

## Research Area F 'Nano-Energy'

### Project F1 'Organic Solar Cells'

#### F1.1 'New Concepts for Hybrid Solar Cells' (H. Kalt, U. Lemmer)

- [F1.1:1] \* ‡ H.J. Zhou, J. Fallert, J. Sartor, R.J.B. Dietz, C. Klingshirn, H. Kalt, D. Weissenberger, D. Gerthsen, H.B. Zeng, and W.P. Cai, *Ordered n-type ZnO nanorod arrays*, Appl. Phys. Lett. **92**, 132112 (2008)
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- [F1.1:3] A. Colsmann, F. Stenzel, G. Balthasar, H. Do, and U. Lemmer, *Plasma patterning of Poly(3,4-ethylenedioxythiophene): Poly(styrenesulfonate) anodes for efficient polymer solar cells*, Thin Solid Films **517**, 1750 (2009)
- [F1.1:4] H. Do, M. Reinhard, H. Vogeler, A. Pütz, M.F.G. Klein, W. Schabel, A. Colsmann, and U. Lemmer, *Polymeric anodes from poly(3,4-ethylenedioxythiophene): poly(styrenesulfonate) for 3.5% efficient organic solar cells*, Thin Solid Films **517**, 5900 (2009)
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- [F1.1:8] \* D. Weissenberger, D. Gerthsen, A. Reiser, G.M. Prinz, M. Feneberg, K. Thonke, H. Zhou, J. Sartor, J. Fallert, C. Klingshirn, and H. Kalt, *Influence of the measurement procedure on the field-effect dependent conductivity of ZnO nanorods*, Appl. Phys. Lett. **94**, 042107 (2009)
- [F1.1:9] \* J. Sartor, F. Maier-Flaig, J. Conradt, J. Fallert, H. Kalt, D. Weissenberger, and D. Gerthsen, *Modifying growth conditions of ZnO nanorods for solar cell applications*, phys. stat. sol. (c) **7**, 1583 (2010)
- [F1.1:10] F. Nickel, A. Puetz, M. Reinhard, H. Do, C. Kayser, A. Colsmann, and U. Lemmer, *Cathodes comprising highly conductive poly(3,4-ethylenedioxythiophene):poly(styrenesulfonate) for semi-transparent polymer solar cells*, Organic Electronics **11**, 535 (2010)
- [F1.1:11] S. Kettlitz, S. Valouch, and U. Lemmer, *Organic solar cell degradation probed by the nanosecond photoresponse*, Appl. Phys. A **99**, 805 (2010)
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- [F1.1:16] \* A. Puetz, T. Stubhan, M. Reinhard, O. Loesch, E. Hammarberg, S. Wolf, C. Feldmann, H. Kalt, A. Colsmann, and U. Lemmer, *Organic solar cells incorporating buffer layers from indium doped zinc oxide nanoparticles*, Sol. En. Mat. Sol. Cells **95**, 579 (2011)
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- [F1.1:18] N. Christ, S.W. Kettlitz, S. Züfle, S. Valouch, and U. Lemmer, *Nanosecond response of organic solar cells and photodiodes: Role of trap states*, Phys. Rev. B **83**, 195211 (2011)
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- [F1.1:20] ‡ M. Sanyal, B. Schmidt-Hansberg, M.F.G. Klein, A. Colsmann, C. Munuera, A. Vorobiev, U. Lemmer, W. Schabel, H. Dosch, and E. Barrena, *In-situ x-ray study of drying temperature influence on the structural evolution of bulk heterojunction polymer-fullerene solar cells processed by doctor-blading*, Adv. Energy Mat. **1**, 363 (2011).
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- [F1.1:26] ‡ F.M. Pasker, M.F.G. Klein, M. Sanyal, E. Barrena, U. Lemmer, A. Colsmann, and S. Höger, *Photovoltaic Response to Structural Modifications on a Series of Conjugated Polymers Based on 2-Aryl-2H-benzotriazoles*, J. Polymer Sci. A: Polymer Chem. **49**, 5001 (2011)
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- [F1.1:28] ‡ B. Schmidt-Hansberg, M. Sanyal, N. Grossiord, Y. Galagan, M. Baunach, M. F.G. Klein, A. Colsmann, P. Scharfer, Uli Lemmer, H. Dosch, J. Michels, E. Barrena, and W. Schabel, *Investigation of non-halogenated solvent mixtures for high throughput fabrication of polymer–fullerene solar cells*, Sol. En. Mat. Sol. Cells **96** 195 (2011)
- [F1.1:29] \* A. Colsmann, M. Reinhard, T.-H. Kwon, C. Kayser, F. Nickel, U. Lemmer, Noel Clark, J. Jasieniak, A. Holmes, and D. Jones, *Inverted semi-transparent organic solar cells with spray coated, surfactant free polymer top-electrodes*, Sol. En. Mat. Sol. Cells (2011), DOI:10.1016/j.solmat.2011.10.016 (2011)
- [F1.1:30] ‡ J.D. Yuen, R. Kumar, J. Seifert, S. Valouch, D. Zakhidov, D. Moses, U. Lemmer, A.J. Heeger, and F. Wudl, *Observations of PDDTT Subject to Thermal Treatment: Correlation between Performance and Order*, J. Am. Chem. Soc. **133**, 19602 (2011)

