

2016 APCBEES JEJU ISLAND CONFERENCE ABSTRACT

Jeju Island, South Korea

May 23-25, 2016

Jeju National University International Center



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**Jeju Island, South Korea
May 23-25, 2016**

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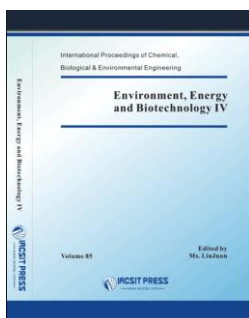
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2016 APCBEES Jeju Island Conference Introductions

Welcome to CBEES 2016 conferences in Jeju Island, South Korea. The objective of the Jeju Island conferences 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, Energy, Biotechnology, Asia Agriculture, Animal, Chemical and Process Engineering.

The 2016 5th International Conference on Environment, Energy and Biotechnology (ICEEB 2016)

❄ Paper publishing and index: **ICEEB 2016** papers will be published in the proceeding as followed:

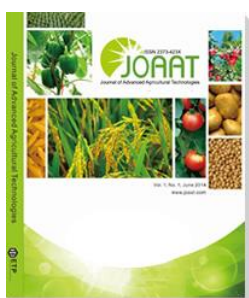


❄ **International Proceedings of Chemical, Biological and Environmental Engineering (IPCBE, ISSN: 2010-4618)**, which will be included in EI Geobase (Elsevier), Chemical Abstracts Services (CAS), CABI, CNKI, WorldCat, Google Scholar, Ulrich's Periodicals Directory, Crossref, and Engineering & Technology Digital Library

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

The 2016 6th International Conference on Asia Agriculture and Animal (ICAAA 2016)

❄ Paper publishing and index: **ICAAA 2016** papers will be published in the journey as followed:



❄ **Journal of Advanced Agricultural Technologies (JOAAT, ISSN:2301-3737)**, which will be included in the Ulrich's Periodicals Directory, Google Scholar, Engineering & Technology Digital Library, Crossref and Electronic Journals Digital Library.

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

The 2016 5th International Conference on Chemical and Process Engineering (ICCPE 2016)

❄ **Paper publishing and index:** **ICCPE 2016** papers will be published in one of the following proceeding/journal:



❄ **The volume of MATEC Web of Conferences (ISSN: 2261-236X).** All papers will be indexed by Ei Compindex, Inspec, DOAJ, CPCI (Web of Science) and Scopus.



❄ **International Journal of Chemical Engineering and Applications (IJCEA ISSN: 2010-0221).** All papers will be indexed by Chemical Abstracts Services (CAS), Ulrich's Periodicals Directory, CABI, DOAJ, Electronic Journals Library, Google Scholar, Engineering & Technology Digital Library, ProQuest, and Crossre.

❄ **Conference website and email:** <http://www.iccpe.org/> ; iccpe@cbees.org.

2016 2nd Journal Conference on Environmental Science and Development (JCESD 2016 2nd)

❄ **Paper publishing and index:** **JCESD 2016** papers will be published in the journey as followed:



❄ **International Journal of Environmental Science and Development. (IJESD, ISSN: 2010-0264),** available at: <http://www.ijesd.org/list-6-1.html>), and indexed by Chemical Abstracts Services (CAS), CABI, DOAJ, Ulrich Periodicals Directory, Crossref, ProQuest.

❄ **Conference website and email:** <http://www.ijesd.org/jcesd/2nd/index.htm>; jcesd02@iacsitp.com

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 **35** Minutes of Presentation and **5** Minutes of Question and Answer

Plenary Speech: about **20** 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 oral presentation will be selected from each oral presentation session, and the Certificate for Best Oral Presentation will be awarded at the end of each session on May 24, 2016.

Dress code

Please wear formal clothes or national representative of clothing.

Keynote Speaker Introductions

Keynote Speaker I



Prof. Byoung Ryong Jeong
Dean. College of Agriculture and Life Sciences,
Gyeongsang National University, Jinju, Korea

Field of Specialty: Floriculture, Protected horticulture, Plant factory, Transplants (Micropropagated & Plug) & Hydroponics

Major Professional Experience & Titles:

1990~1992. Postdoctoral Fellow, Univ. of Missouri-Columbia (USA), Water relations
1992. Japanese Society for the Promotion of Science Postdoctoral Fellow, Chiba University (Japan), Environ. control in micropropagation
1992~present, Lecturer-Professor, GNU, Floriculture, Plant Tissue Culture, & Horticultural Production Technology; Horticulture department chairman, GNU (1995-1997; 2004-2007; 2009-2010); Horticultural professor in charge of Agricultural Managerial Courses, GNU (1994-1999; 2000-2001; 2009-2010); Director, Education & Research Farm of GNU (2001-2003); Associate Dean of College of Agriculture & Life Science, GNU (2005-2006).
1997~2012. Editor, J. Kor. Soc. Hort. Sci.; J. Bio-Environ. Control; J. Kor. Flower Res. Soc.
2001. Training Course on Tissue Culture held at Taiwan Agriculture Research Institute and organized by Asian Productivity Organization
2006~2009. Visiting Professor. Yangtze Delta Region Institute of Tsinghua University, Zhejiang, China
1999~2001. Editor-in-chief. J. Kor. Hydroponic Soc.
2002~2004. Editor-in-chief. J. Bio-Environ. Control
2003~2004. Visiting Professor. Department of Environmental Horticulture, University of California-Davis, USA
2006~2008. Editor-in-chief. Flower Research J.
2008~2009. President, Korean Soc. Plug Seedling Research

Topic: “Plant tissue culture: Tool for mass propagation and study of ornamental and medicinal germplasm”

Abstract: Plant tissue culture, as a tool for micropropagation and research of plant species, can be efficiently used not only for mass propagation and conservation of rare and endangered species, but also for genetic transformation and breeding of various ornamental and medicinal plant species. The techniques can play an important role in the clonal propagation and qualitative improvement of many important plants. Direct adventitious organogenesis is preferred as it enables to retain clonal fidelity, since many plant species are propagated for one or more unique features. Clonal propagation through somatic embryogenesis has also become an essential method for mass propagation and improvement of important plants. Direct embryogenesis reduces the time required for mass propagation, which may be beneficial to minimize culture-induced genetic changes. The success in regeneration of adventitious organs varies depending upon plant species and a number of endogenous and exogenous factors, among which hormonal balance has a primary role. In particular, the auxin-cytokinin ratio appears to be the most important factor in channeling regeneration responses toward a specific in vitro morphogenic process. Efficient protocols were developed for in vitro mass propagation of many plants including *Ajuga multiflora*, *Campanula punctata*, *Cotoneaster wilsonii*, *Crocus vernus*, *Dendranthema grandiflorum*, *Dianthus caryophyllus*, *Hedera helix*, *Jeffersonia dubia*, *Paeonia lactiflora*, *Rhododendron keiskei* var. *hypoglucum*, and *Senecio cruentus*. Efficient protocols were developed also for genetic transformation of *Dendranthema grandiflorum* and *Rosa hybrida* for silicon transporter genes *Lsi1* and *Lsi2*. Methods of suppressing hyperhydricity in micropropagated plantlets such as carnations have also been studied.

This study was carried out with the support of ‘Cooperative Research Program for Agriculture Science & Technology Development (Project No. 01090805)’, Rural Development Administration, Republic of Korea. Sowbiya Muneer, Prabhakaran Soundararajan, Manivannan Abinaya, Chung Ho Ko, and Hao Wei were supported by a scholarship from the BK21 Plus Program, the Ministry of Education.

Keynote Speaker II



Prof. Young Sun Mok

**Department of Chemical and Biological Engineering, Jeju National University, Jeju,
Korea**

Professor Young Sun Mok received the B.S. degree in chemical engineering from Yonsei University, Seoul, Korea, in 1989, and the M.S. and Ph.D. degrees in chemical engineering from the Korea Advanced Institute of Science and Technology (KAIST), in 1991 and 1994, respectively. He has been with the Department of Chemical Engineering, Jeju National University, Korea, since 2000. He spent a year at the University of Manchester (School of Chemistry), UK, as a visiting researcher in 2007. During the last two decades, he has studied applications of non-thermal plasma to pollution (air/water) control, energy production and material syntheses, and he is widening his plasma research horizon to meet various industrial needs, including plasma-mediated hydrophobic coating of powdery materials, sterilization of microorganisms, heterogeneous catalyst preparation, etc. He is a life member of the Korean Institute of Chemical Engineers and the Korean Society of Industrial and Engineering Chemistry.

Topic: “Energy-efficient treatment of greenhouse gas nitrous oxide using non-thermal plasma coupled with adsorption”

Abstract: Nitrous oxide (N_2O) has a considerably high global warming potential of 310, known for its contribution of around 6% to global warming. Since the middle of last century, the concentration of N_2O in the atmosphere has been on an increasing trend at 0.2-0.3 % per year via a variety of agricultural and industrial emission sources. Up to now, lots of efforts have been made to develop economically and technically feasible N_2O abatement methods, one of which is catalytic decomposition. For catalytic decomposition, either noble or non-noble metal has been investigated elsewhere. Even though some of metallic catalysts exhibit high N_2O decomposition efficiency, the catalyst activation temperature, i.e., the energy requirement to heat up the catalyst is pretty high, above at least $300^\circ C$. Lately, atmospheric-pressure non-thermal plasmas generated in nitrogen or argon have been studied as an alternative method for direct destruction of N_2O . The direct destruction of N_2O in air by plasma is hardly effective from the practical application viewpoint on account of inevitable formation of another pollutant, namely, nitrogen oxides. In this sense, the use of adsorption to remove and enrich N_2O from exhausted oxygen-containing gases before destroying the adsorbed N_2O by N_2 plasma could be a feasible way. In such a cyclic process consisting of adsorption and plasma decomposition, a long adsorption step followed by a short decomposition results in a great reduction of energy consumption. In this work, a combination of zeolite adsorbent and non-thermal plasma for abating dilute N_2O was experimentally studied and discussed. Zeolite 13X was modified with Ca^{2+} cation by ion exchange, which was used as the adsorbent to remove and enrich N_2O . From the infrared images, it has been found that the desorption of previously adsorbed N_2O during plasma discharge is ascribed to plasma-induced heat, rather than direct attack of plasma-generated reactive species on the adsorbed N_2O molecules. Compared to continuous treatment of N_2O -containing exhaust gas, the cyclic process proposed in this work was more advantageous in terms of energy consumption, revealing its capability for practical application to the abatement of dilute N_2O .

Acknowledgment: This work was supported by the Basic Science Research Program through the National Research Foundation funded by the Ministry of Science, ICT and Future Planning, Korea (Grant No. 2013R1A2A2A01067961),

Plenary Speaker



Prof. Gede Wibawa
Dept. of Chemical Engineering, ITS, Indonesia

Dr. Gede Wibawa is with the Dept. of Chem. Eng, Faculty of Industrial Technology, Sepuluh Nopember Institute of Technology (ITS), Kampus ITS Sukolilo Surabaya. He got the B.S., Dept. Of Chem. Eng, ITS, Surabaya, Indonesia in 1986. And got Master of Engineering (M.Eng), Dept. of Chem. Eng. Tokyo Institute of Technology (TIT), Tokyo Japan in 1995. He got Doctor of Engineering (D.Eng.), Dept. of Chem. Eng. Graduate School of Engineering, Hiroshima University, Higashi-Hiroshima Japan in 2003. He was Lecturer in Dept. Of Chem. Eng. Sepuluh Nopember Institute of Technology (ITS) from 1986 to Now; He was Post Doctoral Researcher, Hiroshima University Japan from 2003 to 2004. He was Head of Centre for Energy and Energy Studies Institute of Reserach and Public Services ITS from 2007 to 2011. He was Professor in Dept. Of Chem. Eng. ITS from 2008 to Now. And he was head of Chemical Engineering Thermodynamic Laboratory ITS from 2009-Now; He was Secretary of Post Graduate Program, Dept. of Chem. Eng. ITS from 2012 to 2016.

Topic: “The Performance of Wilson, NRTL and UNIQUAC Models in Prediction of Ternary Vapor-Liquid Equilibrium for Alcohols + Glycerol + Water Systems Based on Binary Interaction Parameter Pairs”

Abstract: In this work, the performance of Wilson, Non-Random Two-Liquid (NRTL) and Universal Quasi-Chemical (UNIQUAC) models were investigate in predicting VLE for ternary of 1-butanol + glycerol + water and 2-methyl-1-propanol + glycerol + water systems. The ternary VLE data for both systems were measured experimentally using simple ebulliometer as proposed in our previous works. The binary parameters of these models were optimized from the binary experimental literature data. The investigation indicate that Wilson, NRTL and UNIQUAC models show good performances giving average absolute deviation (AAD) between experimental and predictive vapor pressures of 1.9%, 1.8% and 2.5% for 1-butanol+ glycerol + water system and 3.6%, 3.0% and 2.6% for 2-methyl-1-propanol + glycerol + water system. Moreover, these results were also compared with predictive UNIQUAC Functional Group Activity Coefficients (UNIFAC) model giving AAD less than 6% for both systems studied.

Brief Schedule for Conferences

May 23, 2016 (Monday) 10:00~17:00 Venue: Lobby Arrival Registration	
May 24, 2016 (Tuesday) 8:30~19:00 Venue: Seminar Room 3 & Seminar Room 2 Arrival Registration, Keynote Speeches, and Conference Presentations	
Morning Conferences	
Venue: Seminar Room 3 Opening Remarks 8:30~8:35 Keynote Speech I 8:35~9:15 Keynote Speech II 9:15~9:55 Coffee Break & Photo Taking 9:55~10:20	
Plenary Speech & Session 1: 10:20~12:45 Venue: Seminar Room 3 8 presentations-Topic: "Chemistry"	Session 2: 10:20~12:35 Venue: Seminar Room 2 9 presentations-Topic: "Agriculture"
Lunch 12:40~13:40 Venue: Global House	
Afternoon Conferences	
Session 3: 13:40~16:10 Venue: Seminar Room 3 10 presentations-Topic: "Chemistry"	Session 4: 13:40~16:10 Venue: Seminar Room 2 10 presentations-Topic: "Bioscience"
Coffee Break 16:10~16:30	
Session 5: 16:30~19:00 Venue: Seminar Room 3 10 presentations-Topic: "Chemistry"	Session 6: 16:30~18:45 Venue: Seminar Room 2 9 presentations-Topic: "Environment"
Poster Session: 8:30~19:00 Venue: Seminar Room 3	
Dinner: 19:00 Venue: Global House	
May 25, 2016 (Wednesday) One-Day Visit & Tour: 8:30~17:00	

Detailed Schedule for Conferences

May 23, 2016 (Monday)

Venue: Lobby

10:00-17:00	Arrival and Registration
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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 oral presentation will be selected from each oral presentation session, and the Certificate for Best Oral Presentation will be awarded at the end of each session on May 24, 2016.

