

**MATERIALS RESEARCH SOCIETY**  
**SYMPOSIUM PROCEEDINGS VOLUME 871**

# **Organic Thin-Film Electronics**

March 28 – April 1, 2005  
San Francisco, California, USA

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571  
[www.proceedings.com](http://www.proceedings.com)

ISBN: 1-55899-825-X

**Some format issues inherent in the e-media version may also appear in this print version.**

CAMBRIDGE UNIVERSITY PRESS  
Cambridge, New York, Melbourne, Madrid, Cape Town,  
Singapore, São Paulo, Delhi, Tokyo, Mexico City

Cambridge University Press  
32 Avenue of the Americas, New York, NY 10013-2473, USA

[www.cambridge.org](http://www.cambridge.org)

Materials Research Society  
506 Keystone Drive, Warrendale, PA 15086  
<http://www.mrs.org>

©Materials Research Society 2027

This publication is in copyright. Subject to statutory exception  
and to the provisions of relevant collective licensing agreements,  
no reproduction of any part may take place without the written  
permission of Cambridge University Press.

First published 2027

CODEN: MRSPDH

ISBN: 3/77: ; /: 47/Z

Cambridge University Press has no responsibility for the persistence or  
accuracy of URLs for external or third-part Internet Web sites referred to  
in this publication and does not guarantee that any content on such Web sites  
is, or will remain, accurate or appropriate.

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## TABLE OF CONTENTS

- 1 Functionalized Regioregular Polyalkylthiophenes for Biosensing Applications**  
*Brown, Stewart; Eccleston, Bill; Higgins, Simon; Mouffouk, Fouzi; Reeman, Stuart; Sedghi, Naser*
- 6 Stability in OTFT Gas Sensors**  
*Frechet, Jean; Heeney, Martin; Lee, Josephine; Liu, Jinsong; McCulloch, Iain; Murphy, Amanda; Subramanian, Vivek; Tierney, Steve*
- 12 Modeling of Spin Injection and Spin Transport Properties in Organic and Inorganic Semiconductors**  
*Albrecht, J. D.; Ruden, P. P.; Smith, D. L.*
- 18 Large Magnetoresistance at Room Temperature in Organic Semiconductor Sandwich Devices**  
*Francis, Thomas; Mermer, Omer; Nguyen, Tho; Sheng, Yugang; Veeraraghavan, Govindarajan; Wohlgenannt, Markus*
- 24 High-Temperature Operation of Pentacene Field-Effect Transistors with Polyimide Gate Insulators**
- 37 Organic-Inorganic Hybrid Encapsulation for P3HT Field-Effect Transistors**  
*Kasahara, Jiro; Kawashima, Noriyuki; Nomoto, Kazumasa; Wada, Masaru*
- 43 Organic Thin Film Transistors with Contacts Printed from Metal Nanoparticles**  
*Gardner, Sandra; Li, Yuning; Ong, Beng; Wu, Yiliang*
- 49 Highly Efficient Multifunctional Phosphorescent Dendrimers Consisting of an Iridium-Complex Core and Charge-Transporting Dendrons for Organic Light-Emitting Devices**  
*Shirasawa, Nobuhiko; Suzuki, Toshiyasu; Tokito, Shizuo; Tsuzuki, Toshimitsu*
- 55 Substituted Indolo[3,2-b]Carbazoles: A New Class of Stable, High Mobility Organic Semiconductors for Thin Film Transistors**  
*Li, Yuning; Ong, Beng; Wu, Yiliang*
- 61 Molecular Dielectric Multilayers for Ultra-Low-Voltage Organic Thin Film Transistors.**  
*Facchetti, Antonio; Marks, Tobin; Yoon, Myung-Han*

