SPEX CertiPrep®

Inorganic and Organic Certified Reference Materials

NEW

Product Supplement

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- Custom Standards

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SPEXperience™

Creating an Awesome Customer Experience!

It's not only what we do, it's how we do it. We have been manufacturing Inorganic and Organic Certified Reference Materials and Calibration Standards for the Analytical Spectroscopy and Chromatography communities since 1954. Our passion for science and dedication to the analytical community drives us to go above and beyond for you. We want to provide you with the customer experience you deserve and can rely on. We do this by making sure you are our priority in everything we do.

- Over 60 years experience manufacturing Certified Reference Materials (CRMs)
- Most comprehensive scope of accreditations and certifications in the industry
- Selection of over 4,000 inventoried products
- Stock products ship within 24 hours
- Dedicated technical support to answer your CRM and lab questions
- Custom standards manufactured upon request, based on your individual needs

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CERTIFIED REFERENCE MATERIALS

SPEX CertiPrep is the industry leader for over 60 years in the CRM marketplace, meeting the needs of laboratories worldwide with innovation and research. Accredited by A2LA to ISO/IEC 17025:2005 & ISO Guide 34:2009. Certified by DQS to ISO 9001:2015.

CannStandards™

Analytical Standards for Medicinal and Recreational Cannabis Testing

While the legalization of cannabis, for both medicinal and recreational purposes, has been gaining speed, legislation and regulation has not necessarily kept pace. Even so, out of a drive for self-regulation and significant consumer safety concerns, many producers and manufacturers are turning to testing labs in order to ensure that their products are of high quality and free of chemical contaminants. SPEX CertiPrep offers ISO/IEC 17025 and ISO Guide 34 Certified Reference Materials (CRMs) for all of the common contaminants such as pesticide residues, residual solvents and heavy metals, as well as qualitative analysis CRMs, such as terpenes. As the industry demands change and regulations are put into place, we continually update our product offerings.

Designed for Methods: State specific pesticide regulations

• OAR 333-008-11 • HB 3460 • AOAC 2007-01 • EN 15662

For additional product information, please visit www.spexcertiprep.com/cannabis.

Pesticide Residues				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Organochlorine Pesticides Mix A, 18 compounds	200 µg/mL	1 mL	Acetone	5252-PA
Organochlorine Pesticides Mix B, 15 compounds	200 µg/mL	1 mL	Acetone	5252-PB
Nitrogen-Phosphorus Pesticides Mix C, 33 compounds	200 µg/mL	1 mL	Methylene chloride	5252-PC
Nitrogen-Phosphorus Pesticides Mix D, 9 compounds	200 µg/mL	1 mL	Acetone	5252-PD
Nitrogen-Phosphorus Pesticides Mix E, 3 compounds	200 µg/mL	1 mL	Acetone	5252-E

Terpenes					
Description	**CAS #**	**Concentration**	**Volume**	**Matrix**	**Part #**
Linalool	78-70-6	1,000 µg/mL	1 mL	Methanol	S-5133
Borneol	507-70-0	1,000 µg/mL	1 mL	Methanol-P&T	S-4570
Eucalyptol	470-82-6	1,000 µg/mL	1 mL	Methanol	S-4352
(R)-(+)-Limonene	5989-27-5	1,000 µg/mL	1 mL	Methanol-P&T	S-4021
alpha-Pinene	80-56-8	1,000 µg/mL	1 mL	Methanol-P&T	S-4172
beta-Pinene	127-91-3	1,000 µg/mL	1 mL	Methanol-P&T	S-3142

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Cannabis (cont'd)

Residual Solvents					
Description	**CAS #**	**Concentration**	**Volume**	**Matrix**	**Part #**
Residual Solvent Mix, 24 compounds	Multiple	1,000 µg/mL	1 mL	Dimethyl sulfoxide	USP-RS-C3A
Acetone	67-64-1	1,000 µg/mL	1 mL	Methanol-P&T	S-140
n-Butane	106-97-8	1,000 µg/mL	1 mL	Methanol-P&T	S-605
Ethane	74-84-0	1,000 µg/mL	1 mL	Methanol-P&T	S-1880
Ethanol	64-17-5	1,000 µg/mL	1 mL	Methanol-P&T	S-1885
n-Hexane	110-54-3	1,000 µg/mL	1 mL	Methanol-P&T	S-2190
Methane	74-82-8	1,000 µg/mL	1 mL	Methanol-P&T	S-2379
2-Methylbutane	78-78-4	1,000 µg/mL	1 mL	Methanol-P&T	S-2462
2-Methylpropane	75-28-5	1,000 µg/mL	1 mL	Methanol-P&T	S-2555
n-Pentane	109-66-0	1,000 µg/mL	1 mL	Methanol-P&T	S-2975
Propane	74-98-6	1,000 µg/mL	1 mL	Methanol-P&T	S-3145
2-Propanol	67-63-0	1,000 µg/mL	1 mL	Methanol-P&T	S-3165

Heavy Metals				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
USP Oral Elemental Impurities A	Multiple	125 mL	5% HNO_3	USP-TXM2
Chromium	1,000 µg/mL	125 mL	2% HNO_3	PLCR2-2Y
Nickel	1,000 µg/mL	125 mL	2% HNO_3	PLNI2-2Y
Arsenic	1,000 µg/mL	125 mL	2% HNO_3	PLAS2-2Y
Silver	1,000 µg/mL	125 mL	2% HNO_3	PLAG2-2Y
Cadmium	1,000 µg/mL	125 mL	2% HNO_3	PLCD2-2Y
Mercury	1,000 µg/mL	125 mL	10% HNO_3	PLHG4-2Y
Lead	1,000 µg/mL	125 mL	2% HNO_3	PLPB2-2Y
Thallium	1,000 µg/mL	125 mL	2% HNO_3	PLTL2-2Y

Cannabis (cont'd)

Terpene Mixes - CAN-TERP-MIX1 & CAN-TERP-MIX2

Purchase together as CAN-TERP-KIT and save!

Can-Terp Mix 1 - 21 Compounds

Description	CAS #	Concentration	Volume	Matrix	Part #
(-)-alpha-Bisabolol	23089-26-1	100 µg/mL for each component in the mix	1 mL	Methanol	CAN-TERP-MIX1
Camphene	79-92-5				
Camphor	76-22-2				
(1S)-(+)-3-Carene	498-15-7				
(-)-Caryophyllene oxide	1139-30-6				
trans-Caryophyllene	87-44-5				
(+)-Cedrol	77-53-2				
Eucalyptol	470-82-6				
Farnesene (mix of isomers)	502-61-4				
(+)-Fenchone	4695-62-9				
Geranyl acetate	105-87-3				
Hexahydrothymol	89-78-1				
Isoborneol	124-76-5				
(-)-Isopulegol	89-79-2				
Linalool	78-70-6				
p-Mentha-1,5-diene	99-83-2				
beta-Myrcene	123-35-3				
Nerol	106-25-2				
cis-Nerolidol	3790-78-1				
Ocimene (mix of isomers)	13877-91-3				
Valencene	4630-07-3				

Terpene Mixes - CAN-TERP-MIX1 & CAN-TERP-MIX2

Purchase together as CAN-TERP-KIT and save!

