7th International Symposium on Organic Molecular Electronics (ISOME2012)

June.7~June.8, 2012, NTT Musashino R&D Center, Japan
The Electronics Society of IEICE

Book of Abstracts
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Organized by:
Technical Committee on Organic Molecular Electronics (OME), Electronics Society of
The Institute of Electronics, Information, and Communication Engineering (IEICE)

Supported by:
Electronics Society of IEICE
Division of Molecular Electronics and Bioelectronics, The Japanese Society of Applied
Physics

In cooperation with:
Technical Committee on Dielectric and Electrical Insulation Materials, IEEJ
Preface

Recent Progress in Organic molecular Devices

We are pleased to invite you to the 7th International Symposium on Organic Molecular Electronics ISOME2012. This is the 7th in a series of the biennial conference that begun in Nagoya University in 2000, continued in Riken (Saitama), Kyoto University, Saitama University, University of Hyogo, Chiba University, and now NTT Musashino R&D Center (Tokyo). This symposium provided a good opportunity for a wide range of researchers to meet together since the development of organic molecular electronics has been supported by different kinds of technologies.

Organic devices such as electroluminescent devices, organic thin-film-transistors, organic sensors, biological systems and so on have attracted much attention not only in the field of electronics and photonics applications but also in environmental and energy issues. The main purpose of this symposium is to provide the opportunities to researchers, who are interested in organic molecular electronics, to come together in an informal and friendly atmosphere and exchange their knowledge and experience. I am sure that this symposium is very useful and fruitful for all participants to summarize the recent progress in organic molecular electronics and prepare a new step for the next generation.

The symposium will be attended by wide range of researchers and invited speakers in organic molecular electronics as well as by contributed speakers in various fields including fabrication, evaluation, bio-electronics, sensors, displays, and so on. These researchers are very much active in the most progressive topics of organic molecular electronics which have received a great deal of attention. We expect that illuminating discussions are conducted in this symposium to stimulate future development of this field.

I would like to express my sincere thanks to the organizing committee of this symposium and thank organizations such as the electronics society of the Electronics, Information and Communication Engineers (IEICE), Division of Molecular Electronics and Bioelectronics, The Japan Society of Applied Physics (M&BE) and NTT Musashino R&D Center for the support including financial one. Thanks are also due to the many people who have given great efforts to make this symposium possible and valuable.

Finally, we thank you again for attending the symposium. We hope that all of you have an enjoyable and informative time in Musashino, Tokyo.

June 7, 2012

ISOME 2012 Chair

Dr. Tohru Maruno
NTT Advanced Technology
Scope and Topics
Organic molecules are recognizing as important materials for electronics and photonics. They are an insulator, a semiconductor, a conductor, a superconductor, and an optical material. The research in this field has also been distributing to various applications like as memories, operational elements, displays, optical elements, actuators, and so on. The special symposium ISOME was proposed to summarize the studies and bring up new buds on the study to progress in this 21st Century.

The ISOME2012 will be composed with review papers and original papers. Here we call for original papers. The main topics are as follows, but not limited to: fundamental and applied researches on organic materials, thin film fabrication, device fabrication, electrical and electronic properties, optical properties, optically nonlinear properties, interface properties, EL and LCD devices, sensing devices, bio-electronics, optical electronics, materials for batteries, and so on.

Language
The working language of the symposium will be English. All printed matter will appear in English.

Submission of Papers
You are invited to submit an abstract on A4 size paper within 2 pages to the Symposium Secretariat by April 17, 2012. The abstract must include the title, author’s names and affiliations, phone and fax numbers, mail and e-mail addresses and body of abstract, which must be printed out clearly for the off-set printing.

The authors of accepted papers will also be requested to submit manuscripts to the IEICE Transactions on Electronics by June 30, 2012. The special issue is scheduled to publish in March, 2013. The paper must be a full paper of maximum 6 pages or a letter paper of 2 pages, and the manuscript must be prepared according to the Information for Authors, IEICE Transactions on Electronics [See (http://www.ieice.or.jp)].