- 67 Control of Thin Film Transistor Operations with Polar Self-Assembled Monolayers**  
*Iwasa, Yoshi;Kobayashi, Shin-ichiro;Kubozono, Yoshihiro;Mitani, Tadaoki;Nishikawa, Takao;Shimoda, Tatsuya;Takenobu, Taishi*
- 73 Orientation of Organic Semiconductor Films on Photoreactive Polyimide Films**  
*LC group*
- 79 Fullerene Based n-type Organic Thin-Film Transistors**  
*Domercq, Benoit;Haddock, Joshua;Kippelen, Bernard*
- 85 Structural Characterization of a Functionalized Organic Semiconductor**  
*Bao, Zhenan;Chabal, Yves;Katz, Howard;Kortan, Refik;Rivillon, Sandrine;Stickle, Melissa*
- 91 Effective Dopant Analysis for the High Performance Poly(3-Hexylthiophene) Field-Effect Transistors**  
*Kawamura, Shinichi*
- 97 Organic Field Effect Transistors Based on Multilayer Films via Molecular Layer Epitaxy.**  
*Ofir, Yuval;Schwartzglass, Offer;Shappir, Joseph;Yitzchaik, Shlomo*
- 103 Electroluminescence Spectral Imaging in Polymer Blend Light Emitting Diodes**  
*Kamata, Toshihide;Takada, Noriyuki;Tsutsumi, Kiyohiko*
- 108 Influence of Cavity Q-factor on Near-Infrared Emitting Microcavity Organic Light Emitting Diodes**  
*Chan, Wai Kin;Cheah, Kok Wai;Cheung, Chi Hang;Chui, Po Ching;Djurišić, Aleksandra B.;Kwong, Chung Yin;Liu, Zhengtong;Tam, Hoi Lam*
- 114 Time Dependent Parallel Resistance in an Organic Schottky Contact**  
*Fok, Chi Wah Eddie;Madden, John;Takshi, Arash;Warren, Mya*
- 120 The Effect of Oxygen Exposure on Pentacene Thin Film Electronic Structure**  
*Arfaoui, Imad;Jurchescu, Oana;Koch, Norbert;Niemax, Jens;Palstra, Thomas;Pflaum, Jens;Rabe, Jürgen;Rudolf, Petra;Salzmann, Ingo;Vollmer, Antje*
- 126 Nanoscale Measurements of Electronic Properties in Organic Thin Film Transistors**  
*Chan, Calvin;Kahn, Antoine;Roichmann, Yohai;Rosenwaks, Yossi;Tal, Oren;Tessler, Nir*
- 132 Turn-on and Charge Build-up Dynamics in Polymer Field Effect Transistors**  
*Roichmann, Yohai;Tessler, Nir*

- 138 Enhanced Mobility of Organic Field-Effect Transistors with Epitaxially Grown C60 Film by in-situ Heat Treatment of the Organic Dielectric**  
*Singh, Birendra*
- 146 Organic CMOS Technology Based on Interface Doped Pentacene**  
*Ahles, Marcus;Schmechel, Roland;von Seggern, Heinz*
- 152 Power Dependence and Turn-on Dynamics of Polymer Photocells - Extracting Mobilities**  
*Rappaport, Noam;Tessler, Nir*
- 158 A Structural Investigation of Polypyrrole as a Function of Oxidation State**  
*Madden, John;Warren, Mya*
- 164 Pentacene Transistors with Polymer Gate Dielectrics on Metallized Optical Fibers**  
*Jimmy Granstrom, Bell Laboratories, Lucent Technologies, Murray Hill, New Jersey, 07974*  
*Howard E. Katz, Bell Laboratories, Lucent Technologies, Murray Hill, New Jersey, 07974*
- 177 Novel Dielectric Materials for Organic Electronics**  
*Facchetti, Antonio;Marks, Tobin;Yan, He;Yoon, Myung-Han*
- 183 Modeling the Organic Thin Film Transistors**  
*Dimmler, Klaus;Grigas, Michelle;Mohapatra, Siddharth;Olariu, Viorel;Rotzoll, Robert;Wenz, Robert*
- 189 Tuning of Metal Work Function with Self-assembled Monolayers**  
*B. de Boer, A. Hadipour, M. M. Mandoc, P. W. M. Blom*
- 197 Advanced Characterization of the Electronic Structure of MEH-PPV**  
*David Keith Chambers and Sandra Selmic*
- 203 A New Bis-Cyclometalated Iridium (III) Complex as a Triplet Emitter in Organic Light Emitting Devices**  
*Byun, Younghun;Das, Rupasree;Han, Eun Sil;Kim, Heekyung;Kim, Mu-Gyeong;Kim, Myeong-Suk;Kwon, Ohyun;Lyu, Yi-Yeol;Park, Jong-Jin;Pu, Lyongsun*
- 208 Interfacial electronic states of TNAP thin film deposited on metal substrates**  
*Kaname Kanai*
- 214 The Effect of Atmospheric Doping on the Interfacial Electronic Structure of Phthalocyanine Thin Films as Studied by UPS**  
*Nishi, Toshio*
- 220 Large-Area Wet Micro-Printing (LAMP) for Organic Device Patterning**  
*Jin, Hongzheng;Sturm, James*

