Food Safety

www.chiron.no

Food Safety Catalogue - 2012

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BMF 1 - Chiron - A world class SME

Chiron was established in 1983 by Dr. Jon Eigill Johansen in Trondheim, Norway and started with the development and production of biomarkers for use in search for oil in the North Sea.

Today we deliver a wide range of reference materials for analytical use in the fields of

- ◊ Environmental analysis
- ◊ Petroleum analysis
- ◊ Food Safety analysis
- ◊ Pharmaceutical and forensic analysis
- ◊ Custom syntheses and custom mixes following our customer`s request

Trondheim - from the bridge at Bakkelandet*

Reference materials (RM) play an important role as they build the link between measurement results in the laboratory and international recognized standards in the traceability chain. Our standards are made according to the general requirements of ISO 9001. In 2011 we started to implement ISO 17025 and ISO guides 30-35.

Your benefits using our standards include:

- ◊ Fast turnover time due to excellent service.
- ◊ Guaranteed high and consistent quality.
- ◊ Sufficient capacity to serve the market, and bulk quantities available on request.
- ◊ Custom solutions on request.

*http://www.trondheim.no/multimedia.ap?id=1115017159, © Carl-Erik Erikson

Chiron - A world class SME

Food analysis:

- ◊ POPs like PCBs, PBDEs, Dioxins, PCAs, PFCs, PAPs, Persistent pesticides
- ◊ Phthalates
- ◊ PAHs, BTEX
- ◊ Pharmaceuticals
- ◊ Mycotoxins /Algal toxins
- ◊ Food packaging contaminants like plastcizers
- ◊ Contaminants formed during food processing like Glycidyl and MCPD fatty acid esters, acryamide, PAHs
- ◊ Pharma /Agro drugs
- ◊ Allergenes
- ◊ Food constituents

Petroleum analysis:

- ◊ Hopanes (C30 Hopanes, Norhopanes, Rearranged hopanes, Methylhopanes, Homohopanes and gammacerane) and Steranes
- ◊ Priority PAHs and F-PAHs, large PAHs and metabolites
- ◊ GC-IRMS (12C / 13C-ratio)
- ◊ Diamonoids and Adamantanes
- ◊ Oil-in-water and Produced water analysis (Phenol and phenolethoxylates, NPDs)
- ◊ Hydrocarbons
- ◊ PIONA, PONA and PNA mixtures
- ◊ Sulfur and Nitrogen standards
- ◊ Phosphorous standards
- ◊ Organophosphates
- ◊ Petrochemical products

Environmental analysis:

- ◊ POPs like PCBs, PBDEs, Dioxins, PCAs, PFCs, PAPs, Persistent pesticides
- ◊ Organotin
- ◊ Nonylphenol ethoxylates
- ◊ Alkylphenols
- ◊ Phthalates
- ◊ PAHs, BTEX
- ◊ Hydrocarbons
- ◊ Biomarkers
- ◊ Pharmaceuticals

Pharmaceutical and forensic analysis:

- ◊ Metabolites
- ◊ Intermediates
- ◊ Impurities
- ◊ Drugs of Abuse:
  - SPICE®: (various JWHs, AMs, HUs)
  - Designer drugs
  - Opioides
  - Cannabinoids
  - Cocains
  - Amphetamines
  - Benzodiazepines

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BMF 29 - Food Safety I

Highly Purified Natural Toxins for Food Analysis

Chiron has built up a strong track record of supplying new reference standards during the past 30 years of operation. We are proud to announce our extended offer of Highly Purified Natural Toxins for Food Analysis:

- ◊ **Mycotoxins**
- ◊ **Plant toxins**
- ◊ **Marine toxins**

The basis of a good analytical method is the availability of appropriate standards of defined purity and concentration.

Our mission is to market highly purified toxin calibrates in crystalline as well as standardized solutions for chemical analysis, including internal standards.

Your benefits using our standards include:

- ◊ Fast turnover time due to excellent service.
- ◊ Guaranteed high and consistent quality.
- ◊ Sufficient capacity to serve the market, and bulk quantities available on request.
- ◊ Custom solutions on request.

Reference materials (RM) play an important role as they build the link between measurement results in the laboratory and international recognized standards in the traceability chain. Our standards are made according to the general requirements of ISO 9001. In 2011 we started to implement ISO 17025 and ISO guides 30-35.

Mycotoxins

Calibrant solutions, Neat standards, Matrix reference materials.

2240.17-100-AN*	3-Acetyldeoxynivalenol	3-AcDON	100µg/mL	acetonitrile	1mL
3630.17-25-AN*	U{13C17}-3-Acetyl-dexoynivalenol		25µg/mL	acetonitrile	1.2mL
2247.17-100-AN	15-Acetyldeoxynivalenol	15-AcDON	100µg/mL	acetonitrile	1mL
2233.17-2-AN *	Aflatoxin B1	AFB1	2µg/mL	acetonitrile	1mL
8634.17-05-AN	U{13C17}-Aflatoxin B1		0.5µg/mL	acetonitrile	1.2mL
2234.17-050-AN*	Aflatoxin B2	AFB2	0.5 µg/ml	acetonitrile	1mL
9262.17-050-AN	U{13C17}-Aflatoxin B2		0.5µg/mL	acetonitrile	1.2mL
2235.17-2-AN*	Aflatoxin G1	AFG1	2µg/mL	acetonitrile	1mL
9263.17-050-AN	U{13C17}-Aflatoxin G1		0.5µg/ml	acetonitrile	1.2mL
2236.17-050-AN*	Aflatoxin G2	AFG2	0.5µg/ml	acetonitrile	1mL
9264.17-050-AN	U{13C17}-Aflatoxin G2		0.5µg/ml	acetonitrile	1.2mL
2237.17-050-AN	Aflatoxin M1	AFM1	0.5 µg/ml	acetonitrile	1mL
2237.17-050-5AN	Aflatoxin M1	AFM1	0.5 µg/ml	acetonitrile	5mL
3769.17-1MG	Aflatoxin M2	AFM2	neat	neat	1mg
8516-100-5dried	Agroclavine		100µg/ml, dried down	dried down	5mL
9248.14-100-dried	Alternariol		100µg/mL	dried down	1mL
9249.15-100-dried	Alternariol methyl ether		100µg/mL	dried down	1mL
9251.13-100-AN	Citrinin		100µg/mL	acetonitrile	1mL
9250.23-100-dried	Citreoviridin		100µg/mL	dried down	1mL
2245.15-50-AN	Deepoxy-deoxynivalenol	DOM-1	50µg/mL	acetonitrile	1mL
2245.15-50-5AN	Deepoxy-deoxynivalenol	DOM-1	50µg/mL	acetonitrile	5mL
2239.15-100-AN*	Deoxynivalenol	DON	100µg/mL	acetonitrile	1mL
3629.21-50-AN	Deoxynivalenol-3-glucoside		50µg/mL	acetonitrile	1mL
3627.15-25-AN	U{13C15}-Deoxynivalenol		25µg/mL	acetonitrile	1.2mL
3802-100G	Maize fluor, Deoxynivalenol 474 +/-30µg/kg		474 +/- 30µg/kg		100g
8531-100G	Wheat fluor, Deoxynivalenol 1062+/-116µg/kg		1062+/- 116µg/kg		100g
2249.19-100-AN	Diacetoxyscirpenol	DAS	100µg/mL	acetonitrile	1mL
2249.19-100-5AN	Diacetoxyscirpenol	DAS	100µg/mL	acetonitrile	5mL
9252.35-100-5dried	Dihydroergocristine		100µg/mL	dried down	5mL
9253.32-25-5dried	Ergocorninine	Isoergocornine	25µg/mL	dried down	1mL
8518.35-100-5dried	Ergocristine		100µg/mL, dried down	dried down	5mL
9254.35-25-5dried	Ergocristinine	Isoergocristine	25µg/mL	dried down	5mL
3765.32-100-ME	Ergocryptine		100µg/mL	methanol	1mL
3765.32-100-5dried	Ergocryptine		100µg/mL, dried down	dried down	5mL
9255.32-25-5dried	Ergocryptinine	Isoergocryptine	25µg/mL	dried down	5mL
8519.19-100-5dried	Ergometrine		100µg/mL, dried down	dried down	5mL
8520.30-100-5dried	Ergosine		100µg/mL, dried down	dried down	5mL
8521.33-100-5dried	Ergotamine		100µg/mL, dried down	dried down	5mL
9256.33-25-5dried	Ergotaminine	Isoergotamine	25µg/mL	dried down	5mL
8522-100-AN	Fumagillin		100µg/mL	acetonitrile	1mL

2244.34-50-MX *	Fumonisin B1	FB1	50µg/mL	acetonitrile/water (50/50)	1mL
2246.34-50-MX	Fumonisin B2	FB2	50µg/mL	acetonitrile/water (50/50)	1mL
2246.34-50-5MX	Fumonisin B2	FB2	50µg/mL	acetonitrile/water (50/50)	5mL
3626.34-50-MX	Fumonisin B3	FB3	50µg/mL	acetonitrile/water (50/50)	1mL
3625.34-25-AN	U{13C34}-Fumonisin B1		25µg/mL	acetonitrile	1.2mL
8535.34-10-AN	U{13C34}-Fumonisin B2		10µg/mL	acetonitrile	1.2mL
8536.34-10-AN	U{13C34}-Fumonisin B3		10µg/mL	acetonitrile	1.2mL
2243.17-100-AN *	Fusarenon-X	FusX	100µg/mL	acetonitrile	1mL
8523.13-100-AN	Gliotoxin		100µg/mL	acetonitrile	1mL
2248.22-100-AN	HT-2 Toxin	HT-2	100µg/mL	acetonitrile	1mL
2248.22-100-5AN	HT-2 Toxin	HT-2	100µg/mL	acetonitrile	5mL
3635.22-25-AN	U{13C22}-HT-2 Toxin		25µg/mL	acetonitrile	1.2mL
9258.6-100-dried	Kojic acid		100µg/mL	dried down	1mL
9259.23-100-dried	Meleagrin		100µg/mL	dried down	1mL
2968.23-25-AN	U{15N5}-Meleagrin		25µg/mL	acetonitrile	1.2mL
8524.4-100-MX	Moniliformin		100µg/mL	acetonitrile/water (50/50)	1mL
8376.17-100-AN	Mycophenolic acid		100µg/mL	acetonitrile	1mL
8376.17-100-5AN	Mycophenolic acid		100µg/mL	acetonitrile	5mL
9265.17-100-AN	U{13C17}-Mycophenolic acid		100µg/mL	acetonitrile	1.2mL
2242.19-100-AN*	Neosolaniol	NEO	100µg/mL	acetonitrile	1mL
2230.15-100-AN*	Nivalenol	NIV	100µg/mL	acetonitrile	1mL
2231.20-10-AN*	Ochratoxin A		10 µg/mL	acetonitrile	1mL
3638.20-10-AN	U{13C20}-Ochratoxin A		10µg/mL	acetonitrile	1.2mL
8533-100G	Wheat Flour, Ochratoxin A		2. 7+/- 1.0µg/kg		100g
8525.20-10-AN	Ochratoxin B		10µg/mL	acetonitrile	1mL
8526.11-10-AN	Ochratoxin-alpha		10µg/mL	acetonitrile	1mL
2232.7-100-AN *	Patulin		100µg/mL	acetonitrile	1mL
8876.7-25-AN	U{13C7}-Patulin		25µg/mL	acetonitrile	1,2mL
8527.27-100-AN	Paxilline		100µg/mL	acetonitrile	1mL
8528.8-100-AN	Penicillic acid		100µg/mL	acetonitrile	1mL
9260.22-100-dried	Roquefortine C		100µg/mL	dried down	1mL
9267.22-25-AN	U{13C22}-Roquefortine C		25µg/mL	acetonitrile	1.2mL
8378.18-50-AN*	Sterigmatocystine		50µg/mL	acetonitrile	1mL
9266.18-25-AN	U{13C18}-Sterigmatocystine		25µg/mL	acetonitrile	1.2mL
3633.15-50-AN	T-2 Tetraol		50µg/mL	acetonitrile	1mL
2241.25-100-AN*	T-2 Toxin	T-2	100 µg/mL	acetonitrile	1mL
3634.24-25-AN	U{13C24}-T-2 Toxin		25µg/mL	acetonitrile	1.2mL
3632.20-50-AN	T-2 Triol		50µg/mL	acetonitrile	1mL
9261.22-100-dried	Tentoxin		100µg/mL	dried down	1mL
9262.10-100-dried	Tenuazonic acid		100µg/mL	dried down	1mL
8376.15-25-AN	Verrucarol		25µg/mL	acetonitrile	1mL
8529.27-100-AN	Verruculogen		100µg/mL	acetonitrile	1mL
8530.23-100-AN	Wortmannin		100µg/mL	acetonitrile	1mL
8517.18-10-AN	α-Zearalanol	Zeranol	10 µg/mL		1mL
2250.18-10-5AN	α-Zearalenol		10 µg/mL	acetonitrile	1mL
2796.18-10-AN	ß-Zearalanol	Taleranol	10 µg/mL	acetonitrile	1mL
2251.18-10-AN	β-Zearalenol		10 µg/mL	acetonitrile	1mL
2252.18-10-AN	Zearalanone		10 µg/mL	acetonitrile	1mL
2238.18-100-AN*	Zearalenone	ZON	100µg/mL	acetonitrile	1mL
8635.18-25-AN	U{13C18}-Zearalenone		25µg/mL	acetonitrile	1.2mL
3803-100G	Maize fluor, zearalenone		60 +/-9 µg/kg		100g

* Also delivered in 5mL and 5 MG neat.
* Also delivered in 5 mL and 5 MG / 10 MG neat.

Mycotoxin calibrant mixtures

S-4296-ASS-AN/ S-4296-ASS-5AN	MIX 1 Aflatoxins mixture; AFB1&AFG1,AFB2&AFG2; 2 µg/mL; 0,5 µg/mL	Mixture in acetonitrile, available in 1 mL and 5 mL
S-4297-100-AN/ S-4297-100-5AN	MIX 2 B-Trichothecenes mixture, DON, NIV, 3AcDON & 15-DON;	100 µg/mL each in acetonitile, available in 1 mL and 5 mL
S-4298-50-MX/ S-4298-50-5MX	MIX 3 Fumonisins mixture, FB1&FB2	50 µg/mL in acetonitrile/water, available in 1 mL and 5 mL
S-4531-10-AN/ S-4531-10-5AN	MIX 4 A+B-Trichothecenes+Zearalenone 3AcDON, DON, NIV, FusX, HT-2, T-2, DAS, ZON	10 µg/mL each in acetonitile, available in 1 mL and 5 mL
S-4532-025-AN/ S-4532-025-6AN	MIX 5 Aflatoxins mixture, AFB1&AFG1;AFB2&AFG2	0.25 µg/mL each in acetonitrile, available in 1 mL and 6 mL
S-4533-100-5dried	MIX 6 Ergotalkaloids mixture of Ergocornine, Ergocrisitine, Ergocryptine,Ergometrine, Ergosine, Ergotamine	100 µg/mL, 5 mL dried down

Plant and other natural toxins in

	Toxic pyrrolizidine alkaloids		
3914.16-100-ME	Crotaline	Monocrotaline	100 µg/mL in methanol, 1 mL
8021.16-100-ME	Heliotrine		100 µg/mL in methanol, 1 mL
8035.21-100-ME	Lasiocarpine		100 µg/mL in methanol, 1 mL
3817.18-100-ME	Retrorcine		100 µg/mL in methanol, 1 mL
3818.18-100-ME	Senecionine		100 µg/mL in methanol, 1 mL
3819.18-100-ME	Seneciphylline		100 µg/mL in methanol, 1 mL
	Solanine		
3865.45-2MG	Solanine		2 mg neat
3865.45-100-AC	Solanine		100 µg/mL in acetonitrile, 1 mL
3866.27-10MG	Solanidine		10 mg neat
	Coumarin		
3867.9-K-ME	Coumarin		1000 µg/mL in methanol, 1 mL
3868.9-K-ME	Coumarin-d4		1000 µg/mL in methanol, 1 mL
8941.10-100MG	Coniferaldehyde		100 mg neat
3869.9-1ML	Cinnamaldehyde		1 mL neat
3870.7-1ML	Benzaldehyde		1 mL neat
3900.10-1ML	Eugenol		1 mL neat
3872.6-KIT	Coumarin Kit		One of each above

Marine toxins

	Algae and shellfish toxins		
	Amnesic shellfish (ASP) toxins		
3692.15-100-05MX	Domoic acid	CRM-DA-e	99.4 µM in acetonitrile/water, 0.5 mL
3693.15-40-8G	*Myticus edulis*, homogenized (Domoic acid)	CRM-ASP-Mus-c	41 µg/g, homogenized mussel, 8 g
3694-100-15G	*Myticus edulis*, homogenized (Domoic acid)	RM-ASP-Mus	98 µg/g, homogenized mussel, 15 g
	Diarrhetic shellfish (DSP) and lipophilic toxins		
3695.44-20-05ME	Okadaic acid	CRM-OA-c	17.7 µM in methanol, 0.5 mL
3696.44-10-4G	Blue mussel, homogenized (Okadaic acid)	CRM-DSP-Mus-b	10.1 µg/g, homogenized blend, 4 g
3697.45-100UG	Dinophysis toxin 1		100 µg neat
3698.X-10-05ME	Pectenotoxin	CRM-PTX2	10.0 µM in methanol, 0.5 mL
3700.42-10-05ME	13-Desmethyl spirolide C	CRM-SPX1	10.2 µM in methanol, 0.5 mL
3701.32-10-05ME	Gymnodimine	CRM-GYM	9.9 µM in methanol, 0.5 mL
3702.55-5-05ME	Yessotoxin	CRM-YTX	4.6 µM in methanol, 0.5 mL
8202.X-1-05ME	Azaspirazide 1	CRM-AZA1	1.47 µM/L in methanol, 0.5 mL
9884.X-1-05ME	Azaspirazide 2	CRM-AZA2	1.5 µmol/L in methanol, 0.5 mL
9885.X-1-05ME	Azaspirazide 3	CRM-AZA3	1.25 µmol/L in methanol, 0.5 mL
	Paralytic shellfish (PSP) toxins		
3703.10-60-05HC	Saxitoxin dihydrochloride	CRM-STX-e	65 µM in 10^{-3} M HCl, 0.5 mL
9976.10-65-05HC	Neosaxitoxin	CRM-NEO-b	65 µM in 10-3 M HCl, 0.5 mL
3705.-60-05HC	Descarbamoylsaxitoxin	CRM-dcSTX	62 µM in 10-3 M HCl, 0.5 mL
3706.10-05HC	Gonyautoxin-1 and -4	CRM-GTX1&4-b	106+35 µM HCl/acetic acid, 0.5 mL
3707.10-05HC	Gonyautoxin-2 and -3	CRM-GTX2&3-b	118+39 µM in HCl/acetic acid, 0.5 mL
3708.10-60-05HC	Gonyautoxin-5 (akaB1)	CRM-GTX5-b	65 µM in HCl(aq) pH5, 0.5 mL
3710.X-30-05W	Descarbamoylneosaxitoxin	CRM-dcNEO	30 µM in water
3711.X-140-05HC	*N*-Sulfocarbamoyl-gonyautoxin-2 and -3	CRM-C1&2	114+35 µM in HCl(aq) pH5, 0.5 ml
	Freshwater / cyanobacterial toxins		
3712.15-30-05W	Cylindrospermopsin	CRM-CYN	30 µM in water, 0.5 mL
2552.10-1MG	(+/-)-Anatoxin A, fumarate		1 mg neat

BMF 30 - Food Safety II

Contaminants from food processing and packaging

Chiron has built up a strong track record of supplying new reference standards during the past 30 years of operation. We are proud to announce our offer of Contaminants and Impurities for Food Analysis. In this leaflet you will find analytes within the following categories:

Toxic compounds formed during food processing

3-MCPD and Glycidyl fatty acid ester, Acrylamide, Furan, Stigmastadienes, PAH´s

Food packaging contaminants

Plasticizers, 2-Ethylhexanoic acid, SEM, Ethyl carbamate, ITX

Environmental contaminants

PFOS / PFC´s, Pesticides and other POPs

Toxic compounds formed during food processing

3-Monochloropropanediol (3-MCPD) and glycidyl fatty acid esters are formed during food processing e.g. deodorization of vegetable oil. They are metabolised in the human body to toxic substances like 3-MCPD.

Chiron No.	Product	Description
	3-MCPD	
3873.3-K-ME	3-Chloro-1,2-propanediol	3-MCPD
8607.3-K-ME	(*R*)-(-)-3-Chloro-1,2-propanediol	(R)-3-MCPD
8608.3-K-ME	(*S*)-(+)-3-Chloro-1,2-propanediol	(S)-3-MCPD
3874.3-K-ME	3-Chloro-1,2-propane-d5-diol	3-MCPD-d5
	3-MCPD-1-monoesters	
8949.19-100-ME	3-Chloro-1,2-propandiol-1-monopalmitate	3-MCPD-1-16:0
8950.19-100-ME	3-Chloro-1,2-propandiol-1-monopalmitoleate	3-MCPD-1-16:1 (9-*cis*)
8951.21-100-ME	3-Chloro-1,2-propandiol-1-monostearate	3-MCPD-1-18:0
8952.21-100-ME	3-Chloro-1,2-propandiol-1-monooleate	3-MCPD-1-18:1 (9-*cis*)
8953.21-100-ME	3-Chloro-1,2-propandiol-1-monolinoleate	3-MCPD-1-18:2 (9,12-*dicis*)
8954.23-100-ME	3-Chloro-1,2-propandiol-1-monoarachidate	3-MCPD-1-20:0
8955.23-100-ME	3-Chloro-1,2-propandiol-1-monogadolenate	3-MCPD-1-20:1 (11-*cis*)
8956.25-100-ME	3-Chloro-1,2-propandiol-1-monobehenate	3-MCPD-1-22:0
8957.25-100-ME	3-Chloro-1,2-propandiol-1-monoerucidate	3-MCPD-1-22:1 (13-*cis*)

Continued on next page

Toxic compounds formed during food processing

	3-MCPD-2-monoesters (Please inquire)	
8961.21-100-ME	3-Chloro-1,2-propandiol-2-monooleate	3-MCPD-di18:1
8962.21-100-ME	3-Chloro-1,2-propandiol-2-monolinoleate	3-MCPD-di18:2
	3-MCPD-diesters	
8967.35-100-ME	3-Chloro-1,2-propandiol-dipalmitate	3-MCPD-di16:0
8968.35-100-ME	3-Chloro-1,2-propandiol-dimonopalmitoleate	3-MCPD-di16:1
8969.39-100-ME	3-Chloro-1,2-propandiol-distearate	3-MCPD-di18:0
8970.39-100-ME	3-Chloro-1,2-propandiol-dioleate	3-MCPD-di18:1
8971.39-100-ME	3-Chloro-1,2-propandiol-dilinoleate	3-MCPD-di18:2
8972.43-100-ME	3-Chloro-1,2-propandiol-diarachidate	3-MCPD-di20:0
8973.43-100-ME	3-Chloro-1,2-propandiol-digadolenate	3-MCPD-di20:1
8974.47-100-ME	3-Chloro-1,2-propandiol-dibehenate	3-MCPD-di22:0
8975.47-100-ME	3-Chloro-1,2-propandiol-dierucidate	3-MCPD-di22:1
	Labeled MCPD-esters	
8981.19-100-ME	3-Chloro-1,2-propandiol-monopalmitate-d5	3-MCPD-1-16:0-d5
8976.21-100-ME	3-Chloro-1,2-propandiol-1-monostearate-d5	3-MCPD-1-18:0-d5
8977.25-100-ME	3-Chloro-1,2-propandiol-1-monobehenate-d5	3-MCPD-1-22:0-d5
8982.35-100-ME	3-Chloro-1,2-propandiol-dipalmitate-d5	3-MCPD-di16:0-d5
8978.39-100-ME	3-Chloro-1,2-propandiol-distearate-d5	3-MCPD-di18:0-d5
8979.47-100-ME	3-Chloro-1,2-propandiol-dibehenate-d5	3-MCPD-di22:0-d5
	Glycidyl fatty acid esters	
9674.19-10MG	Glycidyl palmitate	glycidyl C16:0
9896.19-10MG	Glycidyl palmitoleate	glycidyl C16:1 (9-cis)
9899.21-10MG	Glycidyl stearate	glycidyl C18:0
9671.21-10MG	Glycidyl oleate	glycidyl C18:1 (9-*cis)*
9673.21-10MG	Glycidyl linoleate	glycidyl C18:2 (9-*cis, 12-cis)*
9672.21-10MG	Glycidyl linolenate	glycidyl C18:3 (6-*cis,* 9-*cis,* 12-*cis)*
9897.23-10MG	Glycidyl arachidate	glycidyl C20:0
9900.23-10MG	Glycidyl gondolenate	glycidyl C20:1 (11-*cis)*
9898.25-10MG	Glycidyl behenate	glycidyl C22:0
9714.3-10MG	Glycidol	
	Labelled Glycidyl fatty acid esters	
9924.19-10MG	Glycidyl palmitate-d31	glycidyl C16:0-d31

Due to the great number of 3-MCPD mono- or di-esters often total 3-MCPD (the underlying alcohol component of all 3-MCPD-esters) is determined by GC-MS. After hydrolysis of the ester the free alcohol can be analysed by GC-MS after being transferred to volatile derivatives using heptafluorobutyrylimidazole, acetone or phenylboronic acid. Chiron provides this volatile derivatives of 3-MCPD.

Chiron No.	Product	Description
	Volatile 3-MCPD derivatives for GC-MS	1000 µg/mL in methanol
8616.11-K-ME	3-Chloropropane-1,2-di(heptafluoro)butyrate	1000 µg/mL in methanol
8617.6-K-ME	4-Chloromethyl-2,2-dimethyl-1,3-dioxolane	1000 µg/mL in methanol
8618. 9-K-ME	4-Chloromethyl-2-phenyl-1,3-dioxa-2-borolane	1000 µg/mL in methanol
9343.6-K-ME	(*S*)-(-)-3-Chloro-1,2-propandiol acetonoide	1000 µg/mL in methanol
9340.3-K-ME	Glycerol-d5	1000 µg/mL in methanol

Acrylamide occurs in many processed starchy foods and is of concern as a possible carcinogen. It was first discovered in food in 2002 and its formation is highly temperature dependent.

Chiron No.	Product	Description
	Acrylamide and metabolites	
3875.3-1G	Acylamide	1 g neat
3876.3-100-ME	Acrylamide-d3	100 µg/mL in methanol
9454.3-100-ME	Acrylamide-d5	100 µg/mL in methanol
8103.3-100-ME	Acrylamide-1-13C	100 µg/mL in methanol
9986.3-10MG	Glycidamide	10 mg neat
9987.8-100-ME	N-Acetyl-(*S*)-(carbamoylethyl-d4)-L-cysteine	100 µg/mL in methanol

Furan can be formed from carbohydrates, amino acids and ascorbic acid during food processing. The major precursor is reported to be ascorbic acid which is transformed to furan.

	Furan	
3877.4-1G	Furan	1g neat
3878.4-100-ME	Furan-d4	100 µg/mL in methanol

Stigmastadienes are formed by processing of olive and other vegetable oils. The ISO method 15788-2:2066 decribes the analysis for the determination of stigmastadienes in vegetable oils by HPLC.

