

Supporting Information

Stable, high-conductive and orthogonal silver nanowire networks via zwitterionic treatment

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1. Zeta potentials

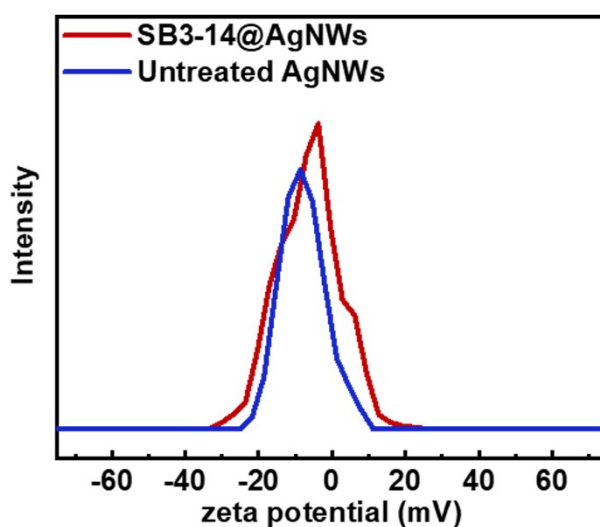


Figure S1. Zeta potentials for SB3-14@AgNWs and untreated AgNWs in solution.

2. Surface potentials

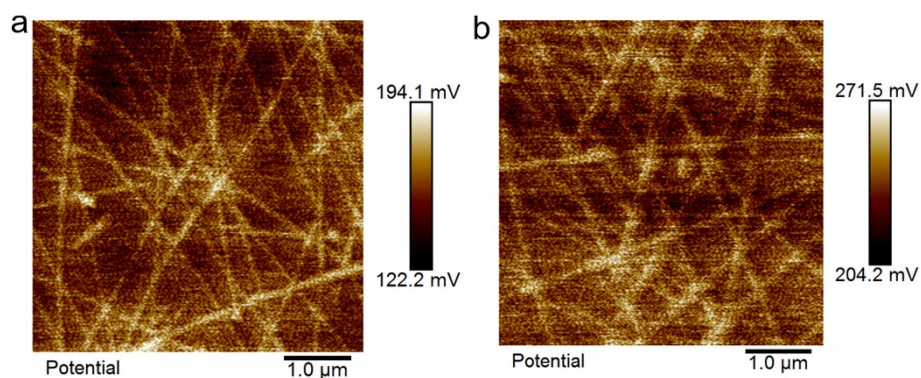


Figure S2. 2D mapping of the surface potentials of the untreated AgNWs (a) and SB3-14@AgNWs (b) surface (1 μm×1 μm) via KPFM.

3. Investigation of treatment conditions

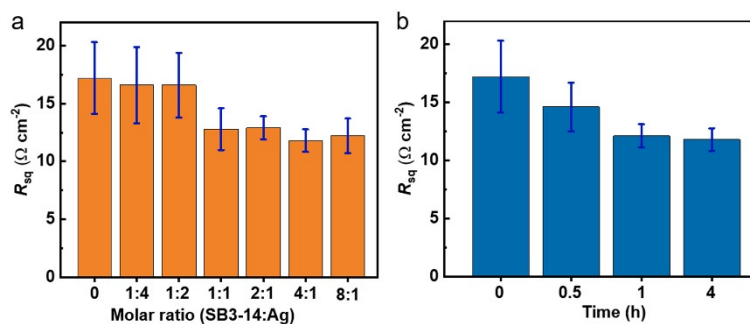


Figure S3. The effect of the molar ratio of SB3-14:Ag (a) and treatment time (b) on the sheet resistance (R_{sh}) of the SB3-14@AgNWs electrode, where the treatment time (4 h) and molar ratio (4:1) were two constants, respectively.