- 226 A General Synthetic Approach to Novel Bis(tetracenyl) Aromatics for OFET Application**  
*Michael Roth and Matthias Rehahn*
- 232 Optimization of Organic Solar Cells and Photodetectors Based on Pentacene Thin Films**  
*Domercq, Benoit; Kippelen, Bernard; Yoo, Seunghyup*
- 238 Radiotracer Diffusion Measurements of Noble Metal Atoms in Semiconducting Organic Films.**  
*Adelung, Rainer; Faupel, Franz; Kanzow, Jörn; Meyer, Stephan; Pflaum, Jens; Rätzke, Klaus; Scharnberg, Michael*
- 245 An efficient polymeric light-emitting device with aluminum cathode**  
*Deng Xianyu*
- 251 Photoresponse Of Organic Field-Effect Transistors Based On Soluble Semiconductors And Dielectrics**  
*Günes, Serap; Marjanovic, Nenad; Neugebauer, Helmut; Sariciftci, Niyazi Serdar; Singh, Th. Birendra*
- 257 Systematic Modification of Indium Tin Oxide to Enhance Diode Device Behavior**  
*Bernasek, Steven; Guo, Jing; Koch, Norbert; Schwartz, Jeffrey*
- 263 Effects of polarized organosilane self-assembled monolayers on organic single-crystal field-effect transistors**  
*J. Takeya<sup>1</sup>, T. Nishikawa<sup>2,3,4</sup>, T. Takenobu<sup>2,3</sup>, H. Shimotani<sup>2,3</sup>, S. Kobayashi<sup>2,3</sup>, T. Mitani<sup>4</sup>, and Y. Iwasa<sup>2,3</sup>*
- 269 Charge Carrier Mobility Measurements in Tetracene Single Crystals**  
*Pflaum, Jens*
- 275 Organic - based Magnetic Thin Films by Low Temperature CVD**  
*Ruth Shima Edelstein,<sup>1</sup> Jung-Woo Yoo,<sup>1</sup> N. P. Raju,<sup>1</sup> Jeremy D. Bergeson,<sup>1</sup> Konstantin I. Pokhodnya<sup>1,2</sup>, Joel S. Miller,<sup>2</sup> and Arthur J. Epstein<sup>1</sup>*
- 281 Mechanical Properties of Oligothiophene Self Assembled Films by Atomic Force Microscopy.**  
*Frechet, Jean; Liddle, Alex; Murphy, Amanda; Neaton, Jeff; Ratera, Imma; Salmeron, Miquel; Schmidt, Gerard*
- 287 Organic Thin-Film Transistor Sensors: Interface Dependent and Gate Bias Enhanced Responses**  
*Maria C. Tanese<sup>1</sup>; Daniel Fine<sup>2</sup>; Ananth Dodabalapur<sup>2</sup>; Luisa Torsi<sup>1</sup>*
- 293 Effects of Various Types of Doping on the Electronic Structure of Organic Interfaces**  
*Ikame, Tadanobu; Ishii, Hisao; Kanai, Kaname; Nishi, Toshio; Seki, Kazuhiko; Tanaka, Senku*