Can-Terp Mix 2 - 21 Compounds

Description	CAS #	Concentration	Volume	Matrix	Part #
(+)-Borneol	464-43-7	100 µg/mL for each component in the mix	1 mL	Methanol	CAN-TERP-MIX2
(-)-Borneol	464-45-9				
(1R)-(+)-Camphor	464-49-3				
(1S)-(-)-Camphor	464-48-2				
alpha-Cedrene	469-61-4				
L(-)-Fenchone	7787-20-4				
(1R)-endo-(+)-Fenchyl alcohol	2217-02-9				
Geraniol	106-24-1				
Guaiol	489-86-1				
alpha-Humulene	6753-98-6				
(R)-(+)-Limonene	5989-27-5				
trans-Nerolidol	40716-66-3				
alpha-Pinene	80-56-8				
beta-Pinene	127-91-3				
(+)-Pulegone	89-82-7				
Sabinene	3387-41-5				
Sabinene hydrate	546-79-2				
alpha-Terpinene	99-86-5				
gamma-Terpinene	99-85-4				
Terpineol (mix of isomers)	8000-41-7				
Terpinolene	586-62-9				

Cannabis (cont'd)

DEA Controlled Substances					
Description	**CAS #**	**Concentration**	**Volume**	**Matrix**	**Part #**
Cannabidiol (CBD)	13956-29-1	1,000 µg/mL	1 mL	Methanol	S-10241
Cannabinol (CBN)	521-35-7	1,000 µg/mL	1 mL	Methanol	S-10242
Cannabidivarin (CBDV)	24274-48-4	1,000 µg/mL	1 mL	Methanol	S-10245
Cannabigerol (CBG)	2808-33-5	1,000 µg/mL	1 mL	Methanol	S-10246
Cannabigerolic acid (CBGA)	25555-57-1	1,000 µg/mL	1 mL	Acetonitrile	S-10247
Cannabichromene (CBC)	20675-51-8	1,000 µg/mL	1 mL	Methanol	S-10248
Cannabidolic acid (CBDA)	1244-58-2	1,000 µg/mL	1 mL	Acetonitrile	S-10249
(-)-delta9-THC	1972-08-3	1,000 µg/mL	1 mL	Methanol	S-10260
(-)-delta8-THC	5957-75-5	1,000 µg/mL	1 mL	Methanol	S-10261
Cannabidivarinic acid (CBDVA)	31932-13-5	1,000 µg/mL	1 mL	Acetonitrile	S-11055
Tetrahydrocannabinolic acid (THCA)	23978-85-0	1,000 µg/mL	1 mL	Acetonitrile	S-11056
Tetrahydrocannabivarin (THCV)	31262-37-0	1,000 µg/mL	1 mL	Methanol	S-11057
Tetrahydrocannabivarinic acid (THCVA)	28172-17-0	1,000 µg/mL	1 mL	Acetonitrile	S-11058
Cannabichromenic acid (CBCA)	20408-52-0	1,000 µg/mL	1 mL	Acetonitrile	S-11059

Pesticide Mixes

Premixed Pesticide Multi-Compound CRMs

Build Your Pesticide Library with SPEX CertiPrep Pesticide Mixes!

Chemical pesticides have become an integral part of the agricultural toolbox, offering protection to crops from destructive pests. However, an unfortunate side effect of their uses is the potential leaching of these, oftentimes, harmful chemicals into the environment leading to their eventual presence in the human food chain. As a result, pesticide residue analysis has become a critical testing process for many different types of laboratories.

Unfortunately, pesticide residue testing is a long, expensive and complicated process covering hundreds of different compounds. Fortunately, as the leader in HPLC, GC, LC/MS, and GC/MS pesticide CRMs, SPEX CertiPrep is happy to assist you with all of your pesticide CRM needs.

For your convenience, we have designed a pesticide residue testing kit which includes 144 of the most commonly analyzed pesticides per EPA, AOAC, FDA and other international testing methods. The kit is structured to maximize stability and solubility, while minimizing unwanted analyte interaction and interference; enjoy shorter calibration times, fewer injections and money savings, as compared to purchasing individual pesticide standards.

For additional product information, please visit www.spexcertiprep.com/products/pesticides/pesticide-mixes.

Description	Compound	CAS #	Concentration	Volume	Part #
Pesticide Kit containing all 10-multi-compound mixes.	Multiple	Multiple	100 µg/mL	1 mL	SPXPR-KIT
Pesticide Mix 1 containing 16 compounds in acetonitrile.	Acetamiprid Aldicarb Aldicarb sulfone Aldicarb sulfoxide Azoxystrobin Boscalid Chlorantraniliprole Fenoxycarb Imazalil Imidacloprid Iprodione Piperonyl butoxide Pirimicarb Tebufenpyrad Thiacloprid Trifloxystrobin	135410-20-7 116-06-3 1646-88-4 1646-87-3 131860-33-8 188425-85-6 500008-45-7 79127-80-3 35554-44-0 138261-41-3 36734-19-7 51-03-6 23103-98-2 119168-77-3 111988-49-9 141517-21-7	100 µg/mL for each component in the mix	1 mL	SPXPR-1

Pesticide Mixes (cont'd)

Description	Compound	CAS #	Concentration	Volume	Part #
Pesticide Mix 2 containing 15 compounds in acetonitrile.	Azinphos-methyl Carbophenothion Coumaphos Dicrotophos Dimethoate Dyfonate (Fonofos) Ethoprophos (Ethoprop) Hexythiazox Malathion Methidathion Phosalone Phosmet (Imidan) Quinalphos Terbufos Triazophos	86-50-0 786-19-6 56-72-4 141-66-2 60-51-5 944-22-9 13194-48-4 78587-05-0 121-75-5 950-37-8 2310-17-0 732-11-6 13593-03-8 13071-79-9 24017-47-8	100 µg/mL for each component in the mix	1 mL	SPXPR-2
Pesticide Mix 3 containing 15 compounds in acetonitrile.	Carbaryl Dimethomorph Etofenprox Etoxazole Flonicamid Methamidophos Monocrotophos Myclobutanil (Systhane) Phenthoate Phorate Pirimiphos-methyl Profenofos Propargite (Omite) Spirodiclofen Thiamethoxam	63-25-2 110488-70-5 80844-07-1 153233-91-1 158062-67-0 10265-92-6 6923-22-4 88671-89-0 2597-03-7 298-02-2 29232-93-7 41198-08-7 2312-35-8 148477-71-8 153719-23-4	100 µg/mL for each component in the mix	1 mL	SPXPR-3
Pesticide Mix 4 containing 15 compounds in acetonitrile.	Acephate Chlorothalonil Chlorpyrifos Diazinon Dichlorvos Disulfoton Edifenphos EPN Ethion Fenitrothion Fenthion Fipronil Fludioxonil Ethyl parathion Methyl parathion	30560-19-1 1897-45-6 2921-88-2 333-41-5 62-73-7 298-04-4 17109-49-8 2104-64-5 563-12-2 122-14-5 55-38-9 120068-37-3 131341-86-1 56-38-2 298-00-0	100 µg/mL for each component in the mix	1 mL	SPXPR-4

Pesticide Mixes (cont'd)

