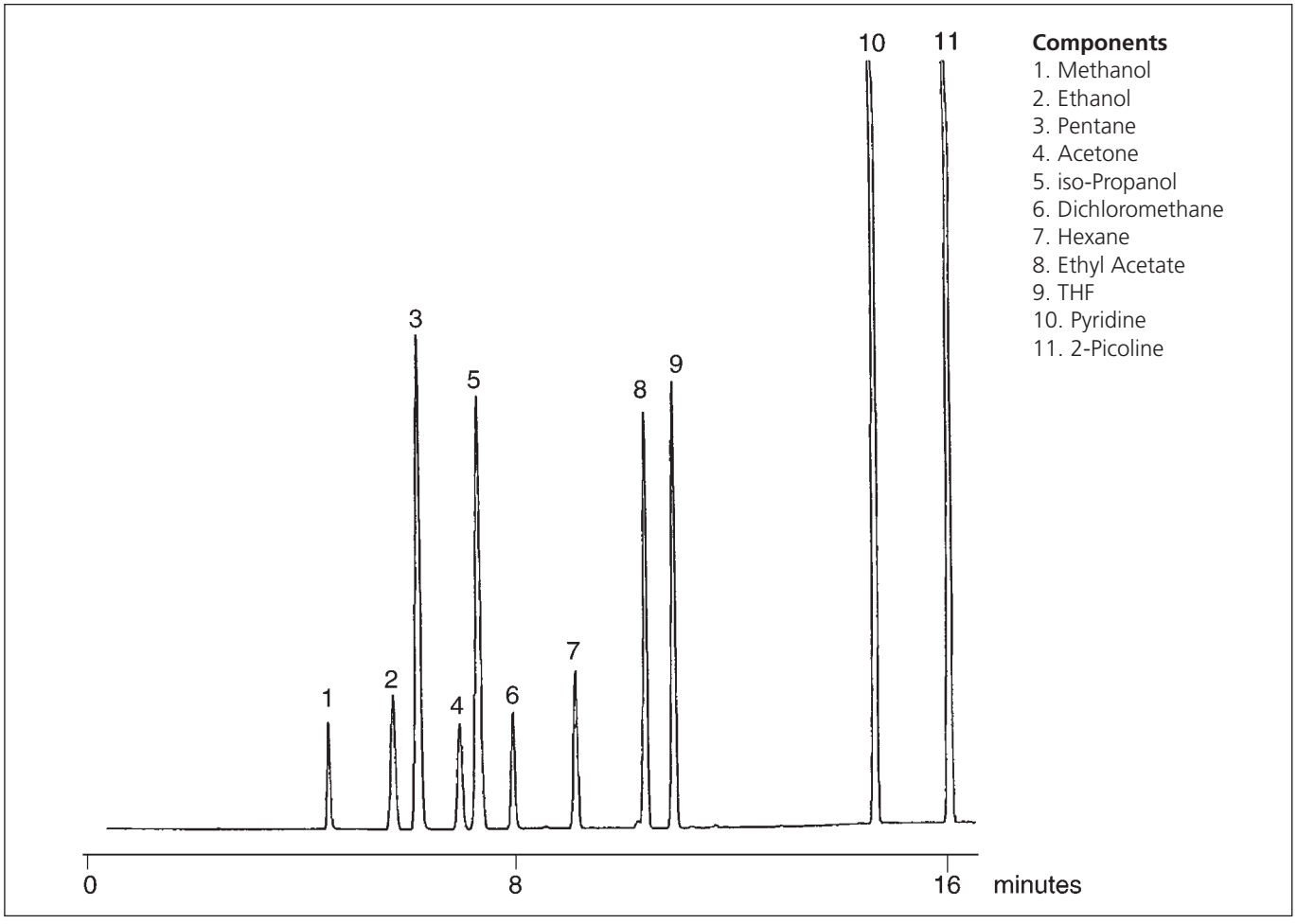
SOLVENT ANALYSIS ON A 0.53 MM ID BP624

SOLVENT ANALYSIS

Column Part No.:	**054835**	Final Temp.:	160 °C, 2 min
Phase:	BP624, 3.0 µm	Detector:	FID 280 °C
Column:	50 m x 0.53 mm ID	Injection Mode:	Split (30:1)
Initial Temp.:	35 °C, 6 min	Carrier Gas:	He, 4 psi
Rate:	15 °C/min		



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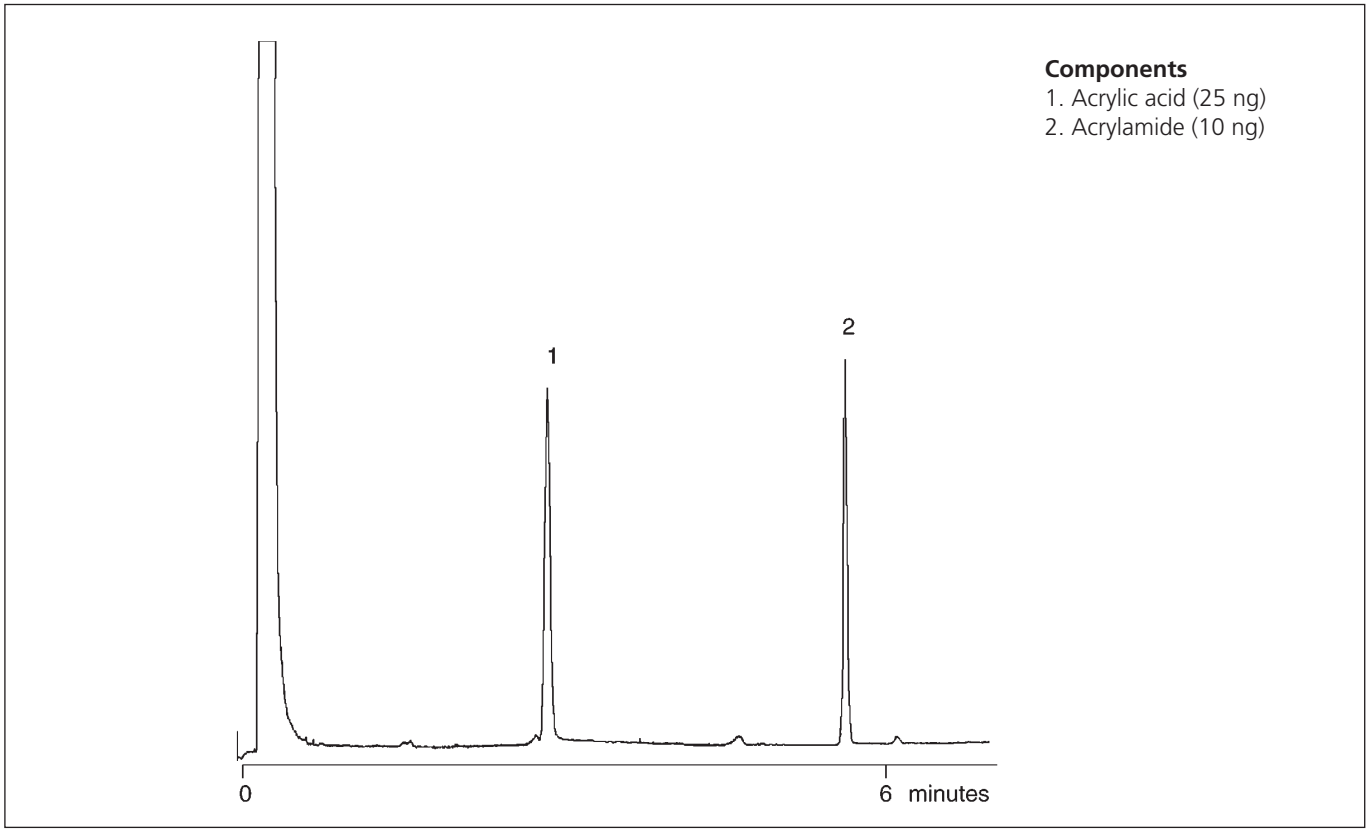
ACRYLIC ACID/ACRYLAMIDE ANALYSIS ON BP21

ACRYLIC ACID/ACRYLAMIDE ANALYSIS

Column Part No.:	**054473**	Final Temp:	150 °C
Phase:	BP21, 0.5 µm film	Detector:	FID, 280 °C
Column:	12 m x 0.53 mm ID	Injection Mode:	On-Column
Initial Temp:	75 °C, 0.5 min	Carrier Gas:	He, 6 psi
Rate:	10 °C/min		

Notes: When response of acrylic acid does occur, removal of 30 cm from the front of the column will correct this loss. On-column injection is recommended or polymerisation of acrylic acid may occur.



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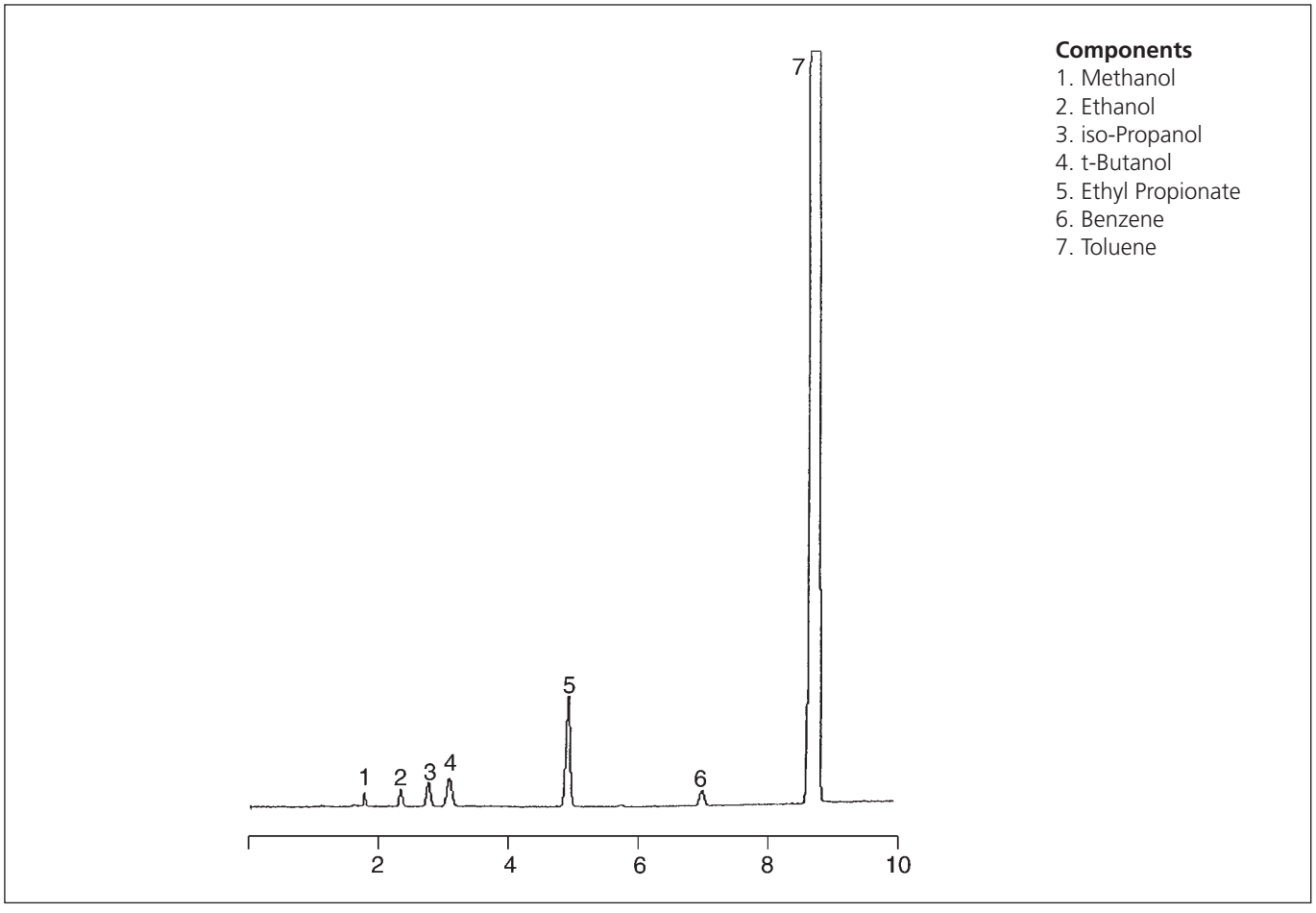
VOLATILE SOLVENT ANALYSIS ON BP624

