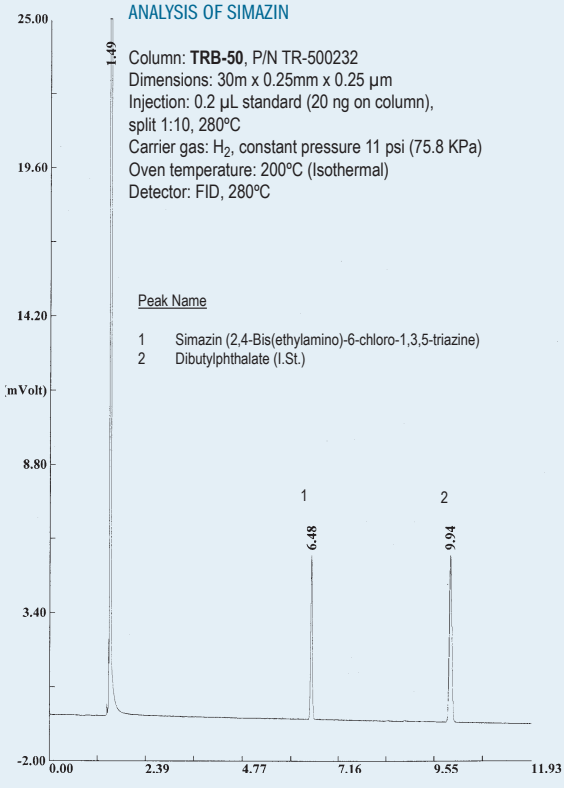
# Index Gas Chromatography Applications

## ANALYSIS OF SIMAZIN

Column: **TRB-50**, P/N TR-500232
Dimensions: 30m x 0.25mm x 0.25 µm
Injection: 0.2 µL standard (20 ng on column),
split 1:10, 280ºC
Carrier gas: $H_2$, constant pressure 11 psi (75.8 KPa)
Oven temperature: 200ºC (Isothermal)
Detector: FID, 280ºC

Peak Name

1 Simazin (2,4-Bis(ethylamino)-6-chloro-1,3,5-triazine)
2 Dibutylphthalate (I.St.)



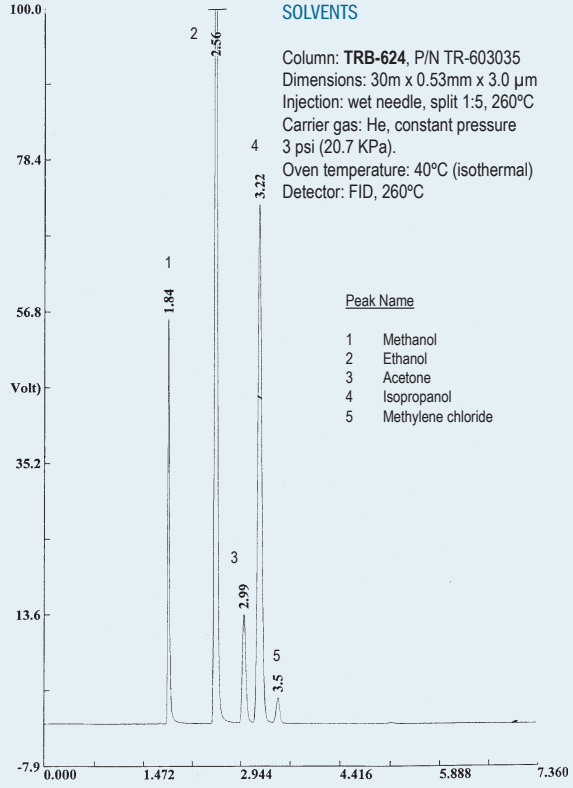

TKG 1001

## SOLVENTS

Column: **TRB-624**, P/N TR-603035
Dimensions: 30m x 0.53mm x 3.0 µm
Injection: wet needle, split 1:5, 260ºC
Carrier gas: He, constant pressure
3 psi (20.7 KPa).
Oven temperature: 40ºC (isothermal)
Detector: FID, 260ºC

Peak Name

1 Methanol
2 Ethanol
3 Acetone
4 Isopropanol
5 Methylene chloride




TKG 1004

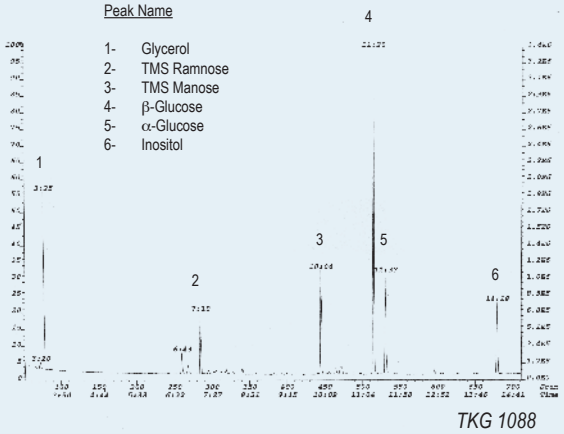
## TRIMETHYLSILYL DERIVATIVES OF METHYLGLYCOSIDES FROM BACTERIOLOGICAL POLYSACARIDES

Column: **TRB-1**, P/N TR-110222
Dimensions: 25m x 0.25mm x 0.25 µm
Injection: 1 µL, split1:3, 250ºC
Carrier gas: He, constant pressure 10 psi (69 KPa).
Oven program: 140ºC(2min) @ 8ºC/min to 280ºC(30min)
Detector: MS, 300ºC

*Chromatogram provided by Antonio Gil from*
*Department of Organic Chemestry. CSIC (Sevilla)*

Peak Name

1- Glycerol
2- TMS Ramnose
3- TMS Manose
4- β-Glucose
5- α-Glucose
6- Inositol



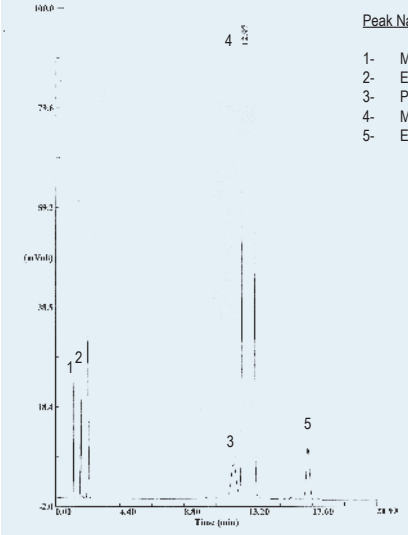

TKG 1088

## IMPURITIES OF METHYL PIVALATE

Column: **Meta .X5**, P/N TR-825035
Dimensions: 30m x 0.53mm x 5.0 µm
Injection: 0.5 µL Methyl Pivalate (+ 0.1% of each impurity),
split 1:25, 250ºC
Carrier gas: $H_2$, constant pressure, 2.5 psi (17.23 KPa).
Oven program: 40ºC(10min) @ 5ºC/min to 130ºC
Detector: FID, 280ºC

Peak Name

1- Methanol
2- Ethanol
3- Pinacolone
4- Methyl Pivalate
5- Ethyl Pivalate



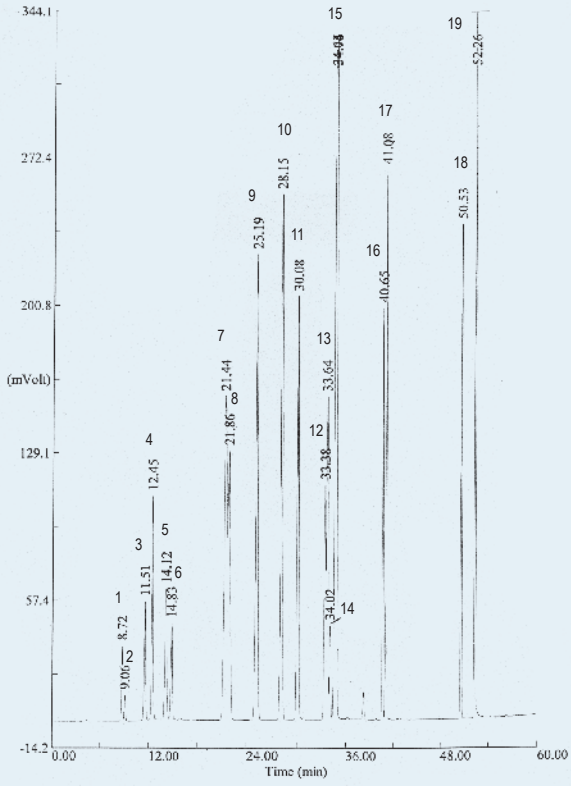

TKG 1085

## ANALYSIS OF SOLVENTS

Column: **TRB-WAX**, P/N TR-142065
Dimensions: 60m x 0.53mm x 2.0 µm
Injection: wet needle, split, 250ºC
Carrier gas: $H_2$, constant pressure 4 psi (27.6 KPa).
Oven program: 55ºC(20min) @ 3ºC/min to 220ºC(15min)
Detector: FID, 260ºC

Peak Name

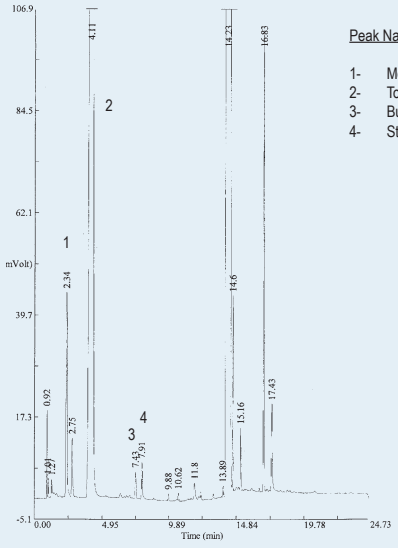
1- Acetone
2- Methyl acetate
3- Ethyl acetate
4- Methanol + MEK
5- Isopropanol
6- Ethanol
7- MIKB
8- Methoxypropyl acetate
9- Isobutyl acetate
10- Toluene
11- Methoxypropanol
12- n-butyl acetate
13- Isobutanol
14- n-butanol
15- p,m-xylenes
16- o-xylene
17- Ethylglycol
18- Diacetone alcohol
19- Butyl glycol




TKG 1003

## SEPARATION OF MONOMERS IN PAINTS

Column: **Meta .WAX**, P/N TR-811035
Dimensions: 30m x 0.53mm x 1.0 µm
Injection: 1 µL Monomers mixture (20ppm, 100ppm toluene in DMSO), split 1:50, 240ºC
Carrier gas: He, 4 psi (27.6 KPa)
Oven temperature: 40ºC(5min) @ 15ºC/min to 180ºC(15min)
Detector: FID, 240ºC




Peak Name

1- Methyl acrylate
2- Toluene
3- Butyl acrylate
4- Styrene

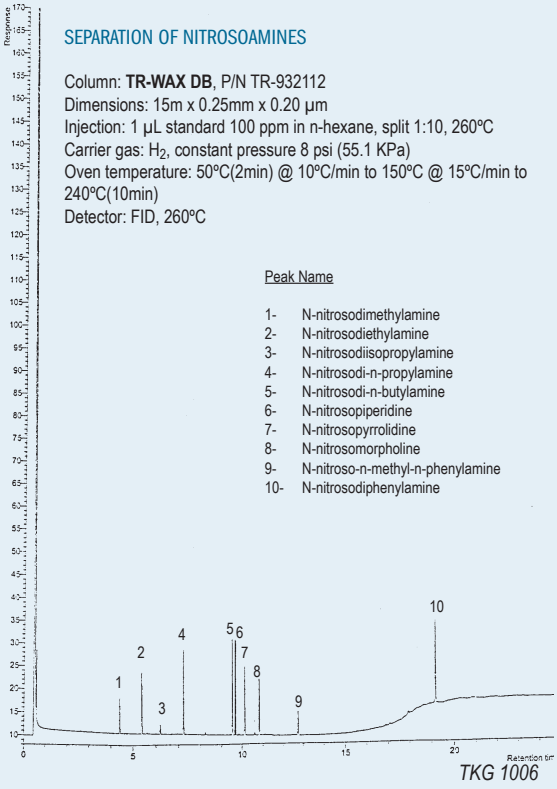
TKG 1005

## SEPARATION OF NITROSOAMINES

Column: **TR-WAX DB**, P/N TR-932112
Dimensions: 15m x 0.25mm x 0.20 µm
Injection: 1 µL standard 100 ppm in n-hexane, split 1:10, 260ºC
Carrier gas: $H_2$, constant pressure 8 psi (55.1 KPa)
Oven temperature: 50ºC(2min) @ 10ºC/min to 150ºC @ 15ºC/min to 240ºC(10min)
Detector: FID, 260ºC

Peak Name

1- N-nitrosodimethylamine
2- N-nitrosodiethylamine
3- N-nitrosodiisopropylamine
4- N-nitrosodi-n-propylamine
5- N-nitrosodi-n-butylamine
6- N-nitrosopiperidine
7- N-nitrosopyrrolidine
8- N-nitrosomorpholine
9- N-nitroso-n-methyl-n-phenylamine
10- N-nitrosodiphenylamine



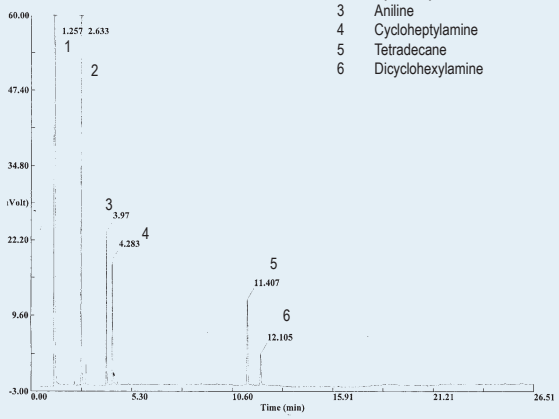

TKG 1006

## SODIUM CYCLAMATE IMPURITIES

Column: **TRB-5A**, P/N TR-210533
Dimensions: 30m x 0.32mm x 0.5 µm
Injection: 1 µL (50-500 ppm), split 1:15, 280ºC
Carrier gas: He, constant pressure 17 psi (117.1 KPa)
Oven program: 85ºC (1 min)@ 8ºC/min to 150ºC(10min) @ 30ºC/min to 220ºC(5min)
Detector: FID, 280ºC

