Conference Proceedings

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19-20 February 2020

CONFERENCE VENUE

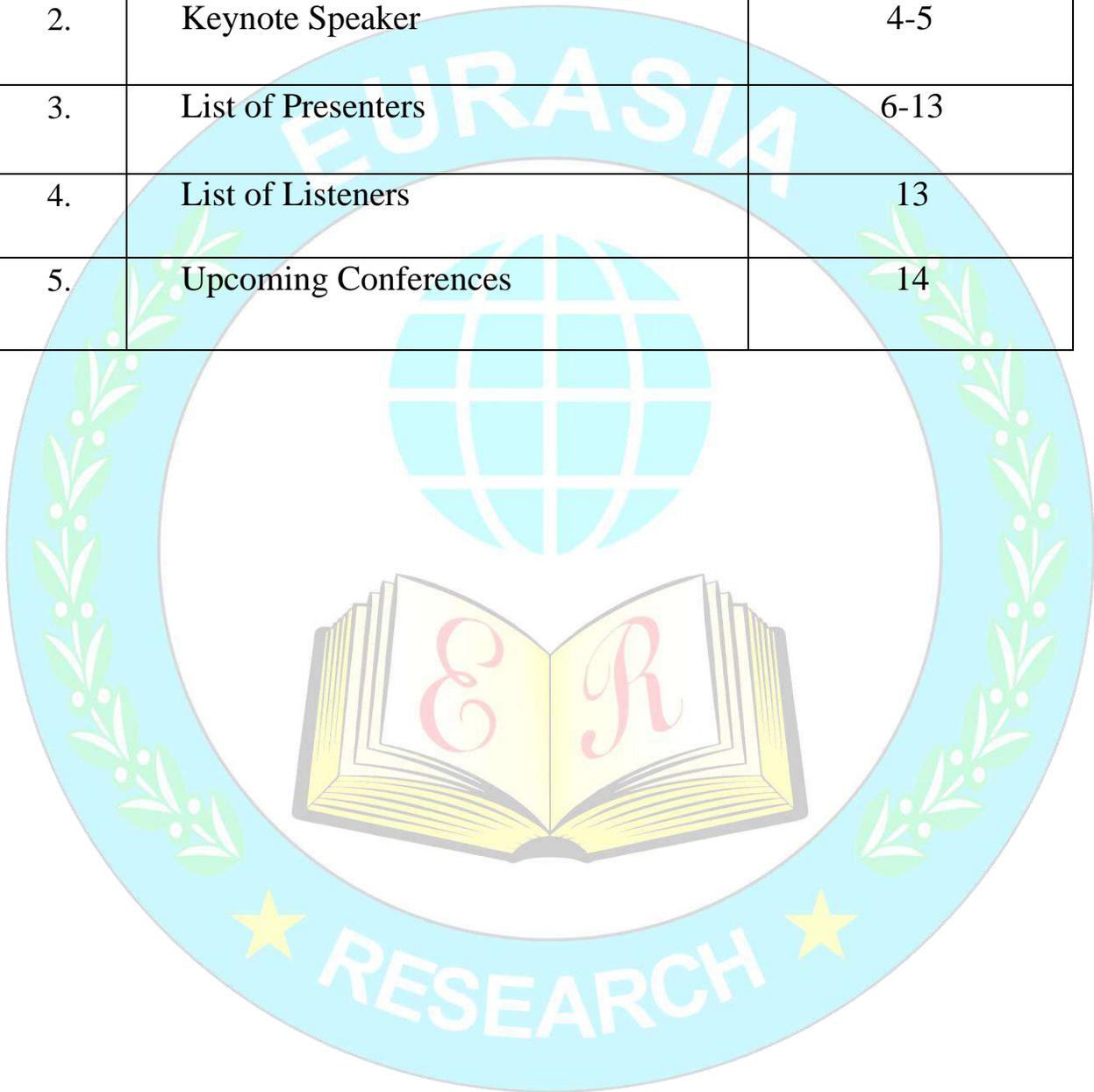**Flora Grand Hotel, Near Al Rigga Metro Station, Deira, Dubai, United Arab Emirates**

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Preface:

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Our mission is to make continuous efforts in transforming the lives of people around the world through education, application of research & innovative ideas.