May 24, 2016 (Tuesday)

Venue: Seminar Room 3

8:30~8:35		<p>Opening Remarks Prof. Young Sun Mok Department of Chemical and Biological Engineering, Jeju National University, Jeju, Korea</p>
8:35~9:15		<p>Keynote Speech I Prof. Byoung Ryong Jeong College of Agriculture and Life Sciences, Gyeongsang National University, Jinju, Korea</p>
9:15~9:55		<p>Keynote Speech II Prof. Young Sun Mok Department of Chemical and Biological Engineering, Jeju National University, Jeju, Korea</p>
9:55~10:20	Coffee Break & Photo Taking	
10:20~10:45		<p>Plenary Speech Prof. Gede Wibawa Dept. of Chemical Engineering, ITS, Indonesia</p>
10:45~12:45	Session 1 "Chemistry"	
10:20~12:35	Session 2 "Agriculture"	
12:40~13:40	Lunch: Global House	

2016 APCBEES JEJU ISLAND CONFERENCES

13:40~16:10	Session 3 “Chemistry” & Session 4 “Bioscience”
16:10~16:30	Coffee Break
16:30~19:00	Session 5 “Chemistry” & Session 6 “Environment”
19:00	Dinner: Global House
8:30~19:00	Poster Session

May 25 (Wednesday)

8:30~17:00	One day visit and tour in Jeju Island
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Let's move to the Sessions!

Session 1

Tips: The schedule for each presentation is for reference only. In case of missing your presentation, we strongly suggest that you attend the whole session.

Morning, May 24, 2016 (Tuesday)

Time: 10:45~12:45

Venue: Seminar Room 3

Session 1: 8 presentations-Topic: “Chemistry”

Session Chair: Prof. Gede Wibawa

C0013 Presentation 1 (10:45~11:00)

Valorization of *Reutealis trisperma* seed from Papua for the production of non-edible oil and protein-rich biomass

Robert Manurung, **Muhammad Yusuf Abduh**, Mochammad Hirza Nadia, Kardina Sari Wardhani and Khalilan Lambangsari

Institut Teknologi Bandung, Indonesia

Abstract—The valorisation of *Reutealis trisperma* seed for the production of non-edible oil and protein was investigated. *Reutealis trisperma* fruits contain approximately 60-61 wt%, d.b. mesocarp, 26-28 wt%, d.b. endosperm and 13 wt%, d.b. endocarp. The endosperm of ripe *Reutealis trisperma* fruit contains about 54-59 wt%, d.b. non-edible oil whereas the mesocarp contains only 3-9 wt%, d.b. oil. The cake obtained after the extraction of oil from the endosperm was mixed with the endocarp (20 wt% cake and 80 wt% endocarp) and used as feed (50 mg/larva/d) for the cultivation of *Hermetia illucens* larvae in a rearing container. The feed contains 39.2 wt%, d.b. hemicellulose, 10.9 wt%, d.b. cellulose and 29.9 wt%, d.b. lignin and 0.2 wt%, d.b. ash. The protein content of the feed was 19.1 wt%, d.b. A prepupal dry weight of approximately 50 mg/larvae was obtained after 12 d of treatment with an estimated productivity of 10.2 kg_{prepupae}/m³_{container}.d. The estimated efficiency of black soldier fly larvae in converting digested food was 21.6% with an assimilation efficiency of 27.7%. The prepupae of *Hermetia illucens* contains approximately 37.6 wt%, d.b. protein and 33.2 wt%, d.b. fat. As such indicates that the remaining biomass from *Reutealis trisperma* seed after the oil extraction has the potential to be used as feed for the production of protein-rich biomass.

Morning May 24, 2016 (Tuesday)

Time: 10:45~12:45

Venue: Seminar Room 3

Session 1: 8 presentations-Topic: “Chemistry”

Session Chair: Prof. Gede Wibawa

G0013 Presentation 2 (11:00~11:15)

Comparison of Two Agricultural Wastes for Phenol Removal via Peroxidase-Catalyzed Enzymatic Approach

Tung Chiong, Ee Huey Khor, Michael Kobina Danquah, and Sie Yon Lau

Curtin University Sarawak, Malaysia

Abstract—Agricultural wastes of jicama and luffa skin peels were used as the source for peroxidase extraction. The extracted crude enzymes showed similar activities, 1.34U/mL and 1.22U/mL for jicama and luffa peroxidase respectively. These peroxidases were used to treat phenol under varying operating conditions of buffer pH, hydrogen peroxide concentration, enzyme volume and temperature. Jicama peroxidase demonstrated a phenol removal efficiency of approximately 90% at buffer pH 7, 1mM hydrogen peroxide using 1.5mL enzyme at 25oC. Luffa peroxidase required a higher dosage of hydrogen peroxide, and exhibited a removal efficiency of 84% at 8mM with other operating conditions same as jicama peroxidase. Jicama peroxidase is sensitive to pH change and more susceptible to thermal denaturation. Luffa peroxidase showed a better stability in terms of temperature.

Morning, May 24, 2016 (Tuesday)

Time: 10:45~12:45

Venue: Seminar Room 3

Session 1: 8 presentations-Topic: “Chemistry”

Session Chair: Prof. Gede Wibawa

G0038 Presentation 3 (11:15~11:30)

Treatment of Various Avian Influenza Virus based on Comparison Using Decision Tree Algorithm

Jongchan Lee, Seojun Kim, and Taeseon Yoon

Hankuk Academy of Foreign Studies, The Republic of Korea

Abstract—Recently, the world is full of anxiety about AI (Avian Influenza). Among Avian Influenza virus subtypes, H5N1 is considered the most threatening to not only birds, but also humans as numerous human cases with high mortality have been reported. Unlike H7N9, which has not been reported infect humans, H5N8 also became infectious to humans due to dramatic mutation. As human infection cases of AI have increased, numerous researchers have been trying to develop an effective treatment against them. Thus, our project group decided to analyze the similarity and difference of H5N1, H5N8, and H7N9, since it would be useful for finding effective treatment of AI, using Decision Tree Algorithm which figures out distinctive factors of given dataset for comparing protein sequences of each viruses. The comparison using Decision Tree Algorithm, which indicates correlation among H5N1, H5N8, and H7N9, will be effective on narrowing the range of attempts on developing treatment for Avian Influenza virus.

Morning, May 24, 2016 (Tuesday)

Time: 10:45~12:45

Venue: Seminar Room 3

Session 1: 8 presentations-Topic: “Chemistry”

Session Chair: Prof. Gede Wibawa

G0041 Presentation 4 (11:30~11:45)

Deeper Understanding of Flaviviruses Including Zika virus by Using Apriori Algorithm and Decision Tree

Youjin Yang, Bokyung Gu, and Taeseon Yoon

Hankuk Academy of Foreign Studies, Korea

Abstract—Zika virus is spreaded by mosquito. There is high probability of Microcephaly. In 1947, the virus was first found from Uganda, but it has broken out all around world, specially North and south America. So, apriori algorithm and decision tree were used to compare polyprotein sequences of zika virus among other flavivirus; Yellow fever, West Nile virus, Dengue virus, Tick borne encephalitis. By this, dissimilarity and similarity about them were found.

Morning, May 24, 2016 (Tuesday)

Time: 10:45~12:45

Venue: Seminar Room 3

Session 1: 8 presentations-Topic: “Chemistry”

Session Chair: Prof. Gede Wibawa

G0042 Presentation 5 (11:45~12:00)

Data Mining and Analysis of Bacillus Virus

Jiwoo An, Chanwoo Kim, Seohyun Moon, Jungeun Huh, and Taeseon Yoon

Hankook Academy of Foreign Studies, South Korea

Abstract—Anthrax- can be found naturally in soil and commonly affects domestic and wild animals around the world. Bacillus anthracis is mostly common viruses of Anthrax. There are some more occurred in similar DNA sequences: 3 Bacillus Viruses: Bacillus anthracis, Bacillus cereus, and Bacillus thuringiensis. This is a report about analyzing the similarities between the Bacillus viruses by investigating the frequency of amino acid and finding the difference between those three viruses based on the gene. Those diseases are infected by parasite and host animals, and cause muscle pain. Therefore, we can conclude that Leucine is a protein that plays a significant role in causing muscle pain. Secondly, In Analysis of decision tree, there are only little differences between each classes. The classes represent positions that include representative protein. The very position that windows mention is their difference.

Morning, May 24, 2016 (Tuesday)

Time: 10:45~12:45

Venue: Seminar Room 3

Session 1: 8 presentations-Topic: “Chemistry”

Session Chair: Prof. Gede Wibawa

G0039 Presentation 6 (12:00~12:15)

Biodiesel Production from Jatropha Oil in a Closed System

Waleed Mohamed, Ahmed Elshazly, Marwa El-Kady, and Masahiro Ohshima

Egypt-Japan University for Science and Technology (E-JUST), Egypt

Abstract—The use of biodiesel as an alternative fuel is becoming increasingly popular nowadays due to global energy shortage. The interest in using Jatropha as a non-edible oil feedstock is rapidly growing. Biodiesel produced from crude Jatropha oil with NaOH as a catalyst is investigated. Transesterification by methanol is carried out in a closed vessel as a batch system. Factors affecting the process which included the reaction temperature and pressure, reaction time, the molar ratio of methanol to oil and catalyst amount are investigated. The maximum conversion ratio of methyl ester yield of 97.7% was recorded under the conditions of 65 °C, 1% (by mass) NaOH of the oil mass and 6:1 methanol to oil ratio.

Morning, May 24, 2016 (Tuesday)

Time: 10:45~12:45

Venue: Seminar Room 3

Session 1: 8 presentations-Topic: “Chemistry”

Session Chair: Prof. Gede Wibawa

G0006 Presentation 7 (12:15~12:30)

Thermal Properties and Morphology of Polypropylene /Polycarbonate/ Polypropylene- Graft-Maleic Anhydride Blends

Muhammad Shafiq Mat Shayuti, Zaki Abdullah, and Puteri Sri Melor Megat Yusoff

University Teknologi MARA, Malaysia

Abstract—This work investigates the effect of blending polycarbonate (PC) into polypropylene (PP) matrix polymer on thermal properties and morphology. The blends, containing 5% to 35% of polycarbonate and 5% compatibilizer, were compounded using twin-screw extruder and fabricated into standard tests samples using injection or compression molding. The compatibilizer used was polypropylene-graft-maleic anhydride (PP-g-MA). Thermogravimetric analysis (TGA) showed improved thermal degradation temperature of PP/PC/PP-g-MA blends compared to pure PP. As PC content increased, the thermal degradation temperature also improved. The highest improvement of thermal degradation temperature was 23.3%, demonstrated by 60/35/5 composition. It was found that the thermal stability of PP/PC blends was improved with the addition of PP-g-MA. PP-g-MA was suspected to enhance the phase adhesion between PP and PC, thus improving thermal stability. Microscopy analysis showed PC reinforcement phase existed as particulates dispersed in PP matrix phase. PC also was in irregular shapes of fibers or flakes in certain compositions, depending on PC fraction and compatibilizer content.

Morning, May 24, 2016 (Tuesday)

Time: 10:45~12:45

Venue: Seminar Room 3

Session 1: 8 presentations-Topic: “Chemistry”

Session Chair: Prof. Gede Wibawa

G0035 Presentation 8 (12:30~12:45)

Effects of Particle Shape and Size on Nanofluid Properties for Potential Enhanced Oil Recovery (EOR)

Tengku Amran Tengku Mohd, Jumadi Baco, Noor Fitrah Abu Bakar, and Mohd Zaidi Jaafar

Universiti Teknologi Malaysia, Malaysia

Abstract—Application of Enhanced Oil Recovery (EOR) in oil and gas industry is very important to increase oil recovery and prolong the lifetime of a reservoir but it has been very costly and losing properties of EOR agent due to harsh condition. Nanoparticles have been used in EOR application since they are not degradable in reservoir condition and used in smaller amount compared to polymer usage. Commonly, EOR techniques are focusing on increasing the sweep efficiency by controlling the mobility ratio between reservoir fluid and injected fluid. Thus, this research aimed to analyze the nanofluid viscosity at different particle size and shape, volumetric concentration and types of dispersing fluid, as well as to determine the oil recovery performance at different nanofluid concentration. The nanofluid viscosity was investigated at nanoparticle sizes of 15nm and 60nm and shapes of 15nm spherical-solid and porous. Five nanofluid samples with concentration ranging from 0.1wt.% to 7wt.% were used to investigate the effect of volumetric concentration. Distilled water, ethanol, ethylene glycol (EG) and brine were used for the effect of dispersing fluids. Oil recovery was investigated at five different concentrations of nanofluid samples through flooding test. It was found that viscosity of nanofluid increased with decreasing particle size and increasing volumetric concentration. Solid shape particle and increasing dispersing fluid viscosity resulted in higher nanofluid viscosity. The higher the nanofluid concentration, the higher the oil recovery obtained. It can be concluded that nanofluid properties have been significantly affected by the environment and the particle used for potential EOR application.

Session 2

Tips: The schedule for each presentation is for reference only. In case of missing your presentation, we strongly suggest that you attend the whole session.

Afternoon, May 24, 2016 (Tuesday)

Time: 10:20~12:35

Venue: Seminar Room 2

Session 2: 9 presentations-Topic: “Agriculture”

Session Chair: Prof. Byoung Ryong Jeong

C3001 Presentation 1 (10:20~10:35)

Evaluation of phytotoxicity of fermented goat manure from two different located south korea farms

Chon. Won-mo, **B. Ravindran**, Jung Kon Kim, Jung Gwang-Hwa, Lee, Dong-Jun, Choi, Dong-Yun

Animal Environment Division, Department of Animal Biotechnology and Environment, National Institute of Animal Science, RDA, Wanju-Gun / Jeonju, South Korea

Abstract—Korea has increased the livestock population with a rise in national per capita income bringing with it the propensity to consume more livestock products. Goats are seen as important multi-functional animals in socio-economic and ecological terms in developing countries throughout the world. Goat manure has received more attention than other animal manure for the following reasons: nutrient rich content (i.e., high nitrogen and other elements) and low odor, etc. However, for the production of high nutrient quality organic fertilizers, we collected and fermented the sunchang and kimcheon region farm goat manure (GM) for 25 days. Our study focused on the evaluation of the phytotoxicity level of fermented and non fermented manure using two different commercial crop varieties, viz., sesame (*Sesamum indicum* L.), and carrot (*Daucus carota*). The results revealed that the relative seed germination (RSG), relative root elongation (RRE) and germination index (GI) values were recorded highly in fermented goat manure (FM) than non fermented manure (NFM) from both farms. The recorded range of two crops RSG (76.6- 98 %), RRE (72-135%) and GI (69.5- 98) in fermented manure and RSG (86- 100 %), RRE (95 - 149%) and GI (93.1- 119.5). However, in between the crops, carrot shown better RSG (%), RRE (%) and GI (%) values than sesame crops. Overall results concluded, the both farm F manure and NF manure did not show any phytotoxicity (based on above 50 % GI) on studied crops, in addition, F manure enhanced the seedling growth and it could be used as organic fertilizer for commercial crops.

