

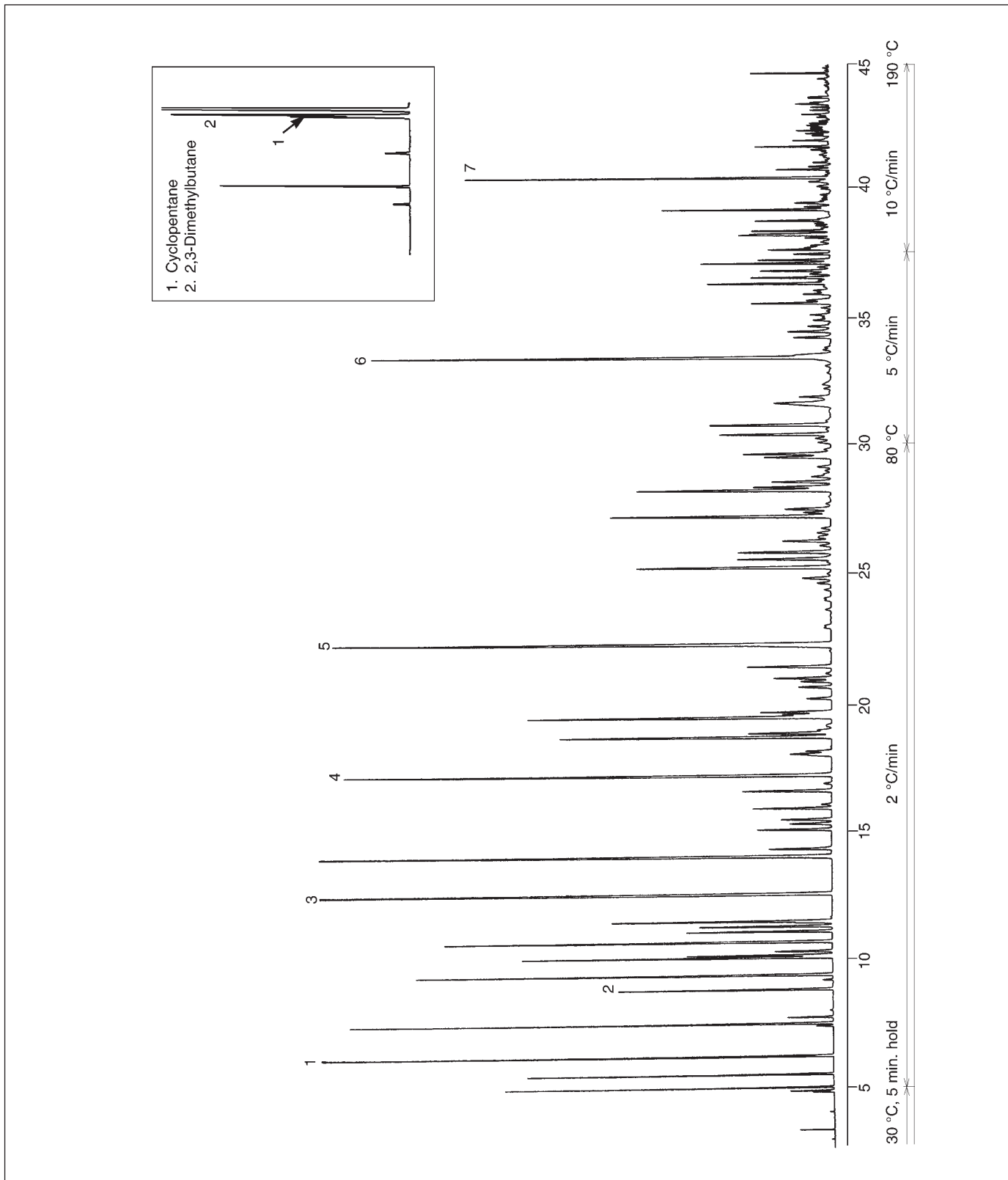
ANALYSIS OF GASOLINE RANGE HYDROCARBONS ON BP1-PONA

GASOLINE RANGE HYDROCARBONS

Column Part No.:	054950	Temp. 3:	120 °C
Phase:	BP1, PONA	Rate 3:	10 °C/min
Column:	50 m x 0.15 mm ID	Final Temp.:	190 °C
Initial Temp.:	30 °C, 5 min hold	Detector:	FID
Rate 1:	2 °C/min	Sensitivity:	32 x 10 ⁻¹² AFS
Temp. 2:	80 °C	Injection Mode:	Split
Rate 2:	50 °C/min	Carrier Gas:	H ₂ , 40 psi

Components	Retention Time (min)	Compound Name
TIME COMPOUND	18.43	2-Methyl-3-ethylpentane
4.85 Cyclopentane	18.84	2-Methylheptane
5.00 2,3-Dimethylbutane	19.69	1-Methyl-2-ethylcyclopentane
5.25 2-Methylpentane	18.98	4-Methylheptane
5.74 3-Methylpentane	19.23	1-cis-2-cis-4-trans-Trimethylcyclopentane
1. 6.45 n-Hexane	19.50	3-Methylheptane
7.46 2,2-Dimethylpentane	19.77	1-trans-4-Dimethylcyclohexane
7.60 Methylcyclopentane	20.73	1-Methyl-cis-2-ethylcyclopentane
7.91 2,4-Dimethylpentane	20.86	1-Methyl-trans-3-ethylcyclopentane
8.18 2,2,3-Trimethylbutane	21.08	1-Methyl-cis-3-ethylcyclohexane
2. 8.99 Benzene	21.27	1-Ethyl-1-methylcyclopentane
9.35 3,3-Dimethylpentane	21.53	1-trans-2-Dimethylcyclohexane
9.55 Cyclohexane	5. 22.43	n-Octane
10.23 2-Methylhexane	23.05	iso-Propylcyclopentane
10.32 2,3-Dimethylpentane	24.14	2.2.5-Trimethylhexane
10.47 1,1-Dimethylcyclohexane	24.19	2,2,4-Trimethylhexane
10.83 3-Methylhexane	24.53	2,4,4-Trimethylhexane
11.23 1-trans-3-Dimethylcyclopentane	24.79	2,3,5-Trimethylhexane
11.43 1-cis-3-Dimethylcyclopentane	25.16	2,4-Dimethylheptane
11.55 3-Ethylpentane	25.41	n-Propylcyclopentane
11.63 1-trans-2-Dimethylcyclopentane	25.73	1-cis-2-Dimethylcyclohexane
11.78 2,2,4-Trimethylpentane	26.00	1,1,3-Trimethylcyclohexane
3. 12.73 n-Heptane	26.25	2,5-Dimethylheptane
14.23 Methylcyclohexane	26.44	3,3-Dimethylheptane
14.53 2,2-Dimethylhexane	26.58	3,5-Dimethylheptane
15.27 Ethylcyclopentane	26.77	4,4-Dimethylheptane
15.49 2,5-Dimethylhexane	26.94	2,3,3-Trimethylhexane
15.65 2,4-Dimethylhexane	27.43	Ethylbenzene
16.09 1-trans-2-cis-4-Trimethylcyclopentane	27.57	1-cis-3-cis-5-Trimethylpentane
16.24 2,3,4-Trimethylpentane	27.69	1,1,4-Trimethylcyclohexane
16.78 1-trans-2-cis-3-Trimethylcyclopentane	27.88	2,3,4-Trimethylhexane
17.05 2,3,3-Trimethylpentane	28.15	3,3,4-Trimethylhexane
4. 17.39 Toluene	28.42	m-Xylene
18.27 2,3-Dimethylhexane	28.54	p-Xylene
	28.74	2,3-Dimethylheptane
	28.84	1-cis-2-trans-4-trans-Trimethylcyclohexane
	28.95	1-cis-2-trans-4-cis-Trimethylcyclohexane
	29.16	3,4-Dimethylheptane
	29.31	3-Methylethylhexane
	29.68	4-Methyloctane
	29.81	2-Methyloctane
	30.56	3-Methyloctane
	30.93	o-Xylene
	31.75	1-Methyl-2-propylcyclopentane and 1-Methyl-trans-4-ethylcyclohexane
	31.98	1-Methyl-cis-4-ethylcyclohexane
	32.46	3,3-Diethylpentane
	32.89	2,2,6-Trimethylheptane
	33.17	1,1,2-Trimethylcyclohexane
	6. 33.52	n-Nonane
	34.26	iso-Propylbenzene
	34.48	tert-Butylcyclopentane
	34.68	tert-Butylbenzene
	35.57	sec-Butylcyclopentane
	36.33	3-Methylnonane
	36.56	n-Propylbenzene
	36.83	n-Propylcyclohexane
	37.12	m-Ethyltoluene
	37.24	p-Ethyltoluene
	37.64	1,3,5-Trimethylbenzene
	38.20	2-Methylnonane
	38.36	o-Ethyltoluene
	38.75	3,6-Dimethyloctane
	38.75	1,2,4-Trimethylbenzene
	7. 40.32	n-Decane
	40.63	1,2,3-Trimethylbenzene
	41.57	4-Methyldecane
	41.94	sec-Butylbenzene
	42.45	n-Butylbenzene
	44.54	n-Undecane

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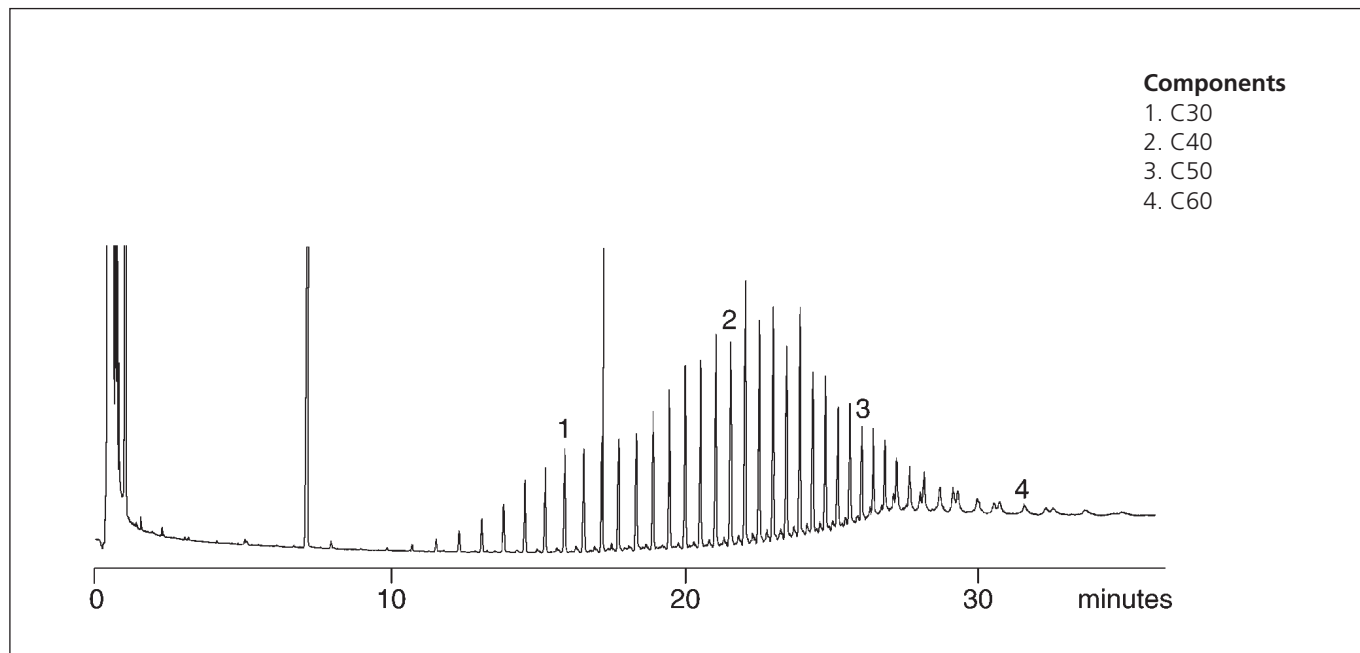
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ANALYSIS OF MICROCRYSTALLINE WAX ON BPX5

MICROCRYSTALLINE WAX

Column Part No.:	054118	Final Temp:	375 °C 20 min
Phase:	BPX5, 0.25 µm film	Detector:	FID
Column:	12 m x 0.32 mm ID	Sensitivity:	30 x 10 ⁻¹² AFS
Initial Temp:	120 °C, 1 min	Injection Mode:	On-Column
Rate:	10 °C/min	Carrier Gas:	H ₂ , 10psi.

