

CHAPTER IV

RESULT

4.1 Distribution Coefficient (D) of Iron (III) in Hydrochloric Acid-n-AnyI Acetate System.Table 4.1 1×10^{-4} M-ferric chloride solution labelled with iron-59.

$D \pm \sigma$	Log D	(HCl)	log (HCl)
$1.45 \times 10^{-3} \pm 5.95 \times 10^{-4}$	3.16	2.00	0.30
$2.43 \times 10^{-2} \pm 1.15 \times 10^{-3}$	2.35	3.00	0.48
$3.83 \times 10^{-1} \pm 4.80 \times 10^{-3}$	1.58	3.98	0.60
$1.42 \times 10 \pm 5.20 \times 10^{-1}$	1.52	5.08	0.71
$1.89 \times 10^2 \pm 2.83 \times 10$	2.28	6.08	0.78
$4.57 \times 10^2 \pm 1.44 \times 10^2$	2.66	7.01	0.85
$6.73 \times 10^2 \pm 3.09 \times 10^2$	2.83	8.01	0.90
$6.65 \times 10^2 \pm 3.02 \times 10^2$	2.82	8.76	0.94

 σ = Standard deviation.

Table 4.2 Ferric chloride solution labelled with iron-59
(almost carrier free)

$D \pm \delta$	log D	(HCl)	log (HCl)
$2.49 \times 10^{-3} \pm 6.46 \times 10^{-4}$	3.37	2.00	0.30
$4.17 \times 10^{-2} \pm 1.61 \times 10^{-3}$	2.62	3.00	0.48
$5.05 \times 10^{-1} \pm 6.21 \times 10^{-3}$	1.70	4.00	0.60
$8.47 \pm 9.83 \times 10^{-2}$	0.93	5.01	0.70
$8.08 \times 10 \pm 1.58 \times 10^2$	1.91	5.96	0.77
$6.65 \times 10^2 \pm 2.65 \times 10^2$	2.82	7.01	0.85
$6.60 \times 10^2 \pm 2.58 \times 10^2$	2.82	8.01	0.90
$6.48 \times 10^2 \pm 2.51 \times 10^2$	2.81	9.01	0.95

4.2 Distribution Coefficient(D) of Iron (III) in
Hydrochloric Acid-B-Methyl Butyl Acetate System.

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Table 4.3 2×10^{-4} M-ferric chloride solution labelled with iron-59

$D \pm 5$	log D	(HCl)	log (HCl)
$2.57 \times 10^{-4} \pm 3.25 \times 10^{-4}$	- 4.41	1.03	0.01
$5.33 \times 10^{-4} \pm 6.70 \times 10^{-4}$	- 4.73	1.98	0.30
$1.98 \times 10^{-2} \pm 1.15 \times 10^{-3}$	- 2.30	2.99	0.48
$3.31 \times 10^{-1} \pm 5.46 \times 10^{-3}$	- 1.52	3.95	0.60
8.65 $\pm 1.62 \times 10^{-1}$	0.94	4.88	0.69
8.68 $\times 10 \pm 5.81$	1.94	5.86	0.77
$1.35 \times 10^2 \pm 5.16 \times 10$	2.13	6.75	0.83
$1.03 \times 10^3 \pm 9.75 \times 10^2$	3.01	7.71	0.89
$9.27 \times 10^2 \pm 8.73 \times 10^2$	2.97	8.94	0.95

Table 4.4 Ferric chloride solution labelled with iron-59
(almost carrier free)

$D \pm \delta$	log D	(HCl)	log (HCl)
$5.20 \times 10^{-4} \pm 3.40 \times 10^{-4}$	- 4.72	1.02	0.01
$2.90 \times 10^{-3} \pm 4.09 \times 10^{-3}$	- 3.46	1.93	0.28
$3.73 \times 10^{-2} \pm 7.41 \times 10^{-4}$	- 2.57	2.92	0.46
$2.57 \times 10^{-1} \pm 3.89 \times 10^{-3}$	- 1.41	3.88	0.59
$4.05 \pm 2.65 \times 10^{-2}$	0.61	4.91	0.69
$5.38 \times 10 \pm 2.60$	1.73	5.88	0.77
$1.30 \times 10^3 \pm 8.46 \times 10^2$	3.11	6.79	0.83
$1.20 \times 10^3 \pm 8.37 \times 10^2$	3.08	7.75	0.89
$1.00 \times 10^3 \pm 8.25 \times 10^2$	3.00	8.81	0.94

4.3 Variations of Distribution Coefficient(D) of Iron(III)
as a Function of Extractant(n-Amyl Acetate)Concentration.

Table 4.5 1×10^{-6} M-ferric chloride solution labelled with iron-59
in 5.01 M-hydrochloric acid.

$D \pm \delta$	log D	N	log N
$8.94 \times 10^{-4} \pm 4.45 \times 10^{-4}$	4.95	0.03	2.48
$8.95 \times 10^{-4} \pm 1.07 \times 10^{-4}$	4.95	0.05	2.66
$1.03 \times 10^{-3} \pm 4.77 \times 10^{-4}$	3.01	0.06	2.79
$2.19 \times 10^{-3} \pm 5.90 \times 10^{-4}$	3.34	0.13	1.11
$6.03 \times 10^{-3} \pm 5.86 \times 10^{-4}$	3.78	0.20	1.31
$2.27 \times 10^{-2} \pm 1.13 \times 10^{-3}$	2.35	0.27	1.43
$4.70 \times 10^{-2} \pm 1.32 \times 10^{-3}$	2.67	0.34	1.53
$2.41 \times 10^{-1} \pm 3.30 \times 10^{-3}$	1.38	0.51	1.70
$6.27 \times 10^{-1} \pm 6.27 \times 10^{-3}$	1.80	0.67	1.83

N = Mole fraction of extractant.

