

The 27th International Conference
on
Semiconductor Photocatalysis and Solar Energy Conversion
(SPASEC-27)

The 28th International Conference
on
**Advanced Oxidation Technologies for Treatment of Water,
Air and Soil**
(AOTs-28)

FINAL PROGRAM

Sponsor



Prepared By:
Dr. Hussain Al-Ekabi
Redox Technologies, Inc., Western University Research Park
London, Ontario N6G 4X8,
Canada

**The Conference will be held under the auspices of Cyprus University of Technology,
Limassol, Cyprus
June 11- 14, 2024**

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Important Notes:

- **PL Stands for Plenary Lecture (Total 30 min)**
- **IL Stands for Invited Lecture (Total 20 min)**
- **ST Stands for Short Talk (Total 15 min)**
- **All presentations on Tuesday and Friday will be held at the Amphitheatre I only**
- **Plenary lectures on the morning of Wednesday and Thursday will be held at Amphitheatre I**
- **TRACK A: SPASEC-27 will be held at Amphitheatre I**
- **TRACK B: AOTs-28 will be held in Amphitheatre II**

Monday, June 10, 2024

14:00 – 16:00 **On-Site Registration**

Tuesday, June 11, 2024

8:30 – 9:30 **On -Site Registration**

9:30 – 9:45 **Welcoming speech by the director of CUT: Professor Panayiotis Zaphiris and Dr. Maria G. Antoniou**

9:45 – 10:00 **Opening Remarks by the Conference Organizer: Dr. Hussain Al-Ekabi**

Session I: Plenary Lectures (SPASEC-27 & AOTs-28) – Online I

10:00 – 10:30 **How can we know true particle shape? Macroscopic morphology analysis of ceria particles based on their electron trap-distribution patterns**
PL

Bunsho Ohtani^{1*} and Mai Takashima²

¹Professor Emeritus, Hokkaido University and Nonprofitable Organization touche NPO, Sapporo, Japan, bunshoohtani@gmail.com

²Department of Energy Science and Engineering, Nagoya University, Furo-cho, Nagoya, Japan

10:30 – 11:00
PL **Isotope Effects in Photocatalysis**
Detlef Bahnemann
Laboratory “Photoactive Nanocomposite Materials” (Director)
Saint-Petersburg State University, Ulyanovskaya str. 1
Peterhof, Saint-Petersburg, Russia

11:00 – 11:15 **Coffee Break**

Session II: Invited Lectures and Short talks (SPASEC-27 & AOTs-28) - Online II

11:15 – 11:35
IL **Enhancing the Production of Reactive Oxygen Species through
Photo(electro)catalytic Processes**
Hyoung-il Kim
Department of Civil and Environmental Engineering, Yonsei University, Seoul, Korea

11:35 – 11:50
ST **Mechanochemical synthesis of AgI/BiOI@g-C₃N₄ for the efficient
degradation of cationic dye RhB under visible light irradiation**
**W. El Mouhri ^{1,*}, I. Nadif ¹, N. Tajat ¹, W. El Hayaoui ¹, A. Idlahcen ¹, J. Talebi ¹,
M. Badreddine ², I. Bakas ¹, S. Qourzal ¹, A. Assabbane ¹, M. Tamimi ¹**
¹Laboratory of Applied Physical Chemistry, Faculty of Sciences, University of IBN
ZOHR, Dakhla, Agadir, Morocco
² Centre régional des métiers d'éducation et de formation, , Marrakech, Maroc

11:50 – 12:10
IL **How studying the photocatalytic degradation in water of selected
organics can help elucidate the basic mechanisms and pathways?**
Pierre Pichat
“Photocatalyse et Environnement”, CNRS/Ecole Centrale Lyon (STMS)
Ecully CEDEX, France

12:10 – 12:30
IL **Remediation of detergent wastewater using catalytic and non-catalytic
ozone gas treatment: Current updates and future directions**
Collin G. Joseph
Sonophotochemistry Research Group, Faculty of Science and Natural
Resources, Universiti Malaysia Sabah, Sabah
Industrial Chemistry Programme, Faculty of Science and Natural Resources,
Universiti Malaysia Sabah, Sabah

12:30 – 14:00 **Lunch**

- 14:00 – 14:20
IL **Biosynthesized Fe/Pd nanoparticles from eucalyptus leaves and used for removing Remazol Black B in aqueous media**
Ahmed K. Hassan, Luay Q. Hashim, Ahmed M. Rezoqi, Mohammed F. Hashim
Environment, Water and Renewable Energy Directorate, Ministry of Science and Technology, Baghdad– IRAQ
- 14:20 – 14:40
IL **Application of LEDs in water treatment - investigation of the UV/Chlorine process in decomposing persistent organic pollutants**
Luca Farkas, Anett Covič, Teodóra Dragič, Tünde Alapi
Department of Inorganic and Analytical Chemistry, University of Szeged, Szeged, Hungary
- 14:40 – 15:00
IL **Photocatalytic degradation of various pollutants of biological concern**
Ottó Horváth^{1*}, Ákos Székely¹, Shoaib Mukhtar¹, Erzsébet Szabó-Bárdos¹,
Truong Nguyen Xuan², Ly Le Thi Khanh², Thu Vu Thi²
¹ Environmental and Inorganic Photochemistry Research Group, Center for Natural Sciences, University of Pannonia, Hungary
²School of Chemistry and Life Sciences, Hanoi University of Science and Technology, Hanoi, Vietnam
- 15:00 – 15:15
ST **Effect of PDS and PMS on the efficiency of ZnO photocatalyst for the elimination of organic pollutants – reaction mechanism and matrix effect**
Bence Veres, Tünde Alapi
Department of Inorganic and Analytical Chemistry, University of Szeged, Szeged, Hungary
- 15:15 – 15:30 **Coffee Break**