Notes: It is recommended to use cool on-column injection to ensure no loss of high molecular weight fraction.

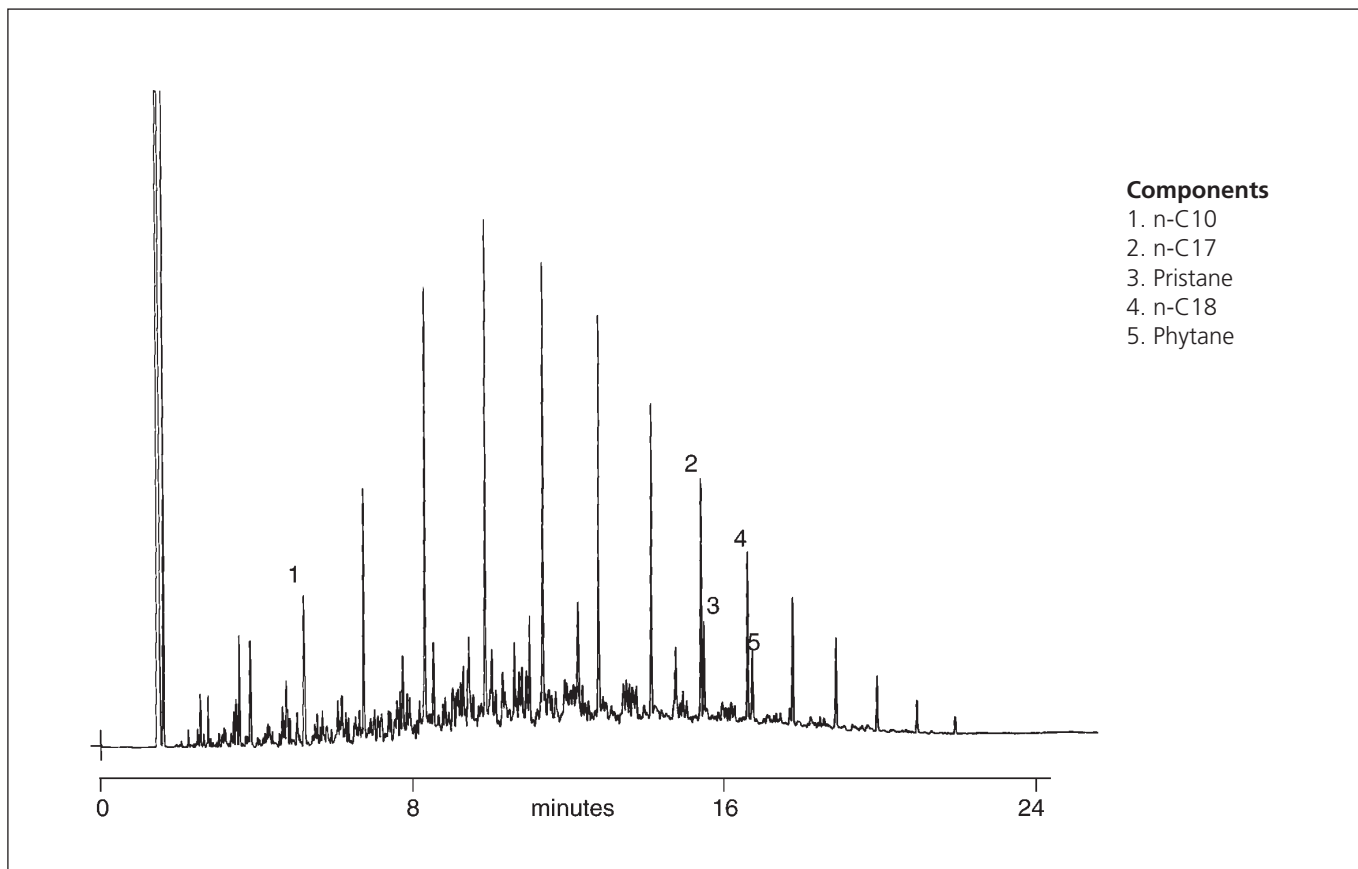


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ANALYSIS OF FURNACE OIL IN PENTANE ON BP5

FURNACE OIL IN PENTANE

Column Part No.:	054118	Final Temp:	350 °C, 20 min
Phase:	BPX5, 0.25 µm film	Detector:	FID
Column:	12 m x 0.32 mm ID	Sensitivity:	40 x 10 ⁻¹² AFS
Initial Temp:	100 °C, 2 min	Injection Mode:	On Column
Rate:	10 °C/min	Carrier Gas:	H ₂ , 10 psi.

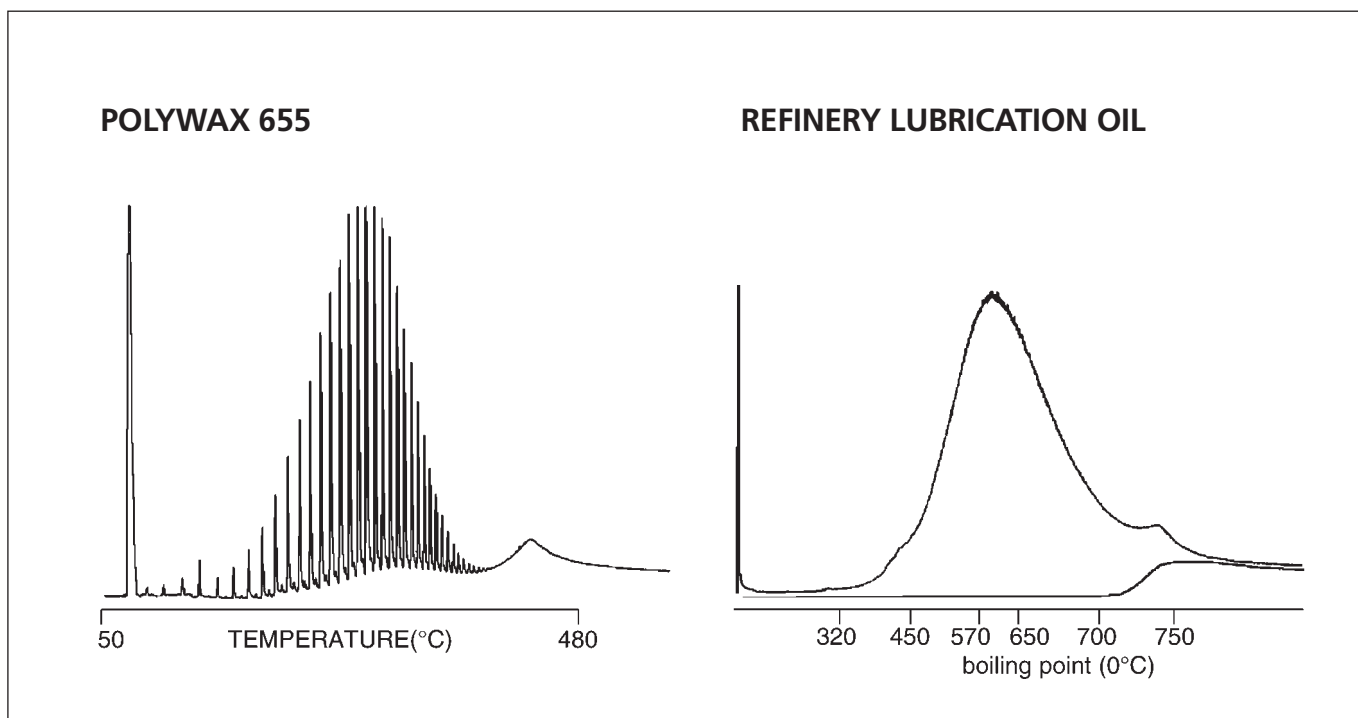


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ANALYSIS OF POLYWAX 655 & REFINERY LUBRICATION OIL ON HT5

POLYWAX 655 & REFINERY LUBRICATION OIL

Column Part No.:	054661	Final Temp.:	480 °C, 15 min
Phase:	HT5, 0.1 µm	Detector:	FID
Column:	6 m x 0.53 mm ID	Sensitivity:	40 x 10 ⁻¹² AFS
Initial Temp.:	50 °C	Injection Mode:	On-Column
Rate:	10 °C/min	Carrier Gas:	Hydrogen, 20 ml/min
		Solvent:	CS ₂

