

2019 9th International Conference on Biotechnology and Environmental Management (ICBEM 2019)

September 10-12, 2019

Madrid, Spain

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Conference Venue

**Computer Science School, Campus de Montegancedo, University of Madrid (UPM),
Madrid, Spain**

**Add: ETSINF-UPM, Campus de Montegancedo s/n, Boadilla del Monte, 28660 Madrid,
Spain**

Tel: +34670712402



The Technical University of Madrid (UPM) was founded in 1971, although the majority of its Centres are over hundreds of years old and was founded in the 18th and 19th centuries. Each of them maintained their independence until being grouped together to form the UPM in 1971. It is no exaggeration to state that for over one and a half centuries great part of the history of Spanish technology has been written by the Schools of Architecture and Engineering of the UPM. They have been during a lot of years nearly the only and in some case actually the only school. All of the important personalities in the area of teaching and research passed through their respective centres as students or lecturers

How to Get Here:

By taxi: It will cost about 20-35 Euro. You can also use the CABIFY service <https://cabify.com/en/spain/madrid> (This service is similar to UBER)

By public transport: The recommended way to come to the Facultad de Informática from Madrid downtown is the following:



1. Take the Underground or Metro and go from your nearest Metro station to ALUCHE metro station.
2. In ALUCHE metro station, get out and look for the BUS number 591. This Bus will take you directly to the Facultad de Informática as last station. Get off the Bus in the last station. You will see a white bulding (Bulding 5) and look for the Bulding 1. Into Bulding 1, look for rooms H-1002 and H-1002.

Other public transportation routes:

Route 865: Madrid (Ciudad Universitaria)-Campus de Montegancedo

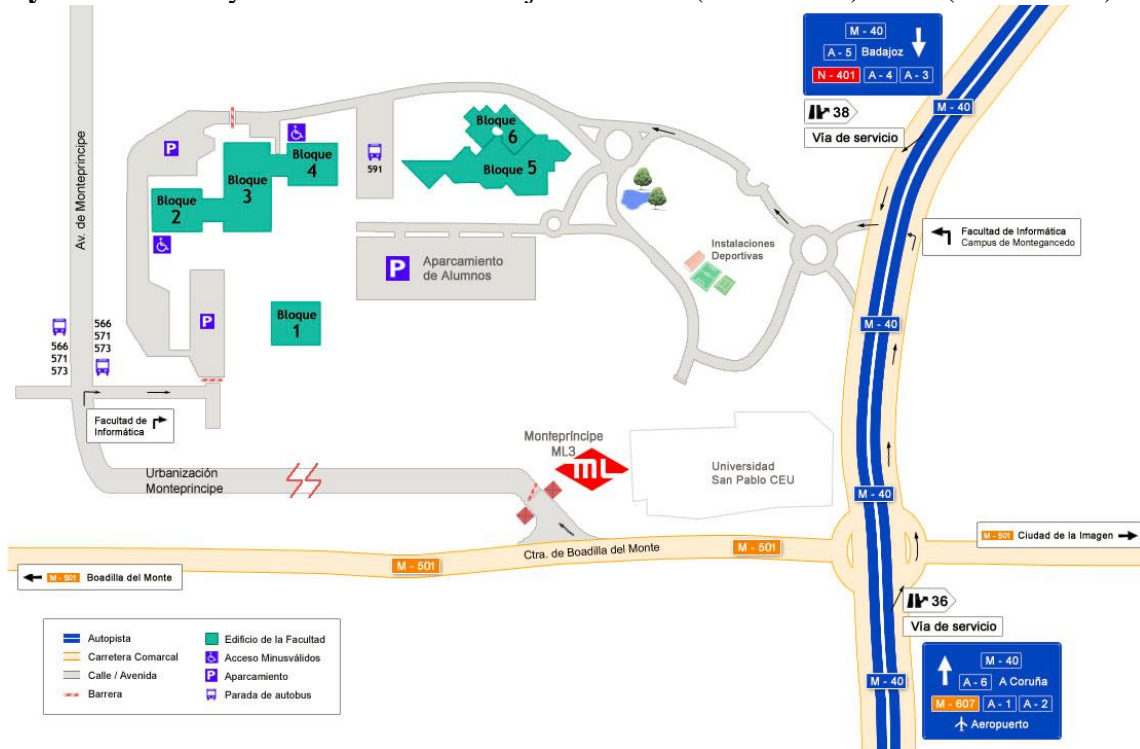
Route 571: Madrid (Campamento)-Boadilla (Lomas - Bonanza)

Route 573: Madrid (Moncloa)-Boadilla (Urbanizaciones)

Route 566: Boadilla (Ronda)-Pozuelo (C. France)

By tram: Route 3 (Colonia Jardín - Puerta de Boadilla) to Montepríncipe station. As you leave the station, turn right and make your way to the Facultad de Informática along Avda. Montepríncipe.

By car: Access by car: Exit the M-40 at junctions 36 (northbound) or 38 (southbound)



Directions: 40°24'22.82"N, 03°50'19.86"W

BLOQUE 1 is the building where the Conference Venue is.

CONFERENCE ROOMS: H-1002 AND H-1002

For the venue, please feel free to contact [+34670712402](tel:+34670712402) for Prof. Roberto San José

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Halima SLIMANI

Madrid Conference Introductions

Welcome to 2019 HKCBEEES Madrid conference. This conference is organized by HKCBEEES. The objective of the Madrid conference is to bring together innovative academics and industrial experts in the field of Biotechnology and Environmental Management to a common forum.

**2019 9th International Conference on Biotechnology and Environmental Management
(ICBEM 2019)**

Papers will be published in one of the following journal:



Journal of Environmental Science and Development (IJESD, ISSN:2010-0264), all accepted papers will be indexed by Scopus (Since 2019) and included in the Chemical Abstracts Services (CAS), CABI, Ulrich Periodicals Directory, Electronic Journals Library, Crossref, ProQuest

Conference website and email: <http://www.icbem.org/>; icbem@cbees.org

Presentation Instructions

Instructions for Oral Presentations

Devices Provided by the Conference Organizer:

Laptop Computer (MS Windows Operating System with MS PowerPoint and Adobe Acrobat Reader)

Digital Projectors and Screen

Laser Sticks

Materials Provided by the Presenters:

PowerPoint or PDF Files (Files should be copied to the Conference laptop at the beginning of each Session.)

