

Refrigerants

Chlorofluorohydrocarbons (CFCs) are ozone-depleting substances that were used primarily in air-conditioning and refrigeration systems. Under the Clean Air Act, CFCs were to be totally phased out of production in the U.S. by January 1, 1996. In order to monitor various refrigerants that may be present in the environment, the following single & multi-component mixes are offered to help labs screen for these compounds.

Refrigerants (CFCs) (in 1 mL of Solvent, unless otherwise noted)

REFRIGERANTS (CFCs)	CAS NO.	QTY./CONC.	MATRIX	CAT. NO.	UNIT	PRICE
Bromochlorodifluoromethane	353-59-3	0.2 mg/mL	MeOH	M-REF-X-01	1 mL	\$ 20
Bromotrifluoromethane (Freon #13b1)	75-63-8	0.2 mg/mL	MeOH	M-REF-01	1 mL	8
1-Chloro-1,1-difluoroethane (Freon #142b)	75-68-3	0.2 mg/mL	MeOH	M-REF-02	1 mL	20
2-Chloro-1,1,1,2-tetrafluoroethane (Freon #124)	2837-89-0	0.2 mg/mL	MeOH	M-REF-X-02	1 mL	20
Chlorodifluoromethane (Freon #22)	75-45-6	0.2 mg/mL	MeOH	M-REF-03	1 mL	8
Chloroethane (Freon #160)	75-00-3	0.2 mg/mL	MeOH	M-REF-04	1 mL	8
Chloromethane	74-87-3	0.2 mg/mL	MeOH	M-REF-05	1 mL	8
Chloropentafluoroethane	76-15-3	0.2 mg/mL	MeOH	M-REF-06	1 mL	20
Chlorotrifluoromethane (Freon #13)	75-72-9	0.2 mg/mL	MeOH	M-REF-07	1 mL	8
1,2-Dibromotetrafluoroethane	124-73-2	0.2 mg/mL	MeOH	M-REF-X-03	1 mL	20
1,1-Dichloro-1-fluoroethane (Freon #141B)	1717-00-6	0.2 mg/mL	MeOH	M-REF-X-04	1 mL	20
1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon #114)	76-14-2	0.2 mg/mL	MeOH	M-REF-10	1 mL	20
2,2-Dichloro-1,1,1-trifluoroethane (Freon #123)	306-83-2	0.2 mg/mL	MeOH	M-REF-X-05	1 mL	20
Dichlorodifluoromethane (Freon #12)	75-71-8	0.2 mg/mL	MeOH	M-REF-08	1 mL	8
Dichlorofluoromethane (Freon #21)	75-43-4	0.2 mg/mL	MeOH	M-REF-09	1 mL	8
1,1-Difluoroethane (Freon 152a)	75-37-6	0.2 mg/mL	MeOH	M-REF-11	1 mL	20
Pentafluoroethane (Freon #125)	354-33-6	0.2 mg/mL	MeOH	M-REF-X-06	1 mL	20
1,1,2,2-Tetrafluoroethane (Freon #134)	359-35-3	0.2 mg/mL	MeOH	M-REF-X-07	1 mL	20
Tetrafluoroethane	811-97-2	0.2 mg/mL	MeOH	M-REF-12	1 mL	20
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	0.2 mg/mL	MeOH	M-REF-14	1 mL	10
		2.0 mg/mL	MeOH	M-REF-14-10X	1 mL	10
Trichlorofluoromethane	75-69-4	0.2 mg/mL	MeOH	M-REF-13	1 mL	8
1,1,1-Trifluoroethane (Freon #143A)	420-46-2	0.2 mg/mL	MeOH	M-REF-X-08	1 mL	20
Trifluoromethane (Freon #23)	75-46-7	0.2 mg/mL	MeOH	M-REF-15	1 mL	8

Refrigerants - Chlorofluorohydrocarbons (CFCs) Sets

Chlorofluorohydrocarbons (CFCs) are ozone-depleting substances that were used primarily in air-conditioning and refrigeration systems. Under the Clean Air Act, CFCs were to be totally phased out of production in the U.S. by January 1, 1996. In order to monitor various refrigerants that may be present in the environment, the following single & multi-component mixes are offered to help labs screen for these compounds.

