

Solar Cell Materials



Perovskite Solar Cell (PSC) Materials

Organic Photovoltaics (OPV) Materials

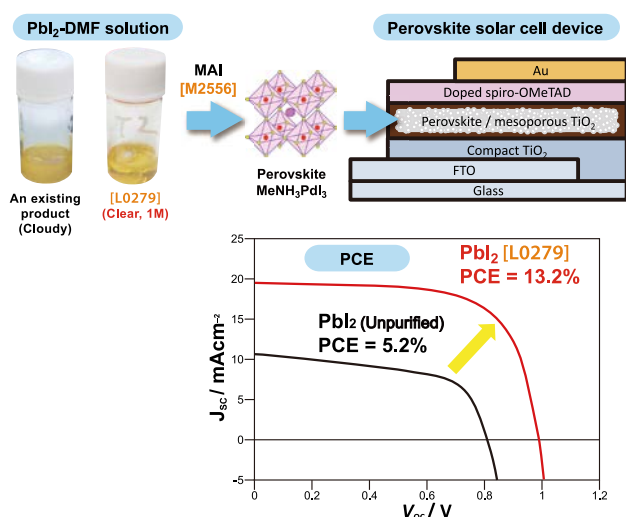
Dye-Sensitized Solar Cell (DSSC) Materials

Solar Cell Materials

Sunlight is one of the renewable energy sources that can globally contribute to environmental and energy solutions in the 21st century. In order to use sunlight as efficiently as possible, low cost and efficient solar cells have been vigorously developed for practical use. As is generally known, practical silicon-based solar cells involve high manufacturing cost, as well as any other inorganic-based solar cells. On the basis of the cost problem, we have developed new solar cells based on organic and organic-inorganic hybrid materials.

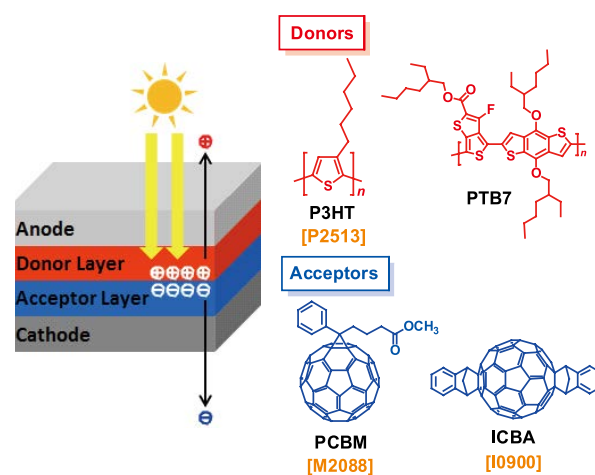
1. Perovskite Solar Cell (PSC) Materials

A perovskite solar cell, that was first reported by Miyasaka *et al.* in 2009, has recently received much attention.¹⁾ The organic-inorganic perovskite, RNH_3PbX_3 ($\text{X} = \text{Cl}, \text{Br}, \text{I}; \text{R} = \text{Me}, \text{NH}=\text{CH}$, etc.), can function as a light absorption layer. Since 2012, power conversion efficiency (PCE) of the perovskite solar cell has been drastically improved and it has reached >15% better than those of OPV and DSSC.²⁻⁵⁾ A device of the perovskite solar cell is solution-processible for fabrication at low cost. The organic-inorganic perovskites RNH_3PbX_3 are easily prepared from HX salts of organic amines and lead halides. A modification of the halide X in the $(\text{MeNH}_3)\text{PbX}_3$ can control the range of absorption wavelength.⁶⁾ The perovskite compound with $\text{X} = \text{Br}$ is useful for light absorption in shorter wavelengths and the compound with $\text{X} = \text{I}$ is relatively useful for that in longer wavelengths. Wakamiya *et al.* reported that use of highly dried lead(II) iodide is a key to fabricate efficient perovskite solar cell devices (PCE > 10%) with high reproducibility.^{7,8)} Carrier behavior in the perovskite layer is different from that in OPV, thus there are free carriers in which electrons and holes can be movable freely.⁹⁾ According to the reason, the perovskite layer can transport both electron and hole carriers without recombination.



2. Organic Photovoltaics (OPV) Materials

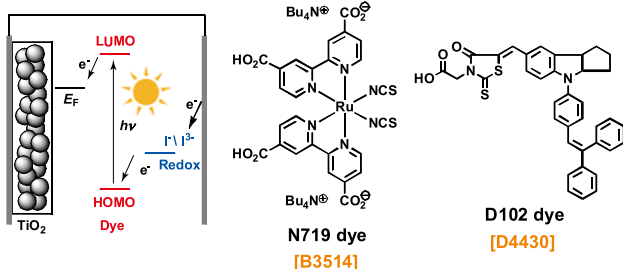
A prototype of organic photovoltaics (OPV) was reported by Tang *et al.* in 1986.¹⁰⁾ In order to fabricate an OPV device, we can use highly productive methods such as printing and roll-to-roll methods. The OPV device usually requires bulk heterojunctions (BHJ) which can be fabricated by mixing an electron-donor (p -type semiconductor) and electron-acceptor (n -type semiconductor).¹¹⁾ The former material involves a π -conjugated polymer and a small molecule semiconductor, and the latter material is normally a fullerene derivative. PCBM, that is a solubility-enhanced fullerene, efficiently provides a bulk heterojunction.¹²⁾ ICBM gives a high open-circuit voltage because it has a higher energy LUMO than that of PCBM.¹³⁾ A C_{70} derivative usually gives higher cell efficiency compared with that of the corresponding C_{60} one, because the C_{70} derivative absorbs light better than the C_{60} .¹⁴⁾ We can introduce an acceptor component into the structure of a p -type semiconducting polymer to form a donor-acceptor (DA-type) polymer, that shows light absorption in the long wavelength area based on a charge transfer.¹⁵⁾



