

Joint Symposium on Fundamental Aspects of Nanostructured Materials and Electrocatalysis

*Catalysis Research Center (CRC) and Graduate School of Science
Hokkaido University*

Sapporo, JAPAN
June 22-23, 2007

19th CRC International Symposium
and

Initiatives for Attractive Education in Graduate Schools: "T-type Chemists with Lofty Ambition"

URL: www.cat.hokudai.ac.jp/osawa/meeting/pre2007.pdf



CHAIRS

K. Uosaki (Division of Chemistry, Graduate School of Science, Hokkaido University)

M. Osawa (Catalysis Research Center, Hokkaido University)

INVITED SPEAKERS

P. Allongue (Palaiseau)

A. Cuesta (Madrid)

K. Hara (Sapporo)

T. Inabe (Sapporo)

S. Kuwabata (Osaka)

M. Osawa (Sapporo)

S. G. Sun (Xiamen)

T. Takeguchi (Sapporo)

M. Watanabe (Kofu)

K. Asakura (Sapporo)

J. Feliu (Alicante)

A. Hillman (Leicester)

M. Kiguchi (Sapporo)

N. Markovic (Argonne)

D. Scherson (Cleveland)

T. Suzuki (Sapporo)

K. Tanaka (Saitama)

A. Wieckowski (Urbana)

H. Baltruschat (Bonn)

A. Gewirth (Urbana)

N. Hoshi (Chiba)

M. T. Koper (Leiden)

T. Morikawa (Osaka)

K. Shimazu (Sapporo)

J. Switzer (Rolla)

R. Yamada (Osaka)

E. Borguet (Philadelphia)

J. Gooding (Sydney)

K. Ikeda (Sapporo)

M. Kubo (Sendai)

H. Noguchi (Sapporo)

J. Stickney (Athens)

S. Takeda (Sapporo)

S. Ye (Sapporo)

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Joint Symposium on Fundamental Aspects of Nanostructured Materials and Electrocatalysis

June 22-23, 2007

Catalysis Research Center and Graduate School of Science
Hokkaido University

Symposium site:

Graduate School of Science, Hokkaido University (N10W8, Sapporo)
Bld. # 7 (room 7-310): Registration, Plenary Lectures, and Electrocatalytic Session
Bld. # 7 (room 7-219): Nanostructured Material Session)
Bld. #6 : Poster presentation

URL: http://www.cat.hokudai.ac.jp/osawa/pre_symposium2007.pdf

Chairs:

Kohei Uosaki (Nanostructured Materials Session)
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Registration Fees : Free

Banquet :

General :	4,000 yen
Student :	1,000 yen

Time Table

June 22 (Friday)			
9:30	Registration		
10:00	Open Ceremony		
10:15	PL1 (Marković)		
11:15	PL2 (Scherson)		
12:15-13:30	Lunch		
Nanostructured Material		Electrocatalysis	
13:30	Switzer	13:30	Koper
14:00	Inabe	14:00	Hoshi
14:30	Stickney	14:20	Sun
15:00-16:15	Short presentation for poster by students (P11-P24)	14:50	Kubo
		15:20	Morikawa
16:30-19:00	Poster Session		
19:00-20:30	Banquet		
June 23 (Saturday)			
Nanostructured Material		Electrocatalysis	
9:30	Gooding	9:30	Wieckowski
10:00	Kiguchi	10:00	Noguchi
10:20	Yamada	10:20	Takeguchi
10:40	Coffee Break		
11:00	Borguet	11:00	Asakura
11:30	Kuwabata	11:30	Cuesta
12:00	Allongue	12:00	Watanabe
12:30-13:45	Lunch		
13:45	Takeda	13:45	Tanaka
14:15	Ye	14:15	Baltruschat
14:45	Ikeda	14.45	Gewirth
15:05-15:35	Coffee break	15:15-15:35	Coffee break
15:35	Suzuki	15:35	Feliu
16:05	Hara	16:05	Shimazu
16:25	Hillman	16:35	Osawa

Program

June 22 (Fri.)