Peak Name

1 Methylene chloride
2 Cyclohexylamine
3 Aniline
4 Cycloheptylamine
5 Tetradecane
6 Dicyclohexylamine



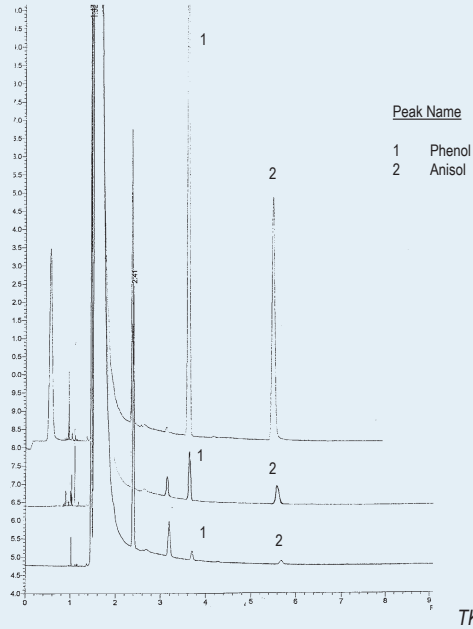

TKG 1007

## PHENOL IN RESINS

Column: **TRB-624**, P/N TR-603035
Dimensions: 30m x 0.53mm x 3.0 µm
Injection: 1 µl (0,5,5 and 50ppm), split 1:5, 260ºC
Carrier gas: He, constant pressure 5 psi (34.5 KPa).
Oven temperature: 150ºC (isothermal)
Detector: FID, 280ºC

Peak Name

1 Phenol
2 Anisol



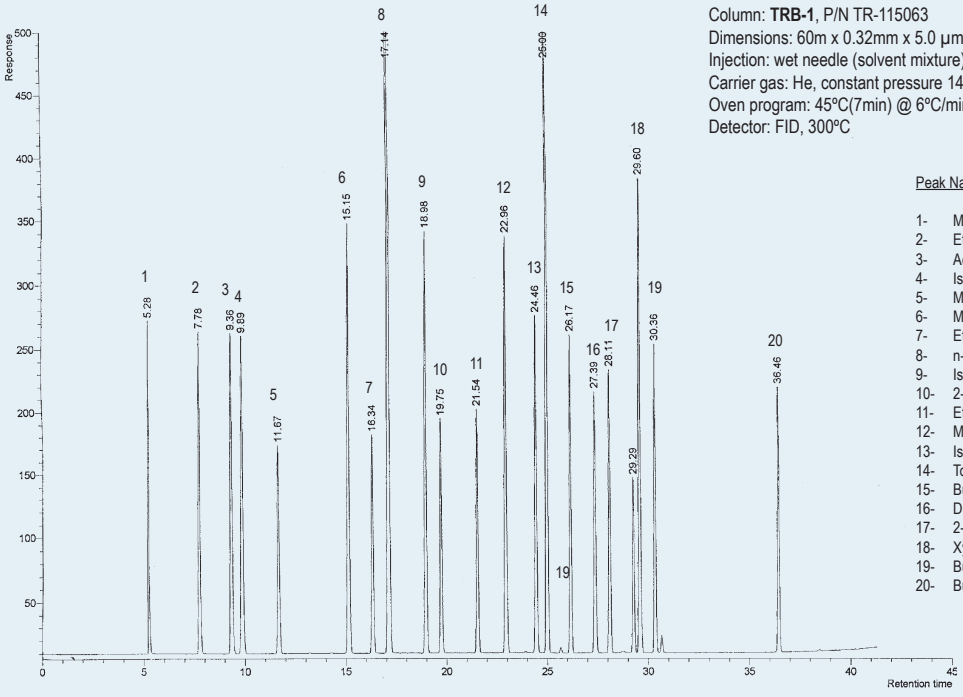
TKG 1008

## SEPARATION OF SOLVENTS

Column: **TRB-1**, P/N TR-115063
Dimensions: 60m x 0.32mm x 5.0 µm
Injection: wet needle (solvent mixture), split 1:100, 280ºC
Carrier gas: He, constant pressure 14 psi (96.5 KPa).
Oven program: 45ºC(7min) @ 6ºC/min to 260ºC(5min)
Detector: FID, 300ºC

Peak Name

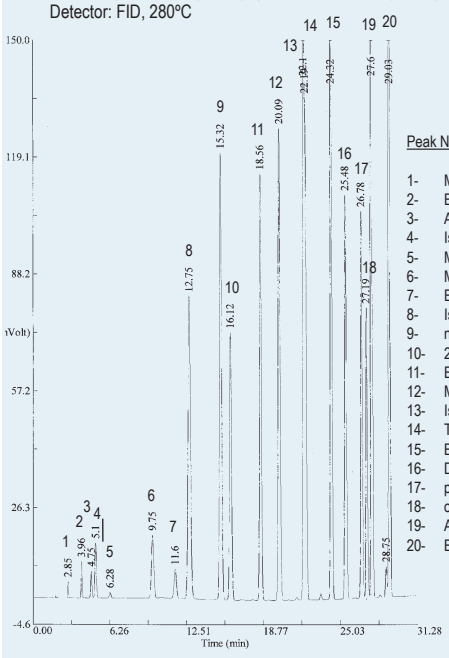
1- Methanol
2- Ethanol
3- Acetone
4- Isopropanol
5- Methyl acetate
6- Methylethyl ketone
7- Ethyl acetate
8- n-Butanol
9- Isobutanol
10- 2-Methoxypropanol
11- Ethyleneglycol
12- Methyl isobutyl ketone
13- Isobutyl acetate
14- Toluene
15- Butyl acetate
16- Dicetone alcohol
17- 2-Methoxypropanol acetate
18- Xylene
19- Butyl glycol
20- Butyl glycol acetate




TKG 1009

## SEPARATION OF SOLVENTS

Column: **TRB-1**, P/N TR-115065
Dimensions: 60m x 0.53mm x 5.0 µm
Injection: 0,1 µl solvent mix, split, 250ºC
Carrier gas: $H_2$, constant pressure 6.5 psi (45 KPa).
Oven program: 40ºC (10min) @ 5ºC/min to 200ºC(15min)
Detector: FID, 280ºC



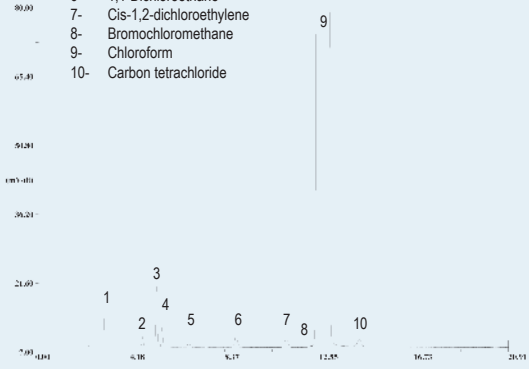

Peak Name

1- Methanol
2- Ethanol
3- Acetone
4- Isopropanol
5- Methyl acetate
6- Methylethyl ketone
7- Ethyl acetate
8- Isobutanol
9- n-Butanol
10- 2-Methoxypropanol
11- Ethyl glycol
12- Methyl isobutyl ketone
13- Isobutyl acetate
14- Toluene
15- Buthyl acetate
16- Diacetone alcohol
17- p,m-Xylenes
18- o-Xylene
19- AMP
20- Butyl glycol

*TKG 1010*

## CHLOROFORM IMPURITIES

Column: **TRB-624**, P/N TR-603035
Dimensions: 30m x 0.53mm x 3.0 µm
Injection: 1 µl split 1:6, 260ºC,
Liner: single tape with wool
Carrier Gas: He, 3psi (20.7 KPa), 21.9cm/s (40ºC)
Program temperature: 40ºC
Detector: FID, 200ºC



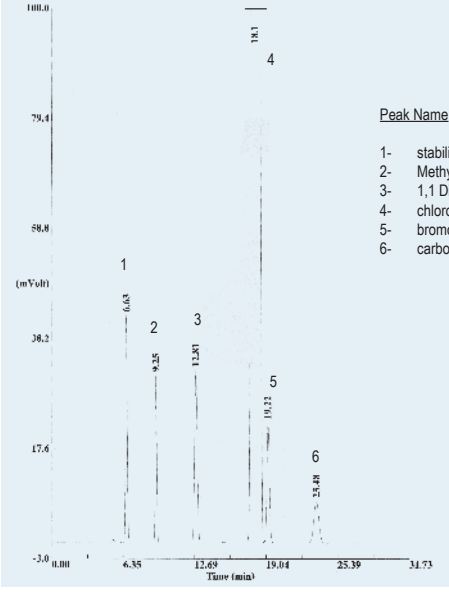
Peak Name

1- Methyl chloride
2- ?
3- Amylene
4- 1,1-Dichloroethylene
5- Methylene chloride
6- 1,1-Dichloroethane
7- Cis-1,2-dichloroethylene
8- Bromochloromethane
9- Chloroform
10- Carbon tetrachloride

*TKG 1012*

## CHLOROFORM IMPORITIES

Column: **Meta.VOC**, P/N TR-943035
Dimensions: 30m x 0.53mm x 3.0 µm
Injection: 1 µl chloroform , split, 5:1, 150ºC
Carrier gas: He, constant pressure 2 psi (13.8 KPa), 19.53 cm/s (30ºC)
Oven program: 30ºC (isothermal)
Detector: FID, 200ºC




Peak Name

1- stabilizer
2- Methylene chloride
3- 1,1 Dicholoroethane
4- chloroform
5- bromochloromethane
6- carbon tetrachloride

*TKG 1013*

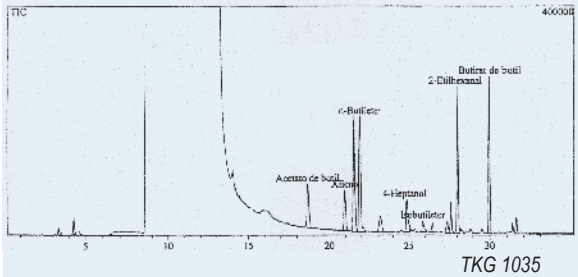
## IMPURITIES OF n-BUTANOL

Column: **TRB-5**, P/N TR-120232
Dimensions: 30m x 0.25mm x 0.25 µm
Injection: 1 µL n-Butanol, split 1:20, 250ºC
Carrier gas: He, constant flow 1 mL/min
Oven temperature: 40ºC @ (5min) @ 4ºC/min to 200ºC
@ 15ºC/min to 300ºC
Detector: MS, 280ºC (interphase)

*Chromatogram provided by F. Sisteré from IUCT*

Peak Name

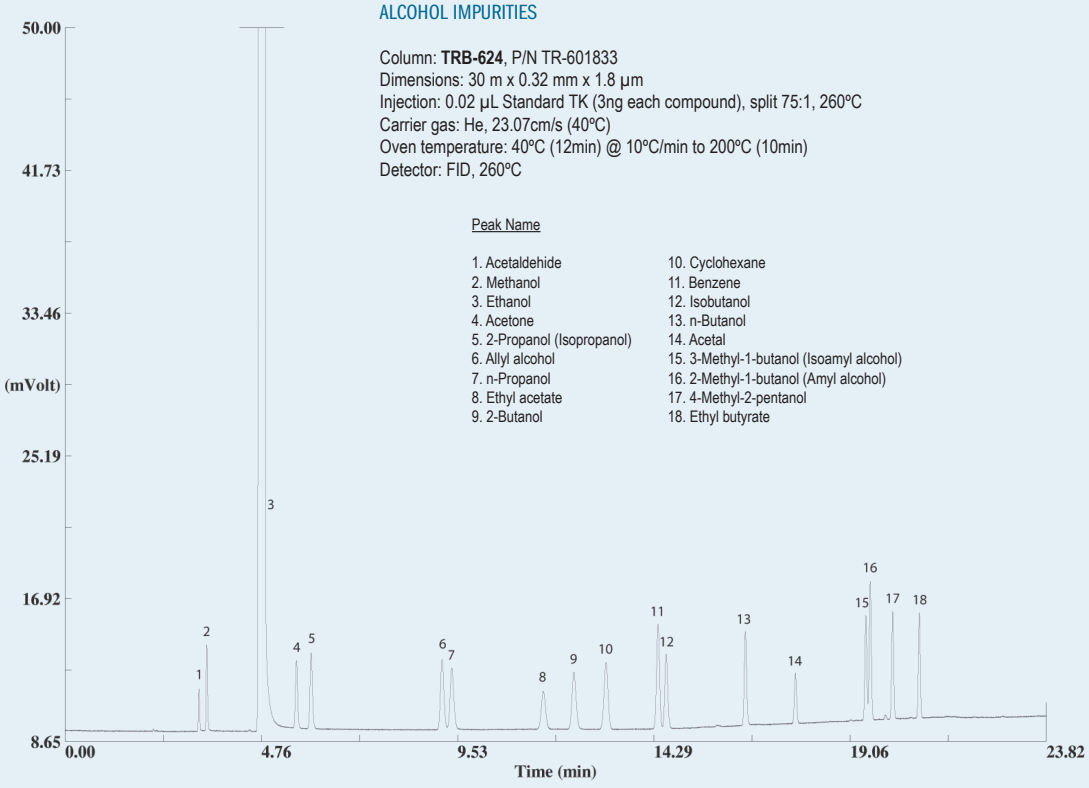
1- Butyl acetate
2- Xylene
3- n-Butylether
4- 4-Heptanol
5- Isobutylether
6- 2-Ethylhexanal
7- Butyl butyrate




*TKG 1035*

## ALCOHOL IMPURITIES

Column: **TRB-624**, P/N TR-601833
Dimensions: 30 m x 0.32 mm x 1.8 µm
Injection: 0.02 µL Standard TK (3ng each compound), split 75:1, 260ºC
Carrier gas: He, 23.07cm/s (40ºC)
Oven temperature: 40ºC (12min) @ 10ºC/min to 200ºC (10min)
Detector: FID, 260ºC