3. Dye-Sensitized Solar Cell (DSSC) Materials

Grätzel *et al.* first developed a dye-sensitized solar cell (DSSC) in 1991.¹⁶⁾ The DSSC is a liquid-type device that involves nanoporous titanium oxide (TiO_2) as a semiconducting electrode, organic dye-sensitizer and an electrolyte solution containing a redox component. This is expected to be a low cost solar cell, because there is a simple device structure compared with other solar cells.¹⁷⁾ The DSSC is usable under conditions with weak light. Thus, it is expected that the DSSC may be installed in a room. A ruthenium complex with a bipyridine ligand is one popular organic dye for solar cells.¹⁸⁾ In the polypyridine ligand of

the ruthenium complex, we can introduce some carboxyl or phosphonic acid groups forming a linkage with TiO₂. In addition, metal-free organic dyes (eg. D-102, D-131 and D-358) were also developed, because they do not contain any expensive ruthenium atoms.^{19,20} Recently, efficient green-colored zinc-porphyrin dyes were developed for DSSC showing more than 10% of PCE.^{21,22} Furthermore, efficient blue-colored metal-free organic dyes having a diketopyrrolopyrrole structure were developed for DSSC (PCE > 10%).²³



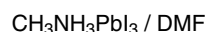
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Perovskite Solar Cell (PSC) Materials

Lead Halides

P2415 1g 5g 25g



PbI₂/MAI(1:1) - DMF Complex
(99.99%, trace metals basis)
[for Perovskite precursor]

L0279 1g 5g 25g 100g 1kg



Lead(II) Iodide
[for Perovskite precursor]
CAS RN: 10101-63-0

L0288 1g 5g 25g



Lead(II) Bromide
[for Perovskite precursor]
CAS RN: 10031-22-8

L0291 1g 5g



Lead(II) Chloride
(purified by sublimation)
[for Perovskite precursor]
CAS RN: 7758-95-4

L0292 1g 5g 25g



Lead(II) Chloride
[for Perovskite precursor]
CAS RN: 7758-95-4

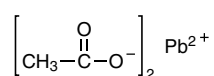
C3569 1g 5g



Cesium Lead Tribromide
(Low water content)
CAS RN: 15243-48-8

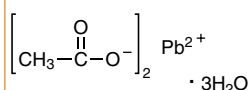
Other Lead Compounds

L0315 1g 5g 25g



Lead(II) Acetate
[for Perovskite precursor]
CAS RN: 301-04-2

L0330 25g 100g



Lead(II) Acetate Trihydrate
CAS RN: 6080-56-4

Bismuth Halides

B5787 5g 25g



Bismuth(III) Iodide Anhydrous
CAS RN: 7787-64-6

Tin Halides

T3449 1g 5g



Tin(II) Iodide
[for Perovskite precursor]
CAS RN: 10294-70-9

Cesium Halides

C2205 25g



Cesium Iodide
CAS RN: 7789-17-5

C2202 25g 100g



Cesium Bromide
CAS RN: 7787-69-1

C2203 25g 100g

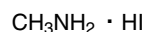


Cesium Chloride
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Organic Onium Salts

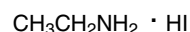
Iodide Salts

M2556 1g 5g 25g 100g



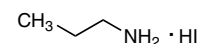
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(Low water content)
CAS RN: 14965-49-2

E1045 1g 5g



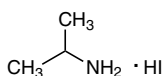
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CAS RN: 506-58-1

P2212 1g 5g



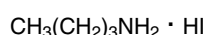
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CAS RN: 14488-45-0

I0934 1g 5g



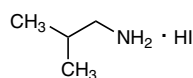
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B4433 1g 5g



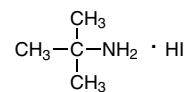
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I0935 1g 5g



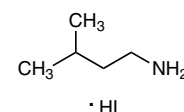
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B4434 1g 5g



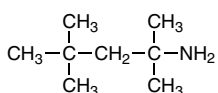
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I1095 1g 5g



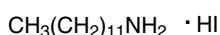
Isopentylamine Hydroiodide

T3785 1g 5g



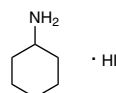
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D5538 1g 5g



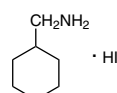
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CAS RN: 34099-97-3

C3532 1g 5g



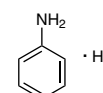
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C3425 1g 5g



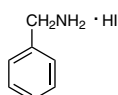
Cyclohexanemethylamine Hydroiodide

A2778 1g 5g



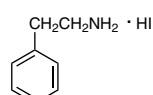
Aniline Hydroiodide
CAS RN: 45497-73-2

B4566 1g 5g



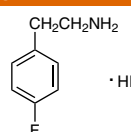
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P2213 1g 5g



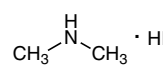
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F1203 1g 5g



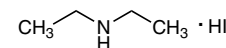
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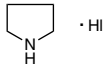
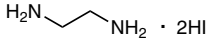
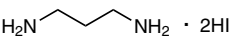
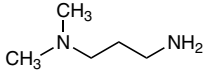
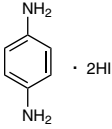
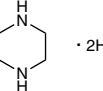
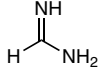
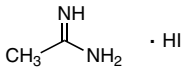
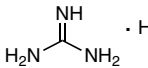


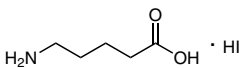
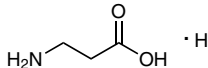
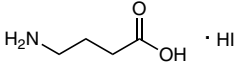

