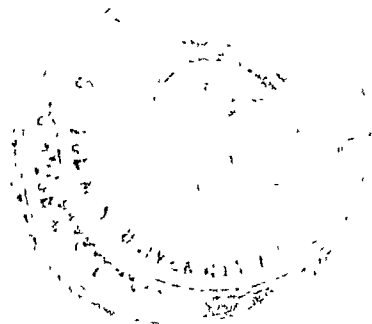




APPENDIX I-I

TABLE 1

METAL-LIGAND TITRATION DATA IN 70% DIOXAN-WATER MEDIA

AT $25 \pm 0.1^\circ\text{C}$

N-p-CHLOROPHENYLBENZOHYDROXAMIC ACID

KOH 0.10 M ml	pH meter reading, B					
	Rare Earths (0.001 M)					
	Pr	Nd	Sm	Eu	Gd	Tb
0.0	2.64	3.51	3.31	3.35	3.31	3.24
0.1	3.01	3.72	3.49	3.50	3.50	3.40
0.2	3.28	3.88	3.67	3.63	3.74	3.59
0.3	3.51	4.05	3.88	3.77	3.97	3.80
0.4	3.79	4.26	4.11	3.93	4.21	3.99
0.5	4.03	4.40	4.34	4.09	4.45	4.20
0.6	4.35	4.59	4.57	4.28	4.72	4.39
0.7	4.66	4.76	4.85	4.53	4.97	4.57
0.8	4.94	4.95	5.12	4.72	5.30	4.85
0.9	5.23	5.13	5.42	4.94	5.70	5.13
1.0	5.53	5.31	5.73	5.16	6.30	5.45
1.1	5.89	5.63	6.23	5.38	6.81	5.83
1.2	6.24	5.90	6.60	5.63	7.10	6.20
1.3	6.51	6.19	6.87	6.00	7.35	6.47

TABLE 2

METAL-LIGAND TITRATION DATA IN 70% DIOXAN-WATER MEDIA

AT $25 \pm 0.1^\circ\text{C}$

N-p-CHLOROPHENYL-m-METHYLBENZOHYDROXAMIC ACID

KOH 0.10 M ml	pH meter reading, B					
	Rare Earths (0.001 M)					
	Pr	Nd	Sm	Eu	Gd	Tb
0.0	2.67	3.53	3.38	3.37	3.33	2.68
0.1	3.03	3.77	3.52	3.52	3.51	3.04
0.2	3.37	3.96	3.71	3.69	3.71	3.39
0.3	3.69	4.18	3.89	3.87	4.00	3.72
0.4	4.12	4.40	4.06	4.04	4.25	4.16
0.5	4.40	4.65	4.27	4.23	4.50	4.48
0.6	4.72	4.86	4.46	4.43	4.76	4.75
0.7	5.06	5.00	5.69	4.64	5.00	5.25
0.8	5.49	5.21	4.90	4.85	5.37	5.53
0.9	5.81	5.45	5.15	5.08	5.79	5.87
1.0	6.18	5.68	5.41	5.32	6.38	6.21
1.1	6.36	5.92	5.66	5.55	6.89	6.36
1.2	6.45	6.25	6.02	5.95	7.20	6.47
1.3	6.66	6.52	6.43	6.36	7.48	6.69

TABLE 3

METAL-LIGAND TITRATION DATA IN 70% DIOXAN-WATER MEDIA

AT $25 \pm 0.1^\circ\text{C}$

N-p-CHLOROPHENYL-m-METHOXYBENZOHYDROXAMIC ACID

KOH 0.10 M ml	pH meter reading, B					
	Rare Earths (0.001 M)					
	Pr	Nd	Sm	Eu	Gd	Tb
0.0	2.67	3.61	3.31	3.28	3.35	3.26
0.1	3.04	3.78	3.50	3.40	3.49	3.44
0.2	3.37	3.97	3.72	3.51	3.69	3.66
0.3	3.69	4.20	3.96	3.61	3.90	3.89
0.4	4.06	4.39	4.21	3.75	4.12	4.11
0.5	4.41	4.57	4.48	3.88	4.40	4.35
0.6	4.79	4.77	4.74	4.05	4.72	4.50
0.7	5.11	4.96	5.00	4.21	4.99	4.91
0.8	5.49	5.13	5.28	4.44	5.27	5.20
0.9	5.84	5.36	5.57	4.69	5.62	5.50
1.0	6.27	5.55	5.94	4.91	6.21	5.89
1.1	6.66	5.76	6.41	5.15	6.71	6.46
1.2	6.84	5.97	6.72	5.40	7.09	6.75
1.3	7.04	6.17	6.99	5.71	7.34	7.16

