1-MATERIAL INC
2290 Chemin St-Francois
Dorval, Quebec
H4P 1K2, Canada

# Technical Data Sheet

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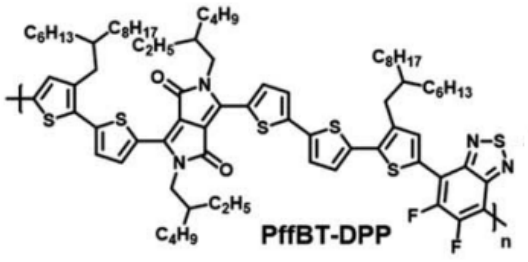
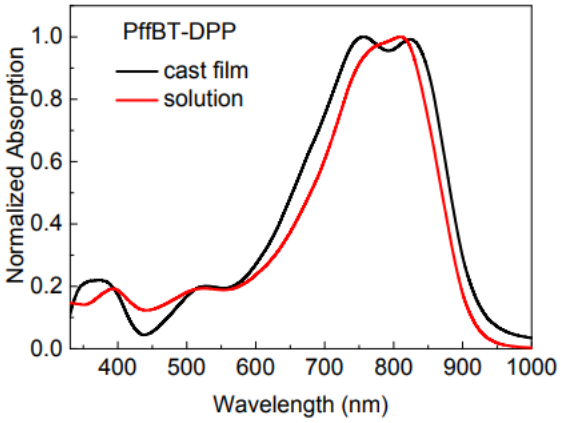
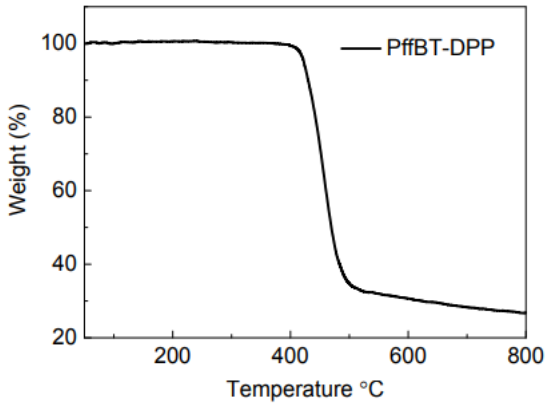
|---|---|
| 1M Material: | PffBT-DPP, low band gap (LBG) polymer |
| Common Name: | PffBT-DPP |
| Chemical Family: | Polymer of (4,7-bis(5- bromo-4-(2-hexyldecyl)thiophen-2-yl)-5,6-difluorobenzo[c][1,2,5]thiadiazole) and (2,5-bis(2- ethylhexyl)-3,6-bis(5-(trimethylstannyl)thiophen-2-yl)-2,5-dihydropyrrolo[3,4- c]pyrrole-1,4-dione) |
| Chemical Structure: |  PffBT-DPP |
| Appearance: | Deep green to black solid |
| Solubility: | Soluble in $CHCl_3$, and other selected solvents |
| Molecular weight: | Mw ~50K. PDI~2.0 |
| Structure confirmation: | NMR of monomers |
| Purity: | 99+% (basing on NMR of monomers) |
| Energy level (Reference): | $E_g^{opt}$ =1.33eV, HOMO/LUMO = -5.66eV/-3.56eV |

Reference data:

1: https://doi.org/10.1021/acs.chemmater.0c02133

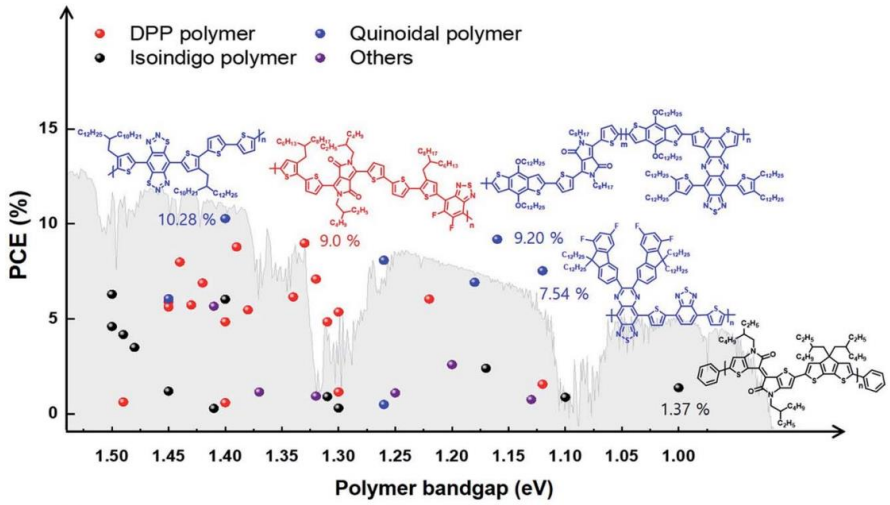



| Material | $\lambda_{max}$ (nm) | $\lambda_{onset}$ (nm) | $E_{ox}$ (eV) | $E_{red}$ (eV) | HOMO[a)] (eV) | LUMO[a)] (eV) | $E_g^{opt}$ [b)] (eV) |
|---|---|---|---|---|---|---|---|
| PffBT-DPP | 758 | 930 | 1.03 | -1.07 | -5.66 | −3.56 | 1.33 |
| [70]PCBM | 718 | 730 | 1.74 | -0.48 | -6.37 | −4.16 | 1.72 |
| MeIC | 342 | 776 | 1.30 | -0.53 | −5.93 | −4.1 | 1.60 |

a) HOMO = $-(5.13 + E_{ox} - E_{Fc/Fc+})$ eV, LUMO = $-(5.13 + E_{red} - E_{Fc/Fc+})$ eV; b) $E_g^{opt}$ (eV)=$1240/\lambda_{onset}$ (nm).

2: DOI: 10.1039/d1na00245g




Band gap and power conversion efficiency trends in narrow-band gap polymers for organic solar cells.