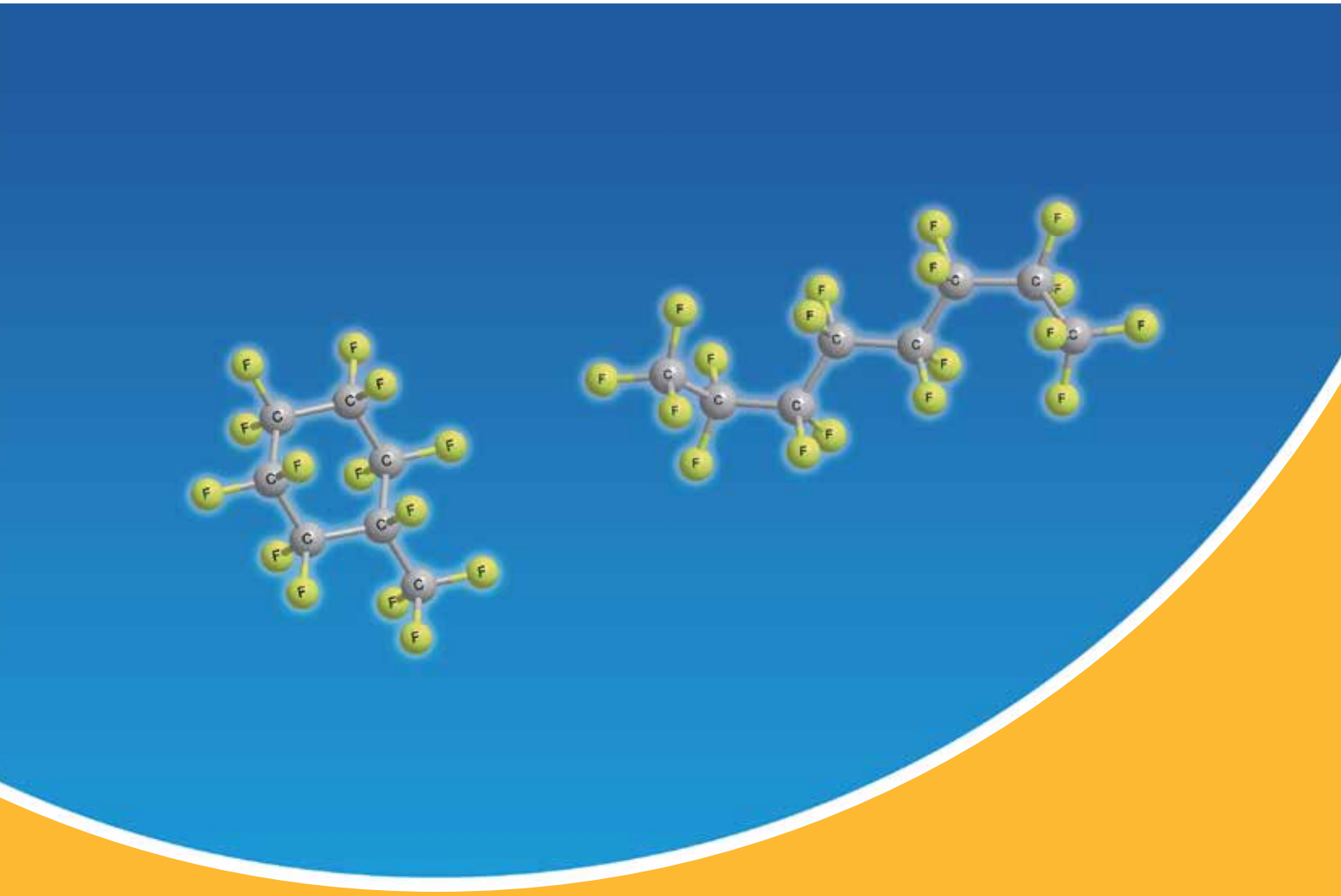
Fluorous Chemistry



Fluorous Solvents

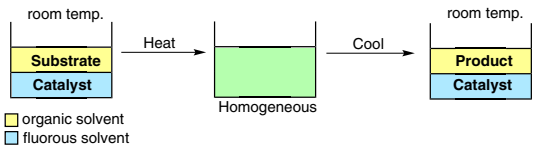
Fluorous Compounds

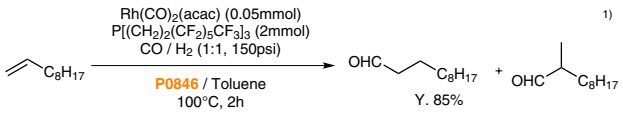
Fluorous Chemistry

Recently, fluorous chemistry has been studied intensively from the perspective of "Green Chemistry", as the products can be readily separated and the solvents used are reusable. The term "fluorous" was introduced as the analogue to the term aqueous, meaning dissolve in fluorocarbon solvents. Although highly fluorinated compounds (fluorous compounds) neither dissolve in common organic solvents nor in water, they dissolve well in fluorous solvents such as perfluoroalkane. Fluorous chemistry utilizes this property and a numerous application of this chemistry has been made.

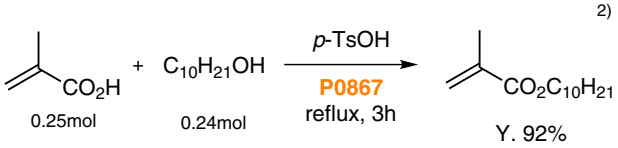
1. Organic reaction using fluorous solvents

Although fluorous solvents are immiscible with water and common organic solvents, certain fluorous solvents have the properties to form a homogeneous solution with some organic solvents at elevated temperatures. They also have the properties that the boiling points are almost equal to thoes of the corresponding hydrocarbons regardless of their molecular weight, and the high solubility of many gases in these solvents. Taking the advantage of these properties, Horváth *et al.* accomplished the hydroformylation of olefins using a fluorous rhodium catalyst in perfluoromethylcyclohexane and toluene in 1994.[1] This was regarded as the origin of the fluorous chemistry. This reaction uses perfluoromethylcyclohexane and toluene as solvent, which form a biphase at room temperature. In this system the fluorous catalyst exists in the fluorous phase and the olefins in the organic phase. However, the two phases form a homogeneous solution when heated. The reaction then proceeds by introduction of carbon monoxide and hydrogen gases. When the reaction is complete and cooled, the two phase system reappears, where the resulting product is dissolved in the toluene phase and the fluorous catalyst in the fluorous phase, thus, making the catalyst and the product easily separable. The biphase system using a fluorous solvent and an organic solvent is called Fluorous Biphase System (FBS), and the multiple phase system is called Fluorous Multiphase System (FMS). The advantages of FBS and FMS are that the resulting product and the catalyst can be easily separated simply by separating the fluorous phase from the other phase after the reaction, and that the fluorous phase containing fluorous catalyst can be reusable after separation.

