PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 9185

, "Front Matter: Volume 9185," Proc. SPIE 9185, Organic Field-Effect Transistors XIII; and Organic Semiconductors in Sensors and Bioelectronics VII, 918501 (11 November 2014); doi: 10.1117/12.2177209

SPIE.

Event: SPIE Organic Photonics + Electronics, 2014, San Diego, California, United States

PROCEEDINGS OF SPIE

Organic Field-Effect Transistors XIII; and Organic Semiconductors in Sensors and Bioelectronics VII

**Zhenan Bao
Iain McCulloch
Ruth Shinar
Ioannis Kyriassis**
Editors

**18–20 August 2014
San Diego, California, United States**

Sponsored by
SPIE

Cosponsored by
Aldrich Materials Science (United States)
Corning Incorporated (United States)

Published by
SPIE

Volume 9185

Proceedings of SPIE 0277-786X, V. 9185

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

Organic Field-Effect Transistors XIII; and Organic Semiconductors in Sensors and Bioelectronics VII,
edited by Zhenan Bao, Iain McCulloch, Ruth Shinar, Ioannis Kyriassis, Proc. of SPIE Vol. 9185,
918501 · © 2014 SPIE · CCC code: 0277-786X/14/\$18 · doi: 10.1117/12.2177209

Proc. of SPIE Vol. 9185 918501-1

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:

Author(s), "Title of Paper," in *Organic Field-Effect Transistors XIII; and Organic Semiconductors in Sensors and Bioelectronics VII*, edited by Zhenan Bao, Iain McCulloch, Ruth Shinar, Ioannis Kymissis, Proceedings of SPIE Vol. 9185 (SPIE, Bellingham, WA, 2014) Article CID Number.

ISSN: 0277-786X

ISBN: 9781628412123

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

SPIE.org

Copyright © 2014, Society of Photo-Optical Instrumentation Engineers.

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/14/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.

SPIDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc.

The CID Number appears on each page of the manuscript. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID Number.

Contents

- vii *Authors*
- ix *Conference Committee*
- xi *Direct electronic probing of biological complexes formation (Organic Photonics + Electronics Plenary Paper) [9183-402]*

Part A Organic Field-Effect Transistors XIII

MORPHOLOGY I

9185 OE	Nanoaggregation of p3ht in chloroform-anisole solution: relationship between morphology and electrical properties [9185-112]

MORPHOLOGY II

9185 OH	Beyond conventional organic transistors: novel approaches with improved performance and stability (Invited Paper) [9185-115]
9185 OI	High-performance organic transistors for printed circuits (Invited Paper) [9185-116]

TRANSISTOR DEVICES I

9185 OM	Study of the improvements in the electrical performance of solution-processed metal oxide thin-film transistors using self-assembled monolayers [9185-121]
9185 ON	Nonvolatile organic transistor memory devices based on nanostructured polymeric materials (Invited Paper) [9185-122]

TRANSISTOR DEVICES II

9185 OS	Terahertz study of hole transport in pentacene thin films [9185-127]

STRETCHABLE ELECTRONICS

9185 OU	Toward intrinsically stretchable organic semiconductors: mechanical properties of high-performance conjugated polymers (Invited Paper) [9185-129]

- 9185 0V **Electrically engineered polymer-carbon hybrid heterojunction for high-performance printed transistors (Invited Paper)** [9185-130]

PROCESSING DEVICES

- 9185 0X **Comparison of conductor and dielectric inks in printed organic complementary transistors (Invited Paper)** [9185-132]
- 9185 11 **Organic field-effect transistor circuits with electrode interconnections using reverse stamping** [9185-136]

POSTER SESSION FROM CONFERENCE ON ORGANIC FIELD-EFFECT TRANSISTORS XIII

- 9185 12 **Investigation of charge injection characteristics in diketopyrrolopyrrole ambipolar semiconducting polymers** [9185-117]
- 9185 15 **Polymeric gated organic field effect transistor using magnesium phthalocyanine** [9185-139]
- 9185 19 **Comparative study on degradation and trap density-of-states of p type and n type organic semiconductors** [9185-143]

Part B *Organic Semiconductors in Sensors and Bioelectronics VII*

ORGANIC SEMICONDUCTORS IN SENSORS AND BIOELECTRONICS I

- 9185 1B **Luminescent AIE materials for high-performance sensing applications (Invited Paper)** [9185-201]

ORGANIC SEMICONDUCTORS IN SENSORS AND BIOELECTRONICS IV

- 9185 1P **Fabrication of an x-ray detector based on molecular plastic electronics** [9185-215]

ORGANIC SEMICONDUCTORS IN SENSORS AND BIOELECTRONICS V

- 9185 1U **Ion-selective electrolyte-gated field-effect transistors: prerequisites for proper functioning (Invited Paper)** [9185-220]

ORGANIC SEMICONDUCTORS IN SENSORS AND BIOELECTRONICS VI

- 9185 1X **Optical method for making spatially and temporally resolved measurements of the hole concentration in organic electrochemical transistors** [9185-223]

POSTER SESSION FROM CONFERENCE ON ORGANIC SEMICONDUCTORS IN SENSORS AND BIOELECTRONICS VII

- 9185 21 **Interface formation between pentacene and silver contacts investigated by surface-enhanced Raman spectroscopy [9185-227]**

