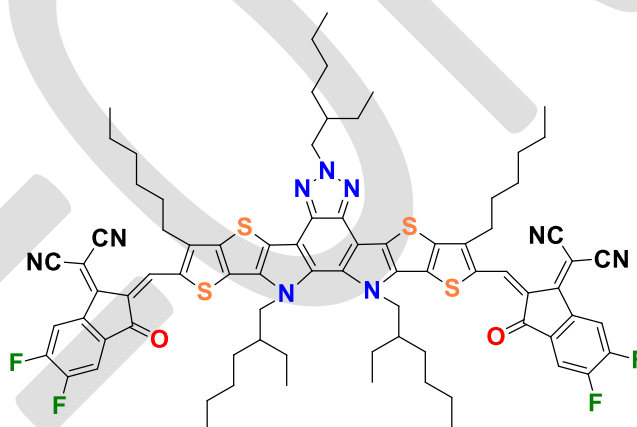


CERTIFICATE OF ANALYSIS

1M Material: Y18, OS4490
 Application: Electron acceptor for OPV
 CAS No.: 2477654-49-0
 Chemical Name: 2,2'-((2Z,2'Z)-((6,12,13-tris(2-ethylhexyl)-3,9-dihexyl-12,13-dihydro-6Hthieno[2'',3'':4',5']thieno[2',3':4,5]pyrrolo[3,2-g]thieno[2',3':4,5]thieno[3,2-b][1,2,3]triazolo[4,5-e]indole-2,10-diyl)bis(methanylylidene))bis(5,6-difluoro-3-oxo-2,3-dihydro-1H-indene-2,1-diylydene))dimalononitrile

Chemical Structure:



Lot: DW8068P
 Appearance: Shine purple-black solid
 NMR: Confirmed (see appendix for NMR spectrum)
 Assay: $\geq 99\%$
 Solubility: soluble in chloroform and other selected solvents