The 3rd International Symposium on Organic Molecular Electronics
18-19 May 2004, Kyoto University, Japan
The Electronics Society of IEICE

The Book of Abstracts
The 3rd International Symposium on Organic Molecular Electronics (ISOME2004)

May 18-19, 2004
Kyoto University, Katsura Campus
Kyoto, Japan
Organizing Committee

Chairperson Kazumi Matsushige (Kyoto University)
Vice-chairperson Teruaki Katsube (Saitama University)
Member Hiroyuki Fujii (Sanyo Electric Co., Ltd.)
Hirotake Kajii (Osaka University)
Tohru Kubota (National Institute of Information and Communication Technology)
Kazuhito Kudo (Chiba University)
Naoki Matsuda (National Institute of Advanced Industrial Science and Technology)
Tohru Maruno (NTT)
Takamichi Nakamoto (Tokyo Institute of Technology)
Masaharu Satoh (NEC)
Tatsuo Wada (RIKEN)
Secretary Mitsuyoshi Onoda (University of Hyogo)

Advisors Mitsumasa Iwamoto (Tokyo Institute of Technology)
Teruyoshi Mizutani (Nagoya University)
Toyosaka Moriizumi (Tokyo Institute of Technology)
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Yutaka Ohmori (Osaka University)
Hiroyuki Sasabe (Chitose Institute of Science and Technology)
Kuniaki Tanaka (Chiba University)
Katsumi Yoshihino (Osaka University)

Supported by:
Electronics Society of IEICE
Kyoto Nanotech Cluster Program (MEXT)
Kyoto University Nanotech Support Program (MEXT)
Group of Organic NICE Devices, The Japan Society of Applied Physics

In cooperation with:
Division of Molecular Electronics and Bioelectronics, The Japan Society of Applied Phys.(M & BE)
The Institute of Electrical Engineers of Japan (IEEJ)
Technical Committee on Dielectric and Electrical Insulation Materials, IEEJ
The Japan Society of Applied Physics
The Society of Polymer Science, Japan
The Japanese Liquid Crystal Society
Preface

May 18, 2004

Innovation of New Electronics Materials and Devices

On behalf of the organizing committee, I would like to welcome all of you to this the 3rd International Symposium on Organic Molecular Electronics (ISOME2004) and to thank the invited speakers, who are internationally distinguished researchers and kindly present their the most recent works. We are also very pleased to have received very many contributed papers. Recently, it is well recognized that organic molecules will become one of the most essential materials in the 21st century electronics, and substantial progress has been made not only from academic but also applicable view-points.

This booklet contains the abstracts of invited speakers as well as of the general contributors in the fields of Evaluation, Fabrication, Sensor, and Devices of organic molecular electronics. These topics are the most essential and attractive research fields to develop actual organic electronic materials and devices. I expect that vital discussion will be made during this conference, stimulation further development in this field.

Again, we, as an organizing committee, would like to thank many organizations, such as by Electronic Society of IEICE, Group of Organic Nice Devices, The Japan Soc. of Appl. Phys., Kyoto Nanotech Cluster Program (MEXT), and Kyoto University Nanotech Support Program (MEXT), which support financially this conference. Also, many people have given their great efforts so as to make this conference possible and valuable. Sincerely, we do expect that many young and active researchers joined this conference will enjoy stimulating discussion and exchange their ideas each other at this ISOME 2004, taken place at Kyoto in Japan.

General Chair
Prof. Kazumi Matsushige
Directors of International Innovation Center
and Venture Business Laboratory
Kyoto University
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<th>Morning</th>
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<td>8:30am-5:00pm Registration</td>
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Symposium program

May 18 (Tuseday)
<Registration> <8:30am-5:00pm>
<Opening remarks> <9:00am-9:05am>
Opening talk
General Chair: Kazumi Matsushige (Kyoto University, Japan)

<Plenary lecture>
<9:05am-9:55am>
Chairperson: Mitsuyoshi Onoda (University of Hyogo)

PL Organic Materials and Electronics in Electrical and Electronic Engineering (invite)
—Molecular Electronics and Photonic Crystals—
Katsumi Yoshino (Osaka University, Japan)

<Organic molecular devices I> <9:55am-10:50am>
Chairperson: Hiroyuki Fujii (SANYO Electric Co., Ltd., Japan)