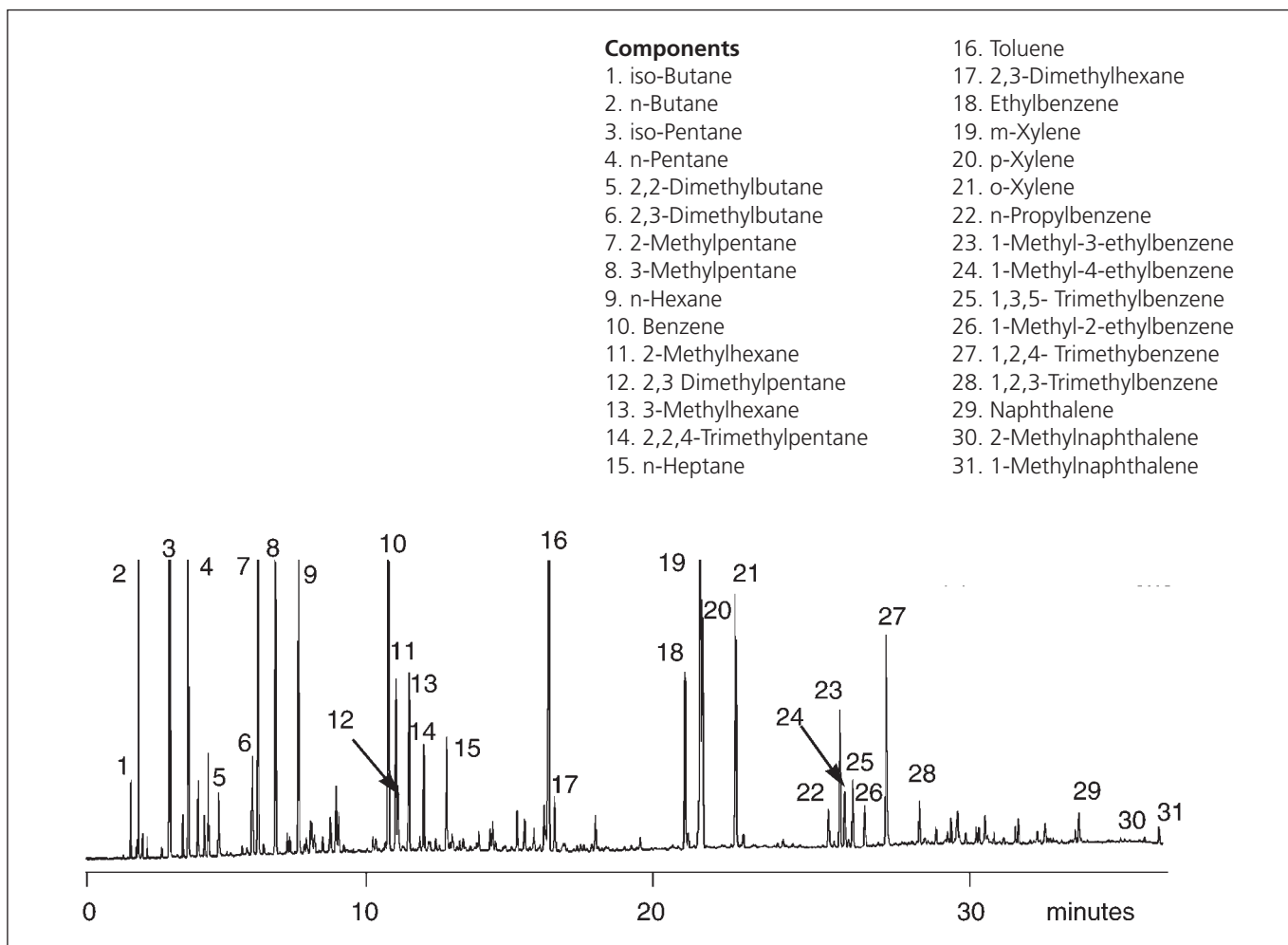


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ANALYSIS OF LEADED PETROL ON BPX5

LEADED PETROL

Column Part No.:	054101	Rate 2:	8 °C/min
Phase:	BPX5, 0.25 µm film	Final Temp.:	150 °C
Column:	30 m x 0.25 mm ID	Detector:	FID
Initial Temp.:	-20 °C, 1 min	Sensitivity:	10 x 10 ⁻¹² AFS
Rate 1:	4 °C/mn	Injection Mode:	Split
Temp. 2:	40 °C	Carrier Gas:	H ₂ , 10 psi



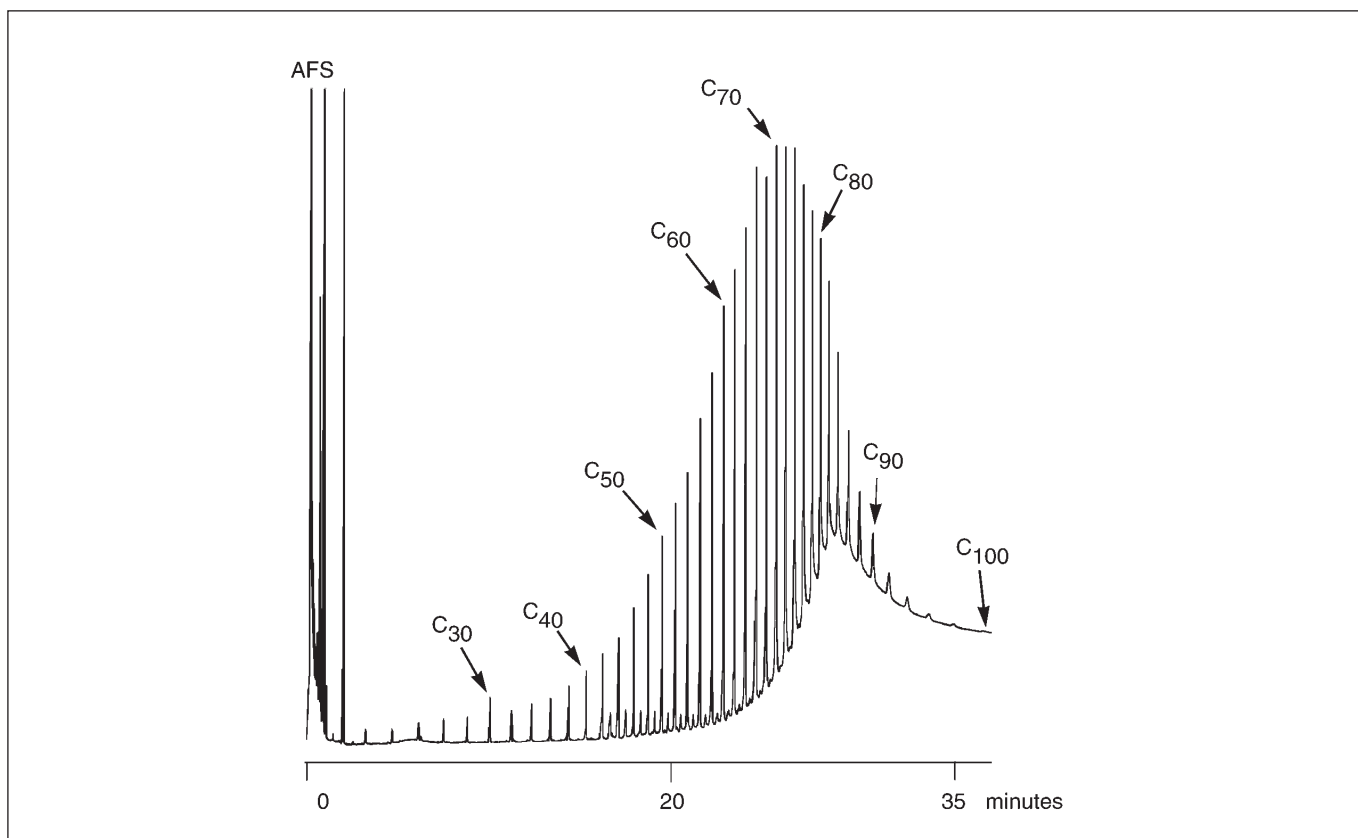
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ANALYSIS OF POLYWAX 1000 ON HT5

POLYWAX 1000

Column Part No.:	054662	Final Temp.:	480 °C
Phase:	HT5, 0.15 µm	Carrier Gas:	H ₂ , 5 psi
Column:	12 m x 0.53 mm I.D. (Aluminium Clad)	Detector:	F.I.D.
Initial Temp.:	200 °C	Sensitivity:	32 x 10 ⁻¹² AFS
Program Rate:	10 °C/min.	Injection Mode:	Split
		Solvent	CS ₂

Notes: On-column injection is recommended for all analyses where hydrocarbons above C₅₀ are to be analysed.



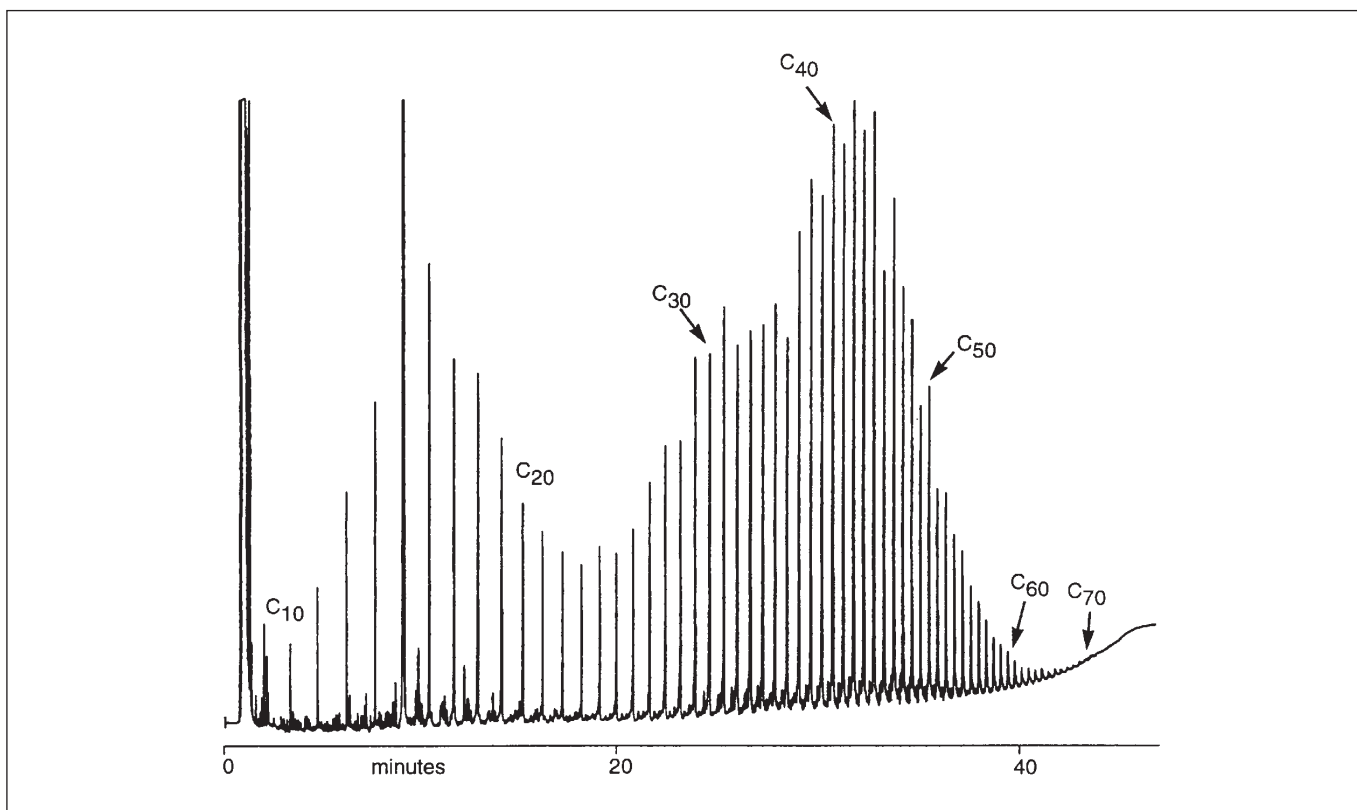
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ANALYSIS OF CRUDE OIL AND WAX MIXTURES ON HT5