Registration
Registration form and related information will be gotten on Web Site. (http://www.ieice.org/~ome/ISOME/Welcome.html).

Important Information
a) Date: June 7 and 8, 2012.
b) Place: NTT Musashino R&D center
3-9-11, Midori-cho, Musashino-shi, Tokyo, 180-8585 Japan
http://www.ntt.co.jp/islab/e/access/index.html
c) Deadline for abstract: April 17, 2012
d) Registration Fee
On or before May 21: Regular ¥25,000-, Student ¥10,000
After May 21: Regular ¥30,000-, Student ¥15,000

Secretariat
Dr. Jiro Nakamura, NTT Energy & Environmental Systems Labs, NTT
3-9-11, Midori-cho, Musashino-shi, Tokyo, 180-8585 Japan
Phone: +81-422-59-2280, Fax: +81-422-59-4128, E-mail: nakamura.jiro@lab.ntt.co.jp
URL: http://www.ntt.co.jp/islab/e/org/en.html
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<td>~ Organic Optical Devices &amp; Properties of Organic Materials ~</td>
<td>14:30–15:00 I-10 (invite) N. Kasai</td>
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<td>09:30–10:00 I-6 (invite) S.H. Su</td>
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<td>~ Biotechnology &amp; Bioelectronics I ~</td>
<td>16:30–17:00 I-12 (invite) D.L. Patton</td>
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<td>Closing Ceremony (18:00–18:05)</td>
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ISOME 2012 Program

June 7, Thursday

-Registration 9:00 - 17:00

-Opening 9:30 - 9:35

**Opening Address**
Tohru Maruno (NTT Advanced Technology Corporation, Japan)
Chair of the Organizing Committee

-Plenary Lecture 9:35 - 10:25

Chairperson: Tohru Maruno (NTT-AT, Japan)

PL (invite) 9:35
**Polymeric Opto-electronic Devices for Optical Signal Transmission**
Yutaka Ohmori
Graduate School of Engineering, Osaka University, Japan

-Coffee Break 10:25 - 10:40

-Session I (Organic Optical Devices) 10:40 - 12:50

Chairperson: Hiroaki Usui (TUAT, Japan)

I-1 (invite) 10:40
**Application of Zinc(II) Complexes to OLED Materials**
Trinh Dac Hoanh, Young-Hoon Im, Ik-Hwan Kim and Burm-Jong Lee
Department of Chemistry, Inje University, Korea

I-2 (invite) 11:10
**Evaluation of Thin Film Deposition and Gas Detection Using Surface Plasmon Resonance and Optical Waveguide Sensors**
Kazunari Shinbo, Yasuo Ohdaira, Akira Baba, Keizo Kato and Futao Kaneko
Department of Electrical Engineering, Niigata University, Japan

O1-1 11:40
**Fabrication of photonic crystal cavity by using a nanoprobe**
Atsushi Yokoo$^{1,2}$, Takasumi Tanabe$^1$, Eiichi Kuramochi$^{1,2}$ and Masaya Notomi$^{1,2}$
$^1$NTT Basic Research Laboratories, NTT Corporation, Japan
$^2$Nanophotonics Center, NTT Corporation, Japan

O1-2 12:00
**Investigation of interfacial charging processes of pentacene/C60/BCP triple-layer organic solar cells**
Xiangyu Chen, Dai Taguchi, Takaaki Manaka, and Mitsumasa Iwamoto
Department of Physical Electronics, Tokyo Institute of Technology, Japan
I-3 (invite)
12:20  Photonic Polymers for Next Generation Optical Interconnect Device
O. Sugihara1, F. S. Tan1, T. Kaino1, T. Yamashita2, D. Inoue2, A. Kawasaki2, O. Watanabe3,
1 IMRAM, Tohoku University, Japan
2 Toyota Central R&D Laboratories, Inc., Japan
3 Yamagata University, Japan
4 Shizuoka University, Japan
5 FUJIFILM Corporation, Japan

