



CONFERENCE PROCEEDINGS

ICSTR London – International Conference on Science & Technology
Research, 11-12 April 2019

11-12 April 2019

CONFERENCE VENUE

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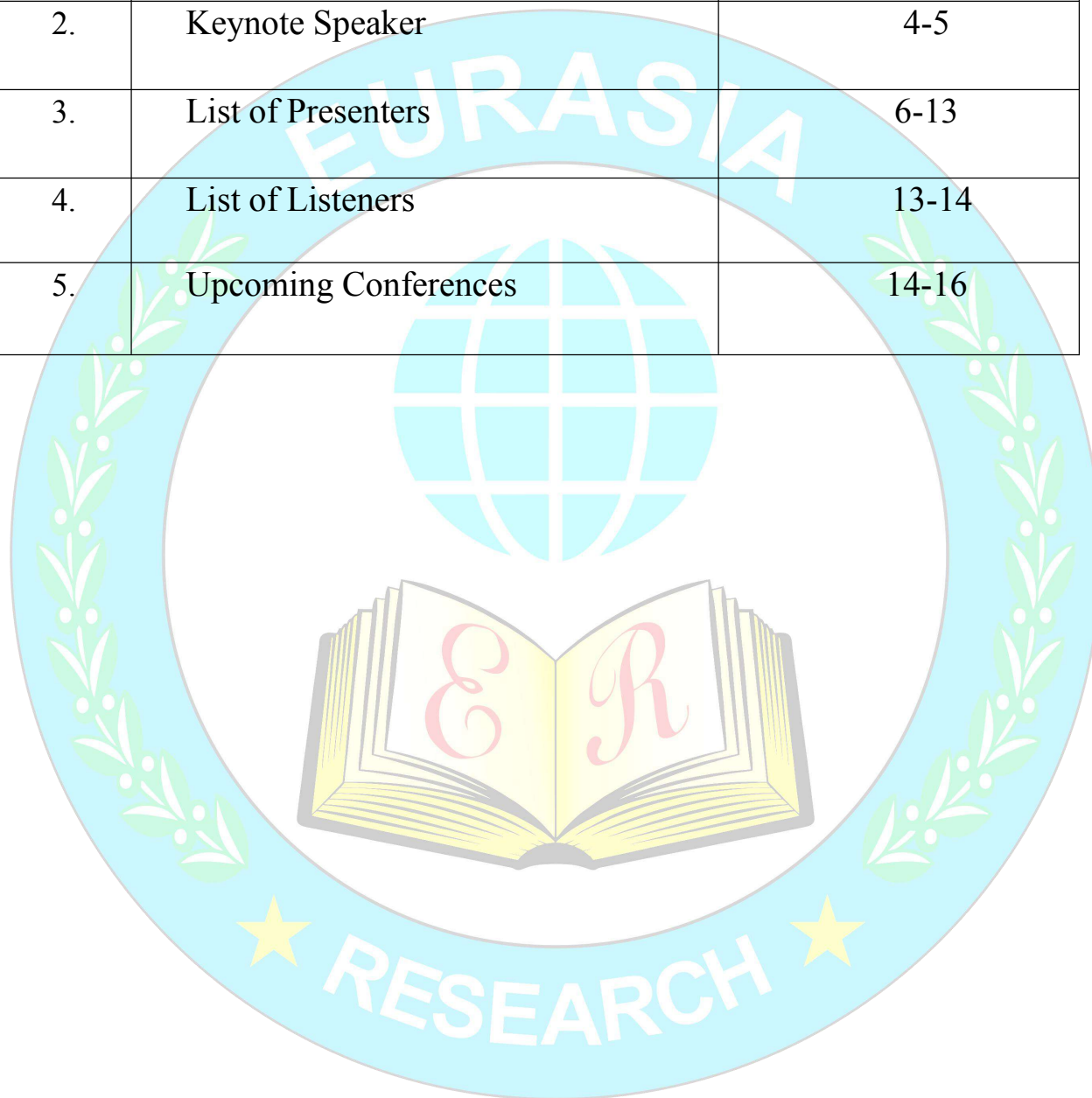
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Preface:

