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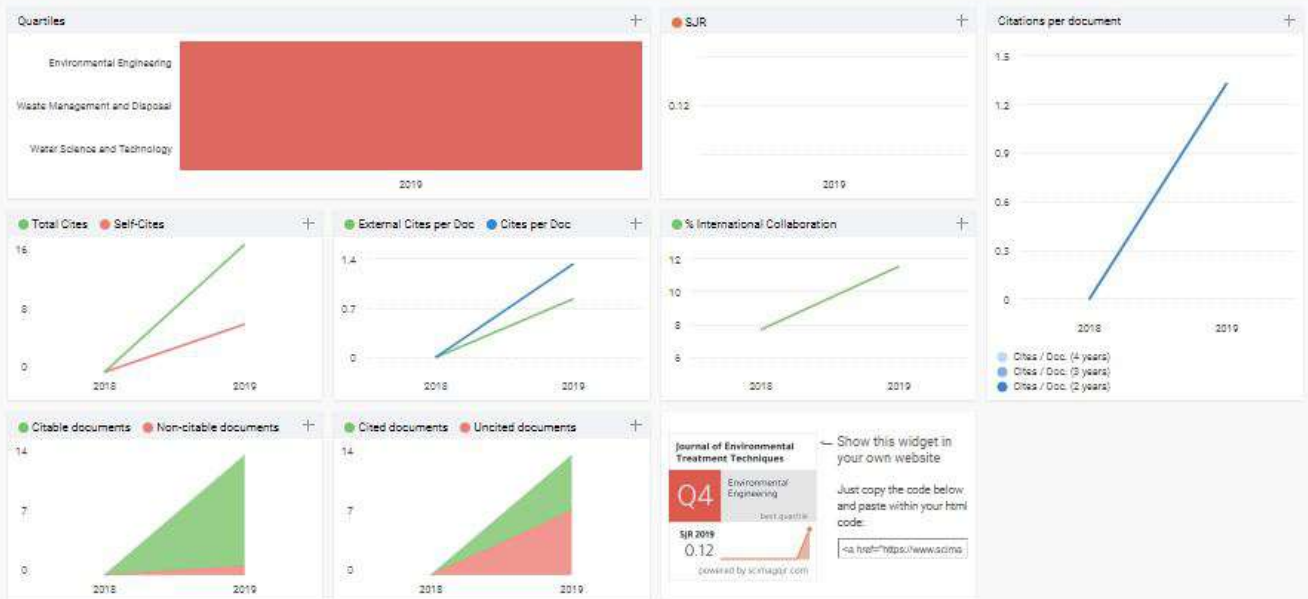
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Journal of Environmental Treatment Techniques

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Integrated Approach as Sustainable Environmental Technique for Managing Construction Waste: A Review

Elamaran Manoharan, Norazli Othman, Roslina Mohammad, Shreeshivadasan Chelliapan and Siti Uzairiah Mohd Tobi
Volume 8 | Issue 2 | Pages: 560-566 | [PDF](#) | [HTML](#)

Abstract: The construction industry was reported as a major consumer of natural resources worldwide. Almost 60% of natural resources consumed by this industry have caused a lot of environmental impacts to humans and the environment. Among the impacts were disruption of human water sources, changes in biological ecosystem and disruption of food supply chain among biological factors. Countries around the world have enforced several laws and regulations. Apart from that, waste management technologies were formulated by government agencies and the world's researchers were among initiatives to minimise the waste generation rate. Several technologies, such as recycling and recovery technologies were highlighted to be very efficient in minimising the waste accumulation rate. This paper discussed an integrated concept for managing construction waste in a sustainable manner. The integrated approach has adopted the reuse method, central sorting facilities, recycling facilities, thermal treatment facilities and disposal facilities. Implementation of these integrated approaches was able to save the world's raw materials and natural energy source as well as reducing the impacts of pollution to the environment.

Keywords: Waste management facilities, Pollution, Sustainable

Treatment of Landfill Leachate using Granular Multi-Stage Anaerobic Reactor: Optimisation through Response Surface Methodology

Aida Batrisyia Jasni, Shreeshivadasan Chelliapan, Mohd Fadhil Md Din and Nithiya Arumugam
Volume 8 | Issue 2 | Pages: 567-572 | [PDF](#) | [HTML](#)

Abstract: One of the most hazardous sources of pollution these days is landfill leachate. This harmful wastewater is not only affecting the environment, but also the health of beings surrounding the landfills. Numerous treatments have been used to treat this recalcitrant wastewater; however, anaerobic treatment has been in focus in recent years. In this study, we investigated the interactive effects of chemical oxygen demand (COD), leachate percentage and pH on the performance of a granular multi-stage anaerobic reactor (GMSAR) treating landfill leachate. Response surface methodology (RSM) was utilised to project the interaction effects of the operating conditions of the treatment system in terms of COD removal and biogas yield. The optimum region of the GMSAR was acquired at influent COD of 1239 mg/L, a leachate percentage of 14.2% and a pH of 7.3. These variables resulted in a 71.9% COD removal and 65.9mL/d of biogas yield. The percentage of leachate and COD influent resulted respectively in the most effective parameters on the COD removal and biogas yield of GMSAR.

Keywords: Landfill leachate, Anaerobic treatment, Multi-stage anaerobic reactor, Response surface methodology, Biogas yield

A Heterogeneous Relationships between Urbanization, Energy Consumption, Economic Growth on Environmental Degradation: Panel Study of Malaysia and Selected ASEAN+3 Countries

Ali Umar Ahmad, Suraya Ismail, Aminu Hassan Jakada, Ibrahim Sambo Farouq, Atiku Abubakar Muhammad, Umar Aliyu Mustapha, Ahmad Tijjani Abdullahi, Aminu Muhammad Fagge

Volume 8 | Issue 2 | Pages: 573-581 | [PDF](#) | [HTML](#)

Abstract: This paper aims to analyse the association among urbanization, economic growth, energy consumption and environmental degradation based on estimates in the context of second-generation techniques. A Malaysian economy and selected ASEAN+3 were estimated using Pesaran (1999) Pooled Mean Grouped (PMG) and a panel dynamic common correlated effects (DCCE) technique pioneered by Pesaran and Chudik (2015) that measures a model of error correction (EC) which is resilient to cross-sectional dependency and co-integration. Evidence from the findings shows that the main actors or driving forces leading to a high level of environmental degradation are urbanization, economic growth, and energy consumption for Malaysia and selected ASEAN+3 nations. Also found was the existence of one-way causality running from economic growth to environmental degradation. It also indicates another one-way causality running from square of economic growth to environmental degradation. Whereas, a bidirectional causality is found between urbanization and environmental degradation, as well as a feedback causality among energy consumption and environmental degradation.

Keywords: Urbanization, environmental degradation, Energy consumption, Economic growth, Heterogeneous panel, Malaysia and Selected ASEAN+3

Stability and Super Stability of Fuzzy Approximately Ring Homomorphisms and Fuzzy Approximately Ring Derivations

N. Eghbali

Volume 8 | Issue 2 | Pages: 582-588 | [PDF](#) | [HTML](#)

Abstract: In this paper, we establish the Hyers-Ulam-Rassias stability of ring homomorphisms and ring derivations in the uniform case on fuzzy Banach algebras.

