

MATERIALS RESEARCH SOCIETY
SYMPOSIUM PROCEEDINGS VOLUME 965

Organic Electronics: Materials, Devices, and Applications

November 27 – December 1, 2006
Boston, Massachusetts, USA

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571
www.proceedings.com

ISBN: 978-1-60423-417-6

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

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

©Materials Research Society 2028

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 2028

CODEN: MRSPDH

ISBN: ; 9: /3/82645/639/8

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
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

Photoluminescence and Electroluminescence in Combination of Rare-Earth Metal Complexes and Phosphorescent Molecules	1
<i>Z. Kin, Y. Hino, H. Kajii, Y. Hasegawa, T. Kawai, Y. Ohmori</i>	
Molecular-Wetting Control by Ultrasoother Pentacene Buffer for High-Crystallinity Organic Field-Effect Transistors	7
<i>K. Itaka, M. Yamashiro, J. Yamaguchi, M. Haemori, S. Yaginuma, Y. Matsumoto, H. Koinuma</i>	
An Investigation of Au-Ag Interface Formed by Cold Welding Using Focused Ion Beam/Transmission Electron Microscopy	13
<i>Y. Cao, N. Yao, K. McIlwrath, J. Zhou, G. Osinkolu, W. O. Soboyejo</i>	
Electronic Structure of Ionic Liquids Studied by UV Photoemission and Inverse Photoemission Spectroscopy	19
<i>T. Nishi, Y. Kamizuru, K. Kanai, Y. Ouchi, K. Seki</i>	
Using Atomic Steps to Control Pentacene Crystal Orientation Texture	25
<i>V. Ignatescu, J. C. M. Hsu, A. C. Mayer, J. M. Blakely, G. G. Malliaras</i>	
Highly Reproducible Electric Bistability in an Organic Single Layer Device with Ag Top Electrode	31
<i>M. Terai, K. Fujita, T. Tsutsui</i>	
Very High On/Off Ratio in Vertical-Type Metal-Base Organic Transistors	37
<i>K. I. Nakayama, M. Yokoyama</i>	
Water-Soluble Conjugated Polyelectrolytes with Molecular Bumper for Efficient FRET Biosensor	40
<i>H. Y. Woo, D. Vak, G. C. Bazan</i>	
Soft Lithography Fabrication of Fully Flexible and Transparent all Organic FETs for Large Area Applications	46
<i>P. Cosseddu, E. Orgiu, A. Bonfiglio</i>	
Availability of Liquid Crystalline Materials for Organic Polycrystalline Semiconductor Thin Films	53
<i>H. Iino, J. I. Hanna</i>	
Dependency of Nonvolatile Memory Behavior on Curing Temperature for Au Nanocrystals Embedded in PVK	59
<i>B. Han, C. K. Lee, J. S. Kwon, I. C. Na, J. Park, Y. M. Kim</i>	
Electronic Structure of Defects in Fcc-C22	64
<i>H. S. Domingos</i>	
Self Organization in Thin Films of a Substituted Perylene Imide with a Twisted Aromatic Core	69
<i>H. Graaf, C. C. Matheus, D. Schlettwein</i>	

