

## イアトロスキャン分析法

24

ポリマー添加剤 データ集

Analysis of Polymer additives by the Iatroscan

A) 試料 Samples

1. Phthalic acid, Monoethyl phthalate, Diethyl phthalate
2. 可塑剤 Plasticizer  
DBP, DOP
3. 酸化防止剤(1) Antioxidant(1)  
BHT
4. 酸化防止剤(2) Antioxidant(2)  
BHT (Yoshinox BHT)  
Dimyristyl thiodipropionate (DMTP Yoshitomi)  
Pentaerythritol tetrakis 3-(3,5-di-tert-butyl-4-hydroxyphenyl)  
propionate (Tominox TT)  
4,4'-Butylidenebis-(6-tert-butyl-3-methylphenol) (Yoshinox BB)
5. 加硫促進剤 Rubber accelerator  
MBT, MBTS
6. 滑剤 Slip additive  
Parafin, n-Butyl stearate, Stearic acid, Stearamide
7. 帯電防止剤 Antistatic agent  
Sodium N-myristoyl sarcosinate (anion)  
POE(5) Oleyl amine (nonion)  
Monoalkyl ammonium chloride (cation)
8. プラスチック, ゴム等の添加剤 Additive reagents from plastics or rubber
9. フィルム添加剤 標品 Standard mixture of film additives  
BHT, Irganox 1076, Erucic amid
10. フィルム添加剤 Film additives

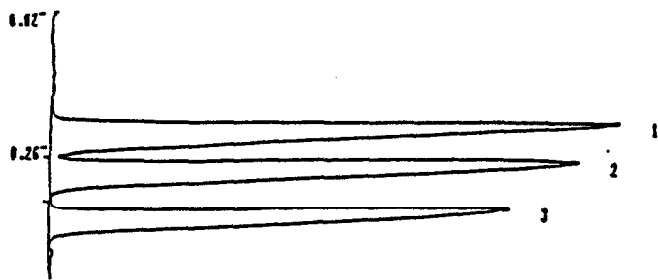
11. 紫外線吸収剤 Ultraviolet absorbent  
 2(2'-Hydroxy-3'-tert-butyl-5'-methylphenyl)-5-chlorobenzo-  
 triazole (Tomisoap 600)  
 2-Hydroxy-4-n-octoxybezophenone (Tomisoap 800)
12. 老化防止剤 Antioxidant (Age resistor)  
 BHT (BHT Swanox)  
 Octylated diphenylamine (Nonflex OD-3)  
 Pentaerythritol tetrakis [3-(3,5-di-tert-butyl-4-hydroxyphenyl)  
 propionate] (Tominox TT)  
 N,N,-Di-β-Naphthyl-p-phenylenediamino (DNBP, Nonflex F)
13. 添加剤 標品 Standard mixture of additive reagents  
 BHT, Mark 2112, Denon-331P, DMTDP, Irganox 1010,  
 Cadenax GS-90, Erucyl amide
14. ポリエチレンペレットからの抽出物 Extract from polyethylene pellet  
 BHT, Denon 331P, DMTDP, Irganox 1010, Cadenax GS-90

B) 下記の成分名は略語を用います。

Components are expressed in the following abbreviations.

成分名 Component	略語 Abbreviation
Diethyl Phthalate	DEH
Dibutyl Phthalate	DBT
Butylated hydroxytoluene	BHT
Mercaptobenzothiazole	MBT
Dibenzothiazyl disulfide	MBTS

1. Phthalic acid, Monoethyl phthalate, Diethyl phthalate



CAL.	METHOD	00	FA	FB	
		SF			
		.100000E+03	.100000E+01	.100000E+01	
NO.	NAME	RT	A OR H	MK	CONC
1		0.248	11455	H	37.2275
2		0.318	10269	H	35.1018
3		0.401	0625		27.6005
TOTAL			31250		100.0000

