# Supplementary materials

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**Photovoltaic Effect in Isotype Phthalocyanine Heterojunctions**

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Figure S1
Molecular structure of compounds

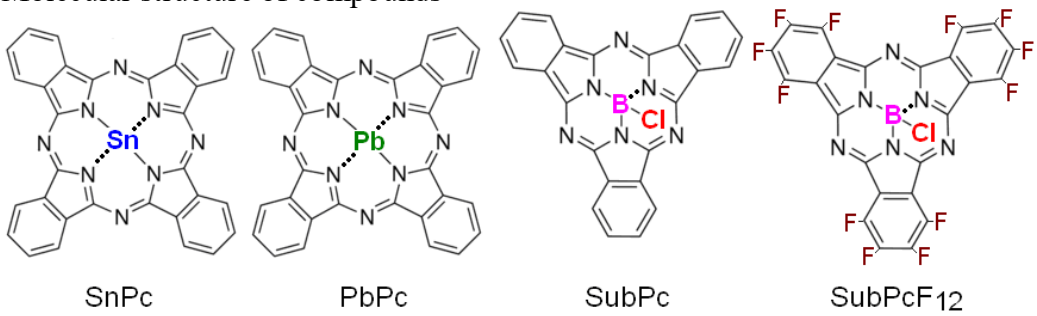
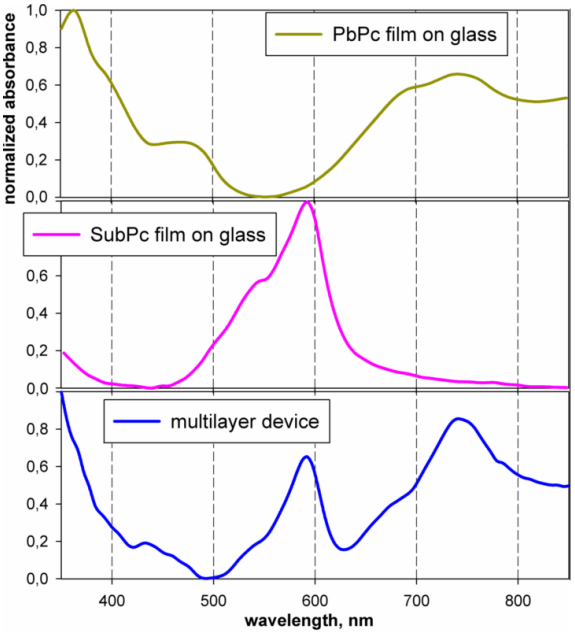
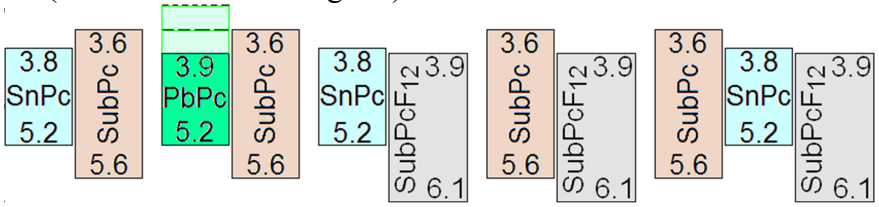



Figure S2
UV/Vis absorbance spectra (top to bottom): 40 nm thick PcPb film; 20 nm thick SubPc; multilayer device Glass/ITO/$MoO_x$/PbPc/SubPc/$MoO_x$/Ag/$MoO_x$.




Comment:
The spectrum of the multilayer device contains the contributions from both PcPb (broad Q-band peaked at ca.740 nm) and SubPc (sharp Q-band at ca.590 nm) films. The increased absorption in the left section of the spectrum of the device is due to $MoO_x$ and metal in the top electrode [20].

Figure S3
Energy level diagrams for the junction used in this work. The energy levels are taken from [6-9,13,16,18,19,21,22] for SubPc (and averaged), from [14] for SnPc, and from [2,11] for PcPb. For the latter compound, the HOMO/LUMO gap in Ref. [1] is 3.26/5.0 eV, in Ref. [17] 3.6/5.0 eV (also shown in the diagram).



Comment: Looking at this very arbitrary, as said in the text, band diagram, one can admit a 'nested' (type-I) heterojunction [26] in case of SnPc/SubPc bilayer. However, the actual positions of energy levels and the role of impurities, both intrinsic and extrinsic (and probably their migration) should be studies in more detail.