- 299 Dielectric Properties of Electrostatic Self-Assembled (ESA) Films**  
*Asmatulu, Ramazan; Claus, Richard; Geist, Brian; Spillman, William, Jr.*
- 305 Dual-Gate SiO<sub>2</sub>/P3HT/SiN<sub>x</sub> OTFT**  
*Koul, Sarswati; Li, Flora; Nathan, Arokia; Servati, Peyman; Vygranenko, Yuri*
- 311 Fabrication of RR-P3HT-based TFTs using low-temperature PECVD silicon nitride passivation**  
*koul, sarswati*
- 317 Dielectrics for Organic Transistors with Low Threshold Voltage**  
*Brill, Jochen; Goettling, Silke; Margallo Balbás, Eduardo*
- 323 Flexible Pentacene/PMMA Thin-Film Transistors Fabricated on Aluminium Foil Substrates**  
*Puigdollers, Joaquim*
- 329 Optical interference as a tool to describe the spectral changes created by a tunable and controllable excitons confinement**  
*Christophe Féry, Salvatore Ciná, Henri Doyeux, Bernard Geffroy, Christine Denis, Pascal Maise*
- 335 Highly Transparent and Conductive CdO Thin Films as Anodes for Organic Light-Emitting Diodes**  
*Huang, Qinglan; Jin, Shu; Marks, Tobin; Metz, Andrew; Ni, Jun; Wang, Lian; Yang, Yu*
- 341 Single-Walled Carbon Nanotube Composites as Hole Injection Layer for Organic Light Emitting Diode Applications**  
*Chan, Wai Kin; Cheung, Chi Hang; Chuui, P. C.; Djurišić, Aleksandra B.; Kwong, Chung Yin; Oey, Ching Ching*
- 347 Spectroscopic Ellipsometry of the Optical Functions of Some Widely Used Organic Light Emitting Diodes (OLEDs) Materials.**  
*Chan, Wai Kin; Cheung, Chi Hang; Chui, Po Ching; Djurišić, Aleksandra B.; Kwong, Chung Yin; Liu, Z. T.; Oey, Ching Ching*
- 353 Photoelectron Spectroscopy Investigation of Interface Formation Between poly(2-methoxy-5-(2'-ethyl-hexyloxy)-1,4-phenylene vinylene) and Aluminum**  
*Demirkan, Korhan; Mathew, Anoop; Opila, Robert*
- 359 Inorganic Nanowire Light-Emitting Diodes in Organic Films**  
*Koenenkamp, Rolf; Schlegel, Christoph; Word, Robert*
- 364 Transverse Electrical Transport in Pentacene Photodiodes**  
*Alcubilla, Ramon; Bisquert, Juan; Fabregat, Francisco; Fonrodona, Marta; Garcia, Germa; Martin, Isidro; Orpella, Albert; Puigdollers, Joaquim; Vetter, Michael; Voz, Cristobal*

- 370 ELECTRICAL PROPERTIES OF ITO/CdSe/P3OT/Metal HETEROJUNCTION**  
*Oscar H.Salinas\*,1, Hailin Hu1, Ma.Elena Nicho-Díaz2, Cecilia López-Mata1,3, Oscar Gomez-Daza1.*
- 376 Programmable Conductance Switching and Negative Differential Resistance in Nanoscale Organic Films**  
*Graves-Abe, Troy;Sturm, James*
- 381 Memory Effect in the Current-Voltage Characteristics of Diodes based on PEDOT:PSS**  
*Liu, Zhengchun;Su, Yi;Varahramyan, Kody;Xue, Fengliang*
- 387 New Conjugated Polymers Derived from Carbazole as Thermoelectric Materials**  
*Blouin, Nicolas;Gao, Xing;Klug, Dennis;Leclerc, Mario;Lévesque, Isabelle;Morin, Jean-François;Ratcliffe, Christopher;Tse, John*
- 393 Water-Soluble Paracyclophane Fluorophores with Large Two-Photon Action Cross Sections**  
*Woo, Han Young*
- 399 Microscopic Morphology of Thin Films of Phthalocyanine/Perylene Tetracarboxyldiimide Blends for Organic Solar Cell Devices**  
*Bayot, Vincent;De Cupere, Vinciane;Geerts, Yves;Lazzaroni, Roberto;Melinte, Sorin;Serban, Dana;Viville, Pascal;Vlad, Alexandru;Zucchi, Gael*
- 405 Characterization for Organic Solid Solution and Formation of Organic Electronics**  
*Shao, Yan;Yang, Yang*
- 411 OLED degradation described by using a time-dependent local relaxation model**  
*Cina, Salvatore*
- 417 Light-emitting polymerizable liquid crystals: Micron scale photolithographic patterning and green electroluminescence.**  
*Aldred, Matthew;Contoret, Adam;Devine, Peter;Farrar, Simon;Hudson, Robert;Kelly, Stephen;Koch, Gene;O'Neill, Mary;Tsoi, Wing;Vlachos, Panos;Woon, Kai*
- 422 A Rapid Evaluation Method to Assess Organic Film Uniformity in Roll-to-Roll Manufactured OLEDs.**  
*Duggal, Anil;Faircloth, Tami;Grande, James;Otero, Maria;Rogojevic, Svetlana;Shiang, Joseph;Tait, Robert*
- 428 13.56 MHz Organic Transistor based Rectifier Circuits for RFID Tags**  
*Dimmler, Klaus;Dodabalapur, Ananth;Grigas, Michelle;Mohapatra, Siddharth;Olariu, Viorel;Rotzoll, Robert;Shchekin, Oleg;Wenz, Robert*



**434 Integrated Complementary-Like Circuits Based on Organic Ambipolar Transistors**

*Anthopoulos, Thomas;Blom, Paul;Cantatore, Eugenio;Hummelen, Jan;Leeuw, Dago;Setayesh, Sepas;Tanase, Cristinal*