244th ECS Meeting

Meeting Abstracts 2023-02

Gothenburg, Sweden
8-12 October 2023

Volume 1 of 8

ISBN: 978-1-7138-9778-1

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571

Some format issues inherent in the e-media version may also appear in this print version.

The Electrochemical Society
65 South Main Street, Building D
Pennington, New Jersey 08534-2839
USA

Phone: 1.609.737.1902
Fax: 1.609.737.2743

ecs@electrochem.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

VOLUME 1

A01-NEW APPROACHES AND ADVANCES IN ELECTROCHEMICAL ENERGY SYSTEMS

A01 - Digital Only Presentations

A01 - Supercapacitors 1

A01 - Supercapacitors 2

A01 - Invited Talks 1 - Electrochemical Energy Systems

A01 - Invited Talks 2 - Electrochemical Energy Systems

A01 - Poster Session

A01 - Invited Talk 3 - Electrochemical Energy Systems

ECS Energy Technology Division Walter van Schalkwijk Award in Sustainable Energy Technology

A01 - Invited Talks 4 - Electrochemical Energy Systems

A01 - Electrode Materials

A01 - Battery Characterization - New Approaches 1

A01 - Battery Electrodes - New Insights

A01 - Battery - Na/Zn/Al/Ti

A01 - Redox Flow Battery

A02-LITHIUM ION BATTERIES

A02 - Digital Only Presentations

A02 - Advanced Processing 1

A02 - Simulation and Modeling for Li-ion Batteries 1

A02 - Battery Diagnosis 1

A02 - Fast Charging of Li-ion Batteries

A02 - Li-ion Battery Cathodes 1

A02 - Electrolytes for Li-ion Batteries 1

A02 - Advanced Characterization 1

A02 - Li-ion Battery Anodes 1

A02 - Advanced Characterization 2

A02 - Li-ion Battery Cathodes 2

Olin Palladium Award Address

A02 - Li-ion Battery Anodes 2

A02 - Advanced Processing 2

A02 - Poster Session

A02 - Li-ion Battery Cathodes 3

A02 - Electrolytes for Li-ion Batteries 2

A02 - Electrolytes for Li-ion Batteries 3

A02 - Li-ion Battery Anodes 3

A02 - Advanced Characterization 3

A02 - Li-ion Battery Cathodes 4

A02 - Li-ion Battery Anodes 4

A02 - Battery Diagnosis 2

A02 - Li-ion Battery Anodes 5

VOLUME 2

A02 - Battery Diagnosis 3

A03-BATTERY SAFETY AND FAILURE MODES 4

A03 - Digital Only Presentations in Battery Safety and Failure Modes 4

A03 - Characterizing Thermal Behavior with Advanced Calorimetry Techniques 1

A03 - Characterizing Thermal Behavior with Advanced Calorimetry Techniques 2

A03 - Ageing Mechanisms

A03 - Policy, Field Experience, & Investigations

A03 - Modeling and Analysis 1

A03 - Modeling and Analysis 2

A03 - Characterizing Internal and External Short Circuits

A03 - Characterizing Safety in Beyond Li-ion Battery Technologies 1

A03 - Characterizing Safety in Beyond Li-ion Battery Technologies 2