Keywords: Fuzzy normed space; Approximately ring homomorphism; Stability

Analyses the Effect of Monetary Policy Transmission on the Inequality in OECD Countries

Mohammad Farajnezhad, Suresh A/L Ramakrishnan, Mani Shehni Karam Zadeh

Volume 8 | Issue 2 | Pages: 589-596 | [PDF](#) | [HTML](#)

Abstract: The aim of this article is to analyze the inequality impacts of monetary policy transmission in OECD countries' economy from 2001 to 2017. Panel regression model has been applied for the hypotheses test. Information gathering has been based on the country's basic information, i.e the data required for research are generally derived from the library method, using the World Bank website. The econometric method used in this research, is Generalized Torque Method. Dependent variable Gini coefficient index is considered as an indicator of income inequality and independent variables of monetary transfer mechanisms include interest rates, liquidity, exchange rates, the gold price, the legal reserves of the central bank and the banks' debt to the central bank. The results show that the interest impact of monetary transfer mechanism at the Gini coefficient as an indifference index in OECD countries is positive and insignificant (probability is 0.18) with a coefficient of 0.004 and it shows that raising interest rates will increase the inequality in these countries. Additionally, the effect of the capital market on the inequality is also positive with a coefficient of 0.001 and a significant probability of 0.002. It shows the positive effect of bank deposits on income inequality.

Keywords: Monetary Policy Transmission, Inequality, OECD countries

Influence of Adsorption Process Parameters on the Removal of Hexavalent Chromium (Cr(VI)) from Wastewater: A Review

Sunil Rajoriya, Ahlaam Haquiqi, Bhawna Chauhan, Girish Tyagi, Avdesh Singh Pundir, Ajay Kumar Jain
Volume 8 | Issue 2 | Pages: 597-603 | [PDF](#) | [HTML](#)

Abstract: In recent years, the release of heavy metals into the aquatic environment has become a major issue. Numerous socio-economic problems are caused due to the presence of several heavy metals in wastewater. Hexavalent chromium (Cr (VI)) is one of the major heavy metal present in the wastewater which comes from various industries such as fertilizers, pesticides, metal cleaning, dyes and pigment, especially in tannery industry. Numerous methods have been employed for the removal of Cr (VI) from wastewater. Adsorption has been reported as a suitable method due to its high efficiency, low cost, generation of minimum chemical sludge and reusability of the prepared adsorbents. In this review, various adsorption process parameters such as solution pH, adsorbent dosage, temperature and initial Cr (VI) concentration have been reviewed on the removal efficiency of Cr (VI) from wastewater. The percentage removal of Cr (VI) strongly depends upon pH of the solution and the optimum pH range was found to be 1.0-4.0. The reusability of the used adsorbents has also been discussed. It is comparatively good for practical applications. It can be concluded that the most of the adsorbents have good regeneration capability. This review paper suggested that the adsorption process parameters had an important role on the removal efficiency of Cr (VI) from wastewater.

Keywords: Adsorption, Wastewater treatment, Hexavalent chromium, Reusability

Yttria Stabilized Zirconia Thin Film as Solid Oxide Fuel Cell Electrolyte: Temperature Dependent Structures and Morphology

N. F. M. Rahimi, Sathiabama T. Thirugnana, S. K. Ghoshal
Volume 8 | Issue 2 | Pages: 604-609 | [PDF](#) | [HTML](#)

Abstract: Fuel Cell is an electrochemical cell that supports clean and alternative energy that is mushrooming nowadays. Being a device of clean energy production, highly efficient solid oxide fuel cells (SOFCs) are increasing in demands. It converts the chemical energy into electrical energy in an environmentally-friendly way following green technology route. The SOFCs are one type of technology that has great promise to improve energy efficiency and to provide the society with clean and abundant energy. Yttria-stabilized zirconia (YSZ) is used as the electrolyte in SOFC wherein its synthesis with controlled properties is important to obtain the highest energy efficiency. The overall characteristics of the YSZ thin-film electrolyte in the SOFC are determined by its structures and morphologies. Based on these factors, a series of YSZ thin films were deposited on the sapphire wafer substrate by the dip-coating method and sintered in the temperature range of 900 – 1500 °C. The temperature dependent structural and morphological attributes of such thin films were determined and the prepared samples were characterized using XRD, AFM and Raman spectroscopy. The XRD patterns of the samples revealed the change in the crystallinity and phase, with an increase in the sintering temperatures while a tetragonal structure was observed at 1300 °C. Furthermore, the Raman spectral analyses supported the XRD results. The AFM morphology analysis of the thin films showed an increase in the grain size from 132.25 to 995.2 nm. The observed temperature-dependent changes in the structures and morphological attributes of these films may be useful for achieving high ionic conductivity required for an efficient SOFC construction.

Keywords: SOFC, Green technology, YSZ electrolyte, Thin film, Dip-coating, Structures, Morphology

Antiviral Pneumonia to Treat Influenza Virus

Sargol Mazraedost, Seyyed Mojtaba Mousavi, Seyyed Alireza Hashemi, Ahmad Gholami

Volume 8 | Issue 2 | Pages: 610-620 | [PDF](#) | [HTML](#)

Abstract: Influenza, an infectious disease of the respiratory system, represents a tremendous sized burden for public health. Influenza was once found not through a direct learn about the disorder in humans, but as a substitute from research on animal diseases. An ailment that can resemble the frequent cold, influenza packs a powerful and on occasion deadly punch. As numerous as half-a-million people around the world die yearly from flu. The perpetrator is a virus that mutates to steer clear of our immune systems, leaving vaccines and remedies scrambling to preserve up. In many years, a mutation creates a pathogen that is specifically nasty, ensuing in pandemic flu. Influenza is an acute respiratory disorder brought on by using the influenza A or B virus. It often happens in outbreaks and epidemics worldwide, frequently in the course of the iciness season. Significant numbers of influenza virus particles exist in the respiratory secretions of infected persons so that infection can be transmitted via sneezing and coughing using large-particle droplets. The imply duration of influenza virus shedding in immunocompetent adult patients is around 5 days but may also proceed for up to 10 days or further mostly in children, elderly adults, patients with chronic illnesses, and immunocompromised hosts. Influenza generally starts with the abrupt onset of high-grade fever, myalgia, headache, and malaise. These manifestations are attended by way of signs of respiratory tract ailments such as non-productive cough, sore throat, and nasal discharge. After an ordinary course, influenza can affect different organs such as the lungs, brain, and heart more than it can affect the respiratory tract and motive hospitalization. The excellent way to stop influenza is to administer annual vaccinations. For centuries, new strains of influenza have emerged to produce human pandemics, inflicting massive illness, death, and disruption. There have been four flu pandemics within the earlier hundred a long time. Throughout this time, globalization processes, globalisation processes, alongside advances in medicine and epidemiology, have altered the way these pandemics are experienced.

Keywords: Pandemic; Influenza; Human; Infectious disease

Role of Short Term Finance for Growing the Business Regarding Environmental Activities

Sri Utami Ady, Marina V. Borovitskaya, Hoai Fyong Nguen, Abshor Marantika, Ruly Artha

Volume 8 | Issue 2 | Pages: 621-624 | [PDF](#) | [HTML](#)

Abstract: For a small time period generally shorter than a year the financing needs can be consider as short term finance to help improve the environmental situation. It can also refer as working capital financing in business regarding environment. In to the business when it happen uneven flow of cash or due to seasonal pattern of business this short term finance is required. Only particular one time order type business is finances at a time.

