Organic Energy Materials - DTU Orbit (06/08/2018)
Organic Energy Materials
Department of Energy Conversion and Storage
Organisational unit: Section

Publications:

**Analysing impact of oxygen and water exposure on roll-coated organic solar cell performance using impedance spectroscopy**
Publication: Research - peer-review › Journal article – Annual report year: 2018

**A Novel Algorithm for Lifetime Extrapolation, Prediction, and Estimation of Emerging PV Technologies**
Publication: Research - peer-review › Journal article – Annual report year: 2018

**High stability of benzotriazole and benzodithiophene containing medium band-gap polymer solar cell**
Publication: Research - peer-review › Journal article – Annual report year: 2018

**Mechanical stability of roll-to-roll printed solar cells under cyclic bending and torsion**
Publication: Research - peer-review › Journal article – Annual report year: 2018

**METHOD AND APPARATUS FOR CHARACTERIZATION OF A SOLAR CELL**
Krebs, F. C. 16 Mar 2017
Publication: Research › Patent – Annual report year: 2017

**Analysis of electrical and thermal stress effects on PCBM:P3HT solar cells by photocurrent and impedance spectroscopy modeling**
Publication: Research - peer-review › Article in proceedings – Annual report year: 2017

**Application of Photocurrent Model on Polymer Solar Cells Under Forward Bias Stress**
Publication: Research - peer-review › Journal article – Annual report year: 2017

**Carbazole-based copolymers via direct arylation polymerization (DArP) for Suzuki-convergent polymer solar cell performance**
Gobalasingham, N. S., Ekiz, S., Pankow, R. M., Livi, F., Bundgaard, E. & Thompson, B. C. 2017 In : Polymer Chemistry. 8, 30, p. 4393-4402
Publication: Research - peer-review › Journal article – Annual report year: 2017

**Conjugated Polymers Via Direct Arylation Polymerization in Continuous Flow: Minimizing the Cost and Batch-to-Batch Variations for High-Throughput Energy Conversion**
Gobalasingham, N. S., Carlé, J. E., Krebs, F. C., Thompson, B. C., Bundgaard, E. & Helgesen, M. 2017 In : Macromolecular Rapid Communications. 38, 22, 7 p., 1700526
Publication: Research - peer-review › Journal article – Annual report year: 2017

**Cost-competitiveness of organic photovoltaics for electricity self-consumption at residential buildings: A comparative study of Denmark and Greece under real market conditions**
Development of outdoor luminescence imaging for drone-based PV array inspection
Publication: Research - peer-review › Article in proceedings – Annual report year: 2017

Development of outdoor luminescence imaging for drone-based PV array inspection
Publication: Research - peer-review › Paper – Annual report year: 2017

Embedded plasmonic nanoparticles in high refractive index TiOx matrix for photovoltaics applications
Pastorelli, F. 2017
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2017

Environmental impacts of electricity self-consumption from organic photovoltaic battery systems at industrial facilities in Denmark
Publication: Research - peer-review › Journal article – Annual report year: 2017

High definition in-situ electro-optical characterization for Roll to Roll printed electronics
Pastorelli, F. 2017
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2017

Highlights from the FP7 Project on Photovoltaics CHEETAH: More Power with Less Material
Publication: Research - peer-review › Article in proceedings – Annual report year: 2018

Highly Conformal Ni Micromesh as a Current Collecting Front Electrode for Reduced Cost Si Solar Cell
Publication: Research - peer-review › Journal article – Annual report year: 2017

In situ electrical and thermal monitoring of printed electronics by two-photon mapping
Publication: Research - peer-review › Journal article – Annual report year: 2017

Improving, characterizing and predicting the lifetime of organic photovoltaics: Topical Review
Publication: Research - peer-review › Journal article – Annual report year: 2017

Indoor measurement of angle resolved light absorption by antireflective glass in solar panels
Publication: Research - peer-review › Article in proceedings – Annual report year: 2017
Indoor Measurement of Angle Resolved Light Absorption by Black Silicon
Publication: Research - peer-review › Article in proceedings – Annual report year: 2017

In-line, roll-to-roll morphology analysis of organic solar cell active layers
Publication: Research - peer-review › Journal article – Annual report year: 2017

Inside or Outside? Linking Outdoor and Indoor Lifetime Tests of ITO-Free Organic Photovoltaic Devices for Greenhouse Applications
Publication: Research - peer-review › Journal article – Annual report year: 2016

Life-Cycle Assessment of Solar Charger with Integrated Organic Photovoltaics
Publication: Research - peer-review › Journal article – Annual report year: 2017

Luminescence Imaging Strategies for Drone-Based PV Array Inspection
Publication: Research - peer-review › Article in proceedings – Annual report year: 2017

Model of Organic Solar Cell Photocurrent Including the Effect of Charge Accumulation at Interfaces and Non-Uniform Carrier Generation
Publication: Research - peer-review › Journal article – Annual report year: 2017

New Light Source Setup for Angle Resolved Light Absorption measurement of PV sample
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2017

Overcoming the Scaling Lag for Polymer Solar Cells
Publication: Research - peer-review › Journal article – Annual report year: 2017

Printed organic smart devices characterized by nonlinear optical
Publication: Research - peer-review › Conference abstract in proceedings – Annual report year: 2017

Printed organic smart devices characterized by ultra-short laser pulses
Pastorelli, F. 2017
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2017

Quantification of solar cell failure signatures based on statistical analysis of electroluminescence images
Publication: Research - peer-review › Article in proceedings – Annual report year: 2017
Novel high band gap pendant-borylated carbazole polymers with deep HOMO levels through direct $^+\text{N}=\text{B}^-$ interaction for organic photovoltaics
Publication: Research - peer-review › Journal article – Annual report year: 2016

