

Advanced Green Chemistry and Sustainable Technology for Environmental Enhancement

Konstantinos V. Plakas, Slim Abdelkafi, Emmanuel Koudoumas, Ahmad ElMoll, Marta Pazos, Najla Fourati, Marzena Smol, Dalila Hammiche, Giusy Lofrano, Tadeusz Szumiata, Majeti Narasimha Vara Prasad, Susana Rodríguez-Couto, Nalan Kabay, Rafael Luque, Osman Adiguzel, Slim Tounsi, Rajneesh Kumar

The 4th International Symposium on Materials and electrochemistry and the Environment (CIMEE22) took place in the period 22–24 September 2022, CNF Tripoli, Lebanon. CIMEE 2022 was officially organized by Lebanese university and hosted by the AUF, Centre Numerique francophone, CNF. A significant number of abstracts received from a whole lot of PhD students, doctors, researchers and scholars.

This conference is concentrated on the recent advances and new trends in materials chemistry, electrochemistry and environment bringing together an international community (Europe, Maghreb and Middle East) of scientists, and researchers interested in the science of materials and innovative processes in Electrochemistry and their applications in various fields of the environment. It was opened by the Chair of the conference Assoc. Professor Ahmad ElMoll (Lebanese University, Faculty of Public Health). Thirty-six scientists from 23 countries comprised the members of the scientific committee and played a very active role in organizing the sessions and events (Table 1).

Table 1 Members of the scientific committee of the CIMEE22 and country of workplace

Honor Committee

Pr. Fawaz El Omar, Dean of the Doctoral School for Sciences and Technology, DSST, Lebanese University
Pr. Mustafa Soyak Faculty of Sciences, Department of Chemistry, Erciyes University, Kayseri, Turkey

Scientific committee Chairs

Pr. Slim Abdelkafi, Director of National School of Engineers of Sfax, ENIS, University of Sfax, Tunisia
Pr. Emmanuel Koudoumas, Department of Electrical and Computer Engineering, Hellenic Mediterranean University, Greece
Pr. Slim Tounsi, Laboratory of Biopesticides, Centre of Biotechnology of Sfax, University of Sfax, Tunisia
Pr. Sibel Ozkan, Ankara University Faculty of Pharmacy Department of Analytical Chemistry, Tandoğan, Ankara,

Scientific Committee

Pr. Marta Pazos, Department of Chemical Engineering, CINTECX, University of Vigo, Spain
Pr. Giusy Lofrano, Department of Chemistry and Biology, DCB, Università degli Studi di Salerno, UNISA, Italy
Pr. K. Besbes, General Director of Centre for Research on Microelectronics and Nanotechnology, Sousse Technopole, Tunisia
Pr. Susana Rodríguez-Couto, Depart. of Separation Science, Lappeenranta-Lahti University of Technology (LUT University), Finland
Pr. Dalila Hammiche, Laboratory of Advanced Polymeric Materials, Faculty of Technology, University A. Mira- Bejaia, Algeria
Pr. Halim Hammi, LVMU, National Center for Research in Materials Sciences, Sousse, Tunisia
Pr. Nalan Kabay, Ege University, Izmir, Turkey
Pr. Mehmet Gumustas, Ankara University, Faculty of Pharmacy, Department of Analytical Chemistry, Tandoğan, Turkey
Pr. Olfa Mahjoub, National Research Institute for Rural Engineering, Water, and Forestry, INRGREF, Tunisia
Pr. Jihen Elleuch, Ecole Nationale d'ingénieurs de Sfax, University of Sfax, 3038 Sfax, Tunisia
Pr. Benhachem Fatima Zahra, Depart. of Chemistry, Faculty of Exact Sciences, University of Djillali Liabès Sidi Bel Abbès Algeria