TABLE 4

METAL-LIGAND TITRATION DATA IN 70% DIOXAN-WATER MEDIA

AT $25 \pm 0.1^\circ\text{C}$

N-p-CHLOROPHENYL-m-FLUOROBENZOHYDROXAMIC ACID

KOH 0.10 M ml	pH meter reading, B					
	Rare Earths (0.001 M)					
	Pr	Nd	Sm	Eu	Gd	Tb
0.0	2.66	3.52	3.34	3.38	3.33	3.30
0.1	3.06	3.72	3.53	3.50	3.50	3.49
0.2	3.38	3.91	3.75	3.64	3.67	3.68
0.3	3.62	4.07	3.99	3.78	3.88	3.90
0.4	4.00	4.24	4.27	3.92	4.10	4.15
0.5	4.29	4.39	4.54	4.11	4.33	4.40
0.6	4.62	4.53	4.76	4.28	4.64	4.60
0.7	5.09	4.70	5.02	4.45	4.93	5.19
0.8	5.45	4.96	5.30	4.64	5.19	5.25
0.9	5.73	5.15	5.60	4.87	5.50	5.56
1.0	6.13	5.35	5.97	5.06	5.88	5.89
1.1	6.39	5.55	6.39	5.21	6.27	6.50
1.2	6.53	5.73	6.65	5.41	6.62	6.80
1.3	6.73	5.96	6.87	5.66	6.86	7.20

TABLE 5

METAL-LIGAND TITRATION DATA IN 70% DIOXAN-WATER MEDIA

AT $25 \pm 0.1^\circ\text{C}$

N-p-CHLOROPHENYL-m-CHLOROBENZOHYDROXAMIC ACID

KOH 0.10 M ml	pH meter reading, B					
	Rare Earths (0.001 M)					
	Pr	Nd	Sm	Eu	Gd	Tb
0.0	3.40	3.37	3.32	3.35	3.45	3.38
0.1	3.64	3.60	3.55	3.54	3.70	3.59
0.2	3.91	3.80	3.80	3.75	3.95	3.81
0.3	4.17	4.02	3.96	3.96	4.20	4.05
0.4	4.45	4.30	4.15	4.20	4.50	4.32
0.5	4.70	4.60	4.40	4.50	4.87	4.62
0.6	4.94	4.90	4.65	4.80	5.08	4.92
0.7	5.18	5.15	4.90	5.12	5.04	5.16
0.8	5.43	5.40	5.25	5.38	5.61	5.43
0.9	5.66	5.62	5.55	5.60	5.90	5.65
1.0	6.00	5.91	5.85	5.85	6.21	5.93
1.1	6.29	6.22	6.12	6.11	6.47	6.25
1.2	6.66	6.50	6.40	6.40	6.70	6.53
1.3	6.99	6.85	6.69	6.67	6.98	6.86

TABLE 6

METAL-LIGAND TITRATION DATA IN 70% DIOXAN-WATER MEDIA

AT $25 \pm 0.1^\circ\text{C}$

N-p-CHLOROPHENYL-m-BROMOBENZOHYDROXAMIC ACID

KOH 0.10 M ml	pH meter reading, B					
	Rare Earths (0.001 M)					
	Pr	Nd	Sm	Eu	Gd	Tb
0.0	2.71	3.50	3.45	3.40	3.39	3.33
0.1	3.03	3.78	3.61	3.61	3.61	3.52
0.2	3.33	4.03	3.76	3.80	3.80	3.70
0.3	3.63	4.22	3.94	3.93	3.98	3.90
0.4	3.89	4.46	4.12	4.10	4.20	4.10
0.5	4.12	4.70	4.31	4.30	4.36	4.31
0.6	4.35	4.91	4.48	4.50	4.59	4.53
0.7	4.75	5.18	4.70	4.67	4.86	4.79
0.8	5.02	5.41	4.90	4.89	5.11	5.00
0.9	5.29	5.66	5.10	5.09	5.42	5.29
1.0	5.59	5.90	5.31	5.28	5.84	5.66
1.1	5.76	6.26	5.55	5.50	6.30	6.09
1.2	5.91	6.42	5.80	5.75	6.52	6.41
1.3	6.06	-	6.03	6.00	-	-

