

SYMPOSIUM NM4

Novel Catalytic Materials for Energy and Environment
April 18 - April 21, 2017

Symposium Organizers

Phillip Christopher, Univ of California-Riverside
Yu Han, King Abdullah University of Science and Technology
Zili Wu, Oak Ridge National Laboratory
Ning Yan, National University of Singapore

Symposium Support

King Abdullah University of Science and Technology

Proceedings Statement

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* Invited Paper

SESSION NM4.1: Novel Catalysts and Reaction Mechanisms I
Session Chairs: Yu Han and Zili Wu
Tuesday Morning, April 18, 2017
PCC West, 100 Level, Room 104 B

10:30 AM *NM4.1.01

Structure-Property Relationships and Reaction Pathways in CO Hydrogenation Reactions over Supported K/MoS₂ Catalysts in Higher Alcohol Synthesis from Syngas [Christopher W. Jones](#); Georgia Institute of Technology, United States.

11:00 AM NM4.1.02

Pt Single-Atom Catalysts—Structure, Stability and Reactivity [Yunzhu Wang](#); National University of Singapore, Singapore.

11:15 AM NM4.1.03

Impact of Dislocations on Water-Gas Shift in Cu-Doped Ceria [Lixin Sun](#); Massachusetts Institute of Technology, United States.

11:30 AM *NM4.1.04

A DFT Rationalization of a Two Metals Strategy to Tune Selectivity in Catalysis [Lujgi Cavallo](#); KAUST, Saudi Arabia.

SESSION NM4.2: Novel Catalysts and Reaction Mechanisms II
Session Chairs: Yu Han, Zili Wu and Xueyi Zhang
Tuesday Afternoon, April 18, 2017
PCC West, 100 Level, Room 104 B

1:30 PM *NM4.2.01

Single-Atom Pt Catalysts for Electrochemical Reactions [Hyunjoo Lee](#); KAIST, Korea (the Republic of).

2:00 PM NM4.2.02

Catalytic Role of Ligands in Supported Au_nR_m Nanoclusters for Gas Phase Reactions [Zili Wu](#); Oak Ridge National Laboratory, United States.

2:15 PM *NM4.2.03

Cellulose Nanocrystals as Catalysts Supports and Chiral Inducers and Silver Nanoparticles for Plasmonic Induced Reductive Catalysis [Audrey Moores](#); McGill University, Canada.

2:45 PM NM4.2.04

Plasmon-Enhancement of the Electro-Oxidation of C₂ Molecules in Alkaline Media with Metal-Semiconductor Embedded, Sandwich and Surface Configurations [Joshua P. McClure](#); U.S. Army Research Laboratory, United States.

3:00 PM BREAK

3:30 PM *NM4.2.05

Tuning Surface Structure of Transition Metal Oxide for Higher Selectivity in Partial Oxidation of Hydrocarbon [Franklin \(Feng\) Tao](#); University of Kansas, United States.

4:00 PM *NM4.2.06

Understanding Catalysis by Transition-Metal Oxides from First Principles [De-en Jiang](#); University of California, Riverside, United States.

4:30 PM NM4.2.07

Surface Reactivity of Pt-Cu(111) Single Atom Alloys—Model Studies that Guide the Design of Atom Efficient Pt Nanoparticle Catalysis [Felicia R. Lucci](#); Tufts University, United States.

4:45 PM NM4.2.08

Tailoring Reaction Enthalpies and Activation Energies in Complex Metal Hydrides Doped with Reactive Metal Ions [Vitalie Stavila](#); Sandia National Labs, United States.

SESSION NM4.3: Poster Session I

Session Chairs: Phillip Christopher, Yu Han, Zili Wu and Ning Yan
Tuesday Afternoon, April 18, 2017
8:00 PM - 10:00 PM
Sheraton, Third Level, Phoenix Ballroom

NM4.3.01

LED-Assisted Degradation of Aromatic Organics Using Cu₂O Photocatalysts [Yang Su](#); University of Cambridge, United Kingdom.

NM4.3.02

Nanoscale Characterization of Carbon Nitride Powders and Correlations to Photocatalytic Activity for Solar Hydrogen Production [Diane Haiber](#); Arizona State University, United States.