Advisory & review Committee

Pr. Marzena Smol, Mineral and Energy Economy, Research Institute, Polish Academy of Sciences, Poland
Pr. Rafael Luque, Depart. de Química Organica, Universidad de Cordoba, Campus de Rabanales, Ctra Nnal, Spain
Pr. Majeti Narasimha Vara Prasad, School of Life Sciences, University of Hyderabad, Hyderabad, India
Pr. Didier Hauchard, Institute of Chemical Sciences of Rennes, CNRS, High National School of Chemistry, Rennes, France
Pr. Mehmet Emin Aydin, Lab Head, Dean of Faculty of Science, Necmettin Erbakan University, Turkey
Pr. Mirela Suche, IMT-Bucharest, National Institute for R&D in Microtechnologies, Bucharest, Romania

Chair : Dr. Ahmad ElMoll, Faculty of public Health, DSST, Lebanese University, Lebanon

Co-Chairs : Dr. Konstantinos V. Plakas, Centre for Research and Technology-Hellas, CERTH, CPERI, Greece
Pr. Rachid Salghi, Laboratory of Applied Chemistry and Environment, ENSA, University Ibn Zohr, Agadir, Morocco

Technical Program Chairs

Pr. Kamel Ouari, Electrochemistry, Molecular Engineering and Redox catalysis Laboratory, University of Ferhat Abbas, Algeria
Pr. Najla Fourati, CNAM, Laboratory of Systems & Applications of Information & Energy Technologies - SATIE Lab, Paris, France
Pr. Tadeusz Szumiata, COMW, Department of Physics, University of Technology and Humanities in Radom, Poland
Dr. Moudida Merzougui, Department of Processes Engineering, Ferhat Abbas University of Setif -1, Algeria

Publication Committee

Pr. Aziz Amine, Department of engineering and processes of Environment, FST, University Hassan II, Morocco
Dr. Shivendu Ranjan, School of Nano Science & Technology, Indian Institute of Technology Kharagpur, Kharagpur, India
Pr. Rafael Luque, Depart. de Química Organica, Universidad de Cordoba, Campus de Rabanales, Ctra Nnal, Spain
Pr. Marta Pazos, Department of Chemical Engineering, CINTECX, University of Vigo, Spain
Pr. Muhammad Akhyar Farrukh, Department of Chemistry, Forman Christian College (A Chartered University), Lahore, Pakistan

The conference consisted of 23 different topics, covering a wide range of environmental chemistry and technology.

Nanomaterial and Nanotechnology for Environmental Remediation, Electrochemistry for the Environment

Environmental chemistry, Analytical chemistry, Bioremediation & Phytoremediation, AgroGeoenvironment & Geomaterials, Biomaterials, Waste & biomass valorization, Air quality monitoring and Climate Change

Agro-Geoenvironment & Geomaterials.

The special session studies the importance of reuse of treated effluent in water scarce regions. This Special session discuss the Reuse of Wastewater in Mediterranean Region and the progress that has been achieved on technical, institutional, financial and legislative levels as regards the development of the process of treatment and the re-use of treated wastewater. The session was a collaborative effort with 6 research center and laboratory in 6 countries (Europe, North Africa and Middle East).

Professor Ahmad ElMoll, the Chairman of the Conference, welcomed the delegates during the opening ceremony.

The first day of the conference started with opening keynote and 4 lecturers gave their presentation:

- Doctor Konstantinos V. Plakas, from the Centre for Research and Technology, Hellas (CERTH), Thessaloniki, Greece, delivered the opening lecture on water management and Wastewater treatment entitled: "Innovative solutions for the promotion of non-conventional water reuse and management in the Mediterranean region."
- Doctor Jihen Elleuch from National School of Engineers of Sfax, University of Sfax, Tunisia, delivered the opening lecture on "Extracellular Polymeric Substances from marine microalgae: application for water and wastewater treatment processes"

- Professor Emmanuel Koudoumas from Department of Electrical and Computer Engineering, Hellenic Mediterranean University, Greece, delivered the opening lecture on “Use of simple, low cost and environment friendly techniques for the growth of thin films, nanostructure layers, nanomaterials, nanocomposites and suspensions”.
- Doctor Ahmad El Moll from Faculty of Public Health, faculty of Science, DSST, Lebanese University, Lebanon, delivered the opening lecture on “Agroecology as new approaches to the transition towards sustainability”.

