

Electronic Supplementary Information (ESI)

In situ electrochemical doping enhances the efficiency of polymer photovoltaic devices

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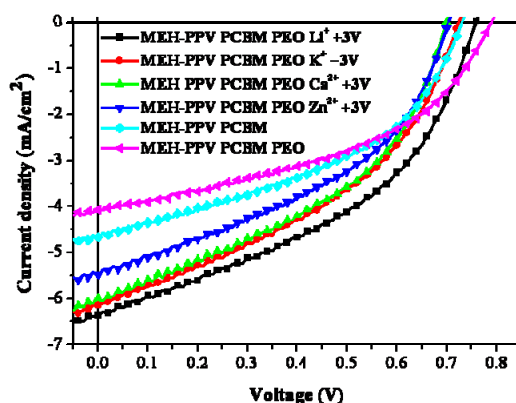


Figure S1 Current density–voltage curves of p–i–n MEH-PPV/PCBM photovoltaic devices prepared without (rhombus) and with LiOTf (square), KOTf (circle), Ca(OTf)₂ (triangle), and Zn(OTf)₂ (upside-down triangle)/PEO mixtures pre-biased at 3 V for 180 s and only with PEO (upside-left triangle).

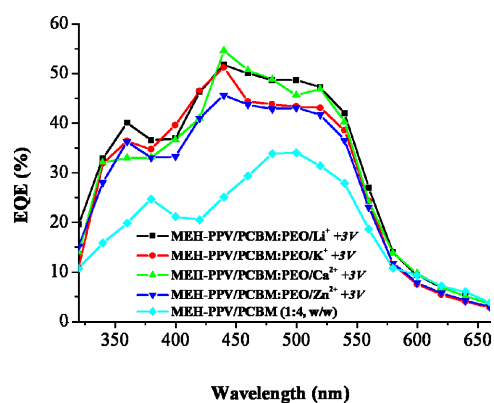


Figure S2 EQE spectra of p–i–n MEH-PPV/PCBM photovoltaic devices prepared without (rhombus) and with LiOTf (square), KOTf (circle), Ca(OTf)₂ (triangle), and Zn(OTf)₂ (inverted triangle)/PEO mixtures pre-biased at 3 V for 180 s.

Figure S2 presents external quantum efficiency (EQE) spectra for the MEH-PPV/PCBM photovoltaic devices prepared with and without LiOTf, KOTf, Ca(OTf)₂, and Zn(OTf)₂/PEO mixtures that had been pre-biased at 3 V for 180 s. All of the pre-biased devices incorporating metal triflate/PEO mixtures provided similar EQE spectra. These spectra resembled the EQE spectra of pure MEH-PPV/PCBM devices, but featured significantly enhanced values. The

devices that had been pre-biased at other voltages (0–5 V) exhibited similar trends in the enhancements of their EQEs.

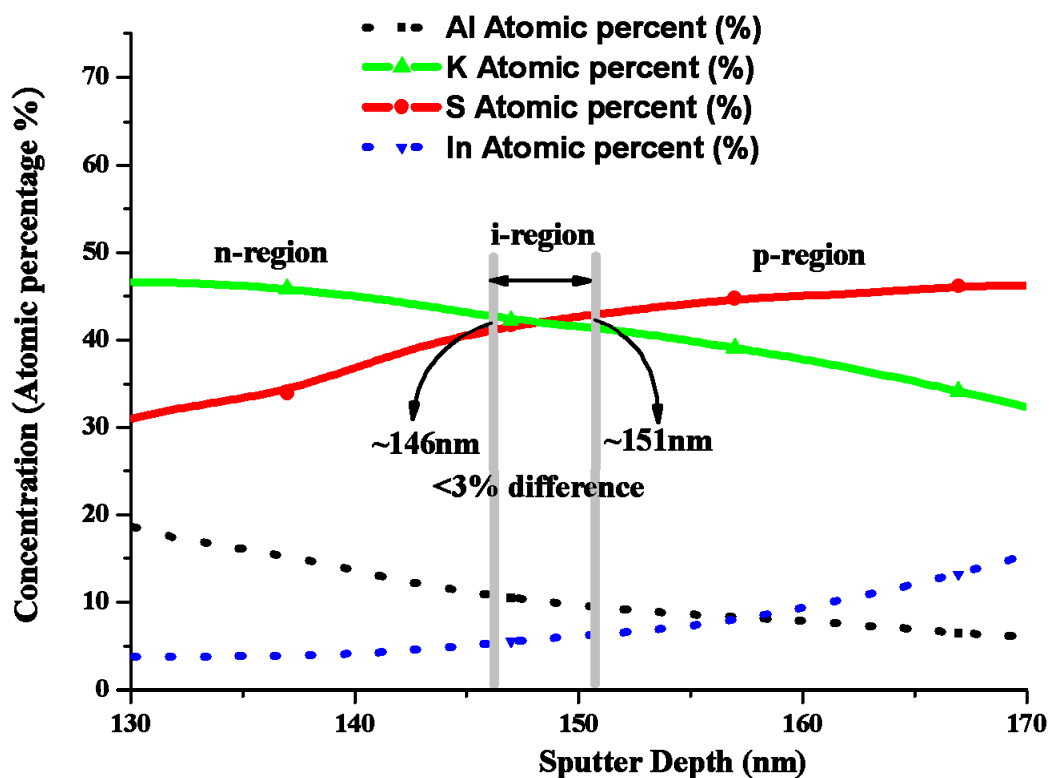


Figure S3 Auger depth profile of the devices of MEH-PPV/PCBM incorporating KOTf/PEO with experienced pre-bias 3V for 180s forming p-i-n junction, respectively. Figure showed enlarged Auger depth profile consequence of the device with experienced a pre-bias 3V for 180s forming p-i-n junction.

In the Auger depth profile analysis, we used Ar gas to etch the sample and could estimate the etched layer thickness during an etching period (10s). The etched layer thickness for every etching period was about 5nm. Figure S3 shows that less than 3% (146nm and 151nm) difference between the positive and negative ions distributions was found for one etching period. Therefore, we estimated that the i region thickness is about 5nm.