Operational stability of large scale OPV modules: interfaces, materials selection and stack design
Publication: Research › Ph.D. thesis – Annual report year: 2016

Outdoor fate and environmental impact of polymer solar cells through leaching and emission to rainwater and soil
Publication: Research - peer-review › Journal article – Annual report year: 2016

Playing with Light in Organic Thin-Film Solar Cells
Pastorelli, F. 2016
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2016

Playing with light in thin film organic materials: from nanoscale to smart windows
Pastorelli, F. 2016
Publication: Research - peer-review › Sound/Visual production (digital) – Annual report year: 2016

Polymer materials for roll coated solar cells: strategies to improve performance and stability
Publication: Research › Ph.D. thesis – Annual report year: 2017

Portable and wireless IV-curve tracer for >5 kV organic photovoltaic modules
Publication: Research - peer-review › Journal article – Annual report year: 2016

Printable luminescent down shifter for enhancing efficiency and stability of organic photovoltaics
Publication: Research - peer-review › Journal article – Annual report year: 2016

Role of Stress Factors on the Adhesion of Interfaces in R2R Fabricated Organic Photovoltaics
Publication: Research - peer-review › Journal article – Annual report year: 2016

Roll coated large area ITO- and vacuum-free all organic solar cells from diketopyrrolopyrrole based non-fullerene acceptors with molecular geometry effects
Publication: Research - peer-review › Journal article – Annual report year: 2016

Roll-coating fabrication of flexible organic solar cells: comparison of fullerene and fullerene-free systems
Publication: Research - peer-review › Journal article – Annual report year: 2016
Roll-to-Roll Printed Electronics for Standalone Smart Windows
Pastorelli, F. 2016
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2016

Roll-to-roll printed silver nanowires for increased stability of flexible ITO-free organic solar cell modules
Publication: Research - peer-review › Journal article – Annual report year: 2015

Screening of materials for OPV - finding the perfect candidate(s)
Bundgaard, E. 2016
Publication: Research - peer-review › Sound/Visual production (digital) – Annual report year: 2016

Self-Assembled Plasmonic Nanoparticles for Organic Photovoltaics
Pastorelli, F. 2016
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2016

Slot-Die-Coated V₂O₅ as Hole Transport Layer for Flexible Organic Solar Cells and Optoelectronic Devices
Publication: Research - peer-review › Journal article – Annual report year: 2016

The Influence of Conjugated Polymer Side Chain Manipulation on the Efficiency and Stability of Polymer Solar Cells
Publication: Research - peer-review › Journal article – Annual report year: 2016

Voltage and Thermally Driven High Current Roll-to-Roll Printed Transistors
Pastorelli, F. 2016
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2016

Which Electrode Materials to Select for More Environmentally Friendly Organic Photovoltaics?
Publication: Research - peer-review › Journal article – Annual report year: 2015

Air-processed organic tandem solar cells on glass: toward competitive operating lifetimes
Publication: Research - peer-review › Journal article – Annual report year: 2015

A model for the impact of the nanostructure size on its gas sensing properties
Publication: Research - peer-review › Journal article – Annual report year: 2015

An isoindigo containing donor-acceptor polymer: synthesis and photovoltaic properties of all-solution-processed ITO- and vacuum-free large area roll-coated single junction and tandem solar cells
Fullerene alloy formation and the benefits for efficient printing of ternary blend organic solar cells
Publication: Research - peer-review › Journal article – Annual report year: 2015

Improving organic tandem solar cells based on water-processed nanoparticles by quantitative 3D nanoimaging
Publication: Research - peer-review › Journal article – Annual report year: 2015

Influence of Functionality on Direct Arylation of Model Systems as a Route Toward Fluorinated Copolymers via Direct Arylation Polymerization (DaRP)
Publication: Research - peer-review › Journal article – Annual report year: 2015

Influence of Side Chain Position on the Electrical Properties of Organic Solar Cells Based on Dithienylbenzothiadiazole-alt-phenylene Conjugated Polymers
Publication: Research - peer-review › Journal article – Annual report year: 2015

Interfacial engineering of self-assembled monolayer modified semi-roll-to-roll planar heterojunction perovskite solar cells on flexible substrates
Publication: Research - peer-review › Journal article – Annual report year: 2015

Lifetime of organic photovoltaics: Linking outdoor and indoor tests
Publication: Research - peer-review › Journal article – Annual report year: 2015

Making Ends Meet: Flow Synthesis as the Answer to Reproducible High-Performance Conjugated Polymers on the Scale that Roll-to-Roll Processing Demands
Publication: Research - peer-review › Journal article – Annual report year: 2015

Matrix Organization and Merit Factor Evaluation as a Method to Address the Challenge of Finding a Polymer Material for Roll Coated Polymer Solar Cells
Publication: Research - peer-review › Journal article – Annual report year: 2015

Over 2 Years of Outdoor Operational and Storage Stability of ITO-free, Fully Roll-to-Roll Fabricated Polymer Solar Cell Modules
Publication: Research - peer-review › Journal article – Annual report year: 2015

Photochemical stability of random poly(3-hexylthiophene-co-3-cyanothiophene) and its use in roll coated ITO-free organic photovoltaics
Roth, B., Rudenko, A. E., Thompson, B. C. & Krebs, F. C. 2015 In : Journal of Photonics for Energy. 5, 1, 9 p., 057205
Publication: Research - peer-review › Journal article – Annual report year: 2015
Printed Energy Technologies: A Special Issue
Publication: Research › Editorial – Annual report year: 2015

