

New Sample Processor for GC-MS Analysis of Volatile Organic Compounds (VOCs) in Water and Soil Samples

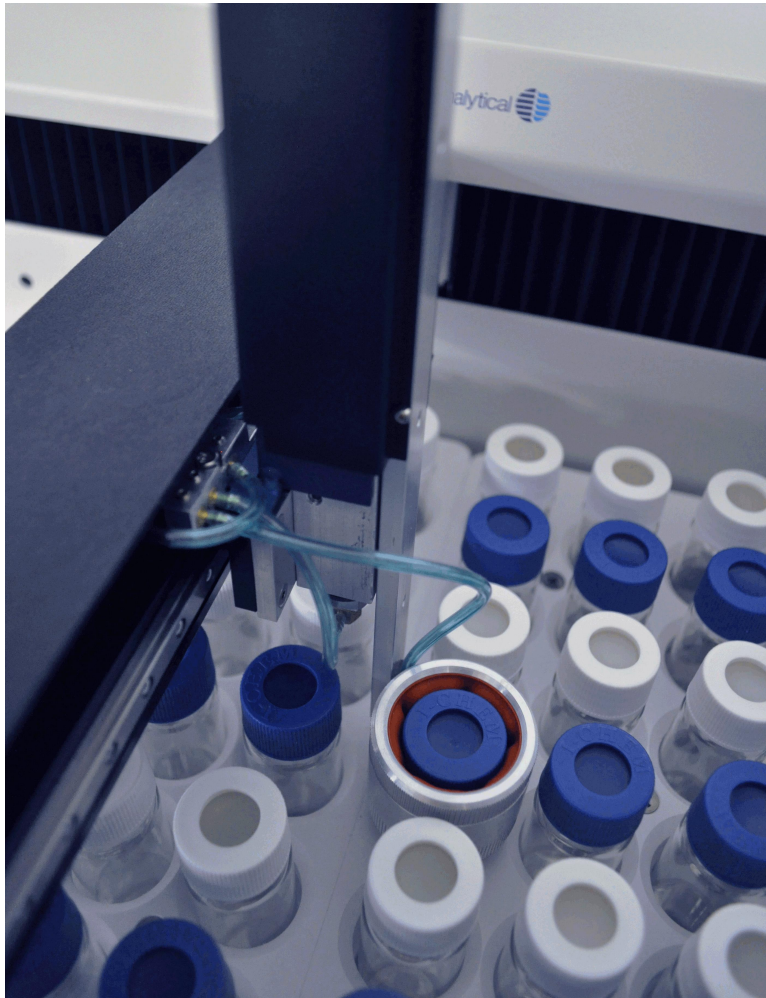
July 13, 2015

Introduction

This presentation will show data collected using an OI Analytical Model 4100 Sample Processor for water and soil volatiles.



