

Analytical Standards for Hemp

- Pesticide Mixes and Kits
- Terpenes and Flavonoids
- Cannabinoids and DEA Controlled Substances
- Residual Solvents
- Heavy Metal Standards





Analytical Standards for Hemp

Spex CertiPrep offers ISO 17034 Certified Reference Materials (CRMs) for all of the common contaminants in hemp 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.



Organic and Inorganic
Certified Reference Materials



Analytical Standards
for Hemp



Supplied with a
Certificate of Analysis



ISO Accredited
Standards

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 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
Organochlorine Pesticides Mix	2,000 µg/mL	1 mL	Benzene	625-PH

Massachusetts Cannabis Pesticide Residue Mix 1 in LC/MS Acetonitrile

Component	CAS #	Component	CAS #
Bifenazate	149877-41-8	Imidacloprid	138261-41-3
Bifenthrin	82657-04-3	Sythane (Myclobutanil)	88671-89-0
Baythroid (Cyfluthrin)	68359-37-5	Spiromesifen	283594-90-1
Etoxazole	153233-91-1	Trifloxystrobin	141517-21-7
Imazalil	35554-44-0		
	Concentration	Volume	Part #
	100 µg/mL	1 mL	MA-CAN-1

Massachusetts Cannabis Pesticide Residue Mix 2 in LC/MS Acetonitrile

Component	CAS #	Component	CAS #
Abamectin	71751-41-2	lambda-Cyhalothrin	91465-08-6
Azadirachtin	11141-17-6	Paclobutrazol	76738-62-0
Azoxystrobin	131860-33-8	Permethrin	52645-53-1
Boscalid	188425-85-6	Piperonyl butoxide	51-03-6
Carbaryl	63-25-2	Pyrethrins (mix of isomers)	8003-34-7
Chlorfenapyr	122453-73-0	Spinosad	168316-95-8
Dinotefuran	165252-70-0	Spirotetramat	203313-25-1
	Concentration	Volume	Part #
	100 µg/mL	1 mL	MA-CAN-2

Carbamate Pesticides

Component	CAS #	Concentration	Volume	Matrix	Part #
Analyte Mix A	Multiple	100 µg/mL	1 mL	Acetonitrile	5311-A10

Pyrethroids/Pesticides

Component	CAS #	Concentration	Volume	Matrix	Part #
Allethrin	584-79-2	1,000 µg/mL	1 mL	Methanol-P&T	S-4240
Bifenthrin	82657-04-3	1,000 µg/mL	1 mL	Acetone	S-494
Bifenthrin	82657-04-3	1,000 µg/mL	1 mL	Acetonitrile	S-494-ACN
Deltamethrin	52918-63-5	1,000 µg/mL	1 mL	Methanol-P&T	S-3977
Fenpropathrin	39515-41-8	1,000 µg/mL	1 mL	Acetone	S-5781
tau-Fluvalinate	102851-06-9	1,000 µg/mL	1 mL	Acetone	S-4161
trans-Permethrin (mix of isomers)	61949-77-7	1,000 µg/mL	1 mL	Acetone	S-5732
d-(cis-trans)-Phenothrin	26002-80-2	1,000 µg/mL	1 mL	Acetone	S-3041
Pallethrin	23031-36-9	1,000 µg/mL	1 mL	Acetonitrile	LCS-5783
Resmethrin	10453-86-8	1,000 µg/mL	1 mL	Acetone	S-3252
Tetramethrin	7696-12-0	1,000 µg/mL	1 mL	Acetone	S-4251-AC
Tetramethrin	7696-12-0	1,000 µg/mL	1 mL	Methanol-P&T	S-4251

