

2nd Nucleation & Growth Research Conference (NGRC2019)
– Electrochemical/Materials Processing for Energy Conversion & Storage Systems
toward CO₂ Zero-Emission Society –

June.9th – 13th, 2019, Kansai Seminar House, Kyoto, Japan

Program (ver. 2019/6/6)

<June 9th, Sunday>

17:30 - 20:00 **Registration • Get together party**

<June 10th, Monday>

9:00 - 9:30 **Registration**

9:30 Welcome Address: T. Nohira

9:35 History of NGRC: T. Moffat and D. Scherson

10:00 - 10:40 OP-1 (Keynote)

Plasma as a Dry Electrochemical Process for Electronic Device Fabrication

Y. Kuo

10:40 - 11:20 OP-2 (Keynote)

Growth and Defect Reduction of SiC for Low-Loss Power Devices

T. Kimoto

11:20 - 11:40 **Coffee Break**

11:40 - 12:05 OP-3 (Invited)

Anodic TiO₂ Nanotube Layers for Photovoltaic Applications

J. Macak

12:05 - 12:30 OP-4 (Invited)

All wet TSV process using Si MACE and electroless plating of barrier and seed layers

S. Shingubara

12:30 - 14:00 **Lunch**

14:00 - 14:40 OP-5 (Keynote)

Electrodeposition of Crystalline Si

S. Maldonado

14:40 - 15:20 OP-6 (Keynote)

Spincoating Epitaxial Semiconductors for Photovoltaics

J. A. Switzer

15:20 - 15:40 OP-7

Electrochemical separation of Dy and Nd using an alloy diaphragm and molten salt

T. Oishi

- 15:40-16:10 **Coffee Break**
16:10-17:30 Short Presentation on Poster: Session Organizer: Luca Magagnin
3-4 min. presentation each
17:30 - 20:00 **Dinner**
20:00 - 22:00 **Poster Session** ①

<June 11th, Tuesday>

- 9:00 - 9:40 OP-8 (Keynote)
Growth and Operando Surface X-ray Diffraction Studies of Cobalt Oxide Thin Films Catalysts
P. Allongue
- 9:40 - 10:20 OP-9 (Keynote)
Electrodeposited Lithium and Sodium Battery Electrodes
P. V. Braun
- 10:20 - 10:50 **Coffee Break**
10:50 - 11:15 OP-10 (Invited)
Dynamic Properties of Non-aqueous Binary Solvent Electrolyte Solution with Silica Surfaces
M. Mizuhata
- 11:15 - 11:40 OP-11 (Invited)
Combinatorial Metal Oxide Processing (TBD)
A. Hassel
- 11:40 - 12:05 OP-12 (Invited)
Superconformal Electrodeposition
T. P. Moffat
- 12:05 - 12:30 OP-13 (Invited)
**Mechanism of Cathodic Reaction in Solid Oxide Fuel Cells
Investigated by Using Operando X-Ray Absorption Measurements**
K. Amezawa
- 12:30 - 14:00 **Lunch**
14:00 - 14:40 OP-14 (Keynote)
Electrodeposition for Batteries and Electrocatalysis
A. A. Gewirth
- 14:40 - 15:05 OP-15 (Invited)
**Sustainable biosynthesis of platinum group metal nanoparticles using metal ion-reducing
microorganisms and their environmental applications**
Y. Konishi
- 15:05 - 15:25 OP-16
Control of Nucleation and Growth of Organic Nanofibers on Surfaces

by Photochemically Induced Self-Assembly

A. Del Guerso

15:25 - 15:50 **Coffee Break**

15:50 - 16:10 OP-17

**Comparative study on Cu-CVD nucleation using β -diketonato and amidinato precursors
for sub-10-nm-thick continuous film formation**

K. Shima

16:10 - 16:35 OP-18 (Invited)

Influence of nanocluster movement in the earliest stages of electrochemical growth

J. Ustarroz

16:35 - 16:55 OP-19

Copper Pulse Deposition in a Micro Fluidic Channel

M. Hayase

16:55 - 17:15 OP-20

Crystalline-state lipid bilayer-based nanohelices for chirality induction and transfer

Y. Okazaki

17:15 - 17:35 OP-21

In-situ observation of Cu electrodeposition by high speed atomic force microscopy

H. Matsushima

17:40 - 20:00 **Dinner**

20:00 - 22:00 **Poster Session** ②

<June 12th, Wednesday>

9:00 - 9:40 OP-22 (Keynote)

Multi-scale Modeling of Growth Processes

T. Jacob

9:40 - 10:20 OP-23 (Keynote)

Topological phases predicted from first-principles calculations

F. B. Prinz

10:20 - 10:50 **Coffee Break**

10:50 - 11:15 OP-24 (Invited)

Computational Science

Simin Nie

11:15 - 11:40 OP-25 (Invited)

**COMPUTATIONAL DESIGN OF NANOSTRUCTURES FOR ENERGY MATERIALS
: A PATHWAY TOWARDS CARBON-NEUTRAL CYCLE**

C. M. Rodrigues

11:40 - 12:00 OP-26

Influence of Hydrogen on Room-Temperature Grain Growth of Electrodeposited Cu Films

