Advanced Materials for Energy Conversion: fuel cell and solar cell(EC)

Oral Presentation

Nov. 7, 2011 (Mon.)

EC 1 (Advanced Materials for Energy Conversion: fuel cell and solar cell 1)

Ballroom 2

Chair: Dr. Angelo Moreno (ENEA, Italy) 15:00-16:10

ECIS1 15:00-15:30 Invited Speech
Polybenzimidazolium based Solid Electrolytes for Fuel Cell Applications
Dirk Henkensmeier, Hyeong-Rae Cho, Hyoung-Juhn Kim, Tae-Hoon Lim
Korea Institute of Science and Technology, Korea

EC1572 15:30-15:50
Effect of Low Processing Temperature of LSGMC based Cell by Aerosol Deposition for IT-SOFC
Jong-Jin Choi, Joon-Hwan Choi, Jungho Ryu, Byung-Dong Hahn, Woon-Ha Yoon, Jong-Woo Kim, Cheol-Woo Ahn, Dong-Soo Park
Korea Institute of Materials Science, Korea

EC1678 15:50-16:10
Ag Interlayered AZO Sandwich Transparent Conducting Electrode for Photovoltaic Cells
Jeong-Do Yang[1,2], Jung-Min Cho[3], Tae-Woo Hong[1], Dong-Ick Son[1], Dong-Hee Park[1], Kyung-Hwa Yoo[2], Won-Suk Shin[3], Sang-Jin Moon[3], Won-Kook Choi[1]
[1]Korea Institute of Science and Technology, Korea, [2]Yonsei University, Korea, [3]Korea Research Institute of Chemical Technology, Korea

Nov. 7, 2011 (Mon.)

EC 2 (Advanced Materials for Energy Conversion: fuel cell and solar cell 2)

Ballroom 2

Chair: Dr. Hee-eun Song (Korea Institute of Energy Research, Korea) 16:30-17:30

EC1043 16:30-16:50
Performance of BHJ Organic Solar Cells Fabricated using Spray Deposited Poly[[9-(1-Octylnonyl)-9H-Carbazole-2.7-Diyl]-2.5-Thiophenediyl-2.1.3-Benzothiadiazole-4.7-Diyl-2.5-Thiophenediyl][PCDTBT]/ [6,6]-phenyl C71 Butyric Acid Methyl Ester ($PC_{71}BM$) Active Layer
Ramraj Ramesh Babu[1,2], Paik-Kyun Shin[3], Shizuyasu Ochiai[1]
[1]Aichi Institute of Technology, Japan, [2]Bharathidasan University, India, [3]Inha Univ., Korea

EC1101 16:50-17:10
Preparation of Photoanode using Pluronic Triblock Copolymer for Dye Sensitized Solar Cell
S.N. Karthick[1], K.V. Hemalatha[1], C. Justin Raj[1], G. Vijayakumar[2], Min-Kyu Son[1], Hee-Je Kim[1]
[1]Pusan National University, Korea, [2]Park College of Technology, India

EC1096 17:10-17:30
Performance of Rosa Multiflora and Rosa Chinensis Flower Dyes as a Sensitizer for Dye Sensitized Solar Cells
K.V. Hemalatha, S.N. Karthick, C. Justin Raj, Na-Yeong Hong, Min-Kyu Son, Hee-Je Kim
Pusan National University, Korea

Advanced Materials for Energy Conversion: fuel cell and solar cell

Nov. 8, 2011 (Tue.)

EC 3 (Advanced Materials for Energy Conversion: fuel cell and solar cell 3) Ballroom 2

Chair: Prof. Michael D. Guiver (National Research Council Canada, Canada) 09:10-10:10

EC1062 09:10-09:30
Interactions between Protons and Their Effect on Proton Migration in Barium Zirconate
Dae-Hee Kim[1], Byung-Kook Kim[2], Yeong-Cheol Kim[1]
[1]Korea University of Technology and Education, Korea, [2]Korea Institute of Science and Technology (KIST), Korea

EC146 09:30-09:50
A Comparative Study of $Sm_{0.5}Sr_{0.5}MnO_{3-\delta}$ and $Sm_{0.5}Sr_{0.5}CoO_{3-\delta}$ for Oxygen Reduction Electrode on $Sm_{0.2}Ce_{0.8}O_{1.9}$ Electrolyte
Feifei Dong, Dengjie Chen, Zongping Shao
Nanjing University of Technology, China

EC1031 09:50-10:10
Mechanism and Stability of Methane Production from CO_2 and H_2O on MgO(001) Surface: A Theoretical Study by DFTcalculations
Rizcky Tamarany[1,2], Seung-Cheol Lee[1], Jung-Hae Choi[1]
[1]Korea Institute of Science and Technology, Korea, [2]University of Science and Technology, Korea

Nov. 8, 2011 (Tue.)

EC 4 (Advanced Materials for Energy Conversion: fuel cell and solar cell 4) Ballroom 2

Chair: Dr. Jeong Dae Suh (Electronics and Telecommunications Research Institute, Korea) 10:40-12:00

EC918 10:40-11:00
Evaluation of the Performance of Organic Thin Film Solar Cell Prepared by the Active Layer of Poly[[9-(1-Octylnonyl)-9H-Carbazole-2.7-Diyl]-2.5-thiophenediyl -2.1.3-Benzothiadiazole-4.7-Diyl-2.5-thiophenediyl][PCDTBT]/[6,6]-phenyl C_{71} Butyric Acid Methyl Ester ($PC_{71}BM$) Composite Thin Film
Shizuyasu Ochiai[1], Paik-Kyun Shin[2]
[1]Aichi Institute of Technology, Japan, [2]Inha Univ., Korea

EC881 11:00-11:20
Thin Single Crystalline Silicon Solar Cell Fabrication
Hee-eun Song[1], Tae-hyeon Baek[2], Kyeom Seon Do[3], Jeong Chul Lee[1], Gi Hwan Kang[1], Gwon Jong Yu[1]
[1]Korea Institute of Energy Research, Korea, [2]Chungbuk National University, Korea, [3]Yonsei University, Korea

EC738 11:20-11:40
Effect of $TiCl_4$ Treatment on Carrier Transport Properties of Zn_2SnO_4 based Dye Sensitized Solar Cells
Alagappan Annamalai, Man-Jong Lee
Konkuk University, Korea

EC277 11:40-12:00 **TiO_2/ITO/SWCNTs Nano-composites Structure Enhanced Photo Electrochemical Activity**
Thanh-Tung Duong, Soon-Gil Yoon
Chungnam National University, Korea

Nov. 8, 2011 (Tue.)

