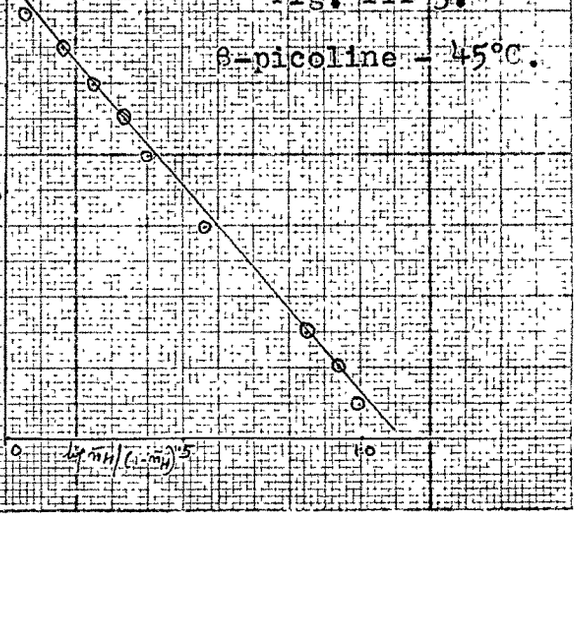


Fig. III 4.

γ-picoline – 35°C.

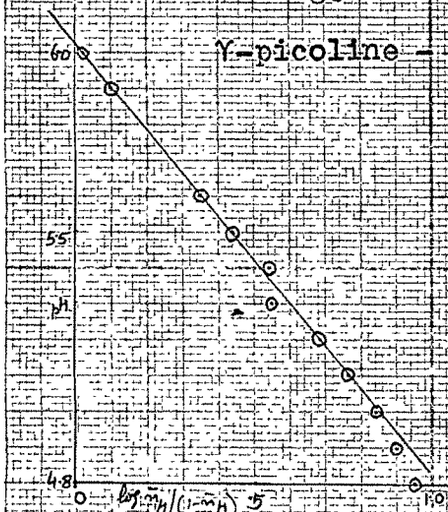


Fig. III 4.

γ-picoline – 45°C.

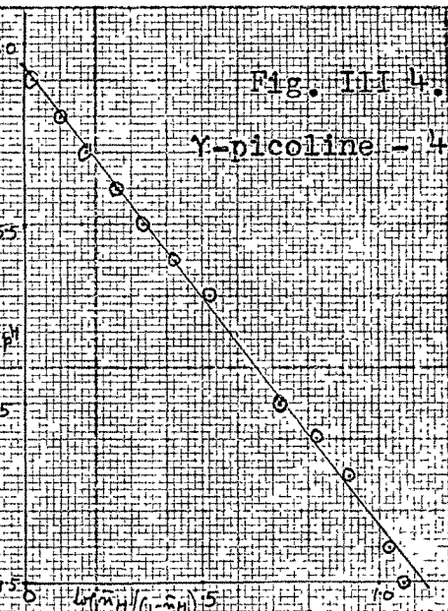


Fig. III 5.

2:4-lutidine – 35°C.

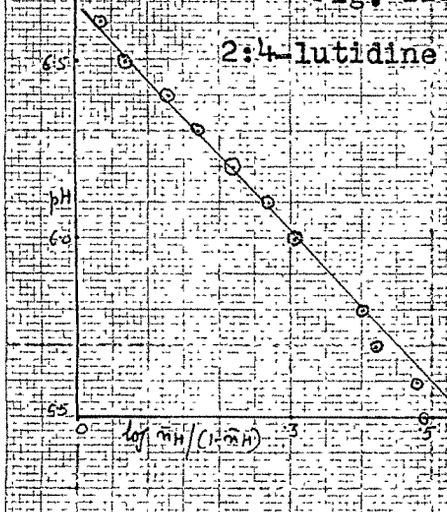


Fig. III 5.

2:4-lutidine – 45°C.

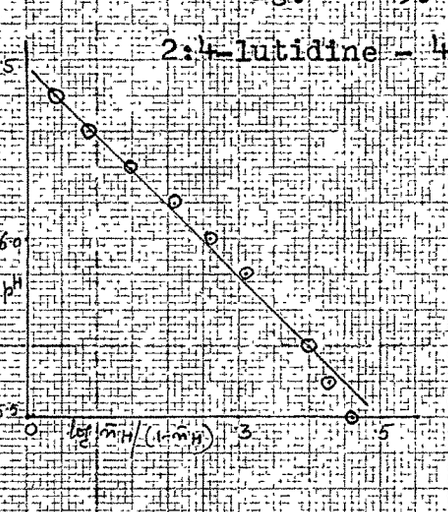


Fig. III 6.

2:6-lutidine – 35°C.

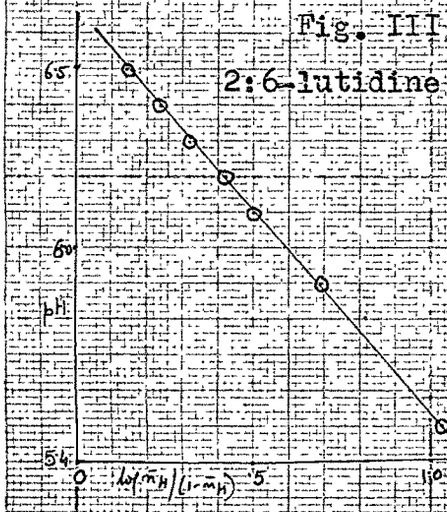


Fig. III 6.

2:6-lutidine – 45°C.

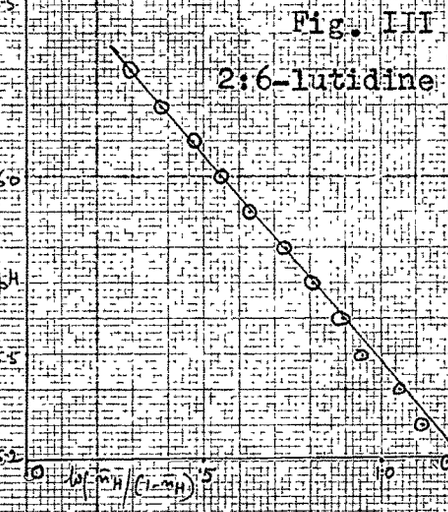


Fig. III 7.

2:4:6-collidine - 35°C.

