

The Biomarker Catalogue

A black silhouette of a person in profile, facing right, holding a bow and arrow. The figure is positioned behind a solid red horizontal band that spans the width of the page. The figure's legs are visible below the band.

**Page 11-39**  
**ISO methods**

A decorative pattern of white hexagons arranged in a honeycomb lattice, located in the bottom left corner of the page.

**The collection of reference standards**  
**- 2008 -**



# Chapter II: Methods

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# ISO methods

## ISO 6468:1996

### Water quality - pesticides, PCBs, chlorobenzenes

Water quality - Determination of certain organochlorine insecticides, polychlorinated biphenyls and chlorobenzenes - Gas chromatographic method after liquid-liquid extraction

This test method covers the determination of certain organochlorine insecticides, polychlorinated biphenyls (PCBs) and chlorobenzenes (except the mono- and dichlorobenzenes) in drinking waters, ground waters, surface waters and waste waters.

Chiron No.	Compound	Abbr.	CAS No.	Conc. 1 mL
<b>Organochlorine pesticides</b>				
3319.6-100-CY or AN	alpha-HCH (alpha-BHC)		[319-84-6]	100 µg/mL
3415.6-100-CY or AN	beta-HCH (beta-BHC)		[319-85-7]	100 µg/mL
2026.6-100-CY or AN	gamma-HCH (gamma-BHC)	Lindane	[58-89-9]	100 µg/mL
3321.6-100-CY or AN	delta-HCH (delta-BHC)		[319-86-8]	100 µg/mL
3318.6-100-CY or AN	epsilon-HCH (epsilon-BHC)		[6108-10-7]	100 µg/mL
3361.14-100-CY or AN	1,1-Dichloro-2-(o-chlorophenyl)- -2-(p-chlorophenyl)ethylene	o,p'-DDE	[3424-82-6]	100 µg/mL
3362.14-100-CY or AN	1,1-Dichloro-2,2-bis(p-chlorophenyl)ethylene	p,p'-DDE	[72-55-9]	100 µg/mL
3357.14-100-CY or AN	1,1-Dichloro-2-(o-chlorophenyl)- 2-(p-chlorophenyl)ethane	o,p'-TDE	[53-19-0]	100 µg/mL
3356.14-100-CY or AN	1,1-Dichloro-2,2-bis(p-chlorophenyl)ethane	p,p'-TDE	[72-54-8]	100 µg/mL
3363.14-100-CY or AN	1,1,1-Trichloro-2-(o-chlorophenyl)- 2-(p-chlorophenyl)ethane	o,p'-DDT	[789-02-6]	100 µg/mL
2028.14-100-CY or AN	1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane	p,p'-DDT	[50-29-3]	100 µg/mL
3448.16-100-CY or AN	1,1,1-Trichloro-2,2-bis(p-methoxyphenyl)ethane	Methoxychlor	[72-43-5]	100 µg/mL
2774.12-100-CY or AN	Aldrin	Aldrin	[309-00-2]	100 µg/mL
2775.12-100-CY or AN	Dieldrin	Dieldrin	[60-57-1]	100 µg/mL
1892.12-100-CY or AN	Endrin	Endrin	[72-20-8]	100 µg/mL
2776.10-100-CY or AN	Heptachlor	Heptachlor	[76-44-8]	100 µg/mL
2777.10-100-CY or AN	Heptachlor-epoxide (trans)	Heptachlor- epoxide	[1024-57-3]	100 µg/mL
3387.9-100-CY or AN	alpha-Endosulfan		[959-98-8]	100 µg/mL
3388.9-100-CY or AN	beta-Endosulfan		[33213-65-8]	100 µg/mL
<b>Chlorobenzenes</b>				
3330.6-K-IO or AN	1,2,3-Trichlorobenzene	123-TrCB	[87-61-6]	1000 µg/mL
3519.6-K-IO or AN	1,2,4-Trichlorobenzene	124-TrCB	[120-82-1]	1000 µg/mL
3749.6-K-IO or AN	1,3,5-Trichlorobenzene	135-TrCB	[108-70-3]	1000 µg/mL
3751.6-K-IO or AN	1,2,3,5-Tetrachlorobenzene	1235-TeCB	[634-90-2]	1000 µg/mL
3656.6-K-IO or AN	1,2,4,5-Tetrachlorobenzene	1245-TeCB	[95-94-3]	1000 µg/mL
2025.6-K-IO or AN	Pentachlorobenzene	PeCB	[608-93-5]	1000 µg/mL
1356.6-K-IO or AN	Hexachlorobenzene	HCB	[118-74-1]	1000 µg/mL
3474.6-100-CY or AN	Pentachloronitrobenzene (=Quintozene)	PCNB	[82-68-8]	100 µg/mL



### Polychlorinated biphenyls

1999.12-100-IO or AN	2,4,4'-Trichlorobiphenyl	PCB-28	[7012-37-5]	100 µg/mL
2000.12-100-IO or AN	2,2',5,5'-Tetrachlorobiphenyl	PCB-52	[35693-99-3]	100 µg/mL
2001.12-100-IO or AN	2,2',4,5,5'-Pentachlorobiphenyl	PCB-101	[37680-73-2]	100 µg/mL
2003.12-100-IO or AN	2,2',3,4,4',5'-Hexachlorobiphenyl	PCB-138	[35065-28-2]	100 µg/mL
2004.12-100-IO or AN	2,2',4,4',5,5'-Hexachlorobiphenyl	PCB-153	[35065-27-1]	100 µg/mL
2005.12-100-IO or AN	2,2',3,4,4',5,5'-Heptachlorobiphenyl	PCB-180	[35065-29-3]	100 µg/mL
2268.12-100-IO or AN	2,2',3,3',4,4',5,5'-Octachlorobiphenyl	PCB-194	[35694-08-7]	100 µg/mL

## ISO 7981-1:2005

### Water quality - Six PAHs by TLC

Water quality - Determination of polycyclic aromatic hydrocarbons (PAH) –

Part 1: Determination of six PAH by high-performance thin-layer chromatography with fluorescence detection after liquid-liquid extraction.

This part of ISO 7981 specifies the determination of six selected PAH in drinking water using high performance TLC.

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#### Single-substance stock solutions

Chiron No.	Name	CAS No.	Concentration
0260.16-10-AN	Fluoranthene	[206-44-0]	10µg/mL
0263.20-10-AN	Benzo[b]fluoranthene	[205-99-2]	10µg/mL
0239.20-10-AN	Benzo[a]pyrene	[50-32-8]	10µg/mL
0265.20-10-AN	Benzo[k]fluoranthene	[207-08-9]	10µg/mL
0277.22-10-AN	Indeno[1,2,3-cd]pyrene	[193-39-5]	10µg/mL
0222.22-10-AN	Benzo[ghi]perylene	[191-24-2]	10µg/mL
3831.6-KIT	ISO 7981-1 Single substance Kit		6 samples

#### S-4062-ASS-5AN

Multiple-substance stock solution (=“6 priority PAH – drinking water analysis”)  
6 Analytes, each 2-10µg/mL in acetonitrile; unit: 1x5mL

Chiron No.	Name	CAS No.	Concentration
0260.16	Fluoranthene	[206-44-0]	10µg/mL
0263.20	Benzo[b]fluoranthene	[205-99-2]	2µg/mL
0239.20	Benzo[a]pyrene	[50-32-8]	2µg/mL
0265.20	Benzo[k]fluoranthene	[207-08-9]	2µg/mL
0277.20	Indeno[1,2,3-cd]pyrene	[193-39-5]	2µg/mL
0222.22	Benzo[ghi]perylene	[191-24-2]	2µg/mL



## ISO 7981-2:2005

### Water quality – Six PAHs by HPLC

Water quality - Determination of polycyclic aromatic hydrocarbons (PAH) -

Part 2: Determination of six PAH by high-performance liquid chromatography with fluorescence detection after liquid-liquid extraction

This part of ISO 7981 specifies the determination of six PAH in drinking, mineral, table waters and ground and surface waters in mass concentrations 0.005µg/L, by high-performance liquid chromatography (HPLC) and fluorescence detection after liquid-liquid extraction.

#### Single-substance stock solutions

1x1mL each

Chiron No.	Name	CAS No.	Concentration
0260.22-10-AN	Fluoranthene	[206-44-0]	10µg/mL
0263.20-10-AN	Benzo[b]fluoranthene	[205-99-2]	10µg/mL
0239.20-10-AN	Benzo[a]pyrene	[50-32-8]	10µg/mL
0265.20-10-AN	Benzo[k]fluoranthene	[207-08-9]	10µg/mL
0277.22-10-AN	Indeno[1,2,3-cd]pyrene	[193-39-5]	10µg/mL
0222.22-10-AN	Benzo[ghi]perylene	[191-24-2]	10µg/mL
3832.6-KIT	ISO 7981-2 Single substance Kit		6 samples

S-4454-10-5AN

#### Multiple-substance stock solution

6 Analytes, each 10µg/mL in acetonitrile; unit: 1x5mL

Chiron No.	Name	CAS No.	Concentration
0260.22	Fluoranthene	[206-44-0]	10µg/mL
0263.20	Benzo[b]fluoranthene	[205-99-2]	10µg/mL
0239.20	Benzo[a]pyrene	[50-32-8]	10µg/mL
0265.20	Benzo[k]fluoranthene	[207-08-9]	10µg/mL
0277.22	Indeno[1,2,3-cd]pyrene	[193-39-5]	10µg/mL
0222.22	Benzo[ghi]perylene	[191-24-2]	10µg/mL

Calibrations solutions are made by request according to customer specifications.