EC 5 (Advanced Materials for Energy Conversion: fuel cell and solar cell 5)

Ballroom 2

Chair: Dr. Dirk Henkensmeier (Korea Institute of Science and Technology, Korea) 15:30-16:40

ECIS2 15:30-16:00 Invited Speech **Densely Sulfonated Copolymer Electrolyte Membranes for Use in Fuel Cells**
Michael D. Guiver[1,2], Nanwen Li[2], Chenyi Wang[2], So Young Lee[2], Chi Hoon Park[2], Dong Won Shin[2], Doo Sung Hwang[2], Young Moo Lee[2]
[1]National Research Council Canada, Canada, [2]Hanyang University, Korea

EC194 16:00-16:20 **Single Step Solvothermal Synthesis of Nanorod Thin Film of TiO_2 and Their Application as Photo Anodes in Dye Sensitized Solar Cells**
J. Nayak[1], J.W. Park[2], Hee-Je Kim[1]
[1]Pusan National University, Korea, [2]Dae Rim Enterprises Co. Ltd., Korea

EC683 16:20-16:40 **Characterization of Platinum-supported Carbon Nanowalls**
Seog-Chul Shin[1], Akihiko Yoshimura[1,2], Masaru Tachibana[1]
[1]Yokohama City University, Japan, [2]IHI Corporation, Japan

Nov. 8, 2011 (Tue.)

EC 6 (Advanced Materials for Energy Conversion: fuel cell and solar cell 6)

Ballroom 2

Chair: Prof. Soo-Kill Kim (Chung-Ang University, Korea) 17:00-18:00

EC656 17:00-17:20 **Fabrication of Cu-Ga-Se and Cu-In-Se Thin Films by Single Target Sputtering and Selenization**
Jeong Dae Suh, Eun Jin Bae
Electronics and Telecommunications Research Institute, Korea

EC147 17:20-17:40 **A New Bimetallic Ni-Fe-ZrO_2 Catalyst as Anode Catalyst Layer for Methane-Fueled Solid Oxide Fuel Cell through Partial Oxidation**
Huaiyu Zhu, Wei Wang, Zongping Shao
Nanjing University of Technology, China

EC471 17:40-18:00 **Strontium Titanate-based Interconnects for Solid Oxide Fuel Cells: Materials Synthesis and Thin-layer Coating**
Jong-Won Lee, Beom-Kyeong Park, Seung-Bok Lee, Tak-Hyoung Lim, Seok-Joo Park, Rak-Hyun Song, Dong-Ryul Shin
Korea Institute of Energy Research, Korea

Advanced Materials for Energy Conversion: fuel cell and solar cell

Nov, 9, 2011 (Wed)

EC 7 (Advanced Materials for Energy Conversion: fuel cell and solar cell 7)

Ballroom 2

Chair: Prof. Shizuyasu Ochiai (Aichi Institute of Technology, Japan) 09:10-10:20

ECIS3 09:10-09:40 Invited Speech
New Materials for Fuel Cells
Angelo Moreno, S. McPhail, E. Simonetti, V. Cigolotti, M. Bellusci, R. Giorgi
ENEA, Italy

EC1231 09:40-10:00
Functionalized Multiwall Carbon Nanotubes with High Pt Loading as an Efficient Cathode Electrocatalyst for Proton Exchange Membrane Fuel Cell
Min Young Song, Daesoo Yang, Sun Young Kwon, Min-Sik Kim, Jung Ho Kim, Yoon Kyung Kim, Hyuk Soo Choi, Eunji Choi, Jin Sol Park, Baizeng Fang, Jong-Sung Yu
Korea University, Korea

EC607 10:00-10:20
Effect of a Gd-doped Ceria Interlayer on $Sm_{0.5}Sr_{0.5}CoO_{3-\delta}$ Cathode for Intermediate-temperature Solid Oxide Fuel Cells
Ju-Hee Kim, Sang-in Ahn, Haekyoung Kim
Yeungnam University, Korea

Poster Presentation

Nov, 7, 2011 (Mon)

ECP 1 (Advanced Materials for Energy Conversion: fuel cell and solar cell) Poster Presentation 1

Lobby 2F

Chair: Dr. Kyungkon Kim (Korea Institute of Science and Technology, Korea) 13:00-15:00

EC1667
Improved Contact Electrode using Cryogenic Metal Deposition for Organic Solar Cell Applications
Byung Doo Chin, Soohwan Jang
Dankook University, Korea

EC1664
Enhanced Activity and Stability of Pt-Hf Alloy Catalysts for Electrocatalytic Oxygen Reduction
Sung Jong Yoo[1], Seung Jun Hwang[1], Kug-Seung Lee[1], Hyoung-Juhn Kim[1], Soo-Kil Kim[2], Tae-Hoon Lim[1]
[1]Korea Institute of Science and Technology, Korea, [2]Chung-Ang University, Korea

EC1662
Methanol-tolerant Oxygen Reduction on Pd_3Pt_1 Nanoparticles Highly Dispersed in Large Pore Sized Mesocellular Carbon Foam
Sunhyung An, Jinwoo Lee
Pohang University of Science and Technology, Korea

EC1650 **Fabrication of Anode-supported SOFCs with 2 μm YSZ Thin Film using Electrostatic Slurry Spray Deposition**
Jungmin Ahn, Inyu Park, Junghoon Kim, Dongwook Shin
Hanyang University, Korea