CRUDE OIL AND WAX MIXTURE

Column Part No.:	054635	Program Rate:	10 °C/min.
Phase:	HT5, 0.1 µm	Final Temp.:	480 °C
Column:	12 m x 0.22 mm I.D. (Aluminium Clad)	Carrier Gas:	H ₂ , 15 psi
Initial Temp.:	35 °C	Detector:	F.I.D.
		Sensitivity:	32 x 10 ⁻¹² AFS
		Injection Mode:	Split

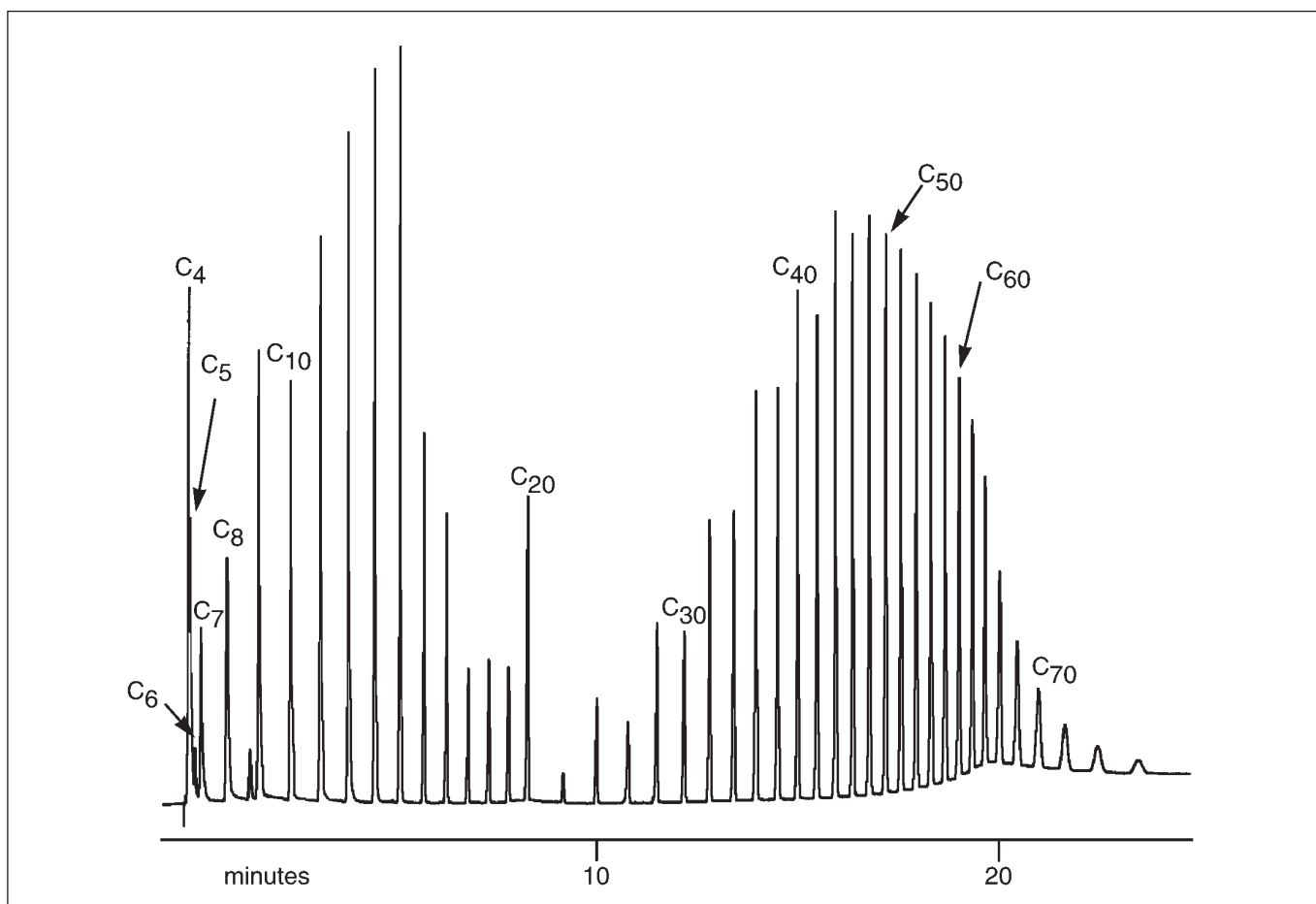
Notes: HT5 is the best column for the analysis of hydrocarbons C₁₀ - C₇₀.



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ANALYSIS OF POLYWAX 500 AND C₄-C₂₀ N-PARAFFINS ON HT5

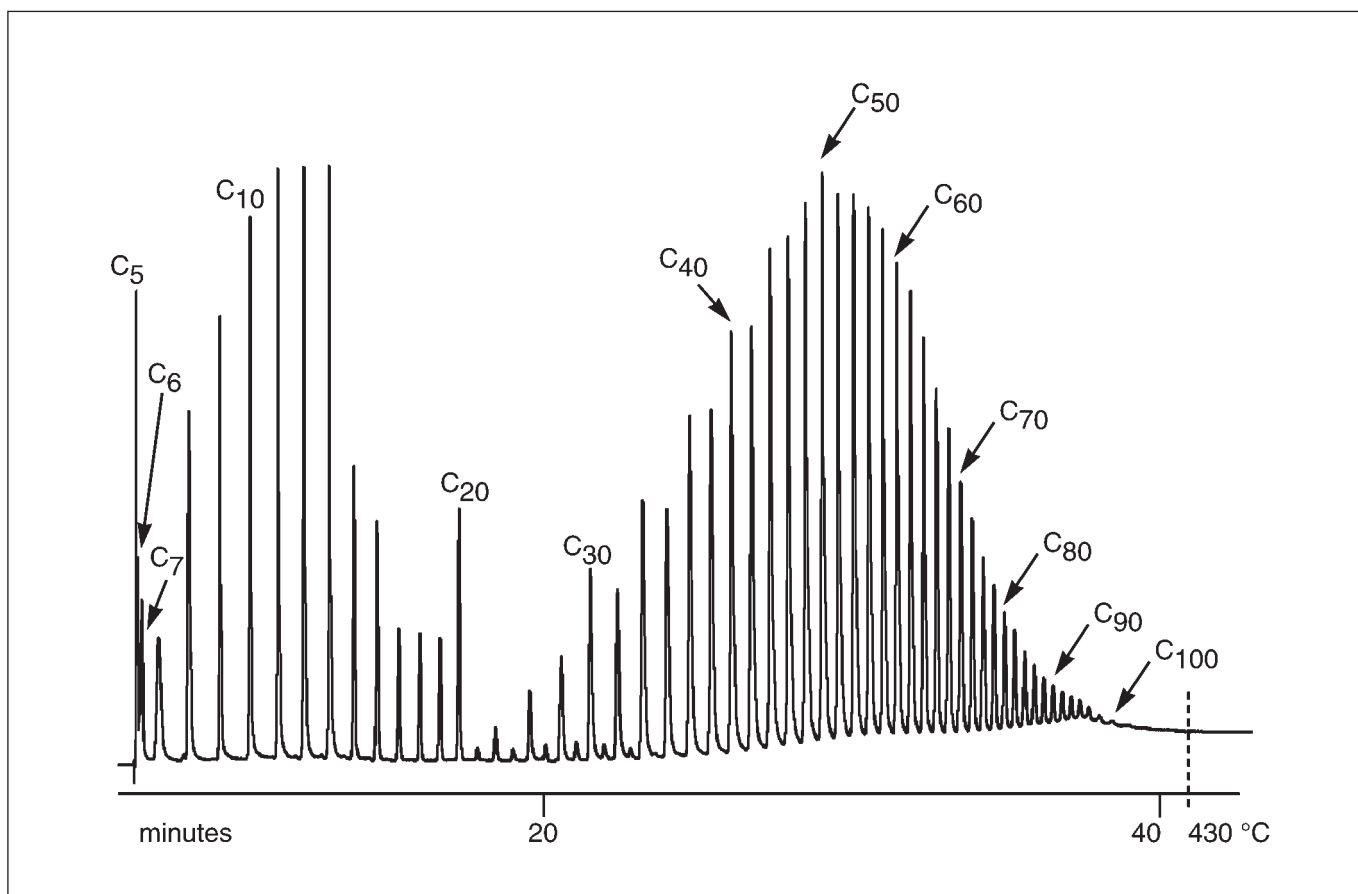
Column Part No.:	054670	Rate:	10 °C/min
Phase:	HT5, 0.5 µm film	Final Temp:	410 °C, 5 min
Column:	10 m x 0.53 mm ID	Carrier Gas:	He, 20 mL/min
Initial Temp:	10 °C, 1 min	Solvent:	CS ₂



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ANALYSIS OF POLYWAX 655 ON A 6 M X 0.53 MM ID HT5

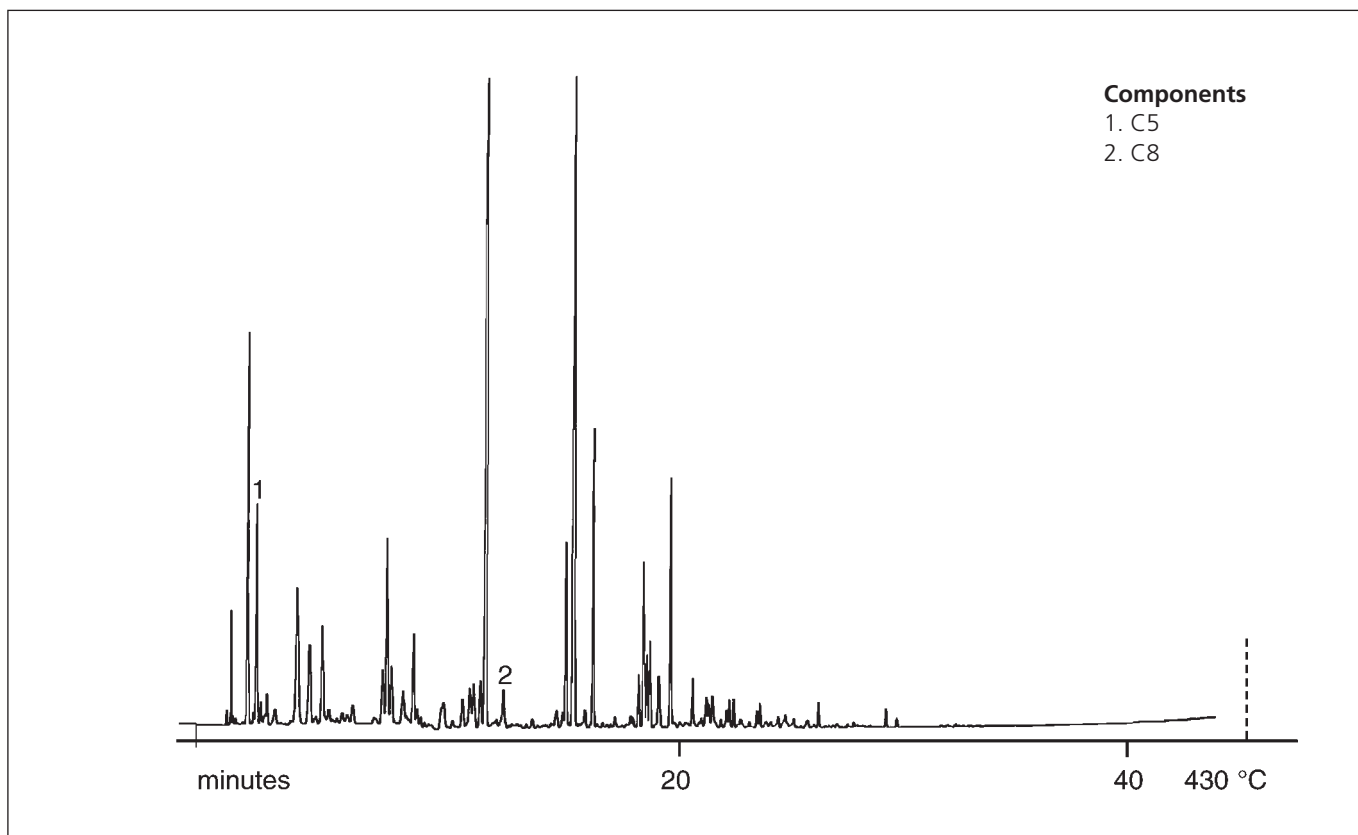
Column Part No.:	054661	Rate:	10 °C/min
Phase:	HT5, 0.1 µm film	Final Temp:	430 °C, 5 min
Column:	6 m x 0.53 mm ID (aluminium clad)	Carrier Gas:	He, 20 mL/min
Initial Temp:	-20 °C, 1 min	Solvent:	CS ₂