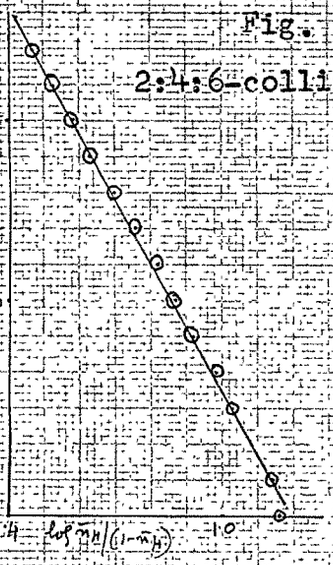


Fig. III 7.

2:4:6-collidine - 45°C.

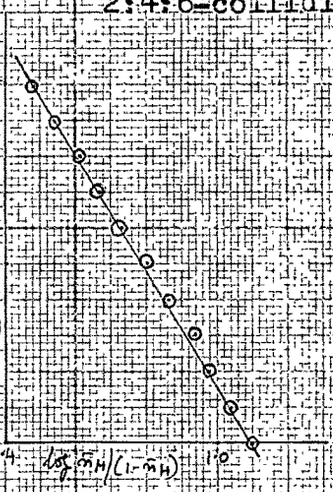


Fig. III 8.

2-amino-pyridine - 35°C.

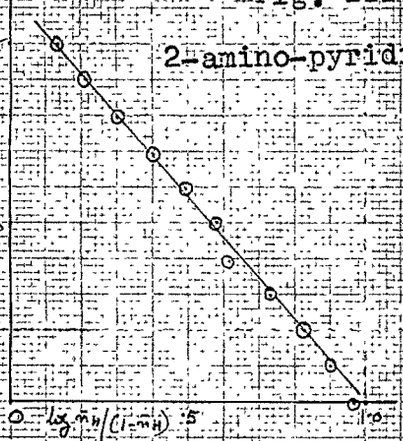


Fig. III 8.

2-amino-pyridine - 45°C.

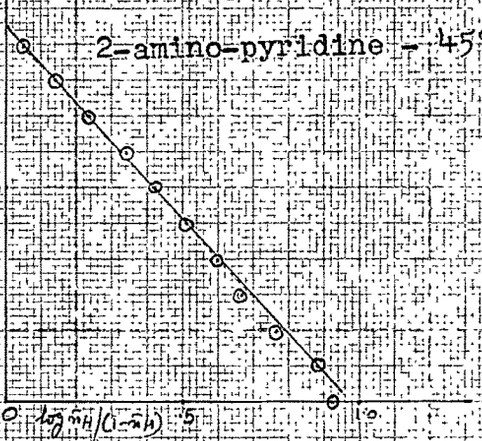


Fig. III 9(i).

2-amino-4-methyl pyridine - 35°C.

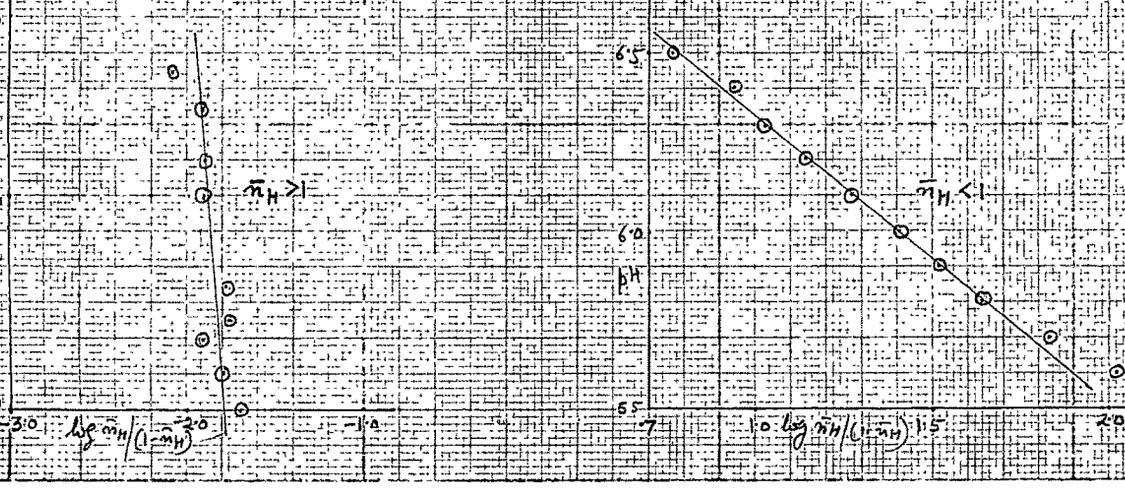
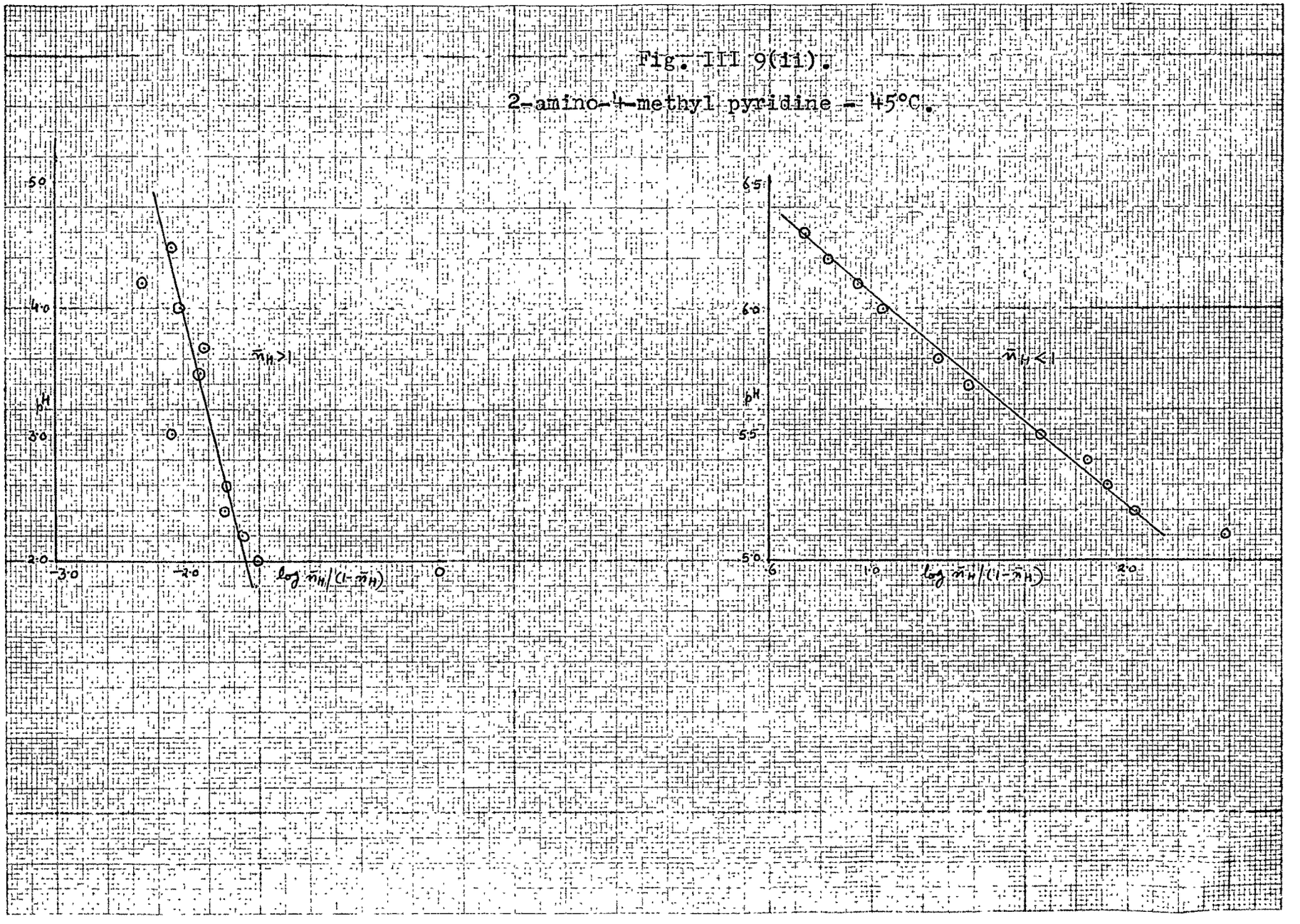