Description	Compound	CAS #	Concentration	Volume	Part #
Pesticide Mix 5 containing 14 compounds in acetonitrile.	Baygon (Propoxur) Clofentezine Diuron Isoproturon Linuron Metalaxyl Methomyl Oxamyl Oxydemeton-methyl Paclobutrazol Pencycuron Prochloraz Pymetrozine Pyraclostrobin	114-26-1 74115-24-5 330-54-1 34123-59-6 330-55-2 57837-19-1 16752-77-5 23135-22-0 301-12-2 76738-62-0 66063-05-6 67747-09-5 123312-89-0 175013-18-0	100 µg/mL for each component in the mix	1 mL	SPXPR-5
Pesticide Mix 6 containing 15 compounds in acetonitrile.	Alachlor Bentazon Captan Chlorpropham Epoxiconazole Fenoprop (2, 4, 5-TP) Fenpropathrin (mix of isomers) Fenvalerate (Sanmarton) tau-Fluvalinate Kresoxim-methyl Metolachlor Pendimethalin (Prowl) Pyridaben Quinoxyfen Quintozene (Pentachloronitrobenzene)	15972-60-8 25057-89-0 133-06-2 101-21-3 133855-98-8 93-72-1 64257-84-7 51630-58-1 102851-06-9 143390-89-0 51218-45-2 40487-42-1 96489-71-3 124495-18-7 82-68-8	100 µg/mL for each component in the mix	1 mL	SPXPR-6
Pesticide Mix 7 containing 8 compounds in acetonitrile.	Bifenthrin Cyfluthrin (Baythroid) Cypermethrin Permethrin (mix of isomers) Prallethrin (mix of isomers) Pyrethrins (mix of isomers) Resmethrin (mix of isomers) Tetramethrin	82657-04-3 68359-37-5 52315-07-8 52645-53-1 23031-36-9 8003-34-7 10453-86-8 7696-12-0	100 µg/mL for each component in the mix	1 mL	SPXPR-7

Pesticide Mixes (cont'd)

Description	Compound	CAS #	Concentration	Volume	Part #
Pesticide Mix 8 containing 15 compounds in acetonitrile.	Abamectin (mix of isomers) Bifenazate Bromacil Fenobucarb (BPMC) Fenpyroximate Hexaconazole Isoprocarb (MIPC) Methiocarb Propazine Propiconazole (Tilt) Spinetoram (J) Spinosad (as Spinosyn A) Spiromesifen Spirotetramat Tebuconazole (Folicur)	71751-41-2 149877-41-8 314-40-9 3766-81-2 111812-58-9 79983-71-4 2631-40-5 2032-65-7 139-40-2 60207-90-1 187166-40-1 131929-60-7 283594-90-1 203313-25-1 107534-96-3	100 µg/mL for each component in the mix	1 mL	SPXPR-8
Pesticide Mix 9 containing 16 compounds in acetonitrile: acetone (9:1).	Acequinocyl Atrazine Atrazine-desethyl Carbofuran Cyanazine (Bladex) 2,4-DB Fenamiphos-sulfone Fenamiphos-sulfoxide Fenhexamid Fenoxaprop Fluometuron 3-Hydroxycarbofuran Molinate Simazine Thiophanate-methyl Trichlorfon (Dylox)	57960-19-7 1912-24-9 6190-65-4 1563-66-2 21725-46-2 94-82-6 31972-44-8 31972-43-7 126833-17-8 95617-09-7 2164-17-2 16655-82-6 2212-67-1 122-34-9 23564-05-8 52-68-6	100 µg/mL for each component in the mix	1 mL	SPXPR-9
Pesticide Mix 10 containing 15 compounds in acetonitrile.	Aldrin Chlordecone o-p'-DDD p-p'-DDD o-p'-DDE p-p'-DDE o-p'-DDT p-p'-DDT Dieldrin Endrin Endrin aldehyde Endrin ketone Isodrin Metribuzin Mirex	309-00-2 143-50-0 53-19-0 72-54-8 3424-82-6 72-55-9 789-02-6 50-29-3 60-57-1 72-20-8 7421-93-4 53494-70-5 465-73-6 21087-64-9 2385-85-5	100 µg/mL for each component in the mix	1 mL	SPXPR-10

Pesticides

Analytical Standards for Pesticide Analysis

There are hundreds of commercial pesticides in use in the world today. From algaecides to virucides, pesticides are used in large quantities in industrial and private agriculture. The concern over human pesticide exposure over the past few decades has led to increased monitoring and oversight of these chemicals. It is essential that testing labs have accurate standard mixes to measure the pesticide levels in the environment. At SPEX CertiPrep, we help streamline your testing process by creating pre-made standards to suit your needs. Several stock pesticide mixes are readily available, along with a large list of over 4,000 individual compounds. In addition, custom pesticide blends can be manufactured to your specifications.

For additional product information, please visit www.spexcertiprep.com/products/pesticides.

Ready-Prep 91 - SOW Matrix Spike					
Description	**CAS #**	**Concentration**	**Volume**	**Matrix**	**Part #**
Aldrin	309-00-2	500 µg/mL	1 mL	Methanol	CLPP-MS91H
gamma-BHC	58-89-9	500 µg/mL			
Dieldrin	60-57-1	1,000 µg/mL			
p,p'-DDT	50-29-3	1,000 µg/mL			
Endrin	72-20-8	1,000 µg/mL			
Heptachlor	76-44-8	500 µg/mL			

3/90 - SOW Surrogate Spike					
Description	**CAS #**	**Concentration**	**Volume**	**Matrix**	**Part #**
Decachlorobiphenyl	2051-24-3	200 µg/mL	1 mL	Acetone	CLPP-S90
2,4,5,6-Tetrachloro-m-xylene	877-09-8				

Pesticide (cont'd)

Organochlorine Pesticide Mix					
Description	**CAS #**	**Concentration**	**Volume**	**Matrix**	**Part #**
Aldrin	309-00-2	2,000 µg/mL for each component in the mix	1 mL	Benzene	625-PH
alpha-BHC	319-84-6				
beta-BHC	319-85-7				
delta-BHC	319-86-8				
gamma-BHC	58-89-9				
p,p'-DDD	72-54-8				
p,p'-DDE	72-55-9				
p,p'-DDT	50-29-3				
Dieldrin	60-57-1				
Endosulfan I	959-98-8				
Endosulfan II	33213-65-9				
Endosulfan sulfate	1031-07-8				
Endrin	72-20-8				
Endrin aldehyde	7421-93-4				
Endrin ketone	53494-70-5				
Heptachlor	76-44-8				
Heptachlor epoxide (Isomer B)	1024-57-3				
Methoxychlor	72-43-5				

Speciation

Analytical Standards for Single & Dual Speciation Analysis

Speciation analysis has become common in many testing fields, including the environmental, food and pharmaceutical testing labs. To analyze species in a sample requires Certified Reference Materials (CRMs) for sample verification and method validation. Many speciation standards are available in today's market, but most of them are not certified or analyzed with a state-of-the-art ICP, ICP-MS or LC-ICP-MS. SPEX CertiPrep offers a wide variety of speciation standards, certified to the strictest ISO/IEC 17025 and ISO Guide 34 guidelines, and tested on our own LC-ICP-MS.

For additional product information, please visit www.spexcertiprep.com/knowledge-base/speciation.

