Effect of Copper Metalation of Tetrabenzoporphyrin Donor Material on Organic Solar Cell Performance

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Supplementary Information

a

Donor	HOMO (eV)
BP (9 nm)	-4.84
BP (60 nm)	-4.79
CuBP (9 nm)	-4.41
CuBP (55 nm)	-4.41

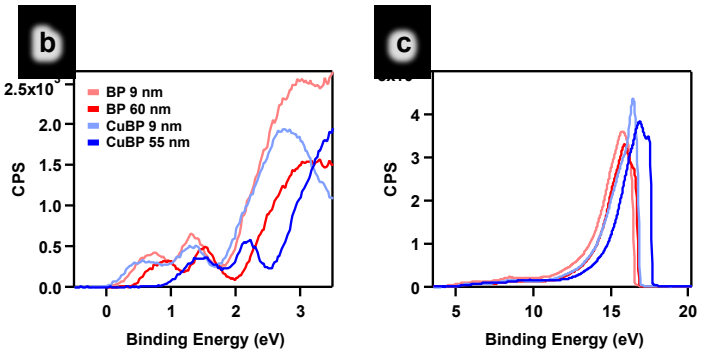

Figure S1. Ultraviolet Photoelectron Spectroscopy (UPS) HOMO and LUMO levels (a), expanded spectra (b) and full spectra (c).

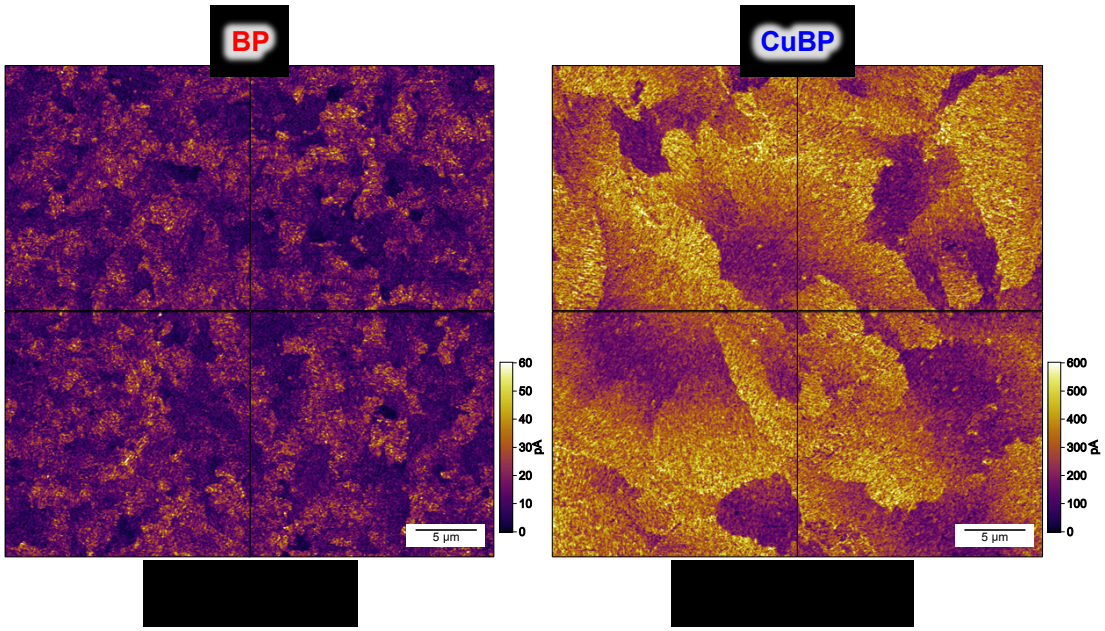

Figure S2. C-AFM current images corresponding to the heigh images in Figure SI2 above, collected at +10 mV applied bias with a gold-coated AFM probe in contact mode.