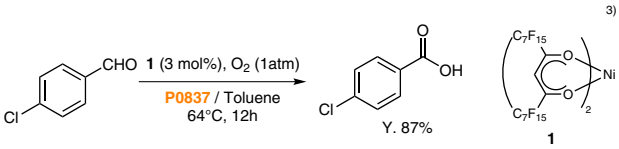




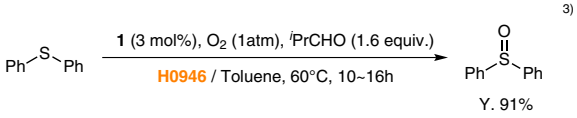
Zhu also reported the synthesis of carboxylic ester from methacrylic acid and decanol using *p*-toluenesulfonic acid in perfluorobutyltetrahydrofuran.[2] Although methacrylic acid, decanol and the acid catalyst dissolve in a fluorous solvent upon heating, the water generated in the reaction does not dissolve in the fluorous solvent. When the reaction mixture is cooled, the resulting carboxylic ester floats on the water phase, and the desired product can be separated.

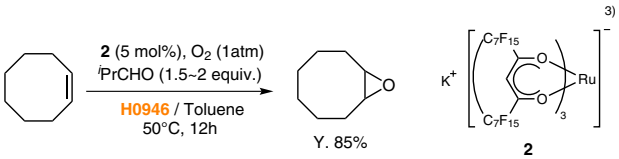


A numerous oxidation reactions in biphase system with fluorous solvents and organic solvents have also been studied with oxygen molecule. Knochel *et al.* have reported the oxidation of aldehydes, olefins and sulfides in the presence of a nickel complex catalyst with a fluorous β-diketone as ligand[3]. For the oxidation of aldehydes, perfluorodecalin and toluene were used as solvents, and this system also was found to form a homogeneous solution upon heating. After the reaction was over and cooled to room temperature, the catalyst staying in the fluorous phase and the product in the organic phase were easily separated. Due to their strong solubility, fluorous solvents are suitable for many reactions that requires to gases reagents.



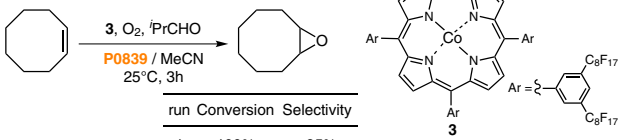
Various oxidation reaction of sulfides and olefins have also been studied similarly in the presence of isobutylaldehyde.[3] The solvents used in these reactions were perfluorooctyl bromide and toluene, and this solvent system also formed a homogeneous solution upon heating.





Pozzi *et al.* have also reported an epoxidation of olefins using molecular oxygen catalyzed by fluorous porphyrin-cobalt complex in the presence of isobutylaldehydes.[4] This reaction was carried out in biphase system of perfluorohexane and acetonitrile by stirring the mixture at room temperature. When the reaction was complete, the catalyst and the product were separated as usual, and the fluorous phase containing the catalyst was reused.

4)

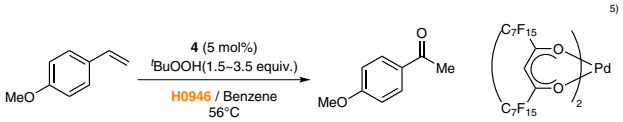


3

run	Conversion	Selectivity
1	100%	>95%
2	100%	>95%

The Wacker oxidation reaction using perfluorooctyl bromide as fluorous solvent has also been reported.[5] Perfluorooctyl bromide and benzene form a homogeneous solution when heated. After the reaction is complete and cooled, the product is separated from the palladium catalyst complexed with fluorous β-diketone. The fluorous phase can be reused after separation.

5)

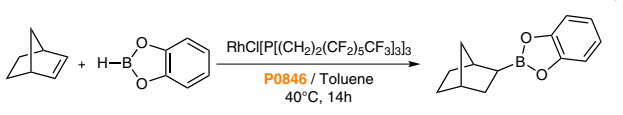


4

run	Yield	run	Yield
1	78%	5	70%
2	77%	6	73%
3	75%	7	72%
4	77%	8	72%

Horváth and Gladysz *et al.* have reported a hydroboration in perfluoromethylcyclohexane and toluene using a rhodium complex catalyst with fluorous ligands.[6] After the reaction was complete, the product was separated, and the fluorous phase containing the catalyst was reused.

6)



run	Yield	TON
1	90%	854
2	83%	785
3	81%	770

2. Application to the synthesis of sugar chains and Combinatorial Chemistry

Curran *et al.* have introduced the use of fluorous substituents (fluorous tags) into non-fluorous substrates and the synthesis of isoxazoline by using this fluorous compound.[7] After the reaction, the fluorous product was separated by extraction with dichloromethane, water, and perfluorohexane. Following this report, a numerous applications of this fluorous chemistry have been made in combinatorial chemistry.[8] And, Inazu *et al.* have applid this chemistry to the synthesis of oligosaccharide.[9] In this reaction, the fluorous tag was first introduced into the sugar molecule, and then glycoxylation followed. The desired oligosaccharide thus obtained was extracted with an organic solvent, water, and perfluorohexane.

As shown by the aforementioned examples, fluorous chemistry introduced by Horváth *et al.* has widely been applied in many areas of synthetic chemistry. Utilizing this chemistry, it is possible to isolate the desired product easily from the catalyst and the fluorous solvents. Furthermore, the separated fluorous solvents and the catalysts can be resused. A great deal of studies have been made on this subject, especially, because of its usefulness in term of Green Chemistry. It is also expected that this chemistry will be widely used in the application to the combinatorial chemistry where many compounds are handled at multiple steps.

References

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3) I. Klement, H. Lütjens, P. Knochel, *Angew. Chem. Int. Ed. Engl.,* **1997**, *36*, 1454.

4) G. Pozzi, F. Montanari, S. Quici, *Chem. Commun.,* **1997**, 69.

