610 Checkout Chromatograms

This section contains typical examples of test sample chromatograms. They may be used as a general guide to instrument performance.

Injection volumes listed with operating conditions in the following chromatograms do not necessarily indicate total absolute volume injected. Volume given is simply the graduation (plunger position) read from a standard 10 mL syringe. For a heated inlet, actual sample volume injected will also include an additional 0.4 to 0.7 mL, the volume of sample volatilized from inside the syringe needle. For the dedicated, on-column inlet (unheated), the syringe plunger position more accurately reflects the true injected volume.

Also note that the following procedures and results are intended only to provide evidence of a properly functioning inlet and/or detector system; they are not necessarily suitable to test a given system against its specification limits.

For more detailed information about instrument specifications, see the *Standard Operating Procedures Kit*, Part No. G1530-61210.

Note: 30 m × 0.32 × 0.25 µm columns may be substituted. Slight elution time differences can be expected but the order of elution will remain the same.

FID checkout conditions and chromatogram

Column and sample

Type	HP-5 30 m × 0.32 mm × 0.25 µm PN 19091J-413
Sample	FID Checkout PN 18710-60170
Injection volume	1 µL

Inlet

Temperature	250°C	Purged/Packed or Split/Splitless
	Oven Track	Cool On-Column
Inlet pressure	25 psi	(Constant pressure for EPC inlets, helium)

Split/Splitless Only

Mode	Splitless	
Purge flow	60 mL/min	
Purge time	0.75 min	

PTV–Splitless Mode

Inlet temperature	40°C	
Initial time	0.1 min	
Rate 1		720°C/min
Final temp 1	350°C	
Final time 1	2 min	
Rate 2		100°C/min
Final temp 2	250°C	
Final time 2	0 min	
Inlet pressure		25 psi (const. press. for EPC inlets)
Mode		Splitless
Purge time	0.75 min	
Purge flow	60 mL/min	

Detector

Temperature	300°C
H_2 flow	30 mL/min
Air flow	400 mL/min
Makeup flow, N_2	25 mL/min
Offset	Should be < 20 pA

Oven

Initial temp	40°C
Initial time	0 min
Rate 1	25°C/min
Final temp	90°C
Final time	0 min
Rate 2	15°C/min
Final temp	170°C
Final time	2 min