TABLE 7

METAL-LIGAND TITRATION DATA IN 70% DIOXAN-WATER MEDIA

AT $25 \pm 0.1^\circ\text{C}$

N-p-CHLOROPHENYL-m-IODOBENZOHYDROXAMIC ACID

KOH 0.10 M ml	pH meter reading, B					
	Rare Earths (0.001 M)					
	Pr	Nd	Sm	Eu	Gd	Tb
0.0	3.48	3.50	3.45	3.35	3.52	3.49
0.1	3.63	3.60	3.59	3.56	3.69	3.68
0.2	3.82	3.80	3.76	3.75	3.86	3.92
0.3	4.05	4.00	3.96	3.92	4.08	4.13
0.4	4.30	4.25	4.18	4.09	4.27	4.39
0.5	4.56	4.50	4.41	4.28	4.46	4.63
0.6	4.80	4.76	4.65	4.47	4.68	4.86
0.7	5.06	4.99	4.91	4.67	4.90	5.12
0.8	5.31	5.27	5.15	4.90	5.10	5.47
0.9	5.60	5.55	5.43	5.09	5.31	5.92
1.0	5.93	5.86	5.69	5.30	5.55	6.29
1.1	6.20	6.15	6.00	5.49	5.73	6.43
1.2	6.45	6.40	6.30	5.71	5.96	6.57
1.3	6.70	6.69	6.58	5.96	6.20	-

TABLE 8

METAL-LIGAND TITRATION DATA IN 70% DIOXAN-WATER MEDIA

AT $25 \pm 0.1^\circ\text{C}$

N-p-CHLOROPHENYL-m-NITROBENZOHYDROXAMIC ACID

KOH 0.10 M ml	pH meter reading, B					
	Rare Earths (0.001 M)					
	Pr	Nd	Sm	Eu	Gd	Tb
0.0	2.93	3.75	3.64	3.51	3.59	2.90
0.1	3.38	4.00	3.86	3.70	3.81	3.25
0.2	3.68	4.21	4.11	3.86	4.06	3.60
0.3	3.99	4.39	4.34	4.00	4.30	3.90
0.4	4.39	4.58	4.54	4.17	4.53	4.30
0.5	4.76	4.78	4.76	4.34	4.77	4.68
0.6	5.09	5.00	4.98	4.45	5.02	5.00
0.7	5.44	5.21	5.21	4.69	5.35	5.40
0.8	5.77	5.41	5.46	4.84	5.62	5.70
0.9	6.05	5.61	5.78	5.03	5.92	5.99
1.0	6.35	5.81	6.15	5.22	6.25	6.30
1.1	6.71	6.01	6.41	5.40	6.61	6.65
1.2	7.12	6.27	6.62	5.61	6.85	7.00
1.3	7.57	6.50	6.76	5.80	7.11	7.39

TABLE 9

METAL-LIGAND TITRATION DATA IN 70% DIOXAN-WATER MEDIA

AT $25 \pm 0.1^\circ\text{C}$ $\text{La} = 0.001 \text{ M}$ $\text{HClO}_4 = 0.0005 \text{ M}$

KOH 0.10 M ml	X=H	X=OCH ₃	X=I	KOH 0.10 M ml	X=F	KOH 0.10 M ml	X=CH ₃
0.00	2.15	2.12	2.10	0.00	2.10	0.00	1.75
0.50	2.25	2.20	2.15	0.50	2.20	0.20	1.80
1.00	2.30	2.30	2.25	1.00	2.35	0.40	1.85
1.50	2.40	2.68	2.35	1.50	2.60	0.60	1.95
2.00	2.55	3.38	2.45	1.60	2.65	0.80	2.05
2.20	2.65	3.88	2.55	1.70	2.72	1.00	2.25
2.40	2.70	4.46	2.65	1.80	2.80	1.10	2.40
2.50	2.75	4.70	2.70	1.90	2.90	1.20	2.72
2.60	2.80	4.10	2.75	2.00	3.05	1.30	3.15
2.80	2.90	5.30	2.85	2.10	3.30	1.40	3.15
3.00	3.05	5.65	3.05	2.20	3.52	1.50	4.50
3.20	3.35	6.00	3.30	2.30	4.05	1.60	5.00
3.40	3.60	6.10	3.95	2.40	4.35	1.70	6.40
3.50	3.90	6.40	4.35	2.50	4.95	1.80	6.90
3.60	4.10	6.90	4.72	2.60	5.25	1.90	7.60
3.80	4.50	7.20	5.10	2.70	5.60	2.00	8.30
4.00	4.85	7.50	5.25	2.80	5.90	2.10	9.50
4.20	5.15	7.80	5.40	2.90	6.30	2.20	10.00
4.40	5.65	8.20	5.70	3.00	6.35		
4.50	6.90	8.80	6.80	3.20	6.75		

