

5th Korea-Japan Joint Symposium on Advanced Solar Cells 2018 2nd International Symposium on Energy Research and Application

Date: February 5 -7, 2018

Venue: Research Complex 1 (8F), Sungkyunkwan University, Suwon, Korea

Organized by

- ICT HRD Institute for New Value Creation, Sungkyunkwan University (SKKU), Korea
- Chemical and Biological Detection Research Center, Sungkyunkwan University (SKKU), Korea

Co-organized by

- Center of Plasma Nano-interface Engineering (CPNE), Kyushu University, Japan
- BK21plus HRD Center for Creative Convergence Chemical Sciences, Sungkyunkwan University (SKKU), Korea

Supported by

- College of Information and Communication Engineering, Sungkyunkwan University (SKKU), Korea
- Department of Chemistry and Institute of Basic Science, Sungkyunkwan University (SKKU), Korea
- Graduate School of Information Science and Electrical Engineering, Kyushu University, Japan
- Joining and Welding Research Institute, Osaka University, Japan

Organizing Committee

Byungyou Hong (SKKU, Korea)
Jin-Hyo Boo (SKKU, Korea)
Jaehyeong Lee (SKKU, Korea)
Chang-Sik Song (SKKU, Korea)
Masaharu Shiratani (Kyushu Univ., Japan)
Yuichi Setsuhara (Osaka University, Japan)
Shota Nunomura (AIST, Japan)
Hyunwoong Seo (Kyushu Univ., Japan)

Programs of Symposium

Monday, February 5

09:30 Opening Addresses by Prof. M. Shiratani and Prof. B. Hong

Plenary Lectures (2) (35min+5min Q&A) *Chair:* **Byungyou Hong**, **Masaharu Shiratani**

09:40 “State of the art silicon heterojunction solar cell devices
~ plasma processing for high-quality passivation~”

Dr. Shota Nunomura (AIST, Japan)

10:20 “Impedance Analysis of Organic Solar Cells”

Prof. Segi Yu (Hankuk University of Foreign Studies, Korea)

Coffee Break with Photo Time (11:00 -11:20)

Poster Session (11:20 -12:30)

Lunch (12:30 - 14:00)

Invited Session 1 (4) (25min+5min Q&A) *Chair:* **Jin-Hyo Boo**, **Hyunwoong Seo**

14:00 “CARRIER TRANSPORT IN CRYSTALLINE SILICON HETEROJUNCTION WITH
ORGANIC THIN-LAYER (HOT) SOLAR CELLS”

Prof. Hajime Shirai (Saitama University, Japan)

14:30 “Design and Fabrication of Organic and Perovskite Tandem Solar Cells”

Prof. Yong-Sang Kim (SKKU, Korea)

15:00 “Micro Energy Harvesting Vortex Induced Vibration in a Downstream of
Cross-flow Hydroturbine”

Prof. Youn-Jea Kim (SKKU, Korea)

15:30 “Plasma-Enhanced Reactive Processes for Low-Temperature Formation of
High-Mobility IGZO Thin Film Transistor and Functional Films for Solar
Cells”

Prof. Yuichi Setsuhara (Osaka University, Japan)

Coffee break (15:30-15:50)

Young Scientists Session (17) (10min w/o Q&A) *Chair:* Dong-In Kim, Susumu Toko

15:50 “Asymmetric Supercapacitors by Tuning Work-function of Graphene Flakes”

Doyoung Kim (SKKU, Korea)

16:00 “Utilizing cluster cloud as a selective filter of deposition precursors of a-Si:H films”

Susumu Toko (Kyushu University, Japan)

16:10 “Enhanced photovoltaic effect of ReS₂ solar cell by oxygen plasma process”

KwanHo Kim (SKKU, Korea)

16:20 “Interface passivation for solution-processed metal oxide based perovskite solar cells with less hysteresis”

Feng Yang (SKKU, Korea)

16:30 “SiH₄ gas flow rate dependence of Si-H₂ bond density at P/I interface in a-Si:H solar cells fabricated by plasma CVD”

Kazuma Tanaka (Kyushu University, Japan)

16:40 “The Impact of Charge Regenerator on the Photo-energy Conversion/Storage Performance of Dye-Sensitized Solar Battery”

Byung-Man Kim (UNIST, Korea)

16:50 “Structural effect on the isomerization of spiropyran-incorporated photochromic materials”

Juhyen Lee (SKKU, Korea)

17:00 “Effect of additive on catalytic enhancement of polymer counter electrode in dye-sensitized solar cells”

Bochen Zhang (Kyushu University, Japan)

- 17:10 “Oxygen-plasma treatment of Spiro-OMeTAD for high performance in perovskite solar cell”
Dong-In Kim (SKKU, Korea)
- 17:20 “Molecular Engineering for Enhancement of Thermal/Photo/Water Stability of Organic Sensitizers for Dye-sensitized Solar Cells”
Jun-Hyeok Park (UNIST, Korea)
- 17:30 “Enhancement on photovoltaic performance of dye-sensitized solar cells by applying up-conversion $Y_2O_3:Er^{3+}$ nanoparticles”
Daisuke Sakamoto (Kyushu University, Japan)
- 17:40 “A study on a nickel oxide by DC sputter with deposition temperature for electrochromic device”
Won Chang Lee (SKKU, Korea)
- 17:50 “Improved electrochromic characteristics of nanorod based WO_3 thin films with inverse opal structure”
Hye-Eun Yang (SKKU, Korea)
- 18:00 “Reduction of activation energy of CO_2 methanation reaction using plasma-catalytic method”
Akihisa Yamamoto (Kyushu University, Japan)
- 18:10 “Impedance Analysis of Bi-layer Organic Photovoltaic Cells Containing Carbon Nanotubes”
Kyeongman Han (SKKU, Korea)
- 18:20 “Efficiency Improvement of CuI-Si Solar Cells through Progress in Hole Selective Layer Quality”
Jian Lin (SKKU, Korea)
- 18:30 “Control of Crystal Structure of Li-Mn-Fe Oxide Nanoparticles for Lithium-Ion Battery Electrodes”
Tadashi Nonaka (Kyushu University, Japan)