Lunch  12:50 - 13:40

-Poster Session  13:40 - 14:50
P-1 ~ P-19
13:40

-Session 2  (Organic Photonics)  15:00 - 16:10
Chairperson: Jiro Nakamura (NTT Energy and Environment Systems Lab., Japan)
I-4 (invite)
15:00  Limonene meets chiral photonics polymers: Instantaneous generation from achiral polymers
without catalyst in 100 % yield at room temperature
Machiya Fujiki
Graduate School of Materials Science, Nara Institute of Science and Technology, Japan

O2-1
15:30  ADE-FDTD analysis of lasing dynamics in cholesteric liquid crystal with absorption process
Tatsunosuke Matsui1,2
1 Department of Electrical and Electronic Engineering, Graduate School of Engineering,
Mie University, Japan
2 The Center of Ultimate Technology on Nano-Electronics, Mie University, Japan

O2-2
15:50  Single molecule spectroscopy under various ambient conditions
Toshiki Yamada, Takahiro Kaji and Akira Otomo
National Institute of Information and Communications Technology, Japan

-Coffee Break  16:10 - 16:30

-Session 3  (Organic Electronic Devices)  16:30 - 18:00
Chairperson: Keizo Kato (Niigata Univ., Japan)
I-5 (invite)
16:30  Vertical Channel Organic Transistors for Information Tag Applications
K. Kudo1, D. Tsutsumi1, H. Yamauchi1, S. Kuniyoshi1, M. Sakai1 and M. Iizuka2
1 Graduate School of Engineering, Chiba University, Japan
2 Faculty of Education, Chiba University, Japan

O3-1
17:00  Laminated Plastic Card Transistors Fabricated by Thermal Press Processes
Masatoshi Sakai, Atsuo Inoue, Tatsuyoshi Okamoto, Shigekazu Kuniyoshi, Hiroshi Yamauchi and
Kazuhiro Kudo
Department of Electrical and Electronic Engineering, Chiba University, Japan
O3-2  
17:20 Ambipolar carrier injection into organic FET probed by charge modulated spectroscopy  
Takaaki Manaka and Mitsumasa Iwamoto  
Department of Physical Electronics, Tokyo Institute of Technology, Japan

O3-3  
17:40 Photoinduced conductance switching in a dye-doped single-electron device composed of molecule/gold-nanoparticle composite  
M. Yamamoto1, T. Terui2, R. Ueda3, K. Imazu3, K. Tamada4, T. Sakano4, K. Matsuda4, H. Ishii1,5, and Y. Noguchi1,3,6  
1 Graduate School of Advanced Integration Science, Chiba University, Japan  
2 KARC, National Institute of Information and Communications technology, Japan  
3 Institute for Materials Chemistry and Engineering, Kyushu University, Japan  
4 Department of Synthetic Chemistry and Biological Chemistry, Graduate School of Engineering, Kyoto University, Japan  
5 Center for Frontier Science, Chiba University, Japan  
6 PRESTO, Japan Science and Technology Agency, Japan

-Banquet 18:20 - 20:00

June 8, Friday

-Registration 9:00 - 12:00

Chairperson: Masatoshi Sakai (Chiba Univ., Japan)

I-6 (invite)  
09:30 The Application of White Organic Light Emitting Diodes for Lighting  
Shui-Hsiang Su and Meiso Yokoyama  
I-Shou University, Taiwan

I-7 (invite)  
10:00 Using interlayer excitation transfer for organic thin-film solar cells  
Musubu Ichikawa1,2  
1 Interdisciplinary Graduate Shool of Science and Technology, Shinshu University, Japan  
2 Presto, Japan Science and Technology Agency (JST), Japan

