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Welcome to ICENS 2015

On behalf of the organizing committee, we are pleased to announce that the 1st International Conference on Engineering and Natural Sciences (ICENS 2015) is held from May 15 to 19, 2015 in Skopje, Macedonia. ICENS 2015 provides an ideal academic platform for researchers to present the latest research findings and describe emerging technologies, and directions in Engineering and Natural Sciences issues. The conference seeks to contribute to presenting novel research results in all aspects of Engineering and Natural Sciences.

The conference aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results about all aspects of Engineering and Natural Sciences. It also provides the premier interdisciplinary forum for scientists, engineers, and practitioners to present their latest research results, ideas, developments, and applications in all areas of Engineering and Natural Sciences. The conference will bring together leading academic scientists, researchers and scholars in the domain of interest from around the world.

ICENS 2015 is the oncoming event of the successful conference series focusing on Engineering and Natural Sciences. The scientific program focuses on current advances in the research, production and use of Engineering and Natural Sciences with particular focus on their role in maintaining academic level in Engineering and Applied Sciences and elevating the science level.

The conference's goals are to provide a scientific forum for all international prestige scholars around the world and enable the interactive exchange of state-of-the-art knowledge. The conference will focus on evidence-based benefits proven in clinical trials and scientific experiments.

Best regards,

Chairman of Conference

Prof. Dr. Özer ÇINAR

AN INVESTIGATION OF THE EFFECTS OF ADDITIVE TYPE AND AMOUNT ON MORTAR PHASE

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Abstract:

In concrete production the use of chemical and mineral contribution today is increasing rapidly in order to improve of strength, durability and viscosity properties. In this respect, ın this study it is investigated that the effect on strength and viscosity properties of used mineral and chemical additive in normal mortar. Thus, both the fresh and hardened properties of a worksheet that provides surveys were conducted. As aggregate 0-2 mm grain size of crushed sand, binding as CEM I 42.5 R cement used in the mortar mixture which three different chemical additives with fly ash mineral additive used. Water / Cement ratio of 0.5 and the amount of binder 500 kg / m^3 in the mixture taken as constant, chemical contribution rate must be selected as %0.5 to %1 and %1.5, fly ash %10 in rates has been substituted with cement. Viscosity of the the mortar was measured to determine the workability and consistencies characteristics. In general, the angular speed increases in viscosity of mortar is reduced and chemical additives mortars viscosity values higher than spending out of control mortars. By making 28 day compressive and bending tests for mechanical properties have been determined amount and type of additives on properties of the mortar. As a result, the mortar will be produced at different temperatures effect of super plasticizer additive for chemical additives both fluidity and strength according to the score from the other additives has been given to the most appropriate.

Keywords: Viscosity of Mortar; Chemical Additives; Fly Ash; Crush Sand.

PRODUCTION AND CHARACTERIZATION OF AL-TIC COMPOSITE MATERIALS

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Abstract:

Abstract. Aluminum matrix composites containing 3,6,9,12%TiC has been fabricated by conventional furnace sintering at 550°C temperature. Compounds formation between Al and TiC powders is observed after sintering under Ar shroud. XRD, SEM(Scanning Electron Microscope), mechanical testing and measurements were employed to characterize the properties of Al + TiC composite. Experimental results suggest that the best properties as hardness 45,32 HV were obtained for Al+12% TiC composite.

Keywords: Powder metallurgy, Sintering, Ceramic-Metal Composites.

PARAMETER ESTIMATION FROM RESIDUAL GRAVITY ANOMALIES OF SUBSURFACE CAVITIES USING MODELLING OPTIMIZATIONS

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Abstract:

In addition to the global method and the traditional method which are commonly used in geophysics artificial neural networks methods were used to estimate the cavity parameters of residual gravity anomalies. Feed Forward Backpropagation neural network is a technique commonly used for inversion problems, recently. In addition to this method, the Cascade Forward Backpropagation and the Nonlinear Autoregressive Network were used for parameter estimation and the results of errors were compared. Also Genetic Algorithm and Levenberg-Marquardt algorithm were used for estimation of depth and radius parameters from residual anomaly and the results of errors compared. In the theoretical study, horizontal cylinder model representing the underground cavity was used. The effectiveness of the method was investigated by adding noise to the horizontal cylinder gravity anomalies. After calculating the error values, it was determined that Levenberg-Marquardt algorithm and Nonlinear Autoregressive Neural Network seem to be the least affected methods from noise. Residual gravity data of Medford (USA) cavity site was used for field investigations. When the results of field data were analyzed, it is seen that Feed Forward Backpropagation and Nonlinear Autoregressive Neural Network gave the closest result to known structure depth value from the drilling. Among the applied methods in the field application, although the lowest error value of inversion results obtained by the Levenberg-Marquardt algorithm, the depth value obtained from this method is the most different known from the drilling value.

Keywords: Gravity, Artificial Neural Network, Genetic Algorithm, Geophysics, FFBP, NARX.

THE CONCEPT OF URBAN FOREST IN TURKEY, SITUATION TODAY AND TARGETS

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Abstract:

Urban people remain away from nature depending on the rapid increase of population, industrialisation and construction density and so the recreation need of people also increases. The concept of urban forest, which was used first in 1960, can be defined as the forest areas around cities used for ecological and recreational functions beyond obtaining wood raw material. Urban forests were first seen at the beginning of 2000s in Turkey with the first one constituted by General Directorate of Forestry in 2003.

In the scope of the study, the development stage of the concept of urban forest in Turkey and the urban forests completed and being completed were evaluated. In this respect, distribution, surface areas, geographical characteristics, social equipment elements, infrastructure features, flora and fauna of urban forest all over the country were determined. With the help of data obtained, urban forest were categorised under different categories.

While there was only one urban forest constituted on an 140-ha area in Turkey in 2003, in 2011, this number was totally 475 constituted on a 62701 – ha area. Related institution to this issue targets in short term to constitute a urban forest in every city while in middle and long term expanding these forest to provincial areas by getting the views of urban people about the planning, renovating and improving ones constituted and being and to be constituted.

Keywords: Urban forest, Spatial quantity, Flora, Fauna, Turkey.

ANALYSIS OF THE TURKMEN TENTS THAT PROVIDE ENERGY EFFICIENCY BY USE OF NATURAL MATERIAL FROM THE SOCIO-ECONOMIC AND ENVIRONMENTAL POINT OF VIEW

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Abstract:

Analysis of the Turkmen Tents that Provide Energy Efficiency by Use of Natural Material from the Socio-Economic and Environmental Point of View

Abstract: The Turkmen tent has been used for more than two thousand years and represents a significant part of Turkish culture and lifestyle.Turkmen tents were preferred for years due to its many properties such as use of natural and local material, being economic, light weight and ease of mantling and dismantling. In addition, Turkmen tents are energy efficient and sustainable structures since they have the abilities to increase interior air quality, have natural insulation, climatisation, as well as natural and local material usage. For these reasons, Turkmen tents don't degrade the environment.

Keywords: Turkmen tents, Socio-economic, Environment.

ENERGY ANALYSIS AND MANAGEMENT: A SAMPLE OF MILK FACTORY IN TURKEY

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Abstract:

Consumption of energy is important for the milk factory in Turkey because it is one of the large food sectors. Energy usage is inefficient in the food industry in Turkey. Energy is an important thing for the food industry which uses a lot of energy for the production processes. Therefore, using energy is very necessary for the factories that can lose energy. Milk factories are the biggest user of energy at the food industry. Milk factories use energy twenty-four hours. So using energy is an important of special scientific interest in milk production. Energy management is remarkable for increasing energy efficiency of the milk industries. When the energy management uses for the factory, energy can be decreased to a low level. Energy management programme should be planned in short-long terms by the factory management.The aim of this study, the food factories should use the energy management programme for energy saving.

In this study, we found medium-sized milk factory that is Harzem Corporation's milk factory. It is located at Aksaray City (TURKEY). A monthly of production and energy consumption data has been taken from Harzem Corporation's factory. Firstly, all of the energy consumptions and production accumulated in monthly. Accordingly, an annual analysis of energy has been calculated. It was determined energy efficiency for the milk factory. An annual of energy consumption quantity was found 882.04 [Gcal] whereas an annual of production quantity was found 2382.43 [ton]. The results obtained with the cumulative values (with Squares Method). CUSUM (Cumulative Sum of the energy) chart has been drawn by the excel programme. The milk factory's sum of energy consumption quantities were found approximately -50 [Gcal] in June and July months. Because the sum of energy consumption rates (June and July months) were less than the other months.Conclusion, if the factories apply an energy management programme for their factories, they can save their energy. So they can decrease their cost and can increase their profits. This study is the first time for the Aksaray City that can be a model for milk industries and the other food industries in Turkey. It is a sample of energy saving for these similar factories.

Keywords: Milk and production, energy consumption, energy management, energy efficiency, CUSUM.

LANDSCAPE PLANNING AND MANAGEMENT FOR RIVER CATCHMENTS OF HYDROELECTRIC POWER PLANTS FOR TURKEY

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Abstract:

In this paper, a methodology is discussed on landscape planning and management for river catchments of hydroelectric power plants in the example of several projects in Turkey. The method is the constructive part of the "National Approach for Catchment Management" which is recommended as a model for Turkey by this work. Landscape planning and management (landscape assessment) are identified by National Rivers Authority of England (NRA) (1993) as an approach to analyse the landscape and accordingly to product recommendations for the protection, management and improvement. River systems are very sensitive landscape components by their ecological and biological characteristics and by their role in natural process. Also, the water bodies and surroundings are very attractive for many human activities. Therefore, a private planning approach for resource allocation and land-use decisions are required, which will covers the methods on both data collecting, recording, analysing, evaluating and also landscape management. In Turkey, however, a comprehensive national planning and management approach for Hydroelectric Power Plants is non-existent. Land-use decisions are generally produced in accordance with the socio-economic requirements and political reasons, and natural landscape elements (soil, vegetation cover, wildlife, climate, etc.) and processes (soil losses, hydrological cycle etc.) are frequently neglected. The systematically constructed National Approach for Catchment Management of Hydroelectric Power Plants (CM) in the present work, particularly landscape planning and management method in the base of information Technologies that is explained in several examples and can be used for all other rivers. This work carries very much importance within the framework of e-government processes in Turkey.

Keywords: Landscape Planning, Landscape Management, Hydroelectric Power Plants.

ANALYTICAL INVESTIGATION OF THE STRESS DISTRIBUTION IN THE BEAM END CONNECTOR IN STORAGE RACK SYSTEMS

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Abstract:

In this study, beam end connector system connecting upright column and pallet beam are investigated for mechanical refinement and optimum dimensions depending upon the stress distribution in the pallet and connector parts. An algorithm is developed and design provisions are provided such that the stability strength of the frame structure constructed by means of beam connector system becomes maximum. Results indicate that an intermediate position of the beam connector with respect to the pallet beam must be preferred instead of top-level or bottom level connections of the connector- pallet beam connection. It has been found that the racks designed recently by some well known companies are in good agreement with the results of the present paper.

Keywords: Keywords: Beam end connector, stiffness, steel rack systems, analytical.

EXAMINATION OF TENSILE RUPTURE TESTING ON ADSS CABLE

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Abstract:

In this study, we examinated the dry-band arc resistance of ADSS All dielectric Self Supporting fiber optic cables. The tests were performed according to the description given in IEEE 1222 ADSS Electrical Test. The basic concept of the arc resistance test is that the energized cable is sprayed by salt water for few minutes. This produces conducting wet layer on the cable surface and initiate leakage current. This current causes to decrease the lifetime of the cable.

We measured the Tensile Rupture of the ADSS cables. Mechanical tests of the material can withstand a maximum tensile force by the tensile test purposes and to determine the breaking elongation occurring in the case where the material occurs.

For this purpose have been exposed to electrical and mechanical tensile testing of normal aging tests were carried out ADSS cable.

We used Test samples ADSS Cable before the aging test which was called CableA and Test Samples after the aging test which was called Cable B

Mechanical tensile tests in CableA where in the cable is broken at 4583.82 N force applied.

Exposed to electrical aging test CableB until the ADSS cable is broken at 2342.79 N applied force and properties in the same environmental conditions.

Deformation on the surface of electrical cable consisting of cable aging test has reduced mechanical strength by half.

Keywords: Aging test, tensile , cable insulation, electrical arcing, dry band arc.

CHARACTERIZATION OF CU-CR-SIC COMPOSITE MATERIALS

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Abstract:

Abstract. Cupper matrix composites containing 1,2,3,4%SiC has been fabricated by conventional furnace sintering at 1000°C temperature. Compounds formation between Cu –Cr and SiC powders is observed after sintering under Ar shroud. XRD, SEM (Scanning Electron Microscope), mechanical testing and measurements were employed to characterize the properties of Cu + Cr + SiC composite. Experimental results suggest that the best properties as hardness 139,45 HV were obtained for Cu + Cr + 4%SiC composite.

Keywords: Powder metallurgy, Sintering, Ceramic-Metal Composites.

EFFECT OF COBALT DOPING ON NANOSTRUCTURED CUO THIN FILMS DEPOSITED BY SILAR METHOD

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Abstract:

The effects of additives and dopants during the growth of thin films have been extensively studied because most of the physical properties of the films can be changed by using additives or dopants. For this reason we have deposited Co-doped CuO thin films on the glass substrates by Successive Ionic Layer Adsorption and Reaction (SILAR) method in order to investigate the effect of doping. It was found that Co-doping considerably influences the growth process, manipulates the band gap and modifies the crystallite size of the films. XRD experiments evidenced that with higher doping concentrations in the growth solution the crystallite size of the films decreased. Furthermore average thicknesses of the nanostructures (~grain size) are found to decrease which is consistent with the decrease in crystallite sizes calculated from the XRD results. Optical band gap -another important physical parameter- is found to be decreasing with increasing dopant concentration.

Keywords: Thin film; Doping; SILAR.

UTILIZATION OF CRYOLITE BASED (NA3ALF6) ELECTRO-METALLURGY WASTES IN FIRED CLAY BRICK PRODUCTION

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Abstract:

Primary aluminum industry generates important amount of waste materials. Clay and iron oxide rich "Red Mud" and Cryolite rich "Crust" wastes are two important of them. Metallic aluminum production from Al2O3 is done in Hall-Herault electrolysis cells. It is accomplished in molten Cryolite electrolyte. Cryolite is also used for the crust formation to isolate the cell system and obtain a heat balance. Crust is removed as a waste material after every electrolysis run. Cryolite melts at 1009 oC itself. However, CaF2 and AlF3 additions lower the melting temperature of the crust to 950 oC. Therefore, waste crust is low temperature melting material.

Fired clay brick is one of the unique industries where many of inorganic and organic industrial process waste can be utilized. This is a way of disposing some the industrial waste in European countries. These additives have different effects on the fired clay brick such as pore forming or enhance the sintering process.

The main objective of this study was to investigate the effect of Cryolite based waste addition on the physical, mechanical and microstructural properties of fired clay. Sample series were prepared by adding different amount of waste (from 0% to max 6 %) to the brick clay. Effect of addition on the sintering activity was also determined by firing the samples at different temperature from 800 oC to 1000 oC. Small amount of cryolite based waste addition improved the sintering activity of the fired clay. Denser fired clay bodies obtained with increase in the waste addition and firing temperature. Apart from the fluxing effect, waste addition resulted in better color (reddish) development. It was concluded that, Cryolite based wastes can be used especially facing bricks where lower water absorption and better color development were important.

Keywords: Cryolite, waste, clay brick, sintering.

NANOINDENTATION STUDY OF COCRMO ALLOYS HAVING DIFFERENT PD ADDITIVE

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Abstract:

CoCrMo alloys have been widely used for surgical prostheses such as hip and knee joint replacement due to their high mechanical properties and corrosion resistance. Therefore in this study, we produced CoCrMo alloys having different mass % Pd additive (%1.68, %2.70 and %4.33) for investigation of nanohardness behaviour. These alloys produced by investment casting method under argon atmosphere. X-ray diffraction method, Scanning electron microscopy, and nanoindentation tests were used to examine the mechanical properties of these alloys. Identification test results show that nanohardness increases with increasing applied indentation test load, i.e., reverse indentation size effect (RISE). Such peak-load dependence is then analyzed using the Meyer's law, the Hays-Kendall's approach, the Proportional Specimen Resistance (PSR) model, and the Modified PSR (MPSR) model. It may be concluded that the reverse ISE phenomenon occurs only in materials in which plastic deformation is predominant.

Keywords: Nanoindentation, CoCrMo alloy, investment casting, size effect.

THE SYNTHESIS OF NOVEL THIOSUBSTITUTED 1,4-NAPHTHOQUINONE COMPOUNDS

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Abstract:

Recently, it is interesting to note that quite a number of substituted naphthoquinones are valuable molecular structures because of their possible biological activity [1]. The quinone structure is common in numerous natural products that are associated with pharmacological properties; such as antiviral, antimalarial, antifungal, and antiproliferative activities [2]. Especially, 2,3-disubstituted-1,4-naphthoquinone derivatives have antibacterial and antifungal properties [3].

1,4-Napthoquinone pharmacofor show anticancer activity in some drugs such as doxorubicin and idarubicin [4]. It is known that many of compounds that contain this structure have biologic activity properties like antibacterial, antimalarial, antifungal…etc [5]. Piperazine derivatives also have effective usage in neurologic pharmaceuticals.

In present study, from the reaction of 2,3-dichloro-1,4-naphthoquinone with thiols were synthesized p-naphthoquinone compounds. The aim of this study is the synthesis and characterization of novel S-substituted naphthoquinone derivatives in various reaction media. Reaction mixture was purified by column chromatography. The synthesized compounds were characterized by fourier transform-infrared, proton and carbon nuclear magnetic resonance, mass spectroscopic techniques, as well as elemental analysis and ultraviolet–visible spectra.

As a result, the novel substituted naphthooquinone compounds were synthesized in various reaction media and characterized using spectroscopic methods. It is thought that reporting the novel coloured compounds will contribute the organic chemistry literature.

Keywords: Quinones compounds, spectroscopic and electrochemical properties, isomeric compounds.

EFFECT OF DIFFERENT PERCENTAGES OF TENCEL® FIBRES ON POLYLACTIC ACID FIBRES BASED NONWOVEN STRUCTURE PROPERTIES

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Abstract:

Natural based hydrophilic fibres have strong potential to widen fibres application in technical textiles such as medical and hygiene sectors. This study was carried out to determine the effects of TENCEL® (TE) fibres reinforcement to Polylactic Acid (PLA) nonwoven structures' absorbency, thermal, and physical properties. The nonwoven structures have been developed and produced by making use of needle punching method. Three different nonwoven combinations, 100% PLA, 50/50% PLA/TE and 80/20% PLA/TE, have been tested and analysed. The thermo physiological properties of the structures were determined by using an Alambeta instrument (Sensora Instruments, Czech Republic). The Alambeta instrument provides values for thermal conductivity, thermal resistance (insulation) and thermal absorbtivity (warmth-to-touch), fabric thickness and thermal diffusion. Water vapour permeability and the resistance to evaporative heat loss of the fabrics were tested using the Permetest instrument (Sensora Instruments, Czech Republic). This instrument is based on a skin model, which simulates dry and wet human skin in terms of its thermal feeling.

The breaking force value of TE reinforced fabrics were considerably higher as compared to 100% PLA fabric's value. A higher thermal resistance will cause the wearer to become uncomfortable and extremely warm. From the results, it has been seen that the TE reinforcement increases the thermal resistance of the structures. 50/50% PLA/TE was found to have 25.8 W-1 k m2×10-3; on the other hand, the thermal resistance value of 80/20% PLA/TE was 21.2 W-1 k m2×10-3. The increase in thermal resistance could be a desired property for some applications such as wound dressing. Overall, this study concluded that TE reinforcement enhances the tested properties of PLA structures noticeably.

Keywords: Polylactic Acid (PLA), TENCEL®, nonwoven, thermo physiological properties.

APPLICATION OF IONIC LIQUIDS AS CATALYSTS FOR THE SYNTHESIS OF 3,4 – DIHYDROPYRIMIDINE – 2(1H) – ONE DERIVATIVES

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Abstract:

3,4-dihydropyrimidine-2(1H)-one derivatives obtained by three-component condensation reaction Biginelli have biological and pharmaceutical properties - analgesic, antistaphylococcal, antiviral, anti-tuberculosis, antifungal, antihypertensive, antiarrhythmic activity, thereby attracting the attention of researchers as a class of organic compounds with a broad spectrum of biological activity and high as key compounds for the modification of existing biologically active matrices. Successful treatment of cardiovascular diseases and hypertension is not possible without the use of drugs of the 1,4-dihydropyridines and their structural analogues 3,4-dihydropyrimidine-2(1H)-one.

The main components in Biginelli reaction are aliphatic and aromatic aldehydes, urea or thiourea, ethyl acetoacetate, and catalysts. One major factor in the selection of the Biginelli reaction is a selective catalyst. We decided to use as a catalyst for this reaction, ionic liquids: N-formilmorpholine hydrogen sulfate and piperazine-2,3-dione dihydrogen sulfate.

In our work we used benzaldehyde, acetylacetone, urea and the reaction conducted in the presence of N-formilmorfoline hydrogen sulfate catalysts (N-FMHS) and piperazine-2,3-dione dihydrogen sulfate (P-DHS) with synthesis 5-asetil-6-methyl-4-phenyl-3,4-dihydropyrimidine-2(1H)-ones.

A mixture of benzaldehyde 1,06 g (10 mmol), acetylacetone, 1 g (10 mmol), urea 1,8 g (30 mmol) and N-FMHS or P-DHS (3 mol %) was stirred while heating at 800C for hour. The progress of the reaction was monitored by thin-layer chromatography. After cooling, the reaction mixture was poured onto crushed ice with stirring. The crude product was filtered, washed with cold water, dried and recrystallized from ethanol to give pure products.

Experiments have shown that the best results are achieved in the presence of N-formilmorpholine hydrogen sulfate with a molar ratio of 1: 1: 3 with a yield of 86%, while in the presence of piperazine 2,3-dione dihydrogen sulfate product yield was 90%. The structure of the 5-acetyl-6-methyl-4-phenyl-3,4-dihydropyrimidine-2(1H)-one was determined by elemental analysis, mass-, IR and NMR spectroscopy.

Keywords: 3,4-dihydropyrimidine-2(1H)-one, Biginelli reaction, ionic liquid, catalyst.

MOLECULAR IDENTIFICATION OF DUNALIELLA SP. ISOLATED FROM AYVALIK SALTERN AND SEYFE LAKE

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Abstract:

Microalgae find use of potential feedstock for food and feed. The three most important classes of microalgae are Bacillariophyceae (diatoms), Chlorophyceae (green algae), and Chrysophyceae (golden algae). There are numerous commercial applications of green microalgae. Haematococcus pluvialis is commercially important as a source of astaxanthin, Chlorella vulgaris as a supplementary food product or food ingredient and the halophilic algae species Dunaliella as a source of β-carotene.

Dunaliella sp. is a type of unicellular flagella green microalgae especially found in hypersaline environments world. The halophilic species of Dunaliella is the richest natural source of the carotenoid β-carotene and accumulate very high concentrations of glycerol. Turkey, especially Anatolia is the richest region as salt and brackish water lakes (Tuz Lake, Seyfe Lake and Sultansazlığı Lake), accommodates extensive saline aeras.

In this research, benthic samples for the isolation of microalgae were collected from 2 different stations of Ayvalık Saltern, Balıkesir and Seyfe Lake, Kirsehir in Turkey. Green algae cells were purified by transferred to fresh medium several times for one to three weeks. Dunaliella sp. cultures were grown in IMK medium at 20±2 ºC.

Species identification of the Dunaliella species based on morphological characteristics can be difficult. A reliable and accurate method is required to evaluate genetic variations. This study aims to apply molecular approaches for the identification of Dunaliella using their 18S ribosomal RNA genes. Based on DNA sequencing, 18S rDNA gene was sequenced and the data was analyzed using the Basic Local Alignment Search Tool (BLAST) program in the National Center for Biotechnology Information (NCBI) database.

Isolated and identified two Dunaliella samples were maintained in the Culture Collection of Ege University (EGEMACC) using long term storage methods.

Keywords: Dunaliella sp., isolation, purification, identification.

NATURAL DYEING ON WOOLLEN FABRIC USING SOME RED ROSE PETALS

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Abstract:

Natural colours are used on a large area such as food, pharmaceutical and textile industries by many researchers. When tannic acid is used together with metal salts for dyeing with natural dyes, antibacterial and fastness properties of textile materials are increased. In this experimental work, some red rose petals were applied on woollen fabric samples as a natural dye with three different dyeing methods and eight different mordant salts. The effect of tannic acid and different metal salts on dyeing of woollen fabric was studied. Colour differences ΔECMC (2:1) and fastness properties of dyed fabrics were investigated and compared with each other. Finally, dark colours and adequate colour fastness results (4+) were obtained after dyeing of wool fabrics with FeSO4.7H2O, FeCl3.6H2O and CuCl2.2H2O in the presence of the tannic acid.

Keywords: natural dye, red rose petals, tannic acid, mordant salts, woollen fabric.

DYEING PROPERTIES OF SILK FABRIC WITH DACTYLOPIUS COCCUS COSTA AND QUERCUS INFECTORIA OLIVIER

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Abstract:

In this study, dyeability of 100 % silk fabric with Dactylopius coccus Costa and Quercus infectoria Olivier was studied. Optimum dyeing parameters were determined by using different concentration of Dactylopius coccus Costa (10%), Quercus infectoria Olivier (0,1,5 and 10%) and FeSO4 as a mordant salt (0 and 3%). The dyed silk fabric samples were examined for their colorimetric and fastness properties. The fabrics were dyed succesfully dark colours with 10 % Dactylopius coccus Costa, 10 % Quercus infectoria Olivier and presence of mordanting after dyeing process (3% mordant salt). The washing and light colour fastness of the dyed fabrics were investigated and adequate results were obtained.

Keywords: Dactylopius coccus Costa, Quercus infectoria Olivier, natural dye, dyeing, silk fabric.

QUANTIFICATION AND NOVEL DUPLEX IDENTIFICATION OF ESCHERICHIA COLI O:157 H:7 AND LISTERIA MONOCYTOGENES

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Abstract:

The wide application of real-time PCR techniques and the increasing industrial interest towards rapid, easy, economical and reliable methods have led to the development of DNA based methods for the detection of microbial pathogens in food. In the present paper, we describe the development of a cost-efficient PCR technique for simultaneous and practical detection of Listeria monocytogenes and Escherichia coli O157:H7 in a complex food matrix. Bacterial DNA was isolated with Multi-Fast DNA Isolation Kit (GIDAGEN, Istanbul, Turkey). An EvaGreen based duplex PCR system was developed with the evaluation and combination of published primers whose GC contents were quite different from one another. Novel Duplex PCR was applied to Listeria monocytogenes and Escherichia coli O157:H7 in model food systems. Target genes hylA and uidA were amplified for the detection of Listeria monocytogenes and E. coli O157:H7, respectively. EvaGreen based simplex and duplex real-time PCR showed that specific PCR products identified by melting curve analysis, and a reproducible Tm of 77.00± 0.4°C for Listeria monocytogenes and 85.60±0.2 for Escherichia coli O:157 H:7. An analysis of 10 different bacterial strains showed that the chosen primers were specific for detection of Listeria monocytogenes and Escherichia coli O: 157 H: 7 by real-time PCR. The absolute detection limit of EvaGreen based simplex and duplex real-time PCR was 0.00001 ng/µl for DNAs for both pathogen. The relative detection limit of simplex and duplex technique was down to less than 10 cells/ml for two pathogens.

Keywords: E.coli O:157 H:7, Listeria monocytogenes, Pathogen detection, Real Time PCR, Duplex Quantification, EvaGreen

DEVELOPING OF A NEW IONIZE RADIATION DETECTION METHOD

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Abstract:

Food irradiation, using gamma radiation, the food is irradiated at a sufficient dose according to technological purpose.Ionizing radiation inactivates microorganisms that cause spoilage of food, molds and yeasts. Ionizing radiation also causes to DNA damages of the biological samples and induces the closely spaced lesion, protein crosslinks, single- and double-strand DNA breaks, damage to the DNA sugars. The purpose of this study was to investigate the ionizing radiation effect on chicken meats, which are unstored and stored meat at-20°C for three and six months, using a new molecular DNA-based method. The samples were exposed to 0, 0.272, 0.497, 1.06, 3.64, 8.82, and 17.42 kGy ionize radiation in the industrial gamma cell (gamma cell 60Co, dose rate 1.97kGy/h). The DNA of the irradiated samples was amplified using RT-PCR. The efficiency and sensitivity of all real-time PCR amplicons were calculated using standard template dilution series of 100, 20, 4, 0.8, 0.16, 0.01, 0.0032, and 0.00064 ng DNA per reaction.The method developed in this study allowed to estimation of the IR dose applied to meat stored up to six months with a dose limit of approximately 1 kGy. The results of new molecular DNA-based method were confirmed with comet assay, gel electrophoresis methods. The results showed that "comet tail" was increased, whereas the diameters of the "comet heads" were decreased with increasing the radiation doses for each sample. According to the agarose gel electrophoresis the intensity of the bands and total intensity of the fluorescence decreased as the radiation dosage increased that resulted from a decrease in double stranded DNA. The molecular sizes of the samples were reduced as the radiation dosage increased. As a result, assay of radiation identification showed that the new developed molecular methodwasuseful for IR dose detection of chicken meats treated gamma radiation.

Acknowledgments

This study was supported by TUBITAK with the Project Grant No. 113Z831.

Keywords: Ionize radiation, Real-time PCR, chicken meat, DNA damage.

DETECTION OF HUMAN-INDUCED DNA CONTAMINATION USING MOLECULAR BASED TECNIQUE

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Abstract:

The aim of this study is to develop a molecular technique that allow to determination of the level of human-induced DNA contamination in unhygienic food products. For this purpose, fourmodel food samples were fabricated in hygiene and unhygienic conditions. Microbial loads of model food were identified. The microbiological findings indicated that the microbial load of the food products produced under unhygienic conditions were higher than expected.DNAs was extracted from the human buccal cell and model food samples fabricated in hygiene and unhygienic conditions, using GIDAGEN Multi-fast DNA extraction kit (Istanbul,TURKEY). DNA quality and quantity were determined by the Microplate Readers (Infinite® 200 PRO –Tecan). One set of primers was designed to yield 139-bp amplicons of D-Loop region of the Homo sapiens mitochondrion (Accession: NC_012920.1) using Primer3 (v.0.4.0) primer design software. To check the target binding region of the primers, an algorithm called BLAST (Basic Local Alignment Search Tool) of NCBI (National Center for Biotechnology Information) was used.The level of human DNA contamination in the samples were investigated using quantitative Real Time PCR. The melting peak value of human DNA and human DNA in foods were recorded as 78.0 ± 0.3°C.The alignment of the experimental points in the standard curve was verified by using DNAs extracted from the dilution series.A linear relationship between the input DNA and the Ct values with a regression coefficient (R2) of 0.997 with 22.552 as the value of y-intercept was obtained for amplification representing human DNAs.The sensitivity of the technique was about 0.00001ng DNA/PCR. Feasibility of the method was tested with 100 food samples purchased from market and human based contaminations were investigated. The findings showed that high DNA content in some products with or without heat treatment could indicate unhygienic conditions.

Acknowledgments

This study was supported by TUBITAK with the Project Grant No. 113Z831.

Keywords: human-induced DNA contamination, Real Time PCR, Ct values.

AGRICULTURAL WASTE BIOMASS HYDROLYSIS BY SCYTALIDIUM THERMOPHILUM XYLANASE

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Abstract:

Plant biomass comprises of an average of 40% cellulose, 33% hemicellulose and 23% lignin. The main heteropolymers of the hemicellulosic fraction are xylan, mannan, galactan and arabinan [1]. Xylan is the most abundant non-cellulosic renewable polysaccharide on the earth and represents up to 30-35% of the total dry weight of land plants. Corn cobs contain approximately 35% hemicellulose and they are potential carbon sources for fermentation processes due to their high hemicellulose content, renewable nature and wide presence [2]. Xylanases (EC 3.2.1.x) are hydrolytic enzymes responsible for the depolymerization of xylan and they have a wide range of industrial applications in different fields such as feed, food and drinks, textiles, pharmaceutical and chemical industries, pulp and paper production and biorefinery [3].

Lignocellulosic biomass is an important raw material for the production of value-added products such as enzymes, organic acids, sugars and biofuels. For biofuel production, lignocellulosic materials must be hydrolysed in order to obtain fermentable sugars. The hydrolysis can be carried out by chemical methods which result a variety of undesired components. Therefore, enzymatic hydrolysis is recommended as it avoids unwanted toxic products [4].

In this study, S. thermophilum xylanase was investigated as the catalyst for biomass hydrolysis with the aim of simple sugar production, a potential raw material for second generation fuel production. Corn cobs were used as the lignocellulosic waste material. Two different types of S. thermophilum xylanases; crude, pure and a commercial xylanase were tested at two different temperatures (25 and 45°C).

Xylanase was able to degrade the lignocellulosic structure of corn cob with the consequent release of reducing sugars. The highest reducing sugar liberation (0.58 mg/ml) was achieved by using S. thermophilum crude xylanase at 45°C. Apparent morphological changes in the corn cob structures were observed by SEM analysis after enzymatic treatment.

Acknowledgement

This study was financially supported by The Scientific and Technological Research Council of Turkey (TUBITAK) by the Project-110M615.

Keywords: Scytalidium thermophilum, xylanase, biomass, corn cob, enzymatic hydrolysis.

ISOLATION AND MOLECULAR CHARACTERIZATION OF BACTERIAL STRAINS WITH ENRICHMENT POTENTIAL FROM MAGNESITE MINES IN KÜTAHYA

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Abstract:

Magnesite mining has became an important economical aspect for countries due to versatile properties of magnesite mineral that allow its usage for various engineering applications in many industrial areas. On the other hand, pollution of the mineral with calcium derivatives directly restricts usage of the mines and causes economical losses. This situation enforces the scientific communities to find effective and sustainable strategies for solving the problem. Thus, the objective of the present study was designated as development of a microbiological approach for magnesite enrichment. For this purpose, magnesite samples were collected from Turanocağı and Ortaocak magnesite mines in Kütahya, and aseptically transferred to the research laboratory where the bacterial isolation studies were done. Then, calcium carbonate and magnesium carbonate solving potentials for each isolate were tested. For characterization, morphological, physiological and biochemical identification studies of active bacterial isolates were performed according to the general microbiology procedures. These studies covered observation of cell and colony morphologies, motility, Gram property, endospore formation, NaCl and pH tolerance, catalase, oxidase and amylase activities. Furthermore, universal primer sets of 16S rRNA gene region were used for molecular characterization of the active strains. In the results of the study, 8 active strains with calcium carbonate and magnesium carbonate solving activities were isolated. According to the characterization studies, 1 isolate was assigned to Arthrobacter sp., 2 isolates to Bacillus atrophaeus, 1 isolate to Bacillus simplex, 1 isolate to Microbacterium schleiferi, 2 isolates to Paenibacillus sp., and 1 isolate to Streptomyces sp. In conclusion, the results of the present study clearly showed the potential of the microbiological approaches for development of new solutions for calcium pollution of magnesite ores.

Keywords: Magnesite, Bacteria, Enrichment, 16S Rrna.

PROTECTIVE EFFECTS OF COENZYME Q10 AND RESVERATROL ON ZNO-TIO2 INDUCED OXIDATIVE STRESS ON D. MELANOGASTER

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Abstract:

With the increasing presence of manufactured nanomaterials in commercial products such as cosmetics and sunscreens, dental fillings, solar-driven self-cleaning coatings and textiles, large quantities of nanoparticles may reach the environment intentionally or accidentally. Thus, proactive research on the potential environmental and health impacts of nanoparticles is crucial to protect the environment and to ensure a sustainable nanotechnology industry. The aim of this study was to investigate the effects of ZnO-TiO2 application on oxidant-antioxidant systems on Drosophila melanogaster, and protective roles of Coenzyme Q10 (CoQ10) and Resveratrol (RSV) on these effects.

For this purpose, transheterozygote larvae of D. melanogaster were divided as follows: untreated control groups (distilled water, DMSO, RSV and CoQ10) and ZnO-TiO2 application group (25mM), ZnO-TiO2+RSV (25mM+100µM), ZnO-TiO2+CoQ10 (25mM+150µg/mL).

Later, the oxidant (for ZnO-TiO2 application group) and antioxidant systems (for ZnO-TiO2+antioxidant application groups) of the biochemical tests and measurements were made. Total antioxidant status (TAS) and total oxidant status (TOS) of adult individuals were measured using commercially available kits. Using tissue homogenates of D. melanogaster, oxidative stress index (OSI) was calculated with TAS and TOS measurements.

It was determined that the TAS value was found higher, and TOS value was found lower in ZnO-TiO2 application group than ZnO-TiO2+antioxidant application groups ($p<0,05$). In addition, it has been put forth that CoQ10 and RSV decrease the oxidative damage and lipid peroxidation caused by ZnO-TiO2 and increased antioxidant activity.

Keywords: Drosophila melanogaster, ZnO-TiO2, TOS, TAS, OSI, Oxidative stress.

FOAM CONCRETE PRODUCTION WITH A MINERAL WASTE ADDITION

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Abstract:

Foam concrete is a lightweight concrete which at least 20% of the volume is composed of air voids. High fluidity, low unit weight, the minimum aggregate usage, controlled low strength properties and superior insulation properties make the foam concrete as a preferred building material. It can be produced 400 to 1600 kg/m3 in dry unit weight and compressive strength of ranges between 1 and 15 MPa. It has certain advantages like easy placement in the mould and pumping ability, does not require compression and vibration, reduction in labour costs. Foam concrete shows a high resistance against water and freeze-thaw effect. It has excellent sound and heat insulation properties as compared to normal concrete. Due to the advances in the production equipment and foaming technology, foam concrete has found a wide range of production and use in recent years.

In this study, fine sand and ground calcite were used as the main raw materials in the production of foam concrete blocks. Marble powder were used in this study is a mineral waste which was obtained from marble sawing plant. The waste marble powder was used without grinding. It has particle size range of 40-200 microns. Water, aggregate and cement were respectively put into the mixer and the foam added in the mixture. Then the mortar was homogenized. When fluid consistency of the mortar was obtained, it was poured into the mould and placed in the oven for 6 hours to complete the setting time. Physical and mechanical tests were carried out on the samples removed from the oven. It was concluded that, waste marble powders can be utilized in foam concrete production without harmful effect on the engineering properties of the product and this way can be a solution to the mass consumption of the mineral waste.

Keywords: Foam concrete blocks, recycle, marble dust, sustainable production.

MBDEPX4: AN INTERACTIVE TOOL FOR CURIE POINT DEPTH (CPD) ESTIMATION FROM SPECTRAL ANALYZES OF MAGNETIC DATA

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Abstract:

Determining of the Curie Point Depth (CPD) or the magnetic basement depth where the magnetic minerals lose their magnetization above the Curie temperature is a key focus in understanding the thermal structure of the crust. Spectral analyses of magnetic anomalies are widely used in estimation of the CPD. The MBDEP developed in this study is a valuable geophysical Matlab based program for interactive CPD estimation from a spectral approach known as the centroid method, providing the relationship between the spectra of magnetic anomalies and the depths of the magnetic source of a 2-D magnetic data. It allows the user a fast and visual processing flow by its simple to use graphical user interface (GUI) which has a single window to be handled without requiring any prior Matlab knowledge. Additionally, it also provides the user to analyze any sub-region data extracted either manually or automatically from a large scale input data. The developed interactive program may also assist to estimation of depths of subsurface causative bodies producing magnetic anomalies. The program was tested on a synthetic magnetic anomaly produced by a prism ensemble model to assess its reliability. The results were straight enough to be satisfactory of the accuracy of the program. Following encouraging test results, the proposed program was also applied on a field data. The depths obtained from the estimation were sufficient in comparison with the results obtained from previous studies.

Keywords: Curie Point Depth; Magnetic basement depth; Spectral approach.

THE EFFECTS OF COOKING CONDITIONS ON THE TOTAL POLAR MATERIALS OF BIODIESEL PRODUCED FROM WASTE FRYING OILS

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Abstract:

Biodiesel is a renewable energy source produced from vegetable oils and animal fats. The most important disadvantage of biodiesel is its high cost. Waste frying oils can be used to reduce its cost. If waste frying oils are released into the environment, they can cause environmental problems and clogs inside drainage pipes. Therefore waste frying oils seem to be an economic and suitable alternative as a biodiesel feedstock.

In this study, the effects of cooking conditions on the total polar materials of biodiesel produced from waste frying oils were investigated. Sunflower, corn and canola oils were used as vegetable oils. Salt content, water content, cooking time and cooking temperature were selected as the experimental parameters. Total polar material contents of biodiesel produced from the waste cooking oils were analyzed by Testo 270 cooking oil tester. The obtained results are presented as graphs. The results of the study showed that increase in salt content, water content, cooking time and cooking temperature leads to increase of the total polar materials of B100 biodiesel samples from waste cooking oils.

Keywords: Biodiesel, waste frying oils, cooking conditions, total polar materials.

LANDSLIDE INVESTIGATION USING ELECTRICAL RESISTIVITY IMAGING AND SELF-POTENTIAL PROFILLING

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Abstract:

Landslides are earthflows that can be triggered by a variety of external factor. Along West Mediterranean region of Turkey, the landslides have occurred due to road constructions, lithological negativeness and the destruction of the natural slopes. The two-dimensional (2-D) electrical resistivity imaging and the self-potential profiling from the geo-electrical methods was used to characterize an active landslide occurred at the ridgeway between Isparta and Burdur cities. 2-D electrical resistivity data were collected along eight profiles with electrode spacing of 4 m, and lengths of 188 m using Wenner-Schlumberger array and a multi-electrode system with 48 electrodes connected to a geo-resistivity meter. The apparent resistivity data were inverted to create a model of the resistivity of the subsurface. Inversion process is based on the smoothness constrained least-squared inversion to obtain the best fit between observed and calculated resistivity data. SP measurements were undertaken along profiles occupying the five lines used for resistivity profiles with the separation between measurement points 5 m with the fixed-base technique achieved a millivolt meter and a pair of non-polarizable electrodes. The SP survey data are presented as 1-D profile for each of the lines. 2-D electrical resistivity results revealed the sliding surface at a depth of between about 7.5 and 10 m. Self-potential results are displayed the trend of increasingly positive potential values is discontinued at the front of drainage path and at the accumulation zone or toe for landslide.

Keywords: Electrical resistivity imaging, Wenner-Schlumberger array, self-potential, landslide.

AN EARLY WARNING SYSTEM DESIGN FOR STEEL FRAME TRUSSES

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Abstract:

Nowadays using steel frame trusses are becoming more common in the construction industry. But steel frame systems are very fragile to failures of project and workmanship. In recent years, there has been a large number of collapse cases. This study aims to minimize these accidents owing to new early warning system. The essence of the proposed method is based on using strain gages and communication devices under the selected steel profiles. Thus, if yield limit of the steel bar exceed, early warning system will be activated. Hence people can be warned by audible alarm. In this study, a collapse case was examined. Stress and strain capacities of roof steel frame were analyzed. Then, suitable locations were determined to locate strain-gages on case study. As a conclusion, an efficient early warning system was purposed for steel framed roof structures.

Keywords: Steel frame roof, Steel frame construction, Early warning system, Snow load.

PROPOLIS AND ITS USAGE OPPORTUNITY

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Abstract:

Propolis is picked up by bees from pine, oak, eucalyptus, poplar etc. trees and bud, leaf and a few more part from some herbaceous plant. It is used as mixing with wax for a lot of gain in hive. It is adhesive as glue and it smells like resin. Its colour changes from dark yellow to brown. Propolis is cheaper in USA and Canada (2-6 dolar/pound) but in New Zealand the price is 26 dolar/pound. Because it is used more commonly in New Zealand. Primary producer countries are China, Argentina, Uruguay, Chili, Brazil, Canada and some of East Europe countries. Japan imports propolis more than Brazil and China. According to studies at the beginning of 20th century, it is determined that the source of propolis is poplar. Propolis's antioxidan and antimicrobial effects provide its usage opportunity in food technology department. Propolis's antimicrobial activity is its one of the important property. Its antimicrobial effect is the most common and the most studied property. There are a lot of scientific study about propolis's effect on bacteria, fungi, virus and other microorganisms. It has useful effects on human health. It has antifungal effect on fruit juice. It prevents mold growth and occurrence of toxin in Ras Cheese. In addition it raises shelf life of sausage; it has protective property in foods to E.coli. Identified compounds of propolis are similar to food compounds, food additives and/or GRAS compounds. According to results of studies propolis has an antimicrobial effect in foods to pathogens.

Keywords: propolis, antimicrobial, food, poplar.

PROVIDING ENGINEERING SOLUTIONS TO FOREST FIRE ACCESS PROBLEMS USING NETWORK ANALYSIS METHOD

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Abstract:

The forest fires are the greatest environmental disaster on forest resources. In order to effectively fight against forest fires, ground team should access fire areas by fire trucks in short time through road network. In this study, Geographical Information System (GIS) based network analysis method was used to decide the optimum route with minimum fire access time. The study area consisted of Paşalar, Sarnıç and Turfal Directories of Forest Enterprises, located in Regional Forestry Directorate of Bursa, Turkey. These Enterprises are classified as the 2nd degree fire sensitive areas where there was a headquarter for the firefighting team.

In this study, firstly, the road network, location of the firefighting headquarter and potential fire sites were digitized by using ArcGIS 10 software. Then, the optimum route, providing the fastest transportation from headquarter to possible fire sites, was determined by using Closest Facility tool of Network Analyst extension of ArcMap module under ArcGIS 10. Also, inaccessible areas due to fire risk were marked in the network database and disregarded in network analysis to ensure safety during the process. Finally, the location of the firefighting headquarter was evaluated using Service Area tool of Network Analyst by considering the critical response time to the possible fire areas. The results indicated that new firefighting headquarters should be established in the study area in order to access the forested areas on time. Building new roads and increasing the design speed on the current roads by improving their standards can be also considered to address the forest fire access problem.

Keywords: Forest Fires, Firefighting Headquarters, Shortest path, GIS, Network Analyst.

NEW SUPPORTED LIQUID MEMBRANES CONTAINING DIOXIME DERIVATIVES AS ION CARRIER FOR FACILITATED TRANSPORT OF MERCURY IONS

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Abstract:

Mercury poisoning is a global concern due to its highly toxic, carcinogenic and non-biodegradable nature. The major sources of mercury pollutions are the waste of various industries such as chloro-alkali, rubber processing, fertilizer, battery, pulp and paper, mining, combustion, etc. Though conventional methods such as precipitation, coagulation, electrodialysis, adsorption, solvent extraction, chemical oxidation and reduction and ion exchange have been used for mercury separation, liquid membrane (LM) based separation process promises an effective separation of metal ions when the amount of ion in the solution is trace.

This study presents an experimental investigation on the facilitated transport of mercury through supported liquid membrane (SLM) containing dioxime derivatives (N,N′-bis[1-bifenil-2-hidroksiimino-2-(4-asetilanilino)-1-etiliden]-1,3-propandiamin and N,N-bis[1-(4-fenilfenil)-2-hidroksiimino-2-(4-kloroanilino)-1-etiliden]-1,3-propandiamin) as ion carrier. The Celgard 2500 membrane was used as support. The morphology of SLMs was characterized using scanning electron microscopy (SEM), atomic force microscopy (AFM) and fourier transform infrared spectroscopy (FTIR). The SEM, AFM and FTIR images, comparing the Celgard 2500 membrane support to SLMs, indicate that the surface morphologies of the membranes are different. The fundamental parameters, such as feed phase pH and concentration, strip phase concentration, carrier concentration, etc., affecting the transfer of mercury through the SLM were studied. As a result of the Donnan dialysis experiments recovery factor values (RF), flux values (J) and permeability coefficient values (P) of Hg(II) ion were calculated. The highest RF and J values were obtained when the feed phase concentration of 1x10-3 M Hg(NO3)2, the strip phase concentration of 0.1 M HCl and different valences ions were absent in the feed phase.

Keywords: Supported liquid membranes, Dioxime, Mercury, Donnan dialysis.

PREPARATION AND CHARACTERIZATION OF MAGNETIC POLYSULFONE / THIOUREA MICROSPHERES AND ITS APPLICATION FOR THE REMOVAL OF CR (III)

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Abstract:

Water pollution caused by toxic metal ions from various industrial effluents has gained much attention worldwide. Chromium and its compounds are contaminant commonly found in wastewater produced by several industries, including the dye, leather tanning, plating, cement, and photography industries producing large quantities of toxic pollutants. Several methods such as coagulation and precipitation, adsorption, solvent extraction, membrane process and ion-exchange have been used for removal of toxic chromium ions from wastewater.

Recently, magnetic separation technologies (MSTs) is gaining growing attention. Magnetite (Fe3O4) has been widely used as magnetic material because of their excellent magnetic properties, chemical stability and biocompatibility. Consequently, magnetic polysulfone/thiourea microspheres are regarded as a promising biosorbent for removing Cr(III) due to the strong metal chelating capability and good magnetic separation performance.

Polysulfone (PSF) microspheres containing both N-benzoil-N'-(4-klorofenil)tiyoüre (KATU) as extractant and magnetic nanoparticles (Fe3O4) that help the isolation operation have been prepared for first time using a phase inversion method. Fourier transform infrared (FTIR), scanning electron microscope (SEM) and thermogravimetric analysis (TGA) have been used to characterize the microspheres. The adsorption of Cr(III) ions from aqueous solutions on to the magnetic microspheres has been studied as a function of contact time, initial ion concentration, adsorbent concentration, temperature and pH. Adsorption data were modeled using Freundlich and Langmuir adsorption isotherms and the appropriate parameters were calculated. The Freundlich equation provided a better fit for Cr(III) ion than the Langmuir equation. Simultaneously, the experimental data fitted the pseudo-second-order kinetic model well.

Keywords: microspheres, Polysulfone, thiourea, adsorption.

DEFLUORIDATION FROM AQUEOUS SOLUTIONS BY NATURAL AND ACID ACTIVATED IGNIMBRITE AND DIATOMITE MATERIALS

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Abstract:

Fluoride is an important and necessary element for human health. Fluoride in the drinking water, depending on the concentration, may be helpful or harmful to health for especially babies and young children. Fluoride level should not be more than 1.5 mg/L in drinking water according to the drinking water standards of WHO[1]. Many methods were used to remove excessive fluoride from drinking waters. Among these methods, adsorption is a relatively much better option as compared to other techniques.

The aim of this research work is to investigate the adsorption capabilities of some natural adsorbents for removal of fluoride ion from aqueous solution. These adsorbents are ignimbrite and diatomite materials. Batch adsorption experiments were conducted to examine the effect of various physicochemical parameters such as pH, adsorbent dose, contact time, initial fluoride concentration and temperature. In order to increase adsorption capacity, ignimbrite and diatomite was activated by 2M H2SO4. The fluoride adsorption capacity of acid-activated form was found to be higher than that of the original form for adsorbents. Scanning electron microscope (SEM) images were evaluated for surface characterization of adsorbents. The maximum adsorption capacity for all adsorbents was achieved at 10 mg/L fluoride concentration, 1 g/mL adsorbent dosage, 273 K and pH 6. All adsorption experimental data fitted the Freundlich isotherm. Thermodynamic studies revealed that the adsorption of fluoride on adsorbents is exothermic and a spontaneous process. The adsorption kinetic was also studied in terms of pseudo-first order and pseudo-second order kinetic models. Mechanism of fluoride adsorption was found to follow a pseudo-second-order rate equation for both adsorbents.

Keywords: Fluoride, Removal, Ignimbrite, Diatomite, Adsorption.

BIOINFORMATICS APPLICATION FOR THE DETECTION OF PATHOGENIC BACTERIA BY DUPLEX REAL TIME PCR

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Abstract:

According to the CDC (Center for Disease Control and Prevention), last year, one in six people were affected by food-borne diseases, resulting in 128,000 hospitalizations, 3,000 deaths, and an economic burden totaling $80 billion. Microbiological quality controls are applied throughout food chain production in order to minimize the risk of infection for the consumer. As an alternative to conventional techniques, Bioinformatics and DNA-based methods are rapid, sensitive and reliable applications for bacterial diagnostics. In this study, we describe a Bioinformatics application for the economical and practical detection of pathogens by intercalating dye based duplex Real-time PCR assay. The primers were elected to amplify the two target regions whose GC contents were quite different from one another using a software-tool called BLAST (Basic Local Alignment Search Tool) of NCBI (National Center for Biotechnology Information) for both duplex detection of Salmonella spp.- Shigella spp and Listeria monocytogenes - Escherichia coli O:157 H:7. A florescence (Eva Green) based duplex PCR system was developed with a combination of two sets of primers. Melting curve analysis of fluorescence based duplex PCR curves described that a reproducible tm (temperature) of 77.00± 0.4°C for Listeria monocytogenes, 85.60±0.2 for Escherichia coli O:157 H:7, 87.60± 0.2°C for Salmonella spp. and 81.40 ± 0.2°C for Shigella spp. The results showed that Bioinformatics is a fundamental tool for the co-amplification of two pathogens in foods.

Keywords: Bioinformatics, NCBI, BLAST, Duplex, Real Time PCR, Pathogen Detection.

MODEL DEVELOPMENT FOR THE PREDICTION OF PRASINOCOCCUS SP. GROWTH

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Abstract:

The field of microalgal biotechnology has undergone a huge leap in importance in recent years. The main target of this study was to optimize physical parameters such as light intensity, temperature and agitation rate which might affect the growth of Prasinococcus sp. by central composite design (CCD) using response surface methodology (RSM). The cells were cultured in 250 ml Erlenmeyer flasks containing 150 ml of F/2 medium for 12 days at different light intensities, temperatures and agitation rates. A total of 18 runs were used to optimize the range and levels of the chosen variables. The optimization solution for Prasinococcus sp. suggested the chlorophyll-a amount of 7.20 mg/L obtaining at 28 °C with the agitation rate of 160 rpm under the light intensity of 40 µmol photons /m2s1. The maximum cell concentration of 9.5±0.10x10^6 cells/mL, which corresponded to the specific growth rate of 0.250 day−1, was obtained under the determined optimum physical process conditions for Prasinococcus sp.. The mathematical model developed was validated and proven to be statistically adequate, optimized result was also reliable, described the region studied well.

Keywords: Agitation, central composite design, Prasinococcus sp., response surface methodology, light, temperature.

THE EFFECTS OF TRITONX-100 ON THE FORMATION BY USING SOL-GEL GROWN OF CU2SNS3

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Abstract:

In this study, Cu2SnS3 thin films were fabricated by using sol-gel spin coating method. The effects of TritonX-100® on the structural, morphological, electro-optical properties of the films were investigated. According to X-ray spectroscopy results, there are no other binary phases such as SnS2, CuS or Cu2S. According to photo-transient measurement results, it was found that TritonX-100® was improved of electro-optic behavior of film.

Keywords: Absorber Layer, Cu2SnS3, Thin film,TritonX-100®.

ALGAE FOR RENEWABLE ENERGY

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Abstract:

Algae are photosynthetic microorganisms which could grow in various aquatic environments also in extreme conditions. They utilize sunlight and carbon dioxide and convert it to chemical energy to be used for chemical reactions such as the formation of sugars or the fixation of nitrogen into amino acids, the building blocks for protein synthesis. Regarding to this abilities, we could describe microalgae as sunlight driven cell factories that convert carbon dioxide to potential biofuels, foods and fine bioactive chemicals.

Microalgae could be a new sustainable energy source substituted for petroleum. They can produce high value biodiesel, bioethanol, bio -hydrogen, biogas, and that they are able to use waste water and nutrients, allowing for integration of such processes with waste treatment. Open ponds in hectares of area, could remove excess CO2 in atmosphere with photosynthesis. Large scale microalgal production in fields which are not suitable for agriculture could be a solution for CO2 capturing from the atmosphere. Sea water could be used for the culture medium not to consume the fresh water. However microalgae reduce the atmospheric CO2 while producing the organic material, using the biomass for either fuel production or food, feed, fertilizer, come out with CO2 release to the atmosphere, when burned by the engine, body and/or bacterial activities. So, microalgal growth can't reduce the CO2 however makes an important contribution to keep the atmospheric CO2 level stable. Long term solution for removing the CO2, could be possible with making durable biomaterials with microalgal biomass and capture the atmospheric CO2 by fixing into the materials and interrupt the carbon cycle for a long while.

Keywords: Microalgae, energy, biofuel, biodiesel, bioethanol, biohydrogen, biogass, global warming.

DETERMINATION OF PUBLIC EXPECTANCY AND APPROACH OF URBAN PEOPLE TOWARDS URBAN FOREST: SAMPLE OF MALATYA-TURKEY

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Abstract:

Objective of the study is to determine the suggestions and views of urban people for Malatya Urban Forest continuing to be constituted using a participatory planning and design approach.

For this aim a questionnaire study was conducted among urban people using rational approach. In addition to demographic and socio–economic data, views of participants for the importance, utilisation possibilities and ecological and recreative benefits of urban forest were investigated.

As the result of the study, 84.3% of participants thought that urban forest project is an important project for Malatya and they support it. As the education and socioeconomic levels increase the rate of participants thinking that urban forest project is a required project for the city also increases. Among the participant 90.7% of those university graduate thought that the most important value urban forest adds to the city is ”having a utilisation area away from stress but close to the city in nature”. When the education level decreases participant views change to utilisation ways as “an ideal picnic area for the city”. According to questionnaire results, public utilisation of urban forest was clearly determined first by its accessibility infrastructure and location, followed by security and maintenance. For the design of the area, participants thought that the least possible amount of artificial structures should be constituted in the area.