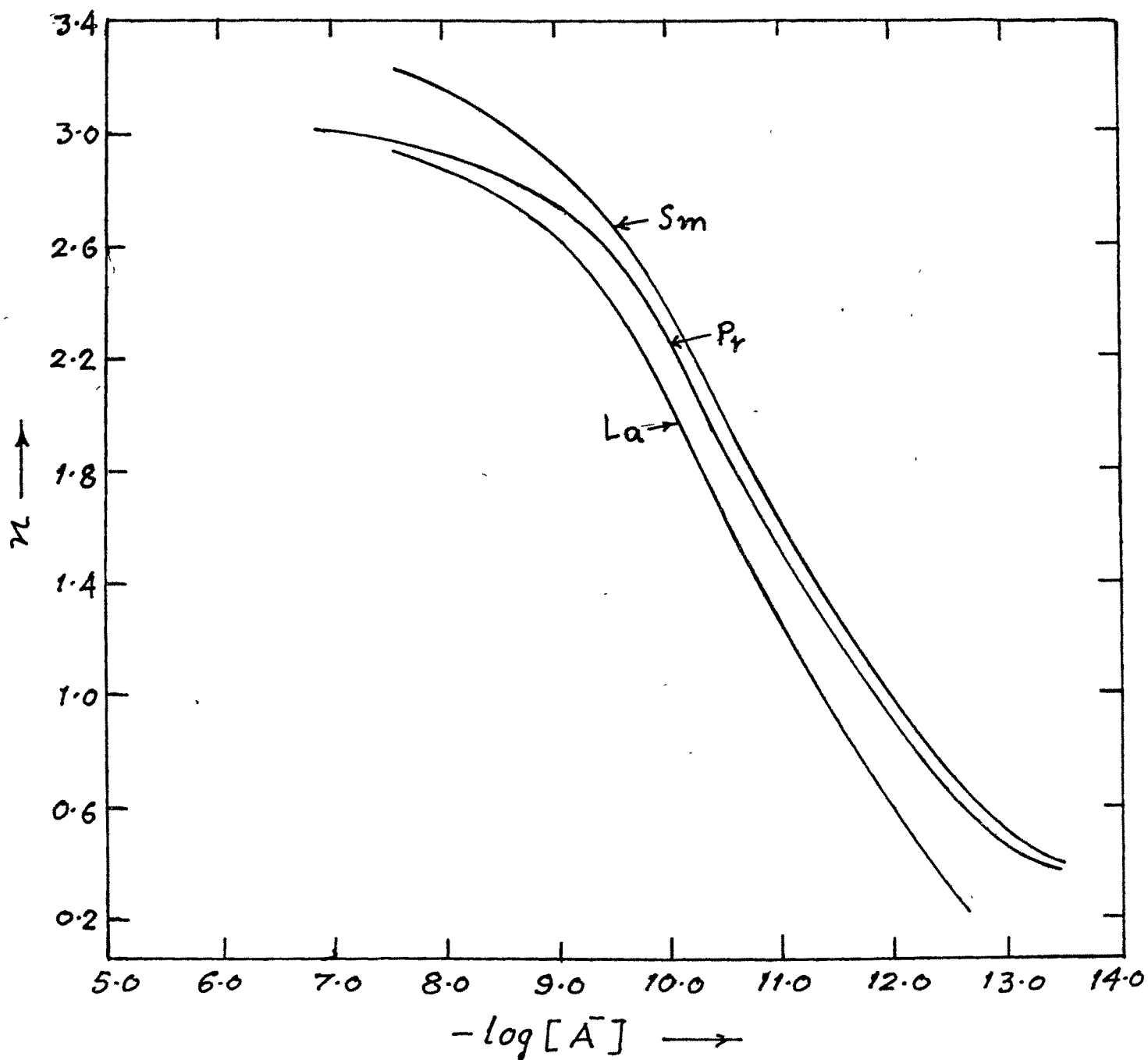


Fig. I. Formation curves for the N-p-chlorophenylbenzohydroxamic acid complexes with La^{3+} , Pr^{3+} , and Sm^{3+} in 70% dioxan-water media at 25°C.