Table 4.6 1×10^{-6} M-ferric chloride solution labelled with iron-59
in 5.96 M-hydrochloric acid.

$D \pm \delta$	log D	N	log N
$1.27 \times 10^{-3} \pm 4.80 \times 10^{-4}$	- 3.10	0.03	- 2.48
$1.79 \times 10^{-3} \pm 5.47 \times 10^{-4}$	- 3.25	0.05	- 2.66
$2.80 \times 10^{-3} \pm 5.89 \times 10^{-4}$	- 3.44	0.08	- 2.89
$8.81 \times 10^{-3} \pm 7.42 \times 10^{-4}$	- 3.94	0.13	- 1.11
$6.16 \times 10^{-2} \pm 1.16 \times 10^{-3}$	- 2.79	0.20	- 1.31
$1.81 \times 10^{-1} \pm 3.03 \times 10^{-3}$	- 1.26	0.27	- 1.43
$4.41 \times 10^{-1} \pm 4.95 \times 10^{-2}$	- 1.65	0.34	- 1.53
$3.76 \pm 5.26 \times 10^{-2}$	0.57	0.51	- 1.70

-6

Table 4.7 1×10^{-6} M-ferric chloride solution labelled with iron-59
in 7.01 M-hydrochloric acid.

$D \pm \sigma$	$\log D$	N	$\log N$
$2.74 \times 10^{-3} \pm 5.63 \times 10^{-4}$	3.44	0.03	2.48
$6.22 \times 10^{-3} \pm 7.02 \times 10^{-4}$	3.79	0.05	2.66
$1.08 \times 10^{-2} \pm 8.03 \times 10^{-4}$	2.04	0.06	2.79
$7.32 \times 10^{-2} \pm 1.80 \times 10^{-3}$	2.86	0.13	1.11
$4.24 \times 10^{-1} \pm 5.75 \times 10^{-3}$	1.63	0.21	1.31
$1.87 \pm 4.05 \times 10^{-2}$	0.27	0.27	1.43
$6.14 \pm 2.71 \times 10^{-1}$	0.79	0.34	1.53
$1.59 \times 10 \pm 4.49 \times 10^{-1}$	1.20	0.51	1.71
$5.87 \times 10 \pm 4.44$	1.77	0.67	1.83



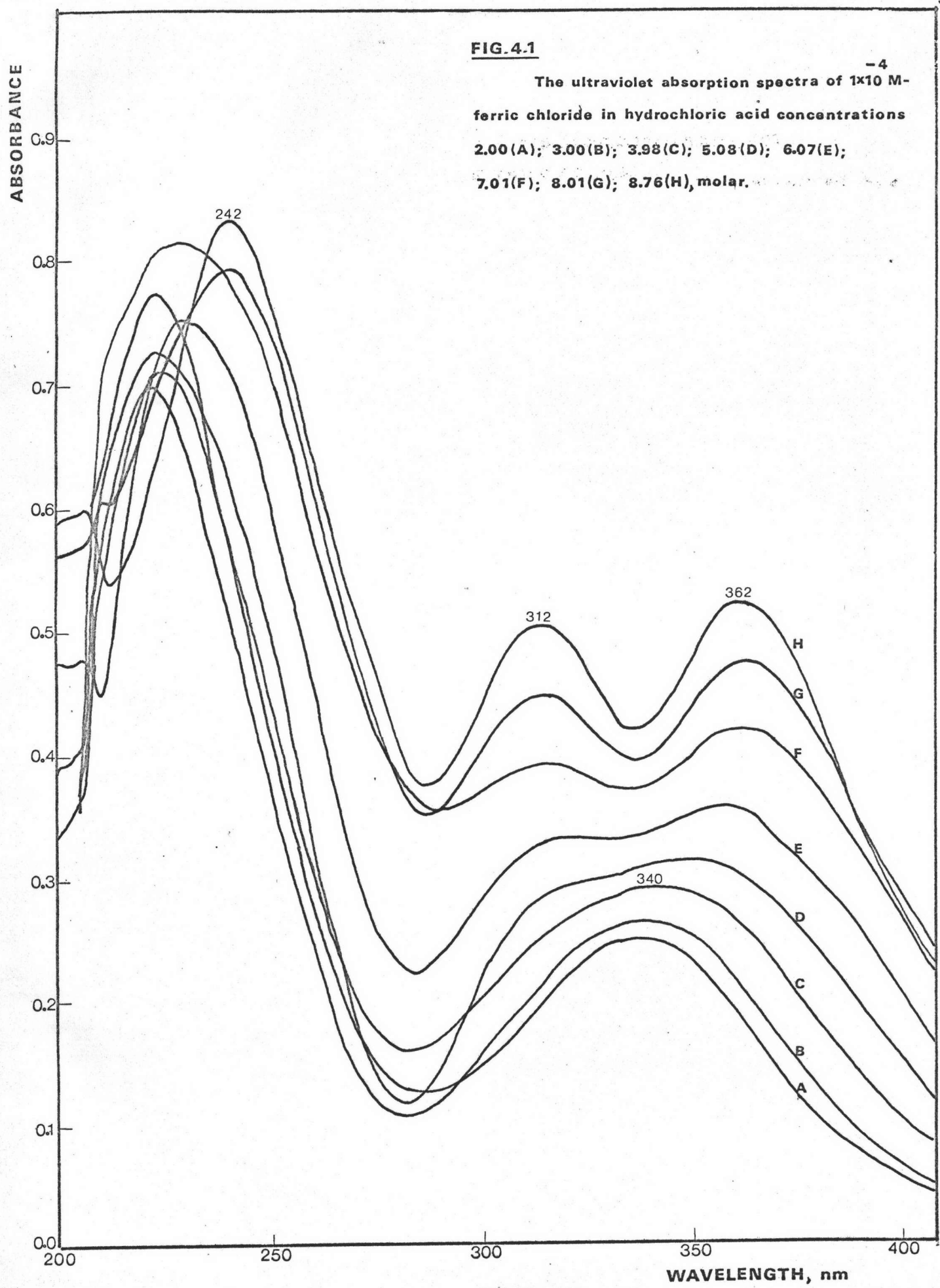
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Table 4.8 1×10^{-6} M-ferric chloride solution labelled with iron-59
 in 8.01 M-hydrochloric acid.