Session III: Invited Lectures and Short talk (SPASEC-27 & AOTs-28) - Online III

- 15:30 -15:50
IL **Coupled photo-Fenton, adsorption and microbiological processes for the removal of organic pollutants in water and wastewater**
Eliana Pace, Estefania Bracco, Matias Butler, Elsa López Loveira, José Luis Marco Brown, Gustavo Curutchet, Roberto Candal
Instituto de Investigación e Ingeniería Ambiental, Escuela de Hábitat y Sostenibilidad, Universidad Nacional de San Martín, CONICET, Buenos Aires, Argentina
- 15:50 – 16:10
IL **Design of efficient photocatalytic structure for electrochemical reduction of CO₂ to solar fuels**
Yongjun Chen* and Hisham Menkara
PhosphorTech Corporation,
Kennesaw, Georgia, USA

- 16:10 – 16:30
IL
- Recent advances in modeling of Solar Photocatalytic Processes: A computational platform for evaluation of heterogeneous photocatalytic reactors**
Miguel Ángel Mueses
Photocatalysis & Solar Photoreactors Engineering, Modeling & Application of Advanced Oxidation Processes, Department of Chemical Engineering, Universidad de Cartagena, Cartagena, Colombia
- 16:30 – 16:50
IL
- Evaluation of a UVC/H₂O₂/TiO₂ process for the degradation of Microcystin-LR in real natural water**
Y. Velásquez-Figueroa^{1,2}, J. Colina-Márquez*¹, G. A. Peñuela³, J. Díaz-Ángulo⁴
¹ Chemical Engineering Department, Universidad de Cartagena, Cartagena, Colombia
² School of Basic Sciences, Technologies and Engineering, ECBTI, Universidad Nacional Abierta y a Distancia, Colombia
³ Chemical Engineering School, Universidad de Antioquía, Medellín, Colombia
⁴ Sustainable Engineering Development Center, SIMPROLAB, Turbaco, Colombia
- 16:50 – 17:10
IL
- Solar photocatalysis as a solution for outdoor air quality control and protection**
Ivana Grčić*¹, Benjamin Radetić¹, Marija Tomaš¹, Paula Benjak¹, Goran Sabol²
¹University of Zagreb, Faculty of Geotechnical Engineering, Varaždin, Croatia
²Međimurje University of Applied Sciences in Čakovec, Čakovec
- 17:10 – 17:25
ST
- Degradation of microcystin-LR using advanced UV/H₂O₂ oxidation process: Mechanism and reversible photoisomerization**
Acevedo-Morantes, Maria T.*¹, Loaiza-González, Jinna², Casas, José Antonio³, Peñuela-Mesa, Gustavo², Colina-Márquez, José¹
¹Chemical Engineering Department, Universidad de Cartagena, Cartagena, Colombia
²Environmental Engineering Department, Universidad de Antioquia, Colombia.
³Chemical Engineering Department, Universidad Autónoma de Madrid, Madrid. España
- 17:25 – 17:45
IL
- Comparison of AOT radical kinetics for wastewater remediations**
Stephen P. Mezyk
California State University at Long Beach, Long Beach, CA, USA
- 17:45 – 18:00
ST
- Manufacture of SnO₂ nanoparticles from eco- friendly materials, and used in solar cells**
Kawther A. Khalaph^{1*}, Nisreen Kh. Abdalameer², Aqel Mashot Jafar³
¹Medical College, Ibn Sina University of Medical and Pharmaceutical Sciences, Baghdad, Iraq
² Department of Physics, College of Science for Women, University of Baghdad, Iraq
³Solar Energy Research Centre, Renewable Energy Directorate, Higher Education and Scientific Research Ministry, Baghdad, Iraq

18:00 – 18:20
IL

Rational design of TiO₂-based nanocomposites for photocatalytic wastewater treatment

**A. Habibi-Yangjeh^{1*}, K. Pournemati¹, M. Jahed-Jaafargolikhanlo¹, A. Khataee^{2,3}
Y. Akinay⁴, S.R. Pouran⁵**

¹Department of Chemistry, Faculty of Science, University of Mohaghegh Ardabili, Ardabil, Iran

²Research Laboratory of Advanced Water and Wastewater Treatment Processes, Department of Applied Chemistry, Faculty of Chemistry, University of Tabriz, Tabriz, Iran

³Department of Environmental Engineering, Faculty of Engineering, Gebze Technical University, Gebze, Turkey

⁴Department of Engineering, Faculty of Mining Engineering, Van Yuzuncu Yil University, Van, Turkey

⁵Department of Environmental and Occupational Health, Social Determinants of Health Research Center, Ardabil University of Medical Sciences, Ardabil, Iran

Wednesday, June 12, 2024

Session IV: Plenary Lectures (SPASEC-27 & AOTs-28)

9:00 – 9:30
PL

Progress in photocatalysis in last decade

A. Zaleska-Medynska, P. Mazierski, O. Cavdar, M.A. Baluk, M. Miodyńska, B. Bajorowicz, J. Nadolna, A. Pancielejko, H. Głowienke, A. Gołębiewska, A. Malankowska

