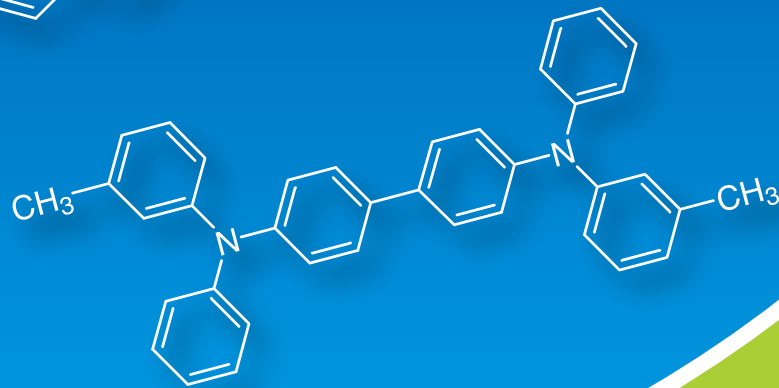
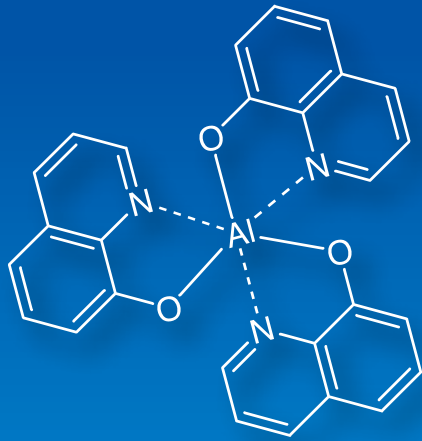


Organic Light-Emitting Diode (OLED) Materials



Host Materials

Hole Transport Materials

Electron Transport Materials

Blue Dopants

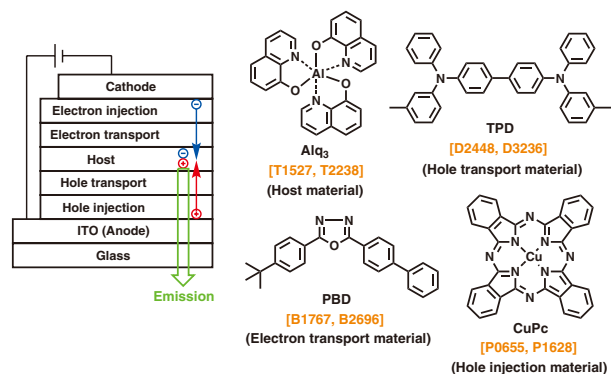
Green Dopants

Red Dopants

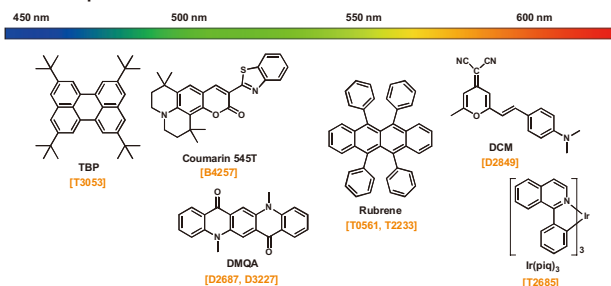
Organic Light-Emitting Diode (OLED) Materials

Organic light-emitting diode (OLED) devices have received much attention, because they are expected to be a next generation display and light source, thanks to lightweight and flexible organic materials. The OLED was focused on practical use, after Tang *et al.* first observed the OLED device by use of a two layered organic thin film.¹⁾ Adachi *et al.* further reported a three layered device, in which a host layer is sandwiched by hole transport and electron transport layers. In addition, they reported a two layered system, in which one layer has roles of host and electron transport properties.^{2,3)} A five layered system including electron injection and hole injection layers has been also studied in order to improve the efficiency of carrier injection. One can control RGB colors of emission by selection of a dopant into a host layer. A suitable combination of the dopant can give a white colored device.^{4,5)} An application using the white organic light-emitting device (WOLED) is an OLED light panel.⁶⁾

An amorphous material is useful for an OLED device, because it is transparent, homogeneous, isotropic and easily processible. A practical OLED device further requires excellent heat-resistance and durability. Many hole transport materials based on triphenylamine derivatives (TPD) are widely usable,



OLED Dopants



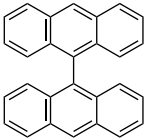
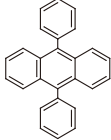
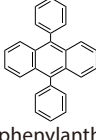
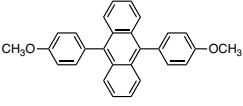
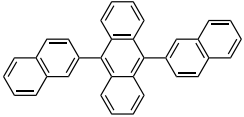
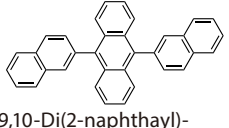
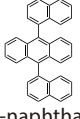
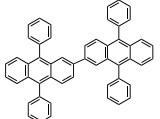
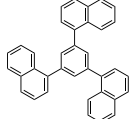
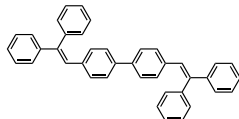
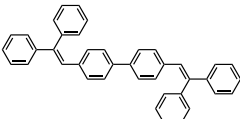
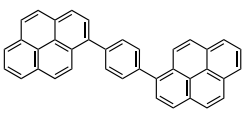
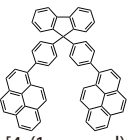
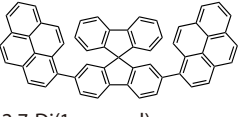
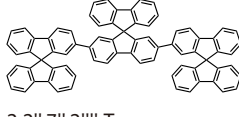
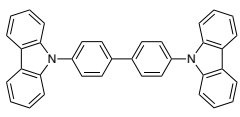
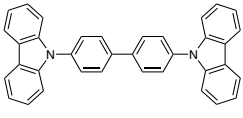
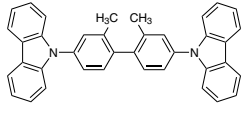
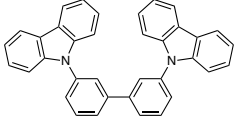
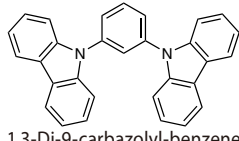
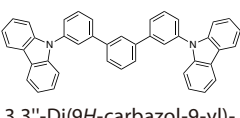
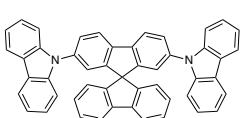
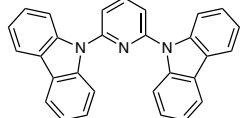
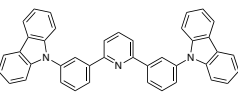
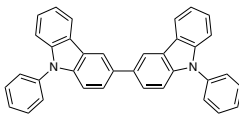
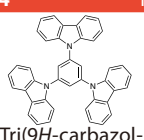
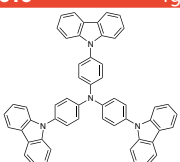
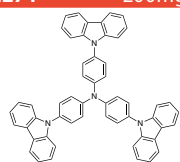
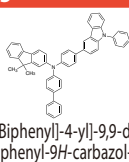
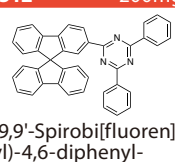
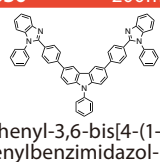
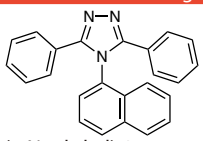
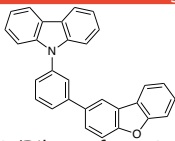
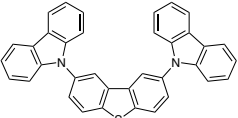
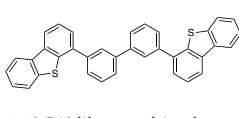
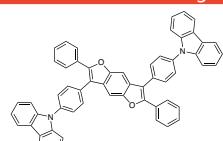
because they are heat-resistant and amorphous.^{7,8)} In addition to the TPDs, oxadiazole derivatives (PBD) having an electron transport property,⁹⁾ Alq₃ as a host material,¹⁾ and blue emissive distylyl derivatives¹⁰⁾ are fundamental materials for amorphous OLED devices.

