

# Comparison Study of the Eclipse 4660 and 4760 Purge and Traps

## Using USEPA Method 524.3

### Introduction

USEPA method 524.3 is used for the analysis of volatile organic compounds in drinking water. This brief presents a comparison of response factors and calibration %RSDs using the 4660 purge and trap and the new 4760 purge and trap.

### Methodology

A multi-point calibration was run from 0.5 ppb to 40 ppb using the same Agilent 7890A gas chromatograph and 5975C mass spectrometer.

### Results

See Table 1.

### Conclusions

Both purge and traps yielded similar results for USEPA Method 524.3. Laboratories upgrading from the 4660 to the 4760 purge and trap should be able to seamlessly transition to the new instrument without extra method development.

Table 1.

Analyte	Compound	Eclipse 4660		Eclipse 4760	
		Avg RF	% RSD	Avg RF	% RSD
1	1,4-Difluorobenzene(IS)	N/A	N/A	N/A	N/A
2	Dichlorodifluoromethane	0.291	9.70	0.298	10.52
3	Chlorodifluoromethane	0.25	5.22	0.301	7.11
4	Chloromethane	0.37	6.94	0.354	3.83
5	Vinyl chloride	0.302	3.91	0.293	4.20
6	1,3-Butadiene	0.296	4.46	0.291	2.70
7	Bromomethane	0.217	13.58	0.233	6.21
8	Trichlorofluoromethane	0.335	5.87	0.47	3.40
9	Ethyl ether	0.119	6.68	0.11	4.79
10	1,1-Dichloroethene	0.295	7.43	0.291	6.88
11	Carbon disulfide	0.676	6.47	0.703	5.08
12	Methyl iodide	0.52	4.83	0.545	3.86
13	Allyl chloride	0.118	5.73	0.119	4.16
14	Methylene chloride	0.268	4.17	0.266	4.31
15	trans-1,2-Dichloroethene	0.318	8.59	0.313	9.27
16	Methyl acetate	0.191	9.23	0.178	16.92
17	Methyl tert-butyl ether d3(SS)	0.599	3.04	0.631	1.42
18	Methyl tert-butyl ether	0.611	8.06	0.606	6.14
19	tert-Butyl alcohol	0.802	3.26	0.773	3.53
20	Diisopropyl ether	0.902	3.03	0.86	3.65

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Analyte	Compound	Eclipse 4660		Eclipse 4760	
		Avg RF	% RSD	Avg RF	% RSD
21	1,1-Dichloroethane	0.513	3.94	0.491	2.99
22	tert-Butyl ethyl ether	0.802	3.26	0.773	3.53
23	cis-1,2-Dichloroethene	0.332	5.58	0.318	6.00
24	Bromochloromethane	0.169	3.21	0.171	3.79
25	Chloroform	0.539	6.21	0.512	4.16
26	Carbon tetrachloride	0.341	4.46	0.395	3.40
27	Tetrahydrofuran	0.018	17.02	0.019	7.64
28	1,1,1-Trichloroethane	0.385	4.35	0.415	4.62
29	1,1-Dichloropropene	0.339	5.00	0.311	3.00
30	1-Chlorobutane	0.555	3.92	0.513	2.63
31	Benzene	0.978	4.46	0.913	2.48
32	tert-Amyl methyl ether	0.545	6.69	0.541	3.87
33	1,2-Dichloroethane	0.433	3.27	0.429	2.50
34	Trichloroethene	0.345	4.16	0.335	3.93
35	tert-Amyl ethyl ether	0.609	4.12	0.586	2.28
36	Dibromomethane	0.189	4.36	0.186	3.76
37	1,2-Dichloropropane	0.25	3.19	0.237	5.72
38	Bromodichloromethane	0.30	6.41	0.316	5.22
39	cis-1,3-Dichloropropene	0.276	8.43	0.283	6.74
40	Chlorobenzene-d5 (IS)	N/A	N/A	N/A	N/A
41	Toluene	0.791	3.98	0.731	8.54
42	Tetrachloroethene	0.357	5.89	0.322	4.33
43	trans-1,3-Dichloropropene	0.312	6.57	0.312	6.76
44	1,1,2-Trichloroethane	0.221	1.74	0.216	2.21
45	Ethyl methacrylate	0.216	5.35	0.196	9.46
46	Chlorodibromomethane	0.275	7.48	0.305	5.34
47	1,3-Dichloropropane	0.35	3.06	0.332	3.18
48	1,2-Dibromoethane	0.299	4.58	0.307	2.48
49	Chlorobenzene	1.031	2.99	0.994	3.05
50	Ethylbenzene	1.461	5.45	1.37	8.14
51	1,1,1,2-Tetrachloroethane	0.291	7.64	0.301	4.11
52	m,p-Xylene	0.61	8.62	0.586	11.03
53	o-Xylene	0.59	7.12	0.535	10.96
54	Styrene	0.962	8.96	0.902	14.52
55	Bromoform	0.161	5.12	0.18	7.58
56	Isopropylbenzene	1.601	8.70	1.473	11.28
57	1,4-Dichlorobenzene-d4 (IS)	N/A	N/A	N/A	N/A
58	4-Bromofluorobenzene (SS)	0.845	3.37	0.863	1.17
59	Bromobenzene	0.774	8.12	0.78	3.39
60	n-Propylbenzene	3.038	5.38	2.945	8.48
61	1,1,2,2-Tetrachloroethane	0.559	6.60	0.574	4.17
62	2-Chlorotoluene	1.86	3.80	1.789	4.73