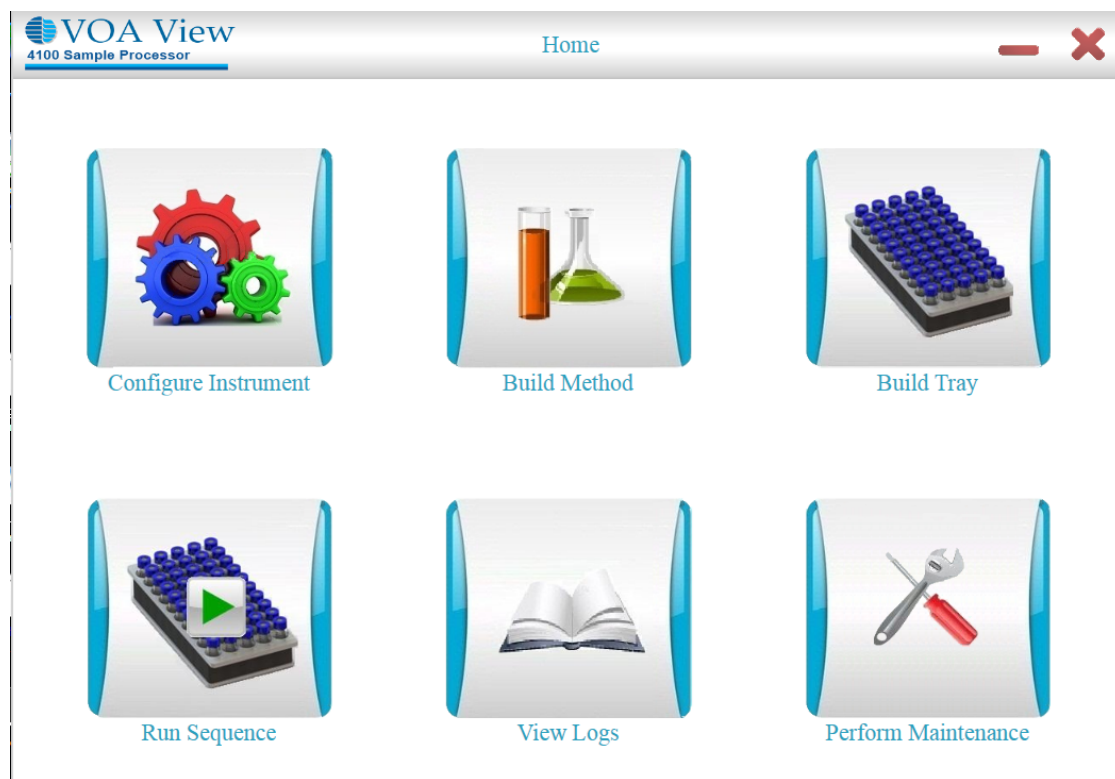
Introduction



4100 Water/Soil Sample Processor

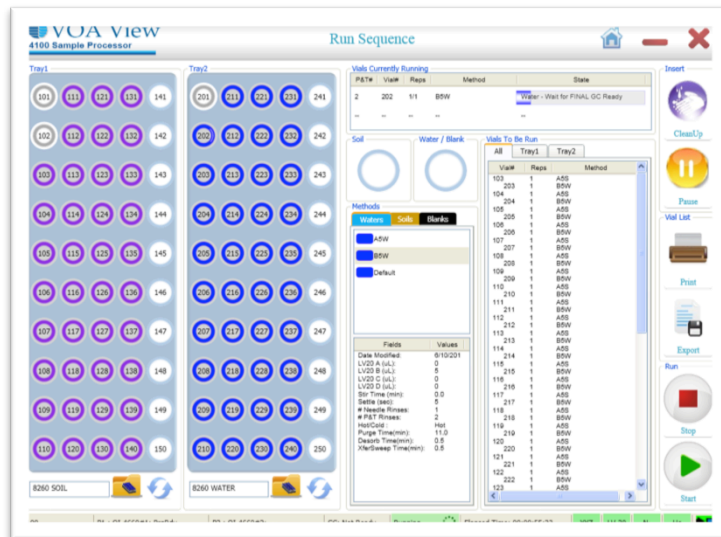
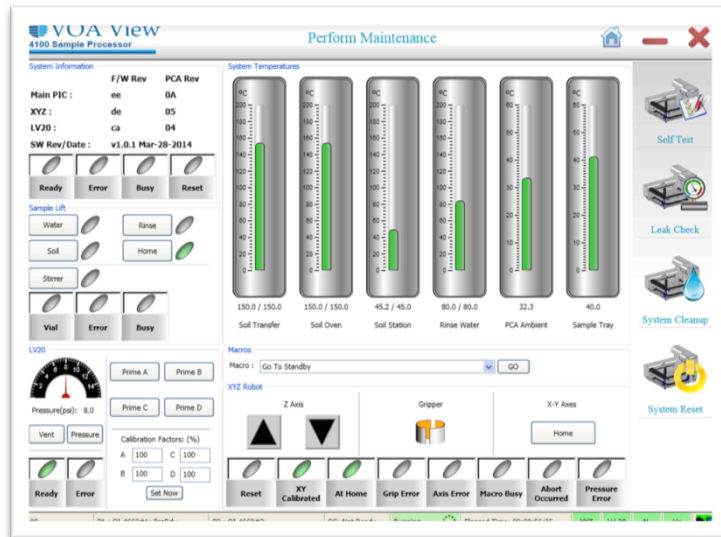
- Holds up to 100 (40-mL) sample vials
- Precisely positions the pneumatic gripping assembly at each vial position
 - Uses gas pressure to raise and lower the gripper and to inflate a flexible cuff around the vial which securely holds the vial
 - It will pick up a vial even if there is dirt, debris or fluids on the outside
 - The vials are automatically moved from their position to a processing station and returned to their original position after processing

Software



- Control the 4100 from VOA View™, intuitive Windows®-based software
- Allows user to configure the hardware, build processing methods, create and control sequences, view usage logs, and perform maintenance.

Software



- See the status of the instrument at a glance
- Add vials, blanks or system clean-ups “on the fly”
- Run a system clean-up and/or blanks after a known contaminated sample
- Simple interface makes it easy to see what is happening with sample sequence

Experimental – Instrument Conditions

Instrument and Analytical Conditions (GC/MS) for Full List 8260

GC		Agilent 7890A Gas Chromatograph
Column	Restek RTX-VMS 20 meter, 0.18 mm ID, 1 µm film	
Column Flow	0.6 mL/minute	
Carrier Gas	Zero grade helium	
Inlet Temperature	250 °C	
Inlet Liner	1.5 mm straight	
Split Ratio	100:1	
Oven Program	Hold at 40 °C for 1.5 minutes 16 °C/minute to 180 °C 40 °C/minute to 220 °C Hold 1.5 minutes	

Experimental – Instrument Conditions

Instrument and Analytical Conditions (GC/MS) for Full List 8260

Mass Spectrometer	Agilent 5975C
Mode	Scan 35 – 300 amu
Scans/second	5.19
Solvent Delay	1.40 minutes
Transfer Line Temperature	240 °C
Source Temperature	230 °C
Quadrupole Temperature	150 °C

Experimental – Instrument Conditions

Instrument and Analytical Conditions (GC/MS) for Full List 8260

Purge-and-Trap	OI Analytical 4660
Autosampler	OI Analytical 4100
Trap	#10; Tenax@ / Silica gel / CMS
Purge Gas	Zero grade helium at 40 mL/minute
Purge Time	11 minutes
Sample Temperature	45 °C
Desorb Time	0.5 minutes
Bake Time	5 minutes
Trap Temperature	Ambient during purge 180 °C during desorb pre-heat 190 °C during desorb 210 °C during bake
Water Management	120 °C during purge Ambient during desorb 240 °C during bake
Transfer Line Temperature	125 °C
Six-port Valve Temperature	125 °C
Autosampler Gas	Nitrogen for 4100 system Zero grade helium for purge gas