Column Part No.:	**054834**	Detector:	FID, 280 °C
Phase:	BP624	Injector Mode:	Split 30:1
Column:	25 m x 0.53 mm ID	Carrier Gas:	He, 2.5 psi
Initial Temp.:	40 °C, 2 min	Injection Volume:	0.5 µl
Rate 1:	7 °C/min	Injection Temp:	200 °C
Final Temp.:	100 °C		



Components
1. Methanol
2. Ethanol
3. iso-Propanol
4. t-Butanol
5. Ethyl Propionate
6. Benzene
7. Toluene

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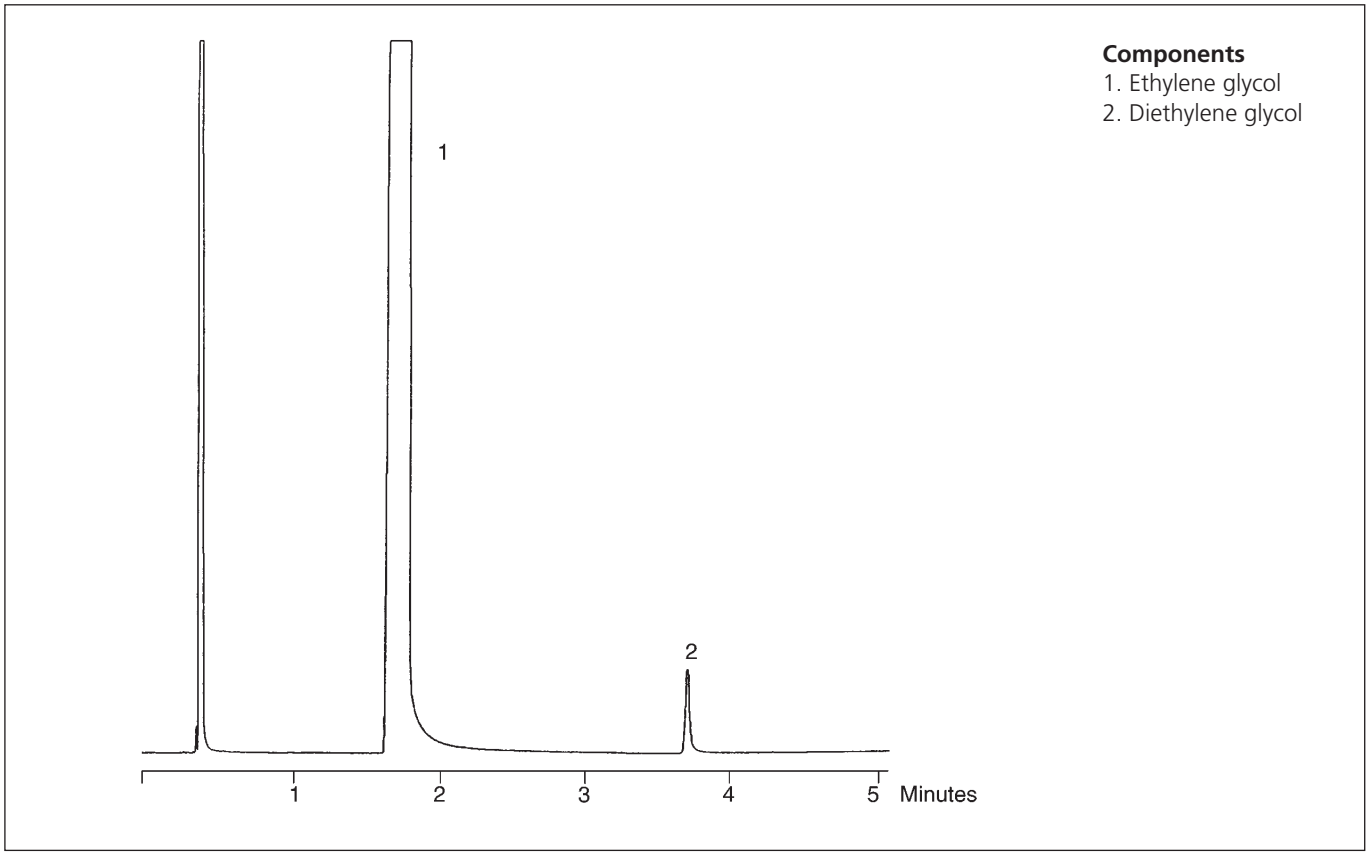
ETHYLENE GLYCOL AND DIETHYLENE GLYCOL ANALYSIS ON BP21

Column Part No.:	**054473**	Detector:	FID, 270 °C
Phase:	BP21, 0.5 µm	Injector Mode:	Split 20:1
Column:	12 m x 0.53 mm ID	Carrier Gas:	He, 2 psi
Initial Temp.:	110 °C, 0.5 min	Injection Volume:	0.4 µl
Rate:	15 °C/min	Injection Temp:	240 °C
Final Temp.:	170 °C		



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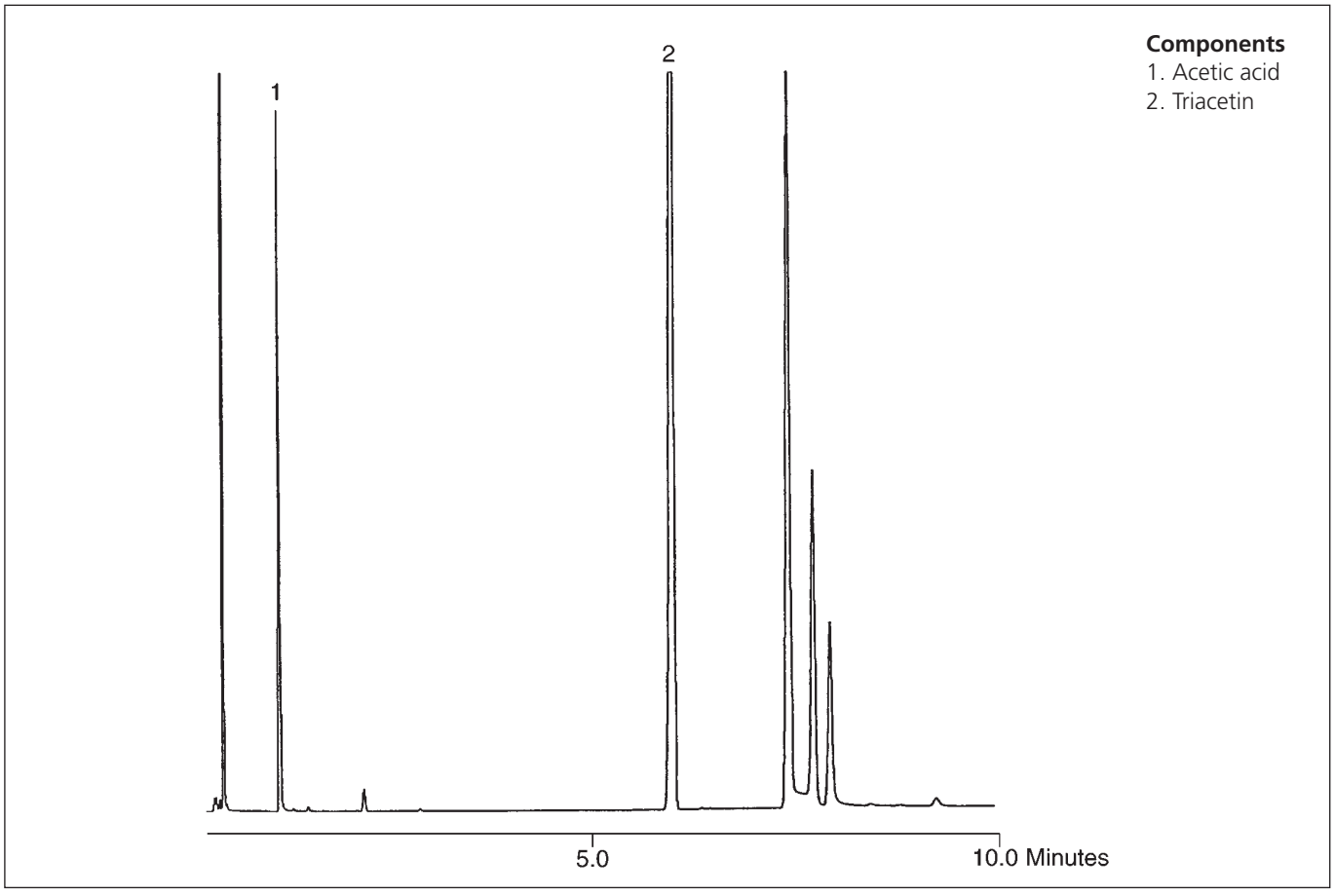
TRIACETIN ANALYSIS ON BP21

Column Part No.:	**054473**	Detector:	FID, 260 °C
Phase:	BP21, 0.5 µm	Injector Mode:	Split 20:1
Column:	12 m x 0.53 mm ID	Carrier Gas:	He, 2 psi
Initial Temp.:	100 °C, 1 min	Injection Volume:	0.2 µl
Rate:	15 °C/min	Injection Temp:	200 °C
Final Temp.:	170 °C, 2 min		



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ETHANOL IMPURITY IN METHANOL ON BP1 ON A 0.53 MM ID COLUMN

Column Part No.:	**054095**	Detector:	FID, 300 °C
Phase:	BPI, 5.0 µm	Injector Mode:	Split, 20:1
Column:	25 m x 0.53 mm ID	Carrier Gas:	He, 4 psi
Temp:	50 °C, Isothermal	Injection Volume:	1 µl