EC1631 **Electrical and Mechanical Properties of Cu-base Interconnected Ribbons for Crystalline Solar Cells**
Hyug Jong Kim, In Gu Kang, Byung Ho Choi
Kumoh National Institute of Technology, Korea

EC1611 **Electrochemical Polarization of Cathode Materials in Intermediate-temperature Solid Oxide Fuel Cells**
Yong-Hoon Kim, Hang-Rim Kim, Yu-Na Kim, Seung-Muk Bae, Jin-Ha Hwang
Hongik University, Korea

EC1594 **Calculation of Output Power Generation from Nonlinear Characteristics of Dye-sensitized Solar Cells**
Kyung-Hunn Han[1], Jung-Ook Weon[1], Doo-Jin Choe[1], Chul-Oh Yoon[1], Ho-Gi Bae[2], Chan-Seok Park[2]
[1]McScience. Inc, Korea, [2]Dongjin Semichem. Co. Ltd, Korea

EC1569 **Performance and Properties of Polyamide-imide Composite Painted 304 Stainless Steel Bipolar Plate with Conductive Inter-layer for PEM Fuel Cell**
Yang-Bok Lee, Kyung-Min Kim, Eun-Ji Hwang, Seung-Koo Lee, Dae-Soon Lim
Korea University, Korea

EC1555 **Application of Silver Nanoparticles Made by Pulsed Wire Evaporation (PWE) Method to SOFC Cathode Layer**
Young-Min Jung[1,2], Seok-Joo Park[2], Rak-Hyun Song[2], Seung-Bok Lee[2], Tak-Hyoung Lim[2], Jong-Won Lee[2], Dong-Ryul Shin[2], Dong-Hyun Kim[1]
[1]Kyungpook National University, Korea, [2]Korea Institute of Energy Research, Korea

EC1538 **Thermoelectric Properties of n-type Bi_2Te_3 Fabricated by High-energy Milling Method**
Chul-Hee Lee[1], Hyo-Seob Kim[1], Fikret Yilmaz[2], Young-Choon Kim[1], Soon-Jik Hong[1]
[1]Kongju National University, Korea, [2]Gaziosmanpa University, Turkey

EC1537 **Barrier Height Modification of ITO/a-Si:H(p) using Oxygen Reactive Sputtering for Advanced Silicon Heterojunction Solar Cells**
Shi-Hyun Ahn[1], Hyung-Wook Choi[2], Sun-Bo Kim[1], Vinh Ai Dao[1], Hyeong-Sik Park[1], Shahzada Qamar Hussain[1], Jun-Sin Yi[1]
[1]SungKyunKwan University, Korea, [2]LG Electronics, Korea

EC1501 **Annealing Effect on the Structural and Optical Properties of CdS Thin Films**
Dong-Hyun Hwang, Jung-Hoon Ahn, Young-Guk Son
Pusan National University, Korea

Advanced Materials for Energy Conversion: fuel cell and solar cell

EC1496 **High Quality Ultra Thin Oxide Passivation Layer by using a Rapid Thermal Oxidation for Hetero-junction Silicon Solar Cell**
Younseok Lee, Vinh Ai Dao, Woongkyo Oh, Jaehyun Cho, Sangho Kim, Junsin Yi
Sungkyunkwan University, Korea

EC1479 **Refining the Impurities of Metallurgical Grade Silicon on Adding Al in Fractional Melting Process**
Woosoon Lee, Wooyoung Yoon
Korea University, Korea

EC1458 **Microstructural Investigation of Anodized TiO_2 on Two Different Ti Substrates for Photo-fuel Conversion**
Hae-Young Choi, Doo-Hun Kim, Yoon-Cheol Ha, Pravin S. Shinde, Jung-Ran Lee, Guen-Ho Go, Dae-Yeong Jeong, Won-Jae Lee
Korea Electrotechnology Research Institute, Korea

EC1446 **Effects of Embossing Structure on the SOFC Electrolyte**
Ji-Ho Lee, In-Yu Park, Hun-Hueong Lee, Dong-Wook Shin
Hanyang University, Korea

EC1435 **Dependence of the Formation of GaAs/Si on the Orientation of Si Substrate**
Hyo Jin Kim, Sou Young Yu, Si Duck Oh, Hyun Chul Ki, Seon Hoon Kim, Doo Gun Kim, Hang Ju Ko, Han Myung Soo, Hwe Jong Kim
Korea Photonics Technology Institute, Korea

EC1388 **Effect on Light Trapping Properties and Carrier Mobility of Al_2O_3 Doped Zinc Oxide Back Reflector for Thin Film Solar Cell Application**
Hyeongsik Park, S. M. Iftiquar, Chonghoon Shin, Juyeon Jang, Jinjoo Park, Minbum Kim, Junhee Jeong, Youn-Jung Lee, Junsin Yi
Sungkyunkwan University (SKKU), Korea

EC1374 **Temperature-dependent Growth Mechanism of Microcrystalline-phase Silicon Thin-films by Hot-wire Chemical Vapor Deposition**
Seungil Park[1], Jeong Chul Lee[2], Yunsung Huh[1], Keunjoo Kim[3]
[1]SNT Co., LTD, Korea, [2]Korea Institute of Energy Research, Korea, [3]Chonbuk National University, Korea

EC1357 **Codoping Processes of Carbon Isoelectronic Center for Silicon Emitter Formation in Silicon Solar Cells**
HyungYong Ji, Jaeho Choi, Jungtack Lee, Keunjoo Kim
Chonbuk National University, Korea

EC1343 **Reflectance Improvement by Multi-layered TiO_2SiO_2 Coating on Stainless Steel Substrate for Dye-Sensitized Solar Cells**
J. H. Lee, G. E. Jang
Chungbuk National University, Korea

EC1339 **Effect of Blocking Layer Between FTO Substrate and TiO_2 Electrode Synthesized by Sol-gel Process for Dye-sensitized Solar Cells**
Man-Su Lee, Gun-Eik Jang
Chungbuk National University, Korea

