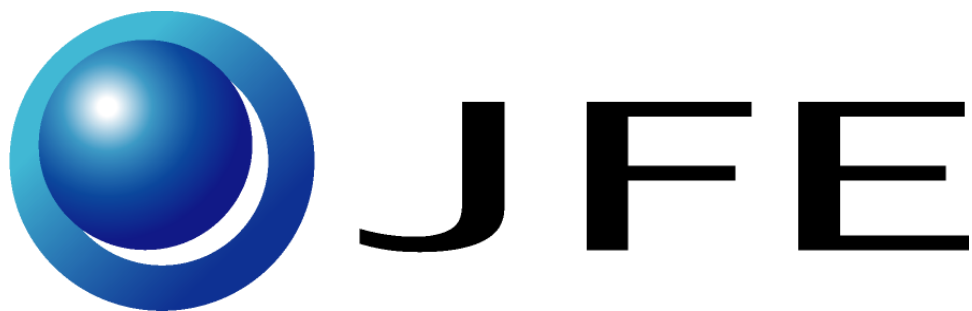




JFE Chemical Corporation

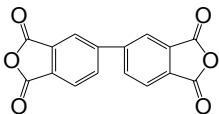
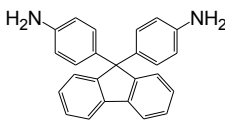
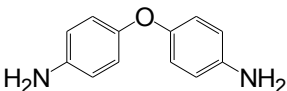
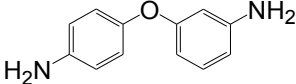
Fine Chemicals Department

Reserching ,production and distribution of indene and fluorene derivatives

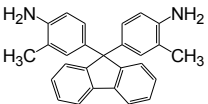
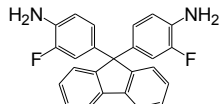
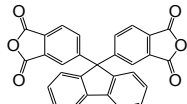
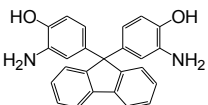
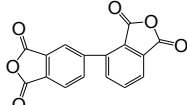
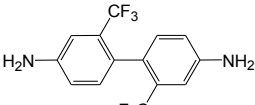
Reserching ,production and distribution of Aromatic polymer and polymer precursor

1. Row material of Aromatic polymer(polyimide,polyamide)

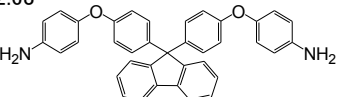
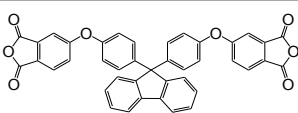
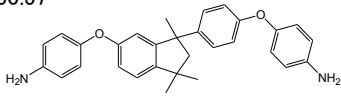
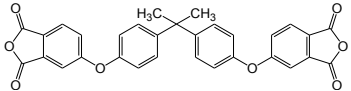
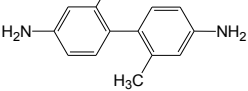
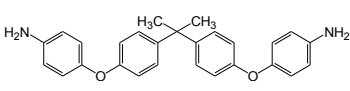
《Commercial Stage》

information of product	structure	other
Name abbrev. Mw Cas.No. ENCS No 3,3',4,4'-Biphenyltetracarboxylic dianhydride s-BPDA 294.22 2420-87-3 (4)-833		capacity packing physicality ~100T/Y aluminum package M.P.: 298.5°C
Name abbrev. Mw Cas.No. ENCS No 9,9-Bis(aminophenyl)fluorene BAFL 348.44 15499-84-0 (4)-1619		capacity packing physicality ~50T/Y aluminum package M.P.: 233°C
Name abbrev. Mw Cas.No. ENCS No 4,4'-Diaminodiphenylether ODA 200.24 101-80-4 (3)-854		capacity packing physicality - aluminum package M.P.: 191.5°C
Name abbrev. Mw Cas.No. ENCS No 3,4'-Diaminodiphenylether DAPE 200.24 2657-87-6 (3)-3633		capacity packing physicality ~50T/Y aluminum package M.P.: 73°C