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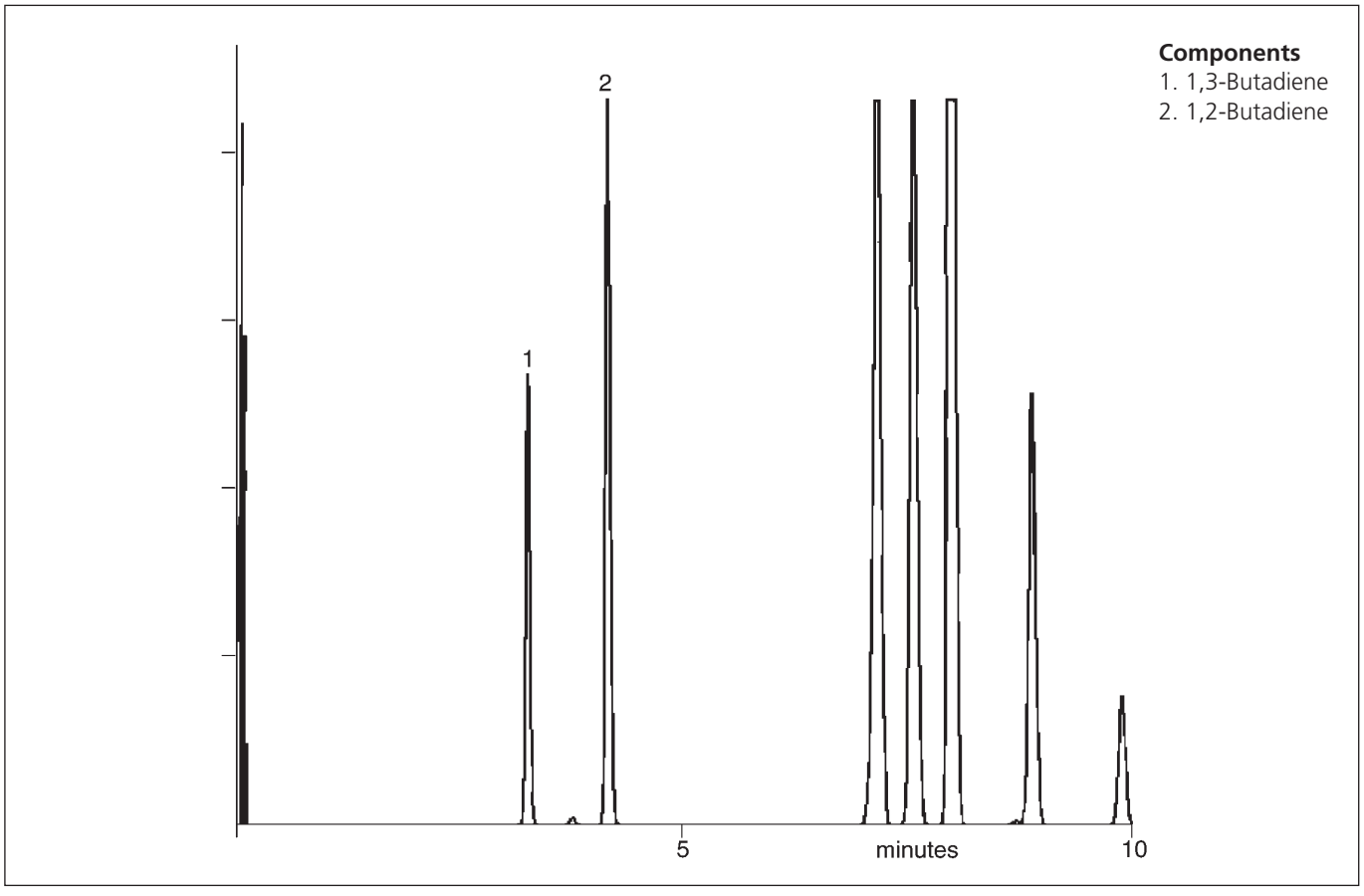
1,2-BUTADIENE AND 1,3-BUTADIENE IN HEXANE ON THICK FILM BP1

Column Part No.:	**054081**	Final Temp.:	140 °C, 1 min
Phase:	BP1, 5.0 µm	Detector:	FID, 300 °C
Column:	25 m x 0.32 mm ID	Injector Mode:	Split, 100:1, 240 °C
Initial Temp.:	40 °C, 2 min	Carrier Gas:	He, 6 psi
Rate 1:	10 °C/min	Injection Volume:	1 µL



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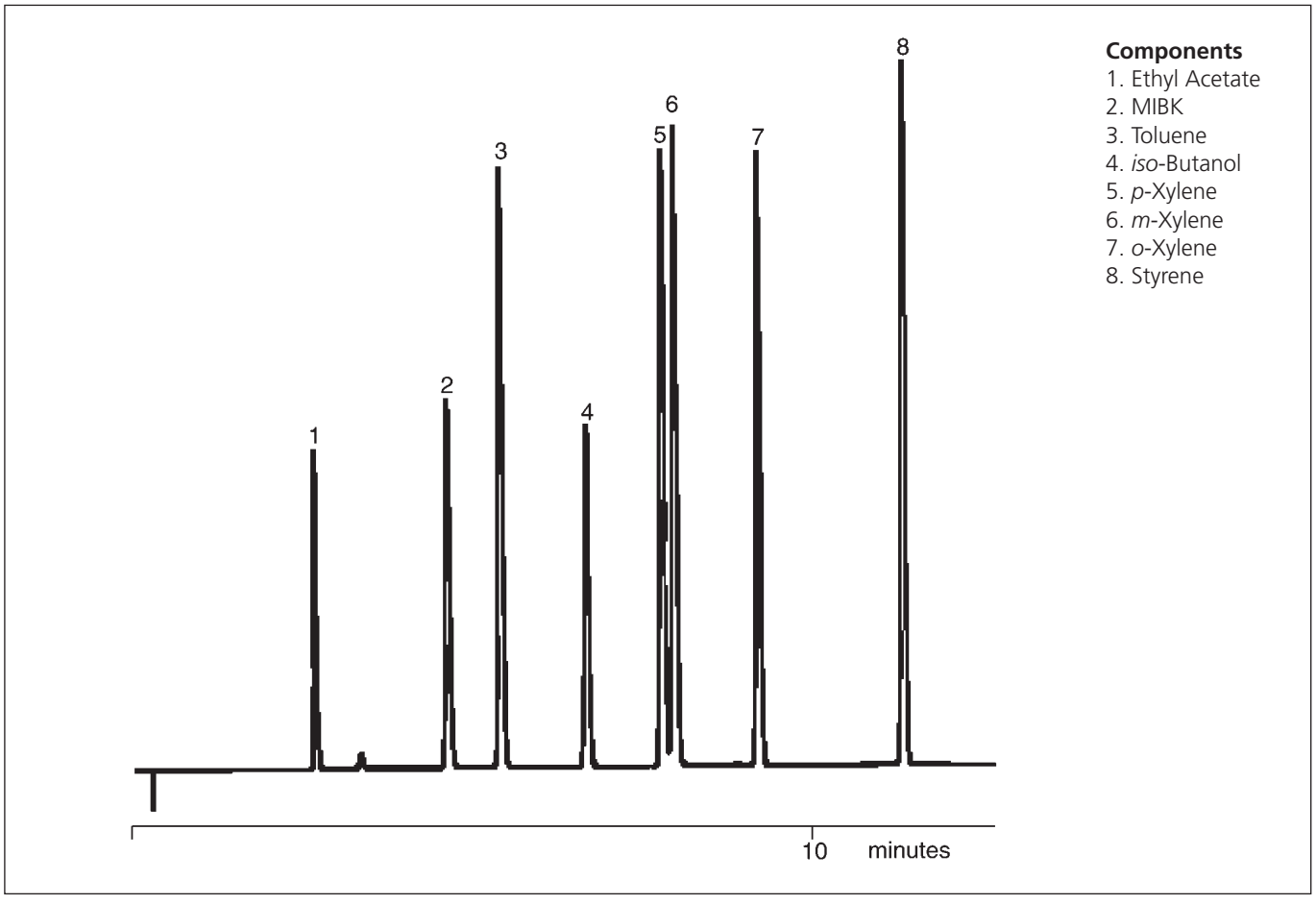
ANALYSIS OF A STANDARD SOLVENT MIXTURE ON BP20

Column Part No.:	**054442**	Final Temp.:	90 °C
Phase:	BP20, 1.0 µm	Detector:	FID, 260 °C
Column:	25 m x 0.32 mm ID	Injector Mode:	Split, 100:1, 240 °C
Initial Temp.:	45 °C, 2 min	Carrier Gas:	Hydrogen, 80 kPa
Rate 1:	5 °C/min	Injection Volume:	0.1 µL



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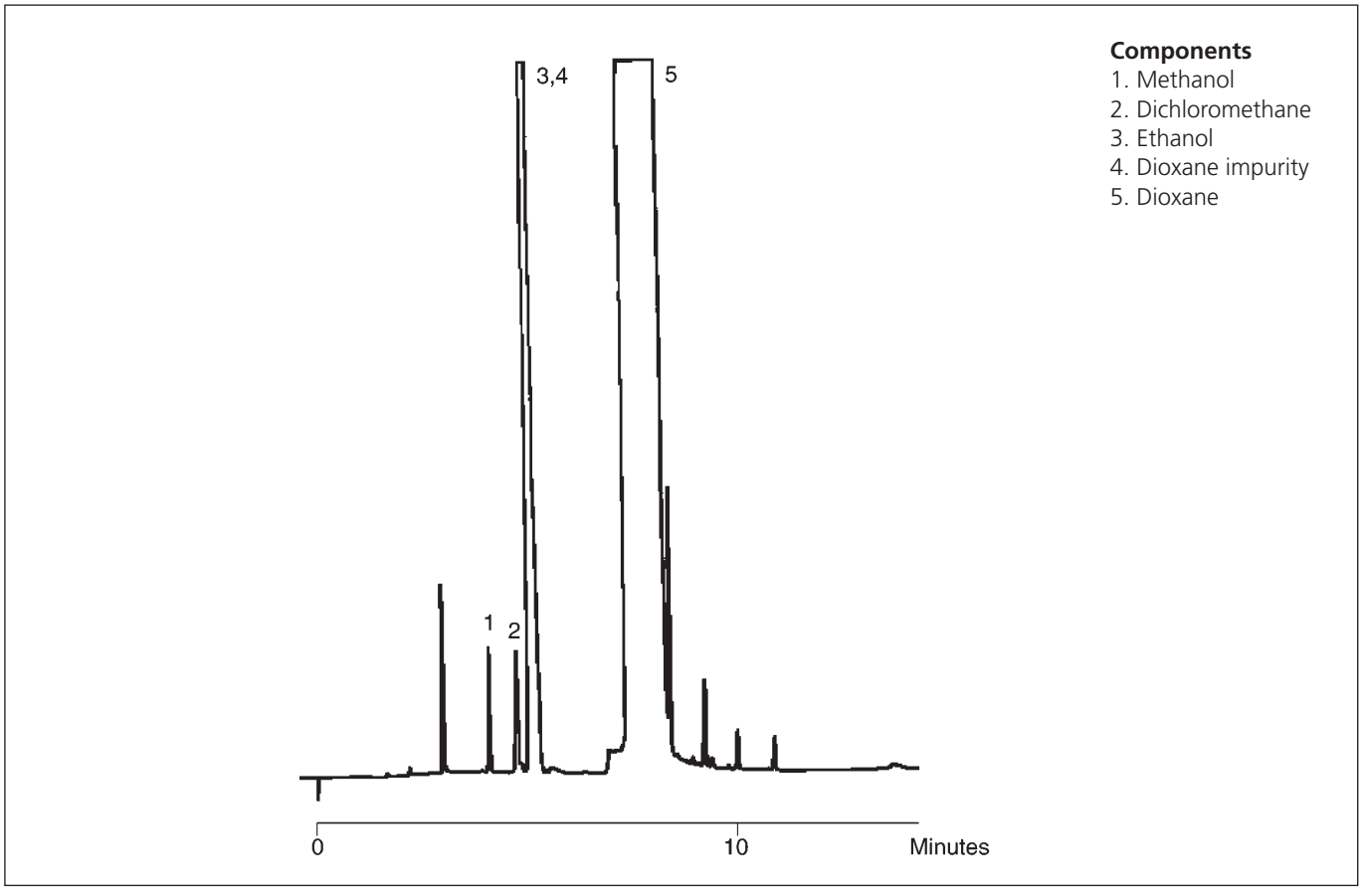
GC APPLICATION NOTE

SOLVENT IMPURITIES IN DIOXANE (10 PPM) ON BP20

Column Part No.:	**054448**	Final Temp.:	120 °C
Phase:	BP20, 1.0 µm	Detector:	FID, 280 °C
Column:	25 m x 0.53 mm ID	Injector Mode:	Split, 3:1, 200 °C
Initial Temp.:	40 °C	Carrier Gas:	Hydrogen, 2 psi
Rate:	10 °C/min	Injection Volume:	1.0 µL



