Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Solvent treatment effect of the PEDOT:PSS anode interlayer in inverted planar perovskite solar cells

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Varying layer thickness of the initial PEDOT:PSS film to achieve a final PEDOT:PSS with layer thickness of 35 nm

It is known that solvent treatment would lead to thinner PEDOT:PSS layer. To achieve similar PEDOT:PSS layer thickness for UV-vis measurement and for device fabrication, the initial PEDOT:PSS layer thickness was increased by reducing the spin speed. Table S1 listed the layer thickness results of the initial PEDOT:PSS films with difference spin speed, and the final layer thickness after H_2O treatment. As can be seen here, using a spin speed of 2000 rpm, a pristine PEDOT:PSS layer with 51.5 nm was obtained, which was decreased to 32.8 nm after H_2O treatment, which is close to that of PEDOT:PSS film deposited at 3500 rpm (the reference PEDOT:PSS film).

Table S2. Layer thickness of PEDOT:PSS films before and after H_2O treatment

Solvent	Spin speed (rpm)[a]	Layer thickness(nm)	
		Before solvent treatment	After solvent treatment
H_2O	1000	71.2	45.5
	1500	63.4	41.2
	2000	51.5	32.8
	2500	45.1	28.6
	3000	40.1	19.9

a: spin speed for the preparation of pristine PEDOT:PSS film

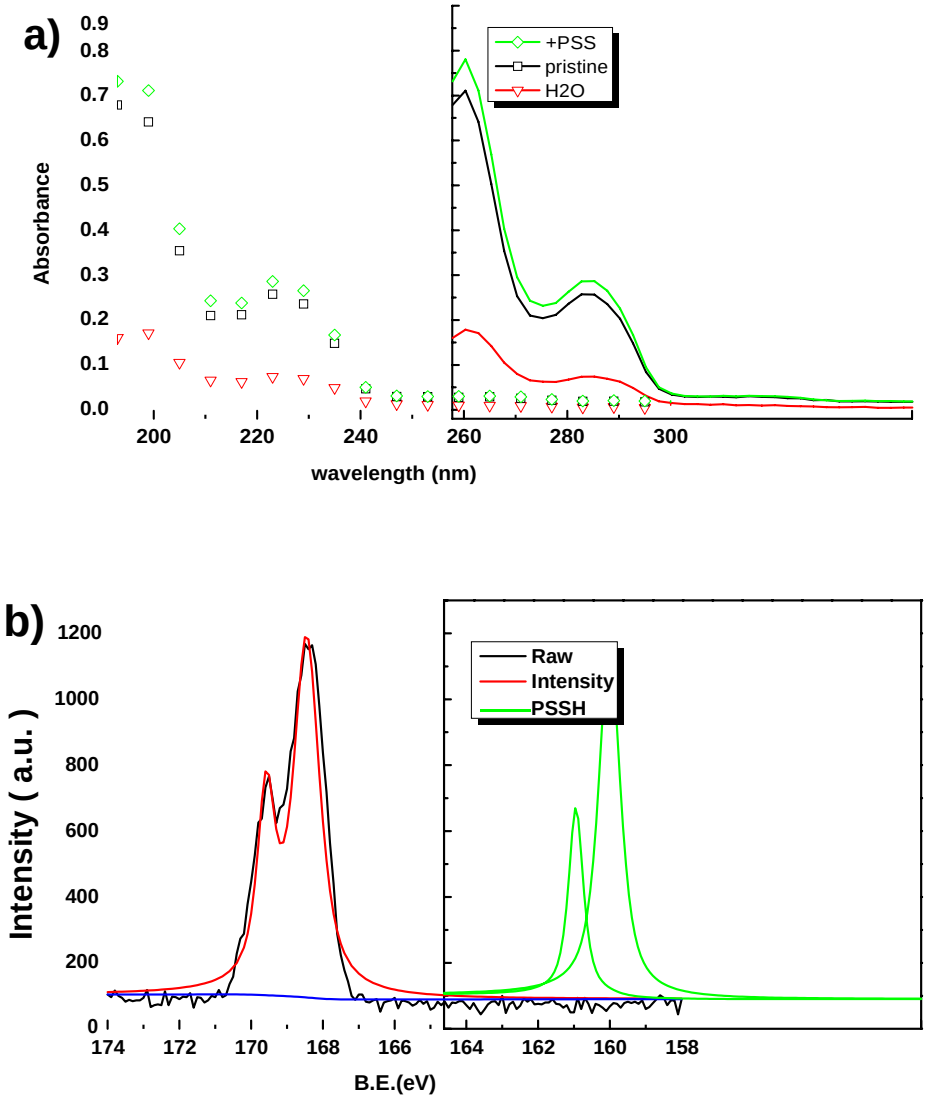

Figure S1. a) UV-Vis absorption spectra comparison of the pristine, H_2O treated and PEDOT:PSS/PSSNa film; b) S (2p) core level spectra for additional PSSNa on H_2O treated PEDOT:PSS films. Note that: the additional PSSNa layer was deposited on H_2O-treated PEDOT:PSS surface.