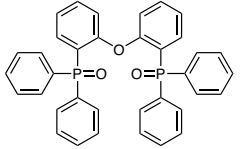
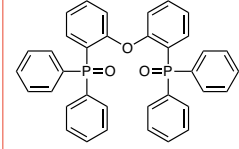
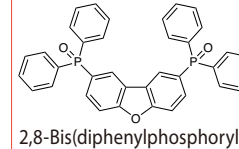
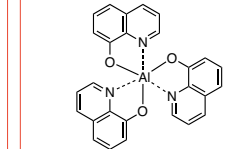
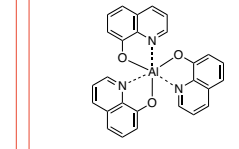
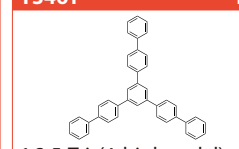
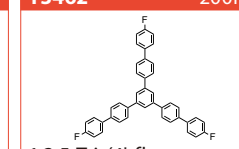
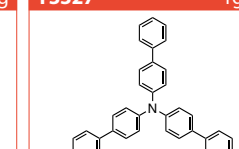
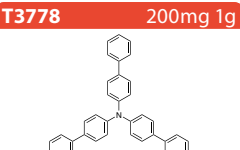
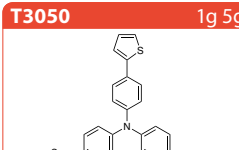
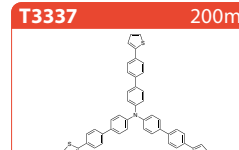
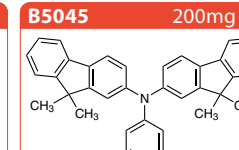
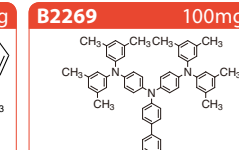
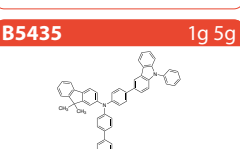
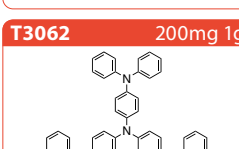
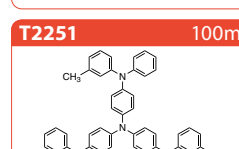
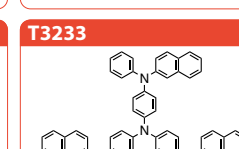
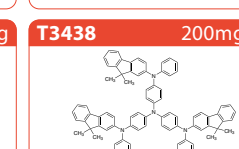
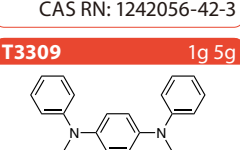
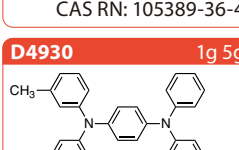
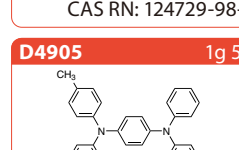
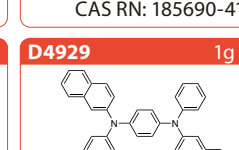
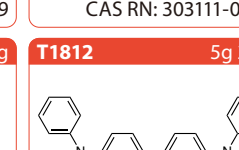
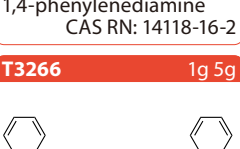
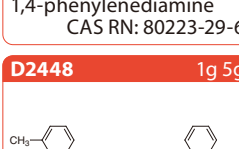
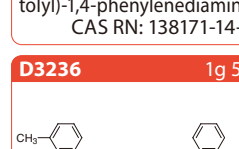
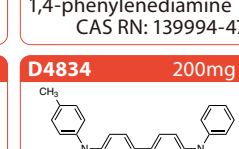
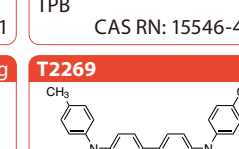
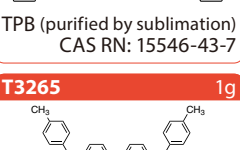
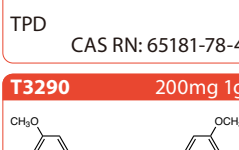
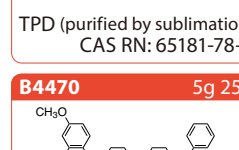
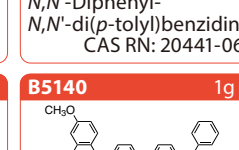
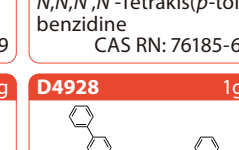
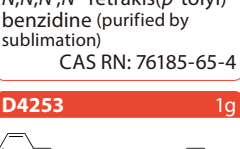
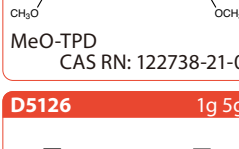
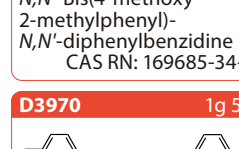
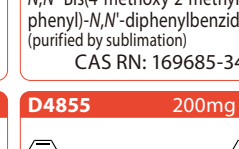
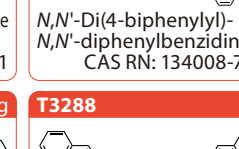
A conventional fluorescent material provides only 25% of a singlet exciton but loses 75% of the triplet one by a nonradiative deactivation, although it has a high current density. On the other hand, a phosphorescent material may provide 100% EL quantum efficiency through an intersystem crossing from singlet to triplet excited states. The phosphorescent Ir(ppy)₃ and its analogues have been reported so far.¹¹⁾ Recently, metal-free materials exhibiting thermally activated delayed fluorescence (TADF) were investigated as well. Adachi *et al.* reported more than 25% quantum efficiency by use of fluorescent materials having a low energy gap between singlet and triplet excited states, because an inverted energy transfer occurs from the triplet to the singlet state.^{12,13)}