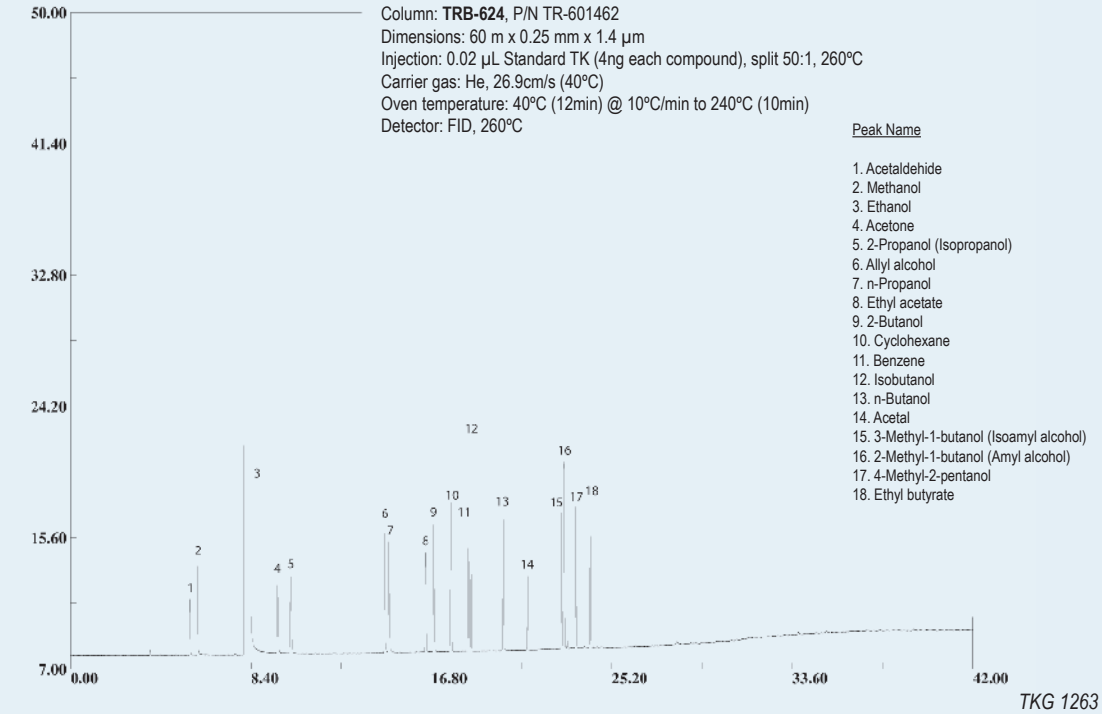

Peak Name

1. Acetaldehide
2. Methanol
3. Ethanol
4. Acetone
5. 2-Propanol (Isopropanol)
6. Allyl alcohol
7. n-Propanol
8. Ethyl acetate
9. 2-Butanol
10. Cyclohexane
11. Benzene
12. Isobutanol
13. n-Butanol
14. Acetal
15. 3-Methyl-1-butanol (Isoamyl alcohol)
16. 2-Methyl-1-butanol (Amyl alcohol)
17. 4-Methyl-2-pentanol
18. Ethyl butyrate

*TKG 1037*

## ALCOHOL IMPURITIES

Column: **TRB-624**, P/N TR-601462
Dimensions: 60 m x 0.25 mm x 1.4 µm
Injection: 0.02 µL Standard TK (4ng each compound), split 50:1, 260ºC
Carrier gas: He, 26.9cm/s (40ºC)
Oven temperature: 40ºC (12min) @ 10ºC/min to 240ºC (10min)
Detector: FID, 260ºC



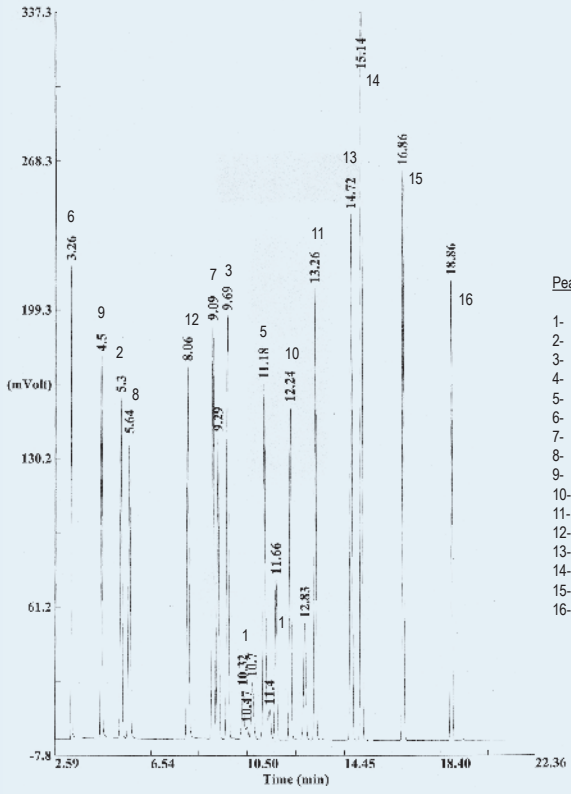

Peak Name

1. Acetaldehide
2. Methanol
3. Ethanol
4. Acetone
5. 2-Propanol (Isopropanol)
6. Allyl alcohol
7. n-Propanol
8. Ethyl acetate
9. 2-Butanol
10. Cyclohexane
11. Benzene
12. Isobutanol
13. n-Butanol
14. Acetal
15. 3-Methyl-1-butanol (Isoamyl alcohol)
16. 2-Methyl-1-butanol (Amyl alcohol)
17. 4-Methyl-2-pentanol
18. Ethyl butyrate

*TKG 1263*

## SEPARATION OF SOLVENTS

Column: **TRB-624**, P/N TR-603075
Dimensions: 75m x 0.53mm x 3.0 µm
Injection: 0.2 µL, split 1:5, 260ºC
Carrier gas: $H_2$, constant pressure 7.8 psi (53.74 KPa).
Oven temperature: 40ºC(5min) @ 7ºC/min to 240ºC
Detector: FID, 280ºC




Peak Name

1- Heptane
2- Acetone
3- Tetrahydrofurane
4- Ethyl acetate
5- Isopropyl acetate
6- Methanol
7- MEK
8- Isopropanol
9- Ethanol
10- n-Propyl acetate
11- MIBK
12- n-Propanol
13- Toluene
14- Butyl acetate
15- Methoxypropanol
16- Methoxypropyl acetate

*TKG 1042*

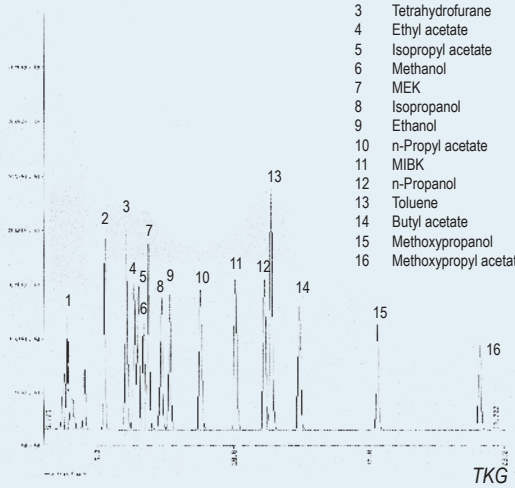
## SEPARATION OF SOLVENTS

Column: **TRB-WAX,** P/N TR-141253
Dimensions: 50m x 0.32mm x 1.2 µm
Injection: 1 µL standard (500 ng/mL comp.), split 1:25, 260ºC
Carrier gas: He, constant pressure 12 psi (82.7 Kpa)
Oven temperature: 65ºC(7min) @ 4ºC/min to 117ºC
Detector: FID, 260ºC

*Chromatogram provided by*
*Jaume Piedrabuena from Danisco*

Peak Name

1 Heptane (isomers mixture)
2 Acetone
3 Tetrahydrofurane
4 Ethyl acetate
5 Isopropyl acetate
6 Methanol
7 MEK
8 Isopropanol
9 Ethanol
10 n-Propyl acetate
11 MIBK
12 n-Propanol
13 Toluene
14 Butyl acetate
15 Methoxypropanol
16 Methoxypropyl acetate



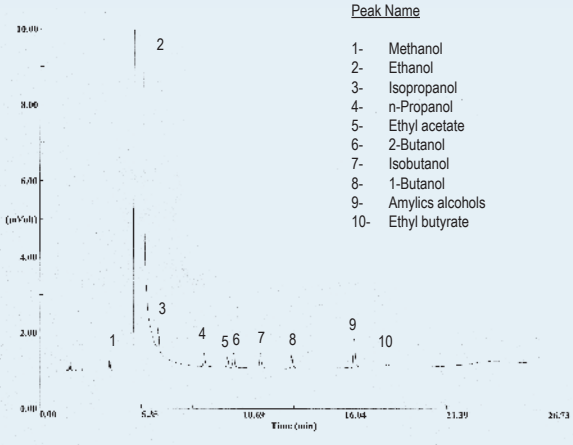
*TKG 1052*

## IMPURITIES OF ETHANOL

Column: **TRB-G43**, P/N TR-163035
Dimensions: 30m x 0.53mm x 3.0 µm
Injection: 1 µL standard alcohols (20 ppm/comp), split 1:5, 200ºC
Carrier gas: He, constant pressure 2.6 psi (17.9 KPa).
Oven temperature: 42ºC(4min) @ 5ºC/min to 140ºC(4min)
Detector: FID, 200ºC

Peak Name

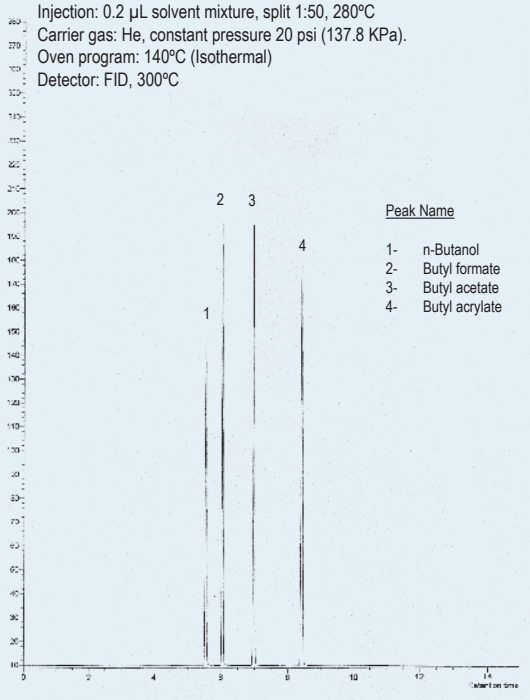
1- Methanol
2- Ethanol
3- Isopropanol
4- n-Propanol
5- Ethyl acetate
6- 2-Butanol
7- Isobutanol
8- 1-Butanol
9- Amylics alcohols
10- Ethyl butyrate



*TKG 1054*

## SEPARATION IMPURITIES OF BUTYL ACRYLATE

Column: **TRB-1**, P/N TR-111052
Dimensions: 50m x 0.25mm x 1.0 µm
Injection: 0.2 µL solvent mixture, split 1:50, 280ºC
Carrier gas: He, constant pressure 20 psi (137.8 KPa).
Oven program: 140ºC (Isothermal)
Detector: FID, 300ºC




Peak Name

1- n-Butanol
2- Butyl formate
3- Butyl acetate
4- Butyl acrylate

*TKG 1056*

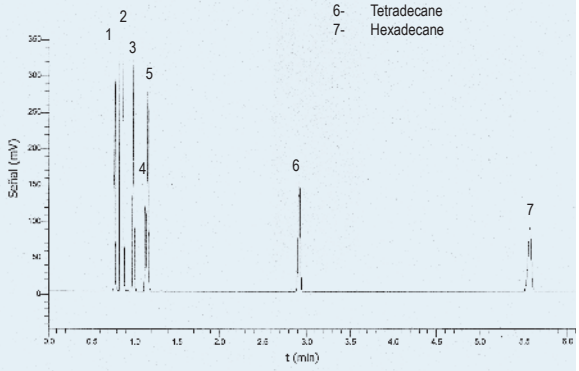
## SEPARATION OF HYDROCARBONS (FAST CHROMATOGRAPHY)

Column: **TRB-1**, P/N TR-110441
Dimensions: 10m x 0.10mm x 0.40 µm
Injection: 0.5 µL standard Hydrocarbons
(0.95%/comp. in 2,2,4-Trimethylpentane), split 1:200, 200ºC
Carrier gas: He, constant pressure 40 psi (275.6KPa).
Oven temperature: 190ºC (Isothermal)
Detector: FID, 200ºC

*Chromatogram provided by J.I. Gómez Cívicos, MªA. Uguina Zamorano and J.L. Sotelo Sancho from Universidad Complutense de Madrid*

Peak Name

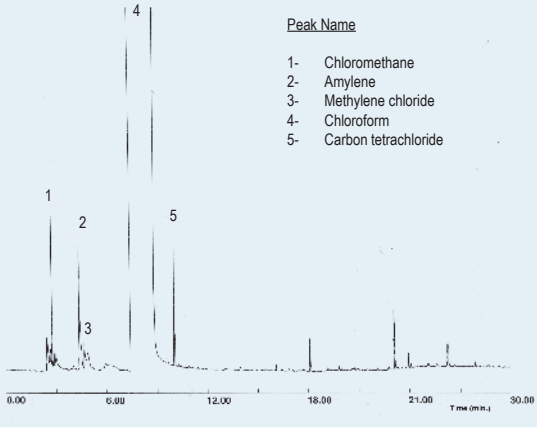
1- n-Pentane
2- 2,2,4-Trimethylpentane
3- Ethylbenzene
4- 1,3,5-Trimethylbenzene
5- Decane
6- Tetradecane
7- Hexadecane




*TKG 1057*

## CHLOROFORM PURITY

Column: **TRB-5**, P/N TR-121063
Dimensions: 60m x 0.32mm x 1.0 µm
Injection: 250ºC, 2 µL (split 20:1)
Carrier gas: $H_2$, 11 psi (75,8 kPa).
Oven temperature: 40ºC (8 min)to 200ºC(5min) @ 10ºC/min
Detector: FID, 250ºC




Peak Name

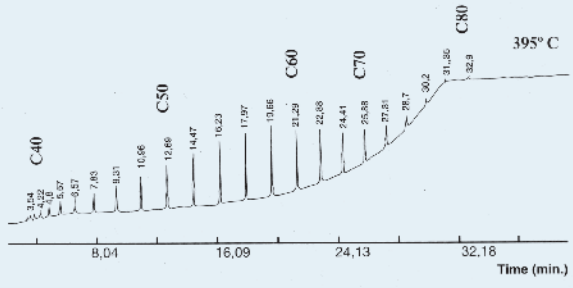
1- Chloromethane
2- Amylene
3- Methylene chloride
4- Chloroform
5- Carbon tetrachloride

*TKG 1062*

## POLYWAX 655

Column: **TRB-5ht**, P/N TR-620112
Dimensions: 15m x 0.32mm x 0.1 µm
Injection: 0, 2 µL (split) 2% Polywax 655 in Carbon sulfide
Oven program: 70ºC to 250ºC @ 70ºC/min. to 395ºC(10min)
@ 5ºC/min.
Detector: FID, 410ºC

