

TABLE OF CONTENTS

Preface	iii
Table of Contents	v

GAS SENSORS AND NEW SENSOR MATERIALS

Higher Order Structure Control for Semiconductor Gas Sensors N. Yamazoe (Faculty of Engineering Sciences, Kyushu University)	1
Preparation of Macroporous Noble Metal Films by R. F. Magnetron Sputtering for Electrochemical Device Applications T. Hyodo (Nagasaki University), J. L. Hertz, and H. L. Tuller (Massachusetts Institute of Technology)	10
Gas Sensor Network for Air-Pollution Monitoring W. Tsujita, A. Yoshino (Tokyo Institute of Technology), H. Ishida (Tokyo University of Agriculture and Technology), and T. Moriizumi (Tokyo Institute of Technology).....	17
Preparation of Macroporous SnO₂ Thick Films and Their Application to Sensor Materials T. Ishibashi, T. Hyodo, Y. Shimizu, and M. Egashira (Nagasaki University)	28
Single Crystal SiC Microhotplate Conductometric Chemical Sensor Arrays R. McEachern, D. Doppalapudi, G. Whitfield, and H. Tuller (Boston MicroSystems, Inc.)	36
Sensitization of SnO₂-based Thick Film Sensor for Ethylene Oxide Gas M. Kugishima, K. Shimano, and N. Yamazoe (Kyushu University).....	43
Carbon Monoxide Sensors for Application in Polymer Electrolyte Membrane Fuel Cells R. Mukundan, E. L. Brosha, M. A. Inbody, and F. H. Garzon (Los Alamos National Laboratory)	49
Investigation of Counter Electrode Material for NASICON Based Potentiometric CO₂ Sensor Y. Miyachi, S. Kishi, K. Shimano, and N. Yamazoe (Kyushu University).....	58
Preparation of Li_xNd_{10-x}Si₆O_{27-x} Sinters and Their Application to Potentiometric CO₂ Gas Sensor M. Fujishima, Y. Itagaki, H. Aono, and Y. Sadaoka (Ehime University).....	66

Influence of SO₂ Gas on Output of Resistive Oxygen Sensor Using CeO₂ or Ce_{0.8}Zr_{0.2}O₂	
N. Izu, W. Shin, I. Matsubara, and N. Murayama (National Institute of Advanced Industrial Science and Technology)	73
Influence of Annealing Temperatures of NiO Sensing -Electrode on Sensing Characteristics of YSZ-based Mixed-potential-type NOx Sensor	
E. Perumal and N. Miura (Kyushu University)	80
Thin Film Mixed Potential NOx Sensor Development for Stationary Reciprocating Engine Applications	
E. Brosha, R. Mukundan, R. Lujan, and F. Garzon (Los Alamos National Laboratory)	89
Phase Evolution, Microstructure, and Gas-Sensing Properties of the Fe₂(MoO₄)₃ System	
U. Kersen (Helsinki University of Technology) and R. Keiski (University of Oulu)	98
Effect of Metal Loading on H₂ Sensing Properties of SnO₂ Modified with Mesoporous SnO₂	
Y. Shimizu, K. Tsumura, T. Hyodo, and M. Egashira (Nagasaki University)	103
Hydrogen Amperometric Gas Sensor: Performance Evaluation by SSTUF	
Y.-T. Chao, W. J. Buttner, K. Gupta, W. R. Penrose, and J. R. Stetter (Illinois Institute of Technology)	109
Micromachined Thermoelectric Hydrogen Sensor	
K. Tajima, Y. Choi, W. Shin, N. Izu, I. Matsubara, and N. Murayama (National Institute of Advanced Industrial Science and Technology).....	117
All Solid State Room Temperature Hydrogen Sensor	
W. Moritz (Humboldt University of Berlin), V. I. Fillipov, A. A. Vasiliev (Kurchatov Institute), and J. Szeponik (BST Biosensor Technology GmbH)	122
Selective, Sensitive, and Tunable Porous Silicon Gas Sensor	
S. Lewis, J. DeBoer, J. Gole, and P. J. Hesketh (Georgia Institute of Technology)	125
Carbon Nanotube Modified Gold (Au) Electrode for H₂S Oxidation Reactions	
S. W. Roh, W. J. Buttner, and J. R. Stetter (Illinois Institute of Technology)	133
Modification of Nanoparticle-Organic Composite Electronic Materials for Improved Chemical Sensors	
S. W. Howell, S. M. Dirk, and D. R. Wheeler (Sandia National Laboratories) ..	139