During the Three-day program, many plenary lectures were delivered by highly reputable experts as follows:

The outlines of the Plenary Sessions and Symposia during the first day are described below.

- Marta Pazos from Department of Chemical Engineering, CINTECX, University of Vigo, Spain
On the road to Zero Waste Treatment Technologies: Regeneration of Spent Adsorbents through Advanced Oxidation Processes
- Najla Fourati from Conservatoire National des Arts et Métiers, Cnam, Paris, France
Trends and perspectives in surface acoustic wave sensors
- Marzena Smol From Mineral and Energy Economy, Research Institute, Polish Academy of Sciences, Poland
Bio-based fertilisers (BBF) in agriculture - achievements and trends
- Dalila Hammiche from Laboratory of Advanced Polymeric Materials, Faculty of Technology, University A. Mira- Bejaia, Algeria
Waste and biomass valorization for use as Bio fillers for biocomposites
- Giusy Lofrano from University of Rome "Foro Italico", Italy
Antimicrobial Effectiveness of Engineered Photocatalysts

The second day of the conference 6 plenary lectures has been delivered and described below.

- Tadeusz Szumiata, Professor, from COMW, Department of Physics, University of Technology and Humanities in Radom, Poland.
“Environmental surveillance with Mössbauer spectrometry, magnetic methods, and modern gravimetry”
- Majeti Narasimha Vara Prasad, Professor, from School of Life Sciences, University of Hyderabad, Hyderabad, India
“Biodiversity as a tool box for environmental cleanup with emphasis on resource recovery”.
- Susana Rodríguez-Couto, Professor, from Department of Separation Science, Lappeenranta-Lahti School of Engineering Science, Lappeenranta-Lahti University of Technology (LUT University), Finland
“Fungal laccases for environmental applications”
- Nalan Kabay, Professor, from Ege University, Izmir, Turkey
“Environmental management of geothermal water by membrane processes”
- Rafael Luque, Professor, from Departamento de Química Orgánica, Universidad de Córdoba, Campus de Rabanales, Edificio Marie Curie (C 3), Ctra Nnal, Spain
“Benign-by-design strategies for a more sustainable future: from (bio)materials to electrochemistry and environmental remediation”
- Osman Adiguzel, Professor, from Firat University, Department of Physics, Elazig, Turkey.
“Lattice Reactions in Displacive Transformations in Shape Memory Alloys”

Third day of the Conference 4 plenaries lectures has been delivered and described below.

- Slim Tounsi, Professor, from Laboratory of Biopesticides, Centre of Biotechnology of Sfax, University of Sfax, Tunisia.
“Biopesticides: A fundamental research towards industrial exploitation”
- Rajneesh Kumar, Assoc professor, from Department of Physics, Institute of Science, Banaras Hindu University, Varanasi, India
“Recent application of plasma technology for environment”
- ElMoll Ahmad, Assoc professor, from Faculty of Public Health, DSST, Faculty of Science, Lebanese university, Lebanon
“Nanomaterials in Circular Economy and Sustainability: New Opportunities and Future Perspectives”
- ElMoll Ahmad, Assoc professor, from Faculty of Public Health, DSST, Department of Science, Lebanese university, Lebanon
“Green technology and environmental sustainability: benefits and future prospects”

The sessions were introduced by 19 invited key note speakers and covered a variety of subjects as shown in Table 2.