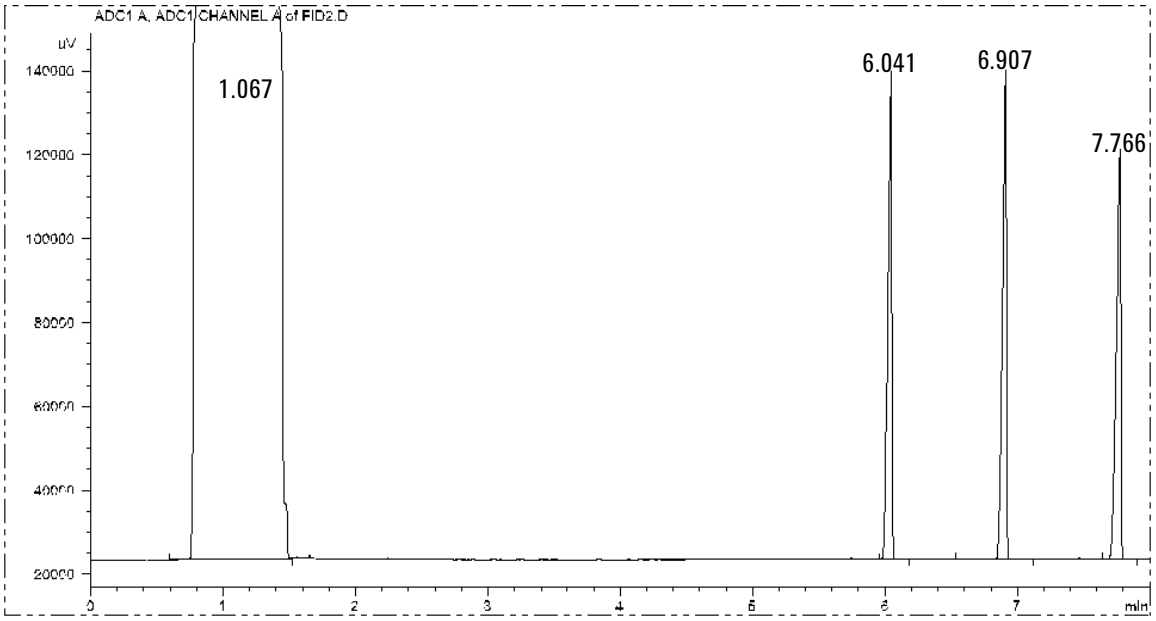

Figure 610-1 FID checkout chromatogram

Typical values

3396B or 3396C or 3397A integrator sample conditions with analog input [6890 Analog output, Range 8]

>>Set DATE and TIME<<

Zero	10	Pk wd	0.04
Att 2^	4	Thresh	3
Cht sp	1	Stop time	8.75

		SS/COC/PTV	PPIP
Sensitivity	C_{14}, C_{15}, C_{16} area counts	125,000	125,000
Discrimination	C_{14}/C_{16} area ratio	1.00±0.05	1.00±0.10

3396B or 3396C or 3397A integrator sample conditions with INET input [6890 INET output, Range 8, 3396 Range 5]

>>Set DATE and TIME<<

Zero	10	Pk wd	0.04
Att 2^	4	Thresh	3
Cht sp	1	Stop time	8.75

		SS/COC/PTV	PPIP
Sensitivity	C_{14}, C_{15}, C_{16} area counts	1,250,000	1,250,000
Discrimination	C_{14}/C_{16} area ratio	1.00±0.05	1.00±0.10

Agilent ChemStation

		SS/COC/PTV	PPIP
Sensitivity	C_{14}, C_{15}, C_{16} area counts	4,000	4,000
Discrimination	C_{14}/C_{16} area ratio	1.00±0.05	1.00±0.10

Agilent Chemstation—ASTM noise

- Measured with 6890 isothermal @ 100°C
- 10 minute blank run, noise range(s) >1 minute
- Performance + noise report

FID ASTM noise ≤ .0382 pA

NPD checkout conditions and chromatogram

Column and sample

Type	HP-5 30 m × 0.32 mm × 0.25-µm PN 19091J-413
Sample	NPD Checkout PN 18789-60060
Injection volume	1 µL

Inlet

Temperature	200°C	Purged/Packed or Split/Splitless
	Oven TrackCool On-Column	
	60°C	PTV (see below)
Inlet pressure	25 psi	(Constant pressure for EPC inlets, helium)

Split/Splitless Only

Mode	Splitless
Purge flow	60 mL/min
Purge time	0.75 min

PTV–Splitless Mode

Inlet temperature	60°C	
Initial time	0.1 min	
Rate 1		720°C/min
Final temp 1	350°C	
Final time 1	2 min	
Rate 2		100°C/min
Final temp 2	250°C	
Final time 2	0 min	
Inlet pressure		25 psi (const. press. for EPC inlets)
Mode		Splitless
Purge time	0.75 min	
Purge flow	60 mL/min	

Detector

Temperature	325°C
H_2 flow	3 mL/min
Air flow	60 mL/min
Makeup+column flow	10 mL/min, nitrogen
*Offset	50 pA

Oven

Initial temp	60°C
Initial time	0 min
Rate 1	20°C/min
Final temp	200°C
Final time	3 min

*Note: 6890 firmware A.03.03 or greater is recommended for slower bead activation. Usually, an NP bead offset of 30 pA is sufficient. Higher offsets reduce bead life.

Note: Always cool the detector below 150°C before changing a bead. The offset, with the bead off but at temperature and all gases on, should be less than 0.9 pA.