## ISO 8165-1:1999

### Water quality - Monovalent phenols

Water quality – Determination of selected monovalent phenols -

Part 1: Gas-chromatographic method after enrichment by extraction

This international method specifies a method for determining phenols by a gas chromatographic method. The determination of selected phenols and nitrophenols in drinking water, ground water and surface water. The method provides a procedure for solid-phase extraction of nitrophenols, followed by solvent elution, derivatization with diazomethane and determination by gas chromatography and mass spectrometry.

**S-4351-100-ME****ISO 8165-1 Phenol Standard Stock Solution**

35 Analytes, each 100µg/mL in methanol; unit: 5x1mL

<b>Chiron No.</b>	<b>Compound</b>	<b>CAS No.</b>
1427.6	Phenol	[108-95-2]
1403.7	2-Methylphenol (o-Cresol)	[95-48-7]
1404.7	3-Methylphenol (m-Cresol)	[108-39-4]
1358.7	4-Methylphenol (p-Cresol)	[106-44-5]
1406.8	2,4-Dimethylphenol	[105-67-9]
1411.8	4-Ethylphenol	[123-07-9]
1448.15	2,6-Di-tert-butyl-4-methylphenol (2,6-Bis(1,1-dimethylethyl)-4-methylphenol)	[128-37-0]
1806.12	2-Phenylphenol	[90-43-7]
2388.13	2-Benzylphenol	[28994-41-4]
2439.14	2-Benzyl-4-methylphenol	[716-96-1]
2062.6	2-Chlorophenol	[95-57-8]
2067.6	3-Chlorophenol	[108-43-0]
2068.6	4-Chlorophenol	[106-48-9]
2070.7	4-Chloro-2-methylphenol	[1570-64-5]
2071.7	4-Chloro-3-methylphenol	[59-50-7]
2379.8	2,4-Dichloro-3,5-dimethylphenol	[133-53-9]
2500.11	2-Cyclopentyl-4-chlorophenol	[13347-42-7]
2378.10	6-Chloro-5-methyl-2- (1-methylethyl)phenol(6-Chorothymol)	[89-68-9]
2066.6	2,3-Dichlorophenol	[576-24-9]
2064.6	2,4-Dichlorophenol	[120-83-2]
2065.6	2,5-Dichlorophenol	[583-78-8]
2069.6	2,6-Dichlorophenol	[87-65-0]
2076.6	2,4,6-Trichlorophenol	[88-06-2]
2073.6	2,3,5-Trichlorophenol	[933-78-8]
2075.6	2,4,5-Trichlorophenol	[95-95-4]
2072.6	2,3,6-Trichlorophenol	[933-75-5]
2081.6	2,3,4,5-Tetrachlorophenol	[4901-51-3]
2149.6	2,3,4,6-Tetrachlorophenol	[58-90-2]
2074.6	2,3,5,6-Tetrachlorophenol	[935-95-5]
2084.6	Pentachlorophenol	[87-86-5]
2376.10	1-Naphthol	[90-15-3]
2377.10	2-Naphthol	[135-19-3]
2063.7	2-Chloro-5-methylphenol (6-Chloro-3-methylphenol)	[615-74-7]
2440.10	2-Chloro-4-tert-butylphenol	[98-28-2]
2441.13	4-Chloro-2-benzylphenol	[120-32-1]

**S-4353-K-5AC****ISO 8165-1 Internal Control Stock Solution 1**

1 Internal standard, 1000µg/mL in acetone; unit: 1x5mL

2061.6      2,4-Dibromophenol      [615-58-7]

Alternative Internal standard:

**ISO 8165-1 Internal Control Stock Standard Solution 2**

2470.6      2,5-Dibromophenol      [28165-52-8]



# ISO 8165-2:1999

## Water quality – Monovalent phenols

Water quality – Determination of selected monovalent phenols –

### Part 2: Method by derivatization and gas chromatography

This international method specifies a method for the determination of phenols by gas chromatography, following pentafluorobenzoyl chloride derivatization. It may in particular be applied to the examination of drinking water, ground water and moderately contaminated surface water.

S-4352-300-ME

#### ISO 8165-2 Phenol Standard Stock Solution 2

33 Analytes, each 300µg/mL in methanol; unit: 5x1mL

Prod.No.	Compound	CAS No.
1427.6	Phenol	[108-95-2]
1403.7	2-Methylphenol (o-Cresol)	[95-48-7]
1404.7	3-Methylphenol (m-Cresol)	[108-39-4]
1358.7	4-Methylphenol (p-Cresol)	[106-44-5]
1406.8	2,4-Dimethylphenol	[105-67-9]
1411.8	4-Ethylphenol	[123-07-9]
1448.15	2,6-Bis(1,1-dimethylethyl)-4-methylphenol	[128-37-0]
1806.12	2-Phenylphenol	[90-43-7]
2388.13	2-Benzylphenol	[28994-41-4]
2439.14	2-Benzyl-4-methylphenol	[716-96-1]
2062.6	2-Chlorophenol	[95-57-8]
2067.6	3-Chlorophenol	[108-43-0]
2068.6	4-Chlorophenol	[106-48-9]
2070.7	4-Chloro-2-methylphenol	[1570-64-5]
2071.7	4-Chloro-3-methylphenol	[59-50-7]
2063.7	2-Chloro-5-methylphenol (6-Chloro-3-methylphenol)	[615-74-7]
2379.8	2,4-Dichloro-3,5-dimethylphenol	[133-53-9]
2440.10	2-Chloro-4-tert-butylphenol	[98-28-2]
2500.11	2-Cyclopentyl-4-chlorophenol	[13347-42-7]
2441.13	4-Chloro-2-benzylphenol	[120-32-1]
2378.10	6-Chloro-5-methyl-2-(1-methylethyl)phenol	[89-68-9]
2066.6	2,3-Dichlorophenol	[576-24-9]
2064.6	2,4-Dichlorophenol	[120-83-2]
2065.6	2,5-Dichlorophenol	[583-78-8]
2069.6	2,6-Dichlorophenol	[87-65-0]
2076.6	2,4,6-Trichlorophenol	[88-06-2]
2073.6	2,3,5-Trichlorophenol	[933-78-8]
2075.6	2,4,5-Trichlorophenol	[95-95-4]
2072.6	2,3,6-Trichlorophenol	[933-75-5]
2081.6	2,3,4,5-Tetrachlorophenol	[4901-51-3]
2149.6	2,3,4,6-Tetrachlorophenol	[58-90-2]
2074.6	2,3,5,6-Tetrachlorophenol	[935-95-5]
2084.6	Pentachlorophenol	[87-86-5]



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2061.6-10-5ME	<b>ISO 8165-2 Internal Control Stock Solution 1</b> 1 Internal standard, 10µg/mL in methanol; unit: 1x5mL
	2,4-Dibromophenol [615-58-7]
2470.6-10-5ME	Alternative Internal standard: <b>ISO 8165-2 Internal Control Stock Solution 2</b> 1 Internal standard, 10µg/mL in methanol; unit: 1x5mL
	2,5-Dibromophenol [28165-52-8]

## ISO 9377-2:2000 / ISO 9377-MOD (OSPAR) Water quality – Hydrocarbons in water

**NEW**

Water quality – Determination of hydrocarbon oil index

Part 2: Method using solvent extraction and gas chromatography

### ISO 9377-2: Hydrocarbon oil index

The method of choice for the determination of oil and grease in water is the new standard ISO 9377-2, and is based on extraction with a hydrocarbon solvent like pentane or hexane.

This test determines the hydrocarbon oil index in water by means of gas chromatography. The method is suitable for surface water, waste water, and water from sewage treatment plants, and allows the determination of the hydrocarbon oil index in concentrations above 0.1 mg/L.

The index is the sum of compounds with retention times between n-decane and n-tetracontane. Substances complying with this definition are long-chain or branched aliphatic, alicyclic, aromatic or alkylsubstituted aromatic hydrocarbons.

For the determination of mineral-oil content of soils and sediments, see ISO/TR 11046.

### ISO 9377-2-Mod: Determination of hydrocarbon oil index down to C7

A modified method for oil in water analysis of produced water from offshore petroleum production installations has recently been taken into force.

ISO 9377-2 is not applicable for volatile hydrocarbons, and a modification of the method is proposed by the OSPAR commission in order to include the determination of certain hydrocarbons with boiling points between 98 and 174 °C from produced water.

The OSPAR Reference Method of Analysis for the Determination of the Dispersed Oil Content in Produced Water: Reference Number 2005-15.



