

Electronic Supplementary Information

Hybrid MoS₂/PEDOT:PSS transporting layer for Interface Engineering of Nanoplatelets based Light-Emitting Diodes

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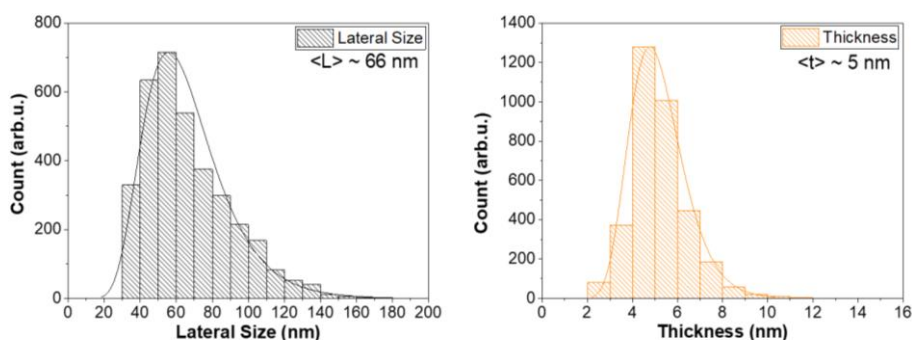


Figure S1: MoS₂ size characterization. Lateral size (on the left) and thickness (on the right) statistic of LPE MoS₂ nanosheets.

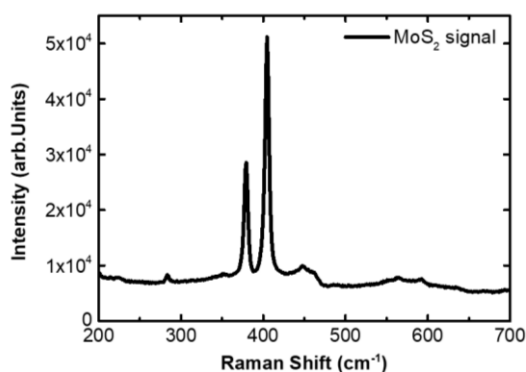


Figure S2: MoS₂ μ-raman spectra deposited on glass.

Table S1: Optimization thicknesses of thin films for PEDOT:PSS and nanocomposite material. Reported the average value obtained out of 5 measurements.

Layer (on glass)	Thickness (nm) 3500 r.p.m.	Thickness (nm) 2500 r.p.m.	Thickness (nm) 1500 r.p.m.	Roughness (nm)
PEDOT:PSS	30 ^{a,b}	32	35	1.4
1.3% MoS ₂	28	30	32	2.0
3.3% MoS ₂	19	26 ^{a,b}	35	5.2
5.0% MoS ₂	21	25	33	5.7
6.6% MoS ₂	22	29 ^a	34	5.8
10% MoS ₂	15	24	30 ^{a,b}	6.2
45% MoS ₂	12	16	25	8.2
MoS ₂	< 10	15	25 ^b	11.9

^{a)} used for LEDs; ^{b)} used for Kelvin Probe measurement.

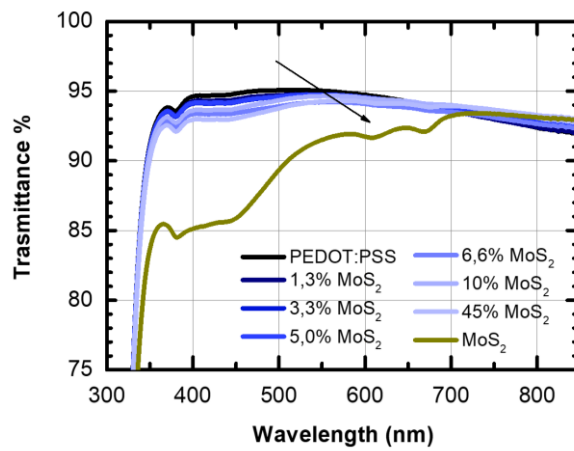


Figure S3: Transmittance spectra of spin coated thin films of PEDOT:PSS, MoS₂ and with different ratios.

