



# The effect of the band structure on the Voc value of ternary planar heterojunction organic solar cells based on pentacene, boron subphthalocyanine chloride and different electron acceptors

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Auteur	El Jouad, Mohamed [1], El-Menyawy, Emad M [2], Louarn, Guy [3], Arzel, Ludovic [4], Morsli, Mustapha [5], Addou, Mohammed [6], Bernède, Christian [7], Cattin, Linda [8]
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Résumé en anglais	<p>Using three organic materials in the cascade configuration of organic photovoltaic cells (OPVs) broadens the absorption range of visible light, resulting in an increase in the short circuit current density (Jsc). Herein, we report for the first time the use of three organic molecules, pentacene, boron subphthalocyanine chloride (SubPc) and fullerene (C60). Upon comparison with the binary pentacene/C60 and SubPc/C60 structures, the high Jsc value obtained for the ternary structure induces an increase in the OPV efficiency. This improvement is limited by the small open circuit voltage (Voc) value due to the low absolute value of the highest occupied molecular orbital of pentacene. Our experimental study confirmed that the Voc is ultimately limited by the energy levels of the outer layers in these cascade structures. Initial attempts to overcome this bottleneck were carried out using a variety of electron acceptors as an alternative to fullerene. However, increasing the Voc was detrimental to the current density, therefore the best OPVs remain those constructed using fullerene.</p>
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## Liens

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