



MoO₃/CuI hybrid buffer layer for the optimization of organic solar cells based on a donor-acceptor triphenylamine

Submitted by Emmanuel Lemoine on Thu, 02/06/2014 - 11:25

Titre	MoO ₃ /CuI hybrid buffer layer for the optimization of organic solar cells based on a donor-acceptor triphenylamine
Type de publication	Article de revue
Auteur	Bernède, Jean Christian [1], Cattin, Linda [2], Makha, Mohammed [3], Jeux, Victorien [4], Leriche, Philippe [5], Roncali, Jean [6], Froger, Vincent [7], Morsli, Mustapha [8], Addou, Mohammed [9]
Editeur	Elsevier
Type	Article scientifique dans une revue à comité de lecture
Année	2013
Langue	Anglais
Date	03/2013
Pagination	107-114
Volume	110
Titre de la revue	Solar Energy Materials and Solar Cells
ISSN	0927-0248
Mots-clés	Anode [10], buffer layers [11], copolymers [12], Copper iodide [13], device performance [14], Interface [15], kelvin probe [16], Open-circuit voltage [17], Organic photovoltaics [18], Oxygen [19], photovoltaic cells [20], Small molecules [21], Stability [22], Thin film [23], thin-films [24], transition-metal oxides [25]
Résumé en anglais	<p>We investigate the effect of anode buffer layers (ABLs) on the performances of multi-layer heterojunction solar cells with thienylenevinylene-triphenylamine with peripheral dicyanovinylene groups (TDCV-TPA) as donor material and fullerene C-60 as acceptor. The deposition of a CuI layer between the ITO anode and the electron donor significantly improves the short-circuit current density (J_{sc}) and fill factor (FF) but reduces the open-circuit voltage (V_{oc}). On the other hand, a MoO₃ buffer layer increases the V_{oc} but leads to limited J_{sc} and FF values, thus reducing power conversion efficiency (PCE). In this context, we show that the use of a hybrid anode buffer layer MoO₃/CuI leads to a considerable improvement of the cells performances and a PCE of 2.50% has been achieved. These results are discussed on the basis of the dual function of MoO₃ and CuI. While both of them reduce the hole injection barrier, CuI improves the conductivity of the organic film through an improvement of molecular order while MoO₃ prevents leakage current through the diode. Finally the results of a cursory study of the ageing process provide further support to this interpretation of the effects of the various buffer layers. (C) 2012 Elsevier B.V. All rights reserved.</p>
URL de la notice	http://okina.univ-angers.fr/publications/ua2763 [26]
DOI	10.1016/j.solmat.2012.12.003 [27]

Liens

- [1] <http://okina.univ-angers.fr/c.bernedede/publications>
- [2] [http://okina.univ-angers.fr/publications?f\[author\]=3568](http://okina.univ-angers.fr/publications?f[author]=3568)
- [3] [http://okina.univ-angers.fr/publications?f\[author\]=21392](http://okina.univ-angers.fr/publications?f[author]=21392)
- [4] [http://okina.univ-angers.fr/publications?f\[author\]=3615](http://okina.univ-angers.fr/publications?f[author]=3615)
- [5] <http://okina.univ-angers.fr/philippe.leriche/publications>
- [6] <http://okina.univ-angers.fr/jean.roncali/publications>
- [7] [http://okina.univ-angers.fr/publications?f\[author\]=9205](http://okina.univ-angers.fr/publications?f[author]=9205)
- [8] [http://okina.univ-angers.fr/publications?f\[author\]=3570](http://okina.univ-angers.fr/publications?f[author]=3570)
- [9] [http://okina.univ-angers.fr/publications?f\[author\]=21394](http://okina.univ-angers.fr/publications?f[author]=21394)
- [10] [http://okina.univ-angers.fr/publications?f\[keyword\]=5634](http://okina.univ-angers.fr/publications?f[keyword]=5634)
- [11] [http://okina.univ-angers.fr/publications?f\[keyword\]=5629](http://okina.univ-angers.fr/publications?f[keyword]=5629)
- [12] [http://okina.univ-angers.fr/publications?f\[keyword\]=5376](http://okina.univ-angers.fr/publications?f[keyword]=5376)
- [13] [http://okina.univ-angers.fr/publications?f\[keyword\]=5633](http://okina.univ-angers.fr/publications?f[keyword]=5633)
- [14] [http://okina.univ-angers.fr/publications?f\[keyword\]=5637](http://okina.univ-angers.fr/publications?f[keyword]=5637)
- [15] [http://okina.univ-angers.fr/publications?f\[keyword\]=3469](http://okina.univ-angers.fr/publications?f[keyword]=3469)
- [16] [http://okina.univ-angers.fr/publications?f\[keyword\]=5638](http://okina.univ-angers.fr/publications?f[keyword]=5638)
- [17] [http://okina.univ-angers.fr/publications?f\[keyword\]=4890](http://okina.univ-angers.fr/publications?f[keyword]=4890)
- [18] [http://okina.univ-angers.fr/publications?f\[keyword\]=5630](http://okina.univ-angers.fr/publications?f[keyword]=5630)
- [19] [http://okina.univ-angers.fr/publications?f\[keyword\]=996](http://okina.univ-angers.fr/publications?f[keyword]=996)
- [20] [http://okina.univ-angers.fr/publications?f\[keyword\]=5258](http://okina.univ-angers.fr/publications?f[keyword]=5258)
- [21] [http://okina.univ-angers.fr/publications?f\[keyword\]=5632](http://okina.univ-angers.fr/publications?f[keyword]=5632)
- [22] [http://okina.univ-angers.fr/publications?f\[keyword\]=249](http://okina.univ-angers.fr/publications?f[keyword]=249)
- [23] [http://okina.univ-angers.fr/publications?f\[keyword\]=5631](http://okina.univ-angers.fr/publications?f[keyword]=5631)
- [24] [http://okina.univ-angers.fr/publications?f\[keyword\]=5639](http://okina.univ-angers.fr/publications?f[keyword]=5639)
- [25] [http://okina.univ-angers.fr/publications?f\[keyword\]=5636](http://okina.univ-angers.fr/publications?f[keyword]=5636)
- [26] <http://okina.univ-angers.fr/publications/ua2763>
- [27] <http://dx.doi.org/10.1016/j.solmat.2012.12.003>

Publié sur *Okina* (<http://okina.univ-angers.fr>)