

Fluoro Chemicals

11th Edition

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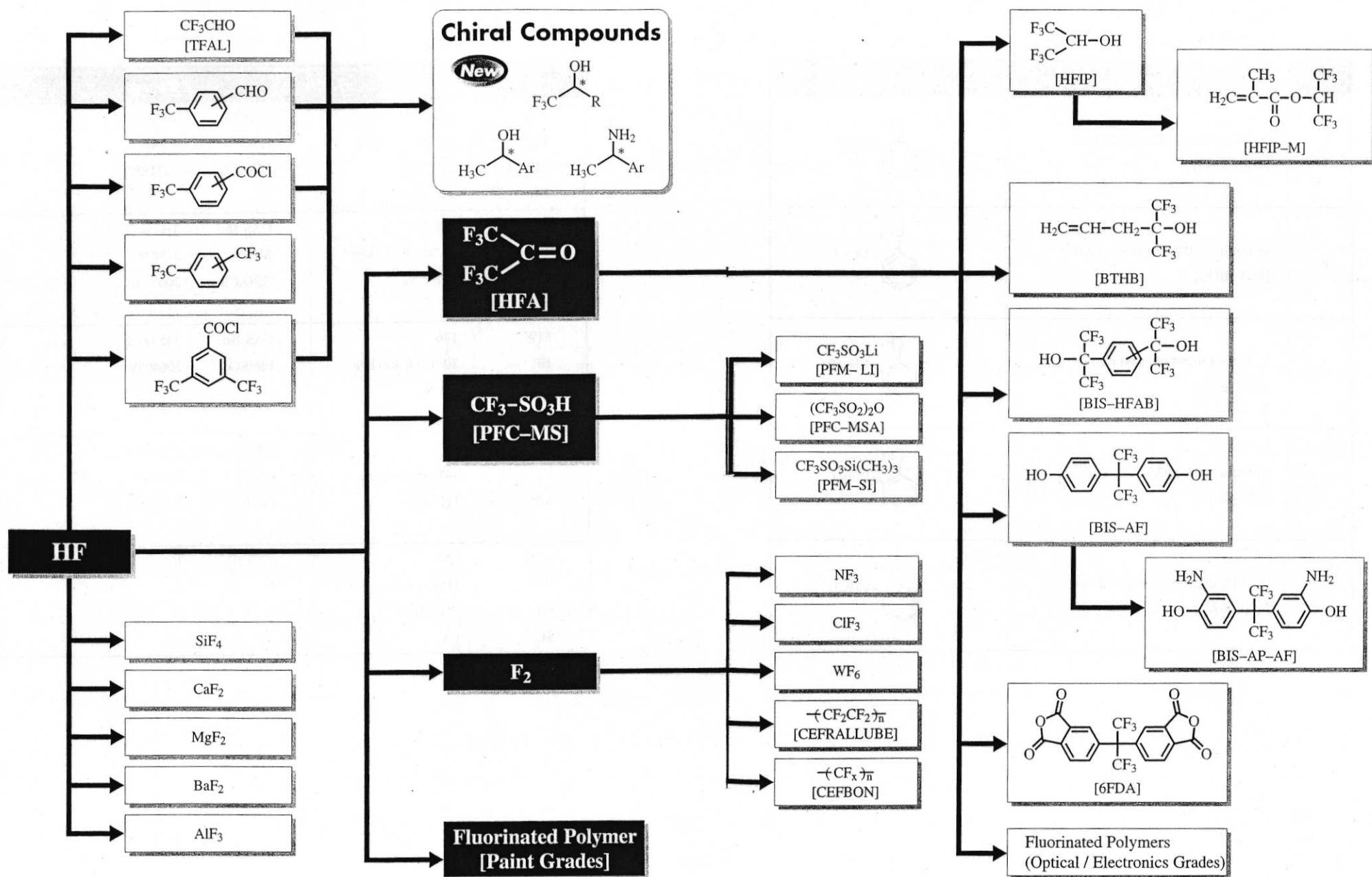
Abbreviations

CAS No.	: Chemical Abstracts Service Registry Number
ENCS	: Existing and New Chemical Substances (Japan)
TSCA	: Toxic Substances Control Act Chemical Substance Inventory (USA)
EINECS	: European Inventory of Existing Commercial Chemical Substances
MW	: Molecular Weight
BP	: Boiling Point
MP	: Melting Point
SG	: Specific Gravity
RI	: Refractive Index
$\overline{MW}$	: Mean Molecular Weight
TS	: Tensile Strength
EB	: Elongation at break
TM	: 3 % Tensile Modulus
HS	: Hardness Shore D
NV	: Nonvolatile Matter
OHV	: OH Value
AV	: Acid Value

Contents

	page
1. Products Line	2 ~ 3
2. Organic Products	4 ~ 51
2.1 Aromatic Products	
2.1.1 o-Derivatives	
2.1.2 m-Derivatives	
2.1.3 p-Derivatives	
2.1.4 MBT Aromatics	
2.1.5 Other Aromatics	
2.2 Aliphatic Products	
2.3 Monomers	
2.3.1 Aromatics	
2.3.2 Aliphatics	
2.4 Triflates	
2.5 Chiral Compounds	
3. Inorganic Products	52 ~ 55
3.1 Gas Products	
3.2 Powder Products	
4. Polymer Products	56 ~ 59
4.1 Cefral Soft, Cefral Coat	
4.2 Other Polymer Products	

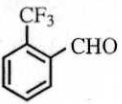
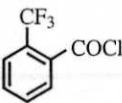
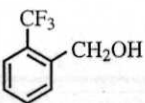
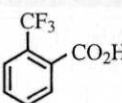
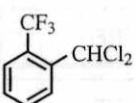
1. Products Line



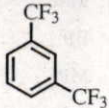
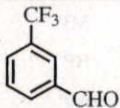
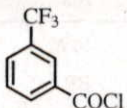
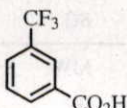
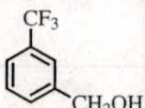
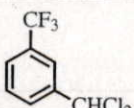
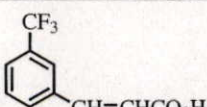
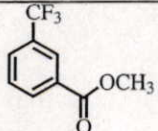
2. Organic Products

2.1 Aromatic Products

2.1.1 o-Derivatives

No.	Products	Structural Formula
201	o-Trifluoromethylbenzaldehyde [OTF-BAD]	
202	o-Trifluoromethylbenzoyl chloride [OTF-BOC]	
501	o-Trifluoromethylbenzyl alcohol [OTF-BYL]	
502	o-Trifluoromethylbenzoic acid [OTF-BOA]	
503	o-Trifluoromethylbenzal chloride [OTF-BAC]	

Properties		Remarks
MW	: 174	CAS No. : 447-61-0
BP	: 71 °C / 2.80 kPa	ENCS : 3-3811
MP	: -39.9 °C	EINECS : 2071859
SG	: 1.3	
MW	: 208.5	CAS No. : 312-94-7
BP	: 72 °C / 0.933 kPa	ENCS : 3-3798
MP	: -21.7 °C	EINECS : 2062336
SG	: 1.4	
MW	: 176	CAS No. : 346-06-5
BP	: 70 °C / 0.400 kPa	EINECS : 2064679
MP	: 4.2 °C	
SG	: 1.3	
MW	: 190	CAS No. : 433-97-6
BP	: 247 °C / 100 kPa	ENCS : 3-1414
MP	: 111 °C	EINECS : 2070939
MW	: 229	CAS No. : 707-72-2
BP	: 71 °C / 1.47kPa	
MP	: -34.4 °C	
SG	: 1.4	