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10) Review
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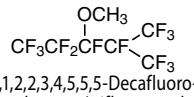
Keywords *: fluorous chemistry, fluorous solvents, environmentally-friendly solvents*

Fluorous Solvents

D4484 25g 500g



1,1,1,2,2,3,4,5,5,5-Decafluoro-3-methoxy-4-(trifluoromethyl)-pentane
CAS RN: 132182-92-4

D2669 25g 100g 500g

$CF_3CHFCHFCF_2CF_3$

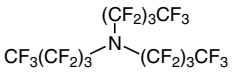
2*H*,3*H*-Decafluoropentane
CAS RN: 138495-42-8

E0485 5g 25g

$CF_3(CF_2)_7CF_3$

Eicosafluorononane
CAS RN: 375-96-2

P0074 25g 100g



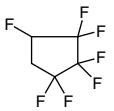
Perfluorotributylamine
CAS RN: 311-89-7

H0946 5g 25g

$CF_3(CF_2)_7Br$

Perfluoro-*n*-octyl Bromide
CAS RN: 423-55-2

H1013 25g 500g



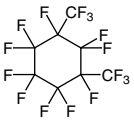
1,1,2,2,3,3,4-Heptafluoro-cyclopentane
CAS RN: 15290-77-4

P1755 1g

$CF_3(CF_2)_{10}CF_3$

Hexacosafluorododecane
CAS RN: 307-59-5

P1420 25g



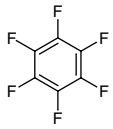
Hexadecafluoro(1,3-dimethyl-cyclohexane)
CAS RN: 335-27-3

P0851 10g

$CF_3(CF_2)_5CF_3$

Hexadecafluoroheptane
(mixture of isomers)
CAS RN: 335-57-9

H0085 5g 25g 250g



Hexafluorobenzene
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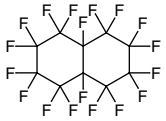
P0837 25g



Perfluorodecalin
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O0268 10g

$CF_3(CF_2)_6CF_3$

Perfluorooctane
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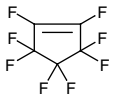
O0292 10g 50g



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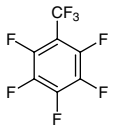
P0856 5g 25g



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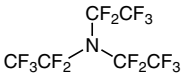

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P0867 25g

Perfluoro-(2-butyltetrahydrofuran)
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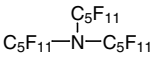
P1051 25g



Perfluorotriamylamine
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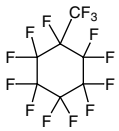
P0839 10g 25g 250g

$CF_3(CF_2)_4CF_3$

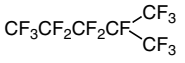
Perfluorohexane
CAS RN: 355-42-0

P0846 25g 100g



Perfluoromethylcyclohexane
CAS RN: 355-02-2

T1012 25mL



Perfluoroisohexane
CAS RN: 355-04-4

Fluorous Compounds

Fluorous Alkanes, Fluorous Alkenes

H0846 5g 25g

$CF_3(CF_2)_7CH{=}CH_2$

(Perfluoro-*n*-octyl)ethylene
CAS RN: 21652-58-4

N0601 5g 25g

$CF_3(CF_2)_3CH{=}CH_2$

(Perfluorobutyl)ethylene
CAS RN: 19430-93-4

P1102 5g 10g 25g 100g

$CF_3(CF_2)_5CH{=}CH_2$

(Perfluorohexyl)ethylene
CAS RN: 25291-17-2

T2496 5g

$CF_3(CF_2)_4CHF_2$

1*H*-Tridecafluorohexane
CAS RN: 355-37-3

U0076 5g

$CF_3(CF_2)_3CHF_2$

1*H*-Undecafluoropentane
CAS RN: 375-61-1

Fluorous Alcohols

D4128 5g 25g

CHF_2CH_2OH

2,2-Difluoroethanol
CAS RN: 359-13-7

D1101 25g 100g 250g

$H(CF_2)_6CH_2OH$

1,1,7-Trihydroperfluoroheptanol
CAS RN: 335-99-9

D2891 5g 25g

$HOCH_2(CF_2)_6CH_2OH$

2,2,3,3,4,4,5,5,6,6,7,7-Dodecafluoro-1,8-octanediol
CAS RN: 90177-96-1

E0239 10g

$H(CF_2)_{10}CH_2OH$

1*H*,1*H*,11*H*-Eicosafluoro-1-undecanol
CAS RN: 307-70-0

H0845 25g 250g

$CF_3(CF_2)_7CH_2CH_2OH$

2-(Perfluoro-*n*-octyl)ethanol
CAS RN: 678-39-7

H1232 5g

$CF_3(CF_2)_7CH_2OH$

1*H*,1*H*-Perfluoro-1-nonanol
CAS RN: 423-56-3

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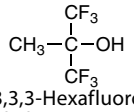
H1349 5g 25g



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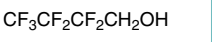
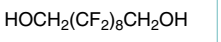
CAS RN: 1515-14-6

H0548 5g 25g



1*H*,1*H*-Heptafluoro-1-butanol
CAS RN: 375-01-9

H1233 1g 5g



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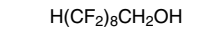
CAS RN: 754-96-1

H1035 25g



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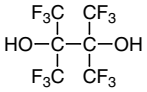
H1279 5g 25g



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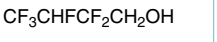
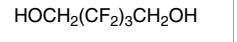
H0649 25g



2,2,3,4,4,4-Hexafluoro-1-butanol
CAS RN: 382-31-0

H0746 1g 5g 25g



2,2,3,3,4,4-Hexafluoro-1,5-pentanediol
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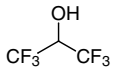

HFIP
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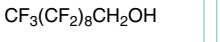
N0814 5g



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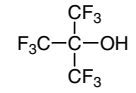
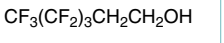
N0692 1g 5g 25g



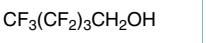
Perfluoro-*tert*-butanol
CAS RN: 2378-02-1

N0600 5g 25g



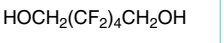
2-(Perfluorobutyl)ethanol
CAS RN: 2043-47-2

N0810 1g 5g 25g



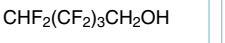
(Perfluorobutyl)methanol
CAS RN: 355-28-2

O0294 5g 25g



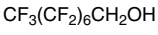
2,2,3,3,4,4,5,5-Octafluoro-1,6-hexanediol
CAS RN: 355-74-8

O0114 25g 100g 500g



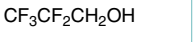
2,2,3,3,4,4,5,5-Octafluoro-1-pentanol
CAS RN: 355-80-6

P0904 5g 25g



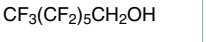
1*H*,1*H*-Perfluoro-1-octanol
CAS RN: 307-30-2

P0845 25g



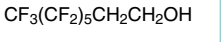
1*H*,1*H*-Pentafluoro-1-propanol
CAS RN: 422-05-9

