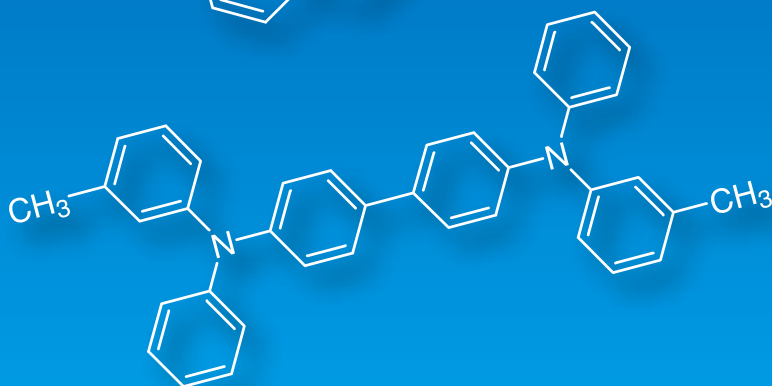
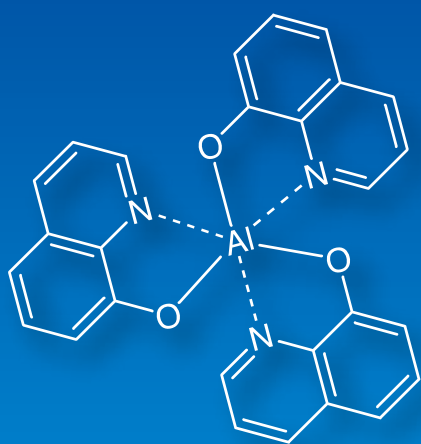


# Organic Light-Emitting Diode(OLED) Materials



Host Materials

Hole Transport Materials

Electron Transport Materials

Blue Dopants

Green Dopants

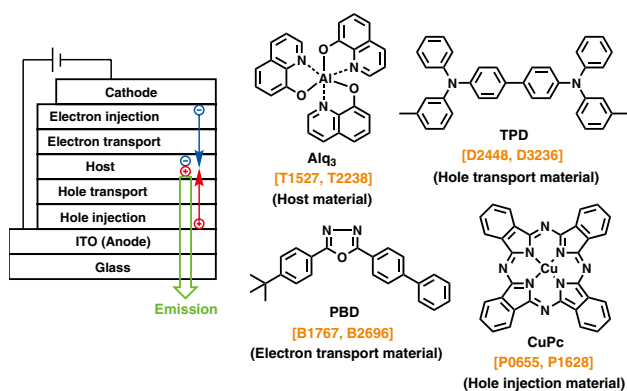
Red Dopants



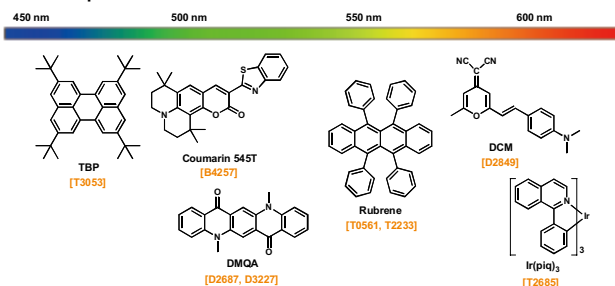
# Organic Light-Emitting Diode(OLED) Materials

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.<sup>1)</sup> 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.<sup>2,3)</sup> 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.<sup>4,5)</sup> An application using the white organic light-emitting device (WOLED) is an OLED light panel.<sup>6)</sup>

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



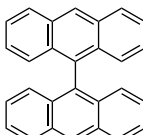
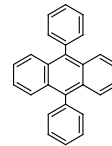
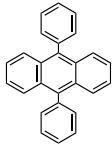
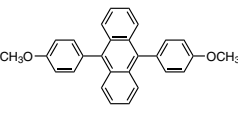
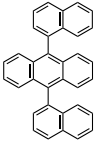
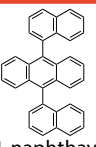
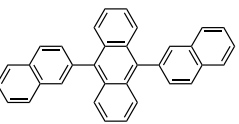
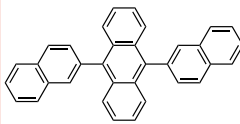
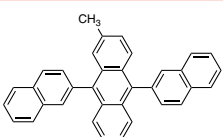
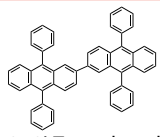
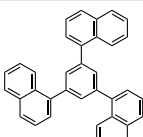
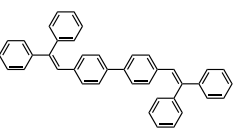
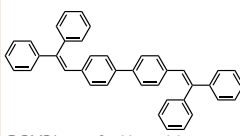
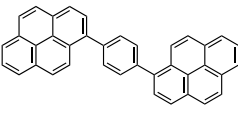
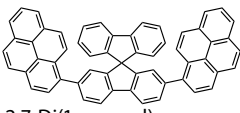
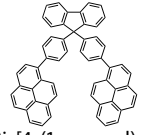
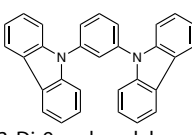
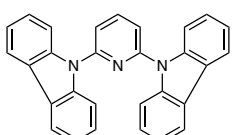
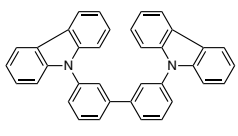
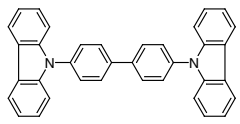
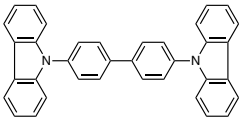
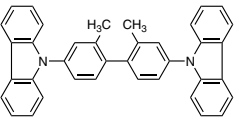
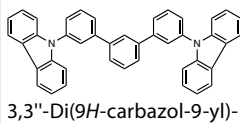
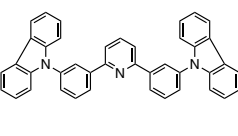
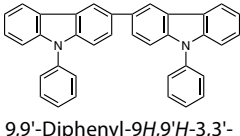
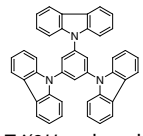
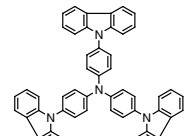
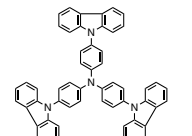
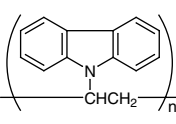
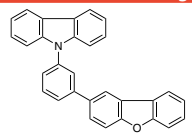
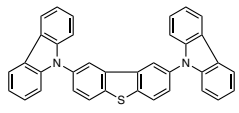
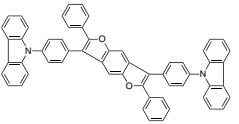
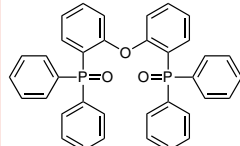
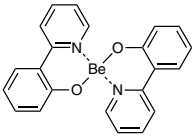
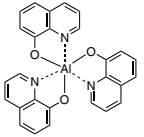
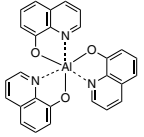
because they are heat-resistant and amorphous.<sup>7,8)</sup> In addition to the TPDs, oxadiazole derivatives (PBD) having an electron transport property,<sup>9)</sup> Alq<sub>3</sub> as a host material,<sup>1)</sup> and blue emissive distylyl derivatives<sup>10)</sup> are fundamental materials for amorphous 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)<sub>3</sub> and its analogues have been reported so far.<sup>11)</sup> 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.<sup>12,13)</sup>