A03 - Test and Characterization 1

A03 - Poster Session

A03 - Test and Characterization 2

A03 - Fast Charging and Lithium Plating

A04-NEXT-GENERATION BATTERIES

A04 - Next Generation Electrodes and Electrolytes 1

A04 - Solid State Batteries 1

A04 - Solid State Batteries 2

A04 - Non-Li Ion Batteries 1

A04 - Next Generation Electrodes and Electrolytes 2

A04 - Solid State Batteries 3

A04 - Next Generation Electrodes and Electrolytes 3

A04 - Multivalent Ion Batteries 1

A04 - Non-Li Ion Batteries 2

A04 - Solid State Batteries 4

A04 - Non-Li Ion Batteries 3

A04 - Solid State Batteries 5

A04 - Advanced Characterization and Computation

A04 - Next Generation Electrodes and Electrolytes 4

A04 - Non-Li Ion Batteries 4

A04 - Next Generation Electrodes and Electrolytes 5

A04 - Non-Li Ion Batteries 5

A04 - Next Generation Electrodes and Electrolytes 6

A04 - Non-Li Ion Batteries 5

A04 - Multivalent Ion Batteries 2

A04 - Next Generation Electrodes and Electrolytes 7

A04 - Next Generation Electrodes and Electrolytes 8

A04 - Multivalent Ion Batteries 3

A04 - Solid State Batteries 6

A04 - Multivalent Ion Batteries 4

A04 - Solid State Batteries 7

A04 - Multivalent Ion Batteries 5

A04 - Li Metal 1

A04 - Next Generation Electrodes and Electrolytes 9

A04 - Li Metal 2

A04 - Non-Li Ion Batteries 6

A04 - Poster Session

A04 - Solid State Batteries 8

A04 - Next Generation Electrodes and Electrolytes 10

A04 - Next Generation Electrodes and Electrolytes 11

A04 - Non-Li Ion Batteries 7

A04 - Solid State Batteries 9

A04 - Next Generation Electrodes and Electrolytes 12

A04 - Next Generation Electrodes and Electrolytes 13

A04 - Non-Li Ion Batteries 8

A05-ELECTROCHEMICAL INTERFACES IN ENERGY STORAGE: THEORY MEETS EXPERIMENT

A05 - Silicon-Electrolyte Interfaces

A05 - Cathode-Electrolyte Interfaces

A05 - Metal-Electrolyte Interfaces

A05 - Poster Session

A05 - Fundamentals of Charge Storage

A05 - Charging Process

A05 - Advanced Simulation Techniques

A05 - Degradation Process

VOLUME 3

A05 - Interfacial Chemistry

A05 - Emerging Battery Systems

A05 - Solid-Electrolyte Interphases

A05 - Diffusion Process

A05 - Materials Modelling and Design

A06-NEW DEVELOPMENTS AND APPLICATIONS OF ELECTRODE BINDERS FOR RECHARGEABLE BATTERY AND OTHER ELECTROCHEMICAL SYSTEMS

A06 - Invited Talks 1

A06 - Invited Talks 2

A06 - Invited Talks 3

A06 - Invited Talks 4

A06 - Binder/Additive

A06 - Membrane/Electrolyte/Interface

A07-INTERPLAY BETWEEN TEMPERATURE AND BATTERY PHENOMENON

A07 - Digital Only Presentations in Interplay between Temperature and Battery Phenomenon