Welcome Reception (19:00 – 21:00)

Tuesday, February 6

Invited Session 2 (5) (25min+5min Q&A) *Chair:* **Changsik Song, Kazunori Koga**

09:30 “Opportunity to gain the renewable energy from environments”
Prof. Joo-Hyung Kim (Inha University, Korea)

10:00 “Plasma CVD of a-C:H films as protective layers for solar cells”
Prof. Masaharu Shiratani (Kyushu University, Japan)

10:30 “Design and application of PEDOT:PSS in organic device”
Dr. Soyeon Kim (KIMS, Korea)

11:00 “High-efficiency wavelength conversion material based on nano-scale optical near-field interactions”
Prof. Naoya Tate (Kyushu University, Japan)

11:30 “Triboelectric Nanogenerators and Tribotronics for Self-Powered Electronics”
Prof. Sang-Woo Kim (SKKU, Korea)

Lunch (12:00 - 13:30)

Invited Session 3 (4) (25min+5min Q&A) *Chair:* **Donggeun Jung, Manabu Tanaka**

13:30 “Photoelectrochemical Water Splitting with Earth-Abundant Semiconductors: from Lab-Scale to Large-Scale”
Dr. Min-Kyu Son (Swiss Federal Laboratories for Materials Science and Technology, Swiss)

14:00 “Catalytic Conversion of C1 Feedstocks to Value-Added Chemicals using Nanostructured Heterogeneous Catalysts”
Prof. Kyungsu Na (Chonnam National University, Korea)

14:30 “Stability Enhancement of Short Channel Polysilicon Thin-Film Transistors for OLED Displays”

Prof. Byoung-deog Choi (SKKU, Korea)

15:00 “Plasma Enhanced Carbon Recycling for Large-Scale Introduction of Solar Cells to Energy Supply Chain”

Prof. Kazunori Koga (Kyushu University, Japan)

Coffee Break (15:30 -15:50)

Invited Session 4 (5) (25min+5min Q&A) Chair: Byoung-deog Choi, Shota Nunomura

15:50 “Hybrid (Triboelectric and Piezoelectric) Energy Harvesters as Mechanical Energy Harvesting Devices”

Prof. Dae Joon Kang (SKKU, Korea)

16:20 “High-Speed Visualization of Temperature Fluctuation Phenomena in Multiphase AC Arc for Nanoparticles Fabrication”

Prof. Manabu Tanaka (Kyushu University, Japan)

16:50 “Metal oxide based transparent photovoltaics”

Prof. Joon Dong Kim (Incheon National University, Korea)

17:20 “Strategy for the commercialization of dye-sensitized solar cells”

Prof. Hyunwoong Seo (Kyushu University, Japan)

17:50 “Toward Sustainable Photocatalysis: Metal-Terpyridine Interaction-enabled Regenerative Photoactive Polymer Networks”

Prof. Changsik Song (SKKU, Korea)

Banquet (18:30 – 21:00)

Poster Session Program

- [P1] “Asymmetric Supercapacitors by Tuning Work-function of Graphene Flakes”
Doyoung Kim (SKKU, Korea)
- [P2] “Utilizing cluster cloud as a selective filter of deposition precursors of a-Si:H films”
Susumu Toko (Kyushu University, Japan)
- [P3] “Enhanced photovoltaic effect of ReS₂ solar cell by oxygen plasma process”
KwanHo Kim (SKKU, Korea)
- [P4] “Interface passivation for solution-processed metal oxide based perovskite solar cells with less hysteresis”
Feng Yang (SKKU, Korea)
- [P5] “SiH₄ gas flow rate dependence of Si-H₂ bond density at P/I interface in a-Si:H solar cells fabricated by plasma CVD”
Kazuma Tanaka (Kyushu University, Japan)
- [P6] “The Impact of Charge Regenerator on the Photo-energy Conversion/Storage Performance of Dye-Sensitized Solar Battery”
Byung-Man Kim (UNIST, Korea)
- [P7] “Structural effect on the isomerization of spiropyran-incorporated photochromic materials”
Juhyen Lee (SKKU, Korea)
- [P8] “Effect of additive on catalytic enhancement of polymer counter electrode in dye-sensitized solar cells”
Bochen Zhang (Kyushu University, Japan)
- [P9] “Oxygen-plasma treatment of Spiro-OMeTAD for high performance in perovskite solar cell”
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- [P10] “Molecular Engineering for Enhancement of Thermal/Photo/Water Stability of Organic Sensitizers for Dye-sensitized Solar Cells”
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- [P11] “Enhancement on photovoltaic performance of dye-sensitized solar cells by applying up-conversion $Y_2O_3:Er^{3+}$ nanoparticles”
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- [P12] “A study on a nickel oxide by DC sputter with deposition temperature for electrochromic device”
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