

TABLE I.

 R_F VALUES OF SOME ALKALOIDS(D. WALDI, *Arch. Pharm.*, 292 (1959) 206)

Paper: Schleicher & Schüll 2043 b Mgl impregnated with formamide-acetone (2:8) and then pressed. No equilibration.

Solvents: I = Petroleum-diethylamine (9:1)
 II = Cyclohexane-diethylamine (9:1)
 III = Cyclohexane-chloroform-diethylamine (7:2:1)
 IV = Cyclohexane-chloroform-diethylamine (5:4:1)
 V = Cyclohexane-chloroform-diethylamine (3:6:1)
 VI = Cyclohexane-chloroform-diethylamine (1:8:1)
 VII = Chloroform-diethylamine (9:1).

$$R_F \text{ corr.} = \frac{R_F \text{ substance (found)}}{R_F \text{ standard (found)}} \times R_F \text{ standard (average value).}$$

Alkaloid	$R_F \text{ corr.}$						
	Codeine as standard				Dihydromorphinone as standard		
	I	II	III	IV	V	VI	VII
<i>Alkaloids of the aromatic amine type</i>							
Amphetamine	0.47	0.58	0.86	1.0	1.0	1.0	1.0
Ephedrine	0.26	0.47	0.76	0.87	0.95	0.96	1.0
Hordenine	0.11	0.27	0.60	0.83	1.0	1.0	1.0
Cathine	0.06	0.22	0.71	0.71	0.91	1.0	1.0
Capsaicin	0.04	0.10	0.77	1.0	1.0	1.0	1.0
<i>Alkaloids with a pyrrole-pyridine ring system</i>							
Sparteine	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Apoatropine	0.92	1.0	1.0	1.0	1.0	1.0	1.0
New psicaine	0.89	1.0	1.0	1.0	1.0	1.0	1.0
Tropacocaine	0.81	1.0	1.0	1.0	1.0	1.0	1.0
Nicotine	0.78	1.0	1.0	1.0	1.0	1.0	1.0
Cocaine	0.70	0.71	1.0	1.0	1.0	1.0	1.0
Procaine	0.17	0.25	0.67	0.89	1.0	1.0	1.0
Homatropine	0.11	0.27	0.75	0.95	1.0	1.0	1.0
Atropine	0.10	0.33	0.78	0.95	1.0	1.0	1.0
Scopoline	0.07	0.11	0.46	0.77	1.0	1.0	1.0
Scopolamine	0.03	0.12	0.54	0.85	1.0	1.0	1.0
<i>Alkaloids with a quinoline ring</i>							
Cinchonine	0.23	0.51	1.0	1.0	1.0	1.0	1.0
Quinidine	0.22	0.47	1.0	1.0	1.0	1.0	1.0
Quinine	0.19	0.40	1.0	1.0	1.0	1.0	1.0
Cupreine	0.0	0.0	0.12	0.31	0.58	0.73	0.77
<i>Alkaloids with an isoquinoline ring</i>							
Emetine	0.25	0.37	1.0	1.0	1.0	1.0	1.0
Bulbocapnine	0.13	0.13	0.76	0.94	1.0	1.0	1.0
Cephaeline	0.04	0.05	0.93	1.0	1.0	1.0	1.0
Apomorphine	0.0	0.0	0.27	0.96	1.0	1.0	1.0
Berberine	0.0	0.04	0.13	0.30	0.46	0.77	0.82
Hydrastinine	0.0	0.01	0.12	0.33	0.68	0.83	0.88
Boldine	0.0	0.0	0.08	0.37	0.75	0.75	0.87

(Continued on p. D2)

TABLE 2
R_F VALUES OF SOME NON-POLAR ALKALOIDS
 (D. WALDI, *Arch. Pharm.*, 292 (1959) 206)

Paper: Schleicher & Schüll 2043 b Mgl impregnated with petroleum.

Solvents: A = Propanol-diethylamine-water (1:1:8)

B = Propanol-diethylamine-water (1.33:1:7.66)

C = Propanol-diethylamine-water (1.66:1:7.33)

D = Propanol-diethylamine-water (2:1:7).

<i>Alkaloid</i>	<i>R_F</i>			
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
Sparteine	0.03	0.07	0.08	0.22
Psicaine	0.10	0.18	0.36	0.53
Eupaverine	0.15	0.25	0.46	0.84
Tropacocaine	0.21	0.31	0.44	0.58
Apoatropine	0.16	0.23	0.47	0.62

TABLE 3
R_F VALUES OF ORGANIC PEROXIDES
 (N. A. MILAS AND I. BELIČ, *J. Am. Chem. Soc.*, 81 (1959) 3358)

Paper: Whatman No. 1.

Solvent systems: 1. N,N-Dimethylformamide-decalin.

2. N-Methylformamide-decalin.

3. *n*-Butanol-ethanol-water (45:5:50).

<i>Peroxide</i>	<i>R_F</i>		
	<i>1</i>	<i>2</i>	<i>3</i>
Hydrogen peroxide	0.0	0.0	0.49
<i>p,p'</i> -Dicyanobenzoyl peroxide	0.0	0.01	0.0-0.50
<i>m</i> -Monocyanobenzoyl peroxide	0.20	0.03	0.97
<i>m</i> -Methoxybenzoyl peroxide	0.29	0.30	0.94
Benzoyl peroxide	0.38	0.37	0.94
<i>p,p'</i> -Dichlorobenzoyl peroxide	0.56	0.40	0.94
2,4-Dichlorobenzoyl peroxide	0.69	0.44	0.94
2,5-Dimethylhexane 2,5-dihydroperoxide	0.00	0.18	0.89
2,5-Dimethyl-3-hexyne 2,5-dihydroperoxide	0.00	0.17	0.89
2,5-Dimethyl-3-hexyne 2,5-diperbenzoate	0.29	0.24	0.97
2,7-Dimethyl-3,5-octadiyne 2,7-dihydroperoxide	0.00	0.10	0.92
Bis-(1-hydroxyheptyl) peroxide	0.00	0.40	
<i>tert.</i> -Butyl hydroperoxide	0.00	0.00	
Cumene hydroperoxide	0.09	0.30	0.91
<i>tert.</i> -Butylperoxymaleic acid	0.00	0.10	0.38
<i>tert.</i> -Butyl perbenzoate	0.63	0.54	0.95
Lauroyl peroxide	0.98	0.88	0.97
3,3-Dihydroperoxy-pentane	0.02		
* 3,3'-Dihydroperoxy-3,3'-dipentylperoxide	0.53		
1,1,4,4,7,7,10,10-Octaethyl-1,4,7-triperoxy-1,10-dihydroperoxide	0.86		
1,1,4,4,7,7-Hexaethyl-1,4,7-cyclononatriperoxane	0.91		

TABLE 4

 R_F VALUES OF QUATERNARY AMMONIUM SALTS(G. B. MARINI-BETTÒLO AND M. MIRANDA, *Rend. ist. super. sanità*, 17 (1954) 463)

Solvent: butanol-acetic acid-water (4.3:1.4:4.3).

Paper: Whatman No. 1.

Compound	R_F value
$\text{CH}_3\text{CH}_2\text{CH}_2\text{N}(\text{CH}_3)_3\text{I}$	0.67
$\text{CH}_2\text{CH}_2\text{CH}_2\text{ON}(\text{CH}_3)_3\text{I}$	0.70
$\text{CH}_3\text{ON}(\text{CH}_3)_3\text{I}$	0.53
$\text{CH}_3\text{N}(\text{CH}_3)_3\text{Br}$	0.43
$\text{C}_2\text{H}_5\text{N}(\text{C}_2\text{H}_5)_3\text{I}$	0.61
$\text{C}_2\text{H}_5\text{N}(\text{CH}_3)_3\text{I}$	0.52
$\text{C}_2\text{H}_5\text{ON}(\text{CH}_3)_3\text{I}$	0.64
Flaxedil	0.40
Succinylcholine iodide	0.39
Methylamine hydrochloride	0.52

TABLE 5

 R_F VALUES OF SUGAR PHENYLOSAZONES AS THEIR BORATE COMPLEXES(B. ARREGUIN, *Anal. Chem.*, 31 (1959) 1371)

Paper: Schleicher and Schüll 2040 impregnated with a 0.1 M solution of potassium tetraborate at pH 9.3 and dried at 60°.

Technique: descending development.

 $R_X = R_F$ taking xylose as 1.

Solvents: A. 75% dioxane-hexane-water (60:60:30 v/v).

B. 75% dioxane-hexane-water-benzene (55:50:25:20 v/v).

C. 75% dioxane-water-1,2-dichloroethane (54:40:6 v/v).

Osazone of	R_X	R_F	
	A 21°	B 21°	C 17°
Arabinose	1.80-1.90	0.65-0.65	0.92-0.93
Xylose	1.00-1.00	0.28-0.30	0.75-0.77
Glucose	0.40-0.41	0.07-0.08	0.30-0.34
Fructose	0.40-0.42	0.08	0.31-0.33
Rhamnose	1.20-1.28	0.36-0.37	0.82-0.83
Galactose	0.53-0.55	0.12-0.13	0.54-0.55
Sorbose	0.43-0.45	0.09-0.09	0.37-0.40
Cellobiose	0.14-0.15	0.02-0.05	0.01
Melibiose	0.06-0.07	0.05-0.06	0.04
Maltose	0.04-0.08	0.04-0.05	0.01
Lactose	0.31-0.34	0.05-0.05	0.06-0.09

ERRATUM

Chromatog. Data, 2 (1959) D 28, D 29.Table 47, heading of the second column: for β, β' -Hydroxydipropionitrile read β, β' -Oxydipropionitrile.

TABLE 6

 R_F VALUES OF SOME INDOLE DERIVATIVES(Ž. PROCHÁZKA, V. ŠANDA AND K. MACEK (*Collection Czechoslov. Chem. Commun.*, 24 (1959) 2928)

Solvents: (a) Ethyl acetate.
 (b) Ethyl butyrate.
 (c) Butyl butyrate.
 (d) Di-*n*-butyl ether.
 (e) Di-amyl ether.

Paper: Whatman No. 4 (ascending).

Detection: Formaldehyde reagent, Ehrlich reagent, Salkowski reagent, 2,4-dinitrophenylhydrazine reagent, Jaffe reagent.

Compound	Solvent				
	(a)	(b)	(c)	(d)	(e)
Ascorbigen	0.82	0.31	0.14	Start	Start
3-(3-Indolyl)-propanediol-1,2	0.85	0.61	0.51	0.08	Start
Indole-3-carboxylic acid	0.90	0.83	0.81	0.43	0.14
Indole-3-aldehyde	0.93	0.89	0.86	0.58	0.32
3-Indolyl-acetic acid	0.96	0.87	0.86	0.57	Streaking from start
3-(3-Indolyl)-butyric acid	Front	Front	Front	0.82	0.44

TABLE 7

 R_F VALUES OF ANTHRANILIC ACID AND SOME SYNTHETIC AMADORI COMPOUNDS DERIVED FROM CERTAIN N-GLYCOSYLAMINES OF ANTHRANILIC ACID(C. H. DOY AND F. GIBSON, *Biochem. J.*, 72 (1959) 586)

Solvent: Methanol-butan-1-ol-benzene-water (2:1:1:1, by vol.).

Length of run: 19 cm (ascending).

Paper: Whatman No. 1.

Detection: U.V. fluorescence, and where suitable ammonium molybdate, aniline acetate, phloroglucinol, anthrone and alkaline 2,3,5-triphenyltetrazolium chloride.

Compound	Parent glycosylamine	R_F
Anthranilic acid	—	0.93
1-(<i>o</i> -Carboxyphenylamino)-1-deoxy-D-ribulose	N- <i>o</i> -Carboxyphenyl-D-arabinosylamine	0.86
	N- <i>o</i> -Carboxyphenyl-D-ribosylamine	0.85
1-(<i>o</i> -Carboxyphenylamino)-1-deoxy-L-ribulose	N- <i>o</i> -Carboxyphenyl-L-arabinosylamine	0.85
1-(<i>o</i> -Carboxyphenylamino)-1-deoxy-D-xylulose	N- <i>o</i> -Carboxyphenyl-D-xylosylamine	0.84*
1-(<i>o</i> -Carboxyphenylamino)-1-deoxy-D-fructose	N- <i>o</i> -Carboxyphenyl-D-glucosylamine	0.80

* The small difference between the xylulose and ribulose compounds was confirmed on many chromatograms.

TABLE 8

R_F VALUES OF FAT-SOLUBLE DYES(M. R. VERMA AND RAMJI DAS, *J. Sci. Ind. Research (India)*, 16B (1957) 131)

Paper: Whatman No. 1.

Technique: ascending.

Temperature 28–30°.

Dye	<i>R_F</i> value on filter paper impregnated with					
	Liquid paraffin, using eluant				Lauryl alcohol,	
	Water- acetone (30:70)	Water- dioxane (40:60)	Water- methyl alcohol (34:66)	Ethylene glycol	Water- acetone (35:65)	Water- dioxane (45:55)
<i>Yellow</i>						
1 Fat Yellow S.G. (Ciba)	0.00	0.00	0.00	0.00	00.0	0.00
2 Waxoline Yellow A.D.S. (I.C.I.)	0.45	0.40	0.22	0.40	0.27	0.21
3 F.D. & C. Yellow No. 4 (F.D.A.)	0.50	0.43	0.16	0.57	0.16	0.12
4 F.D. & C. Yellow No. 3 (F.D.A.)	0.58	Spot vanished	0.28	0.71	0.21	0.15
5 Spirit Yellow (Synth.)	0.77	0.71	0.61	0.90	0.32	0.26
6 Organol Yellow A.N.P. (French)	0.86	0.81	0.70	0.90	0.25	0.20
7 Ceres Orange G (Chika)	Tailing	Tailing	Tailing	Spot vanished	0.21	Tailing
8 Oil Yellow B (Synth.)	0.93	0.86	0.70	0.95	0.52	0.43
9 Martius Yellow (B.D.H.)	0.98	0.94	0.81	1.00	1.00	0.90
10 Chrysoidine (Synth.)	0.91	0.88	Fades	Spot vanished	0.62	0.56
<i>Orange</i>						
11 F.D. & C. Orange No. 2 (F.D.A.)	0.22	0.23	0.06	0.16	0.17	0.11
12 Fat Orange 4A (Ciba)	0.29	0.30	0.09	0.28	0.21	0.13
<i>Red</i>						
13 F.D. & C. Red No. 32	0.16	0.18	0.03	0.08	0.12	0.07
14 Fat Red 7B (Ciba)	0.11	0.13	0.00	0.00	0.10	0.03
15 Red Powder H 4887 (Bush)	0.21	0.26	0.03	0.13	0.15	0.07
16 Organol Red BS (French)	{ 0.45	0.46	0.13	0.33	0.23	0.16
	{ 0.11	0.13	0.00	0.00	0.10	0.03
17 Fat Red B (Ciba)	0.40	0.46	0.12	0.29	0.15	0.10
18 Ceres Red G (Chika)	0.50	0.56	0.18	0.49	0.28	0.20
19 Fast Pink B (Amritlal)	0.96	0.96	0.87	1.00	0.83	0.86
<i>Brown</i>						
20 Fat Brown 3R (Ciba)	0.64	0.72	0.33	Spot vanished	0.20	0.14
21 Oil Brown 58217 (Amritlal)	0.85	0.85	0.43	0.70	0.33	0.31
22 Oil Brown (Synth.)	{ 0.72	0.72	0.33	Spot vanished	0.21	0.14
	{ 0.15	0.23	0.00	0.13	0.18	0.07

Oil Yellow D (Atul), Oil Yellow (Saco) and Sudan Yellow GG (Capco) give same values as 2; Sudan Orange G (Capco) gives same values as 7; Waxoline Yellow O.S. (I.C.I.) gives same value as 8; Chrysoidine B (Capco) gives same value as 10; Oil Orange 33570 (Amritlal), Ceres Orange R (Chika), Oil Orange (Saco), Waxoline Yellow I.S. (I.C.I.), Oil Orange R (Atul) and Sudan Orange

Method of impregnation of paper: the paper sheets were dipped in the following solutions:

- (a) Liquid paraffin B.P. in petroleum ether (5 %).
 (b) Lauryl alcohol in petroleum ether (1.5 %).
 (c) Oleic acid in petroleum ether (2 %).
 (d) Diethylene glycol monostearate in petroleum ether (1.5 %).

