

Accepted Manuscript

Structural evolution of nanocrystalline silicon in hydrogenated nanocrystalline silicon solar cells

Yujie Yuan, Wei Zhao, Jun Ma, Zhengchun Yang, Wei Li, Kailiang Zhang



PII: S0257-8972(16)31316-0
DOI: doi: [10.1016/j.surfcoat.2016.12.028](https://doi.org/10.1016/j.surfcoat.2016.12.028)
Reference: SCT 21885
To appear in: *Surface & Coatings Technology*
Received date: 31 August 2016
Revised date: 25 November 2016
Accepted date: 8 December 2016

Please cite this article as: Yujie Yuan, Wei Zhao, Jun Ma, Zhengchun Yang, Wei Li, Kailiang Zhang , Structural evolution of nanocrystalline silicon in hydrogenated nanocrystalline silicon solar cells. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Sct(2016), doi: [10.1016/j.surfcoat.2016.12.028](https://doi.org/10.1016/j.surfcoat.2016.12.028)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Structural Evolution of Nanocrystalline Silicon in Hydrogenated Nanocrystalline Silicon Solar Cells

*Yujie Yuan, Wei Zhao, Jun Ma, Zhengchun Yang, Wei Li, Kailiang Zhang**

School of Electronic Information Engineering, Tianjin Key Laboratory of Film
Electronic & Communication Devices, Tianjin University of Technology,
Tianjin 300384, China

*Corresponding author.

E-mail address: kailiang_zhang@163.com (K. Zhang).

Abstract

We deposited hydrogenated nanocrystalline silicon (nc-Si:H) thin films and n-i-p solar cells onto flexible stainless steel substrates through the plasma-enhanced chemical vapor deposition (PECVD) method to investigate the effects of n-doped layers with different crystallinity on the structural evolution of the subsequent intrinsic nc-Si:H layers. The n-doped layers with various crystalline volume fractions were formed by changing the hydrogen dilution ratios. The structural characteristics of the nc-Si:H thin films were tested using transmission electron microscopy (TEM) and Raman scattering measurements. Intrinsic nc-Si:H layers, with an incubation layer up to 200 nm, were observed deposited on low crystallinity n-doped layers during the initial growth stage. Increasing the crystallinity of n-doped layers helps reduce the thickness of the incubation layers at the n/i interface and improves the microstructure homogeneity of i-layers. The experimental results demonstrate that the short circuit current density and fill factors of solar cells can be greatly improved by

Download English Version:

<https://daneshyari.com/en/article/5464987>

Download Persian Version:

<https://daneshyari.com/article/5464987>

[Daneshyari.com](https://daneshyari.com)