《Traial Stage》

9,9-Bis(4-amino-3-methylphenyl)fluorene M.P.: 233°C	9,9-Bis(4-amino-3-fluorophenyl)fluorene M.P.: 256°C	9,9-Bis(3,4-dicarboxyphenyl)fluorene dianhydride
BTFL * [CAS]107934-60-1 [化]-	BFAF [CAS]127926-65-2 [化]-	BPAF [CAS]135876-30-1 [化]-
Mw: 376.49 	Mw: 384.14 	Mw: 458.42 
9,9-Bis(4-hydroxy-3-aminophenyl)fluorene M.P.: 279-282°C	2,3',3,4'-Biphenyltetracarboxylic anhydride M.P.: 200°C	2,2'-Bis(trifluoromethyl)benzidine M.P.: 182°C
BAHF [CAS]20638-07-7 [化]-	a-BPDA [CAS]36978-41-3 [化](4)-1371	TFMB [CAS]341-58-2 [化]-
Mw: 380.44 	Mw: 294.22 	Mw: 320.23 

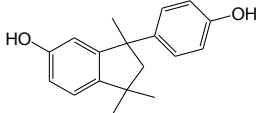
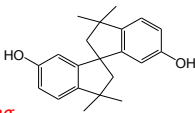
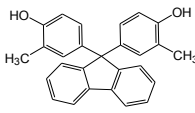
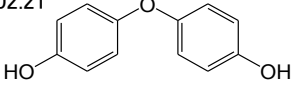
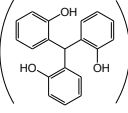
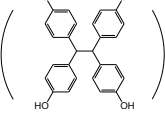
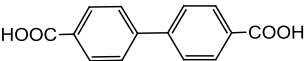
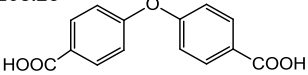
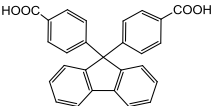
《Researching Stage》

9,9-Bis[4-(4-aminophenoxy)phenyl]fluorene	9,9-Bis[4-(3,4-dicarboxyphenoxy)phenyl]fluorene Dianhydride	5-(4-aminophenoxy)-3-[4-(4-aminophenoxy)phenyl]-1,1,3-trimethylindane
BAOFL [CAS]47823-88-1 [化]-	BPF-PA [CAS]59507-08-3 [化]-	BAO-TMIN [Cas] [化]-
Mw: 532.63 	Mw: 642.61 	Mw: 450.57 
4,4'-(4,4'-Isopropylidenediphenoxy) bis(phthalic anhydride) M.P.: 189-190°C	m-Tolidine M.P.: 103.0-103.5°C	4,4'-(4,4'-Isopropylidenediphenyl-1,1'-diylidenoxy)dianiline M.P.: 127-130°C
BPA-DA [CAS]38103-06-9 [化]-	m-DMB [CAS]84-67-3 [化](4)-803	BAPP [CAS]13080-86-9 [化](4)-1581
Mw: 520.49 	Mw: 212.29 	Mw: 410.51 

2. Dio and dicarboxylic acid of aromatic , polymer precursor, others

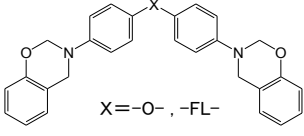
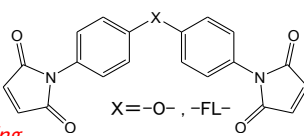
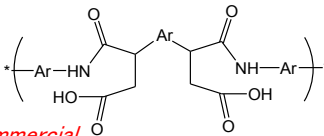
(1) Dio and dicarboxylic acid of aromatic

application: Row material and Additive of aromatic polymer

3-(2-hydroxyphenyl)- 1,1,3-trimethylindan-5-ol M.P.: 196.19°C	6,6'-dihydroxy-3,3,3',3'-tetramethyl -1,1'-spirobiindane M.P.: 222.23°C	9,9-Bis(3-methylphenol)fluorene
Cas 10527-11-4 ENCS (4)-1203	Cas 1568-80-5 ENCS -	Cas 88938-12-9 ENCS (4)-1869
Mw: 268.35  <i>Researching</i>	Mw: 308.41  <i>Researching</i>	Mw: 378.16  <i>Commercial</i>
4,4'-hydroxydiphenol M.P.: 163-168 °C	Trisphenol methane compounds S.P. 113°C/130°C	Tetrakis(4-hydroxyphenyl)ethane compounds
Cas 1965-09-9 ENCS (3)-654	Cas 112755-07-4 ENCS (7)-2401	Cas 7727-33-5 ENCS -
Mw: 202.21  <i>Researching</i>	(Mw: 292.33)  <i>Commercial</i>	(Mw: 398.45)  <i>Researching</i>
Biphenyl-4,4'-dicarboxylic acid	4,4'-Oxybisbenzoic acid	4,4'-(9-Fluorenylidene)bisbenzoic acid
Cas 787-70-2 ENCS -	Cas 2215-89-6 ENCS (3)-4453 / (3)-4483	Cas 54941-51-5 ENCS -
Mw: 242.23  <i>Researching</i>	Mw: 258.23  <i>Researching</i>	Mw: 406.43  <i>Researching</i>