9:30– **Registration** (7-310)

10:00–10:15 **Opening address**
 Prof. Keizo Yamaguchi
 (Dean, Graduate School of Science, Hokkaido University)
 Prof. Wataru Ueda
 (Director, Catalysis Research Center, Hokkaido University)

Plenary Lectures (7-310)

Chair: **Kohei Uosaki**

- PL1 10:15–11:15 **Nenad M. Marković** (Argonne National Laboratory, USA)
 “Surface science of fuel cell reactions: from model systems to real catalysts”
- PL2 11:15–12:15 **Daniel A. Scherson** (Case Western Reserve University, USA)
 “In situ real-time microspectroscopy”
- 12:15–13:30 Lunch

Nanostructured material session (7-219)

Chair: **Tetsuya Taketsugu**

- N1 13:30–14:00 **Jay A. Switzer** (University of Missouri-Rolla, USA)
 “Epitaxial electrodeposition of nanostructured zinc oxide from alkaline solution”
- N2 14:00–14:30 **Tamotsu Inabe** (Hokkaido University, Japan)
 “Electrode surfaces for the electrochemical crystallization of molecular conductors”
- N3 14:30–15:00 **John L. Stickney** (University of Georgia, USA)
 “Electrochemical ALD of metals and semiconductors”
- 15:00–16:15 Short presentation by graduate students of Graduate School of
 Science presentation (5 min. / poster)

Electrocatalysis session (7-310)

Chair: **Masatoshi Osawa**

- E1 13:30–14:00 **Marc T. M. Koper** (Leiden University, Netherlands)
 “Structure sensitivity of electrocatalytic reactions”
- E2 14:00–14:20 **Nagahiro Hoshi** (Chiba University, Japan)
 “Surface electrochemistry on high index planes”

- E3 14:20–14:50 **Shi-Gang Sun** (Xiamen University, China)
 “Electrocatalysts of well-defined structure — From single crystal planes to shape controlled nanoparticles”
- E4 14:50–15:20 **Momoji Kubo** (Tohoku University, Japan)
 “Quantum chemical molecular dynamics approach to electrode reaction dynamics in polymer electrolyte fuel cell”
- E5 15:20–15:50 **Yoshitada Morikawa** (Osaka University, Japan)
 “First-principles molecular dynamics simulation of chemical reactions at electrode surfaces”

16:30–19:00 Poster session (Bld. #6)

19:00–20:30 Banquet (Bld. #6)

June 23 (Sat.)

Nanostructured material session (7-219)

Chair: **Susumu Kuwabata**

- N6 9:30–10:00 **J. Justin Gooding** (The University of New South Wales, Australia)
 “The electrochemical performance of electrodes modified with carbon nanotubes”
- N7 10:00–10:20 **Manabu Kiguchi** (Hokkaido University, Japan)
 “Conductance of a single molecule bridging metal electrodes”
- N8 10:20–10:40 **Ryo Yamada** (Osaka University, Japan)
 “Conductance of oligothiophene molecules”
- 10:40–11:00 Coffee break

Chair: **Jay A. Switzer**

- N9 11:00–11:30 **Eric U. Borguet** (Temple University, USA)
 “Nanostructured materials by electrodeposition onto molecular scale templates”
- N10 11:30–12:00 **Susumu Kuwabata** (Osaka University, Japan)
 “Photoelectrochemical preparation of emissive semiconductor Q-dots using as fluorescence reagents”
- N11 12:00–12:30 **Philippe Allongue** (CNRS, France)
 “Electrochemical lithography using ns voltage pulses”
- 12:30–13:45 Lunch

Chair: **Kei Murakoshi**

- N12 13:45–14:15 **Sadamu Takeda** (Hokkaido University)
 “Surface of antiferromagnetic nano particles and gold nano particles as studied by

solid-state NMR”

N13 14:15–14:45 **Shen Ye** (Hokkaido University, Japan)
“Interfacial structures of thin film materials probed by sum frequency generation (SFG) spectroscopy”

N14 14:45–15:05 **Katsuyoshi Ikeda** (Hokkaido University, Japan)
“Hyper-Raman spectroscopy for carbon nanomaterials”

15:05–15:35 Coffee break

Chair: **Masako Kato**

N15 15:35–16:05 **Takanori Suzuki** (Hokkaido University, Japan)
“Toward the realization of unimolecular memory: novel approach from organic chemistry by using “Dynamic redox system” ”

N16 16:05–16:25 **Kenji Hara** (Hokkaido University, Japan)
“Densely-packed self-assembled monolayer of phosphine-terminated alkanethiolate on gold surface”

N17 16:25–16:55 **A. Robert Hillman** (University of Leicester, UK)
“EQCM studies of dopant and solvation dynamics in p- and n-doping of PEDOT films”

Electrocatalysis session (7-310)

Chair: **Shen Ye**

E6 9:30–10:00 **Andrzej Wieckowski** (University of Illinois, USA)
“Details in Use of BB-SFG for Studies of Adsorption on Electrochemical Surfaces”