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KEYNOTE SPEAKER



Annika Bush

Research Assistant and Lecturer, Department of Science Education, Bielefeld, Germany

Topic: Why collaboration is even more important in times of digitalization

Annika Bush is a research assistant and lecturer at the Bielefeld University in Germany. She studied history, biology and educational sciences and therefore, her research is influenced by many disciplines. She got a scholarship to study at the Universidad de Panama in Panama, and spent much time in North and Latin America, Asia and Australia. Her aim is not only to improve teacher training and higher education but to enhance intercultural communication and learning through international collaborations in every way. Her current research topic is collaboration in e-learning settings.

PLENARY SPEAKER



Ana Maria Diez Pascual

**Department of Analytical Chemistry, Physical Chemistry and Chemical Engineering,
Faculty of Sciences, University of Alcala, Madrid, Spain**

Topic: Biodegradable Food Packaging Nanocomposites Based on Polyhydroxyalkanoates

Ana Maria Diez Pascual graduated in Chemistry in 2001 (awarded Extraordinary Prize) at the Complutense University (Madrid, Spain), where she carried out her Ph.D. (2002-2005) on dynamic and equilibrium properties of fluid interfaces under the supervision of Prof. Rubio. In 2005 she worked at the Max Planck Institute of Colloids and Interfaces (Germany) with Prof. Miller on the rheological characterization of water-soluble polymers. During 2006-2008, she was a postdoctoral researcher at the Physical Chemistry Institute of the RWTH-Aachen University (Germany) in the group of Prof. Richtering, where she worked on the layer-by-layer assembly of polyelectrolyte multilayers onto thermoresponsive microgels. Then she moved to the Institute of Polymer Science and Technology (Madrid, Spain) and participated in a Canada-Spain joint project to develop carbon nanotube (CNT)-reinforced epoxy and polyetheretherketone composites for transport applications. Currently, she is a Postdoctoral researcher at Alcala University (Madrid, Spain) focused on the development of Polymer/Nano filler systems for biomedical applications.



Fahad Suleiman
ERCICSTR1905053

Application of Mathematical Sciences to Farm Management

Fahad Suleiman

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Abstract

Agriculture has been the mainstay of the nation's economy in Nigeria. It provides food for the ever rapidly increasing population and raw materials for the industries. People especially the rural dwellers are gainfully employed on their crop farms and small scale livestock farms for income earning. Mathematics has enabled farming to be more economically efficient and has increased productivity. Farmers use mathematics as a system of organization to effectively utilize their time and manage their money. Farmers use numbers every day for a variety of tasks, from measuring and weighing, to land marking. This paper explores some of the ways mathematics is used in farming. For example, farmers use mathematics to determine the amount of seed they need to plant their crop and how much it will cost. They use math to purchase equipment and make payments. The paper recommends farmers should be mathematically oriented in order to boost their farming activities and also to ensure effective quality control of their farm products.

Keywords: Agriculture; Farming; Mathematics

**Amit Kumar
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ERCICSTR1905060

Structural Properties Analysis of Coir Fibre and Fly ash based Cement Concrete for the Construction of Rigid Pavement