Keywords: Small time; Business; Inventory; Uneven flow

Artificial Neural Network (ANN) Modeling of Cavitation Mechanism by Ultrasonic Irradiation for Cyanobacteria Growth Inhibition

Esmael Salami Shahid , Marjan Salari , Majid Ehteshami , Solmaz Nikbakht Sheibani

Volume 8 | Issue 2 | Pages: 625-633 | [PDF](#) | [HTML](#)

Abstract: Cyanobacteria produce toxins that affect animals and human's health. Therefore, modeling concentration of this type of algae is necessary. This study employs artificial neural network (ANN) modeling method to simulate the cavitation mechanism by ultrasonic irradiation on cyanobacteria concentration variation in treated water. The proposed model used parameters such as power intensity, frequency and the time of ultrasound irradiation as input variables. The results showed that proportional value of cyanobacteria concentration to the initial concentration (C/C_0). The data obtained from a laboratory experiment and number of data in the existed study was not enough for ANN modeling, the data expanded to 7280 data sets from the original 28 data sets obtained by the experimental study. A feed-forward learning algorithm with 20 neurons in the first (hidden) layer and one neuron in the second layer was developed with the MSE value equals to

2.72×10^{-5} . Model results were used for predicting the cell density value. Furthermore, a novel formulation was presented to correlate the C/C_0 values with the cell density. To verify the accuracy of the ANN and developed equation, the value of cell density was predicted by studies performed by other researchers. In this case the MSE was 1.55×10^{-4} .

Keywords: Artificial Neural Networks, Cyanobacteria, Modeling, Ultrasonic irradiation, Water Quality

Risk Characterization and Quantification of Medical Waste in Qom Province

Y. Ghafari, R. Shiri, N. Jafari, Afzal, H. Izanloo

Volume 8 | Issue 2 | Pages: 634-638 | [PDF](#) | [HTML](#)

Abstract: The term healthcare waste includes all the waste generated within healthcare facilities, research centers, and laboratories of medical procedures. The purpose of this study was to determine the quantities and composition of waste generation and evaluate the hospital waste management and hazard analysis by preliminary risk analysis (PRA) in all hospitals in Qom province, Iran. Results showed that the production of sharp, pharmaceutical, cytotoxic, chemical, pathological, and heavy metals wastes is estimated to be 3.6%, 2.5%, 0.18%, 0.11%, 0.3%, and 0.01% of total wastes, respectively. Analysis and partitioning of heavy metal and cytotoxic waste was reported in this study. Events such as segregation and color-coded containers for pharmaceutical waste, especially cytotoxic waste and heavy metals, and unsupervised waste offsite transport in a hospital without safe facilities were identified as high-risk events. In addition, other events were identified as medium risk. Administrative procedures, maintenance, training treatment plant operators, and integrating training with public education on risks of healthcare waste are among the other issues that should be considered in providing strategies in hospital waste management.

Keywords: Qom; Waste; Risk; Assessment; Hospital

Management of a Sustainable Development of the Oil and Gas Sector in the Context of Digitalization

Alexey I. Shinkevich, Damir R. Baygildin, Ekaterina L. Vodolazhskaya

Volume 8 | Issue 2 | Pages: 639-645 | [PDF](#) | [HTML](#)

Abstract: The oil and gas sector is characterized by a high level of polluting emissions, which confirms the need for the development of a management mechanism in the field of automation and greening of technological processes. Thus, in the conditions of the fourth industrial revolution, digital transformation is an integral element of sustainable development. The purpose of the study is to develop a methodology for assessing the sustainable development of the oil and gas sector of the Russian economy, taking into account aspects of digitalization. The methodological base covers the method of systematization of the collected information, which made it possible to track the dynamics of changes in the environmental and economic indicators of the oil and gas sector and in the mining industry as a whole; modeling method (including the correlation-regression method and the method of principal components), which determined the mathematical relationships between indicators of sustainable development and digital transformation of the oil and gas sector; forecasting method, which presents scenarios of changes in the level of environmental friendliness of the oil and gas sector. As a result, a linear regression model is proposed that reflects the dependence of emissions of harmful substances by mining enterprises on the financial leverage ratio and determines the necessities to increase the ratio in order to reduce harmful emissions; alternatives options of forecasting the level of harmful emissions by the mining industry of the Russian economy are developed; to assess the sustainable development of the oil and gas sector of the Russian economy in the context of digitalization, an integrated sustainable development index is elaborated through the use of the factor analysis tool. The factors identified by the principal component analysis enable to evaluate the influence of digitalization on the sustainable development of the oil and gas sector of the Russian economy. In addition, correlation coefficients between each selected factor and each variable were pairwise estimated. Based on the simulation results, interdependencies of two key aspects of the study - the sustainable development of the oil and gas sector and its digital transformation are observed. The practical significance of the obtained model lies in the possibility of its application in order to predict the sustainable development of the oil and gas sector in Russia, taking into account the industry digitalization trend. The results of this study can be taken into account in strategic documents and programs for the development of the oil and gas sector and digital transformation of the industrial complex of the Russian Federation.

Keywords: Oil and gas sector, Sustainable development, Digital technologies, Factor analysis, Sustainable development index

Financial Distress Prediction across Firms

Ali Akbar Rafatnia, Suresh A/L Ramakrishnan, Dewi Fariha Binti Abdullah, Fazel Mohammadi Nodeh, Mohammad Farajnezhad

Volume 8 | Issue 2 | Pages: 646-651 | [PDF](#) | [HTML](#)

Abstract: One of the most important events in a firm's life is financial distress, which can propel sectors into financial and sustainable growth problems. Moreover, independent variables in the background of financial distress are accounting ratios, which are extracted from financial statements and macroeconomic variables that are mostly beyond the control of a firm or sector. The current study analysed the information related to a sample of 300 public Iranian companies, during the periods of 2000-2007 and 2009-2016. Logistic regression and decision trees were applied to the prediction of financial distress. It was found that the profitability, liquidity, leverage, interest rate, cash flow, accruals, and GDP were statistically significant in distinguishing distressed from non-distressed firms across sectors. The obtained results showed that the predictive performance of a DT model was more successful than the other model.

Keywords: Prediction of Financial Distress, Accounting ratio, Decision Trees

Strategic Environment Resource Management Concept and Needs

Abdul Hadi, Poni Yanita, Cahya Fajar Budi Hartanto, Svetlana Nikolaevna Sychanina, Wiflihani

Volume 8 | Issue 2 | Pages: 652-656 | [PDF](#) | [HTML](#)

Abstract: Strategy is a multi-dimensional idea going great past customary aggressive procedure ideas. Methodologies are wide explanations that set a path. Strategies area an obtainable, specific, measurable arrangement of plans carefully created with association by a foundation's partners. These activity proclamations are connected to an individual or people who are responsible and engaged to accomplish their responsibility regarding the environment. The process of human asset work with the key destinations of the association so as to improve execution is known as Strategic environment resource management. Keeping and attracting skilled and talented workers is one of the most significant difficulties associations face in the present powerful business world

Keywords: Strategy, Strategic human resource management, Talented workers, Improve execution

Efficiency of the Solar Energy Usage by Winter Wheat Plantings Made with Different Crop Cultivation Technologies

Olga V. Melnikova, Vladimir E. Torikov, Anatoliy S. Kononov, Viktor P. Kosianchuk, Evgeniy V. Prosyannikov, Alexei A. Osipov

Volume 8 | Issue 2 | Pages: 657-663 | [PDF](#) | [HTML](#)

