

2017 HKCBEEES SINGAPORE CONFERENCE ABSTRACT

**2017 5th International Conference on Environment Pollution and
Prevention (ICEPP 2017)**

**2017 4th International Conference on Environmental Systems Research
(ICESR 2017)**

**Nanyang Executive Centre in
Nanyang Technological University, Singapore**

December 14-16, 2017

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Singapore Conference Introductions

Welcome to 2017 HKCBEEES Singapore conference. This conference is organized by HKCBEEES. The objective of the Singapore conference is to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in Environment Pollution and Prevention; Environmental Systems Research.

2017 5th International Conference on Environment Pollution and Prevention (ICEPP 2017)

Papers will be published in the following proceeding:

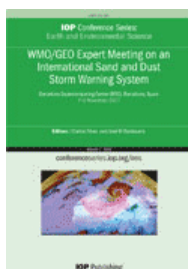


IOP Conference Series: Earth and Environmental Science (EES) (ISSN: 1755-1315), which is indexed by EI Compendex, Scopus, Thomson Reuters (WoS), INSPEC, et al;

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

2017 4th International Conference on Environmental Systems Research (ICESR 2017)

Papers will be published in the following proceeding:



IOP Conference Series: Earth and Environmental Science (EES) (ISSN: 1755-1315), which is indexed by EI Compendex, Scopus, Thomson Reuters (WoS), INSPEC, et al;

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

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 **12** 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 December 15, 2017.

Dress code

Please wear formal clothes or national representative of clothing.

Keynote Speaker Introductions

Keynote Speaker I



Prof. James T. Anderson

West Virginia University, USA

Dr. Jim Anderson is a professor of wildlife ecology and management, Davis-Michael Professor of Forestry and Natural Resources, Program Coordinator for the Wildlife and Fisheries Resources Program, and the Director of the Environmental Research Center at West Virginia University. He earned a B.S. in wildlife from the University of Wisconsin-Stevens Point, an M.S. in range and wildlife management through the Caesar Kleberg Wildlife Research Institute at Texas A&M University-Kingsville, and a Ph.D. in wildlife science from Texas Tech University. Jim has published over 120 scientific research articles on wetland ecology and management, wildlife-habitat relationships, and restoration ecology.

Topic: “Pollution Effects on Fish and Wildlife Communities”

Prof. James T. Anderson
School of Natural Resources
West Virginia University

Abstract—Fish and wildlife can serve as the proverbial canary in the coal mine and alert us to potential impacts of pollutants on human and ecosystem health. The accidental and intentional introduction of foreign substances into atmospheric, aquatic, and terrestrial systems can have deleterious effects on native fish and wildlife species, communities, and ecosystem processes. Pollutants may be solids, liquids, or gases, noise, and light. Even exotic species and direct human-disturbances can be classified as pollutants. Impacts may be displayed as population declines; behavioral changes; teratogenic, genotoxic, hormonal, and immunosuppression effects; and sex-ratio changes, among others. Air pollution impacts include deleterious impacts of acidity, nitrogen, and mercury accumulation on both terrestrial and aquatic species. Foreign substances such as micro- and macro-plastics accumulate in aquatic organisms causing metabolic and nutritional deficiencies. Chronic noise impacts may reduce nesting success and increase levels of stress hormones. Light emissions impact nesting and behavior of a variety of marine and terrestrial organisms. Significant gaps remain in our knowledge regarding pollution impacts on fish and wildlife species. Future research should address interactive effects of multiple pollutants and categories of pollutants and interactive effects of pollutants with environmental changes such as global climate change or habitat loss on both population and physiology of organisms. Implementation of effective pollution control technologies and discovery of socially acceptable programs targeting pollution-reduction behavior are also areas where further research is needed.

Keynote Speaker II



Prof. Ki-Hyun Kim

Department of Civil & Environmental Engineering, Hanyang University, South Korea

Prof. Ki-Hyun Kim was at Florida State University for an M.S. (1984-1986) and at University of South Florida for a Ph.D. (1988-1992). He was a Research Associate at ORNL, USA (1992 to 1994). He moved to Sang Ji University, Korea in 1995. In 1999, he joined Sejong University. In 2014, he moved to the Department of Civil and Environmental Engineering at Hanyang University. His research areas broadly cover the various aspects in the field of “Air Quality & Material Engineering” in connection with advanced novel materials like Coordination Polymers. He was awarded as one of the top 10 National Star Faculties in Korea in 2006. He is a serving editorial board member of several journals (e.g., Environmental Research, Atmospheric Pollution Research, and Sensors). He has published more than 500 articles, many of which are in leading scientific journals like ‘Chemical Society Reviews’, ‘Progress in Material Science’, ‘Progress in Polymer Science’, ‘Coordination Chemistry Reviews’, and ‘Trends in Analytical Chemistry’.

Topic: “The need for VOC removal in ambient air and advances in sorbent technology”

Prof. Ki-Hyun Kim

Department of Civil & Environmental Engineering, Hanyang University, South Korea

Abstract—Numerous materials have been developed and introduced as air quality treatment media for various gaseous pollutants including key volatile organic compounds like benzene based on diverse mechanisms (capture and catalytic degradation). The use of activated carbon (AC) based on sorptive treatment has been one of the most preferable options for the treatment of benzene. However, such options are generally subject to various limitations (e.g., limited sorption capacity and short retention). As a means to resolve those problems, researches have been directed toward either modification of AC’s functionality or invention of new or advanced materials like metal organic frameworks (MOFs). Nonetheless, the basic information is yet limited with respect to the practical option for the sorptive treatment. This review was organized to update all the sorptive technology for hard targets like benzene with respect to the selection of the best sorbent in terms of adsorption capacity and economic feasibility.



Coffee Break & Group Photo Taking

10:40~11:10

Keynote Speaker III



Assoc. Prof. YU Liya E.

Department of Civil and Environmental Engineering, National University of Singapore

Dr. Liya E. YU is an associate professor in the Department of Civil & Environmental Engineering and a principle investigator in the NUS Environmental Research Institute (NERI) at the National University of Singapore (NUS). Her research group investigates evolution of chemical-physical properties of aerosols in the atmosphere and relevant impacts on urban air quality through long-term monitoring and laboratory mechanistic studies. She also enjoys multi-disciplinary studies investigating potential health impacts of aerosols and mitigation of urban airborne pollutants. Arising from recent collaboration with experts in building construction materials, a novel approach is developed to enable buildings as purifiers to mitigate airborne pollutants and as contributors to sustainable urban environment. She is a member of the advisory board of an international scientific journal, *Aerosol and Air Quality Research* after her tenure as an associate editor. She obtains her PhD from the Stanford University, USA.

Topic: “Urban Airborne Pollutants in Southeast Asia: What do we know and what can we do?”

Assoc. Prof. YU Liya E.

Department of Civil and Environmental Engineering, National University of Singapore

Abstract—Urban environments in Southeast Asia experience complex airborne pollutants originating from cross-border and local emissions of traffic, industrial activities, biomass burning, etc. Mixtures of recurrent transboundary pollutants and local emissions under varied meteorological conditions can sometimes incur unexpected episodic air pollution, challenging existing scientific knowledge to tackle their origins and impacts. Additional complications are imposed when airborne pollutants undergo atmospheric evolution. Long-term studies have recently improved our understandings of properties of transboundary airborne pollutants, and demonstrated the capability of newly developed building materials. The latter evidences that building envelopes can serve as purifiers mitigating airborne gaseous and particulate pollutants in large cities. Such capability can revolutionize the role of buildings as long-standing contributors to sustainable urban environment.



Lunch	12:00~13:30
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Brief Schedule for Conference

Day 1	December 14, 2017 (Thursday) 10:00~17:00 Venue: Lobby of Nanyang Executive Centre Participants Onsite Registration & Conference Materials Collection
	December 15, 2017 (Friday) 9:00~18:15 Registration, Keynote Speech
Day 2	Morning Conference Venue: lecture room 3 (third level)
	Opening Remarks 9:00~9:10 Prof. James T. Anderson West Virginia University, USA
	Keynote Speech I 9:10~09:55 Topic: "Pollution Effects on Fish and Wildlife Communities" (Prof. James T. Anderson, West Virginia University, USA)
	Keynote Speech II 9:55~10:40 Topic: "The need for VOC removal in ambient air and advances in sorbent technology" (Prof. Ki-Hyun Kim , Department of Civil & Environmental Engineering, Hanyang University, South Korea)
	Coffee Break & Group Photo Taking 10:40~11:10
	Keynote Speech III 11:10~11:55 Topic: "Urban Airborne Pollutants in Southeast Asia: What do we know and what can we do?" (Assoc. Prof. YU Liya E., Department of Civil and Environmental Engineering, National University of Singapore)
	Lunch 12:00~13:30 Venue: Nanyang Executive Centre
	Afternoon Conference Venue: lecture room 3 - 5 (third level)
	Session 1:13:30~15:30 Venue: lecture room 3 8 presentations-Topic: "Water Resources Management and Soil Science"
	Session 2:13:30~15:45 Venue: lecture room 4 9 presentations-Topic: "Energy Engineering and Emission Reduction"
	Session 3: 13:30~16:15 Venue: lecture room 5 11 presentations-Topic: "Wastewater Treatment and Chemical Engineering"
	Coffee Break 15:45~16:00
	Session 4: 16:00~17:30 Venue: lecture room 3 6 presentations-Topic: "Air Pollution Monitoring and Management"

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	Session 5: 16:00~18:15 Venue: lecture room 4 9 presentations-Topic: “Ecological Environment Management and Sustainable Development”
	Dinner 18:30 Venue: Cosmo
Day 3	December 16, 2017 (Saturday) 9:00~17:00 One Day Visit

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

Detailed Schedule for Conference

December 15, 2017 (Friday)

Venue: lecture room 3 – 5 (third level)

9:00~9:10		Opening Remarks Prof. James T. Anderson West Virginia University, USA
9:10~09:55		Keynote Speech I Prof. James T. Anderson West Virginia University, USA Topic: “Pollution Effects on Fish and Wildlife Communities”
09:55~10:40		Keynote Speech II Prof. Ki-Hyun Kim Hanyang University, South Korea Topic: “The need for VOC removal in ambient air and advances in sorbent technology”
10:40~11:10	Coffee Break & Group Photo Taking	
11:10~11:55		Keynote Speech III Assoc. Prof. YU Liya E. National University of Singapore Topic: “Urban Airborne Pollutants in Southeast Asia: What do we know and what can we do?”
12:00~13:30	Lunch	
13:30~15:30	Session 1-8 presentations-Topic: “Water Resources Management and Soil Science”	
13:30~15:45	Session 2-9 presentations-Topic: “Energy Engineering and Emission Reduction”	
13:30~16:15	Session 3-11 presentations-Topic: “Wastewater Treatment and Chemical Engineering”	
15:45~16:00	Coffee Break	
16:00~17:30	Session 4-6 presentations-Topic: “Air Pollution Monitoring and Management”	
16:00~18:15	Session 5-9 presentations-Topic: “Ecological Environment Management and Sustainable Development”	

18:30	Dinner
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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 December 15, 2017.