Department of Environmental Technology, University of Gdańsk, Gdańsk, Poland

9:30 – 10:00
PL

Water remediation by combining AOP and biodegradation

Yaron Paz

Department of Chemical Engineering, Technion, Haifa, Israel

10:00 – 10:15

Coffee Break

TRACK A: SPASEC-27

Session V: Photocatalysis - Fundamentals

- 10:15 – 10:35
IL **Single-site and single-atom (photo)catalysts: The interplay between support, coordination, oxidation state and performance**
Junhao Huang^{1,3}, Moritz Lang^{1,2}, Marcus Klahn¹, Jennifer Strunk^{1,3}
¹Leibniz Institute for Catalysis at the University of Rostock, Germany
²Present address: University of Colorado, Boulder/CO, USA
³Technical University of Munich, Garching, Germany
- 10:35 – 10:55
IL **A QSAR approach for the understanding of photocatalytic oxidation mechanisms of two sets of VOCs: alkanes and C4-molecules**
C. Raillard^{1,2*}, V. Héquet¹
¹IMT Atlantique, CNRS, GEPEA, UMR 6144, Nantes Cedex 3, France,
²Nantes Université, IUT de Nantes, Département MT2E, Carquefou cedex, France
- 10:55 – 11:15
IL **Temperature and pressure assisted photocatalysis under inert or aerated conditions**
C. Guillard^{*}, A. Flory, F. Dappozze
University Lyon, University Claude Bernard, CNRS, IRCELYON,
UMR5256, Villeurbanne, France
- 11:15 – 11:35
IL **The long history of kinetic models in photocatalysis and their evaluation with initial rate and photoelectron density measurements**
C. Minero^{*}, F. Sordello
Department of Chemistry, University of Torino, Turin, Italy
- 11:35 – 11:55
IL **Down-conversion composite materials implementation to all printed carbon-based perovskite and dye sensitized solar cells for enhanced performance and improved stability**
A. Nikolakopoulou, A. Karavioti, D.A. Chalkias, E. Stathatos
Nanotechnology & Advanced Materials Laboratory, Department of Electrical and Computer Engineering, University of the Peloponnese, Patras, Greece
- 11:55 – 12:10
ST **High entropy oxides in (photo)(electro)catalytic processes**
Barbara Ljubec Božiček^{1,2}, Lara Einfalt^{1,2}, Miran Čeh¹, Belisa Alcantara Marinho^{1*}
¹Department for Nanostructured Materials, Jožef Stefan Institute, Jamova 39, 1000 Ljubljana, Slovenia
²Jožef Stefan International Postgraduate School, Ljubljana, Slovenia

- 12:10 – 12:25
ST **The use of transition mixed oxides catalysts for CO and hydrocarbons oxidation as an option to reduce emissions from small combustion devices**
T. Bílková, K. Pacultová, K. Karásková, D. Fridrichová, L. Obalová
Institute of Environmental Technology, CEET, VSB-Technical university of Ostrava, Ostrava-Poruba, Czech Republic
- 12:25 – 14:00 **Lunch**

Session VI: Photocatalytic Water Treatment

- 14:00 – 14:20
IL **Investigating the Effects of TiO₂ Photocatalytic Action in Environmental Protection and Solar Energy Conversion Processes**
Polycarpos Falaras
Institute of Nanoscience and Nanotechnology, National Center for Scientific Research “Demokritos”, Athens, Greece
- 14:20 – 14:40
IL **Photonanocatalysis reactor adapted with an oxygenation system with micro-nano bubbles for water purification**
Refugio Rodriguez-Vázquez, Ginna Shecid Escudero-Garrido, Edgar Daniel Palacios- Ramírez
Dept. Biotechnology and Bioengineering, Center for Research and Advanced Studies of the National Polytechnic Institute. Av. Instituto Politécnico Nacional, Col, Mexico City
- 14:40 – 15:00
IL **Z- and S-scheme heterojunction photocatalysts for water treatment**
Alex T. Kuvarega*, Potlako J. Mafa, Mope E. Malefane, Bhekie B. Mamba
Institute for Nanotechnology and Water Sustainability, College of Science, Engineering and Technology, University of South Africa, Florida Campus, Johannesburg, South Africa
- 15:00– 15:20
IL **Photocatalytic membrane reactors in water and wastewater treatment**
S. Mozia
Department of Inorganic Chemical Technology and Environment Engineering, West Pomeranian University of Technology in Szczecin, Poland
- 15:20 – 15:35 **Coffee Break**
- 16:00 – 17:00 **Poster session**
- 17:00 – 19:45 **Visit the archaeological site of Kourion Amphitheater, Limassol**

Thursday June 13, 2024

Plenary Session VII: Combined SPASEC-27 & AOTs-28

9:00 – 9:30
PL **Novel multifunctional microbial photo-electro-catalytic approaches for conversion of inorganic carbon to acetate using semiconductor z-scheme heterojunctions**

G. Li Puma¹, L. Huang²

¹Environmental Nanocatalysis & Photoreaction Engineering, Department of Engineering, University of Palermo (UNIPA), Palermo, Italy. Email:

²School of Environmental Science and Technology, Dalian University of Technology, Dalian, China

9:30 – 10:00
PL **Catalysts for Heterogeneous Fenton Advanced Oxidation Processes**
**Nataša Novak Tušar^{1,2*}, Andraž Šuligoj^{1,3}, Ksenija Maver¹, Albin Pintar¹,
Nataša Zabukovec Logar^{1,2}**

¹National Institute of Chemistry, Ljubljana, Slovenia,

²University of Nova Gorica, Nova Gorica, Slovenia,

³Faculty of Chemistry and Chemical Technology, University of Ljubljana, Ljubljana, Slovenia

10:00 – 10:15 **Coffee Break**

Session VIII: Photocatalytic H₂ Production

10:15 – 10:35
IL **Preparation of Au-based photocatalysts from spent materials for the photocatalytic conversion of formic acid to hydrogen**

**Marica Muscetta¹, Laura Clarizia¹, Roberto Andreozzi¹, Raffaele Marotta¹,
Giovanni Palmisano^{2,3}, Marco Race⁴, Ilaria Di Somma⁵**

¹Department of Chemical, Materials and Production Engineering (DICMaPI), University of Naples Federico II, Naples, Italy

²Department of Chemical Engineering, Khalifa University of Science and Technology, Abu Dhabi, United Arab Emirates

³Research and Innovation Center on CO₂ and H₂, Khalifa University of Science and Technology, Abu Dhabi, United Arab Emirates

⁴Department of Civil and Mechanical Engineering, University of Cassino and Southern Lazio, Cassino (FR), Italy

⁵Institute of Sciences and Technologies for Sustainable Energy and Mobility (STEMS) of the National Research Council (CNR), Italy