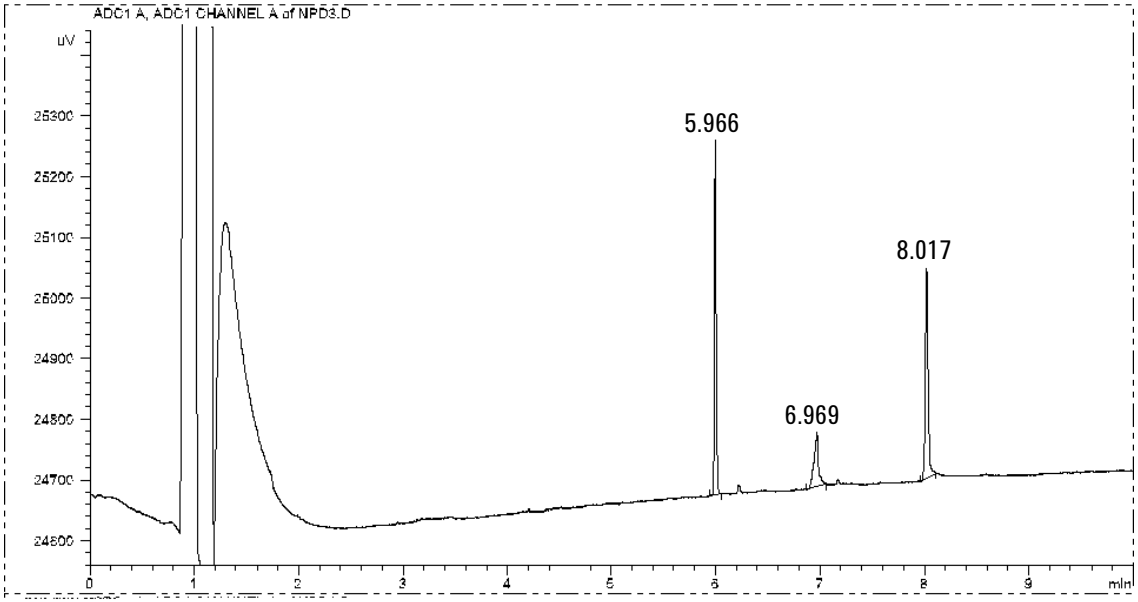

Figure 610-2 NPD checkout chromatogram

Typical values

3396B or 3396C or 3397A integrator sample conditions with analog input [6890 Analog output, Range 0]

>>Set DATE and TIME<<

Zero	10	Pk wd		0.04
Att 2^	7	Thresh		7
Cht sp	1	[Stop time	12.0]	
Ar Rej	1000			

		SS/COC/PTV/PPIP
Sensitivity	Azobenzene area counts	306,000
	Malathion area counts	575,000

3396B or 3396C or 3397A integrator sample conditions with INET input [6890 INET output, Range 0]

>>Set DATE and TIME<<

Zero	10	Pk wd		0.04
Att 2^	7	Thresh		7
Cht sp	1	[Stop time	12.0]	
Ar Rej	1000			

		SS/COC/PTV/PPIP
Sensitivity	Azobenzene area counts	12,000
	Malathion area counts	22,500

Agilent ChemStation

		SS/COC/PTV/PPIP
Sensitivity	Azobenzene area counts	38
	Malathion area counts	71

Agilent Chemstation—ASTM noise

- Measured with 6890 isothermal @ 100°C
- 10 minute blank run, noise range(s) >1 minute
- Performance + noise report

NPD ASTM noise ≤ .0765 pA

TCD checkout conditions and chromatogram

Column and sample

Type	HP-5 30 m × 0.32 mm × 0.25 µm PN 19091J-413
Sample	FID Checkout PN 18710-60170
Injection volume	1 µL