R_F value on filter paper impregnated with

using eluant		Oleic acid, using eluant				Diethylene glycol monostearate, using eluant			
Water-methyl alcohol (30:70)	Water-acetic acid (45:55)	Water-acetone (25:75)	Water-methyl alcohol (15:85)	Water-dioxane (33:67)	Ethylene glycol	Water-acetone (30:70)	Water-methyl alcohol (20:80)	Water-dioxane (33:67)	Water-ethyl cellosolve (48:52)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.37	0.80	0.31	0.50	0.31	0.54	0.52	0.57	0.52	0.58
0.19	0.11	0.27	0.40	0.31	0.17	0.56	0.39	0.43	0.52
0.27	0.15	0.29	0.45	0.47	0.17	0.39	0.47	0.52	0.52
0.45	0.70	0.38	0.62	0.47	Spot vanished	0.56	0.64	0.62	0.63
0.34	0.25	0.38	0.62	0.47	0.84	0.56	0.57	0.62	0.63
Spot vanished	Spot vanished	Tailing	Spot deformed	Spot vanished	Spot vanished	Tailing	Spot vanished	Spot vanished	Spot vanished
0.59	0.80	0.49	0.70	0.58	1.00	0.68	0.66	0.74	0.68
0.67	0.66	1.00	0.70	1.00	1.00	1.00	0.75	Spot vanished	0.85
0.53	0.92	0.45	Spot vanished	0.82	Spot vanished	Spot vanished	—	—	—
0.17	0.13	0.25	0.28	0.22	0.26	0.31	0.39	0.41	0.35
0.24	0.21	0.32	0.34	0.26	0.36	0.38	0.47	0.45	0.49
0.13	0.09	0.20	0.22	0.22	0.17	0.35	0.35	0.35	0.41
0.04	0.00	0.15	0.12	0.11	0.04	0.13	0.11	0.23	0.10
0.14	0.05	0.26	0.21	0.20	0.20	0.21	0.33	0.39	0.31
0.24	0.13	0.35	0.33	0.28	0.26	0.35	0.45	0.42	0.42
0.04	0.00	0.15	0.12	0.11	0.04	0.13	0.12	0.23	0.10
0.22	0.25	0.28	0.31	0.23	0.22	0.30	0.45	0.42	0.30
0.29	0.21	0.41	0.36	0.34	0.37	0.44	0.52	0.55	0.53
0.82	0.96	0.59	0.64	0.81	0.77	0.85	0.81	0.91	0.81
0.20	0.53	0.36	0.41	0.34	0.58	0.32	0.36	0.47	0.34
0.40	0.78	0.50	0.52	0.53	0.66	0.46	0.46	0.67	0.48
0.20	0.53	0.35	0.41	0.34	0.58	0.32	0.37	0.47	0.34
0.16	0.05	0.26	0.21	0.20	0.13	0.19	0.33	0.39	0.31

(Capco) give same values as 12; Oil Red (Saco) and Oil Red (Atul) give same values as 14; Waxoline Red B.N.D. (I.C.I.), Sudan G III (Synth.) and Oil Red AB (Atul) give same values as 15; Oil Red G (Atul) and Sudan Red G (Capco) give same values as 18; Oil Brown (Atul) and Sudan Brown B.B. (Capco) give same values as 22.

TABLE 9

R_F VALUES OF FOOD COLOURS(M. R. VERMA AND RAMJI DAS, *J. Sci. Ind. Research (India)*, 15C (1956) 186)

Paper: Whatman No. 1.

Technique: ascending.

Temperature: 27–32°.

Eluants: A Sodium citrate, 10 g + liquor ammonia, 50 ml; volume made up to 100 ml.
 B Sodium butyrate, 6 g + liquor ammonia, 50 ml; volume made up to 100 ml.
 C 3% solution of sodium phosphate; pH adjusted to 11.
 D Sodium acetate, 3 g + liquor ammonia, 10 ml; volume made up to 100 ml.

Name of dye and source	<i>R_F</i> values				
	A	B	C	D	E
<i>Yellow dyes</i>					
Naphthol Yellow S AF (Ciba)	0.37	0.41	0.44	0.43	0.60
Edicol Supra Yellow YS (I.C.I.)	0.37	0.41	0.44	0.43	0.60
F.D. & C. Yellow No. 1 (F.D.A.)	0.38	0.41	0.44	0.43	0.61
Food colour Tartrazine S (Amritlal)	0.68	0.71	0.63	0.72	0.28
Edicol Supra Tartrazine NS (I.C.I.)	0.68	0.71	0.63	0.72	0.27
F.D. & C. Yellow No. 5 (F.D.A.)	0.68	0.71	0.63	0.72	0.27
Edicol Supra Yellow FCS (I.C.I.)	0.60	0.59	0.48	0.52	0.54
F.D. & C. Yellow No. 6 (F.D.A.)	0.60	0.59	0.48	0.52	0.54
Auramine OAF (Ciba)	Spot vanished	0.39	Spot vanished	0.27	1.00
Golden Yellow E AF (Ciba)	0.53	0.62	0.50	0.62	0.54
<i>Orange dyes</i>					
Hidacid Orange I 21-5005 (Amritlal)	0.33	0.40	0.33	0.28	0.60
F.D. & C. Orange No. 1 (F.D.A.)	0.33	0.40	0.33	0.28	0.61
<i>Red dyes</i>					
Ponceaux NRS 19151 (Amritlal)	0.35	0.23	0.34	0.11	0.43
Edicol Supra Ponceaux RS (I.C.I.)	0.35	0.23	0.34	0.11	0.43
F.D. & C. Red No. 1 (F.D.A.)	0.35	0.23	0.34	0.11	0.43
Hidacid Amaranth 21-6008 (Amritlal)	0.56	0.44	0.40	0.28	0.23
Edicol Supra Amaranth AS (I.C.I.)	0.56	0.44	0.41	0.28	0.23
F.D. & C. Red No. 2 (F.D.A.)	0.56	0.44	0.40	0.28	0.23
Edicol Supra Erythrosine AS (I.C.I.)	0.08	0.07	0.13	0.09	0.66
F.D. & C. Red No. 3 (F.D.A.)	0.08	0.07	0.13	0.09	0.66
F.D. & C. Red No. 4 (F.D.A.)	0.51	0.32	0.27	0.32	0.25
Bordeaux Red—RU AF (Ciba)	0.36	0.22	0.23	0.14	0.10
Carmoisine WNN 19153 (Amritlal)	0.36	0.22	0.23	0.14	0.10
Edicol Supra Carmoisine WS (I.C.I.)	0.36	0.22	0.23	0.14	0.10
Food Colour Rose BS (Amritlal)	0.39	Tailing	Tailing	0.23	0.95
Edicol Supra Rose BS (I.C.I.)	0.39	Tailing	Tailing	0.23	0.95
Edicol Supra Geranine 2 GS (I.C.I.)	0.62	0.54	0.44	0.42	0.30
Edicol Supra Ponceaux 4 RS (I.C.I.)	0.70	0.59	0.55	0.49	0.25
Furnace Red RU AF (Ciba)	0.34	0.34	0.29	0.17	0.53
Edicol Supra Red 10 BS (I.C.I.)	0.31	0.26	0.34	0.15	0.30
<i>Green dyes</i>					
Hidacid Emerald Green 21-9005 (Amritlal)	—	—	—	Tailing	0.83
F.D. & C. Green No. 1 (F.D.A.)	—	—	—	Tailing	0.82
Hidacid Light Green SF 21-9006 (Amritlal)	—	Spot vanished	—	0.83	0.58
F.D. & C. Green No. 2 (F.D.A.)	—	—	—	0.83	0.58

E Isoamyl alcohol, 40 ml + ethyl alcohol, 40 ml + liquor ammonia, 10 ml + water, 20 ml.

F Acetoacetic ester, 50 ml + methyl alcohol, 20 ml + liquor ammonia, 20 ml.

G (i) 10% sodium citrate solution in water saturated with phenol.

(ii) Sodium citrate, 2 g + phenol, 5 g; volume made up to 100 ml.

H Phenol saturated with 10% solution of sodium citrate.

J Amyl alcohol, 50 ml + methyl alcohol, 25 ml + water, 25 ml.

K *n*-Butyl alcohol, 50 ml + acetic acid (3*N*), 50 ml + ethyl alcohol, 20 ml.

L Isobutyl alcohol, 50 ml + formic acid, 20 ml + water, 25 ml.

M Methyl ethyl ketone, 120 ml + acetic acid (4*N*), 40 ml + water, 25 ml.

N Isopropyl alcohol, 85 ml + water, 15 ml.

The eluants A, B, C, D, E and F are alkaline; G, H, J and N neutral; and K, L and M acidic.

<i>R_F</i> values							
<i>F</i>	<i>G</i>	<i>H</i>	<i>J</i>	<i>K</i>	<i>L</i>	<i>M</i>	<i>N</i>
0.35	0.31	0.13	0.32	0.41	0.52	0.61	—
0.35	0.31	0.13	0.30	0.39	0.52	0.61	—
0.35	0.32	0.12	0.30	0.39	0.52	0.62	—
0.08	0.34	0.03	0.03	0.05	0.29	0.03	—
0.08	0.33	0.03	0.04	0.05	0.29	0.03	—
0.08	0.33	0.03	0.04	0.05	0.29	0.03	—
0.32	0.24	0.26	0.17	0.26	0.29	0.32	—
0.32	0.24	0.26	0.17	0.26	0.29	0.33	—
0.88	0.00	1.00	0.86	1.00	1.00	1.00	—
0.25	0.42	0.13	0.23	0.20	0.30	0.35	—
0.51	0.11	0.69	0.58	0.69	0.63	0.87	—
0.51	0.11	0.69	0.58	0.69	0.63	0.86	—
0.41	0.07	0.28	0.36	0.39	0.26	0.42	—
0.41	0.07	0.28	0.36	0.39	0.26	0.42	—
0.41	0.07	0.28	0.36	0.39	0.26	0.40	—
0.08	0.18	0.04	0.06	0.11	0.16	0.09	—
0.08	0.18	0.04	0.06	0.11	0.16	0.09	—
0.08	0.18	0.04	0.06	0.11	0.16	0.09	—
0.50	0.05	0.61	0.62	1.00	1.00	1.00	—
0.48	0.05	0.61	0.62	1.00	1.00	1.00	—
0.31	0.11	0.39	0.25	0.39	0.05	0.43	—
0.31	0.10	0.29	0.25	0.48	0.30	0.52	—
0.31	0.10	0.29	0.25	0.48	0.30	0.52	—
0.31	0.10	0.29	0.25	0.47	0.30	0.52	—
1.00	0.00	1.00	1.00	1.00	1.00	1.00	—
1.00	0.00	1.00	1.00	1.00	1.00	1.00	—
0.36	0.21	0.32	0.15	0.30	0.23	0.34	—
0.16	0.34	0.10	0.09	0.20	0.20	0.25	—
0.58	0.10	0.70	0.65	0.74	0.66	0.82	—
0.28	0.13	0.29	0.11	0.24	Spot vanished	0.33	—
1.00	0.03*	1.00	0.56	0.77	0.71	0.80	0.61
1.00	0.03*	1.00	0.56	0.77	0.71	0.80	0.61
Fades	0.37*	0.54	0.34	0.46	0.34	Spot vanished	0.33
Fades	0.37*	0.54	0.35	0.46	0.34	Spot vanished	0.33

* For footnote see p. D10.

TABLE 9 (continued)

Name of dye and source	R_F values				
	A	B	C	D	E
F.D. & C. Green No. 3 (F.D.A.)	—	—	—	0.83	0.38
Food Colour Green FSL 19122 (Amritlal)	—	—	—	0.83	0.62 (tailing)
Edicol Supra Green BS (I.C.I.)	—	—	—	0.90	Spot vanished
<i>Blue dyes</i>					
Food Colour Blue GES 19111 (Amritlal)	—	—	—	0.70	0.62
Edicol Supra Blue EGS (I.C.I.)	—	—	—	0.70	0.62
F.D. & C. Blue No. 1 (F.D.A.)	—	—	—	0.70	0.62
Edicol Supra Blue XS (I.C.I.)	—	—	—	0.10	Spot vanished
F.D. & C. Blue No. 2 (F.D.A.)	—	—	—	0.10	Spot vanished
<i>Violet dyes</i>					
Violet Powder H 2503 (Bush)	—	—	—	0.13	1.00
F.D. & C. Violet No. 1 (F.D.A.)	—	—	—	0.13	0.82

* The eluant used was a solution of a mixture of sodium citrate, 2 g and phenol, 5 g in 100 ml.

TABLE 10

R_F VALUES OF SOME AMINO ACIDS AT 60°

(J. B. HIMES AND L. D. METCALFE, *Anal. Chem.*, 31 (1959) 1192)

Solvent: Methyl ethyl ketone-propionic acid-water (15:5:6).

Paper: Whatman No. 1 filter paper.

Horizontal development.

Amino acid	R_F	Amino acid	R_F
Cystine	0.21	Alanine	0.54
Lysine	0.31	Proline	0.58
Histidine	0.34	Tyrosine	0.66
Arginine	0.38	Valine	0.71
Serine	0.42	Methionine	0.73
Aspartic acid	0.43	Tryptophan	0.78
Glycine	0.46	Isoleucine	0.81
Threonine	0.49	Phenylalanine	0.82
Glutamic acid	0.51	Leucine	0.85

TABLE 9 (continued)

<i>R_F</i> values							
<i>F</i>	<i>G</i>	<i>H</i>	<i>J</i>	<i>K</i>	<i>L</i>	<i>M</i>	<i>N</i>
0.50	0.70	0.58	0.35	0.50	0.34	0.58 (turns blue)	0.33
Tailing	0.37 (tailing)	Tailing	Tailing	Tailing	Tailing	0.58	Tailing
0.60	0.37 (tailing)	0.81	0.31	0.52	0.50	0.72	0.44
0.60	0.47	0.68	0.31	0.43	0.40	0.63	0.33
0.60	0.47	0.68	0.31	0.43	0.40	0.63	0.33
0.60	0.47	0.68	0.31	0.43	0.40	0.63	0.33
0.21	0.37	0.12	0.07	0.17	0.16	Spot vanished	0.05
0.21	0.37	0.12	0.07	0.17	0.16	Spot vanished	0.05
1.00	0.00	0.04	0.83	1.00	1.00	1.00	0.82
1.00	0.00	1.00	0.56	0.77	0.74	0.80	0.61

TABLE 11

R_F VALUES OF SOME FATTY ACIDS(M. ROMANUK, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 2064)Solvent: 2-Ethylhexanol-1 (prepared by saponification of commercial dioctylphthalate b.p. 184-185°) saturated with 5 *N* ammonia (upper phase).

Paper: Whatman No. 1 (descending, 18 h, ~ 30 cm run, dried 5-7 h in a stream of air at room temperature).

Temperature: 18-20°.

Detection: Aqueous solution of chlorophenol red (spray).

<i>Acid</i>	<i>R_F</i>
Capronic acid	0.11
Oenanthic acid	0.30
Caprylic acid	0.55
Pelargonic acid	0.74
Caprinic acid	0.83
Undecylic acid	0.89

TABLE 13

 R_F VALUES OF PHENOXYACETIC ACIDS(L. S. BARK AND R. J. T. GRAHAM, *Analyst*, 84 (1959) 454)

Paper: Whatman No. 1.