Afternoon, May 24, 2016 (Tuesday)

Time: 10:20~12:35

Venue: Seminar Room 2

Session 2: 9 presentations-Topic: “Agriculture”

Session Chair: Prof. Byoung Ryong Jeong

D0007 Presentation 2 (10:35~10:50)

Population Dynamic Model Reveals a Rapid Declining Trend in Number of Buffaloes Raised in Ubon Ratchathani Province, Thailand

Anuwat Wiratsudakul, Poonyapat Sedwisai, Teeraporn Makaroon, Sunisa Kinawong, Kittipat Angchokchatchawal, Bopit Puyati, and Surapong Senayai

Faculty of Veterinary Science, Mahidol University, Thailand

Abstract—Swamp buffaloes (*Bubalus bubalis*) have been raised for agricultural purposes in Thailand for centuries. However, advances in agricultural technology has recently replaced these buffaloes with sophisticated machines, resulting in the decrease of buffaloes in this country. The present study thus aimed to quantitatively determine the rate of buffalo population reduction in Ubon Ratchathani province where the highest number of buffaloes was recorded. A questionnaire was used in our data collection. The respondents were questioned on number of buffaloes, age at calf delivery and buffalo selling data. Population dynamic model was then constructed. A total of 395 respondents involved in this project. These respondents provided us the data on 1,366 buffaloes which were divided into 418 males and 948 females. Only data on female buffaloes was used in our model as male buffaloes are always sold at young age. Our results indicate that number of female buffaloes in this study is likely to drop below 50% compared to initial population within 12 years with a population growth rate of 0.92. We suggest that the model should be extrapolated to total population of buffaloes in Ubon Ratchathani province. The intervention model to solve the declining trend should also be proposed in order to guide the policy makers. The related authorities should be involved as the swamp buffalo is one of livestock species that secure the sustainable livelihoods especially in the rural communities in Thailand.

Afternoon, May 24, 2016 (Tuesday)

Time: 10:20~12:35

Venue: Seminar Room 2

Session 2: 9 presentations-Topic: “Agriculture”

Session Chair: Prof. Byoung Ryong Jeong

D0010 Presentation 3 (10:50~11:05)

Novel SNPs in Myostatin Promoter Gene and Its Associated with Muscling Traits in Bali Cattle

Himmatul Khasanah, Jakaria Jakaria, Asep Gunawan and Rudy Priyanto

Bogor agricultural university, Indonesia

Abstract—MSTN (Myostatin) gene is known as Growth and Differentiation Factor 8 (GDF8) that is belonging to a member of transforming growth factor β (TGF- β superfamily). The function of MSTN gene was an inhibitor (negative regulator) of proliferation and differentiation of cell cycle during myogenesis in embryonic and adult cell. A total 48 Bali cattle from BPTU Denpasar was screened to identify genetic polymorphisms in MSTN promoter region by using direct sequencing. The traits were measured at 12-15 months of ages. The muscling traits were evaluated by using ultrasound. The result of this research found that in this region were 20 polymorphic SNP. Based on statistical analyses, the SNPs g.-8299G→A and g.-7953C→T had significant effect to ultrasound back fat thickness and intramuscular fat percentage, SNPs g.-8283A→G, g.8216G→A, g.-8168A→G was found significant association with ultrasound back fat thickness, ultrasound rump thickness and intramuscular fat percentage. The SNP g.-8077G→A only has significant association with ultrasound back fat thickness. The SNPs g.-7799T→C and g.-7942C→G significantly associated with rump thickness and intramuscular fat percentage, respectively. These result suggested MSTN as a candidate gene for genetic marker that influence in muscling traits in Bali cattle.

Afternoon, May 24, 2016 (Tuesday)

Time: 10:20~12:35

Venue: Seminar Room 2

Session 2: 9 presentations-Topic: “Agriculture”

Session Chair: Prof. Byoung Ryong Jeong

D0013 Presentation 4 (11:05~11:20)

Effect of Additional Methionine in Drinking Water on the Performance of Laying Hens

Sahin Cadirci

University of Karabük, Turkey

Abstract—Delivering methionine in drinking water is a flexible way of methionine supplementation to the hens’ diet and it provides an opportunity to manipulate the diet without changing the basal diet. A 20 weeks experiment was conducted to study the effects of additional water-soluble DL-methionine supplied through water on the performance of laying hens. A total of 144 ISA BROWN laying hens at 60 weeks of age were used for the study. The birds were divided into six groups of equal number and placed singly in cages. The nutrient specifications of basal diet were set to meet or exceed nutrient requirements (NRC, 1994) where the level of total sulfur amino acids was 5.66 g/kg diet. During the experiment, Group 1 received NRC-Diet and normal water. Groups 2, 3, 4, 5 and 6 received NRC-Diet fortified with one of the five concentrations of methionine treated water (0.010% for group 2; 0.020% for group 3; 0.030% for group 4; 0.040% for group 5; 0.050% for group 6). All birds were fed *ad libitum* using individual feed hoppers and drinkers. Daily feed intake and water consumption were measured gravimetrically every 24 hours. Methionine intake was calculated from the amounts consumed via feed and water. Egg production and egg weight data were recorded each day. Egg mass and feed efficiency were also calculated to better evaluate overall hen performance. All data were obtained on an individual hen basis. There were significant differences in total sulfur amino acid intake and feed conversion ratio between the groups; increasing total sulfur amino acid intake resulted in better feed efficiency. On the other hand, no significant differences were observed in feed intake, water intake, egg weight, egg mass, and egg production. The results suggest that, under the conditions of this study, additional DL-methionine can be effectively provided to laying hens through the drinking water. This offers the potential opportunity for methionine to be offered in drinking water to hen flocks so that individuals whose methionine requirements were not being met via the feed might meet their requirements from the water. This method of supplying methionine should not require additional labour, equipment, or time, therefore, application to flocks requires no investment other than the cost of the methionine.

Afternoon, May 24, 2016 (Tuesday)

Time: 10:20~12:35

Venue: Seminar Room 2

Session 2: 9 presentations-Topic: “Agriculture”

Session Chair: Prof. Byoung Ryong Jeong

D0016 Presentation 5 (11:20~11:35)

Exploring Critical Success Factor for Stakeholder Management in Small Ruminant Farming

Melissa Alina Yusoff, Norsida Man and Nolila Mohd Nawi

Universiti Putra Malaysia, Malaysia

Abstract—The aim of this study was to determine the Critical Success Factor (CSF) in small ruminant farming. A total 600 respondents were surveyed in the field. Face to face interviewed used as a method of this study. The results from factor analysis revealed that the small ruminant farming ranchers’ perspectives, thirteen (13) factors were extracted namely family support, government support and policies, labour, extension services, production system, farm management, feed sources, farm operation, neighborhood relationship, marketing, disease and prevention management, feed strategies and technical skill. All these factors family support, government support and policies, labour, extension services, production system and farm management were identified as critical successful factors among the respondents to perform success in small ruminant farming.

Afternoon, May 24, 2016 (Tuesday)

Time: 10:20~12:35

Venue: Seminar Room 2

Session 2: 9 presentations-Topic: “Agriculture”

Session Chair: Prof. Byoung Ryong Jeong

C0011 Presentation 6 (11:35~11:50)

Bioaccumulation of sp² carbon nanomaterials in wheat and their bio-effects (Presentation Only)

Sheng-Tao Yang, Lingyun Chen and Xue-Ling Chang

Southwest University for Nationalities; Chinese Academy of Sciences, China

Abstract—Due to the researches, productions and applications, sp² carbon nanomaterials can be released into the environment and are potentially hazardous. In this study, we investigated the uptake and bio-effects of water dispersible sp² carbon nanomaterials, namely fullerenol and graphene oxide (GO). ¹³C-labeled fullerenol and GO were prepared and introduced to wheat. Upon the incubation, the ¹³C contents of root, stem and leaf were determined to calculate the bioaccumulation levels. The germination, growth, structure and oxidative stress of wheats were monitored after the exposure to sp² carbon nanomaterials. Our results showed that both fullerenol and GO could be absorbed by the root with minors found in stem and leaf. SEM investigations confirmed the accumulations of sp² carbon nanomaterials in the wheat roots. Fullerenol stimulated the growth of wheats and up-regulated the chlorophyll contents of leaves. GO inhibited the root elongation and growth of wheat. The chlorophyll contents decreased upon the exposure to GO. The toxicity of GO to wheat was due to the oxidative damage. In conclusion, sp² carbon nanomaterials might accumulate in plants, and the bio-effects depend on the shape and functionalities.

Afternoon, May 24, 2016 (Tuesday)

Time: 10:20~12:35

Venue: Seminar Room 2

Session 2: 9 presentations-Topic: “Agriculture”

Session Chair: Prof. Byoung Ryong Jeong

D0020 Presentation 7 (11:50~12:05)

Agronomic evaluation of mechanical and chemical weed management for reducing use of herbicides in single vs. twin-row sugar beet

Meisam Zargar, **Elena Pakina**, and PETR DOKUKIN

Peoples Friendship University of Russia, Russia

Abstract—In order to evaluate the effects of chemical and non-chemical weed management in in sugar beet, an experiment was carried out at a research farm in karaj. The experimental factors were arranged in split–split plot based on a complete randomized block design with four replications. Planting pattern was allotted as main-plot (single row planting with 50 cm row width, single row planting with 60 cm row width and twin row planting with 60 cm row width), time of mechanical control as sub–plot (mechanical weed control at 4 leaves stage, 10 leaves stage and 14 leaves stage of sugar beet), and herbicides as sub–sub plot (metamitron plus combination of phenmedipham + desmedipham + ethofumesat and triflusaluron metil plus combination of phenmedipham + desmedipham + ethofumesat). The results showed that planting pattern had proper effect on weeds biomass that best results were obtained in twin row planting 60 cm. Also, mechanical control at 4 leaves stage of sugar beet had the best effect on weeds density and biomass. metamitron plus combination of phenmedipham + desmedipham + ethofumesat had also the best effect on weeds density and biomass.

Afternoon, May 24, 2016 (Tuesday)

Time: 10:20~12:35

Venue: Seminar Room 2

Session 2: 9 presentations-Topic: “Agriculture”

Session Chair: Prof. Byoung Ryong Jeong

D0025 Presentation 8 (12:05~12:20)

The Variation of Indigenous Upland Rice Landraces in Ratchaburi, Thailand Based on Seed Morphology and DNA Sequencing

Prin Phunggam, Nichakorn Pathumrangsan, Natnaree Khambai, Jaruwan Tongjun, and Uraiwan Arunyawat

Muban Chombueng Rajabhat University, Thailand

Abstract—In this study, variability of rice landraces in Ratchaburi, Thailand was investigated using seed morphology and DNA sequences. This information is useful for understanding the extent of diverse level of rice landraces in order to provide desirable characters for accomplishing the efficient rice improvement and conservation program. Collected 9 rice landraces were observed using qualitative (awn presence, awn color, lemma and palea color, lemma and palea pubescence, sterile lemma color, sterile lemma length, and seed coat color) and quantitative (1000-grain weight, grain length with and without husk, grain width with and without husk, and ratio length/width with and without husk) characters. Using cluster analysis, all traits divided these rice landraces into two major clusters. Moreover, these rice landraces were also analyzed using single nucleotide polymorphism data based on two putative neutral fragments. This study presented low level of nucleotide diversity for all populations. The statistical tests of neutrality indicated significantly positive departure from neutral equilibrium, which suggested the high intermediate-frequency polymorphisms in these rice landraces.

Afternoon, May 24, 2016 (Tuesday)

Time: 10:20~12:35

Venue: Seminar Room 2

Session 2: 9 presentations-Topic: “Agriculture”

Session Chair: Prof. Byoung Ryong Jeong

D0015 Presentation 9 (12:20~12:35)

Relationships Between the Polymorphism of Blood Proteins and Some Reproduction Traits in Norduz Goats

Turgut Aygün

Yüzüncü Yıl University, Republic of Türkiye

Abstract—The aim of this study was to determine the influences of polymorph systems such as hemoglobin and transferrin types on some the reproduction traits in Norduz goats. The material of this study consisted of 65 Norduz goats. The polymorphism of hemoglobin and transferrin phenotypes of Norduz goats were determined. Blood proteins were analyzed through horizontal starch gel electrophoresis. It was found that the hemoglobin and transferrin types were controlled by two allele genes (HbA and HbB; TfA and TfB) in the goats. The phenotypes of HbAA, HbBB and HbAB; TfAA, TfBB and TfAB were observed in the population. Hemoglobin and transferrin gene frequencies were 0.73 for HbA and 0.27 for HbB; 0.80 for TfA and 0.20 for TfB. Hemoglobin and transferrin genotype percentage frequencies were 51% for HbAA, 4% for HbBB and 45% for HbAB; 65% for TfAA, 4% for TfBB and 31% for TfAB. According to the analyses of variance, the influences of hemoglobin and transferrin types on the gestation efficiency were not significant. However, the highest gestation efficiencies were obtained from HbBB and TfBB types with the averages of 16.05 ± 1.75 and 13.67 ± 3.51 kg, whereas the lowest gestation efficiencies were obtained from HbAB and TfAB types with the averages of 9.94 ± 0.82 and 9.67 ± 0.60 kg, respectively. In conclusion, there were polymorphism in hemoglobin and transferrin types in Norduz goats.

