University of Groningen

Charge transfer excitons in low band gap polymer based solar cells and the role of processing additives

Scharber, Markus C.; Lungenschmied, Christoph; Egelhaaf, Hans-Joachim; Matt, Gebhard; Bednorz, Mateusz; Fromherz, Thomas; Gao, Jia; Jarzab, Dorota; Loi, Maria A.

Published in:
Energy & Environmental Science

DOI:
[10.1039/c1ee02181h](https://doi.org/10.1039/c1ee02181h)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2011

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Scharber, M. C., Lungenschmied, C., Egelhaaf, H.-J., Matt, G., Bednorz, M., Fromherz, T., Gao, J., Jarzab, D., & Loi, M. A. (2011). Charge transfer excitons in low band gap polymer based solar cells and the role of processing additives. *Energy & Environmental Science*, 4(12), 5077-5083.
<https://doi.org/10.1039/c1ee02181h>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Supplementary Information

Charge Transfer Excitons in Low Band gap Polymer based Solar Cells and the Role of Processing Additives

Markus C. Scharber*, Christoph Lungenschmied, Hans-Joachim Egelhaaf**

Konarka Austria, Altenbergerstrasse 69, A-4040 Linz, Austria

**Konarka Germany, Landgrabenstrasse 94, Nuremberg, Germany

Gebhard Matt, Mateusz Bednorz, Thomas Fromherz

Johannes Kepler University Linz, Altenbergerstrasse 69, A-4040 Linz, Austria

Jia Gao, Dorota Jarzab, Maria A. Loi*

Physics of Organic Semiconductors, Zernike Institute for Advanced Materials, University of Groningen, Nijenborgh 4, 9747 AG Groningen (The Netherlands)

* Correspondence: M.C. Scharber: mscharber@konarka.com

M.A. Loi: M.A.Loi@rug.nl

In Figure S1 the electroluminescence spectra of a PCPDT diode, PCPDT/PCBM devices processed with and without additive are compared. The measurement was performed with an Andor iDus InGaAs array detector attached to a Shamrock SR-303i monochromator. Due to the relatively lower detectivity compared to the Silicon CCD used in the experiments described in our article, a larger forward bias (1.6 V) a wide slit (2 mm) and relative long integration times (4 s) had to be applied. The electroluminescence of the PCPDT device is similar to the spectrum shown in Figure 4a) with a peak around 830 nm and a shoulder around 900 nm. The electroluminescence spectra of the devices with fullerenes are dominated by the emission peaking around 1100 nm. The emission of the device prepared with octane-dithiol is significantly lower compared to the device prepared without additive.

Figure S1: Electroluminescence Spectra of a PCPDT diode, PCPDT/PCBM diode and PCPDT/PCBM diode prepared with octane-dithiol. Applied bias voltage was 1.6 V. Integration time 4 seconds.