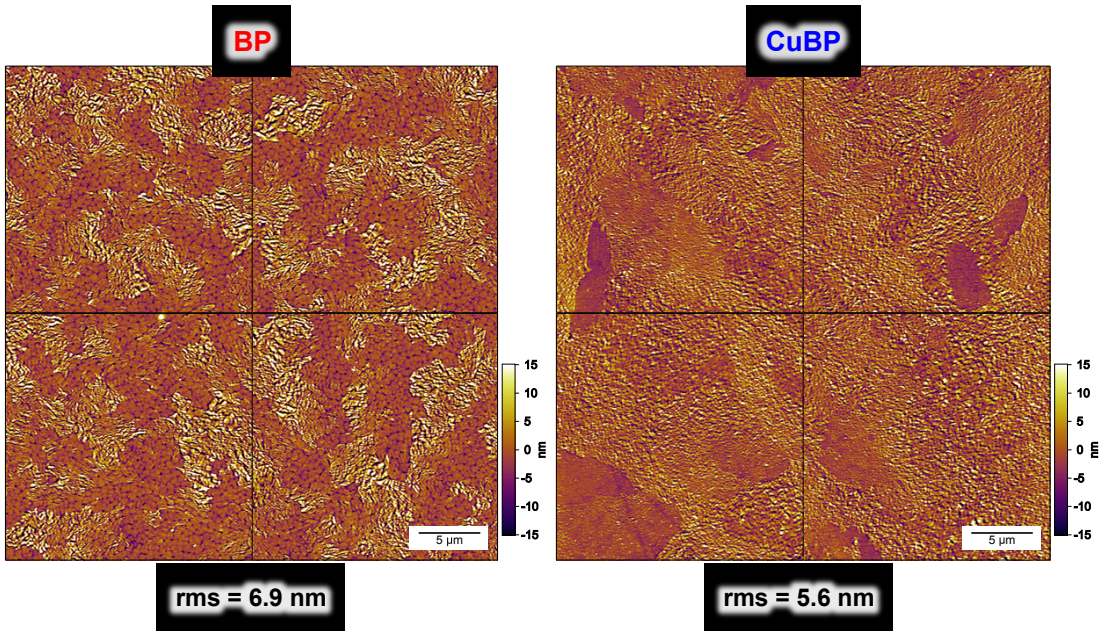

Figure S3. C-AFM topography images of BP (left) and CuBP (right) neat films, with the architecture ITO/PEDOT:PSS/donor (55 nm). Larger area arrays of the images shown in Figure 5 in the main text. Total area shown in images is 40 × 40 µm.

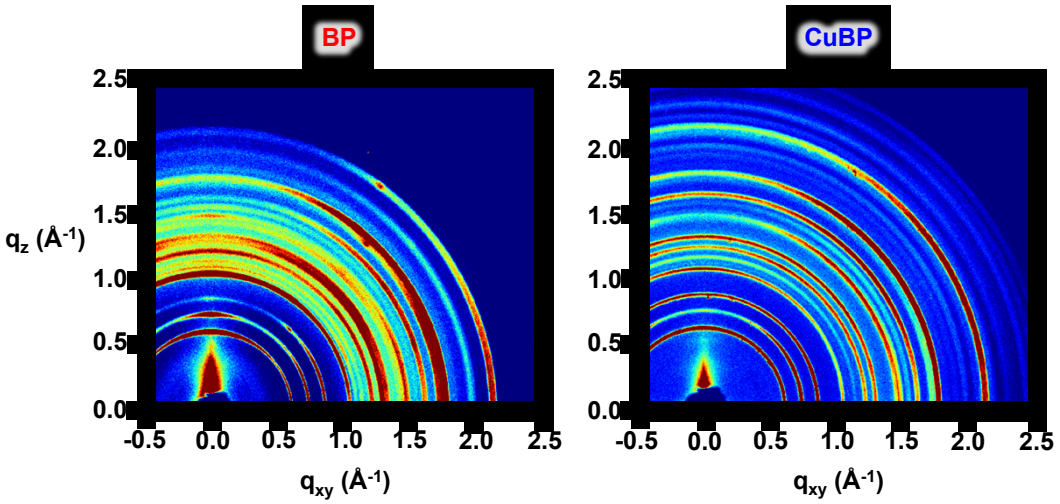

Figure S4. 2-D grazing incidence wide-angle X-ray scattering (GIWAXS) images of BP (left) and CuBP (right) films prepared on Si substrates using the same processing procedure used to make films for AFM characterization. Images collected at beam line 11-3 of the Stanford Sychrotron Radiation Light Source using an X-ray energy of 12.735 keV.

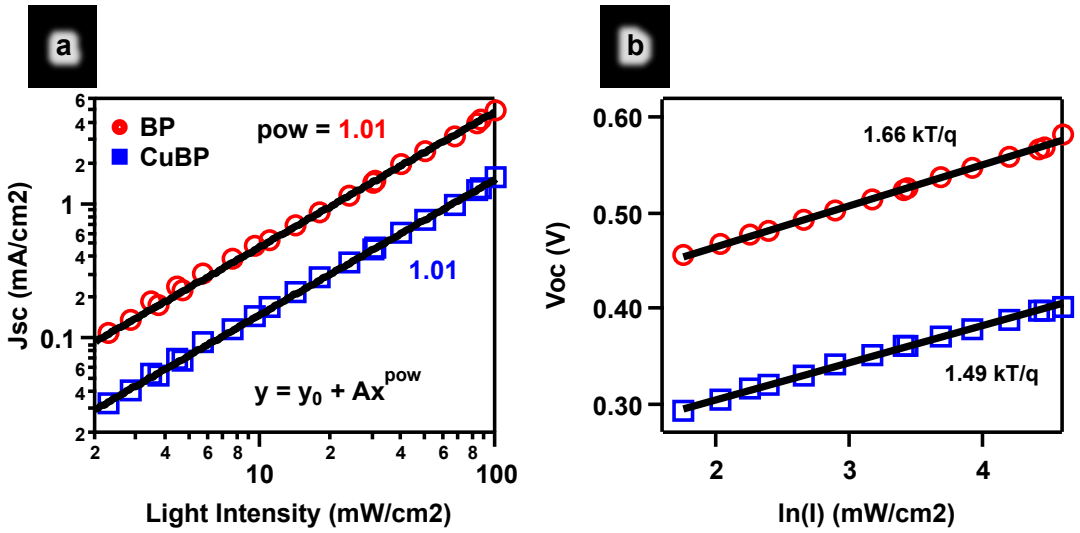

Figure S5. Light-intensity dependent open circuit voltage (a) and short circuit current (b) for bilayer organic photovoltaic devices with BP (red circles) and CuBP (blue squares).