E7 10:00–10:20 **Hidenori Noguchi** (Hokkaido University, Japan)
“SFG study on potential and time dependent structures of electrochemical interfaces”

E8 10:20–10:40 **Tatsuya Takeguchi** (Hokkaido University, Japan)
“Preparation of CO-tolerant Multicomponent Anodes Modified with Metal oxide for PEFC”

10:40–11:00 Coffee break

Chair: **Bunsho Ohtani**

E9 11:00–11:30 **Kiyotaka Asakura** (Hokkaido University, Japan)
“The growth mechanism of metal clusters on TiO₂ surface”

E10 11:30–12:00 **Angel Cuesta** (CSIC, Spain)
“Use of Chemically Modified Surfaces to Study Atomic Ensemble Effects in Electrocatalysis”

E11 12:00–12:30 **Masahiro Watanabe** (University of Yamanashi, Japan)
“CO-Tolerant Anode Catalysis at Pt and Pt based Alloys”

12:30–13:45 Lunch

Chair: **Tamotsu Takahashi**

- E12 13:45–14:15 **Ken-ichi Tanaka** (Saitama Institute of Technology, Japan)
"Preferential Oxidation (PROX) Reaction of CO Catalyzed by H₂O Molecule"
- E13 14:15–14:45 **Helmut Baltruschat** (University of Bonn, Germany)
"Size effects in methanol electrocatalysis: From nanostructured , bimetallic single crystalline model catalysts to nanoparticles"
- E14 14:45–15:15 **Andrew A. Gewirth** (University of Illinois, USA)
"Electrocatalytic reduction of oxygen, peroxide, and nitrate on electrode surfaces"
- 15:15–15:35 Coffee break

Chair: **Angel Cuesta**

- E15 15:35–16:05 **Juan M. Feliu** (Universidad de Alicante, Spain)
"The surface acid-base equilibrium of dicarboxylic acids"
- E16 16:05–16:35 **Katsuaki Shimazu** (Hokkaido University, Japan)
"Reduction of Nitrate Ions on Sn/Noble Metal Binary Electrodes"
- E17 16:35–17:05 **Masatoshi Osawa** (Hokkaido University, Japan)
"Hydrogen evolution reaction on a Pt electrode: A surface-enhanced infrared study"

Poster session (June 22, 16:30-18:30 at Bld. #6)

P-1

Shengjun Huang, Tadashi Oshio, and Atsushi Fukuoka (Catalysis Research Center, Hokkaido University)
"Preferential Oxidation of CO by Pt Nanoparticles in Mesoporous Silica"

P-2

Tatsuya Takeguchi, Norikazu Yamamoto, and Wataru Ueda (Catalysis Research Center, Hokkaido University)
"Internal reforming SOFC with the Ni cermet anode prepared from nanoparticle YSZ"

P-3

Masahiro Sadakane, Toshitaka Horiuchi, Nobuyasu Kato, Chigusa Takahashi, Takahito Asanuma, and Wataru Ueda (Catalysis Research Center, Hokkaido University)
"Facile fabrication of three-dimensionally ordered macroporous mixed metal oxide"

P-4

Ryu Abe and Bunsho Ohtani (Catalysis Research Center, Hokkaido University)
"Polyhydroxylation of benzenes over tungsten oxide photoelectrodes under visible-light irradiation"

P-5

Taro Uchida, Akira Yamakata, and Masatoshi Osawa (Catalysis Research Center, Hokkaido University)
"Acceleration of hydrogen evolution reaction on Ag electrodes by the adsorption of

4,4'-bipyridine: A combined electrochemical and infrared study

P-6

Leilei Lu, Yujin Tong, Yi Zhang, Shen Ye, and Masatoshi Osawa (Catalysis Research Center, Hokkaido University)

"Electrochemical behavior of Dimethyl Ether on Pt(111) electrode"

P-7

Takeshi Miyamoto, Hideyuki Sugawara, Toshio Naito, and Kiyotaka Asakura (Graduate School of Engineering, Graduate School of Science and Catalysis Research Center, Hokkaido University)

"Photo-tunable conduction changing mechanisms of silver-containing molecular conductors"

P-8

Yujin Tong, Takuma Nishida, Eric Tyrode, Shen Ye, Masatoshi Osawa, Naoya Yoshida (Catalysis Research Center, Hokkaido University)

"Sum-frequency generation (SFG) study of the molecular structures on a fused quartz surface modified by mixed self-assembled monolayer (SAM)"