T1701 5g 25g



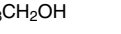
1*H*,1*H*-Perfluoro-1-heptanol
CAS RN: 375-82-6

T2528 5g 25g



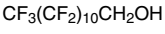
2-(Perfluorohexyl)ethanol
CAS RN: 647-42-7

T0435 25g 100g 500g



TFE
CAS RN: 75-89-8

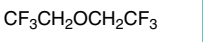
T3381 1g 5g



1*H*,1*H*-Tricosafluoro-1-dodecanol
CAS RN: 423-65-4

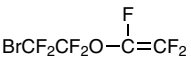
Fluorous Ethers

B1293 1g 5g



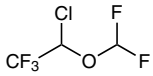
2,2,2-Trifluoroethyl Ether
CAS RN: 333-36-8

B4169 5g



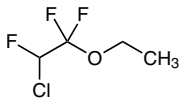
2-Bromotetrafluoroethyl Trifluorovinyl Ether
CAS RN: 85737-06-0

C2485 5g 25g



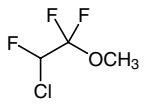
Isoflurane
CAS RN: 26675-46-7

C2862 5g



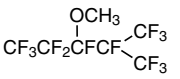
2-Chloro-1,1,2-trifluoroethyl Ethyl Ether
CAS RN: 310-71-4

C0853 5g



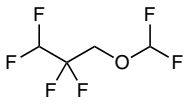
2-Chloro-1,1,2-trifluoroethyl Methyl Ether
CAS RN: 425-87-6

D4484 25g 500g



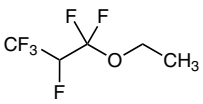
1,1,1,2,2,3,4,5,5,5-Decafluoro-3-methoxy-4-(trifluoromethyl)pentane
CAS RN: 132182-92-4

D4472 1g 5g



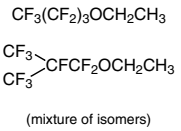
Difluoromethyl 2,2,3,3-Tetrafluoropropyl Ether
CAS RN: 35042-99-0

E1020 5g 25g



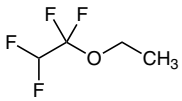
Ethyl 1,1,2,3,3,3-Hexafluoropropyl Ether
CAS RN: 380-34-7

E0528 25g 500g



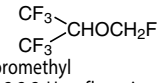
(mixture of isomers)
Ethyl Nonafluorobutyl Ether (mixture of isomers)
CAS RN: 813458-04-7

E1019 5g 25g



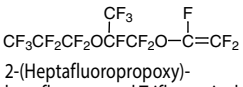
Ethyl 1,1,2,2-Tetrafluoroethyl Ether
CAS RN: 512-51-6

F0691 5g



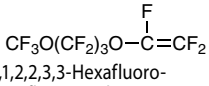
Fluoromethyl 1,1,1,3,3,3-Hexafluoroisopropyl Ether
CAS RN: 28523-86-6

P1226 5g



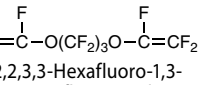
2-(Heptafluoropropoxy)-hexafluoropropyl Trifluorovinyl Ether
CAS RN: 1644-11-7

H1610 5g 25g



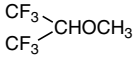
1,1,2,2,3,3-Hexafluoro-1-(trifluoromethoxy)-3-[(1,2,2-trifluorovinyl)oxy]propane
CAS RN: 40573-09-9

H1611 5g 25g



1,1,2,2,3,3-Hexafluoro-1,3-bis[(1,2,2-trifluorovinyl)oxy]-propane
CAS RN: 13846-22-5

H1524 5g 25g

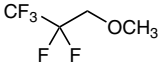


Isoindoklon
CAS RN: 13171-18-1

M1345 25g 500g

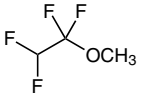
Methyl Nonafluorobutyl Ether
CAS RN: 163702-07-6

M2500 1g 5g



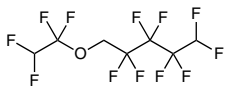
Methyl 2,2,3,3,3-Pentafluoropropyl Ether
CAS RN: 378-16-5

M2514 25g



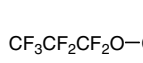
Methyl 1,1,2,2-Tetrafluoroethyl Ether
CAS RN: 425-88-7

O0422 5g 25g



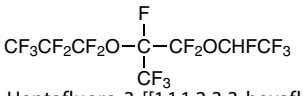
1*H*,1*H*,5*H*-Octafluoropentyl 1,1,2,2-Tetrafluoroethyl Ether
CAS RN: 16627-71-7

P1224 10g



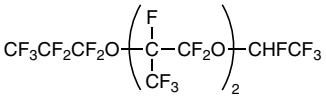
Perfluoropropoxyethylene
CAS RN: 1623-05-8

H1624 25g



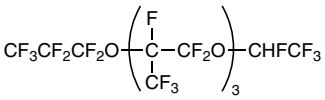
1,1,1,2,2,3,3-Heptafluoro-3-[[1,1,1,2,3,3-hexafluoro-3-(1,2,2,2-tetrafluoroethoxy)propan-2-yl]oxy]propane
CAS RN: 3330-14-1

H1625 25g



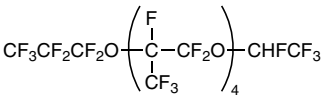
1,1,1,2,2,3,3-Heptafluoro-3-[[1,1,1,2,3,3-hexafluoro-3-[[1,1,1,2,3,3-hexafluoro-3-(1,2,2,2-tetrafluoroethoxy)-propan-2-yl]oxy]propan-2-yl]oxy]propane
CAS RN: 3330-16-3

I1044 25g



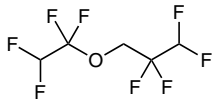
1,1,1,2,4,4,5,7,7,8,10,10,11,13,13,14,14,15,15,15-Icosafluoro-5,8,11-tris(trifluoromethyl)-3,6,9,12-tetraoxapentadecane
CAS RN: 26738-51-2

T3538 25g



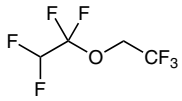
1,1,1,2,4,4,5,7,7,8,10,10,11,13,13,14,16,16,17,17,18,18,18-Tricosafluoro-5,8,11,14-tetrakis(trifluoromethyl)-3,6,9,12,15-pentaoxaoctadecane
CAS RN: 37486-69-4

T3069 5g 25g 100g



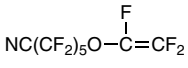
1,1,2,2-Tetrafluoroethyl 2,2,3,3-Tetrafluoropropyl Ether
CAS RN: 16627-68-2