No.	Products	Structural Formula
206	1, 3-Bis (trifluoromethyl)benzene [MTF-TFM]	
507	m-Trifluoromethylbenzaldehyde [MTF-BAD]	
508	m-Trifluoromethylbenzoyl chloride [MTF-BOC]	
509	m-Trifluoromethylbenzoic acid [MTF-BOA]	
510	m-Trifluoromethylbenzyl alcohol [MTF-BYL]	
511	m-Trifluoromethylbenzal chloride [MTF-BAC]	
512	3-(Trifluoromethyl)cinnamic acid [MTF-CNA]	
513	Methyl 3-(trifluoromethyl)benzoate [MTF-BOM]	

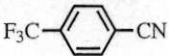
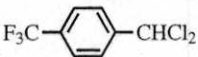
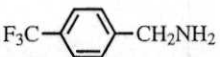
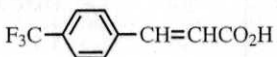
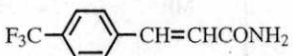
Properties		Remarks
MW	: 214	CAS No. : 402-31-3
BP	: 115 °C	ENCS : 3-54
MP	: -35 °C	TSCA : Registered
SG	: 1.4	EINECS : 2069394
MW	: 174	CAS No. : 454-89-7
BP	: 64 °C / 1.33 kPa	ENCS : 9-923
SG	: 1.3	TSCA : Registered
		EINECS : 2072281
MW	: 208.5	CAS No. : 2251-65-2
BP	: 184 °C / 100 kPa	TSCA : Registered
SG	: 1.3	EINECS : 2188445
MW	: 190	CAS No. : 454-92-2
MP	: 104 °C	ENCS : 3-1414
		EINECS : 2072302
MW	: 176	CAS No. : 349-75-7
BP	: 108 °C / 2.67 kPa	TSCA : Registered
SG	: 1.3	EINECS : 2064899
MW	: 229	CAS No. : 85301-66-2
BP	: 92 °C / 2.00 kPa	
MW	: 216	CAS No. : 779-89-5
MP	: 136 °C	TSCA : Registered
		EINECS : 2123016
MW	: 204	CAS No. : 2557-13-3
BP	: 80 ~ 82 °C / 2.0 kPa	
SG	: 1.295	

2.1.3 p-Derivatives (1)

No.	Products	Structural Formula
203	p-Trifluoromethylbenzaldehyde [PTF-BAD]	
204	1, 4-Bis (trifluoromethyl)benzene [PTF-TFM]	
504	p-Trifluoromethylbenzoyl chloride [PTF-BOC]	
505	p-Trifluoromethylbenzyl alcohol [PTF-BYL]	
506	p-Trifluoromethylbenzoic acid [PTF-BOA]	

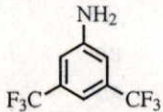
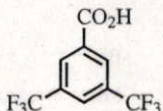
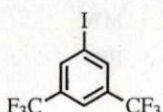
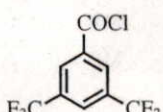
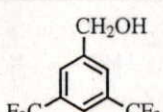
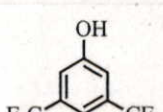
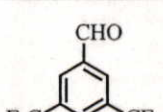
Properties		Remarks
MW	: 174	CAS No. : 455-19-6
BP	: 66 °C / 1.73 kPa	ENCS : 3-3799
MP	: 1 ~ 2 °C	TSCA : Registered
SG	: 1.3	EINECS : 2072407
MW	: 214	CAS No. : 433-19-2
BP	: 116 °C	ENCS : 3-3850
MP	: -1 °C	TSCA : Registered
SG	: 1.4	EINECS : 2070860
MW	: 208.5	CAS No. : 329-15-7
BP	: 68 °C / 1.60 kPa	TSCA : Registered
MP	: -3 °C	EINECS : 2063429
SG	: 1.4	
MW	: 176	CAS No. : 349-95-1
BP	: 85 °C / 1.60 kPa	EINECS : 2064946
MP	: 24 °C	
MW	: 190	CAS No. : 455-24-3
BP	: 224 °C	ENCS : 3-1414
		TSCA : Registered
		EINECS : 2072428

2.1.3 p-Derivatives (2)

No.	Products	Structural Formula
515	p-Trifluoromethylbenzonitrile [PTF-CN]	
516	p-Trifluoromethylbenzal chloride [PTF-BAC]	
517	p-Trifluoromethylbenzyl amine [PTF-BYM]	
518	4-(Trifluoromethyl)cinnamic acid [PTF-CNA]	
527	4-(Trifluoromethyl)cinnamamide [PTF-CNM]	

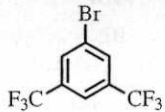
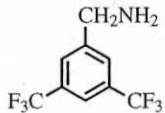
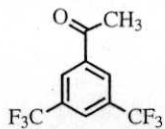
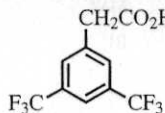
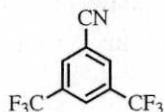
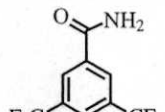
Properties		Remarks
MW	: 171	CAS No. : 455-18-5
BP	: 80 °C / 2.67 kPa	TSCA : Registered
MP	: 41 °C	EINECS : 2072391
MW	: 229	CAS No. : 82510-98-3
BP	: 76 °C / 1.07 kPa	
MP	: -3 ~ -2 °C	
SG	: 1.4	
MW	: 175	CAS No. : 3300-51-4
BP	: 80 ~ 82 °C / 2.00 kPa	TSCA : Registered
MW	: 216	CAS No. : 2062-26-2
MP	: 230 ~ 231 °C	
MW	: 215	CAS No. : 115093-99-7
MP	: 186 ~ 188 °C	

2.1.4 MBT Aromatics (1)

No.	Products	Structural Formula
550	3, 5-Bis (trifluoromethyl)aniline [MBT-NH ₂]	
551	3, 5-Bis (trifluoromethyl)benzoic acid [MBT-BOA]	
552	3, 5-Bis (trifluoromethyl)iodobenzene [MBT-I]	
553	3, 5-Bis (trifluoromethyl)- benzoyl chloride [MBT-BOC]	
554	3, 5-Bis (trifluoromethyl)benzyl alcohol [MBT-BYL]	
555	3, 5-Bis(trifluoromethyl)phenol [MBT-OH]	
556	3, 5-Bis(trifluoromethyl)benzaldehyde [MBT-BAD]	

Properties		Remarks
MW	: 229	CAS No. : 328-74-5
BP	: 85 °C / 2.00 kPa	TSCA : Registered
		EINECS : 2063350
MW	: 258	CAS No. : 725-89-3
MP	: 141 ~ 142 °C	EINECS : 2119701
MW	: 340	CAS No. : 328-73-4
BP	: 75 °C / 3.20 kPa	
MW	: 276.5	CAS No. : 785-56-8
BP	: 80 °C / 2.13 kPa	TSCA : Registered
SG	: 1.5	EINECS : 2123220
MW	: 244	CAS No. : 32707-89-4
MP	: 54 ~ 56 °C	TSCA : Registered
		EINECS : 2511689
MW	: 230	CAS No. : 349-58-6
BP	: 97 °C / 6.67 kPa	TSCA : Registered
MP	: 20 °C	EINECS : 2064883
SG	: 1.5	
MW	: 242	CAS No. : 401-95-6
BP	: 37 °C / 0.173 kPa	
SG	: 1.47	

