Supporting Information

Solution-Processed Molybdenum Oxide Treated Silver Nanowire Network: A Highly Conductive Transparent Conducting Electrode with Superior Mechanical and Hole Injection Properties

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AFM image of s-MoO_x-treated AgNW annealed in N_2

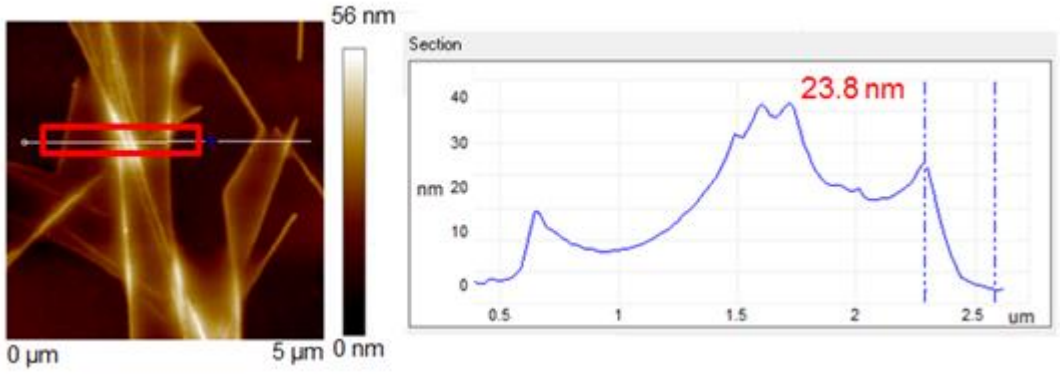

Figure S1. AFM topography image and height line profile in red box of s-MoOx-treated AgNW annealed in N_2 (20 mg/mL).

SEM image of s-MoO_x-treated AgNW annealed in air

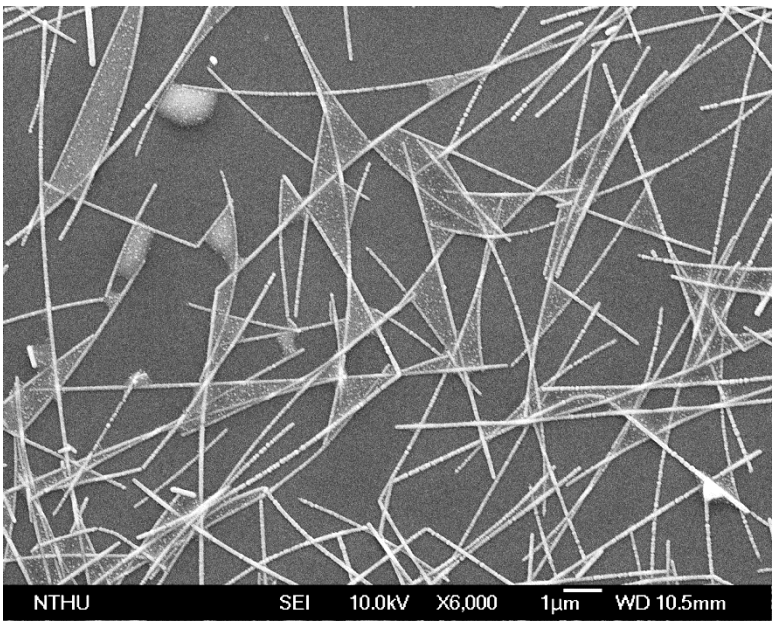

Figure S2. SEM image of s-MoOx-treated AgNW annealed in air.