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Analyte	Compound	Eclipse 4660		Eclipse 4760	
		Avg RF	% RSD	Avg RF	% RSD
63	1,3,5-Trimethylbenzene	2.37	8.28	2.307	12.31
64	1,2,3-Trichloropropane	0.437	7.47	0.453	4.28
65	4-Chlorotoluene	1.956	3.39	1.905	4.79
66	tert-Butylbenzene	2.26	6.11	2.208	9.74
67	Pentachloroethane	0.329	4.89	0.399	6.71
68	1,2,4-Trimethylbenzene	2.385	8.84	2.323	13.99
69	sec-Butylbenzene	3.00	6.00	2.967	9.91
70	p-Isopropyltoluene	2.544	8.20	2.468	14.42
71	1,3-Dichlorobenzene	1.542	4.51	1.53	2.20
72	1,4-Dichlorobenzene	1.552	6.77	1.521	2.51
73	n-Butylbenzene	2.25	5.69	2.209	8.93
74	Hexachloroethane	0.352	6.14	0.37	5.86
75	1,2-Dichlorobenzene-d4 (SS)	0.966	2.55	1.002	1.74
76	1,2-Dichlorobenzene	1.465	3.90	1.454	3.14
77	1,2-Dibromo-3-chloropropane	0.092	12.16	0.096	8.66
78	Hexchlorobutadiene	0.538	6.76	0.595	8.64
79	1,2,4-Trichlorobenzene	0.962	8.74	0.961	2.63
80	Naphthalene	2.029	6.73	1.993	10.61
81	1,2,3-Trichlorobenzene	0.887	8.18	0.929	3.57

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Figure 1. 10 ppb Standard - 4660