NM4.3.03

Novel Catalytic Hybrid Materials Based on Nitroxide Grafted on Transition Metal Oxide for Sugar Oxidation [Mehdi Omri](#)^{1,2,3}; ¹Laboratoire de Glycochimie, des Antimicrobiens et des Agroressources, UMR CNRS 7378, France; ²Laboratoire de Réactivité et Chimie des Solides, UMR CNRS 7314, France; ³Institut de Chimie de Picardie FR 3085 - Université de Picardie Jules Verne, France.

NM4.3.04

In Situ Growth of TiO₂ on TiN Nanoparticles for Non-Noble-Metal Plasmonic Photocatalysis [Qi Li](#); Institute of Metal Research, Chinese Academy of Sciences, China.

NM4.3.05

Structural Evolution and Fluxionality of Sub-Nanometer Pt and Pt-Sn Clusters from First Principles [Victor Fung](#); University of California, Riverside, United States.

NM4.3.06

La-Based Perovskites as Oxygen-Exchange Redox Materials for Solar Syngas Production [Rahul R. Bhosale](#); Qatar University, Qatar.

NM4.3.07

Synergism of Porous-Organic Polymers and Graphene—Opportunities in Electrocatalytic Reduction of CO₂ [Mohamed H. Alkordji](#); Zewail City of Science and Technology, Egypt.

NM4.3.08

Ultrathin Ag-Pd Nanoframes and Their Catalytic Properties [Xiaojun Sun](#); Georgia Institute of Technology, United States.

NM4.3.09

CO₂ Reduction to Renewable Hydrocarbon Fuel—Mimicking Natural Photosynthesis Amit Verma; Texas A&M University, United States.

NM4.3.10

Sulfonated High Surface Area Carbons for Waste-to-Fuel Conversion Shiba P. Adhikari; Wake Forest University, United States.

NM4.3.11

Multi-Metal Oxide for Low Temperature Thermochemical Water Splitting Shang Zhai; Stanford University, United States.

NM4.3.12

Preparation and Properties of Alkylated and Perfluorinated ZnPc-Modified Carbon Nanotubes Derivatives Sunmi Hong; Department of Organic Material Science and Engineering, Korea (the Republic of).

NM4.3.13

High Efficient Ag₂O/Bi₂₄O₃₁Br₁₀ Hybrid Photocatalyst for Enhanced Photocatalytic Activity Yonglei Xing; Xi'an Jiaotong University, China.

NM4.3.14

The Surface Plasmon Resonance Effect on the Enhancement of Photodegradation Activity by Au/ZnSn(OH)₆ Nanocubes Yu Ting Chang; National Tsing Hua University, Taiwan.

NM4.3.15

Durable Pt-Based Alloy Nanoparticle Design for Fuel Cells Electrocatalyst Yung-Eun Sung^{2,1}; ¹Seoul National University, Korea (the Republic of); ²Institute for Basic Science (IBS), Korea (the Republic of).

NM4.3.16

Study of Catalytic Activity of Titanium Oxide Coatings for Ozone Decomposition Sergey M. Karabanov; Ryazan State Radioengineering University, Russian Federation.

NM4.3.17

Novel Very High Surface Area, Mesoporous Films of SrTiO₃ Using Pulsed Laser Deposition and Their Application in Photoelectrochemical Water Splitting Abhijeet L. Sangale; University of Cambridge, United Kingdom.

NM4.3.18

Enhanced Photocatalytic Activity of Monodispersed TiO₂ Quantum Dots Decorated g-C₃N₄ as a Z-Scheme Photocatalyst Limin Huang; South University of Science and Technology of China, China.

NM4.3.19

Functional Group Modified g-C₃N₄ Nanosheets as an Excellent Photocatalyst Limin Huang; South University of Science and Technology of China, China.

NM4.3.20

Oxygen Evolution Catalysis Based on d-Band Tuned p-Band Center Principle Yingfang Yao^{1,2}; ¹Nanjing University, China; ²Nanjing University, China.

NM4.3.21

Carbon Deposition on a Ni/CeO₂ Catalyst from Hydrocarbon Gases Ethan L. Lawrence; Arizona State University, United States.

NM4.3.22

Graphene/Ni Wire Foam with Multivalent Manganese Oxide Catalysts for Li-O₂ Battery Cathode Chueh Liu; University of California, Riverside, United States.

NM4.3.23

A Research Study on Transition Metal Catalyzed Utilization of Reversible Conversion and Alloying Reactions Hui Ying Yang; SUTD, Singapore.

NM4.3.24

Catalytic Synthesis of Highly Mesoporous Carbon Nanotubes/Nanowires for Catalysis and High Performance Energy Storage Devices Honglu Wu^{1,2}; ¹Arizona State University, United States; ²Beijing Jiaotong University, China.