<9:55am-10:35am> (invite)
OD1 Organic Electronic Devices and Heterojunctions
Ching W. Tang (Eastman Kodak Company, USA)

<10:35am-10:50am>
OD2 Fabrication and Characteristics of Low-Molecular Phosphorescent Organic Light-Emitting Diodes Employed by Wet-Process
Yuichi Hino, Hirotake Kajii and Yutaka Ohmori (Osaka University, Japan)

<coffee break> (10:50am-11:05am)

<Organic molecular devices II> <11:05am-12:00am>
Chairperson: Tohru Kubota (National Institute of Information and Communication Technology, Japan)

<11:05am-11:45am> (invite)
OD3 Flexible, Large-Area Sensor Matrix with Organic Transistor-Based Circuits
Takao Someya and Takayasu Sakurai (University of Tokyo, Japan)

<11:45am-12:00am>
OD4 Fabrication of Organic Transistors Using BEDT-TTF and (BEDT-TTF)(TCNQ)
CT-Complex Films
Hirotaka Sakuma, Masatoshi Sakai, Massaki Iizuka, Masakazu Nakamura, and Kazuhiro Kudo (Chiba University, Japan)

<lunch time> (12:00am-1:00pm)

<Bioelectronics and sensors I> <1:00pm-2:10pm>
Chairperson: Takamichi Nakamoto (Tokyo Institute of Technology, Japan)

<1:00pm-1:40pm> (invite)
BS1 Chemsensing: An Adventure in Molecular Recognition
Kenneth S. Suslick (University of Illinois at Urbana-Champaign, USA)

<1:40pm-1:55pm>
BS2 In Situ Observation of Electron Transfer Reaction between ITO Electrode and Surface Immobilized Cytochrome c Using Slab Optical Waveguide Spectroscopy
Naoki Matsuda, Jose H. Santos, Akiko Takatsu, and Kenji Kato (National Institute of
<1:55pm-2:10pm>
BS3 Analysis of Frequency Spectra of Bioelectrical Potential when Plant Purifies the Air Pollution
Yuki Hasegawa, Shigehiro Asada and Teruaki Katube (Saitama University, Japan)

<coffee break> (2:10pm-2:25pm)

<Evaluation of organic materials I>  <2:25pm-3:55pm>
Chairperson: Mitsumasa Iwamoto (Tokyo Institute of Technology, Japan)

<2:25pm-2:40pm>
EM1 Light Emission due to Surface Plasmon Excitations from PVK Film with Cyanine Dyes on Aluminum Thin Film
Wataru Saito, Hiroaki Kobayashi, Susumu Toyoshima, Yasuo Ohdaira, Kazunari Shinbo, Keizo Kato, Futao Kaneko, and Takahiro Kawakami (Niigata University, Japan)

<2:40pm-2:55pm>
EM2 Transient and Steady-State Photocurrent in an Emissive Layer of Green Electrophosphorescent Devices
Noriyuki Matsusue, Satoshi Ikame, Yuichiro Suzuki, and Hiroyoshi Naito (Osaka Prefecture University, Japan)

<2:55pm-3:10pm>
EM3 Different CNT Lengths Alignment under Low Applied Voltage
K. El-Hami and K. Matsushige (Kyoto University, Japan)

<3:10pm-3:25pm>
EM4 A Combinatorial Approach to Investigation of Schottky Diodes Based on Electrochemically Polymerized Conjugated Polymer
Kazuya Tada, Takaya Ueyamada and Mitsuyoshi Onoda (University of Hyogo, Japan)

<3:25pm-3:40pm>
EM5 Fabrication and Characterization of Field Effect Transistor with Layer-by-layer Self-assembled Phthalocyanine Films
Hiroshi Ikarashi, Masahiro Minagawa, Shigenobu Katagiri, Kazunari Shinbo, Futao Kaneko, Keizo Kato, Jason Locklin*, and Rigoberto C. Advincula*(Niigata University, Japan; *University of Houston, USA)

<3:40pm-3:55pm>
EM6 Deposition Polymerization of Polyurethane Thin Film Having Bis(5,8-dihydroxyquinoline) Zinc Complex for Organic LED
Xiaodong Wang, Kenji Ogino, Kuniaki Tanaka, and Hiroaki Usui (Tokyo University of Agriculture and Technology, Japan)