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GASOLINE SAMPLE ON THICK FILM BPX5

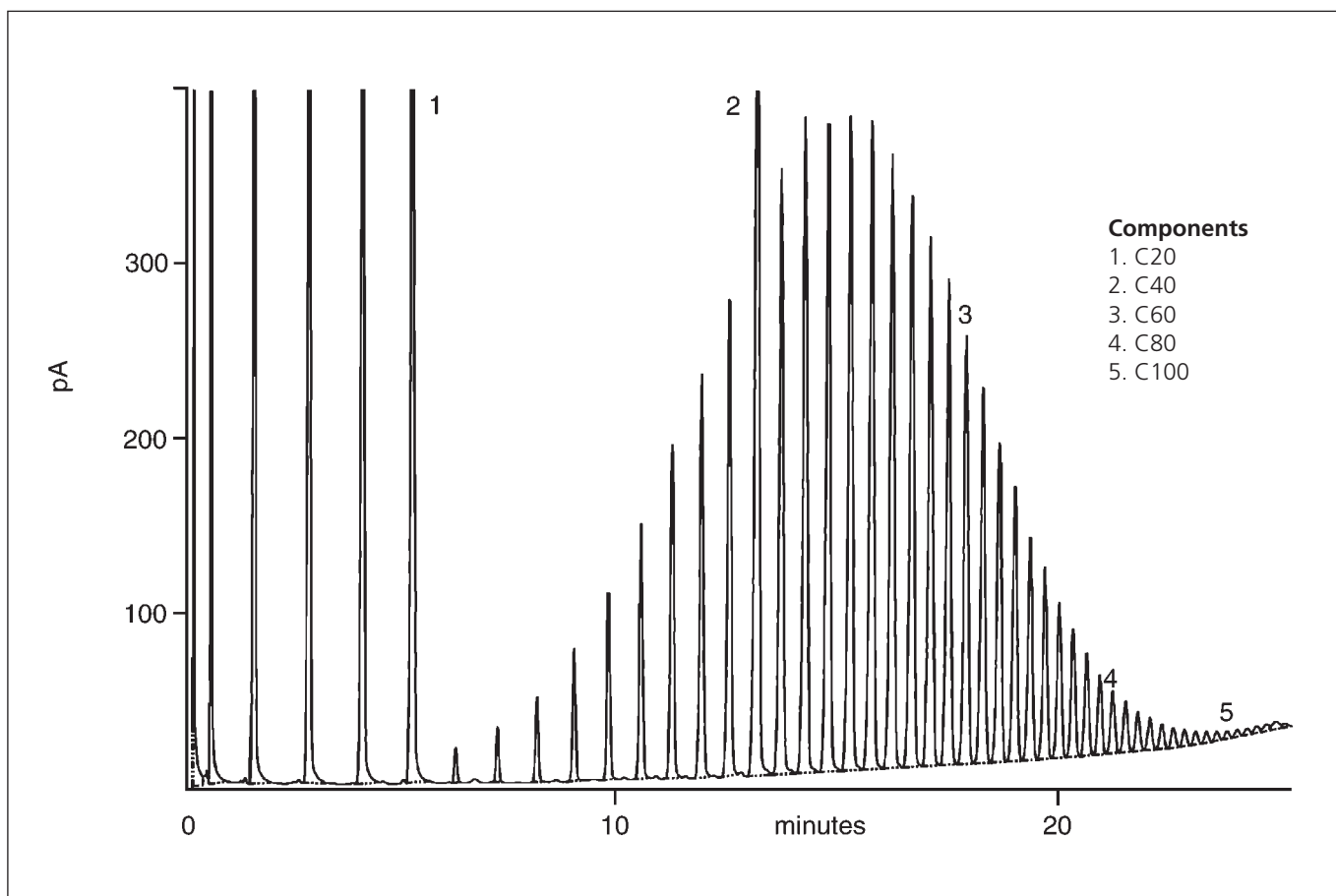
Column Part No.:	054136	Final Temp.:	340 °C, 5 min
Phase:	BPX5, 3.0 μm	Detector:	FID, 360 °C
Column:	25 m x 0.32 mm ID	Injector Mode:	Split, 100:1, 240 °C
Initial Temp.:	35 °C, 5 min	Carrier Gas:	He, 10 psi
Rate 1:	5 °C/min	Injection Volume:	0.1 μL



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ANALYSIS OF POLYWAX 655 ON MEGABORE BPX1

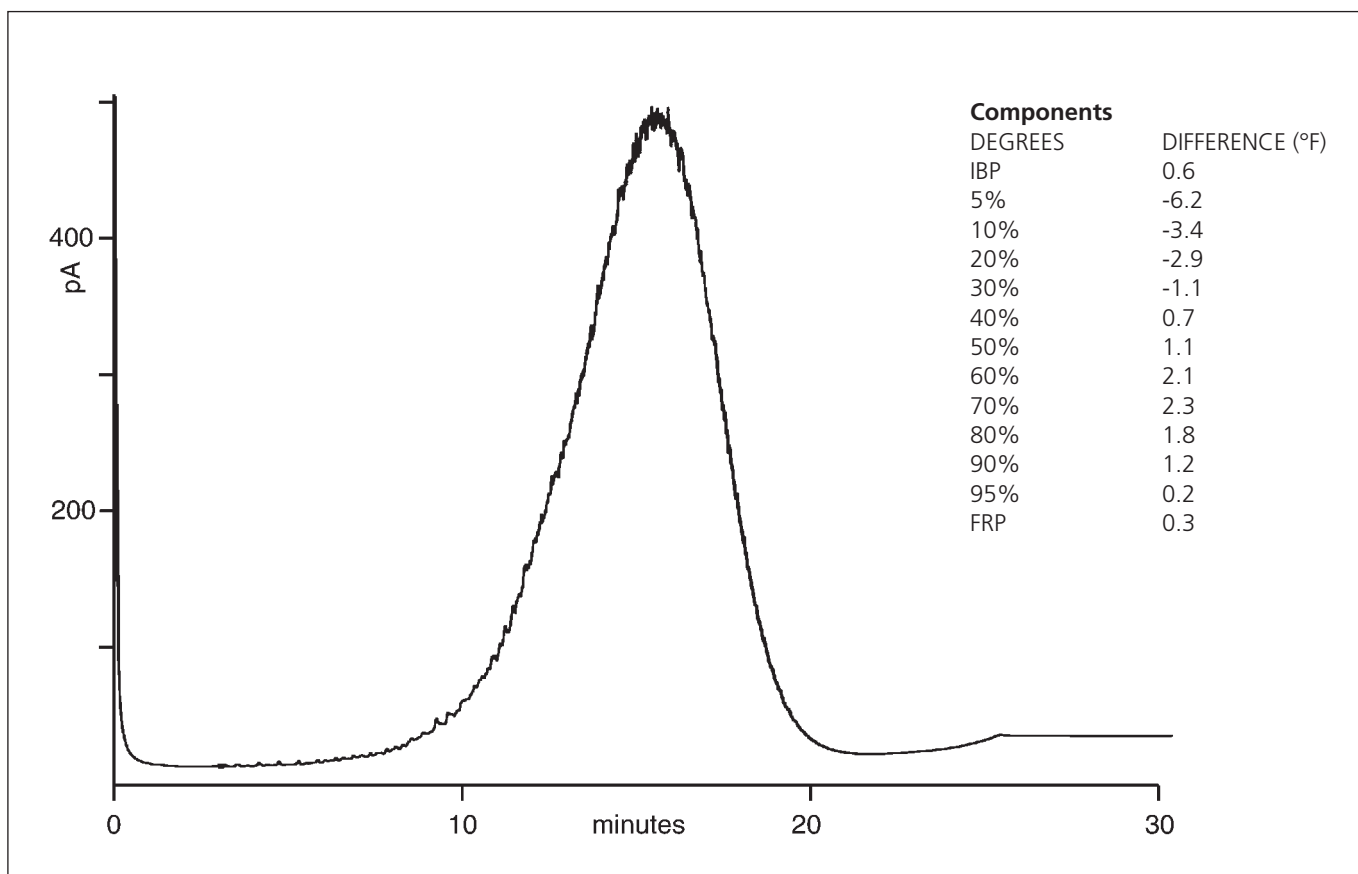
Column Part No.:	054800	Final Temp:	420 °C, 5 min
Phase:	BPX1, 0.1 µm	Detector Temp:	440 °C
Column:	5 m x 0.53 mm ID	Carrier:	He, 10 mL/min
Initial Temp:	40 °C	Instrument:	HP 6890
Rate:	15 °C	Solvent:	CS ₂



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REFERENCE GAS OIL MT-60 ON A MEGABORE BPX1

