

# Perovskite Precursor for Solar Cell Purified Lead(II) Iodide

## Advantages

- **PbI<sub>2</sub> [L0279]** with extremely low water content for preparing a concentrated clear DMF solution.
- Fabricates efficient perovskite solar cell devices (PCE > 10%) with high reproducibility.

## Comparison of an existing product and PbI<sub>2</sub> [L0279]

### PbI<sub>2</sub> [L0279]



Cryst. solid

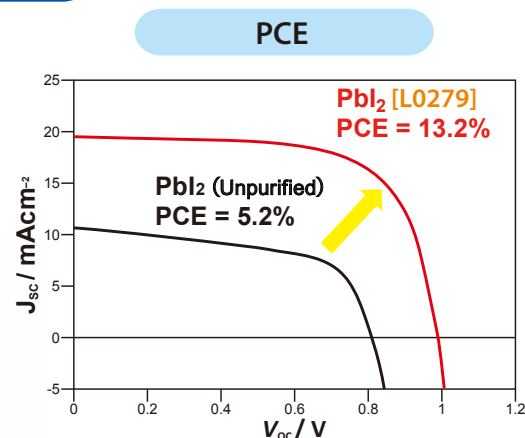


DMF soln.  
(Clear, 1M)

### An exist. product



DMF soln.  
(Cloudy)



A. Wakamiya, M. Endo, Y. Murata, Patent, Appl. No. JP2015-138822. A. Wakamiya, S. Hayase, Y. Murata, *Chem. Lett.* **2014**, 43, 711.

## PbI<sub>2</sub> [L0279] contributed efficient, stable and large area perovskite solar cells

PSC device system	PCE	Active area size	Stability and condition	Reference
(FAPbI <sub>3</sub> ) <sub>0.85</sub> (MAPbI <sub>3</sub> ) <sub>0.15</sub> PTAA, SnO <sub>2</sub> , ALD method	20%	0.16 cm <sup>2</sup>	90 days, RH 20% in dark, uncapsulated	Lee, Nazeeruddin <i>et al.</i> , <i>Adv. Sci.</i> <b>2018</b> , 1800130.
(Rb/Cs/MA/FA)PbI <sub>3</sub> Spiro-OMeTAD, TiO <sub>2</sub>	19%	0.5 cm <sup>2</sup>	500 H, 85 deg-C, under full solar illumination, polymer coated	Gratzel <i>et al.</i> , <i>Science</i> <b>2016</b> , 354, 206.
BA <sub>0.05</sub> (FA <sub>0.83</sub> Cs <sub>0.17</sub> )Pb(I <sub>0.8</sub> Br <sub>0.2</sub> ) <sub>3</sub> Spiro-OMeTAD, PCBM, SnO <sub>2</sub>	17.5%	0.0919 cm <sup>2</sup>	1000 H in air, 4000 H in encapsulated	Snaith <i>et al.</i> , <i>Nat. Energy</i> <b>2017</b> , 2, 17135.
FA <sub>0.98</sub> Cs <sub>0.02</sub> PbI <sub>3</sub> Spiro-OMeTAD, SnO <sub>2</sub> , Adduct approach	19.34%	0.1 cm <sup>2</sup>	-	Yang <i>et al.</i> , <i>J. Am. Chem. Soc.</i> <b>2018</b> , 140, 6317.
MAPbI <sub>3</sub> Spiro-OMeTAD, PMMA, TiO <sub>2</sub>	19.9%	0.1 cm <sup>2</sup>	40 days, RH 40% in dark	Wakamiya, Matsuda <i>et al.</i> , <i>Adv. Mater. Interfaces</i> <b>2018</b> , 5, 1701256.
FA <sub>0.5</sub> MA <sub>0.5</sub> Sn <sub>0.5</sub> Pb <sub>0.5</sub> I <sub>3</sub> PEDOT:PSS, PCBM, C <sub>60</sub> , BCP	17.6%	0.1 cm <sup>2</sup>	-	Kapil, Segawa, Hayase <i>et al.</i> , <i>Nano Lett.</i> <b>2018</b> , 18, 3600.
(FAPbI <sub>3</sub> ) <sub>0.85</sub> (MAPbI <sub>3</sub> ) <sub>0.15</sub> Spiro-OMeTAD, SnO <sub>2</sub> , ALD method	18%	0.16 cm <sup>2</sup>	30 days, uncapsulated, in dry air	Baena, Hagfeldt <i>et al.</i> , <i>Energy Environ. Sci.</i> <b>2015</b> , 8, 2928.
(FAPbI <sub>3</sub> ) <sub>0.83</sub> (MAPbI <sub>3</sub> ) <sub>0.17</sub> NiO, PCBM, SnO <sub>2</sub> /ZTO, ALD method, with Si tandem	23.6%	1 cm <sup>2</sup>	1000 H, 85 deg-C, RH 85%	McGehee <i>et al.</i> , <i>Nat. Energy</i> <b>2017</b> , 2, 17009.
(5-AVA) <sub>x</sub> (MA) <sub>1-x</sub> PbI <sub>3</sub> TiO <sub>2</sub> /ZnO <sub>2</sub> /Carbon, Monolithic solar module	10.74%	70 cm <sup>2</sup>	2000 H, 25-30 deg-C, RH 65-70%	Mhaisalkar <i>et al.</i> , <i>Energy Environ. Sci.</i> <b>2016</b> , 9, 3687.

## Lead(II) Iodide [for Perovskite precursor] (99.99%, trace metal basis)

1g / 5g / 25g / 100g / 1kg [L0279]

This material was produced by collaboration with Prof. Atsushi Wakamiya at Institute for Chemical Research, Kyoto University.

# Perovskite Precursor for Solar Cell: Purified Lead(II) Iodide

## Related Products

Cation \ Anion	Iodide	Bromide	Chloride
<b>Lead</b>	L0279	L0288	L0291, L0292
<b>Cesium</b>	C2205	C2202	C2203
<b>Bismuth</b>	B5787	-	B3546
<b>Methylammonium</b>	M2556	M2589	M0138
<b>Formamidinium</b>	F0974	F0973	F0103
<b>Acetamidinium</b>	A2902	-	A0008
<b>Guanidinium</b>	G0450	G0449	G0162
<b>Ethylammonium</b>	E1045	E0056	E0205
<b>Propylammonium</b>	P2212	P2502	P0522
<b>Isopropylammonium</b>	I0934	I1041	I0166
<b>Butylammonium</b>	B4433	B5186	B0710
<b>Isobutylammonium</b>	I0935	I1007	I0096
<b>tert-Butylammonium</b>	B4434	B5187	-
<b>Dimethylammonium</b>	D4555	D5092	D0644
<b>Diethylammonium</b>	D4643	D4667	D0468
<b>Imidazolium</b>	I0970	I1006	-
<b>Phenylammonium</b>	A2778	A2985	-
<b>Benzylammonium</b>	B4566	B5185	B0407
<b>2-Phenylethylammonium</b>	P2213	P2388	P0086
<b>5-Aminovaleric Acid</b>	A2984	A3094	A0436

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