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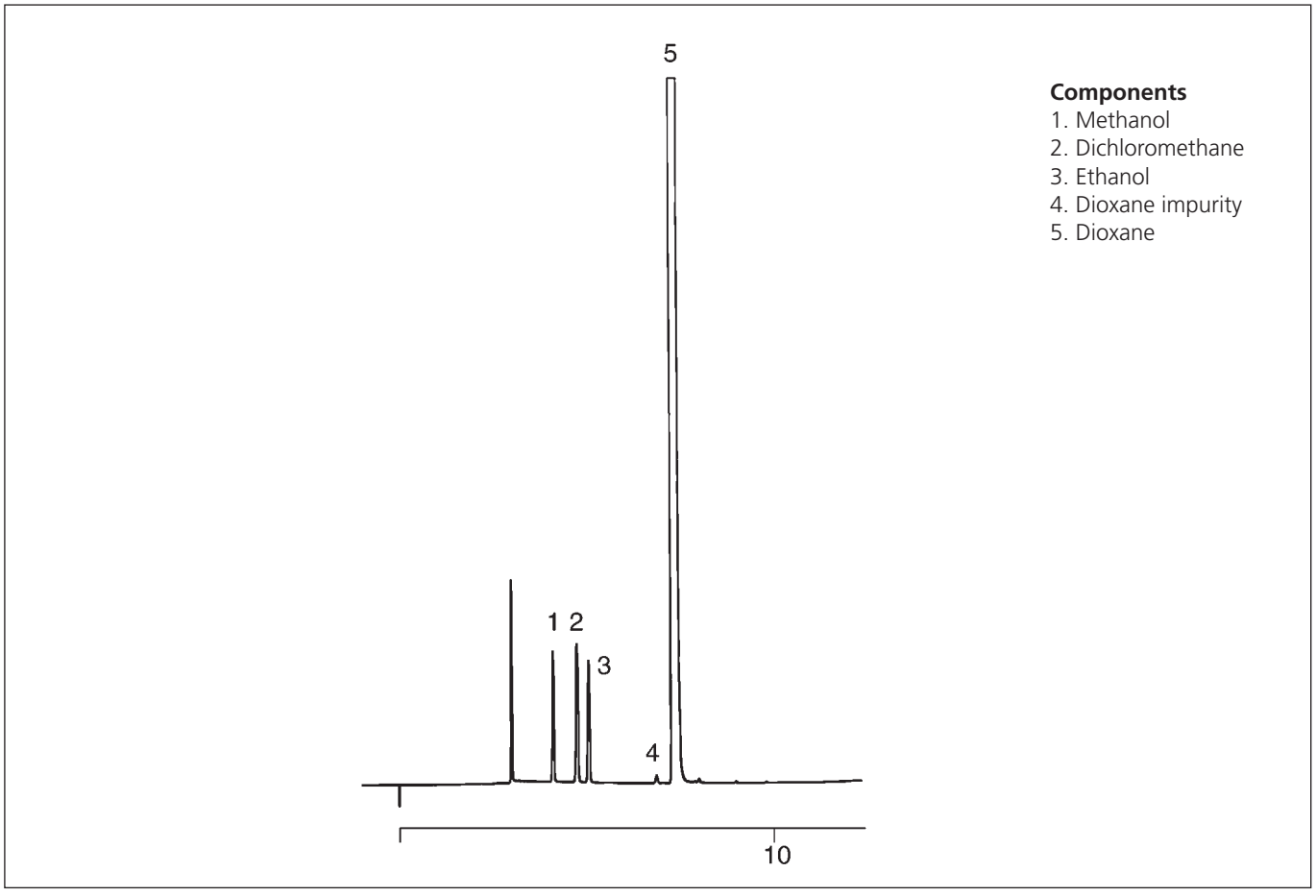
SOLVENT IMPURITIES IN DIOXANE (10 PPM) ON BP20

Column Part No.:	**054448**	Final Temp.:	120 °C
Phase:	BP20, 1.0 µm	Detector:	FID, 280 °C
Column:	25 m x 0.53 mm ID	Injector Mode:	Split, 30:1,
Initial Temp.:	40 °C, 2 min	Carrier Gas:	Hydrogen, 2 psi
Rate:	10 °C/min	Injection Volume:	0.2 µL



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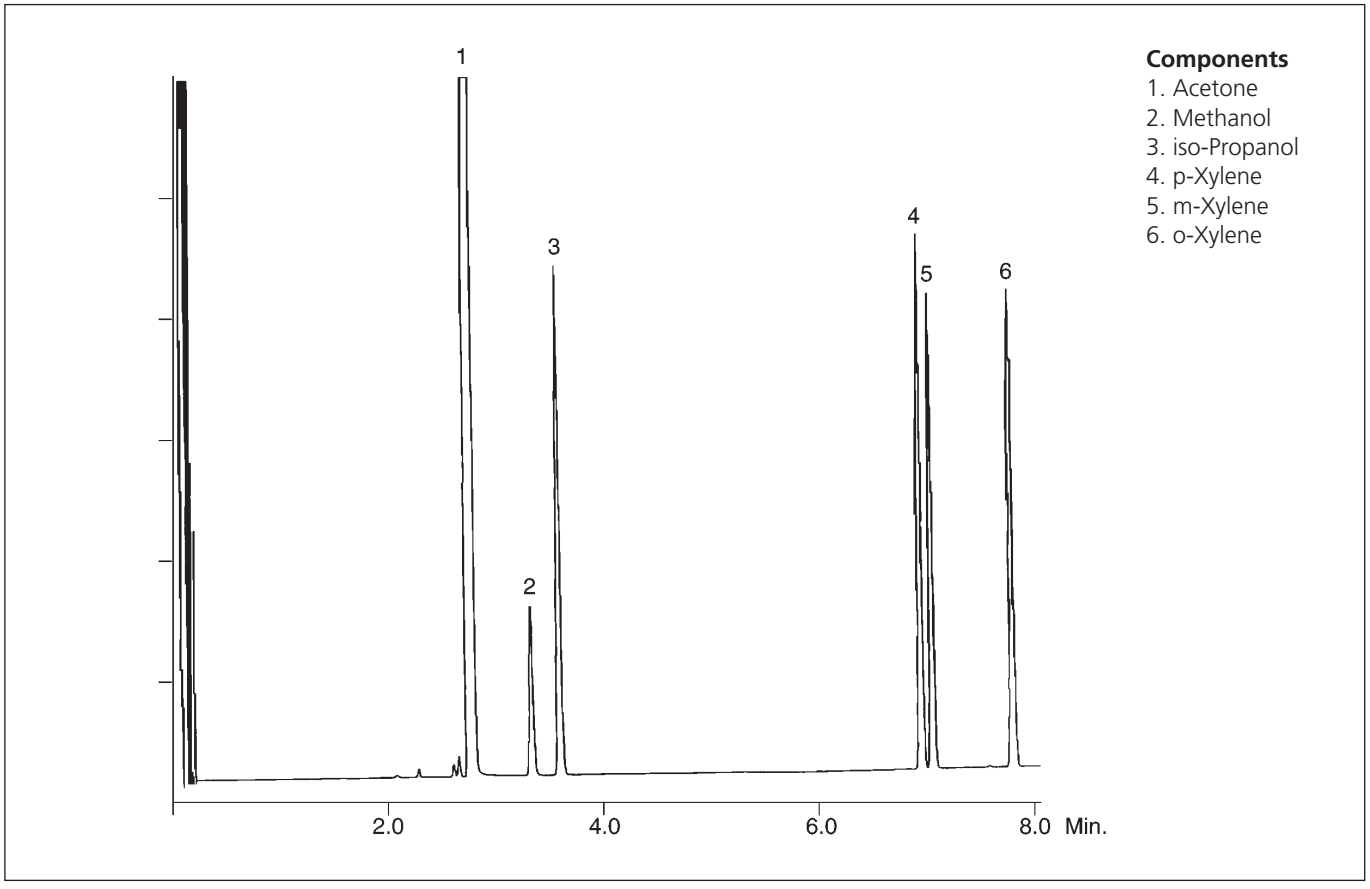
SOLVENT MIXTURE ON BP20

Column Part No.:	**054436**	Final Temp.:	140 °C
Phase:	BP20, 0.5 µm	Detector:	FID, 280 °C
Column:	25 m x 0.32 mm ID	Injector Mode:	Split, 100:1, 240 °C
Initial Temp.:	60 °C, 3.5 min	Carrier Gas:	He, 6 psi
Rate:	15 °C/min	Injection Volume:	1 µL



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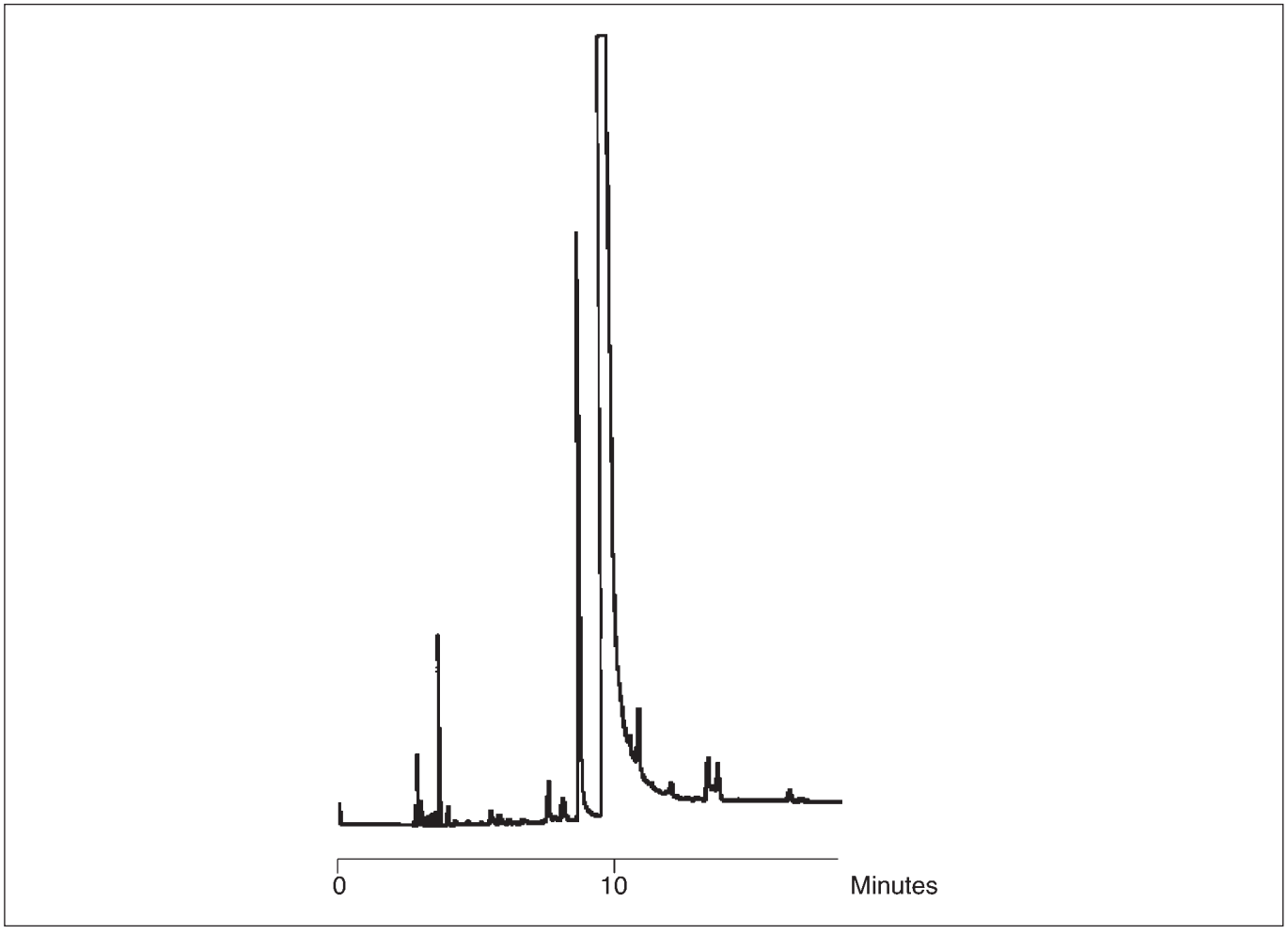
ANALYSIS OF DIETHYLAMINO ETHOXYETHANOL ON BP20