It was determined as the result of the data evaluated that urban people in Malatya city are willing for the urban forest to be constituted in their city, think that such a project may increase the recreative and liveability value of the city, however, they worry about maintenance and security issues and at planning stages these issues should be taken under consideration.

Keywords: Urban forest, Questionnaire, Urban people Demographic variable, Malatya.

EFFECTS OF TEREBINT (*PISTACIA TEREBINTHUS* L) OIL ADDITION TO QUAIL DIETS ON GROWTH PERFORMANCE, CARCASS TRAITS, SOME BLOOD PARAMETERS AND COMPOSITION OF BREAST MEAT FATTY ACID

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Abstract:

This study was conducted to determine effects of terebinth fruit oil (TFO) supplementation to diet on growth performance, carcass traits, some blood parameters and composition of breast meat fatty acid in quails. Two hundred and forty unsexed day old Japanese quail chicks were assigned randomly to three dietary treatment groups. Each treatment had 4 replicate pens with 20 birds per pen. One of the groups was fed with basal starter diet for 1-21th days and grower diet for 22-42th days (Control). Treatment groups were fed same diets but their ration added by 130 mg/kg (Trial I) or 260 mg/kg TFO (Trial II) during the study. At the 42 d of study, 20 quails from the each group slaughtered for determination of carcass traits, blood serum parameters and composition of breast meat fatty acid profile. Final live weight of quails in the Trial II was higher than those of the Control and the Trial I. Average feed intake in the Trial I was lower than those of the Control and Trial II on basis of whole study period. Average feed conversion in the Trial I was lower than that of the Control on basis of whole study period. Carcass weight in the Trial II was higher than that of the Trial I. There were no differences on carcass yield and breast-, leg-, wing-, heart-, liver- and gizzard ratio to carcass weights of the birds in all groups. Serum total cholesterol, HDL, AST, ALP, total protein, albumin and globulin did not differ among the groups. There were no differences on composition of breast meat fatty acid profiles of the birds in all groups. In conclusion, supplementation of 260 mg/kg TFO enhanced live weight and carcass weight, and supplementation of 130 mg/kg TFO decreased feed intake and improved feed conversion. TFO may be used as a supplement at indicated doses for quail rations.

Keywords: Quail, Pistacia terebinthus, growth performance, carcass, blood parameters.

SYNTHESIS AND CHARACTERIZATION OF ACID ACTIVATED ARTVIN BENTONITE (AR) DESIGNED AS A CATALYST

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Abstract:

Clays are by definition fine-grained solids and hydrous silicates with layer structures. Exchangeable cations in the interlamellar space of the clay minerals, also treatments with acids create Bronsted acid sites, are the Lewis acid sites. The amount of these sites which may play an important role in catalysis, can be enhanced by cation exchange or treatment with mineral acid. Spectroscopic and thermal analysis data were used to enlighten the structure of catalyst of acid activated bentonite prepared by interacting AR with mineral acids (HCl, H_2SO_4 and HNO_3) in this study. Thermal curves and FTIR spectra for acid activated bentonites denote the presence of different water species coordinated to the interlayer cations and surface humidity. When the bentonites exposed to acids, the d001 value of Artvin bentonite varied slightly because of partially leaching of octahedral layer as well as tetrahedral layer. Finally, all these data prove the remarkable effects of acid activation on the framework of bentonite which are reflected by the intercalation mechanism.

Keywords: Bentonite, Clay, Catalyst, Spectrocopy, Activation

EFFECT OF NONIONIC AND ANIONIC SURFACTANTS ON ENDOGLUCANASE

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Abstract:

Cellulase is an enzyme complex that performs conversion of cellulose to glucose unit. Components of this enzyme complex are endo- 1, 4-β-glucanase, exo-1, 4- β-glucanase, and 1, 4- β-D-Glucosidase. These enzymes work synergistically. Cellulases are produced by fungi, bacteria, protozoans, and termites. Among them, the genera of Clostridium, Cellulomonas, Thermomonospora, Trichoderma, and Aspergillus are the most extensively studied cellulase producer.

Cellulases are produced commercially by several industries globally and are widely being used in food, animal feed, fermentation, agriculture, pulp and paper, and textile applications.

We have studied effect of some surfactants (Tween 40, Tween 80, Triton X-100 and SDS) on endo-1, 4-β-glucanase activity. This enzyme obtained from local isolate Aspergillus niger and purified with Sephadex G-100 column chromatography.

As a result, it was determined that while Tween 80, Tween 40 and Triton X-100 didn't influence enzyme activity, SDS inhibited its activity.

Keywords: CELLULASE, Surfactants.

GLUCOSE CONCENTRATIONS IN BLOOD REGARDING TO DIFFERENT PHYSIOLOGICAL STATES OF HOLSTEIN - FRIESIAN CATTLE

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Abstract:

Objective – Aim of this study was to determine cow's glucose concentration during the high lactation and periparturient period (dry period and period up to 15 days from calving) and to establish possible reference intervals regard to physiological state of cows.

Methods – Research included a total of 474 Holstein - friesian cows, age between 2 and 9 years, with the largest number of cows at the age of 3 to 5 years. Blood samples were collected by jugular vein-puncture method in tubes á 6ml with EDTA anticoagulant. Investigated animals were comprised of high-lactation cows, cows in dry period and cows up to 15 days after calving. Glucose concentration was determined immediately after sampling, using Accu-Chek Easy (ACE). Mean values between different physiological states were compared using t-test. Differences were considered statistically significant at the level $p < 0.05$.

Results and conclusions – This experiment compared dairy cows's glucose concentration during the high lactation and periparturient period, showing that glucose concentration was significantly higher in animals up to 15 days after calving than in cows during high lactation. Mean blood glucose values were within the physiological range of 2.5-4.2 mmol/L (Radostits et al., 2000), whereas individual hypoglycemia was detected in cows up to 15 days after calving. In the present study, three postpartum cows (2.91%) and none of late pregnant cows (dry period) had blood glucose concentrations below 2.5 mmol/L. Our study revealed four high lactation cows (1,62%) with low blood glucose (<2,5 mmol/L). Described hypoglycemia may occur due to elevated demand for glucose to lactose synthesis by mammary gland (Turnwald and Troy, 1983). High individual glucose levels detected in cows during high lactation (2,66%) and postpartum (1,88%) may be associated with stress, which activates the sympathetic nervous system and therefore increases the secretion of adrenaline.

Keywords: glucose, blood, dairy cattle.

APPLICATION OF DIFFERENTIAL EVOLUTION ALGORITHM FOR INTERPRETATION OF MAGNETIC ANOMALIES DUE TO DIPPING DIKE-LIKE BODIES

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Abstract:

Unlike conventional least – squares approaches mainly used for magnetic anomaly inversion, metaheuristic algorithms do not require good initial estimates to reach the global minimum. Thus, differential evolution (DE) algorithm is one of the most widely used population-based evolutionary algorithms to solve real-valued numerical optimization problems. In DE, a scaled difference between two individuals randomly chosen from the population is added to third one to generate new individuals at each generation. It iteratively modifies randomly generated individual solutions via some operations including mutation, crossover and selection similar to those in genetic algorithm until a predefined termination criterion is satisfied. Thus, the population evolves toward an optimal solution. Since differential mutation plays a key role for the success of the algorithm, multiple mutation strategies are also provided in the algorithm. In this study, application of DE was carried out by a mutation scheme (i.e., DE/best/1/bin) that uses the information of the best solution in the current population. The mutation scheme is also characterized by a faster convergence speed. Dip angle, depth to the surface, half width, horizontal position of the dike together with index parameter and intensity of magnetization are estimated parameters for a magnetic anomaly caused by dipping dike-like bodies. In the test studies, a synthetic noisy data set comprised of an isolated dike and a magnetic anomaly observed over the Marcona district (Peru) were inverted. Effectiveness of the algorithm for the synthetic case was demonstrated by various analysis such as changes in the model parameter values versus generation number and frequency distributions of each parameter estimated. In addition, DE algorithm provided parameter estimations for the field anomaly, which are in good agreement with published works. Hence, this study indicates that performance of the DE algorithm is quite effective for magnetic anomaly inversion.

Keywords: Differential evolution, dike, geophysics, global optimization, magnetic anomaly, parameter estimation.

ALGORITHM ANALYSIS OF COMPUTER GAMES: 2048 GAME EXAMPLE

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Abstract:

One of the most important study areas of computer engineering is computer games. Although they are thought as only funny programs, computer games are important computer programs because they contain many special components of computer engineering. Some of them are : computer vision, modelling and simulation, artificial intelligence, search and sort algorithms, mathematical calculations and formulas, encryption algorithms, web programming methods etc. On the other hand, some additional properties like speed and memory are in many of the computer games although they are missing in other types of computer programs. Another reason of computer games' being successful programs is portability that means "write once, run everywhere - WORA". Today many computer games are written with portable programming languages and if not, mobile versions (for tablets and phones) are developed fort he games. The computer game players usually try to analyse the algorithm of the game because they want to score more points, pass more levels, develop their are quickly, defeat their competitors, win the game, be in top of the lists etc. These all can improve the algorithm analysis capability of the players. To learn the games properties, how many points the game gives for each attack, which answers it gives for each attack, when it gives which answers, if it has artificial intelligence property or not are some issues that whet appetite of players. Some players turn these purposes to greed so they try to find the bugs of the games. Sometimes tey try to write new plugins for the games that are indeed tricks. All these situations show that well-written, qualified and successfull computer games can improve human intelligence. There are a lot of studies in the literature about this subject.

In this study 2048 game which was developed by a 17 year Italian web developer Gabriele Cirulli in March 2014 and expanded to the whole World in a short time is investigated and the algorithm of the game is tried to be analysed. According to the image on the screen, the score of the palyer can be guessed and also there can be different methods for making more scores. It is thogth that this game benefits human intelligence because : it is a number game, it improves the capability of realizing numbers on the screen, it improves the addition operation capability, its motions are different from many games because all the squares move at the same time so player must make a plan about the motions. In this study, it is only tried to analyse the algorithm o fthe game and in following studies, different types of image processing algorithms will be applied to the game, so it will be tried to recognize numbers, characters and colours.

Keywords: Computer games, algorithm analysis, 2048 game.

INVESTIGATION OF DITHIOTHREITOL AND SUCROSE IN BULL SEMEN CRYOPRESERVATION*

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Abstract:

The cryoprotectants are added to extenders to protect the sperm from damage during freezing process. There are few studies performed for investigating the roles of dithiothreitol (D) or sucrose (S) at different ratios on sperm motility characteristics and antioxidant capacities of post-thawed bull spermatozoa. The objectives of this study were to analyze the effects of adding D or S (with/without) as antioxidants and ethylene glycol (EG) as cryoprotectant in Tris extender for cryopreservation of bull semen.

Totally 24 ejaculates were collected from the Three Holstein bulls with the aid of an artificial vagina. A Tris-based extender (T) and EG 5% was used as the base for the experimental extenders. Each ejaculate was split into three equal aliquots and diluted using both of 25 mM sucrose (S) or 5 mM dithiothreitol (D), and control (without additives).

When compared to the control, addition of different antioxidants did not significantly increased the percentages of post-thaw sperm progressive and CASA motitilities, acrosome abnormality and plasma membrane integrity ($P>0.05$). Control group gave the lowest MDA but, these results were not supported with the GPx activity ($P<0.01$). Sperm motion characteristics such as VAP, VCL, ALH and BCF gave significantly different results except for VSL and LIN ($P<0.05$). D and S were showed better DNA integrity than control.

In conclusion, it may be stated that, using D improved the GPx activity. On the other hand, the addition of antioxidants protected tail moment.

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Keywords: Antioxidant activity, Ethylene glycol, Sperm.

COMPARISON OF CRYOPROTECTIVE EFFECTS OF TREHALOSE AND CYSTEINE ON BULL SEMEN

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Abstract:

The major factor affecting the results of insemination with frozen–thawed semen is the addition of cryoprotectants. There are only a few studies performed for exploring the effects of trehalose (T) or cysteine (C) at different ratios on sperm motility characteristics and antioxidant capacities of post-thawed bull spermatozoa. The objectives of this study were to assess the effects of adding T or C as antioxidants and glycerol (G) as a cryoprotectant in Tris extender for cryopreservation of bull semen.

Totally 24 ejaculates were collected from the three Holstein bulls. A Tris-based extender (T) was used as the base for the experimental extenders. A Tris-based extender (T) and G 7% was used as the base for the experimental extenders. Each ejaculate was split into three equal aliquots and diluted using both of 25 mM trehalose (T) or 5 mM cysteine (C), and control (without additives).

When compared to the control, addition of different antioxidants significantly increased the percentages of post-thaw CASA motitilities ($P > 0.05$), but did not any effect acrosome and total abnormality and MDA activity ($P > 0.05$). Control group gave the highest plasma membrane integrity ($P > 0.05$). And C showed lowest GPx activity ($P < 0.001$) (Table 1). Sperm motion characteristics such as VAP, VCL, ALH and BCF gave significantly different results except for VSL. T and C were showed better DNA integrity than control ($P > 0.05$) (Table 2).

In conclusion, it may be stated that, using C did not improved the GPx activity. On the other hand, the addition of T and C protected the DNA integrity.

Three Holstein bulls were housed at Research Institute. Totally 24 ejaculates were collected from the bulls. A Tris-based extender (T) was used as the base for the experimental extenders. Each ejaculate was split into four equal aliquots and diluted using both of the T extenders . After that, each extenders were split into three equal aliquots and diluted using both of %7 G with 25 mM trehalose (S) or 5 mM cysteine (C), and control. The present study was undertaken to ascertain which cryoprotectant and antioxidant would provide the most effective protection against cold shock and oxidative damages during the cryopreservation process.

In conclusion, compared to the cryoprotectant groups in this study, the use of C or T in the extender did not eliminate MDA production and adding 5 mM C in all cryoprotectant groups decreased GPx antioxidant activ-ity during the cryopreservation process ($P < 0.001$). And glutathione peroxidase (GPx) antioxidant activity was increased in the C-treatment groups when compared to the other groups.

This study was published in Animal Reproduction Science 150 (2014) 77-83 and financed under a project supported by the Republic of Turkey, Ministry of Food, Agriculture and Livestock, General Directorate of Agricultural Research and Policy (GDAR) (Project number: 09/01/01/01).

Keywords: Sperm, antioxidantactivity, trehalose, cysteine.

EVALUATION OF PRESPLIT BLASTING OPERATION IN APA-HOTAMIŞ IRRIGATION (AHI) CHANNEL CONSTRUCTION

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Abstract:

Explosive are commonly used in mining operation, dam, highway and tunnel construction. Excavation with blasting operation is the most economic and effective methods for production of raw materials and loosen of rock units.

In the result of the mining activities, dam, highway and tunnel construction by using blasting activity, some problems may be occur which negatively effect to construction project and rock loosen process. In this type projects, controlled blasting tecniques are used to avoid from excessive excavation and protection of main rock strenght except excavation section.

Controlled blasting is defined as general name of special blasting methods improved to avoid from the risk of mining, dam, channel and highway blasting.

In this study, presplit blasting operations applied to AHI project were evaluated. Technical parameters such as explosive types, blasting method and drilling design were investigated and presented.

Keywords: Controlled blasting, irrigation channel, presplit blasting.

β-GLUCAN CONTENT AND ANTIOXIDANT ACTIVITIES OF *BOLETUS EDULIS*

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Abstract:

In this study, β-glucan content and antioxidant activities of *Boletus edulis* were determined. The methanol and acetone extracts of *B. edulis* were analyzed for antioxidant activity in different assays, namely, total phenolic contents, 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radical scavenging activity and reducing power capacities. According to the results obtained, at 1000 µg/mL concentrations of *B. edulis* extracts DPPH radical scavenging activities were found as 78.16±0.17 % for methanol extracts and 51.66±0.24 % for acetone extracts. The EC50 of *B. edulis* methanol and acetone extracts were 0.585 and 0.952 mg/mL, respectively. Total phenolic contents of acetone and methanol extracts of *B. edulis* were found as 41.3±0.42 µg/mg and 45.5±0.71 µg/mg as gallic acid equivalents, respectively. When reducing power capacity of mushrooms was compared to standards, the extracts were observed to have low reducing power capacity. Mushrooms are referred as polysaccaride resources. The glucan contents were determined with using the Megazyme kit. β-glucan content of *B. edulis* was found as 13.93±0.78 %.

Keywords: β-glucan, antioxidant, mushroom.

EDGE DETECTION APPLICATIONS OF MAGNETIC ANOMALIES OF GÖLCÜK CALDERA, ISPARTA, SW TURKEY

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Abstract:

The SW Turkey that mainly controlled by the processes associated with the Africa-Anatolia plate convergence zone is a tectonically active region. In SW Turkey, the Gölcük caldera and its surrounding area situated in the Isparta volcanic complex consist of important volcanic occurrences such as sub-volcanic dykes, caldera, several volcanic domes, circular and elliptical morphologic structures. Total field magnetic data of the area were processed and interpreted for the present study. The reduced to pole (RTP) magnetic data were inverted by means of total horizontal derivative (TDX), horizontal gradient analytic signal (HGAS), boundary analysis (BA), and normalized standard deviations (NSTD) techniques. Among them, the anomalies of TDX and HGAS show significant relations to the geological structures of the study area. Interpretation of various edge detection maps obtained from magnetic data has indicated the presence of buried bodies (dykes and domes) related to the volcanic complex. Both TDX and HGAS distribution clearly indicate to NNE trending buried structures at the south of the area which may to be the deep continuations of the described tephriphonolitic dykes / trachytic domes seen at the outcrops in the area. One more anomaly which is present in the north side of the Gölcük Crater Lake does not show any geological sign on the surface.

Keywords: Edge detection, magnetic anomalies, Gölcük caldera.

INVESTIGATION OF INDUSTRIAL APPLICATIONS OF CELLULASE

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Abstract:

Lignocellulosic materials are respectively cheap and the most abundant material on Earth. Especially, agricultural wastes (e.g. wheat straw and corn stover), forestry residues (e.g. mill wastes and sawdust), portions of municipal solid waste and most of the industrial wastes are its source.

Bioconversion of cellulose to soluble sugar is performed by cellulases. Cellulases can be produced by most of microorganisms including fungi, bacteria and actinomycetes. Trichoderma and Aspergillus species are the most studied cellulolytic microorganisms for cellulase production.

The purpose of this study was to determine some properties (optimum pH, temperature, thermal stability, and kinetic properties) of EG from local isolate Trichoderma atroviride. Otherwise, the paper presents the effect of EG on the properties of pretreated lignocellulosic wastes and denim garments.

An endo-β-1, 4-glucanase (EG), produced under submerged fermantation by local isolate Trichoderma atroviride, was purified using ammonium sulfate precipitation, column and ion exchange chromatography with 55.16 fold and a specific activity of 30.9 EU mg-1.The studies of PAGE, SDS-PAGE and zymogram test have been carried out. The EG had optimum activity at pH 5.0 and 50 °C respectively. Using CMC as substrate, the enzyme showed maximum activity (Vmax) of 6.7 μmol glucose/min mL-1 with its corresponding KM (Michaelis-Menten constant) value of 1.12 mg/mL. While the EG activity was activated by NaCl, inhibited by MgCl2 and MgSO4. Otherwise, Tween 80, Triton X-100 and the total saponins known as biosurfactans enhanced, but SDS inhibited to the EG activity. The obtained EG has low Km and high thermal stability. Additionaly, usability of the EG in some biotechnologic application was investigated. Obtained results showed that the EG had potentially sufficient effects on denim garment and pretreated lignocellulosic wastes.

Keywords: Endo-β-1, 4-glucanase, purification, characterization.

DETERMINATION OF CELLULASE PRODUCING THERMOPHILIC BACTERIA ISOLATES

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Abstract:

Cellulases can be produced by a wide variety of microorganisms in nature. Screening and isolation of cellulase-producing microorganism from nature is one of the important steps for obtaining novel cellulases (Juturu and Wu, 2014). Both fungi and bacteria have been heavily exploited to produce cellulases which have different properties. Fungal cellulases are extensively used because of producing large amount of extracellular cellulases up to now, however, recently bacterial cellulases are attract great attention because of robust bacterial growth, survival in harsh conditions of bioconversion processes, stability and presence of multi-enzyme complexes which provides increased function and synergy (Acharya et al., 2011).

The aim of this study is determined thermophilic Bacillus isolates which can be produced cellulase. For this aim, fifteen local bacteria isolates were used. These isolates were grown overnight on CMC-agar at 50oC. Then, congo red staining was performed.

Consequently, five isolates showed a clear zone on plate. It can be said these thermophilic isolates can be used as cellulase producer.

Keywords: thermophilic bacteria, cellulase, isolate.

HYDROGEN GENERATION FROM AMMONIA BORANE BY PVP-PROTECTED RUTHENIUM-RHODIUM NANOPARTICLES

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Abstract:

Hydrogen has been considered as a clean and environmentally benign energy carrier for heating, transportation, mechanical power and electricity generation [1]. However, the storage of hydrogen is still a challenge for the implementation of hydrogen economy [2]. Ammonia borane (H3NBH3) has recently been employed as a solid hydrogen storage material due to its high hydrogen content (19.6 wt %), high solubility and stability in water at room temperature [3], and releases hydrogen upon hydrolysis at room temperature in the presence of suitable catalysts.

In this study, PVP-protected ruthenium-rhodium nanoparticles (3.4 ± 1.4 nm) have been prepared by co-reduction of ruthenium and rhodium metal ions in ethanol/water mixture by an alcohol reduction method and characterized by TEM-EDX, UV-Vis spectroscopy, and XPS. They provide average turnover frequency of 286 mol H2 (mol cat)-1 min-1, maximum hydrogen generation rate of 9,680 L H2 min-1 (mol cat)-1, and activation energy of 47.4 ± 2.1 kJ/mol for the hydrolysis of ammonia borane.

Keywords: Ruthenium, rhodium, nanoparticle, ammonia borane, hydrogen.

FUNCTIONAL LIVER STRESS IN DAIRY SHEEP DURING SUMMER SEASON

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Abstract:

The aim of this study was to investigate the liver function in dairy sheep during summer. The experiment was performed on 117 samples of sheep breeds on two different locations (Livno, Travnik) during summer grazing period (June, August, and September). Levels of serum enzymes activity were determined as follows: alanine transaminase (ALT), aspartate transaminase (AST), gamma-glutamyl transferase (GGT), alkaline phosphatase (AP) and lactate dehydrogenase (LDH).Enzymes activity was determed spectrophotometrically on automatic analyser Johnson & Johnson Clinical Diagnostics Kodak (Kodak Ektachem analyser DT 60 II, DTSC Modul and DTE Modul) with commercial slides (Products Vitros chemistry-DT Slides. Ortho-Clinical Diagnostics. Inc. Johnson & Johnson Company). Enzymes activities resulted in significant variations and a moderate increase in activity, which is likely to be correlated with the energy balance of animals. Statistical analysis was performed using the software package / program SPSS 15.00. Differences were considered statistically significant at $p<0,05$. Values of investigated serum parameters above reference rangemay indicate intense metabolic process as a liver response to a negative energy balance.

Keywords: Liver, alanine transaminase, aspartate transaminase, gamma-glutamyl transferase, alkaline phosphatase, sheep.

INVESTIGATIONS INTO DEEP GEOLOGICAL STRUCTURE OF GULF OF ANTALYA, TURKEY BY USING AIRBORNE MAGNETIC DATA

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Abstract:

Previous research on west and central Anatolia showed large areas rich in geothermal energy by utilising the airborne magnetic data. In terms of offshore areas, there has not been research to explore any geothermal potential. Gulf of Antalya located at the south of Turkey and northwest of Cyprus appears to be promising for geothermal energy potential. Airborne survey shows three intense magnetic anomalies in the Gulf elongated almost along the north-south direction. Cross-section of a profile was taken along the peaks of the magnetic anomalies. This profile was also digitised to process the data in order to estimate the body parameters such as the depth and vertical extent of the causative bodies. An approximate depth of 1.19 km (excluding the flight height of 0.6 km from the sea surface) to the top of the anomalous bodies was estimated by utilising the method of power spectrum depth estimate. Method of vertical derivatives can be used to delimit the horizontal extents of buried anomalous bodies. 2nd vertical derivative profile shows that horizontal lengths of these buried bodies from the south to north are 11.7, 12.7 and 7.1 kilometres. Upward analytical continuation enhances deep seated bodies while suppressing the shallow ones. It is also possible to observe if the buried anomalous bodies join at depth to form a single body or not. 4 km upward analytical continued profile shows that three separate anomalies form a single anomaly. These three shallow sources can be interpreted as the magmatic intrusions into the oceanic crust by mean of faults. As a conclusion: Such sources if deep rooted could be prospective for geothermal energy as well as hydrocarbon maturation.

Keywords: Airborne, magnetic, Antalya gulf, geothermal.

INVESTIGATION OF REINFORCEMENT CORROSION EFFECT ON CONCRETE STRENGTH BY SEISMIC VELOCITIES

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Abstract:

This study was aimed to put forward the effect of reinforcement corrosion on concrete strength by Seismic Ultrasonic P and S wave velocities. Studies were carried out with preparing 3 different concrete design of showing low, medium and high strength characteristics. For this purpose, cubic samples were prepared including one piece of 10, 14 and 20 mm diameter reinforcement. HCl cure was applied on the prepared samples of designs. The effect of corroding the reinforcement by acid cure on strength was investigated. Throughout 90 days repeated P and S wave measurement with specific intervals, changing of seismic velocities with depending on reinforcement diameter and corrode in time were tried to put forward.

*This study was supported with OYP05277-DR-14 Project number by SDU.

Keywords: Keywords: Seismic Ultrasonic P and S wave velocities, reinforcement, corrosion, concrete strength.

THE IMPORTANCE OF USING SEISMIC ULTRASONIC VELOCITIES TOGETHER IN DETERMINING OF CONCRETE STRENGTH

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Abstract:

This study was tried to put forward importance of the combination Seismic Ultrasonic P and S wave velocities in determination of the concrete strength. For this purpose, cubic samples of 12 different concrete designs were prepared. 150x150x150 mm sizes 9 cubic samples were prepared for each design. Water cure was applied by grouping prepared samples. Seismic ultrasonic P and S wave velocities measurements were taken from two opposed surfaces of samples in specific time periods for 28 days. Also, strength of the samples was determined by uniaxial compression test in 3th, 7th and 28th days. Multi-parameter relationship was established between obtained strength results and seismic velocities. In these relationships, as a result of P and S waves measured at specific time intervals, concrete strength changes in different design depending on the time were tried to put forward.

*This study was supported with OYP05277-DR-14 Project No. by SDU and State Hydraulic Works 13th Regional/2012-01 Project No.

Keywords: Seismic Ultrasonic P and S wave velocities, Concrete Strength, multiparameter relationship.

INVESTIGATION OF BUILDING FOUNDATION TYPE BY MICROTREMOR METHOD

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Abstract:

In low-rise buildings usually shallow foundation types are used. In recent years, raft and strip foundation types are the most widely used among the shallow foundations. In this study, whether an approaching made to foundation type of building was investigated by microtremor method besides ground and building period. For this purpose, microtremor measurements were taken in basement and other floors of the building that ranging between 4-8 floor, foundation type are strip and raft, additionally in natural ground of building. Evaluation of these measurements were made in Geopsy Packaged software. As a result of evaluations depending on the frequency contents; if foundation type is raft, predominant frequency of measurement taken from basement and other floor of the building are approximately the same and different from natural ground predominant frequency were observed. However, if the foundation type is not raft, predominant frequency of measurement taken from basement floor of the building and natural ground are approximately the same and predominant frequency of measurement taken from other floors are similar but different from basement floor of the building were determined. Consequently, by microtremor method is possible to determine whether the foundation type is raft or not beside determining of relationship between ground and building.

Keywords: building, foundation type, microtremor.

COMPARISON OF LABORATORY AND IN-SITU CONCRETE STRENGTH RESULTS

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Abstract:

The aim of the present study is to draw attention to the importance of the concrete strength obtained in-situ. For this purpose respectively Seismic Ultrasonic P wave measurements, Schmidt Hammer Test and Coring were made over the same region of the column. Before making Uniaxial Compression Test of cores, P wave measurements were made determination concrete strength of the existing building. By using P wave arrival time of the applied in the study and distance of the between P wave probs in-situ and laboratory, P wave velocities were determined. Also, Schmidt hammer test was applied in close to each other 5 different points, so an average scale value was obtained. In addition, strength of the cores were determined by using Uniaxial Compressive Strength in the laboratory. P wave velocity which obtained from in-situ and laboratory correlated with concrete strength and correlation coefficient was obtained over %90. Similarly, Correlation coefficient was around %90 in relationship between Schmidt scale value and concrete strength. Also, by using empiricial relationship between concrete strength and P wave velocity from Uyanık et al. (2011), concrete strength was calculated from P wave velocity that obtained in situ and laboratory. Strength of the measured in laboratory and calculated strength are compared and the closest value result of requisite strength was observed that P wave velocity of obtained from in-situ.

Keywords: concrete strength, Seismic Ultrasonic P wave, Schmidt Hammer, Uniaxial compression test.

FLOCCULATION OF WASTE WATER FROM COAL WASHING PLANT BY POLYMERS IN TURKEY

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Abstract:

Fine and ultrafine particles come into existence in consequence of the size reduction operations during the preparation for industrial requirement and causing the environmental problems if not evaluated as raw material. These fines are difficult to separate from the recycled plant water by gravity methods. Some chemicals called polymers are used the size enlargement of fine particles to settle quicker by increasing gravity forces on the flocculated larger particles.

In this study, the flocculation behaviour of waste water from the coal washing plant was investigated. The flocculation tests were performed in the presence of different types of polymers at different polymer dosages. Flocculation time and pH of suspension were also studied. Flocculation of suspensions was ascertained by turbidity (nephelometric turbidity unit, NTU) measurements. After flocculation experiments, the residual turbidity of suspension was measured and the best results at optimum conditions were obtained as 12.3 NTU, 15.1 NTU and 8.9 NTU for A-150 (anionic), FLOC27 AS (anionic) and N-100 (non-ionic) polymers, respectively

Keywords: Flocculation, polymer, waste water, turbidity.

CONTROL OF THE ENERGY FLOW WITH PLC FOR BATTERY SUPPORTED HYBRID GENERATION SYSTEM IN CASE OF A SUPPLYING TO LOCAL AREA

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Abstract:

This study intends to provide the power continuity of wind-solar hybrid power generating system which is set up for lighting the laboratories of the Electrical and Electronic Engineering Department of Technology Faculty in the Afyon Kocatepe University for research and development purposes. Accordingly, a battery group is integrated to this system within the scope of the study for continuous energy. Also, the study proposes to determine and to control the efficiency of the hybrid power generating system .

PLC (Programmable Logic Controller) supported control system is designed in order to efficiently use the production and consumption power of the power generating system which includes wind-solar power and battery.

This controller is supplied dynamically with solar wind energy rather than the battery group. The power continuity is provided by the PLC control system by activating the battery in cases which the demand of the consumer cannot be satisfied with the main power sources, wind and solar power. After a certain charging rate in which there is no more energy requirement, the control system deactivates the battery group in order to prevent unnecessary power consumption. Also, the PLC controller system prolong battery's physical life by preventing the being consistently activated battery group. The units composing the hybrid power generation system; wind turbine, solar panel and battery group have been recorded at 10 second periods subsequently. In this context, instant generated voltage, drawn electrical current and generated power is measured.

In regions which the national grid cannot be reached due to its cost and the region's geographical conditions, the main power requirements such as lightening, irrigation and maintenance of the security camera systems can only be satisfied by off-grid hybrid energy generating systems. As a result of our study, which is conducted in line with this motivation, it is acceptable to assume the applied hybrid power generation system as a model. Concordantly, the system is applicable for the rural areas which are not connected to national grid.

Keywords: Energy flow, hybrid systems, PLC, solar panel, wind turbine.

KINETIC ANALYSIS OF ZN(II) IONS TRANSPORT THROUGH A MULTI DROP LIQUID MEMBRANE CONTAINING DI-(2-ETHYLHEXYL)PHOSPHORIC ACID

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Abstract:

In the near future, the exhaustion of heavy metals from industries will become a more serious problem all over the world. There is a need to economic and technological methods and facilities in matters of purification, seperation and concentration of heavy metals constituted from different sectors that causes environmental problems. Zinc is one of the major component of wastes coming from metallurgical and planting industries.

Solvent extraction process that is one of the techniques for seperation and purification widely used in recovery and seperation of metal ions from aqueous solutions. Nowadays, liquid membrane technique is one of the alternative method of membrane technology that became popular applications has got much more attention. The most popular application of liquid membranes involves the removal and recovery of metal ions from waste water.

In this study, a new method; Multi-Dropped Liquid Membrane (MDLM); which is more practical and more effective than other liquid membrane techniques is used. The advantages of this technique are simple construction, lack of moving parts, lightweight and portable, flexible in operation, high membrane capacity, high separation factor. And this new method reduces operation time, risk of contamination, amounts of reagents used, generated waste.

The present study includes results of the kinetics of Zn(II) ion transport in MDLM containing di-(2-ethylhexyl)phosphoric acid (D2EHPA) as a carrier which flows through aqueous phases. The influences of pH, temperature and phase concentrations were investigated. For the description of relationships of Zn(II) concentration in particular phases with time, a model based on the assumption of consecutive first-order reactions was proposed. The kinetic parameters (k1, k2, Rmmax, tmax, Jdmax, Jamax) were calculated for the interface reactions assuming two consecutive, irreversible first-order reactions. The experiments have demonstrated that D2EHPA derivative is a good carrier for Zn(II) transport through MDLM in the study.

Keywords: Zinc, D2EHPA, extraction, liquid membrane.

THE SYNERGETIC EFFECTS OF PESTICIDES ON SWIMMING PERFORMANCE OF RAINBOW TROUT (ONCORHYNCHUS MYKISS)

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Abstract:

The changes of rainbow trout swimming performance exposed to sub lethal doses of acetochlor and glyphosate pesticide, sole and binary, were investigated. Treatment was designed as 6 groups (0.225 mg/lt, 0.1125 mg/lt sole acetochlor; 43 mg/lt, 21.5 mg/lt sole glyphosate and 21.613 mg/lt, 10.801mg/lt binary acetochlor+glyphosate).

Critical swimming speed, the most important parameter of swimming performance, increased with treatments of pesticide not only sole but also binary, significantly ($p<0.05$).

Keywords: Rainbow trout, swimming performance, toxicity, water pollution.

KINETICS OF FINE DRY GRINDING OF BARITE IN A LABORATORY STEEL BALL MILL

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Abstract:

Grinding is an important industrial operation that is used for the size reduction of materials, production of large surface area and liberation of valuable minerals from their matrices. The kinetics of grinding in ball mills can be analyzed using two major models: the energy-size relationship and the population-balance models. In this study, the population-balance model was used to describe the evolution of the entire size distribution with time in batch grinding. Dry grinding properties of barite specimen, from Huyuk-Turkey, were investigated with the emphasis on a kinetic study in a laboratory steel ball mill. The Si (specific rate of breakage) and Bi,j (primary breakage distribution) values were determined by using the single sized feed fractions of –850+600 μm, –600+425 μm and –425+300 μm.

Keywords: Ball milling, breakage, grinding kinetics, barite.

EFFECT OF MICROWAVE PRETREATMENT ON NICKEL EXTRACTION FROM LATERITIC NICKEL ORE IN HYDROCHLORIC ACID

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Abstract:

In this paper, the leaching conditions of Sivrihisar (Adatepe) limonite type lateritic ore in hydrochloric acid solution were investigated. Leaching experiments were carried out using conventional and microwave-assisted method. Stirring speed, acid concentration, temperature, solid/liquid ratio and particle size of the ore were selected as conventional experimental parameters. All of the microwave-assisted leaching experiments were carried out using pre-heated samples at determined optimum conventional leaching conditions. The samples were treated with different microwave powers (0, 90, 180, 360 and 600 W) and pre-heating time (0, 1, 3, 5, 7, 10, 15 and 20 min). Experimental results demonstrated that microwave-assisted leaching can be applied effectively and efficiently to the nickel extraction from lateritic ore. Consequently, the higher dissolution and the higher Ni recoveries in the microwave-assisted leaching process were obtained in less leach time.

Keywords: Lateritic ore, nickel, leaching, microwave-assisted, hydrochloric acid.

ASSESSMENT OF HEAVY METAL CONTAMINATION IN THE GOLDEN HORN ESTUARY SEDIMENTS, TURKEY

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Abstract:

The Golden Horn is an urban estuary in the hearth of ancient Istanbul, Turkey. Rapid urban growth and uncontrolled industrial development (1950-1985) led to a severe increase in pollution levels of its water and cohesive sediments. The siltation due to liquid and solid waste dumped by two streams caused anaerobic decomposition problems. The last mitigation solution was to bring the Black Sea's clean, but more saline, water into the Golden Horn through the Kağıthane stream which is started at the end of 2012. In order to assess the sediment quality and to highlight the anthropogenic contributions to heavy metal distributions, selected heavy metals in the surficial anoxic sediments were studied before (December-2012) and after (August-2013) the sea water pumped into the Golden Horn. Multiple chemometric approaches, geo-accumulation index and principal component analysis, indicated three different regions characterized by different heavy metal concentrations along the estuary, implying the possible effects of natural and anthropogenic sources. In August 2013, the metal concentrations show slight increments if compared to those measured before the pumping of sea water. The data sets were compared with Interim Sediment Quality Guideline and Probable Effect Level values. The ecotoxicological significance of Pb and Zn also increased at some specific places. Although it is early to evaluate that these findings are caused by the new hydrodynamic regime of the estuary, it is highly possible that flocculation have an impact on the large-scale events such as pollutant transport, deposition, and sedimentation in the estuary. Salinity is one of the main factors affecting the cohesive fine sediment flocculation in water column. Already at moderate salinities, cohesive sediments tend to flocculate if the physical conditions are appropriate. Therefore, considering flocculation of cohesive sediments, sediment quality monitoring in the estuary must be continued regularly.

Keywords: Sediment quality, guidelines, ecological risk, estuaries, heavy metals, enrichment factor, pollution, flocculation.

LOAD FREQUENCY CONTROL BY PID, FUZZY AND FUZZY – PID IN A THREE AREAS POWER SYSTEM

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Abstract:

In this study, problem solution of load – frequency control in a power systems was produced by using PID and Fuzzy logic controllers. Three zones of a power generation system load - frequency control was performed by using PID, Fuzzy and Fuzzy - PID controller. The load and frequency control is achieved in an efficient manner by giving different values to controller gains. PID, Fuzzy and Fuzzy - PID controller is applied to the system respectively by using a single-zone linearized model of power generation systems. Experimental datas were obtained by using PID, Fuzzy and Fuzzy - PID logic methods.

Keywords: Power system, PID control, fuzzy control, load – frequency control.

FIRE BEHAVIOR AND COMPRESSING STRENGTH OF CEMENT BASED COMPOSITES AND CELLULOSIC PANELS PRODUCED FOR THERMAL INSULATION

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Abstract:

This study investigates the compressing strength and fire behavior of cellulosic panels and cement based composites made from barley straw. The experiments were included pre-treatment of the barley straw with acidic solutions of varying concentrations and temperatures for cellulosic panels. Cement, cement + pumice, cement + furnace slag were mixed with the straw at different ratios in order to produce cement based composites. The processing of the panels and composites also included oven heating for periods ranging between two and four hours. The measured thermal conductivities were 0.071 W/mK for cellulosic panels and 0.11 W/mK for cement based composites on the average. According to the ignitability test, EN ISO 11925-2 classification of cellulosic panels and straw-cement based composites were found as B-class. Most of the composites' strength values of which changed within the range of 65 to 1270 kPa, conformed to ASTM and Turkish standards.

Keywords: barley straw, compressing strength, fire behavior.

DETERMINATION OF BACTERIOLOGICAL, PHYSICOCHEMICAL AND MELISSOPALLINOLOGICAL PROPERTIES OF SOME PINE HONEYS IN MUGLA/TURKEY

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Abstract:

Honey samples were collected from producers in Mugla (2012-2013). Total mesophilic, coliform, Bacillus, Paenibacillus larvae, Clostridium sp., Salmonella and Shigella sp. screening has been done to determine the bacteriological contents of samples. Analysis made up to determine physicochemical properties of samples as follows; HMF, humidity, ash, total protein, pH, diastase, total acidity, electrical conductivity, brix, color, invert sugar. Melissopallinological analysis was conducted with 24x24 mm coverslip.

As a result, bacteria count was found in this range; total mesophilic bacteria 1x102-5.75x105 cfu/g, Bacillus sp. 1x102-5.05x105 cfu/g, P. larvae 0.84x102-5.05x105 cfu/g and Clostridium sp. 1x101-0.3x102 cfu/g. Coliform, Salmonella and Shigella sp. wasn't detected in any of samples. Physicochemical analysis results are as follows; HMF 1.97-15.75; humidity 12.1-15.4%; ash 0.14-0.54%; total protein 0.15-0.19%; pH 3.37-4.63; diastase 56.37-75.80; total acidity 21.87-45.88 meq/kg; electrical conductivity 0.48-1.07 mS/cm; brix 82.77-85.83%; color Hunter L 8.95-42.21, a 2.99-5.63, b 3.41-19.64; invert sugar 49.70-63.21%. Pollen diversity 20-27, pollen count 5095-10975 was found with melissopalinological analysis. The seconder pollens in samples were determined as Cruciferae and Leguminosae family and Cistus species.

The findings of this study are an important record for differences in types of bacteria in Turkish pine honey. In addition, contrary to the expectations of our country honeys compared to the world honeys are higher bacterial load. According to the physicochemical properties of processing and storage conditions should be improved. Samples are rich in terms of pollen.

Acknowledgment: The authors would like to thank to the scientific research council of Pamukkale University, Turkey, for the research grant 2012FBE025.

Keywords: Honey, bacteriological, physicochemical, melissopallinological analysis.

CALCIUM CARBONATE PRECIPITATION BY BACILLUS AERIUS STRAIN U2

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Abstract:

Ureolytic bacterial CaCO3 precipitation, one of the bio-mineralization processes, has been a topical subject of research in recent years and this technology has been applied to relevant applications, such as wastewater treatment, and calcareous stone restoration. In this study, impact on the bacterial carbonate precipitation of the initial urea concentration was determined. XRD, TGA and SEM analysis were used for characterization of the calcium carbonate precipitations. Bacillus aerius U2 isolated from river soils in Denizli (Turkey) using at constant temperature (37oC) and pH (6.5) conditions, incubation time (5, 7, 10 and 14th day) and varying amounts of urea concentrations (100, 200, 250, 300, 333 and 350 mM). The obtained results indicate that the amount of calcium carbonate increases together with increasing incubation time, and 300 mM urea concentration. CaCO3 precipitation (calcite and vaterite) was reached up to 100% at 300 mM urea concentration with the increase of incubation time from 5th to 14th day. The maximum amount of carbonate was 1319.84 mg/L in 14th day. Finally, the optimum conditions for precipitation were determined as 300 mM urea and 14th day of incubation time. The greater CaCO3 depositions than optimum conditions were not achievable with higher concentrations of urea (333 and 350 mM).

Acknowledgement: The authors would like to thank the scientific research council of Pamukkale University, Turkey, for research grant 2013FBE017.

Keywords: Bacterial calcium carbonate, XRD, TGA, SEM.

INVESTIGATION OF THE DIFFUSION KINETICS OF BORIDED COLD WORK TOOL STEEL

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Abstract:

In this study, the case properties and diffusion kinetics of cold work tool steel borided in Ekabor-II powder were investigated by conducting a series of experiments at temperatures of 1123, 1223 and 1323K for 2, 4 and 8 h. The boride layer was characterized by optical microscopy, X-ray diffraction technique and micro-Vickers hardness tester. X-ray diffraction analysis of boride layers on the surface of the steels revealed the existence of FeB, Fe2B, CrB and Cr2B compounds.

Depending on the chemical composition of substrates and boriding time, the boride layer thickness on the surface of the steel ranged from 13.54 μm and 164.42 μm. The hardness of the boride compounds formed on the surface of the steels ranged from 1672 to 2118 HV0,05, whereas Vickers hardness values of the untreated the steels was 584 HV0,05. The activation energies (Q) of the borided steel were 180.359 kJ/mol. The growth kinetics of the boride layers forming on the cold work tool steel and the thickness of boride layers were also investigated.

Keywords: Cold work tool steel, boride layer, micro-hardness, kinetics, activation energy.

POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) IN SEDIMENT AS MARKERS OF CONTAMINATION SOURCES IN THE SEA OF MARMARA, TURKEY

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Abstract:

Distribution and sources of polycyclic aromatic hydrocarbons (PAHs) were evaluated in the surficial sediments from Sea of Marmara, Turkey. The samples were extracted by organic solvents and analyzed by gas chromatography-mass selective detector. The results showed that the total concentrations of 13 USEPA priority PAHs in the sediment samples varied from 4.16 to 997.6 ng/g dry weight, with a mean concentration of 317.6 ng/g. The sedimentological properties have been found effective on the accumulation of PAHs. Molecular ratios and principal component analysis (PCA) were used to characterize the possible pollution sources. The pyrogenic activities of industrial waste water discharges, fuel oil spillage from ships and vehicles, biomass and coal combustion are the main sources of PAHs along the coastal areas of the Sea of Marmara. If compared with the several effect-based sediment quality quidelines, the individual PAH concentrations observed were below the Effects Range Low (ERL) and Effects Range Median (ERM) values, implying there is no potential biological impact on the benthic organisms living in the Sea of Marmara.

Keywords: Polycyclic aromatic hydrocarbons (PAHs), marine sediments, sea of Marmara, sediment quality, quidelines.

EFFECT OF FISH MANURE AND NITROGEN FERTILIZATION ON GROWTH AND YIELD OF RADISH (RAPHANUS SATIVUS)

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Abstract:

The use of fertilizers, including chemical fertilizers and manures, to enhance soil fertility and crop productivity has often negatively affected the complex system of the biogeochemical cycles. Therefore, interest has grown in environmentally sustainable and organic agricultural practices. One possible solution to this agro-environmental problem is integrated nutrient management systems that supplement chemical fertilizers with biofertilizers. The use of fish manure could be an important alternative for recycling this organic waste, reducing the direct risks of water pollution from the fish farming industry. Present experiment was designed to determine the response of various dozes of fish manure and ammonium nitrate fertilizers on plant growth, yield and nutrient content of radish. The study was conducted under greenhouse conditions at Atatürk University, Faculty of Agriculture, and Department of Horticulture in 2013. The treatments consisted of fish manure, commercial fertilizer and the combination of fish manure and commercial fertilizer with three dozes nitrogen (0 kg/ha, 100 kg/ha, 150 kg/ha and 200 kg/ha). The results of the study showed that treatments significantly affected the leaf area, root diameter, root length, plant weight, root fresh and dry weight of radish. The best results in regard to plant growth and yield were obtained from 100 and 150 kg/ha nitrogen dozes of the combination of fish manure and commercial fertilizer.

Keywords: Fish manure, nitrogen, growth, yield, radish.

H-AGGREGATES OF PYRONIN Y IN AQUEOUS SOLUTION CONTAINING GRAPHENE OXIDE SHEETS

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Abstract:

Graphene oxide (GO) sheets form a highly stable colloidal dispersion due to its oxygenated functional groups when it is dispersed in aqueous solution. GO sheets is negatively charged in aqueous solution. The interaction of dye with GO sheets in aqueous solution is a significant factor for dye aggregation. In this regard, positively charged dyes interact easily with GO sheets in aqueous solution via both π-π stacking and electrostatic interactions. In this regard, cationic Pyronin Y (PyY) molecules are quickly adsorbed on GO sheets in the aqueous dispersion. The various GO/PyY ratios, which are stable for months, are prepared by mixing the dye and GO in aqueous solution. Transition dipole-dipole interaction between the adsorbed dye molecules on GO sheet causes to form H-aggregates of the dye at dilute concentration [1]. H-aggregates of PyY is characterized by spectroscopic techniques (UV–Vis, steady-state and time-resolved fluorescence spectroscopies). Spectroscopic studies reveals that the amount of GO sheets in aqueous dispersion plays a significant role in H-aggregation of PyY. The critical amount of GO for in aqueous solution is determined to be 17.0 mg/L. H–aggregates of PyY on GO sheets are formed with increasing dye concentration. The presence of H-aggregates decreases the quantum yield and fluorescence lifetime of PyY.

Keywords: Graphene oxide, Pyronin, graphene oxide sheets.

SYNTHESIS AND CHARACTERIZATION OF CARBON NANOTUBE SUPPORTED PDAU FORMIC ACID ELECTROOXIDATION ANODE CATALYSTS

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Abstract:

Direct formic acid fuel cells (DFAFCs) have recently attracted tremendous research interest as potential power sources due to its higher energy density, excellent stability, less toxicity, and lower crossover through nafion membrane compared to alcohols. Pd catalysts exhibit superior performances for the formic acid electrooxidation (FAEO). FAEO mainly proceed through a direct dehydrogenation reaction mechanism on Pd catalyst to form CO2 with less poisoning species generated. To improve the FAEO activity of Pd catalysts, Pd based materials such as Pd-Au, Pd-Pt, Pd-V, Pd-Mo, Pd-W, Pd-Ni, Pd-Mn, Pd-Fe, Pd-Ir, and Pd-Co have been employed for FAEO .

Palladium (Pd) and palladium-gold (Pd-Au) nano particles supported on carbon nano tubes are prepared by a sodium boro hydride reduction method. PdAu/CNT catalyst was prepared with varying Pd:Au atomic ratios and these catalysts are characterized by surdace characterization techniques. Bi metallic Pd-Au/CNT and mono metallic Pd/CNT catalysts tested for formic acid (HCOOH) electro oxidation in 0,5 M H2SO4 + 1 M HCOOH electrolyte. The electro catalytic activity of these electro catalysts was investigated using cyclic voltammograms (CV), chronoamperometry (CA), and electrochemical impedance spectroscopy (EIS). The PdAu/CNT catalyst is found to have a higher electro catalytic activity for formic acid oxidation than Pd/CNT catalyst, indicating that the addition of Au to Pd/CNT improved the oxidation activity of the formic acid. In addition, CV show that PdAu/CNT catalyst at Pd:Au (07:03) atomic ratio present significantly high current formic acid oxidation compared to the PdAu and Pd catalysts. Moreover, chronoamperometric measurements showed that the steady-state current of Pd:Au (07:03) catalyst was also higher than other electro-catalysts. As a result, electro catalytic activity measurements indicated that the Pd07Au03 catalyst was the most active electrode for formic acid electro oxidation.

Keywords: Pd, PdAu, nanocatalysts, formic acid, fuel cells.

ENHANCED FORMIC ACID ELECTROOXIDATION ACTIVITY OF CARBON NANOTUBE SUPPORTED COAUPD CATALYSTS

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Abstract:

Formic acid (FA, HCOOH) is a promising alternative fuel due to its higher energy density, excellent stability, less toxicity, and lower crossover through nafion membrane than CH3OH. Pd catalysts exhibit superior performances for the formic acid electrooxidation (FAEO) compared with Pt catalysts because FAEO mainly proceed through a direct dehydrogenation reaction mechanism on Pd catalyst to form CO2 with less poisoning species generated. Pd and Pd-based materials have attracted a lot of attention due to their superior catalytic activities on FAEO. Wang and co-workers reported that CoAuPd nano alloy is very efficient catalyst for FA dehydrogenation. CoAuPd with the lower consumption of noble metals exhibits the 100% H2 selectivity, highest activity, and excellent stability toward H2 generation. As mentioned earlier, FAEO proceeds through formic acid dehyrogenation on anode catalyst. At present, Carbon nanotube (CNT) supported CoAuPd ternary catalysts were synthesized at different Co:Au:Pd atomic ratios by sodium borohydride reduction under argon atmosphere. The electrocatalytic activity of these ternary catalysts were measured by cyclic voltammetry and chronoamperometry techniques. These catalysts were characterized by x-ray diffraction method. As a result of cyclic voltammetry and chronoamperometry tests, CoAuPd catalyst increases the activity of formic acid electrooxidation. The results of electrochemical tests prove that the Pd0.6Au0.3Co0.1 /CNTs catalysts exhibit highest electro-catalytic activity and stability.

Keywords: CoAuPd, formic acid electrooxidation, formic acid, fuel cells.

EXOPOLYSACCARIDE PRODUCTION POTENTIAL OF BACILLUS PSEUDOMYCOIDES STRAIN T1-11 IN MOLASSES MEDIUM

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Abstract:

In this study, we aimed that determination of the effect of molasses, which is an industrial waste and used as animal food, on bacterial carbohydrate production. We investigated the effect of molasses concentrations pH and temperature on total carbohydrate or exopolysaccaride (EPS) production of strain T1-11. The samples were drawn at regular time intervals (every 12 h), and analyzed for their total carbohydrate content with phenol–sulfuric acid method. Firstly, to determine the maximum EPS production medium 0.5, 1.0, 1.5 and 2.0 ml molasses solution was added per 100 milliliter and these experiments were carried out at pH 7.0 and 37 °C for strain T1-11 based on the optimal growth data. In generally, EPS production in 2:100 molasses media was higher than other concentrations. The EPS production of B. pseudomycoides was 16.23, 26.80, 74.91 and 208.67 mg/L at 36th hours of incubation in 0.5, 1.0, 1.5 and 2.0 ml molasses containing solution respectively. Therefore, we used 2.0 ml molasses concentration for further experiments. Then, to found a suitable pH value for EPS production, pH 6.5, 7.0, 7.5, 8.0 and 9.0 were initially tested. It was observed that B. pseudomycoides product EPS at different amounts in all tested pH values. Nevertheless, the maximum production was obtained at pH 7.5 (453.74 mg/L at 36th hours) and pH 8.0 (334,07 mg/L at 120th hours). Finally, we tested different temperature (25, 30, 37 and 45 °C) on EPS production of the strain at pH 7.5 and 8.0. According to results, maximum EPS production was occurred at 37 °C (453.74 mg/L at 36th hours).

Acknowledgments

The authors would like to thank the scientific research council of Pamukkale University, Turkey (2014FBE036).

Keywords: EPS, molasses, optimum condition.

OPTIMIZATION OF CRYOPRESERVATION OF NEOCHOLORIS TEXENSIS UNDER AXENIC AND NON AXENIC CULTURE CONDITIONS

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Abstract:

Serial sub-culture has always been the principle method for maintaining the cultures of Ege-MACC, but this technique is time consuming, material and human resources demanding, involves the risk of strain loss and could potentially lead to genetic changes over time. The process of stabilizing biological materials at cryogenic temperatures is called cryopreservation, a practical application of cryobiology, or the study of life at low temperatures. Most culturable cyanobacteria and microalgae can be cryopreserved with relatively high viability. Furthermore, many freshwater and marine eukaryotic algae can also be cryopreserved, but typically with lower post-thaw viability levels. Cryopreserved cultures are not required to be axenic, but non-axenic cultures often have a greater risk of major contamination after rewarming, since many kinds of bacteria survive cryopreservation and will grow on the medium nutrients and those released by algae that do not survive the cryopreservation procedures.

The aim of this study was to determine the cell viability differences between axenic and non-axenic N. texensis culture after cryopreservation protochols. Axenic and non- axenic N. texensis were cultured in 200 mL sterik T-flask, containing 100 mL Bold Basal medium under the light intensity of 20 µmol E m−2 s−1 at 22 ± 2 °C until the end of log phase of the growth curve. Growth curves and specific growth rates of the cells was obtained from daily cell counting and optical density measurements results. After the production biomass, the cultures were centrifuged and cells were washed with fresh medium. 1 mL, (about 2x105 cells/ml of cell concentration) of axenic and non axenic cell suspantions were incubated with two different glycerol, dimethylsulfoxide and ethanol concentrations (5-10%), for 30 min at -20ºC, and placed in liquid nitrogen for different time periods. According to growth rate results, axenic culture had a lower growth rate and was growing more slowly. Studies about thawing of frozen cells and cell viability measurements after cryopreservation is still going on.

Acknowledgment

This study is supported by TUBITAK project 113Z202 - 'Determination and Optimization of Appropriate Cryopreservation Methods of Microalgae and Cyanobacteria '.

Keywords: Cryopreservation, N. texensis, microalgae.

CAUSES AND REASONS OF SOIL DEGRADATION PROBLEMS IN TURKEY

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Abstract:

Improper use of soil resources leads soil degradation which causes declines in soil quality. Therefore, use of soil resources without leading soil degradation is extremely important for sustainability. As in many parts of the World, soils of Turkey are also severely degraded mainly because of soil erosion, compaction, crusting, acidification, salinization, alkalization, organic matter loss, fertility decline and contamination. Moreover, surface sealing recently became the most threatened degradation factor because of increasing pressures by industrial developments, population growth and urbanization. The most important soil degradation type is water and wind erosion which effects about 4/5th of the whole country. The main goal of this paper is to define causes and reasons for severity of soil degradation problems in Turkey under natural and anthropogenic factors; complexity in climatic conditions; unfavorable soil conditions, broken and improper topographical features, misuse of land, technical problems, and administrative and legal causes. It is also aimed to discuss main soil degradation types in Turkey, and to make suggestions for combating soil degradation under the principles of sustainable soil management practices.

Keywords: Soil degradation, sustainable soil management, Turkish soils.