A07 - Heat Generation and Degradation

A07 - Keynote Session

A07 - Extreme Environments

A07 - Poster Session

A07 - Pack and Thermal Management Design

A07 - Modeling Across Scales

A07 - Instrumentation and Characterization

ECS Battery Division Awards Session

B01-CARBON NANOSTRUCTURES: FROM FUNDAMENTAL STUDIES TO APPLICATIONS AND DEVICES

B01 - Energy Storage 1 - Capacitors

B01 - Energy Storage 2 - Batteries

B01 - Sensors

B01 - Synthesis and Characterization of Carbons

B01 - Optoelectronic Properties and Devices

B01 - Catalysis and Fuel Cells

B01 - Poster Session

C01-CORROSION GENERAL SESSION

C01 - Digital Only Presentations

C01 - General Session 1

C01 - General Session 2

C01 - General Session 3

C01 - General Session 4

C01 - General Session 5

Corrosion Division Morris Cohen Graduate Student Award Address

Corrosion Division Rusty Award for Mid-Career Excellence Address

Corrosion Division H. H. Uhlig Award Address

C01 - Poster Presentations

C02-CORROSION IN NUCLEAR ENERGY SYSTEMS: FROM CRADLE TO GRAVE 3

C02 - Used Fuel Disposal Containers

C02- Nuclear Fuel, Cladding, and Reactors

C02 - Corrosion in Molten Salts

C03-METALLIC, ORGANIC, INORGANIC, AND COMPOSITE COATINGS FOR CORROSION PROTECTION

C03 - Organic Coatings

C03 - Conversion Coatings, Inorganic and Metallic Coatings 1

C03 - Conversion Coatings, Inorganic and Metallic Coatings 2

C03 - Ultra Thin Coatings and Inhibition Layers

C04-ANALYTICAL TOOLS IN CORROSION RESEARCH

C04 - Advanced Analytical Methods 1

C04 - Advanced Analytical Methods 2

C04 - Advanced Analytical Methods 3

C04 - Advanced Analytical Methods 4

C04 - Advanced Analytical Methods 5

D02-PLASMA AND THERMAL PROCESSES FOR MATERIALS MODIFICATION, SYNTHESIS, AND PROCESSING 5

D02 - Plasma-Assisted Fabrication of Electrodes and Catalysts

D02 - Plasma-Synthesized Device Structures

D02 - Plasma Etching and Patterning

D02 - Plasma-Assisted Fabrication of Novel Materials

D02 - Plasma-Assisted Fabrication of Thin Film Structures

D02 - Poster Session

D03-ADVANCED 3D INTERCONNECT TECHNOLOGIES AND PACKAGING 2

D03 - Digital Only Presentations

D03 - Process & Integration 1

D03 - Process & Integration 2

D03 - Poster Session

D03 - Reliability

D04-WATER-ENERGY NEXUS RESEARCH RELATING TO ELECTROCHEMICAL SCIENCES

D04 - Large-Scale Water Treatment

D04 - Surface Engineering, Water Splitting and Separations

D04 - Poster Session

E01-METAL ELECTRODEPOSITION FROM FUNDAMENTALS TO APPLICATIONS

E01 - Electrodeposition of Enhanced Materials: Electrical and Thermal Conductivities