EC1314 **Position Effect of Two Novel Fulleropyrrolidine Derivatives on the Efficiency of Organic Photovoltaic Devices**
Dongbo Mi, Hee-Un Kim, Ji-Hoon Kim, Sung-Ho Jin, Do-Hoon Hwang
Pusan National University, Korea

EC1282 **Photoelectrochemical Characterization of Electrodeposited α-Fe_2O_3 Thin Films**
Gul Rahman[1,2], Oh-Shim Joo[1]
[1]KoreaInstitute of Science and Technology (KIST), [2]University of Science and Technology, Korea

EC1217 **Site-controlled Growth of ZnO Nanorods and Their Optical Properties**
G. J. Lee[1], E.-K. Kim[1], S.-H. Han[1], S.-B. Lee[1], H. Cheong[2], Y.-P. Lee[1]
[1]Hanyang University, Korea, [2]Sogang University, Korea

EC1215 **The Investigation of Silicon Solar Cell's Front Contact by Ni/Cu Plating**
Dong-Ho Kim, Jae-Doo Lee, Hyuk-Yong Kwon, Soo-Hong Lee
Sejong University, Korea

EC1212 **Epitaxial Growth of Silicon Films on SiO_2 Patterned Si (100) Substrates by APCVD**
C. Y. Duan, Bin Ai, Chao Liu, Y.J. Deng, Hui Shen
Sun Yat-sen University, China

EC1211 **Selected Area Laser-crystallized Polycrystalline Silicon Thin Films by a 355 nm Nanosecond Pulsed Nd:YAG Laser**
C. Y. Duan, J. J. Lai, Bin Ai, Y.J. Deng, Chao Liu, Hui Shen
Sun Yat-sen University, China

EC1202 **Investigation of Selective Emitter in Single Step Diffusion Process for Plated Ni/Cu Metallization Crystalline Silicon Solar Cells**
Woo-Jin Oh, Jae-Doo Lee, Hyuk-Yong Kwon, Soo-Hong Lee
Sejong University, Korea

EC1201 **A Study of Porous Si for Mono-crystalline Silicon Solar Cells**
Hyoung-Kyun Kong, Jae-Doo Lee, Hyuk-Yong Kwon, Soo-Hong Lee
Sejong University, Korea

EC1187 **The Local Back Surface Field Research for the Crystalline Silicon Solar Cell**
Seon Kyu Min, Woo Jin Oh, Jae Doo Lee, Hyuk Yong Kwon, Soo Hong Lee
Sejong University, Korea

EC1181 **Cofiring Properties of Electrode for Multi-Layered SOFC**
Sung-Il Lee[1], Sin-Il Gu[2], Dong-Hun Yeo[2], Hyo-Soon Shin[2], Yong-Soo Yoon[1]
[1]Yonsei University, Korea, [2]Korea Institute of Ceramic Engineering and Technology, Korea

Advanced Materials for Energy Conversion: fuel cell and solar cell

EC1167 **Structural Study of Absorbing Layer in CIGS Thin Film Solar Cell via X-ray Powder Diffraction Data**
Yong-Il Kim[1], Jin-Gyu Kim[2], Yun-Hee Lee[1], Ki-Bok Kim[1]
[1]Korea Research Institute of Standards and Science, Korea, [2]Korea Basic Science Institute, Korea

EC1155 **Effectiveness of Iodine Termination for Ultra High Efficiency Solar Cells as a Means of Chemical Surface Passivation**
Minkyu Ju[1,2], Younjung Lee[2], Kyungsoo Lee[1,2], Changsoon Han[1,2], Youngmi Jo[1,2], Junsin Yi[2]
[1]KPE CO.,Ltd., Korea, [2]Sungkyunkwan University, Korea,

EC1154 **Effect of Filler on the High Temperature Electrical Conductivities and Sealing Properties of Glass-based Seals for Solid Oxide Fuel Cells**
Yun-IL Kim[1], Myung-Jae Choi[1], Sung Park[1], Jae Chun Lee[1], Jong-Ho Lee[2], Hae-Weon Lee[2], Dong Bok Lee[3]
[1]Myongji University, Korea, [2]KIST, Korea, [3]Sungkyunkwan University, Korea

EC1152 **Effects of a- SiOx :B Buffer Layer between TCO and Boron Doped a-Si:H Window Layer in Hydrogenated Amorphous Silicon Solar Cells**
Youngkuk Kim[1], Jinjoo Park[1], Dao vinh Ai[1], Jeongchul Lee[2], Seungsin Paek[1], S.M. Iftiquar[1], Junsin Yi[1]
[1]Sungkyunkwan University, Korea, [2]Korea Institue Energy Research, Korea

EC1145 **New Source Solar Simulator for Large Area DSC & OPV Module**
Se-Hyun Lee[1], Jun-Sin Lee[2]
[1]Korea Institute of Lighting Technology, Korea, [2]Sungkyunkwan University, Korea

EC1128 **Effect of Size, Duration and Temperature on Photo-electrochemical Properties of TiO_2 Photoanode based Dye Sensitized Solar Cells**
C. Justin Raj, S.N. Karthick, K. Prabakar, K. V. Hemalatha, Jhasaketan Nayak, Min-Kyu Son, Jin-Kyoung Kim, Hee-Je Kim
Pusan National University, Korea

EC1122 **Application of CNT/TiO_2 Nanocomposites Paste on Photoelectrode in Dye-sensitized Solar Cell**
Byung-Man Kim, Min-Kyu Son, Jin-Kyoung Kim, Seok-Won Choi, Soo-Kyoung Kim, Kandasamy Prabakar, Hee-Je Kim
Pusan National University, Korea

EC1112 **Synthesis of New Composite Catalyst using Non-precious Metal and Conducting Polymer for Oxygen Reduction Reaction in PEMFC**
Jong-Ho Choi[1], Ho-Young Jung[2]
[1]Kyungil University, Korea, [2]Kangwon National University, Korea