Column Part No.:	**054448**	Final Temp.:	180 °C, 1 min
Phase:	BP20, 1.0 µm	Detector:	FID, 280 °C
Column:	25 m x 0.53 mm ID	Injector Mode:	Split, 50:1, 240 °C
Initial Temp.:	150 °C, 1 min	Carrier Gas:	He, 15 kPa
Rate:	10 °C/min	Injection Volume:	0.1 µL



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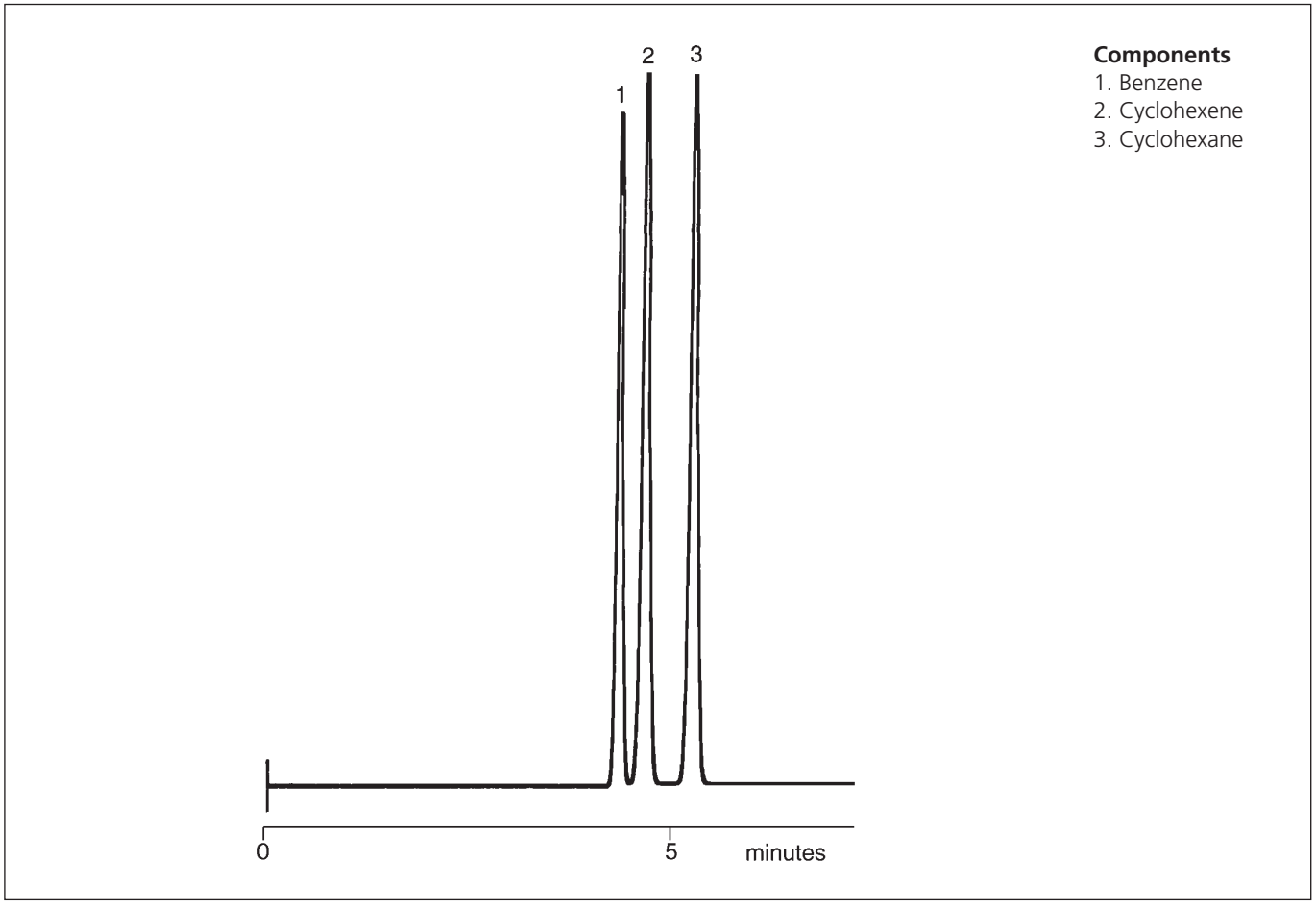
PETROLEUM HYDROCARBONS ON A THICK FILM 0.53 MM ID BP1

Column Part No.:	**054095**	Detector:	FID, 320 °C
Phase:	BP1, 5.0 µm	Injector Mode:	Split, 100:1, 200 °C
Column:	25 m x 0.53 mm ID	Carrier Gas:	He, 8 mL/min
Initial Temp.:	40 °C isothermal	Injection Volume:	0.1 µL



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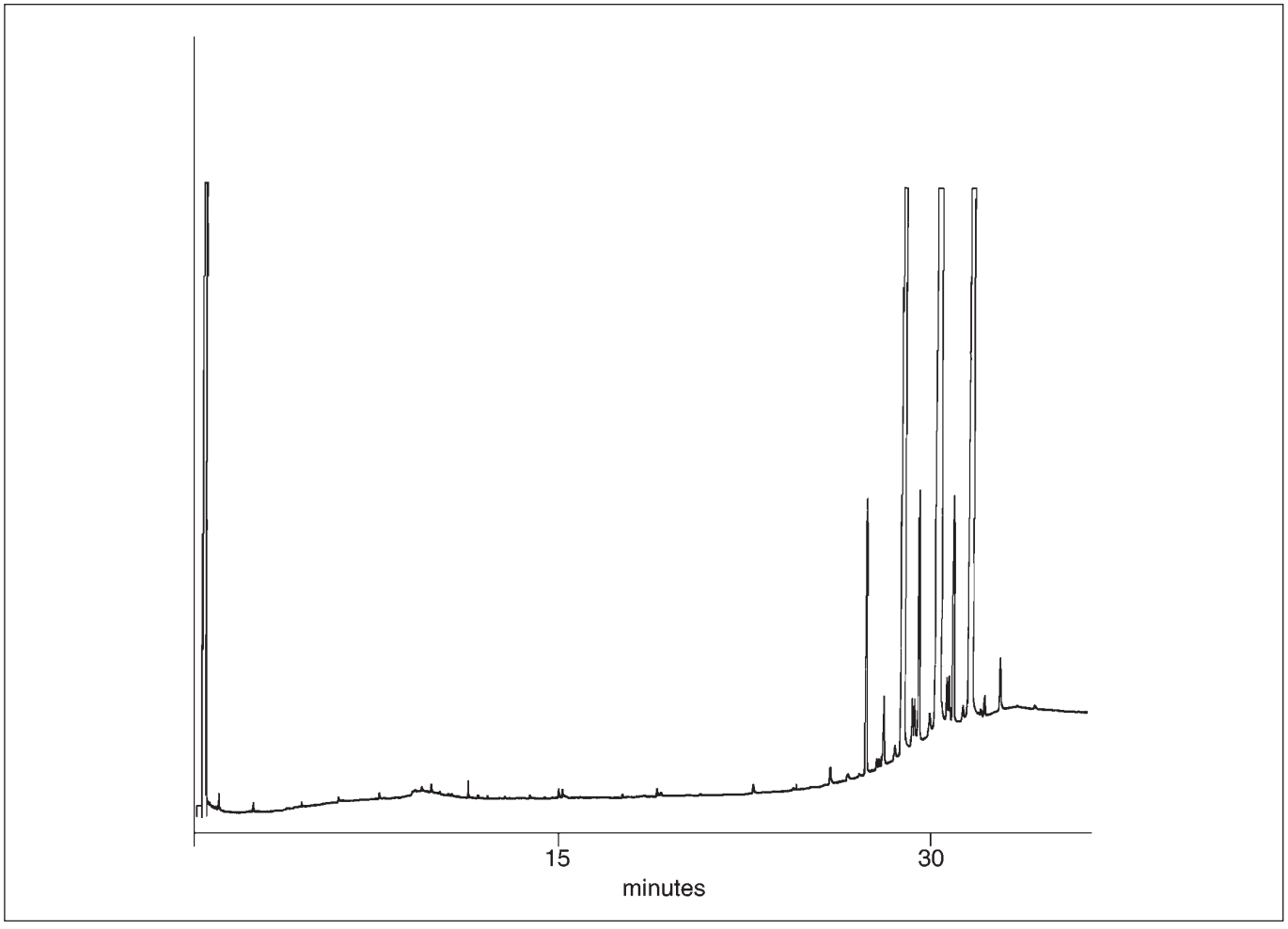
BIS-ETHYLENE STERAMIDE SAMPLE ON BPX5

Column Part No.:	**054118**	Final Temp.:	370 °C, 10 min
Phase:	BPX5, 0.25 µm	Detector:	FID, 400 °C
Column:	12 m x 0.32 mm ID	Injector Mode:	On-Column (OCI-5)
Initial Temp.:	60 °C	Carrier Gas:	He, 10 psi
Rate 1:	10 °C/min	Injection Volume:	1 µL



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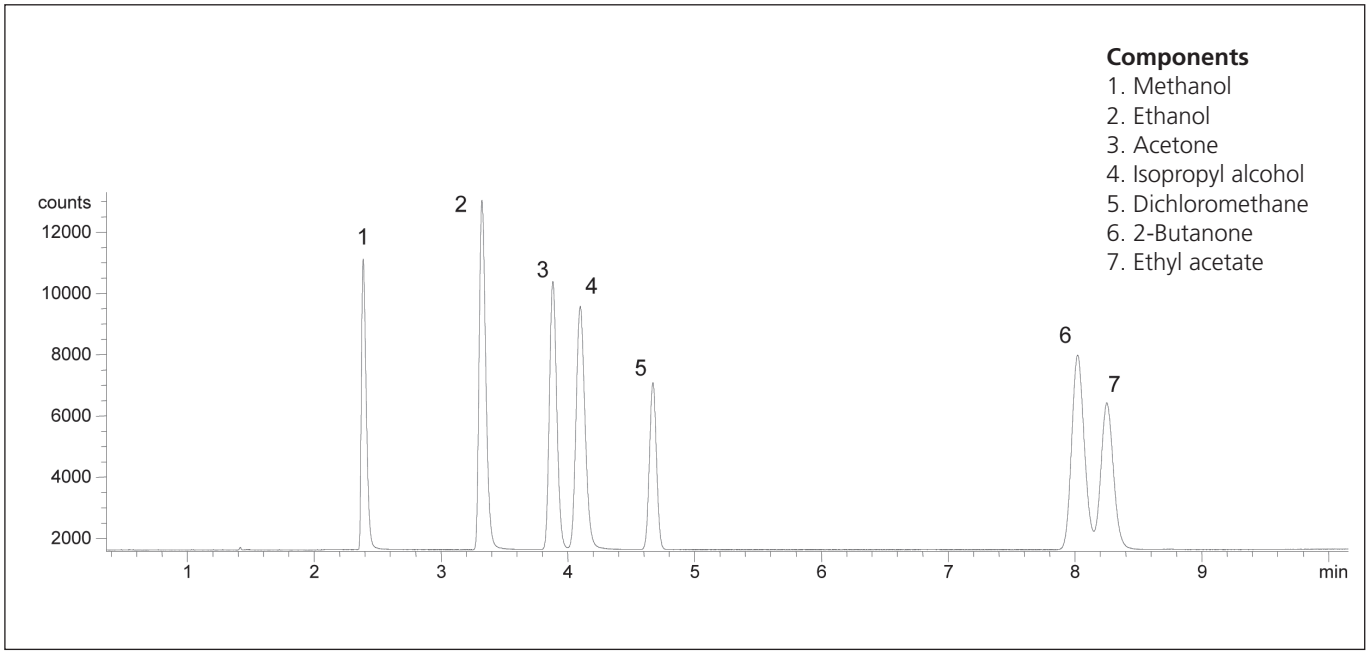
ANALYSIS OF A COMMON SOLVENT MIXTURE ON BP624