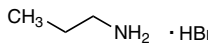
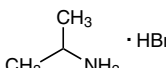
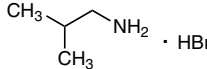
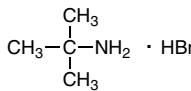


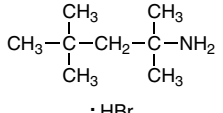
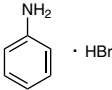
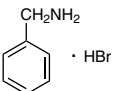
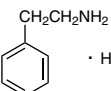
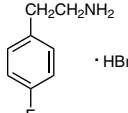
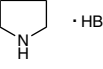
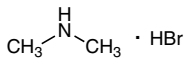
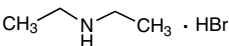
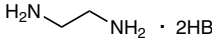
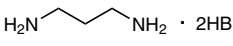
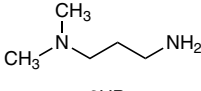
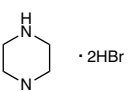
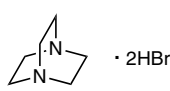
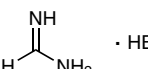
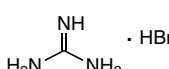


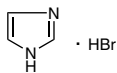
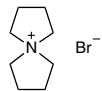
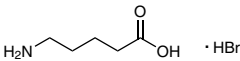
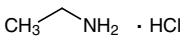
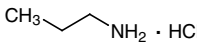
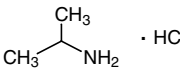
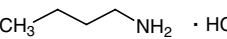
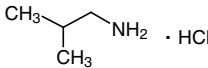
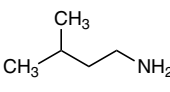
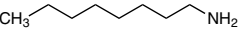
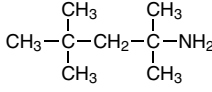

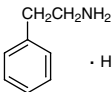
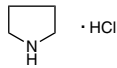
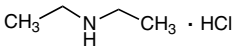
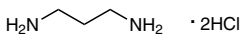
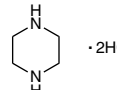
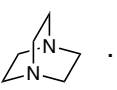
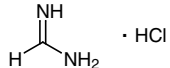
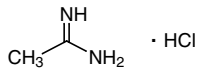
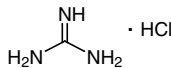
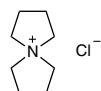
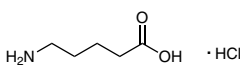
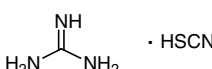
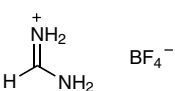
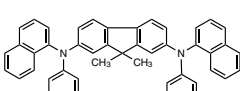
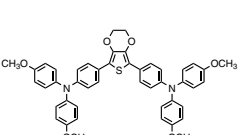
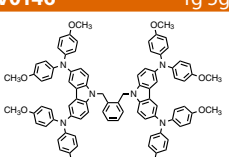
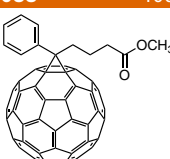
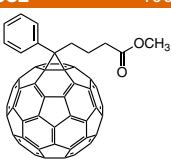
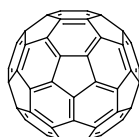
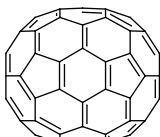
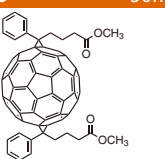
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CAS RN: 51066-74-1

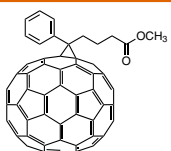
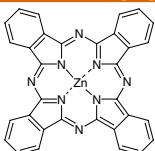
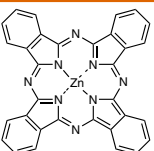
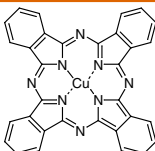
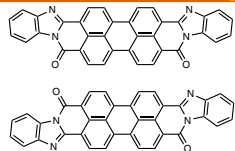
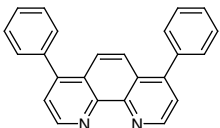
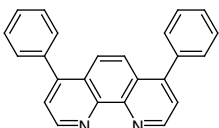
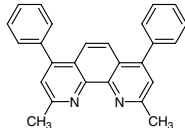
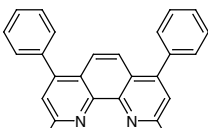
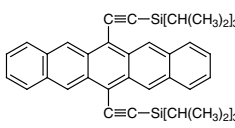
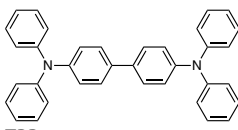
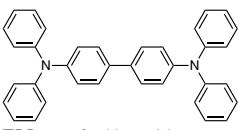
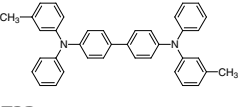
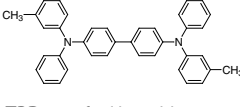
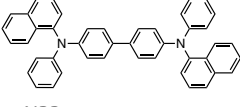
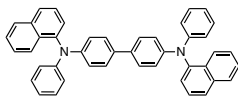
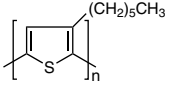
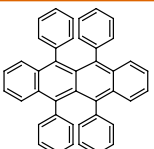
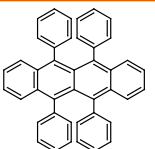