	Stigmastadienes Calibrant Solutions	.
0678.27-K-BM	Δ3,5-Cholestadiene Stock solution	1000 µg/mL in tert-butyl methyl ether
0678.27-10-MX	Δ3,5-Cholestadiene External standard solution	10 µg/mL in acetonitrile/tert-butyl methyl ether 1:1
0678.27-2-PT	Δ3,5-Cholestadiene Internal standard solution	2 µg/mL in petroleum ether
0622.27-K-IO	*ααα*-(20*R*)-Cholestane Standard solution	1000 µg/mL in isooctane
0622.27-100-IO	*ααα*-(20*R*)-Cholestane Standard solution	100 µg/mL in isooctane
	Stigmastadienes Reference Materials	
0678.27-100-IO	Δ3,5-Cholestadiene	100 µg/mL in isooctane
0686.29-100-IO	Δ3,5,22-Stigmastatriene	100 µg/mL in isooctane
0682.28-200-IO	Δ3,5-Campestadiene + Δ3,5-Stigmastadiene	200 µg/mL in isooctane
0683.29-100-IO	Δ5,22-Stigmastadiene	100 µg/mL in isooctane

PAHs

		EU 15+1 2005/108 rec. 2006:Reg. 1881 Certain foods	ISO - 15753:2006 Vegetable fats/oils	ISO 7981.1+2 WHO/EU Drinking water	EPA PAH´s	Relative Carcinogenic-/ Genotoxicity
0711.10	Naphthalene		x		x	0.001
0732.12	Acenaphthene		x		x	0.001
0002.12	Acenaphthylene				x	0.01-0.001
0217.13	Fluorene		x		x	0-0.001
0816.14	Phenanthrene		x		x	0.001
1049.14	Anthracene		x		x	0.01
0260.16	Fluoranthene		x	x	x	0.001-0.01
0235.16	Pyrene		x		x	0-0.001
0309.17	Benzo[*c*]fluorene	x				
0201.18	Benz[*a*]anthracene	x	x		x	0.014-0.1
0212.18	Chrysene	x	x		x	0.001-0.1
0035.18	Cyclopenta[*cd*]pyrene	x				0.012-0.1
0263.20	Benzo[*b*]fluoranthene	x	x	x	x	0.10-1.0
0264.20	Benzo[*j*]fluoranthene	x				0.045-0.1
0265.20	Benzo[*k*]fluoranthene	x	x	x	x	0.037-0.1
0239.20	Benzo[*a*]pyrene	x	x	x	x	1
0203.22	Dibenzo[*a,h*]anthracene	x	x		x	0.89-1.0
0222.22	Benzo[*ghi*]perylene	x	x	x	x	0.012-0.01
0277.22	Indeno[1,2,3-*cd*]pyrene	x	x	x	x	0.067-0.1
0244.24	Dibenzo[*a,e*]pyrene	x				1
0242.24	Dibenzo[*a,h*]pyrene	x				1.0-1.2
0241.24	Dibenzo[*a,i*]pyrene	x				0.1
0243.24	Dibenzo[*a,l*]pyrene	x				100
0296.19	5-Methylchrysene	x				+
Number of compounds		15+1	15	6	16	
Chiron products (native):						
Native mixes		S-4589-100-T	S-4469-100-T	S-4062-ASS-5AN	S-4063-100-5T	
					S-4064-10-CY	
					S-4065-10-5AN	
					S-4470-100-T	
Native Kits		9311.16-KIT			1708.16-KIT (solutions) 1959.16-KIT (neat products)	
Chiron products (D-labelled):		S-4522-100-T 9 of 15+1 EU PAHs	Inquire	Inquire	S-4513-100-5T	

Please inquire for concentrations and volume of single and multi-component solutions.

Food packaging contaminants

Recycled fibres

It has been shown that recycled fibres may contain considerable amounts of diisopropylnaphthalene, diisobutylphthalate and benzophenone. 2,3,5-Trimethylnaphthalene has been applied as internal standard.

2102.16-10MG	Diisobutyl phthalate	DIBP	10 mg neat or 1000 µg/mL in isooctane
1126.16-K-IO	2,6-Diisopropylnaphthalene	DIPN	1000 µg/mL in isooctane
2748.13-1G	Benzophenone		1 g neat
0706.13-500-IO	2,3,5-Trimethylnaphthalene	2,3,5-TMN	500 µg/mL in isooctane

Plasticizers, phtalates and adipates

There are EU-regulations on the content of plasticizers in food as a result of food packaging. Despite of these regulations, high concentrations (with a mean over 200ppm) of plasticizers have been found in the gaskets of lids of food-jars.

1225.12	Diethyl phthalate	DEPH	Available as neat material or isooctane-solution
3049.28	Di-iso-decyl phthalate in mixture with C9-11-branched alkyl o-phthalate, C10 rich	DIDP	Available as neat material or isooctane-solution
9916.26	Di-iso-nonyl phthalate in mixture with C8-10-branched alkyl o-phthalate , C9-rich	DINP	Available as neat material or isooctane-solution
9917.26	Di-iso-nonyl phthalate (C9-alkyl ester isomer mix, mainly one isomer)	DINP	Available as neat material or isooctane-solution
1224.24	Bis(2-ethylhexyl) phthalate	DEHA	Available as neat material or isooctane-solution
8537.16	n-Butyl iso-butyl phthalate (n-Butyl 2-methylpropyl phthalate)		Available as neat material or isooctane-solution
9754.17	n-Butyl n-pentyl phthalate		Available as neat material or isooctane-solution
8539.18	n-Pentyl iso-pentyl phthalate (n-Pentyl 3-methlybutyl phthalate)		Available as neat material or isooctane-solution
9758.20	Iso-pentyl benzyl phthalate (3-Methylbutyl benzyl phthalate)		Available as neat material or isooctane-solution

See BMF 32 (page 44) for a complete list of available phthalates and adipates and BMF 50 (page 48) for Mixed Phthalates.

2-Ethylhexanoic acid

2-Ethylhexanoic acid (EHA) is widely used in the technical sector as an intermediate for production of paint additives, thickening agents for fuel, stabilizers for silicones etc. 2-Ethylhexanoic acid, defined as an hazardous substance, have been found in baby food and fruit juices filled in glass bottles with twist-off lids.

3879.8-K-ME	2-Ethylhexanoic acid	1000 µg/mL in methanol, 1 mL
3880.8-K-ME	2-Ethylhexanoic acid-d15	1000 µg/mL in methanol, 1 mL

Ethyl carbamate

The World Health Organization (WHO) has officially labelled ethyl carbamate, a compound produced during yeast fermentation, as a Group 2A carcinogen, ranking it alongside other substances likely to cause cancer in humans.

3885.3-100MG	Ethyl carbamate	100 mg neat

Semicarbazide (SEM)

Semicarbazide is a metabolite of nitrofurazone (agricultural drug forbidden in Europe) and is formed by thermal breakdown of azodicarbonamide. The analysis is performed by the transformation to 2-nitrobenzaldehyde.

3881.7-1G	2-Nitrobenzaldehyde	1 g neat
3882.1-100MG	Semicarbazide HCl	100 mg neat
3883.2.100MG	Azodicarbonamide	100 mg neat
3884.6-100MG	Nitrofurazone	100 mg neat

ITX, Thioxanthones

Italian authorities have detected baby milk cartons containing Isopropylthioxanthone (ITX). ITX is used in printing inks on milk and fruit juice cartons. ITX is a mixture of two isomers to which US EPA has given a high hazard ranking for environmental effects.

2723.16-100-IO	1,3,4-d3-2-Isopropylthioxanthone	2-ITX-d3	100 µg/mL in isooctane, 1mL
2723.16-10MG	1,3,4-d3-2-Isopropylthioxanthone	2-ITX-d3	10 mg neat
2722.16-K-IO	2-Isopropylthioxanthone	2-ITX	1000 µg/mL in isooctane, 1 mL
2722.16-10MG	2-Isopropylthioxanthone	2-ITX	10 mg neat
2726.16-K-IO	4-Isopropylthioxanthone	4-ITX	1000 µg/mL in isooctane, 1 mL
2726.16-10MG	4-Isopropylthioxanthone	4-ITX	10mg neat
3583.13-K-IO	Thioxanthone		1000 µg/mL in isooctane, 1 mL
3586.10-K-IO	6-Methylthiochroman-4-one		1000 µg/mL in isooctane, 1 mL
3587.13-K-IO	2-Chlorothioxanthone		1000 µg/mL in isooctane, 1 mL
3584.17-K-IO	2,4-Diethylthioxanthone	2,4-DETX	1000 µg/mL in isooctane, 1 mL
3585.30-10MG	Thioxanthone-64		10 mg neat
	Xanthones		
8018.13-K-IO	Xanthone		1000 µg/mL in isooctane, 1 mL

Environmental contaminants in food

PCFs (Perfluorinated compounds) including P-PHOS and and PFOA: BMF 20
PCBs: BMF 14
PBDEs, and other Flame retardants: BMF 15
Pesticides: BMF 33 and 34, also see the Chiron 2008 catalogue pages 267-372, available at www.chiron.no

BMF 31 - Food Safety III

Food Colours and Food Aroma

Chiron has built up a strong track record of supplying new reference standards during the past 30 years of operation. We are now proud to announce our offer of Food Colour and Food Aroma reference materials.

Food Colours

Carotenoids, Chlorophylls, Synthetic colours

Food Aroma

Taste and Flavours

Food Aroma (Taste and Flavours)

Following reference materials are delivered as 100ug/mL (100) or 1000ug/mL (K) in methanol (ME), toluene (T), acetonitrile (AN) or isooctane (IO).

	Caffeine	Caffeine impurities:	Delivered as:
2517.8-K-ME	Caffeine		1000ug/mL in Methanol
2517.8-500MG	Caffeine		500mg neat
9191.8-100-ME	Caffeine-d3 (1-methyl-d3)		100ug/mL in Methanol
9191.8-10MG	Caffeine-d3 (1-methyl-d3)		10mg neat
2518.7-100-ME	Theophylline	Imp. A (EP), 1,3-Dimethylxanthine	100ug/mL in Methanol
2518.7-500MG	Theophylline	Imp. A (EP), 1,3-Dimethylxanthine	500mg neat
9190.7-100-ME	Theophylline-d6 (dimethyl-d3)	1,3-Dimethylxanthine-d6	100ug/mL in Methanol
9190.7-10MG	Theophylline-d6 (dimethyl-d3)	1,3-Dimethylxanthine-d6	10mg neat
2700.8-K-ME	Isocaffeine (1,3,9-Trimethylxanthine)	Imp. C (EP)	1000ug/mL in Methanol
2700.8-10MG	Isocaffeine (1,3,9-Trimethylxanthine)	Imp. C (EP)	10mg neat
2700.8-25MG	Isocaffeine (1,3,9-Trimethylxanthine)	Imp. C (EP)	25mg neat
2540.7-K-ME	Paraxanthine		1000ug/mL in Methanol
2540.7-10MG	Paraxanthine		10mg neat
2540.7-25MG	Paraxanthine		25mg neat
2540.7-50MG	Paraxanthine		50mg neat

Food Aroma (Taste and Flavours)

Following reference materials are delivered as 100ug/mL (100) or 1000ug/mL (K) in methanol (ME) or toluene (T) or isooctane (IO).

	Off-flavour compounds	
3886.8-100-ME	Skatole	3-Methylindole
3887.11-100-ME	2-Methylisoboreneol	
3888.12-100-ME	(+/-)-Geosmine	
3889.7-100-ME	2,4,6-Trichloroanisole	
3890.4-100-ME	Methional	3-Methylthiopropionaldehyde
3891.15-100-ME	Nootkatone	
3892.10-100-ME	Carvone	
	Thiazoles	
3894.5-100-ME	2-Acetylthiazole	
3895.5-100-T	2-Acetyl-2-thiazoline	
3896.7-100-ME	Benzothiazole	
3897.10-100-ME	2-Isobutylthiazole	
	Pyrazines	
	Natural pyrazines	
8830.6-K-IO	Natural dimethylpyrazines (2,5 -and 2,6)-	
8831-K-IO	Natural alkyl pyrazines	
8832.8-K-IO	Natural 2,3,5,6-tetramethylpyrazines	
	Alkylpyrazines	
8874.4-K-IO	Pyrazine	
8843.10-K-IO	2-Butyl-3,5-dimethylpyrazine and 2-butyl-3,5-dimethylpyrazine, Isomer mixture	
8837.9-K-IO	2-Butyl-3-methylpyrazine	
8838.8-K-IO	2-*t*-Butylpyrazine	
8836.8-K-IO	2,3-Diethyl-5-methylpyrazine	FEMA No. 935E
8835.8-K-IO	2,3-Diethylpyrazine	FEMA No. 3136
3771.6-K-IO	2,3-Dimethylpyrazine	FEMA No. 3271
3772.6-K-IO	2,5-Dimethylpyrazine, Research grade	FEMA No. 3272
8833.6-K-IO	2,5-Dimethylpyrazine, Flavour grade	FEMA No. 3273
3773.6-K-IO	2,6-Dimethylpyrazine	FEMA No. 3273
3774.8-K-IO	2-Ethyl-3,5-dimethylpyrazine	
3775.8-K-IO	2-Ethyl-3,6-dimethylpyrazine	
3777.7-K-IO	2-Ethyl-3-methylpyrazine	FEMA No. 3155
3778.7-K-IO	2-Ethyl-5-methylpyrazine	FEMA No. 3154
8834.7-K-IO	2-Ethyl-5-methyl- and 2-Ethyl-6-methylpyrazine, Isomer mixture	FEMA No. 3154&3919
3779.6-K-IO	2-Ethylpyrazine	FEMA No. 3281
3781.9-K-IO	2-Isobutyl-3-methylpyrazine	FEMA No. 3133
8844.10-K-IO	2-Isobutyl-3,5-dimethylpyrazine and 2-isobutyl-3,6-dimethylpyrazine, Isomer mixture	
8839.8-K-IO	2-Isobutylpyrazine	
8845.7-K-IO	2-Isopropylpyrazine	FEMA No. 3940
3785.5-K-IO	2-Methylpyrazine	FEMA No. 3309
8840.9-K-IO	2-Propyl-3,5-dimethylpyrazine and 2-Propyl-3,6-dimethylpyrazine, Isomer mixture	
8841.8-K-IO	2-Propyl-3-methylpyrazine	
8842.7-K-IO	2-*n*-Propylpyrazine	FEMA No. 3961
3787.7-K-IO	2,3,5-Trimethylpyrazine	FEMA No. 3244
3786.8-K-IO	2,3,5,6-Tetramethylpyrazine	FEMA No. 3237

	Methoxy/Alkoxypyrazines	
3770.9-K-IO	2-*sec*-Butyl-3-methoxypyrazine	
8846.7-K-IO	2-Ethoxy-3-methylpyrazine	
8847.8-K-IO	2-Ethoxy-3-ethylpyrazine	
8848.9-K-IO	2-Ethoxy-3-*iso*-propylpyrazine	
3776.7-K-IO	2-Ethyl-3-methoxypyrazine	
3780.9-K-IO	2-Isobutyl-3-methoxypyrazine	
8849.8-K-IO	2-Isopropoxy-3(6)-methylpyrazine, Isomer mixture	
8850.9-K-IO	3-*iso*-Butyl-2-methoxypyrazine	FEMA No. 3132
8851.9-K-IO	3-*sec*-Butyl-2-methoxypyrazine	FEMA No. 3433
3782.8-K-IO	2-Methoxy-3-*iso*-propylpyrazine	FEMA No. 3358
8857.7-K-IO	3-Ethyl-2-methoxypyrazine	FEMA No. 3280
3783.6-K-IO	2-Methoxy-3-methylpyrazine	
8875.8-K-IO	2-Methoxy-3-*n*-propylpyrazine	
3784.5-K-IO	2-Methoxypyrazine	
8852.8-K-IO	2-*n*-Propoxy-6-methylpyrazine	
8853.8-K-IO	2-*n*-Propoxy-3(5)-methylpyrazine, Isomer mixture	
8854.7-K-IO	2-Ethoxy-3-methyl- and 2-ethoxy-5-methylpyrazine, Isomer mixture	FEMA No. 3569
8855.6-K-IO	2-Methoxy-3-methyl- and 2-methoxy-5-methylpyrazine, Isomer mixture	FEMA No. 3183
	Methylthiopyrazines	
8858.10-K-IO	2-Methyl-2,5(6)-(furfurylthio)pyrazine	FEMA No. 3189
8859.7-K-IO	3-Ethyl-2-methylthiopyrazine	
8860.8-K-IO	2-Methylthio-3-*iso*-propylpyrazine	
8861.6-K-IO	2-Methylthio-3-methylpyrazine (single isomer)	
8862.6-K-IO	2-Methylthio-3-methyl- and 2-methylthio-5-methylpyrazine, Isomer mixture	FEMA No. 3208
8863.5-K-IO	2-Methylthiopyrazine	FEMA No. 3231
	Quinoxalines (Benzopyrazines)	
8865.11-K-IO	2-Methylquinoxaline	
8866.11-K-IO	5-Methylquinolxaline	FEMA No. 3203
8867.11-K-IO	6-Methylquinoxaline	
8869.10-K-IO	5*H*-5-Methyl-6,7-dihydrocyclopentapyrazine	FEMA No. 3306
8864.10-K-IO	Quinoxaline	
8868.10-K-IO	5,6,7,8-Tetrahydroquinoxaline	Cyclohexapyrazine, FEMA No. 3321
	Acetylpyrazines	
8870.8-K-IO	2-Acetyl-3-ethylpyrazine	FEMA No. 3250
8871.7-K-IO	2-Acetyl-3-methylpyrazine	FEMA No. 3964
8872.6-K-IO	2-Acetylpyrazine	FEMA No. 3126
8873.8-K-IO	2-Acetyl-3,5- and 2-acetyl-3,6-dimethylpyrazine	FEMA No. 3327

All delivered as 1000ug/mL in Isooctane.

	Phenols	**Delivered as:**
1358.7-1G	*p*-Cresol	1g neat
1411.8-1G	4-Ethylphenol	1g neat
2372.7-K-IO	Guaiacol	1000ug/mL in Isooctane
3898.8-K-MX	4-Vinylphenol	1000ug/mL in mix of solvents
3899.8-K-AN	2-Methoxy-4-vinylphenol	1000ug/mL in Acetonitrile
3900.8-1ML	Eugenol	1mL neat
2370.8-K-IO	Vanillin	1000ug/mL in Isooctane
	Quassins (bitter taste)	
8800.22-100MG	Quassin, mixture of isomers w/Neoquassin and Isoquassin	100mg neat

Food Colours

	Food Colours		Delivered as:
	Carotenoids		
3903.30-5MG	8'-Apo-8-β-caroten-8'-al	E 160e	5mg neat
3902.40-5MG	Astaxanthin		5mg neat
3904.25-5MG	Bixin	E 160b	5mg neat
3901.40-10MG	Canthaxanthin	E 161g	10mg neat
2641.40-10MG	ßß-Carotene	E 160a	10mg neat
8102.40-1MG	Capsanthin		1mg neat
3655.20-5MG	*trans-Crocetine*		5mg neat
3927.40-5MG	Lutein		5mg neat
3925.40-5MG	Lycopene	E160d	5mg neat
3654.40-1MG	Zeaxanthin		1mg neat
	Chlorophylls		
3928.55-1G	Chlorophylls, Na salt	E 140	1g neat
3593.55-1MG	Chlorophyll A		1mg neat
3594.55-1MG	Chlorophyll B		1mg neat
	Other food colours		
3905.16-1G	Tartrazine (E102)	C.I.19140; Acid yellow 23	1g neat
3906.17-1G	Riboflavin (E101)	Vitamin B2: Lactoflavine	1g neat
3907.21-1G	Curcumin (E 100)		1g neat
3908.16-1G	Sunset Yellow FCF (E 110)	C.I.15985, Yellow No.6, Food yellow 3	1g neat
3909.20-1G	Amaranth, Redx No 2 (E 123)	C.I.16185, Acid red 27	1g neat
3910.22-1G	Carmine, Natural red 4 (E 120)	C.I.75470	1g neat
3911.18-1G	Red 2G, Acid red 1 (E 128)	Dye content 60%	1g neat
8719.27-250mg	Patent Blue V, Na salt		250mg neat
8349.27-100MG	Patent Blue V, Acid blue	C.I.42045	100mg neat
8346.27-1G	Patent Blue VF	C.I.42045	1g neat

BMF 17 - Isopropylthioxanthone (ITX)

November 2005: Baby milk scare

Italian authorities are seizing baby milk cartons across the country. The alarm was raised after traces of the chemical **Isopropylthioxanthone (ITX)** was found in infant formula, leading to product recalls in France, Spain, Portugal and Italy.

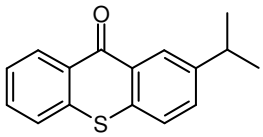
The chemical ITX had been used during the printing processes of the packaging of the baby milk samples in Italy, and was found during a routine analysis. The packaging was manufactured by a Swedish owned company, who has since vowed to seize the use of ITX by January 2006.

ITX is a mixture of two isomers to which the US EPA has given a high hazard ranking for environmental effects. The 2-isomer is the dominant ingredient. The European Food Safety Authority (EFSA) has recently undertaken a risk assessment on ITX: http://www.efsa.europa.eu/en/efsajournal/pub/293.htm.

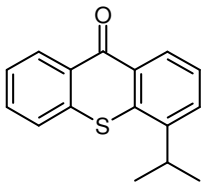
For further reading: **http://www.wecf.de/cms/articles/2005/11/babymilk.php**.

Reference standard

2722.16 **2-Isopropylthioxanthone (99+%)**
[CAS 5495-84-1]
1.0 mg/mL, 1.1 mL in isooctane or 10mg neat

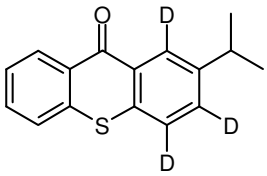


2726.16 **4-Isopropylthioxanthone (99+%)**
[CAS 83846-86-0]
1.0 mg/mL, 1.1 mL in isooctane or 10mg neat



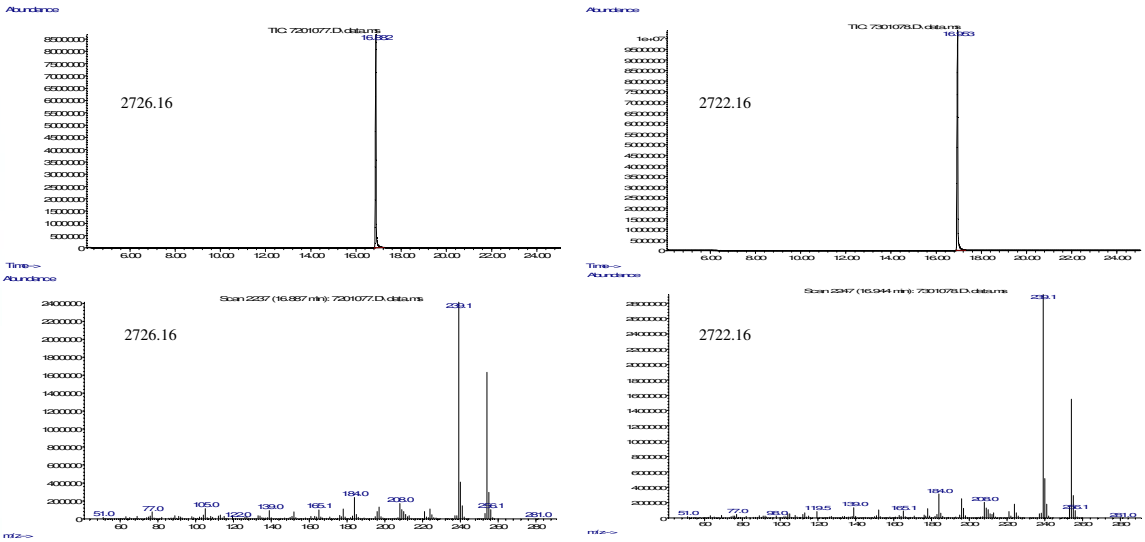
Internal standard

2723.16 **1,3,4-d$_3$-2-Isopropylthioxanthone (98+%)**
100 µg/mL, 1.1 mL in isooctane
10mg neat



For more details, please contact inquire.

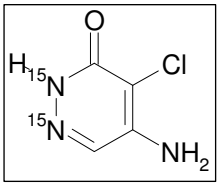
Below you`ll find GC chromatogram and mass spectra of 2726.16 and 2722.16, respectively.



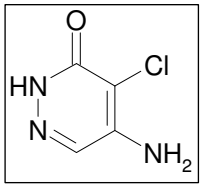
BMF 33 - Desphenylchloridazon-$^{15}N_2$

Desphenylchloridazon (desphenylpyrazon) is an important metabolite of the pesticide chloridazon (pyrazon) and is found in drinking water.

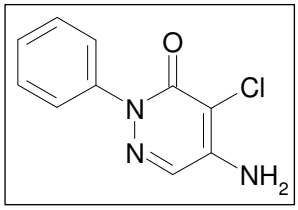
Isotope labelled and native desphenylchloridazon is now available from Chiron AS.



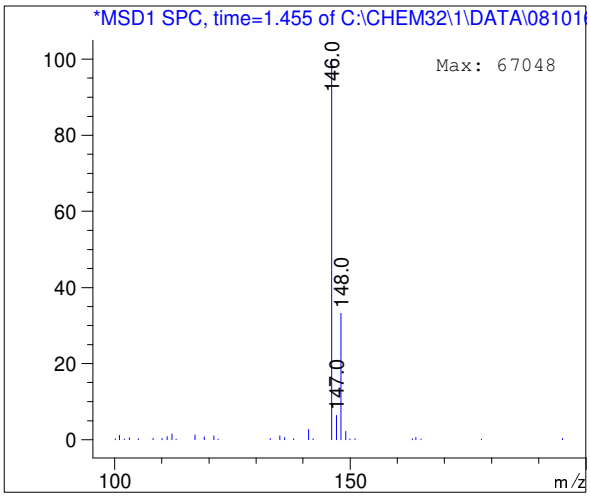
8399.4
Desphenylchloridazon-$^{15}N_2$

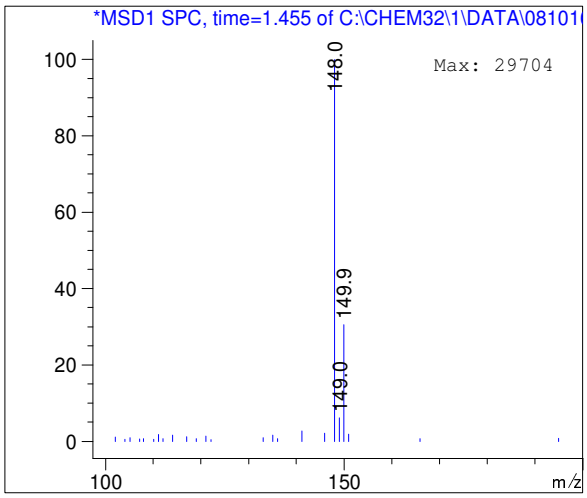


8421.4
Desphenylchloridazon



8423.10
Chloridazon



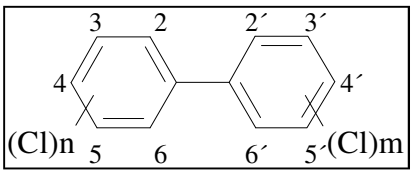


Mass spectra of 8421.4 (left panel) and 8399.4 (right panel) obtained from LC-MS, positive chemical ionization mode.

Choridazones (Pyrazones)

Chloridazon (Pyrazon)	8423.10-100-AN	100 ug/mL in acetonitrile*
	8423.10-10MG	10 mg
	8423.10-100MG	100 mg
Desphenylchloridazon	8421.4-100-AN	100 ug/mL in acetonitrile*
	8421.4-5MG	5 mg
	8421.4-10MG	10 mg
Desphenylchloridazon-$^{15}N_2$	8399.4-100-AN	100 ug/mL in acetonitrile*
	8399.4-5MG	5 mg
	8399.4-10MG	10 mg
Chloridazon Kit	8788.3	* One of each

BMF 14 - Polychlorinated biphenyls (PCBs)



Polychlorinated biphenyls (PCBs) have been the subject of a broad range of studies and investigations because of their environmental persistency and bioaccumulation. Their abundance as pollutants stems from their worldwide manufacture as heavy-used industrial chemicals, *e.g.* Aroclors with the main application as dielectric fluid in capacitors and transformators. PCBs are formed as mixtures by the addition of chlorine to biphenyl.