**S-4213-2K-100MX****ISO 9377-2 Test for Suitability of Fluorisil**

2000µg/mL; unit: 1x100mL

Stearyl Stearate in "Extraction solvent standard solution" (S-4515)

Test with stearyl stearate to determine the separation of polar compounds

**NEW PRODUCT:**

ISO 9377-2 Test for suitability of Fluorosil. Ready to use solution

Units: 1x25mL, 5x25mL, 10x25 mL

Stearyl stearate test solution, 2 mg/mL (S-4134) 10 mL

Extraction solvent (pentane) 15 mL

Total of 25 mL to be used in one experiment

**S-4214-2K-PE****ISO 9377-2 Stearyl Stearate Solution for Comparison**

Unit: 1mL for direct GC-comparison

Stearyl stearate test solution, 2 mg/mL (S-4134) 0.5 mL

Extraction agent (pentane) 24.5 mL

**S-4108-50-PE \***

S-4108-50-5PE

**ISO 9377-2 Standard Mixture of n-Alkanes C10-C40 (all even)**

Determination of Hydrocarbon Oil in Water Index

16 Analytes, each 50 µg/mL in n-Pentane; units: 1x1mL, 1x5mL, 10x1mL

**S-4108-100-CY \***

S-4108-100-5CY

This standard is also available as 100µg/mL in Cyclohexane

Units: 1x1mL, 1x5 mL, 10x1mL

n-Decane	C10	n-Hexacosane	C26
n-Dodecane	C12	n-Octacosane	C28
n-Tetradecane	C14	n-Triacontane	C30
n-Hexadecane	C16	n-Dotriacontane	C32
n-Octadecane	C18	n-Tetraatriacontane	C34
n-Eicosane	C20	n-Hexatriacontane	C36
n-Docosane	C22	n-Octatriacontane	C38
n-Tetracosane	C24	n-Tetracontane	C40

**S-4107-50-PE \***

S-4107-50-5PE

**ISO 9377-2 Standard Mixture of n-Alkanes C20-C40 (all even)**

Determination of Hydrocarbon Oil in Water Index

11 Analytes, each 50µg/mL in n-Pentane, units: 1x1mL, 1x5mL, 10x1mL

n-Eicosane	C20	n-Tetraatriacontane	C34
n-Docosane	C22	n-Hexatriacontane	C36
n-Tetracosane	C24	n-Octatriacontane	C38
n-Hexacosane	C26	n-Tetracontane	C40
n-Octacosane	C28		
n-Triacontane	C30		
n-Dotriacontane	C32		

\*When using the above standards to check column performance, the relative ratio n-Tetracontane to n-Eicosane should be at least 0.8



## ISO 9377-2-Mod: Standards available from Chiron for the determination of hydrocarbon oil index down to C7

S-4215-1ML S-4215 -5ML	<b>ISO 9377-2 Mixture of Mineral Oils A+B without additives</b> See above for ISO 9377-2										
S-4216-SET	<b>ISO 9377-2 Calibration Mixture of Minerals Oils</b> See above for ISO 9377-2										
S-4453-4K-AC	<b>ISO 9377-2 MOD Quality Control Standard of Base Oil EDC 95/4</b> 4000µg/mL in acetone										
S-4217-K-AC S-4217-4K-AC S-4217-10K-AC	<b>ISO 9377-2 Quality Control Standard of Mineral Oils A+B</b> See above for ISO 9377-2										
S-4415-20-PE	<b>ISO 9377-2 MOD Extraction Solvent Stock Solution I</b> 20µL of n-Heptane and 20mg of n-Tetracontane solved in 1000mL n-Pentane Units: 1x5mL, 5x5mL, 10x5mL, 1x100mL and 5x100mL										
S-4516	ISO 9377-2 MOD Extraction solvent standard solution. Dilute of Extraction solvent stock solution (S-4415) 10 times with the extraction solvent (n-Pentane)										
S-4517-ASS-10MX	<b>ISO 9377-2 MOD Stearyl Stearate Test Solution</b> 200mg Stearyl stearate in 100mL Extraction solvent standard solution (S-4516) Units: 1x10mL, 5x10mL, 10x10mL										
S-4518-2K-100MX	<b>ISO 9377-2 MOD Test for Suitability of Fluorisil</b> 10mL Stearyl stearate test solution (S-4517) with 15mL Extraction solvent (n-Pentane) Units: 1x25mL, 5x25mL, 10x25mL, 1x100mL										
S-4519-2K-PE	<b>ISO 9377-2 MOD Stearyl Stearate Solution for Comparison</b> 0,5mL Stearyl stearate test solution (S-4517) with 24,5mL Extraction solvent (n-Pentane) Unit: 1mL for direct GC-Comparison										
S-4422-40-100PE	<b>ISO 9377-2 MOD Extraction Solvent Stock Solution II</b> Units: 1x100mL and 5x100mL extraction solvent stock solution  <table border="0"> <tbody> <tr> <td>n-Heptan</td> <td>40 mg</td> </tr> <tr> <td>n-Tetracontane</td> <td>40 mg</td> </tr> <tr> <td>Pentane</td> <td>Add to 1000 mL</td> </tr> </tbody> </table>	n-Heptan	40 mg	n-Tetracontane	40 mg	Pentane	Add to 1000 mL				
n-Heptan	40 mg										
n-Tetracontane	40 mg										
Pentane	Add to 1000 mL										
S-4257-200-PE S-4257-200-5PE	<b>BTEX Mixture 1</b> 6 Analytes, each 200µg/mL in pentane; units: 1x1mL, 1x5mL  <table border="0"> <tbody> <tr> <td>Benzene</td> <td>   </td> <td>Ethylbenzene</td> <td>   </td> <td>m-Xylene</td> </tr> <tr> <td>Toluene</td> <td>   </td> <td>o-Xylene</td> <td>   </td> <td>p-Xylene</td> </tr> </tbody> </table>	Benzene		Ethylbenzene		m-Xylene	Toluene		o-Xylene		p-Xylene
Benzene		Ethylbenzene		m-Xylene							
Toluene		o-Xylene		p-Xylene							
S-4218-2K-PE S-4218-2K-5PE	<b>BTEX Mixture 2</b> 6 Analytes, each 2000µg/mL in pentane; units: 1x1mL, 1x5mL  <table border="0"> <tbody> <tr> <td>Benzene</td> <td>   </td> <td>Ethylbenzene</td> <td>   </td> <td>m-Xylene</td> </tr> <tr> <td>Toluene</td> <td>   </td> <td>o-Xylene</td> <td>   </td> <td>p-Xylene</td> </tr> </tbody> </table>	Benzene		Ethylbenzene		m-Xylene	Toluene		o-Xylene		p-Xylene
Benzene		Ethylbenzene		m-Xylene							
Toluene		o-Xylene		p-Xylene							



S-4400-10-2ME

**BTX Mixture 1**

5 Analytes, each 10µg/mL in methanol; unit: 1x2mL screw cap bottle

Benzene		o-Xylene
Toluene		m-Xylene
		p-Xylene

S-4278-50-PE

S-4278-50-5PE

**ISO 9377-2 Mod Standard Mixture of n-Alkanes**

**C7+C8+C9+C10-C40 in n-Pentane**

19 Analytes, each 50µg/mL in n-Pentane; units: 1x1mL, 1x5mL, 10x1mL

n-Heptane	C7	n-Tetracosane	C24
n-Octane	C8	n-Hexacosane	C26
n-Nonane	C9	n-Octacosane	C28
n-Decane	C10	n-Triacontane	C30
n-Dodecane	C12	n-Dotriacontane	C32
n-Tetradecane	C14	n-Tetracontane	C34
n-Hexadecane	C16	n-Hexatriacontane	C36
n-Octadecane	C18	n-Octatriacontane	C38
n-Eicosane	C20	n-Tetracontane	C40
n-Docosane	C22		

S-4278-100CY

S-4278-100-5CY

Also available as 100µg/mL in cyclohexane, Units; 1mL, 1x5mL, 10x1mL

S-4423-50-PE

S-4423-50-5PE

**ISO 9377-2 Mod Standard Mixture of n-Alkanes + BTEX I**

**C7+C10+ C20+C40+BTEX in n-Pentane**

Determination of Hydrocarbon Oil in Water Index

12 Analytes, each 50µg/mL in n-pentane; units: 1x1mL, 1x5mL, 10x1mL

Benzene	B	p-Xylene	p-X
Toluene	T	n-Heptane	C7
Ethylbenzene	E	n-Decane	C10
o-Xylene	o-X	n-Eicosane	C20
m-Xylene	m-X	n-Tetracontane	C40

S-4424-50-PE

S-4424-50-5PE

**ISO 9377-2 Mod Standard Mixture of n-Alkanes + BTEX II**

**C7+C8+C9+C10+C20+C40+BTEX in n-Pentane**

Determination of Hydrocarbon Oil in Water Index

10 Analytes, each 50µg/mL in n-pentane; units: 1x1mL, 1x5mL, 10x1mL

Benzene	B	n-Heptane	C7
Toluene	T	n-Octane	C8
Ethylbenzene	E	n-Nonane	C9
o-Xylene	o-X	n-Decane	C10
m-Xylene	m-X	n-Eicosane	C20
p-Xylene	p-X	n-Tetracontane	C40