Inlet

Temperature	250°C	Purged/Packed or Split/Splitless
	Oven Track	Cool On-Column
	40°C	PTV (see below)
Inlet pressure	25 psi	(Constant pressure for EPC inlets, helium)

Split/Splitless Only

Mode	Splitless
Purge flow	60 mL/min
Purge time	0.75 min

PTV–Splitless Mode

Inlet temperature	40°C	
Initial time	0.1 min	
Rate 1		720°C/min
Final temp 1	350°C	
Final time 1	2 min	
Rate 2		100°C/min
Final temp 2	250°C	
Final time 2	0 min	
Inlet pressure		25 psi (const. press. for EPC inlets)
Mode		Splitless
Purge time	0.75 min	
Purge flow	60 mL/min	

Detector

Temperature	300°C
Reference flow (He)	20 mL/min
Makeup flow (He)	2 mL/min
Offset	Should be ≤ 30 display counts

Oven

Initial temp	40°C
Initial time	0 min
Rate 1	25°C/min
Final temp	90°C
Final time	0 min
Rate 2	15°C/min
Final temp	170°C
Final time	2 min

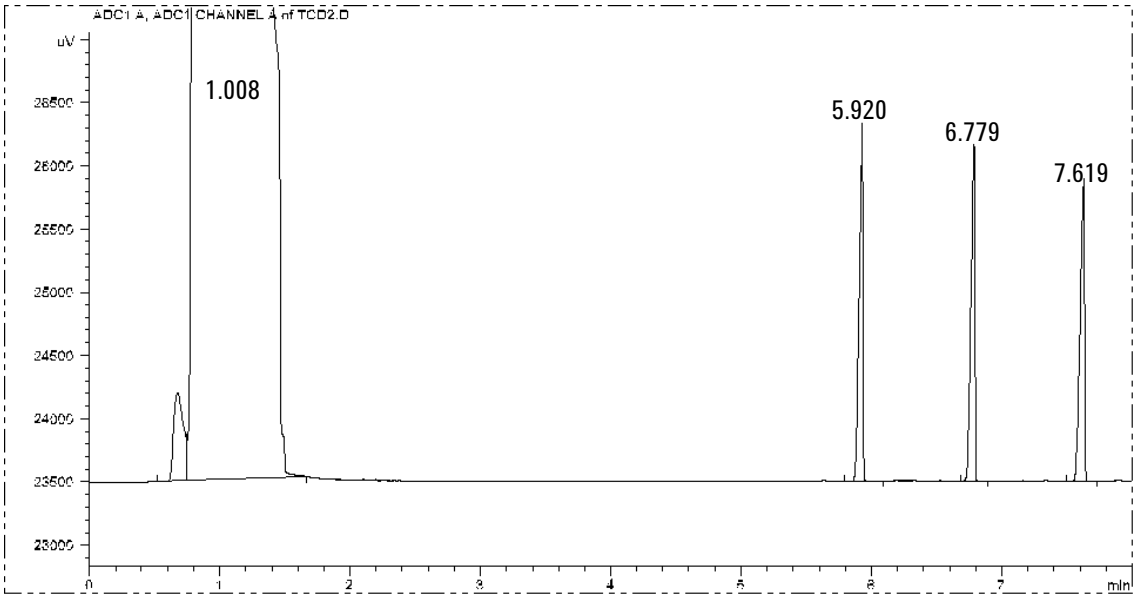

Figure 610-3 TCD checkout chromatogram

Typical values

3396B or 3396C or 3397A integrator sample conditions with analog input [6890 Analog output, Range 0]

>>Set DATE and TIME<<

Zero	10	Pk wd	0.04
Att 2^	7	Thresh	5
Cht sp	1	Stop time	8.75
Ar Rej	1000		

		SS/COC/PTV	PPIP
Sensitivity	C_{14}, C_{15}, C_{16} area counts	585,000	515,000
Discrimination	C_{14}/C_{16} area ratio	1.00±0.10	1.00±0.10