Fig. III 9(ii).

2-amino-4-methyl pyridine – 45°C.



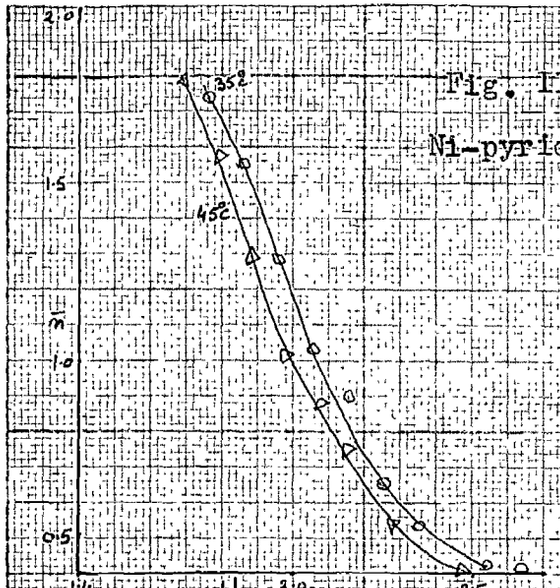


Fig. III 10.

Ni-pyridinate

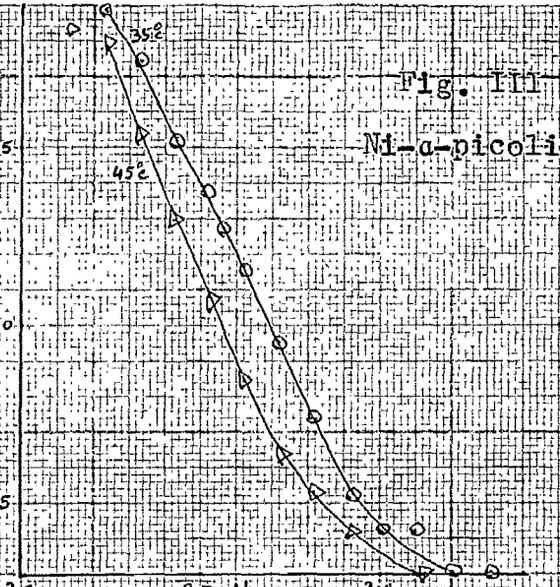


Fig. III 11.

Ni-α-picolinate

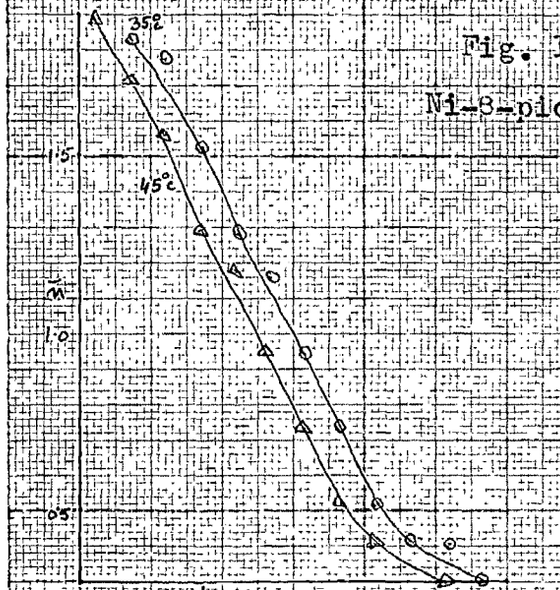


Fig. III 12.

Ni-β-picolinate

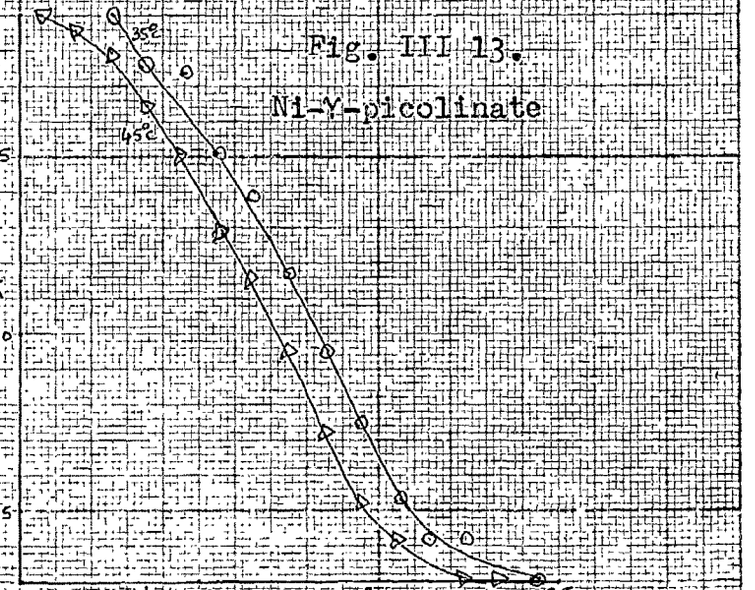


Fig. III 13.