Experimental – Instrument Conditions

Instrument and Analytical Conditions (GC/MS) for 524 THMs and 8260 BTEX

GC		Agilent 7890A Gas Chromatograph
Column	Restek RTX-VMS 20 meter, 0.18 mm ID, 1 µm film or 30 meter, 0.25 mm, 1.40 µm	
Column Flow	0.6 mL/minute (0.8 mL/min for 30 meter)	
Carrier Gas	Zero grade helium	
Inlet Temperature	250 °C	
Inlet Liner	1.5 mm straight	
Split Ratio	50:1	
Oven Program	Hold at 50 °C for 1.0 minutes 30 °C/minute to 220 °C (can use ramp of 20-25 °C for more separation) Hold 1.0 minutes	

Experimental – Instrument Conditions

Instrument and Analytical Conditions (GC/MS) for 524 THMs and 8260 BTEX

Mass Spectrometer	Agilent 5975C
Mode	Scan 35 – 300 amu
Scans/second	5.19
Solvent Delay	2.0 minutes
Auxiliary 2 (MSD)	240 °C
Source Temperature	230 °C
Quadrupole Temperature	150 °C

Experimental – Instrument Conditions

Instrument and Analytical Conditions (GC/MS) for 524 THMs and 8260 BTEX

Purge-and-Trap	OI Analytical 4660
Autosampler	OI Analytical 4100
Trap	#10; Tenax@ / Silica gel / CMS
Purge Gas	Zero grade helium at 45 mL/minute
Purge Time	8 minutes
Sample Temperature	45 °C
Desorb Time	0.5 minutes
Bake Time	4 minutes
Trap Temperature	Ambient during purge 180 °C during desorb pre-heat 190 °C during desorb 210 °C during bake
Water Management	120 °C during purge Ambient during desorb 240 °C during bake
Transfer Line Temperature	125 °C
Six-port Valve Temperature	125 °C
Autosampler Gas	Nitrogen for 4100 system Zero grade helium for purge gas

Experimental – 8260 Results

The instrument calibration data for 8260, with the average response factors for the calibration from 5 to 150 ppb with the relative standard deviations (RSD) for the response factor.

Analyte	Compound	CAS Number	Waters RF	%RSD	Soils RF	%RSD
1	pentafluorobenzene(IS)	771-61-9	N/A		N/A	
2	dichlorodifluoromethane	75-71-8	0.350	3.01	0.391	3.09
3	chloromethane	74-87-3	0.490	3.41	0.551	2.25
4	vinyl chloride	75-01-4	0.540	3.59	0.593	3.09
5	bromomethane	74-83-9	0.293	6.19	0.342	4.51
6	chloroethane	75-00-3	0.348	6.34	0.394	2.47
7	trichlorofluoromethane	75-69-4	0.650	4.76	0.693	3.71
8	ethyl ether	60-29-7	0.321	3.48	0.290	4.02
9	1,1-dichloroethene	75-35-4	0.381	6.49	0.409	3.49
10	carbon disulfide	75-15-0	1.086	4.86	1.472	2.88

Experimental – 8260 Results

Analyte	Compound	CAS Number	Waters RF	%RSD	Soils RF	%RSD
11	1,1,2-trichloro-1,2,2-trifluoroethane	76-13-1	0.403	5.65	0.401	3.19
12	methyl iodide	74-88-4	0.594	6.19	0.664	2.76
13	allyl chloride	107-05-1	0.261	2.87	0.265	7.00
14	methylene chloride	75-09-2	0.468	3.48	0.479	3.51
15	acetone	67-64-1	0.078	3.71	0.053	R = 0.994
16	trans-1,2-dichloroethene	156-60-5	0.448	4.92	0.499	6.18
17	methyl tert-butyl ether	1634-04-4	1.232	3.60	1.037	4.78
18	acetonitrile	75-05-8	0.104	9.67	0.074	8.65
19	chloroprene	126-99-8	0.829	7.71	0.812	6.95
20	1,1-dichloroethane	75-34-3	0.993	1.80	0.968	2.70
21	acrylonitrile	107-13-1	0.306	6.83	0.191	5.16
22	cis-1,2-dichloroethene	156-59-2	0.495	2.11	0.495	3.72
23	2,2-dichloropropane	594-20-7	0.417	7.13	0.465	3.42
24	bromochloromethane	74-97-5	0.240	2.93	0.224	4.30
25	chloroform	67-66-3	0.902	3.44	0.863	2.29

Experimental – 8260 Results

Analyte	Compound	CAS Number	Waters RF	%RSD	Soils RF	%RSD
26	methyl acrylate	96-33-3	0.629	10.59	0.407	9.30
27	carbon tetrachloride	56-23-5	0.607	3.40	0.620	3.91
28	dibromofluoromethane(SS)	1868-53-7	0.507	2.27	0.487	2.47
29	1,1,1-trichloroethane	71-55-6	0.652	2.69	0.660	3.36
30	2-butanone	78-93-3	0.097	1.92	0.060	8.69
31	1,1-dichloropropene	563-58-6	0.640	3.86	0.666	5.71
32	1,4-difluorobenzene(IS)	540-36-3				
33	benzene	71-43-2	1.231	2.95	1.263	3.68
34	methacrylonitrile	126-98-7	0.306	7.80	0.195	10.20
35	1,2-dichloroethane- <i>d</i> ₄ (SS)	17060-07-0	0.086	1.78	0.074	1.69
36	1,2-dichloroethane	107-06-2	0.482	2.44	0.439	3.08
37	trichloroethene	71-55-6	0.306	2.88	0.309	5.05
38	dibromomethane	74-95-3	0.205	3.03	0.180	5.73
39	bromodichloromethane	75-27-4	0.430	3.03	0.402	5.02
40	1,2-dichloropropane	78-87-5	0.350	3.43	0.325	6.85

