Preface: The 6th International Symposium on Materials, Electrochemistry and Environment, CIMEE24

Dear distinguished scholars, academics, researchers and partners from Lebanon and around the world,

We are pleased to have been associated for several years as the organizer of this important annual event, which offers an excellent framework to become familiar with the latest technological developments related to Materials Chemistry, electrochemistry and environment, to identify new to identify new investment and collaboration opportunities and to facilitate the networking with the main players working in these sectors. In this year, CIMEE2024. is organized by Lebanese university and CIMEE group in partnership with:

- Laboratory of Electrochemistry, LEIMCR, Faculty of Technology, University of Ferhat Abbas Sétif-1, Algeria
- Laboratory of Environmental Engineering & Ecotechnology, ENIS, University of Sfax, Tunisia.
- Laboratory of Applied Chemistry & Environment, ENSA, University of Ibn Zohr, Morocco
- Department of analytical Chemistry, Faculty of Pharmacy, Ankara University, Turkey.
- Center of Materials Technology and Photonics, Hellenic Mediterranean University, Heraklion, Crete, Greece

The conference which will take place virtually, (online event) from October 24 to 26, 2024.
By carrying the theme " **Environmental Sustainability through Green Chemistry and renewable Energy**", the CIMEE 2024 brought together more than 70 presenters and participants from several background such as university lecturer, researcher, and student. With this theme, the symposium brought the latest trends of Materials chemistry, electrochemistry research in various applications ranging from air, soil and water Science, Environmental chemistry, Waste Management, bioenergy, and Ecology system, as well as analytical chemistry and bioenergy. This meeting provides a forum for exchange of information and share of experiences on all aspects of Materials chemistry, electrochemistry and chemical related researches as well as aims to initiate scientific cooperation and international collaboration among the research institutions.

Green Chemistry and renewable Energy as solutions to climate change

Climate change is one of the most serious challenges facing the world, requiring immediate and comprehensive action. Processes that minimize adverse environmental impacts can be implemented. At the same time, renewable energy solutions can be a viable way to combat climate change by reducing greenhouse gas emissions, investing in research and innovation to improve the efficiency, reliability, and affordability of renewable energy technologies. This summary explores the central role of green chemistry, which advocates resource efficiency, waste minimization, and renewable energy in ecological sustainability. From environmentally friendly materials and waste management strategies to renewable energy sources, sustainable practices encompass a wide range of initiatives aimed at mitigating environmental degradation and promoting long-term ecological sustainability.

A - Encouraging sustainability through green chemistry

Green chemistry offers solutions to such global challenges as climate change, sustainable agriculture, energy, toxics in the environment, and the depletion of natural resources. A collaborative effort by academia, and researchers is needed to promote the adoption of the green chemistry technologies necessary to achieve a sustainable society.

B - Environmental Sustainability through Renewable Energy

To achieve long-term energy sustainability, renewable energies represent an ideal solution to the urgent challenge. Indeed, renewable energy offers a path toward reducing greenhouse gas emissions. Biomass energy can provide cleaner combustion and reduces greenhouse gas emissions to the atmosphere compared with fossil fuels

Keywords: green chemistry, Materials Chemistry, Electrochemistry, Environmental Sustainability, Renewable Energy

Theme cimee24 Environmental Sustainability through Green Chemistry and renewable Energy

Climate change affects all regions of the world and represents a very serious threat and its consequences have an impact on several aspects of life on earth. From this, many important questions arise for modern society which must prepare itself to face the current

climate crisis as well as all the possible consequences. All this has pushed a global awareness in favor of the fight against the greenhouse effect.
Here are some solutions that we are implementing to contribute to solving the problem of climate change and protecting the planet
1. Management of natural resources and waste (recycling and waste reduction)
2. Reducing and/or treating air pollution
3. Use of renewable energies

1. Sustainable management of natural resources (water, soil) and waste)

The implementation of an effective waste management strategy ensures that natural resources are used optimally and thus reduce the ecological impact of human activities. The benefits of sustainable waste management include reducing environmental impact by limiting waste accumulation and reducing resource waste to improve air and water quality.
Among the issues to be addressed, the climate crisis is known to impact water and food security, as a direct consequence of climate change is soil degradation, which limits the amount of carbon that the Earth can sequester. Indeed, climate change can aggravate erosion, decrease in organic matter content, salinization and loss of soil biodiversity, desertification and flooding. The effect of climate change on soil carbon storage can be linked to changes in atmospheric CO2 concentrations, increased temperatures and changes in precipitation patterns. Extreme precipitation events and increased frequency of droughts are all climate-related events that impact soil degradation.

2. Reduce and/or address air pollution

Another key parameter to combat climate change is reducing air pollution. Pollutants, such as fine particles for example, from the combustion of fossil fuels (such as coal combustion and vehicle emissions) are key drivers of global warming, and addressing the air pollution they cause can mitigate climate change.
Since air pollution and climate change are two sides of the same coin. Broadly speaking, air pollutants and greenhouse gases often come from the same sources, such as transport. Other climate pollutants include methane and ground-level ozone, and these are all much more powerful drivers of global warming than carbon dioxide.
So, if we tackle these types of pollutants, we get a double benefit: better air quality and the mitigation of climate change on a global scale.
Therefore, we can fight air pollution and climate change simultaneously rather than separately, by focusing on reducing emissions from the combustion of fossil fuels which can quickly manifest themselves in a lowering of carbon dioxide concentrations in the atmosphere.

3. Renewable energy as a solution in the fight against climate change.

Renewable energy as alternatives to fossil resources and the capture of atmospheric CO2. On these two issues, we often hear about biomass and its benefits. Indeed, biomass can be presented as a possible solution to control global warming and by adopting strategies to limit greenhouse gas emissions and their impact on the climate.
The fight against climate change THEREFORE requires the widespread adoption of energy solutions
1- Biomass energy is the main source of renewable energy on a global scale. One way to reduce greenhouse gas emissions is to use more renewable energy, such as Biomass energy
2- Energy Transition and Decarbonization: Renewable energy is crucial to decarbonize the energy sector. Key Renewable Energy Technologies
a) Biogas: Produced by anaerobic digestion of organic waste, used for electricity, heating, and as fuel for vehicles.
b) Biofuels: Derived from crops such as corn and sugarcane, used as an alternative to gasoline and diesel.
Use of renewable energy technologies:
BIOFUEL CONVERSION PROCESSES
A - to break down solid biomass into liquid or gaseous intermediates. There are three primary routes used in this pathway: Pyrolysis, Gasification and Hydrothermal liquefaction.
B - use of biological catalysts (enzymes or chemicals to breakdown feedstocks into intermediates)