Ni-γ-picolinate

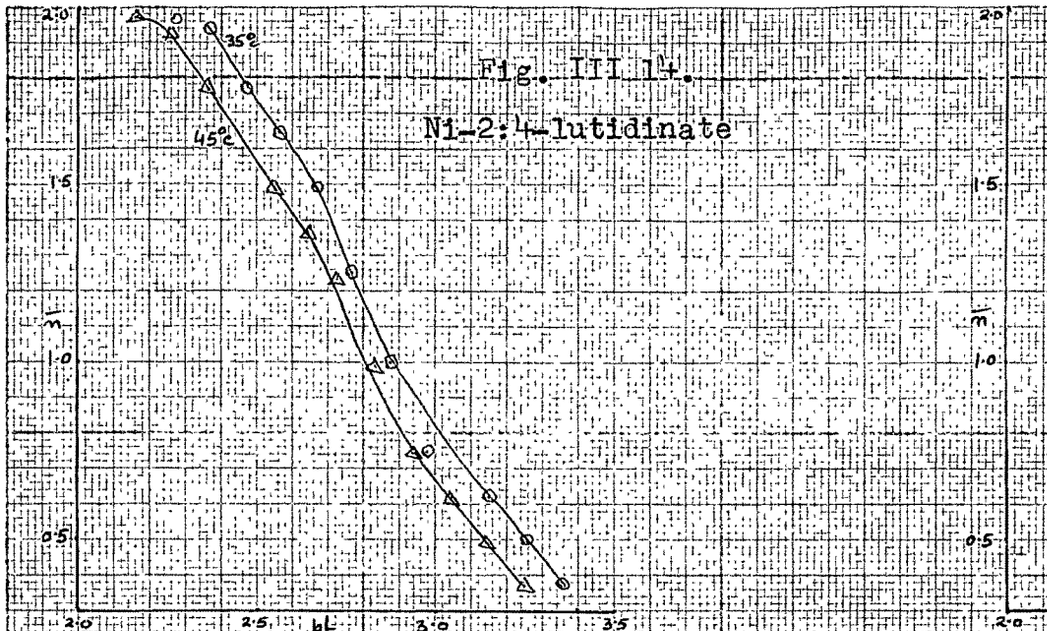


Fig. III 14.

Ni-2:4-lutidinate

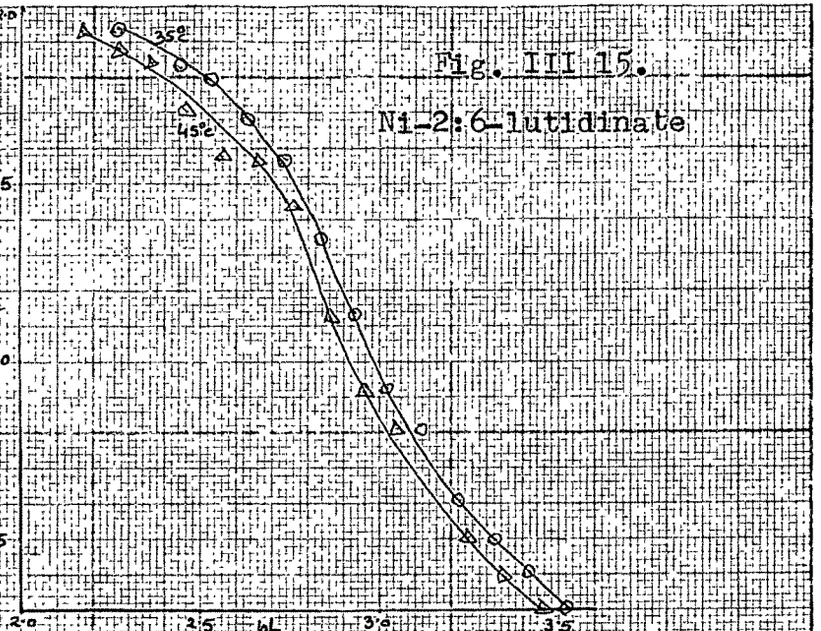


Fig. III 15.

Ni-2:6-lutidinate

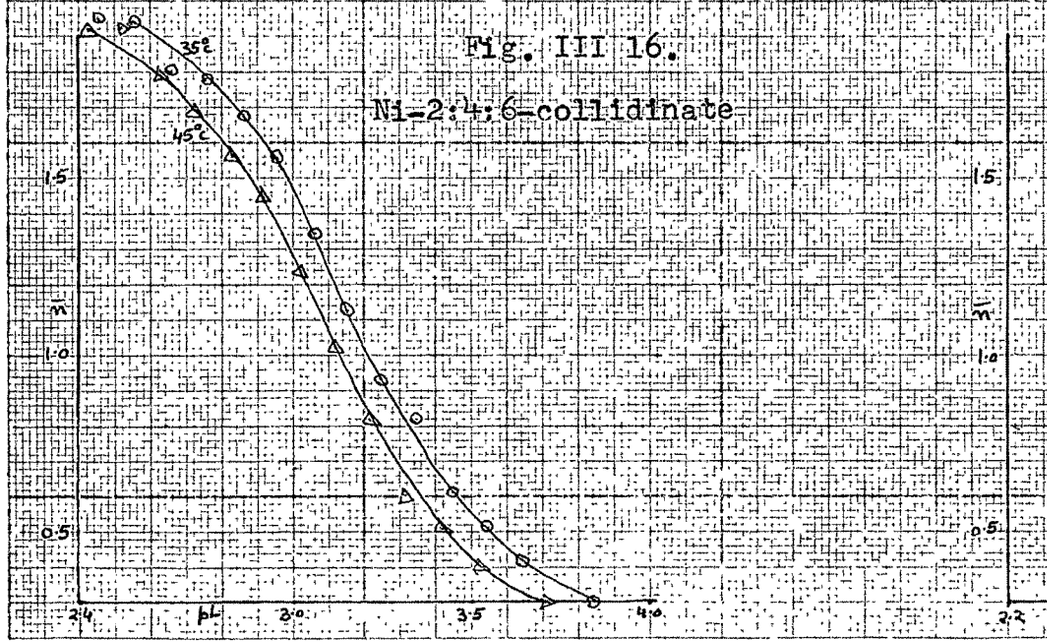


Fig. III 16.

