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5th Global Summit on

Catalysis and Chemical Engineering

July 22-23, 2024 | Berlin, Germany

Theme: "Contemporary Innovations and Emerging Novel Research in Catalysis and Chemical Engineering"

Chemical Catalyst 2024

https://catalyst.mindauthors.com/

ACKNOWLEDGEMENT

We would like to extend our heartfelt gratitude and deepest appreciation to all the esteemed members of the Chemical Catalyst 2024 Advisory Board. Your invaluable expertise, guidance, and unwavering support have been instrumental in shaping this event, ensuring its success and impact within the scientific community. It is an honor and privilege to have such a distinguished group of professionals contributing to the Chemical Catalyst 2024 conference in Berlin, Germany.

Meet the Chemical Catalyst 2024 Advisory Board Members:

TOPICS GOING TO DISUSS

At Chemical Catalyst 2024, we are thrilled to present a wide range of cutting-edge topics in catalysis and material science. This conference will provide a platform for leading experts and researchers to share their insights and foster innovation.The conference will explore the latest developments in electrocatalysis, focusing on catalytic processes that drive electrochemical reactions crucial for energy storage and conversion. Catalytic materials will be examined, highlighting innovative designs like nanostructured catalysts and smart materials that enhance efficiency and selectivity. Smart materials and structures will be discussed for their applications in industries such as aerospace, automotive, and biomedical engineering. These materials, which respond to environmental stimuli, offer groundbreaking technological solutions.

Simulation and modeling will emphasize the importance of computational techniques in optimizing catalytic processes. By simulating reaction mechanisms, researchers can design more efficient catalysts. Biomass catalysis will explore converting biomass into valuable chemicals and fuels, contributing to sustainable energy solutions and reducing fossil fuel reliance. Photocatalysis will cover the mechanisms and applications of using light to drive catalytic reactions, including environmental remediation, energy production, and chemical synthesis. Catalysis for sustainable energy will address the role of catalysis in developing renewable energy sources like hydrogen production and fuel cells.

Nanostructured catalysts will be examined for their unique properties and enhanced performance. Other topics include catalysis in organic and polymer chemistry, environmental catalysis, advances in materials and engineering, nanomaterials, nanotechnology and sensors, energy-saving materials, advanced optical materials, and computational catalysis.

The conference will also cover chemical engineering, materials science and engineering, carbon nanomaterials, devices and technologies, nanomedicine and biomedical engineering, and industrial catalysis. These discussions reflect the interdisciplinary nature of the field, showcasing the latest research driving the future of catalysis and material science. Chemical Catalyst 2024 aims to bring together experts from around the world to share knowledge and foster collaborations. We look forward to welcoming you to Berlin for an inspiring and productive event that will shape the future of this dynamic field.

With deepest gratitude,

Gary Stevenson

Gary Stevenson
Program Manager

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Katakem was founded in 2019 by ***Marco Francardi*** and ***Manuela Oliverio***, a Physicist and a Chemist, respectively. Their combined skills and experiences gave birth a technology that can push the technology transfer of new molecules to the final consumer and have the potential to redefine the way chemical reactions are conducted, setting a new standard in the field.
Katakem has marked a significant milestone in the industry with the introduction of the first-ever Matrix in batch Reactors: OnePot 1L and OnePot 5L.

The Matrix in Batch-Technology is an innovative and patented way to control and manipulate the energy distribution inside a vessel from a 3D matrix of ordered distributed cells.[1,2] The incredible results obtained from several executed use cases from E. Coly cell culture for bio-catalysis applications to the synthesis of Monastrol and PVP K-90 polymer validate the flexibility of OnePot. In April 2024, we published a throughput comparison between standard and OnePot operations in Zein nanoparticles scaleup. These incredible results demonstrate extremely high control over the process parameter, enabling complete automation as the more efficient and effective way to develop the chemistry of the future. [3]

With the advent of OnePot, we have not only automated a complete chemical process but also made it instantly accessible worldwide. This revolutionary technology ensures a 95% reproducibility rate, allowing anyone to replicate the exact process and achieve the same results. OnePot, often likened to a 3D printer for Chemistry, is poised to transform various sectors of the current industrial landscape.

