

# Gas Chromatography

C A T A L O G



**SHINWA CHEMICAL INDUSTRIES LTD.**

## Packing Material

Packed column and capillary column are used for GC analysis. Packed column is a glass or stainless tube packed with stationary phase coated diatomite. Capillary column are fused-silica or stainless tubing coated or chemically bonded with stationary phase on the inner wall. We would like to introduce our excellent GC Packed materials.

### Support

The support hold the stationary phase and the ideal support is said to have no direct contribution to the separation of samples. According to the characteristics of the support, tailed peak or decomposition of the component are sometimes caused. Therefore, packing material should be chosen for each analytical needs.

The conditions required as supports are as follows:

- 1) **Holding stationary phases firmly**
- 2) **Having a structure with proper surface area to contribute a good separation**
- 3) **Not to adsorb itself the samples, the surface should be inert physically and chemically**
- 4) **Excels in mechanical strength and have a good permeability of carrier gas**
- 5) **Excels in heat resistance**

In general, diatomaceous earth is used as a GC support. There are two types of brown and white support.

Compared with white support, brown support has large surface area and can be coated with wide range of stationary phases from low concentration to high. The white support has a low surface activity, so even in low concentration coating of the stationary phase, high sensitive analysis are possible without any adsorption and decomposition.

Telephthalic acid, fluoride support and so on are also used according to the analytical requirements.

- 1) **Diatomite (brown type, white type)**
- 2) **Fluoride beads**
- 3) **Quartz**
- 4) **Glass beads**
- 5) **Telephthalic acid beads**
- 6) **Porous polymer beads, carbon**
- 7) **Adsorbents (aluminum, charcoal and other GSC supports)**

As the diatomite has a metal oxide and silanol group on the surface, adsorption or decomposition of the samples are caused by the interaction between sample and the surface. To remove metal oxide, acid or base treatment are performed. To weaken the activity of silanol, silanization reagent is used for end capping.

Treatment	Contents of the Treatment
NAW	Non acid washed
AW	Acid washed (neutral in pH)
BT	Base treated (alkaline in pH)
BW	Base washed (neutral in pH)
AW-BW	Acid washed and base treated (alkaline)
AW-DMCS	Acid washed and DMCS treated (neutral)

### Stationary Phase

The sample vaporized at the sample injection port is separated by the distribution equilibrium between stationary phase and gaseous phase. There are many kind of stationary phases from non-polar (e.g. squalene) to polar (e.g. polyethyleneglycol) . The sample and stationary phase that have similar polarity show strong affinity and sample is retained strongly on the stationary phase. There are about 300 kinds of stationary phase for GC.

The characteristics of the stationary phases required for GC are as follows:

- 1) **It has low melting point and low vaporized pressure at high temperature so as to keep liquid state at the time of use. Furthermore, having a heat resistance and heat stability.**
- 2) **Stable chemically at the time of use. Having a long life time and reproducibility.**
- 3) **Small resistance of mass transfer.**
- 4) **The quick distribution equilibrium results in the increase of the separation efficiency.**

Category	Class	Appellation
Hydrocarbons	Paraffin hydrocarbons	Apiezon L, Squalane, Hexatriacontane, n-Hexadecane, n-Dodecane
Halogen compounds	Fluorine oils	Kel F Oil No.3, Halocarbon Oil, Fluorolube HG1200
Oxygen compounds	Monoesters	Dibutyl Maleate(DBM), Dioctyl Phthalate(DOP), Dioctyl Sebacate(DOS), Dinonyl Phthalate(DNP), Flexol 8N8
	Polyesters	FFAP, FON, Thermon-1000, Thermon-3000, 1, 4-BDS, DEGS, DEGA, EGA, EGS, NGS, NGA
	Alcohols	Diglycerol, Hyprose SP-80, Mannitol, Undecanol
	Ethers (Polyesters are contained)	Polyphenyl Ether, Bis(2-butoxyethyl) Phthalate
	Polyglycols	Polyethyleneglycols, Ucons
Nitrogen compounds	Amides	Poly-A Series, Versamide900
	Amines	Quadrol, Triethanolamine
	Nitriles	N,N-Bis(2-Cyanoethyl) Formamide(BCEF), 1, 2, 3,-Tris(2-Cyanoethoxy) Propane(TCEP), , '-Oxydipropionitrile(ODPN)
	Nitro compounds, Others	Alukaterge T, 4, 4-Azoxydianisol
Silicones	Methylsilicone	SE-30, DC-200, DC-11, DC-410, OV-1, UCW-98
	Methylphenylsilicone	SE-52, OV-17, OV-3, OV-22, DC-550, DC-710
	Methylphenylvinylsilicone	SE-54
	Trifluoropropylsilicone	QF-1, OV-210
	Cyanoalkylmethylsilicone	XF-1150, OV-105(Propyl)
	Cyanopropylphenylsilicone	OV-225
	Others and Compounds	OV-275, Dexsil Series
Sulfur compounds		Dimethyl Sulfide, Polysulfone, Poly-S Series
Phosphorus compounds	Phosphoric Acid Ester	Tricresyl Phosphate(TCP) Trixylenyl Phosphate(TXP)
Salts, Organic acids, Chlorine-compounds		Bentone 34

## Original Support

Products Name	Characteristics
Shimalite®	Support of diatomaceous earth for high and middle concentration
Shimalite® W	Support of diatomaceous earth for low concentration
Shimalite® TPA	Terephthalic acid support
Shimalite® F	Fluorocarbon polymer (Polytetrafluoroethylene) support
Shimalite® Q	Quartz support
SHINCARBON A	High purity carbon support
Sunpak-A	Porous polymer bead

## Shimalite®

**Shimalite®** is our original brown colored support which are prepared from high purity diatomite. Shimalite® is available for from low to high boiling point sample.

Shimalite® (Shimalite can keep middle or high concentration of stationary phase on the support) (100ml)				
Mesh size	30 / 60	60 / 80	80 / 100	100 / 120
Treatment	NAW, AW, AW-DMCS, BT			

## Shimalite® W

**Shimalite® W** is suitable for analyses of biochemical and pharmaceutical samples (steroids, alkaloids, carbohydrates, amino acid and agricultural chemicals) . The surface activity of Simalite W is very small, so the adsorption of samples on the support is very weak even in low concentration of stationary phases. It is suitable for small amount and rapid analysis of high boiling temperature and activated substances.

Shimalite® W (The white diatomite for analysis of low concentration stationary phase) (100ml)				
Mesh size	30 / 60	60 / 80	80 / 100	100 / 120
Treatment	NAW, AW, AW-DMCS, BT			

## Shimalite® TPA

**Shimalite® TPA** is a terephthalic acid support which can be used for the analysis of water contained samples. Shimalite TPA is suitable for the analysis of aldehyde, fatty acid and alcohol having less 7 carbon number in water. It also be used for the analysis of samples which has such strong adsorption as sulfur compounds.

Shimalite® TPA (The maximum temperature of Shimalite® TPA is 185 ) (100ml)		
Mesh size	30 / 60	60 / 80
Treatment	-	

## Support

### Shimalite® F

**Shimalite®F** is the teflon (4-fluoro ethylene polymer) support. Both Shimalite TPA have a very small surface activity and can be used for the analysis of adsorptive substances such as water.

<b>Shimalite® F</b> (The maximum temperature of Shimalite® F is 210 )				<b>(100ml)</b>
Mesh Size	30 / 60	60 / 80	80 / 100	
Treatment	-			

### Shimalite® Q

**Shimalite® Q** is crystal particles with very small adsorbed activity . It is also used as a resistance tube of reference column.

<b>Shimalite® Q</b> (Quartz support )		<b>(100ml)</b>
Mesh size	100 / 180	
Treatment	Non-treatment, AW-DMCS	

### SHINCARBON A

**SHINCARBON A** is a highly purified carbon support for GC obtained from firing of synthesized polymer and treatment of high deactivity. It has high heat and high water resistance. It can be used for the analysis of water solution containing the substances having low to high boiling point or very small amount substances in the air, which could not be applied on the diatomite, terephthalic acid and teflon support.

#### Characteristics

- 1) **This carbon support is highly deactivated. It is very stable in physically and chemically. The polar compounds such as alcohol or fatty acid are not adsorbed on the surface. As it can not be dehydrated, it is suitable for the analysis of the water soluble compounds.**
- 2) **Support force of the stationary phase and separation ability of SHINCARBON A are equal to diatomaceous earth carrier.**
- 3) **As it consists of 100% carbon, it can be used at high temperature using deactivated.**
- 4) **The mechanical strength is strong since the material is the vitreous carbon, and there are no generation of the fine powder. Therefore, the permeability of the carrier gas become lower on the column pressure, and the separation efficiency is improved.**
- 5) **There is no deviation between lots, because they are not natural product like diatomaceous earth but chemical synthesis product.**

<b>SHINCARBON A</b> (Inactivated carbon support)			<b>(100ml)</b>
Mesh size	60 / 80	80 / 100	
Treatment	-		

**Sunpak-A**

Sunpak-A is the high-performance porous polymer beads highly crosslinked by the original technology. And, the packing materials coated with stationary phase on the Sunpak-A is applied to the separation for such sample as the decomposition and adsorption phenomena is caused on the diatomide as usual.

- 1) Lower hydrocarbons  $C_1 \sim C_3$  in water-content sample. It is possible to analyze lower alcohols  $C_2 \sim C_7$  and inorganic gas  $CO_2$ .
- 2) It is excellent in the microanalysis in the organic solvent.

<b>Sunpak-A</b> (Porous polymer beads) (50ml)	
Max. Temp.	250

**CATALYST FOR THE REDUCTION****Shimalite®-Ni (Catalyst for the reduction )**

- 1) It is catalytic particles which has the thin layer of the metallic nickel structure on the diatomaceous earth particle surface for the reduction.
- 2) It is effective as a reducing agent to convert the material which does not have the sensitivity for hydrogen flame ionization detector (FID) such as carbon dioxide ( $CO_2$ ) and carbon monoxide (CO) into methane ( $CH_4$ ).

<b>Shimalite®-Ni</b> (Reduced) (20ml)
It is the catalyst for the high sensitive analysis (the ppm level) by methane conversion of carbon monoxide, carbon dioxide, formaldehyde, and so on

**GLASS BEADS (Non porous glass beads )**

<b>GLASS BEADS</b> (Non porous glass beads) (100g)			
Mesh size	15 / 30	30 / 60	60 / 80
Treatment	Strontium hydroxide	Alkaline	-

## Support

### Import Support

<b>Chromosorb W (100ml)</b>				
Mesh size	30 / 60	60 / 80	80 / 100	100 / 120
treatment	NAW, AW, AW-DMCS, HP			
	-	HP		

<b>Chromosorb G (100ml)</b>				
Mesh size	45 / 60	60 / 80	80 / 100	100 / 120
Treatment	NAW, AW, AW-DMCS, HP			
	-	-	HP	

<b>Chromosorb P (100ml)</b>				
Mesh size	30 / 60	60 / 80	80 / 100	100 / 120
Treatment	NAW, AW, AW-DMCS, HP			
	-	HP		

<b>Celite545 (100ml)</b>				
Mesh size	30 / 60	60 / 80	80 / 100	100 / 120
Treatment	U, A, AS			

<b>C-22 (100ml)</b>				
Mesh size	30 / 60	60 / 80	80 / 100	100 / 120
Teratment	NAW, AW, AW-DMCS			

## Porous polymer Beads

### High Performance Porous Polymer Beads

Sunpak-A			(50ml)
P/N	Mesh size	Max Temp	
S-98	50 / 80	250	

P/N	Stationary phase	Max Temp	%	Polarity	Supprt	Application
A-42	Apiezon + KOH	220	5 + 1	Non	Sunpak-A	Low amines
F-17	Fon	250	5	Strong		Lower fatty acids
T-86	Thermon 1000 + KOH		5 + 3			Lower diamines
T-87	Thermon 1000 + KOH		5 + 1			Amino alcohol
T-88	Thermon 1000		5			Solvents in water
T-89	Thermon 3000 + KOH		5 + 1			Lower amines

Sunpak-S			(50ml)
P/N	Max temp	Application	
S-125	190	Hydrogen sulfide and carbonyl sulfide in hydrocarbons (C <sub>1</sub> – C <sub>4</sub> )	

### TENAX® TA

TENAX® TA is suitable for the analysis of alcohols, glycols, diols, amines and high boil point and polar compounds. But it's not suitable for analysis of the hydrocarbons. It's also useful as a trap material to collect the atmospheric organic compounds such as styrene monomer in air.

TENAX-TA	
Max temp	375
Mesh size	20/35, 35/60, 60/80, 80/100
Capacity	5g, 8g, 15g

( TENAX® TA is 2,6-diphenyl-*p*-phenylen oxide based porous polymer having a weak polarity. Maximum operating temperature is 375 . )



## Porous Polymer Beads

Porapak® (Made in Waters Corporation)					
Type	Max temp	Volume	Mesh size	Application	
Porapak-P	250	20g	50/80	Carbonyl compounds (Low polarity), Glycols, Alcohols (slightly-polar column)	
Porapak-Q		26g		80/100	O <sub>2</sub> in N <sub>2</sub> , and organic compounds in aqueous hydrocarbons (versatility purpose column)
Porapak-R		24g			100/120
Porapak-S		26g	Alcohols (iso- and normal- type )		
Porapak-PS		20g	Aldehydes, glycols (low-tailing type-P column)		
Porapak-QS			26g		Organic acids, Polar compounds easy to cause Tailing (low-tailing type-P column)
Porapak-N	190	29g		CO <sub>2</sub> , NH <sub>3</sub> , Water, Acetylene gas from C <sub>2</sub> -hydrocarbons	
Porapak-T		31g		Formaldehyde in water (High polarity)	

### Polymer Type

**P : Styrene - Divinylbenzene**

**Q : Ethylvinylbenzene – Divinylbenzene**

**R : Vinylpyrrolidone**

**S : Vinylpyridone**

**N : DVB - EVB – Ethyleneglycoldimethacrylate**

**T : EGDMA**

Chromosorb Century Series (Made in Celite Corporation)					
Type	Max temp	Volume	Mesh size	Application	
101	275	25g	50/80	Water, Free fatty acids, Glycols, Alcohols	
102	250			80/100	Oxygen compounds, Permanent gases
103	275				100/120
105	250		CO <sub>2</sub> , NH <sub>3</sub> , Water, Acetylene gas from C <sub>2</sub> -hydrocarbons		
106			Lower fatty acids(C <sub>2</sub> ~ C <sub>5</sub> ), Lower Alcohols(C <sub>2</sub> ~ C <sub>5</sub> )		
107			Formalin		
108			Polar compounds, Water, Alcohols, Aldehydes, Glycols		

### Polymer type

**101 : Styrene - Divinylbenzene**

**102 : Styrene - Divinylbenzene**

**103 : Cross - Linked Polystyrene**

**105 : Polyaromatic**

**106 : Cross - Linked Polystyrene**

**107 : Cross - Linked Acrylic Ester**

**108 : Cross - Linked Acrylic**

## Adsorbent

### Adsorbent

Adsorbent				
Adsorbent	Capacity	P/N	Mesh size	Application
SHINCARBON ST	10g (30ml)	S-130	50/80	Permanent gases and organic gases (C <sub>1</sub> – C <sub>2</sub> )
Activated Alumina	100ml	A-1	30/60	Inorganic gases and hydrogen
		A-2	60/80	
		A-2D	80/100	
Activated Charcoal		A-3	30/60	Inorganic gases and hydrogen
		A-4	60/80	
		A-4D	80/100	
Molecular Sieve 5A		M-1	30/60	Inorganic gases, methane and so on
		M-2	60/80	
		M-2D	80/100	
Molecular Sieve 13X		M-3	30/60	Inorganic gases, methane and so on
	M-4	60/80		
	M-4D	80/100		
Silica Gel	S-1	40/70	Permanent gases, organic gases and so on	
	S-2	60/80		
	S-2D	80/100		

## Stationary Phase

P/N	Stationary Phase	gram
<b>A</b>		
LA-17	Acetyl Tributyl Citrate	25
LA-4	Apiezon H	25
LA-5	Apiezon L	25
LA-6	Apiezon M	25
LA-7	Apiezon N	25
LA-12	Apiezon T	25
LA-16	4, 4'-Azoxydianisol	10
LA-18	4, 4'-Azoxydiphenetole	1
<b>B</b>		
LB-6	Bentone 34	25
LB-1	7, 8-Benzoquinoline	25
LB-2	Benzyl Cyanide (Phenyl-Acetonitrile)	25
LB-3	Benzyl Diphenyl	25
LB-7	N, N'-Bis(2-Cyanoethyl) Formamide (Deleterious)	25
LB-12	Bis(2-Ethoxyethyl)Sebacate	25
LB-13	Bis(2-Ethylhexyl)Tetrachloro Phthalate	10
LB-14	N, N7-Bis(p-Methoxybenzylidene) - , ' -bi-p-Toluidine (BMBT)	5
LB-9	Bis(2-Butoxyethyl)Phthalate (BBEP)	25
LB-10	Nis(2-Methoxyethyl)Adipate (BMEA)	25
LB-11	1, 4-Butanediol Apipate (1, 4-BDA)	25
LB-5	1, 4-Butanediol Succinate (1, 4-BDS)	25
<b>C</b>		
LC-3	Carnauba Wax	25
LC-2	Caster Wax	25
LC-5	Citroflex 4(Tributyl Citrate)	25
<b>D</b>		
LD-13	Daifloil No.3	
LD-14	Daifloil No.10	
LD-19	Daifloil No.100	
LD-21	Dexsil 300GC	
LD-22	Dexsil 400GC	
LD=23	Dexsil 410GC	

P/N	Stationary Phase	gram
LD-7	Dibutyl Maleate (DBM)	25
LD-11	Dibutyl Phtalate (DBP)	25
LD-24	Dibutyl Sebacate (DBS)	25
LD-4	Didecyl Phthalate (DDP)	25
LD-25	Diethylene Glycol (DEG)	25
LD-1	Diethyleneglycol Adipate (DEGA)	25
LD-26	Diethyleneglycol Sebacate (DEGSe)	25
LD-18	Diethyleneglycol Succinate (DEGS)	10
LD-16	Diglycerol	25
LD-3	Diisodecyl Phthalate (DIDP)	25
LD-27	Diisopropyl Phthalate (DIPP)	25
LD-5	Dilauryl Phthalate (DLP)	25
LD-9	Dimethyl Formamide (DMF)	25
LD-29	Dimethyl Sulfolane (DMS)	5
LD-28	Dimethyl Sulfoxide (DMSO)	25
LD-10	Dinonyl Phthalate (DNP)	25
LD-30	Diocetyl Adipate	25
LD-12	Diocetyl Phthalate (DOP)	25
LD-17	n-Dodecane	25
LD-15	Dodecylbenzene Sulfonic Acid Sodium Salt	25
<b>E</b>		
LE-8	ECNSS-M(Ethylene Succinate- Cyanoethyl Silicone Polymer)	10
LE-9	ECNSS-S(Organo Silicone Polymer)	10
LE-7	EGSS-X(Organo Silicone Polymer)	5
LE-10	EGSS-Y(Organo Silicone Polymer)	10
LE-5	EPON 1001(Epoxyresin)	25
LE-6	Ethofat 60/25	25
LE-1	Ethylacetoacetate	25
LE-2	Ethyleneglycol Succinate(EGS)	25
<b>F</b>		
LF-3	FFAP(Free Fatty Acid Polyester)	10
LF-6	Flexol 8N8	25
<b>G</b>		
LG-2	Glutaronitrile	25
LG-1	Glycerol	25

## Stationary Phase

P/N	Stationary Phase	gram
<b>H</b>		
LH-4	n-Hexadecane	25
LH-6	Hexamethyl Phosphoramidate	25
LH-1	Hexatriacontane	25
LH-5	Hyprose SP-80	25
<b>I</b>		
LI-1	Igepal CO-880	25
LI-5	Igepal CO-990	25
LI-3	, ' -Iminodipropionitrile	25
LI-6	Isophthalic Acid	25
LI-2	Isoquinoline	25
<b>J</b>		
LJ-1	JXR Silicone	10
<b>K</b>		
LK-1	Kel F Oil No.3	25
LK-2	Kel F Oil No.10	25
<b>L</b>		
LL-6	Lanoline	25
LL-8	Liquid Paraffin	25
<b>M</b>		
LM-1	Mannitol	25
<b>N</b>		
LN-4	-Naphthylamine	25
LN-7	Neopentylglycol Isophthalate	25
LN-2	Neopentylglycol Succinate(NGS)	25
LN-5	Nonyl Phenol	25
<b>O</b>		
LO-4	n-Octadecane	25
LO-3	, ' -Oxydipropionitrile(ODPN)	25
LO-10	OV-1 (Demethylsilicone Gum)	10
LO-11	OV-101 (Demethylsilicone)	10
LO-12	OV-3 (10% Phenylmethysilicone)	10
LO-13	OV-7 (20% Phenylmethysilicone)	10

P/N	Stationary Phase	gram
LO-14	OV-11 (35% Phenylmethysilicone)	10
LO-15	OV-17 (50% Phenylmethysilicone)	10
LO-16	OV-22 (65% Phenylmethysilicone)	10
LO-17	OV-25 (75% Phenylmethysilicone)	10
LO-18	OV-61 (33% Phenylmethysilicone)	10
LO-19	OV-73 (Diphenyldimethylsilicone Gum)	10
LO-20	OV-105 (Cyanopropylsilicone)	5
LO-21	OV-202 (Trifluoropropylmethylsilicone)	5
LO-22	OV-210 (Trifluoropropylmethylsilicone)	10
LO-23	OV-215 (Trifluoropropylmethylsilicone-Gum)	5
LO-24	OV-225 (25% Phenyl 25% Cyanopropyl silicone)	5
LO-25	OV-275(Dicyanoallylsilicone)	5
LO-26	OV-330 (Silicone Carbowax Copolymer)	5
LO-27	OV-351 (Polyglycol-Nitroterephthalic)	10
LO-28	OV-1701 (Dimethylphenylcynsilicone)	3
<b>P</b>		
LP-13	Paraffin Wax	25
LP-33	POLY-A 101A	5
LP-24	POLY-A 103	5
LP-22	Polythyleneglycol 200 (PEG 200)	25
LP-27	Polythyleneglycol 300 (PEG 300)	25
LP-3	Polythyleneglycol 400 (PEG 400)	25
LP-4	Polythyleneglycol 600 (PEG 600)	25
LP-5	Polythyleneglycol 1000 (PEG 1000)	25

## Stationary Phase

P/N	Stationary Phase	gram
LP-6	Polythylene glycol 1500 (PEG 1500)	25
LP-7	Polythylene glycol 1540 (PEG 1540)	25
LP-23	Polythylene glycol 2000 (PEG 2000)	25
LP-8	Polythylene glycol 4000 (PEG 4000)	25
LP-9	Polythylene glycol 6000 (PEG 6000)	25
LP-10	Polythylene glycol 9000 (PEG 9000)	25
LP-11	Polythylene glycol 20M (PEG 20M)	25
LP-28	PEG 20M-TPA	10
LP-29	Polyethyleneimine	25
LP-16	Polyphenyl Ether(5 rings)OS-124	10
LP-17	Polyphenyl Ether(6 rings)	10
LP-31	Polyvinylpyrrolidone(PVP)	25
LP-14	Propylenecarbonate	25
LP-12	Propyleneglycol	25
LP-39	Propylsulfone	10
LP-19	Propyleneglycol Sebacate	25
LP-20	Propyleneglycol Sebacate	25
LP-21	Propyleneglycol Seccinate	25
<b>Q</b>		
LQ-1	Quadrol	25
LQ-2	Quinoline	25
<b>R</b>		
LR-1	Reoplex 400	25
<b>S</b>		
LS-32	Sebacic Acid	25
LS-33	Sebaconitrile	25
LS-36	SILAR-5CP	5
LS-37	SILAR-7CP	5

P/N	Stationary Phase	gram
LS-38	SILAR-9CP	5
LS-1	Silicone DC 11	25
LS-2	Silicone DC 200 (Dimethylsilicone Oil)	25
LS-3	Silicone DC 550 (25% Phenylmethylsilicone)	25
LS-4	Silicone DC 702	25
LS-47	Silicone DC 704	25
LS-5	Silicone DC-710 (50% Phenylmethylsilicone)	25
LS-7	Silicone DC QF-1(FS-1265) (50% Trifluoropropylmethylsilicone)	25
LS-8	Silicone SE-30 (Dimethylsilicone Gum)	25
LS-10	Silicone SE-52 (5% Phenylmethylsilicone)	25
LS-29	Silicone SE-54 (1% Vinyl 5% Phenylmethylsilicone)	25
LS-11	Silicone SE-96 (Dimethylsilicone Fluid)	25
LS-14	Silicone XF-1150	10
LS-97	Silicone Oil KF-96 (Dimethylsilicone Fluid)	25
LS-48	Silicone UC L-45	25
LS-31	Silicone UC W-98	25
LS-43	Siponate DS-10	25
LS-20	Sorbitol	25
LS-21	Span 40	25
LS-22	Span 60	25
LS-23	Span 80	25
LS-19	Squalane	25
LS-106	Squalene	25
LS-34	Stearic Acid	25
LS-35	Stearyl Amine	25
LS-18	Sucrose Diacetate Hexaisobutyrate(SAIB)	25
LS-107	Sulfolane	25

## Stationary Phase

P/N	Stationary Phase	gram
<b>T</b>		
LT-24	Terephtharic Acid	25
LT-26	Tetraethyleneglycol Dimethyl Ether	25
LT-25	Tetraethylene Pentamine	25
LT-2	Tetradecanol(Myristyl Alcohol)	25
LT-6	Tetrahydroxyrthyl Ethylene Diamine(THEED)	25
LT-16	Thiodipropionitlie(TDPN)	25
LT-21	Triacetin	25
LT-20	Tri- <i>N</i> -butylphosphate(TBP)	25
LT-22	Tributyryne	25
LT-7	Tricresylphosphate(TCP)	25
LT-10	Triethanolamine(TEA)	25
LT-28	Triethyleneglycol	25
LT-11	Triisobutylene(TIB)	25
LT-8	Tri- <i>m</i> -Cresylphosphate	25
LT-1	1,2,3-Tris(2-Cyanoethoxy)Propane(TCEP)	25
LT-18	Tritone X-100	25
LT-19	Tritone X-305	25
LT-12	Tween 20	25
LT-13	Tween 40	25
LT-14	Tween 60	25
LT-15	Tween 80	25
LT-30	Tween 85	25

P/N	Stationary Phase	gram
<b>U</b>		
LU-7	Ucon 50-HB-280X	25
LU-8	Ucon 50-HB-2000	25
LU-9	Ucon 50-HB-5100	25
LU-10	Ucon 75-HB-90000	25
LU-1	Ucon LB-550X	25
<b>V</b>		
LV-1	Versamid 900	25
LV-2	Versamid 930	25
LV-3	Versamid 940	25

## Packing Material

We have many standard packing materials in order to satisfy your analytical demand. The item marked P/N in the table is the standard materials. The other are special ordered packing materials.

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
<b>A</b>								
	Acetyl Tributyl Citrate (-25 ~ 180) (Citroflex A-4)	High	1 ~ 25	Support you asked for			100ml	
A-40	Advance-DS (30 ~ 230)	-	5 1 ~ 25	Chromosorb W	80/100	AW-DMCS	50ml	Free fatty acids Organic acids Fatty acid methyl- esters Acetylated sugar
A-41	Advance-DS + H <sub>3</sub> PO <sub>4</sub> (30 ~ 230)	High	2+0.5	Chromosorb W	80/100	AW-DMCS	50ml	Chloric pesticide
	Alkaterge T (10 ~ 70)	High	1 ~ 25	Support you asked for			100ml	Lower amines
	Apiezon H (20 ~ 300)	Non	1 ~ 10 10 <	Support you asked for			100ml	High boiling point- compounds
A-10	Apiezon L (20 ~ 300)	Non	25	Shimalite	60/80	NAW	100ml	High boiling point- compounds
A-35			25	Shimalite	80/100	NAW		
A-43			20	Chromosorb W	60/80	AW-DMCS		
A-44			10	Shimalite W	60/80	AW-DMCS		
A-45			10	Chromosorb W	60/80	AW-DMCS		
A-46			10	Chromosorb W	80/100	AW-DMCS		
A-47			5	Shimalite W	60/80	AW-DMCS		
A-48			5	Shimalite W	80/100	AW-DMCS		
A-49			5	Chromosorb W	60/80	AW-DMCS		
A50			5 1 ~ 10 10 <	Chromosorb W	80/100	AW-DMCS Support you asked for		
A-42	Apiezon L + KOH (30 ~ 300)	Non	5+1	Sunpak-A	50/80		50ml	Lower amines
A-51			20+10	Chromosorb W	60/80	AW-DMCS	100ml	Amines
A-52	Apiezon L + Na Capronate (30 ~ 300)	Non	20+10	Chromosorb W	60/80	AW-DMCS	100ml	Nitrile, Dinitrile
A-24	Apiezon M (20 ~ 275)	Non	25 1 ~ 10 10 <	Shimalite	60/80	NAW	100ml	High boiling point- compounds
	Apiezon M (20 ~ 250)	Non	1 ~ 10 10 <	Support you asked for			100ml	High boiling point- compounds
	Apiezon M (20 ~ 250)	Non	1 ~ 10 10 <	Support you asked for			100ml	High boiling point- compounds
	Apiezon Wax W (20 ~ 250)	Non	1 ~ 25	Support you asked for			100ml	High boiling point- compounds
A-53	Armeen SD (30 ~ 100)	Mid	10	Shimalite W	60/80	AW-DMCS	100ml	Amines
A-54			10	Chromosorb W	60/80	AW-DMCS		Nitriles
			1 ~ 25	Support you asked for				
	Atpet 80 (30 ~ 100)	Low	1 ~ 25	Support you asked for			100ml	Lower Hydrocarbons

## Packing material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
	4,4'-Azoxydianisole (30 ~ 150)	Mid	1 ~ 10 10 <	Support you asked for			100ml	Aromatic-hydrocarbons
	4,4'-Azoxydiphenetole (135 ~ 150)	Low	1 ~ 10 10 <	Support you asked for			100ml	
<b>B</b>								
	Bentone 34 (60 ~ 200)	Mid	1 ~ 25	Support you asked for			100ml	
B-19	Bentone 34 + DNP (60 ~ 150)	Mid	5+5	Shimalite	80/100	NAW	50ml	Aromatic hydrocarbon isomers, especially-xylene isomer
B-22	Bentone 34 + DDP (60 ~ 150)	Mid	1 ~ 25	Support you asked for			100ml	Xylene isomers
B-37	Bentone 34 + Silicone DC-200 (50 ~ 200)	Low	5+5	Chromosorb W	60/80	AW-DMCS	100ml	Xylene isomers
B-32	Bentone 34 + DIDP (60 ~ 150)	Mid	5+5	Shimalite	80/100	NAW	100ml	Xylene isomers
	7,8-Benzoquinoline (30 ~ 100)	High	1 ~ 10 10 <	Support you asked for			100ml	Aromatic hydrocarbon isomers
	Bees Wax (30 ~ 110)	Low	1 ~ 25	Support you asked for			100ml	Alchol, Esters
	Bendyl Cyanide (Phenyl-Acetonitrile) (0 ~ 50)	High	1 ~ 25	Support you asked for			100ml	Hydrocarbons (olefine and parafine)
B-17	Benzyl Cyanide+AgNO <sub>3</sub> (0 ~ 50)	High	35	Shimalite	60/80	NAW	100ml	Hydrocarbons (olefine and parafine)
B-7	Benzyl Diphenyl (30 ~ 100)	Low	25 1 ~ 10 10 <	Shimalite	60/80	NAW	100ml	Hydrocarbons
B-27	N,N'-Bis(2-Cyanoethyl) Formamide (20 ~ 125)	High	15 1 ~ 10 10 <	Shimalite	60/80	NAW	100ml	Hydrocarbons
	Bis(2-Ethoxyethyl) Sebacate ( ~ 150)	High	1 ~ 10 10 <	Support you asked for			100ml	
	Bis(2-Ethylhexyl)Tetrachloro Phthalate (0 ~ 150)	Mid	1 ~ 10 10 <	Support you asked for			100ml	
	N,N'-Bis(p-Methoxybenzylidene)- , -bi-p- Toluidine(BMBT) (180 ~ 200)	-	1 ~ 10 10 <	Support you asked for			100ml	
	Bis(2-Buthxyethyl)Phthalate (BBEP) (30 ~ 175)	Mid	1 ~ 25	Support you asked for			100ml	Hydrocarbons



## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
	Bis(2-Methoxyethyl Adipate) (BMEA) (20 ~ 80)	Mid	1 ~ 10 10 <	Support you asked for			100ml	Hydrocarbons
BMEE (See Tetraethyleneglycol Dimethyl Ether)								
	1,4-Butanediol Adipate (1,4-BDA) (30 ~ 210)	High	1 ~ 25	Support you asked for			100ml	Fatty acid esters
B-28	1,4-Butanediol Succinate (1,4-BDS) (50 ~ 210)	High	20	Shimalite	60/80	AW	100ml	Fatty acid esters
B-18			20	Chromosorb W	60/80	AW		
B-33			10	Shimalite W	60/80	AW-DMCS		
B-34			10	Chromosorb W	60/80	AW-DMCS		
B-35			5	Shimalite W	60/80	AW-DMCS		
B-36			5	Chromosorb W	60/80	AW-DMCS		
			1 ~ 25	Support you asked for				
B-29	1,4-Butanediol Succinate-HG (50 ~ 190)	High	20	Chromosorb W	80/100	AW-DMCS	100ml	Alkyl mercury-compounds
B-30			10	Chromosorb W	80/100	AW-DMCS		Phenyl mercury-compounds
C								
Carbowax (See Polyethyleneglycol)								
	Carnauba Wax (90 ~ 200)	Mid	1 ~ 25	Support you asked for			100ml	Hydrocarbons
C-10	Castor Wax (90 ~ 200)	Mid	20 1 ~ 25	Shimalite	60/80	NAW	100ml	High boiling point-compounds
				Support you asked for				
	Citroflex 4(Tributyl Citrate) (30 ~ 150)	Mid	1 ~ 25	Support you asked for			100ml	Alcohols, Esters Aromatic-hydrocarbons
C-3	Cyclohexanedimethanol Succinate(CHDMS) (20 ~ 250)	Mid	20	Shimalite	60/80	AW	100ml	High boiling point-compounds Fatty acid esters
C-9			10	Shimalite W	60/80	AW		
C-2			5	Shimalite W	60/80	AW		
C-8			1.5	Chromosorb W	60/80	AW-DMCS		
					1 ~ 10 10 <	Support you asked for		
D								
	Daifloil No.3 (0 ~ 50)	Non	1 ~ 25	Support you asked for			100ml	Corrosion compounds
	Daifloil No.10 (0 ~ 50)	Non	1 ~ 25	Support you asked for			100ml	Corrosion compounds
	Daifloil No.100 (0 ~ 50)	Non	1 ~ 25	Support you asked for			100ml	Corrosion compounds
D-88	Dexsil 300GC (50 ~ 500)	Non	2	Chromosorb W	80/100	HP	100ml	Triglycerides
D-89	(DMCS-HP 350 )		2	Chromosorb W	80/100	AW		High boiling point-compounds
				1 ~ 2 2 <	Support you asked for			

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
D-90 D-91	Dexsil 400GC (20 ~ 400) (DMCS-HP 350 )	Low	2 2 1 ~ 2 2 <	Chromosorb W Chromosorb W Support you asked for	80/100 80/100	HP AW	100ml	High boiling point- compounds
	Dexsil 410GC (20 ~ 400) (DMCS-HP 350 )	Mid	2 2 1 ~ 2 2 <	Chromosorb W Chromosorb W Support you asked for	80/100 80/100	HP AW	100ml	High boiling point- compounds
D-6 D-84	Dibutyl Maleate(DBM) (-10 ~ 50)	High	25 25 1 ~ 25	Shimalite W Shimalite W Support you asked for	60/80 80/100	NAW NAW	100ml	Lower hydrocarbons
D-10	DBM + ODPN (0 ~ 50)	High	35 (95:5)	Shimalite	60/80	NAW	100ml	
D-11	DBM + Propylene Carbonate (0 ~ 30)	High	35 (35:65)	Shimalite	60/80	NAW	100ml	
	Dibutyl Phthalate(DBP) (20 ~ 100)	Mid	1 ~ 25	Support you asked for			100ml	hydrocarbons Esters
	Dibutyl Sebacate(DBS) (20 ~ 70)	Mid	1 ~ 25	Support you asked for			100ml	hydrocarbons Esters
D-69	Didecyl Phthalate(DDP) (10 ~ 125)	Mid	20 1 ~ 25	Shimalite Support you asked for	60/80	NAW	100ml	hydrocarbons Esters
	Diethylene Glycol(DEG) (20 ~ 50)	High	1 ~ 25	Support you asked for			100ml	hydrocarbons Esters
D-70 D-81 D-1	Diethyleneglycol Adipate (DEGA)(20 ~ 225)	High	15 10 5 1 ~ 25	Shimalite Chromosorb W Shimalite W Support you asked for	60/80 60/80 60/80	AW AW AW	100ml	Fatty acid esters
	Diethyleneglycol Isophthalate(DEGIP) (20 ~ 200)	High	1 ~ 25	Support you asked for			100ml	Fatty acid esters
	Diethyleneglycol Sebacate(DEGSe) (30 ~ 210)	High	1 ~ 25	Support you asked for			100ml	High boiling point- compounds Fatty acid esters
D-23 D-123S D-60S D-25 D-85 D-125S D-86S D-58 D-58S D-87S D-26S	Diethyleneglycol Succinate(DEGS) (20 ~ 225)	High	25 25 25 15 15 15 15 15 15 15 10	Shimalite Celite 545 Chromosorb W Shimalite Shimalite Celite 545 Shimalite W Chromosorb W Chromosorb W Chromosorb W Shimalite W	60/80 60/80 60/80 60/80 80/100 60/80 80/100 60/80 60/80 80/100 60/80	AW AS AW-DMCS AW AW AS AW-DMCS AW AW-DMCS AW-DMCS AW-DMCS	100ml	Fatty acid esters

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
D-27S D-82S	Diethyleneglycol Succinate(DEGS) (20 ~ 225)	High	5 5 1 ~ 25	Shimalite W Chromosorb W Support you asked for	60/80 60/80	AW-DMCS AW-DMCS	100ml	Fatty acid esters
D-73S D-28S D-28 D-74	Diethyleneglycol Succinate + H <sub>3</sub> PO <sub>4</sub> (DEGS + H <sub>3</sub> PO <sub>4</sub> ) (20 ~ 225)	Mid	10+1 5+1 5+1 2+0.5	Chromosorb W Chromosorb W Chromosorb W Chromosorb W	60/80 60/80 60/80 80/100	AW-DMCS AW-DMCS AW AW-DMCS	100ml	Organic acids Organic acid-antiseptics Chloric pesticide
D-54	Diglycerol (20 ~ 150)	High	25 1 ~ 25	Shimalite Support you asked for	60/80	NAW	100ml	Esters, Alcohols
D-80	Diglycerol + Tetraethylene Pentamine + KOH (20 ~ 80)	High	15+15+2	Chromosorb W	80/100	AW-DMCS	100ml	Lower amines
	Diisodecyl Phthalate (DIDP)(20 ~ 150)	Mid	1 ~ 25	Support you asked for			100ml	Hydrocarbons Lower alcohols
	Diisopropyl Phthalate (DIPP) (20 ~ 150)	Mid	1 ~ 25	Support you asked for			100ml	Hydrocarbons
	Dilauryl Phthalate(DLP) (20 ~ 70)	Mid	1 ~ 25	Support you asked for			100ml	Hydrocarbons Lower alcohols
D-12	Dimethyl Formamide (DMF)(-10 ~ 30)	High	50 1 ~ 50	Shimalite Support you asked for	60/80	NAW	100ml	Lower hydrocarbons
D-8 D-9	Dimethyl Sulfolane (DMS)(-10 ~ 50)	High	25 25 1 ~ 10 10 <	Shimalite Shimalite Support you asked for	60/80 80/100	NAW NAW	100ml	Lower hydrocarbons
	Dimethyl Sulfoxide(DMSO) (-10 ~ 50)	High	1 ~ 25	Support you asked for			100ml	Lower hydrocarbons
D-14 D16 D15 D-45	Dinonyl Phthalate (DNP)(0 ~ 150)	Mid	25 25 5 5 1 ~ 25	Shimalite Shimalite Shimalite Shimalite Support you asked for	60/80 80/100 60/80 60/80	BT BT BT BT	100ml	Esters Alcohols
D-78	Dinonyl Phthalate + H <sub>3</sub> PO <sub>4</sub> (DNP+H3P4)(0 ~ 150)	Mid	6+1	Chromosorb W	60/80	AW-DMCS	100ml	Phenols
	Diocetyl Adipate (20 ~ 150)	Mid	1 ~ 25	Support you asked for			100ml	Esters, Alcohols
D-126 D-17 D-18 D-124 D-127	Diocetyl Phthalate [Di(2-Ethylhexyl) Phthalate] (DOP) (20 ~ 150)	Mid	30 25 25 20 10	Chromosorb W Celite 545 Chromosorb W Shimalite Shimalite	80/100 60/80 60/80 60/80 80/100	AW-DMCS AS AW-DMCS AW AW	100ml	Esters, Alcohols

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
D-128	Diocetyl Phthalate [Di(2-Ethylhexyl) Phthalate] (DOP) (20 ~ 150)	Mid	10 1 ~ 25	Chromosorb W  Support you asked for	80/100	AW-DMCS	100ml	Esters, Alcohols
D-4 D-62	Octoil S (Diocetyl-Sebacate) [Di(2-Ethylhexyl) Sebacate] (DOS) (0 ~ 140)	Mid	25 20 1 ~ 25	Shimalite Chromosorb W  Support you asked for	60/80 60/80	NAW AW	100ml	Esters, Alcohols
D-19	DOP-B (50 ~ 120)	Mid	30	Shimalite	60/80	NAW	100ml	The thinner- containing alcohols
	n-Dodecane (-10 ~ 30)	Non	1 ~ 25	Support you asked for			100ml	Lower hydrocarbons
	Dodecylbenzene Sulfonic Acid Sodium Salt (20 ~ 150)	High	1 ~ 25	Support you asked for			100ml	Solvents Phenols Cresols
E								
	ECNSS-M(Ethylene Succinate Cyanoethyl Silicone Polymer) (50 ~ 220)  ECNSS-S is similar (50 ~ 190)	Low	1 ~ 5 5 <	Support you asked for			100ml	Monosaccharide Fatty acid- methylesters
E-24	EGSS-X (50 ~ 225)	Low	10 1 ~ 5 5 <	Chromosorb W  Support you asked for	60/80	AW-DMCS	100ml	Fatty acid esters
	EGSS-Y (50 ~ 210)	Low	1 ~ 5 5 <	Support you asked for			100ml	Monosaccharide Fatty acid- methylesters
E-25 E-26	EPON 1001(Epoxyresin) (50 ~ 200)	High	10 10 1 ~ 25	Shimalite W Chromosorb W  Support you asked for	60/80 60/80	AW-DMCS AW-DMCS	100ml	Compound- containing oxygen
E-13	Ethofat 60/25 (20 ~ 120)	Low	20 1 ~ 10 10 <	Shimalite F  Support you asked for	20/80	AW-DMCS	100ml	Aldehyde Alcohols Esters
	Ethylacetoacetate (-10 ~ 30)	Low	1 ~ 25	Support you asked for			100ml	Low boiling point- compounds
E-5 E-27 E-28 E-29 E-30 E-31	Ethyleneglycol Adipate(EGA) (50 ~ 225)	High	25 20 10 10 2 0.5 1 ~ 25	Shimalite Chromosorb W Shimalite W Chromosorb W Chromosorb G Chromosorb W  Support you asked for	60/80 60/80 60/80 60/80 60/80 80/100	AW AW-DMCS AW-DMCS AW-DMCS AW-DMCS AW	100ml	Fatty acid esters    Pesticide residue Amino acid

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
E-7	Ethylene glycol Sebacate (EGSe) (50 ~ 225)	High	15 1 ~ 25	Shimalite F Support you asked for	20/80		100ml	Compound-containing oxygen Alcohols
E-3 E-32 E-33 E-34	Ethylene glycol Succinate (EGS) (50 ~ 225)	High	25 20 10 10 1 ~ 25	Shimalite Chromosorb W Shimalite W Chromosorb W Support you asked for	60/80 60/80 60/80 60/80	AW AW-DMCS AW-DMCS AW-DMCS	100ml	Fatty acid esters
<b>F</b>								
F-2 F-3 F-1 F-7 F-18	FAL-M (20 ~ 80) (30 ~ 210) (30 ~ 0) (30 ~ 210) (30 ~ 210)	Low	25 12 10 10 10	Chromosorb W Shimalite Shimalite TPA Shimalite TPA SHINCARBON A	80/100 80/100 30/60 60/80 80/100	AW-DMCS AW-DMCS AW-DMCS AW-DMCS	100ml	Lower free fatty acids Lower free fatty acids-in water
F-5	FAP-S (30 ~ 180)	Mid		Chromosorb W	60/80	AW	100ml	Cresol, Xylenol, Alkylphenols
F-8	FFAP (Free Fatty Acid Polyester) (30 ~ 275)	High	10 1 ~ 10 10 <	Shimalite TPA Support you asked for	60/80		100ml	General solvents Fatty acids
F-19	FFAP + H <sub>3</sub> PO <sub>4</sub> (30 ~ 250)	High	0.3 + 0.3	Graphite Carbon	60/80		10g	Lower free fatty acids
F-16	Flexol 8N8 (20 ~ 150)	Low	25 1 ~ 10 10 <	Chromosorb W Support you asked for	60/80	AW-DMCS	100ml	Ethyleneoxide Propyleneoxide
F-13 F-15 F-12 F-14 F-17	FON (20 ~ 250)	High	20 20 10 10 5 1 ~ 10 10 <	Celite545 Chromosorb W Celite545 Chromosorb W Sunpak-A Support you asked for	80/100 80/100 800/100 80/100 50/80	A AW-DMCS A AW-DMCS	50ml	Free fatty acids Organic acids Higher alcohols Styrene monomer-in the resin General solvents-in water
<b>G</b>								
	Glycerol (20 ~ 100)	High	1 ~ 25	Support you asked for			100ml	Alcohols
	Glutaronitrile (20 ~ 100)	High	1 ~ 10 10 <	Support you asked for			100ml	Lower hydrocarbons
<b>H</b>								
H-6	n-Hexadecane (0 ~ 50)	non	25 1 ~ 25	Shimalite Support you asked for	60/80	NAW	100ml	Lower hydrocarbons (Boiling point order-elution)

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
H-14	Hexamethyl Phosphoramide (-10 ~ 35)	Mid	25 1 ~ 25	Shimalite	60/80	NAW	100ml	
				Support you asked for				
H-2	Hexatriacontane (50 ~ 100)	Non	30 1 ~ 10 10 <	Shimalite	60/80	NAW	100ml	Hydrocarbons
				Support you asked for				
H-16	High Vacuum Grease (20 ~ 180)	Non	25	Shimalite	60/80	NAW	100ml	Hydrocarbons
H-19			20	Chromosorb W	60/80	AW-DMCS		
				Support you asked for				
H-21	Hyprose SP-80 (20 ~ 150)	Non	10	Shimalite W	60/80	AW-DMCS	100ml	Purfumes and- Refined oils
H-22			10	Chromosorb W	60/80	AW-DMCS		
				Support you asked for				
I								
I-5	Igepal CO-880 (20 ~ 200)	Low	10	Shimalite W	60/80	AW-DMCS	100ml	Compounds- containing oxygen Esters
I-6			10	Chromosorb W	60/80	AW-DMCS		
				Support you asked for				
	Igepal CO-990 (50 ~ 220)	Low	1 ~ 25	Support you asked for			100ml	Alcohols, Ketones Esters
	Iminodipropionitrile (20 ~ 100)	Mid	1 ~ 25	Support you asked for			100ml	Hydrocarbons
	Isophthalic Acid (10 ~ 100)	Mid	1 ~ 25	Support you asked for			100ml	Carbonic acids
	Isoquinoline (0 ~ 50)	Mid	1 ~ 25	Support you asked for			100ml	Lower hydrocarbons
J								
J-1	JXR Silicone (30 ~ 300)	Non	2	Shimalite W	60/80	AW-DMCS	100ml	High boiling- temperature- compounds
J-2			1.5	Chromosorb W	60/80	AW-DMCS		
				Support you asked for				
				Support you asked for				
K								
K-1	Kel F Oil No.3 (0 ~ 50)	Mid	10	Shimalite F	20/80		100ml	Halogenide
				Support you asked for				
K-2	Kel F Oil No.10 (0 ~ 100)	Mid	10	Shimalite F	20/80		100ml	Halogenide
				Support you asked for				
				Support you asked for				
L								
	Lanoline (20 ~ 200)	Low	1 ~ 25	Support you asked for			100ml	
L-6	Lanoline(Denatured) (20 ~ 200)	Low	10	Chromosorb W	80/100	AW-DMCS	100ml	Cresol (Separation of o,m- and p)
				Support you asked for				