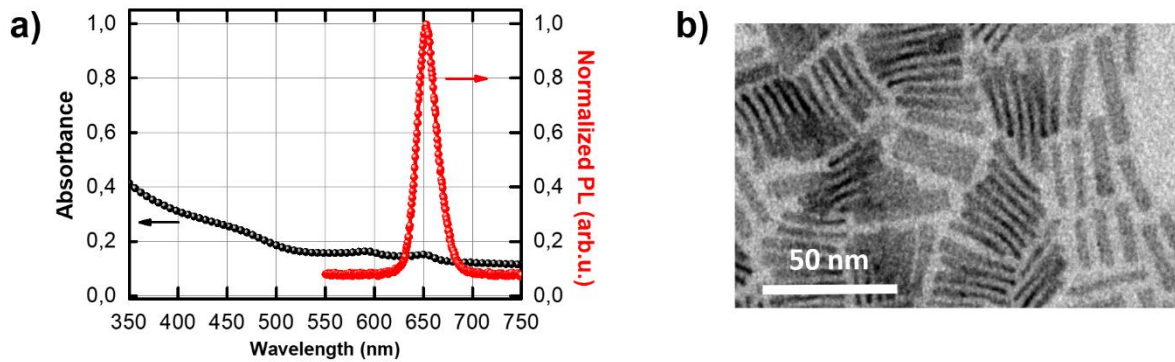


Figure S4: CdSe/CdZnS nanoplatelets: a) absorbance and steady state normalized photoluminescence, b) TEM image of the nanoplatelets.

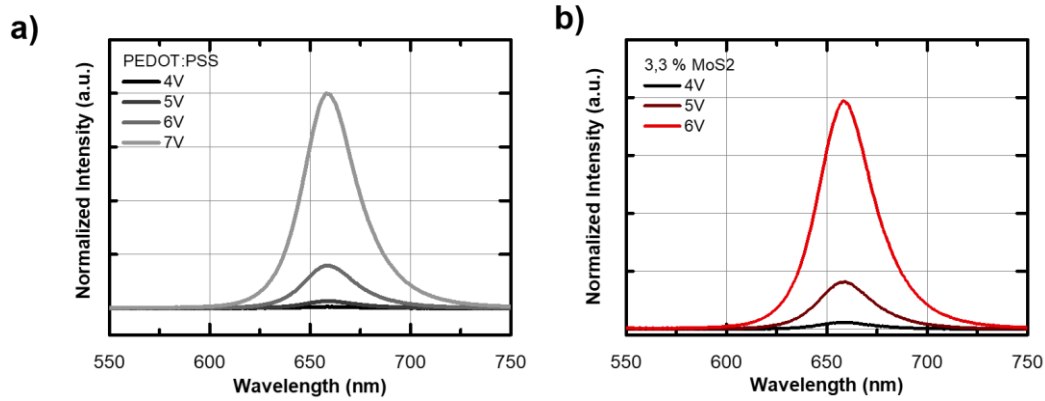


Figure S5: Electroluminescence spectra under different bias for a) PEDOT:PSS only and b) PEDOT:PSS + MoS₂ (3.3%) -based devices.

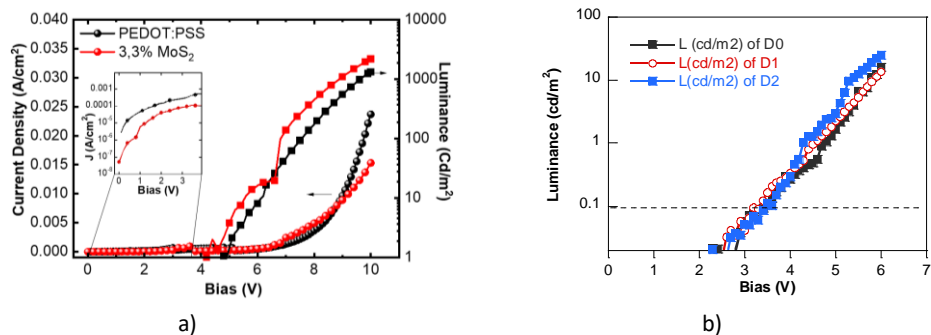


Figure S6: a) Comparison between current density and luminance versus bias of two representative devices with HTL made of PEDOT:PSS (D0) and PEDOT:PSS+MoS₂ (3.3%, D1) featuring highest luminance; b) luminance versus bias to highlight turn on voltage at 0.1 cd/m² for representative D0-2 devices.

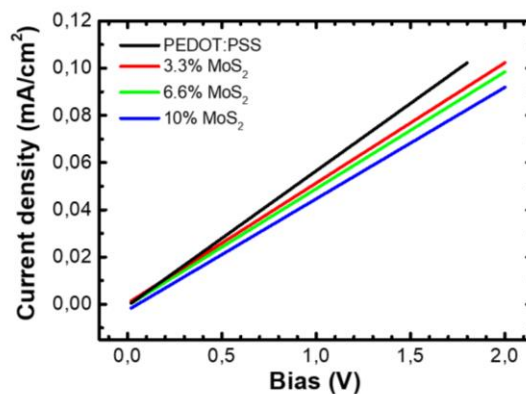


Figure S7: Electrical characterization. Current density vs bias for ITO/HTL/Al structure.