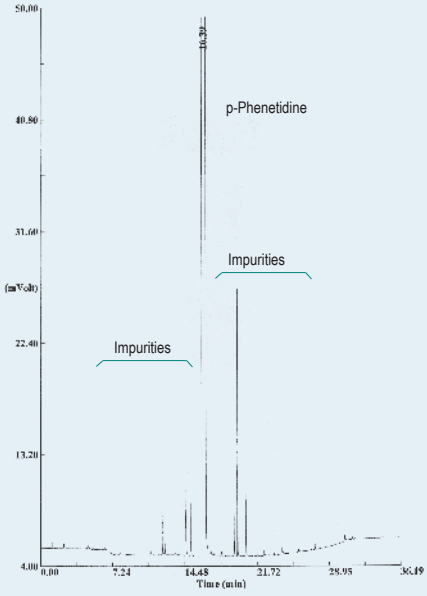
(base line without compensation)




*TKG 1065*

## IMPURITIES OF p-PHENETIDINE

Column: **TRB-5A**, P/N TR-210532
Dimensions: 30m x 0.32mm x 0.50 µm
Injection: p-Phenetidine wet needle, split 1:50, 260ºC
Carrier gas: $H_2$, 11 psi (69 KPa)
Oven temperature: 80ºC(5min) @ 7ºC/min to 260ºC (6min)
Detector: FID, 300ºC

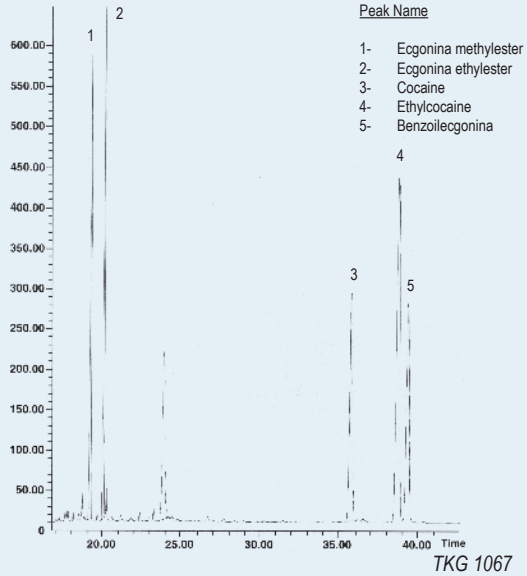



TKG 1090

## DRUGS IN URINE

Column: **TRB-5ms**, P/N TR-520129
Dimensions:25m x 0.20mm x 0.11 µm
Injection: 250ºC, 1 µl splitless (BSTFA Derivatives in ACN)
Carrier gas: He, 15 psi (103.3 kPa)
Oven temperature: 60ºC (1´) to 180ºC (1´) @ 10ºC/min. to 220ºC @ 10ºC/min.
Detector: FID,280ºC

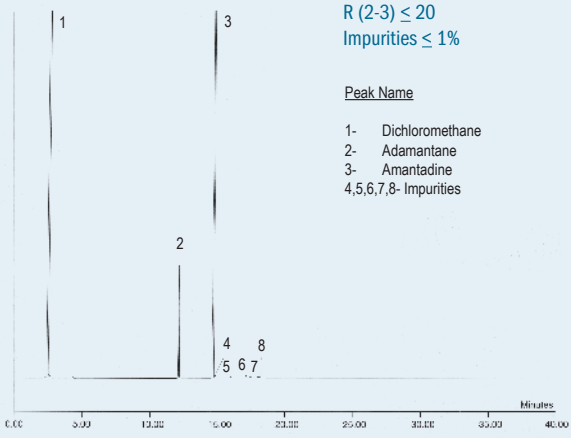
*Chromatogram provided by Jordi To, Hospital Clínico from Barcelona.*




TKG 1067

## AMANTADINE HYDROCHLORIDE IMPURITIES

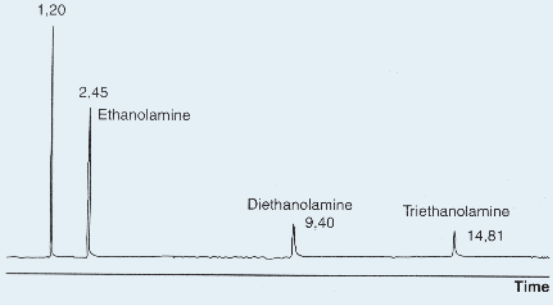
Column: **TRB-5 AMINE**, P/N TR-211035
Dimensions: 30m x 0.53mm x 1.0m
Injection: 2 µl (split 1:50), 220ºC
Carrier gas: He, 4.2 psi (28.9 kPa)
Oven temperature: 70ºC (5´) to 250ºC (20min) @ 10ºC/min.
Detector: FID, 300ºC
Sample: Test soslution according to USP 25




TKG 1074

## ETHANOLAMINES SEPARATION (25 ng/peak level)

Column: **TRB-5 AMINE**, P/N TR-210533
Dimensions: 30m x 0.32mm x 0.50 µm
Injection: 2 µl (split 1:50), 280ºC
Carrier gas: $H_2$, 7 psi (48.2 kPa)
Oven temperature: 50ºC (2´) to 200ºC @ 10ºC/min.
Detector: FID, 300ºC
Sample: Ethanolamines solution in methanol (1,25 mg/ml)

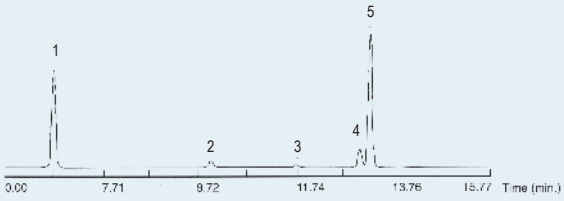



TKG 1075

## USP SOLVENTS <USP> COLUMN TRB-G27+GUARDCOLUMN 5M

Column**: TRB-G27,** P/N-175035
Dimensions: 30m x 0.53mm x 5.0 µm
Oven temp.: 35ºC(5´) to 175ºC@ 8ºC/min. to 260ºC (16´)@35ºC/min.
Carrier gas: He, 4.5 psi (31 KPa), 35 cms. to 35ºC
Injector temp: 70ºC
FID temp: 260ºC
Injection: Direct injection of 1 µl (Unililner), standard disolution in distilled water (1:10)

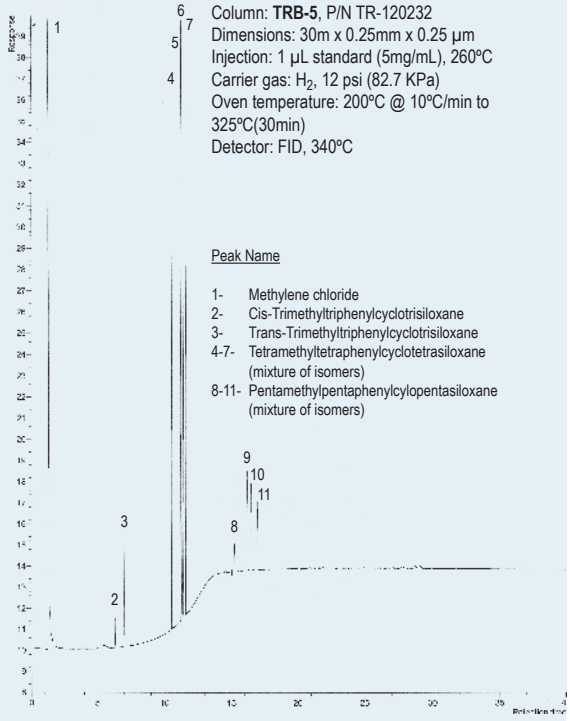
| | Standard | Concentration |
|---|---|---|
| 1- | Methylene chloride | 600ppm |
| 2- | Chloroform | 60ppm |
| 3- | Benzene | 2ppm |
| 4- | Trichloroethylene | 80ppm |
| 5- | 1,4 - Dioxan | 380ppm |




*TKG 1076*

## ANALYSIS OF CYCLOSILOXANES

Column: **TRB-5**, P/N TR-120232
Dimensions: 30m x 0.25mm x 0.25 µm
Injection: 1 µL standard (5mg/mL), 260ºC
Carrier gas: $H_2$, 12 psi (82.7 KPa)
Oven temperature: 200ºC @ 10ºC/min to 325ºC(30min)
Detector: FID, 340ºC



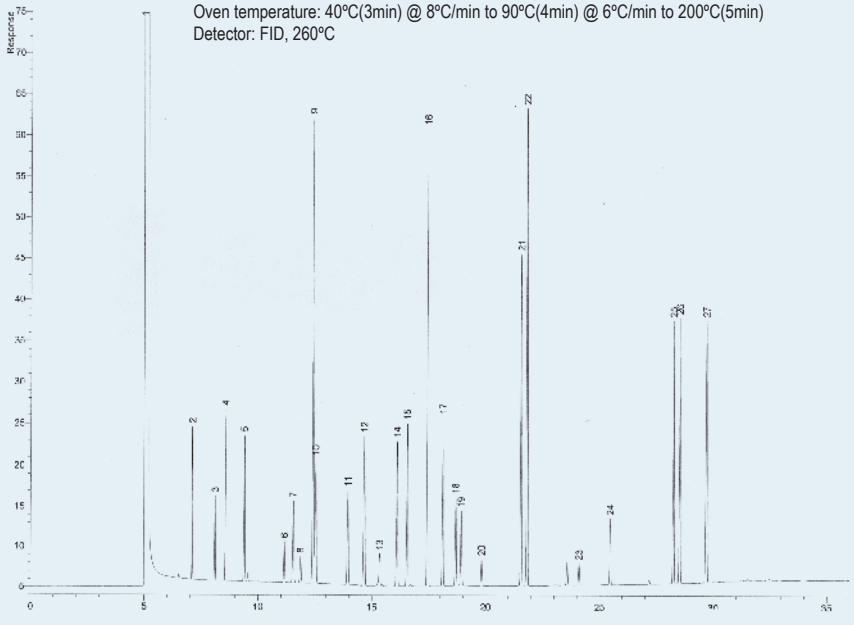

Peak Name

1- Methylene chloride
2- Cis-Trimethyltriphenylcyclotrisiloxane
3- Trans-Trimethyltriphenylcyclotrisiloxane
4-7- Tetramethyltetraphenylcyclotetrasiloxane (mixture of isomers)
8-11- Pentamethylpentaphenylcylopentasiloxane (mixture of isomers)

*TKG 1094*

## EPA 601/602 PURGEABLE HALOCARBONS MIX PLUS 2-CHLOROETHYL VINYL ETHER

Column: **TRB-624**, P/N TR-601462
Dimensions: 60m x 0.25mm x 1.4 µm
Injection: 0.5 µL EPA 601/602 Purgeable Halocarbons Mix (2000 ng/mL), split 1:50, 260ºC
Carrier gas: He 30cm/s, constant pressure 35 psi (241.15 KPa)
Oven temperature: 40ºC(3min) @ 8ºC/min to 90ºC(4min) @ 6ºC/min to 200ºC(5min)
Detector: FID, 260ºC




Peak Name

1- Methanol
2- 1,1-Dichloroethylene
3- Methylene chloride
4- trans-1,2-Dichloroethylene
5- 1,1-Dichloroethane
6- Chloroform
7- 1,1,1-Trichloroethane
8- Carbon Tetrachloride
9- Benzene
10- 1,2-Dichloroethane
11- Trichloroethylene
12- 1,2-Dichloropropane
13- Bromodichloromethane
14- 2-Chloroethyl vinyl ether
15- cis-1,3-Dichloropropene
16- Toluene
17- trans-1,3-Dichloropropene
18- 1,1,2-Trichloroethane
19- Tetrachloroethylene
20- Dibromochloromethane
21- Chlorobenzene
22- Ethylbenzene
23- Bromoform
24- 1,1,2,2-Tetrachloroethane
25- 1,3-Dichlorobenzene
26- 1,4-Dichlorobenzene
27- 1,2-Dichlorobenzene

*TKG 1093*

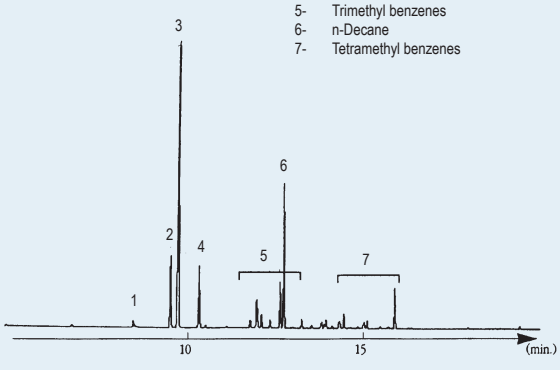
## SOLVENTS IN WATER

Column: **TRB-5**, P/N TR-120232
Dimensions: 30m x 0.25mm x 0.25 m
Injection: 1 µL, split
Carrier gas: He
Oven temperature:
Detector: FID

*Chromatogram provided by J. Teixidor and E. Bosch from Laboratory Dr. Riera*

Peak Name

1- Butyl acetate
2- Ethyl benzene
3- m,p-Xylene
4- o-Xylene
5- Trimethyl benzenes
6- n-Decane
7- Tetramethyl benzenes



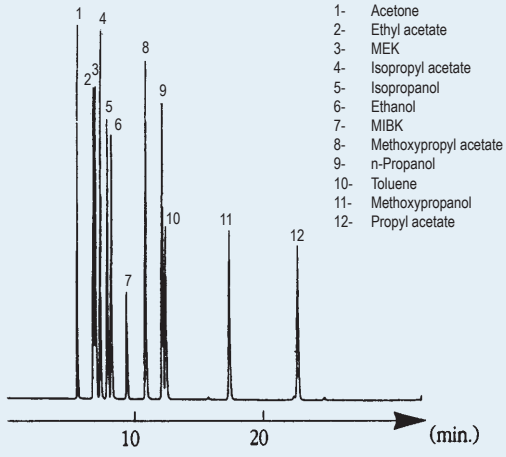

*TKG 1160*

## INDUSTRIAL SOLVENTS

Column: **TR-WAX**, P/N TR-141253
Dimensions: 50m x 0.32mm x 1.2 µm
Injection: 0.1 µL, split
Carrier gas: $H_2$, 16 psi (110.24 KPa)
Oven temperature: 60ºC @ 2ºC/min to 125ºC
Detector: FID, 250ºC

Peak Name

1- Acetone
2- Ethyl acetate
3- MEK
4- Isopropyl acetate
5- Isopropanol
6- Ethanol
7- MIBK
8- Methoxypropyl acetate
9- n-Propanol
10- Toluene
11- Methoxypropanol
12- Propyl acetate