Pesticide Singles					
Component	CAS #	Concentration	Volume	Matrix	Part #
Bifenazate	149877-41-8	1,000 µg/mL	1 mL	Acetonitrile	S-6082
Carbaryl	63-25-2	1,000 µg/mL	1 mL	Acetonitrile	S-725
Chlormequat chloride	999-81-5	1,000 µg/mL	1 mL	HPLC Acetonitrile	LCS-4838
Daminozide	1596-84-5	1,000 µg/mL	1 mL	LC/MS Methanol	LCS-6654
Flubendiamide	272451-65-7	1,000 µg/mL	1 mL	HPLC Acetonitrile	LCS-5773-ACN
Imidacloprid	138261-41-3	1,000 µg/mL	1 mL	Acetone	S-2247
Maltodextrin	9050-36-6	1,000 µg/mL	1 mL	HPLC Water	LCS-5705
Maltose	6363-53-7	1,000 µg/mL	1 mL	HPLC Water	LCS-4188
beta-Myrcene	123-35-3	1,000 µg/mL	1 mL	Methanol	S-2654-MEOH
Paclobutrazol	76738-62-0	1,000 µg/mL	1 mL	HPLC Acetonitrile	LCS-4345-ACN
Permethrin (cis & trans)	52645-53-1	1,000 µg/mL	1 mL	Acetone	S-3000
Piperonyl butoxide	51-03-6	1,000 µg/mL	1 mL	HPLC Acetonitrile	LCS-3117-ACN
Pyrethrins (mix of isomers)	8003-34-7	1,000 µg/mL	1 mL	Acetonitrile	S-5506-ACN
Systhane (Myclobutanil)	88671-89-0	1,000 µg/mL	1 mL	HPLC Acetone	LCS-3306

AOAC Pesticide Standards

AOAC International started as the Association of Official Agricultural Chemists over a century ago and continues to serve as one of the primary method and standard developers for the analytical community when it comes to the area of agriculture. Their activities cover the safety of food and beverages, dietary supplements, feeds, soil, water, veterinary drugs, and other aspects of the agricultural process. Over the last few years, AOAC has issued guidance for screening pesticides in hemp. Spex AOAC CertiPrep standards reflect the list of pesticides under scrutiny for hemp testing.

AOAC Pesticide Standards	
Component	Part #
AOAC Pesticide Mix 1 with 23 components, 100 µg/mL in LC/MS Acetonitrile, 1 mL	AOAC-PEST-1
AOAC Pesticide Mix 2 with 12 components, 100 µg/mL in LC/MS Acetonitrile, 1 mL	AOAC-PEST-2
AOAC Pesticide Mix 3 with 14 components, 100 µg/mL in LC/MS Acetonitrile, 1 mL	AOAC-PEST-3
AOAC Pesticide Mix 4 with 16 components, 100 µg/mL in LC/MS Acetonitrile, 1 mL	AOAC-PEST-4
AOAC Pesticide Mix 5 with 5 components, 100 µg/mL in LC/MS Acetonitrile, 1 mL	AOAC-PEST-5
AOAC Pesticide Mix 6, Dibrom (Naled), 100 µg/mL in HPLC Acetonitrile, 1 mL	AOAC-PEST-6

USP <561> Standards

USP General Chapter <561> Articles of Botanical Origin

The United States Pharmacopeia (USP) creates standards for the monitoring of pharmaceutical and botanical products. General Chapter <561> Articles of Botanical Origin, outlines tests and specifications for the safety of botanical products. The chapter defines sampling procedures and tests for general characteristics for moisture, ash, starch and fiber. The chapter also describes methods for extractables and volatile compounds. In the interests of safety, USP <561> has procedures for the testing of targeted pesticides and Spex CertiPrep provides standards for that testing under the General Chapter <561>.

USP <561> Mix A in Acetonitrile					
Component	CAS #	Component	CAS #	Component	CAS #
Dimethyl-p-Nitrophenylphosphate	950-35-6	Permethrin	52645-53-1	Pyrethrins (mix of isomers)	8003-34-7
Imidan (Phosmet)	732-11-6	Phosalone	2310-17-0	Quinalphos	13593-03-8
Methyl parathion	298-00-0	Piperonyl butoxide	51-03-6	1,2,4,5-Tetrachloro-3-nitrobenzene	117-18-0
N-Desethyl-primiphos-methyl	67018-59-1	Pirimiphos-ethyl	23505-41-1	Bis(2,3,3,3-tetrachloropropyl) ether (S421)	127-90-2
Paraoxon	311-45-5	Pirimiphos-methyl	29232-93-7	Tetradifon	116-29-0
Pentachloroaniline	527-20-8	Procymidone	32809-16-8	Tokuthion/Prothiophos	34643-46-4
2,3,4,5,6-Pentachloroanisole	1825-21-4	Profenofos	41198-08-7		
Pentachloronitrobenzene	82-68-8	Prowl (Pendimethalin)	40487-42-1		
		Concentration	Volume	Part #	
		100 µg/mL	1 mL	USP-561-A	