Duration of each Presentation (Tentatively):

Regular Oral Presentation: about **13** Minutes of Presentation and **3** Minutes of Question and Answer

Keynote Speech: about **40** Minutes of Presentation and **5** Minutes of Question and Answer

Instructions for Poster Presentation

Materials Provided by the Conference Organizer:

The place to put poster

Materials Provided by the Presenters:

Home-made Posters

Maximum poster size is A1

Load Capacity: Holds up to 0.5 kg

Best Presentation Award

One Best Presentation will be selected from each presentation session, and the Certificate for Best Presentation will be awarded at the end of each session on September 11, 2019.

Dress code

Please wear formal clothes or national representative of clothing.

Keynote Speaker Introductions

Keynote Speaker I



Prof. Dr. Gerrit Schüürmann

Technical University Bergakademie Freiberg, Germany

Academic Education

University degrees (M.Sc.) in Chemistry (1982), Physics (1982) and Mathematics (1983); Dr. rer. nat. in Chemistry (1987); Dr. rer. nat. habil. in Ecological Chemistry (2001).

Current Position

Since 1992 Head of the Department of Ecological Chemistry (formerly: Division Head Chemical Ecotoxicology), Helmholtz Centre for Environmental Research – UFZ, Leipzig
2006-2017 Speaker of the UFZ Division of Environmental Health, Leipzig, Germany
Since 2006 Professor of Theoretical & Ecological Chemistry, TU Bergakademie Freiberg

Topic: Non-Animal Toxicity Assessment of Chemical Substances

Abstract— Since the implementation of the European Directive REACH in 2007, alternative methods have gained increased importance as non-animal tools for the toxicological assessment of industrial chemicals. The latter is based on the 3R principle of reducing, refining and replacing animal testing, thus moving away from whole-animal apical endpoints to unravelling molecular mechanisms and their pathways that lead to adverse outcomes. In this context, the internal exposome as cumulative totality of chemical exposure in the organism has gained attention, calling for approaches to understand and ultimately predict the fate and effects of toxicants in a systems chemistry perspective. Besides this internal exposome, the external exposome covers the chemical totality in the environment, and as such also reflects the readiness of xenobiotics to undergo abiotic or microbially mediated degradation. In the presentation, the non-animal concept of toxicity assessment is outlined covering in chemico and in vitro methods as well as in silico tools. Examples address endpoints of environmental and human toxicology, and cover experimental (chemoassays, bioassays) as well as non-test (structural alerts, read-across, computational chemistry) methods. The discussion includes also quantum chemical research into xenobiotic enzyme catalysis for unravelling mechanisms of P450-induced toxification as well as of the biodegradation of otherwise persistent organic pollutants through anaerobic bacteria exploiting vitamin B12 catalysis.

**Coffee Break & Group Photo Taking****10:20~10:40**

Keynote Speaker II



Prof. Maria Liakopoulou-Kyriakides

Bioorganic Chemistry, Faculty of Chemical Engineering, Aristotle University of Thessaloniki,
Greece

Professor of Bioorganic Chemistry, Faculty of Chemical Engineering, Aristotle University of Thessaloniki, acting chair of the Department and director of organic chemistry laboratory. Member of several scientific societies and organisations. Received her PhD from university of Patras, Greece, with postdoctoral studies at Yale Medical School, USA. Supervisor of numerous PhD theses, coordinated several R&D programs, published over 100 research articles in peer-reviewed journals and over 150 other publications as, proceedings, review articles, books etc. Current research interests include Biotechnological production of carotenes and biopolymers. Isolation of biological active compounds from plant extracts, separation and identification. Valorization of agro food wastes for high added value products. Synthesis of oligopeptides, chemical characterization and biological evaluation. Bioremediation, removal of toxic metals from wastewaters or/and biodegradation of chlorinated aromatic compounds using microbial species.

Topic: ‘Bioactive phenolic acids and flavonoids from fruit wastes- Recovery and formulation by encapsulation into biodegradable polymers’

Abstract—Phenolic compounds play a quite important role in food science and technology. They can be used as natural food colorants, as antioxidants, protecting specific ingredients that are sensitive to oxidative changes, such as unsaturated fatty acids, as antimicrobial and/or anticoagulant agents. Nowadays, the interest of scientists focuses on their selective extraction and separation from various natural sources, including fruits, vegetables and their wastes. Phenolic compounds are unstable and sensitive under various conditions used in food processing, such as light, pH, and thermal stress, thus resulting in partial or even complete loss of their biological activities during food processing and storage. Encapsulation of these bioactive ingredients into biodegradable natural and synthetic polymers is suggested in order to retain their stability and biological activities. Encapsulation is also a promising way to ensure the bioavailability of the trapped components and to increase the effectiveness of them as functional foods. On the other hand polymeric nanoparticles protect bioactive compounds from degradation, improve their solubility, and promote controlled release of them and targeting.

Keynote Speaker III



Prof. Roberto San Jose

Technical University of Madrid (UPM), Madrid, Spain

Prof. Roberto San Jose is a Professor of the Technical University of Madrid (UPM). He studied Physics in the University of Valladolid (Spain) and made the Ph. D. in 1983 on relation to Atmospheric Boundary Layer. He became associated professor in University of Valladolid in 1986. He was on leave in the Max-Planck Institute of Meteorology in Hamburg (Germany) in 1989-1990 and He was a guest senior scientist in the IBM-Bergen Environmental Sciences and Solutions Center in Bergen (Norway) in 1990-1992. In 1992 he moved to the Computer Science School of the Technical University of Madrid (UPM) in Madrid (Spain). In 2001 he became head professor of the UPM. In 1992 He started a laboratory in UPM called Environmental Software and Modelling Group. Up to now, Prof. San Jose has been principal investigator in more than 200 projects related with Air Quality and Climate issues. The projects were down with private and public companies and also with European Union. More than 20 EU projects on the environmental area and Information Technology have been carried out.

Topic: ‘Health Effects of Indoor Emissions Combining Outdoor and Indoor Pollution Simulations’

Abstract—The aim of the paper is to show that it is very important to take into account indoor pollution when studying the health effects of the quality of the air we are breathing. The simulations must consider the indoor emissions because they are the ones that make the concentrations of the air that we breathe are different from the outdoor concentrations. We have performed a simulation exercise of air quality both outdoor and indoor in 2 buildings (office and home) located in the center of Madrid (Spain), with different scenarios of indoor emissions to isolate their impacts. The simulations are run over full year 2016 with hourly outputs. The simulations must also model atmospheric dynamics to produce meteorological data that will be key to indoor simulations. Exposure to pollutant concentrations has been calculated based on a predefined pattern that indicates where the person is at each time. In indoor pollution simulations it is very important to model all the physical processes that affect concentrations, such as: emission, infiltration, deposition, mechanical and manual ventilation (closely related to the thermal comfort range of the building) and air exchange between rooms through the doors. The highest impact on health is produced by the emissions that are released when people are cooking.