Solvents: 1. *n*-Butanol-water.2. *n*-Butanol-1.5 *N* ammonia.3. *n*-Butanol-3.0 *N* ammonia.

Acid	R_F		
	1	2	3
Phenoxyacetic	0.22	0.23	0.33
<i>o</i> -Chlorophenoxyacetic	0.295	0.30	0.41
<i>p</i> -Chlorophenoxyacetic	0.29	0.32	0.42
2,4-Dichlorophenoxyacetic	0.37	0.41	0.495
2,4,6-Trichlorophenoxyacetic	0.43	0.50	0.55
<i>p</i> -Methylphenoxyacetic	0.27	0.315	0.36
2,4-Dimethylphenoxyacetic	0.365	0.42	0.45
2,3,5-Trimethylphenoxyacetic	0.405	0.47	0.50

TABLE 14

 R_F VALUES OF SOME TOSYL DERIVATIVES OF AMINO ACIDS AND RELATED COMPOUNDS(M. ZAORAL AND J. RUDINGER, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 1993)Solvent: S_1 = *n*-Butanol-acetic acid-water (4:1:5, upper phase). S_2 = Phenol-water-ammonia. S_3 = Methyl ethyl ketone-acetone-water-formic acid (3:1:1:0.1).

Paper: Whatman No. 4.

Detection: Ninhydrin.

Compound	R_F		
	S_1	S_2	S_3
N^a -Tosyl-L- α,γ -diaminobutyric acid	0.53		
Methyl N^a -tosyl-L- α,γ -diaminobutyrate hydrochloride	0.69		
L- α,γ -Diaminobutyric acid		0.75	0.55
N^a -Tosyl-L-ornithine	0.46		
N^a -Tosyl-L-ornithine methyl ester hydrochloride	0.57		
N^a -Phthaloyl-DL-ornithine methyl ester hydrochloride	0.66		

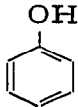
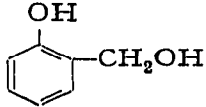
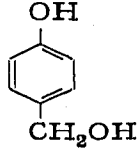
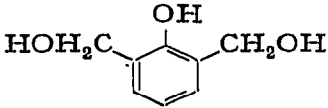
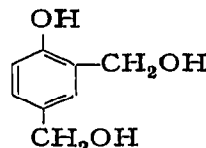
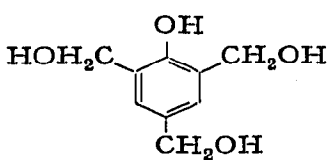
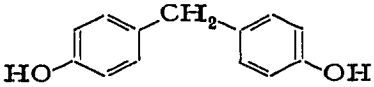
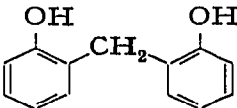
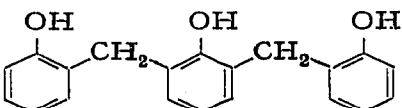
TABLE 15

R_F VALUES OF REACTION PRODUCTS OF PHENOL WITH FORMALDEHYDE
(H. G. PEER, *Rec. trav. chim.*, 78 (1959) 631)

Paper: Whatman No. 1.

Solvents: 1. Butanol-NH₃ (4:1).

2. Benzene-acetic acid-water (10:4:1).

Compound	R_F	
	1	2
	appr. 0.90	0.90
	0.81	0.36
	0.75	0.12
	0.65	0.15
	0.58	0.05
	0.33	0.02
	appr. 0.90	0.54
	appr. 0.90	0.98
	appr. 0.90	0.96

(continued on p. D15)

TABLE 15 (continued)

Compound	R_F	
	r	s
	appr. 0.90	0.80
	appr. 0.90	0.94
	appr. 0.90	0.65
	appr. 0.90	0.33
	appr. 0.90	0.49
	appr. 0.90	0.19

TABLE 16

 R_F VALUES OF FERROCENE AND ITS DERIVATIVES(A. N. DE BELDER, E. J. BOURNE AND J. B. PRIDHAM, *Chem. & Ind. (London)*, (1959) 996)

Paper: Whatman No. 3 dipped twice in a solution of dimethyl sulphoxide in benzene (20% v/v) and heated in an oven at 80° for approx. 30 sec.

Solvent: Light petroleum (b.p. 60-80°) saturated with dimethyl sulphoxide.

Compound	R_F value
Ferrocene	0.98
Acetylferrocene	0.62
Ferrocenealdehyde	0.59
Hydroxymethylferrocene	0.19
Ferrocenecarboxylic acid	0.05

TABLE 17

HIGH VOLTAGE PAPER ELECTROPHORESIS OF ORGANIC ACIDS

(D. GROSS, *Chem. & Ind. (London)*, (1959) 1219)

Electrolytes: (1) 0.75 *M* formic acid solution of pH 2.0.
 (2) 0.5 *M* acetic acid solution adjusted with pyridine to pH 4.0.
 (3) Approx. 0.1 *M* ammonium carbonate solution (7.9 g/l) of pH 8.9.

Conditions: (a) For electrolyte (1) 100 V/cm, 6.5 mA/cm, 25 min, 15.5°.
 (b) For electrolyte (2) 100 V/cm, 9.6 mA/cm, 20 min, 16°.
 (c) For electrolyte (3) 80 V/cm, 8 mA/cm, 25 min, 8°.

Migration rates are relative to the rate of the chloride ion: M_{Cl} .

Acid	M_{Cl}		
	pH 2.0	pH 4.0	pH 8.9
Cl ⁻	1.00	1.00	1.00
Trichloroacetic	0.43	0.39	0.37
Dichloroacetic	0.41	0.45	0.42
Oxalic	0.41	0.48	0.70
Meconic	0.40	0.42	0.27
Maleic	0.28	0.45	0.59
3-Phosphoglyceric	0.28	0.43	0.48
<i>cis</i> -Aconitic	0.23	0.38	0.63
Oxalosuccinic	0.17	0.40	0.57
α -Ketoglutaric	0.17	0.40	0.57
Oxalacetic	0.16	0.34	0.48
Pyruvic	0.16	0.48	0.50
Dihydroxytartaric	0.15	0.45	0.63
Citraconic	0.13	0.35	0.53
α -Ketobutyric	0.13	0.28	0.42
Malonic	0.10	0.44	0.63
Monochloroacetic	0.08	0.46	0.45
Fumaric	0.06	0.40	0.61
Tartronic	0.06	0.40	0.57
<i>trans</i> -Aconitic	0.05	0.38	0.63
Tartaric	0.05	0.40	0.59
2-Ketogluconic	0.05	0.28	0.25
Glyoxylic	0.04	0.39	0.57
Citric	0.04	0.30	0.45
Mesaconic	0.04	0.34	0.57
Galacturonic	0.03	0.22	0.22
Malic	0.03	0.32	0.57
Dihydroxymaleic	0.03	0.38	0.66
β -Hydroxybutyric	0.02	0.12	0.35
Tricarballic	0.02	0.23	0.59
Glycollic	0.02	0.31	0.48
Ascorbic	0.02	0.12	0.25
Lactic	0.02	0.25	0.42
Adipic	0.02	0.10	0.48
Itaconic	0.02	0.23	0.57
Glutaric	0.02	0.13	0.53
Gluconic	0.02	0.20	0.25
Laevulinic	0.02	0.09	0.35
Acrylic	0.01	0.14	0.45
Succinic	0.01	0.18	0.57
Sorbic	0.01	0.05	0.32
Pimelic	0.01	0.09	0.45
Suberic	0.01	0.08	0.45
Sebacic	0.01	0.05	0.41

(continued on p. D17)

TABLE 17 (continued)

Acid	M_{Cl}		
	$pH\ 2.0$	$pH\ 4.0$	$pH\ 8.9$
Cl-	1.00	1.00	1.00
Sulphosalicylic	0.35	0.41	0.53
Picric	0.26	0.23	0.22
3-Nitrosalicylic	0.19	0.21	0.24
5-Nitrosalicylic	0.13	0.22	0.22
Phthalic	0.05	0.27	0.45
Salicylic	0.04	0.24	0.32
Sulphanilic	0.03	0.30	0.37
Pyrrolidone-carboxylic	0.03	0.31	0.35
Syringic	0.01	0.03	0.22
Benzoic	0.01	0.14	0.37
Tannic	0.01	0.03	0.29

TABLE 18

PAPER ELECTROPHORESIS OF CARBOHYDRATES IN MOLYBDATE SOLUTIONS

(E. J. BOURNE, D. H. HUTSON AND H. WEIGEL, *Chem. & Ind. (London)*, (1959) 1047)

Paper: Whatman No. 3 MM.

Conditions: 15 V/cm.

Electrolyte: 0.1 M sodium molybdate adjusted to pH 5 with sulphuric acid.

 M_S value: D-glucitol was used as standard and glycerol as non-migrating marker to correct for electro-osmosis.

Compound	M_S value	Compound	M_S value
D-Glucitol	1.0	Turanose	0.14
D-Mannitol	1.0	Leucrose	0.43
Dulcitol	1.0	Sophorose	< 0.1
Ribitol	1.1	Nigerose	< 0.1
D-Arabitol	1.1	Laminaribiose	< 0.1
Xylitol	1.1	Maltose	< 0.1
D-Altrose	< 0.1	Cellobiose	< 0.1
D-Glucose	< 0.1	Lactose	< 0.1
D-Mannose	0 → 0.9	Isomaltose	< 0.1
D-Gulose	1.1	Gentiobiose	< 0.1
D-Galactose	< 0.1	Melibiose	< 0.1
D-Talose	0.7	Sophoritol (β -1:2)*	0.9
D-Ribose	0.4	Nigeritol (α -1:3)*	0
D-Arabinose	< 0.1	Laminaribitol (β -1:3)*	0
D-Xylose	< 0.1	Maltitol (α -1:4)*	0.4
D-Lyxose	1.1	Cellobiitol (β -1:4)*	0.4
D-Erythrose	0.9	Lactitol (β -1:4)*	0.4
D-Threose	0.6	Isomaltitol (α -1:6)*	0.8
D-Fructose	0.5	Gentiobiitol (β -1:6)*	0.8
L-Sorbose	0.3	Melibiitol (β -1:6)*	0.8

* Glycosidic link in parentheses.

TABLE 19

PAPER ELECTROPHORESIS OF CARBOHYDRATES

(J. L. FRAHN AND J. A. MILLS, *Australian J. Chem.*, 12 (1959) 65)

Paper: Whatman No. 4.

 M_G value = movement relative to glucose. M_R value = movement relative to ribose.

Ninety-minute runs at 20–25 V/cm, with room temperature 20–25° and cooling water 18–20°.

Compounds tested	Relative rates of migration in principal electrolytes			
	Borax 0.05 M ($M_G \times 10^3$)	Sodium arsenite pH 9.6* ($M_R \times 10^3$)	Sodium hydroxide 0.1 N ($M_R \times 10^3$)	Basic lead acetate** ($M_R \times 10^3$)
<i>Reducing sugars</i>				
L-Arabinose	91	30	79	7
D-Lyxose	71	42	97	30
D-Ribose	75	100	100	100
D-Xylose	101	17	93	8
L-Fucose	83E***	22	60	6
L-Rhamnose	49	32	88	28
D-Allose	83	75	68	33
D-Altrose	97	77	96	10
D-Galactose	93	28	65	10
D-Glucose	100	16	80	6
D-Gulose	82	53	70	31
L-Idose	102	115	96	42
D-Mannose	69	35	84	41
D-Talose	87	119	103	110
D-Erythropentulose	90	209	—	73
D-Threopentulose	75	194	—	41
D-Fructose	89	75	89	22
D-Psicose	76	188	125	91S***
L-Sorbose	97	73	88	16
D-Tagatose	95	103	82	65
D-Glycero-L-glucoheptose	104	23	72	7
3-O-Methyl-D-glucose	76	13	77	0
2,3,6-Tri-O-methyl-D-glucose	0†	0†	71	0†
2,4,6-Tri-O-methyl-D-glucose	0†	0†	66	0†
3,5,6-Tri-O-methyl-D-glucose	65	134	—	8
Tetra-O-methyl-D-glucopyranose	0†	0†	74	0†
Cellobiose	22	15	68	10
Lactose	37	24	61	13
Maltose	30	15	68	7
Melibiose	77	32	62	10
Turanose	64	30	79	7
<i>Glycosides</i>				
Sucrose	16	14	29	4
Raffinose	26	25	30	7
Methyl α -D-altropyranoside	58	—	7	1
Methyl α -D-galactopyranoside	35	19	6	5
Methyl β -D-galactopyranoside	34	19	7	5
Methyl α -D-glucopyranoside	10	9	9	1
Methyl β -D-glucopyranoside	15	6	9	3
Methyl α -D-mannopyranoside	39	17	9	0
Phenyl β -D-glucopyranoside	15	12	9	4
<i>Sugar alcohols</i>				
Glycerol	49	24	0	3
Erythritol	75	53	3	3
L-Threitol	75	96	3	11
D-Arabitol	87	124	7	14
Ribitol	85	76	10	4
Xylitol	79	155	3	25

(continued on p. D19)

TABLE 19 (continued)

Compounds tested	Relative rates of migration in principal electrolytes			
	Borax 0.05 M ($M_R \times 10^3$)	Sodium arsenite pH 9.6 [*] ($M_R \times 10^3$)	Sodium hydroxide 0.1 N ($M_R \times 10^3$)	Basic lead acetate ^{**} ($M_R \times 10^3$)
Allitol	90	92	23	9
Dulcitol	97	145	8	32
D-Glucitol	83	161	11	47
L-Iditol	81	173	7	57
D-Mannitol	91	130	12	23
D-Talitol	89	138	16	17
D-Glycero-D-althroheptitol	92	144	44	27
D-Glycero-D-galactoheptitol	98	140	11	51E ^{***}
D-Glycero-D-glucoheptitol	88	171	30	53E
D-Glycero-L-glucoheptitol	95	176	17	59E
D-Glycero-D-idoheptitol	85	168	20	71E
D-Glycero-D-taloheptitol	93	140	24	34
meso-Glycero-alloheptitol	95	100	54	11
meso-Glycero-guloheptitol	85	160	27	72E
meso-Glycero-idoheptitol	78	182	17	79E
<i>Other glycols</i>				
Ethylene glycol	11	3	—	0
Propane-1,2-diol	16	5	0	0
Propane-1,3-diol	5	0	—	—
Butane-1,3-diol	10	0	—	—
Erythrobutane-2,3-diol	13	6	0	0
L-Threobutane-2,3-diol	51	33	0†	0
Butane-1,4-diol	0	0	—	—
Erythropentane-2,4-diol	18	0	0	0
Threopentane-2,4-diol	0	0	—	—
Pentane-1,5-diol	0	0	—	—
2-Methylpentane-1,3-diol	8; 24	0	—	—
Pentaerythritol	85	21	12	0
Poly(vinyl alcohol)	52E	68E	11E	0
cis-Cyclohexane-1,2-diol	6	9	0	0
trans-Cyclohexane-1,2-diol	0	2	—	0
<i>Cyclitols</i>				
allo-Inositol	85	50	9	62
cis-Inositol	79	40	9	116
epi-Inositol	76	29	5	74S ^{***}
(—)-Inositol	59	23	3	20
muco-Inositol	97	36	15	41
myo-Inositol	49E	16	2	75E
neo-Inositol	59	43	1	64
scyllo-Inositol	2	7	3	Adsorbed
3-O-Methyl-(+)-inositol	59	35	—	2
2-O-Methyl-(—)-inositol	24	27	—	14
1-O-Methyl-myoinositol	11	20	—	26
5-O-Methyl-myoinositol	15	25	—	22
<i>Miscellaneous carbohydrates</i>				
Levogucosan	0	0	5	8
1,2-O-Isopropylidene-D-glucose	71	25	31	0
1,2-O-Cyclohexylidene-D-mannitol	63	81	—	3
3,4-O-Isopropylidene-D-mannitol	61	44	—	0
3,4-O-Methylene-D-mannitol	66	47	—	2
2,5-O-Methylene-D-mannitol	62	28	—	0
2,4-O-Methylene-D-glucitol	58	33	—	0
2-Amino-2-deoxy-D-glucitol	47	51	8	116

* 19.8 g As₂O₃ per l and NaOH added.