USP <561> Mix B in Acetonitrile

Component	CAS #	Component	CAS #	Component	CAS #
alpha-BHC	319-84-6	Heptachlor	76-44-8	Methoxychlor	72-43-5
beta-BHC	319-85-7	Heptachlor epoxide (Isomer A)	28044-83-9	Mirex	2385-85-5
delta-BHC	319-86-8	Heptachlor epoxide (Isomer B)	1024-57-3	Monocrotophos	6923-22-4
gamma-BHC	58-89-9	Hexachlorobenzene	118-74-1	Parathion	56-38-2
Endosulfan sulfate	1031-07-8	Malaoxon	1634-78-2	Vinclozolin	50471-44-8
Endrin	72-20-8	Malathion	121-75-5		
Etrimfos	38260-54-7	Methamidophos	10265-92-6		
tau-Fluvalinate	102851-06-9	Methidathion	950-37-8		
		Concentration	Volume	Part #	
		100 µg/mL	1 mL	USP-561-B	

USP <561> Mix C in Acetonitrile

Component	CAS #	Component	CAS #	Component	CAS #
Acarol (Bromopropylate)	18181-80-1	Chlorpyrifos-ethyl	39475-55-3	Fenchlorphos	299-84-3
Azinphos-ethyl	2642-71-9	Chlorpyrifos-methyl	5598-13-0	Fenitrothion	122-14-5
Azinphos-methyl	86-50-0	lambda-Cyhalothrin	91465-08-6	Fensulfothion	115-90-2
Baythroid (Cyfluthrin)	68359-37-5	Cypermethrin	52315-07-8	Fenthion	55-38-9
Bromophos-ethyl	4824-78-6	Dichlofluanid	1085-98-9	Kelthane (Dicofol)	115-32-2
Bromophos-methyl	2104-96-3	Dyfonate (Fonofos)	944-22-9	Sanmarton	51630-58-1
Chlorfenvinfos	470-90-6	Ethion	563-12-2		
		Concentration	Volume	Part #	
		100 µg/mL	1 mL	USP-561-C	

USP <561> Mix D in Acetonitrile

Component	CAS #	Component	CAS #	Component	CAS #
Acephate	30560-19-1	o,p'-DDT	789-02-6	Dieldrin	60-57-1
Alachlor	15972-60-8	p,p'-DDD	72-54-8	Dimethoate	60-51-5
Aldrin	309-00-2	p,p'-DDE	72-55-9	Endosulfan I	959-98-8
alpha-Chlordane	5103-71-9	p,p'-DDT	50-29-3	Endosulfan II	33213-65-9
gamma-Chlordane	5103-74-2	Deltamethrin	52918-63-5	Omethoate	1113-02-6
o,p'-DDD	53-19-0	Diazinon	333-41-5	Oxychlordane	27304-13-8
o,p'-DDE	3424-82-6	Dichlorvos	62-73-7		
		Concentration	Volume	Part #	
		100 µg/mL	1 mL	USP-561-D	

USP <561> Mix E in LC/MS Acetonitrile

Component	CAS #	Component	CAS #	Component	CAS #
Fenchlorophos-oxon	3983-45-7	Fenthion sulfoxide	3761-41-9	Flucythrinate	70124-77-5
Fenpropathrin	39515-41-8	Fenthion-oxon	6552-12-1	Mecarbam	2595-54-2
Fensulfothion-oxon	6552-21-2	Fenthion-oxon-sulfone	14086-35-2	Methacrifos	62610-77-9
Fensulfothion-oxon-sulfone	6132-17-8	Fenthion-oxon-sulfoxide	6552-13-2	Methyl pentachlorophenyl sulfide	1825-19-0
Fensulfothion-sulfone	14255-72-2	Fenthion-sulfone	3761-42-0		
		Concentration	Volume	Part #	
		100 µg/mL	1 mL	USP-561-E	

USP <561> Mix F in Acetonitrile

Component	CAS #
Ziram	137-30-4
Concentration	Volume
100 µg/mL	1 mL
Part #	
USP-561-F	

USP <561> Mix G in Toluene

Component	CAS #
Epsilon-HCH	6108-10-7
Concentration	Volume
100 µg/mL	1 mL
Part #	
USP-561-G	