2.1.4 MBT Aromatics (2)

No.	Products	Structural Formula
557	3, 5-Bis (trifluoromethyl)bromobenzene [MBT-Br]	
558	3, 5-Bis (trifluoromethyl)benzyl amine [MBT-BYM]	
559	3, 5-Bis (trifluoromethyl)acetophenone [MBT-Ac]	
560	3, 5-Bis (trifluoromethyl)phenylacetic acid [MBT-PAA]	
561	3, 5-Bis (trifluoromethyl)benzonitrile [MBT-CN]	
562	3, 5-Bis (trifluoromethyl)benzamide [MBT-BAM]	

Properties		Remarks
MW	: 293	CAS No. : 328-70-1
BP	: 154 °C	EINECS : 2063345
MP	: -16 °C	
SG	: 1.7	
MW	: 243	CAS No. : 85068-29-7
BP	: 81 ~ 83 °C / 1.73 kPa	ENCS : 3-4511
MP	: 59 °C	EINECS : 2852909
MW	: 256	CAS No. : 30071-93-3
BP	: 85 °C / 1.07 kPa	
MW	: 272	CAS No. : 85068-33-3
MP	: 121 ~ 123 °C	
MW	: 239	CAS No. : 27126-93-8
BP	: 90 °C / 3.20 kPa	
MP	: 5 ~ 10 °C	
MW	: 257	CAS No. : 22227-26-5
MP	: 161 ~ 163 °C	

2.1.5 Other Aromatics (1)

No.	Product	Structural Formula
569	5-Fluoro-2-(trifluoromethyl)benzoyl-chloride [OTF-BOC-5F]	
571	5-Fluoro-2-(trifluoromethyl)benzoic acid [OTF-BOA-5F]	
572	5-Fluoro-2-(trifluoromethyl)benzyl-alcohol [OTF-BYL-5F]	
573	5-Fluoro-2-(trifluoromethyl)benzylamine [OTF-BYM-5F]	
575	5-Fluoro-2-(trifluoromethyl)benzaldehyde [OTF-BAD-5F]	

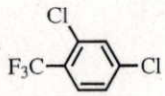
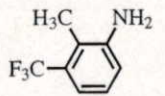
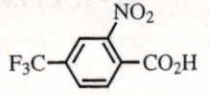
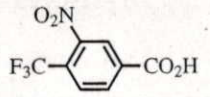
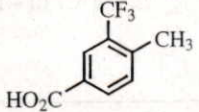
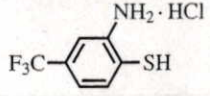
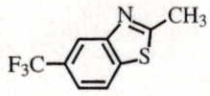
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MW	: 227	CAS No. : 216144-70-6
BP	: 72 ~ 74 °C / 1.7 ~ 1.9 kPa	
MW	: 208	CAS No. : 654-99-9
BP	: 85 ~ 87 °C / 1.6 ~ 1.7 kPa	
MW	: 194	CAS No. : 238742-82-0
BP	: 85 ~ 87 °C / 1.6 ~ 1.7 kPa	
MW	: 193	CAS No. : 231291-14-8
BP	: 82 ~ 83 °C / 3.0 ~ 3.2 kPa	
MW	: 192	CAS No. : 90381-08-1
BP	: 64 ~ 65 °C / 2.8 ~ 2.9 kPa	

2.1.5 Other Aromatics (2)

No.	Product	Structural Formula
576	2-Fluoro-6-(trifluoromethyl)benzoyl-chloride [OTF-BOC-6F]	
577	2-Fluoro-6-(trifluoromethyl)benzoic acid [OTF-BOA-6F]	
578	2-Fluoro-6-(trifluoromethyl)benzyl-alcohol [OTF-BYL-6F]	
579	2-Fluoro-6-(trifluoromethyl)benzylamine [OTF-BYM-6F]	
580	2-Fluoro-6-(trifluoromethyl)benzaldehyde [OTF-BAD-6F]	
570	5-Fluoro-2-(trifluoromethyl)-toluene [PTF-F-3Me]	

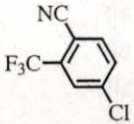
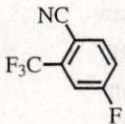
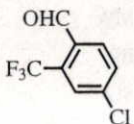
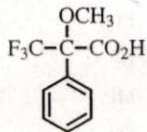
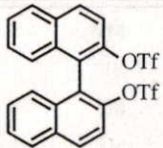
Properties	Remarks
MW : 227	CAS No. : 109227-12-5
MW : 208	CAS No. : 32890-94-1
MW : 194 BP : 80 ~ 81 °C / 1.87 kPa	CAS No. : 152211-15-9
MW : 193 BP : 71 ~ 72 °C / 2.3 ~ 2.4 kPa	CAS No. : 239087-06-0
MW : 192 BP : 73 ~ 74 °C / 1.1 ~ 1.2 kPa	CAS No. : 60611-24-7
MW : 178 BP : 53 ~ 55 °C / 6.7 ~ 6.8 kPa	CAS No. : 80245-26-7

2.1.5 Other Aromatics (3)

No.	Products	Structural Formula
207	2, 4-Dichlorobenzotrifluoride [2, 4-DCBTF]	
208	2-Methyl-3-(trifluoromethyl)aniline [MABTF]	
519	2-Nitro-4-(trifluoromethyl)benzoic acid [2NTF-BOA]	
520	3-Nitro-4-(trifluoromethyl)benzoic acid [3NTF-BOA]	
528	4-Methyl-3-(trifluoromethyl)benzoic acid [MTF-BOA-4Me]	
521	2-Amino-4-(trifluoromethyl)- benzenthioi hydrochloride [AT-BTF]	
522	2-Methyl-5-(trifluoromethyl)- benzothiazole [5TF-BTZ]	

Properties		Remarks
MW	: 215	CAS No. : 320-60-5
BP	: 178 °C	ENCS : 3-3749
MP	: -26 °C	TSCA : Registered
SG	: 1.5	EINECS : 2062781
MW	: 175	CAS No. : 54396-44-0
BP	: 198 °C	ENCS : 3-4077
MP	: 40 °C	EINECS : 2591455
SG	: 1.3	
MW	: 235	CAS No. : 320-94-5
MP	: 140 °C	
MW	: 235	CAS No. : 116965-16-3
MP	: 169 °C	
MW	: 204	CAS No. : 261952-01-6
MP	: 176 ~ 177 °C	
MW	: 229	CAS No. : 4274-38-8
Mp	: 190 °C	
MW	: 217	CAS No. : 398-99-2
BP	: 116 °C / 2.00 kPa	TSCA : Registered
MP	: 63 °C	

2.1.5 Other Aromatics (2)

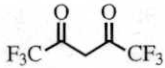
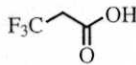
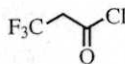
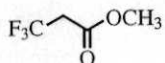
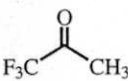
No.	Products	Structural Formula
523	2-Trifluoromethyl-4-chlorobenzonitrile	
524	2-Trifluoromethyl-4-fluorobenzonitrile	
526	2-Trifluoromethyl-4-chlorobenzaldehyde	
530	α -Methoxy- α -(trifluoromethyl)-phenylacetic acid [Mosher acid]	
531	Trifluoromethanesulfonic acid 2'-trifluoromethanesulfonyloxy-[1,1']binaphthalenyl-2-yl ester [BINOL-TF2]	

Properties		Remarks
MW	: 205.5	CAS No. : 320-41-2
BP	: 109 °C / 1.33 kPa	
MW	: 189	CAS No. : 194853-86-6
MP	: 43 ~ 45 °C	
MW	: 208	CAS No. : 320-43-4
BP	: 96 °C / 6.66 kPa	
MP	: 44 °C	CAS No. : 81655-41-6
MW	: 550.5	
		CAS No. : 128575-34-8