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.

Afternoon, December 15, 2017 (Friday)

Time: 13:30~15:30

Venue: Lecture room 3

8presentations- Topic: “Water Resources Management and Soil Science”

Session Chair: Prof. Ki-Hyun Kim

P0032 Presentation 1 (13:30~13:45)

Nutrient supplying potential of different spent mushroom substrate preparations as soil amendment in a potting media

VU Ultra, Jr., JME Ong Sotto and MR Punzalan

Department of Earth and Environmental Sciences, Faculty of Science, Botswana International University of Science and Technology, Palapye, Botswana

Abstract—A three consecutive cropping experiment was conducted to evaluate the nutrient supplying potential of different preparations of the spent mushroom substrate as an amendment of growing media for potted plants using pechay as test plant. There are 12 treatment combinations consisted 4 types of growing media containing soil alone and mixtures of soil with fresh SMS (FSMS), weathered SMS (WSMS) and carbonized SMS (CSMS) in combination with 0%, 50% or 100% recommended rate (RR) of nitrogen fertilizer. Succeeding two trials were conducted on the same pots and treatment assignments. The high yield of pechay during the first and second crop was observed on WSMS and CSMS treatments FSMS media produced high yields only during the 3rd crop. Yield was increased by N fertilizer in WSMS and CSMS treatments but not in FSMS. The growth differences is attributed to differences in available nutrients and C/N ratio between treatments. WSMS and CSMS increased the available N while FSMS immobilized N and other nutrients indicating that weathered SMS and carbonized SMS are more suitable as a component of potting media or as soil amendments without detrimental effect on immobilization and availability of nutrients.

Session 1

Afternoon, December 15, 2017 (Friday)

Time: 13:30~15:30

Venue: Lecture room 3

8presentations- Topic: “Water Resources Management and Soil Science”

Session Chair: Prof. Ki-Hyun Kim

P0004 Presentation 2 (13:45~14:00)

Industrial development and challenges of water pollution in coastal areas: The case of Surat, India

Neeru Bansal

CEPT University, India

Abstract—Industrialisation plays an important role in the economic development of a country, however, pollution is the inevitable price paid for this development. Surat, a major industrial hub in western India, is located on the bank of the river Tapi and extends up to the Arabian Sea. The city is characterised by the presence of a number of creeks (known as ‘khadis’ in local language). This paper focusses on the industrial development in Surat and the challenges faced by the city due to water pollution. A constant deterioration in the quality of surface water resources has been observed due to discharge of treated or partially treated effluents from the industries. The problem of water pollution becomes critical due to increase in frequency of flooding, risks faced by the city due to climate change and the ineffective environmental governance. The paper provides insights into the challenges faced by the city and the learnings can lead to adoption of policy initiatives and other measures which can effectively address these challenges.

Session 1

Afternoon, December 15, 2017 (Friday)

Time: 13:30~15:30

Venue: Lecture room 3

8presentations- Topic: “Water Resources Management and Soil Science”

Session Chair: Prof. Ki-Hyun Kim

P0025 Presentation 3 (14:00~14:15)

Impact of leachate discharge from Cipayung Landfill on water quality of Pesanggrahan River, Indonesia

Eki Noerfitriyani, Djoko M. Hartono, Setyo S. Moersidik, Irma Gusniani

Environmental Engineering Study Program, Civil of Engineering Department, Universitas Indonesia, Depok, West Java, 16424, Indonesia

Abstract—The landfill operation can cause environmental problems due to solid waste decomposition in the form of leachate. The evaluation of environmental impacts related with solid waste landfilling is needed to ensure that leachate discharge to water bodies does not exceed the standard limit to prevent contamination of the environment. This study aims to analyze the impact of leachate discharge from Cipayung Landfill on water quality of Pesanggrahan River. The data were analyzed based on leachate samples taken from influent and effluent treatment unit, and river water samples taken from upstream, stream at leachate discharge, and downstream. All samples were taken three times under rainy season condition from April to May 2017. The results show the average leachate quality temperature is 34,81 °C, TSS 72.33 mg/L, pH 7.83, BOD 3,959.63 mg/L, COD 6,860 mg/L, TN 373.33 mg/L, Hg 0.0016 mg/L. The BOD₅/COD ratio 0.58 indicated that leachate characteristics was biodegradable and resemble intermediate landfill due to the mixing of young leachate and old leachate. The effluent of leachate treatment plant exceeds the leachate standard limit for BOD, COD, and TN parameters. Statistical results from independent T-test showed significant differences ($p < 0,05$) between upstream and downstream influenced with leachate discharge for DO parameter.

Session 1

Afternoon, December 15, 2017 (Friday)

Time: 13:30~15:30

Venue: Lecture room 3

8presentations- Topic: “Water Resources Management and Soil Science”

Session Chair: Prof. Ki-Hyun Kim

P3005 Presentation 4 (14:15~14:30)

Integrity model application: a quality support system for decision-makers on water quality assessment and improvement

D Mirauda, M Ostoich, F Di Maria, S Benacchio and I Saccardo

School of Engineering, Basilicata University, Viale dell’Ateneo Lucano 10, Potenza, 85100, Italy

Abstract—In this paper, a mathematical model has been applied to a river in North-East Italy to describe vulnerability scenarios due to environmental pollution phenomena. Such model, based on the influence diagrams theory, allowed identifying the extremely critical factors, such as wastewater discharges, drainage of diffuse pollution from agriculture and climate changes, which might affect the water quality of the river. The obtained results underlined how the water quality conditions have improved thanks to the continuous controls on the territory, following the application of Water Framework Directive 2000/60/EC. Nevertheless, some fluvial stretches did not reach the “good ecological status” by 2015, because of the increasing population in urban areas recorded in the last years and the high presence of tourists during the summer months, not balanced by a treatment plants upgrade.

Session 1

Afternoon, December 15, 2017 (Friday)

Time: 13:30~15:30

Venue: Lecture room 3

8presentations- Topic: “Water Resources Management and Soil Science”

Session Chair: Prof. Ki-Hyun Kim

P0027 Presentation 5 (14:30~14:45)

Characteristics of Leachate and Their Effect on Shallow Groundwater Quality (Case Study : TPA Cipayung, Depok)

Atika Widiastuti, Djoko M. Hartono, Setyo S. Moersidik, and Irma Gusniani

Universitas Indonesia, Indonesia

Abstract—The problems arising from landfill activity is leaked leachate that is not absorbed well into leachate stabilization pond which furthermore contaminates shallow groundwater around landfill, include Cipayung landfill. The aims of this study is to determine the characteristics of leachate and their effect on shallow groundwater quality around landfill based on temperature, pH, Total Suspended Solids (TSS), Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Nitrogen (TN), Mercury (Hg), and fecal coliform. Data were analyzed based on leachate samples at influent point, effluent point, and 7 sampling points of residents's well with distance variation every 100 meters within 300 meters radius having leachate stabilization pond as benchmark. According to the standard of Indonesia's Ministry of Environment and Forestry law No. 59 of 2016, the results showed that leachate quality was still above the standard of BOD, COD, and Total Nitrogen parameters ; 4178.0 mg/L, 70556.0 mg/L and 373.3 mg/L for influent point, and 3142.0 mg/L, 9055.2 mg/L, and 350 mg/L for the effluent point. Pollution Index of shallow groundwater is between lightly and moderately contaminated. This study showed that the further the distance between sampling point and leachate stabilization pond is, the lower the Pollution Index is.

Session 1

Afternoon, December 15, 2017 (Friday)

Time: 13:30~15:30

Venue: Lecture room 3

8presentations- Topic: “Water Resources Management and Soil Science”

Session Chair: Prof. Ki-Hyun Kim

P0041 Presentation 6 (14:45~15:00)

Detection of waterborne protozoa, viruses, and bacteria in groundwater and other water samples in the Kathmandu Valley, Nepal

E Haramoto

Interdisciplinary Center for River Basin Environment, Graduate Faculty of Interdisciplinary Research, University of Yamanashi, 4-3-11 Takeda, Kofu, Yamanashi 400-8511, Japan

Abstract—In this study, the prevalence of various waterborne pathogens in water samples collected in the Kathmandu Valley, Nepal, and the applicability of *Escherichia coli* as an indicator of pathogen contamination in groundwater were assessed. Fifty-three water samples, including shallow groundwater and river water, were analyzed to examine the presence of protozoan (oo)cysts via fluorescence microscopy and that of viral and bacterial genomes via quantitative PCR. At least one of the seven types of pathogens tested (i.e., *Cryptosporidium*, *Giardia*, human adenoviruses, noroviruses of genogroups I and II, group A rotaviruses, and *Vibrio cholerae*) was detected in 68% (15/22) of the shallow dug well water samples; groundwater in the shallow dug wells was more contaminated compared with that in shallow tube wells (8/15, 53%). River water and sewage samples were contaminated with extremely high concentrations of multiple pathogens, whereas a tap water sample supplied by a water tanker tested positive for human adenoviruses and *V. cholerae*. The detection of host-specific *Bacteroidales* genetic markers revealed the effects of human and animal feces on groundwater contamination. The tested pathogens were sometimes detected even in *E. coli*-negative groundwater samples, indicative of the limitations of using *E. coli* as an indicator for waterborne pathogens in groundwater.

Session 1

Afternoon, December 15, 2017 (Friday)

Time: 13:30~15:30

Venue: Lecture room 3

8presentations- Topic: “Water Resources Management and Soil Science”

Session Chair: Prof. Ki-Hyun Kim

P0044 Presentation 7 (15:00~15:15)

Identification of important parameter from leachate solid waste landfill on water quality, case study of Pesanggrahan River

R Yanidar, D M Hartono, S S Moersidik

University of Indonesia, Indonesia

Abstract—Cipayung Landfill takes waste generation from Depok City approximately ± 750 tons/day of solid waste. The south and west boundaries of the landfill is Pesanggrahan River which 200m faraway. The objectives of this study are to indicate an important parameter which greatly affects the water quality of Pesanggrahan River and purpose the dynamic model for improving our understanding of the dynamic behavior that captures the interactions and feedbacks important parameter in river in order to identify and assess the effects of the treated leachate from final solid waste disposal activity as it responds to changes over time in the river. The high concentrations of BOD and COD are not the only cause significantly affect the quality of the pesanggrahan water, it also because the river has been contaminated in the upstream area. It need the water quality model to support the effectiveness calculation of activities for preventing a selected the pollutant sources. The model should be developed for simulating and predicting the trend of water quality performance in Pesanggrahan River which can potentially be used by policy makers in strategic management to sustain river water quality as raw drinking water.