Smart Carbon Dioxide Gas Sensor Based on Solid Electrolytes

T. Maekawa, K. Suzuki, H. Ishikawa (New Cosmos Electric Co., Ltd.), S.

Tamura, N. Imanaka (Osaka University), and G.-Y. Adachi (College of

Analytical Chemistry).....^{**}**Nanoporous-Carbon for Gas Microsensors: Correlating Growth Structures with Performance**

M. Siegal, G. Yelton, P. Provencio, D. Overmyer, and A. Staton (Sandia

National Laboratories).....^{**}**Exploring the Limits of Detection of Nanoporous-Carbon SAW Coatings**

G. Yelton, M. Siegal, A. Staton, and D. Overmyer (Sandia National

Labs).....^{**}**POSTERS: GAS SENSORS AND NEW SENSOR MATERIALS****Selective Permeable Membrane Based on Two Dimensional Cross-linked Polysiloxane LB Films for Nitric Oxide Sensor**

D. Kato and F. Mizutani (National Institute of Advanced Industrial Science and Technology, Kumamoto University, and Tohoku University).....147

Stick-type Bioelectronic Sniffer for Acetaldehyde Vapor

M. Ogawa, K. Mitsubayashi (Tokyo Medical and Dental University), H.

Matsunaga, and G. Nishio (Tokai University).....154

Electrochemical Gas Sensor for Methyl Mercaptan Vapor

T. Minamide (Tokai University), K. Mitsubayashi, H. Saito (Tokyo Medical and Dental University), and G. Nishio (Tokai University)156

Non-heating Room Temperature SnO₂ Gas Sensors

Q. Yan and X. Liu (Mississippi State University).....158

Sensing Properties and Catalytic Decomposition to Chlorinated Hydrocarbons of Indium Oxide Based Gas Sensors

J. Fukunishi, J. Tamaki (Ritsumeikan University), T. Kawaguchi, and T. Ueda (Figaro Engineering Inc.).....165

Thin Film Chip Acetone Gas Sensor for the Application in Diabetic Diagnosis

M.-L. Yu and T.-C. Chou (National Cheng Kung University).....173

High Sensitivity Micro-NO₂-Sensor Using a WO₃ Thick Film and Its Application to Environmental Monitoring

T. Takagi, A. Hayashi, J. Tamaki, and Y. Yamamoto (Ritsumeikan University).....177

Odor Sensor System for Early Fire Detection and Its Application to a Utility Mobile Robot

Y. Takei, T. Tashiro, N. Kubota, T. Misawa (Kanazawa Inst. of Technology),
H. Kasahara (New Cosmos Electric Co., Ltd.), S. Iwasaki (tmsuk Co., Ltd.), and
H. Nanto (Kanazawa Inst. of Technology) 185

Preparation and Characterization of Apatite-like Neodymium Silicates and Their Application to Potentiometric O₂ Gas Sensor

N. Takeda, Y. Itagaki, H. Aono, and Y. Sadaoka (Ehime University) 194

Reactivity of Solid Electrolyte and Auxiliary Phase on Pt, Li₂CO₃/Na₂O-Al₂O₃-4SiO₂/YSZ/Pt Electrochemical CO₂ Gas Sensor

T. Okamoto, A. Kuramoto, Y. Shimamoto, Y. Itagaki, H. Aono, and Y. Sadaoka (Ehime University) 200

Study on TiO₂ Photoexcitation Reaction Using Mosaic Disk Array from Ideally Order Anodic Porous Alumina