The technological key is a high-frequency control of temperature, pressure, pH, and weight synchronized with all the operative functions of mixing, reagents loading (solid, liquid, and gases), heating, product recovery, and cleaning needed to perform a chemical transformation.

References

[1] M. Francardi, M. Oliverio. PCT/IB2021/053094 Title: Chemical Reactor. Deposit: 15 apr 2021 [2] A.Caravella, M. Francardi, S. Romano, G. Prenesti, M. Oliverio. Front. Energy. Res., 2022, 10, 964511 [3] S. Romano, N. Ambrosio, M. Francardi, M. Fresta, D. Cosco, M. Oliverio. ACS Sust. Chem. Eng., 2024, 12, 5861-5870.

SCIENTIFIC AGENDA

DAY-1

July 22, 2024

In-person Conference

Day 1

08:30 - 09:00 **Onsite Registration & Seating Arrangment | Introduction & Opening Ceremony**

Conference Chair: Klaus-Ulrich Neumann, *SRH-Hochschule of Applied Sciences, Germany*

Moderator : Manuela Oliverio, *University Magna Graecia, Italy*

Keynote Presentations

Sessions: Electrocatalysis, Catalytic Materials, Smart Materials & Structures

09:00 - 09:25
Title: Novel Catalysts for High Temperature PEM Fuel Cells
Dana Schonvogel, *German Aerospace Center (DLR), Germany*

09:25 - 09:50
Title: Ni_2MnGa – The martensitic Phase in pseudo-tetragonal Approximation
Klaus-Ulrich Neumann, *SRH-Hochschule of Applied Sciences,Germany*

09:50 - 10:15
Title: Heterogeneous catalysis based on polyethylenimine for continuous in flow organic transformations
Alessandro Sacchetti, *Politecnico di Milano, Italy*

Refreshment & Coffee - 10:15 - 10:30

Keynote Presentations Continue....

Sessions: Simulation & Modeling, Biomass Catalysis, Photocatalysis, Catalysis for Sustainable Energy,Nanostructured Catalysts, Catalysis in Organic and Polymer Chemistry

10:30 - 10:55
Title: Where the Copenhagen Interpretation Fails: A Quantum Chemists View
Irmgard Frank, *Leibniz University Hannover, Germany*

10:55 - 11:20
Title: Catalytic Synthesis of Ureas Using Carbon Dioxide
Toshiyuki Moriuchi, *Osaka Metropolitan University, Japan*

11:20 - 11:45
Title: Catalytic Conversion of Carbohydrates into Green Platform Chemicals
Charles Chunbao XU, *City University of Hong Kong, Hong Kong*

11:45 - 12:10
Title: Photocatalytic Water Splitting for Hydrogen Production
Hugo de Lasa, *University of western ontario, Canada*

12:10 - 12:35
Title: Catalytic/Photocatalytic Activation of O2/H2O from Biomimetic Metal Complexes. Applications in Fuel Cells
Anastasios D. Keramidas, *University of Cyprus, Cyprus*

12:35 - 13:00
Title: Photoactive biowaste-modified metal oxide nanoparticles for bacteria disinfection and microplastics degradation
Giuseppe Vitiello, *University of Naples Federico II, Italy*

Memorable Group Photo & Tempting Buffet lunch

13:00 - 13:45 (Tempting Buffet Lunch)

Session 2

Oral Presentations

Sessions: Catalytic Materials,Environmental Catalysis, Photocatalysis, Catalysis for Sustainable Energy

13:45 - 14:05	**Title: Metal doping as a strategy to improve catalytic performance** **Patricia Concepcion,** *Instituto de Tecnología Química (CSIC-UPV),Spain*
14:05 - 14:25	**Title: Choline Chloride as new biobased chemical mediator for amide bond formation** **Manuela Oliverio,** *University Magna Graecia, Italy*
14:25 - 14:45	**Title: Optimization of Biomass-derived Activated Charcoal supporting TiO2 nanoparticles as a Photocatalyst for Green Hydrogen Evolution** **Justine Auene,** *University of Namibia, Namibia*
14:45 - 15:05	**Title: New Catalysts for Energy Systems with hight Energy Returned On Energy Invested** **Innocenti Massimo,** *University of Florence, Italy*
15:05 - 15:25	**Title: Design of Dye-Sensitized Semiconductors Photocatalytic Systems for Promoting Eco-Friendly Processes in Water Matrices** **Giuseppe Mele,** *University of Salento, Italy*

Refreshment & Coffee - 15:25 - 15:45

Oral Presentations Cont..