3396B or 3396C or 3397A integrator sample conditions with INET input [6890 INET output, Range 0]

>>Set DATE and TIME<<

Zero	10	Pk wd	0.04
Att 2^	7	Thresh	5
Cht sp	1	Stop time	8.75
Ar Rej	100		

		SS/COC/PTV	PPIP
Sensitivity	C_{14}, C_{15}, C_{16} area counts	23,000	20,130
Discrimination	C_{14}/C_{16} area ratio	1.00±0.10	1.00±0.10

Agilent ChemStation

		SS/COC/PTV	PPIP
Sensitivity	C_{14}, C_{15}, C_{16} area counts	73	65
Discrimination	C_{14}/C_{16} area ratio	1.00±0.10	1.00±0.10

Agilent Chemstation—ASTM noise

- Measured with 6890 isothermal @ 100°C
- 10 minute blank run, noise range(s) >1 minute
- Performance + noise report
- TCD ASTM noise ≤ 0.05733 display units (25 µV/display unit)
- Detector signal set to 5 Hertz

ECD checkout conditions and chromatogram

Column and sample

Type	HP-5 30m × 0.32 mm × 0.25 µm PN 19091J-413
Sample	ECD Checkout PN 18713-60040
Injection volume	1 µL

Inlet

Temperature	200°C	Purged/Packed or Split/Splitless
	Oven TrackCool On-Column	
	80°C	PTV (see below)
Inlet pressure	25 psi	(Constant pressure for EPC inlets, helium)

Split/Splitless Only

Mode	Splitless
Purge flow	60 mL/min
Purge time	0.75 min

PTV–Splitless Mode

Inlet temperature	80°C	
Initial time	0.1 min	
Rate 1		720°C/min
Final temp 1	350°C	
Final time 1	2 min	
Rate 2		100°C/min
Final temp 2	250°C	
Final time 2	0 min	
Inlet pressure		25 psi (const. press. for EPC inlets)
Mode		Splitless
Purge time	0.75 min	
Purge flow	60 mL/min	

Detector

Temperature	300°C
Anode purge, N_2	60 mL/min
Makeup	6 mL/min
Offset	Should be < 70 display counts

Oven

Initial temp	80°C
Initial time	0 min
Rate 1	15°C/min
Final temp	180°C
Final time	10 min