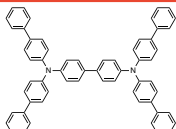
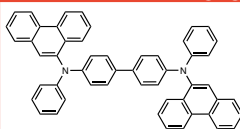
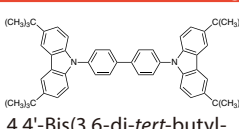
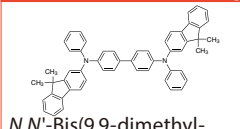
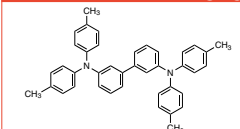
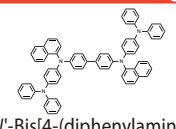
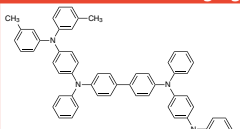
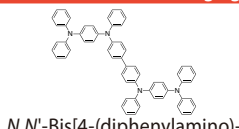
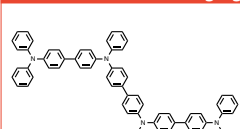
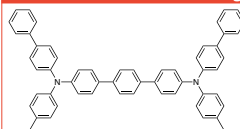
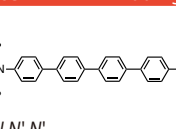
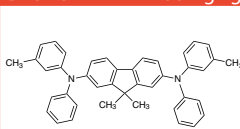
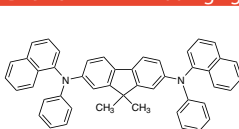
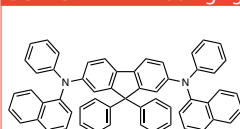
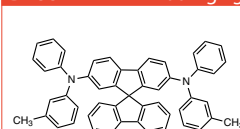
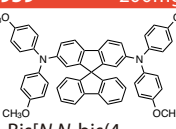
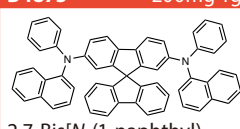
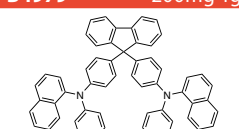
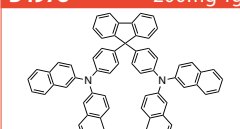
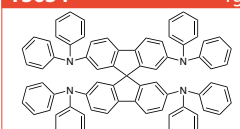
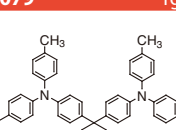
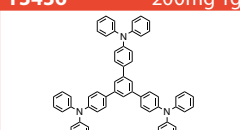
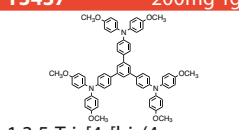
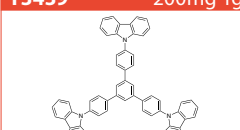
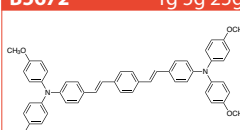
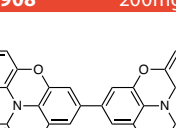
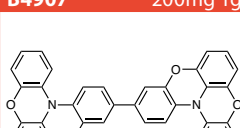
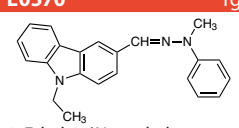
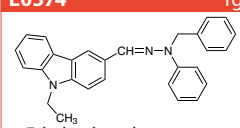
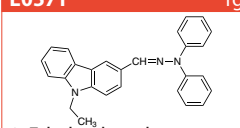
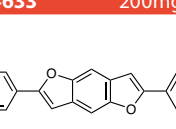
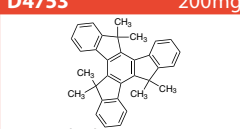
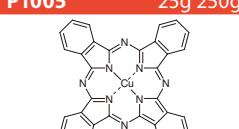
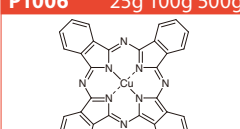
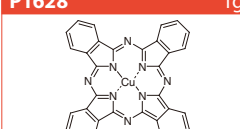
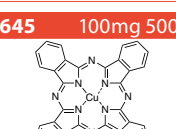
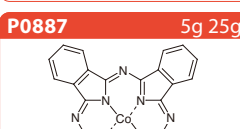
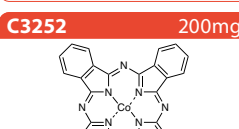
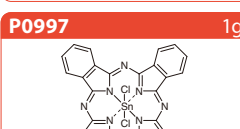
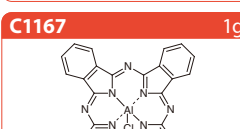
References

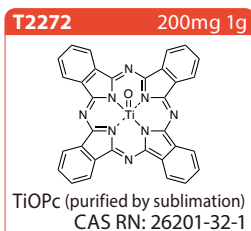
- 1) C. W. Tang, S. A. VanSlyke, *Appl. Phys. Lett.* **1987**, *51*, 913.
- 2) C. Adachi, S. Tokito, T. Tsutsui, S. Saito, *Jpn. J. Appl. Phys.* **1988**, *27*, L269.
- 3) C. Adachi, S. Tokito, T. Tsutsui, S. Saito, *Jpn. J. Appl. Phys.* **1988**, *27*, L713.
- 4) Review: B. Luessem, M. Riede, K. Leo, *Phys. Org. Semicon. (2nd Edition)* **2012**, 427.
- 5) Review: C. Adachi, T. Oyamada, T. Matsushima, *Mol. Electron. Bioelectron.* **2007**, *18*, 25.
- 6) Review: H. Sasabe, J. Kido, *J. Mater. Chem. C* **2013**, *1*, 1699.
- 7) Y. Shirota, K. Okumoto, H. Inada, *Synth. Met.* **2000**, *111-112*, 387.
- 8) X. Zhou, J. Blochwitz, M. Pfeiffer, A. Nollau, T. Fritz, K. Leo, *Adv. Funct. Mater.* **2001**, *11*, 310.
- 9) M. Era, C. Adachi, T. Tsutsui, S. Saito, *Chem. Phys. Lett.* **1991**, *178*, 488.
- 10) C. Hosokawa, H. Higashi, H. Nakamura, T. Kusumoto, *Appl. Phys. Lett.* **1995**, *67*, 3853.
- 11) C. Adachi, M. A. Baldo, S. R. Forrester, M. E. Thompson, *Appl. Phys. Lett.* **2000**, *77*, 904.
- 12) H. Uoyama, K. Goushi, K. Shizu, H. Nomura, C. Adachi, *Nature* **2012**, *492*, 234.
- 13) Q. Zhang, B. Li, S. Huang, H. Nomura, H. Tanaka, C. Adachi, *Nat. Photonics* **2014**, *8*, 326.

