Semivolatile Organic Compounds In Drinking Water By Solid-Phase Extraction And Capillary Column (GC/MS) **EPA Method 525.3** Version 1.0

UCT Part Number:
ECUNI525 (1500 mg 525 C18, 83 mL cartridge)
or
EC525006-P (1500 mg 525 C18, 6 mL cartridge, PE Frit)

Method Summary

A 1-liter water sample is fortified with surrogate analytes then extracted using a solid phase extraction (SPE) cartridge (ECUNI525). Analytes are eluted from the solid phase with a small amount of organic solvents. The extract is dried using anhydrous sodium sulfate and concentrated to approximately 0.7 mL using N_2. IS are added and the volume adjusted to 1 mL with ethyl acetate. A splitless injection is made into a GC equipped with a capillary column, interfaced to an MS with either scan, SIM or SIS detection used for analysis. **The GC/MS may be calibrated using standards prepared in solvent or using matrix-matched standards.**

Internal standards are added after the extract concentration step. If the analyte pentachlorophenol is being measured, use IS ^{13}C-pentachlorophenol at 1000 µg/mL.

Sample Preservation

Preservation reagents, listed in the table below, are added to each sample bottle as dry solids prior to shipment to the field (or prior to sample collection).

Compound	Amount	Purpose
L-ascorbic acid	0.10 g/L	Dechlorination
Ethylenediaminetetraacetic acid, trisodium salt (EDTA)	0.35 g/L	Inhibit metal-catalyzed hydrolysis of targets
Potassium dihydrogen citrate	9.4 g/L	pH 3.8 buffer, microbial inhibitor

Procedure

1. **Cartridge Cleanup**
   a) Assemble an extraction system
   b) Rinse bottle holders and cartridges with 5 mL 1:1 EtOAc:DCM (ethyl acetate:dichloromethane)
   c) Draw half the volume through the cartridge and then soak for 1 min
   d) Draw remaining solvent through the cartridge
   e) Maintain full vacuum for 2 min to dry cartridge

2. **Cartridge Conditioning**
   a) Add 10 ml of methanol to each cartridge
   b) Soak for 1 minute
   c) Draw through leaving a thin layer of methanol on the cartridge frit

Note: Do not let the cartridge go dry from this point until elution, otherwise recondition

   d) Add 10 mL of reagent water to each cartridge
   e) Draw through leaving a thin layer of water on the cartridge frit

3. **Sample Extraction**
   a) All field and QC samples, including LRBs and LFBs, must contain preservatives
   b) Ensure that sample pH is ≤ 4 (use a pH meter for reagent water)
   c) Place sample bottle(s) in holder
   d) Adjust vacuum to fast drip flow rate. A flow of 10 mL/min is optimum
   e) After entire sample has extracted, rinse bottle with 10 mL reagent water
   f) Add rinse to cartridge
   g) Rinse cartridge using 10 mL reagent water to remove sample preservatives
   h) Dry cartridge for 10 min under full vacuum or nitrogen positive pressure

4. **Cartridge Elution**
   a) Insert 40-mL glass vial in manifold
   b) Rinse bottle, holder, and cartridge with 5 mL EtOAc
   c) Pour rinsate into cartridge
   d) Draw ½ volume through cartridge, soak 1 min then draw through completely
   e) Repeat using 5 mL DCM rinse
   f) Repeat using 5 mL EtOAc
   g) Repeat using 5 mL DCM

5. **Extract Drying**
   a) Pre-rinse a drying tube containing 10-20 g of anhydrous sodium sulfate with DCM
   b) Quantitatively transfer the eluant through the sodium sulfate tube and collect
   c) Rinse the collection tube 2 x 5 mL of DCM
   d) Pass the DCM through the sodium sulfate and collect

6. **Extract Concentration**
   a) Concentrate extract to about 0.7 mL (not < 0.5 mL) under a gentle stream of N_2 in a water bath at 40 °C
   b) Transfer to a 1-mL volumetric flask, add IS and bring to volume using EtOAc