Brief Schedule for Conference

Day 1	<p style="text-align: center;">September 10, 2019 (Tuesday) 10:00~17:00</p> <p style="text-align: center;">Venue: Computer Science School, Campus de Montegancedo, University of Madrid, Bloque 1 (H-1002)</p> <p style="text-align: center;">(Add: ETSIINF-UPM, Campus de Montegancedo s/n, Boadilla del Monte, 28660 Madrid, Spain)</p> <p style="text-align: center;">Participants Onsite Registration & Conference Materials Collection</p>
Day 2	<p style="text-align: center;">September 11, 2019 (Wednesday) 9:30~18:24</p> <p style="text-align: center;">Arrival Registration, Keynote Speech, Conference Presentation</p>
	<p>Morning Conference</p> <p>Venue: Bloque 1 (H-1002)</p>
	<p style="text-align: center;">Opening Remarks 9:30~9:35</p> <p style="text-align: center;">Prof. Roberto San Jose</p> <p style="text-align: center;">Technical University of Madrid (UPM), Madrid, Spain</p>
	<p style="text-align: center;">Keynote Speech I 9:35~10:20</p> <p style="text-align: center;">Topic: Non-Animal Toxicity Assessment of Chemical Substances</p> <p style="text-align: center;">(Prof. Dr. Gerrit Schüürmann, Technical University Bergakademie Freiberg, Germany)</p>
	<p style="text-align: center;">Coffee Break & Group Photo Taking 10:20~10:40</p>
	<p style="text-align: center;">Session 1: 10:40~12:32 Venue: Bloque 1 (H-1002)</p> <p style="text-align: center;">7 presentations-Topic: “Environment and Chemistry”</p> <p style="text-align: center;">Session Chair: Prof. Dr. Gerrit Schüürmann& Prof. Maria Liakopoulou-Kyriakides</p>
	<p style="text-align: center;">Lunch 12:32~14:00(All the participants will go to the catering site together)</p>
	<p>Afternoon Conference</p> <p>Venue: Bloque 1 (H-1002)</p>
	<p style="text-align: center;">Keynote Speech II 14:00~14:45</p> <p style="text-align: center;">Topic: ‘Bioactive phenolic acids and flavonoids from fruit wastes- Recovery and formulation by encapsulation into biodegradable polymers’</p> <p style="text-align: center;">(Prof. Maria Liakopoulou-Kyriakides, Aristotle University of Thessaloniki, Greece)</p>
	<p style="text-align: center;">Keynote Speech III 14:45~15:30</p> <p style="text-align: center;">Topic: ‘Health Effects of Indoor Emissions Combining Outdoor and Indoor Pollution Simulations’</p> <p style="text-align: center;">(Prof. Roberto San Jose Technical, University of Madrid (UPM), Madrid, Spain)</p>
<p style="text-align: center;">Coffee Break 15:30~16:00</p>	

Session 2:16:00~18:24 Venue: Bloque 1 (H-1002)
9 presentations-Topic: “Environmental Pollution and Control”
Session Chair: Prof. Roberto San Jose

Dinner 19:00(All the participants will go to the catering site together)

Tips: Please arrive at the conference to upload or copy PPT into the laptop room 10 minutes before the session begins.

Note: (1) The registration can also be done at any time during the conference.

(2) The organizer doesn't provide accommodation, and we suggest you make an early reservation.

(3) One Best Presentation will be selected from each presentation session, and the Certificate for Best Presentation will be awarded at the end of each session on September 11, 2019.

Session 1

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Morning, September 11, 2019 (Wednesday)

Time: 10:40~12:32

Venue: Bloque 1 (H-1002)

7 presentations- Topic: “Environment and Chemistry”

Session Chair: Prof. Dr. Gerrit Schüürmann & Prof. Maria

Liakopoulou-Kyriakides

S8021-A Presentation 1 (10:40~10:56)

Enzyme-assisted extraction and liquid chromatography-inductively coupled plasma mass spectrometry for the determination of arsenic species in fish

Yanming Liu, Jianhua Zhu, Fa Zhao

Shandong Institute for Food and Drug Control, China

Abstract—A sensitive, simple and rapid method for the simultaneous determination of eleven arsenic species has been developed. A high performance liquid chromatography-inductively coupled plasma mass spectrometry (HPLC-ICP-MS) technique was used for the analysis of eleven arsenic species in less than 17 min. Different extraction solutions were explored and the recovery results using water and aqueous acidic solvents, aqueous organic solvents and enzymes showed that 40 mg protease with 0.75 mL 0.5% hydrochloric acid (v/v) as the extraction agent gave the best experimental results. Species separation with ammonium carbonate solution as the mobile phase was conducted on an anion-exchange chromatographic column using gradient elution. The column temperature was 20 °C and kinetic energy discrimination (KED) was employed to eliminate spectral interference. The use of KED mode effectively removed interference from $^{75}\text{ArCl}$. The detection limit (LD) of the method was in the range of 0.11–0.59 $\mu\text{g kg}^{-1}$. Repeatability values obtained for spiked real fish samples were in the range of 1.1%–7.6%. Accuracy was calculated based on the analysis of spiked real fish samples at five concentration levels. Obtained recoveries were 91%–106%. The validated method was used in a pilot study to analyze real samples of fish, the organic arsenic especially AsB was the major arsenic specie present in the analyzed samples, only trace amount of inorganic arsenic were detected. The analytical method should improve the assessment of human exposure associated with arsenic intake from fish.

Session 1

Morning, September 11, 2019 (Wednesday)

Time: 10:40~12:32

Venue: Bloque 1 (H-1002)

7 presentations- Topic: “Environment and Chemistry”

Session Chair: Prof. Dr. Gerrit Schüürmann & Prof. Maria

Liakopoulou-Kyriakides

S0003 A Presentation 2 (10:56~11:12)

Elemental composition of whole blood and head hair in residents of Eastern and North-Eastern Kazakhstan

Yuliya Semenova, Lyudmila Pivina

Semey Medical University, Semey, East Kazakhstan region, Kazakhstan.