4. TEM images

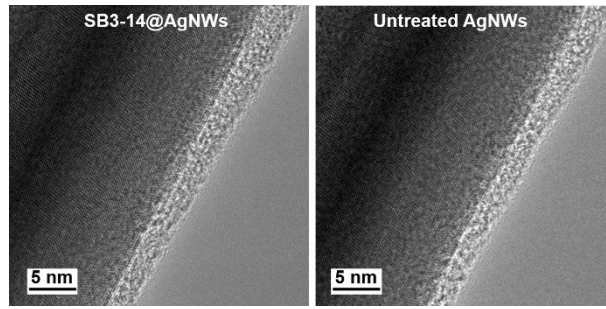


Figure S4. TEM images for the single SB3-14@AgNWs and untreated AgNWs.

5. SEM characterizations

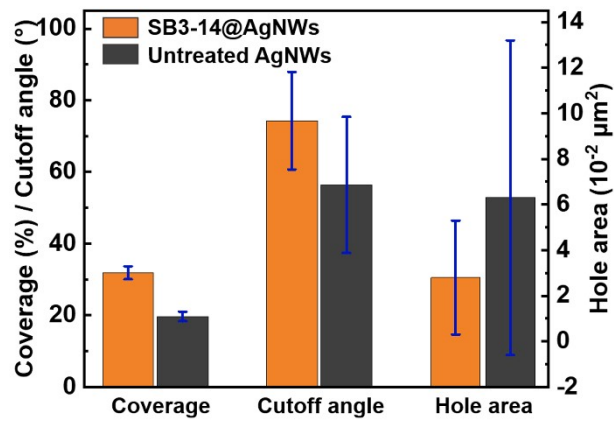


Figure S5. Statistical analysis results obtained from the SEM images.