NM4.3.25

Synthesis and Performance of Non-Precious Metal Oxygen Evolution Catalysts for Anion Exchange Membrane Electrolyzer Kyu Hwan Lee; KIMS, Korea (the Republic of).

NM4.3.26

Quantitative Spectrochemical Characterization of Nanoalloy/Nanocomposite Catalysts via Calibration-Free Laser Induced Breakdown Spectroscopy (LIBS) Seyyed Ali Davari; University of Tennessee, United States.

NM4.3.27

Facile Synthesis of PdS₂/C Porous Nanospheres and Their Applications for Ethanol Oxidation Reaction Shifeng Hou; Shandong University, China.

SESSION NM4.4: ORR and CO₂RR
Session Chairs: Phillip Christopher and Ning Yan
Wednesday Morning, April 19, 2017
PCC West, 100 Level, Room 104 B

8:30 AM *NM4.4.01

Atomistic Engineering of Efficient Oxygen Reduction Electro-Catalysts by Tailoring Local Chemical Environment of Pt Surface Sites Suljo Linic; University of Michigan, United States.

9:00 AM NM4.4.02

Designing Better Platinum Alloys for the Oxygen Reduction Reaction Jakob Schiøtz; Technical University-Denmark, Denmark.

9:15 AM NM4.4.03

Controlling Nanoscopic and Atomic Segregation of Pt within Pt-Ni Rhombic Dodecahedra and Nanoframes for Fuel Cell Catalysis Nigel Becknell; University of California, Berkeley, United States.

9:30 AM NM4.4.04

Catalytic Reduction of CO₂ into Solar Fuels via Ferrite Based Thermochemical Redox Reactions Rahul R. Bhosale; Qatar University, Qatar.

9:45 AM NM4.4.05

3D Free Standing RGO-Cu₂O Electrode for the Electrochemical Reduction of Carbon Dioxide Rini Ravindranath^{1,2}; ¹National Taiwan University, Taiwan; ²Academia Sinica, Taiwan.

10:00 AM BREAK**10:30 AM *NM4.4.06**

Material Designs of High-Performance Electrocatalysts for Oxygen Reduction and Evolution Reactions Hong Yang; University of Illinois at Urbana-Champaign, United States.

11:00 AM NM4.4.07

Electrochemical Synthesis of Hydrogen Peroxide Using Cost-Effective Materials, Challenges and Opportunities Samira Siahrostami; Chemical Engineering, United States.

11:15 AM NM4.4.08

Nanoscale Compositions and Structures of Non-Precious Metal Mesoporous Carbon Electrocatalysts Niels P. Zussblatt; University of California, United States.

11:30 AM NM4.4.09

Composition Tunable Ternary Pt-Ni-Co Octahedra for Optimized Oxygen Reduction Activity Zipeng Zhao; University of California, Los Angeles, United States.

11:45 AM NM4.4.10

Large Scale Synthesis of Porous Carbon Nanotubes for High Performance Electrocatalysts PengXiang Hou; Chinese Academy of Sciences, China.

SESSION NM4.5: *In Situ* and *Operando* Characterization
Session Chairs: Yu Han and Ning Yan
Wednesday Afternoon, April 19, 2017
PCC West, 100 Level, Room 104 B

1:30 PM *NM4.5.01

***In Situ* and *Operando* Electron Microscopy Imaging and Spectroscopy of Catalysts** Peter A. Crozier; Arizona State University, United States.

2:00 PM *NM4.5.02

High-Resolution and *In Situ*/Operando (S)TEM Imaging of Catalysts [Nigel Browning](#); Pacific Northwest National Lab, United States.

2:30 PM BREAK

3:30 PM *NM4.5.03

New Aspects in Applying Environmental TEM to Catalyst Chemistry [Seiji Takeda](#); Osaka University, Japan.

4:00 PM *NM4.5.04

Probing Catalytic Conversion of Biomass-Derived Molecules at Solid-Liquid Interfaces Using Operando Solid-State NMR Spectroscopy [Susannah Scott](#); University of California, Santa Barbara, United States.

4:30 PM NM4.5.05

Accelerating Nanoparticle Synthetic Design Using *In Situ* Synchrotron-Based Small Angle X-Ray Scattering [Liheng Wu](#)^{1,2}; ¹Stanford University, United States; ²SLAC National Accelerator Laboratory, United States.