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Abstract

In fast growing today's world, development of new building material, new technique and utilization of industrial or agricultural waste is being given the top priority. This is important for conservation of scarce resources and for achieving maximum disposal of waste. Energy generation is increasing day by day due to rapid industrialization and it is accomplished from thermal power plants. Thermal power plants which use pounded coal as a fuel, generates millions of tons of fly ash every year as a waste. Conservative clearance of this material which gets easily air-borne and constitutes a serious health hazards to the community, is an expensive operation. With the emphasis to protect the environment, research was carried out for utilization of flyash. For the improvement of the flexural and tensile strength of concrete, class C fly ash and coir fibre using different composition was casted. Study was carried out to investigate the structural properties of coir fibre and fly ash based cement concrete for the construction of rigid pavement in India. AS per IRC, a design mix proportion for the M30 concrete was designed using coir fibre with 0.0%, 0.5%, 1.0%, 1.5%, 2.0% and 30% flyash for pavement construction, in India. The cubes and beams were prepared in 5 sets for this study. Three samples from each set of the mix were tested at the age of 7, 14, and 28 days for compressive strength and 7 and 28 days for flexural strength. Test result of specimens indicates that the workability and strength characteristic has a significant change due to incorporation with fly ash and coir fibre. Slump test having an appropriate workable mix of a concrete gave sufficient compressive strength and flexural strength. Test of 28 days specimens were taken to calculate the optimum content. The maximum compressive strength obtained was 46.50 mpa of 28 day cube for a mix with fibre length of 40mm, 30% fly ash and fibre content of 0.50 % by weight of cement. The maximum value of flexural strength obtained was 7.20 mpa for the mix with fibre length of 40mm, 30% fly ash and fibre content of 0.50% by weight. Thus from the studies it was found that the compressive strength and flexural Strength of fly ash and coconut fibre based reinforced concrete specimens were higher than the conventional concrete at all ages.

Keywords: Fly ash, Coir fibre, Compressive strength, Flexural strength, Concrete mix, Rigid pavement

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

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Abstract



Yusuf Babangida
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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



Muhammad Amar
Gul
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Characterization of Datta Formation as Shale Gas Reservoir

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Abstract

The discovery and extension of alternative plays, have been accelerated worldwide due to mounting cost of hydrocarbons. Shale gas is not only copious in Pakistan but also inexpensive. Shale gas plays a key role to overcome the energy crisis existing within the country. No exploration have been made in shale gas reservoirs until now in Pakistan. To find out the potential of the shale gas in Kohat-Potwar basin, this research work is completed.

In this study, the wireline logs and well cuttings, data is utilized to calculate total organic carbon (TOC), thermal maturity, kerogen type, mineralogy, brittleness index (BI) and elastic properties. TOC was measured from well cuttings by Loss on ignition method as well as from wire line logs by using Passey's method. Kerogen type, maturity and genetic potential were also evaluated in lab by Rock Eval Pyrolysis. Vitrinite Reflectance of Datta Formation in each well, calculated by the help of burial history curve using PetroMod. BI calculated using formulations proposed by Jarvie and Wang based on brittle and ductile content.

The shale gas prospect of Datta formation of Kohat-Potwar Basin is determined based on geochemical studies and on formational evaluation data. Gross thickness of Datta formation ranges from 40-300 meters in the Potwar-Kohat Basin and the formation is almost 80 meters thick in study area and is almost 4.5 Km deep. Geochemical Analysis indicates that TOC of the formation ranges from 0.3 to 2 % by weight with 58-158 mg HC/g Rock Hydrogen Index (Kerogen type III). T max (436 oC) & Ro (0.5-1.4%) suggest that kerogen in the Datta Formation is well mature".

In Shale Interval of Datta Formation, clay minerals content is ranging from 35% to 50%, while Brittle mineral content is ranging from 40% to 50% including Quartz. High Brittleness Index, ranging from 0.48 to 0.65, lower values of Poison Ratio and higher values of Young's Modulus shows that Shale of Datta formation lies in brittle region. Hence suitable for hydraulic fracturing for the development of Shale Gas Reservoir in Datta Formation which may have good Shale Gas prospects.

Keywords: Shale Gas, Geochemistry, Geomechanics, Datta Formation, Unconventional



Mobin
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Sustainable Design and Pollution Prevention by Approaching Economy of Resources as the Principle of Sustainability in Architecture

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Abstract

Sustainable design (also called environmental design, environmentally sustainable design, environmentally conscious design, etc.) is the philosophy of designing physical objects, the built environment, and services to comply with the principles of social, economic, and ecological sustainability. Sustainable design is the intention to reduce or completely eliminate negative environmental impacts through thoughtful designs. This concept can be applied across all fields of design such as designing buildings or products.