Probing individual subcells of fully printed and coated polymer tandem solar cells using multichromatic opto-electronic characterization methods
Publication: Research - peer-review › Journal article – Annual report year: 2015

Roll and roll-to-roll process scaling through development of a compact flexo unit for printing of back electrodes
Publication: Research - peer-review › Journal article – Annual report year: 2015

Roll-Coated Fabrication of Fulleren-Free Organic Solar Cells with Improved Stability
Publication: Research - peer-review › Journal article – Annual report year: 2015

Roll-coating fabrication of ITO-free flexible solar cells based on a non-fullerene small molecule acceptor
Publication: Research - peer-review › Journal article – Annual report year: 2015

Roll-to-Roll Printed Silver Nanowire Semitransparent Electrodes for Fully Ambient Solution-Processed Tandem Polymer Solar Cells
Publication: Research - peer-review › Journal article – Annual report year: 2015

Round-Robin Studies on Roll-Processed ITO-free Organic Tandem Solar Cells Combined with Inter-Laboratory Stability Studies
Publication: Research - peer-review › Journal article – Annual report year: 2015

Scalable single point power extraction for compact mobile and stand-alone solar harvesting power sources based on fully printed organic photovoltaic modules and efficient high voltage DC/DC conversion
Publication: Research - peer-review › Journal article – Annual report year: 2015

Solution and vapour deposited lead perovskite solar cells: Ecotoxicity from a life cycle assessment perspective
Publication: Research - peer-review › Journal article – Annual report year: 2015

Structure and crystallinity of water dispersible photoactive nanoparticles for organic solar cells
Publication: Research - peer-review › Journal article – Annual report year: 2015
The Critical Choice of PEDOT: PSS Additives for Long Term Stability of Roll-to-Roll Processed OPVs
Publication: Research - peer-review › Journal article – Annual report year: 2015

The effect of mesomorphology upon the performance of nanoparticulate organic photovoltaic devices
Publication: Research - peer-review › Journal article – Annual report year: 2015

The effect of molecular geometry on the photovoltaic property of diketopyrrolopyrrole based non-fullerene acceptors
Publication: Research - peer-review › Journal article – Annual report year: 2015

The Solar Textile Challenge: How It Will Not Work and Where It Might
Publication: Research - peer-review › Journal article – Annual report year: 2015

Thiophene in Conducting Polymers: Synthesis of Poly(thiophene)s and Other Conjugated Polymers Containing Thiophenes, for Application in Polymer Solar Cells
Publication: Research - peer-review › Book chapter – Annual report year: 2014

Thiophene in Conducting Polymers: Synthesis of Poly(thiophene)s and Other Conjugated Polymers Containing Thiophenes, for Application in Polymer Solar Cells
Publication: Research - peer-review › Book chapter – Annual report year: 2014

Three dimensional corrugated organic photovoltaics for building integration; improving the efficiency, oblique angle and diffuse performance of solar cells
Publication: Research - peer-review › Journal article – Annual report year: 2015

Tin- and Lead-Based Perovskite Solar Cells under Scrutiny: An Environmental Perspective
Publication: Research - peer-review › Journal article – Annual report year: 2015

Trends In energy supply integration: Solar PV
Publication: Research - peer-review › Book chapter – Annual report year: 2015

Untitled
Publication: Research - peer-review › Editorial – Annual report year: 2015

Upscaling of Perovskite Solar Cells: Fully Ambient Roll Processing of Flexible Perovskite Solar Cells with Printed Back Electrodes
Publication: Research - peer-review › Journal article – Annual report year: 2015

25th Anniversary Article: Rise to Power – OPV-Based Solar Parks
Publication: Research - peer-review › Journal article – Annual report year: 2013
2D Characterization of OPV from Single and Tandem Cells to Fully Roll-to-Roll Processed Modules with and without Electrical Contact
Publication: Research - peer-review › Journal article – Annual report year: 2014

A comparative study of fluorine substituents for enhanced stability of flexible and ITO-free high-performance polymer solar cells
Publication: Research - peer-review › Journal article – Annual report year: 2014

All-Solution-Processed, Ambient Method for ITO-Free, Roll-Coated Tandem Polymer Solar Cells using Solution-Processed Metal Films
Publication: Research - peer-review › Journal article – Annual report year: 2014

A rational method for developing and testing stable flexible indium- and vacuum-free multilayer tandem polymer solar cells comprising up to twelve roll processed layers
Publication: Research - peer-review › Journal article – Annual report year: 2013

Carbon: The Ultimate Electrode Choice for Widely Distributed Polymer Solar Cells
Publication: Research - peer-review › Journal article – Annual report year: 2014

Comparison of additive amount used in spin-coated and roll-coated organic solar cells
Publication: Research - peer-review › Journal article – Annual report year: 2014

Cost analysis of roll-to-roll fabricated ITO free single and tandem organic solar modules based on data from manufacture
Publication: Research - peer-review › Journal article – Annual report year: 2014

Digital grayscale printing for patterned transparent conducting Ag electrodes and their applications in flexible electronics
Publication: Research - peer-review › Journal article – Annual report year: 2014

Editorial for the special issue dedicated to tandem solar cells based on organic and polymer materials
Publication: Research › Editorial – Annual report year: 2014

Efficient decommissioning and recycling of polymer solar cells: justification for use of silver
Publication: Research - peer-review › Journal article – Annual report year: 2014
Environmental impacts of global and regional electricity generation from 1980 to 2010: What can we learn for sound energy transition plannings?
Laurent, A. & Espinosa, N. 2014
Publication: Research - peer-review › Poster – Annual report year: 2014