$D \pm \delta$	log D	N	log N
$1.34 \times 10^{-2} \pm 8.49 \times 10^{-4}$	2.13	0.03	2.48
$1.65 \times 10^{-2} \pm 9.03 \times 10^{-4}$	2.22	0.05	2.66
$2.48 \times 10^{-2} \pm 1.05 \times 10^{-3}$	2.39	0.06	2.79
$2.14 \times 10^{-1} \pm 3.66 \times 10^{-3}$	1.33	0.13	1.11
$3.51 \pm 5.01 \times 10^{-2}$	0.54	0.20	1.31
$1.62 \times 10 \pm 4.44 \times 10^{-1}$	1.21	0.27	1.43
$2.49 \times 10 \pm 8.52 \times 10^{-1}$	1.40	0.34	1.53
$1.77 \times 10^2 \pm 2.93 \times 10$	2.25	0.51	1.70

FIG. 4.1

-4

The ultraviolet absorption spectra of 1×10^{-4} M-
ferric chloride in hydrochloric acid concentrations
2.00(A); 3.00(B); 3.98(C); 5.08(D); 6.07(E);
7.01(F); 8.01(G); 8.76(H), molar.



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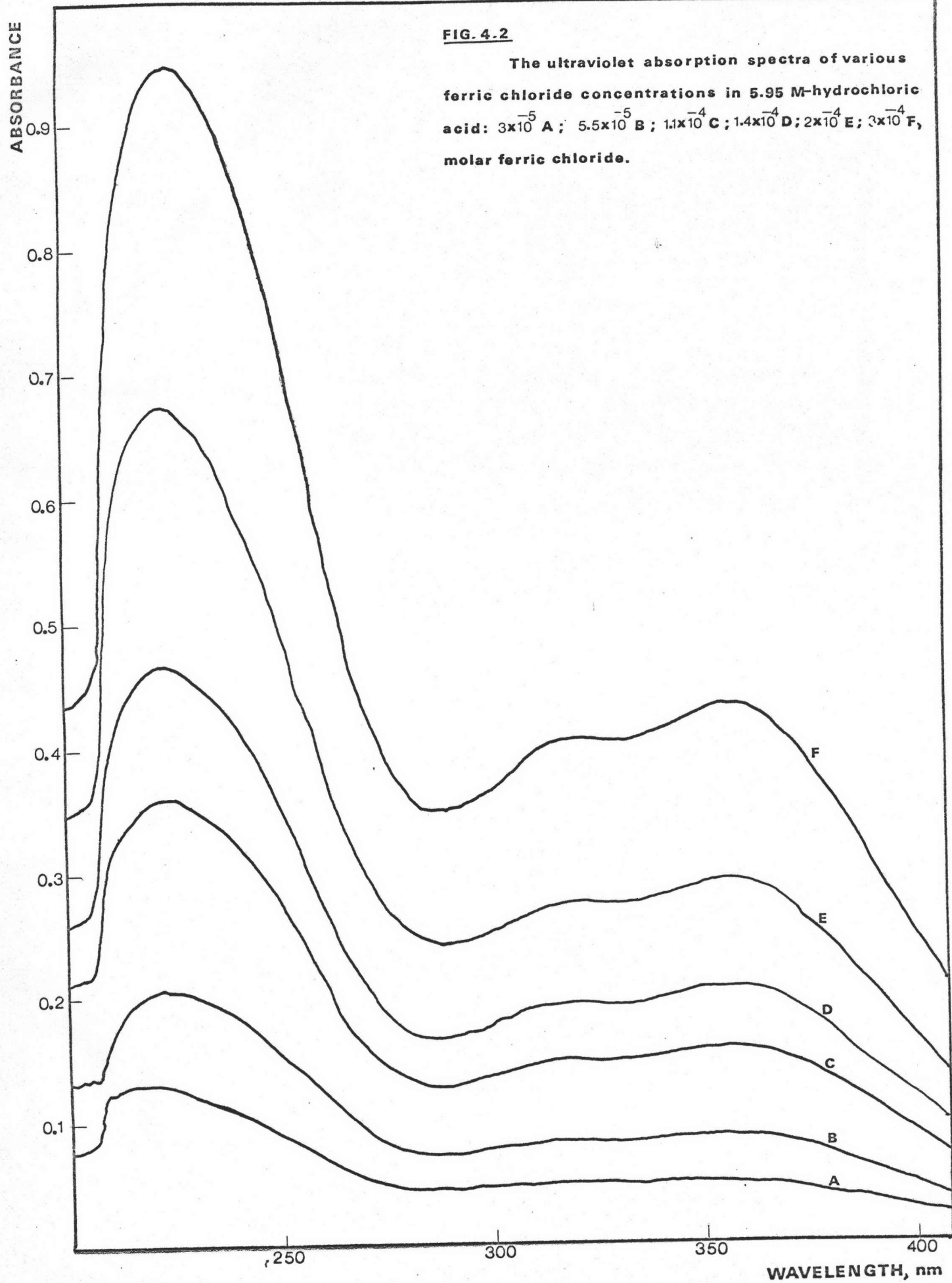


FIG.4-3

The ultraviolet absorption spectra of 1×10^{-4} M ferric chloride in 3.98 M hydrochloric acid (A) and in 3.98 M hydrochloric acid saturated with about 2 M sodium hydroxide (B).