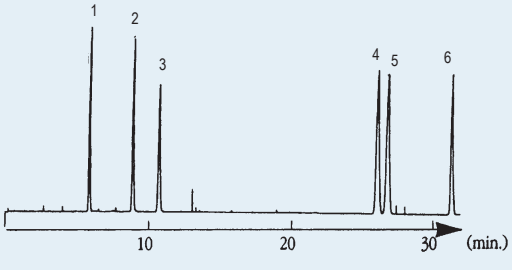

*TKG 1161*

## INDUSTRIAL SOLVENTS

Column: **TR-WAX**, P/N TR-141233
Dimensions: 30m x 0.32mm x 1.2 µm
Injection: 0.1 µL, split
Carrier gas: He, 12 psi (82.7 KPa)
Oven temperature: 40ºC @ 1ºC/min to 70ºC @ 7.5ºC/min to 125ºC
Detector: FID, 250ºC

Peak Name

1- Acetone
2- Methanol
3- Ethanol
4- p-Xylene
5- m-Xylene
6- o-Xylene



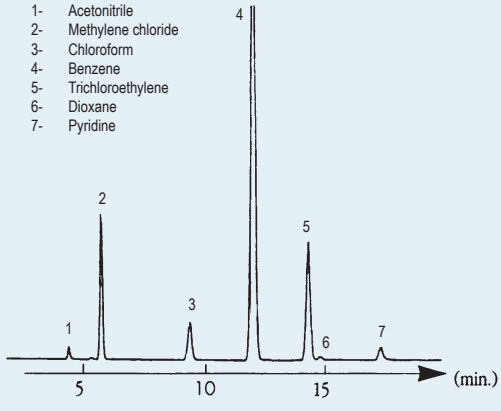

*TKG 1162*

## INDUSTRIAL SOLVENTS IN RAW MATERIALS

Column: **TRB-5,** P/N TR-125035
Dimensions: 30m x 0.53mm x 5.0 µm
Injection: 1 µL, head space
Carrier gas: N2, 5 mL/min
Oven temperature: 40ºC(5min) @ 3ºC/min to 110ºC
Detector: FID

Peak Name

1- Acetonitrile
2- Methylene chloride
3- Chloroform
4- Benzene
5- Trichloroethylene
6- Dioxane
7- Pyridine




*TKG 1163*

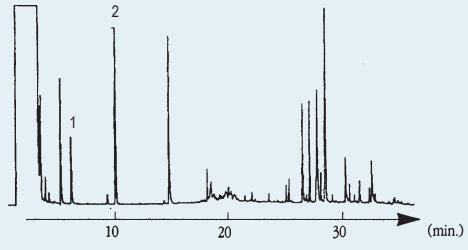
## IMPURYTIES IN RAW MATERIALS
### Analysis of Monochloroacetic acid

Column: **TRB-5**, P/N TR-120233
Dimensions: 30m x 0.32mm x 0.25 µm
Injection: splitless 1 min, 260ºC
Carrier gas: He, 8 psi
Oven temperature: 30ºC(12min) @ 10ºC/min to 250ºC
Detector: FID, 260ºC

*Chromatogram provided by A. Tintó from MOEHS, S.A., Barcelona.*

Peak Name

1- Methyl chloroacetate
2- Internal Standard




*TKG 1164*

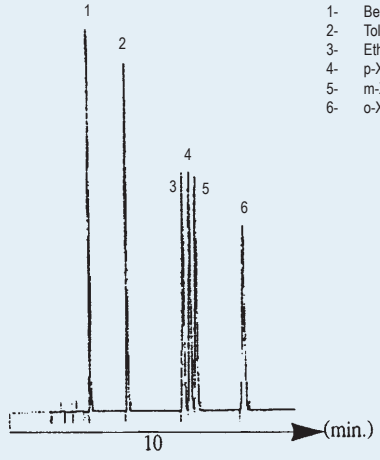
## AROMATIC SOLVENTS

Column: **TRB-WAX**, P/N TR-141233
Dimensions: 30m x 0.32mm x 1.2 µm
Injection: split
Carrier gas: He, 10 psi (68.9 KPa)
Oven temperature: 80ºC (Isothermal)
Detector: FID, 250ºC

*Chromatogram provided by E. Cura from SGS, S.A., Barcelona.*

Peak Name

1- Benzene
2- Toluene
3- Ethyl benzene
4- p-Xylene
5- m-Xylene
6- o-Xylene




*TKG 1165*

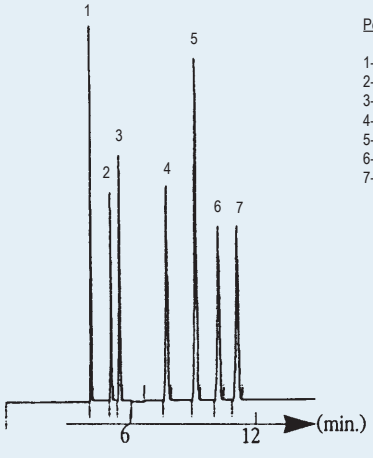
## MIXTURE OF SOLVENTS

Column: **TRB-WAX**, P/N TR-141233
Dimensions: 30m x 0.32mm x 1.2 µm
Injection: split
Carrier gas: He, 10 psi (68.9 KPa)
Oven temperature: 75ºC (Isothermal)
Detector: FID, 250ºC

*Chromatogram provided by E. Cura from SGS, S.A., Barcelona.*

Peak Name

1- Acetone
2- Methanol
3- Isopropanol
4- MIBK
5- Toluene
6- Butyl acetate
7- Isobutanol



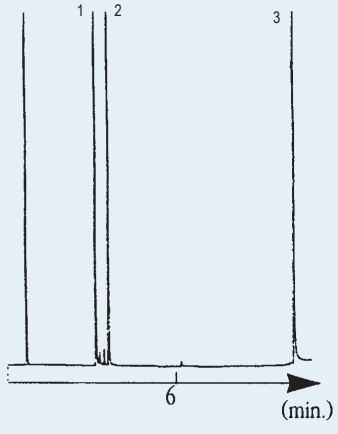

*TKG 1166*

## GLYCOLS IN WATER

Column: **TRB-FFAP**, P/N TR-150535
Dimensions: 30m x 0.53mm x 0.5 µm
Injection: 1 µL, split
Carrier gas: $H_2$, 2 psi (13.8 KPa)
Oven temperature: 100ºC @ 10ºC/min to 220ºC
Detector: FID

Peak Name

1- Butanediol
2- Propylene glycol
3- Glycerine



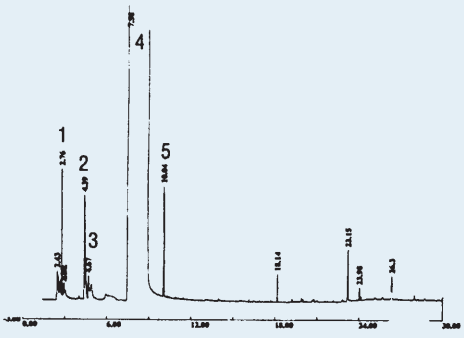

*TKG 1167*

## PURITY OF CHLOROFORM

Column: **TRB-5**, P/N TR-121063
Dimensions: 60m x 0.32mm x 1.0 µm
Injection: 2 µL, split, 260ºC
Carrier gas: $H_2$, 11 psi (75.8 KPa)
Oven temperature: 40ºC(8min) @ 10ºC/min to 200ºC(5min)
Detector: FID, 260ºC

Peak Name

1- Methyl chloroform
2- Amylene
3- Methylene chloride
4- Chloroform
5- Carbon tetrachloride



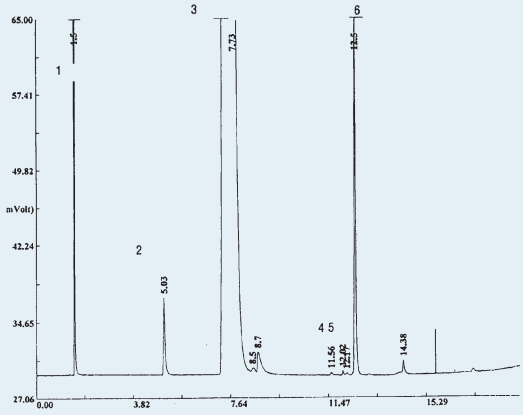

TKG 1168

## IMPURITIES OF DIMETHYLACETAMIDE

Column: **TRB-WAX**, P/N TR-140232
Dimensions: 30m x 0.25mm x 0.25 µm
Injection: 0.3 µL, split, 260ºC
Carrier gas: $H_2$, 11 psi (78.8 KPa)
Oven temperature: 75ºC(7min) @ 10ºC/min to 200ºC
Detector: FID, 280ºC

Peak Name

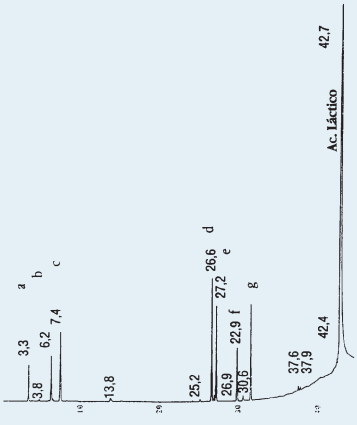
1- Methanol
2- Dimethylformamide
3- Dimethylacetamide
4- Propylene glycol
5- Ethylene glycol
6- Monomethyl acetamide




TKG 1169

## IMPURITIES OF LACTIC ACID

Column: **TRB-FFAP**, P/N TR-151035
Dimensions: 30m x 0.53mm x 1.0 µm
Injection: 0.5 µL, split, 260ºC
Carrier gas: $H_2$, 3 psi (20.7 KPa)
Oven temperature: 45ºC(15min) @ 8ºC/min to 240ºC(15min)
Detector: FID, 280ºC



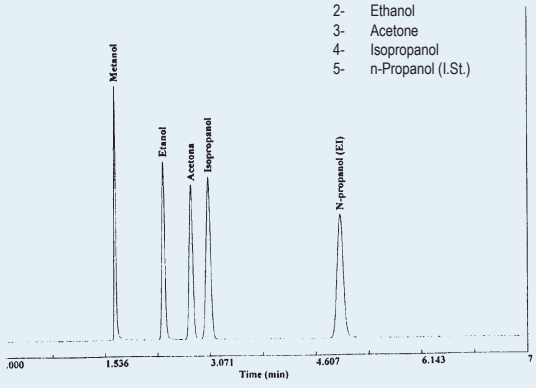

TKG 1170

## ALCOHOLS IN BLOOD

Column: **TRB-G43**, P/N TR-163035
Dimensions: 30m x 0.53mm x 3.0 µm
Injection: 1 µL, split, alcohols standard
Carrier gas: $H_2$, 4 psi (27.6 KPa)
Oven temperature: 35ºC (isothermal)
Detector: FID, 250ºC

Peak Name

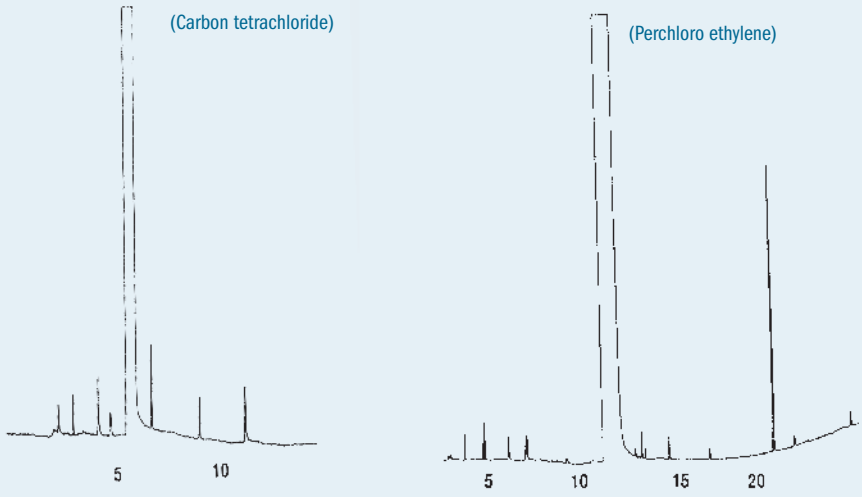
1- Methanol
2- Ethanol
3- Acetone
4- Isopropanol
5- n-Propanol (I.St.)




TKG 1172

## IMPURITIES IN SOLVENTS

Column: **TRB-1**, P/N TR-110352
Dimensions: 50m x 0.25mm x 0.33 µm
Injection: 1 µL, split, neat solvent
Carrier gas: $H_2$, 19 psi (130.9 KPa)
Oven temperature: 35ºC(5min) @ 6ºC/min to 150ºC(5min)
Detector: FID, 275ºC



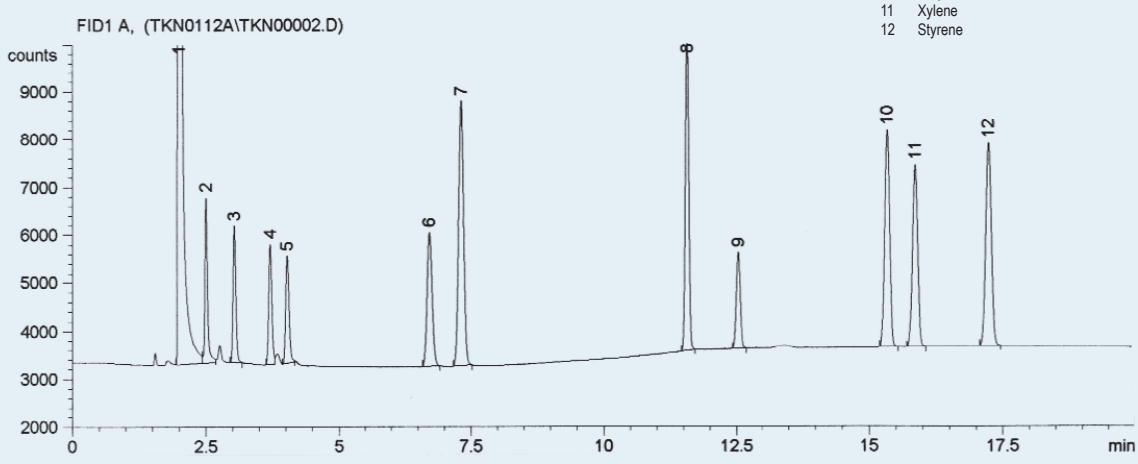

*TKG 1171*

## POLLUTANTS IN BLOOD

Column: **MetaBLOOD 1**, P/N TR-853035
Dimensions: 30m x 0.53mm x 3.0µm
Injection: 1 mL Head Space 2t (vial 70ºC), alcohols and aromatics in blood (2-20 ppm), split 1:30, 225ºC
Carrier gas: He, 5 psi
Oven temperature: 45ºC(7 min) @ 10ºC/min to 90ºC(10min)
Detector: FID, 300ºC