Individual Refrigerant Solutions (CFCs)

Freon #	Description	1 mL Cat. No.	Price
13b1	Bromotrifluoromethane (01)	M-REF-01	\$ 8
142b	1-Chloro-1,1-difluoroethane (02)	M-REF-02	20
22	Chlorodifluoromethane (03)	M-REF-03	8
160	Chloroethane (04)	M-REF-04	8
40	Chloromethane (05)	M-REF-05	8
115	Chloropentafluoroethane (06)	M-REF-06	20
13	Chlorotrifluoromethane (07)	M-REF-07	8
12	Dichlorodifluoromethane (08)	M-REF-08	8
21	Dichlorofluoromethane (09)	M-REF-09	8
114	1,2-Dichloro-1,1,2,2-tetrafluoroethane (10)	M-REF-10	20
152a	1,1-Difluoroethane (11)	M-REF-11	20
134a	Tetrafluoroethane (12)	M-REF-12	20
11	Trichlorofluoromethane (13)	M-REF-13	8
113	1,1,2-Trichloro-1,2,2-trifluoroethane (14)	M-REF-14	10
23	Trifluoromethane (15)	M-REF-15	8
M-REF-SET		\$ 175 / set of 15 x 1 mL	
<i>Each at 0.2 mg/mL in MeOH (above 15 analytes)</i>			

Multi-Component Refrigerant Solution

M-REF **\$ 60 / 1 x 1 mL**
Each at 0.2 mg/mL in MeOH (above 15 comps.)

Additional Individual Refrigerant Solutions (CFCs)

Freon #	Description	1 mL Cat. No.	Price
12B1	Bromochlorodifluoromethane (01)	M-REF-X-01	\$ 20
124	2-Chloro-1,1,1,2-tetrafluoroethane (02)	M-REF-X-02	20
114B2	1,2-Dibromotetrafluoroethane (03)	M-REF-X-03	20
141b	1,1-Dichloro-1-fluoroethane (04)	M-REF-X-04	20
123	2,2-Dichloro-1,1,1-trifluoroethane (05)	M-REF-X-05	20
125	Pentafluoroethane (06)	M-REF-X-06	20
134	1,1,2,2-Tetrafluoroethane (07)	M-REF-X-07	20
113a	1,1,1-Trichlorotrifluoroethane (Freon 113a) (09)	M-REF-X-09	18
143a	1,1,1-Trifluoroethane (08)	M-REF-X-08	20
M-REF-X-R1-SET		\$ 112 / set of 9 x 1 mL	
<i>Each at 0.2 mg/mL in MeOH (above 9 analytes)</i>			

Multi-Component Refrigerant Solution

M-REF-X **\$ 40 / 1 x 1 mL**
0.2 mg/mL each in MeOH (above 8 comps. not including Freon 113a)

Method 5041 VOCs from Stack Gas Effluents

VOCs From Stack Gas Effluents of Hazardous Waste Incinerators Using Volatile Organic Sampling Train (VOST) Methodology by Wide-Bore Capillary Column Technique

M-5041 \$ 80 / 1 x 1 mL
0.2 mg/mL each in MeOH 37 comps.

Acetone	<i>cis</i> -1,3-Dichloropropene *
Acrylonitrile	<i>trans</i> -1,3-Dichloropropene **
Benzene	Ethylbenzene
Bromodichloromethane	Iodomethane
Bromoform	Methylene chloride
Bromomethane	Stryrene
Carbon disulfide	1,1,2,2-Tetrachloroethane
Carbon tetrachloride	Tetrachloroethene
Chlorobenzene	Toluene
Chlorodibromomethane	1,1,1-Trichloroethane
Chloroethane	1,1,2-Trichloroethane
Chloroform	Trichloroethene
Chloromethane	Trichlorofluoromethane
Dibromomethane	1,2,3-Trichloropropane
1,1-Dichloroethane	Vinyl chloride
1,2-Dichloroethane	<i>o</i> -Xylenes
1,1-Dichloroethene	<i>m</i> -Xylenes
<i>trans</i> -1,2-Dichloroethene	<i>p</i> -Xylenes
1,2-Dichloropropane	

* *cis* (1.06 x conc.)
** *trans* (0.94 x conc.)