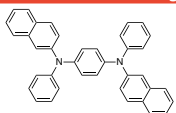
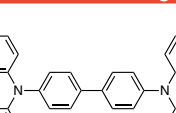
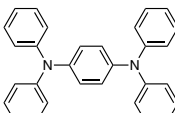
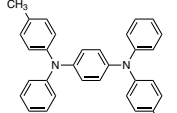
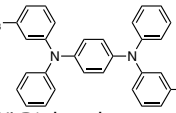
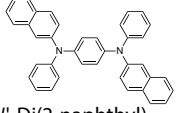
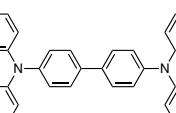
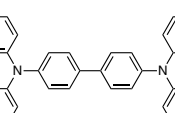
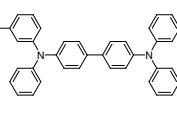
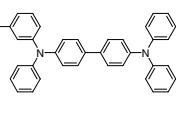
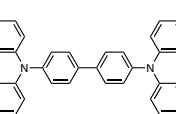
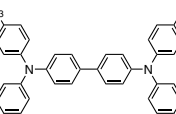
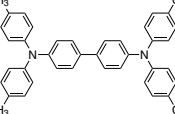
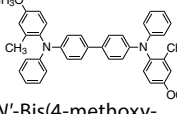
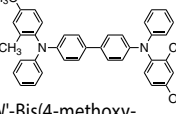
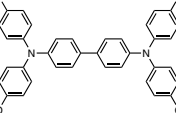
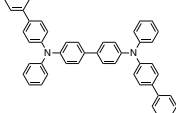
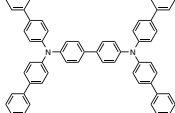
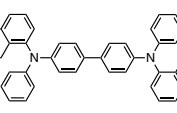
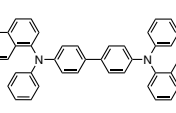
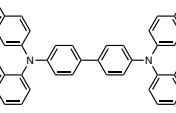
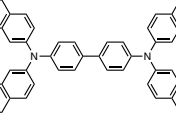
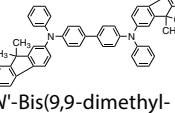
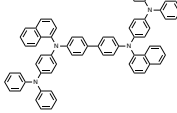
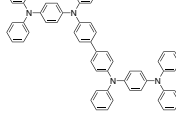
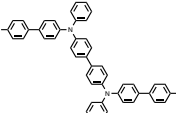
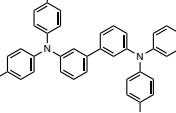
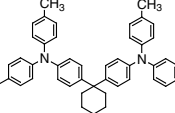
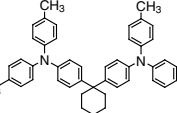
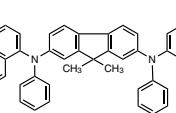
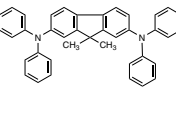
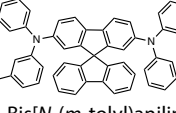
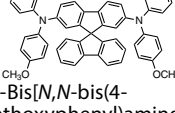
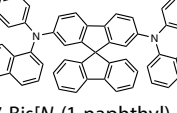
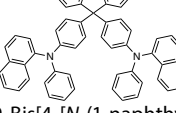
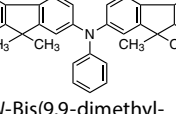
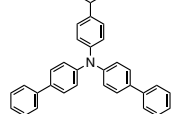
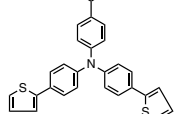
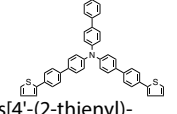
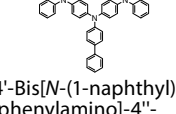
## References