Lunch	
12:40-13:40	Global House

Session 3

Tips: The schedule for each presentation is for reference only. In case of missing your presentation, we strongly suggest that you attend the whole session.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 3

Session 3: 10 presentations-Topic: “Chemistry”

Session Chair: Prof. Young Sun Mok

G0005 Presentation 1 (13:40~13:55)

Novel CdS/ZnO Core/Shell Nanowires for Hydrogen Generation

Shuen Tso

National Tsing Hua University, Taiwan

Abstract—The increasing global energy demand and continuous depletion of fossil fuel reserves are an important issue for human civilization. Hydrogen produced from water splitting, either electrochemically or photochemically, is a promising and sustainable solution to the storage of energy. The researcher produces CdS/ZnO core/shell nanowires for hydrogen generation. Nanowires, compared to thin films, have much more surface areas for release hydrogen ions. In addition, its small dimension shortens the path for electrons to the surface, avoiding electrons-holes recombination. The researcher selects ZnO as the shell to protect CdS nanowires. ZnO has the same wurtzite structure as CdS and also serves to lower the energy barrier at the contact surface. Its wide band gap allows a wide spectrum of lights to penetrate. As a result, electrons excited by sunlight would migrate from CdS to ZnO, then to the surface to reduce hydrogen ions. The researcher uses VLS process to grow CdS nanowires. A layer of ZnO is then coated on CdS nanowires by RF sputtering. Compared to other semiconductors with no precious metal as cocatalyst, the present structure produces extraordinary amount of hydrogen. The researcher believes that further modification of CdS/ZnO core/shell nanowires will lead to even better performance.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 3

Session 3: 10 presentations-Topic: “Chemistry”

Session Chair: Prof. Young Sun Mok

G0040 Presentation 2 (13:55~14:10)

Investigation of the Parameters Affecting Subcritical CO₂ –assisted Polyaniline Polymerization

Hussien Noby Badry Hussein, Ahmed Elshazly, Marwa El-Kady, and Masahiro Oshima

Egypt-Japan University for Science and Technology (E-JUST), Egypt

Abstract—Specific Polyaniline (PANI) morphologies such as nanotubes and nanofiber are required for enhancing its performance in the various applications. CO₂ –assisted Polyaniline polymerization is a method recently used to produce these anticipated morphologies. In this study, polyaniline nanotube was prepared successfully in the presence of compressed CO₂ utilizing Aniline as a monomer and Ammonium peroxydisulfate (APS) as an oxidizing agent. The effect of both reaction temperature and the oxidizing agent feed rate on the morphology and surface area of the produced PANI was investigated. The synthesized PANI was examined by FT-IR, XRD, and BET surface area analysis. Furthermore, SEM was carried out to figure out the morphology of the prepared PANI. It was indicated that Polyaniline nanotubes PANNTs size and homogeneity were affected by the reaction temperature. The averages of the outer and inner diameters of the PANNTs at 25 °C, 45 °C, 65 °C were found to be about (120, 60 nm), (140, 65 nm), and (175, 75 nm) respectively. Also, the produced surface area was slightly augmented with the increase of the temperature. In addition, it was observed that increasing the feeding rate of the APS was associated with the reduction of the size and the surface area of the produced PANI nanotubes.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 3

Session 3: 10 presentations-Topic: “Chemistry”

Session Chair: Prof. Young Sun Mok

G2006 Presentation 3 (14:10~14:25)

Controlled Assembly of Dipeptide into Novel Biological Nanomaterials

Hongchao Ma

China University of Petroleum (East China), China

Abstract—Controlled molecular assembly is a powerful strategy to build nanomaterials with versatile functions. Recently, controlled assembly of bio-molecules has attracted widely attention due to their applications in fields such as drug delivery, tissue engineering and biosensors. Peptides, as an important member of bio-molecules, have been used to fabricate nanomaterials with diverse structures and functions. The morphologies, structures and functions could be regulated by artificially design molecular structures and control assembly environment. Herein, taking diphenylalanine peptides (FF) and its cationic derivatives as building block, the researchers have constructed a series of assemblies with 1D, 2D and 3D structures. Moreover, the controlled assembly of diphenylalanine peptides has also been performed through efficient strategies including changing concentration, altering solvents and introducing adventive small molecules to assembly systems. The main results are listed as follows. (1) Three sulfonic azobenzenes were used to manipulate the assembly of cationic dipeptides into urchin, flower and plate-like structures. (2) The photo-induced reversible structural transition of a cationic diphenylalanine peptide is observed by co-assembly with a photo-switchable azobenzene. (3) Rectangular microtubes and microrods which possessing waveguiding property are obtained by self-assembly of cationic diphenylalanine peptide through a slow solvent-evaporation method. (4) The controlled self-assembly of diphenylalanine (FF) into hollow spheres was successfully achieved by an ultrasound-assisted emulsion droplet template method. The researchers believe that these assembly structures which possess excellent optical and biological properties, may be potentially applied in optical waveguiding, cell labeling, cell culture and gene transfection.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 3

Session 3: 10 presentations-Topic: “Chemistry”

Session Chair: Prof. Young Sun Mok

G0046 Presentation 4 (14:25~14:40)

Microencapsulation of Citronella Oil by Complex Coacervation Using Chitosan-Gelatin (B) System: Operating Design, Preparation and Characterization

Fitrah Rabani Abdul Aziz, Junaidah Jai, **Rafeqah Raslan**, and Istikamah Subuki

Universiti Teknologi MARA, Malaysia

Abstract—Citronella oil (CO) can be an effective mosquito, but due to its nature which having high volatility, oils rapidly evaporates causing loss of efficacy and shorten the repellent effect. Therefore, microencapsulation technology was implemented to ensure the encapsulated material being protected from immediate contact with environment and offers controlled release. In this study, microencapsulation of CO was done by employing complex coacervation using chitosan-gelatin (B) system and utilized proanthocyanidins as the crosslinker. Remarkably, nearly all material involved in this study are from natural sources which are safe to human and environment. In designing operating process condition for CO encapsulation process, we found that wall ratio of 1:35 and pH 5 was the best operating condition based on zeta potential and turbidity analysis. FT-IR analysis found that gelatin-B had coated the CO droplet during emulsification stage, chitosan started to interact with gelatin-B to form a polyelectrolyte complex in adjust pH stage, CO capsules solidified at cooling process and were hardened during crosslinking process. Final product of CO capsules after settling process was identified at the top layer. Surface morphology of CO capsules obtained in this study were described having diameter varies from 81.63 μm to 156.74 μm with almost spherical in shape.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 3

Session 3: 10 presentations-Topic: “Chemistry”

Session Chair: Prof. Young Sun Mok

G0051 Presentation 5 (14:40~14:55)

A Comparison between the Effects of Sepiolite and Silica on Mechanical Properties and Thermal Stability of NR/EPDM Blend

Nattawat Winya and Nanthiya Hansupalak

Defence Technology Institute, Thailand

Abstract—This study focused on improving the ablation properties and mechanical properties of natural rubber (NR)/ethylene propylene diene monomer (EPDM) blends by using two different commercial fillers: sepiolite and silica. The results showed that sepiolite and silica similarly improved both properties in the loading range of interest (0-12.5 phr). However, sepiolite was superior than silica as using less loading to achieve comparable mechanical and thermal properties. The optimum loading of sepiolite was 5 phr, while that of silica was 10 phr. For both filler systems, the minimum ablation rate found was approximately 0.17 mm/s, and the tensile strength and the hardness of corresponding NR/EPDM composite were improved after modification with sepiolite or silica. Thus, the composite reinforced with sepiolite or silica is suitable for many applications, such as internal insulations of rocket motor.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 3

Session 3: 10 presentations-Topic: “Chemistry”

Session Chair: Prof. Young Sun Mok

G0029 Presentation 6 (14:55~15:10)

Pyrolysis of Carbonaceous Particles and Properties of Carbonaceous-g-Poly(acrylic acid) Superabsorbent Polymer for Agricultural Applications

Suriati Ghazali and Saidatul Shima Jamari

Universiti Malaysia Pahang, Malaysia

Abstract—Fertilizer and water are very important in determining the production of agriculture nowadays. The excessive use of fertilizer in plantation somehow could leads to environmental pollution. The present study reported a synthesis of controlled release water retention (CRWR) fertilizer coating with superabsorbent polymer (SAPs) that could enhance the utilization of fertilizer and reduce the environmental pollution. In this study, the preparation of carbonaceous-SAPs was carried out via solution polymerization technique by using monomer of poly(acrylic acid) (AA), cross linker, methylene bisacrylamide (MBA) and initiator, ammonium peroxydisulfate (APS) that partially neutralized with sodium hydroxide (NaOH). The CRWR fertilizer was later be prepared by coated the fertilizer granule with carbonaceous-SAPs. The morphology and the bonding formation of the final product of CRWR fertilizer were investigated by using Scanning Electron Microscopy (SEM) and Fourier Transform Infrared Spectrophotometer (FTIR), respectively. Moreover, the water absorbency and water retention in soil were conducted in order to investigate the efficiency of carbonaceous-SAP on the properties of CRWR. Based on the results, the CRWR fertilizer that was coated with carbonaceous-SAP had higher water absorbency value than the CRWR fertilizer without carbonaceous-SAP. 1 wt % CRWR fertilizer in organic soil gave higher water retention ability compared with 1 wt % CRWR fertilizer in top soil. In conclusion, CRWR fertilizer gave a significant influence on the performance of water absorbency and controlled of nutrients release rate as well as function as water retention in soil.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 3

Session 3: 10 presentations-Topic: “Chemistry”

Session Chair: Prof. Young Sun Mok

G0008 Presentation 7 (15:10~15:25)

The Effectiveness Study of Different Membrane in Treating Industrial Wastewater

Munawar Zaman Shahrudin, Izzah Sofiahannun Ishak, Nur Hidayati Othman, Nur Hashimah Alias, and Nur Azrini Ramlee

University Teknologi MARA, Malaysia

Abstract—This paper focuses on the effectiveness study of different membranes in treating petroleum based wastewater. Polysulfone (PSF) and Polyether Sulfone (PES) were prepared using phase inversion method in NMP solvent. The composition of membrane was varied by manipulating the PVP additives concentration (5 wt%) in the membrane dope solution. The morphological study of prepared membranes was analysed using Field Emission Scanning Electron Microscope (FESEM) while the permeating flux and Chemical Oxygen Demand (COD) rejection rate were determined accordingly by using the refinery wastewater as the feed. The result found that the permeating flux increased as the operating pressure increased. However, for COD rejection, it was reported that only certain membrane show the best rejection. To clarify and support this finding, the membrane performance was further analyzed by determining the Total Dissolved Solid (TDS) rejection for PSF2 and PES2 membrane samples. The result showed that both membranes recorded relatively high TDS rejection which can be justified by the morphological studies of each samples. Therefore, this study proved that the membrane treatment have a high potential to treat the industrial wastewater for a larger scale.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 3

Session 3: 10 presentations-Topic: “Chemistry”

Session Chair: Prof. Young Sun Mok

G0022 Presentation 8 (15:25~15:40)

In-Situ Catalytic Surface Modification of Micro-Structured $\text{La}_{0.6}\text{Sr}_{0.4}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_{3-\delta}$ (LSCF) Oxygen Permeable Membrane Using Vacuum-Assisted Technique

Nur Hidayati Othman, Nur Zafirah Azmee, Munawar Zaman Sharuddin, Nur Hashimah Alias, Zhentao Wu, and K. Li

Universiti Teknologi Mara, Malaysia

Abstract—This paper aims at investigating the means to carry out in-situ surface modification of $\text{La}_{0.6}\text{Sr}_{0.4}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_{3-\delta}$ (LSCF) oxygen permeable membrane by using vacuum assisted technique. The unique structure of the LSCF hollow fibre membrane used in this study, which consists of an outer dense oxygen separation layer and conical-shaped microchannels open at the inner surface has allowed the membrane to be used as oxygen separation membrane and as a structured substrate for where catalyst can be deposited. A catalyst solution of similar material, LSCF was prepared using sol-gel technique. Effects of calcination temperature and heating rate were investigated using XRD and TGA to ensure pure perovskites structure of LSCF was obtained. It was found that a lower calcination temperature can be used to obtain pure perovskite phase if slower heating rate is used. The SEM photograph shows that the distribution of catalyst onto the membrane microchannels using in-situ deposition technique was strongly related to the viscosity of LSCF catalytic sol. Interestingly, it was found that the amount of catalyst deposited using viscous solution was slightly higher than the less viscous sol. This might be due to the difficulty of catalyst sol to infiltrate the membrane and as a result, thicker catalyst layer was observed at the lumen rather than onto the conical-shaped microchannels. Therefore, the viscosity of catalyst solution and calcination process should be precisely controlled to ensure homogeneous catalyst layer deposition. Analysis of the elemental composition will be studied in the future using energy dispersive X-ray Spectroscopy (EDX) to determine the elements deposited onto the membranes. Once the elemental analysis is confirmed, oxygen permeation analysis will be carried out.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 3

Session 3: 10 presentations-Topic: “Chemistry”

Session Chair: Prof. Young Sun Mok

G0007 Presentation 9 (15:40~15:55)

Removal of Ammonia Using a Continuous Higeer Stripping Process

Yu-Shao Chen, Hsiao-Ping Huang, and Yi-Ning Wu

Chung Yuan University, Taiwan

Abstract—Ammonia is a common pollutant in wastewaters and is typically removed by air stripping in a bubble column and a packed column. However, a high temperature, a high ratio of gas-to-liquid flow rates and a bulky column are usually required because the mass transfer efficiency in the gas-liquid contactors is low. In this study, a continuous stripping of ammonia from water was conducted in a rotating packed bed (RPB) with a high mass transfer efficiency. The removal efficiency of ammonia from ammonia chloride solution as a function of rotational speed, liquid and gas flow rates, and the pH and temperature of the solution were examined. Additionally, the overall mass transfer coefficient and the height of transfer unit were also calculated. Experimental results showed that the removal efficiency increased with the rotational speed, the gas-to-liquid flow rate ratio and the pH level. At a rotational speed of 2000 rpm, a liquid flow rate of 0.1 L/min, a gas flow rate of 90 L/min, and a temperature of 40°C at pH 12, a removal efficiency of 95.8% and an HTU less than 0.01 m were obtained. Compared with other contactors, an RPB provides a higher removal efficiency at a lower gas-to-liquid ratio and lower temperature in the continuous stripping of ammonia.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 3

Session 3: 10 presentations-Topic: “Chemistry”

Session Chair: Prof. Young Sun Mok

G0020 Presentation 10 (15:55~16:10)

An Optimization Study on Syngas Production and Economic Evaluation

Faraz Qasim, Jae Sun Shin, Jong Hwa Jeong, and Sang Jin Park

Dongguk University, Korea

Abstract—Syngas production in Gas-to-liquid (GTL) process is focused in past by several researchers to increase the production with minimal capital and operating costs. In this study, syngas production process is simulated and optimized to increase its production and the economic analysis is studied for the proposed optimized process. Aspen HYSYS v8.4 is used for all process simulation work in this article. A new configuration is rigorously simulated while using auto-thermal reforming. Results exhibit a tremendous rise in production of syngas.

Session 4

Tips: The schedule for each presentation is for reference only. In case of missing your presentation, we strongly suggest that you attend the whole session.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 2

Session 4: 10 presentations-Topic: “Bioscience”

Session Chair:

C0004 Presentation 1 (13:40~13:55)

Experimental Study on Start-up Process of Ceramic-Volcanic Rock BAF and Volcanic Rock-Ceramic BAF

Qian Fan, Aiyin Chen and Qing Tian

Capital Aihua (Tianjin) Municipal & Environmental Engineering Co., Ltd.

