MATERIALS

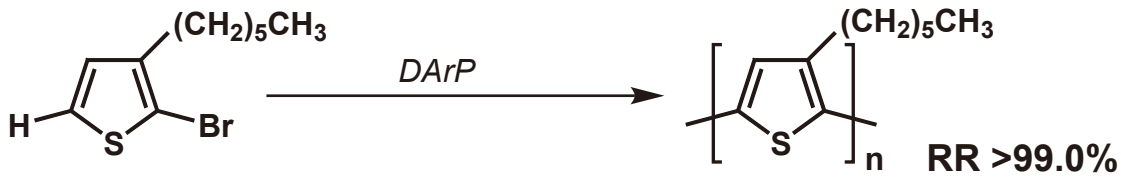
Organic Semiconducting Polymer Highly Regioregular P3HT

P3HT (regioregular) [for organic electronics]
100mg / 500mg
[P2513]

Advantages

- High regioregularity (RR) >99.0%
- Number average molecular weight: M_n = 27,000 - 45,000
- Electronic material grade: High purity, low metal (Pd <100 ppm)
- Highly soluble, excellent to film

Synthesis of P3HT by direct arylation polymerization (DArP) and physical properties[1,2)]



DArP = Direct Arylation Polymerization

[P2513]

The data is extracted from Reference 2.

Method	M_n (PDI)	RR /%	T_m (°C)	μ_{max} (cm²/V·s)
DArP	33,000 (1.8)	99.5	237	0.19
Rieke	25,000 (1.3)	95.5	224	0.02
GRIM	88,000 (1.5)	98.0	234	0.11

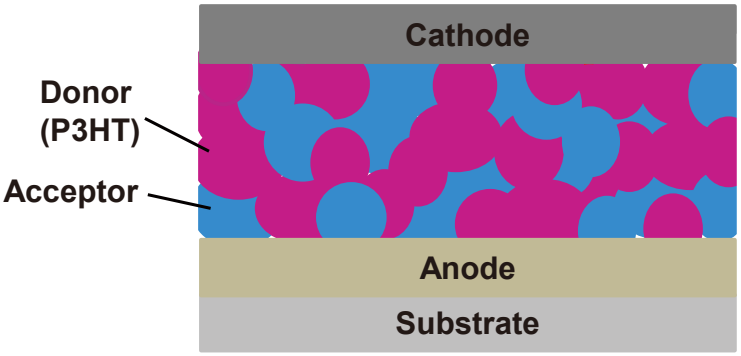
References
1) Q. Wang, R. Takita, Y. Kikuzaki, F. Ozawa, *J. Am. Chem. Soc.* **2010**, *132*, 11420. https://doi.org/10.1021/ja105767z
2) J.-R. Pouliot, M. Leclerc, *et al.*, *Macromol. Chem. Phys.* **2016**, *217*, 1493. https://doi.org/10.1002/macp.201600050

This product has been commercialized under the instruction of Prof. Fumiyuki Ozawa.

Organic Semiconducting Polymer: Highly Regioregular P3HT

Applications

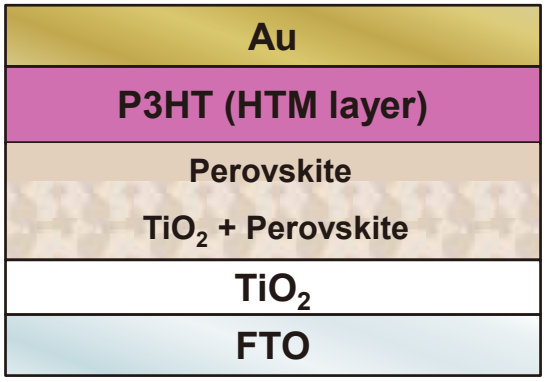
Organic Photovoltaics (OPV)[1)]



P3HT: Donor material

Usable for a solution processable OPV device
Fabricates a bulk heterojunction (BHJ) with a highly soluble donor and acceptor

Perovskite Solar Cell (PSC)[2)]



P3HT: Hole transport material (HTM)

Usable for a solution processable PSC device
Realizes high power conversion efficiency

Organic Transistor (OFET)[3)]

P3HT: p-Type semiconductor

Usable for a solution processable OFET device

References

1) OPV:
a) E. L. Lim, M. H. H. Jumali, *et al.*, *Org. Electron.* **2016**, *36*, 12. https://doi.org/10.1016/j.orgel.2016.05.029
b) A. Marrocchi, D. Lanari, A. Facchetti, L. Vaccaro, *Energy Environ. Sci.* **2012**, *5*, 8457. https://doi.org/10.1039/C2EE22129B
2) PSC: L. Calió, S. Kazim, M. Grätzel, S. Ahmad, *Angew. Chem. Int. Ed.* **2016**, *55*, 14522. https://doi.org/10.1002/anie.201601757
3) OFET: H. Sirringhaus, *Adv. Mater.* **2014**, *26*, 1319. https://doi.org/10.1002/adma.201304346

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