Internal/Surrogate Standard

CLP-PIPS \$ 40 / 1 x 1 mL
CLP-PIPS-PAK SAVE 20% \$ 160 / 5 x 1 mL
2.5 mg/mL each in MeOH 6 comps.

Bromochloromethane	1,2-Dichloroethane-d ₂
<i>p</i> -Bromofluorobenzene	1,4-Difluorobenzene
Chlorobenzene-d ₂	Toluene-d ₈

Calibration Check Compounds (CCC)

CLP-020-10X \$ 30 / 1 x 1 mL
CLP-020-10X-PAK SAVE 20% \$ 120 / 5 x 1 mL
2.0 mg/mL each in MeOH 6 comps.

Chloroform	Ethylbenzene
1,1-Dichloroethene	Toluene
1,2-Dichloropropane	Vinyl chloride

System Performance Check Compounds (SPCC)

CLP-021-10X \$ 30 / 1 x 1 mL
CLP-021-10X-PAK SAVE 20% \$ 120 / 5 x 1 mL
2.0 mg/mL each in MeOH 5 comps.

Bromoform	1,1-Dichloroethane
Chlorobenzene	1,1,2,2-Tetrachloroethane
Chloromethane	

Instrument Performance Check Solution

CLP-004-100X \$ 10 / 1 x 1 mL
CLP-004-100X-PAK SAVE 20% \$ 40 / 5 x 1 mL
2500 µg/mL in MeOH

p-Bromofluorobenzene

Method USP 467 VOCs from Stack Gas Effluents

USP/National Formulary VOC Mixture

NF-467 \$ 20 / 1 x 1 mL
NF-467-PAK SAVE 20% \$ 80 / 5 x 1 mL
At stated conc. in MeOH 5 comps.

Benzene (200 µg/mL)	Methylene chloride (200 µg/mL)
Chloroform (100 µg/mL)	Trichloroethene (200 µg/mL)
1,4-Dioxane (200 µg/mL)	

USP/National Formulary VOC Mixture

NF-467-R \$ 20 / 1 x 1 mL
NF-467-R-PAK SAVE 20% \$ 80 / 5 x 1 mL
At stated conc. in DMSO 6 comps.

Benzene (200 µg/mL)	Ethylene oxide (20 µg/mL)
Chloroform (100 µg/mL)	Methylene chloride (200 µg/mL)
1,4-Dioxane (200 µg/mL)	Trichloroethene (200 µg/mL)

USP/National Formulary VOC Mixture

NF-467-R3 \$ 25 / 1 x 1 mL
NF-467-R3-PAK SAVE 20% \$ 100 / 5 x 1 mL
At stated conc. in MeOH 5 comps.

Benzene (2 µg/mL)	Dichloromethane (600 µg/mL)
Chloroform (60 µg/mL)	Trichloroethene (80 µg/mL)
<i>p</i> -Dioxane (380 µg/mL)	

USP/National Formulary VOC Mixture

NF-467-R4 \$ 25 / 1 x 1 mL
NF-467-R4-PAK SAVE 20% \$ 100 / 5 x 1 mL
At stated conc. in Dimethyl sulfoxide 5 comps.

Benzene (2 µg/mL)	Dichloromethane (600 µg/mL)
Chloroform (60 µg/mL)	Trichloroethene (80 µg/mL)
<i>p</i> -Dioxane (380 µg/mL)	

Hazardous Substances List (Volatiles)

Compounds on the EPA Hazardous Substances List (HSL)

HSL Volatiles Standard Mixture

M-HSL ‡ \$ 25 / 1 x 1 mL
2.0 mg/mL each in MeOH 8 comps.

Acetone	4-Methyl-2-pentanone
2-Butanone	Styrene
Carbon disulfide	Vinyl acetate
2-Hexanone	<i>o</i> -Xylene

‡ To delay premature breakdown of thermally labile products in transit we suggest shipping with a "Cold Pack"

Method 465-D List of Volatiles

The State of Minnesota Dept. of Health mandates analysis of these Compounds

M-465D-SET \$ 75 / 3 x 1 mL
(Set includes **M-502A-R**, **M-465B-10X** and **M-465D-ADD-R**)
M-465D-SET-PAK **SAVE 20%** \$ 300 / 5 x (3 x 1 mL)

Liquids

M-502A-R \$ 60 / 1 x 1 mL
M-502A-R-PAK **SAVE 20%** \$ 240 / 5 x 1 mL
0.2 mg/mL each in MeOH 54 comps.