Single Speciation Standards				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Assurance Grade Arsenic (+3) Speciation Standard	1,000 µg/mL	125 mL	2% HCl	SPEC-AS3
Assurance Grade Arsenic (+3) Speciation Standard	1,000 µg/mL	30 mL	2% HCl	SPEC-AS3M
Assurance Grade Arsenic (+5) Speciation Standard	1,000 µg/mL	125 mL	H_2O	SPEC-AS5
Assurance Grade Arsenic (+5) Speciation Standard	1,000 µg/mL	30 mL	H_2O	SPEC-AS5M
Assurance Grade Chromium (+3) Speciation Standard	1,000 µg/mL	125 mL	2% HNO_3	SPEC-CR3
Assurance Grade Chromium (+3) Speciation Standard	1,000 µg/mL	30 mL	2% HNO_3	SPEC-CR3M
Assurance Grade Chromium (+6) Speciation Standard	1,000 µg/mL	125 mL	H_2O	SPEC-CR6
Assurance Grade Chromium (+6) Speciation Standard	1,000 µg/mL	30 mL	H_2O	SPEC-CR6M
Assurance Grade Selenium (+4) Speciation Standard	1,000 µg/mL	125 mL	2% HNO_3	SPEC-SE4
Assurance Grade Selenium (+4) Speciation Standard	1,000 µg/mL	30 mL	2% HNO_3	SPEC-SE4M
Assurance Grade Selenium (+6) Speciation Standard	1,000 µg/mL	125 mL	H_2O	SPEC-SE6

Speciation (cont'd)

Organic Arsenic Speciation Standards				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Dimethylarsinic Acid Sodium Salt	10 µg/mL	30 mL	H_2O	SPEC-AS-DMA
Disodium Methylarsonate Hexahydrate	10 µg/mL	30 mL	H_2O	SPEC-AS-MMA

Unique Features of Dual Speciation Standards

- Standards are each at a total of 20 µg/mL and are optimized to work well for both ICP and ICP-MS (with a one-step dilution)
- Percentages of the species are determined by LC-ICP-MS and reported on our Certificate of Analysis
- An LC Chromatogram is featured on our Certificate of Analysis
- Trace impurities in the final solution are analyzed by ICP-MS and reported on our Certificate of Analysis

Dual Speciation Standards				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Dual Arsenic (+3, +5) Speciation Standard	Total As 20 µg/mL	30 mL	H_2O/tr. HCl	SPEC-DUAL-AS
Dual Chromium (+3, +6) Speciation Standard	Total Cr 20 µg/mL	30 mL	H_2O	SPEC-DUAL-CR
Dual Selenium (+4, +6) Speciation Standard	Total Se 20 µg/mL	30 mL	H_2O/tr. HNO_3	SPEC-DUAL-SE

US EPA Semivolatiles

Analytical Standards for Drinking Water, Wastewater and Solid Waste

Single & Multi-Component Standards for GC & GC/MS

Designed for Methods: 600 Series • 8000 Series • CLP Series

For additional product information, please visit www.spexcertiprep.com/organic-standards/semivolatiles.

Method 600 Series					
Description	**Concentration**	**Volume**	**Matrix**	**# of Comp.**	**Part #**
Method 604					
Phenolics Mix	2,000 µg/mL	1 mL	Methylene chloride	11	CLPS-A
Polynuclear Aromatic Hydrocarbons	2,000 µg/mL	1 mL	$MeCl_2$:Benzene	16	CLPS-B
Haloethers & Phthalates	2,000 µg/mL	1 mL	Methylene chloride	13	CLPS-C
Chlorinated/Nitrated Hydrocarbons	2,000 µg/mL	1 mL	Methylene chloride	13	CLPS-D
Additional Analytes	2,000 µg/mL	1 mL	Methylene chloride	7	CLPS-G
Base/Neutral Surrogate	1,000 µg/mL	1 mL	$MeCl_2$:Acetone	3	CLPS-SB
Base/Neutral Surrogate	1,000 µg/mL	5 mL	$MeCl_2$:Acetone	3	CLPS-SB5
Base/Neutral Surrogate (High Level)	5,000 µg/mL	1 mL	$MeCl_2$:Acetone:Benzene	3	CLPS-SBH
Base/Neutral Surrogate (High Level)	5,000 µg/mL	5 mL	$MeCl_2$:Acetone:Benzene	3	CLPS-SBH5
Base/Neutral Surrogate, Tinted (High Level)	Multiple	5 mL	$MeCl_2$:Acetone:Benzene	4	CLPS-SBH5-TI
Acid Surrogates	2,000 µg/mL	1 mL	Methanol	3	CLPS-SA
Acid Surrogates	2,000 µg/mL	5 mL	Methanol	3	CLPS-SA5
Acid Surrogates (High Level)	10,000 µg/mL	1 mL	Methanol	3	CLPS-SAH
Acid Extractable Surrogates	10,000 µg/mL	5 mL	Methanol	3	CLPS-SAH5

US EPA Semivolatiles (cont'd)

Method 600 Series (cont'd)					
Description	**Concentration**	**Volume**	**Matrix**	**# of Comp.**	**Part #**
Internal Standards	4,000 µg/mL	1 mL	Methylene chloride	6	CLPS-I
BNA Internal Standards	4,000 µg/mL	5 mL	Methylene chloride	6	CLPS-I5
Internal Standards	2,000 µg/mL	2 mL	Methylene chloride	6	CLPS-I2
Alternate Internal Standard	2,000 µg/mL	1 mL	Methylene chloride	6	CLPS-I90
Acids Matrix Spike	2,000 µg/mL	1 mL	Methanol	5	CLPS-MSA
Acids Matrix Spike	2,000 µg/mL	5 mL	Methanol	5	CLPS-MSA5
Acids Extractable Matrix Spike	Multiple	1 mL	Methanol	6	CLPS-MSA15-TI
Base/Neutral Matrix Spike	1,000 µg/mL	1 mL	Methanol	6	CLPS-MSB
Base/Neutral Matrix Spike Tinted	1,000 µg/mL	1 mL	Methanol	7	CLPS-MSB-TI
Semivolatile GC/MS Tuning Standard	2,500 µg/mL	1 mL	Methanol	1	CLPS-T
Semivolatile GC/MS Tuning Standard	2,500 µg/mL	1 mL	Methylene chloride	4	CLPS-T4

Method 8000 Series					
Description	**Concentration**	**Volume**	**Matrix**	**# of Comp.**	**Part #**
Method 8100					
Polynuclear Aromatic Hydrocarbons	2,000 µg/mL	1 mL	$MeCl_2$:Benzene	16	CLPS-B
Method 8270C					
Analytes	2,000 µg/mL	1 mL	Methylene chloride	11	CLPS-A
Haloethers & Phthalates	2,000 µg/mL	1 mL	Methylene chloride	13	CLPS-C
Chlorinated/Nitrated Hydrocarbons Mix	2,000 µg/mL	1 mL	Methylene chloride	13	CLPS-D
Additional Analytes	2,000 µg/mL	1 mL	Methylene chloride	7	CLPS-G

The 76 Big Mix

The most routinely analyzed semivolatile compounds in one ampule. All compounds checked on our GC/MS ensuring the highest quality at an affordable price.

Description	Concentration	Volume	Matrix	# of Comp.	Part #
Semivolatile Organics Mix	1,000 µg/mL*	1 mL	Methylene chloride	76	76-BIG-MIX

* 3-Methylphenol and 4-Methylphenol are each at 500 µg/mL

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US EPA Semivolatiles (cont'd)

CLP Series					
Description	**Concentration**	**Volume**	**Matrix**	**# of Comp.**	**Part #**
Method 8100					
Semivolatile Control Sample, Low Level	2,000 µg/mL	1 mL	Methanol	3	CLPS-LC-ALCS
Acid Surrogate Standard	2,000 µg/mL	1 mL	Methanol	4	CLP90-SA
Acid Surrogate Standard	2,000 µg/mL	5 mL	Methanol	4	CLP90-SA5
High Concentration Acid Surrogates	7,500 µg/mL	1 mL	Methanol	4	CLP90-75SA
Semivolatile Acid Surrogates	7,500 µg/mL	5 mL	Methanol	4	CLP90-75SA5
Acid Surrogates	2,000 µg/mL	1 mL	Methanol	3	CLPS-SA
Acid Surrogates	2,000 µg/mL	5 mL	Methanol	3	CLPS-SA5
Acid Surrogates (High Level)	10,000 µg/mL	1 mL	Methanol	3	CLPS-SAH
Acid Extractable Surrogates	10,000 µg/mL	5 mL	Methanol	3	CLPS-SAH5
Base/Neutral Surrogates	1,000 µg/mL	1 mL	$MeCl_2$:Acetone	4	CLP90-SB
Base/Neutral Surrogates	1,000 µg/mL	5 mL	$MeCl_2$:Acetone	4	CLP90-SB5
High Concentration Base/Neutral Surrogates	5,000 µg/mL	1 mL	$MeCl_2$:Acetone:Benzene	4	CLP90-SBH
High Concentration Base/Neutral Surrogates	5,000 µg/mL	5 mL	$MeCl_2$:Acetone:Benzene	4	CLP90-SBH5
Combination Semivolatile Surrogates	Multiple	1 mL	$MeCl_2$:Acetone	6	CLPS-SURR
Combination Semivolatile Surrogate, Tinted	Multiple	1 mL	$MeCl_2$:Acetone	9	CLP90-SURR-TI

US EPA Volatiles

Analytical Standards for Drinking Water, Wastewater and Solid Waste

Single & Multi-Component Standards for GC & GC/MS

Designed for Methods:

500 Series • 600 Series • 8000 Series • CLP Series

For additional product information, please visit www.spexcertiprep.com/organic-standards/volatiles.