Column Part No.:	**054832**	Carrier Gas Flow:	2.2 mL/min.
Phase:	BP624, 1.8 µm film	Constant Flow:	On
Alcohol mix:	1000 ppm in Dimethyl Sulfoxide	Average Linear Velocity:	34 cm/sec at 32 °C
		Injection Mode:	Split
Column:	30 m x 0.32 mm ID	Split Ratio:	100:1
Initial Temp:	32 °C, 9 min.	Injection Volume:	0.2 µL
Rate:	30 °C/min to 190 °C	Injection Temperature:	250 °C
Final Temp:	190 °C, 0 min.	Autosampler:	No
Detector Type:	FID	Liner Type:	4 mm ID Double Taper Liner
Carrier Gas:	He, 9.6 psi	Liner Part Number:	092018



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CAPILLARY COLUMN TEST MIX ON SOLGEL-1MS™

Column Part No.:	**054795**	Injection Mode:	Splitless
Phase:	SolGel-1ms, 0.25 µm film	Purge on Time:	0.5 min.
Sample:	1000 ppm in Pentane	Purge on (Split)	
Column:	30 m x 0.25 mm ID	Vent Flow:	60 mL/min.
Isothermal Temp.:	145 °C, 9 min.	Injection Volume:	1 µL
Detector Type:	Mass Spectrometer	Injection Temp.:	250 °C
Carrier Gas:	He, 34.5 psi	Liner Type:	4 mm ID Double Taper Liner
Carrier Gas Flow:	1.6 mL/min.	Liner Part Number:	092017
Constant Flow:	On	Full Scan / SIM:	Full scan 45-450
Average Linear Velocity:	35 cm/sec at 50 °C		

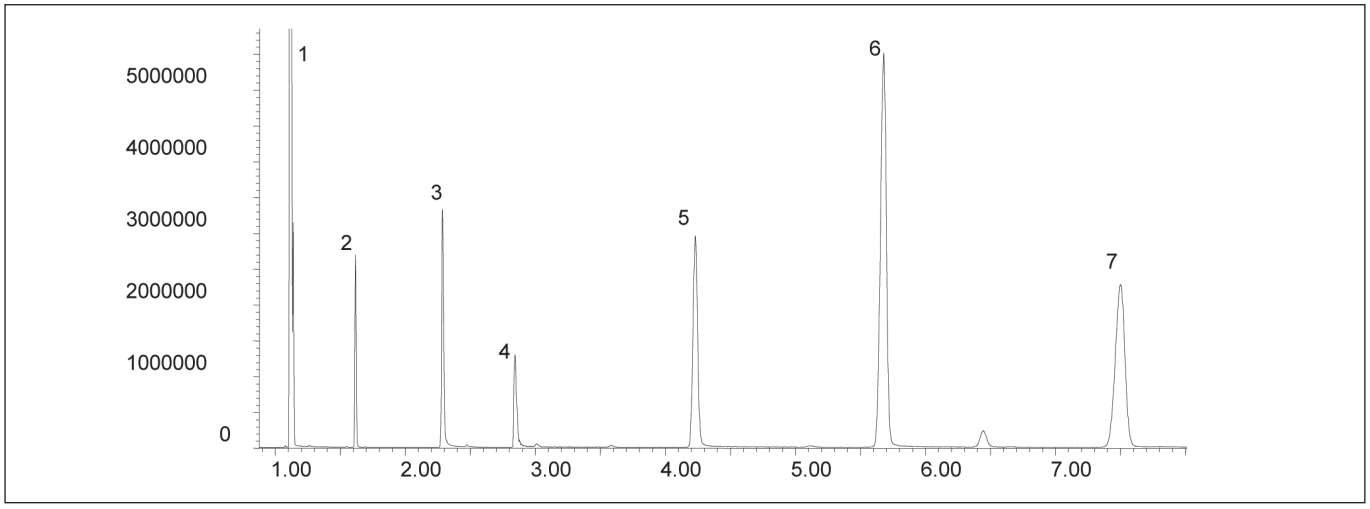

Table 1.

Kovats Index comparison of SolGel-1 with BP1 and a competitors 100 % Dimethyl Polysiloxane.

No.	Component	Kovats Index		
		SolGel-1	BP1	Competitors 100 % Dimethyl Polysiloxane
1	Pentane			
2	Decane	1000	1000	1000
3	4-Chlorophenol	1165	1167	1164
4	Decylamine	1240	1241	1239
5	Undecanol	1357	1358	1356
6	Acenaphthylene	1433	1434	1434
7	Pentadecane	1500	1500	1500

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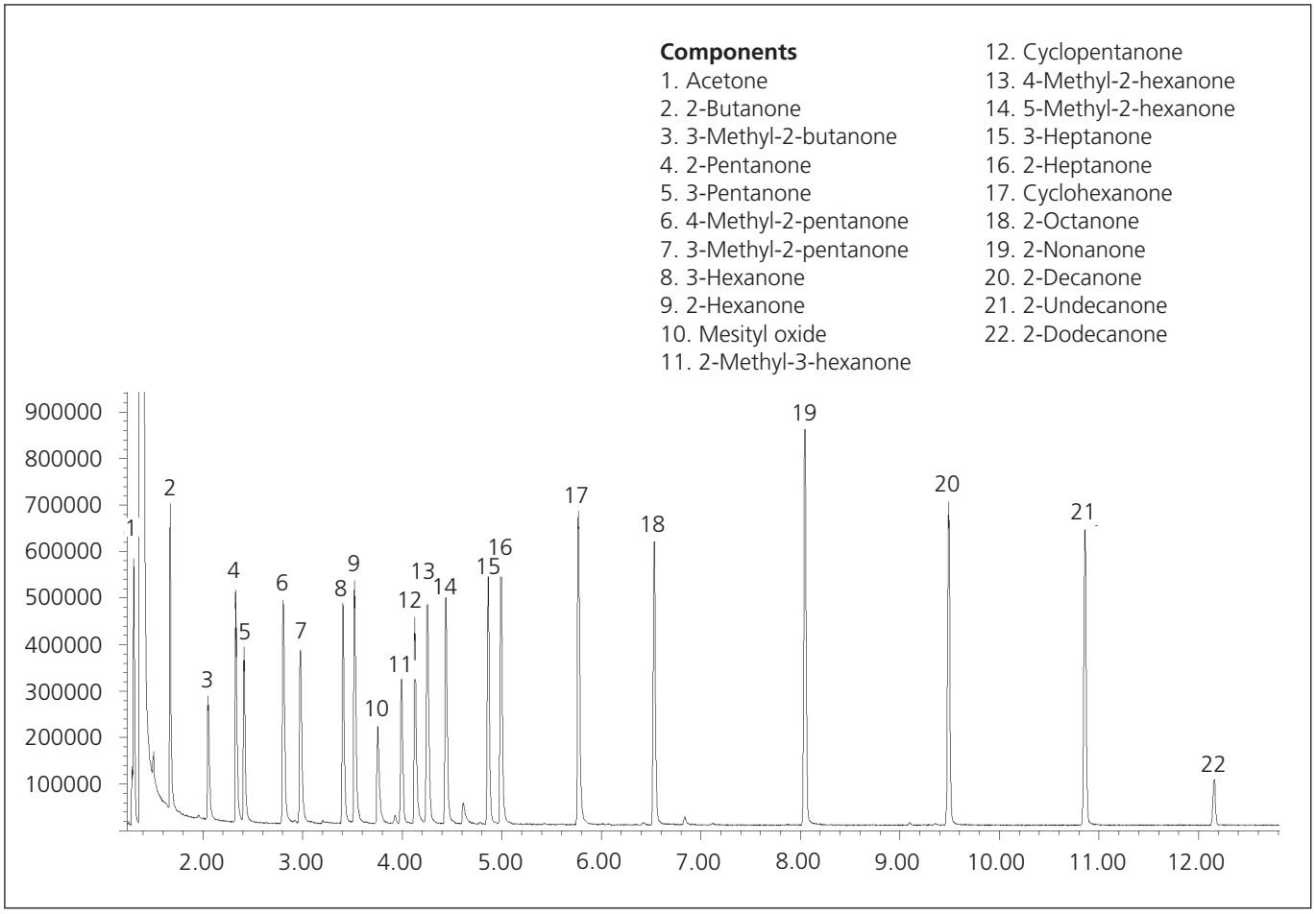
ANALYSIS OF 22 KETONES ON BPX35

Column Part No.:	**054701**	Constant Flow:	On
Phase:	BPX35, 0.25 µm film	Average	
Sample:	300 ppm in dichloromethane	Linear Velocity:	35 cm/sec at 40 °C
Column:	30 m x 0.25 mm ID	Injection Mode:	Split
Initial Temp:	40 °C, 5 min.	Split Ratio:	80:1
Rate:	10 °C/min to 170 °C,	Injection Volume:	0.5 µL
Final Temp:	170 °C, 5 min.	Injection Temp.:	250 °C
Detector Type:	Mass Spectrometer	Liner Type:	4 mm ID Single Taper Liner
Carrier Gas:	He, 25.6 psi	Liner Part Number:	092017
Carrier Gas Flow:	1.6 mL/min.	Full Scan / SIM:	Full scan 45-450