Environmentally Printing Efficient Organic Tandem Solar Cells with High Fill Factors: A Guideline Towards 20% Power Conversion Efficiency
Publication: Research - peer-review › Journal article – Annual report year: 2014

Environmental sustainability of electricity supply in the world between 1980 and 2011: Lessons learnt and perspectives
Publication: Research - peer-review › Conference abstract in proceedings – Annual report year: 2014

Failure Modes and Fast Repair Procedures in High Voltage Organic Solar Cell Installations
Publication: Research - peer-review › Journal article – Annual report year: 2014

Fast Switching ITO Free Electrochromic Devices
Publication: Research - peer-review › Journal article – Annual report year: 2013

Flexible organic tandem solar modules with 6% efficiency: combining roll-to-roll compatible processing with high geometric fill factors
Publication: Research - peer-review › Journal article – Annual report year: 2014

From the Bottom Up – Flexible Solid State Electrochromic Devices
Publication: Research - peer-review › Journal article – Annual report year: 2014

Fully printed multi square meter large organic solar cell modules for real energy production
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2014

Generic roll-to-roll compatible method for insolubilizing and stabilizing conjugated active layers based on low energy electron irradiation
Helgesen, M., Carlé, J. E., Helt-Hansen, J., Miller, A. & Krebs, F. C. 2014 In : Journal of Applied Polymer Science. 131, 18 , 8 p., 40795
Publication: Research - peer-review › Journal article – Annual report year: 2014

High-Volume Processed, ITO-Free Superstrates and Substrates for Roll-to-Roll Development of Organic Electronics
Publication: Research - peer-review › Journal article – Annual report year: 2014

In situ monitoring of structure formation in the active layer of polymer solar cells during roll-to-roll coating
Publication: Research - peer-review › Journal article – Annual report year: 2014

Indium Tin Oxide-Free Polymer Solar Cells: Toward Commercial Reality
Predicting, categorizing and intercomparing the lifetime of OPVs for different ageing tests
Publication: Research - peer-review › Journal article – Annual report year: 2014

Roll-coating fabrication of flexible large area small molecule solar cells with power conversion efficiency exceeding 1%
Publication: Research - peer-review › Journal article – Annual report year: 2014

Roll-to-Roll Processing of Polymer Solar Cells
Publication: Research - peer-review › Book chapter – Annual report year: 2014

Round robin performance testing of organic photovoltaic devices
Publication: Research - peer-review › Journal article – Annual report year: 2014

Scalable, ambient atmosphere roll-to-roll manufacture of encapsulated large area, flexible organic tandem solar cell modules
Publication: Research - peer-review › Journal article – Annual report year: 2014

Scaling Up ITO-free solar cells
Publication: Research - peer-review › Journal article – Annual report year: 2014

Solution processed large area fabrication of Ag patterns as electrodes for flexible heaters, electrochromics and organic solar cells
Publication: Research - peer-review › Journal article – Annual report year: 2014

Solvent-resistant small molecule solar cells by roll-to-roll fabrication via introduction of azide cross-linkable group
Publication: Research - peer-review › Journal article – Annual report year: 2014

Spatial degradation mapping and componentwise degradation tracking in polymer-fullerene blends
Publication: Research - peer-review › Journal article – Annual report year: 2014

The influence of additives on the morphology and stability of roll-to-roll processed polymer solar cells studied through ex situ and in situ X-ray scattering
Publication: Research - peer-review › Journal article – Annual report year: 2014
Towards large-scale production of solution-processed organic tandem modules based on ternary composites: Design of the intermediate layer, device optimization and laser based module processing
Publication: Research › peer-review › Journal article – Annual report year: 2014

Upscaling from single cells to modules – fabrication of vacuum- and ITO-free polymer solar cells on flexible substrates with long lifetime
Publication: Research › peer-review › Journal article – Annual report year: 2014

Upscaling of Indium Tin Oxide (ITO)-Free Polymer Solar Cells: Performance, Scalability, Stability, and Flexibility
Publication: Research › Ph.D. thesis – Annual report year: 2014

Will organic photovoltaic technology render benefits in a 30-year horizon?
Publication: Research › peer-review › Conference abstract for conference – Annual report year: 2014

Worldwide outdoor round robin study of organic photovoltaic devices and modules
Publication: Research › peer-review › Journal article – Annual report year: 2014

Organic solar cells
Publication: Research › peer-review › Book chapter – Annual report year: 2013

Accurate characterization of OPVs: Device masking and different solar simulators
Publication: Research › peer-review › Journal article – Annual report year: 2013

Advanced Functional Polymers for Increasing the Stability of Organic Photovoltaics
Bundgaard, E., Helgesen, M., Carlé, J. E., Krebs, F. C. & Jørgensen, M. 2013 In : Macromolecular Chemistry and Physics. 214, 14, p. 1546-1558
Publication: Research › peer-review › Journal article – Annual report year: 2013

A laboratory scale approach to polymer solar cells using one coating/printing machine, flexible substrates, no ITO, no vacuum and no spincoating
Publication: Research › peer-review › Conference article – Annual report year: 2013

All polymer photovoltaics: From small inverted devices to large roll-to-roll coated and printed solar cells
Ambient roll-to-roll fabrication of flexible solar cells based on small molecules
Publication: Research - peer-review › Journal article – Annual report year: 2014

An Efficient Solution-Processed Intermediate Layer for Facilitating Fabrication of Organic Multi-Junction Solar Cells
Publication: Research - peer-review › Journal article – Annual report year: 2014

A novel benzodipyrrolidone-based low band gap polymer for organic solar cells
Yue, W., Huang, X., Yuan, J., Ma, W., Krebs, F. C. & Yu, D. 2013 In : Journal of Materials Chemistry A. 1, p. 10116-10119
Publication: Research - peer-review › Journal article – Annual report year: 2014