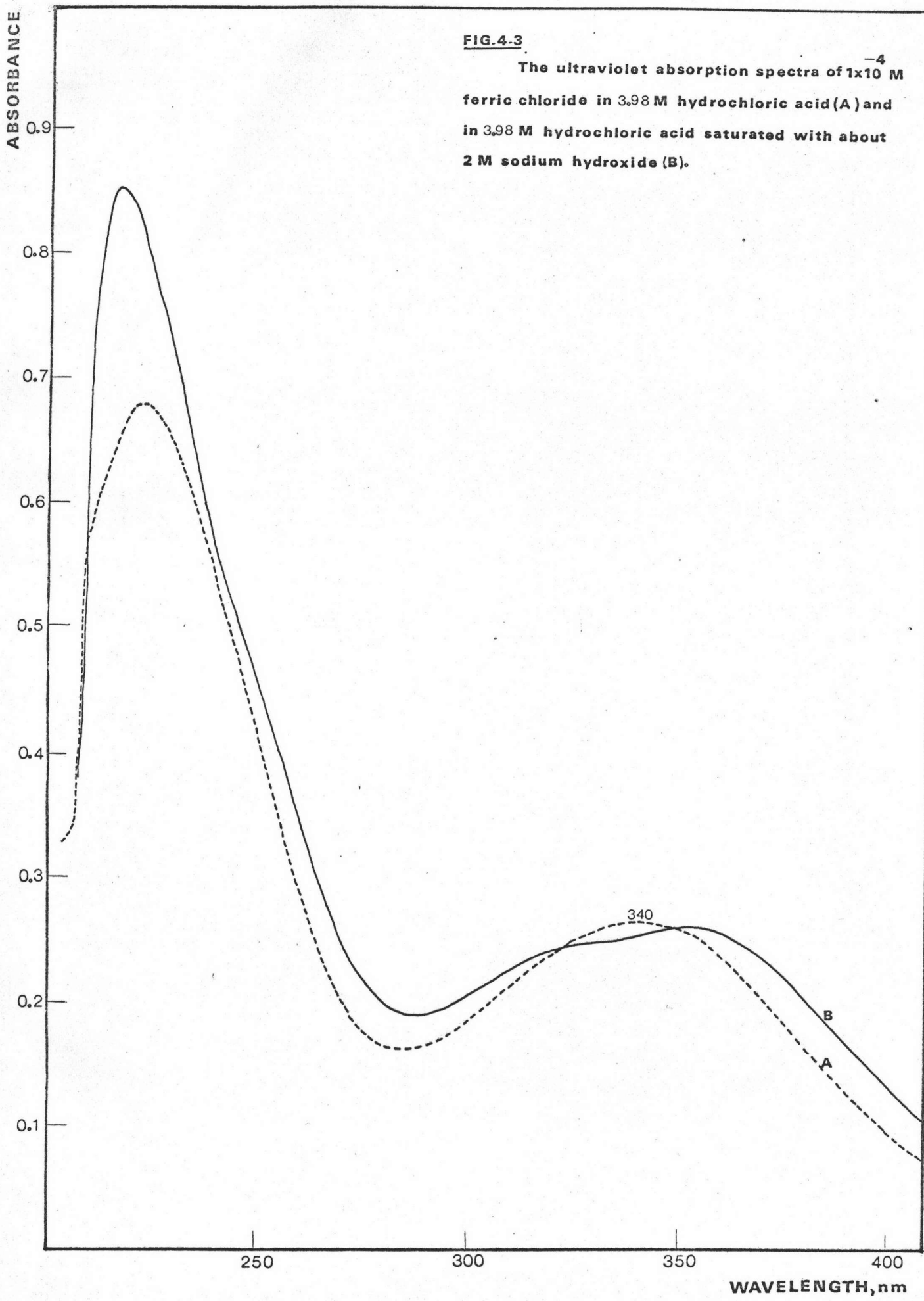


FIG.4-4
The ultraviolet absorption spectra of n- amyl
acetate extracts obtained from 1×10^{-4} M ferric chloride
in 3.98(A), 6.07(B), and 8.76(C) M hydrochloric acid.