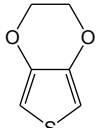
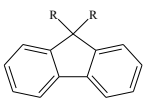
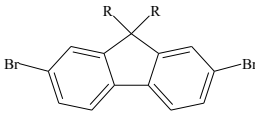
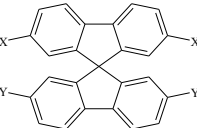
(2) polymer precursor

application: Pripreg, Additive and modified of polymer

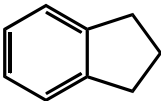
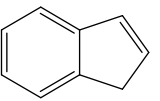
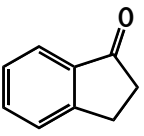
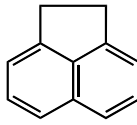
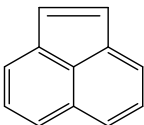
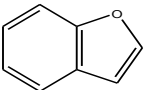
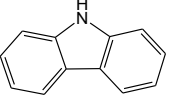
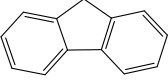
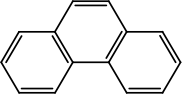
Benzoxazine derivatives (origomer)	Bismaleimide derivatives	Polyamic acid varnish (Solvent=DMAc or NMP)
Cas (X=O) 918788-89-3 ENCS -	Cas (X=O) 13132-94-0 ENCS -	Cas - ENCS -
 X = -O-, -FL- <i>Trial</i>	 X = -O-, -FL- <i>Researching</i>	 <i>Commercial</i>

※BenzoxazineとBismaleimide物性は別紙参照

(3) others

3,4-Ethylenedioxythiophene	Fluorene derivatives		
Cas 126213-50-1 ENCS 5-6421	Cas - ENCS -	Cas - ENCS -	Cas - ENCS -
 <i>Researching</i>	 <i>Trial</i>	 <i>Trial</i>	 <i>Researching</i>

3. Tar Chemicals(polycyclic aromatic hydrocarbon)
application: Row material and Additive of aromatic polymer

indane(Traial)		indene(Commercial)		1—indanone(Traial)	
【Cas】	496-11-7	【Cas】	95-13-6	【Cas】	83-33-0
【化】	-	【化】	(4)-580	【化】	-
physical property	structure	physical property	structure	physical property	structure
Mw	118.18	Mw	116.16	Mw	132.16
M.P.	177	M.P.	183	M.P.	243-245
B.P.	-51	B.P.	-2	B.P.	38-40
					
Acenaphthene(Traial)		Acenaphthylene(Commercial)		coumarone(Traial)	
【Cas】	83-32-9	【Cas】	208-96-8	【Cas】	271-89-6
【化】	(4)-645	【化】	-	【化】	-
physical property	structure	physical property	structure	physical property	structure
Mw	154.21	Mw	152.19	Mw	120.15
M.P.	277	M.P.	280	M.P.	174
B.P.	95	B.P.	91.8	B.P.	-28
					
carbazole(Researching)		Fluorene(Commercial)		phenanthrene(Researching)	
【Cas】	86-74-8	【Cas】	86-73-7	【Cas】	85-01-8
【化】	5-150	【化】	4-643	【化】	(4)-635
physical property	structure	physical property	structure	physical property	structure
Mw	167.21	Mw	166.22	Mw	178.23
M.P.	355	M.P.	298	M.P.	340
B.P.	245	B.P.	115	B.P.	100
					
anthracene(Researching)		pyrene(Researching)		fluoranthene(Researching)	
【Cas】	120-12-7	【Cas】	129-00-0	【Cas】	206-44-0
【化】	4-683	【化】	4-782	【化】	(4)-2
physical property	structure	physical property	structure	physical property	structure
Mw	178.23	Mw	204.27	Mw	202.25
M.P.	342	M.P.	394	M.P.	384
B.P.	218	B.P.	150	B.P.	111
	