LOCAL FORAGE ECOTYPES AND THEIR IMPORTANCE IN TURKEY

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Abstract:

Local ecotypes represent the genetic diversity of a country together with wild species. However, with the development of high yielding bred cultivars local species have lost their significance and have faced extinction threat in many regions all over the world. This threat is so big that today local ecotypes of several vitally important plants, such as wheat, are beginning to disappear. Although not convenient for the modern agriculture, local ecotypes are of importance for being breeding materials since their genetic variations are diverse. Turkey is a rich country in the number of forage ecotypes. Cultivation history of especially alfalfa, common vetch, sainfoin, forage pea, chickling vetch and bitter vetch dates back to very ancient times. However, these genotypes are facing to extinct today and their importance has begun to be realized in the respect of sustainable and organic crop yielding as well as due to the increased global warming and water shortage threats. This paper was prepared to summarize some information about local forage ecotypes in Turkey and to mention about their importance.

Keywords: Forage crops, local ecotypes, legume crops, alfalfa.

THE EFFECT OF ENVIRONMENTAL CONDITIONS ON EXOPOLYSACCARIDE PRODUCTION OF BACILLUS LICHENIFORMIS STRAIN B18 IN MOLASSES MEDIUM

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Abstract:

In the present study, the bacterial exopolysaccharide production in molasses medium, which is an industrial waste and used as animal food was optimized. For this purpose, we used thermo-tolerant Bacillus licheniformis B18 isolated from Pamukkale and investigated the effect of molasses concentrations, pH and temperature. The total carbohydrate contents of samples were analyzed at regular time intervals (every 12 h), with phenol–sulfuric acid method. Firstly, to determine the maximum EPS production medium 0.5, 1.0, 1.5 and 2.0 ml molasses solution was added per 100 milliliter and these experiments were carried out at pH 7.0 and 40°C. In generally, maximum EPS production was observed in 2:100 molasses medium. The EPS production of strain B18 was 39.01, 192.80, 254.4 and 295.9 mg/L at 24th hours of incubation in 0.5, 1.0, 1.5 and 2.0 ml molasses, respectively. Therefore, 2.0 ml molasses medium was used for further experiments. Then, to determining of effect of pH, pH 6.5, 7.0, 7.5, 8.0 and 9.0 were tested to found optimal pH value for the maximum EPS production by B18 cells. In all tested pH values, B. licheniformis B18 was produced good EPS at different amounts. However, the maximum EPS production was obtained at pH 7.0 (635.62 mg/L at 60th hours) and pH 8.0 (556.02 mg/L at 48th hours). Finally, the effect of different temperature (40, 45, 50 and 55 °C) on EPS production was investigated at pH 7.0 and 8.0. According results, maximum yield was occurred at 45 °C, pH 8.0 (649.82 mg/L at 72nd hours and 702.4 mg/L at 96th hours).

Acknowledgments

We would like to thank the scientific research council of Pamukkale University (2014FBE037).

Keywords: Bacterial EPS, molasses, bacillus.

PRODUCTION OF AL BASED B4C REINFORCED FOAMABLE COMPOSITE MATERIALS AND INVESTIGATION OF THEIR MECHANICAL PROPERTIES

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Abstract:

In this study, foamable composite materials were produced by powder metallurgy method. Experimental study, 1 wt. % foaming agent (TiH2) and 7 wt.% Si with aluminum powder was mixed. Then mixed powders were pressed, extruded and rolled for the production of foamable materials. According to the experimental results, the secondary operations on foamable materials were increased relative density and over 98% relative density were obtained. In addition the tensile strength of the composites increased with increase in the rate of B4C.

Keywords: Foamable material, mechanical properties, B4C, Aluminum.

COMPARISON OF ENERGY AND EXERGY EFFICIENCY OF THE REFRIGERANTS INSTEAD OF R22 IN AIR-TO-AIR HEAT PUMPS

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Abstract:

The refrigerants instead of R22 limited usage due to the harmful effects of greenhouse and ozone layer has important area in the literature. The objective of this study is to investigate the usage of alternative refrigerants (R134a, R407C, R404A) instead of limited usage R22 and their performance in heat pump systems. It is investigated experimentally the effects of evaporator air inlet temperature(from 24 0C to 32 0C),evaporator air mass flow rate (from 0,58 kg/s to 0,74 kg/s),condenser air inlet temperature(from 24 0C to 32 0C), evaporator air mass flow rate(from 0,57 to 0,73 kg/sn) on the coefficient of performance and exergetic efficiency values of vapor compression heat-pump systems. The set up comprised of an air-to-air vapor compression heat pump, a scroll compressor, plate-fin air-cooled condenser, thermostatic expansion valve, a plate-fin air-cooled evaporator, electrical air heater in order to keep the air temperature passing into the evaporator and condenser at the desired level. As results, it was found that R134a has the highest COP values and R404A the lowest COP values at similar operating conditions at the heat pump system designed for R22. The COP values for R407C are found to be nearly equal to the COP values for R22 but a little less. The results show that these refrigerants can be used at the heat pump systems designed for R22.

Keywords: Alternative refrigerant; R22, heat pump, COP.

EFFECTS OF CADMIUM ON METALLOTHIONEIN GENE EXPRESSION AND MINERAL ELEMENTS UPTAKE IN TOMATO (*LYCOPERSICON ESCULENTUM*)

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Abstract:

Cadmium is one of the most toxic heavy metal and important environmental pollutants. It is a non-essential element that affects plant growth and development. Plants have evolved different mechanisms to minimize its harmful effects. Metallothioneins (MT) are low molecular weight proteins that bind metal ions. MT genes can be induced by various heavy metals and they are expressed high levels in tissues. The accumulation of Cd in plants may cause several physiological, biochemical and structural changes such as alteration in mineral elements uptake. The goal of the present study is to determine the MT gene expression, Cd accumulation and mineral elements uptake in different tissues of tomato exposed to cadmium.

Tomato seedlings were grown in pots under the greenhouse conditions. Total RNA were extracted by using Plant RNA isolation Kit (Biobasic). cDNA synthesis and real time PCR was performed QuantiTect SYBR Green RT-PCR protocols (Qiagen). The contents of Cd and mineral elements in dry matter were quantified using ICP-MS.

Cadmium induced MT gene expression in all plant tissues. The induction was seen in all treatment groups and the highest MT response was detected in leaves of tomato. Expression level in ripening fruits was low as compared to roots and leaves. Binding of heavy metals to MTs protects plant from metal stress. The present results indicate that MTs was stimulated by cadmium uptake.

Cd content increased in all treatment groups. The highest Cd level was determined in roots, followed by leaves and fruits. Cadmium affected the levels of mineral elements in plant, differently. Unlike the amount of Fe, Ca decreased depending on the increasing of Cd doses in leaves. Mg, Ca, Fe contents increased, whereas Mn content decreased in fruits. Cd show synergistic or antagonistic effects on the mineral accumulation in plant, depending on its amount and type of tissue.

Keywords: Cadmium, gene expression, metallothionein, mineral uptake.

KINETIC STUDY OF CD2+ IONS THROUGH A MDLM SYSTEM USING TNOA AS A MOBILE CARRIER

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Abstract:

Cadmium, with numerous industrial applications is commonly present in industrial waste waters that contaminate environments. As a toxicant, biological, non-essential, an environmental pollutant and an occupational hazard in industry, it is very significant. Cadmium unveils human health to fatal dangers by inciting cancer, kidney damage, mucous membrane destruction, vomiting, diarrhea, and bone damage and also influence the generation of progesterone and testosterone. Instantaneous hypertension, shortening of life span; kidney damage, bronchitis, retardation of growth, gross abnormalities of the vital organs and the risk of prostatic cancer are the signs of cadmium poisons. Hence, for environment and economy, removal of cadmium from industrial sources and waste waters is significant.

The transport of Cd2+ ions through MDLM containing TNOA in kerosene as mobile carrier and protons as counter ions in the acceptor phase (ammonium acetate) was studied. The motivation of this work is to compare the efficiency of the recovery process in the case of Cd2+ using extractant TNOA that can form complexes with the cations Cd2+ or the anions $CdCl_3^-$ and $CdCl_4^{2-}$, respectively. The maximal Cd2+ recovery factors obtained in 205 min. is 99.52% with TNOA. The transport kinetics were analysed by means of a kinetic model involving two consecutive irreversible first order reactions. The apparent extraction activation energies were found to be 17.07 kcal/mol for TNOA, respectively. The value of calculating activation energy indicates that the process is chemically controlled by Cd2+ ions. The study demonstrates the applicability of the present hydrometallurgical approach for the treatment of hazardous waste, the spent Cd2+ ions.

Acknowledgements: This research project was financially supported by Pamukkale University as a Scientific Research Project (Project No: BAP 2011 FBE 072).

Keywords: Cadmium, TNOA, extraction, liquid membrane.

NON-ENZYMATIC H2O2 SENSOR BASED ON PTAU/C CATALYSTS

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Abstract:

The detection of H2O2 is an important feature in clinical, food, pharmaceutical and environmental fields. Several analytical procedures have been reported for detection of H2O2 including chromatography, spectrophotometry, and fluorescence. However, these methods have some disadvantages such as high costs, long analysis times. On the other hand, electrochemical methods have attracted great interest because of their simplicity, rapidness and high sensitivity. Early studies of H2O2 sensors involved the use of immobilized enzymes but nowadays to reduce the possibility of enzyme denaturation, non-enzymatic sensors based on metals are widely used to overcome this problem.

Many recent research studies have focused on the development of nanoparticles for sensor applications. Nanoparticles play an important role in improving sensor performances, due to their high active surface areas, improved selectivity and catalytic activity. The substrates for supporting metal nanoparticles have a considerable influence on their size and distribution and response characteristics. Carbon materials have unique properties that include high surface areas, and high electrical conductivities, make them attractive supports for catalysis.

In this study, we described the synthesis, characterization of PtAu/C bimetallic cataysts at different atomic ratios and demonstrated their electrocatalytic activities towards the detection of H2O2. Catalysts are synthesized by a microwave assisted polyol process. Transmission electron microscopy (TEM), (XPS), and X-ray diffraction (XRD) techniques were used to characterize the morphology of the catalysts. Electroanalytical methods such as cyclic voltammetry and chronoamperometry were used to evaluate the catalytic activities of the prepared electrodes towards H2O2 electro-oxidation. The sensitivity of the PtAu sensors to the oxidation of H2O2 was investigated, and the interference from ascorbic acid and uric acid was also evaluated. The electrochemical measurements showed that Pt5Au5/C catalyst exhibited high electrocatalytic activity toward the oxidation of H2O2. Therefore, Pt5Au5/C could have potential usage for non-enzymatic H2O2 sensors.

Keywords: Non-enzymatic sensor, hydrogen peroxide detection.

ELECTROCHEMICAL DETECTION OF HYDROGEN PEROXIDE BASED ON PT–MNO2/C NANOCOMPOSITE

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Abstract:

Electrochemical biosensors play essential roles in clinical diagnostics, industrial process control, environmental and food industry due to their high sensitivity and selectivity, excellent reproducibility, and fast response.

In recent years, intense interest has been paid to various nanoparticles such as carbon, metal and metal oxides since they exhibit improved mechanical and electronic properties. Metal oxides have some advantages such as high electron communication features and chemical stability but unsupported metal oxide catalysts have very low surface areas. Therefore, the combination of metals and metal oxides with carbon support will lead to new materials holding the properties of each component, which have been applied in the construction of biosensors. Recent studies have been concentrated on the preparation of carbon-based nanostructures by modification of carbon with metals such as Ag, Au and Pt or metal oxides such as NiO, CuO, MnO2, Cu2O and Co3O4. Among all the metal oxides, MnO2 is an attractive inorganic material because of its low cost and high molecular adsorption ability and non-toxicity compared to other metal oxides such as cobalt, nickel and vanadium. However, MnO2 has poor electrical conductivity and thus become less sensitive in electrochemical analysis. Therefore, MnO2 has to be modified to increase the conductivity.

In this study, carbon supported platinum based MnO2 (Pt-MnO2 /C) nanocomposite was synthesized for electrochemical detection of hydrogen peroxide. The characterization of catalysts was evaluated by transmission electron microscopy, X-ray photoelectron spectroscopy, and X-ray diffraction techniques. Electrochemical performance of hydrogen peroxide sensor has been studied by cyclic voltammetry and chronoamperometry. The results show that Pt-MnO2/C sensor has high electrocatalytic activity and sensitivity, fast response time, good reproducibility, stability, and selectivity, indicating that the prepared Pt-MnO2/C nanocomposite have to be great potential in electrochemical detection.

Keywords: Pt, MnO, nanocomposite, hydrogen peroxide, sensor.

ASTRONOMICAL ASPECTS OF THE CULT PRACTICE OF THE PEAK SANCTUARY KOKINO

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Abstract:

The latest astronomical research of the site known as "Tatichev Kamen" (or peak sanctuary Kokino) casts light on the cult practice of the local population of the Bronze Age in this region in Northeast Macedonia.

The newly-discovered astronomic platform has been used to observe the heliacal appearance of the star Aldebaran in a period of approximately 500 years, as well as the sunrise at the equinox. In 21 century BC, Aldebaran has been much nearer to the point of equinox. Therefore, the stone notch that marked the spring equinox has been used in the same time as a marker for the heliacal rising of Aldebaran, an event which has happened two months after the spring equinox. In the morning of the heliacal rising of the star, the appearance of the sun on the "common marker" has been visible from the platform with the stone thrones.

In this article we express the view that the period from the spring equinox to the appearance of the Sun at the "common marker" (from the platform with the thrones) is a period in which, even nowadays, according to the local culture and folklore tradition, the local population celebrates different holidays which still encapsulate visible elements from pagan cults. Those are folklore customs related to the celebrations of the so-called Agrarian and Stock Breeding New Year, as well as holidays related to the cosmological concepts of the Bronze Age people in the region.

Keywords: Archaeoastronomy, solar calendars, stone markers, heliacal rising.

MATHEMATICAL MODEL TO INCREASE THE SOUND ABSORPTION ABILITY OF TEXTILE FLOOR COVERINGS

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Abstract:

Nowadays we spend the most of our time in loud and noisy environments and tend to underestimate the health risk a loud soundscape might become. We spend half our lives in classrooms and open-plan offices, where many people work and talk with each other. This creates a high room noise which can be counteracted with sound absorbing measures during furnishing. Due to their large surface, textile floor coverings are a space saving method to increase the sound quality in a noisy room.

The absorption quality of textile floor coverings is measured in a reverberation room. In which the amount of absorbed sound energy for different frequencies is determined. The sound absorption rate is highly frequency dependent. To be able to compare the sound absorption the weighted sound absorption coefficient is used. The weighted sound absorption coefficient is determined according to BS EN ISO 11654 from the measured absorption values at 250 Hz - 4000 Hz.

To be able to predict the sound absorption quality of textile floor coverings, the influence of the construction parameters of carpets on their acoustic properties have been tested.

Sound absorption of a carpet can be sub-divided into absorption by porous absorber and absorption by resonance absorber. The former absorbs higher frequencies whereas the latter addresses the lower. High-frequency-absorption is already satisfyingly achieved, though there are certain deficiencies concerning the low-frequency-absorption.

The resonance absorber can be seen as a mass-spring system. The effects of variation of the flexibility of the textile support, acting as a spring, and the mass of the sizing and pile are examined. From this analysis a mathematical model is developed to predict the weight absorption based on the construction parameters. With this model it is possible to specifically influence the resonance absorption frequency and thus get textile floor covering with better sound absorbing properties.

Keywords: Technical textiles, modelling.

EVALUATION OF GRAVITY AND MAGNETIC IMPRINTS OF THE EASTERN ANATOLIAN COLLISION ZONE

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Abstract:

Gravity and aeromagnetic analysis have been processed in the Eastern Anatolian Collision Zone (EACZ), in order to explain the crustal structure beneath the region. These processes include a boundary analysis of causative structures from both gravity and magnetic data, depth estimation from spectral analysis of the anomalies and 2D crustal modeling by using the Talwani technique. In consequence of gravity and magnetic analysis, the region can be divided to four subregions of different tectonic characters. These are the Arabian foreland, Bitlis-Pötürge Suture Zone (BPSZ), high magnetized body and the Anatolian Block. Transition zone between the BPSZ and the high magnetized body is correlated by the East Anatolian Fault Zone (EAFZ) which has intense tectonic activity. An average crustal thickness has been calculated as 44 km from the power spectrum of the gravity data. The constructed model shows a thinner lithospheric mantle to the north of the study area. This shallowing of the thickness of the lithosphere could be related with the break-off of a northward subducted slab of the Arabian plate under Eurasia as suggested previously.

Keywords: crustal modelling, depth estimation, Eastern Anatolian Collision Zone.

IS PLANT GROWTH PROMOTING RHIZOBACTERIA AN ALTERNATIVE TO MINERAL PHOSPHORUS FERTILIZER IN PEA SEED PRODUCTION?

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Abstract:

The interest in the usage of biofertilizer as alternative to mineral fertilizer increase continuously due to increasing mineral fertilizer cost and heavy metal accumulation in the soil such as cadmium. The objective of this study was to assess the effects of four biofertilizer (N2-fixing (NF), P-solibilizing (PS), N2 fixing-P solubilizing (NF+PS), commercial biofertilizer (CB) with and without mineral phosphorus fertilizer on seed yield forage pea (Pisum sativum spp. arvense L.) The application of biofertilizer did not affect seed yield, biological yield, crude protein content and SPAD value. The use of mineral fertilizer only increased seed crude protein content. The effects of biofertilizer on pea seed yield, biological yield and crude protein content varied significantly depending on year. These results indicated that understanding of factors such as biofertilizer, mineral fertilizer and environment will enable us to use biofertilizer as an alternative to mineral fertilizer to optimize productivity and sustainability of pea production.

Keywords: biofertilizer, mineral fertilizer, phosphorus, seed yield, pea.

INPUT AND OUTPUT MATCHING CIRCUITS DESIGN FOR LOW NOISE AMPLIFIERS BY USING TAPERED MICROSTRIP LINES

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Abstract:

This paper presents a new design method of impedance matching circuits for a 8-18 Ghz ultra wideband low noise amplifier. Design of Low Noise Amplifier (LNA) is an important part of electronics engineering. Microstrip lines are widely used in microwave engineering due to its size and bandwith. In this study tapered microstrip lines are used as Input Matching Circuit (IMC) and Output Matching Circuit (OMC) for low noise amplifier. In the design phase , firstly the potential performance characteristics of active element in the amplifier are obtained to form the target of the optimization then microstrip line conductor widths (W1 and W2) and microstrip line length (L) are optimized in both IMC and OMC.

Keywords: Matching Circuits, Tapered Microstrip Lines, LNA.

DISTRUBUTION OF ANTIBIOTIC AND ANTISEPIC RESISTANCE GENES IN ISOLATED STAHPYLOCOCCI FROM BOVINE MASTITIS

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Abstract:

The resistance to antimicrobial agents is an important problem in veterinary area. The increasing of antibacterial resistance in Staphylococci, especially methicillin resistance, is a serious problem in the treatment and control of staphylococcal infections. In this study was aimed to detection of the antibiotic resistance genes and antiseptic resistance genes in staphylococci obtained from bovine subclinical mastitis in three different regions (Burdur, Hatay and Van) in Turkey. Totally 283 isolates (Burdur 36 isolates, Hatay 47 isolates and Van 200 isolates) were studied. The resistance genes were detected by simplex PCR.

As a conclusion, distributions of antibiotic and antiseptic resistance genes were determined with different proportions. The presence of these genes and transmission among strains may pose a risk for treatment mastitis and public health. The determination of the resistance genes and a constant monitoring of their distribution will be beneficial for development of therapy and prevention strategies.

Keywords: Bovine mastitis, resistance genes, Staphyloccocci.

RESEARCH DATA MANAGEMENT SYSTEM PROPOSAL HAVING CONFIDENTIALITY AND PRIVACY

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Abstract:

Research data sets are collected during research projects all around the world. The value of research data sets continues to exist also after the projects. It is important to keep them available to be used for further researches. However, there are practical, legal and ethical issues in archiving and sharing this research data. There should be mechanisms by which researchers can share scientific data while preserving data privacy and confidentiality. In this paper, a web based research data management system is proposed where researchers can upload and share their research data. A web interface with the user authentication is generated as a prototype. The user will be able to upload the research data, and can specify which fields to be anonymized. CryptDB is used to keep the specified database fields encrypted to provide privacy and confidentiality. The user password for logging in the system is used to create the encryption/decryption key. The platform will also provide services that researchers can share their research data while preserving the privacy of the data. The modules will include privacy tests like k-anonymity. Research data can be shared fully or partially between researchers. It is aimed to provide data summarization and statistical methods as services to the users. These services can also be used to create subsets of the research data. Surveillance, Epidemiology, and End Results Program (SEER) research data will be used as the test data source in this work. Implementation details, performance issues and recommendations will be given in the paper.

Keywords: Confidentiality, data privacy, encryption, privacy test, research data management.

USING BASE ALGORITHMS COMBINATORIALLY IN ADABOOST ENSEMBLE FOR INTRUSION DETECTION

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Abstract:

With the increased bandwidth thereby wider usage of the Internet, the risk of attacks has raised dramatically. To prevent these attacks, intrusion detection tools are being used. Conventional intrusion detection tools are signature-based which can detect only known type of attacks. The aim of the researchers, who are developing machine learning based intrusion detection methods, is to the previously unknown attacks.

The main objective of this study is to use an ensemble method for intrusion detection. This ensemble method, unlike other similar methods, combines the multiple prediction models of different base classification algorithms.

As a methodological approach, we run experiments by combining several combinations of different base classification algorithms in ensemble method. We used 5 different algorithms that produced 15 different combinations. KDD99 dataset, which is a widely used dataset for intrusion detection studies, is used in the experiments. We trained our ensemble methods with 2%, 10% and 14% of KDD99 dataset which produced 45 different experiments. In every experiment we assigned a label to each row of KDD99 testing dataset and measured accuracy of each label as metric. KDD99 dataset contains 5 different labels and at the end we calculated 225 metric values.

We found that;

For Normal, Probe, DoS, and U2R labeled traffic 10% of dataset is used for training for the best results and this value is 14% for R2L labeled traffic respectively. Probe, U2R, and R2L labeled traffic are detected with highest accuracy by Naïve Bayes. For the other labels:

- Normal labeled traffic is detected with the highest accuracy by the combination of random forest, stochastic gradient descent and Naïve Bayes,
- DoS labeled traffic is detected with the highest accuracy by support vector machines, random forest and stochastic gradient descent.

Keywords: Adaboost, ensemble, intrusion detection.

PLANTS USED FOR FOLK MEDICINE IN THE PLATEAU GOLLER (ADANA-TURKEY) AND CLOSE VILLAGES

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Abstract:

This research has been made by meeting with people who lives in the plateau Göller of Kozan of Adana and close villages. In this research, we interviewed with seasonal and perpetual residents by face to face quastionnaires and essential datas of the study were collected belonging to the questions in the questionnaries.

Towards these informations, which parts of the medicinal plants were used by preparing what kind of methods (decoction, infusion, crush, mash or ointment, dried or fresh form) and which plants were used for what kind of treatments were noted. The natural plants, that were used, were collected by obeying the rules. Herbarium materials were prepared and the scientific definitons were done.

In this ongoing study, 25 taxa belonging to 16 families have been defined. 2 of these medicinal plants belong to fern (Pteridophyta), 3 of them belong to gymnosperms (Gymnospermae) and the rest taxa belong to angiosperms (Angiospermae). Most of the angiosperm taxa belong to Asteraceae and Lamiaceae families.

It is established that, these medicinal plants are usually used for the treatments of the upper respiratory tract disorders, gastrointestinal disorders (ulcer, flatulence, constipation), gynecological diseases, skin diseases, diabetes and other diseases.

Keywords: Folk medicine, medicinal plants, Adana, Turkey.

SELF-ORGANIZATION OF NANOSTRUCTURES USING A BURIED SQUARE NETWORK OF SCREW DISLOCATIONS

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Abstract:

Quantum dots (QDs) grown on semiconductors surfaces are actually the main researchers' interest for applications in the forecoming nanotechnology era a like nanotransistors and nanomemories. Control over the location, distribution, and size of these QDs is essential for the engineering of next-generation semiconductor devices employing these remarkable nanostructures. Let's note the the spontaneous formation of structures with sizes on the order of 10 nm and a well defined size distribution will be referred to as self-assembly (SA) of nanostructures and a natural tendency to form ordered assemblies, will be referred to as self-organization (SO).

One way to control the location of quantum dot nucleation and their size is the use of a functional substrate inducing a lateral self-organization by a buried dislocation network. The organization driving force in this case is the strain field induced on the surface. The network periodicity is controlled by the orientation angle between the substrate and the bonded film.

In this work, the anisotropic elasticity theory is used to determine the strain and the stress fields and the energy density, generated by a square network of screw dislocations, at the free surface of a finite layer bonded onto a semi infinite substrate. The effect of the thickness of the layer and the periodicity of dislocations are also shown. The Si/Si(110) and GaAs/GaAs (110) systems are chosen in this study. Finally computational results and discussions are given and then compared to those obtained in the isotropic elasticity.

The results obtained show that:

- For a fixed period, maximal strain increases when the layer thickness decreases. This evolution is exponential; therefore, it seems so natural to thin a maximum the layer to benefit almost in surface of the effects of the elastic field.

- For a fixed thickness, maximal strain increases with the periodicity of the network, until reach a limit value.

- The maximal energy value calculated at the free surface is in the order of 1.43×10^{-5} J/m2 and extremes are located above the medium of the dislocation lines.

Finally, these results show that by using a strain-selective etching, we can manage to define a nanopatterned surface in a well-controlled way.

Keywords: Self-organization, nanostructures, dislocations, quantum dots, nanotechnology, misfit, self-assembly, anisotropy.

ANALYSIS AND BACK-CALCULATION MODELLING OF SNOW AVALANCHE EVENT OF 10TH JANUARY 2015 IN UZUNTARLA (TRABZON-TURKEY)

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Abstract:

A deadly snow avalanche event which buried 5 workers and killed, occurred in 10th January 2015 in Uzuntarla region of Trabzon city of Turkey. The workers were employed in building site of Hydroelectric Plant (HP). Avalanche released at 12:00 o'clock and rescuers could arrive later one half hours after the accident. Two of workers were luckily saved from death although they were in a truck because snow mass flowed back side of trailer. Rescue works were continued for five days because of harsh topographical and climatic conditions of the region. In study, Uzuntarla snow avalanche event analyzed depending on field observations which were made one week after the accident. And also, ELBA+ simulation software used to back calculation avalanche friction parameters by taking account of field observations. The Coulomb friction was found as 0.275 for starting zone, 0.25 for truck, and 0.295 for run-out zone depending on fitting between observed extent and calculated extent of avalanche as well as observed flow heights.

Keywords: Back-calculation, ELBA+, numerical simulation, snow avalanche, Trabzon-Uzuntarla (Turkey).

A NEW SPECIES OF ZERCON C. L. KOCH, 1836 (ACARI, ZERCONIDAE) FOR TURKISH FAUNA: ZERCON JUVARAE CĂLUGĂR, 2004

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Abstract:

Mites belonging to genus Zercon collected from litter, soil, lichen and moss of different habitats of Kütahya province are investigated in order to contribute of Turkish zerconid fauna and to contribute the zerconid mite fauna of world. The new record for Turkish fauna, the species Zercon juvarae Călugăr, 2004, was defined according to the samples collected from Kütahya province and its geographic distribution was given.

Materials and Methods: Samples with mites were placed into plastic bags, labelled and transferred to the laboratory, they were placed into combined Berlese funnels and mites were separated. 60 % lactic acid was used for bleaching and cleaning of the samples. Microscobic analyses were mainly made in enviroments containing glycerine. After the analysed and identified of samples were photographed with a microscope and their shapes were drawn and different body parts were measured. Then, the samples were put in stock bottles containing 70 % alcohol and 1- 3 drops glycine and labelled.

Samples selected in Zercon, total 47 mite samples of species Zercon juvarae were identified, 21 of them are females,13 of them are males, 8 of them are deutonymphs and 5 of them protonymphs, samples were analysed under light microscope,their shapes were drawn, measures of their various body parts were made their geographic distributions were given and according to the literatures are discussed.

It was determined this species spread in Romania before and is recorded from Turkey for the first time.

Keywords: Acari, Zercon juvarae, systematic, Kütahya, Turkey.

A NEW RECORD OF MESOSTIGMATID MITES FOR TURKISH FAUNA FROM KIRKLARELI

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Abstract:

Mites belonging to Zercon C. L. Koch, 1836 collected from litter, soil, lichen and moss of different habitats of Kırklareli province are investigated in order to contribute Turkish zerconid fauna and to determine the zerconid mite fauna of Thrace Region (Turkey). The new record for Turkish fauna, the species Zercon similifoveolatus Ivan et Călugăr, 2004, was defined according to the samples collected from Kırklareli province and its geographic distribution was given.

Samples with mites were placed into plastic bags, labelled and transferred to the laboratory, they were placed into combined Berlese funnels and mites were separated. 60 % lactic acid was used for bleaching and cleaning of the samples. Microscobic analyses were mainly made in enviroments containing glycerine. However, temporary samples were prepared in Hoyer medium when it was necessary to observe in different conditions. After the analysed and identified of samples were photographed with a microscope and their shapes were drawn and different body parts were measured. Then, the samples were put in stock bottles containing 70 % alcohol and 1- 3 drops glycine and labeled.

8 females, 4 males and 3 deutonymphs individuals of Zercon similifoveolatus were identified. The samples were analysed under light microscope, their shapes were drawn, measures of their various body parts were made, their geographic distributions were given and according to the literatures are discussed.

It was determined this species spread in Romania before and is recorded from Turkey for the first time.

Keywords: Acari, Zercon similifoveolatus, systematic, Kırklareli, Turkey.

GENOTOXIC EFFECTS OF ANABOLIC DOPING STEROID NANDROLONE DECANOATE IN HUMAN PERIPHERAL LYMPHOCYTE

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Abstract:

It is known that sportsmen especially youngers who engaged in athletism, weight lifting and body building sport have been using anabolic androgenic steroid intensively for purpose of doping during world sport history. With this study, banned, though in research as illegal is still frequently being used Nandrolone decanoate (Deca-durabolin®) doping substance, the possible genotoxic, mutagenic and cytotoxic effects on human blood cultures in vitro micronucleus test is aimed to determine.

For this aim different concentrations (1, 10, 25, 50, 75 and 100mm) of doping substances were prepared and applied to the blood culture. Micronucleus frequencies for genotoxic effects and nuclear division index (NBI) for cytotoxic effects were calculated. The obtained data was compared with used as solvent dimethyl sulfoxide (DMSO) negative control group and well known to the genotoxic effects of Mitomycin C positive control group.

Significant statistical differences ($p<0.05$) were noted in peripheral blood cells exposed to nandrolone decanoate at the two doses (75 and 100mm) evaluated. A clear dose–response relationship was observed between groups. Under our experimental conditions, the nandrolone decanoate steroid hormone showed genotoxic and clastogenic effects in human peripheral lymphocyte.

Keywords: Doping, micronucleus, nandrolone decanoate, human peripheral lymphocyte.

MATERIALS SELECTION FOR CAR BUMPER WITH A CONVENTIONAL METHOD AS WELL AS CES SELECTOR SOFTWARE

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Abstract:

In engineering design, selecting the suitable materials is known as an important step for the design process. Nowadays, selecting the suitable material from the 160 thousands industrial material is important as well as difficult issue to meet the different design requests and having the properties of designer will promote. In order to select the suitable materials, the technical personnel should have enough knowledge such as materials structure, density, melting point, heat elongation coefficient, tensile and yield strength, elongation percentage, modulus of elasticity, hardness and other properties. In order to select the most suitable material, there are a lot of selection systems assisting to the design engineer. The simplest one of these methods is to use the tables for materials properties in design engineers' handbooks. Besides, using the computer systems are nowadays gradually extended in which stored materials properties. In the current study, selection materials for car bumper will be done using a classical selection method as well as computer aided selection software, and advantages and disadvantages for both methods will be compared to each other according to the obtained results. During the materials selection, the evaluations are done considering mechanical, physical, chemical properties as well as economical and production processes. The selected materials are consistent with the related studies as well as recent trends in sector. In case of comparing materials selection methods, it is concluded that the most practical selection can be done via computer aided software in the light of recent data.

Keywords: Materials selection, computer aided CES software, computer aided design, car bumper.

THE INVESTIGATION OF WEAR PROPERTIES OF SICP REINFORCED POLYPROPYLENE COMPOSITE

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Abstract:

In this experimental study, wear behavior of pure PP and 10-30wt% SiCp filled PP composites were examined. Pressure moulding technique has been used in the production of polymer composite samples, and the produced materials were characterised via density measurement, hardness tests and wear tests. Density measurements of polymer composites were determined according to ASTM D 792.08 standard. Hardness tests of PP composite were performed using a Shore A and Shore D hardness equipment. Wear tests were carried out at dry sliding conditions with configuration of a polymer pin on a rotating steel disc. Test conditions were atmospheric conditions, applied forces were 50, 100 and 150 N, and sliding speeds were 0.5, 1.0 and 1.5 m/s by the test machine. At the end of the study, the effect of amount of SiCp on wear rate and friction coefficient was investigated. Worn surfaces of pin and disk specimens were examined with an optical microscope.

Keywords: Polypropylene, wear, friction, SiC, pressure moulding

EFFECT OF CATALYST AMOUNT ON AZO DYE (BASIC YELLOW 28) OXIDATION USING PR DOPED TIO2-MMT COMPOSITE PHOTOCATALYST

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Abstract:

Insufficient traditional wastewater discharge quality and increased expenditures of wastewater treatment directed industries to research more efficient water management projects. Hence, researches lead scientists to advance oxidation processes (AOP) because of having less operating problems and high treatment efficiencies. Among AOP's using TiO2/UV process comes into prominence by its cheapness and stability for breaking down hazardous organic compounds into nonhazardous compounds like O2, H2O and CO2.

Due to limited solar spectrum properties of TiO2 under UV irradiation (only 5%), its practical use has been restricted. In order to increase TiO2's visible light effectiveness dopant praseodymium (Pr) which belongs to rare earth transition metals of lanthanides group has been selected. It is also known through the experiments that rare earth transition metals are capable of forming Lewis Bases to break down acids, amines, aldehydes and alcohols and enhance the degradation of dyes more, compared to TiO2-Montmorillonite catalyst.

In this experiment, sol-gel method is used to prepare catalyst Pr doped TiO2-Montmorillonite (TiO2-MMT). It is easy to prepare TiO2-MMT catalyst to increase the surface area of TiO2 by using cheap and widespread bentonite in our country. Photocatalytic degradation of C.I. Basic Yellow 28 (BY28) as a model wastewater has been choosen.

Pr-TiO2-MMT experiments were conducted at three different catalyst amounts: 1.00, 1.25, 1.50g/L in a reactor equipped with UV-A lamb under 365nm intensity. Initial dye concentration kept constant at 100ppm throughout the experiments. In order to evaluate the extend of degradation, dissolved organic carbon (DOC) measurements were carried out by using TOC analyzer. As we increased the catalyst amount from 1.0g/L to 1.5g/L adsorption increased from 52.5% to 92.8% with a decrease in oxidation from 33.8% to 0%. This was due to increase in MMT support material concentration. Hence, increase in surface area for the adsorption has been observed proportionally. Our results showed that out of 15, 25, 35 and 45min of adsorption in the dark 15 min is the optimum adsorption time with 1.0g/L optimum catalyst amount. We reached the degradation of 86.3% by using these optimum parameters with 2 hours of illumination, 52.5% adsorption and 33.8% oxidation.

Keywords: Nanotechnology, wastewater treatment, TiO2 photocatalyst, praseodymium, Basic Yellow 28.

INVESTIGATION OF AERODYNAMIC CHARACTERISTICS AND FLOW VISUALIZATION UNDER PITCHING MOTION OVER NON-SLENDER DELTA WING

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Abstract:

The aerodynamics of unmanned combat air vehicles (UCAVs), which can be represented by simplified planforms, including delta wings, and micro air vehicles (MAVs) have taken important place in recent years. Vortex dynamics over delta wing and the effects on delta wing performance have become an important key role. The aim of this investigation is to underlying flow physics and to understand aerodynamic performance over non-slender diamond wing having low sweep angle (Λ = 510) by using dye flow visualization and force measuring systems (Submersible S Beam Junior Load Cell and two torque sensors). The flow visualization of vortex flow structure, the formation of the vortex breakdown, lift and drag force (FL and FD) as aerodynamic forces, and pitching moment (PM) over the wing in terms of the different angle of attacks, α, with in the range of $50 \leq \alpha \leq 300$ were studied under both static and dynamic condition (in pitching motion such as α=25o± 1o and α=30o± 1o). Force measurements and dye flow visualization are carried out in a water tunnel to explain the dynamic characteristics of the non-slender wing model.

Experimental investigation includes the time-averaged velocity components for dye-visualization, the coefficients of lift and drag force (CL and CD), and pitching moment (PM) for aerodynamic performance with different angle of attacks under different period (α=25o and α=30o for T=1.0s, 1.5s, 2.0s ve 2.5s). It was concluded that vortex breakdown occurred far from the trailing-edge of the wing at low angle of attack. The results show that aerodynamic lift and drag coefficient, and pitching moment are strongly affected by the vortex interactions as the angle of attack changes in pitching motion. CL, CD, and pitching moment are also affected by the vortex breakdown and stall condition for different angle of attacks.

Keywords: Delta Wing, Vortex, aerodynamic, flow visualization.

TEN LIGNOCELLULOLYTIC FUNGAL ISOLATES FROM DECAYING WOODY MATERIALS AND THEIR ETHANOL PRODUCTION POTENTIALS

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Abstract:

Recently there has been a growing interest in development of novel technologies where lignocellulosic materials are used as feedstock for production of various industrial products. Huge abundance of lignocellulosic materials around the world and their non-competitive properties with food supplies also highlight the importance of lignocellulosic biomass processing related studies. Thus, the aim of the present study was determined as isolation of fungal strains with lignocellulolytic activity and determination of their ethanol production capabilities. Decaying woody materials were collected from Erzurum and near locations, and aseptically transferred to the laboratory. Purification of isolates was done according to general procedures. After lignocellulolytic activity determination tests, the ethanol production determination for each active isolate was done by cultivation in modified BMC media and ethanol levels were determined by gas chromatography method. According to the lignocellulolytic activity results, ten active strains (MG4, MG5, MG6, MG10, MG12, MG13, MG14, MG15, MG24 and MG25) were determined. Among these strains, MG6, MG12, MG13, MG24 and MG25 isolates also significantly produced bioethanol at 5.25 g/L, 5.88 g/L, 7.50 g/L, 7.94 g/L and 1.87 g/L concentrations in modified BMC media for 5 days fermentation process, respectively. In a conclusion, the experimental data and results offer that ten fungal isolates of the present study show valuable properties for development of technologies focused on lignocellulosic biomass as a fundamental feedstock for industrial productions. This study was supported by Republic of Turkey – Ministry of Food, Agriculture and Livestock: TAGEM-13/ARGE/17.

Keywords: Bioethanol, biomass, lignocellulose, renewable energy.

EXTRACELLULAR BIOSYNTHESIS AND CHARACTERIZATION OF ZNO NANOPARTICLES USING RHODOCOCCUS K85 STRAIN

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Abstract:

Recently synthesis of zinc oxide (ZnO) nanoparticles has attracted a great interest due to their unique photocatalytic, electrical, electronic, optic and several biological properties, which has enabled development of various synthesis methods including chemical, physical and biological processes. Biosynthesis of nanoparticles has gained more attention because of high biocompatibility of the products. However, required complex purification steps of biological production methods have remained as a challenge and recent research efforts have focused on extracellular biosynthesis of nanoparticles to develop more suitable methods. Thus, extracellular biosynthesis of ZnO nanoparticles using Rhodococcus K85 strain was aimed in the present study. For this goal, the bacterial strain was growth on TSA plates. The bacterial colonies collected with a sterile inoculation loop and transferred into mineral salt basal (MSB) solution to reach 0.5 OD at 600 nm. Then, 5 ml of the prepared culture was inoculated in MSB supplemented with zinc sulfate monohydrate solution and incubated at 25 °C for 3 days at 120 rpm. In the end of the incubation period, nanoparticles were collected after centrifugation, washing and drying steps, respectively. Characterization of synthesized nanoparticles was done by using SEM and EDAX analytical methods. According to the results, ZnO nanoparticles were successfully biosynthesized in an extracellular manner by using Rhodococcus K85 strain. The sizes of the nanoparticles were in the range of 100-500 nm. As a conclusion, the present study showed that the bacterial Rhodococcus K85 strain is capable of extracellular biosynthesis of ZnO nanoparticles, but optimization studies are still needed to develop more controllable synthesis methods that allow tuning sizes of nanoparticles.

Keywords: Nanoparticles, ZnO, biosynthesis.

EXTRACELLULAR BIOSYNTHESIS OF BIOCOMPATIBLE TITANIUM DIOXIDE NANOPARTICLES BY USING FUNGUS ASPERGILLUS SP.

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Abstract:

Titanium dioxide (TiO2) nanoparticles has been widely used in many industrial and medical areas such as dye, cosmetics, drug, paper and plastic manufacturing industries. Although there are various effective conventional chemical methods for synthesis of TiO2 nanoparticles, production of biocompatible nanomaterials without any adverse effect on living organisms has left a challenge due to the high toxic properties of conventionally synthesized ones. Thus, the main objective of the present study was chosen as determination of biocompatible nanoparticle synthesis potential of a fungal strain. For this aim, Aspergillus TK4 strain was initially growth and maintained on PDA plates. Nanoparticle biosynthesis experiments were begun in a special broth medium inducing extracellular secretion under appropriate conditions. After 15 day incubation period, biomass was removed by a filtration step and fungal cell free filtrate was treated with Ti(IV)O solution. Biosynthesized TiO2 nanoparticles were collected after centrifugation, washing and drying steps, and characterized by using SEM and EDAX analytical techniques. According to the results, the cell free filtrate of Aspergillus TK4 strain was significantly produced biocompatible TiO2 nanoparticles through an extracellular process. The characterization data of nanoparticles showed that the TiO2 nanoparticles were in the structure of a spherical shape and their sizes were ranged from 75 to 300 nm. In conclusion, the results of the present study show the potential of fungal strains to synthesize biocompatible nanoparticles and provide valuable information for further studies focusing on development of novel approaches to nanotechnology.

Keywords: Titanium dioxide, nanoparticles, biosynthesis.

BIOSYNTHESIS POTENTIAL OF BACILLUS SUBTILIS K101 FOR BIOCOMPATIBLE AND BIODEGRADABLE CACO3 NANOPARTICLES

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Abstract:

Nanotechnology applications have dominated many of recent engineering studies due to unique properties of synthesized nanoparticles. As a part of this concept, calcium carbonate (CaCO3) nanoparticles has attracted a special interest because of their importance in plastic and rubber industries as well as their critical roles in medical applications. This resulted in development of various synthesis methods including chemical, physical and biological methods. In this regard, biosynthesis of the nanoparticles has become an important approach to decrease adverse effects of synthesized nanoparticles for last years. Thus, the aim of the present study was determined as biosynthesis of biocompatible and biodegradable CaCO3 nanoparticles by using a bacterial strain Bacillus subtilis K101. For this aim, the bacterial strain was inoculated onto TSA plates and growth at 28 °C for 24 hours. After the growth, an isolated single colony was transferred into modified B4 medium supplemented with calcium acetate. The culture was incubated at 28 °C for up to 7 days at 120 rpm. Then, the synthesized CaCO3 nanoparticles were collected via centrifugation, washing and drying steps. Characterization of the nanoparticles was performed by SEM and EDAX analytical techniques. According to the results of the present study, Bacillus subtilis K101 strain achieved biosynthesis of the biocompatible and biodegradable CaCO3 nanoparticles. The characterization data showed that the sizes of the nanoparticles were ranged from 100 to 500 nm. In a conclusion, the present study provides an important data for the biosynthesis of calcium-based nanoparticles by using a bacterial strain. This information can be supply related further studies, which aim development of novel biological approaches for synthesis of CaCO3 nanoparticles.

Keywords: CaCO3 nanoparticles, biosynthesis, biocompatible.

THE INVESTIGATION OF TRIBOLOGICAL PROPERTIES OF CERAMIC FILLED POLYPROPYLENE COMPOSITES

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Abstract:

In this study, tribologial behavior of pure polypropylene (PP) and various ceramic filled PP composites were investigated. SiC, Al2O3, SiO2 and talc at 10% as ceramic particulate material were used. Density measurement, hardness tests and wear tests were characterized to polymer composite samples which were produced via pressure moulding technique has been used in the production of through density measurement, hardness tests and wear tests. Wear tests were carried out at dry sliding conditions with configuration of a polymer pin on a rotating steel disc. Test conditions were atmospheric conditions, applied forces were 50, 100 and 150 N, and sliding speeds were 0.5, 1.0 and 1.5 m/s by the test machine. Density measurements of polymer composites were determined according to ASTM D 792.08 standard. Hardness tests of PP composite were performed using a Shore A and Shore D hardness equipment. The effect of ceramic additives as SiC, Al2O3, SiO2 and talc on specific wear rate and friction coefficient of PP polymer composites was determined. Worn surfaces of pin and disk specimens were examined by using an optical microscope.

Keywords: Polypropylene, wear, friction, ceramic fillers.

IDENTIFICATION OF WASTE SOURCES IN READY-MIXED CONCRETE PLANTS

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Abstract:

In today's highly industrialized world, an enormous amount of wastes is originated from the construction industry. This type of wastes conversely affects both macro-economic conditions and environment of a country or a region. Therefore, waste management is an important aspect of project management. Although there is a wide variety of construction materials, concrete is still the mostly used one in the construction industry and thus has a big impact on the amount of construction-based wastes. Reducing such wastes is among the objectives of the waste management issue in construction projects. Accordingly, the determination of waste sources is the first step to deal with them. Based on these arguments, the current paper presents a study that aims to identify the sources of fresh concrete wastes in ready-mixed concrete (RMC) plants as a part of an on-going research project. Toward this aim, production and delivery processes of RMC were reported and discussed in a detailed manner from the perspective of waste management. As a result, four sources were identified for such wastes. It was also found out that only two types of these sources (i.e., over-order and residual RMC in the truck-mixer drum) are quantifiable.

Keywords: Construction waste, fresh concrete waste, ready-mixed concrete, waste sources.

EVALUATION OF CURRENT RECYCLING FACILITIES FOR RMC PLANTS IN TURKEY

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Abstract:

Construction wastes are mostly generated during implementation and demolition phases of a project. Since these wastes are inevitable, waste management focuses on reducing, reusing, and recycling of wastes instead of eliminating them. As the largest part of construction wastes, concrete is one of the mostly used materials in construction projects. Three raw materials of concrete (i.e., gravel, cement, and water) are natural resources, and over consumption can negatively affect the economy and environment of a country. In this regard, recycling of fresh concrete wastes is an important issue for waste management in the domain of construction. Although there are different recycling facilities for fresh concrete wastes, ready-mixed concrete (RMC) plants in Turkey do not have to build them. In the current study, it was aimed to present the benefits of the recycling facilities for RMC plants in Turkey as a part of an on-going research project. To this aim, different recycling facilities were compared with each other, and then, operation processes of these facilities were investigated by visiting some RMC plants. The results revealed that most of managers in these plants are aware of potential benefits of the recycling facilities. However, they find managing these facilities difficult, and thus, most of them do not build these facilities in their plants.

Keywords: Construction waste, fresh concrete waste, ready-mixed concrete, recycling facilities.

CALCIUM CARBONATE PRECIPITATION INDUCED BY UREOLYTIC BACILLUS LICHENIFORMIS B22 UNDER SOME ENVIRONMENTAL CONDITIONS

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Abstract:

Bacteria are unbelievable diverse. Numerous diverse bacterial species cause in the precipitation of mineral carbonates in various natural environments, including soils, geological formations, and freshwater biofilms. It has been hypothesized that almost all bacteria are capable of CaCO3 production because precipitation occurs as a by-product of common metabolic processes such as photosynthesis, sulphate reduction, and urea hydrolysis. It was detected impact on bacterial carbonate precipitation of the initial urea concentration, incubation temperature, initial pH and different incubation time in this study. Bacillus licheniformis B22 isolated from Pamukkale thermal waters in Denizli was used at varying amounts of urea (100, 200, 250, 300, 333 and 350 mM), different incubation temperature (20, 25, 30, 37 and 42℃) ,different initial pH value (5.0, 5.5, 6.0, 6.5, 7.0 and 7.5) and incubation time (5th ,7th ,10th and 14th day). The results indicate that the highest amount of calcium carbonate on 100 mM of urea concentration at 5th day. The optimum temperature that the best carbonate precipitation in the medium containing 100 mM urea is 37℃. The maximum precipitation medium with the same concentration of urea and temperature has observed 2264.4 mg/L calcium carbonate in 7th day at pH 6.5. As a result of the optimum conditions for precipitation under our experimental conditions were 100 mM urea, 37℃, pH 6.5 and 7th day of incubation time. Mineral composition of CaCO3 was determined by SEM analyses.

Keywords: Calcium carbonate, Bacillus licheniformis, SEM.

ISOLATION OF IAA PRODUCING BACTERIA FROM ROCKY AREAS IN GÜMÜŞHANE-TURKEY

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Abstract:

Plantation of poor soils and naturally plant growth promotion studies have dominated recent related scientific trends owing to loss of productivity caused by increasing chemical pollution of soils closely associated with rising world population. In this context, Plant growth promoting Rhizobacteria (PGPR) focused researches remain a key concept to develop novel alternative technologies to solve these problems. The present study was conducted to isolate potential plant growth-promoting bacteria from rocky areas around Karaca cave in Gümüşhane-TURKEY and determine their IAA producing properties. For this aim, rhizospheric soil samples for the isolation of the PGPR strains were collected from rocky places around Karaca Cave (40º 32′ 39″ N - 39º 24′ 10″ E) in Gümüşhane-TURKEY. The samples were taken from up to 6 inches depth and aseptically transferred into the research laboratory. The serial dilution method was used to isolate bacterial strains. Morphological, physiological and biochemical characterization studies of bacterial isolates were performed according to the general procedures covering observation of cell and colony morphologies, motility, Gram property, endospore formation, NaCl and pH tolerance, catalase, oxidase and amylase activities. Indole-3-acetic acid (IAA) production capabilities of the isolates were determined by using the Salkowski's method. According to the results, 7 active distinguished bacterial strains were determined as positive for IAA production. In conclusion, the findings of the present study mark that the different environments with stringent conditions have a valuable potential to identify novel resistant PGPR strains and remedy extreme habitats for plantation.

Keywords: PGPR, IAA, Rhizobacteria.

A BACTERIOCINOGENIC LACTIC ACID BACTERIUM FROM TURKISH TRADITIONAL FERMENTED SUCUK AND ITS MOLECULAR CHARACTERIZATION

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Abstract:

Traditional fermented products have become very crucial and popular for daily diets especially on economical and healthy aspects. Lactic acid bacteria (LAB) are extensively used in fermentation to enhance food preservation. LAB play a key role in to produce inhibitory compounds such as organic acids and ribosomally synthesized antagonistic polypeptides called as bacteriocins. The main goals of this study were to assess the bacteriocinogenic potential of bacteria isolated from traditional fermented Turkish sucuk samples and molecular characterization of active strains. Samples were cultured in MRS agar. Antimicrobial activity of strains was performed using the agar spor test and agar well diffusion method. A potential bacteriocin producing LAB strain was isolated from the Turkish fermented sucuk products. It showed significant antimicrobial activities against to food pathogens; Staphylococcus aureus (ATCC25923), Listeria monocytogenes (C3970) and Escherichia coli (ATCC25922). Molecular characterization data from the 16S rRNA gene region showed that the strain is Lactobacillus plantarum subsp. plantarum. In conclusion, this study demonstrated that LAB strains from traditional fermented Turkish sucuk have potential for development of biotechnological applications in food sciences because of their bacteriocin production capabilities. This study was supported by Republic of Turkey – Ministry of Food, Agriculture and Livestock: TAGEM-13/ARGE/6.

Keywords: Bacteriocin, lactic acid bacteria, sucuk.

INVESTIGATION OF THE EFFECT OF CONNECTION MODELS ON THE OPTIMUM DESIGN OF SEMI-RIGID STEEL FRAMES

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Abstract:

This study aims to carry out the effect of beam-to-column connections on the minimum weight design of steel plane frames. In the practical analysis of steel frames, end connections are assumed to be either fully restrained or pin-connected. However, experiments reveal that the real behavior is between these extremes and should be taken into account for the realistic design of structures. Hunting search algorithm is used for the automation of optimum design process. It is a numerical optimization method inspired by group hunting of animals such as wolves and lions. It is proven that it is a reliable and efficient technique for obtaining the solution of discrete structural optimization problems. Present design algorithm developed on the basis of hunting search algorithm selects w- sections for the members of semi rigid steel frame from the complete list of w- sections given in LRFD- AISC (Load and Resistance Factor Design, American Institute of Steel Construction). The design constraints are implemented from the specifications of the same code which covers serviceability and strength limitations. The selection of w-sections is carried out such that the design limitations are satisfied and the weight of semi- rigid frame is the minimum. The steel frames with various connection models are designed by the optimum design algorithm presented to demonstrate its efficiency. The designs obtained by use of this algorithm are also compared with the ones produced by particle swarm optimization method.

Keywords: Stochastic search techniques, hunting search algorithm, optimization problems, semi-rigid steel frames, end plate connections.

OPTIMIZATION OF RAPID DNA EXTRACTION PROTOCOL FROM ANCIENT HUMAN BONES

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Abstract:

There is a necessity for identification of the deceased as a result of many accidents and sometimes bones are the only accessible source of DNA. Although noticeable different methodologies have been developed for DNA extraction from variety of human tissues or evidentiary materials, the methods commonly used, especially those using phenol-chloroform, are unable to eliminate the effects of co-extracting inhibitors that reduces amplification efficiency and not always sufficient. The main objective of this study was to develop and optimize a rapid protocol for DNA extraction. Bone specimen pulverization (powdering/slicing), lysis buffer type/content, pretreatment (agitation in an incubator shaker and microwave digestion) and extraction methodologies (phenol-chloroform/silica based columns) were compared in order to investigate the best conditions yielding the highest concentration of DNA. Furthermore, major process variables including power, temperature and treatment time in microwave digestion were optimized. Best results were obtained in decalcification buffer for total demineralization and using microwave assisted digestion proved to be very rapid with an incubation time of 2 min instead of 24 h at an incubator shaker. Hence, microwave digestion followed by silica column extraction yielded a high purity DNA with a concentration of 19.40 ng/µl and proved to be a valid alternative to the phenol/chloroform method, presenting an environmentally friendly, besides providing an inexpensive and rapid technique for DNA extraction, thereby proving to be a potential application for forensic genetic analysis.

Keywords: Bones, ancient DNA, silica-column, microwave-assisted digestion.

SYNTHESIS OF B-CHLORALOSE DERIVATIVE VIA [3+2]-CYCLOADDITION OF AZIRIDINE WITH ACETONITRILE

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Abstract:

Aziridines are interesting synthetic building blocks for the construction of complex nitrogen containing compounds such as amino acids, heterocycles and alkaloids.1, 2 When activated by a N-tosyl group, they are especially reactive towards nucleophilic ring opening and provide an easy access to a wide variety of alkaloid structures.1 [3+2]-Cycloaddition of aziridines with dipolarophiles is a useful method for the synthesis of nitrogen-containing five-membered cyclic moieties. Alkenes and alkynes have been used as dipolarophiles for the [3+2]-cycloaddition of aziridines. Substituted imidazoline derivatives are obtained result of this reactions.

Herein, we reported synthesis of β-Chloralose derivatives (7) containing imidazoline ring. Chloraloses is a commercially available product which possesses anesthetic and hypnotic effects. It has been widely used as a rodenticide, veterinary drug, and bird repellent. 3-O-Methyl derivative (1) of glucochloralose (β-Chloralose) starting materials was prepared according to literature.4 6-Azidosugar (3) was obtained by reacted with NaN3 after selective tosylation (2) of β-chloralose sugar. 6-Aminosugar (4) was synthesized from 6-azidosugars via Staudinger reduction method, and then the product was reacted with TsCl give as a 5,6-ditosylated sugar (5). N-Tosyl-5,6-epimino-β-chloralose(6) was obtained in good yield from reaction of 5,6-ditosylated sugars with anhydrous K2CO3 in CH3CN. And finaly this compound reacted with acetonitrile presence of BF3-Et2O as a lewis acid.5 Consequently compound 7 was synthesized by cycloaddition. All new products were characterized by modern spectroscopic methods such as FTIR, NMR and LC-MS.

Keywords: Imidazoline, aziridine, chloralose.

ALTERATIONS IN THE ACTIVITIES OF CHICKPEA ANTIOXIDANT ENZYMES DURING THE PROGRESSION OF DROUGHT STRESS

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Abstract:

Drought stress is one of the main abiotic stresses that leads to the overproduction of reactive oxygen species (ROS) such as hydrogen peroxide (H2O2), superoxide (O2.-), hydroxyl (OH.) and singlet oxygen (1O2) in plants. Plants have well-developed endogenous defence systems to minimize the effects of oxidative stress caused by ROS which are highly reactive and harmful to proteins, lipids, carbohydrates and DNA in cells. Enzymatic components of this system act as efficient ROS scavengers and become effective proportionally to the extent of the stress imposed. In this study, alterations in the active oxygen scavenging enzyme [superoxide dismutase (SOD), ascorbate peroxidase (APX), glutathione reductase (GR) and peroxidase (POD)] activities of two chickpea lines (AkN 87 and AkN 290) were analysed. To understand their tolerance to drought stress, twenty-day-old plants were subjected to three different regimes of drought stress by withholding water for 3, 5 or 7 days in soil culture. Each treatment has own control –watered- group which was kept watering during the drought periods. Under watered conditions there was no change in antioxidant enzyme activities in lines with time. SOD activity showed a sharp increase in AkN 290 in 3rd day while it was stable until 5th day in AkN 87. APX activity of both lines only subjected to 7-days-drought stress increased significantly. AkN 290 had no change in GR activity during all periods although AkN 87 exhibited induced activities throughout the experiment. Drought stress caused a fast increase in POD activity in AkN 290 leaves relative to the other line. The results of this study revealed that antioxidant enzymes play an essential protective role against drought induced oxidative stress in chickpea lines.