Abstract—In order to improve the treatment efficiency and capacity of resisting impact load in nitrogen removal process of the biological aerated filter (BAF), and effectively reduce cost of investment and operation, volcanic rocks and ceramics were used to construct two systems with different fillers combinations of pre denitrification BAF process for nitrogen removal: Ceramics - volcanic rocks BAF (C-V BAF) and volcanic rocks - ceramics BAF (V-C BAF). Compared the process characteristics of two kinds of filler combinations during the start-up stage. And ,at the same time, nitrogen removal mechanism of two kinds of filler combinations was explored preliminarily.The results of start-up process of C-V BAF and V-C BAF indicated that the ammonia of start-up. The conclusion was obtained by determining the distribution of nitrogen forms in the effluent that the removal efficiency of ammonia nitrogen was maintained a high level mainly through the adsorption of volcanic during the initial stage of start-up process of two kinds of filler combinations. During the middle and late stage of the start-up process, ammonia nitrogen was removed mainly by nitrification, and the biofilm formation rate of nitrification bacteria in V-C BAF was faster than that of C-V BAF.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 2

Session 4: 10 presentations-Topic: “Bioscience”

Session Chair:

C2002 Presentation 2 (13:55~14:10)

Rheological Properties and Crystallization Kinetics of Biodiesel during Gelation Process

Wuhua Chen

Department of Petroleum Engineering, China University of Petroleum (East China), Qingdao 266580, P.R.China

Abstract—Variation of rheological parameters with temperature and processing time for biodiesels were studied by oscillatory rheometer. Influence of cooling rate on the gelation characteristics of biodiesel were analyzed. The gelation point lowers and the storage modulus during non-isothermal and entire isothermal processes decreases with increasing of cooling rate. Isothermal gelation kinetics of biodiesels at different conditions were estimated based on rheological measurements. It has been found the crystallization rate constants during isothermal process decreases with the increasing of temperature and decreasing of cooling rate. Activation energy of soybean oil biodiesel is greater than that of waste oil biodiesel.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 2

Session 4: 10 presentations-Topic: “Bioscience”

Session Chair:

G0030 Presentation 3 (14:10~14:25)

Techno-Economic Analysis for Small Scale Production of Plant Oil and Biodiesel from Rubber Seeds in Palangkaraya, Indonesia

Muhammad Yusuf Abduh, Robert Manurung, and Hero Jan Heeres

Institut Teknologi Bandung, Indonesia

Abstract—Estimation of production cost and sensitivity analysis for small scale production of rubber seed oil and biodiesel was studied. The production unit is projected to be built in the ex-Mega Rice Project area south of Palangkaraya, Indonesia which has a serious land degradation and deforestation problem. The valorization of rubber seed to produce bioproducts is seen as a contribution to revitalize the area. The production cost for rubber seed oil and rubber seed biodiesel in a small-scale (55 ton/y) was estimated to be €0.42/L and 1.00/L, respectively. This value is comparable with the price of diesel in remote areas in the ex-Mega Rice Project area close to Palangkaraya (up to €1.25/L). The effects of capital investment, production capacity, price of co-product credit, employees’ salary and price of raw materials towards the production cost of rubber seed oil and biodiesel were investigated in the sensitivity analysis. The cost of capital investment has a relatively minor impact on the production cost of the rubber seed oil and biodiesel. The production capacity has a very strong influence in the production cost of rubber seed oil. The effect of other input variables are significant and all are showing about equal sensitivity.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 2

Session 4: 10 presentations-Topic: “Bioscience”

Session Chair:

C0009 Presentation 4 (14:25~14:40)

Taxonomical Classification of the Genome Sequencing Data from Arbuscular Mycorrhizal Fungi and their Associated Bacteria

Jee Eun Kang, Mohamed Hijri and Antonio Ciampi

Université de Montréal, McGill University, Canada

Abstract—Arbuscular Mycorrhizal Fungi (AMF) are plant root symbionts that play major roles in plant growth and crop yield increase as well as soil and plant health. Despite their importance for ecosystem functioning, only partial genome of one isolate of AMF is available so far. This is mainly due to their biotrophic lifecycle, coenocytic and multinucleate mycelia. In addition, AMF are associated intimately with a myriad of microorganisms inhabiting in their spores of adhering to the surface of their mycelia. In AMF genome sequencing (GS) data, there are sequences not only from the AMF itself but also from other microbes which bring another level of complexity. Thus it is impossible to sort AMF sequences from non-AMF GS data using current technologies in molecular and computational biology. In this study, we developed a novel bioinformatics program to classify AMF GS based on synonymous codon usage biases and compositional patterns of subunits of the secondary structures from Protein Data Bank. We select 54 taxonomical groups of bacteria and fungi to test our program which consists of two major parts; one is reference datasets of 54 genera and the other is probability calculation from each of 54 genera. Each genus reference data consist of three hierarchies-amino acid characteristics, corresponding synonymous amino acid usage biases, and corresponding synonymous codon usage biases of subunits of the secondary structures (SS) from PDB (Protein Data Bank) for coding sequence (CDS) and compositional pattern tables for non-coding sequence (non-CDS). We identified amino acid trimers of secondary structure subunits in a query sequence in 6 frames, and calculate a probability score in each 6 frame of that the query sequence belongs to each genus based on reference dataset. Compared

to existing methods which use overall average substitution rates regardless of specificities of amino acids in various structures, our program provides a high resolution classification for short sequences (150-300 bp) because synonymous codon usage biases of approx. 8000 specific amino acid trimers of secondary structure subunits were extracted with amino acid substitutions taken into consideration in each specific trimer. We tested the program with randomly extracted bacterial and fungal CDS and non-CDS sequences from 54 genera. The correct prediction rates of CDS and non-CDS were 71% and 50% for bacterial group, and 65% and 73% for fungal group, respectively. For AMF testing, 49% of CDS and 72% of non-CDS were correctly classified into AMF. Our program provides multiple answers if probability scores are of little difference, which reflect molecular evolution of query sequence: genera with phylogenetically close relations tend to have similar probability scores. As 90% of soil bacteria are not culturable outside of soil in laboratory conditions and the microbial sequences available in the public databases are only small fractions of the existing microbes, our program has advantages over existing programs because unpublished AMF sequence and a novel fungal and bacterial sequence will be likely classified to a genus with phylogenetically close relation. This program enables us to estimate the approximate abundances of microbial communities associated with AMF, which will be highly useful for environmental studies and *in vivo* cultures of AMF.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 2

Session 4: 10 presentations-Topic: “Bioscience”

Session Chair:

C0010 Presentation 5 (14:40~14:55)

Identification of xylitol producing *Candida tropicalis* strain LY15 from *Persea americana* (Butter fruit) and its Statistical optimization

Agastian Paul and Barathikannan Kaliyan

Loyola College, India

Abstract—Xylitol is a compound which has broad-spectrum application in medical and food industries. Yeast isolates utilize xylose to produce xylitol but the quality and quantity of product yield varied among organisms. This study was aimed to isolate potential yeast species from commercial fruits available in different places of Tamil Nadu, India for their xylanase activity, D-xylose assimilation and xylitol production ability. A total of 33 yeast isolates originating from fruit juice were identified by molecular approaches and screened for the potential yeast for fermenting condition of xylitol production. Xylanase assay were carried out for all the 33 isolated isolates. Based on enzyme assay result, only one isolate showed maximum enzyme activity. *Candida tropicalis* strain LY15 showed maximum zone of clearance, xylose utilization ability and xylose reductase activity after 48 h of incubation at pH 6.5, temperature 28°C and agitation speed 140 rpm. Xylose and dextrose were utilized similarly for enzyme production by the new isolate. Peptone and yeast extract were found to be potential nitrogen source for the production of xylose reductase. The selected factors when employed with response surface approach, gave enhancements in the enzyme production compared to non-optimized parameters using the basal medium. Three dimensional response and interaction plot of the quadratic model showed interdependent interaction between the effective variables. Analysis of variance (ANOVA) predicts coefficient of determination R^2 value close to 1 which makes the result highly significant ($p \leq 0.0001$). Xylose-utilizing yeasts are one of the potential producers of xylitol. *Candida tropicalis* strain LY15 showed promising xylose reductase activity as well as xylitol production ability at optimized parameters. In addition production of xylose reductase was increased at optimized parameters through RSM.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 2

Session 4: 10 presentations-Topic: “Bioscience”

Session Chair:

C1001 Presentation 6 (14:55~15:10)

Antimicrobial Activities of Actinomycetes Isolated from Malaysian Tropical Mangrove Forest of Kuantan, Pahang

Zaima Azira Zainal Abidin, Nurfathiah Abdul Malek, Ahmed Jalal Khan Chowdhury, Zarina Zainuddin

INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

Abstract—Actinomycetes, a group of slow growing, Gram positive bacteria belonging to the order of *Actinomycetales* are widely distributed in nature. They are biotechnologically important for their renowned capability to produce various bioactive secondary metabolites. Isolation and screening from poorly explored habitat offers a promising natural source of bioactive actinomycetes. This study aimed to assess the diversity of actinomycetes from mangrove sediments of Kuantan, Pahang and evaluate their potential for the production of antimicrobial secondary metabolites. A total of 100 representative isolates were selected for further investigation from a collection of 3484 isolates recovered from 5 different sampling sites using various isolation procedures. The antimicrobial potential of the representative isolates were preliminary assessed using the cross streak method against *Bacillus subtilis*, *Candida albicans*, *Escherichia coli*, *Serratia marcescens* and *Staphylococcus aureus*. Approximately 53.0 % of the total isolates possessed antimicrobial potential against at least one of the test organisms. The crude ethyl acetate extract of these bioactive isolates were further evaluated using disc diffusion method, in which 26.4% ($n=14$) isolates exhibited inhibitory activity against more than half of the test organisms. *Streptomyces* sp. K1-01 and *Streptomyces* sp. K2-03 demonstrated broad spectrum of antimicrobial activity against all test organisms, indicating that genus *Streptomyces* could provide high quality metabolites for drug discovery. Fourteen selected bioactive isolates were screened for biosynthetic genes encoding the non-ribosomal peptide synthetases (NRPS) and polyketide synthases type I (PKS-I). The

NRPS and PKS-I gene were detected in 50.0% and 71.4% of the total isolates, respectively. Six isolates exhibited the presence of both NRPS and PKS-I genes, of which 4 isolates belong to genus *Streptomyces* and another 2 isolates belong to genus *Micromonospora*. The occurrence of NRPS and PKS-I genes provides an early evaluation on their biosynthetic capabilities. Mangrove actinomycetes enumerated in this study demonstrated high level of diversity as the 33 isolates chosen for phylogenetic analysis using 16S rRNA gene sequences were distributed among 9 genera. *Streptomyces* and *Micromonospora* are the most predominant genera observed; alongside *Micrococcus*, *Gordonia* and *Nocardia*. Besides, this is the first report describing the isolation of *Dietzia*, *Pseudonocardia*, *Saccharopolyspora* and *Verrucosipora* from Malaysian mangrove sediments. In conclusion, Malaysian mangrove ecosystem has the potential as an important reservoir of actinomycetes for the discovery of antimicrobial secondary metabolites.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 2

Session 4: 10 presentations-Topic: “Bioscience”

Session Chair:

C0026 Presentation 7 (15:10~15:25)

Metagenomics and Plant-Microbe Interfaces

Tae Hyuk Ahn

Saint Louis University

Abstract—The Plant-Microbe Interfaces (PMI) project at Oak Ridge National Laboratory is directed towards understanding the dynamic interface that exists between plants, microbes and their environment. A specific focus is on defining the genetic bases of molecular communication between *Populus trichocarpa* and its microbial consortia. Understanding the inherent chemical and physical processes involved will facilitate natural routes to the cycling and sequestration of carbon in terrestrial environments, ecosystem response to climate change, and the development and management of renewable energy sources. The project integrates expertise in the areas of plant genomics, fungal and bacterial research, fungal ecology, analytical tool development and computational biology. We just launched a sub-project to use the metagenomics tools, Sigma and Omega, for identifying endophytes of the plant and to assemble the new bacteria and fungus genomes. From the simulation results of many (~1000) samples, plant biologists and microbiology scientists try to explain differences in microbiome composition between all sampled of different environments, while most variation remains unattributed and unknown.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 2

Session 4: 10 presentations-Topic: “Bioscience”

Session Chair:

C0027 Presentation 8 (15:25~15:40)

Gene Variation and Molecular Provenance Study on H9N2 Avian Influenza Virus

Jiani Wang

Beijing No.8 High School

Abstract—Avian Influenza (AI), a poultry infectious disease caused by type A influenza A virus, arouses worldwide attention. Although H9N2 influenza virus now widely prevalent around the world is a kind of low pathogenic AI, it can provide internal gene segment for H5N1, a highly pathogenic influenza virus. Therefore, the study, through understanding of the molecular evolution and gene variation pattern of H9N2 influenza virus, attempts to provide some theoretical basis for the prevention and treatment of infectious disease. The study acquires gene information of AI virus by adopting molecular virology and molecular cloning, analyzes the relation between crucial sites mutation of virus genes and virus properties as well as the source of virus, and builds up protein molecular structure by using bioinformatics method for presenting a more vivid picture of virus protein site mutation. The project has come up with an innovative research method of combining molecular virology and bioinformatics to interpret the variation pattern of virus.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 2

Session 4: 10 presentations-Topic: “Bioscience”

Session Chair:

C0016 Presentation 9 (15:40~15:55)

Biomimicry Method for Implementing Natural Lighting Performance in Underground Buildings

Jungwon Lee, **Junekyung Kang**, Sanghoo Han and Taegy Lee

Chungnam National University, Korea

Abstract—The purpose of this research is to develop a biomimicry method for implementing natural lighting performance in underground buildings. Existing planning techniques and lighting principles in forest canopies were studied to derive a unique way to implement natural lighting performance in underground buildings. The main goal was to develop a lighting system which can be used in buildings with upper floors. Upper floors unable planning open spaces which are existing techniques for introducing natural lighting into underground spaces. Introducing even ambient lighting to deep spaces was also an important matter. This method can help avoid planning large open spaces and increase design-flexibility for planning underground spaces. As inducing air flow and transferring rainwater to lower trees are also functions founded in forest canopies, the result of this research can be further developed to also show other environmental functions.

Afternoon, May 24, 2016 (Tuesday)

Time: 13:40~16:10

Venue: Seminar Room 2

Session 4: 10 presentations-Topic: “Bioscience”

Session Chair:

C0017 Presentation 10 (15:55~16:10)

Development of Biomimicry Wind Louver Surface Design

Jaepil Choi, Gensong Piao, Youngwoo Kim and **Donghwa Shon**

Seoul National University, Korea; Chungnam National University, Korea

Abstract—This study aims to determine the appropriate surface geometry of a wind louver system that introduces the outside air into the interior of a building. In this study, we applied biological principles to determine the geometry of a wind louver surface by observing the characteristics of organisms, and conduct computational fluid dynamics (CFD) simulation to verify the effect. Simulation was conducted for three different types of wind louver surfaces, flat, patterned, and wing types, and the effect was analyzed both visually and quantitatively. Visual analysis was based on the observation of the change in direction of the air flow into the indoor space, and the quantitative analysis was based on the examination of the influence of the change in wind louver surface geometry on the overall change in wind velocity within the indoor surface. As a result, it was found that installing a 100mm-wide wing-shaped plate on the wind louver surface leads to a pleasant introduction of outside air into the indoor space.