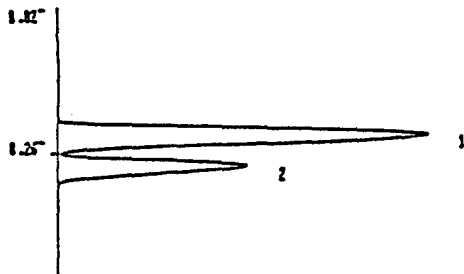
Mobile phase

n-Hexane:Ethyl ether:Formic acid 30:30:1 10cm

Component

1.Phthalic acid 2.Monoethyl phthalate 3.Diethyl phthalate

2. 可塑剂 Plasticizer



CAL.	METHOD	00	PA	PB	
		SF			
		.100000E+03	.100000E+01	.100000E+01	
NO.	NAME	RT	A OR H	MK	CONC
1		0.252	29340	D <sup>1</sup> M	69.3173
2		0.311	12907	D	30.6826
TOTAL			42327		100.0000

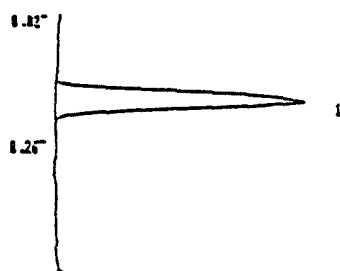
Mobile phase

n-Hexane:Ethyl ether 58:12 10cm

Component

1.DOP 2.DBP

### 3. 酸化防止剤(1) Antioxidant(1)



CAL.	METHOD	00	SF	PA	PB
			.100000E+03	.100000E+01	.100000E+01
NO.	NAME	RT	A OR H	MK	CONC
1		0.193	10776	D	100.0000
TOTAL			10776		100.0000

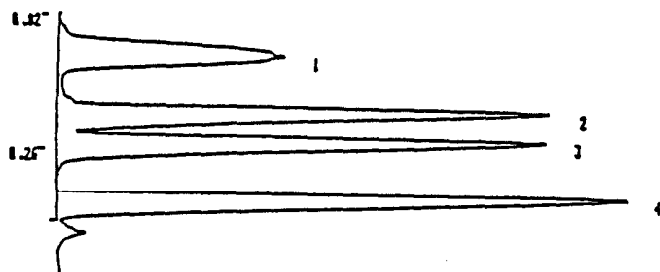
Mobile phase

n-Hexane:Ethyl ether 36:24 10cm

Component

1.BHT

### 4. 酸化防止剤(2) Antioxidant(2)



CAL.	METHOD	00	SF	PA	PB
			.100000E+03	.100000E+01	.100000E+01
NO.	NAME	RT	A OR H	MK	CONC
1		0.099	11968	D	17.9900
2		0.203	17137	D	25.7720
3		0.253	17080	D	25.6850
4		0.362	20310	D H	30.5440
TOTAL			66496		100.0000

Mobile phase

1st n-Hexane:Chloroform 45:15 10cm

2nd n-Hexane:Chloroform 40:20 10cm

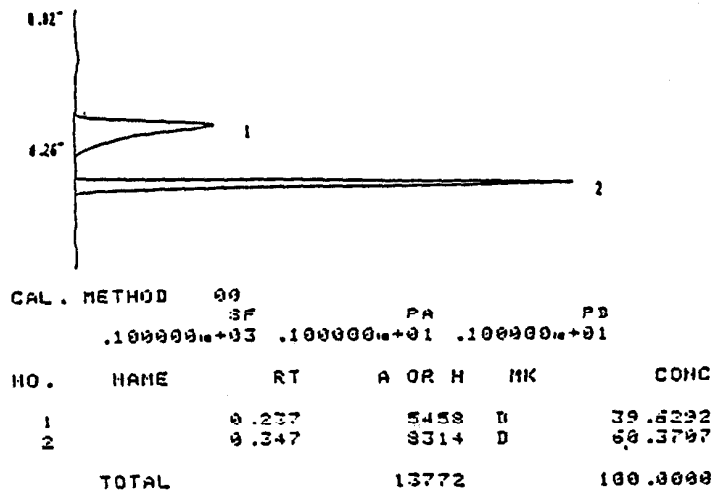
Component

1.BHT (Yoshinox BHT) 2.Dimyrystyl thiodipropionate (DMTP Yoshitomi)

3.Pentaerythritol tetrakis 3-(3,5-di-tert-butyl-4-hydroxyphenyl) propionate (Tominox TT)

4.4,4'-Butylidenebis-(6-tert-butyl-3-methylphenol) (Yoshinox BB)