*Chromatogram provided by Dra. Guadalupe Montoya and Dra. Isabel Bonaparte de General Lab (Barcelona)*

| Peak | Name |
|---|---|
| 1 | Methanol |
| 2 | Ethanol |
| 3 | Isopropanol |
| 4 | Acetone |
| 5 | n-Propanol |
| 6 | Methylethylketone (MEK) |
| 7 | Benzene |
| 8 | Toluene |
| 9 | Methylisobutylketone (MIBK) |
| 10 | Ethylbenze |
| 11 | Xylene |
| 12 | Styrene |

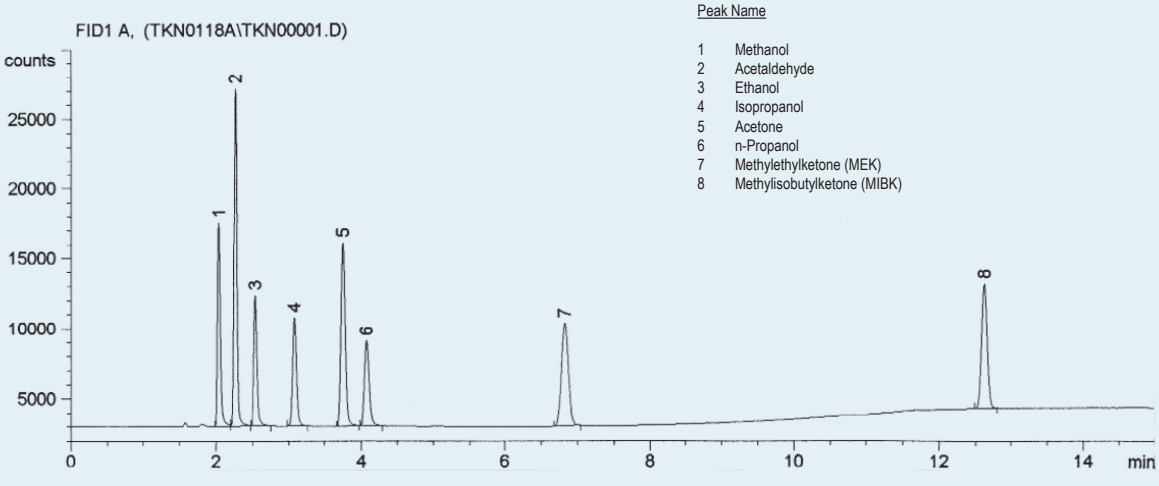



*TKG 1210*

## POLLUTANTS IN BLOOD

Column: **MetaBLOOD 1**, P/N TR-853035
Dimensions: 30m x 0.53mm x 3.0µm
Injection: 1 mL Head Space 2t (vial 70ºC), alcohols and aromatics in blood (2-20 ppm), split 1:30, 225ºC
Carrier gas: He, 5 psi
Oven temperature: 45ºC(7 min) @ 10ºC/min to 90ºC(10min)
Detector: FID, 300ºC

*Chromatogram provided by Dra. Guadalupe Montoya and Dra. Isabel Bonaparte de General Lab (Barcelona)*



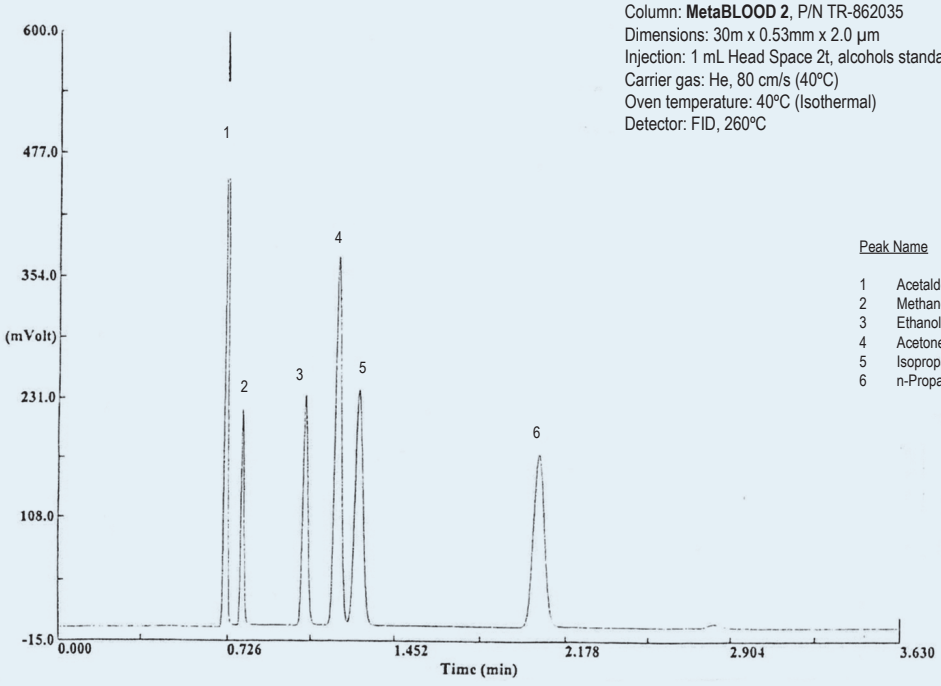

Peak Name

1 Methanol
2 Acetaldehyde
3 Ethanol
4 Isopropanol
5 Acetone
6 n-Propanol
7 Methylethylketone (MEK)
8 Methylisobutylketone (MIBK)

*TKG 1213*

## ALCOHOLS IN BLOOD

Column: **MetaBLOOD 2**, P/N TR-862035
Dimensions: 30m x 0.53mm x 2.0 µm
Injection: 1 mL Head Space 2t, alcohols standard, split 1:10, 250ºC
Carrier gas: He, 80 cm/s (40ºC)
Oven temperature: 40ºC (Isothermal)
Detector: FID, 260ºC



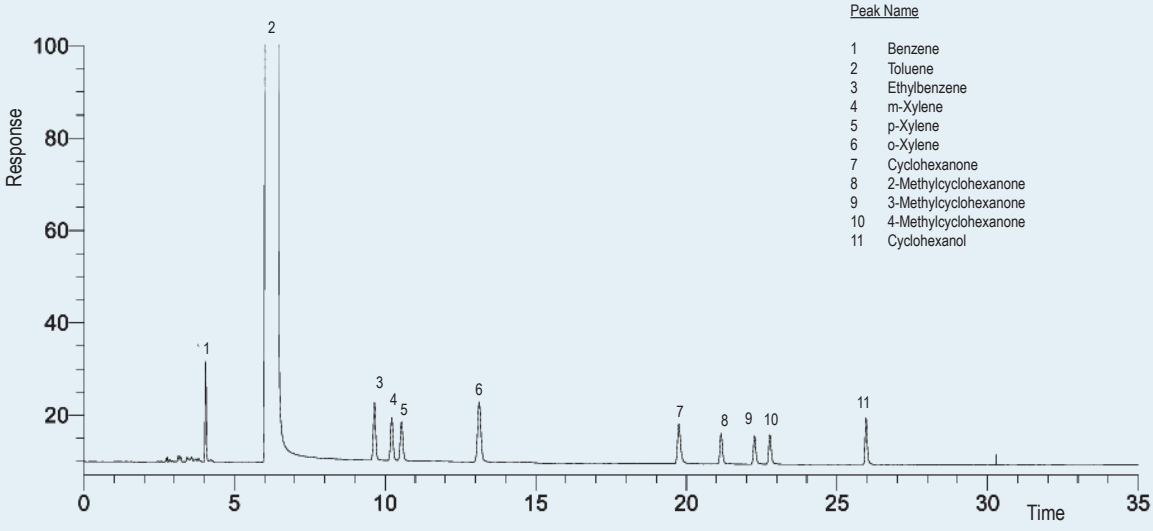

Peak Name

1 Acetaldehyde
2 Methanol
3 Ethanol
4 Acetone
5 Isopropanol
6 n-Propanol

*TKG 1192*

## IMPURITIES IN TOLUENE

Column: **TRB-PAG**, P/N TR-550232
Dimensions: 30m x 0.25mm x 0.25µm
Injection: 1 µL Toluene Standard, split 1:50, 260ºC
Carrier gas: He, constant pressure 11 psi (75.8 Kpa)
Oven Temperature: 40ºC @ 6ºC/min to 230ºC(5min)
Detector: FID, 260ºC



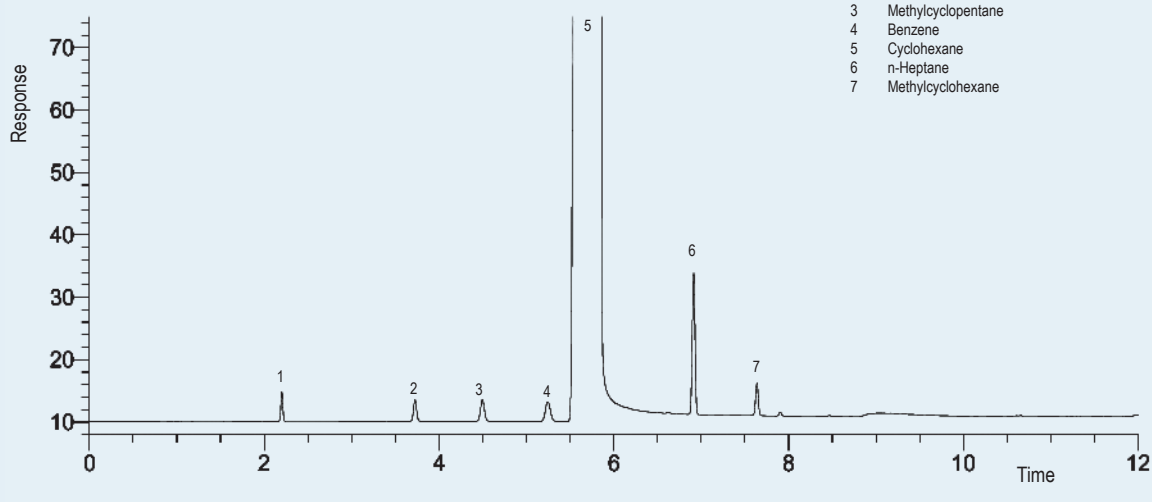

Peak Name

| | |
|---|---|
| 1 | Benzene |
| 2 | Toluene |
| 3 | Ethylbenzene |
| 4 | m-Xylene |
| 5 | p-Xylene |
| 6 | o-Xylene |
| 7 | Cyclohexanone |
| 8 | 2-Methylcyclohexanone |
| 9 | 3-Methylcyclohexanone |
| 10 | 4-Methylcyclohexanone |
| 11 | Cyclohexanol |

*TKG 1194*

## IMPURITIES IN CYCLOHEXANE

Column: **TRB-1**, P/N TR-111226
Dimensions: 25m x 0.15mm x 1.2 µm
Injection: 1µL Cyclohexane, split 1:100, 260ºC
Carrier gas: $H_2$, constant pressure 22 psi (0.8 mL/min)
Oven temperature: 60ºC(6 min) @ 20ºC/min to 160ºC(2 min)
Detector: FID, 300ºC



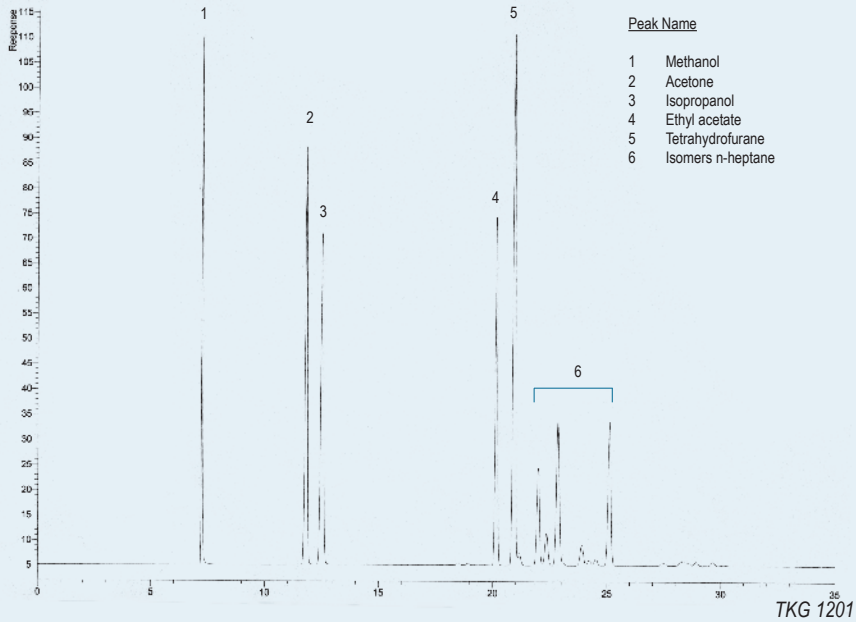

Peak Name

| | |
|---|---|
| 1 | n-Pentane |
| 2 | n-Hexane |
| 3 | Methylcyclopentane |
| 4 | Benzene |
| 5 | Cyclohexane |
| 6 | n-Heptane |
| 7 | Methylcyclohexane |

*TKG 1195*

## MIXTURE OF SOLVENTS AND ISOMERS OF N-HEPTANE

Column: **TRB-624**, P/N TR-603075
Dimensions: 75m x 0.53mm x 3.0 µm
Injection: mixture of solvents (wet needle), split 1:100, 250ºC
Carrier gas: He, constant pressure 8 psi (55.7 Kpa)
Oven temperature: 40ºC(15 min) @ 15ºC/min to 75ºC(15 min)
Detector: FID, 250ºC