Terpenes

Terpenes					
Component	CAS #	Concentration	Volume	Matrix	Part #
Bisabolene	495-62-5	1,000 µg/mL	1 mL	Methanol-P&T	S-502
(-)-alpha-Bisabolol	23089-26-1	1,000 µg/mL	1 mL	Methanol	S-7598
Borneol	507-70-0	1,000 µg/mL	1 mL	Methanol-P&T	S-4570
(+)-Borneol	464-43-7	1,000 µg/mL	1 mL	Methanol-P&T	S-5093
(-)-Borneol	464-45-9	1,000 µg/mL	1 mL	Methanol	S-7587
D-Camphene	5794-03-6	1,000 µg/mL	1 mL	Methanol-P&T	S-710
Camphene (mix of isomers)	79-92-5	1,000 µg/mL	1 mL	Methanol	S-7599
Camphor	76-22-2	1,000 µg/mL	1 mL	Methanol-P&T	S-3925
(1R)-(+)-Camphor	464-49-3	1,000 µg/mL	1 mL	Methanol	S-7600
(1S)-(-)-Camphor	464-48-2	1,000 µg/mL	1 mL	Methanol	S-7601
3-Carene	13466-78-9	1,000 µg/mL	1 mL	Methanol-P&T	S-4171
(1S)-(+)-3-Carene	498-15-7	1,000 µg/mL	1 mL	Methanol	S-7602
trans-Caryophyllene	87-44-5	1,000 µg/mL	1 mL	Methanol	S-5690
(-)-Caryophyllene oxide	1139-30-6	1,000 µg/mL	1 mL	Methanol	S-7584
alpha-Cedrene	469-61-4	1,000 µg/mL	1 mL	Methanol	S-5691
(+)-Cedrol	77-53-2	1,000 µg/mL	1 mL	Methanol	S-7603
Citronellol	106-22-9	1,000 µg/mL	1 mL	Methanol-P&T	S-4868
(1R)-endo-(+)-Fenchyl alcohol	2217-02-9	1,000 µg/mL	1 mL	Methanol	S-7604
2-Ethyl-Fenchol	18368-91-7	1,000 µg/mL	1 mL	Ethanol	S-4952
Ethylenediamine	107-15-3	1,000 µg/mL	1 mL	HPLC Grade Water	LCS-1961
Eucalyptol	470-82-6	1,000 µg/mL	1 mL	Methanol	S-4352
Farnese (mix of isomers)	502-61-4	1,000 µg/mL	1 mL	Methanol-P&T	S-1989
Fenchone	1195-79-5	1,000 µg/mL	1 mL	Methanol-P&T	S-4569
(+)-Fenchone	4695-62-9	1,000 µg/mL	1 mL	Methanol	S-7585
L(-)-Fenchone	7787-20-4	1,000 µg/mL	1 mL	Methanol-P&T	S-5091
Geraniol	106-24-1	1,000 µg/mL	1 mL	Methanol-P&T	S-4866
Geranyl acetate	105-87-3	1,000 µg/mL	1 mL	Methanol	S-7605
Guaiool	489-86-1	1,000 µg/mL	1 mL	Methanol-P&T	S-5698
Hexahydrothymol	89-78-1	1,000 µg/mL	1 mL	Methanol	S-7588
alpha-Humulene	6753-98-6	1,000 µg/mL	1 mL	Methanol	S-5692
Isobomeol	124-76-5	1,000 µg/mL	1 mL	Methanol	S-4674
Isoprene	78-79-5	1,000 µg/mL	1 mL	Methanol-P&T	S-2300
p-Isopropyltoluene	99-87-6	1,000 µg/mL	1 mL	Methanol-P&T	S-2320
(-)-Isopulegol	89-79-2	1,000 µg/mL	1 mL	Methanol	S-7606
(R)-(+)-Limonene	5989-27-5	1,000 µg/mL	1 mL	Methanol-P&T	S-4021

Terpenes (continued)