Session 1

Afternoon, December 15, 2017 (Friday)

Time: 13:30~15:30

Venue: Lecture room 3

8presentations- Topic: “Water Resources Management and Soil Science”

Session Chair: Prof. Ki-Hyun Kim

P3002 Presentation 8 (15:15~15:30)

Site-Specific Bioaccessibility of Arsenic-Contaminated Soil near a Former Smelter Site and Its Consequence on Risk-based Remediation

Kyoungphile Nam

Seoul National University, Korea

Abstract—An old, abandoned smelter site including rice paddy field and forest area has been widely contaminated with heavy metals in Korea. The surface soil (i.e., up to 15 cm below the top) was found to be contaminated mainly with arsenic (As) ranging from 9.8 to 170 mg/kg soil-with an average of 42.7 mg/kg-soil. The concentration of As in the subsurface soil was not significant, probably indicating that As contamination occurred from the flue gas (i.e., As₂O₃) from the smelter stack. Five-step sequential extraction demonstrates that about 70% of total As were bound to amorphous and crystalline Fe-oxides. Bioaccessible As concentration determined by the extraction method proposed by Solubility/Bioavailability Research Consortium (Kelly et al., Assessing Oral Bioavailability of Metals in Soil, Battelle Press, 2002) was 2-45 mg/kg-soil. The SBRC-extractable As concentrations were not related to soil properties such as pH, CEC, and clay/organic matter contents, but showed an inverse correlation to the As bound to crystalline Fe-oxides. A total of six operable units (OU) was designated in the study site, and relative bioavailability (RBA) of As was determined following the RBA and in vitro bioaccessibility relationship proposed by Juhaz et al. (Environmental Science & Technology, 2009, 43:9487-9494). RBA values for the six OUs were from 28 to 66%, and then exposure concentrations were derived, ranging from 11.1 to 31.6 mg/kg-soil. As a result, risk from ingestion, dermal contact, and fugitive dust inhalation of the surface soil was calculated. Noncarcinogenic risk was below the unity (i.e., HI < 1) when RBA was used for risk calculation. In contrast, carcinogenic risk of the six OUs exceeded 1.0-05E irrespective of RBA incorporation and soil ingestion exhibited the highest risk followed by dermal contact and fugitive dust inhalation. Soil remediation goals for the six OUs were determined to be from 11 to 20 mg/kg-soil and all of them were less than the Korean Soil Standard for As (i.e., 25 mg/kg-soil in residential area), demonstrating the necessity of risk calculation, not soil concentration, to protect potential receptors.

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, December 15, 2017 (Friday)

Time: 13:30~15:45

Venue: lecture room 4

9 presentations- Topic: “Energy Engineering and Emission Reduction”

Session Chair: Prof. Raghava Kommalapati

P0020 Presentation 1 (13:30~13:45)

Algae-Based Carbon Sequestration

Cai Haoyang

Hangzhou Foreign Language School, China

Abstract—Our civilization is facing a series of environmental problems, including global warming and climate change, which are caused by the accumulation of green house gases in the atmosphere. This article will briefly analyze the current global warming problem and propose a method that we apply algae cultivation to absorb carbon and use shellfish to sequester it. Despite the importance of decreasing CO₂ emissions or developing carbon-free energy sources, carbon sequestration should be a key issue, since the amount of carbon dioxide that already exists in the atmosphere is great enough to cause global warming. Algae cultivation would be a good choice because they have high metabolism rates and provides shellfish with abundant food that contains carbon. Shellfish’s shells, which are difficult to be decomposed, are reliable storage of carbon, compared to dead organisms like trees and algae. The amount of carbon that can be sequestered by shellfish is considerable. However, the sequestering rate of algae and shellfish is not high enough to affect the global climate. Research on algae and shellfish cultivation, including gene technology that aims to create “super plants” and “super shellfish”, is decisive to the solution. Perhaps the baton of history will shift to gene technology, from nuclear physics that has lost appropriate international environment after the end of the Cold War. Gene technology is vital to human survival.

Session 2

Afternoon, December 15, 2017 (Friday)

Time: 13:30~15:45

Venue: lecture room 4

9 presentations- Topic: “Energy Engineering and Emission Reduction”

Session Chair: Prof. Raghava Kommalapati

P0021 Presentation 2 (13:45~14:00)

The costs of climate change

Jason Guo

High School Student, The Paideia School, Atlanta, USA

Abstract—This research paper talks about the economic costs of climate change, as well as the costs involved in responding to climate change with alternative fuels. This paper seeks to show that climate change, although seemingly costly in the short run, will both save future generations trillions of dollars and serve as a good economic opportunity. Scientists have long argued that the fate of humanity depends on a shift towards renewable energy. However, this paper will make clear that there is also an economic struggle. By embracing alternative fuels, we will not only lessen the danger and the frequency of these natural disasters but also strengthen the world’s financial state. Although a common argument against responding to climate change is that it is too expensive to make the switch, this research shows that in the future, it will save millions of lives and trillions of dollars. The only question left for policymakers is whether they will grasp this energy source shift.

Session 2

Afternoon, December 15, 2017 (Friday)

Time: 13:30~15:45

Venue: lecture room 4

9 presentations- Topic: “Energy Engineering and Emission Reduction”

Session Chair: Prof. Raghava Kommalapati

P0010 Presentation 3 (14:00~14:15)

Impact of Subsidies on the Optimization of a Stochastic Biofuel Supply Chain with Different Risk Preferences

B. Sharma¹, **T E Yu**, B C English, C N Boyer and J A Larson

University of Tennessee, Knoxville, USA

Abstract—Lignocellulosic biomass feedstock, such as switchgrass, has been suggested as a potential source for biofuel production to meet the national goal of renewable fuels in the United States (U.S.). Currently, the high logistics cost due to yield uncertainty of feedstock has presented a hindrance of a large scale switchgrass biofuel industry. The Biomass Crop Assistance Program (BCAP), introduced by the U.S. Department of Agriculture, aims to alleviate the risk of biomass feedstock supply by providing subsidies to owners and operators of agricultural or non-industrial private forest land who agree to establish, produce, and deliver biomass feedstocks for biofuel production. Thus, the objective of this study is to assess the impact of the government’s subsidies on the optimal specification of a stochastic biofuel supply chain that considers yield variation of feedstock in the investment decision given diverse risk preferences of the decision maker. Results suggest that investment on lands for switchgrass production under the risk averse case is much higher than the risk neutral case to manage the adverse influences of low yield scenarios. Also, optimal investment decisions in feedstock acreage and biofuel plants configuration are more responsive to BCAP subsidies with risk-averse compared to risk-neutral decision makers under switchgrass supply uncertainty.

Session 2

Afternoon, December 15, 2017 (Friday)

Time: 13:30~15:45

Venue: lecture room 4

9 presentations- Topic: “Energy Engineering and Emission Reduction”

Session Chair: Prof. Raghava Kommalapati

P1008 Presentation 4 (14:15~14:30)

Use of sewage sludge in incinerators

C. Iticescu, **M. Timofti**, D. Dima, A. Circiumaru, G. Murariu, L. Georgescu

Department of Chemistry, Physics and Environment, European Centre of Excellence for the Environment, “Dunarea de Jos” University of Galati, 111 Domneasca Street, 800201 Galati, Romania

Abstract—The amounts of sludge resulting from the treatment of the domestic and industrial wastewater can create serious environmental problems if no solutions are found to eliminate them. That is why we seek to identify optimal ways of treating, capitalizing and eliminating the sludge safely. The sewage sludge can be used in industry or as a source of energy by incineration or co-incineration with other waste or coal, and can be a long-term solution for diminishing the amount of waste. In order to use sewage sludge as fuel, we need to know their calorific values. In this study, caloric power was determined on samples of sewage sludge from SEAU Braila using a calorimetric bomb. The apparatus used to determine the calorific power was a Parr 6755 Solution Calorimeter calorimetric bomb. It was also determined the main chemical and physico-chemical parameters both of the sludge and the ashes. Heavy metal content was determined using an XRF Niton device. TOC (total organic carbon) content was determined using a Spectroquant TR 620 digestion system and a NOVA 60 spectrophotometer.

Session 2

Afternoon, December 15, 2017 (Friday)

Time: 13:30~15:45

Venue: lecture room 4

9 presentations- Topic: “Energy Engineering and Emission Reduction”

Session Chair: Prof. Raghava Kommalapati

P0046 Presentation 5 (14:30~14:45)

Structural break, stock prices of clean energy firms and carbon market

Yubao Wang and **Junyu Cai**

School of Economics and Finance, Xi'an Jiaotong University, Xi'an, China

Abstract—This paper uses EU ETS carbon future price and Germany/UK clean energy firms stock indices to study the relationship between carbon market and clean energy market. By structural break test, it is found that the ‘non-stationary’ variables judged by classical unit root test do own unit roots and need taking first difference. After analysis of VAR and Granger causality test, no causal relationships are found between the two markets. However, when Hsiao’s version of causality test is employed, carbon market is found to have power in explaining the movement of stock prices of clean energy firms, and stock prices of clean energy firms also affect the carbon market.

Session 2

Afternoon, December 15, 2017 (Friday)

Time: 13:30~15:45

Venue: lecture room 4

9 presentations- Topic: “Energy Engineering and Emission Reduction”

Session Chair: Prof. Raghava Kommalapati

R0004 Presentation 6 (14:45~15:00)

Synergistic Emission Reduction of SO₂ and CO₂ Based on Clean Energy Replacement in ports

Zhu Li and Qin Cuihong

China Waterborne Transport Research Institute, #8, Xitucheng Road, Beijing, 100088, China

Abstract—China's energy-saving emission reduction policy calls for improved air quality while reducing greenhouse gas emissions. This paper takes the container terminal as the research object, the energy saving and emission reduction of clean energy alternative fuels such as solar energy, wind energy, geothermal energy, LNG and electricity are studied through the combination of energy substitution and emission factors. In particular, SO₂ and CO₂ Synergistic mitigation effect. The results show that the reduction SO₂ and CO₂ is positively correlated with the usage of clean energy amount. Among them, LNG has the greatest contribution to the coordinated emission reduction of SO₂, and solar energy contributes the most to CO₂ reduction. Our conclusion is that the use of LNG and shore power in ports can achieve better synergistic emission reductions for SO₂ and CO₂. And through the use of air sources, solar energy, wind energy and light energy, CO₂ emission reduction effect is better than SO₂ emission reduction. The Chinese government can use this method as a policy tool for energy conservation and emission reduction, and vigorously promoted the application of LNG and shore power in ports.