Reliability Study of a Fluorescent Blue Organic Light-Emitting Device	75
<i>J. H. Lee, Y. H. Ho, T. C. Lin, C. F. Wu</i>	
Novel Organic Light-Emitting Transistors with PN-Hetero-Boundary Carrier Recombination Sites Fabricated by Lift-off Patterning of Organic Semiconductor Thin Films	81
<i>N. Sugauma, N. Shimoji, Y. Oku, K. Matsushige</i>	
O₂ Plasma Treatment of Al Layer on Metal Anode to Improve the Performance of Organic Light-Emitting Devices	87
<i>S. H. Lee, D. W. Shin, S. J. Kim, Y. H. Kang, G. S. Lee, J. Park</i>	
Electrochemical Deposition of End-Capped Triarylamine and CBP Dendrimers: Alternate Technique for the Fabrication of Organic Light-Emitting Devices	93
<i>H. J. Son, W. S. Han, J. Y. Chun, K. R. Wee, D. H. Kim, K. W. Lee, H. J. Jung, C. Lee, J. Ko, S. O. Kang</i>	
The Impact of Capping on the Mobility and Thermal Stability of Organic Thin Film Transistors	97
<i>S. Meyer, S. Sellner, F. Schreiber, H. Dosch, G. Ulbricht, M. Fischer, B. Gompf, J. Pflaum</i>	
Modeling the Capacitance-Voltage Characteristics of Organic Schottky Diode in the Forward Bias	103
<i>K. Y. Chiang, H. Y. Tseng, C. Y. Lin, C. P. Kung, W. H. Hou</i>	
A Classic Molecular Semiconductor Revisited: New Aspects of Growth Mode and Conduction Characteristics in Thin Films of Phthalocyaninatozinc (PcZn)	109
<i>H. Brinkmann, D. Schlettwein</i>	
In-Plane Structure and Polymorphism of Pentacene Thin Films	115
<i>T. Kakudate, N. Yoshimoto, Y. Saito</i>	
Exciton and Defect Photoluminescence Signatures in Single Crystal Rubrene	121
<i>O. Mitrofanov, D. V. Lang, C. Kloc, T. Siegrist, W. Y. So, M. A. Sergent, A. P. Ramirez</i>	
Transition from Non-Dispersive to Dispersive Hole Transport in a Small Molecule Organic	126
<i>A. Fleissner, H. Schmid, C. Melzer, R. Schmechel, H. von Seggern</i>	
Perylene Diimide as the Black-Layer Material of the OLEDs	132
<i>J. H. Lee, K. H. Chuang, Y. H. Ho, C. F. Lin, C. C. Chao, M. Leung, C. Y. Li, H. L. Chen</i>	
Organic Field-Effect Based Devices for Pressure Detection	137
<i>I. Manunza, A. Bonfiglio</i>	
Development of Flexible Photo Sensor and Memory Devices Based on Organic Photo FET	143
<i>M. Yoshida, H. Kawai, T. Kondoh, T. Kawai, K. Suemori, S. Uemura, S. Hoshino, T. Kodzasa, T. Kamata</i>	

Molecular Multilayer Organic Solar Cells with Large Excitonic Diffusion Length	149
<i>S. Yoo, W. J. Potscavage, B. Domercq, S. H. Han, D. Levi, B. Kippelen</i>	
Effect of Structural Phase Transition on Thermally Activated Time-of-Flight Charge Carrier Mobility and Field Effect Transport in Diindenoperylene Single Crystals	159
<i>A. K. Tripathi, J. Pflaum</i>	
Patterning Scheme Based on Photoacid Induced Spectral Changes for Single Layer, Patterned Full Color Light Emitting Diodes	165
<i>M. Vasilopoulou, G. Pistolis, A. Botsialas, N. Stathopoulos, M. Rangoussi, P. Argitis</i>	
Improved Stability of Solid State Light Emitting Electrochemical Cells Consisting of Ruthenium and Iridium Complexes	171
<i>H. J. Bolink, L. Cappelli, E. Coronado, R. D. Costa, M. Graetzel, M. Nazeeruddin, P. M. Viruela, E. Orti</i>	
Spin-Orbital Coupling Effects on Magnetoresistance in Organic Light-Emitting Diodes	179
<i>B. Hu, Y. Wu</i>	
Bottom Contact Ambipolar Organic Thin Film Transistors Based on C60/Pentacene Heterostructure	185
<i>K. Kanai, S. Wang, K. Seki</i>	
Robust Circular Polarized Emission from Nanoscopic Single-Molecule Sources: Application to Solid State Devices	192
<i>R. Hassey, E. J. Swain, N. I. Hammer, E. L. Richards, D. Venkataraman, M. D. Barnes</i>	
Structure and Morphology of Tetracene Thin Films on Hydrogen-Terminated Si(001)	198
<i>X. R. Qin, A. Tersigni, J. Shi, D. T. Jiang</i>	
Characterization of Pyrazoline Organic Nanoparticles Encapsulated with Poly(Methyl Methacrylate-co-Ethylene Glycol Dimethacrylate) for Color Electronic Paper	204
<i>H. S. Kang, S. W. Oh, Y. S. Kang</i>	
The Molecular Structures and Properties of Novel Eu(III) Complexes with Asymmetric Bis-Phosphine Oxides	211
<i>H. Iwanaga, F. Aiga, A. Amano</i>	
Single Molecule Studies of a 2,7-Bis-(Phenylethenyl)fluorenone: Implications for Green-Emission Bands in Fluorene-Based OLEDs	217
<i>M. Y. Odoi, N. I. Hammer, H. Rathnayake, P. M. Lahti, M. D. Barnes</i>	
Epitaxial Growth of C60 Thin Films using Continuous-Wave Laser Molecular Beam Epitaxy	223
<i>S. Yaginuma, K. Itaka, M. Haemori, M. Katayama, Y. Matsumoto, H. Koinuma</i>	
Molecular-Scale Structure of Pentacene Interfaces with Si (111)	228
<i>S. Seo, P. G. Evans</i>	