O4-1  
10:30 Temporal change in electric potential distribution and film thickness in electrophoretic deposition of conjugated polymer  
Kazuya Tada  
Division of Electrical Engineering, University of Hyogo, Japan

O4-2  
10:50 Oxidation Time Dependence of Graphene Oxide  
Koichi Sakaguchi1, Akinori Fujito1, Seiko Uchino1, Asami Ohtake1, Noboru Takisawa1, Kunio Akedo2, and Masanao Era1  
1 Department of Chemistry and Applied Chemistry, Saga University, Japan  
2 Toyota Central Research and Development laboratories, Japan
Coffee Break 11:10 - 11:30

Session 5 (Biotechnology & Bioelectronics I) 11:30 - 12:50
Chairperson: Naoki Matsuda (AIST, Japan)

I-8 (invite)
11:30 Novel Optical Strategies for Biodetection
Harshini Mukundan
Los Alamos National Laboratory, USA

I-9 (invite)
12:00 In vitro cell sensing with semiconductor-based biosensing technology
Toshiva Sakata
Department of Materials Engineering, School of Engineering, The University of Tokyo, Japan

O5-1
12:30 Bright Fluorescence Image of Neurons Observed with a Plasmonic Chip
Keiko Tawa1, Chikara Yasui2, Chie Hosokawa1, Junji Nishii3 and Hiroyuki Aota2
1 HRI, AIST, Japan
2 Kansai University, Japan
3 RIES, Hokkaido University, Japan

Lunch & Guided Tour around NTT Musashino R&D Center Showroom 12:50 - 14:30

Session 6 (Biotechnology & Bioelectronics II) 14:30 - 16:10
Chairperson: Akira Baba (Niigata Univ., Japan)

I-10 (invite)
14:30 Micro/nano-fabrication for Biological Interface
Nahoko Kasai, Akiyoshi Shimada, Shingo Tsukada, Aya Tanaka, Yoshiaki Kashimura, Koji Sumitomo, and Keiichi Torimitsu
NTT Basic Research Laboratories, Japan

I-11 (invite)
15:00 Interdigitated electrode based impedance biosensor for label-free detection of human immunoglobulin A
Hitoshi Ohnuki1, Ryuzo Ohno1, Huihui Wang1, Takuya Yokoyama1, Hideaki Endo2, Daiju Tsuya1 and Mitsuru Izumi3
1 Faculty of Marine Technology, Tokyo University of Marine Science and Technology, Japan
2 Faculty of Marine Science, Tokyo University of Marine Science and Technology, Japan
3 National Institute for Materials Science, Japan

O6-1
15:30 In situ observation of cytochrome c functionality immobilized on solid/liquid interfaces with slab optical waveguide spectroscopy
Naoki Matsuda and Hirotaka Okabe
Measurement Solution Research Center, AIST, Japan

O6-2
15:50 Graphene Oxide as Optical Platform for Protein Recognition
Kazuaki Furukawa1, Yuko Ueno2, Emi Tamechika2 and Hiroki Hibino1
1 NTT Basic Research Laboratories, Japan
2 NTT Microsystem Integration Laboratories, Japan
Coffee Break 16:10 - 16:30

Session 7 (Preparation & Characterization of Organic Materials & Films) 16:30 - 18:00

Chairperson: Takaaki Manaka (Tokyo Tech, Japan)

I-12 (invite)
16:30 Versatile Synthetic Routes to Functional Polymer Surfaces via Thiol-Click Chemistry
Ryan M. Hensarling, Arthur L. LeBlanc, Emily A. Hoff, Wei Guo and Derek L. Patton
School of Polymers and High Performance Materials, University of Southern Mississippi, USA

