



Effect of the deposition conditions of NiO anode buffer layers inorganic solar cells, on the properties of these cells

Submitted by Christian Bernède on Thu, 06/04/2015 - 13:54

Titre	Effect of the deposition conditions of NiO anode buffer layers inorganic solar cells, on the properties of these cells
Type de publication	Article de revue
Auteur	Nguyen, Duc Tuong [1], Ferrec, A [2], Keraudy, J [3], Bernède, Jean Christian [4], Stephant, Nicolas [5], Cattin, Linda [6], Jouan, P Y [7]
Editeur	Elsevier
Type	Article scientifique dans une revue à comité de lecture
Année	2014
Langue	Anglais
Pagination	110-116
Volume	311
Titre de la revue	Applied Surface Science
ISSN	0169-4332
Mots-clés	Annealinga [8], anode buffer layer [9], DC reactive sputtering [10], Forming process [11], NiO thin films [12], Organic photovoltaic cells [13]
Résumé en anglais	<p>tNiO thin films deposited by DC reactive sputtering were used as anode buffer layer in organic photovoltaic cells (OPVs) based on CuPc/C₆₀ planar heterojunctions. Firstly we show that the properties of the NiO films depend on the O₂ partial pressure during deposition. The films are first conductive between 0 and 2% partial oxygen pressure, then they are semiconductor and p-type between 2 and 6% partial oxygen pressure, between 6 and 9% partial oxygen pressure the conduction is very low and the films seem to be n-type and finally, for a partial oxygen pressure higher than 9%, the conduction is p-type. The morphology of these films depends also on the O₂ partial pressure. When the NiO films is thick of 4 nm, its peak to valley roughness is 6 nm, when it is sputtered with a gas containing 7.4% of oxygen, while it is more than double, 13.5 nm, when the partial pressure of oxygen is 16.67%. This roughness implies that a forming process, i.e. a decrease of the leakage current, is necessary for the OPVs. The forming process is not necessary if the NiO ABL is thick of 20 nm. In that case it is shown that optimum conversion efficiency is achieved with NiO ABL annealed 10 min at 400 °C.</p>
URL de la notice	http://okina.univ-angers.fr/publications/ua12248 [14]
DOI	10.1016/j.apsusc.2014.05.020 [15]
Lien vers le document	http://dx.doi.org/10.1016/j.apsusc.2014.05.020 [15]

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- [15] <http://dx.doi.org/10.1016/j.apsusc.2014.05.020>

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