Assembly of Tailored Thiophene Oligomers on Gold Electrodes - Film Formation and Properties	234
<i>P. A. Collier; T. C. Deivaraj; W. T. Kerk; W. S. Chin; K. P. Loh; P. Bai; E. P. Li</i>	
Waveguiding, Microcavity Effects and Optically Pumped Lasing in Single Melt Processed Polyfluorene Nanowires	240
<i>D. O'Carroll, G. Redmond</i>	
Study on Electron Injection Effect of Low Molecular Organic Light-Emitting Diodes Utilizing LiF/Al and Li/Al Cathode	246
<i>Z. Kin, H. Kajii, Y. Ohmori</i>	
The Control of Electronic States Spreading Outside the Conjugated Polymer Surface	252
<i>X. T. Hao, T. Hosokai, N. Mitsuo, S. Kera, K. Sakamoto, K. K. Okudaira, N. Ueno</i>	
Interfacial Phenomena Affecting Charge Transport In Small Molecule Organic Thin-Film Transistors	258
<i>A. Facchetti, C. Kim, M. Yoon, T. J. Marks</i>	
Surface Modifications using Thiol Self-Assembled Monolayers on Au Electrodes in Organic Field Effect Transistors	264
<i>N. Hiroshiba, R. Kumashiro, N. Komatsu, Y. Suto, H. Ishii, S. Takaishi, M. Yamashita, K. Tsukagoshi, K. Tamigaki</i>	
Rubrene Single-Crystal Organic Field Effect Transistor with Laser Ablated BaTiO₃ Epitaxial Growth Thin-Film as High-k Insulator	270
<i>N. Hiroshiba, R. Kumashiro, T. Takenobu, N. Komatsu, Y. Suto, Y. Iwasa, K. Kotani,</i>	
The Electronic Structure and the Energy Level Alignment at the Interface Between Organic Molecules and Metals	276
<i>E. Kawabe, H. Yamane, K. Koizumi, R. Sumii, K. Kanai, Y. Ouchi, K. Seki</i>	
Spin Injection and Spin Dynamics at CuPC/GaAs(100) Interface	282
<i>H. Ding, Y. Gao, M. Sanchez-Albaneda, J. P. Wüstenberg, M. Cinchetti, O. Andreyev, M. Bauer, M. Aeschlimann</i>	
Optically Transparent Conducting Polymers from Fused Heterocycles	289
<i>M. S. Yavuz, A. Kumar, B. Lee, J. G. Bokria, T. Dey, V. Seshadri, Y. Ner, Z. Buyukmumcu, G. A. Sotzing</i>	
Ab Initio Study of Switching Properties of Photochromic Dithienylethene Molecules	296
<i>A. Odell, A. Delin</i>	
Dendritic Iridium(III)-Encapsulated Complexes for Organic Light Emitting Diodes	301
<i>H. J. Son, W. S. Han, K. B. Choi, D. H. Kim, J. Ko, S. U. Noh, C. Lee, S. O. Kang</i>	
p- and n-Type Charge Transport in Field-Effect Transistors of Pristine Poly(p-Phenylenevinylene)	306
<i>H. Kayashima, T. Yasuda, K. Fujita, T. Tsutsui</i>	