<coffee break> (3:55pm-4:10pm)

<Evaluation of organic materials II>  <4:10pm-5:25pm>
Chairperson: Futao Kaneko (Niigata University)

<4:10pm-4:25pm>
EM7 In-situ Observation of 4'-n-pentyl-4-cyanobiphenyl Evaporated Film Growth by Polarized Absorption Measurement
<4:25pm-4:40pm>
EM8 Investigation of Local Electric Properties at the Metal/Organic Interface in an Operating Organic Thin Film Transistor
(Kyoto University, Japan)

<4:40pm-4:55pm>
EM9 Spectroscopic Ellipsometry Study of Organic Light Emitting Diode Based on Phosphorescent PtOEP
Taiju Tsuboi, Yoko Wasai* and Nataliya Nabatova-Gabain*(Kyoto Sangyo University, Japan; *Horiba Ltd., Japan)

<4:55pm-5:10pm>
EM10 Improvement of Coupling-Out Efficiency of Organic Light-Emitting Devices by Dot Array Structures with Organic Layer
Takashi Matsumoto, Masayuki Yahiro, Kenji Ishida, and Kazumi Matsushige
(Kyoto University, Japan)

<5:10pm-5:25pm>
EM11 Temperature Dependence of Photoluminescence Decay Time of Ir(ppy)_3
Taiju Tsuboi and Nadeer Alfaloudi (Kyoto Sangyo University, Japan)

<Banquet> (5:40pm-7:00pm)

May 19 (Wedseday)
<Registration>

<8:30am-5:00pm> - <Bioelectronics and sensors II>
Chairperson: Naoki Matsuda (National Institute of Advanced Industrial Science and Technology, Japan)

<9:00am-9:40am> (invite)
BS4 Direct Electron Transfer of Organic Film-Entrapped Protein and Its Application to Third-Generation Biosensors
Genxi Li (Nanjing University, China)

<9:40am-10:20am> (invite)
BS5 Non-Contact Optical Waveguide Spectroscopy for the Analysis of Proteins on the Electrodes
Hiroyuki Ohno and Kyoko Fujita (Tokyo University of Agriculture and Technology, Japan)

<10:20am-10:35am>
BS6 Computation of Torsion in Superhelix of DNA
Hirofumi Hirayama (Asahikawa Medical College, Japan)

<coffee break> (10:35am-10:50am)

<10:50am-12:15pm>
<Bioelectronics and sensors III>
Chairperson: Hirofumi Hirayama (Asahikawa Medical College, Japan)

<10:50am-11:30am> (invite)
BS7 Sorptive Polymeric Films for Acoustic Wave Vapor Sensor Arrays
Jay W. Grate (Pacific Northwest National Laboratory, USA)
11:30am-11:45am
BS8 Analysis of Adsorbed Molecules on Pt Surface Using Electrochemical Impedance Spectroscopy
Kenshi Hayashi, Kosuke Hayama, Hiroki Tanaka, Wataru Futagami*, Seung-Woo Lee*, and Kiyoshi Toko (Kyushu University, Japan; *the University of Kitakyushu, Japan)

11:45am-12:00pm
BS9 Fundamental Study of Odor Recorder Using Inkjet Devices for Low-Volatile Scents
Takamichi Nakamoto, Hidetaka Takigawa and Takao Yamanaka (Tokyo Institute of Technology, Japan)

12:00pm-12:15pm
BS10 Study of Sweetness-sensitive Taste Sensor with Lipid/polymer Membranes
Masaaki Habara, Hidetaka Ikezaki* and Kiyoshi Toko (Kyushu University, Japan; *Intelligent Sensor Technology Inc., Japan)

<lunch time> (12:15pm-1:15pm)

1:15pm-2:00pm
Fabrication of organic materials
Chairperson: Hiroaki Usui (Tokyo University of Agriculture and Technology, Japan)

1:15pm-1:30pm
FM1 Build-up of Films with Organic-Inorganic Multilayer Structures by Wet Process
Hisashi Higuchi, Yasuo Miyazaki and Seimei Shiratori (Keio University, Japan)