KEYNOTE SPEAKER

Dr. Saadia Khouyibaba

Senior Instructor of Mathematics, American University of Sharjah, U.A.E.

Topic: The role of History of Mathematics in Teaching Math

Dr. Saadia Khouyibaba is a senior instructor of Mathematics in the Department of Mathematics and Statistics at AUS. She holds a bachelor's degree in mathematics and a master's degree in Graph Theory from the University of Montreal in Canada. Her Ph.D. was in History of Mathematics at Laval University, Canada. In June 2006, Dr. Khouyibaba started her carrier at AUS where she is currently teaching courses in Algebra, Calculus, Math for Business, and History of Mathematics. Her research interest is Math Education and History of Mathematics. Dr. Khouyibaba is the co-author of the Arab World Edition of Haeussler's bestseller "Introductory Mathematical Analysis for Business, Economics, and Life and Social Sciences

KEYNOTE SPEAKER

Dr. Peiman Kianmehr

Associate Professor of Civil Engineering, American University, Dubai

Dr. Peiman Kianmehr is associate professor of civil engineering at American University in Dubai (AUD). His expertise is in water and environmental engineering, with emphasis on sustainable water resources. He has directed various design, planning, and QC projects in the field of hydraulic engineering and earth dam construction and flood control projects; then he worked with Environment Canada as R&D Engineer for four years. Dr. Kianmehr is WEF and WEAO member. One of his major research interests is the evaluation of stormwater in new developments in Dubai to propose sustainable solutions for local stormwater handling systems. He has contributed in many research projects associated with green development and the enhancement of relevant local and international sustainable development guidelines. He has published more than 40 papers and book chapters in his field.

https://www.aud.edu/aud-school/school-of-engineering/faculty-staff/peiman-kianmehr/

PRESENTERS

Prof. Dr. Adel Dagher Fahed Budagher ERCICSTR2001053	**The Future Demand Technology** **Prof. Dr. Adel Dagher Fahed Budagher** **International Speaker, Trinity International University Counsellor, Philippines** **Abstract** Considering the growing rate of global wind power and overall benefits of the permanent magnet synchronous generator wind turbines, the future demand for high-performing magnet and its constituent elements is likely to increase. Future deployment of wind power generation may be affected by potential disruptions in supply and price rises of critical rare earth elements. Evaluating the substitution options for the rare earths permanent magnet-based wind turbines at the material and component levels, the future demand for rare earths, in particular for dysprosium, could be reduced by improving material efficiency. The future market share of rare earth-based wind turbines will most likely depend on the evolution of the price of rare earths and the techno-economic advantages of PMSG in comparison to alternative technologies that use no rare earths elements.
Mohammed Ali Zanna ERCICSTR2001054	**Application of Central Composite Design for the removal of Copper (II) Ions from Aqueous Solution Using Azadirachta indica (Neem) Leaf Powder** **Mohammed Ali Zanna** **Pure A D Iindustrial Chemistry Faculty of Science, Federal Unversity, Birnin Kebbi, Nigeria** **M.S. Sulaiman** **Department of Pure and Industrial Chemistry, Federal Unversity Birnin Kebbi,P.M.B 1157 Nigeria** **Abstract** Biosorption is considered as a potential method for the removal of heavy toxic metals from waste solution and as alternative to other conventional process such as precipitation, ion exchange, electrochemical treatment and evaporative recovery, especially, when the concentration of the heavy metal ion is low. In the present study, (Azadirachta indica) neem leaves Powder (NLP), was investigated for the removal of Cu(II) ions from aqueous solution based on modelling and optimization. Central composite design was successfully applied to develop a response surface to optimize medium conditions. Characterisations of the NLP was conducted, and the effects of contact time (0-180 minutes), Cu(II) ion concentration (10-50 mg/L), temperature (298-318 K) and dosage (0.5-2.5 g/L) were studied in batch process. The analysis with FTIR indicated that possible hydroxyl and carboxyl functional groups are involved in metal Cu(II) ions biosorption. Adsorption isotherms were modelled by the Langmuir and Freundlich isotherm equations, with the former providing a better fit for the data. Results obtained from this study indicate that NLP is a very promising candidate for the low-cost and high-capacity of Cu(II) ions from aqueous solution. Keywords: Biosorption, Neem, Copper (II), Response Surface Methodology And Central Composite Design
Nausheen Jaffur ERCICSTR2001056	**Valorisation of Agricultural Residues and Invasive Species for Application in Pulp and Paper Production** **Jaffur nausheen** **Department of Chemical and Environmental Engineering, University of Mauritius, Réduit, Mauritius** **Jeetah Pratima** **Department of Chemical and Environmental Engineering, University of Mauritius, Réduit, Mauritius** **Abstract** The reduction in waste material generation via reuse brought forth the concept of sustainable manufacturing in several field of activities. With the sole sanitary landfill in Mauritius nearing saturation, the challenge of waste build-up is a pressing issue to be tackled. This paper investigates into the conversion of invasive species such as Furcraea Foetida and agricultural residues such as waste leaves from Ananas Comosus plant into value added products in order to substitute traditional paper