Experimental – 8260 Results

Analyte	Compound	CAS Number	Waters RF	%RSD	Soils RF	%RSD
41	methyl methacrylate	80-62-6	0.240	10.18	0.168	13.45
42	2-chloroethyl vinyl ether	110-75-8	0.229	13.99	0.168	R = 0.999
43	cis-1,3-dichloropropene	10061-01-5	0.471	6.31	0.444	8.29
44	chlorobenzene- <i>d</i> ₅ (IS)	3114-55-4	N/A		N/A	
45	toluene- <i>d</i> ₈ (ss)	2037-26-5	1.387	1.70	1.407	1.34
46	toluene	108-88-3	0.852	3.27	0.875	3.04
47	2-nitropropane	79-46-9	0.144	7.29	0.093	12.42
48	4-methyl-2-pentanone	108-10-1	0.067	10.41	0.041	R = 0.997
49	tetrachloroethene	127-18-4	0.289	3.59	0.297	5.12
50	trans-1,3-dichloropropene	10061-02-6	0.510	8.34	0.461	8.24
51	ethyl methacrylate	97-63-2	0.461	11.94	0.344	R = 0.999
52	1,1,2-trichloroethane	79-00-5	0.297	2.70	0.246	5.30
53	chlorodibromomethane	124-48-1	0.336	7.42	0.294	9.40
54	1,3-dichloropropane	142-28-9	0.602	3.35	0.514	5.56
55	1,2-dibromoethane	106-93-4	0.326	2.91	0.269	5.53

Experimental – 8260 Results

Analyte	Compound	CAS Number	Waters RF	%RSD	Soils RF	%RSD
56	2-hexanone	591-78-6	0.415	11.54	0.225	R = 0.998
57	chlorobenzene	108-90-7	0.946	3.29	0.925	4.07
58	ethylbenzene	100-41-4	1.630	3.83	1.626	5.76
59	1,1,1,2-tetrachloroethane	630-20-6	0.316	4.36	0.304	6.10
60	<i>m,p</i> -xylenes	1330-20-7	0.580	5.93	0.584	8.54
61	<i>o</i> -xylene	95-47-6	0.541	7.83	0.546	8.93
62	styrene	100-42-5	0.944	9.92	0.895	12.65
63	bromoform	75-25-2	0.259	6.79	0.192	11.98
64	isopropylbenzene	98-82-8	1.474	8.40	1.504	9.33
65	<i>cis</i> -1,4-dichloro-2-butene	1476-11-5	0.219	5.85	0.140	9.97
66	1,4-dichlorobenzene- <i>d</i> ₄ (IS)	3855-82-1	N/A		N/A	
67	4-bromofluorobenzene(SS)	460-00-4	0.973	2.19	0.982	1.40
68	bromobenzene	108-86-1	0.729	3.53	0.739	4.57
69	<i>n</i> -propylbenzene	103-65-1	3.725	4.48	3.965	7.65
70	1,1,2,2-tetrachloroethane	79-34-5	1.041	3.28	0.801	6.43