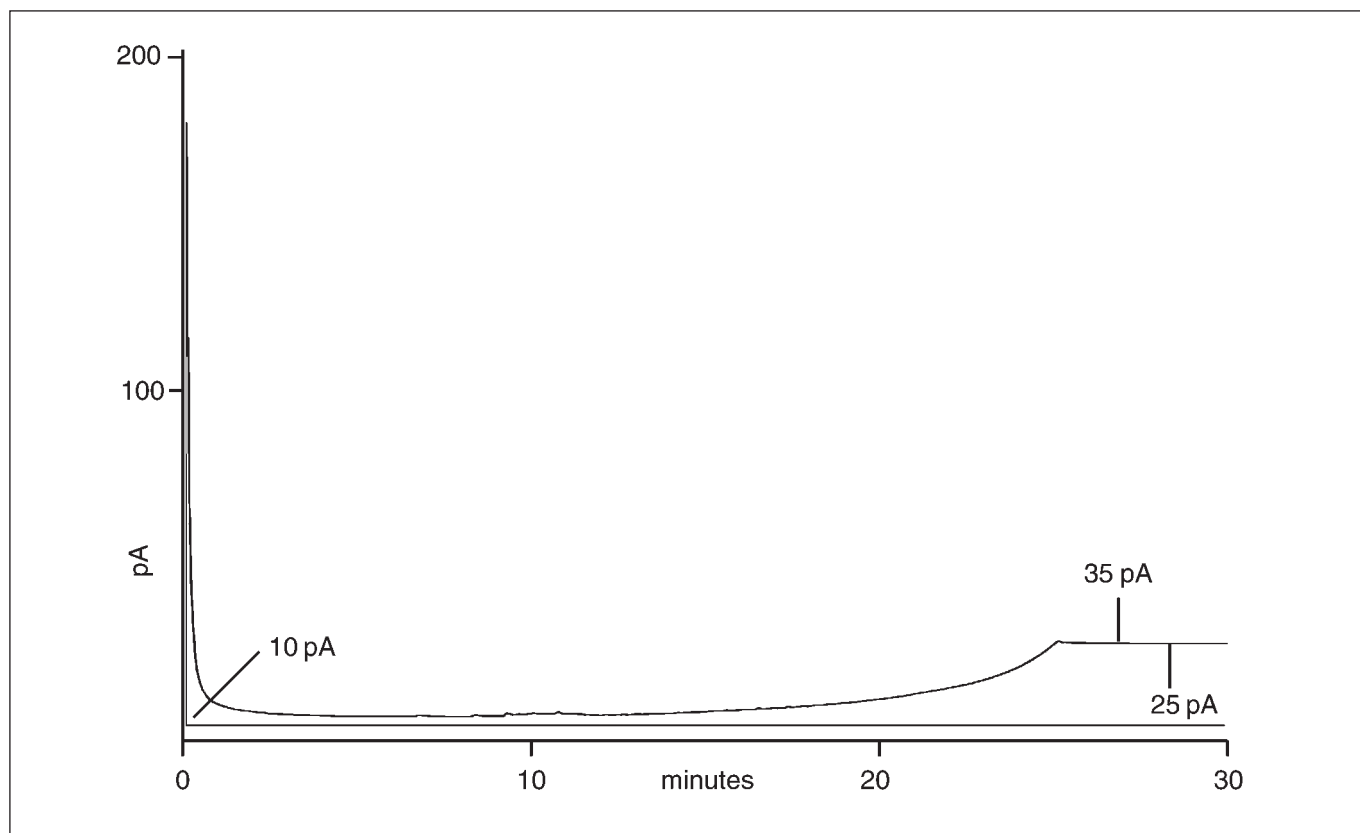
Column Part No.:	054800	Final Temp:	420 °C, 5 min
Phase:	BPX1, 0.1 µm	Detector Temp:	440 °C
Column:	5 m x 0.53 mm ID	Carrier:	He, 10 mL/min
Initial Temp:	40 °C	Instrument:	HP 6890
Rate:	15 °C		



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CS2 BLANK SIMDIS ON A 5 M 0.53 MM ID BPX1 COLUMN

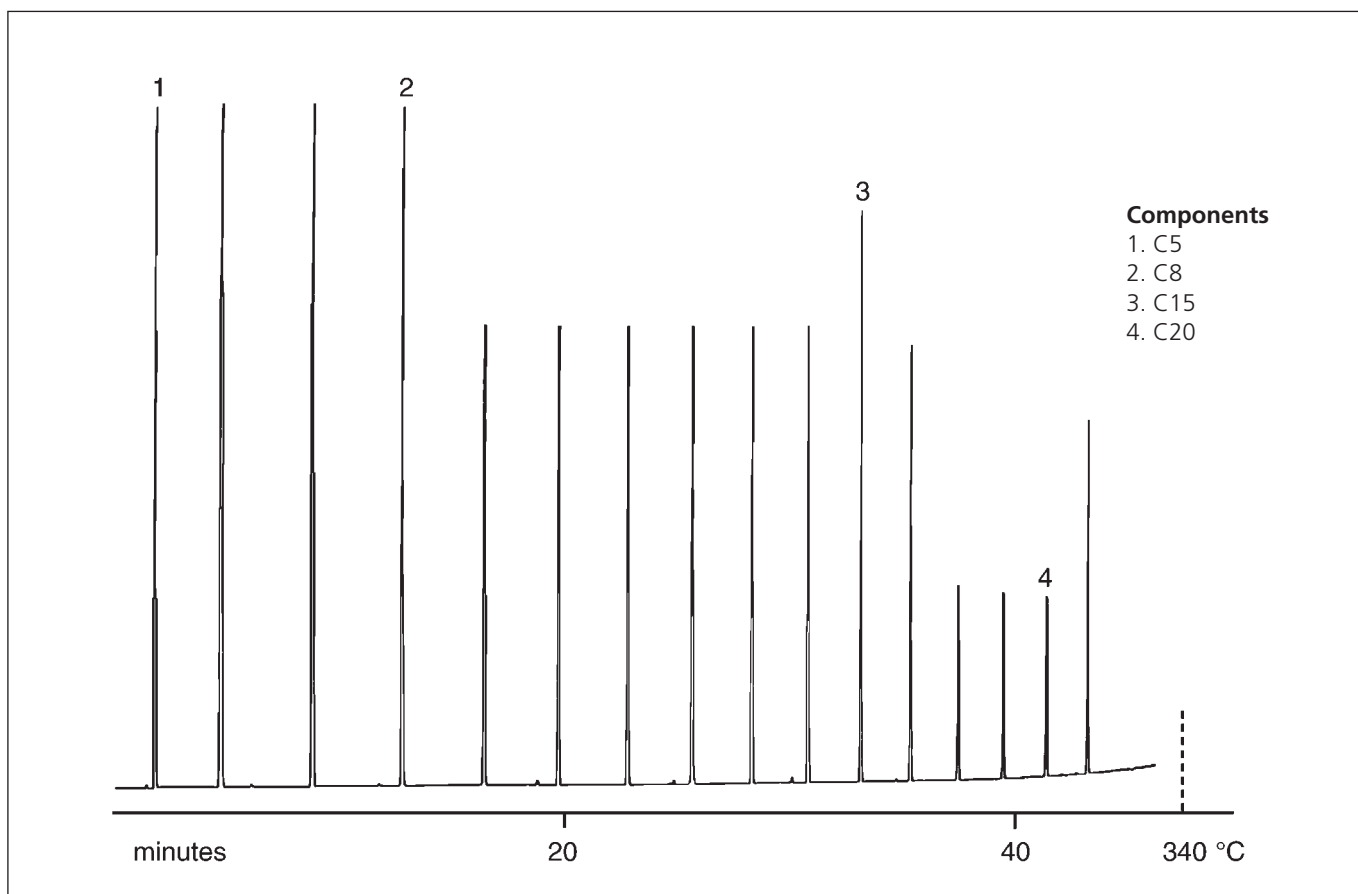
Column Part No.:	054800	Final Temp:	420 °C, 5 min
Phase:	BPX1, 0.1	Detector Temp:	440 °C
Column:	5 m x 0.53 mm ID	Carrier:	He, 10 mL/min
Initial Temp:	40 °C	Instrument:	HP 6890
Rate:	15 °C		



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HYDROCARBON STANDARD ON A THICK FILM BPX5 COLUMN

Column Part No.:	054136	Final Temp.:	340 °C, 5 min
Phase:	BPX5, 3.0 µm	Detector:	FID, 360 °C
Column:	25 m x 0.32 mm ID	Injector Mode:	Split, 100:1, 240 °C
Initial Temp.:	35 °C, 5min	Carrier Gas:	He, 10 psi
Rate 1:	5 °C/min	Injection Volume:	0.1 µL



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UNLEADED GASOLINE ON BPX5

Sample Description: Pure Unleaded Gasoline

Column Part No.: 054101
 Phase: BPX5, 0.25 µm film
 Column: 30 m x 0.25 mm ID

Sample Introduction:
 Split / Splitless
 Injector Temp.: 240 °C
 Injection Volume: 0.1 µL
 Autosampler Syringe: 0.5 µL Removable Needle Part No. 000410
 Septa: Auto-Sep T™ Part No. 041882

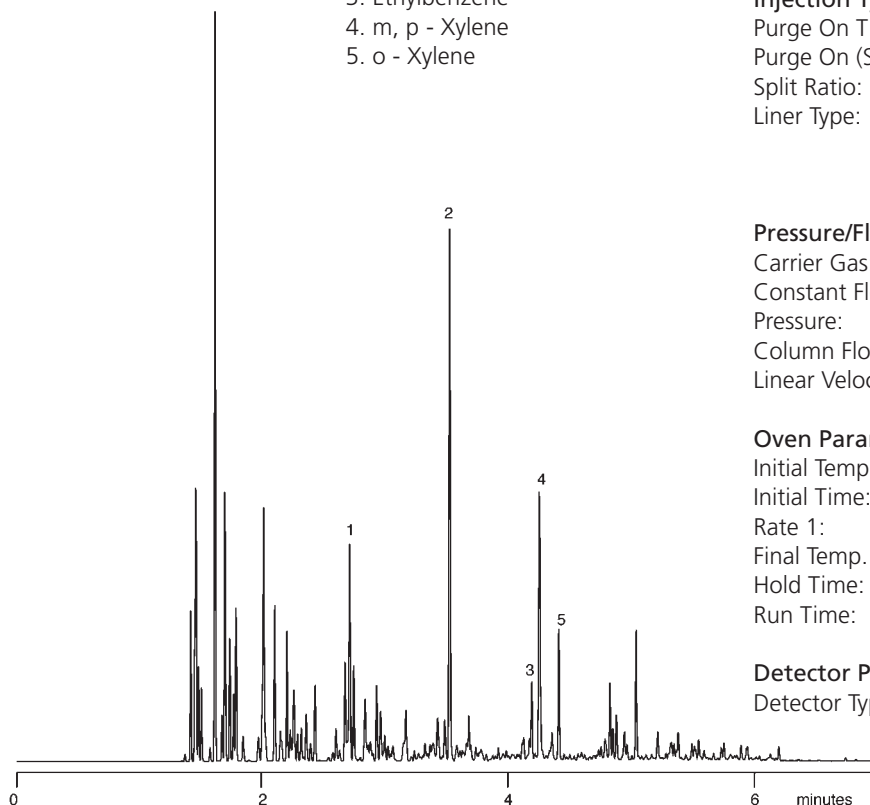
- Components**
1. Benzene
 2. Toluene
 3. Ethylbenzene
 4. m, p - Xylene
 5. o - Xylene