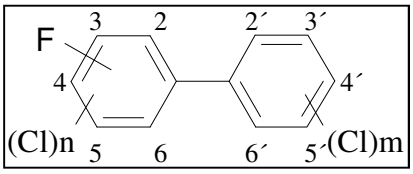
PCB congeners can be classified as coplanar, dioxinlike with none or one orthosubstitution and non-planar with substitutions in the *ortho*-positions. The coplaner PCBs shows a similar toxicity as the dibenzofurans and the dioxins.

F-PCBs®, An overview of advantages

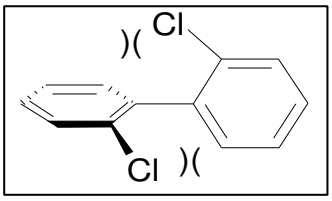
F-PCBs® Fluorinated Internal Standards for PCB analysis - A flexible and cost-efficient alternative:

Mono- and difluorinated PCBs are closely similar to the parent PCBs in terms of physico-chemical properties, and are ideal internal or surrogate standards for GC-MS, GC-ECD, GC-FID and two-dimentional GC. The F-PCB® internal standards offered by Chiron have several advantages over the more traditionally used ^{13}C isotopes and unlabelled internal standards:

- Cost efficient. Much cheaper than the ^{13}C isotopes.
- Gives one single, pure isotope (F has only one isotope)
- Can be used with GC-ECD detection, ^{13}C can not since they coelute with the native.
- Do not discriminate from the native upon work-up.
- "Designer retention times" (*ortho-, meta-, para*-F) possible for optimal elution rate.



Native Non-coplanar PCBs: "Dutch Seven PCBs"



IUPAC No.	Compound	Cat. No.	Cat. No. neat
Trichloro: CB-28	2,4,4'-Trichlorobiphenyl	1999.12-100-IO	1999.12-10MG
Tetrachloro: CB-52	2,2',5,5'-Tetrachlorobiphenyl	2000.12-100-IO	2000.12-25MG
Pentachloro: CB-101	2,2',4,5,5'-Pentachlorobiphenyl	2001.12-100-IO	2001.12-5MG
CB-118	2,3',4,4'5-Pentachlorobiphenyl	2002.12-100-IO	2002.12-10MG
Hexachloro: CB-138	2,2',3,4,4',5'-Hexachlorobiphenyl	2003.12-100-IO	2003.12-10MG
CB-153	2,2',4,4',5,5'Hexachlorobiphenyl	2004.12-100-IO	2004.12-10MG
Heptachloro: CB-180	2,2'3,4,4',5,5'-Heptachlorobiphenyl	2005.12-100-IO	2005.12-10MG
Multiple components	Dutch Seven PCBs	S-4236	
Multiple components	Seven Dutch single components, Neat Mix, 1 mg each		S-4418-7x1MG
Multiple components	Deuterated PCBs	S-4724	
KIT	Seven Dutch single components, Solution-KIT	8549.7-KIT	

Single standards solution available in 100 µg/mL in isooctane (IO), 1 mL or as neat.
Multiple component solutions are available in various concentrations. Please inquire.

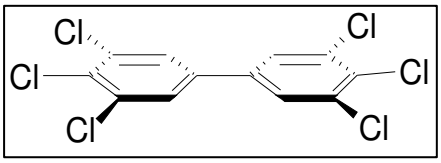
Internal Standards (IS) for Non-coplanar PCBs: "Dutch Seven F-PCBs®"

IUPAC No.	Compound	Cat. No.
Trichloro: 3'-F-CB-28	3'-Fluoro-2,4,4'trichlorobiphenyl	2228.12-100-IO
Tetrachloro: 3-F-CB-52	3-Fluoro-2,2',5,5'-tetrachlorobiphenyl	2660.12-100-IO
Pentachloro: 5'-F-CB-118	5'-Fluoro-2,3',4,4',5-pentachlorobiphenyl	2865.12-50-IO
3'-F-CB-101	3'-Fluoro-2,2',4,5,5'-pentachlorobiphenyl	8353.12-50-IO
Hexachloro: 5'-F-CB-156	5'-Fluoro-2,3,3',4,4',5-hexachlorobiphenyl	2871.12-50-IO
3'-F-CB-166	3'-Fluoro-2,3,4,4',5,6-hexachlorobiphenyl	2746.12-50-IO
Heptachloro: 5'-F-CB-190	5'-Fluoro-2,3,3',4,4',5,6-heptachlorobiphenyl	3730.12-50-IO
Multiple components	Dutch Seven F-PCBs®	S-4617 (Please inquire)
KIT	Dutch Seven F-PCBs®, single components	8550.7-KIT

Solutions of single reference substances, internal standards and multiple component solution, 50 or 100 µg/mL in isooctane, 1mL.

Native Coplanar PCBs:

"Dioxin-like PCBs"



IUPAC No.		Compound	Cat. No.	Cat. No. neat
Tetrachloro:	CB-77	3,3'4,4'-Tetrachlorobiphenyl	2006.12-100-IO	2006.12-25MG
	CB-81	3,4,4',5-Tetrachlorobiphenyl	2007.12-100-IO	2007.12-5MG
Pentachloro:	CB-105	2,3,3',4,4'-Pentachlorobiphenyl	2008.12-100-IO	2008.12-5MG
	CB-114	2,3,4,4',5-Pentachlorobiphenyl	2009.12-100-IO	-
	CB-118	2,3',4,4',5-Pentachlorobiphenyl	2002.12-100-IO	2002.12-10MG
	CB-123	2',3,4,4',5-Pentachlorobiphenyl	2011.12-100-IO	-
	CB-126	3,3',4,4',5-Pentachlorobiphenyl	2012.12-100-IO	2012.12-5MG
Hexachloro:	CB-156	2,3,3',4,4',5-Hexachlorobiphenyl	2013.12-100-IO	2013.12-5MG
	CB-157	2,3,3',4,4',5'-Hexachlorobiphenyl	2014.12-100-IO	-
	CB-167	2,3',4,4',5,5'-Hexachlorobiphenyl	2015.12-100-IO	2015.12-5MG
	CB-169	3,3',4,4',5,5'-Hexachlorobiphenyl	2220.12-100-IO	-
	CB-189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	2016.12-100-IO	-
Multiple components		Dioxin-like PCBs, WHO+ISO/DIS 17858	S-4590	2ug/mL each, 12 comp.
KIT		Dioxin-like PCB-Kit, solutions	8551.12-KIT	-

Solutions of single reference substances, internal standards and multiple component solutions,100 µg/mL in isooctane, 1 mL or as neat.

Dioxin-like PCBs: Optional calibration standards

IUPAC No.	Compound	Cat.No.
CB-170	2,2',3,3',4,4'5-Heptachlorobiphenyl	2267.12-10-IO
CB-180	2,2',3,4,4',5,5'-Heptachlorobiphenyl	2005.12-10-IO

10 µg/mL in isooctane, 1 mL.

Internal Standards (IS) for Coplanar PCBs: "Dioxinlike F-PCBs ®"

IUPAC No.		Compound	Cat.No.
Tetrachloro:	5-F-CB-77	5-Fluoro-3,3'4,4'-tetrachlorobiphenyl	2863.12-50-IO
	3'-F-CB-81	3'-Fluoro-3,4,4',5-tetrachlorobiphenyl	2344.12-50-IO
Pentachloro:	5'-F-CB-105	5'-Fluoro-2,3,3',4,4'-pentachlorobipenyl	2864.12-50-IO
	3'-F-CB-114	3'Fluoro-2,3,4,4',5-pentachlorobiphenyl	2870.12-50-IO
	5'-F-CB-118	5'-Fluoro-2,3',4,4',5-pentachlorobiphenyl	2865.12-50-IO
	5'-F-CB-126	5'-Fluoro-3,3',4,4',5-pentachlorobiphenyl	2866.12-50-IO
Hexachloro:	5'-F-CB-156	5'-Fluoro-2,3,3',4,4',5-hexachlorobiphenyl	2871.12-50-IO
	3'-F-CB-166	3'-Fluoro-2,3,4,4',5,6-hexachlorobiphenyl	2746.12-50-IO
Heptachloro:	5'-F-CB-190	5'-Fluoro-2,3,3',4,4',5,6-heptachlorobiphenyl	3730.12-50-IO
Multiple components		Dioxin-like F-PCB Multiple-component solution	S-4472/S-4615 (Please inquire)
KIT		Dioxin-like F-PCB Kit, all single solutions	3087.9-KIT

Solutions of single reference substances, internal standards and multiple component solution, 10 µg/mL in isooctane, 1mL.

Technical Mixtures

Chiron No.	Name
2124.12	Arochlor 1016
2125.12	Arochlor 1221
2661.12	Arochlor 1232
2126.12	Arochlor 1242
2127.12	Arochlor 1248
2128.12	Arochlor 1254
2129.12	Arochlor 1260
2326.12	Arochlor 5460

Available in concentrations 10-1000 µg/mL in isooctane 1mL.

International Standard Methods for PCB Analysis

ISO 17858-2004	Water quality - Dioxin-like PCBs by GC-MS
ISO 10382-2002	Soil quality - Organochlorine pesticides and PCBs by GC-ECD
ISO 6468-1996	Water quality - Organochlorine insecticides and PCBs by GC methods
ISO 8260-2008	Milk and milk products—pesticides and PCBs via GC-ECD
ISO 16000	Indoor air - PCB analysis by GC-MS
EPA 505-1995	Organohalide pesticides and PCBs in water by GC
EPA 608-1984	Organochlorine pesticides and PCBs by GC and GC-MS (cf methods 625) in municipal discharges.
EPA 8082-1996	PCBs from solid and aqueous matices by GC-ECD or GC-ELCD.
EPA 1668A-1999	PCB congeners in water, soil, sediments and tissue by HRGC/HRMS
EPA 8270C-1996	Semivolatile compounds from solid waste, soil, air, and water by GC-MS

Native PCBs, Complete list of most relevant PCB congeners:

IUPAC No.	Compound	Cat. No.
8810.12-100-IO	4-Chlorobiphenyl	PCB-3
8880.12-100-IO	2,4-Dichlorobiphenyl	PCB-7
9317.12-100-IO	2,4'-Dichlorobiphenyl	PCB-8
8811.12-100-IO	2,6-Dichlorobiphenyl	PCB-10
3731.12-100-IO	3,5-Dichlorobiphenyl	PCB-14
3732.12-100-IO	4,4'-Dichlorobiphenyl	PCB-15
2263.12-100-IO	2,2',5-Trichlorobiphenyl	PCB-18
9313.12-100-IO	2,3,3'-Trichlorobiphenyl	PCB-20
3734.12-100-IO	2,3,4'-Trichlorobiphenyl	PCB-22
1999.12-100-IO	2,4,4'-Trichlorobiphenyl	PCB-28
8813.12-10MG	2,4,5-Trihlorobiphenyl	PCB-29
3619.12-100-IO	2,4,6-Trichlorobiphenyl	PCB-30
2264.12-100-IO	2,4',5-Trichlorobiphenyl	PCB-31
8814.12-100-IO	2',3,5-Trichlorobiphenyl	PCB-34
9314.12-100-IO	3,3',4-Trichlorobiphenyl	PCB-35
3735.12-100-IO	3,4,4'-Trichlorobiphenyl	PCB-37
3736.12-100-IO	3,4',5-Trichlorobiphenyl	PCB-39
3737.12-100-IO	2,2',3,4'-Tetrachlorobiphenyl	PCB-42
2265.12-100-IO	2,2',3,5'-Tetrachlorobiphenyl	PCB-44
3738.12-100-IO	2,2',4,4'-Tetrachlorobiphenyl	PCB-47
9886.12-100-IO	2,2',4,5'-Tetrachlorobiphenyl	PCB-49
2000.12-100-IO	2,2',5,5'-Tetrachlorobiphenyl	PCB-52
9388.12-100-IO	2,2',5,6'-Tetrachlorobiphenyl	PCB-53
8701.12-100-IO	2,2',6,6'-Tetrachlorobiphenyl	PCB-54
8815.12-100-IO	2,3,3',4-Tetrahlorobiphenyl	PCB-55
3739.12-100-ME	2,3,5,6-Tetrachlorobiphenyl	PCB-65
9658.12-100-ME	2,3',4,4'-Tetrachlorobiphenyl	PCB-66
3740.12-100-IO	2,3',4,5-Tetrachlorobiphenyl	PCB-67
2904.12-100-IO	2,4,4',5-Tetrachlorobiphenyl	PCB-74
2006.12-100-IO	3,3',4,4'-Tetrachlorobiphenyl	PCB-77
8819.12-100-IO	3,3',4,5-Tetrachlorobiphenyl	PCB-78
2007.12-100-IO	3,4,4',5-Tetrachlorobiphenyl	PCB-81
2906.12-100-IO	2,2',3,5',6-Pentachlorobiphenyl	PCB-95
8702.12-100-IO	2,2',4,4',5-Pentachlorobiphenyl	PCB-99
8703.12-100-IO	2,2',4,4',6-Pentachlorobiphenyl	PCB-100
2001.12-100-IO	2,2',4,5,5'-Pentachlorobiphenyl	PCB-101
8816.12-100-IO	2,2',4,6,6'-Pentachlorobiphenyl	PCB-104
2008.12-100-IO	2,3,3',4,4'-Pentachlorobiphenyl	PCB-105
8704.12-100-IO	2,3,3',4',6-Pentachlorobiphenyl	PCB-110
2720.12-100-IO	2,3,3',5,5'-Pentachlorobiphenyl	PCB-111
8356.12-100-IO	2,3,3',5,6-Pentachlorobiphenyl	PCB-112
2009.12-100-IO	2,3,4,4',5-Pentachlorobiphenyl	PCB-114
3741.12-100-IO	2,3,4',5,6-Pentachlorobiphenyl	PCB-117
2002.12-100-IO	2,3',4,4',5-Pentachlorobiphenyl	PCB-118
8817.12-10MG	2,3',4,4',6-Pentachlorobiphenyl	PCB-119
2011.12-100-IO	2',3,4,4',5-Pentachlorobiphenyl	PCB-123
9657.12-100-IO	'2,3',4',5',6-Pentachlorobiphenyl	PCB-125
2012.12-100-IO	3,3',4,4',5-Pentachlorobiphenyl	PCB-126
2895.12-100-IO	2,2',3,4,4',5-Hexachlorobiphenyl	PCB-137
2003.12-100-IO	2,2',3,4,4',5'-Hexachlorobiphenyl	PCB-138
8820.12-100-IO	2,2',3,4,5,5'-Hexachlorobiphenyl	PCB-141
3252.12-100-IO	2,2',3,4,5,6'-Hexachlorobiphenyl	PCB-143
2266.12-100-IO	2,2',3,4',5',6-Hexachlorobiphenyl	PCB-149
2004.12-100-IO	2,2',4,4',5,5'-Hexachlorobiphenyl	PCB-153
3308.12-100-IO	2,2',4,4',6,6'-Hexachlorobiphenyl	PCB-155
2013.12-100-IO	2,3,3',4,4',5-Hexachlorobiphenyl	PCB-156
2014.12-100-IO	2,3,3',4,4',5'-Hexachlorobiphenyl	PCB-157
9516.12-100-IO	2,3,3',4,5,6-Hexachlorobiphenyl	PCB-160
8711.12-100-IO	2,3,3',4',5,6-Hexachlorobiphenyl	PCB-163

9667.12-100-IO	2,3,3',5,5',6-Hexachlorobiphenyl	PCB-165
3742.12-100-IO	2,3,4,4',5,6-Hexachlorobiphenyl	PCB-166
2015.12-100-IO	2,3',4,4',5,5'-Hexachlorobiphenyl	PCB-167
2220.12-100-IO	3,3',4,4',5,5'-Hexachlorobiphenyl	PCB-169
2267.12-100-IO	2,2',3,3',4,4',5-Heptachlorobiphenyl	PCB-170
8705.12.100-IO	2,2',3,3',4',5,6-Heptachlorobiphenyl	PCB-177
8799.12.100-IO	2,2',3,3',4',5,6-Heptachlorobiphenyl	PCB-178
2005.12-100-IO	2,2',3,4,4',5,5'-Heptachlorobiphenyl	PCB-180
8706.12-100-IO	2,2',3,4,4',5',6-Heptachlorobiphenyl	PCB-183
8707.12-100-IO	2,2',3,4',5,5',6-Heptachlorobiphenyl	PCB-187
2016.12-100-IO	2,3,3',4,4',5,5'-Heptachlorobiphenyl	PCB-189
3743.12-100-IO	2,3,3',4,4',5,6-Heptachlorobiphenyl	PCB-190
2268.12-100-IO	2,2',3,3',4,4',5,5'-Octachlorobiphenyl	PCB-194
8712.12-100-IO	2,2',3,3',4,4',5',6-Octachlorobiphenyl	PCB-196
8818.12-100-IO	2,2',3,3',4,5,5',6-Octachlorobiphenyl	PCB-198
8713.12-100-IO	2,2',3,3',4',5,5',6-Octachlorobiphenyl	PCB-199
8822.12.5MG	2,2',3,3',4,5',6,6'-Octachlorobiphenyl	PCB-201
2477.12-100-IO	2,2',3,4,4',5,6,6'-Octachlorobiphenyl	PCB-204
3604.12-100-IO	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl	PCB-207
8708.12-100-CY	Decachlorobiphenyl	PCB-209

Solutions of single reference materials are available in 100 µg/mL, 1 mL or as neat. Please inquire.

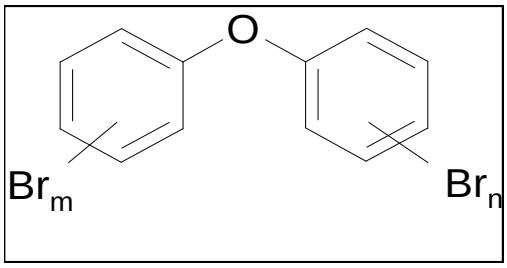
Internal Standards (IS) F-PCBs ®: Complete list

Cat No.	Compound	IUPAC No
1601.12-100MG	2-Fluorobiphenyl	2-F-PCB-0
1712.12-100MG	4-Fluorobiphenyl	4-F-PCB-0
8359.12-100-IO	3,3'-Difluorobiphenyl	3,3'-F_2-PCB-0
8238.12-100MG	4,4'-Difluorobiphenyl	4,4'-F_2-PCB-0
2654.12-100-IO	4-Chloro-4'-fluorobiphenyl	4-F-PCB-3
9513.12-100-IO	4-Chloro-2'-fluorobiphenyl	2'-F-PCB-3
2745.12-100-IO	3'-Fluoro-3,5-dichlorobiphenyl	3'-F-PCB-14
2655.12-100-IO	3-Fluoro-4,4'-dichlorobiphenyl	3-F-PCB-15
2656.12-100-IO	3-Fluoro-2,2',5-trichlorobiphenyl	3-F-PCB-18
2657.12-100-IO	3'-Fluoro-2,3,4'-trichlorobiphenyl	3'-F-PCB-22
2228.12-100-IO	3'-Fluoro-2,4,4'-trichlorobiphenyl	3'-F-PCB-28
2223.12-100-IO	3'-Fluoro-2,4,5-trichlorobiphenyl	3'-F-PCB-29
2224.12-100-IO	2'-Fluoro-2,4,6-trichlorobiphenyl	2'-F-PCB-30
2225.12-100-IO	3'-Fluoro-2,4,6-trichlorobiphenyl	3'-F-PCB-30
2229.12-100-IO	4'-Fluoro-2,4,6-trichlorobiphenyl	4'-F-PCB-30
2658.12-100-IO	3'-Fluoro-3,4,4'-trichlorobiphenyl	3'-F-PCB -37
2666.12-100-IO	3'-Fluoro-3,4',5-trichlorobiphenyl	3'-F-PCB-39
2177.12-100-IO	3-Fluoro-2,2',4,4'-tetrachlorobiphenyl	3-F-PCB-47
2660.12-100-IO	3-Fluoro-2,2',5,5'-tetrachlorobiphenyl	3-F-PCB-52
2869.12-100-IO	3'-Fluoro-2,3,5,6-tetrachlorobiphenyl	3'-F-PCB-65
2222.12-100-IO	4'-Fluoro-2,3',4,5-tetrachlorobiphenyl	4'-F-PCB-67
9514.12-100-IO	5'-Fluoro-2,3',4,5-tetrachlorobiphenyl	5'-F-PCB-67
9515.12-100-IO	3-Fluoro-2,3',4',5-tetrachlorobiphenyl	3-F-PCB-70
3800.12-100-IO	3'-Fluoro-2,4,4',5-tetrachlorobiphenyl	3'-F-PCB-74
2863.12-50-IO	5-Fluoro-3,3',4,4'-tetrachlorobiphenyl	5-F-PCB-77
8358.12-50-IO	5,5'-Difluoro-3,3',4,4'-tetrachlorobiphenyl	5,5'-F_2-PCB-77
2344.12-50-IO	3'-Fluoro-3,4,4',5-tetrachlorobiphenyl	3'-F-PCB-81
8353.12-50-IO	3'-Fluoro-2,2',4,5,5'-pentachlorobiphenyl	3'-F-PCB-101
2864.12-50-IO	5'-Fluoro-2,3,3',4,4'-pentachlorobiphenyl	5'-F-PCB-105
2870.12-50-IO	3'-Fluoro-2,3,4,4',5-pentachlorobiphenyl	3'-F-PCB-114
3801.12-50-IO	3'-Fluoro-2,3,4,5,6-pentachlorobiphenyl	3'-F-PCB-116
2868.12-50-IO	3'-Fluoro-2,3,4',5,6-pentachlorobiphenyl	3'-F-PCB-117
2865.12-50-IO	5'-Fluoro-2,3',4,4',5-pentachlorobiphenyl	5'-F-PCB-118
2866.12-50-IO	5'-Fluoro-3,3',4,4',5-pentachlorobiphenyl	5'-F-PCB-126
2871.12-50-IO	5'-Fluoro-2,3,3',4,4',5-hexachlorobiphenyl	5'-F-PCB-156
3727.12-50-IO	2'-Fluoro-2,3,3',4,5,6-hexachlorobiphenyl	2'-F-PCB-160
3728.12-50-IO	5'-Fluoro-2,3,3',4,5,6-hexachlorobiphenyl	5'-F-PCB-160
3729.12-50-IO	4'-Fluoro-2,3,3',4,5,6-hexachlorobiphenyl	4'-F-PCB-160
2746.12-50-IO	3'-Fluoro-2,3,4,4',5,6-hexachlorobiphenyl	3'-F-PCB-166
3730.12-50-IO	5'-Fluoro-2,3,3',4,4',5,6-heptachlorobiphenyl	5'-F-PCB-190
1958.12-2K-AN	Decafluorobiphenyl	
1958.12-100MG	Decafluorobiphenyl	

Solutions of single reference materials are available in 50 or 100 µg/mL, 1 mL. Please inquire.

BMF 15 - Polybrominated Diphenylethers (PBDEs) and other flame retardants

PBDEs have been used as flame retardants over the past two decades, and are globally distributed in the environment. PBDEs accumulate in the food chain and there is a strong concern about the health effects of PBDE exposure.



Native PBDEs

Chiron offers single native PBDEs in solution for analytical purposes and as neat material up to gram quantities for toxicological studies. Mixtures are offered according to international methods **and on request.**

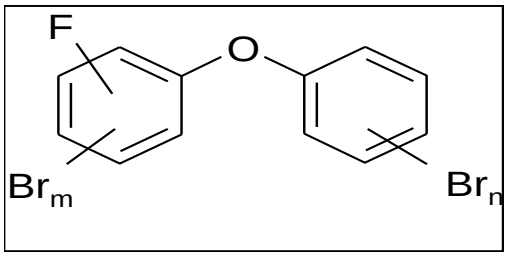
F-PBDEs® Internal standards: An overview of advantages

F-PBDEs® Fluorinated Internal Standards for PBDE analysis are flexible and cost-efficient

Mono- and difluorinated PBDEs are closely similar to the parent PBDEs in terms of physico-chemical properties, and are ideal internal or surrogate standards for GC-MS, GC-ECD, GC-FID and twodimentional GC.

The F-PBDE® internal standards offered by Chiron have several advantages over the more traditionally used ^{13}C isotopes and unlabelled internal standards:

- Cost-efficient. Much cheaper than the ^{13}C isotopes. Useful with electron impact ionization and negative ion chemical ionization.
- Gives one single, pure isotope (F has only one isotope)
- Can be used with GC-ECD detection, ^{13}C can not since they coelute with the native.
- Do not discriminate from the native upon work-up.
- "Designer retention times" (*ortho-, meta-, para*-F) possible for optimal elution rate.



ISO 22032: 2006

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

Native ISO 22032 PBDEs

	IUPAC No.	Compound	Cat. No.	Cat. No.
Tetrabromo:	BDE-47	2,2',4,4'-Tetrabromodiphenyl ether	1962.12-50-IO	1962.12-5MG
Pentabromo:	BDE-99	2,2',4,4',5-Pentabromodiphenyl ether	1967.12-50-IO	1967.12-5MG
	BDE-100	2,2',4,4',6-Pentabromodiphenyl ether	1968.12-50-IO	1968.12-5MG
Hexabromo:	BDE-153	2,2',4,4',5,5'-Hexabromodiphenyl ether	1971.12-50-IO	1971.12-5MG
	BDE-154	2,2',4,4',5,6'-Hexabromodiphenyl ether	1972.12-50-IO	1972.12-5MG
Heptabromo:	BDE-183	2,2',3,4,4',5',6-Heptabromodiphenyl ether	1973.12-50-IO	1973.12-5MG
Octabromo:	BDE-205	2,3,3',4,4',5,5',6-Octabromodiphenyl ether	2647.12-50-IO	2647.12-5MG
Decabromo:	BDE-209	Decabromodiphenyl ether	1811.12-50-IO	1811.12-5MG
	Multiple components	ISO 22032 PBDEs, 10 µg/mL each in isooctane	S-4535-10-IO	-
	KIT	ISO 22032 PBDE single components, solutions Kit	8573.8-KIT	-

Solutions of single reference substances and multiple components solution; 50 µg/mL in isooctane (IO), 1 mL or as neat.

Internal Standards (IS) for ISO 22032: F-PBDEs®

	IUPAC No.	IS for BDE No.	Compound	Cat. No.
Tetrabromo:	6-F-BDE-47	47	6-Fluoro-2,2',4,4'-tetrabromodiphenyl ether	2161.12-50-T*
	5,5'-F_2-BDE-47	47	5,5'-Difluoro-2,2',4,4'-tetrabromodiphenyl ether	2506.12-50-T
Pentabromo:	3,6-F_2-BDE-99	99,100	3,6-Difluoro-2,2',4,4',5-pentabromodiphenyl ether	2505.12-50-IO
	3-F-BDE-100	99, 100	3-Fluoro-2,2',4,4',6-pentabromodiphenyl ether	2163.12-50-T
Hexabromo:	4'-F-BDE-160	153, 154,183	4'-Fluoro-2,3,3',4,5,6-hexabromodiphenyl ether	1929.12-50-T
Heptabromo:	3-F-BDE-183	183	3-Fluoro-2,2'3,4,4',5',6-heptabromodiphenyl ether	2166.12-50-T
Octabromo:	2,4'-F_2-BDE-199	205, 209	4,6'-Difluoro-2,2',3,3',4,5,5',6'-octabromodiphenyl ether	2167.12-50-T
Nonabromo:	4'-F-BDE-208	205, 209	4'-Fluoro-2,2',3,3',4,5,5',6,6'-nonabromodiphenyl ether	2168,12-50-T*
	Multiple components		Multicomponent Stock Solution of Native Substances: ISO 22032 PBDEs, 50 µg/mL each	S-4388-50-IO
	KIT		ISO 22032 F-PBDE® single components, solutions	8574.8.KIT

Solutions of single internal standards and multiple components solution; 50 µg/mL in isooctane (IO) or toluene (T), 1 mL.

Internal Standards (IS) for ISO 22032 PBDEs

(Negative ion chemical ionization)

	IUPAC No.	IS for BDE No.	Compound	Cat. No.
Tetrabromo:	BDE-77	47, 99,100	3,3',4,4'-Tetrabromodiphenyl ether	1991.12-50-IO
Hexabromo:	BDE-181	153, 154,183	2,2',3,4,4',5,5'-6-Hexabromodiphenyl ether	2652.12-50-IO

Solutions of single internal standards and multiple component solution; 50 µg/mL in isooctane (IO), 1 mL.