** 58 g per l.

*** E, markedly elongated spot; S, extensive streaking.

† Non-migrating by definition.

TABLE 20

 R_G VALUES OF MONO- AND DIGLYCOSYL UREAS(M. H. BENN AND A. S. JONES, *Chem. & Ind. (London)*, (1959) 997)

Paper: Whatman No. 1.

Solvent: *n*-Butanol-acetic acid-water (4:1:5).

<i>Glycosyl ureas</i>	R_G	<i>Diglycosyl ureas</i>	R_G
Glucosyl	0.63	Diglucosyl	0.14
Mannosyl	0.68	Dimannosyl	0.15
Galactosyl	0.51	Digalactosyl	0.09
Rhamnosyl	1.35	Dirhamnosyl	0.52
Ribopyranosyl	0.92	Diribosyl	0.25, 0.34, 0.43
Ribofuranosyl	1.23	Diarabinosyl	0.19, 0.25, 0.33
Arabinosyl	0.70	Dixylosyl	0.28, 0.45
Xylosyl	0.85		

TABLE 21

 R_F VALUES OF HYDROPEROXIDIC DERIVATIVES OF THYMINE(B. EKERT AND R. MONIER, *Nature*, 184 (1959) B.A. 58)

Paper: Whatman No. 1.

Solvent: *n*-Propanol-1 *N* HCl (85:15).

Temperature: 2°.

<i>Thymine derivative</i>	R_F
<i>cis</i> -4-Hydroxy-5-hydroperoxythymine	0.51
<i>trans</i> -4-Hydroxy-5-hydroperoxythymine	0.33
<i>cis</i> -4-Hydroperoxy-5-hydroxythymine	0.62
<i>trans</i> -4-Hydroperoxy-5-hydroxythymine	0.43
<i>trans</i> -4-Hydroperoxy-5-bromothymine	0.83
Hydrogen peroxide	0.68
Thymine	0.55

TABLE 22

 R_F VALUES OF HYPONITRITE, NITRITE, NITRATE AND HYDROXYLAMINE(H. M. STEVENS, *Anal. Chim. Acta*, 21 (1959) 456)

Paper: Whatman No. 1.

Solvent: ethanol 70 ml, water 30 ml, sodium hydroxide 2 g.

	R_F values (approximate)
Hyponitrite ($N_2O_2^{--}$)	0.1
NO_2^-	} 0.5-0.6
NO_3^-	
NH_2OH	

TABLE 23

 R_F VALUES OF SOME NAPHTHALENE DERIVATIVES(J. LATINÁK, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 2939)Solvents: S_1 = Formamide/benzene-ethyl acetate (8:2). S_2 = Formamide/chloroform-ethyl acetate (8:2). S_3 = Formamide/chloroform. S_4 = Formamide/carbon tetrachloride. S_5 = Formamide/cyclohexane. S_6 = Dimethylformamide/cyclohexane.

Paper: Whatman No. 4 (descending 25-30 cm); impregnated by dipping in 10-30% methanolic solution of formamide (or of dimethylformamide).

Detection: diazotised *p*-nitraniline (spray) or ferric chloride-potassium ferricyanide (spray or dip) and U.V.

Compound	R_F					
	S_1	S_2	S_3	S_4	S_5	S_6
1-Naphthol	0.90	0.89	0.66	0.31	0.10	0.07
2-Naphthol	0.87	0.87	0.62	0.21	0.06	0.04
1,1'-Dinaphthol	0.95	0.95		0.08	0.00	
Unknown substance in 2-naphthol	0.96	0.96		0.59	0.21	
1-Iodo-2-naphthol				0.83	0.63	
1,3-Dihydroxynaphthalene	0.30	0.21		0.00	0.00	
1,5-Dihydroxynaphthalene	0.32	0.23	0.03	0.01	0.00	0.00
1,6-Dihydroxynaphthalene	0.27	0.22				
1,7-Dihydroxynaphthalene	0.27	0.22				
1,8-Dihydroxynaphthalene	0.80	0.81	0.48	0.02	0.00	0.02
2,3-Dihydroxynaphthalene	0.40	0.37				
2,6-Dihydroxynaphthalene	0.18	0.18				
2,7-Dihydroxynaphthalene	0.20	0.19				
1-Naphthylamine	0.92	0.93	0.93	0.73	0.45	0.08
2-Naphthylamine	0.89	0.92	0.92	0.68	0.38	0.05
1,5-Diaminonaphthalene	0.46	0.51	0.40	0.05	0.02	0.00
1,8-Diaminonaphthalene	0.87	0.88	0.85	0.58	0.23	
1,6-Aminonaphthol	0.32	0.31	0.05	0.02	0.00	0.00
1,7-Aminonaphthol	0.33	0.33				
1-N-Phenyl-naphthylamine	0.96	0.96	0.95	0.94	0.94	0.52
2-N-Phenyl-naphthylamine	0.95	0.95	0.94	0.93	0.93	0.39

TABLE 24

 R_F VALUES OF TWO N-ALKYL-SULPHONAMIDES(J. PETRÁNEK AND M. VECERA, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 2191)Solvents: S_1 = Benzene-cyclohexane (3:2) (formamide-impregnated paper). S_2 = 75% ethanol (petroleum-impregnated paper).

Paper: Whatman No. 4.

Detection: Ehrlich reagent after reduction of the nitro group with zinc chloride.

Compound	R_F	
	S_1	S_2
N-Allyl-N-allylthio- <i>p</i> -nitrobenzenesulphonamide	1.00	0.51
N-Allyl-N-benzylthio- <i>p</i> -nitrobenzenesulphonamide	—	0.42

TABLE 25

R_F VALUES OF BASIC DI- AND TRIPHENYL-METHANE DYES AND RELATED SUBSTANCES(J. GASPARIČ AND M. MATRKA, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 1943)Solvents: S₁ = Ethanol-ammonia-water (2:2:1); paper impregnated with 2% lauryl alcohol.S₂ = Ethanol-ammonia-water (2:2:1); paper impregnated with 5% lauryl alcohol.S₃ = Ethanol-ammonia (1:1); paper impregnated with 5% lauryl alcohol.S₄ = Ethanol-5% KCl (1:1); paper impregnated with 5% lauryl alcohol.(Mobile phases S₁-S₄ were saturated with lauryl alcohol before use.)

Paper: Whatman No. 3, 13 × 40 cm (descending).

Temperature: Room temperature.

Detection: 1% potassium dichromate-1% oxalic acid mixture (1:1) (spray) for leucobases.

Removal of excess ammonia (drying in the presence of hydrochloric acid or acetic acid fumes if necessary) reveals the coloured spots; U.V.

Compound	<i>R_F</i>			
	S ₁	S ₂	S ₃	S ₄
Methane base	0.05	0.02	0.17	0.07
Michler's hydrol	0.11	0.06	0.22	—
Bis-(4,4'-bis-dimethylamino-benzhydryl) ether	0.54	0.36	0.54	—
Tetraethyldiaminodiphenyl-carbinol	0.01	0.00	—	—
Michler's ketone	0.33	0.18	0.45	0.24
Auramine O	0.25	0.14	0.38	0.84
Auramine G	0.48	0.30	0.56	0.84
Döbner's Violet	0.77	0.68	0.75	0.80
Malachite Green (oxalate)	0.14	0.06	0.29	0.80
Malachite Green (perchlorate)	0.14	0.06	0.29	—
Malachite Green (chloride)	0.14	0.06	0.29	—
Malachite Green (carbinol base)	0.14	0.06	0.29	—
N,N-Dimethyl-N',N'-diethyl-diaminotriphenyl-carbinol	0.04	0.02	0.15	—
Brilliant Green	0.02	0.01	0.08	—
Döbner's Violet leucobase	0.63	0.43	0.67	0.59
Malachite Green leucobase	0.03	0.00	0.11	—
Setoglaurine O	0.08	0.04	0.09	—
	0.26	0.11	0.23	—
	0.41	0.26	0.37	—
	0.61	—	0.53	—
Turquoise Blue (extra) B	0.07	0.01	0.09	—
	0.14	0.05	0.16	—
	0.32	0.14	0.28	—
	0.50	0.31	0.43	—
	0.67	—	0.58	—
Parafuchsine	0.77	0.73	0.71	0.80
Methyl Violet	0.18	0.09	0.32	—
	0.38	0.19	0.47	—
	0.58	0.38	0.60	—
	0.70	0.53	0.71	—
Crystal Violet	0.18	0.09	0.32	0.80
Methyl Green	0.26	0.14	0.32	0.33
Fuchsine	0.85	0.80	0.80	0.85
Neofuchsine	0.85	0.80	0.80	0.85
Parafuchsine leucobase	0.78	0.77	0.79	0.78
Crystal Violet leucobase	0.04	0.02	0.15	0.06
Victoria Blue B	0.09	0.00	0.13	0.32
Aniline Blue B	0.02	0.00	0.10	0.00
Night Blue	0.02	0.00	0.02	0.07

TABLE 26

 R_F VALUES OF SOME TRIPHENYLMETHANE DYES AND THEIR LEUCOBASES(J. GASPARIČ AND M. MATRKA, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 1943)

Solvent: Benzene using paper impregnated with formamide.

Paper: Whatman No. 4 impregnated by dipping in a 10% formamide solution (descending).

Compound	R_F
Döbner's Violet	0.00
Döbner's Violet leucobase	0.90
Parafuchsine	0.00
Parafuchsine leucobase	0.40
Malachite Green	0.00
Malachite Green leucobase	0.96
Crystal Violet	0.00
Crystal Violet leucobase	0.96
Michler's ketone	0.95

TABLE 27

INFLUENCE OF PAPER IMPREGNATION ON R_F VALUES OF TRIPHENYLMETHANE DYES(J. GASPARIČ AND M. MATRKA, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 1943)

Solvent: Ethanol-ammonia-water (2:2:1).

Paper: Whatman No. 4 (descending), impregnated with lauryl alcohol.

Dye	R_F		
	2%	Degree of impregnation 5%	10%
Malachite Green	0.14	0.06	0.03
Crystal Violet	0.18	0.09	0.03
	0.08	0.04	0.01
Setoglaurine O	0.26	0.11	0.05
	0.41	0.26	0.13

TABLE 28

 R_F VALUES OF PIPTANTHINE AND DIACETYLP IPTANTHINE(U. EISNER AND F. ŠORM, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 2348)Solvent: *n*-amyl alcohol-acetic acid-water (5:1:4).

Paper: Whatman No. 2.

Detection: Dragendorff reagent.

Compound	R_F
Piptanthine	0.20
Diacetylp iptanthine	0.34

TABLE 29

 R_F VALUES OF A NUMBER OF YOHIMBINE DERIVATIVES(Z. J. VEJDELEK AND K. MACEK, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 2493)*Solvents: S_1 = Chloroform; paper impregnated with stationary phase. S_2 = Chloroform-benzene (1:1); paper impregnated with stationary phase.

Paper: Paper used is impregnated with 50% ethanolic formamide solution (with 5% ammonium formate added).

Detection: U.V. (green fluorescence) and Dragendorff reagent (spray).

Compound	R_F	
	S_1	S_2
Yohimbyl alcohol	0.06	0.01
Yohimbol	0.15	0.06
16-Methylyohimbol	0.27	0.12
Acetylyohimbyl alcohol	0.30	0.12
Yohimbine	0.56	0.25
Yohimbone	0.81	0.56
16-Methylyohimbone	0.86	0.67
Diacetylyohimbyl alcohol	0.90	0.75
Trimethoxybenzoate of yohimbol	0.94	—
Trimethoxybenzoate of 16-methylyohimbol	0.96	0.92
Reserpine**	0.96	0.92

* First appeared in *Chem. listy*, 52 (1958) 2140.

** For comparison.

TABLE 30

 R_F VALUES OF 3,4-DIMETHYLANILINE AND SOME RELATED COMPOUNDS(E. BOYLAND AND P. SIMS, *Biochem. J.*, 73 (1959) 377)Solvents: S_1 = *n*-Butanol saturated with aq. 2 *N* NH_3 soln.; 15 h. S_2 = *n*-Butanol-*n*-propanol-water (2:1:1, by vol.); 15 h. S_3 = *n*-Butanol-acetic acid-water (2:1:1, by vol.).

Paper: Whatman No. 1.

Reagents: Ehrlich (*p*-dimethylaminobenzaldehyde, 0.5% in ethanol containing 1 ml conc. HCl/100 ml); or solution of *p*-dimethylaminocinnamaldehyde (2 g) in 6 *N* HCl (100 ml) and ethanol (100 ml); or successively with aq. NaNO_2 (0.5%), 0.5 *N* HCl and 2-naphthol (0.5%) in ethanol-2 *N* NaOH (1:1, v/v). Others sprayed with 2 *N* HCl and heated to 70° for 15 min before spraying with previous reagents; U.V.

Compound	R_F		
	S_1	S_2	S_3
3,4-Dimethylaniline	0.93	0.91	0.83
3,4-Dimethylacetanilide	0.88	0.88	0.92
2-Amino-4,5-dimethylphenol	0.82	0.78	0.84
2-Amino-4,5-dimethylphenyl sulphate	0.42	0.51	0.65
3,4-Dimethylphenyl sulphate	0.37	0.45	0.59
4-Amino-2-methylbenzoic acid	0.11	0.86	0.87
4-Acetamido-2-methylbenzoic acid	0.22	0.88	0.90
Conjugate, probably 4-amino-2-methylbenzoyl-glucosiduronate	0.07	0.20	0.53

TABLE 31

R_F VALUES OF 5-HYDROXYTRYPTAMINE AND RELATED COMPOUNDS
(D. KEGLEVIĆ, Z. SUPEK, S. KVEDER, S. ISKRIĆ, S. KEČKEŠ AND
A. KISIĆ, *Biochem. J.*, 73 (1959) 53)

Solvents: S_1 = *n*-Butanol-acetic acid-water (4:1:5), 19 h.
 S_2 = Propan-2-ol-aq. NH_3 soln.-water (10:1:1), 22 h.
 S_3 = Methanol-benzene-*n*-butanol-water (4:2:2:2), 14 h.
 S_4 = *n*-Butanol-ethanol-water (4:1:1), 20 h.

Paper: Whatman No. 1 (descending).

Detection: Radioautography (Ferrania X-ray film; 5-10 days); Geiger-Müller mica window counter (with automatic recorder) for ^{14}C ; Ehrlich reagent.

Compound	R_F			
	S_1	S_2	S_3	S_4
5-Hydroxytryptamine	0.50	0.61	0.68	0.52
5-Hydroxyindolylacetic acid	0.78	0.32	0.68	0.52
5-Hydroxyindolylaceturic acid	0.63	0.35	0.49	0.19

TABLE 32

R_F VALUES OF CERTAIN KETO ACIDS, THEIR THIOSEMICARBAZONES
AND SOME URACIL AND THYMINE ANALOGUES

(J. MORÁVEK, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 2571) *

Solvent: *n*-Butanol, saturated with water.

Paper: Whatman No. 4 (descending).

Detection: Geiger-Müller counter VUPEF.20/400A with automatic recorder for ^{14}C ; see also table.