Experimental – 8260 Results

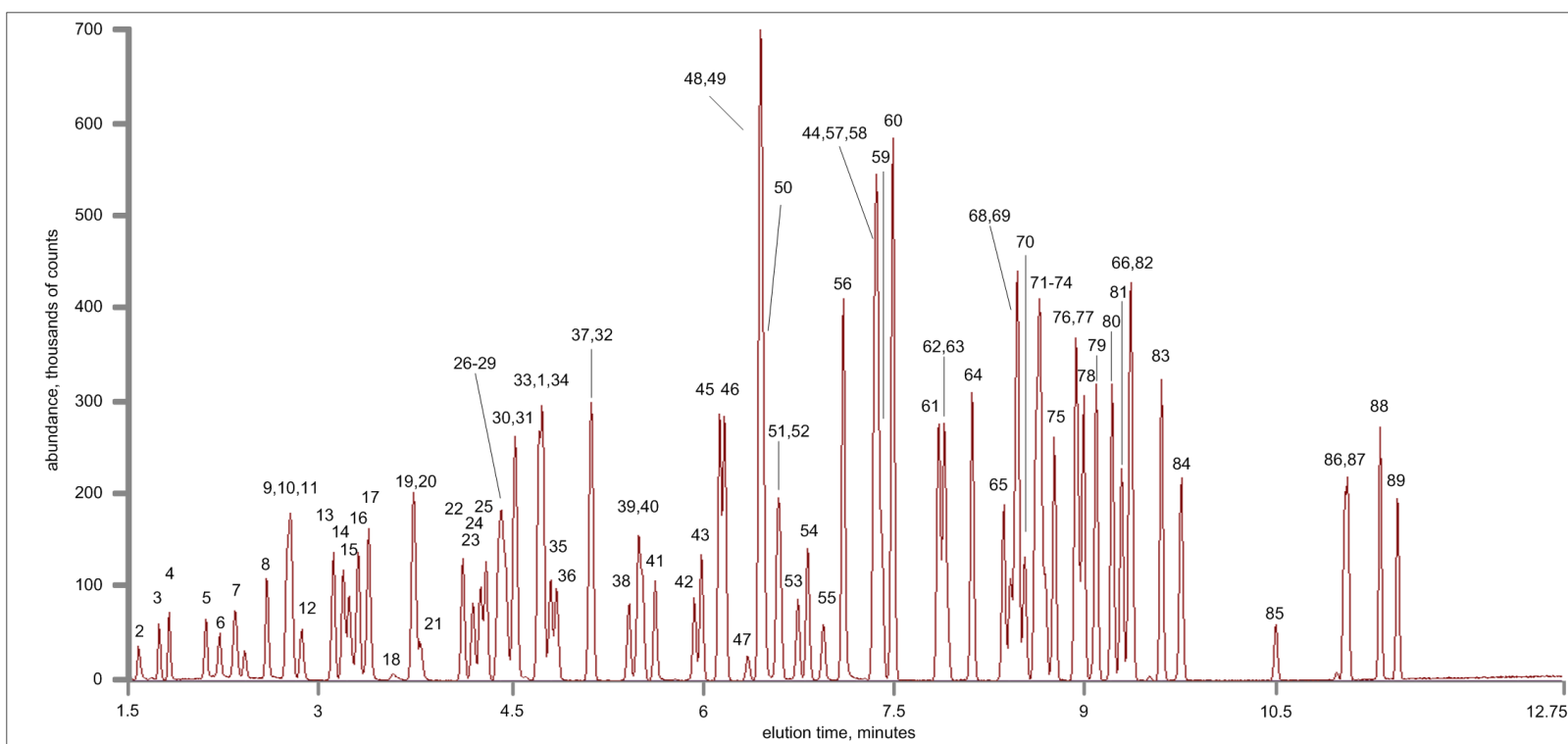
Analyte	Compound	CAS Number	Waters RF	%RSD	Soils RF	%RSD
71	2-chlorotoluene	95-49-8	2.355	4.56	2.495	7.52
72	1,3,5-trimethylbenzene	108-67-8	2.339	6.07	2.495	10.47
73	1,2,3-trichloropropane	96-18-4	1.330	4.90	0.980	8.61
74	<i>trans</i> -1,4-dichloro-2-butene	110-57-6	0.396	8.05	0.264	11.77
75	4-chlorotoluene	106-43-4	2.212	5.76	2.289	6.47
76	<i>tert</i> -butylbenzene	98-06-6	2.298	4.74	2.471	8.56
77	pentachloroethane	76-01-7	0.413	5.43	0.424	8.17
78	1,2,4-trimethylbenzene	95-63-6	2.358	7.34	2.464	10.59
79	<i>sec</i> -butylbenzene	135-98-8	3.142	5.30	3.411	9.34
80	<i>p</i> -isopropyltoluene	99-87-6	2.465	7.94	2.649	11.12
81	1,3-dichlorobenzene	541-73-1	1.398	2.69	1.437	3.35
82	1,4-dichlorobenzene	106-46-7	1.449	2.89	1.497	3.98
83	<i>n</i> -butylbenzene	104-51-8	2.542	7.59	2.758	9.18
84	1,2-dichlorobenzene	95-50-1	1.340	3.29	1.326	3.88
85	1,2-dibromo-3-chloropropane	96-12-8	0.222	9.54	0.137	R = 0.996

Experimental – 8260 Results

Analyte	Compound	CAS Number	Waters RF	%RSD	Soils RF	%RSD
86	hexachlorobutadiene	87-68-3	0.423	6.25	0.512	6.21
87	1,2,4-trichlorobenzene	120-82-1	0.795	9.32	0.827	6.35
88	naphthalene	91-20-3	2.371	10.20	1.748	11.99
89	1,2,3-trichlorobenzene	87-61-6	0.746	10.22	0.751	6.62

Experimental – 8260 Results

Peak-Labeled Chromatogram for the 50-ppb Water Standard



Experimental - 524.3 THM Results

Table 4. Results for a 7-point calibration for 524.3 THMs.

Compound	CAS Number	Waters RF Purge and Trap #2	%RSD	Waters RF Purge and Trap #1	%RSD
fluorobenzene (Marker)*	462-06-6				
1,4-difluorobenzene (IS)	540-36-3				
methyl tert-butyl ether d ₃ (SS)	29366-08-3	0.983	2.07	0.966	5.09
chloroform	67-66-3	0.655	1.37	0.600	4.59
chlorobenzene-d ₅ (IS)	3114-55-4				
bromodichloromethane	75-27-4	0.535	3.12	0.503	4.28
chlorodibromomethane	124-48-1	0.327	4.15	0.322	4.38
bromoform	75-25-2	0.206	3.66	0.483	2.33
4-bromofluorobenzene (SS)	460-00-4	0.503	1.94	0.483	2.33
1,4-dichlorobenzene-d ₄ (IS)	3855-82-1				
1,2-dichlorobenzene-d ₄ (SS)	2199-69-1	0.962	2.50	0.991	3.39

*Required by Method 524

Experimental – 8260 BTEX Results

Table 5. Results for 7-point calibration (5 to 400 ppb) of 8260 BTEX comparing tandem P&Ts and waters and soils mode.