Session 2

Afternoon, December 15, 2017 (Friday)

Time: 13:30~15:45

Venue: lecture room 4

9 presentations- Topic: “Energy Engineering and Emission Reduction”

Session Chair: Prof. Raghava Kommalapati

R3005 Presentation 7 (15:00~15:15)

Evaluation of the Life Cycle Environmental Impact of Onshore and Offshore Wind Farms in Texas

Raghava Kommalapati, Jesuina Chipindula, Venkata Botlaguduru, Hongbo Du and Ziaul Huque

Dept. of Civil & Environmental Engineering, Prairie View A&M University, Prairie View, TX, USA

Abstract—The decade from 2005-2015 witnessed a tenfold increase in the contribution of wind energy toward total electricity generated in the U.S. Although the environmental impact during operation of wind farms is minuscule in comparison to fossil fuel powerplants, there is a potential for high impact during the early stages of wind energy lifecycle. This study attempts to quantify the potential impacts of individual stages in the lifecycle of wind farms toward total lifecycle environmental impact, at onshore, shallow- and deep-water locations in Texas. SimaPro[®] 8.3.0 life cycle assessment (LCA) software in combination with Impact 2002+ method was used to identify that material extraction/processing stage has the highest impact across 15 midpoint categories at all locations. Results from sensitivity analysis on electricity sourcing reveal that increasing natural gas contribution for material extraction could reduce impact in respiratory inorganics and aquatic eutrophication categories by 2-5%. The payback times for CO₂ and energy consumption range from (6-14) and (6-17) months respectively, with onshore wind farms having shorter payback times. Lifecycle global warming potential (GWP) for onshore, shallow- and deep-water locations were 6.76±0.81, 7.99±2.12 and 7.92±0.45 gCO_{2eq}/kWh respectively. The higher variability in estimating GWP for shallow-water location is attributed to the significance of foundation installation.

Session 2

Afternoon, December 15, 2017 (Friday)

Time: 13:30~15:45

Venue: lecture room 4

9 presentations- Topic: “Energy Engineering and Emission Reduction”

Session Chair: Prof. Raghava Kommalapati

P0026 Presentation 8 (15:15~15:30)

Affecting Factors on Local Waste Management in Penyangkringan Village, Weleri: an Identification

Nadia Puspita Adriyanti, Ova Candra Dewi , Ahmad Gamal, Mohammad Joko Romadhon and Raditya

Universitas Indonesia, Indonesia

Abstract—Villages in Indonesia usually does not have proper waste management and it is affecting the environmental and social condition in those places. Local governments have been trying to implement many kinds of solid waste management systems and yet many of them does not bear fruit. We argue that the failure of the waste management implementation in Indonesian villages is due to several aspects: the geographic condition of the villages, the social conditions, and the availability of facilities and infrastructures in those villages. Waste management should be modeled in accordance to those three aspects.

Session 2

Afternoon, December 15, 2017 (Friday)

Time: 13:30~15:45

Venue: lecture room 4

9 presentations- Topic: “Energy Engineering and Emission Reduction”

Session Chair: Prof. Raghava Kommalapati

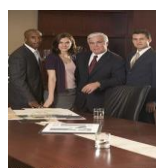
P3008 Presentation 9 (15:30~15:45)

Modification of Indirect Solar Dryer for Simplicia Production

C W Purnomo and S Indarti

Agrotechnology Innovation Center (PIAT), Universitas Gadjah Mada, Berbah Sleman, Yogyakarta, Indonesia

Abstract—Simplicia is natural ingredient for herbal medicine that has been subjected to drying only. This study aims to develop an appropriate drying equipment to produce dried leaves of sambung nyawa (*Gynura procumbens* (Lour.) Merr.) or also called “longevity spinach”. Typical indirect solar drier was modified to be able to process more fresh leaves in order to speed up the production. The modification was done using double solar collector and wind powered ventilation. The double solar collector was applied in order to collect more solar energy for larger dimension of drying chamber, while the wind-ventilator was installed to provide forced convection of hot air flow inside the dryer. The drying kinetic including the drying constants were investigated using three common thin layer drying equations to model the drying behavior of the leaves. The moisture ratio (MR) depletion with respect to the drying time (t) of the leaves can be well represented by equation of $MR = 1.1732\exp(-0.0993t) - 0.1732\exp(-17.3871t)$.



Coffee Break & Group Photo Taking	15:45~16:00
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Session 3

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, December 15, 2017 (Friday)

Time: 13:30~16:15

Venue: lecture room 5

11 presentations- Topic: “Wastewater Treatment and Chemical Engineering”

Session Chair: Prof. Hideyoshi Toyoda

P0007 Presentation 1 (13:30~13:45)

Generation of OH radical by ultrasonic irradiation in batch and circulatory reactor

Yu Fang, Sayaka Shimizu, Takuya Yamamoto and Sergey Komarov

Graduate school of environmental studies, Tohoku University, Sendai, Miyagi Prefecture 980-8579, Japan

Abstract—Ultrasonic technology has been widely investigated in the past as one of the advance oxidation processes to treat wastewater, in this process acoustic cavitation causes generation of OH radical, which play a vital role in improving the treatment efficiency. In this study, OH radical formation rate was measured in batch and circulatory reactor by using Weissler reaction at various ultrasound output power. It is found that the generation rate in batch reactor is higher than that in circulatory reactor at the same output power. The generation rate tended to be slower when output power exceeds 137W. The optimum condition for circulatory reactor was found to be 137W output and 4L/min flow rate. Results of aluminum foil erosion test revealed a strong dependence of cavitation zone length on the ultrasound output power. This is assumed to be one of the reasons why the generation rate of HO radicals becomes slower at higher output power in circulatory reactor.

Session 3

Afternoon, December 15, 2017 (Friday)

Time: 13:30~16:15

Venue: lecture room 5

11 presentations- Topic: “Wastewater Treatment and Chemical Engineering”

Session Chair: Prof. Hideyoshi Toyoda

P0008 Presentation 2 (13:45~14:00)

Optimization of lead removal via Napier grass in synthetic brackish water using response surface model

P Hongswat, P Suttiarporn, K Wutsanthi and G Kongsiri

Faculty of Science Energy and Environment, King Mongkut's University of Technology North Bangkok, Rayong campus, Thailand

Abstract—The efficiency of the lead (Pb) phytoremediation by Napier grass was studied on the plant's growth and plant's tolerance on the Pb toxicity in synthetic brackish water. It was found that the plant was high tolerance to high level of Pb concentration (10 mg/l) in synthetic brackish water. Which revealed on the possibilities of plant's growth under the presence of Pb contaminated condition. According to the Pb removal efficiency, the highest one ($88.63 \pm 4.9\%$) was found at 10 ppm Pb concentration, 0.3 g/l NaCl concentration during the period 45 day. However, this study investigated the optimum condition for lead (Pb) removal from synthetic brackish water using phytoremediation treatment with Napier grass through a Box-Behnken Design. Three operational variables, i.e. Pb concentration (1, 5.5, 10 mg/l), NaCl (0.1, 0.3, 0.5 g/l) and period time (7, 26, 45 day), were determined. The results were provided evidence that the highest Pb removal efficiency (93.56%) from synthetic brackish water via Napier grass was Pb and NaCl concentration at 10 mg/l and 0.5 g/l during 45 day.

Session 3

Afternoon, December 15, 2017 (Friday)

Time: 13:30~16:15

Venue: lecture room 5

11 presentations- Topic: “Wastewater Treatment and Chemical Engineering”

Session Chair: Prof. Hideyoshi Toyoda

P0047 Presentation 3 (14:00~14:15)

Modeling the performance of a tannery wastewater common effluent treatment plant using artificial neural networks

Priya Kuppusamy, Tasneem Abbasi and V Murugaiyan

Department of Chemical Engineering, Pondicherry Engineering College, Puducherry 605014, India

Abstract—This paper demonstrates the application of artificial neural networks (ANNs) to model the performance of a common effluent treatment plant (CETP) for treating tannery waste water. A Levenberg-Marquardt feed forward back-propagation neural network with two hidden layers and 300 hidden neurons was used to develop the model. The influent and effluent wastewater quality for the previous year, in terms of COD, TDS, TSS, chlorides, sulphides, total alkalinity and total hardness was taken to set up the model. Overall 240 such sets of data were used for the training of the network. The ability of the ANN model to predict the plant performance was assessed on the basis of the coefficient of determination (R^2), the normalized root mean square error (NRMSE) and the percentage average relative error (%ARE). The model gave an R^2 of 0.997 and a NRMSE of less than 1. Further tests to assess the accuracy of the model was done by calculating the %ARE for each of the individual water quality parameters, which were found to be 9.97 for COD, 3.36 for TDS, 18.09 for TSS, 2.53 for chlorides, 6.56 for total Alkalinity and 4.14 for total hardness. Thus the ANN model has been found to be suitable for assessing the performance of the CETP.

Session 3

Afternoon, December 15, 2017 (Friday)

Time: 13:30~16:15

Venue: lecture room 5

11 presentations- Topic: “Wastewater Treatment and Chemical Engineering”

Session Chair: Prof. Hideyoshi Toyoda

P1007 Presentation 4 (14:15~14:30)

Effect of Fe hydrolytic flocs on antimonate removal from water

Muhammad Ali Inam, Du Ri Park, Rizwan Khan, Saba Zamzam, So Hee Kim and Ick Tae Yeom

Graduate School of Water Resources, Sungkyunkwan University, Republic of Korea

Abstract—Since the last decade, antimony removal from water had been paid attention due to its carcinogenicity and adverse impacts upon humans. It exists in an environment in the form of antimonite (Sb(III)) and antimonate (Sb(V)) as a result of natural as well as anthropogenic activities. Sb(V) is usually found in oxic environments and its removal from water is essential. Therefore, in this study, we investigated the adsorptive removal of Sb(V) using Fe hydrolytic flocs. Initially, Fe hydrolytic flocs formation were observed at various pH using ferric chloride. Furthermore, experiments were conducted to observe the behavior of Sb(V) removal under various pH conditions. In addition, the effect of different Fe flocs concentrations for Sb(V) removal at neutral pH was also analyzed. Adsorption isotherm study was also conducted to identify the Sb(V)-Fe sorption phenomenon. The results indicated that the Fe flocs formation was continuously enhanced across broad pH range i.e. 4 to 10 in the absence of Sb(V). While the dependency of Sb(V) on pH was found significant. Although Sb(V) showed high removal efficiency at pH 6-8; at pH 9 and 10, no Sb(V) removal was observed due to complete dissolution of Fe hydrolytic flocs. While, at neutral pH, when more Fe flocs were supplied, Sb(V) removal efficiency was enhanced. Adsorption isotherm study showed that Sb(V) removal by Fe hydrolytic flocs followed Langmuir isotherm, thus indicating the homogeneous surface of Fe flocs with same energy of adsorption for Sb(V) and monolayer formation between Fe hydrolytic flocs and Sb(V). This study concluded that pH is a significant factor affecting Sb(V) removal from water. While at pH 6-8, Fe hydrolytic flocs contain strong potential in adsorbing Sb(V) molecules from water.