Ni-2:4:6-collidinate

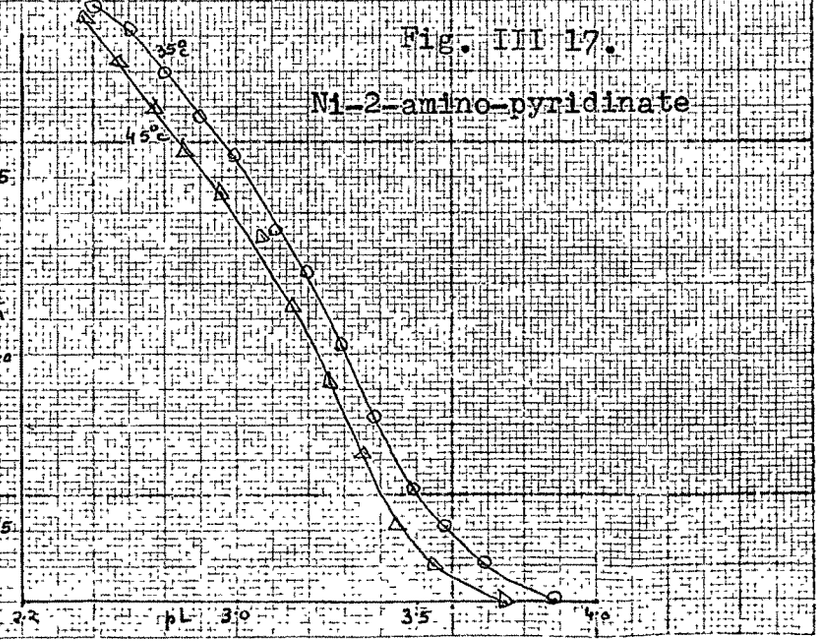


Fig. III 17.

Ni-2-amino-pyridinate

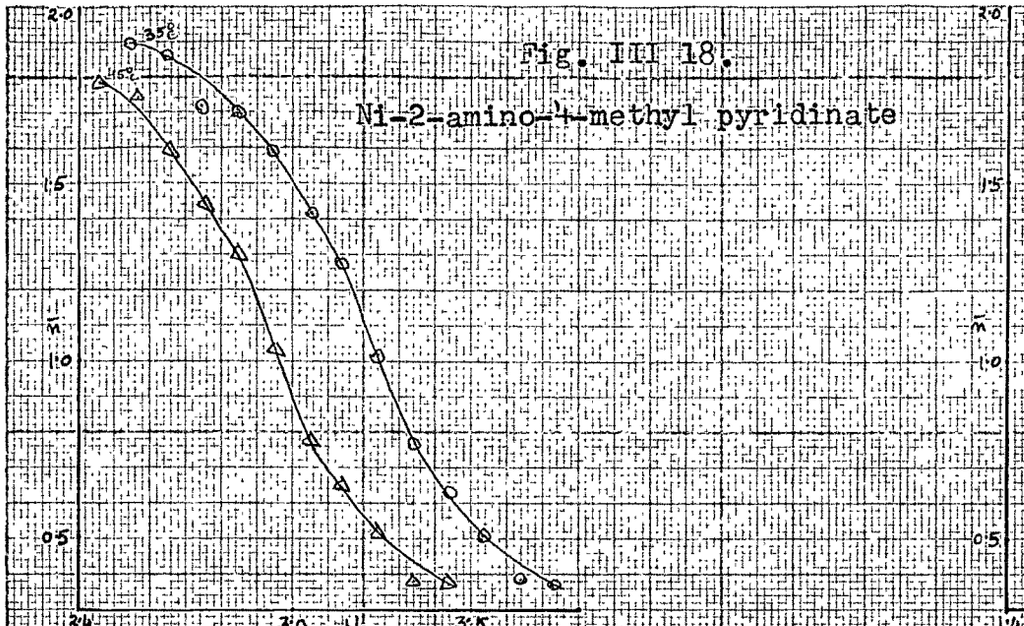


Fig. III 18.

Ni-2-amino-4-methyl pyridinate

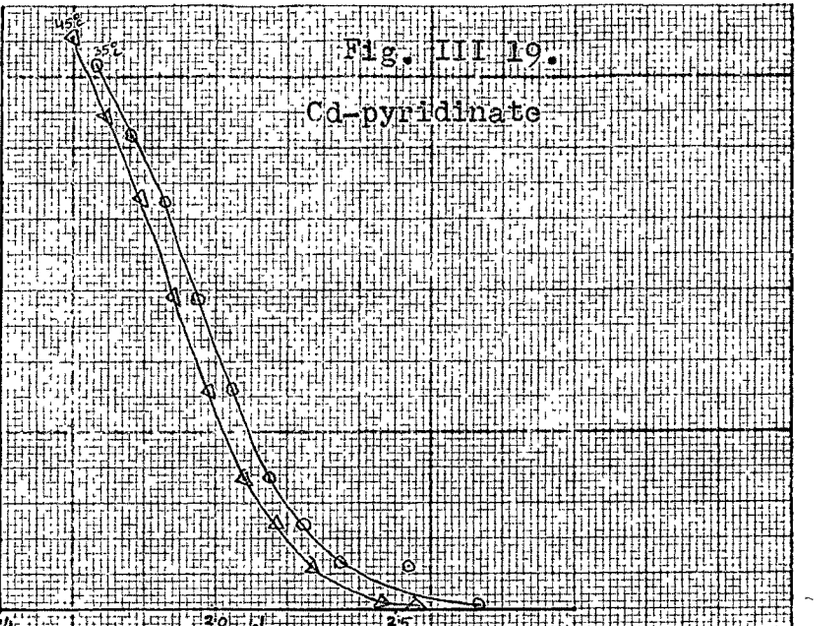


Fig. III 19.

Cd-pyridinate

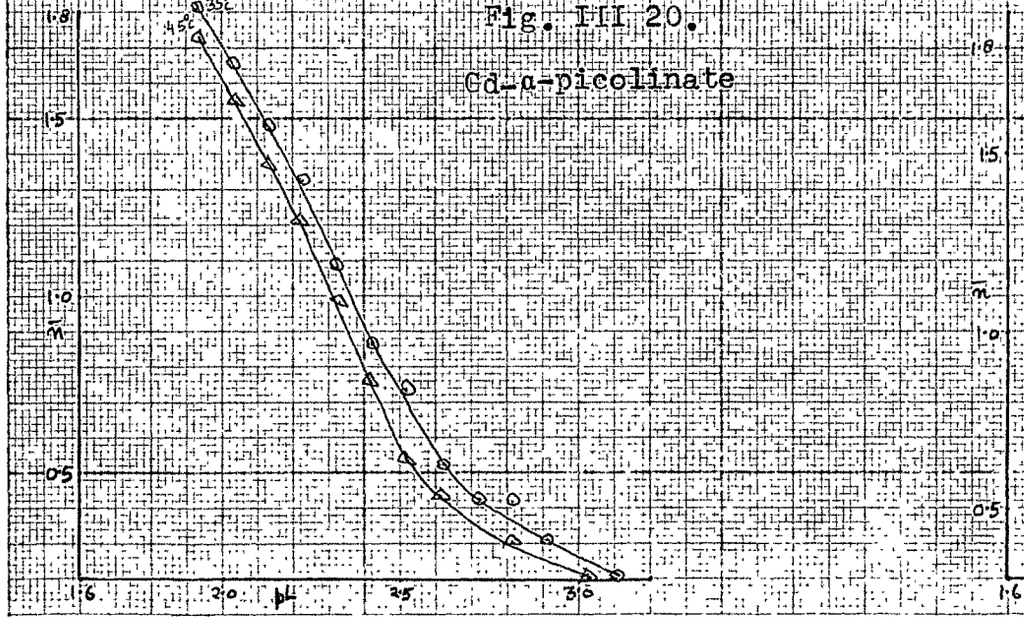


Fig. III 20.