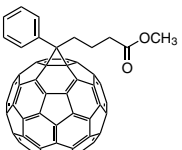
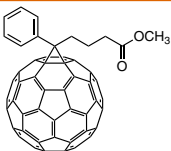
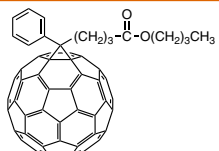
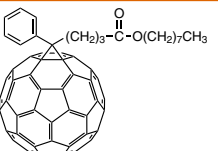
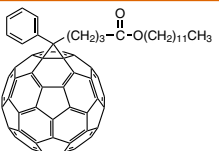
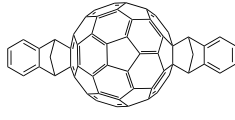
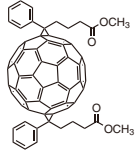
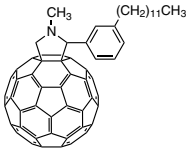
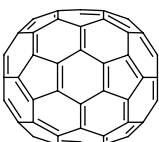
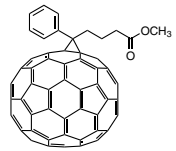
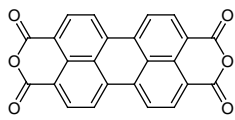
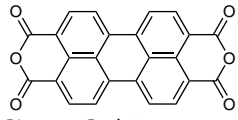
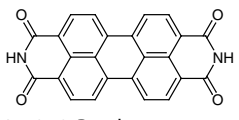
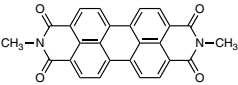
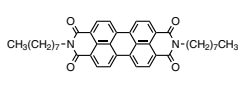
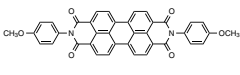
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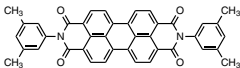
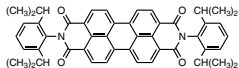
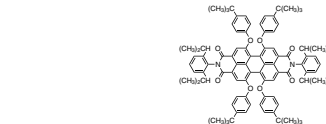
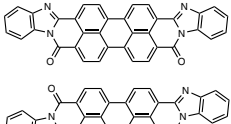
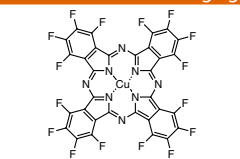
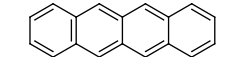
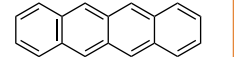
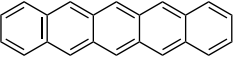
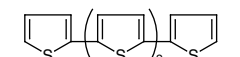
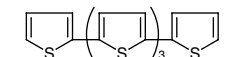
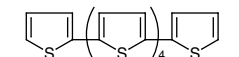
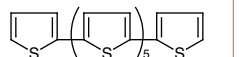
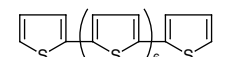
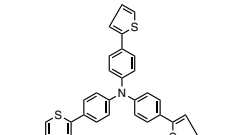
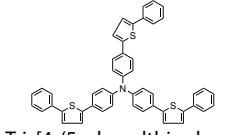
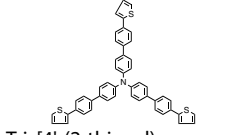
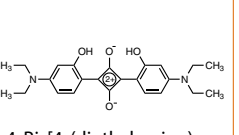
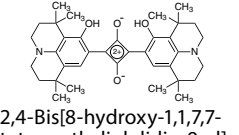
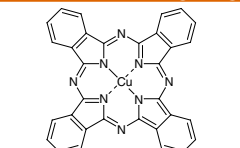
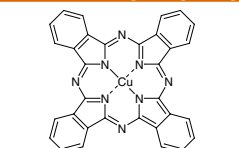
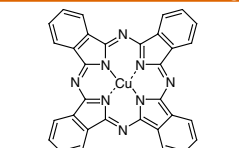
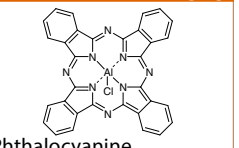
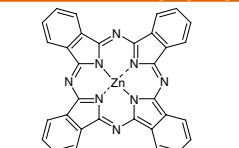
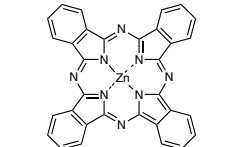
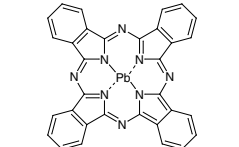
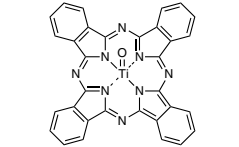
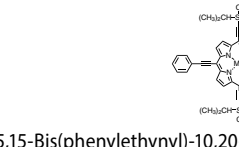
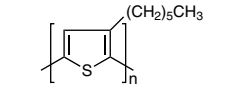