M. Harada (Tokyo Metropolitan University), F. Matsumoto (Kanagawa Academy of Science and Technology), K. Nishio, and H. Masuda (Tokyo Metropolitan University) 208

▲

CHEMICAL SENSING IN LIQUIDS AND THE ENVIRONMENT

State-of-the-Art Fuel Acidity Monitoring

J. Widera (Innovative Scientific Solutions Inc.) and J. Johnson (University of Dayton Research Institute) 208

A Reference Electrode Based on a Microfluidic-Flowing Liquid Junction Through a Nanochannel Glass Array

F. G. Gao, T.-Y. Chen, S. T. Broadley, P. M. Payne (Broadley-James Corporation), and H. P. Silverman (Consultant) 215

Micromachined Amperometric Nitrate Sensor with an Anion Permeable Membrane

D. Kim, I. B. Goldberg, and J. W. Judy (University of California, Los Angeles) 223

Amperometric Sensor for Hydrogen Phosphate Ion with Perovskite Type Oxide Thin Film

Y. Shimizu, S. Takase, N. Higuchi, and M. Kawasaki (Kyushu Institute of Technology) 232

Signatures for Newtonian Fluids on Smooth QCMs

J. Stalgren, C. Frank, K. Kanazawa (Stanford University), and S. Martin (Sandia National Laboratory) 238

Detection of Copper with Potentiostatically Controlled Microcantilever Sensors G. M. Brown, F. Tian, J. Pei, H. David, and T. Thundat (Oak Ridge National Laboratory)	244
Rotating Sample System: A Simple Equivalent of a Rotating Disk Electrode for Detection of Trace Lead in Microliter Samples G. N. Shetty and M. Gratzl (Case Western Reserve University)	252
Aptazyme-Coated Microcantilevers for the Detection of Lead Ions K. M. Hansen, K. A. Stevenson, and T. Thundat (Oak Ridge National Laboratory)	256
Surface Plasmon Resonance Based Immunosensor for Trace Level Analysis of TNT and Related Nitroaromatic Compounds Aiming for On-site Detection of Buried Landmines D. R. Shankaran, K. V. Gobi, K. Matsumoto, K. Toko, and N. Miura (Kyushu University)	260
Acetic Acid Sensor Using Diamond-Like Carbon as a Working Electrode for Disinfection and the Sterilization Industry C.-C. Chen and T.-C. Chou (National Cheng Kung University).....	272
Effect of Electrode Modification by Ionic Polymer Adsorption on Electrochemiluminescence of Luminol M. Kamada and Y. Yoshimi (Shibaura Institute of Technology).....	275
Effects of Chemical Environment on Organic Electronics H. Chen, M. Josowicz, and J. Janata (Georgia Institute of Technology)	279
Critical Micelle Concentration (CMC) Sensor Based on Porous Sol-Gel Doped Cladding U-Shaped Optical Fiber M. Ogita, C. D. Singh, H. Isobe, and T. Fujinami (Shizuoka University)	283
POSTERS: CHEMICAL SENSING IN LIQUIDS AND IN THE ENVIRONMENT	
Electrochemical Response Dependent with Composition of Parallel Opposed Dual Electrode and Flow Rate in a Microchannel T. Ito (Kanagawa Industrial Technology Research Institute), K. Maruyama (Keio University), O. Niwa (National Institute of Advanced Industrial Science and Technology), and K. Suzuki (Keio University)	289
Flow Injection Analysis of Zinc(II) Ions with an ALP-Column Based on an Apoenzyme Reactivation Method and Application of the Method to Regulation of the Column Activity Y. Iida, M. Sekine, S. Nemoto, and I. Satoh (Kanagawa Institute of Technology)	300