Session 3

Afternoon, December 15, 2017 (Friday)

Time: 13:30~16:15

Venue: lecture room 5

11 presentations- Topic: “Wastewater Treatment and Chemical Engineering”

Session Chair: Prof. Hideyoshi Toyoda

P0012 Presentation 5 (14:30~14:45)

Treatment of pesticide contaminated wastewater using bioaugmented stirred tank reactor

Seema Jilani and M. Altaf Khan

Institute of Environmental Studies, University of Karachi, Karachi-75270, Pakistan

Abstract—In Pakistan, pesticides are being used in high amount to increase the agricultural production. The residue of the applied pesticides stays in the environment for a longer period of time and therefore causing the soil and water contamination. These pesticides may be toxic, mutagenic and carcinogenic and may be bioaccumulated or biomagnified by the biota. With new regulations and a greater environmental concern, treatment of such hazardous compounds needs especial attention. Research on the removal of pesticides by a single potential microbial strain is limited. The research objective was to assess the growth and biodegradation potential of soil isolate in the presence of cypermethrin. During experimental studies conducted in the flask as well as in bioreactor, it was observed that the isolated strain, *Pseudomonas*, designated as IES-*Ps*-1, grows normal at low concentration of cypermethrin when compared with the control test (without pesticide). However, at high concentration, the microbial count decreased, but the culture remained in lag phase and no death occurred. In many cases, the growth of organisms in the presence of particular substrate serves as an indication about its metabolic potential. However, to confirm this, COD and HPLC analysis was performed. The results described that under aerobic culture conditions using mechanical aerators, almost complete removal of Cypermethrin (20mg/L) occurred in 48 hours. It may be concluded that the isolated strain, IES-*Ps*-1, can be used for biodegradation or bioremediation of pesticide contaminated environment.

Session 3

Afternoon, December 15, 2017 (Friday)

Time: 13:30~16:15

Venue: lecture room 5

11 presentations- Topic: “Wastewater Treatment and Chemical Engineering”

Session Chair: Prof. Hideyoshi Toyoda

R1004 Presentation 6 (14:45~15:00)

Experimental Study on the Integrated Performance of Dust Removal and Water Vapour Recovery in Catalytic Cracking Gas

LIU An-Lin, ZHANG Yan-Hong, MA Liang* and HE Meng-Ya

State Key Laboratory of Chemical Engineering, East China University of Science and Technology, Shanghai 200237, China

Abstract—Industrial combustion flue gas contains fine dust, water vapor, in order to remove micro dust, and to recover water vapor at the same time. we have put forward a research on the technology of recovering water vapor and dust removal by using a cyclone separator for the first time. By studying the pressure drop, the separation efficiency and the efficiency of recovering condensed water of the flue gas, we can get the optimum technological parameters for the actual working conditions. The results show that the pressure drop increases with the increase of inlet velocity and temperature, and the rate of increase is increasing. When under the same cooling water flow rate, the dust separation efficiency increases first and then decrease with the inlet velocity increase. When the inlet velocity is near the 50 m³/h, the separation efficiency reaches the maximum, 96%. The amount of vapor recovery increases with the increase of cooling medium flow rate in 15 minutes. When at the same cooling medium flow rate, the recovery increases first and then decrease with the inlet velocity increase, and reaches the maximum when the inlet velocity is 60-80 m³/h.

Session 3

Afternoon, December 15, 2017 (Friday)

Time: 13:30~16:15

Venue: lecture room 5

11 presentations- Topic: “Wastewater Treatment and Chemical Engineering”

Session Chair: Prof. Hideyoshi Toyoda

P2005 Presentation 7 (15:00~15:15)

Effect of Morphological Change to Photochemical/Electrochemical Performance of Graphene Nanocomposites

Meilan Pan

Nanjing University, China

Abstract—Graphene is easily warped in the out-of-plane direction because of its high in-plane Young’s modulus, and exploring the influence of morphological change on its properties is essential for the design of graphene-based nanocomposites for environmental applications.¹⁻⁴ Herein, firstly, we prepared wrinkle graphene (WGN-1 and WGN-2) by thermal treatment and compared their electrochemical properties with those of flat graphene nanosheets (FGN).^{5,6} FGN exhibit activities those are much better than those of wrinkled graphene nanosheets (WGN), not only in the electrochemical oxidation of methylene blue (MB) but also in the electrochemical reduction of nitrobenzene (NB). Most importantly, we also prepared nanoparticles supported by graphene (NPs@G), verifying that graphene confined in NPs@G became flatter than the separate graphene sheets based on AFM, SEM and TEM analysis. The flatter graphene in NPs@G could enhance electron transfer across/along graphene surface, resulting in much better performance of the composites for photochemical/electrochemical water treatment and energy conversion applications. These findings reveal that morphology change of the graphene (graphene nanocomposites) greatly affects photochemical/electrochemical performances and may have important implications for the design of novel graphene-based nanostructures and for our understanding of graphene morphology-dependent performances in environmental process.

Session 3

Afternoon, December 15, 2017 (Friday)

Time: 13:30~16:15

Venue: lecture room 5

11 presentations- Topic: “Wastewater Treatment and Chemical Engineering”

Session Chair: Prof. Hideyoshi Toyoda

P0030 Presentation 8 (15:15~15:30)

Heavy Metals and Radioactivity Reduction from Acid Mine Drainage Lime Neutralized Sludge

T Mashifana, N Sithole

University of Johannesburg, Department of Chemical Engineering, P.O. Box 17011, Doornfontein 2088, South Africa

Abstract—The worldwide known treatment processes of acid mine drainage result into the formation of hydrous ferric oxides that is amorphous, poorly crystalline and into the generation of hazardous voluminous sludge posing threat to the environment. Applicable treatment technologies to treat hazardous solid material and produce useful products are limited and in most cases nonexistence. A chemical treatment process utilizing different reagents was developed to treat hazardous acid mine drainage (AMD) sludge with the objectives to conduct radioactivity assessment of the sludge generated from lime treatment process and determine the reagent that provides the best results. Leaching with 0.5 M citric acid, 0.4 M oxalic acid, 0.5 M sodium carbonate and 0.5 M sodium bicarbonate was investigated. The leaching time applied was 24 hours at 25 °C. The characterization of the raw AMD revealed that the AMD sludge from lime treatment process is radioactive. The sludge was laden with radioactive elements namely, ^{238}U , ^{214}Pb , ^{226}Ra , ^{232}Th , ^{40}K and ^{214}Bi . 0.5 M citric acid provided the best results and the hazardous contaminants were significantly reduced. The constituents in the sludge after treatment revealed that there is a great potential for the sludge to be used for other applications such as building and construction.

Session 3

Afternoon, December 15, 2017 (Friday)

Time: 13:30~16:15

Venue: lecture room 5

11 presentations- Topic: “Wastewater Treatment and Chemical Engineering”

Session Chair: Prof. Hideyoshi Toyoda

P0031 Presentation 9 (15:30~15:45)

Kinetic Study on the Removal of Iron from Gold Mine Tailings by Citric Acid

T Mashifana, N Mavimbela and N Sithole

University of Johannesburg, Department of Chemical Engineering, P.O. Box 17011, Doornfontein 2088, South Africa

Abstract—The Gold mining generates large volumes of tailings, with consequent disposal and environmental problems. Iron tends to react with sulphur to form pyrite and pyrrhotite which then react with rain water forming acid rain. The study focuses on the removal of iron (Fe) from Gold Mine tailings; Fe was leached using citric acid as a leaching reagent. Three parameters which have an effect on the removal of Fe from the gold mine tailings, namely; temperature (25 °C and 50 °C), reagent concentration (0.25 M, 0.5 M, 0.75 M and 1 M) and solid loading ratio (20 %, 30 % and 40 %) were investigated. It was found that the recovery of Fe from gold mine tailings increased with increasing temperature and reagent concentration, but decreased with increasing solid loading ratio. The optimum conditions for the recovery of Fe from gold mine tailings was found to be at a temperature of 50 °C, reagent concentration of 1 M and solid loading of 20 %. Three linear kinetic models were investigated and Prout-Tompkins kinetic model was the best fit yielding linear graphs with the highest R^2 values.

Session 3

Afternoon, December 15, 2017 (Friday)

Time: 13:30~16:15

Venue: lecture room 5

11 presentations- Topic: “Wastewater Treatment and Chemical Engineering”

Session Chair: Prof. Hideyoshi Toyoda

P0037 Presentation 10 (15:45~16:00)

The removal of Cu (II) from aqueous solution using sodium Borohydride as a reducing agent

N T Sithole, F Ntuli, T Mashifana

University of Johannesburg, Department of Chemical Engineering, P.O. Box 17011, Doornfontein 2088, South Africa

Abstract—The removal and recovery of metals from wastewater has been a subject of significant importance due the negative impact these toxic metals have on human health and the environment as a result of water and soil pollution. Increased use of the metals and chemicals in the process industries has resulted in generation of large quantity of effluents that contains high level of toxic metals and other pollutants. The objective of this work was to recover of Cu in its elemental form as metallic powder from aqueous solution using NaBH₄ as a reducing agent. Reductive precipitation was achieved in a batch reactor at 65oC using Cu powder as a seeding material. This study also investigated the effect of concentration of sodium borohydride (NaBH₄) as a reducing agent. The amount of NaBH₄ was varied based on mole ratios which are 1:1, 1:0.25 and 1:0.1 to recover Cu from synthetic wastewater. The results obtained showed that sodium borohydride is an effective reducing agent to recover Cu from wastewater. The optimum concentration of NaBH₄ that gives the best results the 1:1 molar ratio with over 99% Cu removal.

Session 3

Afternoon, December 15, 2017 (Friday)

Time: 13:30~16:15

Venue: lecture room 5

11 presentations- Topic: “Wastewater Treatment and Chemical Engineering”

Session Chair: Prof. Hideyoshi Toyoda

P0042 Presentation 11 (16:00~16:15)

Removal of manganese from solution using polyamide membrane

MJ Mathaba, **NT Sithole**, T Mashifana

University of Johannesburg, Department of Chemical Engineering, P.O. Box 17011, Doornfontein 2028, South Africa

Abstract—The work demonstrates the performance of polyamide membrane in the removal of manganese ions from single salt aqueous solution simulating real acid mine drainage. The membrane was tested using a dead-end filtration cell with manganese sulphate was used to prepare a feed solution. The membrane flux and metal rejection was evaluated. Effect of operating parameters such as pH, initial feed concentration and pressure on membrane performance was investigated. The pressure was varied between 10 and 15 bars and it was observed that increasing the pressure increases the membrane flux. Acidic pH conditions contributed to the removal of the contaminate as Mn^{2+} ions are freely at low pH. The percentage rejection was found to be 63.5 to 77.6 % as concentration is increased from 290 ppm to 321 ppm for a feed solution. The membrane showed satisfactory results in removing metal ions from solution.

Session 4

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, December 15, 2017 (Friday)

Time: 16:00~17:30

Venue: Lecture room 3

6 presentations- Topic: “Air Pollution Monitoring and Management”

Session Chair: Assoc. Prof. YU Liya E.