E01 - Highlighting Early Career Researchers

E01 - Poster Session

E01 - Nucleation and Growth of Electrodeposited Metals

E01 - Novel Applications

E01 - Alloys and More

E01 - Beyond Water

E02-ELECTRODEPOSITION OF POROUS MATERIALS AND MATERIALS WITH COMPLEX GEOMETRIES

E02 - Dealloying

E02 - Complex Geometries 1

E02 - Porous Materials 1

E02 - Poster Session

E02 - Periodic and 3D Nanostructured Materials

E02 - Complex Geometries 2

E02 - Porous Materials 2

E04-CURRENT TRENDS IN ELECTRODEPOSITION - AN INVITED SYMPOSIUM

ECS Electrodeposition Division Research Award Address

E04 - Current Trends in Electrodeposition

F01-ADVANCES IN INDUSTRIAL ELECTROCHEMISTRY AND ELECTROCHEMICAL ENGINEERING

F01 - Digital Only Presentations

F01 - Carbon Dioxide Reduction to Ethylene

F01 - Carbon Dioxide Reduction, Electrodialysis and Peroxide Production

F01 - Electrolysis and Recycling

F02 - Resource Recovery, Recycling, and Chemical Purification 1

F02 - Poster Session

F02 - Water Purification and Wastewater Treatment 2

F02 - Resource Recovery, Recycling, and Chemical Purification 2

F02 - Carbon Dioxide Capture

F03-PULSE AND REVERSE PULSE ELECTROLYTIC PROCESSES 4: IN HONOR OF EJ TAYLOR

F03 - Industrial Applications of Pulse and Pulse Reverse Electrolysis

F03 - Pulse and Pulse Reverse Electrodeposition 1

F03 - Pulse and Pulse Reverse Electrodeposition 2

F03 - Pulse and Pulse Reverse Surface Finishing

F03 - Pulse and Pulse Reverse Electrolytic Conversion

F04-ELECTROCHEMICAL CONVERSION OF BIOMASS 4

F04 - Poster Session

F04 - Utilizing Biomass in Paired Electrolyses

F04 - Electrochemical Conversions of Biomass

G01-ATOMIC LAYER DEPOSITION AND ETCHING APPLICATIONS 19

G01 - Keynote

G01 - ALD for Semicon Applications

G01 - ALD On 0D and 1D Materials

G01 - ALD of/on Dichalcogenides

G01 - Poster Session

G01 - Area-Selective ALD

G01 - Atomic Layer Etching1

G01 - Atomic Layer Etching 2

G01 - Spatial/Solution/Fast ALD

G01 - ALD for Battery Applications

G01 - ALD of Conductive Oxides

G01 - ALD for Thermoelectrics

G01 - Molecular Layer Deposition

G01 - Infiltration Processes

G01 - ALD of Metals

G01 - ALD for (Electro)catalysis

G01 - ALD of Nitrides

G01 - Plasma Processes

G02-SEMICONDUCTOR PROCESS INTEGRATION 13

G02 - Digital Only Presentations in Semiconductors, Dielectrics, and Metals for Nanoelectronics 20

G02 - Devices and Process Technology 1

G02 - Devices and Process Technology 2

G02 - Devices and Process Technology 3

G02 - Memory and Process Technology

G02 - Memory, Wide-Gap Semiconductor Devices and Processes

G02 - Emerging Technologies & Processes 1

G02 - Emerging Technologies & Processes 2

G02 - Microsystems 1

G02 - Microsystems 2

G02 - Emerging Technologies & Processes 3

G02 - Emerging Technologies & Processes 4

G02 - Poster Session

G02 - Semiconductors, Dielectrics, and Metals for Nanoelectronics 1

G02 - Semiconductors, Dielectrics, and Metals for Nanoelectronics 2

H01-STATE-OF-THE-ART PROGRAM ON COMPOUND SEMICONDUCTORS 66 (SOTAPOCS 66)

H01 - Energy Conversion: Solar Cells and Photovoltaics

H01 - InN

H01 - Optoelectonics

H01 - Power Electronics: GaN and Beyond

H01 - Poster Session

H02-SEMICONDUCTOR WAFER BONDING: SCIENCE, TECHNOLOGY AND APPLICATIONS 17

H02 - Fundamental and Characterization 1

H02 - Fundamental and Characterization 2

H02 - Fundamental and Characterization 3

H02 - Hybrid Bonding and 3D Applications

H02 - Surface Activated and Low Temperature Wafer Bonding 1

H02 - Surface Activated and Low Temperature Wafer Bonding 2

H02 - Surface Activated and Low Temperature Wafer Bonding 3

H02 - Die to Wafer Bonding

H02 - Poster Session

H02 - Wafer Bonding for Sensors and MEMS

H02 - SiC, GaN, Li-based, Diamond and Other Material Bonding 1

H02 - SiC, GaN, Li-based, Diamond and Other Material Bonding 2

H03-LOW-DIMENSIONAL NANOSCALE ELECTRONIC AND PHOTONIC DEVICES 16

H03 - Digital Only Presentations

H03 - 2D Materials 1

H03 - Nanophotonic Devices

H03 - Perovskites

H03 - 2D Materials 2

H03 - Low-Dimensional Materials 1

H03 - Energy and Catalysis

H03 - Poster Session

H03 - Low-Dimensional Materials 2

H03 - Flexible Electronics

H04-GALLIUM NITRIDE AND SILICON CARBIDE POWER TECHNOLOGIES 13

H04 - General

H04 - GaN Devices

H04 - GaN Substrates

H04 - GaN Doping

H04 - SiC Technologies

H04 - Poster Session

I01A-POLYMER ELECTROLYTE FUEL CELLS AND ELECTROLYZERS 23 (PEFC&E23) - DIAGNOSTICS/CHARACTERIZATION METHODS, MEA DESIGN/ MODEL