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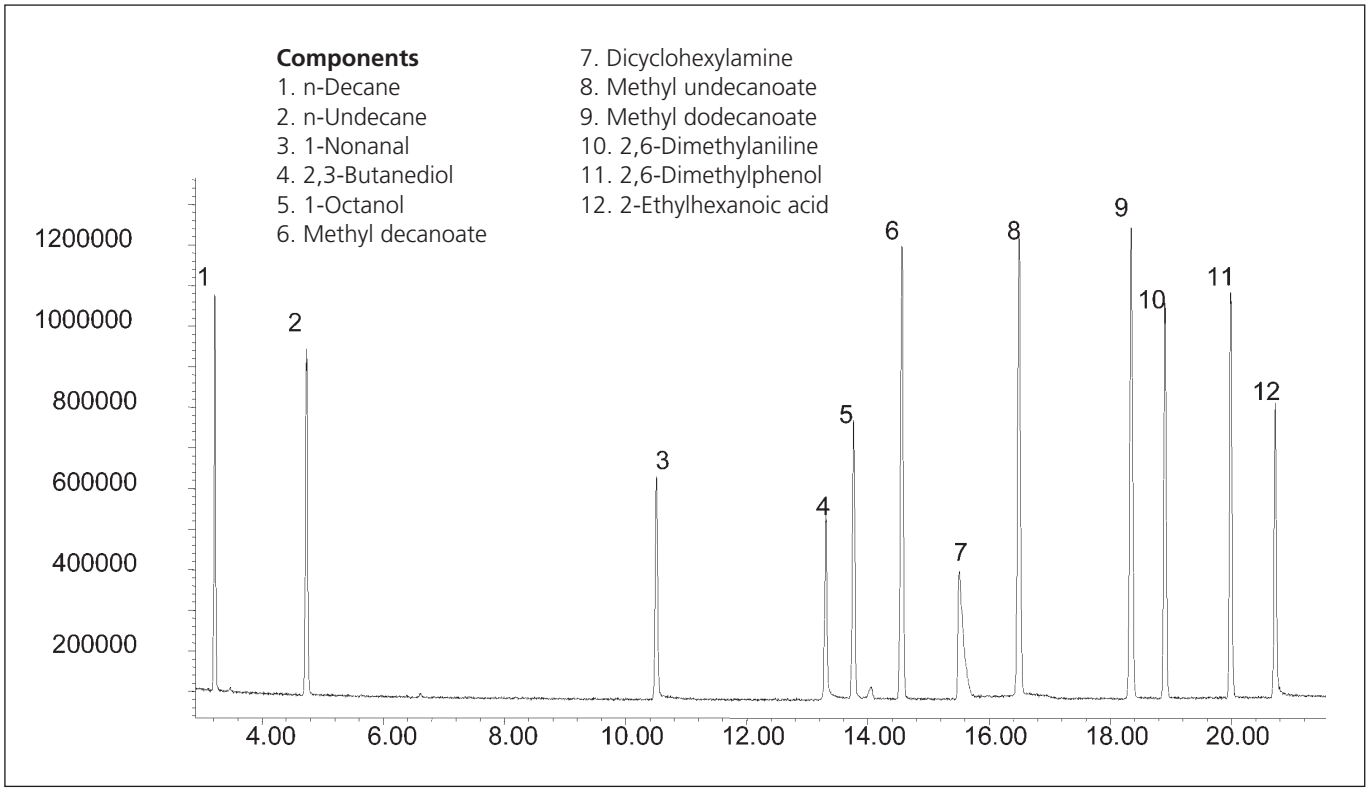
GROB TEST MIX ON SOLGEL-WAX™

Column Part No.:	**054796**	Constant Flow:	On
Phase:	SolGel-WAX, 0.25 µm film	Average	
Sample:	200 ppm in dichloromethane	Linear Velocity:	35 cm/sec at 40 °C
Column:	30 m x 0.25 mm ID	Injection Mode:	Split
Initial Temp.:	40°C, 1 min.	Split Ratio:	50:1
Rate 1:	6 °C/min to 160 °C,	Injection Volume:	1 µL
Final Temp.:	160 °C, 5 min.	Injection Temp.:	250 °C
Detector Type:	Mass Spectrometer	Liner Type:	4 mm ID Single Taper Liner
Carrier Gas:	He, 25.7 psi	Liner Part Number:	092017
Carrier Gas Flow:	1.8 mL/min.	Full Scan / SIM:	Full scan 45-450



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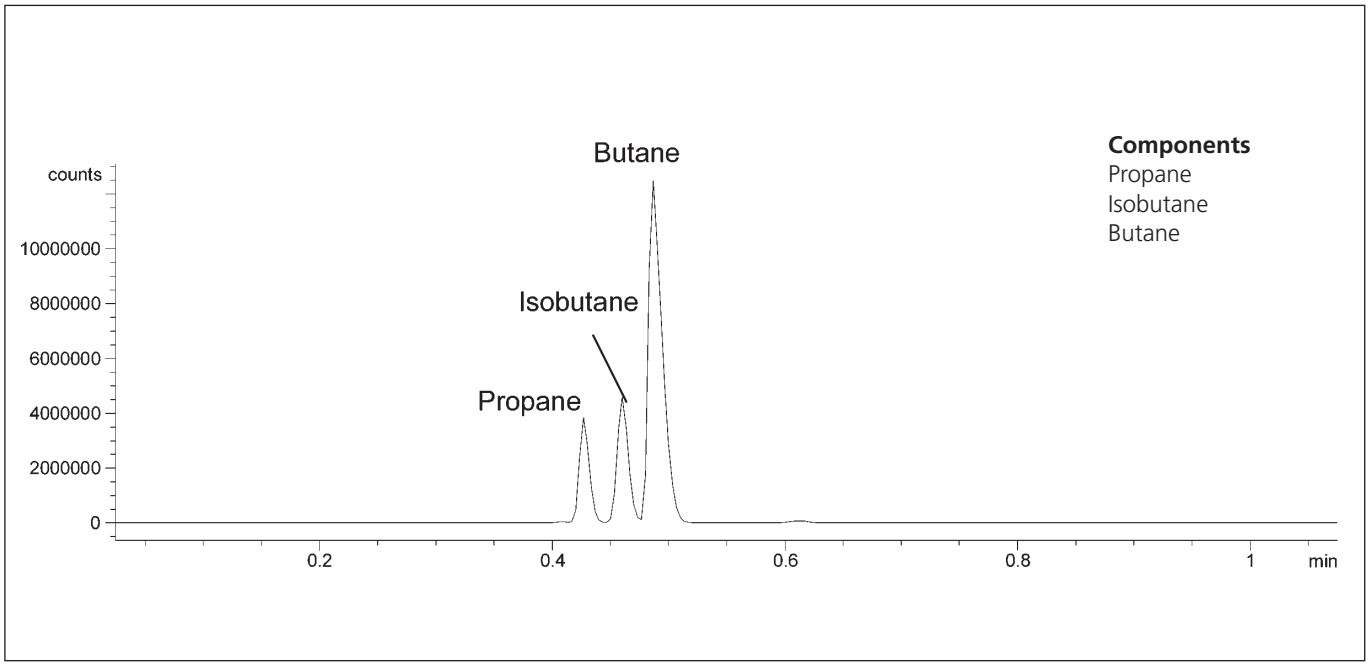
ANALYSIS OF CIGARETTE LIGHTER FUEL ON A 6 METRE BPX5 COLUMN

Column Part No.:	**0541261**	Constant Flow:	On
Phase:	BPX5, 1.0 µm film	Average	
Sample:	Butane mixture from lighter	Linear Velocity:	35 cm/sec at 30 °C
Column:	6 m x 0.32 mm ID	Injection Mode:	Split
Isothermal Temp.:	30 °C, 5 min.	Split Ratio:	100:1
Detector Type:	FID	Injection Volume:	10 µL
Detector Temp.:	270 °C	Injection Temp.:	250 °C
Carrier Gas:	He, 1.94 psi	Liner Type:	4 mm ID Single Taper Liner
Carrier Gas Flow:	1.7 mL/min.	Liner Part Number:	092017



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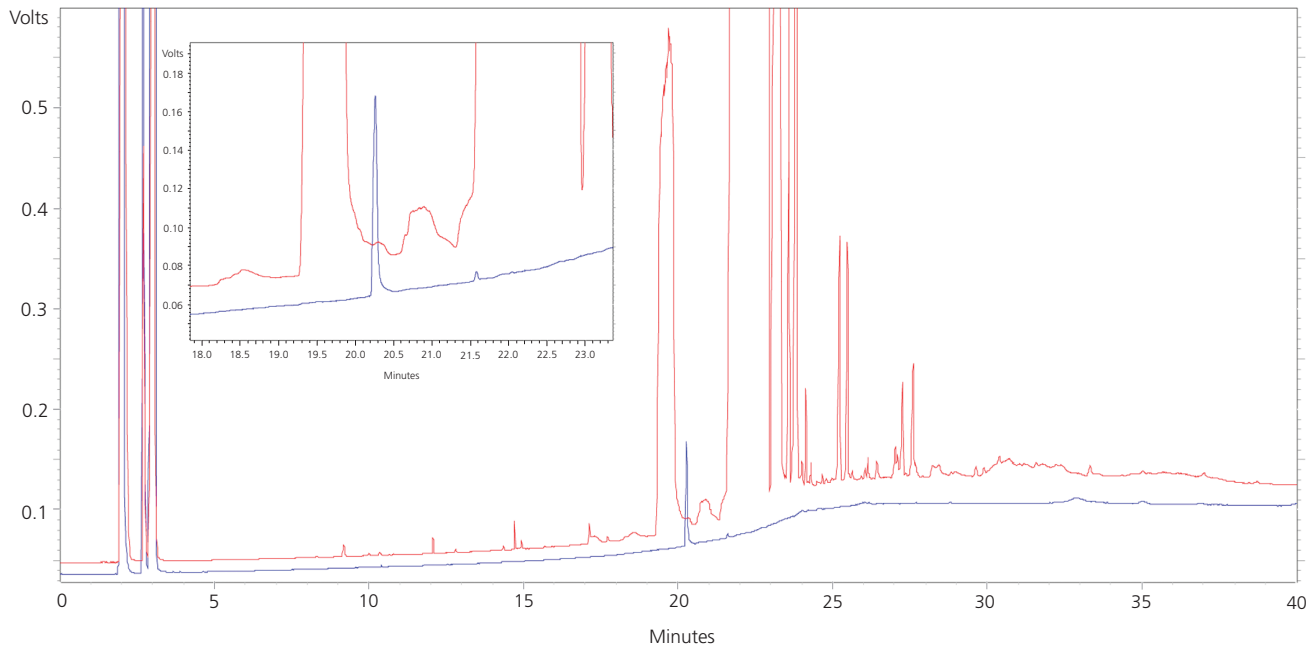
ANALYSIS OF GLYCEROL IN BIODIESEL ON SOLGEL-WAX

Column Part No.:	**054796**	Carrier Gas:	He, 14 psi
Phase:	SolGel-WAX, 0.25 µm film	Carrier Gas Flow:	1.2 mL/min.
Sample:	500 ppm glycerol and Biodiesel	Constant Flow:	On
Column:	30 m x 0.25 mm ID	Average	
Instrument:	HP5890	Linear Velocity:	29 cm/sec at 50 °C
Initial Temp:	50 °C, 2 min.	Injection Mode:	Split
Rate 1:	10 °C/min to 280 °C,	Injection Volume:	1 µL
Final Temp:	280 °C, 16 min.	Injection Temp.:	250 °C
Detector Type:	FID	ATAS Optic 2-200 programmable injector	
Detector Temp.:	300 °C	Focus Autosampling Robot	



Upper trace: *Injection of 1 µL of Biodiesel;* ***Lower trace:*** *injection of 1 µL of 500 ppm glycerol; Insert: Close-up of glycerol peak*

SGE would like to thank ATAS UK for supplying the chromatograms and conditions for this analysis

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GC ANALYTICAL SOLUTIONS

SGE

SOL 32

SOLVENTS

Analysis of Ethylene Glycol in Wastewater by Direct Aqueous Injection on SolGel-WAX

Phase:	**SolGel-WAX, 0.25µm film**
Sample:	**ethylene glycol in HPLC grade water (standards)**
Column:	**30m x 0.25 mm ID**
Instrument:	**Agilent 5890**

Injector Optic 3 Programmable Injector

Initial Temp:	100°C, 2 min.
Rate 1:	10°C/min to 230°C,
Final Temp:	230°C
Detector Type:	FID
Detector temp:	250°C
Carrier Gas:	He,

Optic conditions

Initial Temp:	60°C
Ramp Rate:	16°C/min
Final temp:	250°C
Injection Volume:	2 µL
Liner Type:	4 mm ID Fritted
Transfer column flow:	2.3mL/min
Transfer time:	2 min.
Initial column flow:	2.3 mL/min
Column flow:	2.3 mL/min
Split flow:	100 mL/min
Column Part Number:	**054796**