4:45 PM NM4.5.06

Chemical Composition-Phase State-3D Atomic Structure and Catalytic Activity Relationship in Metallic Nanocatalysts inside Fuel Cells by *In Situ* Operando Energy Dispersive X-Ray Spectroscopy and Atomic Pair Distribution Studies [Valeri Petkov](#); Central Michigan University, United States.

SESSION NM4.6: Poster Session II

Session Chairs: Phillip Christopher, Yu Han, Zili Wu and Ning Yan

Wednesday Afternoon, April 19, 2017

8:00 PM - 10:00 PM

Sheraton, Third Level, Phoenix Ballroom

NM4.6.01

Pt/TiO₂ Nanocomposites for Active Chemical-Electrical Signal Transduction [Nathan Ray](#); University of Chicago, United States.

NM4.6.02

Stationary Reaction Current Generation in Mesoporous Pt/ZrO₂ under Oxyhydrogen Conditions [Eduard Karpov](#); University of Chicago, United States.

NM4.6.03

Efficient Hydrogen Evolution Electrocatalysis by Three-Dimensional Porous NiSe₂-Based Architectures [Haiqing Zhou](#); University of Houston, United States.

NM4.6.04

Cobalt Oxide Nanoplates with Enriched Oxygen Vacancies for Oxygen Evolution Reaction [Wenjing Xu](#); University of California, Riverside, United States.

NM4.6.05

Novel Humic Acid Derivatives and Potential Applications [Mark Riggs](#); Texas State University, San Marcos, United States.

NM4.6.06

Formation of Highly Dense, Monodispersed, Metal and Transition Metal Nanoparticles by Electroless Deposition [Minh Tran](#); Iowa State University, United States.

NM4.6.07

Facile Method to Synthesize Au Nanostructures of Controlled Morphology [Minh Tran](#); Iowa State University, United States.

NM4.6.08

Fabrication of Size Controlled Copper (I) Oxide Nanostructured Film by Electrodeposition [Tian Lan](#); Iowa State University, United States.

NM4.6.09

Morphology Dependence of the Photocatalytic Activity of Bismuth Oxide and Bismuth Oxychloride Films [Laura Gomez-Velazquez](#); Instituto de Investigaciones en Materiales, UNAM, Mexico.

NM4.6.10

Effect of Sodium Content in Trititanate Nanotubes on Photocatalytic Removal of Methylene Blue Dye [Elena Martinez-Klimova](#); UNAM, Mexico.

NM4.6.11

Enhancement of the Catalytic Activity of Sodium Titanate Nanotubes in Biodiesel Production [Mark Eugenii Martinez-Klimov](#); UNAM, Mexico.

NM4.6.12

Strontium Titanates as Anode Catalysts for Electrocatalytic Oxidative Dehydrogenation of Ethane to Ethylene—Effect of Lanthanum Doping and Chlorine Addition [Doruk Dogu](#); The Ohio State University, United States.

NM4.6.13

Nanoparticle-Enhanced Photodegradation of Disposable Plastics under Visible Radiation [Kaan Kalkan](#)^{1,2}; ¹Oklahoma State University, United States; ²Oklahoma State University, United States.

NM4.6.14

Ammonia Synthesis Using Advanced Nano-Catalysts [Vincent Rodriguez](#); QuantumSphere, United States.

NM4.6.15

Study of Surface Chemistry of Ni(111) in the Presence of CO₂ and H₂O [Jun Cai](#)^{3,2,1}; ¹Lawrence Berkeley National Laboratory, United States; ²Shanghai Institute of Microsystem and Information Technology, China; ³ShanghaiTech University, China.

NM4.6.16

Design and Synthesis of Functionalized Organic-Inorganic Hybrid Nanomaterials and Its Application in Biomass Conversion Process [Poonam Bhargava](#); Miranda House, University of Delhi, India.

NM4.6.17

Complete Reaction Mechanisms of H₂S Decomposition on Anatase TiO₂(001) Surface—Density Functional Theory Calculations [Anchalee Junkaew](#); National Science and Technology Development Agency (NSTDA), Thailand.

NM4.6.18

Synthesis of NiCoP for Efficient Overall Water Splitting [Hanfeng Liang](#); King Abdullah University of Science and Technology, Saudi Arabia.

NM4.6.19

Preparation of Nitrogen Doped Porous Carbon Nanotubes for Highly Enhanced Electrocatalytic Activity toward Oxygen Reduction Reaction [Eun Yeob Choi](#); Chung-Ang University, Korea (the Republic of).