5. 加硫促進劑 Rubber accelerator



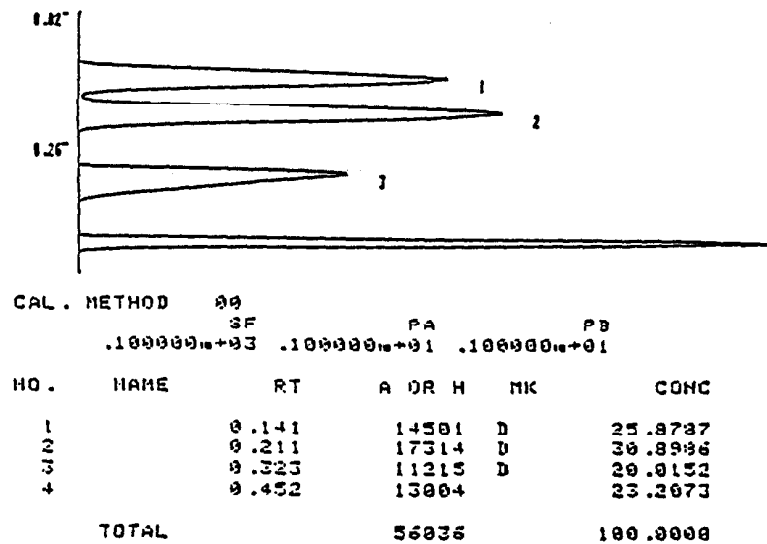
Mobile phase

n-Hexane:Ethyl ether:Formic acid 50:20:1 10cm

Component

1.MBT 2.MBTS

6. 滑劑 Slip additive



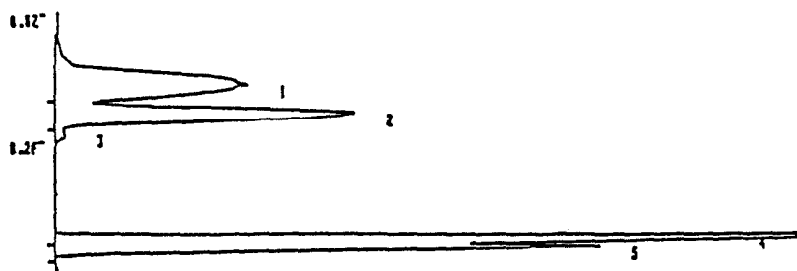
Mobile phase

n-Hexane:Ethyl ether:Formic acid 65:5:0.15 10cm

Component

1.Parafin 2.n-Buthyl starete 3.Stearic acid 4.Stearamide

9. フィルム添加剤 標品 Standard mixture of film additives



CAL. METHOD	DF	SF	PA.	FB	
		.100000e+03	.100000e+01	.100000e+01	
NO.	NAME	RT	A OR H	NK	CONC
1		0.156	12126	M	25.3708
2		0.211	11111	M	23.2473
3		0.253	255		0.5350
4		0.451	16736	M	35.0156
5		0.468	7567	M	15.8312
TOTAL			47730		100.0000

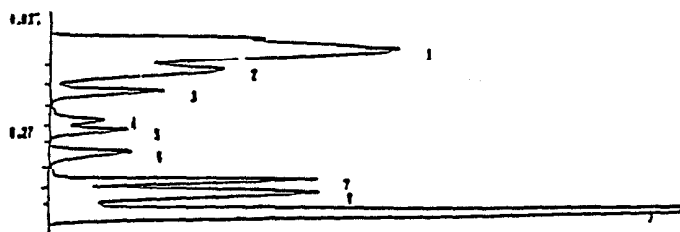
Mobile phase

1st n-Hexane:Ethyl ether:Formic acid 60:10:0.1 8cm  
 2nd n-Hexane:Ethyl ether:Formic acid 66.5:3.5:0.1 11cm