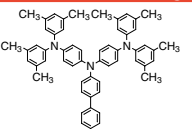
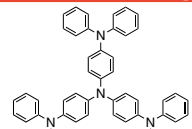
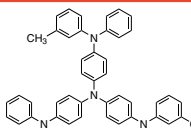
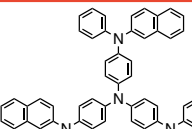
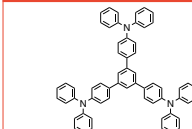
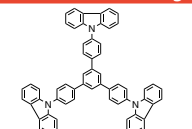
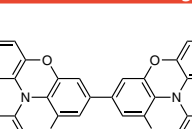
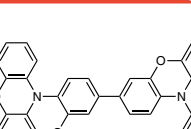
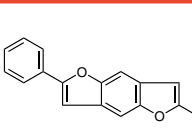
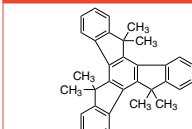
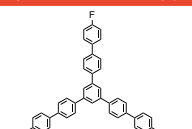
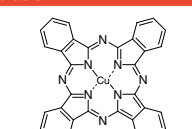
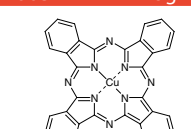
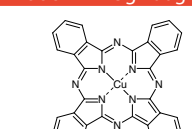
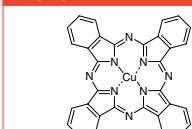
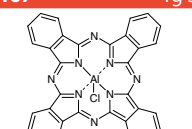
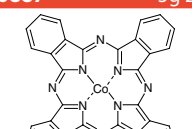
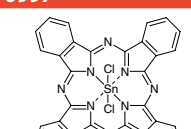
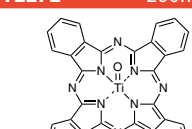
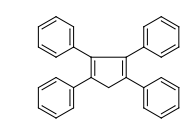
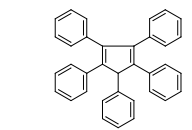
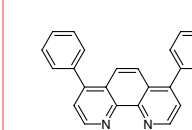
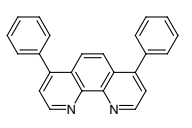
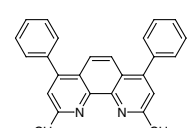
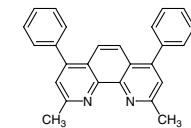
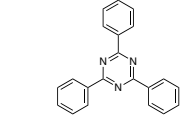
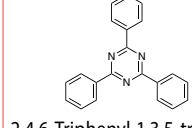
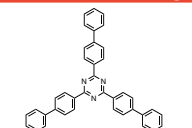
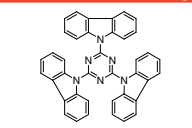
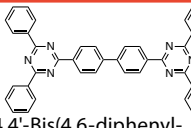
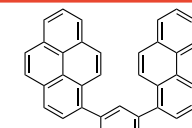
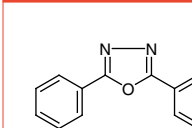
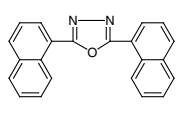
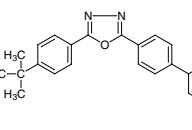
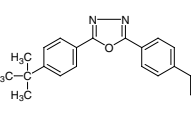
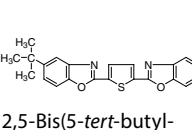
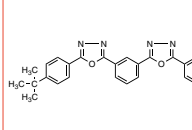
- 1) C. W. Tang, S. A. VanSlyke, *Appl. Phys. Lett.* **1987**, 51, 913.
- 2) C. Adachi, S. Tokito, T. Tsutsui, S. Saito, *Jpn. J. Appl. Phys.* **1988**, 27, L269.
- 3) C. Adachi, S. Tokito, T. Tsutsui, S. Saito, *Jpn. J. Appl. Phys.* **1988**, 27, L713.
- 4) Review: B. Luessem, M. Riede, K. Leo, *Phys. 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. Forrest, 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.

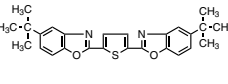
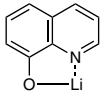
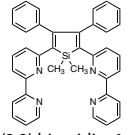
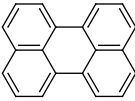
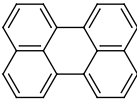
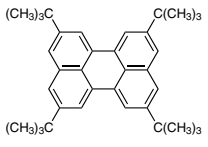
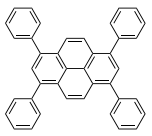
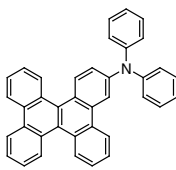
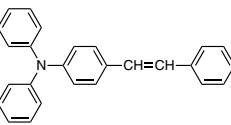
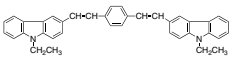
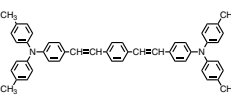
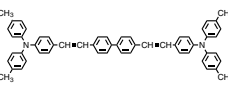
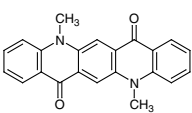
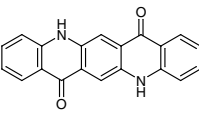
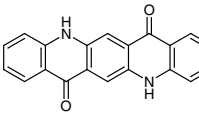
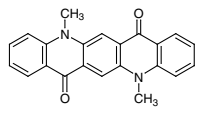
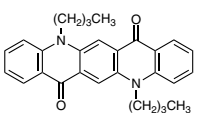
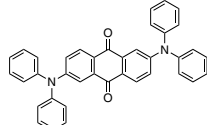
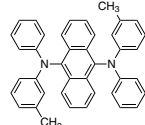
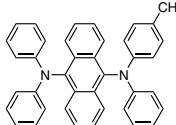
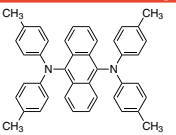
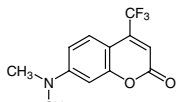
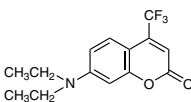
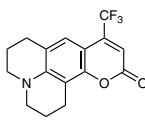
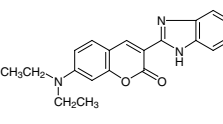
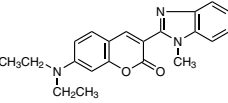
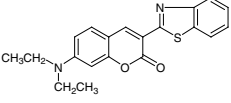
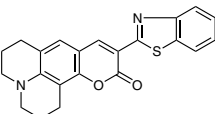
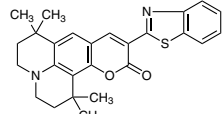
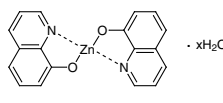
## Host Materials