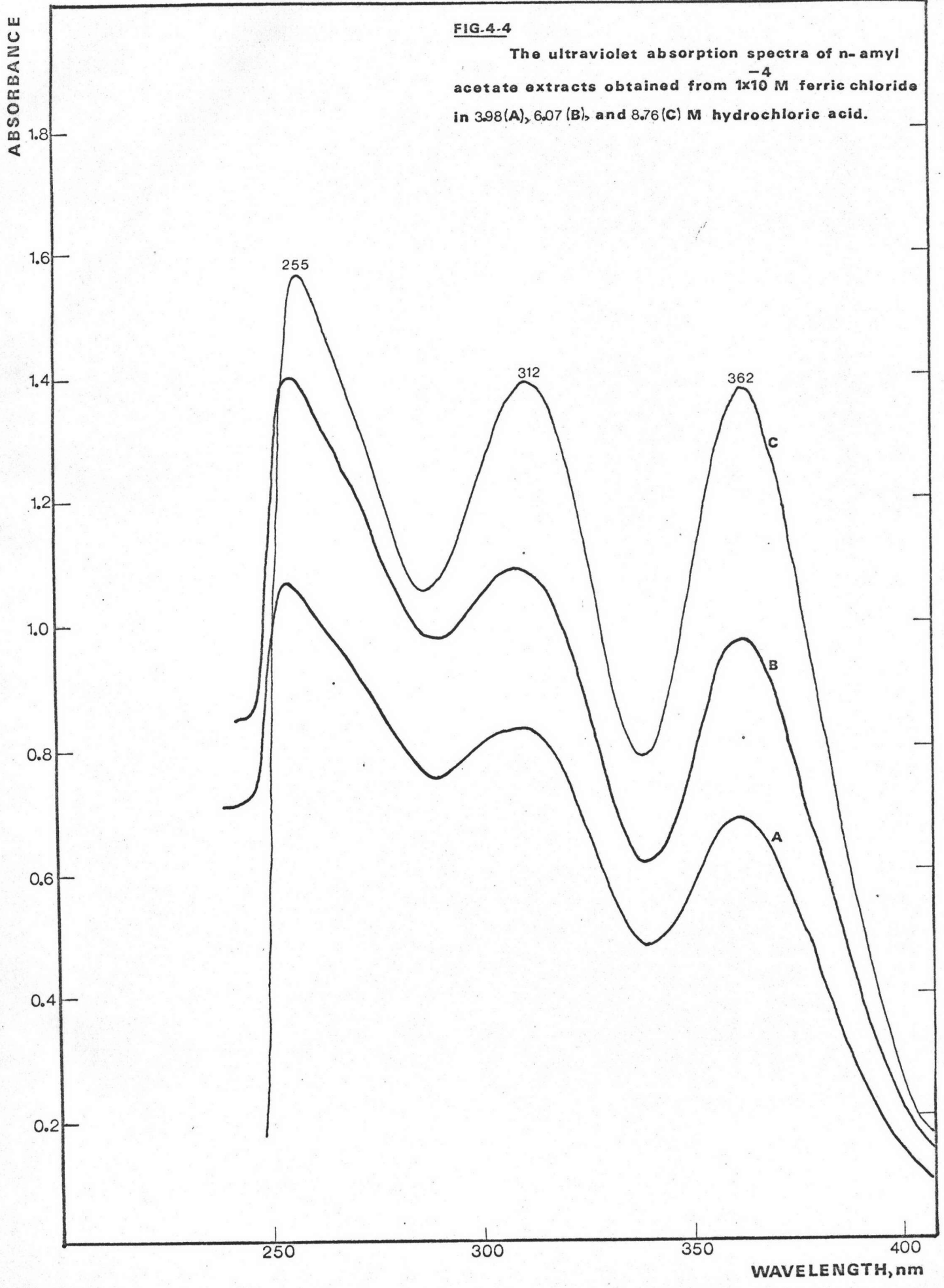


FIG. 4-5

The ultraviolet absorption spectra of extracted iron(III) chloro complexes in diethyl ether(A), n-butyl acetate(B), β -methyl butyl acetate (C), and n-propyl acetate(D).

