

11th International Symposium on Organic Molecular Electronics (ISOME2020)



Book of Abstract

**August 6 – 8, 2020
Aichi Institute of Technology, Yakusa Campus
Toyota, Aichi, Japan**



Electronics Society

11th International Symposium on Organic Molecular Electronics (ISOME 2020)

August 6 - 8, 2020

Aichi Institute of Technology,
Yakusa Campus
Toyota, Japan

Organized by

Technical Committee on Organic Molecular Electronics, Electronics Society of
The Institute of Electronics, Information, and Communication Engineers
(IEICE)

Supported by

- □ Electronics Society of The Institute of Electronics, Information, and
Communication Engineers (IEICE)
- □ Daiko Foundation
- □ The Murata Science Foundation

In cooperation with

- □ Division of Molecular Electronics and Bioelectronics, The Japan Society of
Applied Physics (JSAP)
- □ Technical Committee on Dielectric and Electrical Insulation Materials, The
Institute of Electrical Engineers of Japan (IEEJ)
- □ Investigating R&D Committee on Advanced Nanomaterials and
Nanostructure Control for Innovative Organic Devices and Life Science, IEEJ

Preface

Welcome to AIT!!

Welcome to the 11th International Symposium on Organic Molecular Electronics (ISOME 2020) being held from August 6 to 8, 2020 at Aichi Institute of Technology, Yakusa Campus in Toyota, Japan. The ISOME is organized by the Electronics Society of Institute of Electronics, Information and Communication Engineers (IEICE). This is the 11th in a series of the biennial conference that began in Nagoya University in 2000, continued in Riken (Saitama), Kyoto University, Saitama University, University of Hyogo, Chiba University, NTT Musashino R&D Center (Tokyo), Tokyo University of Agriculture and Technology, Niigata University (Niigata), Sun Messe Tosu (Saga), and now Aichi Institute of Technology.

Originally ISOME2020 had been scheduled to be held on May 28-30, but it had to be postponed because of the widespread infection of COVID-19. Although the threat of COVID-19 is not finished and there are many problems, the committee decided that ISOME2020 is held on this schedule. In ISOME2020, a hybrid presentation system is employed: the international and some domestic speakers present with on-line system and the other domestic speakers present directly in meeting room and area.

On behalf of the organizing committee, I would like to express our sincere thanks to two plenary lecturers and 10 invited speakers, who are internationally distinguished researchers. This symposium has been the most important international conference of IEICE in the field of organic electronics, and has formed landmarks along the development of academic and technological progress in this field. Although the size of symposium is moderate, the active discussions among the leading scientists from diverse background nourish innovative and interdisciplinary concepts that can lead to breakthrough inaccessible by the conventional technology. We strongly believe that this symposium enhances your researches for upcoming years and provides you with invaluable experiences. We also hope that research interchange advances more and more through this symposium. Authors at ISOME 2020 are encouraged to submit original contributed papers on the significant part of their work to the Special Section on “Recent Progress in Organic Molecular Electronics” in the IEICE Transactions on Electronics, to be published in June 2021.

This symposium is warmly supported by **Daiko Foundation and The Murata Science Foundation**. I would like to express my sincere appreciation to all the committee members. The organizing committee expresses sincere thanks to all the participants who we owe the success of this symposium. Finally, we hope you enjoy the symposium and take full opportunity to explore Toyota and Nagoya Cities.

