# Comparison of inorganic electron transport layers in fully roll-to-roll coated/printed organic photovoltaics in normal geometry

Supplementary information

## XPS

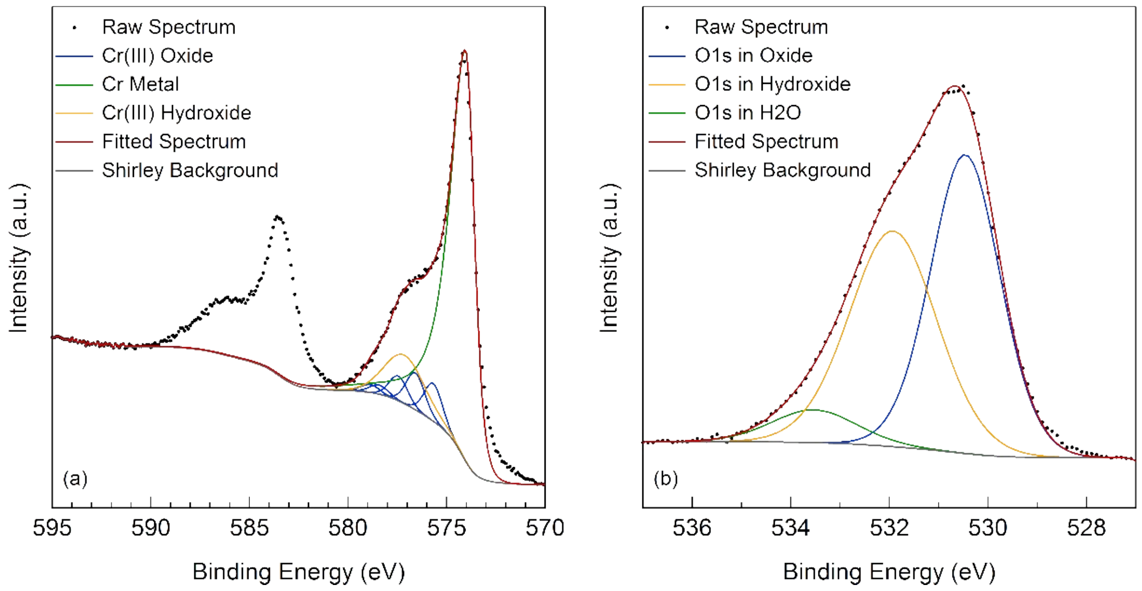

*Figure S1. Fitted XPS spectra of the (a) Cr 2p region and the (b) O 1s for the sputter-coated chromium layer exposed to air.*

| Region | Compound | Peak 1 (eV) | Peak 2 (eV) | Peak 3 (eV) | Peak 4 (eV) | Peak 5 (eV) | FWHM | % of total area |
|---|---|---|---|---|---|---|---|---|
| Cr 2p | Cr(0) | 574.0 | - | - | - | - | 1.05 | 74.8 |
|  | Cr(III) Oxide | 575.7 | 576.6 | 577.5 | 578.4 | 578.9 | 1.09 | 13.2 |
|  | Cr(III) Hydroxide | 577.1 | - | - | - | - | 2.39 | 12.0 |
| O 1s | Lattice Oxide | 530.5 | - | - | - | - | 1.67 | 49.0 |
|  | Hydroxide, hydrated or defective oxide | 531.9 | - | - | - | - | 2.1 | 44.5 |
|  | water, organic O | 533.5 | - | - | - | - | 2.03 | 6.5 |

*Figure S2. Spectral fitting parameters for the Cr 2p and O 1s region scans as shown in Figure 1S. Both scans conducted with a pass energy of 10 eV.*

## Device behaviour for $TiO_X$ devices

Figure S3 shows the J-V characteristics for devices prepared with $TiO_X$ as ETL after each post processing step.