EC1105 **Synthesis and Characterization of Copolymers based on Indolo[3,2-b] Carbazole**
Bui Thi Thu Trang[1,2], Jung Min Cho[1], Hong-Il Kim[1], Won Suk Shin[1,2], Sang Kyu Lee[1,2], Jong-Cheol Lee[1,2], Sang-Jin Moon[1,2]
[1]Korea Research Institute of Chemical Technology, Korea, [2]University of Science and Technology, Korea

EC1103 **Polycrystalline Silicon Wafer with Columnar Grain Structure Grown Directly on Silicon Carbide Coated Graphite Substrate**
Jin-Seok Lee, Bo-Yun Jang, Young-Soo Ahn
Korea Institute of Energy Research, Korea

EC1091 **Effect on the Surface Passivation of a-SiO_x:H and SiN_x Thin Films by ICP-CVD Method**
Sang Ryu[1], Youngman Kim[2], Chaehwan Jeong[1]
[1]Korea Institute of Industrial Technology, Korea, [2]Chonnam National University, Korea

EC1066 **The Effect of Zinc Oxide as a Sintering Aid on Proton Migration in Barium Zirconate**
Dae-Hee Kim[1], Byung-Kook Kim[2], Yeong-Cheol Kim[1]
[1]Korea University of Technology and Education, Korea, [2]Korea Institute of Science and Technology (KIST), Korea

EC1057 **Cell Properties of Al-Doped CdTe Thin Film Solar Cell by He-Ne Laser Exposure**
Nam-Hoon Kim, Kook Do Myung, Woo-Sun Lee
Chosun University, Korea

EC1052 **Characteristics of Amorphous Nb_2O_5 Blocking Layer Grown by Electron Beam Evaporation for Dye-sensitized Solar Cells**
Do Kyung Lee[1], Han Jae Shin[1], Dong Cheul Han[1], Sun Uk Choi[2], Bae In Kim[2]
[1]Gumi Electronics and Information Technology Research Institute, Korea, [2]Toray Advenced Materials Korea Inc, Korea

EC1049 **Desiification of CIGS Layer by CIGS Paste and CIGS Precursor for Solar Cell**
Sin-Il Gu[1,2], Hyo-Soon Shin[1], Dong-Hun Yeo[1], Sahn-Nahm[2]
[1]Korea Institute of Ceramic Engineering Technology, Korea, [2]Korea University, Korea

EC1041 **The Effect of NiO-YSZ Anode Functional Layer on the Nio-GDC Anode Prepared by ESSD and Co-Firing for IT-SOFC**
Jongnam Choi, Jinyi Choi, Junghoon Kim, Dongwook Shin
Hanyang University, Korea

EC1023 **InterfacialStructure and Thermal Stability of Ga-Doped ZnO Thin Films on Polymer Substrates**
Young Soo Lim[1], Dae Wook Kim[1,2], Hyoung-Seuk Choi[1], Won-Seon Seo[1], Hyung-Ho Park[2]
[1]Korea Institute of Ceramic Engineering and Technology, Korea, [2]Yonsei University, Korea

EC1015 **Effect of Bending Stress on Electrical Properties of Al-doped ZnO Thin Film Grown on Polyimide Substate**
Seul Gi Seo[1,2], Bo Bae Kim[1,2], Jong-Ho Kang[1,2], Young Soo Lim[1], Myung-Hyun Lee[1], Won-Seon Seo[1], Yong Soo Cho[2]
[1]Korea Institute of Ceramic Engineering and Technology, Korea, [2]Yonsei University, Korea

Advanced Materials for Energy Conversion: fuel cell and solar cell

EC1008 **Optimization of Anodic/cathodic Utilization for a Residential CHP System to Improve System Power Efficiency**
Donghun Seok[1,2], Minjin Kim[1], Jingo Lee[2]
[1]Korea Institute of Energy Research, Korea, [2]Yonsei University, Korea

EC1006 **Effects of Nb_2O_5 Layer on the Properties of Al-doped ZnO Transparent Conducting Oxide Thin Film Deposited on Polymide Substrate**
Bo Bae Kim[1,2], Seul Gi Seo[1,2], Young Soo Lim[1], Won-Seon Seo[1], Eunhae Koo[1], Hyung-Ho Park[2]
[1]Korea Institute of Ceramic Engineering and Technology, Korea, [2]Yonsei University, Korea

EC998 **Performance and Chemical Compatibility of a ScMnSZ/LaSrCuFe Cell for Solid Oxide Fuel Cells**
Young-Hoon Choi[1,2], Jürgen Wackerl[3], Seongyop Lim[1,2], Sang-Kyung Kim[1], Doo-Hwan Jung[1], Dong-Soo Suhr[2], Dong-Hyun Peck[1]
[1]Korea Institute of Energy Research (KIER), Korea, [2]Chungnam National University, Korea, [3]Research Centre Jülich (FZJ), Germany

EC1272 **Synthesis and Photovoltaic Properties of Oligothiophenes Containing Diketopyrrolopyrrole(DPP)**
Jina Hyun, Sungkoo Lee, Kyeong K. Lee, Eunhee Lim
Korea Institute of Industrial Technology (KITECH), Korea

EC1270 **Synthesis and Photovoltaic Properties of Low-bandgap Oligothiophenes**
Jina Hyun, Sungkoo Lee, Kyeong K. Lee, Eunhee Lim
Korea Institute of Industrial Technology (KITECH), Korea

Nov. 8, 2011 (Tue.)