Peak Name

1 Methanol
2 Acetone
3 Isopropanol
4 Ethyl acetate
5 Tetrahydrofurane
6 Isomers n-heptane

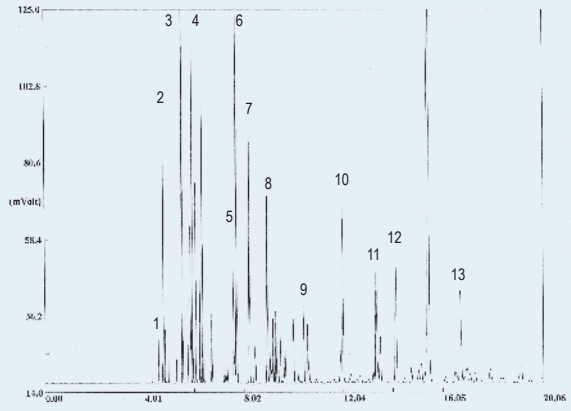
*TKG 1201*

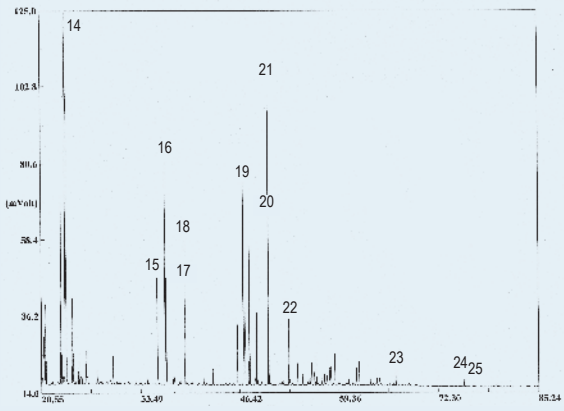
## PETROL

Column: **TRB-PETROL**, P/N TR-110592
Dimensions: 100m x 0.25mm x 0.50µm
Injection: 0.1µL petrol, split 100:1, 280ºC
Carrier gas: $H_2$, constant pressure 221Kpa (35ºC)
Oven temperature:35ºC(18min) @ 2ºC/min to 200ºC(5min)
Detector: FID, 280ºC

Peak Name

1 isobutane
2 n-butane
3 isopentane
4 pentane
5 2,3-dimethylbutane
6 2-methylpentane
7 3-methylpentane
8 hexane
9 2,4-dimethylpentane
10 benzene
11 2-methylhexane
12 3-methylhexane
13 n-heptane
14 toluene
15 ethylbenzene
16 m-xylene
17 p-xylene
18 o-xylene
19 1-methyl-3-ethylbenzene
20 1,3,5-trimethylbenzene
21 1,2,4-trimethylbenzene
22 1,2,3-trimethylbenzene
23 naphtalene
24 2-methylnaphtalene
25 1-methylnaphtalene




*TKG 1203*

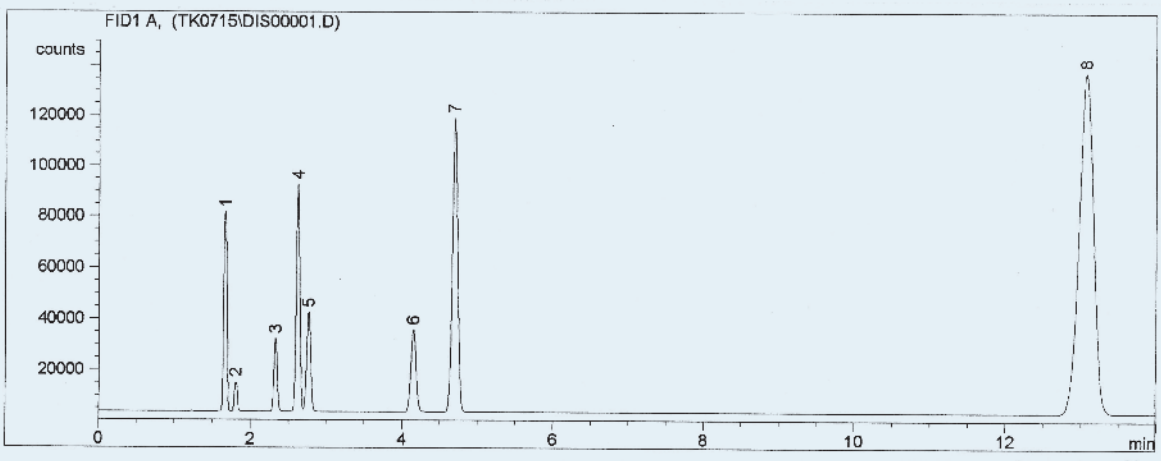
## ALCOHOLS IN BLOOD

Column: **MetaBLOOD 2,** P/N TR-862035
Size: 30m x 0.53mm x 2.0µm
Carrier gas: He, 5 psi
OvenTemperature: 45ºC (15 min)
Injection: 1 mL Head Space 2t (vial 70ºC), alcohols in blood (2-20 ppm), split 1:20, 225ºC
Detector: FID, 300ºC

*Chromatogram provided by Dra. Guadalupe Montoya y Dra. Isabel Bonaparte from General Lab (Barcelona)*

Peak Name

1 Acetaldehyde
2 Methanol
3 Ethanol
4 Acetone
5 Isopropanol
6 n-Propanol
7 Methylethyl ketone (MEK)
8 Methylisobutylketone (MIBK)




*TKG 1209*

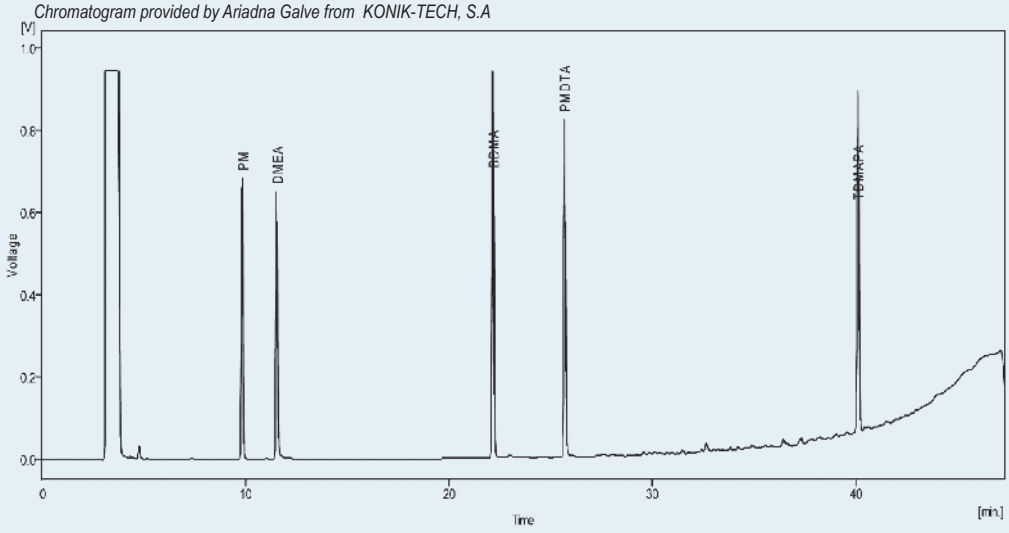
## AMINES

Column: **TRB-624**, P/N TR-603065
Size: 60m x 0.53mm x 3.0µm
Injection: 1 µl amines standard, split 1:5, 260ºC
Carrier Gas: He, 8 mL/min
Program temperature: 40ºC (1min) @ 5ºC/min to 260ºC (10min)
Detector: FID KONIK-TECH, 270ºC

*Chromatogram provided by Ariadna Galve from KONIK-TECH, S.A*

Sample

PM (1-methoxy-2-propanol)
DMEA (N,N-dimethylethanolamine)
BDMA (N,N-dimethylbenzylamine)
PMDTA (pentamethyldiethylentriamine)
TDMAPA (N,N,N-tris(3-dimethylaminopropyl)amine)

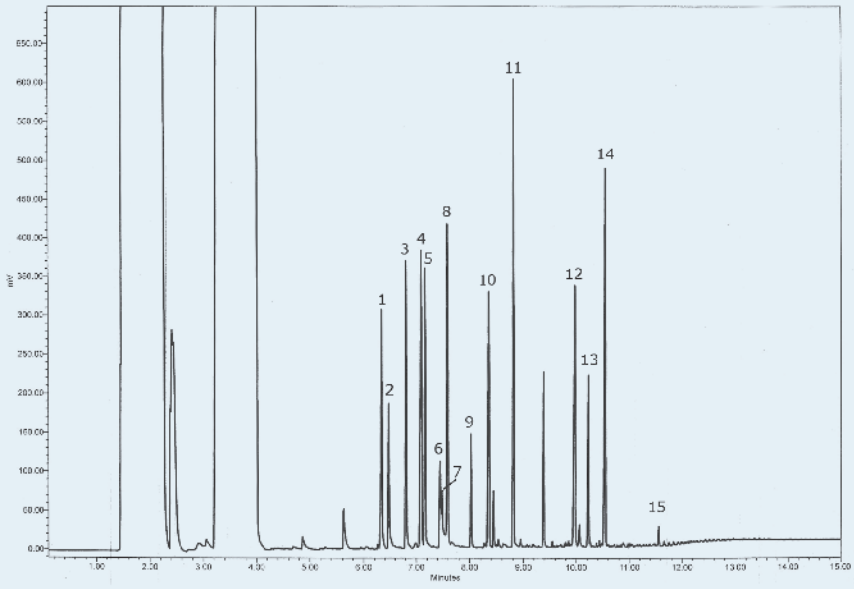



*TKG 1214*

## AMINOACIDS

Column: **TRB-50ht,** P/N TR-531332
Size: 30m x 0.25mm x 0.15µm
Injection: 2 µl standard AA-S-18 Sigma (2.5µmol/ml), split, 300ºC
Carrier gas: He, 1mL/min
Program temperature: 50ºC (2min) @ 30ºC/min to 350ºC (3min)
Detector: MS Polaris Q, EI, 200ºC, transfer line 200ºC

*Chromatogram provided by Antonio Tintó from Moehs S.A.*




Peak Name

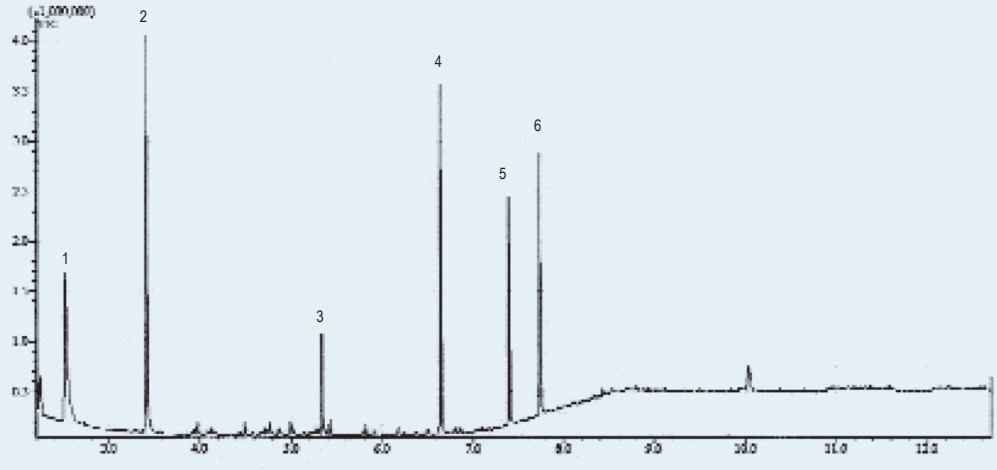
1 Alanine
2 Glycine
3 Valine
4 Leucine
5 Isoleucine
6 Serine
7 Threonine
8 Proline
9 Hydroxyproline
10 Methionine
11 Phenylalanine
12 Lysine
13 Histidine
14 Tyrosine
15 Cystine

*TKG 1215*

## HYDROCARBONS

Column: **TRB-1ht**, P/N TR-610133
Size: 30m x 0.32mm x 0.1µm
Injection: hydrocarbons standard1250 ppb, splitless, 250ºC
Carrier gas: He, constant flow 2 mL/min
Program Temperature: 50ºC(1 min) @ 40ºC/min to 320ºC(5 min)
Detector: MS, ion source 200ºC, Interfase 280ºC, scan 20-600

*Chromatogram provided by Vanesa Riu de ILERSAP, Mollerussa (Lleida).*




Peak Name

1 C10
2 C12
3 C24
4 C28
5 C30
6 C40

*TKG 1221*

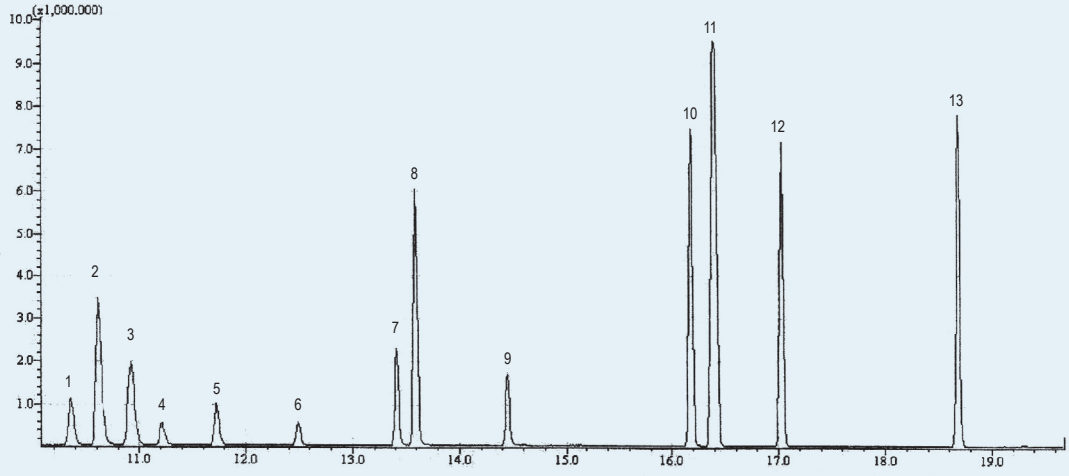
## VOLATIL SOLVENTS NO HALOGENATED

Column: **TRB-1**, P/N TR-111062
Size: 60m x 0.25mm x 1.0µm
Injection: 1 mL Headspace (70ºC, 20min), split 1:5, 250ºC
Carrier Gas: He, constant flow 1mL/min
Program Temperature: 40ºC(2 min) @ 8ºC/min to 240ºC(10 min)
Detector: MS, ion source 200ºC, Interfase 250ºC, scan 20-400

*Chromatogram provided by Vanesa Riu de ILERSAP, Mollerussa (Lleida).*

Peaks

1 Isobutyl acetate
2 Benzene
3 Cyclohexane
4 3-Pentanone
5 Propyl acetate
6 Methyl isobutyl ketone
7 Isobutyl acetate
8 Toluene
9 Butyl acetate
10 Ethylbenzene
11 m,p-Xylene
12 o-Xylene
13 Isobutyl Ketone