Component

1.BHT 2.Irganox 1076 3.Erucic amid

10. フィルム添加剤 Film additives

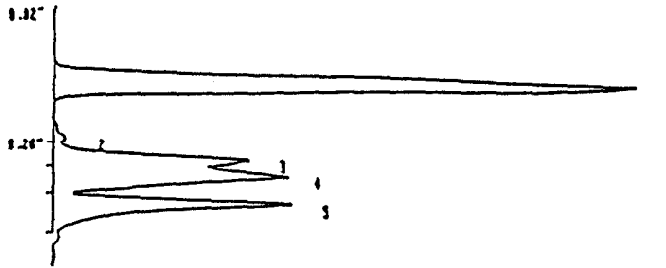


CAL. METHOD	DF	SF	PA.	FB	
		.100000e+03	.100000e+01	.100000e+01	
NO.	NAME	RT	A OR H	NK	CONC
1		0.117	11533	M	29.4955
2		0.158	2229	M	8.3793
3		0.203	1324	M	3.5348
4		0.262	541	M	1.6756
5		0.294	836	M	2.1189
6		0.329	1025	M	2.7502
7		0.325	2706	M	6.8994
8		0.423	4345	M	11.0140
9		0.468	13502	M	34.2209
TOTAL			39445		100.0000

Mobile phase

1st n-Hexane:Ethyl ether:Formic acid 60:10:0.1 8cm  
 2nd n-Hexane:Ethyl ether:Formic acid 66.5:3.5:0.1 11cm

7. 帯電防止剤 Antistatic agent



NO.	NAME	RT	A OR H	MK	CONC
1		0.165	21096	D	47.6502
2		0.267	395	D M	0.8937
3		0.309	5795	D M	13.9692
4		0.339	9329	D M	21.9718
5		0.391	7666	D M	17.3166
TOTAL			44274		100.0000

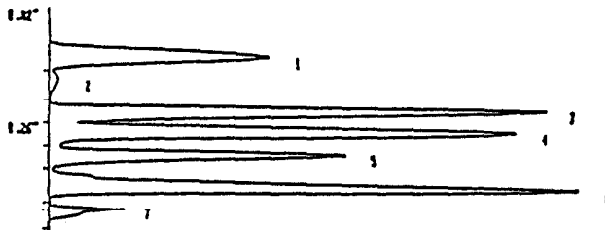
Mobile phase

Chloroform:Methanol:Formic acid 50:20:1 10cm

Component

1.Sodium N-myristoyl sarcosinate (anion) 2.POE(5) Oleyl amine (nonion)  
5.Monoalkyl ammonium chloride (cation)

8. プラスチック, ゴム等の添加剤 Additive reagents plastics or rubber



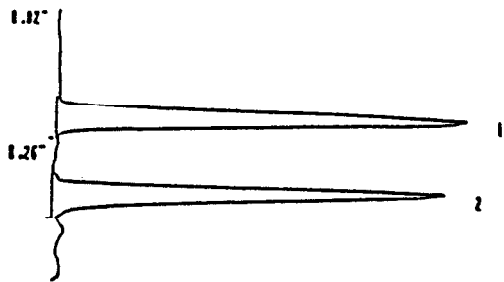
NO.	NAME	RT	A OR H	MK	CONC
1		0.123	19879	M	14.8138
2		0.174	1025	M	0.7236
3		0.248	31973	M	22.4978
4		0.297	32821	M	23.1591
5		0.334	17992	M	12.6397
6		0.498	34463	M	24.3157
7		0.454	3775	M	2.6639
TOTAL			141734		100.0000

Mobile phase

1st Chloroform:Methanol:Water 65:5:0.5 2.0cm  
2nd n-Hexane:Ethyl ether:Formic acid 60:10:0.2 6.5cm  
3rd n-Hexane 100% 10.0cm



11. 紫外線吸収剤 Ultraviolet absorbent



CAL. METHOD		09	SF		PA	PB
			.100000e+03	.100000e+01	.100000e+01	
NO.	NAME	RT	A OR H	MK	CONC	
1		9.212	15189	D H	54.1899	
2		9.342	12848	D H	45.8129	
TOTAL			28028		100.0009	

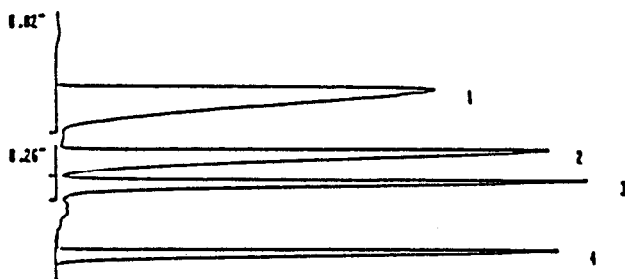
Mobile phase

n-Hexane:Chloroform 50:10 10cm

Component

1. 2(2'-Hydroxy-3'-tert-butyl-5'-methylphenyl)-5-chlorobenzotriazole (Tomisoap 600)
2. 2-Hydroxy-4-n-octoxybezophenone (Tomisoap 800)