Cd-α-picolinate

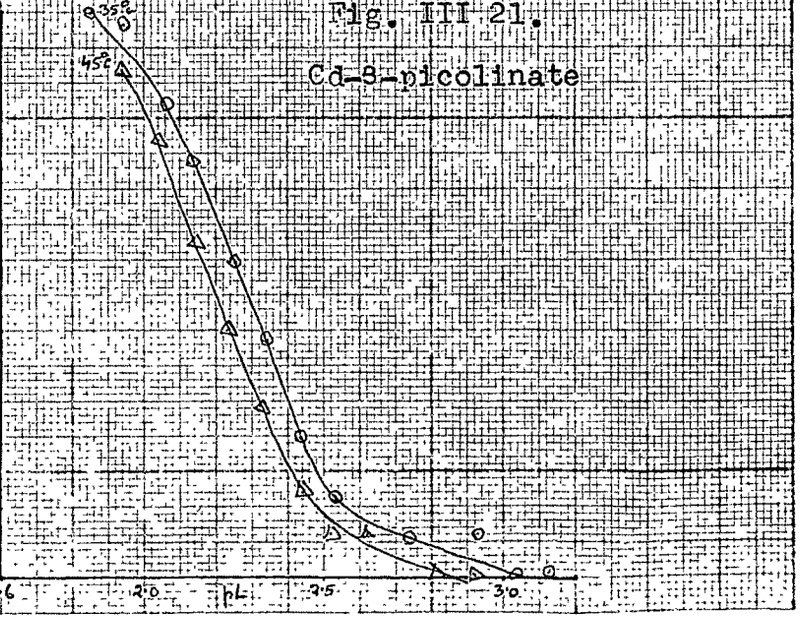


Fig. III 21.

Cd-β-picolinate

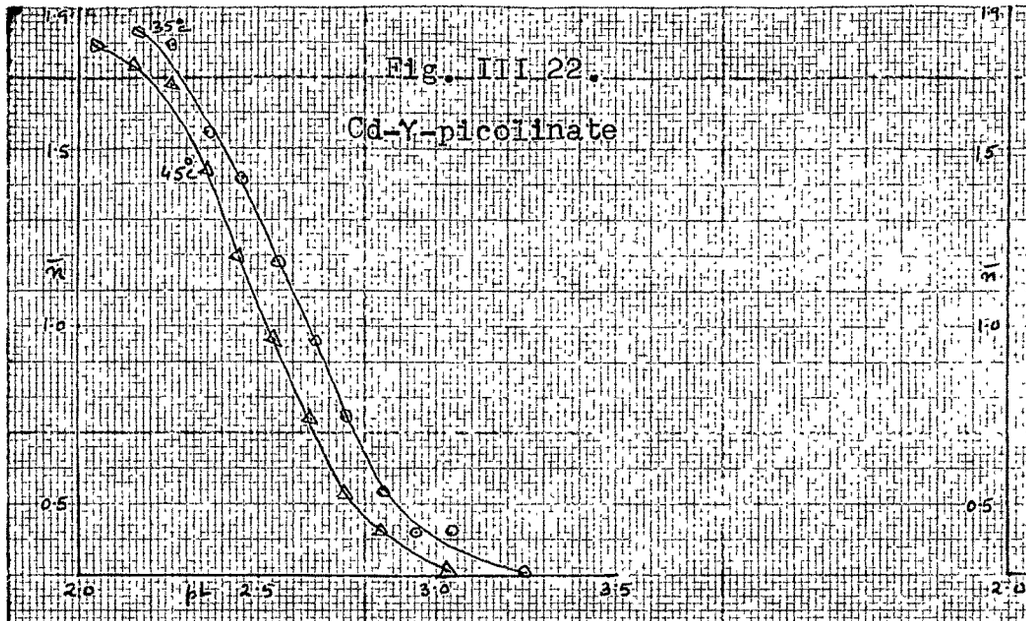


Fig. III 22.

Cd-Y-picolinate

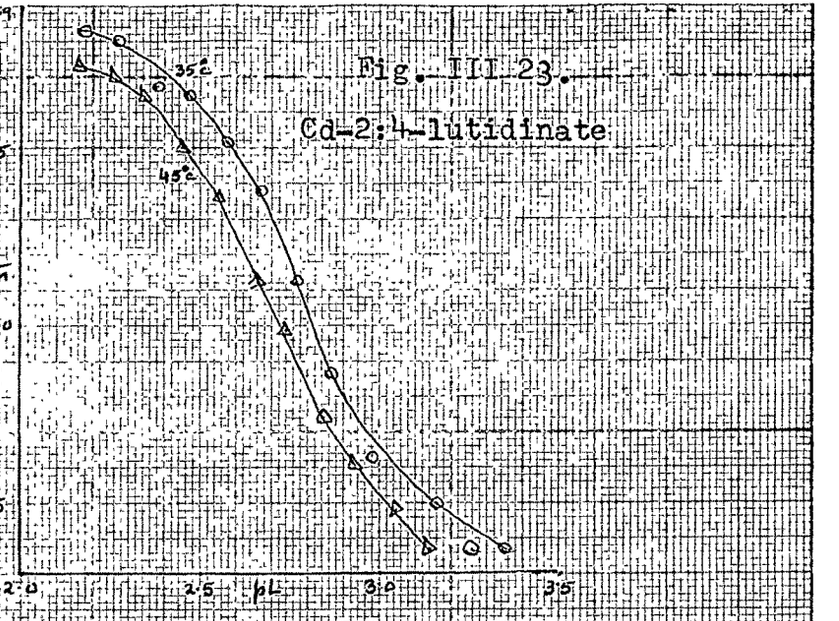


Fig. III 23.

