

Supplementary Information

Highly efficient and bendable organic solar cells using a three-dimensional transparent conducting-electrode

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Fig. S1 Highly magnified FE-SEM images of PET surfaces after the pretreatment using Ar plasma for (a and b) 1 min and (c and d) 3 min. Images show (a and c) 30°-tilted views and (b and d) plane views.

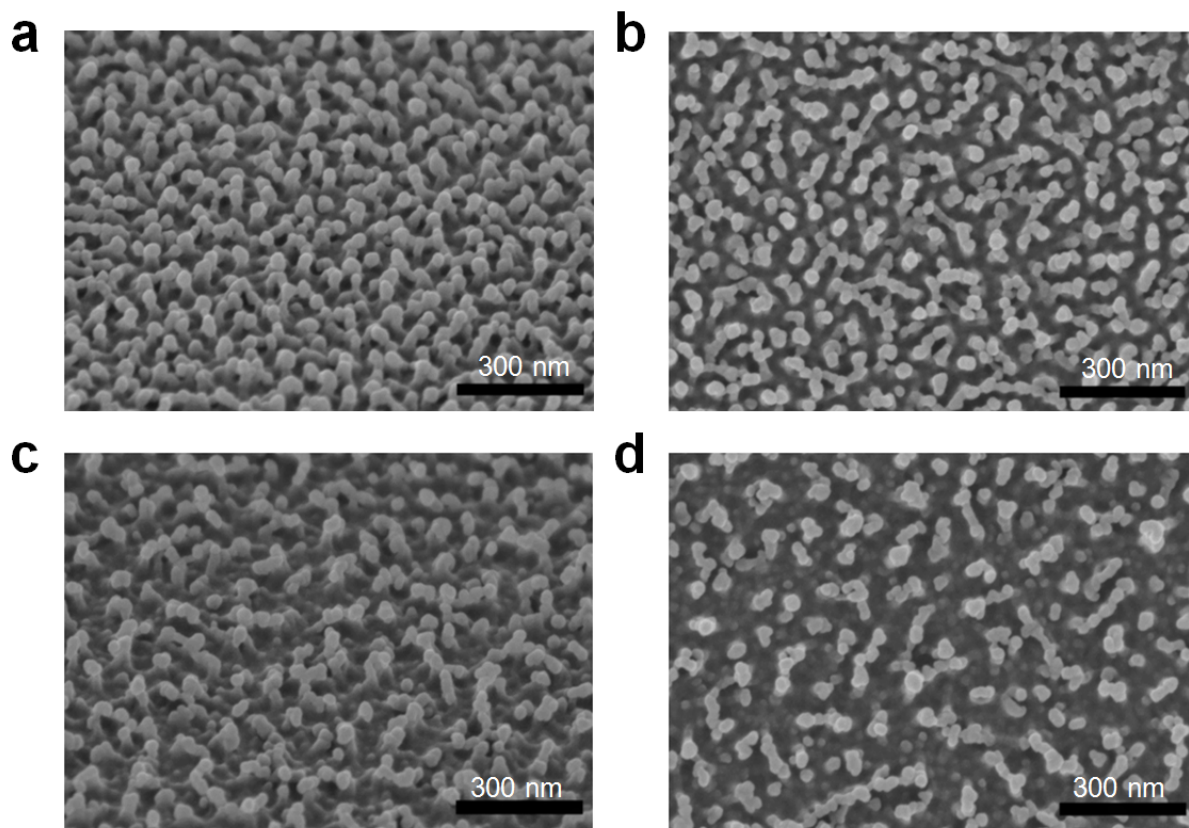


Fig. S2 Relative concentrations of distinct phases in the layers determined by curve deconvolution of XPS Ag 3d_{5/2} spectra.