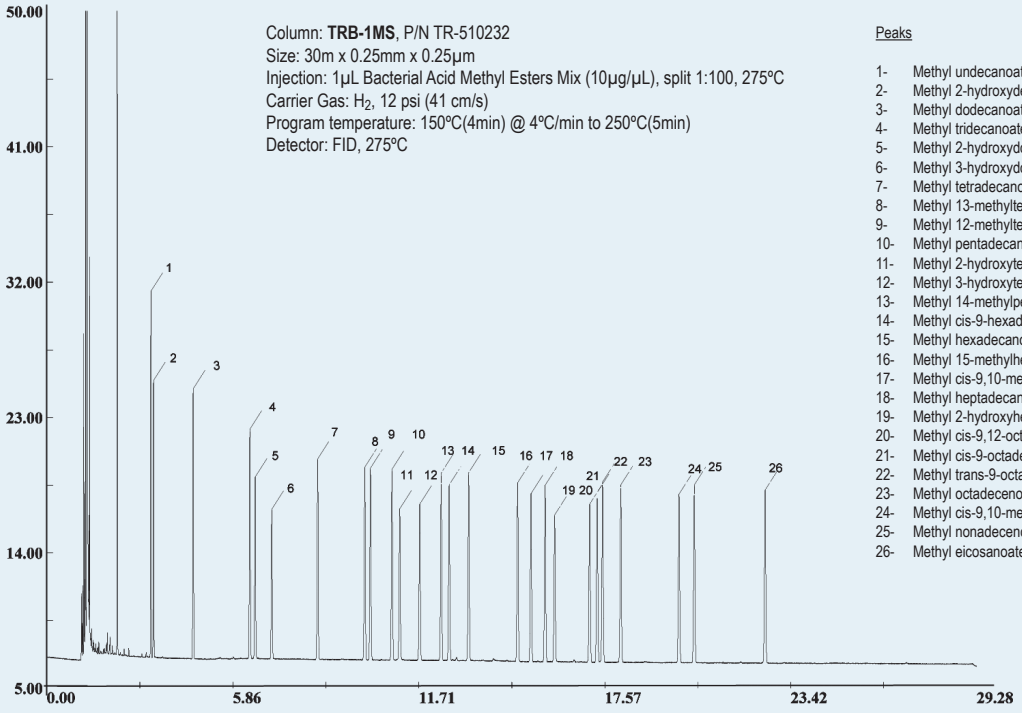

TKG 1220

## BACTERIAL ACID METHYL ESTERS MIX

Column: **TRB-1MS**, P/N TR-510232
Size: 30m x 0.25mm x 0.25µm
Injection: 1µL Bacterial Acid Methyl Esters Mix (10µg/µL), split 1:100, 275ºC
Carrier Gas: $H_2$, 12 psi (41 cm/s)
Program temperature: 150ºC(4min) @ 4ºC/min to 250ºC(5min)
Detector: FID, 275ºC

Peaks

1- Methyl undecanoate
2- Methyl 2-hydroxydecanoate
3- Methyl dodecanoate
4- Methyl tridecanoate
5- Methyl 2-hydroxydodecanoate
6- Methyl 3-hydroxydodecanoate
7- Methyl tetradecanoate
8- Methyl 13-methyltetradecanoate
9- Methyl 12-methyltetradecanoate
10- Methyl pentadecanoate
11- Methyl 2-hydroxytetradecanoate
12- Methyl 3-hydroxytetradecanoate
13- Methyl 14-methylpentadecanoate
14- Methyl cis-9-hexadecenoate
15- Methyl hexadecanoate
16- Methyl 15-methylhexadecanoate
17- Methyl cis-9,10-methylenehexadecanoate
18- Methyl heptadecanoate
19- Methyl 2-hydroxyheptadecanoate
20- Methyl cis-9,12-octadecadienoate
21- Methyl cis-9-octadecenoate
22- Methyl trans-9-octadecenoate
23- Methyl octadecenoate
24- Methyl cis-9,10-methyleneoctadecenoate
25- Methyl nonadecenoate
26- Methyl eicosanoate



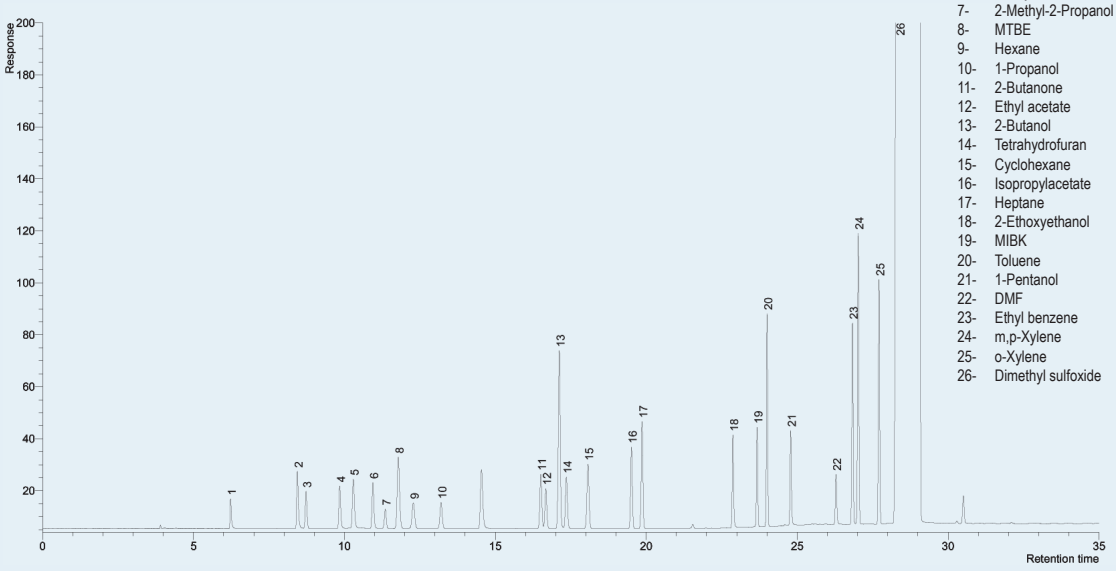

TKG 1231

## RESIDUAL SOLVENTS IN DMSO

Column: **TRB-624**, P/N TR-601863
Size: 60m x 0.32mm x 1.8µm
Injection: 1µL mixture of solvents (500 ppm in DMSO), split 1:50, 260ºC
Carrier gas: He, constant pressure 16 psi
Program Temperature: 40ºC(5 min) @ 2ºC/min to 60ºC @ 9ºC/min to 115ºC @ 35ºC/min to 220ºC(15min)
Detector: FID, 260ºC

Peak Name

1- Methanol
2- Ethanol
3- Acetone
4- 2-Propanol
5- Acetonitrile
6- Methylene chloride
7- 2-Methyl-2-Propanol
8- MTBE
9- Hexane
10- 1-Propanol
11- 2-Butanone
12- Ethyl acetate
13- 2-Butanol
14- Tetrahydrofuran
15- Cyclohexane
16- Isopropylacetate
17- Heptane
18- 2-Ethoxyethanol
19- MIBK
20- Toluene
21- 1-Pentanol
22- DMF
23- Ethyl benzene
24- m,p-Xylene
25- o-Xylene
26- Dimethyl sulfoxide



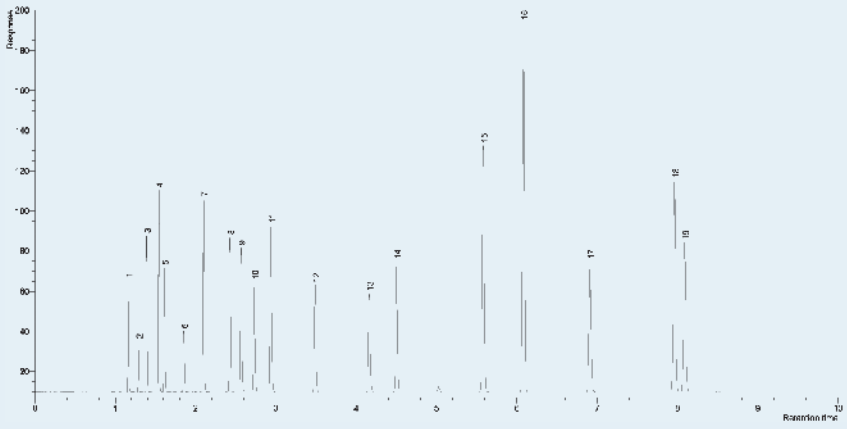

*TKG 1232*

## COMMON INDUSTRIAL SOLVENTS

Column: **TRB-1**, P/N TR-111033
Size: 30m x 0.32mm x 1.0µm
Injection: 0.01µL Neat solvents, split 1:300, 200ºC
Carrier Gas: H2, 7 psi
Program temperature: 30ºC @ 8ºC/min to 140ºC(2min)
Detector: FID, 200ºC

Peaks

1- Methanol
2- Methyl formate
3- Ethanol
4- Acetone
5- Isopropanol
6- Dichloromethane
7- n-Propanol
8- Methyl ethyl ketone
9- Sec-Butanol
10- Ethyl acetate
11- Isobutanol
12- Isopropyl acetate
13- Nitropropane
14- 1,4-Dioxane
15- Toluene
16- Mesityl oxide
17- Diacetone alcohol
18- m-Xylene
19- Cyclohexanone



*TKG 1234*

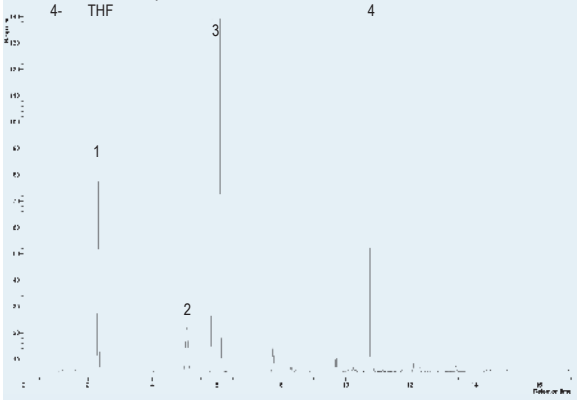
## REACTION PRODUCTS OF 1,1-DIETHOXY BUTANE

Column: **TRB-624**, P/N TR-603035
Size: 30m x 0.53mm x 3.0µm
Injection: 0.5 µl, split 1:5, 260ºC
Carrier Gas: He, 6 psi
Program temperature: 40ºC (6min) @ 30ºC/min to 200ºC (5min)
Detector: FID, 260ºC

*Chromatogram provided by Ion Aguirre from Escuela Superior de Ingeniería de Bilbao (Spain)*

Peak Name

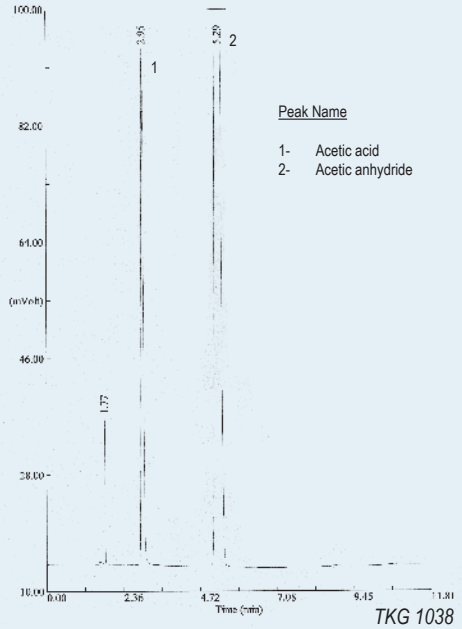
1- Butanal
2- Ethanol
3- 1,1-Diethoxy butane
4- THF




*TKG 1238*

## SEPARATION OF ACETIC ACID AND ACETIC ANHYDRIDE

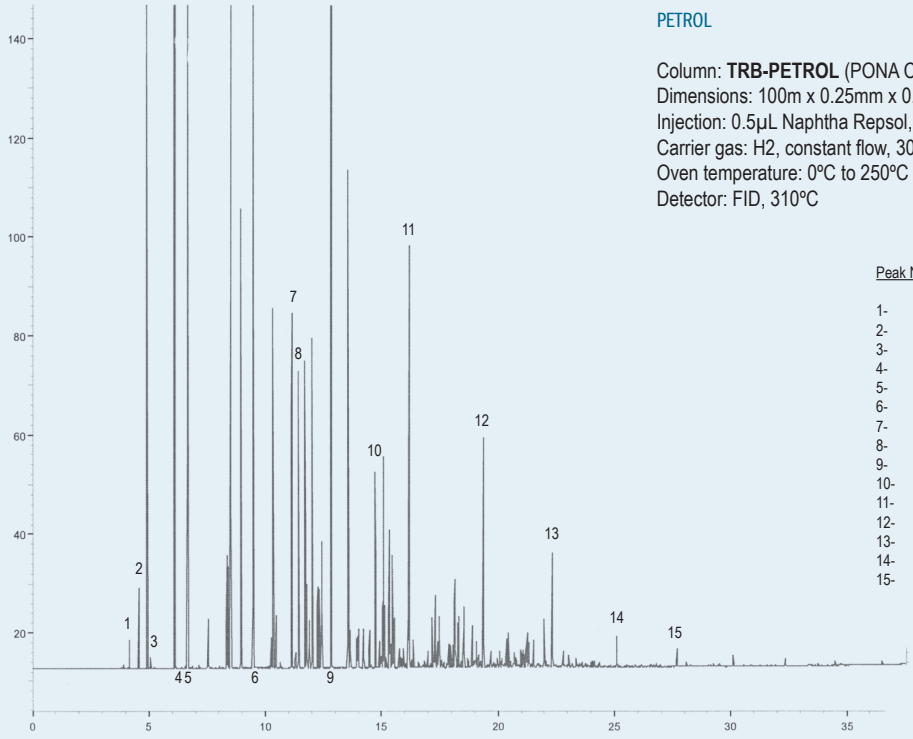
Column: **TRB-1**, P/N TR-115035
Dimensions: 30m x 0.53mm x 5.0 µm
Injection: wet needle (solvent mixture), split 1:100, 200ºC
Carrier gas: $H_2$, constant pressure 3 psi (20.7 KPa).
Oven program: 90ºC
Detector: FID, 260ºC




Peak Name

1- Acetic acid
2- Acetic anhydride

*TKG 1038*




## PETROL

Column: **TRB-PETROL** (PONA Column), P/N TR-110592
Dimensions: 100m x 0.25mm x 0.50µm
Injection: 0.5µL Naphtha Repsol, split 1:250, 250ºC
Carrier gas: H2, constant flow, 30 psi (206.7 KPa)
Oven temperature: 0ºC to 250ºC
Detector: FID, 310ºC

Peak Name

1- Propane
2- Isobutante
3- Butane
4- Isopentane
5- n-Pentane
6- n-Hexane
7- Benzene
8- Cyclohexane
9- n-Heptane
10- Toluene
11- n-Octane
12- n-Nonane
13- n-Decane
14- n-Undecane
15- n-Dodecane

*TKG 1267*