7. Analyze by GC/MS

Internal Standards	CASRN	Solvent	PDS conc.
acenaphthene-*d*10 (IS 1)	15067-26-2	acetone	500 µg/mL
phenanthrene-*d*10 (IS 2)	1517-22-2	acetone	500 µg/mL
chrysene-*d*12 (IS 3)	1719-03-5	acetone	500 µg/mL
^{13}C-pentachlorophenol (IS 4)	85380-74-1	methanol	1000 µg/mL

Surrogates	CASRN	Solvent	PDS conc.
1,3-dimethyl-2-nitrobenzene (SUR 1)	81-20-9	acetone	500 µg/mL
triphenyl phosphate (SUR 2)	115-86-6	acetone	500 µg/mL
benzo[*a*]pyrene-*d*12 (SUR 3)	63466-71-7	acetone	500 µg/mL

Instrument Conditions for GC Analysis	
Agilent 5975C MSD with 6890N GC	**Restek RXI-5sil-MS 30m x 0.25 mm x 0.25 µm column**
4-mm i.d. splitless gooseneck injection port liner	**UCT#GCLGN4MM**
Injection Port	**250 °C**
Injection Vol	**1 µL with 1 min split delay**
GC Oven Temp	**Initial: 55 °C, hold 1 min** **Ramp 10 °C/min to 200 °C** **Ramp 7 °C/min to final T 320 °C** **Hold 0.36 min**

Precision and Accuracy Data Obtained for Method 525.3 Analytes Fortified in Reagent Water at Three Concentrations and Extracted Using UCT 525 Universal Cartridges;
N=4; Full Scan GC/MS Analyses[a]

Analytes	Fortified Conc. 0.25 µg/L[b]		Fortified Conc. 2.0 µg/L[c]		Fortified Conc. 5.0 µg/L[d]	
	Mean % Recovery	RSD	Mean % Recovery	RSD	Mean % Recovery	RSD
acenaphthylene	101	2.0	93.6	0.51	99.8	0.88
acetochlor	99.0	3.9	93.6	2.1	104	2.1
alachlor	100	7.3	89.8	0.72	92.8	1.0
aldrin	77.0	5.0	78.4	2.9	85.0	3.4
ametryn	105	4.8	93.1	1.3	95.8	1.1
anthracene	106	3.8	92.3	1.0	104	0.71
atraton	112	2.9	90.3	4.1	96.8	2.2
atrazine	111	3.5	96.1	3.2	97.3	1.5
benzo[*a*]anthracene	112	5.1	99.1	3.8	112	3.6
benzo[*a*]pyrene	109	5.5	103	1.7	111	1.2
benzo[*b*]fluoranthene	119	5.0	102	1.2	114	2.4
benzo[*g,h,i*]perylene	112	2.9	102	4.3	113	2.8
benzo[*k*]fluoranthene	105	1.9	103	2.4	113	3.1
BHT	ND[e]		ND		ND	
bromacil	102	9.3	98.9	0.86	103	2.1
butachlor	107	3.6	86.3	1.1	99.4	1.4
butylate	85.0	7.1	83.0	2.2	84.0	3.0
butylbenzylphthalate	122	1.9	95.9	3.7	114	3.6
chlordane, cis	98.0	5.3	102	2.5	101	1.3
chlordane, trans	103	1.9	103	2.3	96.6	0.71
chlorfenvinphos	113	1.8	110	2.5	111	3.9
chlorobenzilate	82.0	9.3	99.8	5.1	94.1	1.3
chloroneb	93.0	2.2	92.0	2.9	100	1.4
chlorothalonil	116	2.8	106	3.8	105	1.5
chlorpropham	109	3.5	93.1	2.5	98.6	1.1
chlorpyrifos	102	5.1	93.4	3.3	97.2	2.5
chrysene	117	1.7	97.1	1.7	114	2.1
cyanazine	99.0	3.9	88.1	4.9	106	2.4
cycloate	102	3.9	87.4	1.0	88.8	1.2
dacthal (DCPA)	105	3.6	102	3.5	101	1.7
DDD, 4,4′-	107	3.6	85.8	0.75	105	1.4
DDE, 4,4′-	99.0	3.9	82.3	1.3	101	1.0
DDT, 4,4′-	116	2.8	87.6	2.8	112	0.83
DEET	103	1.9	98.3	3.2	104	2.0
di(2-ethylhexyl)adipate	112	4.1	96.6	3.1	111	1.8
di(2-ethylhexyl)phthalate	137	3.7	97.6	1.3	110	2.4
dibenzo[*a,h*]anthracene	110	3.6	95.4	2.5	109	1.5
dibutyl phthalate	115	3.3	101	1.5	114	2.6
dichlorvos	104	3.1	91.6	1.7	88.8	2.7
dieldrin	103	1.9	87.4	0.55	98.1	0.39
diethylphthalate	111	1.8	111	2.3	114	1.4