Compound	R_F	Detection
Oxalic acid	0.0	Bromocresol Green
Glyoxalic acid	0.73	Bromocresol Green
Glyoxalic acid thiosemicarbazone	0.59	Dinitrophenylhydrazine
Thiouracil	0.61	U.V.; silver chromate**
Azauracil	0.50	
Pyruvic acid	0.07	Bromocresol Green
Pyruvic acid thiosemicarbazone	0.73	Dinitrophenylhydrazine
Thioazathymine	0.75	U.V.; silver chromate**
Azathymine	0.59	

* First published in *Chem. listy*, 52 (1958) 2147.

** A red-brown complex is formed which is insoluble in dilute nitric acid.

TABLE 33

R_F VALUES OF SUCCINIC AND METHYLSUCCINIC ACID

(M. SUCHÝ, V. HEROUT AND F. ŠORM, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 1542) *

Solvent: Butyl acetate saturated with water, containing 1 % formic acid.

Paper: Whatman No. 1.

Compound	R_F
Succinic acid	0.19
Methylsuccinic acid	0.39

* First appeared in *Chem. listy*, 52 (1958) 2110.

TABLE 34

R_F VALUES OF URIDINE MONOPHOSPHATE, ADENOSINE MONOPHOSPHATE,
URIDINE DIPHOSPHATE AND GUANOSINE-5'-PHOSPHATE

(E. L. DOVEDOVA, *Biokhimiya*, 24 (1959) 414)

Solvents: S_1 = Ethanol-pH 3.8 acetate buffer (75:30) (descending).

S_2 = *n*-Propanol-(NH_4)₂SO₄ (saturated)-pH 6.8 phosphate (0.1 *M*) (2:60:100) (ascending).

S_3 = Isobutyric acid-1 *M* NH₄OH-0.1 *M* Versene (100:60:1.6) (descending).

Paper: LM-2 (a slow filtering chromatographic paper), washed first in 0.1 *N* HCl then in water (24-40 h run).

Solvent system	R_F				
	AMP	UMP	Guanosine-5'-phosphate		UDP
			(a)*	(b)*	
S_1	0.71	0.83	0.68	0.55	0.58
S_2	0.25	0.64	0.54	0.41	0.71
S_3	1.0	0.49	0.60	0.41	0.24

* (a) GMP?

(b) GDP?

TABLE 35

R_F VALUES OF SOME METHYLATED GUANINES AND THEIR RIBOSIDES

(J. D. SMITH AND D. B. DUNN, *Biochem. J.*, 72 (1959) 294)

Solvents: S_1 = Propan-2-ol (680 ml), 11.6 *N* HCl (176 ml), water to 1 litre.

S_2 = Propan-2-ol (700 ml), water (300 ml) with NH₃ in vapour phase.

S_3 = Butan-1-ol (770 ml), water (130 ml), 98% formic acid (100 ml).

S_4 = Butan-1-ol (860 ml), water (140 ml) with NH₃ in vapour phase.

Compound	R_F			
	S_1	S_2	S_3	S_4
Guanine	0.26	0.49	0.09	0.08
1-Methylguanine	0.26	0.62	0.19	0.13
6-Hydroxy-2-methylaminopurine	0.50	0.66	0.25	0.18
2-Dimethylamino-6-hydroxypurine	0.43	0.69	0.28	0.20
2-Ethylamino-6-hydroxypurine	0.60	0.82	—	—
Guanosine	0.37	0.42	0.10	0.02
1-Methylguanosine	0.45	0.64	0.16	0.11
6-Hydroxy-2-methylaminopurine riboside	0.55	0.63	0.18	0.08
2-Dimethylamino-6-hydroxypurine riboside	0.49	0.66	0.23	0.10
Uracil	0.69	0.72	0.38	0.20
Uridine	0.70	0.70	0.21	0.08

TABLE 36

R_F VALUES OF GLUTAMIC ACID AND ITS ETHYL ESTERS
(Z. PRAVDA, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 2082)

Solvents: S_1 = Phenol-water (3:1).
 S_2 = *n*-Butanol-acetic acid-water (4:1:1).
 Detection: Ninhydrin or Chlorophenol Red.

Compound	R_F	
	S_1	S_2
Glutamic acid	0.30	0.12
γ -Ethyl L-glutamate	0.83	0.39
α,γ -Diethyl L-glutamate	0.92	0.75

TABLE 37

R_F VALUES OF SOME DINITROPHENYL DERIVATIVES
(N. N. MEL'TEVA AND M. S. REZNICHENKO, *Biokhimiya*, 24 (1959) 435)

Solvents: S_1 = Aqueous sodium citrate (pH 6).
 S_2 = Aqueous sodium phosphate (pH 5).
 S_3 = Aqueous sodium phosphate (pH 6).
 S_4 = Aqueous sodium phosphate (pH 7).
 S_5 = Phenol saturated with water.
 S_6 = Toluene-pyridine-ethylene chlorohydrin-0.8 *N* ammonia (1:1:0.1:0.1, by vol.).

Solvent	R_F of dinitrophenyl derivatives of				R_F	
	Cystine	Glycine	Phenylalanine	Threonine	Dinitrophenol	Dinitroaniline
S_1	0.50	0.59	0.63	—	—	0.28
S_2	0.62	0.67	0.72	—	0.65	—
S_3	0.55	0.67	0.69	0.78	—	0.33
S_4	0.56	0.65	0.65	—	0.62	—
S_5	0.64	0.71	0.88	—	0.53	0.9-0.95
S_6	0.50	0.35	0.60	0.30	0.50	0.92

TABLE 38

R_F VALUES OF SOME DINITROPHENYL DERIVATIVES
(N. N. MEL'TEVA AND M. S. REZNICHENKO, *Biokhimiya*, 24 (1959) 435)

Solvents: S_1 = Aqueous sodium phosphate (pH 7).
 S_2 = Phenol saturated with water.
 S_3 = Toluene-pyridine-ethylene chlorohydrin-0.8 *N* ammonia (1:1:0.1:0.1, by vol.).

Solvent	R_F				
	DNP-oryzenin	Mono-DNP-lysine	Bis-DNP-histidine	Dinitrophenol	Dinitroaniline
S_1	0.70	0.71	0	0.62	Elongated
S_2	0.81	0.83	0.94	0.54	0.90-0.95
S_3	0.53	0.53	0.79	0.71	0.92

TABLE 39

 R_F VALUES OF SOME HYDROXY-AMINO ACIDS(D. L. SWALLOW AND E. P. ABRAHAM, *Biochem. J.*, 72 (1959) 326)

Solvents: S_1 = Butan-1-ol-acetic acid-water (4:1:4, by vol.).
 S_2 = Butan-1-ol-acetic acid-water (4:1:5, by vol.; organic phase).
 S_3 = Butan-2-one-propionic acid-water (15:5:6, by vol.).
 S_4 = Triethylamine-acetone-water (1:16:3, by vol.).
 S_5 = AnalaR phenol (75 g)-water (21 ml)-aq. NH_3 soln. (sp. gr. 0.88; 4.6 ml).
Systems: S_1 , S_2 , S_3 were freshly prepared. S_5 was run 20 h (off paper after 10 h).
Paper: Whatman No. 1 (after S_4 and S_5 air dried).
Detection: Ninhydrin.
 $R_{Val.}$ = R_F relative to R_F of valine.

Compound	R_F				$R_{Val.}$
	S_1	S_2	S_3	S_4	S_5
γ -Hydroxy- α -aminobutyric acid	0.24	0.23	0.47	0.56	0.50
γ -Hydroxy- β -aminobutyric acid	0.31	0.28	0.41	0.60	0.71
δ -Hydroxy- α -aminovaleric acid	0.26	0.27	0.35	0.68	0.55
δ -Hydroxy- γ -aminovaleric acid	0.36	0.35	0.43	0.70	0.96
γ -Hydroxy- α -aminobutyric acid lactone*	0.39	—	—	—	—
γ -Hydroxy- β -aminobutyric acid lactone**	0.32	0.33	—	—	1.09
δ -Hydroxy- α -aminovaleric acid lactone	—	—	—	—	—
Aspartidiol	0.36	0.35	0.57	—	> 1.5
Leucine and isoleucine	0.67	0.61	0.48	—	1.32
Phenylalanine	0.63	0.56	0.48	—	1.32

* Grey colour with ninhydrin.

** Yellow colour with ninhydrin.

TABLE 40

 R_F VALUES OF SOME TOSYL DERIVATIVES OF AMINO ACIDS AND RELATED COMPOUNDS(K. PODUŠKA AND J. RUDINGER, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 3449)

Solvents: S_1 = *n*-Butanol-acetic acid-water (4:1:1).
 S_2 = Phenol saturated with water- NH_3 atmosphere.
Paper: Whatman No. 1 (descending).
Detection: Ninhydrin.

Compound	R_F	
	S_1	S_2
α,γ -Diaminobutyric acid	0.03	0.40
N^{α} -Tosyl-L- α,γ -diaminobutyric acid	0.20	0.88
1-Tosyl-L-3-aminopyrrolid-2-one hydrobromide	0.62	
1-Tosyl-L-3-aminopyrrolid-2-one		0.82*
N^{γ} -Tosyl- α,γ -diaminobutyric acid		0.72*
N^{γ} -Tosyl-L- α,γ -diaminobutyric acid	0.35	0.76
N^{γ} -Tosyl-L- α,γ -diaminobutyryl-L-threonine ethyl ester hydrochloride	0.71	

* By circular chromatography.

TABLE 41

R_F VALUES OF LOMBRICINE (GUANIDINOETHYL SERYL PHOSPHATE)
IN VARIOUS SOLVENT SYSTEMS

(R. PANT, *Biochem. J.*, 73 (1959) 30)

Solvents: Proportions by volume.

S_1 = Butan-1-ol-water-acetic acid (73:17:10).

S_2 = Pyridine-isoamyl alcohol-water-acetic acid (80:40:40:10).

S_3 = Pyridine-isoamyl alcohol-water (80:40:70).

S_4 = Pyridine-isoamyl alcohol-water-20% (v/v) aq. NH_3 , sp. gr. 0.88 (80:40:40:10).

S_5 = Phenol saturated with water.

S_6 = Propan-1-ol-water-20% (v/v) aq. NH_3 , sp. gr. 0.88 (73:7:20).

S_7 = Methanol-water-acetic acid (80:20:10).

S_8 = Phenol (80% w/v)- NH_3 atmosphere.

S_9 = Aqueous methyl "Cellosolve" (90%) (2-methoxyethanol).

Paper: Whatman No. 1 (25-35 cm, 6-8 h) (ascending).

Temperature: 22°.

Detection: Sakaguchi.

Solvent	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9
R_F	0.00	0.06	0.15	0.11	0.05	0.05	0.17	0.48	0.06

TABLE 42

R_F VALUES OF 2-AMINOETHYL 2-AMINO-2-CARBOXYETHYL HYDROGEN
PHOSPHATE (SEP) AND RELATED COMPOUNDS

(H. ROSENBERG AND A. H. ENNOR, *Biochem. J.*, 73 (1959) 521)

Solvents: S_1 = Water-saturated phenol (13-14 h).

S_2 = Butan-1-ol-acetic acid-water (5:3:2; v/v) (8-9 h).

S_3 = Acetone-acetic acid-water (2:2:1; v/v) (3-4 h).

S_4 = Diisopropyl ether-acetic acid-ethanol-water (4:4:1:2; v/v) (8-9 h).

S_5 = Methyl Cellosolve (2-methoxyethanol)-water (9:1; v/v) (8-9 h).

S_6 = Methanol-formic acid-water (8:1:1; v/v) (4 h).

S_7 = Ethanol-formic acid-water (7:1:2; v/v) (8-9 h).

S_8 = Ethanol-*M* ammonium acetate buffer pH 3.8 (7:3; v/v) (7-8 h).

Paper: Whatman No. 3 washed (ascending).

Detection: 0.2% ninhydrin in acetone; inorganic phosphate detection.

Compound	R_F								
	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9
Serine	0.43	0.44	0.62	0.49	0.17	0.57	0.64	0.46	
Serine phosphate	0.12	0.23	0.44	0.31	0.04	0.42	0.42	0.22	
Ethanolamine	0.53-0.69	0.53	0.84	0.62	0.44	0.68	0.75	0.70	
2-Aminoethyl phosphate	0.46	0.29	0.55	0.41	0.06	0.40	0.46	0.44	
Lombricine	0.55	0.23	0.31	0.26	0	0.18	0.28	0.23	
SEP	0.34	0.15	0.22	0.23	0	0.13	0.20	0.19	

TABLE 43

R_F VALUES OF SOME INDOLE DERIVATIVES(Ž. PROCHÁZKA, V. ŠANDA AND K. MACEK, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 2928)

Solvents: S₁ = Petroleum ether-methanol-water. Water (50 ml), methanol (100 ml) and petroleum ether (100 ml) are placed on the tank floor. Petroleum ether (b.p. 60-70°)-methanol (25:1) is the solvent used as the mobile phase.

S₂ = Carbon tetrachloride-acetic acid-water. Water (50 ml), acetic acid (50 ml) and carbon tetrachloride (50 ml) are placed on the tank floor in a broad dish. The mobile phase is carbon tetrachloride-glacial acetic acid (50:1).

S₃ = Isopropyl ether-water. Isopropyl ether (50 ml) and water (50 ml) with the addition (in certain cases) of 0.88 ammonia (10 ml) are placed on the tank floor. The mobile phase is isopropyl ether saturated with water (or in certain cases with 2% ammonia).

S₄ = Butyl acetate-water. Water (50 ml) and butanol-free butyl acetate (50 ml) (butanol drastically increases the R_F) are placed on the floor of the tank. The mobile phase is freshly prepared butyl acetate (b.p. 126°) saturated with water.

S₅ = Chloroform saturated with formamide using formamide-impregnated paper.

S₆ = Benzene saturated with formamide using formamide-impregnated paper.

S₇ = Cyclohexane saturated with formamide using formamide-impregnated paper.

S₈ = Isopropanol-0.88 ammonia-water (10:1:1), used as a one phase system.

Paper: (a) Whatman No. 4 for water-saturated systems (ascending); equilibrated first.

(b) Whatman No. 2 for formamide-saturated systems (ascending). The paper was dipped in a 50% formamide solution (35 cm paper length). Detection: In the case of formamide-impregnated papers, the chromatograms were developed before the evaporation of the formamide.

Formaldehyde reagent, Ehrlich reagent, Salkowski reagent, 2,4-dinitrophenylhydrazine, Jaffé reagent, together with the aid of U.V.