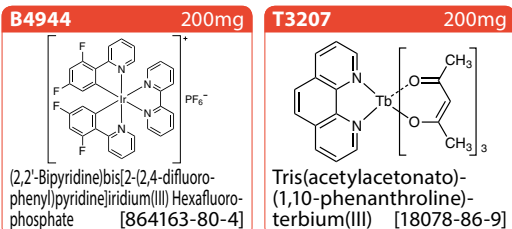
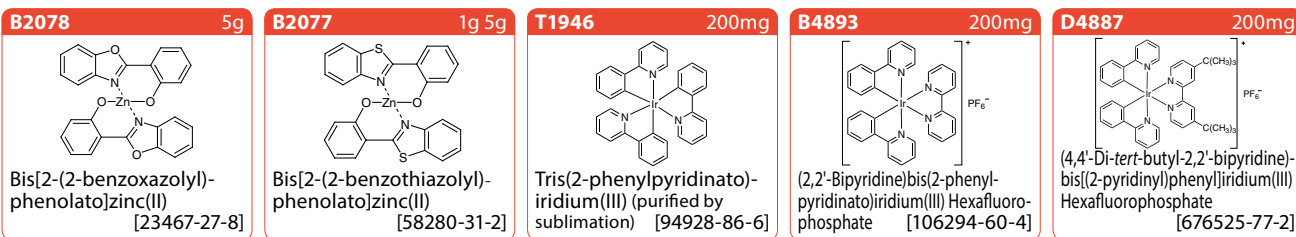
|  |  |   |   |   |
|--|--|---|---|---|
|  | <b>B4095</b> 1g 5g<br><br>9,9'-Bianthryl [1055-23-8]  | <b>D1689</b> 1g 25g<br><br>9,10-Diphenylanthracene [1499-10-1]                                       | <b>D4401</b> 1g<br><br>9,10-Diphenylanthracene (purified by sublimation) [1499-10-1]       |   |
| <b>B5022</b> 200mg 1g<br><br>9,10-Bis(4-methoxyphenyl)-anthracene [24672-76-2]        | <b>D3975</b> 1g 5g<br><br>9,10-Di(1-naphthyl)-anthracene [26979-27-1]                       | <b>D5065</b> 1g<br><br>9,10-Di(1-naphthyl)-anthracene (purified by sublimation) [26979-27-1]           | <b>D4127</b> 1g 5g<br><br>9,10-Di(2-naphthyl)-anthracene [122648-99-1]                      | <b>D5066</b> 200mg<br><br>9,10-Di(2-naphthyl)-anthracene (purified by sublimation) [122648-99-1] |
| <b>M2821</b> 200mg 1g<br><br>2-Methyl-9,10-di(2-naphthyl)-anthracene [804560-00-7]    | <b>T3336</b> 200mg 1g<br><br>9,9',10,10'-Tetraphenyl-2,2'-bianthracene [172285-72-2]        | <b>T3193</b> 200mg 1g<br><br>1,3,5-Tri(1-naphthyl)-benzene [7059-70-3]                                 | <b>B2737</b> 5g 25g<br><br>DPVBi [142289-08-5]  | <b>B5139</b> 200mg 1g<br><br>DPVBi (purified by sublimation) [142289-08-5]                       |
| <b>D4922</b> 200mg 1g<br><br>1,4-Di(1-pyrenyl)benzene [475460-77-6]                  | <b>D4932</b> 200mg 1g<br><br>2,7-Di(1-pyrenyl)-9,9'-spirobi[9H-fluorene] [886456-80-0]     | <b>B4980</b> 200mg 1g<br><br>9,9-Bis[4-(1-pyrenyl)-phenyl]fluorene [1174006-47-3]                     | <b>D4087</b> 1g<br><br>1,3-Di-9-carbazolyl-benzene (purified by sublimation) [550378-78-4] | <b>B4961</b> 200mg 1g<br><br>2,6-Bis(9H-carbazol-9-yl)-pyridine [168127-49-9]                   |
| <b>D4772</b> 200mg<br><br>mCBP [342638-54-4]  | <b>B2713</b> 1g 5g<br><br>CBP [58328-31-7]  | <b>B4219</b> 1g<br><br>CBP (purified by sublimation) [58328-31-7]                                    | <b>B4910</b> 200mg<br><br>CDBP [604785-54-8]  | <b>D4904</b> 200mg 1g<br><br>3,3''-Di(9H-carbazol-9-yl)-1,1':3',1''-terphenyl [1116499-73-0]   |
| <b>B4702</b> 200mg<br><br>DCzPPy [1013405-24-7]                                     | <b>D4903</b> 1g 5g<br><br>9,9'-Diphenyl-9H,9'H-3,3'-bicarbazole [57102-62-2]              | <b>T1934</b> 1g 5g<br><br>1,3,5-Tri(9H-carbazol-9-yl)benzene (purified by sublimation) [148044-07-9] | <b>T2616</b> 1g 5g<br><br>TCTA [139092-78-7]  | <b>T2274</b> 200mg 1g<br><br>TCTA (purified by sublimation) [139092-78-7]                      |
| <b>P0656</b> 5g 25g<br><br>Poly(N-vinylcarbazole) [25067-59-8]                      | <b>D4919</b> 200mg 1g<br><br>9-[3-(Dibenzofuran-2-yl)-phenyl]-9H-carbazole [1338446-77-7] | <b>B4942</b> 200mg 1g<br><br>DCzDBT [913738-04-2]  | <b>C2780</b> 200mg<br><br>CZBDF [1092578-51-2]  | <b>B5240</b> 1g<br><br>DPEPO [808142-23-6]   |
| <b>B4720</b> 200mg<br><br>Bis[2-(2-pyridinyl)phenolato]-beryllium(II) [220694-90-6] | <b>T1527</b> 5g 25g 250g<br><br>Alq <sub>3</sub> [2085-33-8]                              | <b>T2238</b> 5g<br><br>Alq <sub>3</sub> (purified by sublimation) [2085-33-8]                        |   |   |