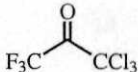
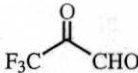
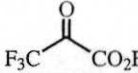
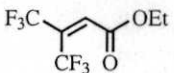
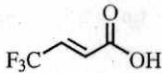
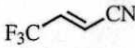
2.2 Aliphatic Products

No.	Products	Structural Formula
102	Hexafluoroacetone trihydrate [HFA • 3W]	$\begin{array}{c} \text{F}_3\text{C} \\ \diagdown \\ \text{C}=\text{O} \cdot 3\text{H}_2\text{O} \\ \diagup \\ \text{F}_3\text{C} \end{array}$
103	Hexafluoro-2-propylalcohol [HFIP]	$\begin{array}{c} \text{F}_3\text{C} \\ \diagdown \\ \text{CHOH} \\ \diagup \\ \text{F}_3\text{C} \end{array}$
404	Trifluoroacetaldehyde ethylhemiacetal [TFAL-EtOH]	$\begin{array}{c} \text{OCH}_2\text{CH}_3 \\ \diagup \\ \text{CF}_3\text{CH} \\ \diagdown \\ \text{OH} \end{array}$
410	Hexafluoro-2-propylalcohol-d2 [HFIP-d2]	$\begin{array}{c} \text{F}_3\text{C} \\ \diagdown \\ \text{CDOD} \\ \diagup \\ \text{F}_3\text{C} \end{array}$
411	Trifluoroacetaldehyde hydrate [TFAL-W]	$\begin{array}{c} \text{OH} \\ \diagup \\ \text{CF}_3\text{CH} \\ \diagdown \\ \text{OH} \end{array}$
419	1, 1-Dichloro-3, 3, 3-trifluoro- acetone hydrate [DCTFA-W]	$\begin{array}{c} \text{O} \\ \parallel \\ \text{F}_3\text{C}-\text{C}-\text{CHCl}_2 \\ \cdot \text{H}_2\text{O} \end{array}$
420	1-Chloro-3, 3, 3-trifluoropropene	$\text{CF}_3\text{CH}=\text{CHCl}$

Properties	Remarks
MW : 220 BP : 105 °C MP : -11 °C SG : 1.6	CAS No. : 34202-69-2 ENCS : 2-581 EINECS : 2116763
MW : 168 BP : 58.6 °C MP : -3.3 °C SG : 1.6	CAS No. : 920-66-1 ENCS : 2-291 TSCA : Registered EINECS : 2130594
MW : 144 BP : 104 °C SG : 1.2	CAS No. : 433-27-2 TSCA : Registered EINECS : 2070876
MW : 170 BP : 57.5 ~ 58 °C MP : -3.3 °C SG : 1.6	CAS No. : 38701-74-5
MW : 116 BP : 107 °C MP : -55 °C SG : 1.5	CAS No. : 421-53-4 TSCA : Registered EINECS : 2070064
MW : 181 BP : 103 °C	CAS No. : 126266-75-9
MW : 130.5 BP : 21 °C	CAS No. : 2730-43-0

No.	Products	Structural Formula
433	1, 1, 1, 5, 5, 5,-Hexafluoroacetylacetone [HFAcAc]	
421	1-Chloro-3, 3, 3-trifluoropropane	$\text{CF}_3\text{CH}_2\text{CH}_2\text{Cl}$
422	3, 3, 3-Trifluoropropanal	$\text{CF}_3\text{CH}_2\text{CHO}$
436	3, 3, 3-Trifluoropropionic acid [TFPA]	
440	3, 3, 3-Trifluoropropiyl chloride [TFPAC]	
441	Methyl 3, 3, 3-trifluoropropionate [Me-TFPA]	
405	1, 1, 1-Trifluoroacetone [TFA]	

Properties		Remarks
MW	: 208	CAS No. : 1522-22-1
BP	: 68 ~ 71 °C	TSCA : Registered
SG	: 1.5	EINECS : 2161910
MW	: 132.5	CAS No. : 460-35-5
BP	: 46 °C	TSCA : Registered
SG	: 1.3	
MW	: 112	CAS No. : 460-40-2
MW	: 128	CAS No. : 2516-99-6
BP	: 146 °C	
SG	: 1.47	
MW	: 146.5	CAS No. : 41463-83-6
BP	: 70 ~ 71 °C	
MW	: 142	CAS No. : 18830-44-9
BP	: 96 °C	
MW	: 112	CAS No. : 421-50-1
BP	: 22 °C	TSCA : Registered
SG	: 1.25	EINECS : 2070059

No.	Products	Structural Formula
416	1, 1, 1-Trichloro-3, 3, 3-trifluoroacetone [TCTFA]	
417	Trifluoropyruvic aldehyde [TFPAD]	
418	Ethyl trifluoropyruvate [E-TFPA]	
437	Ethyl 3, 3-bis(trifluoromethyl)acrylate [Et-BTFA]	
438	4, 4, 4-Trifluorocrotonic acid	
439	4, 4, 4-Trifluorocrotonitrile	

Properties		Remarks
MW	: 215	CAS No. : 758-42-9
BP	: 85 °C	EINECS : 2020633
SG	: 1.59	
MW	: 126	CAS No. : 91944-47-7
MW	: 170	CAS No. : 13081-18-0
MW	: 237	CAS No. : 1513-60-6
BP	: 102 °C / 44 kPa	
MW	: 140	CAS No. : 71027-02-6
BP	: 75 °C / 4.67 kPa	
MP	: 40 °C	
MW	: 121	CAS No. : 406-86-0
BP	: 85 °C	

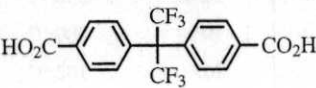
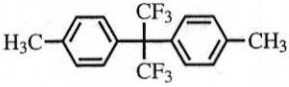
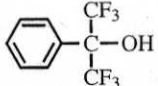
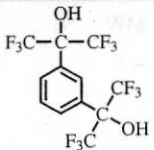
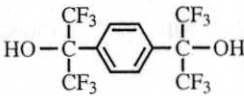
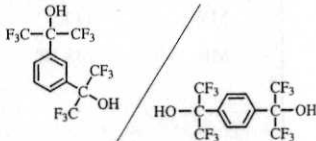
2.3 Monomers

2.3.1 Aromatics (1)

No.	Products	Structural Formula
205	2, 2-Bis (4-hydroxyphenyl)- hexafluoropropane [BIS-AF]	
821	2, 2-Bis [4- (4-aminophenoxy) phenyl]- hexafluoropropane [BIS-AF-A]	
822	2, 2-Bis (3-amino-4-hydroxyphenyl)- hexafluoropropane [BIS-AP-AF]	
828	2, 2-Bis (3-amino-4-methylphenyl)- hexafluoropropane [BIS-AT-AF]	
827	2, 2-Bis (4-aminophenyl)- hexafluoropropane [BIS-A-AF]	
829	2, 2-Bis (3, 4-anhydrodicarboxyphenyl)- hexafluoropropane [6FDA]	
830	2, 2'-Bis (trifluoromethyl)benzidine [ABL-21]	

Properties	Remarks
MW : 336 BP : 400 °C MP : 162 °C	CAS No. : 1478-61-1 ENCS : 4-1335 TSCA : Registered EINECS : 2160367
MW : 518 MP : 163 °C	CAS No. : 69563-88-8 TSCA : Registered
MW : 366 MP : 240 °C	CAS No. : 83558-87-6 TSCA : Registered
MW : 362 MP : 105 ~ 106 °C	CAS No. : 116325-74-7
MW : 334 MP : 196 °C	CAS No. : 1095-78-9 TSCA : Registered
MW : 444 MP : 248 °C	CAS No. : 1107-00-2 EINECS : 2141700 TSCA : Registered
MW : 320 MP : 183 ~ 184 °C	CAS No. : 341-58-2