I01A - Digital Only Presentations

I01A - Modeling 1

VOLUME 5

I01A - Modeling 2

I01A - Poster Session

I01A - Catalyst Layer 1

I01A - Catalyst Layer 2

I01A - GDL & MPL

I01A - MEA Degradation & Durability

I01A - Imaging 1

I01A - Cell Level Analytics

I01A - Imaging 2

I01B-POLYMER ELECTROLYTE FUEL CELLS AND ELECTROLYZERS 23 (PEFC&E23) - DESIGN, FABRICATION AND OPERATION OF CELLS, STACKS AND SYSTEMS

I01B - Electrodes & MEAs

I01B - Poster Session

I01B - Stacks and Durability Testing 1

I01B - Stacks and Accelerated Durability

I01B - Stacks and Durability Testing 2

I01B - Flow Field(s), Plates and Channels

I01B - Gas Diffusion Layers

I01C-POLYMER ELECTROLYTE FUEL CELLS AND ELECTROLYZERS 23 (PEFC&E23) - ION-EXCHANGE MEMBRANE AND IONOMER DEVELOPMENT, PERFORMANCE, AND DURABILITY

I01C - Poster Session

I01C - Ionomer & Membrane Development

I01C - Ionomer Characterization: Theory and Experiments

I01C - Membrane Degradation and Durability

I01C - Catalysts Ionomers

I01D-POLYMER ELECTROLYTE FUEL CELLS AND ELECTROLYZERS 23 (PEFC&E23) - CATALYST ACTIVITY/DURABILITY FOR HYDROGEN(-REFORMATE) ACIDIC FUEL CELLS

I01D - 01 Non-PGM Catalysts

I01D - 02 Non-PGM Catalysts & Pt Cathode Catalysts

I01D - Poster Session

I01D - 21 Anode Catalysts & Cathode Catalyst Layers

I01D - 22 Pt-Alloy Cathode Catalysts

I01D - 31 Pt-Alloy Cathode Catalysts & New Support Materials

I01D - 32 New Support Materials Based on Carbon

I01D - 41 New Support Materials - Carbon and Oxides

I01E-POLYMER ELECTROLYTE FUEL CELLS AND ELECTROLYZERS 23 (PEFC&E23) - MATERIALS FOR ALKALINE FUEL CELLS AND DIRECT-FUEL FUEL CELLS

I01E - Liquid Alkaline Electrolysis

I01E - Poster Session

I01E - Alkaline Hydrogen Catalysts and Fundamentals

I01E - Alkaline Membranes and Devices

I01E - Alkaline Oxygen Reduction

I01E - Anodes: Non-H2 Oxidation Reactions

I01F-POLYMER ELECTROLYTE FUEL CELLS AND ELECTROLYZERS 23 (PEFC&E23) - POLYMER-ELECTROLYTE ELECTROLYSIS

I01F - Digital Only Presentations

I01F - 01 PEM Hydrogen Evolution and Oxygen Evolution Beyond Ir

I01F - 02 Anion Exchange Membrane Electrolysis

VOLUME 6

I01F - 02 PEM Ir Based Oxygen Evolution Electrocatalyst

I01F - Poster Session

I01F - 21 Supported Ir for Oxygen Evolution

I01F - 21 Impact of Bubble Generation

I01F - 22 Big Picture Electrolysis Issues

Carl Wagner Memorial Award Address

I01F - 31 Electrolysis Cell Testing

I01F - 32 Porous Transport Layers

I01F - 41 Alkaline Oxygen Evolution Electrocatalysis

I01F - 42 Alkaline Electrocatalysis

I01Z-POLYMER ELECTROLYTE FUEL CELLS AND ELECTROLYZERS 23 (PEFC&E23) - PLENARY

I01Z - PEFC&E Plenary 1

I01Z - PEFC&E Plenary 2

I02-PHOTOVOLTAICS FOR THE 21ST CENTURY 19: NEW MATERIALS AND PROCESSES

I02 - Perovskite 1

I02 - Perovskite 2

I02 - Perovskite 3

I02 - Thin Films

I02 - Silicon PV and Recycling

I03-HIGH TEMPERATURE CORROSION AND MATERIALS CHEMISTRY 15

I03 - Session 1

I03 - Session 2

I04-IONIC AND MIXED CONDUCTING CERAMICS 14: IN HONOR OF PROF. ANIL VIRKAR

I04 - Digital Only Presentations

I04 - Electrodes for SOFCs and SOECs

I04 - Modeling Mixed Ionic and Electronic Conduction

I04 - Fundamental Properties and Mechanisms

High-Temperature Energy, Materials, & Processes Division J. B. Wagner, Jr. Young Investigator Award Address