6, August, 2020

Chair : Tatsuo Mori

ISOME2020 Organizing Committee

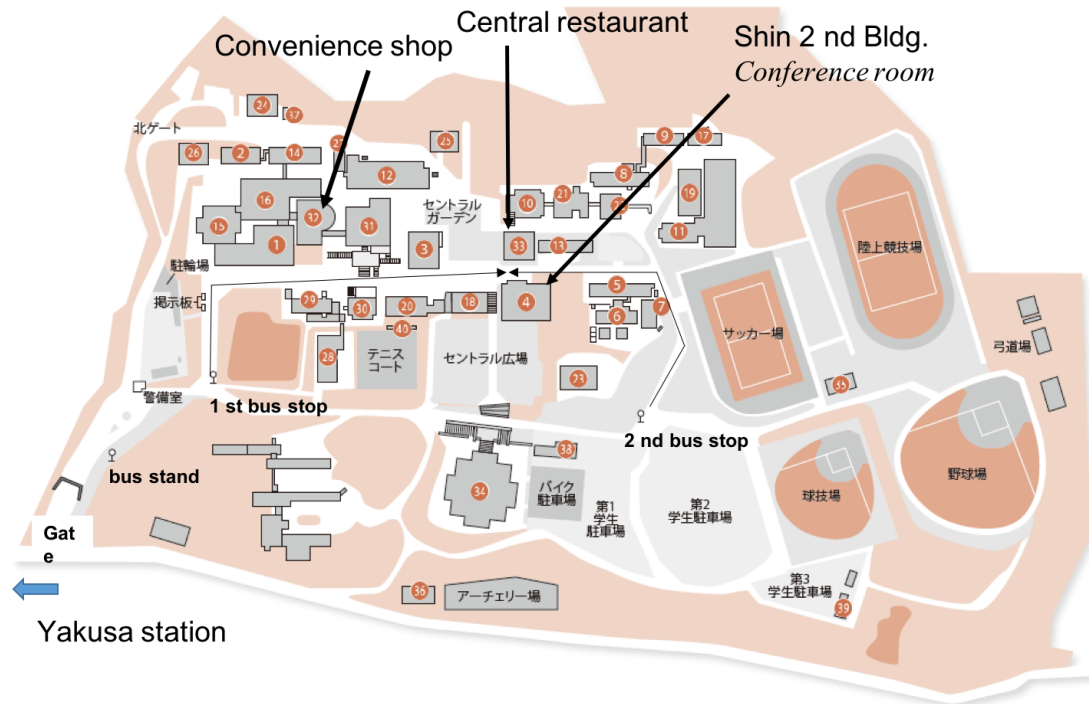
Chair	Tatsuo Mori, Aichi Institute of Technology
Vice Chair	Yutaka Majima, Tokyo Institute of Technology Toshiki Yamada, NICT
Members	Yusuke Aoki, Mie University Takashi Amemiya, Yokohama National University Eiji Itoh, Shinshu University Yuko Ueno, Chuo University Makoto Karakawa, Kanazawa University Morihiko Saito, Seikei University Masatoshi Sakai, Chiba University Koichi Sakaguchi, Saga University Toshihiro Shimada, Hokkaido University Hidenobu Shiroishi, National Institute of Technology, Tokyo College Okihiko Sugihara, Utsunomiya University Yasushi Sobajima, Gifu University Noriyuki Takada, AIST Yoko Tatewaki, Tokyo University of Agriculture and Technology Kazuya Tada, University of Hyogo Yumi Tanaka, Tokyo University of Science Shigeki Naka, University of Toyama Akira Baba, Niigata University Takeshi Fukuda, Sekisui Integrated Research
Advisors	Mitsumasa Iwamoto, Tokyo Institute of Technology Hiroaki Usui, Tokyo University of Agriculture and Technology Yutaka Ohmori, Osaka University Mitsuyoshi Onoda, University of Hyogo Kazuhiro Kudo, Chiba University Hiroyuki Sasabe, Chitose Institute of Science and Technology Tohru Maruno, NTT-AT CR Keizo Kato, Niigata University Katsumi Yoshino, Shimane Institute for Industrial Technology Naoki Matsuda, AIST
Secretariat	Hirotake Kajii, Osaka University Toshihiko Kaji, Tokyo University of Agriculture and Technology Yoshiyuki Seike, Aichi Institute of Technology Dai Taguchi, Tokyo Institute of Technology

Local Arrangements Committee

Chair	Tatsuo Mori, Aichi Institute of Technology
Members	Eiji Itoh, Shinshu University Takeshi Fukuda, Sekisui Integrated Research Yasushi Sobajima, Gifu University Yoshiyuki Seike, Aichi Institute of Technology

AIT MAP

Please enter the west stairs and climb up stairs.