dimethipin	24.0	14	29.5	6.5	24.9	2.5
dimethylphthalate	110	3.6	113	0.25	113	0.78
DIMP	112	5.8	90.0	1.9	93.7	3.0
dinitrotoluene, 2,4-	126	1.8	105	2.6	113	2.5
dinitrotoluene, 2,6-	121	1.7	106	0.71	111	0.67
diphenamid	106	2.2	95.1	0.90	97.8	0.69
disulfoton	79.0	2.5	91.5	8.9	85.3	1.5
endosulfan I	95.0	5.3	88.4	1.3	101	1.0
endosulfan II	103	1.9	89.6	3.5	103	1.0
endosulfan sulfate	112	7.1	96.5	2.4	106	0.75
endrin	89.0	5.7	82.9	3.4	91.3	4.0
EPTC	89.0	2.2	88.0	0.80	85.8	0.60
ethion	106	2.2	100	2.7	108	3.1
ethoprop	110	2.1	91.3	1.6	96.2	1.4
ethyl parathion	117	4.3	97.6	2.3	105	3.5
etridiazole	118	3.4	90.6	2.2	101	1.5
fenarimol	110	4.7	87.1	2.0	91.7	3.4
fluorene	106	3.8	97.5	2.1	101	1.1
fluridone	92.0	5.0	103	4.9	98.6	2.9
HCCPD	92.0	3.5	65.6	1.7	68.0	5.8
HCH, α	101	3.8	92.5	1.3	95.2	0.47
HCH, β	101	3.8	94.0	4.0	102	1.7
HCH, δ	97.0	6.2	96.4	1.3	101	0.49
HCH, γ (lindane)	90.0	4.4	95.6	2.1	97.9	1.8
heptachlor	96.0	3.4	83.1	2.0	86.2	1.2
heptachlor epoxide	104	3.1	86.9	2.0	95.9	1.6
hexachlorobenzene	94.0	5.5	78.4	3.8	93.0	1.9
hexazinone	107	1.9	84.6	1.7	94.6	2.6
indeno[1,2,3-*c,d*]pyrene	113	4.5	95.0	2.1	112	2.4
isophorone	108	3.0	108	3.2	102	1.1
methoxychlor	122	1.9	89.9	1.5	109	0.72
methyl parathion	129	3.0	103	2.1	112	2.5
metolachlor	109	1.8	93.1	1.1	97.8	0.42
metribuzin	116	2.8	97.3	0.30	106	2.5
mevinphos	115	3.3	96.1	3.1	97.0	1.5
MGK 264(a)	94.0	2.5	75.5	1.9	88.3	4.1
MGK 264(b)	94.0	2.5	82.8	0.35	92.3	0.80
molinate	88.0	3.7	89.4	1.2	88.9	2.1
napropamide	105	3.6	89.9	2.4	99.2	1.5
nitrofen	129	3.0	106	2.7	113	3.9
nonachlor, trans	119	3.2	103	2.3	96.2	1.0
norflurazon	106	2.2	91.9	1.6	102	1.6
oxyfluorfen	129	1.6	93.9	2.9	111	3.5
pebulate	85.0	8.0	84.5	1.7	84.7	2.4
pentachlorophenol	104	4.1	100	1.3	96.0	3.6
permethrin, cis	110	3.6	107	1.3	107	2.2
permethrin, trans	115	3.3	96.1	3.1	97.0	1.5
phenanthrene	94.0	2.5	75.5	1.9	88.3	4.1
phorate	94.0	2.5	82.8	0.35	92.3	0.80
phosphamidon	88.0	3.7	89.4	1.2	88.9	2.1