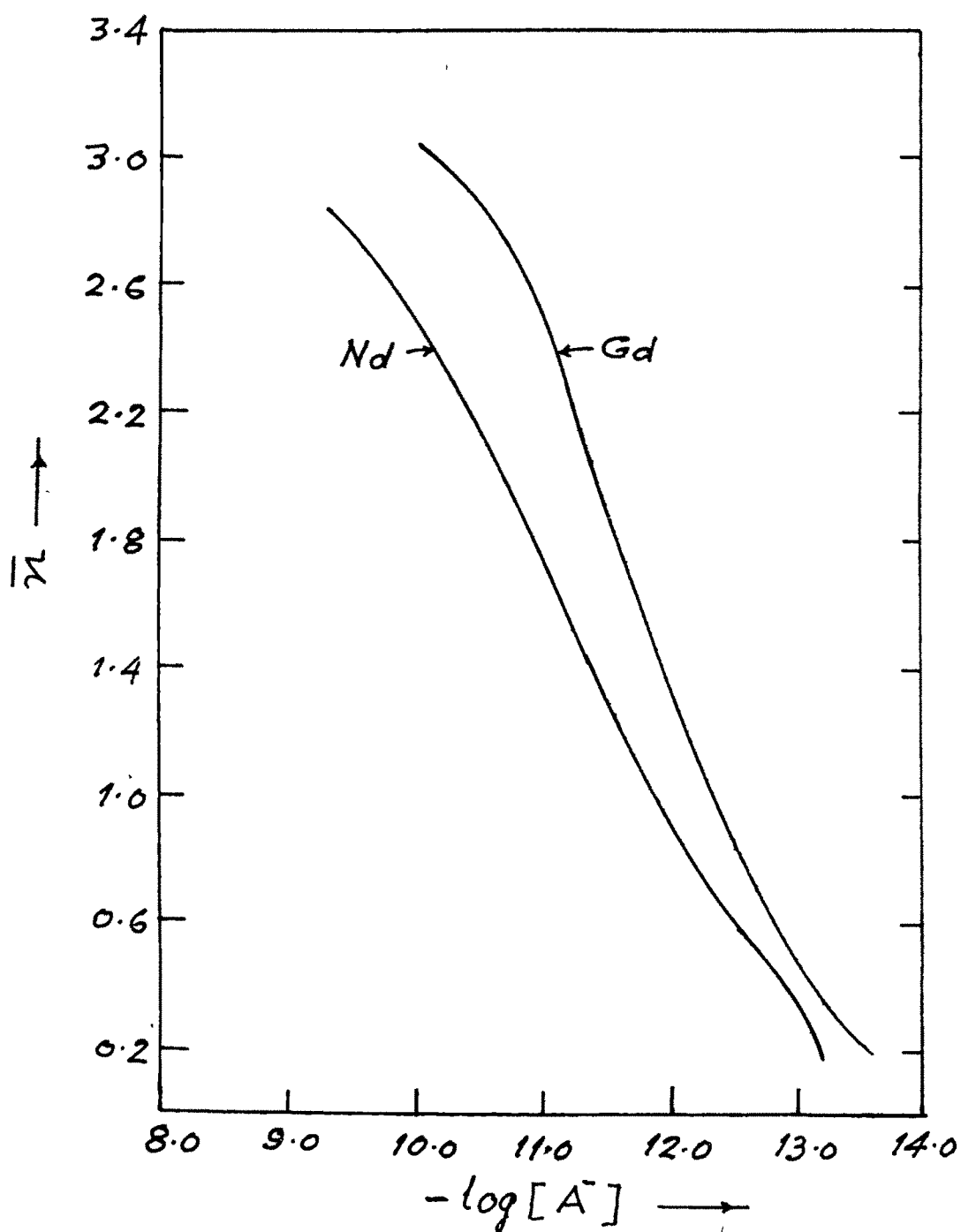


Fig. II. Formation curves for the N-p-chlorophenylbenzohydroxamic acid complexes with Nd^{3+} and Gd^{3+} in 70% dioxan-water media at 25°C.