Abstract—Eastern and North-Eastern regions of Kazakhstan are considered to be environmentally disadvantaged due to industrial pollution and activity of the former Semipalatinsk Nuclear Test Site. Ferrous metallurgy is represented by the world’s largest ferroalloy plant located in Aksu. In addition to a ferroalloy plant, Aksu is the home for the largest in Kazakhstan thermal power station. Ust-Kamenogorsk – a capital city of East Kazakhstan region, is the center of nonferrous metallurgy. The bulk of metallurgical complex of Ust-Kamenogorsk is composed of zinc refinery, lead smelter, copper plant, precious metals refinery, and acid plant. We assessed the elemental composition of whole blood and head hair of local population and compared them with that of the population of environmentally clear area. The levels of trace elements were analyzed using inductively coupled plasma mass spectrometry. High levels of blood barium, manganese, lead, vanadium, and zinc were established in residents of Aksu and Ust-Kamenogorsk. However, the elemental composition of head hair was relatively stable between the study sites. On the basis of our findings we may conclude that residency in these industrial settlements appears to be rather adverse. There is a need to conduct further investigations and to apply pollution shortening measures.

Session 1

Morning, September 11, 2019 (Wednesday)

Time: 10:40~12:32

Venue: Bloque 1 (H-1002)

7 presentations- Topic: “Environment and Chemistry”

Session Chair: Prof. Dr. Gerrit Schüürmann & Prof. Maria

Liakopoulou-Kyriakides

S8004-A Presentation 3 (11:12~11:28)

Influence of 3D Printed Channels' Shapes on the Extractive Desulfurization Efficiency of Liquid Fuel

Marwah Al-Azzawi, Farouk S. Mjalli, Talal Al-Wahaibi, Abdulaziz Al-Hashmi, Basim Abu-Jdayil

Sultan Qaboos University , Muscat, Oman

Abstract—A massive need to reduce the sulfur oxides has been raised in the world due to the negative effect on health and environment. Extractive desulfurization (EDS) was proposed since it overcomes the drawbacks of conventional Hydrodesulfurization (HDS). However, the high cost of solvents forms an obstacle against using EDS in large scale. This difficulty can be overcome by utilizing micro-channels that need much less quantities of solvent and offer better performance. In this work, polyethyleneglycol (PEG200) and diesel were introduced to a micro-contactors using syringe pumps. Different shapes of the micro-extractor chips were fabricated using a 3D printer. After studying the hydrodynamics, extraction of sulfuric compounds was conducted at varied mixture velocity and constant volume ratio of 1:1. The importance of studying the effect of channel shape is to find the design that offers better performance with minimum pressure drop. It was observed that the shape of the channel highly influences the pressure drop of the system. The triangular channel offered the lowest pressure drop readings while the square channel showed the highest readings. On the other hand, extraction efficiency was found to vary with mixture velocity, which is attributed to the flow patterns within the channel.

Session 1

Morning, September 11, 2019 (Wednesday)

Time: 10:40~12:32

Venue: Bloque 1 (H-1002)

7 presentations- Topic: “Environment and Chemistry”

Session Chair: Prof. Dr. Gerrit Schüürmann & Prof. Maria

Liakopoulou-Kyriakides

S9018-A Presentation 4 (11:28~11:44)

Removal of Methadone in Aqueous Environment Through Sunlight Photolysis of Free Chlorine

Ming-Chi Hsieh, Sri Chandana Panchangam, Webber Wei-Po Lai, and Angela Yu-Chen Lin

National Taiwan University, Taiwan

Abstract—Methadone is one of the most persistent pharmaceutical in the aqueous environment due to the fact that many traditional water and wastewater treatment processes cannot effectively remove methadone, resulting in its presence in aqueous environments. In this study, free chlorine sunlight photolysis (sunlight/FC) was used to degrade methadone. Results demonstrated that sunlight/FC enhanced the methadone degradation with 5 times higher rate constant compared with that of sunlight alone. The pseudo-first-order rate constants of methadone degradation under acidic conditions ([methadone] = 0.2 μM , [free chlorine] = 4 μM , and pH = 4) for sunlight/FC and sunlight photolysis are $7.0 \pm 1.1 \times 10^{-2} \text{ min}^{-1}$ and $1.4 \pm 0.2 \times 10^{-2} \text{ min}^{-1}$, respectively. The improved methadone degradation can be attributed to the production of HO• and reactive chlorine species (RCS) during sunlight/FC. HO• and RCS predominantly accounted for degradation during sunlight/FC under acidic and neutral conditions, while direct photolysis was the major contributor towards methadone degradation in alkaline conditions. Furthermore, the initial pH, free chlorine, HCO₃⁻, and Cl⁻ significantly influenced methadone degradation rate. These parameters may competitively react with HO• and RCS, further retarding methadone degradation in synthetic wastewater. These results emphasize the need to consider different water matrices when applying sunlight/FC for water treatment.

Session 1

Morning, September 11, 2019 (Wednesday)

Time: 10:40~12:32

Venue: Bloque 1 (H-1002)

7 presentations- Topic: “Environment and Chemistry”

Session Chair: Prof. Dr. Gerrit Schüürmann& Prof. Maria

Liakopoulou-Kyriakides

S8018 Presentation 5 (11:44~12:00)

Data Mining on data of Catalytic Cracking Microactivity Reactors using PCEM

Benjamin Moreno-Montiel, Carlos-Hiram Moreno-Montiel, Miriam-Noemi Moreno-Montiel, and René MacKinney-Romero

Universidad Autónoma Metropolitana – Unidad Iztapalapa, Departamento de Ingeniería Eléctrica, México

Abstract—Crude oil can have great uses and applications, to achieve this it must undergo a process of conversion of primary to secondary energy called refining. Refining is the set of processes that are applied to crude oil in order to separate its useful components and adapt its characteristics to the needs of society. Among these products obtained from the refining process is gasoline, which is obtained using various types of catalysts. In this paper, we propose to use the Parallel System of Classification based on the Ensemble of Mixture of Experts (PCEM) developed in C using MPI (Message Passing Interface) that guarantees the obtaining of results that reflect the performance of a set of evaluated catalysts and thus proceed to the election of one that meets the industrial requirements of this process or propose improvements to this based on their behavior in the process. To carry out this system, it is proposed to use the Data Mining process on a repository of data obtained from a Catalytic Cracking Microactivity Reactor. Within the process of Data Mining is the task of classification of data, which was selected to be the engine of operation of the system proposed in this paper. We implemented a series of classifiers to compare the operation of the PCEM, that can predict new data between three different types of gasoline grades, obtaining in all the tests that the PCEM high rates in the performance measures with respect to the traditional classifiers.