Note: 1 display count = 5 Hertz

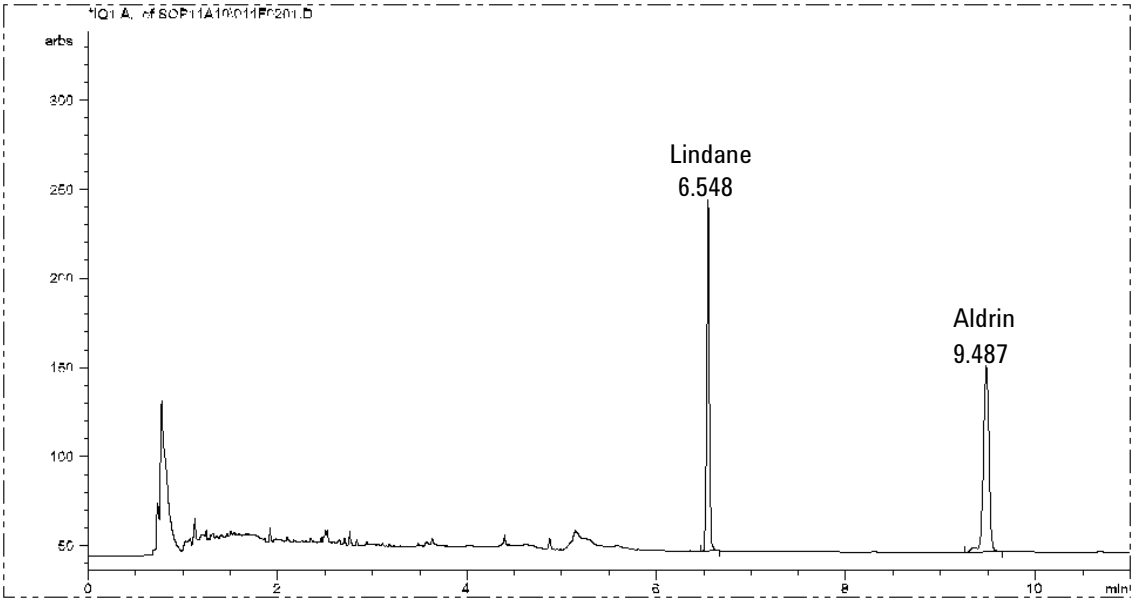

Figure 610-4 ECD checkout chromatogram

Typical values

3396B or 3396C or 3397A integrator sample conditions with analog input [6890 Analog output, Range 0]
>>Set DATE and TIME<<
Noise ([N1])
Measured at Attn. 0, Chart speed 1 [N1] <9 mm for 1 min. measurement
Signal

Zero	10	Pk wd	0.04
Att 2^	7	Thresh	7
Cht sp	1	[Stop time	11.0]
Ar Rej			

Area, Lindane peak 84150× [N1]

3396B or 3396C or 3397A integrator sample conditions with INET input [6890 INET output, Range 0]
>>Set DATE and TIME<<
Noise ([N2])
Measured at Attn. (–5), Chart speed 1 [N2] 11.25 mm for 1 min. measurement
Signal

Zero	10	Pk wd	0.04
Att 2^	7	Thresh	7
Cht sp	1	[Stop time	12.0]
Ar Rej			

Area, Lindane peak 2627 × [N2]

Agilent ChemStation
Noise ([N3])
Measured by ChemStation, ASTM noise [N3] <0.05733 display units (5 Hz/display unit)
Signal

Area, Lindane peak 1650 × [N3]

Microcell ECD checkout conditions and chromatogram

Column and sample

Type	HP-5 30m × 0.32 mm × 0.25 µm PN 19091J-413
Sample	ECD Checkout PN 18713-60040
Injection volume	1 µL

Inlet

Temperature	200°C	Purged/Packed
	250°C	Split/Splitless
	Oven TrackCool On-Column	
	80°C	PTV (see below)
Inlet pressure	25 psi	(Constant pressure for EPC inlets, helium)

Split/Splitless Only

Mode	Splitless
Purge flow	60 mL/min
Purge time	0.75 min

PTV—Splitless Mode

Inlet temperature	80°C	
Initial time	0.1 min	
Rate 1		720°C/min
Final temp 1	350°C	
Final time 1	2 min	
Rate 2		100°C/min
Final temp 2	250°C	
Final time 2	0 min	
Inlet pressure		25 psi (const. press. for EPC inlets)
Purge time	0.75 min	
Purge flow	60 mL/min	

Detector

Temperature	300°C
Const. Makeup Flow, N_2	30 mL/min
Offset	Should be <400 display units

Oven

Initial temp	80°C
Initial time	0 min
Rate 1	15°C/min
Final temp	180°C
Final time	10 min