P0009 Presentation 1 (16:00~16:15)

Indoor PM_{2.5} and its Polycyclic Aromatic Hydrocarbons in Relation with Incense Burning

Susira Bootdee, Somporn Chantara and Tippawan Prapamontol

Environmental Science Program, Faculty of Science, Chiang Mai University, Chiang Mai, Thailand, 50200

Abstract—This study aims to determine fine particulate matter (PM_{2.5}) and polycyclic aromatic hydrocarbons (PAHs) emitted from incense burning to assess human health risk. PM_{2.5} samples were collected for 8 hrs and 24 hrs during special occasions and normal period from two shrines in the city of Chiang Mai, Thailand. PM_{2.5}-bound PAHs were extracted and analyzed by GC-MS. The highest average PM_{2.5} concentrations were found during Chinese New Year ($625 \pm 147 \mu\text{g}/\text{m}^3$ (8 hrs) and $406 \pm 159 \mu\text{g}/\text{m}^3$ (24 hrs)). The highest total PAHs concentrations were also found during the same period ($168 \pm 60 \text{ ng}/\text{m}^3$ for 8 hrs and 102 ± 26 and for 24 hrs). Concentrations of PM_{2.5} and carcinogenic-PAHs were highly correlated ($r = 0.451\text{--}0.802$) and were high during special occasions particularly during Chinese New Year due to high number of visitors and amount of incense being burned. The toxicity equivalent (TEQ) values were also relatively high during Chinese New Year ($31\text{--}32 \text{ ng}/\text{m}^3$ (8 hrs) and $10\text{--}20 \text{ ng}/\text{m}^3$ (24 hrs)). It can be revealed that incense burning emits air pollutants and can increase degree of indoor air pollution and human health risk.

Session 4

Afternoon, December 15, 2017 (Friday)

Time: 16:00~17:30

Venue: Lecture room 3

6 presentations- Topic: “Air Pollution Monitoring and Management”

Session Chair: Assoc. Prof. YU Liya E.

P0033 Presentation 2 (16:15~16:30)

Development of Coplanar-Coaxial Dielectric Barrier Discharge Conjugated with Ag/ γ -Al₂O₃ catalyst for the NO_x Reduction

Duc Ba Nguyen and Young Sun Mok

Department of Chemical and Biological Engineering, Jeju National University, Jeju 690-756, Korea

Abstract—Reduction of NO_x was examined in a coplanar-coaxial dielectric barrier discharge (DBD) reactor conjugated with Ag/ γ -Al₂O₃ catalyst, which was prepared by incipient wetness impregnation method and calcination process at 500°C in 5 hours. Plasma-catalyst for NO_x reduction was performed with various operating parameters, namely applied voltage, oxygen concentration in feed, and amount of Ag catalyst loading. The process was considered regarding NO reduction efficiency and energy efficiency. The research elevated and extended our knowledge for NO_x reduction in a combination of a coplanar-coaxial DBD plasma with Ag/ γ -Al₂O₃. Since the simple configuration of coplanar-coaxial DBD reactor and it facilitated parking materials in the discharge zone, the results are critical for future application.

Session 4

Afternoon, December 15, 2017 (Friday)

Time: 16:00~17:30

Venue: Lecture room 3

6 presentations- Topic: “Air Pollution Monitoring and Management”

Session Chair: Assoc. Prof. YU Liya E.

P0035 Presentation 3 (16:30~16:45)

Short-term introduction of air pollutants from fireworks during Diwali in rural Palwal, Haryana, India: A case study

S Gautam, A Yadav, A Pillarisetti, K Smith and N Arora

Marwadi University, Rajkot, India

Abstract—The contribution of firework-related air pollutants into the rural atmosphere was monitored by measuring ambient air concentrations of PM_{2.5}, CO, and metals over Mitrol–Aurangabad, Haryana, India, before, during, and after the 2015 Diwali celebration. PM_{2.5} concentrations were observed to be approximately 5 times and 12 times higher than Indian and WHO 24-h standards, respectively. CO concentrations on the day of Diwali were found to be nearly 7.5 times and nearly 1.5 times higher than Indian standards and WHO 8-h standards, respectively. Increased concentrations of SO₄, K, N₃, Al, and Na were observed. SO₄, K, N₃, Al, and Na were found between approximately 2 and 5 times higher on festival days than on a normal, non-festival day in November. Use of firecrackers during Diwali and surrounding celebrations thus contribute to decreased air quality and elevated levels of air pollutants associated with adverse health impacts. Optimization or controlled use of firecrackers during Diwali is suggested in rural areas.

Session 4

Afternoon, December 15, 2017 (Friday)

Time: 16:00~17:30

Venue: Lecture room 3

6 presentations- Topic: “Air Pollution Monitoring and Management”

Session Chair: Assoc. Prof. YU Liya E.

P3003 Presentation 4 (16:45~17:00)

Characterization of Chemical Composition in PM_{2.5} in Beijing before, during, and after a Large-Scale International Event

Xiaowen Yang, Shuiyuan Cheng, Jianbing Li, Jianlei Lang and Gang Wang

Beijing University of Technology, China

Abstract—To commemorate the 70th anniversary of the victory of the Chinese people's Anti-Japanese War and the World Anti-Fascist War, an international parade was held in Beijing in September 2015. In order to ensure satisfactory air quality during this event, a phased emission control measures were taken in Beijing and its surrounding provinces. The 24-h PM_{2.5} samples were collected in Beijing from August 1 to September 15, 2015 covering the period before, during and after this large-scale event. The observed PM_{2.5} data, meteorological data, emission reduction measures, and air mass trajectory simulation results were systematically analyzed to understand the pollution characteristics and chemical compositions of PM_{2.5} in Beijing. The results indicated that PM_{2.5} concentration during the two emission control phases was reduced by 61.7% comparing to the non-control period, but the regional transport of pollutants and meteorological conditions had a more prominent impact on PM_{2.5} than emission reduction during phase 2. The secondary water-soluble ions including SO₄²⁻, NO₃⁻, and NH₄⁺ were found as the main ions present in PM_{2.5}. During the entire emission control period, organic carbon (OC) and elemental carbon (EC) mass concentrations were decreased by 53.1% and 57.9%. A PM_{2.5} mass balance was analyzed, and it was found that the organic matter accounted for 29.3, 37.6 and 28.5% of the PM_{2.5} mass before, during and after the emission control, while the contribution of mobile sources to PM_{2.5} was relatively outstanding after a series of emission control measures.

Session 4

Afternoon, December 15, 2017 (Friday)

Time: 16:00~17:30

Venue: Lecture room 3

6 presentations- Topic: “Air Pollution Monitoring and Management”

Session Chair: Assoc. Prof. YU Liya E.

P3004 Presentation 5 (17:00~17:15)

An Integrated WRF-CAMx Modeling Approach for Impact Analysis of Implementing the Emergency PM_{2.5} Control Measures during Red Alerts in Beijing in December 2015

Jia Jia, Shuiyuan Cheng, Lei Liu, Jianlei Lang, Gang Wang, Guolei Chen, Xiaoyu Liu

Beijing University of Technology, China

Abstract—In December 2015, the Beijing-Tianjin-Hebei (BTH) region experienced several episodes of heavy air pollution. Beijing municipal government therefore issued 2 red alerts on December 7 and 19, respectively, and also implemented emergency control measures to alleviate the negative effects of pollution. It is estimated that the heavy pollutions in 2 red alert periods in Beijing were due mainly to the accumulation of air pollutants from local emission sources and the transboundary transport of pollutants from surrounding areas. The collected meteorological and PM_{2.5} data indicate that the severity of air pollutions were enlarged by the poor meteorological conditions along with lower mixing layer height. In this study, the WRF-CAMx modeling system was utilized not only for analyzing the contributions of PM_{2.5} from different sources, but also for quantitatively assessing the effects of implementing various emergency control measures on PM_{2.5} pollution control during the red alert periods. The modeling results show that local emissions were the most dominant contributors (64.8%–83.5%) among all emission sources, while the main external contributions came from the city of Baoding (3.4%–9.3%). In addition, among 5 different emission source categories, coal and traffic were the two dominant contributors to PM_{2.5} concentration in urban area of Beijing. Then four pollution control scenarios were designed particularly to investigate the effectiveness of the emergency control measures, and the results show that, generally these emergency control measures have positive effects on air pollution reduction. In particular, restrictive measures of traffic volume control and industrial activity shutdown/suspension have been found as the most effective measures in comparison to other emergency control measures. It is recommended that such effective measures should be considered to implement when next time similar heavy air pollutions occur in the city of Beijing.

Session 4

Afternoon, December 15, 2017 (Friday)

Time: 16:00~17:30

Venue: Lecture room 3

6 presentations- Topic: “Air Pollution Monitoring and Management”

Session Chair: Assoc. Prof. YU Liya E.

P2002 Presentation 6 (17:15~17:30)

An Integrated Air Quality Model and Optimization Model for Regional Economic and Environmental Development: A Case Study of Tangshan, China

Xiaowei Sun, Shuiyuan Cheng , Jianbing Li , Wei Wen

Beijing University of Technology, China

Abstract—An interval programming optimization model was formulated to develop effective and feasible regional economic structure adjustment plan using Tangshan Municipality in China as a case study. The optimization model was coupled with a WRF-CAMx-PSAT air quality simulation system through the estimated industrial emission sensitivity coefficients and equivalent coefficients for PM_{2.5} concentrations. Seven categories of industries were examined, and the results indicated that industries with higher emission sensitivity coefficients should be given priority for control. The effectiveness of the obtained optimal schemes was further assessed by the air quality simulation system. It indicated that PM_{2.5} concentrations in Tangshan would decrease by [33.5%, 39.3%] than those in 2013. This study provided an effective method framework for industries to maximize profits while meeting certain air quality constraints under uncertainty through the coupling of air quality simulation and optimization models.

Session 5

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, December 15, 2017 (Friday)

Time: 16:00~18:15

Venue: lecture room 4

9 presentations- Topic: “Ecological Environment Management and Sustainable Development”

Session Chair: Prof. James T. Anderson

P0013 Presentation 1 (16:00~16:15)

Green Open Space: awareness for health or sustainability?

O C Dewi, I Chairunnisa, T Hidayat, M Anggraini, A Napitupulu

Universitas Indonesia, Indonesia

Abstract—Universitas Indonesia in cooperation with American Red Cross and Indonesian Red Cross have been assisting green open space revitalisation program in 7 locations in Bogor Regency (2016-2007). The program was held under The Urban Disaster Risk Reduction Greater Jakarta Project; an initiative program from American Red Cross Indonesia. This project was not only improving the existing green open space quality, but also creating one adapted from public land. The revitalization project figures what happened on daily basis on the existing land, proposing new programming facilities, community-based construction, monitoring and handing over. This paper discovers the meaning of a green space for the community, whether the community aware of its benefit on human health or environmental sustainability. The research question is does the community aware of green open space benefit for human health or environmental sustainability? Or both? The original data from the community was gathered and grouped based on its relevance with environmental quality and public health.