S-4395-50-PE

S-4395-50-5PE

**ISO 9377-2 Mod Standard Mixture of n-Alkanes + BTEX III**

**C7+C8+C9+C10-C40 (all even)+BTEX in n-Pentane**

Determination of Hydrocarbon Oil in Water Index

25 Analytes, each 50µg/mL in n-pentane; units: 1x1mL, 1x5mL, 10x1mL



Benzene	B	n-Octadecane	C18
Toluene	T	n-Eicosane	C20
Ethylbenzene	E	n-Docosane	C22
o-Xylene	o-X	n-Tetracosane	C24
m-Xylene	m-X	n-Hexacosane	C26
p-Xylene	p-X	n-Octacosane	C28
n-Heptane	C7	n-Triacontane	C30
n-Octane	C8	n-Dotriacontane	C32
n-Nonane	C9	n-Tetracontane	C34
n-Decane	C10	n-Hexatriacontane	C36
n-Dodecane	C12	n-Octatriacontane	C38
n-Tetradecane	C14	n-Tetracontane	C40
n-Hexadecane	C16		

## Other n-Alkane solutions available from Chiron

(See also the Petroleum section page 186-189)

S-4106-100-CY	n-Alkanes, C10-C40 (all even+pristane/phytane), 18 Analytes
S-4109-50-CY -100-CY	n-Alkanes, C10-C40 (all even and uneven), 31 Analytes
S-4110-100-CY	n-Alkanes, C10-C40 (all even and uneven+pristane/phytane), 33 Analytes
S-4066-K-IO	n-Alkanes, C14-C32 (all even+pristane/phytane), 12 Analytes
S-4075-100-DCM	n-Alkanes, C10-C40 (all even+unevenC15-27+pristane/phytane), 24 Analytes

## ISO 10382:2002

### Soil quality - Organochlorine pesticides and PCBs

Soil quality - Determination of organochlorine pesticides and polychlorinated biphenyls – Gas chromatographic method with electron capture detection

This International standard specifies a method for the quantitative determination of seven polychlorinated biphenyls and seventeen organochlorine pesticides in soil.

Chiron No.	Compound	Abbr.	CAS No	Conc. 1 mL
<b>Polychlorinated biphenyls</b>				
1999.12-100-IO	2,4,4'-Trichlorobiphenyl	PCB-28	7012-37-5	100 µg/mL
2000.12-100-IO	2,2',5,5'-Tetrachlorobiphenyl	PCB-52	35693-99-3	100 µg/mL
2001.12-100-IO	2,2',4,5,5'-Pentachlorobiphenyl	PCB-101	37680-73-2	100 µg/mL
2002.12-100-IO	2,3',4,4',5'-Pentachlorobiphenyl	PCB-118	31508-00-6	100 µg/mL
2003.12-100-IO	2,2',3,4,4',5'-Hexachlorobiphenyl	PCB-138	35065-28-2	100 µg/mL
2004.12-100-IO	2,2',4,4',5,5'-Hexachlorobiphenyl	PCB-153	35065-27-1	100 µg/mL
2005.12-100-IO	2,2',3,4,4',5,5'-Heptachlorobiphenyl	PCB-180	35065-29-3	100 µg/mL
<b>Organochlorine pesticides</b>				
1356.6-100-CY or AN	Hexachlorobenzene	HCB	118-74-1	100µg/mL
3319.6-100-CY or AN	α-Hexachlorocyclohexane	α-HCH	319-84-6	100µg/mL
3415.6-100-CY or AN	β-Hexachlorocyclohexane	β-HCH	319-85-7	100µg/mL
2026.6-100-CY or AN	γ-Hexachlorocyclohexane (Lindane)	γ-HCH	58-89-9	100µg/mL
2775.12-100-CY or AN	Aldrin		309-00-2	100µg/mL
2775.12-100-CY or AN	Dieldrin		60-57-1	100µg/mL
1892.12-100-CY or AN	Endrin		72-20-8	100µg/mL
2776.10-100-CY or AN	Heptachlor		76-44-8	100µg/mL
2778.10-100-CY or AN	Heptachloro epoxide (exo-, cis-)	A-isomer	28044-83-9	100µg/mL



2771.10-100-CY or AN	Heptachloro epoxide (endo-, trans-)	B-isomer	1024-57-3	100µg/mL
3387.9-100-CY or AN	α-Endosulfan		959-98-8	100µg/mL
3362.14-100-CY or AN	p,p'-DDE		72-55-9	100µg/mL
3357.14-100-CY or AN	o,p'-DDD		53-19-0	100µg/mL
3363.14-100-CY or AN	o,p'-DDT		789-02-6	100µg/mL
3356.14-100-CY or AN	p,p'-DDD		72-54-8	100µg/mL
3361.14-100-CY or AN	o,p'-DDE		3424-82-6	100µg/mL
2028.14-100-CY or AN	p,p'-DDT		50-29-3	100µg/mL

#### Injection standards

3308.12-100-IO	2,2',4,4',6,6'-Hexachlorobiphenyl	PCB-155	33979-03-2	100 µg/mL
3252.12-100-IO	2,2',3,4,5,6'-Hexachlorobiphenyl	PCB-143	68194-15-0	100 µg/mL
3604.12-100-IO	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl	PCB-207	52663-79-3	100 µg/mL

#### S-4236-10-IO

#### ISO 10382 Multicomponent Stock Solution of PCBs

S-4236-100-IO  
S-4236-200-IO

“Dutch Seven” PCBs in isooctane, 10µg/mL each, 1x1ml, 5x1ml, 10x1ml  
100µg/mL each, 1x1ml, 5x1 ml, 10x1 ml  
200µg/mL each, 1x1ml, 5x1 ml, 10x1 ml

#### S-4457-400-IO

#### ISO 10382 Multicomponent Solution of PCBs and Organochlorine pesticides

PCBs and pesticides as listed above, each 400µg/mL in isooctane; unit: 1x1ml

#### S4458-400-IO

#### ISO 10382 Multicomponent Solution of PCBs and Organochlorine pesticides + injection standards

PCBs and pesticides as listed above + injection standards 3308.12 and 3604.12, each 400µg/mL in isooctane; unit: 1x1mL

## ISO 12078, IDF 159:2006 Sterols in milk fat

**NEW**

**Anhydrous milk fat – Determination of sterol composition by gas liquid chromatography (Reference method)**

This International Standard specifies a gas liquid chromatography reference method for the determination of the sterol composition of anhydrous milk fat extracted from dairy products.

1583.30-600-DI	Betulin, Internal Standard Solution 600µg/mL in di-isopropyl ether	1x1mL, 1x10mL, 5x10mL
2900.27-600-10HX	Cholesterol standard solution 600µg/mL in n-hexane	1x1mL, 1x10mL
3919.28-100-HX	Campesterol standard solution 100µg/mL in n-hexane	1x1mL, 5x1mL
3767.29-100-HX	Stigmasterol standard solution 100µg/mL in n-hexane	1x1mL, 5x1mL
2732.29-100-HX	β-Sitosterol standard solution 100µg/mL in n-hexane	1x1mL, 5x1mL



S-4487

**Sterol standard mixture for ISO 12078**

Neat mixture in 1mL sealed ampoule (Ref 9.1.2) for qualitative analysis after silylation

2900.27	Cholesterol	600µg
3919.28	Campesterol	100µg
3767.29	Stigmasterol	100µg
2717.29	Sitosterol	100µg
1583.30	Betulin (IS)	600µg

Silylating agents

1940.3-5ML	Trimethylchlorosilane
1943.6-10ML	Hexamethyldisiazane

## ISO 12228:1999

### Sterols in animal and vegetable fats and oil

**NEW**

**Animal and vegetable fats and oils – Determination of individual and total sterols contents – Gas Chromatographic method**

This International Standard specifies a method for gas chromatographic determination of the contents and compositions of sterols in animal and vegetable fats and oils.

1583.30-K-AC	Betulin, Internal standard solution
1583.30-K-10AC	1.0 mg/mL in acetone; units: 1x1mL, 1x10mL
2795.30-K-AC	5α-Cholestan-3β-ol (Cholestanol), Alternative internal standard
2795.30-K-10AC	1.0 mg/mL in acetone; units: 1x1mL, 1x10mL

S-4498-ASS-AC

**Standard solution for TLC, ISO 12228**

2 Analytes, each concentration as listed in acetone; unit: 1x1mL

2900.27	Cholesterol	1mg/mL
1583.30	Betulin	5mg/mL

Silylating agent

3916.8-1ML	N-methyl-N-(trimethylsilyl)-heptafluorobutyramide (MSHFBA)
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S-4499-50-IO

**Identification mixture for sterols**

10 Analytes, each 50µg/mL in isoctane; unit: 1x1mL

2900.27	Cholesterol
2795.27	Cholestanol
2734.28	Brassicasterol
3913.28	Champesterol
3767.29	Stigmasterol
2732.29	Sitosterol
2717.29	Sitostanol
3915.30	Erythodiol
1681.30	Uvaol
1583.30	Betulin



## ISO 13877:1998

### Soil quality - 16 PAHs by HPLC

Soil quality - Determination of polynuclear aromatic hydrocarbons  
- Method using high-performance liquid chromatography

This standard describes two methods for quantification of polynuclear aromatic hydrocarbons (PAH) in soil.