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
L-8	Lubrol MOA+KOH (30 ~ 150)	Low	10+1	Chromosorb W	60/80	AW-DMCS	100ml	Dimethylformamide
	Liquid Paraffin (30 ~ 130)	Non	1 ~ 25	Support you asked for			100ml	
<b>M</b>								
	Mannitol (30 ~ 200)	High	1 ~ 25	Support you asked for			100ml	Nitrogen contained-compounds
<b>N</b>								
	-Naphthylamine (20 ~ 70)	Mid	1 ~ 25	Support you asked for			100ml	Hydrocarbons
N-20	Neopentylglycol Adipate(NGA) (50 ~ 225)	High	15	Shimalite W	60/80	AW-DMCS	100ml	Fatty acid esters
N-21			15	Chromosorb W	60/80	AW-DMCS		
			1 ~ 25	Support you asked for				
	Neopentylglycol Isophthalate(50 ~ 225)	High	1 ~ 25	Support you asked for			100ml	
	Neopentylglycol Sebacate (NGSe)(50 ~ 225)	High	1 ~ 25	Support you asked for			100ml	High boiling-temperature-compounds
N-22	Neopentylglycol Succinate (NGS)(50 ~ 240)	High	5	Shimalite W	60/80	AW-DMCS	100ml	Fatty acid esters
N-23			5	Chromosorb W	60/80	AW-DMCS		
N-17			2	Chromosorb W	60/80	AW-DMCS		
N-24			1.5	Shimalite W	60/80	AW-DMCS		
N-4			1	Chromosorb W	60/80	AW-DMCS		
N-25			1	Chromosorb W	80/100	AW-DMCS		
			1 ~ 25	Support you asked for				
	Nonyl Phenol (20 ~ 120)	Low	1 ~ 25	Support you asked for			100ml	Phenols Alcohols
<b>O</b>								
	n-Octadecane (0 ~ 90)	Non	1 ~ 25	Support you asked for			100ml	Hydrocarbons
D-4	Octoil S (Dioctyl-Sebacate) [Di(2-Ethylhexyl) Sebacate] (DOS) (0 ~ 140)	Mid	25	Shimalite	60/80	NAW	100ml	Esters Alcohols
D-62			20	Chromosorb W	60/80	AW		
			1 ~ 25	Support you asked for				
OV-1 (See Silicone OV-1)		OV-101 (See Silicone OV-101)						
OV-17(See Silicone OV-17)		OV-210 (See Silicone OV-210)						
OV-25(See Silicone OV-25)		OV-225 (See Silicone OV-225)						
O-42	Oxydipropionitrile (ODPN) (0 ~ 100)	High	25	Shimalite	60/80	NAW	100ml	hydrocarbons
O-55			25	Shimalite	80/100	NAW		Mercaptanes
O-56			25	Chromosorb W	60/80	AW-DMCS-ST		Sulfur compounds (Monosulfides)
			1 ~ 25	Support you asked for				

**AW-DMCS-ST** means the special treatment for the analysis of sulfur compounds

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
P								
	Paraffin Wax (20 ~ 80)	Non	1 ~ 25	Support you asked for			100ml	Hydrocarbons
	POLY-A 101A (50 ~ 275)	Mid	1 ~ 5 5 <	Support you asked for			100ml	High boiling- temperature- compounds
	POLY-A 103 (50 ~ 275)	Mid	1 ~ 5 5 <	Support you asked for			100ml	High boiling- temperature- compounds
	Polyethyleneglycol 200 (PEG 200) (10 ~ 100)	High	1 ~ 25	Support you asked for			100ml	Lower Alcohols Thinner
	Polyethyleneglycol 300 (PEG 300) (10 ~ 100)	High	1 ~ 25	Support you asked for			100ml	Lower Alcohols Thinner
P-22 P-70	Polyethyleneglycol 400 (PEG 400) (10 ~ 100)	High	25 15 1 ~ 25	Shimalite Shimalite W Support you asked for	60/80 60/80	BT BT	100ml	Lower Alcohols Thinner
P-6 P-84 P-85 P-56	Polyethyleneglycol 600 (PEG 600) (10 ~ 125)	High	25 20 10 10 1 ~ 25	Shimalite Chromosorb W Shimalite TPA Shimalite TPA Support you asked for	60/80 60/80 30/60 60/80	BT BT	100ml	Lower Alcohols Thinner
P-10 P-11 P-110 P-87 P-71 P-88 P-89	Polyethyleneglycol 1000 (PEG 600) (10 ~ 125)	High	25 25 25 20 10 10 10 1 ~ 25	Shimalite Shimalite Celite 545 Chromosorb W Shimalite W Shimalite TPA Shimalite TPA Support you asked for	60/80 80/100 60/80 60/80 60/80 30/60 60/80	BT BT	100ml	Lower Alcohols Thinner
P-29 P-134 P-30 P-72	Polyethyleneglycol 1500 (PEG 1500) (10 ~ 150)	High	25 25 15 10 1 ~ 10	Shimalite Chromosorb W Shimalite F Shimalite W Support you asked for	60/80 60/80 20/80 60/80	BT AW-DMCS BT	100ml	General solvents
	Polyethyleneglycol 1540 (PEG 1540) (50 ~ 150)	High	1 ~ 25	Support you asked for			100ml	General solvents
	Polyethyleneglycol 2000 (PEG 2000) (20 ~ 150)	High	1 ~ 25	Support you asked for			100ml	General solvents
P-73	Polyethyleneglycol 4000 (PEG 4000) (50 ~ 170)	high	10 1 ~ 10	Shimalite W Support you asked for	60/80	BT	100ml	General solvents



## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application			
P-15	Polyethyleneglycol 6000 (PEG 6000) (50 ~ 200)	High	25	Shimalite	60/80	BT	100ml	Nitogen contained-compounds			
P-16	(50 ~ 200)		25	Shimalite	80/100	BT					
P-90	(50 ~ 200)		20	Chromosorb W	60/80	BT					
P-115	(50 ~ 200)		15	Celite 545	60/80	BT					
P-18	(50 ~ 200)		15	Shimalite F	20/80						
P-17	(50 ~ 200)		10	Shimalite W	60/80	BT					
P-74	(50 ~ 185)		10	Shimalite TPA	30/60						
P-91	(50 ~ 185)		10	Shimalite TPA	60/80						
P-130	(50 ~ 200)		10	SHINCARBON A	60/80				50ml	Lower fatty acids	
			1 ~ 25	Support you asked for			100ml				
P-19	PEG6000 + KOH (50 ~ 200)	High	10+10	Chromosorb W	60/80	BT	100ml	Nitogen contained-compounds			
P-135			15+1	Chromosorb 103	80/100		25g	Lower amines			
P-47	Polyethyleneglycol 20M (PEG 20M) (50 ~ 230)	High	25	Shimalite	60/80	NAW	100ml	Hydrocarbons Alcohols Esters Ketones			
P-48	(50 ~ 230)		25	Shimalite	80/100	NAW					
P-120	(50 ~ 230)		25	Chromosorb W	60/80	AW-DMCS					
P-46	(50 ~ 230)		20	Shimalite	60/80	NAW					
P-49	(50 ~ 230)		20	Shimalite	80/100	NAW					
P-57	(50 ~ 230)		20	Chromosorb W	60/80	AW					
P-58	(50 ~ 230)		20	Chromosorb W	80/100	AW					
P-25	(50 ~ 230)		20	Chromosorb W	60/80	AW-DMCS					
P-26	(50 ~ 230)		20	Chromosorb W	80/100	AW-DMCS					
P-54	(50 ~ 230)		15	Shimalite F	20/80						
P-45	(50 ~ 230)		10	Shimalite	80/100	NAW					
P-51	(50 ~ 230)		10	Shimalite	80/100	NAW					
P-75	(50 ~ 230)		10	Shimalite	80/100	NAW					
P-121	(50 ~ 230)		10	Shimalite	80/100	AW-DMCS					
P-122	(50 ~ 230)		10	Shimalite	80/100	AW-DMCS					
P-55	(50 ~ 230)		10	Chromosorb W	60/80	AW					
P-56	(50 ~ 230)		10	Chromosorb W	60/80	AW					
P-23	(50 ~ 230)		10	Chromosorb W	60/80	AW-DMCS					
P-24	(50 ~ 230)		10	Chromosorb W	80/100	AW-DMCS					
P-136	(50 ~ 185)		10	Shimalite TPA	60/80						
P-131	(50 ~ 230)		10	SHINCARBON A	60/80				50ml		
			1 ~ 25	Support you asked for					100ml		
	PEG 20M-TPA (50 ~ 250)		Mid	1 ~ 10 10 <	Support you asked for				100ml	Aldehydes Alcohols, Ketones	

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
	Polyethyleneimine (0 ~ 180)	Mid	1 ~ 25	Support you asked for			100ml	High polar-compounds
P-127	Polyphenyl Ether (5 rings) (OS-124) (10 ~ 200)	Low	10	Shimalite W	60/80	AW-DMCS	100ml	Aromatic-Hydrocarbons
P-128	(10 ~ 200)		10	Chromosorb W	60/80	AW-DMCS		Sulfur compounds Phenols in water  Phenols in water
P-81	(10 ~ 185)		10	Shimalite TPA	30/60			
P-82	(10 ~ 185)		10	Shimalite TPA	60/80			
			1 ~ 10 10 <	Support you asked for				
P-129	Polyphenyl Ether (6 rings) (10 ~ 210)	Low	10	Shimalite W	60/80	AW-DMCS	100ml	Aromatic-Hydrocarbons
P-132			10	Chromosorb W	60/80	AW-DMCS		
			1 ~ 10 10 <	Support you asked for				
P-133	Polysulfone (240 ~ 330)	High	10	Chromosorb W	60/80	NAW	100ml	High boiling-temperature-compounds
			1 ~ 10 10 <	Support you asked for				
	Polyvinylpyrrolidone (PVP) (30 ~ 200)	Low	1 ~ 25	Support you asked for			100ml	High boiling-temperature-compounds
	Propylenecarbonate (0 ~ 50)	High	25 1 ~ 25	Shimalite	60/80	BT	100ml	Lower hydrocarbons
			Support you asked for					
	Propyleneglycol (30 ~ 150)	Mid	1 ~ 25	Support you asked for			100ml	Alcohols, Esters
	Propylsulfone (0 ~ 50)	High	1 ~ 25	Support you asked for			100ml	Lower hydrocarbons
P-65	Propyleneglycol Adipate (10 ~ 225)	High	20 1 ~ 25	Shimalite	60/80	AW	100ml	High boiling-temperature-compounds, Esters
			Support you asked for					
P-66	Propyleneglycol Sebacate (10 ~ 225)	High	20 1 ~ 25	Shimalite	60/80	AW	100ml	High boiling-temperature-compounds, Esters
			Support you asked for					
P-67	Propyleneglycol Succinate (10 ~ 225)	High	20 1 ~ 25	Shimalite	60/80	AW	100ml	High boiling-temperature-compounds, Esters
			Support you asked for					
<b>Q</b>								
Q-11	Quadrol (10 ~ 150)	High	5	Shimalite W	60/80	AW-DMCS	100ml	Higher amines
Q-12			5	Chromosorb W	60/80	AW-DMCS		Aromatic amines
			1 ~ 25	Support you asked for				
	Quinoline (0 ~ 50)	Hgih	1 ~ 10	Support you asked for			100ml	Lower hydrocarbons

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
R								
R-1	Reoplex 400 (20 ~ 80)	High	20	Shimalite	60/80	NAW	100ml	High boiling-temperature-compounds
R-2			20	Chromosorb W	60/80	AW-DMCS		Terpenes
R-3			10	Chromosorb W	80/100	AW-DMCS		Anaerobe-identification
			1 ~ 25	Support you asked for				
S								
SAIB (See Sucrose Diacetate Hexaisobutyrate)								
S-93	SBS-1 (20 ~ 120)	Mid	10	Shimalite TPA	60/80		100ml	General solvents
S-94	SBS-100 (30 ~ 150)	Mid	10	Shimalite TPA	60/80		100ml	Working environment-measurement-substances
S-120	SBS-120 (30 ~ 150)	Mid	12	SHINCARBON A	80/100		50ml	Organic solvents-in the air Working environment-measurement-substances
S-99	SBS-200 (30 ~ 250)	Low	20	Shimalite W	100/120	AW-DMCS	100ml	Working environment-measurement-substances
S-100	SBS-300 (30 ~ 280)	Non	20	Shimalite W	80/100	AW-DMCS	100ml	Chloric solvents
	Sebacic Acid (20 ~ 150)	Mid	1 ~ 25	Support you asked for			100ml	
S-66	Sebaconitrile (-10 ~ 90)	High	25	Shimalite	60/80	NAW	100ml	Lower hydrocarbons
S-85			25	Shimalite	80/100	NAW		Lower hydrocarbons
			1 ~ 10	Support you asked for				
			10 <					
E-23	Shinchrom E 71 (100 ~ 250)	High	25	Shimalite	80/100	AW	50ml	Fatty acid-methylesters
F-9	Shinchrom F51 + Bentone34 (30 ~ 140)	Low	6+2	Chromosorb W	80/100	AW-DMCS	50ml	Styren monomer (xylene and-ethylbenzene-isomers)
			6+4	Chromosorb W	80/100	AW-DMCS		
F-11	Shinchrom F51 + H <sub>3</sub> PO <sub>4</sub> (30 ~ 140)	Low	10+1	Chromosorb W	80/100	AW-DMCS	50ml	Lower fatty acids
	SILAR-5CP (50 ~ 275)	High	1 ~ 5 5 <	Support you asked for			100ml	Higher fatty acid-methylesters
	SILAR-7CP (50 ~ 275)	High	1 ~ 5 5 <	Support you asked for			100ml	Higher fatty acid-methylesters
	SILAR-9CP (50 ~ 275)	High	1 ~ 5 5 <	Support you asked for			100ml	Higher fatty acid-methylesters
S-61	Silicone DC 11 (10 ~ 250)	Low	5 1 ~ 25	Chromosorb G	60/80	AW-DMCS	100ml	Pesticide residue
				Support you asked for				

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
S								
S-6	Silicone DC 200 (10 ~ 250) (Dimethylsilicone Oil)	Non	25	Shimalite	60/80	NAW	100ml	High boiling point-compounds
S-7			25	Shimalite	80/100	NAW		High boiling point-compounds
S-101			20	Chromosorb W	60/80	AW-DMCS		Trihalomethane
S-102			20	Chromosorb W	80/100	AW-DMCS		Trihalomethane
S-67			10	Shimalite W	60/80	NAW		High boiling point-compounds
S-103			10	Shimalite W	60/80	AW-DMCS		High boiling point-compounds
S-104			10	Chromosorb W	60/80	AW-DMCS		Trihalomethane
S-95			10	Chromosorb W	80/100	AW-DMCS		Trihalomethane
S-105			5	Chromosorb W	60/80	AW-DMCS		High boiling point-compounds
			1 ~ 25	Support you asked for				
S-8	Silicone DC 550 (10 ~ 250) (25% Phenylmethylsilicone)	Low	25	Shimalite	60/80	NAW	100ml	High boiling point-compounds
S-10			25	Shimalite	80/100	NAW		High boiling point-compounds
S-106			20	Chromosorb W	60/80	AW-DMCS		Trihalomethane
S-107			20	Chromosorb W	80/100	AW-DMCS		
S-11			10	Shimalite F	20/80			General solvents
S-68			10	Shimalite W	60/80	NAW		High boiling point-compounds
S-108			10	Shimalite W	60/80	AW-DMCS		
S-109			10	Chromosorb W	60/80	AW-DMCS		Trihalomethane
S-96			10	Chromosorb W	80/100	AW-DMCS		Trihalomethane
S-110			5	Chromosorb W	60/80	AW-DMCS		High boiling point-compounds
	1 ~ 25	Support you asked for						
S-15	Silicone DC 702 (-20 ~ 130)	Low	25	Shimalite	60/80	NAW	100ml	Hydrocarbons
			1 ~ 25	Support you asked for				
			1 ~ 25	Support you asked for				
	Silicone DC 703 (-20 ~ 130)	Low	1 ~ 25	Support you asked for			100ml	Hydrocarbons
			1 ~ 25	Support you asked for			100ml	Hydrocarbons
			1 ~ 25	Support you asked for			100ml	Hydrocarbons
S-111	Silicone DC 710 (0 ~ 150) (50% Phenylmethylsilicone)	Low	10	Shimalite W	60/80	AW-DMCS	100ml	Solvents
S-112			10	Chromosorb W	60/80	AW-DMCS		Solvents
			1 ~ 10	Support you asked for				
Q-13	Silicone DC QF-1 (FS-1265) (10 ~ 250) (50% Trifluoropropyl methylsilicone)	Low	5	Shimalite W	60/80	AW-DMCS	100ml	High boiling point-compounds
Q-8			5	Chromosorb W	60/80	AW-DMCS		
Q-7			2	Shimalite W	80/100	AW-DMCS		Steroids in the Urea
Q-6			2	Chromosorb G	60/80	AW-DMCS		Chloric pesticide
Q-14			2	Chromosorb W	80/100	HP		Cholic acids, Phosphorus pesticide
Q-3			1.5	Chromosorb W	60/80	AW-DMCS		Steroids, High boiling point-compounds
	1 ~ 25	Support you asked for						

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application	
S-70	Silicone SE-30 (50 ~ 300)	Non	20	Shimalite W	60/80	AW	100ml	High boiling point-compounds	
S-75			15	Chromosorb W	60/80	AW-DMCS		Medicine	
S-91			15	GasChrom Q	60/80				
S-71			10	Shimalite W	60/80	AW-DMCS			High boiling point-compounds
S-39			10	Chromosorb W	60/80	AW-DMCS			High boiling point-compounds
S-89			10	GasChrom Q	60/80				Medicine
S-113			10	Chromosorb W	80/100	HP			Medicine
S-3			5	Shimalite W	60/80	AW-DMCS			High boiling point-compounds
S-64			5	Chromosorb W	60/80	AW-DMCS			High boiling point-compounds
S-24			1.5	Chromosorb W	60/80	AW-DMCS			Steroids, Alkaroids
S-114			1.5	Chromosorb W	80/100	AW-DMCS			Steroids, Alkaroids
					1 ~ 25	Support you asked for			
S-72	Silicone SE-52 (50 ~ 300)	Low	10	Shimalite W	60/80	AW-DMCS	100ml		High boiling point-compounds
S-4			5	Shimalite W	60/80	AW			
S-65			5	Chromosorb W	60/80	AW-DMCS			
S-25			1.5	Chromosorb W	60/80	AW-DMCS		Steroids	
			1 ~ 25	Support you asked for					
	Silicone SE-54 (50 ~ 300) (1% Vinyl 5% Phenylmethylsilicone)	Low	1 ~ 10	Support you asked for			100ml	High boiling point-compounds	
S-42	Silicone SF-96 (10 ~ 210) (Dimethylsilicone Fluid)	Non	15	Shimalite F	20/80		100ml	Halogenides	
S-115			(10 ~ 250)	15	Shimalite W	60/80		AW-DMCS	High boiling point-compounds
S-116			(10 ~ 250)	10	Chromosorb W	60/80		AW-DMCS	
			1 ~ 25	Support you asked for					
X-14	Silicone XF-1150 (10 ~ 230)	High	5	Shimalite W	60/80	AW-DMCS	100ml	High boiling point-compounds	
X-15			5	Chromosorb W	60/80	AW-DMCS		High boiling point-compounds	
X-6			1	Chromosorb W	60/80	AW-DMCS		Steroids, High boiling point-compounds	
			1 ~ 10 10 <	Support you asked for					
	Silicone Oil KF-96 (30 ~ 250) (Dimethylsilicone Fluid)	Low	1 ~ 25	Support you asked for			100ml	High boiling point-compounds	
O-57	Silicone OV-1 (50 ~ 350) (Dimethylsilicone Gum)	Non	5	Shimalite W	60/80	AW-DMCS	100ml	High boiling point-compounds	
O-58			5	Shimalite W	80/100	AW-DMCS			
O-59			5	Chromosorb W	60/80	AW-DMCS			
O-60			5	Chromosorb W	80/100	AW-DMCS			

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application		
P										
O-19	Silicone OV-1 (50 ~ 350) (Dimethylsilicone Gum)	Non	2	Shimalite W	80/100	AW-DMCS	100ml	Steroids, Alkaroids		
O-23			2	Chromosorb W	60/80	AW-DMCS		Chloric pesticide PCB		
O-23D			2	Chromosorb W	80/100	AW-DMCS				
O-22			1.5	Chromosorb W	60/80	AW-DMCS		Steroids, Alkaroids		
O-22D			1.5	Chromosorb W	80/100	AW-DMCS				
O-10			1.5	Shimalite W	80/100	AW-DMCS				
O-18			1	Shimalite W	80/100	AW-DMCS		Steroids in the Urea		
			1 ~ 10 10 <	Support you asked for						
	Silicone OV-3 (20 ~ 350) (10% Phenylmethylsilicone)	Low	1 ~ 10 10 <	Support you asked for			100ml	High boiling-temperature-compounds		
	Silicone OV-7 (20 ~ 350) (20% Phenylmethylsilicone)	Low	1 ~ 10 10 <	Support you asked for			100ml	High boiling-temperature-compounds		
	Silicone OV-11 (30 ~ 350) (35% Phenylmethylsilicone)	Low	1 ~ 10 10 <	Support you asked for			100ml	High boiling-temperature-compounds		
O-61	Silicone OV-17 (20 ~ 340) (50% Phenylmethylsilicone)	Low	10	Shimalite W	60/80	AW-DMCS	100ml	Medicine		
O-48			10	Chromosorb W	60/80	AW-DMCS		Nucleic acids		
O-46			5	Shimalite W	80/100	AW-DMCS		High boiling-temperature-compounds		
O-49			5	Chromosorb W	60/80	AW-DMCS		Steroids Alkaroids		
O-26			3	Shimalite W	80/100	AW-DMCS			High boiling-temperature-compounds	
O-29			2	Chromosorb W	60/80	AW-DMCS		Steroids		
O-29D			2	Chromosorb W	80/100	AW-DMCS				
O-9			1.5	Shimalite W	80/100	AW-DMCS				
O-28			1.5	Chromosorb W	60/80	AW-DMCS		Alkaroids Medicine		
O-28D			1.5	Chromosorb W	80/100	AW-DMCS		High boiling-temperature-compounds		
O-24			1	Shimalite W	80/100	AW-DMCS		2,4-DNPH- Acetaldehyde		
O-53			1	Chromosorb W	80/100	AW-DMCS				
					1 ~ 10 10 <	Support you asked for				

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
	Silicone OV-22 (20 ~ 300) (65% Phenylmethylsilicone)	Low	1 ~ 5 5 <	Support you asked for			100ml	High boiling-temperature-compounds
O-33 O-31 O-34D	Silicone OV-25 (20 ~ 300) (75% Phenylmethylsilicone)	Low	3 1.5 1.5 1 ~ 10 10 <	Shimalite W Shimalite W Chromosorb W  Support you asked for	80/100 80/100 80/100	AW-DMCS AW-DMCS AW-DMCS	100ml	Steroids, Alkaroids Steroids, Alkaroids Steroids, Alkaroids
	Silicone OV-61 (20 ~ 350) (75% Phenylmethylsilicone)	Low	1 ~ 5 5 <	Support you asked for			100ml	High boiling-temperature-compounds
	Silicone OV-73 (20 ~ 325) (5.5% Phenylmethylsilicone Gum)	Low	1 ~ 5 5 <	Support you asked for			100ml	High boiling-temperature-compounds
O-39 O-37 O-40D	Silicone OV-101 (20 ~ 350) (Dimethylsilicone Fluid)	Non	3 1.5 1.5 1 ~ 10 10 <	Shimalite W Shimalite W Chromosorb W  Support you asked for	80/100 80/100 80/100	AW-DMCS AW-DMCS AW-DMCS	100ml	Steroids, Alkaroids Steroids, Alkaroids Steroids, Alkaroids
	Silicone OV-105 (20 ~ 270) (Cyanopropylsilicone)	Low	1 ~ 10 10 <	Support you asked for			100ml	
	Silicone OV-202 (20 ~ 250) (Trifluoropropylmethylsilicone)	Low	1 ~ 10 10 <	Support you asked for			100ml	Steroids Alkaroids High boiling-temperature-compounds
O-44 O-50D	Silicone OV-210 (20 ~ 275) (50% Trifluoropropylmethylsilicone)	Low	2 1.5 1 ~ 10 10 <	Shimalite W Chromosorb W  Support you asked for	80/100 80/100	AW-DMCS AW-DMCS	100ml	Steroids, Alkaroids
	Silicone OV-215 (20 ~ 250) (Trifluoropropylmethylsilicone Gum)	Low	1 ~ 5 5 <	Support you asked for			100ml	Steroids Alkaroids High boiling-temperature-compounds
O-45 O-51D	Silicone OV-225 (20 ~ 280) (25% Phenyl 25% Cyanopropyl silicone)	Low	2 1.5 1 ~ 5 5 <	Shimalite W Chromosorb W  Support you asked for	80/100 80/100	AW-DMCS AW-DMCS	100ml	Steroids, Alkaroids

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
	Silicone OV-275 (20 ~ 250) (Dicyanoallylsilicone)	Low	1 ~ 5 5 <	Support you asked for			100ml	
	Silicone OV-330 (30 ~ 250) (A silicone carbowax copolymer)	Low	1 ~ 5 5 <	Support you asked for			100ml	
	Silicone OV-351 (50 ~ 270) (Polyglycol nitroterephthalic)	Low	1 ~ 5 5 <	Support you asked for			100ml	
	Silicone OV-1701 (20 ~ 340) (Dimethylphenylcyano substituted polymer)	Low	1 ~ 5 5 <	Support you asked for			100ml	
S-119	SM-PACK (40)	High		Shimalite	60/70	NAW	200ml	LP Gas Freon
S-55	Sorbitol (100 ~ 150)	Mid	30 1 ~ 30	Shimalite	60/80	NAW	100ml	Lower alcohols
S-84	SP-1200 + Bentone34 (10 ~ 175)	Low	5 +1.75	Chromosorb W	80/100	AW-DMCS	100ml	Stylenemonomer
S-128			5 +1.75	Chromosorb W	60/80	AW-DMCS		
	Span 40 (20 ~ 150)	Low	1 ~ 25	Support you asked for			100ml	Hydrocarbons
	Span 50 (20 ~ 150)	Low	1 ~ 25	Support you asked for			100ml	Hydrocarbons
	Span 80 (20 ~ 150)	Low	1 ~ 25	Support you asked for			100ml	Hydrocarbons
S-20	Squalane (10 ~ 150)	Non	25	Shimalite	60/80	NAW	100ml	Hydrocarbons
S-19			25	Shimalite	80/100	NAW		
S-121			5	Shimalite W	60/80	AW-DMCS		
S-53			1 1 ~ 25	Alumina	60/80	Heated at 600 Support you asked for		
	Squalene (30 ~ 140)	Low	1 ~ 25	Support you asked for			100ml	Hydrocarbons
	Stearic Acid (30 ~ 140)	Mid	1 ~ 25	Support you asked for			100ml	
	Stearyl Amine (20 ~ 100)	Low	1 ~ 25	Support you asked for			100ml	Amines, Alcohols
S-129	Sucrose Diacetate Hexaisobutyrate(SAIB) (10 ~ 190)	Low	5	Shimalite W	60/80	AW-DMCS	100ml	Purfumes Essential oils
S-118			5 1 ~ 25	Chromosorb W	60/80	AW-DMCS Support you asked for		
	Sulfolane (20 ~ 110)	High	1 ~ 25	Support you asked for			100ml	Hydrocarbons



## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
<b>T</b>								
	Terephtharic Acid (20 ~ 200)	High	1 ~ 25	Support you asked for			100ml	High boiling-temperature-compounds
	Tetraethyleneglycol Dimethyl Ether(BMEE) (10 ~ 80)	Mid	1 ~ 25	Support you asked for			100ml	Sulfur compounds
	Tetraethylene Pentamine (0 ~ 80)	High	1 ~ 25	Support you asked for			100ml	Lower amines
	Tetradecanol (Myristyl Alcohol) (40 ~ 120)	Mid	1 ~ 25	Support you asked for			100ml	
T-30 T-91 T-92	Tetrahydroxyethyl Ethylene Diamine (THEED) (10 ~ 180)	Mid	15	Shimalite F	20/80		100ml	Alcohols
	10		Shimalite W	60/80	AW-DMCS			
	10		Chromosorb W	60/80	AW-DMCS			
	1 ~ 25		Support you asked for					
T-46	Tetramethyl Cyclobutanediol Adipate (10 ~ 230)	Low	20	Chromosorb W	60/80	AW-DMCS	100ml	High boiling-temperature-compounds Higher fatty acid-esters
	1 ~ 10 10 <		Support you asked for					
	Tetramethyl Cyclobutanediol Succinate (10 ~ 250)	Low	1 ~ 10 10 <	Support you asked for			100ml	High boiling-temperature-compounds
T-70 T-63 T-64 T-88	Thermon-1000 (50 ~ 270)	High	25	Shimalite	80/100	AW-DMCS	100ml	General solvents Esters, Medicine Alcohols High boiling-temperature-compounds
	10		Chromosorb W	80/100	HP			
	5		Chromosorb W	80/100	AW-DMCS			
	5		Sunpak-A	50/80		50ml	General solvents in-the water	
	1 ~ 10 10 <		Support you asked for			100ml		
T-67 T-86 T-87	Thermon-1000+KOH (50 ~ 250)	High	10+3	Chromosorb W	80/100	AW-DMCS	100ml	Alcohols, Higher amines
	5+3		Sunpak-A	50/80		50ml	Lower amines	
	5+1		Sunpak-A	50/80				
T-65 T-66	Thermon-1000+H <sub>3</sub> PO <sub>4</sub> (50 ~ 250) (50 ~ 230)	High	10+1	Chromosorb W	80/100	HP	100ml	Free fatty acids
	5+0.5		Chromosorb W	80/100	AW-DMCS			
T-82 T-81 T-79 T-78 T-77 T-94 T-75 T-95	Thermon-3000 (50 ~ 280) (50 ~ 280) (50 ~ 280) (50 ~ 280) (50 ~ 280) (50 ~ 280) (50 ~ 185) (50 ~ 280)	High	10	Shimalite	80/100	AW-DMCS	50ml	Gasoline
	10		Chromosorb W	80/100	AW-DMCS	Glycol		
	10		Celite 545	80/100	AS	p-Hydroxy benzoic acid		
	5		Shimalite W	80/100	AW-DMCS	TCP		
	5		Chromosorb W	80/100	AW-DMCS	Perfumes		
	5		SHINCARBON-A	60/80		Free fatty acids in the-water, Lactic acids		
	3		Shimalite TPA	60/80				
	2		SHINCARBON-A	60/80		Free fatty acids in the-water		

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application	
T-76	Thermon-3000 (50 ~ 280)	High	2	Chromosorb W	80/100	AW-DMCS	50ml	TBZ, PEG	
T-90	(50 ~ 210)		2	Shimalite F	40/80			Free fatty acids in the- Water, Lactic acids	
T-74	(50 ~ 185)		1	Shimalite TPA	60/80			Catecol in water	
			1 ~ 10 10 <	Support you asked for					
T-89	Thermon-3000+KOH (50 ~ 250)	High	5+1	Sunpak-A	60/80		50ml	Lower amines	
T-68	Thermon-HG (60 ~ 170)	High	10	Chromosorb W	80/100	AW-DMCS	50ml	Alkyl Mercury	
	Thiodipropionitrile (TDPN)(20 ~ 90)	High	1 ~ 25	Support you asked for			100ml	Hydrocarbons	
	Triacetin (0 ~ 60)	Mid	1 ~ 25	Support you asked for			100ml	Hydrocarbons	
	Tri-N-Butylphosphate (TBP)(0 ~ 50)	Low	1 ~ 25	Support you asked for			100ml	Hydrocarbons	
	Tributyryne (0 ~ 100)	Mid	1 ~ 25	Support you asked for			100ml	Hydrocarbons	
T-17	Tricresylphosphate (TCP) (0 ~ 125)	Mid	25	Shimalite	60/80	NAW	100ml	Hydrocarbons Nitrogen- contained- compounds	
T-18			25	Shimalite	80/100	NAW			
T-108			20	Chromosorb W	60/80	AW-DMCS			
T-109			10	Shimalite W	60/80	AW-DMCS			
T-110			10	Chromosorb W	60/80	AW-DMCS			
			1 ~ 25	Support you asked for					
T-34	TCP+H <sub>3</sub> PO <sub>4</sub> (0 ~ 125)	Mid	10+2	Chromosorb W	60/80	AW	100ml	Cresols, Phenols	
T-19	Triethanolamine(TEA) (0 ~ 100)	High	25	Shimalite	60/80	NAW	100ml	Lower amines	
T-111			20	Chromosorb W	60/80	AW-DMCS			
			1 ~ 25	Support you asked for					
	Triethylene Glycol (20 ~ 100)	Low	1 ~ 25	Support you asked for			100ml		
	Triisobutylene(TIB) (-10 ~ 120)	Low	1 ~ 25	Support you asked for			100ml	Hydrocarbons	
	Tri-m-Cresylphosphate (0 ~ 120)	Low	1 ~ 25	Support you asked for			100ml	Hydrocarbons Nitrogen- contained- compounds	
T-48	1,2,3-Tris (2- Cyanoethoxy) Propane(TCEP) (10 ~ 150)	High	25	Shimalite	80/100	AW-DMCS- ST	100ml	Mercaptane, Sulfur compounds descended- from Monosulfite	
T-2			25	Shimalite	80/100	NAW			
T-1			20	Shimalite	60/80	NAW			
			1 ~ 10	Support you asked for					
			10 <	Support you asked for					

**AW-DMCS-ST** means the special treatment for the analysis of sulfur compounds.

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
	Triton X-100 (20 ~ 190)	High	1 ~ 25	Support you asked for			100ml	Nitrogen contained-compounds
	Triton X-305 (20 ~ 230)	High	1 ~ 25	Support you asked for			100ml	Nitrogen contained-compounds
	Trixylenylphosphate (TXP) (20 ~ 150)	Low	1 ~ 25	Support you asked for			100ml	
T-49	TXP+H <sub>3</sub> PO <sub>4</sub> (20 ~ 150)	Low	10 +0.5	Chromosorb W	60/80	AW-DMCS	100ml	Cresols
T-96	TSG-1 (50 ~ 230)	High	3	SHINCARBON A	60/80		50ml	Formaline analysis-only
	Tween 20 (10 ~ 60)	Low	1 ~ 25	Support you asked for			100ml	
	Tween 40 (10 ~ 80)	Low	1 ~ 25	Support you asked for			100ml	
T-42	Tween 60 (10 ~ 100)	Mid	20	Shimalite	60/80	AW	100ml	Esters, Ketones
T-60			15	Chromosorb W	60/80	AW		
			1 ~ 25	Support you asked for				
T-22	Tween 80 (10 ~ 150)	Mid	20	Shimalite	60/80	AW	100ml	Esters, Ketones
T-61			15	Chromosorb W	60/80	AW		
T-23			5	Shimalite W	60/80	AW		
T-62			5	Chromosorb W	60/80	AW		
			1 ~ 25	Support you asked for				
	Tween 85 (10 ~ 150)	Mid	1 ~ 25	Support you asked for			100ml	Esters, Ketones
<b>U</b>								
U-10	Ucon 50-HB-280X (10 ~ 190)	High	25	Shimalite	60/80	NAW	100ml	High boiling-temperature-compounds
U-23			20	Chromosorb W	60/80	AW-DMCS		
U-24			5	Shimalite W	60/80	AW-DMCS		
U-25			5	Chromosorb W	60/80	AW-DMCS		
			1 ~ 25	Support you asked for				
U-12	Ucon 50-HB-2000 (10 ~ 200)	High	20	Shimalite	60/80	NAW	100ml	High boiling-temperature-compounds
U-26			15	Chromosorb W	60/80	AW-DMCS		
			1 ~ 25	Support you asked for				
U-27	Ucon 50-HB-5100 (10 ~ 190)	High	10	Shimalite W	60/80	AW-DMCS	100ml	High boiling-temperature-compounds
U-28			10	Chromosorb W	60/80	AW-DMCS		
U-29			5	Chromosorb W	60/80	AW-DMCS		
			1 ~ 25	Support you asked for				
	Ucon 70-HB-90000 (10 ~ 190)	High	1 ~ 25	Support you asked for			100ml	
U-37	Ucon LB-550X (10 ~ 200)	Low	25	Chromosorb W	60/80	AW-DMCS	100ml	Vinyl chloride-monomer
U-2			20	Chromosorb W	80/100	AW		
U-30			10	Shimalite W	60/80	AW-DMCS		

## Packing Material

P/N	Stationary Phase (Operation Temperature )	Polarity	%	Support	Mesh Size	Treatment	Capacity	Application
U-31	Ucon LB-550X (10 ~ 200)	Low	10	Chromosorb W	60/80	AW-DMCS	100ml	High boiling- temperature- compounds
U-32			5	Shimalite W	60/80	AW-DMCS		
U-33			5	Chromosorb W	60/80	AW-DMCS		
			1 ~ 25	Support you asked for				
<b>V</b>								
V-10	Versamid 900 (185 ~ 275)	Mid	25	Shimalite W	60/80	AW-DMCS	100ml	High boiling- temperature- compounds
V-11			20	Chromosorb W	60/80	AW-DMCS		
V-8			10	Shimalite W	60/80	AW		
V-12			10	Shimalite W	60/80	AW-DMCS		
V-13			15	Chromosorb W	60/80	AW-DMCS		
			1 ~ 25	Support you asked for				
	Versamid 930 (100 ~ 200)	Mid	1 ~ 25	Support you asked for			100ml	High boiling- temperature- compounds, Alcohols
	Versamid 940 (100 ~ 200)	Mid	1 ~ 25	Support you asked for			100ml	High boiling- temperature- compounds, Alcohols

## Standard Packed Column

P/N	Packing Material					Column Size Length x I.D.	Material of column	Application
	Stationary Phase	%	Support	Mesh Size	Treatment			
<b>A</b>								
ZA-1	Activated Charcoal			60/80		1.0mx3.0mm	SUS	Permanent gases
ZA-2	Activated Charcoal			60/80		2.0mx3.0mm	SUS	Permanent gases
ZA-3	Activated Charcoal			60/80		3.0mx3.0mm	SUS	Permanent gases
<b>B</b>								
ZB-1	1,4-BDS-HG	20	Chromosorb W	80/100	AW-DMCS	0.5mx3.2mm	Glass	Alkyl mercury
ZB-2	1,4-BDS-HG	10	Chromosorb W	80/100	AW-DMCS	0.5mx3.2mm	Glass	Phenyl mercury
<b>C</b>								
ZD-1	DEGS-HG	20	Chromosorb W	80/100	AW-DMCS	0.5mx3.2mm	Glass	Alkyl mercury
ZD-2	DEGS-HG	10	Chromosorb W	80/100	AW-DMCS	0.5mx3.2mm	Glass	Phenyl mercury
ZD-3	DEGS+H <sub>3</sub> PO <sub>4</sub>	2+ 0.5	Chromosorb W	80/100	AW-DMCS	2.1mx3.2mm	Glass	Chloric pesticide
ZD-4	Diglycerol+TEP +KOH	15+ 15+ 2	Chromosorb W	80/100	AW-DMCS	3.1mx3.2mm	Glass	Lower amines
<b>E</b>								
ZE-1	Ethyleneglycol Adipate(EGA)	0.5	Chromosorb W	80/100	AW	1.6mx3.2mm	Glass	Amino acid (Bu-TFA)
<b>F</b>								
ZF-1	FAL-M	10	SHINCARBON- A	80/100		2.1mx3.2mm	Glass	Lower free fatty- acids in water
ZF-2	FFAP+H <sub>3</sub> PO <sub>4</sub>	0.3 + 0.3	Graphite Carbon	60/80		1.6mx3.2mm	Glass	Lower free fatty- acids
ZF-3	Flexol	25	Chromosorb W	60/80	AW-DMCS	2.1mx3.2mm	Glass	Ethyleneoxide Propyleneoxide
<b>M</b>								
ZM-1	Molecular Sieve 5A			60/80		2.0mx3.0mm	SUS	H <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> , CO, CH <sub>4</sub>
ZM-2	Molecular Sieve 5A			60/80		1.0mx3.0mm	SUS	H <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> , CO, CH <sub>4</sub>
ZM-3	Molecular Sieve 5A			60/80		3.0mx3.0mm	SUS	H <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> , CO, CH <sub>4</sub>
ZM-4	Molecular Sieve 13X			60/80		1.0mx3.0mm	SUS	H <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> , CO, CH <sub>4</sub>
ZM-5	Molecular Sieve 13X			60/80		2.0mx3.0mm	SUS	H <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> , CO, CH <sub>4</sub>
ZM-6	Molecular Sieve 13X			60/80		3.0mx3.0mm	SUS	H <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> , CO, CH <sub>4</sub>
<b>N</b>								
ZN-1	Neopentylglycol Succinate(NGS)	1	Chromosorb W	60/80	AW-DMCS	0.5mx3.2mm	Glass	Steroids, 17KS(TMS)
ZN-2	NGS	1	Chromosorb W	60/80	AW-DMCS	1.1mx3.2mm	Glass	Steroids, 17KS(TMS)
ZN-3	NGS	1	Chromosorb W	60/80	AW-DMCS	1.6mx3.2mm	Glass	Steroids ,17KS(TMS)
ZN-4	NGS	1	Chromosorb W	60/80	AW-DMCS	2.1mx3.2mm	Glass	Steroids, 17KS(TMS)

## Standard Packed Column

P/N	Packing Material					Column Size Length x I.D.	Material of column	Application
	Stationary Phase	%	Support	Mesh Size	Treatment			
ZN-5	NGS	1	Chromosorb W	60/80	AW-DMCS	2.6mx3.2mm	Glass	Steroids, 17KS(TMS)
ZN-6	NGS	1	Chromosorb W	60/80	AW-DMCS	3.1mx3.2mm	Glass	Steroids, 17KS(TMS)
<b>O</b>								
ZO-1	Oxydipropionitrile (ODPN)	25	Chromosorb W	60/80	AW-DMCS- ST	3.1mx3.2mm	Glass	Hydrogen sulfide Methylmercaptane Sulfur dioxide
<b>P</b>								
ZP-1	PEG1500	25	Chromosorb W	60/80	AW-DMCS	3.1mx3.2mm	Glass	Isobutanol
ZP-2	PEG6000	10	SHINCARBON- A	60/80		2.1mx3.2mm	Glass	Alcohols in water
ZP-3	PEG20M	10	SHINCARBON- A	60/80		2.1mx3.2mm	Glass	Alcohols in water
ZP-4	Polyphenyl Ether 5rings(OS-124)	10	Shimalite-TPA	60/80		3.1mx3.2mm	Glass	Hydrogen sulfide Methylmercaptane Sulfur dioxide
ZP-5	Porapak-N			80/100		1.0mx3.0mm	SUS	Lower Hydrocarbons CO <sub>2</sub>
ZP-6	Porapak-Q			80/100		2.0mx3.0mm	SUS	Lower Hydrocarbons CO <sub>2</sub>
ZP-7	SP-1200 +Bentone34	5+ 1.75	Chromosorb W	80/100	AW-DMCS	2.1mx3.2mm	Glass	Styrenemonomer
ZP-8	SP-1200 +Bentone34	5+ 1.75	Chromosorb W	60/80	AW-DMCS	3.1mx3.2mm	Glass	Styrenemonomer
ZP-9	PEG6000	10	Shimaite-TPA	60/80		2.1mx3.2mm	Glass	Lower free fatty acids
ZP-10	PEG20M	10	Chromosorb W	60/80	AW-DMCS	2.1mx3.2mm	Glass	Hydrocarbons Alcohols Esters Ketones
ZP-11	Porapak-N			50/80		1.0mx3.0mm	SUS	Lower Hydrocarbons CO <sub>2</sub>
ZP-12	Porapak-N			50/80		2.0mx3.0mm	SUS	Lower Hydrocarbons CO <sub>2</sub>
ZP-13	Porapak-N			50/80		3.0mx3.0mm	SUS	Lower Hydrocarbons CO <sub>2</sub>
ZP-14	Porapak-N			80/100		2.0mx3.0mm	SUS	Lower Hydrocarbons CO <sub>2</sub>
ZP-15	Porapak-N			80/100		3.0mx3.0mm	SUS	Lower Hydrocarbons CO <sub>2</sub>
ZP-16	Porapak-Q			50/80		1.0mx3.0mm	SUS	Lower Hydrocarbons CO <sub>2</sub>
ZP-17	Porapak-Q			50/80		2.0mx3.0mm	SUS	Lower Hydrocarbons CO <sub>2</sub>
ZP-18	Porapak-Q			50/80		3.0mx3.0mm	SUS	Lower Hydrocarbons CO <sub>2</sub>
ZP-19	Porapak-Q			80/100		1.0mx3.0mm	SUS	Lower Hydrocarbons CO <sub>2</sub>
ZP-20	Porapak-Q			80/100		3.0mx3.0mm	SUS	Lower Hydrocarbons CO <sub>2</sub>

## Standard Packed Column

P/N	Packing Material					Column Size Length x I.D.	Material of column	Application
	Stationary Phase	%	Support	Mesh Size	Treatment			
<b>R</b>								
ZR-1	Reoplex400	10	Chromosorb W	80/100	AW-DMCS	2.1mx3.2mm	ガラス	For the anaerobe identification
<b>S</b>								
ZS-1	SBS-100	10	Shimalite-TPA	60/80		3.1mx3.2mm	Glass	Working- environmental- substances
ZS-2	SBS-120	12	SHINCARBON- A	80/100		3.1mx3.2mm	Glass	(Organic solvents)
ZS-3	SBS-200	20	Shimalite-W	100/ 120	AW-DMCS	3.1mx3.2mm	Glass	(Organic solvents)
ZS-4	SBS-300	20	Shimalite-W	80/100	AW-DMCS	3.1mx3.2mm	Glass	Chloric solvents
ZS-5	Shinchrom E-71	5	Shimalite	80/100	AW	3.1mx3.2mm	Glass	Fatty acid- methylesters
ZS-6	Silicone DC 200	10	Chromosorb W	80/100	AW-DMCS	3.1mx3.2mm	Glass	Tthalomethane
ZS-7	Silicone DC 200	20	Chromosorb W	80/100	AW-DMCS	3.1mx3.2mm	Glass	Tthalomethane
ZS-8	Silicone DC 550	10	Chromosorb W	80/100	AW-DMCS	3.1mx3.2mm	Glass	Tthalomethane
ZS-9	Silicone DC 550	20	Chromosorb W	80/100	AW-DMCS	3.1mx3.2mm	Glass	Tthalomethane
ZS-11	Silicone DC 200	5	Chromosorb W	80/100	HP	2.1mx3.2mm	Glass	Phosphorus system pesticide residue
ZS-13	Silicone DC 200	5	Chromosorb W	80/100	HP	1.1mx3.2mm	Glass	Phosphorus system pesticide residue
ZS-15	Silicone DC QF-1	2	Chromosorb W	80/100	HP	2.1mx3.2mm	Glass	Phosphorus system pesticide residue
ZS-16	Silicone DC QF-1	2	Shimalite-W	80/100	AW-DMCS	3.1mx3.2mm	Glass	Steroids in the Urea (MO-TMSi)
ZS-18	Silicone DC QF-1	1.5	Chromosorb W	60/80	AW-DMCS	1.1mx3.2mm	Glass	Steroids, Alkaloids
ZS-24	Silicone SE-30	1.5	Chromosorb W	60/80	AW-DMCS	1.1mx3.2mm	Glass	Steroids, Alkaloids
ZS-30	Silicone SE-52	1.5	Chromosorb W	60/80	AW-DMCS	1.1mx3.2mm	Glass	Steroids, Alkaloids
ZS-35	Silicone SE-52	5	Shimalite-W	60/80	AW	2.5mx3.0mm	SUS	Kerosene, Light oil
ZS-36	Silicone SE-52	5	Shimalite-W	60/80	AW	2.6mx3.2mm	Glass	Kerosene, Light oil
ZS-44	Silicone XF-1150	1	Chromosorb W	60/80	AW-DMCS	1.1mx3.2mm	Glass	High boiling point- compounds
ZS-46	Silicone XF-1150	1	Chromosorb W	60/80	AW-DMCS	2.1mx3.2mm	Glass	High boiling point- compounds
ZS-50	Silicone OV-1	1.5	Shimalite-W	80/100	AW-DMCS	1.1mx3.2mm	Glass	Steroids, Alkaloids High boiling point- compounds
ZS-52	Silicone OV-1	1.5	Shimalite-W	80/100	AW-DMCS	2.1mx3.2mm	Glass	Steroids, Alkaloids High boiling point- compounds
ZS-55	Silicone OV-1	1	Shimalite-W	80/100	AW-DMCS	3.1mx3.2mm	Glass	Steroids in the Urea (MO-TMSi)
ZS-56	Silicone OV-1	2	Chromosorb W	60/80	AW-DMCS	2.1mx3.2mm	Glass	PCB
ZS-57	Silicone OV-1	2	Chromosorb W	80/100	AW-DMCS	2.1mx3.2mm	Glass	PCB
ZS-58	Silicone OV-17	2	Chromosorb W	60/80	AW-DMCS	2.1mx3.2mm	Glass	Chloric pesticide PCB