No.	Compound	R _F							
		S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	S ₈
1	Indole	0.38	0.88		m	0.82	0.81		0.24
<i>Monosubstituted derivatives</i>									
<i>(a) Neutral</i>									
2	3-Methylindole (Skatole)	0.58	0.93		m	0.92	0.89		0.51
3	3-Propylindole	0.78							
4	3-Allylindole	0.69							
5	3,3'-Diindolylmethane	0.18							
6	3-Hydroxymethylindole ^a		m			0.87	0.86		0.04
7	3-(2'-Hydroxyethyl)-indole (Tryptophol)				0.92	0.39			
8	3-(3-Indolyl)-propanol-1		0.19	0.835					
9	1-(3-Indolyl)-propanol-2	0.034	0.35	0.875					
10	4-(3-Indolyl)-butanol-1	0.055	0.53	0.87					
11	4-(3-Indolyl)-butanol-2		0.55	0.925	m				
12	Indole-3-aldehyde		0.60						
13	3-Indolylacetaldehyde		0.10	0.78	0.93				
14	3-Indolylacetone	0.075	0.32	0.925	m			0.81	
15	1-(3-Indolyl)-buten-1-one-3 ⁱ		0.25	0.825	m				
				0.41					
16	3-(3-Indolyl)-propanediol-1,2		0.02	0.49 ^k	0.72				0.05
17	Ascorbigen			0.04	0.51				

18	"Substance C"								
19	3-Indolylacetoneitrile	0.55	0.00	0.12					
20	3-Indolylacetamide	0.05		0.68					
21	γ -(3-Indolyl)-butyramide	0.13		0.85					
22	3-Indolylacetodithylamide	0.88		m					
23	1-Diazo-2,3-dioxo-3-(3-indolyl)-propane	0.37		0.29					
24	2,3-Dioxo-3-(3-indolyl)-propanol-1 ^h	0.00							
25	2-Hydroxyindole (Oxindole) ⁱ	0.68	0.59					0.61	
26	5-Hydroxyindole	0.035	0.80	0.925				0.065	
27	5-Methoxyindole	0.79							
	(b) Acids and esters								
28	Indole-3-carboxylic acid	0.13	0.74	0.90				0.005	
29	Indole-3-carboxylic acid methyl ester	0.53	0.94	m					
30	Indole-2-carboxylic acid	0.54						0.035	
31	Indole-2-carboxylic acid methyl ester	0.98	m						
32	3-Indolylacetic acid (Heteroauxin)	0.25	0.76	0.92				0.035	
33	3-Indolylacetic acid methyl ester	0.775	0.94	m					
34	β -(3-Indolyl)-propionic acid	0.46	0.805	m					
35	β -(3-Indolyl)-propionic acid methyl ester	0.85	0.90						
36	γ -(3-Indolyl)-butyric acid	0.715	0.91	m				0.195	
37	γ -(3-Indolyl)-butyric acid methyl ester	0.92	m	m				0.96	0.29
38	3-Indolylpyruvic acid ^h	0.04	0.72						
39	3-Indolylpyruvic acid methyl ester ^b	0.79	0.94						
40	3-Indolylglyoxylic acid	0.00		0.35 ^c					
41	β -(3-Indolyl)-acrylic acid	0.14	0.695	m					
42	β -(3-Indolyl)-lactic acid	0.02	0.036	0.76					
43	β -(3-Indolyl)-lactic acid methyl ester	0.32	0.76						
44	β -(3-Indolyl)-lactic acid ethyl ester	0.535	0.87						
45	Skatylidenemalonic acid ^c	0.00		0.24					
46	N-(3-Indolylacetyl)-aspartic acid ^d	0.00		0.13					
	(c) Bases								
47	3-Dimethylaminomethyl-indole (Gramine)		0.94 ^k					0.04	
48	3-(2-Aminoethyl)-indole (Tryptamine)		0.47 ^k						
49	Tryptophan		0.00	0.00					
50	Tryptophan methyl ester		0.00	0.00					
	Disubstituted derivatives								
	(a) Neutral								
51	1-Acetyl-3-acetonyl-indole	0.92						0.81	
52	1-(1-Acetyl-3-indolyl)-buten-1-one-3 ^e	0.865							
53	2-Hydroxytryptophan ^f	0.00	0.00						

TABLE 43 (continued)

No.	Compound	R_F						
		S_1	S_2	S_j	S_t	S_3	S_4	S_7
<i>(b) Acids</i>								
54	5-Hydroxy-3-indolylacetic acid		0.00		0.56			
55	β -(2-Hydroxy-3-indolyl)-propionic acid		0.15	0.88	n			
56	1-Acetyl-3-indolylacetic acid		0.53					
57	2-Carboxy-3-indolylacetic acid		0.03	0.05	0.735			
58	β -(2-Carboxy-3-indolyl)-propionic acid		0.14	0.15	0.89			
59	β -(2-Carboxy-3-indolyl)-propionic acid diethyl ester	0.64	m	m	n			
<i>(c) Bases</i>								
60	5-Hydroxytryptamine (Serotonin)	0.00	0.00	0.02 ^k		0.00		
61	5-Methoxytryptamine			0.25 ^k				
62	6-Methoxytryptamine			0.23 ^k				
<i>Trisubstituted derivatives</i>								
63	2,3-Dimethyl-5-nitroindole	0.13	0.9				0.72	
64	2,3-Dimethyl-7-nitroindole	0.75	m				0.92	
65	2-Methyl-6-nitroindole-3-carboxylic acid		0.05	0.015	0.575			
66	5,6-Dimethoxytryptamine			0.025 ^k			0.14 ^g	
67	2,3-Dimethyl-5-aminoindole	0.03	0.00	0.25 ^k			0.27 ^g	
68	2,3-Dimethyl-7-aminoindole	0.075	0.00	0.89 ^k			0.26 ^g	
69	2-Methyl-3-ethyl-5-aminoindole					0.61 ^g		0.41
70	2-Methyl-3-ethyl-7-aminoindole					0.65 ^g		0.45
71	2,3-Dimethyl-4-methoxyindole							0.41
72	2,3-Dimethyl-5-methoxyindole							0.41
73	2,3-Dimethyl-6-methoxyindole							0.81
74	2,3-Dimethyl-7-methoxyindole							

^a R_F of 0.33 in amyl ether-dil. ammonia system.

^b Apparently not the methyl ester of 38 but a reaction product of 3-indolylpyruvic acid with diazomethane.

^c Because of its strongly acidic character, the spot is elongated and the R_F changes with concentration.

^d The R_F value was very variable.

^e Tentative structure only.

^f Possesses a suitable R_F in butanol-acetic acid-water (4:1:5), which is, however, almost indistinguishable from that of tryptophan.

^g A better separation of the acids and certain amino derivatives is achieved by the addition of 5% ammonium formate to the formamide.

^h The compound gives an orange to red colour with 2,4-dinitrophenylhydrazine.

ⁱ The compound reacts with Jaffé reagent.

^j The R_F in this system is only considered to be of relative value.

^k In the presence of ammonia.

^m Compound moves with the solvent front.

ⁿ Compound decomposes.

TABLE 44

 R_F VALUES OF SOME NAPHTHOLS AND RELATED COMPOUNDS(R. J. W. BYRDE, D. F. DOWNING AND D. WOODCOCK, *Biochem. J.*, 72 (1959) 344)Solvents: S_1 = Aqueous 0.1 *N* ammonia. S_2 = Butan-1-ol-ethanol-3 *N* ammonia (4:1:5, by vol.). S_3 = Benzene-propionic acid-water (10:7:1).Detection: 0.2% *p*-nitrobenzenediazonium fluoroborate in acetone (for S_1); U.V. light; 2% aqueous ferric chloride; B.D.H. universal indicator adjusted to pH 9-10 with sodium hydroxide.

Compound	R_F		
	S_1	S_2	S_3
2-Naphthol	0.48		
5-Hydroxy-2-methoxynaphthalene	0.39		
6-Hydroxy-2-methoxynaphthalene	0.28		
7-Hydroxy-2-methoxynaphthalene	0.36		
8-Hydroxy-2-methoxynaphthalene	0.43		
7-Methoxycoumarin		0.88	
4-Ethoxysalicylic acid		0.68	
4-Methoxysalicylic acid	0.69	0.59	0.78

TABLE 45

 R_F VALUES OF SOME AURONES(D. ROUBATOVÁ, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 2166)*Solvent: Aqueous 30% acetic acid (d 1.038).

Paper: Schleicher & Schüll No. 20436; paper equilibrated for 12 h (descending).

Temperature of run: $19 \pm 1^\circ$.

Detection: U.V. light (after exposure to ammonia vapour); antimony trichloride in chloroform (for 2-benzylidenecumaran-3-one).

Compound	R_F
2-Benzylidenecumaran-3-one	0.84
2-Benzylidene-6-hydroxycumaran-3-one	0.40
2-Benzylidene-4,6-dihydroxycumaran-3-one	0.25
2-Benzylidene-6,7-dihydroxycumaran-3-one	0.15
2-(4-Methoxybenzylidene)-cumaran-3-one	0.42
2-(4-Methoxybenzylidene)-6-hydroxycumaran-3-one	0.22
2-(4-Methoxybenzylidene)-4,6-dihydroxycumaran-3-one	0.12
2-(4-Methoxybenzylidene)-6,7-dihydroxycumaran-3-one	0.18
2-(3,4-Dihydroxybenzylidene)-cumaran-3-one	0.24
2-(3,4-Dihydroxybenzylidene)-6-hydroxycumaran-3-one	0.10
2-(3-Methoxy-4-hydroxybenzylidene)-cumaran-3-one	0.25
2-(3-Methoxy-4-hydroxybenzylidene)-6-hydroxycumaran-3-one	0.12
2-(3-Methoxybenzylidene)-4,6-dihydroxycumaran-3-one	0.03
2-(3-Methoxy-4-hydroxybenzylidene)-6,7-dihydroxycumaran-3-one	0.09
2-(3,4-Dimethoxybenzylidene)-cumaran-3-one	0.24
2-(3,4-Dimethoxybenzylidene)-6-hydroxycumaran-3-one	0.10
2-(3,4-Dimethoxybenzylidene)-4,6-dihydroxycumaran-3-one	0.04

* First appeared in *Chem. listy*, 52 (1958) 1120.

TABLE 46

R_F VALUES OF VARIOUS SUGARS AND POLYOLS
(R. VAN HEYNINGEN, *Biochem. J.*, 73 (1959) 197)

Solvents: S_1 = Phenol-water (100:28, w/v).

S_2 = Benzene-butanol-pyridine-water (1:5:3:3; upper phase).

S_3 = Butanol-acetic acid-water (40:9:20).

Paper: Whatman No. 1 (descending).

Detection: $AgNO_3$ -NaOH reagent; aniline phthalate.

Compound	R_F		
	S_1	S_2	S_3
Xylose	0.46	0.43	0.32
Glucose	0.40	0.32	0.24
Xylulose	0.61	0.54	0.39
Sorbitol	0.48	0.29	0.26
Xylitol	0.61	0.35	0.31

TABLE 47

R_F VALUES OF SOME AMINO-SUGARS AND THEIR N-ACETYL DERIVATIVES
(M. J. CRUMPTON, *Biochem. J.*, 72 (1959) 479)

Solvents: S_1 = Phenol-aq. NH_3 solution.

S_2 = *n*-Butanol-acetic acid-water (4:1:5, by vol; upper phase).

S_3 = *n*-Butanol-pyridine-water (6:4:3, by vol.).

Paper: Whatman No. 1.

Detection: Alkaline acetylacetone (spray), then *p*-dimethylaminobenzaldehyde hydrochloride (spray).

Compound	R_F		
	S_1	S_2	S_3
D-Glucosaminuronic acid	0.23	0.61	0.68
D-Fructosamine	0.62	1.71	—
D-Allosamine	0.66	1.65	—
D-Galactosamine	0.69	1.61	—
D-Talosamine	0.75	1.66	—
D-Glucosamine	0.76	1.53	—
Muramic acid	0.76	1.26	1.39
D-Gulosamine	0.77	1.61	—
D-Mannosamine	0.80	1.61	—
D-Xylosamine	1.00	1.68	—
D-Fucosamine	1.00	2.00	—
N-Acetyl-D-galactosamine	1.21	1.82	1.38
N-Acetyl-D-glucosamine	1.30	1.70	1.44
N-Acetyl-D-allosamine	1.32	1.83	1.54
N-Acetyl-D-mannosamine	1.36	1.72	1.62
N-Acetyl-D-gulosamine	1.42	1.81	—
N-Acetyl-D-fructosamine	1.44	—	—
N-Acetyl-D-talosamine	1.45	1.88	1.65
N-Acetyl-D-fucosamine	1.61	2.07	2.16
N-Acetyl-D-xylosamine	1.62	1.84	2.14

TABLE 48

R_G VALUES OF SOME OLIGOSACCHARIDES(A. R. ARCHIBALD AND D. J. MANNERS, *Biochem. J.*, 73 (1959) 292)

Solvent: Ethyl acetate-pyridine-water (10:4:3, by vol.).

Compound	<i>R_G</i> *
Glucose	1.00
Maltose	0.62
Isomaltose	0.47
Maltotriose	0.41 (0.39)
Panose	0.28
Maltotetrose	0.26
6 ³ - α -Glucosylmaltotriose	0.18

* *R_G* = *R_F* value relative to that of glucose.

TABLE 49

R_F VALUES OF CYCLOHEXANEDIOLS AND RELATED GLUCURONIDES(T. H. ELLIOTT, D. V. PARKE AND R. T. WILLIAMS, *Biochem. J.*, 72 (1959) 193)Solvents: *S*₁ = Butan-2-one-xylene-water (1:1:1, by vol.).*S*₂ = Propanol-aq. NH₃ soln. (sp. gr. 0.88) (7:3, v/v).*S*₃ = Butan-1-ol-acetic acid-water (4:1:2, by vol.).

Paper: Whatman No. 4.

Detection: Ammoniacal silver nitrate (for cyclohexanediols). 2% naphthoresorcinol in 33% aqueous trichloroacetic acid, heating to 135° for 5 min after air drying (for the glucuronides).

Compound	<i>R_F</i>		
	<i>S</i> ₁	<i>S</i> ₂	<i>S</i> ₃
<i>trans</i> -Cyclohexane-1,2-diol	0.25		
<i>cis</i> -Cyclohexane-1,2-diol	0.38		
Cyclohexyl glucuronide		0.55	0.59
<i>trans</i> -Cyclohexane-1,2-diol glucuronide		0.46	0.42
<i>cis</i> -Cyclohexane-1,2-diol glucuronide		0.43	0.40

TABLE 50

R_F VALUES OF SOME PHENYLCARBONYL COMPOUNDS(Z. ARNOLD AND J. ŽEMLIČKA, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 2378)

Solvent: Cyclohexane (paper impregnated with dimethyl formamide).

Compound	<i>R_F</i>
α -Methyl- β -dimethylaminocinnamaldehyde	0.1
α -Methyl- β -dimethylaminovinyl phenyl ketone	0.05

TABLE 51

 R_F VALUES OF SOME KETONE THIOSEMICARBAZONES(J. FRANC, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 2096)*Solvents: S_1 = Cyclohexane-*n*-butanol (25:1). S_2 = Chlorocyclohexane. S_3 = Carbon tetrachloride. S_4 = Chlorobenzene.

Paper: Whatman No. 1 (descending).

Impregnation: (a) 30% ethanolic formamide.

(b) 20% ethanolic acetamide.

(c) 30% ethanolic dimethylformamide.

Chromatography: Carried out, after evaporation of ethanol, in a tank saturated with mobile and stationary phase vapours.

Temperature of run: 26-31°.

Detection: 5% silver nitrate spray followed by an aqueous 1-2% ammonia solution; Ehrlich reagent and U.V. light.

Ketone	R_F											
	S_1			S_2			S_3			S_4		
	a	b	c	a	b	c	a ^a	c	a ^a	c	a ^b	c ^b
Cyclohexanone	0.05	0.10	0.14	0.12	0.33	0.53	0.12	0.42	0.32	0.42	0.32	0.79
2-Methylcyclohexanone	0.13	0.23	0.22	0.30	0.54	0.66	—	0.51	0.60	0.51	0.60	0.84
3-Methylcyclohexanone	0.11	0.20	0.20	0.29	0.50	0.62	0.30	0.51	0.57	0.51	0.57	0.83
4-Methylcyclohexanone	0.10	0.18	0.19	0.27	0.48	0.60	0.28	0.50	0.55	0.50	0.55	0.83
Cyclopentanone	0.03	0.06	0.08	0.07	0.20	0.41	0.08	0.37	0.23	0.37	0.23	0.74
2-Methylpentanone	0.07	0.13	0.15	0.21	0.45	0.54	0.22	0.48	0.47	0.48	0.47	0.80
3-Methylpentanone	0.06	0.10	0.12	0.16	0.38	0.52	0.19	0.46	0.43	0.46	0.43	0.79
Dimethyl ketone	0.016	0.03	0.04	0.035	0.09	0.21	0.02	0.26	0.08	0.26	0.08	0.59
Methyl ethyl ketone	0.03	0.05	0.09	0.09	0.22	0.26	0.08	0.42	0.22	0.42	0.22	0.71
Diethyl ketone	—	—	—	—	0.49	—	0.22	0.56	0.47	0.56	0.47	0.79
Ethyl propyl ketone	0.21	0.25	0.30	0.40	0.63	0.73	0.37	0.59	0.70	0.59	0.70	0.84
Methyl butyl ketone	0.18	0.18	0.25	0.40	0.60	0.66	0.41	0.59	0.70	0.59	0.70	0.82
Methyl isobutyl ketone	0.18	0.19	0.26	0.39	0.59	0.68	0.33	0.59	0.63	0.59	0.63	0.82
Methyl amyl ketone	0.32	0.35	—	—	0.80	—	0.61	—	0.84	—	0.84	0.85

* First appeared in *Chem. listy*, 52 (1958) 2311.^a Chromatographed at 31°; ^b chromatographed at 30°; others at 27° ± 1°.

