

The 7th Korea-Japan Workshop on Plasma Technology

**Thin Film and Plasma Technology for Next Generation Energy
Advanced Plasma Diagnostics for Plasma-Nano Processing**

July 3-5, 2008, Sungkyunkwan University, Suwon, Korea

Organized by

Center for Advanced Plasma Surface Technology (CAPST), SKKU, Korea

Supported by

**Brain Korea 21 Human Resource Center for Next Generation IT materials
and Components, SKKU, Korea**

Flexible Electronics Research Institute (FERI), SKKU, Korea

**Plasma-Nano Technology Research Center (PLANT), Nagoya University,
Japan**

**Plasma Center for Industrial Applications, Nagoya Urban Industries
Promotion Corp., Japan.**

Japan Society of Promotion of Science International Training Program

***"Program for incubating young researchers on Plasma Nanotechnology
Material & Device Processing"***

Sponsored by

Ministry of Education Science and Technology (MEST)

Korea Science and Engineering Foundation (KOSEF)

Pyeong Taek city / GyeongGi-Do

Program

[July 3\(Thu\) Arrival and welcome reception in Seoul](#)

[July 4\(Fri.\)](#)

8:30-9:30 Move to SKKU from hotel in Seoul

9:30-9:50 Registration and coffee time

Chairs: Prof. Byung Y. Hong, Prof. Y. Setsuhara

9:50-10:00 Opening Remarks (*Prof. J. G. Han, Prof. M. Hori*)

Plenary and invited lectures

10:00-10:40 Plenary talk from Korea

Dr. Hyung D. Kang (Jusung Engineering Co. Ltd.,)

Silicon Solar Cells : Recent research trend and future issues

10:40-11:20 Plenary talk from Japan

Prof. T. Nozaki and K. Okazaki (Tokyo Institute of Technology)

Prospective and Challenges of Hydrogen and Fuels Cell
Technology: Contribution of Non-thermal Plasma Assisted Fuel
Conversion

11:20-11:45 Invited talk from Korea

Prof. Sung-Ho Park (Sungkyunkwan University)

Nanorod and nanotube arrays for fuel cell applications: their comparison
for intrinsic catalytic activity

11:45-12:10 Invited talk from Japan

Prof. H. Toyoda (Nagoya University)

Production Of Meter-Scale High-Density Microwave Plasma For
Large Area $\mu\text{c-Si}$ Depositon

12:10-13:10 Lunch at SKKU restaurant

Chairs: Students Itself

13:10-15:40 **Korea-Japan international young researchers session**

(Oral + Poster)

(10 minute talks by 5 students from each country)

(All poster materials should be posted from 10:00 to 15:30)

13:10-13:20

Yong S. Park, Byung Y. Hong

Characterization of nanocrystalline conductive carbon and the
application to pentacene-based organic thin film transistor
(*Sungkyunkwan University, CAPST, Korea*)

13:20-13:30

William Makoto Nakamura, Hiroshi Sato, Hiroomi Miyahara, Hidefumi Matsuzaki, Kazunori Koga, and Masaharu Shiratani

**High Deposition Rate of Highly Stable a-Si:H Films for The Third Generation of Photovoltaics
(Kyushu University, Japan)**

13:30-13:40

Youn J. Kim, Su B. Jin, Sing I. Kim, Yoon S. Choi, In S. Choi, Jeon G. Han
**Effect of Power Density on ITO Thin Films by Facing Targets Sputtering
(Sungkyunkwan University, CAPST, Korea)**

13:40-13:50

Hitoshi Watanabe, Mineo Hiramatsu, and Masaru Hori

**Fabrication of nanowall using radical injection plasma enhanced chemical vapor deposition and its electrochemical evaluation
(Meijo University, Japan)**

13:50-14:00

Ho Y. Jung, Y. R. Park, H. J. Lee and N.E. Lee

**Selective etching of attenuated phase-shift mask (PSM) structure in inductively coupled plasmas (ICP) for extreme ultraviolet lithography (EUVL)
(Sungkyunkwan University, CAPST, Korea)**

14:00-14:20 Coffee Break

14:20-14:30

Hiroto Inui, Yuto Matsudaira, Hiroyuki Kano, Naofumi Yoshida, Hori Masaru

**Characterization of ac excited nonequilibrium atmospheric pressure plasma with ultra high electron density for glass surface cleaning
(Nagoya University, Japan)**

14:30-14:40

Sung I. Kim, Su B. Jin, Yoon S. Choi, In S. Choi, Jeon G. Han

The properties of ITO films synthesized by dual pulse magnetron sputtering

(Sungkyunkwan University, CAPST, Korea)