Compound	CAS Number	Waters R		Soils RF	
		Purge and Trap #1	%RSD	Purge and Trap #2	%RSD
fluorobenzene (Marker)	462-06-6	----	----	----	----
pentafluorobenzene (IS)	363-72-4	----	----	----	----
methyl tert-butyl ether	1634-04-4	1.456	2.24	1.205	3.55
dibromofluoromethane (SS)	1868-53-7	0.536	2.37	0.543	2.41
1,4-difluorobenzene (IS)	540-36-3	----	----	----	----
benzene	71-43-2	1.518	2.24	1.447	2.78
1,2-dichloroethane-d ₄ (SS)	17060-07-0	0.083	3.43	0.069	2.76
chlorobenzene-d ₅ (IS)	3114-55-4	----	----	----	----
toluene-d ₈ (SS)	2037-26-5	1.367	2.69	1.410	4.41
toluene	108-88-3	0.975	2.59	0.947	3.51
ethylbenzene	100-41-4	1.771	2.65	1.715	3.08
m,p-xylenes	1330-20-7	0.662	5.37	0.645	4.38
o-xylene	95-47-6	0.615	5.57	0.617	2.80
1,4-dichlorobenzene-d ₄ (IS)	3855-82-1	----	----	----	----
4-bromofluorobenzene (SS)	460-00-4	1.107	1.20	1.062	0.96

Experimental - Results

- 8260 calibrations were run individually on different days.
- Calibrations were carried out in a tandem purge and trap configuration for 524 THM and 8260 BTEX.
- For 524.3 THMs, both concentrators received samples processed in the water mode.
- For 8260 BTEX, both water and soil mode processing was used.
- To identify the separate paths for 524 THM's and 8260 BTEX, a specific marker compound was used to identify the P&T #2 sample and the absence of that compound identified the opposite path.

Experimental Results

VOA View
4100 Sample Processor

View Logs

Run Log

Method Log

Config Log

Maint Log

Service Log

Date	Time	Vial#	P&T	Type	Method	Comment
2015/06/22	8:56 AM	103		W	A5W	Priority Vial Added
2015/06/22	8:56 AM	102		W	A5W	Priority Vial Added
2015/06/22	8:56 AM	101		W	A5W	Priority Vial Added
2015/06/20	4:35 AM					Sequence -- Completed
2015/06/20	4:14 AM	131	1	S	A5S	Vial 131 -- Rep 1 of 1 -- Started
2015/06/20	3:52 AM	130	1	S	A5S	Vial 130 -- Rep 1 of 1 -- Started
2015/06/20	3:30 AM	129	1	S	A5S	Vial 129 -- Rep 1 of 1 -- Started
2015/06/20	3:08 AM	128	1	S	A5S	Vial 128 -- Rep 1 of 1 -- Started
2015/06/20	2:47 AM	127	1	S	A5S	Vial 127 -- Rep 1 of 1 -- Started
2015/06/20	2:25 AM	126	1	S	A5S	Vial 126 -- Rep 1 of 1 -- Started
2015/06/20	2:04 AM	125	1	S	A5S	Vial 125 -- Rep 1 of 1 -- Started
2015/06/20	1:41 AM	124	1	S	A5S	Vial 124 -- Rep 1 of 1 -- Started
2015/06/20	1:20 AM	123	1	S	A5S	Vial 123 -- Rep 1 of 1 -- Started
2015/06/20	12:58 AM	122	1	S	A5S	Vial 122 -- Rep 1 of 1 -- Started
2015/06/20	12:37 AM	121	1	S	A5S	Vial 121 -- Rep 1 of 1 -- Started
2015/06/20	12:15 AM	120	1	S	A5S	Vial 120 -- Rep 1 of 1 -- Started
2015/06/19	11:53 PM	119	1	S	A5S	Vial 119 -- Rep 1 of 1 -- Started
2015/06/19	11:32 PM	118	1	S	A5S	Vial 118 -- Rep 1 of 1 -- Started
2015/06/19	11:10 PM	117	1	S	A5S	Vial 117 -- Rep 1 of 1 -- Started
2015/06/19	10:48 PM	116	1	S	A5S	Vial 116 -- Rep 1 of 1 -- Started
2015/06/19	10:27 PM	115	1	S	A5S	Vial 115 -- Rep 1 of 1 -- Started
2015/06/19	10:05 PM	114	1	S	A5S	Vial 114 -- Rep 1 of 1 -- Started
2015/06/19	9:43 PM	113	1	S	A5S	Vial 113 -- Rep 1 of 1 -- Started
2015/06/19	9:22 PM	112	1	S	A5S	Vial 112 -- Rep 1 of 1 -- Started
2015/06/19	9:00 PM	111	1	S	A5S	Vial 111 -- Rep 1 of 1 -- Started
2015/06/19	8:38 PM	110	1	S	A5S	Vial 110 -- Rep 1 of 1 -- Started
2015/06/19	8:16 PM	109	1	S	A5S	Vial 109 -- Rep 1 of 1 -- Started
2015/06/19	7:55 PM	108	1	S	A5S	Vial 108 -- Rep 1 of 1 -- Started
2015/06/19	7:33 PM	107	1	S	A5S	Vial 107 -- Rep 1 of 1 -- Started
2015/06/19	7:11 PM	106	1	S	A5S	Vial 106 -- Rep 1 of 1 -- Started
2015/06/19	6:50 PM	105	1	S	A5S	Vial 105 -- Rep 1 of 1 -- Started
2015/06/19	6:28 PM	104	1	S	A5S	Vial 104 -- Rep 1 of 1 -- Started
2015/06/19	6:06 PM	103	1	S	A5S	Vial 103 -- Rep 1 of 1 -- Started
2015/06/19	5:48 PM	131		S	A5S	Priority Vial Added
2015/06/19	5:48 PM	130		S	A5S	Priority Vial Added
2015/06/19	5:48 PM	129		S	A5S	Priority Vial Added
2015/06/19	5:48 PM	128		S	A5S	Priority Vial Added
2015/06/19	5:48 PM	127		S	A5S	Priority Vial Added
2015/06/19	5:45 PM	102	1	S	A5S	Vial 102 -- Rep 1 of 1 -- Started
2015/06/19	5:29 PM	101	1	S	A5S	Vial 101 -- Rep 1 of 1 -- Started
2015/06/19	5:29 PM					Tray1 = 8260 SOIL ; Tray2 = {Empty}
2015/06/19	5:29 PM					Sequence -- Started
2015/06/19	4:22 PM					Sequence -- Completed
2015/06/19	4:01 PM	134	1	S	A5S	Vial 134 -- Rep 1 of 1 -- Started
2015/06/19	3:47 PM	134		S	A5S	Priority Vial Added
2015/06/19	3:45 PM	133	1	S	A5S	Vial 133 -- Rep 1 of 1 -- Started
2015/06/19	3:45 PM					Tray1 = 8260 SOIL ; Tray2 = 8260 WATER
2015/06/19	3:45 PM					Sequence -- Started