Warning: No smoking in AIT except for smoking positions!

Conference rooms 2F, Shin 2nd Bldg.



transistors, memories, displays, photovoltaics, optical devices, energy devices, sensors, actuators, and bioelectronics. The topics related to basic physics and chemistry, material development, process technologies, devices and applications are covered in this symposium.

Date and Venue

Date: August 6 – August 8, 2020

Venue: Aichi Institute of Technology, Yakusa Campus
(1247 Yachigusa Yakusa-cho Toyota Aichi Japan 470-0392)
<https://www.ait.ac.jp/en/access/>

Abstract submission

Please submit the abstract together with submission form to the Symposium Secretariat by June 30, 2020. Template files are available at the ISOME2020 webpage.

Registration

Please fill the registration form and send it to the conference secretariat by e-mail. Payment should be transferred by bank transfer.

Registration fee is (regular)20,000JPY, (student)10,000JPY

The registration fee does not include banquet fee.

Submission to IEICE Transactions on Electronics

The authors of accepted papers will also be requested to submit manuscripts for the special section of IEICE Transactions on Electronics by August 8, 2020. The special section is scheduled to appear in the issue published in June, 2021. The paper must be either Full Paper (standard 8 printed pages) or Brief Paper (up to 4 printed pages). The manuscript must be prepared according to Information for Authors, IEICE Transactions on Electronics.

Information for Presentation

Plenary presentation 40 min (including discussion)

Invited presentation 25 min (including discussion)

Oral Presentation 15 min (including discussion)

Poster Presentation The recommended poster size is A0 (118.9 cm x 84.1 cm, portrait format).

Contact

Website <https://www.ieice.org/~ome/ISOME/Welcome.html>

Email info_isome2020@aitech.ac.jp

ISOME2020 Schedule

	Aug 6 (Thursday)	Aug 7 (Friday)	Aug 8 (Saturday)
	Registration (11:30-17:00)	Registration (9:00-17:00)	Registration (9:00-11:00)
Morni		<p>Session 2 (9:20-11:15)</p> <p>Invited-2-1 <i>T Matsushima</i> Invited-2-2 <i>H Fukagawa</i> Invited-2-3 <i>T Sano</i> Invited-2-4 <i>X Chen</i> Oral-2-1 <i>Y Tanaka</i></p> <p>Luncheon Poster & Coffee Break (11:15-13:30)</p>	<p>Plenary Lecture 2 (9:20-10:00) Plenary Lecture 2 <i>C Adachi</i></p> <p>Session 4 (10:25-11:25)</p> <p>Oral-4-1 <i>Y Majima</i> Oral-4-2 <i>H Usui</i> Oral-4-3 <i>K Tada</i> Oral-4-4 <i>C Lertvachirapaiboon</i></p> <p>Closing Ceremony (11:25-11:50)</p>
Aftern	<p>Opening Remarks (13:00)</p> <p>Session 1 (13:10-15:05)</p> <p>Invited-1-1 <i>C-J Huang</i> Invited-1-2 <i>Y Nagasaki</i> Invited-1-3 <i>M Toma</i> Oral-1-1 <i>N Matsuda</i> Invited-1-4 <i>Y Ueno</i></p> <p>Coffee break</p> <p>Student oral session (15:25-17:25)</p> <p>Student Oral-1 <i>N Tunghathaithip</i> Student Oral-2 <i>Y Tazo</i> Student Oral-3 <i>T Hiraga</i> Student Oral-4 <i>R Hamano</i> Student Oral-5 <i>T N Lang</i> Student Oral-6 <i>S Nakamura</i> Student Oral-7 <i>S Anuthum</i> Student Oral-8 <i>T Izumi</i></p>	<p>Session 3 (13:30-15:05)</p> <p>Invited-3-1 <i>H-W Lin</i> Invited-3-2 <i>T Miyadera</i></p> <p>Oral-3-1 <i>A Tomioka</i> Oral-3-2 <i>Md. Shahiduzzaman</i> Oral-3-3 <i>H Ogata</i></p> <p>Coffee break</p> <p>Plenary Lecture 1 (15:45-16:25)</p> <p>Plenary Lecture 1 <i>S Hayase</i></p> <p>Oral-3-4 <i>T Yamada</i> Oral-3-5 <i>H Kajii</i></p>	