T3057 5g 25g



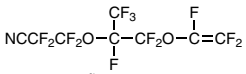
1,1,2,2-Tetrafluoroethyl 2,2,2-Trifluoroethyl Ether
CAS RN: 406-78-0

D5223 5g 25g



2,2,3,3,4,4,5,5,6,6-Decafluoro-6-[(1,2,2-trifluorovinyl)oxy]-hexanenitrile
CAS RN: 120903-40-4

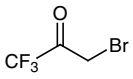
T3493 5g 25g



2,2,3,3-Tetrafluoro-3-[[1,1,1,2,3,3-hexafluoro-3-[(1,2,2-trifluorovinyl)-oxy]propan-2-yl]oxy]propionitrile
CAS RN: 69804-19-9

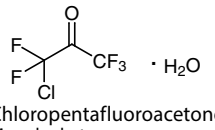
Fluorous Ketones

B1240 5g 25g



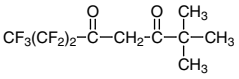
1-Bromo-3,3,3-trifluoroacetone
CAS RN: 431-35-6

C0993 1g 5g



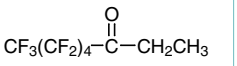
Chloropentafluoroacetone Monohydrate
CAS RN: 6984-99-2

D1729 5g



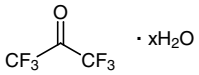
2,2-Dimethyl-6,6,7,7,8,8,8-heptafluoro-3,5-octanedione
CAS RN: 17587-22-3

P1363 5g



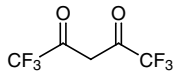
Ethyl Undecafluoroamyl Ketone
CAS RN: 383177-55-7

H0425 5g 25g



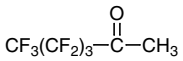
Hexafluoroacetone Hydrate
CAS RN: 34202-69-2

H0476 5g 25g



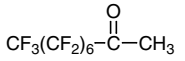
Hexafluoroacetylacetone
CAS RN: 1522-22-1

N0645 5g 25g



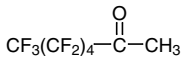
Methyl Nonafluorobutyl Ketone
CAS RN: 678-18-2

P1452 5g



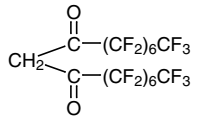
Methyl Pentadecafluoroheptyl Ketone
CAS RN: 754-85-8

U0071 5g



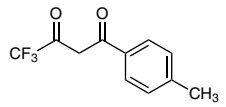
Methyl Undecafluoroamyl Ketone
CAS RN: 2708-07-8

T2037 100mg



9*H*,9*H*-Triacontafluoro-8,10-heptadecanedione
CAS RN: 36554-97-9

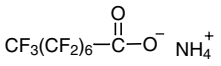
T2997 5g 25g



4,4,4-Trifluoro-1-(*p*-tolyl)-1,3-butanedione
CAS RN: 720-94-5

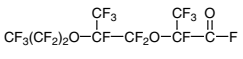
Fluorous Carboxylic Acids, Anhydrides and Halides

P1449 25g



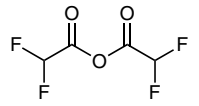
Ammonium Pentadecafluoro-octanoate
CAS RN: 3825-26-1

B1698 5g



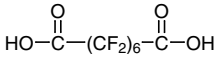
2,5-Bis(trifluoromethyl)-3,6-dioxaundecafluorononanoyl Fluoride
CAS RN: 2641-34-1

D4164 5g



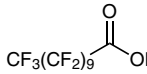
Difluoroacetic Anhydride
CAS RN: 401-67-2

D2465 5g 25g



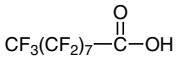
Dodecafluorosuberic Acid
CAS RN: 678-45-5

H1234 1g



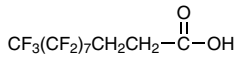
Heneicosafluoroundecanoic Acid
CAS RN: 2058-94-8

H0843 5g 25g



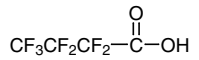
Heptadecafluorononanoic Acid
CAS RN: 375-95-1

H1502 1g



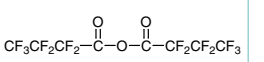
2*H*,2*H*,3*H*,3*H*-Heptadecafluoroundecanoic Acid
CAS RN: 34598-33-9

H0024 25g 100g



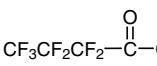
Heptafluorobutyric Acid
CAS RN: 375-22-4

H0337 10g



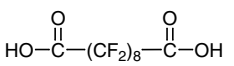
Heptafluorobutyric Anhydride
CAS RN: 336-59-4

H0508 5g 25g



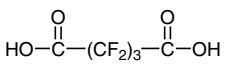
Heptafluorobutyryl Chloride
CAS RN: 375-16-6

H0892 5g 25g



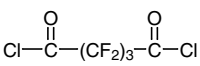
Hexadecafluorosebacic Acid
CAS RN: 307-78-8

H0658 10g 25g



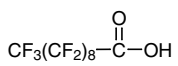
Hexafluoroglutaric Acid
CAS RN: 376-73-8

H0743 1g 5g



Hexafluoroglutaryl Dichloride
CAS RN: 678-77-3

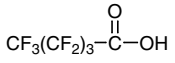
N0607 5g



Nonadecafluorodecanoic Acid
CAS RN: 335-76-2

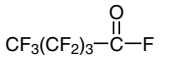
Please inquire for pricing and availability of listed products to our local sales representatives.

N0605 5g 25g



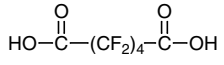
Nonafluorovaleric Acid
CAS RN: 2706-90-3

N0809 5g



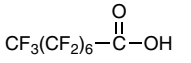
Nonafluorovaleryl Fluoride
CAS RN: 375-62-2

O0260 5g 25g



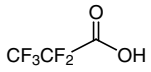
Octafluoroadipic Acid
CAS RN: 336-08-3

P0764 10g 25g



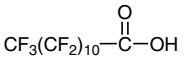
Pentadecafluorooctanoic Acid
CAS RN: 335-67-1

P1125 25g 100g



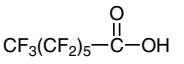
Pentafluoropropionic Acid
CAS RN: 422-64-0

T2492 1g 5g



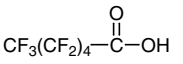
Tricosafluorododecanoic Acid
CAS RN: 307-55-1

T1545 5g 25g



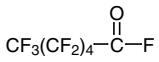
Tridecafluoroheptanoic Acid
CAS RN: 375-85-9

