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Supplementary Information

Mixed co-solvent engineering of PEDOT:PSS to enhance its conductivity and hybrid solar cell properties

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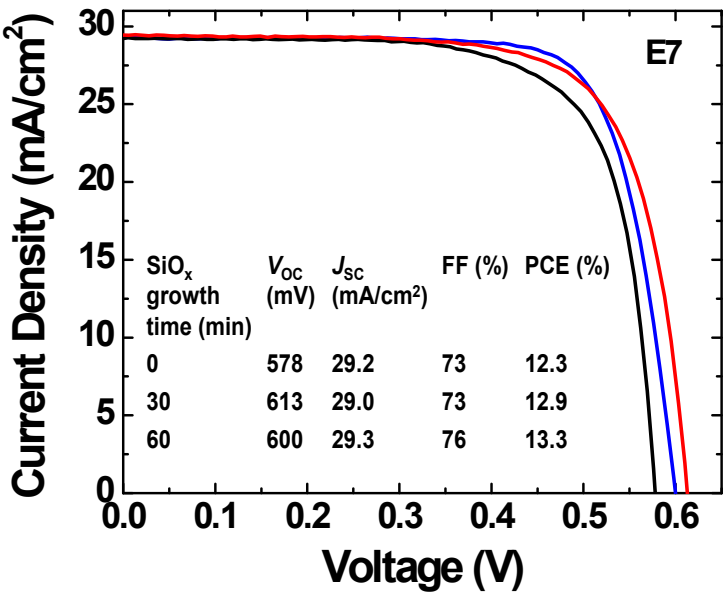

Fig. S1 Effects of the SiO_x growth time on the solar cell properties of the E7 sample.

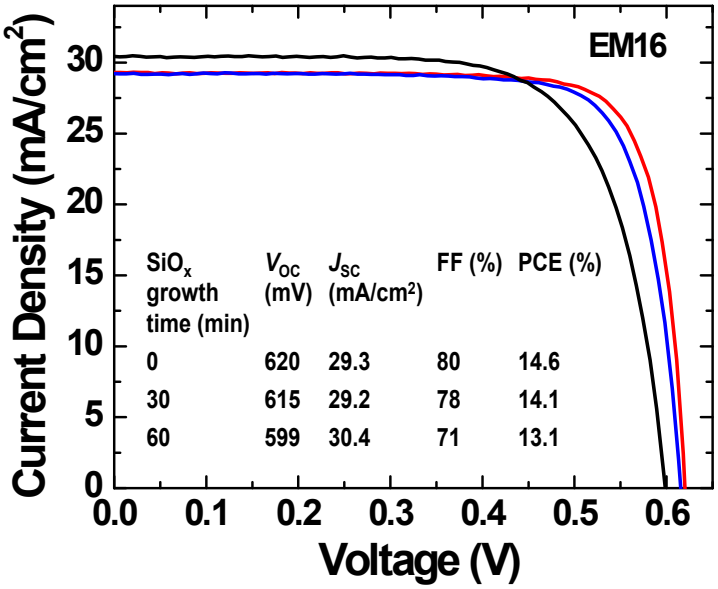

Fig. S2 Effects of the SiO_x growth time on the solar cell properties of the EM16 sample.

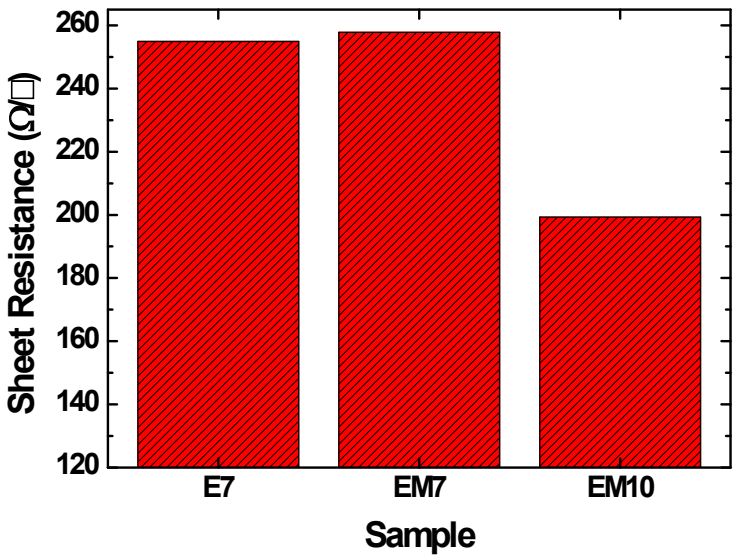

Fig. S3 Comparison of sheet resistance of the E7, EM7, and EM10 samples.