# Hole Transport Materials

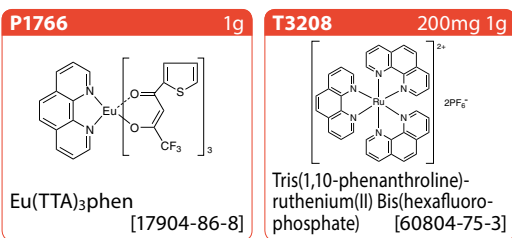
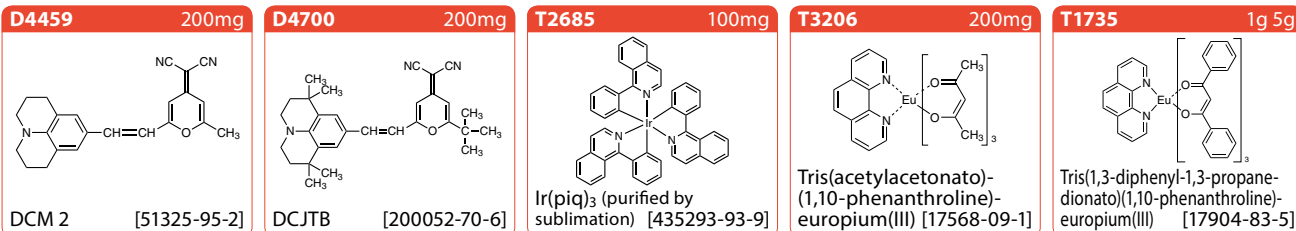
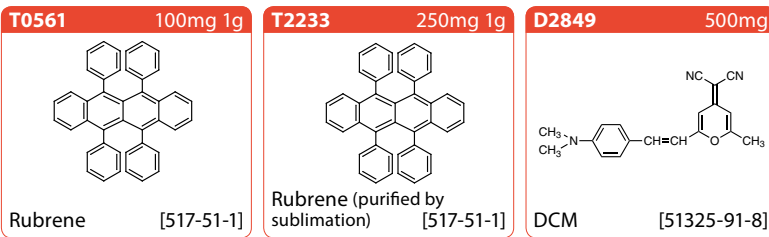
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|---|---|---|---|--|
| <p><b>D4929</b> 1g 5g</p>  <p><i>N,N'</i>-Di(2-naphthyl)-<i>N,N'</i>-diphenyl-1,4-phenylenediamine<br/>[139994-47-1]</p> | <p><b>T1812</b> 5g 25g</p>  <p>TPB [15546-43-7]</p>  | <p><b>T3309</b> 1g 5g</p>  <p><i>N,N,N',N'</i>-Tetraphenyl-1,4-phenylenediamine<br/>[14118-16-2]</p>                                     | <p><b>D4905</b> 1g 5g</p>  <p><i>N,N'</i>-Diphenyl-<i>N,N'</i>-bis(<i>p</i>-tolyl)-1,4-phenylenediamine<br/>[138171-14-9]</p>       | <p><b>D4930</b> 1g 5g</p>  <p><i>N,N'</i>-Diphenyl-<i>N,N'</i>-di(<i>m</i>-tolyl)-1,4-phenylenediamine<br/>[80223-29-6]</p>                           |
| <p><b>D4929</b> 1g 5g</p>  <p><i>N,N'</i>-Di(2-naphthyl)-<i>N,N'</i>-diphenyl-1,4-phenylenediamine<br/>[139994-47-1]</p> | <p><b>T1812</b> 5g 25g</p>  <p>TPB [15546-43-7]</p>  | <p><b>T3266</b> 1g 5g</p>  <p>TPB (purified by sublimation)<br/>[15546-43-7]</p>   | <p><b>D2448</b> 1g 5g</p>  <p>TPD [65181-78-4]</p>  | <p><b>D3236</b> 1g 5g</p>  <p>TPD (purified by sublimation)<br/>[65181-78-4]</p>  |
| <p><b>D4834</b> 200mg 1g</p>  <p><i>N,N'</i>-Diphenyl-<i>N,N'</i>-di(<i>p</i>-tolyl)-benzidine<br/>[20441-06-9]</p>      | <p><b>T2269</b> 5g</p>  <p><i>N,N,N',N'</i>-Tetrakis(<i>p</i>-tolyl)-benzidine [76185-65-4]</p>                                      | <p><b>T3265</b> 1g</p>  <p><i>N,N,N',N'</i>-Tetrakis(<i>p</i>-tolyl)-benzidine (purified by sublimation)<br/>[76185-65-4]</p>            | <p><b>B4470</b> 5g 25g</p>  <p><i>N,N'</i>-Bis(4-methoxy-2-methylphenyl)-<i>N,N'</i>-diphenylbenzidine<br/>[169685-34-1]</p>        | <p><b>B5140</b> 1g 5g</p>  <p><i>N,N'</i>-Bis(4-methoxy-2-methylphenyl)-<i>N,N'</i>-diphenylbenzidine (purified by sublimation)<br/>[169685-34-1]</p> |
| <p><b>T3290</b> 200mg 1g</p>  <p>MeO-TPD [122738-21-0]</p>  | <p><b>D4928</b> 1g 5g</p>  <p><i>N,N'</i>-Di(4-biphenyl)-<i>N,N'</i>-diphenylbenzidine<br/>[134008-76-7]</p>                        | <p><b>T3054</b> 1g</p>  <p><i>N,N,N',N'</i>-Tetrakis(4-biphenyl)benzidine<br/>[164724-35-0]</p>   | <p><b>D5126</b> 1g 5g</p>  <p><i>N,N'</i>-Di-1-naphthyl-<i>N,N'</i>-diphenylbenzidine<br/>[123847-85-8]</p>                        | <p><b>D3970</b> 1g 5g</p>  <p><i>N,N'</i>-Di-1-naphthyl-<i>N,N'</i>-diphenylbenzidine (purified by sublimation)<br/>[123847-85-8]</p>                |