S-4459-50-AN

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#### ISO 13877 Standard stock solution

16 Analytes, each 50µg/mL in acetonitrile; unit: 1x1.1mL

0711.10	Naphthalene	[91-20-3]
0002.12	Acenaphthylene	[208-96-8]
0732.12	Acenaphthene	[83-32-9]
0217.13	Fluorene	[86-73-7]
0816.14	Phenanthrene	[85-01-8]
1049.14	Anthracene	[120-12-7]
0260.16	Fluoranthene	[206-44-0]
0235.16	Pyrene	[129-00-0]
0201.18	Benzo[a]anthracene	[56-55-3]
0212.18	Chrysene	[218-01-9]
0263.20	Benzo[b]fluoranthene	[205-99-2]
0265.20	Benzo[k]fluoranthene	[207-08-9]
0239.20	Benz[a]pyrene	[50-32-8]
0203.22	Dibenzo[a,h]anthracene	[53-70-3]
0222.22	Benz[ghi]perylene	[191-24-2]
0277.22	Indeno[1,2,3-cd]pyrene	[193-39-5]

## ISO 14154:2005

### Soil quality – Phenols by GC-ECD

Soil quality - Determination of some selected chlorophenols –  
Gas Chromatographic method with electron-capture detection

The method describes the gas chromatographic determination of 15 chlorophenols (2,3-, 2,4-, 2,5-, 2,6-, 3,4-, and 3,5-dichlorophenol; 2,3,4-, 2,3,5-, 2,3,6-, 2,4,5-, 2,4,6-, and 3,4,5-trichlorophenol; 2,3,4,5- and 2,3,4,6-tetrachlorophenol and pentachlorophenol) in soil samples. This method can also be applied to other solid samples such as sediments and solid wastes.

The method provides a procedure for solid/liquid extraction and purification based on successive extractions in basic and acidic aqueous media and hexane. Finally the chlorophenols are derivatized with acetic anhydride and analyzed by gas chromatography with electron capture or mass detection.

S-4361

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#### 2,4,6-Tribromophenol, Internal Standard Stock Solution

1.148 mg/mL, in ethanol, 5mL

Alternative Internal Standards:

S-4362

#### 2,4-Dibromophenol, Internal Standard Stock Solution

S-4363

#### 2,6-Dibromophenol, Internal Standard Stock Solution



S-4364-ASS-ET

**Chlorophenol Standard, Stock Solution**

15 Analytes, each concentration as listed in ethanol; unit: 5x1mL

2066.6	2,3-Dichlorophenol	[576-24-9]	400 µg/mL
2064.6	2,4-Dichlorophenol	[120-83-2]	400 µg/mL
2065.6	2,5-Dichlorophenol	[583-78-8]	400 µg/mL
2069.6	2,6-Dichlorophenol	[87-65-0]	400 µg/mL
2080.6	3,4-Dichlorophenol	[95-77-2]	400 µg/mL
2078.6	3,5-Dichlorophenol	[591-35-5]	400 µg/mL
2077.6	2,3,4-Trichlorophenol	[15950-66-0]	400 µg/mL
2073.6	2,3,5-Trichlorophenol	[933-78-8]	400 µg/mL
2072.6	2,3,6-Trichlorophenol	[933-75-5]	400 µg/mL
2075.6	2,4,5-Trichlorophenol	[95-95-4]	400 µg/mL
2076.6	2,4,6-Trichlorophenol	[88-06-2]	600 µg/mL
2082.6	3,4,5-Trichlorophenol	[609-19-8]	200 µg/mL
2081.6	2,3,4,5-Tetrachlorophenol	[4901-51-3]	200 µg/mL
2149.6	2,3,4,6-Tetrachlorophenol	[58-90-2]	600 µg/mL
2084.6	Pentachlorophenol	[87-86-5]	1000 µg/mL

**ISO 15009:2002****Soil quality – Volatile compounds by GC/purge-and-trap**

Soil quality - Gas chromatographic determination of the content of volatile aromatic hydrocarbons, naphthalene and volatile halogenated hydrocarbons – Purge-and-trap method with thermal desorption

This International Standards specifies a method for quantitative gas-chromatographic determination of volatile hydrocarbons, naphthalene and volatile hydrocarbons in all types of soil.

S-4460-2K-5ME

**ISO 15009 Stock internal standard solution for aromatic hydrocarbons**

2 Analytes, each 2000µg/mL in methanol; unit: 1x5mL

2253.7	Toluene-d8	[2037-26-5]
2171.8	Ethylbenzene-d10	[25837-05-2]

S-4461-2K-5ME

**ISO 15009 Stock internal standard solution for volatile halogenated hydrocarbons**

3 Analytes, each 2000µg/mL in methanol; unit: 1x5mL

3932.4	1,4-Dichlorobutane	[110-56-5]
2048.7	α,α,α-Trifluorotoluene	[98-08-8]
3933.6	2-Bromofluorobenzene	[1072-85-1]

**S-4462-4K-5ME****ISO 15009 Volatile aromatic hydrocarbons**8 Analytes, each 4000 $\mu$ /mL in methanol; unit: 1x5mL

1300.6	Benzene	[71-43-2]
1264.7	Toluene	[108-88-3]
1268.8	Ethylbenzene	[100-41-4]
1267.8	o-Xylene	[95-47-6]
1266.8	m-Xylene	[108-38-3]
1265.8	p-Xylene	[106-42-3]
2558.8	Styrene	[100-42-5]
0711.10	Naphthalene	[91-20-3]

**S-4463-4K-5ME****ISO 15009 Volatile halogenated hydrocarbons**18 Analytes, each 4000 $\mu$ g/mL in methanol; unit: 1x5mL

2554.1	Dichloromethane	[75-09-2]
1350.1	Trichloromethane	[67-66-3]
1352.1	Tetrachloromethane	[56-23-5]
3929.2	1,1-Dichloroethane	[75-34-3]
1355.2	1,2-Dichloroethane	[107-06-2]
1351.2	1,1,1-Trichloroethane	[79-01-6]
3934.2	1,1,2-Trichloroethane	[79-00-5]
3935.3	1,2-Dichloropropane	[78-87-5]
3936.3	1,2,3-Trichloropropane	[98-18-4]
3937.3	cis-1,3-Dichloropropene	[10061-01-5]
3938.3	trans-1,3-Dichloropropene	[10061-02-6]
3939.2	cis-1,2-Dichloroethene	[156-59-2]
3940.2	trans-1,2-Dichloroethene	[156-60-5]
3941.3	3-Chloropropene	[107-05-1]
1354.2	Trichloroethene	[79-01-6]
1353.2	Tetrachloroethene	[127-18-4]
2273.6	Monochlorobenzene	[108-90-7]
3364.6	1,2-Dichlorobenzene	[95-50-1]

**ISO 15680:2003****Water quality – Volatile compounds by GC/purge-and-trap**

Water quality - Gas-chromatographic determination of a number of monocyclic aromatic hydrocarbons, naphthalene and several chlorinated compounds using purge-and-trap and thermal desorption.

This International Standard specifies a general method for the determination of volatile organic compounds (VOCs) in water by purge-and-trap isolation and gas chromatography (GC).

**S-4464-2K-5ME****ISO 15680 Stock internal standard solution**4 Analytes, each 2000 $\mu$ g/mL in methanol; unit: 1x5mL

2017.6	Fluorobenzene	[462-06-6]
3942.6	1,4-Difluorobenzene	[540-36-3]
3943.6	Monochlorobenzene-d5	[3114-55-4]
1957.6	1,4-Dichlorobenzene-d4	[3855-82-1]

**S-4465-2K-5ME****ISO 15680 Stock calibration standard solution 1**

14 Analytes to be used with Internal standard S1, each 2000µg/mL in methanol; unit: 1x5mL

3944.1	Dichlorodifluoromethane	[75-71-8]
3945.1	Monochloromethane	[75-87-3]
3946.1	Monobromomethane	[74-83-9]
3947.2	Monochlorethane	[74-87-3]
2260.1	Trichlorofluoromethane	[75-69-4]
2260.2	1,1-Dichloroethene	[75-35-4]
2554.1	Dichloromethane	[75-09-2]
3940.2	trans-1,2-dichloroethene	[156-09-2]
3929.2	1,1-Dichloroethane	[175-34-3]
3951.3	2,2-Dichloropropane	[544-16-1]
3939.2	cis-1,2-dichloroethene	[156-59-2]
3950.1	Bromochloromethane	[74-47-5]
1350.1	Trichloromethane	[66-67-3]
1351.2	1,1,1-Trichloroethane	[110-82-7]