Optical properties of pure e-MoO_x and s-MoO_x on glass substrates

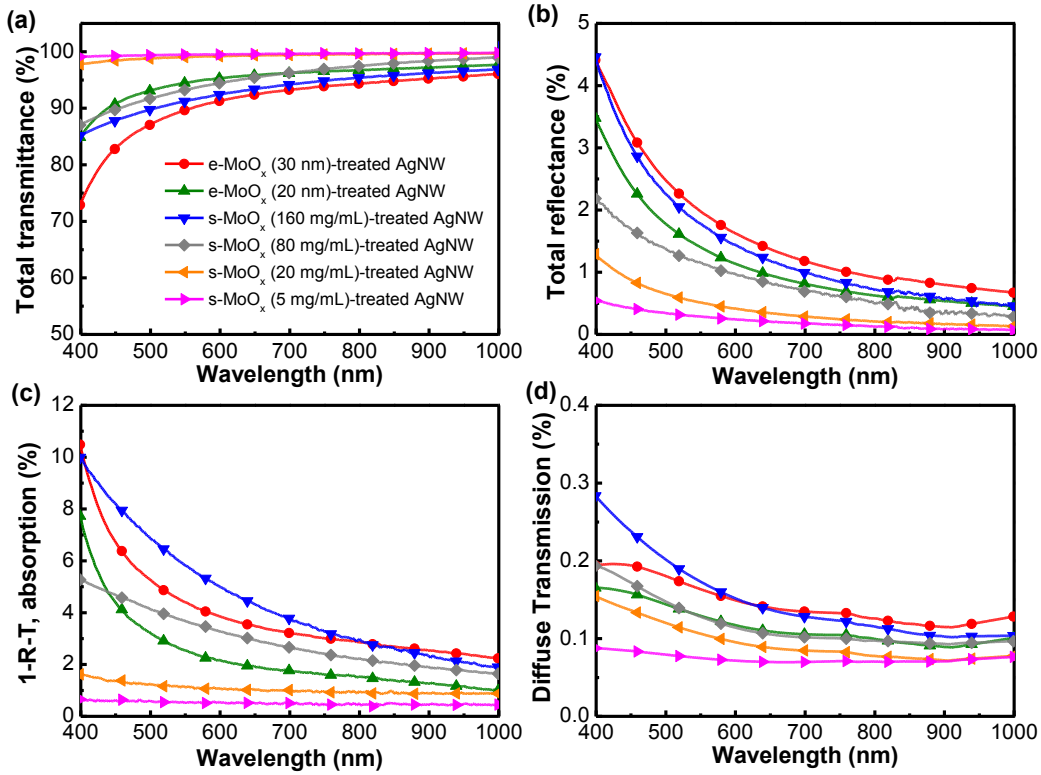

Figure S3. (a) Total transmittance (T), (b) total reflectance (R), (c) absorption (1 − R − T) and (d) diffuse transmission of pure e-MoO_x and s-MoO_x on glass substrates. The s-MoO_x were annealed in N_2 atmosphere.

Table S1. Parameters of AgNW electrodes for various preparation methods.

	Average total transmittance (%), [@ 550 nm]	**Average total reflectance (%)**	**Average absorption (1 − R − T, %)**	**Haze value (%)**
e-MoO_x (30 nm)	91.4, [89.8]	1.86	4.86	0.14
e-MoO_x (20 nm)	94.9, [94.5]	1.11	2.83	0.11
s-MoO_x (160 mg/mL)	93.3, [92.3]	1.56	4.81	0.15
s-MoO_x (80 mg/mL)	94.7, [94.3]	0.85	2.93	0.12
s-MoO_x (20 mg/mL)	98.7, [98.8]	0.33	0.97	0.09
s-MoO_x (5 mg/mL)	99.2, [99.1]	0.21	0.59	0.07

The s-MoO_x-treated samples were annealed in N_2 atmosphere.