| <p><b>D4855</b> 200mg 1g</p>  <p><i>N,N'</i>-Di-1-naphthyl-<i>N,N'</i>-di-2-naphthylbenzidine<br/>[374592-88-8]</p>    | <p><b>T3288</b> 1g</p>  <p><i>N,N,N',N'</i>-Tetra(2-naphthyl)-benzidine [141752-82-1]</p>  | <p><b>B4962</b> 1g 5g</p>  <p><i>N,N'</i>-Bis(9,9-dimethyl-9<i>H</i>-fluoren-2-yl)-<i>N,N'</i>-diphenylbenzidine<br/>[361486-60-4]</p> | <p><b>B5093</b> 1g 5g</p>  <p><i>N,N'</i>-Bis[4-(diphenylamino)phenyl]-<i>N,N'</i>-di(1-naphthyl)-benzidine<br/>[910058-11-6]</p> | <p><b>B5117</b> 200mg 1g</p>  <p><i>N,N'</i>-Bis[4-(diphenylamino)phenyl]-<i>N,N'</i>-diphenylbenzidine<br/>[209980-53-0]</p>                       |
| <p><b>D4863</b> 1g 5g</p>  <p>TPTE [167218-46-4]</p>   | <p><b>B4874</b> 1g 5g</p>  <p>3,3'-Bis(di(<i>p</i>-tolyl)amino)biphenyl<br/>[161485-60-5]</p>                                      | <p><b>B2079</b> 1g 5g</p>  <p>TAPC [58473-78-2]</p>  | <p><b>B3146</b> 1g</p>  <p>TAPC (purified by sublimation)<br/>[58473-78-2]</p>  | <p><b>B4926</b> 200mg 1g</p>  <p>DMFL-NPB [222319-05-3]</p>   |
| <p><b>D4920</b> 200mg 1g</p>  <p>DMFL-TPD [143886-11-7]</p>  | <p><b>B4882</b> 200mg 1g</p>  <p>2,7-Bis[<i>N</i>-(<i>m</i>-tolyl)anilino]-9,9'-spirobi[9<i>H</i>-fluorene]<br/>[1033035-83-4]</p> | <p><b>B4959</b> 200mg 1g</p>  <p>2,7-Bis[<i>N,N</i>-bis(4-methoxyphenyl)amino]-9,9'-spirobi[9<i>H</i>-fluorene]<br/>[1138220-69-5]</p> | <p><b>B4875</b> 200mg 1g</p>  <p>2,7-Bis[<i>N</i>-(1-naphthyl)anilino]-9,9'-spirobi[9<i>H</i>-fluorene]<br/>[932739-76-9]</p>     | <p><b>B4979</b> 200mg 1g</p>  <p>9,9-Bis[4-[<i>N</i>-(1-naphthyl)-<i>N</i>-phenylamino]phenyl]fluorene<br/>[510775-24-3]</p>                        |
| <p><b>B5045</b> 200mg 1g</p>  <p><i>N,N</i>-Bis(9,9-dimethyl-9<i>H</i>-fluoren-2-yl)aniline<br/>[165320-27-4]</p>      | <p><b>T3327</b> 1g 5g</p>  <p>Tris(4-biphenyl)amine<br/>[6543-20-0]</p>  | <p><b>T3050</b> 1g 5g</p>  <p>Tris[4-(2-thienyl)phenyl]amine<br/>[142807-63-4]</p>   | <p><b>T3337</b> 200mg</p>  <p>Tris[4'-(2-thienyl)-4-biphenyl]amine<br/>[1092356-36-9]</p>   | <p><b>B2305</b> 100mg</p>  <p>4,4'-Bis[<i>N</i>-(1-naphthyl)-<i>N</i>-phenylamino]-4'-phenyltriphenylamine<br/>[1073183-32-0]</p>                   |