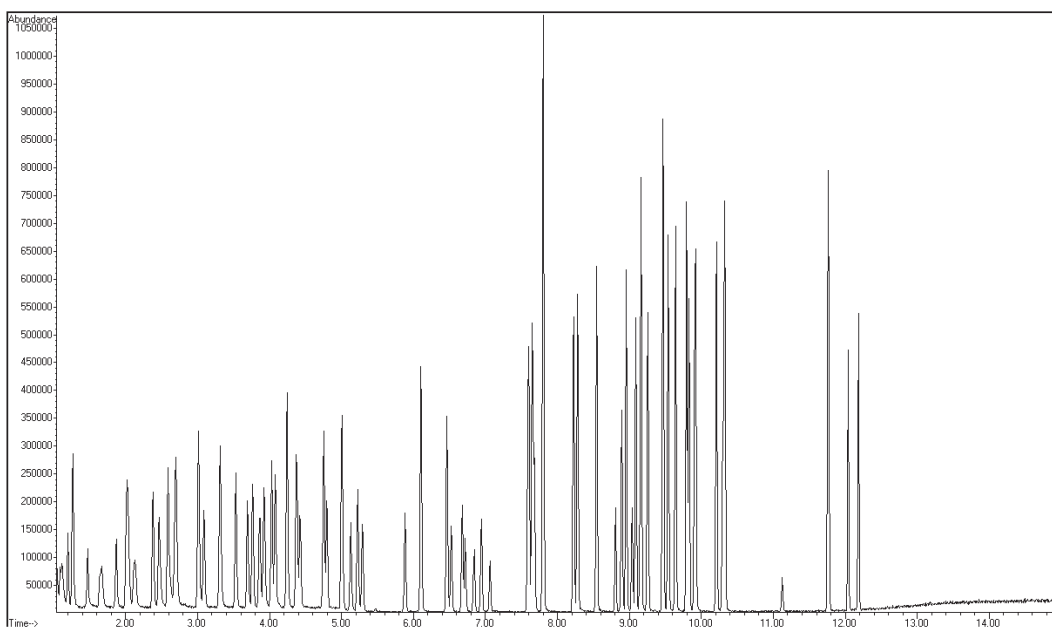
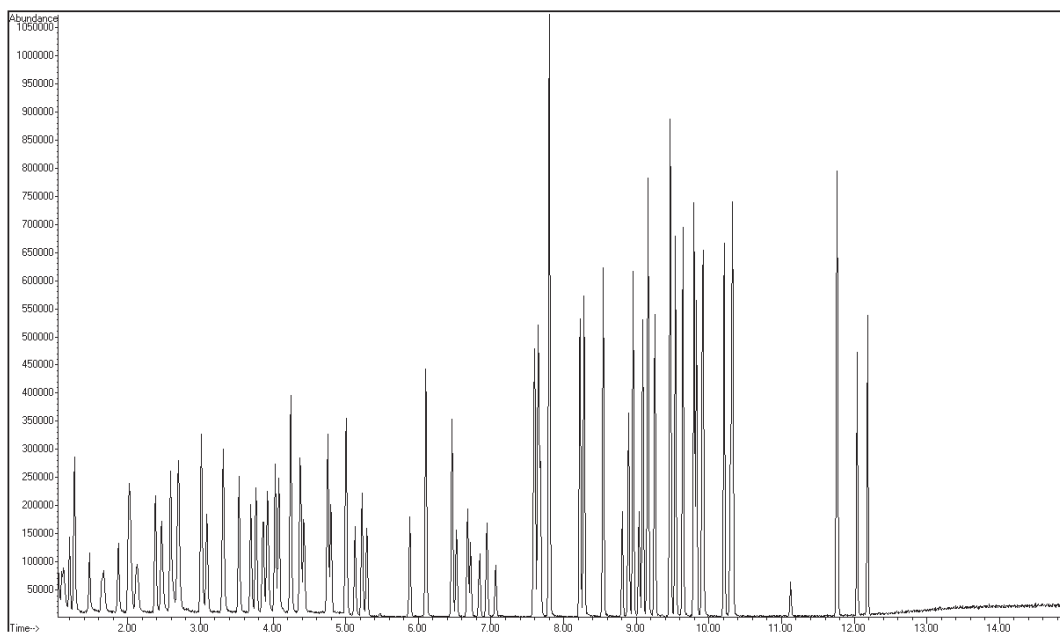


Figure 2. 10 ppb Standard - 4760



## Reference

USEPA Method 524.3 Measurement of Purgeable  
Organic Compounds in Water by Capillary Column Gas  
Chromatography/Mass Spectrometry, Version 1.0, June 2009.