Cd-2:4-lutidinate

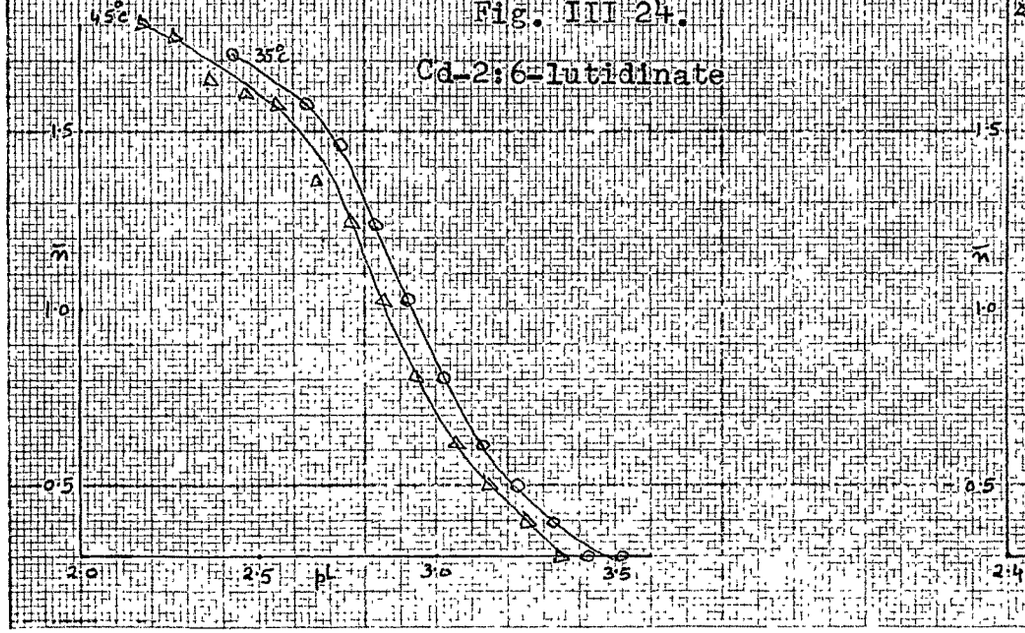


Fig. III 24.

Cd-2:6-lutidinate

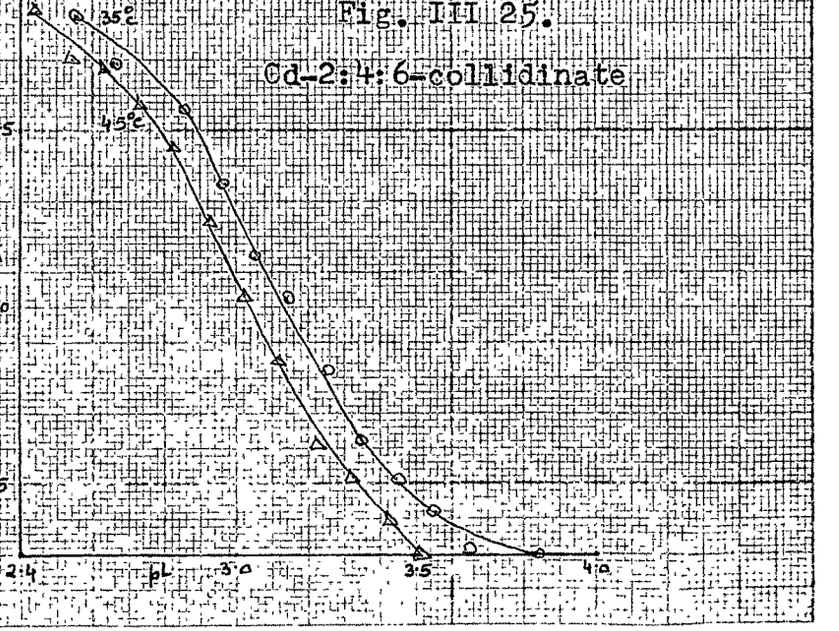


Fig. III 25.

Cd-2:4:6-collidinate

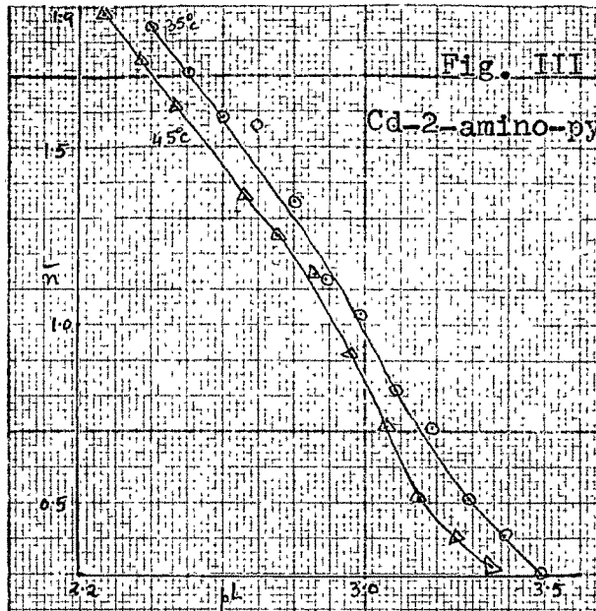


Fig. III 26.

Cd-2-amino-pyridinate

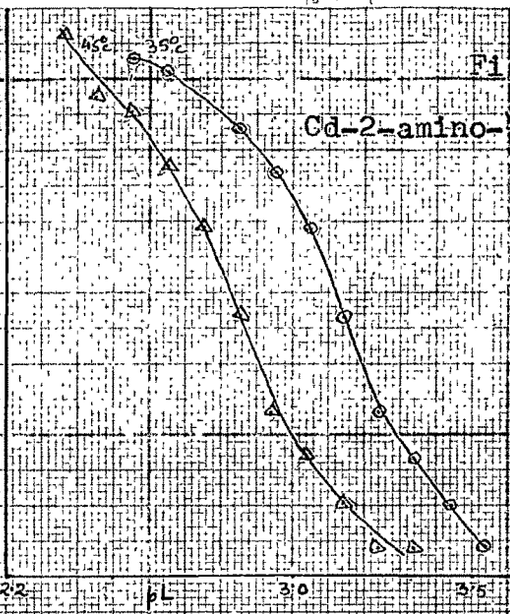


Fig. III 27.

Cd-2-amino-4-methyl pyridinate

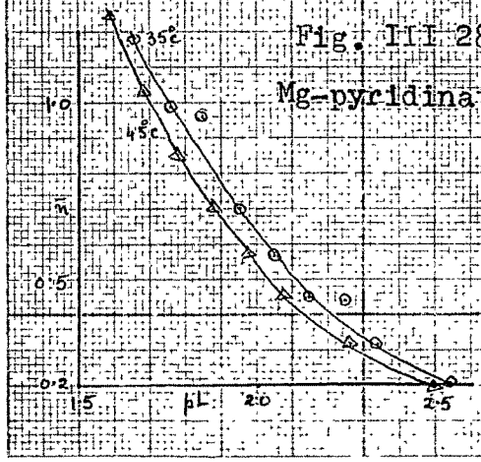


Fig. III 28.