Table 2 List of sessions, conveners, and keynote speakers

From: Advanced Green Chemistry and Sustainable Technology for Environmental Enhancement

Session title	Conveners	Keynote/Invited Speakers
Opening keynote	Opening Keynote	Konstantinos Plakas, Ahmad ElMoll, Jihen Alleuch, Emmanuel Koudoumas
1. ELECTROCHEMISTRY & ENVIRONMENT (Opening keynote)	Dalila Hammiche, Ahmad ElMoll	Marta Pazos
2. AGRO GEOENVIRONMENT & AGROCHEMISTRY	Najla Fourati, Ahmad ElMoll	Marzena Smol, Dalila Hammiche
3. MATERIALS & THE ENVIRONMENT	Moufida Merzougui, Ahmad ElMoll	Giusy Lofrano
4. STRUCTURAL, ANALYTICAL & PHYSICAL CHEMISTRY	Konstantinos Plakas, Ahmad ElMoll	Tadeusz Szumiata, Majeti Narasimha Vara Prasad, Susana Rodríguez-Couto
5. AGRO GEOENVIRONMENT & AGROCHEMISTRY	Ahmad ElMoll, Marta Pazos	Nalan Kabay
6. MATERIALS & THE ENVIRONMENT	Najla Fourati, Ahmad ElMoll	Rafael Luque, Osman Adiguzel,
7. ELECTROCHEMISTRY & ENVIRONMENT	Kamel Ouari, Ahmad ElMoll	Kamel Ouari,
8. STRUCTURAL, ANALYTICAL & PHYSICAL CHEMISTRY	Konstantinos Plakas, Ahmad ElMoll	Slim Tounsi, Rajneesh Kumar
9. ATMOSPHERIC CHEMISTRY & ENVIRONMENTAL POLLUTION	Konstantinos Plakas, Ahmad ElMoll	Ahmad ElMoll, Tadeusz Szumiata
10. Special SESSION: AGRO GEOENVIRONMENT & AGROCHEMISTRY: Biomaterials, Waste & biomass Valorization	Konstantinos Plakas, Ahmad ElMoll	Konstantinos Plakas,
11. AGRO GEOENVIRONMENT & AGROCHEMISTRY	Ahmad ElMoll, Kamel Ouari	Ahmad ElMoll
12. CLIMATE CHANGE, MARINE & COASTAL ECOSYSTEM	Konstantinos Plakas, Ahmad ElMoll	Konstantinos Plakas
13. Poster Session: STRUCTURAL, ANALYTICAL & PHYSICAL CHEMISTRY	Konstantinos Plakas, Ahmad ElMoll s	Ahmad ElMoll
14. Closing session	Ahmad ElMoll, Dalila Hammiche, Moufida Merzougui, Najla Fourati, Nalan Kabay, Konstantinos Plakas, Kamel Ouari, Tadeusz Szumiata,	Discussion

On Saturday, Day three, special session was organized as shown in Table 3.

This Special session discuss the progress that has been achieved on technical, institutional, financial and legislative levels as regards the development of the process of treatment and the re-use of treated wastewater.

Table 3 List of session, conveners, and speakers

Session title	Convener	Speakers
Biomaterials, Waste & biomass Valorization. Title: Reuse of Wastewater in Mediterranean Region: challenges and future opportunities	Organized by Konstantinos Plakas <i>Centre for Research and Technology, Hellas, Greece</i> <i>Integrated Resources Management Company Ltd. (IRMCo), Malta</i> <i>Faculty of Public Health, DSST, Lebanese University, Lebanon</i> <i>Regional Entity for Wastewater Sanitation and Treatment in Murcia, ESAMUR, Spain</i> <i>Water Research and Technologies Center, CERTE, Tunisia</i> <i>Plataforma Solar de Almeria (PSA), Energy Department, Solar Treatment of Water Unit, Spain</i> <i>Tunis International Center for Environmental Technologies, CITET, Tunisia</i>	Konstantinos Plakas, Ahmad ElMoll