**S-4466-2K-5ME****ISO 15680 Stock calibration standard solution 2**

12 Analytes to be used with Internal standard S2, each 2000µg/mL in methanol; unit: 1x5mL

1352.1	Tetrachloromethane	[56-23-5]
3952.3	1,1-Dichloropropene	[563-58-6]
1300.6	Benzene	[71-43-2]
1355.2	1,2-Dichloroethane	[107-06-2]
1354.2	Trichloroethene	[79-01-6]
3935.3	1,2-Dichloropropane	[78-87-6]
3953.1	Dibromomethane	[74-95-1]
1690.1	Bromodichloromethane	[75-27-4]
3938.3	trans-1,3-dichloropropene	[10061-02-6]
1264.7	Toluene	[108-88-1]
3937.3	cis-1,3-Dichloropropene	[10061-01-5]
3934.2	1,1,2-Trichloroethane	[79-00-5]
2256.2	1,2-Dibromoethane	[106-93-4]

**S-4467-2K-5AN****ISO 15680 Stock calibration standard solution 3**

11 Analytes to be used with Internal standard S3, each 2000µg/mL in methanol; unit: 1x5mL

1352.1	Tetrachloroethene	[56-23-5]
3954.3	1,3-Dichloropropane	[142-28-9]
1691.1	Dibromochloromethane	[124-48-1]
2273.6	Monochlorobenzene	[108-90-7]
3955.2	1,1,1,2-Tetrachlorethane	[630-20-6]
1268.8	Ethylbenzene	[100-41-4]
1266.8	m-Xylene	[108-38-3]
1265.8	p-Xylene	[106-42-3]
1267.8	o-Xylene	[95-47-6]
2558.8	Styrene	[100-42-5]
1689.1	Tribromomethane	[75-25-1]

**S-4468-2K-5ME****ISO 15680 Stock calibration standard solution 4**

22 Analytes to be used with Internal standard S1, each 2000µg /mL in methanol; unit: 1x5mL

2155.9	Isopropylbenzene	[98-82-8]
2157.6	Monobromobenzene	[106-86-1]
3957.2	1,1,2,2-Tetrabromoethane	[79-27-6]
3936.3	1,2,3-Trichloropropane	[96-18-4]
1298.9	n-Propylbenzene	[103-65-1]
3959.7	2-Chlorotoluene	[95-49-8]
3960.7	4-Chlorotoluene	[106-43-4]
1269.9	1,3,5-Trimethylbenzene	[108-67-8]
2343.10	tert-Butylbenzene	[98-06-6]
1270.9	1,2,4-Trimethylbenzene	[95-63-6]
2341.10	sec-Butylbenzene	[135-98-8]
3365.6	1,3-Dichlorobenzene	[541-73-1]
3366.6	1,4-Dichlorobenzene	[106-46-7]
0924.10	4-Isopropyltoluene	[99-87-6]
3364.6	1,2-Dichlorobenzene	[95-50-1]
0392.10	n-Butylbenzene	[104-51-8]
3963.3	1,2-Dibromo-3-chloropropane	[96-12-8]
3519.6	1,2,4-Trichlorobenzene	[120-82-1]
2027.4	Hexachlorobutadiene	[87-68-3]
0711.10	Naphthalene	[91-20-3]
3330.6	1,2,3-Trichlorobenzene	[87-61-6]
3749.6	1,3,5-Trichlorobenzene	[108-70-3]

## ISO 15753:2006 PAHs in animal and vegetable fats and oils

**NEW**

### Animal and vegetable fats and oils – Determination of polycyclic aromatic hydrocarbons

This International Standard describes two methods for the determination of 15 polycyclic aromatic hydrocarbons in animal and vegetable fats and oils. The quantification limit is 0.2µg/kg for all compounds, except fluoranthene and benzo[ghi]perylene where the limit is 0.3µg/kg and indeno[1,2,3-cd]pyrene where the limit is 1µg/kg.

**S-4469-100-T****ISO 15753 Multiple compound standard solution**

15 Analytes, each 100µg/mL in toluene; unit: 1x1mL

0711.10	Naphthalene	[91-20-3]
0732.12	Acenaphthene	[83-32-9]
0217.13	Fluorene	[86-73-7]
0816.14	Phenanthrene	[85-01-8]
1049.14	Anthracene	[120-12-7]
0260.16	Fluoranthene	[206-44-0]
0235.16	Pyrene	[129-00-0]
0201.18	Benzo[a]anthracene	[56-55-3]
0212.18	Chrysene	[218-01-9]
0263.20	Benzo[b]fluoranthene	[205-99-2]
0265.20	Benzo[k]fluoranthene	[207-08-9]
0239.20	Benzo[a]pyrene	[50-32-8]
0203.22	Dibenzo[a,h]anthracene	[53-70-3]



0222.22	Benz[ghi]perylene	[191-24-2]
0277.22	Indeno[1,2,3-cd]pyrene	[193-39-5]

**S-4469-200-5AN**      **ISO 15753 Multiple compound stock standard solution**  
15 analytes, each 200ng/mL in acetonitrile; unit: 1x5mL

**S-4469-50-5MX**      **ISO 15753 Multiple compound working standard solution**  
15 analytes, each 50ng/mL in acetonitrile/THF/methanol; unit: 1x5mL

**S-4470-100-T**      **Alternatively: Standard solution of 16 EPA-PAHs may be used, but this mixture also contain acenaphthene**  
EPA 100µg each/mL in toluene; unit: 1x1mL

## ISO 15788-2:2006 NEW

### Animal and vegetable fats and oils

### – Determination of stigmastadienes in vegetable oils

#### Part 2: Method using high-performance liquid chromatography (HPLC)

This part of ISO 15788 specifies a method for the determination of steradienes, especially stigmastadienes. Steradienes are formed by dehydration of sterols during bleaching and also partially during steam washing and deodorization. The method is also suitable as a screening method to detect the presence of refined vegetable oils in virgin oils such as olive oil.

- Δ3,5-Cholestadiene stock solution  
1mg/mL in tert-butyl methyl ether
- Δ3,5-Cholestadiene External standard solution  
10µg/mL (0.01µg/µL) in acetonitrile/ tert-butyl methyl ether 1:1
- Δ3,5-Cholestadiene Internal standard solution  
2µg/mL in petroleum ether
- 5α-Cholestane standard solution for GC  
1mg/mL in isooctane

Reference standards for cholesta-, campesta- and stigmastadienes and stigmastatriene

0678.27-100-IO	Cholestadiene
0686.27-100-IO	Stigmastatriene
0682.28-200-IO	Campestdiene and Stigmastadiene



## ISO 17353:2004 Organotin compounds in water

**NEW**

Water quality - Determination of selected organotin compounds – Gas Chromatographic method

This International Standard specifies a method for the identification and quantification of organotin compounds and/or cation in drinking water, surface water and wastewater.

The principle is alkylation of the organotin compounds in water with sodium tetraethylborate and extraction with hexane. The tetrasubstituted organotin compounds are separated by GC and detected by Mass spectrometry, FPD or AED.

**S-4380-K-5ME**      **ISO 17353/23161 Multicomponent OC\* Standard Solution, Stock Solution A**  
8 Analytes, each 1000µg/mL OC in methanol; units: 5x1mL, 5x5mL  
\* OC: Organotin cation  
OCT: Organotin compound

Prod.No.	Compound	CAS No.	Weight OCT
1983.4	Mono-n-butyltin trichloride	[1118-46-3]	1605 µg/mL
1982.8	Di-n-butyltin dichloride	[683-18-1]	1304 µg/mL
1981.12	Tri-n-butyltin chloride	[1461-22-9]	1122 µg/mL
2497.16	Tetra-n-butyltin	[1461-25-2]	1000 µg/mL
2487.8	Mono-n-octyltin trichloride	[3091-25-6]	1458 µg/mL
2488.16	Di-n-octyltin dichloride	[3542-36-7]	1205 µg/mL
1985.18	Triphenyltin chloride	[639-58-7]	1101 µg/mL
2489.18	Tricyclohexyltin chloride	[3091-32-5]	1096 µg/mL

**S-4381-K-ME**      **ISO 17353/23161 Internal Standard OC, Stock Solution B**  
**S-4381-K-5ME**      4 Analytes, each 1000µg/mL OC in methanol; units: 5x1mL, 5x5mL

Prod.No.	Compound	CAS No.	Weight OCT
2496.14	Di-n-heptyltin dichloride	[74340-12-8]	1224 µg/mL
2495.7	Mono-n-heptyltin trichloride	[59344-47-7]	1488 µg/mL
1989.9	Tri-n-propyltin chloride	[2279-76-7]	1143 µg/mL
2490.12	Tetra-n-propyltin	[2176-98-9]	1000 µg/mL

## ISO 17495:2001 Water quality - Nitrophenols by GC-MS

Water quality - Determination of selected nitrophenols - Method by solid phase extraction and gas chromatography with mass spectrometric detection

This international method specifies a method for the determination of selected nitrophenols in drinking water, ground water and surface water.

The method provides a procedure for solid-phase extraction of nitrophenols, followed by solvent elution, derivatization with diazomethane and determination by gas chromatography and mass spectrometry.