A photovoltaic module
Krebs, F. C. & Sommer-Larsen, P. 2013
Publication: Research › Patent – Annual report year: 2013

A round robin study of polymer solar cells and small modules across China
Publication: Research - peer-review › Journal article – Annual report year: 2013

Coating, Degrading and Testing of Organic Polymer Devices - Reducing the route from Laboratory to Production scale devices
Publication: Research › Ph.D. thesis – Annual report year: 2014

Comparison of Fast Roll-to-Roll Flexographic, Inkjet, Flatbed, and Rotary Screen Printing of Metal Back Electrodes for Polymer Solar Cells
Publication: Research - peer-review › Journal article – Annual report year: 2013

Comparison of Two Types of Vertically Aligned ZnO NRs for Highly Efficient Polymer Solar Cells
Publication: Research - peer-review › Journal article – Annual report year: 2012

Comparison of UV-Curing, Hotmelt, and Pressure Sensitive Adhesive as Roll-to-Roll Encapsulation Methods for Polymer Solar Cells
Publication: Research - peer-review › Journal article – Annual report year: 2013

Concentrated Light for Accelerated Photo Degradation of Polymer Materials
Publication: Research - peer-review › Journal article – Annual report year: 2014

Conductance Enhancement of InAs/InP Heterostructure Nanowires by Surface Functionalization with Oligo(phenylene vinylene)
Cyclopolymerization-derived block-copolymers of 4,4-bis(octyloxymethyl)-1,6-heptadiyne with 4,4- dipropargyl malonodinitrile for use in photovoltaics

Determining the coating speed limitations for organic photovoltaic inks

Development of polymers for large scale roll-to-roll processing of polymer solar cells

Direct Photopatterning of Electrochromic Polymers

Fast Inline Roll-to-Roll Printing for Indium-Tin-Oxide-Free Polymer Solar Cells Using Automatic Registration
Hösel, M., Søndergaard, R. R., Jørgensen, M. & Krebs, F. C. 2013 In : Energy Technology. 1, 1, p. 102-107

Flexible ITO-Free Polymer Solar Cells

Freely available OPV - The fast way to progress

High-temperature Thermoelectric Properties of Ca$_{0.9}$Y$_{0.1}$Mn$_{1-x}$Fe$_x$O$_3$ (0 ≤ x ≤ 0.25)

Industrialisation of polymer solar cells. Phase 2: Consolidation

Inkjet Printing of Back Electrodes for Inverted Polymer Solar cells
Interlaboratory outdoor stability studies of flexible roll-to-roll coated organic photovoltaic modules: Stability over 10,000 h
Publication: Research - peer-review › Journal article – Annual report year: 2013

It is all in the Pattern-High-Efficiency Power Extraction from Polymer Solar Cells through High-Voltage Serial Connection
Publication: Research - peer-review › Journal article – Annual report year: 2013

Large-scale Roll-to-Roll Fabrication of Organic Solar Cells for Energy Production
Publication: Research › Ph.D. thesis – Annual report year: 2014

Lengthening the lifetime of roll-to-roll produced polymer solar cells
Publication: Research › Ph.D. thesis – Annual report year: 2013

Low-Cost Upscaling Compatibility of Five Different ITO-Free Architectures for Polymer Solar Cells
Publication: Research - peer-review › Journal article – Annual report year: 2013

MoO3–Au composite interfacial layer for high efficiency and air-stable organic solar cells
Publication: Research - peer-review › Journal article – Annual report year: 2013

Morphology of polymer solar cells
Publication: Research › Ph.D. thesis – Annual report year: 2014

Multi-THz spectroscopy of mobile charge carriers in P3HT:PCBM on a sub-100 fs time scale
Publication: Research - peer-review › Conference article – Annual report year: 2013

Publication: Research - peer-review › Journal article – Annual report year: 2013

Optical coherence tomography (OCT) as a 3-dimensional imaging technique for non-destructive testing of roll-to-roll coated polymer solar cells
Publication: Research - peer-review › Article in proceedings – Annual report year: 2013

OPV for mobile applications: an evaluation of roll-to-roll processed indium and silver free polymer solar cells through analysis of life cycle, cost and layer quality using inline optical and functional inspection tools
Publication: Research - peer-review › Journal article – Annual report year: 2014
Slot-die Coating of a High Performance Copolymer in a Readily Scalable Roll Process for Polymer Solar Cells
Publication: Research - peer-review › Journal article – Annual report year: 2013

Synthesis and characterization of new electron-withdrawing moiety thieno[2,3-c]pyrrole-4,6-dione-based molecules for small molecule solar cells
Publication: Research - peer-review › Journal article – Annual report year: 2013

Synthesis and photovoltaic properties from inverted geometry cells and roll-to-roll coated large area cells from dithienopyrrole-based donor-acceptor polymers
Publication: Research - peer-review › Journal article – Annual report year: 2014

Technological status of organic photovoltaics (OPV)
Publication: Research - peer-review › Journal article – Annual report year: 2013

The state of organic solar cells-A meta analysis
Publication: Research - peer-review › Journal article – Annual report year: 2013

Towards 15% energy conversion efficiency: a systematic study of the solution-processed organic tandem solar cells based on commercially available materials
Publication: Research - peer-review › Journal article – Annual report year: 2013

Ultra high open circuit voltage (>1 V) of poly-3-hexylthiophene based organic solar cells with concentrated light
Publication: Research - peer-review › Journal article – Annual report year: 2013