P-9

Yi Zhang, Shen Ye, Masaaki Abe, Masatoshi Osawa, Kohei Uosaki, and Yoichi Sasaki, (Catalysis Research Center, Hokkaido University)

"In situ infrared study of self-assembled monolayers of triruthenium clusters on gold electrodes: reactivity and pattern formation"

P-10

Hua-Xin Zhang, Masaaki Abe, Kiyoshi Tsuge, Masatoshi Osawa, and Yoichi Sasaki (Catalysis Research Center and Graduate School of Science, Hokkaido University, and Graduate School of Engineering, Kyushu University)

"Preparation, structures, and properties of some new oxo-bridged dinuclear ruthenium complexes"

P-11

Takanori Suzuki, Tomohiro Iwai, Eisuke Ohta, Hidetoshi Kawai, and Kenshu Fujiwara (Graduate School of Science, Hokkaido University)

"Electrochiroptical Systems Based on Hexaphenylethane Derivatives: Strong Chiroptical Signals through the Transmission of Point Chirality to Axial Chirality"

P-12

Baku Takimoto, Hideki Nabika, and Kei Murakoshi (Graduate School of Science, Hokkaido University)

"Characterization of Molecular Motion at Metal Nanogap in Lipid Bilayer via Single Molecule Tracking"

P-13

Tatsuya Konishi, Manabu Kiguchi, and Kei Murakoshi (Graduate School of Science, Hokkaido University)

"Fabrication of atomic size ferromagnetic metal contact in solution"

P-14

Eisuke Ohta, Hidetoshi Kawai, Kenshu Fujiwara, and Takanori Suzuki (Graduate School of Science, Hokkaido University)

"Molecular Switching Behavior over Three States: Electrochiroptical and Fluorescence ON/OFF Response of Chiral Dihydrodibenzo[c,g]phenanthrene Derivatives"

P-15

Keirei Uruma, Hiroyuki Noda, Kiyoshi Tsuge, Yoichi Sasaki, and Taira Imamura (Graduate School of Science, Hokkaido University)

“Arrangement of Box-shaped Pentaporphyrins in the Single Crystal State and on Gold surfaces”

P-16

Y. Hashimoto, Y. Matsuo, and K. Ijro (Research Institute for Electronic Science, Hokkaido University)

“Nano Electroless Plating of DNA toward Fabrication of Nano Wires”

P-17

A.Tanaka, Y. Matsuo, and K. Ijro (Graduate of School of Science and Research Institute for Electronic Science, Hokkaido University)

“Enzymatic Synthesis of DNA Block Copolymers for Site-Selective Metal Deposition”

P-18

Daisuke Kina, Akira Nakayama, Takeshi Noro, and Tetsuya Taketsugu (Graduate School of Science, Hokkaido University)

“Ab initio molecular dynamics simulation on the excited state proton transfer in 7-azaindole in solution”

P-19

Y. Nakamura, R. Washiya, G. Maruta, and S. Takeda (Graduate School of Science, Hokkaido University)

“Surface spins and magnetic ordering of antiferromagnetic nano particles as studied by solid-state NMR”

P-20

K. Konno, M. Yamada, S. Ishizaka, and N. Kitamura (Graduate School of Science, Hokkaido University)

“Laser-Induced Single Microdroplet Formation and Its Application to Liquid/Liquid Extraction in Microflow Device”

P-21

Masaya Tsukamoto, Satoru Takakusagi, Yoshiro Chuman, Kazuyasu Sakaguchi, and Kohei Uosaki (Graduate School of Science, Hokkaido University)

“Study of the Interaction between Amyloid Fibrils and Self-assembled Monolayers with Various Functional Groups”

P-22

Hiroshi Minowa, Hidenori Noguchi, Naoyuki Takedomi, Kousuke Kamada, Taiki Tominaga, Jian Ping Gong, Yoshihito Osada, and Kohei Uosaki (Graduate School of Science, Hokkaido University and CREST JST)

“Characterization of interfacial water structure at low friction gel/solid interfaces by sum frequency vibrational spectroscopy”

P-23

Motoko Harada, Nikolas Tzanetakis, Masayuki Okamura, Satoru Takakusagi, Hidenori Noguchi, and Kohei Uosaki (Graduate School of Science, Hokkaido University)

“Electrocatalytic Properties of Multilayer Assemblies of Pd Modified Au Nanoclusters”

P-24

H. Fukumitsu, T. Masuda, and K. Uosaki (Graduate School of Science, Hokkaido University)

“Construction and Electronic Property of Pt/Organic Monolayer/Si(111) Junctions”

Map of Hokkaido University