2.3.1 Aromatics (2)

No.	Products	Structural Formula
819	2, 2-Bis (4-carboxyphenyl)- hexafluoropropane [BIS-B-AF]	
820	2, 2-Bis (4-methylphenyl)- hexafluoropropane [BIS-T-AF]	
823	2-Hydroxy-2-phenyl- hexafluoropropane [HFAB]	
824	1, 3-Bis (hexafluoro-2-hydroxy-2- propyl)benzene [1,3-HFAB]	
825	1, 4-Bis (hexafluoro-2-hydroxy-2- propyl)benzene [1, 4-HFAB]	
831	Mixture of 1, 3-HFAB and 1, 4-HFAB [BIS-HFAB]	

Properties	Remarks
MW : 392 MP : 272 °C	CAS No. : 1171-47-7 TSCA : Registered
MW : 332 BP : 117 °C / 0.267 kPa MP : 82 °C	CAS No. : 1095-77-8
MW : 244 BP : 159 °C SG : 1.4	CAS No. : 718-64-9 TSCA : Registered EINECS : 2119434
MW : 410 BP : 115 ~ 120 °C / 4.00 kPa MP : 21 ~ 22 °C	CAS No. : 802-93-7 ENCS : 3-4346 TSCA : Registered EINECS : 2123545
MW : 410 MP : 87 ~ 87.5 °C	CAS No. : 1992-15-0
MW : 410 BP : 100 °C / 2.67 kPa MP : 8 °C	CAS No. : 802-93-7 : 1992-15-0 TSCA : Registered

2.3.2 Aliphatics

No.	Products	Structural Formula
409	Hexafluoro-2-propyl methacrylate [HFIP-M]	$\begin{array}{c} \text{CH}_3 \quad \text{CF}_3 \\ \quad \\ \text{H}_2\text{C}=\text{C}-\text{C}(=\text{O})-\text{O}-\text{CH} \\ \quad \\ \text{O} \quad \text{CF}_3 \end{array}$
406	Trifluoroethyl acrylate [TFOL-A]	$\text{H}_2\text{C}=\text{CH}-\text{C}(=\text{O})-\text{O}-\text{CH}_2\text{CF}_3$
407	Hexafluoro-2-propyl acrylate [HFIP-A]	$\begin{array}{c} \text{CF}_3 \\ \\ \text{H}_2\text{C}=\text{CH}-\text{C}(=\text{O})-\text{O}-\text{CH} \\ \quad \\ \text{O} \quad \text{CF}_3 \end{array}$
408	Trifluoroethyl methacrylate [TFOL-M]	$\begin{array}{c} \text{CH}_3 \\ \\ \text{H}_2\text{C}=\text{C}-\text{C}(=\text{O})-\text{O}-\text{CH}_2\text{CF}_3 \\ \\ \text{O} \end{array}$
412	Heptafluoro-2-propyl acrylate [PFIP-A]	$\begin{array}{c} \text{CF}_3 \\ \\ \text{H}_2\text{C}=\text{CH}-\text{C}(=\text{O})-\text{O}-\text{CF} \\ \quad \\ \text{O} \quad \text{CF}_3 \end{array}$
413	Heptafluoro-2-propyl allylether [HpIP-AE]	$\begin{array}{c} \text{CF}_3 \\ \\ \text{H}_2\text{C}=\text{CHCH}_2-\text{O}-\text{CF} \\ \\ \text{CF}_3 \end{array}$
414	Bis (hexafluoro-2-propyl)itaconate [HFIP-I]	$\begin{array}{c} \text{H}_2\text{C}=\text{C}-\text{CO}_2\text{CH}(\text{CF}_3)_2 \\ \\ \text{CH}_2-\text{CO}_2\text{CH}(\text{CF}_3)_2 \end{array}$
423	1, 1, 1-Trifluoro-2-trifluoromethyl- pent-4-en-2-ol [BTHB]	$\begin{array}{c} \text{CF}_3 \\ \\ \text{H}_2\text{C}=\text{CHCH}_2-\text{C}-\text{OH} \\ \\ \text{CF}_3 \end{array}$

Properties	Remarks
MW : 236 BP : 60 °C / 4.27 kPa SG : 1.3 RI : 1.331	CAS No. : 3063-94-3 ENCS : 2-1031 TSCA : Registered EINECS : 2213099
MW : 154 BP : 91 °C SG : 1.2 RI : 1.350	CAS No. : 407-47-6 TSCA : Registered EINECS : 2069876
MW : 222 BP : 74 °C SG : 1.4 RI : 1.319	CAS No. : 2160-89-6 TSCA : Registered EINECS : 2184791
MW : 168 BP : 107 °C SG : 1.2 RI : 1.361	CAS No. : 352-87-4 ENCS : 2-1031 TSCA : Registered EINECS : 2065253
MW : 240 BP : 86 ~ 87 °C SG : 1.4 RI : 1.312	CAS No. : 13057-08-4 EINECS : 2359439
MW : 226 BP : 64 ~ 65 °C	CAS No. : 15242-17-8
MW : 430	CAS No. : 98452-82-5
MW : 208 BP : 97 ~ 99 °C SG : 1.3 RI : 1.340	CAS No. : 646-97-9 TSCA : Registered

2.4 Triflates

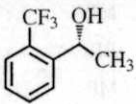
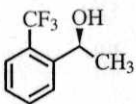
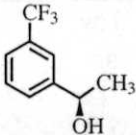
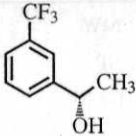
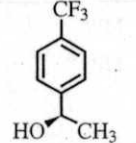
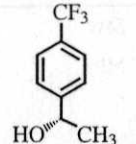
No.	Products	Structural Formula
603	Trifluoromethanesulfonic acid [PFC-MS]	$\text{CF}_3\text{SO}_3\text{H}$
604	Trifluoromethanesulfonic anhydride [PFC-MSA]	$\begin{array}{c} \text{CF}_3\text{SO}_2 \\ \diagup \quad \diagdown \\ \text{O} \\ \diagdown \quad \diagup \\ \text{CF}_3\text{SO}_2 \end{array}$
607	Lithium trifluoromethanesulfonate [PFM-Li]	$\text{CF}_3\text{SO}_3\text{Li}$
608	Trifluoromethanesulfonyl fluoride [PFC-MSF]	$\text{CF}_3\text{SO}_2\text{F}$
609	Trifluoromethanesulfonyl chloride [PFC-MSCl]	$\text{CF}_3\text{SO}_2\text{Cl}$
610	N, N-Bis (trifluoromethanesulfonyl)- imide acid	$\begin{array}{c} \text{CF}_3\text{SO}_2 \\ \diagup \quad \diagdown \\ \text{NH} \\ \diagdown \quad \diagup \\ \text{CF}_3\text{SO}_2 \end{array}$
615	N, N-Bis (pentafluoroethanesulfonyl)- imide acid	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{SO}_2 \\ \diagup \quad \diagdown \\ \text{NH} \\ \diagdown \quad \diagup \\ \text{CF}_3\text{CF}_2\text{SO}_2 \end{array}$
614	Sodium trifluoromethanesulfinate	$\text{CF}_3\text{SO}_2\text{Na}$
613	2, 2, 2-Trifluoroethyl trifluoromethane- sulfonate [TFOL-Tf]	$\text{CF}_3\text{SO}_3\text{CH}_2\text{CF}_3$