Session 1

Morning, September 11, 2019 (Wednesday)

Time: 10:40~12:32

Venue: Bloque 1 (H-1002)

7 presentations- Topic: “Environment and Chemistry”

Session Chair: Prof. Dr. Gerrit Schüürmann & Prof. Maria

Liakopoulou-Kyriakides

S9010 Presentation 6 (12:00~12:16)

The study of the effect of concentration of the agar-agar solution on the Rheological and thermo rheological behavior

H. Abchiche, M.Mellal, **N.Sahraoui**, S. Bertouche, L.Tebachi, A.Mameri

University of Science and Technology Houari Boumediene, Algeria

Abstract—The purpose of this work is to study the parameters that influence the rheological behavior of a complex fluid (agar agar solution), on a capillary rheometer. The rheological properties of agar solution were studied, in particular the concentration's effect (0,1%, 0,15%, 0,17% , 0,2%), and temperature (20°C, 30°C, 40°C, 50°C, 60°C, 70 °C) on the rheological behaviour of the agar agar solution. A comparative study of various rheological laws (Herschel-Buckley, Cross, Oswald De Waele, Bingham) was made, to establish a model that presents the rheological behavior which applies to different samples of agar agar solution, based on the coefficient of correlation. Results indicated that the rheological behavior of agar agar solution depends on the range of shear rate used : for low shear rate (lower than 6.2 s⁻¹) the solution of agar agar can be modeled by an Ostwald-De Waele-type power-law, but for the high shear rate (higher than 6.2 s⁻¹) the solution of agar agar can be described by Bingham's model. The concentration's and temperature's effect of agar agar solution on the two models studies's parameters (Ostwald-De Waele, Bingham) was studied.

Session 1

Morning, September 11, 2019 (Wednesday)

Time: 10:40~12:32

Venue: Bloque 1 (H-1002)

7 presentations- Topic: “Environment and Chemistry”

Session Chair: Prof. Dr. Gerrit Schüürmann& Prof. Maria

Liakopoulou-Kyriakides

S8003 Presentation 7 (12: 16~12:32)

Simulation of Dual Site - Bond Network Modeling for Porous Media through the Graphics class in Java

Benjamin Moreno-Montiel, Carlos-Hiram Moreno-Montiel, Jacqueline Luna-Sánchez, and René MacKinney-Romero

Universidad Autónoma Metropolitana – Unidad Iztapalapa, Departamento de Ingeniería Eléctrica, México

Abstract—In the last four decades the advance in the study of porous surfaces has been considerable mainly due evolution of new technologies that allow theoretical and experimental study by Computational Simulations. In this work we will show one of these simulations, we use the Dual Site - Bond Network Modeling for porous media using the Graphics class of Java. In this model, the largest holes in porous media are modeled with Spheres or Sites and the smaller ones or that connect a Site with another one is modeled with Cylinders or Bonds. The objective of the Dual Site - Bond Network Modeling is create three - dimensional models with these two entities to later have a simulation of Mercury Intrusion and Retraction. The construction of these three-dimensional networks is a complex task, since thousands or millions of entities that must be sort under a series of rules defined in the Dual Site - Bond Network Modeling. In this work we will show each of the algorithms that were considered to achieve the simulation of construction of three-dimensional porous media based on the Dual Site - Bond Network Modeling. We will review the evaluation of each implemented version and finally we will show the graphic application developed through the Graphics class.



Lunch	12:32~14:00
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Session 2

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, September 11, 2019 (Wednesday)

Time: 16:00~18:24

Venue: Bloque 1 (H-1002)

9 presentations- Topic: “Environmental Pollution and Control”

Session Chair: Prof. Roberto San Jose

S8016 Presentation 1 (16:00~16:16)

Chemical Contamination in a Typical Independent Water Scheme (IWS) Catchment

T. Imo, P.Amosa, V. Vaurasi and F. Latu

National University of Samoa, Samoa

Abstract—Surface fresh waters including rivers, streams and lakes are a major source of drinking water and are habitats for plants and animals. Surface waters are often contaminated with chemicals such as pesticides, nutrients, heavy metals and dissolved inorganics. The sources of these chemicals include agricultural and anthropogenic activities. The occurrence of chemical contaminants in drinking water has become a problem of increasing concern. Samoa, the baseline information on the contamination problems in a typical Independent Water Scheme (IWS) catchment is very limited. Hence, this article will provide detail information on the past and current status of drinking water by chemical contaminants.

Session 2

Afternoon, September 11, 2019 (Wednesday)

Time: 16:00~18:24

Venue: Bloque 1 (H-1002)

9 presentations- Topic: “Environmental Pollution and Control”

Session Chair: Prof. Roberto San Jose

S0008 A Presentation 2 (16:16~16:32)

Genetic relatedness of bacterial isolates with coal-degrading potentials obtained from coal slurry and diesel-contaminated soil: implication for environmental bioremediation

Yinka Titilawo and Ashton Cowan

Institute for Environmental Biotechnology (EBRU), Rhodes University, Grahamstown 6140, South Africa

Abstract—The study aimed at identifying 10 bacterial strains, previously reported for degradation potentials, from coal slurries and diesel contaminated soils were identified based on the 16S rRNA gene sequencing and deduce their relatedness with other reference strains. The preliminary Basic Local Alignment Search Tool (BLAST) analysis revealed very high homology (99 %) of the isolates with strains of *Bacillus*, *Escherichia*, *Citrobacter*, *Exiguobacterium*, *Serratia* and *Microbacterium* on the National Center for Biotechnology Information (NCBI) database, whereas one of the sequences recorded the least value of 91 % with *Proteus*. Further phylogenetic analysis of the gene sequences confirmed the identity and relatedness of the isolates, as they form 7 distinct clades with other reference bacterial isolates with confirmed degradation potentials, with the exception of the genus *Escherichia*. Generally, 6 of the 10 isolates were of diesel-contaminated soils origin, whereas 4 were retrieved from coal slurries with *Bacillus* spp strains being frequently detected from both sample types. Since biological degradation of coal is a good alternative to chemical combustion of coal, microbial strains identified in this study can be potential microbial candidates for coal conversion to important biochemicals needed for environmental bioremediation and agricultural yield.

Session 2

Afternoon, September 11, 2019 (Wednesday)

Time: 16:00~18:24

Venue: Bloque 1 (H-1002)

9 presentations- Topic: “Environmental Pollution and Control”

Session Chair: Prof. Roberto San Jose

S0007 A Presentation 3 (16:32~16:48)

Evaluation of the psychological status of residents of Ust-Kamenogorsk exposed to industrial pollution

Lyudmila Pivina, Yuliya Semenova, Aigerim Abisheva, **Almira Manatova**

Semey Medical University, Semey, East Kazakhstan region, Kazakhstan.