Keywords: Sustainable design, Pollution Prevention, Economy Resources, Sustainability in Architecture

Blessings Masina
ERCICSTR1905077

Design and Testing of Improved Short Time process for white flour production in the maize mill with an option of fortification at low cost

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Abstract

Maize mills have failed in Malawi and some parts of the world to produce white flour locally known as 'Ufa woyera' directly. The white flour is produced in 48 hours or more after soaking and sun drying the maize grits. The product used for cooking 'nsima' is of low nutritional value and production process requires a three phase voltage source. Vital in improving performance and cutting short the process of white flour production was the development of the hammer mill and sheller with drying and steaming processing units which run on single phase voltage source. Laboratory small-scale model for processing units, hammer mill and sheller with output capacity of 300kg/hr and 250kg/hr respectively, boiler producing saturated steam at 100°C and dryer with oven temperature of 105°C were fabricated and tested in a local fabrication shop to determine the performance of such new design. Groundnut with 25% protein and 46.22% oil, carrot with 21384IU B-carotene per 150ml teacup and soybean with 421g/kg protein and 195 g/kg oil were introduced 10 grams each to the process in the hammer mill as a means of fortification. The trials revealed that a 48-hour process was reduced to 15 minutes with an average milling capacity of 300kg/hr, extraction rate of 85% and nutrient recovery rate of 90%. The white flour produced had protein, oil and B-carotene 6.71 grams, 5.72 grams and 279.63 IU which gave 94%, 57% and 100% increase in composition respectively per 100 grams of fortified flower. The maize mill innovation favoured everyone in rural or urban areas, under single or three phase voltage source, bad or good weather, facilitating production of white flour directly at low cost with an option of fortification using locally available raw materials and effectively addressing adverse effects of inclement weather limitations in white flour production.

Keywords: White flour, Hammer mill, sheller, steaming, drying processing unit, fortification




Nadir Ali Mugheri
ERCICSTR1905082

Code-Mixing of English in Urdu Electronic Media in Pakistan: A Case Study of Country's leading News Channel Geo Television

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Abstract

In a multilingual and bilingual society, the fact of code-mixing is done often. This aspect is also demonstrated in different written and verbal communications. This research will explore the scope to which code-mixing is observed in the programs & news bulletins of Pakistan's leading Urdu News Channel Geo Television. A qualitative approach will be applied to this case study. The programs and news bulletins of the channel Geo News for the month of February & March 2018 would be scrutinized and examined for this study. Those sentences and words which show code-mixing will be fixed appropriately with deliberations below them. Samples will definitely show the amazing outcomes along with their socio-political motives ranging from choice of language to linguistic supremacy and influence. Code-mixing leads to language crossbreeding that in return creates issues of language protection and