Gate Dielectric Dependent on Pentacene Growth and Electrical Stability in OTFTs	312
<i>K. C. Su, J. S. Jin, L. S. Won, B. H. Koo</i>	
Characterization of TFT-LCD and OLEDs Devices by Phase Modulated Spectroscopic Ellipsometry for Display Applications	317
<i>E. Teboul, L. Yan, M. Gaillet</i>	
Microfluidic Devices for Novel Synthesis	323
<i>K. Choi</i>	
Extracting the Device Parameters from Organic Thin Film Transistors	327
<i>E. S. Park, P. S. Kang, G. T. Kim</i>	
Enhanced Efficiency and Stability in P3HT:PCBM Bulk Heterojunction Solar Cell by using TiO₂ Hole Blocking Layer	333
<i>O. Yoshikawa, A. Hayakawa, T. Fujieda, K. Uehara, S. Yoshikawa</i>	
Controlling the pK_a for Protonic Doping of Polyaniline by Non-Covalent Complexation	339
<i>H. Wan, S. C. Yang</i>	
Improvement of Short Channel Mobility and Operational Stability of Pentacene Bottom-Contact Transistors with a Sulfuric Acid and Hydrogen Peroxide Mixture (SPM) Treatment of Au Electrodes	345
<i>H. Kawakami, T. Maeda, H. Kato</i>	
Electronic Memory Effects in Zinc Oxide Nanoparticle -Polystyrene Devices with a Calcium Top Electrode	351
<i>F. Verbakel, S. C. J. Meskers, R. A. J. Janssen</i>	
Effect of Buffer or Barrier Layer on Bistability for Nonvolatile Memory Fabricated with Al Nanocrystals Embedded in a-NPD	357
<i>S. Seo, W. Nam, J. Kim, C. Shin, S. Lim, J. Park, Y. Kim</i>	
Deep-Level Optical Spectroscopy Investigation of Trap Levels in Tris(8-Hydroxyquinoline) Aluminum	362
<i>Y. Nakano, K. Noda, H. Fujikawa, T. Morikawa, T. Ohwaki</i>	
Organic Thin Film Transistors on Synthesis Paper	368
<i>H. C. Cheng, Y. R. Peng, C. A. Chung, W. H. Hou, Z. W. Pei</i>	
Ultra-high Vacuum Seebeck Effect and Conductivity Measurements on N-Doping of C₆₀ Films	374
<i>N. Hayashi, K. Kanai, Y. Ouchi, K. Seki</i>	
Orientation Control of Standing Epitaxial Pentacene Monolayers Using Surface Steps and Inplane Band Dispersion Analysis by Angle Resolved Photoelectron Spectroscopy	380
<i>T. Suzuki, T. Shimada, K. Ueno, S. Ikeda, K. Saiki, T. Hasegawa</i>	
New Concepts for the Development of Active Functional Polymers for p and n-Type OFET- Applications	386
<i>S. Janietz, U. Assawapirom, D. Sainova</i>	

Fabrication of Ion-Paths for Ionic Liquid Type Quasi-Solid Dye Sensitized Solar Cell	392
<i>T. Kado, T. Kato, T. Kogo, F. Inakazu, Y. Noma, Y. Ogomi, Y. Yamaguchi, M. Kohno, S. Hayase</i>	
Fabrication of Organic Thin Film Transistors Using Low Temperature, Soluble Silicon Oxide as the Gate Dielectrics	398
<i>J. H. Wei, H. J. Lin, Y. R. Chen</i>	
Author Index	