Accelerated stability testing of organic photovoltaics using concentrated sunlight
Publication: Research - peer-review › Article in proceedings – Annual report year: 2012

Aesthetically Pleasing Conjugated Polymer: Fullerene Blends for Blue-Green Solar Cells Via Roll-to-Roll Processing
Publication: Research - peer-review › Journal article – Annual report year: 2012

All printed transparent electrodes through an electrical switching mechanism: A convincing alternative to indium-tin-oxide, silver and vacuum
Publication: Research - peer-review › Journal article – Annual report year: 2012

All solution processing of ITO-free organic solar cell modules directly on barrier foil
Publication: Research - peer-review › Journal article – Annual report year: 2012
Ambient fabrication of flexible and large-area organic light-emitting devices using slot-die coating
Publication: Research - peer-review › Journal article – Annual report year: 2012

A Nanoparticle Approach towards Morphology Controlled Organic Photovoltaics (OPV)
Publication: Research - peer-review › Journal article – Annual report year: 2012

Barrier Technology and Applications
Publication: Research - peer-review › Book chapter – Annual report year: 2012

Carbon dioxide - a themed issue
Krebs, F. C. 2012 In : Energy & Environmental Science. 5, 6, p. 7238-7239
Publication: Research - peer-review › Editorial – Annual report year: 2012

Characterization and Reporting of OPV Device Lifetime
Publication: Research - peer-review › Book chapter – Annual report year: 2012

Characterization of Thin Films for Polymer Solar Cells: Stability and Response to Concentrated Light
Publication: Research › Ph.D. thesis – Annual report year: 2012

Chemical and Physical Probes for Studying Degradation
Publication: Research - peer-review › Book chapter – Annual report year: 2012

Combined Characterization Techniques to Understand the Stability of a Variety of Organic Photovoltaic Devices - the ISOS-3 inter- laboratory collaboration
Publication: Research - peer-review › Conference article – Annual report year: 2012

Comparative studies of photochemical cross-linking methods for stabilizing the bulk hetero-junction morphology in polymer solar cells
Publication: Research - peer-review › Journal article – Annual report year: 2012

Comprehensive Investigation of Silver Nanoparticle/Aluminum Electrodes for Copper Indium Sulphide/Polymer Hybrid Solar Cells
Publication: Research - peer-review › Journal article – Annual report year: 2012

Concentrated Light for Organic Photovoltaics
Current Collecting Grids for ITO-Free Solar Cells

Degradation of Polymer-Based OPV

Direct Observation of Sub-100 fs Mobile Charge Generation in a Polymer-Fullerene Film

Effect of Solvent-Assisted Nanoscaled Organo-Gels on Morphology and Performance of Organic Solar Cells

Fine tuning the HOMO energy levels of polythieno[3,4-b]thiophene derivatives by incorporation of thiophene-3,4-dicarboxylate moiety for photovoltaic applications

Improved adhesion of metal oxide layer

Improved electron transport layer
Industrialization of Polymer Solar Cells – phase 1
Publication: Research › Report – Annual report year: 2013

Influence of processing and intrinsic polymer parameters on photochemical stability of polythiophene thin films
Publication: Research - peer-review › Journal article – Annual report year: 2012

Investigation of the degradation mechanisms of a variety of organic photovoltaic devices by combination of imaging techniques—the ISOS-3 inter-laboratory collaboration
Publication: Research - peer-review › Journal article – Annual report year: 2012

Large-scale roll-to-roll photonic sintering of flexo printed silver nanoparticle electrodes
Publication: Research - peer-review › Journal article – Annual report year: 2012

Low-temperature side-chain cleavage and decarboxylation of polythiophene esters by acid catalysis
Publication: Research - peer-review › Journal article – Annual report year: 2012

Manufacture and demonstration of organic photovoltaic-powered electrochromic displays using roll coating methods and printable electrolytes
Publication: Research - peer-review › Journal article – Annual report year: 2012

Method of making optoelectric devices
Publication: Research › Patent – Annual report year: 2012

Mobile charge generation dynamics in P3HT:PCBM observed by time-resolved terahertz spectroscopy
Publication: Research - peer-review › Article in proceedings – Annual report year: 2013

New Low-Bandgap Materials with Good Stabilities and Efficiencies Comparable to P3HT in R2R-Coated Solar Cells
Publication: Research - peer-review › Journal article – Annual report year: 2012

Nye solcelle på markedet – plastsolceller
Lauritzen, H. 2012
Publication: Communication › Sound/Visual production (digital) – Annual report year: 2012
On the origin of metallic conductivity at the interface of LaAlO3/SrTiO3
Publication: Research - peer-review › Conference article – Annual report year: 2012

On the stability of a variety of organic photovoltaic devices by IPCE and in situ IPCE analyses – the ISOS-3 inter-laboratory collaboration
Publication: Research - peer-review › Journal article – Annual report year: 2012

Photochemical stability of conjugated polymers, electron acceptors and blends for polymer solar cells resolved in terms of film thickness and absorbance
Publication: Research - peer-review › Journal article – Annual report year: 2012

Photovoltaics efficiency improvements
Publication: Research - peer-review › Report chapter – Annual report year: 2012

Polystolceller
Lauritzen, H. 2012
Publication: Communication › Sound/Visual production (digital) – Annual report year: 2012

Polystolceller
Lauritzen, H. 2012
Publication: Communication › Sound/Visual production (digital) – Annual report year: 2012

Plast solceller / fremtidens solcelle(r)
Lauritzen, H. 2012
Publication: Communication › Sound/Visual production (digital) – Annual report year: 2012