Properties	Remarks
MW : 150 BP : 162 °C MP : -40 °C SG : 1.7	CAS No. : 1493-13-6 ENCS : 2-2809 TSCA : Registered EINECS : 2160875
MW : 282 BP : 84 °C MP : -80 °C SG : 1.7	CAS No. : 358-23-6 ENCS : 2-3807 TSCA : Registered EINECS : 2066168
MW : 156 BP : 423 °C SG : 1.9	CAS No. : 33454-82-9 ENCS : 2-3223 TSCA : Registered EINECS : 2515285
MW : 152 BP : -21 °C	CAS No. : 335-05-7 EINECS : 2063848 TSCA : Registered
MW : 169 BP : 30 °C SG : 1.58	CAS No. : 421-83-0 EINECS : 2070090
MW : 281 MP : 52 ~ 56 °C	CAS No. : 82113-65-3 TSCA : Registered
MW : 381 MP : 40 °C	CAS No. : 152894-10-5 TSCA : Registered
MW : 156	CAS No. : 2926-29-6
MW : 232 BP : 93 °C	CAS No. : 6226-25-1

2.5 Chiral Compounds

No.	Products	Structural Formula
924	(R)-1-[3,5-Bis-(trifluoromethyl)phenyl]-ethanol [R-MBT-PEL]	
925	(S)-1-[3,5-Bis-(trifluoromethyl)phenyl]-ethanol [S-MBT-PEL]	
926	(R)-1-[3,5-Bis-(trifluoromethyl)phenyl]-ethylamine [R-MBT-PEM]	
927	(S)-1-[3,5-Bis-(trifluoromethyl)phenyl]-ethylamine [S-MBT-PEM]	
975	(R)-N-Methyl-1-[3, 5-bis-(trifluoromethyl)phenyl]ethylamine [R-MBT-PEM-NMe]	
974	(S)-N-Methyl-1-[3, 5-bis-(trifluoromethyl)phenyl]ethylamine [S-MBT-PEM-NMe]	

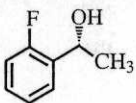
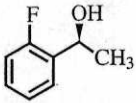
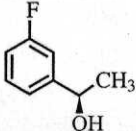
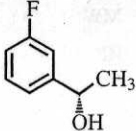
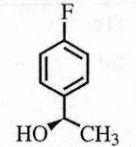
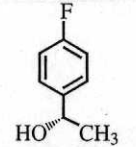
Properties	Remarks
MW : 258 BP : 83 °C / 11 kPa MP : 54 ~ 55 °C	CAS No. : 127852-28-2
MW : 258 BP : 83 °C / 11 kPa	CAS No. : 225920-05-8
MW : 257 BP : 90 ~ 93 °C / 3.07 kPa	CAS No. : 127733-47-5
MW : 257 BP : 60 °C / 0.533 kPa [α] _D ²⁴ : -14.8 °(c1.015, EtOH)	CAS No. : 127733-40-8
MW : 271 MP : 174 ~ 176 °C	CAS No. : 334477-60-0
MW : 271 MP : 174 ~ 176 °C	CAS No. : 511256-36-3

No.	Products	Structural Formula
912	(R)-1-[2-(Trifluoromethyl)phenyl]ethanol [R-OTF-PEL]	
913	(S)-1-[2-(Trifluoromethyl)phenyl]ethanol [S-OTF-PEL]	
916	(R)-1-[3-(Trifluoromethyl)phenyl]ethanol [R-MTF-PEL]	
917	(S)-1-[3-(Trifluoromethyl)phenyl]ethanol [S-MTF-PEL]	
920	(R)-1-[4-(Trifluoromethyl)phenyl]ethanol [R-PTF-PEL]	
921	(S)-1-[4-(Trifluoromethyl)phenyl]ethanol [S-PTF-PEL]	

Properties	Remarks
MW : 190 BP : 70 °C / 1.33 kPa	CAS No. : 127852-29-3
MW : 190 BP : 84 °C / 0.533 kPa	CAS No. : 127852-27-1
MW : 190	CAS No. : 127852-24-8
MW : 190	CAS No. : 96789-80-9
MW : 190 BP : 112 ~ 114 °C / 2.66 kPa	CAS No. : 76155-79-8
MW : 190 BP : 112 ~ 114 °C / 2.67 kPa	CAS No. : 99493-93-3

No.	Products	Structural Formula
914	(R)-1-[2-(Trifluoromethyl)phenyl]-ethylamine [R-OTF-PEM]	
915	(S)-1-[2-(Trifluoromethyl)phenyl]-ethylamine [S-OTF-PEM]	
918	(R)-1-[3-(Trifluoromethyl)phenyl]-ethylamine [R-MTF-PEM]	
919	(S)-1-[3-(Trifluoromethyl)phenyl]-ethylamine [S-MTF-PEM]	
923	(S)-1-[4-(Trifluoromethyl)phenyl]-ethylamine [S-PTF-PEM]	

Properties		Remarks
MW	: 189	CAS No. : 127733-46-4
BP	: 67 °C / 2.27 kPa	
MW	: 189	CAS No. : 127733-39-5
BP	: 67 °C / 2.27 kPa	
MW	: 189	CAS No. : 127852-30-6
BP	: 88 ~ 92 °C / 2.93 kPa	
MW	: 189	CAS No. : 127852-21-5
BP	: 88 ~ 92 °C / 2.93 kPa	
MW	: 189	CAS No. : 84499-73-0
BP	: 95 ~ 97 °C / 1.70 kPa	

No.	Products	Structural Formula
900	(R)-1-(2-Fluorophenyl)ethanol [R-OF-PEL]	
901	(S)-1-(2-Fluorophenyl)ethanol [S-OF-PEL]	
904	(R)-1-(3-Fluorophenyl)ethanol [R-MF-PEL]	
905	(S)-1-(3-Fluorophenyl)ethanol [S-MF-PEL]	
908	(R)-1-(4-Fluorophenyl)ethanol [R-PF-PEL]	
909	(S)-1-(4-Fluorophenyl)ethanol [S-PF-PEL]	

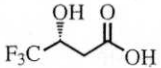
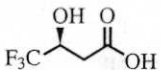
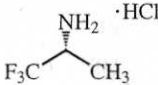
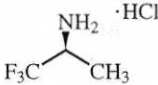
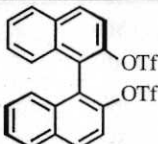
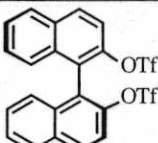
Properties		Remarks
MW	: 140	CAS No. : 162427-79-4
BP	: 65 °C / 2.00 kPa	
MW	: 140	CAS No. : 171032-87-4
BP	: 65 °C / 2.00 kPa	
MW	: 140	CAS No. : 126534-33-6
BP	: 71 °C / 10 kPa	
MW	: 140	CAS No. : 126534-32-5
BP	: 71 °C / 10 kPa	
MW	: 140	CAS No. : 101219-68-5
BP	: 84 °C / 1.3 kPa	
MW	: 140	CAS No. : 101219-73-2
BP	: 84 °C / 1.3 kPa	

No.	Products	Structural Formula
902	(R)-1-(2-Fluorophenyl)ethylamine [R-OF-PEM]	
903	(S)-1-(2-Fluorophenyl)ethylamine [S-OF-PEM]	
906	(R)-1-(3-Fluorophenyl)ethylamine [R-MF-PEM]	
907	(S)-1-(3-Fluorophenyl)ethylamine [S-MF-PEM]	
910	(R)-1-(4-Fluorophenyl)ethylamine [R-PF-PEM]	
911	(S)-1-(4-Fluorophenyl)ethylamine [S-PF-PEM]	
976	(R)-1-(2, 4-Difluorophenyl)ethylamine [R-2,4-DF-PEM]	
977	(S)-1-(2, 4-Difluorophenyl)ethylamine [S-2,4-DF-PEM]	