Component	CAS #	Concentration	Volume	Matrix	Part #
Linalool	78-70-6	1,000 µg/mL	1 mL	Methanol	S-5133
Maltitol	585-88-6	1,000 µg/mL	1 mL	LCMS Grade Water	LCS-4348
Maltotriose	1109-28-0	1,000 µg/mL	1 mL	HPLC Grade Water	LCS-4859
p-Mentha-1,5-diene	99-83-2	1,000 µg/mL	1 mL	Methanol	S-4173
Menthol	2216-51-5	1,000 µg/mL	1 mL	Methanol-P&T	S-4669
beta-Myrcene	123-35-3	1,000 µg/mL	1 mL	Hexane	S-2654
Nerol	106-25-2	1,000 µg/mL	1 mL	Methanol	S-7607
cis-Nerolidol	3790-78-1	1,000 µg/mL	1 mL	Methanol	S-7608
trans-Nerolidol	40716-66-3	1,000 µg/mL	1 mL	Methanol	S-7609
Ocimene (mix of isomers)	13877-91-3	1,000 µg/mL	1 mL	Methanol	S-7515
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
(+)-Pulegone	89-82-7	1,000 µg/mL	1 mL	Methanol	S-5136
Sabinene	3387-41-5	1,000 µg/mL	1 mL	Methanol	S-6645
Sabinene hydrate	546-79-2	1,000 µg/mL	1 mL	Methanol	S-7610
Terpineol (mix of isomers)	8000-41-7	1,000 µg/mL	1 mL	Methanol	S-7611
alpha-Terpineol	10482-56-1	1,000 µg/mL	1 mL	Acetone	S-3356-AC
alpha-Terpineol	98-55-5	1,000 µg/mL	1 mL	Methanol-P&T	S-4145
alpha-Terpinene	99-86-5	1,000 µg/mL	1 mL	Methanol	S-5687
gamma-Terpinene	99-85-4	1,000 µg/mL	1 mL	Methanol	S-5688
2,6,10,14-Tetramethylpentadecane	1921-70-6	1,000 µg/mL	1 mL	Tetrachloroethylene	LCS-3125-TETCHET
Valencene	4630-07-3	1,000 µg/mL	1 mL	Methanol	S-7612

CAN-TERP Mix 1 in Methanol

Component	CAS #	Component	CAS #	Component	CAS #
(-)-alpha-Bisabolol	23089-26-1	Eucalyptol	470-82-6	Linalool	78-70-6
Camphene	79-92-5	Farnesene (mix of isomers)	502-61-4	p-Mentha-1,5-diene	99-83-2
Camphor	76-22-2	(+)-Fenchone	4695-62-9	beta-Myrcene	123-35-3
(1S)-(+)-3-Carene	498-15-7	Geranyl acetate	105-87-3	Nerol	106-25-2
(-)-Caryophyllene oxide	1139-30-6	Hexahydrothymol	89-78-1	cis-Nerolidol	3790-78-1
trans-Caryophyllene	87-44-5	Isoborneol	124-76-5	Ocimene (mix of isomers)	13877-91-3
(+)-Cedrol	77-53-2	(-)-Isopulegol	89-79-5	Valencene	4630-07-3
Concentration	Volume	Part #	Concentration	Volume	Part #
100 µg/mL	1 mL	CAN-TERP-MIX1	1,000 µg/mL	1 mL	CAN-TERP-MIX1H

CAN-TERP Mix 2 in Methanol

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

Concentration	Volume	Part #	Concentration	Volume	Part #
100 µg/mL	1 mL	CAN-TERP-MIX2	1,000 µg/mL	1 mL	CAN-TERP-MIX2H

CAN-TERP Kit in Methanol

Kit Contains					
CAN-TERP-MIX1			CAN-TERP-MIX2		
	Concentration	Volume	Part #		
	100 µg/mL	1 mL	CAN-TERP-KIT		

CAN-TERP Kit (High Level) in Methanol

Kit Contains					
CAN-TERP-MIX1H			CAN-TERP-MIX2H		
	Concentration	Volume	Part #		
	1,000 µg/mL	1 mL	CAN-TERP-KIT-H		

Flavonoid Standards and Compound Mix

Flavonoids are naturally occurring secondary metabolic products that can have important functions within plants and benefit consumers with health and healing properties. Similar to terpenes, flavonoids share a role in how we perceive cannabis and hemp through our senses. Flavonoids are not unique to the cannabis plant. They have been identified in nature, from flowers to fruits and vegetables. Researchers have started to investigate the potential therapeutic properties of individual cannabis and hemp flavonoids.

Many beneficial compounds are metabolites produced as an end product of chemical and biological processes. Metabolites are small molecules that have many functions including defense, pigments, pheromones, odorants, and catalysts. Primary metabolites are necessary for growth, development and reproduction. Flavonoids are secondary plant, algae or fungus metabolites composed of polyphenolic compounds. Secondary metabolites are not directly involved in critical processes but have secondary functions involving defense and pigmentation. We offer analytical standards for flavonoid analysis.