Polymer Solar Cells – Non Toxic Processing and Stable Polymer Photovoltaic Materials
Søndergaard, R. & Krebs, F. C. 2012 Department of Energy Conversion and Storage, Technical University of Denmark. 346 p. (Risø-PhD; No. 82(EN)).
Publication: Research › Ph.D. thesis – Annual report year: 2012

Polymer solar cells / OPV and their perspectives in our future fossil-free energy supply
Lauritzen, H. 2012
Publication: Research › Sound/Visual production (digital) – Annual report year: 2012

Polymer Solar Cells / OPV and their perspectives in our future fossil-free energy supply
Lauritzen, H. 2012
Publication: Research › Sound/Visual production (digital) – Annual report year: 2012

Polymersolceller
Publication: Communication › Book chapter – Annual report year: 2012
PROCESS OF ELECTRICAL CONNECTION OF PHOTOVOLTAIC DEVICES
Krebs, F. C. 2012
Publication: Research › Patent – Annual report year: 2012

Rapid flash annealing of thermally reactive copolymers in a roll-to-roll process for polymer solar cells
Helgesen, M., Carlé, J. E., Andreasen, B., Hösel, M., Normann, K., Søndergaard, R. & Krebs, F. C. 2012 In : Polymer Chemistry. 3, 9, p. 2649-2655
Publication: Research - peer-review › Journal article – Annual report year: 2012

Removal of Solubilizing Side Chains at Low Temperature: A New Route to Native Poly(thiophene)
Publication: Research - peer-review › Journal article – Annual report year: 2012

Roll-to-roll coated PBI membranes for high temperature PEM fuel cells
Publication: Research - peer-review › Journal article – Annual report year: 2012

Roll-to-roll fabrication of polymer solar cells
Publication: Research - peer-review › Journal article – Annual report year: 2012

Round-Robin Studies as a Method for Testing and Validating High-Efficiency ITO-Free Polymer Solar Cells Based on Roll-to-Roll-Coated Highly Conductive and Transparent Flexible Substrates
Publication: Research - peer-review › Journal article – Annual report year: 2012

Stability and Degradation of Organic and Polymer Solar Cells
Publication: Research - peer-review › Book – Annual report year: 2012

Stability and degradation of organic photovoltaics fabricated, aged, and characterized by the ISOS 3 inter-laboratory collaboration
Publication: Research - peer-review › Conference article – Annual report year: 2012

Stability of Polymer Solar Cells
Publication: Research - peer-review › Journal article – Annual report year: 2012
Status and perspectives in R&D in PV
Lauritzen, H. 2012
Publication: Research › Sound/Visual production (digital) – Annual report year: 2012

Synthesis and properties of poly(aryl sulfone benzimidazole) and its copolymers for high temperature membrane electrolytes for fuel cells
Publication: Research - peer-review › Journal article – Annual report year: 2012

The Different PV Technologies and How They Degrade
Publication: Research - peer-review › Book chapter – Annual report year: 2012

The role of fuel cells and electrolyzers in future efficient energy systems
Publication: Research - peer-review › Report chapter – Annual report year: 2012

The use of polyurethane as encapsulating method for polymer solar cells—An inter laboratory study on outdoor stability in 8 countries
Publication: Research - peer-review › Journal article – Annual report year: 2012

TOF-SIMS investigation of degradation pathways occurring in a variety of organic photovoltaic devices – the ISOS-3 inter-laboratory collaboration
Publication: Research - peer-review › Journal article – Annual report year: 2012

Polymers for organic photovoltaics based on 1,5-bis(2-hexyldecyloxy)-naphthalene, thiophene, and benzothiadiazole
Publication: Research - peer-review › Poster – Annual report year: 2012

Polymer Solar Cells
Krebs, F. C. & Lauritzen, H. 2011
Publication: Research › Sound/Visual production (digital) – Annual report year: 2012

Refined life-cycle assessment of polymer solar cells
Publication: Research - peer-review › Article in proceedings – Annual report year: 2012

Study of the behaviour of YSZ dispersions in water
Publication: Research › Poster – Annual report year: 2012
Fabrication and Processing of Polymer and Organic Solar Cells
Krebs, F. C. & Lauritzen, H. 2010
Publication: Research › Sound/Visual production (digital) – Annual report year: 2010

Polymer Solar Cells
Lauritzen, H. 2010
Publication: Research › Sound/Visual production (digital) – Annual report year: 2010

Integration of organic based Schottly junctions into crossbar arrays by standard UV lithography
Publication: Research - peer-review › Journal article – Annual report year: 2008

Synthesis and structural properties of 5,17-bis (N-methyl-N-arylaminocarbonyl)calix[4]arenes. Directing the substituents toward the cavity by use of the cis-generating property of the N-methylaminocarbonyl linker
Publication: Research - peer-review › Journal article – Annual report year: 1999

Projects:

DronEL
01/01/2017 → 31/12/2019
Project

Cost and energy effective all-black solar cell panel | Black Si BIPV | Phase 2
Poulsen, P. B., Thorsteinsson, S., Davidsen, R. S., Iandolo, B., Hansen, O., Riedel, N. & Benatto, G. A. D. R.
01/10/2016 → 30/09/2018
Project

High Current All Printed Transistors
Pastorelli, F.
01/05/2015 → ...
Project

CHEETAH FP7
Beliatis, M.
21/07/2014 → ...
Project

SMARTONICS FP7
Beliatis, M.
01/01/2013 → 01/08/2014
Project

Hybrid metal-graphene nanostructured materials for innovative plasmonic electrodes
Beliatis, M.
01/03/2012 → 01/03/2014
Project

