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Supporting Information

Co-Functionalized Organic/Inorganic Hybrid ZnO Nanorods as Electron Transporting Layers for Inverted Organic Solar Cells

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Estimation of structural parameters: The structural parameters of each ETL were estimated from XRD using Debye Scherrer formula.

$$D = \lambda k / \beta \cos\theta \qquad (1)$$

where k is a constant and, λ, β, and θ are the XRD wavelength (λ = 1.5406 Å), full width at half maximum (FWHM) and Bragg angle respectively. The crystal structure and lattice strain calculated from equation 1 are presented in Table S1.

Table S1. The structural parameters calculated from the XRD data.

ETL	Orientation	FWHM [2θ°]	d-spacing [Å]	Crystallite size (nm)	Lattice Strain
ZnO NRs	(100)	0.097416	2.81460	95.00	0.0015
	(002)	0.162360	2.53955	60.15	0.0022
	(101)	0.129888	2.39503	73.99	0.0017
MEA-ZnO NRs	(100)	0.194832	2.93873	50.65	0.0031
	(002)	0.389664	2.60236	28.80	0.0055
	(101)	0.389664	2.47258	28.92	0.0052
SM-ZnO NRs	(100)	0.5196	2.81538	22.91	0.0080
	(002)	0.2273	2.53940	44.83	0.0031
	(101)	0.3897	2.39787	28.99	0.0050
SM-MEA-ZnO NRs	(100)	0.7144	2.80831	18.58	0.0109
	(002)	0.1948	2.53997	51.22	0.0027
	(101)	0.2598	2.39710	40.24	0.0033

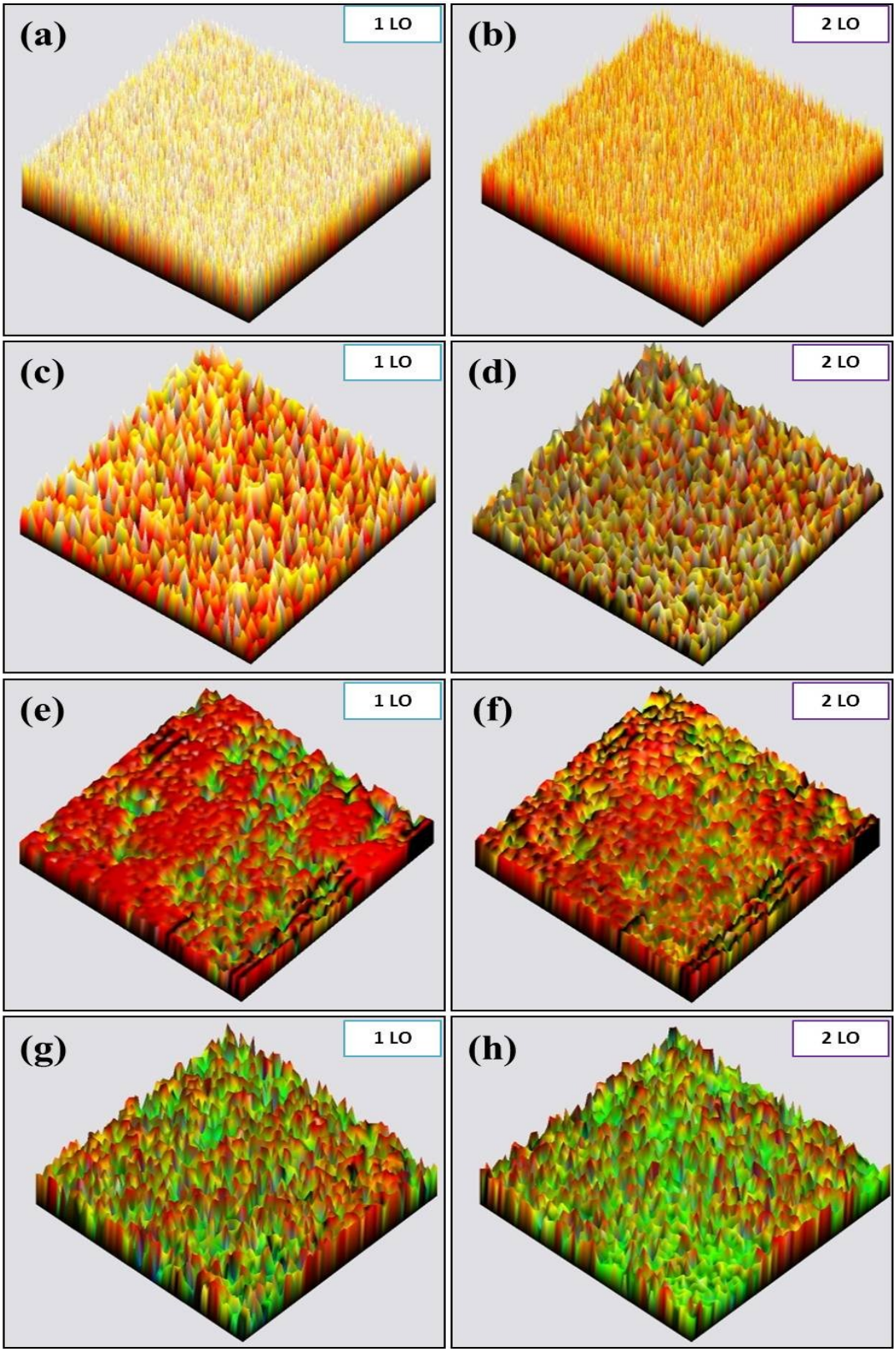

Figure S1. Raman mapping of ETLs (a-b) ZnO NRs, (c-d) MEA-ZnO NRs, (e-f) SM-ZnO NRs and (g-h) SM-MEA-ZnO NRs.