TABLE 52

 R_F VALUES OF SOME NITRODERIVATIVES OF AROMATIC HYDROCARBONS(J. FRANC AND J. KNIŽEK, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 2299)

Solvent: Stationary phase, liquid paraffin; mobile phase, ethanol-acetic acid-water (100:5:70).
 Paper: Whatman No. 1 (descending) impregnated by dipping in a 20% petroleum ether solution of liquid paraffin (b.p. 190-275°) and allowing the petroleum ether to evaporate for quarter of an hour.

Length of run: 20-25 cm.

Detection: 10% SnCl₂ solution (reduction), followed by Ehrlich reagent.

Compound	R_F	Compound	R_F
1,3-Dinitrobenzene	0.58	2,4-Dinitro- <i>m</i> -xylene	0.37
1,3,5-Trinitrobenzene	0.45	2,3-Dinitro- <i>p</i> -xylene	0.62
2,3-Dinitrotoluene	0.73	2,5-Dinitro- <i>p</i> -xylene	0.33
2,6-Dinitrotoluene	0.55	2,6-Dinitro- <i>p</i> -xylene	0.38
2,5-Dinitrotoluene	0.44	2,4-Dinitroethylbenzene	0.39
3,4-Dinitrotoluene	0.72	2,6-Dinitroethylbenzene	0.47
3,5-Dinitrotoluene	0.45	3,4,6-Trinitro- <i>o</i> -xylene	0.50
2,4-Dinitrotoluene	0.52	3,4,5-Trinitro- <i>o</i> -xylene	0.65
2,4,6-Trinitrotoluene	0.36	2,4,6-Trinitro- <i>m</i> -xylene	0.25
3,5-Dinitro- <i>o</i> -xylene	0.41	4,5,6-Trinitro- <i>m</i> -xylene	0.82
3,4-Dinitro- <i>o</i> -xylene	0.74	2,3,5-Trinitro- <i>p</i> -xylene	0.43
4,5-Dinitro- <i>o</i> -xylene	0.71	2,4,6-Trinitroethylbenzene	0.27
3,6-Dinitro- <i>o</i> -xylene	0.31	Dinitromesitylene	0.32
4,6-Dinitro- <i>o</i> -xylene	0.43		

TABLE 53

 R_F VALUES OF SOME 2,4-DINITROPHENYLHYDRAZONES OF HOMOLOGOUS CYCLIC KETONES(V. DUDEK AND J. STUHLÍK, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 3797)Solvents: S₁ = Methanol-water-acetic acid (90:10:3).S₂ = Methanol-water-acetic acid (95:5:3).S₃ = 80% methanol.S₄ = Methanol-water-acetic acid (80:20:2).

Stationary phase: Liquid paraffin (b.p. 200-220°) in petroleum ether (b.p. 30-45°) for impregnation.

Temperature of run: 20°.

Paper: Whatman No. 1 (S₁, S₂ descending; S₃, S₄ ascending).

Detection: Red light; U.V.; 10% KOH.

2,4-Dinitrophenylhydrazone of	R_F			
	S ₁	S ₂	S ₃	S ₄
Cyclopentanone	0.45	0.53	—	—
Cyclohexanone	0.42	0.50	0.93	0.95
Cycloheptanone	0.33	0.44	0.75	0.86
Cyclooctanone	0.29	0.41	0.67	0.80
Cyclononanone	0.26	0.37	0.56	0.72
Cyclodecanone	0.20	0.33	—	—
Cyclododecanone	0.13	0.25	—	—

TABLE 54

 R_F VALUES OF SOME ALDEHYDE-RHODANINE CONDENSATION PRODUCTS(J. FRANC, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 2102)Solvents: S_1 = Chlorocyclohexane. S_2 = Chlorobenzene. S_3 = Carbon tetrachloride. S_4 = Cyclohexane-*n*-butanol (25:1).

Paper: Whatman No. 1 (descending).

Impregnation: (a) 30% ethanolic formamide.

(b) 30% ethanolic dimethyl formamide.

Temperature of run: $21^\circ \pm 1^\circ$.

Detection: U.V. and visible light; 5% ammoniacal silver nitrate (spray).

Aldehyde	R_F							
	S_1		S_2		S_3		S_4	
	a	b	a	b	a	b	a	b
Benzaldehyde	0.43	0.59	0.65	0.78	0.19	0.54	0.19	0.12
3-Hydroxybenzaldehyde	0.014	0.20	0.017	0.64	0.00	0.16	0.15	0.013
3-Methoxy-4-hydroxybenzaldehyde	0.028	0.20	0.074	0.69	0.016	0.10	0.014	0.011
3-Methoxy-4-benzyloxybenzaldehyde	0.68	0.71	0.89	0.85	0.59	0.76	0.15	0.049
2-Hydroxy-3-methoxybenzaldehyde	0.057	0.30	0.18	0.72	0.025	0.20	0.014	0.011
2-Hydroxy-3-ethoxybenzaldehyde	0.03	0.16	0.077	0.67	0.013	0.12	0.00	0.07
3-Hydroxy-4-methoxybenzaldehyde	0.067	0.35	0.19	0.79	0.075	0.25	0.027	0.015
3,4-Dimethoxybenzaldehyde	0.17	0.47	0.54	0.91	0.105	0.34	0.038	0.017
2-Benzyloxybenzaldehyde	0.80	0.75	0.90	0.86	0.71	0.77	0.09	0.08
<i>p</i> -Aminobenzaldehyde	0.037	0.28	0.06	0.72	0.16	0.19	0.00	0.00
<i>p</i> -Nitrobenzaldehyde	0.12	—	0.36	0.69	0.05	0.23	0.00	0.017
<i>m</i> -Nitrobenzaldehyde	0.09	0.37	—	0.68	0.042	0.23	0.013	0.022
<i>o</i> -Nitrobenzaldehyde	0.03	0.21	—	0.66	0.015	0.14	0.00	0.012
<i>p</i> -Chlorobenzaldehyde	0.51	0.62	0.77	0.80	0.47	0.55	0.31	0.14
Salicylaldehyde	1.00	0.92	—	0.90	—	0.86	—	0.28
Fural	0.33	0.53	0.49	0.77	0.25	0.41	0.14	0.061
<i>p</i> -Tolualdehyde	0.67	0.74	0.82	0.86	—	0.67	0.425	0.21
Rhodanine	0.03	0.37	0.00	0.63	0.00	0.24	0.00	0.058

TABLE 55

 R_F VALUES OF SOME ALKYL-BENZIDINE DERIVATIVES(M. MATRKA, *Collection Czechoslov. Chem. Commun.*, 25 (1960) 294)

Solvent: Cyclohexane.

Paper: Whatman No. 4 (descending).

Impregnation: 25% dimethylformamide.

Detection: 0.1 *N* cerium (IV) sulphate solution (spray).

Compound	R_F
N,N,N',N'-Tetraethylbenzidine	0.92
N,N,N'-Triethylbenzidine	0.75
N,N'-Diethylbenzidine	0.15

TABLE 56

R_F VALUES OF KETONE-RHODANINE CONDENSATION PRODUCTS
(J. FRANC, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 2102)

Solvents: S_1 = Chlorocyclohexane.
 S_2 = Carbon tetrachloride.
 S_3 = Chlorobenzene.
 S_4 = Cyclohexane-*n*-butanol (25:1).
 Paper: Whatman No. 1 (descending).
 Impregnation: (a) 30 % ethanolic formamide.
 (b) 30 % ethanolic dimethyl formamide.
 Temperature of run: $20^\circ \pm 1^\circ$.
 Detection: U.V. light or in visible light.

Ketone	R_F							
	S_1		S_2		S_3		S_4	
	a	b	a	b	a	b	a	b
Acetone	0.33	0.74	0.22	0.81	0.54	0.92	0.26	0.32
Methyl ethyl ketone	0.61	0.84	0.50	0.88	0.79	0.92	0.57	0.47
Ethyl propyl ketone	0.90	0.93	0.85	0.935	0.92	0.93	0.88	0.76
Diethyl ketone	0.80	0.91	0.71	0.92	0.91	0.89	0.77	0.63
Methyl isobutyl ketone	0.87	0.92	0.82	0.94	0.925	0.91	0.85	0.74
Methyl butyl ketone	0.89	0.93	0.85	0.94	0.925	0.93	0.87	0.75
Cyclopentanone	0.52	0.83	0.43	0.89	0.75	0.88	0.49	0.43
2-Methylcyclopentanone	0.72	0.88	0.71	0.90	0.87	0.93	0.62	0.65
3-Methylcyclopentanone	0.70	0.88	0.68	0.89	0.87	0.92	0.61	0.65
α, α' -Dimethylcyclopentanone	0.72	0.87	0.70	0.89	0.87	0.93	0.615	0.64
Cyclohexanone	0.78	0.89	0.75	0.90	0.88	0.935	0.62	0.66
2-Methylcyclohexanone	0.89	0.92	0.86	0.92	0.93	0.935	0.785	0.75
3-Methylcyclohexanone	0.88	0.925	0.85	0.92	0.93	0.925	0.785	0.75
4-Methylcyclohexanone	0.87	0.92	0.84	0.915	0.93	0.915	0.77	0.73
Rhodanine	0.00	0.18	0.00	0.22	0.04	0.60	0.03	0.06

TABLE 57

R_F VALUES OF 2,4,5-TRIHIDROXYBUTYROPHENONE AND RELATED COMPOUNDS
(B. D. ASTILL, D. W. FASSETT AND R. L. ROUDABUSH, *Biochem. J.*, 72 (1959) 451)

Solvents: S_1 = Organic phase of freshly mixed *n*-butanol-acetic acid-water (4:1:5, by vol.).
 S_2 = Organic phase of benzene-acetic acid-water (2:2:1, by vol.).
 Paper: Whatman No. 1.
 Detection: A: Aqueous 1 % (w/v) AgNO_3 soln.-aq. 10 % NH_3 soln. (1:1).
 B: 1 % FeCl_3 in aq. 50 % v/v ethanol.
 C: Freshly mixed 1 % (w/v) sulphanilic acid in 3 N HCl-aq. 5 % (w/v) NaNO_2 (1:1, v/v). Dried paper suspended in NH_3 atmosphere.
 D: U.V.

Compound	R_F	
	S_1	S_2
2,4,5-Trihydroxybutyropenone	0.92-0.95	0.42-0.44
4-Butyryl-2,5-dihydroxyphenyl glucosiduronic acid	0.75-0.81	0.14
5-Butyryl-2,4-dihydroxyphenyl hydrogen sulphate	0.68-0.72	0.12
Probably 5-O-glucuronide of 2,4,5-trihydroxybutyropenone	0.45-0.55	0.05

TABLE 58

R_F VALUES OF CYSTEINE AND N,S-DIACETYL-CYSTEINE
(J. F. BERRY AND V. P. WHITTAKER, *Biochem. J.*, 73 (1959) 447)

Solvent: *n*-Butanol saturated with water.
Paper: Whatman No. 1 (ascending).
Detection: Ninhydrin; hydroxylamine and FeCl_3 .

Compound	R_F
Cysteine	0.00
N,S-Diacetylcysteine	0.12

TABLE 59

R_F VALUES OF SOME PEPTIDES
(B. KEIL AND F. ŠORM, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 1558)*

Solvent: *n*-Butanol-acetic acid-water (144:13:43).
Paper: Whatman No. 4 (descending).
Detection: 0.5% ninhydrin in acetone (dip).
 $R_F\text{-glu} = R_F$ relative to that of glutamic acid (run under the same conditions).

Peptide	$R_F\text{-glu}$	Peptide	$R_F\text{-glu}$
CySO_3H	0.1	(Leu, Val, CySO_3H)	1.9
(Ser, CySO_3H)	0.2	(CySO_3H , Ala)	0.7
Thr· CySO_3H	0.3	(Thr, CySO_3H , Val)	1.2
(Ser, Thr, CySO_3H)	} 0.05	CySO_3H ·(Lys, Asp)	0.1
(Ser, CySO_3H , MetSO_2)		(CySO_3H , Lys)	0.1
(CySO_3H , MetSO_2)	0.2	Asp	0.7
(Gly, CySO_3H)	1.0	CySO_3H ·Lys	0.1
(Ileu, CySO_3H , Ala)	1.0		

TABLE 60

RELATIVE PAPER ELECTROPHORETIC MOBILITIES OF CYSTEIC ACID PEPTIDES
(B. KEIL AND F. ŠORM, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 1558)*

Electrolyte: 4 ml pyridine + 1 ml acetic acid diluted to 1 litre with distilled water (pH 5.6).
Potential: 1400 V (*i.e.* 30 V/cm).
Paper: Whatman No. 1.
Type: Vertical; anode connected to upper trough.
Migration units: Relative to glutamic acid (glutamic acid = 1).
Detection: Ninhydrin.

Peptide	Relative mobility	Peptide	Relative mobility
Ser· CySO_3H	1.0	CySO_3H ·Val	0.9
Phe· CySO_3H	1.0	CySO_3H · MetSO_2	0.9
Ileu· CySO_3H	0.85	Leu·Val· CySO_3H	0.6
Thr· CySO_3H	0.95	Ser· CySO_3H · MetSO_2	0.7
CySO_3 ·Ala	1.0	Ileu· CySO_3H ·Ala	0.7
CySO_3 ·Gly	1.05	Thr· CySO_3H ·Val	0.65

* First appeared in *Chem. listy*, 52 (1958) 1327.

TABLE 61

R_F VALUES OF SOME MERCAPTURIC ACIDS, S-SUBSTITUTED CYSTEINES
(H. G. BRAY, T. J. FRANKLIN AND S. P. JAMES, *Biochem. J.*, 73 (1959) 465)

Solvents: S_1 = Butan-1-ol-acetic acid-butyl acetate (24:10:5:2, v/v).

S_2 = Butan-1-ol saturated with aqueous 2 N NH_3 solution.

S_3 = Benzene-acetic acid-water (2:2:1, v/v).

Paper: Whatman No. 4 or 3MM (descending).

Time of run: T (hours).

Detection: Potassium dichromate-silver nitrate reagent; ninhydrin.

Compound	R_F					
	S_1	T	S_2	T	S_3	T
S-Butyl-L-cysteine	0.73	7	0.35	16	—	
N-Acetyl-S-butyl-L-cysteine	0.92	7	0.46	16	—	
N-Acetyl-S-(2,3,5,6-tetrachlorophenyl)-L-cysteine	0.95	14	0.60	16	—	
S-(2,3,5,6-Tetrachlorophenyl)-L-cysteine	0.60*	14	0.44	16	—	
2,3,5,6-Tetrachlorothiophenol**	—		0.75	4	1.0	4
S-(2-Chloro-4-nitrophenyl)-L-cysteine	0.50	16	***		—	
S-Benzyl-L-cysteine	0.63	7	0.22	16	—	
N-Acetyl-S-benzyl-L-cysteine	0.93	7	0.41	16	—	

* Streaks.

** Ascending.

*** Decomposes in this solvent.

TABLE 62

ELECTROPHORETIC MOBILITIES OF ARGININE AND CANAVANINE

(M. H. RICHMOND, *Biochem. J.*, 73 (1959) 261)

Electrolytes: E_1 = Ammonium carbonate buffer (2%, w/v), pH 9.1 (pH adjusted with 0.88 NH_3 soln.).