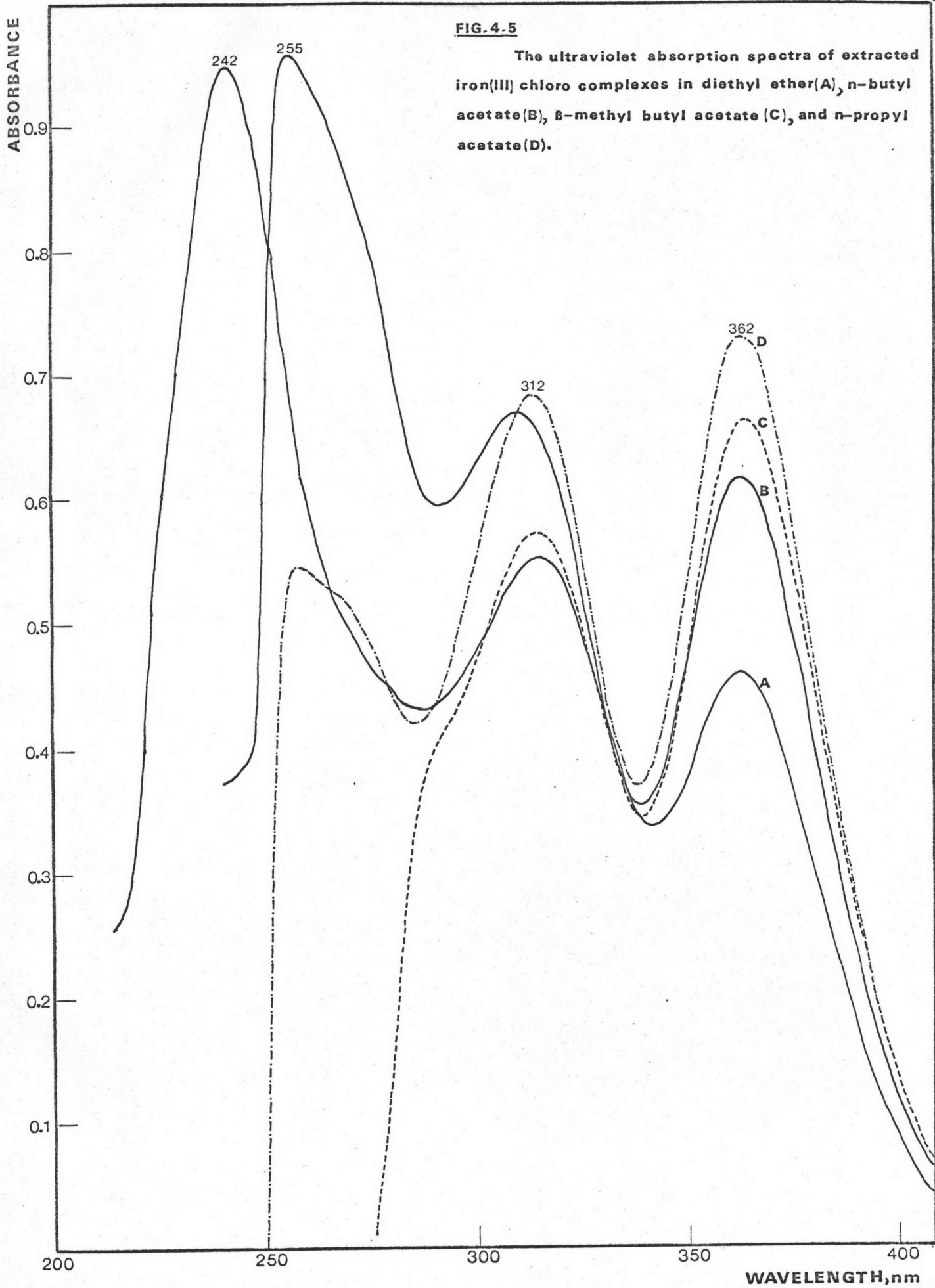
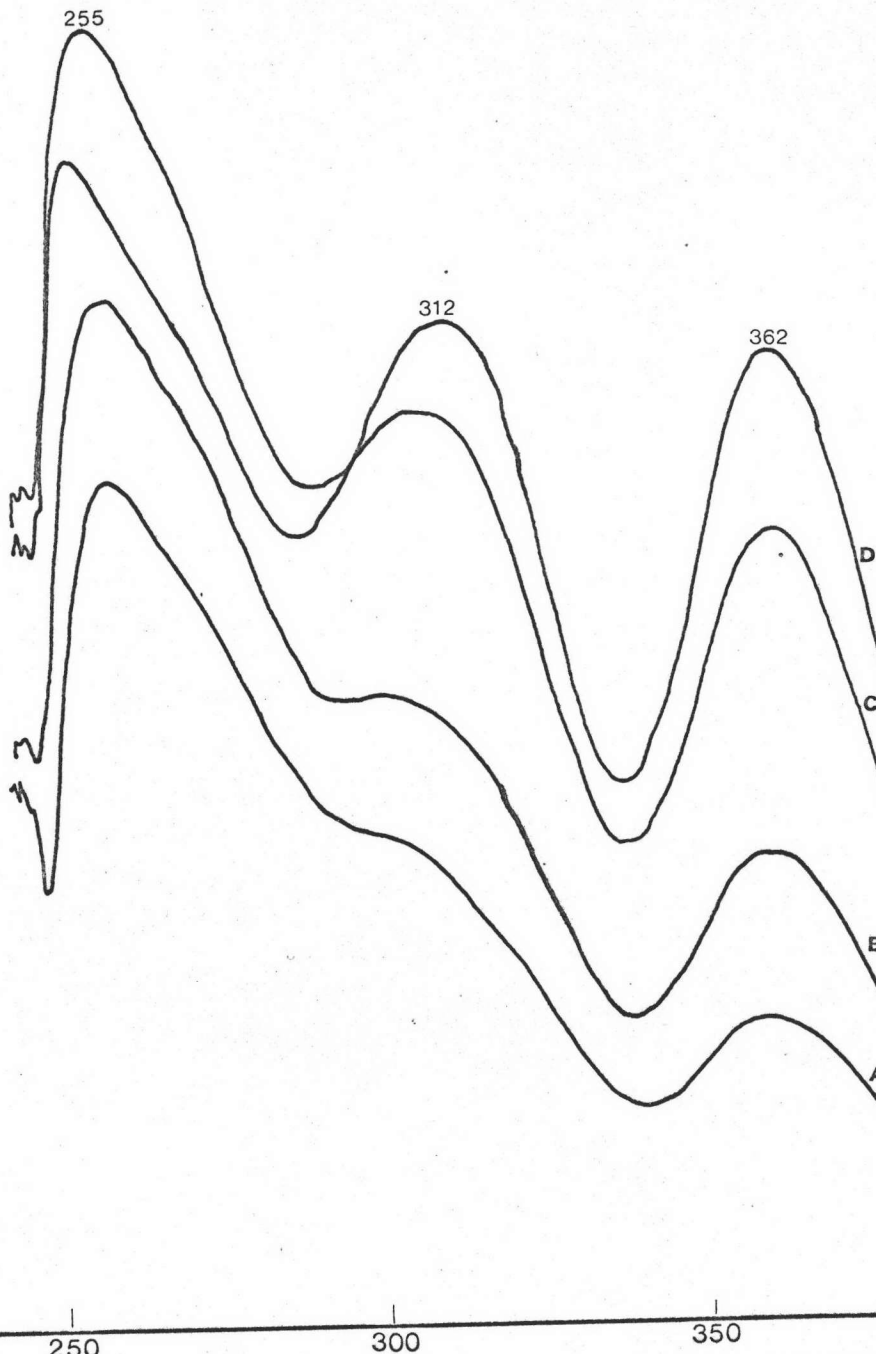


FIG. 4-6

The ultraviolet absorption spectra of n-amyI acetate extracts obtained from various ferric chloride concentrations in 5.95 M-hydrochloric acid: 3×10^{-5} A; 5.5×10^{-5} B; 1.1×10^{-4} C; 1.4×10^{-4} D, molar ferric chloride.