- 10:35 – 10:55
IL **Hydrogen generation through visible light activated photocatalysis and simultaneous wastewater treatment**
L. Clarizia
Dipartimento di Ingegneria Chimica, dei Materiali e della Produzione Industriale, Università di Napoli Federico II, Napoli, Italy
- 10:55 – 11:15
IL **2D Nanomaterials and visible light: a great combination for green hydrogen production**
Rengaraj Selvaraj* and Madappa C Maridevaru
Department of Chemistry, College of Science, Sultan Qaboos University, Al Khoudh, Muscat, Sultanate of Oman
- 11:15 – 11:30
ST **Single-atom-based photocatalysis for sustainable production of hydrogen via direct splitting of water**
Stepan Kment
Regional Centre of Advanced Technologies and Materials, Czech Advanced Technology and Research Institute, Palacký University Olomouc, Olomouc, Czech Republic
Nanotechnology Centre, Centre for Energy and Environmental Technologies, VŠB–Technical University of Ostrava, Ostrava-Poruba, Czech Republic
- 11:30 – 11:45
ST **Visible light photocatalytic water splitting over Ni₂P /Ga₂O₃**
Bo Yang, Gongxuan Lu*
Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, Lanzhou, people republic of China

Session IX: Photocatalytic CO₂ Reduction

- 11:45 – 12:05
IL **Photocatalytic reduction of CO₂ over Ti³⁺ self-doped tio₂-based photocatalysts**
Rudolf Ricka^{1,2}, Agnieszka Wanag³, Ewelina Kusiak-Nejman³, Dariusz Moszyński³, Miroslava Filip Edelmannová¹, Martin Reli¹, Zdeněk Baďura^{4,5}, Giorgio Zoppellaro^{4,5}, Radek Zbořil^{4,5}, Antoni W. Morawski³, Kamila Kočí^{1,6*}
¹ Institute of Environmental Technology, CEET, VŠB-Technical University of Ostrava, Ostrava-Poruba, Czech Republic
² Faculty of Materials Science and Technology, VŠB-Technical University of Ostrava, Ostrava-Poruba, Czech Republic
³ West Pomeranian University of Technology in Szczecin, Faculty of Chemical Technology and Engineering, Department of Inorganic Technology and Environment Engineering, Szczecin, Poland
⁴ Regional Centre of Advanced Technologies and Materials, Czech Advanced Technology and Research Institute (CATRIN), Palacký University, Šlechtitelů, Czech Republic

⁵ Nanotechnology Centre, CEET, VŠB-Technical University of Ostrava, Ostrava-Poruba, Czech Republic

⁶ Department of Physics and Materials Engineering, Faculty of Technology, Tomas Bata University in Zlín, Czech Republic

12:05 – 12:20
ST

CuO/TiO₂ nanocomposites for photocatalytic reduction of CO₂

**Miroslava Filip Edelmannová¹, Kamila Kočí¹, Mateja Knap^{2,3}, Peter Nadrah²,
Andrijana Sever Škapin^{2,4}, Urška Lavrenčič Štangar³**

¹VŠB-TUO, CEET, Institute of Environmental Technology, Ostrava-Poruba, Czech Republic

²Slovenian National Building and Civil Engineering Institute, Ljubljana, Slovenia

³University of Ljubljana, Faculty of Chemistry and Chemical Technology, Ljubljana, Slovenia

⁴Faculty of Polymer Technology - FTPO, Slovenj Gradec, Slovenia

Session X: Modified / Doped Photocatalysts

12:20 – 12:40
IL

Titania modified with copper for photocatalytic activity enhancement

Zuzanna Bielan,¹ Kunlei Wang,^{1,2} Marcin Janczarek,³ Zhishun Wei,⁴ Maya Endo-Kimura,² Agata Markowska-Szczupak,⁵ Bunsho Ohtani^{2,6} and Ewa Kowalska^{1,2}

¹Jagiellonian University, Krakow, Poland

¹Institute for Catalysis, Hokkaido University, Sapporo, Japan

³Poznan University of Technology, Poznan, Poland

⁴Hubei University of Technology, Wuhan, China

⁵West Pomeranian University of Technology, Szczecin, Poland

⁶touché NPO, Sapporo, Japan

12:40 – 14:00

Lunch

14:00 – 14:20
IL

Sn doped hematite photoelectrodes

H. Krýsová^{1*}, T. Imrich², Z. Hubička³, M. Neumann-Spallart², J. Krýsa²

¹J. Heyrovský Institute of Physical Chemistry, Czech Academy of Sciences, Prague, Czech Republic

²Department of Inorganic Technology, University of Chemistry and Technology Prague, Prague, Czech Republic

³Institute of Physics, Czech Academy of Sciences, Prague, Czech Republic

14:20 – 14:40
IL **N-doped Titania made via Aerosol Synthesis for the Photocatalytic Degradation of Toxic Organics with Visible Light**
Panagiotis Smirniotis
Department of Chemical & Environmental Engineering
College of Engineering and Applied Science, University of Cincinnati
Cincinnati, OH, USA

Session XI: Photocatalytic Air Treatment

14:40 – 15:00
IL **Photocatalytic degradation and mineralization of gaseous pollutants using TiO₂ nanotubes**
J. Rusek, M. Baudys, J. Krýsa*
Department of Inorganic Technology, University of Chemistry and Technology Prague, Prague, Czech Republic

15:00 -15:20
IL **Preparation of novel photocatalytic bed based on polystyrene spheres for degradation of air pollution**
P. Miądlicki¹, P. Rychtowski¹, B. Prowans¹, B. Tryba^{1,*}
¹Department of Catalytic and Sorbent Materials Engineering, West Pomeranian University of Technology, Szczecin, Poland