Diethylamine Hydroiodide
CAS RN: 19833-78-4

P2486 1g 5g  Pyrrolidine Hydroiodide CAS RN: 45361-12-4	E1222 1g 5g  Ethylenediamine Dihydroiodide CAS RN: 5700-49-2	D5091 1g 5g  1,3-Diaminopropane Dihydroiodide CAS RN: 120675-53-8	D5619 1g 5g  3-(Dimethylamino)propylamine Dihydroiodide	P2389 1g  1,4-Phenylenediamine Dihydroiodide CAS RN: 116469-02-4
P2492 1g 5g  Piperazine Dihydroiodide CAS RN: 58464-47-4	F0974 1g 5g 25g  Formamidine Hydroiodide (Low water content) CAS RN: 879643-71-7	A2902 1g 5g  Acetamidine Hydroiodide CAS RN: 1452099-14-7	G0450 1g 5g  Guanidine Hydroiodide CAS RN: 19227-70-4	I0970 1g 5g  Imidazole Hydroiodide CAS RN: 68007-08-9
A3093 1g 5g  5-Azoniaspiro[4.4]nonane Iodide CAS RN: 45650-35-9	A2984 1g 5g  5-Aminovaleric Acid Hydroiodide (Low water content) CAS RN: 1705581-28-7	A3112 1g 5g  beta-Alanine Hydroiodide (Low water content) CAS RN: 2096495-59-7	A3113 1g 5g  GABA-HI CAS RN: 2096495-60-0	Bromide Salts
M2589 1g 5g 25g $\text{CH}_3\text{NH}_2 \cdot \text{HBr}$ Methylamine Hydrobromide CAS RN: 6876-37-5	E0056 25g 500g  Ethylamine Hydrobromide CAS RN: 593-55-5	P2502 1g 5g  Propylamine Hydrobromide CAS RN: 4905-83-3	I1041 1g 5g  Isopropylamine Hydrobromide CAS RN: 29552-58-7	
I1007 1g 5g  Isobutylamine Hydrobromide CAS RN: 74098-36-5	B5187 1g 5g  tert-Butylamine Hydrobromide CAS RN: 60469-70-7	H1678 1g 5g  Hexylamine Hydrobromide CAS RN: 7334-95-4	O0442 1g 5g  n-Octylamine Hydrobromide CAS RN: 14846-47-0	T3783 1g 5g  tert-Octylamine Hydrobromide CAS RN: 1093859-61-0
D5537 1g 5g $\text{CH}_3(\text{CH}_2)_{11}\text{NH}_2 \cdot \text{HBr}$ Dodecylamine Hydrobromide CAS RN: 26204-55-7	A2985 1g 5g  Aniline Hydrobromide CAS RN: 542-11-0	B5185 1g 5g  Benzylamine Hydrobromide CAS RN: 37488-40-7	P2388 1g 5g  2-Phenylethylamine Hydrobromide CAS RN: 53916-94-2	F1229 1g 5g  4-Fluorophenethylamine Hydrobromide CAS RN: 1807536-06-6
P2484 1g 5g  Pyrrolidine Hydrobromide CAS RN: 55810-80-5	D5092 1g 5g  Dimethylamine Hydrobromide CAS RN: 6912-12-5	D4667 1g 5g  Diethylamine Hydrobromide CAS RN: 6274-12-0	E1221 1g 5g  Ethylenediamine Dihydrobromide CAS RN: 624-59-9	D5090 1g 5g  1,3-Diaminopropane Dihydrobromide CAS RN: 18773-03-0
D5618 1g 5g  3-(Dimethylamino)propylamine Dihydrobromide	P2490 1g 5g  Piperazine Dihydrobromide CAS RN: 59813-05-7	D5250 1g 5g  1,4-Diazabicyclo[2.2.2]-octane Dihydrobromide CAS RN: 54581-69-0	F0973 1g 5g 25g  Formamidine Hydrobromide CAS RN: 146958-06-7	G0449 1g 5g  Guanidine Hydrobromide CAS RN: 19244-98-5

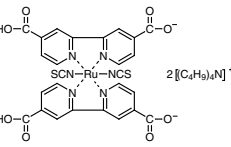
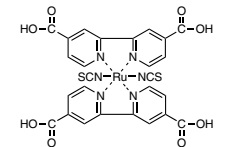
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<p>E0205 25g 500g</p>  <p>Ethylamine Hydrochloride CAS RN: 557-66-4</p>	<p>P0522 25g</p>  <p>Propylamine Hydrochloride CAS RN: 556-53-6</p>	<p>I0166 25g 100g 500g</p>  <p>Isopropylamine Hydrochloride CAS RN: 15572-56-2</p>	<p>B0710 25g 500g</p>  <p>Butylamine Hydrochloride CAS RN: 3858-78-4</p>	<p>I0096 25g 500g</p>  <p>Isobutylamine Hydrochloride CAS RN: 5041-09-8</p>
<p>I0083 1g 5g</p>  <p>Isopentylamine Hydrochloride CAS RN: 541-23-1</p>	<p>O0484 1g 5g</p>  <p>n-Octylamine Hydrochloride CAS RN: 142-95-0</p>	<p>T3784 1g 5g</p>  <p>tert-Octylamine Hydrochloride CAS RN: 58618-91-0</p>	<p>B0407 25g 100g 500g</p>  <p>Benzylamine Hydrochloride CAS RN: 3287-99-8</p>	<p>P0086 25g 100g 500g</p>  <p>2-Phenylethylamine Hydrochloride CAS RN: 156-28-5</p>
<p>P2485 1g 5g</p>  <p>Pyrrolidine Hydrochloride CAS RN: 25150-61-2</p>	<p>D0468 25g 500g</p>  <p>Diethylamine Hydrochloride CAS RN: 660-68-4</p>	<p>D5253 1g 5g</p>  <p>1,3-Diaminopropane Dihydrochloride (Low water content) CAS RN: 10517-44-9</p>	<p>P2491 1g 5g</p>  <p>Piperazine Dihydrochloride CAS RN: 142-64-3</p>	<p>D5251 1g 5g</p>  <p>1,4-Diazabicyclo[2.2.2]octane Dihydrochloride CAS RN: 49563-87-3</p>
<p>F0103 5g 25g</p>  <p>Formamidinium Hydrochloride CAS RN: 6313-33-3</p>	<p>A0008 25g 500g</p>  <p>Acetamidinium Hydrochloride CAS RN: 124-42-5</p>	<p>G0162 25g 500g</p>  <p>Guanidinium Hydrochloride CAS RN: 50-01-1</p>	<p>A3092 1g 5g</p>  <p>5-Azoniaspiro[4.4]nonane Chloride CAS RN: 98997-63-8</p>	<p>A0436 1g 5g</p>  <p>5-Aminovaleric Acid Hydrochloride (Low water content) CAS RN: 627-95-2</p>
<p>Pseudo Halide Salts</p>	<p>M2991 1g 5g</p> <p>$\text{CH}_3\text{NH}_2 \cdot \text{HSCN}$</p> <p>Methylamine Thiocyanate CAS RN: 61540-63-4</p>	<p>G0230 25g 500g</p>  <p>Guanidinium Thiocyanate CAS RN: 593-84-0</p>	<p>F1152 1g 5g</p>  <p>Formamidinium Tetrafluoroborate</p>	<p>M2990 1g 5g</p> <p>$\text{CH}_3\text{NH}_3^+ \text{BF}_4^-$</p> <p>Methylammonium Tetrafluoroborate CAS RN: 42539-74-2</p>
<p>M3134 1g 5g</p> <p>$\text{CH}_3\text{NH}_2 \cdot \text{HOCN}$</p> <p>Methylamine Cyanate CAS RN: 63405-91-4</p>	<p>Carrier Transport Materials</p>	<p>B4926 200mg 1g</p>  <p>DMFL-NPB CAS RN: 222319-05-3</p>	<p>D5155 200mg</p>  <p>H101 CAS RN: 1622008-73-4</p>	<p>V0146 1g 5g</p>  <p>V886 CAS RN: 1801701-58-5</p>
<p>M2088 100mg</p>  <p>PCBM CAS RN: 160848-22-6</p>	<p>P2682 100mg</p>  <p>PCBM [for organic electronics] CAS RN: 160848-22-6</p>	<p>B1641 100mg 1g</p>  <p>C₆₀ (pure) CAS RN: 99685-96-8</p>	<p>B1694 100mg</p>  <p>C₇₀ CAS RN: 115383-22-7</p>	<p>B4576 50mg</p>  <p>Bis-PCBM (mixture of isomers) CAS RN: 1048679-01-1</p>