Host Materials

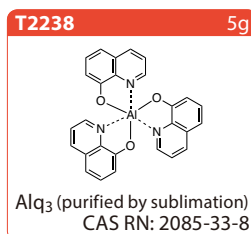
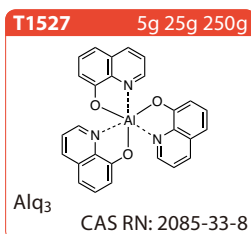
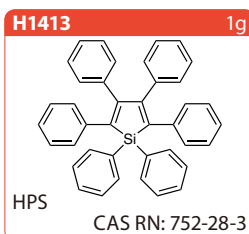
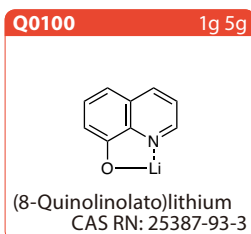
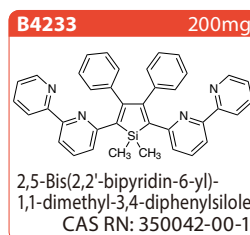
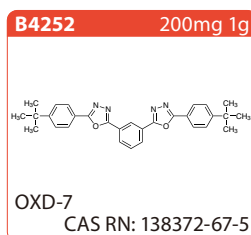
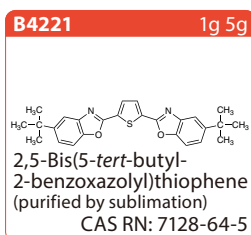
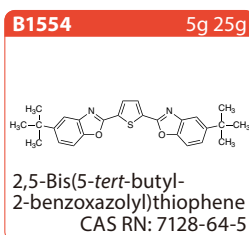
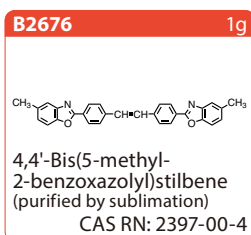
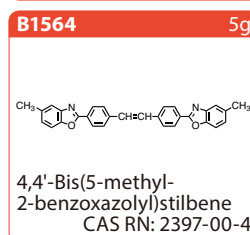
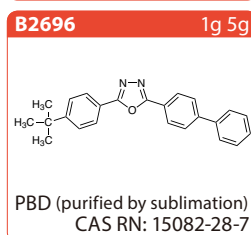
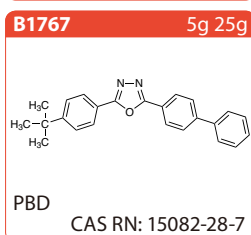
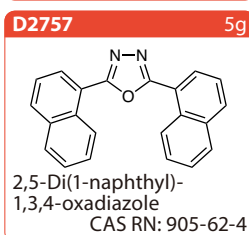
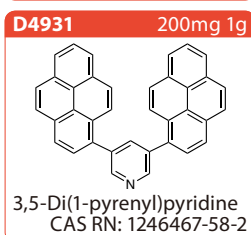
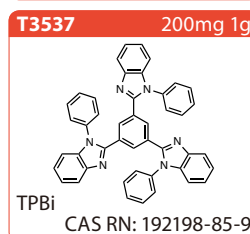
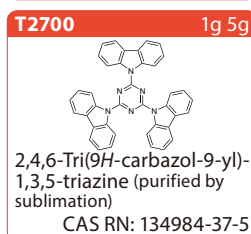
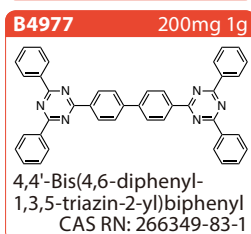
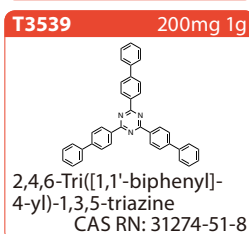
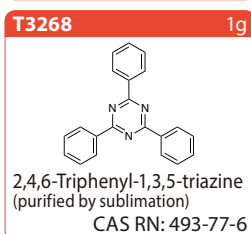
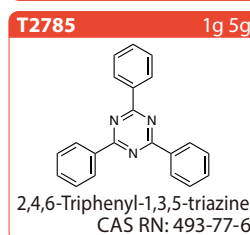
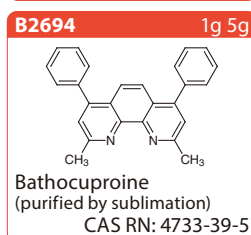
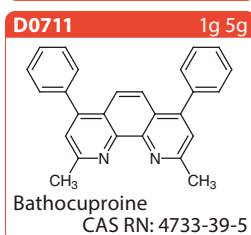
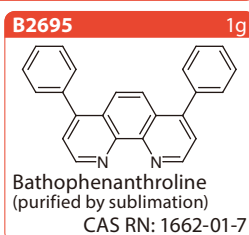
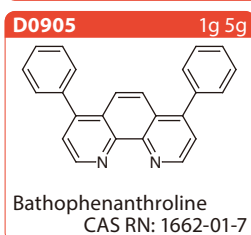
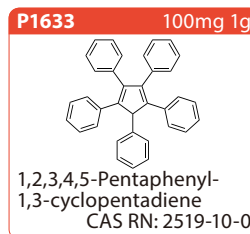
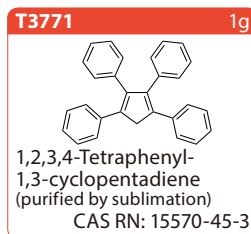
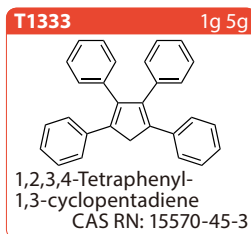
Host Materials		B4095 1g 5g  9,9'-Bianthryl CAS RN: 1055-23-8	D1689 1g 25g  9,10-Diphenylanthracene CAS RN: 1499-10-1	D4401 1g  9,10-Diphenylanthracene (purified by sublimation) CAS RN: 1499-10-1
		B5022 200mg 1g  9,10-Bis(4-methoxyphenyl)-anthracene CAS RN: 24672-76-2	D4127 1g 5g  9,10-Di(2-naphthyl)-anthracene CAS RN: 122648-99-1	D5066 200mg  9,10-Di(2-naphthyl)-anthracene (purified by sublimation) CAS RN: 122648-99-1
D5065 1g  9,10-Di(1-naphthyl)-anthracene (purified by sublimation) CAS RN: 26979-27-1	T3336 200mg 1g  9,9',10,10'-Tetraphenyl-2,2'-bianthracene CAS RN: 172285-72-2	T3193 200mg 1g  1,3,5-Tri(1-naphthyl)-benzene CAS RN: 7059-70-3	B2737 5g  DPVBi CAS RN: 142289-08-5	B5139 200mg 1g  DPVBi (purified by sublimation) CAS RN: 142289-08-5
D4922 200mg 1g  1,4-Di(1-pyrenyl)benzene CAS RN: 475460-77-6	B4980 200mg 1g  9,9-Bis[4-(1-pyrenyl)-phenyl]fluorene CAS RN: 1174006-47-3	D4932 200mg 1g  2,7-Di(1-pyrenyl)-9,9'-spirobi[9H-fluorene] CAS RN: 886456-80-0	T3433 200mg 1g  2,2''-7'',2''''-Ter-9,9'-spirobi[9H-fluorene] CAS RN: 518997-91-6	B2713 1g 5g  CBP CAS RN: 58328-31-7
B4219 1g  CBP (purified by sublimation) CAS RN: 58328-31-7	B4910 200mg  CDBP CAS RN: 604785-54-8	D4772 200mg  mCBP CAS RN: 342638-54-4	D4087 1g  1,3-Di-9-carbazolyl-benzene (purified by sublimation) CAS RN: 550378-78-4	D4904 200mg 1g  3,3''-Di(9H-carbazol-9-yl)-1,1':3',1''-terphenyl CAS RN: 1116499-73-0
D5442 1g  Spiro-2CBP CAS RN: 924899-38-7	B4961 200mg 1g  2,6-Bis(9H-carbazol-9-yl)-pyridine CAS RN: 168127-49-9	B4702 200mg  DCzPPy CAS RN: 1013405-24-7	D4903 1g 5g  9,9'-Diphenyl-9H,9'H-3,3'-bicarbazole CAS RN: 57102-62-2	T1934 1g 5g  1,3,5-Tri(9H-carbazol-9-yl)benzene (purified by sublimation) CAS RN: 148044-07-9
T2616 1g 5g  TCTA CAS RN: 139092-78-7	T2274 200mg 1g  TCTA (purified by sublimation) CAS RN: 139092-78-7	B5435 1g 5g  N-[(1,1'-Biphenyl)-4-yl]-9,9-dimethyl-N-[4-(9-phenyl-9H-carbazol-3-yl)-phenyl]-9H-fluorene-2-amine CAS RN: 1242056-42-3	P2512 200mg 1g  2-(9,9'-Spirobi[fluorene]-2-yl)-4,6-diphenyl-1,3,5-triazine CAS RN: 1207176-84-8	P2330 200mg 1g  9-Phenyl-3,6-bis[4-(1-phenylbenzimidazol-2-yl)phenyl]carbazole CAS RN: 1258780-50-5
N1139 200mg 1g  4-(1-Naphthyl)-3,5-diphenyl-1,2,4-triazole CAS RN: 16152-10-6	D4919 200mg 1g  9-[3-(Dibenzofuran-2-yl)-phenyl]-9H-carbazole CAS RN: 1338446-77-7	B4942 200mg 1g  DCzDBT CAS RN: 913738-04-2	D5473 1g  3,3'-Di(dibenzothiophen-4-yl)-1,1'-biphenyl CAS RN: 1128045-14-6	C2780 200mg 1g  CZBDF CAS RN: 1092578-51-2