## Standard Packed Column

P/N	Packing Material					Column Size Length x I.D.	Material of column	Application
	Stationary Phase	%	Support	Mesh Size	Treatment			
ZS-59	Silicone OV-17	2	Chromosorb W	80/100	AW-DMCS	2.1mx3.2mm	Glass	Chloric pesticide PCB
ZS-61	Silicone OV-17	1.5	Shimalite W	80/100	AW-DMCS	1.1mx3.2mm	Glass	Medicine High boiling point- compounds
ZS-63	Silicone OV-17	1.5	Shimalite W	80/100	AW-DMCS	2.1mx3.2mm	Glass	Medicine High boiling point- compounds
ZS-66	Silicone OV-17	1	Chromosorb W	80/100	AW-DMCS	2.1mx3.2mm	Glass	2,4-DNPH acetaldehyde
ZS-70	Sunpak-S			80/100		2.1mx3.2mm	Glass	Hydrogen sulfide sulfurization Carbonium in Lower Hydrocarbons (C <sub>1</sub> ~ C <sub>4</sub> )
ZS-71	SM-6		Shimalite	60/70	NAW	6.0mx3.0mm	SUS	LPG (with DATA)
ZS-72	Sunpak-A			50/80		2.1mx3.2mm	Glass	ALower alcohols Lower hydrocarbons
ZS-73	Silica Gel			60/80		1.0mx3.0mm	SUS	Permanent Gases
ZS-74	Silica Gel			60/80		2.0mx3.0mm	SUS	Permanent Gases
ZS-75	Silicca Gel			60/80		3.0mx3.0mm	SUS	Permanent Gases
<b>T</b>								
ZT-1	Thermon-1000	5	Sunpak-A	50/80		2.1mx3.2mm	Glass	Lower alcohols in- the water
ZT-2	Thermon-3000	5	SHINCARBON A	60/80		1.6mx3.2mm	Glass	Lower free fatty- acids and Lactic- acids in water
ZT-3	Thermon-3000	2	SHINCARBON A	60/80		2.1mx3.2mm	Glass	PEG300 in water
ZT-4	Thermon-3000 +KOH	5+1	Sunpak-A	50/80		2.1mx3.2mm	Glass	Lower amines in water
ZT-5	Thermon-HG	10	Chromosorb W	80/100	AW-DMCS	0.5mx3.0mm	Glass	Alkyl Mercury
ZT-6	1,2,3-Tris (2- (cyanoethoxy)Prop ane(TCEP))	25	Shimalite	80/100	AW-DMCS- ST	3.1mx3.2mm	Glass	Hydrogen sulfide Methylmercaptane Sulfur dioxide
ZT-7	TSG-1	15	SHINCARBON A	60/80		3.1mx3.2mm	Glass	Formalin Lower alcohols
ZT-10	Shimalite Q			100 /180		0.5mx3.0mm	SUS	Reference column
ZT-11	SHINCARBON ST			50/80		2.0mx3.0mm	SUS	CO, CH <sub>4</sub> , CO <sub>2</sub> , C <sub>2</sub> H <sub>4</sub> , C <sub>2</sub> H <sub>6</sub>
ZT-12	SHINCARBON ST			50/80		4.0mx3.0mm (2.0mx2)	SUS	H <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> , CO, CH <sub>4</sub> , CO <sub>2</sub> , C <sub>2</sub> H <sub>4</sub> , C <sub>2</sub> H <sub>6</sub>
ZT-13	SHINCARBON ST			50/80		6.0mx3.0mm (2.0mx3)	SUS	H <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> , CO, CH <sub>4</sub> , CO <sub>2</sub> , C <sub>2</sub> H <sub>4</sub> , C <sub>2</sub> H <sub>6</sub>
ZT-14	SHINCARBON ST			50/80		8.0mx3.0mm (2.0mx4)	SUS	H <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> , CO, CH <sub>4</sub> , CO <sub>2</sub> , C <sub>2</sub> H <sub>4</sub> , C <sub>2</sub> H <sub>6</sub>
ZT-15	SHINCARBON ST			50/80		1.0mx3.0mm	SUS	CO, CH <sub>4</sub> , CO <sub>2</sub> , C <sub>2</sub> H <sub>4</sub> , C <sub>2</sub> H <sub>6</sub>
ZT-17	Thermon-3000 +KOH	2+2	Sunpak-N	60/100		2.1mx3.2mm	Glass	Ammonia in water Methylamine



## Standard Packed Column

P/N	Packing Material					Column Size Length x I.D.	Material of column	Application
	Stationary Phase	%	Support	Mesh Size	Treatment			
<b>U</b>								
ZU-1	Ucon LB-550X	25	Chromosorb W	60/80	AW-DMCS	3.1mx3.2mm	ガラス	Ethyl acetate Methyl isobutyl- ketone
<b>Y</b>								
The parallel separation column (with the test data)								
ZY-1	Molecular Sieve 5A			60/80		2.5mx3.0mm	SUS	O <sub>2</sub> , N <sub>2</sub> , CO <sub>2</sub> , CO, CH <sub>4</sub>
	Porapak Q			80/100		1.5mx3.0mm	SUS	
	Shimalite Q			100 /180		0.5mx3.0mm	SUS	
ZY-2	Molecular Sive 5A			60/80		3.0mx3.0mm	SUS	H <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> , CO <sub>2</sub> , CO, CH <sub>4</sub>
	Porapak Q			80/100		1.5mx3.0mm	SUS	
	Shimalite Q			100 /180		0.5mx3.0mm	SUS	

## Application for Each Usage

Sample	Stationary Phase	%	Support	P/N	Application
Sulfur-compounds	1,2,3-TCEP	25	Shimalite 80/100 AW-DMCS	T-48	Hydrogen sulfide Methylmercaptane SO <sub>2</sub>
	PPE-5 rings	10	Shimalite TPA 60/80	P-82	
	, '-ODPN	25	Chromosorb W 60/80 AW-DMCS-ST	O-56	
	Sunpak-S			S-125	Hydrogen sulfide in C <sub>1</sub> ~ C <sub>4</sub> Carbonyl sulfate
Nitrogen compounds	Diglycerol+TEP +KOH	15+15+2	Chromosorb W 80/100 AW-DMCS	D-80	Tri-, Di-, Mono-methylamines
	PEG6000+KOH	15+1	Chromosorb 103 80/100	P-135	Ammonia in water Trimethylamine
	Thermon-3000 +KOH	5+1	Sunpak-A 50/80	T-89	Mono-, Di-, Tri-methylamines in water and in air
Styrenmonomer	FFAP	20	Chromosorb W 80/100 AW	F-8	Styrenemonomer in packing materials
	FON	20	Celite545 80/100 A	F-13	
	SP-1200 +Bentone34	5+1.75	Chromosorb W 80/100 AW-DMCS	S-84	Styrenemonomer in air
Acetaldehyde	Silicone OV-17	1	Chromosorb W 80/100 AW-DMCS	O-53	2,4-DNPH-Acetaldehyde
Phthalic esters	Silicone OV-1	1.5	Shimalite W 80/100 AW-DMCS	O-10	
	Silicone OV-17	1.5	Shimalite W 80/100 AW-DMCS	O-9	Phthalic esters (Diethylphthalate ~ Diocylphthalate)
	Thermon-3000	2	Chromosorb W 80/100 AW-DMCS	T-76	
Organochlorine solvents	SBS-300	20	Shimalite W 80/100 AW-DMCS	S-100	Trihalomethane (Chloroform, Dibromochloromethane, Dichlorobromomethane, Bromoform)
	Silicone DC 200	10	Chromosorb W 80/100 AW-DMCS	S-95	
	Silicone DC 550	10	Chromosorb W 80/100 AW-DMCS	S-96	
	Thermon-1000	25	Shimalite 80/100 AW-DMCS	T-70	1,1,1-Trichloroethane, Dichloromethane, Trichloroethylene, Chloroform, Tetrachloroethylene, 1,2-Dichloroethane
	Thermon-3000	10	Shimalite 80/100 AW-DMCS	T-82	
	Silicone DC 550	20	Chromosorb W 80/100 AW-DMCS	S-107	
	Silicone DC 550	10	Chromosorb W 80/100 AW-DMCS	S-96	
	Silicone DC 200	20	Chromosorb W 60/80 AW-DMCS	S-102	1,1,1-Trichloroethane in carbon tetrachloride
	Silicone DC 200	10	Chromosorb W 80/100 AW-DMCS	S-95	
SBS-100	10	Shimalite TPA 60/80	S-94	Freon113, Chloropropane	
Vinylchloridemonomer	Ucon LB-550X	20	Chromosorb W 80/100 AW	U-2	Vinylchloridemonomer
Specific-chemical-compounds	PEG20M	10	Chromosorb W 60/80 AW-DMCS	P-23	Acrylamide
	Thermon-3000	5	SHINCARBON A 60/80	T-94	Acrylamide in water (50ppm)
	FAL-M	10	Shimalite TPA 60/80	F-7	Acrylonitrile
	Thermon-1000	25	Shimalite 80/100 AW-DMCS	T-70	
	Thermon-3000	5	SHINCARBON A 60/80	T-94	Acrylonitrile in water
	1,4-BDS-HG	20	Chromosorb W 80/100 AW-DMCS	B-29	Methyl Mercury
	Thermon-HG	10	Chromosorb W 80/100 AW-DMCS	T-68	

## Application for Each Usage

Sample	Stationary Phase	%	Support	P/N	Application
Organic solvents	PEG20M	10	Chromosorb W 60/80 AW-DMCS	P-23	Acetone, Methanol, Toluene, Esters, Chloroethylene
	Thermon-1000	25	Shimalite 80/100 AW-DMCS	T-70	
	Thermon-1000	5	Sunpak-A 50/80	T-88	
	SBS-1	10	Shimalite TPA 60/80	S-93	Thinner components
	SBS-100	10	Shimalite TPA 60/80	S-94	Working environment measurement substances
	SBS-200	20	Shimalite W 100/120 AW-DMCS	S-99	
	SBS-120	12	SHINCARBON A 80/100	S-120	
	Thermon-1000	25	Shimalite 80/100 AW-DMCS	T-70	Thinner components
	Ucon LB-550X	20	Chromosorb W 80/100 AW	U-2	
Organic mercury	1,4-BDS-HG	20	Chromosorb W 80/100 AW-DMCS	B-29	Methyl mercuric chloride    Ethyl mercuric chloride
	Thermon-HG	10	Chromosorb W 80/100 AW-DMCS	T-68	
	Ucon LB-550X	10	Chromosorb W 80/100 AW-DMCS	B-30	Phenyl mercury
Pesticides residue	Advance-DS +H <sub>3</sub> PO <sub>4</sub>	2+0.5	Chromosorb W 80/100 AW-DMCS	A-41	chlorinated pesticides residue
	Silicone OV-17	2	Chromosorb W 60/80 AW-DMCS	O-29	
	Silicone OV-17	2	Chromosorb W 80/100 AW-DMCS	O-29D	
	Silicone DC QF-1	2	Chromosorb W 80/100 HP		Phosphorus pesticides
	Silicone DC 200	5	Chromosorb W 80/100 HP		
	Silicone OV-17	2	Chromosorb W 80/100 HP		
PCB	Silicone OV-1	2	Chromosorb W 80/100 AW-DMCS	O-23D	PCB
	Silicone OV-17	2	Chromosorb W 60/80 AW-DMCS	O-29	
	Silicone OV-17	2	Chromosorb W 80/100 AW-DMCS	O-29D	
Tynthetic-sweetener	Silicone SE-30	5	Chromosorb W 60/80 AW-DMCS	S-64	Sodium cyclamate, Sulfite ester
	Silicone SE-30	15	Chromosorb W 60/80 AW-DMCS	S-75	Saccharin in juice (Methylated)
Antifugal agents	Thermon-3000	2	Chromosorb W 80/100 AW-DMCS	T-76	Thiobendazole (TBZ)
Preservatives	DEGS+H <sub>3</sub> PO <sub>4</sub>	5+1	Chromosorb W 60/80 AW-DMCS	D-28S	Sorbic acids, Dehydroacetic- acids, Benzoic acids, Hydroxybenzoic esters
	FON	10	Celite 545 80/100 A	F-12	Other preservatives components
	Silicone OV-25	3	Shimalite W 80/100 AW-DMCS	O-33	BHA, BHT
	PEG20M	10	SHINCARBON A 60/80	P-131	
	PEG6000	10	Shimalite TPA 60/80	P-91	
	Thermon-1000 +H <sub>3</sub> PO <sub>4</sub>	5+0.5	Chromosorb W 80/100 AW-DMCS	T-66	
	Thermon-3000	5	SHINCARBON A 60/80	T-94	

## Application for Each Usage

Sample	Stationary Phase	%	Support	P/N	Application
Spices	Thermon-3000	2	Chromosorb W 80/100 AW-DMCS	T-76	Capsaicine
Perfume	Thermon-3000	5	Chromosorb W 80/100 AW-DMCS	T-77	Perfume components
Package -Plastic container substances	FFAP	20	Chromosorb W 80/100 AW	F-8	styrenemonomer
	FON	20	Celite 545 80/100 A	F-13	
	PEG20M	10	Chromosorb W 80/100 AW	P-56	
	Shinchrom F51 +Bentone34	6+2	Chromosorb W 80/100 AW-DMCS	F-9	
	SP-1200 +Bentone34	5+1.75	Chromosorb W 80/100 AW-DMCS	S-84	
	Thermon-1000	25	Shimalite 80/100 AW-DMCS	T-70	
Oil and fat	Dexsil 300GC	2	Chromosorb W 80/100 HP	D-88	Coconut oil
	Silicone OV-17	2	Chromosorb W 80/100 AW-DMCS	O-29D	
	Thermon-3000	5	SHINCARBON A 60/80	T-94	
Lower free fatty acids	FAL-M	10	SHINCARBON A 80/100	F-18	Lower free fatty acids in water
	FAL-M	10	Shimalite TPA 60/80	F-7	
	FFAP	20	Chromosorb W 80/100 AW	F-8	Lower free fatty acids
	FON	10	Celite 545 80/100 A	F-12	
	Thermon-1000+H <sub>3</sub> PO <sub>4</sub>	10+1	Chromosorb W 80/100 HP	T-65	
	Thermon-1000+H <sub>3</sub> PO <sub>4</sub>	5+0.5	Chromosorb W 80/100 AW-DMCS	T-66	
	Thermon-3000	5	SHINCARBON A 60/80	T-94	Lower fatty acids in water (such- as Acrylic acid, Methacrylic acid- and Acetic acid)
	PEG6000	10	Shimalite TPA 60/80	P-91	
	Reoplex 400	10	Chromosorb W 80/100 AW-DMCS	R-3	Methylactic acid, Dimethyl- succinic acid, Volatile fatty acid, Norvolatile fatty acid, Anaerobic- bacteria
	Thermon-3000	5	Shimalite F 40/80		Acetic Acid in Acetic Anhydride
	Thermon-3000	5	SHINCARBON A 60/80	T-94	
	Thermon-1000	2	Shimalite TPA 60/80		Enanthic acid, Pantoyl lactone
	Thermon-1000+H <sub>3</sub> PO <sub>4</sub>	5+0.5	Chromosorb W 80/100 AW-DMCS	T-66	Lower free fatty acids in organic solvents
	Thermon-1000+H <sub>3</sub> PO <sub>4</sub>	10+1	Chromosorb W 80/100 HP	T-65	
	Thermon-3000	3	Shimalite TPA 60/80	T-75	Lower free fatty acids in organic solvents
	Thermon-3000	5	SHINCARBON A 60/80	T-94	
Higher free fatty-acids	FFAP	10	Chromosorb W 80/100 AW-DMCS		Palm oil acids in fish                      Fatty
	FON	10	Celite 545 80/100 A	F-12	Higher fatty acids                      Fatty
	FON	10	Chromosorb W 80/100 AW-DMCS	F-14	acids in fish

## Application for Each Usage

Sample	Stationary Phase	%	Support	P/N	Application
Aromatic acids, Oxy acids, Keto acids	Thermon-3000	2	Chromosorb W 80/100 AW-DMCS	T-76	Rosin acid
	Thermon-3000	10	Celite 545 80/100 AS	T-79	Cinnamic acid, Hippuric acid, Hydroxybenzoic acid
	Thermon-3000	5	Shimalite W 80/100 AW-DMCS	T-78	Tricresyl phosphate
	Thermon-3000	5	SHINCARBON A 60/80	T-94	Lactic acid (free)
	Thermon-3000	3	Shimalite TPA 60/80	T-75	
	Thermon-3000	2	Shimalite F 40/80	T-90	
	Thermon-3000	5	SHINCARBON A 60/80	T-94	Mono-, Dichloro acetic acid
	Thermon-3000	3	Shimalite TPA 60/80	T-75	
	Thermon-1000 +H <sub>3</sub> PO <sub>4</sub>	5+0.5	Chromosorb W 80/100 AW-DMCS	T-66	Maleic anhydride, Phthalic- anhydride, Benzoic acid
	FAL-M	25	Chromosorb W 80/100 AW-DMCS- H <sub>3</sub> PO <sub>4</sub>	F-2	Levulinic acid (free)
	Thermon-1000 +H <sub>3</sub> PO <sub>4</sub>	10+1	Chromosorb W 80/100 HP	T-65	
	FAL-M	10	Shimalite TPA 60/80	F-7	Pyruvic acid (free)
	Thermon-3000	5	SHINCARBON A 60/80	T-94	
	Thermon-3000	3	Shimalite TPA 60/80	T-75	Lactic acids, Levulinic acids
	Thermon-3000	5	SHINCARBON A 60/80	T-94	Glycolic acids, Thioglycolic acids in soy
	Thermon-3000	2	Shimalite F 40/80	T-90	
Esters	FAL-M	25	Chromosorb W 80/100 AW-DMCS- H <sub>3</sub> PO <sub>4</sub>	F-2	Acrylic acid esters (Methyl-, Ethyl, methacrylate)
	Advance-DS	5	Chromosorb W 80/100 AW-DMCS	A-40	Higher fatty acid methylesters
	DEGS	15	Shimalite 60/80 AW	D-25	Fatty acid methyl esters
	DEGS	10	Shimalite W 60/80 AW-DMCS	D-26S	
	DEGS	15	Chromosorb W 60/80 AW-DMCS	D-58S	
	Shinchrom E71	5	Shimalite 80/100 AW	E-23	Fatty acid methyl esters in Rape- oil, Linseed oil, Coconut oil, Fish- oil
	Thermon-3000	5	SHINCARBON A 60/80	T-94	Dicarboxylic acid esters (Oxalic acids ~ Citric acid esters)
	Thermon-3000	5	Chromosorb W 80/100 AW-DMCS	T-77	
LPG	SM-PACK		Shimalite 60/70 NAW	S-119	Liquefied petroleum gases
Permanent- gases			Activated Charcoal 60/80	A-4	Carbon monoxide, Carbon dioxide, Methane
			Molecular Sieve 5A 60/80	M-2	Carbon monoxide, Hydrogen, Oxygen, Nitrogen
			Silica Gel 60/80	S-2	Permanent gases, Organic gases
Lower hydrocarbons	Sebaconitrile	25	Shimalite 60/80 NAW	S-66	1-Butene and Isobutene in- propylene
	Silicone DC 200	25	Shimalite 60/80 NAW	S-6	Impurities in 1,3-Butadiene
Aromatic- hydrocarbons	Bentone34+DNP	5+5	Shimalite 80/100 NAW	B-19	Xylene isomer
	Shinchrom F51 +Bentone34	6+4	Chromosorb W 80/100 AW-DMCS	F-10	
	DMS	25	Shimalite 60/80 NAW	D-8	Alkene isomer(C <sub>4</sub> ~ C <sub>6</sub> )
	Thermon-1000	5	Chromosorb W 80/100 AW-DMCS	T-64	Paraffin wax
	Thermon-3000	10	Shimalite 80/100 AW-DMCS	T-82	Aromatic hydrocarbons in gasoline

## Application for Each Usage

Sample	Stationary Phase	%	Support	P/N	Application
Paraffin oil, Light oil, fuel oil	Thermon-1000	25	Shimalite 80/100 AW-DMCS	T-70	Hydrocarbons, Nitriles, Styrenemonomer, Aromatic hydrocarbons in gasoline, Ligroin
	Thermon-1000	5	Chromosorb W 80/100 AW-DMCS	T-64	Crude oil, A fuel oil, Light oil
	Silicone OV-101	5	Chromosorb W 80/100 AW-DMCS		Paraffin oil, Light oil, Naphtha, regular gasoline
	Silicone SE-52	5	Shimalite W 60/80 AW	S-4	
	Silicone SE-52	5	Shimalite W 60/80 AW-DMCS	S-65	
	Silicone OV-17	2	Chromosorb W 60/80 AW-DMCS	O-29	Benzopyrene in tar
Alcohols	FAL-M	10	Shimalite TPA 60/80	F-7	Lower Alcohols
	TSG-1	15	SHINCARBON A 60/80	T-96	Formaline
	Thermon-1000	5	Sunpak-A 50/80	T-88	Lower alcohols in whisky
	PEG6000	10	SHINCARBON A 60/80	P-130	
	Sorbitol	30	Shimalite W 60/80 NAW	S-55	Ethanol in methanol
	Thermon-1000	5	Chromosorb W 80/100 AW-DMCS	T-64	Higher alcohols
	Thermon-1000	5	Sunpak-A 50/80	T-88	Minor methanols, Ethanols, Lower alcohols
	TSG-1	15	SHINCARBON A 60/80	T-96	
	Thermon-3000	10	Chromosorb W 80/100 AW-DMCS	T-81	Diols
Aldehydes	FAL-M	10	Shimalite TPA 60/80	F-7	Lower saturated aldehydes
	FAL-M	10	SHINCARBON A 60/80	F-18	Lower unsaturated aldehydes (Acrolein, Crotonaldehyde, Furfural)
	PEG6000	10	Shimalite TPA 60/80	P-91	
	TSG-1	15	SHINCARBON A 60/80	T-96	Formalin
	Thermon-1000 +H <sub>3</sub> PO <sub>4</sub>	5+0.5	Chromosorb W 80/100 AW-DMCS	T-66	Lower aldehydes, Alcohols, Esters, Isobutylaldehyde in isobutyric acid
Glycols	Thermon-3000	5	Chromosorb W 80/100 AW-DMCS	T-77	Ethyleneglycol, Diethyleneglycol, Triethyleneglycol
	Thermon-3000	1	Shimalite TPA 60/80	T-74	
	Thermon-3000	2	SHINCARBON A 60/80	T-95	Poyethyleneglycol300
			TENAX-TA 60/80		Ethyleneglycol, Diethyleneglycol, Triethyleneglycol, Glycols
	Thermon-3000	5	SHINCARBON A 60/80	T-94	
Phenols	Thermon-3000	1	Shimalite TPA 60/80	T-74	Catechol in water, Resorcinol, Hydroquinone
	FAP-S		Chromosorb W 80/100 AW	F-5	<i>o,m,p</i> -Cresol, Phenols, Xylenol isomers
	Lanoline (Denatured)	10	Chromosorb W 80/100 AW-DMCS	L-6	<i>o,m,p</i> -Cresol, Phenols
	Thermon-1000 +H <sub>3</sub> PO <sub>4</sub>	5+0.5	Chromosorb W 80/100 AW-DMCS	T-66	2,4-Dichlorophenol, <i>p</i> -Chlorophenol
Amines, Amides	PEG20M	10	Chromosorb W 80/100 AW-DMCS	P-23	Acrylamide
	Thermon-1000 +KOH	10+3	Chromosorb W 80/100 AW-DMCS	T-67	Phenylenediamine, Tetraethylenepentamine

## Application for Each Usage

Sample	Stationary Phase	%	Support	P/N	Application
Amines, Amides	Thermon-3000	5	SHINCARBON A 60/80	T-94	Acrylamide
	Thermon-3000	5	Chromosorb W 80/100 AW-DMCS	T-77	Nicotine in tobacco, Acetamide
	Thermon-3000	5	SHINCARBON A 60/80	T-94	
Others	Apiezon Grease L	5	Chromosorb W 60/80 AW-DMCS	A-49	Trinitro propane
	Flexol 8N8	25	Chromosorb W 60/80 AW-DMCS	F-16	Ethylene oxides in ethanols
	Bentone34+DNP	5+5	Shimalite 80/100 NAW	B-19	<i>m,p</i> -Chlorostyrene
	FAL-M	25	Chromosorb W 80/100 AW-DMCS- H <sub>3</sub> PO <sub>4</sub>	F-2	Acetonitrile, Acrylonitrile
	Thermon-1000	25	Shimalite 80/100 AW-DMCS	T-70	
Fat	Dexsil 300GC	2	Chromosorb W 80/100 HP	D-88	Triglycerides
	Dexsil 400GC	2	Chromosorb W 80/100 HP	D-90	
	Silicone OV-17	1.5	Shimalite W 80/100 AW-DMCS	O-9	
Amino acids	EGA	0.5	Chromosorb W 80/100 AW	E-31	Amino acids (Butyl esters, TFA)
	NGS	1	Chromosorb W 60/80 AW-DMCS	N-4	
Catecholamine	Silicone SE-30	5	Chromosorb W 60/80 AW-DMCS	S-64	Catecholamine(TMS)
Bile acid	Silicone DC QF-1	1.5	Chromosorb W 60/80 AW-DMCS	Q-3	Tri-, Deoxy-, Dehydroxycol acids (Me-TFA), Bile acids
Alkaloids	Silicone SE-30	1.5	Chromosorb W 60/80 AW-DMCS	S-24	Codeine, Morphine, papaverine, thebaine
Steroids	Silicone OV-17	1.5	Shimalite W 80/100 AW-DMCS	O-9	Estrogen (such as Estrone, Estriol)
	Silicone OV-1	1	Shimalite W 80/100 AW-DMCS	O-18	Urinary Androsterone, Etiocolanolone, Dehydroepiandrosterone (MO-,MO-TMS)
	Silicone DC QF-1	2	Shimalite W 80/100 AW-DMCS	Q-7	Urinary steroids(MO complete, TMSi)
	Silicone OV-210	2	Shimalite W 80/100 AW-DMCS	O-44	
Sugar	Advance-DS	5	Chromosorb W 80/100 AW-DMCS	A-40	Adonitol, Erythritol, Xylitol
	Silicone OV-1	1	Shimalite W 80/100 AW-DMCS	O-18	Saccharide(TMSi, Acetylated)
	Silicone OV-17	2	Chromosorb W 80/100 AW-DMCS	O-29D	
	Silicone SE-30	1.5	Chromosorb W 60/80 AW-DMCS	S-24	
	Thermon-3000	5	Chromosorb W 80/100 AW-DMCS	T-77	Erythritol, Adinitol, Xylitol, Mannitol, Inositol, Sorbitol (Acetylated)
Tocopherol	Silicone SE-30	1.5	Chromosorb W 80/100 AW-DMCS	S-114	-Tocopherol (Accetylated)

## Application for Each Usage

	Sample	Stationary Phase	%	Support	P/N	Application
	Medicine	Silicone OV-17	2	Chromosorb W 80/100 AW-DMCS	O-29D	Ephedrine hydrochloride, dl-Methyl-ephedrine, Papaverine, Diphenhydramine salicylate, Caffeine, Chloropheniramine maleate, Diprophiline, Hyoscyamine, Glycerylguaiacol ester
		Silicone SE-30	10	Chromosorb W 60/80 AW-DMCS	S-39	
		Thermon-3000	5	Shimalite W 80/100 AW-DMCS	T-78	
		Thermon-3000	10	Chromosorb W 80/100 AW-DMCS	T-81	
		Thermon-1000 +H <sub>3</sub> PO <sub>4</sub>	5+0.5	Chromosorb W 80/100 AW-DMCS	T-66	
		Thermon-3000	10	Chromosorb W 80/100 AW-DMCS	T-81	Dl-Camphor, l-Menthol, Methyl salicylate, Thymol
		Thermon-3000	5	Chromosorb W 80/100 AW-DMCS	T-77	Diphenhydramine
		Thermon-3000	5	Chromosorb W 80/100 AW-DMCS	T-77	



## Application Data

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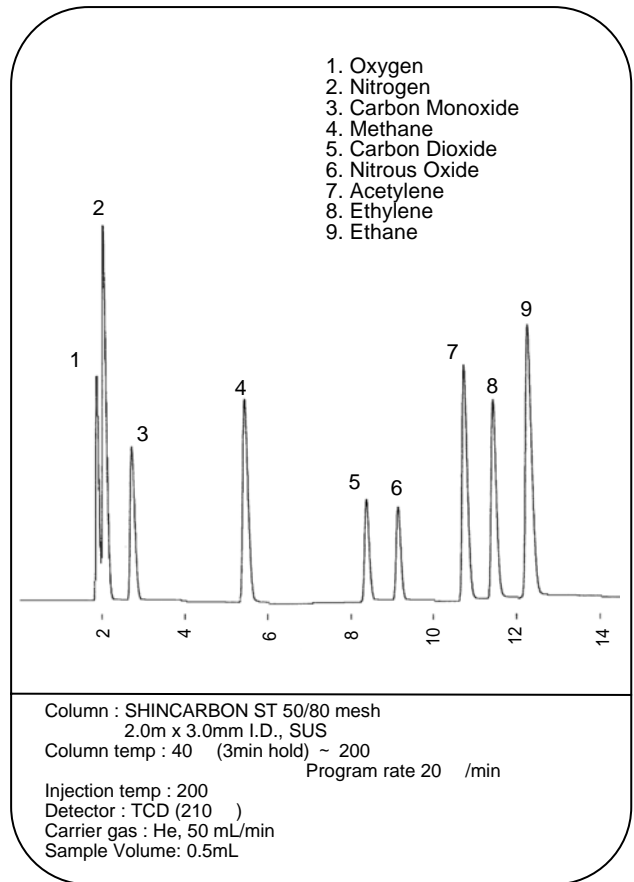
**SHINCARBON ST**

**SHINCARBON ST** is modified-carbon packings for analyzing the inorganic gases, and which is acceptance of the innovative packings for possessing the advantages of the molecular sieves and Porapak Q.

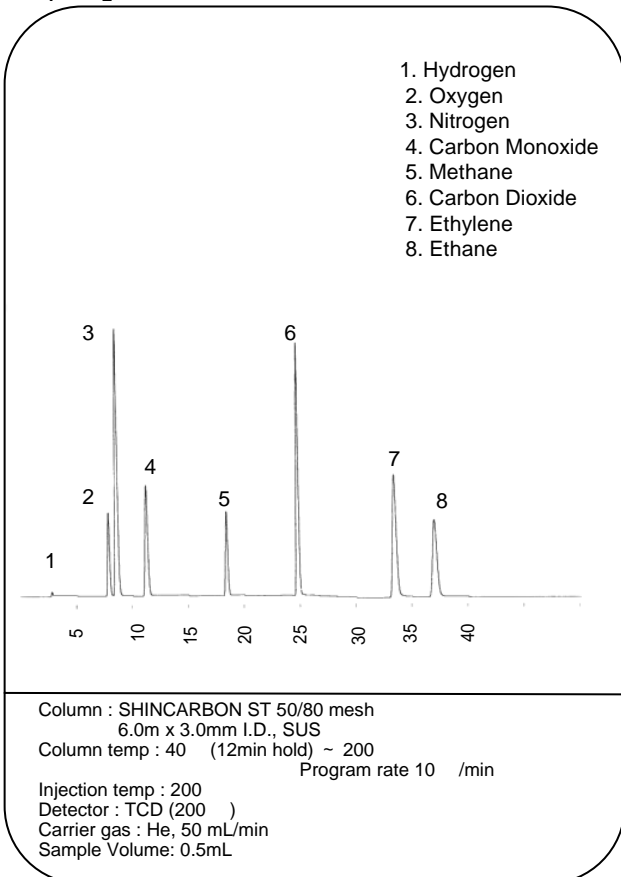
**Characteristics**

- 1)  $H_2$ ,  $O_2$ ,  $N_2$ ,  $CO$ ,  $CH_4$ ,  $CO_2$ ,  $N_2O$ ,  $C_2H_2$ ,  $C_2H_4$ ,  $C_2H_6$  can be analyzing in 1 injection.
- 2) The column performance does not drop for moisture-samples. Injected water can be flush out by heating. (Water peak is not observed.)
- 3) Column length can be controlled in 2m, 4m, 6m, 8m, by connecting.
- 4) Carbonyl sulfide and sulfur dioxide can be analyzing with a glass column. (hydrogen sulfide is absorbed. see, sulfur compounds)
- 5) Vinyl chloride, chloromethane can be analyzing from  $Cl_2$  and  $HCl$  gases. (see, Halogen compounds)

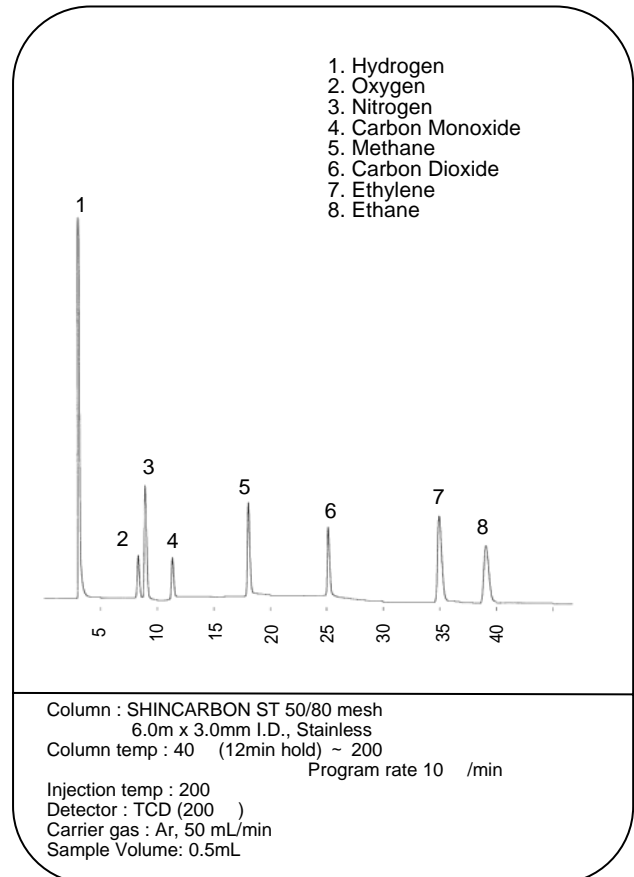
**Inorganic Gases and Lower Hydrocarbons ( $C_1 \sim C_2$ )**



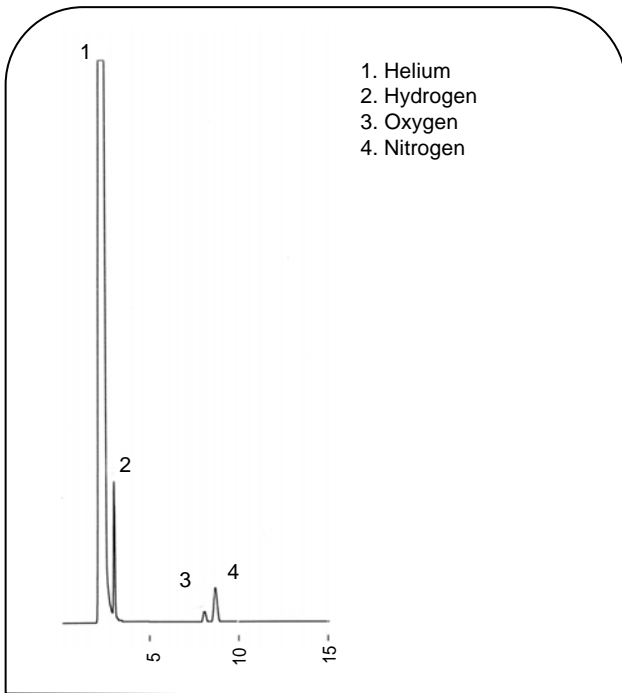
**Inorganic Gases and Lower Hydrocarbons ( $C_1 \sim C_2$ )**



**Inorganic Gases and Lower Hydrocarbons ( $C_1 \sim C_2$ )**

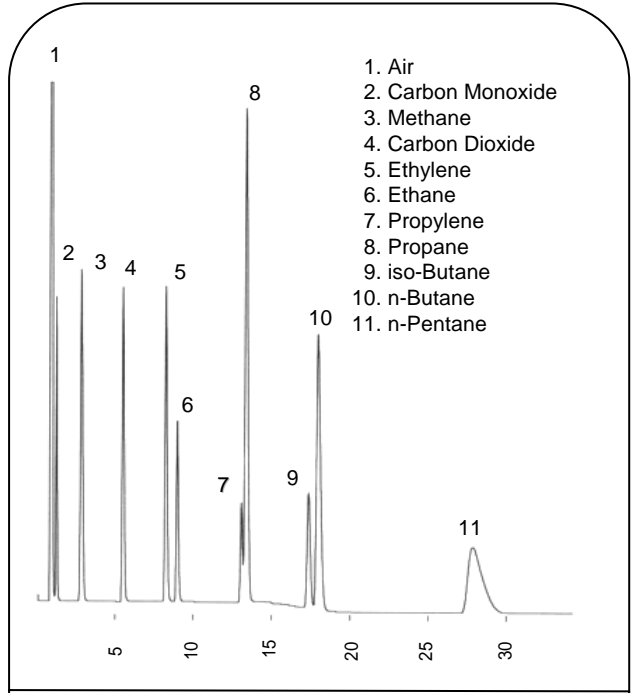


Hydrogen in Helium



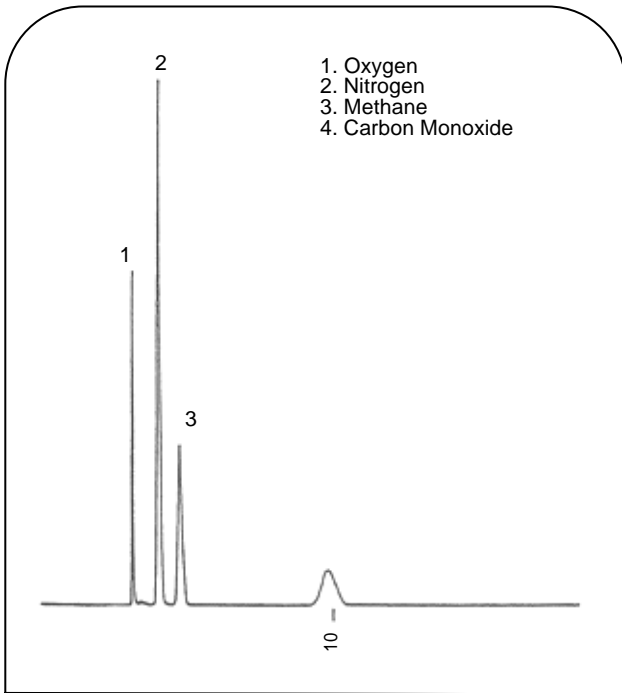
Column : SHINCARBON ST 50/80 mesh  
6.0m x 3.0mm I.D., SUS  
Column temp : 40  
Injection temp : 50  
Detector : TCD (50 )  
Carrier gas : Ar, 50 mL/min  
Sample Volume: 1.0mL

Inorganic Gases and Lower Hydrocarbons (C<sub>1</sub> ~ C<sub>2</sub>)



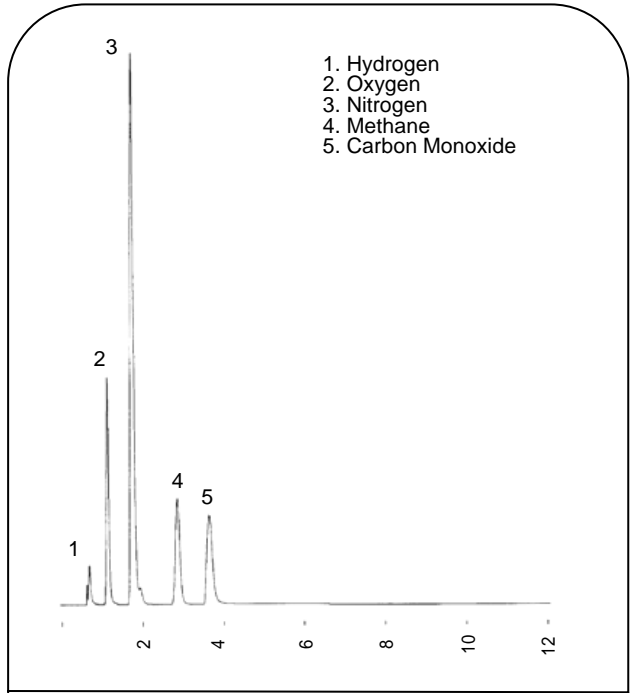
Column : SHINCARBON ST 50/80 mesh  
1.0m x 3.0mm I.D., SUS  
Column temp : 40 ~ 300 Program rate 20 /min  
Injection temp : 300  
Detector : TCD (300 )  
Carrier gas : He, 50 mL/min  
Sample Volume: 0.75mL

Inorganic Gases (Oxygen, Nitrogen, Methane, Carbon Monoxide)



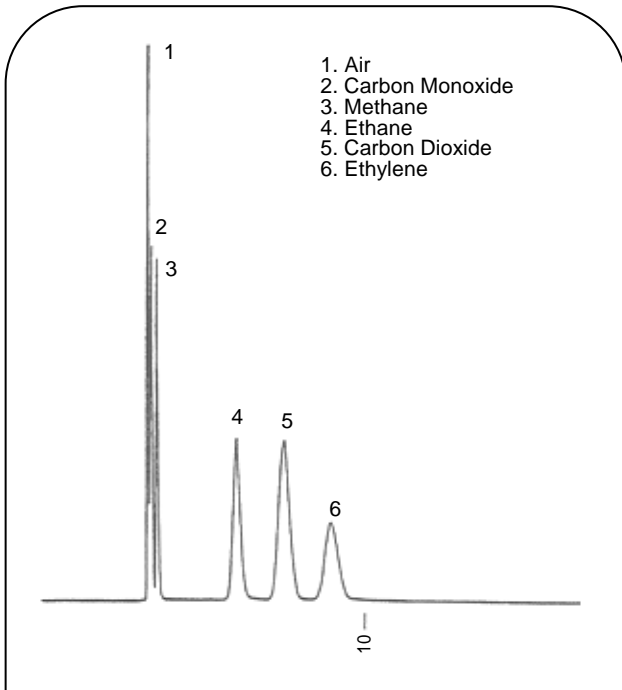
Column : Molecular Sieve 5A 60/80 mesh  
1.6m x 3.2mm I.D., Glass  
Column temp : 50  
Injection temp : 50  
Detector : TCD (50 )  
Carrier gas : He, 40 mL/min  
Sample Volume: 1.0mL

Inorganic Gases (Oxygen, Nitrogen, Methane, Carbon Monoxide)



Column : Molecular Sieve 13X 60/80 mesh  
2.5m x 3.0mm I.D., SUS  
Column temp : 60  
Injection temp : 70  
Detector : TCD (70 )  
Carrier gas : He, 50 mL/min  
Sample Volume: 1.0mL

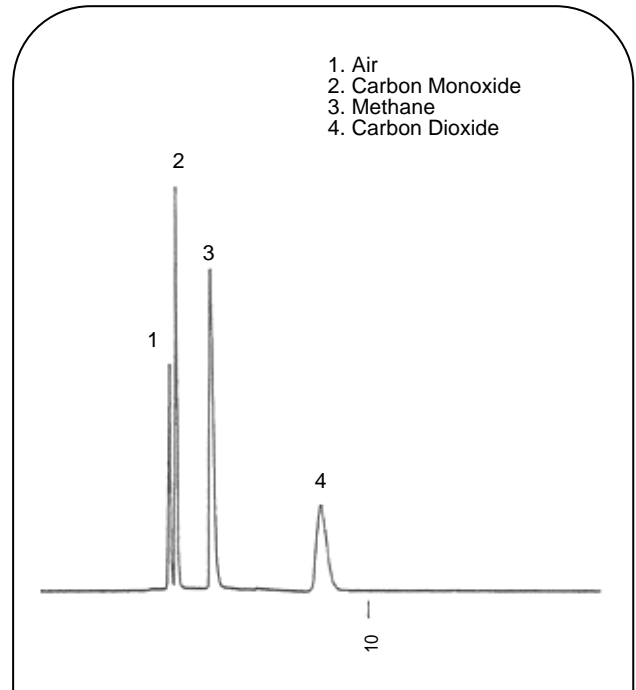
**Inorganic Gases and Lower Hydrocarbons**



Column : Silica Gel 60/80 mesh  
1.6m x 3.2mm I.D., Glass  
Column temp : 50  
Injection temp : 50  
Detector : TCD (50 )  
Carrier gas : He, 60 mL/min  
Sample Volume: 1.0mL

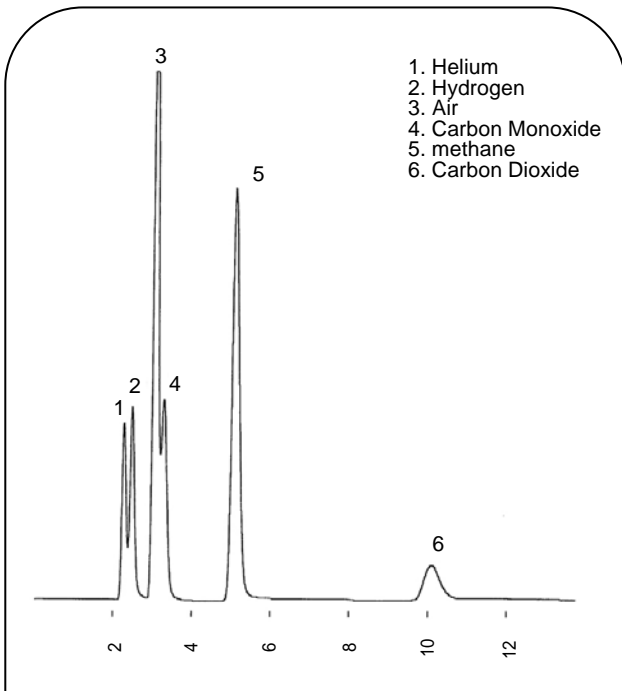
**Inorganic Gases and Methane**

(Carbon Monoxide, Methane, Carbon Dioxide)



Column : Activated Charcoal 60/80 mesh  
1.6m x 3.2mm I.D., Glass  
Column temp : 50  
Injection temp : 50  
Detector : TCD (50 )  
Carrier gas : He, 50 mL/min  
Sample Volume: 1.0mL

**Inorganic Gases and Methane**



Column : Porapak Q 80/100 mesh  
5.0m x 3.0mm I.D., SUS  
Column temp : 40  
Injection temp : 60  
Detector : TCD (60 )  
Carrier gas : Air, 20 mL/min  
Sample Volume: 1.0mL

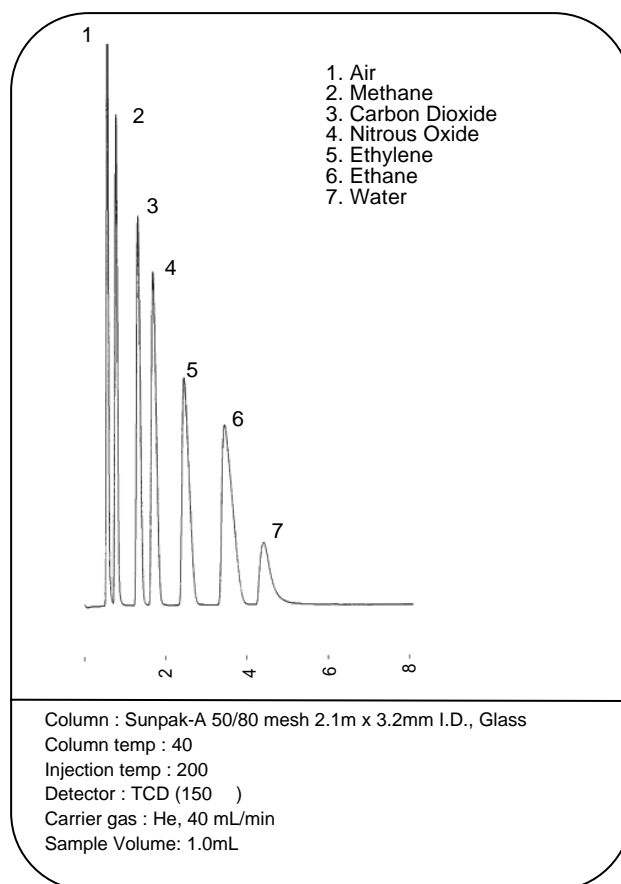
## Inorganic Gases and Lower Hydrocarbons

### Sunpak-A

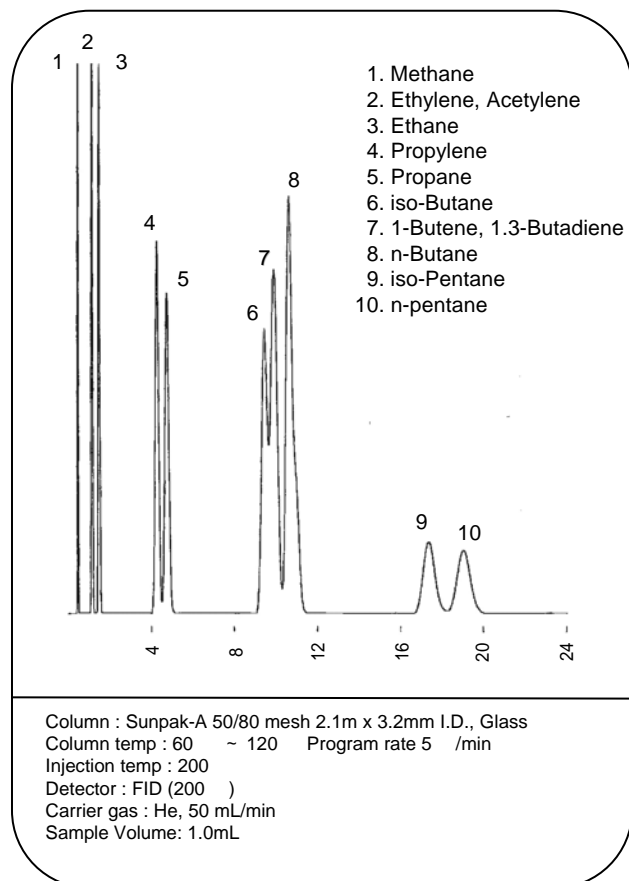
**Sunpak-A** is an original high effective high-cross-linking porous polymer packings. Higher resolution, efficiency and stability can be obtained than others.