ABSORBANCE

1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2



WAVELENGTH, nm

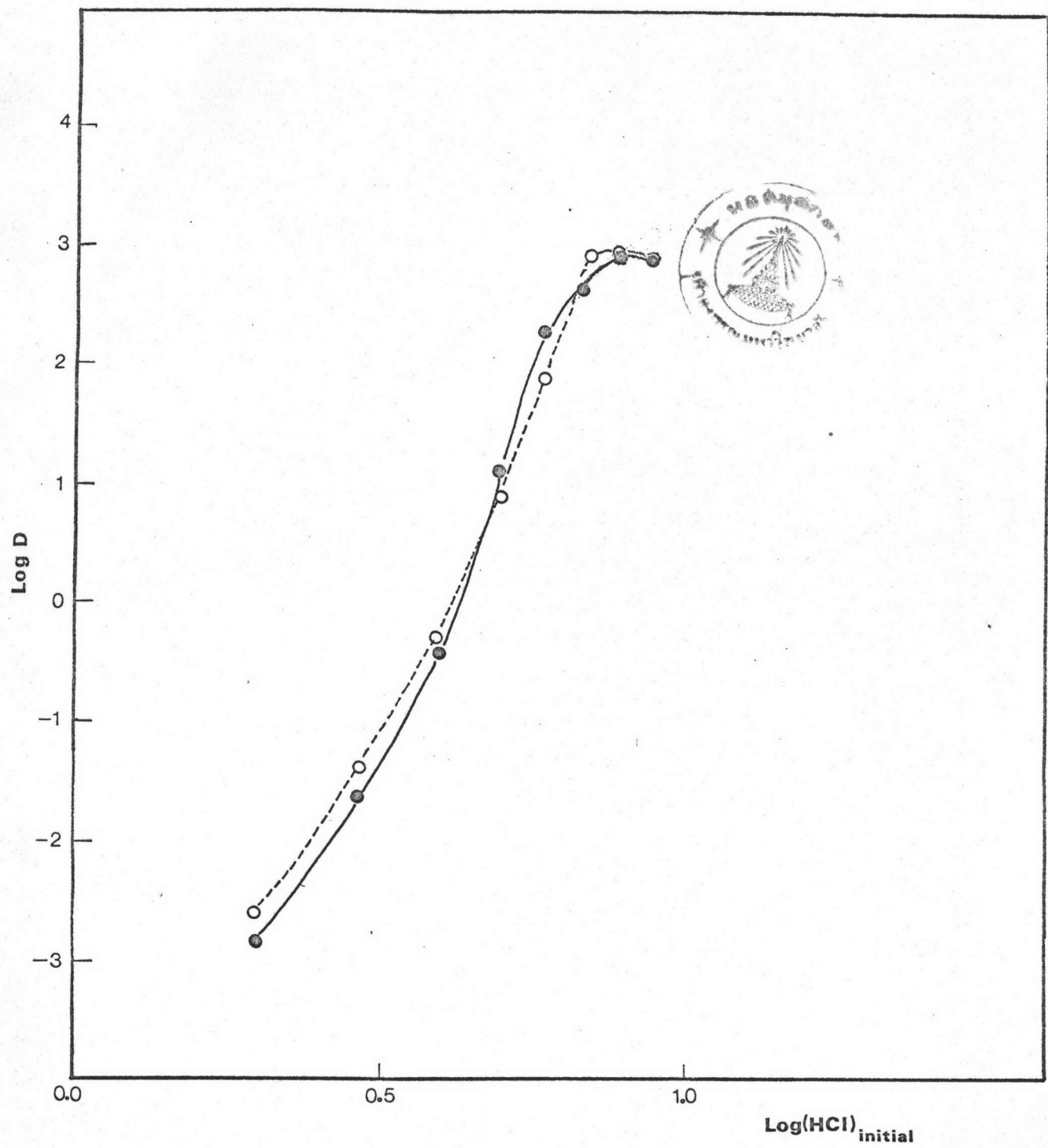


FIG. 4.7 Acid Dependence of Distribution Coefficient of Iron(III) in Hydrochloric Acid-n-Amyl Acetate System:
— 1×10^{-4} M ferric chloride solution labelled with iron-59;
--- ferric chloride solution labelled with iron-59, almost carrier free.

