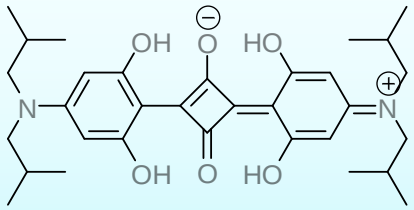
Luminescence Technology Corp.

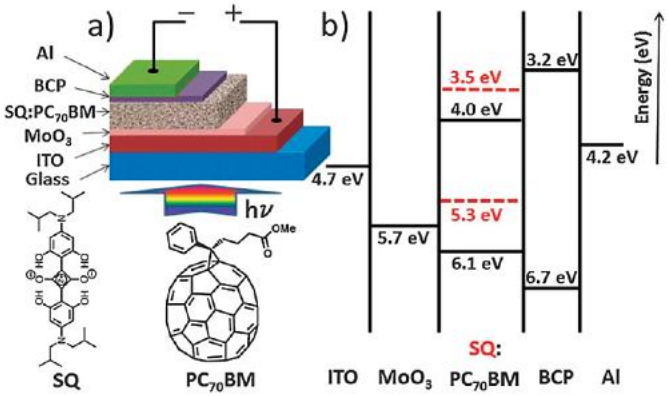
Novel Solution-Processed Small Molecule OPV Cell Materials

LT-S9074 DIBSQ



Formula: $C_{32}H_{44}N_2O_6$
CAS. No. 432493-75-9
Molecular Weight: 522.70

*Reference: Phys. Chem. Chem. Phys., 2012, **14**, 14661–14666*



DIBSQ was a novel molecule that had been developed as a donor, in which the squaraine moiety was condensed with electron-rich aromatic moiety used in solution-processed organic photovoltaic cells.

DIBSQ also exhibits a broad band UV absorption from 500 nm up to 750 nm, SQ film from a solution process has a hole mobility of 3.54 x 10^{-5} cm^2 V^{-1} s^{-1}. Upon blending with $PC_{71}BM$, it drops further by one order of magnitude. At room temperature, the averaged values of electron and the hole mobilities from multiple devices range about 10^{-4} and 10^{-5} cm^2 V^{-1} s^{-1} respectively. At 80°C, the hole mobilities increased by at least 2 times, while electron mobilities slightly increased.

Moreover, a solution-processed organic solar cell employing **DIBSQ** combined with the electron acceptor $PC_{71}BM$ achieved high power conversion efficiency(PCE) of **4.0%** with V_{oc} of ~0.93V, J_{sc} of 10.6mA/cm^2, and fill factor of 0.41 at room temperature, efficiency was even improved to **5.1%** at 80°C mainly result from the improvement of photocurrent extraction.

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