## S-4357-500-AC

**ISO 17495 Methylated Phenols Stock Solution,**

14 Analytes, each 500µg/mL in acetone; units: 5x1mL

<b>Prod.No.</b>	<b>Compound</b>	<b>CAS No.</b>
2442.7	2-Nitroanisole	[91-23-6]
2443.7	3-Nitroanisole	[555-03-3]
2444.7	4-Nitroanisole	[100-17-4]
2448.8	4-Methyl-2-nitroanisole	[119-10-8]
2447.8	3-Methyl-4-nitroanisole	[5367-32-8]
2449.8	3-Methyl-2-nitroanisole	[5345-42-6]
2450.8	5-Methyl-2-nitroanisole	[38512-82-2]
2451.7	2,4-Dinitroanisole	[119-27-7]
2452.7	2,5-Dinitroanisole	[3962-77-4]
2453.7	2,6-Dinitroanisole	[3535-67-9]
2454.8	2,4-Dinitro-6-methylanisole	[29027-13-2]
2455.7	2,6-Dichloro-4-nitroanisole	[17742-69-7]
2456.7	2,4-Dichloro-6-nitroanisole	[37138-82-2]
2457.9	2,6-Dimethyl-4-nitroanisole	[14804-39-8]

## S-4358-500-AC

**ISO 17495 Nonmethylated Phenols Stock Solution,**

14 Analytes, each 500µg/mL in acetone; units: 5x1mL

<b>Prod.No.</b>	<b>Compound</b>	<b>CAS No.</b>
2085.6	2-Nitrophenol	[88-75-5]
2086.6	3-Nitrophenol	[554-84-7]
2087.6	4-Nitrophenol	[100-02-7]
2458.7	4-Methyl-2-nitrophenol	[119-33-5]
2459.7	3-Methyl-4-nitrophenol	[2581-34-2]
2460.7	5-Methyl-2-nitrophenol	[700-38-9]
2461.7	3-Methyl-2-nitrophenol	[4920-77-8]
2079.6	2,4-Dinitrophenol	[51-28-5]
2462.6	2,5-Dinitrophenol	[329-71-5]
2463.6	2,6-Dinitrophenol	[573-56-8]
2083.7	2,4-Dinitro-6-methylphenol	[534-52-1]
2465.6	2,6-Dimethyl-4-nitrophenol	[2423-71-4]
2466.6	2,4-Dichloro-6-nitrophenol	[609-89-2]
2467.6	2,6-Dichloro-4-nitrophenol	[618-80-4]

## S-4359-10-5AC

**ISO 17495 Internal Standard Stock Solution**

2 Internal standards, each 10µg/mL in acetone; unit: 1x5mL

2061.6	2,4-Dibromophenol	[615-58-7]
2060.6	2,4,6-Tribromophenol	[118-79-6]

**The following compounds are suggested as alternative Internal Standards for this method:**

2061.6	2,4-Dibromophenol	[615-58-7]
2472.6	2,6-Dibromophenol	[608-33-3]

Deuterated or <sup>13</sup>C-labelled substances



## ISO 17858:2007 Water quality - Dioxin-like PCBs

**NEW**

Water quality - Determination of dioxin-like polychlorinated biphenyls – Method using gas chromatography/mass spectrometry

This International Standard specifies a method for the determination of tetra- to hepta- dioxin-like polychlorinated Biphenyls (PCBs) in waters and waste waters using high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS). The method is optimized for dioxin-like PCBs, but may include other co-planar compounds as Polychlorinated Dioxins and Furans.

S-4471-20-NO

### Precision and recovery (PAR) standard solution

Dioxin-like PCBs each in 20ng/mL solution in n-nonane; unit: 1x1mL

Chiron No.	Dioxin-like PCBs	PCB No.	CAS No.
2006.12	3,3',4,4'-TetraCB	PCB-77	[32598-13-3]
2007.12	3,4,4',5-TetraCB	PCB-81	[70362-50-4]
2008.12	2,3,3',4,4'-PentaCB	PCB-105	[32598-14-4]
2009.12	2,3,4,4',5-PentaCB	PCB-114	[74472-37-0]
2011.12	2',3,4,4',5-PentaCB	PCB-123	[65510-44-3]
2012.12	3,3',4,4',5-PentaCB	PCB-126	[57465-28-8]
2013.12	2,3,3',4,4',5-HexaCB	PCB-156	[38380-08-4]
2014.12	2,3,3',4',5'-HexaCB	PCB-157	[69782-90-7]
2015.12	2,3',4,4',5,5'-HexaCB	PCB-167	[52663-72-6]
2220.12	3,3,4,4',5,5'-HexaCB	PCB-169	[32774-16-6]
2267.12	2,2',3,4,4',5-HeptaCB	PCB-170	[35065-30-6]
2005.12	2,2',3,3',4,4',5,5'-HeptaCB	PCB-180	[35065-29-3]
2016.12	2,3,3',4,4',5,5'-HeptaCB	PCB-189	[39635-31-9]

S-4472-20-NO

### Labelled –compound spiking solution

Dioxin-like F-PCBs each in 20ng/mL solution in n-nonane; unit: 1x1mL

Chiron No.	Dioxin-like IS, FluoroPCBs	PCB No.
2863.12	5-F-3,3',4,4'-TetraCB	F-PCB-77
2344.12	3'-F-3,4,4',5-TetraCB	F-PCB-81
2864.12	5'-F-2,3,3',4,4'-PentaCB	F-PCB-105
2870.12	3'-F-2,3,4,4',5-PentaCB	F-PCB-114
2866.12	5'-F-3,3',4,4',5-PentaCB	F-PCB-126
2871.12	5'-F-2,3,3',4,4',5-HexaCB	F-PCB-156
2746.12	3'-F-2,3,4,4',5,6-HexaCB	F-PCB-166 (PCB-167,169)
3730.12	5'-F-2,3,3',4,4',5,6-HeptaCB	F-PCB-190 (PCB-189)

Single F-labelled compounds are available in concentrations 10-100µg/mL in isoctane.

Single native compounds are available in concentrations 100µg/mL in isoctane.



## ISO 17993:2002

### Water quality – 15 PAHs by HPLC

Water quality - Determination of 15 polycyclic aromatic hydrocarbons (PAH) in water by HPLC with fluorescence detection after liquid-liquid extraction

This International Standard specifies a method using high performance liquid chromatography (HPLC) with fluorescence detection after liquid-liquid extraction for the determination of 15 selected PAH in drinking water and ground water in mass concentrations greater than 0.005µg/L (for each single compound) and surface water in mass concentrations above 0.01µg/L.

S-4473-10-AN

#### ISO 17993 Multiple compound stock solution

15 Analytes, each 10µg/mL in acetonitrile; unit: 1x1mL

0711.10	Naphthalene	[91-20-3]
0732.12	Acenaphthene	[83-32-9]
0816.14	Phenanthrene	[85-01-8]
0260.16	Fluoranthene	[206-44-0]
0201.18	Benzo[a]anthracene	[56-55-3]
0263.20	Benzo[b]fluoranthene	[205-99-2]
0239.20	Benz[a]pyrene	[50-32-8]
0203.22	Dibenzo[a,h]anthracene	[53-70-3]
0217.13	Fluorene	[86-73-7]
1049.14	Anthracene	[120-12-7]
0235.16	Pyrene	[129-00-0]
0212.18	Chrysene	[218-01-9]
0265.20	Benzo[k]fluoranthene	[207-08-9]
0277.22	Indeno[1,2,3-cd]pyrene	[193-39-5]
0222.22	Benz[ghi]perylene	[191-24-2]

Additional compound:

0297.19 6-Methylchrysene [1705-85-7]

0297.19-10-AN

10 µg/mL in acetonitrile, 1 mL

## ISO 18252, IDF 200:2006

### Sterols in milk fat by GC

NEW

Anhydrous milk fat – Determination of sterol composition by gas liquid chromatography (Routine method)

This Internal Standard specifies a routine gas liquid chromatography method for the determination of the sterol composition in anhydrous milk fat extracted from dairy products directly on the unsaponifiable matter, without purification and derivatization.

0622.27-600-HX	5α-Cholestane (99+%), Internal standard solution	1x1mL, 1x10mL
0622.27-600-10HX	600µg/mL in n-hexane/ethanol (1:10) or n-hexane	
2900.27-600-HX	Cholesterol (99+%) standard solution	1x1mL, 1x10mL
2900.27-600-10HX	600µg/mL in n-hexane	



3913.28-100-HX	Campesterol standard solution 100µg/mL in n-hexane	1x1mL, 5x1mL
3737.29-100-HX	Stigmasterol standard solution 100µg/mL in n-hexane	1x1mL, 5x1mL
2732.29-100-HX	β-Sitosterol standard solution 100µg/mL in n-hexane	1x1mL, 5x1mL

#### S-4494

#### Sterol standard mixture for ISO 18252

For Qualitative analysis, neat in 1mL sealed ampoules

2900.27	Cholesterol	600µg
3913.28	Campesterol	100µg
3767.29	Stigmasterol	100µg
2732.29	Sitosterol	100µg
1583.30	5α-Cholestane (IS)	600µg

Dissolve in 0.25 mL n-hexane for split injector or 3mL for on-column injector

## ISO 18857-1: 2005 Water quality - Alkylphenols by GC-MS

### Water quality - Determination of selected alkylphenols

#### Part 1: Method for non-filtered samples using liquid-liquid extraction and gas chromatography with mass selective detection

This method specifies a method for the determination of 4-nonylphenol (mixture of isomers) and 4-(1,1,3,3-tetramethylbutyl)phenol in non-filtered samples of drinking water, ground water and surface water.