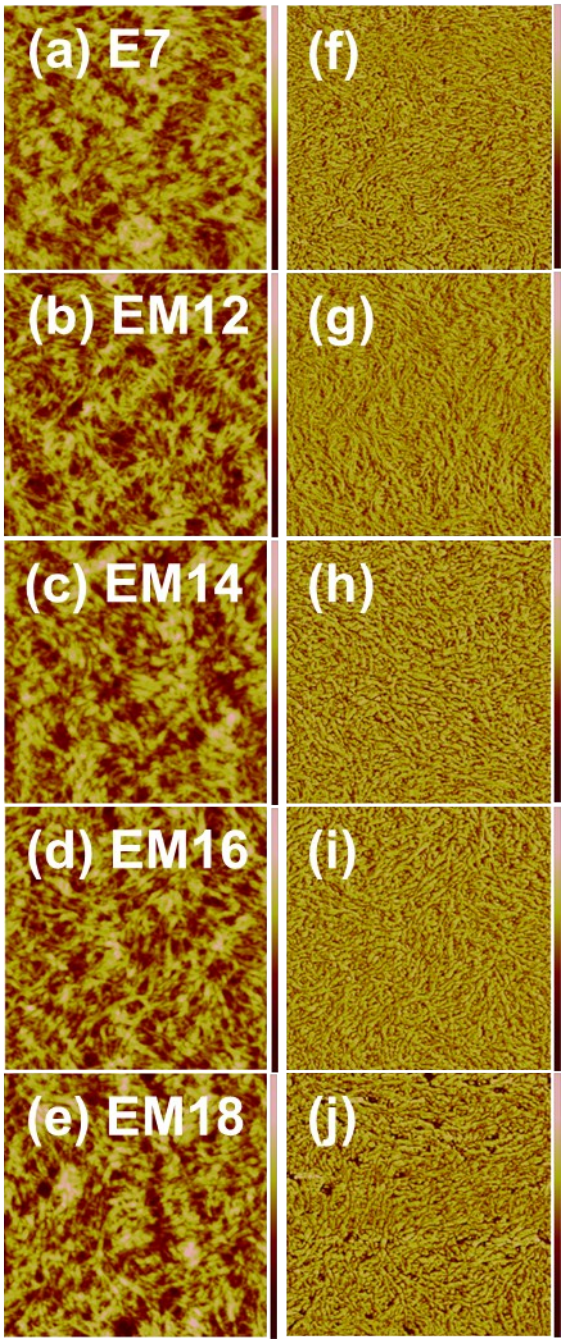

Fig. S4 AFM topography images of (a) E7, (b) EM12, (c) EM14, (d) EM16, and (e) EM18 samples and their corresponding phase images in (f-j). The image area is 1 × 1 μm^2 and the vertical scale bar is from 0 to 20 nm.

