



Mo(SxOy) thin films deposited by electrochemistry for application in organic photovoltaic cells

Submitted by Christian Bernède on Sun, 07/21/2019 - 15:23

- Titre** Mo(SxOy) thin films deposited by electrochemistry for application in organic photovoltaic cells
- Type de publication** Article de revue
- Auteur** Martinez-Rojas, F. [1], Hssein, Mehdi [2], El Jouad, Zouhair [3], Armijo, Francisco [4], Cattin, Linda [5], Louarn, Guy [6], Stephant, Nicolas [7], del Valle, María Angélica [8], Addou, Mohammed [9], Soto, Juan Pablo [10], Bernède, Christian [11]
- Editeur** Elsevier
- Type** Article scientifique dans une revue à comité de lecture
- Année** 2017
- Langue** Anglais
- Date** 1er Nov. 2017
- Pagination** 331-338
- Volume** 201
- Titre de la revue** Materials Chemistry and Physics
- ISSN** 0254-0584
- Mots-clés** Hybrid anode buffer layer [12], Organic Photovoltaic Cell [13], planar heterojunction [14], Tin oxide anode [15], Transition metal dichalcogenides [16]
- Résumé en anglais**
In this study, Mo(SxOy) thin films were deposited onto fluorine doped tin oxide (FTO) using pulsed electrochemical deposition method. It is shown by scanning electron microscopy, energy-dispersive spectroscopy and X-ray photoelectron spectroscopy that after water cleaning the deposited Mo(SxOy) film corresponds to a hybrid layer MoSx:MoO3. This hybrid is used as anode buffer layer (ABL) in planar organic photovoltaic cells (OPVCs) based on the couple copper-phthalocyanine/fullerene. It is shown that it is necessary to proceed to a soft annealing-5 min at 150 °C- of the anode FTO/Mo(SxOy) to clean the ABL surface in order to obtain efficient contact with the organic material. The OPVC with the optimum Mo(SxOy) thickness, 12 nm, showed a power conversion efficiency, PCE = 1.41% under an illumination of AM1.5, which is 12% higher than that achieved with a simple MoO3 ABL. This improvement is attributed to the fact that using a hybrid MoS2:MoO3 ABL allows to combine the advantages of its both constituents. The MoSx blocks the electrons, while the high work function of MoO3 induces a high hole extraction efficiency at the interface electron donor/anode.
- URL de la notice** <http://okina.univ-angers.fr/publications/ua19982> [17]
- DOI** 10.1016/j.matchemphys.2017.08.021 [18]
- Lien vers le document** <https://www.sciencedirect.com/science/article/abs/pii/S0254058417306387?...> [19]

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- [18] <http://dx.doi.org/10.1016/j.matchemphys.2017.08.021>
- [19] <https://www.sciencedirect.com/science/article/abs/pii/S0254058417306387?via%3Dihub>

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