Session 5

Afternoon, December 15, 2017 (Friday)

Time: 16:00~18:15

Venue: lecture room 4

9 presentations- Topic: “Ecological Environment Management and Sustainable Development”

Session Chair: Prof. James T. Anderson

P0022 Presentation 2 (16:15~16:30)

Impact of industrialization on environment and sustainable solutions – Reflections from a south Indian region

Rasmi Patnaik

Center of Excellence for Sustainable Development, Indian Institute of Corporate Affairs, Manesar, Gurugram, India

Abstract—Industrialization has brought economic prosperity; additionally it has resulted in more population, urbanization, obvious stress on the basic life supporting systems while pushing the environmental impacts closer to the threshold limits of tolerance. With booming industrial growth and relatively low land mass, environmental sustainability is now becoming a significant deciding factor in industrial development process. Accumulating evidences constantly indicate that the transition of the existing industries into eco-industrial network through successful implementation of green approaches provides a viable solution to preserve the natural resources of the region while concurrently enhances the regional economy on a sustainable basis. It calls for an appropriate planning and integrated framework in harmony with the environment, after careful assessment of past and prevailing conditions. The empirical knowledge on affected area helps understanding the local context and developing further course of action based on ground realities. With this aim, a study was conducted on the current industrial pollution and environmental setting of Puducherry. A causal chain analysis indicated severe impacts of industrialization on local environment while highlighting its immediate and root causes. The findings form a base for suggesting sustainable solutions to curb rampant pollution in Puducherry region and similar scenarios found across the world.

Session 5

Afternoon, December 15, 2017 (Friday)

Time: 16:00~18:15

Venue: lecture room 4

9 presentations- Topic: “Ecological Environment Management and Sustainable Development”

Session Chair: Prof. James T. Anderson

P2006 Presentation 3 (16:30~16:45)

The resource recycling and innocent treatment of chromium-bearing vanadium slag for environmental sustainability

Xiaohua Jing, Jianyou Wang, Pengge Ning, Hongbin Cao, Zhi Sun

College of Environmental Science and Engineering, Nankai University, Tianjin 300050, China

Abstract—The industrial chromium-bearing vanadium (V-Cr slag) produced from the metallurgical and chemical industry is one kind of hazardous solid waste that mainly contains both metals^{1,2}. The resource recycling or innocent treatment is one of the most urgent investigations³. Considering the shortages of resources and the aim of environmental sustainability, the high-efficient recovery of vanadium and chromium from the solid waste has been used for industrial production in China^{1,3}. The products of $\text{NH}_4\text{VO}_3/\text{V}_2\text{O}_5$ can be used as one component of catalysis and battery materials due to their excellent physiochemical properties⁵. The current aims of the whole process are optimizations of the different disposal procedures, e.g., solvent extraction, stripping and precipitation. Now the state-of-the-art annular centrifugal contactors have been applied in the solvent extraction¹, and the degradation/oxidation of extractants has been fully studied for improving the reuse efficiency of extractants⁴. Many aspects for the recovery process will be considered and investigated in our future work, including environmentally friendly and green extractants, advanced stripping equipments and efficient reduction of chromium.

Session 5

Afternoon, December 15, 2017 (Friday)

Time: 16:00~18:15

Venue: lecture room 4

9 presentations- Topic: “Ecological Environment Management and Sustainable Development”

Session Chair: Prof. James T. Anderson

R3007 Presentation 4 (16:45~17:00)

Analysis on Industrial Land Efficiency in Sichuan Province from the Perspective of Sustainable Development

Xu Mingqiang and Wei Wei

Chengdu University, Chengdu, China

Abstract—To promote the efficiency of industrial land in Sichuan province is an inevitable requirement of realizing sustainable development. Through the improvement of the Cobb-Douglas production function to construct the Two-way Fixed Effects panel model of output efficiency of urban industrial land, the data regression analysis of 93 prefecture-level cities since 1998 has found that the growth rate of industrial land efficiency indexes in Sichuan province is higher than the national level and has fallen back in recent years, but the absolute level is always lower than the national average, due to the fact that in the chase of national level, Sichuan industry did not fundamentally eliminate the root cause of low efficiency of industrial land. As a result, it is necessary to realize the improvement of optimal land utilization and land use efficiency through scientific planning, progressive construction steps and industrial transformation and upgrading, etc.

Session 5

Afternoon, December 15, 2017 (Friday)

Time: 16:00~18:15

Venue: lecture room 4

9 presentations- Topic: “Ecological Environment Management and Sustainable Development”

Session Chair: Prof. James T. Anderson

R0005 Presentation 5 (17:00~17:15)

Income and conservation dynamics of the biological bee-fence: A bio-economic simulation

A Taruvinga and N Gumpo

Department of Agricultural Economics and Extension, University of Fort Hare, Private Bag X1314, Alice, 5700, South Africa

Abstract—Human-elephant conflicts in most African countries coincide in areas where poverty and natural resources are most profound. Although popularly believed to be an asset capable of generating consumptive and non-consumptive ecotourism revenue, African elephants are in some parts of Africa viewed as pests and predators worth eradicating as a result of high human-elephant conflicts (crop raiding, property damage, human and livestock predation). This has shifted the conservation debate to issues of how much biodiversity (elephants) can be saved in the face of suffering local communities. With that background, we tested the income and conservation premise of the biological bee-fence concept as a complementary problem animal control (PAC) measure from a rural setting where elephants interact with local poor communities using bio-economic simulations. We conclude that the biological bee-fence concept has a significant potential to deter elephants from invading surrounding communities` fields as well as generating the much needed household income. These findings reinforce the conservation and income premise of the biological bee-fence under a typical African rural setting worth up-scaling.

Session 5

Afternoon, December 15, 2017 (Friday)

Time: 16:00~18:15

Venue: lecture room 4

9 presentations- Topic: “Ecological Environment Management and Sustainable Development”

Session Chair: Prof. James T. Anderson

R0021 Presentation 6 (17:15~17:30)

Mount Sinabung Eruption: Impact on Local Economy and Smallholder Farming in Karo Regency, North Sumatra

Jongkers Tampubolon, H L Nainggolan, A Ginting² and J Aritonang

Department of Agribusiness, HKBP Nommensen University, Indonesia

Abstract—Indonesia is a disaster prone country. One of the geo physical disaster is the prolonged of Mount Sinabung Eruption in Karo Regency, North Sumatra. This area is famous for horticulture (vegetable and fruit) producer in the region. The eruption has displaced people, destroyed infrastructure and livelihood. This research aims: (i) to investigate the magnitude of the economic losses, (ii) to find out impact on agricultural production and (iii) to investigate the adaptation pattern undertaken by farmers. The results of research showed that (i) the extent of losses on the regional level is bigger than the annual local government budget, whereas the feasibility of farm business deteriorated significantly, (iii) the disaster has jeopardized village self help organization, worsened access to farm credit as well as labour shortage in agriculture. Based on empirical finding, recommendation for the rehabilitation and mitigation is proposed.

Session 5

Afternoon, December 15, 2017 (Friday)

Time: 16:00~18:15

Venue: lecture room 4

9 presentations- Topic: “Ecological Environment Management and Sustainable Development”

Session Chair: Prof. James T. Anderson

R0018 Presentation 7 (17:30~17:45)

Human alteration of the nitrogen cycle and its impact on the environment

Jianing Hu

Thayer Academy, Braintree, MA, USA

Abstract—Nitrogen(N) is a key element that controls the functions and dynamics of Earth’s various ecosystems. In recent years, however, human activities, including the use of N fertilizers and the combustion of biomass and fossil fuels, have been injecting artificially transferred nitrogen into the atmosphere. Human alteration of the nitrogen cycle poses a threat to various aspects of the environment. Organisms in terrestrial and aquatic ecosystems used to lower nitrogen levels struggle with the new conditions; plant species richness and biodiversity are reduced due to excessive use of N fertilizers; reactive nitrogen in different forms negatively alter the ozone layer and exacerbate the greenhouse effect. Although most nitrogen inputs are serving human needs, the long-term environmental consequences are serious and should not be ignored.

Session 5

Afternoon, December 15, 2017 (Friday)

Time: 16:00~18:15

Venue: lecture room 4

9 presentations- Topic: “Ecological Environment Management and Sustainable Development”

Session Chair: Prof. James T. Anderson

R3010 Presentation 8 (17:45~18:00)

Survey on the Effects of Frequency of Experiencing Water Environments on Moods in China

C C Peng, M Rooks and Y Hu

Psychological Center, Dalian University of Technology, Liaoning, China

Abstract—This study describes findings of the impacts of water area on environmental factors including ocean, rivers, lakes and so on, and how these affected human mood in China. We used a short version of Sakano et al.’s Mood Inventory to measure tension and excitement, fatigue, depressive, anxious, and refreshed moods. 207 people (121 males and 86 females) were randomly selected from a Chinese university, and categorized into three groups according to different frequencies (high, medium, and low frequencies) of experiencing water area environment views. We found that a high frequency of experiencing water environment views had a more significant effect on mood than did medium and low frequencies. There were vast differences in scores on the subscales assessing depressive and refreshed moods among the three frequencies, and (2) for males, the differences in the mood inventory scores among the high, medium, and low frequencies were more pronounced and significant than they were for females. The effects of water environment on mood had large variations and substantial effects, especially on depressive and refreshed moods. These findings may provide new insights for future living environment and design guidelines for structuring more water-enriched environments.

Session 5

Afternoon, December 15, 2017 (Friday)

Time: 16:00~18:15

Venue: lecture room 4

9 presentations- Topic: “Ecological Environment Management and Sustainable Development”

Session Chair: Prof. James T. Anderson

R3001 Presentation 9 (18:00~18:15)

Black Sea sustainability - Ballast water treatment facilities in harbours

V. Rata

Dunărea de Jos" University of Galați, Romania

Abstract—Motivated by the fact that in Black Sea it was not adopted a policy to regulate the ballast water treatment, the objective of the present work is to evaluate the capability of ports in the area to the new IMO regulations that has entered or will come into force. Although the problem of invasive species has precedent in the Black Sea basin, only 3 of 6 neighboring countries have signed ratification in 2004 of the International Convention on the Management of Ships' Ballast Water and Sediments. An analysis of the impact on lack ballast water management is first carried out considering historical data. As a further step, also was calculated an estimate of ballast water volume resulted from shipping activities for the most important harbours in the Black Sea area. On the basis of the estimates, a case study was created for Port of Constanta; so that ballast water treatment harbour's facilities, could be sized now. Harbour's facilities helping for ships arriving in port to load the cargo and it must comply with the ballast water treatment convention, which not having the capacity to do this operation. The results show that a barge for ballast water treatment is not a solution for a port like Constanta, because of ships traffic. In this situation it was choose a container type shore ballast water treatment facility dimensioned by port of Constanta characteristics.