profenofos	105	3.6	89.9	2.4	99.2	1.5
prometon	129	3.0	106	2.7	113	3.9
prometryn	119	3.2	103	2.3	96.2	1.0
pronamide	106	2.2	91.9	1.6	102	1.6
propachlor	129	1.6	93.9	2.9	111	3.5
propazine	85.0	8.0	84.5	1.7	84.7	2.4
pyrene	104	4.1	100	1.3	96.0	3.6
simazine	110	3.6	107	1.3	107	2.2
simetryn	115	3.3	96.1	3.1	97.0	1.5
tebuconazole	94.0	2.5	75.5	1.9	88.3	4.1
tebuthiuron	94.0	2.5	82.8	0.35	92.3	0.80
terbacil	88.0	3.7	89.4	1.2	88.9	2.1
terbutryn	105	3.6	89.9	2.4	99.2	1.5
tetrachlorvinphos	129	3.0	106	2.7	113	3.9
triadimefon	119	3.2	103	2.3	96.2	1.0
tribufos+merphos	106	2.2	91.9	1.6	102	1.6
trifluralin	129	1.6	93.9	2.9	111	3.5
vernolate	85.0	8.0	84.5	1.7	84.7	2.4
vinclozolin	104	4.1	100	1.3	96.0	3.6
PCB Congeners by UPAC#						
2-chlorobiphenyl (1)	75.0	2.7	81.0	2.6	85.0	1.1
4-chlorobiphenyl (3)	85.0	2.4	84.4	2.8	88.9	1.5
2,4′-dichlorobiphenyl (8)	85.0	2.4	82.5	2.2	87.1	0.51
2,2′,5-trichlorobiphenyl (18)	104	3.1	89.3	2.9	95.3	4.0
2,4,4′-trichlorobiphenyl (28)	81.0	2.5	88.6	3.3	92.4	0.48
2,2′,3,5′-tetrachlorobiphenyl (44)	85.0	9.7	91.1	3.1	93.4	1.6
2,2′,5,5′-tetrachlorobiphenyl (52)	84.0	3.9	90.3	4.4	96.4	1.1
2,3′,4′,5-tetrachloroobiphenyl (70)	84.0	3.9	92.4	3.4	97.0	0.94
2,3,3′,4′,6-pentachlorobiphenyl (110)	81.0	2.5	94.3	3.2	97.1	0.90
2,3′,4,4′,5-pentachlorobiphenyl (118)	90.0	2.6	94.5	3.7	98.8	1.1
2,2′,3,4,4′,5′-hexachlorobiphenyl (138)	86.0	4.7	99.0	3.2	105	1.3
2,2′,3,4′,5′,6-hexachlorobiphenyl (149)	87.0	5.8	96.5	4.3	101	1.2
2,2′,4,4′,5,5′-hexachlorobiphenyl (153)	79.0	2.5	96.9	2.8	101	1.1
2,2′,3,4,4′,5,5′-heptachlorobiphenyl (180)	101	2.0	93.1	2.9	91.6	2.2
Surrogate Analytes						
1,3-dimethyl-2-nitrobenzene	92.9	4.0	98.9	3.1	88.8	4.0
benzo[*a*]pyrene-*d*12	112	2.1	101	2.6	101	4.9
triphenyl phosphate	107	2.5	97.9	4.1	104	3.2