I04 - Proton Conductors for SOFCs and SOECs

I04 - Materials Stability and Device Degradation

I04 - Novel Chemical Processing Methods

I04 - Poster Session

I04 - Solid State Batteries and Novel Phenomena

I04 - Fabrication and Synthesis

I05-PHOTOCATALYSTS, PHOTOELECTROCHEMICAL CELLS, AND SOLAR FUELS 13

I05 - Metal Oxide Photocatalysts & Electrocatalysts for Water Splitting 1

I05 - Metal Oxide Photocatalysts & Electrocatalysts for Water Splitting 2

I05 - Metal Oxide Photocatalysts & Electrocatalysts for Water Splitting 3

I05- Photocatalysts and Electrocatalysts Beyond Metal Oxides 1

I05 - Catalysis Toward Nitrogen-Containing Compound Conversion

I05 - Poster Session

I05 - Mechanistic Studies on Adsorption, Photocatalysis and Electrocatalysis

I05 - Photocatalysts and Electrocatalysts Beyond Metal Oxides 2

I05 - Photocatalytic or Electrocatalytic Carbon Dioxide Conversion 1

I05 - Photocatalysts and Electrocatalysts Beyond Metal Oxides 3

I05 - Photocatalytic or Electrocatalytic Carbon Dioxide Conversion 2

I05 - Photocatalytic or Electrocatalytic Carbon Dioxide Conversion 3

I06-CROSSCUTTING MATERIALS INNOVATION FOR TRANSFORMATIONAL CHEMICAL AND ELECTROCHEMICAL ENERGY CONVERSION TECHNOLOGIES 5

I06 - Accelerated Discovery & Development of Energy Materials 1

I06 - Accelerated Discovery & Development of Energy Materials 2

I06 - Energy Materials Innovation 1

I06 - Energy Materials Innovation 2

I06 - Integrated Materials Synthesis, Characterization and Theory 1

I06 - Integrated Materials Synthesis, Characterization and Theory 2

I06 - Materials to Market 1

I06 - Poster Session

I06 - Materials to Market 2

J01-LUMINESCENCE AND DISPLAY MATERIALS: FUNDAMENTALS AND APPLICATIONS

J01 - Digital Only Presentations

J01 - Phosphors for Lighting 1

J01 - Phosphors for Lighting 2

J01 - Quantum Dots and Molecules

J01 - Optical Thermometry

J01 - Poster Session

K01-ADVANCES IN ORGANIC AND BIOLOGICAL ELECTROCHEMISTRY

K01 - Organic Electrochemistry 1

K01 - Bioelectrochemistry 1

K01 - Poster Session

K01 - Organic Electrochemistry 2

VOLUME 7

K01 - Bioelectrochemistry 2

K01 - Organic Electrochemistry 3

K01 - Bioelectrochemistry 3

L01-PHYSICAL AND ANALYTICAL ELECTROCHEMISTRY, ELECTROCATALYSIS, AND PHOTOELECTROCHEMISTRY GENERAL SESSION

L01 - Digital Only Presentations

L01 - Electrode Processes 1

L01 - Modeling and Energy Storage/Conversion

L01 - Electrode Processes 2

L01 - Water Remediation

L01 - Poster Session

L01 - Electrocatalysts and Electrocatalysis 1

L01 - Novel Methods/Materials

L01 - Electrocatalysts and Electrocatalysis 2

L01 - Voltammetry and Microscopy

L01 - Electrolysis and Electrochemical Processes

L03-ADVANCED TECHNIQUES FOR IN SITU ELECTROCHEMICAL SYSTEMS 6

L03 - Digital Only Presentations in Advanced Techniques for In Situ Electrochemical Systems 6