Note: 1 display unit = 1 Hertz

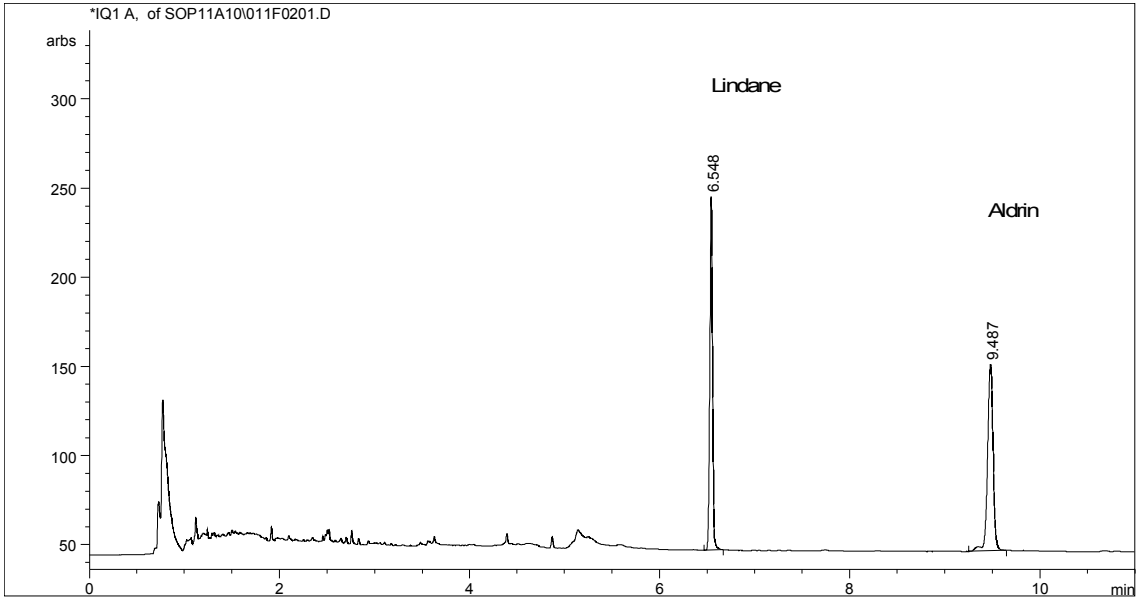

Figure 610-5 µECD checkout chromatogram

Typical values

3396B or 3396C or 3397A integrator sample conditions with analog input [6890 Analog output, Range 0]
>>Set DATE and TIME<<
6890 Analog output
Noise ([N1])
Measured at [6890 Range 0],
[3396 Attn. 3, Chart speed 1, zero 50] <37 mm for 1 min. measurement
Signal
6890 Range 6
3396

Zero	10	Pk wd	0.04
Att 2^	5	Thresh	5
Cht sp	1	Stop time	11.0
Ar Rej	100000		

Area, Lindane peak 47,950 × [N1]

Agilent ChemStation
Noise ([N3])
Measured by ChemStation, ASTM [N3] < 3 Hz
Signal

Area, Lindane peak 7500 × [N3]

FPD checkout conditions and chromatogram

Column and sample

Type	HP-5 30m × 0.32 mm × 0.25 µm PN 19091J-413
Sample	FPD Checkout PN 8500-3697
Injection volume	1 µL

Inlet

Temperature	250°C Purged/Packed 250°C Split/Splitless Oven TrackCool On-Column 80°C PTV (see below)
Inlet pressure	25 psi (Constant pressure for EPC inlets, helium)

Split/Splitless Only

Mode	Splitless
Purge flow	60 mL/min
Purge time	0.75 min

PTV—Splitless Mode

Inlet temperature	80°C	
Initial time	0.1 min	
Rate 1		720°C/min
Final temp 1	350°C	
Final time 1	2 min	
Rate 2		100°C/min
Final temp 2	250°C	
Final time 2	0 min	

Inlet pressure	25 psi (const. press. for EPC inlets)
Purge time	0.75 min
Purge flow	60 mL/min

Detector

Temperature	200°C
Hydrogen flow	75±2 mL/min
Air flow	100±2 mL/min
Const. Makeup Flow, N_2	60±2 mL/min
Offset, flow off (O–fa)	Should be <40 display units
Offset, flame on (O+fb)	<[(O–fa) + 85 display units]

Oven

Initial temp	60°C
Initial time	0 min
Rate 1	25°C/min
Final temp	110°C
Final time	0 min
Rate 2	10°C/min
Final temp 2	170°C
Final time 1	3 min