ISOME 2020 Program

August 6 (Thursday)

Registration 11:30-17:00

Opening Remarks

13:00-13:10 Welcome Address

Conference Chair

Tatsuo Mori (Aichi Institute of Technology, Japan)

Session 1 == Biotechnologies and Organic Sensors ==

Chairperson: Akira Baba (Niigata University)

Naoki Matsuda (AIST)

13:10-13:35 Invited-1-1

Functional zwitterionic self-assemblies for surface engineering

Chun-Jen Huang^{1,2}

¹Department of Biomedical Sciences and Engineering, and Department of Chemical & Materials Engineering, National Central University, Taiwan

²R&D Center for Membrane Technology, Chung Yuan Christian University, Taiwan

13:35-14:00 Invited-1-2

Design of novel self-assembling based drugs

Yukio Nagasaki

Department of Materials Science, Graduate School of Pure and Applied Sciences, Master's School of Medical Sciences, Graduate School of Comprehensive Human Sciences and Center for Research in Isotopes and Environmental Dynamics (CRiED), University of Tsukuba, Japan

14:00-14:25 Invited-1-3

Color generation in plasmonic metasurface and biosensor application

Mana Toma

School of Engineering, Tokyo Institute of Technology, Japan

14:25-14:40 Oral -1-1

***In-situ* observation of desorption reaction and immobilization of cytochrome *c* on solid/liquid interfaces by slab optical waveguide spectroscopy**

Naoki Matsuda, Hirotaka Okabe

Sensing System Research Center, AIST, Japan

14:40-15:05 Invited-1-4

Graphene-based micro biosensors

Yuko Ueno

Faculty of Science and Engineering, Department of Applied Chemistry, Chuo University, Japan

15:05-15:25 Coffee Break

Student Oral Session

Chairpersons: Yukio Nagasaki (University of Tsukuba)
Hirotake Kajii (Osaka University)

15:25-15:40 Student oral-1

Fabrication of silicon nanowires by metal-catalyzed electroless etching method and their solar cell application

Naraphorn Tunghathaihip^{1,2}, Chutiparn Lertvachirapaiboon¹, Kazunari Sinbo¹, Keizo Kato¹, Sukkaneste Tungasmita², Akira Baba¹

¹Graduate School of Science and Technology and Faculty of Engineering, Niigata University, Japan

²Faculty of Science, Chulalongkorn University, Thailand

15:40-15:55 Student oral-2

Increase of accumulation charge in TPBi-based bilayer device by irradiating light during deposition

Yuki Tazo¹, Yuya Tanaka^{1,2,3}, Hisao Ishii^{1,2,4}

¹Graduate School of Science and Engineering, Chiba University, Japan

²Center for Frontier Science, Chiba University, Japan

³Science and Technology Agency, PRESTRO, Japan

⁴Molecular Chirality Research Center, Chiba University, Japan

15:55-16:10 Student oral-3

Development of AC voltage superimposed displacement current measurement for light-emitting electrochemical cell

Taichi Hiraga¹, Yuya Tanaka^{1,2} and Hisao Ishii^{1,2,3}

¹Graduate School of Science and Engineering, Chiba University, Japan

²Center of Frontier Science, Chiba University, Japan

³Molecular Chirality Research Center, Chiba University, Japan

16:10-16:25 Student oral-4

Optical response of single-walled carbon nanotubes affected by oxidation of DNA molecules by reactive oxygen species

Ryo Hamano¹, Daisuke Miyashiro^{1,2} and Kazuo Umemura¹

¹Graduate School of Science, Department of Physics, Tokyo University of Science, Japan