	<p>change. These entire circumstances have momentous socio-cultural and political repercussions in the framework of globalization and beginning of English as a universal language in the recent times which has posed a serious challenge to the endurance of local and domestic languages of many nations. Keywords: Code-mixing, verbal communication, linguistic hegemony, globalization, indigenous languages</p>
<p>Noshaba Manarvi ERCICSTR1905084</p>	<p>Design and Development of Tailoring Management System Software Application for SMEs in Pakistan</p> <p style="text-align: center;">Noshaba Manarvi Department of Computer Science, Virtual University Pakistan, Pakistan</p> <p style="text-align: center;">Abstract</p> <p>A large number of tailoring shops in Pakistan may be considered as Small and Medium Enterprises (SMEs) due to their number of employees and annual turnover. Although these may have a lot of customers interacting with them on daily basis for different designs of clothing; the tailors need to maintain their records mostly in hard copy registers and note books. It is mostly because they may not have the ability to purchase expensive software for their management systems due to limitations of cost and expenses involved to purchase and maintain such systems. This research was conducted as a part of final year project of undergraduate degree course. In this research, user requirements for customers, tailoring shop employees and administrator for a typical tailoring organization were identified. Then researchers designed a suitable process model, developed case diagram to show functionality, prepared business rule catalogue, made architectural design, team structures, project schedule, sequence diagrams, logical models/class diagram, entity relationship diagram, database and user interfaces using php language for developing the software code. Finally; the software application was executed and demonstrated to customers, tailors and admin for suitability. This application is expected to assist the customers for online submission of their orders based on designs shown on the website, as well as tailors to be able to keep complete record of orders including measurements of customers for future use as well. Administrator's features are were also added to fix any errors or problems as well as generate reports based on weekly, monthly or annual frequency as required by the management.</p> <p>Keywords: SMEs; Tailoring Management System; Requirements Specification; Use Case Diagram and scenarios; Architectural diagram; Sequence diagram; Database design; Customer Tailor</p>
 <p>Yu-Hsaun Liu ERCICSTR1905090</p>	<p>Improving Electrode Activity in a Semi-Ce-I Redox Flow Battery by Sol-Gel and Electroless Deposition Methods</p> <p style="text-align: center;">Yu-Hsaun Liu Department of Chemical Engineering, National United University, Miaoli, Taiwan (R.O.C.)</p> <p style="text-align: center;">Abstract</p> <p>The energy of a redox flow battery (RFB) is stored in separated positive and negative electrolytes on the electrodes, which provide the driving force that initiates the oxidation-reduction reaction. We developed a novel cerium/iodine-vitamin C redox flow battery (Ce/I-VRFB) with iodine (I₂), vitamin C, and cerium (Ce) salt, and using modified electrodes. The Ce (III)/Ce (IV) redox couple has a high standard potential, but its electrochemical reversibility is poor. In order to increase the energy storage efficiency of the Ce/I-VRFB, we modify the anode electrode by the electroless plating and sol-gel methods to enhance electrochemical activity. The basic characteristics of the modified electrodes, such as the surface structural morphology, metal crystal phases, and electrochemical properties, were verified through cyclic voltammetry (CV), field emission-scanning electron microscopy and energy-dispersive X-ray spectrometry (SEM/EDS), and X-ray diffraction. Results imply that the C-TiO₂-Pd electrode has a ratio value (1.08) of symmetric redox currents, which was close to unity, meaning that this is a reversible redox reaction for the Ce (III)/Ce(IV) redox couple. In addition, the C-TiO₂-Pd electrode presented high diffusion coefficient (D₀) and electric double layer capacitor values (Cd), which can enhance the electrocatalytic effect of the electrode. Consequently, the C-TiO₂-Pd electrode performed better in the redox kinetic reaction and can be expected to effectively improve the energy storage ability of Ce/I-VRFB system.</p> <p>Keywords: Cerium/Iodine-Vitamin C Redox Flow Battery; Electroless Plating; Electrodes; Diffusion Coefficient</p>
<p>Chih-Chun Yang ERCICSTR1905093</p>	<p>Preparation and Application of the Organic Silica/Acrylic acid/Optic Fiber Biosensor</p>

Chih-Chun Yang
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Abstract

In this study, using the special fiber technology, which were spliced by the hollow fiber and the single mode fiber to produce double cone structure to form a highly sensitive fiber Mach-Zehnder interferometer (MZI). Then combining the acrylic acid (AA)/organic siloxane coupling agent by sol-gel and photo-polymerization methods were used as a sensing layer. The organic silica/AA/optic fiber biosensor (OFB) contains acidic functional groups, which didn't need to be labeled and can instantly detect the concentrations of ammonia water. The sensing principle is that the carboxylic acid groups (-COOH) of poly-AA can undergo acid-base neutralization reaction with ammonia water, and resulting in a change in the transmission response of the fiber causes the wavelength shift in the spectrum. The concentration changed and response time of ammonia water were obtained from the degree of light spectrum drift. The ratio of AA in the sensing layer directly affects the amount of light drift and response time of ammonia sensing. The results showed that this organic silica/AA/OFB has an excellent resolution in very small amount (ppm) of ammonia water and at less than 30 seconds. Moreover, this OFB presented many advantages of simple manufacturing, anti-electromagnetic interference, small size, portability and high sensitivity and so on. It will be a valuable physiological parameter monitoring device for environmental detection and medical care in future.