14:40-14:50

Chang S. Moon, Keigo Takeda, Makoto Sekine, Yuichi Setsuhara, Masaharu Shiratani, and Masaru Hori

Development of combinatorial plasma etching process system

(Nagoya University, Japan)

14:50-15:00

Sang J. Cho, I.-S. Bae, and J.-H. Boo

A study on synthesis and analysis of hybrid low-k plasma-polymer thin films by PECVD method

(Sungkyunkwan University, CAPST, Korea)

15:00-15:10

Sachiko Iseki, Keiji Yamamoto, Takayuki Ohta, Masafumi Ito, Hiroyuki Kano, Yasuhiro Higashijima, Masaru Hori

Contributions of UV light to Sterilization Using Nonequilibrium Atmospheric Pressure Plasma

(Wakayama University, Japan)

15:40-16:30 Move to Pyeong Taek city

**16:30-18:00 Visit to Pyeong Taek city
(Meeting with Governor or Vice governor)**

18:00-20:00 Dinner with cooperation discussion

20:00-21:30 Move to hotel in Seoul

July 5(Sat.)

09:00-09:50 Move to SKKU from hotel in Seoul

Chairs: Prof. Hyoung S. Kim, Prof. H. Toyoda

09:50-10:30 Invited talk from Japan

Prof. Masaru Hori (Nagoya University)

Advanced Plasma Diagnostics in Nagoya University Plasma Nanotechnology Research Center

10:30-11:10 Invited talk from Korea

Prof. Jeon G. Han , Dr. N. Britun (Sungkyunkwan University, CAPST)

Optical diagnostics of a magnetron sputtering discharge for process temperature and film structure control

11:10-11:20 Coffee Break

11:20-11:45 Invited talk from Japan

Prof. M. Sekine (Nagoya University)

Advanced Plasma Etching Technology for ULSIs Surface Reaction Mechanism of Low-k Film Etching with Low GWP Gas and Nitrogen

11:45-12:10 Invited talk from Japan

Prof. K. Nakamura (Chubu University)

Development of Frequency Shift Probes for Monitoring of Electrons in Reactive Processing Plasmas

12:10-14:00 Lunch at restaurant near SKKU

Chairs: Prof. Jin H. Boo, K. Nakamura

14:00-14:25 Invited talk from Korea

Prof. Hee Y. Chae (Sungkyunkwan University)

Surface Treatment and Printing Processes for Organic Devices

14:25-14:50 Invited talk from Japan

Prof. Y. Setsuhara (Osaka University)

Nano-Surface Processing of Polymers with Low-Damage Reactive High-Density Plasmas for Flexible Electronics

14:50-15:00 Coffee Break

15:00-15:25 Invited talk from Korea

Prof. Hyung K. Cho (Sungkyunkwan University, CAPST)

Growth and applications of active metal-oxide semiconductors

15:25-16:25 Tour of CAPST and SKKU labs

16:25-17:40 Move to hotel in Seoul

17:40- Dinner

10:00-15:40 : Poster session

[KJP-1] *Soo G. Oh (Ajou University, CAPST, Korea)*

TiO₂ deposition mode change by O₂ flow modulation in reactive sputtering

[KJP-2] *Wakana Takeuchi (Nagoya University, Japan)*

Control of Graphene Sheet Structure Using Oxygen Gas Addition to C₂F₆/H₂ Plasma

[KJP-3] *Sun K. Kim (Ulsan University, CAPST, Korea)*

Effect of Si content on the mechanical properties of TiAlSiN thin films

[KJP-4] *Shingo Kondo (Nagoya University, Japan)*

Growth Mechanism of Carbon Nanowalls Synthesized by Irradiations of Ions and Radicals

[KJP-5] *Dong B. Lee (Sungkyunkwan University, CAPST, Korea)*

High temperature oxidation of WC-CrN superhard nanolayered film

[KJP-6] *William Makoto Nakamura (Kyushu University, Japan)*

High Deposition Rate of Highly Stable a-Si:H Films for The Third Generation of Photovoltaics

[KJP-7] *Youn J. Kim (Sungkyunkwan University, CAPST, Korea)*

Effect of Power Density on ITO Thin Films by Facing Targets Sputtering

[KJP-8] *Hirotohi Inui (Nagoya University, Japan)*

Characterization of ac excited nonequilibrium atmospheric pressure plasma with ultra high electron density for glass surface cleaning

[KJP-9] *Sung I. Kim (Sungkyunkwan University, CAPST, Korea)*

The properties of ITO films synthesized by dual pulse magnetron sputtering

[KJP-10] *Chang S. Moon (Nagoya University, Japan)*

Development of combinatorial plasma etching process system

[KJP-11] *Yong S. Park (Sungkyunkwan University, CAPST, Korea)*

Characterization of nanocrystalline conductive carbon and the application to pentacene-based organic thin film transistor