²ESTECH CORP., Japan

16:25-16:40 Student oral-5

Liquid crystal based NRD waveguide type terahertz phase shifter

Trong Nghia Lang, Yo Inoue, Hiroshi Moritake

Department of Electrical and Electronic Engineering, National Defense Academy, Japan

16:40-16:55 Student oral-6

Screening of lead-free copper organic-inorganic halide material for photovoltaic applications

Shotaroh Nakamura, Toshihiko Kaji

Department of Applied Physics, Tokyo University of Agriculture and Technology, Japan

16:55-17:10 Student oral-7

Photothermal properties of graphene/silver nanoparticles grating film

Siriporn Anuthum^{1,2}, Chutiparn Lertvachirapaiboon¹, Ryouyusuke Ishikawa³, Kazunari Shinbo¹, Keizo Kato¹, Kontad Ounnunkad², and Akira Baba¹

¹Graduate School of Science and Technology and Faculty of Engineering, Niigata University, Japan

² 2Department of Chemistry, Faculty of Science, Chiang Mai University, Thailand

³*Advanced Research Laboratories, Tokyo City University, Japan*

17:10-17:25 Student oral-8

Deposition polymerization of naphthalene diimide on a vinyl-terminated SAM

Takuya Izumi¹, Naoyuki Fukui¹, Satoshi Usui² and Hiroaki Usui¹

¹*Institute of Engineering, Tokyo University of Agriculture and Technology, Japan*

²*Faculty of Science, Niigata University, Japan*

August 7 (Friday)

Registration 09:00-17:00

Session 2 == Organic Optical Devices and Photonics ==

Chairpersons: Toshinori Matsushima (Kyushu University)
Toshihiko Kaji (Tokyo University of Agriculture and Technology)

09:20-09:45 Invited-2-1

New era of metal halide perovskite-based optoelectronics

Toshinori Matsushima^{1,2} and Chihaya Adachi¹⁻³

¹*PCNER, Kyushu University, Japan*

²*OPERA, Kyushu University, Japan*

³*JST-ERATO, Japan*

09:45-10:10 Invited-2-2

Universal method to efficient electron injection into organic semiconductors utilizing bases

Hirohiko Fukagawa¹, Munehiro Hasegawa², Katsuyuki Morii^{2,3},

Tsubasa Sasaki¹ and Takahisa Shimizu¹

¹*NHK, Japan*

²*Nippon Shokubai Co., Ltd., Japan*

³*Osaka University, Nippon Shokubai Research Alliance Laboratories, Japan*

10:10-10:35 Invited-2-3

Applications of organic electronics toward the new normal lifestyle

Takeshi Sano¹, Yutaka Okuyama¹, Yoshiyuki Suzuri¹, Mitsuhiro Koden¹, Toshinao Yuki¹, Makoto Mizukami¹, Hitoshi Nakada¹ and Junji Kido²

¹*Innovation Center for Organic Electronics, Yamagata University, Japan*

²*Frontier Center for Organic Materials, Yamagata University, Japan*

10:35-11:00 Invited-2-4

The self-powered nanosystem based on triboelectric nanogenerator

Xiangyu Chen

Faculty of Beijing Institute of nanoenergy and nanosystems, Chinese Academic of Sciences, China

11:00-11:15 Oral-2-1

Operation mechanism of electret-based vibrational energy generator composed of polar molecules for organic light-emitting diodes

Yuya Tanaka^{1,2,3,4}, Noritaka Matsuura², Masahiro Ohara², Yuki Tazo²,

Hideyuki Kayaguchi³ and Hisao Ishii^{1,2,3,5}

¹*Center for Frontier Science, Chiba University, Japan*

²*Graduate School of Science and Engineering, Chiba University, Japan*

³*Faculty of Engineering, Chiba University, Japan*

⁴*Japan Science and Technology Agency, PRESTO, Japan*

⁵*Molecular Chirality Research Center, Chiba University, Japan*

11:15-13:30 Luncheon Poster & Coffee Break

Session 3 == OLEDs & Organic Solar Cells ==

Chairpersons: Takeshi Sano (Yamagata University)
Yoshiyuki Seike (Aichi Institute of Technology)