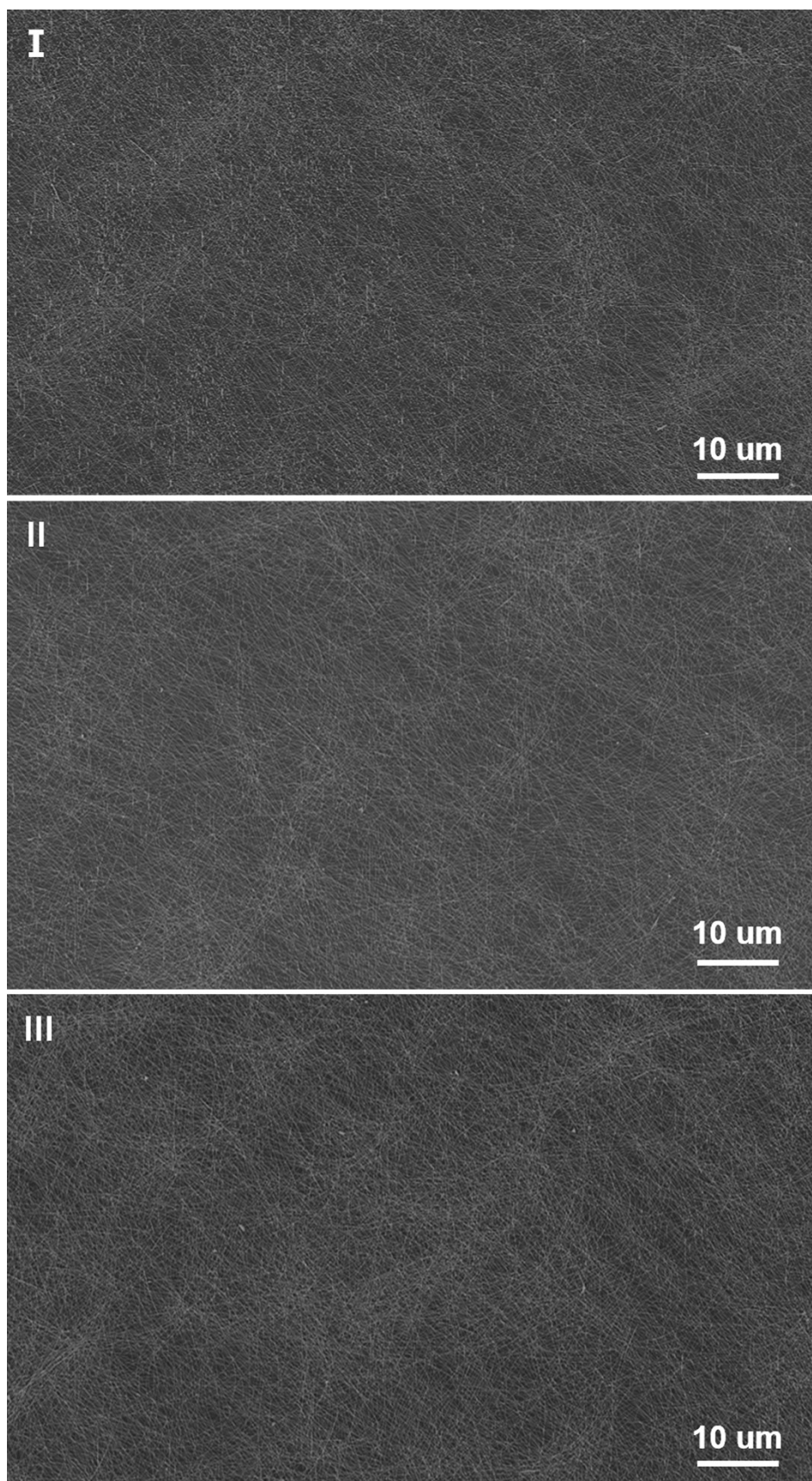


Figure S6. SEM images of the SB3-14@AgNWs electrode with characterization area of $100 \times 60 \mu\text{m}^2$, where images I, II and III refer to three different positions of the same electrode.