Abstract: The paper presents the results of determining the efficiency of the solar energy usage by winter wheat crops cultivated with different technologies on the gray forest middle-loamy soil in the southwestern part of the Central region of Russia. The authors found that the photosynthetic active radiation (PAR) usage coefficient can be increased by agrotechnical methods of cultivation, primarily by optimizing the mineral nutrition of plants. It was shown that the application of mineral fertilizers in intensive agricultural technologies ($N_{60-90}P_{60}K_{120}+N_{30}+N_{30}+pesticides$) contributed to 1.8-2.0 times greater solar energy accumulation in the biomass of the winter wheat plantings Moskovskaya 56 and Nemchinovskaya 57, compared to biological technology ($N_0P_0K_0$ -control). When cultivating winter wheat Moskovskaya 56 and Nemchinovskaya 57 against

a high background of mineral nutrition, in comparison with the control variant (N₀P₀K₀), solar energy costs per unit of grain yield were reduced due to the formation of a higher yield (5,75 -6,36 t/ha of grain). Such an “economical” expenditure of solar energy on an economically valuable part of the plantings’ biomass can be explained by an increase in the PAR usage coefficient in crops by 2.8–2.9% at a high agricultural background, compared to the 1.4–1.6% increase of the control variant. A multiple correlation and regression analysis revealed a close positive relationship between the winter wheat grain yield and indicators of the dry plantings’ biomass ($r = 0.998$), total accumulated energy by plantings ($r = 0.998$), and the PAR usage by plantings ($r = 0.998$).

Keywords: Winter wheat, Grain yield, Dry biomass, Solar energy, Photosynthetic active radiation (PAR), PAR usage coefficient

Taking the Business Organizations into Account in Improving Environment

Ida Ayu Nuh Kartini, Herningsih, Samsul Susilawati, E. Laxmi Lydia, K. Shankar
Volume 8 | Issue 2 | Pages: 664-668 | [PDF](#) | [HTML](#)

Abstract: The links between the economy and the environment are manifold: the environment provides resources to the economy, and acts as a sink for emissions and waste. Poor environmental quality in turn affects economic growth and wellbeing by lowering the quantity and quality of resources or due to health impacts, etc. Environmental impact of economic growth. Economic growth means an increase in real output (real GDP). Therefore, with increased output and consumption we are likely to see costs imposed on the environment. Also, economic growth caused by improved technology can enable higher output with less pollution. This study aims to investigate the consequences of interfering economic organizations into activities which help the environmental treatment. Based on researches done through this study the slope of the number of such companies which their works are in tune with positive environmental activities is increasing.

Keywords: Customer Experience, Integration, REAL World, Organized Methodology

A Life Cycle Assessment Study for Integrated Management of Electronic Waste

Norazli Othman, Shreeshivadasan Chelliapan, Roslina Mohammad and Nurul Aini Osman
Volume 8 | Issue 2 | Pages: 669-673 | [PDF](#) | [HTML](#)

Abstract: An amount of 21,378,553 tonnes of electronic waste or e-waste is expected to be accumulated in Malaysia in the near 2020. To manage this increasing volume of solid wastes, the waste management technologies have to be further integrated. Knowledge of electronic waste compositions, contamination compounds in wastes, laws, guidelines and the management methods is essential to form a cost-effective and an environmental friendly management system. The aim of this study is to propose a technique for managing the electronic wastes through an integrated and holistic manner. The study proposed the use of a life cycle assessment to predict the burden and impacts of the integrated electronic waste management system towards the surroundings. The result of this study was obtained from a field study, data collection, life cycle assessment model, as well as by computer calculation development and impact analysis study. The findings of the study proposed that the implementation of an integrated electronic waste management must combine sustainable techniques for waste collection, waste sorting, materials recycling, thermal treatment and landfill methods to achieve the maximum system effectiveness. However, the pollution control facilities are important to be part of the sustainable technique to ensure that the system will produce the best management method for electronic waste. The advantages of implementing an integrated electronic waste management are that this system is able to contribute to the economic growth of a country and reduce the impacts of pollutants to the environment.

Keywords: Waste collection, Central sorting, Recycling process, Thermal treatment, Landfill

Physical Training Teacher Certification as a Basis of the Professional Standard Requirements for Teachers

Elena V. Bystritskaya, Vitaly L. Skitnevskiy, Yulia S. Krasilnikova, Elena L. Grigoryeva, Ivan A. Sedov, Valentina F. Balashova, Gennadij N. Germanov

Volume 8 | Issue 2 | Pages: 674-678 | [PDF](#) | [HTML](#)

Abstract: The relevance of the research subject is defined by the special attention currently paid by employers to the professional competence of teachers. Whereas the professional standard for Teachers describes all requirements to personality of professional teacher's competence, which motivates a teacher for self-improvement to become competitive in the labor market. The goal of the article is to develop a concept of "Creative vector certification of a Physical training teacher from the perspective of the professional standard requirements". The leading research method of the study of the subject matter is the systematic approach applied in the procedure of professional certification of Physical training teachers in conditions of education upgrading. Findings of the research are in defining the main requirements of the professional standard for Teachers in relation to Physical training teachers, as well as in development of certification technology for Physical training teachers to ensure achievement by a teacher of high meta-subject, subject and personal results by means of using the author's concept. The article materials can be helpful for teachers of various education levels, as well as for supplementary education teachers, coaches, school-counselors in the field of physical education.

Keywords: Federal state higher education standard, Qualification assessment procedure, Professional standard for Teachers, Internship center, Certification

Physical Security Problems in Local Governments: A Survey

Poon Ai Phin, Hafiza Abbas, Norshaliza Kamaruddin

Volume 8 | Issue 2 | Pages: 679-686 | [PDF](#) | [HTML](#)

Abstract: Physical security refers to the control of access into organizations, buildings, rooms, and information technology (IT) peripherals. However, physical security may be overlooked by organizations because they are more concerned about information security; this is because the organization assumes that those granted access can be trusted. The physical security is not a new issue in a local government environment; however, in most cases, hackers are to blame, while the actual culprits may be the employee(s) of the local government itself. This paper is a survey done to investigate the problems faced by a local government and the measures needed to be taken to keep their physical access secure. The subject of the research is chosen from among municipal councils in Malaysia since they hold various private information about the residents of the area, where physical security awareness is still low among the members of the organization. As a case study, the Kota Bharu Municipal Council (KBMC) was selected and its security problems were identified through a research comprising a mixed method of quantitative (questionnaire and observation) and qualitative (interview) techniques. The respondents of the research were eight employees of the IT Department, while the solution to their security problems was derived through interviewing its IT Officer. The researchers also discuss if KBMC is able to apply other local government's solutions to their own security problems. The discussion reveals that the security awareness program is the most suitable solution to the KBMC's security problems since it enhances security awareness of top management officers and enables the employees to be aware of their responsibilities in their daily work routine.

Keywords: Physical security, Physical access, Local government, Security awareness, SETA, Sustainable security culture

Isolation and Characterization of Microorganisms for Protease Production from Soil Samples from Kosovo and Testing the Enzymes in Food Industry Application

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Abstract: Soil samples from different locations in Kosovo were screened for bacteria suitable for high-level production of various proteases. 5 isolates were found and selected to be promising candidates and further characterized by biochemical and morphological assays as well as 16S RNA sequencing and identified as *Bacillus* spp. The isolates were used for protease production via submerged fermentation. The produced enzymes were tested for different food industry applications, like meat, beer, milk, and feather degradation. The highest protease activity achieved was 0.63U mL⁻¹ at 37°C pH 4.7 from strain S10-1 which showed high potential for meat industry application.