## F1.2 ,Electronic and Morphological Properties of Organic and Hybrid Solar Cells' (D. Gerthsen / U. Lemmer)

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*solution cast films for organic electronics*, Chemical and Process Engineering **50**, 509 (2011)

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### F1.3 ,Nanoscale Transparent Conductive Oxides‘ (C. Feldmann)

- [F1.3:1] E. Hammarberg, A. Prodi-Schwab, and C. Feldmann, *Microwave-assisted Synthesis of  $In_2O_3:Sn$  (ITO) Nanocrystals in Polyol Media and Transparent, Conductive Layers thereof*, *Thin Solid Films* **516**, 7437 (2008)
- [F1.3:2] E. Hammarberg, Anna Prodi-Schwab, and C. Feldmann, *Microwave-assisted Polyol Synthesis of Aluminium- and Indium-doped ZnO Nanocrystals*, *J. Colloid Interface Sci.* **334**, 29 (2009)
- [F1.3:3] A. Luz and C. Feldmann, *Reversible Photochromatic Effect and Electrochemical Voltage driven by Light-induced  $Bi^0$ -Formation*, *J. Mater. Chem.* **19**, 8107 (2009)
- [F1.3:4] H. Goesmann and C. Feldmann, *Nanoparticulate Functional Materials (Review)*, *Angew. Chem. Int. Ed.* **49**, 1362 (2010)
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- [F1.3:8] P. Schmitt, N. Brem, S. Schunk, and C. Feldmann, *Polyol-mediated Synthesis of Nanoscale Molybdates/Tungstates and Its Properties: Color, Luminescence, Catalysis*, *Adv. Funct. Mater.* **21**, 3037 (2011)
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- [F1.3:10] \* C. Kind, C. Feldmann, A. Quintilla, and E. Ahlswede, *Citrate-capped  $Cu_{11}In_9$  Nanoparticles and Its Use for Thin-film Manufacturing of CIS Solar Cells*, *Chem. Mater.* **23**, 5269 (2011)
- [F1.3:11] H. Dong and C. Feldmann, *Porous ZnO Platelets via controlled thermal Decomposition of Zinc Glycerolate*, *J. Alloys Comp.* **513**, 125 (2012)
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## Project F2 'Nanomaterials for Fuel Cells'

### F2.1 'Nanostructured Functional Layers for Advanced Oxygen Separation Membranes' (D. Gerthsen / E. Ivers-Tiffée)

- [F2.1:1] ‡ M. Burriel, C. Niedrig, W. Menesklou, S.F. Wagner, J. Santiso, and E. Ivers-Tiffée, *BSCF epitaxial thin films: Electrical transport and oxygen surface exchange*, *Solid State Ionics* **181**, 602 (2010)
- [F2.1:2] \* P. Müller, L. Dieterle, E. Müller, H. Störmer, D. Gerthsen, C. Niedrig, S. Taufall, S.F. Wagner, and E. Ivers-Tiffée, *Ba<sub>0.5</sub>Sr<sub>0.5</sub>Co<sub>0.8</sub>Fe<sub>0.2</sub>O<sub>3-δ</sub> for Oxygen Separation Membranes*, *ECS Transactions* **28**, 309 (2010)
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- [F2.2:1] C. Peters, M. Bockmeyer, R. Krüger, A. Weber, and E. Ivers-Tiffée, *Processing of Dense Nanocrystalline Zirconia Thin Films by Sol-Gel Method*, Mater. Res. Soc. Symp. Proc. Vol. **928**, 0928-GG16-01 (2006)
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- [F2.2:3] B. Rüter, A. Weber, and E. Ivers-Tiffée, *3D-Modelling and Performance Evaluation of Mixed Conducting (MIEC) Cathodes*, ECS Transactions **7**, 2065 (2007)
- [F2.2:4] A. Leonide, V. Sonn, A. Weber, and E. Ivers-Tiffée, *Evaluation and modeling of the cell resistance in anode-supported solid oxide fuel cells*, J. Electrochem. Soc. **155**, B36 (2008)
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## Project F3 'Nanomaterials for Lithium-Ion Batteries'

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