Injection Type: Split
 Purge On Time: NA
 Purge On (Split) Vent: 200 mL/min
 Split Ratio: 149 to 1
 Liner Type: FocusLiner™ single taper Part No. 092003

Pressure/Flow Values:
 Carrier Gas: Helium
 Constant Flow: On
 Pressure: 13.6 psi
 Column Flow: 1.34 mL/min
 Linear Velocity: 30 cm/sec at 25 °C

Oven Parameters:
 Initial Temp.: 25 °C
 Initial Time: 1 min
 Rate 1: 30 °C/min
 Final Temp. 1: 240 °C
 Hold Time: 1 min
 Run Time: 9.17 min

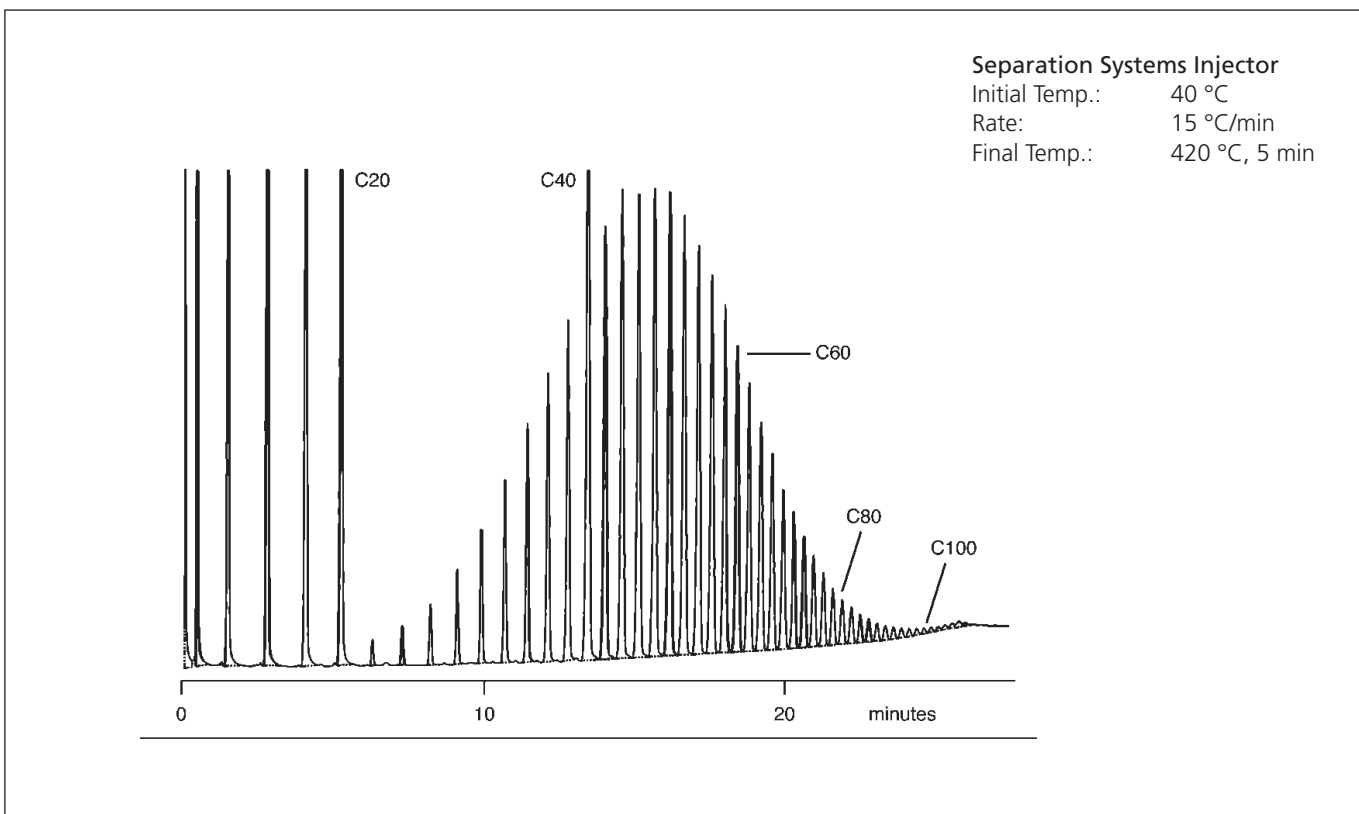
Detector Parameters:
 Detector Type: FID at 280 °C



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STANDARD MIX FOR HIGH TEMPERATURE SIMULATED DISTILLATION (HTSD) ON BPX1

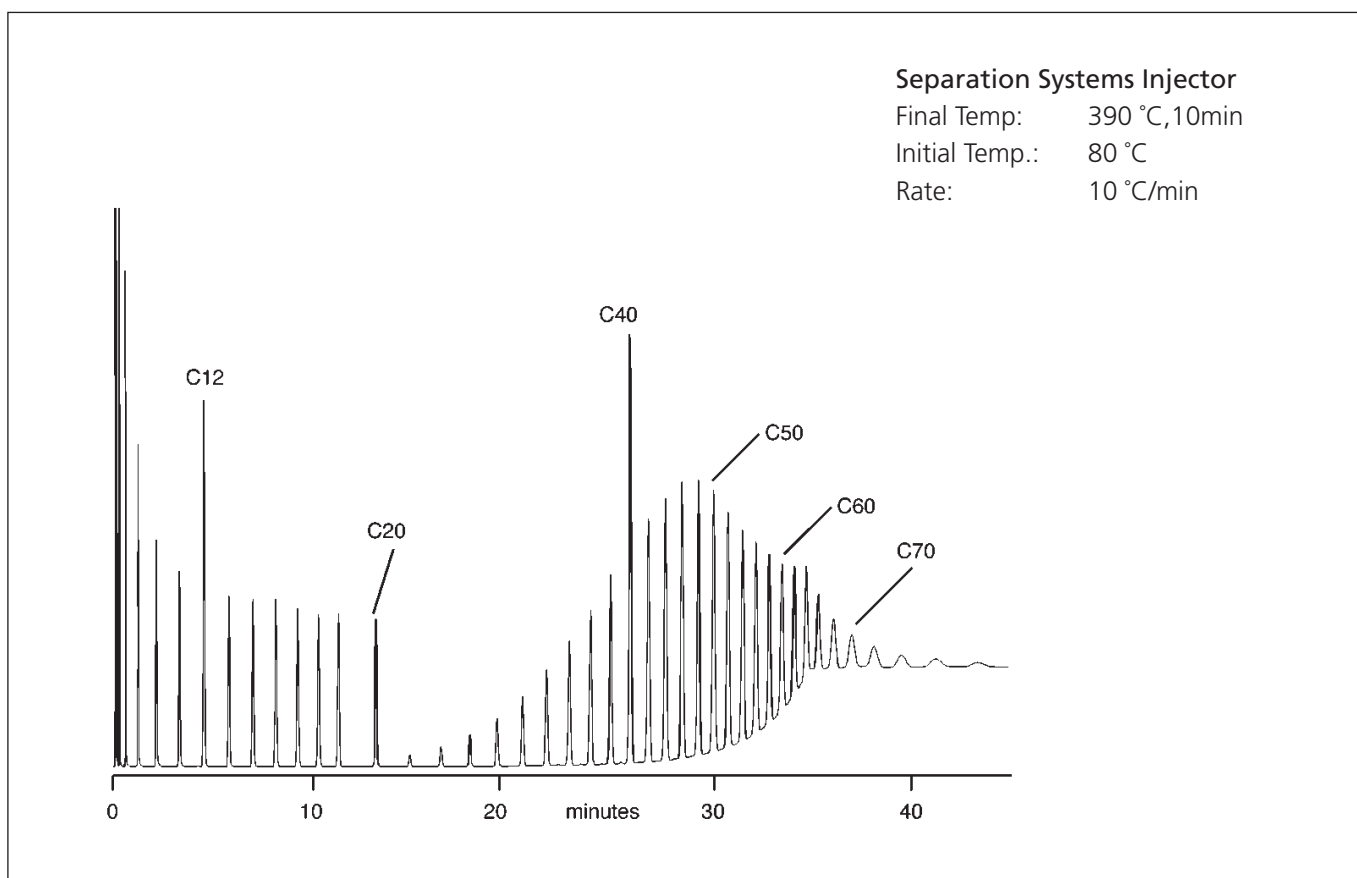
Column Part No.:	054800	Final Temp.:	420 °C, 5 min
Column:	BPX1, 0.1 µm	Detector Temp.:	440 °C
Dimensions:	5 m x 0.53 mm ID	Carrier Gas:	He, 10 mL/min
Initial Temp.:	40 °C	Instrument:	HP 6890
Rate:	15 °C/min		



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RETENTION TIME HYDROCARBON STANDARD ON BPX1

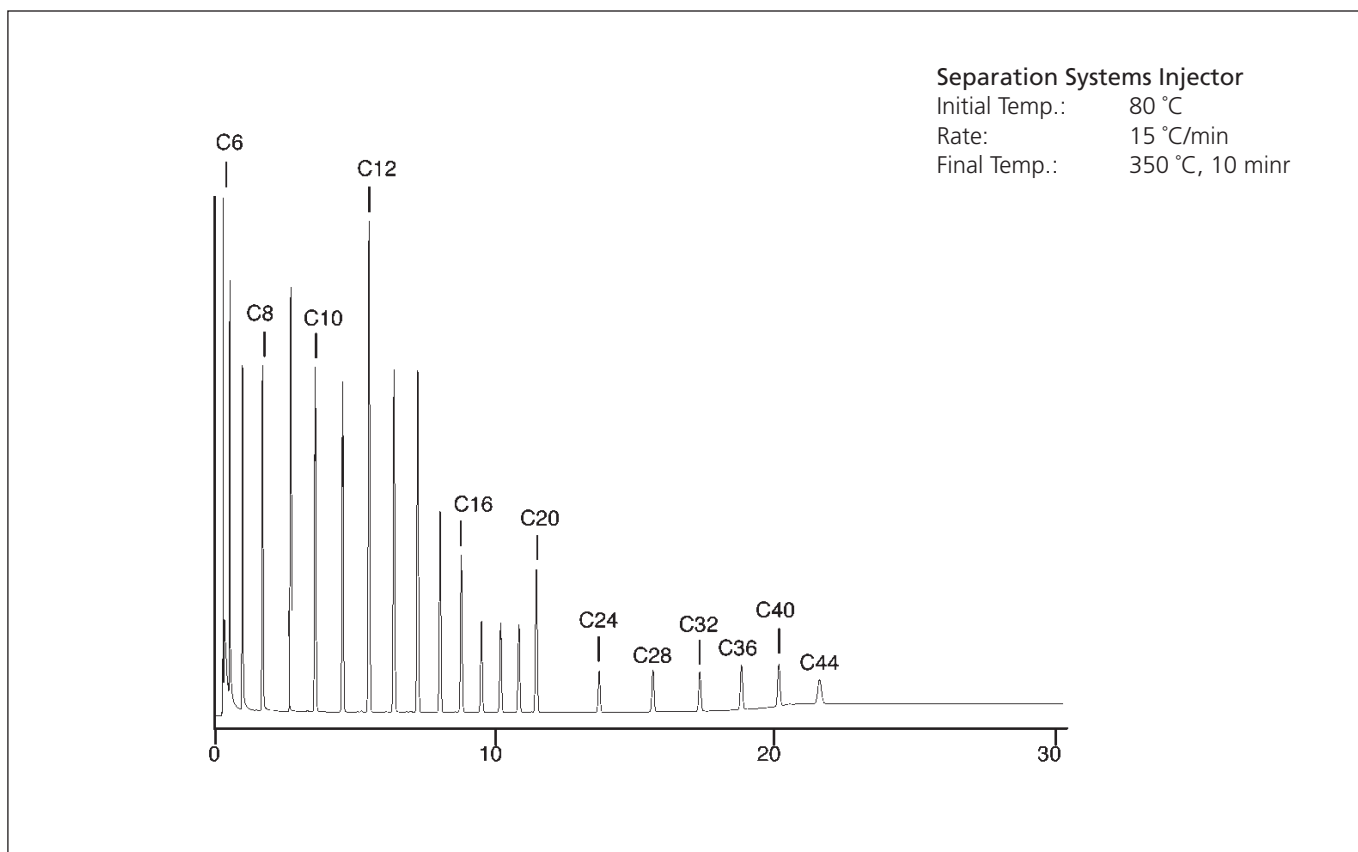
Column Part No.:	054801	Final Temp.:	390 °C, 10 min
Phase:	BPX1, 0.9 µm film	Detector Temp:	400 °C
Column:	10 m x 0.53 mm ID	Carrier Gas:	He, 20 mL/min
Initial Temp.:	40 °C	Instrument:	HP 6890
Rate:	10 °C/min		