EPA METHOD 1614, 2007

Brominated diphenyl ethers in Water, Soil, Sediments and Tissue by HRGC/HRMS.

Native PBDEs

Most relevant with respect to EPA Method 1614 (BDEs of primary interest as determined at the 4th Annual Workshop on Brominated Flame Retardants in the Environment, 2002).

IUPAC No.	Compound	Cat No.	Cat No. neat
BDE-28	2,4,4'-Tribromodiphenyl ether	1961,12-50-IO	1961,12-5MG
BDE-47	2,2',4,4'-Tetrabromodiphenyl ether	1962.12-50-IO	1962.12-5MG
BDE-99	2,2',4,4',5-Pentabromodiphenyl ether	1967.12-50-IO	1967.12-5MG
BDE-100	2,2',4,4',6-Pentabromodiphenyl ether	1968.12-50-IO	1968.12-5MG
BDE-153	2,2',4,4',5,5'-Hexabromodiphenyl ether	1971.12-50-IO	1971.12-5MG
BDE-154	2,2',4,4',5,6'-Hexabromodiphenyl ether	1972.12-50-IO	1972.12-5MG
BDE-183	2,2',3,4,4',5',6-Heptabromodiphenyl ether	1973.12-50-IO	1973.12-5MG
BDE-209	Decabromodiphenyl ether	1811.12-50-IO	1811.12-5MG
Multiple components	EPA 1614 PBDEs, 20 µg/mL each*	S-4390-20-IO	-
KIT	EPA 1614 PBDE single components, solutions	8575.8-KIT	-

Solutions of single reference substances, 50 µg/mL in isooctane ,1 mL or as 5 mg neat.

* Also available in other concentrations. Please inquire.

Internal Standards (IS) for EPA 1614 PBDEs

	IUPAC No.	IS for BDE No.	Compound	Cat. No.
Monobromo:	4'-F-BDE-2	3	3-Bromo-4'-fluorodiphenyl ether	1608.12-50-IO
Dibromo:	3'-F-BDE-7	15	3'-Fluoro-2,4-dibromodiphenyl ether	2258.12-50-IO
	3'-F-BDE-12	15	3'-Fluoro-3,4-dibromodiphenyl ether	2257.12-50-IO
Tribromo:	2'-F-BDE-28	28	2'-Fluoro-2,4,4'-tribromodiphenyl ether	2160.12-50-T
	4'-F-BDE-25	28	4'-Fluoro-2,3',4-tribromodiphenyl ether	1926.12-50-IO
	4'-F-BDE-27	28	4'-Fluoro-2,3',6-tribromodipheyl ether	1927.12.50-IO
Tetrabromo:	6-F-BDE-47	47	6-Fluoro-2,2',4,4'-tetrabromodiphenyl ether	2161.12-50-T
	5,5'-F_2-BDE-47	47	5,5'-Difluoro-2,2',4,4'-tetrabromodiphenyl ether	2506.12-50-IO
	6-F-BDE-66	47	6-Fluoro-2,3',4,4'-tetrabromodiphenyl ether	2162.12.50-IO
	4'-F-BDE-69	47	4'-Fluoro-2,3',4,6-tetrabromodiphenyl ether	1928.12.50-IO
Penta-bromo:	3,6-F_2-BDE-99	99, 100	3,6-Difluoro-2,2',4,4',5-pentabromodiphenyl ether	2505.12-50-IO
	3-F-BDE-100	99, 100	3-Fluoro-2,2',4,4',6-pentabromodiphenyl ether	2163.12-50-T
	3-F-BDE-119	99, 100	3-Fluoro-2,3',4,4',6-pentabromodiphenyl ether	2164.12.50-IO
	3,5-F_2-BDE-119	99, 100	3,5-Difluoro-2,3',4,4',6-pentabromodiphenyl ether	2504.12-50-IO
	5,6-F_2-BDE-85	99,100	5,6-Difluoro-2,2',3,4,4'-pentabromodiphenyl ether	2503.12-50-IO
	4'-F-BDE-160	138,153,154	4'-Fluoro-2,3,3',4,5,6-hexabromodiphenyl ether	1929.12-50-T
Hepta-bromo:	3-F-BDE-183	183	3-Fluoro-2,2',3,4,4',5',6-Heptabromodiphenyl ether	2166.12-50-T
Nonabromo:	4'-F-BDE-208	209	4'-Fluoro-2,2',3,3',4,5,5',6,6'-nonabromodiphenyl ether	2168.12-50-IO

Solutions of single internal standards and multiple component solution, 50 µg/mL in isooctane or toluene, 1 mL or as neat.

Native Lake Michigan PBDEs

	IUPAC No.	Compound	Cat. No.	Cat. No. neat
Tribromo:	BDE-28	2,4,4'-Tribromodiphenyl ether	1961.12-50-IO	1961.12-5MG
Tetra-bromo:	BDE-47	2,2',4,4'-Tetrabromodiphenyl ether	1962.12-50-IO	1962.12-5MG
	BDE-66	2,3',4,4-Tetrabromodiphenyl ether	1964.12-50-IO	1964.12-5MG
Penta-bromo:	BDE-85	2,2',3,4,4'-Pentabromodiphenyl ether	1966.12-50-IO	1966.12-5MG
	BDE-99	2,2',4,4',5-Pentabromodiphenyl ether	1967.12-50-IO	1967.12-5MG
	BDE-100	2,2',4,4',6-Pentabromodiphenyl ether	1968.12-50-IO	1968.12-5MG
Hexa-bromo:	BDE-138	2,2',3,4,4',5-Hexabromodiphenyl ether	1970.12-50-IO	1970.12-5MG
	BDE-153	2,2',4,4',5,5'-Hexabromodiphenyl ether	1971.12-50-IO	1971.12-5MG
	BDE-154	2,2',4,4',5,6'-Hexabromodiphenyl ether	1972.12-50-IO	1972.12-5MG
	Multiple components	Lake Michigan PBDEs, 10 µg/mL each	S-4391-10-IO	-
	KIT	Lake Michigan single components, solutions	2653.9KIT	-

Solutions in isooctane (IO), 1 mL or as neat; different concentration.

Internal Standards for Lake Michigan PBDEs: "Lake Michigan F-PBDEs ®"

	IUPAC No.	IS for BDE No.	Compound	Cat. No.
Tribromo:	2'-F-BDE-28	28	2'-Fluoro-2,4,4'-tribromodiphenyl ether	2160.12-50-T
Tetrabromo:	6-F-BDE-47	47	6-Fluoro-2,2',4,4'-tetrabromodiphenyl ether	2161.12-50-T
	5,5'-F_2-BDE-47	47	5,5'-Difluoro-2,2',4,4'-tetrabromodiphenyl ether	2506.12-50-IO
	6-F-BDE-66	66	6-Fluoro-2,3',4,4'-tetrabromodiphenyl ether	2162.12-50-IO
Pentabromo:	5,6-F_2-BDE-85	85	5,6-Difluoro-2,2',3,4,4'-pentabromodiphenyl ether	2503.12-50-IO
	3,6-F_2-BDE-99	99, 100	3,6-Difluoro-2,2',4,4',5-pentabromodiphenyl ether	2505.12-50-IO
	3- F-BDE-100	99,100	3-Fluoro-2,2',4,4',6-pentabromodiphenyl ether	2163.12-50-T
Hexabromo:	4'-F-BDE-160	138, 153, 154	4'-Fluoro-2,3,3',4,5,6-hexabromodiphenyl ether	1929.12-50-T
	Kit		Lake Michigan Study F-PBDEs® Kit single solutions (including 2160.12-50-T, 2161.12-50-T, 2162.12-50-IO, 2503.12-50-IO, 2505.12-50-IO, 2163.12-50-T, 1926.12-50-T)	9751.7-KIT

Solutions of single internal standards and multiple components solution, 50 µg/mL in isooctane (IO) or toluene.

EPA 527.1: 2005

Drinking water – Pesticides and PBDEs by GC-MS

Determination of selected pesticides and flame retardants in drinking water by solid phase extrac-

IUPAC No.	Compound	Cat. No.	Cat. No. neat
PBB-153	2,2',4,4',5,5'-Hexabromobiphenyl	3108.12-50-HX	-
BDE-47	2,2',4,4'-Tetrabromodiphenyl ether	1962.12-50-IO	1962.12-5MG
BDE-99	2,2',4,4',5-Pentabromodiphenyl ether	1967.12-50-IO	1967.12-5MG
BDE-100	2,2',4,4',6-Pentabromodiphenyl ether	1968.12-50-IO	1968.12-5MG
BDE-153	2,2',4,4',5,5'-Hexabromodiphenyl ether	1971.12-50-IO	1971.12-5MG
Multiple components	EPA 527 Mix 3, BDE congeners and hexabromobiphenyl, 50 µg/mL each in isooc-tane:ethyl acetate	S-4484-50-MX	-

Solutions of single reference substances and multiple components solution, 50 µg/mL in hexane (HX) , isooctane (IO) or a mix of solvents (MX). Please inquire.

Native PBDEs; complete list of most relevant PBDEs

Cat No.	Compound	IUPAC No.
8948.12-100-IO	Phenyl ether	
9124.12-50-IO	2-Bromodiphenyl ether	PBDE-1
8747.12-50-IO	3-Bromodiphenyl ether	PBDE-2
8748.12-50-IO	4-Bromodiphenyl ether	PBDE-3
8748.12-5MG	4-Bromodiphenyl ether	PBDE-3
9246.12-50-IO	2,4-Dibromodiphenyl ether	PBDE-7
8749.12-50-IO	3,4'-Dibromodiphenyl ether	PBDE-13
8750.12-50-IO	4,4'-Dibromodiphenyl ether	PBDE-15
8750.12-5MG	4,4'-Dibromodiphenyl ether	PBDE-15
8742.12-50-IO	2,2',4-Tribromodiphenyl ether	PBDE-17
8742.12-5MG	2,2',4-Tribromodiphenyl ether	PBDE-17
1960.12-50-IO	2,3',4-Tribromodiphenyl ether	PBDE-25
1960.12-5MG	2,3',4-Tribromodiphenyl ether	PBDE-25
1961.12-50-IO	2,4,4'-Tribromodiphenyl ether	PBDE-28
1961.12-5MG	2,4,4'-Tribromodiphenyl ether	PBDE-28
2116.12-50-IO	3,3',4-Tribromodiphenyl ether	PBDE-35
1962.12-50-IO	2,2',4,4'-Tetrabromodiphenyl ether	PBDE-47
1962.12-50-IOx10	2,2',4,4'-Tetrabromodiphenyl ether	PBDE-47
1962.12-50-IOx20	2,2',4,4'-Tetrabromodiphenyl ether	PBDE-47
1962.12-5MG	2,2',4,4'-Tetrabromodiphenyl ether	PBDE-47
1963.12-50-IO	2,2',4,5'-Tetrabromodiphenyl ether	PBDE-49
1963.12-5MG	2,2',4,5'-Tetrabromodiphenyl ether	PBDE-49
1964.12-50-IO	2,3',4,4-Tetrabromodiphenyl ether	PBDE-66
1964.12-5MG	2,3',4,4-Tetrabromodiphenyl ether	PBDE-66
1965.12-50-IO	2,3',4',6-Tetrabromodiphenyl ether	PBDE-71
1965.12-5MG	2,3',4',6-Tetrabromodiphenyl ether	PBDE-71
1990.12-50-IO	2,4,4',6-Tetrabromodiphenyl ether	PBDE-75
1990.12-5MG	2,4,4',6-Tetrabromodiphenyl ether	PBDE-75
1991.12-50-IO	3,3',4,4'-Tetrabromodiphenyl ether	PBDE-77
1991.12-5MG	3,3',4,4'-Tetrabromodiphenyl ether	PBDE-77
1966.12-50-IO	2,2',3,4,4'-Pentabromodiphenyl ether	PBDE-85
1966.12-5MG	2,2',3,4,4'-Pentabromodiphenyl ether	PBDE-85
1967.12-50-IO	2,2',4,4',5-Pentabromodiphenyl ether	PBDE-99
1967.12-5MG	2,2',4,4',5-Pentabromodiphenyl ether	PBDE-99
1968.12-50-IO	2,2',4,4',6-Pentabromodiphenyl ether	PBDE-100
1968.12-5MG	2,2',4,4',6-Pentabromodiphenyl ether	PBDE-100
2867.12-50-IO	2,3',4,4',5-Pentachlorobiphenyl ether	PBDE-118
1969.12-50-IO	2,3',4,4',6-Pentabromodiphenyl ether	PBDE-119
1969.12-5MG	2,3',4,4',6-Pentabromodiphenyl ether	PBDE-119
1970.12-50-IO	2,2',3,4,4',5-Hexabromodiphenyl ether	PBDE-138
1970.12-5MG	2,2',3,4,4',5-Hexabromodiphenyl ether	PBDE-138
1971.12-50-IO	2,2',4,4',5,5'-Hexabromodiphenyl ether	PBDE-153
1971.12-5MG	2,2',4,4',5,5'-Hexabromodiphenyl ether	PBDE-153
1972.12-50-IO	2,2',4,4',5,6'-Hexabromodiphenyl ether	PBDE-154
1972.12-5MG	2,2',4,4',5,6'-Hexabromodiphenyl ether	PBDE-154
2652.12-50-IO	2,2',3,4,4',5,6-Heptabromodiphenyl ether	PBDE-181
1973.12-50-IO	2,2',3,4,4',5',6-Heptabromodiphenyl ether	PBDE-183
1973.12-5MG	2,2',3,4,4',5',6-Heptabromodiphenyl ether	PBDE-183
1992.12-50-IO	2,3,3',4,4',5,6-Heptabromodiphenyl ether	PBDE-190
1992.12-5MG	2,3,3',4,4',5,6-Heptabromodiphenyl ether	PBDE-190
2486.12-50-IO	2,2',3,3',4,4',5,6-Octabromodiphenyl ether	PBDE-195
9135.12-50-IO	2,2',3,3',4,4',5,6'-Octabromodiphenyl ether	PBDE-196
1975.12-50-IO	2,2',3,4,4',5,5',6'-Octabromodiphenyl ether	PBDE-203
1975.12-5MG	2,2',3,4,4',5,5',6'-Octabromodiphenyl ether	PBDE-203
2647.12-50-IO	2,3,3',4,4',5,5',6-Octabromodiphenyl ether	PBDE-205
2647.12-5MG	2,3,3',4,4',5,5',6-Octabromodiphenyl ether	PBDE-205
9033.12-50-IO	2,2',3,3',4',5,5',6-Nonabromodiphenyl ether	PBDE-206
9034.12-50-IO	2,2',3,3',4,4',5,6,6'-Nonabromodiphenyl ether	PBDE-207
9035.12-50-IO	2,2',3,3',4,5,5',6,6'-Nonabromodiphenyl ether	PBDE-208
1811.12-50-T	Decabromodiphenyl ether	PBDE-209
1811.12-5MG	Decabromodiphenyl ether	PBDE-209
2653.9-KIT	Lake Michigan Study' PBDEs (Kit w/single solutions)	
8573.8-KIT	ISO 22032 single components, solutions	
8575.8-KIT	EPA 1614 PBDE single components, solutions	

Solutions of single reference substances, 50 µg/mL in 1mL isooctane (IO) or as neat.

Bromophenols

Cat No.	Compound
3822.6-K-IP	2-Bromophenol
2383.6-K-IP	4-Bromophenol
3721.6-K-IP	2,3-Dibromophenol
2061.6-K-IP	2,4-Dibromophenol
2470.6-10-5ME	2,5-Dibromophenol
2470.6-K-IP	2,5-Dibromophenol
2472.6-K-IP	2,6-Dibromophenol
8595.6-K-IP	3,4-Dibromophenol
2507.6-K-IP	2,3,4-Tribromophenol
2471.6-K-IP	2,3,6-Tribromophenol
2508.6-K-IP	2,4,5-Tribromophenol
2060.6-K-IP	2,4,6-Tribromophenol
2060.6-5K-5IP	2,4,6-Tribromophenol
2509.6-K-IP	2,3,4,6-Tetrabromophenol
2509.6-10MG	2,3,4,6-Tetrabromophenol
2672.6-50-IO	Pentabromophenol

Delivered in 1000 µg/mL in isopropanol or 50 µg/mL in isooctane or neat (2509.6).

Flame retardants other than PBDEs

PBBs (polybromobiphenyls)

Cat No.	IUPAC No.	Compound
3089.12-50-IO	PBB-1	2-Bromobiphenyl
3090.12-50-IO	PBB-2	3-Bromobiphenyl
3091.12-50-IO	PBB-3	4-Bromobiphenyl
3092.12-50-IO	PBB-4	2,2'-Dibromobiphenyl
3093.12-50-IO	PBB-7	2,4-Dibromobiphenyl
3094.12-50-IO	PBB-9	2,5-Dibromobiphenyl
3095.12-50-IO	PBB-10	2,6-Dibromobiphenyl
3096.12-50-IO	PBB-15	4,4'-Dibromobiphenyl
3097.12-50-IO	PBB-18	2,2',5-Tribromobiphenyl
3098.12-50-IO	PBB-26	2,3',5-Tribromobiphenyl
2664.12-50-IO	PBB-29	2,4,5-Tribromobiphenyl
2744.12-35-IO	PBB-30	2,4,6-Tribromobiphenyl
2744.12-50-IO	PBB-30	2,4,6-Tribromobiphenyl
3099.12-50-IO	PBB-31	2,4',5-Tribromobiphenyl
3101.12-50-IO	PBB-38	3,4,5-Tribromobiphenyl
3102.12-50-IO	PBB-49	2,2',4,5'-Tetrabromobiphenyl
3103.12-50-IO	PBB-52	2,2',5,5'-Tetrabromobiphenyl
3104.12-50-IO	PBB-56	2,2',5,6'-Tetrabromobiphenyl
3105.12-50-IO	PBB-80	3,3',5,5'-Tetrabromobiphenyl
3106.12-50-IO	PBB-101	2,2',4,5,5'-Pentabromobiphenyl
3107.12-50-IO	PBB-103	2,2',4,5',6-Pentabromobiphenyl
3108.12-50-HX	PBB-153	2,2',4,4',5,5'-Hexabromobiphenyl
3110.12-50-IO	PBB-155	2,2',4,4',6,6'-Hexabromobiphenyl
3109.12-10-CY	PBB-169	3,3',4,4',5,5'-Hexabromobiphenyl
9534.12-50-IO	PBB-189	2,3,3',4,4',5,5'-Heptabromobiphenyl
9716.12.50-IO	PBB-194	2,2',3,3',4,4',5,5'-Octabromobiphenyl
9536.12-50-IO	PBB-206	2,2',3,3',4,4',5,5',6-Nonabromobiphenyl ether
2677.12-50-IO	PBB-209	Decabromodiphenyl
2679.12-50-IO	PBB-Mix	Octabromodiphenyl, techn.

Delivered in 50 µg/mL in isooctane (IO), hexane (HX) or cyclohexane (CY), 1 mL.

Internal Standard (IS) F-PBDEs®: Complete list

Cat. No.	IUPAC No.	Compound
1604.12-50-IO	2-F-PBDE-0	2-Fluorodiphenyl ether
1605.12-50-IO	4-F-PBDE-0	4-Fluorodiphenyl ether
2178.12-K-IO	2,4'-F_2-PBDE-0	2,4'-Difluorodiphenyl ether
3620.12-K-IO	3,3'-F_2-PBDE-0	3,3'-Difluorodiphenyl ether
1608.12-50-IO	3-F-PBDE-2	3-Bromo-4'-fluorodiphenyl ether
2258.12-50-IO	3'-F-PBDE-7	3'-Fluoro-2,4-dibromodiphenyl ether
2257.12-50-IO	3'-F-PBDE-12	3'-Fluoro-3,4-dibromodiphenyl ether
1926.12-50-IO	4'-F-PBDE-25	4'-Fluoro-2,3',4-tribromodiphenyl ether
1927.12-50-IO	4'-F-PBDE-27	4'-Fluoro-2,3',6-tribromodiphenyl ether
2160.12-50-IO	2'-F-PBDE-28	2'-Fluoro-2,4,4'-tribromodiphenyl ether
2160.12-50-T	2'-F-PBDE-28	2'-Fluoro-2,4,4'-tribromodiphenyl ether
2161.12-50-IO	6-F-PBDE-47	6-Fluoro-2,2',4,4'-tetrabromodiphenyl ether
2161.12-50-T	6-F-PBDE-47	6-Fluoro-2,2',4,4'-tetrabromodiphenyl ether
2506.12-50-IO	5,5'-F_2-PBDE-47	5,5'-Difluoro-2,2',4,4'-tetrabromodiphenyl ether (2,2',4,4'-Tetrabromo-5,5'-difluorodiphenyl ether)
2162.12-50-IO	6-F-PBDE-66	6-Fluoro-2,3',4,4'-tetrabromodiphenyl ether
1928.12-50-IO	4'-F-PBDE-69	4'-Fluoro-2,3',4,6-tetrabromodiphenyl ether
2503.12-50-IO	5,6-F_2-PBDE-85	5,6-Difluoro-2,2',3,4,4'-pentabromodiphenyl ether (2,2',3,4,4'-Pentabromo-5,6-difluorodiphenyl ether)
2505.12-50-IO	3,6-F_2-PBDE-99	3,6-Difluoro-2,2',4,4',5-pentabromodiphenyl ether (2,2',4,4',5-Pentabromo-3,6-difluorodiphenyl ether)
2163.12-50-T	3-F-PBDE-100	3-Fluoro-2,2',4,4',6-pentabromodiphenyl ether
2163.12-50-IO	3-F-PBDE-100	3-Fluoro-2,2',4,4',6-pentabromodiphenyl ether
2164.12-50-IO	3-F-PBDE-119	3-Fluoro-2,3',4,4',6-pentabromodiphenyl ether
2504.12-50-IO	3,5-F_2-PBDE-119	3,5-Difluoro-2,3',4,4',6-pentabromodiphenyl ether (2,3',4,4',6-Pentabromo-3,5-difluorodiphenyl ether)
1929.12-50-T	4'-F-PBDE-160	4'-Fluoro-2,3,3',4,5,6-hexabromodiphenyl ether
2166.12-50-T	3-F-PBDE-183	3-Fluoro-2,2',4,4',5,5',6-heptabromodiphenyl ether
2167.12-50-T	4',6-F_2-PBDE-199	4',6-Difluoro-2,2',3,3',4,5,5',6'-octabromodiphenyl ether
2168.12-50-T	4'-F-PBDE-208	4'-Fluoro-2,2',3,3',4,5,5',6,6'-nonabromodiphenyl ether
2168.12-50-IO	4'-F-PBDE-208	4'-Fluoro-2,2',3,3',4,5,5',6,6'-nonabromodiphenyl ether
8574.8-KIT		ISO 22032 F-PBDE® single components, solutions Kit

Solutions of single reference substances, 50 µg/mL in isooctane (IO) or toluene (T), 1 mL.

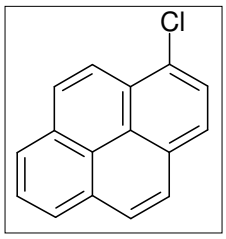
Other halogenated and non-halogenated flame retardants

Cat No.	Compound	
8751.21-50-T	2,2-Bis[3,5-dibromo-4-(2,3-dibromopropoxy)phenyl]propane	BDBPT
8885.24-10MG	Bis(2-ethylhexyl)tetrabromophthalate	TBPH
8757.14-50-T	1,2-Bis(2,4,6-tribromophenoxy)ethane	BTBPE
8897.3-100MG	2-Bromo-2-nitro-1,3-propanediol	Bronopol
2071.7-K-IP	4-Chloro-3-methylphenol	
2670.14-50-CB	Decabromodiphenylethane	
8770.18-50-T	Dechlorane plus	
8898.2-100MG	2,2-Dibromo-2-cyano-acetamide	DBNPA
2671.5-50-IP	Dibromoneopentylglycol	
2061.6-10-5ME	2,4-Dibromophenol	
2061.6-K-IP	2,4-Dibromophenol	
8884.18-50-T	Ethylene bis(tetrabromophthalamide	
2678.6-50-IO	Hexabromobenzene	
1894.6-50-IO	1,2,3,4,5,6-Hexabromocyclohexane	
1893.12-K-T	1,2,5,6,9,10-Hexabromocyclododecane	HBCD, Racemic mixture
8881.8-50-IO	Pentabromoethylbenzene	PBEB
9561.16-K-IO	Butyldiphenylphosphate	DPhBP

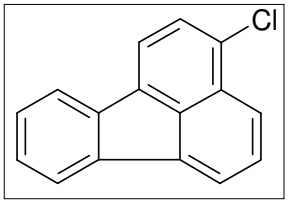
Solutions of single reference substances in isooctane (IO), methanol (ME), isopropanol (IP) or toluene (T), 1 mL, various concentrations. Please inquire.