#### Characteristics

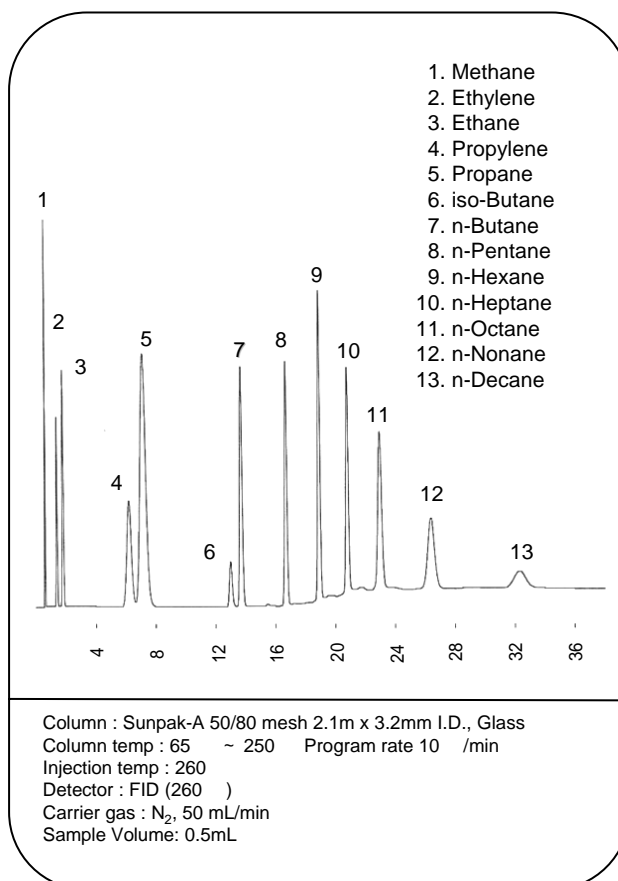
- 1) Porous copolymer beads of ethylvinylbenzene and divinylbenzene. Supporting the USP code [3]
- 2) Low hydrocarbons, lower alcohols, CO<sub>2</sub>(inorganic gases) can be analyzing from aqueous sample.
- 3) Short retention time of water. Excellent for the micro analysis of water in organic solvents.
- 4) High lot-to-lot uniformity.
- 5) Samples, difficult for diatomite supports by degradation reaction, can be analyzed by coating the liquid phase. (see, alcohols and amines)



### Lower Hydrocarbons



### Lower Hydrocarbons



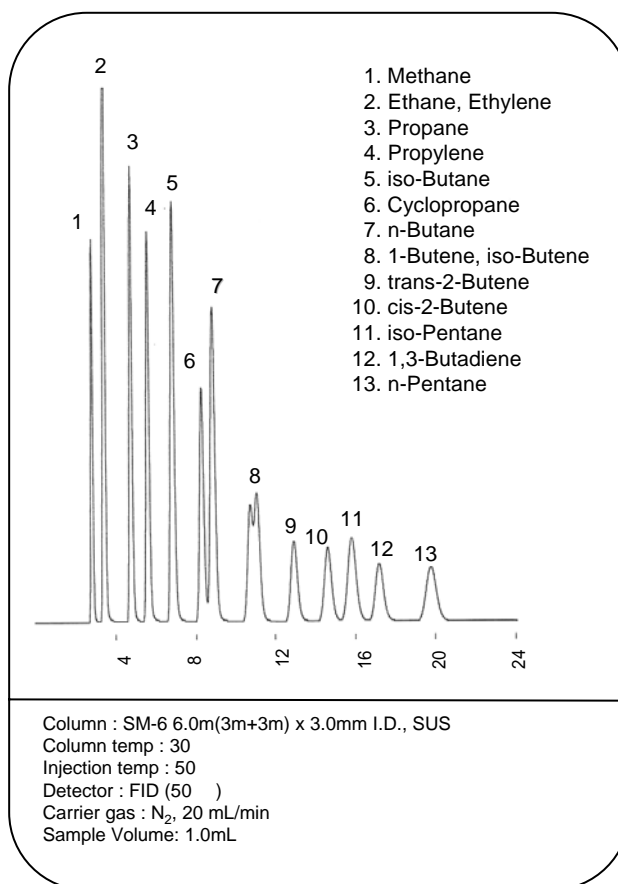
## SM-6

**SM-6** is the analytical column for LPG (liquefied petroleum gas). High performance is obtained for the separation of low hydrocarbon isomers.

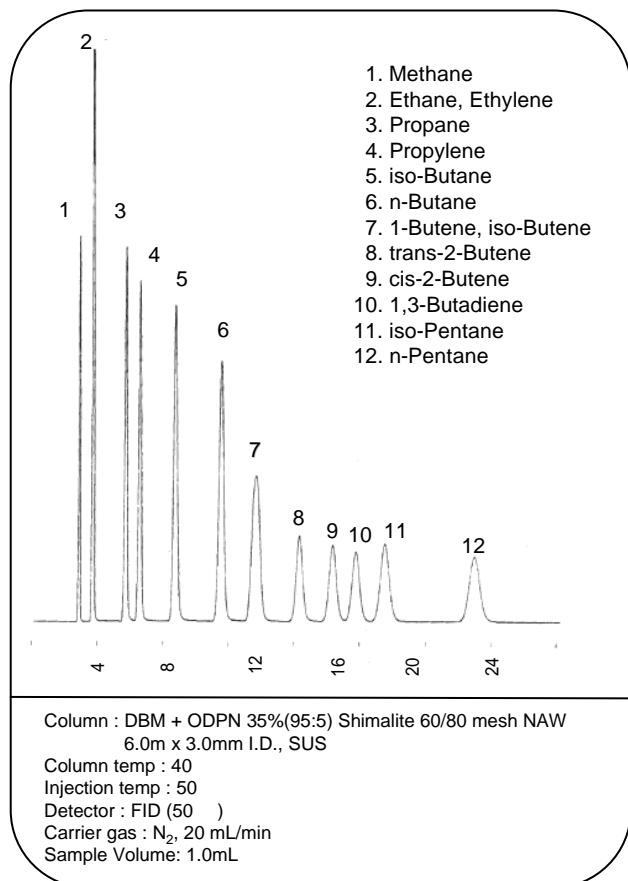
### Characteristics Characteristics

- 1) **SM-6** is composed of each 3m of **SM-PACK (S)** and **SM-PACK (M)**.
- 2) Connecting the **SM-PACK (S)** side to injector. The label is on the column inlet.

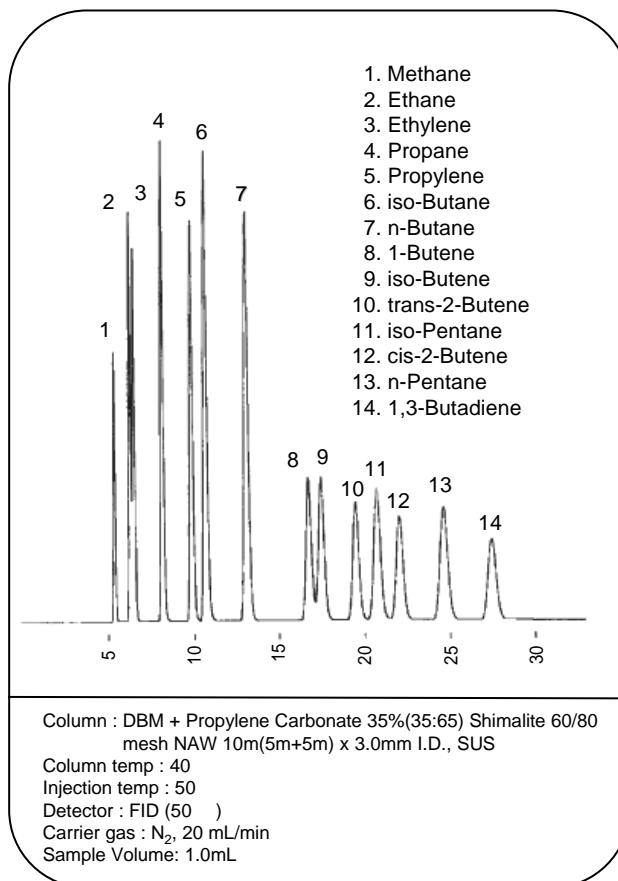
## Lower Hydrocarbons



## Lower Hydrocarbons

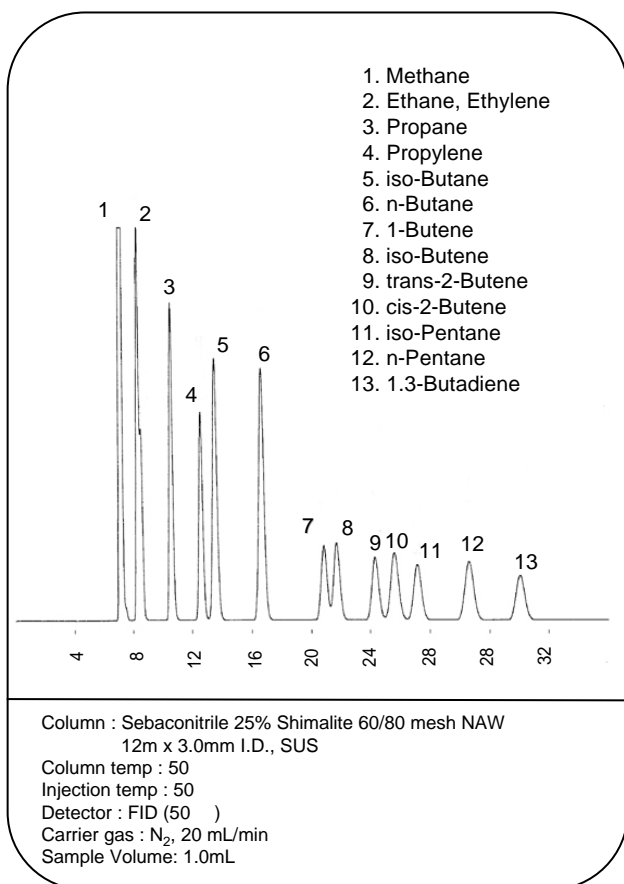


## Lower Hydrocarbons

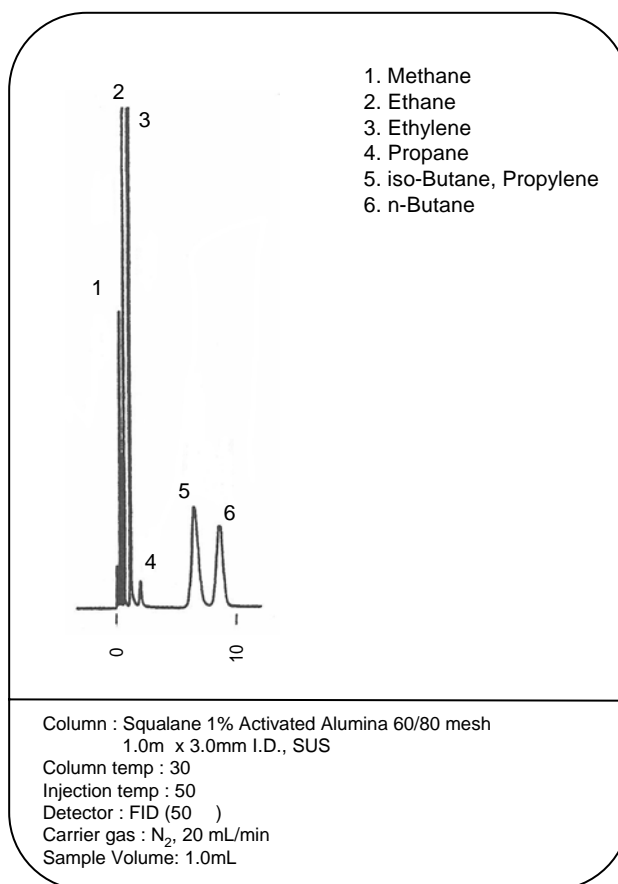


## Lower Hydrocarbons

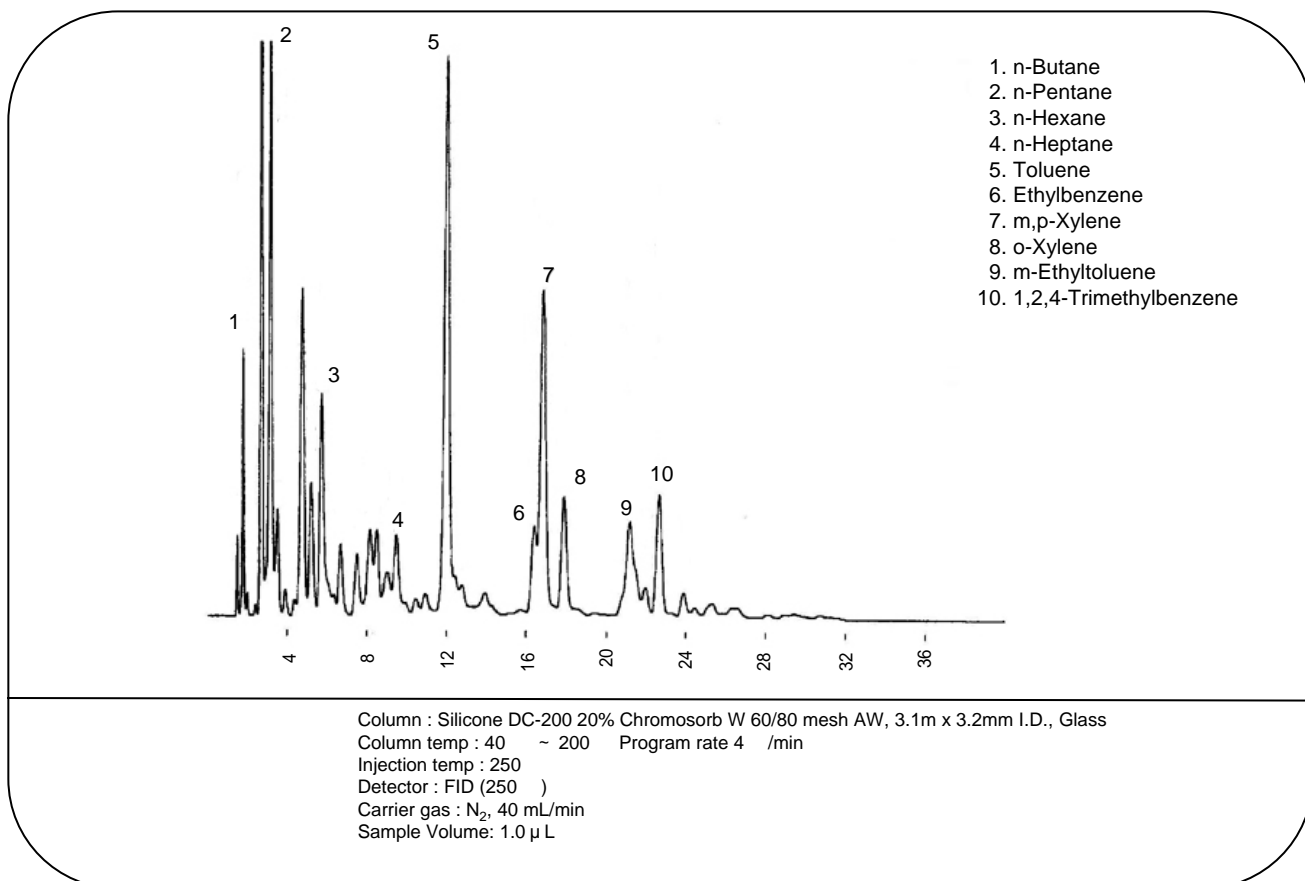
### Lower Hydrocarbons



### Lower Hydrocarbons

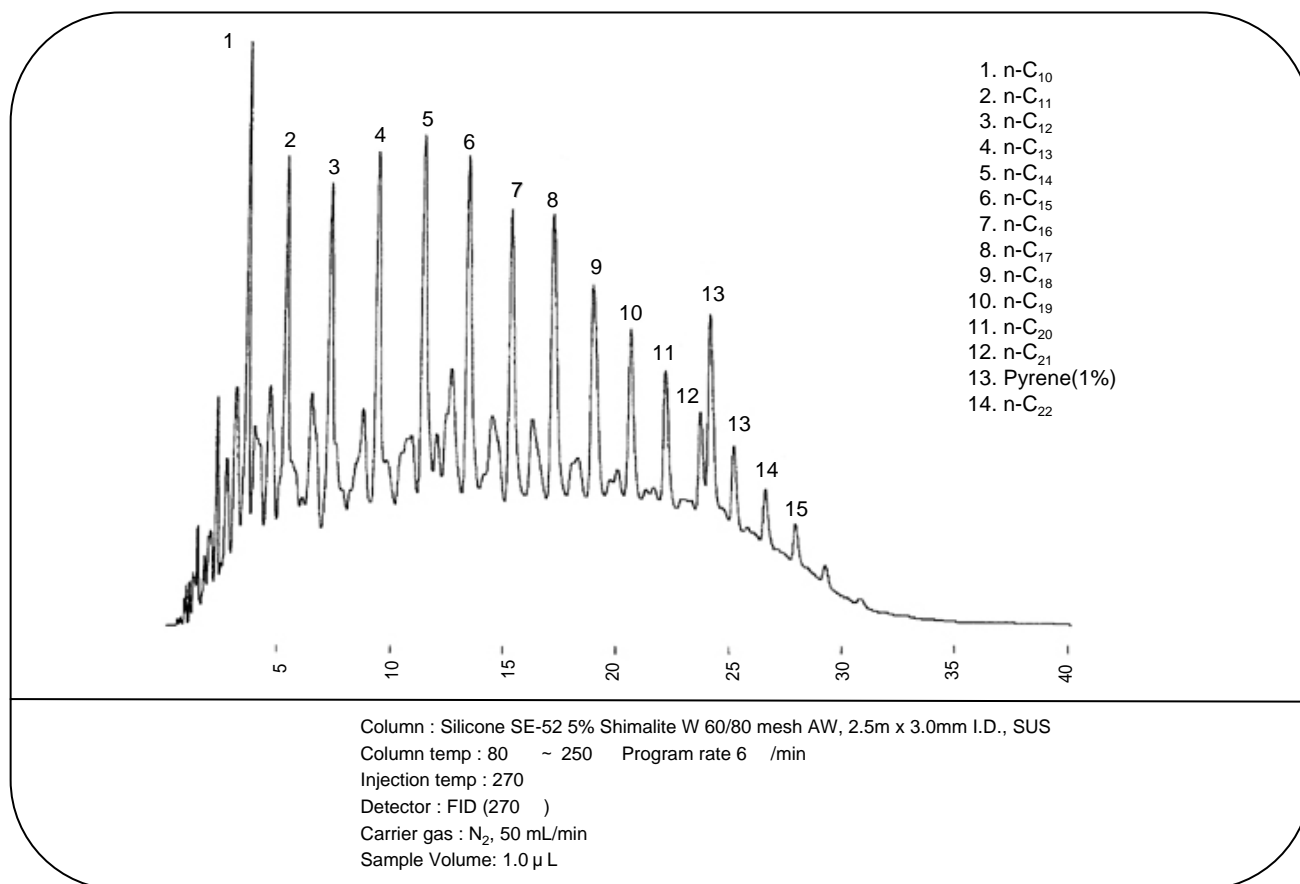


### Gasoline

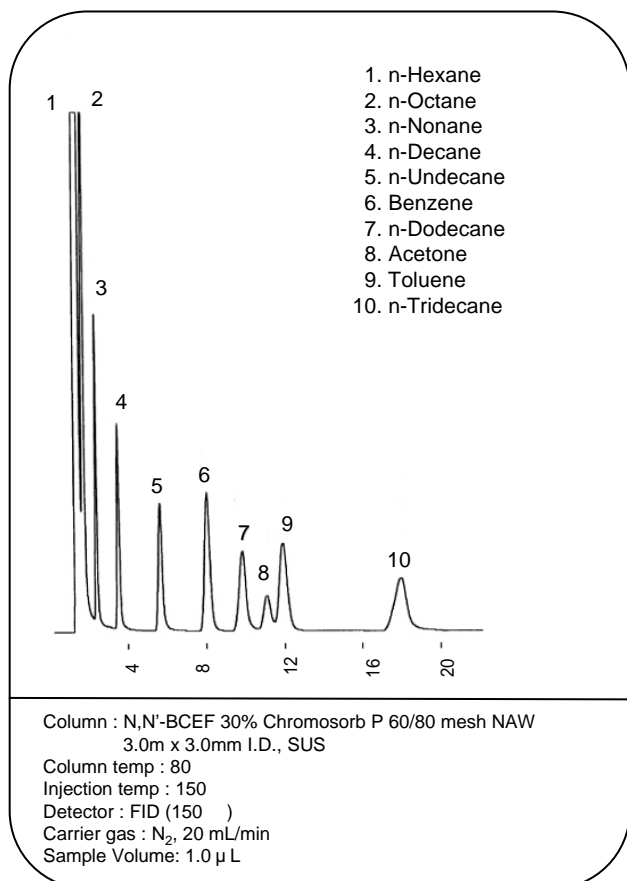


# Hydrocarbons

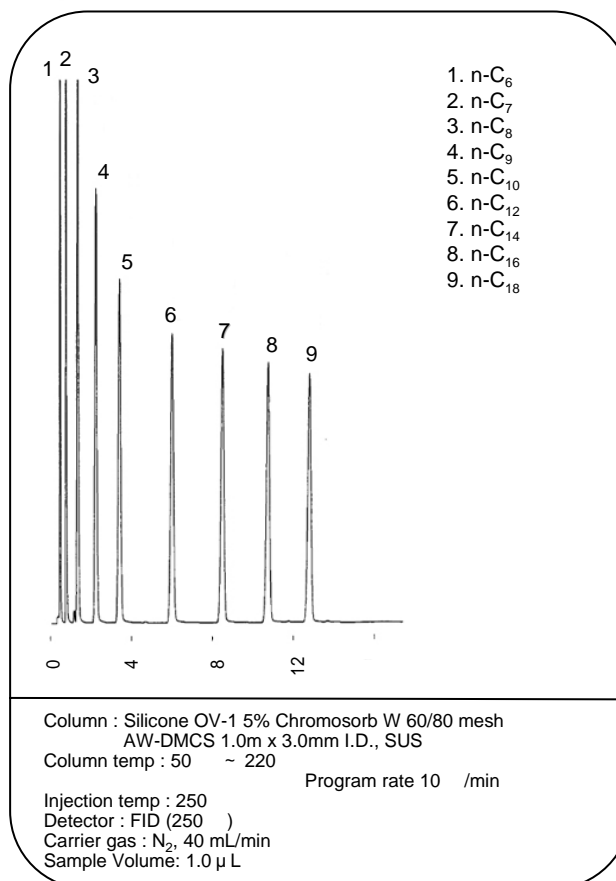
## Mixture of Kerosene and Light Oil



## Hydrocarbons and Acetone

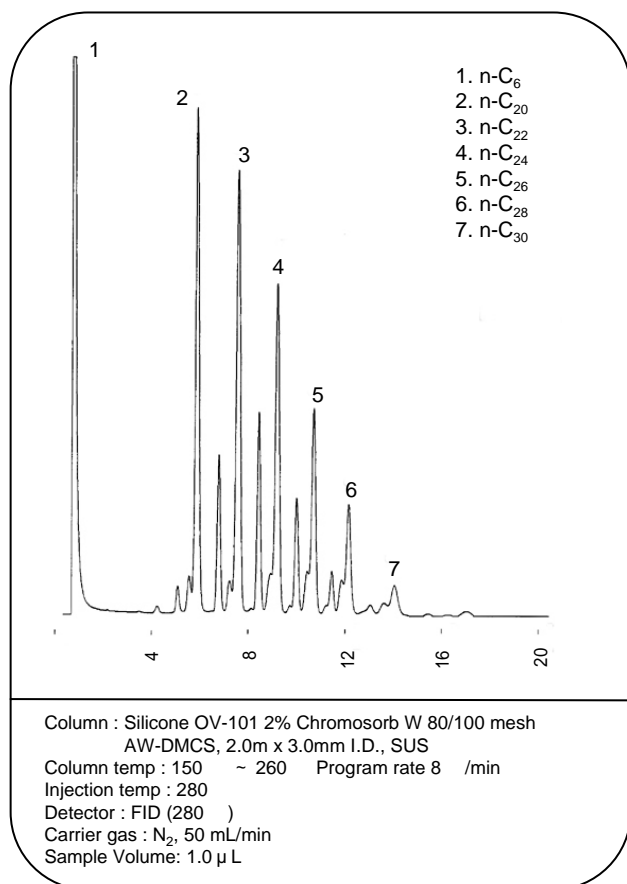


## Hydrocarbons

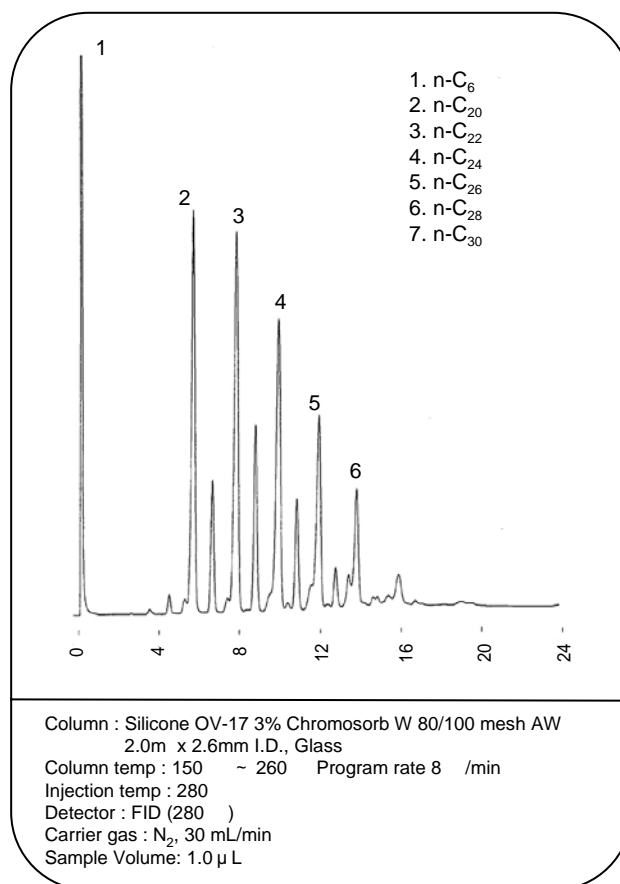




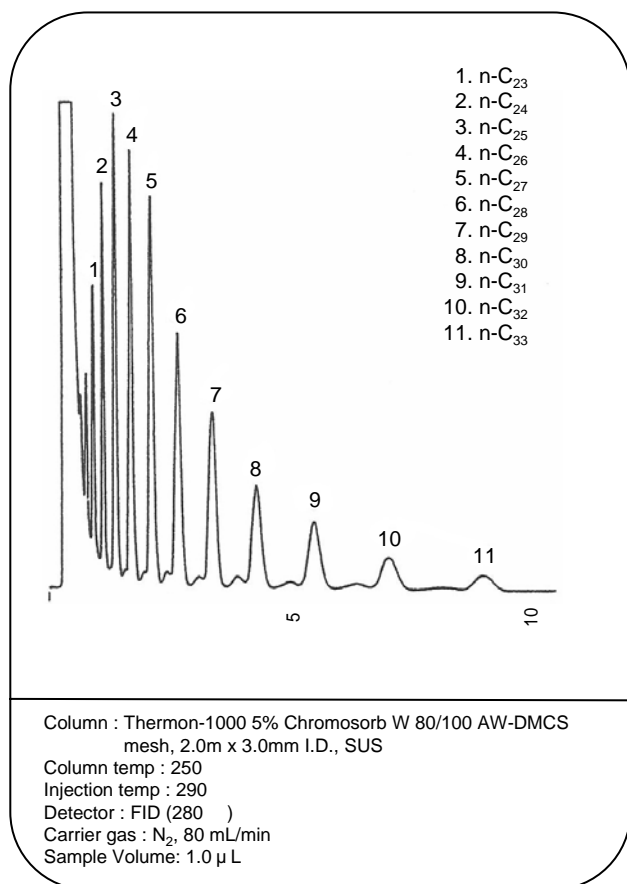
**Paraffin Wax m.p. 40 ~ 42**



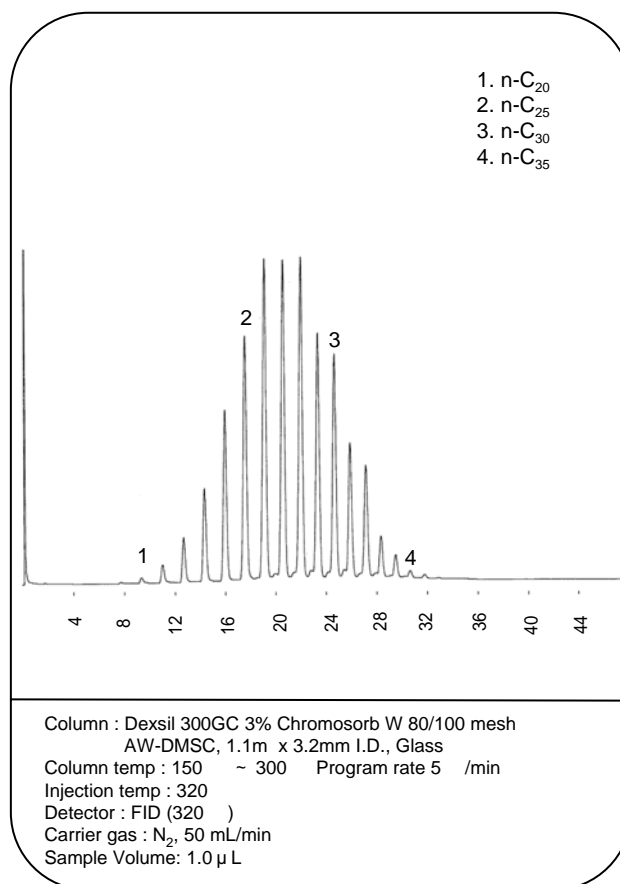
**Paraffin Wax m.p. 40 ~ 42**



**Paraffin Wax m.p. 48 ~ 50**



**Paraffin Wax m.p. 60 ~ 62**



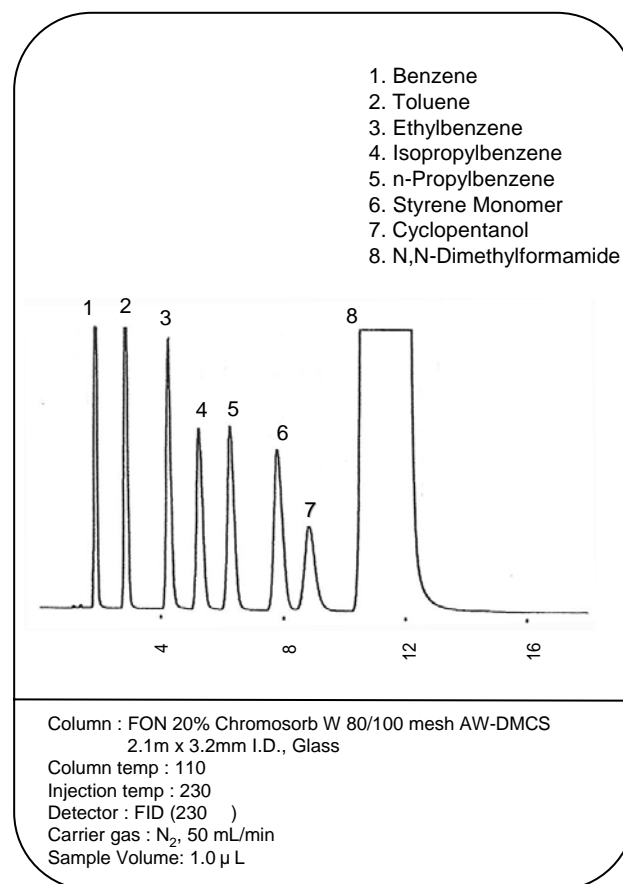
## Styrenemonomer in Resin

### FON

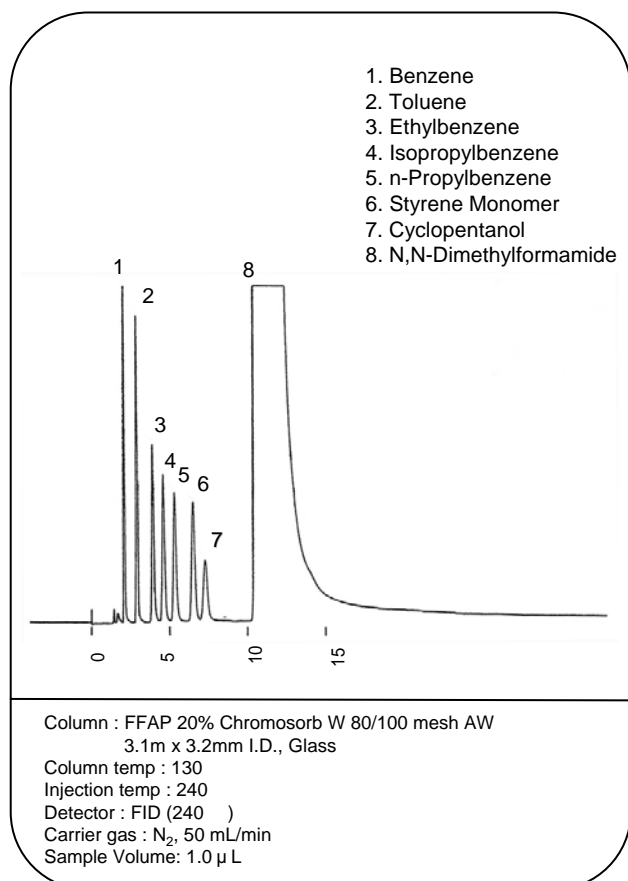
The chemical structure of FON is similar to that of FFAP.

#### Characteristics

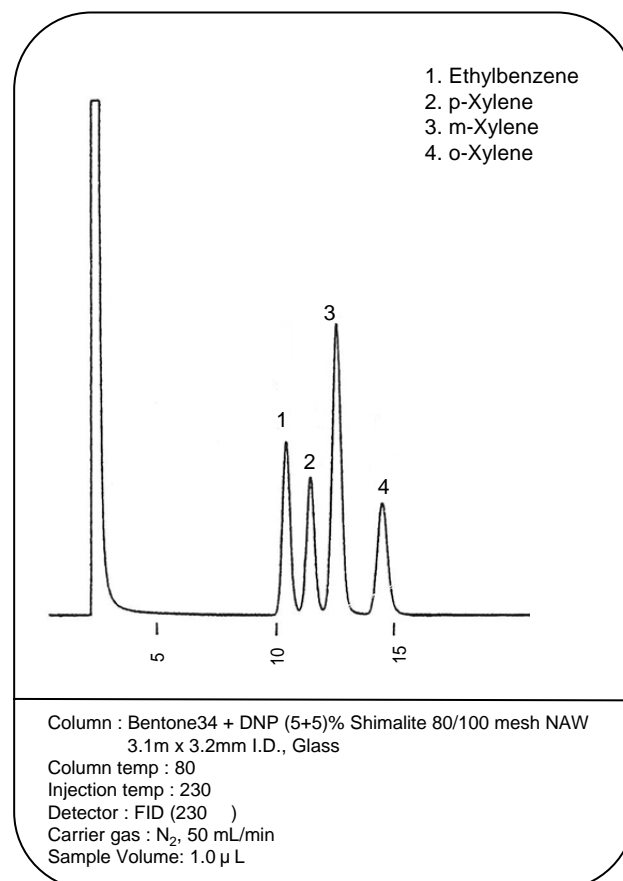
- 1) Because of the acidic stationary phase, the excellent analysis of acidic compounds can be performed.  
(see, lower fatty acids)
- 2) It is also available for the analysis of aromatic hydrocarbons.
- 3) The maximum operation temperature is 250 .



## Styrenemonomer in Packing Materials



## Xylene Isomers



**SBS Series (SBS-100, 120, 200, 300)**

When small amount sample are analysed in head space method, about 5 mL of air including sample are injected. It is well known that packing material loaded polyethylene glycols is cleaved by oxygen in the air and the separation could not be performed. **SBS** series are designed not to affect by oxygen in air.

**SBS** series are composed of SBS-100, SBS120, SBS-200 and SBS-300.

**SBS-100 [SBS-100 10% Shimalite TPA 60/80 (30 ~ 150 )]****Characteristics**

- 1) **SBS-100 has middle polarity and has an oxidation-resistance.**
- 2) **Polar compounds such as alcohols in air can not be absorbed on the packing material, so quantitative analysis of small amount sample is possible.**
- 3) **As the support of SBS-100 is TPA, the column is not suffer from influence of the sample containing water in the air.**

**SBS-120 [SBS-120 12% SHINCARBON-A 80/100 (30 ~ 150 )]****Characteristics**

- 1) **The stationary phase of SBS-120 is the same of SBS-100.**
- 2) **SHINCARBON-A of graphite carbon is used for support. Therefore, the separation of alcohols, esters, ketones, hydrocarbons and cellosorbs is excellent. And minor quantitative analysis is possible. SBS-120 is possible minor quantitative analysis. Even if moisture is included in air, SBS-120 is unaffected.**

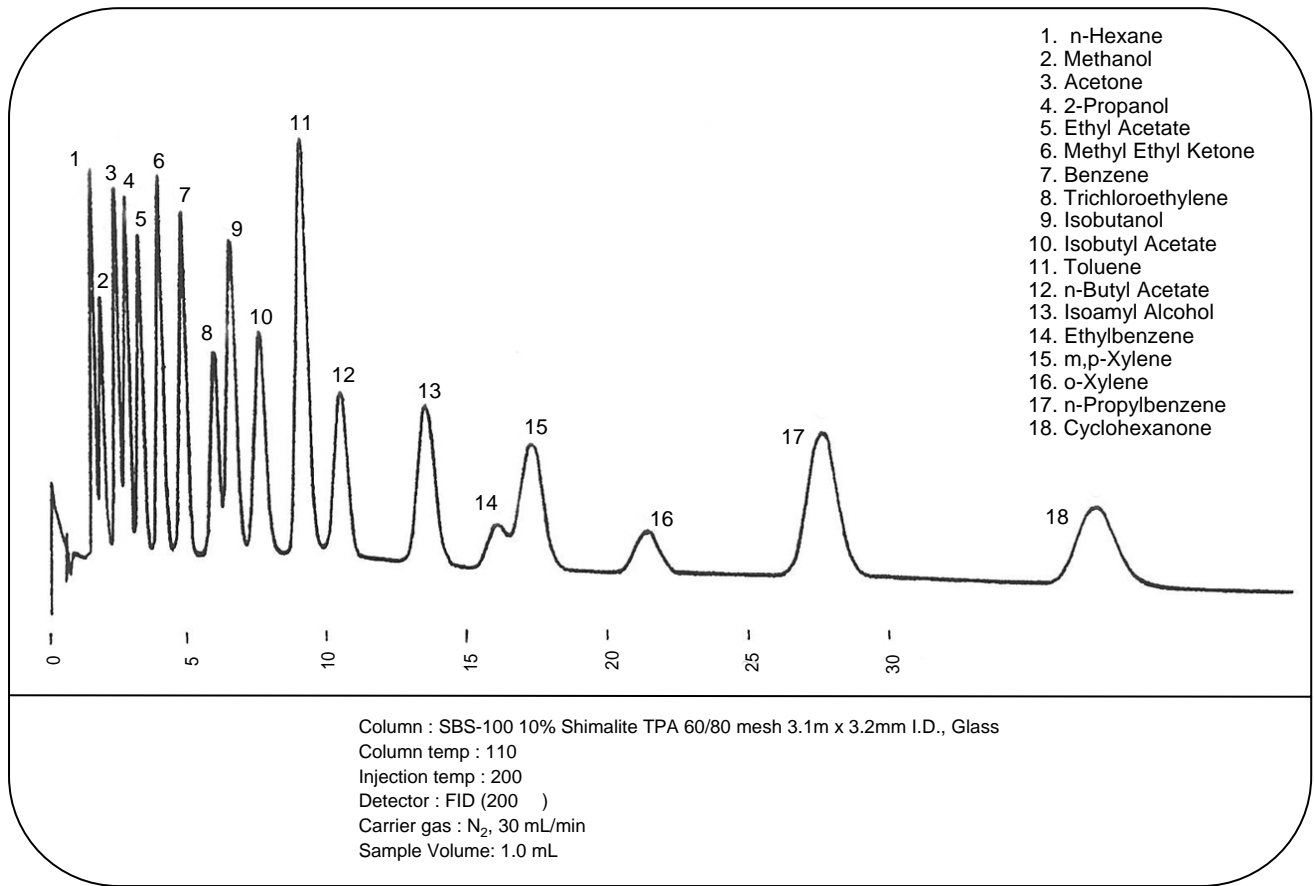
**SBS-200 [SBS-200 20% Shimalite W 100/120 AW-DMCS (30 ~ 250 )]****Characteristics**

- 1) **SBS-200 has middle polarity and oxidation resistance.**
- 2) **SBS-200 can analyze compounds of wide range from low boiling point to high boiling point**
- 3) **The number of theoretical plates is high, and the separation is excellent. Because support of diatomaceous earth is used.**

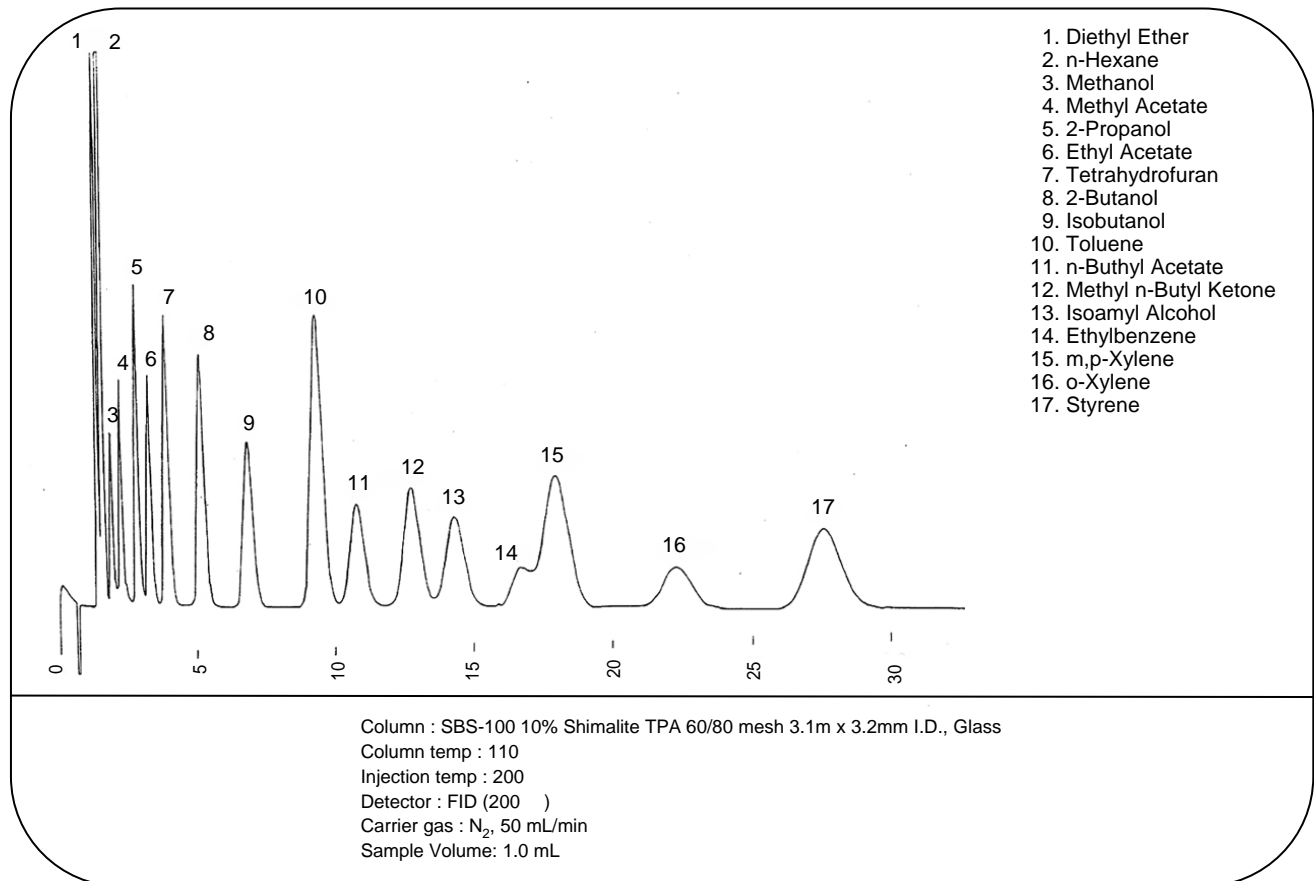
**SBS-300 [SBS-300 20% Shimalite W 80/100 AW-DMCS (30 ~ 280 )]****Characteristics**

- 1) **SBS-300 is a packing material having silicone structure.**
- 2) **SBS-300 has non polarity and oxidation resistance.**
- 3) **Minor chloric compounds can be separated.**
- 4) **Heat resistance temperature is high, and bleeding of stationary phase doesn't occur. As a result, the bleeding of stationary phase doesn't occur and ECD analysis is also possible.**
- 5) **The number of theoretical plates is high, and the separation is excellent. Because support of diatomaceous earth is used.**