NM4.6.20

Photocatalytic Activity of TiO₂ Nanotubes Obtained by a New Chemical Route [Fernando R. Paula](#); UNESP, Brazil.

NM4.6.21

Low Cost Cu-Based Electrocatalysts for Carbon Dioxide Reduction [Aditi Halder](#); Indian Institute of Technology, Mandi, India.

NM4.6.22

Amphiphilic Dipyridinium-Phosphotungstate Complex as an Active, Selective and Recyclable Catalyst for the Epoxidation of Oils and Fatty Acids with Hydrogen Peroxide [Luis Carlos de la Garza Becerra](#); McGill, Canada.

NM4.6.23

Heteroatoms-Doped Carbon Nanowire Aerogels with Enhanced Electrocatalytic Performance for Oxygen Reduction [Shaofang Fu](#); Washington State University, United States.

NM4.6.24

Electrodeposition of Size Controlled Ceria Nanostructures for Solar Water Splitting [Ahmad M. Fallatah](#); Iowa State University, United States.

NM4.6.25

Photocatalytic Hydrogen Generation from 2D CdS Heterostructures [Maksym Zhukovskiy](#); University of Notre Dame, United States.

NM4.6.26

Gas Sensing of ZnO/SnO₂ Macro Porous Silicon Composite: Highly Sensitive CO₂ Detection for Monitoring Air Quality Venkata Krishna Karthik Tangirala; Universidad Autonoma De Estadno Hidalgo, Mexico.

SESSION NM4.7: OER and HER
Session Chairs: De-en Jiang and Xueyi Zhang
Thursday Morning, April 20, 2017
PCC West, 100 Level, Room 104 B

8:30 AM *NM4.7.01

Oxygen Evolution Reaction Electrocatalysis—Redefining Intrinsic Activity Trends and Illustrating Design Principles Shannon W. Boettcher; University of Oregon, United States.

9:00 AM NM4.7.02

Oxygen Evolution Reaction on α -Fe₂O₃ (0001)—A First-Principles Study of the Impact of Surface Hydroxylation and Hydration Junghyun Noh^{1,2,3}; ¹Georgia Institute of Technology, United States; ²Georgia Institute of Technology, United States; ³King Abdullah University of Science and Technology, Saudi Arabia.

9:15 AM NM4.7.03

Investigating Transition Metal Chalcogenides for Efficient Oxygen Evolution Electrocatalysis—The Effect of Covalency and Lattice Directionality Manashi Nath; Missouri S&T, United States.

9:30 AM NM4.7.04

Electrochemical Tuning of Catalysts for Improved Water Splitting and Fuel Cell Electrocatalysis Haotian Wang; Harvard University, United States.

9:45 AM BREAK**10:15 AM *NM4.7.05**

Sub-Particle Reaction and Photocurrent Mapping on Single-Particle Photoanodes Peng Chen; Cornell University, United States.

10:45 AM NM4.7.06

Highly Active Non-Noble Nanocatalysts for Fuel Cell Applications Jinsong Hu; Institute of Chemistry, Chinese Academy of Sciences, China.

11:00 AM NM4.7.07

The Catalytic Sites of MoS₂ for Hydrogen Evolution Guoqing Li; North Carolina State University, United States.

11:15 AM NM4.7.08

Computational Screening of Two-Dimensional Metal Dichalcogenides with Anion Vacancies for Hydrogen Evolution Reaction Joohee Lee; Seoul National University, Korea (the Republic of).

11:30 AM NM4.7.09

Photoluminescence Imaging as a Tool to Surface Reactions on MoS₂ Koichi Yamaguchi; University of California, Riverside, United States.

SESSION NM4.8: Photocatalysis and PEC
Session Chairs: Phillip Christopher and Zili Wu
Thursday Afternoon, April 20, 2017
PCC West, 100 Level, Room 104 B

1:30 PM *NM4.8.01

Photocatalytic Overall Water Splitting Using Semiconductor Particulate—Essential Role of Electrocatalyst Decoration Kazuhiro Takanabe; KAUST, Saudi Arabia.

2:00 PM *NM4.8.02

Efficient Water Splitting by Metal Oxide Multi-Shelled Hollow Microspheres Dan Wang^{1,2}; ¹Institute of Process Engineering, China; ²Griffith University, Australia.