ECP 2 (Advanced Materials for Energy Conversion: fuel cell and solar cell) Poster Presentation 2

Lobby 2F

Chair: Dr. Soo Kil Kim (Chung-Ang University, Korea) 14:00-15:30

EC995 **Controlled Porosity in Nb-doped Mesoporous TiO_2**
Ja Young Cho[1,2], Woo Hyun Nam[1,3], Young Soo Lim[1], Won-Seon Seo[1], Hyung-Ho Park[2], Jeong Young Lee[3]
[1]Korea Institute of Ceramic Engineering and Technology, Korea, [2]Yonsei University, Korea, [3]Korea Advanced Institute of Science and Technology, Korea

EC965 **Analysis of Water-flow Marks of Crystalline Silicon PV Modules After Field Exposure**
Seung-min Shin, Kyu-jin Sim, Sang-wook Wee, Keyman Bae, Chang-ryong Lee
Hyundai Heavy Industries Co., Ltd., Korea

EC953 **Low Temperature Growth of TiO_2 Films by Aerosol Deposition Method for Dye-Sensitized Solar Cells**
Sung Hwan Cho[1], Young Joon Yoon[1], Yeonjun Oh[2], Jihoon Kim[2], Hyo Tae Kim[2], Song-Min Nam[2], Jong-Hee Kim[1]
[1]Korea Institute of Ceramic Engineering & Technology, Korea, [2]Kwangwoon University, Korea

EC944 **The Research of Ni/Cu Front Metal Contact Applying Selective Emitter for Silicon Solar Cells**
Hyuk-yong Kwon, Soo-Hong Lee
Sejong University, Korea

EC939 **Membraneless Microfluidic Fuel Cell Fabricated by LTCC and Photolithographic Process**
Ji-Yun Seon[1,2], Young Joon Yoon[1], Jin-Chul Bae[1], Kwang Youn Cho[1], Jihoon Kim[1], Hyo Tae Kim[1], Hong Koo Baik[2], Jong-Hee Kim[1]
[1]Korea Institute of Ceramic Engineering & Technology, Korea, [2]Yonsei University, Korea

EC911 **BOW Reduction in Thin Crystalline Silicon Solar Cell with Control of Rear Al Layer Thickness**
Tae-hyeon Baek[1], Kyeom Seon Do[2], Ji-Hwa Hong[1], Gi Hwan Kang[3], Gwon Jong Yu[3], Kee-Joe Lim[1], Hee-eun Song[3]
[1]Chungbuk National University, Korea, [2]Yonsei University, Korea, [3]Korea Institute of Energy Research, Korea

EC909 **A Study on the Dye-sensitized Solar Cells with the W-doped TiO_2 Nanoparticles**
Na-Yeong Hong, Jin-Kyoung Kim, Jin-Ho Choi, Soo-Kyoung Kim, SongYi Park, Kandasamy Prabakar, Hee-Je Kim
Pusan National University, Korea

EC899 **Optical and Structural Properties of Al-doped ZnO Thin Films by Sol Gel Process**
Min-Chul Jun, Jung-Hyuk Koh
Kwangwoon University, Korea

EC897 **Catalytic Activity of Core-shell Nano-cluster based on Platinum for Hydrogen Oxidation Reaction: All-electron DFT Study**
Jungho Shin[1,2], Hyunjoo Lee[2], Jung-Hae Choi[1], Seung-Cheol Lee[1]
[1]Korea Institute of Science and Technology, Korea, [2]Yonsei University, Korea

EC889 **Double Antireflection Coating Layer with Silicon Nitride and Silicon Oxide for Crystalline Silicon Solar Cell**
Jin-kuk Kim[1], Ji-hwa Hong[1], Je-jun Park[2], Gi-hwan Kang[3], Nam-soo Kim[1], Hee-eun Song[3]
[1]Chungbuk National University, Korea, [2]Chungnam National University, Korea, [3]Korea Institute of Energy Research, Korea

EC886 **Degradation Behaviors of the Microstructure Controlled Membrane Electrode Assemblies Under Freeze/thaw Cycles in Polymer Electrolyte Membrane Fuel Cells**
Jong-Mun Jang[1,2], Gu-Gon Park[1], Young-Jun Shon[1], Sung-Dae Yim[1], Chang-Soo Kim[1], Tae-Hyun Yang[1]
[1]Korea Institute of Energy Research, Korea, [2]University of Science & Technology, Korea

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EC872 **Amphiphilic Block Copolymer Directed Synthesis of Intermetallic PtPb Nanocatalysts in Ordered Mesoporous Carbon/Silica Composites for Direct Formic Acid Fuel Cells**
Jongmin Shim[1], Jaehyuk Lee[1], Youngjin Ye[1], Jongkook Hwang[1], Soo-kil Kim[2], Tae-Hoon Lim[2], Ulrich Wiesner[3], Jinwoo Lee[1]
[1]Pohang University of Science and Technology (POSTECH), Korea, [2]Korea Institute of Science and Technology, Korea, [3]Cornell University, USA

EC862 **The Improvement in Overall Performance of Dye-sensitized ZnO Solar Cells with a Seed Layer**
Jinho Choi[1], Hyunwoong Seo[2], Min-Kyu Son[1], Seok-Won Choi[1], Byung-Man Kim[1], Kandasamy Prabakar[1], Hee-je Kim[1]
[1]Pusan National University, Korea, [2]Kyushu University, Japan

EC797 **Operational Optimization of a Polybenzimidazole-based High Temperature Proton Exchange Membrane Fuel Cells using Design of Experiments**
Jintae Kim, Minjin Kim
KIER, Korea

EC781 **Formation of CdS Nanowall Structure and its Application to Solar Cells**
Su-Han Park, Mang-Jong Lee
Konkuk University, Korea

EC769 **Fabrication of Quantum-dots Sensitized Solar Cells with Nb_2O_5 Blocking Layer by using Various Alloyed Quantum-dots**
JaeHwan Chun, Jong Sung Kim
Kyungwon University, Korea

EC758 **Dye-sensitized Solar Cells Having TiO_2 Nanotube Arrays and Fluorescent Material**
Young-Joon Lee[1], Woong-Rae Kim[1], Hun Park[2], Won-Youl Choi[1]
[1]Gangneung-Wonju National University, Korea, [2]Hyundai Heavy Industries Co., Ltd., Korea

EC754 **Preparation of Doping Metal TiO_2 Particle/Nanotube Composite Layer and Their Applications in Dye-sensitized Solar Cells**
Chang-Hyo Lee, Kyung-Hwan Kim, Hyung-Wook Choi
Kyungwon University, Korea