manufactured from wood. The quality of paper produced from a combination of non-wood lignocellulosic fibres alongside recycled wastepaper in different ratios of 20:80, 60:40 and 100:0 as well as paper blends reinforced with starch were assessed and evaluated based on several mechanical and physical tests in conformity with the TAPPI standard methods. The results were then compared along with 60 g m-2 commercial paper. Overall, a better paper quality was achieved with the Furcraea Foetida fibre since the bulk densities (240.21-248.42 g m-2), tensile indexes (2.292-5.851 Nm g-1), burst indexes (0.163-0.354 kPa m2 g-1) as well as abrasion resistance (18-30 turns) were relatively greater than the blend of Ananas Comosus paper. Moreover, the starch reinforced composite paper samples depicted higher strength attributes than their unreinforced equivalent. The recycling of these plant species into value added products such as writing and packaging materials as well as paper cups and plates can open up new possibilities for collaborations with industries and food outlets and consequently boosting the local economy.

Keywords: Lignocellulosic Fibre; Pulp And Paper Production; Tensile Strength; Burst Index; Abrasion Resistance; Bio-Composite System

Very Virulent Infectious Bursal Disease Virus- Induced Liver Damage and Hepato- Protective Capacity of Neem (Azadirachta Indica) Leaf Aqueous Extracts in Cockerels

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Sirajo Garba
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Abstract
The research was aimed to study the effects of aqueous extract of Neem (Azadirachta indica) leaf in the liver of cockerels vaccinated and/ or challenged with very virulent infectious bursal disease virus (vvIBDV) strain. Four hundred and eighty (480) day old cockerels were used and allocated into 8 groups randomly. The birds were grouped as vaccinated/ unvaccinated, challenged/ unchallenged, neem leaf treated/ untreated groups. The IBD vaccines (intermediate plus strain) were given at 14 and 28 days of age while the experimental infection using vvIBD virus was inoculated at 35 days of age and the extracts at 3.0 mg/ml were given from day old to 6 weeks old. Serum samples were collected on the last day of the neem leaf extracts administration and that was a week post vvIBDV challenge (6 weeks), and the hepato- cellular enzymatic activities of alanine aminotransferase (ALT), aspartate aminotransferase (AST) and alkaline phosphatase (ALP) were analyzed and recorded. The results obtained showed no significant difference between the vaccinated, neem leaf treated and the control groups. However, significantly higher values of ALT, AST and ALP were obtained in the vvIBDV challenged groups when compared to the control groups. Furthermore, the values obtained in those groups that were challenged but were given the extracts had significantly lower values when compared to the challenged groups alone without prior neem extract administration. These results indicated that neem leaf aqueous extracts and IBD vaccines have no hepato- toxic effects in contrast to the vvIBDV which showed a hepato- toxic evidence. Moreover, the results showed a hepato- protective capacity of neem leaf against the vvIBDV- induced liver damage.