15:20 – 15:35 **Coffee Break**

15:35 – 15:55
IL **Development and application of photocatalytic paints for indoor air quality improvement and energy savings in buildings**
T. Maggos^{1,*}, V. Binas^{2,4}, P. Panagopoulos¹, E. Skliri², K. Theodorou³, A. Nikolakopoulos³, D. Saraga¹, G. Kiriakidis², Effrosyni Giama⁵, Georgios Chantzis⁵, Agis Papadopoulos⁵, I. Chochorelos⁶, T. Karlesi⁶, I. Michopoulos⁶
¹Atmospheric Chemistry and Innovative Technologies Laboratory (AirTechLab), NCSR “Demokritos”, Athens, Greece
²Institute of Electronic Structure and Laser, Foundation for Research and Technology, Heraklion, Crete, Greece
³VITEX S.A, Aspropyrgos, Greece
⁴Physical Chemistry Laboratory, Chemistry Department, Aristotle University of Thessaloniki, Thessaloniki
⁵Process Equipment Design Laboratory, Mechanical Engineering Department, Aristotle University of Thessaloniki, Thessaloniki, Greece
⁶EvolutionProjects+, Ergaton Typou 2, Ilioupoli, Greece

15:55 – 16:15 **Advanced kinetic modelling for photocatalytic pollutant removal and for description of air purifiers: effect of process variables**

IL

Alireza Ranjbari¹, Philippe M. Heynderickx^{1,2,*}

¹Centre for Green Chemistry and Environmental Engineering (GREAT) – Engineering of Materials via Catalysis and Characterization, Ghent University Global Campus, Incheon, Republic of Korea

²Department of Green Chemistry and Technology, Faculty of Bioscience Engineering, Ghent University, Ghent, Belgium

Session XII Visible light Photocatalysis

16:15 – 16:35 **Photocatalytic degradation of pharmaceuticals and PFAS employing tailored solar-active materials**

IL

Hrvoje Kusic^{1,2}, Josipa Papac Zjadic¹, Suresh Kumar Pandey¹, Marijana Kraljic Rokovic¹, Marin Kovacic¹, Ana Loncaric Bozic¹, Urska Lavrencic Stangar³, Andraz Suligoj³, Praveen Kumar³

¹University of Zagreb, Faculty of Chemical Engineering and Technology, Zagreb, Croatia

²University North, Department for Packaging, Recycling and Environmental Protection, Koprivnica, Croatia

³University of Ljubljana, Faculty of Chemistry and Chemical Technology, Ljubljana, Slovenia

16:35 – 16:55 **Direct oxygen activation on plasmonic metals using visible light**

IL

F. Dingenen,^{1,2} R. Borah,^{1,2} R. Ninakanti,^{1,2} S.W. Verbruggen^{1,2,*}

¹Sustainable Energy, Air & Water Technology (DuEL), University of Antwerp, Antwerp, Belgium

²NANOLab Center of Excellence, University of Antwerp, Antwerp, Belgium

16:55 – 17:15 **Novel supported photocatalysts for solar-assisted environmental remediation**

IL

B. Trindade Barrocas^{1,*}, A.C. Marques¹, T. Alcobia¹, S.M. Fernandes¹, M. Vale¹, M. Conceição Oliveira², E. Maçôas², M. Fátima Montemor², J.M. Lopes², S. Martins-Dias³, C.C.C.R. de Carvalho⁴, A. Lauria⁵, M. Niederberger⁵,

¹CERENA, Department of Chemical Engineering (DEQ), Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal

²CQE, Department of Chemical Engineering (DEQ), Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal

³CERENA, Department of Bioengineering (DBE), Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal

⁴iBB-Institute for Bioengineering and Biosciences and Associate Laboratory i4HB-Institute for Health and Bioeconomy, Department of Bioengineering (DBE), Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal

⁵Laboratory for Multifunctional Materials, Department of Materials, ETH Zürich, Zürich, Switzerland

17:15 – 20:30 **Free Time**

20:30 – Late **Gala Dinner**

Friday, June 14, 2024

Session XIII: Interesting Developments in Photocatalysis

- 9:00 – 9:20
IL **Leveraging computational modeling as a design tool for integrated air purification technologies**
Siegfried Denys*, Donja Baetens, Kobe Schoofs, Marjan Demuynck, Allan Alvarado and Megha Ramteke
Sustainable Energy, Air and Water Technology, Department of Bioscience Engineering, University of Antwerp, Belgium
- 9:20 – 9:40
IL **From flame-made photocatalysts to bactericidal nanosilver and breath sensors of liquor adulteration (methanol poisoning)**
Sotiris E. Pratsinis
ETH Zurich, Switzerland
- 9:40 – 10:00
IL **Peculiar photoelectrochemical activity of zinc oxide and tin dioxide**
Ladislav Kavan¹, Hana Krysová^{1,2}, Marketa Zukalova¹, Vera Mansfeldova¹, Hana Tarabkova¹, Zdenek Hubicka²
¹ J. Heyrovsky Institute of Physical Chemistry of the Czech Academy of Sciences, Prague, Czech Republic
² Institute of Physics of the Czech Academy of Sciences, Prague, Czech Republic
- 10:00 – 10:20
IL **Selenium as a top-cell absorber for tandem photovoltaic- and PEC-cells**
Rasmus Nielsen, Thomas Youngman, Alireza Azzar, Andrea Crovetto, Brian Seger, Hadeel Moustafa, Sergiu Levenco, Hannes Hempel, Thomas Olsen, Ole Hansen, Ib Chorkendorff, Thomas Unold, Peter C. K. Vesborg*
Technical University of Denmark

- 10:20 – 10:40
IL **Enhancing chitosan-based smart packaging with oxygen vacancy-rich TiO₂/oyster shell--derived CaO NPs and anthocyanin from passion fruit peel extract**
Girma Sisay¹, Ying-Chen Chen², Chih-Huang Weng³, Yao-Tung Lin^{1,*}
¹ Department of Soil and Environmental Sciences, National Chung Hsing University, Taichung, Taiwan
² Doctoral Program in Plant Health Care, National Chung Hsing University, Taichung, Taiwan
³ Department of Civil Engineering, I-Shou University, Kaohsiung, Taiwan
- 10:40 – 11:00
IL **Solution-processed graphitic carbon nitride coatings with enhanced porosity**
P. Dzik*, S. Patakyová, M. Veselý, M. Králová
Faculty of Chemistry, Brno University of Technology, Brno, Czech Republic
- 11:00 – 11:20
IL **Anticancer activity of synthesized zinc oxide nanoparticles and nanocomposites in the presence and absence of ultrasonic waves on the human osteosarcoma cancer cell**
Mansoureh Parsa^{1,2}, Mohammad H Entezari*^{1,3}, Azadeh Meshkini²
¹Sonochemical Research Center, ²Biochemical Research Center, ³Environmental Chemistry Research Center, Department of Chemistry, Faculty of Science, Ferdowsi University of Mashhad, Mashhad, Iran
- 11:20 – 12:00 **Discussion**
- 12:00 – 14:00 **Coffee Break & Lunch**