2672.6-50-IO	Pentabromophenol	
2673.7-50-IO	Pentabromotoluene	
2674.15-50-IO	3,3',5,5'-Tetrabromobisphenol A	TBBA
8887.21-50-T	3,3',5,5'-Tetrabromobisphenol A diallyl ether	
2675.17-50-IO	3,3',5,5'-Tetrabromobisphenol A dimethyl ether	
8771.21-50-IO	3,3',5,5'-Tetrabromobisphenol A bis(2,3-dibromopropyl) ether	
8772.19-50-IO	3,3',5,5'-Tetrabromobisphenol A bis(2-hydroxyethyl) ether	
8882.9-50-IO	2,4,6-Tribromophenylallyl ether	ATE
2060.6-K-IP	2,4,6-Tribromophenol	
2676.8-50-IO	Tetrabromophthalic anhydride	
1812.18-50-CY	Tetradecabromo-1,4-diphenoxybenzene	
	Melamine (triazine)-based flame retardants	
8754.3-1G	Melamine cyanurate	Reflam MCA
8755.0-1G	Melamine micronized	Reflam MA
8752.0-1G	Melamine phosphate	Reflam MP
8753.0-1G	Melamine polyphosphate	Reflam MPP
	Phosphor-Phosphate-based flame retardants	
8798.0-1G	Ammonium polyphosphate (Phase II n>1000)	Reflam APP
8764.6-50-IO	Bis(2,3-dibromopropyl)phosphate	
8764.6-10MG	Bis(2,3-dibromopropyl)phosphate	
8756.0-100MG	Bisphenol A bis(diphenyl)phosphate, Rx product of Phosphoric acid trichloride biphenol A and phenol	BDP
8738.20-K-IO	Ditolylphenylphosphate - Mixture of *o-,m-,p*-tolyl isomers	
3967.19-K-IO	Diphenyltolylphosphate - Mixture of *o-,m-,p*-tolyl isomers	
8777.9-1G	Isopropylated trisphenyl phosphate (Phenol, isopropylated, phosphate)	IPPP
8767.0-1G	Phenoxyterminated carbonate oligomer of tetrabromobisphenol A	
8769.0-1G	Polyphosphoric acids ammonium salt	APP
8768.0-1G	2,4,6-Tribromophenylterminated tetrabromobisphenol-A carbonate oligomer	
1399.12-K-IO	Tri-*n*-butylphosphate	TBP
8026.6-K-IO	Triethylphosphate	TEP
3966.12-K-IO	Tri-*iso*-butylphosphate	TiBP
1400.3-K-IO	Trimethylphosphate	TMP
3968.12-100MG	Trimethylpropanephosphate	
8027.9-K-IO	Tri-*n*-propylphosphate	
2138.18-K-IO	Triphenylphosphate	TPP
2209.6-100-ME	Tris-(aziridinyl)-phosphineoxide	TEPA
2209.6-K-ME	Tris-(aziridinyl)-phosphineoxide	TEPA
2209.6-10MG	Tris-(aziridinyl)-phosphineoxide	TEPA
2209.6-100MG	Tris-(aziridinyl)-phosphineoxide	TEPA
8586.9-100MG	Tris(2,3-dibromopropyl)phosphate	TBPP
8586.9-1G	Tris(2,3-dibromopropyl)phosphate	TBPP
8436.6-1G	Tris(2-chloroethyl)phosphate	
8457.9-1G	Tris(monochloropropyl)phosphate	TCPP
8774.9-10MG	Tris(2-chloropropyl)phosphate	
8505.9-1G	Tris(1,3-dichloro-2-propyl)phosphate	
8775.9-K-ME	Tris(2,3-dichloropropyl)phosphate	
2135.21-K-IO	Tri-*o*-tolylphosphate	ToTP
2134.21-K-IO	Tri-*m*-tolylphosphate	TmTP
2136.21-K-IO	Tri-*p*-tolylphosphate	TpTP
2137.21-K-IO	Tritolylphosphate (isomer mixture) "Tricresylphosphate"	TCP
9490.26-1G	2-Ethylhexyldiphenylphosphate	
	Labelled Phosphate based Flame retardants	
9491.12-100-IO	Tri-*n*-butylphosphate-d27	TBP-d27
9492.6-100-IO	Triethylphosphate-d15	TEP-d15
9493.3-100-IO	Trimethylphosphate-d9	TMP-d9
9494.18-100-IO	Triphenylphosphate-d15	TPP-d15
9495.9-100-IO	Tri-*n*-propylphosphate-d21	

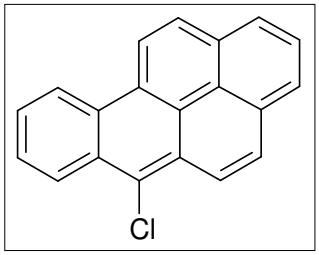
BMF 51 - PCNs, PBNs and HaloPAHs



1-Chloropyrene (9486.16)



3-Chlorofluoranthene (9487.16)



6-Chlorobenzo[a]pyrene (9485.20)

Available ChloroPAHs

	ChloroPAHs	
8230.13	9-Chloro-9H-fluorene	
8374.14	9-Chlorophenanthrene	
8231.14	2-Chloroanthracene	
9486.16	1-Chloropyrene	
9487.16	3-Chlorofluoranthene	
9485.20	6-Chlorobenzo[a]pyrene	
	ChloroNaphthalenes (PCNs)	
1993.10	1-Chloronaphthalene	PCN-1
1994.10	2-Chloronaphthalene	PCN-2
1995.10	1,4-Dichloronaphthalene	PCN-5
1996.10	1,5-Dichloronaphthalene	PCN-6
1997.10	2,3-Dichloronaphthalene	PCN-10
3112.10	2,6-Dichloronaphthalene	PCN-11
3621.10	2,7-Dichloronaphthalene	PCN-12
3744.10	1,2,3,4-Tetrachloronaphthalene	PCN-27
3752.10	1,2,3,4-Tetrachloro-1,2,3,4-tetrahydronaphthalene	PCN-27-tetrahydro
1998.10	Octachloronaphthalene	PCN-75
8229.10	2,4-Dichloro-1-naphthol	

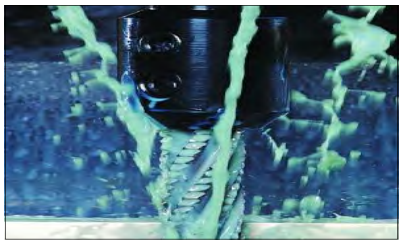
Fluoro– and BromoPAHs

	F-PAHs® (Useful internal standards for PAH analysis)	
1313.10	1-Fluoronaphthalene	
2364.11	2-Fluoro-6-methylnaphthalene	
1314.12	5-Fluoroacenaphthylene	
1607.13	4-Fluorodiphenylmethane	
1315.13	2-Fluorofluorene	
1606.13	2-Fluorodiphenylmethane	
8240.13	4,4'-Difluorodiphenylmethane	
1328.14	2-Fluorophenanthrene	
1316.14	3-Fluorophenanthrene	
8891.14	4-Fluorophenanthrene	
2873.15	3-Fluoro-6-methylphenanthrene	
1319.16	3-Fluorofluoranthene	
1318.16	1-Fluoropyrene	
1900.18	1-Fluorochrysene	
1317.18	3-Fluorochrysene	
2872.19	9-Fluoro-5-methylchrysene	
1322.20	9-Fluorobenzo[*k*]fluoranthene	
	F-PASHs	
1602.9	5-Fluoro-3-methylbenzothiophene	5-F-3-MBT
2739.10	5-Fluoro-2,3-dimethylbenzothiophene	2-F-2,3-DMBT
1692.12	2-Fluorodibenzothiophene	2-F-DBT
	F-PANHs	
1603.8	5-Fluoroindole	
3543.10	6-Fluoro-2-methylquinoline	
8019.8	5-Fluorosatin	
	BromoNaphthalenes (PBNs)	
3114.10	1-Bromonaphthalene	PBN-1
3115.10	2-Bromonaphthalene	PBN-2
3116.10	1,4-Dibromonaphthalene	PBN-5
3117.10	2,3-Dibromonaphthalene	PBN-10
3118.10	2,6-Dibromonaphthalene	PBN-11
3119.10	2,7-Dibromonaphthalene	PBN-12
8101.10	1,2,3,4,6,7-Hexabromonaphthalene	PBN-66

All HaloPAHs are available as single solutions from Chiron, different concentrations and solvents are possible. Please inquire for an offer.

BMF 10 - Polychlorinated alkanes (SCCP)

Applications



Polychloro-*n*-alkanes (PCAs) or chlorinated paraffins are a class of industrial chemicals used as high-temperature lubricants in metal-working machinery and as flame retardant plasticizers in vinyl plastics. Less common applications include the use as flame retardants in rubber, paints, adhesives and as sealants.

"SCCP", "MCCP", "LCCP"

Industrially, the PCAs are synthesized by direct chlorination of *n*-alkane feedstock with molecular chlorine at elevated temperatures and pressures, and sometimes in the presence of UV-light. PCAs fall into three categories, C_{10}-C_{13} (short, "SCCP"), C_{14}-C_{17} (medium, "MCCP"), and C_{18}-C_{30} (long, "LCCP"). They are further sub-categorized into their weight content of chlorine, 40-50%, 50-60% and 60-70%.

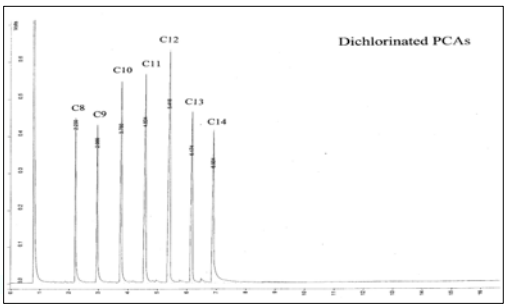
C_{10}-C_{13} PCA ("SCCPs" short-chain-chlorinated-paraffines): Listed as Priority Pollutants in the US, Canada, and Europe

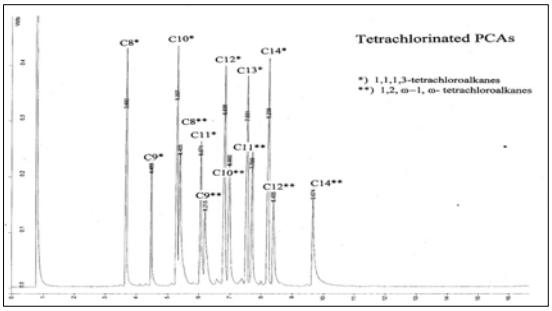
In the US, C_{10}-C_{13} PCAs have been placed on the US Environmental Protection Agency (EPA) Toxic Release Inventory, in Canada they are classified as "Track 1" Priority Toxic substances under the Canadian Environmental Protection Act, and in Europe the C_{10}-C_{13} PCAs are included on the list of priority substances in the field of water policy submitted by the Commission of European Communities for the European Parliament and Council Decision.

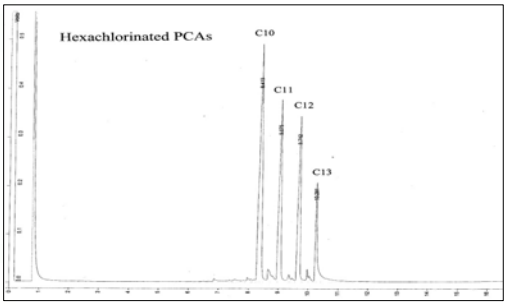
Analysis of PCAs

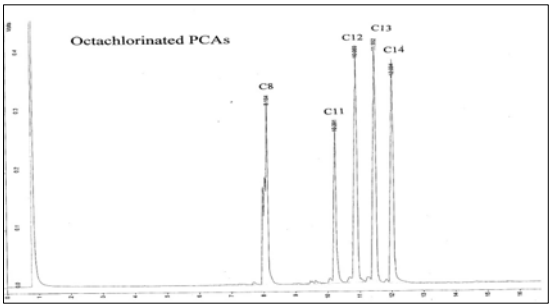
PCAs are analyzed by GC using ECD detector, or more sophisticated by high resolution gas chromatography/electron capture negative ion-mass spectrometry (HRGC/ECNI-MS).

Chiron offers a broad range of single polychlorinated PCAs as reference materials. They are useful in the quantification and as standards for PCA determination, for dividing PCAs into various classes according to carbon length and chlorine content. PCAs are C_8-C_{20} alkanes with a chlorine weight content of 27-73%.









PCAs according to their carbon chain length

Cat. No.	Compound	Molecular formula	% Weight of Cl
	C8-C9 PCAs		
1664.8-K-IO	1,2-Dichlorooctane	$C_8H_{16}Cl_2$	38,7
1660.8-K-IO	1,1,1,3-Tetrachlorooctane	$C_8H_{14}Cl_4$	56,3
1672.8-K-IO	1,2,7,8-Tetrachlorooctane	$C_8H_{14}Cl_4$	56,3
1656.8-K-IO	1,1,1,3,6,8,8,8-Octachlorooctane	$C_8H_{10}Cl_8$	72,8
1665.9-K-IO	1,2-Dichlorononane	$C_9H_{18}Cl_2$	36,0
1661.9-K-IO	1,1,1,3-Tetrachlorononane	$C_9H_{16}Cl_4$	53,3
1673.9-K-IO	1,2,8,9-Tetrachlorononane	$C_9H_{16}Cl_4$	53,3
1658.9-K-IO	1,1,1,3,8,9-Hexachlorononane	$C_9H_{16}Cl_4$	65,6
	C10-C13 PCAs (SCCPs)		
1666.10-K-IO	1,2-Dichlorodecane	$C_{10}H_{20}Cl_2$	33,6
1662.10-K-IO	1,1,1,3-Tetrachlorodecane	$C_{10}H_{18}Cl_4$	50,6
1671.10-K-IO	1,2,9,10-Tetrachlorodecane	$C_{10}H_{18}Cl_4$	50,6
1659.10-K-IO	1,1,1,3,9,10-Hexachlorodecane, isomer mixture	$C_{10}H_{16}Cl_6$	61,0
1622.10-K-IO	1,1,1,3,8,10,10,10-Octachlorodecane	$C_{10}H_{14}Cl_8$	67,9
1667.11-K-IO	1,2-Dichloroundecane	$C_{11}H_{22}Cl_2$	31,5
1649.11-K-IO	1,1,1,3-Tetrachloroundecane	$C_{11}H_{20}Cl_4$	48,2
1674.11-K-IO	1,2,10,11-Tetrachloroundecane	$C_{11}H_{20}Cl_4$	48,2
1650.11-K-IO	1,1,1,3,10,11-Hexachloroundecane, isomer mixture	$C_{11}H_{18}Cl_6$	58,6
1623.11-K-IO	1,1,1,3,9,11,11,11-Octachloroundecane	$C_{11}H_{16}Cl_8$	65,7
1668.12-K-IO	1,2-Dichlorododecane	$C_{12}H_{24}Cl_2$	29,6
1663.12-K-IO	1,12-Dichlorododecane	$C_{12}H_{24}Cl_2$	29,6
1651.12-K-IO	1,1,1,3-Tetrachlorododecane	$C_{12}H_{22}Cl_4$	46,0
1675.12-K-IO	1,2,11,12-Tetrachlorododecane	$C_{12}H_{22}Cl_4$	46,0
1652.12-K-IO	1,1,1,3,11,12-Hexachlorododecane, isomer mixture	$C_{12}H_{22}Cl_4$	46,0
1624.12-K-IO	1,1,1,3,10,12,12,12-Octachlorododecane	$C_{12}H_{18}Cl_8$	63,6
1669.13-K-IO	1,2-Dichlorotridecane	$C_{13}H_{26}Cl_2$	28,0
1653.13-K-IO	1,1,1,3-Tetrachlorotridecane	$C_{13}H_{24}Cl_4$	44,0
1654.13-K-IO	1,1,1,3,12,13-Hexachlorotridecane, isomer mixture	$C_{13}H_{22}Cl_6$	54,4
1625.13-K-IO	1,1,1,3,11,13,13,13-Octachlorotridecane	$C_{13}H_{20}Cl_8$	61,7
	C14+ PCAs (MCCPs and LCCPs)		
1670.14-K-IO	1,2-Dichlorotetradecane	$C_{14}H_{28}Cl_2$	26,5
1676.14-K-IO	1,1,1,3-Tetrachlorotetradecane	$C_{14}H_{26}Cl_4$	42,2
1677.14-K-IO	1,2,13,14-Tetrachlorotetradecane	$C_{14}H_{26}Cl_4$	42,2
1678.14-K-IO	1,1,1,3,12,12,12,14-Octachlorotetradecane	$C_{14}H_{22}Cl_8$	59,8
8506.15-K-IO	1,1,1,3,14,15-Hexachloropentadecane	$C_{15}H_{26}Cl_6$	52,5
8507.16-K-IO	1,1,1,3,14,16,16,16-Octachlorohexadecane	$C_{16}H_{26}Cl_8$	56,6
8508.17-K-IO	1,1,1,3,15,17,17,17-Octachloroheptadecane	$C_{17}H_{28}Cl_8$	55,0
2051.18-10K-DC	1-Chlorooctadecane	$C_{18}H_{39}Cl$	12,2
8509.18-K-IO	1,1,1,3,16,18,18,18-Octachlorooctadecane	$C_{18}H_{32}Cl_8$	53,6
8510.19-K-IO	1,1,1,3,17,19,19,19-Octachlorononadecane	$C_{19}H_{34}Cl_8$	52,2
8511.20-K-IO	1,1,1,3,18,20,20,20-Octachloroeicosane	$C_{20}H_{36}Cl_8$	50,9

Reference materials are available in various concentrations (e.g. 100µg/mL and 1000µg/mL) and solvents. Please inquire (also for other PCAs).

PCAs according to their degree of chlorination

Cat.No.	Compound name	Molecular formula	% Weight of Cl
	Dichloroalkanes		
1664.8-K-IO	1,2-Dichlorooctane	$C_8H_{16}Cl_2$	38,7
1665.9-K-IO	1,2-Dichlorononane	$C_9H_{18}Cl_2$	36,0
1666.10-K-IO	1,2-Dichlorodecane	$C_{10}H_{20}Cl_2$	33,6
1667.11-K-IO	1,2-Dichloroundecane	$C_{11}H_{22}Cl_2$	31,5
1668.12-K-IO	1,2-Dichlorododecane	$C_{12}H_{24}Cl_2$	29,6
1663.12-K-IO	1,12-Dichlorododecane	$C_{12}H_{24}Cl_2$	29,6
1669.13-K-IO	1,2-Dichlorotridecane	$C_{13}H_{26}Cl_2$	28,0
1670.14-K-IO	1,2-Dichlorotetradecane	$C_{14}H_{28}Cl_2$	26,5
	Tetrachloroalkanes		
1660.8-K-IO	1,1,1,3-Tetrachlorooctane	$C_8H_{14}Cl_4$	56,3
1672.8-K-IO	1,2,7,8-Tetrachlorooctane	$C_8H_{14}Cl_4$	56,3
1661.9-K-IO	1,1,1,3-Tetrachlorononane	$C_9H_{16}Cl_4$	53,3
1673.9-K-IO	1,2,8,9-Tetrachlorononane	$C_9H_{16}Cl_4$	53,3
1662.10-K-IO	1,1,1,3-Tetrachlorodecane	$C_{10}H_{18}Cl_4$	50,6
1671.10-K-IO	1,2,9,10-Tetrachlorodecane	$C_{10}H_{18}Cl_4$	50,6
1649.11-K-IO	1,1,1,3-Tetrachloroundecane	$C_{11}H_{20}Cl_4$	48,2
1674.11-K-IO	1,2,10,11-Tetrachloroundecane	$C_{11}H_{20}Cl_4$	48,2
1675.12-K-IO	1,2,11,12-Tetrachlorododecane	$C_{12}H_{22}Cl_4$	46,0
1651.12-K-IO	1,1,1,3-Tetrachlorododecane	$C_{12}H_{22}Cl_4$	46,0
1653.13-K-IO	1,1,1,3-Tetrachlorotridecane	$C_{13}H_{24}Cl_4$	44,0
1677.14-K-IO	1,2,13,14-Tetrachlorotetradecane	$C_{14}H_{26}Cl_4$	42,2
1676.14-K-IO	1,1,1,3-Tetrachlorotetradecane	$C_{14}H_{26}Cl_4$	42,2
	Hexachloroalkanes		
1658.9-K-IO	1,1,1,3,8,9-Hexachlorononane	$C_9H_{16}Cl_4$	65,6
1659.10-K-IO	1,1,1,3,9,10-Hexachlorodecane	$C_{10}H_{16}Cl_6$	61,0
1650.11-K-IO	1,1,1,3,10,11-Hexachloroundecane	$C_{11}H_{18}Cl_6$	58,6
1652.12-K-IO	1,1,1,3,11,12-Hexachlorododecane	$C_{12}H_{22}Cl_4$	46,0
1654.13-K-IO	1,1,1,3,12,13-Hexachlorotridecane	$C_{13}H_{22}Cl_6$	54,4
8506.15-K-IO	1,1,1,3,14,15-Hexachloropentadecane	$C_{15}H_{26}Cl_6$	52,5
	Octachloroalkanes		
1656.8-K-IO	1,1,1,3,6,8,8,8-Octachlorooctane	$C_8H_{10}Cl_8$	72,8
1622.10-K-IO	1,1,1,3,8,10,10,10-Octachlorodecane	$C_{10}H_{14}Cl_8$	67,9
1623.11-K-IO	1,1,1,3,9,11,11,11-Octachloroundecane	$C_{11}H_{16}Cl_8$	65,7
1624.12-K-IO	1,1,1,3,10,12,12,12-Octachlorododecane	$C_{12}H_{18}Cl_8$	63,6
1625.13-K-IO	1,1,1,3,11,13,13,13-Octachlorotridecane	$C_{13}H_{20}Cl_8$	61,7
1678.14-K-IO	1,1,1,3,12,14,14,14-Octachlorotetradecane	$C_{14}H_{22}Cl_8$	59,8
8507.16-K-IO	1,1,1,3,14,16,16,16-Octachlorohexadecane	$C_{16}H_{26}Cl_8$	56,6
8508.17-K-IO	1,1,1,3,15,17,17,17-Octachloroheptadecane	$C_{17}H_{28}Cl_8$	55,0
8509.18-K-IO	1,1,1,3,16,18,18,18-Octachlorooctadecane	$C_{18}H_{32}Cl_8$	53,6
8510.19-K-IO	1,1,1,3,17,19,19,19-Octachlorononadecane	$C_{19}H_{34}Cl_8$	52,2
8511.20-K-IO	1,1,1,3,18,20,20,20-Octachloroeicosane	$C_{20}H_{36}Cl_8$	50,9

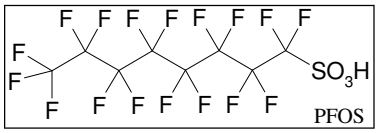
Reference materials are available in various concentrations (e.g. 100µg/mL and 1000µg/mL) and solvents. Please inquire (also for other PCAs).

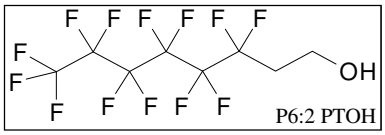
BMF 20 - Perfluorinated Organic Compounds

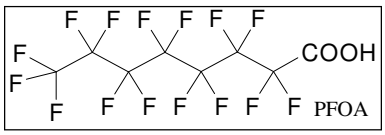
Perfluorinated Organic Compounds (PFCs) are used in numerous commercial products like fire protection agents, textile protection agents, floor polishers, detergents, paints, paper treatment agents and electronic equipment.

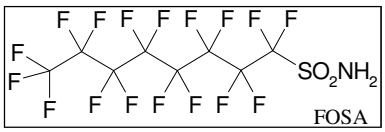
The first PFAs (PFCs = Perfluorinated alkanoic acids, alcohols and sulfonic acids) were based on Perfluorooctanesulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA). However, due to environmental reports with warning about the bioaccumulation of these compounds, new and more readily biodegradable substances have been introduced. Typically, these are various telomeric acids, alcohols and sulfonamides.

The biodegradation-route of the commercial telomers is currently under investigation and new metabolites are likely to be found. Chiron now offers a large range of PFCs and its telomeric acid, alcohols and possible metabolites.









PFAs - Perfluorinated alkanoic acids and alcohols

PFA Sulfonic acids:	2041.4-50-ME	Perfluorobutane sulfonic acid	PFBS
	2719.4-50-ME	Perfluorobutane sulphonate, potassium salt	PFBS-K
	8581.6-50-ME	Perfluorohexane sulfonic acid, potassium salt	PFHxS-K
	2037.8-50-ME	Perfluorooctane sulfonic acid	PFOS
	2193.8-50-ME	Perfluorooctane sulfonic acid, potassium salt	PFOS-K
	8012.8-100MG	Perfluorooctane sulfonylfluoride	
	2192.8-50-ME	Perfluoro-4-ethylcyclohexane sulfonic acid, potassium salt	
Telomeric PFA Sulfonic acid:	2559.8-50-ME	1*H*,1*H*,2*H*,2*H*-Perfluorooctane sulfonic acid	
PFA Sulfonamides:	2043.8-50-AN	Perfluorooctane sulfonamide	FOSA
PFA Acids:	2190.3-50-ME	Perfluoropropionic acid, sodium salt	PFPrA-Na
	2810.4-50-ME	Perfluorobutyric acid	PFBA
	2189.4-50-ME	Perfluorobutyric acid, sodium salt	PBBA-Na
	2834.5-50-ME	5*H*-Perfluoropentanoic acid	5H PFPA
	2819.5-50-ME	*n*-Perfluoropentanoic acid	PFPA
	2590.6-50-ME	Perfluorohexanoic acid	PFHxA
	2820.7-50-ME	Perfluorocyclohexanoic acid	PFCyHxA
	2835.7-50-ME	7*H*-Perfluoroheptanoic acid	7H PFHPA
	2821.7-50-ME	*n*-Perfluoroheptanoic acid	PFHpA
	2042.8-50-ME	*n*-Perfluorooctanoic acid	PFOA
	2822.8-50-ME	*n*-Perfluorooctanoic acid, ammonium salt	PFOA-NH4
	2191.8-50-ME	Perfluoroctanonic acid, sodium salt	PFOA-Na
	2836.9-50-ME	9*H*-Perfluorononanoic acid	9H PFNA
	2715.9-50-ME	Perfluorononanoic acid	PFNA
	2823.10-50-ME	*n*-Perfluorodecanoic acid	PFDA
	2824.10-50-ME	Perfluoro-3,7-dimethyloctanoic acid	PF3,7DiMeOA
	2825.11-50-ME	11*H*-Perfluoroundecanoic acid	11H PFUndA
	2874.11-50-ME	Perfluoroundecanoic acid	PFUndA
	2826.12-50-ME	*n*-Perfluorododecanoic acid	PFDodA
	2827.14-50-ME	Perfluorotetradecanoic acid	PFTedA
	2828.16-50-ME	Perfluorohexadecanoic acid	PFHxdA
	2829.18-50-ME	Perfluorooctadecanoic acid	PFOdA
Telomeric acids :	2830.6-50-ME	2*H*,2*H*,3*H*,3*H*-Perfluorohexanoic acid	3:3 FTCA
	2831.9-50-ME	2*H*,2*H*,3*H*,3*H*-Perfluorononanoic acid	6:3 FTCA
	2832.9-50-ME	1*H*,1*H*-Perfluoro-3,5,5-trimethylhexanoic acid	3,5,5-TriMe 5:1
	8548.10-50-ME	2*H*,2*H*-Perfluorodecanoic acid	H2PFDA
	8547.11-50-ME	2*H*,2*H*,3*H*,3*H*-Perfluoroundecanoic acid	H4PFUnA