Authors

Numbers in the index correspond to the last two digits of the six-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first four digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Abraham, Biby, 0X	Ng, Tse Nga, 0X
Arend, Thomas R., 0S	O'Connor, Timothy F., 0U
Bartkowiak, W., 0E	Paez-Sierra, Beynor A., 1P, 21
Bielecka, U., 0E	Pahner, Paul, 0H
Burke, Daniel J., 0U	Palazzo, Gerardo, xi
C. S., Menon, 15	Park, Jin-Woo, 0M
Chen, Wen-Chang, 0N	Pérez, Leon D., 1P
Choi, Sangmoo, 11	Printz, Adam D., 0U
Dindar, Amir, 11	Prinz, Markus, 0S
Engelbrecht, Stefan G., 0S	Puigdollers, J., 19
Fischer, Axel, 0H	R., Rajesh K., 15
Friedlein, Jacob T., 1X	Rodríguez, Hernán, 1P, 21
Fuentes-Hernandez, Canek, 11	Rodríguez, Miguel A., 1P
Giordano, Francesco, xi	Sánchez, Juan M., 1P
Günther, Alrun, 0H	Savagatrup, Suchol, 0U
Janus, K., 0E	Sawyer, Eric J., 0U
Jayaraj, M. K., 19	Schmoltner, Kerstin, 1U
Jung, Seok Heon, 12	Schwartz, David E., 0X
Kang, Gyu Won, 0V	Shaheen, Sean E., 1X
Kasemann, Daniel, 0H	Shijeesh, M. R., 19
Kersting, Roland, 0S	Shin, Hyeon-Jin, 0V
Khan, Talha M., 11	Takeya, J., 0I
Kim, Cheawon, 12	Tang, Ben Zhong, 1B
Kim, Dae Hwan, 0M	Tietze, Max L., 0H
Kim, Do Hwan, 0V	Torsi, Luisa, xi
Kim, Hyungjoong, 0M	Veres, Janos, 0X
Kim, Woo-Jae, 0V	Vikas, L. S., 19
Kippelen, Bernard, 11	Wang, Cheng-Yin, 11
Kleemann, Hans, 0H	Whiting, Gregory L., 0X
Kofler, Johannes, 1U	Wu, Yiliang, 0X
Lee, Jin-Kyun, 12	Yun, Minseong, 11
Lee, Mi Jung, 0M, 12	Zaretski, Aliaksandr V., 0U
Lee, Seon Jeng, 12	
Leo, Karl, 0H	
Leung, Chris Wai Tung, 1B	
Li, Meng-Hsien, 0N	
Lipomi, Darren J., 0U	
List-Kratochvil, Emil J. W., 1U	
Liu, Cheng-Liang, 0N	
Lu, Chien, 0N	
Lu, Mau-Shen, 0N	
Lüssem, Björn, 0H	
Macchia, Eleonora, xi	
Magliulo, Maria, xi	
Makaram, Aditya S., 0U	
Manoli, Kyriaki, xi	
Marulanda, Diana Maritza, 21	
McLeod, Robert R., 1X	
Mei, Ping, 0X	

Conference Committee

Symposium Chair

Zakya H. Kafafi, National Science Foundation, *ret* (United States)

Part A: Organic Field-effect Transistors XIII

Conference Chairs

Zhenan Bao, Stanford University (United States)

Iain McCulloch, Imperial College London (United Kingdom)

Session Chairs

- 1 New Materials I
Iain McCulloch, Imperial College London (United Kingdom)
- 2 New Materials II
John E. Anthony, University of Kentucky (United States)
- 3 Morphology I
Michael L. Chabinyc, University of California, Santa Barbara (United States)
- 4 Morphology II
Dean M. DeLongchamp, National Institute of Standards and Technology (United States)
- 5 Transistor Devices I
Zhenan Bao, Stanford University (United States)
- 6 Transistor Devices II
Alejandro L. Briseno, University of Massachusetts Amherst (United States)
- 7 Stretchable Electronics
Zhenan Bao, Stanford University (United States)
- 8 Processing Devices
Natalie Stingelin, Imperial College London (United Kingdom)

Part B: Organic Semiconductors in Sensors and Bioelectronics VII

Conference Chair

Ruth Shinar, Iowa State University (United States)

Conference Co-chair

Ioannis Kymissis, Columbia University (United States)

Conference Program Committee

Magnus Berggren, Linköping University (Sweden)

Fabio Cicoira, Ecole Polytechnique de Montréal (Canada)

Emil J. W. List-Kratochvil, Technische Universität Graz (Austria)

Róisín M. Owens, Ecole Nationale Supérieure des Mines de Saint-Étienne (France)

Ifor D. W. Samuel, University of St. Andrews (United Kingdom)

Franky So, University of Florida (United States)

Luisa Torsi, Università degli Studi di Bari (Italy)

Session Chairs

- 1 Organic Semiconductors in Sensors and Bioelectronics I
Malte C. Gather, University of St. Andrews (United Kingdom)
- 2 Organic Semiconductors in Sensors and Bioelectronics II
Ioannis Kymissis, Columbia University (United States)
- 3 Organic Semiconductors in Sensors and Bioelectronics III
Paul L. Burn, The University of Queensland (Australia)
- 4 Organic Semiconductors in Sensors and Bioelectronics IV
Emil J. W. List-Kratochvil, Technische Universität Graz (Austria)
- 5 Organic Semiconductors in Sensors and Bioelectronics V
Joseph Shinar, Iowa State University (United States)
- 6 Organic Semiconductors in Sensors and Bioelectronics VI
Ruth Shinar, Iowa State University (United States)