

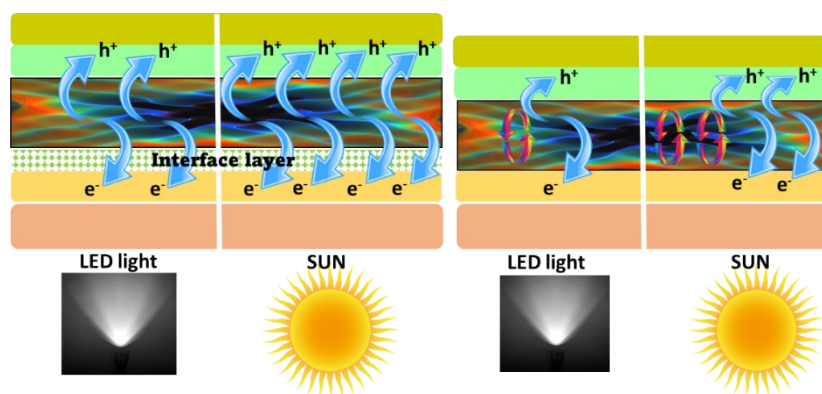
Supplementary Information

Effect of PEIE and Polylysine as Interfacial Layers on the Performance of Air-Processed Organic Solar Cell under both Indoor and 1-Sun Condition

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Average Photovoltaic Parameters for OPVs with and without Interlayers under 1-Sun Illumination

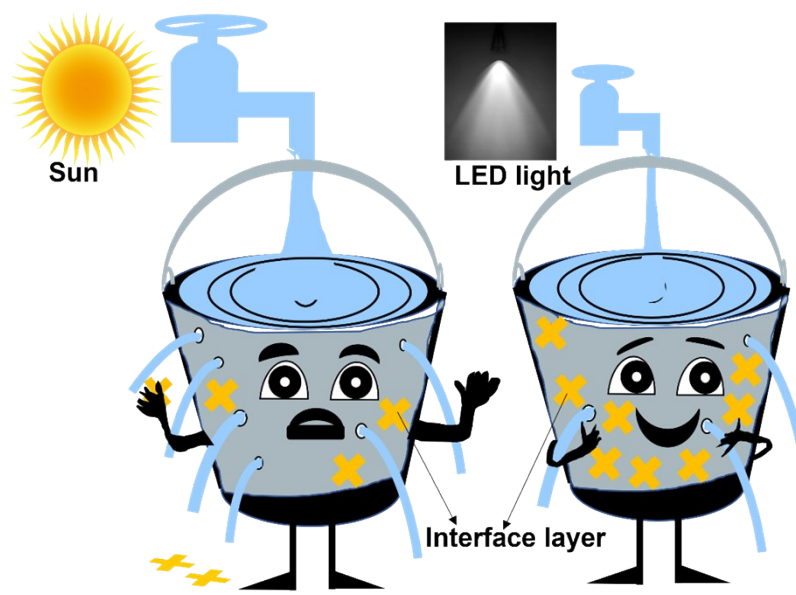


Table S1 The average Photovoltaic Parameters of the studied OPVs with and without interlayers under 1-sun illumination

Photo Active Layer	Interlayer	V_{OC} (V)	J_{SC} (mA/cm^2)	FF(%)	PCE(%)
PBDB-T-2Cl:IT-4F	NO IFL	0.75±0.01	20.43±0.45	66.28±2.42	10.55±0.31
	PEIE	0.79±0.02	20.18±0.63	67.54±2.02	10.87±0.68
	Polylysine	0.79±0.03	21.29±0.85	69.13±3.15	11.71±0.76
PM6:Y6	NO IFL	0.74±0.001	21.81±1.29	45.64±6.50	7.49±1.52
	PEIE	0.72±0.012	23.12±0.43	48.66±1.19	8.16±0.88
	Polylysine	0.72±0.009	23.49±0.34	48.87±2.81	8.36±0.60

Charge Carrier Extraction and Recombination Times Derived from TPC and TPV Decay Curves

Table S2 The charge carrier extraction time and charge carrier recombination time extracted from the TPC and TPV decay curves

Illumination	Interlayer	Charge extraction time (μs)	Charge recombination time (μs)
1-Sun	NO IFL	6.27	15.21
	PEIE	5.60	9.43
	Polylysine	5.34	17.34
1000 Lx	NO IFL	5.92	41.79
	PEIE	3.63	98.63
	Polylysine	5.79	128.71

Average Shunt resistance (R_{sh}) and Series resistance (R_s) obtained from the J-V curves of the cells

Table S3 Average (R_{sh}) and (R_s) obtained from the J-V curves of the cells w/o IFLs under standard test conditions (AM1.5G, 100 mW/cm^2).