Keywords: Bacillus spp.; Enzymes; Fermentation; Industrial biotechnology

Adsorptive Remediation of Crude Oil Contaminated Marine Water Using Chemically and Thermally Modified Coconut (*Cocos nucifera*) Husks

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Abstract: This study evaluated the potential of a chemically and thermally modified coconut husk as oil-spill sorbents in the remediation of crude oil contaminated marine water under varying physical factors of sorption time, initial oil concentration, temperature, sorbent dosage and oil weathering number of days. Coconut husk (CH) was chemically activated with zinc chloride and then pyrolyzed at a different combination of temperatures-retention times of 400 -800 °C and 30 – 60 minutes to produce un-activated and activated coconut husk-derived biochar (CHB and ACHB), while acetylated-coconut husk (ACCH) was produced using acetic anhydride. The results revealed that the sorption potential of coconut husk can be enhanced by chemical, thermal (pyrolysis) and chemo-thermal treatments (chemical/pyrolysis). The oil sorption capacities and oil removal efficiencies of raw CH, ACCH, CHB₈₀₀₋₆₀, and ACHB₈₀₀₋₆₀ were a function of the physical factors. The rate of oil sorption by raw CH, ACCH, and CHB₈₀₀₋₆₀ follows pseudo-second-order kinetics while that of ACHB₈₀₀₋₆₀ follows pseudo-first-order kinetics. The oil sorption by raw CH, ACCH, CHB₈₀₀₋₆₀ and ACHB₈₀₀₋₆₀ occurs via both surface and intraparticle diffusion mechanism. Freundlich isotherm best describe the oil sorption behaviour of ACCH, CHB₈₀₀₋₆₀, and ACHB₈₀₀₋₆₀, respectively, while Langmuir isotherm best describes the sorption of raw CH. The maximum monolayer sorption capacities were 12.11 g/g, 15.06 g/g, 16.10 g/g, and 16.84 g/g for the raw CH, ACCH, CHB₈₀₀₋₆₀ and ACHB₈₀₀₋₆₀, respectively, and hence the performance of the sorbents was in the following order: ACHB₈₀₀₋₆₀ > CHB₈₀₀₋₆₀ > ACCH > raw CH.

Keywords: Adsorptive remediation; Isotherms; Kinetics; Modified coconut husk; Oil spill

Optimization of Operating Conditions of Increasing HBsAg Protein Expression in FED BATCH Fermentation Process by Changing *Pichia Pastoris* Culture Medium Conditions and Examining Growth of Yeast Cells by Methanol Testing

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Abstract: Optimization of the culture medium and induction conditions in the fed-batch fermentor is the commonest and easiest method to increase the overall productivity of recombinant proteins production. Environmental conditions such as temperature, dissolved oxygen (DO), PH, and agitation also have a major impact on the expression of recombinant protein. Since the production of the recombinant protein in *pichia pastoris* is highly affected by induction conditions, providing induction conditions is one of the most important ways to increase the productivity rate. AOX1 gene enables recombinant proteins expression at the highest level in methylotrophic yeasts. This gene is activated by methanol and induced protein expression. Low and high methanol amounts respectively lead to its reduced induction ability and overproduction of formaldehyde and other toxic substances. However, given that carbon is considered as microorganisms feed, therefore, the injection of pure methanol in a timely manner in sufficient quantities in specified time intervals, the necessary amounts of carbon were supplied for feeding them. Also, vitamins such as vitamin A and B were regularly injected to the extent necessary in the fermentation process. Therefore, this study aimed to investigate the methanol feeding process, an increase

in specific growth rate (μ), OD and dry weight (WW), comparison of the increase in OD and WW. The results showed that the performance of the feeding profile is improved as much as possible according to the existing facilities.

Keywords: *Pichia pastoris*; Methanol utilization pathway; Fed-batch fermentation; Recombinant protein expression; Genome annotation

Enhancing the Physical, Mechanical, Oxygen Permeability and Photodegradation Properties of Styrene-acrylonitrile (SAN), Butadiene Rubber (BR) Composite by Silica Nanoparticles

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Abstract: Polymer-nanosilica composite was prepared using Silica nanoparticles as reinforcing fillers in Styrene-acrylonitrile (SAN). Copolymer Styrene-acrylonitrile (SAN) is such warm, soft clear resins that because of having suitable Physical and mechanical properties, have excellent resistance against chemical also low solvent and cost toward another copolymer styrene that caused to be in a category of much used of them. The effect of increasing nano-silica loadings on the mechanical properties of BR nanocomposites was also studied. Its defect is its fragility that, with its alloying with Butadiene Rubber, prevents its fragility. Basically, with adding inorganic Nano bits, changed strength and modulus of elasticity of plastics while increasing Nano bits decrease the strength of the hit. In this study, copolymer Styrene-acrylonitrile considered as a matrix and for increasing mechanical qualities used Nano bits silica diacid. Results of automated tests (XRD), (TGA), (HDT), and (SEM) were a sign of improvement of mechanical and thermal qualities. Nowadays, due to using lots of plastics in various industries, this probability exists that destroyed whit being exposed to direct solar radiation. So light destroyed plastics is very important. In this project whit using Oxoperoxidant blend prepared with the ability of light destruction, so that after one and three months, results show to destroy its lights.

Keyword: Permeability, Oxoperoxidant, Styrene-acrylonitrile, Degradation

Logistics Linking Territories - Producers of Raw Materials and Territories - Producers of Final Products

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Abstract: Logistics, linking territories - producers of raw materials and territories - producers of final products, is considered as the logistics of an end-to-end technological process, reflecting the interconnection of technological operations of production of raw materials, formation of stocks, their transportation, processing of raw materials and production of final products from it with its subsequent launch on the market. It is shown that such cross-cutting processes are characteristic of a number of sectors of the economy and the agro-industrial complex, including agriculture and food industry, logging and deep processing of wood, metallurgy and machine building, the generation of nuclear fuel waste, their packaging, transportation and storage. Such cross-cutting processes have a special role for the Russian economy, the effective development of which necessitates its provision with scientifically sound logistic territorial inter-regional and global world ties. At the same time, cross-cutting technological processes in agriculture and the food industry, which are necessary for the production of functional food products that increase the food security of the northern territories of Russia, are of particular importance. In this regard, the present work considers the solution of logistics problems using the example of the production of agricultural food products, their transportation, processing and production of functional food products. Recommendations have been developed to improve these problems.

Keywords: Safety of the northern territories, Forestry, Logistics, Nuclear fuel waste, Agricultural food raw materials, End-to-end technological process, Functional food products

The Role of Education System in Counteracting and Preventing Extremism among Teenagers and Youth

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Abstract: The authors believe that to prevent and control extremism and terrorism among modern teenagers and youth it is necessary to purposefully and systemically form, first, their value world and legal consciousness; and second, to instill a scientific perception of the world and mode of thinking in order to address social, worldview political, economic and other problems of the country and the world. The current surge of extremism and terrorism in the teenage and youth milieu on religious, racial, ethnic and other grounds is connected, on the one hand with a low level of legal consciousness and with legal nihilism. On the other hand, it is a consequence of the historical processes of transition of the mass of the population from the religious perception of the world and life in it to a life according to the norms and rules that are the fruit of their own intellectual activity. They are not “given” or “vouchsafed” from outside by some “Forces.” That is why one of the main aims of education today is the study of the issues related to the value world of the modern man. The authors argue that in the period of the change of the civilization mentalities of ethnic groups and peoples the role of education systems of states in bringing up a personality with a high level of legal consciousness and law abidance increases immeasurably. The problem takes on added relevance, especially for the education systems of the community of nations, against the background of the unstoppable integration and migration processes characterizing the modern world.