16:10-16:30	Coffee Break
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Session 5

Tips: The schedule for each presentation is for reference only. In case of missing your presentation, we strongly suggest that you attend the whole session.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~19:00

Venue: Seminar Room 3

Session 5: 10 presentations-Topic: “Chemistry”

Session Chair: Assoc. Prof. Muhammad Yusuf Abduh

G0017 Presentation 1 (16:30~16:45)

Carbamazepine-Fumaric Acid Co-Crystal Screening Using Solution Based Method

Syarifah Abd Rahim and Chou Choang Tan

Universiti Malaysia Pahang, Malaysia

Abstract—Co-crystals can be defined as “a stoichiometric multi-component system which connected by non-covalent interactions and present in solid form under ambient conditions”. Co-crystal plays a critical role in the pharmaceutical industry and becoming as an alternative approach to improve the bioavailability of poor water soluble drugs especially for a weakly ionisable groups or neutral compounds. In this study the co-crystal screening was carried out for carbamazepine (CBZ) and fumaric acid (FUM) co-crystal former (CCF) using non-stoichiometric method (addition of CBZ to CCF saturated solution) and stoichiometric method (evaporation of 1:1 molar ratio of CBZ to CCF) in acetonitrile, ethyl acetate, propanol, ethanol and formic acid solvent systems. The crystals produced from the screening were characterized using Powder X-ray Diffraction (PXRD), Differential Scanning Calorimetry (DSC) and Fourier Transform Infrared (FT-IR). The PXRD analysis had confirmed that the co-crystal was successfully formed in both methods for all of the solvent system studied with an exception to formic acid in the stoichiometric method where no crystal was found precipitated. The findings from this analysis revealed that Form A and Form B of CBZ-FUM co-crystal had been successfully formed from different solvents systems. DSC analysis had shown that the melting point of CBZ-FUM co-crystal was in the range of 172.00-176.00° C for Form A while 186.00-190.00° C for Form B. The characterization using FT-IR indicated

that the functional groups which include amides and carboxylic acids were presented in the co-crystal produced. There were some differences in wavelength frequency for Form A with amides (3456.79-1562.80 cm^{-1}) and carboxylic acids (3059.21-1655.51 cm^{-1}) where Form B with amides (3460.99-1520.25 cm^{-1}) and carboxylic acids (3026.84-1655.79 cm^{-1}). Further study on the co-crystal solubility and dissolution rate is needed in order to access the efficacy of the co-crystal since the screening methods have been successfully confirmed the formation of the co-crystal.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~19:00

Venue: Seminar Room 3

Session 5: 10 presentations-Topic: “Chemistry”

Session Chair: Assoc. Prof. Muhammad Yusuf Abduh

G0026 Presentation 2 (16:45~17:00)

Variation of Particle Size and Pretreatment Temperature to the Crystallinity of *Leucaena Leucocephala*

Nor Sharliza Mohd Safaai, Amizon Azizan, Mohammad Izzudin Ibrahim, and Habsah Alwi
Universiti Teknologi MARA, Malaysia

Abstract—This study was conducted in order to determine the effect of different particle size and pretreatment temperature to the crystallinity of *leucaena leucocephala*. The *leucaena* was pretreated by ionic liquid [1-ethyl-3 methylimidazolium acetate [Emim]Ac. There were three different particle sizes that have been tested in this experiment; less than 0.3 mm, 0.5 mm and 0.7 mm. In the other hand, the pretreatment temperature tested were 30°C, 60°C and 90°C. The effect of particle size and pretreatment temperature to the crystallinity of *leucaena* was investigated by using X-Ray Diffraction (XRD) and Scanning Electron Microscopy (SEM). The crystallinity index of the sample represents the percentage of crystalline materials. A lower in the crystallinity index indicated that the material has lower crystallinity, hence give more benefit to the cellulose hydrolysis. From XRD analysis, it shows that the crystallinity index of *leucaena* decreased with decreasing particle size and increasing pretreatment temperature. SEM analysis also shows that the structure of *leucaena* has more irregular, porous and destroyed structure with decreasing particle size and increasing pretreatment temperature. Thus, the result from this experiment shows that the smaller particle size and higher pretreatment temperature would provide a more accessible surface area to enhance the cellulose hydrolysis.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~19:00

Venue: Seminar Room 3

Session 5: 10 presentations-Topic: “Chemistry”

Session Chair: Assoc. Prof. Muhammad Yusuf Abduh

G2005 Presentation 3 (17:00~17:15)

Highly Efficient and Selective Photocatalytic Hydrogenation of Functionalized Nitrobenzenes

Xiu-Jie Yang

China University of Petroleum (East China), China

Abstract—Functionalized anilines are important intermediates for the manufacture of agrochemicals, pharmaceuticals, dyes and pigments. Most functionalized anilines are produced by hydrogenation of the corresponding aromatic nitro compounds. The key problem in such hydrogenation is the chemoselectivity when other reducible groups are present in the same molecule. Herein, we reported a simple but efficient photocatalytic nitrobenzene reduction method employing eosin Y as the photocatalyst and triethanolamine (TEOA) as the reducing agent. With green LED light irradiation, the nitro group in the nitrobenzenes containing other reducible groups was chemoselectively reduced into an amino group, and the corresponding anilines were isolated in quantitative yields. The photoinduced electron transfer mechanism suggests that the high chemoselectivity originates from the better electron-withdrawing ability of the nitro group.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~19:00

Venue: Seminar Room 3

Session 5: 10 presentations-Topic: “Chemistry”

Session Chair: Assoc. Prof. Muhammad Yusuf Abduh

G0021 Presentation 4 (17:15~17:30)

A Study on Conceptual Design of Fischer-Tropsch Reactors in GTL Applications

Jae Sun Shin, Faraz Qasim, and Sang Jin Park

Dongguk University, Korea

Abstract—GTL (Gas-to-liquid) process is becoming an attractive technology which can produce liquid petroleum products using natural gas. As a part of preliminary design of GTL-FPSO application, process simulation analysis for conceptual design and optimization of reformers and F-T reactors are performed in GTL-FPSO applications by implementing the user made subroutine programs of kinetic equations into PRO/II PROVISION simulator. As for the F-T reactors, Plug Flow Reactor (PFR) model is used with detailed kinetics equations over two different Fe based catalysts (Fe-Cu-K and K/Fe-Cu-Al). Dry reformer is also studied with Plug Flow Reactor (PFR) model. In this study, simulation results are compared with available experimental data and found well agreed with experimental data for both reformer and FT reactor. The Peng-Robinson equation of state is also used to calculate the vapor phase non-idealities and vapor-liquid equilibrium. The optimum operating conditions and process simulation analysis are also presented.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~19:00

Venue: Seminar Room 3

Session 5: 10 presentations-Topic: “Chemistry”

Session Chair: Assoc. Prof. Muhammad Yusuf Abduh

G0034 Presentation 5 (17:30~17:45)

An Adaptive Neuro Fuzzy Prediction of Carbon Monoxide Emission from a Clinical Waste Incineration Plant

Norhayati Ismail and Mohd Rashid Mohd Yusof

Universiti Teknologi Malaysia, Malaysia

Abstract—The current practice of monitoring air emission from an incineration plant is through a hardware system known as Continuous Emission Monitoring Systems (CEMS). However, CEMS suffers from high installation and maintenance cost and often give unreliable measurement. Thus, the present work focuses on modelling approach through an Adaptive Neuro Fuzzy Inference System (ANFIS) to develop a predictive model of carbon monoxide (CO) emission utilizing real data taken from a clinical waste incineration plant. An hourly averaged of 1000 index dataset consisted of eight input-output data pairs were utilized to develop a Sugeno-type fuzzy structure by applying subtractive clustering method. As the data were divided into three sets i.e. 70% for training, 15% for checking and the rest for testing, the values of the coefficient of determination (R^2), Root Mean Square Error (RMSE), Mean Bias Error (MBE) and accuracy were calculated for each set to demonstrate its applicability and validity, especially in the testing set since unseen data were exposed to the model. Result showed that ANFIS was able to learn from these data and excellently predicted the emission of CO with R^2 , RMSE, MBE and accuracy of 0.98, 3.81 ppm, 3.11 ppm and 89.40% in the testing set, respectively.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~19:00

Venue: Seminar Room 3

Session 5: 10 presentations-Topic: “Chemistry”

Session Chair: Assoc. Prof. Muhammad Yusuf Abduh

G0037 Presentation 6 (17:45~18:00)

Thermal Behavior and The Solvent Effects of ρ -Methoxy Tetraphenylporphyrin (TOMPP), Copper Porphyrin (CuTOMPP), and Nitroporphyrin (CuTOMPP-NO₂)

Tossapon Phromsatit, Wootthiphan Jantayot, Kusuma Pinsuwan, Autthavit Nuchthanom, and Supakorn Boonyuen

Thammasat University, Thailand

Abstract—In this work, ρ -methoxy tetraphenylporphyrin (TOMPP) Copper porphyrin (CuTOMPP) and nitro porphyrin (CuTOMPP-NO₂) are synthesized following Adler Longo method by the reaction of pyrrole with and ρ -anisaldehyde. These compounds have been characterized by UV-Vis, fluorescence spectroscopy and thermogravimetric analysis (TGA). The ρ -methoxy tetraphenylporphyrin (TOMPP) was obtained in 26% yield. Reactions of TOMPP with copper ions gave CuTOMPP in 85% yield. Moreover, the nitration of CuTOMPP gave CuTOMPP-NO₂ in 0.03% yield. The absorption spectra for TOMPP exhibited one S-band (416 nm) and four Q-bands (518, 555, 593 and 650 nm) in dichloromethane solvent. The absorption band of copper porphyrin and nitroporphyrin displays one S band (415 and 423) and two Q bands (range from 550 – 600 nm). When excited to 530-570 nm, the fluorescence spectra show only one emission band at 645-654 nm for TOMPP and copper complexes. The results confirmed the solvent effect on the electronic absorption as found a small red shift from 414 nm (chloroform) to 417 nm (ethyl acetate) for TOMPP. The thermal behaviors including the possible phase transition of porphyrins were studied during the heating process at temperature of 298-973 K. Copper complexes exhibits the thermal stability from 653.3 K, which is slightly lower than that of the free base porphyrin ligand (TOMPP 703.9 K).

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~19:00

Venue: Seminar Room 3

Session 5: 10 presentations-Topic: “Chemistry”

Session Chair: Assoc. Prof. Muhammad Yusuf Abduh

C3002 Presentation 7 (18:00~18:15)

Institutional Challenges in Resolving China’s Wind Power Curtailment

Ekaterina Kuroedova and Minghui Jiang

Harbin Institute of Technology

Abstract—This paper seeks to analyze the main institutional factors leading to and perpetuating the high rate of wind energy curtailment in China. It examines the current policies guiding wind industry development, identifies critical weaknesses, and offers feasible policy prescriptions within the context of China’s policy making framework, market conditions and the current state of the wind power industry. The findings indicate that while policy has somewhat effectively contained curtailment, this has been primarily through closer administrative control over all the actors involved in wind energy. For the industry’s sustainable growth, improvements to the underlying legal framework and enforcement mechanisms, and efforts to ameliorate curtailment by rationalizing market incentives are necessary.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~19:00

Venue: Seminar Room 3

Session 5: 10 presentations-Topic: “Chemistry”

Session Chair: Assoc. Prof. Muhammad Yusuf Abduh

C0029 Presentation 8 (18:15~18:30)

Screening of Various Parameters of *Enterobacter aerogenes* Batch Culture for Biohydrogen Production

Noor Illi Mohamad Puad, Nor Amira Mamat and Azlin Suhaida Azmi

International Islamic University Malaysia, Malaysia

Abstract—Hydrogen (H₂) gas has been widely known as a potential renewable energy. Throughout the advancements of technologies, a method of producing H₂ gas which is known as biohydrogen was developed. Biohydrogen has a potential to solve the current greenhouse effects since it is an eco-friendly and harmless gas that is operated at ambient temperature and atmospheric pressure using renewable substrates as a source. In this study, *Enterobacter aerogenes* (*E. aerogenes*) was used as the biohydrogen producing microorganism. The parameters that influence the biohydrogen production such as glucose, glycerol, initial pH, inoculum size, tryptone, yeast extract, agitation rate and temperature were screened using Plackett-Burman design tool (Design Expert 6.08 software). The results were analyzed using Minitab 17 software and fitted into the secondary-order polynomial regression equation for further analysis. Based on the results, for the bioreactor fermentation, glucose, glycerol, tryptone, inoculum size and agitation rate have negative effects to the biohydrogen production whereas initial pH, yeast extract and temperature gave positive effects. For the shake flask experiments, some of the low level of the parameters gave greater influence on hydrogen yield (glucose, tryptone, agitation rate and temperature) while some of the high level of the parameters gave greater influenced on the hydrogen yield (glycerol, initial pH, inoculum size and yeast extract). The highest hydrogen yield achieved in the bioreactor was 10 ppm while in the shake flask experiments, the highest yield recorded was 24 ppm.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~19:00

Venue: Seminar Room 3

Session 5: 10 presentations-Topic: “Chemistry”

Session Chair: Assoc. Prof. Muhammad Yusuf Abduh

C0014 Presentation 9 (18:30~18:45)

Air Crash Case Study: Icing event over the Taiwan Strait

Nan-Ching Yeh, Chia-Rei Tao, Chih-Hsien Wei and Ching-Chin Lee

Air Force Institute of Technology, Taiwan; China Airlines, Taiwan

Abstract—Various meteorological data charts derived from in situ observations, satellite imagery, soundings near an air crash site and the Tropical Rainfall Measuring Mission Microwave Imager (TMI) level 2A hydrometeor profile product were used to investigate the synoptic and mesoscale environment of an icing event (IE) over the Taiwan Strait on 20 December 2002. The IE occurred in a frontal cloud system. A series of meteorological chart analyses shows that the relative humidity at the 850 and 700 hPa levels reached 80% and 90%, respectively. In addition, there was an occurrence of small-scale negative vorticity (shear vorticity). The sounding observations revealed widespread light to moderate icing over the crash site. The TMI level 2A hydrometeor profile product provided further evidence of the existence of icing. The intensity of the icing was 0.3 gm^{-3} , the vertical thickness reached 4 km, and the icing duration exceeded 24 h.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~19:00

Venue: Seminar Room 3

Session 5: 10 presentations-Topic: “Chemistry”

Session Chair: Assoc. Prof. Muhammad Yusuf Abduh

C0028 Presentation 10 (18:45~19:00)

The Valorization of Rice Waste via Torrefaction Method

Saidatul S. Jamari and Kwo W. The

Universiti Malaysia Pahang, Malaysia

Abstract—Biomass plays a crucial role as the source of renewable carbon which can be utilised in the production of biofuels. However, the raw biomass itself has some undesirable properties such as high moisture content, low energy density and deterioration after a short duration of storing period. Hence, a thermochemical process, known as torrefaction is normally used to preliminary treat the biomass to enhance its physical properties. This study focus on the characterization of the physical properties of the torrefied rice biomass which are rice husk and rice straw under three different temperatures of 220 °C, 250 °C and 280 °C with residence time of 30min. The heating rate was set as 15 °C/min after the temperature profile study on the customized reactor was investigated. From the experimental results, it is noticeable that torrefaction enhances the calorific value of the biomass by 3-17% for rice husk and 4-20% for rice straw. The torrefied rice-based biomass also helps to remove the moisture content of raw rice husk and rice straw by 6.5% and 8.3% respectively. The mass yield of the torrefied rice-based biomass is between the range of 78-91% for rice husk and 82-90% for rice straw. Meanwhile, the energy yield for rice husk is in the range of 92-94% and 93-98% for rice straw after torrefaction. This study concludes that 250 °C is the optimum torrefaction temperature for the conversion of rice waste into valuable biofuel.