Keywords: Antioxidant, chickpea, drought, enzymes, ROS.

GAUSSIAN AND WAVELET FILTERING METHODS FOR MICHELSON INTERFEROMETRIC EXPANSION MEASUREMENT

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Abstract:

In this study, the extension of metals was measured using a Michelson interferometric measuring system. The resulting signal was analyzed using video processing. In order to improve the measurement performance noisy signal were filtered. For filtering, standard Gaussian filtration, which commonly used for such applications and a new approach wavelet filtering method is used. Gaussian filtering relative error obtained as %3.3 and Wavelet filtering relative error obtained as %2.1. The results show that the wavelet filtering method is more successful for interferometric video signals.

Keywords: Expansion measurement, wavelet filtering, interferometry, video processing.

INVESTIGATION OF THE TEST DEVICE DETERMINING CHARACTERISTICS OF AUTOMOTIVE BRAKE PADS

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Abstract:

To learn about the coefficient of friction of the brake disk and the tribological properties of the materials to learn the various test devices have been developed. Friction and wear resistance test method used to measure the number of models to be the cause of much friction and wear mechanisms and tribological system is because of the over. For this reason, large part of the studies of friction and wear at present are done by using determined by the international standard test specifications and parameters. In the design used in friction materials, the most important factor of friction event is coefficient of friction and wear. Basic properties requested of a brake pad are suitable to the standards of corrosion resistance, friction coefficient and economical. These features in determining the precise hardware with automatic control unit and the importance of testing equipment is quite significant. Earlier studies that are conducted to learn about and considering the coefficient of friction of the brake discs to find the tribological properties of the materials, various testing devices have been developed. In our country and in developed countries it is possible to show examples of this work. In this study , a number of research studies have been conducted to examine automobile brake pads used in determining the characteristics of the test equipment used for the purpose for what and contribution to Turkey industry.

Keywords: Test device, tribology, design.

MILK COMPONENTS FROM NATIVE COWS VERSUS HUMAN MILK COMPONENTS

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Abstract:

The aim of this study was to compare basic biochemical components such as total fat and protein in native cow milk versus human milk standards. In the experiment, 20 native cow (Yerli kara) milk samples were collected and examined during September month. The samples were composites of milk collected at consecutive morning and afternoon. The protein and fat rates of native cow milk were compared with the values (3-5% fat, 0.9% protein) for human milk standards using one-sample t test. Comparing the mean values for milk contents, it seems obvious the differences in protein content between human milk standards and observed values in Yerlikara cows. However, there were no differences in total fat levels between human milk standards and observed values in native cow milk. High milk fat and protein levels in Yerli kara cows may not be advantages for young babies since some infants are allergic to cow's milk constituents such as fat and protein. However, observed milk fat and protein levels in native cow breed are sufficient for human nutrition according to WHO (least 2.6% fat and 3.5% protein) standards. Also, milk fat and protein rates of native Yerli kara cows in this study are compatible with normal values for healthy cows. Since the study was done for September month, this study should be repeated for entire season to see if the results will change over the time.

Keywords: Milk, components, cow, human.

INVESTIGATION OF MECHANICAL PROPERTIES OF CHASSIS PROFILE DESIGNED FOR LIGHT VEHICLES

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Abstract:

Today, one of the goals of automobile producers is to develop new light and thus enabling fuel-saving and high strength materials without comprimising safety and comfort. Aluminum, is one of the lightweight metals which has low cost, good workability, corrosion resistance, recycling, energy absorbtion and lightness properties. Because of these properties it is preferred during the light material selection for fuel saving by the growing automotive industry.

When a material is put to cold forming, its hardness and strength increase because of the distortion which takes place at its cage structure. By this means, sheet materials to which plastic forming is applied, become more durable with respect to ready extrusion profiles. In this work, open profiles have been compared according to their tensile strength, hardness and impact resistance (charpy) properties in their plain sheet states. These profiles are named P1 and P1r. Also these profiles were designed as lightweight chasis profile and formed from a 2 mm thick AA5754 plate material by using moulding in bending machine eccentric press.

In the first phase of the work, tensile, charpy and hardness samples were taken from unformed AA5754 sheets by using laser cut technique in accordance with the standards. In the second phase, ear parts of the open profiles (P1 and P1r) were bended in the bending machine and moulds were shaped. In the third phase, standard samples from bended profiles have been cut by using wire EDM proecess and tests were realized. Acquired results were compared.

As a result of the performed tests, when P1 profile was compared to plain sheet, in the average value of mechanical; in the tensile strength 3.24%, in the charpy 35.71% ve in the hardness 1% increase observed. In the P1r profile, in the tensile strength 12.54%, in the charpy 34.42% and in the hardness 3.1% increase observed.

Keywords: Chassis profile, AA5754, cold forming.

MODAL ANALYSIS OF A NEW ELECTRO-HYDRAULIC DUAL AXIS SOLAR TRACKING SYSTEM PROTOTYPE USING THE FINITE ELEMENT METHOD.

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Abstract:

Dual axis solar tracker systems are used to maximize the amount of the solar direct radiation that falls normally on the photovoltaic modules. Photovoltaic parks can consist of hundreds of solar tracker that are subject to wind-induced loads, vibration, and gravity-induced sag. A modal vibration analysis of a new prototype of dual axis solar tracker with 24 m panel sizes is presented in this paper. It is a very important step in the conception of solar structure tracker. Three-dimensional solid model was firstly established by SolidWorks software, then CosmosWorks Simulation module was used for modal analysis by using finite element method (FEM).

This analysis is carried out to determine the natural frequencies and corresponding vibrations modes to avoid resonance phenomena (excited wind).

Results shows that dynamic reliability of solar tracker has been confirmed as the range of natural frequencies obtained is very far in value compared to the frequencies excitations caused by the electro-hydraulic control device and wind speeds, which allows us to avoid the resonance phenomenon.

The analysis results presented in this paper can be used for further analysis on optimal design and vibration safety verification for the dual axis solar trackers.

Keywords: Dual axis solar tracker; modal vibration, finite element method, CosmosWorks Simulation.

A NEW STATISTICAL APPROACH TO ASSESS ALTERNATIVE STORE LOCATIONS: PUGH METHOD

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Abstract:

The intention of this study is to apply Pugh's method for choosing convenient one among alternative store locations. Pugh method is a qualitative multi-criteria decision making method used to rank the multidimensional options of an option set. This statistical approach is a new application to be offered for the assessment of multiple store locations. This study attempts to evaluate alternative locations against a list of attributes by comparing each alternative with a reference location. Location attributes are determined as coherent target market, located at a street corner (or road intersection), passenger traffic, ease in accessibility, buying or renting costs, competitors' store numbers. Location selection decision is applied to the opening of a new clothing store in Istanbul, Turkey.

Keywords: Store location, Pugh method, clothing, location-selection attributes, decision making method.

NOISE FILTERING ON 3D POINT CLOUDS USING POINT CLOUD LIBRARY

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Abstract:

With the advent of new-generation three-dimensional (3D) sensing hardware and the growing interest in aplication fields, 3D perception and modelling became a popular research field in recent years. A point cloud is generated as a result of 3D scanning and provides a way of keeping 3D data usually defined by X, Y, and Z coordinates. However these generated 3D point clouds usually have noisy data and outliers. To obtain the best results from 3D perception, these noisy data and outliers must be eliminated.

In this study, three different 3D filtering algorithms were explained and implemented on a 3D model obtained from a 3D perception system. Point Cloud Library (PCL) was used for loading point clouds and implementing filtering algorithms. Results show that using 3D filtering algorithms on a 3D point cloud eliminates the noise and the outliers from the 3D model.

Keywords: 3D, point cloud, PCL.

EFFECT OF TEMPERATURE ON COPPER LOSSES IN SYNTHETIC MATTE-SLAG SYSTEM WITH COLEMANITE ADDITION

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Abstract:

During copper matte smelting, copper losses to slag are mainly affected by slag properties (composition, viscosity and density), matte grade and partial pressure of oxygen. Apart from these factors, temperature is another important parameter on copper content in slag due to its effect on decreasing slag viscosity. Therefore, in this study, the aim was to find out the variation of copper in slag with temperature at different colemanite additions (from 0% to 6 % of total charge) in synthetic copper matte-slag system. Several experiments were carried out with master matte (MM) and master slag (MS) produced synthetically samples at 1200°C, 1250°C and 1300°C under a controlled partial pressure of oxygen (Po_2= 10^{-9} atm.) for 2 hours. In this way, behavior of copper losses to slag without the presence of other oxides (Al_2O_3, ZnO, BaO etc.) could be investigated. Results of the experiments showed that the copper losses increased somewhat with increasing temperature without the addition of colemanite. However, this effect became negligible as the colemanite addition increased.

Keywords: Synthetic slag, Colemanite, copper losses.

APPLICATION OF THE ENVIRONMENTAL AND SAFETY INTEGRATED MANAGEMENT SYSTEMS IN THE ENERGY SECTOR

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Abstract:

Taking the necessary measures to evaluate the environmental impacts; and preventing, overcoming and controlling the adverse effects that may occur in business management are the indications of the importance attached to the environment. This can be achieved through the establishment of the environmental management system. The standard representing the environmental management system is the ISO 14001:2004 standard.

However, as well as the establishment of the system, it is essential to evaluate the factors that may cause risks independently in terms of occupational health and safety; and to take measures before the accidents and incidents occur. In such a case, the guiding standard is the ISO 18001: 2007 standard.

These two standards are similar as they are based on operation, system cycle, proactive approach and risk management. Its preparation and application in an integrated way lead to a reduction in the workload and documentation; and to an increased productivity and motivation.

In this study, the integrated establishment and application of the environmental and occupational health and safety systems at a Natural Gas Combined Cycle Power Plant has been evaluated. This integrated model's positive contributions on both systems were evaluated in terms of its environmental and occupational health and safety performances; and the measurable efficiency capacities that the model will provide for the organizations serving in this type of energy industry were calculated.

Keywords: Environment, risk management, system, reduction, efficiency.

SAPANCA LAKE AIR POLLUTION ORIGINATING FROM TRANSPORTATION-INVESTIGATION OF HEAVY METAL EMISSIONS

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Abstract:

Due to the population growth and the quality improvement of people's lives due to industrialization; the number of vehicles in traffic is increasing rapidly in the developing cities. This situation causes air pollution originating from transportation. Transportation-originated emissions of heavy metals are serious threats for the ecology and human health. Particles of heavy metals are released to the atmosphere from the vehicles because of the brake and tire wears, vehicle and road corrosion, oil leaks and exhaust systems. These pools of emissions on the roads are usually moved to different places by the effects of wind and rain. Especially, they seriously affect the water resources that are close to the highways.

Sapanca Lake which is an important source of drinking water has two highways on both northern and southern parts. The aim of this study is the hourly investigation of emissions affecting the Sapanca Lake. E-5 and TEM Anatolian highways are located around Sapanca Lake; therefore their best sections to determine the effects of the highways were selected; and the traffic characteristics between 08:00 to 02:00 were examined. The vehicles that used these highways were classified as cars, buses, light commercial vehicles, trucks and motorcycles. The covered distance was determined in km. with the help of the activation functions obtained in the previous studies. The average speed of the vehicles was accepted as 90 km/h; and the emission values were calculated for each vehicle class by using the emission factors (EF) published in COPPERT III

Keywords: Air pollution, transportation, heavy metal effect.

THE PRODUCTION OF HEXADECYLTRIMETHYLAMMONIUM BROMIDE (HDTMA-BR) MODIFIED SEPIOLITE FOR HEAVY METAL REMOVAL

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Abstract:

Important features like the change of surface properties from hydrophilic to hydrophobic, and the change of surface charge from negative to positive, enable the production of organosepiolites from sepiolites, their use in various processes including adsorption of organic pollutants, removal of heavy metal contaminants, and water treatment processing. To determine the amount of surfactant used in the modification, the critical micelle concentration (CMC) was investigated. Raw sepiolite was modified by using hexadecyltrimethylammonium bromide (HDTMA-Br) which is a cationic surfactant with different surfactant concentrations (1CMC and 2CMC) and different contact times (1, 1.5, 2, and 2.5,3 h). The synthesized samples were called organosepiolite. The organosepiolites were characterized by an X-ray diffractometry (XRD), Fourier transform infrared spectroscopy (FTIR), Brunauer-Emmett-Teller (BET), thermogravimetric analysis (TG), total organic carbon (TOC), and particle size analysis. The XRD patterns showed that the intergallery distances of the raw sepiolite increase with the surfactant loading. The FTIR measurements were used to indicate the interactions between the raw sepiolite surface and the HDTMA cations. The BET surface area of the organosepiolites significantly decreased after the modification due to the coverage of the pores of the raw sepiolite. The thermogravimetric peaks (DTG) in the range between 350-450 °C depended on the surfactant loadings, and provided the evidence for the formation of the multilayers on the sepiolite surface. The particle sizes of the organosepiolites increased with the increasing surfactant concentration. The cation exchange capacity (CEC) is also increased along with the increasing contact time. The organosepiolite sample that was labeled 1.5h-2CMC, was chosen for the next heavy metal adsorption studies.

Keywords: X-ray diffraction, Sepiolite, Organic modification, Total organic carbon.

DETERMINATION OF LEAKAGE AREA IN AN EARTH DAM USING GEO-ELECTRICAL METHODS

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Abstract:

In this study, the applications of geo-electrical methods are discussed in detecting and mapping the leakage paths at an earth dam in Turkey. The two-dimensional electrical resistivity imaging (2-D ERI) and self-potential (SP) mapping from geo-electrical methods provide detailed knowledge about leakages zones in dams. The dam used for water supply was designed as a zoned earth dam. When water started to fill the reservoir, the seepage developed at the base of the spillway and the downstream of the right bank. Because of the rise in the reservoir water level, the seepage increased, and several springs occurred at different places in the valley. A series of investigations were planned to find the causes and locations of the seepages and to determine rehabilitation methods. Although the curtain grouting was done, in spring locations the seepage continued. In the current study, the geo-electrical investigations, dye tracer tests, and observation drillings were done. Dye tracer results did not produced the expected response curves for a non-ideal flow system due to measurement period and observer failure. Groundwater velocities from tracer test were then calculated using the linear distance between the dye releases well and the sample location. The dipole-dipole electrode array for 2-D ERI and the fixed reference method for SP mapping were used. Resistivity data were acquired along two profiles with an electrode spacing of 10 m. The SP mapping was applied at right bank of the dam. According to the results of the survey were determined the seepage paths of the dam.

Keywords: dam, leakage, resistivity, self-potential.

REMOVAL EFFICIENCY OF THE HERBICIDE ACLONIFEN BY SOIL FUNGI

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Abstract:

In this study, laboratory campaigns were done to determine the removal efficiency of Aclonifen (2-chloro-6-nitro-3-phenoxyaniline). This compound is widely used during weed activity in Thrace Region and Anatolia in order to protect grain and cereal cultivation. The fungi isolated from these lands were used in the study. Monitoring were mostly conducted by chemical oxygen demand (COD) with all isolated fungi and mix of them. Total Organic Carbon (TOC) experiments were done only with mix of the fungi. Isolation of fungi from the soils, where aclonifen was applied, were made through seeding to standard plate count agar. Fungi acquired from this isolation procedure were identified by 16s RNA gene technique. Herbicide including liquid of 100 ml was prepared and fungi culture was included in this liquid. This mixture was held in a shaker at a standard temperature of 20C. Monitoring took 5 days at aerobic condition. Daily culture sample was taken and COD and TOC analysis were made with this culture.

According to the COD results, highest and lowest removal efficiencies were obtained by Metacordyceps chlamydosporia and Penicillium talaromyces, from 15600mg/L to 1040 mg/L and 6390mg/L, respectively. Additionally, experiments were done by the isolated fungi culture (Penicillium thrichoderma, Stachybotrys chartarum, Penicillium simplicissimum, and Alternia alternata), in parallel. Experimental studies were completed by adding the analysis of total organic carbon. According to the COD and TOC experiment results with fungi mix, the degradation efficiency was % 88, from 7150mg/L to 870mg/L as TOC and removal efficiency as COD was % 91, from 15600mg/l to 1360mg/L in 5 days.

Keywords: Aclonifen, Chemical Oxygen Demand, Total Organic Carbon, Degradation efficiency.

REMOVAL RATE OF HERBICIDE TRIFLURALIN IN AGRUCULTURAL SUNFLOWER FIELD IN NATURAL PERIOD

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Abstract:

Herbicides are intensively used in Turkish sunflower agriculture. Trifluralin has been used almost in all sunflower fields in Turkey since 1970s. Microbial degradation is an important mechanism controlling the fate of pesticides in soils and is generally considered to be desirable both from an environmental as well agricultural perspective. In this study, The Trifluralin herbicide active ingredient, sold under the trade name "Tefralin 480" was, supplied by an agricultural products shop and applied to the sunflower agricultural field in Kirklareli City at Thrace region, with concentration of 200 ml/1000m2. This herbicide contains 480 grL-1 of Trifluralin. Experiments were conducted on soil samples obtained from farming areas around the city of Kirklareli and the majority of farms selected from the area have been cultivating sunflower and wheat for several years. All samples were collected randomly from the top 0–20 cm of soil following the standard procedure about 6 months and stored in glass vessels at an ambient temperature.

According to the field study results, Trifluralin could be decreased to %43 and this shows that Trifluralin can be stay in the soil for long time.

Keywords: Trifluralin, Sunflower, Herbicide, Active Ingredient.

DETERMINATION OF FAILURE DISTRIBUTION PARAMETERS FOR WELDING MACHINES USED IN SHIP CONSTRUCTION

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Abstract:

Planning, conducting and control of maintenance activities enable to the highest level of availability of transport vehicles in the fleet is one of the most important aspects of transportation. Maintenance is a set of activities that carry out to keep a system or equipment in operation. Maintenance activities are basically divided into two types as preventive maintenance and corrective maintenance. Failure distribution of machines and equipment has to be known for planning space parts, labour and tools. This can be determined by using failure data and suitable statistical method. In this study, failure distribution parameters of welding machines which is used in ship construction were determined by using real failure data. Applied method was shown for the equipment which is vitally important.

Keywords: Failure distribution parameters, ship construction, maintenance, welding machine.

VIBRATION CONTROL OF AN ONELINK FLEXIBLE MANIPULATOR WITH HARMONIC EXCITATION

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Abstract:

Flexible manipulators are more desirable than rigid manipulator due to lightweight arm, higher motion speed and better energy efficiency. The flexibility causes residual vibrations at the end point after motion. Therefore, controlling residual vibration of flexible manipulators is important. In this study the residual vibration of a flexible beam is studied in ANSYS. The trapezoidal velocity profile is applied in the transient analysis. The residual vibrations are observed for the control-off case. A high frequency harmonic velocity excitation is applied after the end of the trapezoidal velocity profile to control the residual vibration. An exponential decaying is added to the harmonic excitation after a certain time. It is known that the vibration amplitudes of a system decrease when the system is excited at higher frequency than the natural frequencies. The effect of the amplitude, frequency, the duration of the application and the exponential decaying factor on the suppression of the residual vibration is analyzed.

Keywords: Flexible manipulators, vibration control, harmonic excitation.

HYBRIDIZATION OF ELECTRIC VEHICLE WITH FUEL CELL BASED ON TWO CONTROL STRATEGIES

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Abstract:

Nowadays, alternative power sources like fuel cells and their applications on vehicles have increased permanently. Fuel cells generate electric energy without storing ability of it instead of a chemical battery. Electric energy produces as long as a fuel supply is maintained. Compared with hybrid vehicle that uses ICE (Internal Combustion Engine) and battery as power sources, it has the advantages of high energy efficiency and much lower emissions. In the future, fuel cell vehicles will be used widely in the world because of deficiency of petroleum fuels and environmental limitations. These concerns push researches to study about fuel cell vehicles and existence of such studies will lead to create our own fuel cell vehicle designs and technology. This study investigates fuel cell hybrid electric vehicles (FCHEV) and its design parameters such as electric motor, fuel cell stack and battery capacity including two control strategies. Propulsion system and control strategy will be created according to theoretical models. Analyzing propulsion system of FCHEV in a driving cycle, battery state of charge positions and vehicle range are main purpose of this study.

Keywords: Fuel cell, hybrid electric vehicle, control strategy, drive cycle simulation.

TESTING A VHDL DESIGN USING OPEN SOURCE VHDL VERIFICATION METHODOLOGY

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Abstract:

Hardware description languages have become widespread with the improvements on FPGA hardware structures. VHDL is the most commonly used language in hardware description. Quite complex circuits can be coded with VHDL due to its flexible design, simplicity and affordability. However, the coded design must be widely tested before moving to production phase. The success of the test depends on exercising all design specifications. Open Source VHDL Verification Methodology (OSVVM) test library coded by VHDL can easily generate test input data consisting of random numbers in a specified range and capacity, and also can exercise all design specifications at the test phase.

In this study, a VHDL design was described and tested by using OSVVM. As a result, generated test report contains a full function coverage which shows whether VHDL design specifications were exercised with best efficiency.

Keywords: vhdl, fpga, testbench, osvvm, open source.

A GENETIC ALGORITHM FOR SAFE AND RAPID TRANSMISSION OF MILITARY VEHICLES IN A MINEFIELD

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Abstract:

Abstract— Often, military vehicles need to pass through mines. In such circumstances, ensuring the safety and rapid transmission of a vehicle in a minefield is a serious task. Hitting a mine might cause a great damage on the vehicle and the worst of all, can cause death of soldiers. To prevent a possible damage, a safe and short path to a destination can be determined in advance provided that the locations of mines are known. In this paper, we proposed a Genetic Algorithm (GA) to find the shortest secure path from the given source to the destination through a minefield. In the proposed method, first, the shortest path between source and destination is constructed ignoring the mines. Then, the path is improved step by step by creating sub paths eliminating mines on the path. To walk around a mine on the path, the GA creates a number of different sub-paths excluding the location of that mine. Once all the locations of the mines are removed from the path, this path is said to be a safe path. Using this procedure, a population of safe paths from the source to the destination is generated. In order to produce shorter paths among the safe path population, we apply crossover and mutation operators accordingly. At the end of the GA, the shortest path found is selected as the path between the source and the destination. The proposed GA has been experimented with different parameters, and the results have proven that the proposed method is successful in finding safe and shorter paths effectively.

Keywords: Minefield, genetic algorithm, mine, shortest path, tabu search.

DETERMINATION OF EFFECT OF MANGANESE TOXICITY ON LTR RTS POLYMORPHISM IN ZEA MAYS

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Abstract:

Manganese (Mn) is an important plant micronutrient and it is used as a regulator in various biological systems including reproduction, photosynthesis, respiration and biosynthesis of DNA by plants. However, it has several useful functions, the critical toxicity concentrations of Mn can have a limiting factor on plant growth, also leads to damage lipids, proteins and DNA via accumulation of reactive oxygen species (ROS). In addition to genomic toxicity, Mn may alter the epigenome. The impact of Mn toxicity on DNA damage and DNA methylation alteration in plants is little known but LTR RTs (Long Terminal Repeat Retrotransposons) polymorphism is not determined. So the current study was designed to detect the impact of Mn contamination in Zea mays, in terms of LTR RTs activities by using IRAP (Inter Retrotransposon Amplified Polymorphism) assay. Five LTR RTs (Nikita-E2647, N57 (Nikita), Sukkula, Wltr2105 and Bare 1) of maize genome, were investigated. The results indicated that all doses of MnSO4.H2O (20, 40 and 60 mM) mobilized to all of LTR RTs and caused polymorphism so the increase of polymorphism under Mn stress may be a part of the defense system against the stress in Zea mays.

Keywords: Heavy metal, retrotransposon, maize, genotoxicity.

EFFECT OF PICLORAM ON DNA METHYLATION IN COMMON BEAN (PHASEOLUS VULGARIS L.)

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Abstract:

Picloram is structurally related auxinic herbicides that acts as a plant growth regulator. It is known that genotoxic potential at high concentrations that induces point mutations and single-double strand DNA breaks. However, there are many reports of picloram as a toxic agent in many plant species. To the best of our knowledge, we did not find any previous information about the epigenetic effects of auxinic herbicides picloram by using CRED-RA (Coupled Restriction Enzyme Digestion-Random Amplification) technique in the leaves of common bean (Phaseolus vulgaris L.) seedlings. CRED-RA is a method to detect DNA methylation, which is one of the main causes of epigenetic variations. Four picloram concentrations (5 mg/L, 10 mg/L, 20 mg/L, 40 mg/L) were used for analysis. The results indicated that DNA methylation was increased according to concentrations ratio of picloram.

Keywords: Herbicide, CRED-RA, epigenetic, DNA methylation.

TREATMENT OF DAIRY WASTEWATERS USING ANAEROBIC BAFFLED BIOREACTOR STARTED WITH WASTE ACTIVATED SLUDGE

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Abstract:

Anaerobic treatment of high strength wastewater is an effective and applicable way. In full scale applications, generally anaerobic up-flow sludge blanket (UASB) reactors are preferred due to its high efficiency, high removal rate and process stability. In order to start a new UASB bioreactor, a healthy granular sludge is needed as the granulation may take long time (> 1 year) and UASB reactors cannot be operated with flocculent anaerobic sludge. In many countries, it is very difficult to find a healthy granular sludge and if found it is quite expensive (>150-200 Euros/m3 in Turkey without including transportation expenses). Because of this fact, many wastewater treatment companies in Turkey prefer to avoid using anaerobic bioprocesses and try to treat the wastewater using quite big aerobic processes together with some chemical treatment methods.

In this study, we tried to use anaerobic baffled reactor (ABR) in place of UASB reactor as an alternative considering that ABR may be operated with flocculent type of biomass due to much lower up-flow velocity (< 0.5-1 m/h) requirement compared to UASB reactors (≥ 1.5-2 m/h). Additionally, we have started ABR using waste activated sludge from a full scale activated sludge process treating dairy industry wastewater. The total volume and the working volume of 4-stage ABR were 20 L and 10 L, respectively. The waste activated sludge was stored two months in the ABR without feeding at 35°C. Then, the ABR was fed with dairy wastewater and operated at 35°C with increasing loading rate from 2.3 kg/m3.d to 11 kg/m3.d within two months. The COD removal efficiency was 98% at lowest loading and the removal efficiency decreased to only 76% at highest loading rate, which illustrates that ABR started with waste activated sludge may be considered as a powerful alternative for anaerobic treatment.

Keywords: Anaerobic treatment, anaerobic baffled reactor, waste activated sludge, dairy wastewater.

ANALYSES OF SOMACLONAL VARIATION IN ENDOSPERM-SUPPORTED MATURE EMBRYO CULTURE OF RYE (SECALE CEREALE L.)

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Abstract:

Rye is second only to wheat as a grain used in bread making and it is also very well adapted to sub marginal conditions including low fertility soils, drought and cold. Regeneration of plants from in vitro-cultured cells is an important advance in the genetic manipulation of plants. However, regenerated plants showing genetic polymorphisms that are known as somaclonal variation. Although somaclonal variation could be useful for crop breeding programs as a source of beneficial variation, it is not desirable in plant transformation studies. The most common approach for cereal regeneration is indirect somatic embryogenesis. Unfortunately, callus-mediated methods such as indirect somatic embryogenesis induce somaclonal variation. Therefore, somaclonal variation should be detected during the early stage of plant tissue culture for plant transformation studies. In this study, endosperm supported mature embryos of Aslım 93 cultivar (Secale cereale L.) were cultured in petri dishes containing MS (Murashige and Skoog, 1962) medium supplemented with 20 mg/l sucrose, 2 g/l phytagel and different concentrations (2, 4, 6, 8, 10 and 12 mg/l) of auxins (2,4-D, dicamba and picloram) in order to evaluate the somaclonal variation rate. The petri dishes incubated at 25±1 □C for 21 days in darkness for callus induction from endosperm supported mature embryos. Genetic and epigenetic changes in callus were examined by RAPD and CRED-RA techniques, respectively. Increased auxin concentration led to the decrease in the GTS value. DNA hypermethylation occurred in higher concentrations of 2,4-D and picloram, while DNA hypomethylation was observed in dicamba.

Keywords: regeneration, in-vitro culture, genetic polymorphism, auxin.

DNA DAMAGE AND RETROTRANSPOSON POLYMORPHISM IN WHEAT SUBJECTED TO DROUGHT STRESS

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Abstract:

In this study, we aimed to elucidate DNA damage and LTR retrotransposon polymorphism in wheat (Triticum aestivum L.) subjected to drought stress. IRAP (Inter-Retrotransposon Amplified Polymorphism) and REMAP (Retrotransposon-microsatellite amplified polymorphism) were used to define the DNA damage levels and retrotransposon polymorphism. Retrotransposon polymorphism has been investigated that occurred with the stress of different three concentrations (-4, -6 and -8 bar) of polyethylene glycol (PEG) 8000 that depended on activations of retrotransposons. DNA damage was measured as GTS (which is a qualitative measurement reflecting the changes in REMAP patterns) in relation to the pattern showed in the control plants. The results showed that drought stress (-4, -6 and -8 bar PEG 8000) led to an increase in retrotransposon polymorphism and a reduction in genomic template stability (GTS). These results suggest that drought induced harmful effects on wheat.

Keywords: PEG 8000, genomic instability, IRAP, REMAP, Triticum aestivum L.

EFFICIENT ROUTING OF AMBULANCES AFTERMATH OF A DISASTER

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Abstract:

Abstract— Aftermath of a disaster, there could be numerous people injured throughout the affected geographical area. In such a case, reaching an ambulance in a short time is utmost important. However, as the number of ambulances and their capacity are limited, to minimize the tour lengths and waiting times, one should route the ambulances efficiently. In this study, we focus on creating efficient routes for ambulances aftermath of a disaster considering limited number and capacity of ambulances. We aim to minimize the number of tours to be conducted by an ambulance and the average time to take all injured people to a hospital. This problem is related with the well-known capacitated Vehicle Routing Problem (C-VRP), and, as such, the proposed Genetic Algorithm (GA) is developed and tested using some of the VRP (C-VRP) benchmark files as the victim locations. For the number of victims we created various scenarios. The proposed GA aims to minimize the tour lengths of the ambulances while respecting all real life constraints given in these scenarios. In order to evaluate the proposed method, we also developed a method based on the Nearest Neighbor (NN) heuristic. The initial results show the success of the proposed GA over the NN heuristic.

Keywords: Genetic algorithm, Vehicle routing problem, capacitated vehicle routing problem, ambulance routing.

GAS TURBINE BLADE LEADING EDGE COOLING EFFECTIVENESS BASED ON THE DISTANCE OF TURBULENCE PROMOTERS

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Abstract:

It is well known that performance of a gas turbine strongly depends on effective cooling of turbine blades. Today studies in this field are concentrated on high thermal and centrifugal loads on the gas turbine blades. Small variations of blade temperature can lead to a strong reduction of blade life and higher power output. To effectively cool the turbine blades, it is very common to introduce extended surfaces -known as the turbulence promoters- into the internal cooling channels. The flow and heat transfer characteristics of 3-D triangular turbulence promoters located in a triangular duct representing internal cooling channel of a gas turbine blade are investigated deeply to find the best distance of the turbulence promoters. The investigated turbulence promoters are periodically located inside the triangular duct in alternating directions to provide the best thermo hydraulic performance. A finite volume based Computational Fluid Dynamics (CFD) code (ANSYS FLUENT) is used in the present numerical study. The flow Reynolds number is fixed to 20.000. Inlet and wall temperatures are fixed to 20°C and 1760°C, respectively. The rotation number is 0.488. "RNG k-ε" turbulence model with "Enhanced wall treatment" option is used to determine the flow and temperature fields inside the triangular ducts. Based on the present numerical results, it is found that the best stream wise distance between the turbulence promoters should be equal to 0.5 times the turbulence promoter length.

Keywords: Turbulence promoter, CFD, gas turbine blade, thermo hydraulic performance.

NUMERICAL INVESTIGATION OF CONVECTIVE HEAT TRANSFER CHARACTERISTICS OF TIO2/WATER NANOFLUID IN A TRAPEZOIDAL MICROCHANNEL

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Abstract:

In this study, the forced convective heat transfer and fluid flow of TiO2/water nanofluid through the trapezoidal cross-sectioned microchannel having corner angle of 45o was numerically investigated. The flow was considered as three-dimensional steady-state thermally and hydrodynamically developing laminar flow condition (100≤Re≤1000). The constant heat flux was applied at the bottom and side surfaces of the microchannel. Top surface of the microchannel was insulated. The hydraulic diameter and the length of the trapezoidal microchannel were considered as 150 μm and 5 cm, respectively. The numerical analyses were performed for different nanoparticle volume concentrations (φ = 1- 4 vol.%) of TiO2/water nanofluid. The convection heat transfer coefficient and the Darcy friction factor values were obtained from numerical calculations. As a result, it is observed that the convective heat transfer coefficient increases with increasing in nanoparticle volume concentration. The maximum convective heat transfer enhancement was obtained to be 14.87% for TiO2 nanoparticle addition of 4.0 vol.%. However, the Darcy friction factor does not affect by the increasing in nanoparticle volume concentration.

Keywords: TiO2/water nanofluid, trapezoidal microchannel, forced convection, convection heat transfer coefficient, Darcy friction factor.

EFFECT OF DYNAMIC STRESSES AND GEOMETRIC DEFORMATIONS ON THE FATIGUE STRENGTH.

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Abstract:

The aim of this work is the study of behavior of rotor dynamics of industrial turbines and shafts, using numerical simulation. Finite element model of hollow shaft was studied by introducing a new hysteresis parameter to control more precisely the behavior of rolling bearings. The finite element model is used to extract the natural frequencies and modal deformed rotor vibration, as it identifies the constraints acting on the system and predict the dynamic behavior of the rotor transient. Results represent Campbell diagram, normal stresses at the surface of the shaft and damping factor. The determination of the dynamic stresses uses a maximum amplitude equal to 1 mm. Analytical and numerical results are compared for the maximum rotation speed (100 000 rpm).

Different results clearly show that it is necessary to take into account the stress concentration produced by local geometric modifications to avoid fatigue phenomena in dynamic rotors.

Keywords: Rotor dynamics, hysteresis, finite element, rotor vibration, dynamic stresses, Campbell diagram.

THE FACTORS THAT EFFECT THE EXTERNEL PATCH REPAIRED IN LAMINATED COMPOSITE MATERIALS

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Abstract:

For this study, class and carbon fibres reinforced composite materials heve been produced with eight laminates. For experimental study, specimens with 10 mm internal hole were prepared. Than, these specimens have been repaired by using adhasive and compozite patches with different parameters in necessary curing temperatures and labratory conditions. By performing the unidirectional tensile test, the ultimate failure loads of these repared specimens were indicated. By comparing these ultimate failure loads of repaired specimens that prepaired with different parameter, the effects of several repair parameters on the ultimate failure strength are investigated. These repair parameters are , patch bonded area (D/W ratio), adhasive thickness, patch thickness and fibres orientation angles (0,15,30,45).

Keywords: Laminate composite materials, bonded repair, patch, adhasive, failure strength.

ANALYSIS OF LAMINATED COMPOSITE PLATES BY USING ELEMENT-FREE GALERKIN METHOD

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Abstract:

The desire to use materials with high strength/weight or stiffness/weight ratio is increased the importance of composite materials nowadays. Due to this, much attention has been devoted to the numerical analysis of composite plates. The performance of well-known numerical methods, FEM and BEM, are based on mesh structures. Meshfree methods are free from the drawbacks of mesh-based interpolation techniques, FEM and BEM, and also promising candidates for solving composite material problems. Because of its high convergence rate, Element-Free Galerkin Method (EFGM) is one of the most widely used meshfree method in solid body mechanics. In this study; deformation and stress analysis of laminated composite plates are studied and several composite plate problems are solved with regular and irregular node distributions. The EFGM solutions are compared with exact solutions for displacement and stress values at critical points.

Keywords: Laminate, composite plate, element-free Galerkin method, meshfree methods

COMPARISON OF DIFFERENT VARIABLES ON ASPERGILLUS TERREUS IN DIFFERENT FERMENTATION TYPES

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Abstract:

Xylan-degrading enzymes (especially cellulose-free xylanases) have a wide range of potential biotechnological applications in various industrial processes, involving the modification of cereal-based foodstuffs, enhancing the digestibility of animal feedstocks, the delignification of paper pulp. In addition they take role in textile manufacture, in baking, in the release of aroma and anti-oxidant molecules, in the production of biopharmaceuticals and for bioconversion of lignocelluloses to sugar, ethanol, and other useful substances. The huge industrial usage area has provided an increased drift to identify and obtain new xylanases with different specificities and properties [1].

Plant materials hold captive huge amount of carbon sources as renewable resources. The structural portion of lignocellulosic biomass is composed mainly of cellulose (40–45%), hemicellulose (30–35%) and lignin (20–23%) [2,3]. Agricultural (e.g., corn stover and sugarcane bagasse) residues are considered as lignocellulosic biomass. Their degradation mainly depends on a complex enzyme system including cellulases, xylanases and other xylanolytic enzymes [4].

In this study, we performed xylanase production optimization from Aspergillus terreus on corn cob as a agricultural residue in both submerged fermentation culture (SMF) and solid state fermentation culture (SSF) Indeed the study aimed to compare both fermentation cultures. Since, SMF mainly used in industrial application and SSF culture is for mimicing the natural enviroment. Optimization studies of both cultures showed that microorganism was behaved differently in the cultures because, such as corn cob concentration was positively effective on xylanase production in SMF but it was negative for SSF.

This study was financially supported by The Scientific and Technological Research Council of Turkey (TUBITAK) by the Project-212T143.

Keywords: Xylanase, Optimization, Fermentation, Lignocellulosic materials

EFFECT OF MUNICIPAL SOLID WASTE (MSW) COMPOST ON GROWTH OF PHASEOLUS VULGARIS

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Abstract:

The Municipal Solid Waste (MSW) compost samples used in this study were obtained from the Istanbul Solid Waste Recycling and Composting Facility, Turkey. Two different soil samples were used; the commercial soil and topsoil samples that were collected from a rural area in the Black Sea region within the boundaries of Trabzon province, Turkey. It was detected that soil samples taken from the rural area involve very high amount of heavy metals (Cd, Cu, Pb, Zn) and have acidic (pH 3) characteristics. In the tests conducted in pots, the effect of the use of compost on the growth of bean plant (Phaseolus vulgaris) was investigated. At the end of the test completed within 21 days, the grown plants were harvested and the height and weight of the grown Phaseolus vulgaris were measured. In addition, pH values of soil-compost mixture in the pots were measured at the end of 21 days. Accordingly, no plant growth was found in the rural soil to which no compost was added. However, it was observed that plant growth was better as the amount of compost added to rural soil increased and in parallel, height and weight of plants increased as well. It is known that the plants grow less as the amount of the added compost increased in commercial soil. It is clear that the best pH range for the growth of Phaseolus vulgaris is 5.5-6.7. The addition of compost to soil samples increased the pH value of the soil to around pH 6 which is suitable for the plant growth. This situation positively affected the growth of plants in soil. However, it was found that the soil pH reached 8 as the amount of compost added to commercial soil increased and the growth of plants in soil was adversely affected.

Keywords: Compost, Phaseolus vulgaris, Soil

AVAILABLE AND TOXIC HEAVY METAL CONCENTRATIONS IN SOIL AND COMPOST

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Abstract:

In this study, the soil sample taken from the rural of Trabzon province which is located in the Black Sea Region, Turkey was investigated. The Municipal Solid Waste (MSW) compost sample was supplied from the Istanbul Solid Waste Recycling and Composting Facility within the boundaries of Istanbul Metropolitan Municipality. Total concentration of the elements within these soil and compost samples was determined. In addition, concentrations of immediately available and potentially available forms of some heavy metals (Cd, Cu, Ni, Pb, Zn) were determined. Afterwards, TCLP (Toxicity Leaching Procedure) leaching test was used to determine the concentration of toxic forms of these heavy metals. It was observed that Cd, Ni, Pb, Zn are mostly found in immediately available form in soil, and all heavy metals investigated in compost are found in potentially available form. According to the TCLP results, Cu has the highest concentration within compost sample.

Keywords: Available forms, Heavy metals, Compost, Soil, TCLP test.

EVALUATION OF MYCOTOXIN CONTENT OF DIFFERENT TRADEMARKS OF TURKISH RAVIOLI IN KARAMAN PROVINCE OF TURKEY

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Abstract:

Turkish Ravioli is one of the famous traditional foods in Turkey. Because of increasing demand for traditional food in the world, it is necessary and important to standardize the commercial traditional foods. For this purpose, the objective of this study was analyse the 15 different trademarks of Turkish ravioli based on mycotoxin (Aflatoxin B1, Aflatoxin-total and Okratoxin-A) contents. Six of fifteen samples had higher mycotoxin with respect to Turkish Food Codex. Moreover, the mycotoxin amounts in two samples were too high that related protection immediately put into effect. Since high mycotoxin content in Turkish Ravioli has a considerable effect for consumer's health it is important to determine mycotoxin content in it.

Keywords: Turkish Ravioli, Mycotoxin, Food Safety, Traditional Food

OPTIMUM AUTOFRETTAGE PRESSURE FOR A HIGH PRESSURE CYLINDER OF A WATERJET INTENSIFIER PUMP

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Abstract:

This study presents analytical approach for the determination of optimum autofrettage pressure of a thick walled cylinder which is commercially used as a high pressure cylinder of a waterjet intensifier pump. Bilinear kinematic hardening model is used in the derivation of analytical model based on plane strain, Von-Mises yield criteria and incompressible volume assumptions. Elasto-plastic radius is dependent on autofrettage pressure and optimum value of autofrettage pressure is found as a value that will give minimum value of maximum Von-Mises stress on the wall of the cylinder under operating pressure. Hence, considering elasto-plastic radius as the design variable, its optimum value is determined for the specified operating pressure. Reverse yielding owing to Bauschinger effect is used as the only non-linear constraint, matlab© optimtool finds optimum value of the elasto-plastic radius and the corresponding autofrettage pressure is then calculated. By using ANSYS 14©, stress analysis of the autofrettaged cylinder has been performed and the results obtained from both methods are found to be almost the same.

Keywords: Autofrettage, Kinematic hardening, Bauschinger effect, Optimization, FE analysis

CONVENIENCE OF DIGITAL DESIGN WITH FPGA

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Abstract:

Almost every electronic device that is used daily is controlled by a digital circuit. Transistors composed of semi-conductive materials are the main electronic elements composing these circuits. In some of the digital circuits, the number of transistors reach billions. When looked from the perspective of engineering, the circuits as complex as those are difficult to design.

The most recent approach to the digital design of complex circuits is to use a hardware description language. By this means, it is possible to implement digitally complex designs.

The aim of this study is to demonstrate the convenience that digital design methods provide on FPGA platform by using VHDL.

Keywords: FPGA, digital design, VHDL

NANOCOMPOSITE OF CEMENT PASTE/GRAPHENE COMPOSITE AND FUNCTIONALIZED NANOSILICA - HYDRATION KINETICS AND EARLY STAGE RESPONSE

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Abstract:

The application of nanomaterials in construction is a new alternative to enhance the mechanical properties of the traditional materials e.g. cement mortars and concretes. One of the most interesting nanomaterial which still requires detailed investigation is graphene and graphene oxide. Therefore, here we present study on hydration kinetics and early stage mechanical response of the cement mortar modified with graphene composite. The results were compared to cement nanocomposite modified with functionalized silica (SiO2). The two types of nano modifiers have specific potential effect on the behavior of cement paste. The interaction of nano additives with the cement hydrates and interfered with the production of C–S–H was compared. The kinetics of the hydration process was investigated by Infrared (IR) and X-Ray diffraction (XRD) techniques. The morphology of the nanocomposite was revealed by transmission electron microscopy (TEM) and scanning electron microscopy (SEM).

Keywords: nanotechnology, graphene, cement composites, civil engineering

8D PROBLEM SOLVING TECHNIQUE CASE STUDIES IN INDUSTRY FOR METALLIC MATERIALS PRODUCTION

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Abstract:

8D Problem Solving Technique Case Studies in Industry for Metallic Materials Production

The 8D as a problem solving method for product and process improvement was used since three decades that was often required in automotive industries. This technique, by its efficient problem solving ability, has proven itself with a powerful way in the automotive industry, and thus it has come into use for other areas. The eight dimensions problem solving basic steps can be considered as generating a team, describing the problem, immediate corrective actions, determining the reason of the problem (Root causes), chosen permanent corrective actions, implemented corrective actions, preventive actions to avoid the reoccurrence, evaluation and rewarding the contributors.

Essentially in addition to 8D analysis, some other important problem solving, process improvement and analysis methods such as "Failure Tree Analysis" (FTA), "Failure Modes and Effect Analysis" (FMEA), "Six Sigma" and so forth are also available. In the present study, case studies, which have been performed via 8D problem solving technique, were discussed, and also were made comparisons as technique with other problem solving methods which are mentioned above. Consequently, it was emphasized that 8D is a reliable, simple and timesaving method, and it might be considered as a robust problem-solver analysis method for many fields.

Keywords: Eigth dimensions analysis, problem solving, metallic production cases

ADAPTIVE FILTERS FOR SPEECH NOISE CANCELLATION

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Abstract:

In speech communication from mobile phones, in a moving car, train, factory, or over a noisy telephone channel audio signal is corrupted by an additive random noise. Since noise is random and varying continuously, we need to estimate the noise at every instant to remove it from the desired signal. There are many schemes for noise reduction but the most efficient scheme to accomplish noise cancellation is to employ adaptive filters. In speech signal enhancement there are two categories of algorithms in which either a single microphone or multiple microphones are employed to clean up the noisy signal. In this paper, Matlab simulations of different adaptive algorithms and comparison of their performances for noise cancellation in a noisy environment, specifically industrial noise, will be carried out. A comparative analysis of different adaptive filters considering their output MSE and SNR in the presence of a single and dual microphone will be provided. A robust voice activity detector (VAD) is incorporated in the single channel speech enhancement.

Keywords: Speech Enhancement, Kalman Filter, Least Mean Square, Spectral Subtraction, Wiener Filter, VAD

SYNTHESIS AND CHARACTERIZATION OF NOVEL ANTIMICROBIAL ACTIVE BENZOXANTHENE CARBOXAMIDE DERIVATIVES

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Abstract:

Drug resistance in diseases treatments created a need for the research and development of novel medicine agents. In the last few decades, the chemistry of benzoxanthene and their fused heterocyclic derivatives have received considerable attention owing to their synthetic and effective biological importance. For example, a large number of benzoxanthene-containing ring systems have been incorporated into a wide variety of therapeutically interesting drug candidates including photodynamic cancer treatment, anti-inflammatory activities, antiviral and antibacterial activities.

Because of these important many applications, recently, various methods have been reported for the synthesis of benzoxanthene derivatives. Herein, we were reported the synthesis of novel antimicrobial active carboxamide derivatives containing a benzoxanthene ring system and all prepared benzoxanthene products were characterized by melting points, FT-IR, NMR, and HRMS analyzes.

Keywords: benzoxanthene, carboxamide, drug, HRMS

ANALYSIS OF THE ESSENTIAL OIL OF MARRUBIUM PEREGRINUM L.

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Abstract:

The genus Marrubium L. belongs to the Lamiaceae family is comprised of about forty species, distributed in Europe, Asia and Brazil. It is represented by 20 species and 11 of them are endemic in Turkey. Some species are traditionally used to treat various diseases, including asthma, pulmonary infections, inflammation and hypotension, as cholagogues and sedative agents, and for pain relief. The GC–MS analysis of the essential oil were resulted in the determination of thirty compounds, representing 98.3 % of the total oil and the essential oil was 0.05%. The main components of the essential oil were cadinol<epi-alpha-> (40.7%), α-cadinol (35.7%), cedren-13-ol, 8- (7.6%). The essential oil contained oxygenated sesquiterpenes (87.5%), sesquiterpenes (7.1%), monoterpenes (2.5%), oxygenated monoterpenes (1.2%).

Keywords: Marrubium peregrinum L., essential oil, GC-MS

CHEMICAL COMPOSITION OF ESSENTIAL OIL FROM TEUCRIUM CHAMAEDRYS L.

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Abstract:

Teucrium L. genus, a member of the Lamiaceae, includes 100 species, is a large genus distributed in Europe, North Africa, and Mediterranean region. The genus Teucrium have been used for more than 2000 years as medicinal herbs for its anti-inflammatory, anti-rheumatic, digestive and diuretic effects. Teucrium chamaedrys L., is one of the most common and highly investigated species in this genus. . In this study, T. chamaedrys essential oil was obtained by hydrodistillation in a clevenger apparatus and analysed by gas chromatography–mass spectrometry (GC-MS). Fourty compounds were identified in the essential oil, representing 99.8 % of the total oil and the essential oil was 0.023%. The main components of the essential oil were 4-terpineol (22.8%), α- Bergamotene (15.8%), gurjunene (12.9%), Z-Caryophyllene (8.6%) The essential oil contained sesquiterpenes (51.1%), oxygenated monoterpenes (34.4%), monoterpenes (7.4%) , oxygenated sesquiterpenes (6.1%).

Keywords: Teucrium chamaedrys L., essential oil, GC-MS

STRUCTURAL ANALYSIS OF THE WHEEL VEHICLE'S SUSPENSION CARRIER

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Abstract:

Control technologies progressively developing in technological vehicles increase the number of studies examining the behaviors of vehicles in different road conditions. Additionally, optimization studies are performed for different road profiles of suspension systems. In this study, helical spring suspension system used in an off-road vehicle was modeled. In this study, vehicle with maximum compression and swing arm suspension system in the publication of the maximum movement scenarios stemming from the roof barrier formation by analyzing dynamic forces on axle carrier have been detected. Suspension conveyor, is one of the load-bearing parts of the system based on the dynamic effects of the vehicle on road conditions, was examined by the finite elements method. All these analyzes were conducted in the CREO program.

Keywords: Stuructural analysis, Suspension carier, Finite elements

OPTIMIZATION OF STRUCTURAL FRAME SECTIONS FOR THE PROTECTION OF LIVING SPACE FOR THE BUS ROLLOVER

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Abstract:

The buses in public transport have become an indispensable part of today. Structural strength of road passenger vehicles is of great importance. To prevent the consequences that may occur in rollover accident and protect the safety of bus passengers European regulations ECE R66 standards were taken as the basis. In this study, the bus side walls to be acceptable as a reinforcement into the upright profile sections (X, H, U sections) were determined using modeling programs. This profile will be placed on the bus side walls of the section determined which region, and wherein the behavior was examined by NASTRAN analysis program. Consequently, it is verified which section performs the best behavior.

Keywords: Bus rollover, Finite elements, Structural analysis, Living space,

NUTRITIONAL COMPOSITION OF THE WILD EDIBLE MUSHROOM AGARICUS LANIPES COLLECTED FROM THE GIRENIZ VALLEY OF DENIZLI

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Abstract:

The nutritional composition of sporocarps of the wild edible mushroom Agaricus lanipes collected from the Gireniz Valley of Denizli was determined. Results of the study showed that, based on dry weight, the moisture content of the samples of mature fruiting bodies of A. lanipes was 4.49%, while the contents of other components were, in order: total carbohydrate (52.32 g/100 g) > crude protein (30.14 g/100 g) > crude fibre (9.17 g/100 g) > ash (8.14 g/100 g) > crude fat (4.90 g/100 g). In addition, The major elements found in the mushroom samples were K, P, Mg, Ca, and Na (20280.8, 6468.9, 927.5, 270.2 and 238.8 mg kg-1 respectively), and trace elements were Fe, Zn, Cu, Mn, and Se (13.5, 6.21, 0.90, 0.58 and 0.11 mg kg-1 respectively). The metabolizable energy content of A. lanipes was also calculated and it was found that the energy content of this mushroom was 374 kcal/100g and 1583 kj/100g. This study suggests that A. lanipes may be used as healthy food with protein supplementing properties.

Keywords: Agaricus lanipes, protein, fat, fiber, ash, carbohydrates, energy, minerals, Gireniz Valley, Turkey.

AERODYNAMIC SIMULATION OF A TRADITIONAL HIGH-SPEED TRAIN WITH DIFFERENT HEAD ANGLES

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Abstract:

The shapes of traditional high speed trains (THST) which are becoming more widespread every other day are important in terms of the pressure they are exposed to and velocity distribution. This study examined the effect of different head angles of a traditional high speed train on aerodynamic characteristics. The aerodynamic analysis was conducted by taking five different models of train head angles which were 10, 15, 20, 25 and 30 degrees, and considering that the train was travelling at a speed of 50 m/s in clear weather. The simulation was created by using ANSYS/Fluent program based on the mechanical theory of viscous flow and 3D incompressible viscous flow model. By the final of this study; maximum speed of air flow was revealed between 61.7- 71.6 m/s. The maximum pressure differences value of the train surface was revealed between 1294.9 - 2723.6 Pa. The minimum value of coefficient drag was obtained 0.3090 at the 15º.

Keywords: Train head shape, aerodynamic characteristic, numerical calculation, head angle

PORPHYRIN-METAL COMPLEX GOLD NANORODS

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Abstract:

It was synthesized of Zn, Cu porphyrin complex thiol monolayer-protected Gold Nano-Rods (GNRs) (ZnP-GNR, CuP-GNR) .As expected, the resulting GNRs encapsulated with porphyrin Zn, Cu complex through strong covalent Au–S linkages were soluble and stable in various organic solvents such as THF, CH2Cl2, CHCl3 and toluene. The resulting GNRs exhibited distinct spectroscopic properties and were able to self-assemble into side-by-side arrays driven by p–p intermolecular interactions of the surface metal porphyrin chromophores.

Keywords: porhyrin-metal complex, gold nanorod

PRODUCTION OF CHITOSAN-LAYERED SILICATE NANOCOMPOSITE HYDROGELS AND INVESTIGATION OF THEIR HEAVY METAL ADSORPTION CAPACITIES

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Abstract:

The water pollution caused by toxic heavy metals has been one of the biggest problem for its long-lasting harm. Especially, chromium existing as Cr(III) and Cr(VI) ions in wastewater, has attracted a great attention due to their toxic effects to environment and human health. Adsorption technique has been applied primarily to the uptake of the metal ions due to its easy application and low cost [1]. Hydrogels are the one of the mostly used adsorbents materials because of their easy preparation and accessibility, respectively. In recent years, development and applications of biopolymers for adsorption processes have become popular due to their unique properties such as biocompatibility, biodegradability and nontoxicity. Chitosan, as a naturally occurring polymer, has been widely used in hydrogel material owing to its excellent biodegradability, high hydrophilicity and other interesting chemical/physical properties due to the presence of amino and hydroxyl groups [2].

In this project, we report enhanced Cr (VI) adsorption and swelling properties of chitosan nanocomposite hydrogels by the immobilization of Spirulina microalgea onto montmorillonite clay (MMT). Chitosan nanocomposite hydrogels having MMT and Spirulina modified MMT (Sp-MMT) clays in different loading degrees were prepared by physical crosslinking. The composite hydrogel having 1 % of Sp-MMT exhibited enhanced swelling compared to other hydrogels. Moreover, in the presence of the same amount of Sp-MMT, the resultant composite hydrogel showed quite high adsorption capacity as compared with neat chitosan hydrogel and MMT/Sp-MMT containing composite hydrogels.

Support given by Yalova University Scientific Research Projects Coordination Department (projects no. 2014/YL/036) is gratefully acknowledged.

Keywords: nanocomposite hydrogel, heavy metal removal, microalgea

E-INVOICING IN TURKEY AND A SOFTWARE-AS-A-SERVICE SOLUTION

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Abstract:

E-invoicing is becoming the standard way of billing globally thanks to its efficiency, cost and auditing convenience. Turkey is one of the countries that standardized its e-invoicing procedures and e-invoice is now mandatory for certain companies and optional for others. The companies have two options for e-invoicing: they may implement their own software, which should meet the imposed specifications; or they may lean to eligible integrator companies that provide software-as-a-service solutions. In this paper, we first discuss the e-invoicing procedure in general. Then, we move on to the standard that is used in Turkey, and its differences from the other countries. We then discuss the platform-independent software solution that is used by one of the leading integrator companies. In particular, we describe the database, web and web service structures employed in detail. Finally, we give statistics about the usage and penetration of e-invoicing solutions.

Keywords: e-invoice, web design, web service, database

EFFECT OF MAGNET MATERIALS ON THE EFFICIENCY OF LINE START PERMANENT MAGNET SYNCHRONOUS MOTOR

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Abstract:

In this paper, the effect of the magnet materials on a line start permanent magnet synchronous motor (LSPMSM) is investigated. Using NdFe and SmCo magnets 1.1kW LSPMSM is designed by helping RMxprt software and the differences of the efficiency curves have been obtained. The results demonstrated that maximum efficiency can be succeed with properly choosen used materials and optimisation of the motor dimension in the analyses.

As a conclusion, the connection between materials and the shape of the geometry are directly related with the efficiency of the LSPMSM are revealed.