Keywords: Civilizational mentality, Religious civilizations, Scientific world perception, Teenagers, Youth, Extremism, Terrorism

Use of Yoga Elements in the Training of Martial Arts

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Abstract: The relevance of the topic presented because now an important condition for improving the effectiveness of educational and training process and competitive activities in all sports, including martial arts, is the development and implementation of technologies to optimize these processes. The use of yoga elements allows to increase the efficiency of the process of preparing athletes for competitions, helps to form the mood for a fight, allows an athlete to form the skills of self-control. The aim of this research is to theoretically and practically justify the possibility and expediency of using elements of yoga in the training process of martial arts. The article deals with the possibility of applying elements of yoga in the process of technical, tactical, physical and psychological training of athletes specializing in martial arts. The materials may be used to improve the quality of educational and training process and the effectiveness of competitive activities in martial arts.

Keywords: Elements of yoga, Eastern martial arts, Training process, Competitive activities

Effects of Different Wastewater Treatment Processes on Occurrence and Prevalence of Antibiotic Resistant Bacteria and Their Resistance Genes

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Abstract: This study aimed to explore the difference between hospital and municipal wastewater treatment processes regarding the reduction of antibiotic-resistant bacteria (ARB) and antibiotic resistant genes (ARGs). Samples were collected from raw and final effluent of four different wastewater treatment plants (WWTPs). ARB were evaluated by modified HPC

method. Extraction and purification of DNA from the samples were conducted by Freeze-Thaw and DNA extraction kit. Real-time PCR (qPCR) was utilized to obtain the quantity of *Sul1* and *ErmB* genes in the samples. For standard control in qPCR, was used plasmid containing each gene sequence. The average ARB concentration in the raw wastewater and effluent was 1.03×10^7 - 6.63×10^7 CFU/100mL. Quantitative range of the *Sul1* and *ErmB* genes were obtained as 0 - 8.3×10^{10} Copies/100 mL and 9.29×10^5 - 9.64×10^9 Copies/100 mL, respectively. The results show that urban wastewaters play a more significant role than hospital wastewaters in the emission of sulfonamides and erythromycin-resistant bacteria and genes to the environment. Findings revealed that conventional wastewater treatment plants cannot be regarded as reliable barriers for the control of these agents.

Keywords: Antibiotic-resistant bacteria, ARGs, Hospital wastewater, Urban wastewater, Real-time PCR, *Sul1*, *ErmB*

Improvement of the Master's Training in the University in the Context of Educational Standards of the New Generation

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Abstract: The topic of the investigation is considered relevant due to the fact that at the moment in the higher education establishments of the Russian Federation the federal educational standard of a new generation (three plus plus) has commenced in many majors. This standard implies the formation of general professional and universal competencies among university graduates. Professional competencies can be established as compulsory or recommended by the main educational program. In this regard, the theoretical necessity and practical development of the content of educational programs, which will include not only general professional competencies, but also professional ones, which will solve the tasks of developing the skills required by a professional standard by type of activity, is an urgent need. The goal is to develop new approaches, forms and criteria for assessing professional competency (PC-1) formulated in the main educational master degree program in the major 44.04.01 Pedagogical education, "Educational technologies in the field of physical education". The leading method of research on this topic is the analysis of existing approaches to the implementation of the FSES (Federal State Educational Standard, 2018) three plus plus, the development of the content of the discipline "Modern educational technologies in the physical education of children and adults", as well as the criteria for assessing professional competencies in the process of studying the discipline in the master's program. The article discusses examples of a project assignment and contextual task for master degree students, the implementation of which determines the degree of formation of skills to implement modern educational technologies of PE for teaching and development of children and adults engaged in educational activities, to analyze the process of their effectiveness using modern science methods, as well as information and innovative technologies. Materials can be applied to improve the quality of PE teachers training on the level of Master's program and organize the control and evaluation activities of future teachers in order to objectively evaluate the achieved learning outcomes.

Keywords: Teacher, Master's program, Educational standard, Basic educational program, Professional competencies, Forms for assessing learning outcomes

Synthesis and Swelling Kinetic Study of BSA-based Hydrogel Composite by Subcritical Water Technology

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Abstract: This study, for the first time, aimed to analyse 'Bovine serum albumin' hydrogel composite by simple and quick method (SCWT) since not only there had been some indications that the low temperature subcritical water treatment may be as valuable products as its high temperature treatment, but also, the positive outcome would put a stop to the waste of energy and money. For BSA-based hydrogel at first, the optimum conditions were identified by assessing the effect of different influential parameters (SCWT temperature, time). SCWT was done using a batch subcritical reactor. Additionally, the characterization tests were carried out on the BSA-based hydrogels which was produced by this unique method. BSA-based Hydrogel preparation condition by SCWT accurately was investigated and optimized SCWT condition according to

maximum ESR (50%). Schott kinetic swelling model provided evidence to approve two-step water diffusion mechanism in BSA-based hydrogel by SCWT.

Keywords: Bovine Serum Albumin, Subcritical Water, Batch Reactor, Hydrogel

Investigate of Mercury Contents in Different Spent Fluorescent Lamps in Iran

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Abstract: The usage of fluorescent lamps is increasingly common in the world. The advantages of these lamps have led to consuming these kinds of lamps compared to incandescent lamps. But disposal of the fluorescent lamps because of containing heavy metals such as mercury is considered. The objective of this study is to confirm the comparison of mercury concentration in different linear and compact fluorescent lamps made in Iran. This study was conducted on two kinds of spent fluorescent lamps in Mashhad city in Iran. Lamp crusher (LAMPA) was introduced as an eco-friendly method for obtaining the phosphor powder. Extracting mercury was done by acid leaching method. Mercury concentration was determined by cold vapor atomic absorption spectrometry. Mercury concentration in five kinds of spent fluorescent lamps T8, T10, CFL23W, CFL15W, and CFL11W was 372.52, 510.53, 55.65, 175.53 and 260.82 ppb, respectively. There are differences between Hg concentration and phosphor powder that might be due to some factors like the year of manufacture and the hours of operation. According to the Hg concentration from the powder and generation rate of the spent fluorescent lamps in the world and Iran, waste management of spent fluorescent lamps is necessary.

Keywords: Mercury, Phosphor Powder, Spent Fluorescent Lamps, Waste Management, Lamp Crusher Machine

Acetogenic Aerobic Sequential Batch Reactors in Series Operation for Textile Wastewater Treatment

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Abstract: This paper reports on the efficacy of textile wastewater treatment using series operation of acetogenic sequential batch reactor followed by aerobic sequential batch polishing reactor. The experimental protocol was conducted using wastewater obtained from the equalization basin of a composite textile wastewater treatment plant. The experimental reactors were operated at the bench level under controlled conditions. The acetogenic reactor was maintained in a washout mode with daily shock aeration and the aerobic reactor was constantly aerated. Both acetogenic lead reactor and aerobic polishing reactor influent and effluent water were monitored for color, COD, BOD₅, TDS, and pH. The reactor HRT, TSS, F/M ratio, and temperature, were also monitored and controlled. The treatment train was operated till steady state operation was ensured and the data analyzed to determine the efficacy of the treatment system with respect to textile wastewater treatment. The results indicated that after a period of culture acclimation high rates of wastewater stabilization was achieved by the system. The color, BOD₅, COD, removal efficient were greater than 95%. The experimental program confirmed that acetogenic pretreatment followed by aerobic polishing is a viable option for treating textile processing wastewater.

