



Study of CuI thin films properties for application as anode buffer layer in organic solar cells

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Résumé en anglais	<p>After chemico-physical characterization of CuI thin films, the structures indium tin oxide (ITO) /CuI are systematically studied. We show that the morphology of the 3 nm thick CuI film depends on its deposition rate. To obtain smooth homogeneous CuI film, it is necessary to deposit it at 0.005 nm/s. After optimization of the deposition conditions of CuI, it is shown that it behaves like a template for the organic layer. For instance, when the organic film is copper-phthalocyanine, the molecules which are usually perpendicular to the plane of the substrate lie parallel to it when deposited onto CuI. In a same way, when the electron donor is a porphyrin derivative, CuI allows to double the power conversion efficiency of the cells based on the heterojunction porphyrin/C-60. When CuI is used as anode buffer layer, it increases systematically the short circuit current, the open circuit voltage, thus the efficiency of the organic solar cell. These effects are related, not only to the improvement of the band matching between the ITO and the electron donor, but also to the templating effect of the CuI. Moreover, we show that the beneficial effect of CuI. is effective, not only with ITO, but also with fluorine doped tin oxide.</p>
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