

*The 3<sup>rd</sup> 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)*

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*May 18-19, 2004  
Kyoto University, Katsura Campus  
Kyoto, Japan*

## Organizing Committee

Chairperson	Kazumi Matsushige (Kyoto University)
Vice-chairperson	Teruaki Katsube (Saitama University)
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## 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 researches 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



ISOME 2004 Schedule  
 Kyoto University, Katsura Campus  
 Kyoto, Japan  
 May 18-19, 2004

Date	Morning	Afternoon	Evening
May 18 (Tue.)	8:30am-5:00pm Registration		5:40pm-7:00pm Banquet
	9:00am-9:05am Opening remarks 9:05am-9:55am Plenary lecture 9:55am-10:50am Organic molecular devices I 10:50am-11:05am coffee break 11:05am-12:00am Organic molecular devices II	1:00pm-2:10pm Bioelectronics and sensors I 2:10pm-2:25pm coffee break 2:25pm-3:55pm Evaluation of organic materials I 3:55pm-4:10pm coffee break 4:10pm-5:25pm Evaluation of organic materials II	
May 19 (Wed.)	8:30am-5:00pm Registration		5:50pm-5:55pm Concluding remarks
	9:00am-10:35am Bioelectronics and sensors II 10:35am-10:50am coffee break 10:50am-12:15pm Bioelectronics and sensors III	1:15pm-2:00pm Fabrication of organic materials 2:00pm-3:10pm Organic molecular devices III 3:10pm-3:25pm coffee break 3:25pm-4:35pm Organic molecular devices IV 4:35pm-4:50pm coffee break 4:50pm-5:50pm Organic molecular devices V	

## Symposium program

May 18 (Tuesday)

<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, Masaaki 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 Katsube (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, Yuichirou 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**

Dai Taguchi, Takaaki Manaka and Mitsumasa Iwamoto (Tokyo Institute of Technology, Japan)

<4:25pm-4:40pm>

**EM8 Investigation of Local Electric Properties at the Metal/Organic Interface in an Operating Organic Thin Film Transistor**

T.Miyazaki, K.Kobayashi, K.Ishida, S.Hotta, T.Horiuchi, H.Yamada, and K.Matsushige  
(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)<sub>3</sub>**

Taiju Tsuboi and Nadeer Aljaloudi (Kyoto Sangyo University, Japan)

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

May 19 (Wednesday)

<Registration>

<8:30am-5:00pm>

<Bioelectronics and sensors II>

<9:00am-10:35am>

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)

<Bioelectronics and sensors III>

<10:50am-12:15pm>

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, Hidehiko 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, Hidekazu Ikezaki\* and Kiyoshi Toko (Kyushu University, Japan; \*Intelligent Sensor Technology Inc., Japan)*

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

<Fabrication of organic materials>

<1:15pm-2:00pm>

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 Shiratori (Keio University, Japan)*

<1:45pm-2:00pm>

**FM3 PVDF Electron Emitter by Reversed Polarization Method**

*Shinzo Morita and Kazuaki Omura (Nagoya University, Japan)*

<Organic molecular devices III>

<2:00pm-3:10pm>

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 Tani\* 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>

<3:25pm-4:35pm>

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>

<4:50pm-5:50pm>

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>

<5:50pm-5:55pm>

Closing talk

Vice-chair: Teruaki Katsube (Saitama University, Japan)