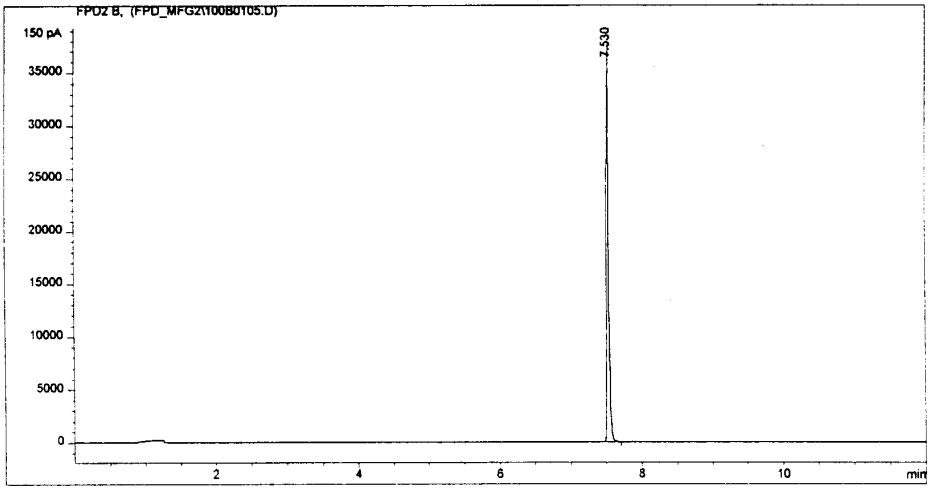

Figure 610-6 FPD checkout chromatogram—sulfur channel

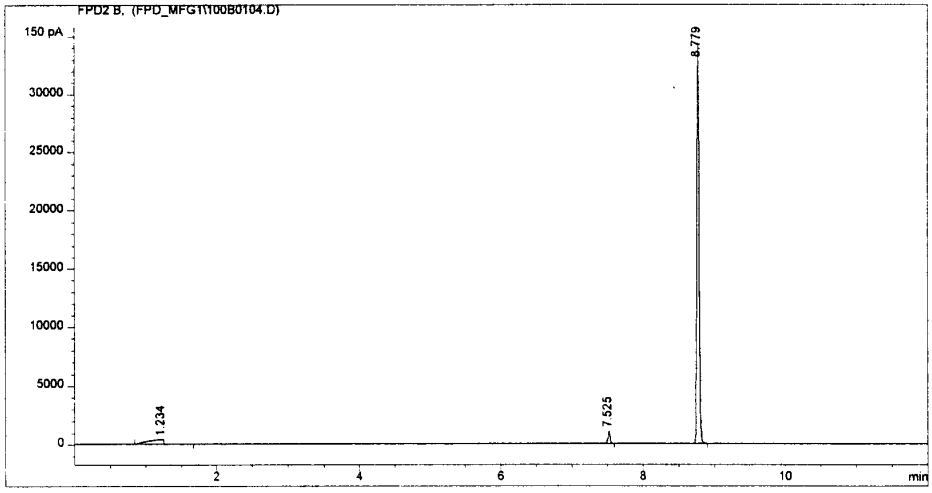

Figure 610-7 FPD checkout chromatogram—phosphorus channel

Typical values

3396B or 3396C or 3397A integrator sample conditions with analog input [6890 Analog output, Range 5]
>>Set DATE and TIME<<
6890 Analog output
Noise ([N1])
Measured at [6890 Range 5],
[Attn. 0, Chart speed 1, zero 50] ~30 mm for 1 min. measurement
Signal
6890 Range 5
3396

Zero	10	Pk wd	0.04
Att 2^	9	Thresh	3
Cht sp	1	Stop time	11.0
Ar Rej	100000		

Area, Sulfur mode ≥ 7,000,000

Agilent ChemStation
[6890 GPIB output]
Noise ([N3])
Measured by ChemStation, ASTM [N3] ≤ 5 display units (150 pA/display units)

Signal
Area, Sulfur mode ≥ 26,000