Supporting information

Organic-inorganic charge transfer complex with charge modulation after electrical pre-biasing

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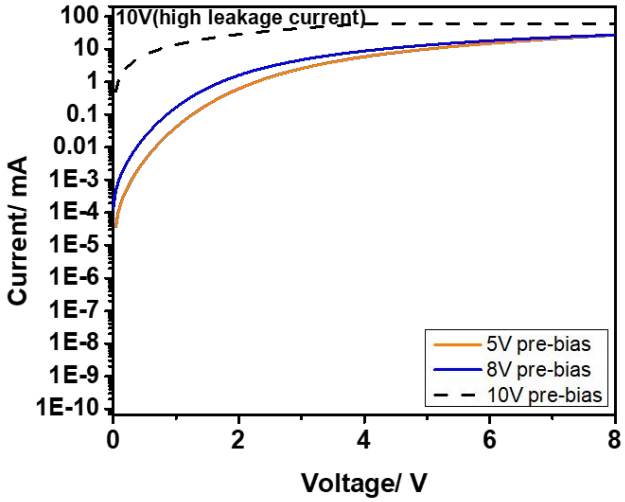

Figure S1. I-V characteristics of the ITO/MoO_3:pentacene(100nm)/Bphen(8nm)/Al device under 5, 8, 10 V pre-biased conditions.

Different pre-bias conditions on I-V characteristics of ITO/MoO_3:pentacene(100nm)/Bphen(8nm)/Al are studied. A higher pre-bias condition shows a better "training" effect. However, when the pre-bias is 10V, the leakage current will be too high, and the CTC cannot be trained. An 8V pre-bias is used in current studied.

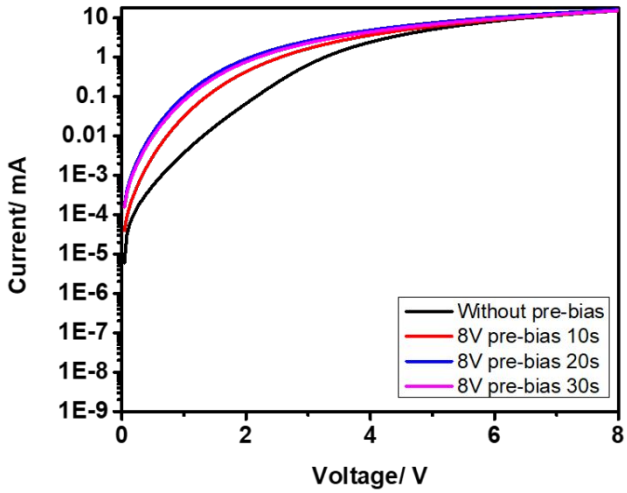

Figure S2. IV characteristics of the device without and with 10, 20, 30 s pre-bias duration.

The longer the pre-bias duration, the better the training effect. The effect is eventually saturated under 30 s duration, and is selected in current studied.

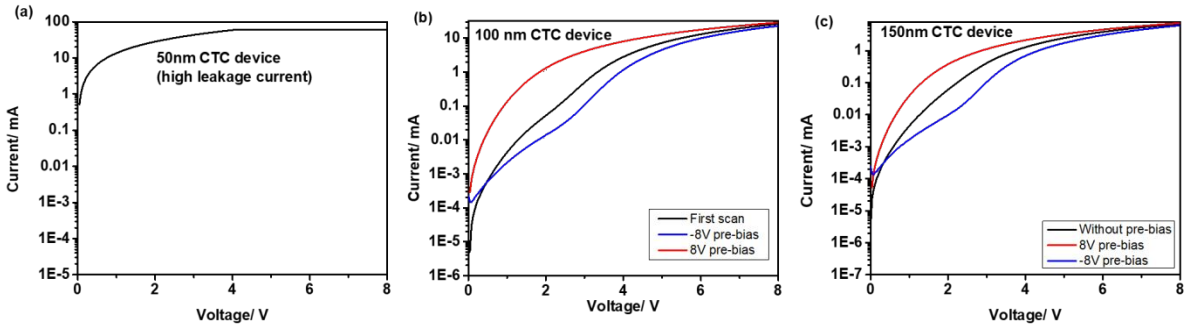

Figure S3. IV characteristics of devices with (a) 50nm, (b) 100nm, (c) 150nm CTC layers, respectively.

For a 50 nm thick CTC layer, a high current leakage is observed and the device cannot be trained. For 100 and 150nm device, the training behavior is similar, and a 100nm thick device is selected in current studies.