Print

Add

Export

4100 P&T #1: --- P&T #2: --- GC: Not Ready Running Elapsed Time: 00:01:20:09 XYZ LV-20 N₂ He

start OI 4100 Auto-Sample... OI 4100 - 4100 1:46 PM

- Single P&T method 8260
- 21-minute cycle time
- ~ 34 runs in 12 hours

Experimental Results

VOA View
4100 Sample Processor

View Logs

Run Log

Method Log

Config Log

Maint Log

Service Log

Date	Time	Vial#	P&T	Type	Method	Comment
2015/06/19	7:27 AM	124	1	S	A5S	Vial 124 -- Rep 1 of 1 -- Started
2015/06/19	7:10 AM	223	2	W	B5W	Vial 223 -- Rep 1 of 1 -- Started
2015/06/19	6:54 AM	123	1	S	A5S	Vial 123 -- Rep 1 of 1 -- Started
2015/06/19	6:38 AM	222	2	W	B5W	Vial 222 -- Rep 1 of 1 -- Started
2015/06/19	6:22 AM	122	1	S	A5S	Vial 122 -- Rep 1 of 1 -- Started
2015/06/19	6:05 AM	221	2	W	B5W	Vial 221 -- Rep 1 of 1 -- Started
2015/06/19	5:49 AM	121	1	S	A5S	Vial 121 -- Rep 1 of 1 -- Started
2015/06/19	5:33 AM	220	2	W	B5W	Vial 220 -- Rep 1 of 1 -- Started
2015/06/19	5:17 AM	120	1	S	A5S	Vial 120 -- Rep 1 of 1 -- Started
2015/06/19	5:00 AM	219	2	W	B5W	Vial 219 -- Rep 1 of 1 -- Started
2015/06/19	4:44 AM	119	1	S	A5S	Vial 119 -- Rep 1 of 1 -- Started
2015/06/19	4:28 AM	218	2	W	B5W	Vial 218 -- Rep 1 of 1 -- Started
2015/06/19	4:11 AM	118	1	S	A5S	Vial 118 -- Rep 1 of 1 -- Started
2015/06/19	3:55 AM	217	2	W	B5W	Vial 217 -- Rep 1 of 1 -- Started
2015/06/19	3:39 AM	117	1	S	A5S	Vial 117 -- Rep 1 of 1 -- Started
2015/06/19	3:22 AM	216	2	W	B5W	Vial 216 -- Rep 1 of 1 -- Started
2015/06/19	3:06 AM	116	1	S	A5S	Vial 116 -- Rep 1 of 1 -- Started
2015/06/19	2:50 AM	215	2	W	B5W	Vial 215 -- Rep 1 of 1 -- Started
2015/06/19	2:34 AM	115	1	S	A5S	Vial 115 -- Rep 1 of 1 -- Started
2015/06/19	2:17 AM	214	2	W	B5W	Vial 214 -- Rep 1 of 1 -- Started
2015/06/19	2:01 AM	114	1	S	A5S	Vial 114 -- Rep 1 of 1 -- Started
2015/06/19	1:44 AM	213	2	W	B5W	Vial 213 -- Rep 1 of 1 -- Started
2015/06/19	1:28 AM	113	1	S	A5S	Vial 113 -- Rep 1 of 1 -- Started
2015/06/19	1:12 AM	212	2	W	B5W	Vial 212 -- Rep 1 of 1 -- Started
2015/06/19	12:56 AM	112	1	S	A5S	Vial 112 -- Rep 1 of 1 -- Started
2015/06/19	12:39 AM	211	2	W	B5W	Vial 211 -- Rep 1 of 1 -- Started
2015/06/19	12:23 AM	111	1	S	A5S	Vial 111 -- Rep 1 of 1 -- Started
2015/06/19	12:06 AM	210	2	W	B5W	Vial 210 -- Rep 1 of 1 -- Started
2015/06/18	11:50 PM	110	1	S	A5S	Vial 110 -- Rep 1 of 1 -- Started
2015/06/18	11:34 PM	209	2	W	B5W	Vial 209 -- Rep 1 of 1 -- Started
2015/06/18	11:17 PM	109	1	S	A5S	Vial 109 -- Rep 1 of 1 -- Started
2015/06/18	11:01 PM	208	2	W	B5W	Vial 208 -- Rep 1 of 1 -- Started
2015/06/18	10:45 PM	108	1	S	A5S	Vial 108 -- Rep 1 of 1 -- Started
2015/06/18	10:28 PM	207	2	W	B5W	Vial 207 -- Rep 1 of 1 -- Started
2015/06/18	10:12 PM	107	1	S	A5S	Vial 107 -- Rep 1 of 1 -- Started
2015/06/18	9:56 PM	206	2	W	B5W	Vial 206 -- Rep 1 of 1 -- Started
2015/06/18	9:39 PM	106	1	S	A5S	Vial 106 -- Rep 1 of 1 -- Started
2015/06/18	9:23 PM	205	2	W	B5W	Vial 205 -- Rep 1 of 1 -- Started
2015/06/18	9:06 PM	105	1	S	A5S	Vial 105 -- Rep 1 of 1 -- Started
2015/06/18	8:50 PM	204	2	W	B5W	Vial 204 -- Rep 1 of 1 -- Started
2015/06/18	8:34 PM	104	1	S	A5S	Vial 104 -- Rep 1 of 1 -- Started
2015/06/18	8:18 PM	203	2	W	B5W	Vial 203 -- Rep 1 of 1 -- Started
2015/06/18	8:01 PM	103	1	S	A5S	Vial 103 -- Rep 1 of 1 -- Started
2015/06/18	7:45 PM	202	2	W	B5W	Vial 202 -- Rep 1 of 1 -- Started
2015/06/18	7:29 PM	102	1	S	A5S	Vial 102 -- Rep 1 of 1 -- Started
2015/06/18	7:13 PM	201	2	W	B5W	Vial 201 -- Rep 1 of 1 -- Started
2015/06/18	6:56 PM	101	1	S	A5S	Vial 101 -- Rep 1 of 1 -- Started
2015/06/18	6:56 PM					Tray1 = 8260 SOIL ; Tray2 = 8260 WATER