Keywords: Textile wastewater, Acetogenic/Aerobic, Treatment

Data Understanding for Flash Flood Prediction in Urban Areas

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Abstract: Flash flood has become one of the major disastrous events, especially in urban areas in Malaysia. It has become more prominent to city dwellers, causing massive loss of infrastructures, damage to people, and disruption in business and daily activities. Population growth and rapid development of urban areas have worsened the situation even more. Since the era of Big Data, the possibility to analyse complex data coming from heterogeneous sources, which can be used to predict flash flood, has given a different perspective and hope for finding innovative ways to reduce the impact of flood, especially in urban areas. The purpose of this study is to understand data needed to produce predictive visual analytics for flash flood forecasting using Cross-Industry Standard Process for Data Mining (CRISP-DM) Methodology. Focusing on understanding the flash flood data, this paper intends to characterize data pertaining to disaster management and identify the right data that can facilitate more accurate decision making by stakeholders. Literature review was done to determine which data are needed in the Malaysian urban setting. The research found the critical factors for determining flash flood occurrence in Malaysia are unique due to the tropical climate and urbanization. Therefore, it is important to understand and characterize these factors for more effective and accurate data collection and predictive analytics later. Based on the findings, the most significant factors identified for flash flood prediction are rainfall, urbanization, and fluvial flood which eventually lead to blocked drainage. Details of data under these categories will be analysed as part of data understanding of flash flood occurrence. This study intends to uncover the potential of using Predictive Visual Analytics in flood forecasting and also to discuss how prediction can bring values to the Malaysian environment and create a sustainable ecosystem.

Keywords: Flash Flood, Disaster, Predictive Analytics, Data Understanding

Exploring Sustainable Human Resource Management Change in the Context of Digital Banking

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Abstract: Human resource management (HRM) function plays a meaningful role in creating a sustainable and productive work environment for organizations. The changing banking environment and altering circumstances are affecting the way human resource function is delivering its services and practices. This shows a need to explore the way HRM practices can be delivered in a way to affect social and environmental factors at workplace. This paper is to explore recent trends and changes in the strategic practices of the HRM function in a banking institution. The paper provides a case-study investigation based on a qualitative research design. Some in-depth interviews were conducted with HRM practitioners, and document analysis was also done on the context and nature of HRM changes happening in a banking institution. Interview transcripts were coded with the aid of NVivo software using a structured thematic analysis to generate distilled data summaries. Some illustrative extracts were provided to search for meaningful themes and interpret patterns of evidence. The studied banking institution is still in the process of exploring fit-for-purpose people for HRM functions in a way to enable HRM to have sustainable effects on the business. There are three emerging themes of the changing and evolving role of the HRM function: infusion of the function with diverse capabilities, the importance of driving agile working culture, and the emerging focus on employees' experience using data and technology. The study indicated that HRM function is moving in the right direction; although, more requirements are still to be met. In organizing the HRM function, a cohesive approach is required for conceptualizing, planning and executing a shift in how HRM function shall operate in the future to understand external and internal factors of change with sustainable delivery of HRM practices for impacts on workplace, society, and the wider environment.

Keywords: Human resource management function; Human resource management change; Digital banking transformation; Sustainable human resource management practices

The Development of a New Data Migration Model for NoSQL Databases with Different Schemas in Environment Management System

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Abstract: Data migration transfers data from one database to another database. The motivations of data migration are, for example, transferring data from a legacy database to a modern one and maintaining data up-to-date and consistent in a distributed system. Compared to data migration between traditional databases, data migration between heterogeneous NoSQL databases is more challenging due to the characteristics of NoSQL database such as flexible schema, different supporting features, and different storage paradigms. The differences may cause data quality problem after data migration, especially for environment management system where data are required to predict or to convey accurate information. Therefore, the migration of data between heterogeneous NoSQL databases requires not only to overcome the differences of these databases, but also to ensure the quality of the migrated data. In this paper, we proposed a data migration hub, a model that uses a record to record migration style to transfer data between different NoSQL database schemas. The proposed hub is applicable to the environment management system with data validation and fault tolerance in migration process. As confirmed by the pilot study, our method is able to migrate full set of fields to the destined database in MongoDB.

Keywords: Data migration; NoSQL database; Heterogeneous schema; Document-based NoSQL, MongoDB, Environment management system

Biogas Generation from Rice Cooking Wastewater

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Abstract: Rice is the staple of all families of South Asia and South East Asia. The process of cooking rice involves boiling the rice in water which leaves a byproduct of decanted liquid. The research showed that the wastewater generated from cooked rice could be used to generate biogas with a biogas generation potential of 190 ± 46 mL/g BOD₅ (5.38 ± 0.75 L of biogas/per L of Maar) with the methane content of 78 %. First order reaction defines the kinetics of biogas production with the intent of fitting between modelled and observed data (r^2) of 0.961. The first order kinetics constant “k” was determined to be 0.2 d^{-1} . Further a family of four produces 1.0 L of starch rich wastewater per day that has the potential to produce 5.38 L of biogas with 78 % methane content. Further a household reactor was built out of recycled plastic chemical drum seeded with cow dung fed with waste rice cooking wastewater handling the wastewater decanted from the daily rice cooking for a family of five. The biogas generated was used as demonstration to fire a biogas household burner. The experimental program shows the potential for the use of starch rich wastewater in an urban setting to augment the energy needs for cooking.

Keywords: Biogas generation potential, Cooked rice decant wastewater, Kinetics

The Potential of Napier Grass Leaf Fibres as an Acoustic Absorber

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Abstract: Acoustic absorbers are introduced to treat poor acoustic environment in rooms. However, many available acoustic absorbers in the market are composed of hazardous materials. Therefore, there are demands for the use of sustainable materials in the production of acoustic absorbers. This research investigated the sound absorption potential of grass leaf fibres, i.e. Napier grass, as material for acoustic absorbers. Various bound Napier grass fibre samples, with and without binder under normal press with different thickness, were prepared and tested by using an impedance tube test for sound absorption coefficient (SAC) determination. Samples with binder under hot press with thickness of 10mm were also prepared. The results revealed that 5mm and 20mm fibres, respectively, when bonded with urea formaldehyde (UF) under normal press and with thickness of 30mm, produced a relatively high SAC for frequencies at 500 Hz, 1000 Hz and 2500 Hz, and thus resulted in a high average NRC value of 0.59. This exceeded the value for synthetic fibre-glass and was similar to rockwool. Moreover, the sound absorption performance of 20 mm fibre size hot pressed samples were better than hot pressed 5mm fibre size at 500 Hz frequency until 1000 Hz, as well as the bulk and fibre bonded with UF samples for all frequencies. This study concluded that non-toxic Napier grass fibres can be used in the production of sustainable acoustic absorbers.