Keywords: Line start motor, Permanent magnet motor

THE KINEMATIC ANALYSIS OF THE EIGHT LEGGED SCORPION ROBOT

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Abstract:

Multi-legged robots have been commonly used in different applications in all areas of life, especially at the defense and space industry, in harmful places for human health (radioactive and dangerous materials transportation, earthquake zones etc.). In this study, a walking robot mechanism has been designed and manufactured. Robot is formed of parts such as battery, gear, bushing, ring, DC motor and sound-sensitive sensor. Eight-legged scorpion robot's design was made in SolidWorks software. Connecting rod curve of the walking mechanism consisting of six members was drawn using geometric analysis program (Cinderella). The position, velocity and acceleration analysis of mechanism members was performed.

Keywords: Scorpion Robot, Robot Design, Position, Velocity, Acceleration.

EFFECTS OF DIFFERENT BACTERIAL STRAINS ON YIELD AND QUALITY OF STRAWBERRY

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Abstract:

This study was focused at the assessment of effects of some bacterial strains (Bacillus licheniformis M3, Bacillus subtilis OSU142, Variovorax paradoxus RC 21, Paenibacillus polymxa R 22, Bacillus sp. RC 23, Bacillus subtilis RC-11, Bacillus mycoides T8, Bacillus sp. RCR03, Bacillus cereus RC18, Bacillus cereus T30, Pseudomonas fluorescens T32, and Bacillus megaterium RC101) on yield and quality of strawberries grown under mulching bobbin system, in a relatively short vegetation period.

Strawberry seedlings, belong to the day-neutral cultivar of "Fern" were used in this study. Earliness, yield per plant, average fruit weight, quality classes of fruits, total soluble solids, total sugar, glucose, vitamin C, titrable acidity, malic acid and pH were evaluated. Results of this study show that bacterial strains have significantly increased yield and quality of strawberries grown under mulching bobbin system, also significant correlations were found between all of the investigated parameters. The results of this study clearly indicated that bacterial strains used in this study could be used as a bio-fertilizer to promote the plant growth, yield and quality of strawberry.

Keywords: Strawberry, Fern, yield, quality, bacteria

DESIGN OF FIVE DEGREES OF FREEDOM BOMB LOADER

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Abstract:

In this study, a non-motorized and hydro-mechanical loading device that have five degrees of freedom for fighter jets is designed on the Pro-Engineer program. The moving tables part of the three dimensional design with were transferred to the Matlab Simmechanics program. Later creating a mathematical model of the design made the necessary connections to the actuator. Pressure, force, velocity, position and flow rates graphics with respect to time is achieved by creating mathematical models of hydraulic systems that the real movement of the device. The state of motion of the system and graphics were obtained with hydraulic actuators which connected to the system. As a result, no problem observed after movement with appropriate cylinder and pressures of the manually driven device.

Keywords: Bomb Loading Device, Computer Aided Design, Pro-Engineer, Matlab, Simmechanics.

THE CORRELATION BETWEEN CPU CORE TEMPERATURES OF A SERVER UNDER SPECIFIC COOLING SYSTEMS

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Abstract:

The improvements in the computer world have promoted faster and ergonomic systems in recent years. Although the speed and the ergonomics are desirable for users, they introduce some issues to the computer systems such as the control of increased temperature. Since servers continuously provide services to many clients, they are chiefly affected by this temperature increment. In this study, thermoelectric cooler was applied on the CPU of the server and the effect of this application was investigated on the CPU and the CPU cores in short time intervals in the perspective of cooling. We also made an approach to uncover the correlations between whole CPU temperature and each CPU core temperatures.

Keywords: Thermoelectric module, Heatsink, CPU, Cooling Systems, Server, Quad Core CPUs.

CROSSLINK AGENT EFFECT ON AU/POLY(4-VINYL PHENOL):PMF (POLY(MELAMINE-COFORMALDEHYDE) METHYLATED)/P-SI SCHOTTKY DIODE

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Abstract:

The electrical and interfacial properties of the Au/Poly(4-vinyl phenol)(PVP):Poly(melamine-coformaldehyde) methylated (PMF)/p-Si Schottky diode was investigated by $(C-f-V)$ and $(G-f-V)$ techniques at room temperature. The insulator layer with cross link agent was growth by spin coating technique at the same weight ratio onto p-Si substrate. Some important diode parameters such as diode ideality factor (n), barrier height ($\emptyset_b$), interface state density (N_{ss}), series resistance (R_s) of the Au/PVP:PMA/p-Si structure were calculated from the current-voltage ($I-V$) and capacitance-voltage ($C-V$) characteristics at room temperature. The PVP:PMF interface effect on the electrical characteristics of metal-polymer-semiconductor (MPS) type Schottky diode have been investigated frequency dependent capacitance ($C-V$) and conductance-voltage ($G-V$) measurements to explain the deviation of the ideality factor of MPS device. It is found that the interface states and R_s which indicate the deviation of the ideality factor of Au/PVP:PMF/p-Si structure is strongly depended on bias voltage and frequency. The interface state density, N_{ss}, profiles as a function of ($E_{ss}-E_v$) was obtained. The values of N_{ss} vary between 10^{11} $eV^{-1}cm^{-2}$ and 10^{12} cm^{-3} $eV^{-1}cm^{-2}$ which mean that the cross-link agent reduced the N_{ss} in comparison with PVP thin layer.

Keywords: Poly(4-vinyl phenol), poly(melamine-coformaldehyde) methylated, Schottky diode, interface states.

THE EFFECTS OF MODIFIED ATMOSPHERE PACKAGING WITH ETHYLENE ABSORBERS ON ASCORBIC ACID CONTENTS IN RED BELL PEPPERS.

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Abstract:

The Effects of Modified Atmosphere Packaging with Ethylene Absorbers on Ascorbic Acid Contents in Red Bell Peppers.

The effects of modified atmosphere packaging (MAP) with and without ethylene absorbers (2 % O2 5 % CO2 and 93 % N) of red bell peppers (Capsicum annuum) on the ascorbic acid content and mass loss have been studied during storage (10 □C and 95 % RH for 21 days).

The red bell peppers were immersed into 100 ppm chlorine water for 1 minute and rinsed with tap water and dried with paper towel. Samples (500 ± 50 g) were packaged with film (BOPA/PE, 90μm) and stored at three different conditions. The first and second conditions consisted in a modified atmosphere packaging with ethylene absorber and without ethylene absorber. Then, the third sample group consisted of unpackaged controls. On days 7, 14 and 21 of storage period, the ascorbic acid contents of the samples were determined spectrophotometrically, as well as mass loss of the samples.

According to ascorbic acid analyses results of packaged samples with and without ethylene absorbers and unpackaged red bell pepper samples, the minimum loss in ascorbic acid was determined in the samples packaged with ethylene absorber as 16.45, 39.76 and 59.80 % on days 7, 14 and 21, respectively. In contrast, the highest loss (81.67 %) was in the unpackaged samples on day 21 of storage. Regarding to mass loss results, the mass loss was 18.9 % in unpackaged samples stored for 21 days, while those were 2.49 % and 2.64 % in the MAP samples with and without ethylene, respectively.

Keywords: Red Bell Pepper, MAP, Ethylene Absorber, Ascorbic Acid

A NEWLY RECORDED MITE SPECIES OF THE GENUS *STORCHIA* OUDEMANS (ACARI: STIGMAEIDAE) FOR TURKEY: *S. HENDERSONAE* FAN AND ZHANG

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Abstract:

The family Stigmaeidae (Acari) is the most abundant in the superfamily Raphignathoidea, and it consists of 32 valid genera. The genus *Storchia* is one of the smallest genera of the Stigmaeidae with 11 described species. Members of this genus live in soil, litter, moss, tree bark and stored products. This genus was previously represented by three species in Turkey: *Storchia ardabiliensis, S. hakkariensis* and *S. robustus*. This paper deals with the description of a *Storchia* mite based on the Turkish material, *Storchia hendersonae* Fan and Zhang, as a new record for Turkey. In this study, we aimed to contribute to the knowledge of mites present in Turkey.

The mite specimens were extracted in the lichen and moss collected from Harşit Valley by using Berlese funnels, cleared in 60 % lactic acid and mounted on microscopic slides in Hoyer's medium under stereo microscope. Drawings were made with the aid of a Leica DM 4000 B phase-contrast light microscope. Body size and measurements of various structures of the body were taken in micrometers (μm) with the aid of The Leica Application Suite (LAS) Software Version 3.8.

With this study, only two female specimens among mite specimens in lichen and moss from the valley were identified as *Storchia hendersonae*. The description, illustrations of the species and its measurements for some body parts were made, and its distribution in the world was also given.

Storchia hendersonae Fan and Zhang is only given before from the type of locality, New Zealand. It is concluded that this species is a new record for the Turkish fauna. This is also the second report of the species up to this time.

Acknowledgment: This study was supported by the Scientific and Technological Research Council of Turkey (TÜBITAK), research project number 113Z094.

Keywords: Acari, Stigmaeidae, *Storchia*, New record, Harşit Valley, Turkey

APPLICATION PROPERTIES OF GROUNDNUT HULL/EPOXY COMPOSITES

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Abstract:

Polymeric composites are developed with polymeric matrix/convenient filler, much better interactions between matrix and filler. Polymeric composites have many using areas such as buildings, automotive, aerospace, and packing industries. And also biodegradability of natural fibers is significant factor in polymeric materials (Saba et al., 2014). Some parameters as microstructure and dimensions have an effect on polymer composite properties (Fu and Qutubuddin, 2001). Epoxy resins (ER) are one of the most important classes of thermoset polymers that harden with heat effect. They are used in high-performance composites on a large scale due to their great mechanical, thermal and chemical properties such as good resistance to chemicals, high tensile and compressive strength, and high heat distortion temperature (May, 1998). In this study, groundnut hull/epoxy resin composites were prepared. Groundnut hull as filler, epoxy resin (NPEL 128), polyethylene glycol (PEG), and 25 wt % hardener based on aliphatic amines for epoxy resins (EPAMINE PC17) were used. Commercially available epoxy resin was a bisphenol A-type resin modified with aromatic diluents. Hardness, adhesion, corrosion, water sorption, freezing tests and thermal analysis were carried out to determine composite properties.

Keywords: epoxy, groundnut hull, composite

INVESTIGATION OF THE TRIBOLOGICAL PERFORMANCE OF DOPED SEMI-SYNTHETIC ENGINE OIL

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Abstract:

The widespread use of semi-synthetic oil in internal combustion engines because of performance and cost. However, these oils have to show the desired operating conditions of the internal combustion engine cannot show sometimes tribological performance. Increasing the tribological performance of the oils with synthetic additives which are placed in mineral oil are improved. Some causes of the high rate of use of semi- synthetic oil, high price of synthetic oils and oils used according to the recommendations of the engine manufacturer. Improving with oil additives added to the tribology performance semi-synthetic oil is an affordable and easy way. In this research, the effect of the tribological performance of the semi-synthetic motor oil of different additives were investigated.

Keywords: Oil additives, Semi-synthetic oil, Tribology, Friction, Wear

INTAGRATED DYNAMIC ANALYSIS OF A SIX AXIS SERIAL ROBOT

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Abstract:

Serial robots are by far the most common robots used in industrial applications such as welding, pick and place, and various processes. Computers and engineering programs play important role to constitute motion analysis and design process. In this study, a six axis serial robot is discussed by using integrated approaches with parallel analysis in SolidWorks, CosmosMotion, VisualBasic and Adlink Motion Control Card. The parts of the robot are modeled in SolidWorks. Kinematic analysis is studied in CosmosMotion by defining the velocity profile to the end effector point through the software algorithm developed in VisualBasic, which uses the application programming interface (API) capabilities. The kinematic workspace and maximum motor velocities are evaluated by inverse kinematic analysis. The kinetic workspace and maximum motor torques are evaluated by forward kinetic analysis. The trajectory is generated using ADLINK PCI-8366 motion control card after evaluating the results in terms of kinematic and kinetic work space. The maximum deviation for each motor is determined which is between the sending velocity profile data and the receiving feedback velocity profile data and compared whether the deviation values are in acceptable ranges.

Keywords: six axis robot, motion control, simulation

PLASMA PASTE BORIDING OF 21NICRMO2 STEEL USING BORAX PASTE FOR MULTIPLE GAS MIXTURES

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Abstract:

Plasma paste boriding is a thermo-chemical diffusion process in which boron is diffused into the steel in plasma environment at high temperatures. The paste used having environmentally friendly boron raw materials and gases which have inert characteristics make this process more advantageous when compared with plasma boriding.

In this study, 21NiCrMo2 steel was borided using borax paste in plasma environment at temperatures of 700 and 800oC for duration of 2 and 5 h and for gas mixtures of 60%N2+20%H2+20%Ar and 20%N2+60%H2+20%Ar. The properties of the boride layer were evaluated by optical microscopy, X-ray diffraction (CuKα radiation, λ=1.5418 Å) and Vickers hardness tester (for 50 g load). The results revealed that X-ray diffraction analysis of boride layers on the surface of the boronized steel exhibited FeB and Fe2B phases and intensity of FeB and Fe2B phases changed depending on the plasma gas mixtures. The thickness and hardness of boride layer increased with the increase in temperature and time of plasma paste boriding process.

Keywords: Borax, Plasma paste boriding, Iron borides, Microhardness, Case hardening steel

ANIMAL MANURE EFFECT ON CLIMATE CHANGE AND USAGE AS A ENERGY SOURCES IN TURKEY

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Abstract:

Climate is changing with the increasing number of population. Since the people wealth is mostly depended on economy and economical growth is explained by the high energy usage, there will be high energy needed. The energy demand is mostly supplied by non-renewable energy sources for human beings wealth and economy. The investigators are searching new energy sources due to the possible end of non-renewable energy sources. The renewable energy sources such as wind, solar radiation, water, biogas production from the wastes and animal manure are becoming more and more important due to consideration of positive environmental effect. The animal manure is one of the new valuable energy sources for the people. Within this study, the animal manure's CH4 and N2O emissions and the energy potential from manure as biogases will be considered. The highest energy could be produced in Balıkesir, Konya and Izmir provinces, because 12% of Turkey's animals (cattle, buffalo and dairy cattle) are in these cities. The CH4 and N2O emissions from these provinces are 63.44 Gg and 0.82 Gg, respectively. These emissions are 1586.44 Gg CO2 equivalent. According to the 2013's energy balance tables, 1564 ktones of Oil Equivalent (TOE) was produced from the animal wastes. The total CH4 and N2O emission from this energy source are around 2.03 Gg CH4 and 0.27 Gg N2O. These emissions are just 42.67 Gg CO2 equivalent. Therefore, producing energy from animal wastes will not only result emission reduction, but also produce clean energy which decreases total consumption of renewable energy.

Keywords: Climate Change, Greenhouse Effect, CO2 equivalent, CH4 and N2O emissions, IPCC Methodology

NATURAL GAS CONSUMPTION AND ITS EFFECT ON AIR EMISSIONS IN TURKEY

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Abstract:

Air is polluted and it is one of the biggest problems of earth environment. There is some agreement for the reduction of air emissions and almost all countries signed the Kyoto Protocol to decrease the earth emissions for the future. However, this is not the case, the world still emits CO2 and its concentration reaches approximately 380 ppm in the atmosphere. This gas, as a direct greenhouse gas, is important because it is responsible for approximately 60% of the earth's climate change. The other direct greenhouse gases such as CH4, N2O and F-gases are the responsible for remaining part. At the beginning of the 1970s, the natural gases are firstly used in industries in Turkey, with a value of 15 million m3/year, but it was reaches 45 600 million m3/year in 2013. This quantity is important because it is approximately produce 33.9 million tones of oil equivalent (TOE) energy. The same quantity of energy could be produced by approximately 158 million tones lignite or 60 million tones of hard coal. In 2013, with the consumption of natural gas totally produce 88.2 million tones of CO2 equivalent emissions. If hard coal was used instead of natural gas, the total emission would be 240 million tones of CO2 equivalent emissions which is 272% more than natural gas consumption. If lignite was used, the total CO2 equivalent emission would be 670 million tones. This quantity is 760% more. Therefore, using natural gas is one of the ways to tackle with climate change in Turkey in short time.

Keywords: Climate Change, Greenhouse Effect, CO2 equivalent, CH4 and N2O emissions, IPCC Methodology

THE RESEARCH OF THE ECONOMIC IMPACT OF GRANITE DUST REMAINS USAGE IN AUTO BRAKE PADS

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Abstract:

The pads used in auto brakes are made of the composition of a large number of materials. What is expected from a pad is that is provides the minimum friction and corrosion values, does not give damage to environment, and does contribute to country economy. In the study carried out for this purpose, from the materials composing brake pad component was produced brake pad involving granite dust instead of barite. The granite dust which is the smallest size granite waste is the wastes which occur during the cutting of blocks and plates in marble workshops and whose size is below 250 μm. The 30% of the processes granite are thrown away as dust and particles. In the cutting process, it is carried to sediment tanks accompanied by water and the granite dust subsiding in the pools is then taken into dump sites. The majority of this amount is left as waste and cause environmental problems.

Following a series of milling-screening process for this purpose, auto brake pad added by granite dust with new formulation was manufactured using some additive agents. In order to determine the usability of the produced pads, braking performance was examined in brake test device. In the light of the results, considerable results were obtained both in the utilization of waste materials and in decreasing the cost of production.

Keywords: Barite, Pad, Granite dust.

EFFECTS OF HEAT TREATMENT ON ABRASION PROPERTIES OF FIR AND BEECH WOOD

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Abstract:

Heat treatment alters chemical, physical, and mechanical properties of wood. Heat treated wood, in another word ThermoWood is generally used in outdoor applications such as flooring, decking, siding, fenching and exposed weathering effects such as rain, ultraviolet (UV), wind etc. . In this study, abrasion and wear resistance of heat treated fir (Abies nordmanniana subsp.) and beech (Fagus orientalis) wood at temperatures 170, 180, 190, 200 and 212 oC for 2 h with ThermoWood method were determined. The results were compared with industrially kiln-dried reference samples.

As a result, the heat treatment temperature effects the abrasion properties. Due to the increasing of heat treatment temperature, the abrasion increases correspondingly.

Keywords: Heat treatment, Abrasion, Wear index, ThermoWood

A KINETIC MODELING STUDY OF PHOSPHATE REMOVAL ONTO MODIFIED BENTONITE CLAY

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Abstract:

Phosphate is regarded as one of the key nutrient elements for the growth of biological organisms in aquatic environment. However, an excess of phosphate present in water body induces eutrophication, which leads the overgrowth of algae, decline of dissolved oxygen, reduction of water quality, and depopulation of aquatic animals. Therefore, a great deal of effort has been devoted toward the development of different adsorbents to decrease and control the amount of phosphate in water with adsorption method.

In the present study, the removal of phosphate from aqueous solutions by adsorption onto modified bentonite clay was studied using the batch technique. Acid-thermal treatment was employed to treat the raw bentonite clay. The determination of adsorption kinetics is very useful for understanding the involved mechanism and also for the future design of a large scale adsorption system. In order to investigate the mechanism of sorption and potential rate controlling steps, pseudo first-order, pseudo second-order, external mass transfer and intra-particle diffusion were applied to test experimental data. Kinetic analysis of the four models was carried out for initial phosphate concentration in the range of 25–150 mg/L. It was found that both external mass transfer and intra-particle diffusion played an important role in the adsorption mechanisms of phosphate and adsorption kinetics followed the pseudo-second-order type kinetic model for different initial phosphate concentrations.

Keywords: phosphate, adsorption, kinetic, modified bentonite clay

EFFECT OF CARBON AND NITROGEN CONCENTRATIONS ON PHB PRODUCTION BY MIXED CULTURE SUBMITTED TO AEROBIC DYNAMIC FEEDING REGIME

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Abstract:

The aim of this study was to investigate the polyhydroxybutyrate (PHB) production by mixed culture submitted to aerobic dynamic feeding regime (ADF) in sequencing batch reactor (SBR). The study was composed of two main parts. In the first part, influent carbon concentration was kept constant and nitrogen was limited, corresponding to C/N ratios of 15-∞. The results demonstrated that PHB accumulation within the cell increased linearly by increasing C/N ratio and maximum PHB content reached 34.5% at optimum C/N ratio of 100. However, PHB accumulation yield decreased prominently when SBR was fed with nitrogen free influent and SBR could only be operated about 10 days under these conditions. In the second part, 2-fold and 3-fold increases in carbon-nitrogen loading were performed at the optimum C/N ratio obtained from the first part of the study. PHB content was reached 39% of cell dry weight with a 3-fold increase, corresponding to maximum value obtained during all study periods.

Keywords: aerobic dynamic feeding regime; C/N ratio; nitrogen limitation; nitrogen starvation; polyhydroxybutyrate

A NUMERICAL METHOD TO FIND THE TRANSIENT TEMPERATURE DISTRIBUTION OF HOLLOW CYLINDERS

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Abstract:

In scope of this study, we investigated one-dimensional transient hyperbolic heat conduction problem of thick walled hollow cylinders made of isotropic and homogeneous materials. As is well known, it is important to know temperature distribution more accurately to determine the effects on the system due to thermal loading. In order to correctly predict the transient temperature distribution for hollow cylinders we employ a numerical method called Durbin's Inverse Laplace Transform technique. By using this method, the analytical solution of the differential equations in the Laplace domain are converted in an accurate manner to their corresponding numerical values in the time domain. The temperature distribution through the radial coordinate for different thermal relaxation time values are demonstrated in non-dimensional form.

Keywords: Durbin's method, Inverse Laplace Transform, Transient Hyperbolic Heat Conduction, One-Dimensional Heat Problem, Non-Fourier Heat Conduction

EFFECT OF WAX AND POLYTETRAFLUOROETHYLENE ON TRIBOLOGICAL PROPERTIES OF FIBRE GLASS FILLED POLYPHENYLENE SULFIDE COMPOSITES

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Abstract:

In this experimental research, the tribological performance of 40%wt fibre glass (GF) filled polyphenylene sulfide (PPS-GF), wax and polytetrafluoroethylene (PTFE) filled PPS-GF composites were studied. The examined materials were PPS-GF, PPS-GF+2wt%wax, PPS-GF+5wt%PTFE and PPS-GF+2wt%wax+5wt%PTFE. All the materials were dried at 140 oC for 4 hour before compounding. PPS-GF composites were fabricated on twin screw extruder. The temperatures from the feed zone to the die of the extruder were 275, 280, 288, 295 and 300 oC, respectively. Thereafter, the specimens for tribological tests were produced using injection-molding machine, with an injection pressure of 500 bar and temperature profile of 275, 285, 295, 300 and 300 oC. The screw speed was fixed at 80 cm3/s and the mould temperature was 30 oC. Wear tests were carried out at dry sliding conditions with configuration of a polymer pin on a rotating X40CrMoV5-1 steel disc. Test conditions were atmospheric conditions, applied forces were 60, 90 and 120 N, and sliding speeds were 0.5, 1.0 and 1.5 m/s by the test machine. The experimental setup designed according to the 2000 m sliding distance for all test specimens. The results show that the coefficient of friction for PPS-GF and its composites were decreased while specific wear rate increased with increased applied load and sliding speed values. The coefficient of friction and specific wear rate of the PPS-GF polymer decreased with the addition of wax and PTFE. The specific wear rate for PPS-GF and its composites are in the order of 10−14 m2 / m. Finally it is concluded that the wear mechanisms is a combination of adhesive and abrasive wear.

Keywords: PPS, Wax, PTFE, Friction, Wear

THE LOX-1 3'UTR188C/T POLYMORPHISM IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING

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Abstract:

Atherosclerosis is characterized by the accumulation of low-density lipoproteins (LDLs) and inflammatory cells within the vessel wall, being a multifactorial disease process, has been suggested to be associated by the interaction of both environmental and genetic risk factors. Lectin-like oxidized low-density lipoprotein receptor-1 (LOX-1), encoded by the ORL1 gene, has been implicated in the pathogenesis of atherosclerosis. The present study was designed to investigate the association of LOX-1 3'UTR188C/T gene polymorphism effect on susceptibility in patients undergoing coronary artery bypass grafting.

The study population consisted of 103 patients with coronary artery bypass graft (CABG) surgery and 127 normal healthy controls. The polymorphism was genotyped by PCR-RFLP technique. Our results indicated that the distribution of the LOX-1 3'UTR188C/T genotypes and alleles did not differ significantly among patient and control groups ($p>0.05$).

The results of the study indicate that, for our Turkish sample, LOX-13'UTR188C>T polymorphism may not be involved in susceptibility to atherosclerosis, implying that the LOX-13'UTR188C/T and different LOX-1 single nucleotide polymorphisms may need to be further evaluated with regard to their single and combined analysis effects at risk of atherosclerosis.

Keywords: Atherosclerosis, LOX-1 3'UTR188C/T, polymorphism

VARIATIONS IN NFKB1, NFKBIA AND PRE-MIR-499 GENES CONTRIBUTE TO SUSCEPTIBILITY TO ATHEROSCLEROSIS IN TURKISH POPULATION

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Abstract:

Atherosclerosis is a chronic immuno-inflammatory disease characterized by endothelial dysfunction, inflammatory mediators and immune activation in arterial wall. MicroRNAs and NF-κB are involved in the regulation of a variety of biological processes, such as inflammation and immune responses. The aim of the present study was to investigate the association of NFKB1, NFKBIA and pre-miR-499 polymorphisms and their single and combined analysis effects on susceptibility of atheroclerosis in Turkish population.

We analyzed the distribution of NFKB1 (rs28362491), NFKBIA (rs696), and pre-miR-499 (rs3746444) polymorphisms using PCR-RFLP method in 150 Atherosclerotic patients and 145 healthy controls in Turkish population. In this study we have examined the association of rs28362491, rs696 and rs3746444 polymorphisms with atherosclerosis. We did not find any statiscally significant difference in distribution of the genotype and alleles of NFKB1 rs28362491, whereas AA genotype of NFKBIA, had a higher risk (OR=2.082, 95%CI:1.093-3.963, p=0.0364) for atherosclerosis. On the other hand, the TT genotype of pre-miR-499 rs3746444 polymorhism was increased risk for atherosclerosis (OR=4.000, 95%CI: 1.690-9.468, p=0.0025; dominant model, OR=5.010, 95%CI: 2.518-9.970, p<0.0001). According to the combined genotype analysis of rs28362491/ rs3746444, ins/ins/TT combined genotype revealed significant protective effect on atherosclerosis.

Our results suggest that genetic polymorphisms of NFKBIA rs696 and pre-miR-499 rs3746444 is associated with atherosclerosis, and the NFKB1/ pre-miR-499 combined genotype is also related to an decreased risk of atheroclerosis in Turkish population.

Keywords: Atherosclerosis, NFKB1, NFKBIA, pre-miR-499, polymorphism

THERMAL ANALYSIS OF NEW MOLTEN SALTS ELECTROLYTE FOR MEDIUM TEMPERATURE THERMAL BATTERIES

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Abstract:

Thermal batteries have generally three sections; anode, cathode and electrolyte. We developed a new molten salts electrolyte with binary mixture. Its thermal conductivity and DSC analysis were evaluated and compared with mixture components. It was concluded that the new molten salts electrolyte with binary mixture can improve thermal and electrical capacity in medium temperature thermal batteries.

Keywords: Binary mixture, thermal analysis, electrolyte, thermal battery

PRELIMINARY REPORT ON ASSOCIATION OF ANTI-SACCHAROMYCES CEREVISIAE ANTIBODIES WITH VITAMIN D DEFICIENCY

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Abstract:

A pandemic of vitamin D insufficiency/deficiency is estimated to affect about 1 billion people worldwide. High prevalences are reported even from regions with extensive sunlight exposure. Vitamin D deficiency is associated with cardiovascular/cerebrovascular and autoimmune disorders. Anti-saccharomyces cerevisiae antibody(ASCA) are increasingly reported in autoimmune disorders, some of which are among the causes of vitamin D deficiency per se. Despite moderate climate with a preponderance of sunny days, we observe a high prevalence of vitamin D deficiency/ insufficiency in our clinical practice. The objective of this study was to investigate a possible association of ASCA with vitamin D deficiency.

208 adults without any complaints presented to internal medicine outpatient clinic for routine history and physical examination has been studied. Serum biochemistry, 25-OH D3, ASCA IgG and IgA were obtained from fasting serum samples in all cases.

Vitamin D deficiency and insufficiency was 83% and 64.4%, respectively. Both were more common among women (93,9% and 82.6%). 25-OH D3 was significantly lower in ASCA positives(P= 0.044). ASCA IgG/gA either positivity was associated with vitamin D deficiency at >20 IU/mL ($\chi 2$ 1df = 4.44; P = 0.035).

The established association of ASCAs with autoimmune disorders, which are associated with vitamin D deficiency per se, made us design this preliminary study to investigate the ASCA status in vitamin D deficiency. We found that ASCA IgG or IgA either positivity was significantly associated with low 25-OH D3. Our findings might help better understanding of the complex mechanisms involving vitamin D deficiency and autoimmune disorders.

Keywords: Vitamin D, Deficiency, ASCA

ASSOCIATION BETWEEN SERUM 25-HYDROXYVITAMIN D AND SOME INFLAMMATORY CYTOKINES AND ANGIOGENIC FACTORS

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Abstract:

A pandemic of vitamin D insufficiency/deficiency is estimated to affect about 1 billion people worldwide. High prevalences are reported even from regions with extensive sunlight exposure. Vitamin D deficiency is associated with cardiovascular/cerebrovascular events, autoimmune disorders and canser. Despite moderate climate with a preponderance of sunny days, we observe a high prevalence of vitamin D deficiency/ insufficiency in our clinical practice. Thus, the objective of this study was to investigate association of some inflammatory cytokines and angiogenic factors and vitamin D deficiency in otherwise healthy population.

208 adults without any complaints presented to internal medicine outpatient clinic for routine history and physical examination has been studied. Serum biochemistry, 25-OH D3, IL-1β, IL-6, IL-8, TNF-α, PDGF, VEGF were measured from fasting serum samples in all cases.

Vitamin D deficiency was 83%. Levels of IL-1β, IL-6, IL-8, TNF-α, PDGF, VEGF as mean±SD were 0.513±0.36, 1.947±0.66, 1.942±1.22, 2.00±0.87,11.38±2.53, 301.0±140 in pg/ml respectively in vitamin deficient individuals and 0.304±0.11, 1.848±0.630, 1.709±1.434, 1.87±0.65,11.77±1.96, 392.0±203 respectively in vitamin D sufficient individuals. Vitamin D showed positive correlation with IL-1β and negative correlation with VEGF.

Conclusion: Despite moderate climate with a preponderance of sunny days, the prevalence of vitamin D deficiency in our clinical practice is very high. 25(OH)D levels are positively correlated with IL-1β and negatively correlated with VEGF and molecular mechanism of 25(OH)D deficiency may be related some inflammatory processes.

Keywords: Vitamine D, inflammatory cytokines, angiogenic factors

FORAMINIFERAL BIOSTRATIGRAPHY OF THE MIDDLE EOCENE IN THE EASTERN PART OF THE MALATYA BASIN, EASTERN ANATOLIA

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Abstract:

Middle Eocene Suludere and Gedik formations occur in the eastern part of the Malatya Basin which is situated on the southern side of the Taurus-Anatolian Platform. The sediments of the formations contain a rich association of benthic and planktic foraminifera.

The benthic foraminiferal assemblages content 24 species belonging to 16 genera, namely Ammodiscus, Anomalinoides, Bulimina, Cibicides, Cibicidoides, Elphidiella, Gavelinella, Karreriella, Lagena, Lenticulina, Nodosaria, Planulina, Robulus, Siphonina, Uvigerina, Vulvulina.

Three middle Eocene planktic foraminiferal biozones were distinguished by using 43 species belonging to 12 genera, consisting of Acarinina, Catapsydrax, Globigerinatheka, Hantkenina, Hastigerina, Igorina, Morozovella, Orbulinoides, Pseudohastigerina, Subbotina, Truncorotaloides, Turborotalia. These biozones are Morozovella lehneri Partial Range Zone (Lutetian-early Bartonian), Orbulinoides beckmanni Total Range Zone (Bartonian), Truncorotaloides rohri-Morozovella spinulosa Partial Range Zone (late Bartonian) respectively.

According to foraminiferal assemblages, the age of the formations is determined as middle Eocene (Lutetian-Bartonian).

Keywords: Foraminifera, Biostratigraphy, middle Eocene, Malatya Basin, Eastern Anatolia.

AN ADSORPTION STUDY OF METHYLENE BLUE FROM AQUEOUS SOLUTION WITH A LOW COST MATERIAL

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Abstract:

In this study, the use of nail particles as a new low-cost adsorbent for adsorption of methylene blue (MB) from solution has been researched. Methylene blue (MB) which may be originated from different industries such as textile, printing, paper etc. is widely used as a reference material of dye removal processes. The adsorption of dyes from the aqueous solutions has been investigated by several researchers on numerous adsorbents but the main issue is the cost along with the capacity of adsorbents for adsorption process. The purpose of this paper is to bring out a new alternative for low cost adsorbents. For this purpose MB adsorption on nail particles at different contact times, pH, adsorbent doses and initial MB concentration has been investigated. Obtained data from the adsorption studies MB using nail particles were applied to Langmuir and Freundlich isotherm models and correlation coefficients were indicated. The MB adsorption process was found in harmonious with Freundlich isotherm model according to high correlation coefficient. Consequently, it can be expressed that nail particles can be used as a low cost adsorbent for MB adsorption.

Keywords: MB, adsorption, low cost adsorbent

THE STUDY ON EFFECTIVE COMPANY APPLICATIONS FOR APPAREL CONSUMERS' ONLINE BUYING DECISIONS

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Abstract:

Having place in the life of people makes internet a device which enables them to supply their needs online. Accordingly, providing apparel products, which are one of the most needed ones, by using internet increases day by day. The aim of the study is to search attitudes of apparel consumers who clothing products online and company applications which are effective for apparel consumers' online buying decisions. On the other hand, it is to gain information about the difficulties that apparel consumers have within online buying.

Keywords: Apparel, consumer, online buying, buying decision

THE INVESTIGATION OF HOW THE METHODS, THE DIFFERENT PARTS AND DIFFERENT CULTIVARS OF APPLES EFFECT ON THE ANTIOXIDANT ACTIVITY

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Abstract:

Free radicals have been implicated in the etiology of large number of major diseases. Antioxidants can protect against the damage induced by free radicals acting at various levels. Apple fruit has been identified as an excellent potential source of carbohydrates, minerals, dietary fiber and antioxidant phenolics. The composition and distribution of nutrients and high value components such as phenolics mainly depends upon genotypes, fruit tissue and the maturity levels of fruits and to a smaller extent on environmental aspects.

In this study, we investigated the antioxidant activity of different parts (shell, fleshy part and the core of a slot) of five different cultivars of apple (Starking, Golden, Pinklady, arab girl and granny), from Egirdir, province of Isparta, by applying different methods (ABTS, DPPH and TFM). For the comparison of the analysis of the findings, we followed up the analysis of varyans (three-way Anova) and we used the duncan multiple comparison test to determine the occurrence of the observed differences between the groups applied in. When the results of analysis are examined, the differences in the levels of antioxidants were observed in respect to the parts of the apple, apple varieties and methods. The results of the analysis showed that the highest antioxidants activities are observed from granny apple from among the apple cultivars, and the fleshy part of apple from among the different parts of the apple and the TFM methods from among the different methods.

Keywords: Apple, different methods, antioxidant activity

COMPARATIVE ASSESSMENT OF ATTRIBUTES AND RANKING OF ALTERNATIVE PRODUCT VARIANTS FOR SMART RUNNING SHOES

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Abstract:

The study attempts to provide insight into two research questions. The first question to which we look for answer here is to explore the weighted importance of the smartness functionality of a particular product for its potential users. Secondly, the study investigates which product alternative is closest to the ideal solution. The "smartness" functionality of the product is compared by other multiple attributes: (1) comfort, (2) price, (3) durability, (4) aesthetic appearance and (5) washability. Three hypothetical products are identified by verifying the level of these attributes. Smart running shoe is an interest of the study to evaluate alternative product variants according to a set of attributes by AHP (Analytical Hierarchy Process) and TOPSIS (Technique for Order Performance by Similarity to Ideal Solution) method in the SDI Tools v4 Triptych software. Prospective users of the smart product are considered as decision makers who would make comparative assessment of attributes to rank alternatives.

Keywords: Key words: TOPSIS, AHP, comparative assessment, product variants, multiple attributes, smartness, running shoes.

SYNTHESIS AND CHARACTERIZATION OF NOVEL POLY(ACRYLAMIDE–CO–METHACRYLIC ACID) NANOCOMPOSITE MODIFIED WITH ORGANOSMECTITE

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Abstract:

Organosmectite was prepared by intercalation of hexadecyltrimethylammonium cations with cation exchange capacity of 1.00 into interlayer of smectite. Afterwards, a novel poly(acrylamide–co–methacrylic acid)/organoclay nanocomposite was prepared based on the obtained hexadecyltrimethylammonium-modified-smectites. Structural, thermal, morphological and textural properties of the synthesized nanocomposite was characterized by powder X-ray diffraction (PXRD), ATR-FTIR spectroscopy, thermal analysis (DTA/TG-DTG) and SEM techniques and compared with unmodified-smectite polymer nanocomposite and neat polymer. The absence of diffraction peaks for poly poly(acrylamide–co–methacrylic acid)/organoclay nanocomposite showed the delamination and dispersion of the clay nanolayers in the form of exfoliated nanostructure within polymer matrix. All the FTIR peaks present in both unmodified and organomodified-smectite nanocomposites were at nearly same position as those of neat polymer. This result indicated that the organo-smectite is physically dispersed in the polymer net without forming any chemical bonding. The organomodifiedsmectite nanocomposite exhibits higher thermal stability compared to those of unmodified-smectite polymer nanocomposite and neat polymer. The organosmectite dispersed in the polymer net caused significant alterations in the morphology of the neat polymer.

Keywords: Organoclay, polymer nanocomposite, thermal stability, methacrylic acid

THE EVALUATION OF THE ADSORPTION PROPERTIES OF THE ORANGE PEELS AS A (BIO)SORBENT MATERIAL: THE REMOVAL OF THE CU(II) AND NI(II)

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Abstract:

The heavy metal waste waters are undesired products of diverse industries such as: electroplating, metal finishing, mining, production of pigment, etc, which are a major threat to environment and the human live. Thus, the necessity to remove these toxic species from the polluted waters is an urgent demand. Although, nowadays there is a vast number of methods capable to achieve this task (chemical precipitation, electrochemical treatment, oxidation/reduction, filtration, ion exchange, membrane technologies, etc), in general, these methods suffer from the fact that they are moderately effective and in major cases cost-expensive processes. The technology based on the adsorption, represents an alternative and a powerful mean for the removal of toxic species from solutions. This is based on the fact that this technology is cost effective (easily technically feasible) when combined with the natural sorbent materials (clays) or industrial waste sorbent materials such as fruit and vegetable peels, etc.

In this study, the orange peel – a fruit waste, was used for the production of the eco-friendly (bio) adsorbent material. The preparation of the (bio)sorbent material involved: cutting, drying, grounding and sieving at the particular particle size of the orange peels. The performance of the removal of copper (II) and nickel (II) ions onto this material was evaluated by controlling different parameters such as: particle size, pH of the sorption solution, contact time, temperature, etc. The obtained adsorption data was fitted using the Langmuir and Freundlich adsorption isotherms. The study indicated promising use of the orange peels as an important (bio) adsorbent material that possesses a strong capacity for the adsorption of copper and nickel ions from the aqueous solutions.

Keywords: orange peels, (bio) adsorbent, heavy metal ions, adsorption isotherms

DETECTION OF TOTAL ANNUAL RAINFALL TRENDS OF ELAZIĞ CITY, TURKEY

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Abstract:

In this study, a possible trend is investigated for total annual rainfalls fall to Elazığ city in Turkey. For this purpose, Mann-Kendall test, Spearman's Rho test and Sen's slope method is applied to total annual rainfall data of 8 rainfall observation stations that is obtained from General Directorate of Meteorology (GDM), changing from 1960 to 2013. The run test (Swed and Eisenharth) and Pettitt tests are used in determine the homogeneity of total annual rainfall data series.

According to trend analysis results; decreasing significant trend existence is observed at 2 rainfall observation stations being as Baskil and Sivrice, for are 95% confidence level. For 90% confidence level, Ağın and Elazığ have also decreasing trends in addition to them. According to Sen's slope method a decreasing direction tendency at all 8 observation stations. These results could be associated with regional climate changes and are consistent with projections related to global changing phenomena.

Keywords: Elazığ; trend analysis, Mann–Kendall test, Spearman's rho test, Sen's slope method

INFLUENCE OF ULTRAVIOLET RADIATION ON QUALITY AND MICROBIAL POPULATION IN GRAPE MUST

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Abstract:

In winemaking technology, microorganisms play an imperative role. Although certain species of yeasts and bacteria can cause spoilage defects. As a result of this, the final product is of lower quality. To date, the only one effective means of stabilizing grape juice and wine microbiologically is SO2 addition. It is known that SO2 is associated with possible health risks, the wine industry is looking for alternative strategies of wine production. For a long time ultraviolet (UV) light has been known as a good method to inactivate microorganisms, and it can be used in food technology for disinfection of water, liquids, such as fruit juice, apple cider or milk. UV-C (200-280 nm) has an influence on microorganisms DNA replication and therefore inhibits of their growth and proliferation. The most effective range of wavelength of UV-C irradiation is 254 nm, as then photons are best absorbed by the DNA of microorganisms. The practical application of the UV-C light has been successfully used for decontaminating drinking water since many years.

The aim of this study was focused on alternative strategies of SO2 addition in vinification process. The experiment was concentrated on reduction of SO2 content, through the use of UV-C irradiation. UV-C treatment was used during vinification process of grape juices. Reactions were carried out in an inner-irradiation-type reactor with medium pressure mercury lamp (150 W) for illumination. The source of the light in the range of 200 nm and 600 nm with the maximum intensity of 366 nm was used. Microbiological tests were performed to detect the presence of yeast and bacteria.

It was found that viability of the microorganisms decreases as illumination time increases.

Keywords: grape must, microorganisms, UV-C, vinification, yeasts

OPTIMIZATION OF CONTROL PARAMETERS OF 2-DOF TWIN-ROTOR MIMO SYSTEM

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Abstract:

Twin-Rotor MIMO System modelling a real helicopter offers a highly nonlinear and a complicated control problem. In this paper, classical proportional-integral-derivative control with optimized controller parameters is applied to handle challenges of the system control. The Pattern Search (PS) and Genetic Algorithm (GA) are employed for the optimization of coupled controller's parameters to obtain fast step response and good control performance. Performance of the controllers are illustrated with step response by simulation studies. Simulations are performed with linearized model of Twin-Rotor MIMO system by using MATLAB program.

Keywords: Twin rotor, helicopter, optimization, genetic algorithm, pattern search.

REMOVAL OF ORGANIC MOLECULES BY BIO-SORPTION PROCESS USING ACTIVATED BANANA PEELS AS SORBENTS

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Abstract:

Drinking water is a necessary requirement for the survival of humans and vital for their well being. Industrial waste and other human activities degrade at great extent the water quality, thus imposing the necessity for the removal of unwanted molecules (pollutants) from those polluted waters. Although, there are many different strategies (membrane process, coagulation, etc) which enable to achieve the removal of organic and inorganic species, these strategies suffer from the fact that they are economically expensive and in general do not give the required degree of the removal.

In our study, we used the organic waste materials such as banana peels to evaluate their capacity toward the removal of used organic model molecule - phenolphthalein- from aqueous solution. The study was conducted by using different concentration of the phenolphthalein solutions, furthermore we evaluated the effect of different parameters such as: pH, stirring time, temperature, etc., in order to find the most favorable conditions to get a maximum sorption values for this material. The estimation of sorption capacity for the phenolphthalein molecule was done by using UV-VIS spectroscopy. The results presented here, showed that this low cost material has a large capacity for sorption/removal of this molecule from the aqueous solution.

Keywords: (bio) adsorbent, color removal, UV/VIS, phenolphtalein

NUMERICAL INVESTIGATION OF PRESSURE DROP OF AL2O3 NANO-DISPERSION IN WATER AT COMMON COMPONENTS OF PIPE SYSTEM

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Abstract:

The aim of this numerical study is to investigate flow properties of various concentration of Al2O3 Nano-dispersion mixed in water as base fluid at some common components of pipe system: elbow, sudden contraction and sudden enlargement. The volume concentrations of Al2O3 Nano fluid are taken as 2.0 %, 5.0%, and 8.0%. Results are compared with water to exhibit the role of nanoparticle on heat transfer and flow properties. A constant temperature on the surfaces is assumed and the single-phase model approach has been employed in order to describe the Nano fluid behavior. The numerical analysis is performed in the steady state regime. The CFD code ANSYS Fluent 15.1 is employed in order to solve the two-dimensional numerical models. Velocity, vorticity, temperature, and pressure distributions are given for investigate heat and flow properties.

Keywords: Nano fluid, pressure drop, elbow, sudden contraction and enlargement

COMPARING THE ANALYTICAL PERFORMANCE OF THE GC-FID AND GC-MS FOR THE DETERMINATION OF THE DRUGS OF ABUSE:COCAINE AND HEROIN

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Abstract:

Cocaine is a highly addictive stimulant naturally present as an alkaloid in the coca plant (Erythroxylon coca or Erythroxylon novogranatense) from which it can be extracted from the leaves. Although, traditionally the coca leaves are chewed or brewed as tea, this substance now is a widely abused psychotropic drug which can cause development of tolerance, strong psychological dependence, malnutrition, disorientation, hallucination and paranoid psychosis. Heroin (diacetylmorphine or morphine diacetate) is a synthesized opioid analgesic (by adding two acetyl groups to the molecule morphine), which is found naturally in the opium poppy. The analytical analysis of these drugs is of a great importance for ensuring the limited use, illegal smuggling and the abuse of these drugs.

In this work, we describe the use of GC-FID and GC-MS methods for rapid and secure analysis of cocaine and heroin. Furthermore, the analytical performance of these methods was evaluated and compared by analyzing the analytical parameters for quality insurance such as: limit of detection and quantification, precisity, sensitivity, selectivity/specificity and linearity. Both of the used methods, performed excellently in scope of the determination of the abuse drugs, and were successfully applied for the determination of these compounds in real samples.

Keywords: Quality insurance, GC-FID, GC-MS, Drugs

MONITORING OF THE DAILY GLOBAL SOLAR RADIATION IN EASTERN TURKEY BY USING SATELLITE IMAGES

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Abstract:

Estimation of global solar radiation at the Earth surface by using satellite images is a very common method. However, the accuracy of such an estimation method is not reliable especially in cloudy, snowy and snow free weathers. It is known that the first generation satellites (MFG) and the old satellites models, which are not capable of unraveling the snow covered areas with clouds reflections, fail especially in winter seasons. This study presents the comparison of the satellite model (HELIOSAT) and ground measured data for the selected station in Eastern Turkey in clear days with land area having snow coverage. The preliminary results show that the satellite model estimation is unreliable in clear days which the surface is covered by snow. This situation is verified using snow depth and bright sunshine hours measured at selected period. The second generation satellites (MSG), with 12 channels and high resolutions, currently uses to differentiate the snow coverage from clouds and to increase the estimation accuracy. However, the determination of snow procedure from satellite images needs complex computational procedure with their spectral channels. The obtained results show that the accuracy of global solar irradiation estimation can be enhanced by adding a simple procedure about determining the days having clear sky and with snow coverage land surface into the preexisting models. Such a procedure can be carried out by using the surface data of bright sunshine hour and snow depth and, satellite derived cloud index.

Keywords: Solar Radiation, Satellite, Snow, HELIOSAT.

REMOVAL OF HEAVY METAL IONS CU(II) AND NI(II) FROM AQUEOUS SOLUTIONS USING BANANA PEELS AS A (BIO) ADSORBENT MATERIAL

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Abstract:

Eco-toxicity of heavy metal ions on living organism is a prime concern for the last few decades. The continuous massive urbanization involves the release of chemically polluted waters to the ecosystem, causing the decrease of the living environment quality. Even though several adverse health effects of heavy metals have been recognized for a long time, exposure to heavy metals continues to this day on.

Although, banana peels in different countries represent an agro waste which is regarded as a useless material, in fact, it may be the contrary: this material is an important abandoned (bio)adsorbent, which is readily available, with a low cost and is environment friendly.

In our study we used banana peels to remove the heavy metal ions from aqueous solutions through the sorption process. Banana peels were initially dried at room temperature and then at 1050C (until a constant weight). The obtained material was then milled and sieved in different dimensions to increase the active surface of the particles for more successful sorption properties. In order to determine the interaction of the heavy metals with the banana peels as a (bio) adsorbent material, the experimental results were applied to Langmuir and Freundlich adsorption isotherms and isotherm constants were obtained.

Based on the obtained results, we show that the use of the banana peels should be regarded as an important mean for the removal of heavy metals from the polluted waters.

Keywords: banana peels, adsorption isotherms, (bio) adsorbent, heavy metal ions.

OPTIMIZATION OF GC-FID PROCEDURE FOR SIMULTANEOUS DETERMINATION OF HEROIN AND COCAINE IN REAL SAMPLES

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Abstract:

Cocaine (naturally occurring alkaloid) and heroin (synthesized opioid analgesic by adding two acetyl groups to the molecule morphine) a common drugs of abuse with potentially harmful and adverse effects to the health. The determination of these molecules in reals samples it's a difficult task due to the matrix interference, thus the optimization of the method is a necessity in order to develop analytical procedures that offer real results about the content of those molecules in analyzed samples and which methods are rapid and very sensitive.

In order to develop and analyze the methods performance toward the determination of these compounds in real samples, the obtained results underwent a rigorous statistical analysis and as a reference the results were compared with GC-MS results. The performance of the optimized GC-FID method for the determination of heroin and cocaine full filled all statistical parameters and delivered results almost identical with the compared GC-MS method.

Keywords: GC-MS, GC-FID, Heroine, Cocaine, Statistical parameters

THE ESTIMATION OF THE SORPTION CAPACITY OF ORANGE PEELS TOWARD THE ANALYTICAL INDICATOR - METHYL ORANGE

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Abstract:

The bio sorption method offers numerous benefits when compared to the conventional methods typically used for the removal of the undesired molecules from aqueous solutions. The advantage of using bio adsorbents include their low cost, minimization of the volume of waste sludge as well as the high degree of efficiency in the decontamination of very diluted effluents.

Studies have shown that activated carbon can be used as an adsorbent of heavy metals, color and odor of waste water, but since the activated carbon is generally expensive to be used as an adsorbent, there is an urge to find substitutes for it. Cheap and eco¬friendly adsorbents are an alternative for its replacement.

In this context, different peels such as lemon, bananas, potatoes, different tea leaves, oranges and so on, showed excellent capacities to remove unwanted substances from aqueous solutions.

In our study we used methyl orange as a model molecule to evaluate the sorption efficacity of the activated orange peels and to compare this capacity with that reflected by the activated carbon. The orange peels were collected, dried (at 100 0C), grinded, sieved at different particle size and afterwards activated in order to achieve the maximum sorption degree. The results showed that this material in scope of sorption performance is comparable with activated carbon.

Keywords: orange peels, analytical indicator, bio adsorbent

2-((2/3/4-HYDROXYBENZYLIDENE)AMINO)-6-METHYL-4,5,6,7-TETRAHYDROTHIENO[2,3-C]PYRIDINE-3-CARBONITRILE SYNTHESIS AND INVESTIGATION

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Abstract:

Schiff bases have a large number of synthetic uses in organic chemistry. Schiff's bases are among the most important ligands used in modern coordination chemistry due to their well-known coordinative capability. Schiff's base compounds had been shown to exhibit a variety of applications including biological, clinical, analytical and industrial in addition to their important roles in catalysis and organic synthesis. Schiff's bases considered as an important class of compounds in both the medical and pharmaceutical fields. They also found to exhibit a broad range of biological activities, including anti-fungal, anti-bacterial, anti-malarial, anti-proliferative, anti-inflammatory, anti-viral, and anti-pyretic properties.

The present work involved preparation and characterization of novel Schiff bases as an extension of our work. Its importance stems from their hopeful applications in different industrial life sides and their potential biological activities.

Keywords: Schiff base, amino thiophene, imine

CHEMICAL CONSTITUENTS OF SIDERITIS PHRYGIA BORNM. WITH ANTIMICROBIAL AND ANTIOXIDANT ACTIVITIES

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Abstract:

The genus Sideritis (Lamiaceae) represented in the Flora of Turkey by 46 species with high endemism (almost 80 %). Turkey is the 2nd country in the world which has the maximum species of the genus and one of the most important gene centers. Sideritis genus named 'Dagcayi or Adacayi' and used as herbal tea and folk medicine in Turkey as well as in the world for their anti-inflammatory, anti-ulcerogenic, digestive and antimicrobial properties.

Sideritis phrygia BORNM., named as Taşlık çayı in vernacular, endemic species for Turkey and grown in Middle Anatolia especially Konya region. In the present study, we have been reported the essential oils contents, isolation and characterization of the diterpenic compounds, the antimicrobial and antioxidant properties of hexane, acetone and methanol extracts of Sideritis phrygia.

The essential oil of Sideritis phrygia investigated by GC-MS. Caryophyllene oxide (11.4%), Limonene (10.6%) and Cymene (10.1%) were identified as main components.

The hexane, acetone and methanol extracts of the plant were subjected column chromatography. The structures of isolated compounds were determined by using 1H-NMR, 13C-NMR spectroscopy. The structures of the diterpenes are as follow: Siderol (Ent-7α-asetoksi,18-hidroksi-kaur-15-ene), Sideroxol (ent-7α,18-dihidroksi-15β, 16β-epoksikauran), Sideridiol (ent-7α, 18β-dihidroksi kaur-15-en), Linearol (ent-3β, 7α-dihidroksi-18-asetoksikaur-16-en), 7- Epicandicandiol (ent-7α,18-hidroksikaur-16-en), Athanolone (ent-7α,17,18-trihidroksi-9,11-(en)-12-on). Besides diterpenoids, a steroid Stigmasterol (3S,8S,9S,10R,13R,14S,17R)-17-[(E,2R,5S)-5-ethyl-6-methylhept-3-en-2-yl]-10,13-dimethyl-2,3,4,7,8,9,11,12,14,15,16,17-dodecahydro-1H cyclopenta[a]phenanthren-3-ol) and a triterpenoid Oleanolic acid (3-β-Hydroxyolean-12-en-28-oic acid) were isolated.

The antimicrobial activity tested against Escherichia coli DSMZ1103, Staphylococcus aureus DSMZ1104, Candida albicans DSMZ1386 and Mycobacterium smegmatis ATCC14468. Only hexane extract was showed weak activity against S. aureus.

The antioxidant activities were measured based 2,2-Diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging activity, β-carotene linoleic acid assays and cupric ion reducing antioxidant capacity (CUPRAC). All the activity results showed that the extracts of the plant have moderate activity.

The authors thank TÜBITAK for supporting this study as a part of the project 113Z710.

Keywords: Sideritis phrygia BORNM., Diterpenoids, Essential Oil,Antimicrobial Activity, and Antioxidant Activity

PROPOSALS FOR THE PROTECTION OF WATER RESOURCES IN THE PRESPA LAKE BASIN, GREECE

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Abstract:

The present paper focuses on the region of Prespa in northwestern Greece, a disadvantaged mountainous region, whose natural environment is protected by numerous international treaties (Ramsar, Natura2000) and which depends heavily on its surface water resources for most of its socio-economical activities. The study area's primary surface water bodies are the trans-border lakes Small and Great Prespa, which, over the years, have witnessed a decline in both the quality and the quantity of their waters.

Therefore, the paper's main objectives were to investigate the pressures that the water resources are under and to propose ways to counteract the current negative quantity and quality trends.

The research methods employed in the present research include: review of relevant literature, a field study and the implementation of a set of methodological tools, namely SWOT Analysis, Stakeholder Analysis and the Logical Framework Approach (LFA).

The literature review showed that activities of the primary sector are responsible for the largest percentage of water use in the study area, with agriculture being the top consumer of water. It was also found that the cultivation of beans prevails in the study area, to such an extent that they can be regarded as a monoculture there. Therefore, the paper discusses and proposes new irrigation-related technologies, aimed at achieving higher water efficiency and lower levels of agrochemical pollution of the aquifer.

The field study records the farmers' opinion on the proposed irrigation-related technologies and the implementation of the methodological tools results in an overall schematization of the factors that can affect water resources in the study area and in probable policy making axes.

The research concludes, among others, that the region can exploit several developmental and financial programs in order to achieve the goals of enhancing water quality and quantity and achieving sustainable economic development.

Keywords: Prespa lakes, Water resources, Irrigation

GROUNDWATER MODELLING OF AFYONKARAHISAR SINANPASA PLAIN

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Abstract:

Water resources should be developed to meet the water demands for rapidly increasing world population and consequent irrigation water requirement in a safe manner. In such places of the world, use of groundwater is especially very crucial where there is no surface water or the use of surface water is inadequate or not economic. In our country, according to research the amount of water per capita is 1519 m3/year. Akarçay river basin has an average rainfall is approximately 532 mm/year.