2:30 PM NM4.8.03

Enhancing Photocatalytic Activity of Titanium Dioxide Nanoparticles by Internal Polarization of a Hydroxyapatite Support Xuefei Zhang; University of Rochester, United States.

2:45 PM NM4.8.04

Hybrid Metallic Nanostructures—A New Photocatalyst for the Effective Production of H₂ Gas Utilizing Artificial and Real Sunlight Nathalia Ortiz; North Carolina State University, United States.

3:00 PM BREAK**3:30 PM *NM4.8.05**

Highly Concentrated CO Evolution for Photocatalytic Conversion of CO₂ by H₂O as an Electron Donor Kentarō Teramura; Kyoto University, Japan.

4:00 PM NM4.8.06

Complete Splitting of Carbon Dioxide Using Amorphous Oxide Semiconductor under Light Irradiation Shicheng Yan; Nanjing University, China.

4:15 PM NM4.8.07

Coaxial Tubular TiO₂-PtPd Nanomachines for Efficient Water Purification under Sunlight Fajer Mushtaq; ETH Zurich, Switzerland.

4:30 PM NM4.8.08

Hybrid Organic-Inorganic Electrochemical Systems for Photo-Catalytic Hydrogen Production Maria Rosa Antognazza; Istituto Italiano di Tecnologia, Italy.

4:45 PM NM4.8.09

Porous Carbon-Doped TiO₂ on TiC Nanostructures for Enhanced Photocatalytic Hydrogen Production under Visible Light Jiaqian Qin; Chulalongkorn University, Thailand.

SESSION NM4.9: Nanoparticles for Catalysis
Session Chairs: Phillip Christopher and Yu Han
Friday Morning, April 21, 2017
PCC West, 100 Level, Room 104 B

8:00 AM NM4.9.01

Dual Catalyst: Ag@Pd Core-Frame Nanocubes for Monitoring Stepwise Reduction and Oxidation Reaction by Surface-Enhanced Raman Scattering Dong Qin; Georgia Institute of Technology, United States.

8:15 AM NM4.9.02

Synthetic Tuning of Heterostructured Nanoparticles for Electrocatalytic Applications Sen Zhang; University of Virginia, United States.

8:30 AM NM4.9.03

Spatial Localization of Metallic Nanoparticles Dispersed in Hierarchical Macro-Porous Meso-Porous Materials Using 3D Multiscale Image Correlation Ali Chirazi; FEI Application Software Group, France.

8:45 AM NM4.9.04

Nanocarbon and Nanocarbon Supported Metal Catalysts for Heterogeneous Catalytic Reactions Hongyang Liu; Institute of Metal Research Chinese Academy of Sciences, China.

9:00 AM NM4.9.05

Combinatorial Synthesis of Multimetallic Nanoparticles Pengcheng Chen; Northwestern University, United States.

9:15 AM NM4.9.06

Encapsulating PdZn and Pd Nanoparticles into the Porous Walls of Hollow Carbon Tubes for CO₂ Conversion Jia Xu; Arizona State University, United States.

9:30 AM BREAK

SESSION NM4.10: Porous Materials for Catalysis

Session Chairs: Zili Wu and Xueyi Zhang

Friday Morning, April 21, 2017

PCC West, 100 Level, Room 104 B

10:00 AM *NM4.10.01

Engineering Catalytic Cooperativity in Porous Materials for Chemoselective C-O Bond Activation Yuriy Roman; Massachusetts Institute of Technology, United States.

10:30 AM *NM4.10.02

Nanoscale Structural Characterization of Beam-Sensitive Materials for Gas Separation Jim Ciston; Lawrence Berkeley National Lab, United States.

11:00 AM NM4.10.03

Correlated Atomic-Scale Compositions, Structures and Reaction Properties of Heterogeneous Aluminosilicate Zeolite Catalysts Zachariah Berkson; University of California, Santa Barbara, United States.

11:15 AM NM4.10.04

Fabricating Hierarchical Zeolites Using Polymer-Based Dual-Function Templates Yu Han; KAUST, Saudi Arabia.

11:30 AM NM4.10.05

Chemistry in Confined Spaces—Reactivity of the Zn-MOF-74 Channels Kui Tan; University of Texas at Dallas, United States.

11:45 AM NM4.10.06

A Precise and Scalable Post-Modification of Metal-Organic Framework NU-1000 via Atomic Layer Deposition for Catalysis Alex Martinson; Argonne National Laboratory, United States.