Keywords: Very Virulent Infectious Bursal Disease Virus, Neem Leaf Aqueous Extracts, Hapatic Damage, Vaccine, Cockerels

Influence of School Location on Students' Academic Achievement in Basic Technology in Egor Local Government Area of Edo State, Nigeria

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Abstract
This Study examined the influence of school location on students' academic achievement in basic technology in Egor Local Government Area of Edo State, Nigeria. A total of 50 respondents were selected for this study from the public secondary schools in Egor Local Government Area; from both urban and rural locations. The instrument used was Basic Technology Achievement Test (BTAT). One hypothesis was tested. Junior Secondary School (JSS) III Students were selected for the study. The data was analyzed using mean and standard deviation for the scores while t-test was used for test of significance of influence at .05 level. The findings revealed that there was significant influence of school location on academic achievement in Basic Technology.

Keywords: School Location, Basic Technology, Influence

Nazeef Idris Usman
ERCICSTR2001059

Antimicrobial Activity of Silver Nanoparticles on Hypervirulent Klebsiella Pneumoniae

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Abstract
Klebsiella pneumoniae is one of the main pathogens responsible for many hospital acquired infections. K. pneumoniae was also isolated from many community related infections such as; bourn wound, septicemia, pneumonia, urinary tract infection, pyogenic liver abscess. Recently a more invasive and virulent strain of Klebsiella pneumoniae has developed a total resistant to almost all the antibiotics. The study research the activity of bacterial synthesis AgNPs on HvKp. Identification of K.pneumoniae was carried out according to standard method and Hypermucoviscosity test was conducted at which 75% were HvKp, while 25% were cKp. Cell supernatant of E.coli was used for synthesis of AgNPs, a color change was observed from whitish yellow to brown and no change in control. A characteristic of AgNPs were obtained at 262nm, 268nm, 264nm, and 266nm 0f α, β, γ and δ respectively by spectrophotometric. In this study, the antimicrobial activity of AgNPs against HvKp was investigated, and AgNPs was compared to commonly used antibiotic discs on HvKp, the diameters of bacterial inhibition zones (mm) measured at different concentration by which α at 5μl concentration shows highest zone of inhibition with 14mm and 12mm(AWDM and DDDM) and least by δ at 30μl with zone of inhibition of 9mm, and 6mm using (AWDM and DDDM) in compare with commonly used antibiotics, except Ciprofloxacin and Ofloxacin which have zone of inhibition to be 17mm and 15mm respectively.
Keywords : Classic Klebsiella Pneumoniae, Hypervirulent Klebsiella Pneumoniae, Silver Nanoparticles, Antibacterial Activity

Anas Shamsi
ERCICSTR2001063

Unraveling Binding Mechanism of Alzheimers Drug Rivastigmine Tartrate with Human Transferrin: Molecular Docking and Multi-Spectroscopic Approach Towards Neurodegenerative Diseases

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Abstract
Studying drug protein interactions have gained significant attention lately and this is because that majority of drugs interact with proteins thereby altering their structure and moreover their functionality. Rivastigmine tartrate (RT) is a drug that is in use for mild to moderate Alzheimer therapy. Our study was targeted to characterize the interaction between human transferrin (hTf) and RT employing spectroscopy, isothermal titration calorimetry (ITC) and molecular docking studies. Experimental results of fluorescence quenching of hTf induced by RT implied the formation of static complex between hTf and RT. Further elucidation of the observed fluorescence data retorting Stern-Volmer and modified Stern-Volmer resulted in binding constants for hTf-RT complex of the order 104M-1 over the studied temperatures. Thermodynamic parameters of hTf-RT interaction were elucidated further employing these obtained binding constant values. It was quite evident from obtained thermodynamic attributes that RT spontaneously binds to hTf with a postulated existence of

hydrogen bonding or Van der Waals forces. Further, CD spectroscopy also confirmed the RT-hTf complex formation owing to upward movement of CD spectra in the presence of RT. ITC profile advocated the existence of reaction to be spontaneous. Moreover, molecular docking further revealed the important residues play a pivotal role in RT-hTf interaction. The findings of this study can be of a significant benefit to the drug designing industry in this disease prone era.