Periodic Change of Viscosity and Density in an Oscillating Chemical Reaction	303
H. Shirahama and M. Yoshimoto (Kagoshima University)	
Effect of the Immersion Angle of a One-Face Sealed Quartz Crystal Microbalance in Electrolytic Solution	309
S. Tokimura and M. Yoshimoto (Kagoshima University)	
Development of a pH Sensor for Acidic Rain or Mist	
N. Matsunaga (Kitakyushu Foundation for the Advancement of Industry, Science and Technology), A. Nogami, and T. Murata (The University of Kitakyushu).....	313
Excited State Kinetics of Ru(bpy)₂(PVP)₁₀²⁺	
L. Dennany and R. J. Forster (Dublin City University).....	319
Tubular-Type Carbon Nanofibers Used as Probing Materials for a Solid-Phase Extraction Device	
C.-T. Hsieh, J.-M. Chen (Industrial Technology Research Institute), M.-R. Chao, C.-W. Hu (Chung Shan Medical University), Y.-H. Huang, and R.-R. Kuo (Industrial Technology Research Institute).....	322
 BIOSENSORS AND NEW BIODETECTION METHODS	
An Enzyme Sensor Fabricated on a Transparency Film by Applying the Line Patterning Method to Prepare Basal Electrodes	
S. Toyama, K. Aoki, S. Kato (National Rehabilitation Center for Persons with Disabilities), M. Nakamura, and R. Usami (Toyo University).....	327
Three Dimensional Bio-Inorganic Arrays	
L. Vayssieres (National Institute for Materials Science).....	332
Electrochemical Signaling in Green Plants Induced by Photosensory Systems: Molecular Recognition of the Direction of Light	
G. Volkov, T. C. Dunkley, A. J. Labady, D. Ruff II, and S. A. Morgan (Oakwood College).....	344
Electrospun Bio-composite Nanofibers for Bio-sensing	
K. Sawickam P. Gouma, and S. Simon (Stony Brook University)	354
Sequence-Specific Electrochemical Recognition of Multiple Species Using Au/Ag Nanoparticle Labels	
H. Cai and I.-M. Hsing (Hong Kong University of Science and Technology) ...	359
Continuous Measurement with a Chemical Sensor and a Semipermeable Hollow Fiber Using the Null Method	
K. Otsuka (Tokyo Medical and Dental University), T. Sumino, M. Miyagi, T. Togawa (Waseda University), and K. Mitsubayashi (Tokyo Medical and Dental University)	366

Precise Enzyme Immobilization at the Bottom of a Micro Flow Channel and Its Application to a Sensing System	
M. Hashimoto, S. Upadhyay, and H. Suzuki (University of Tsukuba)	369
Rapid, Sensitive Detection of Botulinum Toxin Using a Flexible Microfluidics Platform	
M. J. Warner, B. Dockendorff, M. J. Feldhaus, N. C. Anheier, Jr. (Pacific Northwest National Laboratory), J. D. Marks (University of California, San Francisco), J. W. Grate, and C. J. Bruckner-Lea (Pacific Northwest National Laboratory)	376
Label-Free Electrical Detection of Biomolecular Interactions with Metal-Oxide-Semiconductor Diodes and Thin Film Transistors	
P. Estrela, A. G. Stewart, P. Migliorato (University of Cambridge), and H. Maeda (Seiko Epson Corporation)	381
Surface Electrochemical Measurement of Acetylcholinesterase Activity: Application to Monitoring a Peptide Hormone with Enzyme Immunoassay System	
H. Matsuura (University of Tsukuba), Y. Sato, O. Niwa (Tsukuba Center, National Institute of Advanced Industrial Science and Technology), and F. Mizutani (Hokkaido Center, National Institute of Advanced Industrial Science and Technology)	386
Development of Molecularly Imprinted Polymer Films for L-Proline Detection	
M. L. Homer, S.-P. Yen, M. A. Ryan, and A. Ksendzov (Jet Propulsion Laboratory, California Institute of Technology)	394
Carbon Nanotube Based Nanoelectrode Arrays: Fabrication, Evaluation, and Sensing Applications	
Y. Lin (Pacific Northwest National Laboratory), Y. Tu (Boston College), F. Lu, W. Yantasee (Pacific Northwest National Laboratory), and Z. Ren (Boston College).....	399
Microfluidic System for the Analysis of GOT and GPT Activities	
N. Ohgami, S. Upadhyay (University of Tsukuba), H. Kusakabe (Yamasa Corporation), and H. Suzuki (University of Tsukuba)	410
The Application of Various Crown Ether Modified Electrodes as Potentiometric Detectors for Flow Injection Analyses of Catechol and Catecholamines	
S. Lunsford (Wright State University).....	416
Immunoassay for Environmentally Hazardous Chemicals Using Electrochemical Microscopy with Shear Force Feedback Systems	
T. Yasukawa, Y. Hirano, Y. Mase (Tohoku University), D. Oyamatsu (Osaka University), H. Shiku, and T. Matsue (Tohoku University)	**