<p>B5240 1g</p>  <p>DPEPO CAS RN: 808142-23-6</p>	<p>B5448 200mg 1g</p>  <p>DPEPO (purified by sublimation) CAS RN: 808142-23-6</p>	<p>B5822 200mg 1g</p>  <p>2,8-Bis(diphenylphosphoryl)- dibenzo[b,d]furan CAS RN: 911397-27-8</p>	<p>T1527 5g 25g 250g</p>  <p>Alq₃ CAS RN: 2085-33-8</p>	<p>T2238 5g</p>  <p>Alq₃ (purified by sublimation) CAS RN: 2085-33-8</p>
<p>Hole Transport Materials</p>				
		<p>T3461 1g</p>  <p>1,3,5-Tris(4-biphenyl)- benzene CAS RN: 6326-64-3</p>	<p>T3462 200mg</p>  <p>1,3,5-Tris(4'-fluoro- biphenyl-4-yl)benzene CAS RN: 372956-40-6</p>	<p>T3327 1g 5g</p>  <p>Tris(4-biphenyl)amine CAS RN: 6543-20-0</p>
<p>T3778 200mg 1g</p>  <p>Tris(4-biphenyl)amine (purified by sublimation) CAS RN: 6543-20-0</p>	<p>T3050 1g 5g</p>  <p>Tris[4-(2-thienyl)phenyl]amine CAS RN: 142807-63-4</p>	<p>T3337 200mg</p>  <p>Tris[4'-(2-thienyl)- 4-biphenyl]amine CAS RN: 1092356-36-9</p>	<p>B5045 200mg 1g</p>  <p>N,N-Bis(9,9-dimethyl- 9H-fluoren-2-yl)aniline CAS RN: 165320-27-4</p>	<p>B2269 100mg 1g</p>  <p>4,4'-Bis[di(3,5-xylyl)amino]- 4''-phenyltriphenylamine CAS RN: 249609-49-2</p>
<p>B5435 1g 5g</p>  <p>N-[1,1'-Biphenyl]-4-yl]-9,9-dimethyl- N-[4-(9-phenyl-9H-carbazol-3-yl)- phenyl]-9H-fluoren-2-amine CAS RN: 1242056-42-3</p>	<p>T3062 200mg 1g</p>  <p>TDATA CAS RN: 105389-36-4</p>	<p>T2251 100mg</p>  <p>m-MTDATA CAS RN: 124729-98-2</p>	<p>T3233 1g</p>  <p>2-TNATA CAS RN: 185690-41-9</p>	<p>T3438 200mg 1g</p>  <p>4,4',4''-Tris[9,9-dimethyl- fluoren-2-yl]-amino- triphenylamine CAS RN: 303111-06-0</p>
<p>T3309 1g 5g</p>  <p>N,N,N',N'-Tetraphenyl- 1,4-phenylenediamine CAS RN: 14118-16-2</p>	<p>D4930 1g 5g</p>  <p>N,N'-Diphenyl- N,N'-di(m-tolyl)- 1,4-phenylenediamine CAS RN: 80223-29-6</p>	<p>D4905 1g 5g</p>  <p>N,N'-Diphenyl-N,N'-bis(p- tolyl)-1,4-phenylenediamine CAS RN: 138171-14-9</p>	<p>D4929 1g 5g</p>  <p>N,N'-Di(2-naphthyl)- N,N'-diphenyl- 1,4-phenylenediamine CAS RN: 139994-47-1</p>	<p>T1812 5g 25g</p>  <p>TPB CAS RN: 15546-43-7</p>
<p>T3266 1g 5g</p>  <p>TPB (purified by sublimation) CAS RN: 15546-43-7</p>	<p>D2448 1g 5g</p>  <p>TPD CAS RN: 65181-78-4</p>	<p>D3236 1g 5g</p>  <p>TPD (purified by sublimation) CAS RN: 65181-78-4</p>	<p>D4834 200mg 1g</p>  <p>N,N'-Diphenyl- N,N'-di(p-tolyl)benzidine CAS RN: 20441-06-9</p>	<p>T2269 5g</p>  <p>N,N,N',N'-Tetrakis(p-tolyl)- benzidine CAS RN: 76185-65-4</p>
<p>T3265 1g</p>  <p>N,N,N',N'-Tetrakis(p-tolyl)- benzidine (purified by sublimation) CAS RN: 76185-65-4</p>	<p>T3290 200mg 1g</p>  <p>MeO-TPD CAS RN: 122738-21-0</p>	<p>B4470 5g 25g</p>  <p>N,N'-Bis(4-methoxy- 2-methylphenyl)- N,N'-diphenylbenzidine CAS RN: 169685-34-1</p>	<p>B5140 1g 5g</p>  <p>N,N'-Bis(4-methoxy-2-methyl- phenyl)-N,N'-diphenylbenzidine (purified by sublimation) CAS RN: 169685-34-1</p>	<p>D4928 1g 5g</p>  <p>N,N'-Di(4-biphenyl)- N,N'-diphenylbenzidine CAS RN: 134008-76-7</p>
<p>D4253 1g</p>  <p>N,N'-Di-2-naphthyl- N,N'-diphenylbenzidine CAS RN: 139255-17-7</p>	<p>D5126 1g 5g</p>  <p>N,N'-Di-1-naphthyl- N,N'-diphenylbenzidine CAS RN: 123847-85-8</p>	<p>D3970 1g 5g</p>  <p>N,N'-Di-1-naphthyl- N,N'-diphenylbenzidine (purified by sublimation) CAS RN: 123847-85-8</p>	<p>D4855 200mg 1g</p>  <p>N,N'-Di-1-naphthyl-N,N'- di-2-naphthylbenzidine CAS RN: 374592-88-8</p>	<p>T3288 1g</p>  <p>N,N,N',N'-Tetra(2-naphthyl)- benzidine CAS RN: 141752-82-1</p>