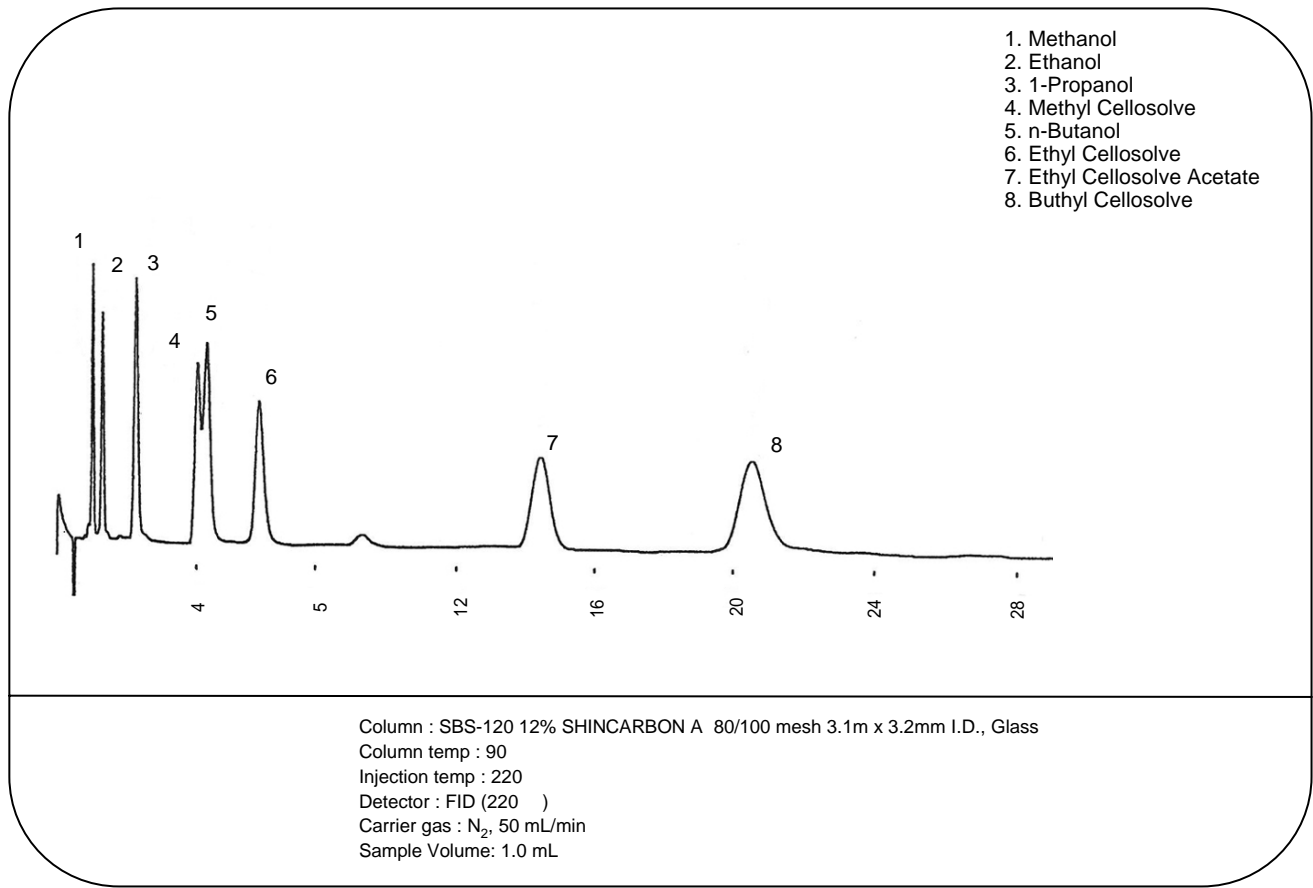
Organic Solvents in Air



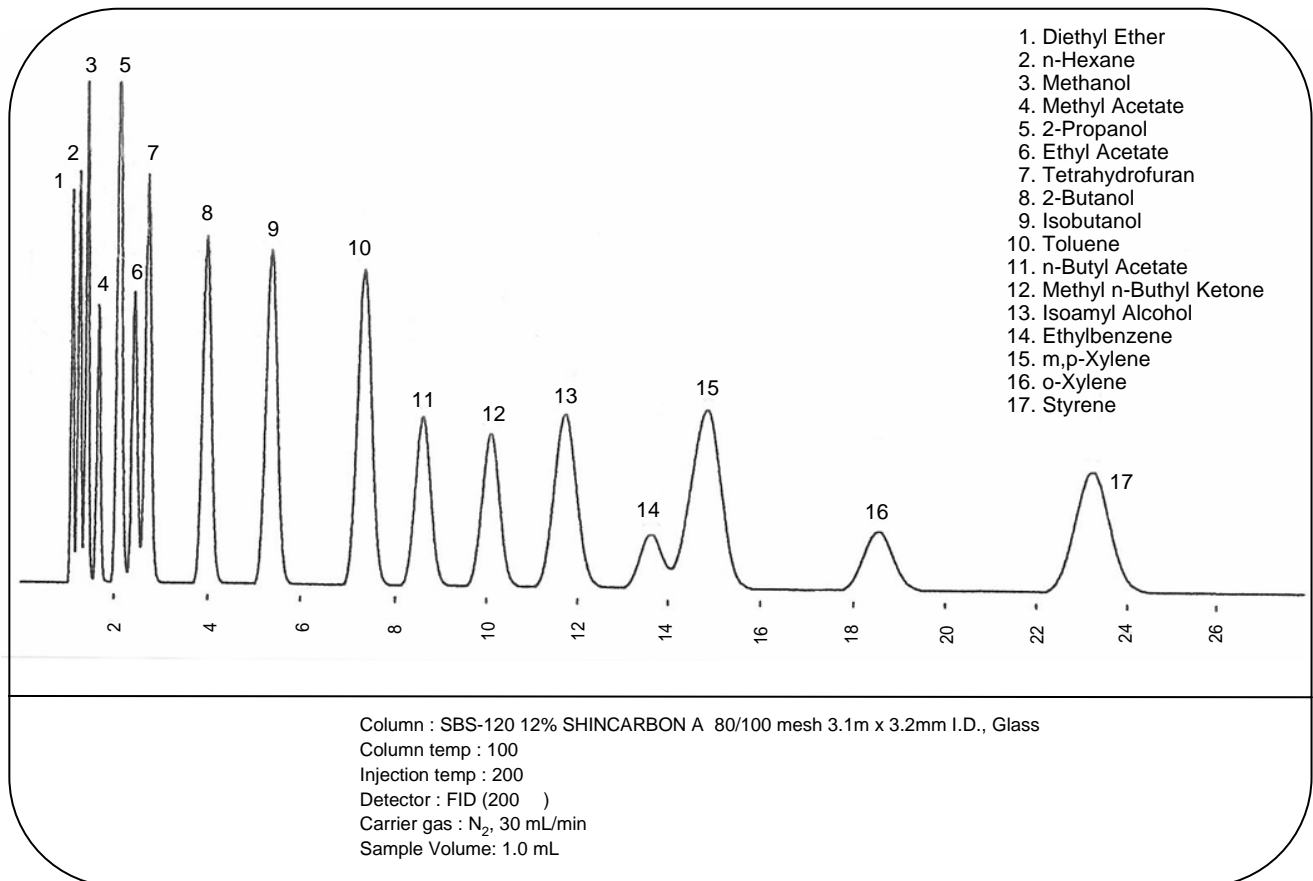
Organic Solvents in Air



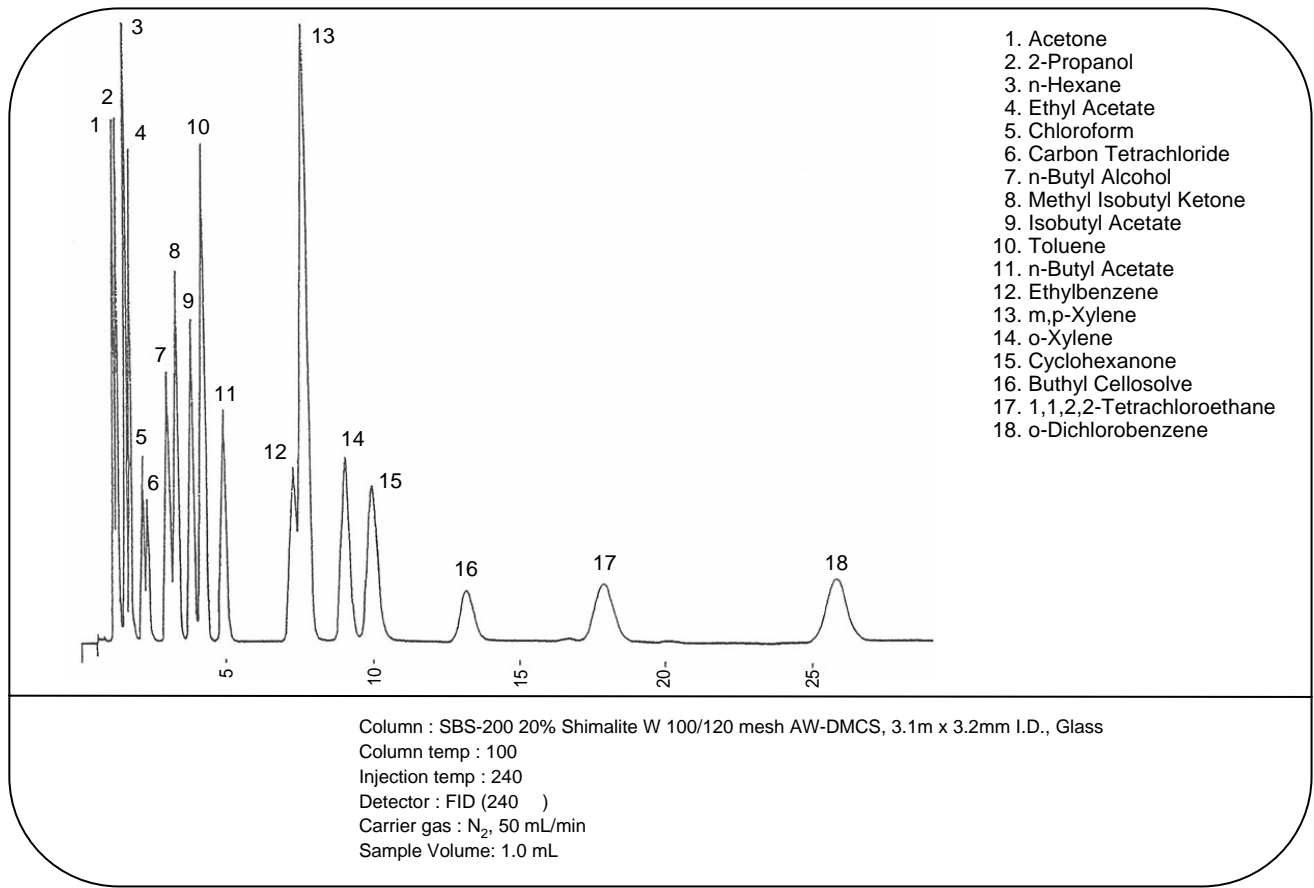
Organic Solvents in Air



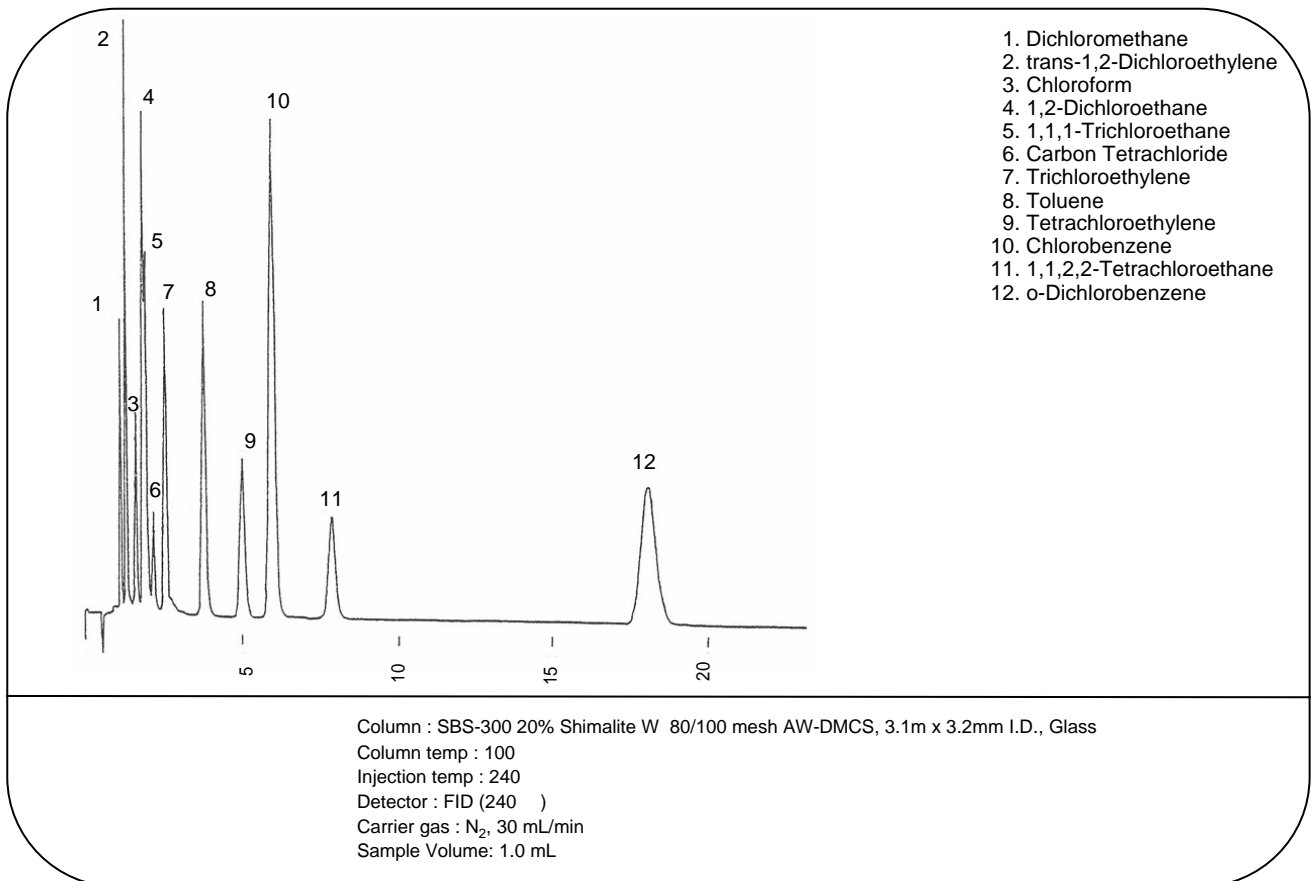
Organic Solvents in Air



Organic Solvents in Air



Organic Solvents in Air

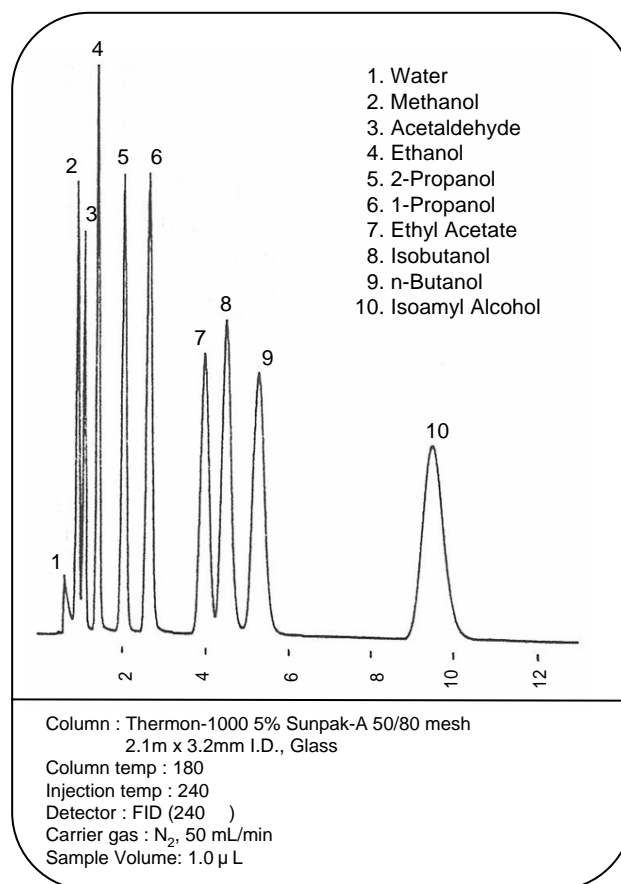
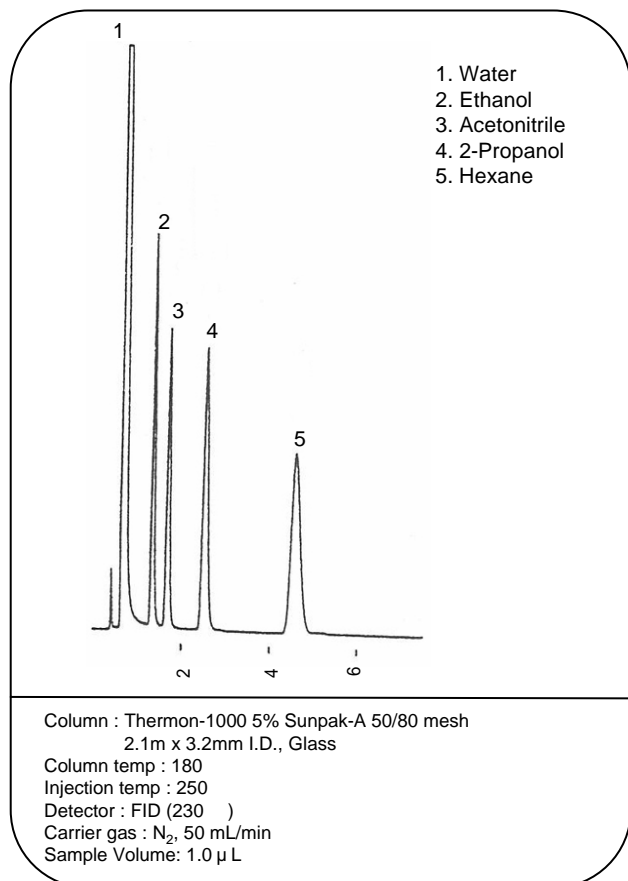
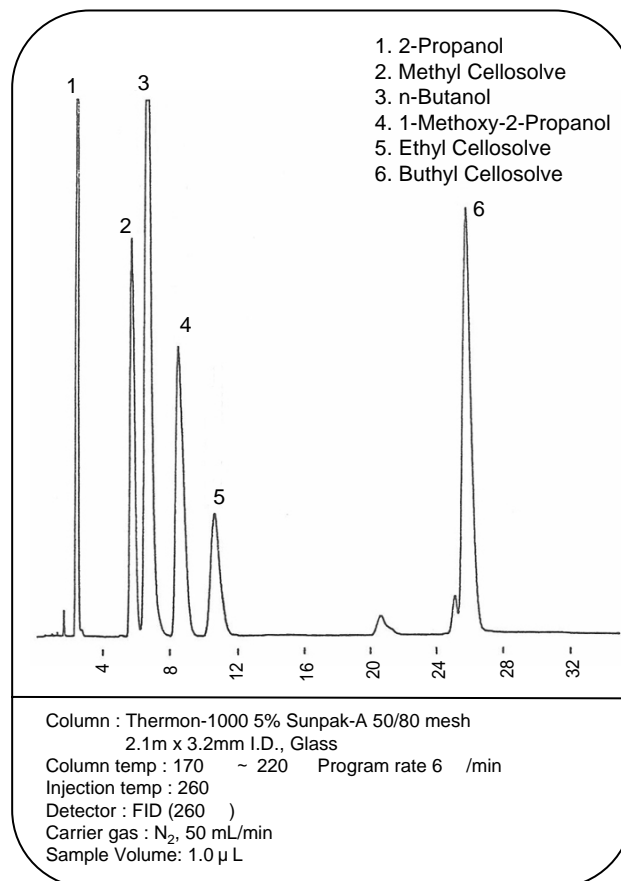


**Thermon-1000 5% Sunpak-A**

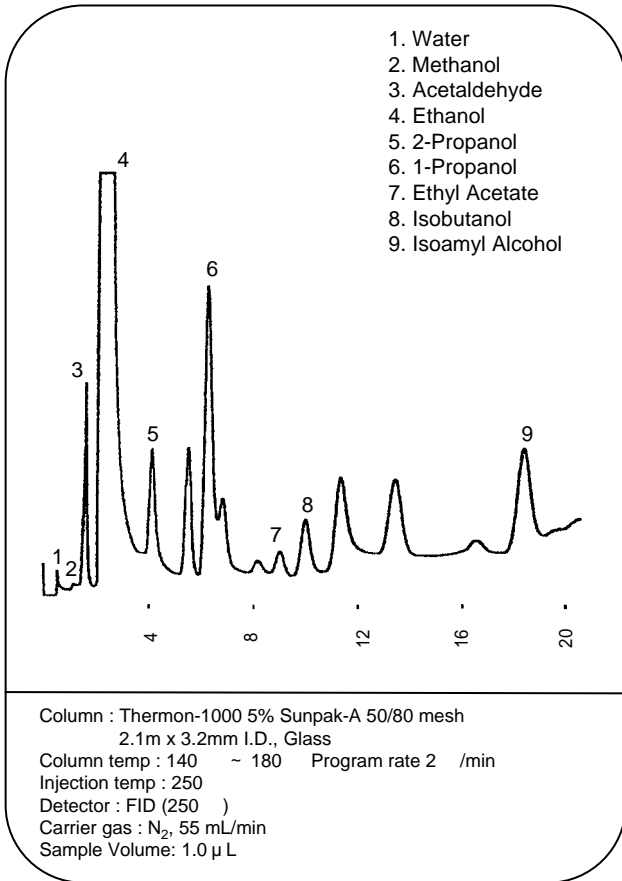
Thermon-1000 is packing material which Sunpak-A is an original high effective high-cross-linking porous polymer packings. Thermon-1000 can be analyzed at compounds that can not be separated on the diatomaceous earth support.

**Characteristics**

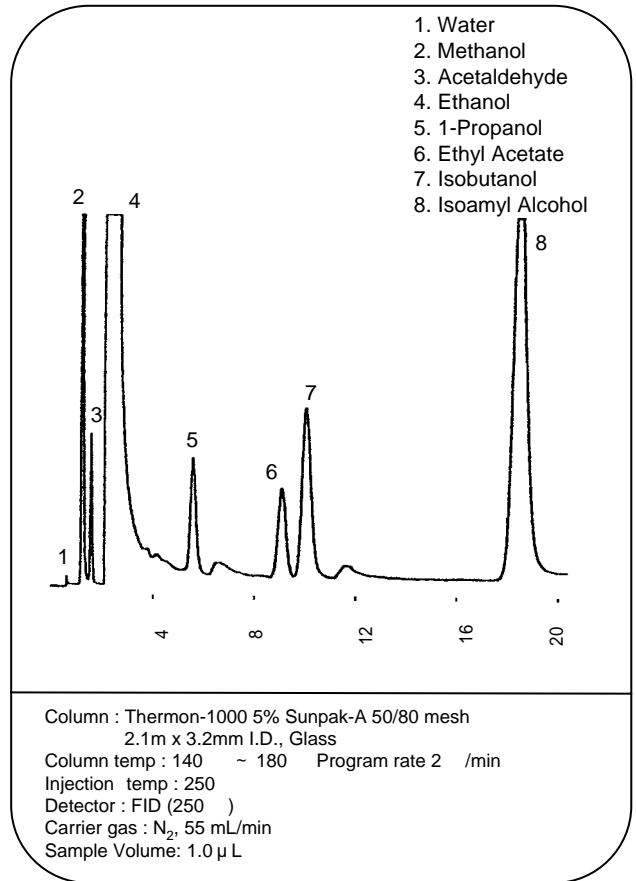
- 1) As the porous polymer beads are used as a support, hydrocarbons (C<sub>1</sub> – C<sub>4</sub>), lower alcohols, aldehyde and ketone containing water can be analyzed.
- 2) Analysis objective compounds are eluted in order of molecular weight. As a result, the quantitative analysis is performed easily
- 3) By the partition equilibrium on Sunpack A, compounds impossible by diatomaceous earth support can be separated by Sanpak-A.

**Alchols in Water****Organic Solvents in Water****Alchols and Cellosolves**

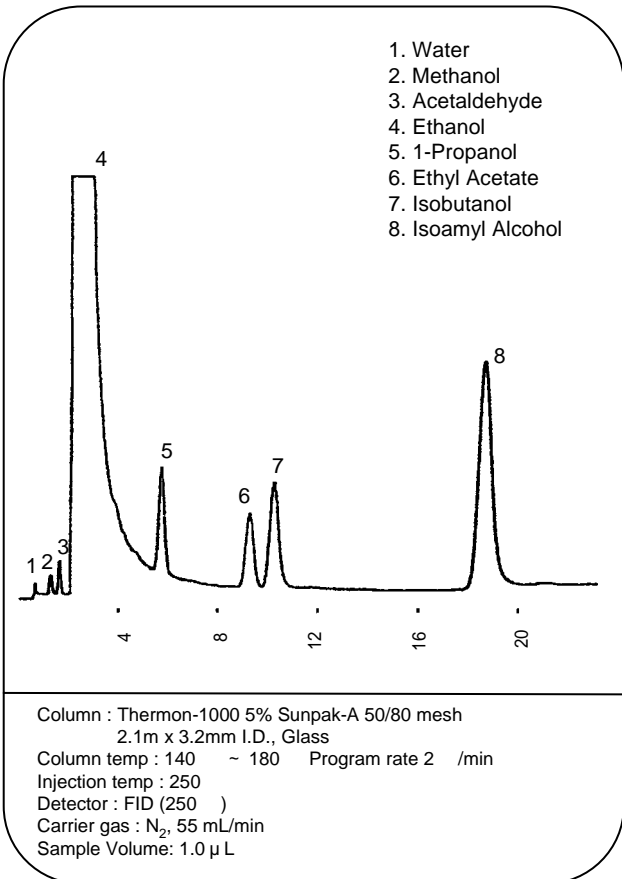
**Sake**



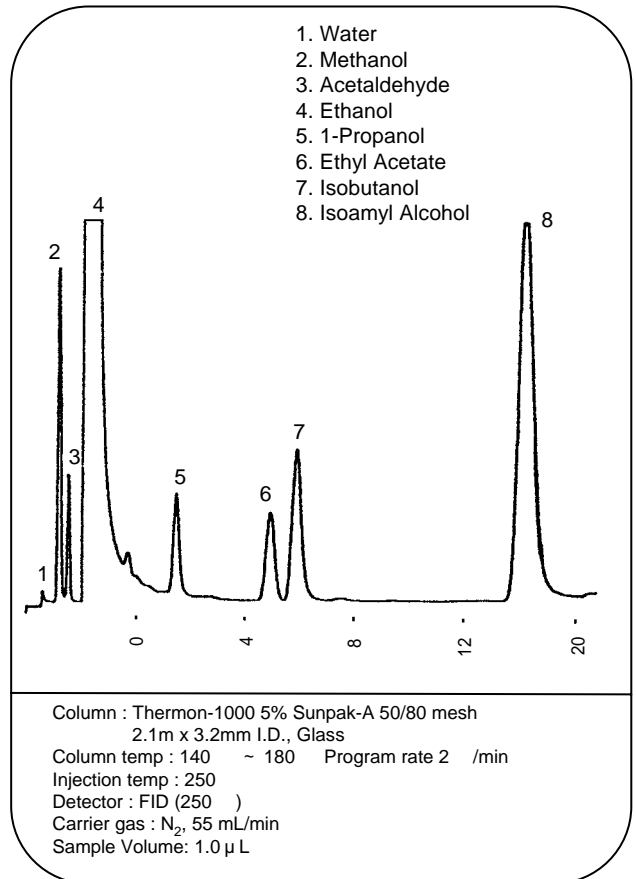
**Brandy**



**Whiskey**



**Wine**





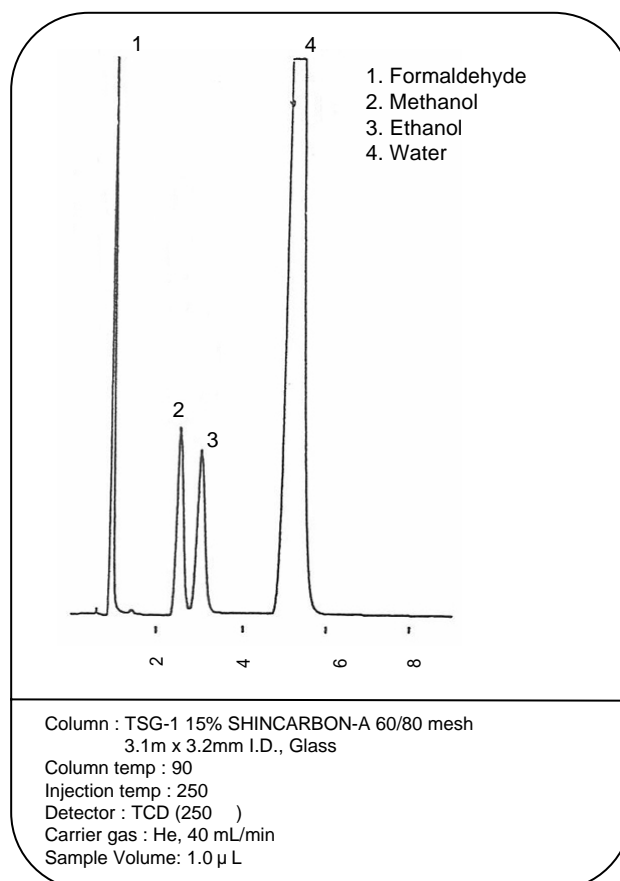
## Formaldehyde in Water

## TSG-1

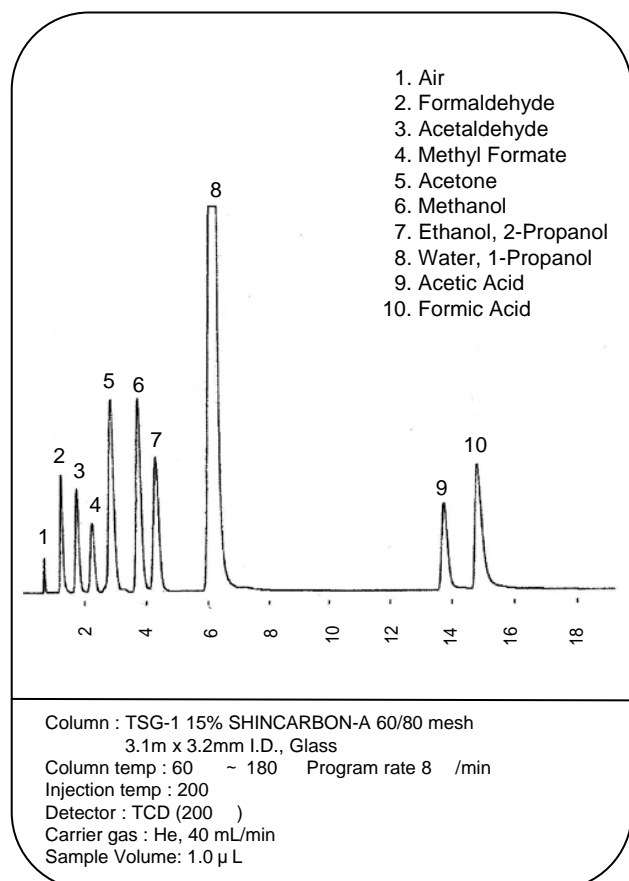
**TSG-1** is the original packing material developed for analyzing of formaline.

## Characteristics

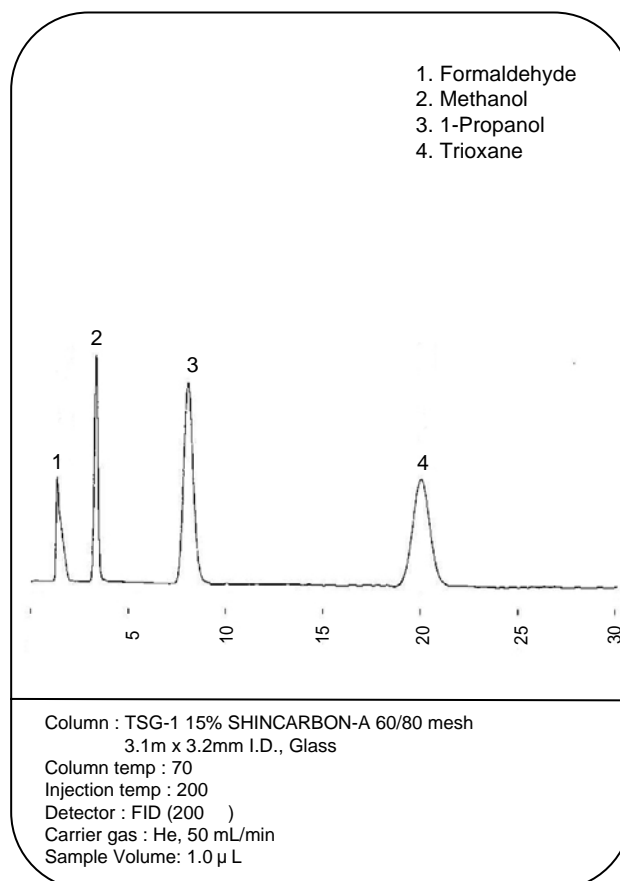
- 1) As SHINCARBON A is used as the support, activity of adsorption is not recognized. And quantitative analysis can be extremely performed. The detection limit of aldehyde is 300 - 500 ppm.
- 2) Lower alcohols, ketone and aldehyde in water can be separated by TSG-1.



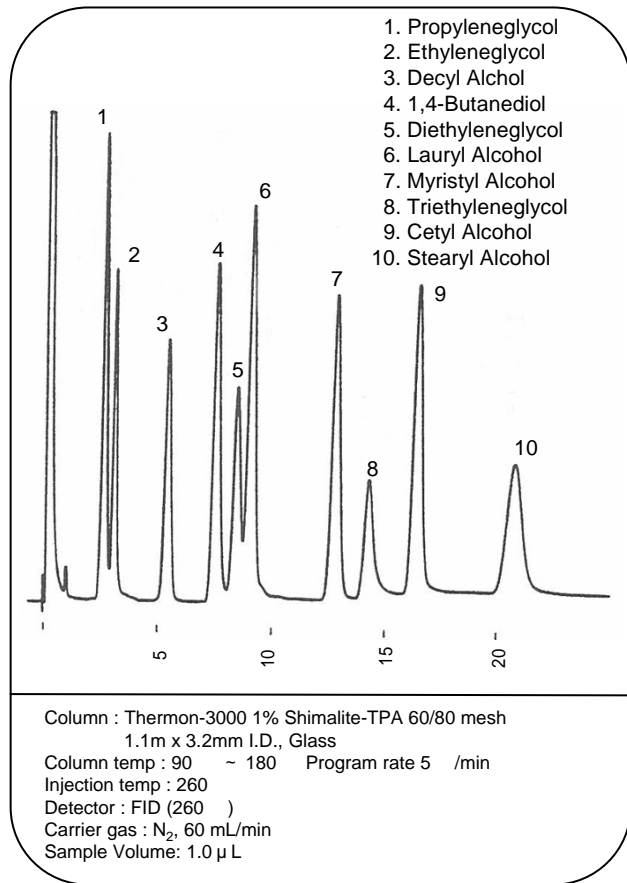
## Volatile Organic Compounds in Water



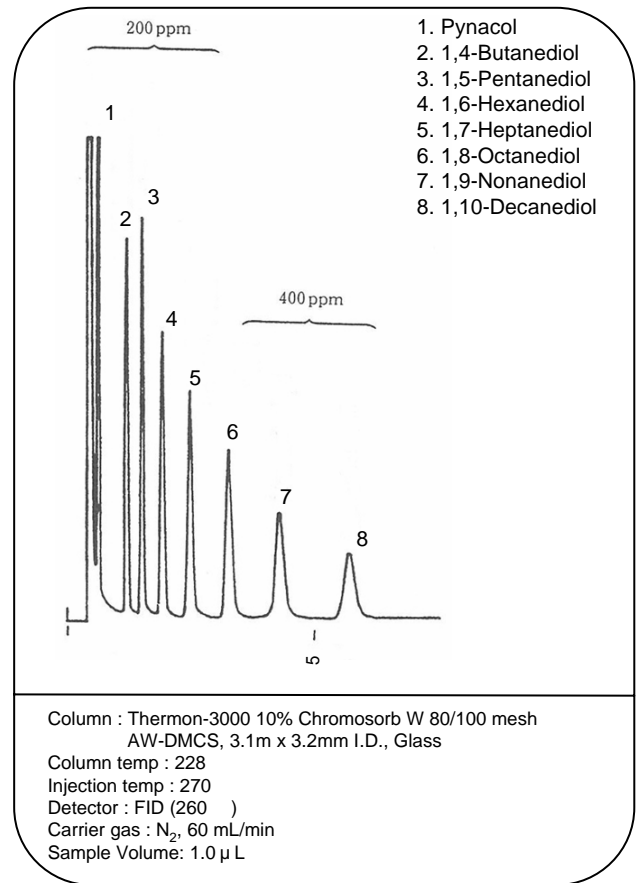
## Trioxane in Water



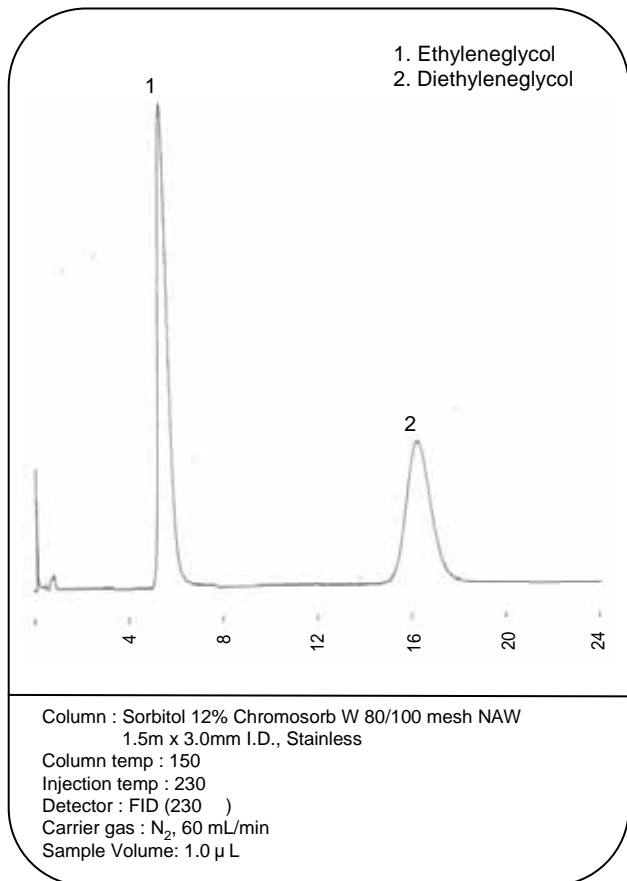
Glycols and Alchols



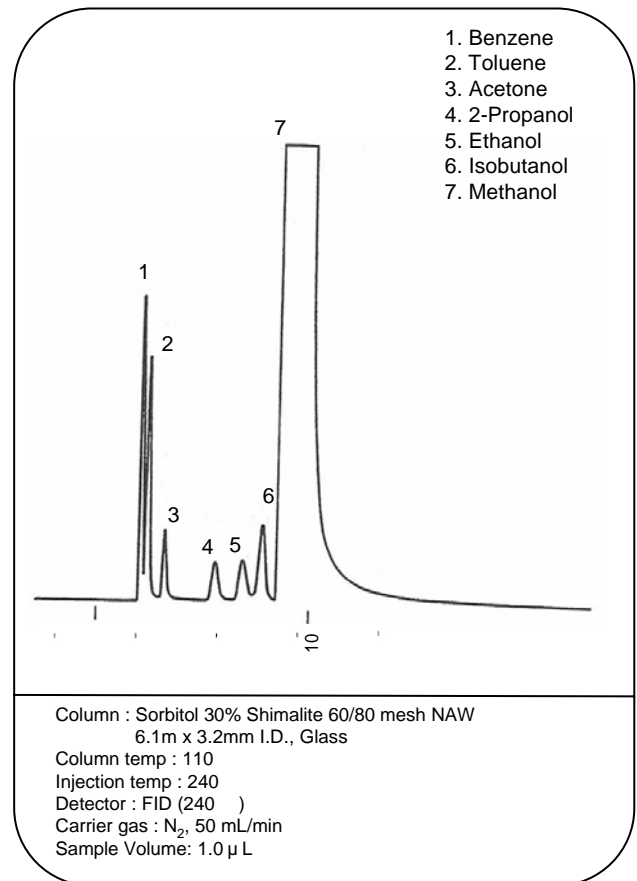
Diols



Ethyleneglycol and Diethyleneglycol in Water



Impurities in Methanol



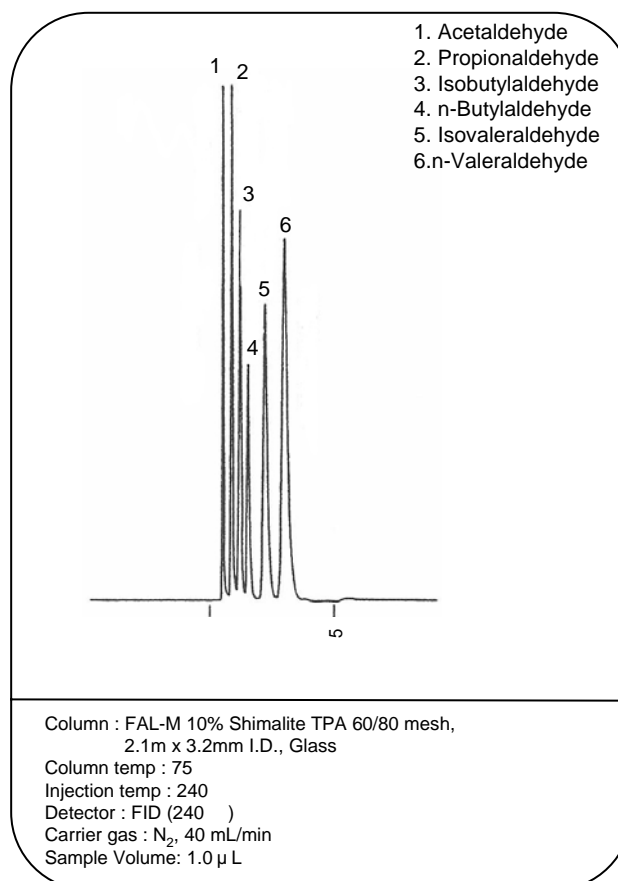
## FAL-M

**FAL®-M** is a stationary phase having a structure of polyoxyethylenesorbitane ester. It is available for the analysis of lower free fatty acid, lower aldehyde, lower alcohol, essential oils and perfumes. Propionic acid and iso-butyric acid can be separated perfectly.

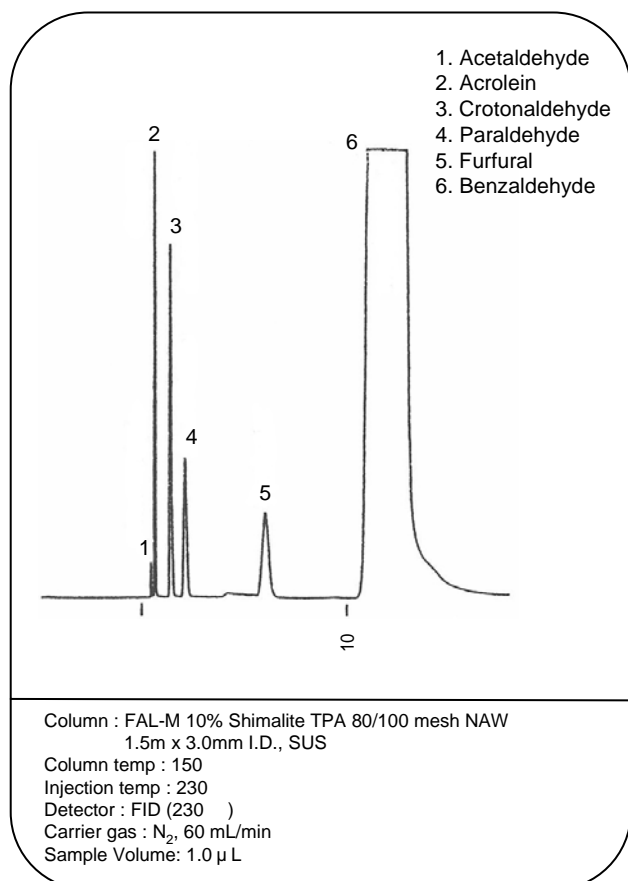
## Characteristics

- 1) Normal and iso C<sub>2</sub> – C<sub>6</sub> fatty acids can be separated at equal interval.  
(See Lower fatty acids)
- 2) Aldehyde C<sub>2</sub> – C<sub>5</sub> can also be separated.
- 3) Low boiling point polar compounds in the wide range can be analyzed directly in the state of free body.