Flavonoid Standard Compound Mix					
Component	CAS #	Concentration	Volume	Matrix	Part #
Apigenin	520-36-5	1,000 µg/mL	1 mL	Dimethyl Sulfoxide	FLAVIN-1
Baicalin	21967-41-9				
(+)-Catechin	154-23-4				
Catechol	120-80-9				
Chrysin	480-40-0				
(-)-Epicatechin	490-46-0				
Epigallocatechin	989-51-5				
Isovitexin	38953-85-4				
Kaempferol	520-18-3				
Luteolin	491-70-3				
Myricetin	529-44-2				
Orientin	28608-75-5				
Quercetin	117-39-5				
Rutin	153-18-4				
Vitexin	3681-93-4				

We offer the additional analytical standards listed below for flavonoid analysis. Contact the Emerald Scientific team at 877.567.3598 x1 or via email at Sales@EmeraldScientific.com for details and to discuss your specific requirements.

Analytical Standards for Flavonoid Analysis	
Component	CAS #
Apigenin	520-36-5
+/- Catechin (as catechin hydrate)	7295-85-4
Catechol	120-80-9
(-)-Epicatechin	490-46-0
(-)-Epigallocatechin	970-74-1
Kaempferol	520-18-3
Luteolin	491-70-3
Myricetin	529-44-2
Quercetin	117-39-5
Vitexin	3681-93-4

Cannabinoids and DEA Controlled Substances

Cannabinoids and DEA Controlled Substances					
Component	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
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

Residual Solvents

Residual Solvents					
Component	CAS #	Concentration	Volume	Matrix	Part #
Acetone	67-64-1	1,000 µg/mL	1 mL	Methanol-P&T	S-140
Anisole	100-66-3	1,000 µg/mL	1 mL	Methanol	S-288
n-Butane	106-97-8	1,000 µg/mL	1 mL	Methanol-P&T	S-605
1-Butanol	71-36-3	1,000 µg/mL	1 mL	Methanol-P&T	S-610
2-Butanol	78-92-2	1,000 µg/mL	1 mL	Methanol-P&T	S-615
2-Butanone	78-93-3	1,000 µg/mL	1 mL	Methanol-P&T	S-620
Butyl acetate	123-86-4	1,000 µg/mL	1 mL	Methanol-P&T	S-635
2,2-Dimethylbutane	73-85-2	1,000 µg/mL	1 mL	Methanol-P&T	S-1614
2,3-Dimethylbutane	79-29-8	1,000 µg/mL	1 mL	Methanol-P&T	S-1615
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
Ether	60-29-7	1,000 µg/mL	1 mL	Methanol-P&T	S-1900
Ethyl acetate	141-78-6	1,000 µg/mL	1 mL	Methanol-P&T	S-1920
Ethyl formate	109-94-4	1,000 µg/mL	1 mL	Methanol-P&T	S-4279
Ethylbenzene	100-41-1	1,000 µg/mL	1 mL	Methanol-P&T	S-1940A
n-Heptane	142-82-5	1,000 µg/mL	1 mL	Methanol-P&T	S-2125
n-Hexane	110-54-3	1,000 µg/mL	1 mL	Methanol-P&T	S-2190
Isobutyl acetate	110-19-0	1,000 µg/mL	1 mL	Methanol-P&T	S-2274
Isopropyl acetate	108-21-4	1,000 µg/mL	1 mL	Methanol-P&T	S-2305
Isopropylbenzene	98-82-8	1,000 µg/mL	1 mL	Methanol-P&T	S-2315
Methane	74-82-8	1,000 µg/mL	1 mL	Methanol-P&T	S-2379
Methanol	67-56-1	1,000 µg/mL	1 mL	Water	S-2380
3-Methyl-1-butanol	123-51-3	1,000 µg/mL	1 mL	Methanol-P&T	S-2579
2-Methyl-1-propanol	78-83-1	1,000 µg/mL	1 mL	Methanol-P&T	S-2585
4-Methyl-2-pentanone	108-10-1	1,000 µg/mL	1 mL	Methanol-P&T	S-2600
Methyl acetate	79-20-9	1,000 µg/mL	1 mL	Methanol-P&T	S-3893
Methyl tertiary-butyl ether	1634-04-4	1,000 µg/mL	1 mL	Methanol-P&T	S-2455
2-Methylbutane	78-78-4	1,000 µg/mL	1 mL	Methanol-P&T	S-2462
Methylene chloride	75-09-2	1,000 µg/mL	1 mL	Methanol-P&T	S-2480
3-Methylpentane	96-14-0	1,000 µg/mL	1 mL	Methanol-P&T	S-2530
2-Methylpropane	75-28-5	1,000 µg/mL	1 mL	Methanol-P&T	S-2555