L03 - Fundamental In-Situ Liquid Electrolyte Studies

L03 - Fundamental In-Situ Solid-Liquid Interface Studies 1

L03 - Fundamental in-situ Solid-Liquid Interface Studies 2

L03 - Fundamental in-situ Catalyst Layers Studies

L03 - In-situ Electrocatalyst and Reaction Mechanism Studies 1

L03 - In-situ Electrocatalyst and Reaction Mechanism Studies 2

L03 - In-situ Electrocatalyst and Reaction Mechanism Studies 3

L03 - In-situ Studies of Batteries 1

L03 - Poster Session

L03 - In-situ Studies of Batteries 2

L03 - In-situ Studies of Batteries 3

L04-PHYSICAL AND ANALYTICAL ELECTROCHEMISTRY IN IONIC LIQUIDS 6

L04 - Physical and Analytical Electrochemistry in Ionic Liquids 1

L04 - Physical and Analytical Electrochemistry in Ionic Liquids 2

L04 - Poster Session

L07-NANOSCALE ELECTROCHEMISTRY

L07 - Energy Storage and Batteries

L07 - PGM Catalysts for Oxygen Reduction Reaction and Fuel Cells

L07 - Fuel Cell Technology

L07 - Poster Session

L07 - Catalysis for Oxygen Reduction and Evolution Reactions

L07 - Catalysts and Supports for Electrocatalysis

L07 - Nanocatalysis for Water Electrolyzing, Nitrogen Reduction and CO2 Reduction

L07 - Nanocatalyst Design for Electrocatalysis

L08-NANOSTRUCTURED METAL OXIDES AND POLYOXOMETALLATE CLUSTERS IN ELECTROCATALYSIS, ELECTROCHEMICAL ENERGY CONVERSION, AND STORAGE

Europe Section Heinz Gerischer Award Address

L08 - Oxygen Electrochemistry

L08 - Oxygen Evolution Reaction

L08 - Electrocatalytic Carbon Dioxide Reduction

L08 - Electroreduction of Inert Molecules: CO2, CO and N2

L08 - Materials Chemistry for Electrocatalysis

L08 - Electrochemical Water Splitting

L08 - Hydrogen Evolution Reaction

L08 - Structure and Reactivity of Electrochemical Interfaces

L08 - Nanostructured Materials Engineering in Electrocatalysis

L08 - Electrocatalytic and Photoelectrochemically Active Materials

L08 - Poster Session

L08 - Development and Characterization of Electrocatalytic Interfaces

L09-PHYSICAL AND ELECTROCHEMICAL PROCESSES AT FLOW BATTERY ELECTRODES

L09 - Flow Batteries - New Topics

L09 - Flow Battery Alternative Electrolytes

L09 - Poster Session

L09 - VRFB Electrodes

L09 - Flow Battery Electrode Design

L10-INTERFACIAL ANALYSIS FOR ENERGY STORAGE

L10 - Poster Session

L10 - Advanced Methods for Interfacial Analysis

L10 - Fundamental Processes at Interfaces and Interphases

LA-LATE POSTER PRESENTATIONS IN BATTERIES AND ENERGY STORAGE

LA - Late Digital Only Poster Presentations in Batteries and Energy Storage

LA - Late Poster Presentations in Batteries and Energy Storage (Monday)

LA - Late Poster Presentations in Batteries and Energy Storage (Tuesday)

VOLUME 8

LA - Late Poster Presentations in Batteries and Energy Storage (Wednesday)