Benzene (01)	1,1-Dichloropropene (33)
Bromobenzene (02)	<i>cis</i> -1,3-Dichloropropene (34A) *
Bromochloromethane (03)	<i>trans</i> -1,3-Dichloropropene (34B) **
Bromodichloromethane (04)	Ethylbenzene (35)
Bromoform (05)	Hexachlorobutadiene (36)
<i>n</i> -Butylbenzene (07)	Isopropylbenzene (<i>Cumene</i>) (37)
<i>sec</i> -Butylbenzene (08)	<i>p</i> -Isopropyltoluene (<i>p-Cymene</i>) (38)
<i>tert</i> -Butylbenzene (09)	Methylene chloride (39)
Carbon tetrachloride (10)	Naphthalene (40)
Chlorobenzene (11)	<i>n</i> -Propylbenzene (41)
Chloroform (13)	Styrene (42)
2-Chlorotoluene (15)	1,1,1,2-Tetrachloroethane (43)
4-Chlorotoluene (16)	1,1,2,2-Tetrachloroethane (44)
Dibromochloromethane (17)	Tetrachloroethene (45)
1,2-Dibromo-3-chloropropane (18)	Toluene (46)
1,2-Dibromoethane (19)	1,2,3-Trichlorobenzene (47)
Dibromomethane (20)	1,2,4-Trichlorobenzene (48)
1,2-Dichlorobenzene (21)	1,1,1-Trichloroethane (49)
1,3-Dichlorobenzene (22)	1,1,2-Trichloroethane (50)
1,4-Dichlorobenzene (23)	Trichloroethene (51)
1,1-Dichloroethane (25)	1,2,3-Trichloropropane (53)
1,2-Dichloroethane (26)	1,2,4-Trimethylbenzene (54)
1,1-Dichloroethene (27)	1,3,5-Trimethylbenzene (55)
<i>cis</i> -1,2-Dichloroethene (28)	<i>o</i> -Xylene (57)
<i>trans</i> -1,2-Dichloroethene (29)	<i>m</i> -Xylene (58)
1,2-Dichloropropane (30)	<i>p</i> -Xylene (59)
1,3-Dichloropropane (31)	
2,2-Dichloropropane (32)	

Gases

M-465B-10X \$ 25 / 1 x 1 mL
M-465B-10X-PAK **SAVE 20%** \$ 100 / 5 x 1 mL
0.2 mg/mL each in MeOH 7 comps.

Bromomethane	Dichlorofluoromethane
Chloroethane	Trichlorofluoromethane
Chloromethane	Vinyl chloride
Dichlorodifluoromethane	

M-465D-ADD-R ‡ \$ 30 / 1 x 1 mL
0.2 mg/mL each in MeOH 8 comps.

Acetone	Methyl isobutyl ketone
Allyl chloride	Methyl- <i>t</i> -butyl ether
Ethyl ether	Tetrahydrofuran
Methyl ethyl ketone	Trichlorotrifluoroethane

‡ To delay premature breakdown of thermally labile products in transit we suggest shipping with a "Cold Pack"

Method 465-D Pesticides & Herbicides

The State of Minnesota Dept. of Agriculture (MDA) Minnesota Method Revision

AccuStandard introduces a new standard that covers the expanded analyte list for the state of Minnesota Department of Agriculture method (465-D). This product contains all the analytes in one multi-component standard, has the highest concentration in the industry, and eliminates the need to combine more than one standard to cover the complete analyte list.

As an added benefit, if you purchase the single component Pesticide Butylate (Cat.# P-088S-10X \$ 24 / 1 x 1 mL) in conjunction with the new MDA 465 formulation you will have all the required analytes for the Wisconsin DATCP pesticide program. Since many labs perform work in both Minnesota and Wisconsin, a single calibration curve can be established relatively easily to monitor analytes covered by both methods.