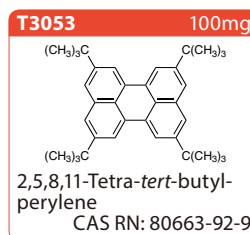
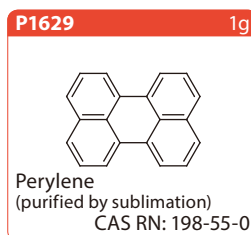
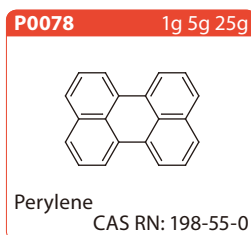
<p>T3054 1g</p>  <p><i>N,N,N',N'</i>-Tetrakis(4-biphenyl)benzidine CAS RN: 164724-35-0</p>	<p>D5177 200mg 1g</p>  <p><i>N,N'</i>-Di(9-phenanthrenyl)-<i>N,N'</i>-diphenylbenzidine CAS RN: 182507-83-1</p>	<p>B5675 1g</p>  <p>4,4'-Bis(3,6-di-<i>tert</i>-butyl-9<i>H</i>-carbazol-9-yl)-1,1'-biphenyl CAS RN: 838862-47-8</p>	<p>B4962 1g</p>  <p><i>N,N'</i>-Bis(9,9-dimethyl-9<i>H</i>-fluoren-2-yl)-<i>N,N'</i>-diphenylbenzidine CAS RN: 361486-60-4</p>	<p>B4874 1g 5g</p>  <p>3,3'-Bis(di(<i>p</i>-tolyl)amino)biphenyl CAS RN: 161485-60-5</p>
<p>B5093 1g 5g</p>  <p><i>N,N'</i>-Bis[4-(diphenylamino)phenyl]-<i>N,N'</i>-di(1-naphthyl)benzidine CAS RN: 910058-11-6</p>	<p>B5634 1g 5g</p>  <p>DNTPD CAS RN: 199121-98-7</p>	<p>B5117 200mg 1g</p>  <p><i>N,N'</i>-Bis[4-(diphenylamino)phenyl]-<i>N,N'</i>-diphenylbenzidine CAS RN: 209980-53-0</p>	<p>D4863 1g 5g</p>  <p>TPTE CAS RN: 167218-46-4</p>	<p>T3656 1g</p>  <p>TaTm CAS RN: 952431-34-4</p>
<p>T3657 200mg 1g</p>  <p><i>N,N,N',N'</i>-Tetraphenyl[1,1':4,1'':4'',1''':4''',1''''-quaterphenyl]-4,4''-diamine CAS RN: 145898-89-1</p>	<p>D4920 200mg 1g</p>  <p>DMFL-TPD CAS RN: 143886-11-7</p>	<p>B4926 200mg 1g</p>  <p>DMFL-NPB CAS RN: 222319-05-3</p>	<p>D5443 200mg 1g</p>  <p>DPFL-NPB CAS RN: 357645-40-0</p>	<p>B4882 200mg 1g</p>  <p>2,7-Bis[<i>N</i>-(<i>m</i>-tolyl)anilino]-9,9'-spirobi[9<i>H</i>-fluorene] CAS RN: 1033035-83-4</p>
<p>B4959 200mg 1g</p>  <p>2,7-Bis[<i>N,N</i>-bis(4-methoxyphenyl)amino]-9,9'-spirobi[9<i>H</i>-fluorene] CAS RN: 1138220-69-5</p>	<p>B4875 200mg 1g</p>  <p>2,7-Bis[<i>N</i>-(1-naphthyl)anilino]-9,9'-spirobi[9<i>H</i>-fluorene] CAS RN: 932739-76-9</p>	<p>B4979 200mg 1g</p>  <p>9,9-Bis[4-[<i>N</i>-(1-naphthyl)anilino]phenyl]fluorene CAS RN: 510775-24-3</p>	<p>B4978 200mg 1g</p>  <p>9,9-Bis[4-[di(2-naphthyl)amino]phenyl]fluorene CAS RN: 916061-87-5</p>	<p>T3634 1g</p>  <p>2,2',7,7'-Tetrakis(diphenylamino)-9,9'-spirobi[9<i>H</i>-fluorene] CAS RN: 189363-47-1</p>
<p>B2079 1g 5g</p>  <p>TAPC CAS RN: 58473-78-2</p>	<p>T3436 200mg 1g</p>  <p>1,3,5-Tris[4-(diphenylamino)phenyl]benzene CAS RN: 147951-36-8</p>	<p>T3437 200mg 1g</p>  <p>1,3,5-Tris[4-[bis(4-methoxyphenyl)amino]phenyl]benzene CAS RN: 142894-38-0</p>	<p>T3439 200mg 1g</p>  <p>1,3,5-Tris[4-(9-carbazolyl)phenyl]benzene CAS RN: 160780-82-5</p>	<p>B5672 1g 5g 25g</p>  <p>TOP-HTM-α1 CAS RN: 872466-50-7</p>
<p>B4908 200mg 1g</p>  <p>HN-D1 CAS RN: 1395881-55-6</p>	<p>B4907 200mg 1g</p>  <p>HN-D2 CAS RN: 1395881-58-9</p>	<p>E0570 1g</p>  <p>9-Ethyl-3-(<i>N</i>-methyl-<i>N</i>-phenylhydrazonomethyl)carbazole CAS RN: 75232-44-9</p>	<p>E0574 1g</p>  <p>9-Ethylcarbazole-3-carboxaldehyde <i>N</i>-Benzyl-<i>N</i>-phenylhydrazone CAS RN: 75238-79-8</p>	<p>E0571 1g</p>  <p>9-Ethylcarbazole-3-carboxaldehyde Diphenylhydrazone CAS RN: 73276-70-7</p>
<p>D4633 200mg 1g</p>  <p>2,6-Diphenylbenzo[1,2-<i>b</i>:4,5-<i>b'</i>]difuran CAS RN: 5379-77-1</p>	<p>D4753 200mg</p>  <p>10,15-Dihydro-5,5,10,10,15,15-hexamethyl-5<i>H</i>-tribenzo[<i>a,f,k</i>]-trindene CAS RN: 597554-76-2</p>	<p>P1005 25g 250g</p>  <p>Copper(II) Phthalocyanine (α-form) CAS RN: 147-14-8</p>	<p>P1006 25g 100g 500g</p>  <p>Copper(II) Phthalocyanine (β-form) CAS RN: 147-14-8</p>	<p>P1628 1g</p>  <p>Copper Phthalocyanine (purified by sublimation) CAS RN: 147-14-8</p>
<p>C3645 100mg 500mg</p>  <p>Copper(II) Phthalocyanine (purified by sublimation) [for organic electronics] CAS RN: 147-14-8</p>	<p>P0887 5g 25g</p>  <p>Cobalt(II) Phthalocyanine CAS RN: 3317-67-7</p>	<p>C3252 200mg</p>  <p>Cobalt(II) Phthalocyanine (purified by sublimation) CAS RN: 3317-67-7</p>	<p>P0997 1g</p>  <p>Tin(IV) Phthalocyanine Dichloride CAS RN: 18253-54-8</p>	<p>C1167 1g</p>  <p>Phthalocyanine Chloroaluminum CAS RN: 14154-42-8</p>