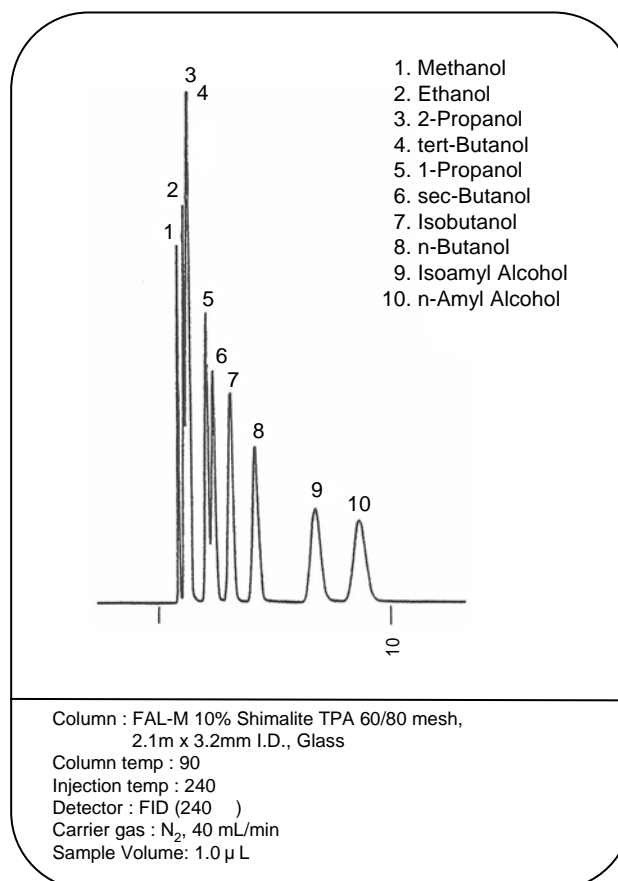
## Saturated Aldehydes



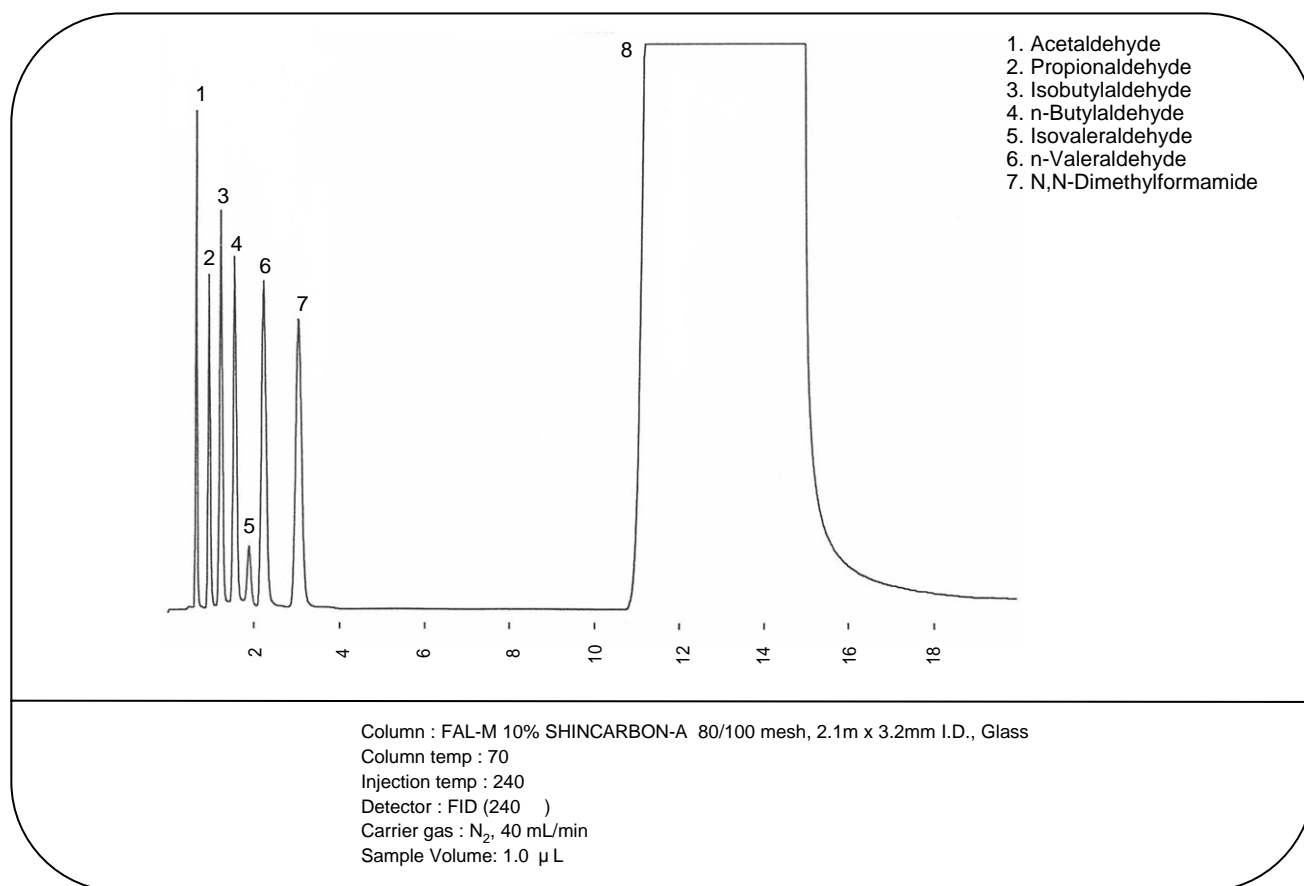
## Saturated Aldehydes



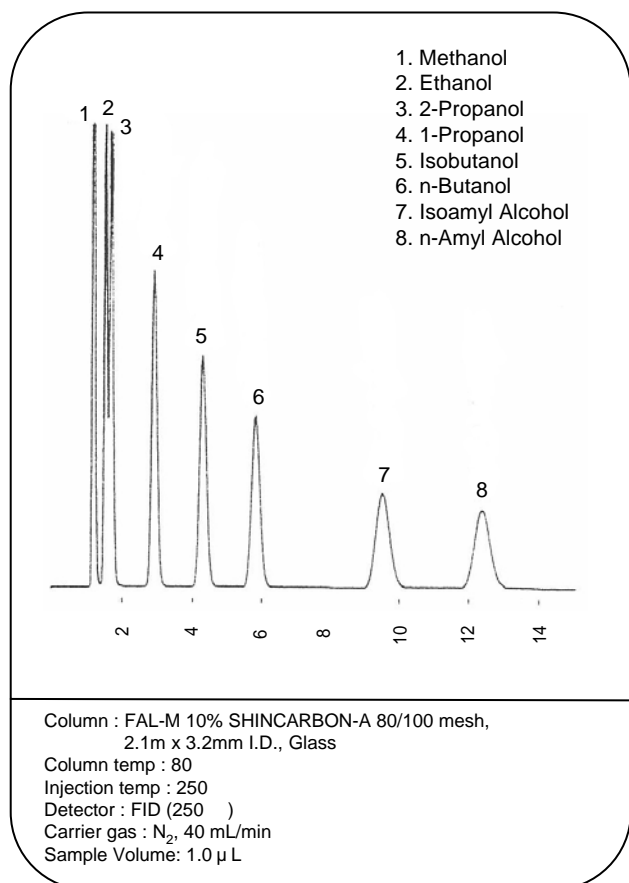
## Alcohols



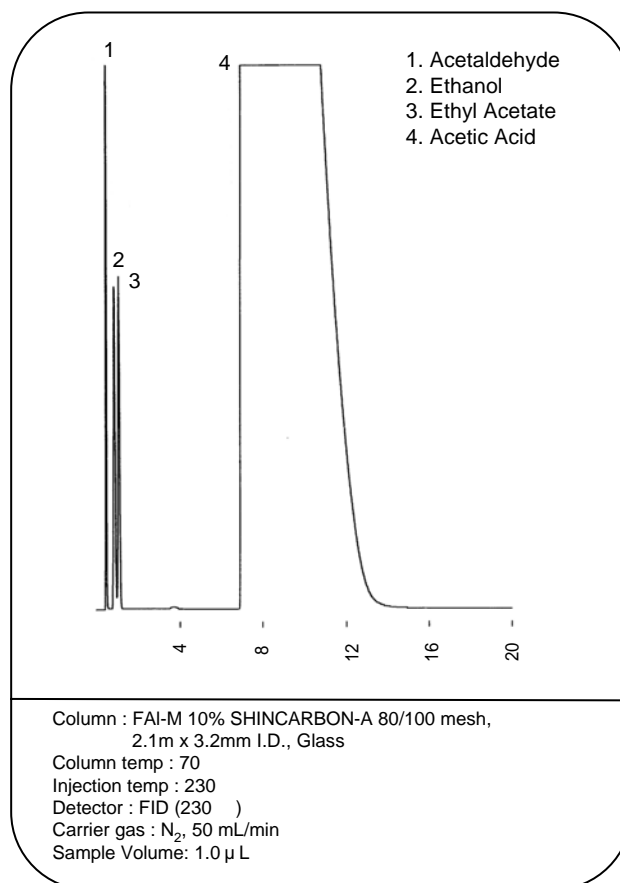
Saturated Aldehydes in Dimethylformamide



Alcohols



Impurity in Acetic Acid



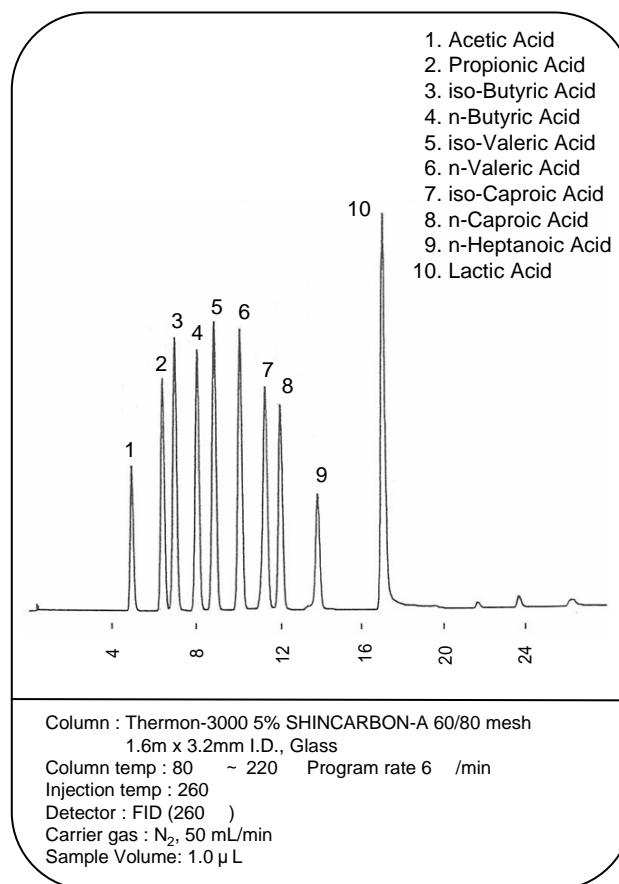
Lower Free Fatty Acids and Lactic Acid in Water

Thermon-3000

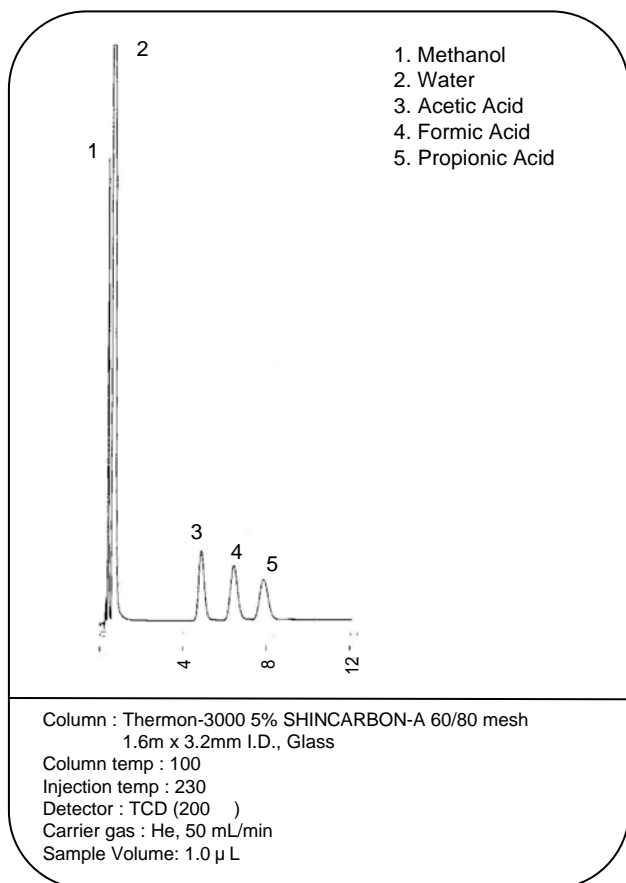
Thermon-3000 is a packing material with the polyester (Alkylene glycol phthalic ester) structure.

Characteristics

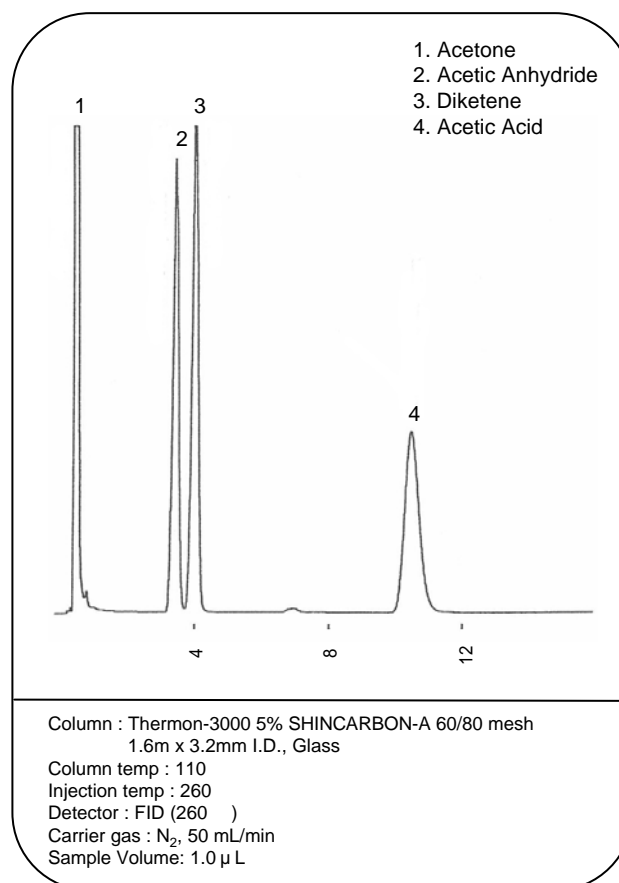
- 1) Maximum heat resistance temperature is 280 that is the highest temperature in polyester stationary phases.
- 2) The polarity is similar to PEG20M.
- 3) Thermon-3000 can be used for a wide usage from no polar samples to high polar samples.
- 4) SHINCARBON-A support gives high resolution for complicated organic acids.



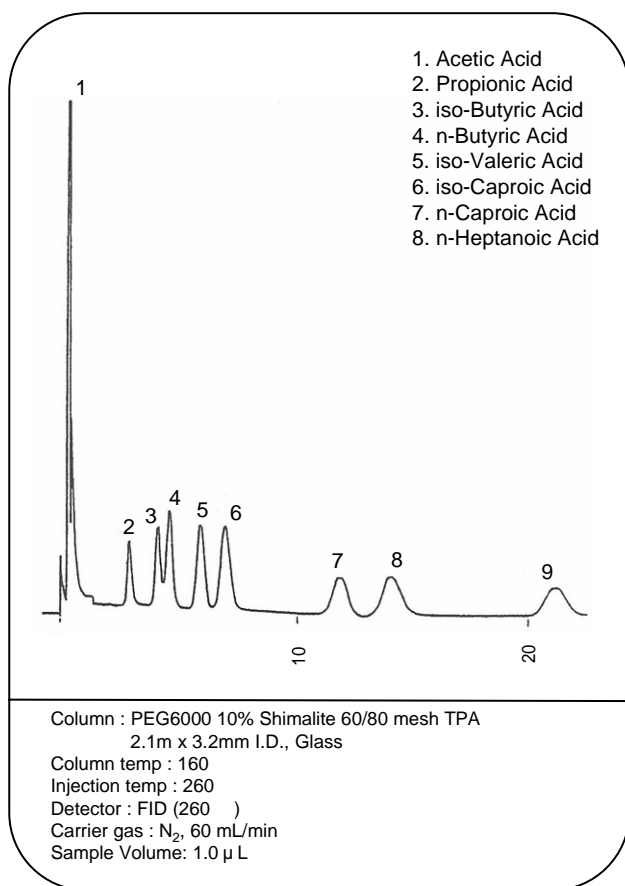
Lower Free Fatty Acids in Water



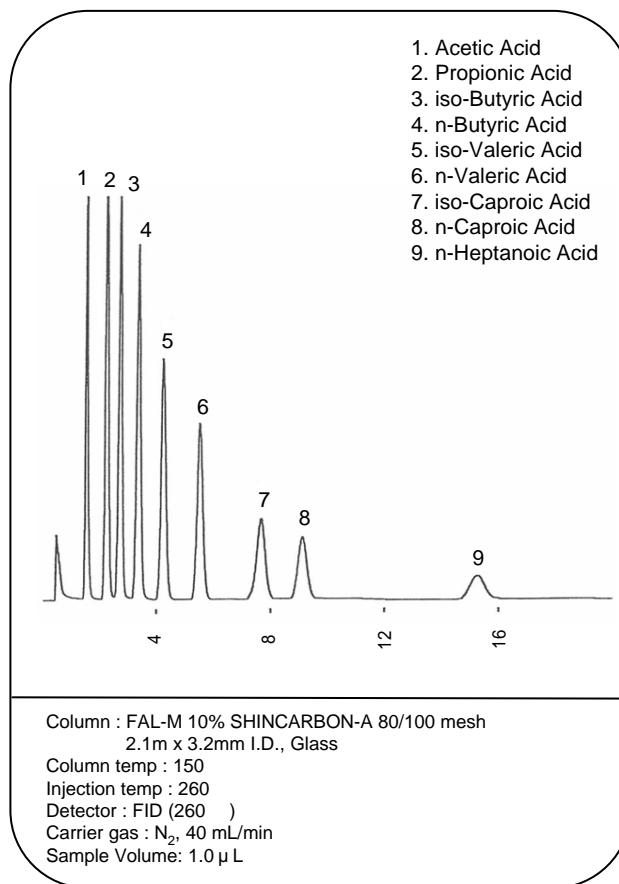
Acetic Anhydride, Diketen, Acetic Acid in Acetone



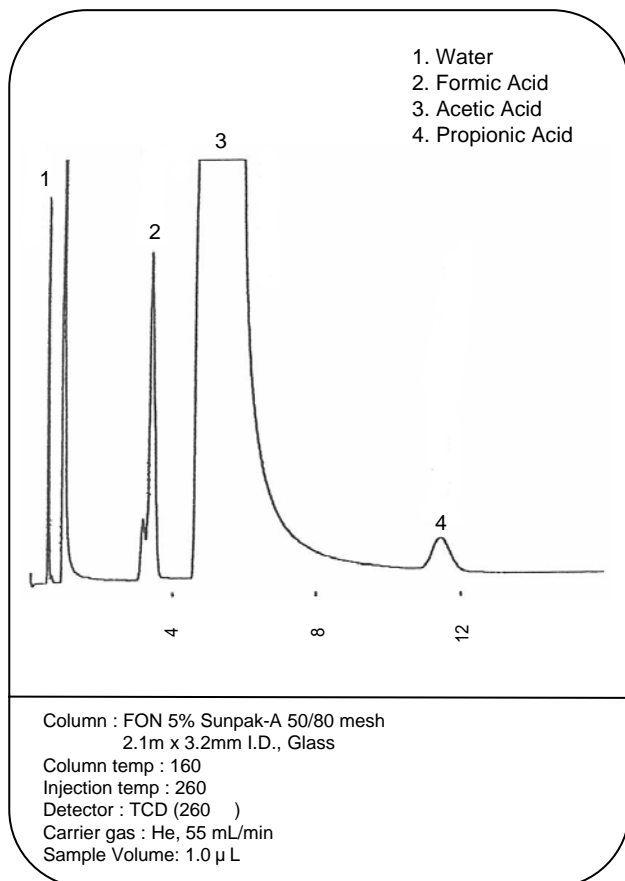
## Lower Free Fatty Acids in Water



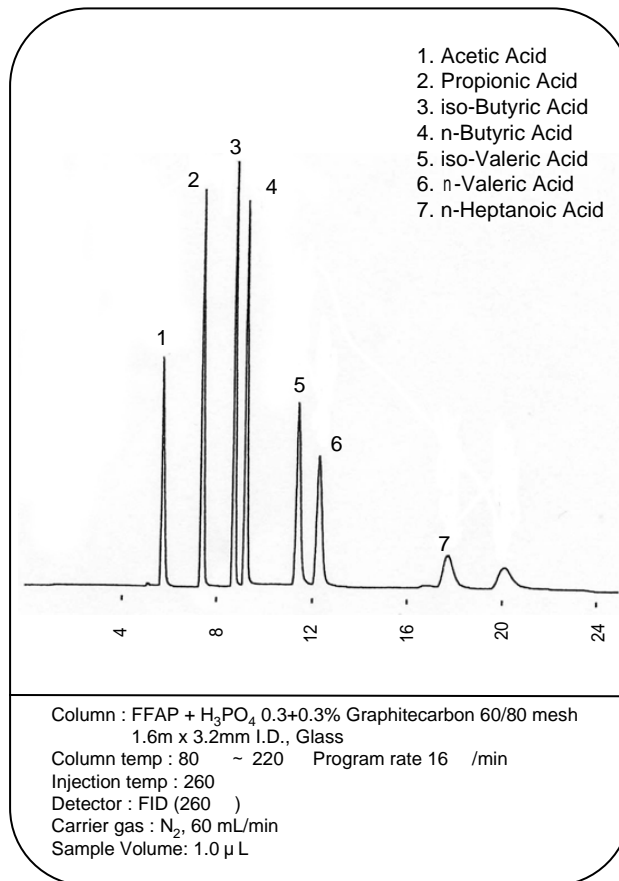
## Lower Free Fatty Acids in Water



## Formic Acid and Propionic Acid in Acetic Acid



## Lower Free Fatty Acids in Water



Standard Mixture of Fatty Acid Methyl Esters

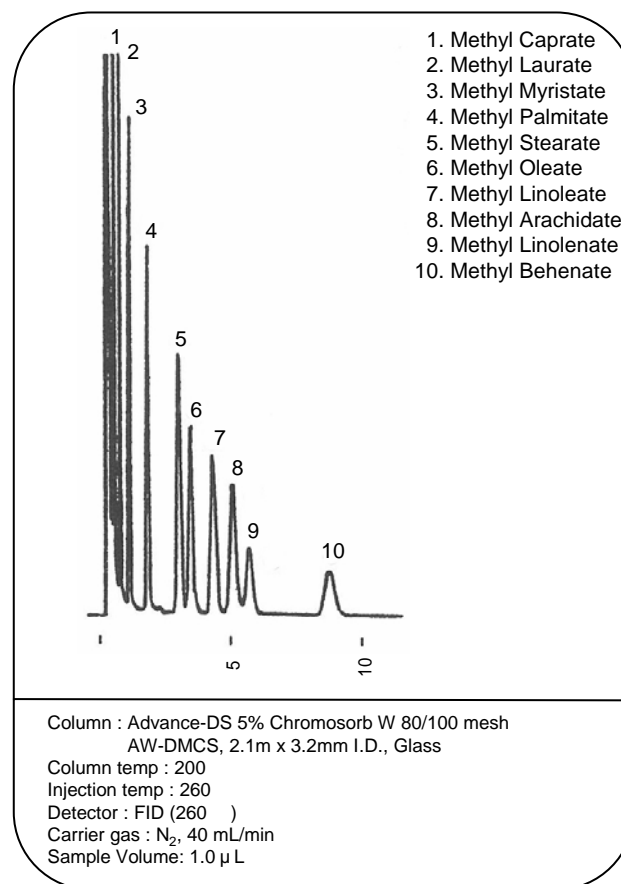
Advance-DS

The chemical structure of Advance-DS is similar to that of DEGS and is excellent in heat resistance. Advance-DS is especially effective in the separation of fatty acid methyl ester.

Advance-DS can also analyze chlorinated pesticide by high stability and high sensitivity.

Characteristics

- 1) Each peak of C<sub>18:0</sub>, C<sub>18:1</sub>, C<sub>18:2</sub>, C<sub>20:0</sub>, C<sub>18:3</sub> can be eluted at equal interval.
- 2) The maximum heat resistance temperature is 230 and it's 20 higher than DEGS.
- 3) The separation characteristics is stable.
- 4) Food additives can be analyzing similar to DEGS (see, food additives).



Fatty Acid Methyl Esters in Serum

Shinchrom E71

(Analysis exclusively for higher fatty acid esters)

Shinchrom E71 is a packing material having a nitrile polyester structure for the analysis of fatty acid methyl esters(C<sub>10</sub> ~ C<sub>22</sub>).

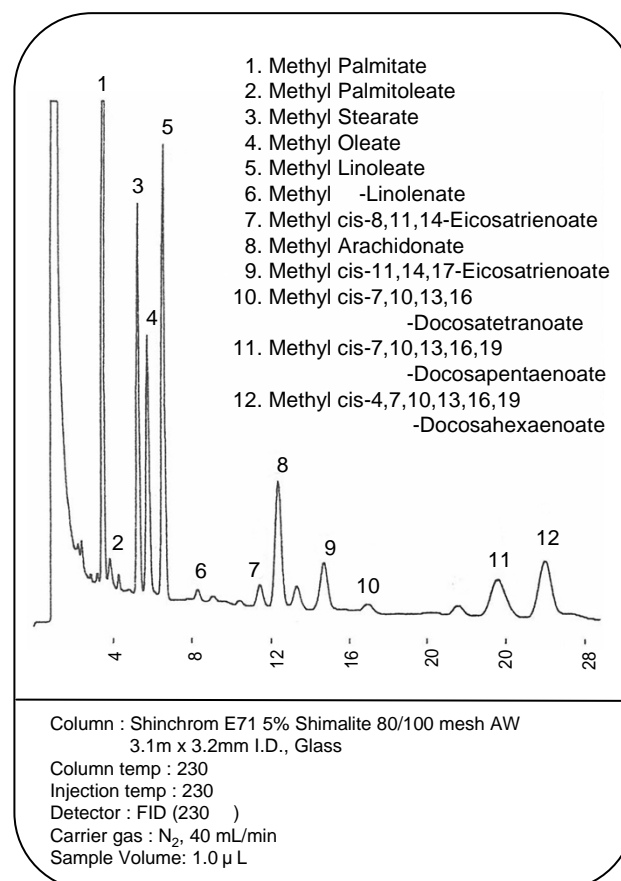
DEGS columns are used to separate fatty acid esters in generally. But it has some weak points described below.

- 1) The retention order of C<sub>18:2</sub>, C<sub>20:0</sub>, C<sub>18:3</sub> are not described.
- 2) The maximum heat resistance temperature is to 210 .

Shinchrom E71 is cleared these problems.

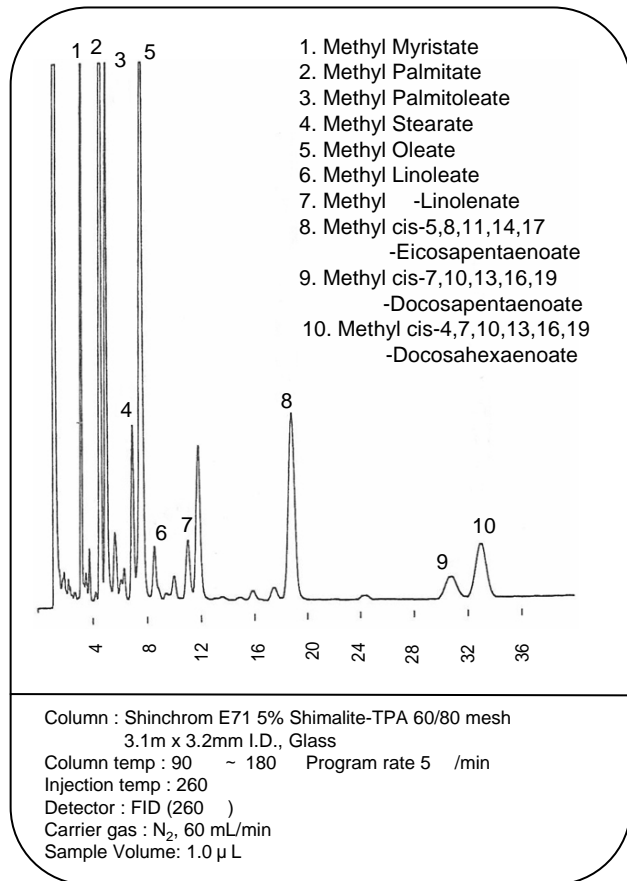
Characteristics

- 1) The retention order is C<sub>18:0</sub>, C<sub>18:1</sub>, C<sub>18:2</sub>, C<sub>18:3</sub>, C<sub>20:0</sub> are stable.
- 2) The separation characteristic are stable.
- 3) The maximum operation temperature is 250 .

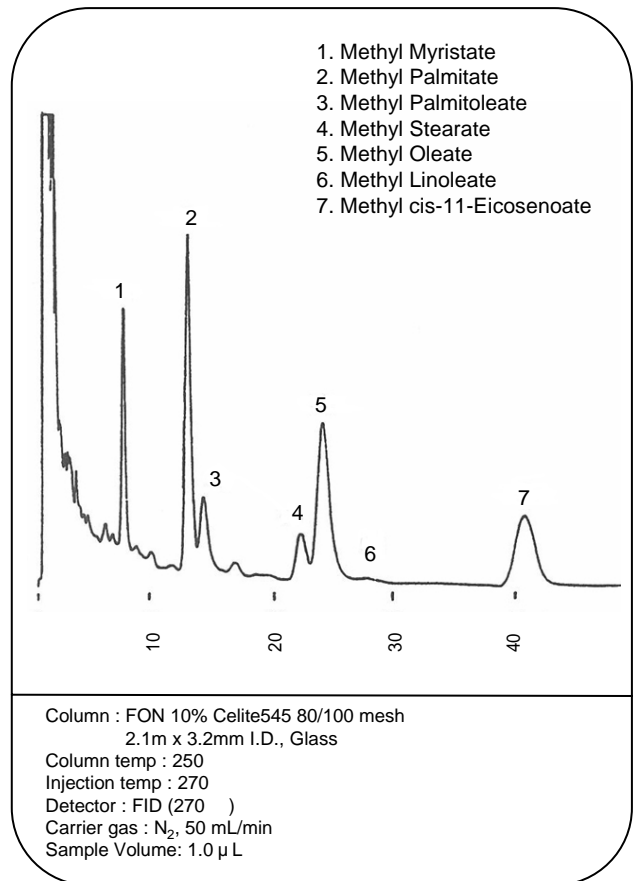


## Fatty Acid Methyl Esters

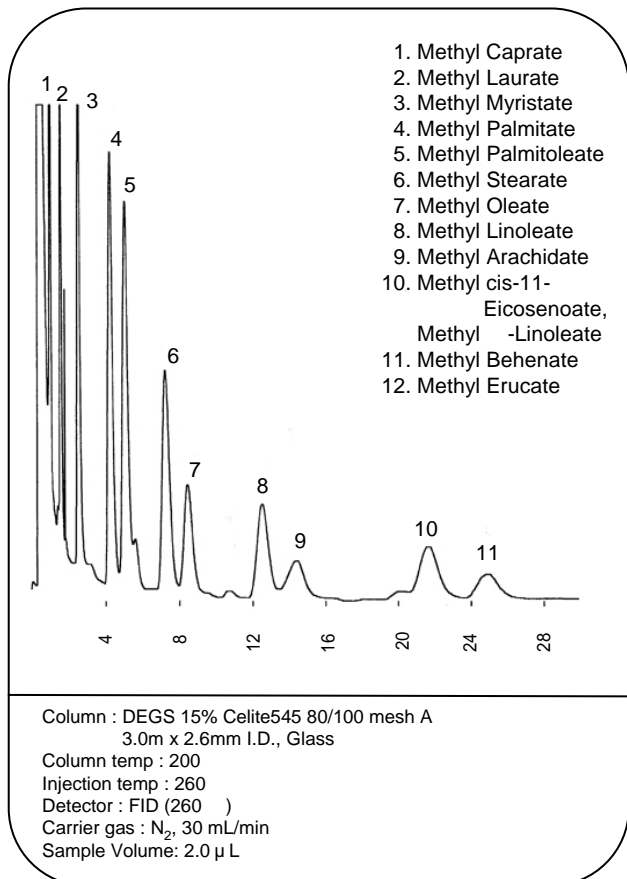
### Fatty Acid Methyl Esters in Fish Oil (Mackerel)



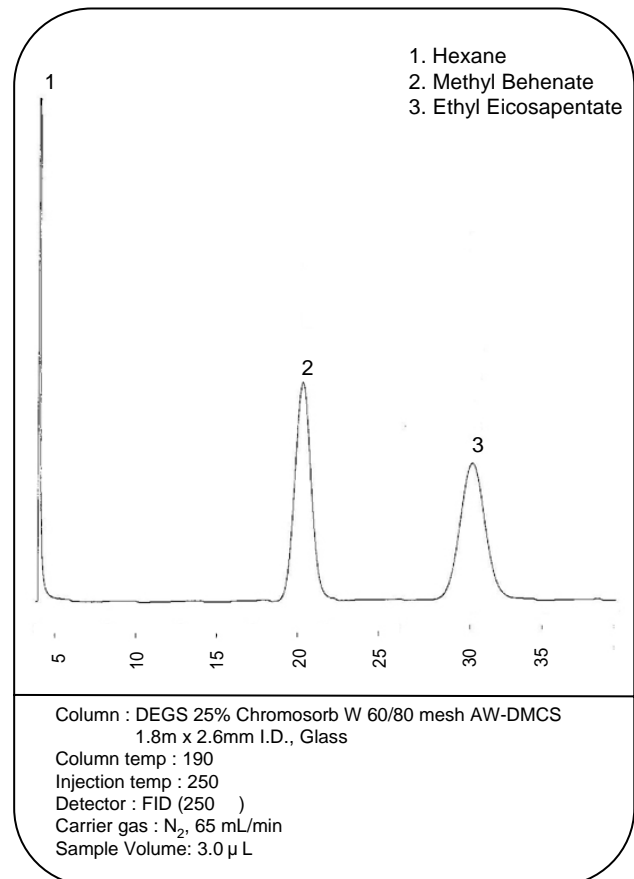
### Higher Free Fatty Acids in Fish Oil (Mackerel)



### Fatty Acid Methyl Esters



### Ethyl Eicosapentate



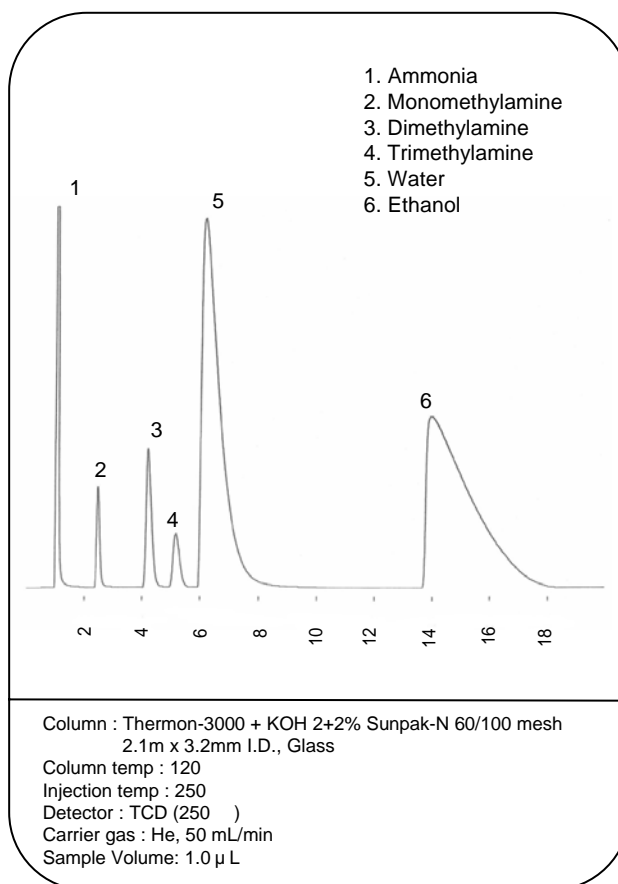


## Thermon-3000 + KOH 2+2% Sunpak-N 60/100 mesh Ammonia and Mono, Di, Tri-Methylamine in Water

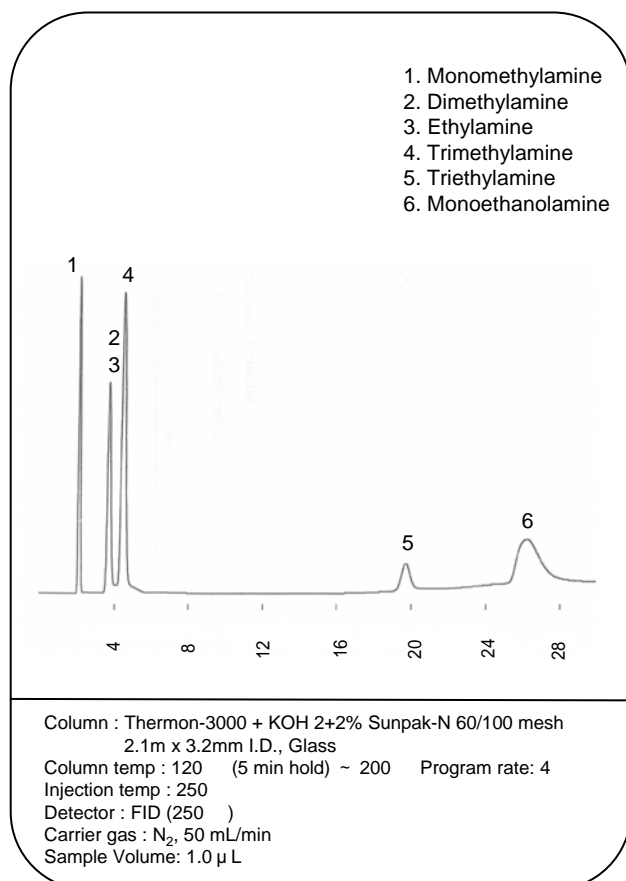
In trimethylamine offensive odor analysis, Diglycerol + Tetraethylenepentamine + KOH (15+15+2)% which can be completely separated colocalized monomethylamine and dimethylamine, also ethanol which is used as a solvent when is constructed calibration curve are generally used. However, the high sensitivity analysis was difficult, because the disorder of the baseline by the bleeding was large in case of comparatively low analysis temperature 70 . However, the high sensitivity analysis was difficult, because the disorder of the baseline by the bleeding was large in case of comparatively low analysis temperature 70 . Thermon-3000 +KOH (2+2)% Sunpak-N 60/100 is cleared these problems.

### Characteristics

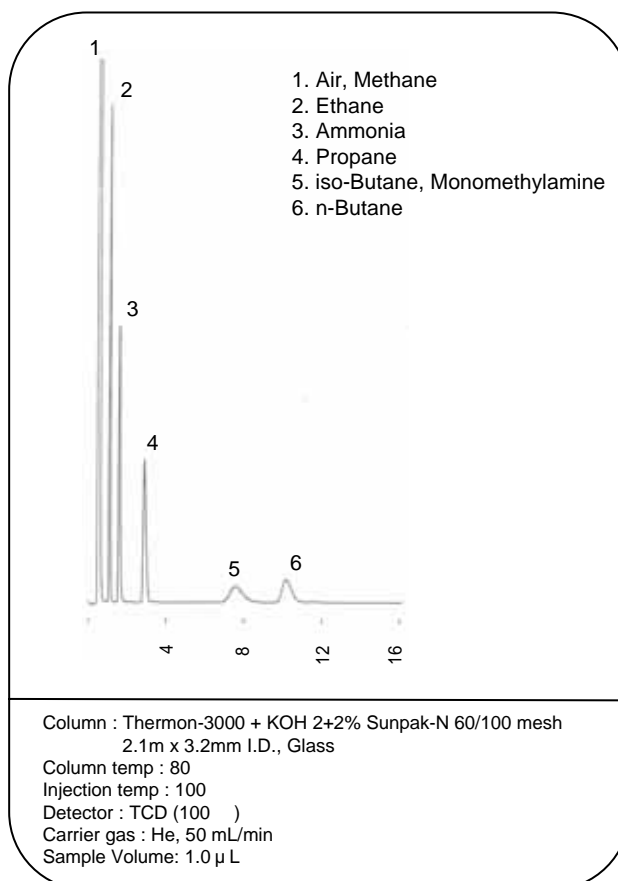
- 1) Mixture of ammonia, mono-methylamine, dimethylamine, tri-methylamine, water and ethanol can be separated completely in order.
- 2) Sunpak-N is composed of porous polymer beads, which is adequate for analyzing the aqueous solution.
- 3) The maximum service temperature is 250 . Low bleeding and stable base-line enables the high-sensitive analysis.
- 4) Tri-methylamine over 30 ppb in air can be analyzed directly (without cold-trap system), by utilizing the Needle trap extraction tools (NeedIEx for tri-methylamine).



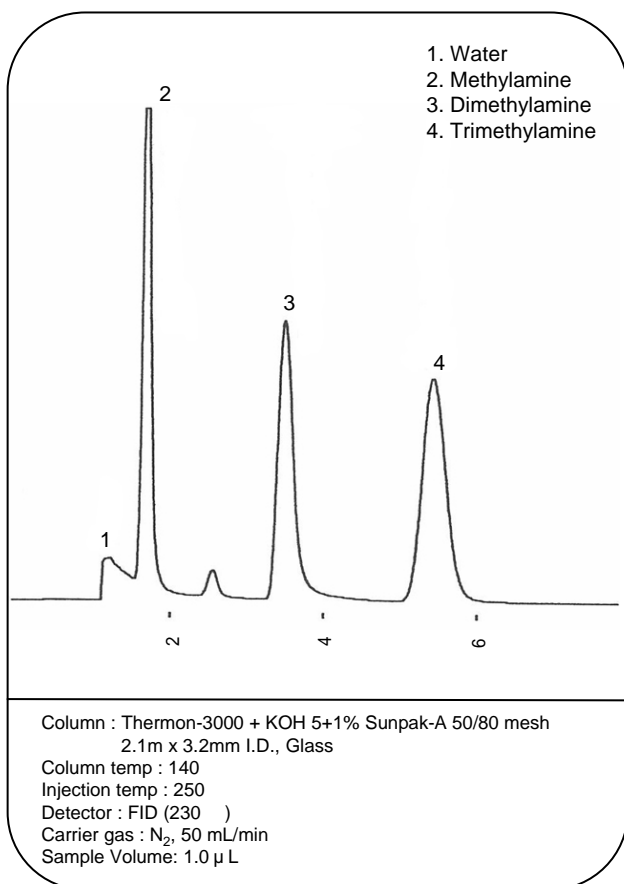
## Methylamines and Ethylamines in Water