Integrated Sample Preparation and Analysis of Biological Agents Using the Hand Portable Capillary Electrophoresis Instrument, MicroChemlab

J. A. A. West (Sandia National Laboratories)
**

POSTERS: BIOSENSORS AND NEW BIODETECTION METHODS

A Needle Puncture System for Automatic Blood Sampling

H. Saito, K. Mitsubayashi (Tokyo Medical and Dental University), and M. Shibata (University of Tokyo) 419

A Wearable Oxygen Sensor for Rabbit Conjunctiva

S. Iguchi (Tokai University), K. Mitsubayashi, M. Ogawa (Tokyo Medical and Dental University), T. Saito (Tokyo Denki University), and T. Goto (Tokai University) 421

Electrochemical DNA Sensors Based on Polymeric Indicator

Liu (National Institute of Advanced Industrial Science and Technology) and J.-I. Anzai (Tohoku University) 423

Synthesis and Antigen-Binding Properties of Fluorescent Labeled Camel Antibody

H. Hamada, R. Abe, M. Taki (Okayama University), H. Shinohara (Toyama University), T. Hohsaka (JAIST), and M. Sisido (Okayama University) 431

Simultaneous Cell Analysis by PT-Mesh Enzyme Electrode and CLSM Image

S. Nakakura (Tokai University), K. Mitsubayashi (Tokyo Medical and Dental University), T. Kon, T. Okamoto (Tokai University), and K. Otsuka (Tokyo Medical and Dental University) 436

Electrochemical Responses of a Polyeugenol and Overoxidized Polypyrrole Composite Film Modified Graphite Electrode to Dopamine and Ascorbic Acid

K. Hirakawa, T. Imato (Kyushu University), S. Yamasaki, and H. Ohura (Kyushu Sangyo University) 438

Application of a Microfluidic Gas-Diffusion Unit to Flow Injection Analysis of L-Lysine with an L-Lysine α -oxidase Column

Y. Iida, T. Sano, and Il Satoh (Kanagawa Institute of Technology) 444

Development of the Ammonia Bio-Sniffer with FMO3

T. Okamoto (Tokai University), K. Mitsubayashi, H. Saito (Tokyo Medical and Dental University), Y. Kaneko, Y. Hashimoto, and S. Nakakura (Tokai University) 447

Development of a Stick-Type Bioelectronic Sniffer Device for Ethanol Vapor

G. Nishio (Tokai University), K. Mitsubayashi, and M. Ogawa (Tokyo Medical and Dental University) 449

A Gas-Phase Biosensor for Lactate Vapor	
T. Goto (Tokai University), K. Mitsubayashi (Tokyo Medical and Dental University), H. Amagai, S. Iguchi, T. Shinoda (Tokai University), and K. Otsuka (Tokyo Medical and Dental University)	451
Pharmacological Active Cell Sensor Array	
H. D. Wanzenboeck, K. Dominizi, P. Hagl, C. Almeder, E. Bertagnolli (Vienna University of Technology), E. Bogner, M. Wirth, and F. Gabor (University of Vienna)	453
Subject Index	459

♦♦ No proceedings volume manuscript was received.