a. Data obtained on the instrumentation described in Sect. 13.1.1.4
b. Exceptions to the stated concentration are as follows: Surrogate concentrations are 5.0 µg/L, pentachlorophenol is 1.0 µg/L, c-permethrin is 0.13 µg/L, t-permethrin is 0.38 µg/L, MGK 264 (a) is 0.085 µg/L and MGK 264 (b) is 0.17 µg/L.
c. Exceptions to the stated concentration are as follows: Surrogate concentrations are 5.0 µg/L, pentachlorophenol is 8.0 µg/L, c-permethrin is 1.0 µg/L, t-permethrin is 3.0 µg/L, MGK 264 (a) is 0.67 µg/L and MGK 264 (b) is 1.3 µg/L.
d. Exceptions to the stated concentration are as follows: Surrogate concentrations are 5.0 µg/L, pentachlorophenol is 20.0 µg/L, c-permethrin is 2.5 µg/L, and t-permethrin is 7.5 µg/L, MGK 264 (a) is 1.7 µg/L and MGK 264 (b) is 3.3 µg/L.
e. ND = Not determined.

Precision and Accuracy Data Obtained for Method Analytes Fortified into Finished Drinking Waters from Ground and Surface Water Sources, and Extracted Using UCT 525 Universal Cartridges; N=4; Full Scan GC/MS Analyses[a]

Analytes	Fortified Conc. (µg/L)	Ground Water[b]		Surface Water[c]	
		Mean % Recovery[d]	RSD	Mean % Recovery[d]	RSD
acenaphthylene	2.0	99.3	5.7	95.1	1.8
acetochlor	2.0	97.4	5.5	106	4.9
alachlor	2.0	93.5	3.5	95.0	3.3
aldrin	2.0	94.9	4.0	81.1	0.59
ametryn	2.0	98.9	5.7	93.4	6.2
anthracene	2.0	102	4.7	101	1.6
atraton	2.0	92.6	5.9	87.3	5.3
atrazine	2.0	100	4.6	95.6	1.5
benzo[*a*]anthracene	2.0	104	1.5	102	2.4
benzo[*a*]pyrene	2.0	106	3.2	100	2.7
benzo[*b*]fluoranthene	2.0	104	3.3	100	3.9
benzo[*g,h,i*]perylene	2.0	101	3.9	101	5.3
benzo[*k*]fluoranthene	2.0	103	3.0	101	2.6
BHT	2.0	95.5	1.2	114	1.9
bromacil	2.0	98.9	5.5	104	4.6
butachlor	2.0	96.4	2.9	95.6	3.3
butylate	2.0	87.6	3.2	83.6	1.8
butylbenzylphthalate	2.0	107	4.1	107	2.9
chlordane, cis-	2.0	96.1	6.2	98.0	5.9
chlordane, trans	2.0	94.5	5.9	98.3	7.3
chlorfenvinphos	2.0	93.1	3.9	111	3.4
chlorobenzilate	2.0	101	5.6	97.1	4.3
chloroneb	2.0	104	2.0	108	4.0
chlorothalonil	2.0	108	1.5	110	2.2
chlorpropham	2.0	95.9	5.6	98.1	2.4
chlorpyrifos	2.0	97.8	5.3	103	4.1
chrysene	2.0	106	2.2	100	3.2
cyanazine	2.0	97.4	5.2	91.0	11
cycloate	2.0	92.3	5.6	95.1	1.6
dacthal (DCPA)	2.0	92.1	7.3	107	4.3
DDD, 4,4′-	2.0	93.1	3.7	91.0	2.0
DDE, 4,4′-	2.0	90.0	3.6	85.6	2.7
DDT, 4,4′-	2.0	91.4	3.7	90.4	3.5
DEET	2.0	101	1.8	109	1.1