4100 P&T #1: --- P&T #2: --- GC: Ready Running Elapsed Time: 00:01:35:17 XYZ LV-20 N₂ He

start VOA View OI 4100 Auto-Sample... OI 4100 - 4100 10:57 AM

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- Dual P&T Method 8260
- 16-minute cycle time
- ~45 runs in 12 hours

Quick Start Guide for USEPA Method 8260

4660/4100 Quick Start Guide (Helium Purge)

Application: Analysis of Volatile Organic Compounds in Soils and Waters by GC/MS Using USEPA Method 8260

Suggested Operating Conditions

Purge-and-Trap	Eclipse 4660 P&T Sample Concentrator
Trap	#10 trap, Tenax® / Silica gel / CMS
Purge Gas	Zero grade Helium at 40 mL/min
Purge Time	11 min
Spurge Mount Temperature	45 °C
Sample Temperature	45 °C
Desorb Time	0.5 min
Bake Time	4 min
Oil #10 Trap Temperature	Ambient during purge 180 °C during desorb pre-heat 190 °C during desorb 210 °C during bake
Water Management	120 °C during purge Ambient during desorb 240 °C during bake
Transfer Line Temperature	120 °C - 150 °C
Six-port Valve Temperature	120 °C - 150 °C

Autosampler	4100 Water/Soil Sample Processor
System Gas	Zero grade nitrogen
Purge Gas	Zero grade helium
LV20 Pressure	8.0 psi
Loop-based Time Settings	Default
Rinse Water	80 °C
Soil Sample Transfer	150 °C
Soil Oven	150 °C
Soil Lift Station	45 °C



4100 Sample Processor Methods			
Sample Type	Waters Only	Soils Only	Blanks Only
Vial Cap Color	Blue	Yellow	Green
Needle Rinses	1	1	0
SAM A (µL)	5	5	5
SAM B (µL)	0	0	0
SAM C (µL)	0	0	0
SAM D (µL)	0	0	0
Purge Time (min)	11.0	11.0	11.0
Desorb Time (min)	0.5	0.5	0.5
P&T Rinses	2	1	0
Rinse Water	Hot	Hot	Hot
Water Stir Time (min)	0.0		
Water Settle Time (sec)	0		
Soil Add Water to Vial (#loops)		* 1 x 5 mL	
Soil Pre-Heat Stir		Yes	
Soil Pre-Heat/Purge Temp (°C)		45.0	
Soil Stir During Purge		Yes	

* Suggested initial volume in vial should be 5 mL and final volume 10 mL.

Gas Chromatograph	Agilent 7890A
Column	Restek RTX-VMS 20 meter, 0.18 mm ID, 1 µm film
	Zero grade helium
	250 °C
	1 mm straight
	0.6 mL/min
	50:1 to 150:1
	Hold at 40 °C for 1.5 min 16 °C/minute to 180 °C 40 °C/minute to 220 °C Hold at 220 °C for 1.5 min Total GC Run is 12.75 min
Mass Spectrometer	Agilent 5975C
	Scan 35 - 300 amu
	5,19
	1.40 min
	250 °C
	300 °C
	200 °C

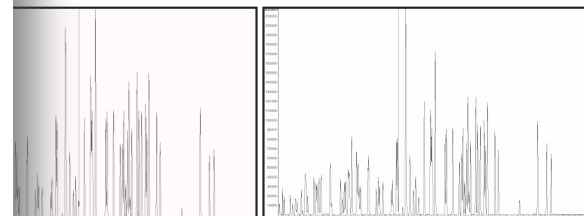


Figure 2. Water

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Conclusions

The OI Analytical 4100 Sample Processor:

- can handle both water and soil VOC samples;
- is capable of rapid processing of VOC samples according to established EPA volatiles methods yielding good results;
- can direct samples to either single or tandem P&T sample concentrators;
- saves time (no lost vials);

Conclusions

- allows efficient cycle time for USEPA 8260 – P&T cycle time is balanced with GC cycle time, so that the instruments don't wait for each other;
- offers significant time savings by using the tandem P&T configuration;
- allows for multiple analysis methods to be performed on the hardware with only a minimum of parameter adjustment.



4100 Water/Soil Sample Processor

Thank you very much
for your time today.

For more information, please call or visit us online.

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