Abstract—Ust-Kamenogorsk City located in the East Kazakhstan region is a large industrial object, and its population is exposed to environmental risk factors for a long time. A cross-sectional study of the health status of the population living in the city of Ust-Kamenogorsk (sample size 500 people) was conducted. Criteria for inclusion in the study group: age 18-50 years, legally confirmed residence of the examined people in the territory of environmental risk. Control group: people permanently residing in the Uralsk City (248 people) who were not exposed to environmental pollution. The psychophysiological status of the exposed population was characterized by a predominance of general asthenia, a decrease in activity, and manifestation of moderate depression and moderate severity of somatic symptoms. The average values of quality of life for each of the 8 scales were statistically lower in comparison with control rates. Inadequate public awareness of the effect of radiation risk factors on the health of residents of contaminated areas has been established.

Session 2

Afternoon, September 11, 2019 (Wednesday)

Time: 16:00~18:24

Venue: Bloque 1 (H-1002)

9 presentations- Topic: “Environmental Pollution and Control”

Session Chair: Prof. Roberto San Jose

S0002 A Presentation 4 (16:48~17:04)

Environmental Quality and Environmental Inferiority in Tourism Sector: Insights from North Cyprus

Ali Ozturen

Eastern Mediterranean University, Gazimagusa, North Cyprus, Turkey

Abstract—Tourism is one of the principal sectors that consume environmental resources. A tourism destination that neglects environmental quality is doomed to disappear. Environmental quality is a hygiene factor for any tourism destination and a necessity for sustainable development. Tourism sectors have a potential not only to destroy and but also protect the resources. The purpose of this study is to explore determining factors and barriers for environmental quality and environmental inferiority caused by tourism development. Semi-structured interviews were conducted with stakeholders in Northern Cyprus. The most underlined barriers for environmental quality, which are the causes of environmental inferiority, are lack of stakeholder collaboration and prioritizing economic sustainability. The stakeholder collaboration philosophy can create shared concern and helps to generate common long-run benefits. The balance between economic, environmental, and social goals is necessary for sustainable development. Weak sanction power of authorities and political instability are also emphasized as the factors that lead to environmental inferiority and drive away from environmental quality at a destination. The most emphasized drivers for environmental quality are consciousness of stakeholders and the linkage between legislation, policy, and implementation. The respondents agreed on that most of the failures grow out of lack of awareness, education, intention, and initiation. Furthermore, disconnectedness and disunity between plans, policies, and implementation lead to unsustainable consequences

Session 2

Afternoon, September 11, 2019 (Wednesday)

Time: 16:00~18:24

Venue: Bloque 1 (H-1002)

9 presentations- Topic: “Environmental Pollution and Control”

Session Chair: Prof. Roberto San Jose

S8017 Presentation 5 (17:04~17:20)

Climatic Considerations and Their Role in Explaining Sustainable Development of Urban Environments

Aryan Amirkhani , Fatemeh Tehrani

Tarbiat Modares University, Tehran, Iran

Islamic Azad University, Science and Research Branch, Tehran, Iran

Abstract—The issue of sustainable urban development has been considered an important scientific issue in all communities in recent years and has received a large part of the literature on urban development. In this regard, various dimensions of sustainable development from different angles have been studied, analyzed, and evaluated, and various approaches have been considered in different perspectives. By defining sustainable development as development of quality of life and life in the capacity to tolerate backup ecosystems, and with regard to concepts such as development and the environment, the relationship between human, the environment and sustainable development is explained in the context of this definition.

Various causes play a role in the formation and sustainable development of urban environments, among which climatic considerations play an important role. Climate as one of the subsystems involved in the ecological structure of nature with other components of the system has interacted with each other and thus reacts to the changes occurring in the natural systems and adapts itself to new conditions.

Within the framework of this discussion, the following climatic changes are briefly discussed. In fact, these are the changes that, in the sense of “urban climate”, give a special identity:

1. Irradiance, transparency and / or air turbidity; 2. Air temperature; 3. Air flow or wind system; 4. Humidity; 5. Quantity and quality of atmospheric precipitation; 6. Air pollution

After mentioning the factors affecting the urban climate, climatic solutions and considerations in urban spaces can be briefly analyzed in terms of performance in places such as walking paths, riding paths, and green spaces.

Session 2

Afternoon, September 11, 2019 (Wednesday)

Time: 16:00~18:24

Venue: Bloque 1 (H-1002)

9 presentations- Topic: “Environmental Pollution and Control”

Session Chair: Prof. Roberto San Jose

S8005-A Presentation 6 (17:20~17:36)

Assessment of Biochar Impact on Adsorption of Imidacloprid on Soil under No-tillage and Rotary tillage treatments: Isotherms and Kinetics

Jean Yves Uwamungu and Chunsheng Hu

University of Chinese Academy of Sciences, Beijing, China

Abstract—The use of pesticides is highly harmful to the soil environment, this has always been a research hotspot, and measures must be taken in future to eradicate soil and groundwater pollution. The main objective dealt with the investigation of biochar application on the adsorption behavior of Imidacloprid on soil under no-tillage and rotary tillage treatments. Batch experiments were carried out in laboratory to assess the adsorption of Imidacloprid on soil through equilibrium and Kinetic modeling under biochar addition. The Imidacloprid adsorption equilibrium significantly shortened to 25 min after biochar addition. The kinetic and thermodynamic analyzes showed the adsorption under both treatments matched with pseudo-second-order kinetic and Freundlich models, respectively. The pesticide adsorption capacity (45>35>25oC) decreased with increasing temperature suggesting an exothermic adsorption process while negative values of Gibbs free energy (ΔG°); -6980.5 and 5983.93 Jmol⁻¹; for soil under no-tillage treatment and rotary treatment at 25C, respectively, indicated a spontaneous adsorption. Negative entropy values (ΔS°); -21.92 and -38.15 Jmol⁻¹K⁻¹, for no-tillage and rotary tillage treatments, respectively, explained a decreased randomness process. The enthalpy was higher (P<0.05) under rotary tillage (-17533 J mol⁻¹) than no-tillage treatment (-450 J mol⁻¹). Conclusively, it was shown that the Imidacloprid adsorption capacity was greater under no-tillage than rotary tillage treatment, and biochar addition increased more pesticide adsorption under no-tillage compared to that of rotary tillage.

Session 2

Afternoon, September 11, 2019 (Wednesday)

Time: 16:00~18:24

Venue: Bloque 1 (H-1002)

9 presentations- Topic: “Environmental Pollution and Control”

Session Chair: Prof. Roberto San Jose

S0004 A Presentation 7 (17:36~17:52)

Concentrations of trace metals in urban industrial soils and open water sources of Ust-Kamenogorsk, East Kazakhstan

Yuliya Semenova, Almira Manatova, Lyudmila Pivina, **Tatyana Belikhina**

Semey Medical University, Semey, East Kazakhstan region, Kazakhstan.