|   |  |   |  |  |
|---|--|---|--|--|
| <p><b>B2269</b> 100mg 1g</p>  <p>4,4'-Bis(di(3,5-xylyl)amino)-4''-phenyltriphenylamine<br/>[249609-49-2]</p> | <p><b>T3062</b> 200mg 1g</p>  <p>TDATA [105389-36-4]</p>  | <p><b>T2251</b> 100mg</p>  <p><i>m</i>-MTDATA [124729-98-2]</p>  | <p><b>T3233</b> 1g</p>  <p>2-TNATA [185690-41-9]</p>   | <p><b>T3436</b> 200mg 1g</p>  <p>1,3,5-Tris[4-(diphenylamino)phenyl]benzene<br/>[147951-36-8]</p>                                 |
| <p><b>T3439</b> 200mg 1g</p>  <p>1,3,5-Tris[4-(9-carbazolyl)phenyl]benzene<br/>[160780-82-5]</p>             | <p><b>B4908</b> 200mg 1g</p>  <p>HN-D1 [1395881-55-6]</p>   | <p><b>B4907</b> 200mg 1g</p>  <p>HN-D2 [1395881-58-9]</p>  | <p><b>D4633</b> 200mg 1g</p>  <p>2,6-Diphenylbenzo[1,2-<i>b</i>:4,5-<i>b'</i>]-difuran<br/>[5379-77-1]</p>   | <p><b>D4753</b> 200mg</p>  <p>10,15-Dihydro-5,5,10,10,15,15-hexamethyl-5<i>H</i>-tribenzo[<i>a,f,k</i>]trindene [597554-76-2]</p> |
| <p><b>T3462</b> 200mg</p>  <p>1,3,5-Tris(4'-fluorobiphenyl-4-yl)benzene<br/>[372956-40-6]</p>                | <p><b>P0655</b> 25g</p>  <p>Copper Phthalocyanine<br/>[147-14-8]</p>  | <p><b>P1005</b> 25g 250g</p>  <p>Copper(II) Phthalocyanine (<math>\alpha</math>-form)<br/>[147-14-8]</p>   | <p><b>P1006</b> 25g 100g 500g</p>  <p>Copper(II) Phthalocyanine (<math>\beta</math>-form)<br/>[147-14-8]</p> | <p><b>P1628</b> 1g</p>  <p>Copper Phthalocyanine (purified by sublimation)<br/>[147-14-8]</p>                                     |
| <p><b>C1167</b> 1g 5g</p>  <p>Phthalocyanine Chloroaluminum<br/>[14154-42-8]</p>                            | <p><b>P0887</b> 5g 25g</p>  <p>Cobalt(II) Phthalocyanine<br/>[3317-67-7]</p>   | <p><b>P0997</b> 1g</p>  <p>Tin(IV) Phthalocyanine Dichloride<br/>[18253-54-8]</p>   | <p><b>T2272</b> 200mg 1g</p>  <p>TiOPc (purified by sublimation)<br/>[26201-32-1]</p>                       |  |
| <p><b>Electron Transport Materials</b></p>  |  |   |  |  |
|   |  | <p><b>T1333</b> 1g 5g</p>  <p>1,2,3,4-Tetraphenyl-1,3-cyclopentadiene<br/>[15570-45-3]</p>   | <p><b>P1633</b> 100mg 1g</p>  <p>1,2,3,4,5-Pentaphenyl-1,3-cyclopentadiene<br/>[2519-10-0]</p>             | <p><b>D0905</b> 1g 5g</p>  <p>Bathophenanthroline<br/>[1662-01-7]</p>   |
| <p><b>B2695</b> 1g</p>  <p>Bathophenanthroline (purified by sublimation)<br/>[1662-01-7]</p>               | <p><b>D0711</b> 1g 5g</p>  <p>Bathocuproine [4733-39-5]</p>   | <p><b>B2694</b> 1g 5g</p>  <p>Bathocuproine (purified by sublimation)<br/>[4733-39-5]</p>  | <p><b>T2785</b> 1g 5g</p>  <p>2,4,6-Triphenyl-1,3,5-triazine<br/>[493-77-6]</p>                            | <p><b>T3268</b> 1g</p>  <p>2,4,6-Triphenyl-1,3,5-triazine (purified by sublimation)<br/>[493-77-6]</p>                          |
| <p><b>T3539</b> 200mg 1g</p>  <p>2,4,6-Tri(1,1'-biphenyl-4-yl)-1,3,5-triazine<br/>[31274-51-8]</p>         | <p><b>T2700</b> 1g 5g</p>  <p>2,4,6-Tri(9<i>H</i>-carbazol-9-yl)-1,3,5-triazine (purified by sublimation)<br/>[134984-37-5]</p> | <p><b>B4977</b> 200mg 1g</p>  <p>4,4'-Bis(4,6-diphenyl-1,3,5-triazin-2-yl)biphenyl (This product is unavailable in the U.S.)<br/>[266349-83-1]</p> | <p><b>D4931</b> 200mg 1g</p>  <p>3,5-Di(1-pyrenyl)pyridine<br/>[1246467-58-2]</p>                          | <p><b>D1429</b> 10g</p>  <p>2,5-Diphenyl-1,3,4-oxadiazole<br/>[725-12-2]</p>  |
| <p><b>D2757</b> 5g</p>  <p>2,5-Di(1-naphthyl)-1,3,4-oxadiazole<br/>[905-62-4]</p>                          | <p><b>B1767</b> 5g</p>  <p>PBD [15082-28-7]</p>   | <p><b>B2696</b> 1g 5g</p>  <p>PBD (purified by sublimation)<br/>[15082-28-7]</p>   | <p><b>B1554</b> 5g 25g</p>  <p>2,5-Bis(5-<i>tert</i>-butyl-2-benzoxazolyl)thiophene<br/>[7128-64-5]</p>    | <p><b>B4252</b> 200mg 1g</p>  <p>OXD-7 [138372-67-5]</p>  |