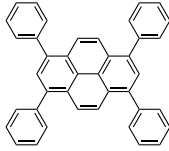
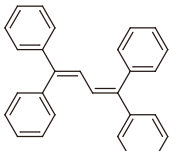
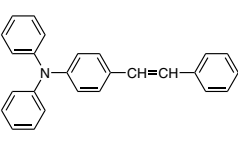
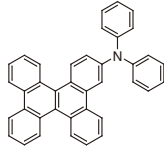
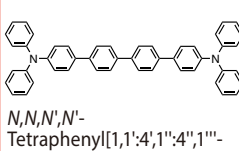
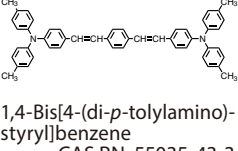
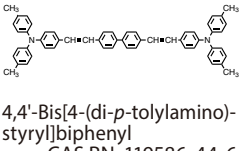
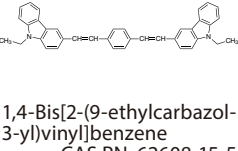
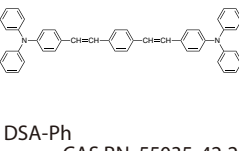
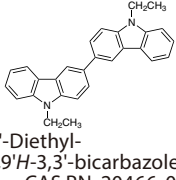
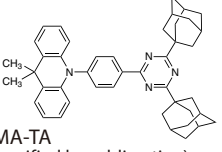
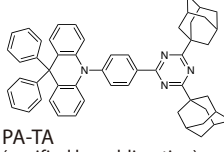
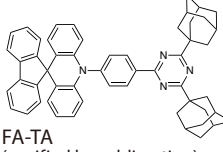
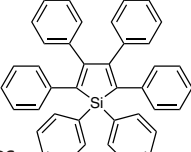
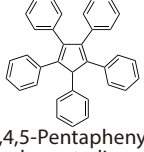
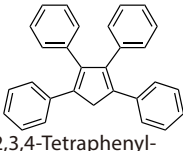
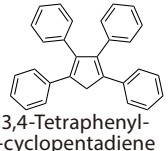
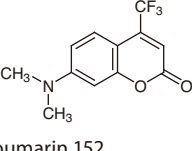
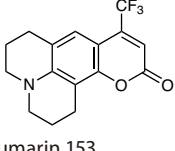
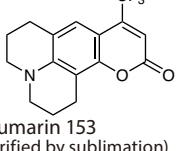
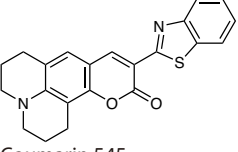
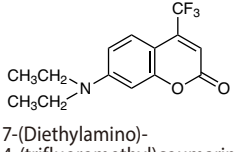
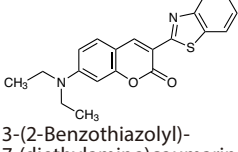
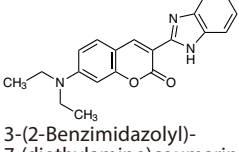
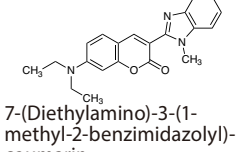
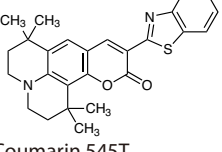
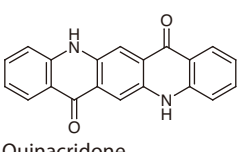
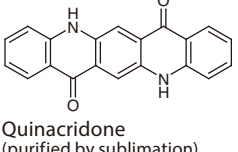
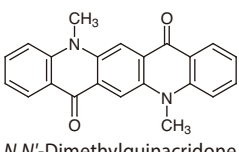
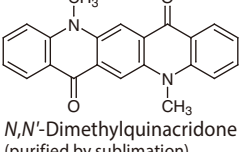
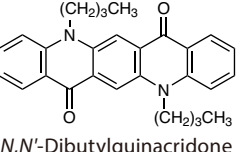
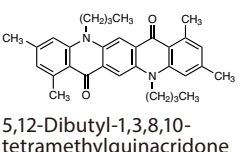
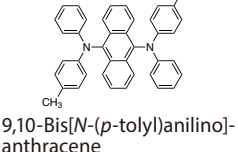
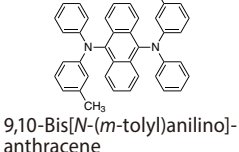
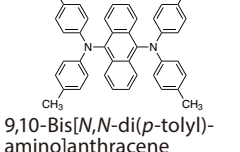


Electron Transport Materials

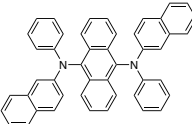
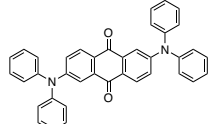
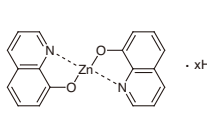
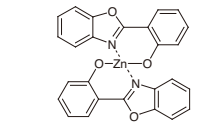
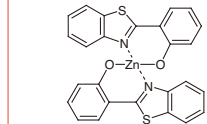
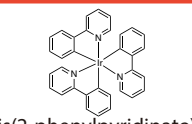
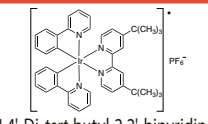
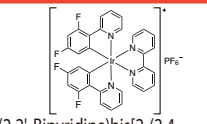
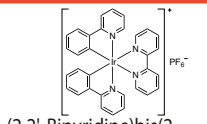
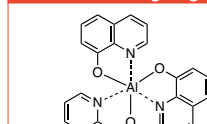
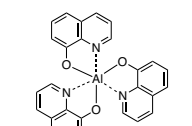
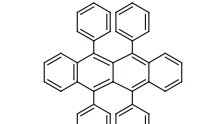

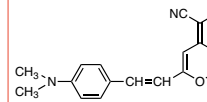
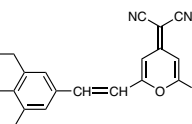
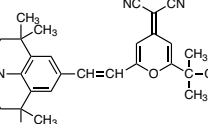
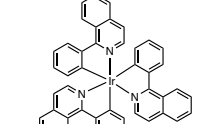
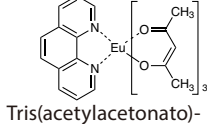
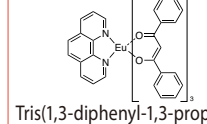
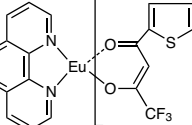
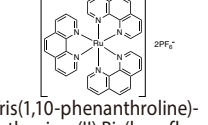