12. 老化防止剤 Antioxidant (Age resistor)



CAL. METHOD		09	SF		PA	PB
			.100000e+03	.100000e+01	.100000e+01	
NO.	NAME	RT	A OR H	MK	CONC	
1		9.169	18372	D H	37.4347	
2		9.279	13727	D H	27.9717	
3		9.339	9924	D H	19.3873	
4		9.458	7953		16.2061	
TOTAL			49977		100.0009	

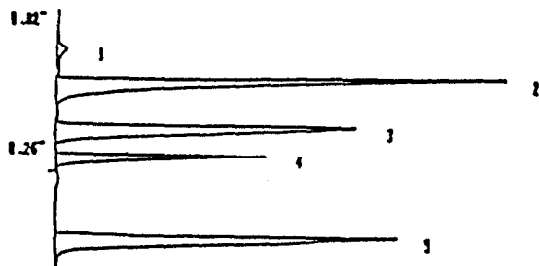
Mobile phase

- 1st n-Hexane:Ethyl ether 42:28 5cm  
 2nd n-Hexane 100% 10cm  
 3rd n-Hexane 100% 10cm

Component

1. BIT (BIT Swanox)
2. Octylated diphenylamine (Nonflex OD-3)
3. Pentaerythritol tetrakis [3-(3,5-di-tert-butyl-4-hydroxyphenyl) propionate] (Tominox TT)
4. N,N-Di-β-Naphthyl-p-phenylenediamino (DNDF, Nonflex F)

13. 添加剤 標品 Standard mixture of additive reagents



CAL. METHOD		09	PA	PB	
		SF			
		.100000e+03	.100000e+01	.100000e+01	
NO.	NAME	RT	A OR H	HK	CONC
1		0.094	353	D	1.3741
2		0.158	7919	D	30.7561
3		0.246	6773	D	26.3072
4		0.300	3555	D H	13.8129
5		0.458	7145		27.7495
TOTAL			25748		100.0000

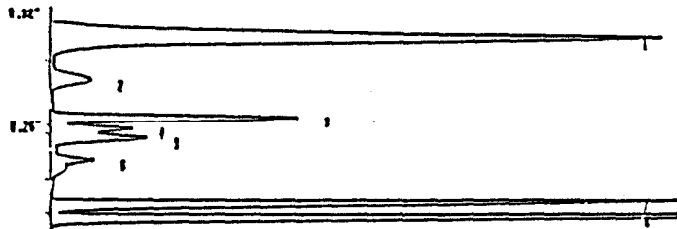
Mobile phase

1st	n-Hexane:Ethyl ether	36:27	5cm
2nd	n-Hexane:Ethyl ether:Formic acid	60:10:0.2	8cm
3rd	n-Hexane	100%	10cm

Component

- 2.BHT + Mark2112 3.Denon-331P + DMTDP 4.Irganox1010  
5.Cadenax GS-90 + Erucyl amide

14. ポリエチレンペレットからの抽出物 Extract from polyethylene pellet



CAL. METHOD		09	PA	PB	
		SF			
		.100000e+03	.100000e+01	.100000e+01	
NO.	NAME	RT	A OR H	HK	CONC
1		0.096	22172	D H	34.1376
2		0.176	1699	D	2.6143
3		0.250	5919	D H	8.9594
4		0.295	1699	D H	2.6150
5		0.396	2522	D	3.8830
6		0.353	1467	D H	2.2525
7		0.447	12271	D H	19.8939
8		0.488	17301		26.5376
TOTAL			64959		100.0000

Mobile phase

1st	n-Hexane:Ethyl ether	36:27	5cm
2nd	n-Hexane:Ethyl ether:Formic acid	60:10:0.1	8cm
3rd	n-Hexane	100%	10cm

Component

- 2.BHT 3.Denon 331P + DMTDP 5.Irganox 1010 7.Cadenax GS-90