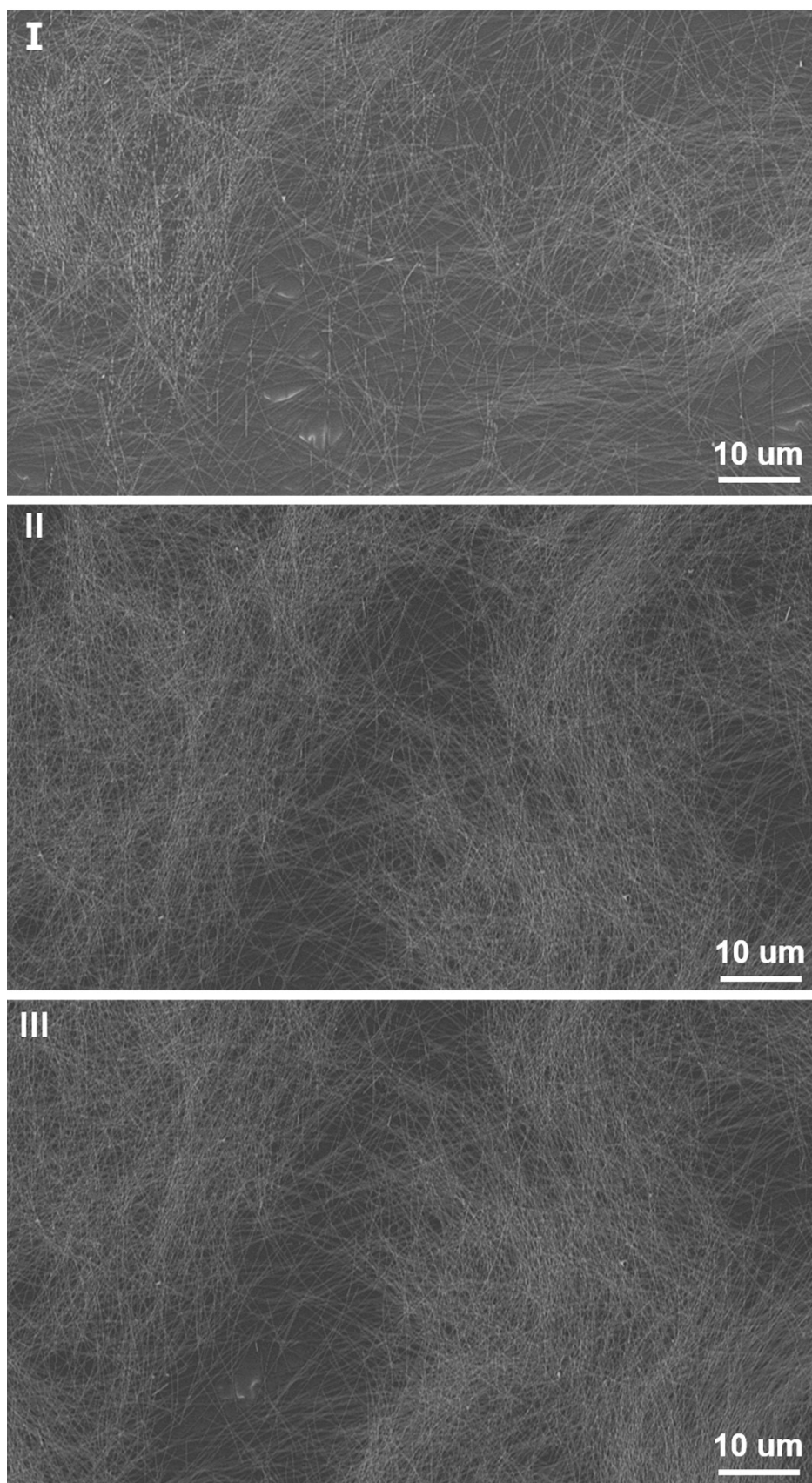


Figure S7. SEM images of the untreated AgNWs electrode with characterization area of $100 \times 60 \mu\text{m}^2$, where images I, II and III refer to three different positions of the same electrode.

6. Performance of the FTE

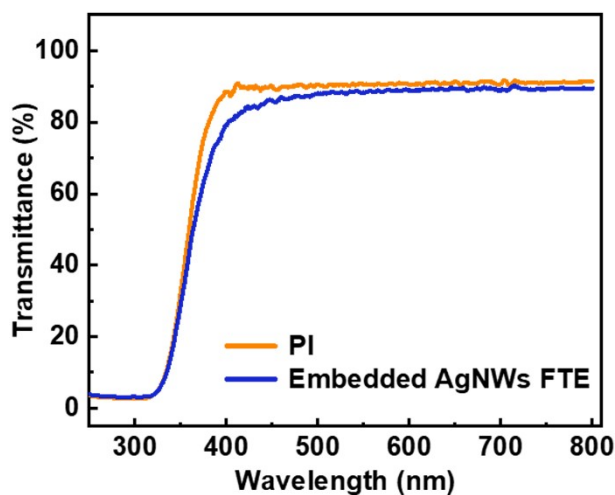


Figure S8. Optical transmittance curves of the Em-AgNWs FTE and PI film.

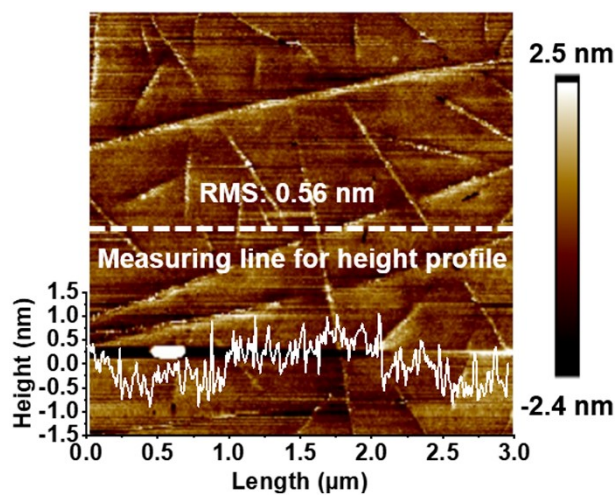


Figure S9. The planar AFM image of the Em-AgNWs FTE and height values obtained from the dashed line in the planar AFM image.