O7-1
17:00 P3HT:PCBM Thin Film with Different Concentrations by Electrospray Deposition Method
Takeshi Fukuda¹, Kenji Takagi¹, Jungmyoung Ju², Yutaka Yamagata² and Yusuke Tajima²
¹ Department of functional materials science, Saitama University, Japan
² RIKEN, Japan

O7-2
17:20 Electrospray-Coated PEDOT:PSS Thin Films with Optimized Additional Solvent and Applied Voltage
Yingjie Liao, Takeshi Fukuda, Asumi Suzuki, Kenji Takagi and Norihiko Kamata
Graduate School of Science and Engineering, Saitama University, Japan

O7-3
17:40 Theoretical study on the reaction mechanism of formation of lutidine derivatives
Hiroyuki Teramae and Yasuko Y. Maruo
Department of Chemistry, Josai University, Japan

-Closing 18:00 - 18:05

Closing Remarks
Hiroaki Usui (Tokyo University of Agriculture and Technology, Japan)
Chair of the Technical Committee on Organic Molecular Electronics, IEICE
Poster Session (June 7, Thursday, 13:40 - 14:50)

P-1
Synthesis of Zinc Complexes Containing Quinaldic Acid for OLED
Young-Hoon Im, Ik-Hwan Kim, Trinh Dac Hoanh and Burm-Jong Lee
Department of Chemistry, Inje University, Korea

P-2
Fabrication of Stacked OLED using Electro-Spray Deposition
Takaomi Okada, Tetsuo Sakamoto and Hideaki Anzai
Graduate School of Electrical and Electronic Engineering, Kogakuin University, Japan

P-3
Effects of Using a Co-evaporation Layer of MoOx and α-NPD in Organic Light-Emitting Diodes
Sang-Geon Park¹, Haiying Wang¹, Kazuhiro Imai¹, Takuya Morimoto¹, Tomoya Inden¹, Shizuyasu Ochiai² and Tatsuo Mori²
¹ Department of Electrical Engineering and Computer Science, Nagoya University, Japan
² Department of Macromolecular Science and Engineering, Case Western Reserve University, USA

P-4
Effect of Photoreactive SAM at the Interface of ITO and Hole Transport Layer
Seong-Ho Kim¹, Hanae Ohtsuka¹, Rigoberto C. Advincula² and Hiroaki Usui¹
¹ Department of Organic and Polymer Materials Chemistry, Tokyo University of Agriculture and Technology, Japan
² Department of Macromolecular Science and Engineering, Case Western Reserve University, USA

P-5
Fabrication and Characterization of All Solution-Processed Organic Thin Film Photovoltaic Cells
Sho Noguchi, Koichi Sakaguchi and Masanao Era
Department of Chemistry and Applied Chemistry, Faculty of Science and Engineering, Saga University, Japan

P-6
Fabrication of tandem dye-sensitized solar cells with Pt-coated Ni-mesh
ChengChieh Yen¹, Takehiro Jikumaru¹ and Tatsuo Mori¹²
¹ Department of Electrical Engineering and Computer Science, Nagoya University, Japan
² Department of Electrical Engineering, Aichi Institute of Technology, Japan

P-7
Enhanced Photocurrent Properties of Dye/Au-loaded TiO₂ Films by Grating-coupled Surface Plasmon Excitation
Hathaithip Ninsontï¹², Weerasak Chomkititchai¹², Akira Baba¹, Wiyong Kangwansupamonkon³, Sukon Phanichphant¹, Kazumari Shinbo¹, Keizo Kato¹ and Futao Kaneko¹
¹ Center for Transdisciplinary Research, Niigata University, Japan
² Department of Chemistry, Faculty of Science, Chiang Mai University, Thailand
³ National Nanotechnology Center, National Science and Technology Development Agency, Thailand
⁴ Materials Science Research Center, Faculty of Science, Chiang Mai University, Thailand