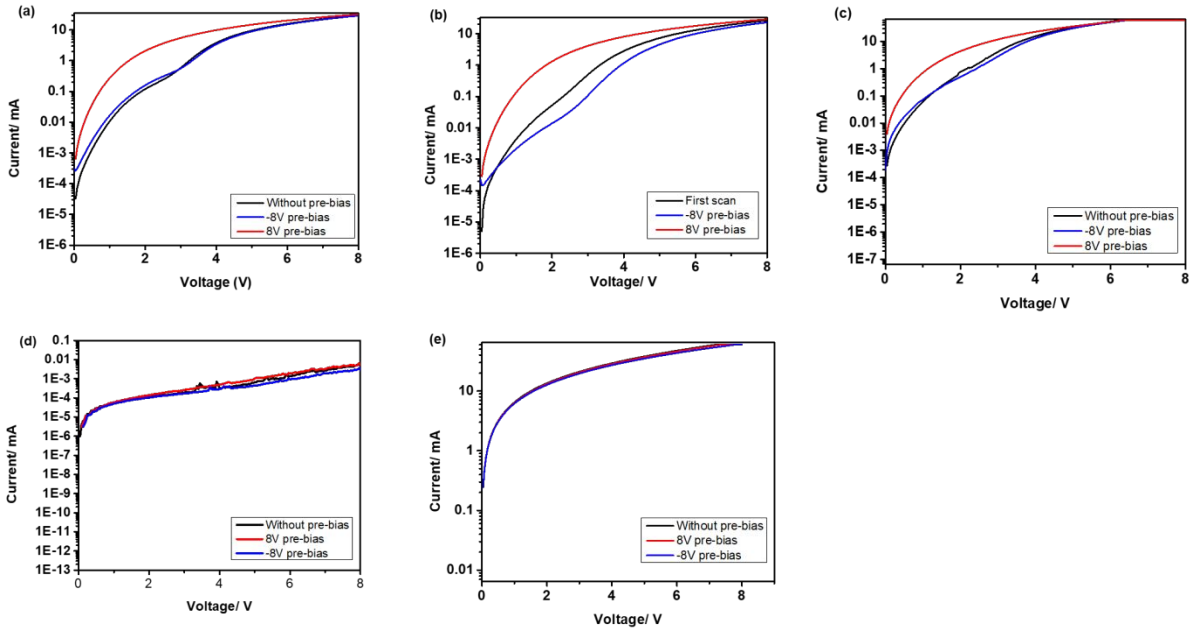

Figure S4. IV characteristics of devices with (a)2:1, (b)1:1, (c)1:2, (d) 0:1 (pentacene only device), (e) 1:0 (MoO_3 only device) of MoO_3:pentacene doping ratio, respectively.

For 1:1 doping ratio, the training behavior is the obvious and is used in current studies.

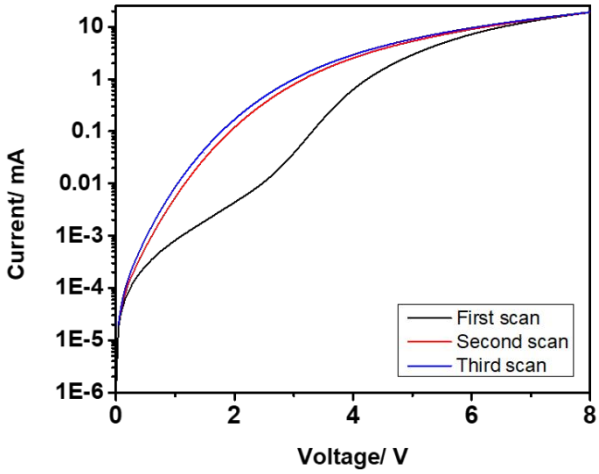

Figure S5. First, second and third scans of IV characteristics of devices

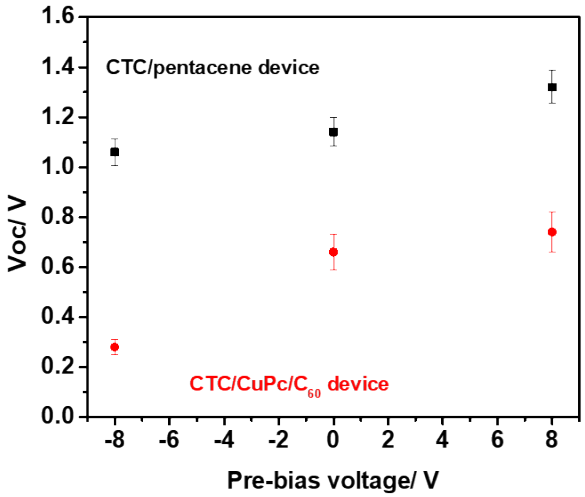

Figure S6. Voc of OPV devices with structures of ITO/ MoO_3:pentacene (25 nm)/ pentacene (50 nm)/ Bphen(8 nm)/Al and ITO/ MoO_3:pentacene (25 nm)/CuPc(32 nm)/ C_{60}(40 nm)/Bphen(8 nm)/Al after 0V and ±8V pre-bias conditions with error bar as determined from 5 devices.