Method 500 Series					
Description	**Concentration**	**Volume**	**Matrix**	**# of Comp.**	**Part #**
Method 502					
Mix B-Purgeable Gases (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	6	5022-BH
Mix B-Purgeable Gases	200 µg/mL	1 mL	Methanol-P&T	6	5022-B
Trihalomethanes (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	4	THM-XH
Trihalomethanes	200 µg/mL	1 mL	Methanol-P&T	4	THM-X
Method 524					
Method 524.3 Mix A	2,000 µg/mL	1 mL	Methanol-P&T	6	5243-G
Method 524.3 Supplemental Mix	2,000 µg/mL	1 mL	Methanol	8	5243-A
UCMR-3 Method 524.3 Standard	Multiple	1 mL	Methanol-P&T	9	UCMR-3
Combination Mix - Analyte Mixes A, C & D	2,000 µg/mL	1 mL	Methanol-P&T	54	5242-VCX
EPA Method 524.2 Volatile Calibration Standard	200 µg/mL	1 mL	Methanol-P&T	54	5242-VCX-200
Method 524.2-Rev. 4	200 µg/mL	1 mL	Methanol-P&T	24	5242-R4200
Method 524.2-Rev. 4 (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	24	5242-R4

US EPA Volatiles (cont'd)

Method 500 Series (cont'd)					
Description	**Concentration**	**Volume**	**Matrix**	**# of Comp.**	**Part #**
Method 524 (cont'd)					
Fortification Solution	1,000 µg/mL	1 mL	Methanol-P&T	3	5242-F
GC/MS Tuning Standard (High Level)	2,500 µg/mL	1 mL	Methanol-P&T	1	CLPV-TH
4-Bromofluorobenzene	1,000 µg/mL	1 mL	Methanol-P&T	1	S-550
Method 524.3 Mix B	2,000 µg/mL	1 mL	Methanol	69	5243-VCM
Internal Standard	2,000 µg/mL	1 mL	Methanol-P&T	1	5242-I
Surrogate Standard	1,000 µg/mL	1 mL	Methanol-P&T	2	5242-S
Internal Standard	2,000 µg/mL	1 mL	Methanol-P&T	3	5243-I
Method 551					
Chlorinated Disinfection By-Products, Solvents and Trihalomethanes	2,000 µg/mL	1 mL	Acetone	15	5511-A
Halogenated Pesticides and Herbicides Mix	2,000 µg/mL	1 mL	Acetone	16	5511-PH
Internal Standard	10,000 µg/mL	1 mL	Acetone	1	5511-I
Laboratory Performance Check Standard	Multiple	1 mL	Methyl tert-butyl ether	7	5511-PC

Method 600 Series					
Description	**Concentration**	**Volume**	**Matrix**	**# of Comp.**	**Part #**
Method 601					
Volatile Organics Combination Mix	200 µg/mL	1 mL	Methanol-P&T	23	601-A
Mix B-Purgeable Gases (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	6	5022-BH
Mix B-Purgeable Gases	200 µg/mL	1 mL	Methanol-P&T	6	5022-B
Method 602					
Purgeable Aromatics for Gasoline Identification	2,000 µg/mL	1 mL	Methanol-P&T	11	P-GAS
BTEX Standard (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	6	BTEX-H
BTEX Standard	200 µg/mL	1 mL	Methanol-P&T	6	BTEX

US EPA Volatiles (cont'd)

Method 600 Series (cont'd)					
Description	**Concentration**	**Volume**	**Matrix**	**# of Comp.**	**Part #**
Method 602 (cont'd)					
Alternate BTEX Standard	Multiple	1 mL	Methanol-P&T	6	BTEX-2-1H
Internal Standard	200 µg/mL	1 mL	Methanol-P&T	1	602-I
Method 603					
Acrolein and Acrylonitrile	2,000 µg/mL	1 mL	H_2O	2	603-X
Acrolein and Acrylonitrile	2,000 µg/mL	1 mL	Methanol-P&T	2	603-XM
Methanol 624					
Volatile Analyte Mix A (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	15	CLPV-AH
Volatile Analyte Mix A	200 µg/mL	1 mL	Methanol-P&T	15	CLPV-A
Mix B-Purgeable Gases (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	5	624-BH
Mix B-Purgeable Gases	200 µg/mL	1 mL	Methanol-P&T	5	624-B
Mix C (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	8	624-CH
Mix C	200 µg/mL	1 mL	Methanol-P&T	8	624-C
Mix D (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	3	624-DH
Mix D	200 µg/mL	1 mL	Methanol-P&T	3	624-D
Combination Mix Analyte Mix A	2,000 µg/mL	1 mL	Methanol-P&T	26	624-A
Internal Standard	1,000 µg/mL	1 mL	Methanol-P&T	3	624-I
Surrogate Standard	1,000 µg/mL	1 mL	Methanol-P&T	3	624-S

US EPA Volatiles (cont'd)

Method 8000 Series					
Description	**Concentration**	**Volume**	**Matrix**	**# of Comp.**	**Part #**
Method 8011					
EDB/DBCP (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	2	504-AH
Method 8015					
Alcohols Mix	2,000 µg/mL	1 mL	H_2O	9	8015B-A
Oxygenates Calibration Mix	2,000 µg/mL	1 mL	Methanol-P&T	5	8015-OX
Acrolein and Acrylonitrile	2,000 µg/mL	1 mL	H_2O	2	603-X
Acrolein and Acrylonitrile	2,000 µg/mL	1 mL	Methanol-P&T	2	603-XM
Method 8021					
Volatile Organics Combination Mix	2,000 µg/mL	1 mL	Methanol-P&T	54	5242-VCX
EPA Method 524.2 Volatile Calibration Standard	200 µg/mL	1 mL	Methanol-P&T	54	5242-VCX-200
Mix A for GC/PID	2,000 µg/mL	1 mL	Methanol-P&T	10	8020-A
Mix B-Purgeable Gases (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	6	5022-BH
Mix B-Purgeable Gases	200 µg/mL	1 mL	Methanol-P&T	6	5022-B
Internal Standard	200 µg/mL	1 mL	Methanol-P&T	1	602-I
Internal Standard	1,000 µg/mL	1 mL	Methanol-P&T	2	5022-I
Surrogate Standard	1,000 µg/mL	1 mL	Methanol-P&T	1	8021B-S
Method 8260					
Volatile Analyte Mix A (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	15	CLPV-AH
Volatile Analyte Mix A	200 µg/mL	1 mL	Methanol-P&T	15	CLPV-A
Mix B-Purgeable Gases (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	6	5022-BH
Mix B-Purgeable Gases	200 µg/mL	1 mL	Methanol-P&T	6	5022-B
Volatile Analyte Mix C (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	22	5242-CH
Volatile Analyte Mix D (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	17	5242-DH
Volatile Organics Combination Mix	2,000 µg/mL	1 mL	Methanol-P&T	54	5242-VCX
EPA Method 524.2 Volatile Calibration Standard	200 µg/mL	1 mL	Methanol-P&T	54	5242-VCX-200