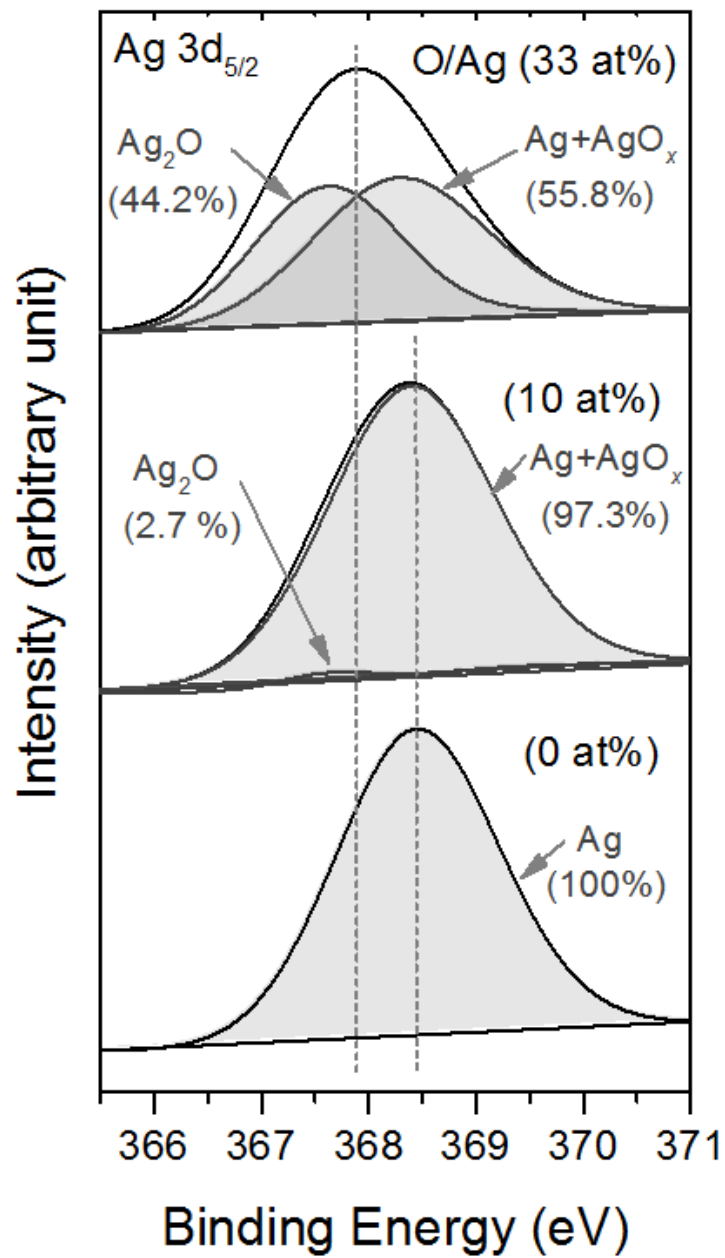


Fig. S3 Refractive indices and extinction coefficients of the Ag and AgO_x (O/Ag = 10 at%) layers.