Keyword: Optic Fiber; Biosensor; Mach-Zehnder Interferometer; Ammonia Water; Sol-Gel

Multi-Objective Optimization (MOOP) of Biodiesel Production from Waste Cooking Oil Via Response Surface Methodology (RSM)

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Abstract

In order to achieve the optimal conditions of multi-objective optimization (MOOP) of the procedure of using waste cooking oil to produce biodiesel, response surface methodology (RSM) based on a central composite design (CCD) was utilized. There are two functions of the MOOP, which are minimizing the total capital cost (f_1) and minimizing the cost of operations (f_2). This research study included an experiment that was conducted using the CCD in order to determine the conditions that provide optimization of the procedure for producing biodiesel. The choice of CCD to improve the thirteen parameters was due to it being one of the most widely-used programs in RSM that is commonly known to provide the most effective results. The production of this experimental set using CCD was conducted to examine the effects of the independent parameters on the mass fraction of FAME, % FAME purity, the mass fraction of Glycerol, and % Glycerol purity. Additional research on the optimization by CCD showed the total capital cost to be USD 8,364,795 and the cost of operations as USD 1,732,590 per year. In comparison with the original procedure, it was found that there is a cost savings that can reach USD 1,185 and USD 6,870 per year, respectively. Therefore, the findings of this research from the MOOP based on RSM for the process for producing biodiesel from used cooking oil were satisfactory. In conclusion, it can be summarized that this method of optimizing the procedure will provide an effective basis for the achievement of future production of biodiesel that is stable and reliable.

Keywords: Multi-objective optimization (MOOP), Biodiesel Production, Response surface methodology (RSM)

The Impact of Silver Nanoparticles on Oryza Sativa L.CV. Kdml105, Oryza Sativa Var. Glutinosa Cv. Rd 6 and Ipomoea Aquatica Forsk. Var. Reptan

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Abstract

Currently, agriculture is widely which the properties of silver nanoparticles (AgNPs) can be used as anti-bacterial and fungi. AgNPs may be released into the environment and impact on agricultural crops have been exposed. In this work, to investigate the effects of AgNPs to accumulate translocation and impact on three plants including rice (Oryza sativa L. cv. KDML 105), sticky rice (Oryza sativa var. glutinosa cv. RD 6) and Chinese water convolvulus (Ipomoea aquatic Forsk. Var. reptan). In the



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Sukpancharoen
ERCICSTR1905094**



**Dr. Sujittra Srisung
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experiment, the AgNPs were synthesized by pure natural honey as a reducing agent. In addition, to study on the wet digestion of D1, D2 and D3 methods. Moreover, the three plants were exposed with AgNPs to various concentrations of 0.02, 0.05, 0.1 and 1 mg/L. After wet digestion the AgNPs were determined by graphite furnace atomic absorption spectroscopy (GFAAS). Therefore, the D2 method was the optimum wet digestion process for the determination of AgNPs in plants, resulting show the percent recovery of between 81.67 to 94.00. While the effect of AgNPs to aggregate and accumulate within the roots and shoots of three plants. The result showed that the roots of sticky rice at a concentration of 0.05 mg/L was accumulated and penetrated to the cell wall and cell in root lead to effect on structural features and transporting nutrients to the plants, including the development on the growth of plant cells.