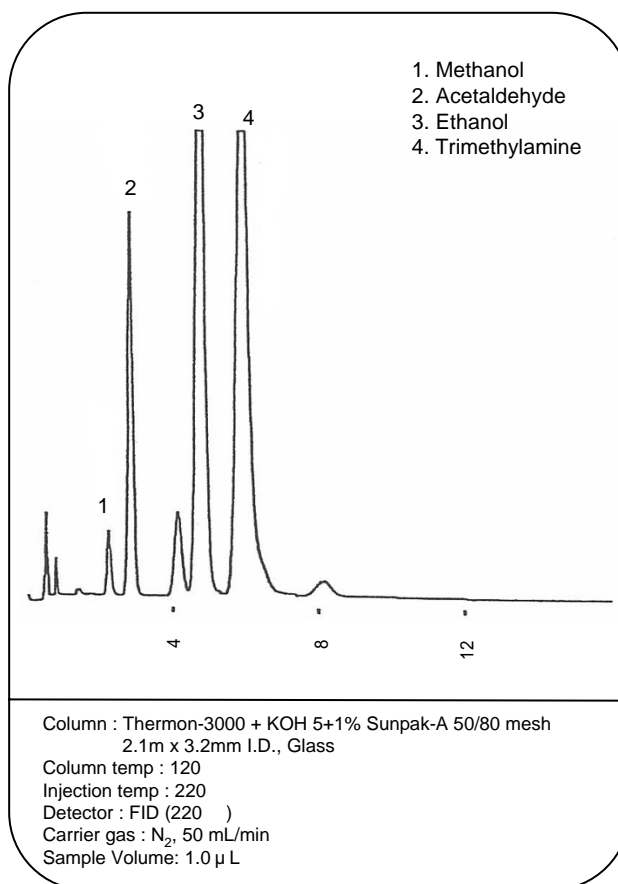
## Lower Hydrocarbons and Ammonia



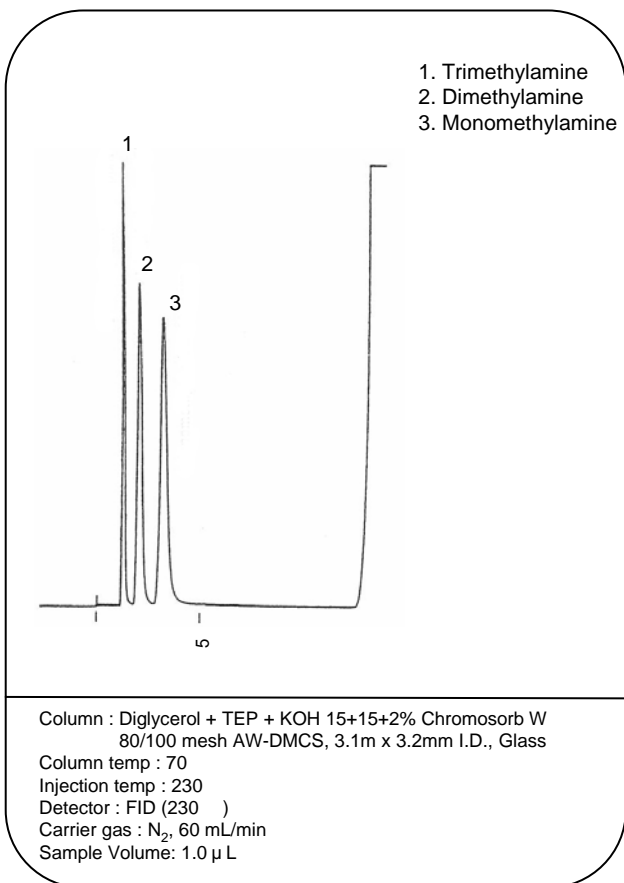
## Tri, Di, Mono-Methylamine in Water



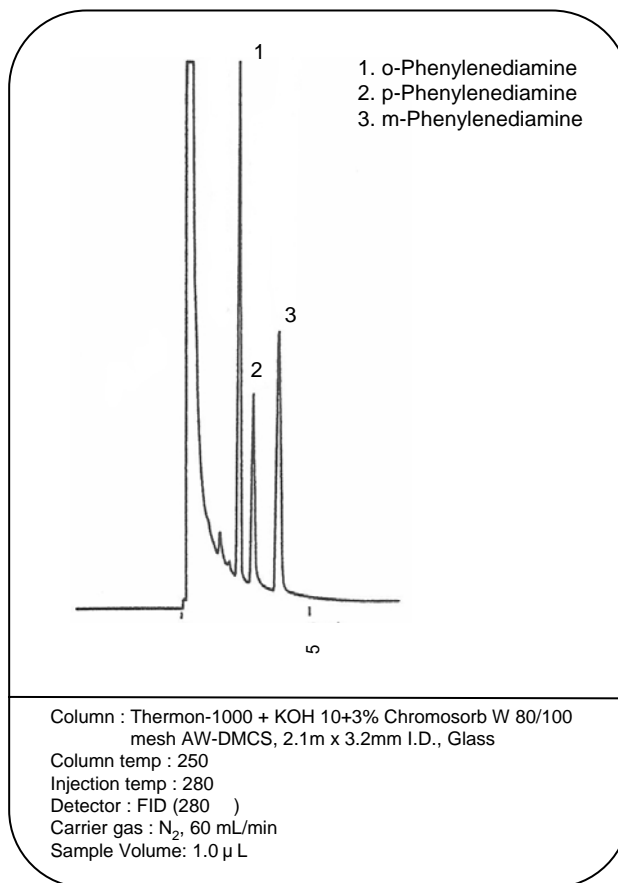
## Lower Amines in Water



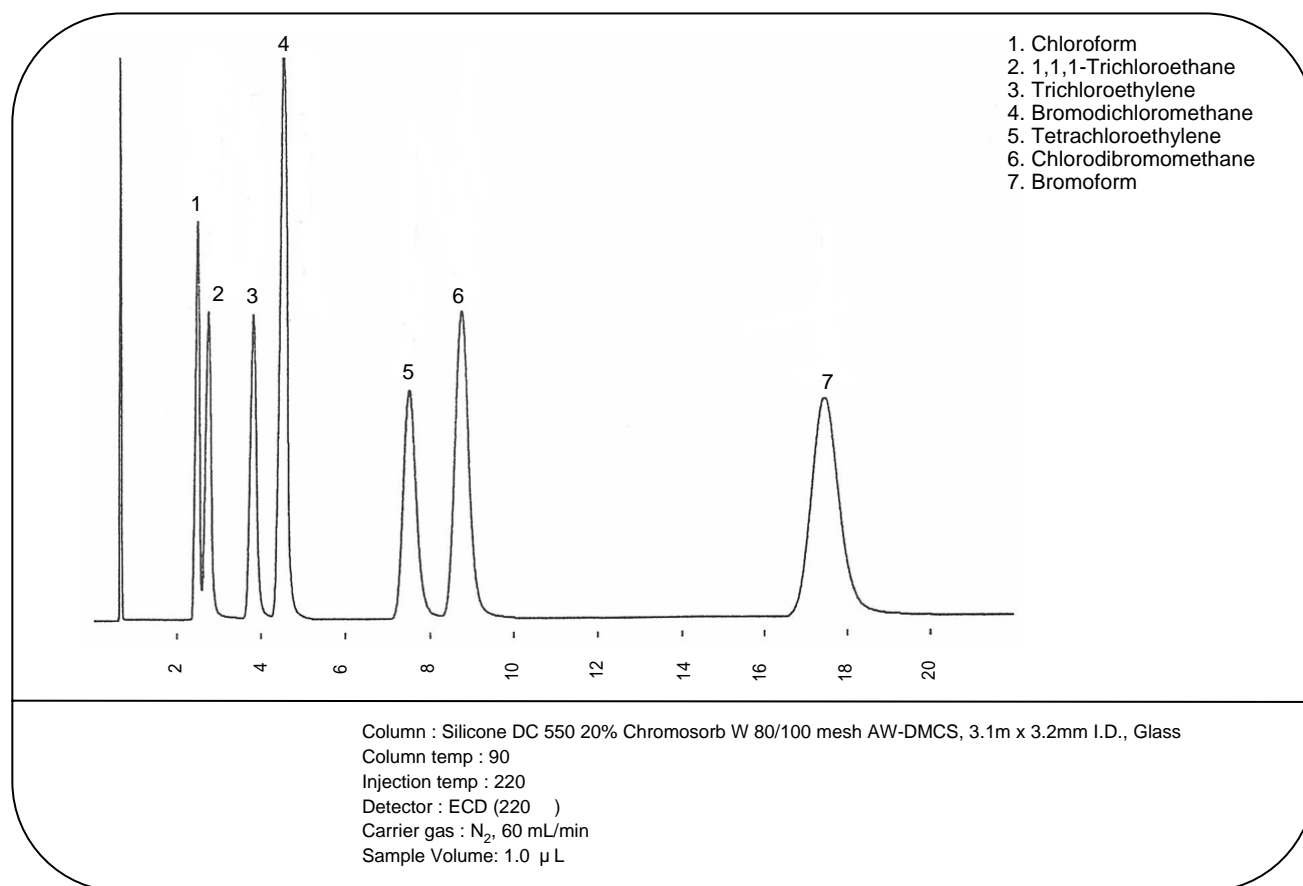
## Mono, Di, Tri-Methylamine in Ethanol



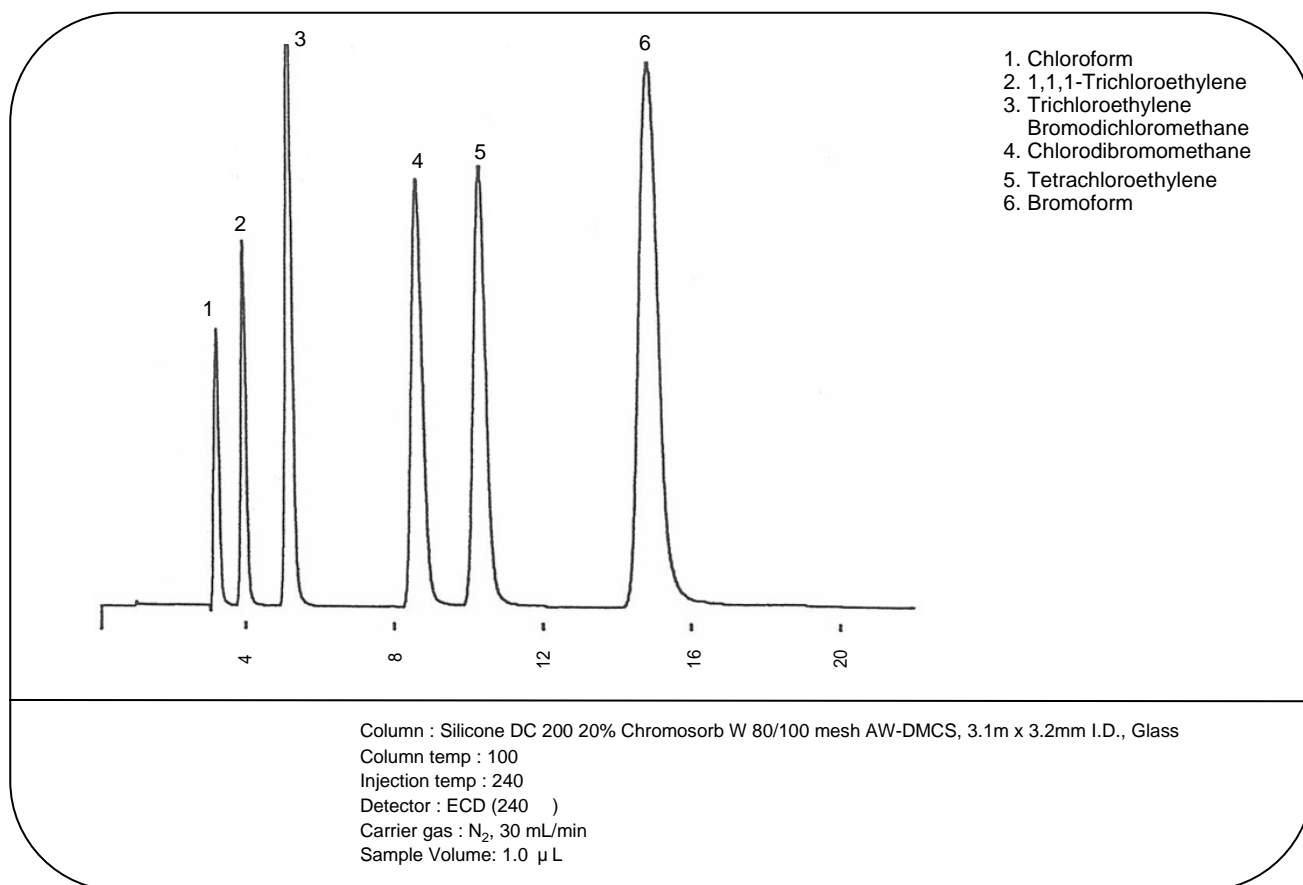
## Phenylenediamines



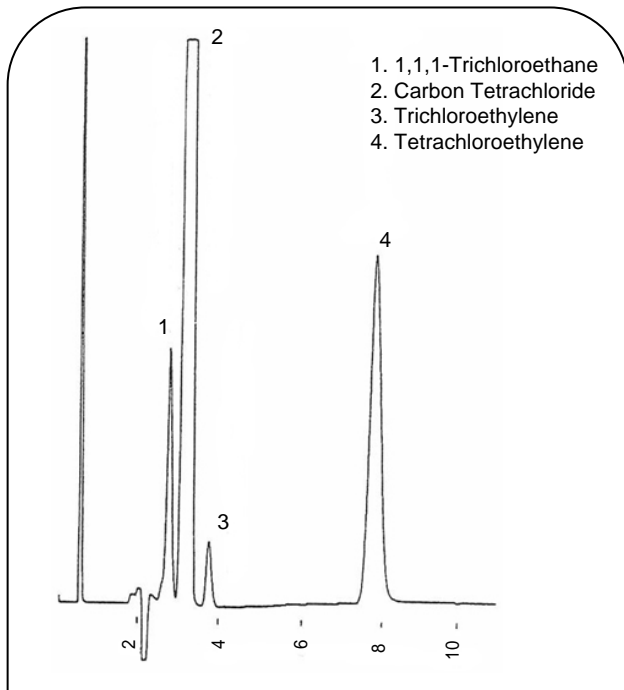
Standard Mixture of Trihalomethanes



Standard Mixture of Trihalomethanes

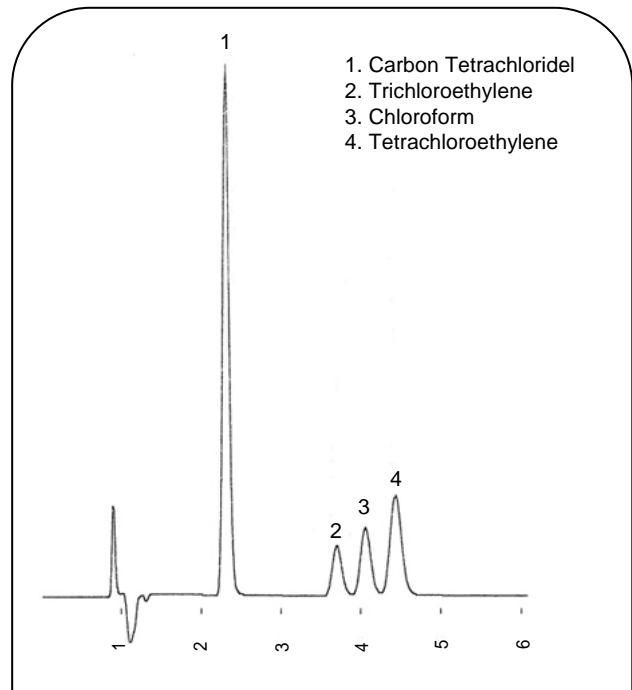


Chloride Solvents



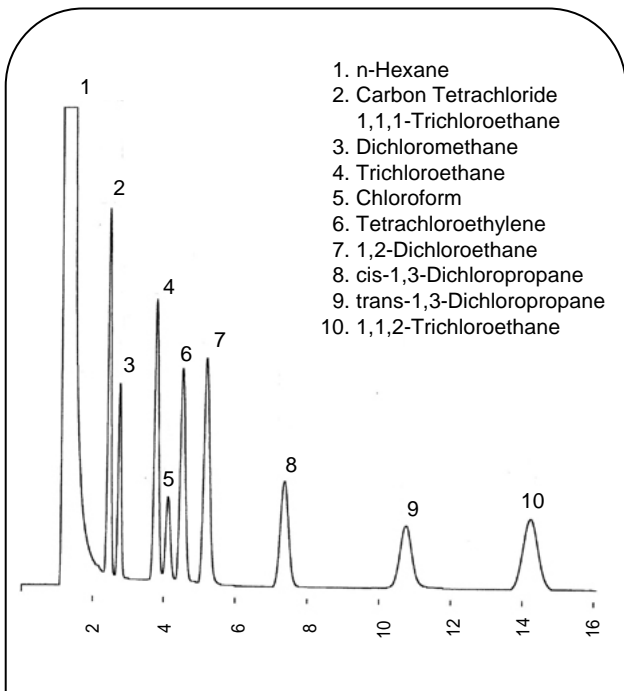
Column : Silicone DC 200 20% Chromosorb W 80/100 mesh  
AW-DMCS, 3.1m x 3.2mm I.D., Glass  
Column temp : 85  
Injection temp : 220  
Detector : ECD (220 )  
Carrier gas : N<sub>2</sub>, 50 mL/min  
Sample Volume: 1.0 µ L

Chloride Solvents



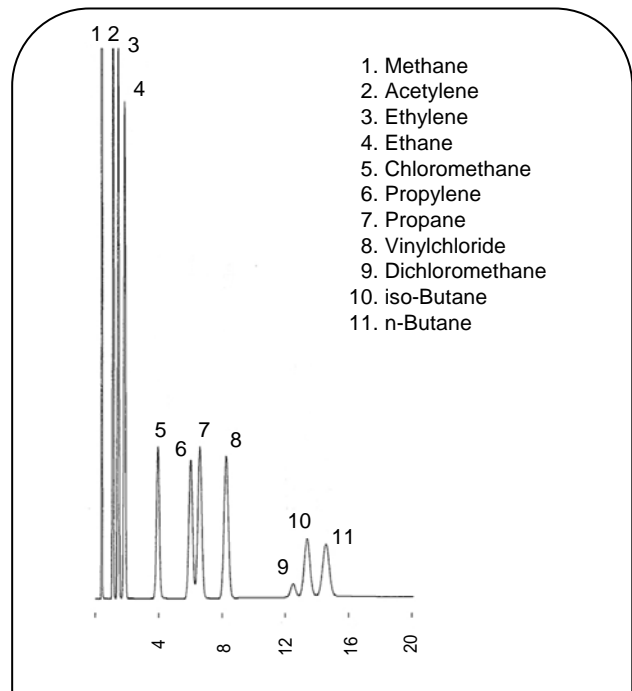
Column : Thermon-3000 10% Chromosorb W 80/100 mesh  
AW-DMCS, 3.1m x 3.2mm I.D., Glass  
Column temp : 90  
Injection temp : 250  
Detector : ECD (250 )  
Carrier gas : N<sub>2</sub>, 50 mL/min  
Sample Volume: 1.0 µ L

Chloride Solvents



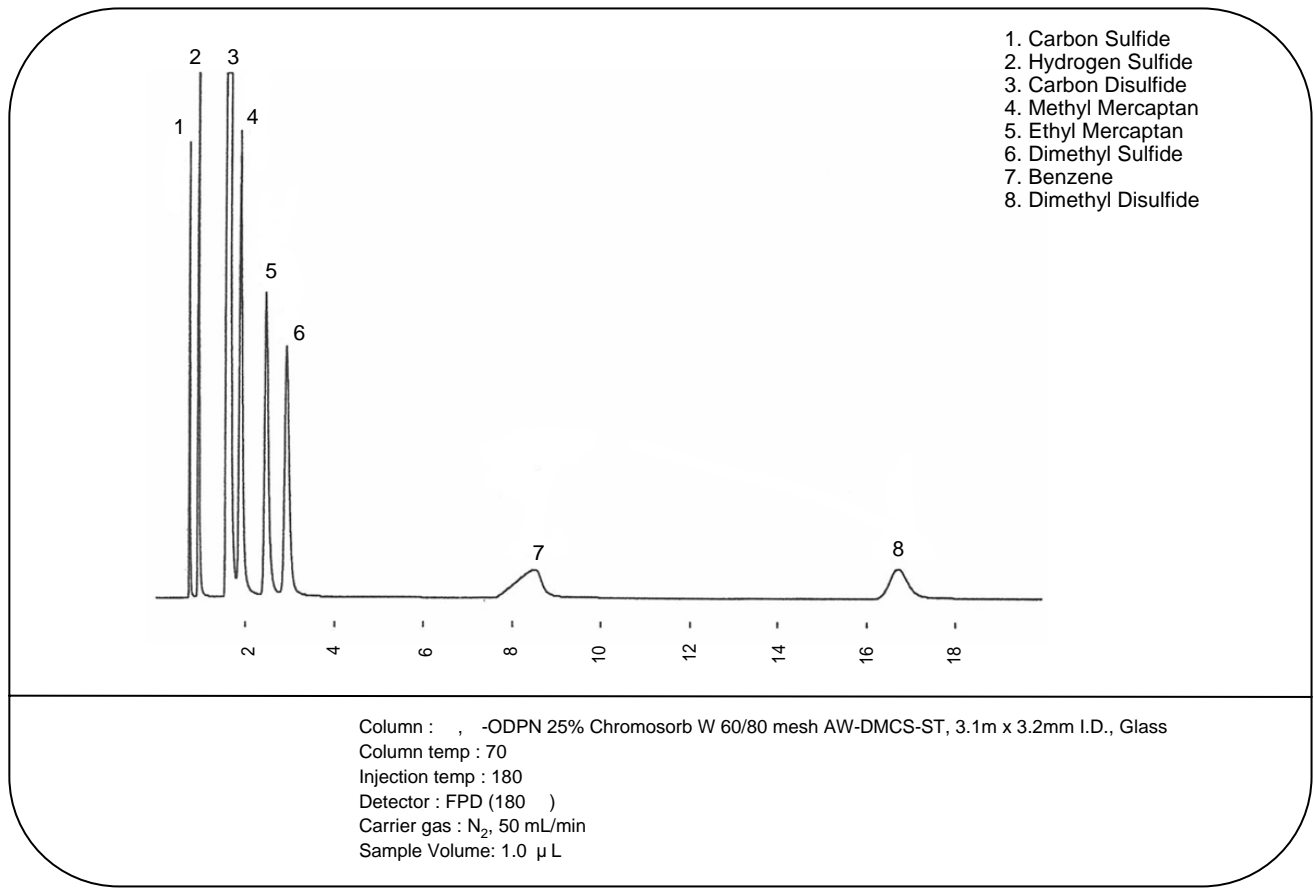
Column : Thermon-3000 10% Chromosorb-W  
80/100 mesh AW-DMCS, 3.1m x 3.2mm I.D., Glass  
Column temp : 90  
Injection temp : 230  
Detector : FID (250 )  
Carrier gas : N<sub>2</sub>, 50 mL/min  
Sample Volume: 1.0 µ L

Lower Hydrocarbons and Chlorinated Hydrocarbons

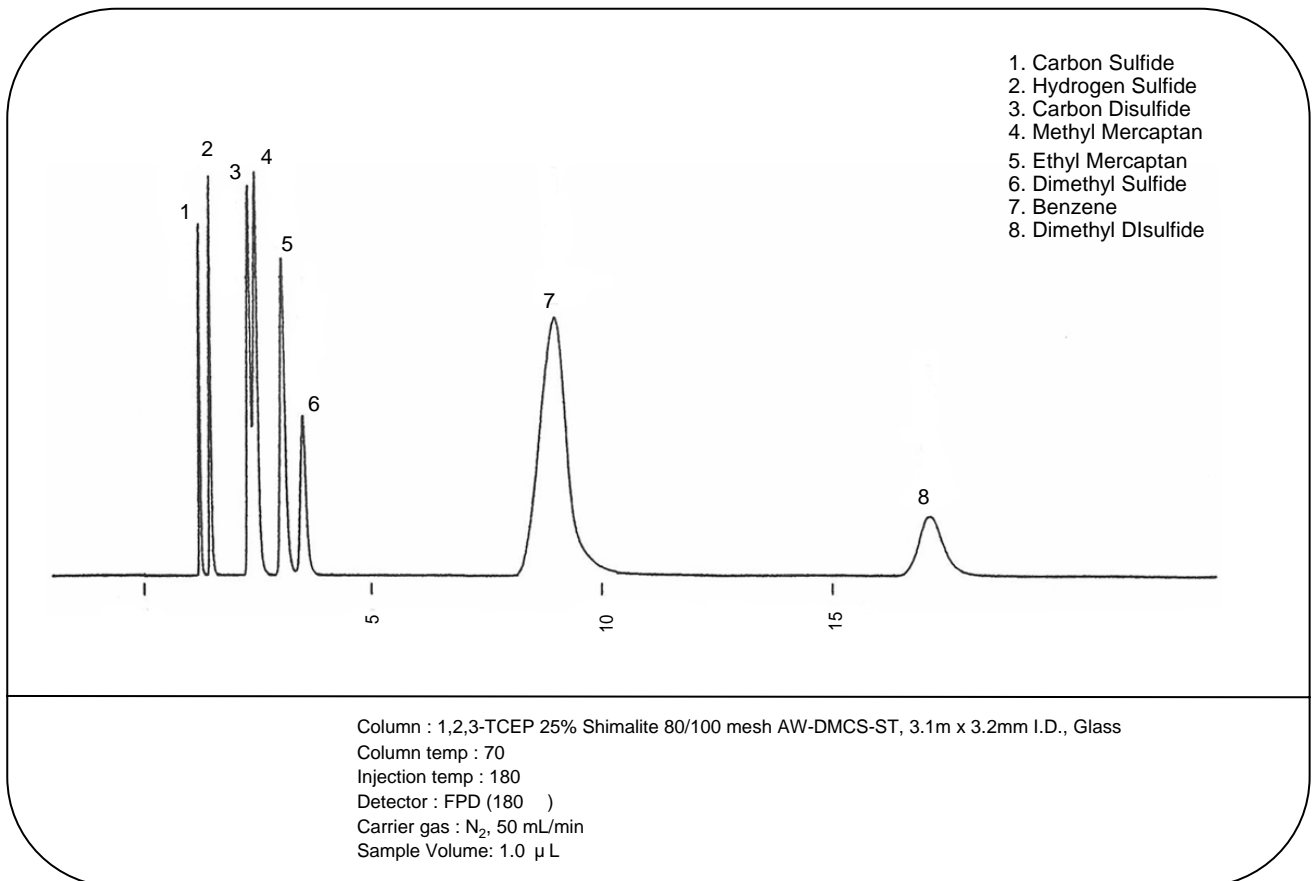


Column : SHINCARBON-ST 50/80 mesh,  
1.0m x 3.0mm I.D., Glass  
Column temp : 170 ~ 270 Program rate: 8  
Injection : 280  
Detector : FID (280 )  
Carrier gas : N<sub>2</sub>, 50 mL/min  
Sample Volume: 0.25 µ L

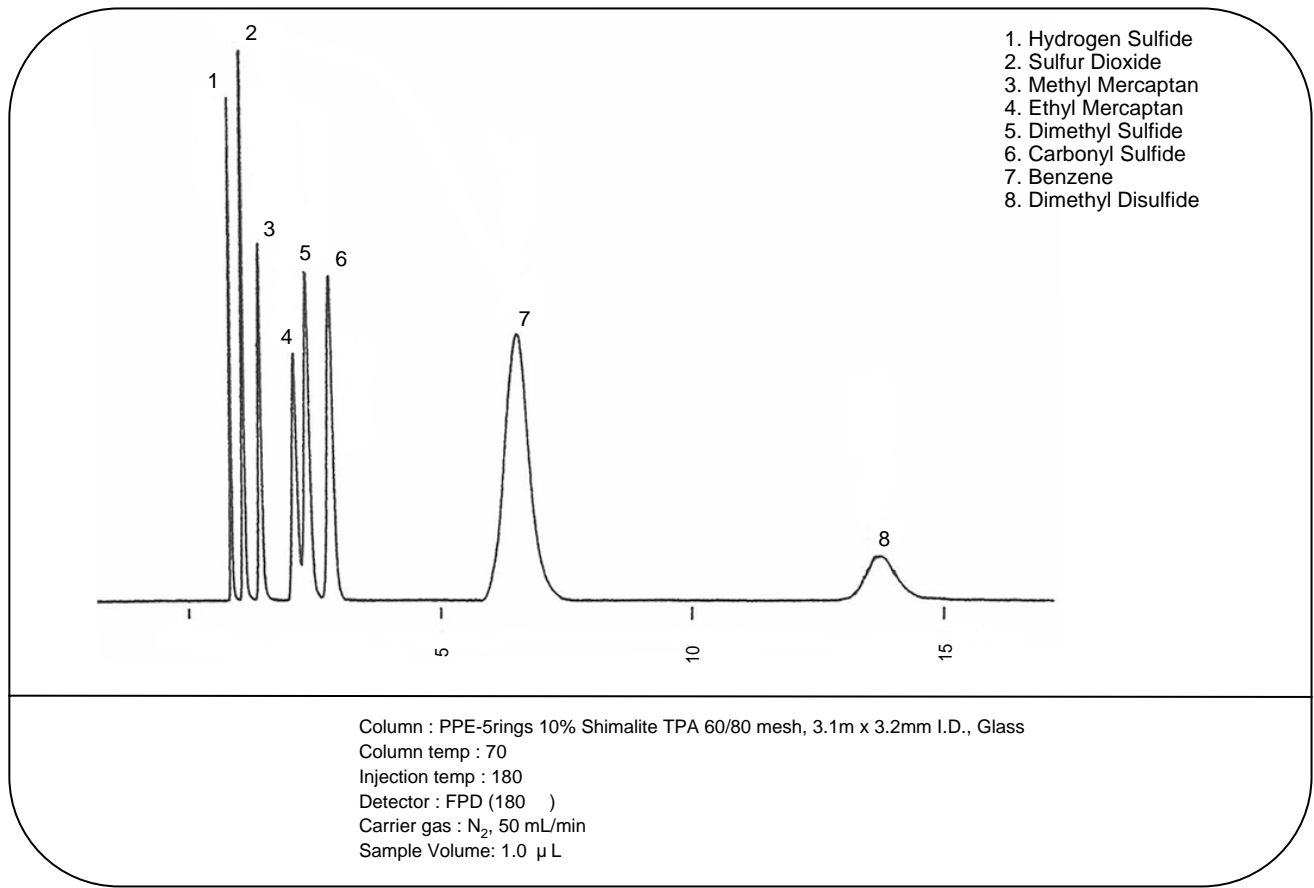
Sulfur Compounds of Air Pollution



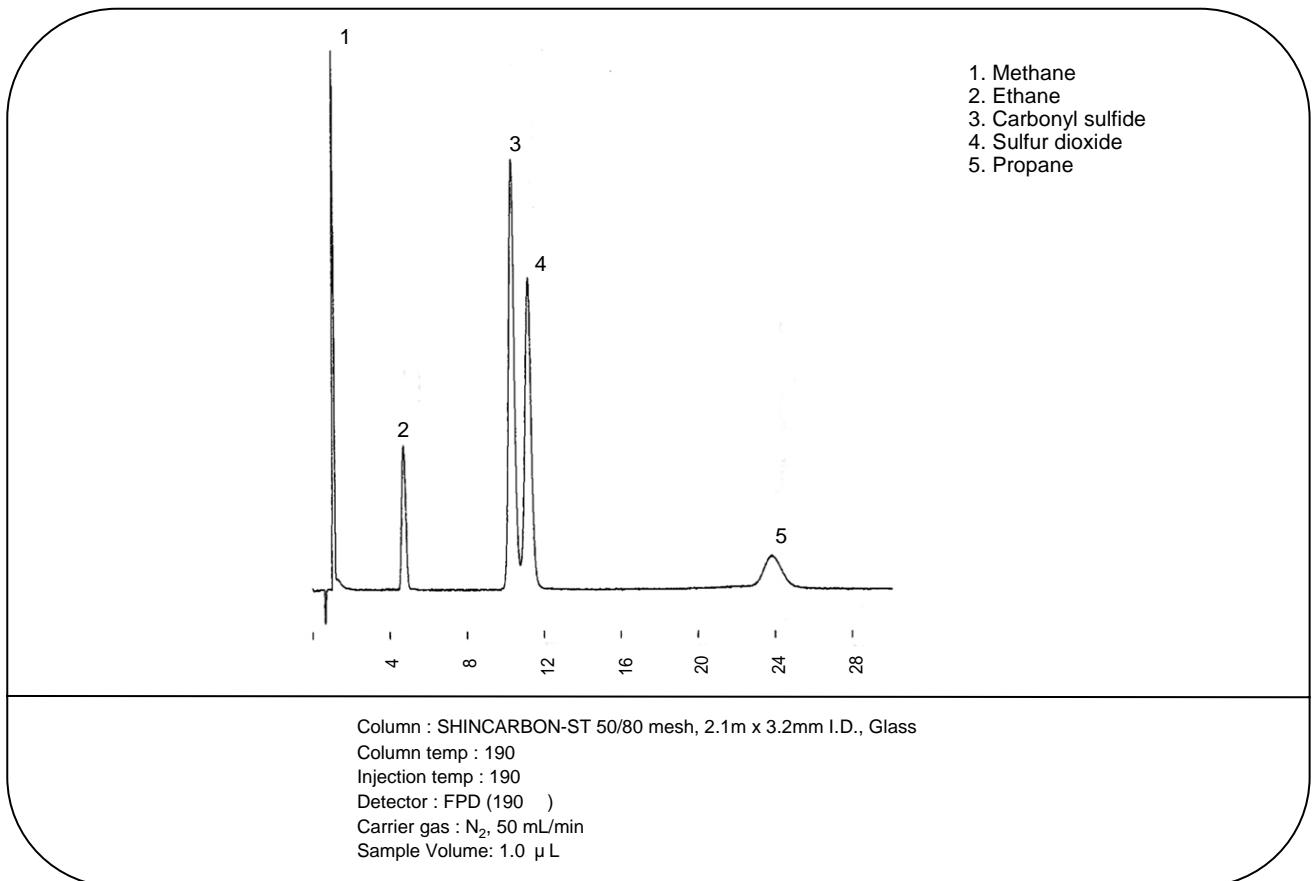
Sulfur Compounds of Air Pollution



Sulfur Compounds of Air Pollution



Sulfur Compounds of Air Pollution



### Sunpak-S

Sunpak-S is a suitable packing material for analyzing sulfur compounds in lower hydrocarbons (C1 ~ C4).

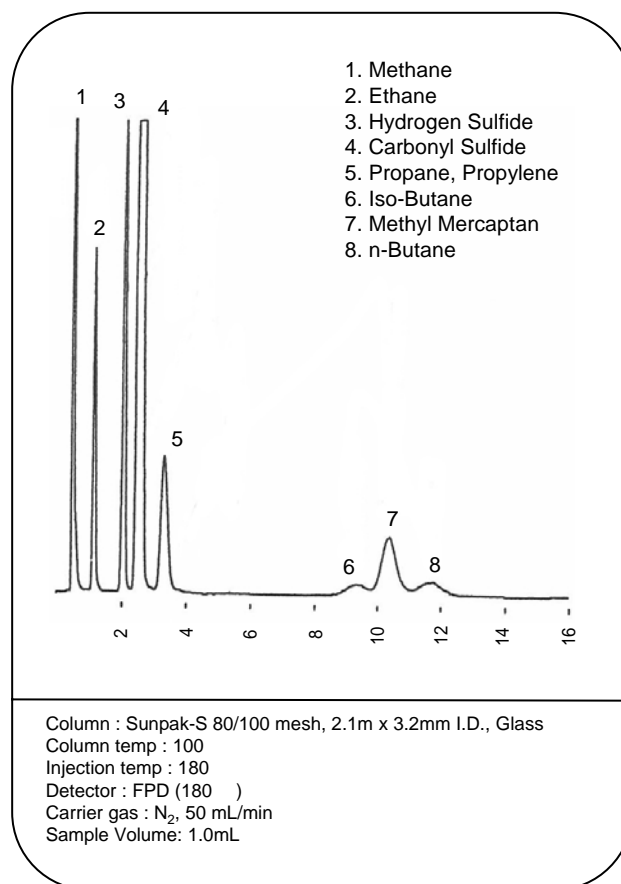
1,2,3-TCEP, PPE-5rings and  $\gamma$ -ODPN are used for the analysis of sulfur compounds. However, carbonyl sulfide can't be separated from methane, ethylene and ethane by 1,2,3-TCEP and PPE-5rings. And also carbonyl sulfide and hydrogen sulfide can't be separated from methane and ethylene by  $\gamma$ -ODPN.

The quenching phenomenon happens in FPD detector when sulfur compounds and too much hydrocarbons are eluted at the same time, so correct qualitative analysis of sulfur compounds can not be achieved. Therefore, SUNPAK-S enabled hydrocarbons and sulfur compounds to be separated completely.

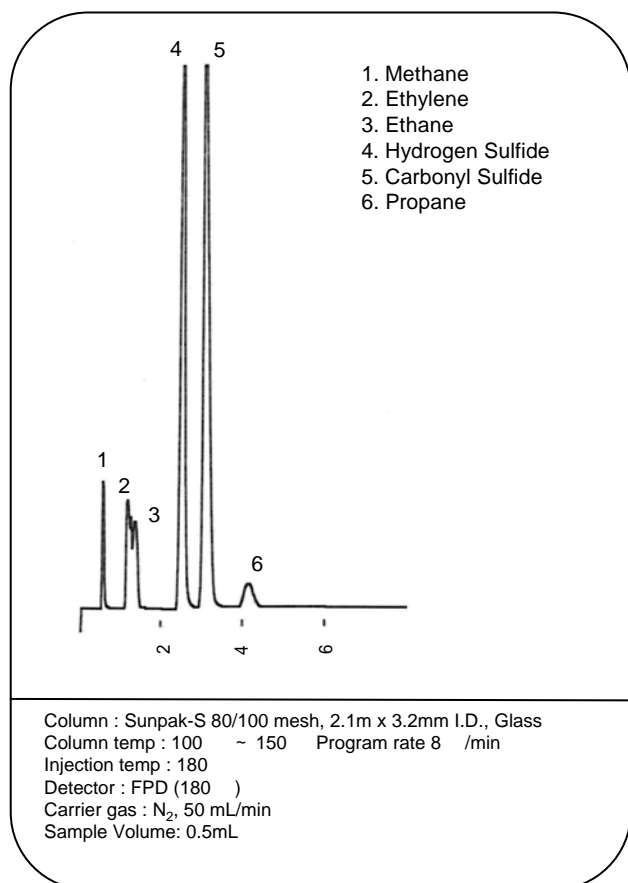
#### Characteristics

- 1) Carbonyl sulfide and hydrogen sulfide can be separated from methane, ethane, ethylene, propane and propylene by Sunpak-S, minor sulfur compounds can be detected.
- 2) Methyl mercaptane can be eluted between isobutane and n-butane.

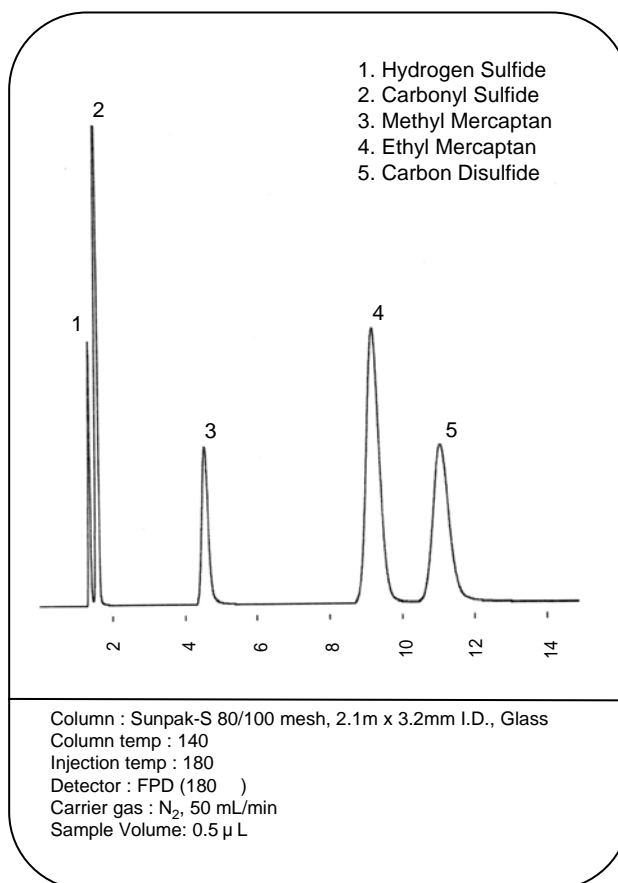
### Sulfur Compounds in Lower Hydrocarbons



### Sulfur Compounds in Lower Hydrocarbons



### Sulfur Compounds in Lower Hydrocarbons



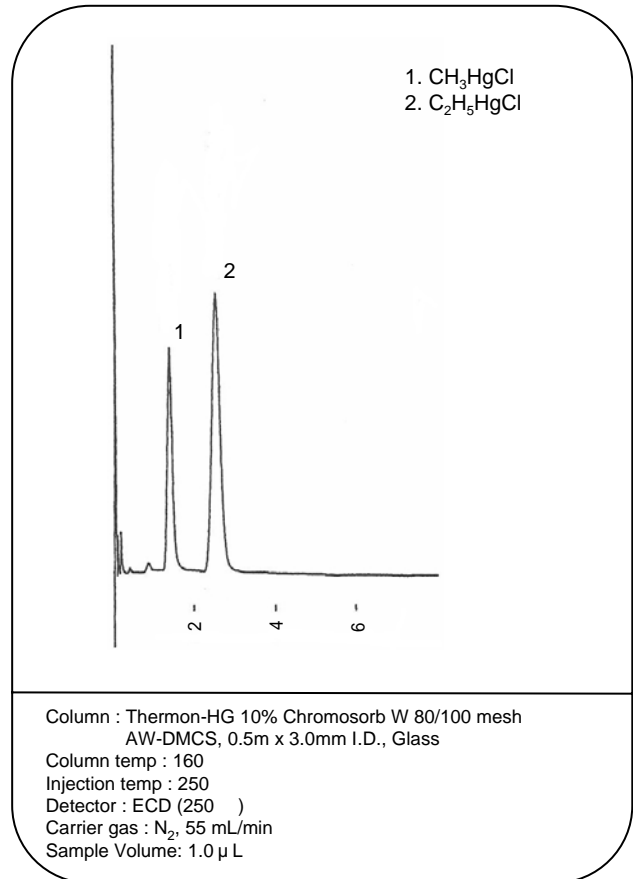
## Methyl Mercuric Chloride and Ethyl Mercuric Chloride

## Thermon-HG

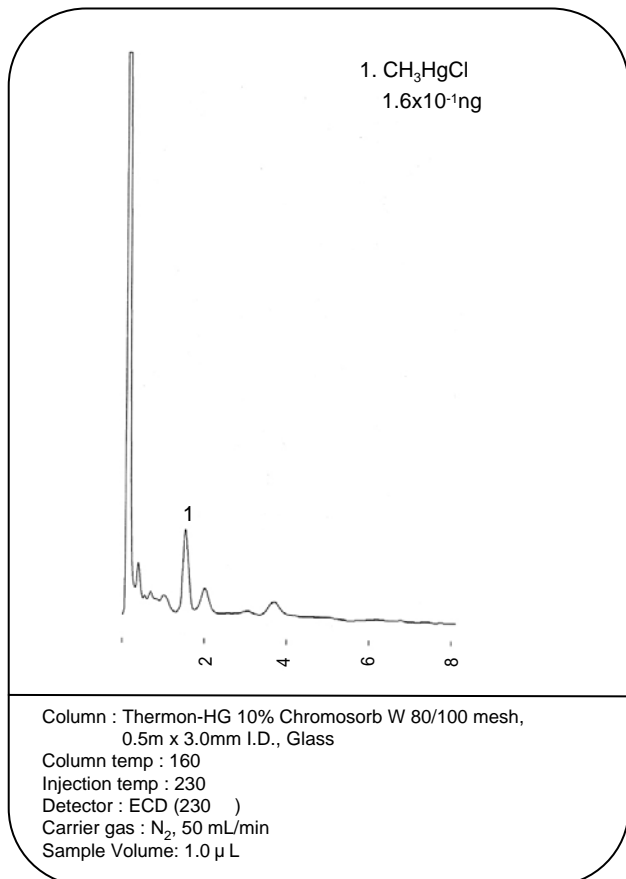
**Thermon-HG** is a packing material having a structure of polyester for analysis of organic mercury compounds.

## Characteristics

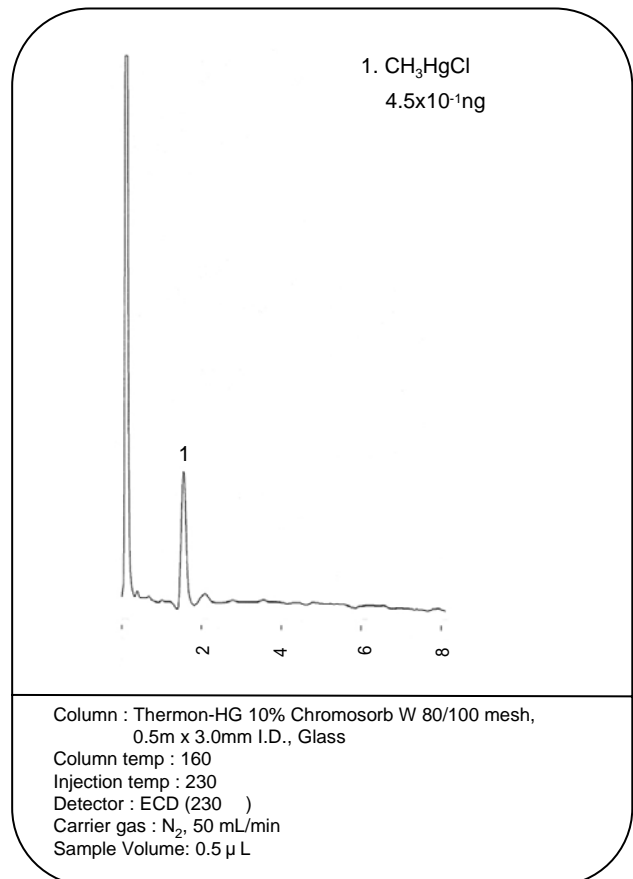
- 1) Compared with DEGS, the low bleeding of Thermon-HG stationary phase results in higher sensitivity of detection (3 to 5 times). As the result, the time of sample condensation can be shortened by half.
- 2) The conditioning time can be shorten.
- 3) Thermon-HG is excellent in thermostability compared with DEGS. As a result, Life is longer than DEGS.