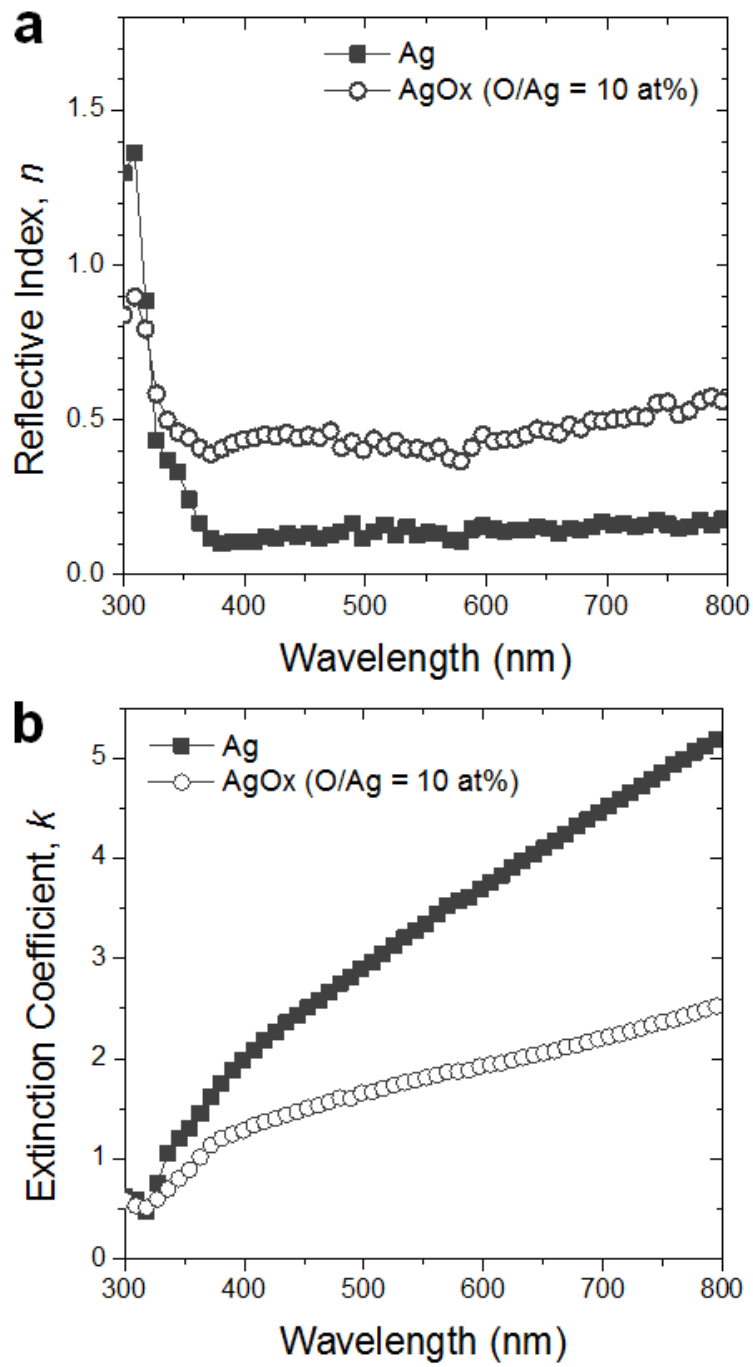


Fig. S4 Changes in the specular reflections of the IAOI-NPA and IAI-NPA electrodes for different O/Ag atomic ratios and thicknesses of the AgO_x layer, which was sandwiched between the bottom and top ITO layers; these layers had nominal deposition thicknesses of 5 nm and 60 nm, respectively.

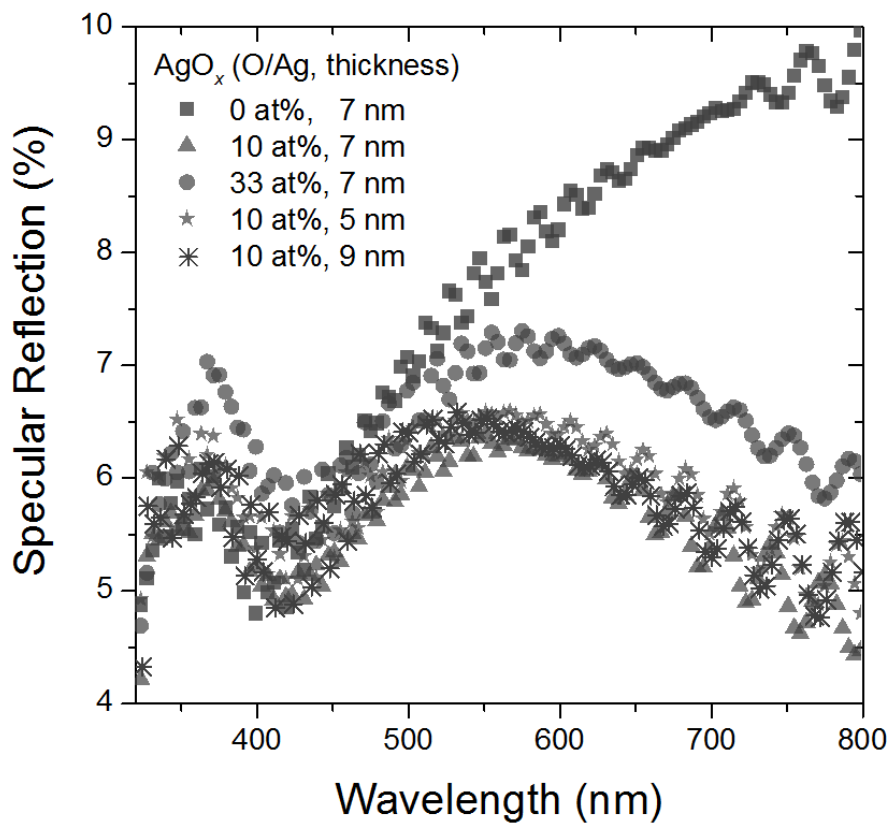


Table S1. Comparisons between the J_{sc} values determined from simulated AM 1.5G illuminations and the integrated J_{sc} values determined from IPCE spectra.

| Photoactive polymers | Electrode | J_{sc} [mA cm ⁻²] | Integrated J_{sc} [mA cm ⁻²] |
|-------------------------------|------------------|------------------------------------|---|
| PBDTTT-C: PC ₆₁ BM | Planar ITO film | 11.12 ± 0.39 | 11.01 ± 0.15 |
| | IAOI-NPA (3 min) | 11.72 ± 0.13 | 11.12 ± 0.21 |
| | IAOI-NPA (7 min) | 10.91 ± 0.29 | 10.45 ± 0.35 |
| PTB-7: PC ₇₁ BM | Planar ITO film | 13.73 ± 0.10 | 13.31 ± 0.21 |
| | IAOI-NPA (3 min) | 14.58 ± 0.17 | 14.04 ± 0.11 |
| | IAOI-NPA (7 min) | 13.07 ± 0.66 | 12.81 ± 0.38 |