Keywords: Napier grass, Sound absorber, Natural fibre, Sound absorption coefficient

The Meaning of Social Projects in Sphere of Health Formation for Adult Population

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Abstract: This article considers actual problem of exposing target audience and determining focus group for social projects of health preservation among the country's adult population which is worsened due to changing of the age of retirement. Periodization of population based on health components' condition in different periods of life should be useful. Also it is topical to search modern meaningful contents and technologies, which were implemented within projects directed on improvement not only separate health components (physical, psychic and social), but also on their integrated status. The relevance of this problem is reflected in barriers of health implementation technologies' implementation analyzed by authors. These barriers are related to subjects of this process and with sociocultural environment where this activity is being realized. The purpose of this article is to describe classification by age of adult population based on health components and to offer a project directed on health preservation and correction of all health components for one of these categories, using authors' classification. Another goal is to present efficient social project to improve ternary health of selected part of population (pre-retirement and retirement) based on health forming technologies. The basis of authors' research is methodological nature-conformity concept of social and educational activity. This concept is consist of taking into the account for actual state of all health components of target audience representatives in course of social design, and also in orienting it into the field of next stage of development. However, if we are talking about pre-retirement and retirement population, it can be interpreted as concept of ecological defense of human's body and personality from negative effects of environment. Authors show the solution of mentioned problem of target audience choice, based on periodization of age by state of ternary health and prove the meaning of this solution from the perspective of mature and senior age persons involvement in socially and personally significant project activity. To that end, periodization of age has been offered, which reflects need of ternary health preservation. According to authors' periodization the technology of ternary health forming for pre-retirement and retirement age has been developed. The results, that prove effectiveness of health preserving social project, developed by authors, are presented and discussed.

Keywords: mature and senior age persons, periodization of age, ternary health, sociocultural environment, project activity, health preserving technology.

Phycoremediation of Paper and Pulp Mill Effluent using *Planktochlorella nurekis* and *Chlamydomonas reinhardtii* – A Comparative Study

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Abstract: In the present study, the wastewater collected from a paper and pulp mill industry was treated using two microalgae, *Planktochlorella nurekis* and *Chlamydomonas reinhardtii*. The microalgae was grown in paper and pulp mill effluent (PPME) under natural environmental conditions and harvested on the 12th day. Results of the study showed that both *P.nurekis* and *C. reinhardtii* could reduce nitrate (96 % and 86%), phosphate (100% and 88%), COD (92% and 93%) and other physico-chemical parameters after the experiment. The percentage reduction of heavy metals such as Cr, Co, Ni, Cu, Zn, As, Sr and Cd were 100%, 97%, 77%, 71%, 72%, 98%, 88% and 88% respectively by *P.nurekis*. Similarly the percentage reduction of the foresaid heavy metals were 100%, 46%, 44%, 49%, 68%, 57%, 86% and 86% respectively by *C. reinhardtii*. The lipid content of *P.nurekis* was 24% and 20.5% for *C.reinhardtii* was after the experiment. Comparatively, *P.nurekis* exhibited significantly higher phycoremediation capacity as well as lipid production potential than *C. reinhardtii*. It is evident that both microalgae have the potential for the treatment of paper and pulp mill effluent and both the species can be used as good candidates for lipid production.

Keywords: Phycoremediation, paper and pulp mill effluent, Heavy metals, Lipids, *P.nurekis*, *C. reinhardtii*

Thermal Catalytic Treatment (Thermolysis): An Effective Process for the Removal of COD and Color from Industrial Wastewater

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Abstract: Nowadays, water pollution control is one of the global concern areas of scientific research. To meet stringent regulating measures set by various regulatory authorities for effluent discharge, it is a challenging task for various industries. Various processes such as adsorption, biological process, thermal catalytic, membrane technology, electrochemical etc. are reported for the treatment of industrial wastewater. Amongst all the above processes, thermal catalytic process has appeared as an advance process for the treatment of highly polluted wastewater originating from various industries. In this paper, mechanism of thermal catalytic (thermolysis) process towards the pollutant removal has been discussed. This paper provides information about the recent research on thermal catalytic process for the treatment of synthetic and real industrial wastewater. In addition to this, a case study on the treatment of tannery wastewater using thermolysis process has also been investigated. The obtained results showed that maximum 65.25% COD and 72.65% color were reduced using copper sulphate salt with catalyst mass loading of 2 kg/m³ at pH of 4.

Keywords: Chemical oxygen demand, Color, Wastewater treatment, Tannery wastewater, Thermal catalytic process

Modeling of Factors of Development of Cyclic Economy at the Meso Level

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Abstract: The article presents modeling of factors of development of a cyclical economy at the mesoscale. The relevance of the article is due to the fact that the issues of the development of a cyclical economy and its influence on trends in the industrial sector have not yet been fully resolved and require additional study and systematization of the factors that determine it. The purpose of the article is to summarize theoretical approaches to managing the cyclical economy at the mesoscale and to analyze its implementation. As the main research methods, the article used methods of description, comparison, generalization, analysis and synthesis, descriptive statistics, and regression analysis. Based on a synthesis of theoretical approaches, the basic principles of managing a cyclical economy are identified. The article provides a systematization of the trends of cyclical economics and industrial production for the mesoscale of the economic system. The obtained results of the regression analysis allow calculating the growth of industrial production based on the elasticity factors of the model using indicators of the cyclic economy, which can be used to develop environmental monitoring programs and projects for introducing the fundamentals of the cyclic economy in industrial enterprises.

Keywords: Cyclical economy, Industrial production, Meso-economic system, Gross value added, Ecology, Rational use of natural resources, Modeling

The Influence of Territorial Brands on the Behavior of Local Consumers

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Abstract: The relevance of the study is due to the need for practical implementation of the domestic strategy for the formation and promotion of successful territorial brands in the Russian Federation and abroad. In this regard, the goal and objectives of this study are to implement the specification of the constituent components of territorial brands, to compare the Soviet and Russian models of the influence of territorial brands on the behavior of local consumers, to identify and compare the positive and negative aspects of the formation and promotion of territorial brands in the country, to develop

practical recommendations on optimization of the territorial branding management system. When conducting the study, the authors relied on the application of the comparative approach and the retrospection method, as well as the conceptual model of competitive identity management. The indicated tools made it possible to profile the levels of alternative consumer response to territorial brands, to determine the components of the system for creating and implementing brand strategies of territories. The materials of the article are of academic and practical value and will be in demand by specialists in the field of state and municipal administration, marketing and branding of territories, entrepreneurs, experts in the field of institutional and behavioral economics.

Keywords: Influence, Territorial brands, Behavior, Local consumers

General analysis of the Application of the Architectural Bionics in the Renovation and Reconstruction of Building Objects

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Abstract: Bionic architecture brings new horizons to human beings that can be used to sustain and reduce environmental damage. Another advantage of Bionic architecture is that it utilizes natural biological methods to solve design problems in modern life. The aim of this paper is to discuss the general concepts of architectural bionics and environmental renovation of construction sites, analyses the stages of formation and development of these areas in the context of modern trends in the sustainable development of the North Caucasian territories. So, we have... As it observed, architectural and bionics practice gives rise to unusual architectural forms that can be considered original in their aesthetic qualities, while the functional and strength qualities are not lost. Moreover, trends in the modern construction industry are reduced to that the design and reconstruction of buildings are advisable within the framework of the environmentally friendly concept so that energy sources must be renewable, and the object used in construction, itself becomes part of the environment. It can be concluded that an environmentally-oriented approach to changes in urban infrastructure as a method of updating and modernization is becoming a priority in the construction industry of the North Caucasus region.

Keywords: Architectural Bionics, Renovation, Reconstruction, Environmentally Friendly Construction, North Caucasus