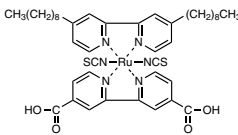
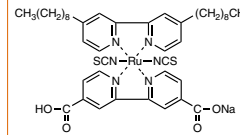
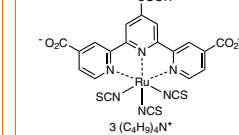
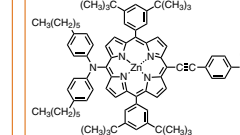
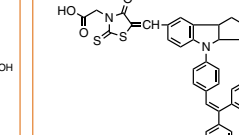
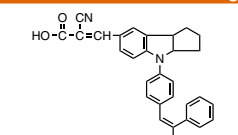
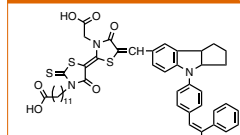
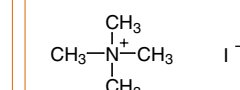
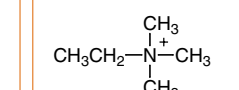
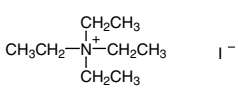
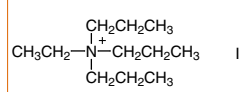
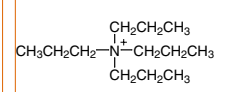
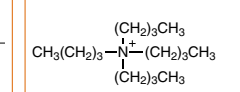
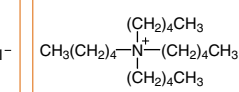
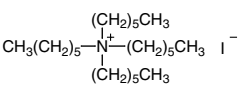
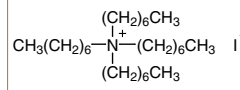
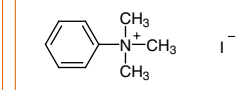
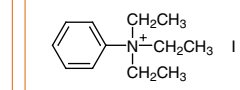
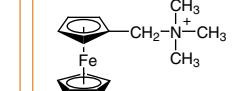
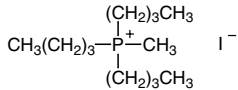
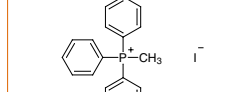
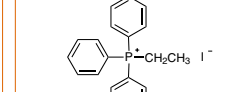
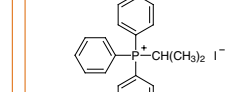
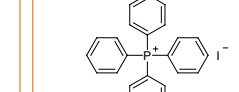
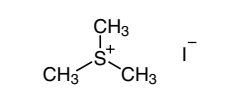
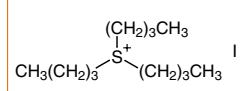
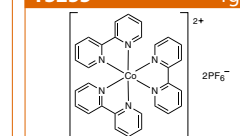
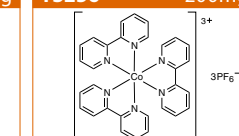
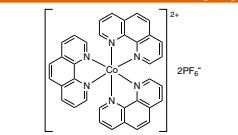
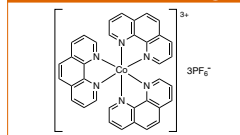
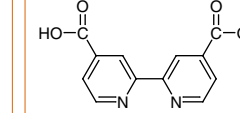
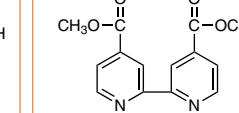
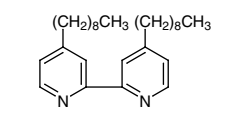
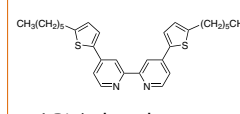
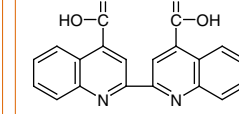
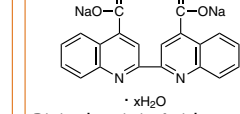
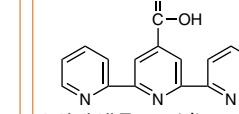
M2550 50mg  [70]PCBM (mixture of isomers) CAS RN: 609771-63-3	P0767 1g 5g 25g  Zinc Phthalocyanine CAS RN: 14320-04-8	Z0037 500mg  ZnPc (purified by sublimation) CAS RN: 14320-04-8	P1628 1g  CuPc (purified by sublimation) CAS RN: 147-14-8	P2119 200mg  PTCBI (cis- and trans- mixture) CAS RN: 79534-91-1
D0905 1g 5g  Bathophenanthroline CAS RN: 1662-01-7	B2695 1g  Bphen (purified by sublimation) CAS RN: 1662-01-7	B2694 1g 5g  Bathocuproine (purified by sublimation) CAS RN: 4733-39-5	D0711 1g 5g  Bathocuproine CAS RN: 4733-39-5	B3562 100mg  TIPS Pentacene (This product is unavailable in the U.S.) CAS RN: 373596-08-8
T1812 5g 25g  TPB CAS RN: 15546-43-7	T3266 1g 5g  TPB (purified by sublimation) CAS RN: 15546-43-7	D2448 1g 5g  TPD CAS RN: 65181-78-4	D3236 1g 5g  TPD (purified by sublimation) CAS RN: 65181-78-4	D5126 1g 5g  α -NPB CAS RN: 123847-85-8
D3970 1g 5g  α -NPB (purified by sublimation) CAS RN: 123847-85-8	P2513 100mg 500mg  P3HT (regioregular) CAS RN: 125321-66-6	T0561 100mg 1g  Rubrene CAS RN: 517-51-1	T2233 250mg 1g  Rubrene (purified by sublimation) CAS RN: 517-51-1	
Organic Solar Cell (OPV) Materials		Acceptor Materials		
			B1641 100mg 1g  C ₆₀ (pure) CAS RN: 99685-96-8	M2088 100mg  PCBM CAS RN: 160848-22-6
P2682 100mg  PCBM (for organic electronics) CAS RN: 160848-22-6	P2013 100mg  PCBB CAS RN: 571177-66-7	P2014 100mg  PCBO CAS RN: 571177-68-9	P2015 100mg  [60]PCB-C ₁₂ CAS RN: 571177-69-0	I0900 50mg  ICBA CAS RN: 1207461-57-1
B4576 50mg  Bis-PCBM (mixture of isomers) CAS RN: 1048679-01-1	C2415 100mg  C ₆₀ MC ₁₂ CAS RN: 403483-19-2	B1694 100mg  C ₇₀ CAS RN: 115383-22-7	M2550 50mg  [70]PCBM (mixture of isomers) CAS RN: 609771-63-3	P0972 25g 100g 500g  Pigment Red 224 CAS RN: 128-69-8
P2102 1g  Pigment Red 224 (purified by sublimation) CAS RN: 128-69-8	P0984 25g  3,4,9,10-Perylene-tetracarboxylic Diimide CAS RN: 81-33-4	D4429 1g 5g  Pigment Red 179 CAS RN: 5521-31-3	D4175 1g  PTCDI-C ₈ CAS RN: 78151-58-3	B2892 1g 5g  Pigment Red 190 CAS RN: 6424-77-7