di(2-ethylhexyl)adipate	2.0	102	5.8	106	3.4
di(2-ethylhexyl)phthalate	2.0	107	2.7	104	2.2
dibenzo[*a,h*]anthracene	2.0	106	6.2	102	2.2
dibutyl phthalate	2.0	110	3.7	107	1.5
dichlorvos	2.0	90.4	7.3	88.8	2.3
dieldrin	2.0	96.0	5.4	96.3	2.6
diethylphthalate	2.0	110	2.5	107	1.1
dimethipin	2.0	29.4	8.7	38.1	4.2
dimethylphthalate	2.0	111	2.4	111	1.0
DIMP	2.0	89.6	5.9	99.6	5.9
dinitrotoluene, 2,4-	2.0	95.6	7.0	105	4.1
dinitrotoluene, 2,6-	2.0	95.6	6.2	101	5.0
diphenamid	2.0	98.5	5.6	101	2.3
disulfoton	2.0	79.6	5.9	103	6.3
endosulfan I	2.0	96.9	7.0	93.0	4.5
endosulfan II	2.0	98.5	5.7	94.3	4.1
endosulfan sulfate	2.0	102	2.8	100	2.1
endrin	2.0	97.9	2.6	88.1	3.4
EPTC	2.0	89.0	7.2	85.8	3.0
ethion	2.0	95.8	6.9	98.9	4.3
ethoprop	2.0	94.9	5.7	103	3.9
ethyl parathion	2.0	97.6	5.9	103	3.0
etridiazole	2.0	104	2.4	104	3.1
fenarimol	2.0	93.5	4.4	86.6	3.3
fluorene	2.0	101	5.1	104	1.8
fluridone	2.0	111	3.9	97.4	6.0
HCCPD	2.0	64.6	6.7	69.1	2.8
HCH, α	2.0	93.5	5.7	91.8	2.4
HCH, β	2.0	97.9	4.2	97.8	1.8
HCH, δ	2.0	102	6.4	94.3	3.7
HCH, γ (lindane)	2.0	100	6.8	90.0	2.1
heptachlor	2.0	91.0	3.0	86.1	1.5
heptachlor epoxide	2.0	98.3	6.2	91.6	1.6
hexachlorobenzene	2.0	90.4	4.0	89.0	2.7
hexazinone	2.0	93.4	3.1	97.0	8.1
indeno[1,2,3-*c,d*]pyrene	2.0	107	6.6	103	4.6
isophorone	2.0	104	3.9	101	2.6
methoxychlor	2.0	94.0	5.6	94.0	2.6
methyl parathion	2.0	100	3.7	110	2.5
metolachlor	2.0	97.5	5.6	97.8	2.1
metribuzin	2.0	102	2.6	120	0.77
mevinphos	2.0	89.9	5.3	96.3	4.5
MGK 264(a)	1.3	92.9	2.3	86.4	4.1
MGK 264(b)	0.67	95.9	4.1	92.6	3.9
molinate	2.0	94.9	5.0	89.1	2.3
napropamide	2.0	95.9	4.6	104	3.1
nitrofen	2.0	111	6.2	96.4	5.3
nonachlor, trans	2.0	105	4.0	98.4	5.3
norflurazon	2.0	98.1	3.8	101	6.4
oxyfluorfen	2.0	91.8	7.7	94.9	5.0
pebulate	2.0	89.3	4.4	84.3	1.0
pentachlorophenol	8.0	98.3	2.6	97.3	2.9
permethrin, cis	1.0	92.6	6.0	108	4.3
permethrin, trans	3.0	91.4	7.1	100	2.3
phenanthrene	2.0	106	3.7	104	2.5