US EPA Volatiles (cont'd)

"Long List" Appendix of Compounds for 8260B					
Description	**Concentration**	**Volume**	**Matrix**	**# of Comp.**	**Part #**
Method 8260B					
Mix E (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	7	8260-EH
Mix E	200 µg/mL	1 mL	Methanol-P&T	7	8260-E
2-Chloroethylvinyl Ether Stock Standard	1,000 µg/mL	1 mL	Methanol-P&T	1	S-855
Vinyl Acetate Stock Standard	1,000 µg/mL	1 mL	Methanol-P&T	1	S-3800
Combined Stock Standard	2,000 µg/mL	1 mL	Methanol-P&T	2	CNVA
Ethylene Oxide Stock Standard	1,000 µg/mL	1 mL	Methanol-P&T	1	S-1960
Xylene-Free Chloroprene Stock Standard	1,000 µg/mL	1 mL	Methanol-P&T	1	S-930

CLP Series					
Description	**Concentration**	**Volume**	**Matrix**	**# of Comp.**	**Part #**
Method 8260B					
Volatiles Mix for OML04.1	2,000 µg/mL	1 mL	Methanol-P&T	44	CLPV-43CH
Mix B-Purgeable Gases (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	6	5022-BH
Mix B-Purgeable Gases	200 µg/mL	1 mL	Methanol-P&T	6	5022-B
Volatile Organics Combination Standard	2,000 µg/mL	1 mL	Methanol-P&T	32	CLPV-32CH
Mix B-Purgeable Gases (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	4	CLPV-BH
Volatiles Analyte Mix A (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	15	CLPV-AH
Volatiles Analyte Mix A	200 µg/mL	1 mL	Methanol-P&T	15	CLPV-A
Volatiles Mix D (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	8	CLPV-D90H
Volatiles Mix D for CLP SOW Alternate (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	9	CLPV-DH
Supplementary Volatiles Mix for CLP OLM04.1	200 µg/mL	1 mL	Methanol-P&T	12	CLPV-041X
Combined Stock Standards	2,000 µg/mL	1 mL	Methanol-P&T	2	CNVA

US EPA Volatiles (cont'd)

CLP Series (cont'd)					
Description	**Concentration**	**Volume**	**Matrix**	**# of Comp.**	**Part #**
Method 8260B (cont'd)					
Surrogate Standard (High Level)	2,500 µg/mL	1 mL	Methanol-P&T	3	CLPV-SH
Volatile Matrix Spike (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	5	CLPV-MH
GC/MS Tuning Standard (BFB) (High Level)	2,500 µg/mL	1 mL	Methanol-P&T	1	CLPV-TH

The 60 Big Mix

The most routinely analyzed volatile compounds in one ampule. All compounds checked on our GC/MS ensuring the highest quality at an affordable price.

Description	Concentration	Volume	Matrix	# of Comp.	Part #
Volatile Organics Mix	1,000 µg/mL	1 mL	Methanol-P&T	60	60-BIG-MIX
Volatile Organics Mix (Low Level)	200 µg/mL	1 mL	Methanol-P&T	60	60-BIG-MIX-200
Volatile Organics Mix (High Level)	2,000 µg/mL	1 mL	Methanol-P&T	60	60-BIG-MIX-2000

The Big Mix

Volatile organics mix with 76 certified components.

Description	Concentration	Volume	Matrix	# of Comp.	Part #
Volatile Organics Mix	2,000 µg/mL	1 mL	Methanol-P&T	76	8260-BIG-MIX

USP <232>, <233> & <2232> Elemental Impurities

Analytical Standards for USP <232>, <233> & <2232> Elemental Impurities

The new guidelines set by the United States Pharmacopeia (USP) and the International Conference on Harmonization (ICH) have pushed the pharmaceutical and nutraceutical industries to provide accurate, quantifiable results for metal analysis in drugs, pharmaceutical substances and raw materials.

USP <232> outlines new limits in pharmaceutical products for arsenic, cadmium, lead, and mercury. The proposed procedures focus on the use of ICP-MS (Inductively Coupled Plasma/Mass Spectrometry) for the analysis of low level impurities. ICP-MS instrumentation, along with accurate ICP-MS standards, allow for increased efficiency and accuracy of the analysis necessary to comply with the new regulations. In addition to the changes enacted by the USP, the ICH is also planning to release similar guidelines on elemental impurities in pharmaceutical materials and products.

Developed in accordance with USP <232> Elemental Impurities, SPEX CertiPrep is proud to offer these additions to our Consumer Safety Compliance Standards line. These standards can be used as a calibration or check standard to verify Oral Daily Dose PDE, Parenteral Component Limit or Parenteral Daily Dose PDE. Our extensive experience in creating quality trace metal standards, coupled with your ICP-MS analysis, will ensure your company will remain compliant with the new and changing regulations.

Oral Elemental Impurities A				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Cadmium	5 mg/kg	125 mL	5% HNO_3/1% HCl	USP-TXM2A
Mercury	30 mg/kg			
Lead	5 mg/kg			
Arsenic	15 mg/kg			

Precious Metal Impurities B (with Os)				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Iridium	100 mg/kg for each component in the mix	125 mL	15% HCl	USP-TXM3
Osmium				
Palladium				
Platinum				
Rhodium				
Ruthenium				

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USP <232>,<233> & <2332> Elemental Impurities (cont'd)

Precious Metal Impurities B (without Os)				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Iridium	100 mg/kg for each component in the mix	125 mL	15% HCl	USP-TXM4
Palladium				
Platinum				
Rhodium				
Ruthenium				

Oral Elemental Impurities C				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Copper	3,000 mg/kg	125 mL	5% HNO_3	USP-TXM5A
Nickel	200 mg/kg			
Molybdenum	3,000 mg/kg			
Vanadium	100 mg/kg			
Chromium	11,000 mg/kg			

Parenteral Elemental Impurities C				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Copper	300 mg/kg	125 mL	5% HNO_3	USP-TXM5B
Nickel	20 mg/kg			
Molybdenum	1,500 mg/kg			
Vanadium	10 mg/kg			
Chromium	1,100 mg/kg			

Parenteral Elemental Impurities D				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Lead	5 mg/kg	125 mL	5% HNO_3 /1% HCL	USP-TXM6A
Cadmium	2 mg/kg			
Arsenic	15 mg/kg			
Mercury	3 mg/kg			

USP <232>,<233> & <2332> Elemental Impurities (cont'd)

USP 232 Revision 40 Oral 2A				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Cobalt	50 mg/kg	125 mL	2% HNO_3	USP-ORAL2A
Nickel	200 mg/kg			
Vanadium	100 mg/kg			

USP 232 Revision 40 Oral 2B Mix 1				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Selenium	150 mg/kg	125 mL	2% HNO_3	USP-ORAL2B-1
Silver	150 mg/kg			
Thallium	8 mg/kg			

USP 232 Revision 40 Oral 2B Mix 2				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Gold	100 mg/kg for each component in the mix	125 mL	15% HCl	USP-ORAL2B-2
Iridium				
Osmium				
Palladium				
Platinum				
Rhodium				
Ruthenium				