Blue Dopants



T3042 50mg 200mg  1,3,6,8-Tetraphenylpyrene CAS RN: 13638-82-9	T0168 1g 5g  TPB CAS RN: 1450-63-1	S0924 1g 5g  4-Styryltriphenylamine CAS RN: 89114-74-9	D3739 200mg  3-DPADBC CAS RN: 1397202-77-5	T3657 200mg 1g  <i>N,N,N',N'</i> -Tetraphenyl[1,1':4,1'':4'':1''']-quaterphenyl-4,4''-diamine CAS RN: 145898-89-1
B2080 1g  1,4-Bis[4-(di- <i>p</i> -tolylamino)-styryl]benzene CAS RN: 55035-43-3	B4682 200mg  4,4'-Bis[4-(di- <i>p</i> -tolylamino)-styryl]biphenyl CAS RN: 119586-44-6	B4792 200mg  1,4-Bis[2-(9-ethylcarbazol-3-yl)vinyl]benzene CAS RN: 62608-15-5	B5820 200mg 1g  DSA-Ph CAS RN: 55035-42-2	D5387 1g 5g  9,9'-Diethyl-9 <i>H</i> ,9' <i>H</i> -3,3'-bicarbazole CAS RN: 20466-00-6
D5745 200mg  MA-TA (purified by sublimation) CAS RN: 2250187-15-4	D5746 200mg  PA-TA (purified by sublimation) CAS RN: 2250187-17-6	D5747 200mg  FA-TA (purified by sublimation) CAS RN: 2250187-16-5	H1413 1g  HPS CAS RN: 752-28-3	P1633 100mg 1g  1,2,3,4,5-Pentaphenyl-1,3-cyclopentadiene CAS RN: 2519-10-0
T1333 1g 5g  1,2,3,4-Tetraphenyl-1,3-cyclopentadiene CAS RN: 15570-45-3	T3771 1g  1,2,3,4-Tetraphenyl-1,3-cyclopentadiene (purified by sublimation) CAS RN: 15570-45-3	Green Dopants		
D3356 5g 25g  Coumarin 152 CAS RN: 53518-14-2	C2858 200mg 1g  Coumarin 153 CAS RN: 53518-18-6	C3640 200mg  Coumarin 153 (purified by sublimation) CAS RN: 53518-18-6		
C2900 200mg  Coumarin 545 CAS RN: 85642-11-1	D4466 200mg  7-(Diethylamino)-4-(trifluoromethyl)coumarin CAS RN: 41934-47-8	B2088 1g 5g  3-(2-Benzothiazolyl)-7-(diethylamino)coumarin CAS RN: 38215-36-0	B2111 100mg 1g  3-(2-Benzimidazolyl)-7-(diethylamino)coumarin CAS RN: 27425-55-4	C2837 200mg 1g  7-(Diethylamino)-3-(1-methyl-2-benzimidazolyl)-coumarin CAS RN: 41044-12-6
B4257 200mg  Coumarin 545T CAS RN: 155306-71-1	Q0057 5g 25g  Quinacridone CAS RN: 1047-16-1	Q0083 1g  Quinacridone (purified by sublimation) CAS RN: 1047-16-1	D2687 1g 5g  <i>N,N'</i> -Dimethylquinacridone CAS RN: 19205-19-7	D3227 1g  <i>N,N'</i> -Dimethylquinacridone (purified by sublimation) CAS RN: 19205-19-7
D4780 200mg 1g  <i>N,N'</i> -Dibutylquinacridone CAS RN: 99762-80-8	D4697 200mg 1g  5,12-Dibutyl-1,3,8,10-tetramethylquinacridone CAS RN: 850815-10-0	B5149 200mg 1g  9,10-Bis[<i>N</i> -(<i>p</i> -tolyl)anilino]anthracene CAS RN: 190974-21-1	B4965 200mg 1g  9,10-Bis[<i>N</i> -(<i>m</i> -tolyl)anilino]anthracene CAS RN: 189263-81-8	B4966 200mg 1g  9,10-Bis[<i>N,N</i> -di(<i>p</i> -tolyl)amino]anthracene CAS RN: 177799-16-5

Organic Light-Emitting Diode (OLED) Materials

B5023 200mg 1g  9,10-Bis[N-(2-naphthyl)-anilino]anthracene CAS RN: 473717-08-7	B5092 200mg 1g  2,6-Bis(diphenylamino)-anthraquinone CAS RN: 868850-50-4	B1678 5g 25g  Bis(8-quinolinolato)zinc(II) Hydrate CAS RN: 13978-85-3	B2078 5g  Bis[2-(2-benzoxazolyl)-phenolato]zinc(II) CAS RN: 23467-27-8	B2077 1g 5g  Bis[2-(2-benzothiazolyl)-phenolato]zinc(II) CAS RN: 58280-31-2		
T1946 200mg  Tris(2-phenylpyridinato)-iridium(III) (purified by sublimation) CAS RN: 94928-86-6	D4887 200mg  (4,4'-Di-tert-butyl-2,2'-bipyridine)-bis[(2-pyridinyl)phenyl]iridium(III) Hexafluorophosphate CAS RN: 676525-77-2	B4944 200mg  (2,2'-Bipyridine)bis[2-(2,4-difluoro-phenyl)pyridine]-iridium(III) Hexafluorophosphate CAS RN: 864163-80-4	B4893 200mg  (2,2'-Bipyridine)bis(2-phenylpyridinato)iridium(III) Hexafluoro-phosphate CAS RN: 106294-60-4	T1527 5g 25g 250g  Alq ₃ CAS RN: 2085-33-8		
T2238 5g  Alq ₃ (purified by sublimation) CAS RN: 2085-33-8	<div style="background-color: #e67e22; color: white; padding: 20px; border-radius: 10px;"> <h3 style="margin: 0;">Red Dopants</h3> </div>					
				T0561 100mg 1g  Rubrene CAS RN: 517-51-1	T2233 250mg 1g  Rubrene (purified by sublimation) CAS RN: 517-51-1	D2849 500mg  DCM CAS RN: 51325-91-8
D4459 200mg  DCM 2 CAS RN: 51325-95-2	D4700 200mg  DCJTb CAS RN: 200052-70-6	T2685 100mg  Ir(piq) ₃ (purified by sublimation) CAS RN: 435293-93-9	T3206 200mg  Tris(acetylacetonato)-(1,10-phenanthroline)-europium(III) CAS RN: 17568-09-1	T1735 1g 5g  Tris(1,3-diphenyl-1,3-propanedionato)(1,10-phenanthroline)-europium(III) CAS RN: 17904-83-5		
P1766 1g  Eu(TTA) ₃ phen CAS RN: 17904-86-8	T3208 200mg 1g  Tris(1,10-phenanthroline)-ruthenium(II) Bis(hexafluorophosphate) CAS RN: 60804-75-3					

Ordering and Customer Service

TCI AMERICA

Tel : 800-423-8616 / 503-283-1681
 Fax : 888-520-1075 / 503-283-1987
 E-mail : Sales-US@TCIchemicals.com

TCI EUROPE N.V.

Tel : +32 (0)3 735 07 00
 Fax : +32 (0)3 735 07 01
 E-mail : Sales-EU@TCIchemicals.com

TCI Deutschland GmbH

Tel : +49 (0)6196 64053-00
 Fax : +49 (0)6196 64053-01
 E-mail : Sales-DE@TCIchemicals.com

Tokyo Chemical Industry UK Ltd.

Tel : +44 (0)1865 78 45 60
 E-mail : Sales-UK@TCIchemicals.com

梯希爱(上海)化成工业发展有限公司

Tel : 800-988-0390 / 021-67121386
 Fax : 021-6712-1385
 E-mail : Sales-CN@TCIchemicals.com

Tokyo Chemical Industry (India) Pvt. Ltd.

Tel : 1800 425 7889 / 044-2262 0909
 E-mail : Sales-IN@TCIchemicals.com

TOKYO CHEMICAL INDUSTRY CO., LTD.

Tel : +81 (0)3-5640-8878
 E-mail : globalbusiness@TCIchemicals.com

* Chemicals itemized in this brochure are for research and testing use only. Please avoid use other than by chemically knowledgeable professionals. * Information such as listed products and its specifications and so on are subject to change without prior notice. * The contents may not be reproduced or duplicated in whole or in part without permission of Tokyo Chemical Industry Co., Ltd.