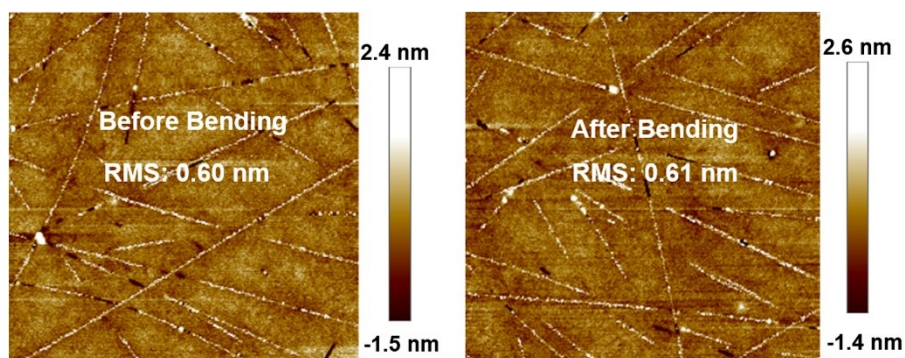


Figure S10. The planar AFM images of the Em-AgNWs FTE before and after bending at a radius of 0 mm for 1000 cycles.

7. Photovoltaic parameters and EQE spectrum of the FOSC

Table S1. Photovoltaic parameters of the flexible and rigid OSCs.

Electrode	V_{oc} [V]	J_{sc} [mA cm ⁻²]	$J_{EQE}^{[a]}$ [mA cm ⁻²]	FF [%]	PCE ^[b] [%]
Em-AgNWs FTE	0.834 (0.854 ± 0.013)	24.26 (23.67 ± 0.40)	23.23	76.34 (75.25±0.91)	15.41 (15.21 ± 0.09)
ITO/glass	0.879 (0.880 ± 0.002)	25.34 (25.00 ± 0.06)	24.17	74.43 (75.00±0.59)	16.58 (16.50 ± 0.21)

^[a] J_{EQE} was calculated from the EQE integration. ^[b] Average PCEs with standard deviations were calculated from 6 individual devices.

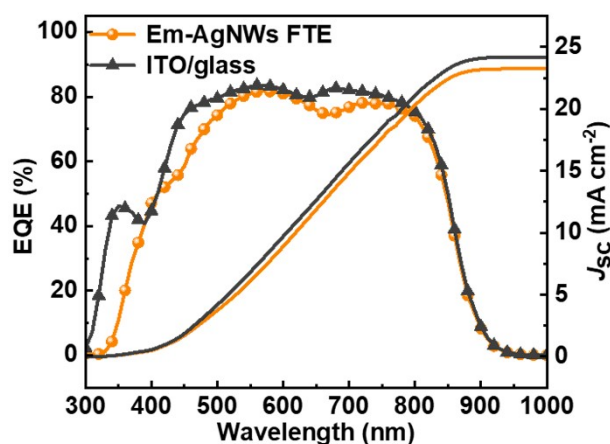


Figure S11. EQE spectrum of the flexible and rigid OSCs.

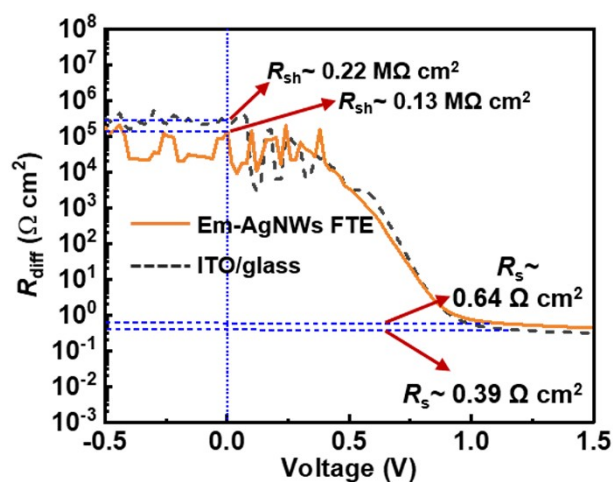


Figure S12. Differential resistance (R_{diff}) of the flexible and rigid OSCs in the dark vs applied bias.