Wednesday, June 12, 2024

Session IV: Plenary Lectures (SAPASEC-27 & AOTs-28)

- 9:00 – 9:30
PL **Progress in photocatalysis in last decade**
A. Zaleska-Medynska, P. Mazierski, O. Cavdar, M.A. Baluk, M. Miodyńska, B. Bajorowicz, J. Nadolna, A. Pancielejko, H. Głowienke, A. Gołębiewska, A. Malankowska
Department of Environmental Technology, University of Gdańsk, Gdańsk, Poland

9:30 – 10:00 **Water remediation by combining AOP and biodegradation**
PL
Yaron Paz
Department of Chemical Engineering, Technion, Haifa, Israel

10:00 – 10:15 **Coffee Break**

TRACK B: AOTs-28

Session V: Advanced Oxidation Technologies I

10:15 – 10:45 **Fundamental studies on the advanced oxidative transformations of problematic toxic substrates in aqueous media**
PL
Kevin O'Shea
Department of Chemistry and Biochemistry, Florida International University, Miami, Florida, 33199, USA

10:45 – 11:05 **Can peroxymonosulfate (pms) outperform hydrogen peroxide treatment for the *in-situ* mitigation of cyanobacteria harmful blooms (cyano-habs)?**
IL
M. G. Antoniou^{1,*}, E. Keliri¹, A. Zindrou², Y. Deligiannakis^{2,3}, E. Passa⁴, K. Weitzel⁴, and D. Dionysiou^{4,†}
¹Department of Chemical Engineering, Cyprus University of Technology, Lemesos, Cyprus
²Laboratory of Physical Chemistry of Materials & Environment, Department of Physics, University of Ioannina, Ioannina, Greece
³Institute of Environment & Sustainable Development, University Research Center of Ioannina, Ioannina, Greece
⁴Environmental Engineering and Science Program, Department of Chemical and Environmental Engineering (DChEE), University of Cincinnati, Cincinnati, OH, United States

11:05 – 11:25 **Activation mechanisms of peroxymonosulfate by inorganic ions for the degradation of emerging contaminants in wastewater reuse**
IL
Ying Huang
School of Environment, Hangzhou Institute for Advanced Study, UCAS, Hangzhou, China

11:25 – 11:40
ST **Removal of Paracetamol by solar radiation and persulfate**
S. Kpange¹, S. Pirgalioglu², S. Doğan^{1*}
¹Department of Civil Engineering, Environmental Engineering Program, Cyprus International University, Nicosia, Northern Cyprus TR-10, Mersin, Turkey.
²Department of Environmental Engineering, Engineering Faculty, European University of Lefke, Lefke, Northern Cyprus, TR-10, Mersin, Turkey.

Session VI: Fenton and Photo-Fenton Reactions

11:40 – 12:00
IL **Photo-Fenton reactions in the site-specific modification of proteins**
Christian Schöneich
Department of Pharmaceutical Chemistry, University of Kansas
Constant Avenue, Lawrence, USA

12:00 – 12 :20
IL **Iron-based catalysts to activate oxidants for decomposing micropollutants in water and wastewater**
Aebin Sin¹, Gwangmin Kim¹, Libor Machala², Minhee Kim³, Polycarpus Falaras⁴ Mallikarjuna N. Nadagouda⁵ and Changseok Han^{1,6}
¹Program in Environmental and Polymer Engineering, Graduate School of INHA University, Incheon, Korea
²Department of Experimental Physics, Faculty of Science, Palacký University Olomouc, 17. Olomouc, Czech Republic
³Ministry of Environment, Hanam-si, Gyeonggi-do, Republic of Korea 12902
⁴Institute of Nanoscience and Nanotechnology, National Center for Scientific Research “Demokritos”, Athens, Greece
⁵Center for Environmental Solutions and Emergency Response, U.S. Environmental Protection Agency, Cincinnati, OH, USA
⁶Department of Environmental Engineering, INHA University, 100 Inha-ro, Michuhol-gu, Incheon, Korea

12:20 – 12:50
PL **The Mechanisms of the Fenton and Fenton-Like Reactions**
Dan Meyerstein
Chemical Sciences Department and the Radical Research Center, Ariel University, Ariel, Israel and Chemistry Department, Ben-Gurion University, Beer-Sheva, Israel

12:50 – 14:00
Lunch

14:00 – 14:15
ST **Innovative strategy for the intercalation of borate anion in A CuMgFe-CO₃ layered double hydroxide: application in the degradation of antibiotics using the Fenton process**
J. M. Aquino, Y. E. Serge-Correales, N. M. Costa-Serge, R. F. P. Nogueira*
São Paulo State University (UNESP), Institute of Chemistry, Araraquara, SP, Brazil

- 14:15 – 15:20 **Joining TRACK A**
- 15:20 – 15:35 **Coffee Break**
- 16:00 – 17:00 **Poster Session**
- 17:00 – 19:45 **Visit the archaeological site of Kourion Amphitheater, Limassol**

Thursday June 13, 2024

Session VII: Plenary Lectures (SPASEC-27 & AOTs-28)