N. Fukumuro

12:00 - 12:20 OP-27

Application of magnetic nanofluids for water electrolysis

Y. Iwamoto

12:30 - 14:00 **Lunch**

14:00 - 14:40 OP-28 (Keynote)

Nucleation and growth of small atom clusters into superatom for functional units

A. Nakajima

14:40 - 15:05 OP-29 (Invited)

Critical factor determining the capacity of lithium-oxygen batteries

S. Nakanishi

15:05 - 15:30 OP-30 (Invited)

Fractal-like structures composed of Ag nano-particles forming in AgNO₃ solution exposed to atmospheric pressure ammonia plasma

O. Sakai

15:30 - 16:00 **Coffee Break**

16:00 - 16:20 OP-31

Mass Transfer in Fuel Cells

H. Nakajima

16:20 - 16:40 OP-32

Electrodeposition of Silicon from High Temperature Molten Salts

T. Nohira

17:00 - 18:30 **Noh Experience**

18:00 – 20:00 Banquet

<June 13th, Thursday>

9:00 - 9:40 OP-33 (Keynote)

Electrode Stimulation

D. Scherson

9:40 - 10:20 OP-34 (Keynote)

Mechanisms of Pt surface restructuring by electrochemical oxidation/reduction

O. M. Magnussen

10:20 - 10:50 **Coffee Break**

10:50 - 11:15 OP-35 (Invited)

Production of Cu₂O/CuO photocathodes with non-noble catalysts

for improved photocurrent and stability

L. Magagnin

11:15 - 11:40 OP-36 (Invited)

Photoelectrochemical water splitting at GaAs protected by electroplated alloys

G. Zangari

11:40 - 12:00 OP-37

Electrochemical formation of iron-based alloy

T. Goto

12:00-12:15 Poster Award Luca Maganin

12:15-12:30 Future Projects for Special Issue Publication T. P. Moffat, G. Zangari and D. Scherson

12:30-12:35 Concluding Address: T. Goto

Posters

- 1. Electrodeposition of Li at Liquid Electrolyte/Liquid Metal Cathode**
Yuta Suzuki (Doshisha University)
- 2. Inhibition with the addition of LiCoO₂ for an increase in electrical conductivity of LiClO₄/PC-DME with DME content**
Yoshimasa Suzuki (Kobe University)
- 3. In situ observation of Cu electrodeposition with PEG additives**
Taiki Yoshioka (Hokkaido University)
- 4. Analysis of Hydrogen in Electroless Nickel/Electroless Palladium/Immersion Gold Multilayer Films Using Thermal Desorption Spectroscopy**
Yusaku Sagara (University of Hyogo)
- 5. Hydrogen generation and nickel electrodeposition under high hydrostatic pressure**
Takanobu Nishimoto (University of Hyogo)
- 6. Electrochemical Synthesis of Diamond in Molten LiCl–KCl–K₂CO₃–KOH**
Seigo Maruyama (Kyoto University)
- 7. Effect of Temperature on Electrodeposition of Ti Films in Fluoride–Chloride Mixture Melt**
Yutaro Norikawa (Kyoto University)
- 8. Electrodeposition of Silicon in AF–ACl (A = Li, Na, K, Cs) Molten Salts**
Airi Kondo (Kyoto University)
- 9. Development of a Yeast with Improved Tolerance to Ionic Liquid for Production of Bioethanol from Cellulose**
Takashi Kishiro (Kyoto University)
- 10. Development of Water Electrolysis using Magnetic Nanofluids**
Makito Okubo (Nagoya Institute of Technology)
- 11. Green synthesis of platinum nanoparticles using metal ion-reducing bacterium *Shewanella* algae and their electrical properties in a fuel cell**
Kei Niguma (Osaka Prefecture University)
- 12. Green synthesis of palladium nanoparticles using baker's yeast and their catalytic properties**
Yusuke Hanaichi (Osaka Prefecture University)
- 13. Microbial deposition and characterization of platinum group metal nanoparticles using metal ion-reducing bacterium *Shewanella* algae**
Kazuya Bandoh (Osaka Prefecture University)
- 14. Influence of oxygen vacancy on electrochemical properties of Li-rich positive electrode material Li_{1.2}Mn_{0.6}Ni_{0.2}O₂**
Kento Ohta (Tohoku University)
- 15. Fuel Production by a Cathode-Supported Honeycomb Solid Oxide Electrolysis Cell**
Yoshihiro Iwanaga (Kyushu University)

16. Operando SEM Observation of High-Performance Si Anode Materials for Next Generation Lithium-Ion Battery

Kei Hosoya (Osaka University)

17. Effects of carbon materials in Pt nanoparticle supported electrocatalysts prepared by one-pot ionic liquid pyrolysis method

Yu Yao (Osaka University)

18. Expansion of the optimal potential window for prolonged discharge capacity of Li-O₂ batteries by surface modifications of a cathode

Kiho Nishioka (Osaka University)

19. Discharge/charge properties of Li-O₂ batteries under potential control conditions

Kota Morimoto (Osaka University)

20. Reliability of Metal Films Directly Formed on Semiconductor Substrates Using Gold Nanoparticles as Catalysts

Naoki Yamada (Hyogo Prefectural Institute of Technology)