Interlayer	Number of Cells	Avg. R_{sh} ($\text{k}\Omega\text{cm}^2$)	Avg. R_s (Ωcm^2)
NO IFL	6	4.26±2.38	7.78±3.37
PEIE	6	20.60±11.62	99.90±17.44
Polylysine	6	5.97±2.61	91.95±47.26

Photovoltaic Performance of PBDB-T-2Cl:IT-4F OSCs with and without PEIE and Polylysine IFLs under 1-Sun Illumination

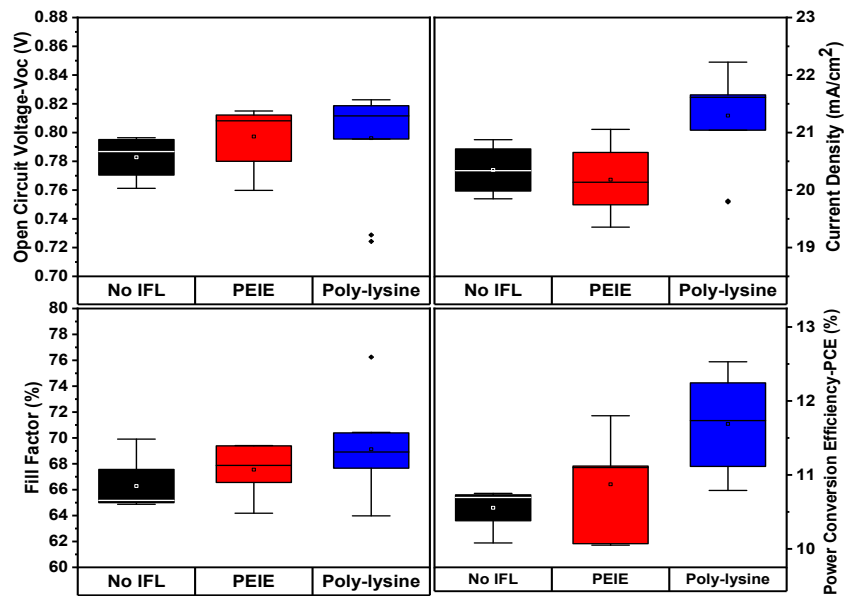


Fig. S1 Photovoltaic parameters of organic solar cells (PBDB-T-2Cl:IT-4F) based devices w/o IFLs (PEIE and Polylysine) under 1-sun illumination

Photovoltaic Performance of PM6:Y6 OSCs with and without PEIE and Polylysine IFLs under 1-Sun Illumination

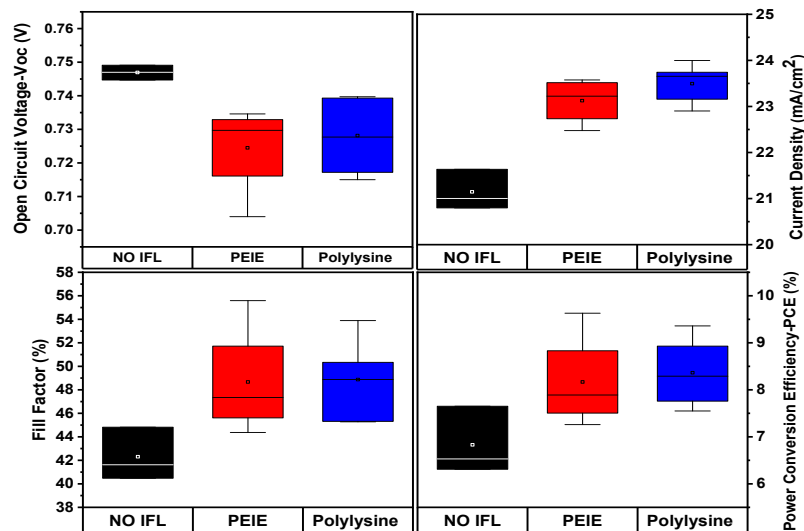


Fig. S2 Photovoltaic parameters of organic solar cells (PM6:Y6) based devices w/o IFLs (PEIE and Polylysine) under 1-sun illumination