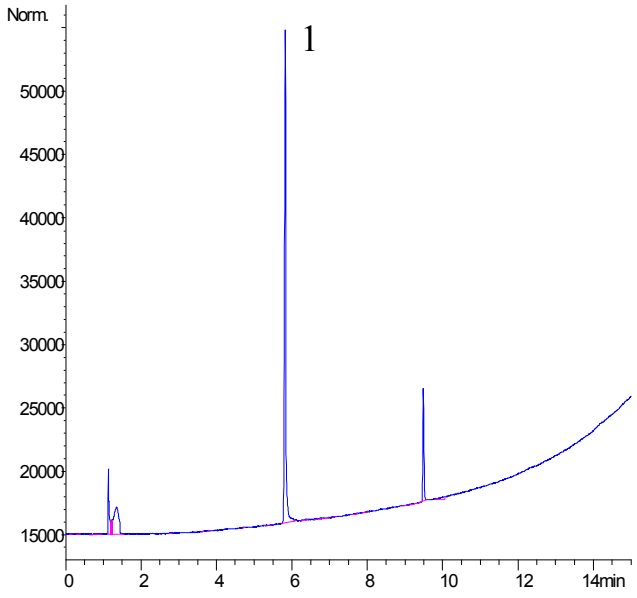


Figure 1: *2uL cold split injection of 5ppm ethylene glycol (1) standard*

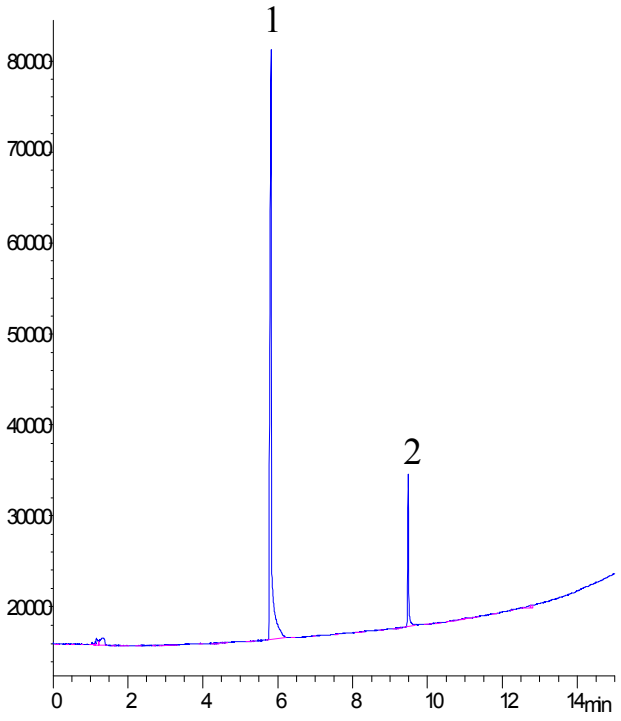


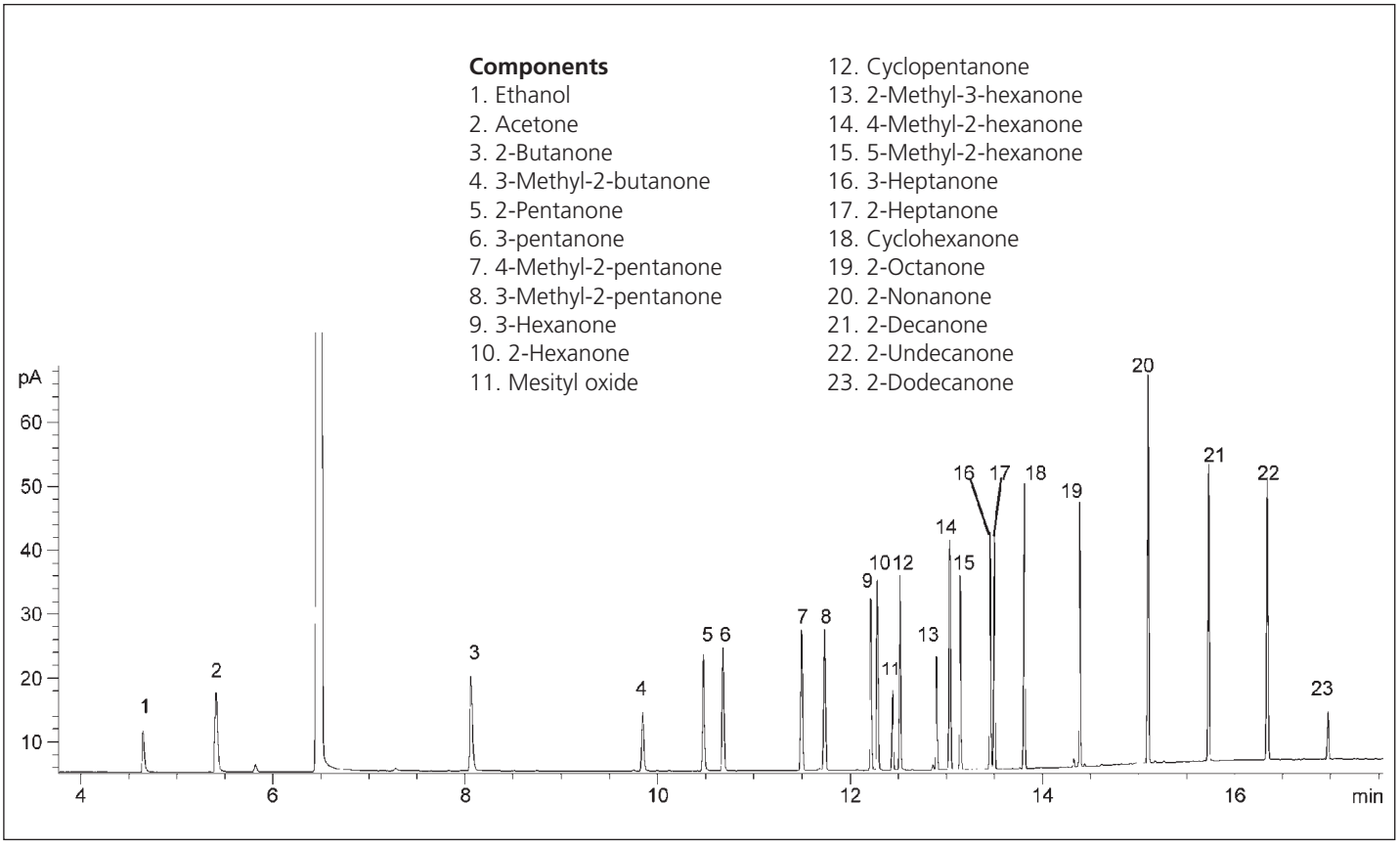
Figure 2: *2uL cold split injection of waste water: (1) ethylene glycol; (2) diethylene glycol*

ACKNOWLEDGEMENT

SGE would like to thank ATAS for supplying the chromatograms and data for this application note.

ANALYSIS OF KETONES ON THICK FILM BPX5

Column Part No.:	**054123**	Carrier Gas Flow:	1.9 mL/min.
Phase:	BPX5, 1.0 µm film	Constant Flow:	On
Sample:	300 ppm in dichloromethane	Average	
Column:	60 m x 0.25 mm ID	Linear Velocity:	35 cm/sec at 40 °C
Initial Temp.:	40 °C, 5 min.	Injection Mode:	Split
Rate 1: 1	0 °C/min to 80 °C	Split Ratio:	100:1
Rate 2:	30 °C/min to 260 °C	Injection Volume:	0.4 µL
Final Temp:	260 °C, 4 min.	Injection Tem.:	250 °C
Detector Type:	FID	Liner Type:	4 mm ID Single Taper Liner
Detector Temp.:	360 °C		
Carrier Gas:	He, 27.6 psi	Liner Part Number:	092017



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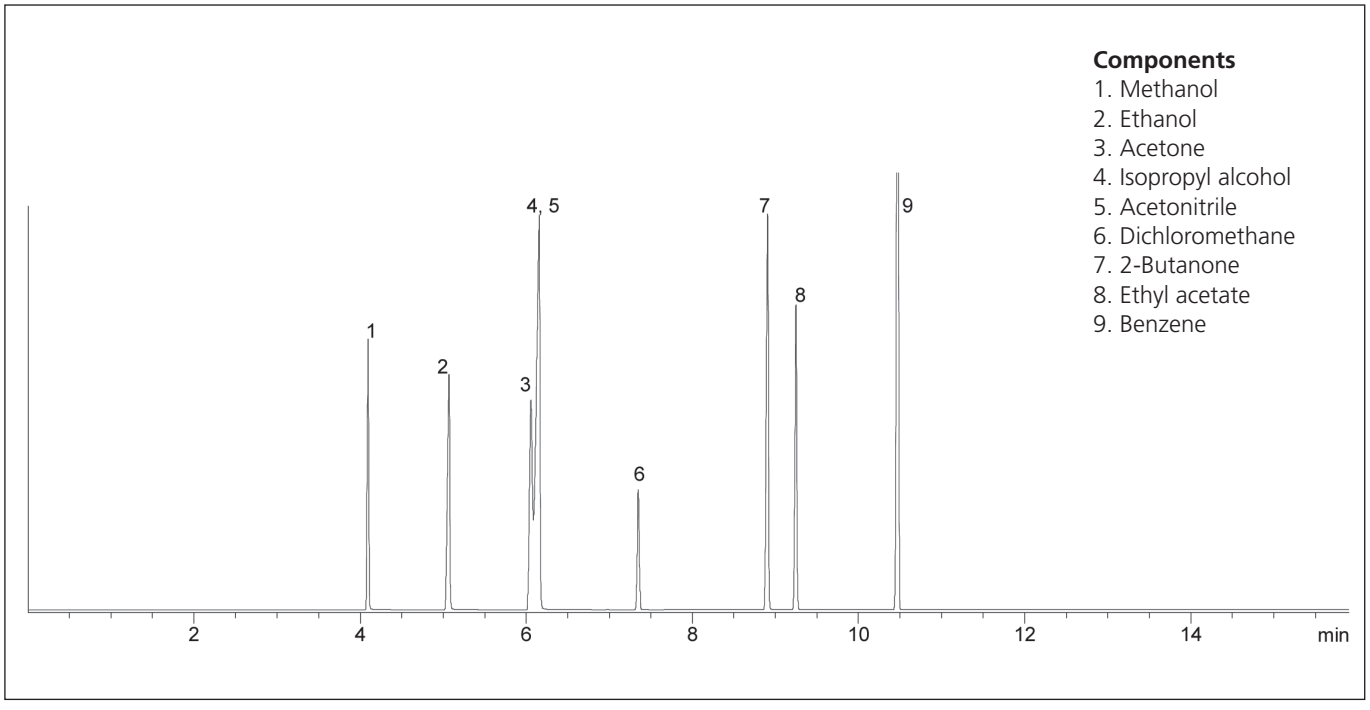
SGE Analytical Science

ANALYSIS OF A COMMON SOLVENT MIXTURE ON A THICK FILM BPX5

Column Part No.:	**054123**	Carrier Gas Flow:	1.9 mL/min.
Phase:	BPX5, 1.0 µm film	Constant Flow:	On
Sample:	neat	Average	
Column:	60 m x 0.25 mm ID	Linear Velocity:	35 cm/sec at 40 °C
Initial Temp.:	32 °C, 5 min.	Injection Mode:	Split
Rate 1:	20 °C/min to 190 °C,	Split Ratio:	100:1
Final Temp:	190 °C, 2 min.	Injection Volume:	0.3 µL
Detector Type:	FID	Injection Temp.:	250 °C
Detector Temp.:	360 °C	Liner Type:	4 mm ID Single Taper Liner
Carrier Gas:	He, 26.9 psi	Liner Part Number:	092017



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