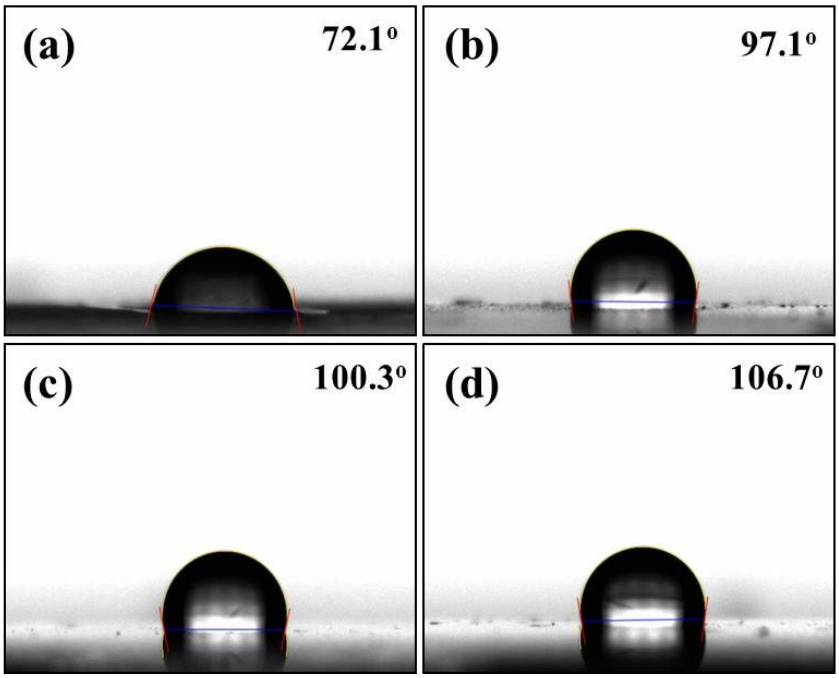

Figure S2. Water contact angle measurements after P3HT: PCBM photoactive coating on (a) ZnO NRs, (b) SM-ZnO NRs, (c) MEA-ZnO NRs and (d) SM-MEA-ZnO NRs.

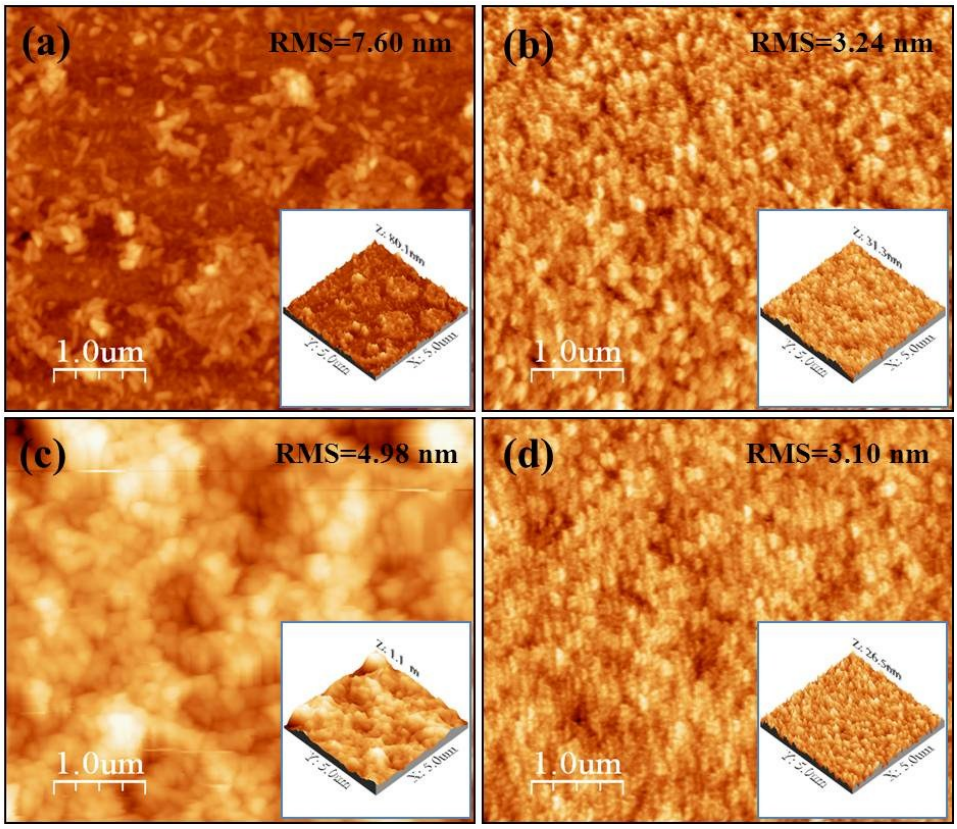

Figure S3. AFM topography of ETLs (a) ZnO NRs, (b) MEA-ZnO NRs, (c) SM-ZnO NRs and (d) SM-MEA-ZnO NRs.