Properties		Remarks
MW	: 139	CAS No. : 185545-90-8
BP	: 62 °C / 1.87 kPa	
MW	: 139	CAS No. : 68285-25-6
BP	: 62 °C / 1.87 kPa	
MW	: 139	CAS No. : 761390-58-3
BP	: 64 °C / 1.33 kPa	
MW	: 139	CAS No. : 444643-09-8
BP	: 64 °C / 1.33 kPa	
MW	: 139	CAS No. : 374898-01-8
BP	: 82 °C / 1.7 kPa	
MW	: 139	CAS No. : 66399-30-2
BP	: 82 °C / 1.7 kPa	
MW	: 157	CAS No. : 791098-84-5
MW	: 157	CAS No. : 845252-02-0

No.	Products	Structural Formula
950	(R)-4,4,4-Trifluorobutane-1,3-diol [R-TFBDOL]	
951	(S)-4,4,4-Trifluorobutane-1,3-diol [S-TFBDOL]	
954	(R)-3,3,3-Trifluoro-2-hydroxy- propionic acid [R-TF-LA]	
955	(S)-3,3,3-Trifluoro-2-hydroxy- propionic acid [S-TF-LA]	
958	(R)-3,3,3-Trifluoro-2-hydroxy- 2-methyl-propionic acid [R-TFM-LA]	
959	(S)-3,3,3-Trifluoro-2-hydroxy- 2-methyl-propionic acid [S-TFM-LA]	

Properties	Remarks
MW : 144 BP : 94 ~ 95 °C / 0.600 kPa [α] _D ²⁵ : +29.9 °(c0.57, CHCl ₃)	CAS No. : 135859-36-8
MW : 144 BP : 75 ~ 76 °C / 0.667 kPa	CAS No. : 135154-88-0
MW : 144 BP : 145 °C / 99.5 kPa MP : 9.7 °C	CAS No. : 121250-04-2
MW : 144 BP : 81 °C / 2.67 kPa	CAS No. : 125995-00-8
MW : 158	CAS No. : 44864-47-3
MW : 158	CAS No. : 24435-45-8

No.	Products	Structural Formula
956	(R)-4,4,4-Trifluoro-3-hydroxy- butyric acid [R-TFHBA]	
957	(S)-4,4,4-Trifluoro-3-hydroxy- butyric acid [S-TFHBA]	
961	(R)-2, 2, 2-Trifluoro-1-methyl- ethylamine hydrochloride [R-TFIPM·HCl]	
960	(S)-2, 2, 2-Trifluoro-1-methyl- ethylamine hydrochloride [S-TFIPM·HCl]	
930	(R)-Trifluoromethanesulfonic acid 2'-trifluoromethanesulfonyloxy- [1,1']binaphthalenyl-2-yl ester [R-BINOL-TF2]	
931	(S)-Trifluoromethanesulfonic acid 2'-trifluoromethanesulfonyloxy- [1,1']binaphthalenyl-2-yl ester [S-BINOL-TF2]	

Properties	Remarks
MW : 158 BP : 115 °C / 0.9 kPa	CAS No. : 108211-36-5
MW : 158 BP : 115 °C / 0.9 kPa	CAS No. : 128899-79-6
MW : 149.5	CAS No. : 177469-12-4
MW : 149.5	CAS No. : 125353-44-8
MW : 550.5 MP : 82 ~ 85 °C	CAS No. : 126613-06-7
MW : 550.5 [α] _D ²⁵ : -140.3 °(c1.010, CHCl ₃)	CAS No. : 128544-05-8

3. Inorganic Products

3.1 Gas Products

No.	Products	Structural Formula
001	Anhydrous Hydrogen Fluoride	HF
007	Diluted Fluorine	F ₂ / He F ₂ / Ar F ₂ / N ₂
317	Chlorine Trifluoride	ClF ₃
306	Nitrogen Trifluoride	NF ₃
006	Silicon Tetrafluoride	SiF ₄
008	Tungsten Hexafluoride	WF ₆

Properties	Remarks
MW : 20 BP : 19.54 °C MP : -83.55 °C SG : 1.0	CAS No. : 32057-09-3 ENCS : 1-306 TSCA : Registered EINECS : 2316348
MW : 38 BP : -219 °C MP : -188 °C SG : 1.3	CAS No. : 7782-41-4 EINECS : 2319548
MW : 92.5 BP : 11.75 °C MP : -76.3 °C SG : 1.8	CAS No. : 7790-91-2 ENCS : 1-212 TSCA : Registered EINECS : 2322304
MW : 71 BP : -129.1 °C MP : -206.79 °C SG : 2.49	CAS No. : 7783-54-2 ENCS : 1-1218 TSCA : Registered EINECS : 2320071
MW : 104 BP : -95 °C MP : -77 °C (0.2 MPa) SG : 3.6	CAS No. : 7783-61-1 ENCS : 1-343 TSCA : Registered EINECS : 2320155
MW : 298 BP : 17.5 °C MP : 2.3 °C SG : 3.5	CAS No. : 7783-82-6 ENCS : 1-1177 TSCA : Registered EINECS : 2320291

3.2 Powder Products

No.	Products	Structural Formula
004	Aluminium Fluoride	AlF_3
014	Barium Fluoride	BaF_2
318	Calcium Fluoride	CaF_2
319	Magnesium Fluoride	MgF_2
309	Strontium Fluoride	SrF_2
003	Cryolite	Na_3AlF_6

Properties	Remarks
MW : 84 BP : 1,278 °C (Sub) MP : 1,260 °C SG : 3.10	CAS No. : 7784-18-1 ENCS : 1-14 TSCA : Registered EINECS : 2320511
MW : 175 BP : 2,260 °C MP : 1,280 °C SG : 4.83	CAS No. : 7787-32-8 ENCS : 1-82 TSCA : Registered EINECS : 2321080
MW : 78 BP : 2,513 °C MP : 1,360 °C SG : 3.18	CAS No. : 7789-75-5 ENCS : 1-179 TSCA : Registered EINECS : 2321887
MW : 62 BP : 2,227 °C MP : 1,263 °C SG : 3.13	CAS No. : 7783-40-6 ENCS : 1-328 TSCA : Registered EINECS : 2319951
MW : 126 BP : 2,460 °C MP : 1,190 °C SG : 2.44	CAS No. : 7783-48-4 ENCS : 1-347 TSCA : Registered EINECS : 2320003
MW : 210 BP : Decomposition MP : 1,012 °C SG : 2.97	CAS No. : 15096-52-3 ENCS : 1-332, 1-14 EINECS : 2391488

4. Polymer Products

4.1 Cefral Soft, Cefral Coat

No.	Products	Structural Formula
702	Flexible Fluoroplastic "CEFRAL SOFT" G150F200	Fluorinated Graft Copolymer
703	Solvent-soluble fluoro-resin for paint "CEFRAL COAT" CC-04	Fluorinated Copolymer
705	Solvent-soluble fluoro-resin for paint "CEFRAL COAT" CC-03	Fluorinated Copolymer
706	Solvent-soluble fluoro-resin for paint "CEFRAL COAT" CC-05	Fluorinated Copolymer
707	Fluoropolymer emulsion for water-borne coatings	Fluorinated Copolymer