13:30-13:55 Invited-3-1

Vacuum deposited perovskite photodiodes and spray synthesized perovskite nano-crystals

Hao-Wu Lin

Department of Materials Science and Engineering, National Tsing Hua University, Taiwan

13:55-14:20 Invited-3-2

Crystallization control of organolead-halide perovskite by vacuum deposition

Tetsuhiko Miyadera

Global Zero Emission Research Center, National Institute of Advanced Industrial Science and Technology, Japan

14:20-14:35 Oral-3-1

Luminescent organic nanoparticles continuously fabricated by simultaneous suspension and laser processing of dye solution microdroplets

Akihiro Tomioka, Shoma Arai, Tatsuya Okada and Kazuya Shinbo

Graduate School of Engineering, Osaka Electro-Communication University, Japan

14:35-14:50 Oral-3-2

Efficient and stable perovskite solar cells by utilizing MAPbI₃ nanoparticle-seeded growth approach

Md. Shahiduzzaman¹, LiangLe Wang², Shoko Fukaya², Ersan Y. Muslih³, Masahiro Nakano³, Makoto Karakawa^{1,2,3}, Kohshin Takahashi³, Koji Tomita⁴, Jean-Michel Nunzi^{1,5}, and Tetsuya Taima^{1,2,3}

¹*Nanomaterials Research Institute, Kanazawa University, Japan*

²*Graduate School of Frontier Science Initiative, Kanazawa University, Japan*

³*Graduate School of Natural Science and Technology, Kanazawa University, Japan*

⁴*Department of Chemistry, School of Science, Tokai University, Japan*

⁵*Department of Physics, Engineering Physics and Astronomy, Queens University, Canada*

14:50-15:05 Oral-3-3

Effect of the type of organic cation on the durability of 2D/3D mixed lead halide perovskite films for photovoltaic applications

Hironori Ogata^{1,2,3}, Satsuki Hata² and Ryusuke Umeda¹

¹*Graduate School of Science and Engineering, Hosei University, Japan*

²*Dept. Chem.Sci. and Technol., Hosei University, Japan*

³*Research Center for Micro-Nano Technology, Hosei University Japan*

15:05-15:45 Coffee Break

Plenary Lecture 1

Chairpersons: Tatsuo Mori (Aichi Institute of Technology)

15:45-16:25 Plenary 1 (Invited)

Progress in perovskite solar cells

Shuzi Hayase

Info-Powered Energy System Research Center, The University of Electro-Communications, Japan

16:25-16:40 Oral-3-4

Polarization dependences in terahertz wave detection by Stark effect of nonlinear optical polymers

Toshiki Yamada, Takahiro Kaji, Chiyumi Yamada, and Akira Otomo

Advanced ICT Research Institute, National Institute of Information and Communications Technology,

Japan

16:40-16:55 Oral-3-5

Fabrication and characteristics of bulkheterojunction polymer photodetectors based on inverted structure toward narrowband-light detection devices

Hirotake Kajii, Hiyuto Okui and Masahiko Kondow

Graduate School of Engineering, Osaka University, Japan

August 8 (Saturday)

Registration 09:00-11:00

Plenary Lecture 2

Chairpersons: Yutaka Majima (Tokyo Institute of Technology)

09:20-10:00 Plenary 2 (Invited)

Recent progress in blue TADF OLEDs

Jong Uk Kim, Thanh Ba Nguyen, Chin-Yiu Chan, Masaki Tanaka, Hajime Nakanotani, and Chihaya Adachi

Center for Organic Photonics and Electronics Research (OPERA), Kyushu University, Japan

10:00-10:25 Coffee Break

Session 4 == *Biotechnologies and Organic Sensors* ==

Chairpersons: Dai Taguchi (Tokyo Institute of Technology)

Toshiki Yamada (*National Institute of Information and Communications Technology*)