Residual Solvents (continued)

Component	CAS #	Concentration	Volume	Matrix	Part #
n-Pentane	109-66-0	1,000 µg/mL	1 mL	Methanol-P&T	S-2975
1-Pentanol	71-41-0	1,000 µg/mL	1 mL	Methanol-P&T	S-2980
1-Propanol	71-23-8	1,000 µg/mL	1 mL	Methanol-P&T	S-3160
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
Propyl acetate	109-60-4	1,000 µg/mL	1 mL	Methanol-P&T	S-3204
m-Xylene	108-38-3	1,000 µg/mL	1 mL	Methanol-P&T	S-3830
o-Xylene	95-47-6	1,000 µg/mL	1 mL	Methanol-P&T	S-3835
p-Xylene	106-42-3	1,000 µg/mL	1 mL	Methanol-P&T	S-3840
Xylene (mix of isomers)	1330-20-7	1,000 µg/mL	1 mL	Methanol-P&T	S-3845

Residual Solvent Mix in Dimethyl Sulfoxide

Component	CAS #	Component	CAS #	Component	CAS #
Acetone	67-64-1	Ethyl acetate	141-78-6	4-Methyl-2-pentanone	108-10-1
Anisole	100-66-3	Ethyl formate	109-94-4	Methyl acetate	79-20-9
1-Butanol	71-36-3	n-Heptane	142-82-5	Methyl tertiary-butyl ether	1634-04-4
2-Butanol	78-92-2	Isobutyl acetate	110-19-0	n-Pentane	109-66-0
2-Butanone	78-93-3	Isopropyl acetate	108-21-4	1-Pentanol	71-41-0
Butyl acetate	123-86-4	Isopropylbenzene	98-82-8	1-Propanol	71-23-8
Ethanol	64-17-5	3-Methyl-1-butanol	123-51-3	2-Propanol	67-63-0
Ether	60-29-7	2-Methyl-1-propanol	78-83-1	Propyl acetate	109-60-4
		Concentration	Volume	Part #	
		1,000 µg/mL	1 mL	USP-RS-C3A	

Arkansas Cannabis Residual Solvent Mix 3 in N,N-Dimethylacetamide

Component	Concentration	CAS #	Component	Concentration	CAS #
n-Butane	5,000 µg/mL	106-97-8	Ethylene oxide	50 µg/mL	75-21-8
2-Methylpropane	5,000 µg/mL	75-28-5	Propane	2,000 µg/mL	74-98-6
		Volume	Part #		
		1 mL	RS-AR-3		

Arkansas Cannabis Residual Solvent Mix 1 in N,N-Dimethylacetamide

Component	CAS #	Component	CAS #
Isopropyl acetate	108-21-4	2-Methylbutane	78-78-4
n-Pentane	109-66-0	2-Propanol (Isopropanol, Isopropyl alcohol)	67-63-0
Ether	60-29-7	2-Butanol	78-92-2
n-Heptane	142-82-5	2-Butanone	78-93-3
Ethanol	64-17-5	1-Pentanol	71-41-0
Ethyl acetate	141-78-6	1-Propanol	71-23-8
Acetone	67-64-1	1-Butanol	71-36-3
Methyl sulfoxide	67-68-5		