Sessions: Advances Materials & Engineering, Nanomaterials, Nanotechnology and Sensors, Energy-saving Materials, Advances Materials & Engineering , Advanced optical material or optical material, Smart Materials & Structures

15:45 - 16:05	**Title: Microstructure Characterization and Intermetallic compounds formation in Sub-10micron Sn-Ag Microbumps via Doping Zn and Ni in Cu Metallization** **Jenq-Gong Duh,** *National Tsing Hua University,Taiwan*
16:05 - 16:25	**Title: Guiding of highly charged ions through capillaries in insulating materials: milestones in experiments and simulations** **Nikolaus Stolterfoht,** *Helmholtz-Zentrum Berlin für Materialien und Energie, Germany*
16:25 - 16:45	**Title: First-principles assisted the design of high entropy thermoelectric materials based on half-Heusler alloys** **Na Yan,** *Northwestern Polytechnical University, China*
16:45 - 17:05	**Tilte: Novel ultrasonic solidification technologies for magnesium alloy manufacturing** **Wei Zhai,** *Northwestern Polytechnical University, China*
17:05 - 17:25	**Tilte: A lifetime on synthesis of nitrogen-containing liquid crystals in Taiwan** **Win-Long Chia,** *Fu Jen Catholic University, Taiwan*
17:25 - 17:45	**Tilte: Analysis of Proband in Hereditary Colorectal Carcinoma using APC and MSH2 mRNA Quantitative Gene Expression and Bayesian calculation** **Tjahjadi Robert Tedjasaputra,** *University of Indonesia, Indonesia*

***** End of Day 1 *****

SCIENTIFIC AGENDA

DAY-2

July 23, 2024

In-person Conference

Day 2

08:30 - 09:00	**Onsite Registration, Introduction**
Keynote Presentations	
Sessions: Computational Catalysis, photocatalysis	
09:00 - 09:25	**Title: Unravelling Palladium reconstruction under reaction conditions** **Matthias Vandichel,** *University of Limerick, Ireland*
09:25 - 09:50	**Title: Ligand Topology as a Tool for In Silico Catalyst Optimization** **Konstantinos Vogiatzis,** *University of Tennessee, USA*
09:50 - 10:15	**Title: Photo-induced degradation of priority air pollutants on TiO2-based coatings in indoor and outdoor environments-A mechanistic view of the processes at the air/ catalyst interface** **Dimitrios Kotzias,** *University of Bonn, Germany*
Refreshment & Coffee - 10:15 - 10:30	
Keynote Presentations Continue....	
Sessions: Catalytic Materials,Advances Materials & Engineering	
10:30 - 10:55	**Title: Calculation and data-driven MOF catalyst discovery: Rational design and intelligent synthesis** **Ge Wang,** *University of Science and Technology Beijing, China*
10:55 - 11:20	**Title: Materials Design of ZnO- and In2O3-Based Conductive Films for Wide Applications** **Tetsuya Yamamoto,** *Kochi University of Technology, Japan*
Oral Presentations	
Sessions: Computational Catalysis, Nanostructured Catalysts, Electrocatalysis, Chemical Engineering, Smart Materials & Structures	
11:20 - 11:40	**Title: Cathodic Hydride Formation and Structure–Activity Relations in Hydrogen Evolution Reaction on Palladium Surface** **Apinya Ngoipala,** *University of Limerick, Ireland*
11:40 - 12:00	**Title: Nanocatalysts for wastes valorization and circular economy** **Angelo Nacci,** *University of Bari Aldo Moro and CNR – Istituto di Chimica dei Composti Organometallici (ICCOM), Italy*
12:00 - 12:20	**Title: Hydrogen Sulfide Utilization and Removal by Simultaneous Adsorption and Catalysis in Fuel Cells** **Venko Bechkov,** *Bulgarian Academy of Sciences, Bulgaria*
12:20 - 12:40	**Title: Adsorption Dynamics in Porous Materials: A Hybrid Grand Canonical Monte Carlo-Molecular Dynamics Simulation Approach** **Sousa Javan Nikkhah,** *University of Limerick, Ireland*
12:40 - 13:00	**Title: Improvement of Mechanical Properties of Polyamids with Filler Reinforcement** **Lubov Andrusiv,** *United States Air Force Academy, USA*
Memorable Group Photo & Selfie	
Tempting Buffet Lunch 13:00 - 13:45	

Session 2

Oral Presentations Cont..