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|---|---|---|--|--|--|
| <p><b>B4221</b> 1g 5g</p>  <p>2,5-Bis(5-<i>tert</i>-butyl-2-benzoxazolyl)thiophene (purified by sublimation) [7128-64-5]</p> | <p><b>Q0100</b> 1g 5g</p>  <p>(8-Quinolinolato)lithium [25387-93-3]</p>                        | <p><b>B4233</b> 200mg</p>  <p>2,5-Bis(2,2'-bipyridin-6-yl)-1,1-dimethyl-3,4-diphenylsilole [350042-00-1]</p> |  |  |  |
| <p><b>Blue Dopants</b></p>  |   |   | <p><b>P0078</b> 5g 25g</p>  <p>Perylene [198-55-0]</p>  | <p><b>P1629</b> 1g</p>  <p>Perylene (purified by sublimation) [198-55-0]</p>                       | <p><b>T3053</b> 100mg</p>  <p>2,5,8,11-Tetra-<i>tert</i>-butylperylene [80663-92-9]</p> |
| <p><b>T3042</b> 50mg 200mg</p>  <p>1,3,6,8-Tetraphenylpyrene [13638-82-9]</p>  | <p><b>D3739</b> 200mg</p>  <p>3-DPADBC [1397202-77-5]</p>                                      | <p><b>S0924</b> 1g 5g</p>  <p>4-Styryltriphenylamine [89114-74-9]</p>  | <p><b>B4792</b> 200mg</p>  <p>1,4-Bis[2-(9-ethylcarbazol-3-yl)vinyl]benzene [62608-15-5]</p>               | <p><b>B2080</b> 1g</p>  <p>1,4-Bis[4-(<i>di-p</i>-tolylamino)styryl]benzene [55035-43-3]</p>      |  |
| <p><b>B4682</b> 200mg</p>  <p>4,4'-Bis[4-(<i>di-p</i>-tolylamino)styryl]biphenyl [119586-44-6]</p>                          | <p><b>Green Dopants</b></p>   |   |  |  |  |
| <p><b>D3227</b> 1g</p>  <p><i>N,N'</i>-Dimethylquinacridone (purified by sublimation) [19205-19-7]</p>                     | <p><b>Q0057</b> 5g 25g</p>  <p>Quinacridone [1047-16-1]</p>                                  | <p><b>Q0083</b> 1g</p>  <p>Quinacridone (purified by sublimation) [1047-16-1]</p>                         | <p><b>D2687</b> 1g 5g</p>  <p><i>N,N'</i>-Dimethylquinacridone [19205-19-7]</p>                         |  |  |
| <p><b>D4780</b> 200mg 1g</p>  <p><i>N,N'</i>-Dibutylquinacridone [99762-80-8]</p>  | <p><b>B5092</b> 200mg 1g</p>  <p>2,6-Bis(diphenylamino)anthraquinone [868850-50-4]</p>       | <p><b>B4965</b> 200mg 1g</p>  <p>9,10-Bis[<i>N</i>-(<i>m</i>-tolyl)anilino]anthracene [189263-81-8]</p>   | <p><b>B5149</b> 200mg 1g</p>  <p>9,10-Bis[<i>N</i>-(<i>p</i>-tolyl)anilino]anthracene [190974-21-1]</p> |  |  |
| <p><b>B4966</b> 200mg 1g</p>  <p>9,10-Bis[<i>N,N</i>-di(<i>p</i>-tolyl)amino]anthracene [177799-16-5]</p>                  | <p><b>D3356</b> 5g</p>  <p>7-(Dimethylamino)-4-(trifluoromethyl)coumarin [53518-14-2]</p>    | <p><b>D4466</b> 200mg</p>  <p>7-(Diethylamino)-4-(trifluoromethyl)coumarin [41934-47-8]</p>                | <p><b>C2858</b> 200mg 1g</p>  <p>Coumarin 153 [53518-18-6]</p>   | <p><b>B2111</b> 100mg 1g</p>  <p>3-(2-Benzimidazolyl)-7-(diethylamino)coumarin [27425-55-4]</p> |  |
| <p><b>C2837</b> 200mg 1g</p>  <p>7-(Diethylamino)-3-(1-methyl-2-benzimidazolyl)coumarin [41044-12-6]</p>                   | <p><b>B2088</b> 1g 5g</p>  <p>3-(2-Benzothiazolyl)-7-(diethylamino)coumarin [38215-36-0]</p> | <p><b>C2900</b> 200mg</p>  <p>Coumarin 545 [85642-11-1]</p>  | <p><b>B4257</b> 200mg</p>  <p>Coumarin 545T [155306-71-1]</p>  | <p><b>B1678</b> 5g 25g</p>  <p>Bis(8-quinolinolato)zinc(II) Hydrate [13978-85-3]</p>            |  |



## Red Dopants



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