Development of Green Roads and Highways using Carbon Neutral Materials: A Review

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Engr. Yusuf Babangida Attahiru ERCICSTR2001067

Abstract

An estimated 2.2 billion people in 108 countries are expected to survive on multidimensional poverty and almost 1.5 billion out of 2.2 billion people survived on or less than US$1.25 a day. This review highlights the concept of a green economy that promotes an attractive green revolution to the present economic crises affecting developing countries for sustainable economic and environmental improvement.Green roads and highways can reduce the emissions released from fossil fuels and greenhouse gases if constructed with carbon neutral materials. Thus, carbon neutral materials used for the construction of green roads and highways can absorb temperature and excess emissions released by the vehicles because of their neutralities. This is because of the massive quantity of natural aggregates used during construction. Problems associated with green roads and highways made from carbon neutral materials are incompatibles with land use, geology, topography, substructure, landscape, rainfall, and other physical features. Therefore, physical features, geology, landscape, transportation, and development substructures were measured as crucial problems for national development. Most of the approaches used in this study are based on the context of a green economy and the development of green roads and highways. The USA possesses the highest GDP per capita of US$52,194.90 and Bangladesh possesses the lowest GDP per capita of US$1,029.60. This implies that the GDP for USA is 50.70 times higher than that of Bangladesh. The study highlights positive solutions to the above global challenges. It can be concluded that global challenges will be addressed through the concept of green revolutions.

Keywords: Carbon Neutral Materials; Green Economy; Green Roads; Green Highways; Environmental Sustainability; Fossil Free Fuels

Intake and Digestibility of Urea Treatment and Concentrate Supplementation at Varying Levels on the Utilization of Shredded Sugarcane Top Pellets in Goats

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Abstract

An experiment was conducted to determine the intake and digestibility of sugarcane tops-based pellets with urea-treatment and concentrate suplementation at varying level; to evaluate the effect of urea treatment and concentrate supplementation in the intake and digestibility of shredded sugarcane tops; and to determine the interaction effect between urea treatment and concentrate supplementation in shredded sugarcane tops-based pellets in goats. The dietary treatments considered two factors, namely: factor A (untreated, urea-treated) factor B (level of concentrate supplemenr at 0.75, 1.00 and 1.25 % BW, DM basis. Result showed no significant difference in dry matter intake of concentrates, but dry matter digestibility were significantly higher at 1.00 to 1.25% of BW levels. Urea treatment significantly increased DM intake of SCT-based pellets over that of the untreated only at 0.75% of BW level. However, DM digestibility was significantly reduce with 1.25% of BW level of concentrate supplementation when SCT was treated with urea. Intake of OM, CP and NDF were significantly increased by urea treatment but highest intake were obtained at 1.00% of BW level of concentrate supplementation. There was significant increase in NDF digestibility with urea treatment and especially when coupled with concentrate supplementation at 0.505 to 1.00% of BW level, thus, highly

recommended.

Keywords: Sugarcane Top-Based Pellets, Urea Treatment, Concentrate Supplementation, Digestibility

| Aegean Reducto ERCICSTR2001074 | Multi-Step Project Risk Analysis Model Utilizing Artificial Neural Network |

Multi-Step Project Risk Analysis Model Utilizing Artificial Neural Network

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Abstract
There is no other industry that requires proper application of business practices much as construction industry, because construction is a risky industry. The main objective of this research is to develop a predictive multi-step project risk analysis model for construction projects utilizing Artificial Neural Network (ANN). Extensive meta-analysis is used to be able to determine the different correlates for the risks in a construction project in Metro Manila.