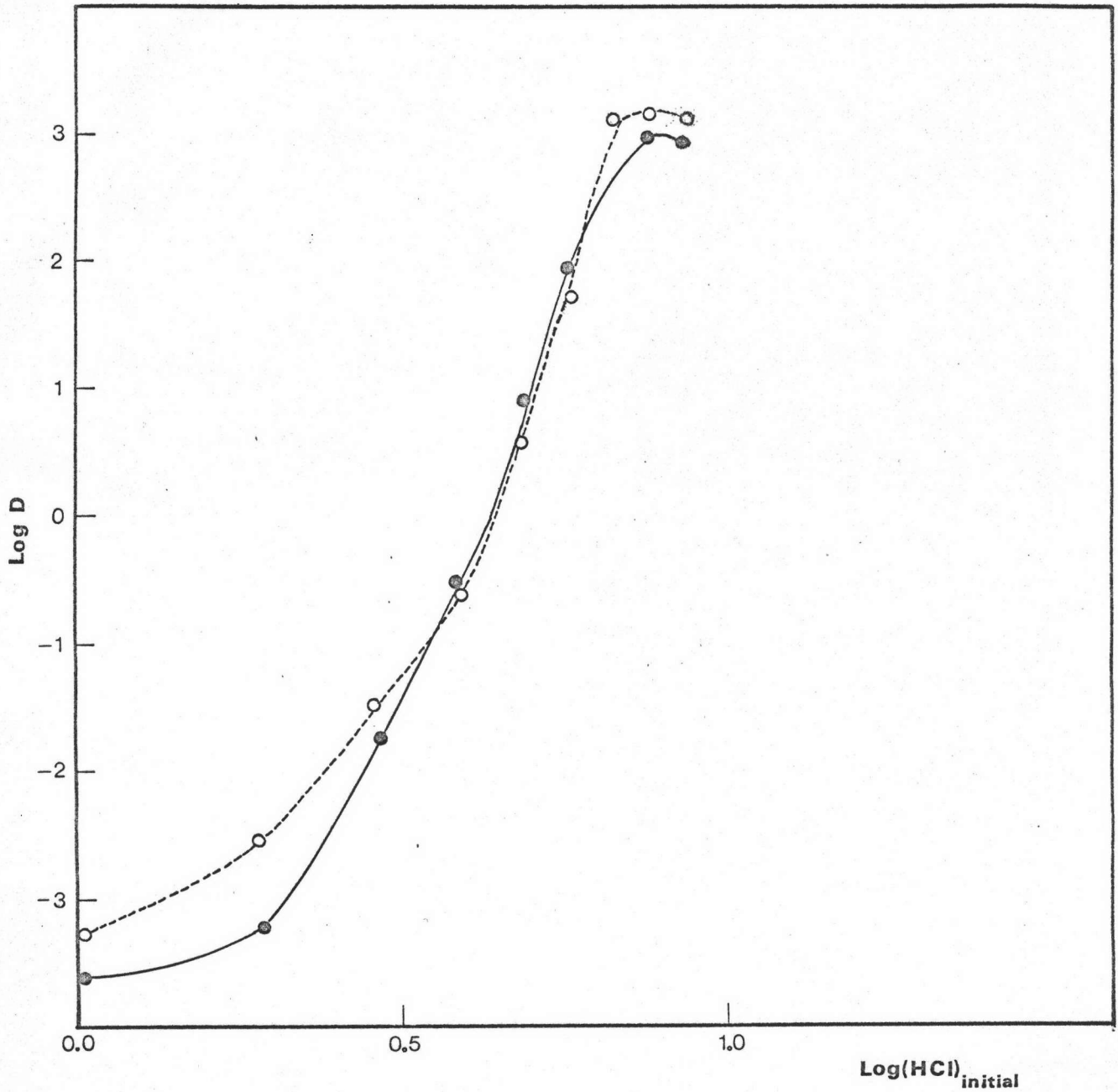


FIG.4-8 Acid Dependence of Distribution Coefficient of Iron(III) in Hydrochloric Acid- β -Methyl Butyl Acetate System:
 — 2×10^{-4} M ferric chloride solution labelled with iron-59,
 - - - ferric chloride solution labelled with iron-59, almost carrier free.

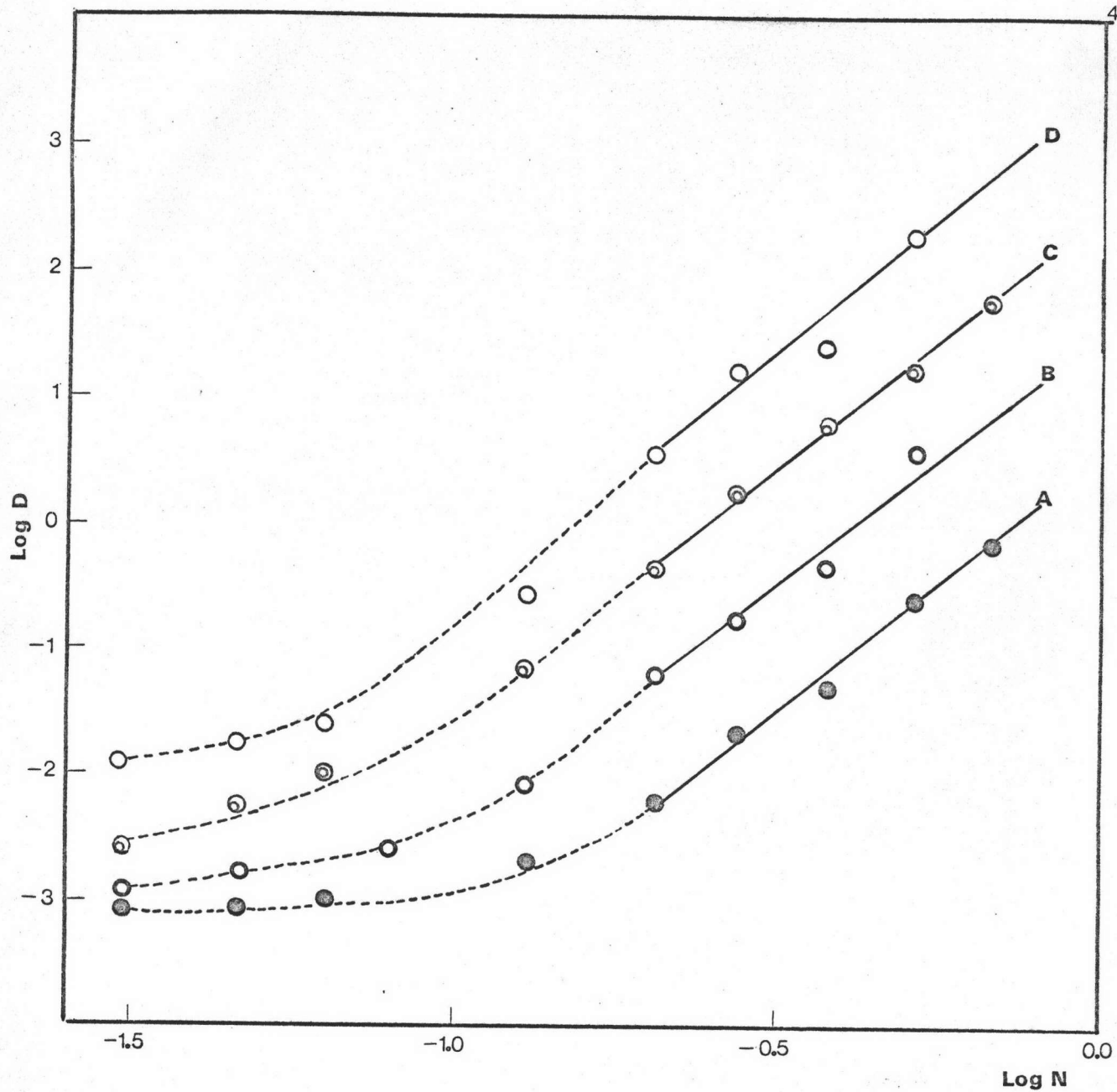


FIG. 4.9 Variations of Distribution Coefficient(D) of Iron(III) as a Function of Extractant Concentration(n-Amyl Acetate Mole Fraction, N):

A. data taken from Table 4.5 ;

B. data taken from Table 4.6 ;

C. data taken from Table 4.7 ;

D. data taken from Table 4.8.