Properties	Remarks
TS*1 : 220 ~ 320 EB : 480 ~ 600 3 % TM*1 : 1,000 ~ 1,600 HS : 46 ~ 56	ENCS : 6-1791
NV : 50 wt% OHV : 28 mgKOH / varnish-g AV : 4 mgKOH / varnish-g Solvents : n-Butyl acetate	ENCS : 1-1218 TSCA : Registered
NV : 61 wt% OHV : 48 mgKOH / varnish-g AV : 4 mgKOH / varnish-g Solvents : Xylene	TSCA : Registered
NV : 60 wt% OHV : 70 mgKOH / varnish-g AV : 8 mgKOH / varnish-g Solvents*2 : Xylene, Naphtha	TSCA : Registered
Developmental Quantities	—

*1 Kgf / cm²

*2 Naphtha : Coal tar Naphtha

4.2 Other Polymer Products

No.	Products	Structural Formula
301	Graphite Fluoride "CEFBON"	$(CF_x)_n$
701	Tetrafluoroethylene Oligomer "CEFRAL LUBE"	$(CF_2-CF_2)_n$
	Fluorinated Functional Polymers	Polyimides
		Polybenzoxazoles
		Polyacrylates
		Polyolefines

Properties	Remarks
MP : Decomposition	CAS No. : 51311-17-2
SG : 2.6	ENCS : 1-131
	TSCA : Registered
	EINECS : 2571313
MW : 1,500 ~ 20,000	CAS No. : 9002-84-0
MP : 265 ~ 315 °C	ENCS : 6-939
SG : 2.1	TSCA : Registered
High Heat Resistance	—
Low Refractive Index	
Screen Print Process	
Low CTE	—
Low Dielectric Constant	
High Transparency	—
Low Refractive Index	
Crosslinking Process	
Solvent Solubility	—

Triflic acid

Trifluoromethanesulfonic acid



Properties

Molecular weight	150
Boiling Point (°C)	162
Freezing Point (°C)	-40
Specific gravity (at 25°C)	1.70
Flash Point (°C)	Nonflammable
Appearance	Colorless clear liquid

Triflic anhydride

Trifluoromethanesulfonic anhydride



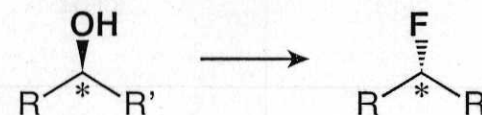
Properties

Molecular weight	282
Boiling Point (°C)	84
Freezing Point (°C)	-80
Specific gravity (at 25°C)	1.67
Flash Point (°C)	Nonflammable
Appearance	Colorless clear liquid

CENTRAL GLASS CO., LTD.

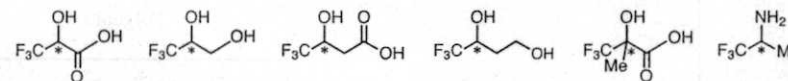
Fluorinated Chiral Molecules

Deoxyfluorination

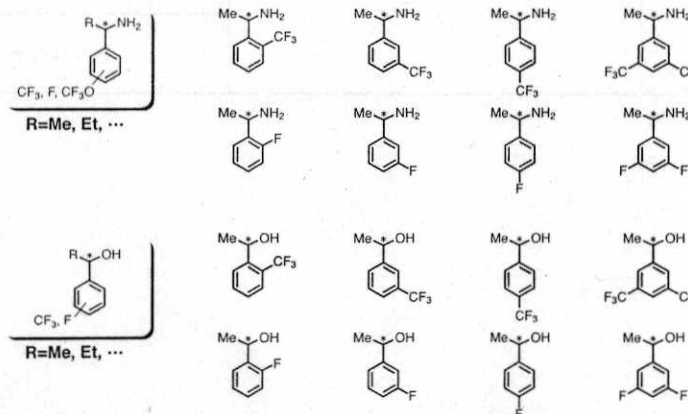


Commercial Scale Available

Aliphatic Compounds



Aromatic Compounds

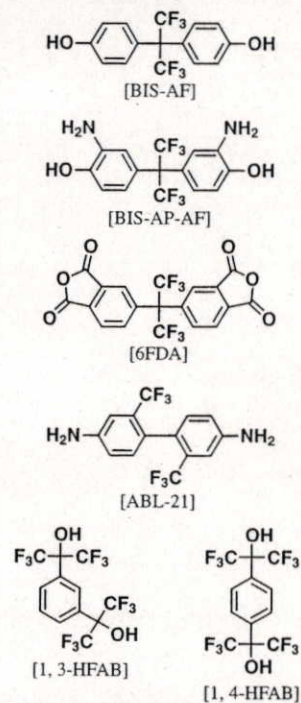


Available from reagents to commercial scale

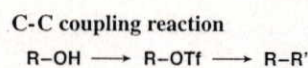
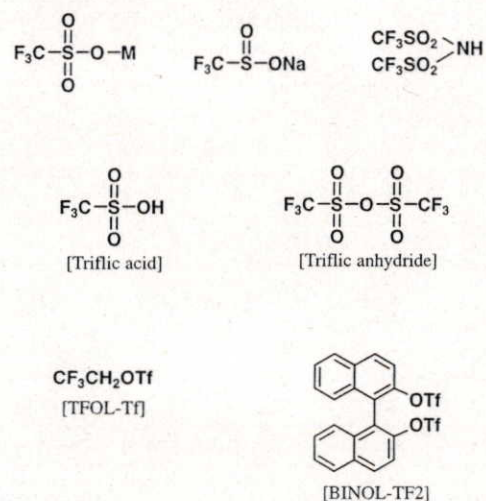
HF

Hydrogen Fluoride

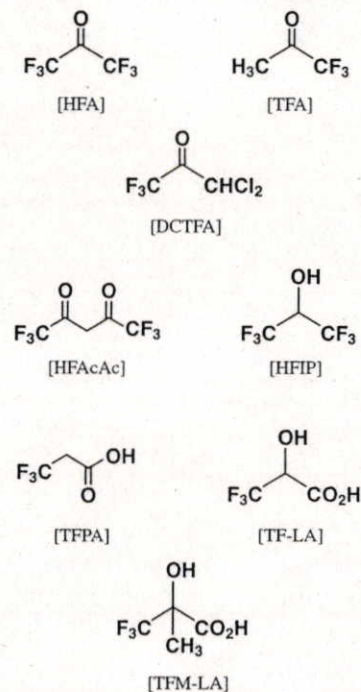
Fluorinated Monomers



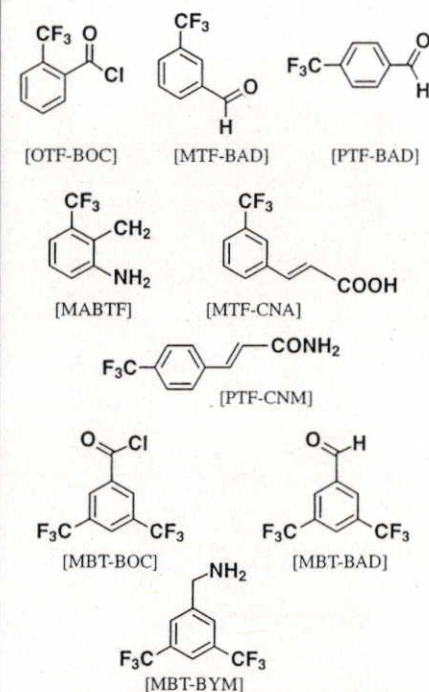
Triflates



Fluorinated Aliphatics



Fluoro Aromatics



Fluorinated Chiral Molecules