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STANDARD FOR D2887 ON BPX1

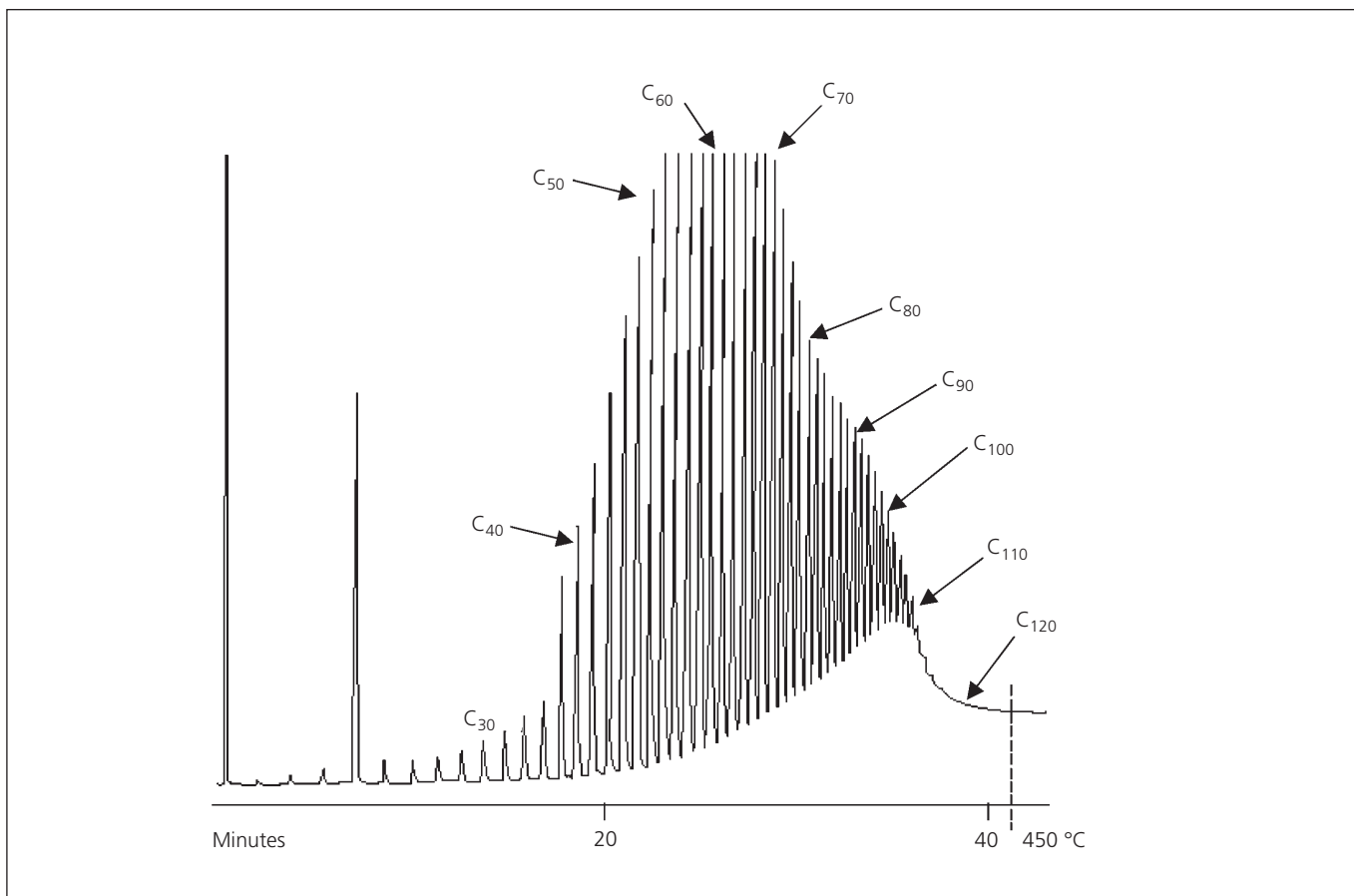
Column Part No.:	054802	Final Temp.:	350 °C, 10min
Phase:	BPX1, 2.65 µm film	Detector Temp.:	400 °C
Column:	10 m x 0.53 mm ID	Carrier Gas:	He, 20 mL/min
Initial Temp.:	40 °C	Instrument:	HP 6890
Rate:	15 °C/min		



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ANALYSIS OF POLYWAX 1000 ON AN ALUMINIUM CLAD HT5

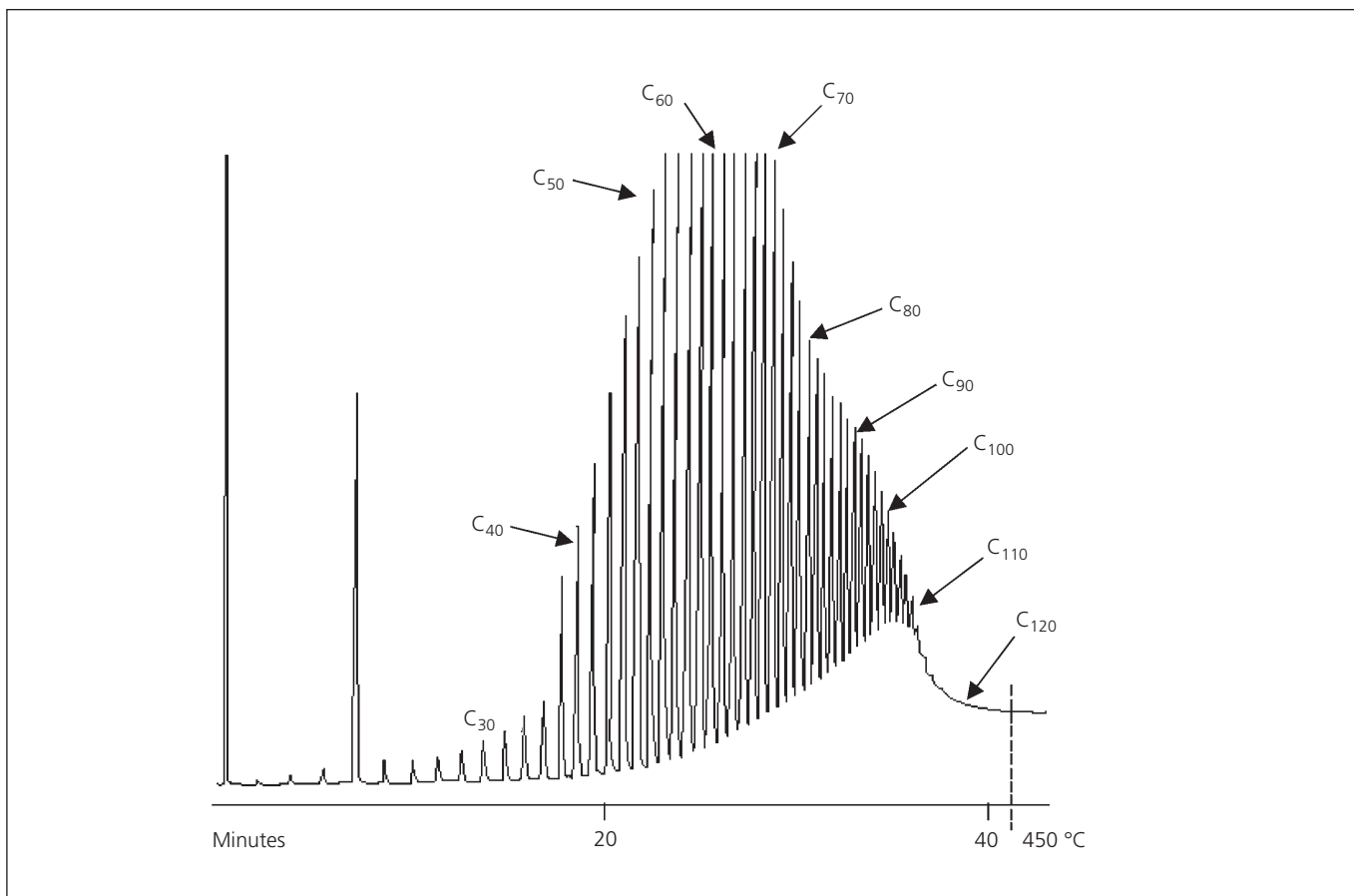
Column Part No.:	054673	Rate:	10 °C/min
Phase:	HT5, 0.075 µm film	Final Temp.:	450 °C, 10 min
Column:	5 m x 0.53 mm ID	Carrier Gas:	He, 20 mL/min
Initial Temp.:	40 °C, 1 min	Solvent:	CS ₂



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ANALYSIS OF POLYWAX 1000 ON AN ALUMINIUM CLAD HT5

Column Part No.:	054673	Rate:	10 °C/min
Phase:	HT5, 0.075 µm film	Final Temp.:	450 °C, 10 min
Column:	5 m x 0.53 mm ID	Carrier Gas:	He, 20 mL/min
Initial Temp.:	40 °C, 1 min	Solvent:	CS ₂



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