OPENING KEYNOTE SESSION

OPENING KEYNOTE 1

The First speaker is Dr. ElMoll Ahmad, Senior lecturer in Lebanese university, talk about Analytical Techniques for Environmental Analysis and describes the all types of green analytical tools and methods used for the analysis of water, wastewater, soil and sediment, toxic organic and inorganic analytes, and biological samples then the importance of materials ad electrochemistry in environmental remediation. This presentation is divided into two parts: 1) a First section presenting recent progress in materials chemistry. In the area of environmental remediation, nanomaterials (Nanomembranes, Nanocatalysts and nanoparticles used for groundwater remediation) offer the potential for the efficient removal of pollutants and biological contaminants while reducing the environmental impact of agricultural production.2) a second section dealing with the development and use of electrochemical materials and electrochemical processes which can make better contributions to environmental protection through implementation of effluent treatment, minimisation of waste and elimination of pollutants. Finally, a series of sustainable remediation case studies are presented and a view of the possible future for "sustainable remediation" Example: Soil and groundwater remediation, although designed to remedy contamination and reduce risks to human health and/or the environment

OPENING KEYNOTE 2

The Second speaker is Dr. Konstantinos Plakas, Senior researcher in CERTH, presents the process of bioelectrochemical systems [BES], as innovative, promising and "green" electrochemical technologies for (waste)water treatment. BESs is a hybrid technology that combines physical-chemical, biological and electro-chemical reactions, towards the conversion of the biodegradable fraction of organic compounds in water and wastewater streams (chemical energy) into renewable (electrical) energy and by-products (e.g. hydrogen, methane, carbon dioxide, nutrients, metals etc.) in a sustainable way, utilizing certain electro-active microorganisms as biocatalysts in order to catalyze the redox reactions at electrode–electrolyte interfaces of MESs.
Moreover, Based on the field of their applications, BESs can be broadly categorized into Microbial Fuel Cells [MFCs] for producing bio-electricity, Microbial Electrolysis Cells [MECs] for bio-hydrogen production, Microbial ElectroSynthesis Cells [MESs] for high-value products generation and Microbial Desalination Cells [MDCs] for water desalination, with MFCs and MECs being the main representatives of BESs that are rapidly developed towards environmental sustainability.

OPENING KEYNOTE 3

The third speaker is Professor Babak Minofar, the title of the presentation: Applications of molecular modelling in environmental chemistry, the presence of micro-pollutants such as pharmaceuticals, hormones, herbicides, insecticides, pesticides become crucial problem in aquatic environments. To understand the interaction of micropollutants (bioactive materials) with components of aquatic system, the classical molecular dynamics (MD) simulation is one of the computational methods, which can give very useful information about such interactions. The Speaker has presented then some applications of MD simulations in environmental chemistry applications such as the interaction of micro-pollutants with models of humic acid and fulvic acid. As many micro-pollutants have hydrophobic groups, thus they can show surface propensity to the air/water interface thus influence the bulk and surface properties of water. Finally, MD simulations revealed that the graphene oxide has a potential for removal of micro-pollutants such as drugs, pharmaceutical and personal care products from aquatic environments.

OPENING KEYNOTE 4

The Fourth speaker is Dr. Carlo Ingrao, University of Messina, Italy, The title of the presentation: Life Cycle Assessment for sustainable circular models of the economy: Theoretical aspects and practical applications. The Circular Economy can make a relevant contribution in Sustainable Development (combatting climate change and protecting the oceans and land ecosystems), by making material flows more efficient and maintaining the utility and value of materials and products for as long as possible. To achieve such an ambitious goal, the speaker proposes the Improving circularity and increasing the efficiency of materials management can be achieved through: extending product lifetimes; reducing material losses; recirculating materials and products; preventing downcycling; and substituting greenhouse gas-intensive materials with those with lower emissions. In this context, product and process innovation must be developed and tested from an environmental and socio-economic perspective to contribute to implement holistically sustainable circular models of the economy.

OPENING KEYNOTE 5

The title of the presentation: Nanotechnologies for environmental remediation: applications, limits and side effects. Speaker describes first, the use of ENMs and nanoremediation as an emerging technology. Second, the growing interest in nanotechnological solutions for pollution remediation, with significant economic investment worldwide. The feverish development of nanoscale (NM) materials holds great potential to advance water and wastewater treatment and contaminated site remediation with improved efficiency and lower energy consumption. These technical innovations, Environmental nanoremediation of various contaminants is used for the treatment of surface water, groundwater, wastewater and for cleaning soil and sediment from toxic metal ions, organic and inorganic solutes and emerging contaminants. such as pharmaceuticals and personal care products. Although the great potential advantages offered by the introduction of environmental nanoremediation, the author mentions the potential risk of eco-nano-toxicity due to uncontrolled releases of NMs into the environment. Finally, more ecological, sustainable and innovative nanostructured materials should be more supported, are ENMs that meet the highest standards of environmental safety.

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