E_2 = Pyridine-acetic acid-water (10:0.4:90, v/v), pH 6.5.

E_3 = Pyridine-acetic acid-water (1:10:89, v/v), pH 3.5.

(All buffers removed by heating at 50° for 30 min).

Detection: Ninhydrin; alkaline α -naphthol-diacetyl reagent.

Paper: Whatman No. 3.

Potential gradient: 40 V/cm.

Apparatus: Kunkel (1954); closed strip method.

Units: cm (distance moved in 2 h at a potential difference of 40 V/cm).

Compound	Mobility		
	E_1	E_2	E_3
Arginine	+ 5.3	+ 31	+ 43
Canavanine	— 6.7	+ 27.5	+ 43

+ Migration towards cathode.

— Migration towards anode.

TABLE 63

 R_F VALUES OF SOME PEPTIDE DERIVATIVES(H. NEUMANN, Y. LEVIN, A. BERGER AND E. KATCHALSKI, *Biochem. J.*, 73 (1959) 33)Solvents: S_1 = *n*-Butanol-acetic acid-water (25:6:25, v/v). S_2 = *n*-Propanol-water-conc. NH_3 solution (100:50:1, v/v).

Paper: Whatman No. 1.

Detection: Ninhydrin; *p*-dimethylaminobenzaldehyde; diazotized sulphanilic acid; U.V. (where necessary paper chromatogram exposed to HBr gas to allow detection).

Abbreviations: Tyr = L-tyrosyl residue.

Glu = L-glutamyl residue.

Phe = L-phenylalanyl residue.

Am = amide group.

PAB = *p*-aminobenzoyl group.

Compound	R_F	
	S_1	S_2
Tyr	0.45	
Tyr ₂	0.68	
PAB·Tyr		0.76
PAB·Tyr ₂		0.83
<i>p</i> -Aminobenzoic acid		0.51
Glu·Tyr	0.52	
Phe·Tyr	0.80	
Tyr·Am	0.45	0.79
Phe	0.65	

TABLE 64

ELECTROPHORETIC MOBILITIES OF SOME N-BENZYLOXYCARBONYL-PEPTIDES

(H. NEUMANN, Y. LEVIN, A. BERGER AND E. KATCHALSKI, *Biochem. J.*, 73 (1959) 33)Electrolyte: phosphate buffer, pH 6.8 (0.05 M Na_2HPO_4 and 0.05 M NaH_2PO_4).

Paper: Whatman No. 1.

Potential: 10 V/cm.

Time of run: 2 h.

Apparatus: Consden and Stanier (1952).

Units: cm.

Detection: Ninhydrin; diazotized sulphanilic acid; *p*-dimethylaminobenzaldehyde; U.V.

Abbreviations: Z = benzyloxycarbonyl group.

Tyr = L-tyrosyl residue.

Glu = L-glutamyl residue.

Compound	Mobility cm/2 h
Tyr	- 0.4
Tyr ₂	+ 1.2
Z-Tyr	+ 4.5
Z-Tyr ₂	+ 3.1
Z-Glu·Tyr	+ 6.5
Z-Glu·Tyr ₂	+ 5.0
Z-Glu·Tyr ₃	+ 4.0
Z-Glu	+ 9.5

+ Towards anode.

- Towards cathode.

TABLE 65

R_F VALUES OF SOME PEPTIDE ETHYL ESTERS,
THEIR CONSTITUENT AMINO ACIDS AND SOME CARBOBENZOXY DERIVATIVES

(Z. A. SHABAROVA, N. I. SOKOLOVA AND M. A. PROKOFIEV, *Compt. rend. acad. sci. U.R.S.S.*,
128 (1959) 740)

Solvents: S_1 = *n*-Butanol saturated with water.
 S_2 = *n*-Butanol-acetic acid-water (4:1:5, organic phase).
 S_3 = Isoamyl alcohol-disodium hydrogen phosphate.
 S_4 = *n*-Butanol saturated with NH_3 .

Detection: Ninhydrin; U.V. light.

Compound	R_F			
	S_1	S_2	S_3	S_4
<i>Ethyl esters of</i>				
Phenylalanylglycine		0.73		
Leucylglycine		0.76		
Valylphenylalanylglycine		0.65		
<i>Amino acid components</i>				
Phenylalanine		0.50	—	—
Glycine		0.16	—	0.33
Leucine		0.59		
Valine		0.42		
<i>Carbobenzoxy derivatives of O-aminoacyl derivatives of adenosine</i>				
2(3),5-Di-O-Cbz-phenylalanyladenosine	0.87			
5-O-Cbz-phenylalanyl-2,3-isopropylideneadenosine	0.90			
<i>Other compounds</i>				
Adenosine	0.27		0.55	
Cytidine			0.75	
DNP-phenylalanine			—	0.79

TABLE 66

ELECTROPHORETIC MOBILITIES OF SOME *p*-AMINOBENZOYL-PEPTIDES

(H. NEUMANN, Y. LEVIN, A. BERGER AND E. KATCHALSKI, *Biochem. J.*, 73 (1959) 33)

Electrolyte: Phosphate buffer, pH 6.8 (0.05 *M* NaH_2PO_4 and 0.05 *M* Na_2HPO_4).

Paper: Whatman No. 1.

Potential: 10 V/cm.

Time of run: 2 h.

Apparatus: Consden and Stanier (1952).

Units: cm.

Detection: Sulphanilic acid; *p*-dimethylaminobenzaldehyde; U.V.

Peptide	Mobility (cm/a h)
<i>N-p</i> -Aminobenzoyl-L-tyrosyl-L-tyrosine	— 7.5
<i>N-p</i> -Aminobenzoyl-L-tyrosine	— 5.3
<i>p</i> -Aminobenzoic acid	— 11.0

— Towards cathode.

TABLE 67

R_F VALUES OF SOME AMINO ACIDS AND RELATED COMPOUNDS
(C. E. ROWE, *Biochem. J.*, 73 (1959) 438)

Solvents: S_1 = *n*-Butanol-acetic acid-water (63:10:27, v/v).
 S_2 = Phenol-water (5:2, v/v).

Paper: Whatman No. 1.

Detection: Ninhydrin; phosphomolybdic acid followed by SnCl_2 reduction.

Compound	R_F	
	S_1	S_2
Ethanolamine	0.20	0.91-0.92
Serine	0.10	0.40
Serine methyl ester	0.20	0.91
Choline	0.47	0.82
Methoxycholine*	0.24-0.26	0.89-0.90

* Tentative identification.

TABLE 68

R_F VALUES OF SOME CHOLINE ESTERS.

(J. F. BERRY AND V. P. WHITTAKER, *Biochem. J.*, 73 (1959) 447)

Solvent: *n*-Butanol saturated with water.

Paper: Whatman No. 1.

Detection: Iodine vapour; bromocresol purple; hydroxylamine and FeCl_3 .

Compound	R_F
Choline	0.08
Acetylcholine	0.10
Propionylcholine	0.22
<i>n</i> -Butyrylcholine	0.28
<i>n</i> -Valerylcholine	0.31
Hexanoylcholine	0.36
Palmitoylcholine*	0.70
Palmitic acid*	1.0

* Form a complex if run together.

TABLE 69

R_F VALUE OF 2-(PHENYLCYCLOHEXYLACETOXY)-ETHYL-DIMETHYL- ^{35}S SULPHONIUM IODIDE (^{35}S -THIOSPASMIN)

(O. PITÁK AND J. ZIKMUND, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 4053)

Solvent: *n*-Butanol-acetic acid-water (4:1:5).

Paper: Whatman No. 1.

Detection: Dragendorff reagent; autoradiographically by FOMA-Röntgen-X-Film.

Compound	R_F
^{35}S -Thiospasmin	0.82

TABLE 70

 R_F VALUES OF SOME ETHANOLAMINES(J. FRANC AND M. HÁJKOVÁ, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 4043)Solvents: S_1 = Dimethyl formamide-ethanol (3:7). S_2 = *n*-Butanol-amyl alcohol (10:4). S_3 = Hexanol-*n*-butanol- NH_4OH (1:3:4).

Paper: Whatman No. 1 (24 × 47 cm).

Time: 5 h (at 20°).

Length of run: 25 cm (at 20°).

Temperature: S_1 , 24°; S_2 , 20°; S_3 , 20°.Detection: Gibbs reagent in *m*-cresol (0.5 g 2,6-dibromoquinone chloroimine and 0.3 g phenol in 100 ml ethanol) or 0.2-0.3 % Pyrocatechol Violet.

Compound	R_F		
	S_1	S_2	S_3
Hydroxylamine	0.36	—	—
Monoethanolamine	0.52	0.32	0.30
Diethanolamine	0.70	0.47	0.45
Triethanolamine	0.81	0.62	0.60

TABLE 71

 R_F VALUES OF SOME HALOGENATED ALIPHATIC ACIDS(C. RAPPE AND N. HELLSTRÖM, *Arkiv Kemi*, 13 (1959) 485)

Solvent: Benzene-cyclohexane mixture (60 ml + 30 ml) saturated with water, excess water removed, organic phase then filtered through paper moistened with the organic mixture. Acetic acid (10 ml) was added to this.

Time of run: 2 h (approx).

Length of run: 20-22 cm.

Paper: Whatman No. 1 (descending).

Detection: 0.04 % ethanolic bromophenol blue or bromocresol green solution (spray).

Acid	R_F	Acid	R_F
$CH_2ClCOOH$	0.23	CH_2ICH_2COOH	0.78
$CH_2BrCOOH$	0.30	$CH_2BrCHBrCOOH$	0.71
CH_2ICOOH	0.45	$CH_3CH_2CHBrCOOH$	0.84
$CHCl_2COOH$	0.15	$CH_3CH_2CH_2CHBrCOOH$	0.90
CCl_3COOH	0.05-0.12	$(CH_3)_2CHCHBrCOOH$	0.89
CF_3COOH	0	$CH_3CH_2CH_2CH_2CHBrCOOH$	0.92
$CH_3CHClCOOH$	0.59	$CH_3COCH_2CH_2COOH$	0.22
CH_2ClCH_2COOH	0.61	$CH_3COCHClCH_2COOH$	0.44
$CH_3CHBrCOOH$	0.69	$CH_3COCHBrCH_2COOH$	0.54
CH_2BrCH_2COOH	0.67	$CH_2ClCOCH_2CH_2COOH$	0.30
$CH_3CHICOOH$	0.79	$CH_2BrCOCH_2CH_2COOH$	0.38
		$CH_2BrCOCHBrCH_2COOH$	0.62

TABLE 67

R_F VALUES OF SOME AMINO ACIDS AND RELATED COMPOUNDS
(C. E. ROWE, *Biochem. J.*, 73 (1959) 438)

Solvents: S_1 = *n*-Butanol-acetic acid-water (63:10:27, v/v).

S_2 = Phenol-water (5:2, v/v).

Paper: Whatman No. 1.

Detection: Ninhydrin; phosphomolybdic acid followed by SnCl_2 reduction.

Compound	R_F	
	S_1	S_2
Ethanolamine	0.20	0.91-0.92
Serine	0.10	0.40
Serine methyl ester	0.20	0.91
Choline	0.47	0.82
Methoxycholine*	0.24-0.26	0.89-0.90

* Tentative identification.

TABLE 68

R_F VALUES OF SOME CHOLINE ESTERS.

(J. F. BERRY AND V. P. WHITTAKER, *Biochem. J.*, 73 (1959) 447)

Solvent: *n*-Butanol saturated with water.

Paper: Whatman No. 1.

Detection: Iodine vapour; bromocresol purple; hydroxylamine and FeCl_3 .

Compound	R_F
Choline	0.08
Acetylcholine	0.10
Propionylcholine	0.22
<i>n</i> -Butyrylcholine	0.28
<i>n</i> -Valerylcholine	0.31
Hexanoylcholine	0.36
Palmitoylcholine*	0.70
Palmitic acid*	1.0

* Form a complex if run together.

TABLE 69

R_F VALUE OF 2-(PHENYLCYCLOHEXYLACETOXY)-ETHYL-DIMETHYL- ^{35}S SULPHONIUM IODIDE (^{35}S -THIOSPASMIN)

(O. PITÁK AND J. ZIKMUND, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 4053)

Solvent: *n*-Butanol-acetic acid-water (4:1:5).

Paper: Whatman No. 1.

Detection: Dragendorff reagent; autoradiographically by FOMA-Röntgen-X-Film.

Compound	R_F
^{35}S -Thiospasmin	0.82

TABLE 70

 R_F VALUES OF SOME ETHANOLAMINES(J. FRANC AND M. HÁJKOVÁ, *Collection Czechoslov. Chem. Commun.*, 24 (1959) 4043)Solvents: S_1 = Dimethyl formamide-ethanol (3:7). S_2 = *n*-Butanol-amyl alcohol (10:4). S_3 = Hexanol-*n*-butanol- NH_4OH (1:3:4).

Paper: Whatman No. 1 (24 × 47 cm).

Time: 5 h (at 20°).

Length of run: 25 cm (at 20°).

Temperature: S_1 , 24°; S_2 , 20°; S_3 , 20°.Detection: Gibbs reagent in *m*-cresol (0.5 g 2,6-dibromoquinone chloroimine and 0.3 g phenol in 100 ml ethanol) or 0.2-0.3 % Pyrocatechol Violet.

Compound	R_F		
	S_1	S_2	S_3
Hydroxylamine	0.36	—	—
Monoethanolamine	0.52	0.32	0.30
Diethanolamine	0.70	0.47	0.45
Triethanolamine	0.81	0.62	0.60

TABLE 71

 R_F VALUES OF SOME HALOGENATED ALIPHATIC ACIDS(C. RAPPE AND N. HELLSTRÖM, *Arkiv Kemi*, 13 (1959) 485)

Solvent: Benzene-cyclohexane mixture (60 ml + 30 ml) saturated with water, excess water removed, organic phase then filtered through paper moistened with the organic mixture. Acetic acid (10 ml) was added to this.

Time of run: 2 h (approx).

Length of run: 20-22 cm.

Paper: Whatman No. 1 (descending).

Detection: 0.04 % ethanolic bromophenol blue or bromocresol green solution (spray).

Acid	R_F	Acid	R_F
CH_2ClCOOH	0.23	$\text{CH}_2\text{ICH}_2\text{COOH}$	0.78
CH_2BrCOOH	0.30	$\text{CH}_2\text{BrCHBrCOOH}$	0.71
CH_2ICOOH	0.45	$\text{CH}_3\text{CH}_2\text{CHBrCOOH}$	0.84
CHCl_2COOH	0.15	$\text{CH}_3\text{CH}_2\text{CH}_2\text{CHBrCOOH}$	0.90
CCl_3COOH	0.05-0.12	$(\text{CH}_3)_2\text{CHCHBrCOOH}$	0.89
CF_3COOH	0	$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CHBrCOOH}$	0.92
$\text{CH}_3\text{CHClCOOH}$	0.59	$\text{CH}_3\text{COCH}_2\text{CH}_2\text{COOH}$	0.22
$\text{CH}_2\text{ClCH}_2\text{COOH}$	0.61	$\text{CH}_3\text{COCHClCH}_2\text{COOH}$	0.44
$\text{CH}_3\text{CHBrCOOH}$	0.69	$\text{CH}_3\text{COCHBrCH}_2\text{COOH}$	0.54
$\text{CH}_2\text{BrCH}_2\text{COOH}$	0.67	$\text{CH}_2\text{ClCOCH}_2\text{CH}_2\text{COOH}$	0.30
$\text{CH}_3\text{CHICOOH}$	0.79	$\text{CH}_2\text{BrCOCH}_2\text{CH}_2\text{COOH}$	0.38
		$\text{CH}_2\text{BrCOCHBrCH}_2\text{COOH}$	0.62