LB-LATE POSTER PRESENTATIONS IN CARBON NANOSTRUCTURES AND DEVICES

LB - Late Poster Presentations in Carbon Nanostructures and Devices

LC-LATE POSTER PRESENTATIONS IN CORROSION SCIENCE AND TECHNOLOGY

LC - Late Digital Only Poster Presentations in Corrosion

LD-LATE POSTER PRESENTATION IN DIELECTRIC SCIENCE AND MATERIALS

LD - Late Poster Presentations in Dielectric Science and Materials

LE-LATE POSTER PRESENTATIONS IN ELECTROCHEMICAL/ELECTROLESS DEPOSITION

LE - Late Poster Presentations in Electrochemical/Electroless Deposition

LF-LATE POSTER PRESENTATIONS IN ELECTROCHEMICAL ENGINEERING

LF - Late Digital, Poster Presentations in Electrochemical Engineering

LF - Late Poster Presentations in Electrochemical Engineering

LG-LATE POSTER PRESENTATIONS IN ELECTRONIC MATERIALS AND PROCESSING

LG - Late Poster Presentations in Electronic Materials and Processing

LH-LATE POSTER PRESENTATIONS IN ELECTRONIC AND PHOTONIC DEVICES AND SYSTEMS

LH - Late Poster Presentations in Electronic and Photonic Devices and Systems

LI-LATE POSTER PRESENTATIONS IN FUEL CELLS, ELECTROLYZERS, AND ENERGY CONVERSION

LI - Late Digital Only Presentations in Fuel Cells, Electrolyzers, and Energy Conversion

LI - Late Poster Presentations in Fuel Cells, Electrolyzers, and Energy Conversion (Monday)

LI - Late Poster Presentations in Fuel Cells, Electrolyzers, and Energy Conversion (Tuesday)

LI - Late Poster Presentations in Fuel Cells, Electrolyzers, and Energy Conversion (Wednesday)

LJ-LATE POSTER PRESENTATIONS IN LUMINESCENCE AND DISPLAY MATERIALS, DEVICES, AND PROCESSING

LJ - Late Poster Presentations in Luminescence and Display Materials, Devices, and Processing

LK-LATE POSTER PRESENTATIONS IN ORGANIC AND BIOELECTROCHEMISTRY

LK - Late Poster Presentations in Organic and Bioelectrochemistry

LL-LATE POSTER PRESENTATIONS IN PHYSICAL AND ANALYTICAL ELECTROCHEMISTRY, ELECTROCATALYSIS, AND PHOTOELECTROCHEMISTRY

LL - Late Digital Only Poster Presentations in Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry

LL - Late Poster Presentations in Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry

LM-LATE POSTER PRESENTATIONS IN SENSORS

LM - Late Digital Only Poster Presentations in Sensors

LM - Late Poster Presentations in Sensors (Monday)

LM - Late Poster Presentations in Sensors (Wednesday)

LZ-LATE PRESENTATIONS IN ELECTROCHEMISTRY IN SPACE

LZ - Late Poster Presentations in Electrochemistry in Space

M01-RECENT ADVANCES IN SENSORS SYSTEMS 4

M01 - Digital Only Presentations

M01 - Recent Advances in Sensor Systems Session 1

M01 - Recent Advances in Sensor Systems Session 2

M01 - Recent Advances in Sensor Systems Session 3

M01 - Recent Advances in Sensor Systems Session 4

M01 - Poster Session

M02-BIOSENSORS, LAB-ON-CHIPS, POINT-OF-CARE TESTING, IN VITRO, AND IN VIVO IMAGING 2

M02 - Real-Time Monitoring with Sensors

M02 - Optical Sensors and Bio-Imaging 1

M02 - Wearable Sensors, Lab-on-Chips and Point-of-Care Testing 1

M02 - Wearable Sensors, Lab-on-Chips and Point-of-Care Testing 2

M02 - Optical Sensors and Bio-Imaging 2

M02 - Electrochemical Biosensors 1

M02 - Wearable Sensors, Lab-on-Chips and Point-of-Care Testing 3

M02 - Poster Session

M02 - DNA - or Aptamer-Based Biosensors

M02 - Detection of Pathogens and Toxins with Biosensors

M02 - Electrochemical Biosensors 2

Z01-GENERAL STUDENT POSTER SESSION

Z01 - General Student Poster Session

Z02-ELECTROCHEMISTRY IN SPACE 3

Z02 - Electrochemistry in Space 1