As can be seen from Figure S1a, the absorption bands of PSS increased after deposition of PSSNa layer, indicating that PSSNa was successfully deposited on PEDOT:PSS surface. No PEDOT component was detected from the XPS spectra, confirming a PSS-rich surface on the PEDOT:PSS/PSSNa surface.

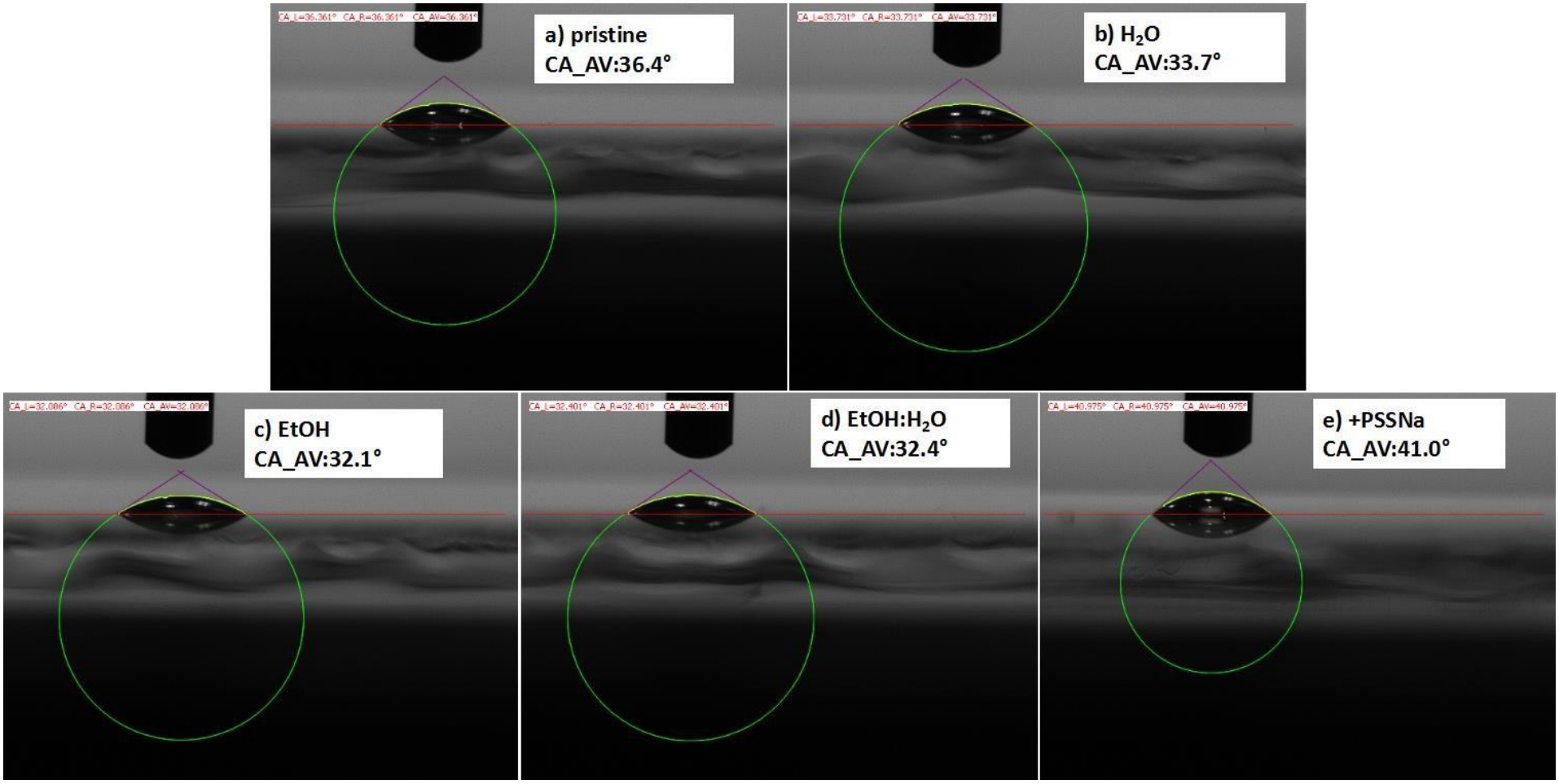

Figure S2: Images of contact angle of CH_2I_2 on a) pristine; b) H_2O- c) EtOH- d) EtOH:H_2O-(v/v, 8:2) treated PEDOT:PSS film and on PEDOT:PSS/PSSNa film (e).