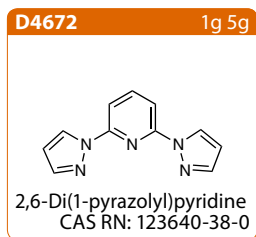
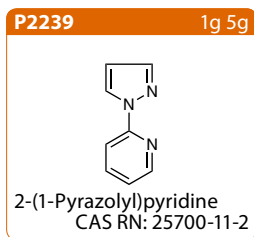
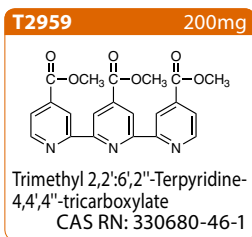
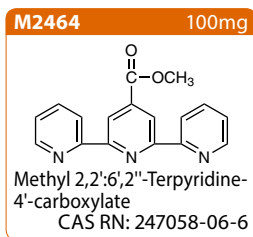
<p>B4231 1g 5g</p>  <p>Pigment Red 149 CAS RN: 4948-15-6</p>	<p>B4268 1g 5g</p>  <p>Perylene Orange CAS RN: 82953-57-9</p>	<p>T3061 200mg</p>  <p>1,6,7,12-Tetrakis(4-tert-butylphenoxy)-N,N'-bis(2,6-diisopropylphenyl)-3,4,9,10-perylenetetracarboxylic Diimide CAS RN: 112078-08-7</p>	<p>P2119 200mg</p>  <p>PTCBI (cis- and trans- mixture) CAS RN: 79534-91-1</p>	
<p>H1194 100mg 1g</p>  <p>F₁₆CuPc (purified by sublimation) CAS RN: 14916-87-1</p>	<p>Donor Materials</p>	<p>N0001 100mg 1g 5g</p>  <p>Naphthacene CAS RN: 92-24-0</p>	<p>N0951 200mg 1g</p>  <p>Naphthacene (purified by sublimation) CAS RN: 92-24-0</p>	<p>P0030 100mg 1g</p>  <p>Pentacene (purified by sublimation) CAS RN: 135-48-8</p>
<p>Q0078 100mg</p>  <p>α-Quaterthiophene CAS RN: 5632-29-1</p>	<p>Q0079 100mg 500mg</p>  <p>α-Quinquethiophene CAS RN: 5660-45-7</p>	<p>S0504 100mg 1g</p>  <p>6T (purified by sublimation) CAS RN: 88493-55-4</p>	<p>S0505 100mg</p>  <p>α-Septithiophene CAS RN: 86100-63-2</p>	<p>O0313 100mg</p>  <p>α-Octithiophene CAS RN: 113728-71-5</p>
<p>T3050 1g 5g</p>  <p>Tris[4-(2-thienyl)phenyl]amine CAS RN: 142807-63-4</p>	<p>T3328 200mg</p>  <p>Tris[4-(5-phenylthiophen-2-yl)phenyl]amine CAS RN: 803727-09-5</p>	<p>T3337 200mg</p>  <p>Tris[4'-(2-thienyl)-4-biphenyl]amine CAS RN: 1092356-36-9</p>	<p>B4342 1g 5g</p>  <p>2,4-Bis[4-(diethylamino)-2-hydroxyphenyl]squaraine CAS RN: 68842-66-0</p>	<p>B4649 1g 5g</p>  <p>2,4-Bis[8-hydroxy-1,1,7,7-tetramethyljulolidin-9-yl]-squaraine CAS RN: 358727-55-6</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>CuPc (purified by sublimation) CAS RN: 147-14-8</p>	<p>C1167 1g 5g</p>  <p>Phthalocyanine Chloroaluminum CAS RN: 14154-42-8</p>	<p>P0767 1g 5g 25g</p>  <p>Zinc Phthalocyanine CAS RN: 14320-04-8</p>
<p>Z0037 500mg</p>  <p>ZnPc (purified by sublimation) CAS RN: 14320-04-8</p>	<p>P0766 1g 25g</p>  <p>Lead(II) Phthalocyanine CAS RN: 15187-16-3</p>	<p>T2272 200mg 1g</p>  <p>TiOPc (purified by sublimation) CAS RN: 26201-32-1</p>	<p>B4314 50mg</p>  <p>[5,15-Bis(phenylethynyl)-10,20-bis[(triisopropylsilyl)ethynyl]-porphyrinato]magnesium(II) CAS RN: 1397288-30-0</p>	
<p>P2513 100mg 500mg</p>  <p>P3HT (regioregular) CAS RN: 125321-66-6</p>				