U0067 5g 25g



Undecafluorohexanoic Acid
CAS RN: 307-24-4

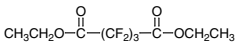
U0075 5g



Undecafluorohexanoyl Fluoride
CAS RN: 355-38-4

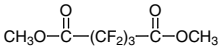
Fluorous Esters

H0744 1g



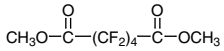
Diethyl Hexafluoroglutarate
CAS RN: 424-40-8

D3589 1g 5g



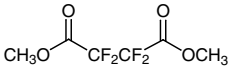
Dimethyl Hexafluoroglutarate
CAS RN: 1513-62-8

D3590 1g 5g



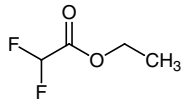
Dimethyl Octafluoroadipate
CAS RN: 3107-98-0

D3588 1g 5g



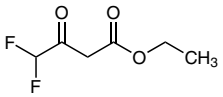
Dimethyl Tetrafluorosuccinate
CAS RN: 356-36-5

D2498 5g 25g



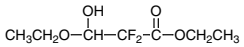
Ethyl Difluoroacetate
CAS RN: 454-31-9

E1018 5g 25g



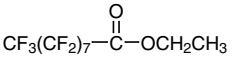
Ethyl 4,4-Difluoroacetoacetate
CAS RN: 352-24-9

E0547 1g



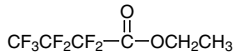
Ethyl 3-Ethoxy-2,2-difluoro-3-hydroxypropionate
CAS RN: 141546-97-6

H1038 5g



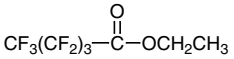
Ethyl Heptadecafluorononanoate
CAS RN: 30377-52-7

H0594 5g 25g



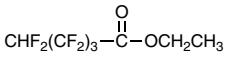
Ethyl Heptafluorobutyrate
CAS RN: 356-27-4

N0689 5g



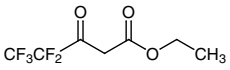
Ethyl Nonafluorovalerate
CAS RN: 424-36-2

E1022 5g 25g



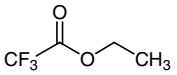
Ethyl 5*H*-Octafluorovalerate
CAS RN: 2795-50-8

P1062 5g



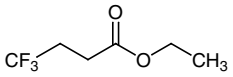
Ethyl Pentafluoropropionylacetate
CAS RN: 663-35-4

T0432 25g 100g 500g



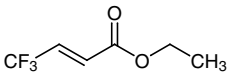
Ethyl Trifluoroacetate
CAS RN: 383-63-1

E0830 1g 5g



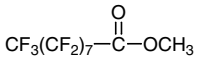
Ethyl 4,4,4-Trifluorobutyrate
CAS RN: 371-26-6

E0772 5g 25g



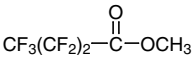
Ethyl 4,4,4-Trifluorocrotonate
CAS RN: 25597-16-4

M1915 5g 25g



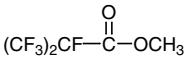
Methyl Heptadecafluorononanoate
CAS RN: 51502-45-5

H1033 5g 25g



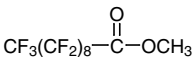
Methyl Heptafluorobutyrate
CAS RN: 356-24-1

M2022 5g 25g



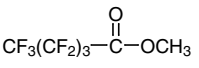
Methyl Heptafluoroisobutyrate
CAS RN: 680-05-7

M1916 5g 25g



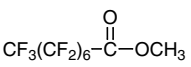
Methyl Nonadecafluorodecanoate
CAS RN: 307-79-9

M1912 5g



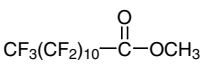
Methyl Nonafluorovalerate
CAS RN: 13038-26-1

P1453 5g



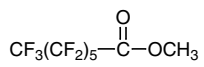
Methyl Pentadecafluorooctanoate
CAS RN: 376-27-2

M1917 5g 25g



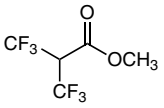
Methyl Tricosafluorododecanoate
CAS RN: 56554-52-0

M1914 5g 25g



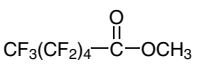
Methyl Tridecafluoro-heptanoate
CAS RN: 14312-89-1

M2496 1g 5g



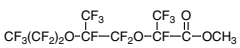
Methyl 2-(Trifluoromethyl)-3,3,3-trifluoropropionate
CAS RN: 360-54-3

M1913 5g



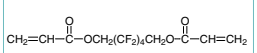
Methyl Undecafluoro-hexanoate
CAS RN: 424-18-0

M2030 5g



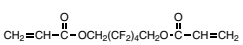
Methyl 2,5-Bis(trifluoromethyl)-3,6-dioxaundecafluorononanoate
(mixture of isomers)
CAS RN: 26131-32-8

B2340 1g 5g



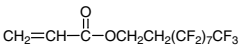
1,6-Bis(acryloyloxy)-2,2,3,3,4,4,5,5-octafluoro-hexane
CAS RN: 2264-01-9

B5785 1g 5g



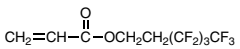
1,6-Bis(acryloyloxy)-2,2,3,3,4,4,5,5-octafluorohexane
(stabilized with 4-Hydroxy-TEMPO)
CAS RN: 2264-01-9

A1330 10g



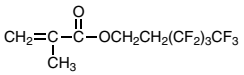
1*H*,1*H*,2*H*,2*H*-Heptadecafluoro-decyl Acrylate
CAS RN: 27905-45-9

N0977 5g 25g



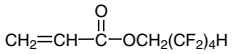
1*H*,1*H*,2*H*,2*H*-Nonafluorohexyl Acrylate
CAS RN: 52591-27-2

N1014 5g 25g



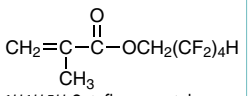
1*H*,1*H*,2*H*,2*H*-Nonafluorohexyl Methacrylate
CAS RN: 1799-84-4

O0318 5g 25g



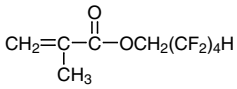
1*H*,1*H*,5*H*-Octafluoropentyl Acrylate
CAS RN: 376-84-1

O0481 5g 25g



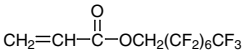
1*H*,1*H*,5*H*-Octafluoropentyl Methacrylate (stabilized with MEHQ)
CAS RN: 355-93-1

M1433 5g 25g



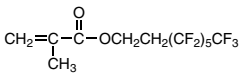
1*H*,1*H*,5*H*-Octafluoropentyl Methacrylate
CAS RN: 355-93-1