Session 6

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~18:45

Venue: Seminar Room 2

Session 6: 9 presentations-Topic: “Environment”

Session Chair: Dr. Noor Illi Mohamad Puad

C0022 Presentation 1 (16:30~16:45)

Characterization and adsorption properties of a lanthanum-loaded magnetic cationic hydrogel composite for fluoride removal

Dong Shuoxun

Beijing Forestry University, China

Abstract—In this study, a novel lanthanum-loaded magnetic cationic hydrogel (MCH-La) was synthesized for fluoride adsorption from drinking water. The adsorption kinetics, isotherms, and effects of pH and co-existing anions on fluoride uptake by MCH-La were evaluated. FTIR, Raman and XPS were used to analyze the fluoride adsorption mechanism of MCH-La. Results showed that MCH-La had positive zeta potential values of 23.6–8.0 mV at pH 3.0–11.0, with the magnitude of saturation magnetization up to 10.3 emu/g. The fluoride adsorption kinetics by MCH-La fitted well with the fractal-like-pseudo-second-order model, and the adsorption capacity reached 93% of the ultimate adsorption capacity within the first 10 min. The maximum fluoride adsorption capacity for MCH-La was 136.78 mg F⁻/g at an equilibrium fluoride concentration of 29.3 mg/L and pH 7.0. Equilibrium adsorption data showed that the Sips model was more suitable than the Langmuir and Freundlich models. MCH-La still had more than 100 mg of F⁻/g adsorption capacity at a strongly alkaline solution (pH > 10). The adsorption process was highly pH-dependent, and the optimal adsorption was attained at pH 2.8–4.0, corresponding to ligand exchange, electrostatic interactions, and Lewis acid–base interactions. With the exception of both anions of HCO₃⁻ and SiO₄⁴⁻, Cl⁻, NO₃⁻, and SO₄²⁻ did not evidently prevent fluoride removal by MCH-La at their real concentrations in natural groundwater. The fluoride adsorption capacity of the

regenerated MCH-La approached 70% of the fresh MCH-La from the second to fifth recycles. FTIR and Raman spectra revealed that C–O and C=O functional groups on MCH contributed to the fluoride adsorption, this finding was also confirmed by the XPS F 1s spectra. Deconvolution of C 1s spectra before and after fluoride adsorption indicated that the carboxyl, anhydride, and phenol groups of MCH were involved in the fluoride removal.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~18:45

Venue: Seminar Room 2

Session 6: 9 presentations-Topic: “Environment”

Session Chair: Dr. Noor Illi Mohamad Puad

C0024 Presentation 2 (16:45~17:00)

Novel $\text{Na}_2\text{Mo}_4\text{O}_{13}/\alpha\text{-MoO}_3$ hybrid material as highly efficient CWAO catalyst for dye degradation at ambient conditions

Zhang Zhang and Qiang Wang

College of Environmental Science and Engineering, Beijing Forestry University, China

Abstract—We report a novel hybrid material $\text{Na}_2\text{Mo}_4\text{O}_{13}/\alpha\text{-MoO}_3$ as highly efficient catalytic wet air oxidation (CWAO) catalyst, which showed the highest ever activity at room temperature and atmosphere pressure for the degradation of cationic red GTL. SEM and TEM analyses indicated that this hybrid catalyst has bamboo-shaped nanofiber morphology. In view of practical applications, the influence of some key parameters including operation temperature, catalyst calcination temperature, and the volume of dye wastewater have been optimized. The mechanism for the superior catalytic performance was investigated.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~18:45

Venue: Seminar Room 2

Session 6: 9 presentations-Topic: “Environment”

Session Chair: Dr. Noor Illi Mohamad Puad

C0028 Presentation 3 (17:00~17:15)

Novel Na₂Mo₄O₁₃/α-MoO₃ hybrid material as highly efficient CWAO catalyst for dye degradation at ambient conditions

Dan A, Daiki Fujii, Satoshi Soda, Takashi Machimura and Michihiko Ike

Osaka University, Japan

Abstract—Open landfill is the most popular method for solid waste treatment in Southeast Asia. However, those landfills are mostly non-engineered facilities, resulting in emission of polluted leachate to groundwater and surface water, especially in the rainy season of monsoonal climates. Landfill leachate contains easily-degradable organic matter, ammonium, and toxic pollutants such as phenolic chemicals. If highly advanced processes such as Fenton oxidation and membrane separation were introduced into those regions, leachate treatment might be suspended because of lack of funds, materials, and human resources.

So as to reduce such a difficulty, constructed wetlands (CWs) are considered to be the most desirable low-cost technology providing on-site passive treatment of landfill leachate. CWs involve a complex mixture of water, substrates, plants, and microorganisms for removing organic matter, nutrients, trace elements, pathogens, and other pollutants from wastewater. Major purification mechanisms of CWs are plant uptake, sedimentation, adsorption to soil and biodegradation in the rhizosphere. Hence, the Southeast Asian climate favors plant growth, microbial activity and leachate evapotranspiration in CWs.

Several researchers have studied the removal of organic pollutants and nitrogen in CWs. However, the feasibility of removal of phenolic chemicals has not been fully assessed. In this study, eight experimental vertical flow CWs were set up in a greenhouse to assess the removal of phenolic chemicals from synthetic leachate. In addition to acetate, propionate, and ammonium nitrogen, three phenolic chemicals, namely phenol, bisphenol-A, and 4-tert-butylphenol, were selected as target contaminants due to their high concentrations in landfill leachates. The treatments in this study consisted of different landfill ages (acetogenic and methanogenic), plant presence (planted with common reed (*Phragmites australis*) and unplanted), and hydraulic retention times (2 d and 4 d). These pollutants were efficiently

removed by all CWs operated in sequencing batch modes, particularly planted ones. All the CWs performed better removal of the phenolic chemicals in acetogenic leachate rather than methanogenic leachate, and for longer hydraulic retention times. Hence, the possible removal mechanisms in the CWs were rhizodegradation for phenol and biophenol-A, while adsorption and rhizodegradation for 4-tert-butylphenol. The knowledge obtained in this study is useful for the sustainable application of CWs for treating landfill leachate in Southeast Asian countries.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~18:45

Venue: Seminar Room 2

Session 6: 9 presentations-Topic: “Environment”

Session Chair: Dr. Noor Illi Mohamad Puad

C0035 Presentation 4 (17:15~17:30)

Evaluation of heavy metal immobilization in mine soils amended with peat moss or peat moss-derived biochar

Jun Hee Park, Seul-Ji Lee, Myoung-Eun Lee and Jae Woo Chung

Korea Institute of Geoscience and Mineral Resources

Abstract—Peat moss and peat moss-derived biochar have been tested for heavy metal adsorption in solution and showed adsorption capacity for heavy metals. However, it is not clear whether they immobilize or mobilize heavy metals in soil. Therefore, this study evaluated the mobility and bioavailability of Pb, Cu, and Cd in contaminated mine soil after treating the soil with peat moss and peat moss-derived biochar. Metal immobilization was tested by a column leaching experiment and a batch extraction after incubation of the mine soil with peat moss or peat moss-derived biochar at 0.5%, 1%, and 3% levels. The addition of increased amounts of peat moss increased both mobility and bioavailability of Pb, Cu, and Cd as measured by leached metals from the column and extracted metals using 1 M NH₄NO₃ solution, respectively. However, the addition of peat moss-derived biochar significantly reduced both mobility and bioavailability of heavy metals through the interaction of metal-C=C bonds and increased pH. Maximum immobilization was achieved with 3% peat moss-derived biochar and the metal immobilization rate was 97.8%, 100%, and 77.2% for Pb, Cu, and Cd, respectively. Peat moss and peat moss-derived biochar showed conflicting results in mobility and bioavailability of heavy metals in soils. Therefore, organic amendments should be carefully applied to mine soils for remediation purposes.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~18:45

Venue: Seminar Room 2

Session 6: 8 presentations-Topic: “Environment”

Session Chair: Dr. Noor Illi Mohamad Puad

C0025 Presentation 5 (17:30~17:45)

Physiological and transcriptional responses of continuously cultured *Nitrosomonas europaea* to ZnO nanoparticles and impaired cell recovery

Junkang Wu, Ran Yu and Lianghai Chen

Southeast University, China

Abstract—The long-term effects of ZnO nanoparticles (NPs) on continuously cultured ammonia oxidizing bacteria (AOB), *Nitrosomonas europaea*, were investigated via 45-d exposure tests. Fifty mg/L n-ZnO was found to exert more serious impairment effects on the ammonia removal efficiency (ARE), the cell density, the membrane integrity, the ammonia monooxygenase (AMO) activity, and the amoA1 expression than 1 or 10 mg/L n-ZnO, which caused the cells irreversibly damaged and almost completely death after 8 days' exposure. However, higher concentrations of dissolved oxygen (DO) demonstrated the lessened impairment effects of n-ZnO on the membrane integrity and the amoA1 expression, suggesting higher concentration of DO facilitated the anti-toxicity ability of cells under NP stress. Twelve-hr batch recovery test displayed that only when the ammonia removal efficiency (ARE) declined to 90% did the physiological and genetic activity of impaired cells recover, indicating the potential recovery ability of stressed cells at the initial NP exposure stage. Microarray results suggested the disruptions of the membrane structure or function, like the glucose phosphotransferase (PTS) transport, the ATP-binding cassette (ABC) transport, and the secondary or electron transport systems, as be potential mechanisms of n-ZnO cytotoxicity.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~18:45

Venue: Seminar Room 2

Session 6: 9 presentations-Topic: “Environment”

Session Chair: Dr. Noor Illi Mohamad Puad

C0040 Presentation 6 (17:45~18:00)

Layout and detailed design of sanitary sewer system using evolutionary algorithm

Shu Lin, Han Lin, Fantang Zeng, Huaiyang Fang and Haofeng Hu

South China Institute of Environmental Science, Ministry of Environmental Protection, China

Abstract—The steps of using evolutionary algorithms in layout design of sanitary sewer systems are introduced. Two new techniques are developed. Randomly generating tree methods are used to generate initial layouts. “Or” operations are used in executing crossover operators. These two techniques are rarely used in this area. A real world example is used to illustrate the effectiveness of these steps. The results show that these steps can help to optimize the design of sanitary sewer systems.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~18:45

Venue: Seminar Room 2

Session 6: 9 presentations-Topic: “Environment”

Session Chair: Dr. Noor Illi Mohamad Puad

C2004 Presentation 7 (18:00~18:15)

Prospect of Application of EM Technology in the Water Ditch of Paddy Field

Liu Lihuan and Wang Wenping

Hunan Polytechnic of Water Resources and Electric Power

Abstract—Agricultural non-point source pollution has become an important source of China's river basin water pollution, and drainage from paddy field is a kind of important non-point source pollution. Exploring the EM effect on TP and TN absorption characteristics in ditch sediments of paddy field drainage and screening for proper proportion as well as unique fermentation process is an important means of biotechnology to solve the problem of non-point source pollution from paddy fields, which also can promote ecological environment sustainable development in irrigation area.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~18:45

Venue: Seminar Room 2

Session 6: 9 presentations-Topic: “Environment”

Session Chair: Dr. Noor Illi Mohamad Puad

C0030 Presentation 8 (18:15~18:30)

Waste to Energy: A look into community-based charcoal briquetting in the Philippines

Erees Queen Macabebe, Samuel Matthew Dumlao and Teresita Perez

Ateneo de Manila University

Abstract—The Philippine government issued Executive Order No. 23, s 2011 declaring a moratorium on the cutting and harvesting of timber in the natural and residual forests, and creating anti-illegal logging task force. This prevents communities engaged in traditional charcoal making from continuing their enterprise. And yet, traditional charcoal is still being sold in the market and is widely utilized by households. This study looks into charcoal briquetting in the country and aims to identify factors that affect the production and marketability of the briquettes. In particular, the challenges experienced by two communities that have received training and financial support from the government and from a non-profit organization to establish a charcoal briquetting facility were investigated. Focused group discussions and key informant interviews were conducted to gather information on the implementation and benefits of charcoal briquetting in community. The study found that the factors leading to the success of charcoal briquetting at the community level include a strong cooperative that oversees the operation of the facility and additional income to community members involved in the production of charcoal briquettes. However, consumers still need to be educated on the benefits of using charcoal briquettes. Despite the availability of the financial and technical supports, and the existence of an established cooperative to run the operations of the facility, the absence of external support in finding a suitable market for these briquettes limits the production and marketing capability of the community.

Afternoon, May 24, 2016 (Tuesday)

Time: 16:30~18:45

Venue: Seminar Room 2

Session 6: 9 presentations-Topic: “Environment”

Session Chair: Dr. Noor Illi Mohamad Puad

C0008 Presentation 9 (18:30~18:45)

The Increased Risk of Schistosomiasis Caused by High Frequency of Rainfall and Open-Defecation Habit in Indonesia

Fildzah Auliaul Haq, Helistia Yuniarni and Fahmi Rasyidah

Universitas Indonesia

Abstract—*Schistosomiasis* is the third most common parasitic disease worldwide has been reported from 78 countries and endemic in 52 countries. Indonesia is one of countries which has tropical climate with high frequency of rainfall and the habit of some Indonesian people on doing open-defecation. This paper is created through the method of literature review from several sources, such as journals, websites (UNICEF, WHO, CDC, meteorology climatology and geophysics agency (BMKG) Indonesia), and other resources that associated with *Schistosoma*. The spatial analysis method used to determine the risk of *Schistosomiasis* in an area in topology analysis, which analyzes the relation between units of the research. Topology analysis in geospatial information system performed buffer and overlay. In Indonesia, the average rainfall during the period from 2005-2013 is 2177.24 mm/year, with an average of rainy days within a period from 2006-2013 is approximately 184 days/year. And the other risk factor, Indonesia ranked second in the number of people who practice open defecation as many as 51 million people where its 2/3 from rural areas. The risk factor that can increase the transmission of *Schistosomiasis* is open-defecation and frequency of rainfall. Indonesia is predicted to be the potential habitat of *Oncomelania* (*Schistosimiasis* vector) as the rainfall enables to provide a suitable environment to the life cycle of *Oncomelania*. And the other risk factor is open defecation behavior that affects in supporting the life cycle of *Schistosoma*.