POSTER

Afternoon, December 15, 2017 (Friday)

Time: 9:00~18:15

Venue: lecture room 3

P2001 Presentation (9:00~18:15)

The Study of Indigenous Microorganisms for Enhancing Oil Recovery

Aliya Yernazarova, Gulzhan Kayirmanova¹ and Azhar Zhubanova

Al-Farabi Kazakh National University, Kazakhstan

Abstract—The rising global demand for energy and existing problem of residual oil recovery is driving the development of techniques of enhanced oil recovery. According to "Global Enhance Oil Recovery (EOR) Market: Trends, Opportunities and Forecasts (2016-2021)" report during 2016-21 global Enhanced Oil Recovery (EOR) Market in oilfield is expected to increase at a Compound Annual Growth Rate (CAGR) of 8.11%.

One of the most effective methods for enhanced oil recovery is the microbial enhanced oil recovery. The use of microbiological approaches in the development of the ways of increasing oil production requires a thorough screening of active microbial strains with a high target activity among a large diversity of microorganisms' species of natural microflora objects of the environment on the territory of the field.

The aim of this work was the isolation and selection microbial strains resistant to extreme conditions in oil-producing regions, for further constructing the microbial consortium for using in biotechnology development that leads to the oil recovery enhancement.

For the selection of microorganisms-candidates capable to grow in extreme conditions has been studied the ability of 33 cultures of microorganisms isolated from sample of oil from oilfields with the following parameters: high concentrations of salinity, a temperature of 45 °C and acidity of the medium 3.5 and 6.5.

As a result of growth of microorganisms on a universal medium with high concentration of NaCl (90g/l) and low acidity (pH 3.5) showed that 24 hour cultures of microbial strains had slow growth, but a three-day cultures of microbial strains KM-1, NKK-1, NKK-2, NKK-3, NKZH-2, NKZH-3 adapted and showed abundant growth. The growth of microorganisms in the medium with acidity of the medium 6.5 and high concentration of NaCl it was showed that 21 cultures of microorganisms from 33 indigenous microorganisms of oil on the 3rd day of cultivation had abundant growth.

In this way from 33 cultures of microbial strains isolated from oilfields selected 6 cultures of microbial strains able to grow temperature of 45 °C and acidity of the medium 3.5.

Further, these cultures will be studied on the production of metabolites.

POSTER

Afternoon, December 15, 2017 (Friday)

Time: 9:00~18:15

Venue: lecture room 3

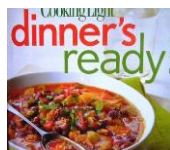
P0005 Presentation (9:00~18:15)

Multivariate analysis of physico-chemical parameters and WQI of Lower Danube water to identify potential pollution sources

Catalina Iticescu, Lucian Georgescu, Gabriel Murariu, Maria Catalina Topa, Mihaela Timofti, Violeta Pintilie

‘Dunărea de Jos’ University of Galati, European Center of Excellence for the Environment, Faculty of Sciences and Environment, 111 Domneasca Street, 800201, Galati, Romania

Abstract—In this paper we present a series of multivariate techniques at determining the water quality in the Lower Danube Region. In order to investigate and identify potential pollution sources, between 2014 – 2016 years the following parameters were measured: pH, OD, COD, BOD, N-NH₄⁺, N-NO₂⁻, N-NO₃⁻, N total, P-PO₄³⁻, P total, SO₄²⁻, Cl⁻, Fe-total, Cr-total, Pb²⁺, Ni²⁺, Mn²⁺, Zn²⁺, As²⁺. The samples were taken made of 6 points upstream and downstream the city of Galati along the Danube River. Based on these parameters the water quality index (WQI) was calculated by the Weighted Arithmetic of Water Quality Index Method. The interpretation of the variation in the physical and chemical parameters monitored and of the WQI was made by using the principal components analysis (PCA) and the response surface method (RSM).



Dinner

18:15

One Day Visit

December 16, 2017 (Saturday) 9:00~17:00

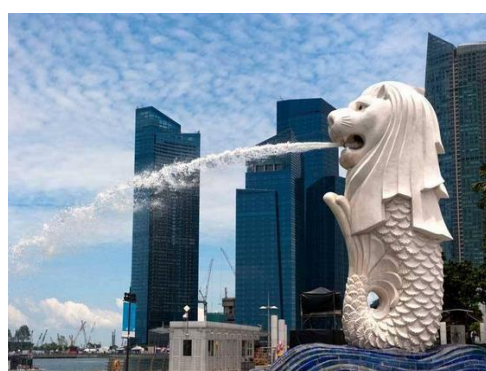
(Tip: Please arrive at Nanyang Executive Centre, Singapore before 9 a.m. The following places are for references, and the final schedule should be adjusted to the actual notice.)

1. (9:00am) Assemble at Nanyang Executive Centre

2. (9:00-12:00pm) Morning Vist

Visit Merlion Park

Merlion Park, is a Singapore landmark and major tourist attraction, located at One Fullerton, Singapore, near the Central Business District (CBD). The Merlion is a mythical creature with a lion's head and the body of a fish that is widely used as a mascot and national personification of Singapore. Two Merlion statues are located at the park. The original Merlion structure measures 8.6 meters tall and spouts water from its mouth. It has subsequently been joined by a Merlion cub, which is located near the original statue and measures just 2 metres tall. The park was first designed by the Singapore Tourism Board (STB) in 1964 as an emblem of Singapore.



Visit St Andrew's Cathedral



In the mid-1980's, St. Andrew's Cathedral was restored and renovated to its present. Though there are many changes in the liturgical space, they made every effort to respect the Victorian period during which the Cathedral was designed. Restoration architects, Bawlf, Cooper & Associates completed the design work. The decorative panels are designed by Nicholas Bawlf and based on the Book of Kells. The Cathedral's

altar is of particular significance. It was built by acclaimed West Coast native artist Charles Elliot. The top of the altar is yellow cedar, weighing about 400 pounds, which rests on two traditional native "bent boxes". Each box has a different picture carved on each of its four sides, representing different events in the life of Christ or stories from Scripture. These altar panels are rotated several times a year, to coincide with the events in the Church's liturgical year. The lectern was carved by native artist Roy Henry Vickers. It has a carving of Christ on the front, symbolizing both death and resurrection, the red side being the crucified Christ wearing the crown of thorns and the black side being the risen Christ. A new icon of the Holy Family was formally installed on September 8, 2007. The icon, which is 7 feet high by 5 feet wide, is the largest ever written by iconographer André Prevost of Manitoba.

Visit Chinatown, Singapore



Chinatown in Singapore is a sharp contrast to the rest of the city, with low rise buildings and culture bursting out onto the streets, from the fragrant smells of traditional cuisine to the bold red and gold tones that run through the neighbourhood. This is an area that's proud of its heritage, and has it very much on display. There are ornate Chinese, Buddhist and Hindu temples, museums galore and plenty of opportunities to soak up the bustling streets lined with old shophouses.

3. (12:00-14:00) Lunch time

4. (14:00-17:00) Afternoon visit

Visit Gardens by the Bay

Gardens by the Bay is an independent organization responsible for developing and managing one of Asia's foremost garden destinations.

The Gardens is led by a multidisciplinary team of professionals who have been involved in the greening of Singapore



and had worked alongside international and local experts to develop the Gardens. It has an in-house team of skilled landscape designers, horticulturists, arborists, engineers, plant health, garden and turf management experts, as well as plant research and orchid breeding professionals, who leverage on the extensive global network of plant sources cultivated during the development days, to continuously curate and grow the Gardens.

Guided by its vision to be a world of gardens for all to own, enjoy and cherish, Gardens by the Bay has earned numerous awards and accolades including the World Building of the Year in 2012, the President's Design Award (Singapore) in 2013, the Outstanding Achievement Award by the Themed Entertainment Association in 2014, the Largest Glass Greenhouse (Flower Dome) in the Guinness World Records for 2015, and the TripAdvisor Certificate of Excellence in 2016. These achievements are testament to the ongoing excellence of the Gardens and spur the team towards attaining greater success.

Visit Little India

Little India, an ethnic district in Singapore. It is located east of the Singapore River—across from Chinatown, located west of the river—and north of Kampong Glam. Both areas are part of the urban planning area of Rochor. Little India is commonly known as Tekkain the Indian Singaporean community.



5. (17:00) Back to Nanyang Executive Centre

Conference Venue

**Nanyang Executive Centre in
Nanyang Technological University, Singapore**

Add: 60 Nanyang View, Singapore 639673



Nanyang Executive Centre is located amidst tranquil settings and soothing greenery at the Yunnan Garden Campus of Nanyang Technological University, offering a premier venue for corporate trainings, retreats and private functions.

The 170 guestrooms and suites have been designed to meet the needs of both training executives and business travellers. All the guestrooms are equipped with a work area and other modern amenities to ensure they provide guests with a pleasant stay. Complimentary Wi-Fi is available to all guests in their rooms, lobby and function spaces.

Be it seminars, executive trainings, workshops, conferences, social events or simply a business meeting, our meeting and event venues offers capacity for a size of 3 to 210 persons. Our newly refurbished Campus Clubhouse offers an interesting mix of local and Western cuisine at restaurant, Fusion Spoon. In addition, chill-out wine lounge and bistro, The Attic, offers guests a wide selection of beverages and snacks.

We look forward to welcome you and your guests at Nanyang Executive Centre!

NTU has 2 campuses in Singapore. The main campus is a 200-ha residential, garden campus located in the south-western part of Singapore, near the Jurong West Extension area. This campus is easily accessible by two expressways, the Pan-island Expressway (PIE) and Kranji Expressway (KJE). It is also near the Boon Lay bus interchange and the Boon Lay Mass Rapid Transit (MRT) station.

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Feedback Information

(Please fill this form and return it to conference specialist during the conference days.)

Personal Information					
Conference Name and Paper ID					
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Area of Research					
Affiliation					
Please indicate your overall satisfaction with this conference with “√”					
	Very Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatisfied	Very Dissatisfied
Conference Content					
Presentation and Paper Value					
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Are You A Member of HKCBEEES	Yes <input type="checkbox"/> No <input type="checkbox"/> (If “No”, you may apply membership from http://www.cbees.org/list-34-1.html)				
Do You Willing to Receive HKCBEEES Future Conferences Information Via E-mail	Yes <input type="checkbox"/> No <input type="checkbox"/>				
Where did you get the conference information?					
Would you please specify the main reason for attending this conference?					
Did the conference fulfill your reason for attending?	Yes– Absolutely <input type="checkbox"/> Yes- But not to my full extent <input type="checkbox"/> No <input type="checkbox"/> (If “No”, please tell us the main reason)				

2017 HKCBEEES SINGAPORE CONFERENCE

Would you please list the top 3 to 5 universities in your city?	
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