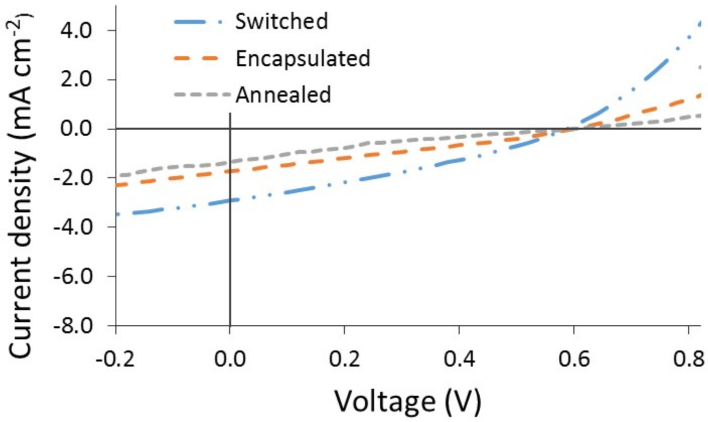

*Figure S3 I-V curves variation of $TiO_X$ devices with different treatment*

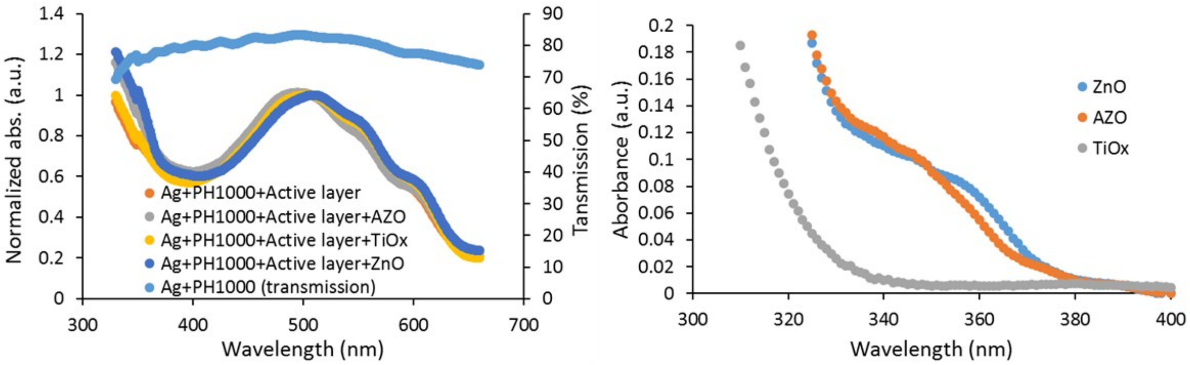

*Figure S4. Normalized absorbance of the active layer and active layer with each of the 3 printed ETL's on the Ag+PH1000 electrode and transmission of Ag+PH1000 electrode, all spectra's are without the absorbance of PET.*

## Light beam wavelength dependency

Light beam induced current maps of the same device section (1 $cm^2$) prepared with two different lasers with wavelengths of 405 and 635 nm, respectively. As seen in Figure S4 the better current extraction due to slight thicknesses variations in the active layer on the map prepared with the 635 nm laser does not appear when the more suitable 405 nm laser is applied.

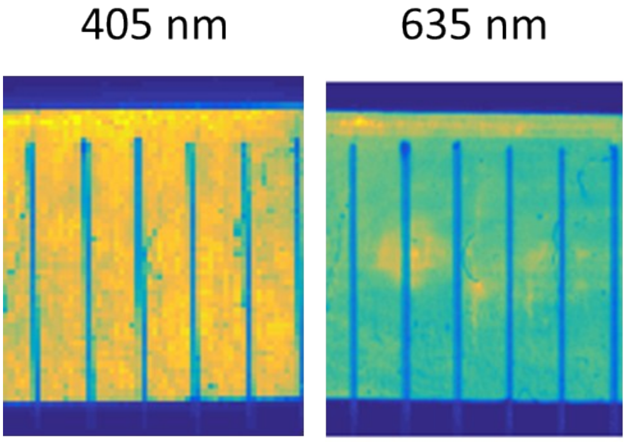

*Figure S5. LBIC maps of the same section of a device prepared with two lasers which wavelengths at 405 and 635 nm, respectively.*

## Irradiation spectrum for the Sulphur plasma lamp vs AM1.5G

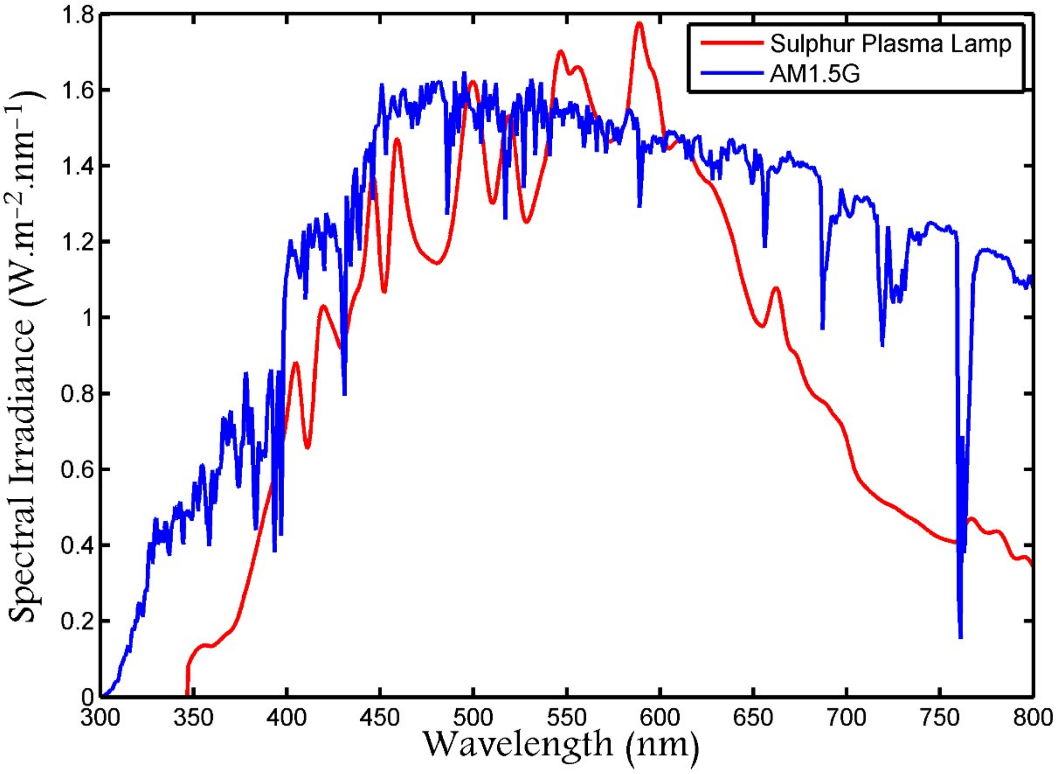

*Figure S6. irradiation spectrum for the sulphur plasma lamp and AM1.5G.*