Dinner	
19:00	Global House

Poster Session

Tips: The schedule for each presentation is for reference only. In case of missing your presentation, we strongly suggest that you attend the whole session.

Afternoon, May 24, 2016 (Tuesday)

Time: 8:30~19:00

Venue: Seminar Room 3

D0011 Poster Presentation 1

The Efficiency of Marine Yeast Encapsulation as Dietary Supplement to Enhance Antibody in White Sea Bass (*Lates Calcarifer*)

Janjarus Watanachote, Supanee Leethochavalit, Jarunan Pratoomyot, Molruedee Sonthi, and Maliwan Kutako

Burapha University, Thailand

Abstract—This study aims to investigate the efficiency of marine yeast encapsulation by using calcium alginate as dietary supplement to enhance fish antibody and parasite resistance. We grouped 180 sea bass into three samples in a cage-cultured environment according to their experimental diets. The three experimental diets were: 1) the control diet, i.e. a sea bass basal feed; 2) a mixture of the control diet and the yeast *Pichia* sp. and 3) a mixture of the control diet and calcium alginate. All the experimental diets contained between 49-51% protein and 12-13% lipid. We subsequently challenged them with infective stage of the ciliate *Cryptocaryon irritans*. The initial weight and length of the fish were 6.21 ± 0.79 g and 8.15 ± 0.58 cm respectively. Throughout the 4-weeks long feeding trial, the fish were fed at 3% body weight day⁻¹. Each group of fish were fed on their specified experimental diet for two weeks and then were switched to the control diet for two weeks afterward. At the end of the feeding period, 30 fish from each treatment group were taken and challenged with live theronts of *C. irritans* at a dose of 15,000 theronts fish⁻¹. Eighty-three percent of the fish fed with control diet survived the challenge, while 93% and 90% of those fed with diets 2 and 3 respectively survived. After fish were immunized with those diets at two and four weeks, an ELISA confirmed that the levels of serum antibody in the fish fed with diets 2 significantly increased more than those in the fish fed with diets 1 ($P < 0.05$).

Afternoon, May 24, 2016 (Tuesday)

Time: 8:30~19:00

Venue: Seminar Room 3

D0012 Poster Presentation 2

The Immobilized Parasitic Protozoa Cryptocaryon Irritans Induced Immune Response in Clownfish (*Amphiprion Ocellaris*)

Supanee Leethochavalit, Janjarus Watanachote, Jarunan Pratoomyot, and Nanthika Khongchareonporn

Burapha University, Thailand

Abstract—We examined the protective immunity of clownfish (*Amphiprion ocellaris*) against the *Cryptocaryon irritans*. We divided 180 fish into three groups and fed them with three formular diets: 1) the control diet, i.e. a clownfish basal feed; 2) a mixture of the control diet and the immobilized parasite, theront stage and 3) a mixture of the control diet and calcium alginate. Each group of the fish was fed on their specified experimental diet for two weeks and switched to the control diet for another two weeks. At the end of the experiment, 30 fish from each treatment group were moved to the tank and challenged with live theronts of *C. irritans* at a dose of 15,000 theronts fish⁻¹. Their blood samples were taken on the seventh and the fourteenth day after the challenge. We determined specific antibody levels of the immunized fish serum by using the enzyme-linked immunosorbent assay (ELISA). The results showed that the levels of serum antibody in the fish fed with the immobilized parasite diet were significantly higher than those in the fish fed with the control ($P<0.05$).

Afternoon, May 24, 2016 (Tuesday)

Time: 8:30~19:00

Venue: Seminar Room 3

G0012 Poster Presentation 3

Effect of Rich Selenium Mushroom Polysaccharides on Hyperlipidemia Metabolism and Lipoprotein Lipase Activity of Tests Mice

Yue Li-Hong, Wang Yu-Jun, Yu Jing-Ni, and **Zhang Yue-Hua**
JiaMuSi University, China

Korea Maritime and Ocean University, Korea

Abstract—The Selenium-Polysaccharides from Rich selenium Chemical explicitly defined the Edible Fungus (Se-EF) in Boiling water extraction by alcohol precipitation, analysis indicated that the there were main ingredient comprises xylose, dextrose, rhamnose, galactose, and arabinose. First investigate lipids Metabolic and lipoprotein lipase (LPL) activated in the selenium-rich -EF rich in cholesterol and prospects by feeding rich foods (PRD). The purpose of this study is to explore the prospect 1st fed cholesterol-enriched diet (PRD) of KM mice selenium -EF on cholesterol metabolism and lipoprotein lipase (LPL) activated of antioxidant capacity. In addition, studies of the relationship between atherosclerosis and total antioxidant capacity index (AI) and LPL activity (TAC). The results showed that selenium polysaccharide significantly reduce TC serum total cholesterol and LDL-C concentrations comparatively in with the CK control groups. Furthermore, orally administered of polysaccharide selenium notable enhance pay, lipoprotein lipase activity and reduce MDA levels, and artificial intelligence. These results indicate that the beneficial affects of selenium on -EF hypercholesterolemia precautions. In addition, oral administration of polysaccharide selenium notable enhance TAC and LPL activity in the meantime reduce MDA levels, the same as AI. These results indicate that Se-EF has a beneficial effect on the prevention of hyperlipidemia. These results indicate that the beneficial affects of selenium on -EF hypercholesterolemia precautions.

Afternoon, May 24, 2016 (Tuesday)

Time: 8:30~19:00

Venue: Seminar Room 3

G0018 Poster Presentation 4

Research of H5N6 Treatment by Comparing with H10N8 and H6N1 by Using Decision Tree and Apriori Algorithm

Sunghyun Kim, Hojoon Lee, and Taeseon Yoon

Hankuk Academy of Foreign Studies, Republic of Korea

Abstract—Since 2003, 608 people in 15 countries have infected with human-infectious AI viruses and 359 of them died. Especially, in China, H6N1 and H10N8 viruses were wide-spread and a lot of people were infected and died. Recently, H5N6 virus emerged in China and the number of patients has been increasing gradually. Therefore, this research compared amino acid strain of Matrix Protein, Hemagglutinin, Neuraminidase and Nucleoprotein of H5N6, H6N1 and H10N8, by using Decision tree and Apriori Algorithm, to figure out their similarity and devise the treatment. In result, Matrix protein and Nucleoprotein sequences of H5N6 were similar with those of H6N1 and H10N8. Therefore, this research concluded that the treatment targeting those proteins of H6N1 and H10N8 will be also effective to H5N6.

Afternoon, May 24, 2016 (Tuesday)

Time: 8:30~19:00

Venue: Seminar Room 3

G0024 Poster Presentation 5

Deeper Understanding about the Genetic Structure of Dengue Virus Using SVM

Subin Choi, Hyunjin Choi, and Taeseon Yoon

Hankuk Academy of Foreign Studies, Republic of Korea

Abstract—Dengue fever, mainly found in the tropical and subtropical regions, is carried by mosquitoes. With the help of greenhouse effect, places considered to be a Dengue safe-zone are becoming more and more dangerous. Dengue fever shows similar aspects to MERS, which caused heavy casualties in South Korea; Dengue virus does not have clear treatments nor vaccines like MERS. Development of Dengue vaccine is actively investigated lately. However, it is not easy to succeed; the fact that Dengue's 4 serotypes have different properties and that repeated infections worsen the symptoms. This research aims to analyze the 4 serotypes (DENV1, DENV2, DENV3, DENV4) using SVM and ANN algorithms to investigate the constraints in the development of Dengue's vaccines and treatments

Afternoon, May 24, 2016 (Tuesday)

Time: 8:30~19:00

Venue: Seminar Room 3

G0025 Poster Presentation 6

Electricity Generation from the Mud by Using Microbial Fuel Cell

Sitinoor Adeib Idris, Farah Nasyitah Esat, Ain Adilla Abd Rahim, W. A. Zahin Rizzqi W. Ruzlee, and W. M. Zyaid Razali

Universiti Teknologi MARA (UiTM), Malaysia

Abstract—Microbial fuel cells (MFCs) is a bio-electrochemical device that harnesses the power of respiring microbes to convert organic substrates directly into electrical energy. This is achieved when bacteria transfer electrons to an electrode rather than directly to an electron acceptor. Their technical feasibility has recently been proven and there is great enthusiasm in the scientific community that MFCs could provide a source of “green electricity”. Microbial fuel cells work by allowing bacteria to do what they do best, oxidize and reduce organic molecules. Bacterial respiration is basically one big redox reaction in which electrons are being moved around. The objective is to generate electricity throughout the biochemical process using chemical waste basically sludge, via microbial fuel cells. The methodology includes collecting sludge from different locations, set up microbial fuel cells with the aid of salt bridge and observing the results in voltage measurement. The microbial fuel cells consist of two chambers, iron electrodes, copper wire, air pump (to increase the efficiency of electron transfer), water, sludge and salt bridge. After several observations, it is seen that this MFC can achieve up until 202 milivolts (0.202volts) with the presence of air pump. It is proven through the experiments that sludge from different locations gives different results in term of the voltage measurement. This is basically because in different locations of sludge contain different type and amount of nutrients to provide the growth of bacteria. Apart from that, salt bridge also play an important role in order to transport the proton from cathode to anode. A longer salt bridge will give a higher voltage compared to a short salt bridge. On the other hand, the limitations that this experiment facing is the voltage that being produced did not last long as the bacteria activity slows down gradually and the voltage produced are not really great in amount. Lastly to conclude, microbial fuel cell essentially is a solution for a renewable energy emitted by bacteria activity that need to be take a further attention , research and development.

Afternoon, May 24, 2016 (Tuesday)

Time: 8:30~19:00

Venue: Seminar Room 3

G0043 Poster Presentation 7

Theoretical Study of Two States Reactivity of NO Activation on Iron Atom

Xiaoman Wang, Yaxin Su, Wenyu Liao, and Wenyi DENG

Donghua University, China

Abstract—The mechanism of Fe+NO was calculated by the Density Functional Theory (DFT) with the B3LYP methods combined with the 6-311+G (d, p) basis set. The geometry of reactants, transition states, intermediates and products of two reaction systems were completely optimized, and all the transition states were verified by the vibration analysis and intrinsic reaction coordinate (IRC) calculations. The "Two State Reactivity (TSR)" was used to analyze the reaction mechanisms; Results showed that the reaction system preferentially involves low-spin state entrance channel and the high-spin state exit channel. In the reaction channel, the crossing point appears, which would effectively reduce the activation energy and increase the release of reaction heat, play a significant and beneficial role in the kinetic and thermodynamic aspects of this catalytic reaction.

Afternoon, May 24, 2016 (Tuesday)

Time: 8:30~19:00

Venue: Seminar Room 3

G0047 Poster Presentation 8

Comparison of CIV, SIV and AIV Using Decision Tree and SVM

Hyorin Park, Yoojin Park, Yerin Moon, and Taeseon Yoon

Hankuk Academy of Foreign Studies, Republic of Korea

Abstract—The H3N2, the canine influenza virus has numerous types of animal hosts that can live and reproduce on. They mostly settle on pigs and birds. However, some concerned voices are rising that there is high possibility that humans could be an additional victim for the canine flu. Consequently, our project group expect that the information about the H3N2's DNA are valuable, since the information could attribute to development of vaccine and medicine. In the experiments of analysing the properties of CIV with the comparison of SIV and AIV with the decision tree and SVM. The result came out that CIV, SIV and AIV are alike but also different in some aspects.

One-Day Visit & Tour

May 25, 2016 (Wednesday)

8:30 ---17:00

8:30—9:30 Depart from the Jeju National University International Center (Inside Jeju National University) to Jeju Smart Grid Test Bed.

9:30—12:00 Visit Jeju Smart Grid Test Bed to experience various renewable energy sources. Jeju Smart Grid will become the world's largest Smart Grid community that allows the testing of the most advanced Smart Grid technologies and R&D results, as well as the development of business models. Korea is also pursuing sustainable development while dealing with climate change. At the same time, it is shifting toward a low carbon economy and a society capable of recovering from climate change. As part of these efforts, Korea launched a Smart Grid national project to achieve green growth in a transparent, comprehensive, effective, and efficient way. This project envisions laying the foundation for a low carbon, green-growth economy by building a Smart Grid. Thus, it can serve as a yardstick to evaluate the future of Korea's green-growth economy. In light of this, Korea came up with a proactive and ambitious.

12:00—13:00 Having lunch and rest.

13:00—15:30 To go sight-seeing in Sunrise Peak.

15:30—17:00 To go sight-seeing in Seobjikoji Beach. And then go back to Jeju National University International Center.



Conference Venue

Jeju National University International Center (Inside Jeju National University)

http://www.jejunu.ac.kr/_2014/eng/main.jsp

Jeju National University, 102 Jejudaehak-ro, Jeju-si, Jeju Special Self-Governing Province, 63243, Republic of Korea



Campus map. 101 is the main gate. 702 is the international center.

1. Maison Glad Jeju

Address: 263-15 Yeon-dong

Built in a valley in Halla Mountain, Maison Glad Jeju is situated in the downtown Jeju and only a few steps from duty-free shops and not far from Jeju International Airport.

Offering both Korean ondol and Western style rooms, the property provides comfortable accommodation for guests in Jeju. All rooms are provided with modern conveniences and afford wonderful views over the surrounding area.

2. Boutique Hotel Villa De Aewol

Address: 2768-7 Sineom-ri, Aewol-eup, Aewol, 695-912 Jeju, South Korea

Overlooking sweeping views of Jeju Ocean just 200 metres away, Villa de Aewol welcomes guests with a spacious seasonal outdoor swimming pool and elegant guestrooms. Free Wi-Fi access is available at all areas.

Featuring contemporary décor, the air-conditioned rooms at Villa de Aewol all come with a 42-inch flat-screen TV and seating area. Guests can enjoy a rejuvenating shower in the attached bathroom fitted with marble flooring.

3. Jeju December Hotel

Address: 260-58 Yeon-Dong, Jeju City, 690-813 Jeju by, Sør-Korea

Only 2.3 km from Jeju International Airport, Jeju December Hotel offers basic air-conditioned rooms with free Wi-Fi and wooden flooring. Providing free parking, it is 3.7 km from Halla Arboretum and 4.3 km from Yongduam.

The organizer won't provide accommodation; we suggest you make an early reservation.



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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Please indicate your overall satisfaction with this conference with “√”					
	Very Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatisfied	Very Dissatisfied
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Are You A Member of APCBEES	Yes <input type="checkbox"/> No <input type="checkbox"/> (If “No”, you may apply membership from http://www.cbees.org/member.htm)				
Do You Willing to Receive APCBEES 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?					

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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)
Would you please list the top 3 to 5 universities in your city?	
Other Field of Interest	
Any Other Suggestions/Comments	

Thank you for taking time to participate in this conference evaluation. Your comments will enable us to execute future conferences better and tailor them to your needs!