Abstract—East Kazakhstan region is the outpost of Kazakhstan’s ore mining and processing industry, being the part of a large diversified industrial complex. The bulk of metallurgical complex is composed of zinc refinery, lead smelter, copper plant, precious metals refinery, and acid plant. Furthermore, the city has a titanium and magnesium plant and processes beryllium, tantalum, uranium, and niobium. Polymetal ores are mined directly at the city’s border. We assessed the concentrations of trace metals in soils and open water sources of Ust-Kamenogorsk within residential area. The concentration of zinc (Zn) was demonstrated to be 4.3 times higher than maximum permissible concentration (MPC), the concentration of copper (Cu) was 2.4 times higher than MPC, while that of lead (Pb) was 4.6 times higher than MPC. However, the concentrations of chromium (Cr) and nickel (Ni) were within the MPC. As for open water sources, the concentrations of all trace elements (Zn, Cu, Pb, Ni, and Cr) did not exceed the MPC. There is a need to apply pollution safety measures.

Session 2

Afternoon, September 11, 2019 (Wednesday)

Time: 16:00~18:24

Venue: Bloque 1 (H-1002)

9 presentations- Topic: “Environmental Pollution and Control”

Session Chair: Prof. Roberto San Jose

S1002 Presentation 8 (17:52~18:08)

Production of esters based on waste vegetable oils

Yelubay M.A., Orazbekuly Ye., Aitkaliyeva G.S.

S.Toraigyrov Pavlodar State University, Pavlodar, 140008 Kazakhstan

Abstract—The paper presents the results of a study of the main characteristics of sunflower and waste sunflower oil. It is revealed that one of the main methods of their processing is esterification and transesterification with the formation of carboxylic acid esters. It is shown that the use of the two-stage method of esterification with ethyl alcohol leads to an increase in the yield of esters with improved physical properties.

Session 2

Afternoon, September 11, 2019 (Wednesday)

Time: 16:00~18:24

Venue: Bloque 1 (H-1002)

9 presentations- Topic: “Environmental Pollution and Control”

Session Chair: Prof. Roberto San Jose

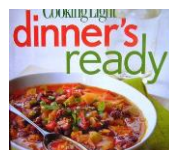
S0006 A Presentation 9 (18:08~18:24)

Assessment of biochemical indicators of the population of the East Kazakhstan region exposed to radiation due to nuclear weapons tests

Lyudmila Pivina, Yuliya Semenova, Almira Manatova

Semey Medical University, Semey, East Kazakhstan region, Kazakhstan.

Abstract—On the territory of the Semipalatinsk nuclear test site, about 110 atmospheric and ground-based nuclear tests were conducted, which resulted in radioactive contamination of East Kazakhstan region. We have studied the biochemical indicators characterizing the health status of the exposed population. The sample size in the Abay region was 222 people, in the Borodulikha district it was 233 people, in the Kurchumsky district it was 245 people. Biochemical indicators (calcium, potassium, sodium, magnesium, glycosylated hemoglobin, total protein, thyroid hormones, antibodies to thyroperoxidase, adrenocorticotropic hormone, cortisol, insulin) were studied. Inclusion criteria: age 18-50 years, legally confirmed residence in the territory of the influence of the Test Site. Control - residents of the Kurchum district. Statistical processing: IBM SPSS Statistics 20. High levels of thyroid-stimulating hormone were found in the residents of Borodulikha district (13.5%), in Abai district it was defined in 3.9% of residents. The excess of antibody titre to thyroperoxidase was recorded in both study groups (80.09 in Abai and 43.77 in Borodulikha districts). Signs of violations of nonspecific resistance manifested in the changes of the blood microelements (decrease of magnesium, calcium and potassium), increased cortisol.



Dinner

19:00

Poster Session

September 11, 2019 (Wednesday)

Time: 9:30~18:24

Venue: Bloque 1 (H-1002)

S9011 Presentation 1 (9:30~18:24)

Remediation of heavy metal pollution in soil by microbial immobilization with carbon microspheres

Xiaohui Sun, Jing Meng, Shengnan Huo, Jianhua Zhu, **Shichao Zheng**

Shandong Institute for Food and Drug Control, China

Abstract—Cultivate resistant strains in soil contaminated with heavy metals, improve the survival rate of strains in microbial remediation, and use the interaction between resistant strains and contaminated soil to achieve the purpose of remediation of heavy metal pollution in soil. Using carbon microspheres as the carrier of bacterial strains, the bacterial strains were fixed reasonably and the survival rate was high, which was conducive to the formation of stable bacterial colonies and the reduction of heavy metal pollution.

Poster Session

September 11, 2019 (Wednesday)

Time: 9:30~18:24

Venue: Bloque 1 (H-1002)

S1004 A Presentation 2 (9:30~18:24)

Seed priming: benefits and mechanisms

Lilya BOUCELHA, Ouzna ABROUS-BELBACHIR and **Réda DJEBBAR**

Université of Science and Technology Houari Boumediene (USTHB), Algeria

Abstract—Pre-germination treatments (seed priming) represent the physiological methods that improve plant production by modulating the metabolic activities of germination before the emergence of the radicle. The priming of seeds allows the dormancy-breaking, acceleration and synchronization of germination as well as a better growth, an earlier flowering, a greater tolerance to abiotic stress and higher yields. In this presentation, we summarize our studies about this subject in order to understand the mechanisms involved in seed priming.

Poster Session

September 11, 2019 (Wednesday)

Time: 9:30~18:24

Venue: Bloque 1 (H-1002)

S9015 Presentation 3 (9:30~18:24)

Mesophilic anaerobic co-digestion of cheese whey with cow manure in batch reactor

Nassima Tirichine , Meryem Saber , Hakim Lounici and Rabah Bouarab

Centre de Développement des Energies Renouvelables, CDER, Algiers

Abstract—Anaerobic digestion is a biological process that takes place under very strict operating conditions, including a pH close to neutrality. This experimental work aims to study the effect of pH control on CH₄ production in mesophilic anaerobic co-digestion of cheese whey with cow manure. Two experiments were conducted in batch reactor, the first without pH adjustment and the second with pH adjustment. The results of the first co-digestion revealed an inhibition of the methanization process by acidification of the medium and accumulation of volatile fatty acids; whereas during the second co-digestion with pH adjustment by sodium bicarbonates (1M) the process was improved with methane levels (> 50%) in the biogas. The biogas value crosses in this case two times higher for the same operating time in the digester.