10:25-10:40 Oral-4-1

Pt-nanogap electrodes based oxygen gas sensor

Yutaka Majima, Tsubasa Tosa, and Phan Trong Tue

Laboratory for Materials and Structures, Tokyo Institute of Technology, Japan

10:40-10:55 Oral-4-2

Deposition polymerization of a layered polymer structure on a SAM

Takumi Miyayama, Satsuki Mayuzumi, Yamato Ogawa and Hiroaki Usui

Institute of Engineering, Tokyo University of Agriculture and Technology, Japan

10:55-11:10 Oral-4-3

Effect of temperature on electrical resistance-length characteristics of electroactive supercoiled polymer artificial muscle

Kazuya Tada, Takashi Yoshida

Department of Electrical Materials and Engineering, University of Hyogo, Japan

11:10-11:25 Oral-4-4

Chemical mixture identification using transmission surface plasmon resonance based metallic grating sensor chip and pattern-recognition technique

Chutiparn Lertvachirapaiboon, Akira Baba, Kazunari Shinbo and Keizo Kato

Graduate School of Science and Technology, Niigata University, Japan

Closing Ceremony

11:25-11:50 Award Ceremony & Closing Address

Chair of the Technical Committee on Organic Molecular Electronics, IEICE

Yutaka Majima

Tokyo Institute of Technology, Japan

Poster Session

August 7 (Friday) 11:15-13:30

P01

Biofuel cell using cellulose nanofiber for fuel supply

Ryutaro Tanaka, Mitsuhiro Ogawa, Satomitsu Imai

Department of Precision Machinery Engineering, Nihon University, Japan

P02

Development and evaluation of fructose biofuel cell using gel fuel and liquid fuel as hybrid structure

Atsuya Yamakawa, Keisuke Todaka, and Satomitsu Imai

Department of Precision Machinery Engineering, Nihon University, Japan

P03

Graphene coated carbon fiber woven fabric and by FAD-GDH Glucose biofuel cell

Tatsuki Oginō and Satomitsu Imai

Department of Precision Machinery Engineering, Nihon University, Japan

P04

Dielectric multilayer film using photocured organic-inorganic hybrid materials

Taisei Ito, Satoshi Jinbo, Okihiro Sugihara

Department of Optical Engineering, Utsunomiya University, Japan

P05

Evaluation of modal power distribution of graded-index plastic optical fiber connections

Shintaro Ueda and Okihiro Sugihara

Department of Optical Engineering, Utsunomiya University, Japan

P06

Method of fabrication of microneedle using biodegradable UV curable resin polyanhydride and polyanhydride mechanical strength

Kosuke Yasuda, Katsuya Sugisaki, Tomohiro Shimoda, Yuki Nakamura, Satomitsu Imai

Department of Precision Machinery Engineering, Nihon University, Japan

P07

Fabrication and characterization of inverted polymer light emitting diodes with multilayered nano-hybrid carrier injection layers

Shingo Takada, Eiji Itoh

Department of Electrical and Computer Engineering, Shinshu University, Japan

P08

Color tuning of PL and organic light-emitting diodes with perylene excimer and crystallinity

Kazuho Furukawa¹, Masahiro Morimoto² and Shigeki Naka²

¹ *Graduate School of Science and Engineering for Education, University of Toyama, Japan*

² *Academic Assembly Faculty of Engineering, University of Toyama, Japan*

P09

Low voltage drive for organic light-emitting diodes with polarization treated ferroelectric polymer

Yoshiki Maegawa¹, Masahito Morimoto² and Shigeki Naka²

¹ *Graduate School of Science and Engineering for Education, University of Toyama, Japan*

² *Academic Assembly Faculty of Engineering, University of Toyama, Japan*

P10**Electrical conduction of carbazole-derivatives used for TADF OLEDs**

Ryo Sato, Satoru Aoyama, Yoshiyuki Seike, Tatsuo Mori

Department of Electrical and Electronics Engineering, Graduate School of Engineering, Aichi Institute of Technology, Japan

P11**Inverted organic multi-function-diodes with polyethyleneimine ethoxylated as a buffer layer**