Unsaturated telomeric acid:	2833.6-50-ME	2*H*,3*H*-Perfluorohex-2-enoic acid	3:3 FTUCA
PFA Acid Internal standards:	2834.5-50-ME	5*H*-Perfluoropentanoic acid	5H PFBA
	2835.7-50-ME	7*H*-Perfluoroheptanoic acid	7H PFHPA
	2836.9-50-ME	9*H*-Perfluorononanoic acid	9H PFNA
	2825.11-50-ME	11*H*-Perfluoroundecanoic acid	11H PFUndA
PFA amides:	2837.4-50-ME	Perfluorobutyramide	
	2838.8-50-ME	Perfluorooctanamide	
		PFA alcohols	
Telomeric alcohols:	2839.4-50-ME	3,3,4,4,4-Perfluorobutan-1-ol	2:2 FTOH
	2860.5-50-ME	1*H*,1*H*,5*H*-Perfluoropentan-1-ol	5H 4:1 FTOH
	8802.6-50-ME	1*H*,1*H*,2*H*,2*H*-Perfluorohexan-1-ol (2-Perfluorobutyl ethanol)	4:2 FTOH
	2841.6-50-ME	1*H*,1*H*,2*H*,2*H*,3*H*,3*H*-Perfluorohexan-1-ol	3:3 FTOH
	2842.6-50-ME	1*H*,1*H*-Perfluorohexan-1-ol	5:1 FTOH
	2861.7-50-ME	1*H*,1*H*,7*H*-Perfluoroheptan-1-ol	7H 6:1 FTOH
	2843.7-50-ME	1*H*,1*H*-Perfluoroheptan-1-ol	6:1 FTOH
	2147.8-50-ME	1*H*,1*H*,2*H*,2*H*-Perfluorooctan-1-ol	6:2 FTOH
	2146.8-50-ME	1*H*,1*H*,8*H*-Perfluorooctane-1-ol	8H 7:1 FTOH
	2145.8-50-ME	1*H*,1*H*-Perfluorooctane-1-ol	7:1 FTOH
	2844.9-50-ME	1*H*,1*H*,2*H*,2*H*,3*H*,3*H*-Perfluorononan-1-ol	6:3 FTOH
	2847.9-50-ME	1*H*,1*H*,2*H*,2*H*-Perfluoro-7-methyloctan-1-ol	7Me 6:1 FTOH
	2846.9-50-ME	1*H*,1*H*,9*H*-Perfluorononan-1-ol	9H 8:1 FTOH
	2845.9-50-ME	1*H*,1*H*-Perfluorononan-1-ol	8:1 FTOH
	2851.10-50-ME	1*H*,1*H*,10*H*,10*H*-Perfluoro-1,10-decanediol	1:8:1 FTdiOH
	2849.10-50-ME	1*H*,1*H*,2*H*,2*H*-Perfluorodecan-1-ol	8:2 FTOH
	2848.10-50-ME	1*H*,1*H*-Perfluorodecan-1-ol	9:1 FTOH
	2850.10-50-ME	1*H*,1*H*-Perfluoro-3,7-dimethyloctan-1-ol	3,7-DiMe 7:1 FTOH
	2854.11-50-ME	1*H*,1*H*,2*H*,2*H*-Perfluoro-9-methyldecan-1-ol	9Me 8:2 FTOH
	2853.11-50-ME	1*H*,1*H*,11*H*-Perfluoroundecan-1-ol	11H 10:1 FTOH
	2852.11-50-ME	1*H*,1*H*-Perfluoroundecan-1-ol	10:1 FTOH
	2767.12-50-ME	1*H*,1*H*,2*H*,2*H*-Perfluorododecan-1-ol	10:2 FTOH
	3821.13-50-ME	1*H*,1*H*,13*H*-Perfluorotridecan-1-ol	13H 12:1 FTOH
	2855.14-50-ME	1*H*,1*H*-Perfluorotetradecan-1-ol	13:1 FTOH
	2856.16-50-ME	1*H*,1*H*-Perfluorohexadecan-1-ol	15:1 FTOH
	2857.18-50-ME	1*H*,1*H*-Perfluorooctadecan-1-ol	17:1 FTOH
Allylic alkohols:	2858.6-50-ME	1*H*,1*H*,2*H*,3*H*-Perfluorohex-2-en-1-ol	Allylic 3:3 FTOH
	2859.9-50-ME	1*H*,1*H*,2*H*,3*H*-Perfluoronon-2-en-1-ol	Allylic 6:3 FTOH
Internal Standards:	2860.5-50-ME	1*H*,1*H*,5*H*-Perfluoropentan-1-ol	5H 4:1 FTOH
	2861.7-50-ME	1*H*,1*H*,7*H*-Perfluoroheptan-1-ol	7H 6:1 FTOH
	2146.8-50-ME	1*H*,1*H*,8*H*-Perfluorooctane-1-ol	8H 7:1 FTOH
	9825.10-10MG	1*D*,1*D*,2*H*,2*H*-1-Hydroxyperfluorodecan	
PFA aldehydes:	2862.7-50-ME	7*H*-Perfluoroheptanal	
PFA esters:	9228.13-50-ME	1*H*,1*H*,2*H*,2*H*-Perfluorodecyl acrylate	8:2 FTO acrylic acid, Repellion 120 C1
	9520.13-50-ME	1*H*,1*H*,2*H*,2*H*-Perfluorodecyl acrylate-d3	8:2 FTO acrylic acid-d3
	9519.14-50-ME	1*H*,1*H*,2*H*,2*H*-Perfluorodecyl methacrylate	8:2 FTO methacrylic acid
	9521.14-50-ME	1H,1,H,2H,2H-Perfluorodecyl methacrylate -d5	8:2 FTO methacrylic acid-d5
Fluoroalkanes:	8400.6-1ML	Perfluoro-*n*-hexane	
	8401.7-1ML	Perfluoroheptane, isomer mixture	
	8402.8-1ML	Perfluoro-*n*-octane	
	8403.9-1ML	Perfluoro-*n*-nonane	
	8404.10-100MG	Perfluoro-*n*-decane	
	8405.11-1G	1*H*-Perfluoro-*n*-undecane	
	8406.12-100MG	Perfluoro-*n*-dodecane	
	8407.13-1G	Perfluoro-*n*-tridecane	
	8408.14-100MG	Perfluoro-*n*-tetradecane	
	8409.15-100MG	Perfluoro-*n*-pentadecane	
	8410.16-100MG	Perfluoro-*n*-hexadecane	
	8414.20-100MG	Perfluoro-*n*-eicosane	
Cyclic fluoroalkanes/PAHs:	8416.10-10G	Perfluorodecalin (mix *E/Z*)	
	8417.14-10G	Perfluoro(ethyldimethyldecalin)	
	8418.14-10G	Perfluoroperhydrophenanthrene	
	8029.10-10G	Perfluoronaphthalene	
Chlorinated fatty acids:	3746.18-100-ME	9-Chloro- /10-Chlorooctadecanoic acid	
	3745.16-100-ME	7,8-Dichlorohexadecanoic acid	
	3622.18-100-ME	9,10-Dichlorooctadecanoic acid	
	3747.18-100-ME	9,10-/, 9,13-/, 10,12-/, 10,13-	
	3748.18-100-ME	9,10,12,13-Tetrachlorooctadecanoic acid	

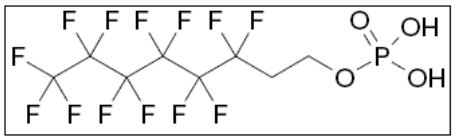
BMF 54 - PAPS

Telomeric 6:2, 8:2 and 10:2 mono-, di– and tri-polyfluoroalkyl phosphate esters

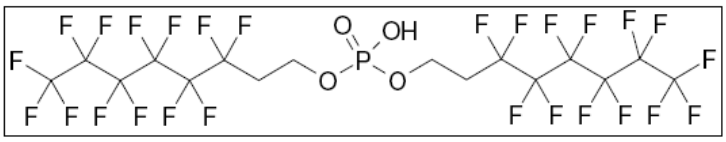
It is recommended that the EU member states (recommendation 2010/161/EU, 17 March 2010) carry out the analysis of perfluoro-alkylated substances including PERFLUOROPHOSPHATE SURFACTANTS such as 8:2 mono-PAPS and 8:2 di-PAPS in order to relevance their presence in food.

Chiron has developed the first series of telomeric PAPS as reference standards, as well as internal standards:

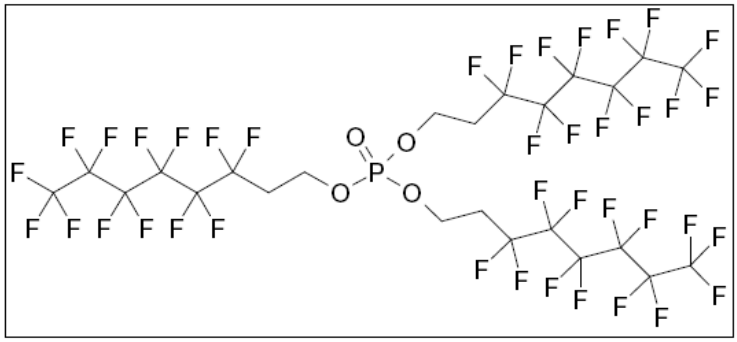
6:2 Mono-PAPS



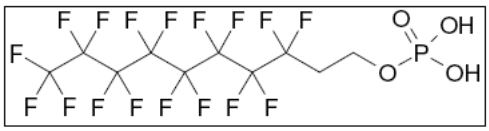
6:2 Di-PAPS



6:2 Tri-PAPS



8:2 Mono-PAPS



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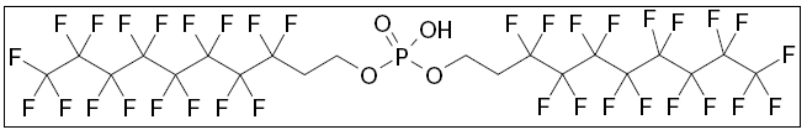
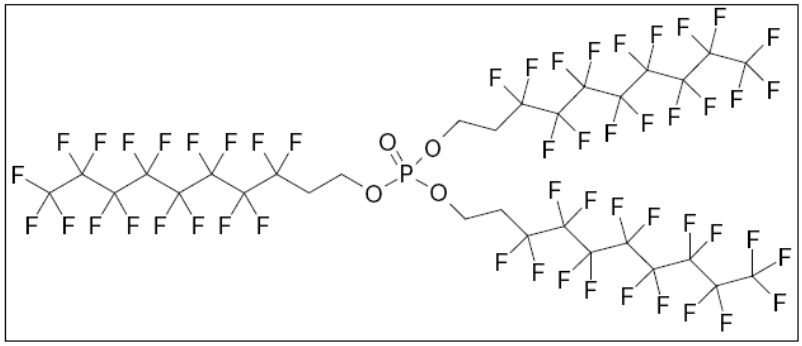
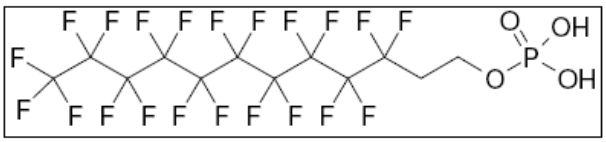


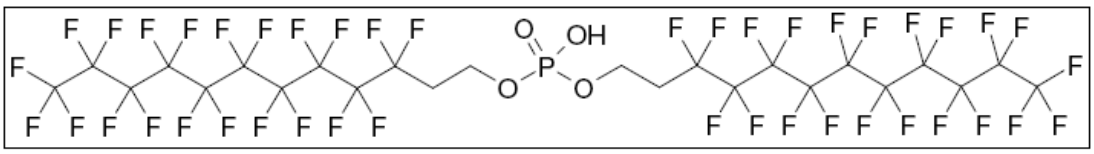
8:2 Tri-PAPS



10:2 Mono-PAPS



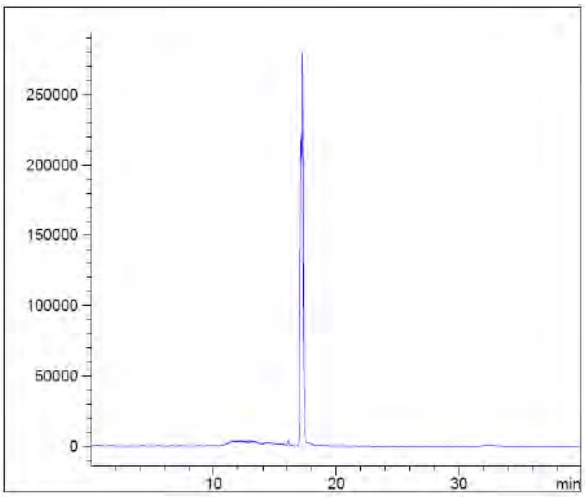
10:2 Di-PAPS

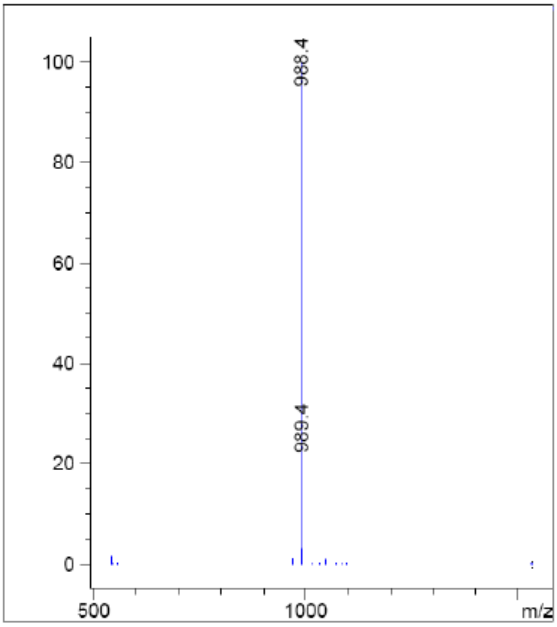


All native PAPS are available as neat (50 µg and 10 mg). All labeled PAPs are available as neat (50 µg and 5 mg). 50ug quantities can be used as qualitative standard. Please inquire.

Chiron No.	Native PAPs	Chiron No.	Internal Standards
9563.8	6:2 Mono-PAPS		
9564.16	6:2 Di-PAPS	9928.16	6:2 Di-PAPS-d4
9565.24	6:2 Tri-PAPS		
9391.10	8:2 Mono-PAPS		
9392.20	8:2 Di-PAPS	9929.20	8:2 Di-PAPS-d4
9394.30	8:2 Tri-PAPS		
9566.12	10:2 Mono-PAPS		
9393.24	10:2 Di-PAPS	9930.24	10:2 Di-PAPS-d4

Chromatogram and MS of 8:2 Di-PAPS





Reference:
Jessica C. D'eon and Scott A. Mabury. *Environ. Sci. Technol.* 2007, **41** 4799-4805.

BMF 32 - Plasticizers: Phthalates and Adipates

Phthalate and adipate esters are widely used as surfactants and in food and personal care products as plasticizers. Phthalates and adipates are also found in food as a result of leakage into food containers. Chiron offers a wide range of analytically pure deuterated and native phthalates and adipates, as well as mixes. Custom made mixes are available on request.

Metabolites: Phthalate biomarkers

It has been shown that dialkylphthalates are metabolized in the body to endocrine-active monoalkylphthalates, and appears to be linked with the prevalence of abdominal obesity and insulin resistance in men.

General information

Neat Compounds: Most of the compounds are also available in neat form. Please inquire for an offer. Custom solutions: Please inquire for custom solution of the plasticizers. Please inquire if you have need for others. Other labelled plasticizers are available upon request (deuterium or ^{13}C). Description of pr. no.: isooctane (IO), isopropanol (IP), n-hexane (HX), mixture of solvents (MX).

Phthalates, adipate and similar plasticizers	
Phthalates	
	Deuterium labelled phthalates
2478.10-100-IO	Dimethyl phthalate-3,4,5,6-d4
2892.12-K-IO	Diethyl phthalate-3,4,5,6-d4
9365.14-100-IO	Di-*n*-propyl phthalate-3,4,5,6-d4
9926.16-100-IO	*n*-Butyl-2-methylpropyl phthalate-3,4,5,6-d4
2479.16-100-IO	Di-*n*-butyl phthalate-3,4,5,6-d4
9925.18-100-IO	*n*-Pentyl-3-methylbutyl phthalate-3,4,5,6-d4
2893.18-100-IO	Di-*n*-pentyl phthalate-3,4,5,6-d4
2893.18-100-HX	Di-*n*-pentyl phthalate-3,4,5,6-d4
2893.18-K-IO	Di-*n*-pentyl phthalate-3,4,5,6-d4
3125.18-100-IO	Benzyl-*n*-butyl phthalate-3,4,5,6-d4
9366.20-100-IO	Dicyclohexyl phthalate-3,4,5,6-d4
9367.20-100-IO	Di-*n*-hexyl phthalate-3,4,5,6-d4
2361.24-100-IO	Di-*n*-octyl phthalate-3,4,5,6-d4
2361.24-100-IP	Di-*n*-octyl phthalate-3,4,5,6-d4
2894.24-K-IO	Bis(2-ethylhexyl) phthalate-3,4,5,6-d4
	Monophthalate esters (metabolites)
3805. 9-K-IO	Monomethyl phthalate
3806.10-K-IO	Monoethyl phthalate
3807.12-K-IO	Mono-*n*-butyl phthalate
8633.12-K-IO	Mono-*iso*-butyl phthalate
9368.13-K-IO	Mono-*n*-pentyl phthalate
9369.13-K-IO	Mono-*iso*-pentyl phathalate
3808.15-K-MX	Monobenzyl phthalate
3590.15-K-IO	Mono-*n*-hexyl phthalate
8344.35-K-IO	Monocholestryl phthalate
3809. 16-K-IO	Mono(2-ethylhexyl) phthalate

	Diphthalate esters	
2094.10-K-IO	Dimethyl phthalate	
2094.10-10MG	Dimethyl phthalate	
2094.10-100MG	Dimethyl phthalate	
1225.12-K-IO	Diethyl phthalate	
1225.12-10MG	Diethyl phthalate	
8779.14-K-IO	Di-*n*-propyl phthalate	
8779.14-10MG	Di-*n*-propyl phthalate	
8945.14-K-IO	Di-*iso*-propyl phthalate	
2097.14-K-IO	Bis(2-methoxyethyl) phthalate	
2097.14-10MG/100MG	Bis(2-methoxyethyl) phthalate	
1226.16-K-IO	Di-*n*-butyl phthalate	DBP
1226.16-10MG/100MG	Di-*n*-butyl phthalate	DBP
2102.16-100K-NO	Di-*iso*-butyl phthalate	DiBP
2102.16-K-IO	Di-*iso*-butyl phthalate	DiBP
2102.16-10MG/100MG	Di-*iso*-butyl phthalate	DiBP
8537.16-100-IO/K-IO	*n*-Butyl *iso*-butyl phthalate	BiBP
8537.16-10MG/100MG/250MG	*n*-Butyl *iso*-butyl phthalate	BiBP
2096.16-K-IO	Bis(2-ethoxyethyl) phthalate	
2096.16-10MG/100MG	Bis(2-ethoxyethyl) phthalate	
9754.17-100-IO/K-IO	*n*-Butyl *n*-pentyl phthalate	
9754.17-10MG/100MG/250MG	*n*-Butyl *n*-pentyl phthalate	
9755.17-100-IO/K-IO	*iso*-Butyl *n*-pentyl phthalate	
9755.17-10MG/100MG/250MG	*iso*-Butyl *n*-pentyl phthalate	
9756.17-100-IO/K-IO	*n*-Pentyl *iso*-pentyl phthalate	*n*-Butyl 3-methylbutyl phthalate
9756.17-10MG/100MG/250MG	*n*-Pentyl *iso*-pentyl phthalate	*n*-Butyl 3-methylbutyl phthalate
9757.20-100-IO/K-IO	*n*-Pentyl benzyl phthalate	
9757.20-10MG/100MG/250MG	*n*-Pentyl benzyl phthalate	
9758.20-100-IO/K-IO	*Iso*-pentyl benzyl phthalate	3-Methylbutyl benzyl phthalate
9758.20-10MG/100MG/250MG	*Iso*-pentyl benzyl phthalate	3-Methylbutyl benzyl phthalate
9759.24-100-IO/K-IO	2-Ethylhexyl *n*-octyl phthalate	
9759.24-10MG/100MG/250MG	2-Ethylhexyl *n*-octyl phthalate	
2099.18-K-IO	Di-*n*-pentyl phthalate	Diamyl phthalate
2099.18-10MG/100MG	Di-*n*-pentyl phthalate	Diamyl phthalate
8425.18-K-IO	Diisopentyl phthalate (diisoamyl phthalate)	DiPP
8425.18-100MG	Diisopentyl phthalate (diisoamyl phthalate)	DiPP
8539.18-100-IO	*n*-Pentyl *iso*-pentyl phthalate	DiPP
8425.18-1G	Diisopentyl phthalate (diisoamyl phthalate)	DiPP
8539.18-K-IO	*n*-Pentyl *iso*-pentyl phthalate	DiPP
8539.18-10MG/100MG/1G	*n*-Pentyl *iso*-pentyl phthalate	DiPP
8539.18-1G	*n*-Pentyl *iso*-pentyl phthalate	DiPP
1227.19-K-IO	Butylbenzyl phthalate	BBP
1227.19-10MG	Butylbenzyl phthalate	BBP
9360.19-K-IO	*iso*-Butylbenzyl phthalate	iBBP
9360.19-10MG	*iso*-Butylbenzyl phthalate	iBBP
2056.20-100-HX	Diphenyl phthalate	
2100.20-K-IO	Dicyclohexyl phthalate	
2100.20-10MG/100MG	Dicyclohexyl phthalate	
2095.20-K-IO	Bis(2-*n*-butoxyethyl) phthalate	
2095.20-10MG/100MG	Bis(2-*n*-butoxyethyl) phthalate	
2098.20-K-IO	Bis(4-methyl-2-pentyl) phthalate	
2098.20-10MG/100MG	Bis(4-methyl-2-pentyl) phthalate	
9957.28-K-IO	Di-*iso*-decyl phthalate	(C10-alkyl ester isomer mix)
9957.28-10MG/100MG	Di-*iso*-decyl phthalate	(C10-alkyl ester isomer mix)
8733.20-K-IO	Butyl octyl phthalate	
8733.20-100MG	Butyl octyl phthalate	
2101.20-K-IO	Di-*n*-hexyl phthalate	
2101.20-10MG/100MG	Di-*n*-hexyl phthalate	

2054.22-100-HX	Dibenzyl phthalate	
2054.22-100MG	Dibenzyl phthalate	
8721.22-K-IO	Di-*n*-heptyl phthalate	
8721.22-100-100MG	Di-*n*-heptyl phthalate	
2103.22-K-IO	Hexyl 2-ethylhexyl phthalate (isomer mixture)	
2103.22-10MG/100MG	Hexyl 2-ethylhexyl phthalate (isomer mixture)	
1224.24-K-IO	Bis(2-ethylhexyl) phthalate	DEHP
1224.24-10MG	Bis(2-ethylhexyl) phthalate	DEHP
1223.24-K-IO	Di-*n*-octyl phthalate	DNOP
1223.24-10MG/100MG	Di-*n*-octyl phthalate	DNOP
8741.24-K-IO	Di-*iso*-octyl phthalate (mixture of C8-isomers)	DIOP
8741.24-100MG	Di-*iso*-octyl phthalate (mixture of C8-isomers)	DIOP
2110.26-K-IO	Di-*n*-nonyl phthalate	DNP
2110.26-10MG/100MG	Di-*n*-nonyl phthalate	DNP
9916.26-K-IO	Di-*iso*-nonyl phthalate in mixture with C8-10-branched alkyl o-phthalate , C9-rich	DiNP
9916.26-10MG/100MG	Di-*iso*-nonyl phthalate in mixture with C8-10-branched alkyl o-phthalate, C9-rich	DiNP
3049.28-K-IO	Di-*iso*-decyl phthalate	DIDP
3049.28-10MG	Di-*iso*-decyl phthalate	DIDP
3049.28-100MG	Di-*iso*-decyl phthalate	DIDP
8732.30-K-IO	Di-*n*-undecyl phthalate	Mix of C9-C11 branched alkyl esters C10 rich
8732.30-100MG	Di-*n*-undecyl phthalate	
	Mixed phthalate kits	
9361.3-KIT-N	Butyl-/Isobutyl phthalate Kit, neat (1226.16+8537.16+2102.16, 100mg each)	
9362.3-KIT-N	Pentyl/Isopentyl phthalate Kit, neat (2099.18+8539.18+8425.18, 100mg each)	
9363.3-KIT-N	Butyl-/Benzyl phthalate Kit, neat (1227.19+9360.19+2054.22)	
	Isophthalates	
2055.20-100-HX	Diphenyl isophthalate	
8016.24-K-IO	Bis(2-ethylhexyl) isophthalate	
8016.24-10MG	Bis(2-ethylhexyl) isophthalate	
8016.24-100MG	Bis(2-ethylhexyl) isophthalate	
	Terephthalates	
8729.9-K-IO	Monomethyl terephthalate	
8722.10-K-IO	Dimethyl terephthalate	
8730.12-K-IO	Diethyl terephthalate	
8731.22-K-IO	Bis(2-ethylhexyl) terephthalate	
Adipates (linear C6-dicarboxylic esters)		
	Deuterium labelled adipates	
2276.22-K-IO	Bis(2-ethylhexyl) adipate-d8	
	Monoadipate esters	
8727.7-K-IO	Monomethyl adipate	
	Diadipate esters	
8724.8-K-IO	Dimethyl adipate	
8725.10-K-IO	Diethyl adipate	
8728-12-K-IO	Bis(2-mthoxyethyl) adipate	
8726.12-K-IO	Dipropyl adipate	
8729.14.K-IO	Bis(2-ethoxyethyl) adipate	
1228.22-K-IO	Bis(2-ethylhexyl) adipate	BEHA
1228.22-10MG	Bis(2-ethylhexyl) adipate	BEHA
2212.22-K-IO	Di-*n*-octyl adipate	
2213.22-K-IO	Di-*iso*-octyl adipate	
2214.24-K-IO	Di-*n*-nonyl adipate	
2218.24-K-IO	Di-*iso*-nonyl adipate	
3127.10-KIT	Adipate Kit	
1919.39-KIT	Phthalate and adipate Kit	
Sebacates (linear C10-dicarboxylic esters)		
8723.12-K-IO	Dimethyl sebacate	
8889.14-K-IO	Diethyl sebacate	
8387.18-K-IO	Di-*n*-butyl sebacate	
8724.26-K-IO	Bis(2-ethylhexyl) sebacate	

Standard Mixtures

This is a selection of our phthalate containing mixtures, please inquire for other variations or for custom mixes.

Surfactants Mixture 1 S-4002
7 Analytes, each 1000µg/mL in isooctane

1225.12	Diethyl phthalate	DEP
1228.22	Bis(2-ethylhexyl) adipate	BEHA
1223.24	Di-*n*-octyl phthalate	DNOP
1227.19	Benzyl butyl phthalate	BBP
1224.24	Bis(2-ethylhexyl) phthalate	BEHP
9916.26	Di-*iso*-nonyl phthalate in mixture with C8-10-branched alkyl o-phthalate , C9-rich	DINP
1226.16	Di-*n*-butyl phthalate	DBP

Surfactant Mixture 2 S-4074
Each 100µg/mL in toluene

1224.24	Bis(2-ethylhexyl) phthalate	BEHP
1223.24	Di-*n*-octyl phthalate	DNOP

EPA 606 Phthalate Esters in Waste Water by GC-ECD S-4233
2000µg/mL in hexane

1224.24	Bis(2-ethylhexyl) phthalate	BEHP
1227.19	Benzyl butyl phthalate	BBP
1226.16	Di-*n*-butyl phthalate	DBP
1225.12	Diethyl phthalate	DEP
2094.10	Dimethyl phthalate	DMP
1223.24	Di-*n*-octyl phthalate	DNOP

EPA 606 Control Sample Mixture S-4234
6 Analytes in acetone

1224.4	Bis(2-ethylhexyl) phthalate	BEHP	500µL/mL
1227.19	Benzyl butyl phthalate	BBP	100µL/mL
1226.16	Di-*n*-butyl phthalate	DBP	250µL/mL
1225.12	Diethyl phthalate	DEP	250µL/mL
2094.10	Dimethyl phthalate	DMP	250µL/mL
1223.24	Di-*n*-octyl phthalate	DNOP	500µL/mL

Biomarker Focus 50 - Mixed phthalates

Butyl isobutyl phthalate, Pentyl isopentyl phthalate, Butyl benzyl phthalate

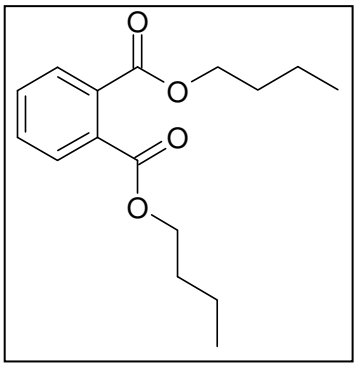
Certain phthalates are now listed on the CANDIDATE LIST OF SUBSTANCES OF VERY HIGH CONCERN FOR AUTHORIZATION by ECHA, the European Chemicals Agency:

Dibutyl phthalate
Diisobutyl phthalate
Benzyl butyl phthalate
Bis(2-ethylhexyl) phthalate
Bis(2-methoxyethyl)phthalate

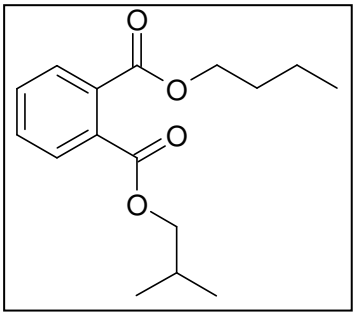
UNIQUE in-house proprietary technology enables Chiron to offer pure mixed phthalate-esters in sufficient quantities for toxicological and analytical purposes. In contrary to traditional synthesis methods were transesterification is a problem, the new method enables us to synthesize these esters is pure separated isomeric forms.