- 9:00 – 9:30
PL **Novel multifunctional microbial photo-electro-catalytic approaches for conversion of inorganic carbon to acetate using semiconductor z-scheme heterojunctions**
G. Li Puma¹, L. Huang²
¹Environmental Nanocatalysis & Photoreaction Engineering, Department of Engineering, University of Palermo (UNIPA), Palermo, Italy. Email:
²School of Environmental Science and Technology, Dalian University of Technology, Dalian, China
- 9:30 – 10:00
PL **Catalysts for Heterogeneous Fenton Advanced Oxidation Processes**
Nataša Novak Tušar^{1,2*}, Andraž Šuligoj,^{1,3} Ksenija Maver,¹ Albin Pintar,¹ Nataša Zabukovec Logar^{1,2}
¹National Institute of Chemistry, Ljubljana, Slovenia
²University of Nova Gorica, Nova Gorica, Slovenia
³Faculty of Chemistry and Chemical Technology, University of Ljubljana, Ljubljana, Slovenia
- 10:00 – 10:15 **Coffee Break**

VIII: UV-Based Oxidation Processes

- 10:15 – 10:35
IL **AOPs assisted by modulated irradiation: energy saving or improved performances?**
N. Morante¹, L. De Guglielmo², N. Oliva², N. Femia¹, G. Di Capua³, V. Vaiano, D. Sannino¹
¹DIIN-DIEM, University of Salerno, Fisciano (Salerno)Italy
²Exeling S.r.l. Avellino (AV), Italy
³DEIE, University of Cassino and Southern Lazio, Cassino (Frosinone), Italy
- 10:35 – 10:55
IL **How wavelength impact photochemical processes for the treatment of emerging contaminants**
X. Duan
Key Laboratory of Organic Compound Pollution Control Engineering (MOE), School of Environmental and Chemical Engineering, Shanghai University, Shanghai, China
- 10:55 – 11:15
IL **Impact of UV-C treatment devices on indoor air quality**
C. Raillard^{1,2*}, V. Héquet¹
¹IMT Atlantique, CNRS, GEPEA, UMR 6144, Nantes Cedex 3, France,
²Nantes Université, IUT de Nantes, Département MT2E, Carquefou cedex, France

Session IX: Advanced Oxidation Technologies II

- 11:15 – 11:35
IL **The growing problem of water pollution with pharmaceuticals. Challenges, prospects and solutions.**
Anna Zielińska-Jurek, Anna Grzegórska, Marta Kowalkińska, Agata Zasada
Department of Process Engineering and Chemical Technology, Faculty of Chemistry, Gdańsk University of Technology, Gdańsk, Poland
- 11:35 – 11:50
ST **Enhancing industrial wastewater treatment efficiency and hydrogen production by integrating thermal pre-treatment with electrochemical oxidation**
R. Núñez^{1*}, N. Merayo¹, A. Caravaca¹, A.J. Dos santos-Garcia¹ A. Gascó², D. Hermosilla²
¹Department of Mechanical Chemical and Industrial Design Engineering, Universidad Politécnica de Madrid, Escuela Técnica Superior de Ingeniería y Diseño Industrial, Madrid, Spain
²G-Aqua Research Group & Department of Forest and Environmental Engineering and Management, Universidad Politécnica de Madrid, Escuela Técnica Superior de Ingeniería de Montes, Forestal y del Medio Natural, Madrid, Spain

Session X: Catalytic Oxidation Processes

- 11:50 – 12:10
IL **Single particle catalysis: In situ surface microscopy of oxidation reactions**
Günther Rupprechter*
Institute of Materials Chemistry, TU Wien, Vienna, Austria
- 12:10 – 12:30
IL **Metal-organic frameworks (MOFs) as next-generation photocatalysts**
D. Eder
Institut für Materialchemie, Technische Universität Wien, Wien
- 12:30 – 14:00
Lunch
- 14:00 – 14:20
IL **Supporting nature-based technologies of wastewater treatment with advanced oxidation processes**
Daphne Hermosilla Redondo
Polytechnic University of Madrid, Spain
- 14:20 – 14:35
ST **Synthesis of catalysts thin films by anodization for photoelectrocatalytic applications**
Lara Einfalt^{1,2}, Barbara Ljubec Božiček^{1,2}, Belisa Alcantara Marinho¹, Miran Čeh^{1,*}
¹Department for Nanostructured Materials, Jožef Stefan Institute, Jamova, Ljubljana, Slovenia.
²Jožef Stefan International Postgraduate School, Ljubljana, Slovenia.
- 14:35 – 14:50
ST **Enhancing anaerobic digestion redox mechanism by the addition of iron microparticles**
D.Arango¹, A. García-Álvaro², H. Pizarro¹, K. Jiménez-Bautista¹, C. de los Ríos¹, I. de Godos², D. Hermosilla¹, A. Gascó^{1,*}
¹G-Aqua Research Group & Department of Forest and Environmental Engineering and Management, Universidad Politécnica de Madrid, Escuela Técnica Superior de Ingeniería de Montes, Forestal y del Medio Natural, Madrid, Spain
²Department of Chemical Engineering and Environmental Technologies, Universidad de Valladolid, Campus Universitario Duques de Soria, Valladolid, Spain

Session XI: Advanced Oxidation Technologies III

- 14:50 – 15:10
IL **Development of efficient ozone generation system for deep NO oxidation**
A. Li Si Ko¹, B. Amir Machmud¹, C. Yung Jie Yu¹, D. Katsuyuki Takahashi²,
Moo Been Chang^{1*}
¹Graduate Institute of Environmental Engineering, National Central University, Taoyuan City, Taiwan
²Electrical, Electronic, and Communication Engineering, Faculty of Science and Engineering, Iwate University, Ueda, Morioka, Japan
- 15:10 – 15:20
IL **Affordable water decontamination: a shift towards oxidative processes**
Antoine Ghauch*
Department of Chemistry, Faculty of Arts and Sciences, American University of Beirut, Lebanon
- 15:30 – 15:45
ST **Investigating the Impact of Ozonation on Freshwater Cyanobacteria and Green Algae in Surface Water Systems**
Tsiarta N.¹, Chatziathanasiou E.¹, Hadjipetri A. ¹, Antoniou G.M. ^{1,*}
¹Department of Chemical Engineering, Cyprus University of Technology, Limassol, Cyprus
- 15:45 – 17:00 **Joining TRACK-A**
- 20:30 – Late **Gala Dinner**