## Methyl Mercuric Chloride in Foreign Fish Species

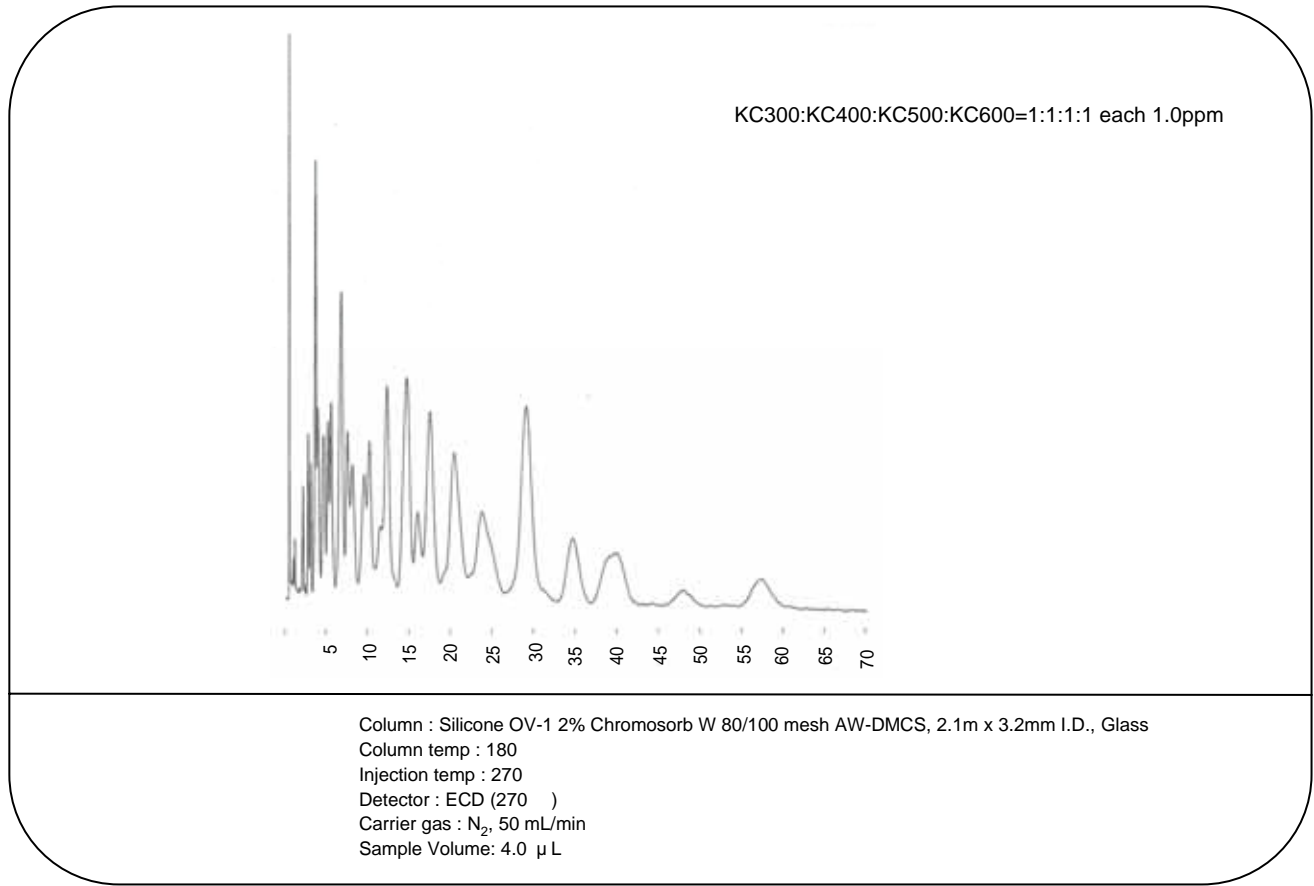


## Methyl Mercuric Chloride in Pelagic Tuna

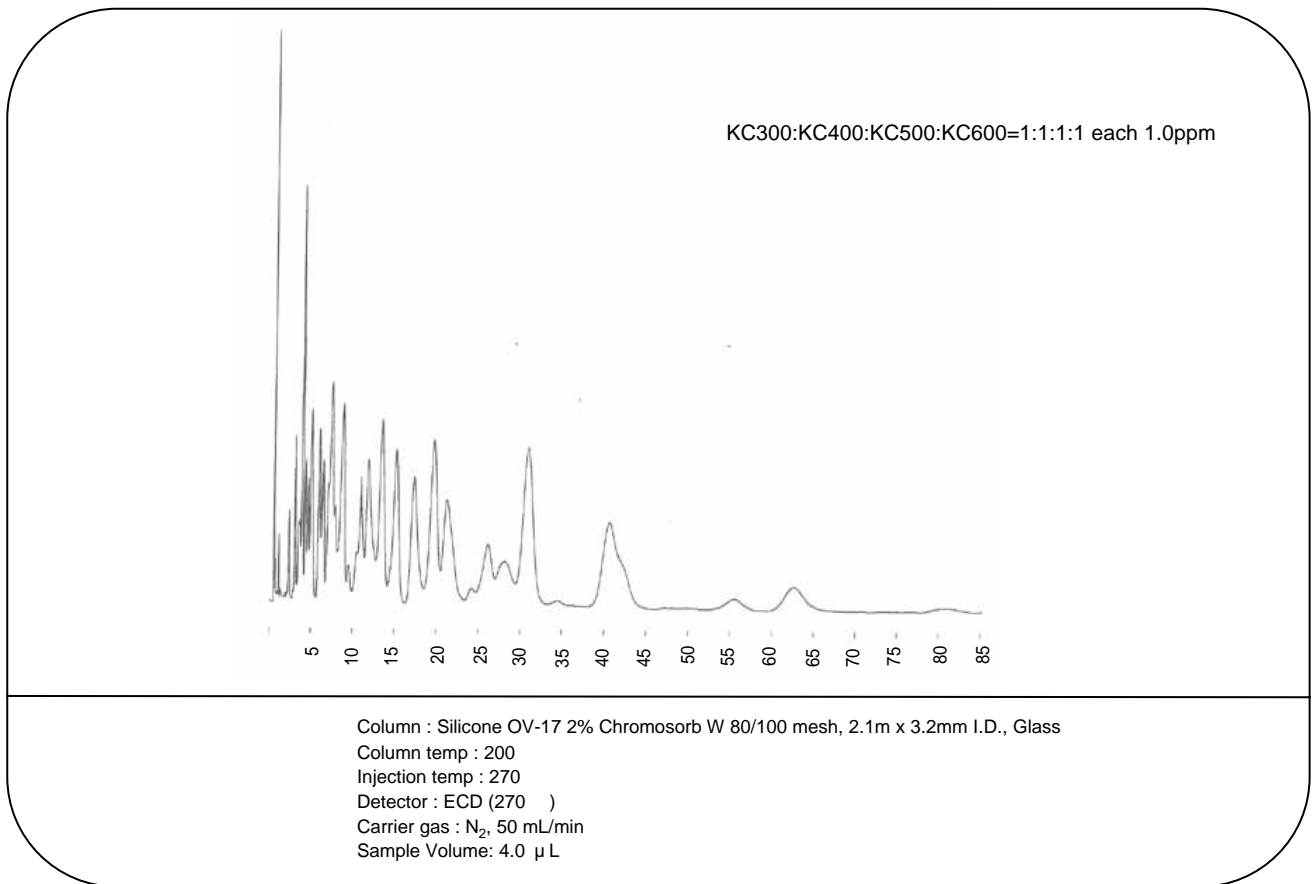




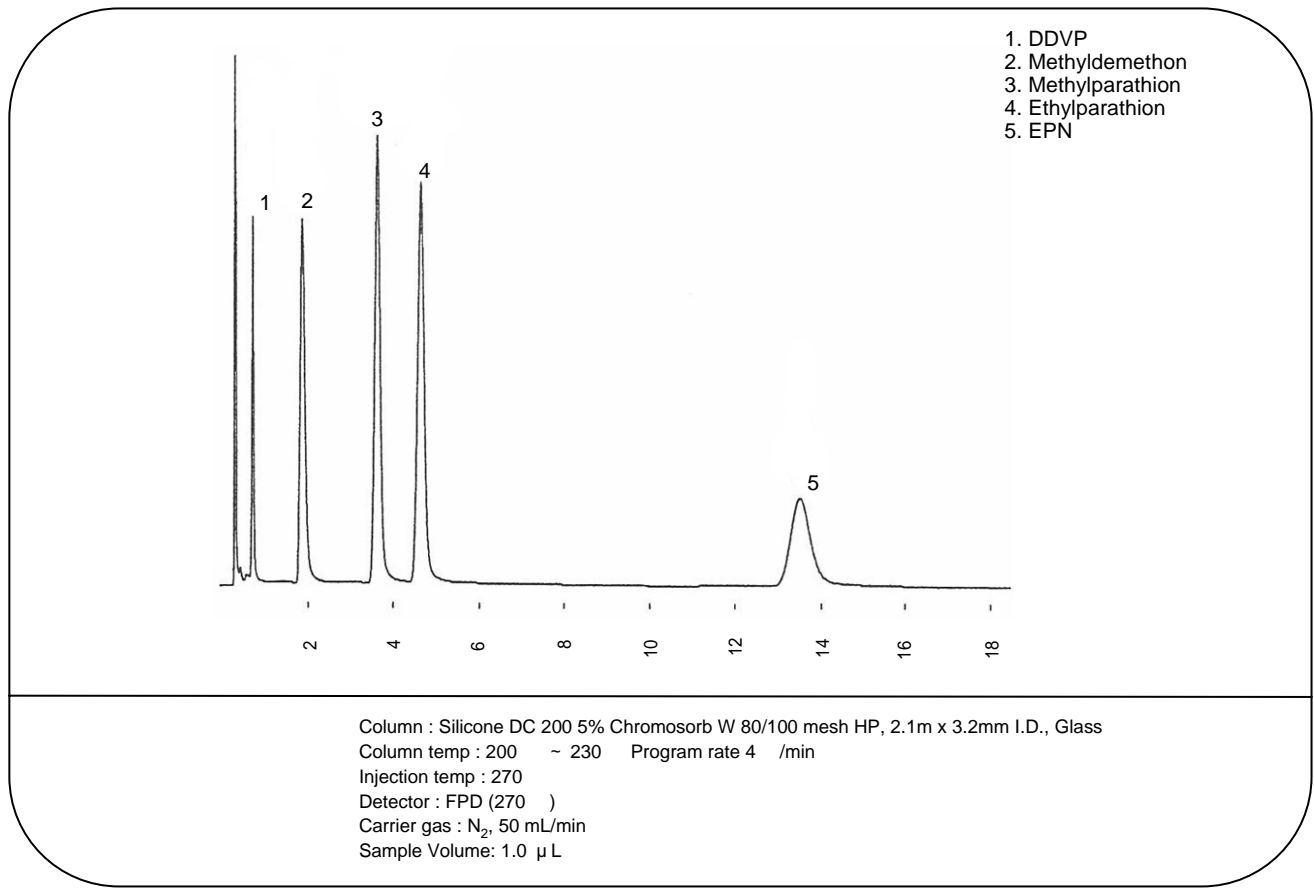
PCB



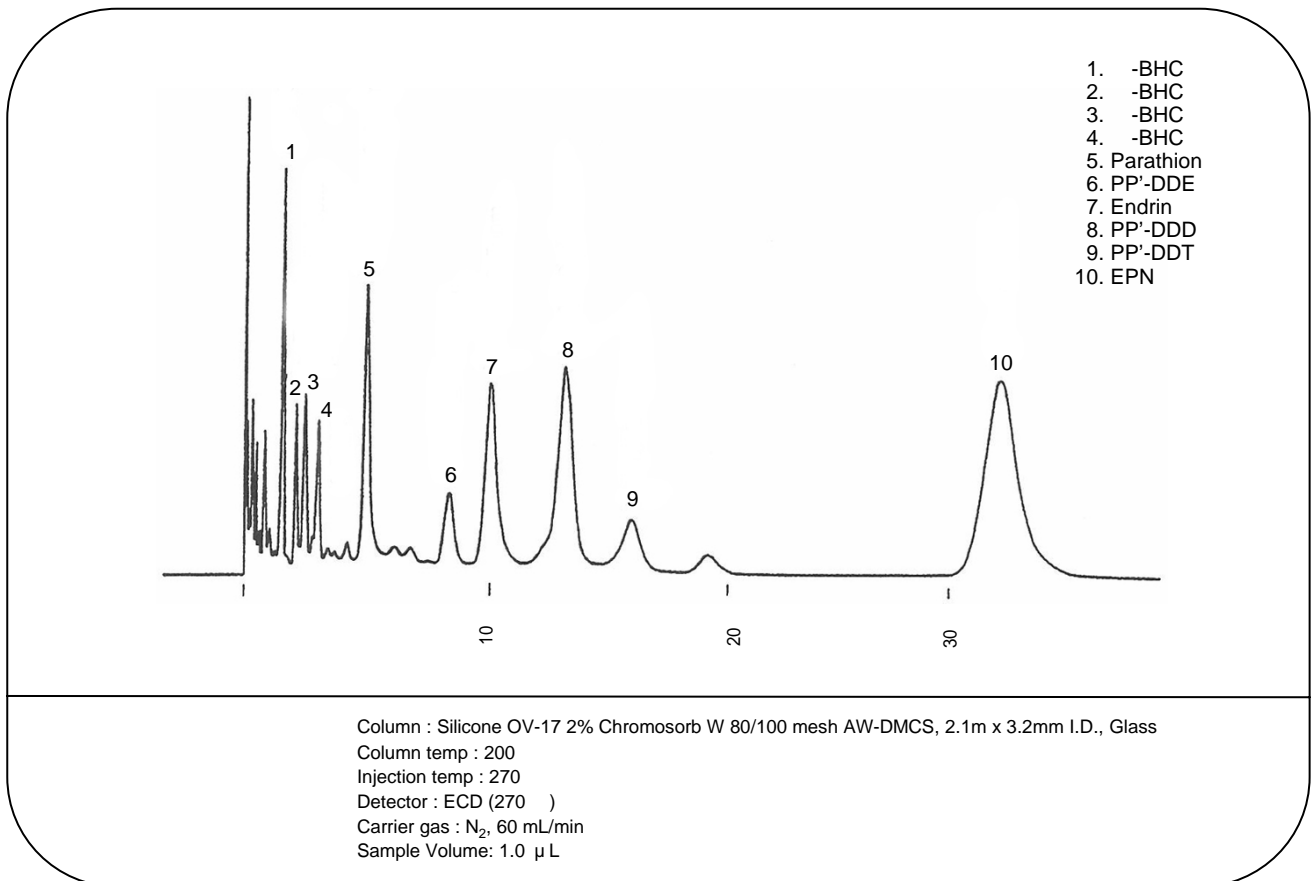
PCB



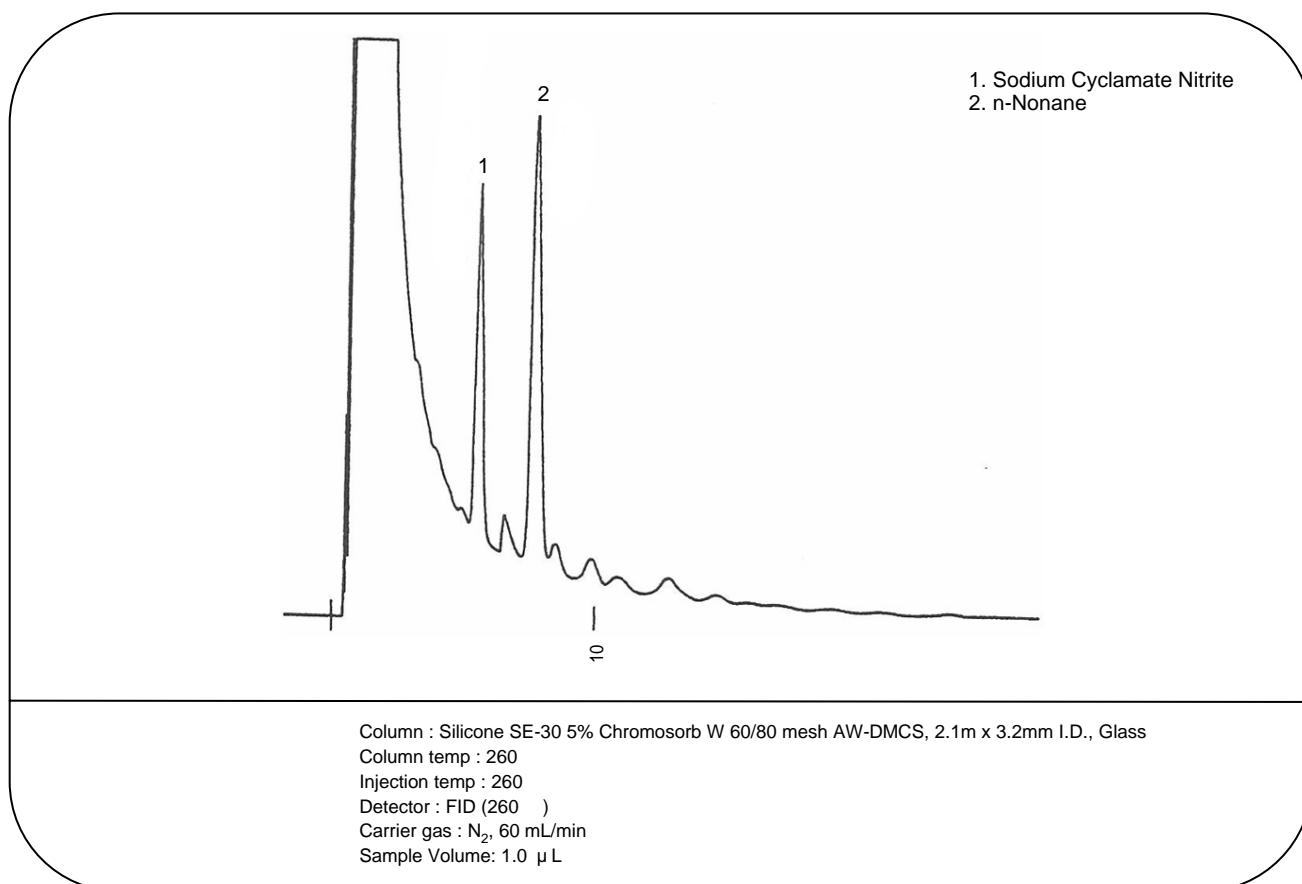
Organophosphorus Insecticides



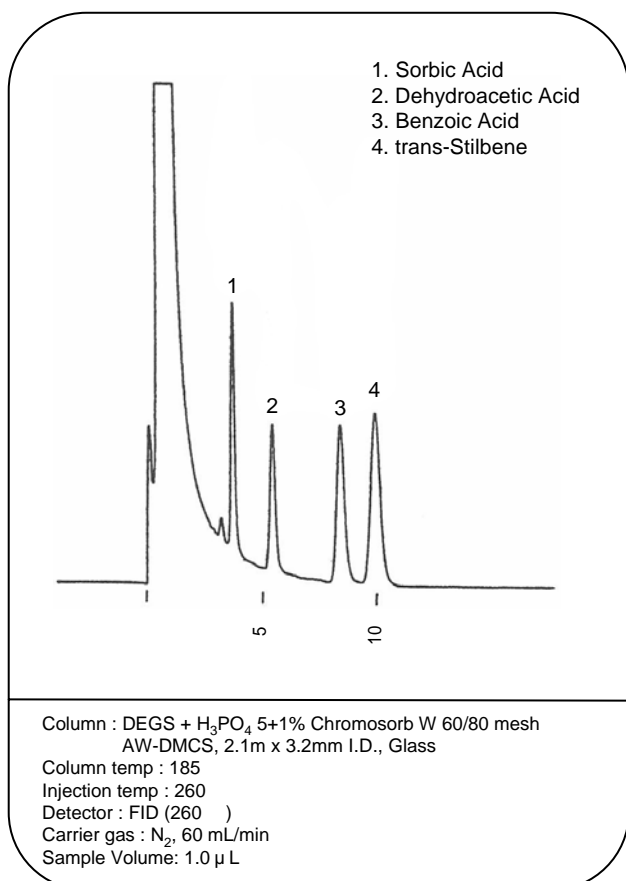
Chlorinated Pesticides in Green Tea



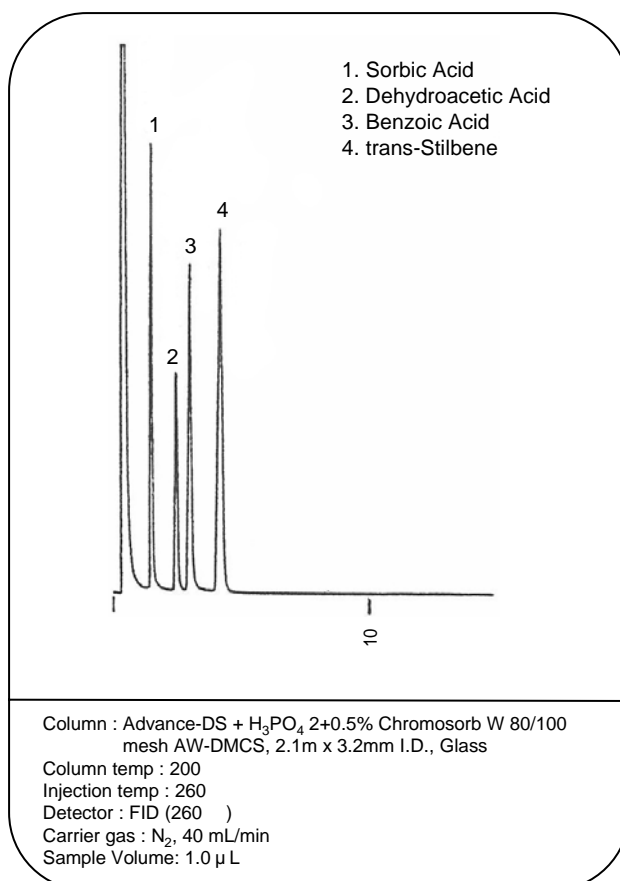
Sodium Cyclamate Nitrite



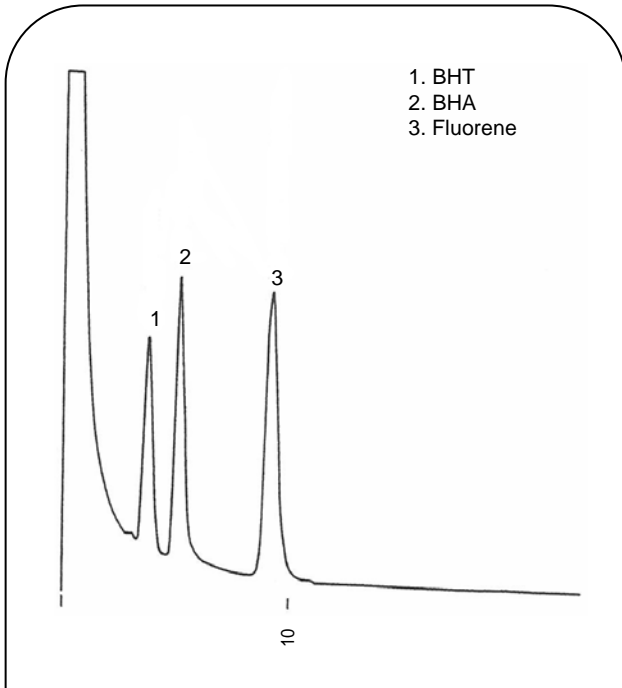
Antiseptics



Antiseptics

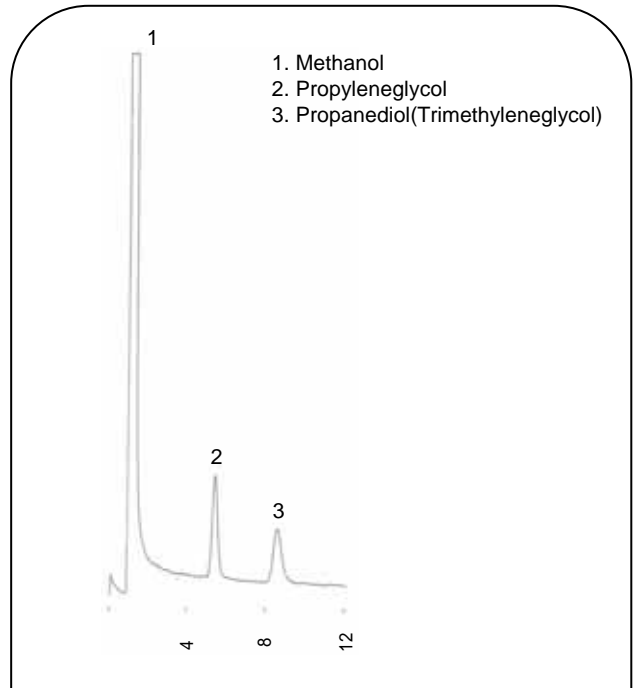


**Dibutylhydroxytoluene and Butylhydroxyanisole in Margarine**



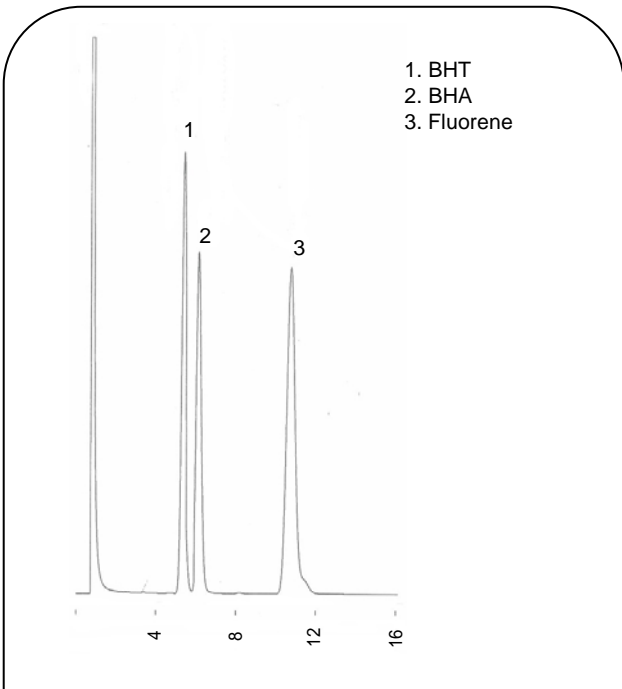
Column : Silicone OV-25 3% Shimalite W 80/100 mesh  
AW-DMCS, 2.6m x 3.2mm I.D., Glass  
Column temp : 165  
Injection temp : 260  
Detector : FID (260 )  
Carrier gas : N<sub>2</sub>, 50 mL/min  
Sample Volume: 1.0 µ L

**Propyleneglycol**



Column : Chromosorb 101 60/80 mesh  
AW-DMCS, 2.1m x 3.2mm I.D., Glass  
Column temp : 200  
Injection temp : 250  
Detector : FID (250 )  
Carrier gas : N<sub>2</sub>, 25 mL/min  
Sample Volume: 1.0 µ L

**Dibutylhydroxytoluene and Butylhydroxyanisole**



Column : Silicone OV-17 5% Chromosorb W 80/100 mesh HP,  
3.1m x 3.2mm I.D., Glass  
Column temp : 180  
Injection temp : 260  
Detector : FID (250 )  
Carrier gas : N<sub>2</sub>, 50 mL/min  
Sample Volume: 1.0 µ L

## FAP-S

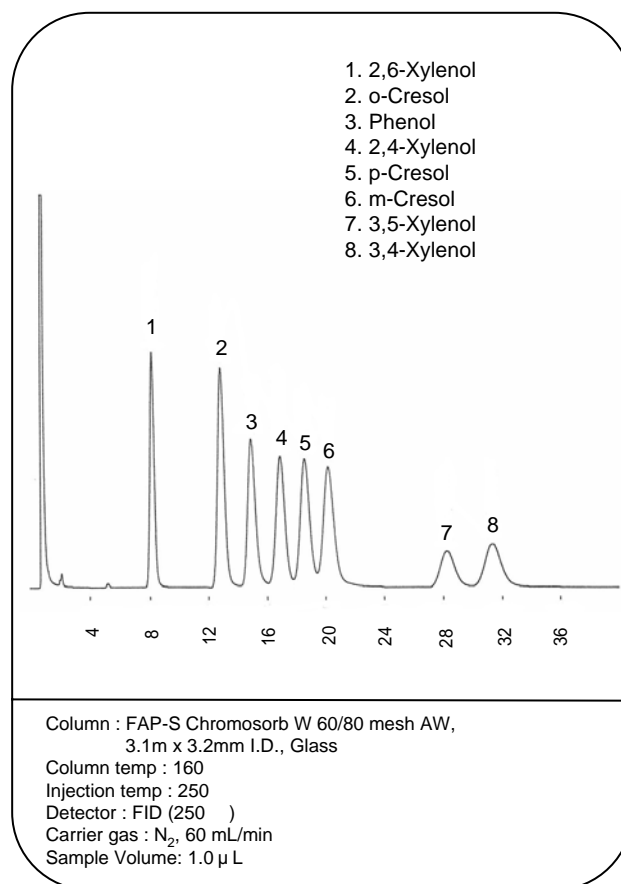
**FAP-S** is a packing material coated with stationary phase which has a nitro-ester structure and can be used for the analysis of cresol isomers and alkyl phenols.

GC method is authorized for the separation of cresol isomers by food hygiene law. Lanoline and tricresyl phosphate (TCP) are used as a stationary phase for these analysis, and occasionally  $H_3PO_4$  may be added depending on the purpose. For cresol analysis, the operation temperature is needed at 160 . But the stationary phases described above are bled and unstable at the temperature. The problem is cleared by **FAP-S**.

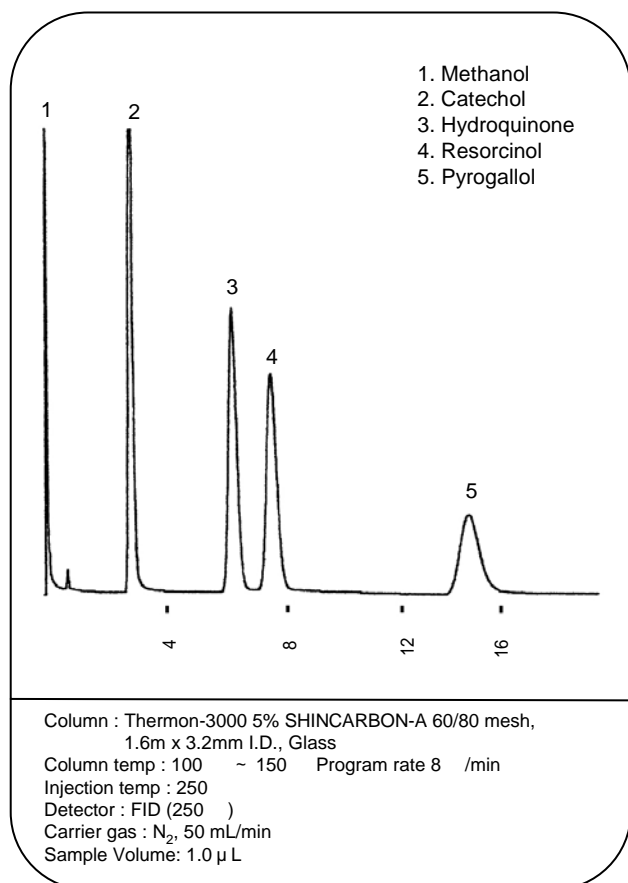
### Characteristics

- 1) The maximum operation temperature is 180 .
- 2) High sensitive analysis is possible at 160 .
- 3) The analysis of minor compounds can be possible in the various fields.

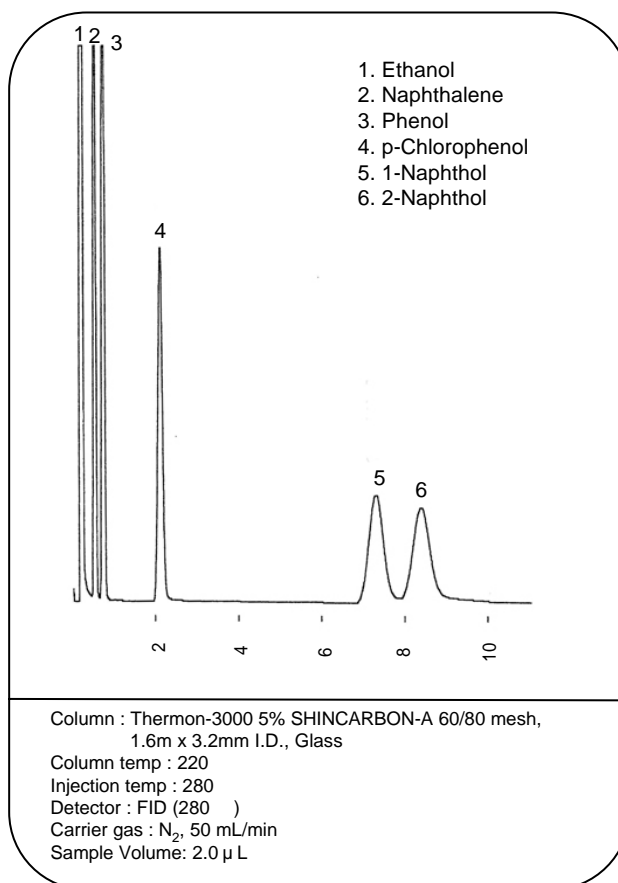
## Cresol Isomers and Xylenols



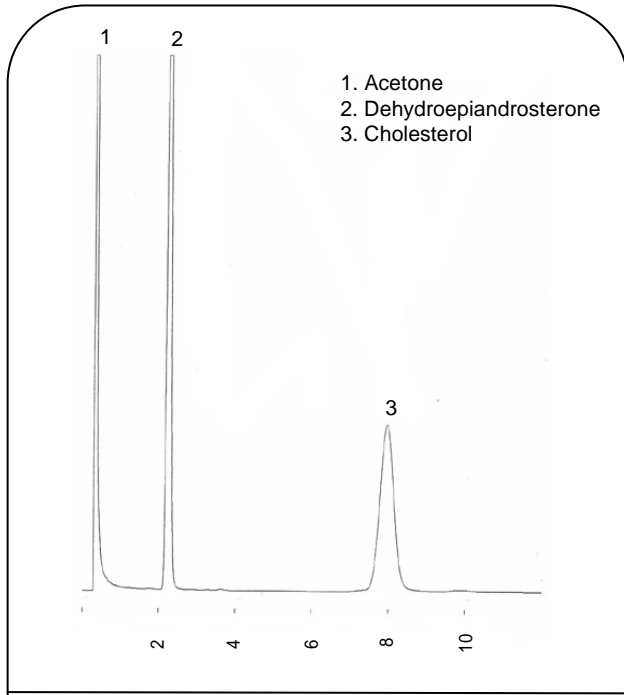
## Polyhydric Phenols



## Phenols and Naphthols

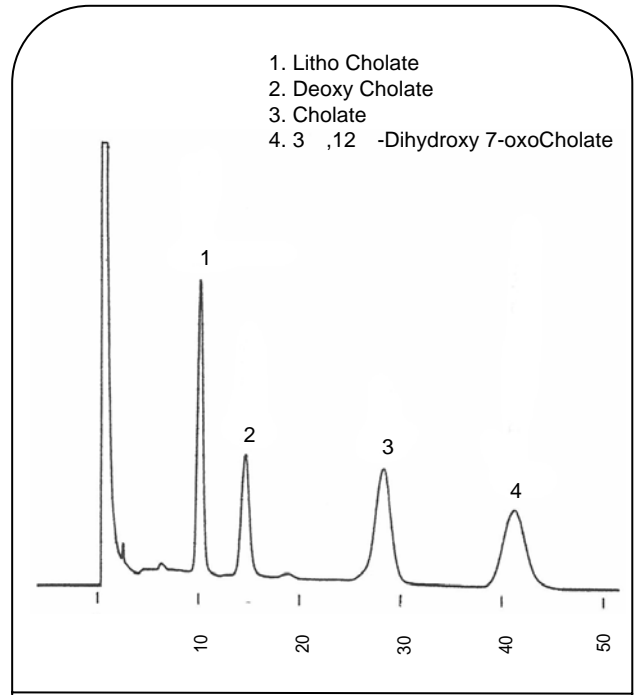


Dehydroepiandrosterone and Cholesterol



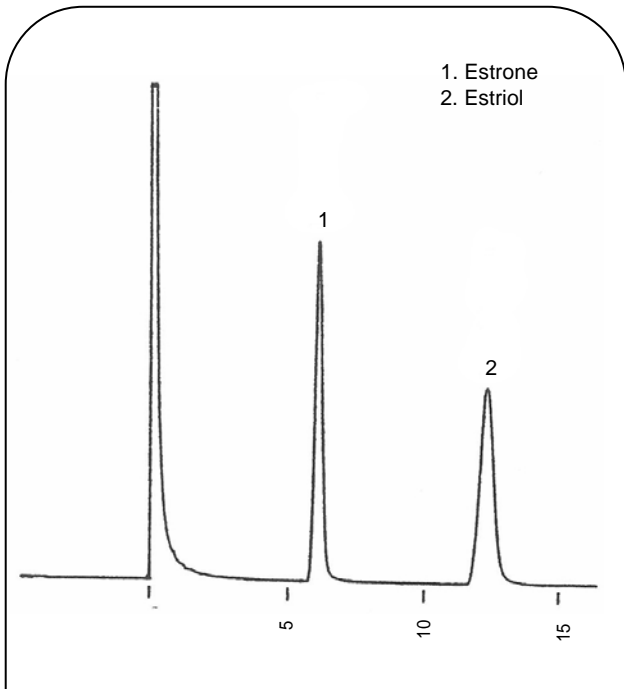
Column : Silicone OV-1 2% Chromosorb W 60/80 mesh  
AW-DMCS, 2.6m x 3.2mm I.D., Glass  
Column temp : 165  
Injection temp : 260  
Detector : FID (260 )  
Carrier gas : N<sub>2</sub>, 50 mL/min  
Sample Volume: 1.0 μL

Bile Acids (Transaction of ME-TFA)



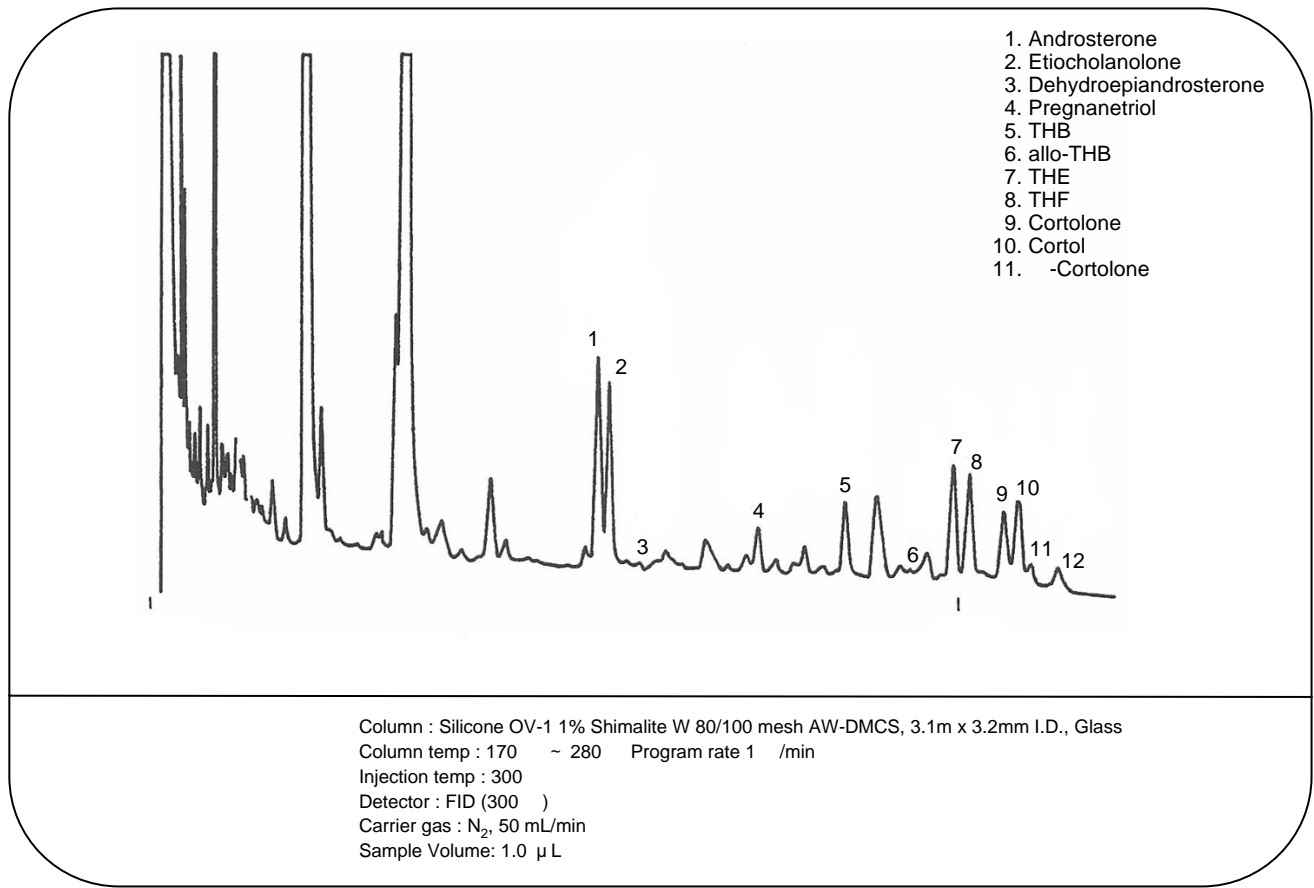
Column : Silicone DC QF-1 1.5% Chromosorb W 80/100 mesh  
HP, 2.1m x 3.2mm I.D., Glass  
Column temp : 240  
Injection temp : 270  
Detector : FID (270 )  
Carrier gas : N<sub>2</sub>, 50 mL/min  
Sample Volume: 1.0 μL

Estrone and Estriol

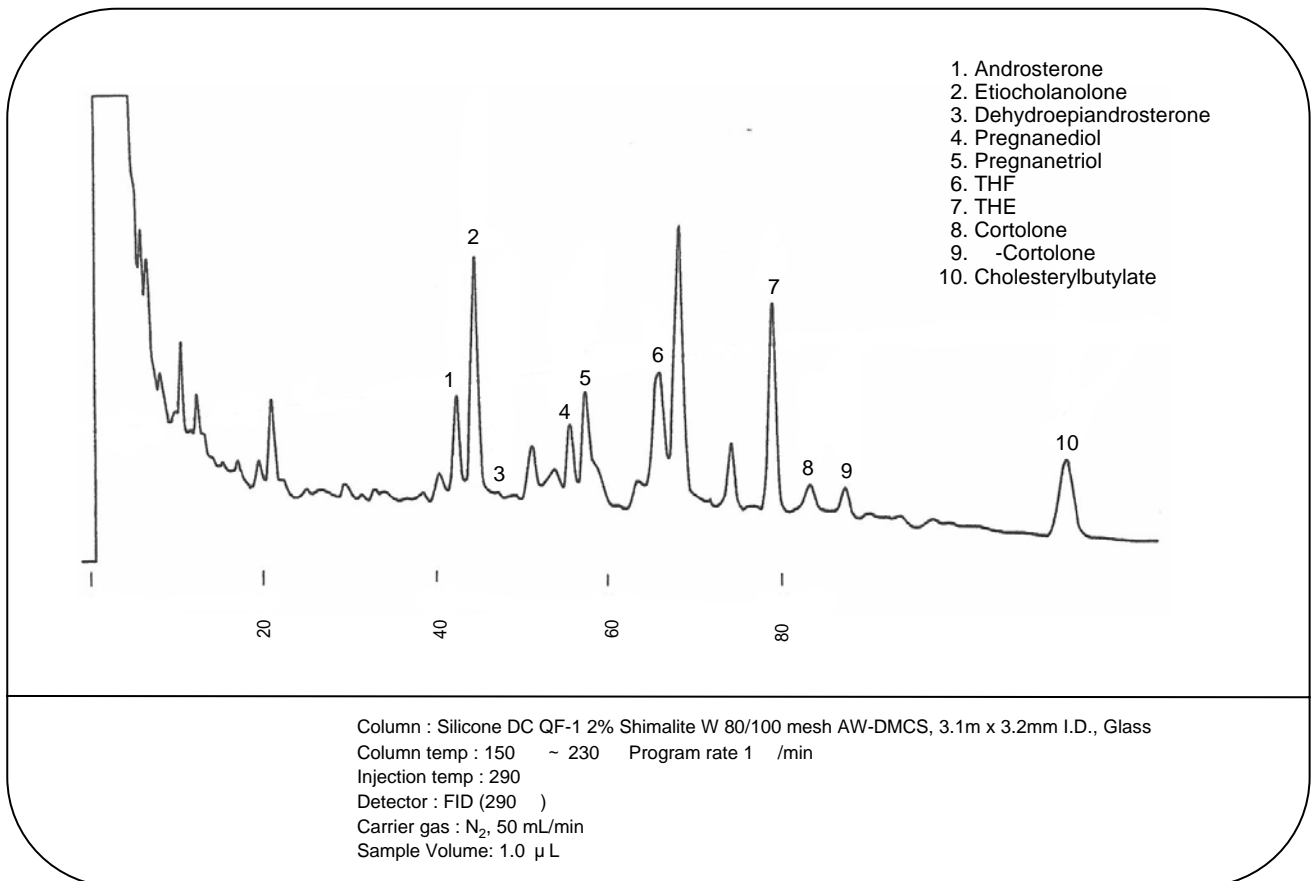


Column : Silicone OV-17 1.5% Shimalite W 80/100 mesh  
AW-DMCS, 1.6m x 3.2mm I.D., Glass  
Column temp : 260  
Injection temp : 290  
Detector : FID (290 )  
Carrier gas : N<sub>2</sub>, 50 mL/min  
Sample Volume: 1.0 μL

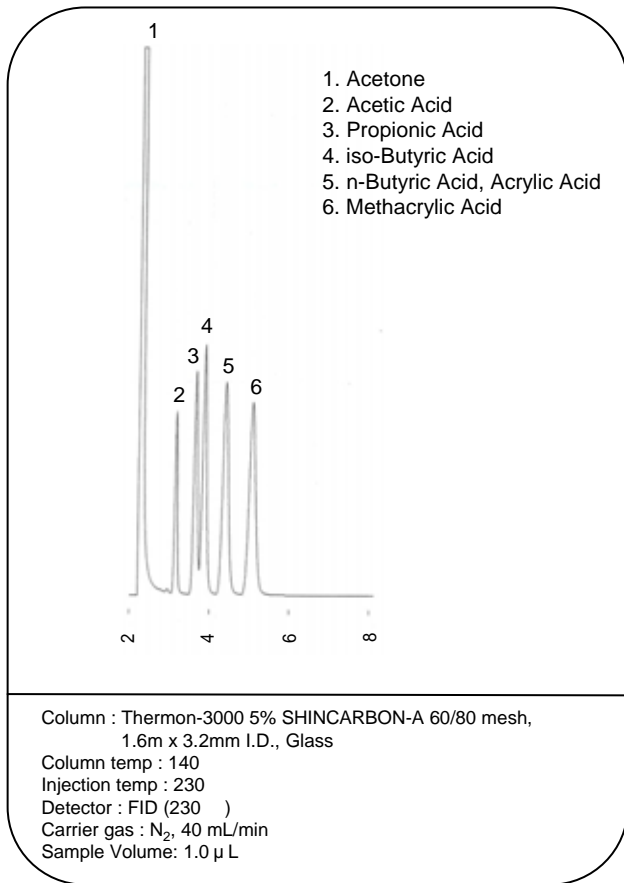
Urinary Steroids



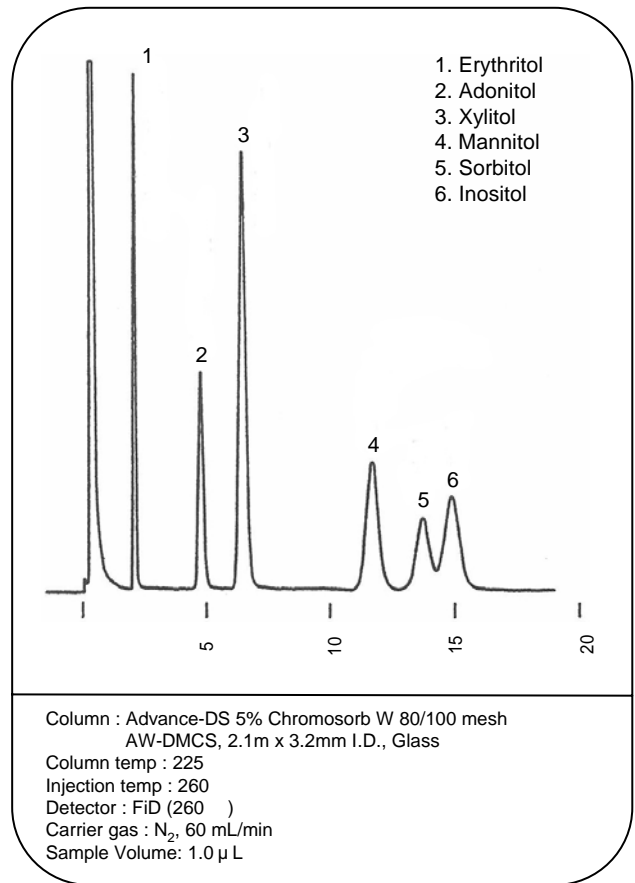
Urinary Steroids



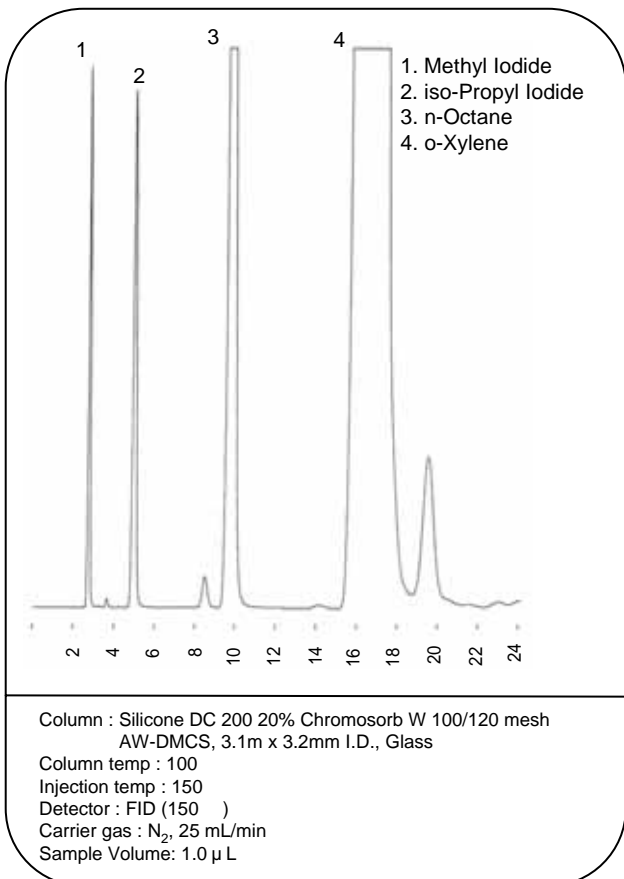
**Fatty Acids and Acrylic Acids**



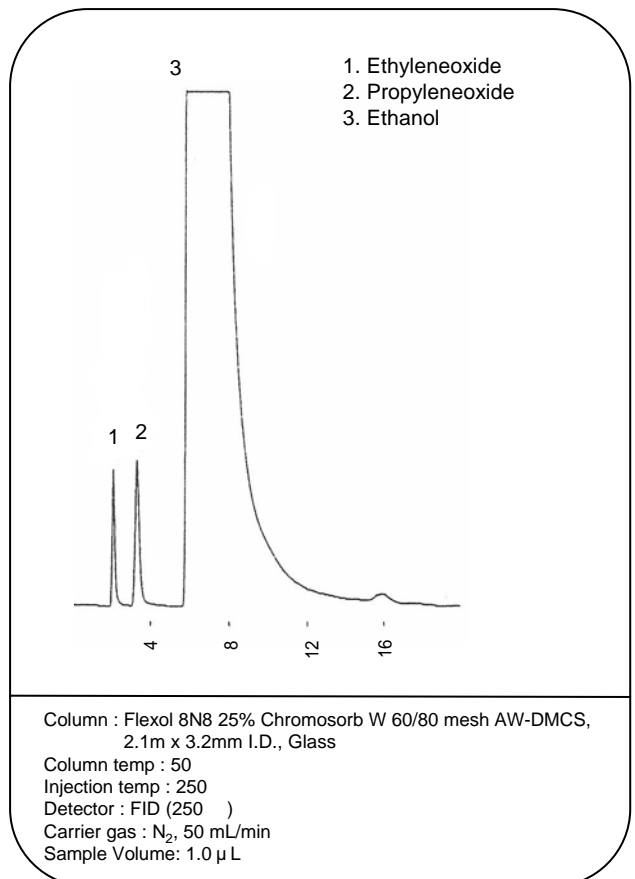
**Acetylated Sugar Alcohol**



**Hypromelloses**

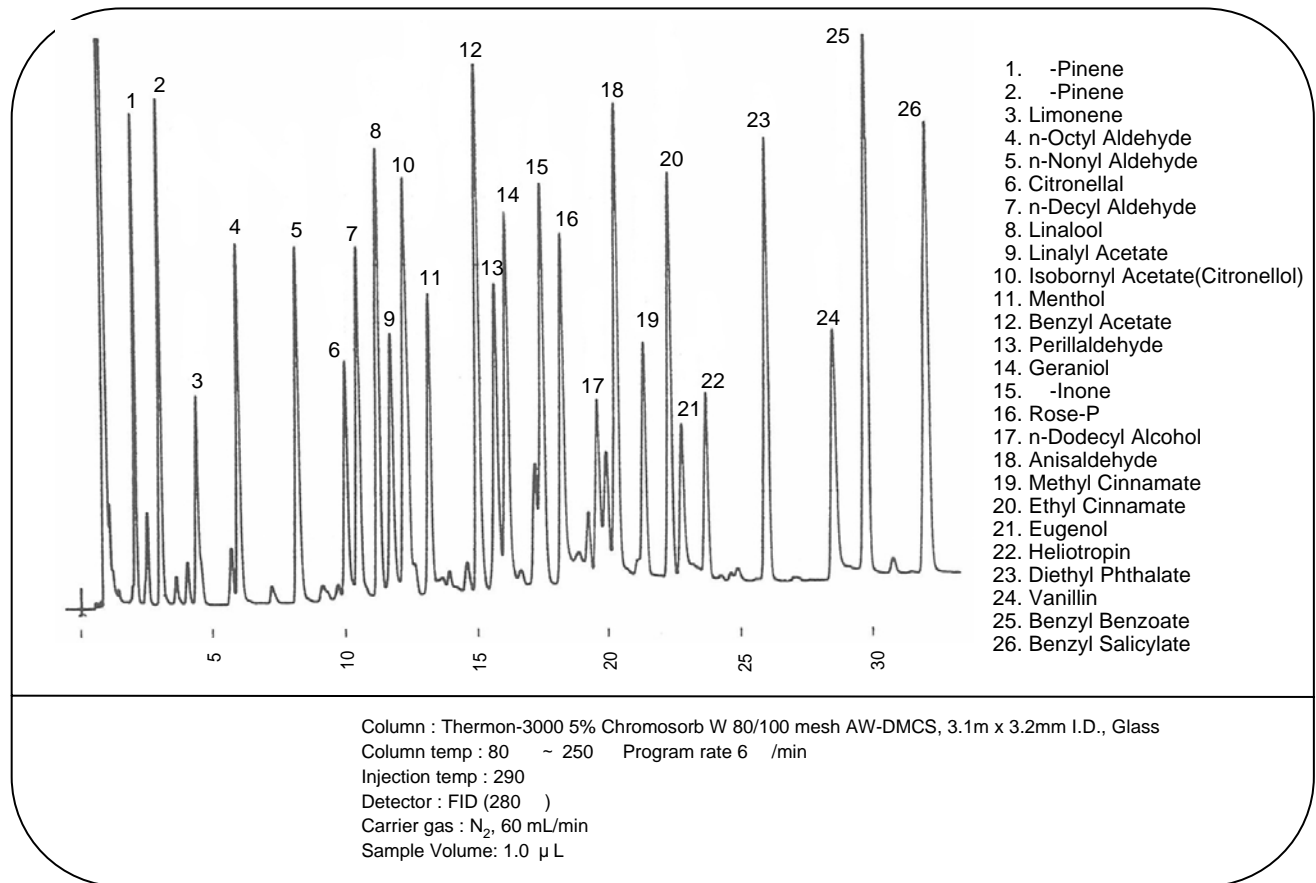


**Ethyleneoxide and Propyleneoxide in Ethanol**

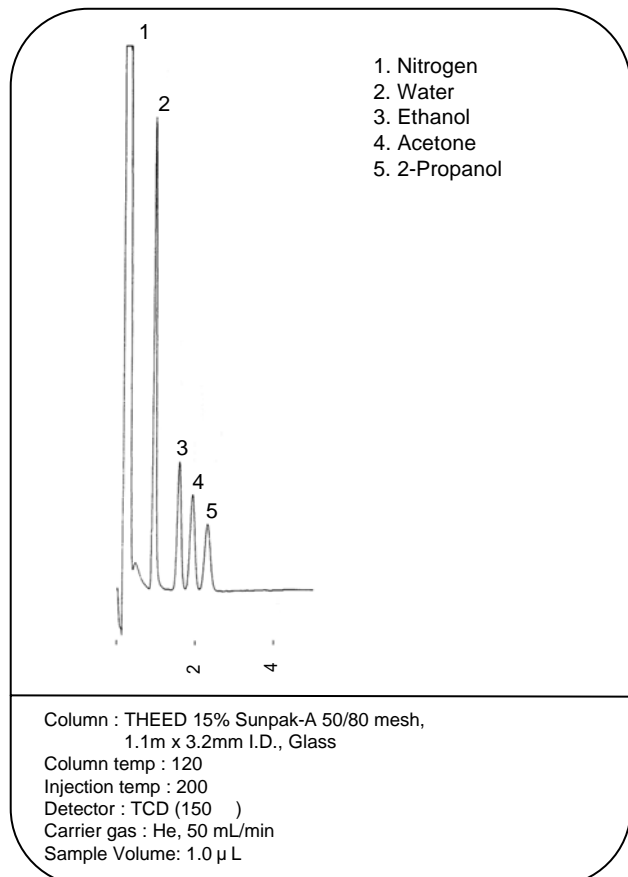




Mixtures of Flavor



Alcohol and Acetone



## Application Index

A	
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-BHC	82
-BHC	82
-BHC	82
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