Figure S4

(a) Comparison of *J-V* characteristics of the devices with PbPc/SubPc and PbPc/SnPc bilayers; (b) dark and illuminated *J-V* characteristics of SnPc/SubPc and SubPc/SnPc based devices.

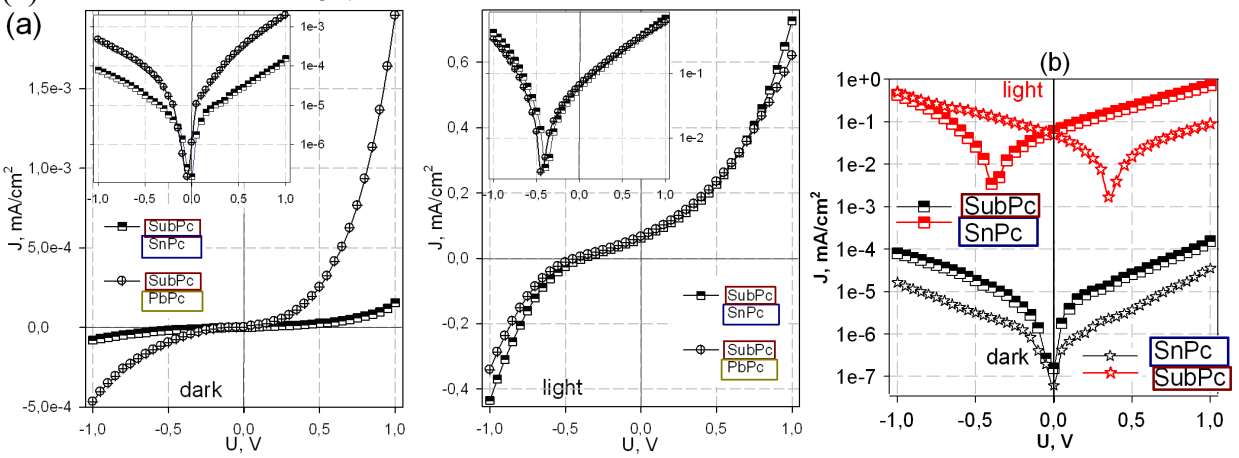
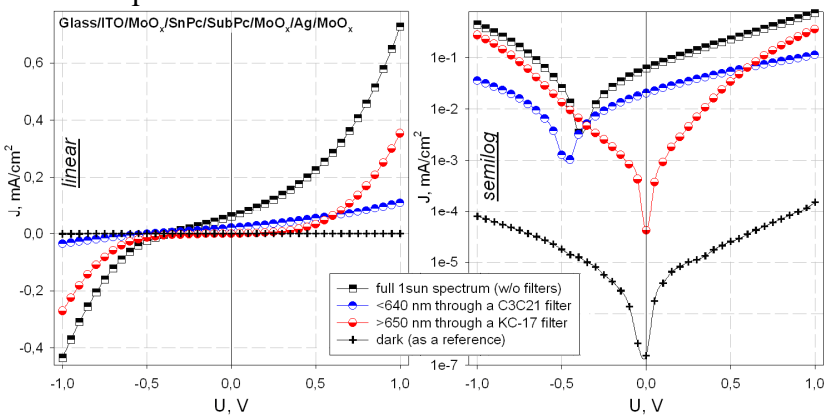



Figure S5

Comparison of *J-V* characteristics of the devices with the SnPc/SubPc bilayer illuminated in different spectral domains.




Comment: Dark and 1sun illuminated *J-V* dependences are taken from Figure 1. Then, the two optical cut-off filters were applied to obtain the selective illumination for the Q-bands of the respective compounds. The first filter (C3C21) transmits the light in the range of 320-640 nm, which coincides with the Q-band absorption of SubPc – see, Figure S2. The second filter (KC-17) removes the wavelengths shorter than 650 nm, thus cutting the SubPc absorption, and enables the Q-band absorption of PbPc. Clearly, the main contribution to the device performance comes from the SubPc photoabsorber.

Figure S6

Comparison of *J-V* characteristics of the devices with the bilayer (SnPc/SubPcF$_{12}$ or SubPc/SubPcF$_{12}$) and trilayer junctions.