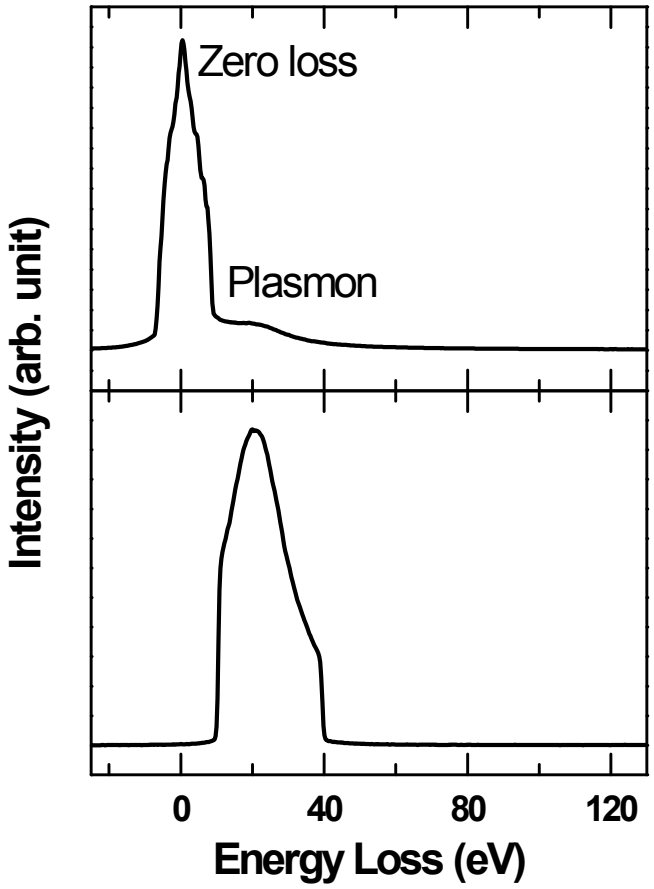

Fig. S5 Typical electron energy loss (EELS) spectra of the EM16 sample before (upper) and after (lower) applying an energy filter. The zero loss and plasmon peaks are labelled in the spectrum before applying the filter. Similar EELS spectra were also observed for other samples. An adjustable slit was used as a filter to selectively limit the energy range to 10-40 eV, which was used to form the low-loss energy-filtered TEM (EFTEM) images.

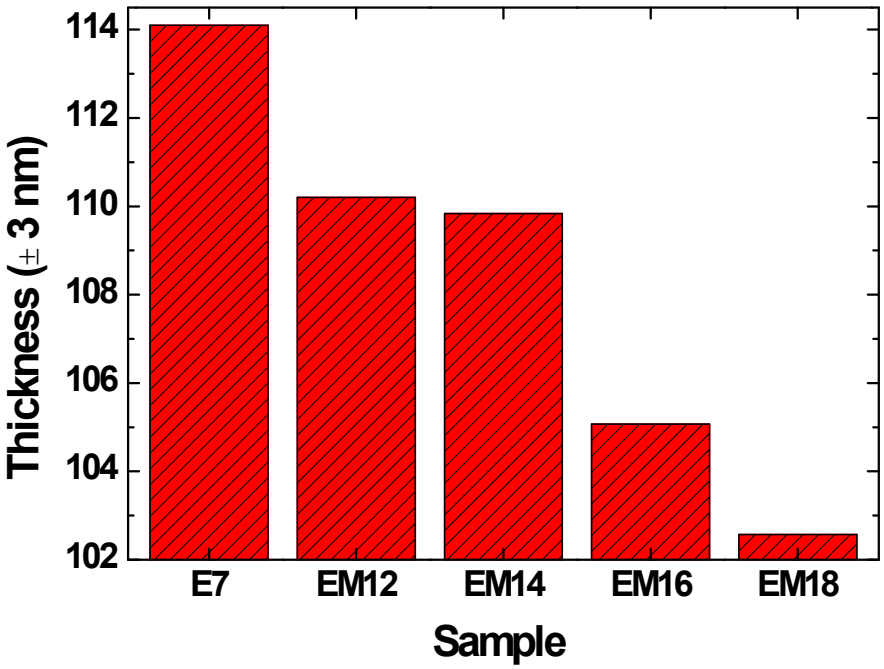

Fig. S6 Comparison of the film thickness of EG added and mixed co-solvent added PEDOT:PSS films on n-type Si substrates, as estimated by UV-reflectometry method.

Table S1. Conductivity and photovoltaic properties of E7 and EM12–EM18 cells.

Sample	σ [S/cm]	V_{OC} [mV]	J_{SC} [mA/cm^2]	FF [%]	PCE [%]
E7	448	613	29	72.8	12.9
EM12	749	600	29.9	74.9	13.4
EM14	786	615	29.9	73.1	13.4
EM16	822	620	29.3	80.2	14.6
EM18	744	583	30.7	76.0	13.6

Table S2. Photovoltaic properties of four different EM16 cells.

Sample No.	J_{SC} [mA/cm^2]	V_{OC} [mV]	FF [%]	PCE [%]
1	620	29.3	80.2	14.6
2	623	29.6	78.5	14.5
3	615	29.9	78.4	14.4
4	619	30.5	75.6	14.3