Riku Imaeda¹, Masahiro Morimoto² and Shigeki Naka²

¹Graduate School of Science and Engineering for Education, University of Toyama, Japan

²Academic Assembly Faculty of Engineering, University of Toyama, Japan

P12**Evaluation of the dynamic characteristics of microdroplets by vibration**

Kosuke Fujishiro and Satomitsu Imai

Department of Precision Machinery Engineering, Nihon University, Japan

P13**Superhydrophobic coating made from polydimethylsiloxane-based organic-inorganic hybrid materials and ceramic powders using electrophoretic deposition**

Yusuke Aoki

Graduate School of Engineering, Mie University, Japan

P14**Visualizing positive and negative charges of triboelectricity generated on polyimide film**

Dai Taguchi, Takaaki Manaka and Mitsumasa Iwamoto

Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, Japan

P15**Fabrication of silver nanowire bundles with insulation coating suitable for a flexible circuit wiring**

Kazuya Shinbo, Tatsuya Okada and Akihiro Tomioka

Graduate School of Engineering, Osaka Electro-Communication University, Japan

P16**Characterization of nonlinear optical chromophores having tricyanopyrroline acceptor and amino benzene donor unit with or without a benzyloxy group**

Toshiki Yamada, Yoshihiro Takagi, Chiyumi Yamada, and Akira Otomo

Advanced ICT Research Institute, National Institute of Information and Communications Technology, Japan

P17**Silver nanowire patterning on flexible sheets for wireless power transfer antenna as a replacement for rigid batteries**

Tatsuya Okada, Kazuya Shinbo, Ryo Fushii, Kouta Hamazoe, and Akihiro Tomioka

Graduate School of Engineering, Osaka Electro-Communication University, Japan

P18**Effect of hybrid solutions for PbI₂ on perovskite layer fabricated using 2-step method**

Daiki Okawa, Yoshiyuki Seike, Tatsuo Mori

Department of Electrical and Electronics Engineering, Graduate School of Engineering, Aichi Institute of Technology, Japan

P19**Fabrication of concavoconvex PEDOT: PSS layer by inkjet-printing in inverted perovskite solar cell**

Ryoma Hayashi, Tatsuo Mori and Yoshiyuki Seike

Graduate School of Engineering, Aichi Institute of Technology, Japan

P20

Intercalation control of CsI in MAPbI₃ framework for efficient and stable perovskite solar cells

LiangLe Wang¹, Md. Shahiduzzaman², Shoko Fukaya¹, Ersan Y. Muslih³, Masahiro Nakano³, Makoto Karakawa^{2,3}, Kohshin Takahashi³, Koji Tomita⁵, Jean Michel Nunzi^{2,4} and Tetsuya Taima^{1,2,3}

¹Graduate School of Frontier Science Initiative, Kanazawa University, Japan

²Nanomaterials Research Institute, Kanazawa University, Japan

³Graduate School of Natural Science and Technology, Kanazawa University, Japan

⁴Department of Physics, Engineering Physics and Astronomy, Queens University, Canada

⁵Department of Chemistry, School of Science, Tokai University, Japan

P21

Low damage inductively coupled plasma treatment for polyimide bank on organic light-emitting diodes

Kohei Yamamoto^{1,2}, Toshimitsu Nakamura¹, Kenta Suzuki¹, Takaomi Kurata¹ and Junya Kiyota¹

¹Advanced Technology Institute, ULVAC Inc., Japan

²Nanomaterials Research Institute (NanoMaRi), Kanazawa University, Japan

P22

Influence of potassium ions on the fabrication of inverted organic perovskite solar cells

Tatsuya Kato, Tatsuo Mori and Yoshiyuki Seike

Graduate School of Engineering, Aichi Institute of Technology, Japan

P23

Effects of surface modification on the stability and electric properties of cesium lead halide perovskite films

Ryusuke Umeda¹ and Hironori Ogata^{1,2,3}

¹Graduate School of Science and Engineering, Hosei University, Japan

²Department of Chemical Science and Technology, Hosei University, Japan

³Research Center for Micro-Nano Technology, Hosei University, Japan

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