[KJP-12] *Hiroshi Yamamoto (Nagoya University, Japan)*

Evaluating damages on porous SiOCH film during H₂/N₂ plasma ashing process

[KJP-13] *Ho Y. Jung (Sungkyunkwan University, CAPST, Korea)*

Selective etching of attenuated phase-shift mask (PSM) structure in inductively coupled plasmas (ICP) for extreme ultraviolet lithography (EUVL)

[KJP-14] *Hitoshi Watanabe (Meijo University, Japan)*

Fabrication of nanowall using radical injection plasma enhanced chemical vapor deposition and its electrochemical evaluation

[KJP-15] *Sang J. Cho (Sungkyunkwan University, CAPST, Korea)*

A study on synthesis and analysis of hybrid low-k plasma-polymer thin films by PECVD method

[KJP-16] *Makoto Ohira (Meijo University, Japan)*

Shape change of carbon nanowalls grown using inductively coupled plasma-enhanced chemical vapor deposition

[KJP-17] *Young Y. Kim (Sungkyunkwan University, CAPST, Korea)*

Influence of Mg composition on the characteristics of MgZnO/ZnO heterostructures grown by co-sputtering

[KJP-18] *Sachiko Iseki (Wakayama University, Japan)*

Contributions of UV light to Sterilization Using Nonequilibrium Atmospheric Pressure Plasma

[KJP-19] *Sung M. Kim (Korea Aerospace University, CAPST, Korea)*

A comparison study on the thermal stability of CrN/AlN and CrSiN/AlN multilayer coatings

[KJP-20] *Ken Cho (Osaka University, Japan)*

Nano-surface analysis of polymers exposed to low-damage plasmas inductively sustained with low-inductance antenna modules

[KJP-21] *Young S. Kim (Korea Aerospace University, CAPST, Korea)*

Mechanical Properties of CrSi-Zr-N coatings Synthesized by closed field unbalanced magnetron sputtering

[KJP-22] *Xiaoping Han (Sungkyunkwan University, CAPST, Korea)*

Enhanced ferromagnetism in oxygen deficient CeO₂

[KJP-23] *Do Duc Cuong (Sungkyunkwan University, CAPST, Korea)*

Oxygen divacancies and clustering in perovskite materials PbTiO₃ and BaTiO₃

[KJP-24] *Jae W. Lee (KAIST, CAPST, Korea)*

Microstructural Characterization of A-plane ZnO Films Grown on R-plane Sapphire Substrates by Plasma-Assisted Molecular Beam Epitaxy

[KJP-25] *Ju H. Lee (KAIST, CAPST, Korea)*

Microstructural Analysis of Ga-doped ZnO Films and Its Thickness Dependence of

Properties

[KJP-26] Jeong H. In (KAIST, CAPST, Korea)

Characteristics of deposition rate per unit power on Pulsed-DC Magnetron Sputtering Source

[KJP-27] Jeong H. In (KAIST, CAPST, Korea)

Two Fold Decay of Plasma Density near Substrate in Pulsed-DC Magnetron Discharge

[KJP-28] Su H. Chae (KAIST, CAPST, Korea)

Electron temperature lowering for multi-step ionizations in an electron beam generated plasma

[KJP-29] Byoung I. Hwang (Sungkyunkwan University, CAPST, Korea)

The effects of post-annealing temperatures on electrical characteristics of ZnO TFTs

[KJP-30] Dong C. Kim (Sungkyunkwan University, CAPST, Korea)

Multidimensional ZnO light-emitting diode structures grown by metal organic chemical vapor deposition on p-Si

[KJP-31] Su B. Jin (Sungkyunkwan University, CAPST, Korea)

A study on the synthesis of ITO thin film by magnetron sputtering

[KJP-32] Kyung S. Shin (Sungkyunkwan University, CAPST, Korea)

Electrical and optical properties of ITO thin films deposited by ICP-assisted magnetron sputtering

[KJP-33] Tae J. Byun (Sungkyunkwan University, CAPST, Korea)

Surface modification of polyimide by internal antenna driven ICP

[KJP-34] K. Park (Sungkyunkwan University, CAPST, Korea)

Thermal Stabilities and Electrical Characteristics of Various Metal-Germanide Schottky Contacts on Ge Substrate

[KJP-35] Seung H. Kim (Sungkyunkwan University, CAPST, Korea)

Application of the Minimum Length Nozzle on The Thermal Spray Coating systems