P-8
Surface Plasmon Resonance Enhanced Photocurrent of Dye/Ag-loaded Titanium Dioxide Thin Film on Metallic Grating Surface
Weerasak Chomkititchai¹², Hathaithip Ninsontï¹², Akira Baba¹, Sukon Phanichphant³, Kazumari Shinbo², Keizo Kato² and Futao Kaneko
¹ Center for Transdisciplinary Research, Niigata University, Japan
² Department of Chemistry, Faculty of Science, Chiang Mai University, Thailand
³ Materials Science Research Center, Faculty of Science, Chiang Mai University, Thailand
P-9
Improved Adhesion of Fluoropolymer Thin Films by Vapor Deposition Polymerization
Kazuo Senda, Tsuyoshi Matsuda, Takumi Kawanishi, Kuniaki Tanaka and Hiroaki Usui
Department of Organic and Polymer Materials Chemistry, Tokyo University of Agriculture and Technology, Japan

P-10
Vapor Deposition of Low-Molecular Weight PEDOT Thin Films
Taikai Eguchi, Ai Hasegawa, Kousuke Tsuchiya, Kuniaki Tanaka, Kenji Ogino and Hiroaki Usui
Department of Organic and Polymer Materials Chemistry, Tokyo University of Agriculture and Technology, Japan

P-11
Electron-Assisted Vapor Deposition Polymerization of Fluorinated Alkylacrylate
Misato Yagisawa, Yasuhiro Hosoda, Kuniaki Tanaka and Hiroaki Usui
Department of Organic and Polymer Materials Chemistry, Tokyo University of Agriculture and Technology, Japan

P-12
Effect on thermoelectric property of conductive polymer by adding polyols
Akihiro Kohno, Shigeo Ogawa and Yoh Somemura
NTT Energy and Environment Systems Laboratories, Japan

P-13
Optimization of Langmuir-Blodgett film formation for organic-inorganic layer perovskite by squeeze out method
Koichi Souda, Koichi Sakaguchi and Masanao Era
Department of Chemistry and Applied Chemistry, Faculty of Science and Engineering, Saga University, Japan

P-14
Photocatalytic CO₂ reduction on Re(bpy-R₂)(CO)₃Cl (R = H, CH₃, COOH, CN)
Yoko Ono, Masayuki Tsuda, Yasuko Y. Maruo and Yoh Somemura
NTT Energy and Environment Systems Laboratories, Japan

P-15
Electrostatic Control of Artificial Cell Membrane Spreading through Molecule Gate Modulation within Nanogap
Yoshiaki Kashimura, Kazuaki Furukawa and Keiichi Torimitsu
NTT Basic Research Laboratories, Japan

P-16
Micropatterning of chondrocyte spheroids on the gold electrode
Hidenori Otsuka¹, Koichi Kutsuzawa¹, Akie Kano¹, Masako Nagamura¹ and Toshiya Sakata²
¹Department of Applied Chemistry, Faculty of Science, Tokyo University of Science, Japan
²Department of Materials Engineering, Graduate School of Engineering, The University of Tokyo, Japan

P-17
The Effect of Electric Fields on Biological Cells
Hidenori Otsuka¹, Koichi Kutsuzawa¹, Hideki Kohn², Saya Okimura¹, Masako Nagamura¹, Daisuke Matsukuma¹, Tatsuro Nakashima², Hirotaka Okabe² and Naoki Matsuda²
¹Department of Applied Chemistry, Faculty of Science, Tokyo University of Science, Japan
²Measurement Solution Research Center, AIST, Japan

P-18
Newly Developed Optical Adhesives for Optical Connectors
Satoru Tomaru, Yutaka Murakoshi, Masayuki Murakami, Naomi Kawakami and Kazumi Yamauchi
NTT Advanced Technology Corporation, Japan

P-19
Development and evaluation of ozone sensor using azo dye with OH groups
Yasuko Yanada Maruo, Kunihiro Akaoka and Jiro Nakamura
NTT Energy and Environment Systems Laboratories, Japan