Emission Spectrum of White LED and AM 1.5G Solar simulator

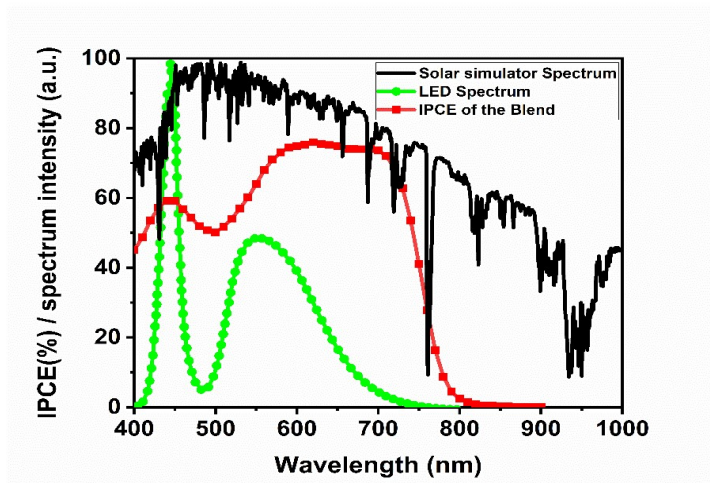


Fig.S3 The emission spectrum of a white LED and, AM 1.5G solar simulator and IPCE of the photo active material used in this

Schematic figure of Indoor I-V Measurement Setup

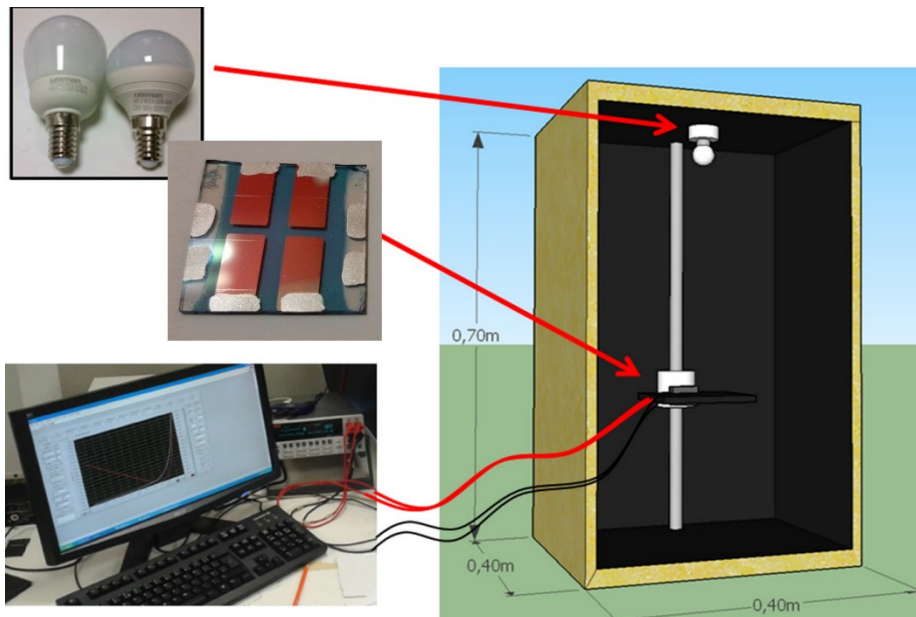


Figure S4 Schematics of the setup for Indoor I-V measurements. Reprinted with permission from Ref [1], copy right 2015, Applied Energy, Elsevier.

Reference

- [1] F. De Rossi, T. Pontecorvo, and T. M. Brown, "Characterization of photovoltaic devices for indoor light harvesting and customization of flexible dye solar cells to deliver superior efficiency under artificial lighting," *Appl. Energy*, vol. 156, pp. 413–422, 2015, doi: 10.1016/j.apenergy.2015.07.031.