Sessions: Chemical Engineering, Materials Science and engineering, Advances Materials & Engineering, Smart Materials & Structures

13:45 - 14:05	**Title: From bench to bedside: design, prototipation and applications of OnePot® reactor** **Marco Francardi,** *Katakem B4Chem srl, Catanzaro, Italy*
14:05 - 14:25	**Title: Creating a digital twin and how it helps to speed up your coating development** **Nick Bierwisch,** *Saxonian Institute of Surface Mechanics, Germany*
14:25 - 14:45	**Title: Characteristics of Oxide Semiconductor Films Deposited by Reactive Plasma Deposition** **Hisashi Kitami,** *Sumitomo Heavy Industries, Ltd., Japan*
14:45 - 15:05	**Tilte: A Green Concrete made only from Waste Concrete Powder and Biomass Waste** **Ejazulhaq Rahimi,** *Ritsumeikan University, Japan*
15:05 - 15:25	**Tilte: Multi-functional shape memory polymer composites and applications** **Yujie CHEN,** *Shanghai Jiao Tong University, China*

Refreshment & Coffee - 15:25 - 15:45

Oral Presentations Cont..

Sessions: Materials Science and engineering, Advances Materials & Engineering, Smart Materials & Structures, Carbon Nanomaterials, devices and technologies, Nanomedicine and Biomedical Engineering

15:45 - 16:05	**Title: NIR-triggered Conjugated polymers/Liquid crystal elastomer Actuators for Potential Biomedical Applications** **Gary CP Tsui,** *The Hong Kong Polytechnic University, Hong Kong*
16:05 - 16:25	**Tilte: Development of Green Platform Based on 3D Graphenes** **Mineo Hiramatsu,** *Meijo University, Japan*
16:25 - 16:45	**Tilte: Antimicrobial surfaces for aircraft cabins** **Sebastian Geier,** *German Aerospace Center, Germany*
16:45 - 17:05	**Tilte: Carbon nanofibers/carbon foam composites for electromagnetic interference shielding and thermal insulation** **Bugao Xu,** *University of North Texas, USA*
17:05 - 17:25	**Tilte: Ion density evolution in the plasma jet vacuum arcs** **Diego Fernando Devia Narváez,** *Technological University of Pereira, Colombia*

Poster Presentation

Sessions: Industrial Catalysis, Photocatalysis, Computational Catalysis

Title: Nitrous Oxide Abatement Technologies in the Ostwald Process with Precious Metal-based Catalysts

Karina Hemmer, *Heraeus Precious Metals GmbH & Co. KG, Germany*

Tilte: Steel slag as low-cost catalyst for photoreduction of CO2 and water splitting

Angelo Nacci, *University of Bari Aldo Moro and CNR – Istituto di Chimica dei Composti Organometallici (ICCOM), Italy*

Tilte: Computational Insights into LiTB as Molecular Electron Transfer Catalyst at the TFT|water Interface

Raju Lipin, *University of Limerick, Ireland*

17:25-18:05

Tilte: Microstructural, Mechanical and Tribological Evaluation of High Entropy TiAlTaZrNb Coatings Manufactured by Magnetron Sputtering

Gilberto Bejarano Gaitán, *University of Antioquia, Colombia*

Tilte: Improving self-healing performance of asphalt pavement through Ecofriendly and smart materials based on microencapsulation technology