A questionnaire was designed and forty-five risks were identified and categorized in three main categories as follows: Project Management, Quality Management and Cost Management. The validity and reliability of the questionnaire was assessed in cronbach alpha and show that the instrument was very reliable since 0.96578 is in between the 0.8-1.0. Criticality of risk were evaluated through 100 questionnaires which were distributed within 6 places within Metro Manila namely Caloocan City, Malabon City, Manila City, Pasay City, Quezon City and Valenzuela City.

The gathered data were assessed and produce a predictive model utilizing Artificial Neural Network. The interaction between the risks are recognized utilizing correlational matrix using Matlab. Thus, the researchers was able to create a risk management and risk response action plan that can help construction projects on preventing risks.

Keywords: Risk, Risk Analysis, Artificial Neural Network, Risk Response Action Plan

The Discovery of the Sequence of Pseudo remains to Generate Prime Numbers Facilitates the Cracking of RSA-Encryption the cracking of RSA-encryption

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Abstract
Prime numbers, considered as the building blocks of integer universe as well as the composition of natural numbers, have always been a major and fascinating topic in the number theory. Throughout the years, many mathematicians have devoted themselves to solving the enigma that reigns around the generation of these numbers and their prediction. This paper aims to give a suggestion in this way.

To continue on the same path, a study of prime numbers was conducted in order to generate a sequence of natural numbers which will give a helping hand in cracking cryptography algorithms. The fundamental algorithm in this study is the RSA-algorithm known to be one of those that have not been cracked yet.

Keywords: Prime Number, Generation, Prediction, Cryptography, RSA-Algorithm

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ERCICSTR2001075

A Review of the Insurance Laws and Practices in the United States of America and South Africa: Lessons for Nigeria

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Abstract
The United States of America is one of the largest financial markets, and houses the most mature and viable insurance sector in the world, with a huge population and well developed technologically advanced insurance sector. Insurance contributes close to 40% of the GDP of the financial institutions in the USA. Similarly, in the Republic of South Africa, though smaller in population to the United States and Nigeria, SA enjoys a robust insurance sector with the latest insurance Act 2018 to help the sector and the economy. Nigeria, on the other hand is much larger in terms of size and population to SA, being over 200million in population, but with a weak insurance sector and little legislation sustaining insurance practice. The insurance Act 2004 is the primary legal regime. This paper examines the prospects, challenges and pitfalls of these experienced sectors, with a view to gaining useful insights into their insurance law, practices and for useful insights that can benefit the Nigerian insurance industry. This paper made recommendations that attention must be given to our laws, by way of a review and an amendment to grow the industry in Nigeria, digital and technological infrastructure, though presently at its nascent stages, must be fully explored. While attention must be given to the cost and over-dependence on digital and tech innovations to avoid their pitfalls.
Keywords: Insurance, United States of America, South Africa, Nigeria, Lessons

Biochemical Studies on Metallothionein Expression as A Biomarker of Heavy Metal Pollution in Certain Freshwater-Derived Fungi Under Different Ph Conditions

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Abstract
The aim of this work was to evaluate metallothionein(MT) as a bioindicator of heavy metal pollution in certain freshwater-derived fungi under different pH conditions. During the last decades, environment in general and water in particular have been strongly exposed to the effect of different harmful pollutants, especially heavy metals which have become one of the most serious environmental problems. Any modification of environmental parameters leading to a response by organisms may be considered as a stress. There are several biomarkers to measure the stress response. Stress proteins as a part of cellular defense response, are strong candidates as biomarkers of environmental pollution. Fungi are capable of removing metals either by biosorption or bioaccumulation in the cytoplasm, binding them by stress protiens, e.g., by cysteine-rich peptides such as Metalthioneins (MTs). In potato broth medium adjusted to neutral, alkaline and acidic pH conditions, two concentrations were