Chiron AS now offers highly purified mixed phthalates:

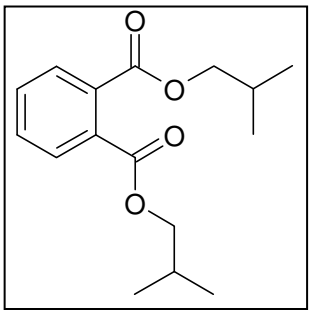
Butyl- / Isobutyl phthalates



1226.16 Di-*n*-butyl phthalate



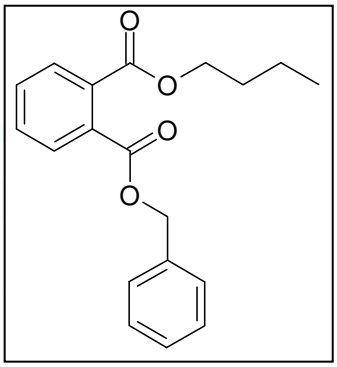
8537.16 *n*-Butyl *iso*-butyl phthalat



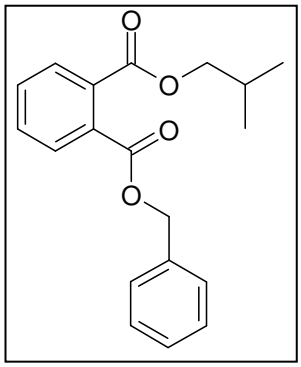
2102.16 Di-*iso*-butyl phthalate

9361.3 Butyl- /Isobutyl phthalate Kit (1226.16 + 8537.16 + 2102.16)

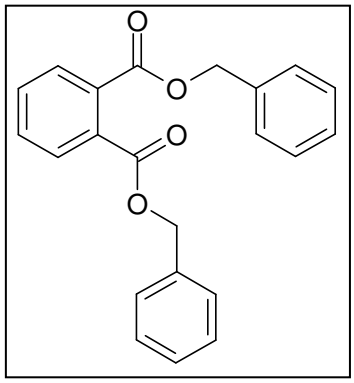
Butyl- / Benzyl phthalates



1227.19 *n*-Butylbenzyl phthalate



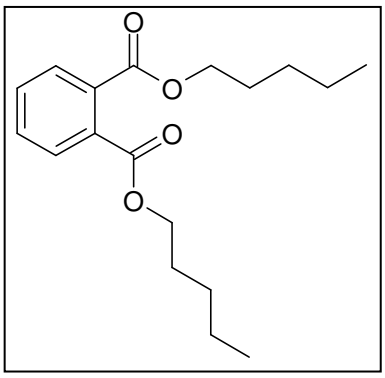
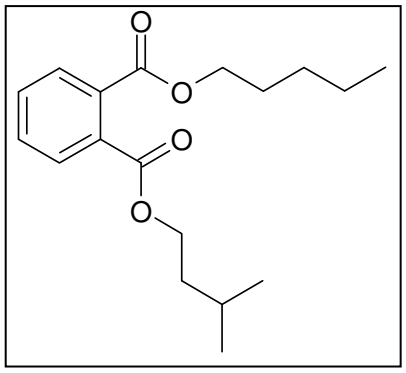
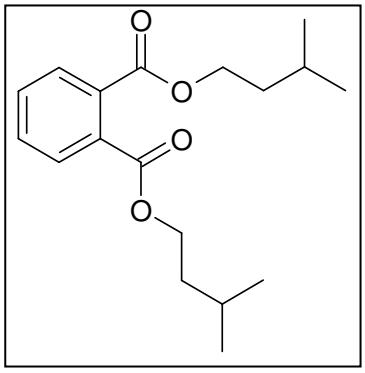
9360.19 *Iso*-butyl benzyl phthalate



2054.22 Dibenzyl phthalate

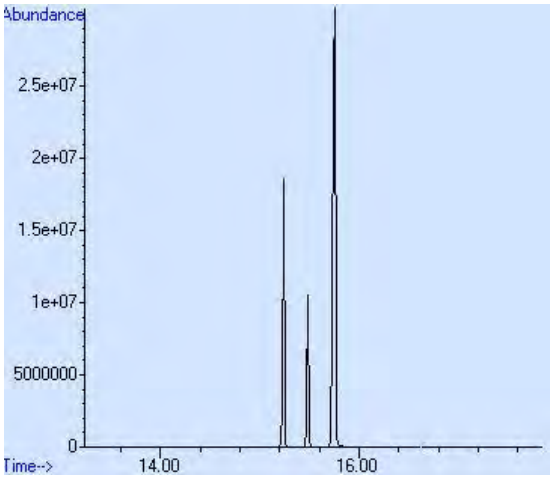
9363.3 Butyl- /Benzyl phthalate Kit (1227.19 + 9360.19 + 2054.22)

Pentyl- / Isopentyl phthalates

2099.18 Di-*n*-pentyl phthalate 8539.18 *n*-Pentyl *iso*-pentyl phthalate 8425.18 Di-*iso*-pentyl phthalate

9362.3 Pentyl- /Isopentyl phthalate Kit (2099.18 + 8539.18 + 8425.18)



GC of 2099.18 , 8539.18 and 8425.18 (Kit 9362.3)

These standards are available from Chiron AS as 100µg/mL and 1000µg/mL in isooctane (1mL). Neat material is available on request.

Pr.no.	Name
9754.17	*n*-Butyl *n*-pentyl phthalate
9755.17	*Iso*-Butyl *n*-pentyl phthalate
9756.17	*n*-Butyl *iso*-pentyl phthalate (*n*-Butyl 3-methylbutyl phthalate)
9757.20	*n*-Pentyl benzyl phthalate
9758.20	*Iso*-pentyl Benzyl phthalate (Benzyl 3-methylbutyl phthalate)
9759.24	2-Ethylhexyl *n*-octyl phthalate
8733.20	*n*-Butyl *n*-octyl phthalate
2103.22	Hexyl 2-ethylhexyl phthalate (isomer mixture)
3125.18	Benzyl *n*-butyl phthalate-3,4,5,6-d4
9925.18	*n*-Pentyl-*iso*-pentyl phthalate-3,4,5,6-d4
9926.16	*n*-Butyl *iso*-butyl phthalate-3,4,5,6-d4

Lit: http://www.echa.europa.eu/web/guest/candidate-list-table

BMF 40 - Priority PAHs

Polycyclic aromatic hydrocarbons (PAHs) occur in oil, coal, and tar deposits, and are found as pollution in air, water and soil. Amongst the PAHs are some of the most toxic compounds known. Some of the PAHs are known to be carcinogenic, mutagenic, and teratogenic (linked to birth defects). Because of their wide distribution, it is therefore important to monitor these compounds.[1,2]

PAHs are by-products of fuel from burning, both fossil fuel and biomass. Incomplete combustion that leads to formation of PAHs might also happen in industrial processes, cooking on barbecues, in fires, and in cigarette smoke. PAHs are also present in food. The highest intake is shown to come from cereals, oils, and fats. Smaller amounts come from vegetables and cooked meat.[1,2]

The toxicity of the PAHs is highly structurally dependent, and isomers may therefore vary from being nontoxic to very toxic. One PAH compound, benzo[*a*]pyrene is notable for being the first chemical carcinogen to be discovered (and is one of many carcinogens found in cigarette smoke).

PAH compounds of particular toxicological and environmental concern are monitored using internationally recognized methods. The list of priority PAHs varies in different countries. In the United States, the EPA (Environmental Protection Agency) has listed 16 priority PAHs. All of these are available from Chiron as solutions and neat material, in addition to deuterated and fluorinated internal standards. Please inquire for additional information.

16 EPA PAHs: EPA Methods 550.1/610/8100/8270C/8310

Available from Chiron:

Chiron No.	Compound	CAS
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	Benz[*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	Dibenz[*a,h*]anthracene	[215-58-7]
0222.22	Benzo[*ghi*]perylene	[191-24-2]
0277.22	Indeno[*1,2,3-cd*]pyrene	[193-39-5]

Available as 10 mg neat or as solution. Different concentrations and solvents are available, please inquire for details.

EPA-PAH kit, one of each of the 16 priority PAHs, solutions or neat compounds:
1708.16-KIT (1000µg/mL each in isooctane or toluene) or 1959.16-KIT (10 mg neat of each)

Internal Standards available from Chiron

Deuterated 16 EPA PAH Internal Standards

Chiron No.	Compound	CAS
0978.10	Naphthalene-d8	[1146-65-2]
1336.12	Acenaphthylene-d8	[93951-97-4]
1524.12	Acenaphthene-d10	[15067-26-2]
1530.13	Fluorene-d10	[81103-79-9]
0389.14	Phenanthrene-d10	[1517-22-2]
0390.14	Anthracene-d10	[1719-06-8]
1337.16	Fluoranthene-d10	[93951-69-0]
0329.16	Pyrene-d10	[1718-52-1]
1087.18	Benz[*a*]anthracene-d12	[1718-53-2]
1024.18	Chrysene-d12	[1719-03-5]
1348.20	Benzo[*b*]fluoranthene-d12	[205-99-2]
1349.20	Benzo[*k*]fluoranthene-d12	[93591-98-5]
1088.20	Benzo[*a*]pyrene-d12	[63466-71-7]
1089.22	Benzo[*ghi*]perylene-d12	[93951-66-7]
1531.22	Indeno[1,2,3-*cd*]pyrene-d12	[203578-33-0]
1330.22	Dibenz[*a,h*]anthracene-d14	[13250-98-1]

Available as 10 mg neat or as solution. Different concentrations and solvents are available, please inquire for details.

F-PAHs® Internal Standards

Chiron No.	Compound	CAS
1313.10	1-Fluoronaphthalene	[321-38-0]
1314.12	5-Fluoroacenaphthylene	[17521-01-6]
1315.13	2-Fluorofluorene	[343-43-1]
1328.14	2-Fluorophenanthrene	[532-41-1]
1316.14	3-Fluorophenanthrene	[440-40-4]
8891.14	4-Flurophenanthrene	[521-66-4]
1319.16	3-Fluorofluoranthene	[1691-66-3]
1318.16	1-Fluropyrene	[1691-65-2]
1900.18	1-Fluorochrysene	-
1317.18	3-Fluorochrysene	[36288-22-9]
1322.20	9-Fluorobenzo[*k*]fluoranthene	[113600-15-0]

Available as solution, different concentrations and solvents are available. Please inquire for details or neat material.

In addition to the single solutions, Chiron also offers convenient EPA PAH all-in-one mixtures, both for native and labelled standards:

Chiron No.	Name	Concentration, Volume, Content*
S-4063-100-5T	**16 Priority EPA PAHs, Cocktail 1**	100µg/mL each, 5mL in toluene
S-4064-10-5CY	**16 Priority EPA PAHs, Cocktail 2**	10µg/mL each, 5mL in cyclohexane
S-4065-10-5AN	**16 Priority EPA PAHs, Cocktail 3**	10µg/mL each, 5mL in acetonitrile
S-4560-100-10DC	**16 Priority EPA PAHs, Cocktail 4**	100µg/mL each, 10mL in dichloromethane
S-4513-100-5T	**Perdeuterated Internal Standard**	100µg/mL each, 1mL in toluene
S-4114-ASS-5AN	**16 Priority EPA PAHs control mix**	Assorted concentrations, 5mL in acetonitrile

* Please inquire for different quantities.

15 EU PAHs and 15+1 EU PAHs

(2005/108 Rec. + 2006: Reg.1881 Recommendation, PAHs in certain foods)

Available from Chiron:

Chiron No.	Component	CAS
0201.18	Benz[*a*]anthracene	[56-55-3]
0212.18	Chrysene	[218-01-9]
0035.18*	Cyclopenta[*cd*]pyrene	[27208-37-3]
0263.20	Benzo[*b*]fluoranthene	[205-99-2]
0264.20	Benzo[*j*]fluoranthene	[205-82-3]
0265.20	Benzo[*k*]fluoranthene	[207-08-9]
0239.20	Benzo[*a*]pyrene	[50-32-8]
0203.22	Dibenz[*a,h*]anthracene	[215-58-7]
0222.22	Benzo[*ghi*]perylene	[191-24-2]
0277.22	Indeno[1,2,3-*cd*]pyrene	[193-39-5]
0244.24	Dibenzo[*a,e*]pyrene	[192-65-4]
0242.24	Dibenzo[*a,h*]pyrene	[189-64-0]
0241.24*	Dibenzo[*a,i*]pyrene	[189-55-9]
0243.24	Dibenzo[*a,l*]pyrene	[191-30-0]
0296.19*	5-Methylchrysene	[3697-24-3]
0309.17	Benzo[*c*]fluorene	[205-12-9]

Available as 10 mg neat or as solution. Different concentrations and solvents are available, please inquire for details. * By default, only available as solution. Please inquire for neat material.

Single 15 EU-PAH Kit (3958.15-KIT) one of each of the 15 priority PAHs, 200µg/mL each in toluene.
Single 15+1 EU PAH Kit (9311.15-KIT) one of each of the 15+1 priority PAHs, 200µg/mL each in toluene.

Single Internal Standards:

Chiron No.	Compound	CAS
1087.18	Benz[*a*]anthracene-d12	[1718-53-2]
1024.18	Chrysene-d12	[1719-03-5]
1348.20	Benzo[*k*]fluoranthene-d12	[93951-98-5]
1088.20	Benzo[*a*]pyrene-d12	[63466-71-7]
1330.22	Dibenz[*a,h*]anthracene-d14	[13250-98-1]
1089.22	Benzo[*ghi*]perylene-d12	[93951-66-7]
1531.22	Indeno[*1,2,3-cd*]pyrene-d12	[203578-33-0]
1529.24	Dibenzo[*a,i*]pyrene-d14	[158776-07-9]

Available as 10 mg neat or as solution. Different concentrations and solvents are available, please inquire for details.

In addition to the single solutions, Chiron also offers convenient EU PAH all-in-one mixtures, both for native and labelled standards:

Chiron No.	Name	Concentration, Volume, Content*
S-4452-100-T	**15 EU PAH Cocktail, 15 Analytes**	100µg/mL each, 1mL in toluene
S-4522-100-T	**EU Deuterated PAH Cocktail, 8 Analytes**	100µg/mL each, 1mL in toluene
S-4589-100-T	**15+1 EU PAH Cocktail, 16 Analytes**	100µg/mL each, 1mL in toluene

* Please inquire for different quantities.

ISO methods:
ISO 7981.1 and 7981.2: WHO PAHs in drinking water

6 priority PAHs in acetonitrile: S-4062-ASS-5AN

Chiron No.	Compound	CAS	Concentration
0260.16	Fluoranthrene	[206-44-0]	10µg/mL
0277.22	Indeno[*1,2,3-cd*]pyrene	[193-39-5]	2µg/mL
0263.20	Benzo[*b*]fluoranthene	[205-99-2]	2µg/mL
0265.20	Benzo[*k*]fluoranthene	[207-08-9]	2µg/mL
0239.20	Benzo[*a*]pyrene	[50-32-8]	2µg/mL
0222.22	Benzo[*ghi*]perylene	[191-24-2]	2µg/mL

ISO 17993: Water quality – 15 PAHs by GC

The PAHs analyzed in this method are identical to the16 EPA PAHs, but without Acenaphthylene (Product No. 0002.12); 6-Methylchrysene may optionally be included.

S-4473-10-AN: ISO 17993 Multiple Compound Stock Solution
15 analytes, each 10 µg/mL in acetonitrile

Additional and optional compound:

0297.19-10-AN 6-Methylchrysene [1705-85-7]
1 analyte, 10 µg/mL in acetonitrile

ISO 15753: PAHs in animal and vegetable fats and oils

The PAHs analyzed in this method are identical to the16 EPA PAHs but without Acenaphthylene (Product No. 0002.12):

S-4469-100-T: ISO 15751 Multiple Compound Standard Solution

Other relevant methods:

ASTM D 5186-03	SFC-method
ASTM D 5580-02	Gasoline
ASTM D 5739-06	Oil spill
ASTM D 5769-04	Aromatics in gasoline
ASTM D 6370-04	Aviation fuels
ASTM D 6591-06	Middle distillates
ISO 7981-1: 2005	Water quality, TLC
ISO 7981:2: 2005	Water quality, HPLC
ISO 15753: 2006	Animal and vegetable fats and oils
ISO 17993: 2002	Water quality, 15 PAHs by HPLC
EPA 525 2	Drinking water by GC-MS
EPA 550.0/550.1	Drinking water by HPLC
EPA 610	Waste water by HPLC and GC
EPA 8100	Ground/waste water and solid waste by GC-FID
EPA 8270C	Semivolatile compounds by GC-MS
EPA 8275A	Ground water and solid waste by GC-MS
EPA 8310	Ground water and solid waste by HPLC
NS 9815	Water and air analysis by GC

***For standard mixtures for these methods, please consult www.chiron.no* or chiron@chiron.no**

Litterature:
1. http://ec.europa.eu/food/fs/sc/scf/out154_en.pdf
2. http://www.atsdr.cdc.gov/tfacts69.html#bookmark02

BMF 57 - PAH METABOLITES

Tha major source of PAHs is incomplete combustion of organic material like coal, oil or wood. Except of breathing in contaiminated air from e.g. cigarette smoke or a fire place, eating food is a significant source of PAHs for humans, too. Exposure to PAHs means always a mixture of PAHs - therefore the dynamics of metabolism are important and dependent on composition of the mixture.

Chiron AS offers a broad selection of PAH Nitro-/Amino- and Hydroxy-/Keto- Metabolites as reference materials. Please inquire for more details (solution, neat).

	PAH Metabolites			**Naphthalenes**
	Internal standards			***Nitronaphthalenes***
	Deuterated nitroPAHs		0007.10	1-Nitronaphthalene
2216.10	1-Nitronaphthalene-d7		0008.10	2-Nitronaphthalene
8243.11	2-Methyl-1-nitronaphthalene-d9		2195.11	1-Methyl-4-nitronaphthalene
1109.13	2-Nitrofluorene-d9		2196.11	1-Methyl-5-nitronaphthalene
8382.14	9-Nitrophenanthrene-d9		2197.11	1-Methyl-6-nitronaphthalene
1107.14	9-Nitroanthracene-d9		2199.11	2-Methyl-1-nitronaphthalene
2217.16	1-Nitropyrene-d9		2198.11	2-Methyl-4-nitronaphthalene
1116.16	3-Nitrofluoranthene-d9		1105.10	1,5-Dinitronaphthalene
8242.18	1-Nitrotriphenylene-d11		1458.10	2,4-Dinitro-1-naphthol
1115.18	6-Nitrochrysene-d11			***Aminonaphthalenes***
1112.20	6-Nitrobenzo[*a*]pyrene-d11		1779.10	1-Aminonaphthalene
	Deuterated aminoPAHs		1780.10	2-Aminonaphthalene
2215.10	1-Aminonaphthalene-d7		1774.11	1-Amino-2-methylnaphthalene
1542.10	2-Aminonaphthalene-d7		1781.10	1,5-Diaminonaphthalene
1539.12	2-Aminobiphenyl-d9		1782.10	1,8-Diaminonaphthalene
1540.12	4-Aminobiphenyl-d9		1783.10	2,3-Diaminonaphthalene
1541.13	2-Aminofluorene-d11		1759.10	5-Amino-1-naphthol
	Biphenyls and terphenyls		1760.10	8-Amino-2-naphthol
	Nitrobiphenyls and terphenyl			**Acenaphthenes and acenaphthylenes**
1485.12	2-Nitrobiphenyl			***Nitroacenaphthenes***
1340.12	4-Nitrobiphenyl		1113.12	5-Nitroacenaphthene
1208.12	2,2'-Dinitrobiphenyl			**Fluorenes**
1738.12	4,4'-Dinitrobiphenyl			***Nitrofluorenes***
1739.12	3,3'-Dinitrobenzidine		1108.13	2-Nitrofluorene
1114.18	4,4"-Dinitro-p-terphenyl		1111.13	2,7-Dinitrofluorene
	Aminobiphenyls		3550.13	2-Nitro-9-fluorenone
1804.12	3-Aminobiphenyl			***Aminofluorenes***
2696.12	2-Aminobiphenyl		1761.13	2-Aminofluorene
2783.12	4-Aminobiphenyl		1764.13	2-Amino-9-fluorenone
1773.12	4,4'-Diaminobiphenyl		1762.13	2,7-Diaminofluorene
1815.12	3,3'-Diaminobenzidine		3553.13	9-Aminoflourene
2785.12	3,3'-Dichlorobenzidine		1763.13	9-Aminofluorene hydrochloride
2786.14	3,3'-Dimethylbenzidine			**Phenanthrenes**
2761.14	3,3'-Dimethoxybenzidine			***Nitro- and Aminophenanthrenes***
F-7008	2,3-Diaminobiphenyl 2HCl		2206.14	2-Nitrophenanthrene
F-7009	3,4-Diaminobiphenyl 2HCl		2205.14	3-Nitrophenanthrene
	Aminodiphenylmethanes		2204.14	9-Nitrophenanthrene
2762.13	4,4'-Methylenedianiline		0041.18	5-Nitrobenzo[c]phenanthrene
2787.15	3,3'-Dimethyl-4,4'-diaminodiphenylmethane		8241.18	1-Nitrotriphenylene

	Anthracenes			**Anthanthrenes**
	Nitroanthracenes		0050.22	6-Nitroanthanthrene
1459.14	2-Nitroanthracene			**Perylenes**
1106.14	9-Nitroanthracene			***Nitro- and aminoperylenes***
1460.15	9-Methyl-10-nitroanthracene		0045.20	1-Nitroperylene
0042.14	9,10-Dinitroanthracene		0046.20	3-Nitroperylene
	Nitrobenzanthracenes		1791.20	1-Aminoperylene
0043.18	7-Nitrobenz[*a*]anthracene		1792.20	3-Aminoperylene
0044.22	7-Nitrobenz[*a,h*]anthracene			**Coronenes**
	Aminoanthracenes			***Nitrocoronenes***
1784.14	1-Aminoanthracene		0047.24	1-Nitrocoronene
1765.14	2-Aminoanthracene			***Other nitro/aminoPAHs***
1793.18	7-Aminobenz[*a*]anthracene		1127.17	3-Nitrobenzanthrone
	Fluoranthrenes		8386.17	3-Aminobenzanthrone
	Nitrofluoranthrenes			
1463.16	1-Nitrofluoranthene			**Hydroxy-Keto PAH-metabolites**
1278.16	2-Nitrofluoranthene			
0025.16	3-Nitrofluoranthene			***Hydroxy- and methoxy F-PAHs®***
	Aminofluoranthenes			***Internal Standards***
1766.16	3-Aminofluoranthene		1923.14	3-Fluoro-6-hydroxyphenanthrene
	Pyrenes		2207.18	1-Fluoro-3-hydroxychrysene
	Nitropyrenes		2227.18	1-Fluoro-4-hydroxychrysene
0009.16	1-Nitropyrene		2208.18	3-Fluoro-2-hydroxychrysene
1468.16	2-Nitropyrene		1947.19	1-Fluoro-3-methoxychrysene
0048.16	4-Nitropyrene		1946.19	3-Fluoro-2-methoxychrysene
0013.16	1,3-Dinitropyrene		1948.19	3-Fluoro-4-methoxychrysene
0014.16	1,6-Dinitropyrene		1945.19	4-Fluoro-1-methoxychrysene
0015.16	1,8-Dinitropyrene		3544.10	6-Fluoro-4-hydroxy-2-methylquinoline
	Nitrobenzo[a]pyrenes			***Deuterated hydroxy- and keto-PAHs***
1635.20	1-/3-Nitrobenzo[*a*]pyrene			***Internal Standards***
0049.20	6-Nitrobenzo[*a*]pyrene		8479.10	1-Naphthol-d7
	Nitrobenzo[e]pyrenes		8480.10	2-Naphthol-d7
2170.20	1-/3-Nitrobenzo[*e*]pyrene		1490.16	1-Hydroxypyrene-d9
	Hydroxynitropyrenes		9523.10	1,4-Naphthoquinone-d6
8204.16	6-Hydroxy-1-nitropyrene		9524.14	Anthraquinone-d8
	Aminopyrenes			
1767.16	1-Aminopyrene			
1786.16	2-Aminopyrene			**Biphenyls and terphenyls**
1787.16	4-Aminopyrene			***Hydroxy biphenyls***
1768.16	1,3-Diaminopyrene		1600.12	4,4'-Dihydroxybiphenyl
1769.16	1,6-Diaminopyrene			
1770.16	1,8-Diaminopyrene			
1788.20	6-Aminobenzo[*a*]pyrene			
	Chrysenes			
	Nitrochrysenes			
0017.18	6-Nitrochrysene			
	Aminochrysenes			
1794.18	2-Aminochrysene			
1785.18	6-Aminochrysene			

	Naphthalenes			**Phenanthrenes**
	Naphthols			***Hydroxyphenanthrenes***
2376.10	1-Naphthol		0321.14	1-Hydroxyphenanthrene
2377.10	2-Naphthol		0322.14	2-Hydroxyphenanthrene
1597.10	2,3-Dihydroxynaphthalene		0323.14	3-Hydroxyphenanthrene
9697.10	1,4-Dihydroxynaphthalene		0324.14	4-Hydroxyphenanthrene
9705.10	1,2-Dihydroxynaphthalene		0325.14	9-Hydroxyphenanthrene
1924.10	*trans*-1,2-Dihydroxy-1,2-dihydronaphthalene		1925.10	*trans*-1,2-Dihydroxy-1,2-dihydro-
3670.11	2-Methyl-1-naphthol			phenanthrene
2808.11	3-Methyl-1-naphthol		1488.14	*trans*-9,10-Dihydroxy-9,10-dihydro-
2805.11	4-Methyl-1-naphthol			phenanthrene
3071.11	5-Methyl-1-naphthol			***Glucuronides***
3072.11	6-Methyl-1-naphthol		1487.20	Phenanthryl-9-O-glucuronide
2816.11	7-Methyl-1-naphthol			***Methoxyphenanthrenes***
2817.11	1-Methyl-2-naphthol		1726.15	1-Methoxyphenanthrene
2815.11	3-Methyl-2-naphthol		3674.15	2-Methoxyphenanthrene
3073.11	4-Methyl-2-naphthol		1728.15	3-Methoxyphenanthrene
3074.11	5-Methyl-2-naphthol		3675.15	4-Methoxyphenanthrene
2755.11	6-Methyl-2-naphthol		1729.15	9-Methoxyphenanthrene
2766.11	7-Methyl-2-naphthol			***Ketophenanthrenes***
2809.11	8-Methyl-2-naphthol		0055.15	4H-Cyclopenta[def]phenanthren-4-one
1346.10	*cis*-4-(2-Hydroxyphenyl)-2-oxobut-3-enoic acid (Naphthalene metabolite)		0051.14	Phenanthrene-1,4-dione
	Ketonaphthalenes (naphthoquinones)		0056.18	Benzo[*c*]phenanthrene[1,4]quinone
0010.13	Perinaphthenone		0057.18	Benzo[*c*]phenanthrene[5,6]quinone
3546.11	2-Methyl-1,4-naphthoquinone			**Anthracenes**
1401.14	ß-Naphthylpropylketone			***Hydroxy- and ketoanthracenes***
8107.10	1,4-Naphthoquinone		0016.14	1,4-Anthraquinone
8468.6	Quinone		1178.14	9,10-Anthraquinone
	Acenaphthenes and acenaphthylenes		3560.15	2-Methyl-9,10-anthraquinone
	Hydroxy-, Keto-acenaphthenes		3562.16	2,3-Dimethyl-9,10-anthraquinone
1735.12	1-Acenaphthenol		3561.16	2-Ethyl-9,10-anthraquinone
0006.12	Acenaphthenequinone		3677.14	1-Hydroxy-9,10-anthraquinone
9841.12	1-Acenaphthenone		8015.14	2-Hydroxy-9,10-anthraquinone
	Fluorenes		1679.14	1,3-Dihydroxy-9,10-anthraquinone
	Hydroxy- and ketofluorenes		3557.14	1,4-Dihydroxy-9,10-anthraquinone
1599.13	2-Hydroxyfluorene		3558.14	1,5-Dihydroxy-9,10-anthraquinone
2322.13	9-Fluorenone		3555.14	1,8-Dihydroxy-9,10-anthraquinone
1737.13	9-Hydroxyfluorene		3556.14	2,6-Dihydroxy-9,10-anthraquinone
1734.13	1-Hydroxy-9-fluorenone		3559.14	1,2,4-Trihydroxy-9,10-anthraquinone
1509.13	2-Hydroxy-9-fluorenone		3563.16	Aceanthrenequinone
0052.17	Benzo[*a*]fluoren-11-one		1809.16	1,8-Bis(hydroxymethyl)anthracene
0053.17	Benzo[*b*]fluoren-11-one		3564.18	3,4-Dihydrobenzo[*a*]anthracene-1(2*H*)-one
3547.27	Truxenone		1291.18	5,6,8,9-Tetrahydrobenz[*a*]anthracen-11(10*H*)-
				one
			1733.18	1,2-Benz[a]anthraquinone

	Pyrenes			**PASHs**
	Hydroxy-, methoxy-, and ketopyrenes			***Hydroxydibenzothiophenes***
0021.16	1-Hydroxypyrene		2123.12	2-Hydroxydibenzothiophene
8203.16	2-Hydroxypyrene			***Other dibenzothiophenes***
3565.20	7,8,9,10-Tetrahydro-benzo[*a*]pyren-7-ol		1753.12	Dibenzothiophene sulfone
1506.17	1-Methyoxypyrene		1289.17	gamma-Oxo-α-methyl-2-dibenzothiophene-butyricacid
0063.18	Cyclopenta[cd]pyren-3(4*H*)-one			
0059.19	6H-Benzo[cd]pyren-6-one			***PANHs***
1293.20	9,10-Dihydrobenzo[*a*]pyren-7(8*H*)-one			**Quinolines and benzoquinolines**
0058.24	Dibenzo[*a,i*]pyrene[*5,8*]quinone			***Hydroxycarbazoles***
1596.16	Pyrene-1-sulfonic acid sodium salt		1588.12	2-Hydroxycarbazole
	Glucuronides		1590.12	4-Hydroxycarbazole
1489.22	Pyrenyl-1-*O*-glucuronide		1587.12	2-Hydroxy-5,6,7,8-tetrahydrocarbazole
	Hydroxynitropyrenes		1589.13	2-Hydroxy-5,6,7,8-tetrahydro-9-
8204.16	6-Hydroxy-1-nitropyrene			methylcarbazole
	Chrysenes		1593.16	4-Hydroxy-11H-indolo[2,3-f]naphthalene
	Hydroxychrysenes		1591.16	5,6-Dihydro-4-hydroxy-11H-indolo[2,3-f]-
1492.18	1-Hydroxychrysene			naphthalene
1680.18	2-Hydroxychrysene		1594.16	4-Hydroxy-5,6,6a,11a-tetrahydro-11H-
1493.18	3-Hydroxychrysene			benzo[a]carbazole
1736.18	4-Hydroxychrysene		1592.16	8-Bromo-5,6-dihydro-4-hydroxy-11H-
1324.18	Chrysene-*trans*-1,2-dihydrodiol			indolo[2,3-f]napththalene
1325.18	Chrysene-*trans*-3,4-dihydrodiol			
1326.18	Chrysene-*trans*-5,6-dihydrodiol			**PAOHs**
	Methoxychrysenes			**Dibenzofurans**
1629.19	1-Methoxychrysene			***Hydroxydibenzofurans***
1709.19	2-Methoxychrysene		1595.12-10MG	2-Hydroxydibenzofuran
1630.19	3-Methoxychrysene			
1710.19	4-Methoxychrysene			
	Ketochrysenes			
0011.18	1,4-Chrysenequinone			
0019.18	5,6-Chrysenequinone			
	Bisanthenes			
2613.28	Bisanthone			
	Acenes and phenes			
3566.18	5,12-Naphthacenequinone			
3567.22	5,7,12,14-Pentacenetetrone			
	Other ketoPAHs			
1684.17	Benzanthrone			
1730.13	9(10*H*)-Acridone			
2615.34	Isoviolanthrone			
2614.34	Violanthrone			
9683.14	Anthrone			

BMF 55 - Nitrosamines and Nitramines

Chiron has built up a strong track record of supplying new reference standards during the past 28 years of operation. We are now proud to offer various nitrosamine and nitramine reference standards.