The method provides procedures for the determination of phenols in finished drinking water. This method can also be used on untreated course water and other types of water samples. A large variety of phenols can be determined by this method.

S-4376-1-5AC	ISO 18857-1	4-n-Nonylphenol (ring13C6), Internal standard 1 ng/µL, in acetone, 5 mL
2414.15-1-5AC	ISO 18857-1	4-n-Nonylphenol-2,3,5,6-d4, Alternative Int. standard 1 ng/µL, in acetone, 5 mL
S-4377-1-5T	ISO 18857-1	4-n-Nonylphenol solution, Calibration standard 1 ng/µL, in toluene, 5 mL =1450.15-1-5T
S-4378-1-5T	ISO 18857-1	4-(1,1,3,3-Tetramethylbutyl)phenol solution, Calibration standard 1 ng/µL, in toluene, 5 mL =1446.14-1-5T



# ISO 22032:2006

## Water quality - PBDEs by GC-MS

**NEW**

Determination of selected polybrominated diphenyl ethers in sediment and sewage sludge –Method using extraction and gas chromatography/mass spectrometry.

This International standard specifies a method for the determination of selected polybrominated diphenylethers (PBDE) in sediment and sludge using GC and mass spectrometry (GC-MS) in the electron impact (EI) or negative ion chemical ionization (NCI) mode.

ISO 22032 Solutions of single reference substances / internal standards (§5.7):

Chiron No.	Compound Natives	Abbr.	Conc.
1962.12-50-T	2,2',4,4'-Tetrabromodiphenylether	PBDE-47	50 µg/mL
1967.12-50-T	2,2',4,4',5-Pentabromodiphenylether	PBDE-99	50 µg/mL
1968.12-50-T	2,2',4,4',6-Pentabromodiphenylether	PBDE-100	50 µg/mL
1971.12-50-T	2,2',4,4',5,5'-Hexabromodiphenylether	PBDE-153	50 µg/mL
1972.12-50-T	2,2',4,4',5,6'-Hexabromodiphenylether	PBDE-154	50 µg/mL
1973.12-50-T	2,2',3,4,4',5',6-Heptabromodiphenylether	PBDE-183	50 µg/mL
2647.12-50-T	2,3,3',4,4',5,5',6-Octabromodiphenylether	PBDE-205	50 µg/mL
1811.12-50-T	Decabromodiphenylether	PBDE-209	50 µg/mL
<b>Internal Standards F-PBDEs®</b>			
2161.12-50-T	6-Fluoro-2,2',4,4'-tetrabromodiphenylether	F-PBDE-47	50 µg/mL
2506.12-50-T	5,5'-Difluoro-2,2',4,4'-tetrabromodiphenylether	2F-PBDE-47	50 µg/mL
2505.12-50-T	3,6-Difluoro-2,2',4,4',5-pentabromodiphenylether	2F-PBDE-99	50 µg/mL
2163.12-50-T	3-Fluoro-2,2',4,4',6-pentabromodiphenylether	F-PBDE-100	50 µg/mL
1929.12-50-T	4'-Fluoro-2,3,3',4,5,6-hexabromodiphenylether	F-PBDE-160	50 µg/mL
2166.12-50-T	3'-Fluoro-2,2',3,4,4',5',6-hexaBDE	F-PBDE-183	50 µg/mL
2167.12-50-T	4',6-Difluoro-2,2',3,3',4,5,5',6-octaBDE	2F-PBDE-201	50 µg/mL
2168.12-50-T	4'-Fluoro-2,2',3,3',4,5,5',6,6'-nonabromodiphenylether	F-PBDE-208	50 µg/mL
<b>Additional Internal Standards</b>			
2258.12-50-T	3'-Fluoro-2,4-dibromodiphenylether	F-PBDE-7	50 µg/mL
2257.12-50-T	3'-Fluoro-3,4-dibromodiphenylether	F-PBDE-12	50 µg/mL
1926.12-50-T	4'-Fluoro-2,3',4-tribromodiphenylether	F-PBDE-25	50 µg/mL
1927.12-50-T	4'-Fluoro-2,3',6-tribromodiphenylether	F-PBDE-27	50 µg/mL
2160.12-50-T	2'-Fluoro-,2,4,4'-tribromodiphenylether	F-PBDE-28	50 µg/mL
2162.12-50-T	6-Fluoro-2,3',4,4'-tetrabromodiphenylether	F-PBDE-66	50 µg/mL
1928.12-50-T	4'-Fluoro-2,3',4,6-tetrabromodiphenylether	F-PBDE-69	50 µg/mL
2503.12-50-T	5,6-Difluoro-2,2',3,4,4'-pentabromodiphenylether	2F-PBDE-85	50 µg/mL
2504.12-50-T	3,5-Difluoro-2,3',4,4',6-pentabromodiphenylether	F-PBDE-119	50 µg/mL
1991.12-50-T	3,3',4,4'-Tetrabromodiphenylether	PBDE -77	50 µg/mL
2653.12-50-T	2,2',3,4,4',5,6-Heptabromodiphenylether	PBDE-181	50 µg/mL

For a complete list of internal standards see the Compounds section pages 358-359.



S-4388-50-IO

**Multicomponent Stock Solution of native reference substances (§ 5.8)**

8 Analytes, each 50µg/mL in isooctane; unit: 1x1mL

S-4389-SET

**Calibration Curve Set, Native Compounds (§ 5.9)**

Set of 7 solutions in isooctane/toluene; unit: 7x1mL

Compound	Solution 1 ng/mL	Solution 2 ng/mL	Solution 3 ng/mL	Solution 4 ng/mL	Solution 5 ng/mL	Solution 6 ng/mL	Solution 7 ng/mL
PBDE-47	5	12.5	25	50	100	150	250
PBDE-99	5	12.5	25	50	100	150	250
PBDE-100	5	12.5	25	50	100	150	250
PBDE-153	5	12.5	25	50	100	150	250
PBDE-154	5	12.5	25	50	100	150	250
PBDE-183	5	12.5	25	50	100	150	250
PBDE-205	5	12.5	25	50	100	150	250
PBDE-209	25	50	100	200	500	700	1000

Calibration curve sets S-4389 including fluorinated internal standards of choice are available on request (§5.9)

ISO 22032

**Fluorinated Internal Standard Calibration curve Set and Stock solutions are available on request (§5.10)**

## ISO/DIS 23161: 2007 Organotin compounds in soil by GC

**NEW**

**Soil quality - Determination of selected organotin compounds Gas Chromatographic method**

This International Standard specifies a method for the identification and quantification of organotin compounds and/or cations in solids such as soil, sediments and waste.

The principle: See ISO 17353, page 32.

S-4380-K-ME

**ISO 17353/23161 Multicomponent OC\* Standard Solution, Stock Solution A**

S-4380-K-5ME

8 Analytes, each 1000µg/mL OC in methanol; units: 5x1mL, 5x5mL

\* OC: Organotin cation

OCT: Organotin compound

Prod.No.	Compound	CAS No.	Weight OCT
1983.4	Mono-n-butyltin trichloride	[1118-46-3]	1605 µg/mL
1982.8	Di-n-butyltin dichloride	[683-18-1]	1304 µg/mL
1981.12	Tri-n-butyltin chloride	[1461-22-9]	1122 µg/mL
2497.16	Tetra-n-butyltin	[1461-25-2]	1000 µg/mL
2487.8	Mono-n-octyltin trichloride	[3091-25-6]	1458 µg/mL
2488.16	Di-n-octyltin dichloride	[3542-36-7]	1205 µg/mL
1985.18	Triphenyltin chloride	[639-58-7]	1101 µg/mL
2489.18	Tricyclohexyltin chloride	[3091-32-5]	1096 µg/mL



S-4381-K-ME  
S-4381-K-5ME

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**ISO 17353/23161 Internal Standard OC, Stock Solution B**

4 Analytes, each 1000µg/mL OC in methanol; units: 5x1mL, 5x5mL

<b>Prod.No.</b>	<b>Compound</b>	<b>CAS No.</b>	<b>Weight OCT</b>
2496.14	Di-n-heptyltin dichloride	[74340-12-8]	1224 µg/mL
2495.7	Mono-n-heptyltin trichloride	[59344-47-7]	1488 µg/mL
1989.9	Tri-n-propyltin chloride	[2279-76-7]	1143 µg/mL
2490.12	Tetra-n-propyltin	[2176-98-9]	1000 µg/mL

3956-2K-ME  
3956-2K-5ME

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**ISO 21361 Injection standard**

Tetra-n-pentyltin [3765-65-9]

2000µg/mL in methanol; units: 5x1mL, 5x5mL