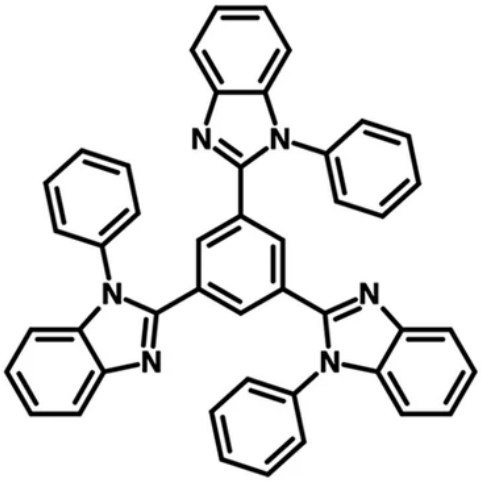


TPBi

CAS Number 192198-85-9

MSDS

Charge Transport Layer Materials, **Electron Injection Layer Materials**, **Electron Transport Layer Materials**, **Fluorescent Host Materials**,
[+] View more

Grade

Sublimed Grade (>99.5% purity)

Quantity

250mg

Product Code **M651-250mg**

In stock for priority dispatch

Price **$315**

Estimated tariffs $50 - $60 per unit

Qty. 1 Add to Cart / Quote

How to Order | Free shipping over $340 | Fast dispatch on in-stock items

TPBi, ETL material for optoelectronic devices

Low price and available online for fast and secure dispatch, Sublimed ≥99.0%, Unsublimed ≥98.0%

Overview | **Specifications** | **Pricing and Options** | **MSDS** | **Literature and Reviews**

Pictiva EX2039-p.1
Samsung v Pictiva
IPR2026-00129

2,2',2''-(1,3,5-Benzinetriyl)-tris(1-phenyl-1-H-benzimidazole), TPBi (CAS number 192198-85-9), being electron deficient, is normally used as electron transport layer material in optoelectronic devices. Having a low LUMO energy level (2.7 eV), TPBi is also used as host material for both fluorescent and phosphorescent light emitting systems.

In some cases, TPBI is used to replace **CBP** (HBL)/**Alq_3** (ETL) to simplify the device structure for its excellent electron transporting and also its hole blocking abilities with very deep HOMO energy level (HOMO = 6.2/6.7 eV). It has also been reported that TPBi could be used as electron injection layer material between Alq_3 (ETL) and Cs_2O_3/Al (electrode). It suggested that TPBI thin layer at the Alq_3/Cs_2O_3 interface facilitates the electron injection and is also involved with hole-blocking and exciton confinement [3].

TPBi from Ossila was used in the high-impact paper (IF 15.88), **Suppressing Efficiency Roll-Off at High Current Densities for Ultra-Bright Green Perovskite Light-Emitting Diodes**, C. Zou et al., ACS Nano, 14, 6076−6086 (2020); DOI: 10.1021/acsnano.0c01817; and paper (IF 29.4), ***Single-Layer Blue Organic Light-Emitting Diodes With Near-Unity Internal Quantum Efficiency,*** O. Sachnik et al., Adv. Mater., 35 (26), 2300574 (2023); DOI: 10.1002/adma.202300574.

General Information

CAS number	192198-85-9
Chemical formula	$C_{45}H_{30}N_6$
Molecular weight	654.76 g/mol
Absorption	λ_{max} 305 nm in THF
Fluorescence	λ_{em} 370 nm in THF
HOMO/LUMO	HOMO 6.2/6.7 eV, LUMO 2.7 eV [1, 2]
Synonyms	2,2',2''-(1,3,5-Benzinetriyl)-tris(1-phenyl-1-H-benzimidazole)
Classification / Family	Benzimidazole derivatives, Electron transport layer materials (ETL), Electron injection layer materials (EIL), Hole blocking layer materials (HBL), Fluorescent and phosphorescent host materials. Light-Emitting Diodes, Organic electronics

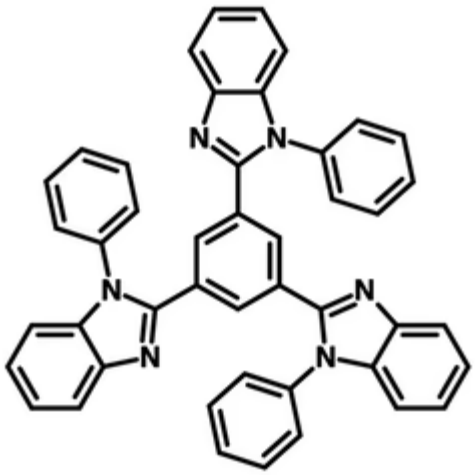
Product Details

Pictiva EX2039-p.2
Samsung v Pictiva
IPR2026-00129

Purity	Sublimed* >99.5% Unsublimed* >98.0%
Melting point	272 - 277 °C (lit.)
Color	White Powder

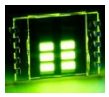
*Sublimation is a technique used to obtain ultra pure-grade chemicals. For more details about sublimation, please refer to the **Sublimed Materials**.

Chemical Structure

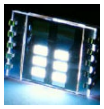


Chemical Structure of 2,2',2"-(1,3,5-Benzinetriyl)-tris(1-phenyl-1-H-benzimidazole) (TPBi), CAS 192198-85-9

Device Structure(s)

Device structure	ITO/MoO_3(1 nm)/**mCP** (60 nm)/mCP:**TPBi**:Ir(tfmppy)$_2$(tpip)* (20 nm, 1:1, 6 wt%)/**TPBi** (15 nm)/TPPhen:W_2(hpp)$_4$* (45 nm, 12 wt%)/Al (100 nm) [2]
Color	Green 
Max. EQE	20.8%
Max. Current Efficiency	72.9 cd/A

Max. Power Efficiency	66.3 lm W^{-1}

Device structure	ITO/**PEDOT:PSS**/**PFO**:**MEH-PPV** (1.0 wt%)/**TPBi**/LiF/Al [4]
Color	White 
Max. Luminance	7,560 cd/m^2
Max. Current Efficiency	7.8 cd/A

[–] View more Device Structures

Pricing

Grade	Order Code	Quantity	Price
Sublimed (>99.5% purity)	M651	250 mg	$315
Unsublimed (>98.0% purity)	M652	500 mg	$330
Sublimed (>99.5% purity)	M651	500 mg	$495
Unsublimed (>98.0% purity)	M652	1 g	$525
Sublimed (>99.5% purity)	M651	1 g	$780

MSDS Documentation

TPBi MSDS sheet

Literature and Reviews

1. *Highly efficient single-layer dendrimer light-emitting diodes with balanced charge transport,* T. D. Anthopoulos et al., Appl. Phys. Lett., 82, 4824 (2003); doi: 10.1063/1.1586999.
2. *High efficiency green phosphorescent organic light-emitting diodes with a low roll-off at high brightness,* J. Wang et al., Org. Electronics, 14, 2854–2858 (2013). http://dx.doi.org/10.1016/j.orgel.2013.08.006.
3. *Improved Hole-Blocking and Electron Injection Using a TPBI Interlayer at the Cathode Interface of OLEDs,* J. Lian et al., Chin. Phys. Lett., 28, 047803 (2011). http://iopscience.iop.org/0256-

307X/28/4/047803.

[+] View Literature and Reviews

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