phorate	2.0	95.5	2.0	98.9	4.8
phosphamidon	2.0	100	3.3	114	2.8
profenofos	2.0	98.4	4.4	108	1.7
prometon	2.0	96.9	2.1	88.4	5.7
prometryn	2.0	98.8	4.9	94.6	4.9
pronamide	2.0	95.1	5.5	96.6	3.4
propachlor	2.0	106	1.4	110	3.4
propazine	2.0	101	2.8	96.4	2.5
pyrene	2.0	106	1.2	107	2.2
simazine	2.0	101	3.7	96.1	3.0
simetryn	2.0	98.6	4.2	87.9	3.8
tebuconazole	2.0	94.4	5.4	96.0	5.2
tebuthiuron	2.0	88.5	7.1	101	1.8
terbacil	2.0	101	5.6	95.8	10
terbutryn	2.0	97.3	5.1	87.4	5.1
tetrachlorvinphos	2.0	97.5	6.6	104	5.4
triadimefon	2.0	99.3	2.1	101	3.0
tribufos+merphos	4.0	96.6	7.3	107	2.0
trifluralin	2.0	90.8	2.2	90.0	4.5
vernolate	2.0	88.0	6.0	88.3	1.8
vinclozolin	2.0	98.6	7.0	111	1.7
PCB Congeners by IUPAC#					
2-chlorobiphenyl (1)	2.0	90.8	1.7	96.3	5.6
4-chlorobiphenyl (3)	2.0	96.1	0.65	99.9	5.4
2,4′-dichlorobiphenyl (8)	2.0	97.9	0.87	86.6	6.3
2,2′,5-trichlorobiphenyl (18)	2.0	101	3.8	90.9	7.5
2,4,4′-trichlorobiphenyl (28)	2.0	101	2.2	86.1	4.9
2,2′,3,5′-tetrachlorobiphenyl (44)	2.0	93.0	3.0	88.1	6.9
2,2′,5,5′-tetrachlorobiphenyl (52)	2.0	97.1	3.1	87.8	6.6
2,3′,4′,5-tetrachloroobiphenyl (70)	2.0	107	1.5	88.1	5.2
2,3,3′,4′,6-pentachlorobiphenyl (110)	2.0	107	1.3	92.0	6.3
2,3′,4,4′,5-pentachlorobiphenyl (118)	2.0	108	1.2	91.3	6.4
2,2′,3,4,4′,5′-hexachlorobiphenyl (138)	2.0	110	2.0	93.8	5.3
2,2′,3,4′,5′,6-hexachlorobiphenyl (149)	2.0	106	1.4	91.5	6.0
2,2′,4,4′,5,5′-hexachlorobiphenyl (153)	2.0	108	0.89	91.3	6.3
2,2′,3,4,4′,5,5′-heptachlorobiphenyl (180)	2.0	99.6	1.0	87.6	7.2
Surrogate Analytes					
1,3-dimethyl-2-nitrobenzene	5.0	91.7	7.5	89.0	6.5
benzo[*a*]pyrene-d_{12}	5.0	103	2.7	104	3.0
triphenyl phosphate	5.0	104	0.58	112	3.5

a. Data obtained on the instrumentation described in Sect. 13.1.1.4.
b. Tap water from a ground water source with high mineral content. Tap water hardness was 300mg/L as calcium carbonate
c. Tap water from a surface water source. TOC of 2.4 mg/L
d. Recoveries have been corrected to reflect the native amount in the unfortified matrix water.

Toxaphene from Fortified Reagent Water Precision and Accuracy: Extracts Analyzed by SIM

Fortified Concentration 10 µg/L N=4	Mean % Recovery	RSD
Toxaphene	111	1.8

Method 525.3, "Determination Of Semivolatile Organic Chemicals In Drinking Water By Solid Phase Extraction And Capillary Column Gas Chromatography/ Mass Spectrometry (GC/MS)," Ver 1.0, February 2012, Jean W. Munch and Paul E. Grimmett (U.S. EPA, Office of Research and Development, National Exposure Research Laboratory), David J. Munch and Steven C. Wendelken (U.S. EPA, Office of Water, Office of Ground Water and Drinking Water, Technical Support Center) Mark M. Domino (Industrial and Environmental Services, LLC) Alan D. Zaffiro and Michael L. Zimmerman (Shaw Environmental and Infrastructure, Inc.), National Exposure Research Laboratory Office Of Research And Development, U. S. Environmental Protection Agency, Cincinnati, Ohio 45268

Complete details at www.epa.gov/safewater/methods/methods.html

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