P1754 1g 5g 25g



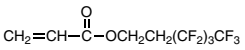
1*H*,1*H*-Pentadecafluoro-*n*-octyl Acrylate
CAS RN: 307-98-2

T3259 5g 25g



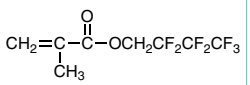
1*H*,1*H*,2*H*,2*H*-Tridecafluoro-*n*-octyl Methacrylate
CAS RN: 2144-53-8

N1107 5g 25g



1*H*,1*H*,2*H*,2*H*-Nonafluorohexyl Acrylate (stabilized with TBC)
CAS RN: 2591-27-2

H1674 5g 25g



2,2,3,3,4,4,4-Heptafluorobutyl Methacrylate (stabilized with MEHQ)
CAS RN: 13695-31-3

Fluorous Alkyl Halides

B2333 1g 5g

$BrCF_2CH{=}CH_2$

3-Bromo-3,3-difluoro-propene
CAS RN: 420-90-6

B3222 5g 25g

$BrCF_2CF_2CH{=}CH_2$

4-Bromo-3,3,4,4-tetrafluoro-1-butene
CAS RN: 18599-22-9

D3572 1g 5g

$Br(CF_2)_6Br$

1,6-Dibromododecafluoro-hexane
CAS RN: 918-22-9

D3587 1g 5g

$Br(CF_2)_8Br$

1,8-Dibromohexadecafluoro-octane
CAS RN: 812-58-8

D3573 5g

$Br(CF_2)_4Br$

1,4-Dibromooctafluoro-butane
CAS RN: 335-48-8

D2804 5g 25g

$Cl(CF_2)_8Cl$

1,8-Dichlorohexadecafluoro-octane
CAS RN: 647-25-6

D2333 10g

$I(CF_2)_6I$

Dodecafluoro-1,6-diiodohexane
CAS RN: 375-80-4

H0844 5g 25g

$CF_3(CF_2)_9I$

Heneicosafluorodecyl Iodide
CAS RN: 423-62-1

H1084 5g 25g

$CF_3(CF_2)_7CH_2CH_2I$

1*H*,1*H*,2*H*,2*H*-Perfluoro-decyl Iodide
CAS RN: 2043-53-0

H0946 5g 25g

$CF_3(CF_2)_7Br$

Perfluoro-*n*-octyl Bromide
CAS RN: 423-55-2

P1084 25g

$CF_3(CF_2)_7I$

Perfluoro-*n*-octyl Iodide
CAS RN: 507-63-1

H0689 5g

$CF_3CF_2CF_2Br$

Heptafluoropropyl Bromide
CAS RN: 422-85-5

H0596 5g 25g

$CF_3CF_2CF_2I$

Perfluoropropyl Iodide
CAS RN: 754-34-7

N0808 5g

$CF_3(CF_2)_8Br$

Nonadecafluorononyl Bromide
CAS RN: 558-96-3

N0499 25g 100g 500g

$CF_3CF_2CF_2CF_2I$

Nonafluorobutyl Iodide
CAS RN: 423-39-2

P1155 5g 25g

$CF_3(CF_2)_3CH_2CH_2I$

2-(Nonafluorobutyl)ethyl Iodide
CAS RN: 2043-55-2

D2329 5g 25g

$I(CF_2)_4I$

Octafluoro-1,4-diiodobutane
CAS RN: 375-50-8

P1753 5g

$CF_3(CF_2)_6Br$

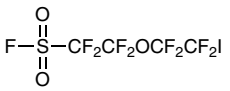
Pentadecafluoroheptyl Bromide
CAS RN: 375-88-2

P1839 5g

$CF_3(CF_2)_6I$

Pentadecafluoroheptyl Iodide
CAS RN: 335-58-0

T2914 5g



Tetrafluoro-2-(tetrafluoro-2-iodoethoxy)-ethanesulfonyl Fluoride
CAS RN: 66137-74-4

T2482 1g 5g

$CF_3(CF_2)_5CH_2I$

1*H*,1*H*-Tridecafluoroheptyl Iodide
CAS RN: 212563-43-4

T2479 5g 25g

$CF_3(CF_2)_5Br$

Tridecafluorohexyl Bromide
CAS RN: 335-56-8

T1098 5g 25g

$CF_3(CF_2)_5I$

Tridecafluorohexyl Iodide
CAS RN: 355-43-1

T2074 5g 25g

$CF_3(CF_2)_5CH_2CH_2I$

1*H*,1*H*,2*H*,2*H*-Perfluoro-*n*-octyl Iodide
CAS RN: 2043-57-4

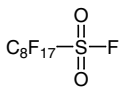
U0081 5g 25g

$CF_3(CF_2)_4I$

Undecafluoropentyl Iodide
CAS RN: 638-79-9

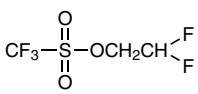
Fluorous Sulfonic Acids & their derivatives

H1176 25g 250g



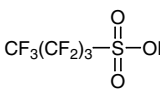
Perfluoro-1-octanesulfonyl Fluoride (mixture of *n*- and *iso*- isomers)
CAS RN: 307-35-7

D5299 1g 5g



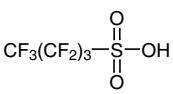
2,2-Difluoroethyl Trifluoromethanesulfonate
CAS RN: 74427-22-8

N0710 25g



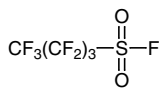
Lithium Nonafluoro-1-butane-sulfonate
CAS RN: 131651-65-5

N0709 5g 25g



Nonafluoro-1-butanesulfonic Acid
CAS RN: 375-73-5

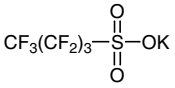
P1098 25g 250g



Perfluoro-1-butanesulfonyl Fluoride
CAS RN: 375-72-4

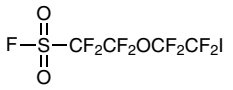
Please inquire for pricing and availability of listed products to our local sales representatives.