Dye-Sensitized Solar Cell (DSSC) Materials

Dye Sensitizers

<p>B3514 100mg</p>  <p>N719 Dye CAS RN: 207347-46-4</p>	<p>B4372 200mg</p>  <p>N3 Dye CAS RN: 141460-19-7</p>
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B4373 200mg  Z907 Dye CAS RN: 502693-09-6	B4432 200mg  Z907 Dye Sodium Salt CAS RN: 871466-65-8	N1104 100mg  N749 Black Dye CAS RN: 359415-47-7	Y0011 50mg  YD2 CAS RN: 1201915-91-4	D4430 50mg  D 102 CAS RN: 652145-28-3	
D4431 50mg  D 131 CAS RN: 652145-29-4	D4432 50mg  D 358 CAS RN: 1207638-53-6	Electrolytes		T0139 25g 100g 500g  Tetramethylammonium iodide CAS RN: 75-58-1	E0190 25g  Ethyltrimethylammonium iodide CAS RN: 51-93-4
T0097 25g 100g 500g  Tetraethylammonium iodide CAS RN: 68-05-3	E0191 25g  Ethyltripropylammonium iodide CAS RN: 15066-80-5	T0172 25g 500g  Tetrapropylammonium iodide CAS RN: 631-40-3	T0057 25g 100g 500g  Tetrabutylammonium iodide CAS RN: 311-28-4	T1011 5g 25g  Tetraamylammonium iodide CAS RN: 2498-20-6	
T1010 5g 25g  Tetrahexylammonium iodide CAS RN: 2138-24-1	T1396 25g  Tetraheptylammonium iodide CAS RN: 3535-83-9	P0246 25g  Trimethylphenylammonium iodide CAS RN: 98-04-4	P0242 25g  Triethylphenylammonium iodide CAS RN: 1010-19-1	F0167 5g  (Ferrocenylmethyl)-trimethylammonium iodide CAS RN: 12086-40-7	
M1455 5g 25g  Tributylmethylphosphonium iodide CAS RN: 1702-42-7	M0253 25g 100g 500g  Methyltriphenylphosphonium iodide CAS RN: 2065-66-9	E0549 25g 250g  Ethyltriphenylphosphonium iodide CAS RN: 4736-60-1	I0552 5g 25g  Isopropyltriphenylphosphonium iodide CAS RN: 24470-78-8	T1450 10g  Tetraphenylphosphonium iodide CAS RN: 2065-67-0	
T1056 25g 500g  Trimethylsulfonium iodide CAS RN: 2181-42-2	T1564 1g  Tributylsulfonium iodide CAS RN: 18146-62-8	Hole Conductor Cobalt Dopants		T3255 1g 5g  Tris(2,2'-bipyridine)cobalt(II) Bis(hexafluorophosphate) CAS RN: 79151-78-3	T3256 200mg 1g  Tris(2,2'-bipyridine)cobalt(III) Tris(hexafluorophosphate) CAS RN: 28277-53-4
T3553 1g 5g  Tris(1,10-phenanthroline)cobalt(III) Bis(hexafluorophosphate) CAS RN: 31876-74-1	T3554 1g 5g  Tris(1,10-phenanthroline)cobalt(III) Tris(hexafluorophosphate) CAS RN: 28277-59-0	Ligands		B1876 100mg 1g  2,2'-Bisonicotinic Acid CAS RN: 6813-38-3	D4635 1g 5g  Dimethyl 2,2'-Bipyridine-4,4'-dicarboxylate CAS RN: 71071-46-0
D3917 1g 5g  4,4'-Dinonyl-2,2'-bipyridyl CAS RN: 142646-58-0	B4420 200mg  4,4'-Bis(5-hexyl-2-thienyl)-2,2'-bipyridyl CAS RN: 1047684-56-9	B3509 1g 5g  2,2'-Bicinchoninic Acid CAS RN: 1245-13-2	B4509 1g 5g  Bicinchoninic Acid Disodium Salt Hydrate CAS RN: 979-88-4	T3245 200mg 1g  2,2':6',2''-Terpyridine-4'-carboxylic Acid CAS RN: 148332-36-9	



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