1:30pm-1:45pm
FM2 Anti Reflection Films Fabricated by Roll-to-Roll Layer-by-Layer Adsorption Process
Shiro Fujita, Kouji Fujimoto and Seimei Shirator (Keio University, Japan)

1:45pm-2:00pm
FM3 PVDF Electron Emitter by Reversed Polarization Method
Shinzo Morita and Kazuaki Omura (Nagoya University, Japan)

2:00pm-3:10pm
Organic molecular devices III
Chairperson: Kazuhiro Kudo (Chiba University, Japan)

2:00pm-2:40pm (invite)
OD5 Time-resolved photoluminescence excitation characterisation of lanthanide and group III tris(8-hydroxyquinoline) molecules
P.Desai, O.M. Khreis*, M. Somerton, R.J. Curry**, W.P. Gillin (University of London, UK; *Yarmouk University, Jordan; **University of Southampton, UK)

2:40pm-2:55pm
OD6 Enhancing the Color Purities of Organic Electrophosphorescent Devices Using New Cyclometalated Iridium (III) Compounds
Hiroyuki Fujii, Hidehiro Sakurai* Kazuyasu Tan* Lisheng Mao* and Toshikazu Hirao* (SANYO Electric Co., Ltd., Japan; *Osaka University, Japan)

2:55pm-3:10pm
OD7 Characteristics of Organic Field-Effect Transistors Using Simple Fabricated Nano-Gap Electrode
Masayuki Yahiro, Kenji Ishida and Kazumi Matsushige (Kyoto University, Japan)

<coffee break> (3:10pm-3:25pm)
<Organic molecular devices IV>  
Chairperson: Hirotake Kajii (Osaka University, Japan)

<3:25pm-4:05pm> (invite)  
OD8 Charge Injection into Cathode-doped Amorphous Organic Semiconductors  
Benjie N. Limketkai and Marc A. Baldo (Massachusetts Institute of Technology, USA)

<4:05pm-4:20pm>  
OD9 High Power Organic Radical Battery for Information Systems  
Masaharu Satoh, Kentaro Nakahara, Jiro Iriyama, Shigeyuki Iwasa, and Masahiro Suguro  
(NEC Corporation)

<4:20pm-4:35pm>  
OD10 Light Assisted Switching Characteristic of Molecular Single Electron Tunneling Device  
Tohru Kubota, Takashi Nagase, Yutaka Wakayama* and Shinro Mashiko  
(National Institute of Information and Communication Technology, Japan; *National Institute for Materials Science, Japan)

<coffee break> (4:35pm-4:50pm)

<Organic molecular devices V>  
Chairperson: Masaharu Satoh (NEC Corporation)

<4:50pm-5:05pm>  
OD11 Organic Light Emitting Diode Using Starburst Molecule Doped with Rubrene Fabricated by Wet-Processing for Application on an Electr-Optical Conversion Device  
Kazuya Takahashi, Hirotake Kajii, Yuichi Hino, and Yutaka Ohmori (Osaka University, Japan)

<5:05pm-5:20pm>  
OD12 Actuator Using Electrostriction Effect of Carbon Nanotubes (CNTs) Doped Polyurethane Elastomer (PUE) Films  
Jun Kyokane, Naoki Tsujimoto, Yuki Yanagisawa, Tsutomu Ueda*, and Masumi Fukuma**  
(Nara National College of Technology, Japan; *Nitta Corporation Ltd., Japan; **Matsue National College of Technology, Japan)

<5:20pm-5:35pm>  
OD13 Effect of Cathode Materials on Organic p-i-n Hetero-Junction Photovoltaic Cell  
T.Tamai, M.Chikamatsu, Y.Yoshida, K.Saito, and K.Yase (National Institute of Advanced Industrial Science and Technology, Japan)

<5:35pm-5:50pm>  
OD14 Colorimetric Detection of Iron (II) Using Novel Paired Emitter Detector Diode (PEDD) Based Optical System  
Susan Baldwin, King Tong Lau, William Yerazunis*, Roderick Shepherd* and Dermot Diamond (Dublin City University, Dublin 9, Ireland; *Mitsubishi Electric Research Laboratories, USA)

<Concluding remarks>  
Closing talk
Vice-chair: Teruaki Katsube (Saitama University, Japan)