Keywords: Silver nanoparticles, Rice (*Oryza sativa* L.cv. KDML105), Sticky rice (*Oryza sativa* var. glutinosa cv. RD 6), Chinese water convolvulus (*Ipomoea aquatica*Forsk. Var. reptan), Accumulation

Sanam Abedini
ERCICSTR1905055

Finite Element Analysis of Edge Delamination and Detachment of SiC coating on 316L Stainless Steel

Sanam Abedini

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Abstract

Ceramic coatings have recently attracted the attention of researchers is improving different properties of metallic parts such as hydrogen storage stainless steel containers. In this paper, finite element analysis was applied to study edge delamination and detachment failure mechanisms of ceramic coatings on metallic parts. To this end, SiC coatings were considered as the ceramic coatings on a 316L stainless steel substrate. The finite element model used in this study was a 2D axisymmetric model of a cylindrical specimen of 316L stainless steel substrate coated with SiC coatings of different thickness values. The model was cooled down from stress free temperature of 600°C to room temperature and thermal residual stresses were analysed at different locations throughout the model. It was observed that the most severe stress concentration was for shear stress at the edge of the model and at the interface between the substrate and the coating layer. The residual shear stress was found to be mainly responsible for the delamination of SiC coatings. Coating detachment as another catastrophic failure mechanism was then analysed and the residual radial stress above the delamination crack was considered as the main stress component for this type of failure. For both delamination and detachment of coating, the thicker coating layers were found to be more prone to failure.

Keywords: Ceramic Coating, Finite Element Analysis, Delamination, Hydrogen Storage, Silicone Carbide, Failure Mechanisms



Ana Maria Diez
Pascual
ERCICSTR1905076

Synthesis and Characterization of Conductive HDI-Functionalized Graphene Oxide/ PEDOT:PSS Composites

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Abstract

Conductive polymers like poly(3,4-ethylenedioxythiophene):poly(styrenesulfonate) (PEDOT:PSS) show great potential for solar cell applications due to their outstanding optical and electrical properties, light weight, inexpensiveness, flexibility and good processability. On the other hand, graphene oxide (GO) is a perfect candidate to reinforce polymeric matrices due to its large specific surface area, transparency, flexibility, and extraordinary mechanical properties. However, functionalization is needed to enhance its solubility in organic solvents and extend its range of applications. In this work, hexamethylene diisocyanate (HDI)-functionalized GO (HDI-GO)/ PEDOT:PSS conductive composites were developed by solution casting process. The composites with different HDI-GO concentration were characterized by a variety of techniques to obtain information about the state of filler dispersion within the matrix, the nanofiller-matrix interactions, as well as their thermal, mechanical and electrical properties. SEM analysis revealed a uniform distribution of the HDI-GO within the matrix. A steady increase in thermal stability was found as the HDI-GO content raised with just a small loss in transparency. A decrease in the sheet resistance of PEDOT:PSS was observed upon addition of low HDI-GO contents, while it grew slightly at high loadings. The nanocomposites with HDI-GO content between 2 and 5 wt% showed the optimum combination of stiffness, strength and toughness. These solution-processed nanocomposites are suitable for