List 1 - Pesticide Standard

MDA-PEST-01-R1 \$ 105 / 1 x 1 mL
MDA-PEST-01-R1-PAK **SAVE 20%** \$ 420 / 5 x 1 mL
500 µg/mL each in CH₂Cl₂ 22 comps.

Acetochlor	Dyfonate	Propachlor
Alachlor	EPTC	Prometon
Atrazine	Ethalfuralin	Propazine
Atrazine-desisopropyl	Metolachlor	Simazine
Cyanazine	Metribuzin	Terbufos
Desethyl atrazine	Pendimethalin	Triallate
Dimethenamid	Phorate	Trifluralin
Dursban		

P-088S-10X \$ 12 / 1 x 1 mL
100 µg/mL in MeOH

Butylate

List 2 - Herbicide Acids Standards

MDA-HERB-01 \$ 60 / 1 x 1 mL
At stated conc. in Acetone 9 comps.

2,4-D (0.1 mg/mL)	Dicamba (0.1 mg/mL)
2,4-DB (0.1 mg/mL)	MCPA (10 mg/mL)
2,4,5-T (0.1 mg/mL)	Picloram (0.1 mg/mL)
Silvex (0.1 mg/mL)	Triclopyr (0.1 mg/mL)
Bentazon (0.1 mg/mL)	

Perfluorooctanoic Acid, also commonly referred to by its acronym PFOA, is a synthetic chemical that is not naturally occurring in the environment. PFOA is used to refer to not only the Perfluorooctanoic Acid, but also its principal salts and Perfluorooctane sulfonate (PFOS). These groups of compounds are typically used to aid in the manufacturing of fluoropolymers. These polymers have valuable properties of fire resistance, oil, stain and grease repellence. They are also commonly used in fire fighting foams. Fluorotelomers will thermally and biologically decompose to form the PFOAs.

Recent studies by the EPA have indicated the potential need for concern and the necessity for additional analytical testing and monitoring. PFOAs have been determined to bioaccumulate and are highly persistent. Continued testing has shown that this class of compounds is widely distributed in the environment. Toxicological studies have shown that exposure to PFOAs can result in developmental/reproductive toxicity, liver damage and possibly cancer.

AccuStandard has responded to the need for reference Standards to support this research and is introducing the following line of products. These products have been chosen to offer a few of the most popular compounds. If there is another salt or derivative that you do not see, but require for your analysis, contact our Technical Department by phone or e-mail at techservice@accustandard.com for a quotation.

NEW



PFOAs	CAS NO.	QTY./CONC.	MATRIX	CAT. NO.	UNIT	PRICE
Perfluorooctanoic acid	335-67-1	100 mg	NEAT	PFOA-001N	100 mg	\$ 22
		100 µg/mL	MeOH	PFOA-001S	1 mL	22
Perfluorooctane sulfonic acid	1763-23-1	100 mg	NEAT	PFOS-001N	100 mg	22
		100 µg/mL	MeOH	PFOS-001S	1 mL	22
Potassium perfluorooctanesulfonate	2795-39-3	100 mg	NEAT	PFOS-002N	100 mg	22
		100 µg/mL	MeOH	PFOS-002S	1 mL	22
Scotchgard™ PFOS Formulation (Tech mix)		100 µg/mL	MeOH	PFOS-SCG-001S	1 mL	22
Scotchgard™ New (2002) Formulation (Tech mix)		100 µg/mL	MeOH	PFOS-SCG-002S	1 mL	22

F-List Hazardous Waste from Non-Specific Sources

F001 & F002 Solvent List Components

FL-0102 \$ 25 / 1 x 1 mL
2.0 mg/mL each in MeOH 10 comps.

Carbon tetrachloride	1,1,1-Trichloroethane
Chlorobenzene	1,1,2-Trichloroethane
1,2-Dichlorobenzene	Trichloroethene
Methylene chloride	1,1,2-Trichloro-1,2,2-trifluoroethane
Tetrachloroethene	Trichlorofluoromethane

F003 List Components (excluding MeOH as analyte)

FL-0003 \$ 25 / 1 x 1 mL
2.0 mg/mL in MeOH 10 comps.