XPS and UPS results of MoO_x-treated AgNW

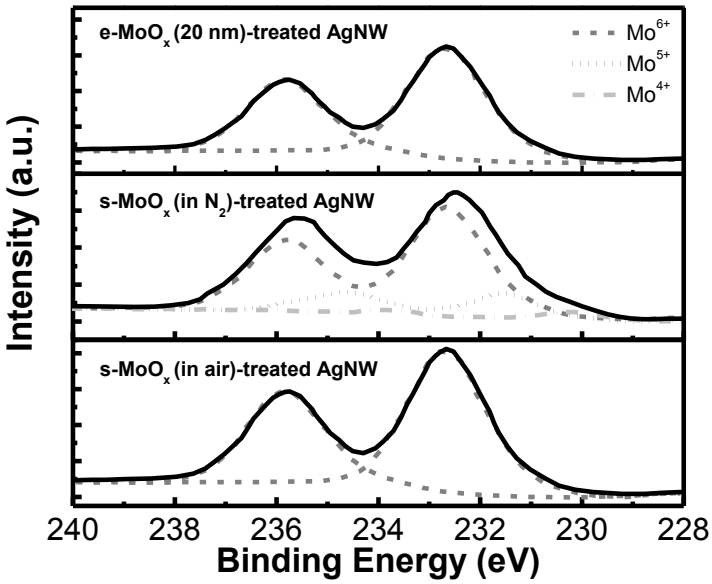

Figure S4. Mo 3d XPS spectra of e-MoO_x (20 nm)-treated AgNW, s-MoO_x (in N_2)-treated AgNW and s-MoO_x (in air)-treated AgNW.

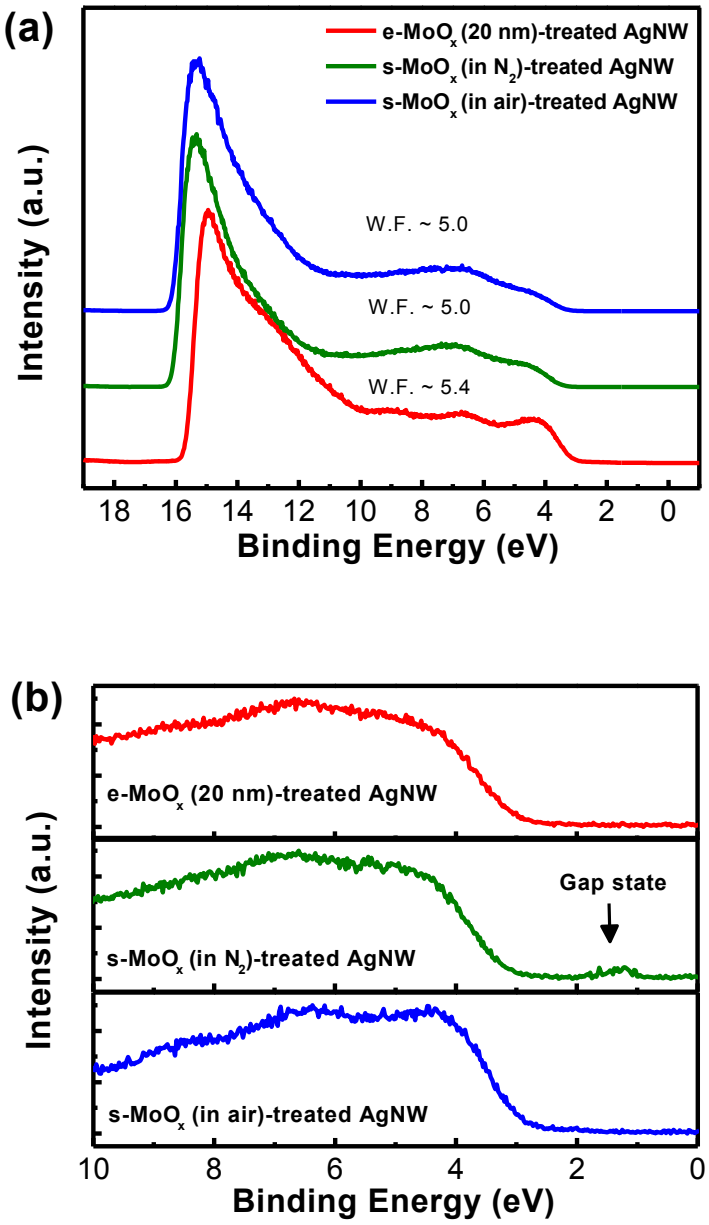

Figure S5. MoO_x layers by vacuum deposition (red line)-treated AgNW, s-MoO_x annealed in glove box (green line)-treated AgNW and s-MoO_x annealed in air (blue line)-treated AgNW: (a) UPS secondary-electron valence spectra and (b) the oxygen vacancy gap states of valence scans.