Mg-pyridinate

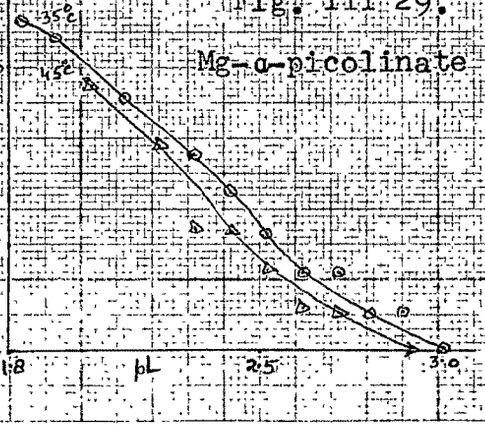


Fig. III 29.

Mg-α-picolinate

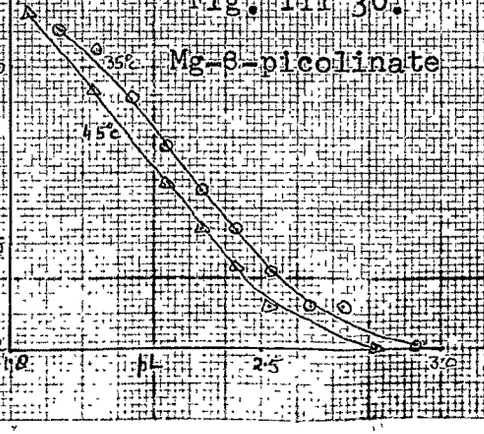


Fig. III 30.

Mg-β-picolinate

Fig. III 31.

Mg-γ-picolinate

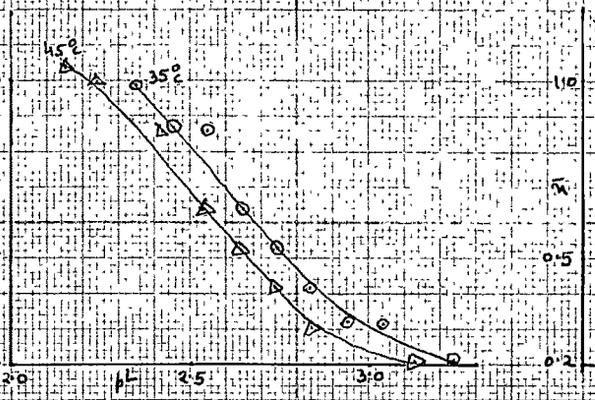


Fig. III 32.

Mg-2:4-lutidinate

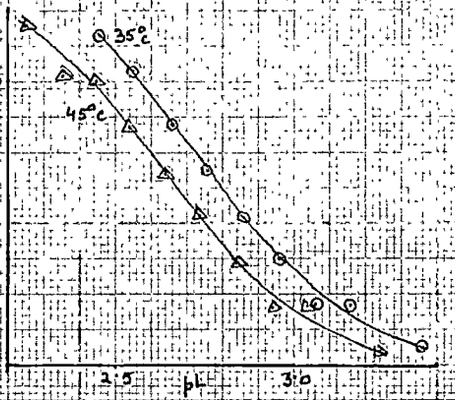


Fig. III 33.

Mg-2:6-lutidinate

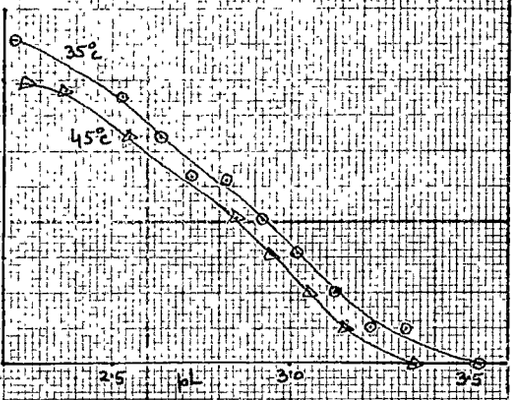


Fig. III 34.

Mg-2:4:6-collidinate

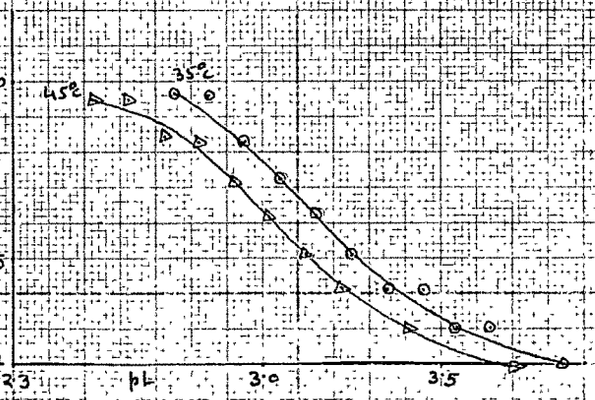


Fig. III 35.

Mg-2-amino-pyridinate

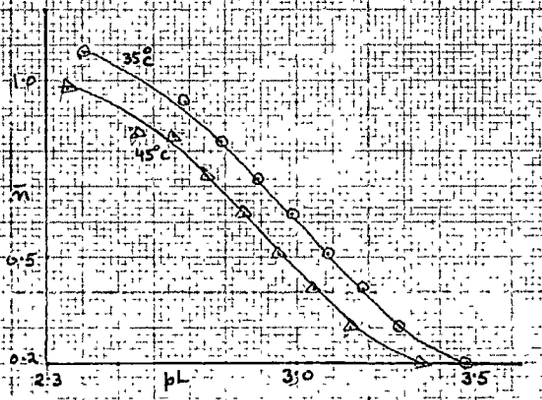
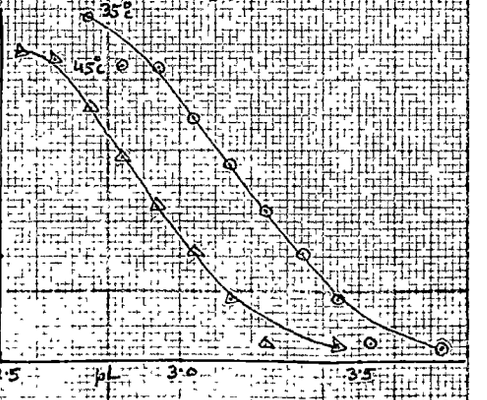


Fig. III 36.

Mg-2-amino-4-methyl-pyridinate



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