EC748 **Fabrication of YSZ/GDC Bilayer Electrolyte Thin Film for Solid Oxide Fuel Cells**
Seon-Ho Yang, Woo-Jae Kim, Hyung-Wook Choi
Kyungwon University, Korea

EC739 **Dye-sensitized Solar Cells based on ZnO, AZO, and SnO_2 Nanoparticles at Low Temperature**
Byoung Wook Kwon[1,2], Dong Ick Son[1], Dong Hee Park[1], Jeong Do Yang[1], Heon Jin Choi[2], Won Kook Choi[1]
[1]Korea Institute of Science and Technology, Korea, [2]Yonsei University, Korea

EC737 **Evidence of TiO_2(B) Phase Formation in $TiCl_4$ Treated Zn_2SnO_4 Photoanodes and its Effect on Photo-conversion Efficiencies of Zn_2SnO_4 based DSSC**
Alagappan Annamalai, Man-Jong Lee
Konkuk University, Korea

EC730 **Preparation of Bipolar Plate via Compression Molding of Epoxy/Graphite /Carbon Fiber**
Bum-Choul Choi, Ji-Jung Lee, Yun-Kyeong Park, Jae-Young Lee, Hong-Ki Lee
Woosuk University, Korea

EC727 **Preparation of Gas Diffusion Layer for PEMFC using Carbon Composites on a Metallic Mesh**
Ji-Jung Lee, Bum-Choul Choi, Yun-Kyeong Park, Jae-Young Lee, Hong-Ki Lee
Woosuk University, Korea

EC719 **Preparation of Pt/Ni Nano Particles on a Carbon Supporter via the Reduction of Organometallic Compounds in a Drying Process**
Jae-Young Lee, Bum-Choul Choi, Ji-Jung Lee, Hong-Ki Lee
Woosuk University, Korea

EC698 **Effect of Acetic Acid in $TiCl_4$ Post-treatment on Nanoporous TiO_2 Electrode in Dye-sensitized Solar Cell**
Soo-Kyoung Kim, Jin-Kyoung Kim, Min-Kyu Son, NaYeong Hong, Byung-man Kim, Hee-Je Kim
Pusan National University, Korea

EC668 **Pulsed Electron Deposition of CIGS Layer for Thin Film Solar Cell**
Pham Hong Quang[1], Ngo Dinh Sang[2], Tran Hai Duc[3], Le Tuan Tu[1], Do Quang Ngoc[1]
[1]Vietnam National University, Vietnam, [2]National University of Civil Engineering, Vietnam, [3]Chungbuk National University, Korea

EC665 **A Study on the Characteristics of the Various Oxide Coating Layers by the Performance Analysis for Dye Sensitized Solar Cell**
Jin-Kyoung Kim, Min-Kyu Son, Soo-Kyoung Kim, NaYeong Hong, SongYi Park, Kandasamy Prabakar, Hee-Je Kim
Pusan National University, Korea

EC663 **Effect of Sulfamic Acid as Complexing Agent on Electrodeposition of CIGS Absorber Thin Film**
Pham Hong Quang[1], Dang Thi Bich Hop[1], Ngo Dinh Sang[2], Tran Hai Duc[3], Le Tuan Tu[1]
[1]Vietnam National University, Vietnam, [2]National University of Civil Engineering, Vietnam, [3]Chungbuk National University, Korea

EC661 **Fabrication Characterization of 1Ce10ScSZ Electrolyte Prepared by Co-precipitation and Hydrothermal Treatment for SOFCs**
Young Mi Kim[1], Ju Hee Kang[1], Ik-Hyun Oh[1], Ho-Sung Kim[1], Moo Sung Lee[2], Yoon-Sung Lee[2], Eon Soo Lee[3]
[1]Korea Institute od Industrial Technology, Korea, [2]Chonnam National University, Korea, [3]Samsung Electrio-Mechanics Co., LTD, Korea

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EC640 **CuInGaSe Thin Flim Growth from Cu-In-Ga Metallic Precursors by Sputtering and Selenization**
Eun-Jin Bae, Jeong-Dae Suh
Electronics and Telecommunications Research institute, Korea

EC626 **Stress Distribution Analysis of GDL for Optimizing PEMFC Stack**
Chul-Hyun Kim[1], Young-Jun Shon[2,3]
[1]Uni. of Science & Technology, Korea, [2]Korea Institute of Energy Research, Korea, [3]Seoul National University, Korea

EC624 **Functional Requirements of Junction Box of PV Module with Bypass Diode in Operation**
Kyujin Sim, Suhan Kim, Keyman Bae
Hyundai Heavy Industries Co. Ltd., Korea

EC623 **Comparisons of Encapsulation Materials for High Performance PV Module**
Oh-June Kwon, Keyman Bae
Hyundai Heavy Industries Co. Ltd., Korea

EC622 **Estimation of PEM Fuel Cell Performance using Analytical Modeling**
Yeongkwang Jee[1], Young-Jun Sohn[2,3]
[1]University of Science & Technology, Korea, [2]Korea Institute of Energy Research, Koea, [3]Seoul National Univ., Korea

EC620 **Characteristics of Ultrathin SiO_x and Si Films on Al_2O_3/Si Substrates for Photovoltaic Applications**
Kwang-Ho Kim, Ji-Hoon Kim, Pyungwoo Jang, Chisup Jung, Kyu Seomoon
Cheongju Univ., Korea

EC604 **Lanthanum based Iron and Cobalt-containing Perovskite using an Inorganic Nanodispersants Aqueous Solution**
Hyun Woo Jin[1], Ju Hee Kim[1], Young Min Park[2], HaeKyoung Kim[1]
[1]Yeungnam University, Korea, [2]Research Institute of Industrial Science and Technology, Korea

EC601 **New Composite Membrane using a Compatibilizer for a Unitized Regenerative Fuel Cell**
Ho-Young Jung[1], Jong-Ho Choi[2]
[1]Kangwon National University, Korea, [2]Kyungil University, Korea