Our mission is to market highly purified calibrates in crystalline as well as standardized solutions for chemical analysis, including internal standards. Your benefits using our standards include:

- **Fast turnover time due to excellent service.**
- **Guaranteed high and consistent quality.**
- **Bulk quantities available on request.**
- **Custom solutions and custom synthesis on request.**
- **We continuously develop new and innovative products.**

It is well known that **nitrosamines and nitramines** can be dangerous to human health, animals and plant lives. There are several technologies which release them into the environment.

Nitrosamines are a class of chemical compounds that have received much attention since 1956, when two British scientists, John Barnes and Peter Magee, reported that dimethylnitrosamine produced liver tumors in rats. Nitrosamines are formed by reactions of nitrites and secondary amines (e.g. in proteins) under acidic conditions like gastric milieus. Human beings ingest nitrites **from food, esp. fried or grilled meat and vegetables. Disposal of tobacco products** also causes a high intake of nitrosamines (mainly N-Nitrosonornicotin).

CO_2 capture causes a huge interest in these days. Solvents used for CO_2 capture are often a mixture of several amines according to the latest developments in this field. These amine compositions are not always known in detail. However, it is known that the amine blends for CO_2 capture are recycled, but as a side reaction/effect a certain percentage of the amines are either degraded or emitted to air. The released amines are often unstable on air, and degrade to toxic substances like nitrosamines and nitramines.

Nitramines

Chiron No.	Name	Appearance	QTY
9813.2-100MG	Dimethylnitramine	neat	100 mg
9812.2-100MG	2-Nitroaminoethanol	neat	100 mg
9907.2-100MG	*N*-Nitro-2-oxazolidone	neat	100 mg
9912.4-100MG	Diethylnitramine	neat	100 mg
9913.4-100MG	*N*-Nitropiperazine	neat	100 mg

Native nitrosamines for EPA 621

Chiron No.	Name	Description	Conc.	Solvent	QTY
9004.2-2K-DC	*N*-Nitrosodimethylamine	NDMA	2000µg/mL	DCM	1mL
9005.3-2K-DC	*N*-Nitrosomethylethylamine	NMEA	2000µg/mL	DCM	1mL
9006.4-2K-DC	*N*-Nitrosodiethylamine	NDEA	2000µg/mL	DCM	1mL
9007.6-2K-DC	*N*-Nitrosodi-*n*-propylamine	NDPA	2000µg/mL	DCM	1mL
9008.8-2K-DC	*N*-Nitrosodi-*n*-butylamine	NDBA	2000µg/mL	DCM	1mL
9009.4-2K-DC	*N*-Nitrosopyrolidine	NPYR	2000µg/mL	DCM	1mL
9010.5-2K-DC	*N*-Nitrosopiperidine	NPIP	2000µg/mL	DCM	1mL

Please inquire for neat material.

Internal standards for EPA 621

Chiron No.	Name	Description	Conc.	Solvent	QTY
9011.2-K-DC	*N*-Nitrosodimethylamine-d6	NDMA-d6	1000µg/mL	DCM	1mL
9012.3-K-DC	*N*-Nitrosomethylethylamine-d3	NMEA-d3	1000µg/mL	DCM	1mL
9013.4-K-DC	*N*-Nitrosodiethylamine-d10	NDEA-d10	1000µg/mL	DCM	1mL
9014.6-K-DC	*N*-Nitrosodi-*n*-propylamine-d14	NDPA-d14	1000µg/mL	DCM	1mL
9015.8-K-DC	*N*-Nitrosodi-*n*-butylamine-d18	NDBA-d18	1000µg/mL	DCM	1mL
9016.4-K-DC	*N*-Nitrosopyrolidine-d8	NPYR-d8	1000µg/mL	DCM	1mL
9017.5-K-DC	*N*-Nitrosopiperidine-d10	NPIP-d10	1000µg/mL	DCM	1mL

Other nitrosamines and internal standards

Chiron No.	Name	Description	Conc.	Solvent	QTY
1703.10-K-AN	4-(*N*-Methyl-*N*-nitrosamino)-1-(3-pyridyl)-1-butanone		1000µg/mL	acetonitrile	1mL
2743.12-K-IP	*N*-Nitroso-di-*n*-hexylamine		1000µg/mL	isopropanol	1mL
9688.8-K-AN	*N*-Nitroso-*N*-ethylaniline		1000µg/mL	acetonitrile	1mL
8926.2-500-ME	*N*-Nitroso-*N*-methylurea	NMU	500µg/mL	methanol	1mL
8986.4-K-AN	*N*-Nitrosopiperazine		1000µg/mL	acetonitrile	1mL
9018.7-K-AN	*N*-Nitrosomethylphenylamine		1000µg/mL	acetonitrile	1mL
9019.4-K-AN	1,4-Dinitrosopiperazine		1000µg/mL	acetonitrile	1mL
9326.4-K-AN	*N*-Nitrosomorpholine		1000µg/mL	acetonitrile	1mL
9328.12-K-AN	*N*-Nitrosodiphenylamine	Ndiphen	1000µg/mL	acetonitrile	1mL
9666.4-K-AN	*N*-Nitrosodiethanolamine		1000µg/mL	acetonitrile	1mL
9666.4-100MG	*N*-Nitrosodiethanolamine		neat	neat	100mg
9329.14-K-AN	*N*-Nitrosodibenzylamine		1000µg/mL	acetonitrile	1mL
9330.8-K-AN	*N*-Nitrosodi-*iso*-butylamine		1000µg/mL	acetonitrile	1mL
9330.8-100MG	*N*-Nitrosodi-*iso*-butylamine		neat	neat	100mg
9331.16-K-AN	*N*-Nitrosodi-*n*-octylamine		1000µg/mL	acetonitrile	1mL
9331.16-100MG	*N*-Nitrosodi-*n*-octylamine		neat	neat	100mg
9332.16-K-AN	*N*-Nitrosodiisooctylamine (Di-(2-ethylhexyl)amine)		1000µg/mL	acetonitrile	1mL
9332.16-100MG	*N*-Nitrosodiisooctylamine (Di-(2-ethylhexyl)amine)		neat	neat	100mg
9861.2-100MG	*N*-Methyl-*N*-nitro-N-nitrosoguanidine (wetted with ca. 50% water)	MNNG	neat	neat	100mg
9927.18-K-AN	*N*-Nitroso-*N*,*N*-di(3,5,5-trimethylhexyl)amine		1000µg/mL	acetonitrile	1mL
9927.18-10MG	*N*-Nitroso-*N*,*N*-di(3,5,5-trimethylhexyl)amine		neat	neat	10mg
9327.4-100-AN	4-Nitrosomorpholine-d8		100µg/mL	acetonitrile	1mL
9022.4-100-AN	1,4-Dinitrosopiperazine-d8		100µg/mL	acetonitrile	1mL
1707.10-K-AN	4-(*N*-Methyl-*N*-nitrosamino)-1-(3-pyridyl)-1-butanone-d4		1000µg/mL	acetonitrile	1mL
9915.4-100-AN	*N*-Nitrosopiperazine-d4		100µg/mL	acetonitrile	1mL
10037.4-100MG	4-Nitrosopiperazin-2-one		neat	neat	100mg

Nicotine nitrosamines including internal standards

Chiron No.	Name	Conc.	Solvent	QTY
1702.9-K-AN	*N*-Nitrosonornicotine	1000µg/mL	acetonitrile	1mL
1706.9-K-AN	*DL*-*N*-Nitrosonornicotine-d4	1000µg/mL	acetonitrile	1mL
1706.9-K-2AN	*DL*-*N*-Nitrosonornicotine-d4	1000µg/mL	acetonitrile	2mL
1705.10-K-AN	(*RS*)-*N*-Nitrosoanatabine	1000µg/mL	acetonitrile	1mL
1704.10-K-AN	(*RS*)-*N*-Nitrosoanabasine	1000µg/mL	acetonitrile	1mL

BMF 47 - European standard CEN/TC 347/WG 4N 19

24 Suspected allergens in analytical purity

Safe and accurate analysis of priority suspected allergens has been hampered by the lack of pure and reliable standards. Many of the known allergens have only been available as mixtures of isomers or impure compounds, and purities stated by various fine chemical suppliers has proven to be unreliable for most of these substances.

Chiron has purified each individual allergen in order to obtain a reliable standard mixture of the 24 suspected compounds as suggested in the new CEN/TC347/WG 4N 19 method, altogether 26 isomers.

Chiron AS now offers highly purified substances for allergen analysis and toxicological studies, as well as a convenient all-in-one mixture.

24 Suspected Allergens in analytical purity are presented in table below:

Chiron No.	Name	Description	CAS, isomer mix	CAS, pure isomer
9934.14	Amylcinnamic alcohol[A,B]	Buxinol	101-85-9	
9086.14	(2*E*)-Amylcinnamic aldehyde		122-40-7	78605-96-6
9087.8	Anisyl alcohol[A]	4-Methoxybenzyl alcohol		105-13-5
3843.7	Benzyl alcohol			100-51-6
2053.14	Benzyl benzoate			120-51-4
9089.16	(2*E*)-Benzyl cinnamate		103-41-3	78277-23-3
9091.14	Benzyl salicylate			118-58-1
9092.14	Butylphenyl methylpropional	Lilial	80-54-6	
9094.9	(2*E*)-Cinnamic alcohol[A]		104-54-1	4407-36-7
9097.9	(2*E*)-Cinnamic aldehyde		104-55-2	14371-10-9
9100.10	(*Z*)-Citral (96-97%)	Neral	5392-40-5	106-26-3
9101.10	(*E*)-Citral	Geranial	5392-40-5	141-27-5
9102.10	Citronellol		106-22-9	
3867.9	Coumarin	1,2-Benzopyrone		91-64-5
3900.10	Eugenol			97-53-0

List continues on next page.

24 Suspected Allergens , list continued:

Chiron No.	Name	Synonym	CAS,	CAS,
9104.15	(2*E*,6*E*)-Farnesol[A]		4602-84-0	106-28-5
9108.10	Geraniol	(2*E*)-3,7-Dimethyl-2,6-octadien-1-ol	624-15-7	106-24-1
9109.10	Nerol	(2*Z*)-3,7-Dimethyl-2,6-octadien-1-ol	624-15-7	106-25-2
9111.15	(2*E*)-Hexylcinnamic aldehyde	Jasmonal®	101-86-0	165184-98-5
9113.10	Hydroxycitronellal		107-75-5	
9114.13	Hydroxyisohexyl-3-cyclohexene carboxaldehyde	Lyral		31906-04-4
9116.10	(1*E*)-Isoeugenol		97-54-1	5932-68-3
9935.14	*α*-Isomethyl ionone[B]		127-51-5	
9121.10	Limonene			5989-27-5
9122.10	Linalool		78-70-6	
9123.9	Methyl 2-octynoate	Folione®		111-12-6

([A] qualitative. not quantitative, [B] one pure isomer, stereo chemistry not specified)

24 Suspected Allergens in analytical purity in one mixture:

Chiron No.	Name	Description	Concentration
S-4649-100-EA	24 Suspected Allergens, European Standard CEN/TC 347/WG 4N 19	26 purified isomers/ compounds (all in list above)	100 µg/mL each in ethyl acetate

Internal Standards used in the CEN-method:

Chiron No.	Name	CAS, isomer mix
9027.6-K-IO	1,4-Dibromobenzene	106-37-6
3096.12-K-IO	4,4'-Dibromobiphenyl	92-86-4

Deuterated Internal standards:

Chiron No.	Name	CAS, isomer mix
9023.7-K-IO	Benzylalcohol-d7	71258-23-6
9024.14-K-IO	Benzyl-d5 benzoate	347840-01-1
9025.16-100-IO	Benzyl-d5 cinnamate, *E*-isomer	347840-02-2
9026.14-K-IO	Benzyl salisylate-d4 (Benzyl 2-hydroxybenzoate-3,4,5,6-d4)	118-58-1 of unlabelled
3868.9-K-ME	Coumarin-d4	185056-83-1
9325.10-K-ME	Linalool-d3 (vinyl-d3)	78-70-3 of unlabelled

Neat material for toxicological tests are available upon request.
Single components solution also available, please inquire.
Please request for other isomers.

BMF 49 - 3-Monochloropropanediol esters (3-MCPD esters)

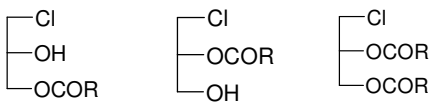
Over the last years, there has been an increase in interest for 3-MCPD fatty acid esters in food analysis. These esters are formed during production and heating of oils and fats, and are considered harmful at a high level of consumption.

3-MCPD is a known carcinogen found as a heat-induced contaminant in many different types of fat-containing foodstuffs. The European Food Safety Authority (EFSA) has defined a limit of 2µg/kg body weight as a tolerable daily intake (TDI).

However, in most foodstuffs only a small percentage of 3-MCPD is present as free 3-MCPD, most of it is ester-linked with fatty acids. The 3-MCPD fatty acid esters are assumed to be 100% metabolized to free 3-MPCD by a lipase-catalyzed hydrolysis. They are found to be present in all refined fats and oils, with the highest levels found in palm oil.

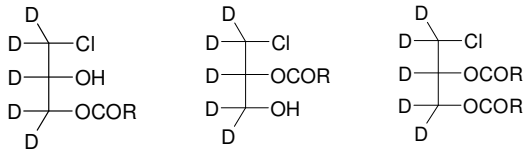
3-MCPD esters are a complex mixture of mono- and diesters linked with different fatty acids. The two different monoesters are often difficult to separate by GC or HPLC.

Types of 3-MCPD esters:



1-Monoesters 2-Monoesters 1,2-Diesters

Internal standards:

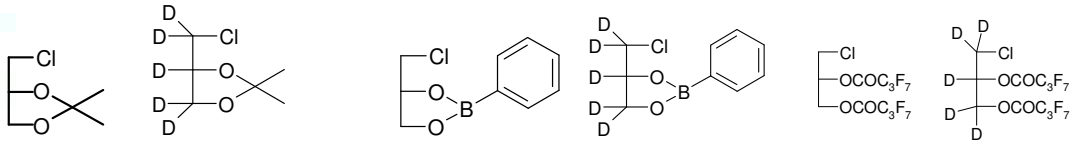


1-Monoesters 2-Monoesters 1,2-Diesters

R can be for example C_{15} (Palmitate), C_{17} (Stearate), C_{21} (Behenate), etc.

Chiron AS now offers highly purified 1-mono- and diesters, both native and deuterated, for analytical work and for toxicological studies, as well as free 3-MCPD.

Analysis of intact individual 3-MCPD esters can be performed by HPLC or GC/MS. An alternative is to determine the total amount of 3-MCPD, the underlying alcohol-component of all 3-MCPD esters. Volatile derivates for analysis by GC/MS can be achieved by saponification of the ester followed by reaction of the resulting alcohol with acetone, phenylboronic acid, or heptafluorobutyrylimidazole (HFBI). The internal standards can be derivatized in the same manner:



8617.6/ 9343.6 9344.6 8618.9 8616.11

Acetone derivative **Phenylboronic acid derivative** **HFBI derivative**

Derivatization with phenylboronic acid is the most commonly used procedure, and is used in a number of official methods for determination of free 3-MCPD. Please inquire if you are interested in this derivatives.

Now available from Chiron AS:

Chiron No.	Product	Description
	Monochloropropanediols	
10030.3-K-ME	2-Chloro-1,2-propanediol	2-MCPD
3873.3-K-ME	3-Chloro-1,2-propanediol	3-MCPD
8607.3-K-ME	(*R*)-(-)-3-Chloro-1,2-propanediol	(R)-3-MCPD
8608.3-K-ME	(*S*)-(+)-3-Chloro-1,2-propanediol	(S)-3-MCPD
3874.3-K-ME	3-Chloro-1,2-propane-d5-diol	3-MCPD-d5

Available from Chiron as 1000µg/mL solution (1mL) in methanol.

Chiron No.	Product	Description
	3-MCPD-1-monoesters	
8949.19-100-ME	3-Chloro-1,2-propandiol-1-monopalmitate	3-MCPD-1-16:0
8950.19-100-ME	3-Chloro-1,2-propandiol-1-monopalmitoleate	3-MCPD-1-16:1 (9-cis)
8951.21-100-ME	3-Chloro-1,2-propandiol-1-monostearate	3-MCPD-1-18:0
8952.21-100-ME	3-Chloro-1,2-propandiol-1-monooleate	3-MCPD-1-18:1 (9-cis)
8953.21-100-ME	3-Chloro-1,2-propandiol-1-monolinoleate	3-MCPD-1-18:2 (9,12-dicis)
8954.23-100-ME	3-Chloro-1,2-propandiol-1-monoarachidate	3-MCPD-1-20:0
8955.23-100-ME	3-Chloro-1,2-propandiol-1-monogadolenate	3-MCPD-1-20:1 (11-cis)
8956.25-100-ME	3-Chloro-1,2-propandiol-1-monobehenate	3-MCPD-1-22:0
8957.25-100-ME	3-Chloro-1,2-propandiol-1-monoerucidate	3-MCPD-1-22:1 (13-cis)
	3-MCPD-diesters	
8967.35-100-ME	3-Chloro-1,2-propandiol-dipalmitate	3-MCPD-di16:0
8968.35-100-ME	3-Chloro-1,2-propandiol-dimonopalmitoleate	3-MCPD-di16:1
8969.39-100-ME	3-Chloro-1,2-propandiol-distearate	3-MCPD-di18:0
8970.39-100-ME	3-Chloro-1,2-propandiol-dioleate	3-MCPD-di18:1
8971.39-100-ME	3-Chloro-1,2-propandiol-dilinoleate	3-MCPD-di18:2
8972.43-100-ME	3-Chloro-1,2-propandiol-diarachidate	3-MCPD-di20:0
8973.43-100-ME	3-Chloro-1,2-propandiol-digadolenate	3-MCPD-di20:1
8974.47-100-ME	3-Chloro-1,2-propandiol-dibehenate	3-MCPD-di22:0
8975.47-100-ME	3-Chloro-1,2-propandiol-dierucidate	3-MCPD-di22:1
	Labelled MCPD-esters	
8981.19-100-ME	3-Chloro-1,2-propandiol-monopalmitate-d5	3-MCPD-1-16:0-d5
8976.21-100-ME	3-Chloro-1,2-propandiol-1-monostearate-d5	3-MCPD-1-18:0-d5
8977.25-100-ME	3-Chloro-1,2-propandiol-1-monobehenate-d5	3-MCPD-1-22:0-d5
8982.35-100-ME	3-Chloro-1,2-propandiol-dipalmitate-d5	3-MCPD-di16:0-d5
8978.39-100-ME	3-Chloro-1,2-propandiol-distearate-d5	3-MCPD-di18:0-d5
8979.47-100-ME	3-Chloro-1,2-propandiol-dibehenate-d5	3-MCPD-di22:0-d5

Available from Chiron as 100 µg/mL solution (1mL) in methanol

Soon available: 2-MCPD-monoesters and mixed 3-MCPD esters - Please inquire!

Literature: http://www.efsa.europa.eu/en/efsajournal/pub/1048.htm
Eur. J. Lipid Sci. Technol. 2011, *113*, 277-278 *and* 304-308; Czech J. Food Sci., 2009, *27*, 417-420
Eur. J. Lipid Sci. Technol. 2008, *110*, 671-672;
Weisshaar, R: "3-MCPD-esters in edible fats and fat containing products", Fresenius Conference 2008
Food Additives and Contaminans, 2002, Vol 19, No 7, 619-631

BMF 56 - Glycidyl fatty acid esters

Over the last years, there has been an increase in interest for 3-MCPD fatty acid esters and glycidyl fatty acid esters in food analysis. These esters are formed during production and heating of oils and fats, and are thought to be harmful at a high level of consumption.

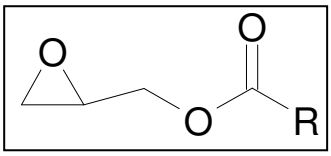
3-MCPD (3-monochloropropane-1,2-diol) is a known carcinogen found as a heat-induced contaminant in many different types of foods. Recently, attention has been given to another group of heat-induced contaminants, 3-MCPD fatty acid esters (bound 3-MCPD) - see our BMF 49.

Glycidyl fatty acid esters are also found in foodstuffs in question. This is a challenge because the method of choice for analysis of 3-MCPD esters is derivatization with phenylboronic acid in NaCl solution. Hereby glycidyl fatty esters are partly degraded to 3-MCPD by opening the epoxide and hydrolysis of the ester. Glycidol derivatives are therefore also detected as 3-MCPD using this method.

In the human body the glycidyl esters are metabolized into free glycidol, a compound that is classified as possibly carcinogenic (group 2 carcinogens) by IARC (International Agency for Research on Cancer).

Chiron AS now offers highly purified glycidyl fatty acid esters for use as reference standards in food analysis, as well as an internal standard and free glycidol!

Glycidyl fatty acid esters		
9674.19-10MG	Glycidyl palmitate	glycidyl C16:0
9896.19-10MG	Glycidyl palmitoleate	glycidyl C16:1 (9-*cis*)
9899.21-10MG	Glycidyl stearate	glycidyl C18:0
9671.21-10MG	Glycidyl oleate	glycidyl C18:1 (9-*cis*)
9673.21-10MG	Glycidyl linoleate	glycidyl C18:2 (9-*cis*, 12-*cis*)
9672.21-10MG	Glycidyl linolenate	glycidyl C18:3 (6-*cis*, 9-*cis*, 12-*cis*)
9897.23-10MG	Glycidyl arachidate	glycidyl C20:0
9900.23-10MG	Glycidyl gondolenate	glycidyl C20:1 (11-*cis*)
9898.25-10MG	Glycidyl behenate	glycidyl C22:0
9714.3-10MG	Glycidol	
Internal Standards of Glycidyl fatty acid esters		
9924.19-10MG	Glycidyl palmitate-d31	glycidyl C16:0-d31

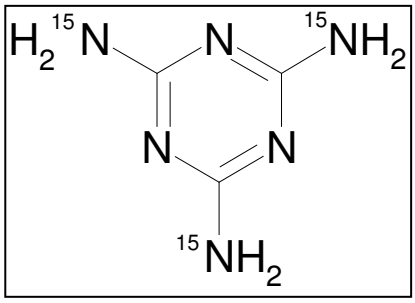


Structure of glycidyl fatty acid esters

Chiron AS also offers a wide range of mono-and di-esters of 3-MCPD, including deuterated standards, see BMF 49.

Literature:
Eur. J. Lipid Sci. Technol. 2011, *113*, 277-278.
Eur. J. Lipid Sci. Technol. 2011, *113*, 304-308.
http://monographs.iarc.fr/ENG/Classification/index.php.
R. Weisshaar, ”3-MCPD-esters in edible fats and fat containing products”; 6th Int. Fresenius Conf.

BMF 48 - Melamine-[$^{15}N_3$]



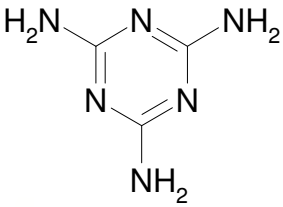
Melamine is a trimer of cyanamide with a 1,3,5-triazine skeleton. It contains 66% nitrogen by mass and, if mixed with resins, has fire retardant properties due to release of nitrogen. It is most commonly encountered as melamine resin in combination with formaldehyde, which is a very durable thermosetting plastic used among other things for dinnerware, countertops and cooking spoons.

Melamine recently caught the world's attention for another reason - babies in China and pets in the USA became ill after having consumed foodstuffs containing this chemical.

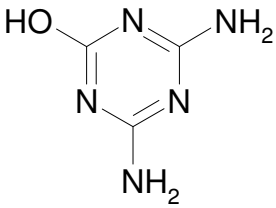
Melamine had been added to low quality pet food and infant formula to make the protein content appear higher than it actually is. Simple protein tests uses nitrogen content as a measure for proteins, and addition of protein-rich compounds like melamine therefore alters the results.

Melamine is relatively non-toxic to humans, but in combination with cyanuric acid it is absorbed into the bloodstream, where they concentrate and interact in the urine-filled renal microtubules. Melamine-cyanurate then crystallize and form large numbers of round, yellow crystals, which block and damage the renal cells that line the tubes, causing the kidneys to malfunction.

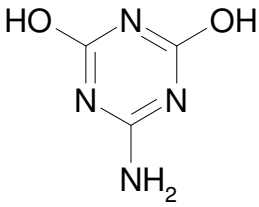
Chiron AS now offers both native and ^{15}N-labelled melamine for analytical work, as well as the related metabolites like ammeline and ammedine!



Melamine



Ammeline



Ammelide

Chiron No.	Product
2528.3	1,3,5-Triazine-2,4,6-triamine (Melamine)
9797.3	1,3,5-Triazine-2,4,6-triamine-[$^{15}N_3$] (Melamine-[$^{15}N_3$])
8735.3	Ammelide
8736.3	Ammeline

Available as 100µg/mL solution in methanol (1mL), 2528.3 also available as neat material.

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