Poster Session

September 11, 2019 (Wednesday)

Time: 9:30~18:24

Venue: Bloque 1 (H-1002)

S1005 A Presentation 4 (9:30~18:24)

Assesment of phytoremediation potential of pea (*Pisum sativum*) in naphthalene contaminated soil

Salima AGOUN-BAHAR S, Réda DJEBBAR, Ouzna ABROUS-BELBACHIR

Université of Science and Technology Houari Boumediene (USTHB), Algeria

Abstract—The lack of data on the bioavailability of polycyclic aromatic hydrocarbons or PAHs in polluted environments, their passage through food chains and the effects of interaction with other pollutants, justifies priority research on this vast family of hydrocarbons. Naphthalene is a PAH listed and classified as a priority pollutant. Although longer, biological techniques such as bioremediation or phytoremediation are often considered more environmentally friendly and less expensive than conventional techniques. In order to be able to contribute to the study of phytoremediation mechanisms, the behavior of the pollutant in the soil and its fate in different parts of the plant (roots, stems, leaves and fruit) was studied by GPC / MS. A second part of this study was focused on the evaluation of the impact of naphthalene on the root-specific Rhizobia strain of *Pisum sativum* and its effect after inoculation on seedling growth.

Pea seedling growth results showed no signs of toxicity. However, the pollutant slightly increased the amounts of fatty acid peroxides and strongly those of malonyldialdehyde, the product of lipid peroxidation. The inoculated Rhizobia bacteria appear to be specific to the roots of pea seedlings and naphthalene tolerant for the different concentrations used. The pea was able to cope with naphthalene by taking charge of the active oxygen molecules by increasing all the activities of the antioxidant enzymes studied particularly glutathione S transferase activity which increased for all concentrations used especially in leaves. From a quantitative data, 67% of the naphthalene was removed from the soil and then found in the leaves of the seedlings in just three weeks of cultivation but not found in fruits after five weeks of growth. Thus, pea seedlings seem in our experimental conditions, tolerate the pollutant when applied in the soil.

Poster Session

September 11, 2019 (Wednesday)

Time: 9:30~18:24

Venue: Bloque 1 (H-1002)

S9013 Presentation 5 (9:30~18:24)

A Multi-Class, Multi-Residue Method for Detection of Veterinary Drugs in Meat using a Pass-through Cleanup SPE Technique and HPLC-MS/MS Analysis

Jianhua Zhu, Yanxia Zhang, Yanming Liu, **Shichao Zheng**

Shandong Institute for Food and Drug Control, China

Abstract—A quantitative method using high performance liquid chromatography coupled with tandem mass spectrometry (HPLC-MS/MS) was developed for the determination of 60 compounds, belonging to a variety of veterinary drug (VD) classes, in meat. The included analytes belong to the following VD classes: β -agonists, sulfanilamides, quinolones, macrolides, β -lactams, nitroimidazoles, sex hormones, chloromycetins, sedatives and olaquinox metabolite. The effective PRiME (process, robustness, improvements, matrix effects, ease of use) pass-through cleanup procedure was used to ensure high extraction efficiency and good sample cleanup after a simple liquid extraction of the meat samples with acetonitrile/water. The developed method was validated successfully. Mean recoveries for all analytes ranged from 80% to 116%, with the relative standard deviations (RSDs) \leq 7.8%. Limits of quantification were in the range 0.05–3.0 $\mu\text{g kg}^{-1}$ and limits of detection were in the range 0.1–10 $\mu\text{g kg}^{-1}$. The matrix effect was evaluated for the different meat matrices and was found to be markedly different in different matrices. The validated method was used in a pilot study to analyse real samples of pork, beef, mutton, chicken, and pork liver, lambs' liver and chicken liver. Trace amounts of clenbuterol, salbutamol, oxytetracycline and enrofloxacin were detected in these samples. In conclusion, this workflow can provide a simpler and more cost-effective alternative to conventional analytical methods and is compatible with processing large sample numbers in a short time period.

Poster Session

September 11, 2019 (Wednesday)

Time: 9:30~18:24

Venue: Bloque 1 (H-1002)

S9008 Presentation 6 (9:30~18:24)

Removal of Metribuzin Herbicide Using Photocatalytic Support under Natural Sunlight

Nadia Chekir, Djilali Tassalit, Mounir Mellal, Ouassila Benhabiles, Naima Sahraoui, Madina Belmihoub and Houria Habbi

Université des Sciences et de la Technologie Houari Boumediene (USTHB), Alger, Algérie.

Abstract—Water polluted with pesticides is not compatible with classical biological treatment, Advanced Oxidation Processes (AOPs) can be used for the complete mineralization of these substances. They have been shown to be an alternative for treating wastewater containing biorecalcitrant contaminant. These processes involve generation and subsequent reaction of hydroxyl radicals (OH.), which are one of the most powerful oxidizing species, it is able to completely transform organic carbon into CO₂ and H₂O. Heterogeneous photocatalysis has recently emerged as an efficient method for purifying water. It can be considered as one of the new advanced oxidation Processes (AOPs) for water purification treatment.

In the present paper, we present the performance of 2 kinds of Titanium dioxide (Commercial Media Ahlstrom and impregnated TiO₂ on glass) as photocatalytic support in fixed bed reactor for the degradation of Metribuzin herbicide under solar radiation. The degradation Performance was studied under various conditions such as substrate and pH solution.

Poster Session

September 11, 2019 (Wednesday)

Time: 9:30~18:24

Venue: Bloque 1 (H-1002)

S1006 A Presentation 7 (9:30~18:24)

Long-term impact vegetation and biodiversity degradation on soil in an arid steppe of Algeria
Halima SLIMANI

Université of Science and Technology Houari Boumediene (USTHB), Algeria

Abstract—During the last decades, natural ecosystems, in particular those of arid lands have been marked by a rapid and severe degradation. One of the main problems of degradation of arid steppe rangelands in the southern Mediterranean is the changes in vegetation and loss of plant diversity.

A set of soil characters and vegetation were analyzed, in arid steppe of Algeria subject to desertification, between 1976 and 2016. During the four last decades, these rangelands faced two main driving forces: climate through more or less lasting and recurrent droughts and overgrazing by sheep.

The pre-existing system had been, about forty years ago, a pure steppe dominated by alfa-grass that was the typical landscape of the whole region under homogeneous environment features. Results show relative significant changes are declining rates of organic matter and of clay. These changes are related to declining vegetation and biodiversity mainly caused by overgrazing and drought.



Feedback Information

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