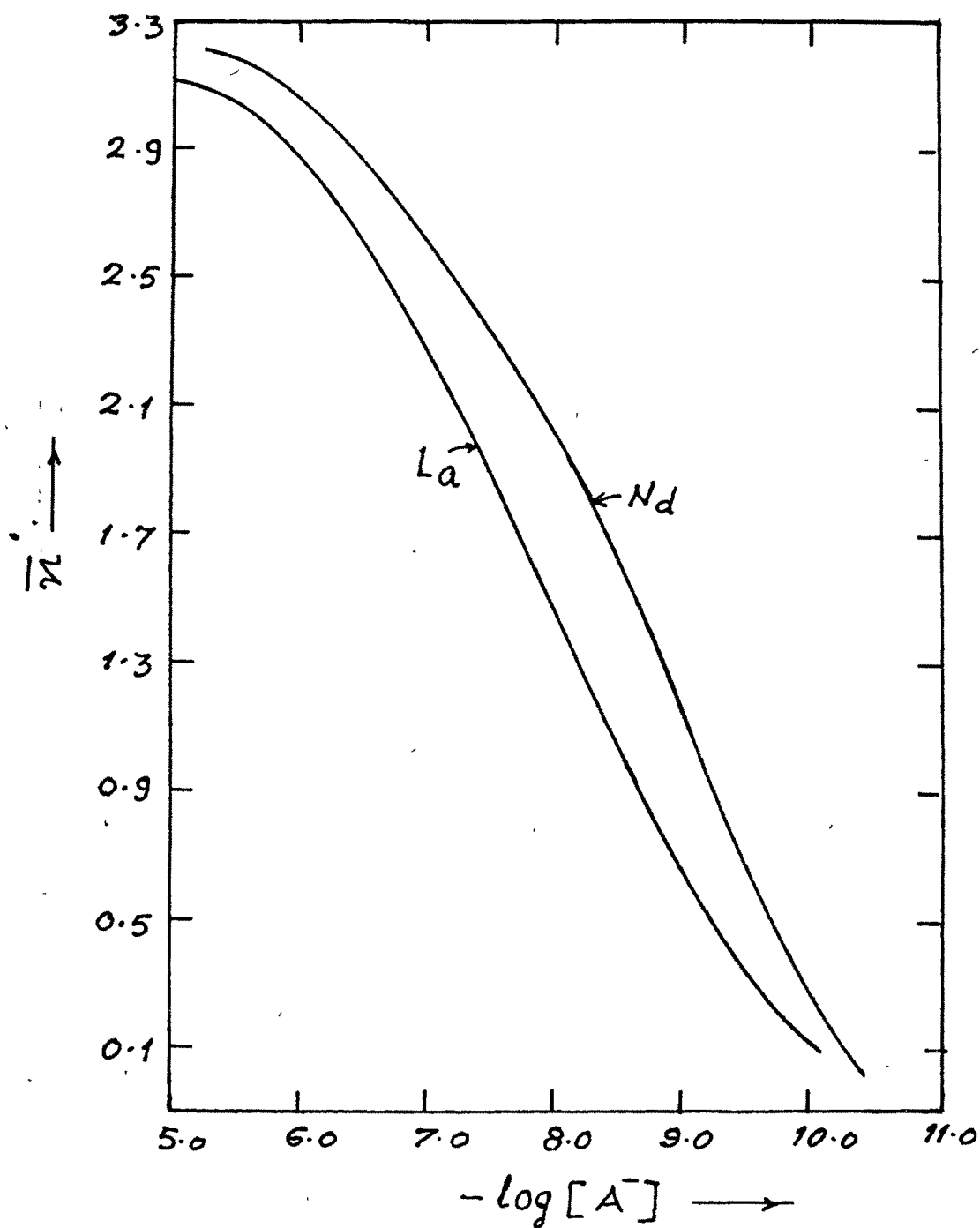


Fig. III. Formation curves for the N-p-chlorophenyl-m-nitro-benzohydroxamic acid complexes with La^{3+} and Nd^{3+} in 70% dioxan-water media at 25°C.