XPS and UPS results of MoO_x on glass substrates

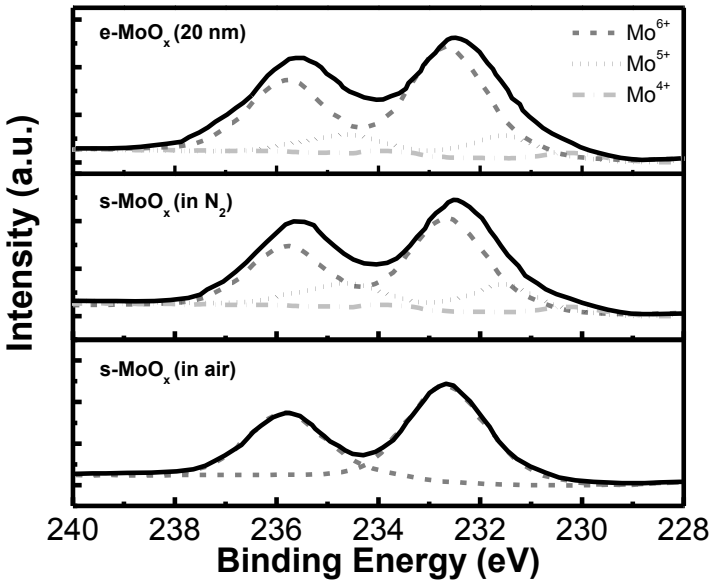

Figure S6. Mo 3d XPS spectra of e-MoO_x (20 nm), s-MoO_x (in N_2) and s-MoO_x (in air).

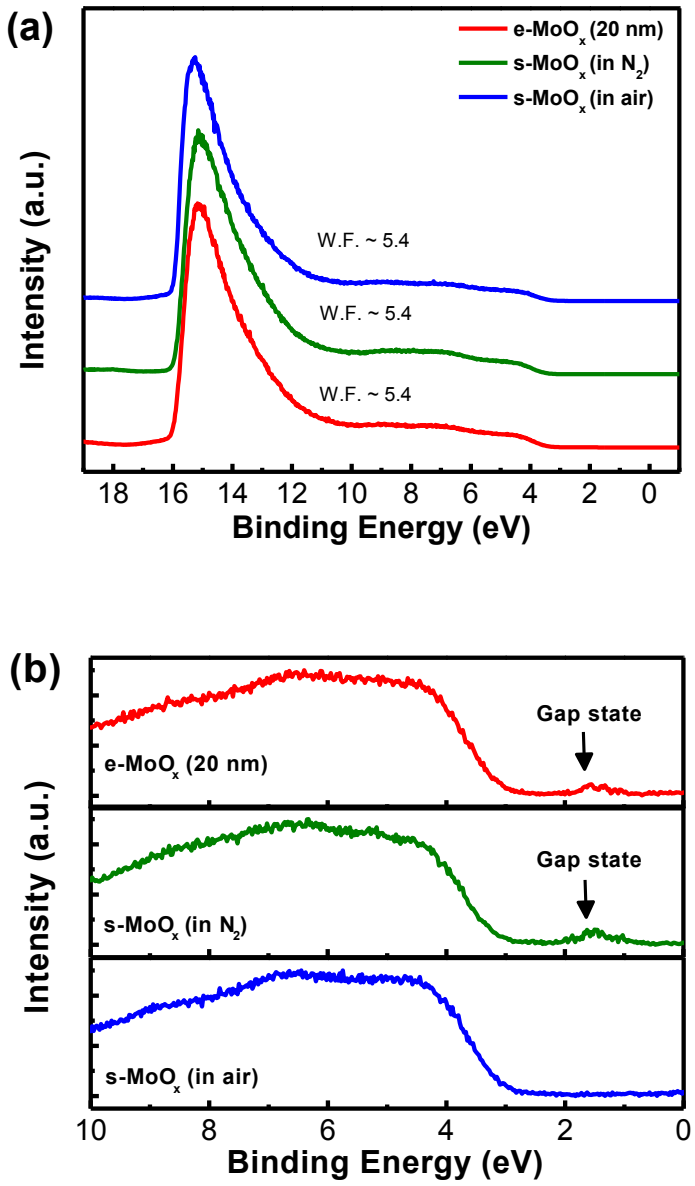

Figure S7. MoO_x layers by vacuum deposition (red line), s-MoO_x annealed in glove box (green line) and s-MoO_x annealed in air (blue line): (a) UPS secondary-electron valence spectra and (b) the oxygen vacancy gap states of valence scans.