Acetone	Ethyl ether
<i>n</i> -Butanol	Methyl isobutyl ketone
Cyclohexanone	<i>m</i> -Xylene
Ethyl acetate	<i>o</i> -Xylene
Ethylbenzene	<i>p</i> -Xylene

F004 List Component Mixes

FL-0004-CR \$ 20 / 1 x 1 mL
2.0 mg/mL in MeOH 3 comps.

<i>m</i> -Cresol	<i>p</i> -Cresol
<i>o</i> -Cresol	

FL-0004-CA \$ 15 / 1 x 1 mL
2.0 mg/mL in MeOH

Cresylic acid
(technical mixture of phenol, cresols & xylenes)

F005 List Components (includes Nitrobenzene)

FL-0005-NB \$ 25 / 1 x 1 mL
2.0 mg/mL each in MeOH 9 comps.

Benzene	Nitrobenzene
Carbon disulfide	2-Nitropropane
2-Ethoxyethanol	Pyridine
Isobutanol	Toluene
Methyl ethyl ketone	

Additional Alcohol Solvents

FL-OADD \$ 15 / 1 x 1 mL
2.0 mg/mL each in H₂O 3 comps.

Ethanol	Methanol
Isopropanol	



Odor Standards



Odor determination is now possible with the new Odor Chemical Reference Materials, including both Quantitative and Qualitative Standards. Growing demand for determination of odor in drinking water, waste water, and solids has prompted AccuStandard to develop a complete line of Odor Standards. Products include the required Japanese Quantitative Standards, as well as products to meet the Standard Methods Odor Testing Parameters.

Individual Odor Standards

Storage: Refrig (0-5° C), except ODOR-01S & ODOR-02S

	CAS No.	Conc. / Solvent	Cat. No.	Unit	Price
(+/-) Geosmin	16423-19-1	2 µg/mL in MeOH	ODOR-01S	1 mL	\$ 45
2-methylisoborneol	2371-42-8	2 µg/mL in MeOH	ODOR-02S	1 mL	45
trans-2, cis-6-Nonadienal	557-48-2	NEAT	ODOR-03N	10 mg	30
Styrene	100-42-5	NEAT	ODOR-04N	10 mg	20
Toluene	108-88-3	NEAT	ODOR-05N	10 mg	20
Cumene	98-82-8	NEAT	ODOR-06N	10 mg	20
m-Xylene	108-38-3	NEAT	ODOR-07N	10 mg	20
cis-3-Hexenyl acetate	3681-71-8	NEAT	ODOR-08N	10 mg	35
cis-3-Hexen-1-ol	928-96-1	NEAT	ODOR-09N	10 mg	35
Methyl isobutyl ketone	108-10-1	NEAT	ODOR-10N	10 mg	20
Indene	95-13-6	NEAT	ODOR-11N	10 mg	20
Indan	496-11-7	NEAT	ODOR-12N	10 mg	20
Naphthalene	91-20-3	NEAT	ODOR-13N	10 mg	20
2-Methylbenzofuran	4265-25-2	NEAT	ODOR-14N	10 mg	45
2,4,6-Trichloroanisole	87-41-1	1000 µg/mL in MeOH	ODOR-15S-10ML	10 mL	45
2-Isopropyl-3-methoxy-pyrazine	25773-40-4	1000 µg/mL in MeOH	ODOR-16S-10ML	10 mL	45
2-Isobutyl-3-methoxy-pyrazine	24683-00-9	1000 µg/mL in MeOH	ODOR-17S-10ML	10 mL	45

Odor Set

ODOR-STM-SET

\$ 200 / 12 x 10 mg

trans-2, cis-6-Nonadienal	cis-3-Hexen-1-ol
Styrene	Methyl isobutyl ketone
Toluene	Indene
Cumene	Indan
m-Xylene	Naphthalene
cis-3-Hexenyl acetate	2-Methylbenzofuran

Japan Drinking Water Odor Standard

ODOR-JDWOS

\$ 80 / 1 x 1 mL

100 µg/mL each in MeOH

2 comps.

(+/-) Geosmin
2-methylisoborneol

Online MSDSs, C of As & EPA methods on Demand 24/7



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