In this study, a groundwater model will be developed for Sinanpaşa Plain which is one of the important agricultural plains of Turkey. The study area is 830 km2 and 50 km west of Afyonkarahisar Province where groundwater is used excessively for irrigation because of inadequate surface water availability. In this study, Sinanpaşa Plain's geological, hydrological, hydrogeological characteristics and groundwater flow response to withdrawals for irrigation are investigated. Three dimensional groundwater flow model of the study area will developed using MODFLOW. According to Sinanpasa plains geological properties layer number will be determined. As a result of calibration the hydrogeological parameters of the study area will be determined. Steady state groundwater flow time will be specified. According to calibrated model, steady state groundwater budget of Sinanpaşa Plain will also calculated using developed model

Keywords: Groundwater, modeling, Sinanpasa Plain, MODFLOW

ISOLATION AND CHARACTERIZATION OF BACTERIAL FLORA FROM DIGESTIVE SYSTEM OF EUSOMUS OVULUM (CURCULIONIDAE)

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Abstract:

Curculionidae is considered to be one of the most richest families in Coleoptera. The most of species in the family that except some species are phytophagous. Larva and adults feed on plant organs such as: roots, stems, leaves and fruits. This group has a detrimental effect on crops and forest trees and can cause huge economic losses. Thus, this family has an economic importance.

In this study, the bacteri flora in digestive system of Eusomus ovulum (Curculionidae) were investigated. The samples were collected from different localities in Kırşehir between May and August in 2014. The catch samples put in sterile tube and lively bring to laboratory. Samples dissected and removed to digestive system and spreaded to plaque of Nutrient Agar at the sterile conditions. Developed single colonies selected and purified and achieved 1 isolate. The isolate was described by morphological, physiological, biochemical tests and molecular methods (16S rRNA PCR and 16S rRNA sequence analysis).

As a result of assessment which datums of phenotype, genotype characterization and diagnosis of Escherichia coli isolate was made. As a results, the bacterial species that achieved from the species of Curculionidae family (Coleoptera) which have economic and ecological importance can used.

Keywords: Bacterial Flora, Escherichia coli, Curculionidae, Eusomus ovulum

EMPLOYEE SELECTION WITH ANALYTIC HIERARCHY PROCESS IN CLOTHING SECTOR: TURKISH CASE

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Abstract:

Competition is increased day by day in clothing sector which has a significant place in Turkish economy with its export potential and employment. The enterprises, which desire success under intense rivalry, must give great importance to labor which is a classic production factor. When the labor intensive structure of clothing sector is taken into consideration, the importance of labor can be understood better. At this point, the enterprises confront with the employment of qualified, well educated and knowledgeable employees as an important factor which increases their competitiveness. Therefore, the clothing enterprises must select their qualified employees correctly. Analytic hierarchy process is one of these methods which can be used in accordance with this purpose.

Analytic hierarchy process is one of the multi criteria decision making methods and it provides a selection from among alternatives. Analytic hierarchy process is a fast, effective and easy applicable method in cases where the number of criteria and alternatives are surplus just as employee selection in clothing sector. The managers of clothing enterprises can manage the qualified employee selection process effectively and successfully by using this method.

Within the scope of this study, the blue-collar employee selection of a clothing enterprise, which operates in Izmir province and takes place within the 500 biggest industrial enterprises of Turkey, will be performed with analytic hierarchy process and suggestions will be made related to blue-collar employee selection criteria.

Keywords: Employee selection, analytic hierarchy process, clothing sector, Turkey

ISOLATION AND IDENTIFICATION OF RHIZOBIUM STRAINS OF WILD LEGUMINOUS SPECIES COLLECTED FROM KIRŞEHIR

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Abstract:

Legumes play an important role in sustainable management of dry arid. Rhizobia have been widely used in agricultural systems for enhancing the ability of legumes to fix atmospheric nitrogen. The objective of this study was to isolate and characterize the rhizobial populations naturally associated wild legumes originating from different ecological areas by a polyphasis approach including the evaluation of phenotypic properties.

The root nodules were sum from wild vetch (Vicia cracca) and yellow sweet clover (Melilotus officinalis) in several regions at in Kırşehir province, Turkey. From each plant sampled, three to six nodules were at random excised and surface sterilized with ethanol and hydrogen peroxide. Rhizobia were isolated on yeast-extract mannitol agar (YEMA) using standard procedures. Single colonies were marked and checked for purity by repeated streaking on YEMA medium and verifying a single type of colony morphology, absorption of Congo red and a uniform Gram-stain reaction. Colony morphology and acid / alkaline reaction were evaluated on YEMA containing bromthymol blue as indicator. All isolates were incubated at 280 C and stored at -200 C in 20 % glycerol-YEMA broth.

In the present study, 9 strains were isolated from root nodules of species of wild vetch and clover . All strains tested were found to have circular colonies with regular borders, creamy in color, showing intermediate to high production of mucus, catalase (+), oxidace (+), movement. After 3 to 5 day of growth on YMA at 280C, all of strains acidified the medium (as indicated by the bromothymol blue) and colony diameter ranged from 2-5mm as informed in Bergey's Manuel of Determinative Bacteriology.

Keywords: Rhizobium sp., wild Leguminous, microbial fertilizer, Vicia cracca, Melilotus officinalis

PERFORMANCE ANALYSIS OF TURBOCHARGED TWO-STROKE DIESEL ENGINE

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Abstract:

Turbocharger systems are very important for vessels in terms of increasing energy efficiency and reducing green gas emissions. Ambient conditions (winter, ISO and summer) effect intake air temperature so do turbocharger efficiency. Engine load and fuel types that effect exhaust gas energy level are the other parameters for the turbocharger efficiency. In this study, a new numerical method is improved for enthalpy and entropy calculation based on exhaust gas components. Also two-stroke Diesel engine performance which operates various ambient conditions is analyzed in terms of thermal efficiency, engine load, specific fuel oil consumption (SFOC), exergy efficiency and exegetic performance coefficient (EPC). The results show that the highest thermal efficiency is obtained in winter ambient condition and turbocharger efficiency increases when make fuel oil quality better.

Keywords: Two-Stroke Diesel Engine, Exergy Efficiency, Exergetic Performance Coefficient.

THE EFFECTS OF FRANCHISING SYSTEM ON INTERNATIONAL MARKETING STRATEGIES: TURKISH CLOTHING SECTOR CASE

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Abstract:

The enterprises must think globally instead of locally due to the today's rapidly globalizing business world. Enterprises, especially the ones that operate in international markets, struggle with compelling rivalry conditions in order to survive and accommodate to new circumstances. Within this context, rapidly globalizing business world, which is parallel to the globalizing world, intensively affects the marketing strategies and implementations of enterprises. Turkish clothing sector, which rapidly penetrates into the international markets since 1980s, is intensively affected from this globalization and alteration movement.

Turkish clothing enterprises use different techniques and methods in order to penetrate into the international markets effectively and successfully. Franchising, which is the exclusivity of definite privileges for a certain time in a specific area from the main enterprise to another enterprise, is one of these methods which can be used with this purpose. Franchising system is generally used by Turkish clothing enterprises during the international market penetration. Enterprises benefit from this strategy during the penetration to the countries, which possess different political, judicial, economical and cultural structure, in order to be able to reduce the risk. When they get used to the market, they eliminate franchising system and establish their own retailing systems. However, franchising system is an effective and successful method especially for the first international market penetration of an enterprise with its own brand.

In this study, the franchising systems of successful Turkish clothing enterprises, which use this strategy as an international marketing strategy and possess their own brands, will be analyzed. Also the effects of franchising systems on the enterprises' marketing success will be investigated.

Keywords: Marketing strategy, franchising system, clothing sector, Turkey

MODELLING OF SPECIFIC CUTTING RESISTANCE IN MACHINING OF AISI P20 PLASTIC MOULD STEEL

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Abstract:

AISI P20 plastic mould steels are frequently used where wear and corrosion resistance is needed in the industry. This study was performed in two stages whose first is to measure the cutting forces occurred in machining of AISI P20 plastic mold steel and second is to model of specific cutting resistance (k_s). The machining experiments were performed on CNC lathe for AISI P20 plastic mold steel. The uncoated cemented carbide cutting tools which have SNMG 120408-QM form with a 75° approaching angle according to ISO 1832 were used in the experiments. Three different levels of cutting speed, feed rate and depth of cut as cutting parameters were selected and experiments were performed according to Taguchi L27 orthogonal array. In first stage, cutting forces were measured by using Kistler 9257B type dynamometer. In second stage, specific cutting resistance was calculated by using data of main cutting force. The effects of cutting parameters on specific cutting resistance were evaluated with the analysis of variance (ANOVA). The feed rate is the most important factor on k_s value with %61.32 PCR. Mathematical model were developed using the artificial neural nets (ANN) in order to predict the specific cutting resistance.

Keywords: Specific cutting resistance, AISI P20, Analysis of variance, Artificial Neural Networks (ANN)

GENDER DETERMINATION FROM REGIONS OF THE FACE

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Abstract:

Face contains a lot of information such as identity, gender, age and emotional expression. In the present study, automatically gender determination has been performed when in the case of only certain region of the face is appeared. Frontal face images of the 100 people (50 male and 50 female) in Nottingham Scan face database has been used. Firstly, face region of the images has been identified by using OpenCV library Haar Cascade function, and it has been cropped. The obtained facial region has been made standard size, the regions that contain eye and lip automatically have been cropped. Two dimensional discrete wavelet transform has been applied separately to eye and lip regions in order to extract features to be used for analysis. Support Vector Machine, Artificial Neural Networks, Naive Bayes and k-nearest neighbor methods have been used to make a gender determination.

The experimental results show that the highest accuracy rate is achieved by using the support vector machine for both the eye and lip regions. The success rate and area under ROC curve are %88 and %92.80 for eye region, and respectively %82 and %87.20 for the lip region. As a result, gender determination through the eye region has high accuracy when compared to the lip region.

Keywords: Discrete Wavelet Transform, Gender Determination, Support Vector Machine

EFFECTS OF PISTON MOTION ON SPECIFIC SURFACES OF THE CYLINDER LINER IN A COMPRESSION IGNITION ENGINE

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Abstract:

A large part of the engine friction in internal combustion engine is between the piston-ring cylinder-wall contacts. The cylinder liner and piston-ring wear are very important for performance, fuel economy and engine life in internal combustion engine. In this study, surface morphologies on the Central Region (CR) and Bottom Dead Center (BDC) region of cylinder liner was investigated after the diesel engine worked 200 hours. The microstructural analyses of worn surfaces were examined by SEM. Surface deformations were compared between the two regions. As a result of, the abrasive wear was observed deeply formed axial scratches. It was observed surface deformations of the CR are less than surface deformations of the BDC for the formation of hydrodynamic lubrication regimes on the CR.

Keywords: Engine wear, Cylinder liner-piston ring contact

EVALUATION OF THE PHENOLIC CONTENT OF SIDERITIS TROJANA AND S. ATHOA TEA DECOCTION AND INFUSION

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Abstract:

The herbal teas; easily available, low cost are important foods to daily consumed. Also it is believed to contain many of bioactive phytochemicals. The evaluation of functional properties and bioactive composition of the tea is essential for its exploitation as a health-promoting beverage.

The total phenolic content and antioxidant properties of some herbal teas were previously reported in some studies and usually correlated with species had the highest amounts of flavonoids and phenolics, showed the highest antioxidant activity.

Several aromatic plants are used as herbal tea in Turkey and one of the most commonly used is the genus Sideritis. Sideritis trojana BORNM. (Sarıkız çayı) and Sideritis athoa PAPANIKOLAOU ET KOKKINI (Kedi kuyruğu çayı) are endemic species for Mount Ida (Kaz Dağı). Both species consumed due to its special flavor and possible pharmacological properties widely.

In the study, flavonoid and phenolics contents of the S. trojana and S. athoa tea were investigated. Two methods were used for prepare of the tea: infusion and decoction. The major phytochemicals were found to be fumaric acid, t-ferulic acid, palorgonin and apigenin for S. trojana and fumaric acid, penduletin and pyrogallol for S. athoa.

The tea prepared for decoction methods have been found rich in flavonoids and phenolics.

Keywords: Sideritis trojana, S. athoa, Phenolic

OPTIMISATION OF TOOL EDGE GEOMETRY AND CUTTING PARAMETERS IN HARD TURNING OF AISI 52100 USING TAGUCHI METHOD

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Abstract:

An experimental investigation was conducted to determine the effects of cutting tool edge geometry, feed rate and cutting speed on surface roughness and resultant cutting forces in the hard turning of AISI 52100 steel with ceramic cutting tools. Ceramic inserts with two different edge preparations (chamfered and chamfered plus honed) were used. Three components of cutting forces and roughness of the machined surfaces were measured. Cutting speed, feed rate and cutting tool edge geometry were chosen as the cutting conditions (control factors). Taguchi's L_{16} orthogonal array was used for design of experiment. Optimum levels of the cutting conditions were determined using signal-to-noise (S/N) ratio, which was calculated for machining output variables (surface roughness and resultant cutting force) according to the 'the-lower-the-better' approach. Analysis of variance (ANOVA) was applied for observing the effect levels of cutting conditions on the quality characteristics (machining output) statistically. The analysis of variance results showed that the feed rate and tool edge geometry were the most significant factor on resultant cutting forces and surface roughness.

Keywords: Hard turning, Surface roughness, Tool edge geometry, Taguchi, ANOVA

PLANT PREBIOTICS FOR THE DEVELOPMENT OF FERMENTED DAIRY PRODUCTS

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Abstract:

There has been an increasing interest in functional dairy foods during the last years. Among these foods attention has focused on probiotic and prebiotics. The probiotic species and prebiotics s as dietary adjuncts in fermented dairy products as synbiotic has given rise to a tremendous consumption of these products in world.

Probiotics term is described as cultures of live microorganisms that are beneficial to health when administered to humans or animals, improve properties of gastrointestinal microflora. Probiotic products which make health claims meet the presence of probiotic bacteria at minimum levels of 10^6–10^7 cfu mL^{-1} or cfu g^{-1} is recommended in functional foods.

Prebiotics are non-digestible food ingredients that play a beneficial role by selectively stimulating the growth and/or the activity of one or more indigenous probiotic bacteria especially *Lactobacillus* and *Bifidobacterium* spp in the colon. Prebiotics cannot be digested by small intestinal enzymes but are fermented by probiotic bacteria the large intestine to produce short-chain fatty acids (SCFA), mainly acetate, propionate, and butyrate.

Oligosaccharides of fructose and galactose such as fructooligosaccharides (FOS) and galactooligosaccharides (GOS), soybean oligosaccharides, inulin, guar gum, resistant starch, pectins and chitosan derived plants are best-known sources of prebiotics. Prebiotic carbohydrates from cereal and legume crops like barley, wheat, chickpea and lentil have been used as non-digestible ingredients due to their prebiotic potential. Fructans proven prebiotics occur naturally in plants such as chicory, Jerusalem artichoke, onion, garlic, okra, shallot, and leek by-products. Dragon fruit, jack fruit, nectarine, and palm fruit among fruits; chicory and yacon among crops; and mushroom has been reported as potential source of prebiotics. This is a comprehensive review providing insight on the detailed current knowledge about the potential sources for diverse polysaccharides to produce new prebiotics.

Keywords: Prebiotic, Probiotic, Plants

PRESTRESSED NEAR-SURFACE MOUNTED FIBRE REINFORCED POLYMER REINFORCEMENT FOR CONCRETE STRUCTURES

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Abstract:

Prestressed near surface mounted (NSM) fibre reinforced polymer (FRP) reinforcement is a special type of format. This reinforcement for strengthening reinforced concrete (RC) structures combines the advantages of FRP and external prestressing.

This paper presents an outline review of different kind of combinations and applications of NSM FRP reinforcement with prestressing. To improve the efficiency of the NSM strengthening technique, the FRP reinforcement must be prestressed or post-tensioned. The stress in the internal reinforcing steel and deflections will decrease using prestressing the FRP. In this way FRP materials show better performance. Numerous techniques and anchorage systems developed to prestress the NSM FRP are also presented.

Keywords: Fibre reinforced polymer, near-surface mounted, prestress, strengthening, reinforced concrete structure.

IMPROVEMENT OF LAUNDERING DURABILITY OF POLYPYRROLE COATED COTTON FABRICS

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Abstract:

In general, textile fabrics have dielectric character but can be converted into conductive surfaces by conductive polymer coating/deposition. In literature there are many researches are exist investigating the conductive polymer usage onto the textile substrates such as polypyrrole (PPy), polyaniline, polythiophene etc. There are just a few study exist considering the enhancement of conductive polymer durability onto the textile surfaces. In this study, chemical oxidative polymerization of pyrrole monomer has been performed onto the cotton fabric surfaces by using ferric chloride as oxidant and an aliphatic polyether with acidic groups as surfactant. Then the obtained PPy deposited cotton fabrics have been evaluated in terms of weight increment, surface electrical resistivity and electromagnetic shielding efficiency (EMSE). According to the results, weight increment, electrical resistance and EMSE values have been found as 73 %, 1.06x103 Ω and 23 dB respectively. In order to investigate the laundering durability of PPy deposition, fabric sample was coated by epoxyacrylate (EA) adhesive formulation and then cured by UV light. The characteristic peaks of PPy and EA have been proved by Fourier transform infrared (FTIR) spectroscopy. For the laundering durability testing, EA coated and un-coated, PPy deposited cotton fabrics have washed 3 times by ECE non-ionic detergent solution (4g/L) in order to observe the effect of EA layer. All tests were repeated after each washing process. Results proved that, EA layer helps to preserve PPy layer thus the shielding property. After 3 times washing, PPy deposited cotton fabric has showed just 1.23 dB EMSE value, whilst the sample with PPy+EA coating layers still showed 3.85 dB shielding efficiency.

Keywords: Polypyrrole, Cotton Fabric, Electromagnetic Shielding, Epoxyacrylate, UV-curing, Oxidative Polymerization

A COMPARATIVE STUDY ON TARGET DENSITY FUNCTIONS

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Abstract:

In this work a comparative approach on target density functions used in sensor imaging is presented. The target density functions that are widely used in medical and military engineering areas considered in various theoretical methods. The target density function used in SAR – ISAR systems in the form of $\rho(x,y)$ considering the cartesian coordinates is employed with the Fourier approach. The image function $g(\rho, \theta)$ in one dimensional or $f(x,y)$ two dimensional form in the Radon Transform is considered with 1-D Fourier transform. With x (velocity) and y (range) variables, $D(x,y)$ target density function of Fowle - Naparst is considered for dense target environments. A new $G(R,\beta)$ shaped target density function which is different from the previously developed ones will be presented. The new target density function with the variables R as range and $\beta=\cos(\theta)$ as a function of scanning angle is reconstructed with phased array sensor approach.

Keywords: Phased array radar system, active sensor imaging, target density functions, ambiguity functions, Radon transform.

DETERMINATION OF ANTIOXIDANT ACTIVITIES OF GRAPE SEED EXTRACTS BY FRAP, HRSA AND MCA METHODS

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Abstract:

Antioxidant activities of grape seed extracts of Besni and Horoz Karası grape varieties were determined by Ferric Reducing Antioxidant Potential (FRAP), Hydroxyl Radical Scavenging Ability (HRSA) and Metal Chelating Activity (MCA) methods. For this aim, the grape seeds of Besni and Horoz Karası varieties were dried in oven in whole or powdered forms. The extracts were prepared by using 70% acetone in water, and then the antioxidant activities of the extracts were tested by the methods mentioned above.

The results showed that the FRAP values and HRSA were higher in grape seed extracts of Besni variety than those of Horoz Karası variety ($P<0.05$). In respect to HRSA and FRAP results, the physical form of seed was significant ($P<0.05$) and drying in powdered form resulted in higher antioxidant activity than drying in whole form. However, the MCA values of Horoz Karası and Besni grape seeds dried in powdered form were lower than the grape seeds dried in whole form.

As a conclusion, the drying form, i.e. whole or powdered, could affect antioxidant properties of grape seeds. It could be recommended to use two or more methods to determine the antioxidant activity due to the differences between the testing methods investigated.

Keywords: Antioxidant activity, grape seed, FRAP, HRSA, MCA

3D INVERSION OF AIRBORNE MAGNETIC ANOMALIES BY DIFFERENTIAL EVOLUTION: A CASE STUDY FROM THE BIGA PENINSULA (NW TURKEY)

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Abstract:

The complex geological structure of the Biga Peninsula (NW Turkey) has attracted intense attention so far. It is located on a tectonically very important region where different tectonic zones meet. Additionally, the Peninsula comprise various kinds of sedimentary, metamorphic and igneous rocks. Among them, igneous rocks occupy considerably amount of areas. These rocks are mostly associated with geothermal systems and mineral deposits, and they therefore play an important role in the geology of the Peninsula. Active faults and also young granitic and volcanic rocks have importance on the geothermal sources in the Biga Peninsula. More than 50 hot springs with temperatures ranging from 30 to 100 °C exist in the region, and thus it is considered as a significant geothermal area in Turkey. Since building general understanding of the subsurface structure of those intrusions is of great importance considering their significance on geothermal systems, we have carried out a 3D inversion using a global optimization algorithm routine to delineate subsurface extensions of some granitoids such as Ilıca-Şamlı and Danişment located at the eastern part of the Biga Peninsula. Airborne total field magnetic data collected by the General Directorate of Mineral Research and Exploration of Turkey were used for inversion by Differential Evolution (DE), which is a population-based meta-heuristic algorithm. Considering proposed Curie-point depths for the region, geologically consistent depth estimations for three plutonic masses which exposure on the study area were obtained by DE. Results showed that two granitoid masses located at the eastern part of the study area are closer to each other at subsurface than as seen on the surface geological map. Additionally, about 1.5 km difference between the bottom depths of these granitoids might have been caused by the existence of a fault which needs further investigation.

Keywords: Biga Peninsula, Differential Evolution, Global Optimisation, Granitoids, Magnetic Anomalies

INVESTIGATION OF PHYSICAL PROPERTIES OF WOOLEN FABRICS ON THERMAL COMFORT

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Abstract:

Comfort is a complex notion including physical, physiological, and psychological factors. It is the most important parameter determining the consumer preferences in garment technology. The thermal balance is the key factor to feel comfort and can be achieved by heat exchange between the human body and the surrounding. Heat exchange mechanism consists of conduction, convection, and radiation of heat, evaporation and heat production. The deterministic parameters of thermal comfort are heat and moisture transfer capability, air permeability, heat retention, static electrical tendency, water vapor resistance and water absorbency. Recently, many researches have addressed the issue of thermal comfort parameters in textile industry such as footwear, technical textiles, surgical gowns, sportswear, ballistic applications etc. In this study, three different woolen fabric samples having the same weight, composition and different thickness values have been investigated in terms of thermal comfort properties. Firstly, porosity of the fabrics has been calculated by using the warp/weft yarn counts and density values according to the theoretical model with cover factor. Then, thermal and water vapor resistance values have been measured by using PERMETEST Sensora instrument. Air permeability of fabrics has been measured by using a wind tunnel. The effects of porosity and thickness values on thermal comfort properties of fabrics have been discussed. Results proved that when the thickness increases the air permeability decreases but this situation can be explained with the structure effect of the fabric samples. In basket weave, because of the neat and dense character of the structure air permeability value is less than break twill structure. Considering the water vapor and thermal resistance values, because of the finest yarn count and the structure (twill) WB2 has the highest water vapor resistance result. This result is stemming from the fact that finer yarns have much more surface area to resist to the water vapor and thermal energy.

Keywords: Thermal comfort, wind tunnel, cover factor, porosity, woolen, air permeability

IDENTIFICATION OF NORMAL AND ABNORMAL HEART SOUNDS USING NEURAL NETWORK

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Abstract:

Heart sounds include significant information about the pathological conditions of the heart and cardiovascular system. These sounds can be classified into two categories as normal or abnormal. While normal sounds signify healthy heart, abnormal sounds may indicate various cardiac disorders. Therefore, correct recognition and evaluation of the heart sounds have great importance in Medicine. In this study, it is intended to identification of normal and eight different abnormal heart sounds, namely, third heart sound, fourth heart sound, opening snap, aortic stenosis, midsystolic click and late systolic murmur, ventricular septal defect, atrial septal defect, patent ductus arteriosus. Autoregressive (AR) model and Artificial Neural Network (ANN) are used for this purpose.

In this study, firstly, heart sounds are filtered to eliminate environmental noise and unnecessary frequency components. Then sounds are segmented into a little duration of complete one cycle of heart beat. Following the filtering and segmentation process, AR model is used to extract features from the segmented heart sounds. As a result of this process, AR parameters; a1, a2, a3, a4, a5, a6, and signal power are obtained as features of the sounds. These features are applied as inputs to the ANN for identification of the normal and eight types of abnormal heart sounds. After 1000 iterations and 10 cross validation, nine types heart sounds are identified at a high accuracy of %99.33.

Keywords: Artificial Neural Network, Autoregressive Model, Heart Sound

NEAR SURFACE MOUNTED CFRP COMPOSITES FOR SHEAR STRENGTHENING OF RC BEAMS

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Abstract:

In order to keep structures efficient and functioning, inadequate structures or structure parts have to be strengthened. External bonding of carbon fiber-reinforced polymer (CFRP) composites is one of the most effective method for strengthening deteriorated reinforced concrete members. However, utilizing full tension strength of CFRP is not possible due to main drawback of this technique, debonding. Embedding the strengthening material into a groove, in which concrete is typically in better quality, could be a reasonable and economic alternative to prevent debonding and delimitation of CFRP composite. To demonstrate the efficiency of this technique an experimental program was conducted and the effects of embedded CFRP bars on behavior and ultimate strength of shear deficient (without stirrups) reinforced concrete beams were investigated under cyclic loading. Specimens, one of which was the control specimen and the remaining were the shear deficient test specimens, were strengthened with CFRP bars with distinct arrangements. Spacing of CFRP bars and application of CFRP bars were the selected variables of the experimental program. Tests results confirmed that all in all an increase in strength was seen in every specimen to which CFRP bars applied with no occurrence of delamination, debonding.

Keywords: RC Beam, Debonding, Strengthening, Shear, CFRP bars, Cyclic Load.

COMPARISON OF LINEAR AND NON-LINEAR STRAIN EFFECTS ON AN ANGLED TIMOSHENKO BEAM FEM MODEL

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Abstract:

In non-linear strain-displacement relations, the bending displacement affects on the axial strain. Also when the finite elements are placed angled with each other, one element's bending displacement can become the axial displacement of an adjacent element.

In this study, effects of non-linear strains are investigated on an arc shaped beam model and compared with between two non-linear strain-displacement theory and also linear strains. Arc shaped model was built with 2 node first order Timoshenko beam elements. Both von-Karman's and Green-Lagrange strain-displacement relationships were used for non-linear finite element formulations. Linear static and geometric non-linear static analyses were performed. These finite element analyses were performed by using an individual code which is written on MATLAB software.

Keywords: Timoshenko Beam, Finite Element Method, Geometric Non-linear Analysis,

REMOVAL OF COLOR AND COD FROM WASTEWATER OF A LOCAL TEXTILE FACTORY BY COAGULATION

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Abstract:

Textile industries use large amount of water and complex chemicals during various processing stages such as desizing, scouring, bleaching, mercerising, dyeing, printing, and finishing. Textile industry wastewater containing intensive color, high pH and chemical oxygen demand (COD) and large amount of suspended solids impose environmental concern. Many methods such as physicochemical, chemical and biological processes and advanced oxidation processes have been reported for the decolorization of color wastewater. Among these, coagulation is one of widely used processes owing to relatively simple operation and low cost. The most commonly used coagulants in treatment of textile wastewater are Al(III) and Fe(III) salts. In this study, coagulation technique was applied to remove color and COD from wastewater supplied a local textile factory. The operating variables were type and dosage of coagulants. In present study, aluminum sulfate and ferric chloride that are readily soluble in water was used as coagulants. The evaluation of treatment efficiency was made using parameters of COD and color. Color was followed by absorbance at 436 nm, 525 nm and 620 nm wave lengths. At 500 mg/L ferric chloride determined as appropriate dosage, while removal efficiencies of color at 436 nm, 525 nm and 620 nm were found to be 84%, 92% and 86%, respectively, COD removal was achieved to be 31%. Removal efficiencies of color at 436 nm, 525 nm and 620 nm were found to be 82%, 85% and 79% using 700 mg/L aluminum sulfate, respectively. The maximum COD removal was achieved to be 26% at dosage of 700 mg/L aluminum sulfate. According to results obtained, coagulation technique may be a good pretreatment option to remove color from textile wastewater.

Keywords: Textile wastewater, coagulation, removal of color and COD

ANALYSIS AND DESIGN OF PASSIVE AND ACTIVE INTERCONNECTED HYDRO-PNEUMATIC SUSPENSION SYSTEMS IN ROLL PLANE

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Abstract:

In this study, analysis and design of a half car model in roll plane with passive and active unconnected and interconnected Hydro-Pneumatic (HP) suspension systems are made. An interconnection configuration with a connection between the piston side oil volume and rod side oil volume of the right and left suspensions, respectively, is considered. The performance of the active unconnected HP and interconnected HP suspension systems are compared in terms of ride comfort and handling. Nonlinear mathematical models are developed for each suspension configuration. A state space model with state dependent coefficients is derived using extended linearization to be used in the controller design. A nonlinear control method, State Dependent Riccati Equation (SDRE) control is used for the active controllers. The active controllers are designed to improve the ride comfort and handling, and to control the attitude and leveling of the vehicle. The performances of the controllers are evaluated by time domain simulations. Comparisons of the active and passive, unconnected and interconnected HP suspension systems with respect to ride comfort and handling are performed to evaluate the relative advantage and disadvantage of each type. The results illustrate the advantages as well as disadvantages of the active interconnected HP suspension system as compared with the other suspension configurations.

Keywords: Hydro-pneumatic suspension, active suspension, interconnected suspension, ride comfort, vehicle handling, attitude and levelling

A NUMERICAL STUDY ON THE EFFECTS OF SURFACE ROUGHNESS FOR A NEW CYCLONE FILTER

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Abstract:

Today in the industry, cyclones are the equipments used in the separation process of the dense phase in multiphase flow. Although cheap and simple structure, the flow inside is quite complex. In addition, because of the multitude of parameters that affect the cyclone pressure drop and dust efficiency, it is necessary to make experimental and numerical analysis for each parameter under different operational and geometrical conditions. In this study, numerical analysis results of a new cyclone design will be presented which is designed taking into consideration the effects of friction. The effects of roughness on the velocity and pressure distribution for this new generation cyclone will be examined which is conducted with the support of a scientific project. The results show that, increase of relative roughness influences the tangential velocity and cyclone pressure drop in the case of high inlet velocities.

Keywords: CFD, Cyclone, Roughness, Pressure drop

A STUDY ON IMPROVING THE THERMAL PERFORMANCE OF THE SOLAR CHIMNEY SYSTEM WITH USING FRESNEL LENSES

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Abstract:

Today, environmentally friendly, high energy efficiency and sustainability methods have been important. From these methods, the solar chimney system, which uses the solar energy for obtaining electricity from the turbines is remarkable. In the literature, there are studies about the system performance depending on geometrical and operational parameters. In the study which carried out experimentally, as distinct from the literature, fresnel lenses are used on the absorbent surfaces exposed directly to solar energy, therefore it is provided to increase the temperature on the sub-floor and there have been made various comments and recommendations by observing the changes in the velocity and temperature distribution at some points in the system which previously identified.

Keywords: Solar chimney, Fresnel Lens, Efficieny

NUMERICAL INVESTIGATION OF THE EFFECT ON FLOW CHARACTERISTIC OF THE OBJECTS PLACED BETWEEN NOZZLE AND IMPINGING PLATE

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Abstract:

In this study, improving of flow characteristics being formed on the impinging surface by impinging air jets has been focused. For this purpose, objects which have the same surface area and different shapes (triangle, square, and circle) are placed between the nozzle and impinging plate. So that, it is aimed to increasing the turbulence kinetic energy on the impinging surface created by air jet. It has been taken nozzle diameter as 8 mm, the distance between the nozzle and impinging surface as H/D=2, Reynolds numbers as $10000 \leq Re \leq 20000$ and the distance between object and impinging surface as $2 \leq L \leq 10$ mm. Numerically, air velocity and turbulence kinetic energy on impact surface was predicted based on CFD method adopted Standard k–ε turbulent model.

Keywords: Impinging air jet, CFD, velocity, Turbulence kinetic energy

INHIBITION EFFECT OF THE HETEROCYCLIC MERCAPTO COMPOUNDS ON CORROSION OF COPPER IN SULPHURIC ACID SOLUTION

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Abstract:

Copper and its alloys are extensively used in different industrial equipments (desalination plants, water cooling systems, heat exchangers, etc). The use of this metal and its alloys it is reflected from the combination of their electrical/thermal conductivity, strength, corrosion resistance, etc. Although these materials have desired properties, in general they are prone to corrosion phenomena. Thus there is a great necessity to find inhibitors that decrease their corrosion rate.

Two heterocyclic mercapto compounds [2-mercaptonicotinic acid and 4-methyl-1,2,4-triazole-3-thiol] were tested as corrosion inhibitors for copper in 0.1 M sulphuric acid using potentiodynamic measurements. The results showed that the inhibition efficiency of these compounds increases with the increase of their concentration in the used corrosion media. The inhibition efficiency of the studied molecules is highest for the 2-mercaptonicotinic acid, this is reflected from the extra oxygen atoms that contains this molecule compared with the 4-methyl-1,2,4-triazole-3-thiol molecule.

Keywords: corrosion inhibition, heterocyclic mercapto compounds, inhibitors, copper

EXPERIMENTAL AND THEORETICAL STUDIES ON CORROSION BEHAVIOR OF SOME MONO AND POLYHYDROXY AROMATIC DERIVATIVES ON MILD STEEL

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Abstract:

Six mono and polyhydroxy aromatic derivatives, namely: A. 4-hydroxy-3-methoxy benzoic acid, B. methyl-3,4,5-trihydroxybenzoate, C. methyl-4-formylbenzoate, D. 2,3,4-trihydroxybenzoic acid, E. syringic acid and F. sinapic acid, were tested for their corrosion behavior toward the corrosion of mild steel. The experimental study was performed through the use of potentiodynamic polarization measurements. Polarization studies showed that corrosion current density decreased in presence of some of the inhibitors in comparison to in the absence of inhibitors. Quantum chemical parameters calculated by Density Functional Theory (DFT) such as: the energies of the highest occupied and lowest unoccupied molecular orbital [E(HOMO) and E(LUMO)], energy gap (ΔE), dipole moment (μ), chemical hardness and softness, etc were determined and were correlated with the experimental results through the use of the Statistica software.

Keywords: inhibitors, polyhydroxy aromatic derivatives, DFT, potentiodynamic measurements

REMOVAL OF PHENOL FROM AQUEOUS SOLUTIONS BY PHOTO-FENTON PROCESS

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Abstract:

Phenol and phenolic compounds are widely used as raw materials in the petrochemical industry and in oil refineries. They are toxic even in the presence of low concentration. Limited phenol concentration in drinking water was determined as $1 \mu g L^{-1}$ by The World Health Organization. Many technologies have been used for treatment of phenolic wastewater. But there are few suitable processes for the complete removal. The fenton and photo-fenton processes are well-known examples. In this study, photo-fenton process were used for removal of phenol and the influence of operating parameters such as H_2O_2, $FeSO_4$ and initial phenol concentrations was investigated. On the photo-fenton experiments, photo reactor was used. Phenol removal efficiency was obtained to be 56% using UV+H_2O_2 concentration of 0.4 mL/L (reaction time 15 minutes). The effect of $FeSO_4$ concentration (10-50 mg/L) was performed at pH 3, initial phenol concentration of 100 mg/L and H_2O_2 concentration of 0.4 mL/L. The maximum phenol removal efficiency was determined as 87% at $FeSO_4$ concentration of 50 mg/L (reaction time 30 minutes). Then, on the optimum conditions, effect of initial phenol concentrations was investigated and removal efficiencies of phenol and COD at the initial phenol concentration of 50 mg/L were determined to be 93% and %76, respectively. These results demonstrated that this process may be used for phenol removal.

Keywords: Phenol, phenol removal, photo-fenton, hydroxyl radical

EVALUATION OF TANK CONTAINER LOGISTICS IN TURKEY

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Abstract:

Container transportation which allows a more efficient delivery of cargoes has an important share in the maritime transport. One of the special area of container transportation is tank container logistics which is used in the transport of liquid and gas cargoes. Tank containers are included for use to carry liquids and gases more economical, faster, safer and environmentally friendly and has found its place in the transportation of many liquid cargoes, primarily in chemical industry. In Turkey, it is obvious that tank container demand will increase and tank container logistics will become more important due to the growth of manufacturing sector in recent years. In this study, it is examined the advantages/disadvantages and important factors of tank container logistics, global status of tank container transportation and the share of Turkey in this market.

Keywords: tank container, container logistics

TOXIC AND HAZARDOUS WASTE MANAGEMENT

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Abstract:

Every year, billions of tons of solid wastes are discarded into our environment. These wastes range in nature from common household trash to complex materials in industrial wastes, range in nature from common household trash to complex materials in industrial wastes, such as hospitals and laboratories. Waste is defined as 'any material that are no longer desired and has no current or substance that has been discarded or otherwise designated as a waste material, or one that may become hazardous by interaction with other substances. Solid waste has to be examined whether it exhibits a characteristic that makes it hazardous. Hazardous Waste is a waste which could potentially threaten human health or the environment. This includes waste which exhibit one of seven hazardous characteristics: ignitability (flammability), corrosively, reactivity (oxidizer), toxicity (poison), infectivity, radioactivity and bioaccumulation effect. Hazardous waste may either be in the form of solid, liquid, semi-solid or contained gaseous material.

Management strategies play an important role in defining a hazardous waste. These steps may include; the source of the waste, generators, waste transport, waste storage, appropriate treatment technologies, final disposal. Hazardous wastes should be identified and disposed of in a manner that will most effectively protect the environment. All the producers and the recipients of waste need to follow certain standard operative procedures (SOP) to manage the waste in accordance with the existing law and waste regulations. The legislators of each country should create regulations enforcing the safe management of the hazardous waste.

Keywords: Key Words: waste, toxic waste, hazardous waste, classification, management.

INVESTIGATION OF EFFECT OF ULTRASONIC SEWING SPEED ON ULTRASONIC SEAM TENSILE PROPERTIES

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Abstract:

In this study, effect of ultrasonic sewing speed on ultrasonic sewing tensile strength properties were investigated. 100% polyester thermal bonded nonwoven fabrics which have different weights were used. Samples were sewn by different speed and their seam tensile properties were compared.

Keywords: Ultrasonic seam, seam tensile properties, polyester, sewing speed

LAND USE CHANGE DETECTION IN TURKISH COASTAL ZONE BY CORINE DATABASE

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Abstract:

Coastal zones are most vulnerable for land use changes. Turkish coastal zone has many types of the coastal land use. The objective of this study is to evaluate and quantify Turkish coastal zone land use changes from 1990 to 2010 using Corine land cover data, geographical information system based geo-spatial analysis and modeling techniques. As a result of analyses the formation of new agricultural areas through the conversion of natural and semi-natural land was concentrated mostly in the southern coast of Turkey was found. The change in land cover between 1990 and 2010 showed an increase in artificial areas and water bodies, but a decrease in agricultural land use, forests and natural vegetation and wetland. The highest overall change in the Turkish coastal zone was to increase in artificial areas. Sustainable land use management strategies need to develop to protect Turkish coastal zone land use types before extinction

Keywords: Corine; land use; Turkish coastal zone; GIS; change detection

EVALUATION OF TURKISH STRAITS VESSEL TRAFFIC SERVICES (TSVTS) APPLICATIONS IN THE ISTANBUL STRAIT

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Abstract:

The region consisting of the Turkish Straits, called Istanbul and Çanakkale Straits and the Sea of Marmara, is one of the regions that have the highest concentration of maritime traffic in the World. In the year 2012, 50.871 ships in total have passed through Istanbul Strait with a monthly average of 4028 ships. Daily averages are 140 ships for Istanbul Strait. In the year 2012, 135.000.000 tons of dangerous cargoes shipped through Istanbul Strait. In addition to these figures, approximately more than two million people pass across the Istanbul Strait daily by small passenger vessels. Turkish Straits Vessel Traffic Services (TSVTS) was put into service with the purpose of lessening the risks of maritime accidents which may happen and directing the maritime traffic in the area with continuous observations made and increasing the safety of life, properties and the environment in the Turkish Straits and in the Sea of Marmara. This study will assess situation from when establishment of VTS. Istanbul Strait ship accidents that may occur, the effect of VTS applications were examined. This analysis allowed us to investigate the impact of various factors on the risk profile of the Istanbul Strait.

Keywords: Istanbul Strait, Vessel Traffic Services, accidents, Maritime Traffic, Sea of Marmara

THE IMPACT OF CLIMATE CHANGE ON MARITIME TRANSPORT ROUTES

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Abstract:

The large part of the international trade is carried out by maritime lines transport. Most commonly used in maritime routes, there are certain routes. Main shipping lanes are those supporting the most important commercial shipping flows servicing major markets. One of the most vital sea routes between the Far East and Europe is the Southern Sea Route, which threads through the Straits of Malacca and across the Indian Ocean to pass through the Suez Canal. A northern passage, crossing the Bering Sea into the Barents Sea of Russia's far north and hugging Russia's Arctic shore, would constitute a mere 60% of the distance of its southern counterpart. The temperature is expected to rise as a result of climate changing. Meteorologists sea ice in the arctic ocean in the next fifty years, they estimate will withdraw quickly further north due to the temperature rise. Northern sea route will become more favorable for maritime transport in Arctic ocean. In this study, the new maritime lines routes that may occur due to climate change impact on maritime transport are discussed.

Keywords: climate change, maritime transport lines, Northern sea route,

ASSESSMENT OF POLLUTION AT SEA CAUSED BY VESSEL WITH NIXOUS LIQUID SUBSTANCES AND OIL PRODUCTS

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Abstract:

Oil, oil products and nixous liquid substances are carried from little river to ocean going by vessel and being increased with global economy situations. There are a lot of nixous liquid substances. These substances based on chemical industries. They have been made to diversify. It's been getting to increase day by day. They are needed by various industries and refineries as raw, semi raw or final product with great tonnage.

It raises risks, especially environmental risks. Risks and pollutions causes by vessel mainly due to accident and neglect, at the same time facilities and ports might be responsible parties. Governments and international organizations have been published regulations about it. Port facilities and marine terminals own application for pollution prevention in their quality systems. After all precautions, Statistics have showed that a lot of marine pollution problems are occurred there every year. This study reveals precautions by all parties, regulations and analyses against pollution at sea.

Keywords: pollution, environment, nixous liquid substances

DETERMINATION OF THE AWARENESS LEVEL OF INDIVIDUALS ABOUT THE PARKS DESIGNED FOR THE DISABLED

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Abstract:

According to "World Report on Disability (2010)" of World Health Organisation (WHO), more than a billion people are estimated to live with some form of disability, or about 15% of the world's population. In Turkey, according to TurkStat, ratio of the disabled to total population is 12.29% which makes nearly 10 million people all over the country. Disability may be inmate or caused during some unfavourable events. Form this point of view, any individual is a candidate for being disabled.

Due to the impossibilities in their physical functions, the disabled have limited access in their living area to urban areas and opportunities to use them. However, basic duty of civilisations and states is to deliver services equally to whole sides of society. In order for the disabled to participate in social life, civilisations should have priory aim to set up various activity areas in urban for such groups.

Required designs and regulations are beginning to be implemented in parks in order to meet the disabled's recreational needs. Extension of the designs for the disabled within parks is a good practice example. In addition, the number of specially designed parks for the disabled to perform their all kinds of activities in these parks by considering their physical disabilities is increasing more and more.

City centre of Malatya shelters totally 105 city parks serving actively in 2015, among which only one was designed especially for the disabled and so-called "Disabled Park".

A questionnaire survey was conducted to determine the disabled's awareness level about the Disabled Park and their use frequency of the park in Malatya city. It was determined according to data obtained from questionnaire survey that 63.8% of the disabled living in Malatya city centre are not aware of a Disabled Park specially designed park serving for themselves. Among the participants, those aware of the presence of such a park (36.2% of all participants), 76.3% reported to visit the park at least once. When the visiting frequency of the participants who replied "yes" to the question "Which often have you visit the Disabled Park?" was asked, 20.8% of the participants stated that they visit the park less than once a month, 44.8% once a month, 17.2% once a week and 17.2% everyday.

According to the results above, it was found that great majority of the disabled living in Malatya city centre are not well aware of the presence of a park specially designed for their own needs. Various suggestions were proposed for the use of the Disabled Park in Malatya more actively.

Keywords: Open green area, city, disabled people, city park, Malatya.

EVALUATION OF MARITIME SAFETY IN ISTANBUL STRAIT USING PORT STATE CONTROL INSPECTIONS

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Abstract:

Approximately 90 % of world trade is carried by maritime transportation. Although, it has a lot of advantages such as less transport cost, it has high risk for human life, environmental pollution and commercial loss. Owing to its global character, environmental disasters resulting from shipping accident affect the whole world nations. Therefore, Port State Control (PSC) has been introduced by International Maritime Organization (IMO) to reduce the risk in the maritime transport. PSC is the inspection of foreign ships in national ports for the purpose of confirming that condition of the ship and its equipment comply with the requirements of international conventions and that the ship is manned and operated in compliance with applicable international laws. While the safety of ships and the protection of the marine environment can be enhanced by port state control, regional agreements on port state control have been established in order to ensure effectiveness of inspections, effective monitoring and uniformity of inspections. At present there are nine regional PSC agreements in operations. Especially, inspections of Black Sea MOU are very important for maritime safely in Istanbul Strait. Istanbul Strait is one of the heaviest maritime traffic of the seaways in the world. On the other hand, it presents significant navigational challenges. In addition to these factors, sub-standards ships which are navigating in an unsafe condition threat the lives as well as the marine environment. Therefore, there is always high risk arising from maritime shipping in this region.

In this context, in this study, Black Sea MOU inspections data are investigated for general an evaluation during 2004-2013 periods. And later, performance of Flag States of the most passing from Strait region is determined by using Black Sea MOU inspections and others regional MOU's inspections. Thus, an assessment of maritime safety is done for this region.

Keywords: Maritime Transport, Port State Control, Black Sea MOU, Istanbul Strait, Safety.

DETERMINING THE RISKS IN MARITIME CONTAINER TERMINALS OPERATIONS: HEALTH AND SAFETY APPLICATIONS

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Abstract:

The maritime container terminal is the physical link between ocean and land modes of transportation. It fulfils functions of the transshipment and the temporary storage of containers. Container terminal system is composed of two components. The first is the quayside with loading and unloading of ships. The second is the land side. It comprises container yard where containers are stacked and gate side where containers are transferred to other modes of transportation. Container terminals have different types of handling equipment and the terminal layouts. Container terminals is a dynamic system in which many operations together. Container terminals operations contain a variety of dangers, because of operation rate, job multiplicity of machines, machines and people working in the same environment and vertically stacking. In this study, container terminal structure, handling equipments and terminal operations are described. The risks in terminal operations are analyzed by divided into two subsystems: quayside operation and yard operation. Measures to be taken and health and safety practices are discussed.

Keywords: Container Terminal, Quayside Operation, Yard Operation, Operational Risk, Safety

CUCURBIT VIRUSES OF TURKEY

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Abstract:

Cucurbits (the Cucurbitaceae family) include 119 genera and 825 species distributed primarily in tropical and subtropical regions of the world. The major cultivated species such as melon (Cucumis melo L.), cucumber (Cucumis sativus L.), squash (Cucurbita pepo L.), and watermelon (Citrullus lanatus (Thunb) Matsum.&Nakai) are important vegetable crops worldwide. Cucurbits are among the major vegetables grown in Turkey. Virus diseases cause important economic losses in cucurbit crops throughout the world. According to the different estimates, viruses cause 3-5% of overall vegetable production is lost, but losses can be occasionally very high, where pest control is insufficient, especially in developing countries. Indeed, more than 35 different viruses have been isolated from cucurbits in the world, but only twelve of them were already found in Turkey. From different parts of Turkey, several virus diseases inducing mosaic symptoms were previously reported including Cucumber mosaic Cucumovirus (CMV), Watermelon mosaic Potyvirus-2 (WMV-2), Zucchini yellow mosaic Potyvirus (ZYMV), Papaya ringspot Potyvirus-watermelon strain (PRSV-W), Cucumber vein yellowing Ipomovirus (CVYV), Cucurbit aphidborne yellows Polerovirus (CABYV), Melon mosaic virus (MMV), Tomato ringspot Nepovirus (TRSV) and Tomato black ring Nepovirus (TBRV) only in cucumber, Squash mosaic Comovirus (SqMV), Melon necrotic spot Carmovirus (MNSV) and Cucumber green mottle mosaic Tobamovirus (CGMMV). Plant viruses have been identified by several methods involving their morphological, physical, biological, cytological, serological and molecular properties, but serology is one of the most specific and accessible methods to obtain a rapid and precise diagnosis of a plant disease caused by virus. Several serological techniques were developed and the advent of the enzyme-linked immunosorbent assay (ELISA) has facilitated the use of serology in the identification and characterization of plant viruses. The present review describes biological, morphological, serological and molecular properties of important virus species infecting cucurbits in commercial fields of Turkey.

Keywords: Cucurbitaceae, DAS-ELISA, RT-PCR, Turkey, Virus diseases

DESIGN OF HYDRAULIC BULGE TEST UNIT FOR WARM FORMING

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Abstract:

The hydraulic bulge test can be used instead of the tensile test to obtain the flow stress curves of sheet materials under biaxial tension. Because using of biaxial stress test data is more convenient in FEA of sheet metal forming operations in which deformation mode is biaxial. Besides that the low formability issue of lightweight materials are tried to overcome by new forming technologies and warm forming have been being inveatigated as a promising alternative process to cold stamping.

In this study, a warm hydraulic bulge test unit which composed of five major sub-systems (a hydraulic system, a set of bulging die, a heating system, in die contact measurement system and data acquisition system) has designed to determine the flow curves of sheet materials at different temperatures.

Any standard is not available for hydraulic bulge test dies and their dimensions. In this test unit, circular bulge dies is used. Induction heaters were preferred for heating the dies and the fluid because they are more efficient than other heating methods. Temperature was measured by two thermocouples one of them is in contact with the center of the sheet and other is in the die. When the thermocouple is in contact with sheet, reached to the desired value, pressure was raised in a controlled way with the hydraulic numeric control (HNC) system to start the bulging. Bulging was maintained until tearing occurred in the sheet. Dome height was measured via a Linear Variable Displacement Transducer (LVDT position sensor) in real time. Bulge height, temperature of the center of the sheet and pressure of the fluid values were measured in real time by LVDT, thermocouple and pressure sensor respectively and both of them were recorded in desired frequency to the computer. Ultimately they were used in the equations which were developed by other researchers to estimate the flow curves of the materials.

Keywords: flow curve, hydraulic bulge test, warm forming

THE INVESTIGATE OF THERMODYNAMIC PROPERTIES OF THE HLA-B*51 PROTEIN BOUND TO DIFFERENT PEPTIDES WHICH PATHOGENIC ROLE IN BEHCET'

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Abstract:

Behçet's Disease (BD), BD has a multifactorial pathogenesis, is a multisystem inflammatory disorder of unknown aetiology which leads to numerous symptoms in the body. HLA-B5/51* is protein and it has been recognized as the strongest genetic risk factor for BD [1]. Pathogenic role of HLA-B*51 in BD has yet to be clarified, and the exact mechanism of action of HLA-B*51 has still been unknown. HLA-B*51 binds to the peptide itself and it become resistant complexes. The peptide-binding region of HLA-B*51 are located between the α1 and α2 domains (Figure 1). In order to understand the effects of bound peptides on the HLA-B*51 protein are investigated the statistical thermodynamics of this peptides by molecular dynamic (MD) simulations for constant temperature (310 K). The thermodynamic properties such as the entropy, Helmholtz free energy, heat capacity and the energy of this peptide are calculated with results obtained from molecular dynamic (MD) simulations. The showing conformational changes in molecules of peptides are illustrated using a map of potential energy levels.

Figure 1 The α1 and α2 domains of HLA-B*51, which form the peptide-binding Groove, are shown in green and blue respectively.

Keywords: Behçet's Disease (BD), Molecular Dynamic Simülation

DETERMINATION OF HAZARD EFFECTS OF TRUCK ACCIDENT CARRYING HAZARDOUS WASTE BY USING RANKING SYSTEM

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Abstract:

Some accidents and disasters due to transportation of hazardous materials could cause a lot of serious health and environmental problems. Generally, hazardous materials spill (spread out) from containers as a result of the natural disasters, accident or sabotages.

This study aimed to investigate some risks related with a scenario of truck accident carrying solvent waste and estimate of hazards. The main approach is to expose some possible risks by setting the classification with a rating system. Wind direction and speed, waste amount, hazard properties, effects on ecosystem and health were used as input variables for rating system. By using this hazard assessment method, some outputs are obtained such as distribution of the hazardous waste, reaching time to receiver, affected people and environment. Risk projection with rating the possible hazards on human health and ecosystem may give suitable information to decision makers for managing hazardous wastes.

Keywords: environment, hazardous waste, ranking system

USE OF RAINWATER IN RECREATIONAL IRRIGATION OF A UNIVERSITY CAMPUS IN TURKEY

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Abstract:

Hot and dry summers require extensive recreational irrigation in urban areas and university campuses that have large green areas. Populated metropolitan areas have already huge amount of water demand for drinking and domestic use. Water requirement for recreational irrigation generally have secondary priority, none the less public attention forces the city managers and university campus administrators to keep the green environment as green even during hot and dry summers. Therefore during the rainy season, rainwater should be collected and stored to use in dry seasons of the year. This task requires large storage facilities, piping and pumping equipment. In this study rainwater harvesting options and cost of the collection and storage are compared with the cost of water use from city's water distribution network. It is found out that the rainwater collection system together with all piping and pumping cost will be paid back in 20-30 years.

Keywords: Rainwater collection, rain harvesting, recreational irrigation

DETECTION OF THE WELD DAMAGES BY LAMB WAVE TECHNIQUE

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Abstract:

Lamb waves are a type of ultrasonic waves has a wide range of applications in non-destructive testing. Most of the studies used simple and flat structures for breaking, cracking or corrosion damages. In this study, the detection of damage in the welding is examined. Two 4.5mm thickness AL2024 plates joined by overlay welding method. Damage was applied to the weld region gradually. Three piezoelectric (PZT) discs were used to create surface waves and to monitor their propagation. For better examination, the envelopes of the monitored signals were calculated by using the Hilbert transform. Damages occurring in the weld region, has led to reflections and attenuation in waves. The study indicated that degradation occurring in the weld can be identified with the Lamb wave technique.

Keywords: Hilbert transform, structural healty monitoring

SEMI-QUANTITATIVE ANALYSIS IN WDXRF SPECTROMETRY OF POLYETHYLENE MATERIALS USED IN FOOD PACKAGING

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Abstract:

Food packaging is an industrial material product which stores the product it contains, keeps and protects from external influences until the consumer from the first stage of the process. Many inorganic materials during the production of polymers used in food packaging are added which could result in changing their physical, chemical and mechanical properties. This situation affects the quality of the materials produced as well as damage to human health and the environment is discussed. Legislation and regulations have been developed in the U.S. and the European Union about food contact materials such as food packaging. In Turkey, additives must be determined as quantitative according to the Turkish Food Codex and notification of Plastic Stuff and Materials that is contact to food. Therefore quantitative analysis of these polymer materials has great importance as spectrometric. Wavelength dispersive X-ray fluorescence spectrometry is preferred in the industry because of superiority and precision of the analytical evaluation, rapid, non-destructive and easy to sample preparation. In this study; polyethylene is one of the polymer food contact materials are examined as PE materials with additives after process via semi-quantitative analysis used in WDXRF, so additives are determined. So that, quantitative analysis methods developed in WDXRF will be a preparatory study to produce of polymer standard materials for food packaging.

Keywords: Food Contact Polymer Materials, Food Packaging, Polythene (PE), Semi Quantitative Analysis Method, WDXRF

WDXRF ANALYSIS AND DETERMINATION OF EFFECTS IN CEMENT PRODUCTION PROCESSES SAMPLE PREPARED WITH PELLET METHOD

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Abstract:

In cement production, X-ray fluorescence spectrometer analyses are generally carried out in order to determine oxide compounds/elemental in clinker and final product. In this study, semi-quantitative analysis of the cement samples taken from the production four processes (raw, clinker, cooling, final product) was made with pellet method. Analysis difference between processes and spectrometer sensitivity via statistical results obtained from multiple sample/measurement were determined by using wavelength dispersive X-ray fluorescence spectrometer. This study will also be a step in production of standard references materials that are used in quantitative analyses.

Keywords: XRF, Cement, Sample Preparation, semi-quantitative analysis

SPECTRUM SENSING APPROACHES FOR COGNITIVE LTE-A SYSTEMS

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Abstract:

We consider the application of cognitive radio technology in future LTE-A systems. The carrier aggregation (CA) features of LTE-A can be exploited for enabling a cognitive operation in a subset of component carriers. Spectrum sharing between different network operators, device-to-device communications and the use of unlicensed bands for LTE-A are potential applications for such an operation. Sensing is expected to play an important role in such systems. To this end we explore the possibilities of spectrum sensing, especially the sensing while receiving a desired signal, in LTE-A systems. Energy detection is one of the most important methods covered in the sensing literature and appealing due to its low computational complexity. The main drawback is its sensitivity to noise variance uncertainties. Nevertheless, energy detection is still attractive for practical implementations due to its simplicity. We have developed beamforming based energy detection (ED-BF) algorithms for sensing while receiving a desired signal in cognitive LTE-A systems, and the performance of the proposed schemes has been compared to that of the optimum but much more complex likelihood ratio test (LRT) algorithm under practical channel conditions and with realistic channel estimation. The results are expected to play an important role in the development of protocols for cognitive operation in LTE-A systems.