USP 232 Revision 40 Oral 3 Mix 1				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Barium	1,400 mg/kg	125 mL	10% HNO_3	USP-ORAL3-1
Chromium	11,000 mg/kg			
Copper	3,000 mg/kg			
Lithium	550 mg/kg			

USP 232 Revision 40 Oral 3 Mix 2				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Antimony	1,200 mg/kg	125 mL	5% HNO_3/tr. Tartaric Acid/tr. HF	USP-ORAL3-2
Molybdenum	3,000 mg/kg			
Tin	6,000 mg/kg			

USP <232>,<233> & <2332> Elemental Impurities (cont'd)

USP 232 Revision 40 Parenteral 2A				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Cobalt	5 mg/kg	125 mL	2% HNO_3	USP-PARENT2A
Nickel	20 mg/kg			
Vanadium	10 mg/kg			

USP 232 Revision 40 Parenteral 2B Mix 1				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Selenium	80 mg/kg	125 mL	2% HNO3	USP-PARENT2B-1
Silver	10 mg/kg			
Thallium	8 mg/kg			

USP 232 Revision 40 Parenteral 2B Mix 2				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Gold	100 mg/kg	125 mL	10% HCl	USP-PARENT2B-2
Iridium	10 mg/kg			
Osmium	10 mg/kg			
Palladium	10 mg/kg			
Platinum	10 mg/kg			
Rhodium	10 mg/kg			
Ruthenium	10 mg/kg			

USP 232 Revision 40 Parenteral 3				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Antimony	90 mg/kg	125 mL	5% HNO_3 /tr. Tartaric Acid/tr. HF	USP-PARENT3
Barium	700 mg/kg			
Chromium	1,100 mg/kg			
Copper	300 mg/kg			
Lithium	250 mg/kg			
Molybdenum	1,500 mg/kg			
Tin	600 mg/kg			

Heavy Metals & Minerals Testing Kits

For Routinely Analyzed Heavy Metals and Minerals

Introducing SPEX CertiPrep's Heavy Metals Testing Kit and Minerals Testing Kit. The kits are designed for routinely analyzed heavy metals and minerals.

All kits come with six, 30 mL ICP-MS grade single element standards which includes a nitric acid blank for easy dilution. Conveniently packaged in a sturdy, heavy-duty carton, these kits are perfect to store on a lab bench or in a cabinet. The 30 mL standards ship non-hazardous, saving money on shipping costs. The smaller volume also allows for less hazardous waste should the standard expire before its contents are used. Contact us for further information.

For additional product information, please visit www.spexcertiprep.com/testing-kits.

Heavy Metals Testing Kit				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Arsenic (CLAS2-2M)	1,000 µg/mL	30 mL	2% HNO_3	SPXHM-KIT
Cadmium (CLCD2-2M)	1,000 µg/mL		2% HNO_3	
Chromium (CLCR2-2M)	1,000 µg/mL		2% HNO_3	
Lead (CLPB2-2M)	1,000 µg/mL		10% HNO_3	
Mercury (CLHG4-2M)	1,000 µg/mL		2% HNO_3	
Nitric Acid Blank (CLBLK-NHO3M)	—		—	

Minerals Testing Kit				
Description	**Concentration**	**Volume**	**Matrix**	**Part #**
Calcium (CLCA2-2M)	1,000 µg/mL	30 mL	2% HNO_3	SPXMT-KIT
Iron (CLFE2-2M)	1,000 µg/mL		2% HNO_3	
Magnesium (CLMG2-2M)	1,000 µg/mL		2% HNO_3	
Potassium (CLK2-2M)	1,000 µg/mL		2% HNO_3	
Sodium (CLNA2-2M)	1,000 µg/mL		2% HNO_3	
Nitric Acid Blank (CLBLK-HNO3M)	—		—	

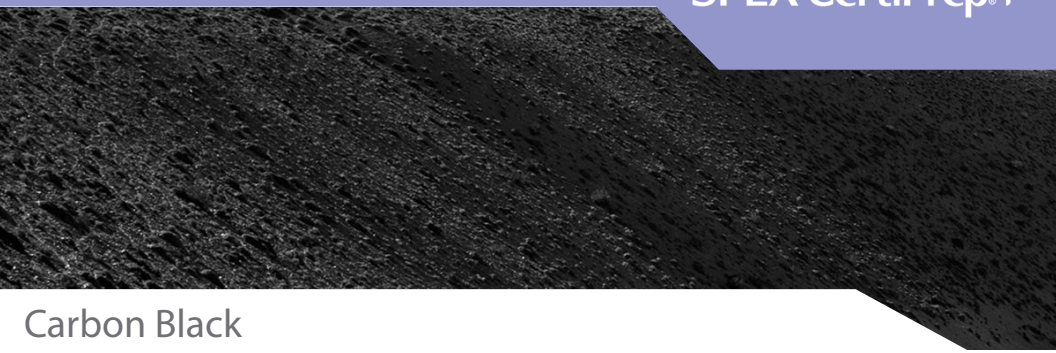
European Pesticide Mix

Addresses European Commission's Regulation 2017/170

SPEX CertiPrep introduces a new pesticide mix to address the European Commission's Regulation 2017/170. The Commission is amending Annexes II, III and V to Regulation (EC) No 396/2005 of the European Parliament and of the Council as regards to maximum residue levels for bifenthrin, carbetamide, cinidon-ethyl, fenpropimorph and triflusulfuron in or on certain products.

For additional product information, please visit www.spexcertiprep.com.

European Pesticide Mix					
Description	**CAS #**	**Concentration**	**Volume**	**Matrix**	**Part #**
Bifenthrin	82657-04-3	100 µg/mL for each component in the mix	1 mL	Acetonitrile	EU-2017-170
Carbetamide	16118-49-3				
Cinidon-ethyl	142891-20-1				
Fenpropimorph	67564-91-4				
Triflusulfuron-methyl	126535-15-7				



Carbon Black

Carbon Black Reagents for ASTM D1510

Details Matter...

Our sodium thiosulfate solutions are prepared from ACS Grade, micro-crystalline materials. In order to maximize shelf life, our matrix is prepared using double-deionized, ASTM Type I Water.

Our iodine solutions are prepared from ACS Grade potassium iodide and crystalline elemental iodine. To guarantee a clean and stable product, our matrix is prepared using double-deionized, ASTM Type I Water.

All solutions are prepared gravimetrically using high accuracy analytical balances to ensure precise target concentrations. Each batch is thoroughly homogenized using a high speed industrial mixer to ensure reliable results from the first bottle to the last.

We are titrating our samples on our automated titrator. The automated dosing drive uses 10,000 steps over a 20 mL volume, so its dosing increment *can be* as small as 2 µl. For these applications, we are using a minimum dose of 10 µl for the sodium thiosulfate endpoint and 4 µl for the iodine endpoint. These settings achieve the extremely precise measurements for each titration, while also staying within the parameters of the dosing unit.