Concentration	Volume	Part #
5,000 µg/mL	1 mL	RS-AR-1

Arkansas Cannabis Residual Solvent Mix 2 in Dimethyl Sulfoxide

Component	Concentration	CAS #	Component	Concentration	CAS #
m-Xylene	2,170 µg/mL	108-38-3	Methylene chloride	600 µg/mL	75-09-2
p-Xylene	2,170 µg/mL	106-42-3	Ethylbenzene	2,170 µg/mL	100-41-4
1,2-Dimethoxyethane	100 µg/mL	110-71-4	Isopropylbenzene	70 µg/mL	98-82-8
o-Xylene	2,170 µg/mL	95-47-6	Cyclohexane	3,880 µg/mL	110-82-7
Toluene	890 µg/mL	108-88-3	Acetonitrile	410 µg/mL	75-05-8
Tetramethylene sulfone	160 µg/mL	126-33-0	Benzene	2 µg/mL	71-43-2
Tetrahydrofuran	720 µg/mL	109-99-9	2,3-Dimethylbutane	290 µg/mL	79-29-8
Dimethylformamide	880 µg/mL	68-12-2	3-Methylpentane	290 µg/mL	96-14-0
Pyridine	200 µg/mL	110-86-1	2-Methylpentane	290 µg/mL	107-83-5
n-Hexane	290 µg/mL	110-54-3	2,2-Dimethylbutane	290 µg/mL	75-83-2
N,N-Dimethylacetamide	1,090 µg/mL	127-19-5	1,4-Dioxane	380 µg/mL	123-91-1
Ethylene glycol	620 µg/mL	107-21-1	2-Ethoxyethanol	160 µg/mL	110-80-5
Methanol	3,000 µg/mL	67-56-1			

Volume	Part #
1 mL	RS-AR-2

Heavy Metal Standards for Hemp Testing

States are pushing for the cannabis industry to provide accurate, quantifiable results for heavy metals, specifically arsenic, cadmium, lead, and mercury for cannabis inhalation products and cannabis goods (i.e. edibles). California and Colorado have mandated the testing of cannabis for dangerous elemental impurities. The procedure focuses on the use of ICP-MS instrumentation, along with accurate ICP-MS standards, and allows for increased efficiency and accuracy of the analysis necessary to comply with the new state regulations.

Our extensive experience in creating quality trace metal standards, coupled with our ICP-MS analysis, will ensure your company will remain compliant with the new and changing regulations.

Inhalants are a well proven method for drug delivery first reported in the early 20th century. Inhalation therapy has become a mainstay in respiratory care since the inhaled drugs are localized to the target organs, which is not the case in injectable therapies. Since inhaled compounds are concentrated in the target organs, it also means that any contaminants are also concentrated in the lungs as well.

Inhalation Metal Mix for Cannabis Metal Analysis				
Element	Concentration	Volume	Matrix	Part #
Arsenic	2 mg/kg	125 mL	5% HNO ₃	CANN-INHL1
Cadmium	2 mg/kg			
Lead	5 mg/kg			
Mercury	1 mg/kg			

Impurities Metal Mix for Cannabis Metal Analysis				
Element	Concentration	Volume	Matrix	Part #
Arsenic	15 mg/kg	125 mL	5% HNO ₃ /1% HCl	CANN-EDBIL
Cadmium	5 mg/kg			
Lead	5 mg/kg			
Mercury	30 mg/kg			

Heavy Metal Standards

Element	Concentration	Volume	Matrix	Part #
Arsenic	1,000 µg/mL	125 mL	2% HNO ₃	PLAS2-2Y
Cadmium	1,000 µg/mL	125 mL	2% HNO ₃	PLCD2-2Y
Chromium	1,000 µg/mL	125 mL	2% HNO ₃	PLCR2-2Y
Lead	1,000 µg/mL	125 mL	2% HNO ₃	PLPB2-2Y
Mercury	1,000 µg/mL	125 mL	10% HNO ₃	PLHG4-2Y
Nickel	1,000 µg/mL	125 mL	2% HNO ₃	PLNI2-2Y
Silver	1,000 µg/mL	125 mL	2% HNO ₃	PLAG2-2Y
Thallium	1,000 µg/mL	125 mL	2% HNO ₃	PLTL2-2Y

Oral Elemental Impurities Mix A

Element	Concentration	Volume	Matrix	Part #
Arsenic	1.5 mg/kg	125 mL	5% HNO ₃	USP-TXM2
Cadmium	25 mg/kg			
Lead	5 mg/kg			
Mercury	15 mg/kg			

Heavy Metals Testing Kit

Element	Concentration	Volume	Matrix	Part #
Arsenic	1,000 µg/mL	30 mL	2% HNO ₃	SPXHM-KIT
Cadmium			2% HNO ₃	
Chromium			2% HNO ₃	
Lead			2% HNO ₃	
Mercury			10% HNO ₃	



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