Keywords: Cognitive radio, spectrum sensing, LTE-A

INVESTIGATION OF PRACTICAL DESIGN APPROACH FOR CIRCULAR STEEL BASE PLATES

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Abstract:

Circular steel base plates are commonly used for pipe and polygonal columns, such as wind turbine towers, lighting and advertisement poles. Although the explicit solutions based on various methods for rectangular base plates can be found in many design manuals and books, very limited studies exists for the design of circular base plates under different loading conditions. These types of connections are used in structures to resist gravity loads and functions as part of lateral-load-resisting systems. Also, circular base plates and anchor bolts are the critical interface between the steel structures and the reinforced concrete foundations. Besides, these connections are often the final structural steel items to be designed but are the first items required on the work site. Consequently, structural design of circular base plates and assembly details are essential for the steel constructions. In this study, practical design approach for the design of circular steel base plates is presented accounting linear stress distribution assumption for compressive bearing area and a design example is given to show the implementation of this approach. Anchor bolt diameter, base plate dimensions and base plate thickness are determined for obtaining safe and cost-effective steel structure.

Keywords: Circular base plate, structural steel design,

ESTIMATION OF EFFECT OF FABRIC WIDTH AND ASSORTMENT DISTRIBUTION ON FABRIC USAGE EFFICIENCY BY NEURAL NETWORK METHOD

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Abstract:

In this study effect of fabric width and assortment distribution on fabric usage efficiency were investigated. Efficiency values were estimated and optimum results were obtained by using Neural Network method.

Keywords: Apparel Industry, Artificial Neural Network, estimation, fabric width, assortment distribution

EVALUATION OF BUILDINGS STRENGTH FROM MICROTREMOR MEASUREMENTS: A CASE OF FOLKART TOWERS (IZMIR/TURKEY)

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Abstract:

Microremor data has an important role on determining the ground dominant periods. Another way of use of the method is the application on the constructed buildings for investigating the strength and periods of each floor. It is possible to define the period of each floor and calculate the floor spectral ratio (FSR) parameter using microtremor data. This parameter is being used to estimate the transfer function (amplification, natural frequency and vulnerability index) of the buildings. In this study, microtremor data were collected in Folkart Towers which have a length of 200 m. The buildings are the longest twin-towers in Turkey and third longest ones in Europe. The data were recorded at 14 floors for 40 minutes. The validation of frequencies were determined using FSR in order to obtain damping ratios accurately. The variation range and tendency between damping ratio and frequency of each floor with damping ratios and vulnerability indices, along with the preliminary influence factor, were presented and discussed. In addition, a fitting curve was plotted indicating the relation between the damping ratio and dominant natural frequencies of the floors. Furthermore, evaluation of strength, damping ratio, natural dominant frequency and vulnerability index of the building were estimated by interpreting microtremor data. The dominant frequencies of 44th, 22nd and 7th floors of the buildings were calculated as 0.4 Hz, 0.4 Hz-1Hz and 1.1 Hz respectively. It was determined that the buldings have 2 dominant periods. They are 1.1 Hz from 1st to 22nd floors and 0.4 Hz from 23 to 44th floors.

Keywords: Dominant frequency, Folkart, FSR, Microtremor, Vulnerability index

GEOPHYSICAL INVESTIGATION OF GÜLBAHÇE GEOTHERMAL AREA (URLA/IZMIR) USING VLF-R METHOD

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Abstract:

Gülbahçe fault, an active fault system located along north-south direction, is in 60 km west of Izmir city center. It is also surrounded by a geothermal system which is being investigated to determine its potential. Very low frequency wave-resistivity (VLF-R) method has been widely used for near surface studies in geophysics. Shallow buried structures that show resistivity variation with respect to a surrounding medium could be determined with VLF-R. It is also a particularly rapid and cost-effective technique for collecting data on large-scale exploration of shallow fracture zones. VLF-R studies were carried out in Gülbahçe (Izmir/Turkey) in order to determine the location, depth and direction of the fault and resistivity distribution in the surrounding area. After performing theoretical studies to test the inversion algorithm, apparent resistivity and phase data were collected with three different frequencies and a laterally constrained two-layer inversion process was applied to each station. In addition to the inversion of all profiles for each frequency, all lines were stacked to obtain a 3D view of the electrically conductive structure representing geothermal water. A drilling site is recommended after achieving the distribution of the anomalous structure.

Keywords: Fault, Geothermal, Gülbahçe, Inversion, VLF-R

REMOVAL RATE OF HERBICIDE ACLONIFEN IN AGRUCULTURAL SUNFLOWER FIELD IN NATURAL PERIOD

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Abstract:

Aclonifen has been used almost in all sunflower fields in Thrace region since 2000s. Microbial degradation, photodegredation, irrigation effect, adsorbtion-desorbtion mechanism, soil character, humidity, soil temperature are an important mechanism controlling the fate of pesticides in soils and is generally considered to be desirable both from an environmental as well agricultural perspective. In this study, The Aclonifen herbicide, sold under the trade name "Chekic 600" was, supplied by an agricultural products shop and applied to the sunflower agricultural field in Kirklareli City at Thrace region, with concentration of 200 ml/1000m2. This herbicide contains 600 grL-1 of Aclonifen. Experiments were done on soil samples obtained from farming areas around the Kirklareli City. The majority of the farms selected in the area have been cultivating sunflower and wheat for several years. All samples were collected randomly from the top 0–20 cm of soil following the standard procedure about 12 months and stored in glass vessels at an ambient temperature

According to the field study results, Aclonifen could be decreased to %11 and this shows that Aclonifen can be stay in the soil for long time.

Keywords: Aclonifen, Sunflower, Herbicide, Active Ingredient

EXPERIMENTAL PERFORMANCE ANALYSIS OF A DESICCANT COOLING SYSTEM

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Abstract:

Desiccant based air conditioning systems are a suitable way to improve indoor air quality due to its superior humidity control. These systems are alternatives for air conditioning in health care facilities to reduce the airborne disease transmission. In these systems, a desiccant removes moisture from the air, which releases heat and increases the air temperature. A combination of heat exchange with ambient air and evaporative or conventional cooling coils then cools the dry air. Temperature and humidity loads are very effectively and efficiently met by separating them in this way. The desiccant is then dried out (regenerated) to complete the cycle using thermal energy.

In this study, a desiccant cooling system, which was constructed in the laboratories of Mechanical Engineering Department of Çukurova University, was investigated experimentally to study the suitability of the system for the health care facilities in which hygiene is crucially important. In the system, temperature, relative humidity, flow rate and power consumption were measured to determine the performance of the system and its components separately. In this paper, experimental data, which were obtained during the cooling season of 2008 at different regeneration temperature set values, was used.

Keywords: Desiccant Cooling, Air-Conditioning, Hygiene

CHEMICAL COMPOSITION AND IN VITRO ANTIMICROBIAL, ANTICANCER, ANTIOXIDANT EFFECTS OF THE ESSENTIAL OIL OF THYMUS CONVOLUTUS

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Abstract:

The genus Thymus is represented in Turkish flora by 38 species and altogether 64 taxa, is rich in essential oils. The chemical composition, the antimicrobial, antioxidant and anticancer activities of essential oil of Thymus convolutus have been investigated. T. convolutus collected from Erzincan, Turkey was subjected to hydrodistillation to yield essential oil that was investigated using Gas Chromatography (GC) and Gas Chromatography/Mass Spectrometry (GC/MS). Sixty-six compounds were identified accounting for 99.9% of the total amount. The major component in the essential oil of T.convolutus was found to be camphor (16.6%). The essential oil and its main component camphor were screened for antibacterial and antifungal activities by the disk diffusion, microdilution broth, and single spore culture techniques. The essential oil and camphor were found to be active against all tested microorganisms. T. convolutus has higher antibacterial and antifungal activity than camphor against the tested microorganisms. The cytotoxicity activity of essential oil and camphor were analyzed on human Hepatoma cells (Hep3B), Human Colon Carcinoma (HT-29) and Human Umbilical Vein Endothelial cell (HUVEC) using MTT assay. We observed a decreasing effect of Camphor in high concentrations (1 mg/ml, 500 µg/ml, 250 µg/ml and 125 µg/ml) compared to the control group in Hep3B cell line. T. convolutus essential oil caused a reduction in Hep3B cell line particularly at 250 µg/ml and 125 µg/ml concentrations. HT-29 cells treated with high concentrations of camphor caused a reduction of cell proliferation at 48 hours. T. convolutus essential oil and camphor weren't showed any statistically significant effects on HUVEC cells. The antioxidant activity of the essential oil and camphor was determined by means of the DPPH radical-scavenging method. At the concentration of the essential oil 1000 µg/mL, 33.39 ± 0.25 % DPPH was scavenging. Any of between 100 -1000 µg/mL concentration Camphor was not indicate antioxidant activity.

Keywords: Thymus convolutus, essential oil, antimicrobial, cytotoxic, antioxidant

THYMUS PECTINATUS var PECTINATUS FROM TURKEY ESSENTIAL OIL: CHEMICAL COMPOSITION AND BIOLOGICAL ACTIVITIES

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Abstract:

The genus Thymus, which is an important member of the Lamiaceae family, is consists of about 215 species. The essential oils of Thymus have often been used in folk medicine. The chemical composition of the essential oil of T. pectinatus var pectinatus have been investigated for the antimicrobial, anticancerand antioxidant activities. A sample of T. pectinatus var pectinatus collected from Sivas, Turkey. The hydrodistilation of the air-dried aerial parts of plant at full flowering period gave an essential oil with yields of 1.3 %. The chemical composition of the essential oils was investigated by gas chromatography (GC) and gas chromatography/mass spectroscopy (GC/MS). 51 components were identified in T. pectinatus var pectinatus essential oil, representing 89.87 % of the oil. p-cymene (23 %) and thymol (22%) were main components in the essential oil. The antimicrobial activity of the essential oil and its main components p-cymene and thymol were assessed by the both disc diffusion and microbroth dilution methods. T. pectinatus var pectinatus has higher antibacterial and antifungal activity than p-cymene and thymol against the tested microorganisms. The effects of Thymus pectinatus var pectinatus on human hepatocelular carcinoma (HEP3B), human colon carcinoma (HT-29) and normal cells (HUVEC) cells remains poorly investigated. This study was undertaken to determine the anticancer efficacy of T. pectinatus var pectinatus (TPE) in these cells. The essential oil showed the best anti-proliferative activity of human colon carcinoma cell line (HT-29) in high doses (1mg/ml-500µg/ml). T. pectinatus var. pectinatus could have an anticancer effect and that some of its bioactive compounds. We also tested these bioactive compenets such as thymol and p-cymene in Hep3B, HT-29 and HUVEC cell lines. Our results showed that p-cymene and thymol also inhibits proliferation of HEP3B and HT-29 cells in high dose treatment. There were no any statistically significant effect on HUVEC cells for thymol, p-cymene and essential oil.

Keywords: Thymus pectinatus var pectinatus, essential oil, antimicrobial, cytotoxic, antioxidant

SOME EXAMPLE OF MISMANAGEMENT PRACTICES IN NATURAL VEGETATION IN TURKEY

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Abstract:

Livestock production is a major segment of the economy and rangelands and meadows are the most important feed resources for animal husbandry in Turkey. Turkey has 14.6 million ha rangeland and meadow areas and the distribution of these areas show great variation among the regions of the country. The North East Anatolia region has the largest pasture and meadow area, the lowest area is in Marmara region. In grazing season, all small livestock and vast majority of large livestock depend on rangelands. On the other hand, the high quality roughage need of livestock in long winter periods is mainly obtained from natural meadows. The produced feed in pasture and meadow areas is not adequate for animal's need due to mismanagement practices and some other factors as social and cultural factors. The main problem of the rangelands is overgrazing. In addition to overgrazing, early and late season grazing practices is another problem with the rangelands. In all regions the rangelands is grazed as long as climatic conditions are favorable for grazing. Especially early spring and late fall grazing causes degradation of rangelands because these periods are critical for rangeland plants. In Turkey, however, meadows are managed for the production of the winter feed for livestock by individual owners. They may also be used for grazing in early spring or late summer after harvesting. Traditionally grazing of meadows in early spring leads to decrease in yield and forage quality. Meadows are irrigated by a surface irrigation system from the beginning of early summer to harvest time. In this irrigation system too much irrigation water is applied, the surface of the meadows becomes excessive wet. The soil structure is then damaged by the poor irrigation management which also affects the forage quality. In rangelands and meadows, suitable management practices are necessary for sustainability.

Keywords: Rangeland, Meadow, mismanagement, suitable management

SEISMIC BEHAVIOR OF MID-STORY BUILDINGS WITH BASE ISOLATION SYSTEM

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Abstract:

The effects of earthquakes on buildings occur due to the movement of the ground during a seismic event. At the buildings with classical foundation system, energy transferred from ground to building is absorbed by resistance of structural system, damping and oscillation. The fundamental idea of seismic isolation is to absorb transferred energy at the foundation level and to reduce earthquake energy absorption demand of the building structural system elements. In the present paper, a midrise building is analyzed for investigation of efficiency of base isolation system compared to traditional fixed base system. At the fixed base design, building is designed according to Turkish Seismic Code. At the base isolated design, building is designed according to seismic isolation code proposed by Turkish Association for Seismic Isolation. Base shear forces, story shear forces, story displacements and relative story drifts results obtained from both analysis are compared and efficiency of base isolation is discussed.

Keywords: base isolation, earthquake analysis, seismic analysis, structural design

A RESEARCH ON THE SAPROPHYTIC MICROFUNGI IN OLIVE FRUIT IN BALIKESIR PROVINCE

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Abstract:

The quality of two types of olive from shops in Balikesir province in respect to microfungal contamination was investigated. Altogether, 15 samples of olive were tested including black and green olive. Thirty microfungi isolates were obtained. The identification of the isolates show that there are 11 different species representing 3 genera and 18 different sterile microfungi were determined. Penicillum was stated as the richest taxa in terms of species numbers. We did not find any correlation between microfungi and type of olive.

Keywords: Olea europaeae, saprophytic microfungi, isolation, identification

THEORETICAL APROACH FOR MODELLING AND SIMULATION OF ELECTRICAL PASSENGER CAR POWERTRAIN SYSTEM

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Abstract:

Growing number of vehicles causes increase in fuel consumption and exhaust gases discharge into atmosphere. Alternative vehicle options such as electric vehicle or powertrain systems like hybrid propulsion can overcome these disadvantages. Therefore, hybrid electric and battery electric vehicles which include electric propulsion systems are located in the focus of researches. In this study, mathematical model of electric vehicle powertrain system was created. Power and torque requirement of electric motor and gearbox are calculated based on optimum performance characteristics. Systems simulation results such as electric driveline system power outputs and battery state of charge changes are investigated for drive cycles considering with electric motor efficiency and battery resistance. Vehicle range is calculated and parameters that effect range were investigated. Theoretically calculated state of charge and battery current results compared with the results of ADVISOR program, which commonly used for hybrid and electric vehicle analysis in literature.

Keywords: Electric vehicle, drive cycle simulation, automotive, advisor

EFFECT OF DRYING CONDITIONS ON MOISTURE DIFFUSIVITY IN THIN LAYER DRYING OF APRICOT

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Abstract:

Drying is a method that slows enzymes and hence prevents nutrients from decomposition by reducing humidity causing mould, bacteria and ferments in fruits and vegetables. When agricultural products are dried by seasoning, products are exposing to dust, dirt and environmental effects during drying under sun at open air conditions, drying period is long and quality and economic values of products are degraded. To avoid these negative effects, drying under controlled circumstances with special designed dryers is became indispensable. In this way, quality and clean products with long shelf life can be acquired in shorter periods. In addition to energy input is the most important parameter in the drying process.

In this study, the drying characteristics, effective moisture diffusivity and activation energy in convective drying of apricot were investigated. Drying experiments were performed at inlet air temperatures of 50, 60, 70 and 80 ˚C, the relative humidity of 5%, 10%, 20% and air velocity of 1.0 m/s. Fick's second law was used to calculate the moisture diffusivity coefficient, which varied from 6.924×10-10 m2/s to 16.412×10-10 m2/s when the air temperature of 50˚C to 80˚C and which varied from 6.338×10-10 m2/s to 9.325×10-10 m2/s when the air relative humidity of 5% to 20%. The variation of effective diffusivity coefficient was depended on temperature by Arrhenius relationship. The energy of activation (Ea) for apricot was calculated as 26.897 kJ/mol. Increasing temperature and decreasing relative humidity values of the air resulted to a decrease of the total drying time.

Keywords: Convective drying, Moisture diffusivity, Diffusion coefficient, Activation energy

NUMERICAL INVESTIGATION OF SIMULTANEOUSLY DEVELOPING LAMINAR FLOW AND CONJUGATE TRANSIENT HEAT TRANSFER IN A THICK WALLED PIPE

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Abstract:

It is well known that conjugate heat transfer analysis has been importance in transient conditions for various engineering applications or scientific investigations. Cooling system design for electronic equipment, analysis of flow field around the gas turbine blades, in nuclear reactors, aircraft engines and spacecrafts, heat transfer in some heat exchangers, solidification process in casting, during start up, shut-off or any change in the operating conditions are some examples including conjugate heat transfer analysis. This problem is more likely to be analyzed in pipes or in flow sections which can be modeled as a pipe or channel.

A numerical study has been carried out for two dimensional transient conjugate heat transfer in a thick walled pipe with simultaneously developing laminar flow involving two-dimensional wall and fluid axial conduction. Flow pipe is infinite length in the positive x- direction. Fluid enters the pipe with a uniform velocity and temperature. The problem is solved numerically by finite-difference method with suddenly applied uniform heat flux from external surface of the pipe. In this study numerical results for steady velocity and transient non-dimensional outer and inner surface temperatures, bulk temprature and interfacial heat flux values are shown graphically.

Keywords: Conjugate heat transfer, Axial conduction, Simultaneously developing flow, Numerical solution

PRACTICING TRANSHUMANCE IN TURKEY: EXAMPLES OF PAST AND PRESENT

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Abstract:

Transhumance is an agricultural activity, villagers move from permanent settlements to uplands with herd in certain periods of year, especially during warmer summer months. Traditional animal raising system, called yaylacılık in Turkish, is one of the best using of upland rangelands, particularly in rough terrain regions. This system is similarly practiced in other regions of the world, such as China, India, Canada, and Greece. In this system, domestic animals, such as sheep, goats, cattle, and horse are grazed on a rangeland around permanent settlements approximately until summer, and thereafter the herds are moved to upland pastoral areas until autumn. Animal owners move together with herds and live with their families in upland. The objective is to keep the animals in suitable conditions during hot summer periods and provide better quality forage for animals. But in recent years, livestock basis yaylacilik activities have decreased; only a few families in some regions continue to practice transhumance in Turkey. As a result of the reduction use of upland rangelands for activities of transhumance, touristic activities have been started in this area.

Keywords: Upland, upland rengelend, transhumance, herd

NUMERICAL INVESTIGATION OF THE PERFORMANCE OF TWISTED AND UNTWISTED BLADES FOR SMALL HORIZONTAL AXIS WIND TURBINES

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Abstract:

The present study deals with the computational analysis of a model of a small horizontal axis wind turbine using CFD Simulation. A three dimensional computational model of the rotor system is created and simulation has been carried out using commercial CFD Simulation software. The analysis has been carried out at various wind speeds in the range of 4 m/s to 12 m/s to study the variation of torque, axial thrust and power with wind speed. The effect of the twist of the blade on the performance of wind turbine is studied. The flow field characteristics around blades at a section placed on the mid of blades have also been studied. The results show that the untwisted blades give a better performance than twisted blades for the studied conditions (tip speed ratio =6 and reynolds number range (16000-51000))in terms of power, torque and thrust force and pressure distribution around blades for the range of velocities tested.

Keywords: CFD, Horizontal axis wind turbines, Twisted Blade and Untwisted Blade

CARNITINE LEVELS IN MILK AND MILK PRODUCTS

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Abstract:

In this study the aim was to determine the levels of L-carnitine in the milk and milk products consumed in Turkey. For this purpose, each of the 15 different of the UHT milk, pasteurized milk, plain yoghurt, strained yoghurt, white cheese, kashar cheese, totally 90 samples were taken from markets . L-carnitine concentrations were measured by HPLC-fluorescence detector.

According to the analysis results, the mean level of free carnitine in UHT milk as 1,57 mg /100g, total carnitine as 2,19 mg /100g, the mean level of free carnitine in pasteurized milk as 1,07 mg /100g and the total karnitin as 1,45 mg /100g were determined. As for the mean level of free carnitine in white cheese as 0,32 mg /100 g, total carnitine as 0,57 mg /100g and the mean level of free in kashar cheese as 0,46 mg/100 g, total carnitine as 0.65 mg/100 g were determined. Furthermore, the mean level of free carnitine in plain yoghurt and in strained yoghurt was respectively determined as 0,47 mg/100g, 0,70 mg /100 g and also for the mean level of total carnitine as 0,80 mg /100g , 1,15 mg /100g.

In statistical evaluation, the difference between the groups of white and kashar cheese in terms of free carnitine was found significant ($p < 0.001$). While the difference between plain and strained yoghurt for free carnitine was not important, the difference in terms of total carnitine was significant ($p = 0.013$). As for between pasteurized and UHT milk, the difference in terms of free and total carnitine was significant ($p < 0.001$). In addition, differences in terms of free and total carnitine were determined to be significant ($p < 0.05$) in product groups and in some types of products.

Consequently, it was concluded that milk and milk products having a great place in nutrition have different concentrations of carnitine and the carnitine levels detected were found to be important for meeting the individuals' needs of daily carnitine.

Keywords: Carnitine, milk, milk products, HPLC, fluorescence dedector

INVESTIGATION OF EFFECT OF SEWING THREAD ON HEATING OF SEWING MACHINE NEEDLE.

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Abstract:

In this study, effect of sewing thread on heating of sewing machine needle was investigated. In this study, 12 ounce denim fabric, 12 number of sewing machine needle, 170x2 dtex poly-cotton sewing thread and Juki DDL-9000A-SS lock stitch sewing machine were used. Optris Pyrometer was used For measurement of sewing needle heating. Denim fabric were sewn by lock stitch sewing machine (3000 rpm/min) with sewing thread and without sewing thread. After sewing process, obtained data was compared.

Keywords: Sewing, sewing machine needle, needle heating, sewing thread,

INVESTIGATION OF EFFECTS ON PHOTODYNAMIC THERAPY BY SYNTHESIZING NOVEL PHOTOSENSITIZERS FROM PERYLENEDIIMIDE DERIVATIVES

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Abstract:

Photodynamic therapy (PDT) is an established one of approaches in the treatment of several types of cancerous and noncancerous diseases. There are many reported or commercially available photosensitizers, but most have limitations, such as low photostability, or a limited usable range of solvent conditions.

In this study, we have synthesized three novel water soluble green perylenediimide derivatives which are efficient singlet oxygen generators. 1H-NMR, 13C-NMR and mass spectrum of these molecules have been measured. These sensitizers have strong absorptions in the therapeutic window. We demonstrated that on red-light excitation, absorption of singlet oxygen trap 1, 3-diphenyl-iso-benzofuran is rapidly degraded. In addition, they display no dark toxicity at the active concentrations. With these remarkable properties, these novel water soluble green perylenediimides are likely to find applications as promising new photosensitizers for photodynamic therapy.

Keywords: Photodynamic Therapy, perylendiimide dyes, photosensitizer, singlet oxygen.

A NEW COMBINED METHOD OF PROTEIN EXTRACTION FOR PROTEOMIC STUDIES

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Abstract:

Sample preparation is the first yet the most important step in most biochemical procedures and for some specimen like plant tissues, this process becomes very problematic. The amount of secondary metabolites and their being difficult to eliminate from the extracts are knots in those issues to untie. Evergreen leaves like the ones of conifer species contain high levels of metabolites which interfere with most analysis including 2D-PAGE by resulting smearing, decreased number of spots/bands and streaking in vertical and horizontal directions; and, MS/MS applications by increasing noise and decreasing resolution. In this study, two popular protocols were compared for protein extraction and a third "combined" method was derived from them. Lane analysis of the gel images after SDS-PAGE showed similar patterns for all samples which means the so-called combined method didn't affect the number of bands. However, 2D-PAGE images of the combined method had almost the same number of spots with respect to others but having better background and remarkably less streaking. Tests with Agilent Bioanalyzer 2100 (with Agilent Protein230 Assay kit) indicated better outcomes for new method with higher purity and less noise possibly because of decreased amount of biomolecules other then proteins.

Keywords: proteomics, 2D-PAGE, plant, protein extraction

CONTROLLING TEMPERATURE RISE IN MASS CONCRETE FOUNDATION OF FOLKART TOWERS

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Abstract:

The precautions taken to control the maximum temperature and temperature gradient caused by heat of cement hydration in the concrete raft foundation of Folkart Towers Construction are reported in this paper. The Folkart Towers are about 200m high and 51m x 54m in cross-sectional area commercial and residential twin building structures constructed in Izmir. In order to measure the temperature gradient thermocouples were placed at the depths of 15, 50 and 150 cm from top surface of C40/50 class concrete. Three-channel data logger thermometers were connected to the thermocouples to record the concrete temperature. During the first 10 days the concrete was isolated with rock wool-nylon sandwich blanket to limit the temperature gradient between its core and surface to 20 ºC. Beyond 10 days, the temperature gradient was controlled by thermal stress analysis to decide on the time of removal of the insulator with minimum risk of thermal cracking and meanwhile keeping the construction speed at maximum level. Moreover, maximum temperature of concrete was predicted and compared with experimental results. A good correlation was found between the predicted and measured temperature values.

Keywords: heat of hydration, temperature gradient in mass concrete, thermocouple, thermal stress analysis

INVESTIGATION OF ROOF AND TERRACE GARDENS AS AN ALTERNATIVE GREEN AREA MODEL FOR CITIES: A CASE STUDY FOR ADANA

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Abstract:

Nowadays, tall buildings, wide roads and factories form the dominant image for many of our so called developed cities. It is a fact that natural factors such as oxygen, carbon-dioxide, water, sunshine, rain, wind etc. help the human beings continue their lives.

However, it is neglected that those factors are diminishing in the areas that people live in. And that causes to reduce the human life span. If the technology is not combined properly with the nature, the recession takes place rather than development.

As a result of the investigations made, in order to protect the natural life and to create newer habitations, roof and terrace gardens are presented as a solution for intensively constructed cities. The scope of this study is to determine the historical developments, to emphasize the importance of roof gardens for the suffocated cities with buildings, to investigate the short and long–run benefits and to determine their current situation.

Keywords: Roof and Terrace Garden, An Alternative Green Area, Adana City

OPTIMIZATION OF SURFACE ROUGHNESS IN WIRE-CUT EDM OF AA6061/B4CP USING RESPONSE SURFACE METHOD

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Abstract:

In the present paper, the influences of cutting parameters on surface roughness in wire electric discharge machining of (WEDM) process of particle- reinforced aluminium AA6061 alloy composite were investigated. The composites were produced using 15% weight fraction of 15 wt.% B4C using powder metallurgy. Experimental trials were performed based on Taguchi L18 (21 x 32) with a mixed orthogonal array and WEDM cutting parameters were optimized for the best surface quality. The investigation results were evaluated by response surface plots and main effect graphs. The machined surface of the metal matrix composite was investigated using scanning electron microscopy (SEM) micrographs. The effect of WEDM machining variables were determined by using analysis of variance (ANOVA). The analysis result showed that the most significant cutting parameter was peak current (IP) for surface roughness. The SEM and optical micrographs were indicated that the reinforced B4C particles were homogeneously distributed in the matrix structure. Mathematical models have also been generated for the surface roughness using regression analysis. Confirmation tests were carried out to determine the prediction performance of the mathematical models and the surface roughness was predicted with an acceptable mean squared error.

Keywords: Wire electric discharge machining, Surface roughness, Taguchi method, Response surface methodology

EVALUATING WATER QUALITY CLASSES AND TROPHIC LEVEL FOR LAKE SAPANCA BASIN

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Abstract:

In this study, important water quality parameters were analyzed on measurement stations selected on tributaries and Lake Sapanca between 2012 and 2014. According to obtained results, water quality classes for tributaries and lake; and trophic level for lake have been assessed based on conventional procedures such as Surface Water Quality Management Directive (SWQM) (Turkey) and Carlson Trophic Index (TSI). Water quality classes were identified as 2nd class for Lake Sapanca and 4th class for tributaries according to conventional procedure (SWQM). Trophic level for Lake Sapanca was determined as eutrophic for TP (Total Phosphorus), oligotrophic for secchi disc and mesotrophic for Chlorophyll-a based on both of indexes; and as mesotrophic for TN (Total Nitrogen) based on SWQM. Lake Sapanca Basin and sub-basin areas were determined by using Geographic Information System (GIS). In this way, the measurement points were associated with the measurement results, and water quality pollution maps were created based on the water quality classes of tributaries and Lake Sapanca Basin.

Keywords: Lake Sapanca, water quality class, trophic level

EFFECT OF BLACK CUMIN OIL (NIGELLA SATIVA) ON THE GROWTH PERFORMANCE, BODY COMPOSITION AND FATTY ACID PROFILE OF RAINBOW TROUT

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Abstract:

In this study, rainbow trout were fed for a total of 144 days with different feed mixes containing 0.00%, 0.10%, 0.40%, 0.70%, 1.00% and 1.30% black cumin oil. The effect of black cumin oil on the growth performance, feed content and fatty acid composition of rainbow trout was researched. The starting weight of fish in the experimental group was approximately 60 gr., which increased respectively to 215.21±4.12gr, 217.32±3.14gr, 235.12±2.9gr, 240.21±6.5gr, 260.14±4.7gr, and 258.89±1.6gr, while the difference in growth between the groups was observed to be statistically significant ($p<0.05$). Black cumin oil decreased the feed conversion rate of the fish. The group receiving 1% oil supplements (group 5) had the greatest growth and lowest FCR. The addition of black cumin oil into the fish feed increased feed consumption and the daily feed consumed per fish was as follows, respective to each group; 0.93gr, 0.93gr, 0.97gr, 1.00gr, 1.02gr and 1.02gr. At the end of the experiment the economic conversion rates of the fish ($/Kg) were between 1.58 and 1.67, while the Economic Benefit Index was between 0.60 and 0.72. The group receiving 1% black cumin oil was observed to have the lowest economic conversion rate and the highest economic benefit index. The study showed that the protein efficiency rate and specific growth rates of the experimental group had been increased. The addition of black cumin oil to the feed increased the proportions of raw protein, oil and raw cinder in the trout and decreased the proportion of moisture, while also increasing the amounts of linoleic, oleic and stearic acids.

In conclusion, our study shows that the addition of 1.00% black cumin oil into the feed increases the fishes' growth performance and decreases costs.

Keywords: Black cumin oil, rainbow trout, Growth performance, body composition, fatty acid profile

DETECTION OF NEURAMINIDASE ACTIVITIES IN BOVINE AND HUMAN GROUP B STREPTOCOCCI

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Abstract:

Extracellular neuraminidase activities of typeable and non-typeable group B streptococcus (GBS) strains from bovine and human were detected. A total of 136 GBS strains, 66 from lactating cow's milk and 70 from routine woman vaginal specimens were tested. Detection of extracellular neuraminidase in culture supernatant fluids was performed by using thiobarbituric acid assay based on estimation amount of released N-acetylneuraminic acid from N-acetylneuraminyl-lactose as substrate. Extracellular neuraminidase activity was determined in 60 (90.9%) GBS from bovine and 33 (47.1%) from human isolates. Means of released N-acetylneuraminic acid amount were estimated as 0.386 µg/mL for bovine GBS and as 0.268 µg/mL for human GBS. Bovine NT isolates released significantly much more N-acetylneuraminic acid (0.409 ± 0.054) from substrate than bovine ST isolates (0.361 ± 0.102). One of each GBS Serotype III, VII and non-typeable GBS strains from bovine were able to release >1.0 µg/mL of N-acetylneuraminic acid from the substrate as measured 2.80, 1.11 and 1.37 µg/mL respectively, whereas none of the typeable and non-typeable human GBS strains showed comparable activity. In conclusion, GBS strains were able to produce extracellular neuraminidase, but elevated levels of enzyme activity were detectable in a few GBS strains from bovine.

Keywords: Group B streptococci; bovine; human; neuraminidase; thiobarbituric acid assay

A STATISTICAL MODEL FOR PREDICTING YARN EVENNESS OF COTTON SIROSPUN YARNS

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Abstract:

Raw material costs constitute the majority of the yarn production costs, therefore it is critically important to select the suitable cotton blend and to know required fibre characteristics for spinning. This article is a part of a comprehensive work including the experimental research and the modeling of the physical and mechanical properties of the cotton sirospun yarns. In this paper, a model for estimating sirospun yarn evenness from cotton fibre properties was investigated. For this purpose, different cotton blends were selected from different spinning mills in Turkey and their properties were measured with AFIS (Advanced Fibre Information System). Besides some yarn production parameters were also selected as independent variable (predictor) due to their significant effect. Sirospun yarns were produced at Ege University Textile Engineering Department's spinning mill under the same conditions. Linear multiple regression method were performed and statistical evaluation showed that generated equations for predicting yarn evenness had a large R2 and adjusted R2 values.

Keywords: Estimation, AFIS, multiple regression analysis, prediction, sirospun, yarn evenness

DEVELOPMENT AND VALIDATION OF A MULTIRESIDUE METHOD FOR THE DETERMINATION OF PESTICIDE RESIDUES IN WATER BY GC-NPD

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Abstract:

A multi-residue method was developed for the determination of organophosphorous pesticides and Herbicide by liquid-liquid extraction (LLE) and followed by gas chromatography-nitrogen-phosphorus detector (GC/NPD).

The method was evaluated with respect to the limit of detection and quantification, linearity and accuracy (repeatability, reproducibility, recovery). The method is linear over the range 2.5 -25 µg/L for eleven pesticides and 5-25 µg/L for methamidophos. Correlation coefficients were higher or equal to 0.992. The limits of detection (LODs) were between 0.67 and 2.23 µg/l. The limits of quantification (LOQs) ranged from 2.24 and 7.45 µg/l. Recoveries of fortified water samples in two different concentration levels with 12 organophosphorous pesticides and herbicide were over 95% in high concentration and 80% in low concentration. For repeatability, relative standard deviation (RSD%) ranged between 2.79 and 10.99%, and for reproducibility (RSD%) ranged between 1.56 and 10.36 %.

The developed method is suitable for routine application in water samples according to the validation data and the parameter as the high sample throughput and cost effective.

Keywords: Organophosphorus pesticides, Herbicide, Multi-residue analysis, Method validation, GC/NPD, environmental pollution.

ANTIMICROBIAL ACTIVITIES OF FOUR PERYLENEDIIMIDES

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Abstract:

Increasing resistance to several antibiotics has a crucial importance. Many researchers are trying to discover alternative methods or agents to develop antimicrobial effectiveness. In this study, antimicrobial activities of four diverse synthesized perylene diimides were tested, because they are well known dyes and pigments for useful various applications and also antimicrobial activities. These perylene diimides were determined by using disc diffusion and microdilution methods against twentyone microorganisms including three yeast cells. The antimicrobial activity of 1,7-dibromo-N,N'-(L-alanine tert-butylester)-3,4:9,10-perylene diimide have shown effect on Staphylococcus aureus, Streptococcus pyogenes, Bacillus cereus, Corynebacterium sp. and Fusobacterium nucleatum bacteria. In addition, the other perylene diimide 1,7-dibromo-N,N'-(L-glutamicacid tert-butylester) 3,4:9,10-perylene diimide was only active against Staphylococcus aureus, Bacillus cereus. Minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of perylene diimides for these bacteria were determined respectively. These results are novel about perylene diimides, and further improvements on these first attempts may produce a practically applicable antimicrobial activity.

Keywords: perylene dimide, antimicrobial activity, antibacterial activity

DEVELOPMENT A SOLID-PHASE EXTRACTION METHOD FOR SEPARATION AND PRECONCENTRATION OF NICKEL IONS USING RHODOCOCCUS RUBER BIOMASS

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Abstract:

A preconcentration method was developed by using Rhodococcus ruber biomass for the determination of nickel ions in tap waters and mineral waters samples. Solid-phase extraction is an efficient, sensitive and inexpensive technique to perform removal and separation of metal ions from environmental samples1.

R. ruber is important in many biotransformations and some transformations results in useful commercial processes. Another important application of Rhodococcus comes from bioconversion, using biological systems to convert cheap starting material into more valuable compounds, such as its ability to metabolize harmful environmental pollutants, including toluene, naphthalene, and herbicides.

Therefore, these organisms have environmental, commercial and economical aspects major importance. In additionally, we investigated parameters bio adsorption of nickel in various samples as new study2.

The optimum experimental conditions for the nickel preconcentration were investigated and opimized. After elution, analyte ions were determined by High Resolution Continuum Source Flame Atomic Absorption Spectrometry (HR CS-FAAS).

Various experimental and analytical parameters such as pH, flow rate and volume of the sample solution, concentration of eluent, amount of adsorbent, and effect of common matrix ions were investigated and optimized. The effect of foreign ions and column reusability on the recovery of the analytes has also been investigated. The quantitative recovery (above 95 %) of nickel ions were obtained at pH 6.5-8.0. Some analytical parameters such as limit of detection (LOD), limit of quantification (LOQ) and linear dynamic range of the method were determined. The LOD for Ni was calculated as 0.10 μg L-1. Preconcentration factor was obtained as 75. The developed method has good reproducibility, accuracy, high preconcentration factor and low detection limit. The method was succesfull applied to the determination of nickel in different water samples.

Keywords: Separation, Adsorption, Nickel, Rhodococcus, Preconcentration

DETERMINATION OF LEAD BY FLAME ATOMIC ABSORPTION SPECTROMETRY AFTER SEPARATION/PRECONCENTRATION PROCESS ON RHODOCOCCUS RUBER

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Abstract:

In the present study, a new solid-phase extraction method (SPE) was developed for the preconcentration and determination of trace lead ion in various matrixes such as water, mineral water samples. Lead ions in aqueous solution were adsorbed on Rhodococcus ruber bacterial biomass. These organism is important in many biotransformations and some transformations result in useful commercial processes. R. ruber and their products may well prove useful for applications such as enhancement for the reduction of heavy oil viscosity, and possibly for the enhancement of oil recovery technologies1,2. Therefore, these organisms have environmental, commercial and economical aspects major importance. In additionally, we investigated parameters bio adsorption of nickel in various samples as new study.

Various experimental and analytical parameters such as sample solution pH, sample flow rate and volume of the sample solution, concentration of eluent, amount of biosorbent, and effect of common matrix ions were investigated and optimized. The adsorbed lead ions on R. ruber were eluted with 5 mL of 2 mol L-1 HCl solutions and their concentrations were determined by High-Resolution Continuum Source Flame Atomic Absorption Spectrometry (HR-CS FAAS). The optimum pH value for quantitative sorption of lead ions was found between 7.0 and 8.5.

The preconcentration factor was found as 50 for 250 mL aqueous solution containing 5 μg lead ions. This new biosorbent was stable with a period greater than 50 cycles and can be safely used an alternative sorbent to separate trace metals in different samples. Under the optimized conditions, limit of detection was calculated as 0.35 μg L-1. The developed method was successfully applied to tap water and mineral water samples for separation and preconcentration of lead ions.

Keywords: Separation, Biosorption, Lead, Rhodococcus, Preconcentration

AN ANALYTICAL METHOD FOR SEPARATION AND PRECONCENTRATION OF INDIUM IONS ON ACTIVATED CARBON FROM VINE SHOOTS

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Abstract:

A simple and accurate analytical method which is based solid phase ectraction (SPE) for determination of trace amounts of indium ion in aqueous solutions was developed. As the adsorbent activated carbon from vine shoots (ACVS) was used.

The experimental parameters that affected the extraction efficiency of the method such as pH, flow rate and volume of the sample solution, concentration and kind of eluent, amount of adsorbent, and effect of other ions were investigated and optimized. The adsorbed indium ions on ACVS were eluted with 5 mL of 2 mol L-1 HCl solutions and their concentrations were determined by High-Resolution Continuum Source Flame Atomic Absorption Spectrometry (HR-CS FAAS). The optimum pH value for quantitative sorption of indium ions was found between 3.0 and 5.5. The preconcentration factor was found as 200 for 1.0 L aqueous solution containing 5 μg indium ions. The developed method was successfully applied to some water samples for separation and preconcentration of indium ions.

The proposed SPE method due to advantages such as: high preconcentration factor (200), the sufficiently good recoveries (>95%), high tolerance limit of interfering ions, and low detection limit (0.15 μg L-1) is a powerful tool for simple selective extraction of indium ions in water samples.

Keywords: Separation, Indium, Preconcentration, Activated carbon, Vine shoots

SEPARATION AND PRECONCENTRATION OF SILVER IONS ON ACTIVATED CARBON FROM VINE SHOOTS

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Abstract:

Solid-phase extraction (SPE) is an efficient, sensitive and inexpensive technique to perform removal and separation of metal ions from environmental samples. In the present study, recovery and separation parameters of silver ions from aqueous solutions on activated carbon from vine shoots (ACVS) were investigated.

The optimum experimental conditions for the silver preconcentration were investigated and opimized. Amount of ACVS, effect of common matrix ions and capacity of ACVS were also obtained. 5 mL of acid solutions [2 mol L-1 HCl and 2 mol L-1 HNO3 solutions (1/1, v/v)] were used for elution of adsorbed silver ions on ACVS. After elution, analyte ions were determined by High Resolution Continuum Source Flame Atomic Absorption Spectrometry (HR CS-FAAS). The quantitative recovery (above 95 %) of silver ions were obtained at pH 4.0 - 5.5. Under the optimized conditions, limit of detections for silver and adsorption capacity of ACVS were 0.18 μg L−1 and 174.6 μg g−1, respectively. The method was applied to the separation and determination of silver in some water samples.

The developed method has good reproducibility, accuracy, high preconcentration factor and low detection limit. The method was succesfull applied to the determination of silver in different water samples.

Keywords: Separation, Adsorption, Silver, Preconcentration, Activated carbon, Vine shoots

RECOVERY OF COPPER AND COBALT FROM CONVERTER SLAG BY A NOVEL FLOTATION METHOD

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Abstract:

In this study, two different samples were obtained from Küre Copper factory. It was determined that the samples contains; the sample of K.B.I.1, 0.70 % Cu and 0.5 % Co and the sample of K.B.I.2; 0.57 % Cu and 0.39 % Co, respecttively. These samples were firstly grounded at –100 mesh dimention. Flotation was done according to previously obtained optimum flotation conditions. The flotation yield of Cu and Co in concantrate phase was found to be low by collective flotation. Even when the samples were grounded at –160 mesh, no change was observed in the flotation result. Especially, Co could not flotated under conditions. There, we have applied a novel flotation method that has not been used until now. For this aim, the samples were firstly sulphurised under the steam of H2S + H2O . By this method the amount Cu and Co in the samples get rich. According to the obtained results the optimum reactions for flotation and sulphurization were determined. In the sixth sulphurization conditions for the sample of K.B.I.1, the yield of flotation for the Co and Co were found to be 88.41 % and 66.22 %, respectively. In the first sulphurization conditions for the sample of K.B.I.2, the yield of flotation for the Co and Co were found to be 98.27 % and 68.07 %, respectively. The results indicate that Cu can be flotated at low yield in the orjinal samples. On the other hand Co can not flotated under these conditions.

Keywords: Converter slag, Flotation, Copper, Cobalt, Cobalt, Sulphurization

EXPERIMENTAL INVESTIGATION OF VERTICAL WELDED CONNECTION DETAIL BETWEEN PRECAST RC SHEAR WALL PANELS

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Abstract:

In recent years, use of external shear walls has arisen as a significant alternative method to conventional strengthening methods. Shear walls are built in either cast-in-place or precast concrete. However, cast-in-place construction is difficult and time-consuming especially in multi-storey buildings as well as a single precast panel is too heavy for transportation and erection. In this study, it was aimed to propose different method for production of precast RC shear wall connections. Within this scope, one casted model as reference and one vertical welded connection model were produced. The mechanical behavior of the connections was tested under reversed-cyclic loading conditions. As a result of the study, it was concluded that the vertical welded connection can be applied to both high and moderate ductility systems.

Keywords: Earthquake; Strengthening; External Shear Wall; Precast RC Panel Connection, Welded Connection.

PRODUCTION OF ALUMIX 13 BASED METAL FOAMS USING POWDER METALLURGY

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Abstract:

Metal foam using Alumix 13 was produced through powder metallurgy. Alumix 13 premix powder and 1% TiH_2 powder were mixed for 30 minutes using a three dimensional mixer. The mixture was then compacted using cold pressing with the application of 300 MPa of pressure, resulting in compacted block samples. The samples were sintered at a temperature of 500 °C for 45 minutes and then were extruded at the same temperature. Extruded product was rolled at 500 °C at thickness of 6 mm. The rolled product was cut into square bars. These were then foamed at varying temperatures (720 °C,730 °C,740 °C and 750 °C). The effects of foaming temperature on density, linear expansion and cell morphology were investigated.

Keywords: Alumix13, metallic foams, powder metallurgy

CAGE CULTURE POTENTIAL OF RAINBOW TROUT IN SEYHAN DAM LAKE

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Abstract:

Recently, cage aquaculture of fish has been getting attention of researchers and commercial producers. Currently, the importance of trout culture for both our region and our country has been very clear. Floating cage culture systems were used in Southern Anatolia Region dam lakes. In such a rapidly expanding metropolitan area like Adana, the development of trout culture techniques close to the market has recently been gaining utmost importance. If it was ensured to get marketable size of trout during the November-May period in particular when the water temperature is suitable in Çukurova region, it can take part in market in a shorter period than the cultured trout from high mountainous areas. Consequently, if the trial period production results are satisfactory , two different crops from one production unit can be obtained within eight months production period in Seyhan Dam Lake by cage culture of trout during the winter and spring period between 10 and 23 0C. This system has been put into practice successfully and it has been proposed as a model to local fish producers.

Keywords: Cage aquaculture, Seyhan Dam Lake, Second Crop.

RECOVERY OF COPPER AND COBALT FROM COPPER SLAGS AS SELECTIVE

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Abstract:

This study focuses on the recovery of copper and cobalt from copper slags obtained from Küre district of Kastamonu city, which is in the north of Turkey, and removal of Se, Te, Sb and As from mixture of copper slag and copper concentrate has been conducted. Homogeneous mixtures of slag / pyrite / copper concentrate rate was subjected to roasting at high temperatures in a closed medium and then it was processed roasting at air atmosphere at 600 0C. In the leaching experiments, the effects of roasting time, rate of slag / pyrite / copper concentrate, the effect of the added iron powder to leaching on the metals dissolution were investigated. Under optimum conditions, 99.6% of copper and 98.4% of cobalt were extracted in roasting at high temperatures in a closed medium 3:6:6 slag / pyrite/copper concentrate rate then roasting at 600 oC at 5 hours. Besides, it was determined that all of Se, Te, Sb, and As can be removed from mixture of slag / pyrite / copper concentrate rate.

Keywords: copper, cobalt, slag, roasting, pyrite, copper concentrate

DRY SLIDING WEAR BEHAVIOURS OF FE3AL AND FE-32.5AL-15TI ALLOYS.

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Abstract:

The base alloy Fe3Al and Fe32.5Al15Ti alloy were prepared by vacuum arc melting under argon atmosphere. The microstructure of the alloys were examined by optical microscopy and scanning electron microscopy. The results showed that an eutectic phase occurred on the grain boundary due to addition of titanium. Microhardness measurement demonstrated that the Fe-32.5Al15Ti alloy is harder than the Fe28Al. The dry sliding wear test of these alloys were performed by ball on disc geometry using tungsten carbide ball. The results showed that the wear resistance increased by addition of titanium to the base Fe3Al.

Keywords: FeAl, FeAlTi, Dry Sliding

SYNTHESES OF POTENTIALLY ACTIVE TRIAZOLES FROM CARBOHYDRATES AND NUCLEOBASES

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Abstract:

Triazole heterocyclic compounds have been paid special attention due to their potential applications as medicinal agents, agrochemicals, man-made materials, artificial acceptors, supramolecular ligands and biomimetic catalysts (Zhou and Wang, 2012; Chang et al, 2011; Bai et al, 2007). Among these topics, triazole-based derivatives as medicinal drugs have been extensively investigated, and have become a quite rapidly developing and specifically attracting highlighted topic. Triazole compounds have clearly shown enormous potential in clinical use as anticancer, antibacterial, antifungal, antiviral, anti-inflammatory, analgesic, antitubercular, anticonvulsant, antiparasitic, antihypertensive as well as other medicinal drugs (Carvalho da Silva et al, 2015).

From this point of view, we continue our exploration of carbohydrate derivatives, in the pursuit of novel triazole compounds that contain important molecules for human being such as carbohydrates and nucleobases, also have biological activities and the potential of becoming new drugs. Copper-catalyzed azide-alkyne cycloaddition (CuAAC) was utilized to couple some protected pyranosyl azido-sugars with propargylated uracil and thymine in the presence of catalytic amounts of CuSO4.5H2O and sodium ascorbate. [2 + 3] dipolar cycloaddition reaction that catalyzed by Cu(I) occurred regioselectively, resulting in the formation of the corresponding 1,4-disubstituted 1,2,3-triazoles (Ferreira et al, 2010). 7 compounds were synthesized and characterized with the assistance of such spectroscopic methods as FTIR, 1D, 2D NMR and MS. This work is supported by the project (114Z757) of TUBITAK-KBAG research council.

Keywords: Triazoles, Click chemistry, Carbohydrates, Nucleobases, Biological activity

SALT BATH NITRIDING OF FE72AL28 INTERMETALLIC ALLOY

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Abstract:

The iron aluminide Fe72Al28 was produced in a vacuum arc melting furnace. The alloys were nitrided by salt bath nitriding process at 580oC for durations of 3 and 6 hours. The nitride layers were characterized with light optical microscopy, scanning electron microscopy equipped with energy dispersive X-ray spectroscopy, X-ray diffraction, and micro hardness measurements. The results showed that the nitride layer thickness increased with an increase in nitriding duration, while the layer hardness did not vary. The nitride layers were composed chiefly of iron nitride and aluminum nitride phases, and also include some carbide phase.

Keywords: Intermetallics compound based on Fe3Al, Nitriding, Scanning electron microscopy, X-ray diffraction. hardness.

COMPUTATIONAL HYDRODYNAMIC ANALYSIS OF TURBULENT DUCT FLOW

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Abstract:

Hydrodynamic characteristic of liquid metal magnetohydrodynamics (MHD) turbulent internal flow under the magnetoviscous forces has been numerically studied. Computational liquid metal incompressible steady state turbulent flow simulation was occurred by ANSYS Fluent MHD module. Hydrodynamic parameters are flow velocity, dynamic and eddy viscosity, turbulent kinetic energy, turbulent intensity, density have been examined and concluded results have been verified with studies from literature. Due to the obtained results flow velocity, eddy viscosity, turbulence kinetic energy, turbulent intensity decreases by the increase of applied magnetic field and also positive directional electrical field. Parameters are dynamic viscosity and density increases by the increase of magnetic and positive directional electrical field. But also, increase in negative directional electrical field intensity increases flow velocity, eddy viscosity, turbulence kinetic energy, turbulent intensity, and decreases dynamic viscosity and density.

Keywords: MHD, turbulent flow, magnetic and electrical field, hydrodynamic characteristics.

INVESTIGATION OF DIFFERENT ELECTROCATALYSTS (CCUZN, CCUZN-RU) FOR PRODUCTION OF HYDROGEN GAS

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Abstract:

Hydrogen energy alternative to fossil fuels is considered as an energy source of the future. There are different methods for production of hydrogen, but their most preferred is electrolysis method. Electrocatalytic electrodes for electrolysis process are investigated. It is asked that the electrodes must have low overpotential [1]. In this study, we have researched into production of hydrogen gas on graphite copper zinc (CCuZn) and graphite copper zinc-ruthenium (CCuZn-Ru) electrodes in 1 M KOH solution. AC impedance spectroscopy obtained at different potential and Cathodic polarization curves measurements were performed with three-electrode technique. More active surface was obtained by removing zinc from CCuZn electrode surface. According to results, CCuZn-Ru electrode prepared by ruthenium precipitation shown higher current value and quantity of hydrogen gas than CNiZn electrode.

Keywords: Hydrogen, graphitecopperzinc coating, EIS.

CFD THERMOPHYSICAL ANALYSIS OF MHD TURBULENT PIPE FLOW

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Abstract:

This study cares about the thermophysical investigation of magnetohydrodynamics (MHD) liquid metal incompressible steady state turbulent closed conduit flow under the imposed transversely magnetic and electrical field. Circular closed conduit model has been studied computationally by ANSYS Fluent MHD module. Thermophysical parameters are temperature and heat flux has been simulated and concluded results have been verified with literature studies. According to the results temperature and heat flux was decreasing by the applied magnetics and positive directional electrical field. Also applied negative directional electrical field increases two of them.

Keywords: MHD, turbulent flow, magnetic and electrical field, thermophysical parameters.

EVALUATION AND MODELLING OF MODIFIED HAZELNUT SHELL IN PB2+ REMOVAL FROM AQUEOUS SOLUTION

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Abstract:

The use of low cost adsorbents has been investigated as a replacement for conventional methods for removing heavy metal ions from aqueous solution and industrial wastewater. In this study the adsorption of Pb2+ from aqueous solution by utilizing chemically modified hazelnut shells were investigated. Citric acid, tartaric acid and sodium hydroxide were used for the modification process. It was revealed that sodium hydroxide enhanced the adsorption of Pb2+ better than the other modification chemicals. In the batch experiments the effects of three different pH levels (pH 3, 4 and 5), three different initial metal concentrations (50 – 100 – 200 mg/l), three different adsorbent amounts (0,5 – 1,0 – 2,0 g) and three different temperature levels (20 – 40 – 60 °C) were examined. The equilibrium adsorption capacity of hazelnut shells were examined by the application of linear Langmuir and Freundlich adsorption isotherms. The equilibrium adsorption level was determined to be a function of the initial solution pH, initial metal concentration, initial adsorbent concentration and temperature. The adsorption capacities have increased with increasing pH and it becomes more favorable with increasing temperature. The most favorable adsorption conditions were achieved at pH 5 and 60°C for Pb2+ ions. The thermodynamic parameters have been determined according to the Van't Hoff equation. The results indicated the adsorption process is spontaneous and endothermic in nature. Hazelnut shell can be further modified with different chemicals to improve the batch efficiency and column studies must be done to evaluate the adsorbents applicability at industrial use.

Keywords: Low cost adsorbent, heavy metal removal

THE EFFECT OF FIBRE CHARACTERISTICS ON THE BREAKING ELONGATION PROPERTIES OF COTTON SIROSPUN YARNS

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Abstract:

Among measurable yarn characteristics, yarn elongation has significant effect on weaving performance, particularly for high speed looms. However, it has not received much attention of researchers. Yarn elongation is affected by fibre properties and basic spinning parameters such as yarn twist and yarn count. This study has been performed to investigate the effect of cotton fibre characteristics and spinning process variables on the breaking elongation properties of 100% cotton sirospun yarns. Sirospun yarns were spun at Ege University, Textile Engineering Department under the same conditions from different cotton blends. Fibre properties were measured by AFIS Instrument and the breaking elongation of the sirospun yarns were measured by Tensorapid. Additionally, for prediction of yarn elongation, a statistical model has been developed with linear multiple regression method.

Keywords: breaking elongation, cotton, estimation, fibre characteristics, sirospun yarns, prediction

PARTICLE SWARM OPTIMIZATION APPROACH TO SOLVE SINGLE MACHINE TOTAL WEIGHTED TARDINESS PROBLEM WITH UNEQUAL RELEASE DATE

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Abstract:

Real-world manufacturing systems are affected by various, which must be taken into consideration to obtain an effective schedule. Single machine total weighted tardiness problem (SMTWT) is a well-known strongly NP hard problem. This paper is concerned with solving the single machine total weighted tardiness problem with unequal release date using Particle Swarm Optimization (PSO). PSO is one of the population based optimization method, which never filters the solution alternatives. Population members of PSO are called particles, each particle flies in the search space with a velocity. PSO has been applied to SMTWT with unequal release date problem. To escape local minima Simulated Annealing (SA) method has been used, to help PSO algorithm. In this study groups of jobs have been generated using some parameters. FCFS, SPT, LPT, EDD, CR have been applied to generated problems. PSO has been applied to obtained solutions from FCFS, LPT, SPT, EDD, CR heuristics. Through the analyses of experimental results, its highly effective performance with substantial margins in solution quality. PSO provides sufficient conditions for optimality in SMTWT problem with unequal release date. Also it is understandable form the results that EDD is the best heuristics for SMTWT problems.

Keywords: Particle Swarm Optimization, total weighted tardiness problem

INVESTIGATING MECHANICAL PROPERTIES OF COMPOSITES PREPARED BY THREE DIMENSIONAL HYBRID FIBERS

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Abstract:

Purpose: Carbon fiber is a material consisting of fibers about 5–10 μm in diameter and composed mostly of carbon atoms. Some properties of carbon fiber are high stiffness, high tensile strength, low weight, high chemical resistance, high temperature tolerance and low thermal expansion; these properties makes it very popular in aerospace, civil engineering, military, and motorsports, along with other competition sports. However, they are relatively expensive when compared to similar fibers, such as glass fiber or plastic fiber. Carbon fibers are usually combined with other materials to form a composite. When combined with a polymer resin it forms carbon fiber reinforced polymer which has a very high strength-to-weight ratio, and is extremely rigid although somewhat brittle.

Aramid fibers are a class of heat-resistant and strong synthetic fibers. They are used in aerospace and military applications, for ballistic rated body armour fabric and ballistic composites, in bicycle tires, and as an asbestos substitute. They are fibers in which the chain molecules are highly oriented along the fiber axis, so the strength of the chemical bond can be exploited.

