

Role of Stress Factors on the Adhesion of Interfaces in R2R Fabricated Organic Photovoltaics - DTU Orbit (08/11/2017)

Role of Stress Factors on the Adhesion of Interfaces in R2R Fabricated Organic Photovoltaics

The role of the common stress factors such as high temperature, humidity, and UV irradiation on interface adhesion of roll-to-roll fabricated organic photovoltaic (OPV) devices is investigated. The samples range from bare front electrodes to complete devices. It is shown that applying single stress or combinations of stresses onto the samples variably affect the adhesion properties of the different interfaces in the OPV device. It is revealed that while the exposure of the complete devices to the stresses results in the loss of photovoltaic performance, some interfaces in the devices present improved adhesion properties. Depth profiling analysis on the fractured samples reveals interdiffusion of layers in the structure, which results in the increase of adhesion and change of the debond path. It is shown that through diffusion and intermixing of internal interfaces coupled stresses can increase the adhesion of OPV interfaces by over tenfold. The results are additionally compared to the photovoltaic performance of the complete devices.

General information

State: Published

Organisations: Department of Energy Conversion and Storage, Functional organic materials, Stanford University

Authors: Corazza, M. (Intern), Rolston, N. (Ekstern), Dauskardt, R. H. (Ekstern), Beliatz, M. (Intern), Krebs, F. C. (Intern), Gevorgyan, S. (Intern)

Number of pages: 7

Publication date: 2016

Main Research Area: Technical/natural sciences

Publication information

Journal: Advanced Energy Materials

Article number: 1501927

ISSN (Print): 1614-6832

Ratings:

BFI (2017): BFI-level 1

Web of Science (2017): Indexed Yes

BFI (2016): BFI-level 1

Scopus rating (2016): CiteScore 12.96 SJR 6.124 SNIP 2.045

Web of Science (2016): Indexed yes

BFI (2015): BFI-level 1

Scopus rating (2015): SJR 6.254 SNIP 2.531 CiteScore 14.2

Web of Science (2015): Indexed yes

BFI (2014): BFI-level 1

Scopus rating (2014): SJR 6.706 SNIP 2.975 CiteScore 15.27

Web of Science (2014): Indexed yes

BFI (2013): BFI-level 1

Scopus rating (2013): SJR 5.979 SNIP 2.936 CiteScore 13.24

ISI indexed (2013): ISI indexed yes

Web of Science (2013): Indexed yes

Scopus rating (2012): SJR 5.571 SNIP 2.216 CiteScore 9.64

ISI indexed (2012): ISI indexed no

ISI indexed (2011): ISI indexed no

Web of Science (2011): Indexed yes

Original language: English

DOIs:

10.1002/aenm.201501927

Source: PublicationPreSubmission

Source-ID: 122923770

Publication: Research - peer-review › Journal article – Annual report year: 2016