	<p>applications in different fields such as solar cells, flexible electronics and thermoelectric devices. Keywords: PEDOT:PSS; graphene oxide; nanocomposite; hexamethylene diisocyanate; sheet resistance</p>
<p>Yacine Benhadid ERCICSTR1905085</p>	<p>Modeling Amortization in Vlasov-Poisson System with Parallel Programming Techniques</p> <p>Yacine Benhadid Mathematics Department College of Basic Education, PAAET, Public Authority of Applied Education and Training, Kuwait City, Kuwait</p> <p>Abstract By a statistical approach on the resolution of the Vlasov Poisson system coupled to a wave equation, we study the nonlinear Landau damping in a hot plasma body. Applying the kinetic limit on the self-coherent Hamiltonian, we obtain the system of non-linear Vlasov wave equations whose superposition of eigenmodes makes it possible to follow the evolution of the particles in the phase space. The particles are positioned relative to the instantaneous separators which constitute the boundary between the trapped particles and those circulating in the plasma. Numerical results were obtained by parallel programming techniques.</p>
 <p>Kiyong Park ERCICSTR1905096</p>	<p>Analysis of the Characteristics of Distribution by Building Use based on Flood Risk</p> <p>Kiyong Park Department of Disaster Prevention, Chungbuk National University, Cheongju, Republic of Korea</p> <p>Abstract Due to recent abnormal climate extremes, damages from natural disasters are increasing globally. This study focused on flood damages, which accounts for the largest proportion of disasters related with climate change, and emphasized the use of land in the aspect of urban planning and the measures in the construction environment in order to reduce flood damage in urban areas. Vulnerability and the degree of exposure were analyzed in order to assess urban flood risk by service area. The vulnerability assessment was analyzed by using the building characteristics as the value index, and for the analysis of the degree of exposure, the flood area was analyzed by considering the environmental factors. The urban flood risk was divided into four grades: Green, Yellow, Orange, and Red Zones by mapping these analyzed results. Also, the distribution of location was analyzed by building use with respect to urban flood risk. According to the flood risk assessment, the commercial area showed the highest degree of risk followed by residential area, industrial area, and finally green area, in respective order. As for the distribution of buildings, a number of residential and business facility groups as well as industrial facility groups, and neighborhood living facility groups were included in the Red and Orange Zones. It is considered to be profoundly related with the use of the buildings that can be constructed in commercial and residential areas. This study may be used not only as the data for establishing specific details of the land use plan in connection with the urban planning in the future but also as the data indicating the appropriateness of the location of the building against the flood damage by showing the distribution status of buildings by their use. It may have great significance in that it provided a basis for preparing measures in terms of urban planning and for buildings by their use to minimize the flood damage in the urban area against the issue of climate change.</p> <p>Acknowledgements This paper was financially supported by Ministry of the Interior and Safety as “Human resource development Project in Disaster management”.</p> <p>Keywords: Climate Change, Flood Risk, Disaster, Flood Damage, Characteristics of Building Use</p>
<p>Dr. Shalini Yadav ERCICSTR1905097</p>	<p>Potential of Pervious Concrete Pavements for Controlling Ground Water Depletion and Climate Control</p> <p>Dr. Shalini Yadav Associate Professor, Department of Civil Engineering, RNT University, Bhopal, India</p> <p>Abstract Growing population and rapid industrialization all over the world are increasing stress, on surface and underground water resources due to extreme use. Over the world approx., one third of the population depends on groundwater for their drinking water, in urban as well as rural areas. Groundwater also plays a pivotal role in agriculture, and an increasing portion of groundwater extracted is used for</p>

irrigated agriculture. It is estimated that at least 40% of the world's food is produced by groundwater-irrigated farming, both in low-income as well as high-income countries

UNESCO- has estimated that the total volume of water on earth is about 1.4 billion km³, which is enough to cover the earth with a layer of 3 km depth. World's oceans cover about three-fourths of earth's surface while the fresh water constitutes a very small proportion .It is only about 35 million km³ or 2.5% of the total volume. Out of these, 24 million km³ or 68.9% is in the form of ice and permanent snow cover in mountainous regions, the Antarctic and Arctic regions and another 29.9% is present as ground water (up to 2,000 metres). The balance only 0.3% is available in lakes, rivers and 0.9% in soil moisture, swamp water and in atmosphere.

The problem of water security is one of the major concerns in Indian economy today. In India groundwater accounts for 65% of irrigation water and 85% of drinking water supplies. It is estimated that 60% of ground water will be in a critical state of degradation within next 20 years.

The natural ground water recharge is prevented to a large extent by the impermeable pavements laid across the country. Therefore, a solution to improve the groundwater recharge and reduce the depletion of water with the use of concrete is needed, which would be a sustainable new technology to protect our environment.

Observed climate change impacts and future trends show that extreme precipitation events over a short period of time now causing higher water run-off leading to inadequate ground water recharge, which is necessity for irrigation and drinking water and other human needs. In this paper pervious concrete using different size of aggregated was casted and their compressive strength was studied.

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