Posters

TiO₂-g-C₃N₄ photocatalytic composite beads for advanced wastewater treatment
C. Bogatu^{1*}, M. Covei¹, I. Tismanar¹, A. Duta¹, H. Stroescu², M. Nicolescu², J.M. Calderon-Moreno², I. Atkinson², M. Gartner^{2,*}

¹Renewable Energy Systems and Recycling Centre, Transilvania University of Brasov, Romania

²“Ilie Murgulescu” Institute of Chemical Physics, Bucharest, Romania

Vis (solar) – active TiO₂ – g-C₃N₄ photocatalytic beads for continuous flow photocatalytic wastewater treatment

I. Tismanar^{1,*}, M. Covei¹, C. Bogatu¹, A. Duta¹, H. Stroescu², M. Nicolescu², J.M. Calderon-Moreno², I. Atkinson², M. Gartner^{2,*}

¹Transilvania University of Brasov, Romania

²“Ilie Murgulescu” Institute of Physical Chemistry, Bucharest, Romania

Stability of solar-active photocatalytic composite beads

M. Covei^{1,*}, I. Tismanar¹, A. Duta¹, J.M. Calderon Moreno², M. Gartner²

¹Systems for Renewable Energy and Recycling Centre, University of Transilvania, Brasov, Romania

²“Ilie Murgulescu” Institute of Chemical Physics, Bucharest, Romania

Optimization of WO₃/Cu₂S@carbon nanotubes heterostructure as photocatalytic materials for wastewater treatment

A. Enesca, C. Cazan

Product Design, Mechatronics and Environmental Engineering, Transilvania University of Brasov, Romania

Kinetics of photocatalytic oxygen indicators using various polymer matrices

D. Filipi, V. Dobiáš, M. Veselý*

Institute of Physical and Applied Chemistry, Faculty of Chemistry,

Brno University of Technology, Czech Republic

Investigating color stability of photocatalytic oxygen indicators under visible light

V. Dobiáš*, D. Filipi, M. Veselý

Institute of Physical and Applied Chemistry, Faculty of Chemistry,

Brno University of Technology, Brno, Czech Republic

Photocatalytic layers of carbon nitride reinforced by siloxane binder

S. Patakyová*, P. Dzik

Institute of Physical and Applied Chemistry, Faculty of Chemistry,

Brno University of Technology, Czech Republic

Preparation and characterization of tungsten trioxide layers by the brick-and-mortar method

M. Kralova*, T. Blecha, P. Dzik

Faculty of Chemistry, Brno University of Technology, Brno, Czech Republic

Eco-photocatalytic fertilizers for photocatalysis-assisted hydroponic cultures

E.R. Illyes, L. Andronic*

Department of Product Design, Mechatronics and Environment, Transilvania University of Brasov, Brasov, Romania

Photoactive foil

M. Fanglova¹, R. Korinkova², M. Vesely^{1,*}

¹Faculty of Chemistry, Brno University of Technology

²Centre for Organic Chemistry, Rybitvi

Effect of light intensity on the antibacterial activity of photoactive layers

M. Veselá*, M. Králová, M. Veselý

Faculty of Chemistry, Brno University of Technology, Brno, Czech Republic

Material printing of disposable ozone dosimeter

M. Veselý*, V. Dobiáš, M. Fanglová, D. Filipi

Faculty of Chemistry, Brno University of Technology, Brno, Czech Republic

Physical CuO/TiO₂, NiO/TiO₂ and CuO/NiO/TiO₂ mixtures for hydrogen production from glycerol aqueous solutions at solar pilot plant scale

J.G. Villachica-Llamosas¹, A. Ruiz-Aguirre¹, G. Colón², **J. Peral**³, S. Malato¹

¹ CIEMAT – Plataforma Solar de Almería, Ctra. De Senés s/n, Tabernas, Almería, Spain

² Instituto de Ciencia de Materiales de Sevilla (Centro mixto Universidad de Sevilla-CSIC), Américo Vespucio 49, Sevilla, Spain

³ Departament de Química, Universitat Autònoma de Barcelona, Edifici Cn, Bellaterra, Cerdanyola del Vallés, Spain

Effects of blended and grafted TiO₂ and TiO₂/CNT on the membrane separation of oily wastewaters with photocatalytic PVDF-nanocomposite membranes

T. Miklós¹, T. Gyulavári², C. Hodúr¹, K. Hernadi³, Zs. László¹, G. Veréb^{1,*}

¹Department of Biosystems Engineering, Faculty of Engineering, University of Szeged, Szeged, Hungary

²Department of Applied and Environmental Chemistry, Institute of Chemistry, University of Szeged, Szeged, Hungary

³Institute of Physical Metallurgy, Metal Forming and Nanotechnology, Faculty of Materials and Chemical Engineering, University of Miskolc, Miskolc-Egyetemváros, Hungary

Processes utilizing UV/Cl & catalysis for the degradation of micropollutants

Chaejin Choi¹· **Kyoun Eun Ha**¹· **Ayoung Choi**¹· **Gwangmin Kim**¹· **Changseok Han**^{1,2,*}

¹Program in Environmental and Polymer Engineering, INHA University,

Michuhol-gu, Incheon, Korea²Department of Environmental Engineering, INHA University, Michuhol-gu, Incheon, Korea

Effects of the composition and pH of oil emulsions on their membrane separation with photocatalytic TiO₂/PVDF composite membranes

Á. Fazekas¹, K. Hochner¹, Z. Jákó¹, Sz. Kertész¹, S. Beszédes¹, C. Hodúr¹, T. Gyulavári², Zs. Pap², K. Hernadi³, Zs. László¹, G. Veréb^{1,*}

¹Department of Biosystems Engineering, Faculty of Engineering, University of Szeged, Szeged, Hungary

²Department of Applied and Environmental Chemistry, Institute of Chemistry, University of Szeged, Szeged, Hungary

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