Devices performance of MoO_x-treated-ITO-based OLEDs

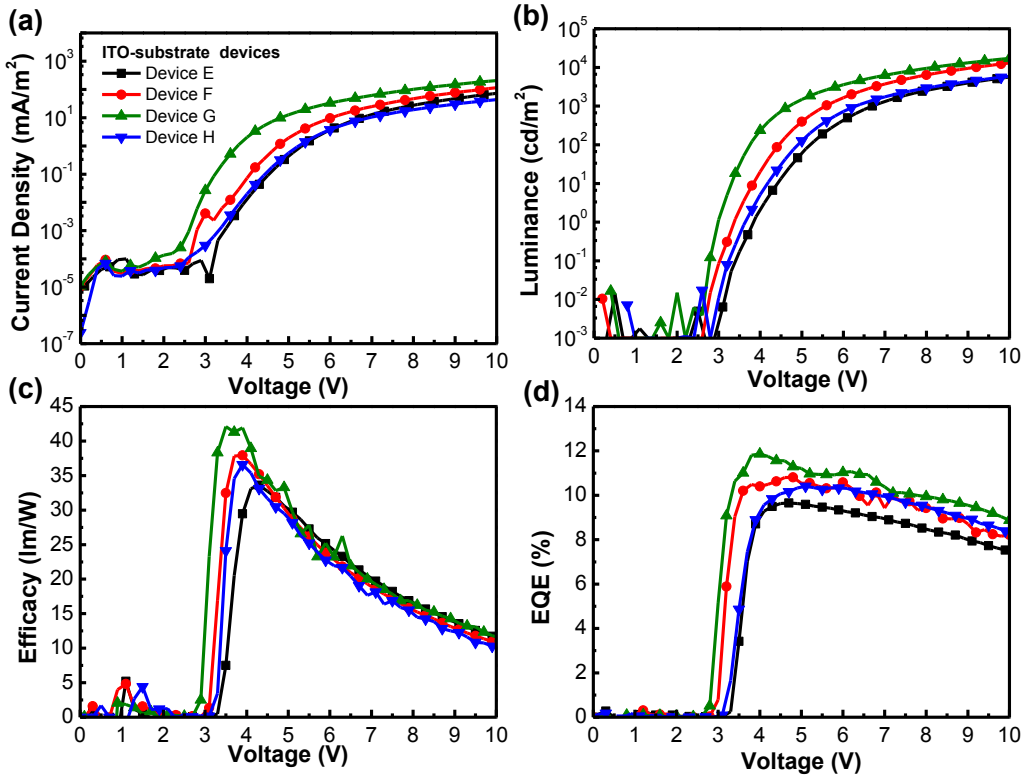

Figure S8. (a) Current density-voltage characteristics, (b) luminance-voltage characteristics, (c) power efficacy-luminance characteristics and (d) external quantum efficiency-luminance characteristics of MoO_x-treated-ITO-based OLEDs. The device structure was configured as follows: (**Device (E)** ITO, **Device (F)** ITO/e-MoO_x (20 nm), **Device (G)** ITO/s-MoO_x (annealed in N_2) and **Device (H)** ITO/s-MoO_x (annealed in air)) / HAT-CN (10 nm) / NPB:HAT-CN (1.5%, 185 nm) / CBP (5 nm) / CBP:$Ir(ppy)_3$ (8%, 20 nm) / TmPyPB (20 nm) / CsF (1 nm) / Al.

Table S2. Performance of MoO_x-treated-ITO-based OLEDs with various preparation methods.

MoOx-treated-ITO-based	**Turn on voltage (0.1 cd/m²)**	**Power efficacy (lm/W)**	**External quantum efficiency (%)**
		@ max, 100 cd/m², 1000 cd/m²	
ITO	3.4 V	33.6, 31.8, 21.2	9.6, 9.6, 8.3
e-MoO_x(20 nm)	3.1 V	37.9, 36.6, 24.9	10.8, 10.5, 9.2
s-MoO_x (Annealed in N_2)	2.9 V	42.1, 41.2, 29.7	11.8, 11.2, 10.1
s-MoO_x (Annealed in air)	3.3 V	36.6, 34.5, 22.5	10.4, 10.1, 9.1