EC599 **Organic Photovoltaic Cells with Graphene Oxide and Reduced Graphene Oxide Hole Extraction Layer**
Kyoung Soon Choi[1], Yensil Park[1], Gwan Ho Jung[2], Jong-Lam Lee[2], Soo Young Kim[1]
[1]Chung-Ang University, Korea, [2]POSTECH, Korea

EC564 **The Characteristics of TiO_2 Nano-particles and the Influence on the Performance of the Dye-sensitized Solar Cell according to Various Calcination Conditions**

Seok-Won Choi[1], Hyunwoong Seo[2], Min-Kyu Son[1], Jin-Kyoung Kim[1], Jinho Choi[1], K. Prabakar[1], Hee-je Kim[1]
[1]Pusan National University, Korea, [2]Kyushu University, Korea

EC452 **Durability of Pt-Co Bimetallic Cathode Catalyst Supported on WC for PEM Fuel Cell**

Injun Jang, Manwook Bong, Inhae Lee, Yongsug Tak
Inha University, Korea

EC450 **Thickness Effect of Aerosol-deposited TiO_2 Passivation Layer on Dye Sensitized Solar Cells**

Yeon Jun Oh[1,2], Sung Hwan Cho[1], Yoong Joon Yoon[1], Ho Gyu Yoon[2], Jihoon Kim[1]
[1]KICET, Korea, [2]Korea University, Korea

EC409 **Solid Alkaline Fuel Cell by using Pore Filling Membranes with Lower Carbonate Cross-over**

Mi-Soon Lee[1], Young-Woo Choi[1], Chang-Soo Kim[1], Seok-Hee Park[1], Jin-Soo Park[2]
[1]Korea Institute of Energy Research, Korea, [2]Sangmyung Univ., Korea

EC398 **Syntheses of Doped-$LaCrO_3$ Interconnect Materials by Hydrothermal Method**

Min Kyung Kang, Seung Min Kim, Chang Yoon Kim, Ki-Soo Kim, Weon-Pil Tai
Ulsan Techno Park, Korea

EC364 **Reduction of Surface Reflectivity in Multicrystalline Silicon Solar Cells by Two-step Wet Texturing**

Hyo Sik Chang
Chungnam National University, Korea

EC291 **Organic Photovoltaic Cells Employing Arylamino-Substituted Fumaronitrile as Small Molecular Electron Donor**

Shun-Wei Liu[1], Wei-Cheng Su[2], Chih-Chien Lee[2]
[1]Mingchi University of Technology, China, [2]National Taiwan University of Science and Technology, China

EC266 **Performance Enhancement of Polymer Electrolyte Membrane Fuel Cells by Dual-layered MEA Structures with Carbon Nanotubes**

Dong-won Jung[1], Jun-Ho Kim[2], Se-Hoon Kim[1], Jun-bom Kim[1], Eun-suok Oh[1]
[1]University of Ulsan, Korea, [2]Ulsan Technopark, Korea

EC265 **Control of Crystallinity in Nanocrystalline Silicon Prepared by Atmospheric - pressure Plasma-enhanced Chemical Vapor Deposition**

Jung-Dae Kwon, Kee-Seok Nam, Yongsoo Jeong, Dong-Ho Kim, Sunghun Lee, Jungheum Yun, Si-Yeong Choi
Korea Institute of Materials Science, Korea

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EC191 **Growth of ZnO Nanorod Assisted by an Electric Field**
Min-Kyu Son[1], Hyunwoong Seo[2], Jin-Kyoung Kim[1], Jinho Choi[1], Seok-Won Choi[1], K.Prabakar[1], Hee-Je Kim[1]
[1]Pusan National University, Korea, [2]Kyushu University, Japan

EC187 **The Properties of Al-doped ZnO Films Deposited with RF Magnetron Sputtering System in Various H_2/Ar Gas Ratio Ambient**
Jwayeon Kim, Jungsu Han, Jaewoong Choi, Duwon Choi, Jaekeun Yu
Hoseo University, Korea

EC120 **Optical Property of ZnS Buffer Layer of the CIGS Solar Cell Deposited by DC + RF Sputtering System**
Bo-Ra Koo, Yong-Taeg Oh, Dong-Chan Shin
Chosun University, Korea

EC113 **Formation of Pt Thin Layer on Nafion Membrane by using the Impregnation -Reduction Method**
Muhammad Rashid, Tae Sun Jun, Yong Shin Kim
Hanyang University, Korea

EC90 **Synthesis of Carbon Supported-Pt@Pd Catalyst by Adopting Chemical Reduction Method on Highly-dispersed Pd Colloid**
Man Su Kim[1], Insoo Choi[2], Jae Jeong Kim[2], Jae Seung Yoo[1], Oh Joong Kwon[1]
[1]University of Incheon, Korea, [2]Seoul National University, Korea

EC86 **The Blocking Effect of Electron Recombination by Dry-processed ZnO Thin Film in Dye-sensitized Solar Cells**
Hyunwoong Seo[1], Min-Kyu Son[2], Hee-Je Kim[2], Masaharu Shiratani[1]
[1]Kyushu University, Japan, [2]Pusan National University, Korea

EC70 **A Comparison of Anodic TiO2 Nanotubes and Mesosponges in Applications**
Doohun Kim[1], Yoon-Chae Nah[2], Hae-Young Choi[1], Dae-Yeong Jeong[1], Won-Jae Lee[1]
[1]Korea Electrotechnology Research Institute, Korea, [2]Korea University of Technology and Education, Korea

EC55 **Durability Test of Commercial Crystalline Silicon Solar Cell under IEC Standard using Sequential and Non-Sequential Methods**
Kyung-Soo Kim[1,2], Gi-Hwan Kang[1], Gwon-Jong Yu[1], Soon-Gil Yoon[2]
[1]Korea Institute of Energy Research(KIER), Korea, [2]Chungnam National University, Korea