N0711 25g



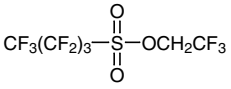
Potassium Nonafluoro-1-butanesulfonate
CAS RN: 29420-49-3

T2914 5g



Tetrafluoro-2-(tetrafluoro-2-iodoethoxy)-ethanesulfonyl Fluoride
CAS RN: 66137-74-4

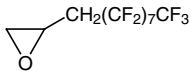
N0677 5g



2,2,2-Trifluoroethyl Perfluorobutanesulfonate
CAS RN: 79963-95-4

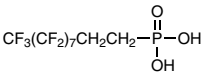
Others

E0462 10g



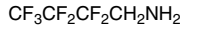
3-(Perfluoro-*n*-octyl)propenoxide
CAS RN: 38565-53-6

H1459 200mg



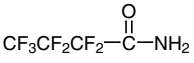
(1*H*,1*H*,2*H*,2*H*-Perfluoro-decyl)phosphonic Acid
CAS RN: 80220-63-9

H1300 1g 5g



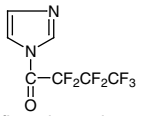
1*H*,1*H*-Perfluorobutylamine
CAS RN: 374-99-2

H0926 25g



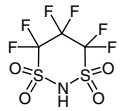
Heptafluorobutyramide
CAS RN: 662-50-0

H0467 5g 25g



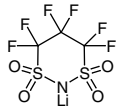
1-(Perfluorobutyryl)imidazole
CAS RN: 32477-35-3

H1056 1g 5g



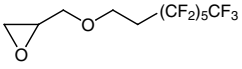
1,1,2,2,3,3-Hexafluoro-propane-1,3-disulfonimide
CAS RN: 84246-29-7

H1057 1g 5g



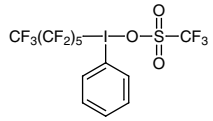
Lithium 1,1,2,2,3,3-Hexafluoro-propane-1,3-disulfonimide
CAS RN: 189217-62-7

P1106 25g



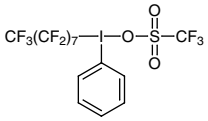
3-[2-(Perfluorohexyl)ethoxy]-1,2-epoxypropane
CAS RN: 122193-68-4

P1080 1g 5g



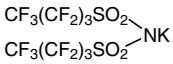
(Perfluorohexyl)phenyliodonium Trifluoromethanesulfonate
CAS RN: 77758-84-0

P1081 1g



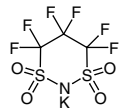
(Perfluoro-*n*-octyl)phenyliodonium Trifluoromethanesulfonate
CAS RN: 77758-89-5

N0712 1g 5g



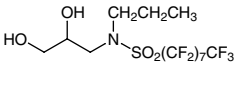
Potassium Bisnonafluoro-1-butanesulfonimidate
CAS RN: 129135-87-1

H1058 1g 5g



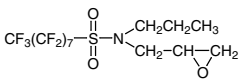
1,1,2,2,3,3-Hexafluoropropane-1,3-disulfonimide Potassium Salt
CAS RN: 588668-97-7

P1162 25g



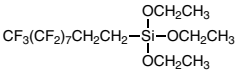
N-Propyl-*N*-(2,3-dihydroxypropyl)-perfluoro-*n*-octylsulfonamide
CAS RN: 2262-49-9

P1163 25g



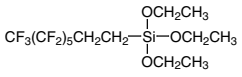
N-Propyl-*N*-(2,3-epoxypropyl)-perfluoro-*n*-octylsulfonamide
CAS RN: 77620-64-5

T2876 5g



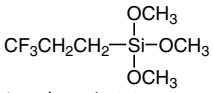
Triethoxy-1*H*,1*H*,2*H*,2*H*-heptadecafluorodecylsilane
CAS RN: 101947-16-4

T1770 5g 25g



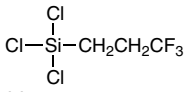
Triethoxy-1*H*,1*H*,2*H*,2*H*-tridecafluoro-*n*-octylsilane
CAS RN: 51851-37-7

T2720 5g 25g



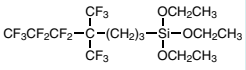
Trimethoxy(3,3,3-trifluoropropyl)silane
CAS RN: 429-60-7

T3518 25g



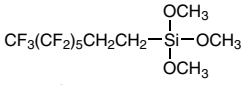
Trichloro(3,3,3-trifluoropropyl)silane
CAS RN: 592-09-6

T3246 1g 5g



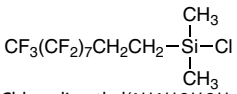
Triethoxy[5,5,6,6,7,7,7-heptafluoro-4,4-bis(trifluoromethyl)heptyl]-silane
CAS RN: 130676-81-2

T3560 5g 25g



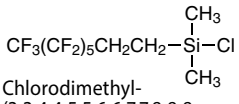
Trimethoxy(1*H*,1*H*,2*H*,2*H*-tridecafluoro-*n*-octyl)silane
CAS RN: 85857-16-5

C3427 5g



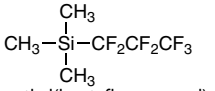
Chlorodimethyl(1*H*,1*H*,2*H*,2*H*-perfluorodecyl)silane
CAS RN: 85857-16-5

C1857 1g 5g



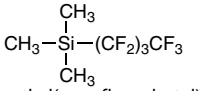
Chlorodimethyl-(3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-*n*-octyl)silane
CAS RN: 102488-47-1

T3593 1g 5g



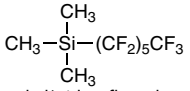
Trimethyl(heptafluoropropyl)-silane
CAS RN: 3834-42-2

T3594 1g 5g



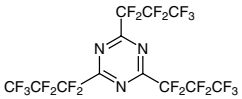
Trimethyl(nonafluorobutyl)-silane
CAS RN: 204316-01-8

T3595 1g 5g



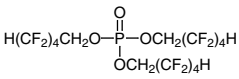
Trimethyl(tridecafluorohexyl)-silane
CAS RN: 135841-49-5

T0859 0.1mL



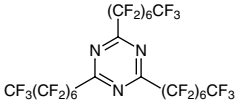
2,4,6-Tris(perfluoropropyl)-1,3,5-triazine
CAS RN: 915-76-4

P1134 10g



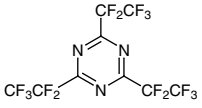
Tris(1*H*,1*H*,5*H*-octafluoro-pentyl) Phosphate
CAS RN: 355-86-2

T0828 100mg



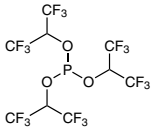
2,4,6-Tris(perfluoroheptyl)-1,3,5-triazine
CAS RN: 21674-38-4

T0858 0.1mL



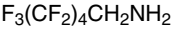
2,4,6-Tris(pentafluoroethyl)-1,3,5-triazine
CAS RN: 858-46-8

T3353 1g 5g



Tris(1,1,1,3,3,3-hexafluoro-2-propyl) Phosphite
CAS RN: 66470-81-3

U0083 1g 5g



1*H*,1*H*-Undecafluorohexylamine
CAS RN: 355-34-0

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