Yousra Zghoundi, *Mohamed VI Polytechnic University, Morocco*

Tilte: Self-Healing Concrete Innovations for Sustainable Seismic Infrastructure

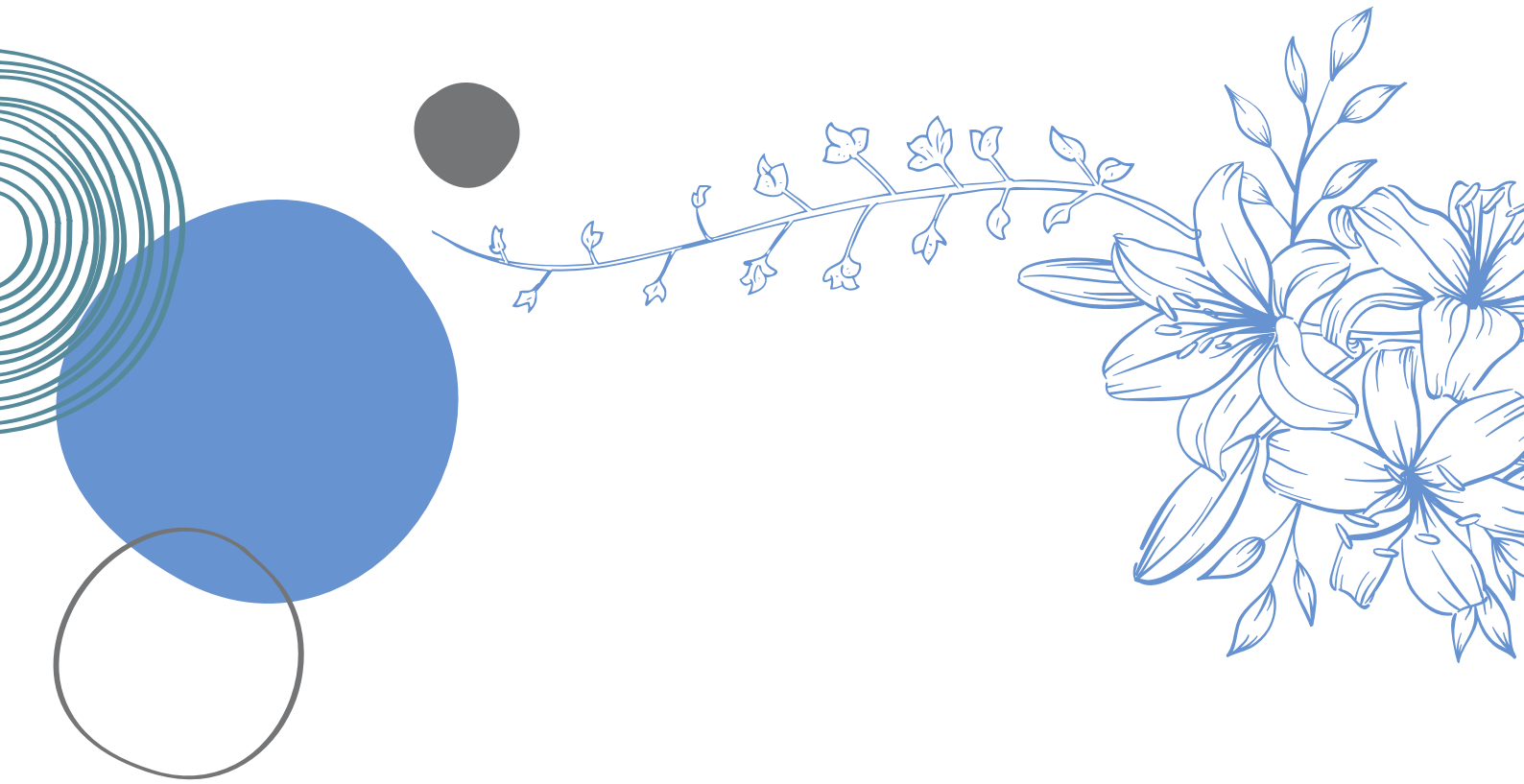
Andres Josue Ramirez Colchero, *Western Institute of Technology and Higher Education, Mexico*

Tilte: Boosted photocatalytic H2 production over p-n S-scheme heterojunction of 0D Ni3V2O8 quantum dots decorated on ultra-thin 2D g-C3N4 nanosheets

Nabil Al-Zaqri, *King Saud University, Saudi Arabia*

Closing Ceremony | Awards | Certificate of Presentation

***** End of Day 2 & Conference *****



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