The main purpose of this study is to use aramid and carbon fibers in three dimensions structure to achieve a more durable composite material. Features of Aramid and Carbon fibers will be combined due to mixing of them together. In addition to these, the strength of the plain weave will be increased because of the three-dimensional fabric features.

Material and Methods: In this study, aramid and carbon fibers, plain weave type were woven in three dimensions. The matrix resin along with aramid and carbon textile fabrics for reinforcing composite materials were produced. The mechanical properties of the obtained sample were examined. The mechanical tests of which tensile strenght, izod impact and three- point bending were applied.

Conclusions and Recommendations:The result of the mechanical tests of the composite materials obtained from three-dimensional woven hybrid fibers showed that the mechanical properties of composite materials of the three-dimensional weave were increased.

Keywords: Carbon fiber, Aramidefiber, three dimensional plain weave, composite materials

INVESTIGATION OF BALLISTIC PROPERTIES OF HYBRID COMPOSITES

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Abstract:

It is possible to obtain the desired properties by hybridising two different reinforcing fabrics in a structure when it is not possible by using only one type of reinforcing fabric. The aim of this study is to obtain a composite structure that has both strength and toughness through the hybridisation of carbon and aramid fabrics. A material which has only high strength is not suitable for many applications. High toughness together with high strength adds many advantages to materials.

Aramid fabric used was made of Kevlar 49 fibre. Carbon fabrics were based on acrylic fibres. The surfaces of carbon fabrics were modified chemically by using 5% by weight (NH4)2HPO4) solution. The surfaces of aramid fabrics were modified chemically by using phosphoric acid H3PO4. Epikote 828 resin was used as matrix material. The hardener used was F-205. Benzyl dimethylamine was used as accelerator. Vacuum assisted resin transfer method (VARTM) was employed in the production of composite plates which were reinforced by varying amounts of fabrics with and without surface modification. Bullet velocity measurements were performed on composite plates (250 mm x 250 mm x 4 mm) by using a Baretta FS 92 model gun together with Oehler 35P model proof chronograph.

Bullet velocity measurements which were conducted from a distance of 5 meters showed a decrease in bullet velocities with the increasing fabric content. It was observed that plates were fractured without delamination when the surface of fabrics was modified chemically.

Keywords: Hybrid composite, surface modification, high velocity impact

GREEN SYNTHESIS OF AG/AU NANOPARTICLES, ATTACHMENT ON THE SIO2 MICROSPHERE SURFACE AND IT'S ANTIBACTERIAL ACTIVITY

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Abstract:

Synthetic methods based on naturally occuring biomaterials provide an alternative, environmental-friendly means of obtaining nanoparticles. In this study, a simple environmentally friendly and cost effective method has been developed to synthesize Ag and Au nanoparticle. Reduction of gold and silver ions during the reactions was analysed by uv spectroscopy. Silica- Metal (Ag,Au) particles were prepared by accumulating Ag, Au nanoparticles on the surface of APTES functionalized silica as a substrat, which was accomplished strong interaction between metal and amino groups. Functionalized silica nanoparticles were initially decorated with Au and Ag metals. The morpholgy of resultant particles was studied using SEM. Presence of gold and silver particles on SiO2 sphere was confirmed by XRD, FTIR, TGA. Silver and gold loaded spheres were tested in antimicrobial study aganist gram negative bacteria E. Coli in vitro. The spheres proved significantly higher antibacterial efficacy against E. Coli.

Keywords: Ag/Au nanoparticles, antibacterial activity

OPTIMIZATION OF PHYSICAL AND MECHANICAL PROPERTIES OF THE MELEAGRIS GALLOPOVA HYDROXYAPATITE-MAGNESIUM OXIDE COMPOSITES BY GRAY

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Abstract:

In the present study the effect of addition magnesium oxide to meleagris gallopova on physical and mechanical properteis was optimazed by gray relational analysis method. The amount of magnesium oxide was 5 and 10 wt%. Composites were wet milled, dried and compacted at 350 MPa. Compacted samples were sintered at five different temperatures between 900oC and 1300oC. Density, hardness and compressive strength measurements were carried out. Experimental results show that increment magnesium oxide rate deal with increasing of all the properties of meleagris gallopova hydroxyapatite. Optimum results were defined by gray relational analysis method.

Keywords: Meleagris gallopova hydroxyapatite, magnesium oxide, gray relational analysis method

WEB SERVER SECURITY SCANNER APPLICATION

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Abstract:

Internet world brings huge benefits to users and nearby it comes with so many security threats like; Stolen of credit card information, Grabbing of Web Site Domains, hacking e-mail accounts, gathering personal information and so on. Our aim in this application, understand web attack types, develop an algorithm according to the attack methods and writing a web security scanner to discover possible threats on web sites. Our resource belongs to the web security and attack based sites and documentation. We bring these different platforms together and develop our program in Python language that is also used by an important company called Google Object oriented programming Python; give us flexibility and fastest base (Python, 2013). Security Scanners do heavy process because of usage high Central Processing Unit(CPU) and Internet connection at the same time. Algorithm's in the program and libraries that is used has an important effect on the speed of workflow. We only import the necessary modules from libraries. So this highly affects the program performance (Litchfield et al., 2005). Our program does these functions ; Discovers, Common Gateway Interface , Remote File Inclusion, SQL Injection exploits on Web Server gathering the Web Server information.

Keywords: Web server security, security system, application of security scanner

THE EFFECTS OF FEATHER COLOR ON HATCHABILITY TRAITS, GROWTH PERFORMANCE, AND SURVIVAL RATE IN JAPANESE QUAILS

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Abstract:

This study was conducted to determine the effects of feather color on hatchability traits, growth performance, and survival rate in Japanese quails (Coturnix coturnix japonica).

Quails having piebald, yellow, white and brown feather color were used in this study. For this purpose, a total of 1975 quails (Piebald: 561, Yellow: 428, White: 484 and Brown: 502) hatched from a total of 2796 eggs obtained from a total of 2796 quails (Piebald: 826, Yellow: 580, White: 708 and Brown: 682) whose ages were between 10 and 12 weeks were studied.

The effect of feather color on hatchability, hatching and late embryonic death rate was found to be statistically significant. It has been determined that hatchability for yellow, brown, white and piebald were 73.79%, 73.60%, 68.36% and %67.91% respectively and hatching weight for the same feather colors were 80.00%, 78.07%, 72.67% and 73.91%.

The effect of different feather color on values of survival rates in different growth periods were statistically significant ($P<0.001$). From the first to sixth week, survival rate was the highest in piebald and white quails and the lowest in brown and yellow quails.

In this study, the effect of different feather color on growth performance was also statistically important ($P<0.001$). Live weights of piebald colored quails were higher than the quails having other colors from the hatching to the sixth week.

In conclusion, there is a need to evaluate yellow and brown quails in respect to the hatching traits and the advantages of piebald and yellow quails in respect to growth performance and to conduct further studies to determine genetic parameters for growth and hatching traits of quails having different feather color.

Keywords: Quails, feather color, hatching traits, survival rate, growth performance.

PERCHLORATE-SELECTIVE CARBON PASTE ELECTRODE BASED ON A CALIX[4]ARENE DERIVATIVE

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Abstract:

Perchlorate is receiving increased attention as an inorganic contaminant in soils, ground and surface waters. Most of the analytical methods developed for perchlorate determination require expensive instrumentation, rather complicated techniques and/or sample pretreatments [1]. However, potentiometry with ion-selective electrodes offer unique advantages such as simplicity, rapid analysis, low cost, wide linear range, reasonable selectivity and non-destructive analysis for direct and easy determination of various species [2]. In comparison with ion-selective electrodes based on polymeric membranes, carbon paste electrodes possess advantages of much lower ohmic resistances, very stable response, ease renewal of surface and not requiring internal filling solution [3].

In this study, a perclorate-selective carbon paste electrode based on a new 5,11,17,23-tetra-tert-butyl-25,27-bis(pyren-1-yl-methylimido-propoxy)-26,28-dihydroxy-calix-[4]arene, as an ionophore was developed. Its optimum working range (1.0x10-1- 1.0x10-6 M), response time (8-9 s), lifetime (at least 18 months), slope (55.7 mV/ pClO4), selectivity coefficients calculated by FIM towards variety of ions were determined. Furthermore, it could be succesfully used as an indicator electrode to determine perchlorate in real samples.

Keywords: Perchlorate-selective electrodes, calix[4]arene, carbon paste electrodes, potentiometry, perchlorate

MORPHOLOGICAL COMPARISON OF TRANSGENIC AND NON-TRANSGENIC CORN (ZEA MAYS L.) LINES UNDER DROUGHT STRESS

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Abstract:

Transgenic corn is one of the most widely cultured genetically modified crops and grown around the world including semi-arid areas. Prolonged drought period is one of the most serious factors that limit and hinder the growth and biomass production of plants. In the same way, deficit irrigation creates water stress that can affect the growth and development of corn plants. Effects of water stress on corn seedlings include the visible symptoms as limited growth and reduced leaf area as well as turgor loss, altered pigment contents and delayed maturity.

In order to understand different effects of drought stress on insect - resistant transgenic corn and non-transgenic corn lines, twenty day-old seedlings are subjected to 7 days drought stress by withholding irrigation. Each line has a control group which was kept watering throughout the experiment.

The present study reveals the effects of drought stress on selected morphological parameters including seedling length, fresh weight and dry weight, leaf area, relative water content, total chlorophyll (a+b) and carotenoid amounts and anthocyanin accumulation in transgenic corn seedlings.

Keywords: corn, drought, genetically modified organisms, morphology, transgenic.

STIFFNESS PREDICTION FOR BI-ADHESIVE SINGLE LAP JOINTS

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Abstract:

Instead of performing stress analysis as was generally done in the literature, the joint stiffness was examined in this study. An analytical model was presented for the stiffness prediction of bi-adhesive single lap joint. Analytical analyses were performed for three different adhesives and bond-length ratios. Stiffness values of the mono and bi-adhesive joints were compared. From the analytical analyses, it was seen that bi-adhesive bondline with low stiffness adhesive at the ends does not reduce the stiffness of the joint noticeably. It is concluded that an ideal bonded lap joint can be characterized by the variable strength and stiffness along the bondline. Therefore, bi-adhesive joint can be proposed as an ideal bonded lap joint.

Keywords: Stiffness Prediction, Bi-adhesive, Single Lap Joints

APPLICATION OF DIGITAL IMAGE CORRELATION IN UNIAXIAL TENSILE TEST

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Abstract:

Application fields of non-contact measurement techniques have been recently increasing by means of optics and technological development in measurement applications. Digital image correlation (DIC) is the one and powerful non-contact measurement method that can be used to obtain elongation and strain as well. It is versatile and flexible measurement method can be adopted to many traditional test experiments such as tensile, compression, and bending in order to calculate mechanical properties of materials. In this study, DP600, DP800 and DP980 steel materials were performed to uniaxial tensile test and DIC technique was used to determine local strains in terms of comparison in different regions at the fracture area. While performing experiments, commercial DSLR camera was installed to capture videos under the white led lighting which is needed to decrease visual blurring and keep contrast as constant. Recorded videos were analyzed with VIC-2D software in an effort to calculate strain data. As a result, it was showed that the strains at the fracture area that were measured with DIC were higher than those measured which out of the fractured area and concluded that DIC method was appropriate and efficient technique to measure local strains in traditional uniaxial tensile test.

Keywords: Digital Image Correlation, Tensile Test, Sheet Metal, Strain Measurement, Optical Measurement.

AN EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF RUNNER PROFILES ON THE FLOWS IN THE PLASTIC INJECTION MOLDS

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Abstract:

Plastics are used in every phase of our daily life. Although there is a lot of a method for shaping the plastics, the most widely used method is injection molding. The cost of the production of the plastic products, its quality, it's the geometric structure, its size tolerance and its views depend on both injection parameters and molding parameters. In the literature, many studies have been occurred about the effects on molded products related to the injection parameters and the studies continue to be performed. However, there is a very few study about the molding parameters according to the injection parameters. Conducted in this study, the effects of the molding parameters on flow length were analyzed. The effects of the runner profile on mold cavity were investigated. In order to exploring the molding parameters, an injection mold is designed in accordance with ASTM D 1223. Moreover, to determine the effects of the runner profiles on flow length, in designed mold cavity four different profiles are created having the same cross-sectional area and length as semi-circled profile, parabolic profile, trapezial profile and rectangular profile. For the effect of the runner profiles on the flow length, with average 26.336 mm cross-sectional area with the largest flow of four different runners profile in length, respectively, half-round, parabolic profile, were obtained in the trapezoidal and rectangular.

Keywords: Plastics injection mold, Runner profiles, Flow length

PHYSICAL ACTIVITY PREDICTION: ACCELEROMETERS OR GYROSCOPES?

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Abstract:

The aim of activity recognition is to recognize the type of physical movements, i.e. walking, running, sitting, staircase climbing etc. Nowadays, physical activity recognition is an important research area because of its potential use in health and emergency care. There are several different sensory devices to determine the orientation and position of an object. Gyroscopes and accelerometers are commonly used for this purpose. The main difference between accelerometer and gyroscope sensors is that gyroscope sensor can sense angular rotational velocity whereas accelerometer can sense linear velocity change of movement. In this study, we aimed at comparing efficacy of accelerometer and gyroscope sensor data for activity prediction. We have first extracted some basic statistical features and auto regressive model coefficients from accelerometer and gyroscope sensor values separately and then we have evaluated the performance of classifiers designed to predict the type of physical activity using these features. Our results indicate that, one can predict the type physical activity using features obtained from accelerometer and gyroscope data equally well, as there are no significant differences among the performance of the classifiers using the features obtained from accelerometer and gyroscope data.

Keywords: Physical activity prediction; first order statistics; autoregressive model; pattern recognition

SPECTROSCOPIC AND MICRO-CHEMICAL ANALYSES FOR THE CHARACTERIZATION OF A 15TH CENTURY OLD-SLAVONIC ILLUMINATED MANUSCRIPT

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Abstract:

The illuminated Old-Slavonic manuscript Kruševo Octoechos, 3rd quater of 15th century, belonging to the Historical Museum of Kruševo was appointed for preservation in the Conservation and Restoration Laboratory, National and University Library "St. Clement of Ohrid - Skopje, Republic of Macedonia. The complex task of manuscript characterization was performed using combination of spectroscopic techniques and micro-chemical analyses that allowed comprehensive characterization of: (i) the palette of pigments used for the illumination and rubrication; (ii) the type of inks used in the written text with distinct handwritings; (iii) the support (paper) and sizing and (iv) the materials used in a previous restoration treatment performed in 18th century.

Mineral based pigments/inks on the illumination page which were revealed by micro-Raman spectroscopy include: vermilion (red), azurite (blue) and logwood (black). Additionally, three different black/brown inks were detected using the Raman technique: two types of iron gall ink in the written text and carbon black in restoration interventions of the text in 18th century, while the organic purple-red pigment used for the rubrication was discovered as madder by ATR-FTIR spectroscopy. Micro-chemical analysis of paper samples in combination with microscopic examination using conventional light microscopy enabled the identification of the type of cellulose fibers confirming that the pulp consists of rag fibers (cotton, hemp and/or flax) and rarely found lignin fibers. Spot tests for sizing gave positive results for gelatin and alum, and negative for starch and rosin accordingly. The infrared spectra obtained for paper and pulp confirmed the presence of gelatin and calcite.

The use of these results was of considerable importance for the understanding of artists' materials thus providing essential information for an appropriate approach in conservation treatments of the manuscript.

Keywords: pigments, paper, micro-Raman, ATR-FTIR, light microscopy

INVESTIGATION OF A NEW HALF CLOVERLEAF INTERSECTION ON THE REGIONAL TRAFFIC BY VISSIM

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Abstract:

Increase in the number of the vehicles causes the existing road network insufficient. Because of this, the drivers and passengers who spent several hours in the traffic are affected adversely and economical and spiritual losses. This situation pushes investor organizations to find new solutions. The alternative solutions are more often to improve the existing road geometries instead of constructing new road routes. Parameters such as delays and travel time are used for the evaluation criteria of the new solutions. In this study, half cloverleaf styled junction planned to be constructed by 12th Regional Directorate of Highways in Erzurum Çat road. This junction is on the intersection of Atatürk University – Bingöl state highway – Educational and Research Hospital and Yıldızkent. The existing transportation between the subject areas are provided by the long routes and travel durations are so long. Besides, this area has one of the most intense and fast traffic in Erzurum. Studied area is selected to be the route between northern border of Atatürk University and Yenişehir. This area has been simulated by VISSIM which is one of the most used micro simulation software. Actual delay and travel times were measured on the site and calibrated according to the evolution of simulation values. The new planned junction and routes were simulated by VISSIM and new delay and travel times were obtained. Consequently, positive results of the half cloverleaf styled junction are assessed.

Keywords: half coverleaf junction, microsimulation, VISSIM, traffic management,

MODELING OF MARSHALL QUOTIENT OF HOT MIX ASPHALTS BY ARTIFICIAL NEURAL NETWORKS

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Abstract:

An asphalt concrete must have high resistance to permanent deformation. Rutting resistance, a type of permanent deformation, is related to the stability and flow characteristics of asphalt concrete. The Marshall Quotient (MQ), ratio of stability to flow, is a measure of the material's resistance to permanent deformation or rutting for Hot Mix Apshalt (HMA). This study presents an Artificial Neural Networks (ANN) model for the prediction of MQ of HMA mixtures. Coarse aggregate to fine aggregate ratio, filler content, bitumen content and Voids in Mineral Aggregates values, and Marshall Quotient were used as input and output, respectively. The results obtained from ANN model show high coefficient of correlation of 0.96, which is conformed very closely to those obtained from test results. It is concluded that this ANN model can be used for predicting the MQ in HMAs.

Keywords: Asphalt Concrete, Marshall Quotient, Neural Networks, Rutting

INTERMODALITY IN URBAN TRANSPORT: THE CASE OF ISTANBUL

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Abstract:

The term of intermodality is generally used in freight transportation, whereas it finds place in daily life as a passenger transport plan without being noticed. Using two or more transport modes between origin and destination makes intermodality unavoidable. At the present time, energy need is at the highest level, therefore efficient use of available resources and selecting the more sensitive transport system about the environment is an issue that should be considered as both government policy and individually. Intermodal transport has an important place in European Union transport policies and shows its effectiveness in passenger transport as well. Transport modes has an integration in harmony and intermodal terminals, where people change the mode, have great importance in an intermodal process. In this study, intermodality in urban transport is researced in a global way, the importance of intermodal terminals is emphasised and intermodal practices in Istanbul are evaluated to find better solutions.

Keywords: Intermodal Passenger Transport, Urban Transport, Intermodal Terminals

A DIFFERENT APPROACH FOR THE PREDICTION OF FABRIC SPREADING TIME IN CUTTING DEPARTMENT OF APPAREL COMPANIES

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Abstract:

In this study, spreading time was forecasted by Artificial Neural Network Model in cutting department. The spreading times which used were obtained from three fleece knited fabrics of different spreading lengths. Spreading time values were estimated and optimum results were obtained by using Neural Network method.

Keywords: Cutting Department, Artificial Neural Network, Fabric Spreading

ALTERNATIVE ENERGY AND AGRICULTURAL ASSESSMENT OF MUNICIPALITY SEWAGE SLUDGE

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Abstract:

In this study, energy recovery potential of municipal sludge disposal, agricultural residuals and availability of the various problems in the agricultural soils were investigated. For this purpose, firstly the hazelnut from agricultural secondary products was added in the sewage sludge to increase energy value of the high moisture content. Hazelnut were homogeneously mixed in different ratios and dried in sun, laboratory oven and microwave oven. High heating values obtained for dried mixture samples were ranged from 14.5 to 20 MJ / kg. In addition to this study, the sludge mixture of chemical and elemental analyzed and mixtures of the heavy metal content (Fe, Cu, Ni, Zn, Pb, Cr, Cd), soil pollution was found to be below the limits set in control regulations. From the results obtained, in the green area of the sludge mixture in the field of recreation in the city landscape, organic fertilizer, germination medium was defined as the availability of rearing.

Keywords: Drying, Sewage sludge

SHIP FINANCING TECHNIQUES IN TURKEY

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Abstract:

Ship financing is needed serious capital. So, it's evaluated as distinct from other investments. Several techniques are used at maritime sector about ship financing on the world and in Turkey, for all that they aren't endless, especially they're restricted in Turkey due to interest rate or international economical situation.

This study reveals ship financing techniques, applying in Turkey.

Keywords: ship financing, sea transportation

THE FRICTION WELDING OF FEAL INTERMETALLIC ALLOY AND AISI 316 STAINLESS STEEL

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Abstract:

In this study the friction welding of FeAl intermetallic alloy with AISI 316 stainless steel was successfully realized. The FeAl intermetallic alloy was melted in vacuum arc melting furnace, stock bar AISI 316 stainless steel was used as opposite welding material. The welding was done at constant 1000 rpm friction speed, 50, 100 and 150 MPa friction pressures and 6, 9 and 12 seconds friction durations. The welding qualities were measured by shear strength tests. The best joining strength of 281 MPs was obtained in 150 MPa friction pressure and 12 seconds duration. The hardness variations from FeAl to 316 stainless steel were measured by microhardness test. The welding interface was examined by scanning electron microscopy (SEM), and line scan analysis revealed that at the welding interface the alloying elements' quantities were decreasing, which means that at both sides of the matrices alloying elements seemed to be diffused in each other.

Keywords: Intermetallic compounds based on FeAl, friction welding, scanning electron microscopy, hardness

JET FORMATION AND WATER PILE-UP IN SLAMMING OF RIGID BODIES

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Abstract:

Predicting impact forces and pressure distribution during water entry is of great importance in designing marine structures, missiles and seaplanes that experience slamming loads. Slamming also effects the operating conditions of the vessels in various sea states. In water entry of blunt bodies, different fluid dynamics phenomena like jet formation, cavity formation, water splashing, flow separation on solid surfaces and air entrapment between solid and liquid surface have been studied for decades. Whether the studies are experimental or numerical, most of them are restricted to 2D analysis, in spite of the fact that the slamming phenomenon itself is 3D. Furthermore, some physical phenomena such as jet formation and air entrapment are usually neglected in numerical models. Our study is aimed at understanding and modeling the dynamics of slamming under an extended range of parameters including jet velocities, surface properties and pile-up formations.

In this study, drop tests have been set up for hull bottom slamming. The slamming phenomenon is demonstrated by using three types of geometry, sphere, conic and cylinder. From digital images captured using a high speed camera, the formation of pile-ups and jets is studied through flow separation and evolution of water splashing at various velocities during the impact process. At the same time, we measure the pressure distribution on surface of the test bodies during impact by employing strain gages.

Here we present the results of our experimental work on drop tests of different shaped solid bodies. First we present preliminary results from our drop tests, using a sphere, a conic and a cylinder made of hard plastic. Second, we consider how flow separation on solid surfaces and splash formation are modified on these bodies. Finally, we present the results of the pressure distribution from strain gage measurements.

Keywords: hull slamming, water entry, hydrodynamic impact force

SYNTHESIS OF ETHYNYL-THIOPHENES AS STARTING MATERIALS FOR THE SYNTHESIS OF BIOLOGICALLY ACTIVE COMPOUNDS

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Abstract:

Synthesis of new heteroaromatic compounds have gained considerable interest due to their wide variety of biological activities. They have been used as anti-cancer], anti-bacterial, anti-parasitic agents. Many synthetic methods have been employed for the synthesis of polyheterocyclics and new variants still continue to appear stimulated by the broad spectrum of biological activity of these compounds. In this study, we synthesized ethynyl-thiophene intermediates as starting organic compounds for the synthesis of novel potentially biologically active heterocyclics. The scope, limitations, mechanism of these reactions and results will be discussed in meeting.

Keywords: Organic Chemistry, heterocyclics, biological activity

THE MICROSTRUCTURE AND HARDNESS ANALYSIS OF DECARBURIZATION FOLLOWED BY BORONIZING AISI 2080 TOOL STEEL

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Abstract:

In this study, X210Cr12 (AISI 2080) steel was subject to heat treatments including decarburizing, boronizing and hardening. Decarburizing and boronizing were carried out in a salt bath consisting of 60% NaCl and 40% NaCO3 for 1 and 3 hours at 980 ^{0}C, and a liquid medium containing 70% borax and 30% silicon carbide for 5 hours at 980 ^{0}C, respectively. The microstructures of the diffusion layers were examined by means of optical microscopy. The microhardness profiles of these layers were studied by a Vickers indenter. The hardness value obtained by the decarburizing followed by boronizing process is 10% higher than a boronized specimen's hardness. The transition zone was enlarged approximately 3 mm via 3 hours decarburizing followed by boronizing process.

Keywords: Tool steel, boronizing, decarburizing, microstructure, hardness, transition zone

TRANSMISSION OF WARNING MESSAGES AND OTHER REPORTS THROUGH VEHICULAR NETWORKS IN SMART CITIES

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Abstract:

Smart city promising new services that involve vehicles, drivers, citizens and city infrastructure are about to arise. Smart city applications could be used in emergency situations that entail the coordination and collaboration of implicated parts to treat immediately the injured who have suffered an accident.

When an accident happens, dynamic sensors (e.g., citizens with smartphones, connected vehicles) could shoot a short video of the accident and send it through an ad hoc network to warn authorities (e.g., hospitals, ambulance) and other citizens. With a video message, the level of seriousness of the accident could be much better evaluated by the authorities rather than with just a simple text message.

In this kind of situations, citizens play an important role in the new smart cities. Today, a high percentage of citizens carry a smart communications device in their bags. In the smart cities, citizens are welcome to participate and interact with the management of their city, e.g. by reporting situations in the city. The smart citizen/driver could send a multimedia message including different information regarding the incident (e.g., the GPS location, a voice message, a short video). A suitable kind of smart-911 (112 in Europe) application in the citizen's mobile/vehicle would send the multimedia message to the smart-911 emergency center, who would activate proper actions.

Different types of data could be gathered from the smart phones or tablets of volunteers, e.g., mobility information. This way, the public administration would have an interactive network of citizens who actively contribute to manage the city.

Our research focuses on the deployment of efficient routing protocols to manage video-warning messages in vehicular ad hoc networks.

This work was partly supported by the Spanish Government through projects TEC2013-47665-C4-1-R (Emergency Response In Smart Communities, EMRISCO) and TEC2010-20572-C02-02 (Continuity of Service, Security and QoS for Transportation Systems, CONSEQUENCE).

Keywords: vehicular ad hoc networks, smart cities, emergency warning and reporting

NUMERICAL ANALYSIS ON OXY-FUEL COMBUSTION FOR DIFFERENT MIXTURE RATE

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Abstract:

CO2, CO and NOx emissions are one of the major problem for pulverised coal combustion. For this reason, oxy-fuel combustion has been studied in recently years. Air isn't suitable for combustion in oxy-fuel process. Air and flue gas mixture was used to combustion coal in this process. Thus, oxy-fuel combustion produced low CO2, CO and NOx emissions. In this study, we investigated oxy-fuel combustion in pulverised coal fired for different mixture rate of combustion air. This numerical analysis for different O2/CO2/H2O mixture rate. Analysis was made by ANSYS-FLUENT 14 commercial software. In this analysis, were used realizable k-e turbulence model, multiple surface reactions char combustion method, single rate devolatilization method, DO radiation method and second-order upwind discretization method. In this analysis, were used to three stage combustion burner. Primary stage include coal+mixture, secondary and tertiary stage include mixture. There are swirl blades in tertiary stage channel regarding pulverised coal combustion burner which were used in this analysis. In this analysis, were investigated affect on combustion efficiency and CO2, CO and NOx emissions using different and different O2/CO2/H2O mixture rate(%21/%0/%0, %32/%40,8/%19,2, %32/%54,4/%13,6, %32/68/%0)

Keywords: oxy-fuel combustion, pulverised coal combustion, low CO2, CO and NOx emissions

POLYMER MODIFIED MORTARS BASED ON FLY ASH

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Abstract:

Fly ash is a puzzolanic material generated ac an industrial waste from the fero-nickel production process as well as coal-burning thermal power plants. Though a significant fraction of coal fly ash is used as a cement and concrete additive in the world, only a very small portion of the million tons of fly ash generated is re-utilized in Macedonia.

Polymer modified mortars based on fly ash were produced. Two types of polymer modified structures with two types of Fly ash obtained from FENI and Oslomej have been tested. Test-samples with 20% of fly ash content in conventional Portland cement were prepared. The obtained sample were tested with simulation of aging test in water, acid media (0,25M HCl) and alkali media (0,25 M NaOH). Besides the absorption %, also morphological changes have been followed. Mechanical behavior was followed by the compression test.

Keywords: Fly Ash, Polymer mortars,

VEHICLE'S ON-BOARD DIAGNOSTIC(OBD) AND ROAD DATA BOARD COMMUNICATION OVER MOBILE DEVICES IN TRAFFIC

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Abstract:

Traffic Management Systems (TMS) provides control of the different sytems such as cameras, traffic signalization, electronic inspection, traffic measurement and variable message board to ensure trouble-growing cities of daily traffic. Intelligent Transportation System(ITS) is an important tool for the solution of different problems encountered in road traffic at the same time provides a significant convenience for TMS. Developments of ITS are supported by large number of hardware and software for the roads, drivers, enviroment and pedestrians. Mobile devices have adapted qiickly to traffic enforcement and thus driver information applications have been developed. Instant monitoring of vehicle data in traffic flow will ensure that there is real-time traffic management and control. On-board Diagnostic (OBD) System is a standart that is developed by Society of Automotive Engineers(SAE) to monitor the flow rate of the vehicle CAN Bus. To provide the necessary controls over standart OBD port situated on the vehicles, considered different models and produced different years, vehicle informations can be transferred to TMS center. In this study CAN Bus data observed in the iPhone application via standard OBD diagnostic equipment. It is aimed that received vehicle data are shared on the information road-boards which are on the way to ensure a regular flow of traffic. For vehicle data transferring from smartphone to road-board is utilized Wi-Fi feature of the smartphones. Road-board telecommunication over mobile devices simplifies monitoring instantaneous data like fault-error of drivers via on-board diagnostic device which is located in vehicles. In future studies, it is expected that a large number of vehicle share state information in traffic by sending CAN data to the road-boards, thanks to the developing of software for smartphones support different operating systems such as Android or iPhone. Thus, this used data by Traffic Management Center enable to minimize potential accidents by finding solutions to the variable status such as traffic congestion, vehicle fault condition on early intervention, vehicle speed controls.

Keywords: OBD II, Smart Phone, IOS, Android, Traffic Management System

DETERMINATION OF THE EFFECTS OF OPERATING PARAMETERS ON THE SUPERNATANT TURBIDITY OF QUARTZ SUSPENSIONS BY EXPERIMENTAL DESIGN

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Abstract:

This work gives the results of flocculation of quartz particles in synthetically prepared suspensions by an anionic type flocculant with high molecular weight (SPP 508). The experiments were designed and carried out according to the Bohn-Behnken design (BBD) which is a type of response surface method (RSM). A BBD with five independent parameters at three levels was applied to jar test studies to investigate the effect of these variables on quartz flocculation process. Flocculant dosage, rapid mixing time, rapid mixing rate, solid ratio and settling time were tested to evaluate the effects and interactions of these factors on residual turbidity at natural pH. An empirical quadratic model with a high correlation coefficient was obtained for the estimation of residual turbidity.

Keywords: Quartz, flocculation, response surface method, Box-Behnken design

FUNCTIONALIZATION OF POLYESTER KNITTED FABRICS BY DYEING WITH MULTI-WALLED CARBON NANOTUBES

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Abstract:

In this study, MWCNTs were incorporated in polyester knitted fabrics by the conventional dyeing process commonly used to dye polyester fabrics, replacing dyes by MWCNTs dispersions. The dyeing process was carried out by the exhaustion method. The polyester fabric was immersed in the MWCNTs dispersion and maintained in motion for a certain period of time and temperature. The effect of MWCNT concentration on morphological properties was investigated with SEM images. To evaluate the colour parameter and the colour difference of the MWCNT dyed polyester fabrics, CIE Lab system is used. Washing fastness properties of the MWCNT dyed fabrics were also studied. Color differences (ΔE) of MWCNT dyed polyester fabrics before and after washing were investigated. The hydrophobic properties of the functionalized fabrics were studied by measuring the static contact angle.

Keywords: multi-walled carbon nanotubes, polyester fabric, knitted fabric, dyeing, textile

A DOUBLY FED INDUCTION GENERATOR MODELLING AND CONTROLLING FOR WIND TURBINE APPLICATIONS

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Abstract:

Doubly Fed Induction Genearators are widely used in wind turbines. It has superiror advantages that are variable operation speed, low converter cost and flexibility of power control. The power electronic converters need only be rated to handle fraction of the total power typically about 30%-40% nominal generator power. Therefore the losses in the power electronic converter can be reduced.

The aim of this project is to present the controlling and mathematical modelling of wind turbine driven doubly-fed induction generator. Firstly, basics of electrical machines were studied, mathematical modeling with a machine modeled in d-q axes and thus establishing the mathematical relationship between the machine quantities. After these studies modeling result was obtained by computer simulation. Finally determined control topology and implementation phase has started with the required equipment.

Keywords: Wind Turbine, Doubly Fed Induction generator, Renewable Energy

NUMERICAL INVESTIGATION OF AL2O3-WATER NANOFLUID FLOW AND HEAT TRANSFER IN SUDDEN EXPANSION CHANNELS

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Abstract:

In the present work forced convection heat transfer were investigated numerically for the fully developed fluid flow of incompressible viscous laminar flow under the constant wall heat flux in sudden expansion channels. Two fluids were selected as water and Al2O3-water nanofluid for considered problem. The flow assumed to be uniform in the channel inlet and numerical computations were performed for the fully developed laminar flow conditions. Ansys Fluent code, commercially available software based on finite volume approach was used to calculate the governing continuity, momentum and energy equations. Obtained results from numerical study was plotted graphically and discussed in detail taking into consideration non dimensional parameters such as Reynolds number, h (convective heat transfer coefficient) and φ nano particle volume fraction. The highest increase in h was calculated about 24.2% for 2% Al2O3 and 51% for 4% Al2O3 respectively according to base fluid (water) at highest value of Re=500.

Keywords: Forced convection, Al_2O_3-water nanofluid; sudden expansion; CFD

PVC MEMBRANE ELECTRODE FOR THE POTENTIOMETRIC DETERMINATION OF IODIDE

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Abstract:

Iodide helps to ensure proper thyroid gland function and serves as an antiseptic for skin wounds and for the emergency disinfection of drinking and swimming pool waters. It is added to table salt as a source of iodine for preventing iodine deficiency disorders. An excess of iodine or iodide ingestion can produce goiter and hypothyroidism as well as hyperthyroidism. Due to the importance of iodide as an essential micronutrient, its determination is an important analytical task[1]. Most of the analytical methods are complicated and expensive for routine analysis. However, ion-selective electrodes offer an inexpensive and convenient method for fast analysis with high selectivity, and have emerged as one of the most promising tools for direct determination of various anionic and cationic species in biological and industrial analysis [2]. Therefore, considerable effort has been devoted to the construction of new polymeric membrane electrodes for the selective potentiometric detection of anionic species by using new macrocyclic compounds as ionophores[3,4].

For this purpose, we developed a new iodide-selective PVC membrane electrode based on [1,1′-Bis(diphenylphosphino)ferrocene] dichloropalladium(II) as an ionophore. An optimum membrane composition of 2 % ionophore, 68.3 % o-nitrophenyloctylether, 29.7 % PVC and tetradodecylammonium tetrakis(4-chlorophenyl) borate 70% mole ratio relative to ionophore was found. The electrode exhibited linear response to iodide ions in the range of 1.0×10-1 -1.0×10-6 M with a slope of 54.7±1.1 mV/pI at pH 4.0. Other response characteristics such as lifetime (at least 6 months), response time (5-10s) and selectivity coefficients calculated by SSM towards a variety of anions were determined. Additionally, SEM images of the membrane and impedance studies of the electrode were evaluated to suggest a possible response mechanism. The electrode was found work well under laboratory conditions by utilising it as an indicator electrode for the potentiometric determiation of iodide content in pharmaceutical samples.

Keywords: Iodide-selective electrode, potentiometric sensors, PVC membrane electrode, iodide determination

DEVELOPMENT SENSOR BASED SYSTEM SOFTWARE FOR THE CONTROL OF MOTOR AND AXIS MOTION ON THE CNC TURNING MACHINE

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Abstract:

Computer Assisted Numerical Control (CNC) machines that forms the basis of modern production is a manufacturing technology open to development today. In this study, real-time control of the axis and spindle motor was done on a CNC Lathe, and software based sensor condition monitoring system was developed. Providing the progress of the piece and spindle rotational speed for a certain work piece according to the information in the database improves the performance and precision of the production. Also, it can minimize the operator-based errors. Simultaneously monitoring the sensor values like real-time current, power, speed and temperature taken from the CNC on graphical user interface display such as temperature sensor data taken from CNC as well as operator-interacted control ability and recording all data related to the piece in a database improves the work quality.

Keywords: CNC, sensor control, user interface design, machinability, database.

A UNIVERSAL MACHINE CONVERTING TO COMPUTER NUMERICAL CONTROL MACHINE WITH MICROCONTROLLER AND CONCURRENT CONTROL

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Abstract:

All universal machine tools have their own specific work skills. These are identified depending on the machine design hardware. Universal machine tools with CNC machines, which is the same as the physical design and construction of a number of operational can work with more sensitive and economically. It is possible to simulate a graphic piece can begin for manufacturing. Also with the computer system, progress, speed values such as instantaneous as can be achieved. In this study, universal lathe has been converted to computer-aided lathe with microcontroller based embedded software and electronic systems. Universal machine system has been controlled with operator software that can work concurrent, suitable motor drive, advanced microprocessor. Electronic system design provides the operator with the possibility of manual and automatic operation.

Keywords: cnc machine converting, cnc design, concurrent control, microcontroller

THE EXAMINATION OF VISCOSITY PROPERTIES OF ALUMINUM POWDER REINFORCED POLYPROPHYLENE

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Abstract:

In this study, viscosity of aluminum (Al) powder reinforced polypropylene was determined according to constant temperature and pressure changing. To achieve that, aluminum powder in size of 100-210 μm and rate of 5%, 10% and 15% as weight were mixed in polypropylene (PP) material and then filled PP granules have been produced via extruder. In order to prevent oxidations, maleic anhydrite % 0.2 as weight was added as an antioxidant. Melt flow index apparatus are used for determining of viscosity. Experiments were carried out under condition of 4 different pressure (298,2 kPa, 524 kPa, 689,5 kPa ve 987,4 kPa) and at 240 oC constant temperature. Besides of viscosity, changes of shear rates of Al powder reinforced were determined. According to this study, viscosity and shear rate values decrease with increasing of Al powder reinforcement rate. Conversely, viscosity and shear rate values increase with increasing pressure.

Keywords: Reinforced polypropylene, Aluminum powder, Viscosity, Shear rate

STRUCTURAL INVESTIGATION OF METHYL 4'-[(3-METHYLPHENYL) (PHENYL) AMINO] BIPHENYL-4-CARBOXYLATE MOLECULE FOR OLED

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Abstract:

In this work, we investigated a combined experimental and theoretical study on molecular and vibrational structure of Methyl 4'-[(3-methylphenyl) (phenyl) amino] biphenyl-4-carboxylate (MZ-85) with FTIR, FT-Raman and Dispersive Raman spectral techniques. Electronic structures were investigated by TD-DFT method. Stability of the molecule arises from hyperconjugative interactions, charge delocalization and hydrogen bonding has been analyzed using natural bond orbital (NBO) analysis. 1H and 13C NMR chemical shifts were computed at B3LYP/6-311G(d,p) level of theory by Gauge-invariant atomic orbital (GIAO) in DMSO as a solvent using the IEFPCM model. The theoretical values showed very good agreement with the experimental values.

Keywords: OLED, DFT, IR,Raman

COMPARISON OF THE HOUSE DUST MITES SEEN IN LIVING ROOMS AND BEDROOMS IN ERZINCAN (TURKEY)

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Abstract:

House dust mites belonging to the subclass Acari are from arachnid organism and difficult to see with a naked eye with body size between 100-400 μm. In houses; they are found especially in carpets and fabric-covered furniture in living rooms and in the beds, pillows, sheets, comforters and carpets close to the beds in bedrooms. Their basic food sources are protein and lipid-rich human skin rashes. Today many commonly seen allergic diseases, including allergic asthma, allergic rhinitis, allergic conjunctivitis and eczema are caused by allergens. The most common allergens are house dust mites which are too small to be visible. We aimed to compare the number of mites in per gram of the dust sample and the species of the dust mites seen in living rooms and bedrooms in Erzincan province (Turkey).

Within scope of the study, a total of 74 dust samples were collected from 37 houses located at different sites in the Erzincan. The dust samples were collected from the carpets and fabric-covered furniture in living rooms and from the beds, pillows, sheets, comforters and carpets close to bed in bedrooms using a vacuum cleaner with a vacuum applied on an area of 1 square meter for 2 minutes. In order to prevent mixing of dusts with each other, disposable dust bags were used. After the dry sieving process, the samples were weighed using assay balance in order to define the number of mites in per 1 g and studied through lactic acid precipitation method. Petri dishes was examined under Leica EZ4 stereo microscope, the mites were collected with the help of a fine-tipped needle and preparations were made in Hoyer's medium. The mites were diagnosed under a phase-contrast light microscope (Leica DM 4000 B) using the relevant literature. Statistical analysis of the data obtained was performed using SPSS 20.0 statistic software.

In this study totally 5210 mite specimens were isolated, 1058 specimens from the living rooms, 4152 from the bedrooms. The median number of the mite specimens in per gram of the dust samples was found as 14 (2-136) in living rooms and 24 (2-1160) in bedrooms. *Dermatophagoides pteronyssinus* was the most commonly seen mite species in the houses followed by *Lepidoglyphus destructor*, *Euroglyphus maynei, D. farinae, Tyrophagus putrescentiae, Acarus siro, T. perniciosus, Suidasia nesbitti and Glycyphagus domesticus* respectively.

Mite-holding rate of the houses in Erzincan province was found as 100%. The most common specie was defined as Dermatophagoides pteronyssinus. There was a statistically significant difference between the number of mites from living rooms and bedrooms ($p<0.05$).

Acknowledgment: This study was supported by the Scientific Research Council of Erzincan University (EUBAP), research project number FEN-A-300614-0107.

Keywords: Acari, house dust mite, living room, bedroom, Erzincan

HUMAN RESOURCES MANAGEMENT AND RELATIONSHIP HOROSCOPE

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Abstract:

The subject of the study is constitute of human resources management and the relationship between horoscopes. Horoscopes will allow people to identify their characteristics, interests, likes and dislikes and will also allow people to move more conscious in relationships with other people. They will also determine their strengths and weaknesses, to observe the properties of others and understand the environment more carefully so they will allow people to obtain information about other people.

Today, along with the intellectual capital of people began to be seen as human resources, managers expectations from employees have started to change. With the "Right job- the right people" approach, the candidate next to the technical and physical properties with the understanding attitude, behavior, compliance with the company and the company's value, taking part in the long term of the company strategy, energy, to be innovative and be open to developing, whether it will be part of a team has become very important. This paper think that the consideration of the horoscopes for all human resources management stages including HR planning, finding- selection and placement of staff, training and development, reward, wages, job security, performance evaluation, career planning and discipline will give a different perspective for human resources management and taking to the horoscopes to the central position for human resources management will useful for the "Right job- the right people" approach.

The findings of the research will be shared HR professionals, managers, and the employees and their awareness as to whether horoscopes will be effective in working life.

Keywords: Human Resource Management, Horoscopes, HRM Stages

THE PARAMETRIC STUDY ON INTERCOOLER IN TURBOCHARGER DIESEL ENGINE

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Abstract:

Intercooler that is placed between the intake manifold and turbocharger, cooling element is a utility used to cool the heated air as a result of compression of the turbo in turbo-charged engine. The air which is heated as a result of compression of the Turbocharger, more air molecules through cooling by the intercooler enters into the cylinder in the engine block. With this operation, the intercooler contributes to the power increase with the pressure provided by the turbocharger. The maximum engine power can be achieved with the help of coldest air entering the engine. Therefore, a large size of intercooler means more air molecules can take to send more cold air into the engine. Thus, increase of the air quantity obtained by cooling results increased fuel economy and engine power, allows the improvement of durability and reduction of emissions.

For receiving the output expected from the intercooler, the intercooler sizing, geometric shape and type of the fins must be well designed. In this study, the intercooler size, type of surface and its thermodynamic parameters were studied for diesel engine. According to the obtained results, louvered surface type on air-side and flat surface type on the gas-side were found to be the best choice for design of intercooler. Designed with intercooler, fuel consumption is reduced about 4%, the effective power is increased by about 18 kW and the heat discharged from the exhaust has fallen 1% was seen that.

Keywords: Intercooler, Parametric study, Engine

A NEW MODIFIED SHAH CORRELATION ON CONDENSATION HEAT TRANSFER IN PLAIN TUBES

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Abstract:

Condensation is an important phenomenon in many industrial applications. Condensation occurs when the temperature of a vapor is reduced below its saturation temperature. Small hydraulic diameter, multi-port extruded aluminum tubes are widely used in automotive refrigerant condensers. Applications of condenser have been developed for heat transfer in small diameter tubes having rectangular shapes.

This study provides condensation heat transfer data for R-134a in small hydraulic diameter plain extruded three aluminum tubes, having different rectangular ports for 1.26 mm, 1.82 and 2.64 mm of hydraulic diameters. Condensation heat transfer are obtained 8 kW/m2 heat flux for 300-1000 kg/m2s mass velocity and 20-80% vapor qualities at 40 oC and 65 oC saturation temperature. The experimental data are compared with the Shah correlation. Condensation coefficient is over-predicted with a mean absolute deviation of 27% and 55% at 40 oC and 65 oC respectively by the Shah correlation. A new modified the Shah correlation is presented for small hydraulic tubes by changing constant to 2.8.

Keywords: Modified Shah Correlation, Condensation, Small hydraulic diameter

TOWARDS ROTATIONAL FOAM MOLDING OPERATIONS BASED ON PHYSICAL BLOWING AGENTS

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Abstract:

To date, applying chemical blowing agents was a common practice and a mandatory routine in rotational foam molding plastics processing operations due to the intrinsic atmospheric nature of the process (vented molds). The newly-patented rapid rotational foam molding process is expected to advance the scientific knowledge in the field and influence the direction of thought and activity. This is so, because for the first time, it fosters engineering potentials for elimination of the blowing agent nature-related limitations in the manufacture of advanced ultra-lightweight multi-layered ultra low-density rotationally foam molded cellular composites. In addition, by applying a variety of nano-fillers the resulting new classes of ultra lightweight integral-skin rotationally foam molded cellular composites would be characterized with dramatically improved mechanical, strength-to-weight, insulative, and morphological properties that are currently not achievable.

Keywords: rotomolding, cellular, composites, blowing agents

AUTOMATING NON-DESTRUCTIVE PRODUCT DISASSEMBLY SEQUENCE GENERATION

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Abstract:

This paper focuses on presenting a newly developed product design software tool, referred to as "OPTIDIS," that is intended for effectively generating, evaluating, and optimizing customized non-destructive product disassembly sequences. The main advantage of this Concurrent Engineering tool include the ability to predict, evaluate, and define optimal disassembly sequences as early as possible into the product design stage while keeping the cost of disassembly operations as low as possible. In this context, "OPTIDIS" can be utilized to increase the percentage of reuse of components and material recycling, reduce their adverse impact on the environment, ease the servicing of products, and secure a greater total return from the end-of-life products. In essence, this engineering tool is capable of integrating the three-dimensional CAD (Computer Aided Design) solid model information that exists for a conceptual design solution for a given technical device with the established constraints regarding its assembly. Consequently, product design engineers can thereby obtain valuable insights and effective means for optimizing product's disassembly sequences at a very early stage of the design process.

Keywords: design, disassembly, optimal disassembly sequence, component, fastener

SLOPE STABILITY ANALYSIS METHOD OF ACCOUNT BACK AND EXAMINATION OF TEKKE LANDSLIDE WITH BACK ANALYSIS METHOD

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Abstract:

One of the methods used in slope stability analysis is the method of back accounts. In the method provides the detection of unknown parameters from the parameters are known. In this study, which is one of slope stability methods back calculation method by including information about the method applied Tekke Landslide was investigated.

There are the characteristics of the soil profile among the factors that control the slope stability. In addition; there are additional loads can be located on the slope with topographic, geological, hydrological, climatic conditions and vibration forces. Ground material condition of Tekke Landslide on Antalya-Burdur highway were investigated and improvement works were carried out for path to enhance the existing standards. As a result of the assessment and accounts; the most appropriate solution is found to be the fore-piling applications for area available protect from landslides an increasing size. This situation has been deducted around the landslide areaso as to be properly drained. This situation was designed and implemented will not be allowedto the water inlets the bottom of the slope in landslide area.

Keywords: Slope, Stability, Tekke Landslide

CONTROLLED RECIRCULATION OF VENTILATING AIR IN UNDERGROUND COAL MINING – APPLICATIONS IN TURKEY AND IN THE WORLD

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Abstract:

As many underground mines have started to exploit reserves at deeper horizons and at locations remote from surface connections, it has become rather difficult to deliver adequate levels of airflow at these remote working areas. In the present work, the effect of controlled recirculation of ventilating air emphasized as an alternative for improving the environmental conditions in deep underground mines on the possible heat, humidity and gaseous contaminant formations are given in details.

Additionally, the applications of this method carried out in Turkey and in some other countries in the world are also presented together with their interpretations.

Keywords: Ventilation, Controlled ventilation, Underground Mining

DETERMINATION OF OXYGEN GAIN IN HYDRAULIC STRUCTURES

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Abstract:

Dissolved oxygen concentration in rivers is one of the most vital parameters for water quality and aquatic life. Hydraulic structures built in river systems increase oxygen saturation by supplying natural aeration. Smooth and stepped spillways are of those systems that provides natural aeration.In this article, the contribution of oxygen saturation from smooth and stepped spillways with various flowrates is studied.

In the experiments, a smooth spillway and a five stepped spillway structure are used respectively. The studies showed that stepped spillways provide a better aeration efficiency than smooth spillways for all flowrate cases considered. In addition, it's observed that aeration efficiency of stepped spillways varies according to flowrate and stream flow regime. The stepped spillways demonstrated "nap flow regime" in low flowrates and "skimming flow regime" in high flowrates.

Keywords: Aeration efficiency, smooth spillways, stepped spillways, nap flow regime, skimming flow regime

ENERGY EFFICIENCY ENHANCEMENT OF A HOUSEHOLD REFRIGERATOR USING WITH OIL COOLING CONDENSER

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Abstract:

An oil tank condenser is proposed for increasing overall performance of household refrigerator. A wire-tube condenser on the household refrigerator chosen as an experimental set was tested and energy consumption was measured. The greatest specialty of this work is using oil tank on the condenser. A novel refrigerator with oil tank condensers and an ordinary refrigerator with conventional hot-wall condensers are compared by means of COP and energy consumption. As a result of this study, according to the energy consumption, condenser with an oil tank (tank is full of oil) was found as % 65 and % 63 more effective than natural convection with unloaded and loaded situation respectively. Using a condenser placed inside the oil tank has caused to increase energy efficiency of the household refrigerator and to decrease energy consumption.

Keywords: Household refrigerator; energy consumption; performance of coefficient (COP); condenser.

WAR ON FAULTS

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Abstract:

Computing devices are becoming more important every day. However, the increase in their performance and the corresponding decrease in their price seems to be near the end. This leaves us with two possibilities. The first possibility is to run the processors much faster to the point zewhere they will make more random errors. The core question now is: If we have fast processors that are making a lot of errors, can we use them to get better overall performance? In communication the answer is yes: it is better to have a fast channel that has a moderate error rate, than a slower exact channel. In computation, the question remains open.

The second possibility is to look for alternative models of computation that are not based on silica. Biomolecular computing is a promising area, since in such models one can introduce even programmed movement. However, the processes at this scale, are inevitably faulty. This again leaves us with the eyes towards fault-tolerance.

In this talk, we will go further into the details of recent advances in these fields.

Keywords: Fault tolerance, reliable computation, faults

CYBERSECURITY: RECENT TRENDS AND PERSPECTIVES

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Abstract:

In this talk cybersecurity trends and perspectives are analyzed. Industry-specific problems are outlined and solutions are sketched. The issue of security countermeasures sponsorship by government and industry is discussed and the pros and cons of each approach are debated. The talk will emphasize on the need of an educated workforce that will reach up to highest echelons of the boardrooms. The necessity of a common understanding between technical, legal and managerial personnel is stressed. The talk concludes with an emphasis on the latest technologies and business practice and how they impact the way cybersecurity is addressed.

Keywords: Cybersecurity, attacks, cloud security, bring you own device, mobile security

5G: CHALLENGES AND INNOVATIVE SOLUTIONS

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Abstract:

Compared to the previous generations of mobile networks, 5G will provide a significant paradigm shift by including beyond state of the art technical solutions, like very high carrier frequencies with massive bandwidths, extreme base station and device densities, and very high number of transceiver antennas. However, unlike the previous generations, it will also be highly integrative and backward compatible: combining the novel 5G air interface and spectrum together with legacy wireless systems like LTE/LTE-A and WiFi, in order to facilitate an umbrella of high-rate coverage and a seamless user experience. In order to support this advances in the radio interface, the core network will also have to reach unprecedented levels of elasticity and intelligence. Spectrum regulation will need to be rethought and significantly improved, whereas energy and cost efficiencies will become one of the key parameters that will steer the 5G design and development. This talk will outline the 5G related topics, identifying the key challenges for future research and preliminary 5G standardization activities, and will provide a comprehensive survey of the current R&D activities.

Keywords: 5G, IoT, mmWave, massive MIMO, M2M/D2D communication, NFV/SDN,C-RAN

TOWARDS A MORE SAFE AND GREEN DRIVING EXPERIENCE IN SMART CITIES USING VEHICULAR NETWORKING

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Abstract:

In this talk, we discuss the challenges and opportunities of the connected cars vision in relation to some of the most needed components in modern smart cities: improved road traffic safety combined with reduced travel times and emissions. Using selected application examples including the use of virtual traffic lights, intelligent intersection management, and platooning, we assess the needs on the underlying system components with a particular focus on inter-vehicle communication.

With the standardization of the DSRC/WAVE protocol stack, the vehicular networking community converged to a common understanding of data dissemination schemes that already have high potentials for many applications. Yet, vehicular networks are way more dynamic than originally considered. Radio signal fading and shadowing effects need to be considered in the entire design process as well as the strong need for low-latency communication, fairness, and robustness. We bring all these aspects together outlining necessary ingredients for future connected cars applications.

Keywords: Vehicular networking, smart cities, intelligent transportation systems, road traffic safety

FINANCIAL PROBLEMS OF SMEs IN TURKEY AND THEIR SOLUTIONS

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Abstract:

Small and Medium Enterprises (SMEs) are defined as independent management, in SMEs person who is taking risk is entrepreneur, the competition power in the current markets, the marketing power in the active market, close cooperation between business owner and staff, cost of business and composition of the expenditures of business owner, low profile of expert level.

The aim of this paper is to investigate main financial problems of SMEs in Turkey, how these problems can be solved with the smallest amount of the help within their own organization.

This paper represents a thorough literature review of multifaceted sources including: studies, books, peer reviewed journals, etc.

The most important qualitative specifications of small and medium sized enterprises are that the entrepreneurship, management and ownership of these enterprises have been collected by the same person. Through this work definitions of SMEs are represented in second part, third part will include SMEs' advantages and disadvantages and last part of this work will include possible solutions for financial problems of these enterprises in Turkey and ways of applications of possible solutions.

Business owner should pay ultimate attention to their individual expenditures and their reimbursement as a system, which should be established to follow up the date of the credits. SMEs should also work with the some credit institutions and at least get in touch with them, so possibility of benefit from the low rate advantages will be increased.

Keywords: Small and Medium Enterprises, Turkey, Financial Problems, Solution Offers.

UAV ROUTE PLANING FOR AVOIDING ENEMY RADARS

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Abstract:

Unmanned Aerial Vehicles (UAV) are one of the most expensive tools for reconnaissance and tactical attack missions in military operations. As a countermeasure to increasing usage of UAVs, the conventional method is to employ stationary radars to detect the presence of any UAV. Therefore, while planning route for an UAV, not only the target locations, but the radar locations and their coverage radius should be taken into consideration. Moreover, to minimize the risk of flying over enemy terrain, total length of UAV route should be minimized. In this study, a route planning solution for multiple UAVs are developed and tested under the aforementioned constraints. Thus, the developed solution generates a route, which is not covered by the radars and its length is shorter. To simulate the locations of radars and targets, we use the Travelling Salesman Problem (TSP) benchmark files. Radar coverage area is modeled as two dimensional circular areas with a fixed radius. We develop a Genetic Algorithm (GA) to create the desired route. The GA initially builds a population of routes from one target to another. Next, each solution is checked to see if any radar coverage intersects with. If so, we apply an avoidance procedure to modify that part of the route such that the UAV can fly out of the radar coverage. The avoidance procedure is repeated until all the parts of the route are out of all radars' coverage. In order to find the shortest route, we build up necessary crossover and mutation operations. Moreover, we also apply a non-heuristic method to solve this problem and the results of both methods are compared. The experiment results prove the success and the validity of the proposed GA.

Keywords: Genetic algorithm, optimization, uav route planing, radar avoidance

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