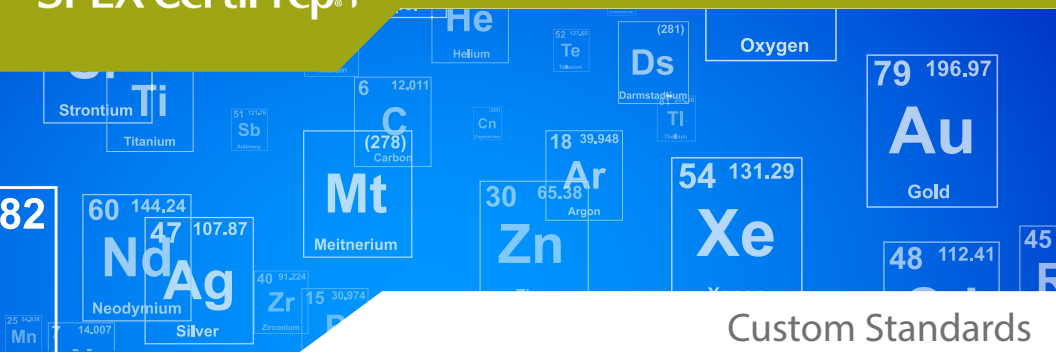
As stated on our Certificate of Analysis, the sodium thiosulfate is run against a 0.1 N potassium dichromate solution. The exact normality of this solution is calculated by comparing it to NIST potassium dichromate. A set of 6 samples are run that must all be within the nominal value of 0.0394 N ± 0.00008 N.

The certified sodium thiosulfate is then used to titrate iodine. A set of 3 samples are run that must all be within the nominal value of 0.0473 N ± 0.00003 N.

Before releasing either of these reagents for packaging, we run QC checks with a previous lot to ensure accuracy over time.

For additional product information, please visit www.spexcertiprep.com/knowledge-base/carbon-black-reagents.

Description	Packaging	Volume	Part #
0.0394 N Sodium Thiosulfate	Cubitainer	1 gallon	182002
0.0473 N Iodine	Amber Glass Bottle	1 gallon	183134



Custom Standards

Inorganic and Organic Custom Standards

Tired of Mixing Your Own Standards? Let SPEX CertiPrep Save You Valuable Time!

SPEX CertiPrep offers Custom Certified Reference Materials (CRMs) because we realize that no two laboratories face exactly the same samples or have precisely the same requirements. With SPEX CertiPrep's custom CRM program, you can create custom standards to meet your specific laboratory needs. Our specialists will be happy to discuss combinations of analytes, concentrations and preferred matrices with you. Our chemists will then design the most compatible, stable mixture using our comprehensive supply of starting materials and certified solutions.

DQS and A2LA Stamp of Approval

- Quality system complies with ISO 9001:2015 - certified by DQS
- SPEX CertiPrep is accredited by A2LA to ISO/IEC 17025:2005 and ISO Guide 34:2009

Features of SPEX CertiPrep Custom Standards

- Single and multi-component standards manufactured to meet your exact specifications
- Packaged in a variety of convenient sizes and packaging types
- Concentration, accuracy and stability of components guaranteed
- Private labeling available
- SDS available in multiple languages

Benefits of SPEX CertiPrep Custom Standards

- Customized for your application
- Inorganic customs certified by AA, ICP or ICP-MS
- Organic customs certified by GC, GC/MS, HPLC, or LC/MS
- High quality starting materials, tested for impurities prior to use
- Over 60 years of experience in manufacturing CRMs

SPEX CertiPrep Custom Standards can be used for:

- AA Atomic Absorption
- ICP Inductively Coupled Plasma
- ICP-MS Inductively Coupled Plasma/Mass Spectrometry
- GC Gas Chromatography
- GC/MS Gas Chromatography/Mass Spectrometry
- HPLC High Performance Liquid Chromatography
- LC/MS High Performance Liquid Chromatography/Mass Spectrometry

For additional details, please visit www.spexcertiprep.com/products/custom-standards.

Units of Measurement

Common Unit Prefixes								
Prefix	kilo	centi	milli	micro	nano	pico	femto	atto
Symbol	k	c	m	µ	n	p	f	a
Factor	10^{3}	10^{-2}	10^{-3}	10^{-6}	10^{-9}	10^{-12}	10^{-15}	10^{-18}
Equivalence	thousand	hundredth	thousandth	millionth	billionth	trillionth	quadrillionth	quintillionth

Weight to Weight Concentrations					
Name	Symbol	Equivalence			
Parts per thousand *	ppt*	g/kg	mg/g	µg/mg	ng/µg
Parts per million	ppm	mg/kg	µg/g	ng/mg	pg/µg
Parts per billion	ppb	µg/kg	ng/g	pg/mg	fg/µg
Parts per trillion **	ppt**	ng/kg	pg/g	fg/mg	ag/µg

Weight to Volume Concentrations					
Name	Symbol	Equivalence			
Parts per thousand *	ppt*	g/L	mg/mL	µg/µL	ng/nL
Parts per million	ppm	mg/L	µg/mL	ng/µL	pg/nL
Parts per billion	ppb	µg/L	ng/mL	pg/µL	fg/nL
Parts per trillion **	ppt**	ng/L	pg/mL	fg/µL	ag/nL

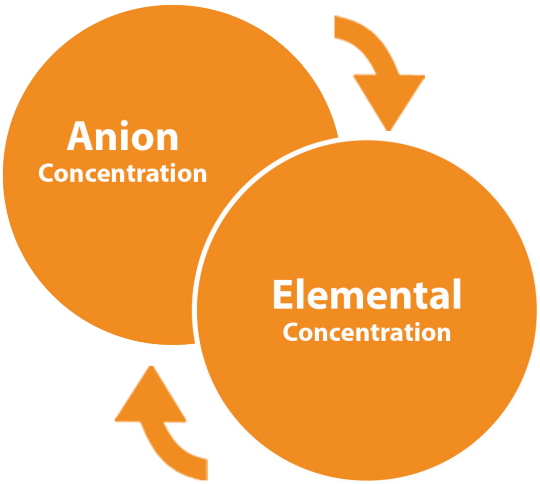
Concentration Conversions					
Unit	Symbol	ppt*	ppm	ppb	ppt**
1 part per thousand *	ppt*	-	1×10^{3}	1×10^{6}	1×10^{9}
1 part per million	ppm	1×10^{-3}	-	1×10^{3}	1×10^{6}
1 part per billion	ppb	1×10^{-6}	1×10^{-3}	-	1×10^{3}
1 part per trillion **	ppt**	1×10^{-9}	1×10^{-6}	1×10^{-3}	-

Temperature Scale			
Scale	Symbol	Convert To	Formula
Celsius	°C	Fahrenheit	°F = °C x 1.8 + 32
Celsius	°C	Kelvin	°K = °C + 273
Fahrenheit	°F	Celsius	°C = (°F - 32) / 1.8
Fahrenheit	°F	Kelvin	°K = (°F - 32) / 1.8 + 273
Kelvin	°K	Celsius	°C = °K - 273
Kelvin	°K	Fahrenheit	°F = 1.8 (°K - 273) + 32

** ppt = parts per thousand*
*** ppt = parts per trillion*

SPEX Lab Bench Tools (cont'd)

Helpful Hint: When calculating gravimetric factors for Ion Chromatography standards, remember that:



Anion Concentration		Elemental Concentration
1,000 µg/mL Nitrate	=	226 µg/mL Nitrogen
1,000 µg/mL Nitrite	=	305 µg/mL Nitrogen
1,000 µg/mL Phosphate	=	326 µg/mL Phosphorus
1,000 µg/mL Sulfate	=	334 µg/mL Sulfur
1,000 µg/mL Nitrogen as Nitrate	=	1,000 µg/mL Nitrogen
1,000 µg/mL Nitrogen as Nitrite	=	1,000 µg/mL Nitrogen
1,000 µg/mL Phosphorus as Phosphate	=	1,000 µg/mL Phosphorus
1,000 µg/mL Sulfur as Sulfate	=	1,000 µg/mL Sulfur

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From Your Bench to Our Bench

Bench Talk!

Have a question? Ask a Chemist!

Do you have a technical CRM question for our experienced chemists?

We have dedicated technical support to answer your CRM and lab questions.

Email us at AskAChemist@spex.com

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