Solar Hydrogen Fuel Production Station
Beliatis, M.
31/10/2011 → 01/09/2012
Project
Adiabatic Liquid Piston Compressed Air Energy Storage
Bang-Møller, C., Reinholdt, L., Elmegaard, B., Pedersen, A. S., Pedersen, A. H. & Crotogino, F.
01/03/2011 → ...
Project

Large-area Organic and Hybrid Solar Cells
Krebs, F. C. & Søndergaard, R. R.
01/09/2010 → 31/08/2014
Project

Danish-Chinese Center for Organic based Photovoltaic Cells with Morphology Control
31/08/2010 → 31/08/2016
Project

Polymer Solar Cells for Solar Energy Conversion
Krebs, F. C.
01/01/2008 → 31/12/2013
Project

Activities:

Advanced Concepts in Photovoltaics
Poulsen, P. B. (Organizer), Benatto, G. A. D. R. (Organizer), Schou, J. (Organizer)
10 Oct 2017 → 13 Oct 2017
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Progress in Photovoltaic Research in Denmark 2017
Poulsen, P. B. (Organizer), Benatto, G. A. D. R. (Organizer)
9 Oct 2017
Activity: Attending an event › Participating in or organising a conference

ISOS-8
Corazza, M. (Speaker)
1 Oct 2015
Activity: Talks and presentations › Conference presentations

IN SITU SMALL ANGLE STUDIES OF ROLL-TO-ROLL COATED PEROVSKITE SOLAR CELLS
Rossander, L. H. (Speaker)
14 Sep 2015
Activity: Talks and presentations › Conference presentations

In situ GISAXS/GIWAXS studies of roll-to-roll coated perovskite solar cells
Rossander, L. H. (Speaker)
10 Sep 2015
Activity: Talks and presentations › Conference presentations

Optical antennas, optical cavity and photonic crystals to enhance the performance of organic solar cells
Pastorelli, F. (Speaker)
2014
Activity: Talks and presentations › Conference presentations
Semitransparent Organic Solar Cell toward Opaque Performances
Pastorelli, F. (Speaker)
2014 → …
Activity: Talks and presentations › Conference presentations

Scalable Roll-to-Roll Fabrication for Fully Solution-Processed Polymer Solar Cells from Small-Scale Test Devices to Multi Square Meter Large Modules for Energy Production
Hösel, M. (Speaker)
3 Dec 2014
Activity: Talks and presentations › Conference presentations

ISOS-7
Corazza, M. (Speaker)
7 Oct 2014
Activity: Talks and presentations › Conference presentations

Massive scale production and installation of flexible printed solar cells
Hösel, M. (Speaker)
19 Sep 2014
Activity: Talks and presentations › Conference presentations

International Summer School on OPV
Corazza, M. (Speaker)
4 Sep 2014
Activity: Talks and presentations › Conference presentations

Will organic photovoltaic technology render benefits in a near future of a 30 years horizon?
Espinosa Martinez, N. (Lecturer)
12 May 2014
Activity: Talks and presentations › Conference presentations

Infinitely Large Organic Solar Cell Modules: At The Edge Of Traditional Territories For Power Supply
Espinosa Martinez, N. (Invited speaker)
16 Apr 2014
Activity: Talks and presentations › Conference presentations

Fully printed multi square meter large organic solar cell modules for real energy production
Hösel, M. (Speaker)
15 Apr 2014
Activity: Talks and presentations › Conference presentations

Outdoor Operational Stability of Indium-free Polymer Solar Cell Modules Investigated over 1 year
Angmo, D. (Speaker)
15 Apr 2014
Activity: Talks and presentations › Conference presentations

What is a solar cell
Corazza, M. (Lecturer)
27 Mar 2014
Activity: Talks and presentations › Conference presentations

Eurotech participants meeting
Corazza, M. (Speaker)
23 Jan 2014
Activity: Talks and presentations › Conference presentations
Light trapping with plasmonic oligomers and photonic crystals to enhance the performance of organic solar cells devices
Pastorelli, F. (Speaker)
2013 → …
Activity: Talks and presentations › Conference presentations

Plasmonic Oligomers studies to Enhance the Performance of Organic Solar Cells devices
Pastorelli, F. (Speaker)
2013 → …
Activity: Talks and presentations › Conference presentations

Eurotech participants meeting
Corazza, M. (Speaker)
17 Jul 2013
Activity: Talks and presentations › Conference presentations

Self assembled dimers of metallic nano-particles for enhanced light harvesting in organic solar cells
Pastorelli, F. (Speaker)
2012 → …
Activity: Talks and presentations › Conference presentations

Self assembled dimers of metallic nano-particles for enhanced light harvesting in organic solar cells
Pastorelli, F. (Speaker)
2012 → …
Activity: Talks and presentations › Conference presentations

Design and fabrication of broadband anti-reflection sub-wavelength periodic structure for solar cells
Pastorelli, F. (Speaker)
2010 → …
Activity: Talks and presentations › Conference presentations

Cimtec 2010
Lauritzen, H. (Speaker)
18 Jun 2010
Activity: Talks and presentations › Conference presentations

Prizes:

Best Poster Award at the Sustain 2017
Gisele Alves dos Reis Benatto (Recipient), Nicholas Riedel (Recipient), Claire Mantel (Recipient), Sune Thorsteinsson (Recipient), Peter Behrensdorf Poulsen (Recipient), Sören Forchhammer (Recipient), Kenn H. B. Frederiksen (Recipient), Jan Vedde (Recipient), Harsh Parikh (Recipient), Sergiu Spataru (Recipient) & Dezso Sera (Recipient), 6 Dec 2017
Prize: Prizes, scholarships, distinctions

Press clippings:

Article in ComputerWorld (DK)
Michael Corazza
02/01/2015
1 media contribution
Press / Media