prepared from the four tested heavy metals; Cd, Cu, Fe and Zn, then discs of Aspergillus oryzae and A. clavatus gowth were added, and all the treatments were incubated for 10 days. The mycelial mats were separated, homogenized and centrifuged to determine total proteins concentrations using spectrophotometer. Sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-PAGE) was used to separate proteins according to their molecular weights. The results showed that in A. oryzae, the (MTs) bands clearly appeared at low molecular weight only in neutral medium containing Cu concentrations, and total proteins concentrations were high in case of all metals at all pH conditions. While, in A. clavatus, no bands appeared at all in the tested metals at all pH conditions, and total proteins showed low concentrations. In conclusion, MTs is a good bioindicator of heavy metal pollution in freshwater-derived fungi.

Keywords: Biomarkers; Metalthioneins; Freshwater Fungi; Heavy Metals

Feasibility Study of Wind Energy in Kuwait: Onshore and Offshore

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ERCICSTR2001068

Abstract

In this paper, the wind energy generated by four wind farms is statically predicated and assessed. The average speed from four weather stations in Kuwait from 2009 to 2017 is adopted in the investigation. Three of these stations are onshore and one offshore. The value of the dimensionless Weibull shape and scale parameters are determined. The maximum annual value for Weibull shape parameter is 4.76, and the maximum annual value for scale parameter is 8.35 m/s. The highest recorded monthly wind power density is 257.36 W/m2. According to NREL classification, one site is categorized as good/excellent, while other sites are marginal. The analyses indicated that the maximum yearly output energy of 11.71 GW-h can be produced by a wind turbine with a rated power of 3.0 MW.

Keywords: Wind Energy, Turbines, Wind Farms

Cladding Fires in High-Rise Buildings

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Ralph E. Hammann
ERCICSTR2001070

Abstract

This conference presentation to the 6th ICSTR Dubai – International Conference on Science & Technology Research, 19-20 February 2020 presents new findings of my research in regards to safety issue in regards to building energy performance retrofits. So-called "cladding fires" in high-rise buildings are one of the most dangerous types of catastrophic events endangering the lives of many. Yet they are relatively little known to the public which is typically more familiar with the outbreak of fires as a result of ignition of combustible material at the interior of buildings. Cladding fires, meaning the fire of the exterior sheathing of a building, spread extremely rapidly, and vertically, capable of covering large expanses of a building's façade with a 'curtain' of high-temperature gases and liquid combustibles. The taller the building the most rapidly the fire is capable to spread, due to a combination of stack effect and temperature differences. This phenomenon is particular of concern in buildings which underwent the common present-day energy performance retrofits, meaning which were outfitted with an exterior layer of insulation material of various kinds. Several fire catastrophes in the recent past have costs, unnecessarily, hundreds of lives. This paper presented at the Dubai conference in February 2020 will focus on a compilation of retrofit insulation strategies, material recommendations and design for the prevention of such events.

Refrigeration and Defrost Energy Consumption in Commercial and Walk-In Freezers

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ERCICSTR2001081

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Abstract

The energy consumption of commercial and walk-in freezers has been experimentally investigated in

this project. Three different sizes of walk-in freezers were tested to observe the difference of the energy consumption among them. The freezers tested are of 5.98 kW, 1.49 kW & 0.57 kW cooling capacity and 37.84 m3, 3.67 m3 & 0.49 m3 in storage volume respectively. In addition, the temperature distribution inside the freezers cabinet were measured to investigate the temperature variation at different places inside the cold spaces. We conducted the tests varying the defrost timer and observed the performance of those freezers. While we ran the tests, we determined the defrost to refrigeration energy consumption ratio and the percentage increased in the temperature from the storage set-point. This ratio represents the amount of energy consumed during the defrost process and the energy required to cool the freezer to the set-point after the defrost process ended. In 8 hours timer, it was found that the average defrost to refrigeration ratio was 37.4% in freezer A and 13.9 % in freezer B. In freezer C, the defrost to refrigeration ratio was 18.2% in 7 hours timer.

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